Full wwPDB X-ray Structure Validation Report ⓘ

Oct 16, 2023 – 05:50 PM EDT

PDB ID	:	1N56
Title	:	Y-family DNA polymerase Dpo4 in complex with DNA containing abasic lesion
Authors	:	Ling, H.; Boudsocq, F.; Woodgate, R.; Yang, W.
Deposited on	:	2002-11-04
Resolution	:	2.40 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:

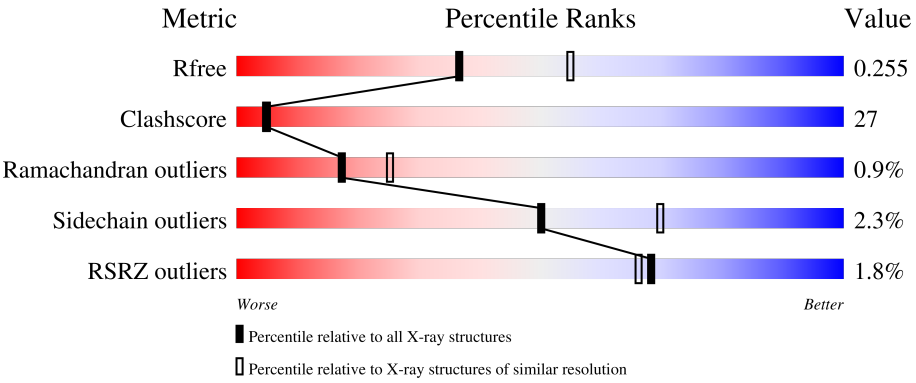
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	C	14	50% 43% 7%
1	E	14	7% 57% 36% 7%
2	D	17	12% 12% 88%
2	F	17	47% 53%
3	A	352	2% 58% 37%

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Mol	Chain	Length	Quality of chain
3	B	352	

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 7285 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 DNA chain called 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*AP*A)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	14	Total	C	N	O	P	0	0	0
			295	139	65	78	13			
1	E	14	Total	C	N	O	P	0	0	0
			295	139	65	78	13			

- Molecule 2 is a DNA chain called 5'-D(*TP*CP*AP*TP*(3DR)P*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	17	Total	C	N	O	P	0	0	0
			324	157	49	102	16			
2	F	17	Total	C	N	O	P	0	0	0
			324	157	49	102	16			

- Molecule 3 is a protein called DNA polymerase IV.

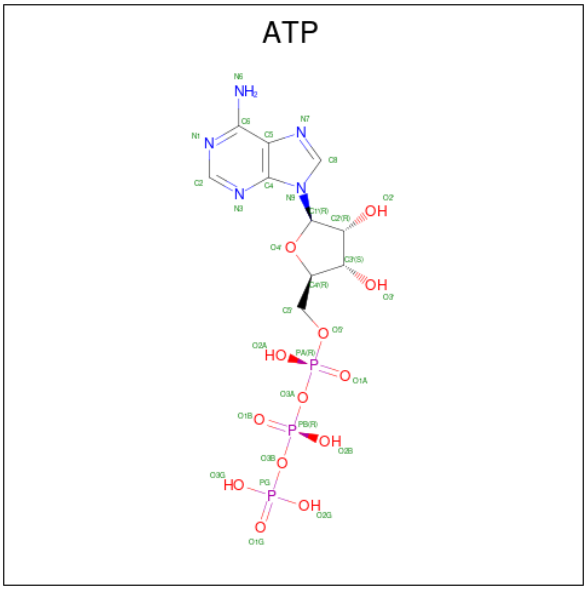
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	A	341	Total	C	N	O	S	0	0	0
			2743	1760	472	504	7			
3	B	341	Total	C	N	O	S	0	0	0
			2743	1760	472	504	7			

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 5 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula:

$C_{10}H_{16}N_5O_{13}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			30	10	5	12	3		
5	B	1	Total	C	N	O	P	0	0
			30	10	5	12	3		

- Molecule 6 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total	Ca	0	0
			1	1		

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	C	26	Total	O	0	0
			26	26		
7	D	33	Total	O	0	0
			33	33		
7	E	48	Total	O	0	0
			48	48		
7	F	47	Total	O	0	0
			47	47		
7	A	162	Total	O	0	0
			162	162		
7	B	181	Total	O	0	0
			181	181		

3 Residue-property plots (i)

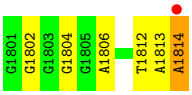
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*AP*A)-3'

Chain C:

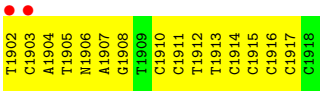
• Molecule 1: 5'-D(*GP*GP*GP*GP*GP*AP*AP*GP*GP*AP*CP*TP*AP*A)-3'

Chain E:



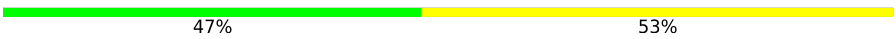
• Molecule 2: 5'-D(*TP*CP*AP*TP*(3DR)P*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'

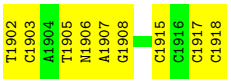
Chain D:



• Molecule 2: 5'-D(*TP*CP*AP*TP*(3DR)P*AP*GP*TP*CP*CP*TP*TP*CP*CP*CP*CP*C)-3'

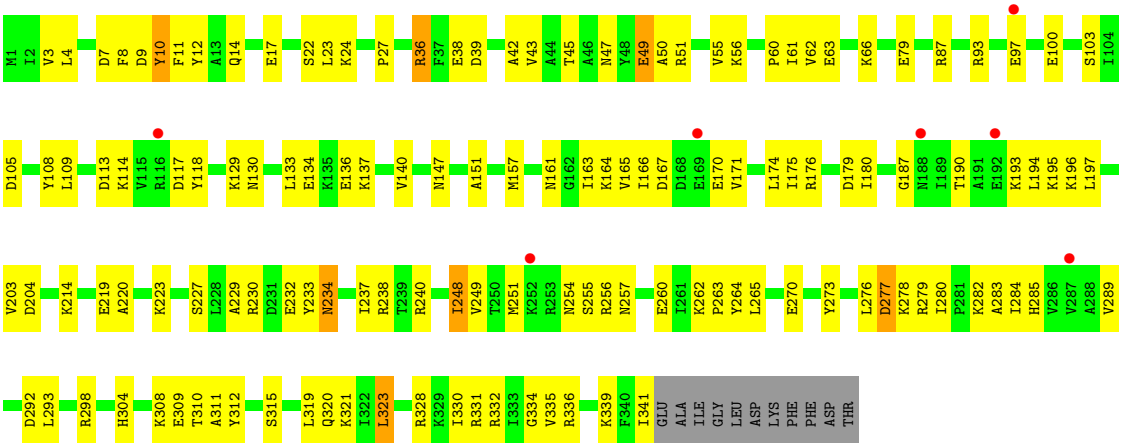
Chain F:





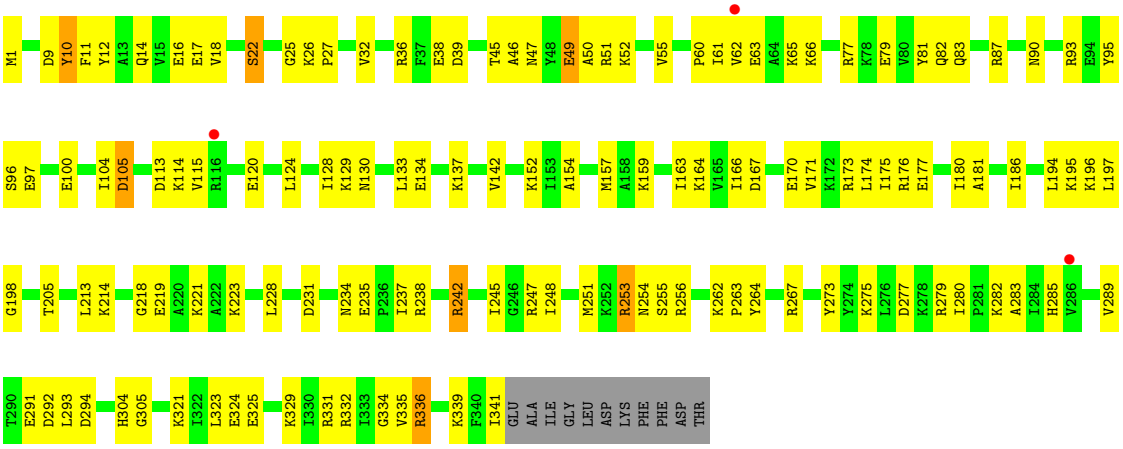
• Molecule 3: DNA polymerase IV

Chain A:



• Molecule 3: DNA polymerase IV

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	98.02Å 102.36Å 105.66Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.90 – 2.40 29.86 – 2.40	Depositor EDS
% Data completeness (in resolution range)	93.6 (29.90-2.40) 93.6 (29.86-2.40)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	0.04	Depositor
$< I/\sigma(I) >$ [1]	2.69 (at 2.39Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.225 , 0.263 0.215 , 0.255	Depositor DCC
R_{free} test set	980 reflections (2.48%)	wwPDB-VP
Wilson B-factor (Å^2)	55.4	Xtriage
Anisotropy	0.257	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 39.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.008 for -h,l,k	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7285	wwPDB-VP
Average B, all atoms (Å^2)	57.0	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 46.07 % 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 1.2072e-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: ATP, CA, 3DR, 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	C	0.50	0/334	0.94	1/516 (0.2%)
1	E	0.52	0/334	0.81	0/516
2	D	0.37	0/346	0.81	0/527
2	F	0.47	0/346	0.81	0/527
3	A	0.39	0/2782	0.60	0/3736
3	B	0.41	0/2782	0.61	0/3736
All	All	0.41	0/6924	0.66	1/9558 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1
1	E	0	1
All	All	0	2

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	1814	DA	N9-C1'-C2'	-7.01	99.27	112.60

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	1814	DA	Sidechain

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Mol	Chain	Res	Type	Group
1	E	1814	DA	Sidechain

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	C	295	0	157	15	0
1	E	295	0	157	14	0
2	D	324	0	191	30	0
2	F	324	0	191	17	0
3	A	2743	0	2889	153	0
3	B	2743	0	2889	139	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
5	A	30	0	10	8	0
5	B	30	0	10	6	0
6	B	1	0	0	0	0
7	A	162	0	0	71	0
7	B	181	0	0	73	0
7	C	26	0	0	7	0
7	D	33	0	0	10	0
7	E	48	0	0	15	0
7	F	47	0	0	9	0
All	All	7285	0	6494	362	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 27.

All (362) 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)
7:E:649:HOH:O	5:B:1804:ATP:H5'1	1.26	1.28
3:A:45:THR:HG21	7:A:936:HOH:O	1.49	1.12
3:A:109:LEU:HB2	7:A:919:HOH:O	1.51	1.08
2:F:1902:DT:H4'	2:F:1903:DC:C5'	1.89	1.03
2:F:1902:DT:H4'	2:F:1903:DC:H5"	1.06	1.03

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:10:TYR:HB3	7:A:656:HOH:O	1.65	0.96
2:D:1903:DC:H2'	2:D:1903:DC:O2	1.66	0.92
2:F:1915:DC:H1'	7:F:729:HOH:O	1.70	0.91
2:F:1902:DT:C4'	2:F:1903:DC:H5"	1.99	0.90
3:A:10:TYR:HA	5:A:1803:ATP:O2B	1.73	0.89
2:D:1905:DT:H2"	2:D:1906:3DR:H2'	1.54	0.89
3:B:341:ILE:HB	7:B:661:HOH:O	1.74	0.85
3:A:341:ILE:HB	7:A:977:HOH:O	1.78	0.83
2:D:1913:DT:H1'	7:D:645:HOH:O	1.79	0.82
2:D:1911:DC:H3'	7:D:512:HOH:O	1.79	0.81
3:A:23:LEU:HG	7:A:754:HOH:O	1.79	0.81
3:B:336:ARG:HD2	7:B:591:HOH:O	1.80	0.80
3:B:205:THR:HB	7:B:670:HOH:O	1.81	0.80
3:B:256:ARG:HD2	7:B:633:HOH:O	1.81	0.80
3:A:17:GLU:HB3	7:A:858:HOH:O	1.82	0.80
3:A:321:LYS:HD3	7:A:521:HOH:O	1.81	0.79
3:A:229:ALA:HA	7:A:689:HOH:O	1.83	0.78
3:A:4:LEU:HB3	7:A:919:HOH:O	1.83	0.78
1:C:1801:DG:H5'	3:B:83:GLN:OE1	1.84	0.77
5:B:1804:ATP:H5'2	7:B:934:HOH:O	1.84	0.77
2:D:1911:DC:H5"	7:D:682:HOH:O	1.86	0.76
3:B:17:GLU:HB3	7:B:998:HOH:O	1.85	0.76
3:B:304:HIS:HD2	3:B:305:GLY:O	1.69	0.76
1:E:1814:DA:O3'	7:E:783:HOH:O	2.03	0.75
1:E:1814:DA:OP1	7:E:649:HOH:O	2.05	0.75
3:A:56:LYS:HG2	7:A:941:HOH:O	1.86	0.75
1:C:1814:DA:OP2	1:C:1814:DA:H3'	1.86	0.74
3:B:267:ARG:HD2	7:B:504:HOH:O	1.88	0.74
3:B:282:LYS:HG3	7:B:872:HOH:O	1.87	0.74
3:A:282:LYS:HD2	7:A:943:HOH:O	1.88	0.73
3:B:171:VAL:O	3:B:175:ILE:HG13	1.87	0.73
3:B:329:LYS:HA	7:B:633:HOH:O	1.88	0.73
3:A:10:TYR:CA	5:A:1803:ATP:O2B	2.37	0.72
2:D:1910:DC:H1'	7:D:784:HOH:O	1.89	0.71
3:A:293:LEU:HD21	7:A:730:HOH:O	1.90	0.71
5:A:1803:ATP:O3'	7:A:936:HOH:O	2.08	0.71
3:A:190:THR:HA	7:A:945:HOH:O	1.90	0.71
3:B:79:GLU:CD	3:B:79:GLU:H	1.94	0.71
1:C:1814:DA:H2"	5:A:1803:ATP:C5	2.26	0.70
2:D:1907:DA:H2'	7:A:685:HOH:O	1.91	0.70
3:A:260:GLU:HA	7:A:713:HOH:O	1.92	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:324:GLU:HB3	7:B:879:HOH:O	1.92	0.70
3:B:62:VAL:HG23	7:B:507:HOH:O	1.92	0.69
3:B:186:ILE:HB	7:B:981:HOH:O	1.92	0.69
3:A:179:ASP:HB2	7:A:1001:HOH:O	1.92	0.69
3:B:105:ASP:CG	7:B:934:HOH:O	2.31	0.69
3:A:62:VAL:HG12	3:A:66:LYS:HE3	1.74	0.69
3:A:282:LYS:HB3	7:A:943:HOH:O	1.91	0.69
7:F:651:HOH:O	3:B:62:VAL:HB	1.92	0.69
3:A:280:ILE:HB	7:A:977:HOH:O	1.93	0.69
3:B:283:ALA:HB2	3:B:339:LYS:HD2	1.74	0.69
3:A:289:VAL:HB	3:A:332:ARG:HB2	1.75	0.68
7:E:649:HOH:O	3:B:105:ASP:OD1	2.11	0.68
3:A:3:VAL:HG11	3:A:147:ASN:C	2.13	0.68
3:B:97:GLU:CD	3:B:97:GLU:H	1.96	0.68
3:B:177:GLU:HG2	7:B:762:HOH:O	1.93	0.68
3:A:240:ARG:HG2	7:A:779:HOH:O	1.93	0.68
3:B:262:LYS:HB2	3:B:263:PRO:HD3	1.76	0.68
3:B:263:PRO:HD2	7:B:660:HOH:O	1.94	0.67
3:A:273:TYR:HA	3:A:276:LEU:HD12	1.75	0.67
3:A:79:GLU:CD	3:A:79:GLU:H	1.96	0.67
3:B:49:GLU:OE1	3:B:49:GLU:HA	1.95	0.66
2:D:1917:DC:H1'	7:D:801:HOH:O	1.95	0.66
3:A:248:ILE:HD13	3:A:249:VAL:N	2.10	0.66
3:B:10:TYR:HA	5:B:1804:ATP:O2B	1.94	0.66
3:B:159:LYS:HE2	7:B:947:HOH:O	1.95	0.66
2:D:1907:DA:H2"	2:D:1908:DG:H5'	1.77	0.66
3:A:12:TYR:HB2	7:A:936:HOH:O	1.95	0.66
3:A:43:VAL:HG23	7:A:557:HOH:O	1.95	0.66
2:F:1906:3DR:H2"	7:F:1007:HOH:O	1.96	0.66
3:B:142:VAL:HG23	7:B:946:HOH:O	1.95	0.66
3:A:24:LYS:HD3	7:A:858:HOH:O	1.96	0.65
3:B:157:MET:HE3	3:B:164:LYS:HD3	1.76	0.65
3:B:26:LYS:HG3	7:B:664:HOH:O	1.95	0.65
3:A:157:MET:HE2	3:A:166:ILE:HD11	1.78	0.65
3:B:22:SER:HB3	7:B:654:HOH:O	1.96	0.65
2:F:1918:DC:H5"	7:F:1010:HOH:O	1.97	0.65
2:D:1904:DA:H2"	7:A:730:HOH:O	1.97	0.64
3:A:279:ARG:HD2	7:A:985:HOH:O	1.98	0.64
3:B:47:ASN:HB2	7:B:636:HOH:O	1.97	0.64
2:D:1904:DA:H3'	7:D:927:HOH:O	1.98	0.64
3:B:228:LEU:HA	7:B:757:HOH:O	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:242:ARG:HG2	7:B:671:HOH:O	1.96	0.64
3:A:87:ARG:HB3	7:A:599:HOH:O	1.97	0.64
3:B:49:GLU:HG2	7:B:800:HOH:O	1.97	0.64
3:B:52:LYS:HB3	7:B:662:HOH:O	1.98	0.64
3:B:100:GLU:HB2	3:B:237:ILE:HG23	1.81	0.63
3:B:77:ARG:HG3	7:B:944:HOH:O	1.99	0.63
3:B:181:ALA:HA	7:B:981:HOH:O	1.99	0.63
3:A:292:ASP:O	3:A:293:LEU:HB2	1.98	0.63
3:A:47:ASN:HB2	7:A:526:HOH:O	2.00	0.62
3:B:275:LYS:NZ	7:B:638:HOH:O	2.32	0.62
3:A:51:ARG:HA	3:A:55:VAL:O	2.00	0.61
3:A:100:GLU:HB2	3:A:237:ILE:HG23	1.81	0.61
3:B:273:TYR:HE1	7:B:697:HOH:O	1.82	0.61
1:C:1814:DA:H3'	1:C:1814:DA:P	2.40	0.61
2:D:1912:DT:H2'	7:D:736:HOH:O	1.99	0.61
1:E:1812:DT:H4'	7:E:880:HOH:O	1.99	0.61
3:A:171:VAL:O	3:A:175:ILE:HG13	2.00	0.61
2:D:1914:DC:H1'	2:D:1915:DC:O5'	2.01	0.61
3:B:12:TYR:HB2	3:B:45:THR:HG21	1.81	0.61
1:E:1814:DA:H5'	7:E:649:HOH:O	2.01	0.61
3:A:93:ARG:NH1	7:A:580:HOH:O	2.34	0.61
3:A:233:TYR:HA	7:A:867:HOH:O	2.00	0.61
3:A:227:SER:HB2	7:A:867:HOH:O	2.01	0.61
3:A:320:GLN:HA	3:A:323:LEU:HB2	1.81	0.60
3:B:157:MET:HE2	3:B:166:ILE:HD11	1.83	0.60
3:A:12:TYR:HB2	3:A:45:THR:HG21	1.82	0.60
7:C:665:HOH:O	3:A:187:GLY:HA3	2.00	0.60
3:B:130:ASN:O	3:B:134:GLU:HB2	2.02	0.60
5:B:1804:ATP:C5'	7:B:934:HOH:O	2.46	0.60
3:B:10:TYR:CA	5:B:1804:ATP:O2B	2.49	0.59
3:A:157:MET:CE	3:A:166:ILE:HD11	2.32	0.59
3:B:105:ASP:CB	7:B:934:HOH:O	2.50	0.59
3:B:247:ARG:HD2	7:B:638:HOH:O	2.01	0.59
3:B:289:VAL:HB	3:B:332:ARG:HB2	1.85	0.59
3:A:161:ASN:N	7:A:865:HOH:O	2.36	0.59
3:A:180:ILE:HD13	3:A:194:LEU:HD13	1.85	0.59
1:C:1806:DA:H2'	7:C:790:HOH:O	2.03	0.58
3:A:49:GLU:HG3	7:A:797:HOH:O	2.03	0.58
3:A:193:LYS:NZ	7:A:926:HOH:O	2.36	0.58
3:A:331:ARG:HA	7:A:940:HOH:O	2.03	0.58
3:A:308:LYS:O	3:A:312:TYR:HD2	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:43:VAL:N	7:A:557:HOH:O	2.35	0.58
2:D:1911:DC:H5'	3:A:220:ALA:HB3	1.87	0.57
3:A:97:GLU:H	3:A:97:GLU:CD	2.07	0.57
3:A:140:VAL:C	7:A:865:HOH:O	2.42	0.57
3:B:242:ARG:HH11	3:B:242:ARG:HG3	1.68	0.57
1:E:1813:DA:P	3:B:152:LYS:HE2	2.45	0.57
3:A:248:ILE:HD11	3:A:332:ARG:HB3	1.86	0.57
2:F:1902:DT:C4'	2:F:1903:DC:C5'	2.71	0.57
3:B:18:VAL:HG23	7:B:794:HOH:O	2.04	0.57
3:B:26:LYS:HE3	7:B:664:HOH:O	2.05	0.56
3:B:105:ASP:HB3	7:B:934:HOH:O	2.05	0.56
3:B:11:PHE:HB2	7:B:812:HOH:O	2.05	0.56
3:B:285:HIS:HD2	7:B:532:HOH:O	1.88	0.56
2:D:1910:DC:H2"	2:D:1911:DC:C6	2.40	0.56
3:B:113:ASP:HB2	7:B:976:HOH:O	2.05	0.56
3:B:198:GLY:C	7:B:971:HOH:O	2.43	0.56
3:B:157:MET:CE	3:B:166:ILE:HD11	2.37	0.55
3:B:27:PRO:HA	3:B:49:GLU:HB2	1.88	0.55
2:D:1910:DC:H4'	7:D:634:HOH:O	2.07	0.55
3:B:51:ARG:HA	3:B:55:VAL:O	2.07	0.55
3:A:60:PRO:HD2	3:A:63:GLU:HG3	1.88	0.55
3:A:175:ILE:HG23	7:A:689:HOH:O	2.05	0.55
1:E:1802:DG:H2'	7:E:562:HOH:O	2.06	0.54
3:B:63:GLU:HA	3:B:66:LYS:HG3	1.90	0.54
2:D:1907:DA:H2"	2:D:1908:DG:C5'	2.37	0.54
3:A:51:ARG:NH2	7:A:656:HOH:O	2.40	0.54
3:A:230:ARG:O	3:A:232:GLU:HG3	2.08	0.54
2:D:1902:DT:H3'	7:D:950:HOH:O	2.07	0.54
3:A:23:LEU:N	7:A:754:HOH:O	2.41	0.54
3:B:280:ILE:HB	7:B:661:HOH:O	2.07	0.54
1:E:1812:DT:H3'	7:E:793:HOH:O	2.08	0.54
2:D:1908:DG:OP2	3:A:336:ARG:NH2	2.34	0.53
1:C:1814:DA:H2"	5:A:1803:ATP:N7	2.22	0.53
3:B:219:GLU:CG	3:B:223:LYS:HE3	2.38	0.53
3:A:9:ASP:O	3:A:10:TYR:C	2.46	0.53
3:A:12:TYR:CB	7:A:936:HOH:O	2.54	0.53
2:F:1902:DT:H5"	7:F:837:HOH:O	2.09	0.53
1:E:1812:DT:H5'	7:E:565:HOH:O	2.08	0.53
3:B:167:ASP:O	3:B:171:VAL:HG23	2.09	0.53
3:A:97:GLU:HA	7:A:836:HOH:O	2.09	0.52
3:A:130:ASN:O	3:A:134:GLU:HB2	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:214:LYS:HE3	3:A:219:GLU:HB2	1.90	0.52
3:A:10:TYR:N	5:A:1803:ATP:O2B	2.43	0.52
3:B:282:LYS:NZ	7:B:872:HOH:O	2.42	0.52
3:B:62:VAL:HG12	3:B:66:LYS:HE3	1.92	0.52
3:B:339:LYS:HE3	7:B:611:HOH:O	2.10	0.52
1:C:1806:DA:H8	7:C:790:HOH:O	1.93	0.52
3:B:221:LYS:HE3	7:B:769:HOH:O	2.10	0.52
3:A:4:LEU:O	7:A:919:HOH:O	2.19	0.52
3:A:285:HIS:HD2	7:A:529:HOH:O	1.92	0.52
3:A:51:ARG:CZ	7:A:656:HOH:O	2.58	0.52
3:B:195:LYS:HB2	7:B:840:HOH:O	2.10	0.52
3:B:25:GLY:N	7:B:928:HOH:O	2.33	0.51
2:D:1905:DT:H2"	2:D:1906:3DR:C2'	2.36	0.51
3:A:129:LYS:HE3	7:A:1020:HOH:O	2.10	0.51
3:B:195:LYS:C	3:B:197:LEU:H	2.13	0.51
3:A:36:ARG:NH2	7:A:940:HOH:O	2.29	0.51
3:A:62:VAL:HG23	7:A:615:HOH:O	2.11	0.51
3:A:240:ARG:HA	7:A:509:HOH:O	2.11	0.51
3:A:263:PRO:HA	7:A:1005:HOH:O	2.10	0.51
3:B:304:HIS:HE1	7:B:834:HOH:O	1.94	0.51
3:B:100:GLU:HG3	3:B:238:ARG:O	2.11	0.51
2:D:1907:DA:H1'	2:D:1908:DG:H5"	1.93	0.50
3:B:251:MET:HG2	3:B:264:TYR:CD2	2.46	0.50
3:A:277:ASP:O	3:A:278:LYS:HB2	2.11	0.50
3:B:256:ARG:HB3	7:B:633:HOH:O	2.11	0.50
2:F:1903:DC:H4'	7:F:651:HOH:O	2.11	0.50
3:B:180:ILE:HD13	3:B:194:LEU:HD13	1.93	0.50
3:A:262:LYS:HB2	3:A:263:PRO:HD3	1.92	0.50
2:D:1903:DC:O2	2:D:1903:DC:C2'	2.48	0.50
3:A:265:LEU:HD21	3:A:315:SER:HB2	1.93	0.50
1:C:1805:DG:H2"	1:C:1806:DA:H8	1.76	0.50
3:A:195:LYS:C	3:A:197:LEU:H	2.15	0.50
3:B:9:ASP:O	3:B:10:TYR:C	2.49	0.49
3:B:214:LYS:HE3	3:B:219:GLU:HB2	1.93	0.49
1:E:1812:DT:C4'	7:E:880:HOH:O	2.59	0.49
1:E:1814:DA:C5'	7:E:649:HOH:O	2.59	0.49
3:A:278:LYS:N	7:A:903:HOH:O	2.41	0.49
3:B:49:GLU:OE1	3:B:49:GLU:CA	2.61	0.49
3:A:331:ARG:NE	7:A:730:HOH:O	2.45	0.49
2:F:1907:DA:C8	7:F:924:HOH:O	2.54	0.49
3:A:136:GLU:OE2	7:A:599:HOH:O	2.20	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:235:GLU:N	7:B:505:HOH:O	2.44	0.49
1:C:1809:DG:H2'	7:A:972:HOH:O	2.11	0.49
3:A:157:MET:HE3	3:A:164:LYS:HD3	1.95	0.48
3:A:27:PRO:HB2	3:A:50:ALA:HB2	1.95	0.48
3:B:142:VAL:N	7:B:946:HOH:O	2.46	0.48
3:A:234:ASN:O	3:A:234:ASN:CG	2.51	0.48
3:B:97:GLU:CD	3:B:97:GLU:N	2.65	0.48
2:F:1903:DC:O2	3:B:60:PRO:HG2	2.13	0.48
3:A:3:VAL:HG13	3:A:151:ALA:HB2	1.96	0.48
3:A:251:MET:HG2	3:A:264:TYR:CG	2.48	0.48
3:B:291:GLU:CD	3:B:329:LYS:HB2	2.34	0.48
3:A:319:LEU:HD12	3:A:319:LEU:O	2.13	0.48
1:C:1805:DG:H2"	1:C:1806:DA:C8	2.48	0.48
3:B:221:LYS:HD2	7:B:1017:HOH:O	2.14	0.48
3:A:331:ARG:HG3	7:A:940:HOH:O	2.14	0.48
3:B:27:PRO:HB2	3:B:50:ALA:HB2	1.96	0.48
3:B:52:LYS:C	7:B:662:HOH:O	2.52	0.47
3:B:248:ILE:HA	3:B:334:GLY:HA3	1.96	0.47
3:A:304:HIS:N	7:A:943:HOH:O	2.46	0.47
3:A:248:ILE:HA	3:A:334:GLY:HA3	1.95	0.47
3:B:335:VAL:HG22	3:B:336:ARG:N	2.29	0.47
3:A:100:GLU:HG3	3:A:238:ARG:O	2.14	0.47
3:B:12:TYR:HB2	3:B:45:THR:CG2	2.44	0.47
3:B:87:ARG:HD3	7:B:727:HOH:O	2.15	0.47
3:B:213:LEU:HD22	7:B:670:HOH:O	2.15	0.47
3:A:14:GLN:O	3:A:17:GLU:HB2	2.15	0.47
3:A:117:ASP:HB2	7:A:590:HOH:O	2.13	0.47
3:B:93:ARG:NE	7:B:814:HOH:O	2.48	0.47
3:B:321:LYS:HG2	3:B:325:GLU:OE2	2.14	0.47
1:C:1814:DA:O3'	5:A:1803:ATP:C8	2.68	0.46
3:B:81:TYR:OH	7:B:944:HOH:O	2.20	0.46
3:A:133:LEU:O	3:A:137:LYS:HA	2.15	0.46
3:B:93:ARG:NH2	7:B:814:HOH:O	2.48	0.46
3:B:253:ARG:HD2	3:B:254:ASN:O	2.14	0.46
2:F:1908:DG:P	3:B:336:ARG:HH22	2.37	0.46
3:B:17:GLU:CD	7:B:706:HOH:O	2.53	0.46
2:D:1902:DT:H4'	2:D:1903:DC:H3'	1.96	0.46
3:A:277:ASP:O	3:A:278:LYS:CB	2.63	0.46
3:A:289:VAL:CB	3:A:332:ARG:HB2	2.44	0.46
3:A:161:ASN:HA	7:A:865:HOH:O	2.15	0.46
3:B:114:LYS:HE2	7:B:813:HOH:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:256:ARG:NH1	3:A:256:ARG:HB2	2.30	0.46
3:B:1:MET:HE1	7:B:776:HOH:O	2.15	0.46
3:A:248:ILE:CD1	3:A:332:ARG:HB3	2.45	0.46
3:B:129:LYS:HD2	7:B:946:HOH:O	2.16	0.46
3:B:213:LEU:CD2	7:B:670:HOH:O	2.64	0.46
3:B:255:SER:OG	3:B:256:ARG:N	2.49	0.46
3:A:289:VAL:CG2	3:A:332:ARG:HB2	2.47	0.45
3:B:219:GLU:O	3:B:223:LYS:HG3	2.15	0.45
3:A:167:ASP:O	3:A:171:VAL:HG23	2.16	0.45
3:B:231:ASP:HA	7:B:757:HOH:O	2.16	0.45
2:D:1905:DT:H5"	7:D:927:HOH:O	2.17	0.45
2:F:1917:DC:H3'	7:F:935:HOH:O	2.16	0.45
3:B:341:ILE:HG13	7:B:872:HOH:O	2.16	0.45
3:A:175:ILE:HG12	7:A:689:HOH:O	2.17	0.45
3:A:61:ILE:N	7:A:557:HOH:O	2.50	0.44
3:A:193:LYS:HE3	7:A:945:HOH:O	2.17	0.44
3:B:95:TYR:O	3:B:96:SER:HB2	2.16	0.44
2:D:1907:DA:OP2	3:A:248:ILE:HG22	2.18	0.44
2:D:1908:DG:P	3:A:336:ARG:HH22	2.41	0.44
3:A:284:ILE:HG12	3:A:285:HIS:N	2.32	0.44
7:C:933:HOH:O	3:A:103:SER:HB2	2.17	0.44
1:E:1806:DA:C5'	7:E:949:HOH:O	2.66	0.44
3:A:273:TYR:HE1	7:A:705:HOH:O	2.00	0.44
3:B:245:ILE:HD11	3:B:279:ARG:CZ	2.47	0.44
2:F:1906:3DR:H5'	3:B:32:VAL:CG1	2.48	0.44
3:A:113:ASP:O	3:A:114:LYS:HD3	2.18	0.44
2:D:1916:DC:H2"	2:D:1917:DC:O5'	2.17	0.44
3:A:310:THR:O	3:A:311:ALA:C	2.55	0.44
3:B:195:LYS:N	7:B:922:HOH:O	2.51	0.44
3:A:292:ASP:O	3:A:293:LEU:CB	2.65	0.43
3:B:173:ARG:NH1	3:B:177:GLU:OE1	2.46	0.43
3:A:335:VAL:HG22	3:A:336:ARG:N	2.33	0.43
3:B:104:ILE:HG12	3:B:104:ILE:O	2.17	0.43
3:A:38:GLU:O	3:A:39:ASP:HB2	2.18	0.43
2:D:1905:DT:O5'	2:D:1905:DT:H6	2.02	0.43
3:A:7:ASP:CG	7:A:1023:HOH:O	2.57	0.43
3:A:255:SER:OG	3:A:256:ARG:N	2.51	0.43
3:B:218:GLY:HA2	7:B:951:HOH:O	2.18	0.43
3:B:242:ARG:HG3	3:B:242:ARG:NH1	2.33	0.43
3:A:8:PHE:N	3:A:8:PHE:CD1	2.86	0.43
3:A:219:GLU:O	3:A:223:LYS:HG3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:263:PRO:CA	7:A:1005:HOH:O	2.67	0.43
3:B:9:ASP:O	3:B:11:PHE:N	2.52	0.43
3:B:16:GLU:HA	3:B:16:GLU:OE1	2.18	0.43
3:A:3:VAL:HG11	3:A:147:ASN:O	2.19	0.43
3:A:4:LEU:HD22	7:A:919:HOH:O	2.18	0.42
3:A:256:ARG:NH1	3:A:256:ARG:CB	2.82	0.42
1:C:1814:DA:H5"	7:C:933:HOH:O	2.19	0.42
3:A:220:ALA:HB3	7:A:663:HOH:O	2.18	0.42
3:B:14:GLN:O	3:B:17:GLU:HB2	2.19	0.42
3:B:159:LYS:CB	7:B:947:HOH:O	2.66	0.42
1:E:1804:DG:H1'	7:E:675:HOH:O	2.19	0.42
2:D:1914:DC:C1'	2:D:1915:DC:O5'	2.65	0.42
1:E:1806:DA:H5"	7:E:949:HOH:O	2.19	0.42
3:A:105:ASP:OD1	5:A:1803:ATP:H5'1	2.20	0.42
3:A:289:VAL:HB	3:A:332:ARG:CB	2.47	0.42
3:B:154:ALA:HA	3:B:157:MET:HE2	2.02	0.42
3:A:176:ARG:HB2	3:A:176:ARG:NH1	2.34	0.42
3:A:238:ARG:HG3	7:A:779:HOH:O	2.18	0.42
3:A:298:ARG:HG2	3:A:298:ARG:HH11	1.84	0.42
3:B:10:TYR:HA	5:B:1804:ATP:PB	2.59	0.42
3:B:292:ASP:O	3:B:293:LEU:HB2	2.19	0.42
1:E:1814:DA:C5'	7:E:917:HOH:O	2.66	0.42
3:A:170:GLU:O	3:A:174:LEU:HG	2.19	0.42
3:A:283:ALA:HB2	3:A:339:LYS:HD2	2.02	0.42
3:A:285:HIS:CD2	7:A:529:HOH:O	2.71	0.42
3:A:336:ARG:NH1	7:A:685:HOH:O	2.52	0.42
3:B:46:ALA:HB1	3:B:50:ALA:HB3	2.01	0.42
3:B:142:VAL:O	3:B:163:ILE:HA	2.20	0.42
3:B:291:GLU:OE1	3:B:329:LYS:HB2	2.19	0.42
2:F:1906:3DR:H5"	7:B:658:HOH:O	2.20	0.42
3:A:133:LEU:O	3:A:137:LYS:HE3	2.19	0.42
3:A:161:ASN:CA	7:A:865:HOH:O	2.67	0.42
3:A:219:GLU:CG	3:A:223:LYS:HE3	2.49	0.42
3:B:82:GLN:HB2	7:B:546:HOH:O	2.20	0.42
3:B:90:ASN:N	7:B:814:HOH:O	2.52	0.42
3:B:159:LYS:HB2	7:B:947:HOH:O	2.19	0.42
3:B:341:ILE:N	7:B:872:HOH:O	2.52	0.42
2:F:1905:DT:H5"	7:F:884:HOH:O	2.20	0.41
3:B:173:ARG:HD3	7:B:988:HOH:O	2.20	0.41
3:A:270:GLU:OE2	3:A:308:LYS:HD3	2.20	0.41
3:A:273:TYR:O	3:A:276:LEU:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:115:VAL:HB	3:B:120:GLU:HB2	2.01	0.41
3:A:9:ASP:O	3:A:11:PHE:N	2.54	0.41
3:A:118:TYR:HB3	3:A:165:VAL:HG11	2.03	0.41
1:C:1806:DA:P	7:C:790:HOH:O	2.79	0.41
3:A:97:GLU:CD	3:A:97:GLU:N	2.72	0.41
1:C:1805:DG:H5'	7:C:519:HOH:O	2.19	0.41
3:A:42:ALA:C	7:A:557:HOH:O	2.57	0.41
3:B:36:ARG:NH1	3:B:331:ARG:NH1	2.68	0.41
3:B:124:LEU:O	3:B:128:ILE:HG13	2.21	0.41
3:A:254:ASN:CG	7:A:940:HOH:O	2.58	0.41
3:A:292:ASP:OD1	3:A:328:ARG:HD2	2.20	0.41
3:B:51:ARG:NH2	7:B:575:HOH:O	2.54	0.41
1:C:1812:DT:H1'	1:C:1813:DA:H5'	2.02	0.41
2:D:1911:DC:H5'	3:A:220:ALA:CB	2.49	0.41
3:A:203:VAL:HG13	3:A:204:ASP:N	2.36	0.41
3:B:176:ARG:NH1	3:B:176:ARG:HB2	2.35	0.41
3:B:234:ASN:HA	7:B:505:HOH:O	2.20	0.41
3:A:163:ILE:O	3:A:163:ILE:HG23	2.20	0.40
3:A:248:ILE:HD11	3:A:332:ARG:CB	2.51	0.40
3:A:257:ASN:C	3:A:257:ASN:ND2	2.73	0.40
3:A:256:ARG:CB	3:A:256:ARG:HH11	2.34	0.40
2:F:1905:DT:H6	2:F:1905:DT:O5'	2.05	0.40
3:A:108:TYR:C	3:A:109:LEU:HD12	2.42	0.40
3:A:254:ASN:HA	3:A:330:ILE:O	2.22	0.40
3:B:61:ILE:O	3:B:65:LYS:HG3	2.21	0.40
3:B:170:GLU:O	3:B:174:LEU:HG	2.22	0.40
3:A:309:GLU:O	3:A:312:TYR:HB2	2.22	0.40
3:B:38:GLU:O	3:B:39:ASP:HB2	2.21	0.40
3:B:133:LEU:O	3:B:137:LYS:HA	2.22	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
3	A	339/352 (96%)	312 (92%)	24 (7%)	3 (1%)	17 25
3	B	339/352 (96%)	313 (92%)	23 (7%)	3 (1%)	17 25
All	All	678/704 (96%)	625 (92%)	47 (7%)	6 (1%)	17 25

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A	10	TYR
3	A	277	ASP
3	B	10	TYR
3	B	277	ASP
3	B	196	LYS
3	A	196	LYS

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
3	A	300/309 (97%)	294 (98%)	6 (2%)	55 74
3	B	300/309 (97%)	292 (97%)	8 (3%)	44 65
All	All	600/618 (97%)	586 (98%)	14 (2%)	50 70

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	A	22	SER
3	A	36	ARG
3	A	49	GLU
3	A	234	ASN
3	A	248	ILE
3	A	323	LEU
3	B	22	SER
3	B	49	GLU
3	B	105	ASP
3	B	242	ARG

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Mol	Chain	Res	Type
3	B	253	ARG
3	B	294	ASP
3	B	323	LEU
3	B	336	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	188	ASN
3	B	188	ASN
3	B	304	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)

2 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	$\#\|Z\| > 2$
2	3DR	F	1906	2	8,11,12	0.47	0	9,14,17	0.77	0
2	3DR	D	1906	2	8,11,12	0.28	0	9,14,17	0.78	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	3DR	F	1906	2	-	0/3/15/16	0/1/1/1
2	3DR	D	1906	2	-	2/3/15/16	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	1906	3DR	O4'-C4'-C5'-O5'
2	D	1906	3DR	C3'-C4'-C5'-O5'

There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	1906	3DR	3	0
2	D	1906	3DR	2	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 6 ligands modelled in this entry, 4 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	$\#\|Z\| > 2$
5	ATP	A	1803	4	26,32,33	1.74	7 (26%)	30,50,52	1.48	5 (16%)
5	ATP	B	1804	4,6	26,32,33	1.65	6 (23%)	30,50,52	1.71	7 (23%)

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
5	ATP	A	1803	4	-	0/18/34/38	0/3/3/3
5	ATP	B	1804	4,6	-	2/18/34/38	0/3/3/3

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1803	ATP	PG-O2G	-3.51	1.41	1.54
5	A	1803	ATP	C2-N3	3.31	1.37	1.32
5	B	1804	ATP	PG-O2G	-3.20	1.42	1.54
5	B	1804	ATP	C8-N7	-3.17	1.29	1.34
5	A	1803	ATP	PB-O2B	-3.13	1.40	1.55
5	B	1804	ATP	PA-O5'	-3.02	1.47	1.59
5	B	1804	ATP	PB-O2B	-2.89	1.41	1.55
5	B	1804	ATP	O4'-C4'	-2.72	1.38	1.45
5	A	1803	ATP	C4-N3	2.62	1.39	1.35
5	A	1803	ATP	C8-N7	-2.46	1.30	1.34
5	B	1804	ATP	C2-N3	2.15	1.35	1.32
5	A	1803	ATP	C2'-C3'	2.11	1.58	1.52
5	A	1803	ATP	PA-O5'	-2.07	1.50	1.59

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	1804	ATP	C2'-C1'-N9	-5.29	102.07	114.27
5	A	1803	ATP	C2'-C1'-N9	-4.96	102.83	114.27
5	B	1804	ATP	PA-O3A-PB	3.82	145.94	132.83
5	B	1804	ATP	O2G-PG-O3B	2.75	113.87	104.64
5	A	1803	ATP	O2G-PG-O3B	2.48	112.96	104.64
5	B	1804	ATP	O3'-C3'-C2'	2.45	119.67	110.90
5	B	1804	ATP	O5'-C5'-C4'	2.33	117.01	108.99
5	B	1804	ATP	C5-C6-N6	2.19	123.68	120.35
5	A	1803	ATP	C5-C6-N6	2.11	123.56	120.35
5	A	1803	ATP	C4'-O4'-C1'	2.10	114.52	109.45
5	B	1804	ATP	C4-C5-N7	2.03	111.51	109.40
5	A	1803	ATP	C5'-C4'-C3'	2.01	126.53	114.74

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1804	ATP	PB-O3A-PA-O2A
5	B	1804	ATP	PB-O3A-PA-O1A

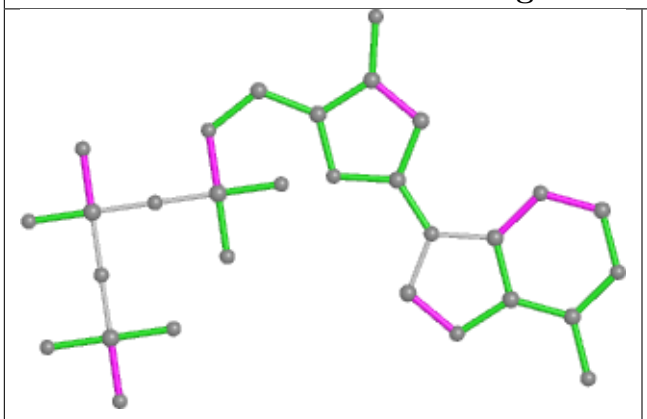
There are no ring outliers.

2 monomers are involved in 14 short contacts:

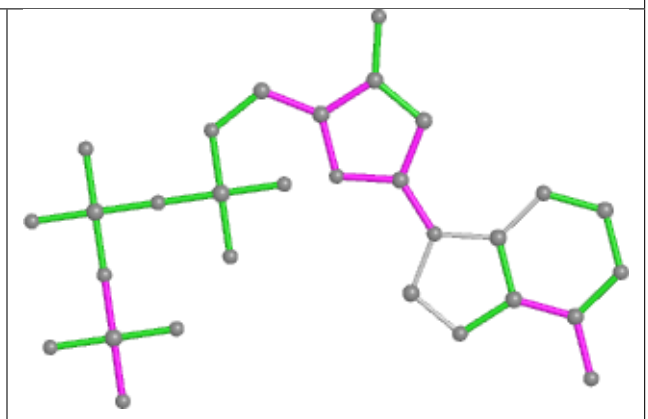
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1803	ATP	8	0
5	B	1804	ATP	6	0

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.

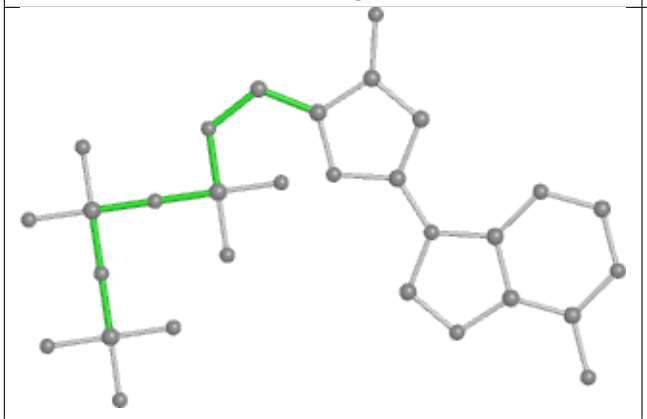
Ligand ATP A 1803



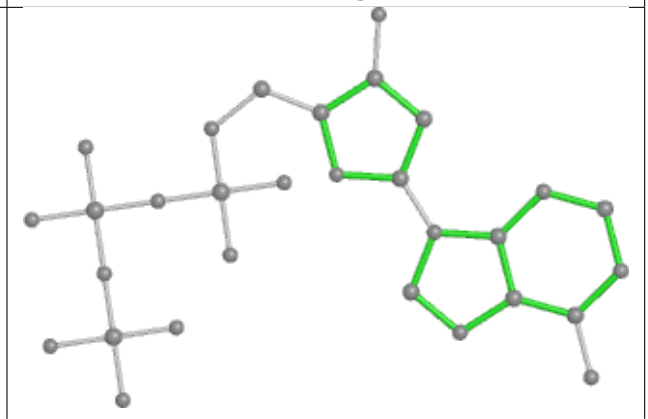
Bond lengths



Bond angles

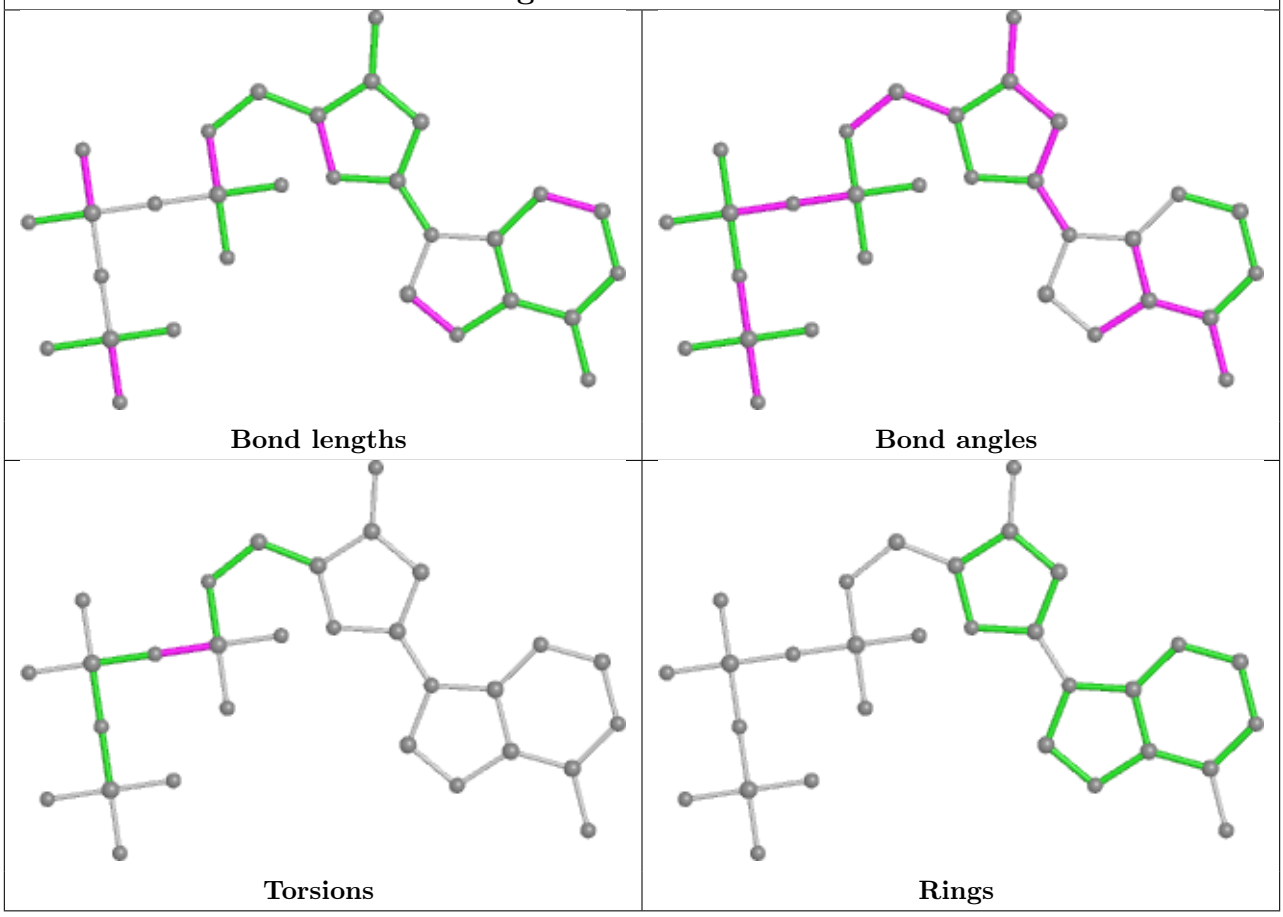


Torsions



Rings

Ligand ATP B 1804



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	C	14/14 (100%)	0.10	0 100 100	53, 69, 79, 98	0
1	E	14/14 (100%)	-0.10	1 (7%) 16 14	41, 50, 73, 79	0
2	D	16/17 (94%)	0.60	2 (12%) 3 3	54, 79, 105, 105	0
2	F	16/17 (94%)	-0.03	0 100 100	38, 49, 94, 102	0
3	A	341/352 (96%)	0.06	7 (2%) 63 61	30, 57, 77, 89	0
3	B	341/352 (96%)	0.03	3 (0%) 84 82	32, 51, 73, 89	0
All	All	742/766 (96%)	0.05	13 (1%) 68 66	30, 54, 77, 105	0

All (13) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	1903	DC	3.6
3	B	116	ARG	2.9
2	D	1902	DT	2.8
3	A	169	GLU	2.7
3	A	192	GLU	2.6
3	A	252	LYS	2.6
3	A	188	ASN	2.3
3	B	62	VAL	2.3
3	B	286	VAL	2.3
3	A	287	VAL	2.1
3	A	97	GLU	2.1
3	A	116	ARG	2.1
1	E	1814	DA	2.1

6.2 Non-standard residues in protein, DNA, RNA chains

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	3DR	D	1906	11/12	0.93	0.15	82,83,88,89	0
2	3DR	F	1906	11/12	0.95	0.17	48,53,58,58	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

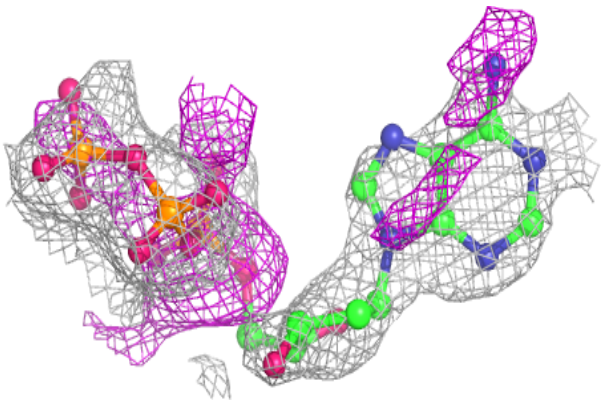
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

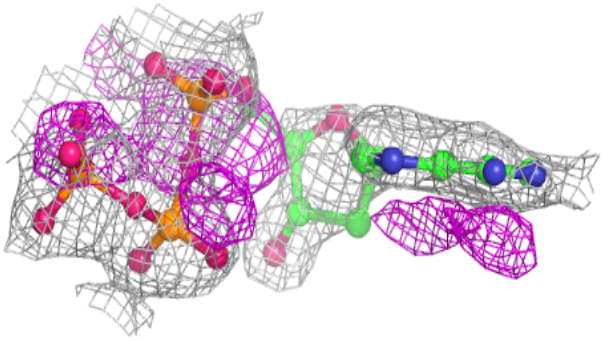
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MG	A	401	1/1	0.75	0.21	95,95,95,95	0
5	ATP	A	1803	30/31	0.76	0.29	97,101,112,113	0
4	MG	A	402	1/1	0.92	0.07	48,48,48,48	0
5	ATP	B	1804	30/31	0.93	0.17	42,55,76,77	0
4	MG	B	404	1/1	0.95	0.19	33,33,33,33	0
6	CA	B	403	1/1	0.99	0.07	62,62,62,62	0

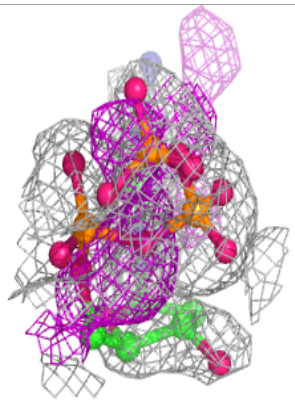
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ATP A 1803:

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

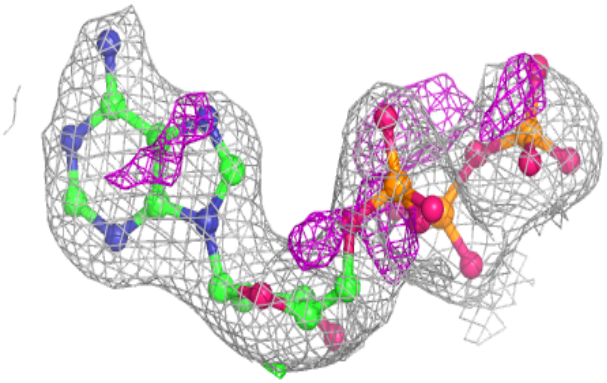


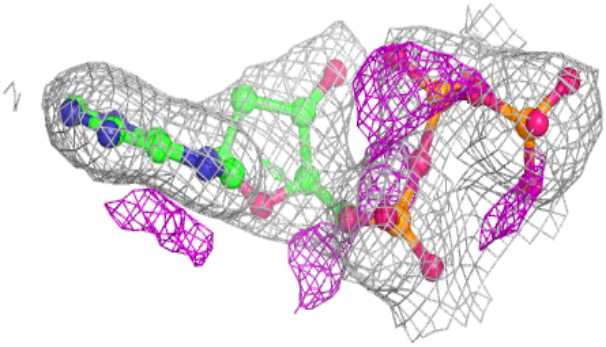


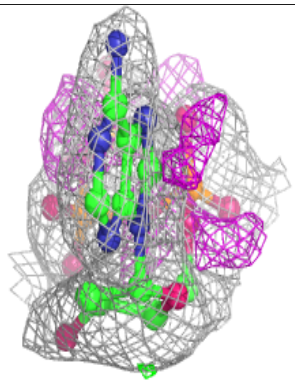


Electron density around ATP B 1804:

$2mF_o$-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.