



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 19, 2020 – 08:02 AM EDT

PDB ID : 6UP3  
Title : Crystal structure of the murine DHX36 helicase in complex with ANP  
Authors : Chuenchor, W.; Jiang, J.; Xiao, T.S.  
Deposited on : 2019-10-16  
Resolution : 2.69 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](mailto: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.

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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 : 2.14.6  
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) : 2.14.6

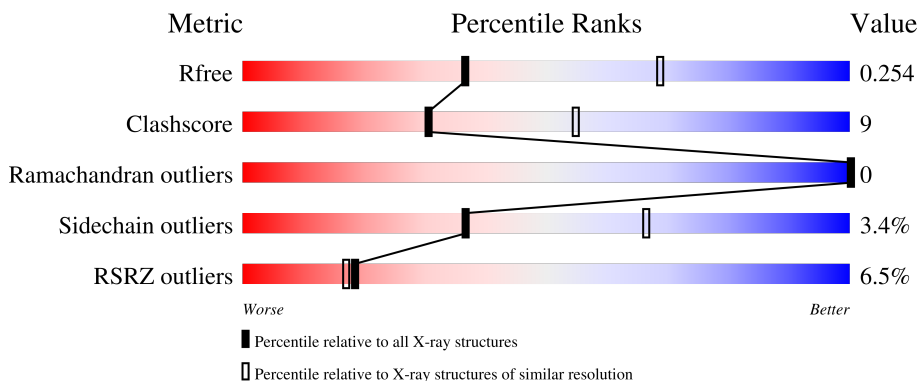
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

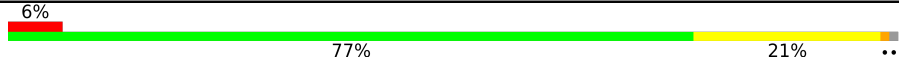
The reported resolution of this entry is 2.69 Å.

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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	830	

## 2 Entry composition [i](#)

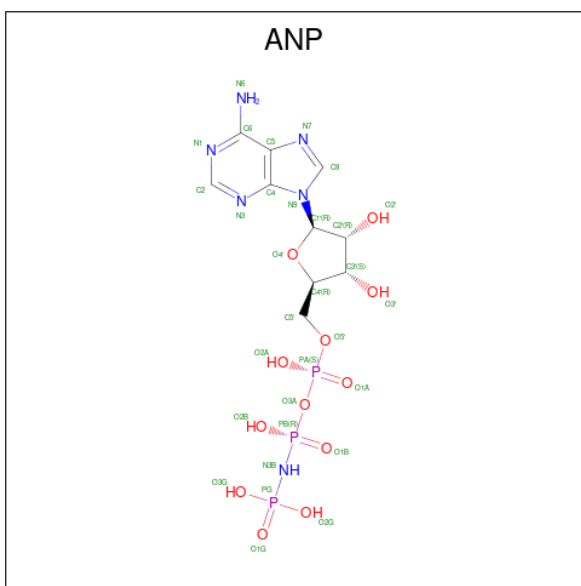
There are 3 unique types of molecules in this entry. The entry contains 6653 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Dhx36 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	821	6599	4200	1142	1223	34	0	0	0

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula:  $C_{10}H_{17}N_6O_{12}P_3$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	31	10	6	12	3	0	0

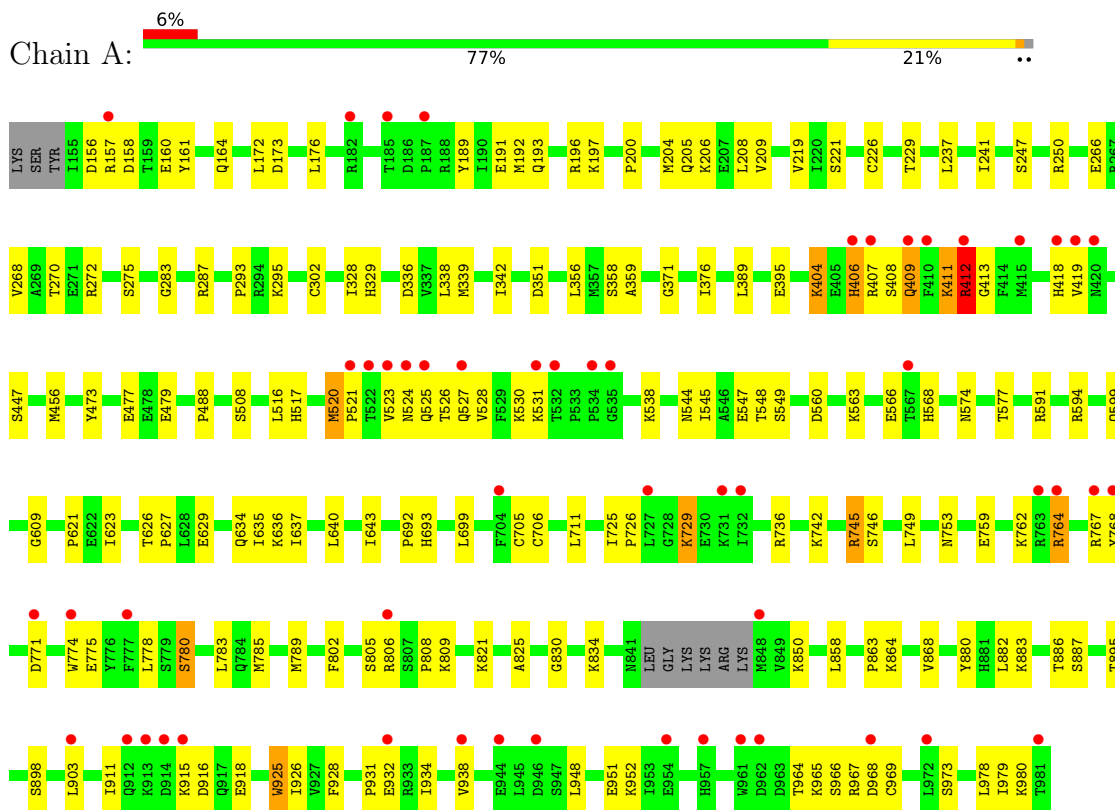
- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	23	Total 23 O	0	0

### 3 Residue-property plots

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: Dhx36 protein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	66.45Å 116.15Å 132.12Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.85 – 2.69 46.85 – 2.69	Depositor EDS
% Data completeness (in resolution range)	98.7 (46.85-2.69) 98.7 (46.85-2.69)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.27 (at 2.69Å)	Xtrriage
Refinement program	PHENIX dev_3374	Depositor
R, $R_{free}$	0.200 , 0.254 0.200 , 0.254	Depositor DCC
$R_{free}$ test set	1465 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	62.8	Xtrriage
Anisotropy	0.201	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 52.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	6653	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	69.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.56% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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 [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ANP

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	0.51	4/6729 (0.1%)	0.67	4/9095 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	404	LYS	CB-CG	-6.22	1.35	1.52
1	A	404	LYS	CG-CD	-5.93	1.32	1.52
1	A	409	GLN	CG-CD	5.43	1.63	1.51
1	A	302	CYS	CB-SG	-5.43	1.73	1.81

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	411	LYS	CD-CE-NZ	-12.82	82.21	111.70
1	A	412	ARG	NE-CZ-NH2	-8.35	116.13	120.30
1	A	404	LYS	CG-CD-CE	-6.72	91.74	111.90
1	A	412	ARG	NE-CZ-NH1	6.09	123.35	120.30

There are no chirality outliers.

There are no planarity outliers.

### 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	A	6599	0	6691	122	10
2	A	31	0	13	6	0
3	A	23	0	0	0	0
All	All	6653	0	6704	123	10

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 (123) 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:229:THR:H	2:A:1001:ANP:HNB1	1.18	0.86
1:A:419:VAL:HB	1:A:577:THR:HG21	1.60	0.82
1:A:404:LYS:HG3	1:A:407:ARG:NH2	1.97	0.79
1:A:911:ILE:HD13	1:A:932:GLU:HG3	1.65	0.78
1:A:266:GLU:OE2	1:A:523:VAL:HG21	1.84	0.77
1:A:964:THR:HG23	1:A:965:LYS:HG3	1.67	0.75
1:A:516:LEU:HD13	1:A:528:VAL:HG21	1.70	0.74
1:A:205:GLN:HG2	1:A:206:LYS:HD2	1.71	0.71
1:A:725:ILE:HD11	1:A:864:LYS:HE3	1.73	0.71
1:A:636:LYS:HE2	1:A:643:ILE:HG13	1.72	0.70
1:A:530:LYS:O	1:A:538:LYS:NZ	2.28	0.66
1:A:193:GLN:O	1:A:197:LYS:HG3	1.97	0.65
1:A:527:GLN:HA	1:A:530:LYS:HG2	1.78	0.65
1:A:517:HIS:O	1:A:520:MET:HB2	1.97	0.64
1:A:964:THR:HG23	1:A:965:LYS:H	1.62	0.64
1:A:911:ILE:HD13	1:A:932:GLU:CG	2.28	0.63
1:A:764:ARG:NE	1:A:764:ARG:HA	2.14	0.62
1:A:934:ILE:O	1:A:938:VAL:HG23	1.99	0.62
1:A:780:SER:HA	1:A:783:LEU:HD12	1.80	0.62
1:A:266:GLU:O	1:A:270:THR:HG23	2.02	0.60
1:A:229:THR:OG1	2:A:1001:ANP:PG	2.59	0.60
1:A:520:MET:HG2	1:A:521:PRO:HD2	1.84	0.59
1:A:886:THR:OG1	1:A:887:SER:N	2.36	0.58
1:A:176:LEU:HB3	1:A:241:ILE:HD12	1.86	0.57
1:A:566:GLU:OE1	1:A:568:HIS:NE2	2.29	0.57
1:A:164:GLN:OE1	1:A:295:LYS:HG3	2.05	0.57
1:A:329:HIS:CD2	1:A:359:ALA:H	2.23	0.56
1:A:329:HIS:CE1	1:A:548:THR:HG21	2.41	0.56
1:A:156:ASP:OD1	1:A:156:ASP:N	2.39	0.56
1:A:351:ASP:N	1:A:351:ASP:OD1	2.39	0.56
1:A:479:GLU:OE1	1:A:599:GLN:NE2	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:785:MET:O	1:A:789:MET:HG3	2.07	0.55
1:A:948:LEU:HD23	1:A:952:LYS:HD2	1.89	0.55
1:A:726:PRO:HG2	1:A:729:LYS:HB2	1.89	0.55
1:A:964:THR:HG23	1:A:965:LYS:N	2.23	0.54
1:A:903:LEU:HD22	1:A:928:PHE:HZ	1.72	0.53
1:A:764:ARG:HB3	1:A:768:TYR:HD2	1.73	0.53
1:A:711:LEU:HD12	1:A:808:PRO:HB3	1.90	0.52
1:A:206:LYS:HA	1:A:209:VAL:HG22	1.92	0.52
1:A:268:VAL:O	1:A:272:ARG:HG2	2.10	0.52
1:A:530:LYS:N	1:A:530:LYS:HD3	2.25	0.52
1:A:736:ARG:HD2	1:A:775:GLU:O	2.10	0.51
1:A:821:LYS:HD3	1:A:980:LYS:HA	1.93	0.51
1:A:408:SER:O	1:A:408:SER:OG	2.28	0.50
1:A:389:LEU:HD13	1:A:609:GLY:HA2	1.92	0.50
1:A:767:ARG:O	1:A:771:ASP:HB2	2.12	0.50
1:A:764:ARG:HE	1:A:764:ARG:HA	1.77	0.50
1:A:527:GLN:HA	1:A:530:LYS:NZ	2.27	0.49
1:A:825:ALA:HB2	1:A:979:ILE:HD13	1.94	0.49
1:A:237:LEU:O	1:A:241:ILE:HG12	2.13	0.49
1:A:545:ILE:O	1:A:549:SER:OG	2.26	0.49
1:A:863:PRO:HA	1:A:868:VAL:HG21	1.93	0.49
1:A:406:HIS:O	1:A:409:GLN:HG2	2.13	0.49
1:A:834:LYS:HB3	1:A:880:TYR:CZ	2.48	0.49
1:A:951:GLU:OE2	1:A:951:GLU:HA	2.12	0.48
1:A:699:LEU:HD11	1:A:802:PHE:CE1	2.48	0.48
1:A:778:LEU:HB3	1:A:783:LEU:HD11	1.95	0.48
1:A:774:TRP:HA	1:A:774:TRP:CE3	2.48	0.48
1:A:850:LYS:HB3	1:A:858:LEU:HD22	1.96	0.47
1:A:834:LYS:HB3	1:A:880:TYR:CE1	2.50	0.47
1:A:882:LEU:HD12	1:A:883:LYS:N	2.29	0.47
2:A:1001:ANP:O3G	2:A:1001:ANP:O1B	2.32	0.47
1:A:219:VAL:HG22	1:A:356:LEU:HD12	1.96	0.47
1:A:404:LYS:HG3	1:A:407:ARG:HH22	1.79	0.47
1:A:526:THR:O	1:A:527:GLN:HB2	2.15	0.47
1:A:544:ASN:O	1:A:547:GLU:HB2	2.15	0.46
1:A:966:SER:HB2	1:A:969:CYS:H	1.80	0.46
1:A:229:THR:HG1	2:A:1001:ANP:PG	2.36	0.46
1:A:969:CYS:O	1:A:973:SER:HB2	2.16	0.45
1:A:160:GLU:O	1:A:164:GLN:HG3	2.17	0.45
1:A:742:LYS:NZ	1:A:753:ASN:OD1	2.46	0.45
1:A:411:LYS:HD3	1:A:412:ARG:N	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:229:THR:N	2:A:1001:ANP:HNB1	1.98	0.45
1:A:523:VAL:HG12	1:A:524:ASN:N	2.32	0.45
1:A:404:LYS:HA	1:A:407:ARG:NH2	2.32	0.45
1:A:413:GLY:H	1:A:418:HIS:CD2	2.35	0.45
1:A:918:GLU:OE1	1:A:931:PRO:HA	2.17	0.44
1:A:204:MET:HE2	1:A:376:ILE:HD11	2.00	0.44
1:A:229:THR:OG1	2:A:1001:ANP:O1G	2.35	0.44
1:A:208:LEU:HD23	1:A:376:ILE:HD13	1.99	0.44
1:A:336:ASP:HA	1:A:339:MET:HE2	1.98	0.44
1:A:411:LYS:HD3	1:A:412:ARG:H	1.81	0.44
1:A:745:ARG:HH11	1:A:745:ARG:HG3	1.82	0.44
1:A:192:MET:O	1:A:196:ARG:HG3	2.18	0.44
1:A:525:GLN:C	1:A:527:GLN:H	2.21	0.44
1:A:173:ASP:OD1	1:A:247:SER:OG	2.32	0.43
1:A:189:TYR:O	1:A:193:GLN:HG2	2.17	0.43
1:A:338:LEU:HD12	1:A:338:LEU:HA	1.81	0.43
1:A:161:TYR:O	1:A:250:ARG:NH2	2.38	0.43
1:A:621:PRO:HB2	1:A:623:ILE:HG22	2.00	0.43
1:A:746:SER:HB2	1:A:895:THR:HG23	2.00	0.43
1:A:925:TRP:NE1	1:A:926:ILE:HG13	2.33	0.43
1:A:634:GLN:O	1:A:637:ILE:HG22	2.18	0.43
1:A:635:ILE:HG23	1:A:640:LEU:HB2	2.00	0.43
1:A:952:LYS:HE2	1:A:968:ASP:OD2	2.19	0.43
1:A:925:TRP:CD1	1:A:926:ILE:HG13	2.54	0.43
1:A:205:GLN:O	1:A:209:VAL:HG13	2.19	0.43
1:A:626:THR:HG22	1:A:627:PRO:O	2.19	0.42
1:A:200:PRO:HG2	1:A:226:CYS:HB2	2.02	0.42
1:A:158:ASP:OD2	1:A:287:ARG:HG2	2.20	0.42
1:A:342:ILE:HA	1:A:342:ILE:HD13	1.86	0.42
1:A:409:GLN:HG3	1:A:409:GLN:H	1.50	0.42
1:A:412:ARG:HD2	1:A:413:GLY:N	2.34	0.42
1:A:221:SER:HA	1:A:358:SER:O	2.20	0.41
1:A:283:GLY:HA3	1:A:293:PRO:HD3	2.02	0.41
1:A:404:LYS:HG2	1:A:404:LYS:O	2.19	0.41
1:A:520:MET:HB3	1:A:520:MET:HE3	1.81	0.41
1:A:560:ASP:OD1	1:A:591:ARG:NH1	2.52	0.41
1:A:726:PRO:HG2	1:A:729:LYS:CB	2.49	0.41
1:A:473:TYR:CE2	1:A:477:GLU:HG3	2.55	0.41
1:A:488:PRO:HG3	1:A:563:LYS:HB2	2.01	0.41
1:A:574:ASN:O	1:A:574:ASN:ND2	2.54	0.41
1:A:693:HIS:HB2	1:A:830:GLY:O	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:172:LEU:HD23	1:A:247:SER:HB3	2.02	0.41
1:A:204:MET:CE	1:A:376:ILE:HD11	2.50	0.41
1:A:527:GLN:CA	1:A:530:LYS:HG2	2.46	0.41
1:A:736:ARG:HH11	1:A:736:ARG:HG3	1.85	0.41
1:A:759:GLU:O	1:A:762:LYS:HG2	2.21	0.41
1:A:749:LEU:HA	1:A:749:LEU:HD23	1.94	0.41
1:A:774:TRP:HA	1:A:774:TRP:HE3	1.85	0.41
1:A:882:LEU:HD12	1:A:883:LYS:H	1.87	0.40
1:A:629:GLU:HB3	1:A:692:PRO:HG2	2.03	0.40
1:A:328:ILE:HD13	1:A:356:LEU:HB3	2.03	0.40

All (10) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:412:ARG:NH2	1:A:916:ASP:OD1[4_456]	1.03	1.17
1:A:371:GLY:O	1:A:404:LYS:NZ[3_555]	1.04	1.16
1:A:371:GLY:O	1:A:404:LYS:CE[3_555]	1.35	0.85
1:A:411:LYS:NZ	1:A:915:LYS:O[4_456]	1.74	0.46
1:A:412:ARG:CZ	1:A:916:ASP:OD1[4_456]	1.74	0.46
1:A:371:GLY:O	1:A:404:LYS:CD[3_555]	1.76	0.44
1:A:412:ARG:NH1	1:A:916:ASP:CG[4_456]	2.00	0.20
1:A:371:GLY:C	1:A:404:LYS:NZ[3_555]	2.00	0.20
1:A:412:ARG:NH1	1:A:916:ASP:OD1[4_456]	2.11	0.09
1:A:411:LYS:CE	1:A:915:LYS:O[4_456]	2.19	0.01

## 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	817/830 (98%)	785 (96%)	32 (4%)	0	<a href="#">100</a> <a href="#">100</a>

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	739/747 (99%)	714 (97%)	25 (3%)	37 66

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	157	ARG
1	A	191	GLU
1	A	275	SER
1	A	395	GLU
1	A	406	HIS
1	A	412	ARG
1	A	447	SER
1	A	456	MET
1	A	508	SER
1	A	520	MET
1	A	531	LYS
1	A	594	ARG
1	A	705	CYS
1	A	706	CYS
1	A	729	LYS
1	A	745	ARG
1	A	764	ARG
1	A	780	SER
1	A	805	SER
1	A	806	ARG
1	A	809	LYS
1	A	898	SER
1	A	925	TRP
1	A	967	ARG
1	A	978	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	181	GLN
1	A	210	ASN
1	A	213	ASN
1	A	329	HIS
1	A	422	GLN
1	A	619	GLN
1	A	693	HIS
1	A	841	ASN

### 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](#)

1 ligand is 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	ANP	A	1001	-	29,33,33	1.17	4 (13%)	31,52,52	1.13	3 (9%)

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
2	ANP	A	1001	-	-	2/14/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1001	ANP	PB-O3A	-2.75	1.55	1.59
2	A	1001	ANP	PG-N3B	2.73	1.70	1.63
2	A	1001	ANP	PG-O1G	2.49	1.50	1.46
2	A	1001	ANP	PB-O1B	2.28	1.49	1.46

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1001	ANP	O1G-PG-N3B	-2.73	107.75	111.77
2	A	1001	ANP	C4-C5-N7	2.34	111.84	109.40
2	A	1001	ANP	PA-O3A-PB	-2.19	124.91	132.62

There are no chirality outliers.

All (2) torsion outliers are listed below:

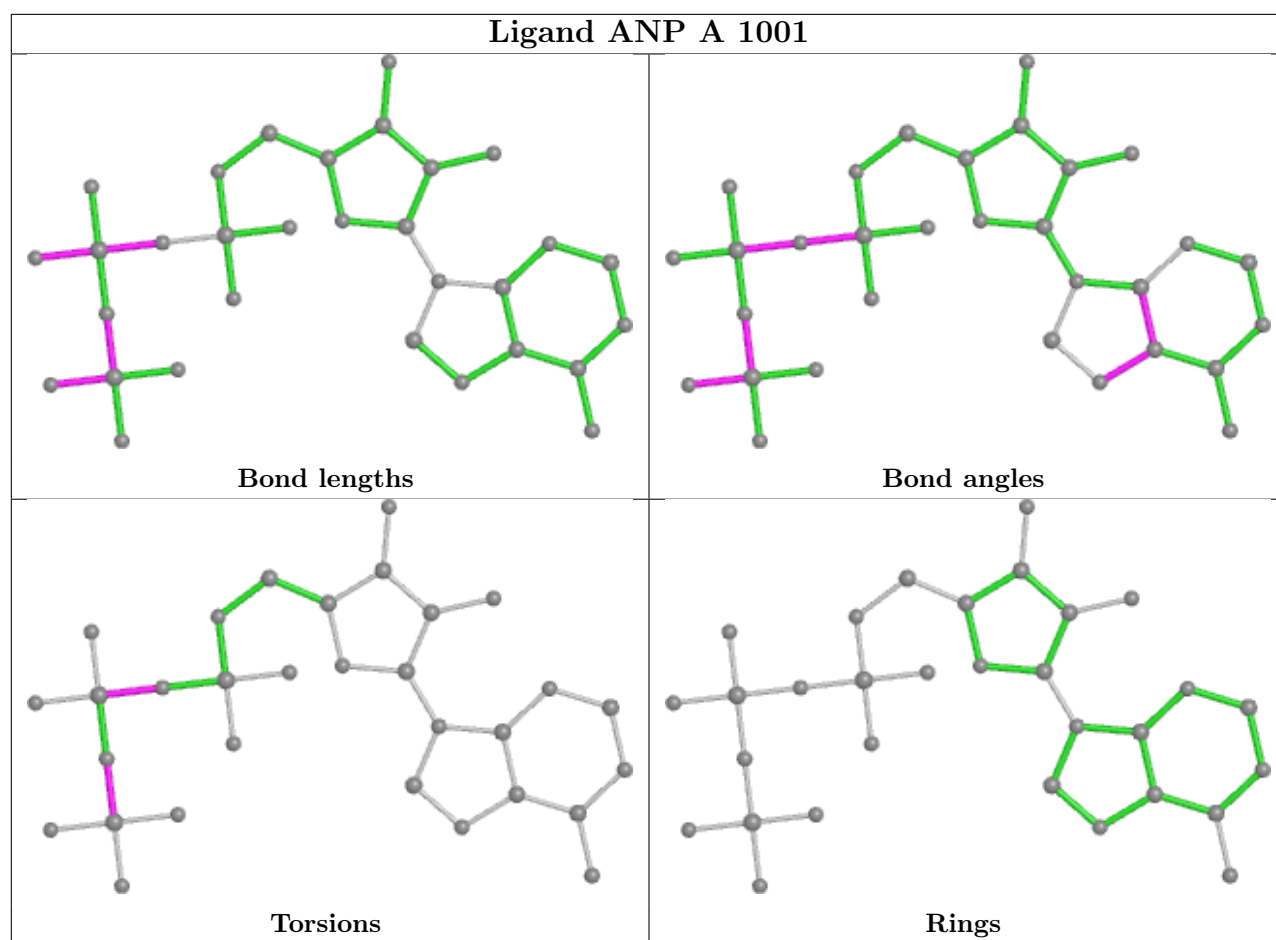
Mol	Chain	Res	Type	Atoms
2	A	1001	ANP	PB-N3B-PG-O1G
2	A	1001	ANP	PA-O3A-PB-O2B

There are no ring outliers.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1001	ANP	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 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	821/830 (98%)	0.47	53 (6%) <b>18</b> <b>17</b>	35, 62, 117, 175	0

All (53) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	535	GLY	6.0
1	A	407	ARG	5.8
1	A	419	VAL	5.6
1	A	409	GLN	5.0
1	A	420	ASN	5.0
1	A	768	TYR	4.9
1	A	522	THR	4.5
1	A	406	HIS	4.5
1	A	848	MET	3.9
1	A	914	ASP	3.4
1	A	567	THR	3.4
1	A	771	ASP	3.4
1	A	774	TRP	3.0
1	A	903	LEU	3.0
1	A	524	ASN	2.9
1	A	525	GLN	2.9
1	A	732	ILE	2.9
1	A	957	HIS	2.9
1	A	527	GLN	2.8
1	A	981	THR	2.8
1	A	415	MET	2.8
1	A	764	ARG	2.8
1	A	410	PHE	2.8
1	A	704	PHE	2.7
1	A	915	LYS	2.7
1	A	727	LEU	2.6
1	A	187	PRO	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	777	PHE	2.6
1	A	767	ARG	2.5
1	A	968	ASP	2.5
1	A	418	HIS	2.5
1	A	521	PRO	2.5
1	A	534	PRO	2.5
1	A	182	ARG	2.3
1	A	961	TRP	2.3
1	A	962	ASP	2.3
1	A	913	LYS	2.3
1	A	944	GLU	2.3
1	A	938	VAL	2.3
1	A	946	ASP	2.2
1	A	954	GLU	2.2
1	A	157	ARG	2.2
1	A	912	GLN	2.2
1	A	412	ARG	2.2
1	A	763	ARG	2.1
1	A	806	ARG	2.1
1	A	523	VAL	2.1
1	A	932	GLU	2.1
1	A	185	THR	2.0
1	A	532	THR	2.0
1	A	531	LYS	2.0
1	A	731	LYS	2.0
1	A	972	LEU	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.

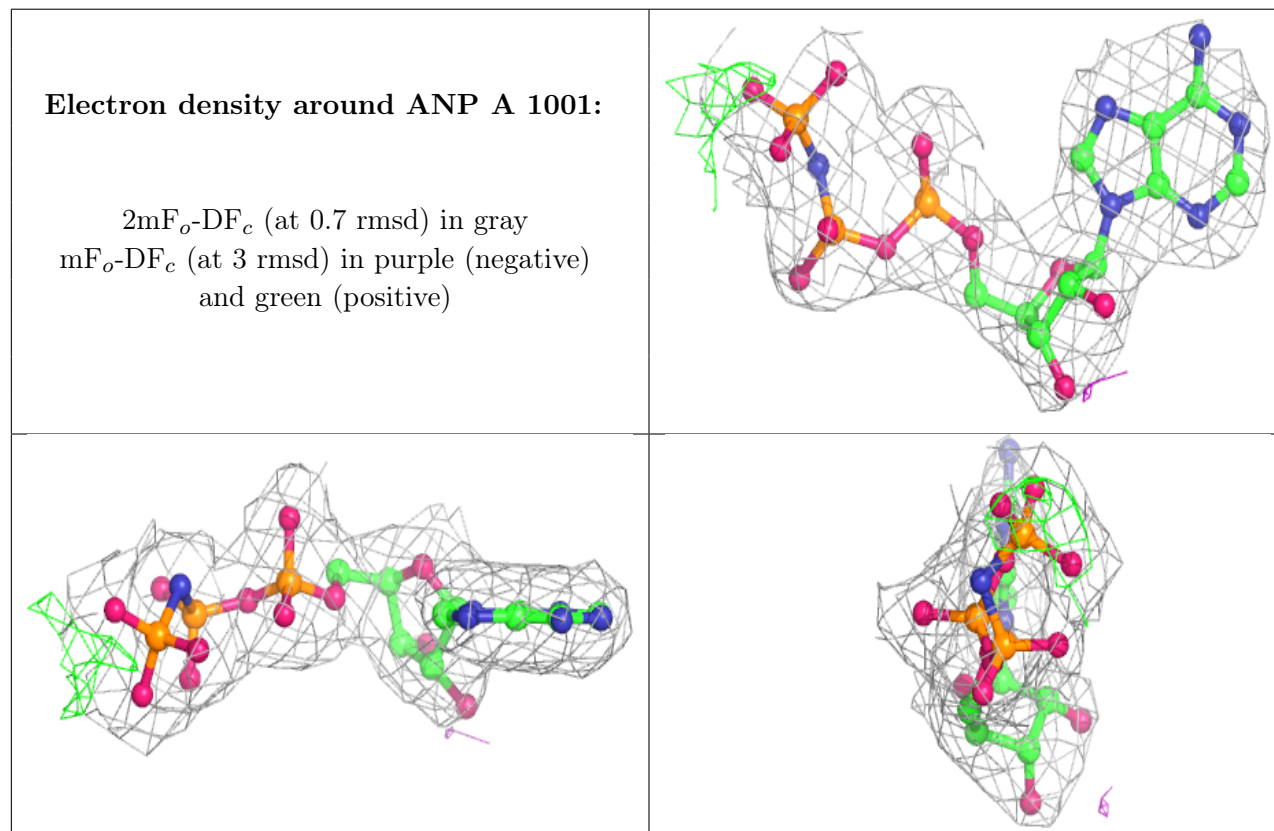
## 6.4 Ligands [\(i\)](#)

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, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
2	ANP	A	1001	31/31	0.95	0.20	46,62,88,112	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.



## 6.5 Other polymers [i](#)

There are no such residues in this entry.