

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

Nov 3, 2025 - 07:55 pm GMT

PDB ID : 9RK8 / pdb 00009rk8

Title : Crystal Structure of compound 3-mediated ternary complex of KRAS G12V

C118S GDP with pVHL:ElonginC:ElonginB

Authors : Zollman, D.; Karolak, N.K.; Ciulli, A.

Deposited on : 2025-06-13

Resolution : 2.63 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org
A user guide is available at

https://www.wwpdb.org/validation/2017/XrayValidationReportHelp with specific help available everywhere you see the (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 : 4-5-2 with Phenix2.0

Mogul : 1.8.4, CSD as 541 be (2020)

Xtriage (Phenix) : 2.0

EDS : 3.0

buster-report : 1.1.7 (2018)

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

CCP4 : 9.0.010 (Gargrove)

Density-Fitness : 1.0.12

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

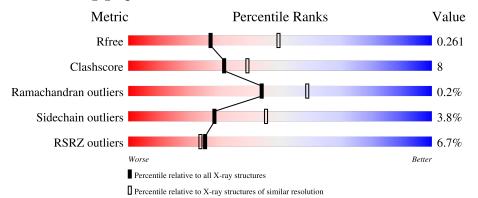
Validation Pipeline (wwPDB-VP) : 2.46

## 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 2.63 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 $(\# \mathrm{Entries})$	$\begin{array}{c} {\rm Similar\ resolution} \\ (\#{\rm Entries},{\rm resolution\ range}({\rm \AA})) \end{array}$
$R_{free}$	164625	1851 (2.66-2.62)
Clashscore	180529	1953 (2.66-2.62)
Ramachandran outliers	177936	1929 (2.66-2.62)
Sidechain outliers	177891	1929 (2.66-2.62)
RSRZ outliers	164620	1850 (2.66-2.62)

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	Δ	104	5%								
1	A	104	69%	26% • •							
1	Е	104	68%	23% • 7%							
2	В	97	70%	18% 12%							
2	F	97	75%	11% • 12%							
3	С	162	77%	12% • 9%							



Mol	Chain	Length	Quality of chain		
3	G	162	72%	20%	8%
4	D	170	15% 75%	22%	
4	Н	170	78%	19%	



# 2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 7992 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 Elongin-B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	100	Total 765			O 149	S 5	0	0	0
1	E	97	Total 722	C 465	N 123	O 130	S 4	0	0	0

• Molecule 2 is a protein called Elongin-C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	В	85	Total			0	S	0	0	0
			662	430	105	121	6			
2	E	F 85	Total	С	N	O	$\mathbf{S}$	0	0	0
2	Г		681	440	109	126	6	0	U	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
В	16	MET	-	initiating methionine	UNP Q15369
F	16	MET	-	initiating methionine	UNP Q15369

• Molecule 3 is a protein called von Hippel-Lindau disease tumor suppressor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	С	147	Total	С	N	О	S	0	1	0
9		147	1174	748	213	211	2	0	1	0
2	С	149	Total	С	N	О	S	0	1	0
)	G	149	1214	773	223	216	2		1	

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference	
С	52	GLY	-	expression tag	UNP P40337	
С	53	SER	-	expression tag	UNP P40337	



Chain	$oxed{ ext{ain}} oxed{ ext{Residue}} oxed{ ext{Modelle}}$		Actual	Comment	Reference	
G	52	GLY	-	expression tag	UNP P40337	
G	53	SER	-	expression tag	UNP P40337	

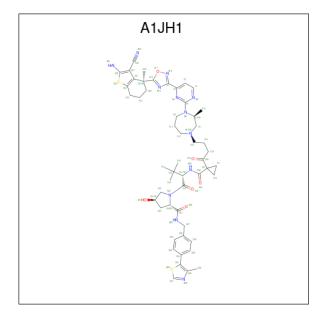
• Molecule 4 is a protein called GTPase KRas.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	D	168	Total	С	N	О	S	0	0	0
4	D	100	1256	787	212	251	6	0		
4	П	167	Total	С	N	О	S	0	0	0
$\mid 4 \mid H$	11	107	1312	822	225	260	5	0	0	

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	0	GLY	-	expression tag	UNP P01116
D	12	VAL	GLY	engineered mutation	UNP P01116
D	118	SER	CYS	engineered mutation	UNP P01116
Н	0	GLY	-	expression tag	UNP P01116
Н	12	VAL	GLY	engineered mutation	UNP P01116
Н	118	SER	CYS	engineered mutation	UNP P01116

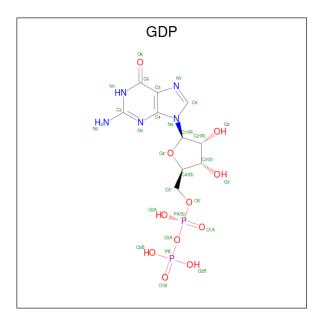
• Molecule 5 is (2 {S},4 {R})-1-[(2 {S})-2-[[1-[4-[(3 {S})-4-[4-[5-[(4 {S})-2-azanyl-3-cyano-4-methyl-6,7-dihydro-5 {H}}-1-benzothiophen-4-yl]-1,2,4-oxadiazol-3-yl]pyrimidin-2-yl]-3-methyl-1,4-diazepan-1-yl]butanoyl]cyclopropyl]carbonylamino]-3,3-dimethyl-butanoyl]- {N}-[[4-(4-methyl-1,3-thiazol-5-yl)phenyl]methyl]-4-oxidanyl-pyrrolidine-2-carboxamide (CCD ID: A1JH1) (formula:  $C_{52}H_{64}N_{12}O_6S_2$ ).





	Mol	Chain	Residues	${f Atoms}$					ZeroOcc	AltConf	
	r.	С	1	Total	С	N	О	S	0	0	
	9		1	72	52	12	6	2	U	U	
ĺ	F.	G	1	Total	С	N	О	S	0	0	
	5	G		72	52	12	6	2	U		

 $\bullet \ \ \mathrm{Molecule} \ 6 \ \mathrm{is} \ \mathrm{GUANOSINE-5'-DIPHOSPHATE} \ (\mathrm{CCD} \ \mathrm{ID} \colon \mathrm{GDP}) \ (\mathrm{formula:} \ \ \mathrm{C}_{10}\mathrm{H}_{15}\mathrm{N}_5\mathrm{O}_{11}\mathrm{P}_2).$ 



Mol	Chain	Residues		Ato	oms			ZeroOcc	AltConf
6	D	1	Total	С	N	О	Р	0	0
0	ע	1	28	10	5	11	2	0	0
6	Н	1	Total	С	N	О	Р	0	0
0	П	1	28	10	5	11	2	U	0

 $\bullet$  Molecule 7 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

$\mathbf{Mol}$	Chain	Residues	Atoms	ZeroOcc	AltConf
7	D	1	Total Mg 1 1	0	0
7	Н	1	Total Mg 1 1	0	0

• Molecule 8 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	Е	1	Total O 1 1	0	0

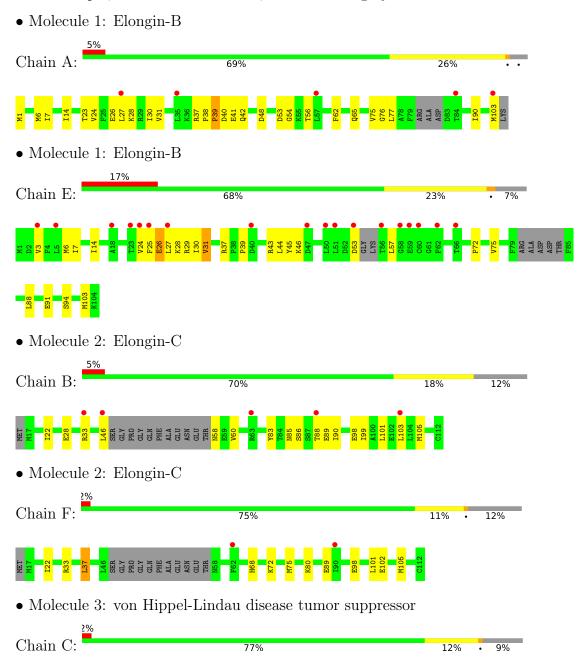


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	G	1	Total O 1 1	0	0
8	Н	2	Total O 2 2	0	0

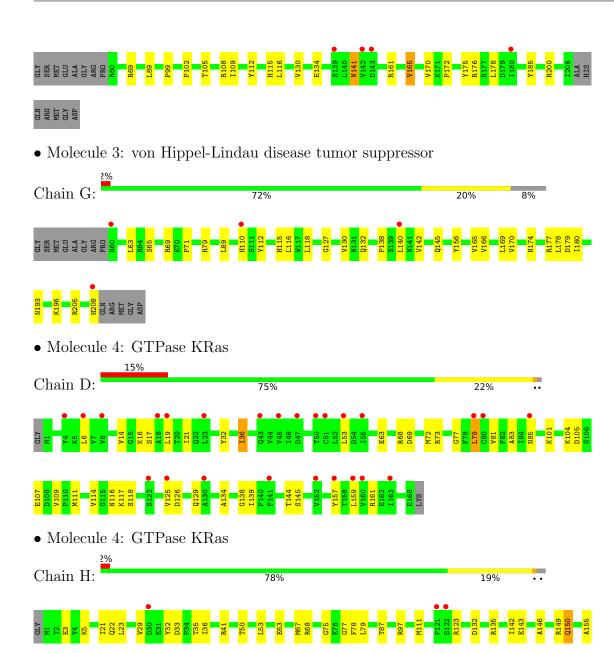


## 3 Residue-property plots (i)

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.











# 4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants	96.19Å 109.43Å 251.97Å	Depositor
a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.18 - 2.63	Depositor
rtesolution (A)	50.18 - 2.63	EDS
% Data completeness	72.6 (50.18-2.63)	Depositor
(in resolution range)	72.8 (50.18-2.63)	EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$< I/\sigma(I) > 1$	1.08 (at 2.62Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
D D.	0.232 , 0.263	Depositor
$R, R_{free}$	0.232 , $0.261$	DCC
$R_{free}$ test set	1411 reflections $(3.52\%)$	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	58.0	Xtriage
Anisotropy	0.020	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$ , $B_{sol}(Å^2)$	0.29, 33.9	EDS
L-test for twinning <sup>2</sup>	$ < L >=0.50, < L^2>=0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	7992	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 3.78% 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: MG, A1JH1, GDP

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
IVIOI	Chain	RMSZ	# Z  > 5	RMSZ	# Z  > 5
1	A	0.18	0/780	0.41	0/1058
1	Е	0.17	0/736	0.46	0/998
2	В	0.15	0/676	0.39	0/915
2	F	0.15	0/695	0.35	0/937
3	С	0.16	0/1209	0.38	0/1657
3	G	0.24	0/1250	0.48	0/1708
4	D	0.20	0/1276	0.41	0/1734
4	Н	0.19	0/1333	0.41	0/1805
All	All	0.19	0/7955	0.42	0/10812

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	765	0	740	18	0
1	Е	722	0	698	20	0
2	В	662	0	650	10	0
2	F	681	0	683	9	0
3	C	1174	0	1141	14	0



Continued	trom	mmoninonic	maaa
COHABABACA		DIEUIUU	DUIUE
0 0 1000100000			

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	1214	0	1205	20	1
4	D	1256	0	1149	25	0
4	Н	1312	0	1270	20	0
5	С	72	0	0	2	0
5	G	72	0	0	0	0
6	D	28	0	12	1	0
6	Н	28	0	12	1	1
7	D	1	0	0	0	0
7	Н	1	0	0	0	0
8	Ε	1	0	0	0	0
8	G	1	0	0	0	0
8	Н	2	0	0	0	0
All	All	7992	0	7560	125	1

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 8.

The worst 5 of 125 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	$\begin{array}{c} {\rm Interatomic} \\ {\rm distance} \ ({\rm \AA}) \end{array}$	$\begin{array}{c} \text{Clash} \\ \text{overlap } (\text{\AA}) \end{array}$
3:C:108:ARG:HD3	3:G:132:GLN:HE22	1.42	0.83
3:G:65:SER:HB2	3:G:115:HIS:HA	1.61	0.82
1:A:7:ILE:HG22	1:A:75:VAL:HB	1.64	0.78
3:G:193:ASN:HB3	3:G:196:LYS:HG2	1.66	0.76
3:G:71:PRO:HB3	3:G:110[B]:HIS:HE1	1.51	0.76

All (1) 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	$\begin{array}{c} {\rm Interatomic} \\ {\rm distance} \ ({\rm \AA}) \end{array}$	Clash overlap (Å)
3:G:69:ARG:NH2	6:H:301:GDP:O2A[3_654]	1.30	0.90

## 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	Perce	entiles
1	A	96/104 (92%)	89 (93%)	5 (5%)	2 (2%)	5	7
1	E	91/104 (88%)	88 (97%)	3 (3%)	0	100	100
2	В	81/97 (84%)	78 (96%)	3 (4%)	0	100	100
2	F	81/97 (84%)	78 (96%)	3 (4%)	0	100	100
3	C	146/162 (90%)	142 (97%)	4 (3%)	0	100	100
3	G	148/162 (91%)	144 (97%)	4 (3%)	0	100	100
4	D	166/170~(98%)	161 (97%)	5 (3%)	0	100	100
4	Н	165/170 (97%)	162 (98%)	3 (2%)	0	100	100
All	All	974/1066 (91%)	942 (97%)	30 (3%)	2 (0%)	44	59

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

Mol	Chain	Res	Type
1	A	54	GLY
1	A	39	PRO

#### 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	83/92 (90%)	82 (99%)	1 (1%)	67 82
1	E	73/92 (79%)	68 (93%)	5 (7%)	13 21
2	В	72/86 (84%)	70 (97%)	2 (3%)	38 58
2	F	77/86 (90%)	72 (94%)	5 (6%)	14 22
3	С	130/148 (88%)	126 (97%)	4 (3%)	35 54
3	G	137/148 (93%)	132 (96%)	5 (4%)	30 47
4	D	125/150 (83%)	119 (95%)	6 (5%)	21 35
4	Н	$142/150 \ (95\%)$	138 (97%)	4 (3%)	38 58



Mol	Chain	Analysed	Analysed Rotameric Out		Percentiles
All	All	839/952 (88%)	807 (96%)	32 (4%)	28 45

5 of 32 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	Н	3	GLU
4	Н	50	THR
4	D	125	VAL
4	D	85	ASN
4	Н	87	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
3	С	141	ASN
3	G	203	GLN
4	Н	150	GLN

#### 5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

#### 5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

#### 5.6 Ligand geometry (i)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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).

Mal	Mol Type Chain Res	Chain Bog	Dec	Res Link	Bond lengths			Bond angles		
IVIOI		nes	Lilik	Counts	RMSZ	$\mid \# Z  > 2$	Counts	RMSZ	# Z  > 2	
5	A1JH1	С	301	-	66,80,80	0.89	2 (3%)	73,120,120	0.78	3 (4%)
5	A1JH1	G	301	-	66,80,80	0.87	2 (3%)	73,120,120	0.88	3 (4%)
6	GDP	D	301	7	24,30,30	0.97	1 (4%)	30,47,47	1.23	4 (13%)
6	GDP	Н	301	7	24,30,30	0.91	1 (4%)	30,47,47	1.19	4 (13%)

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
5	A1JH1	С	301	-	-	1/52/108/108	0/9/9/9
5	A1JH1	G	301	-	-	8/52/108/108	0/9/9/9
6	GDP	D	301	7	-	3/12/32/32	0/3/3/3
6	GDP	Н	301	7	-	3/12/32/32	0/3/3/3

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	$\operatorname{Observed}(\text{\AA})$	Ideal(A)
5	G	301	A1JH1	C5-N9	5.67	1.46	1.36
5	С	301	A1JH1	C5-N9	5.61	1.46	1.36
5	С	301	A1JH1	C11-N12	3.39	1.50	1.46
5	G	301	A1JH1	C11-N12	3.10	1.49	1.46
6	Н	301	GDP	C6-N1	-2.39	1.34	1.37

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	$\operatorname{Observed}(^{o})$	$\operatorname{Ideal}({}^o)$
5	С	301	A1JH1	C24-C23-C22	-3.37	107.99	113.53
5	G	301	A1JH1	C24-C23-C22	-3.30	108.11	113.53
6	D	301	GDP	C3'-C2'-C1'	2.99	105.48	100.98
6	Н	301	GDP	PA-O3A-PB	-2.80	123.21	132.83
6	D	301	GDP	PA-O3A-PB	-2.78	123.30	132.83

There are no chirality outliers.

5 of 15 torsion outliers are listed below:



Mol	Chain	Res	Type	Atoms
5	G	301	A1JH1	C34-C33-N12-C11
5	G	301	A1JH1	O70-C36-C37-C71
5	G	301	A1JH1	C50-C49-C54-N55
5	G	301	A1JH1	C50-C49-C54-O56
6	D	301	GDP	C5'-O5'-PA-O2A

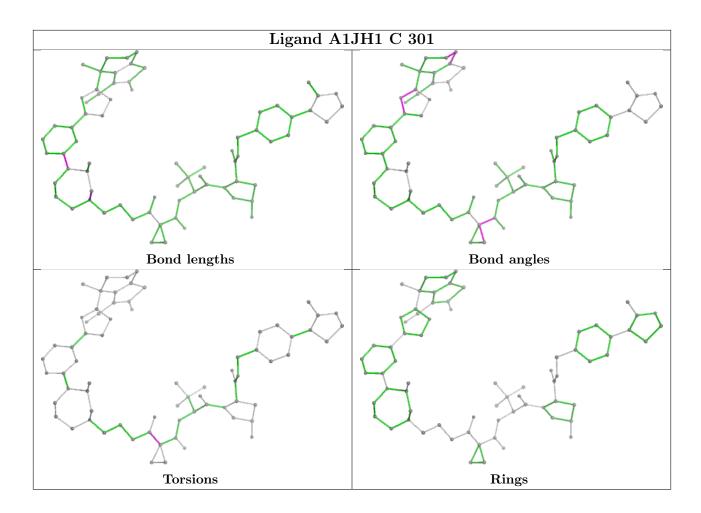
There are no ring outliers.

3 monomers are involved in 5 short contacts:

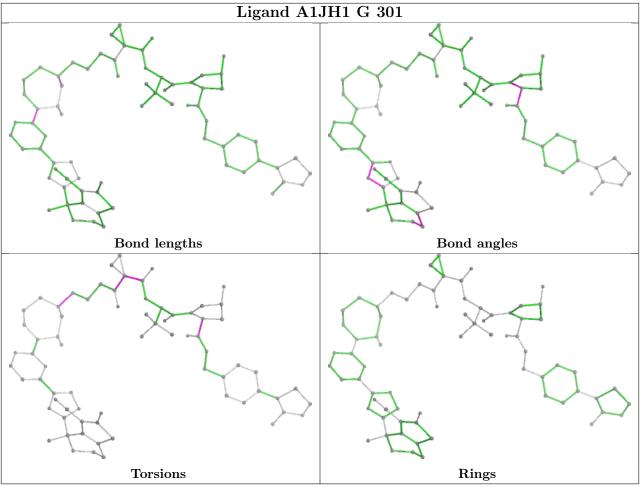
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	С	301	A1JH1	2	0
6	D	301	GDP	1	0
6	Н	301	GDP	1	1

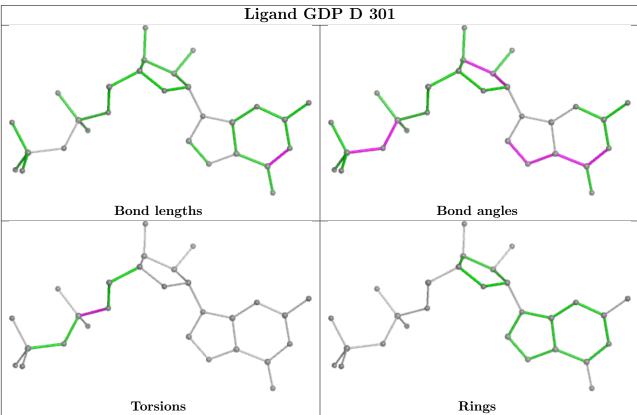
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



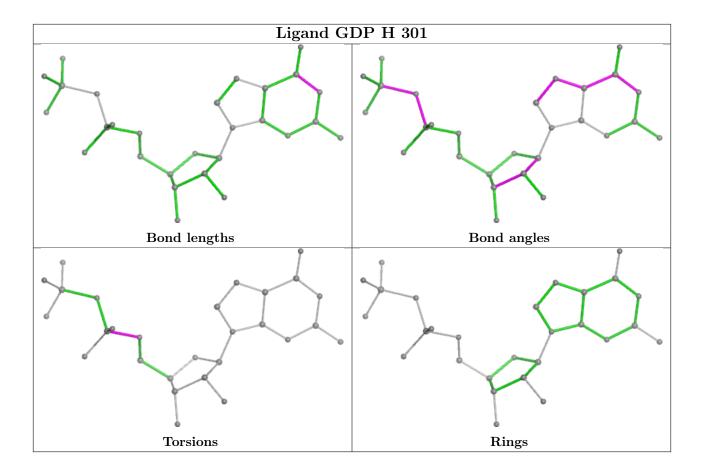












## 5.7 Other polymers (i)

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	<rsrz></rsrz>	$\# \mathrm{RSRZ}{>}2$	$\mathbf{OWAB}(\mathrm{\AA}^2)$	Q < 0.9
1	A	100/104~(96%)	0.57	5 (5%) 35 34	52, 75, 98, 108	0
1	E	97/104 (93%)	1.03	18 (18%) 4 4	53, 87, 109, 124	0
2	В	85/97 (87%)	0.50	5 (5%) 29 28	44, 70, 87, 96	0
2	F	85/97 (87%)	0.32	2 (2%) 59 58	44, 62, 76, 88	0
3	С	147/162 (90%)	0.24	4 (2%) 56 55	29, 52, 89, 110	1 (0%)
3	G	149/162 (91%)	0.14	4 (2%) 56 55	26, 46, 73, 101	1 (0%)
4	D	168/170 (98%)	1.04	25 (14%) 7 7	47, 86, 117, 135	0
4	Н	167/170 (98%)	0.43	4 (2%) 59 58	39, 59, 81, 100	0
All	All	998/1066 (93%)	0.53	67 (6%) 25 24	26, 66, 102, 135	2 (0%)

The worst 5 of 67 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	D	122	SER	4.4
1	A	35	LEU	4.1
4	Н	122	SER	3.9
4	D	6	LEU	3.7
1	Е	24	VAL	3.4

#### 6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

#### 6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

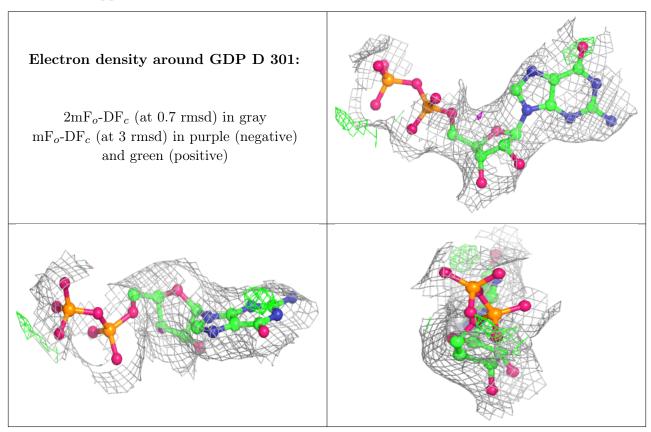


### 6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median,  $95^{th}$  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
7	MG	D	302	1/1	0.79	0.20	79,79,79,79	0
6	GDP	D	301	28/28	0.83	0.12	78,103,111,112	0
6	GDP	Н	301	28/28	0.92	0.10	37,52,61,69	0
5	A1JH1	С	301	72/72	0.93	0.11	39,49,61,64	0
7	MG	Н	302	1/1	0.93	0.19	45,45,45,45	0
5	A1JH1	G	301	72/72	0.94	0.10	30,41,47,56	0

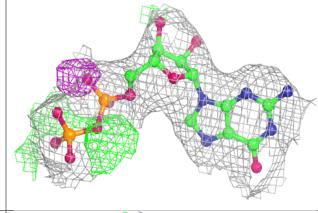
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

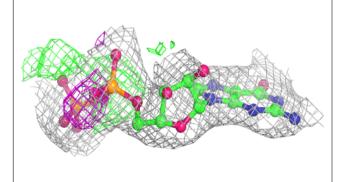


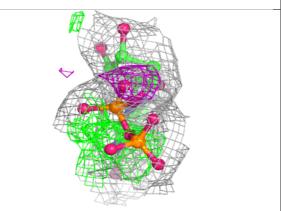


# Electron density around GDP H 301:

 $2 {\rm mF}_o\text{-}{\rm DF}_c$  (at 0.7 rmsd) in gray  ${\rm mF}_o\text{-}{\rm DF}_c$  (at 3 rmsd) in purple (negative) and green (positive)

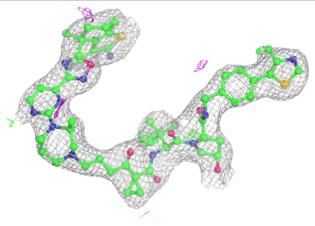


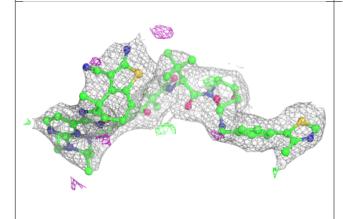


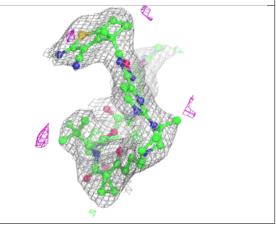


#### Electron density around A1JH1 C 301:

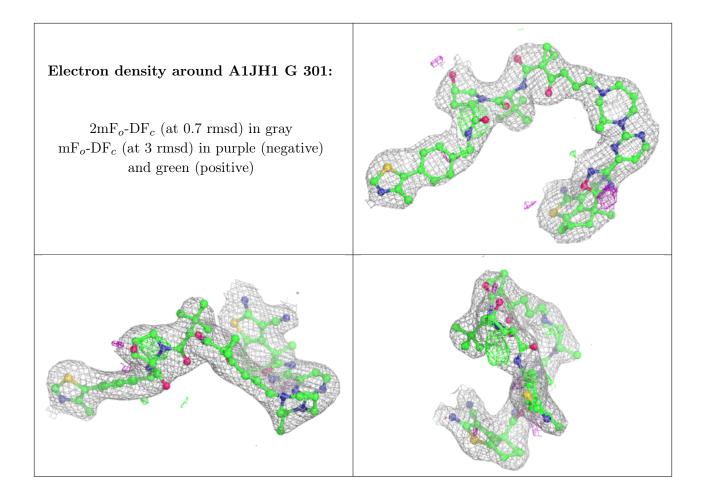
 $2 {
m mF}_o {
m -DF}_c$  (at 0.7 rmsd) in gray  ${
m mF}_o {
m -DF}_c$  (at 3 rmsd) in purple (negative) and green (positive)











## 6.5 Other polymers (i)

There are no such residues in this entry.

