



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2018 – 02:33 pm GMT

PDB ID : 5IZJ  
Title : Complex of PKA with the bisubstrate protein kinase inhibitor ARC-1411  
Authors : Pflug, A.; Enkvist, E.; Uri, A.; Engh, R.A.  
Deposited on : 2016-03-25  
Resolution : 1.85 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.

---

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)  
Xtrriage (Phenix) : 1.13  
EDS : trunk30967  
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) : trunk30967

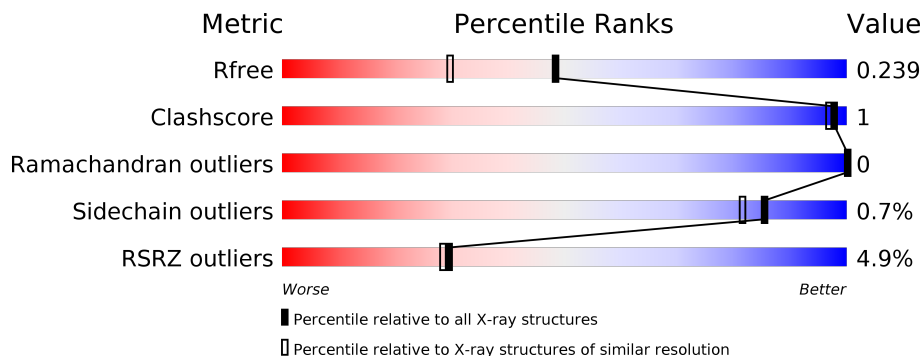
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.85 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	2111 (1.86-1.86)
Clashscore	122126	2258 (1.86-1.86)
Ramachandran outliers	120053	2234 (1.86-1.86)
Sidechain outliers	120020	2234 (1.86-1.86)
RSRZ outliers	108989	2075 (1.86-1.86)

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	351	
1	B	351	
2	G	4	
3	F	5	

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	PO4	A	412	-	-	-	X
4	PO4	A	413	-	-	-	X

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 6384 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 cAMP-dependent protein kinase catalytic subunit alpha.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	P	S			
1	A	330	Total	C	N	O	P	S	0	4	0
			2767	1798	462	496	2	9			
1	B	327	Total	C	N	O	P	S	0	3	0
			2729	1772	458	488	2	9			

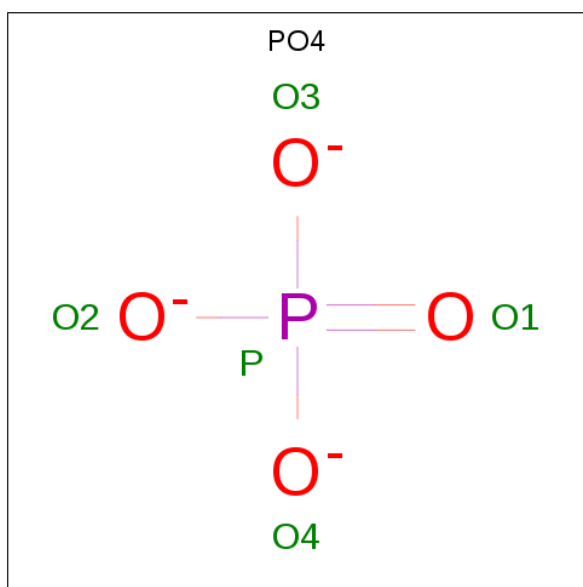
- Molecule 2 is a protein (with D amino acids) called 47P-AZ1-DAR-DAR.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	G	4	Total	C	N	O	0	0	0
			48	31	13	4			

- Molecule 3 is a protein (with D amino acids) called 47P-AZ1-DAR-DAR-DAR.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	F	5	Total	C	N	O	0	1	0
			67	42	20	5			

- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



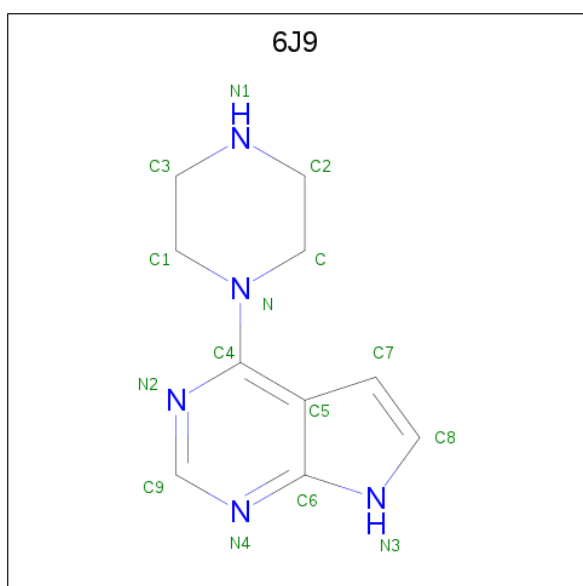
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	B	1	Total O P 5 4 1	0	0

*Continued on next page...*

Continued from previous page...

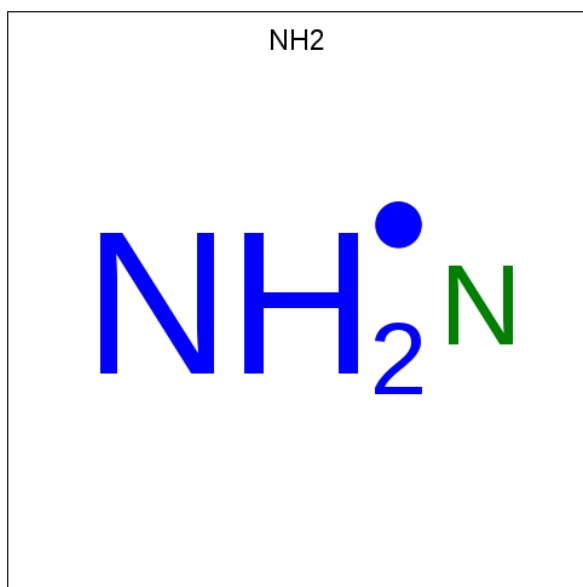
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	O	P		
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	F	1	Total 5	O 4	P 1	0	0

- Molecule 5 is 4-(piperazin-1-yl)-7H-pyrrolo[2,3-d]pyrimidine (three-letter code: 6J9) (formula: C<sub>10</sub>H<sub>13</sub>N<sub>5</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	N	0	0
			15	10	5		
5	B	1	Total	C	N	0	0
			15	10	5		

- Molecule 6 is AMINO GROUP (three-letter code: NH2) (formula: H<sub>2</sub>N).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	G	1	Total	N	0	0
			1	1		
6	F	1	Total	N	0	0
			1	1		

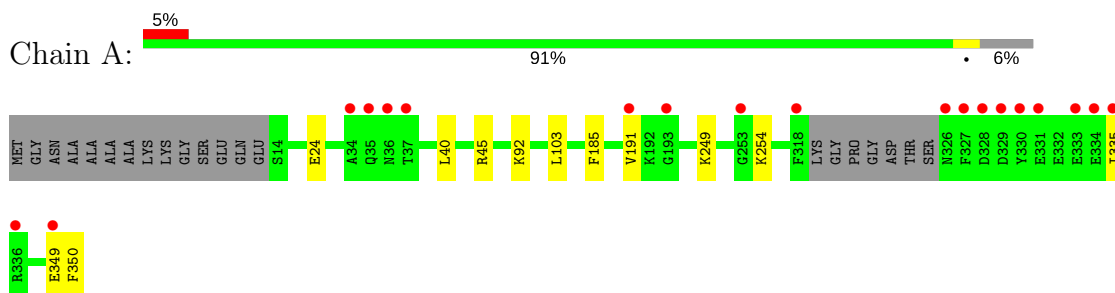
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	245	Total	O	0	0
			245	245		
7	B	360	Total	O	0	0
			360	360		
7	F	6	Total	O	0	0
			6	6		

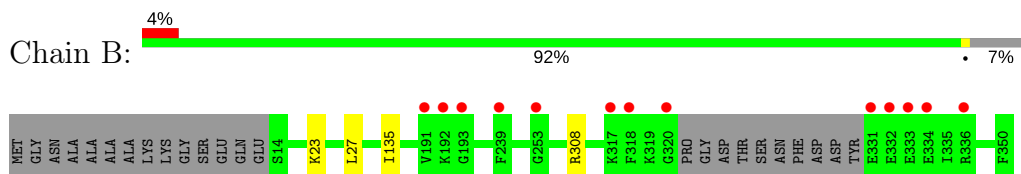
### 3 Residue-property plots [i](#)

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: cAMP-dependent protein kinase catalytic subunit alpha



- Molecule 1: cAMP-dependent protein kinase catalytic subunit alpha

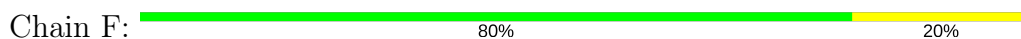


- Molecule 2: 47P-AZ1-DAR-DAR



There are no outlier residues recorded for this chain.

- Molecule 3: 47P-AZ1-DAR-DAR-DAR





## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	63.94Å 84.99Å 77.01Å 90.00° 90.09° 90.00°	Depositor
Resolution (Å)	42.60 – 1.85 42.60 – 1.85	Depositor EDS
% Data completeness (in resolution range)	93.2 (42.60-1.85) 95.7 (42.60-1.85)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.36 (at 1.84Å)	Xtrriage
Refinement program	REFMAC 5.8.0135	Depositor
R, $R_{free}$	0.197 , 0.226 0.210 , 0.239	Depositor DCC
$R_{free}$ test set	3290 reflections (4.87%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	20.9	Xtrriage
Anisotropy	0.029	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 37.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.52$ , $\langle L^2 \rangle = 0.37$	Xtrriage
Estimated twinning fraction	0.016 for h,-k,-l	Xtrriage
Reported twinning fraction	0.884 for H, K, L 0.116 for -h,-k,l	Depositor
Outliers	0 of 67587 reflections	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	6384	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	21.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.44% 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: 6J9, SEP, TPO, PO4, DAR, NH2, AZ1

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	0.43	0/2825	0.60	0/3802
1	B	0.44	0/2778	0.60	0/3736
All	All	0.43	0/5603	0.60	0/7538

There are no bond length outliers.

There are no bond angle outliers.

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	2767	0	2753	6	0
1	B	2729	0	2729	2	0
2	G	48	0	40	0	0
3	F	67	0	65	1	0
4	A	65	0	0	0	0
4	B	60	0	0	0	0
4	F	5	0	0	0	0
5	A	15	0	0	0	0
5	B	15	0	0	0	0
6	F	1	0	0	0	0
6	G	1	0	0	0	0

*Continued on next page...*

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	245	0	0	0	0
7	B	360	0	0	1	0
7	F	6	0	0	0	0
All	All	6384	0	5587	9	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 1.

All (9) 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:349[A]:GLU:OE1	1:A:349[A]:GLU:HA	1.89	0.72
1:A:103:LEU:HD22	1:A:185:PHE:HZ	1.68	0.58
1:B:308:ARG:NH1	7:B:501:HOH:O	2.34	0.47
1:A:249:LYS:HE3	1:A:254:LYS:HG3	1.96	0.47
1:B:23:LYS:HE2	1:B:27:LEU:HD11	1.99	0.44
1:A:45:ARG:HD3	1:A:335:ILE:HD12	2.00	0.43
1:A:103:LEU:HD22	1:A:185:PHE:CZ	2.51	0.42
3:F:3[A]:DAR:NH2	3:F:3[A]:DAR:HB2	2.35	0.41
1:A:92:LYS:HD2	1:A:350:PHE:CE2	2.56	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	A	328/351 (93%)	320 (98%)	8 (2%)	0	100	100
1	B	324/351 (92%)	318 (98%)	6 (2%)	0	100	100
All	All	652/702 (93%)	638 (98%)	14 (2%)	0	100	100

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	295/304 (97%)	292 (99%)	3 (1%)	78	72
1	B	290/304 (95%)	289 (100%)	1 (0%)	93	93
All	All	585/608 (96%)	581 (99%)	4 (1%)	85	81

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	GLU
1	A	40	LEU
1	A	191	VAL
1	B	135	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	84	GLN
1	A	87	HIS
1	A	142	HIS
1	B	142	HIS
1	B	242	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](#)

10 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	TPO	A	197	1	9,10,11	0.85	0	11,14,16	1.47	1 (9%)
1	SEP	A	338	1	9,9,10	0.63	0	9,12,14	1.85	1 (11%)
1	TPO	B	197	1	9,10,11	0.82	0	11,14,16	1.44	1 (9%)
1	SEP	B	338	1	9,9,10	0.60	0	9,12,14	1.51	1 (11%)
3	DAR	F	3[A]	-	10,10,11	0.47	0	7,11,13	0.81	0
3	DAR	F	3[B]	-	10,10,11	0.45	0	7,11,13	0.61	0
3	DAR	F	4	3	10,10,11	0.45	0	7,11,13	0.73	0
3	DAR	F	5	3,6	10,10,11	0.35	0	7,11,13	0.87	0
2	DAR	G	3	2	10,10,11	0.61	0	7,11,13	0.72	0
2	DAR	G	4	2,6	10,10,11	0.36	0	7,11,13	0.98	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	TPO	A	197	1	-	0/8/11/13	0/0/0/0
1	SEP	A	338	1	-	0/5/8/10	0/0/0/0
1	TPO	B	197	1	-	0/8/11/13	0/0/0/0
1	SEP	B	338	1	-	0/5/8/10	0/0/0/0
3	DAR	F	3[A]	-	-	0/7/9/11	0/0/0/0
3	DAR	F	3[B]	-	-	0/7/9/11	0/0/0/0
3	DAR	F	4	3	-	0/7/9/11	0/0/0/0
3	DAR	F	5	3,6	-	0/7/9/11	0/0/0/0
2	DAR	G	3	2	-	0/7/9/11	0/0/0/0
2	DAR	G	4	2,6	-	0/7/9/11	0/0/0/0

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	197	TPO	P-OG1-CB	-4.05	110.98	123.21
1	A	197	TPO	P-OG1-CB	-4.00	111.11	123.21
1	B	338	SEP	OG-CB-CA	2.81	110.93	108.17
1	A	338	SEP	OG-CB-CA	4.12	112.22	108.17

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	F	3[A]	DAR	1	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 30 ligands modelled in this entry, 2 are modelled with single atom - leaving 28 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	$\# Z  > 2$
4	PO4	A	401	-	4,4,4	0.80	0	6,6,6	0.43	0
4	PO4	A	402	-	4,4,4	0.72	0	6,6,6	0.47	0
4	PO4	A	403	-	4,4,4	0.83	0	6,6,6	0.37	0
4	PO4	A	404	-	4,4,4	0.76	0	6,6,6	0.42	0
4	PO4	A	405	-	4,4,4	0.75	0	6,6,6	0.38	0
4	PO4	A	406	-	4,4,4	0.76	0	6,6,6	0.45	0
4	PO4	A	407	-	4,4,4	0.73	0	6,6,6	0.40	0
4	PO4	A	408	-	4,4,4	0.74	0	6,6,6	0.37	0
4	PO4	A	409	-	4,4,4	0.75	0	6,6,6	0.39	0
4	PO4	A	410	-	4,4,4	0.78	0	6,6,6	0.39	0
4	PO4	A	411	-	4,4,4	0.74	0	6,6,6	0.45	0
4	PO4	A	412	-	4,4,4	0.74	0	6,6,6	0.40	0
4	PO4	A	413	-	4,4,4	0.77	0	6,6,6	0.33	0
5	6J9	A	414	-	14,17,17	1.22	2 (14%)	16,23,23	2.66	5 (31%)
4	PO4	B	401	-	4,4,4	0.79	0	6,6,6	0.55	0
4	PO4	B	402	-	4,4,4	0.83	0	6,6,6	0.39	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	PO4	B	403	-	4,4,4	0.81	0	6,6,6	0.41	0
4	PO4	B	404	-	4,4,4	0.83	0	6,6,6	0.37	0
4	PO4	B	405	-	4,4,4	0.76	0	6,6,6	0.42	0
4	PO4	B	406	-	4,4,4	0.80	0	6,6,6	0.45	0
4	PO4	B	407	-	4,4,4	0.74	0	6,6,6	0.43	0
4	PO4	B	408	-	4,4,4	0.74	0	6,6,6	0.35	0
4	PO4	B	409	-	4,4,4	0.75	0	6,6,6	0.34	0
4	PO4	B	410	-	4,4,4	0.77	0	6,6,6	0.40	0
4	PO4	B	411	-	4,4,4	0.66	0	6,6,6	0.40	0
4	PO4	B	412	-	4,4,4	0.76	0	6,6,6	0.34	0
5	6J9	B	413	-	14,17,17	1.19	2 (14%)	16,23,23	2.71	5 (31%)
4	PO4	F	102	-	4,4,4	0.82	0	6,6,6	0.60	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PO4	A	401	-	-	0/0/0/0	0/0/0/0
4	PO4	A	402	-	-	0/0/0/0	0/0/0/0
4	PO4	A	403	-	-	0/0/0/0	0/0/0/0
4	PO4	A	404	-	-	0/0/0/0	0/0/0/0
4	PO4	A	405	-	-	0/0/0/0	0/0/0/0
4	PO4	A	406	-	-	0/0/0/0	0/0/0/0
4	PO4	A	407	-	-	0/0/0/0	0/0/0/0
4	PO4	A	408	-	-	0/0/0/0	0/0/0/0
4	PO4	A	409	-	-	0/0/0/0	0/0/0/0
4	PO4	A	410	-	-	0/0/0/0	0/0/0/0
4	PO4	A	411	-	-	0/0/0/0	0/0/0/0
4	PO4	A	412	-	-	0/0/0/0	0/0/0/0
4	PO4	A	413	-	-	0/0/0/0	0/0/0/0
5	6J9	A	414	-	-	0/4/12/12	0/3/3/3
4	PO4	B	401	-	-	0/0/0/0	0/0/0/0
4	PO4	B	402	-	-	0/0/0/0	0/0/0/0
4	PO4	B	403	-	-	0/0/0/0	0/0/0/0
4	PO4	B	404	-	-	0/0/0/0	0/0/0/0
4	PO4	B	405	-	-	0/0/0/0	0/0/0/0
4	PO4	B	406	-	-	0/0/0/0	0/0/0/0
4	PO4	B	407	-	-	0/0/0/0	0/0/0/0
4	PO4	B	408	-	-	0/0/0/0	0/0/0/0
4	PO4	B	409	-	-	0/0/0/0	0/0/0/0

*Continued on next page...*

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PO4	B	410	-	-	0/0/0/0	0/0/0/0
4	PO4	B	411	-	-	0/0/0/0	0/0/0/0
4	PO4	B	412	-	-	0/0/0/0	0/0/0/0
5	6J9	B	413	-	-	0/4/12/12	0/3/3/3
4	PO4	F	102	-	-	0/0/0/0	0/0/0/0

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	413	6J9	C9-N4	2.04	1.35	1.32
5	A	414	6J9	C9-N4	2.05	1.35	1.32
5	B	413	6J9	C4-C5	2.69	1.49	1.43
5	A	414	6J9	C4-C5	2.83	1.50	1.43

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	414	6J9	N4-C9-N2	-7.16	122.73	128.86
5	B	413	6J9	N4-C9-N2	-7.12	122.77	128.86
5	A	414	6J9	C5-C4-N2	-2.07	117.56	122.66
5	B	413	6J9	C5-C4-N2	-2.02	117.69	122.66
5	A	414	6J9	C9-N4-C6	3.18	120.79	113.33
5	B	413	6J9	C9-N4-C6	3.18	120.80	113.33
5	A	414	6J9	C-N-C1	4.15	120.47	111.54
5	B	413	6J9	C9-N2-C4	4.45	122.61	111.81
5	A	414	6J9	C9-N2-C4	4.50	122.73	111.81
5	B	413	6J9	C-N-C1	4.97	122.24	111.54

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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 [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, 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	328/351 (93%)	0.34	19 (5%) 23 23	9, 18, 36, 68	0
1	B	325/351 (92%)	0.14	13 (4%) 38 36	9, 17, 31, 65	0
2	G	0/4	-	-	-	-
3	F	0/5	-	-	-	-
All	All	653/711 (91%)	0.24	32 (4%) 29 28	9, 18, 34, 68	0

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	333	GLU	6.6
1	A	331	GLU	6.4
1	A	330	TYR	6.2
1	A	329	ASP	6.2
1	A	253	GLY	5.9
1	A	327	PHE	5.4
1	A	334	GLU	5.3
1	A	34	ALA	5.1
1	A	35	GLN	5.0
1	B	320	GLY	4.9
1	A	336	ARG	3.8
1	B	331	GLU	3.7
1	B	333	GLU	3.6
1	A	36	ASN	3.5
1	B	318	PHE	3.4
1	B	193	GLY	3.3
1	B	253	GLY	3.1
1	A	193	GLY	3.1
1	B	334	GLU	2.9
1	A	328	ASP	2.8
1	A	191	VAL	2.6
1	A	335	ILE	2.6

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	A	37	THR	2.4
1	A	318	PHE	2.4
1	B	192	LYS	2.4
1	A	349[A]	GLU	2.4
1	B	239	PHE	2.4
1	B	336	ARG	2.3
1	B	191	VAL	2.3
1	B	332	GLU	2.2
1	A	326	ASN	2.0
1	B	317	LYS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
2	DAR	G	4	11/12	0.69	0.24	44,48,52,52	0
2	DAR	G	3	11/12	0.75	0.20	39,43,45,45	0
3	DAR	F	5	11/12	0.79	0.15	33,34,36,36	0
3	DAR	F	4	11/12	0.83	0.17	30,34,40,40	0
3	DAR	F	3[A]	11/12	0.84	0.28	26,28,28,28	8
3	DAR	F	3[B]	11/12	0.84	0.28	26,28,28,28	8
1	SEP	B	338	10/11	0.93	0.12	25,27,28,29	0
1	SEP	A	338	10/11	0.97	0.10	22,23,23,24	0
1	TPO	B	197	11/12	0.98	0.10	13,13,14,14	0
1	TPO	A	197	11/12	0.99	0.09	15,15,16,16	0

## 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( $\text{\AA}^2$ )	Q<0.9
5	6J9	B	413	15/15	0.59	0.29	59,61,61,62	0
4	PO4	A	412	5/5	0.62	0.42	81,82,83,83	0
4	PO4	A	408	5/5	0.65	0.39	57,57,57,58	0
4	PO4	A	413	5/5	0.67	0.40	56,57,58,59	0
5	6J9	A	414	15/15	0.71	0.27	54,56,57,57	0
4	PO4	A	404	5/5	0.73	0.30	75,75,76,76	0
4	PO4	A	405	5/5	0.76	0.30	75,76,76,77	0
4	PO4	A	411	5/5	0.77	0.33	66,67,67,68	0
4	PO4	B	409	5/5	0.78	0.27	55,55,56,56	0
4	PO4	B	410	5/5	0.78	0.23	56,56,58,58	0
4	PO4	B	411	5/5	0.82	0.29	71,71,71,71	0
4	PO4	A	410	5/5	0.84	0.19	51,52,52,52	0
4	PO4	A	407	5/5	0.86	0.29	45,46,47,47	0
4	PO4	A	406	5/5	0.87	0.27	46,48,49,49	0
4	PO4	A	409	5/5	0.88	0.25	56,56,56,57	0
6	NH2	F	101	1/1	0.89	0.14	34,34,34,34	0
4	PO4	B	406	5/5	0.89	0.16	38,38,39,39	0
4	PO4	B	408	5/5	0.89	0.23	45,47,47,48	0
4	PO4	B	412	5/5	0.90	0.22	71,71,71,71	0
6	NH2	G	101	1/1	0.91	0.16	46,46,46,46	0
4	PO4	B	405	5/5	0.91	0.21	43,43,44,45	0
4	PO4	B	407	5/5	0.94	0.22	59,60,60,60	0
4	PO4	A	401	5/5	0.94	0.11	38,39,40,41	0
4	PO4	B	402	5/5	0.96	0.10	36,37,38,38	0
4	PO4	B	403	5/5	0.96	0.10	30,30,31,31	0
4	PO4	F	102	5/5	0.96	0.12	34,34,35,35	0
4	PO4	B	404	5/5	0.96	0.14	34,34,35,36	0
4	PO4	A	402	5/5	0.97	0.08	19,20,20,21	0
4	PO4	A	403	5/5	0.97	0.14	32,32,32,32	0
4	PO4	B	401	5/5	0.97	0.08	18,18,19,19	0

## 6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.