



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 10:19 AM UTC

PDB ID : 6SIW / pdb\_00006siw  
Title : PaaK family AMP-ligase with AMP  
Authors : Naismith, J.H.; Song, H.  
Deposited on : 2019-08-12  
Resolution : 1.96 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

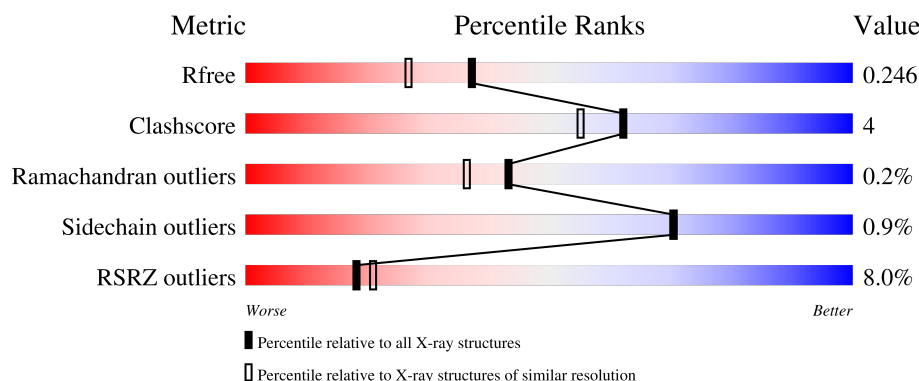
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.96 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	3494 (1.96-1.96)
Clashscore	190562	3612 (1.96-1.96)
Ramachandran outliers	187476	3587 (1.96-1.96)
Sidechain outliers	187428	3587 (1.96-1.96)
RSRZ outliers	180081	3495 (1.96-1.96)

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	436	
2	B	437	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
7	EDO	A	506	-	-	X	-

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 7190 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 PaaK-like ligase (AMP-dependent synthetase and ligase).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	432	Total	C	N	O	S	0	3	0
			3396	2145	606	632	13			

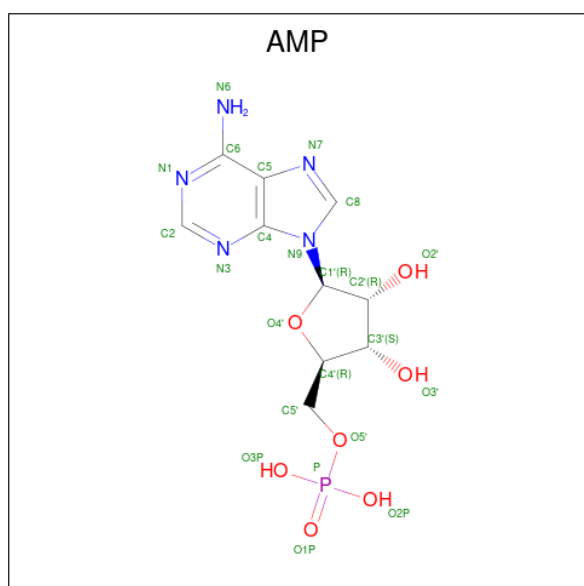
- Molecule 2 is a protein called PaaK-like ligase (AMP-dependent synthetase and ligase).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	433	Total	C	N	O	S	0	4	0
			3416	2155	608	637	16			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	ALA	-	expression tag	UNP A0A022MRT4

- Molecule 3 is ADENOSINE MONOPHOSPHATE (CCD ID: AMP) (formula: C<sub>10</sub>H<sub>14</sub>N<sub>5</sub>O<sub>7</sub>P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
3	B	1	Total	C	N	O	P	0	0
			23	10	5	7	1		

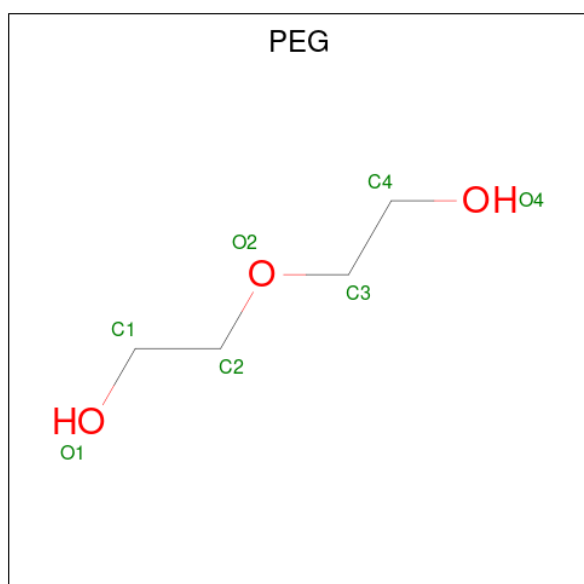
- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	3	Total	Mg	0	0
			3	3		
4	B	1	Total	Mg	0	0
			1	1		

- Molecule 5 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Zn	0	0
			1	1		
5	B	1	Total	Zn	0	0
			1	1		

- Molecule 6 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



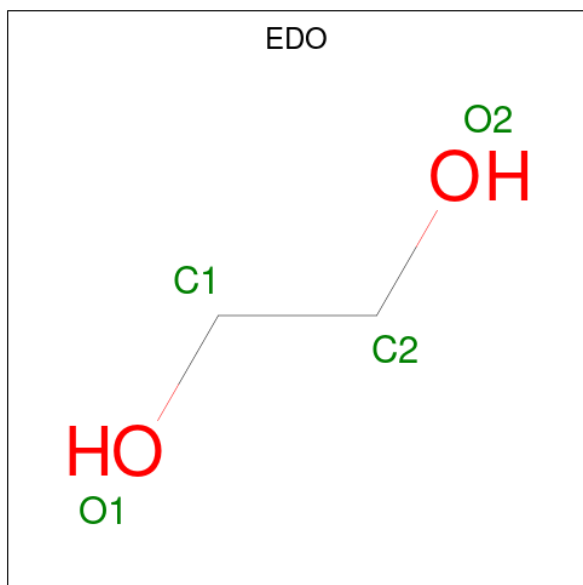
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			7	4	3		

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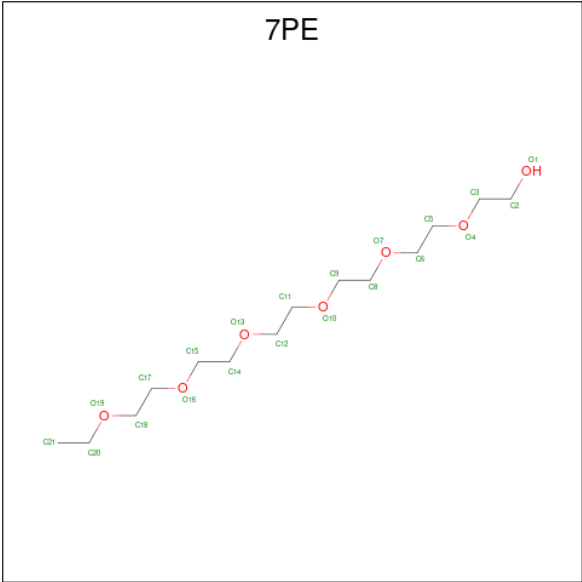
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula:  $C_2H_6O_2$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			4	2	2		
7	A	1	Total	C	O	0	0
			4	2	2		
7	B	1	Total	C	O	0	0
			4	2	2		
7	B	1	Total	C	O	0	0
			4	2	2		

- Molecule 8 is 2-(2-(2-(2-(2-(2-ETHOXYETHOXY)ETHOXY)ETHOXY)ETHOXY)ETHOXY)ETHANOL (CCD ID: 7PE) (formula:  $C_{14}H_{30}O_7$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	B	1	Total	C	O	0	0
			21	14	7		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	129	Total	O	0	0
			129	129		
9	B	132	Total	O	0	0
			132	132		





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	107.13Å 138.09Å 130.43Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	84.65 – 1.96 84.65 – 1.96	Depositor EDS
% Data completeness (in resolution range)	98.7 (84.65-1.96) 98.7 (84.65-1.96)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.71 (at 1.95Å)	Xtriage
Refinement program	REFMAC 5.8.0253	Depositor
R, $R_{free}$	0.200 , 0.236 0.212 , 0.246	Depositor DCC
$R_{free}$ test set	3574 reflections (5.15%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	30.2	Xtriage
Anisotropy	0.197	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 50.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	7190	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.93% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PEG, 7PE, AMP, ZN, MG, EDO

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	1.02	3/3481 (0.1%)	1.30	1/4746 (0.0%)
2	B	1.01	2/3499 (0.1%)	1.29	3/4768 (0.1%)
All	All	1.02	5/6980 (0.1%)	1.29	4/9514 (0.0%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	55	ALA	C-O	8.31	1.34	1.24
2	B	308	CYS	C-O	7.18	1.32	1.23
1	A	308	CYS	C-O	7.04	1.32	1.23
2	B	55	ALA	C-O	5.67	1.31	1.24
1	A	57	VAL	C-O	-5.49	1.18	1.24

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	154	ASP	CA-CB-CG	5.55	118.15	112.60
1	A	55	ALA	O-C-N	5.14	129.01	122.33
2	B	268	ARG	CA-C-N	5.07	127.49	120.29
2	B	268	ARG	C-N-CA	5.07	127.49	120.29

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	3396	0	3342	25	0
2	B	3416	0	3364	30	0
3	A	23	0	12	0	0
3	B	23	0	12	0	0
4	A	3	0	0	0	0
4	B	1	0	0	0	0
5	A	1	0	0	0	0
5	B	1	0	0	1	0
6	A	7	0	10	0	0
6	B	21	0	30	1	0
7	A	8	0	12	4	0
7	B	8	0	12	0	0
8	B	21	0	30	4	0
9	A	129	0	0	3	0
9	B	132	0	0	2	0
All	All	7190	0	6824	56	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 4.

All (56) 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:310:CYS:HG	5:B:503:ZN:ZN	0.66	0.89
1:A:371:PRO:HD3	7:A:506:EDO:O1	1.87	0.74
1:A:140:GLN:NE2	8:B:508:7PE:H91	2.03	0.74
1:A:140:GLN:HE21	8:B:508:7PE:H91	1.52	0.73
2:B:3:ARG:HH21	2:B:7:GLU:HB2	1.56	0.69
2:B:269:THR:HG22	2:B:271:THR:HG23	1.75	0.68
1:A:263:GLU:OE2	1:A:294:ARG:HD3	1.93	0.68
2:B:263:GLU:OE2	2:B:294:ARG:HD3	1.95	0.66
2:B:280[B]:MET:HA	2:B:280[B]:MET:HE2	1.80	0.62
2:B:3:ARG:HH22	2:B:10:ASP:CG	2.08	0.61
1:A:217:GLU:OE1	1:A:220:ARG:NH2	2.35	0.59
2:B:280[B]:MET:HG2	2:B:301:VAL:HG21	1.85	0.58
2:B:342:LEU:HD13	2:B:386:LEU:HD12	1.85	0.57
7:A:506:EDO:C2	9:A:653:HOH:O	2.56	0.54
2:B:79:GLU:H	2:B:79:GLU:CD	2.16	0.54
1:A:167:ARG:NH1	2:B:69:TYR:OH	2.38	0.53
2:B:3:ARG:NH2	2:B:10:ASP:OD2	2.35	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:241:THR:HG21	2:B:297:LEU:HD11	1.91	0.51
2:B:217:GLU:OE2	2:B:221:ARG:NE	2.45	0.50
1:A:181:PRO:HD2	1:A:213:GLU:CG	2.42	0.50
2:B:280[A]:MET:CE	2:B:317:VAL:HG21	2.43	0.49
1:A:217:GLU:OE2	1:A:221:ARG:NH1	2.46	0.48
1:A:332:ALA:HB3	1:A:392:VAL:CG1	2.42	0.48
1:A:280:MET:CE	1:A:317:VAL:HG21	2.43	0.48
7:A:506:EDO:H22	9:A:653:HOH:O	2.13	0.48
2:B:269:THR:HG22	2:B:271:THR:CG2	2.44	0.48
2:B:144:ARG:HH22	8:B:508:7PE:H92	1.79	0.48
1:A:280:MET:HE2	1:A:301:VAL:HG21	1.95	0.48
1:A:372:GLU:OE1	1:A:372:GLU:HA	2.13	0.48
2:B:127:ARG:HD3	2:B:154:ASP:O	2.13	0.47
1:A:236:TYR:HE2	1:A:280:MET:HE3	1.78	0.47
2:B:280[A]:MET:HE2	2:B:301:VAL:HG11	1.97	0.46
1:A:69:TYR:OH	2:B:167:ARG:NH1	2.47	0.45
1:A:328:ARG:HD2	1:A:330:GLY:O	2.16	0.45
2:B:104:TRP:HB3	8:B:508:7PE:H21	1.99	0.45
1:A:362:ASP:O	1:A:393:PRO:HG2	2.18	0.44
1:A:357:ALA:HA	1:A:365:GLU:O	2.18	0.44
2:B:236:TYR:HE2	2:B:280[A]:MET:HE3	1.84	0.43
2:B:153:GLY:C	2:B:154:ASP:O	2.60	0.43
2:B:280[A]:MET:HE2	2:B:301:VAL:HG21	2.01	0.43
1:A:323:ALA:HB1	1:A:337[B]:GLN:HG2	2.01	0.42
2:B:280[B]:MET:HG2	2:B:301:VAL:HG11	2.01	0.42
2:B:280[A]:MET:HE1	2:B:317:VAL:HG21	2.00	0.42
2:B:357:ALA:HA	2:B:365:GLU:O	2.18	0.42
2:B:362:ASP:O	2:B:393:PRO:HG2	2.20	0.42
1:A:45:THR:HG22	1:A:46:THR:N	2.35	0.42
1:A:168:VAL:HG13	1:A:172:LEU:HD12	2.01	0.42
1:A:280:MET:HE2	1:A:301:VAL:HG11	2.01	0.41
6:B:505:PEG:H31	9:B:714:HOH:O	2.21	0.41
1:A:279:GLN:HA	1:A:299:ASP:O	2.20	0.41
1:A:140:GLN:HG3	1:A:150:VAL:HG11	2.02	0.41
2:B:428:ASP:HA	9:B:605:HOH:O	2.21	0.41
2:B:280[B]:MET:HA	2:B:280[B]:MET:CE	2.50	0.41
1:A:332:ALA:HB3	1:A:392:VAL:HG12	2.02	0.40
7:A:506:EDO:H21	9:A:653:HOH:O	2.20	0.40
1:A:416:ILE:HB	2:B:88:SER:HA	2.04	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	433/436 (99%)	419 (97%)	14 (3%)	0	100	100
2	B	433/437 (99%)	417 (96%)	14 (3%)	2 (0%)	24	16
All	All	866/873 (99%)	836 (96%)	28 (3%)	2 (0%)	43	36

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	154	ASP
2	B	432	ALA

### 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	349/350 (100%)	347 (99%)	2 (1%)	78	79
2	B	353/350 (101%)	349 (99%)	4 (1%)	65	64
All	All	702/700 (100%)	696 (99%)	6 (1%)	70	70

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	320	LEU
1	A	372	GLU
2	B	3	ARG
2	B	62	LYS

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Mol	Chain	Res	Type
2	B	127	ARG
2	B	338	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	204	HIS
1	A	376	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 oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 17 ligands modelled in this entry, 6 are monoatomic - leaving 11 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
3	AMP	B	501	4	25,25,25	0.52	0	37,38,38	0.62	0
7	EDO	A	506	-	3,3,3	0.22	0	2,2,2	0.27	0
7	EDO	A	507	-	3,3,3	0.07	0	2,2,2	0.09	0
8	7PE	B	508	-	20,20,20	0.42	0	19,19,19	0.36	0
6	PEG	B	504	-	6,6,6	0.18	0	5,5,5	0.09	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	AMP	A	501	4	25,25,25	0.32	0	37,38,38	0.44	0
7	EDO	B	506	-	3,3,3	0.11	0	2,2,2	0.17	0
7	EDO	B	509	-	3,3,3	0.15	0	2,2,2	0.19	0
6	PEG	A	505	-	6,6,6	0.15	0	5,5,5	0.08	0
6	PEG	B	507	-	6,6,6	0.16	0	5,5,5	0.03	0
6	PEG	B	505	-	6,6,6	0.23	0	5,5,5	0.16	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	AMP	B	501	4	-	1/10/26/26	0/3/3/3
7	EDO	A	506	-	-	1/1/1/1	-
7	EDO	A	507	-	-	0/1/1/1	-
8	7PE	B	508	-	-	9/18/18/18	-
6	PEG	B	504	-	-	1/4/4/4	-
3	AMP	A	501	4	-	0/10/26/26	0/3/3/3
7	EDO	B	506	-	-	1/1/1/1	-
7	EDO	B	509	-	-	1/1/1/1	-
6	PEG	A	505	-	-	2/4/4/4	-
6	PEG	B	507	-	-	3/4/4/4	-
6	PEG	B	505	-	-	3/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	504	PEG	C1-C2-O2-C3
8	B	508	7PE	C15-C14-O13-C12
6	B	505	PEG	O2-C3-C4-O4
8	B	508	7PE	O16-C17-C18-O19
6	A	505	PEG	O1-C1-C2-O2
8	B	508	7PE	O13-C14-C15-O16
6	B	507	PEG	O1-C1-C2-O2
6	B	507	PEG	O2-C3-C4-O4
7	A	506	EDO	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
7	B	509	EDO	O1-C1-C2-O2
8	B	508	7PE	O7-C8-C9-O10
8	B	508	7PE	C12-C11-O10-C9
6	A	505	PEG	C4-C3-O2-C2
6	B	505	PEG	O1-C1-C2-O2
3	B	501	AMP	C3'-C4'-C5'-O5'
8	B	508	7PE	C11-C12-O13-C14
6	B	505	PEG	C4-C3-O2-C2
6	B	507	PEG	C1-C2-O2-C3
8	B	508	7PE	C21-C20-O19-C18
7	B	506	EDO	O1-C1-C2-O2
8	B	508	7PE	C5-C6-O7-C8
8	B	508	7PE	O10-C11-C12-O13

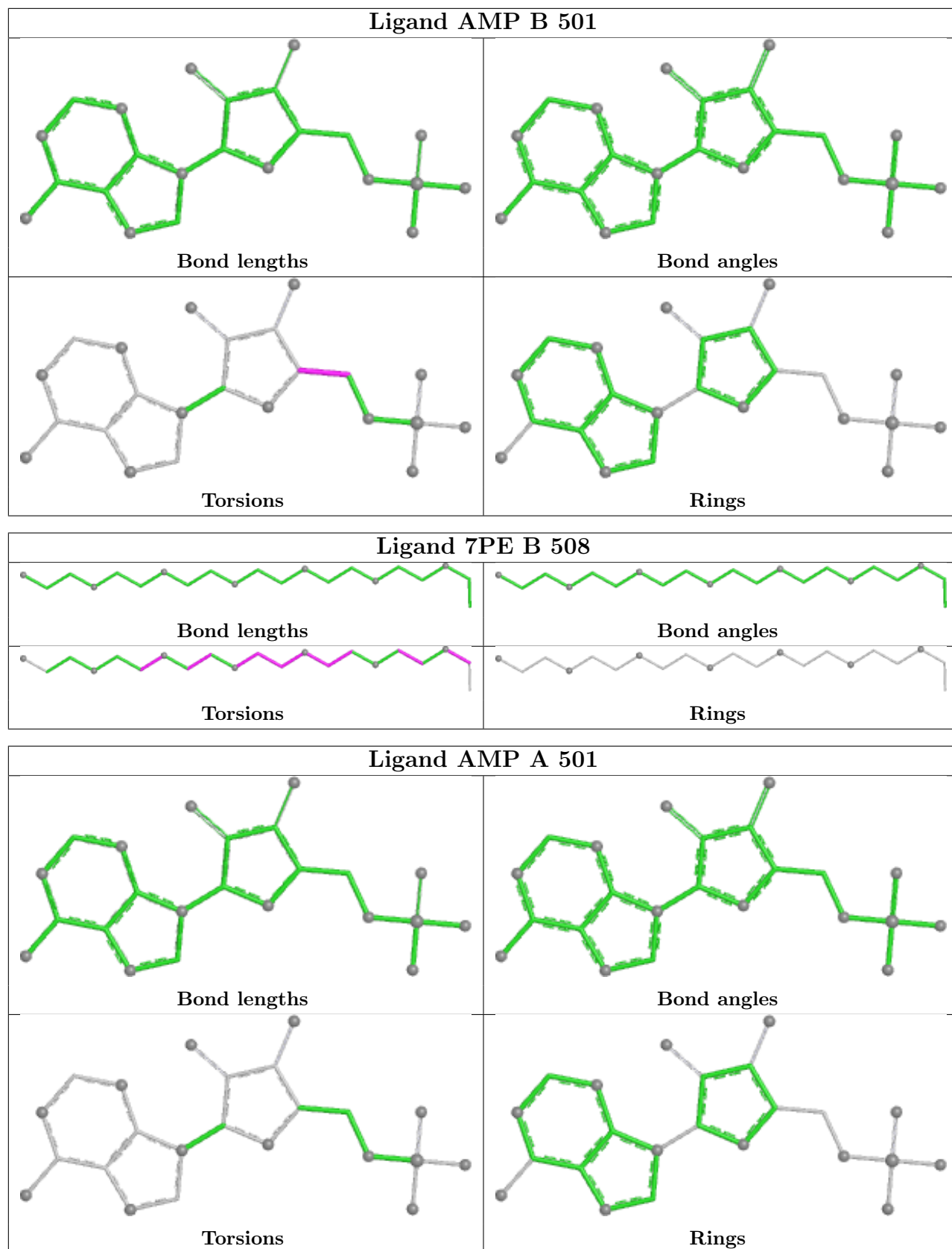
There are no ring outliers.

3 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	506	EDO	4	0
8	B	508	7PE	4	0
6	B	505	PEG	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.





## 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	432/436 (99%)	0.47	29 (6%)	24 27	15, 40, 73, 151	3 (0%)
2	B	433/437 (99%)	0.54	40 (9%)	14 16	13, 41, 70, 109	4 (0%)
All	All	865/873 (99%)	0.50	69 (7%)	18 21	13, 41, 71, 151	7 (0%)

All (69) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	436	PHE	12.1
1	A	433	VAL	5.1
1	A	435	TYR	4.6
1	A	46	THR	4.2
1	A	432	ALA	4.0
2	B	268	ARG	3.8
2	B	330	GLY	3.7
2	B	436	PHE	3.5
2	B	320	LEU	3.5
2	B	0	ALA	3.4
1	A	434	MET	3.3
1	A	372	GLU	3.3
2	B	267	PRO	3.1
1	A	417	LEU	3.1
2	B	2	SER	3.0
2	B	329	ILE	2.9
1	A	45	THR	2.9
2	B	44	GLY	2.9
1	A	47	PRO	2.7
1	A	431	LYS	2.7
2	B	265	TYR	2.7
2	B	430[A]	ASP	2.7
1	A	373	PRO	2.7
2	B	332	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
2	B	269	THR	2.6
2	B	4	SER	2.6
2	B	20	LEU	2.6
2	B	144	ARG	2.6
1	A	267	PRO	2.6
2	B	435	TYR	2.5
1	A	392	VAL	2.5
2	B	57	VAL	2.5
2	B	414	ARG	2.5
1	A	326	GLY	2.5
1	A	90	THR	2.5
2	B	334	VAL	2.5
1	A	308	CYS	2.4
1	A	337[A]	GLN	2.4
1	A	192[A]	LYS	2.4
1	A	269	THR	2.4
2	B	90	THR	2.4
2	B	333	THR	2.4
2	B	390	LEU	2.3
1	A	57	VAL	2.3
1	A	422	LEU	2.3
2	B	91	ALA	2.3
1	A	331	PRO	2.3
2	B	9	GLY	2.3
1	A	20	LEU	2.3
2	B	272	LEU	2.3
2	B	321	GLY	2.2
2	B	46	THR	2.2
1	A	8	LEU	2.2
2	B	15	ALA	2.2
2	B	331	PRO	2.2
2	B	433	VAL	2.1
2	B	56	GLY	2.1
2	B	39	ALA	2.1
2	B	3	ARG	2.1
2	B	322	ARG	2.1
1	A	418	LYS	2.1
2	B	156	ARG	2.1
2	B	221	ARG	2.1
1	A	325	THR	2.0
2	B	217	GLU	2.0
2	B	431	LYS	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	270	GLY	2.0
1	A	34	ARG	2.0
2	B	328	ARG	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 [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<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.

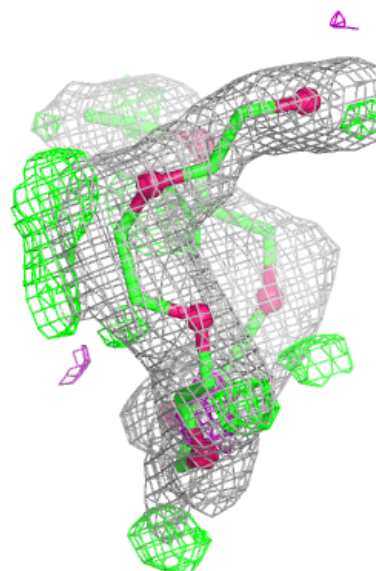
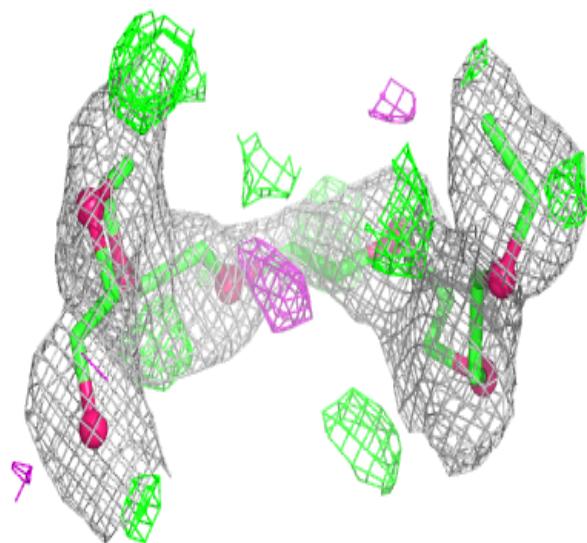
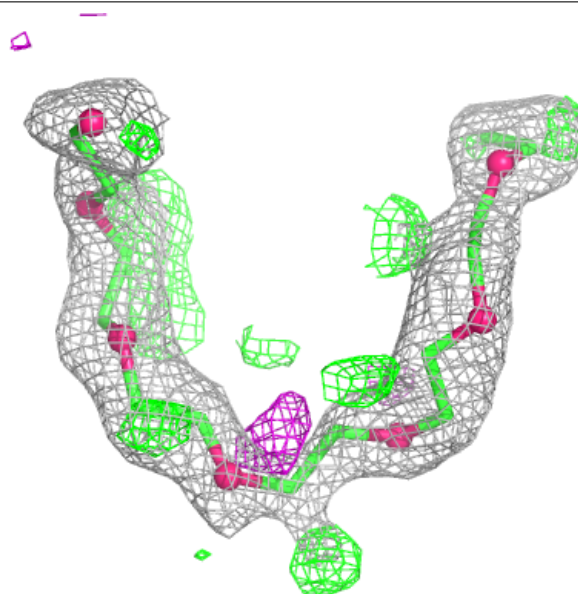
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
5	ZN	A	503	1/1	0.73	0.17	52,52,52,52	0
7	EDO	A	507	4/4	0.76	0.20	51,57,69,69	0
6	PEG	B	507	7/7	0.78	0.17	65,67,68,70	0
8	7PE	B	508	21/21	0.78	0.20	45,57,71,75	0
5	ZN	B	503	1/1	0.80	0.14	45,45,45,45	0
7	EDO	B	506	4/4	0.83	0.28	46,53,60,62	0
7	EDO	B	509	4/4	0.84	0.15	64,65,67,72	0
6	PEG	A	505	7/7	0.86	0.15	69,70,74,77	0
6	PEG	B	505	7/7	0.88	0.14	57,63,67,68	0
4	MG	B	502	1/1	0.88	0.14	60,60,60,60	0
4	MG	A	502	1/1	0.90	0.12	50,50,50,50	0
6	PEG	B	504	7/7	0.90	0.12	37,41,45,45	7
7	EDO	A	506	4/4	0.92	0.24	38,41,43,45	0
3	AMP	B	501	23/23	0.96	0.06	26,30,46,52	0
3	AMP	A	501	23/23	0.96	0.06	29,34,43,45	0
4	MG	A	508	1/1	0.98	0.04	19,19,19,19	0
4	MG	A	504	1/1	0.99	0.07	18,18,18,18	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.

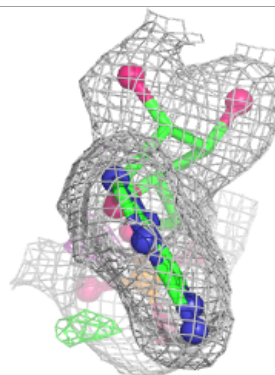
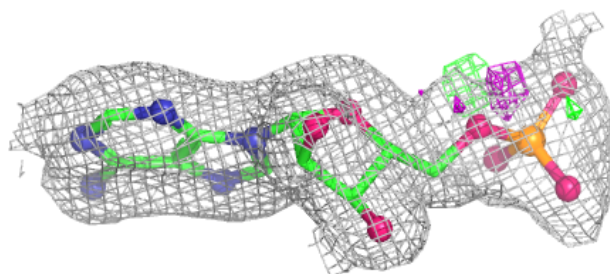
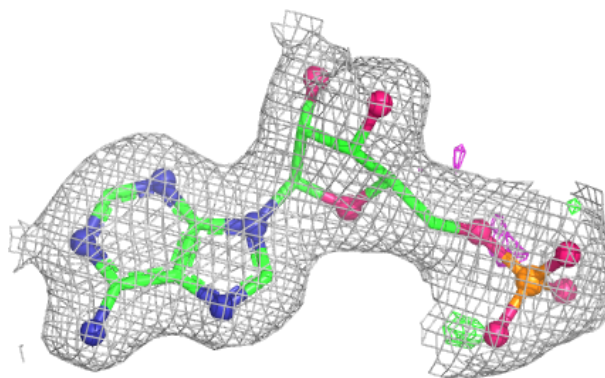
**Electron density around 7PE B 508:**

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

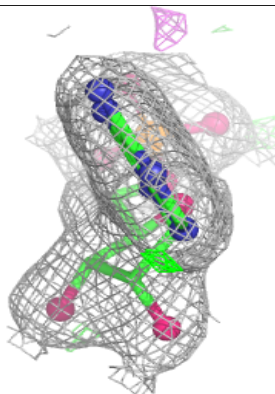
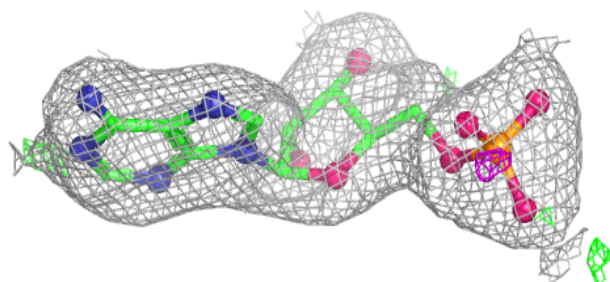
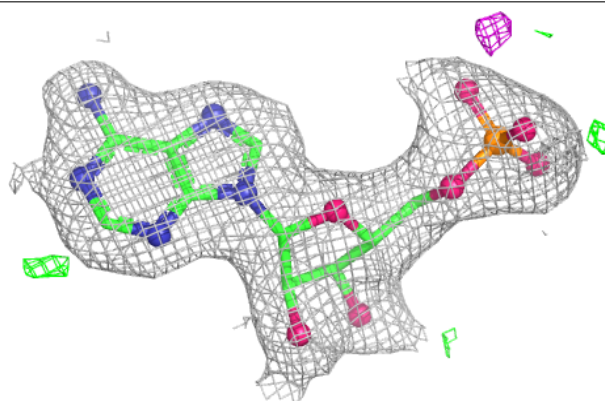


**Electron density around AMP B 501:**

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

**Electron density around AMP A 501:**

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



## 6.5 Other polymers [i](#)

There are no such residues in this entry.