



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 9, 2019 – 10:06 AM EST

PDB ID : 6CGD  
Title : Aminoglycoside Phosphotransferase (2'')-Ia in complex with GMPPNP, Magnesium, and Amikacin  
Authors : Caldwell, S.J.; Berghuis, A.M.  
Deposited on : 2018-02-20  
Resolution : 2.20 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 : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : rb-20031633  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20031633

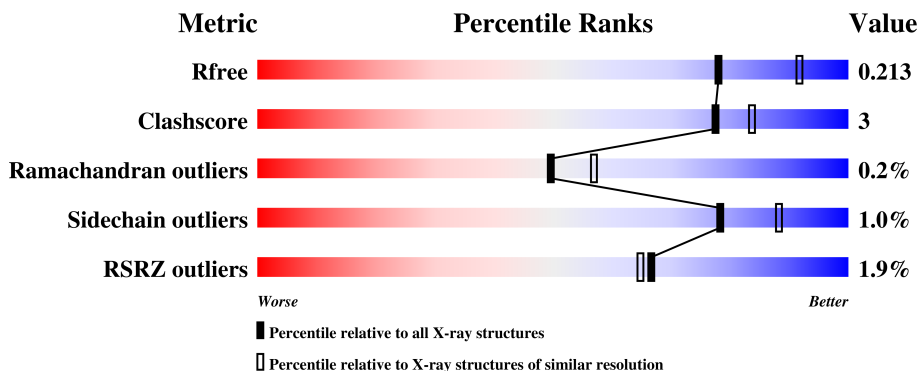
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.20 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))
$R_{free}$	111664	4343 (2.20-2.20)
Clashscore	122126	5027 (2.20-2.20)
Ramachandran outliers	120053	4952 (2.20-2.20)
Sidechain outliers	120020	4953 (2.20-2.20)
RSRZ outliers	108989	4245 (2.20-2.20)

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. 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	305	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 90%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">90% <span style="float: right;">8% •</span></p>
1	B	305	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 89%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">89% <span style="float: right;">9% •</span></p>
1	C	305	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 90%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 7%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">90% <span style="float: right;">7% •</span></p>
1	D	305	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 90%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 7%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">90% <span style="float: right;">7% •</span></p>

## 2 Entry composition i

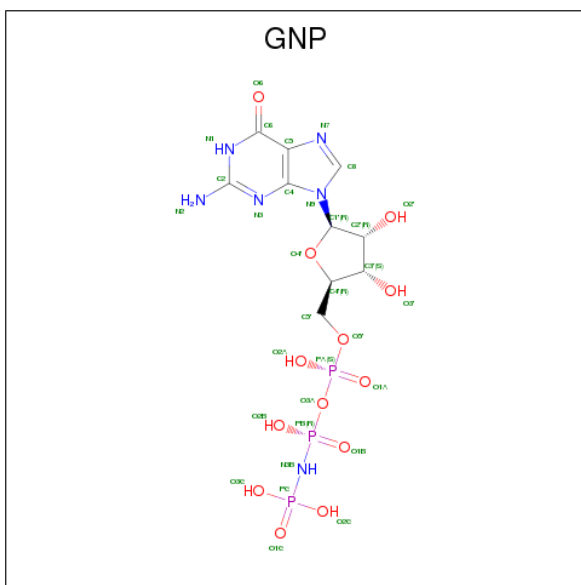
There are 6 unique types of molecules in this entry. The entry contains 10683 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Bifunctional AAC/APH.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	298	Total 2449	C 1561	N 381	O 497	S 10	0	0	0
1	B	297	Total 2460	C 1569	N 382	O 499	S 10	0	1	0
1	C	296	Total 2444	C 1559	N 381	O 494	S 10	0	1	0
1	D	298	Total 2459	C 1569	N 382	O 498	S 10	0	1	0

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula:  $C_{10}H_{17}N_6O_{13}P_3$ ).



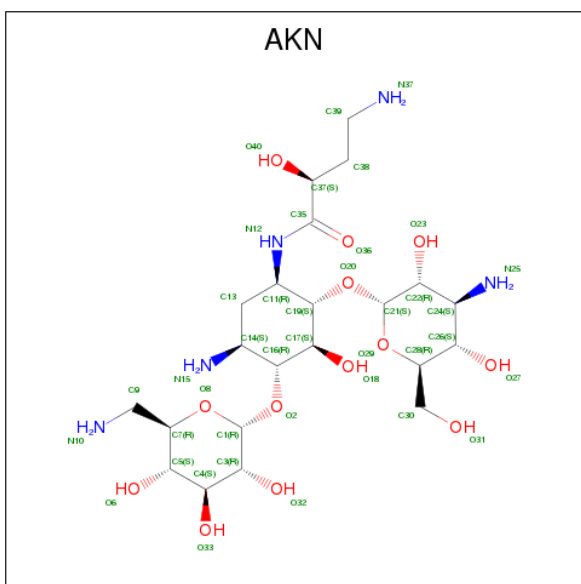
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
2	A	1	Total 32	C 10	N 6	O 13	P 3	0	0
2	B	1	Total 41	C 10	N 7	O 19	P 5	0	1

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
2	C	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
2	D	1	Total	C	N	O	P	0	1
			41	10	7	19	5		

- Molecule 3 is (2S)-N-[(1R,2S,3S,4R,5S)-4-[(2R,3R,4S,5S,6R)-6-(aminomethyl)-3,4,5-tris(oxidanyl)oxan-2-yl]oxy-5-azanyl-2-[(2S,3R,4S,5S,6R)-4-azanyl-6-(hydroxymethyl)-3,5-bis(oxidanyl)oxan-2-yl]oxy-3-oxidanyl-cyclohexyl]-4-azanyl-2-oxidanyl-butanamide (three-letter code: AKN) (formula: C<sub>22</sub>H<sub>43</sub>N<sub>5</sub>O<sub>13</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			40	22	5	13		
3	D	1	Total	C	N	O	0	0
			40	22	5	13		

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

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

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total Cl 1 1	0	0
5	A	1	Total Cl 1 1	0	0
5	C	1	Total Cl 1 1	0	0

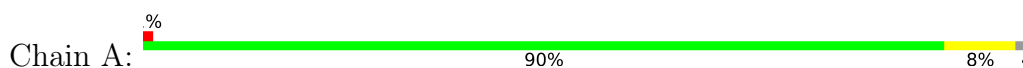
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	169	Total O 169 169	0	0
6	B	197	Total O 197 197	0	0
6	C	164	Total O 164 164	0	0
6	D	104	Total O 104 104	0	0

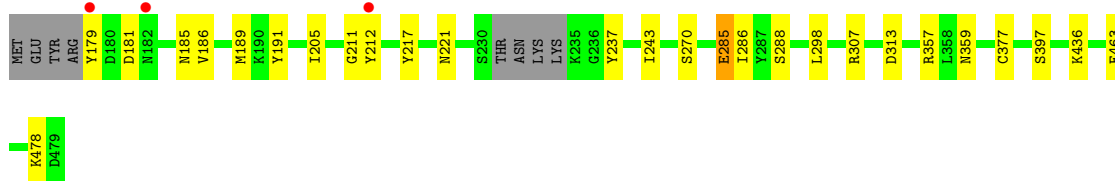
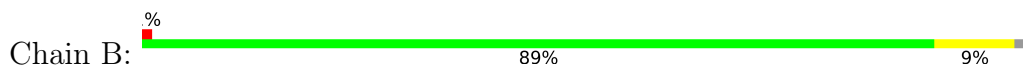
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

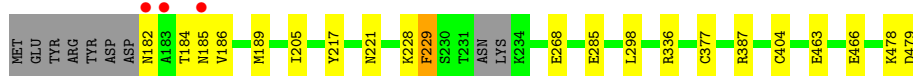
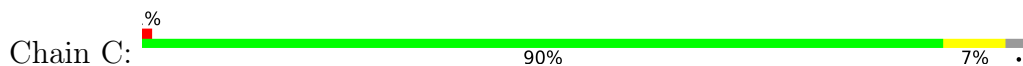
- Molecule 1: Bifunctional AAC/APH



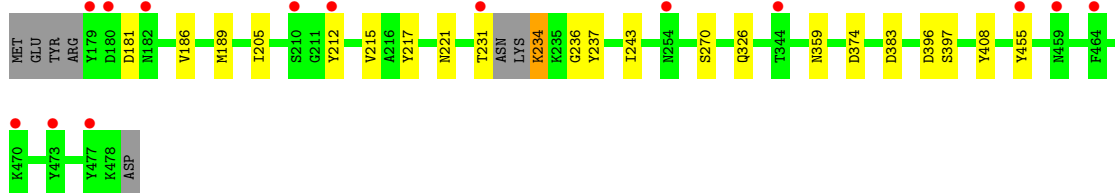
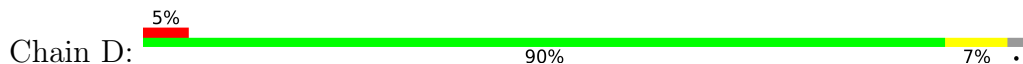
- Molecule 1: Bifunctional AAC/APH



- Molecule 1: Bifunctional AAC/APH



- Molecule 1: Bifunctional AAC/APH



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.08Å 100.22Å 93.99Å 90.00° 105.12° 90.00°	Depositor
Resolution (Å)	90.74 – 2.20 50.11 – 2.20	Depositor EDS
% Data completeness (in resolution range)	100.0 (90.74-2.20) 100.0 (50.11-2.20)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.86 (at 2.20Å)	Xtrriage
Refinement program	REFMAC 5.8.0073	Depositor
R, $R_{free}$	0.172 , 0.209 0.179 , 0.213	Depositor DCC
$R_{free}$ test set	4128 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.1	Xtrriage
Anisotropy	0.086	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 41.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.015 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	10683	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	51.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.83% 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: MG, CL, GNP, AKN

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	0.84	1/2493 (0.0%)	0.84	2/3363 (0.1%)
1	B	0.88	2/2507 (0.1%)	0.82	2/3379 (0.1%)
1	C	0.85	2/2490 (0.1%)	0.87	4/3356 (0.1%)
1	D	0.73	0/2506	0.78	0/3381
All	All	0.83	5/9996 (0.1%)	0.83	8/13479 (0.1%)

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	D	0	1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	377	CYS	CB-SG	-5.61	1.72	1.81
1	B	191	TYR	CE2-CZ	-5.55	1.31	1.38
1	C	377	CYS	CB-SG	-5.24	1.73	1.81
1	A	377	CYS	CB-SG	-5.17	1.73	1.81
1	C	466	GLU	CG-CD	5.13	1.59	1.51

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	357	ARG	NE-CZ-NH2	-5.69	117.45	120.30
1	A	357	ARG	NE-CZ-NH2	-5.66	117.47	120.30
1	C	336	ARG	NE-CZ-NH2	-5.54	117.53	120.30
1	C	229	PHE	CA-C-N	5.54	129.39	117.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	313	ASP	CB-CG-OD1	5.28	123.05	118.30
1	C	336	ARG	NE-CZ-NH1	5.12	122.86	120.30
1	C	404	CYS	CA-CB-SG	-5.03	104.95	114.00
1	A	313	ASP	CB-CG-OD1	5.01	122.81	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	234	LYS	Peptide

## 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	2449	0	2351	13	1
1	B	2460	0	2363	16	1
1	C	2444	0	2355	12	0
1	D	2459	0	2357	17	0
2	A	32	0	13	1	0
2	B	41	0	2	2	0
2	C	32	0	13	0	0
2	D	41	0	2	4	0
3	A	40	0	43	1	0
3	D	40	0	43	10	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
4	C	2	0	0	0	0
4	D	2	0	0	0	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
6	A	169	0	0	3	0
6	B	197	0	0	9	0
6	C	164	0	0	3	2
6	D	104	0	0	6	0
All	All	10683	0	9542	62	2

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 3.

All (62) 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)
2:D:500[B]:GNP:O1G	6:D:924:HOH:O	1.53	1.27
2:B:500[A]:GNP:O3G	6:B:904:HOH:O	1.57	1.23
3:D:600:AKN:N25	6:D:904:HOH:O	1.95	0.90
1:D:359:ASN:OD1	6:D:1050:HOH:O	1.89	0.88
2:A:500:GNP:O1G	6:A:921:HOH:O	1.91	0.88
2:D:500[A]:GNP:O3G	6:D:924:HOH:O	2.01	0.79
1:B:359:ASN:OD1	6:B:1050:HOH:O	2.06	0.73
1:D:326:GLN:NE2	6:D:1013:HOH:O	2.21	0.67
3:D:600:AKN:H23	3:D:600:AKN:H43	1.77	0.66
1:A:233:LYS:O	1:A:235:LYS:N	2.26	0.66
1:C:186:VAL:HG13	1:C:205:ILE:HG23	1.81	0.63
2:B:500[A]:GNP:PG	6:B:904:HOH:O	2.44	0.63
3:A:600:AKN:N15	3:A:600:AKN:O32	2.32	0.62
1:D:186:VAL:HG13	1:D:205:ILE:HG23	1.80	0.62
1:D:396:ASP:OD2	3:D:600:AKN:O27	2.18	0.62
1:A:186:VAL:HG13	1:A:205:ILE:HG23	1.82	0.60
1:B:436:LYS:NZ	6:B:1113:HOH:O	2.33	0.60
3:D:600:AKN:C38	3:D:600:AKN:H23	2.31	0.60
1:B:186:VAL:HG13	1:B:205:ILE:HG23	1.84	0.59
1:C:228:LYS:HE3	6:C:1038:HOH:O	2.02	0.59
1:D:212:TYR:HB3	1:D:455:TYR:OH	2.05	0.56
1:C:229:PHE:O	1:C:268:GLU:O	2.24	0.55
1:B:243:ILE:HD13	1:B:397:SER:HB2	1.90	0.54
1:A:185:ASN:ND2	1:B:179:TYR:OH	2.41	0.53
1:C:463:GLU:HB3	6:C:1001:HOH:O	2.09	0.53
1:B:211:GLY:HA3	6:B:1091:HOH:O	2.09	0.53
1:D:243:ILE:HD13	1:D:397:SER:HB2	1.91	0.53
1:A:243:ILE:HD13	1:A:397:SER:HB2	1.91	0.53
1:C:184:THR:HG21	1:D:215:VAL:HG21	1.90	0.52
1:A:182:ASN:HA	1:B:181:ASP:OD1	2.10	0.51
1:B:285:GLU:HG3	1:B:286:ILE:N	2.24	0.51
1:B:298:LEU:HA	6:B:1268:HOH:O	2.10	0.51
2:D:500[A]:GNP:O3G	3:D:600:AKN:N25	2.43	0.51
2:D:500[A]:GNP:PG	3:D:600:AKN:H28	2.34	0.50
1:A:342:ASP:OD2	6:A:1315:HOH:O	2.19	0.50
1:D:408:TYR:CE1	3:D:600:AKN:H21	2.47	0.49
1:C:185:ASN:ND2	1:D:181:ASP:OD1	2.45	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:374:ASP:OD2	3:D:600:AKN:H27	2.14	0.48
1:C:189:MET:HG2	1:C:217:TYR:CE2	2.50	0.47
1:C:298:LEU:HA	6:C:1268:HOH:O	2.14	0.47
1:D:189:MET:HG2	1:D:217:TYR:CE2	2.49	0.47
1:A:359:ASN:ND2	6:A:1050:HOH:O	2.49	0.46
1:A:233:LYS:C	1:A:235:LYS:N	2.70	0.45
1:D:408:TYR:CD1	3:D:600:AKN:H16	2.52	0.45
1:B:237:TYR:HB2	1:B:270:SER:HB3	1.99	0.45
1:A:229:PHE:O	1:A:231:THR:HG23	2.17	0.45
1:B:463:GLU:HB3	6:B:1001:HOH:O	2.17	0.45
1:A:185:ASN:ND2	1:B:181:ASP:OD1	2.50	0.44
1:B:285:GLU:HG2	6:B:1146:HOH:O	2.17	0.44
1:C:184:THR:CG2	1:D:215:VAL:HG21	2.47	0.43
1:D:234:LYS:C	1:D:236:GLY:H	2.21	0.43
1:C:182:ASN:HA	1:D:181:ASP:OD1	2.19	0.43
1:D:237:TYR:HB2	1:D:270:SER:HB3	2.00	0.43
1:A:423:GLU:OE2	1:A:438:LYS:NZ	2.41	0.43
1:A:184:THR:HB	1:B:185:ASN:ND2	2.34	0.43
1:C:478:LYS:O	1:C:479:ASP:HB2	2.19	0.43
3:D:600:AKN:H1	3:D:600:AKN:O18	2.21	0.41
1:B:307[B]:ARG:HD3	6:B:1030:HOH:O	2.20	0.41
1:A:230:SER:HB2	1:A:268:GLU:HA	2.03	0.41
1:D:383:ASP:HB2	6:D:1008:HOH:O	2.21	0.41
1:C:478:LYS:O	1:C:479:ASP:CB	2.70	0.40
1:B:189:MET:HG2	1:B:217:TYR:CE1	2.55	0.40

All (2) 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:293:GLU:OE1	6:C:1080:HOH:O[2_747]	2.13	0.07
1:B:288:SER:O	6:C:1219:HOH:O[2_646]	2.15	0.05

## 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	296/305 (97%)	283 (96%)	11 (4%)	2 (1%)	24	23
1	B	294/305 (96%)	283 (96%)	11 (4%)	0	100	100
1	C	293/305 (96%)	281 (96%)	12 (4%)	0	100	100
1	D	295/305 (97%)	282 (96%)	13 (4%)	0	100	100
All	All	1178/1220 (97%)	1129 (96%)	47 (4%)	2 (0%)	49	57

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	234	LYS
1	A	230	SER

### 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	271/281 (96%)	269 (99%)	2 (1%)	85	93
1	B	273/281 (97%)	269 (98%)	4 (2%)	67	80
1	C	271/281 (96%)	268 (99%)	3 (1%)	76	87
1	D	272/281 (97%)	270 (99%)	2 (1%)	85	93
All	All	1087/1124 (97%)	1076 (99%)	11 (1%)	78	88

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	221	ASN
1	A	307	ARG
1	B	212	TYR
1	B	221	ASN
1	B	285	GLU
1	B	478	LYS

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Mol	Chain	Res	Type
1	C	221	ASN
1	C	285	GLU
1	C	387	ARG
1	D	221	ASN
1	D	231	THR

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

Mol	Chain	Res	Type
1	A	185	ASN
1	A	341	ASN
1	A	385	ASN
1	A	467	ASN
1	B	185	ASN
1	B	467	ASN
1	C	327	ASN
1	C	341	ASN
1	D	295	GLN
1	D	296	ASN
1	D	326	GLN
1	D	420	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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 19 ligands modelled in this entry, 11 are monoatomic - leaving 8 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
2	GNP	A	500	4	27,34,34	3.01	7 (25%)	30,54,54	2.19	9 (30%)
3	AKN	A	600	-	40,42,42	0.42	0	52,61,61	0.97	3 (5%)
2	GNP	B	500[A]	4	27,34,34	1.93	6 (22%)	30,54,54	2.03	7 (23%)
2	GNP	B	500[B]	4	27,34,34	1.91	7 (25%)	30,54,54	1.84	5 (16%)
2	GNP	C	500	4	27,34,34	2.17	5 (18%)	30,54,54	2.13	6 (20%)
2	GNP	D	500[A]	4	27,34,34	2.00	4 (14%)	30,54,54	1.89	5 (16%)
2	GNP	D	500[B]	4	27,34,34	2.05	5 (18%)	30,54,54	1.86	4 (13%)
3	AKN	D	600	-	40,42,42	0.53	0	52,61,61	1.07	4 (7%)

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	GNP	A	500	4	-	1/16/38/38	0/3/3/3
3	AKN	A	600	-	-	0/23/83/83	0/3/3/3
2	GNP	B	500[A]	4	-	0/16/38/38	0/3/3/3
2	GNP	B	500[B]	4	-	0/16/38/38	0/3/3/3
2	GNP	C	500	4	-	0/16/38/38	0/3/3/3
2	GNP	D	500[A]	4	-	1/16/38/38	0/3/3/3
2	GNP	D	500[B]	4	-	0/16/38/38	0/3/3/3
3	AKN	D	600	-	-	1/23/83/83	0/3/3/3

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	500	GNP	C5-C6	-9.77	1.35	1.52
2	A	500	GNP	C4-N9	-8.90	1.35	1.47
2	D	500[A]	GNP	C4-N9	-7.61	1.37	1.47
2	D	500[B]	GNP	C4-N9	-7.61	1.37	1.47
2	C	500	GNP	C4-N9	-7.04	1.38	1.47
2	B	500[B]	GNP	C4-N9	-6.49	1.39	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	500[A]	GNP	C4-N9	-6.49	1.39	1.47
2	C	500	GNP	C5-C6	-6.32	1.41	1.52
2	A	500	GNP	PG-O3G	-4.24	1.45	1.56
2	D	500[A]	GNP	C5-C6	-3.85	1.46	1.52
2	D	500[B]	GNP	C5-C6	-3.85	1.46	1.52
2	C	500	GNP	C8-N9	-3.38	1.37	1.46
2	A	500	GNP	C8-N9	-3.36	1.37	1.46
2	B	500[B]	GNP	C8-N9	-3.23	1.37	1.46
2	B	500[A]	GNP	C8-N9	-3.23	1.37	1.46
2	B	500[B]	GNP	C5-C6	-2.98	1.47	1.52
2	B	500[A]	GNP	C5-C6	-2.98	1.47	1.52
2	D	500[A]	GNP	C8-N9	-2.88	1.38	1.46
2	D	500[B]	GNP	C8-N9	-2.88	1.38	1.46
2	C	500	GNP	C5-C4	-2.48	1.37	1.52
2	B	500[B]	GNP	C5-C4	-2.47	1.37	1.52
2	B	500[A]	GNP	C5-C4	-2.47	1.37	1.52
2	A	500	GNP	C5-C4	-2.19	1.38	1.52
2	B	500[B]	GNP	PG-O2G	2.12	1.62	1.56
2	D	500[B]	GNP	PB-O3A	2.20	1.61	1.59
2	B	500[B]	GNP	PB-O3A	2.23	1.61	1.59
2	B	500[B]	GNP	C6-N1	2.59	1.37	1.33
2	B	500[A]	GNP	C6-N1	2.59	1.37	1.33
2	C	500	GNP	C6-N1	2.72	1.37	1.33
2	A	500	GNP	C6-N1	2.88	1.38	1.33
2	D	500[A]	GNP	C6-N1	3.42	1.39	1.33
2	D	500[B]	GNP	C6-N1	3.42	1.39	1.33
2	B	500[A]	GNP	PB-O3A	3.57	1.63	1.59
2	A	500	GNP	PG-O2G	4.08	1.67	1.56

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	500[A]	GNP	C5-C6-N1	-5.75	111.42	118.27
2	D	500[B]	GNP	C5-C6-N1	-5.75	111.42	118.27
2	C	500	GNP	C5-C6-N1	-5.36	111.88	118.27
2	B	500[B]	GNP	C5-C6-N1	-4.80	112.55	118.27
2	B	500[A]	GNP	C5-C6-N1	-4.80	112.55	118.27
2	A	500	GNP	C5-C6-N1	-4.78	112.58	118.27
2	A	500	GNP	O2G-PG-O1G	-4.31	102.47	113.43
3	D	600	AKN	C26-C24-C22	-3.64	103.16	111.06
2	B	500[A]	GNP	O3G-PG-O1G	-3.53	104.45	113.43
2	C	500	GNP	O6-C6-N1	-3.17	118.51	122.71

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	600	AKN	C28-C26-C24	-3.11	106.88	110.35
3	A	600	AKN	O2-C16-C14	-2.68	102.75	108.96
2	A	500	GNP	O1G-PG-N3B	-2.34	108.29	111.79
2	D	500[A]	GNP	O6-C6-N1	-2.32	119.62	122.71
2	D	500[B]	GNP	O6-C6-N1	-2.32	119.62	122.71
2	D	500[A]	GNP	O3G-PG-O1G	-2.30	107.59	113.43
2	B	500[B]	GNP	O6-C6-N1	-2.27	119.70	122.71
2	B	500[A]	GNP	O6-C6-N1	-2.27	119.70	122.71
2	A	500	GNP	O6-C6-N1	-2.26	119.70	122.71
3	A	600	AKN	O20-C19-C17	-2.15	101.50	107.27
3	A	600	AKN	C28-C26-C24	-2.06	108.05	110.35
3	D	600	AKN	C11-N12-C35	2.06	126.78	123.08
2	C	500	GNP	O1B-PB-N3B	2.10	114.92	111.79
2	B	500[A]	GNP	PA-O3A-PB	2.23	140.23	132.40
2	B	500[B]	GNP	O1B-PB-N3B	2.24	115.14	111.79
2	A	500	GNP	O3G-PG-O1G	2.29	119.26	113.43
2	A	500	GNP	PA-O3A-PB	2.43	140.91	132.40
2	C	500	GNP	O3G-PG-O2G	2.66	114.83	107.61
3	D	600	AKN	C19-C11-N12	2.73	115.64	110.58
2	A	500	GNP	O3G-PG-O2G	3.48	117.06	107.61
2	B	500[A]	GNP	O1G-PG-N3B	3.60	117.17	111.79
2	A	500	GNP	O6-C6-C5	3.76	127.57	119.82
2	B	500[B]	GNP	O6-C6-C5	3.79	127.63	119.82
2	B	500[A]	GNP	O6-C6-C5	3.79	127.63	119.82
2	D	500[A]	GNP	O6-C6-C5	4.42	128.94	119.82
2	D	500[B]	GNP	O6-C6-C5	4.42	128.94	119.82
2	C	500	GNP	O6-C6-C5	4.70	129.51	119.82
2	D	500[A]	GNP	C4-C5-N7	5.76	110.09	102.46
2	D	500[B]	GNP	C4-C5-N7	5.76	110.09	102.46
2	A	500	GNP	C4-C5-N7	6.13	110.59	102.46
2	B	500[B]	GNP	C4-C5-N7	6.20	110.67	102.46
2	B	500[A]	GNP	C4-C5-N7	6.20	110.67	102.46
2	C	500	GNP	C4-C5-N7	6.32	110.84	102.46

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	500[A]	GNP	O1B-PB-N3B-PG
2	A	500	GNP	O1G-PG-N3B-PB
3	D	600	AKN	C37-C35-N12-C11



There are no ring outliers.

6 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	500	GNP	1	0
3	A	600	AKN	1	0
2	B	500[A]	GNP	2	0
2	D	500[A]	GNP	3	0
2	D	500[B]	GNP	1	0
3	D	600	AKN	10	0

## 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	298/305 (97%)	-0.26	3 (1%) 82 81	28, 46, 74, 103	0
1	B	297/305 (97%)	-0.29	3 (1%) 82 81	30, 44, 73, 114	0
1	C	296/305 (97%)	-0.29	3 (1%) 82 81	28, 44, 77, 119	0
1	D	298/305 (97%)	0.01	14 (4%) 31 30	41, 58, 100, 133	0
All	All	1189/1220 (97%)	-0.20	23 (1%) 66 65	28, 48, 85, 133	0

All (23) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	231	THR	6.0
1	D	212	TYR	5.2
1	D	182	ASN	4.8
1	D	477	TYR	4.7
1	D	473	TYR	4.4
1	D	179	TYR	3.8
1	D	464	PHE	3.6
1	A	231	THR	3.4
1	B	182	ASN	3.3
1	D	254	ASN	3.0
1	D	180	ASP	3.0
1	C	182	ASN	3.0
1	B	179	TYR	2.9
1	A	235	LYS	2.9
1	D	470	LYS	2.8
1	D	459	ASN	2.7
1	C	183	ALA	2.6
1	B	212	TYR	2.6
1	D	455	TYR	2.3
1	A	236	GLY	2.2
1	D	210	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	344	THR	2.1
1	C	185	ASN	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 carbohydrates 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(Å <sup>2</sup> )	Q<0.9
3	AKN	A	600	40/40	0.70	0.23	52,59,64,68	40
3	AKN	D	600	40/40	0.72	0.26	63,72,75,79	40
4	MG	A	702	1/1	0.83	0.13	43,43,43,43	0
5	CL	A	802	1/1	0.91	0.20	77,77,77,77	0
4	MG	A	700	1/1	0.94	0.12	40,40,40,40	0
4	MG	C	700	1/1	0.95	0.10	40,40,40,40	0
5	CL	B	802	1/1	0.95	0.10	81,81,81,81	0
5	CL	C	802	1/1	0.96	0.11	68,68,68,68	0
4	MG	C	702	1/1	0.97	0.06	42,42,42,42	0
2	GNP	D	500[B]	32/32	0.97	0.10	39,49,52,53	9
2	GNP	D	500[A]	32/32	0.97	0.10	39,49,52,53	9
2	GNP	C	500	32/32	0.98	0.10	36,40,45,49	0
2	GNP	B	500[B]	32/32	0.98	0.11	31,39,43,44	9
2	GNP	B	500[A]	32/32	0.98	0.11	31,39,43,44	9
2	GNP	A	500	32/32	0.98	0.14	34,40,46,47	0
4	MG	B	700	1/1	0.99	0.11	36,36,36,36	0
4	MG	D	702	1/1	0.99	0.03	46,46,46,46	0
4	MG	B	702	1/1	0.99	0.04	47,47,47,47	0
4	MG	D	700	1/1	0.99	0.10	40,40,40,40	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.