



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 11:03 AM UTC

PDB ID : 1VHL / pdb_00001vhl
Title : Crystal structure of dephospho-CoA kinase with adenosine-5'-diphosphate
Authors : Structural GenomiX
Deposited on : 2003-12-01
Resolution : 1.65 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

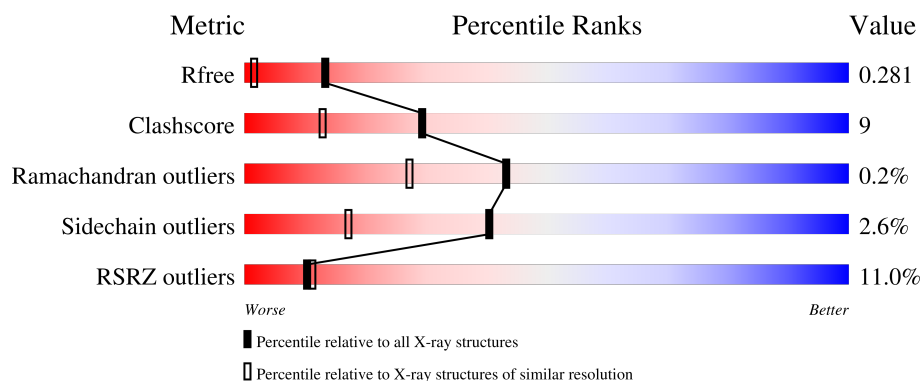
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2563 (1.66-1.66)
Clashscore	190562	2662 (1.66-1.66)
Ramachandran outliers	187476	2621 (1.66-1.66)
Sidechain outliers	187428	2621 (1.66-1.66)
RSRZ outliers	180081	2564 (1.66-1.66)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	218	9% 80% 12% • 5%
1	B	218	4% 84% 10% • 5%
1	C	218	17% 67% 15% • 16%

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
3	ACT	B	217	-	-	X	-
3	ACT	C	217	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5263 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 Dephospho-CoA kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	208	Total	C	N	O	S	0	1	0
			1580	989	288	301	2			
1	B	208	Total	C	N	O	S	0	3	0
			1595	1000	291	302	2			
1	C	183	Total	C	N	O	S	0	3	0
			1378	869	249	258	2			

There are 39 discrepancies between the modelled and reference sequences:

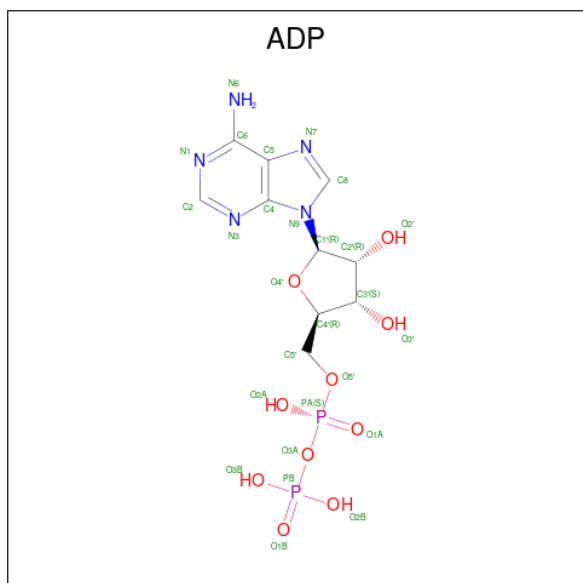
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	cloning artifact	UNP P0A6I9
A	0	SER	-	cloning artifact	UNP P0A6I9
A	1	LEU	-	cloning artifact	UNP P0A6I9
A	207	GLU	-	cloning artifact	UNP P0A6I9
A	208	GLY	-	cloning artifact	UNP P0A6I9
A	209	GLY	-	cloning artifact	UNP P0A6I9
A	210	SER	-	cloning artifact	UNP P0A6I9
A	211	HIS	-	cloning artifact	UNP P0A6I9
A	212	HIS	-	cloning artifact	UNP P0A6I9
A	213	HIS	-	cloning artifact	UNP P0A6I9
A	214	HIS	-	cloning artifact	UNP P0A6I9
A	215	HIS	-	cloning artifact	UNP P0A6I9
A	216	HIS	-	cloning artifact	UNP P0A6I9
B	-1	MET	-	cloning artifact	UNP P0A6I9
B	0	SER	-	cloning artifact	UNP P0A6I9
B	1	LEU	-	cloning artifact	UNP P0A6I9
B	207	GLU	-	cloning artifact	UNP P0A6I9
B	208	GLY	-	cloning artifact	UNP P0A6I9
B	209	GLY	-	cloning artifact	UNP P0A6I9
B	210	SER	-	cloning artifact	UNP P0A6I9
B	211	HIS	-	cloning artifact	UNP P0A6I9
B	212	HIS	-	cloning artifact	UNP P0A6I9
B	213	HIS	-	cloning artifact	UNP P0A6I9

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Chain	Residue	Modelled	Actual	Comment	Reference
B	214	HIS	-	cloning artifact	UNP P0A6I9
B	215	HIS	-	cloning artifact	UNP P0A6I9
B	216	HIS	-	cloning artifact	UNP P0A6I9
C	-1	MET	-	cloning artifact	UNP P0A6I9
C	0	SER	-	cloning artifact	UNP P0A6I9
C	1	LEU	-	cloning artifact	UNP P0A6I9
C	207	GLU	-	cloning artifact	UNP P0A6I9
C	208	GLY	-	cloning artifact	UNP P0A6I9
C	209	GLY	-	cloning artifact	UNP P0A6I9
C	210	SER	-	cloning artifact	UNP P0A6I9
C	211	HIS	-	cloning artifact	UNP P0A6I9
C	212	HIS	-	cloning artifact	UNP P0A6I9
C	213	HIS	-	cloning artifact	UNP P0A6I9
C	214	HIS	-	cloning artifact	UNP P0A6I9
C	215	HIS	-	cloning artifact	UNP P0A6I9
C	216	HIS	-	cloning artifact	UNP P0A6I9

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



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

- Molecule 3 is ACETATE ION (CCD ID: ACT) (formula: $C_2H_3O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	0
			4	2	2		

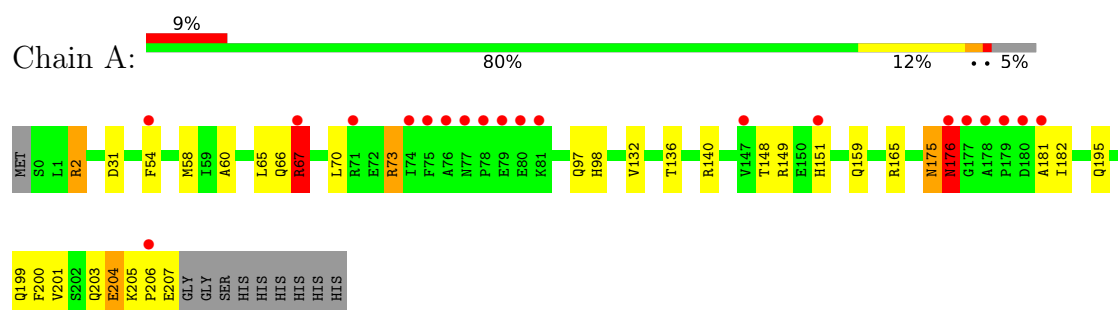
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	263	Total	O	0	0
			263	263		
4	B	253	Total	O	0	0
			253	253		
4	C	159	Total	O	0	0
			159	159		

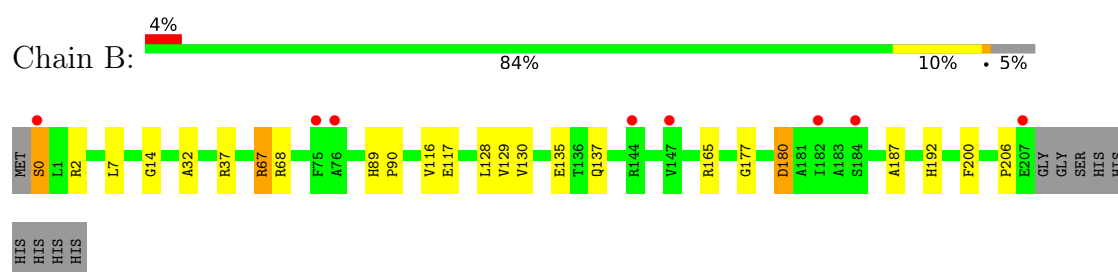
3 Residue-property plots [i](#)

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.

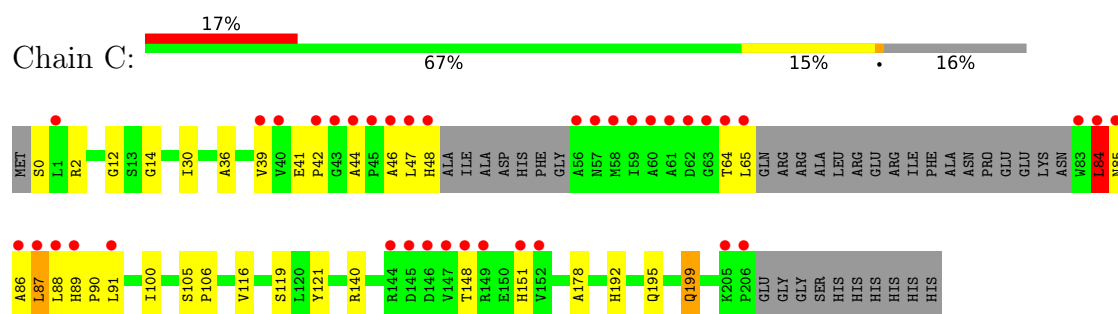
• Molecule 1: Dephospho-CoA kinase



• Molecule 1: Dephospho-CoA kinase



• Molecule 1: Dephospho-CoA kinase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	55.62Å 80.52Å 75.31Å 90.00° 92.80° 90.00°	Depositor
Resolution (Å)	25.15 – 1.65 25.15 – 1.65	Depositor EDS
% Data completeness (in resolution range)	(Not available) (25.15-1.65) 98.9 (25.15-1.65)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.65 (at 1.65Å)	Xtriage
Refinement program	REFMAC 4.0	Depositor
R, R_{free}	0.224 , 0.284 (Not available) , 0.281	Depositor DCC
R_{free} test set	3964 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	20.5	Xtriage
Anisotropy	0.150	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 42.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.022 for h,-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5263	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.21% 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, ACT

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	0.89	0/1610	1.48	11/2198 (0.5%)
1	B	0.97	0/1636	1.58	14/2229 (0.6%)
1	C	0.83	0/1413	1.40	6/1929 (0.3%)
All	All	0.90	0/4659	1.49	31/6356 (0.5%)

There are no bond length outliers.

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	176	ASN	CA-CB-CG	11.78	124.38	112.60
1	B	180	ASP	CA-CB-CG	11.03	123.63	112.60
1	A	31	ASP	CA-CB-CG	9.05	121.65	112.60
1	A	67	ARG	CD-NE-CZ	8.51	136.31	124.40
1	A	181	ALA	N-CA-C	-7.48	103.75	113.17
1	B	200	PHE	N-CA-C	7.21	120.01	111.71
1	C	86	ALA	N-CA-C	-7.17	104.50	113.18
1	C	178	ALA	CA-C-N	6.20	126.38	119.32
1	C	178	ALA	C-N-CA	6.20	126.38	119.32
1	A	159	GLN	OE1-CD-NE2	-6.16	116.44	122.60
1	B	187	ALA	O-C-N	-6.10	115.75	122.09
1	B	177	GLY	CA-C-O	6.06	127.40	121.28
1	B	67	ARG	CD-NE-CZ	6.04	132.86	124.40
1	B	32	ALA	CA-C-O	-5.87	113.47	120.10
1	B	32	ALA	O-C-N	5.86	129.07	122.22
1	A	175	ASN	CA-C-N	-5.60	113.36	122.65
1	A	175	ASN	C-N-CA	-5.60	113.36	122.65
1	A	201	VAL	O-C-N	5.39	127.38	121.83
1	B	117	GLU	CB-CG-CD	5.30	121.62	112.60
1	C	199	GLN	CB-CG-CD	5.24	121.51	112.60
1	B	67	ARG	N-CA-C	5.23	117.39	111.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	200	PHE	N-CA-C	5.21	116.95	111.28
1	A	2	ARG	CA-C-O	-5.19	114.95	120.92
1	C	44	ALA	CA-C-N	5.18	124.63	119.24
1	C	44	ALA	C-N-CA	5.18	124.63	119.24
1	B	128	LEU	CA-C-N	-5.14	116.45	122.93
1	B	128	LEU	C-N-CA	-5.14	116.45	122.93
1	B	137	GLN	O-C-N	5.12	127.54	122.12
1	A	176	ASN	CB-CA-C	5.02	119.50	110.81
1	B	206	PRO	CA-C-N	5.01	130.72	121.70
1	B	206	PRO	C-N-CA	5.01	130.72	121.70

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	1580	0	1562	30	0
1	B	1595	0	1588	16	0
1	C	1378	0	1371	33	0
2	A	27	0	12	0	0
3	B	4	0	3	4	0
3	C	4	0	3	3	0
4	A	263	0	0	9	0
4	B	253	0	0	4	0
4	C	159	0	0	3	0
All	All	5263	0	4539	79	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 (79) 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:C:47:LEU:HD11	1:C:65:LEU:HB2	1.54	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:148:THR:HG23	1:C:151:HIS:H	1.40	0.85
1:C:84:LEU:HD23	1:C:85:ASN:H	1.46	0.81
1:A:148:THR:HG23	1:A:151:HIS:H	1.47	0.77
1:A:60:ALA:HB2	1:A:66:GLN:HE21	1.50	0.77
1:C:84:LEU:CD2	1:C:85:ASN:H	1.98	0.77
1:B:37:ARG:HH12	1:B:67:ARG:NH1	1.83	0.75
1:A:67:ARG:HH11	1:A:67:ARG:HG3	1.52	0.73
1:C:199:GLN:HG3	4:C:329:HOH:O	1.89	0.71
1:C:14:GLY:H	3:C:217:ACT:H3	1.58	0.69
1:C:192:HIS:HD2	4:C:241:HOH:O	1.76	0.67
1:A:199:GLN:HG3	4:A:303:HOH:O	1.96	0.66
1:B:14:GLY:H	3:B:217:ACT:H1	1.62	0.64
1:A:65:LEU:HB3	1:A:67:ARG:HH12	1.62	0.64
1:C:46:ALA:HB2	1:C:91:LEU:CD1	2.28	0.63
1:C:42:PRO:HD3	1:C:64:THR:HG22	1.80	0.63
1:B:0:SER:HA	4:B:459:HOH:O	1.99	0.62
1:A:54:PHE:HB2	1:A:58:MET:HG3	1.82	0.62
1:C:195:GLN:O	1:C:199:GLN:HG2	1.99	0.61
1:B:135:GLU:HG3	4:B:329:HOH:O	2.01	0.61
1:A:206:PRO:O	1:A:207:GLU:C	2.45	0.60
1:C:148:THR:HG23	1:C:151:HIS:N	2.15	0.59
1:B:192:HIS:HD2	4:B:295:HOH:O	1.86	0.59
1:B:14:GLY:H	3:B:217:ACT:CH3	2.17	0.57
1:A:207:GLU:HA	4:A:304:HOH:O	2.04	0.56
1:A:195:GLN:O	1:A:199:GLN:HG2	2.06	0.56
1:C:87:LEU:HD23	1:C:88:LEU:HG	1.87	0.56
1:A:205:LYS:HB3	1:A:206:PRO:HD2	1.89	0.55
1:C:2:ARG:HH21	1:C:2:ARG:HG2	1.71	0.55
1:B:37:ARG:HH12	1:B:67:ARG:HH11	1.53	0.54
1:A:73:ARG:HH11	1:A:73:ARG:HB2	1.72	0.53
1:B:116:VAL:HG21	1:B:165[B]:ARG:HG2	1.91	0.53
1:C:89:HIS:HB3	1:C:90:PRO:HD3	1.91	0.53
1:A:206:PRO:HG2	4:A:325:HOH:O	2.08	0.53
1:A:58:MET:HE3	1:A:58:MET:HA	1.92	0.52
1:A:98:HIS:HD2	4:A:380:HOH:O	1.93	0.52
1:C:14:GLY:H	3:C:217:ACT:CH3	2.24	0.51
1:A:97:GLN:HG2	4:A:315:HOH:O	2.11	0.50
1:C:47:LEU:CD1	1:C:65:LEU:HB2	2.35	0.50
1:C:41:GLU:HB2	1:C:42:PRO:HD2	1.93	0.50
1:C:119:SER:HA	1:C:121:TYR:CE2	2.49	0.48
1:A:175:ASN:OD1	1:A:182:ILE:HD11	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:204:GLU:OE2	1:A:204:GLU:HA	2.15	0.47
1:A:65:LEU:HB3	1:A:67:ARG:NH1	2.28	0.47
1:B:37:ARG:NH1	1:B:67:ARG:HH11	2.12	0.47
1:C:30:ILE:HD13	1:C:100:ILE:CG1	2.45	0.47
1:C:89:HIS:HB3	1:C:90:PRO:CD	2.45	0.47
1:A:148:THR:CG2	1:A:151:HIS:HB2	2.44	0.47
1:A:98:HIS:HE1	4:A:422:HOH:O	1.98	0.46
1:B:14:GLY:N	3:B:217:ACT:H1	2.28	0.46
1:A:67:ARG:HG3	1:A:67:ARG:NH1	2.23	0.46
1:B:7:LEU:HD11	1:B:130:VAL:CG2	2.46	0.46
1:B:7:LEU:HD11	1:B:130:VAL:HG23	1.99	0.45
1:C:46:ALA:HB2	1:C:91:LEU:HD12	1.98	0.45
1:C:2:ARG:HD3	4:C:358:HOH:O	2.18	0.44
1:C:46:ALA:HB2	1:C:91:LEU:HD13	1.99	0.44
1:C:84:LEU:HD23	1:C:85:ASN:N	2.24	0.44
1:A:67:ARG:NH2	4:A:410:HOH:O	2.50	0.44
1:A:132:VAL:HB	1:A:176:ASN:HB3	2.00	0.43
1:A:203:GLN:HG3	1:A:205:LYS:O	2.18	0.43
1:A:136:THR:HG23	1:A:140:ARG:NE	2.34	0.43
1:A:58:MET:HE1	1:A:70:LEU:N	2.33	0.43
1:C:105:SER:HB2	1:C:106:PRO:HD2	2.01	0.43
1:A:54:PHE:CB	1:A:58:MET:HG3	2.49	0.42
1:C:89:HIS:N	1:C:90:PRO:HD2	2.34	0.42
1:A:2:ARG:HG3	4:A:434:HOH:O	2.18	0.42
1:B:68:ARG:HG3	4:B:452:HOH:O	2.19	0.42
1:A:165:ARG:HD3	4:A:266:HOH:O	2.19	0.41
1:B:129:VAL:HG13	1:B:165[B]:ARG:HH11	1.86	0.41
1:C:2:ARG:HG2	1:C:2:ARG:NH2	2.34	0.41
1:C:14:GLY:N	3:C:217:ACT:H3	2.32	0.41
1:C:30:ILE:HD13	1:C:100:ILE:HG12	2.02	0.41
1:C:36:ALA:O	1:C:39:VAL:HG22	2.21	0.41
1:B:14:GLY:HA2	3:B:217:ACT:H1	2.02	0.40
1:A:148:THR:HG22	1:A:151:HIS:HB2	2.04	0.40
1:B:89:HIS:HB3	1:B:90:PRO:HD3	2.03	0.40
1:C:12:GLY:O	1:C:140:ARG:HD2	2.22	0.40
1:C:47:LEU:HD12	1:C:47:LEU:HA	1.93	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	207/218 (95%)	202 (98%)	5 (2%)	0	100	100
1	B	209/218 (96%)	208 (100%)	1 (0%)	0	100	100
1	C	180/218 (83%)	176 (98%)	3 (2%)	1 (1%)	21	8
All	All	596/654 (91%)	586 (98%)	9 (2%)	1 (0%)	43	27

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	84	LEU

5.3.2 Protein sidechains

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	162/177 (92%)	157 (97%)	5 (3%)	35	12
1	B	165/177 (93%)	162 (98%)	3 (2%)	51	30
1	C	142/177 (80%)	138 (97%)	4 (3%)	38	15
All	All	469/531 (88%)	457 (97%)	12 (3%)	40	17

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	67	ARG
1	A	73	ARG

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Mol	Chain	Res	Type
1	A	149	ARG
1	A	176	ASN
1	A	204	GLU
1	B	0	SER
1	B	2	ARG
1	B	180	ASP
1	C	0	SER
1	C	48	HIS
1	C	84	LEU
1	C	87	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	66	GLN
1	A	89	HIS
1	A	97	GLN
1	A	98	HIS
1	B	154	GLN
1	B	192	HIS
1	B	195	GLN
1	B	199	GLN
1	C	97	GLN
1	C	192	HIS
1	C	199	GLN
1	C	203	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	ACT	C	217	-	3,3,3	1.34	1 (33%)	3,3,3	0.57	0
3	ACT	B	217	-	3,3,3	1.34	1 (33%)	3,3,3	1.05	0
2	ADP	A	217	-	28,29,29	1.36	4 (14%)	43,45,45	1.90	11 (25%)

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	ADP	A	217	-	-	3/16/32/32	0/3/3/3

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	217	ADP	C5-N7	-3.99	1.31	1.39
2	A	217	ADP	PA-O3A	-2.83	1.56	1.59
2	A	217	ADP	C4-N9	-2.39	1.32	1.37
3	C	217	ACT	O-C	2.30	1.32	1.22
3	B	217	ACT	O-C	2.25	1.32	1.22
2	A	217	ADP	PA-O1A	-2.12	1.43	1.50

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	217	ADP	N3-C2-N1	-5.73	119.90	128.58
2	A	217	ADP	N9-C8-N7	-4.14	108.07	113.94
2	A	217	ADP	C5-C4-N3	-3.87	121.39	126.72
2	A	217	ADP	C2-N3-C4	3.59	120.60	111.83
2	A	217	ADP	C5-N7-C8	3.58	109.07	103.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	217	ADP	C4-C5-N7	-3.18	106.95	110.58
2	A	217	ADP	C4-N9-C1'	-2.57	120.63	126.63
2	A	217	ADP	O5'-PA-O1A	2.35	118.24	108.94
2	A	217	ADP	C4-N9-C8	2.35	108.20	105.74
2	A	217	ADP	C6-C5-N7	2.26	136.44	132.09
2	A	217	ADP	N3-C4-N9	2.20	130.90	127.17

There are no chirality outliers.

All (3) torsion outliers are listed below:

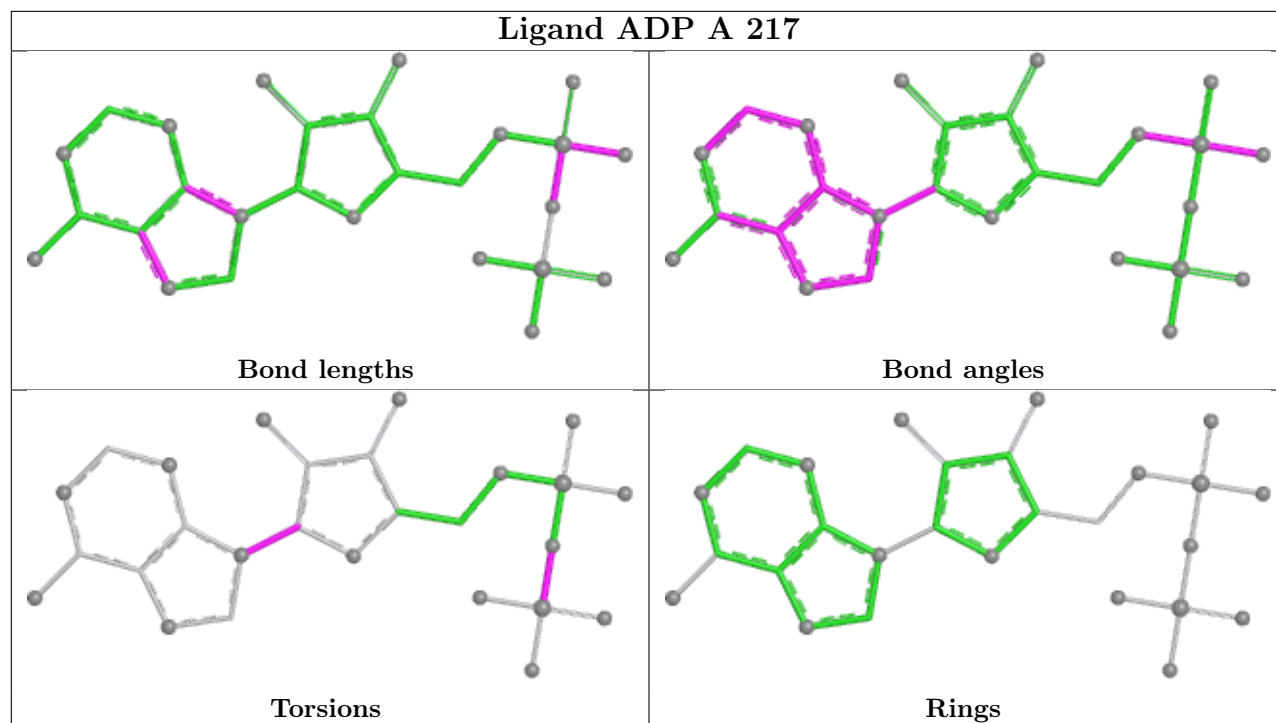
Mol	Chain	Res	Type	Atoms
2	A	217	ADP	PA-O3A-PB-O2B
2	A	217	ADP	C2'-C1'-N9-C4
2	A	217	ADP	PA-O3A-PB-O1B

There are no ring outliers.

2 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	217	ACT	3	0
3	B	217	ACT	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	208/218 (95%)	0.47	20 (9%) 13 14	12, 21, 45, 59	1 (0%)
1	B	208/218 (95%)	0.20	8 (3%) 44 48	8, 19, 34, 46	3 (1%)
1	C	183/218 (83%)	0.85	38 (20%) 2 3	8, 22, 62, 75	3 (1%)
All	All	599/654 (91%)	0.49	66 (11%) 10 11	8, 21, 50, 75	7 (1%)

All (66) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	178	ALA	7.7
1	A	180	ASP	6.3
1	C	83	TRP	6.0
1	C	59	ILE	5.8
1	C	56	ALA	5.6
1	C	61	ALA	5.2
1	C	84	LEU	5.1
1	C	47	LEU	4.9
1	A	74	ILE	4.7
1	C	58	MET	4.7
1	C	62	ASP	4.6
1	C	48	HIS	4.5
1	A	179	PRO	4.1
1	C	65	LEU	4.1
1	C	87	LEU	4.0
1	C	60	ALA	3.9
1	A	176	ASN	3.9
1	C	57	ASN	3.8
1	C	86	ALA	3.8
1	A	77	ASN	3.6
1	C	147	VAL	3.6
1	B	144	ARG	3.5
1	A	75	PHE	3.4

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Mol	Chain	Res	Type	RSRZ
1	A	177	GLY	3.4
1	B	207	GLU	3.4
1	A	76	ALA	3.3
1	C	146	ASP	3.2
1	A	79	GLU	3.1
1	C	44	ALA	3.0
1	C	205	LYS	2.9
1	C	85	ASN	2.9
1	C	1	LEU	2.9
1	C	64	THR	2.8
1	B	76	ALA	2.8
1	A	78	PRO	2.8
1	C	206	PRO	2.8
1	A	67	ARG	2.7
1	C	151	HIS	2.7
1	B	182	ILE	2.7
1	A	80	GLU	2.6
1	C	43	GLY	2.6
1	C	63	GLY	2.6
1	A	181	ALA	2.6
1	B	0	SER	2.5
1	C	42	PRO	2.5
1	C	46	ALA	2.5
1	C	152	VAL	2.4
1	C	45	PRO	2.4
1	C	91	LEU	2.4
1	A	54	PHE	2.4
1	A	147	VAL	2.4
1	B	184	SER	2.3
1	A	206	PRO	2.3
1	C	88	LEU	2.3
1	C	89	HIS	2.3
1	C	40	VAL	2.3
1	C	145	ASP	2.3
1	B	75	PHE	2.3
1	C	148	THR	2.2
1	C	144	ARG	2.2
1	A	71	ARG	2.2
1	A	81	LYS	2.2
1	C	39	VAL	2.1
1	A	151	HIS	2.1
1	B	147	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	149[A]	ARG	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](#)

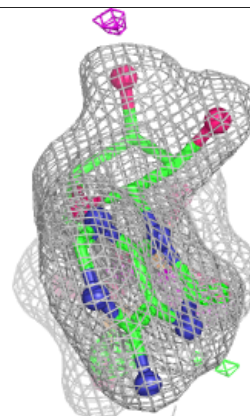
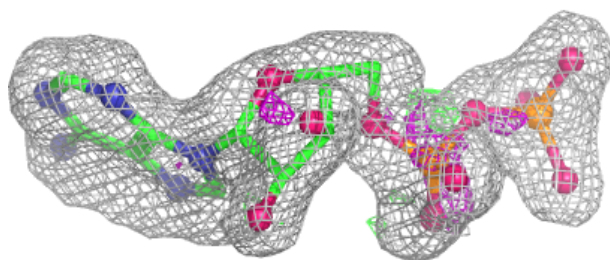
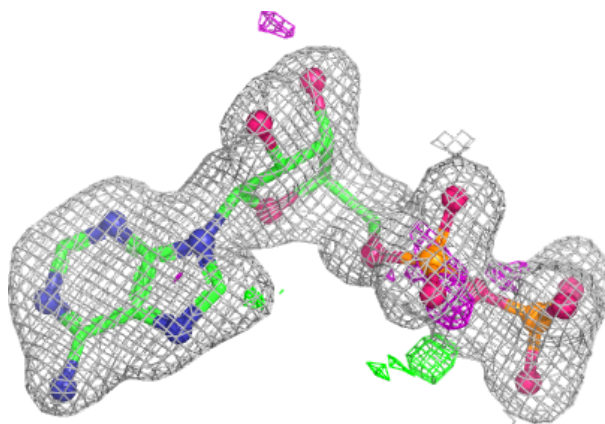
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	ACT	B	217	4/4	0.78	0.15	33,33,35,35	0
2	ADP	A	217	27/27	0.93	0.09	23,32,33,37	0
3	ACT	C	217	4/4	0.93	0.09	33,34,34,36	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 217:

$2mF_o - DF_c$ (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.