Full wwPDB X-ray Structure Validation Report ⓘ

Apr 15, 2026 – 12:05 PM EDT

PDB ID	:	12OC / pdb_000012oc
Title	:	Crystal Structure of serine/threonine-protein kinase (AEK1) from Trypanosoma cruzi in complex with ATP
Authors	:	Seattle Structural Genomics Center for Infectious Disease (SSGCID)
Deposited on	:	2026-04-13
Resolution	:	2.68 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

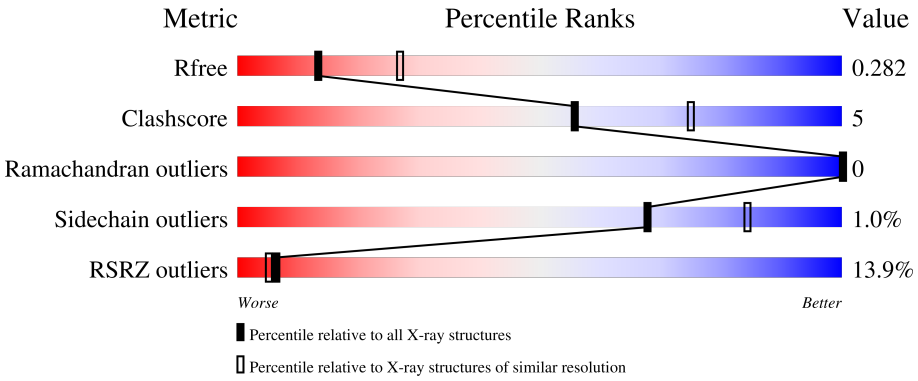
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 (i)

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

The reported resolution of this entry is 2.68 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	5070 (2.70-2.66)
Clashscore	190562	5409 (2.70-2.66)
Ramachandran outliers	187476	5324 (2.70-2.66)
Sidechain outliers	187428	5324 (2.70-2.66)
RSRZ outliers	180081	5070 (2.70-2.66)

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	361	9% 79% 11% 9%
1	B	361	15% 80% 7% 12%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 5143 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.

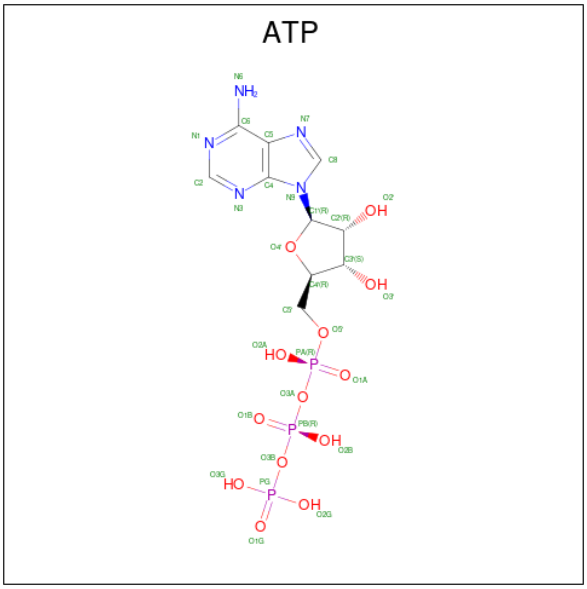
- Molecule 1 is a protein called Putative rac serine-threonine kinase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	327	Total	C	N	O	P	S	0	0	0
			2593	1670	430	478	3	12			
1	B	316	Total	C	N	O	P	S	0	0	0
			2488	1605	415	454	2	12			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	122	MET	-	initiating methionine	UNP Q4E2L0
A	185	ILE	THR	engineered mutation	UNP Q4E2L0
A	227	PHE	VAL	engineered mutation	UNP Q4E2L0
A	314	SER	ASN	engineered mutation	UNP Q4E2L0
A	475	LEU	-	expression tag	UNP Q4E2L0
A	476	GLU	-	expression tag	UNP Q4E2L0
A	477	HIS	-	expression tag	UNP Q4E2L0
A	478	HIS	-	expression tag	UNP Q4E2L0
A	479	HIS	-	expression tag	UNP Q4E2L0
A	480	HIS	-	expression tag	UNP Q4E2L0
A	481	HIS	-	expression tag	UNP Q4E2L0
A	482	HIS	-	expression tag	UNP Q4E2L0
B	122	MET	-	initiating methionine	UNP Q4E2L0
B	185	ILE	THR	engineered mutation	UNP Q4E2L0
B	227	PHE	VAL	engineered mutation	UNP Q4E2L0
B	314	SER	ASN	engineered mutation	UNP Q4E2L0
B	475	LEU	-	expression tag	UNP Q4E2L0
B	476	GLU	-	expression tag	UNP Q4E2L0
B	477	HIS	-	expression tag	UNP Q4E2L0
B	478	HIS	-	expression tag	UNP Q4E2L0
B	479	HIS	-	expression tag	UNP Q4E2L0
B	480	HIS	-	expression tag	UNP Q4E2L0
B	481	HIS	-	expression tag	UNP Q4E2L0
B	482	HIS	-	expression tag	UNP Q4E2L0

- Molecule 2 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



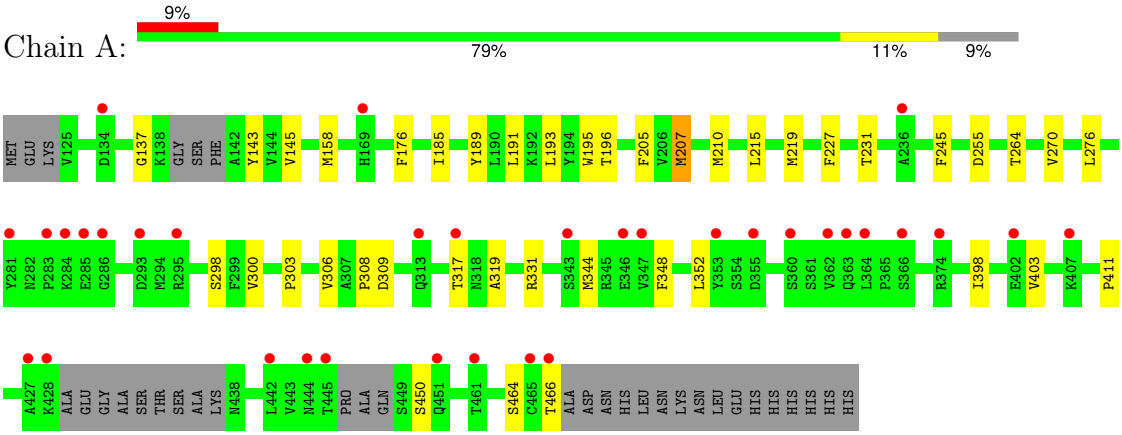
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
2	B	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

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.

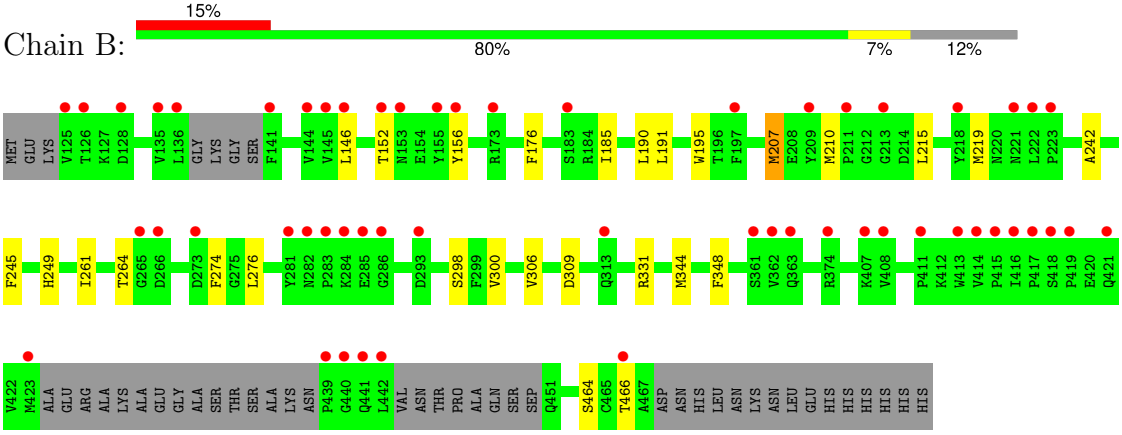
• Molecule 1: Putative rac serine-threonine kinase

Chain A:



• Molecule 1: Putative rac serine-threonine kinase

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α, β, γ	85.26Å 85.26Å 192.62Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.45 – 2.68 48.45 – 2.68	Depositor EDS
% Data completeness (in resolution range)	75.5 (48.45-2.68) 75.5 (48.45-2.68)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.87 (at 2.69Å)	Xtriage
Refinement program	PHENIX (2.0_5936: ???)	Depositor
R, R_{free}	0.233 , 0.283 0.235 , 0.282	Depositor DCC
R_{free} test set	897 reflections (3.81%)	wwPDB-VP
Wilson B-factor (Å^2)	54.8	Xtriage
Anisotropy	0.108	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 60.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.026 for -h,-k,l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	5143	wwPDB-VP
Average B, all atoms (Å^2)	67.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 38.80 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.4908e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: SEP, ATP

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	0.10	0/2624	0.26	0/3551
1	B	0.10	0/2530	0.26	0/3431
All	All	0.10	0/5154	0.26	0/6982

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	2593	0	2488	30	0
1	B	2488	0	2357	22	0
2	A	31	0	12	1	0
2	B	31	0	12	0	0
All	All	5143	0	4869	47	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 5.

All (47) 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:B:306:VAL:HG11	1:B:348:PHE:HE1	1.54	0.71
1:A:306:VAL:HG11	1:A:348:PHE:HE1	1.56	0.69
1:A:210:MET:HE1	1:A:264:THR:HG22	1.74	0.68
1:B:276:LEU:HD13	1:B:300:VAL:HG23	1.76	0.67
1:B:210:MET:HE1	1:B:264:THR:HG22	1.76	0.65
1:B:276:LEU:HD13	1:B:300:VAL:CG2	2.27	0.65
1:A:317:THR:HG23	1:A:319:ALA:H	1.63	0.63
1:B:276:LEU:HB3	1:B:300:VAL:HG21	1.85	0.58
1:B:210:MET:HE1	1:B:264:THR:CG2	2.34	0.58
1:A:176:PHE:CE2	1:B:344:MET:HE2	2.39	0.57
1:B:191:LEU:HD21	1:B:207:MET:HG3	1.86	0.57
1:B:185:ILE:HG23	1:B:245:PHE:HE2	1.70	0.56
1:A:276:LEU:HD13	1:A:300:VAL:CG2	2.36	0.56
1:A:189:TYR:C	1:A:270:VAL:HG23	2.31	0.55
1:A:210:MET:HE1	1:A:264:THR:CG2	2.38	0.54
1:A:344:MET:HE2	1:B:176:PHE:CE2	2.44	0.52
1:A:303:PRO:O	1:A:306:VAL:HG12	2.10	0.51
1:B:219:MET:HE3	1:B:331:ARG:CZ	2.42	0.49
1:A:308:PRO:HB3	1:A:352:LEU:HD23	1.95	0.48
1:B:185:ILE:HD11	1:B:249:HIS:HB3	1.94	0.48
1:B:185:ILE:HD11	1:B:249:HIS:CB	2.43	0.48
1:A:185:ILE:HG23	1:A:245:PHE:HE2	1.79	0.48
1:A:231:THR:HG22	1:A:411:PRO:HD2	1.96	0.47
1:B:215:LEU:HD23	1:B:215:LEU:O	2.14	0.47
1:A:210:MET:HE2	1:A:270:VAL:CG1	2.46	0.46
1:A:306:VAL:HG11	1:A:348:PHE:CE1	2.44	0.46
1:B:190:LEU:HD21	1:B:242:ALA:HB1	1.97	0.45
1:A:191:LEU:HD21	1:A:207:MET:HG3	1.98	0.45
1:B:306:VAL:HG11	1:B:348:PHE:CE1	2.43	0.45
1:A:255:ASP:OD2	1:A:276:LEU:HD12	2.17	0.44
1:A:219:MET:HE3	1:A:331:ARG:CZ	2.47	0.44
1:B:146:LEU:HD12	1:B:156:TYR:O	2.17	0.44
1:B:190:LEU:HD22	1:B:274:PHE:HZ	1.82	0.44
1:A:137:GLY:HA3	2:A:501:ATP:H4'	2.00	0.44
1:A:215:LEU:HD23	1:A:215:LEU:O	2.18	0.43
1:A:466:THR:HG22	1:B:195:TRP:HD1	1.83	0.42
1:A:195:TRP:HD1	1:B:466:THR:HG22	1.85	0.42
1:A:276:LEU:HD13	1:A:300:VAL:HG23	2.02	0.41
1:A:143:TYR:HD2	1:A:145:VAL:HG13	1.85	0.41
1:A:193:LEU:HD21	1:A:196:THR:HG23	2.02	0.41
1:A:398:ILE:HG23	1:A:403:VAL:HG21	2.03	0.41
1:A:176:PHE:CD2	1:B:344:MET:HE2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:210:MET:HE2	1:A:270:VAL:HG11	2.03	0.41
1:B:215:LEU:HD12	1:B:261:ILE:HG21	2.02	0.41
1:A:158:MET:HA	1:A:205:PHE:O	2.22	0.40
1:A:193:LEU:HD21	1:A:196:THR:CG2	2.50	0.40
1:A:215:LEU:HD21	1:A:227:PHE:CE2	2.57	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	316/361 (88%)	310 (98%)	6 (2%)	0	100	100
1	B	306/361 (85%)	300 (98%)	6 (2%)	0	100	100
All	All	622/722 (86%)	610 (98%)	12 (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	270/317 (85%)	268 (99%)	2 (1%)	76	89
1	B	256/317 (81%)	253 (99%)	3 (1%)	63	82
All	All	526/634 (83%)	521 (99%)	5 (1%)	68	84

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	207	MET
1	A	309	ASP
1	B	152	THR
1	B	207	MET
1	B	309	ASP

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	350	ASN
1	A	363	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)

5 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\#\|Z\| > 2$
1	SEP	A	450	1	8,9,10	1.63	1 (12%)	7,12,14	1.53	1 (14%)
1	SEP	B	464	1	8,9,10	1.63	1 (12%)	7,12,14	1.18	1 (14%)
1	SEP	A	298	1	8,9,10	1.62	1 (12%)	7,12,14	1.47	1 (14%)
1	SEP	B	298	1	8,9,10	1.61	1 (12%)	7,12,14	1.49	1 (14%)
1	SEP	A	464	1	8,9,10	1.64	1 (12%)	7,12,14	1.58	1 (14%)

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
1	SEP	A	450	1	-	1/6/8/10	-
1	SEP	B	464	1	-	2/6/8/10	-
1	SEP	A	298	1	-	0/6/8/10	-
1	SEP	B	298	1	-	0/6/8/10	-
1	SEP	A	464	1	-	1/6/8/10	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	464	SEP	P-O1P	3.56	1.61	1.50
1	A	298	SEP	P-O1P	3.55	1.61	1.50
1	A	450	SEP	P-O1P	3.55	1.61	1.50
1	B	464	SEP	P-O1P	3.54	1.61	1.50
1	B	298	SEP	P-O1P	3.50	1.61	1.50

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	464	SEP	OG-CB-CA	3.58	111.63	108.14
1	A	450	SEP	OG-CB-CA	3.49	111.54	108.14
1	B	298	SEP	OG-CB-CA	3.44	111.49	108.14
1	A	298	SEP	OG-CB-CA	3.35	111.41	108.14
1	B	464	SEP	OG-CB-CA	2.50	110.58	108.14

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B	464	SEP	CB-OG-P-O1P
1	A	450	SEP	CB-OG-P-O2P
1	A	464	SEP	CB-OG-P-O2P
1	B	464	SEP	CB-OG-P-O2P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

2 ligands are modelled in this entry.

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	ATP	A	501	-	32,33,33	0.28	0	48,52,52	0.69	0
2	ATP	B	501	-	32,33,33	0.30	0	48,52,52	0.67	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
2	ATP	A	501	-	-	2/22/38/38	0/3/3/3
2	ATP	B	501	-	-	2/22/38/38	0/3/3/3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	ATP	O4'-C4'-C5'-O5'
2	B	501	ATP	O4'-C4'-C5'-O5'
2	B	501	ATP	C3'-C4'-C5'-O5'
2	A	501	ATP	C3'-C4'-C5'-O5'

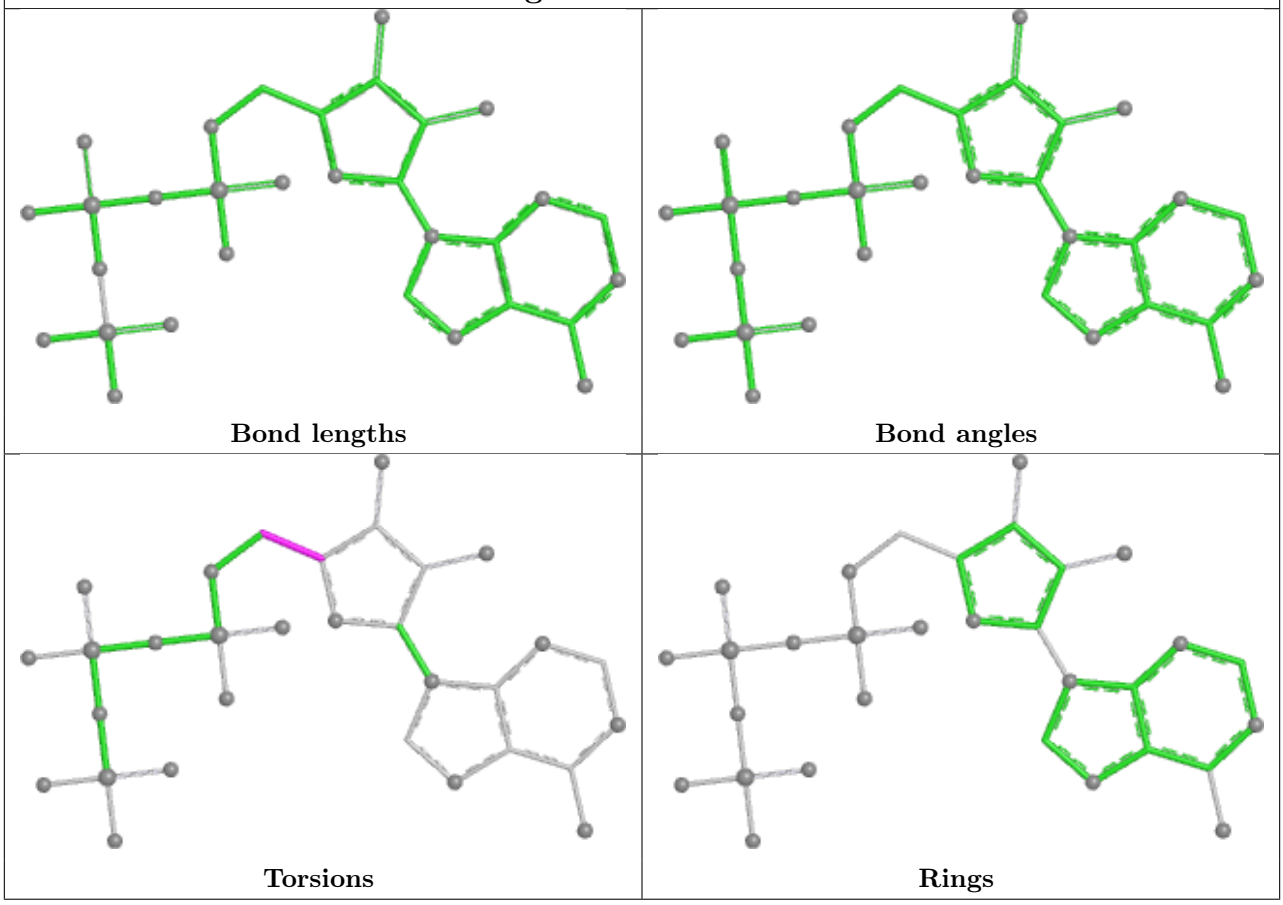
There are no ring outliers.

1 monomer is involved in 1 short contact:

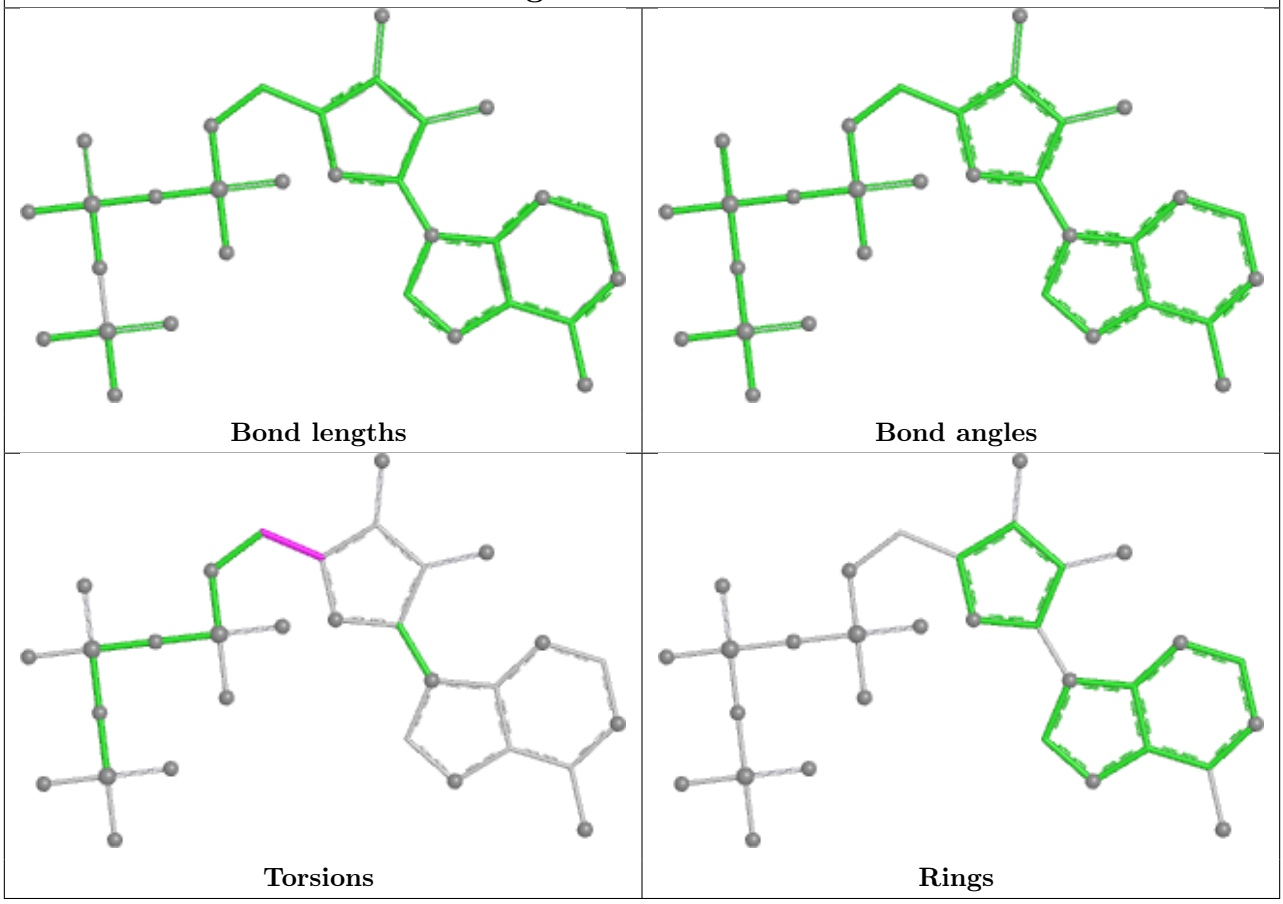
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	ATP	1	0

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 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 ATP A 501



Ligand ATP 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	324/361 (89%)	0.79	34 (10%)	11	9	37, 65, 99, 152	0
1	B	314/361 (86%)	0.98	55 (17%)	4	3	30, 65, 110, 128	0
All	All	638/722 (88%)	0.88	89 (13%)	6	5	30, 65, 107, 152	0

All (89) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	414	VAL	5.2
1	B	417	PRO	4.9
1	B	415	PRO	4.7
1	B	363	GLN	4.4
1	B	125	VAL	4.1
1	B	313	GLN	4.0
1	A	293	ASP	4.0
1	A	284	LYS	3.8
1	B	281	TYR	3.8
1	A	283	PRO	3.6
1	A	281	TYR	3.6
1	B	183	SER	3.5
1	A	313	GLN	3.4
1	B	286	GLY	3.2
1	A	465	CYS	3.2
1	A	169	HIS	3.2
1	B	153	ASN	3.2
1	B	282	ASN	3.2
1	B	285	GLU	3.1
1	B	439	PRO	3.1
1	A	466	THR	3.1
1	B	440	GLY	3.1
1	A	343	SER	3.0
1	B	293	ASP	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	141	PHE	3.0
1	A	428	LYS	3.0
1	B	283	PRO	2.9
1	B	416	ILE	2.9
1	B	135	VAL	2.9
1	B	273	ASP	2.9
1	B	136	LEU	2.8
1	B	411	PRO	2.8
1	A	444	ASN	2.8
1	A	374	ARG	2.8
1	B	173	ARG	2.8
1	B	209	TYR	2.8
1	B	284	LYS	2.7
1	B	419	PRO	2.7
1	A	317	THR	2.7
1	B	197	PHE	2.6
1	A	134	ASP	2.6
1	B	152	THR	2.6
1	B	145	VAL	2.6
1	B	413	TRP	2.6
1	B	441	GLN	2.5
1	A	362	VAL	2.5
1	A	445	THR	2.5
1	B	222	LEU	2.4
1	B	423	MET	2.4
1	A	360	SER	2.4
1	B	156	TYR	2.4
1	B	408	VAL	2.4
1	A	295	ARG	2.4
1	B	146	LEU	2.4
1	A	285	GLU	2.4
1	B	361	SER	2.4
1	B	418	SER	2.4
1	B	211	PRO	2.4
1	B	144	VAL	2.4
1	B	155	TYR	2.3
1	A	353	TYR	2.3
1	B	126	THR	2.3
1	A	347	VAL	2.3
1	A	364	LEU	2.3
1	A	346	GLU	2.2
1	B	218	TYR	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	363	GLN	2.2
1	B	213	GLY	2.2
1	B	466	THR	2.2
1	B	221	ASN	2.2
1	A	451	GLN	2.2
1	A	355	ASP	2.2
1	B	407	LYS	2.2
1	B	421	GLN	2.2
1	B	362	VAL	2.2
1	A	427	ALA	2.1
1	B	223	PRO	2.1
1	A	442	LEU	2.1
1	A	366	SER	2.1
1	B	128	ASP	2.1
1	A	236	ALA	2.1
1	A	407	LYS	2.1
1	B	442	LEU	2.1
1	A	286	GLY	2.0
1	B	374	ARG	2.0
1	A	402	GLU	2.0
1	B	266	ASP	2.0
1	A	461	THR	2.0
1	B	265	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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
1	SEP	A	450	10/11	0.62	0.17	100,120,143,156	0
1	SEP	A	464	10/11	0.81	0.13	77,84,109,116	0
1	SEP	B	464	10/11	0.94	0.09	41,44,58,80	0
1	SEP	A	298	10/11	0.96	0.08	40,43,58,60	0
1	SEP	B	298	10/11	0.97	0.07	32,39,52,59	0

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands

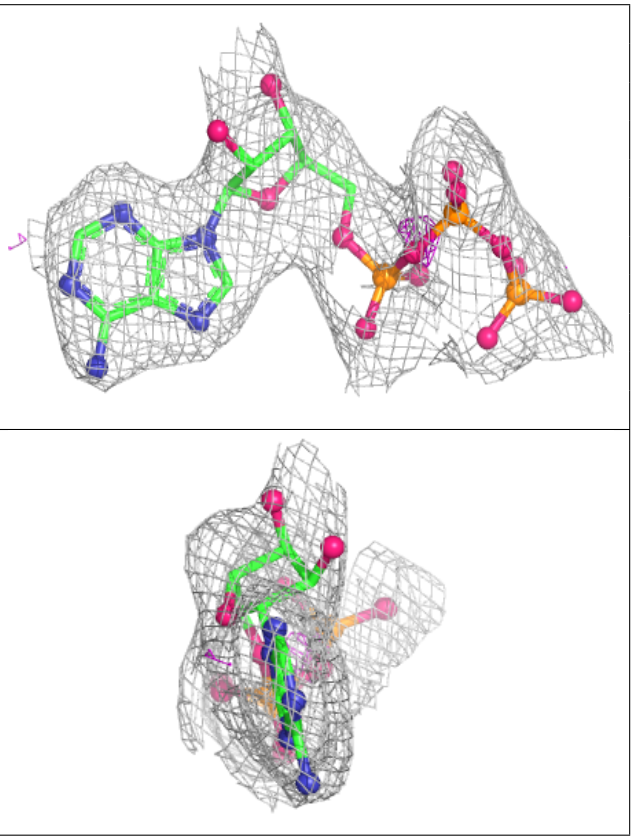
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

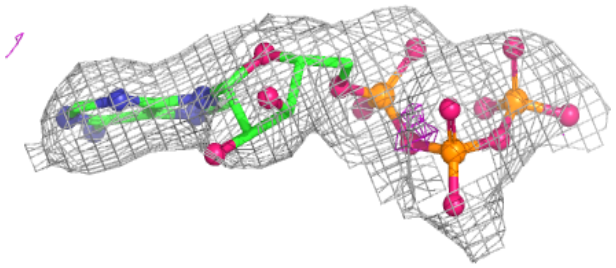
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	ATP	B	501	31/31	0.82	0.12	62,90,118,132	0
2	ATP	A	501	31/31	0.84	0.10	45,63,120,134	0

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 ATP B 501:

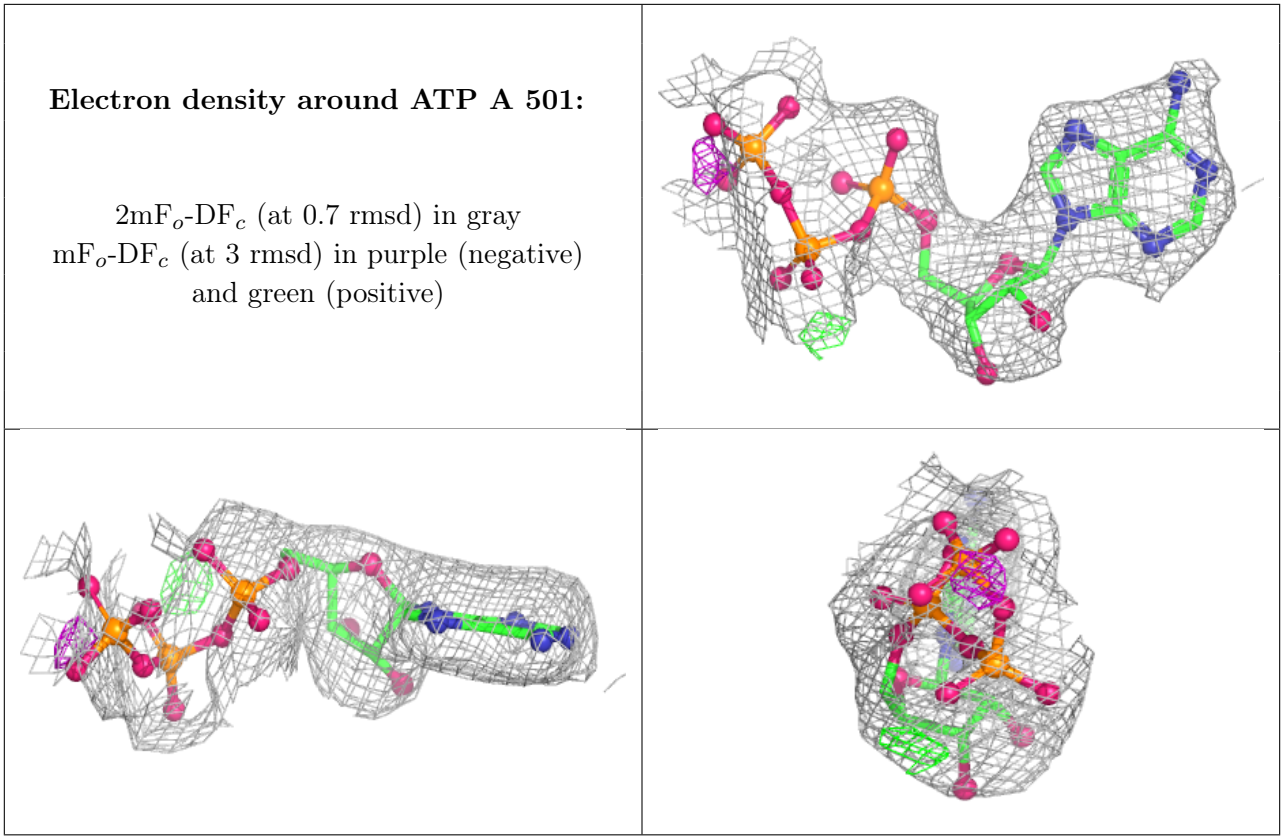
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





Electron density around ATP 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.