Full wwPDB X-ray Structure Validation Report ⓘ

Jul 22, 2025 – 02:18 PM JST

PDB ID	:	9J4P / pdb_00009j4p
Title	:	Regulatory domain and kinase domain of ALPK1 protein
Authors	:	Xu, C.; Xu, T.
Deposited on	:	2024-08-09
Resolution	:	2.25 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:

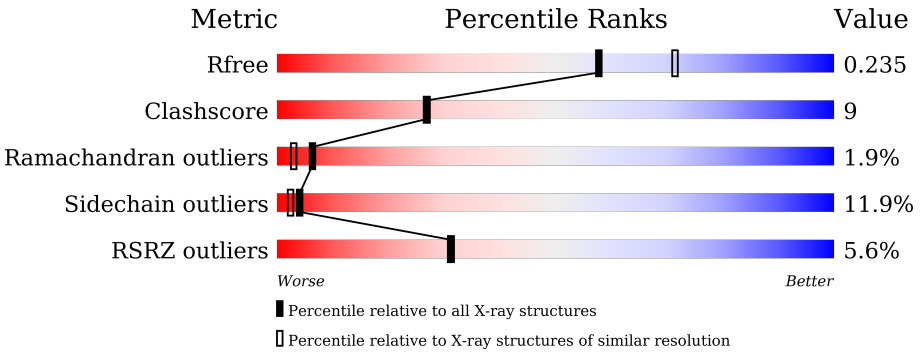
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 2.25 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}	164625	1763 (2.26-2.26)
Clashscore	180529	1919 (2.26-2.26)
Ramachandran outliers	177936	1884 (2.26-2.26)
Sidechain outliers	177891	1885 (2.26-2.26)
RSRZ outliers	164620	1763 (2.26-2.26)

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	B	446	6% 70% 22%
2	A	275	5% 64% 24% 7%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	ZN	A	301	-	-	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 5697 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.

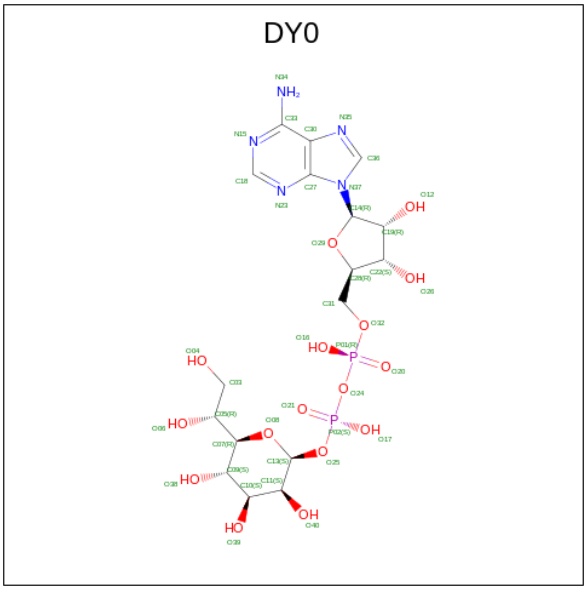
- Molecule 1 is a protein called Alpha-protein kinase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	427	Total	C	N	O	S	0	0	0
			3323	2112	571	624	16			

- Molecule 2 is a protein called Alpha-protein kinase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	255	Total	C	N	O	S	0	0	0
			2111	1350	367	390	4			

- Molecule 3 is [[(2R,3S,4R,5R)-5-(6-aminopurin-9-yl)-3,4-bis(oxidanyl)oxolan-2-yl]methoxy-oxidanyl-phosphoryl] [(2S,3S,4S,5S,6R)-6-[(1R)-1,2-bis(oxidanyl)ethyl]-3,4,5-tris(oxidanyl)oxan-2-yl] hydrogen phosphate (CCD ID: DY0) (formula: $C_{17}H_{27}N_5O_{16}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	B	1	Total	C	N	O	P	0	0
			40	17	5	16	2		

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Zn 1 1	0	0

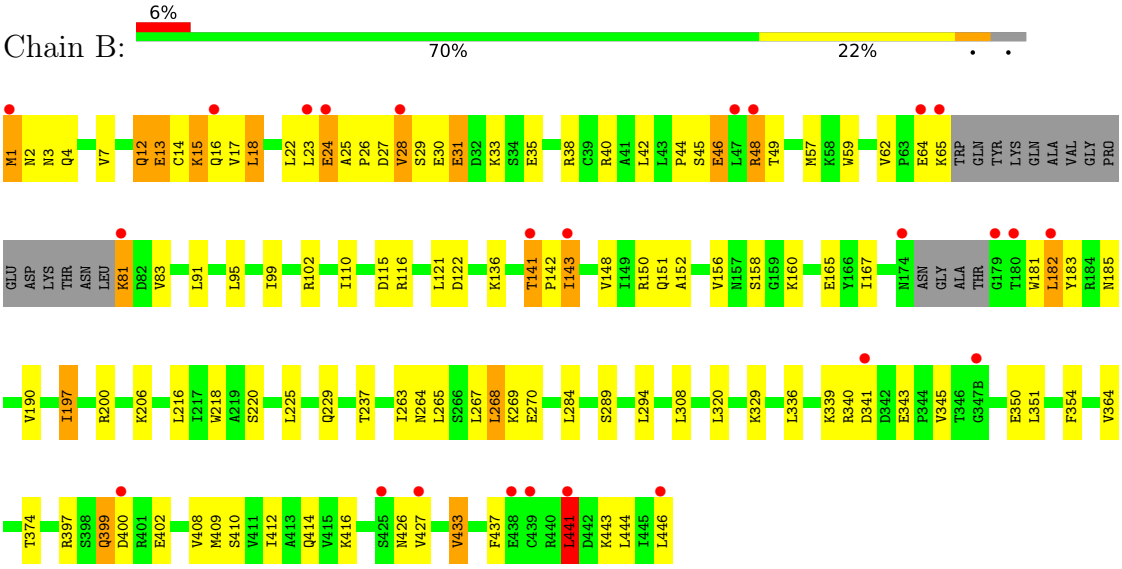
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	130	Total O 130 130	0	0
5	A	92	Total O 92 92	0	0

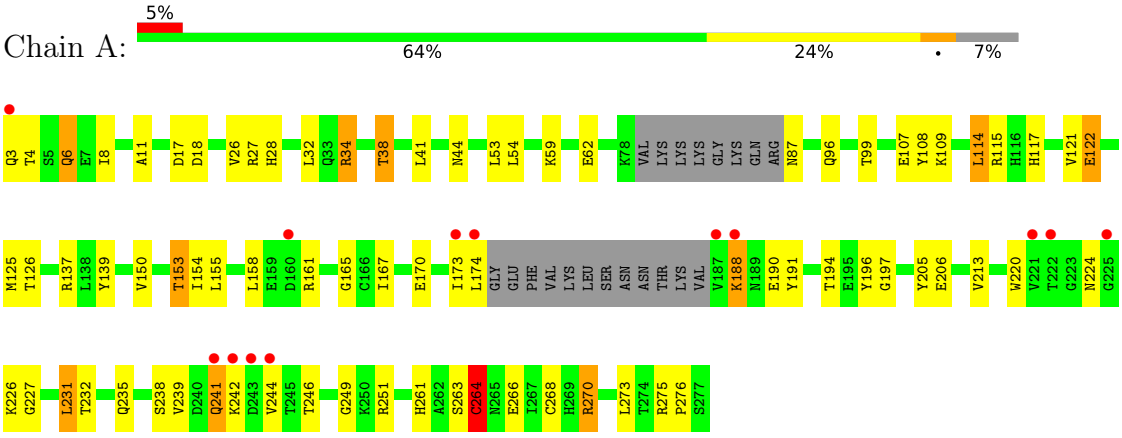
3 Residue-property plots (i)

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: Alpha-protein kinase 1



• Molecule 2: Alpha-protein kinase 1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	93.38Å 93.38Å 172.27Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	38.01 – 2.25 38.01 – 2.25	Depositor EDS
% Data completeness (in resolution range)	84.2 (38.01-2.25) 84.2 (38.01-2.25)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.09 (at 2.24Å)	Xtriage
Refinement program	PHENIX 1.13	Depositor
R, R_{free}	0.206 , 0.235 0.207 , 0.235	Depositor DCC
R_{free} test set	1780 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	31.0	Xtriage
Anisotropy	0.211	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 48.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.027 for -h,-k,l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	5697	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.28% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: ZN, DY0

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	B	0.36	0/3376	0.57	0/4564
2	A	0.41	1/2160 (0.0%)	0.60	2/2921 (0.1%)
All	All	0.38	1/5536 (0.0%)	0.58	2/7485 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	170	GLU	CA-C	5.57	1.58	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	170	GLU	CA-C-N	-5.02	114.61	119.78
2	A	170	GLU	C-N-CA	-5.02	114.61	119.78

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	B	3323	0	3395	64	0
2	A	2111	0	2070	39	0
3	B	40	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	1	0	0	0	0
5	A	92	0	0	10	0
5	B	130	0	0	9	0
All	All	5697	0	5465	100	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 9.

All (100) 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:264:ASN:ND2	5:B:601:HOH:O	2.08	0.85
2:A:231:LEU:O	5:A:401:HOH:O	1.95	0.83
1:B:14:CYS:SG	5:B:648:HOH:O	2.38	0.80
1:B:1:MET:N	5:B:603:HOH:O	2.17	0.78
2:A:261:HIS:O	2:A:275:ARG:NH2	2.15	0.77
2:A:18:ASP:OD2	2:A:34:ARG:NH1	2.17	0.77
1:B:25:ALA:O	1:B:27:ASP:N	2.17	0.76
2:A:3:GLN:N	5:A:405:HOH:O	2.21	0.72
1:B:165:GLU:OE2	2:A:139:TYR:OH	2.03	0.71
1:B:12:GLN:HG2	5:B:640:HOH:O	1.89	0.71
1:B:397:ARG:HG3	1:B:400:ASP:HB2	1.73	0.70
1:B:12:GLN:OE1	5:B:602:HOH:O	2.10	0.70
1:B:158:SER:HB3	2:A:226:LYS:HD3	1.75	0.69
2:A:137:ARG:NE	5:A:407:HOH:O	2.26	0.68
2:A:122:GLU:OE1	5:A:402:HOH:O	2.10	0.68
1:B:151:GLN:HG3	1:B:167:ILE:HD13	1.79	0.64
1:B:142:PRO:O	1:B:143:ILE:HG12	1.97	0.64
1:B:267:LEU:HD21	1:B:284:LEU:HD12	1.80	0.63
1:B:148:VAL:O	1:B:151:GLN:HG2	2.01	0.61
1:B:182:LEU:HD23	1:B:183:TYR:H	1.67	0.58
2:A:11:ALA:O	2:A:34:ARG:NH2	2.39	0.56
1:B:29:SER:HB2	1:B:31:GLU:OE2	2.06	0.55
1:B:351:LEU:HD12	1:B:409:MET:HE2	1.88	0.55
1:B:225:LEU:HD11	1:B:444:LEU:HD23	1.87	0.55
1:B:329:LYS:HB2	1:B:364:VAL:HG11	1.87	0.55
2:A:38:THR:HG21	2:A:114:LEU:HD22	1.88	0.54
2:A:261:HIS:CE1	2:A:268:CYS:SG	2.99	0.54
1:B:57:MET:HE3	1:B:181:TRP:CD2	2.43	0.53
1:B:354:PHE:HB3	1:B:412:ILE:HD13	1.90	0.53
1:B:57:MET:CE	1:B:182:LEU:H	2.22	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:218:TRP:HZ3	1:B:265:LEU:HD13	1.75	0.52
2:A:235:GLN:NE2	5:A:406:HOH:O	2.24	0.52
1:B:13:GLU:HG3	1:B:99:ILE:HD12	1.91	0.52
1:B:18:LEU:HD11	5:B:715:HOH:O	2.08	0.52
1:B:345:VAL:HG21	1:B:409:MET:HE3	1.92	0.52
2:A:205:TYR:HB2	2:A:213:VAL:HG22	1.92	0.52
1:B:182:LEU:HD23	1:B:183:TYR:N	2.25	0.52
1:B:265:LEU:HB3	1:B:268:LEU:HD22	1.93	0.51
1:B:48:ARG:HH11	1:B:49:THR:HG22	1.76	0.51
2:A:263:SER:O	2:A:264:CYS:HB2	2.10	0.51
1:B:116:ARG:HD3	3:B:501:DY0:O20	2.10	0.51
2:A:206:GLU:HG3	2:A:273:LEU:HD22	1.93	0.51
1:B:197:ILE:HG22	1:B:220:SER:HB3	1.93	0.50
1:B:397:ARG:HH11	1:B:399:GLN:HB2	1.76	0.50
1:B:433:VAL:HG13	1:B:437:PHE:HB2	1.94	0.50
1:B:15:LYS:HB2	1:B:15:LYS:NZ	2.27	0.49
1:B:12:GLN:NE2	5:B:618:HOH:O	2.45	0.48
2:A:59:LYS:HD2	2:A:126:THR:HA	1.95	0.48
1:B:160:LYS:HE3	2:A:226:LYS:HG3	1.95	0.48
2:A:270:ARG:HD2	5:A:459:HOH:O	2.13	0.48
1:B:44:PRO:O	1:B:46:GLU:N	2.46	0.48
1:B:269:LYS:HD3	1:B:446:LEU:HD21	1.94	0.48
2:A:238:SER:O	2:A:249:GLY:HA2	2.13	0.48
1:B:354:PHE:HB3	1:B:412:ILE:CD1	2.43	0.48
1:B:410:SER:O	1:B:414:GLN:HG3	2.14	0.47
1:B:35:GLU:HA	1:B:38:ARG:HB2	1.96	0.47
2:A:96:GLN:O	5:A:404:HOH:O	2.20	0.47
1:B:340:ARG:HB3	1:B:343:GLU:HG3	1.97	0.47
1:B:336:LEU:HB3	1:B:416:LYS:HD3	1.97	0.47
2:A:188:LYS:HZ1	2:A:227:GLY:HA2	1.80	0.46
2:A:32:LEU:HD22	2:A:115:ARG:HB2	1.97	0.46
1:B:29:SER:O	1:B:33:LYS:HG3	2.16	0.46
2:A:191:TYR:HB2	2:A:196:TYR:CE2	2.51	0.46
2:A:44:ASN:HD21	2:A:165:GLY:HA3	1.80	0.46
2:A:121:VAL:O	2:A:125:MET:HG2	2.16	0.45
1:B:426:ASN:OD1	1:B:427:VAL:N	2.50	0.45
1:B:57:MET:HE1	1:B:182:LEU:H	1.82	0.45
1:B:95:LEU:O	1:B:99:ILE:HG13	2.18	0.44
2:A:197:GLY:HA3	2:A:220:TRP:CE2	2.52	0.44
2:A:188:LYS:NZ	2:A:227:GLY:HA2	2.33	0.44
2:A:8:ILE:HA	2:A:8:ILE:HD13	1.81	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:24:GLU:HA	1:B:102:ARG:NH2	2.33	0.43
1:B:122:ASP:HA	5:B:679:HOH:O	2.19	0.43
1:B:81:LYS:HE3	1:B:83:VAL:H	1.83	0.43
2:A:121:VAL:HG21	2:A:154:ILE:HD11	2.01	0.43
1:B:200:ARG:HB3	1:B:216:LEU:HD13	2.00	0.43
1:B:95:LEU:HB2	1:B:110:ILE:HG21	2.01	0.42
1:B:441:LEU:HD23	1:B:441:LEU:HA	1.80	0.42
2:A:241:GLN:O	2:A:241:GLN:HG2	2.14	0.42
2:A:54:LEU:HD11	2:A:153:THR:HG21	2.01	0.42
1:B:28:VAL:HG21	1:B:33:LYS:HE2	2.00	0.42
2:A:87:ASN:ND2	5:A:426:HOH:O	2.51	0.42
1:B:38:ARG:NH1	1:B:42:LEU:HD21	2.34	0.42
1:B:294:LEU:HD13	1:B:350:GLU:HB2	2.02	0.42
2:A:53:LEU:HG	2:A:158:LEU:HD11	2.01	0.42
2:A:244:VAL:O	2:A:244:VAL:HG22	2.20	0.42
1:B:339:LYS:HB2	1:B:354:PHE:CZ	2.54	0.42
1:B:354:PHE:CD2	1:B:409:MET:HE1	2.54	0.42
2:A:28:HIS:NE2	2:A:32:LEU:HD11	2.34	0.42
2:A:62:GLU:HB3	5:A:411:HOH:O	2.20	0.41
1:B:115:ASP:CG	1:B:150:ARG:HE	2.27	0.41
2:A:114:LEU:HB2	5:A:431:HOH:O	2.20	0.41
1:B:3:ASN:O	1:B:7:VAL:HG23	2.21	0.41
1:B:141:THR:HG22	1:B:142:PRO:HD2	2.03	0.41
2:A:4:THR:OG1	2:A:6:GLN:HG2	2.20	0.41
1:B:2:ASN:OD1	1:B:4:GLN:HG2	2.20	0.41
1:B:200:ARG:HH11	1:B:200:ARG:HG2	1.85	0.40
1:B:152:ALA:O	1:B:156:VAL:HG23	2.22	0.40
2:A:108:TYR:CE1	2:A:117:HIS:HB2	2.56	0.40
1:B:229:GLN:HG2	5:B:621:HOH:O	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
1	B	421/446 (94%)	399 (95%)	13 (3%)	9 (2%)	5 2
2	A	249/275 (90%)	234 (94%)	11 (4%)	4 (2%)	8 4
All	All	670/721 (93%)	633 (94%)	24 (4%)	13 (2%)	6 3

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	26	PRO
1	B	28	VAL
1	B	45	SER
1	B	46	GLU
2	A	264	CYS
2	A	276	PRO
2	A	242	LYS
1	B	341	ASP
2	A	190	GLU
1	B	143	ILE
1	B	185	ASN
1	B	441	LEU
1	B	24	GLU

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	B	366/383 (96%)	326 (89%)	40 (11%)	5 3
2	A	230/248 (93%)	199 (86%)	31 (14%)	3 1
All	All	596/631 (94%)	525 (88%)	71 (12%)	4 2

All (71) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1	MET
1	B	12	GLN
1	B	13	GLU

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Mol	Chain	Res	Type
1	B	15	LYS
1	B	16	GLN
1	B	17	VAL
1	B	18	LEU
1	B	22	LEU
1	B	23	LEU
1	B	30	GLU
1	B	31	GLU
1	B	40	ARG
1	B	48	ARG
1	B	59	TRP
1	B	62	VAL
1	B	64	GLU
1	B	65	LYS
1	B	81	LYS
1	B	91	LEU
1	B	121	LEU
1	B	136	LYS
1	B	141	THR
1	B	182	LEU
1	B	190	VAL
1	B	197	ILE
1	B	206	LYS
1	B	237	THR
1	B	263	ILE
1	B	268	LEU
1	B	270	GLU
1	B	289	SER
1	B	308	LEU
1	B	320	LEU
1	B	374	THR
1	B	399	GLN
1	B	402	GLU
1	B	408	VAL
1	B	433	VAL
1	B	441	LEU
1	B	443	LYS
2	A	6	GLN
2	A	17	ASP
2	A	26	VAL
2	A	27	ARG
2	A	34	ARG

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Mol	Chain	Res	Type
2	A	38	THR
2	A	41	LEU
2	A	99	THR
2	A	107	GLU
2	A	109	LYS
2	A	114	LEU
2	A	122	GLU
2	A	150	VAL
2	A	153	THR
2	A	155	LEU
2	A	161	ARG
2	A	167	ILE
2	A	173	ILE
2	A	174	LEU
2	A	188	LYS
2	A	194	THR
2	A	224	ASN
2	A	231	LEU
2	A	232	THR
2	A	239	VAL
2	A	241	GLN
2	A	246	THR
2	A	251	ARG
2	A	264	CYS
2	A	266	GLU
2	A	270	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	4	GLN
1	B	12	GLN
1	B	90	GLN
1	B	202	GLN
1	B	259	ASN
1	B	414	GLN
1	B	420	GLN
2	A	146	GLN
2	A	241	GLN
2	A	269	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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	DY0	B	501	-	37,43,43	3.82	11 (29%)	47,66,66	1.75	9 (19%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DY0	B	501	-	-	0/23/63/63	0/4/4/4

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	501	DY0	C19-C14	-14.36	1.32	1.53
3	B	501	DY0	O29-C14	14.17	1.60	1.41
3	B	501	DY0	O29-C28	-7.01	1.29	1.45
3	B	501	DY0	O12-C19	3.93	1.52	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	501	DY0	C33-N34	3.43	1.46	1.34
3	B	501	DY0	O39-C10	2.72	1.49	1.43
3	B	501	DY0	P02-O25	2.67	1.67	1.60
3	B	501	DY0	O26-C22	-2.34	1.37	1.43
3	B	501	DY0	C30-N35	-2.14	1.32	1.39
3	B	501	DY0	C31-C28	2.13	1.58	1.51
3	B	501	DY0	P01-O32	2.02	1.67	1.59

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	501	DY0	O08-C13-O25	-5.76	103.84	111.36
3	B	501	DY0	N23-C18-N15	-3.87	122.64	128.68
3	B	501	DY0	O08-C07-C09	3.70	113.06	107.87
3	B	501	DY0	C27-C30-N35	-3.31	105.95	109.40
3	B	501	DY0	C03-C05-C07	-3.23	105.63	112.17
3	B	501	DY0	O24-P02-O25	2.85	108.23	102.48
3	B	501	DY0	C22-C19-C14	2.15	104.21	100.98
3	B	501	DY0	C31-C28-C22	-2.13	107.19	115.18
3	B	501	DY0	P02-O24-P01	-2.11	125.58	132.83

There are no chirality outliers.

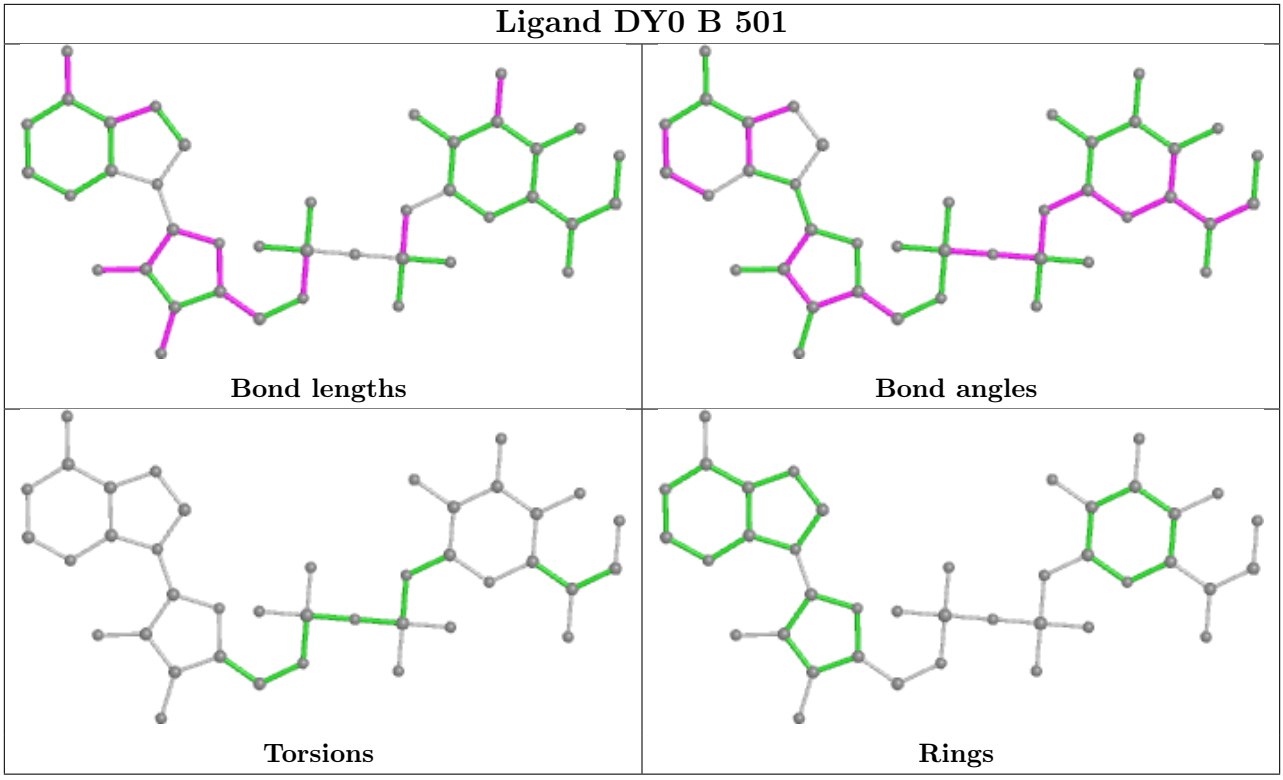
There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	501	DY0	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.



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	B	427/446 (95%)	0.20	25 (5%)	29	29	18, 38, 76, 97	0
2	A	255/275 (92%)	0.24	13 (5%)	34	34	22, 40, 63, 117	0
All	All	682/721 (94%)	0.22	38 (5%)	31	31	18, 39, 72, 117	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	187	VAL	4.7
2	A	221	VAL	4.0
1	B	23	LEU	3.7
1	B	179	GLY	3.7
1	B	182	LEU	3.7
1	B	16	GLN	3.5
1	B	439	CYS	3.5
1	B	28	VAL	3.5
2	A	243	ASP	3.4
1	B	180	THR	3.4
2	A	188	LYS	3.2
2	A	174	LEU	3.0
2	A	225	GLY	3.0
2	A	242	LYS	2.9
1	B	441	LEU	2.8
1	B	400	ASP	2.8
1	B	24	GLU	2.8
2	A	222	THR	2.8
2	A	3	GLN	2.7
1	B	438	GLU	2.7
1	B	427	VAL	2.7
1	B	47	LEU	2.7
1	B	143	ILE	2.7
1	B	81	LYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	1	MET	2.5
1	B	65	LYS	2.4
1	B	174	ASN	2.4
1	B	341	ASP	2.4
1	B	141	THR	2.3
1	B	347(B)	GLY	2.3
2	A	244	VAL	2.2
2	A	241	GLN	2.1
2	A	160	ASP	2.1
2	A	173	ILE	2.1
1	B	48	ARG	2.1
1	B	446	LEU	2.1
1	B	64	GLU	2.0
1	B	425	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 oligosaccharides in this entry.

6.4 Ligands (i)

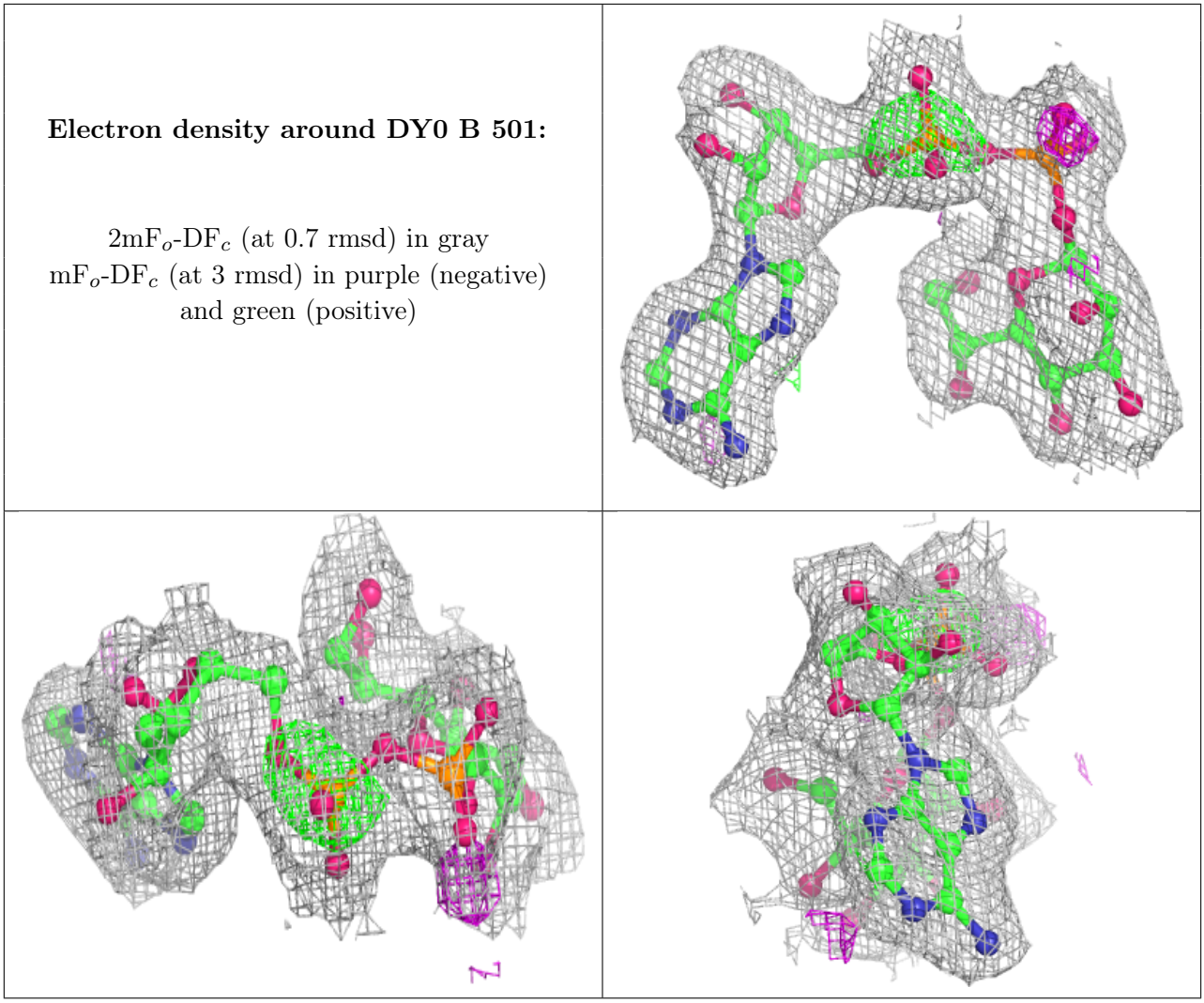
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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	ZN	A	301	1/1	0.75	0.43	286,286,286,286	0
3	DY0	B	501	40/40	0.94	0.08	25,29,37,64	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 DY0 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)



6.5 Other polymers

There are no such residues in this entry.