



# Full wwPDB X-ray Structure Validation Report ⓘ

Dec 3, 2023 – 04:36 pm GMT

PDB ID : 2UYM  
Title : Crystal structure of KSP in complex with ADP and thiophene containing inhibitor 37  
Authors : Lee, T.T.  
Deposited on : 2007-04-10  
Resolution : 2.11 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>.

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

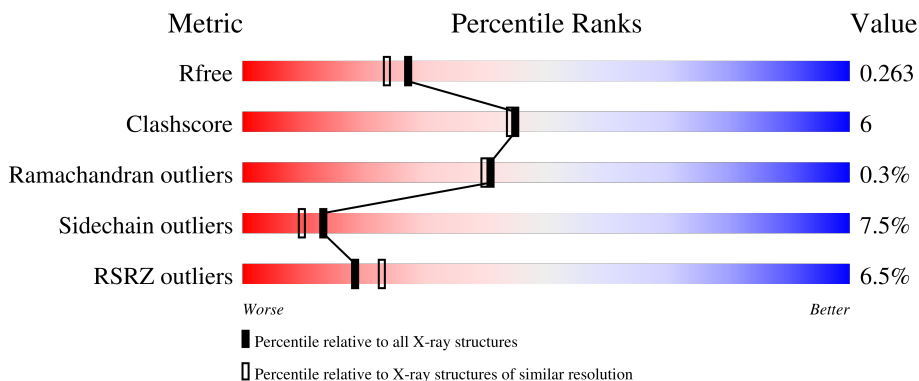
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.11 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	6241 (2.14-2.10)
Clashscore	141614	6778 (2.14-2.10)
Ramachandran outliers	138981	6705 (2.14-2.10)
Sidechain outliers	138945	6706 (2.14-2.10)
RSRZ outliers	127900	6112 (2.14-2.10)

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	368	 8% (red), 72% (green), 16% (yellow), 10% (grey)
1	B	368	 4% (red), 76% (green), 13% (yellow), 10% (grey)

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 5689 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 KINESIN-LIKE PROTEIN KIF11.

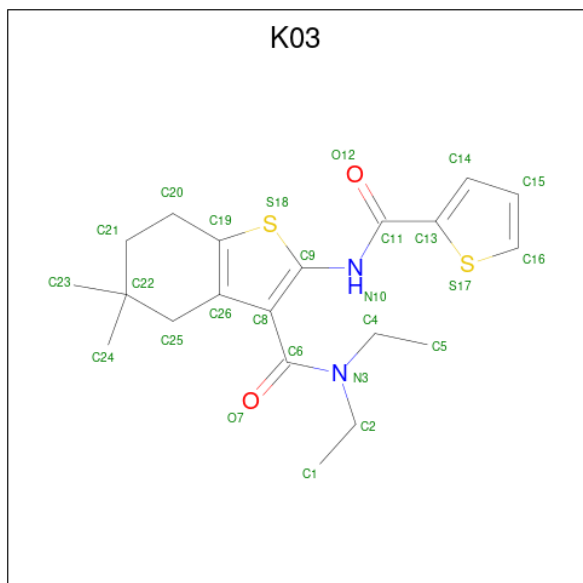
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	331	Total 2599	C 1628	N 453	O 508	S 10	0	0	0
1	B	331	Total 2599	C 1628	N 453	O 508	S 10	0	0	0

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).



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

- Molecule 4 is N,N-DIETHYL-5,5-DIMETHYL-2-[(2-THIENYLCARBONYL)AMINO]-4,5,6,7-TETRAHYDRO-1-BENZOTHIOPHENE-3-CARBOXAMIDE (three-letter code: K03) (formula: C<sub>20</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub>S<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O S 26 20 2 2 2	0	0
4	B	1	Total C N O S 26 20 2 2 2	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	200	Total O 200 200	0	0
5	B	183	Total O 183 183	0	0



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	160.79Å 80.45Å 68.83Å 90.00° 96.16° 90.00°	Depositor
Resolution (Å)	49.45 – 2.11 49.43 – 2.11	Depositor EDS
% Data completeness (in resolution range)	98.8 (49.45-2.11) 98.8 (49.43-2.11)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.04 (at 2.10Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.217 , 0.274 0.211 , 0.263	Depositor DCC
$R_{free}$ test set	2559 reflections (5.14%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	27.3	Xtrriage
Anisotropy	0.317	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 48.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	5689	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.73% 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: K03, ADP, MG

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	0.58	0/2637	0.69	2/3564 (0.1%)
1	B	0.56	0/2637	0.66	0/3564
All	All	0.57	0/5274	0.67	2/7128 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	341	LEU	CA-CB-CG	6.33	129.87	115.30
1	A	30	LEU	CA-CB-CG	6.15	129.45	115.30

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	2599	0	2627	36	0
1	B	2599	0	2627	33	0
2	A	27	0	12	0	0
2	B	27	0	12	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	26	0	26	1	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	26	0	26	3	0
5	A	200	0	0	7	0
5	B	183	0	0	10	1
All	All	5689	0	5330	69	1

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 6.

All (69) 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:82:TYR:OH	1:A:142:GLN:HG3	1.42	1.17
1:B:61:SER:HB3	5:B:2016:HOH:O	1.73	0.89
1:A:82:TYR:HH	1:A:142:GLN:HG3	1.39	0.85
1:A:152:THR:HG23	1:A:247:GLU:HG2	1.59	0.82
1:B:83:ARG:HG2	1:B:83:ARG:HH11	1.44	0.80
1:B:118:GLU:O	4:B:604:K03:H15	1.81	0.79
1:B:184:MET:HE3	1:B:194:VAL:HG11	1.66	0.77
1:B:212:GLN:HG3	5:B:2097:HOH:O	1.87	0.74
1:A:63:ARG:HD2	5:A:2025:HOH:O	1.92	0.70
1:A:200:GLU:HG2	5:A:2101:HOH:O	1.92	0.69
1:B:200:GLU:HG2	5:B:2087:HOH:O	1.93	0.69
1:A:184:MET:CE	1:A:194:VAL:HG11	2.23	0.68
1:A:223:THR:HG21	5:A:2034:HOH:O	1.94	0.66
1:B:184:MET:CE	1:B:194:VAL:HG11	2.27	0.65
1:A:57:LEU:CD2	1:A:58:ALA:H	2.12	0.63
1:A:115:MET:HE1	1:A:135:ILE:HD12	1.82	0.61
1:A:57:LEU:HB3	1:A:60:LYS:O	2.03	0.59
1:A:118:GLU:O	4:A:604:K03:H15	2.04	0.58
1:B:191:LYS:HE2	1:B:191:LYS:HA	1.86	0.57
1:A:354:HIS:HD2	5:A:2079:HOH:O	1.87	0.56
1:A:184:MET:HE3	1:A:194:VAL:HG11	1.86	0.56
1:B:51:SER:OG	1:B:65:THR:HG22	2.06	0.55
1:A:321:GLN:NE2	5:A:2161:HOH:O	2.39	0.55
1:B:223:THR:HG21	5:B:2022:HOH:O	2.06	0.55
1:A:57:LEU:HD22	1:A:58:ALA:H	1.72	0.54
1:A:48:LYS:HA	1:A:71:VAL:HG12	1.90	0.54
1:A:260:LYS:HE2	1:A:262:ASN:HD21	1.72	0.53
1:B:161:LEU:HD22	1:B:196:ILE:HD13	1.90	0.53
1:B:265:ASP:HB2	5:B:2137:HOH:O	2.08	0.52
1:B:87:CYS:HB2	1:B:88:PRO:HD3	1.91	0.52

*Continued on next page...*



Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:246:LYS:HE3	1:B:254:GLU:CD	2.31	0.51
1:A:265:ASP:HB2	5:A:2135:HOH:O	2.10	0.51
1:A:173:ASN:HD22	1:A:174:PRO:HD2	1.75	0.50
1:A:299:ILE:HG23	1:A:359:ILE:HD11	1.93	0.50
1:B:299:ILE:HG23	1:B:359:ILE:HD11	1.92	0.50
1:B:191:LYS:HA	1:B:191:LYS:CE	2.41	0.50
1:A:53:ARG:HD3	1:A:57:LEU:O	2.12	0.49
1:A:161:LEU:HD22	1:A:196:ILE:HD13	1.95	0.49
1:B:212:GLN:HG2	5:B:2103:HOH:O	2.12	0.49
1:A:351:GLU:O	1:A:355:ARG:HG3	2.13	0.48
1:B:83:ARG:HH11	1:B:83:ARG:CG	2.20	0.48
1:A:152:THR:HG22	1:A:154:PHE:HB3	1.95	0.48
1:B:27:PRO:HA	1:B:74:ALA:HB1	1.95	0.47
1:A:289:ASN:ND2	1:A:292:LEU:H	2.13	0.47
1:B:130:ASP:HB3	4:B:604:K03:H16	1.97	0.47
1:A:167:GLU:HG2	1:A:181:ARG:HE	1.80	0.46
1:A:312:ARG:HB3	1:A:312:ARG:HH11	1.80	0.46
1:B:119:ARG:HD2	4:B:604:K03:C15	2.45	0.46
1:A:240:SER:OG	1:A:262:ASN:ND2	2.49	0.46
1:B:257:LYS:HG2	5:B:2132:HOH:O	2.16	0.46
1:B:289:ASN:ND2	1:B:292:LEU:H	2.15	0.45
1:A:143:ILE:O	1:A:147:LEU:HB2	2.16	0.45
1:B:181:ARG:NH2	5:B:2080:HOH:O	2.49	0.45
1:B:362:LYS:C	5:B:2177:HOH:O	2.55	0.44
1:A:189:ARG:H	1:A:189:ARG:HG3	1.64	0.44
1:A:152:THR:HG23	1:A:247:GLU:CG	2.39	0.44
1:B:173:ASN:HD22	1:B:174:PRO:HD2	1.83	0.43
1:B:66:TYR:OH	1:B:351:GLU:OE2	2.23	0.43
1:B:172:LEU:HB3	1:B:202:ILE:CD1	2.48	0.43
1:A:160:LEU:HB3	1:A:172:LEU:HG	2.02	0.42
1:B:289:ASN:HD22	1:B:292:LEU:H	1.66	0.42
1:A:249:THR:HB	1:A:250:ILE:H	1.65	0.41
1:A:308:HIS:HE1	5:A:2159:HOH:O	2.02	0.41
1:B:38:HIS:ND1	1:B:38:HIS:N	2.68	0.41
1:B:173:ASN:HD22	1:B:174:PRO:CD	2.34	0.41
1:B:192:ARG:HD2	5:B:2085:HOH:O	2.20	0.41
1:B:323:SER:HA	1:B:328:THR:HB	2.02	0.41
1:A:289:ASN:HD22	1:A:292:LEU:H	1.68	0.40
1:A:29:ASN:O	1:A:33:ARG:HG3	2.22	0.40

All (1) 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)
5:B:2150:HOH:O	5:B:2150:HOH:O[2_556]	1.90	0.30

### 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	327/368 (89%)	313 (96%)	12 (4%)	2 (1%)	25	20
1	B	327/368 (89%)	316 (97%)	11 (3%)	0	100	100
All	All	654/736 (89%)	629 (96%)	23 (4%)	2 (0%)	41	40

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	249	THR
1	A	256	VAL

#### 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	293/322 (91%)	268 (92%)	25 (8%)	10	7
1	B	293/322 (91%)	274 (94%)	19 (6%)	17	14
All	All	586/644 (91%)	542 (92%)	44 (8%)	13	10

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	LYS
1	A	22	VAL
1	A	46	VAL
1	A	57	LEU
1	A	59	ASP
1	A	129	GLU
1	A	140	LEU
1	A	147	LEU
1	A	149	ASP
1	A	152	THR
1	A	165	ASN
1	A	171	LEU
1	A	173	ASN
1	A	178	VAL
1	A	189	ARG
1	A	191	LYS
1	A	200	GLU
1	A	223	THR
1	A	241	VAL
1	A	246	LYS
1	A	248	THR
1	A	249	THR
1	A	289	ASN
1	A	305	ARG
1	A	361	ASN
1	B	17	LYS
1	B	46	VAL
1	B	50	VAL
1	B	57	LEU
1	B	83	ARG
1	B	85	VAL
1	B	140	LEU
1	B	147	LEU
1	B	165	ASN
1	B	173	ASN
1	B	178	VAL
1	B	191	LYS
1	B	201	GLU
1	B	223	THR
1	B	241	VAL
1	B	289	ASN
1	B	305	ARG
1	B	329	ARG

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	341	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
1	A	173	ASN
1	A	212	GLN
1	A	229	ASN
1	A	262	ASN
1	A	271	ASN
1	A	289	ASN
1	A	308	HIS
1	A	321	GLN
1	A	354	HIS
1	A	361	ASN
1	B	173	ASN
1	B	212	GLN
1	B	229	ASN
1	B	262	ASN
1	B	271	ASN
1	B	289	ASN
1	B	308	HIS
1	B	321	GLN
1	B	342	ASN
1	B	361	ASN

### 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

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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
4	K03	A	604	-	28,28,28	1.64	4 (14%)	36,41,41	1.89	8 (22%)
2	ADP	A	601	3	24,29,29	1.12	3 (12%)	29,45,45	1.24	2 (6%)
4	K03	B	604	-	28,28,28	1.57	3 (10%)	36,41,41	1.79	8 (22%)
2	ADP	B	601	3	24,29,29	1.09	3 (12%)	29,45,45	1.19	2 (6%)

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
4	K03	A	604	-	-	3/20/31/31	0/3/3/3
2	ADP	A	601	3	-	0/12/32/32	0/3/3/3
4	K03	B	604	-	-	2/20/31/31	0/3/3/3
2	ADP	B	601	3	-	0/12/32/32	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	604	K03	C9-S18	4.91	1.78	1.73
4	A	604	K03	C19-C26	4.77	1.40	1.36
4	A	604	K03	C9-S18	4.66	1.78	1.73
4	B	604	K03	C19-C26	4.45	1.39	1.36
4	A	604	K03	C13-S17	2.87	1.80	1.71
4	B	604	K03	C13-S17	2.81	1.79	1.71
2	B	601	ADP	O4'-C1'	2.68	1.44	1.41
2	A	601	ADP	C5-C4	2.46	1.47	1.40
2	A	601	ADP	C2-N3	2.34	1.35	1.32
2	B	601	ADP	C5-C4	2.24	1.46	1.40
4	A	604	K03	C19-S18	2.20	1.78	1.74

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	ADP	O4'-C1'	2.16	1.44	1.41
2	B	601	ADP	C2-N3	2.15	1.35	1.32

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	604	K03	C9-C8-C26	5.25	114.45	111.75
4	A	604	K03	C20-C19-C26	4.74	129.60	125.86
4	A	604	K03	C21-C22-C25	4.62	112.54	108.21
4	A	604	K03	C11-N10-C9	-4.37	121.81	125.26
4	B	604	K03	C20-C19-C26	4.20	129.18	125.86
4	B	604	K03	C21-C22-C25	3.88	111.84	108.21
2	A	601	ADP	N3-C2-N1	-3.71	122.87	128.68
4	A	604	K03	C13-C11-N10	3.36	119.07	115.54
2	B	601	ADP	N3-C2-N1	-3.27	123.56	128.68
4	A	604	K03	O7-C6-N3	-3.18	117.59	122.67
4	A	604	K03	C9-C8-C26	3.06	113.32	111.75
4	B	604	K03	O7-C6-C8	-2.67	114.31	120.09
4	B	604	K03	C15-C16-S17	-2.59	106.73	113.01
4	A	604	K03	C15-C16-S17	-2.55	106.82	113.01
4	B	604	K03	S18-C9-N10	2.37	125.92	122.97
2	B	601	ADP	N6-C6-N1	2.32	123.38	118.57
4	B	604	K03	C11-N10-C9	-2.14	123.57	125.26
4	B	604	K03	O12-C11-C13	-2.06	117.75	120.84
4	A	604	K03	C23-C22-C25	-2.04	106.52	109.85
2	A	601	ADP	O3B-PB-O2B	2.01	115.33	107.64

There are no chirality outliers.

All (5) torsion outliers are listed below:

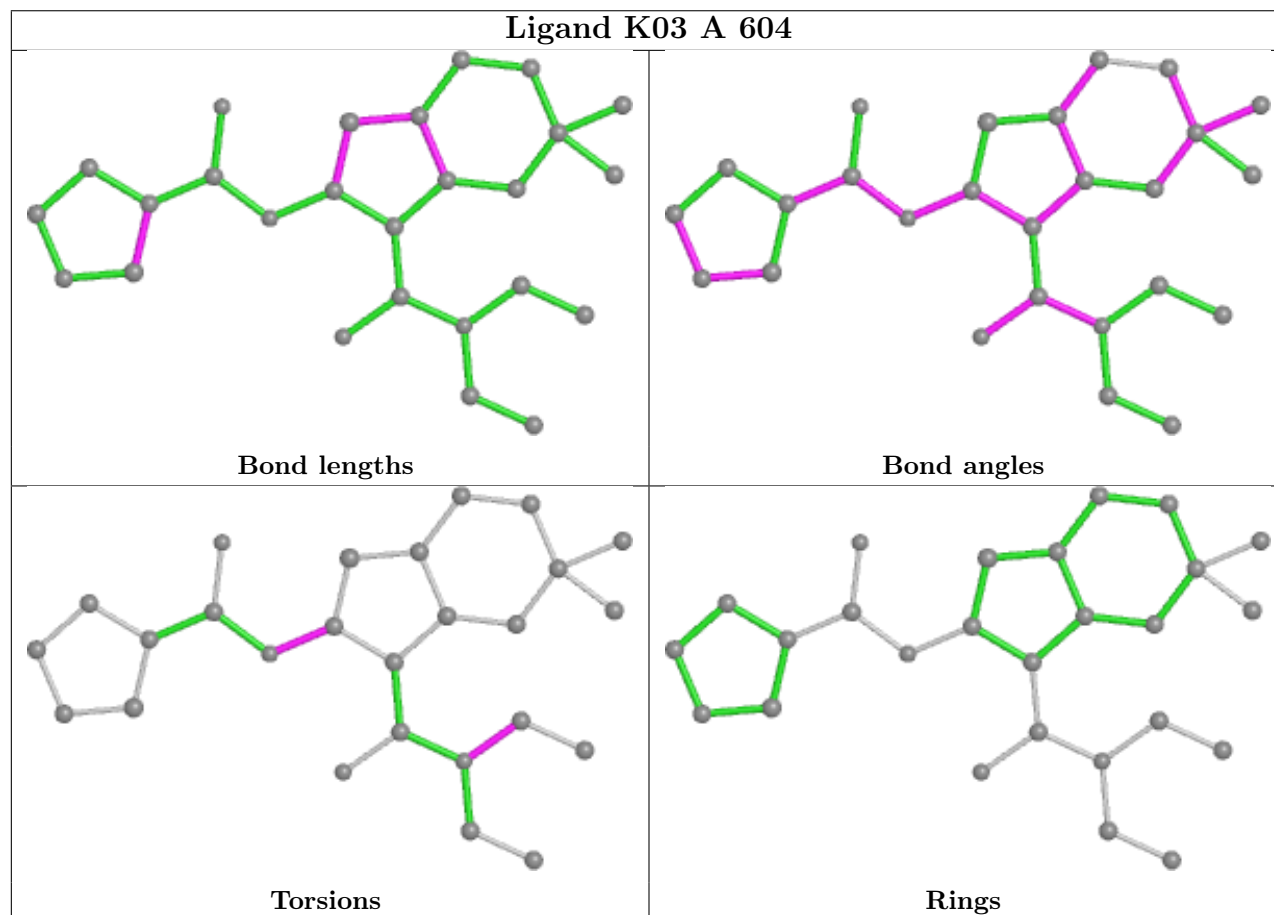
Mol	Chain	Res	Type	Atoms
4	A	604	K03	S18-C9-N10-C11
4	A	604	K03	C8-C9-N10-C11
4	B	604	K03	S18-C9-N10-C11
4	B	604	K03	C8-C9-N10-C11
4	A	604	K03	C1-C2-N3-C4

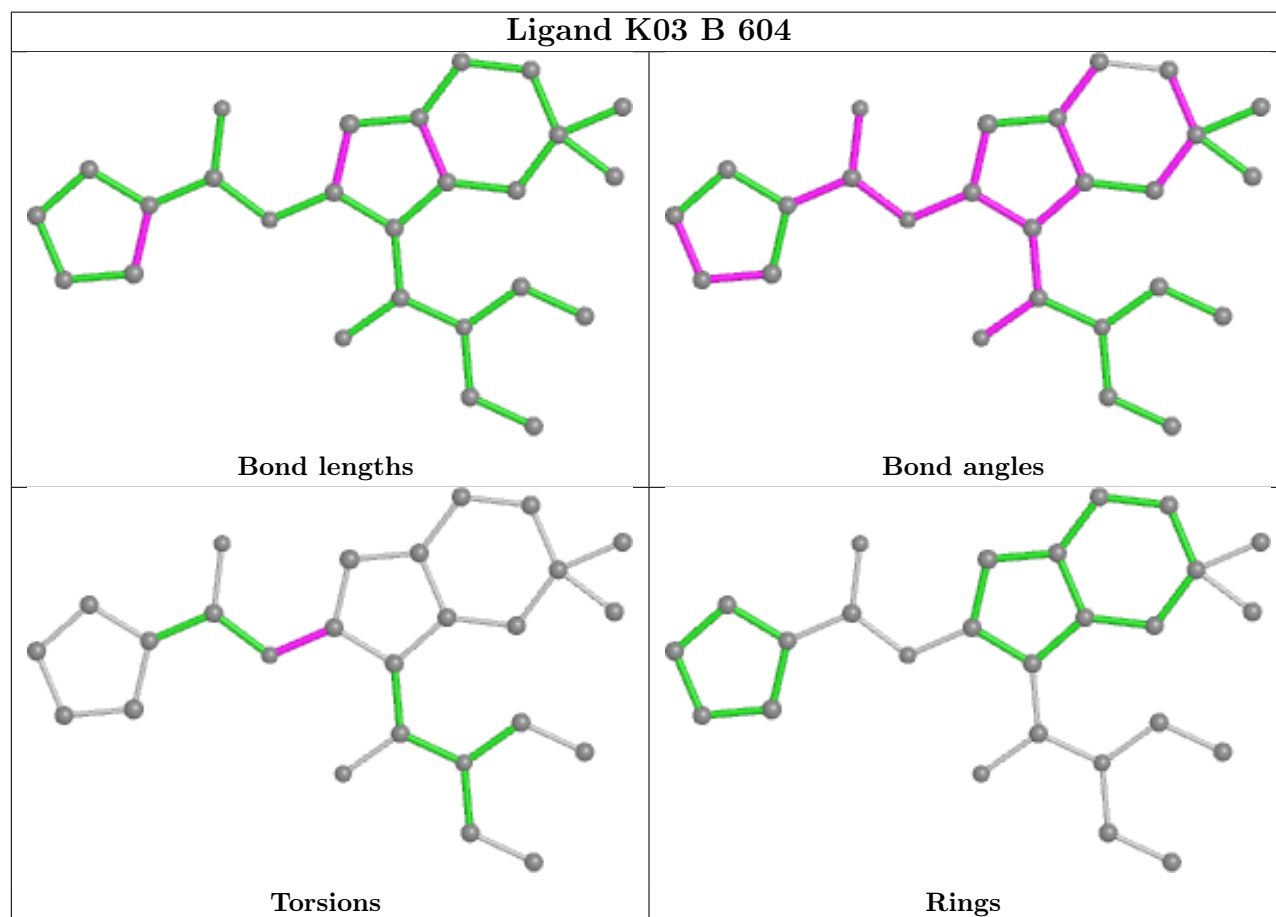
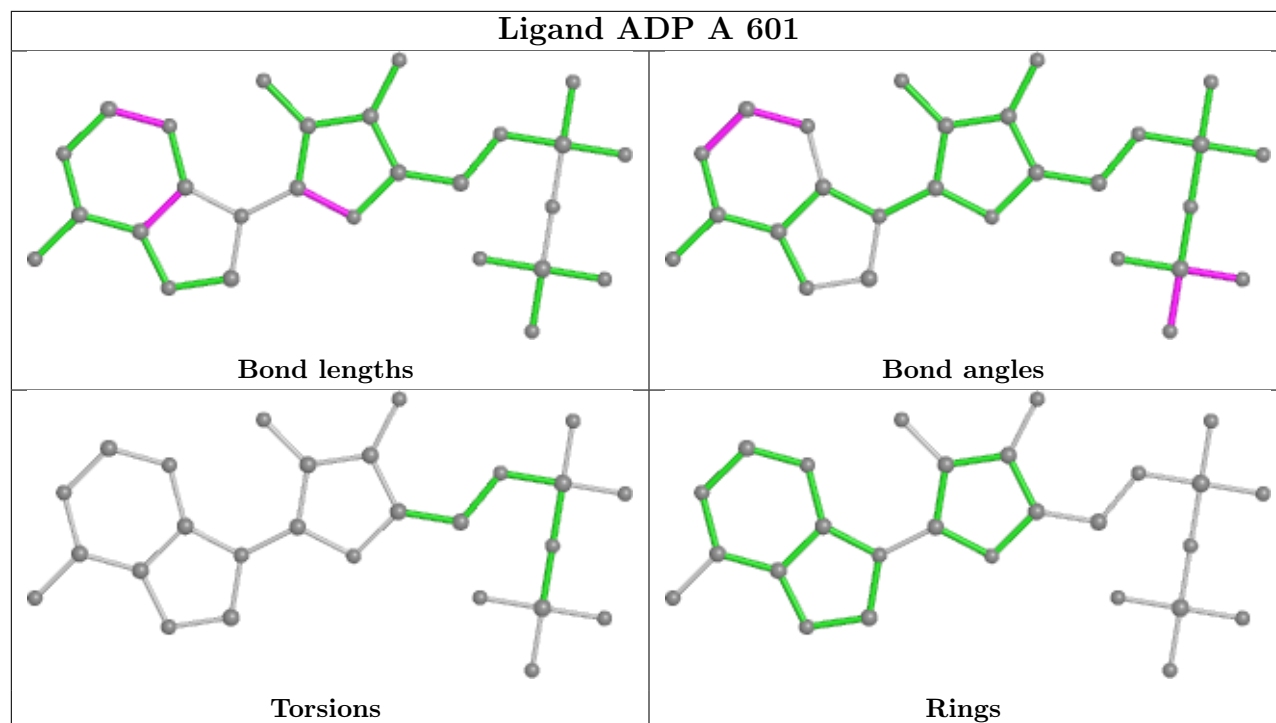
There are no ring outliers.

2 monomers are involved in 4 short contacts:

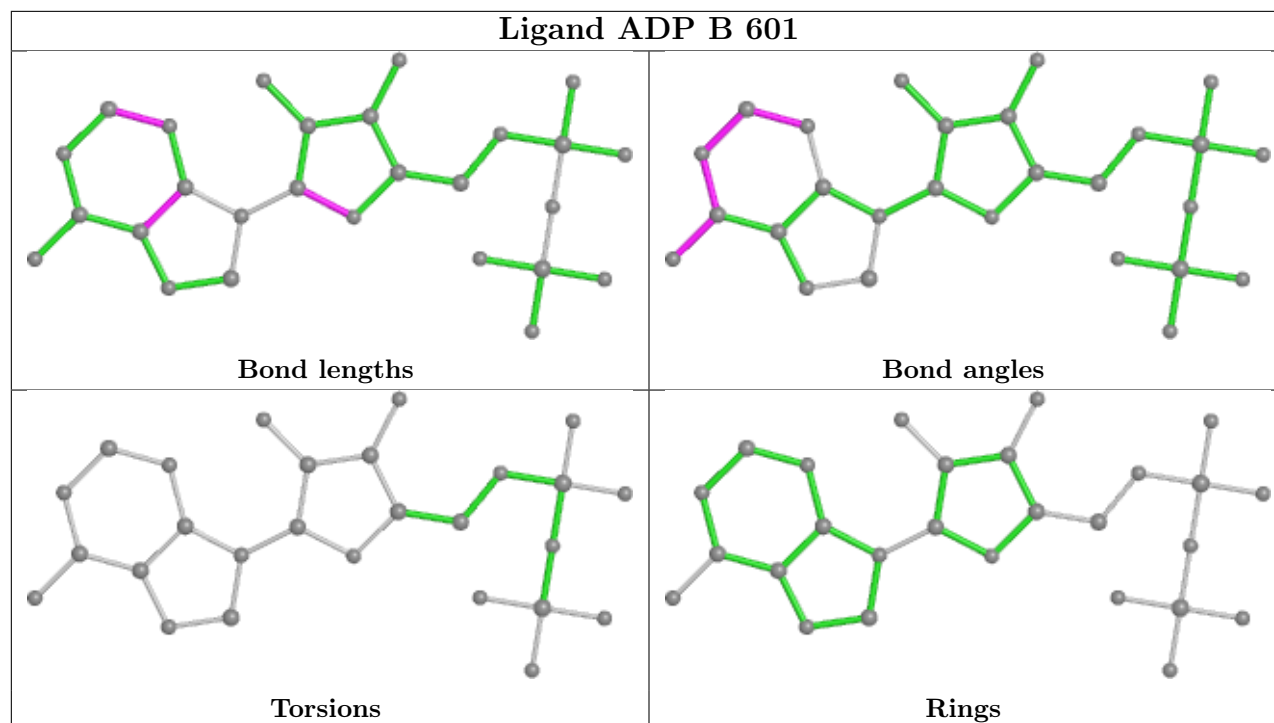
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	604	K03	1	0
4	B	604	K03	3	0

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	331/368 (89%)	0.61	29 (8%) 10 12	13, 28, 59, 78	0
1	B	331/368 (89%)	0.23	14 (4%) 36 42	15, 31, 48, 56	0
All	All	662/736 (89%)	0.42	43 (6%) 18 23	13, 30, 54, 78	0

All (43) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	250	ILE	11.7
1	A	249	THR	10.7
1	A	255	LEU	10.7
1	A	248	THR	10.5
1	A	57	LEU	9.8
1	A	58	ALA	8.1
1	A	256	VAL	7.8
1	A	253	GLU	7.6
1	B	58	ALA	6.6
1	A	247	GLU	6.5
1	B	16	GLY	6.4
1	A	151	GLY	5.8
1	A	252	GLY	5.5
1	A	251	ASP	5.3
1	A	246	LYS	5.2
1	B	57	LEU	4.8
1	A	149	ASP	4.8
1	A	152	THR	4.7
1	A	254	GLU	4.7
1	A	148	THR	4.5
1	A	150	ASN	4.4
1	A	257	LYS	3.9
1	A	190	ASN	3.9
1	A	60	LYS	3.8

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	A	97	TYR	3.8
1	B	360	LEU	3.4
1	A	59	ASP	3.4
1	B	192	ARG	3.3
1	B	34	LYS	2.9
1	B	17	LYS	2.9
1	A	56	GLY	2.9
1	A	153	GLU	2.9
1	B	307	PRO	2.8
1	A	16	GLY	2.8
1	B	190	ASN	2.8
1	B	36	SER	2.8
1	A	360	LEU	2.7
1	A	245	MET	2.7
1	B	38	HIS	2.6
1	A	192	ARG	2.6
1	B	55	GLY	2.3
1	B	305	ARG	2.1
1	B	271	ASN	2.1

## 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<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.

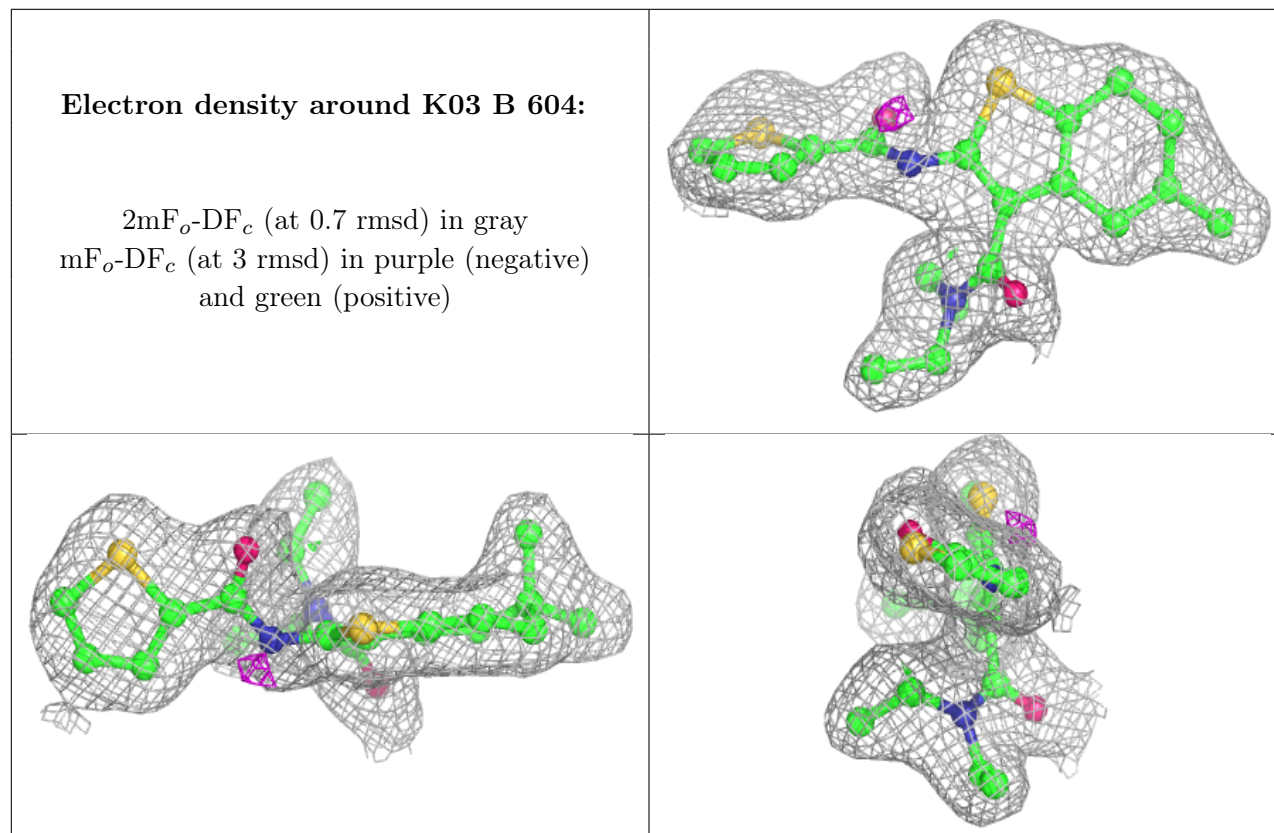
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	K03	B	604	26/26	0.95	0.12	19,23,28,30	0
4	K03	A	604	26/26	0.96	0.13	20,22,26,31	0
3	MG	B	603	1/1	0.98	0.07	24,24,24,24	0
2	ADP	B	601	27/27	0.98	0.09	19,27,28,30	0

*Continued on next page...*

*Continued from previous page...*

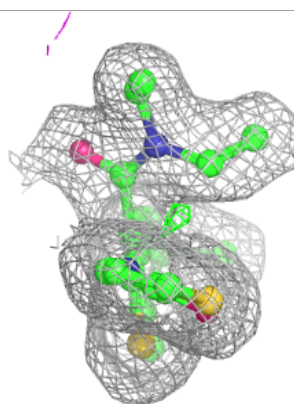
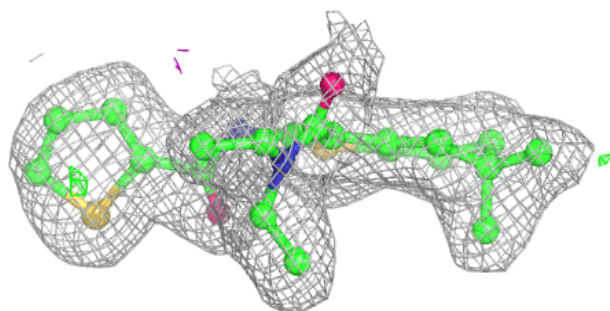
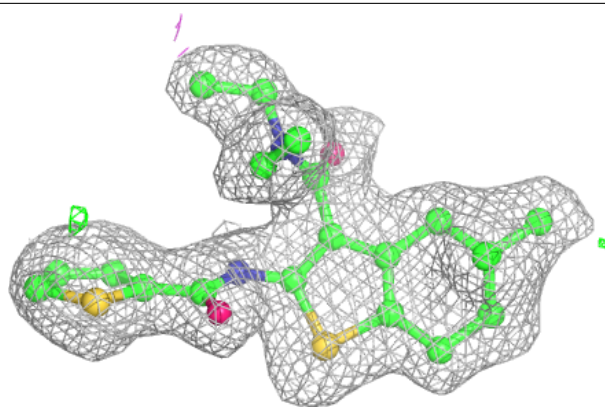
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	MG	A	603	1/1	0.98	0.14	18,18,18,18	0
2	ADP	A	601	27/27	0.99	0.11	12,21,25,25	0

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.

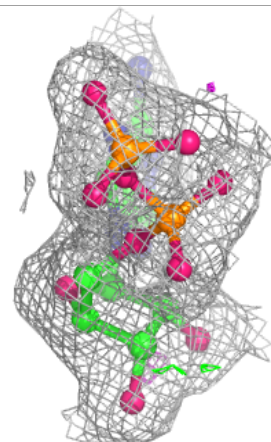
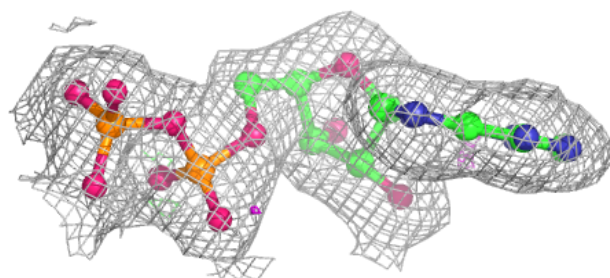
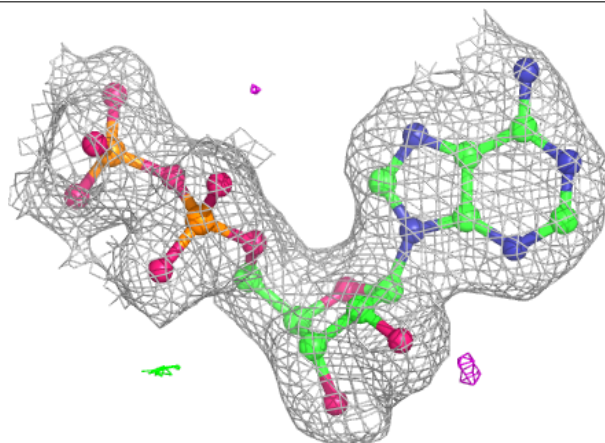


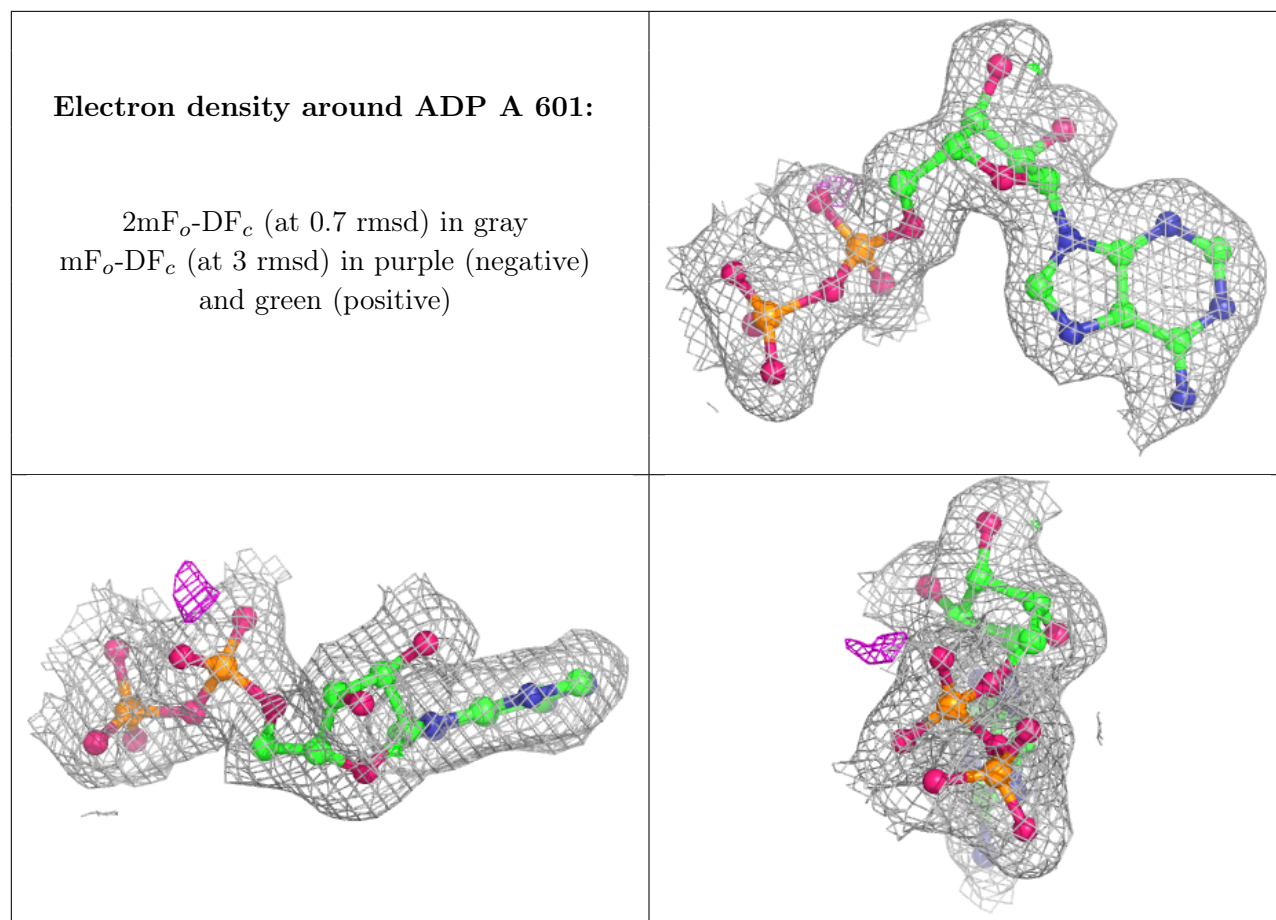
**Electron density around K03 A 604:**

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

**Electron density around ADP B 601:**

$2mF_o-DF_c$  (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.