



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 19, 2023 – 02:22 PM EST

PDB ID : 1J1C
Title : Binary complex structure of human tau protein kinase I with ADP
Authors : Aoki, M.; Yokota, T.; Sugiura, I.; Sasaki, C.; Hasegawa, T.; Okumura, C.;
Kohno, T.; Sugio, S.; Matsuzaki, T.
Deposited on : 2002-12-03
Resolution : 2.10 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 : 4.02b-467
Mogul : 1.8.5 (274361), 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

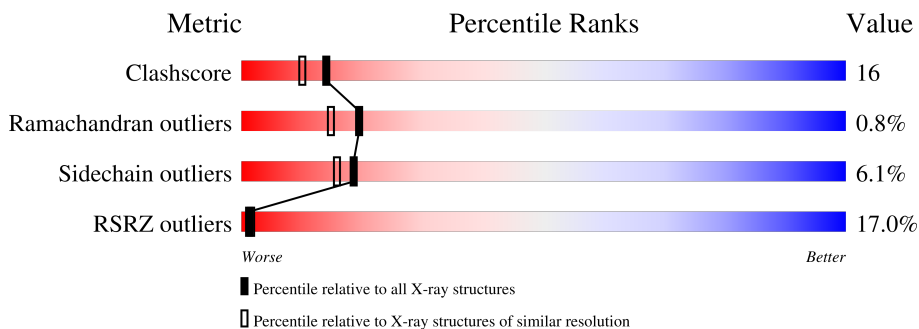
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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))
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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 ≥ 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	420	
1	B	420	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 6060 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.

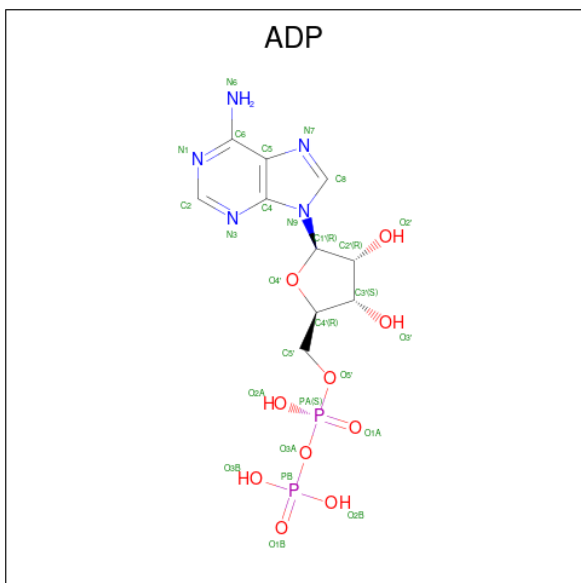
- Molecule 1 is a protein called Glycogen synthase kinase-3 beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	354	Total 2828	C 1818	N 486	O 513	S 11	0	0	0
1	B	364	Total 2909	C 1867	N 501	O 529	S 12	0	0	0

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
3	B	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	147	Total	O	0	0
			147	147		
4	B	120	Total	O	0	0
			120	120		

4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	82.90Å 86.10Å 178.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 2.10 19.91 – 2.00	Depositor EDS
% Data completeness (in resolution range)	(Not available) (15.00-2.10) 99.1 (19.91-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.37 (at 1.99Å)	Xtrriage
Refinement program	X-PLOR 98.1	Depositor
R, R_{free}	0.218 , 0.242 0.208 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	36.9	Xtrriage
Anisotropy	0.617	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.42 , 59.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.016 for k,h,-l	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6060	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.55% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: 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	0.37	0/2899	0.58	0/3944
1	B	0.37	0/2981	0.57	0/4050
All	All	0.37	0/5880	0.57	0/7994

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	2828	0	2856	102	0
1	B	2909	0	2936	104	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	27	0	12	0	0
3	B	27	0	12	0	0
4	A	147	0	0	5	0
4	B	120	0	0	4	0
All	All	6060	0	5816	182	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 16.

All (182) 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:220:ARG:HD3	1:B:720:ARG:HD3	1.50	0.92
1:B:595:ASN:HD22	1:B:598:LEU:H	1.11	0.92
1:A:95:ASN:HD22	1:A:98:LEU:H	1.14	0.91
1:A:361:ASN:HD22	1:A:361:ASN:H	1.18	0.88
1:A:267:VAL:HG11	1:B:566:SER:HB2	1.56	0.87
1:A:337:HIS:HD2	1:A:339:PHE:H	1.26	0.84
1:B:861:ASN:H	1:B:861:ASN:HD22	1.25	0.82
1:A:383:ARG:HG2	1:A:383:ARG:HH11	1.45	0.81
1:A:94:LYS:HE3	1:A:95:ASN:H	1.50	0.76
1:A:361:ASN:HD22	1:A:361:ASN:N	1.82	0.76
1:B:664:GLN:HE22	1:B:695:VAL:HA	1.51	0.76
1:B:807:PRO:O	1:B:808:ARG:HB2	1.87	0.73
1:B:595:ASN:HD21	1:B:597:GLU:HB3	1.53	0.73
1:B:771:LYS:O	1:B:799:HIS:HB2	1.88	0.72
1:A:179:HIS:HD2	1:A:181:ASP:H	1.36	0.72
1:B:861:ASN:HD22	1:B:861:ASN:N	1.81	0.72
1:A:95:ASN:HD21	1:A:97:GLU:HB3	1.56	0.71
1:A:285:ASN:ND2	1:A:287:ASN:HD22	1.88	0.71
1:B:595:ASN:ND2	1:B:598:LEU:H	1.87	0.70
1:A:123:LYS:HB3	1:A:125:GLU:HG2	1.72	0.70
1:B:861:ASN:H	1:B:861:ASN:ND2	1.89	0.70
1:B:592:ARG:HG3	1:B:593:PHE:CE1	2.28	0.69
1:A:361:ASN:H	1:A:361:ASN:ND2	1.90	0.68
1:B:784:MET:HE1	1:B:823:TYR:HD1	1.58	0.68
1:A:62:ILE:HG21	1:A:72:GLN:HB2	1.75	0.68
1:A:94:LYS:HE2	1:A:98:LEU:HD23	1.76	0.68
1:A:94:LYS:HG3	1:A:99:GLN:NE2	2.09	0.68
1:B:679:HIS:HD2	1:B:681:ASP:H	1.42	0.67
1:A:383:ARG:HG2	1:A:383:ARG:NH1	2.09	0.67
1:B:852:ASN:ND2	1:B:854:ARG:H	1.93	0.67
1:A:284:MET:HE1	1:A:323:TYR:HD1	1.60	0.66
1:A:288:TYR:OH	1:B:715:SER:OG	2.13	0.66
1:A:279:GLU:O	1:A:283:GLU:HG2	1.96	0.66
1:B:725:PRO:HG2	1:B:784:MET:HE2	1.78	0.65
1:A:267:VAL:O	1:A:271:LYS:HG3	1.96	0.65
1:A:214:VAL:CG1	1:B:790:GLU:HB2	2.26	0.65
1:B:622:LYS:HB2	1:B:625:GLU:OE2	1.97	0.64
1:A:214:VAL:HG11	1:B:790:GLU:CB	2.27	0.64
1:B:852:ASN:HD22	1:B:852:ASN:C	2.00	0.64
1:A:120:GLY:HA3	1:A:127:TYR:HE1	1.61	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:ASN:ND2	1:A:98:LEU:H	1.91	0.64
1:B:785:ASN:HD21	1:B:787:ASN:HD22	1.46	0.63
1:A:290:GLU:CB	1:B:714:VAL:HG11	2.29	0.63
1:A:284:MET:CE	1:A:323:TYR:HD1	2.12	0.62
1:A:122:LYS:HB3	1:A:125:GLU:OE2	1.99	0.62
1:B:595:ASN:O	1:B:599:GLN:HG2	2.00	0.62
1:B:667:ARG:HH12	1:B:861:ASN:ND2	1.98	0.62
1:A:290:GLU:HB2	1:B:714:VAL:CG1	2.30	0.61
1:B:797:LYS:HD3	1:B:797:LYS:H	1.64	0.61
1:B:523:PHE:CD1	1:B:523:PHE:N	2.68	0.61
1:A:385:GLN:O	1:A:385:GLN:HG3	2.00	0.61
1:B:852:ASN:HD21	1:B:854:ARG:HB3	1.64	0.61
1:A:277:THR:HG22	1:A:279:GLU:N	2.15	0.61
1:A:290:GLU:HB3	1:B:714:VAL:HG11	1.83	0.60
1:B:523:PHE:N	1:B:523:PHE:HD1	1.98	0.60
1:B:761:SER:OG	1:B:763:VAL:HG22	2.01	0.60
1:A:220:ARG:HD3	1:B:720:ARG:CD	2.29	0.60
1:B:667:ARG:HH12	1:B:861:ASN:HD21	1.49	0.60
1:B:784:MET:HE3	1:B:823:TYR:CB	2.32	0.60
1:B:784:MET:HE3	1:B:823:TYR:CA	2.32	0.59
1:B:772:VAL:HA	1:B:799:HIS:HB3	1.84	0.59
1:A:220:ARG:O	1:A:221:TYR:HB2	2.02	0.59
1:B:852:ASN:HD22	1:B:854:ARG:H	1.49	0.59
1:A:214:VAL:HG11	1:B:790:GLU:HB2	1.84	0.59
1:B:562:ILE:HG21	1:B:572:GLN:HB2	1.84	0.59
1:B:578:SER:OG	1:B:580:GLU:HB2	2.03	0.58
1:A:167:ARG:HH12	1:A:361:ASN:HD21	1.50	0.58
1:A:277:THR:HG22	1:A:279:GLU:H	1.69	0.58
1:B:720:ARG:HA	4:B:229:HOH:O	2.04	0.57
1:A:94:LYS:HE3	1:A:95:ASN:N	2.18	0.57
1:A:220:ARG:CZ	1:B:720:ARG:CZ	2.83	0.57
1:A:94:LYS:CE	1:A:95:ASN:H	2.16	0.56
1:B:784:MET:CE	1:B:823:TYR:HD1	2.18	0.56
1:B:530:ARG:HA	1:B:535:SER:O	2.05	0.56
1:A:46:GLN:HG3	4:A:465:HOH:O	2.04	0.55
1:A:352:ASN:HD21	1:A:354:ARG:HB2	1.70	0.55
1:B:720:ARG:O	1:B:721:TYR:HB2	2.05	0.55
1:A:167:ARG:HH12	1:A:361:ASN:ND2	2.05	0.55
1:A:290:GLU:HB2	1:B:714:VAL:HG13	1.89	0.55
1:A:337:HIS:CD2	1:A:339:PHE:H	2.14	0.55
1:B:598:LEU:O	1:B:602:ARG:HG3	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:277:THR:CG2	1:A:279:GLU:H	2.21	0.54
1:B:784:MET:HE3	1:B:823:TYR:HB3	1.89	0.54
1:A:267:VAL:HG21	1:B:567:PHE:HE2	1.73	0.54
1:B:620:GLY:C	1:B:622:LYS:H	2.08	0.54
1:A:277:THR:HG22	1:A:280:GLN:H	1.71	0.54
1:A:98:LEU:O	1:A:102:ARG:HG3	2.08	0.54
1:A:297:LYS:HD3	1:A:297:LYS:H	1.71	0.54
1:B:591:LYS:HB2	1:B:591:LYS:NZ	2.21	0.54
1:A:288:TYR:HD2	1:B:716:TYR:HE2	1.56	0.53
1:A:352:ASN:ND2	1:A:354:ARG:H	2.06	0.53
1:A:214:VAL:HG11	1:B:790:GLU:HB3	1.89	0.53
1:A:231:ALA:HB2	1:A:285:ASN:HB2	1.92	0.52
4:A:555:HOH:O	1:B:566:SER:HB3	2.09	0.52
1:B:592:ARG:HG3	1:B:593:PHE:CD1	2.45	0.51
1:A:202:GLY:HA3	4:A:557:HOH:O	2.11	0.50
1:A:214:VAL:HG13	1:B:790:GLU:HB2	1.92	0.50
1:A:285:ASN:HD21	1:A:287:ASN:HD22	1.56	0.50
1:A:288:TYR:HE2	1:B:716:TYR:HD2	1.59	0.50
1:A:48:PRO:HA	4:A:490:HOH:O	2.11	0.50
1:A:289:THR:HG21	1:B:712:PRO:HG2	1.92	0.49
1:A:164:GLN:HE22	1:A:195:VAL:HA	1.78	0.49
1:B:881:HIS:HD2	4:B:144:HOH:O	1.95	0.49
1:A:290:GLU:CB	1:B:714:VAL:CG1	2.90	0.49
1:A:312:GLU:OE2	1:A:312:GLU:HA	2.13	0.49
1:A:290:GLU:HB2	1:B:714:VAL:HG11	1.93	0.48
1:A:220:ARG:O	1:A:221:TYR:CB	2.61	0.48
1:A:225:PRO:HG2	1:A:284:MET:HE2	1.95	0.48
1:A:284:MET:HE3	1:A:323:TYR:CB	2.44	0.48
1:B:622:LYS:HB2	1:B:625:GLU:CD	2.34	0.47
1:A:94:LYS:HA	1:A:94:LYS:HD2	1.61	0.47
1:B:537:VAL:HG22	1:B:557:THR:CG2	2.44	0.47
1:A:95:ASN:ND2	1:A:97:GLU:HB3	2.25	0.47
1:B:720:ARG:O	1:B:721:TYR:CB	2.61	0.47
1:A:69:VAL:HG12	1:A:70:VAL:N	2.28	0.47
1:B:562:ILE:CG2	1:B:572:GLN:HB2	2.44	0.47
1:B:693:THR:O	1:B:857:PRO:HG3	2.13	0.47
1:B:861:ASN:N	1:B:861:ASN:ND2	2.51	0.47
1:B:595:ASN:ND2	1:B:597:GLU:HB3	2.26	0.47
1:B:852:ASN:ND2	1:B:852:ASN:C	2.68	0.47
1:A:277:THR:CG2	1:A:278:ARG:N	2.78	0.47
1:A:122:LYS:HB3	1:A:125:GLU:CD	2.35	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:662:MET:HE1	1:B:743:ALA:O	2.15	0.46
1:B:679:HIS:HE1	1:B:699:CYS:O	1.99	0.46
1:A:68:GLY:HA3	1:A:86:LYS:O	2.15	0.46
1:A:66:SER:HB2	1:B:767:VAL:HG11	1.96	0.46
1:A:312:GLU:HG2	4:A:468:HOH:O	2.15	0.46
1:A:323:TYR:O	1:A:325:PRO:HD3	2.16	0.46
1:B:664:GLN:NE2	1:B:696:LEU:H	2.14	0.46
1:A:123:LYS:HG2	1:A:124:ASP:H	1.81	0.45
1:A:267:VAL:HG12	1:A:271:LYS:HE3	1.98	0.45
1:A:293:PHE:HA	1:A:294:PRO:HD2	1.82	0.45
1:B:620:GLY:O	1:B:622:LYS:N	2.49	0.45
1:A:275:THR:OG1	1:A:295:GLN:HA	2.17	0.45
1:B:620:GLY:C	1:B:622:LYS:N	2.71	0.45
1:A:288:TYR:HD2	1:B:716:TYR:CE2	2.35	0.45
1:B:784:MET:HE3	1:B:823:TYR:HA	1.99	0.44
1:B:779:GLU:O	1:B:783:GLU:HG2	2.17	0.44
1:B:679:HIS:CD2	1:B:681:ASP:H	2.30	0.44
1:B:784:MET:CE	1:B:823:TYR:CD1	3.00	0.44
1:A:96:ARG:NH1	1:A:205:LYS:HD2	2.32	0.44
1:A:95:ASN:O	1:A:99:GLN:HG2	2.17	0.44
1:A:284:MET:CE	1:A:323:TYR:CD1	2.96	0.44
1:B:622:LYS:O	1:B:623:LYS:HB2	2.17	0.44
1:A:352:ASN:C	1:A:352:ASN:HD22	2.21	0.44
1:B:715:SER:HB3	1:B:731:ALA:O	2.18	0.43
1:B:662:MET:HG3	1:B:747:LEU:HD13	1.99	0.43
1:A:115:PHE:HA	1:A:129:ASN:O	2.18	0.43
1:A:120:GLY:O	1:A:125:GLU:HG3	2.18	0.43
1:B:725:PRO:HG2	1:B:784:MET:CE	2.46	0.43
1:A:284:MET:HE3	1:A:323:TYR:CA	2.49	0.43
1:A:214:VAL:CG1	1:B:790:GLU:CB	2.91	0.43
1:B:797:LYS:H	1:B:797:LYS:CD	2.30	0.43
1:A:360:PHE:O	1:A:383:ARG:HD2	2.18	0.43
1:B:679:HIS:HD2	1:B:681:ASP:N	2.13	0.43
1:B:601:MET:CE	1:B:612:LEU:HB2	2.48	0.43
1:B:708:VAL:HB	1:B:711:GLU:CD	2.38	0.43
1:B:538:THR:O	1:B:555:SER:HA	2.19	0.42
1:A:306:ARG:HG2	1:A:306:ARG:HH11	1.84	0.42
1:A:369:SER:O	1:A:370:ASN:HB2	2.18	0.42
1:B:648:ARG:C	1:B:650:LYS:H	2.22	0.42
1:A:288:TYR:CE2	1:B:716:TYR:HD2	2.37	0.42
1:A:179:HIS:HE1	1:A:199:CYS:O	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:309:THR:HA	1:A:310:PRO:HD3	1.91	0.42
1:B:708:VAL:O	1:B:711:GLU:HB2	2.20	0.41
1:B:601:MET:HE1	1:B:632:LEU:HD21	2.01	0.41
1:B:849:LYS:HE3	1:B:855:ASP:OD2	2.20	0.41
1:A:179:HIS:HD2	1:A:181:ASP:N	2.09	0.41
1:B:873:LEU:HA	1:B:873:LEU:HD23	1.82	0.41
1:A:159:LYS:HE2	1:A:339:PHE:O	2.21	0.41
1:B:857:PRO:O	1:B:859:LEU:HG	2.21	0.41
1:A:284:MET:HE3	1:A:323:TYR:HB3	2.03	0.41
1:B:871:PRO:N	1:B:872:PRO:CD	2.84	0.41
1:A:42:ALA:HB1	1:A:114:TYR:HB3	2.03	0.40
1:B:696:LEU:C	1:B:696:LEU:HD23	2.42	0.40
1:A:89:GLN:NE2	1:A:89:GLN:HA	2.35	0.40
1:A:294:PRO:HB2	1:A:296:ILE:CD1	2.51	0.40
1:B:547:GLY:HA3	4:B:194:HOH:O	2.19	0.40
1:B:606:HIS:HE1	1:B:608:ASN:HD22	1.70	0.40
1:B:869:SER:HB3	4:B:10:HOH:O	2.20	0.40
1:A:284:MET:HE3	1:A:323:TYR:CD1	2.57	0.40
1:B:544:PRO:HG3	1:B:552:GLN:HE21	1.85	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	352/420 (84%)	328 (93%)	22 (6%)	2 (1%)	25	21
1	B	362/420 (86%)	339 (94%)	19 (5%)	4 (1%)	14	9
All	All	714/840 (85%)	667 (93%)	41 (6%)	6 (1%)	19	15

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	221	TYR
1	B	621	GLU
1	B	623	LYS
1	B	721	TYR
1	A	123	LYS
1	B	549	ASP

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	313/364 (86%)	293 (94%)	20 (6%)	17	14
1	B	323/364 (89%)	304 (94%)	19 (6%)	19	17
All	All	636/728 (87%)	597 (94%)	39 (6%)	18	16

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	SER
1	A	36	LYS
1	A	64	ASN
1	A	77	ASP
1	A	94	LYS
1	A	121	GLU
1	A	124	ASP
1	A	125	GLU
1	A	147	SER
1	A	206	GLN
1	A	277	THR
1	A	279	GLU
1	A	289	THR
1	A	293	PHE
1	A	295	GLN
1	A	297	LYS
1	A	317	CYS
1	A	352	ASN

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Mol	Chain	Res	Type
1	A	361	ASN
1	A	385	GLN
1	B	523	PHE
1	B	531	ASP
1	B	560	LYS
1	B	564	ASN
1	B	566	SER
1	B	591	LYS
1	B	593	PHE
1	B	601	MET
1	B	614	TYR
1	B	619	SER
1	B	647	SER
1	B	652	THR
1	B	789	THR
1	B	793	PHE
1	B	795	GLN
1	B	796	ILE
1	B	797	LYS
1	B	852	ASN
1	B	861	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	89	GLN
1	A	95	ASN
1	A	99	GLN
1	A	108	ASN
1	A	145	HIS
1	A	164	GLN
1	A	179	HIS
1	A	265	GLN
1	A	285	ASN
1	A	295	GLN
1	A	337	HIS
1	A	352	ASN
1	A	361	ASN
1	B	546	GLN
1	B	552	GLN
1	B	589	GLN
1	B	595	ASN

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Mol	Chain	Res	Type
1	B	608	ASN
1	B	664	GLN
1	B	679	HIS
1	B	765	GLN
1	B	787	ASN
1	B	795	GLN
1	B	852	ASN
1	B	861	ASN
1	B	881	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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	ADP	B	930	2	24,29,29	2.27	3 (12%)	29,45,45	1.10	2 (6%)
3	ADP	A	430	2	24,29,29	2.22	3 (12%)	29,45,45	1.14	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	ADP	B	930	2	-	5/12/32/32	0/3/3/3
3	ADP	A	430	2	-	5/12/32/32	0/3/3/3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	930	ADP	C4-N3	9.90	1.49	1.35
3	A	430	ADP	C4-N3	9.53	1.48	1.35
3	B	930	ADP	C5-C4	3.19	1.49	1.40
3	A	430	ADP	C5-C4	3.05	1.49	1.40
3	A	430	ADP	O4'-C1'	2.90	1.45	1.41
3	B	930	ADP	O4'-C1'	2.54	1.44	1.41

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	430	ADP	C4-C5-N7	3.52	113.07	109.40
3	B	930	ADP	C4-C5-N7	3.43	112.97	109.40
3	A	430	ADP	O3'-C3'-C4'	2.46	118.16	111.05
3	B	930	ADP	O3'-C3'-C4'	2.18	117.36	111.05

There are no chirality outliers.

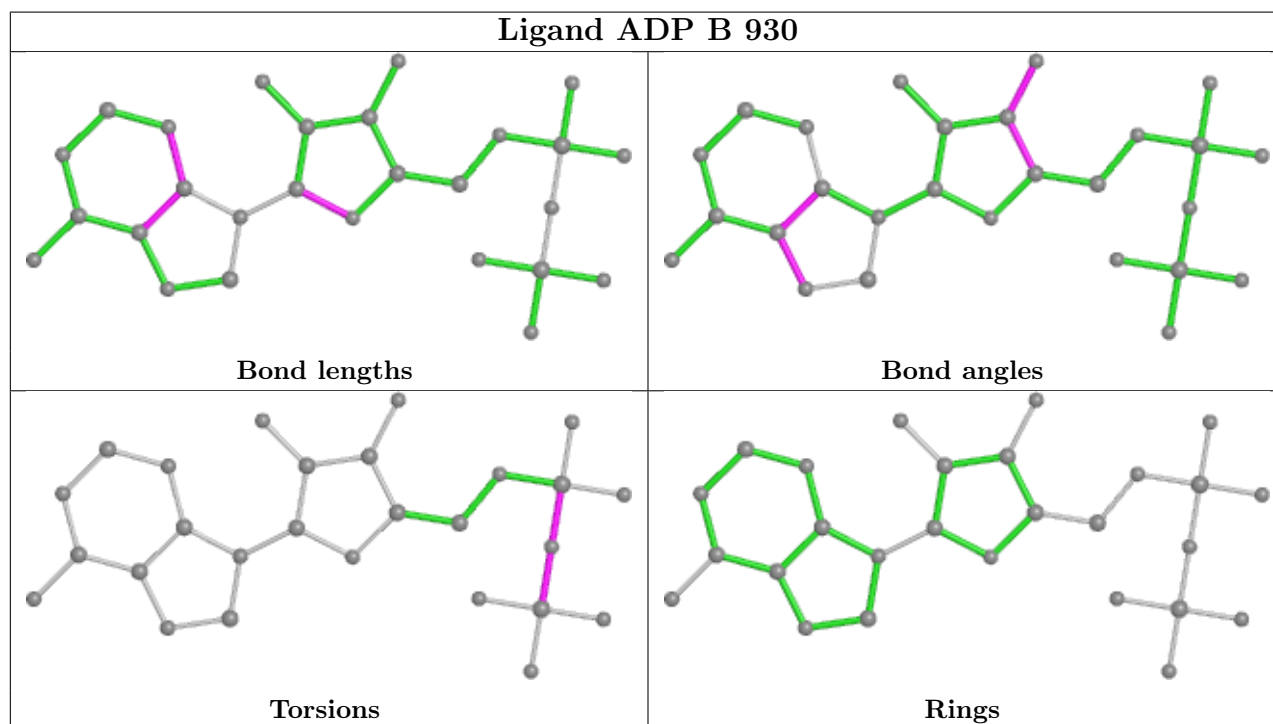
All (10) torsion outliers are listed below:

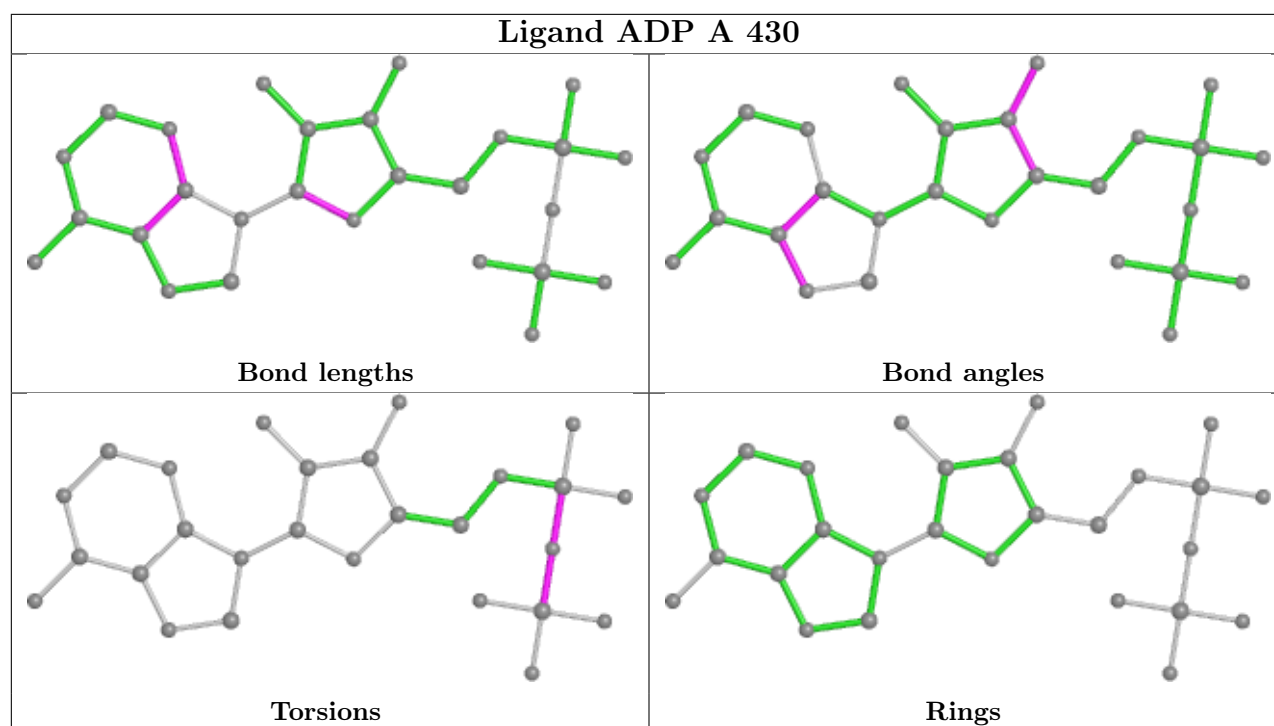
Mol	Chain	Res	Type	Atoms
3	A	430	ADP	PA-O3A-PB-O1B
3	B	930	ADP	PA-O3A-PB-O1B
3	A	430	ADP	PB-O3A-PA-O2A
3	B	930	ADP	PB-O3A-PA-O2A
3	A	430	ADP	PA-O3A-PB-O2B
3	A	430	ADP	PA-O3A-PB-O3B
3	B	930	ADP	PA-O3A-PB-O2B
3	B	930	ADP	PA-O3A-PB-O3B
3	A	430	ADP	PB-O3A-PA-O1A
3	B	930	ADP	PB-O3A-PA-O1A

There are no ring outliers.

No monomer is involved in short contacts.

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, 95th 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	354/420 (84%)	0.91	55 (15%) 2 2	16, 31, 73, 93	0
1	B	364/420 (86%)	1.09	67 (18%) 1 1	17, 34, 84, 94	0
All	All	718/840 (85%)	1.00	122 (16%) 1 1	16, 32, 78, 94	0

All (122) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	620	GLY	13.0
1	B	531	ASP	11.7
1	A	288	TYR	11.2
1	A	120	GLY	10.0
1	B	523	PHE	9.9
1	A	122	LYS	9.8
1	B	534	GLY	9.6
1	B	593	PHE	9.6
1	A	388	ALA	9.3
1	A	387	ALA	9.1
1	B	533	ASP	9.0
1	B	788	TYR	8.2
1	A	35	SER	7.9
1	B	621	GLU	7.9
1	B	592	ARG	7.9
1	A	123	LYS	7.4
1	A	93	PHE	7.4
1	A	121	GLU	7.1
1	A	92	ARG	7.0
1	A	308	ARG	7.0
1	A	286	PRO	6.9
1	B	624	ASP	6.8
1	B	530	ARG	6.3
1	B	797	LYS	6.2

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Mol	Chain	Res	Type	RSRZ
1	B	786	PRO	6.1
1	B	567	PHE	6.1
1	B	623	LYS	6.1
1	B	886	ALA	5.9
1	B	532	LYS	5.9
1	A	287	ASN	5.8
1	B	566	SER	5.8
1	A	386	ALA	5.7
1	B	789	THR	5.6
1	A	297	LYS	5.5
1	B	524	GLY	5.5
1	A	289	THR	5.5
1	A	385	GLN	5.4
1	B	790	GLU	5.2
1	B	535	SER	5.1
1	B	622	LYS	5.1
1	B	778	ARG	5.0
1	B	787	ASN	5.0
1	B	798	ALA	5.0
1	B	796	ILE	4.9
1	B	528	VAL	4.8
1	A	124	ASP	4.7
1	B	799	HIS	4.7
1	A	66	SER	4.7
1	B	594	LYS	4.6
1	B	564	ASN	4.6
1	A	282	ARG	4.5
1	B	650	LYS	4.5
1	B	590	ASP	4.4
1	B	800	PRO	4.3
1	B	619	SER	4.3
1	B	795	GLN	4.2
1	A	384	ILE	4.2
1	A	291	PHE	4.1
1	B	625	GLU	4.1
1	B	529	SER	4.1
1	B	782	ARG	4.1
1	A	65	GLY	4.1
1	A	278	ARG	4.0
1	A	119	SER	4.0
1	A	299	HIS	3.8
1	A	91	LYS	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	67	PHE	3.7
1	B	648	ARG	3.7
1	A	303	LYS	3.7
1	B	591	LYS	3.6
1	A	36	LYS	3.6
1	A	90	ASP	3.5
1	B	630	LEU	3.4
1	A	209	ARG	3.4
1	B	720	ARG	3.3
1	B	547	GLY	3.3
1	B	885	GLN	3.3
1	A	64	ASN	3.2
1	B	584	ILE	3.2
1	B	791	PHE	3.2
1	A	279	GLU	3.1
1	A	290	GLU	3.1
1	B	802	THR	3.0
1	B	709	ARG	2.9
1	A	83	ALA	2.9
1	A	300	PRO	2.8
1	B	803	LYS	2.8
1	A	150	LYS	2.8
1	A	284	MET	2.7
1	A	377	LEU	2.7
1	B	568	GLY	2.7
1	B	525	SER	2.7
1	B	627	TYR	2.7
1	B	526	MET	2.7
1	A	125	GLU	2.6
1	A	71	TYR	2.5
1	A	302	THR	2.5
1	B	560	LYS	2.5
1	B	546	GLN	2.5
1	A	130	LEU	2.5
1	A	296	ILE	2.4
1	A	132	LEU	2.4
1	B	565	GLY	2.4
1	A	294	PRO	2.4
1	A	77	ASP	2.4
1	A	48	PRO	2.4
1	B	577	ASP	2.3
1	A	295	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	148	ARG	2.3
1	B	631	VAL	2.2
1	A	37	VAL	2.2
1	A	82	VAL	2.2
1	B	632	LEU	2.2
1	A	94	LYS	2.2
1	B	589	GLN	2.1
1	B	571	TYR	2.1
1	B	859	LEU	2.1
1	B	728	ILE	2.1
1	B	854	ARG	2.0
1	B	794	PRO	2.0
1	A	131	VAL	2.0
1	B	578	SER	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

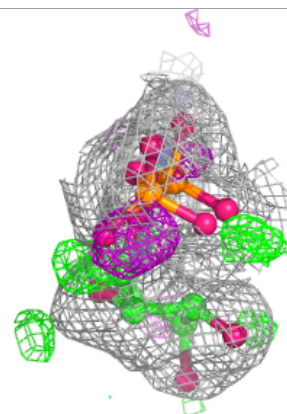
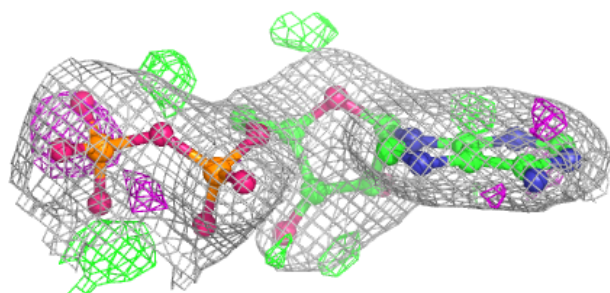
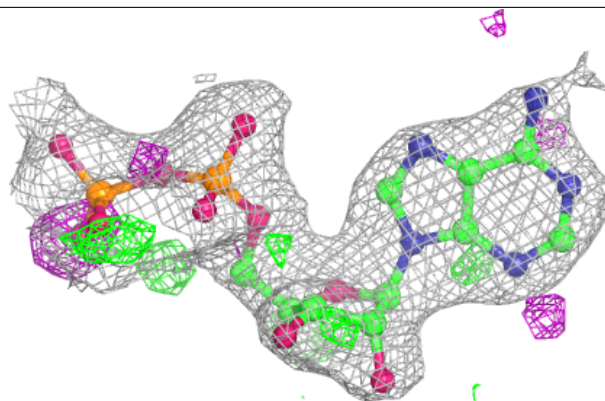
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	MG	B	931	1/1	0.76	0.13	47,47,47,47	0
2	MG	A	431	1/1	0.87	0.21	55,55,55,55	0
3	ADP	A	430	27/27	0.88	0.15	39,48,60,61	0
3	ADP	B	930	27/27	0.94	0.12	34,40,52,52	0

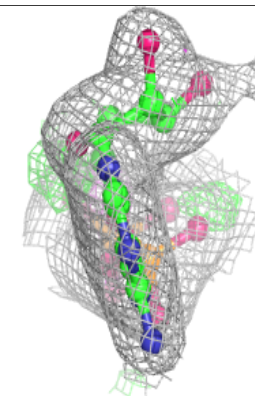
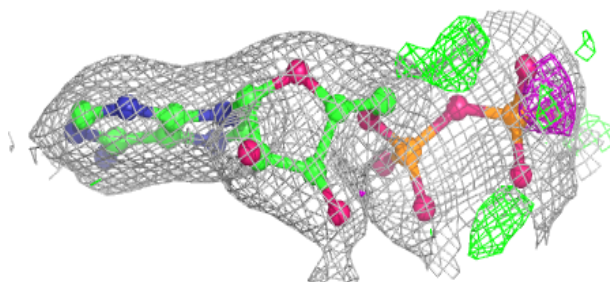
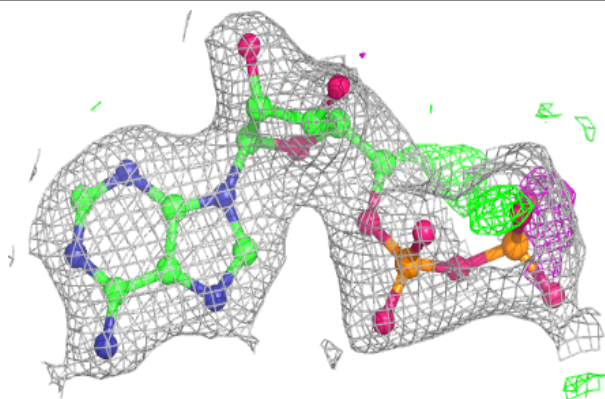
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ADP A 430:

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

**Electron density around ADP B 930:**

$2mF_o-DF_c$ (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.