



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 8, 2022 – 01:50 PM JST

PDB ID : 7VYJ  
Title : The structure of GdmN in complex with carbamoyl adenylate intermediate  
Authors : Wei, J.; Zheng, J.; Zhou, J.; Kang, Q.; Bai, L.  
Deposited on : 2021-11-14  
Resolution : 1.98 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.31.2  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

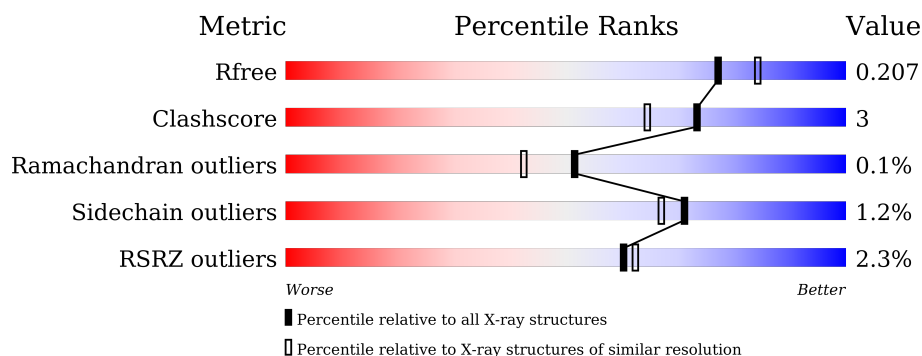
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.98 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	11647 (2.00-1.96)
Clashscore	141614	1014 (1.98-1.98)
Ramachandran outliers	138981	1006 (1.98-1.98)
Sidechain outliers	138945	1006 (1.98-1.98)
RSRZ outliers	127900	11410 (2.00-1.96)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	682	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green, grey);"></div> <div style="display: flex; justify-content: space-between; margin-top: 2px;"> <span>%</span> <span>91%</span> <span>8%</span> </div> </div>
1	B	682	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red, orange, yellow, green, grey);"></div> <div style="display: flex; justify-content: space-between; margin-top: 2px;"> <span>3%</span> <span>92%</span> <span>7%</span> </div> </div>

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 11289 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.

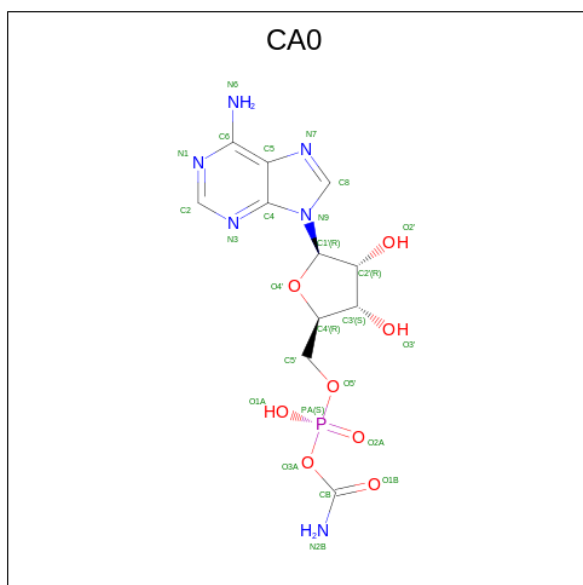
- Molecule 1 is a protein called GdmN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	675	Total	C	N	O	S	0	4	0
			5227	3313	920	985	9			
1	B	679	Total	C	N	O	S	0	1	0
			5233	3314	919	991	9			

- Molecule 2 is FE (III) ION (three-letter code: FE) (formula: Fe).

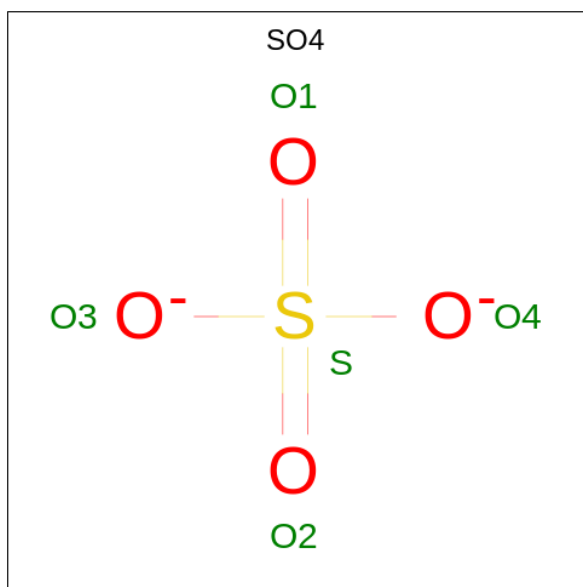
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Fe	0	0
			1	1		
2	B	1	Total	Fe	0	0
			1	1		

- Molecule 3 is 5'-O-[(S)-(carbamoyloxy)(hydroxy)phosphoryl]adenosine (three-letter code: CA0) (formula: C<sub>11</sub>H<sub>15</sub>N<sub>6</sub>O<sub>8</sub>P) (labeled as "Ligand of Interest" by depositor).



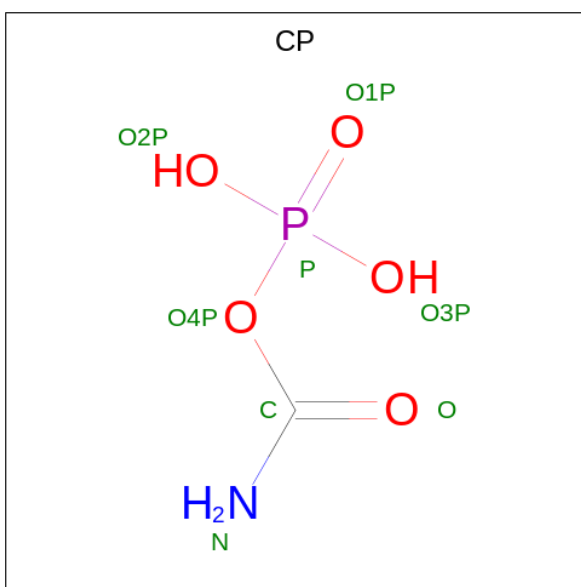
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	1	0
			26	11	6	8	1		
3	B	1	Total	C	N	O	P	0	0
			26	11	6	8	1		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



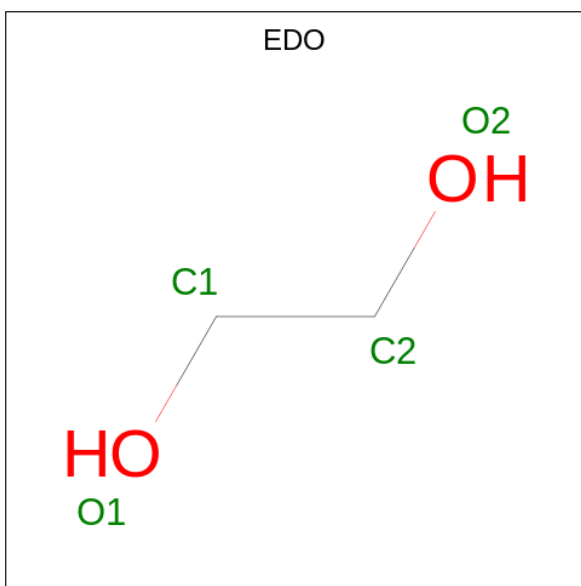
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	S	0	0
			5	4	1		
4	A	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		
4	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 5 is PHOSPHORIC ACID MONO(FORMAMIDE)ESTER (three-letter code: CP) (formula: CH<sub>4</sub>NO<sub>5</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	N	O	P	0	0
			8	1	1	5	1		

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula:  $C_2H_6O_2$ ).



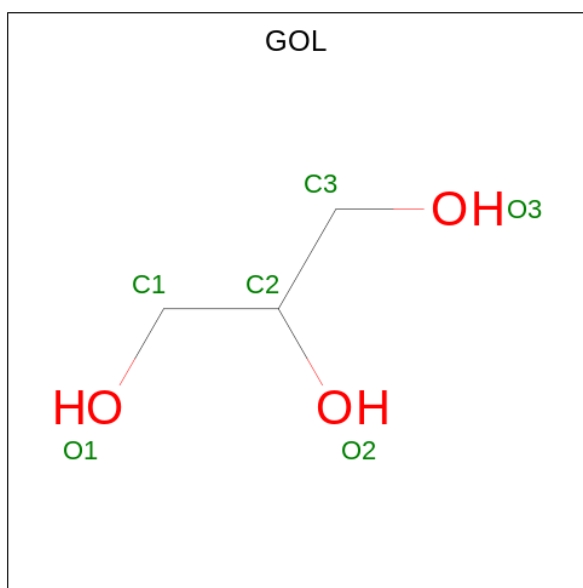
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		

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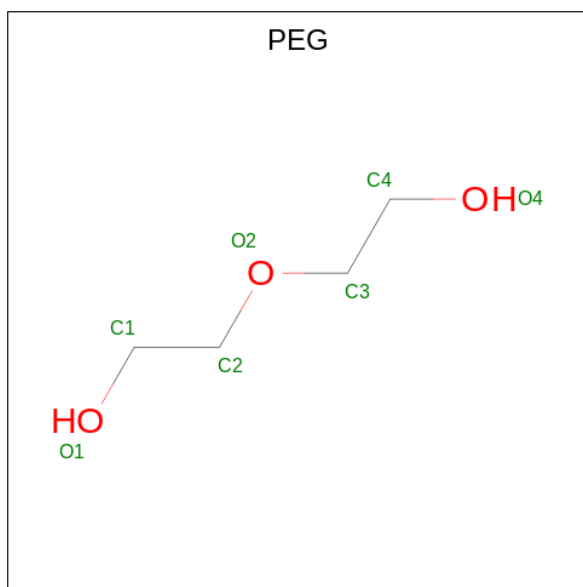
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		

- Molecule 7 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O	0	0
			6	3	3		
7	A	1	Total	C	O	0	0
			6	3	3		

- Molecule 8 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	B	1	Total	C	O	0	0
			7	4	3		

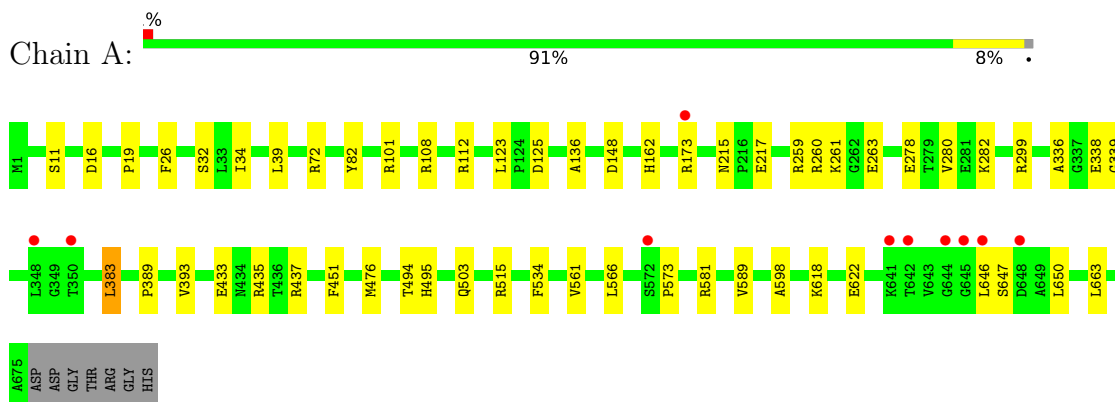
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	378	Total	O	0	0
			378	378		
9	B	285	Total	O	0	0
			285	285		

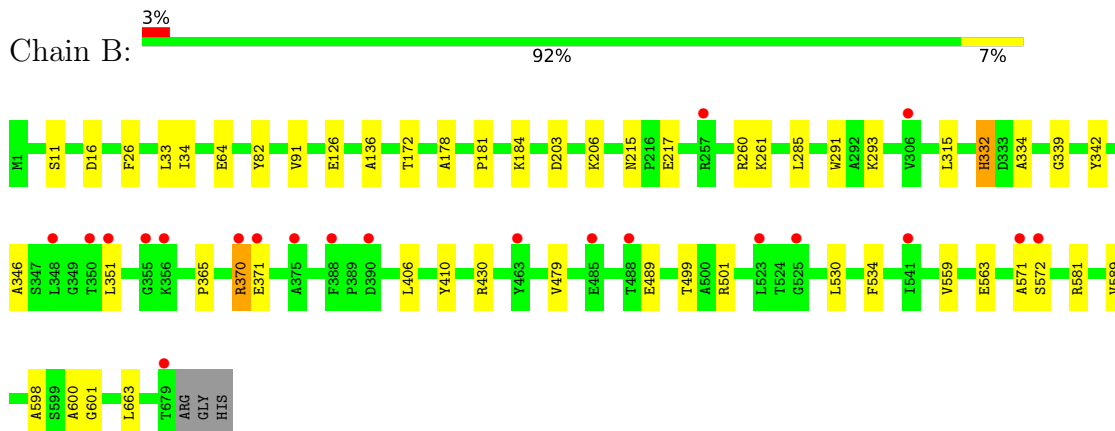
### 3 Residue-property plots

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

#### • Molecule 1: GdmN



#### • Molecule 1: GdmN



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	110.53Å 110.53Å 231.46Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	36.88 – 1.98 36.88 – 1.98	Depositor EDS
% Data completeness (in resolution range)	97.9 (36.88-1.98) 97.9 (36.88-1.98)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.26 (at 1.98Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, $R_{free}$	0.177 , 0.207 0.177 , 0.207	Depositor DCC
$R_{free}$ test set	5629 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	25.6	Xtriage
Anisotropy	0.101	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 48.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.017 for -h,-k,l	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	11289	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.04% 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: FE, CA0, PEG, CP, EDO, GOL, SO4

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	0.46	0/5351	0.65	1/7277 (0.0%)
1	B	0.38	0/5354	0.63	1/7282 (0.0%)
All	All	0.43	0/10705	0.64	2/14559 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	383	LEU	CA-CB-CG	5.46	127.87	115.30
1	B	530	LEU	CA-CB-CG	5.43	127.80	115.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5227	0	5141	40	0
1	B	5233	0	5134	32	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	26	0	14	0	0
3	B	26	0	14	0	0
4	A	10	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	15	0	0	0	0
5	A	8	0	2	0	0
6	A	40	0	60	7	0
6	B	20	0	30	4	0
7	A	12	0	16	1	0
8	B	7	0	10	1	0
9	A	378	0	0	1	0
9	B	285	0	0	1	0
All	All	11289	0	10421	70	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 (70) 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:B:370:ARG:HH11	1:B:371:GLU:HG2	1.56	0.70
1:B:600:ALA:O	6:B:710:EDO:H11	1.93	0.68
1:A:260:ARG:HB2	1:A:263:GLU:HG3	1.76	0.67
1:A:589:VAL:HG23	1:B:589:VAL:HG13	1.76	0.67
1:A:389:PRO:HD3	1:A:566:LEU:HD12	1.78	0.66
1:A:393:VAL:HG11	1:A:515:ARG:HG2	1.76	0.66
1:A:11:SER:HB3	1:A:16:ASP:HA	1.84	0.60
1:A:261:LYS:HA	1:A:261:LYS:HE3	1.83	0.60
1:B:11:SER:HB3	1:B:16:ASP:HA	1.84	0.59
1:A:108:ARG:HD3	1:A:125:ASP:OD1	2.05	0.57
1:B:406:LEU:HG	1:B:559:VAL:HG13	1.86	0.56
1:A:260:ARG:N	1:A:260:ARG:HD2	2.21	0.56
1:B:601:GLY:HA2	6:B:710:EDO:H11	1.88	0.55
1:B:215:ASN:OD1	1:B:217:GLU:HG3	2.07	0.55
1:B:332:HIS:CE1	1:B:334:ALA:HB3	2.43	0.54
1:B:370:ARG:NH1	1:B:371:GLU:HG2	2.22	0.54
6:A:711:EDO:H22	1:B:260:ARG:HB3	1.89	0.53
1:A:112:ARG:NE	1:A:123:LEU:O	2.41	0.53
1:A:101:ARG:HA	6:A:711:EDO:H21	1.91	0.53
1:B:285:LEU:HD11	1:B:315:LEU:HG	1.91	0.53
1:A:476:MET:HG3	1:A:503:GLN:HB2	1.92	0.52
1:A:19:PRO:HA	6:A:713:EDO:H21	1.91	0.52
1:A:259:ARG:HH22	1:A:261:LYS:NZ	2.09	0.51
1:B:260:ARG:N	1:B:260:ARG:HD2	2.25	0.51
1:A:215:ASN:OD1	1:A:217:GLU:HG3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:26:PHE:H	7:A:716:GOL:H32	1.75	0.51
1:B:571:ALA:O	1:B:572:SER:OG	2.26	0.50
1:B:479:VAL:HG22	1:B:501:ARG:HG2	1.94	0.50
1:B:136:ALA:O	1:B:339:GLY:HA3	2.12	0.50
1:B:203:ASP:OD1	1:B:206:LYS:HE3	2.11	0.49
1:A:136:ALA:O	1:A:339:GLY:HA3	2.13	0.49
1:B:601:GLY:HA2	6:B:710:EDO:C1	2.44	0.48
1:A:19:PRO:HA	6:A:713:EDO:C2	2.43	0.48
1:A:162:HIS:HE2	6:A:709:EDO:H21	1.78	0.48
1:A:581:ARG:HB3	1:B:598:ALA:HB1	1.95	0.48
1:A:72:ARG:HH22	6:A:706:EDO:H11	1.77	0.48
1:A:647:SER:HB3	1:A:650:LEU:HB2	1.96	0.47
1:B:172:THR:HB	1:B:351:LEU:HD23	1.96	0.47
1:B:178:ALA:HB2	1:B:291:TRP:CZ2	2.49	0.47
1:A:435[A]:ARG:NH1	1:A:494:THR:O	2.48	0.46
1:A:433:GLU:H	1:A:433:GLU:CD	2.20	0.45
1:A:435[B]:ARG:HG3	1:A:451:PHE:HD1	1.80	0.45
1:B:479:VAL:HG13	1:B:499:THR:HB	1.99	0.45
1:A:383:LEU:HD13	1:A:573:PRO:HB2	1.99	0.45
1:B:26:PHE:HE2	1:B:91:VAL:HG11	1.82	0.45
1:B:410:TYR:CE1	1:B:563:GLU:HA	2.52	0.45
1:A:561:VAL:HG22	1:A:566:LEU:HD23	1.99	0.44
1:A:622:GLU:H	1:A:622:GLU:CD	2.21	0.44
1:B:181:PRO:HD2	1:B:184:LYS:HD2	1.99	0.44
1:A:259:ARG:HH22	1:A:261:LYS:HZ2	1.66	0.44
1:B:26:PHE:CZ	8:B:711:PEG:H11	2.53	0.44
1:A:148:ASP:OD2	1:A:299:ARG:NH1	2.43	0.43
1:A:16:ASP:HB2	6:A:713:EDO:H22	1.98	0.43
1:A:261:LYS:HA	1:A:261:LYS:CE	2.44	0.43
1:A:259:ARG:C	1:A:260:ARG:HD2	2.39	0.43
6:B:709:EDO:H21	9:B:1074:HOH:O	2.18	0.43
1:B:346:ALA:HB2	1:B:351:LEU:HB2	1.99	0.43
1:B:34[A]:ILE:HD12	1:B:342:TYR:CZ	2.54	0.42
1:B:430:ARG:HG2	1:B:489:GLU:O	2.19	0.42
1:A:437:ARG:HD3	9:A:1101:HOH:O	2.19	0.42
1:A:173:ARG:NH1	1:A:173:ARG:HG2	2.35	0.42
1:A:136:ALA:HB1	1:A:336:ALA:O	2.20	0.42
1:A:32[B]:SER:OG	1:A:338:GLU:HA	2.20	0.41
1:A:598:ALA:HB1	1:B:581:ARG:HB3	2.02	0.41
1:B:33:LEU:HD23	1:B:33:LEU:HA	1.95	0.41
1:A:34[A]:ILE:HD13	1:A:39:LEU:HA	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:64:GLU:HB3	1:B:365:PRO:HG3	2.03	0.40
1:A:278:GLU:HG2	1:A:282:LYS:HE2	2.04	0.40
1:A:173:ARG:HG2	1:A:173:ARG:HH11	1.86	0.40
1:B:126:GLU:H	1:B:126:GLU:CD	2.24	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	677/682 (99%)	661 (98%)	15 (2%)	1 (0%)	51	42
1	B	678/682 (99%)	660 (97%)	18 (3%)	0	100	100
All	All	1355/1364 (99%)	1321 (98%)	33 (2%)	1 (0%)	51	42

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	646	LEU

### 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	541/542 (100%)	534 (99%)	7 (1%)	69	64

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	541/542 (100%)	534 (99%)	7 (1%)	69	64
All	All	1082/1084 (100%)	1068 (99%)	14 (1%)	71	64

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	82	TYR
1	A	280[A]	VAL
1	A	280[B]	VAL
1	A	495	HIS
1	A	534	PHE
1	A	618	LYS
1	A	663	LEU
1	B	82	TYR
1	B	261	LYS
1	B	293	LYS
1	B	332	HIS
1	B	370	ARG
1	B	534	PHE
1	B	663	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 2 are monoatomic - leaving 26 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	$\# Z  > 2$
5	CP	A	705	-	6,7,7	3.77	2 (33%)	7,10,10	1.87	2 (28%)
7	GOL	A	717	-	5,5,5	0.78	0	5,5,5	1.38	1 (20%)
3	CA0	A	702	2	24,28,28	3.94	10 (41%)	26,42,42	1.57	5 (19%)
8	PEG	B	711	-	6,6,6	0.53	0	5,5,5	0.43	0
6	EDO	A	706	-	3,3,3	0.59	0	2,2,2	0.10	0
3	CA0	B	702	2	24,28,28	4.05	9 (37%)	26,42,42	1.59	6 (23%)
6	EDO	B	708	-	3,3,3	0.46	0	2,2,2	0.41	0
6	EDO	A	707	-	3,3,3	0.56	0	2,2,2	0.22	0
6	EDO	B	706	-	3,3,3	0.53	0	2,2,2	0.14	0
4	SO4	A	704	-	4,4,4	0.18	0	6,6,6	0.14	0
6	EDO	B	710	-	3,3,3	0.47	0	2,2,2	0.30	0
6	EDO	A	711	-	3,3,3	0.57	0	2,2,2	0.20	0
6	EDO	A	710	-	3,3,3	0.45	0	2,2,2	0.43	0
4	SO4	B	704	-	4,4,4	0.13	0	6,6,6	0.23	0
6	EDO	A	713	-	3,3,3	0.46	0	2,2,2	0.48	0
7	GOL	A	716	-	5,5,5	0.67	0	5,5,5	1.29	1 (20%)
6	EDO	A	714	-	3,3,3	0.49	0	2,2,2	0.35	0
6	EDO	A	709	-	3,3,3	0.46	0	2,2,2	0.34	0
6	EDO	A	708	-	3,3,3	0.60	0	2,2,2	0.14	0
4	SO4	B	705	-	4,4,4	0.13	0	6,6,6	0.21	0
6	EDO	B	707	-	3,3,3	0.45	0	2,2,2	0.38	0
4	SO4	A	703	-	4,4,4	0.20	0	6,6,6	0.29	0
6	EDO	A	715	-	3,3,3	0.53	0	2,2,2	0.25	0
6	EDO	B	709	-	3,3,3	0.60	0	2,2,2	0.10	0
4	SO4	B	703	-	4,4,4	0.14	0	6,6,6	0.22	0
6	EDO	A	712	-	3,3,3	0.60	0	2,2,2	0.16	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
5	CP	A	705	-	-	0/3/5/5	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	GOL	A	717	-	-	3/4/4/4	-
3	CA0	A	702	2	-	1/9/31/31	0/3/3/3
8	PEG	B	711	-	-	1/4/4/4	-
6	EDO	A	706	-	-	0/1/1/1	-
3	CA0	B	702	2	-	1/9/31/31	0/3/3/3
6	EDO	B	708	-	-	0/1/1/1	-
6	EDO	A	707	-	-	0/1/1/1	-
6	EDO	B	706	-	-	1/1/1/1	-
6	EDO	B	710	-	-	1/1/1/1	-
6	EDO	A	711	-	-	0/1/1/1	-
6	EDO	A	710	-	-	0/1/1/1	-
6	EDO	A	713	-	-	0/1/1/1	-
7	GOL	A	716	-	-	1/4/4/4	-
6	EDO	A	714	-	-	1/1/1/1	-
6	EDO	A	709	-	-	0/1/1/1	-
6	EDO	A	708	-	-	0/1/1/1	-
6	EDO	B	707	-	-	1/1/1/1	-
6	EDO	A	715	-	-	0/1/1/1	-
6	EDO	B	709	-	-	1/1/1/1	-
6	EDO	A	712	-	-	0/1/1/1	-

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	702	CA0	C2'-C1'	9.73	1.68	1.53
3	A	702	CA0	C2'-C1'	9.14	1.67	1.53
3	A	702	CA0	O4'-C1'	-9.02	1.28	1.41
3	B	702	CA0	C3'-C2'	-8.97	1.28	1.53
3	A	702	CA0	C3'-C2'	-8.94	1.28	1.53
3	B	702	CA0	O4'-C1'	-8.28	1.29	1.41
3	B	702	CA0	CB-N2B	7.50	1.47	1.33
5	A	705	CP	C-N	7.02	1.46	1.33
3	A	702	CA0	CB-N2B	6.85	1.46	1.33
5	A	705	CP	P-O4P	5.59	1.67	1.59
3	B	702	CA0	O4'-C4'	5.35	1.57	1.45
3	A	702	CA0	O4'-C4'	4.68	1.55	1.45
3	B	702	CA0	C5'-C4'	-4.19	1.38	1.51
3	A	702	CA0	C5'-C4'	-3.79	1.39	1.51
3	B	702	CA0	C6-N6	3.53	1.46	1.34
3	B	702	CA0	O3'-C3'	3.51	1.51	1.43
3	A	702	CA0	C6-N6	3.33	1.46	1.34
3	A	702	CA0	PA-O3A	2.99	1.66	1.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	702	CA0	O3'-C3'	2.95	1.49	1.43
3	B	702	CA0	PA-O3A	2.79	1.66	1.60
3	A	702	CA0	C3'-C4'	2.03	1.58	1.53

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	702	CA0	N3-C2-N1	-4.43	121.75	128.68
3	B	702	CA0	N3-C2-N1	-4.00	122.43	128.68
5	A	705	CP	O-C-N	-3.95	119.00	125.51
3	A	702	CA0	O1A-PA-O3A	3.67	116.13	104.14
3	B	702	CA0	C3'-C2'-C1'	3.14	105.71	100.98
3	A	702	CA0	O4'-C1'-C2'	-2.99	102.56	106.93
3	B	702	CA0	O1A-PA-O3A	2.71	112.98	104.14
3	B	702	CA0	O3A-PA-O5'	2.67	110.73	102.92
3	A	702	CA0	C3'-C2'-C1'	2.61	104.90	100.98
3	B	702	CA0	C4-C5-N7	-2.41	106.89	109.40
7	A	717	GOL	C3-C2-C1	-2.40	102.38	111.70
7	A	716	GOL	C3-C2-C1	-2.24	102.99	111.70
3	B	702	CA0	O1B-CB-N2B	-2.09	122.06	125.51
5	A	705	CP	O2P-P-O4P	2.03	111.43	105.25
3	A	702	CA0	C4-C5-N7	-2.02	107.30	109.40

There are no chirality outliers.

All (12) torsion outliers are listed below:

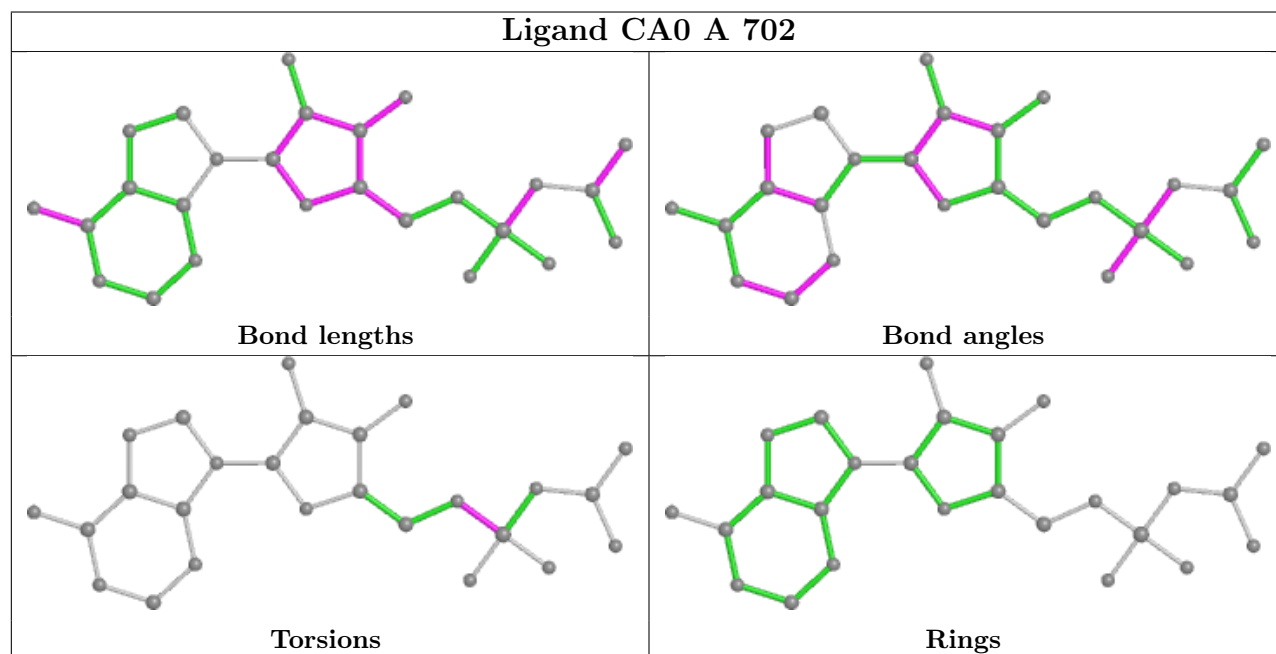
Mol	Chain	Res	Type	Atoms
3	B	702	CA0	C5'-O5'-PA-O2A
7	A	717	GOL	C1-C2-C3-O3
7	A	717	GOL	O2-C2-C3-O3
6	A	714	EDO	O1-C1-C2-O2
6	B	707	EDO	O1-C1-C2-O2
6	B	706	EDO	O1-C1-C2-O2
7	A	717	GOL	O1-C1-C2-C3
8	B	711	PEG	C1-C2-O2-C3
3	A	702	CA0	C5'-O5'-PA-O2A
6	B	709	EDO	O1-C1-C2-O2
7	A	716	GOL	C1-C2-C3-O3
6	B	710	EDO	O1-C1-C2-O2

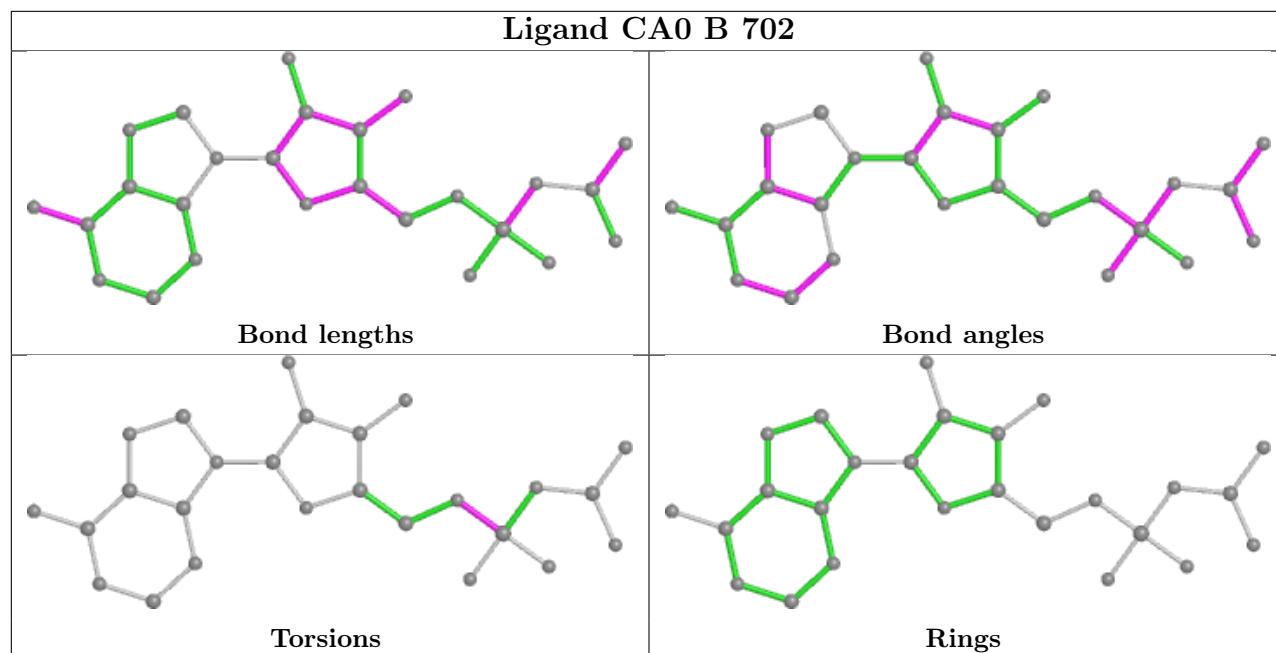
There are no ring outliers.

8 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	B	711	PEG	1	0
6	A	706	EDO	1	0
6	B	710	EDO	3	0
6	A	711	EDO	2	0
6	A	713	EDO	3	0
7	A	716	GOL	1	0
6	A	709	EDO	1	0
6	B	709	EDO	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	675/682 (98%)	-0.08	10 (1%) 73 75	13, 23, 38, 61	0
1	B	679/682 (99%)	0.12	21 (3%) 49 51	18, 29, 49, 64	0
All	All	1354/1364 (99%)	0.02	31 (2%) 60 62	13, 26, 46, 64	0

All (31) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	348	LEU	6.1
1	A	350	THR	4.5
1	A	644	GLY	4.4
1	B	571	ALA	4.3
1	B	355	GLY	4.0
1	B	350	THR	3.8
1	B	370	ARG	3.5
1	B	463	TYR	2.9
1	B	679	THR	2.9
1	A	348	LEU	2.8
1	B	523	LEU	2.8
1	A	641	LYS	2.8
1	B	525	GLY	2.7
1	A	648	ASP	2.7
1	A	173	ARG	2.7
1	A	646	LEU	2.6
1	B	388	PHE	2.5
1	B	485	GLU	2.5
1	B	541	ILE	2.5
1	B	356	LYS	2.4
1	A	572	SER	2.4
1	B	351	LEU	2.4
1	B	572	SER	2.4
1	B	371	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	645	GLY	2.3
1	B	488	THR	2.3
1	B	257	ARG	2.2
1	B	306	VAL	2.2
1	B	390	ASP	2.1
1	A	642	THR	2.1
1	B	375	ALA	2.1

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
6	EDO	A	711	4/4	0.80	0.42	42,43,44,45	0
6	EDO	A	706	4/4	0.82	0.16	42,44,45,47	0
7	GOL	A	716	6/6	0.82	0.18	32,33,38,45	0
6	EDO	A	707	4/4	0.84	0.29	47,48,48,51	0
6	EDO	B	709	4/4	0.85	0.23	42,43,43,44	0
6	EDO	A	715	4/4	0.85	0.14	37,39,42,43	0
8	PEG	B	711	7/7	0.85	0.18	35,36,40,43	0
6	EDO	B	706	4/4	0.87	0.30	37,38,39,39	0
6	EDO	A	714	4/4	0.88	0.18	38,39,39,42	0
6	EDO	A	708	4/4	0.88	0.17	31,32,39,40	0
6	EDO	A	709	4/4	0.91	0.28	38,40,44,48	0
6	EDO	B	707	4/4	0.91	0.13	41,46,48,57	0
6	EDO	B	708	4/4	0.91	0.10	38,39,41,50	0
6	EDO	B	710	4/4	0.92	0.30	29,33,37,39	0
6	EDO	A	712	4/4	0.92	0.28	34,34,40,49	0
6	EDO	A	713	4/4	0.92	0.25	35,36,36,42	0

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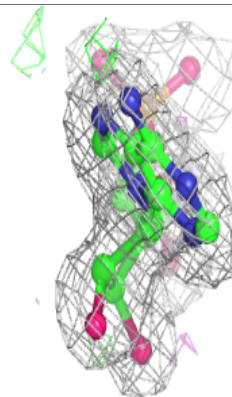
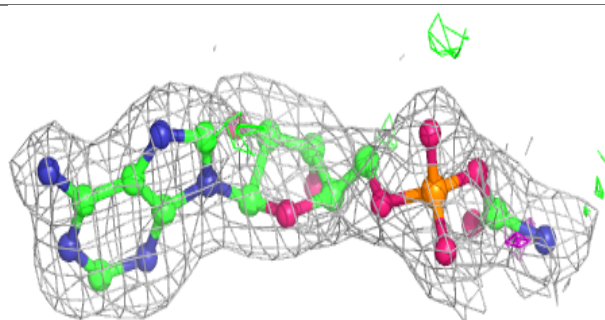
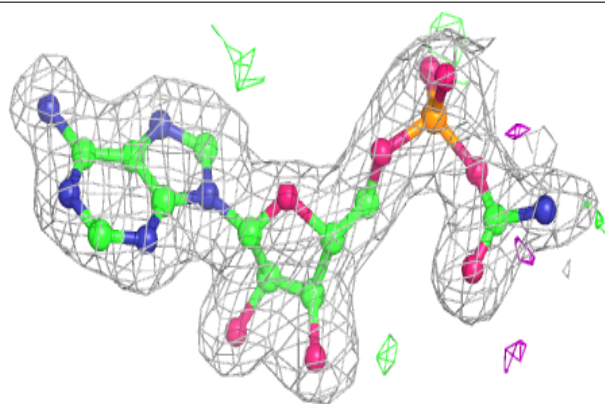
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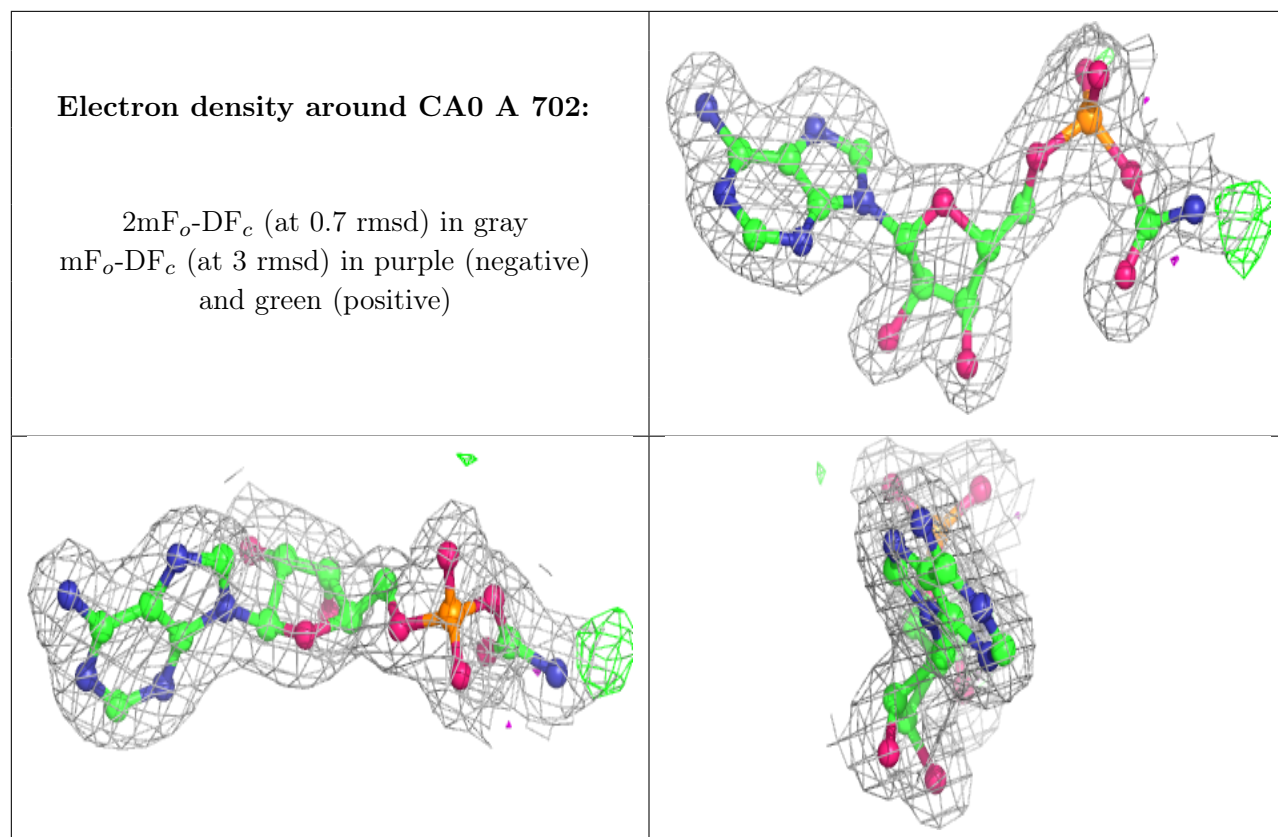
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
6	EDO	A	710	4/4	0.93	0.20	38,42,44,51	0
5	CP	A	705	8/8	0.94	0.23	28,45,49,57	0
7	GOL	A	717	6/6	0.95	0.13	18,30,36,39	0
4	SO4	B	703	5/5	0.95	0.13	40,46,54,54	0
3	CA0	B	702	26/26	0.96	0.11	24,29,33,35	0
4	SO4	A	704	5/5	0.96	0.27	42,42,52,61	0
4	SO4	B	704	5/5	0.97	0.10	48,50,56,57	0
3	CA0	A	702	26/26	0.97	0.10	18,21,26,27	1
4	SO4	B	705	5/5	0.98	0.21	40,41,43,46	0
2	FE	B	701	1/1	0.99	0.07	32,32,32,32	0
4	SO4	A	703	5/5	1.00	0.10	24,25,25,26	0
2	FE	A	701	1/1	1.00	0.05	27,27,27,27	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 CA0 B 702:

2mF<sub>o</sub>-DF<sub>c</sub> (at 0.7 rmsd) in gray  
mF<sub>o</sub>-DF<sub>c</sub> (at 3 rmsd) in purple (negative)  
and green (positive)





## 6.5 Other polymers [i](#)

There are no such residues in this entry.