

# Full wwPDB X-ray Structure Validation Report (i)

#### Apr 23, 2025 – 12:11 PM EDT

PDB ID : 9OB5 / pdb 00009ob5

Title : CDK2/CyclinE bound to compound 20 with P-loop in the EE and CC con-

formations

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Deposited on : 2025-04-22

Resolution : 2.10 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.orgA user guide is available at

https://www.wwpdb.org/validation/2017/XrayValidationReportHelp with specific help available everywhere you see the (i) 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 (1)) were used in the production of this report:

MolProbity : 4.02b-467

Mogul : 2022.3.0, CSD as543be (2022)

Xtriage (Phenix) : 2.0rc1

EDS : 3.0

buster-report : 1.1.7 (2018)

Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)

CCP4 : 9.0.006 (Gargrove)

Density-Fitness : 1.0.12

Ideal geometry (proteins) : Engh & Huber (2001) Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

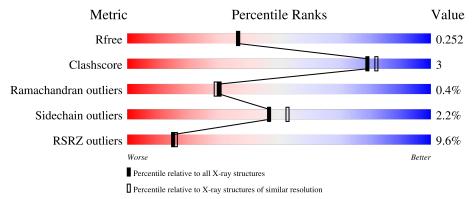
Validation Pipeline (wwPDB-VP) : 2.42

## 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 2.10 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 $(\# \mathrm{Entries})$	$\begin{array}{c} {\rm Similar\ resolution} \\ (\#{\rm Entries,\ resolution\ range(\mathring{A})}) \end{array}$
$R_{free}$	164625	6234 (2.10-2.10)
Clashscore	180529	6893 (2.10-2.10)
Ramachandran outliers	177936	6839 (2.10-2.10)
Sidechain outliers	177891	6840 (2.10-2.10)
RSRZ outliers	164620	6234 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain	
1	A	301	91%	8% ••
2	В	285	13%	11% •



# 2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 4757 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 Cyclin-dependent kinase 2.

$\mathbf{N}$	<b>Iol</b>	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace			
	1	A	298	Total 2448	C 1588	N 415	O 436	P 1	S 8	0	7	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	expression tag	UNP P24941
A	-1	HIS	-	expression tag	UNP P24941
A	0	MET	-	expression tag	UNP P24941

• Molecule 2 is a protein called G1/S-specific cyclin-E1.

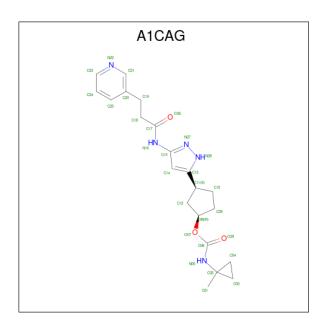
S 17	0	0	0
	S 17	$\begin{bmatrix} S \\ 17 \end{bmatrix} = 0$	$\begin{bmatrix} S \\ 17 \end{bmatrix} = 0 = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
В	94	GLY	-	expression tag	UNP P24864
В	95	SER	-	expression tag	UNP P24864

• Molecule 3 is (1R,3R)-3- $\{3-[3-(pyridin-3-yl)propanamido]$ -1H-pyrazol-5-yl $\}$ cyclopentyl (1-m ethylcyclopropyl)carbamate (CCD ID: A1CAG) (formula:  $C_{21}H_{27}N_5O_3$ ) (labeled as "Ligand of Interest" by depositor).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	Λ	1	Total	С	N	О	0	0
3	A	1	29	21	5	3	U	0

#### • Molecule 4 is water.

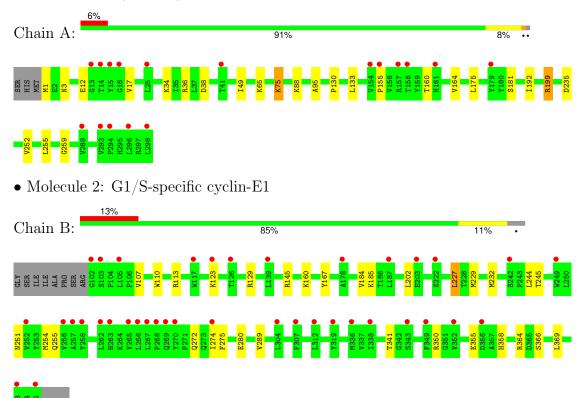
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	34	Total O 34 34	0	0
4	В	3	Total O 3 3	0	0



# 3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Cyclin-dependent kinase 2





# 4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants	101.57Å 101.57Å 151.48Å	Depositor
a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.00° 90.00° 90.00°	Depositor
Resolution (Å)	84.36 - 2.10	Depositor
resolution (A)	84.36 - 2.10	EDS
% Data completeness	99.4 (84.36-2.10)	Depositor
(in resolution range)	99.4 (84.36-2.10)	EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$< I/\sigma(I) > 1$	1.33 (at 2.10Å)	Xtriage
Refinement program	PHENIX 1.21.2_5419	Depositor
P.P.	0.233 , $0.255$	Depositor
$R, R_{free}$	0.236 , $0.252$	DCC
$R_{free}$ test set	44935 reflections $(4.29%)$	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	59.4	Xtriage
Anisotropy	0.263	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$ , $B_{sol}(Å^2)$	0.29 , 41.0	EDS
L-test for twinning <sup>2</sup>	$ < L > = 0.47, < L^2> = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	4757	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	85.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 3.45% of the height of the origin peak. No significant pseudotranslation is detected.

<sup>&</sup>lt;sup>2</sup>Theoretical values of <|L|>,  $<L^2>$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



<sup>&</sup>lt;sup>1</sup>Intensities estimated from amplitudes.

## 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: A1CAG, TPO

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
MIOI	Chain	RMSZ	# Z  > 5	RMSZ	# Z  > 5
1	A	0.24	0/2499	0.45	0/3390
2	В	0.23	0/2299	0.41	0/3120
All	All	0.24	0/4798	0.43	0/6510

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	2448	0	2488	10	0
2	В	2243	0	2245	17	0
3	A	29	0	0	0	0
4	A	34	0	0	0	0
4	В	3	0	0	1	0
All	All	4757	0	4733	25	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 3.

All (25) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.



A 4 1	A 4 0	Interatomic	Clash
Atom-1	Atom-2	${ m distance} \; ({ m \AA})$	overlap (Å)
2:B:145:ARG:HD3	2:B:289:VAL:HG22	1.82	0.60
1:A:255:LEU:HG	1:A:259:GLY:HA3	1.85	0.58
2:B:272:GLN:HB3	2:B:358:HIS:HB3	1.87	0.56
1:A:12[A]:GLU:HG3	1:A:17[A]:VAL:HG22	1.88	0.56
2:B:280:GLU:OE2	2:B:364:ARG:NH2	2.41	0.54
1:A:133:LEU:HD11	1:A:192:ILE:HD13	1.91	0.52
1:A:155:PRO:HD3	2:B:255:GLN:HB2	1.92	0.52
1:A:175:LEU:HA	1:A:235:ASP:HB2	1.91	0.51
2:B:366:SER:HA	2:B:369:LEU:HD23	1.91	0.51
2:B:160:LYS:NZ	2:B:350:ARG:O	2.41	0.50
2:B:341:THR:HG21	2:B:364:ARG:HH12	1.75	0.50
2:B:107:VAL:HA	2:B:113:ARG:HD2	1.94	0.48
1:A:38:ASP:N	1:A:38:ASP:OD1	2.48	0.47
1:A:88:LYS:HB2	1:A:130:PRO:HB2	1.97	0.46
1:A:34:LYS:HE3	1:A:75:LYS:HG2	1.99	0.45
2:B:167:TYR:HB3	2:B:245:THR:HB	1.99	0.44
2:B:229:MET:HA	2:B:232:MET:HE2	2.00	0.44
2:B:355:GLU:H	2:B:355:GLU:HG2	1.59	0.44
2:B:254:MET:HG3	2:B:275:PHE:HD1	1.84	0.43
1:A:49:ILE:HG22	2:B:202:LEU:HD21	2.00	0.42
1:A:95:ALA:HA	1:A:199:ARG:HG2	2.02	0.42
2:B:123:LYS:HD2	2:B:244:LEU:HG	2.02	0.41
2:B:184:VAL:HG22	2:B:185:LYS:H	1.85	0.41
2:B:110:TRP:O	4:B:401:HOH:O	2.22	0.41
2:B:227:LEU:HD12	2:B:227:LEU:HA	1.91	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	302/301 (100%)	292 (97%)	8 (3%)	2 (1%)	19 16	

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
2	В	$272/285 \; (95\%)$	266 (98%)	6 (2%)	0	100	100
All	All	574/586 (98%)	558 (97%)	14 (2%)	2 (0%)	30	37

#### All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	164	VAL
1	A	181	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	266/265 (100%)	259 (97%)	7 (3%)	41 46		
2	В	$247/255 \ (97\%)$	243 (98%)	4 (2%)	58 65		
All	All	513/520 (99%)	502 (98%)	11 (2%)	47 55		

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

Mol	Chain	Res	Type
1	A	1	MET
1	A	3	ASN
1	A	36	ARG
1	A	65	LYS
1	A	75	LYS
1	A	199	ARG
1	A	252	VAL
2	В	129	ARG
2	В	227	LEU
2	В	251	ASN
2	В	274	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:



Mol	Chain	Res	Type		
1	A	5	GLN		
1	A	85	GLN		
1	A	265	GLN		
2	В	136	GLN		
2	В	251	ASN		
2	В	320	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)

1 non-standard protein/DNA/RNA residue 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		
MIOI					Counts	RMSZ	# Z >2	Counts	RMSZ	# Z  > 2
1	TPO	A	160	1	8,10,11	2.56	1 (12%)	10,14,16	1.33	1 (10%)

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
1	TPO	A	160	1	-	0/9/11/13	-

#### All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$\operatorname{Observed}(\textup{\AA})$	$\operatorname{Ideal}(\text{\AA})$
1	A	160	TPO	P-OG1	7.07	1.71	1.59

#### All (1) bond angle outliers are listed below:



$\mathbf{Mol}$	Chain	Res	Type	Atoms	$\mathbf{Z}$	$Observed(^o)$	$Ideal(^{o})$
1	A	160	TPO	OG1-P-O1P	-2.54	100.28	109.33

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates (i)

There are no oligosaccharides 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		
MIOI					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	A1CAG	A	301	-	30,32,32	2.87	10 (33%)	36,45,45	2.75	15 (41%)

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	$\operatorname{Res}$	Link	Chirals	Torsions	Rings
3	A1CAG	A	301	-	-	3/21/35/35	0/4/4/4

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(A)	$\operatorname{Ideal}(\text{\AA})$
3	A	301	A1CAG	O07-C06	6.47	1.46	1.35
3	A	301	A1CAG	C18-C17	6.23	1.63	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(A)	$Ideal(\AA)$
3	A	301	A1CAG	C06-N05	5.98	1.45	1.35
3	A	301	A1CAG	C17-N16	5.74	1.47	1.35
3	A	301	A1CAG	C12-C08	4.15	1.61	1.52
3	A	301	A1CAG	C15-N16	3.88	1.49	1.40
3	A	301	A1CAG	C04-C02	3.49	1.55	1.49
3	A	301	A1CAG	C13-N28	3.35	1.38	1.34
3	A	301	A1CAG	C13-C11	2.36	1.56	1.50
3	A	301	A1CAG	C03-C02	2.03	1.53	1.49

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	$\mathbf{Observed}(^o)$	$Ideal(^{o})$
3	A	301	A1CAG	O07-C06-N05	8.51	119.53	109.50
3	A	301	A1CAG	C14-C13-N28	-5.16	103.37	110.28
3	A	301	A1CAG	O07-C06-O29	-5.13	117.00	124.55
3	A	301	A1CAG	C13-C14-C15	4.97	110.38	105.91
3	A	301	A1CAG	C18-C17-N16	4.56	122.53	114.59
3	A	301	A1CAG	C14-C15-N27	-3.48	105.48	110.47
3	A	301	A1CAG	C09-C10-C11	3.28	109.27	103.39
3	A	301	A1CAG	C11-C12-C08	3.14	110.34	103.01
3	A	301	A1CAG	C11-C13-N28	2.86	124.45	120.23
3	A	301	A1CAG	O07-C08-C12	2.62	115.23	108.55
3	A	301	A1CAG	C25-C20-C21	-2.40	113.58	117.10
3	A	301	A1CAG	O26-C17-C18	-2.32	117.82	122.02
3	A	301	A1CAG	O26-C17-N16	-2.22	119.66	123.64
3	A	301	A1CAG	C04-C02-C03	-2.08	57.99	59.88
3	A	301	A1CAG	C10-C11-C13	2.06	118.03	114.29

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	301	A1CAG	C17-C18-C19-C20
3	A	301	A1CAG	C18-C19-C20-C25
3	A	301	A1CAG	C18-C19-C20-C21

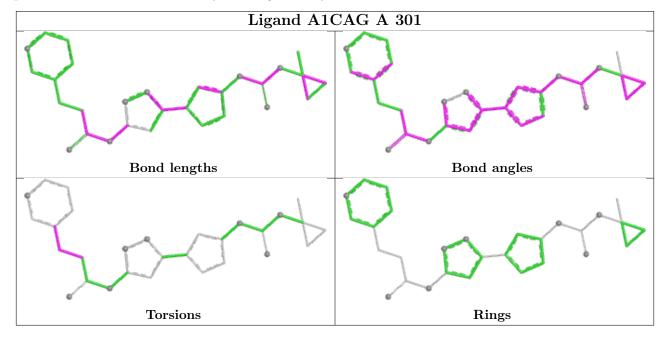
There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will



also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers (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,  $95^{th}$  percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	$\langle { m RSRZ} \rangle$	$\# \mathrm{RSRZ}{>}2$	$OWAB(Å^2)$	Q < 0.9
1	A	297/301 (98%)	0.49	17 (5%) 30 33	36, 69, 121, 168	7 (2%)
2	В	$274/285 \ (96\%)$	1.03	38 (13%) 7 8	64, 94, 134, 199	0
All	All	571/586 (97%)	0.75	55 (9%) 15 16	36, 81, 131, 199	7 (1%)

All (55) RSRZ outliers are listed below:

Mol	Iol Chain F		Type	RSRZ
1	A	14[A]	THR	14.3
1	A	15[A]	TYR	13.4
1	A	154	VAL	5.5
2	В	102	GLY	4.7
2	В	343	SER	4.1
2	В	262	LEU	3.7
2	В	267	LEU	3.7
1	A	16[A]	GLY	3.5
1	A	155	PRO	3.4
2	В	139	LEU	3.2
1	A	13[A]	GLY	3.2
2	В	103	SER	3.1
2	В	117	TRP	3.1
2	В	126	THR	3.0
2	В	265	VAL	3.0
1	A	41	THR	2.9
2	В	123	LYS	2.9
2	В	375	ALA	2.9
2	В	270	TYR	2.9
1	A	289	VAL	2.9
1	A	161	HIS	2.9
2	В	249	TRP	2.8
1	A	296	LEU	2.8
2	В	266	LEU	2.8

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1         A         298         LEU         2.8           2         B         373         ALA         2.7           2         B         222         SER         2.7           2         B         304         LEU         2.6           1         A         293         VAL         2.6           2         B         105         LEU         2.6           1         A         158         THR         2.6           2         B         178         ALA         2.6           2         B         336         MET         2.6           2         B         336         MET         2.6           2         B         336         MET         2.6           2         B         257         ALA         2.5           2         B         349         PHE         2.5           2         B         349         PHE         2.5           2         B         338         ILE         2.5           2         B         319         TYR         2.5           2         B         356         ASP         2.5	Mol	Mol Chain		Type	RSRZ
2       B       222       SER       2.7         2       B       304       LEU       2.6         1       A       293       VAL       2.6         2       B       105       LEU       2.6         1       A       158       THR       2.6         2       B       178       ALA       2.6         2       B       336       MET       2.6         2       B       336       MET       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       2	1	A	298	LEU	2.8
2       B       304       LEU       2.6         1       A       293       VAL       2.6         2       B       105       LEU       2.6         1       A       158       THR       2.6         2       B       178       ALA       2.6         2       B       336       MET       2.6         2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       2	2	В	373	ALA	2.7
1       A       293       VAL       2.6         2       B       105       LEU       2.6         1       A       158       THR       2.6         2       B       178       ALA       2.6         2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       2	2	В	222	SER	2.7
2       B       105       LEU       2.6         1       A       158       THR       2.6         2       B       178       ALA       2.6         2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       2	2	В	304	LEU	2.6
1       A       158       THR       2.6         2       B       178       ALA       2.6         2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         2       B       258       TYR       2.4         2       B       256       VAL       2.3         1       A       2	1	A	293	VAL	2.6
2       B       178       ALA       2.6         2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         2       B       349       PHE       2.5         2       B       338       ILE       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       258       TYR       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       35	2	В	105	LEU	2.6
2       B       336       MET       2.6         1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         1       A       294       PRO       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       319       TYR       2.5         2       B       356       ASP       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       35	1	A	158	THR	2.6
1       A       157       ARG       2.6         2       B       257       ALA       2.5         2       B       349       PHE       2.5         1       A       294       PRO       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       374       ILE       2.5         2       B       274       ILE       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       258       TYR       2.4         2       B       203       GLU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       352       VAL       2.2         2       B       24	2	В	178	ALA	2.6
2       B       257       ALA       2.5         2       B       349       PHE       2.5         1       A       294       PRO       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       26	2	В	336	MET	2.6
2       B       349       PHE       2.5         1       A       294       PRO       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       258       TYR       2.4         2       B       203       GLU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       31	1	A	157	ARG	2.6
1       A       294       PRO       2.5         2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       31	2	В	257	ALA	2.5
2       B       338       ILE       2.5         2       B       319       TYR       2.5         2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	2	В	349	PHE	2.5
2       B       319       TYR       2.5         2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       352       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	1	A	294	PRO	2.5
2       B       274       ILE       2.5         2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	2	В	338	ILE	2.5
2       B       356       ASP       2.5         2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	2	В	319	TYR	2.5
2       B       268       PRO       2.4         1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1		В	274	ILE	2.5
1       A       179       TYR       2.4         2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1		В	356	ASP	2.5
2       B       258       TYR       2.4         2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	2	В	268	PRO	2.4
2       B       187       LEU       2.4         2       B       203       GLU       2.4         2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1	1	A	179	TYR	2.4
2     B     203     GLU     2.4       2     B     256     VAL     2.3       1     A     25     LEU     2.3       2     B     307     PHE     2.3       2     B     252     VAL     2.2       2     B     352     VAL     2.2       2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1	2	В	258	TYR	2.4
2       B       256       VAL       2.3         1       A       25       LEU       2.3         2       B       307       PHE       2.3         2       B       252       VAL       2.2         2       B       352       VAL       2.2         2       B       242       SER       2.2         2       B       269       GLN       2.2         2       B       312       LEU       2.1		В	187	LEU	2.4
1     A     25     LEU     2.3       2     B     307     PHE     2.3       2     B     252     VAL     2.2       2     B     352     VAL     2.2       2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1	2	В	203	GLU	2.4
2     B     307     PHE     2.3       2     B     252     VAL     2.2       2     B     352     VAL     2.2       2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1		В	256	VAL	
2     B     252     VAL     2.2       2     B     352     VAL     2.2       2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1		A	25		
2     B     352     VAL     2.2       2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1		В	307		2.3
2     B     242     SER     2.2       2     B     269     GLN     2.2       2     B     312     LEU     2.1			252	VAL	
2 B 269 GLN 2.2 2 B 312 LEU 2.1		В	352	VAL	2.2
2 B 312 LEU 2.1		В	242		
		В			
2 B 263 HIS 2.0		В	312		2.1
	2	В	263	HIS	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,  $95^{th}$  percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q<0.9
1	TPO	A	160	11/12	0.93	0.14	68,74,79,80	0



#### 6.3 Carbohydrates (i)

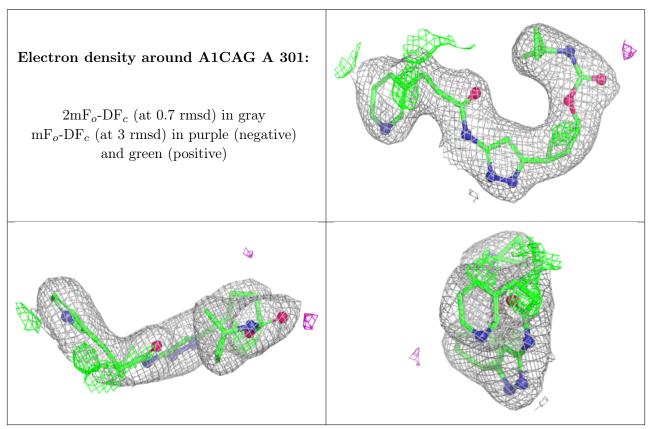
There are no monosaccharides in this entry.

## 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,  $95^{th}$  percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q<0.9
3	A1CAG	A	301	29/29	0.93	0.11	53,61,75,79	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.

