



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 12:08 PM JST

PDB ID : 7VYP
Title : The structure of GdmN complex with the natural tetrahedral intermediate, carbamoylated derivative, and AMP
Authors : Wei, J.; Zheng, J.; Zhou, J.; Kang, Q.; Bai, L.
Deposited on : 2021-11-15
Resolution : 2.88 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

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>.

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 : 2.36
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) : 2.36

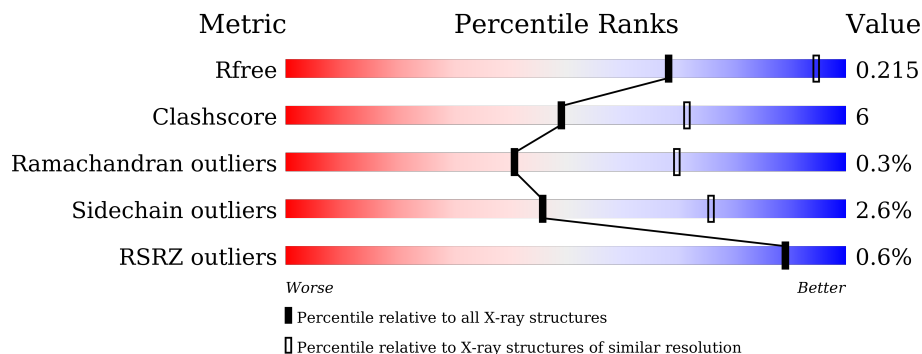
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.88 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	2691 (2.90-2.86)
Clashscore	141614	2947 (2.90-2.86)
Ramachandran outliers	138981	2868 (2.90-2.86)
Sidechain outliers	138945	2871 (2.90-2.86)
RSRZ outliers	127900	2629 (2.90-2.86)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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 $\leq 5\%$. 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	
1	B	682	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	EDO	A	711	-	-	-	X
5	EDO	B	706	-	-	X	-
5	EDO	B	707	-	-	-	X
5	EDO	B	708	-	-	-	X

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 10618 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.

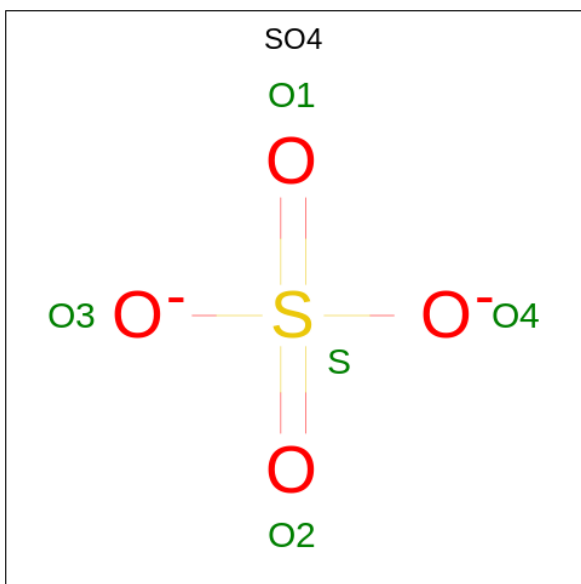
- Molecule 1 is a protein called GdmN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	674	Total 5197	C 3295	N 914	O 979	S 9	0	1	0
1	B	674	Total 5141	C 3263	N 895	O 974	S 9	0	1	0

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

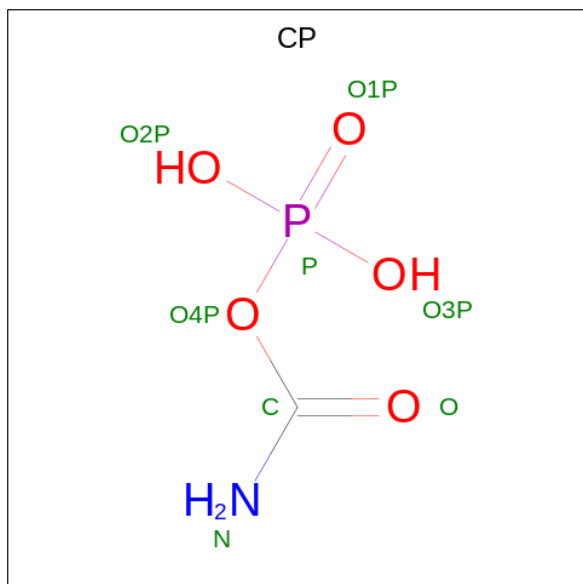
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Fe 1	0	0
2	B	1	Total 1	Fe 1	0	0

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 4 is PHOSPHORIC ACID MONO(FORMAMIDE)ESTER (three-letter code: CP) (formula: CH₄NO₅P).



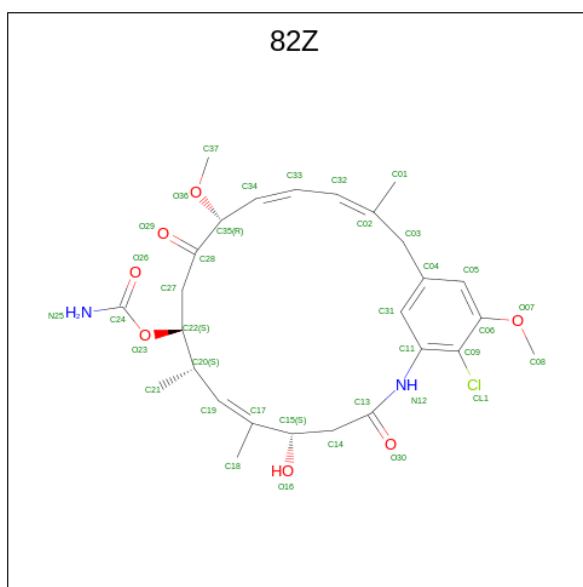
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	A	1	Total	C	N	O	P	0	0
			8	1	1	5	1		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



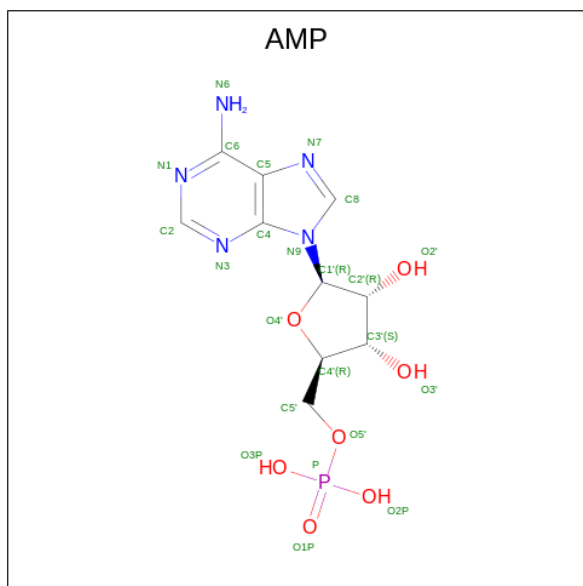
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	A	1	Total C O 4 2 2	0	0
5	B	1	Total C O 4 2 2	0	0
5	B	1	Total C O 4 2 2	0	0
5	B	1	Total C O 4 2 2	0	0
5	B	1	Total C O 4 2 2	0	0

- Molecule 6 is [(5S,6E,8S,9S,12R,13E,15E)-21-chloranyl-12,20-dimethoxy-6,8,16-trimethyl-5-oxidanyl-3,11-bis(oxidanylidene)-2-azabicyclo[16.3.1]docosa-1(21),6,13,15,18(22),19-hexaen-9-yl] carbamate (three-letter code: 82Z) (formula: C₂₇H₃₅ClN₂O₇) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	Cl	N	O		
6	A	1	37	27	1	2	7	0	0

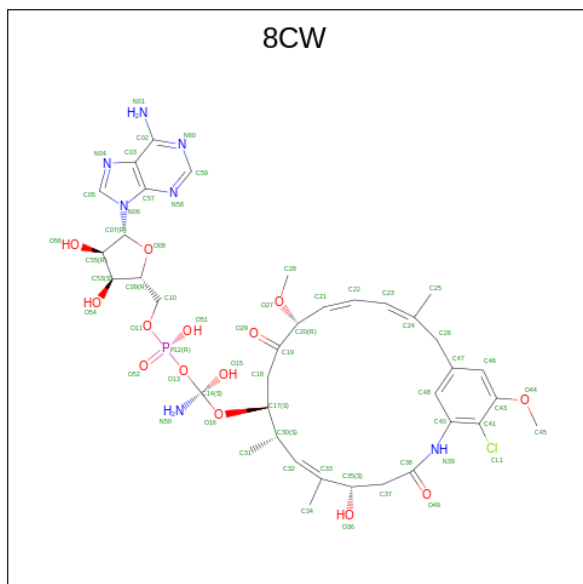
- Molecule 7 is ADENOSINE MONOPHOSPHATE (three-letter code: AMP) (formula: $C_{10}H_{14}N_5O_7P$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
7	A	1	23	10	5	7	1	0	0

- Molecule 8 is [(2 {R},3 {S},4 {R},5 {R})-5-(6-aminopurin-9-yl)-3,4-bis(oxidanyl)oxolan-2-yl]methyl [({S})-azanyl-[(5 {S},6 {E},8 {S},9 {S},12 {R},13 {E},15 {E})-21-chloranyl-12,2

0-dimethoxy-6,8,16-trimethyl-5-oxidanyl-3,11-bis(oxidanylidene)-2-azabicyclo[16.3.1]docosa-1(21),6,13,15,18(22),19-hexaen-9-yl[oxy]-oxidanyl-methyl] hydrogen phosphate (three-letter code: 8CW) (formula: C₃₇H₄₉ClN₇O₁₄P) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	Cl	N	O			P
8	B	1	60	37	1	7	14	1	0	0


- Molecule 9 is water.

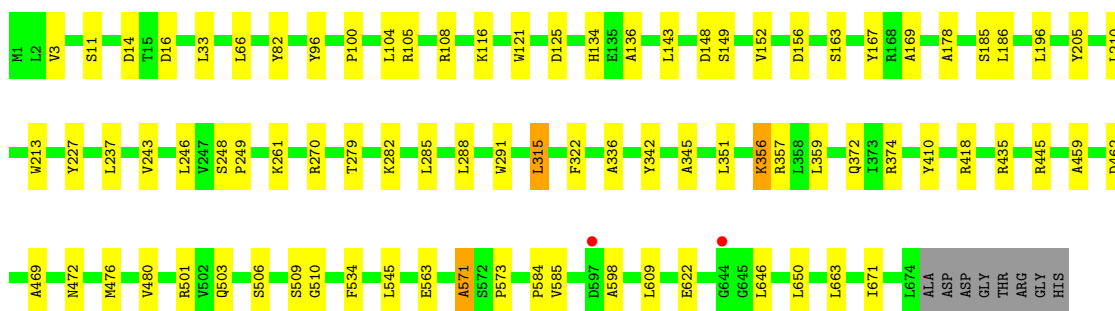
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	48	Total	O	0	0
			48	48		
9	B	22	Total	O	0	0
			22	22		

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.

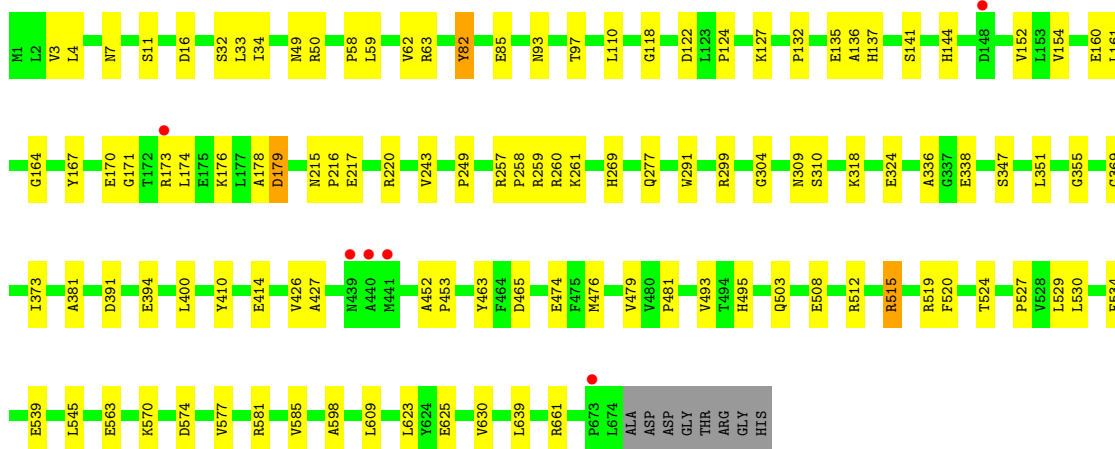
- Molecule 1: GdmN

Chain A:  86% 12%



- Molecule 1: GdmN

Chain B:  82% 16%



4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, α , β , γ	111.03Å 111.03Å 231.28Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	27.76 – 2.88 27.76 – 2.88	Depositor EDS
% Data completeness (in resolution range)	99.8 (27.76-2.88) 99.9 (27.76-2.88)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	0.13	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.43 (at 2.90Å)	Xtrriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.166 , 0.216 0.166 , 0.215	Depositor DCC
R_{free} test set	1845 reflections (4.85%)	wwPDB-VP
Wilson B-factor (Å ²)	49.6	Xtrriage
Anisotropy	0.101	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 40.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.016 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	10618	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.84% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 8CW, FE, SO4, CP, AMP, EDO, 82Z

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	0.47	0/5318	0.67	0/7233
1	B	0.45	0/5262	0.65	0/7168
All	All	0.46	0/10580	0.66	0/14401

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

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	5197	0	5107	55	0
1	B	5141	0	4998	70	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	25	0	0	0	0
3	B	15	0	0	1	0
4	A	8	0	2	2	0
5	A	24	0	36	8	0
5	B	16	0	24	10	0
6	A	37	0	0	3	0
7	A	23	0	11	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	B	60	0	0	1	0
9	A	48	0	0	1	0
9	B	22	0	0	0	0
All	All	10618	0	10178	123	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 6.

All (123) 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)
7:A:715:AMP:C4'	7:A:715:AMP:O4'	1.68	1.17
1:B:176:LYS:NZ	1:B:179:ASP:OD2	2.22	0.73
1:B:152:VAL:HB	1:B:167:TYR:HB2	1.74	0.68
1:A:418:ARG:H	5:A:710:EDO:H11	1.59	0.68
1:B:539:GLU:CB	5:B:706:EDO:H21	2.25	0.67
1:A:3:VAL:HG21	1:A:345:ALA:HB2	1.76	0.66
1:B:85:GLU:H	5:B:708:EDO:H12	1.62	0.65
1:B:259:ARG:HB3	1:B:269:HIS:CE1	2.33	0.63
1:B:539:GLU:HB2	5:B:706:EDO:H21	1.80	0.62
1:B:381:ALA:O	1:B:570:LYS:HE2	2.00	0.62
1:B:476:MET:HG2	1:B:503:GLN:HB2	1.81	0.62
1:B:50:ARG:HB3	5:B:706:EDO:H22	1.81	0.61
1:B:310:SER:HB3	1:B:479:VAL:HG23	1.84	0.60
1:A:418:ARG:HB2	5:A:710:EDO:H22	1.84	0.59
1:A:285:LEU:HD11	1:A:315:LEU:HD23	1.84	0.59
1:A:598:ALA:HB1	1:B:581:ARG:HB3	1.84	0.58
1:B:427:ALA:HB3	1:B:530:LEU:HD22	1.85	0.58
1:B:512:ARG:HH11	1:B:512:ARG:HB2	1.67	0.57
1:B:452:ALA:HB1	1:B:476:MET:HE1	1.85	0.57
1:B:391:ASP:OD2	1:B:515:ARG:NH2	2.38	0.57
1:B:49:ASN:HB2	5:B:707:EDO:H12	1.87	0.56
1:A:14:ASP:OD1	1:A:14:ASP:N	2.39	0.56
1:A:445:ARG:NH1	4:A:707:CP:O3P	2.39	0.56
1:B:520:PHE:O	1:B:524:THR:HG23	2.06	0.55
1:A:476:MET:HG2	1:A:503:GLN:HB2	1.89	0.55
1:A:148:ASP:OD1	1:A:148:ASP:N	2.35	0.55
1:A:213:TRP:HZ2	1:A:435:ARG:HH22	1.53	0.55
1:B:452:ALA:CB	1:B:476:MET:HE1	2.37	0.54
6:A:714:82Z:N25	7:A:715:AMP:O3P	2.40	0.54
1:A:185:SER:HA	5:A:712:EDO:H21	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:152:VAL:HB	1:A:167:TYR:HB2	1.88	0.54
1:A:149:SER:HA	1:A:169:ALA:O	2.08	0.53
1:A:11:SER:HB3	1:A:16:ASP:HA	1.90	0.53
1:A:163:SER:O	5:A:712:EDO:H12	2.09	0.52
1:B:124:PRO:HG2	1:B:127:LYS:HG3	1.91	0.52
1:A:116:LYS:HA	1:A:121:TRP:H	1.74	0.51
1:B:243:VAL:HG22	1:B:249:PRO:HG3	1.93	0.51
1:A:476:MET:HB3	1:A:501:ARG:HG2	1.92	0.51
1:B:574:ASP:O	1:B:577:VAL:HG22	2.11	0.51
1:B:414:GLU:OE1	1:B:414:GLU:N	2.38	0.50
1:A:418:ARG:H	5:A:710:EDO:C1	2.22	0.50
1:A:108:ARG:HD3	1:A:125:ASP:OD1	2.12	0.50
1:B:144:HIS:NE2	1:B:338:GLU:OE2	2.40	0.50
1:A:134:HIS:NE2	1:A:156:ASP:OD1	2.45	0.49
1:B:11:SER:HB3	1:B:16:ASP:HA	1.93	0.49
1:A:108:ARG:NH1	1:A:125:ASP:OD1	2.38	0.49
1:B:299:ARG:HD3	1:B:324:GLU:OE2	2.13	0.49
1:A:237:LEU:HB3	1:A:246:LEU:HD21	1.94	0.49
1:B:50:ARG:HB3	5:B:706:EDO:C2	2.42	0.49
1:A:585:VAL:HG23	1:A:609:LEU:HD22	1.94	0.49
1:B:3:VAL:HB	1:B:34[B]:ILE:CG1	2.44	0.48
1:A:356:LYS:HE2	1:A:359:LEU:HD11	1.96	0.47
1:A:96:TYR:O	1:B:260:ARG:NH2	2.47	0.47
1:A:243:VAL:HG22	1:A:249:PRO:HG3	1.96	0.47
6:A:714:82Z:CL1	1:B:243:VAL:HG12	2.52	0.47
1:B:93:ASN:O	1:B:97:THR:HG23	2.15	0.47
1:B:215:ASN:OD1	1:B:217:GLU:HG3	2.15	0.47
1:A:196:LEU:HD11	1:A:248:SER:HB3	1.96	0.47
1:B:452:ALA:HB1	1:B:476:MET:CE	2.45	0.47
6:A:714:82Z:C24	7:A:715:AMP:O3P	2.63	0.46
1:A:356:LYS:HD3	1:A:357:ARG:O	2.16	0.46
1:B:58:PRO:O	1:B:62:VAL:HG23	2.15	0.46
1:B:585:VAL:HG23	1:B:609:LEU:HD22	1.98	0.46
1:B:630:VAL:HA	1:B:639:LEU:HD11	1.98	0.46
1:A:210:LEU:HD11	1:A:270:ARG:HG2	1.98	0.46
1:B:463:TYR:CE2	1:B:527:PRO:HD2	2.50	0.46
1:B:136:ALA:HB1	1:B:336:ALA:O	2.15	0.45
1:A:33:LEU:HD11	1:A:66:LEU:HD23	1.97	0.45
1:A:435:ARG:HD3	9:A:835:HOH:O	2.14	0.45
1:A:506:SER:H	1:A:509:SER:HB3	1.80	0.45
1:B:173:ARG:NE	1:B:173:ARG:HA	2.32	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:258:PRO:O	1:B:260:ARG:NH1	2.50	0.44
1:A:571:ALA:O	1:A:573:PRO:HD3	2.16	0.44
1:B:391:ASP:OD2	1:B:394:GLU:HB2	2.17	0.44
1:A:288:LEU:HD23	1:A:288:LEU:HA	1.67	0.44
1:A:186:LEU:N	5:A:712:EDO:O1	2.49	0.44
5:A:711:EDO:H12	1:B:598:ALA:HB2	2.00	0.44
1:A:459:ALA:O	1:A:462:ASP:HB2	2.18	0.44
1:A:178:ALA:HB2	1:A:291:TRP:CZ2	2.52	0.44
1:A:598:ALA:CB	1:B:581:ARG:HB3	2.48	0.43
1:A:116:LYS:HB3	1:A:116:LYS:NZ	2.33	0.43
1:B:259:ARG:NH2	3:B:703:SO4:O3	2.51	0.43
1:B:261:LYS:HD3	1:B:261:LYS:HA	1.76	0.43
1:B:178:ALA:HB2	1:B:291:TRP:CZ2	2.53	0.43
1:B:137:HIS:CE1	1:B:304:GLY:HA2	2.53	0.43
1:A:100:PRO:HA	1:B:260:ARG:NH2	2.34	0.43
1:B:277:GLN:HE22	1:B:309:ASN:HD21	1.66	0.43
1:A:342:TYR:HD1	1:A:351:LEU:HD11	1.83	0.43
1:A:622:GLU:H	1:A:622:GLU:CD	2.22	0.43
1:B:132:PRO:HB2	1:B:135:GLU:HB2	2.00	0.43
1:A:143:LEU:HD11	1:A:351:LEU:HD21	2.00	0.42
1:B:110:LEU:HD23	1:B:110:LEU:HA	1.92	0.42
1:A:545:LEU:HD23	1:A:671:ILE:HD12	2.01	0.42
1:B:623:LEU:HD12	1:B:623:LEU:HA	1.87	0.42
1:B:400:LEU:HD21	1:B:426:VAL:HG23	2.01	0.42
1:B:465:ASP:HB3	1:B:481:PRO:HD2	2.00	0.42
1:B:4:LEU:HD12	1:B:32:SER:O	2.19	0.42
1:A:205:TYR:OH	4:A:707:CP:O2P	2.38	0.42
1:A:136:ALA:HB1	1:A:336:ALA:O	2.20	0.42
1:A:322:PHE:O	1:A:469:ALA:HB2	2.20	0.42
1:A:243:VAL:HG12	8:B:701:8CW:CL1	2.57	0.42
1:B:50:ARG:HB3	5:B:706:EDO:H11	2.01	0.42
1:B:369:GLY:O	1:B:373:ILE:HG13	2.20	0.42
1:A:410:TYR:CE1	1:A:563:GLU:HA	2.55	0.41
1:B:154:VAL:O	1:B:164:GLY:HA2	2.20	0.41
1:B:216:PRO:O	1:B:220:ARG:HB2	2.19	0.41
1:A:261:LYS:HD3	1:A:261:LYS:HA	1.69	0.41
1:B:50:ARG:HB3	5:B:706:EDO:C1	2.50	0.41
1:B:410:TYR:CE1	1:B:563:GLU:HA	2.55	0.41
1:B:453:PRO:HB3	1:B:493:VAL:HG21	2.03	0.41
1:A:104:LEU:CD1	1:B:257:ARG:HB3	2.51	0.41
1:A:357:ARG:HH11	1:A:472:ASN:HB3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:174:LEU:HA	1:B:174:LEU:HD23	1.74	0.41
1:B:529:LEU:HD23	1:B:529:LEU:HA	1.92	0.41
1:B:661:ARG:HB3	5:B:706:EDO:H12	2.03	0.41
1:B:661:ARG:HD2	5:B:706:EDO:H12	2.03	0.41
1:A:227:TYR:CE1	1:A:279:THR:HG23	2.57	0.40
1:A:650:LEU:HD23	1:A:650:LEU:HA	1.80	0.40
1:B:59:LEU:HD21	1:B:118:GLY:HA3	2.03	0.40
1:B:33:LEU:HD23	1:B:33:LEU:HA	1.92	0.40
1:B:160:GLU:HG2	1:B:161:LEU:N	2.35	0.40
1:A:584:PRO:HD3	5:A:711:EDO:H11	2.03	0.40
1:B:7:ASN:HB2	1:B:82:TYR:CD2	2.56	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	673/682 (99%)	651 (97%)	20 (3%)	2 (0%)	41 70
1	B	673/682 (99%)	630 (94%)	41 (6%)	2 (0%)	41 70
All	All	1346/1364 (99%)	1281 (95%)	61 (4%)	4 (0%)	41 70

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	355	GLY
1	A	571	ALA
1	A	510	GLY
1	B	171	GLY

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	537/542 (99%)	526 (98%)	11 (2%)	55	81
1	B	525/542 (97%)	508 (97%)	17 (3%)	39	71
All	All	1062/1084 (98%)	1034 (97%)	28 (3%)	46	76

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	82	TYR
1	A	105	ARG
1	A	282	LYS
1	A	315	LEU
1	A	356	LYS
1	A	372	GLN
1	A	374	ARG
1	A	480	VAL
1	A	534	PHE
1	A	646	LEU
1	A	663	LEU
1	B	63	ARG
1	B	82	TYR
1	B	122	ASP
1	B	141	SER
1	B	170	GLU
1	B	179	ASP
1	B	318	LYS
1	B	347	SER
1	B	351	LEU
1	B	474	GLU
1	B	495	HIS
1	B	508	GLU
1	B	515	ARG
1	B	519	ARG
1	B	534	PHE
1	B	545	LEU

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Mol	Chain	Res	Type
1	B	625	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	232	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 24 ligands modelled in this entry, 2 are monoatomic - leaving 22 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	$\# Z > 2$
3	SO4	A	704	-	4,4,4	0.21	0	6,6,6	0.31	0
5	EDO	A	708	-	3,3,3	0.73	0	2,2,2	0.05	0
7	AMP	A	715	2	22,25,25	3.64	6 (27%)	25,38,38	1.43	2 (8%)
3	SO4	B	703	-	4,4,4	0.20	0	6,6,6	0.32	0
5	EDO	B	709	-	3,3,3	0.62	0	2,2,2	0.20	0
3	SO4	A	706	-	4,4,4	0.23	0	6,6,6	0.33	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	SO4	B	705	-	4,4,4	0.17	0	6,6,6	0.28	0
5	EDO	B	708	-	3,3,3	0.69	0	2,2,2	0.02	0
5	EDO	B	707	-	3,3,3	0.63	0	2,2,2	0.06	0
5	EDO	A	709	-	3,3,3	0.63	0	2,2,2	0.09	0
5	EDO	A	710	-	3,3,3	0.49	0	2,2,2	0.38	0
5	EDO	A	712	-	3,3,3	0.60	0	2,2,2	0.15	0
3	SO4	A	703	-	4,4,4	0.12	0	6,6,6	0.31	0
6	82Z	A	714	-	37,38,38	2.00	8 (21%)	43,52,52	2.07	15 (34%)
8	8CW	B	701	2	57,64,64	3.48	18 (31%)	62,94,94	1.95	14 (22%)
3	SO4	A	705	-	4,4,4	0.08	0	6,6,6	0.23	0
3	SO4	A	702	-	4,4,4	0.14	0	6,6,6	0.27	0
5	EDO	A	711	-	3,3,3	0.66	0	2,2,2	0.31	0
5	EDO	A	713	-	3,3,3	0.58	0	2,2,2	0.30	0
4	CP	A	707	-	6,7,7	3.67	3 (50%)	7,10,10	1.55	2 (28%)
3	SO4	B	704	-	4,4,4	0.13	0	6,6,6	0.47	0
5	EDO	B	706	-	3,3,3	0.48	0	2,2,2	0.23	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	EDO	A	711	-	-	0/1/1/1	-
5	EDO	B	708	-	-	1/1/1/1	-
6	82Z	A	714	-	-	16/46/46/46	0/1/2/2
8	8CW	B	701	2	-	11/48/79/79	0/4/5/5
5	EDO	A	708	-	-	0/1/1/1	-
5	EDO	B	707	-	-	1/1/1/1	-
5	EDO	B	709	-	-	1/1/1/1	-
5	EDO	A	713	-	-	1/1/1/1	-
5	EDO	A	710	-	-	0/1/1/1	-
5	EDO	A	709	-	-	1/1/1/1	-
4	CP	A	707	-	-	0/3/5/5	-
7	AMP	A	715	2	-	1/6/26/26	0/3/3/3
5	EDO	A	712	-	-	1/1/1/1	-
5	EDO	B	706	-	-	0/1/1/1	-

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	B	701	8CW	C55-C07	-15.43	1.30	1.53
7	A	715	AMP	O4'-C4'	10.29	1.68	1.45
8	B	701	8CW	O08-C07	9.51	1.54	1.41
8	B	701	8CW	C53-C09	-8.90	1.30	1.53
7	A	715	AMP	C3'-C4'	-8.71	1.30	1.53
7	A	715	AMP	O4'-C1'	-7.81	1.30	1.41
6	A	714	82Z	C24-N25	7.43	1.47	1.33
4	A	707	CP	C-N	7.33	1.47	1.33
8	B	701	8CW	C26-C47	5.40	1.60	1.51
8	B	701	8CW	O08-C09	5.11	1.56	1.45
8	B	701	8CW	C02-N01	4.94	1.52	1.34
8	B	701	8CW	C38-N39	4.85	1.46	1.35
4	A	707	CP	P-O4P	4.53	1.66	1.59
8	B	701	8CW	C22-C23	4.28	1.56	1.43
8	B	701	8CW	C55-C53	4.25	1.65	1.53
8	B	701	8CW	C20-C21	4.16	1.54	1.50
7	A	715	AMP	O2'-C2'	-4.00	1.33	1.43
6	A	714	82Z	C13-N12	3.93	1.44	1.35
8	B	701	8CW	P12-O13	3.89	1.70	1.60
6	A	714	82Z	O23-C22	-3.81	1.39	1.46
8	B	701	8CW	C34-C33	3.34	1.56	1.50
7	A	715	AMP	C6-N6	3.33	1.46	1.34
8	B	701	8CW	C41-CL1	3.22	1.79	1.72
8	B	701	8CW	C25-C24	3.14	1.58	1.50
6	A	714	82Z	C32-C02	-2.95	1.31	1.34
6	A	714	82Z	C33-C32	2.73	1.51	1.43
6	A	714	82Z	O23-C24	2.70	1.41	1.35
8	B	701	8CW	O44-C43	2.67	1.41	1.37
8	B	701	8CW	O49-C38	-2.62	1.17	1.23
8	B	701	8CW	C26-C24	2.56	1.54	1.51
7	A	715	AMP	O3'-C3'	2.43	1.48	1.43
8	B	701	8CW	C30-C32	2.34	1.56	1.51
6	A	714	82Z	O30-C13	-2.33	1.18	1.23
4	A	707	CP	O-C	-2.24	1.18	1.21
6	A	714	82Z	O29-C28	-2.22	1.17	1.21

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	B	701	8CW	C37-C38-N39	6.17	122.97	114.50
6	A	714	82Z	O23-C24-N25	5.46	119.06	110.58
8	B	701	8CW	C23-C22-C21	-5.11	112.14	124.53
8	B	701	8CW	N58-C59-N60	-4.94	120.96	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	714	82Z	C14-C13-N12	4.76	121.03	114.50
7	A	715	AMP	N3-C2-N1	-4.39	121.82	128.68
8	B	701	8CW	C18-C17-C30	-4.00	106.11	115.45
6	A	714	82Z	O26-C24-N25	-3.80	119.24	125.51
8	B	701	8CW	O44-C43-C41	3.75	119.97	115.53
6	A	714	82Z	C21-C20-C22	3.55	117.11	111.80
8	B	701	8CW	O49-C38-N39	-3.49	117.26	123.63
6	A	714	82Z	C27-C22-C20	-3.30	107.74	115.45
6	A	714	82Z	O07-C06-C09	3.27	119.41	115.53
4	A	707	CP	O-C-N	-3.23	120.19	125.51
8	B	701	8CW	C17-C30-C32	-3.21	104.45	110.24
6	A	714	82Z	O30-C13-N12	-2.97	118.22	123.63
8	B	701	8CW	C53-C55-C07	2.88	105.32	100.98
6	A	714	82Z	O16-C15-C14	2.83	117.00	110.05
8	B	701	8CW	C47-C26-C24	-2.75	103.64	114.47
6	A	714	82Z	C20-C19-C17	-2.68	120.68	127.73
8	B	701	8CW	O08-C07-C55	-2.62	103.09	106.93
6	A	714	82Z	C18-C17-C15	2.59	119.96	115.22
6	A	714	82Z	C01-C02-C03	2.34	119.83	114.88
7	A	715	AMP	O5'-P-O1P	2.32	112.97	106.47
6	A	714	82Z	C04-C03-C02	-2.30	105.42	114.47
8	B	701	8CW	O36-C35-C33	-2.22	105.49	110.81
8	B	701	8CW	C25-C24-C26	2.21	119.56	114.88
6	A	714	82Z	O16-C15-C17	-2.16	105.64	110.81
8	B	701	8CW	O08-C09-C10	-2.16	102.28	109.37
8	B	701	8CW	C34-C33-C35	2.14	119.14	115.22
4	A	707	CP	O2P-P-O4P	2.12	111.72	105.25
6	A	714	82Z	C22-C20-C19	-2.10	106.45	110.24
6	A	714	82Z	O23-C24-O26	-2.05	121.62	123.69

There are no chirality outliers.

All (34) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	714	82Z	C21-C20-C22-C27
6	A	714	82Z	C21-C20-C22-O23
6	A	714	82Z	C19-C20-C22-C27
6	A	714	82Z	N25-C24-O23-C22
6	A	714	82Z	O26-C24-O23-C22
6	A	714	82Z	C27-C28-C35-O36
8	B	701	8CW	C30-C17-C18-C19
8	B	701	8CW	O16-C17-C18-C19

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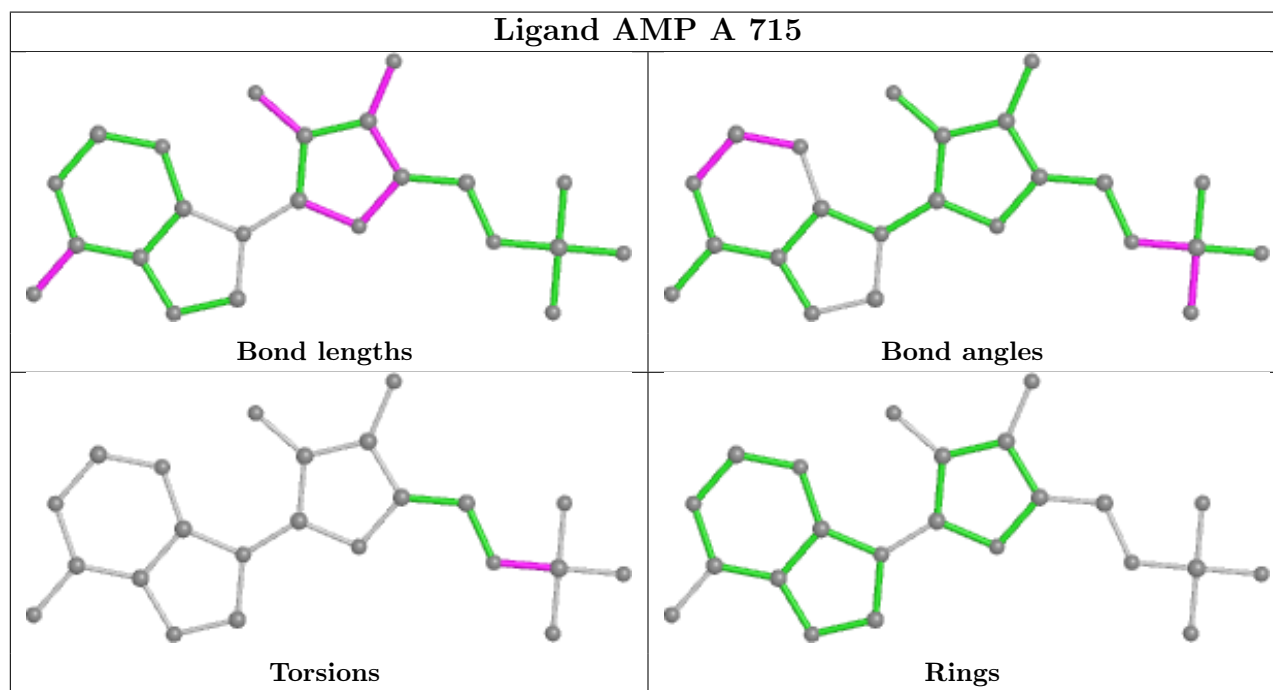
Mol	Chain	Res	Type	Atoms
6	A	714	82Z	O30-C13-N12-C11
8	B	701	8CW	O49-C38-N39-C40
6	A	714	82Z	C14-C13-N12-C11
8	B	701	8CW	C37-C38-N39-C40
8	B	701	8CW	C21-C22-C23-C24
8	B	701	8CW	C10-O11-P12-O13
5	A	712	EDO	O1-C1-C2-O2
5	B	709	EDO	O1-C1-C2-O2
6	A	714	82Z	C09-C11-N12-C13
6	A	714	82Z	C33-C34-C35-C28
8	B	701	8CW	C19-C20-C21-C22
6	A	714	82Z	C31-C11-N12-C13
5	A	709	EDO	O1-C1-C2-O2
7	A	715	AMP	C5'-O5'-P-O2P
6	A	714	82Z	C34-C35-O36-C37
8	B	701	8CW	C21-C20-O27-C28
6	A	714	82Z	O30-C13-C14-C15
6	A	714	82Z	N12-C13-C14-C15
6	A	714	82Z	C19-C20-C22-O23
5	B	708	EDO	O1-C1-C2-O2
8	B	701	8CW	C48-C40-N39-C38
6	A	714	82Z	O29-C28-C35-O36
5	B	707	EDO	O1-C1-C2-O2
8	B	701	8CW	C10-O11-P12-O51
5	A	713	EDO	O1-C1-C2-O2
8	B	701	8CW	C41-C40-N39-C38

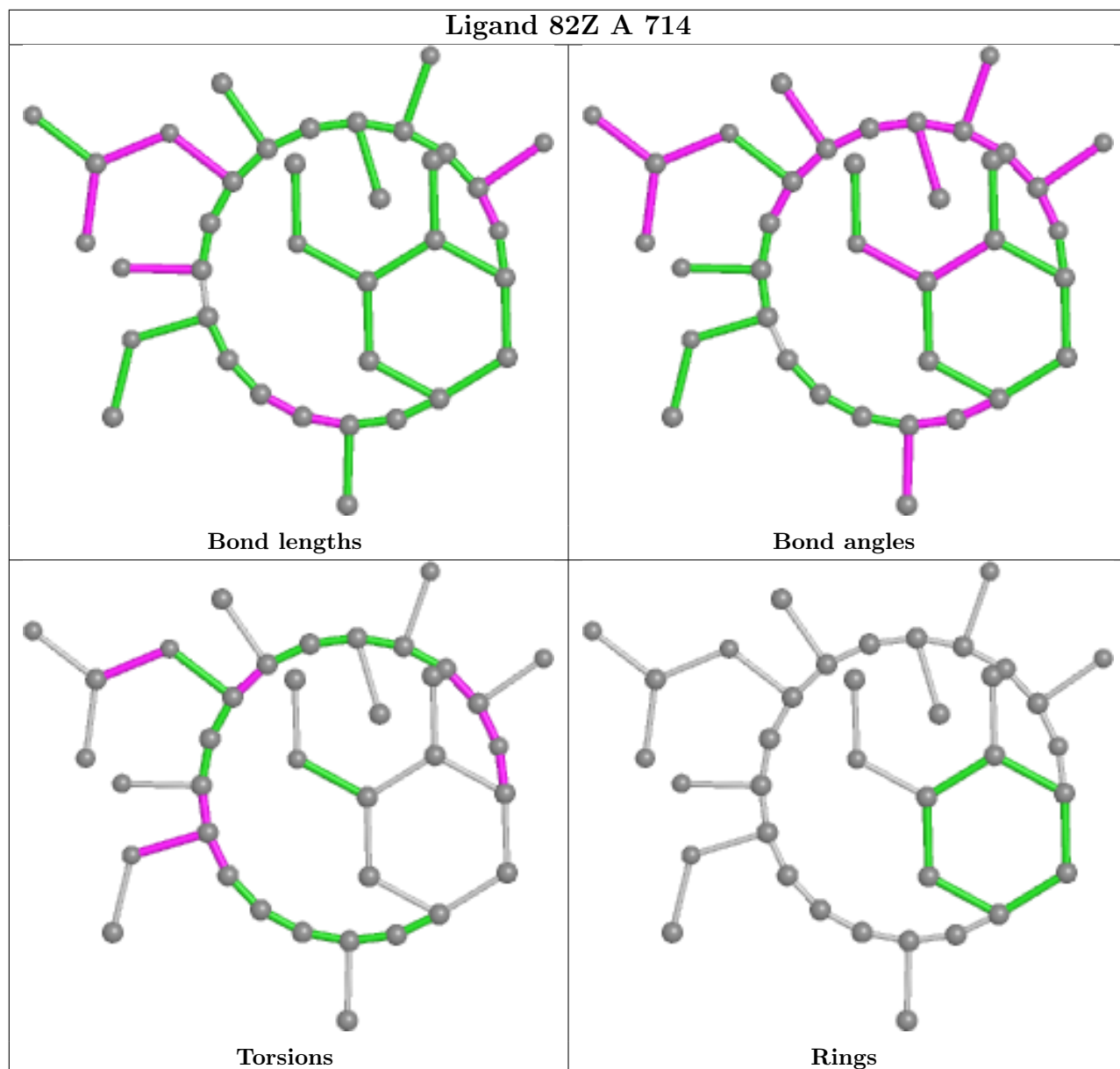
There are no ring outliers.

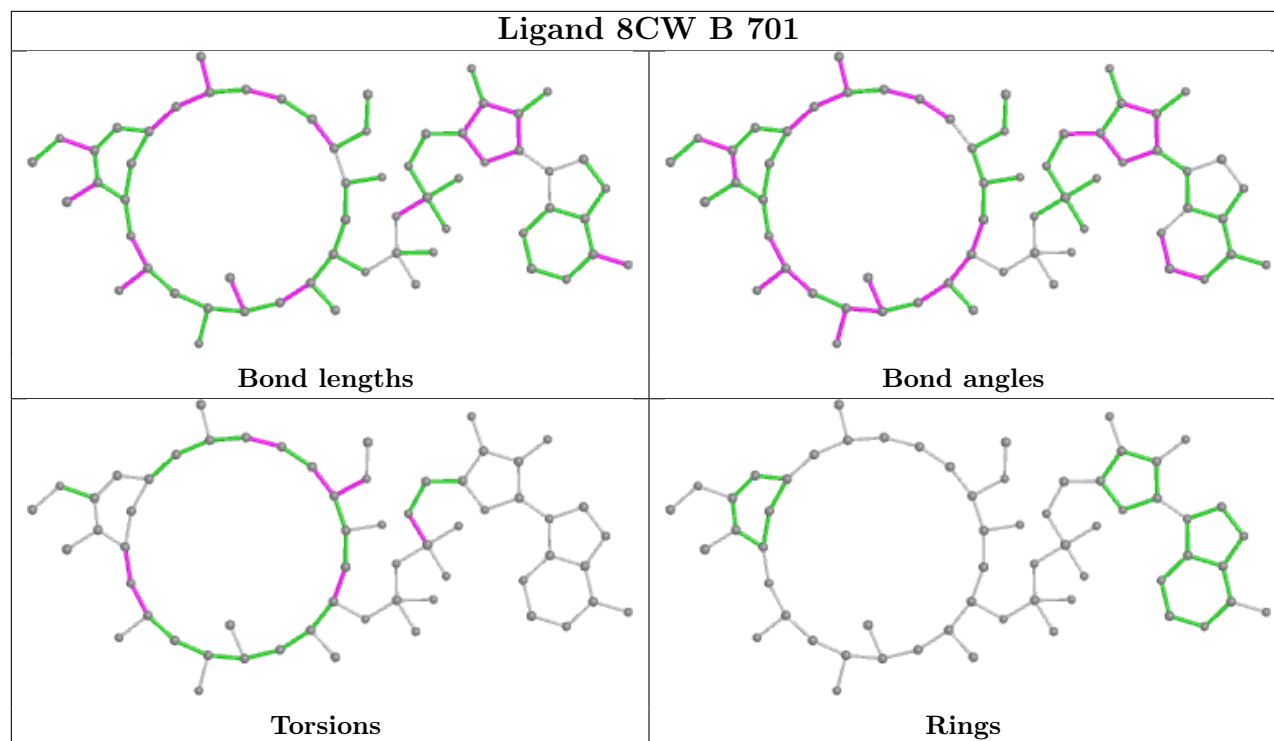
11 monomers are involved in 26 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	715	AMP	3	0
3	B	703	SO4	1	0
5	B	708	EDO	1	0
5	B	707	EDO	1	0
5	A	710	EDO	3	0
5	A	712	EDO	3	0
6	A	714	82Z	3	0
8	B	701	8CW	1	0
5	A	711	EDO	2	0
4	A	707	CP	2	0
5	B	706	EDO	8	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 [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, 95th 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 ²)	Q<0.9
1	A	674/682 (98%)	-0.49	2 (0%) 94 94	25, 37, 55, 69	0
1	B	674/682 (98%)	-0.29	6 (0%) 84 84	29, 46, 69, 84	0
All	All	1348/1364 (98%)	-0.39	8 (0%) 89 89	25, 41, 63, 84	0

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	440	ALA	4.5
1	B	441	MET	3.1
1	A	597	ASP	2.9
1	B	673	PRO	2.6
1	B	439	ASN	2.3
1	A	644	GLY	2.3
1	B	148	ASP	2.2
1	B	173	ARG	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,

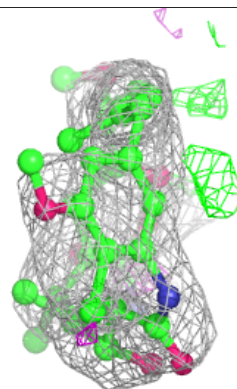
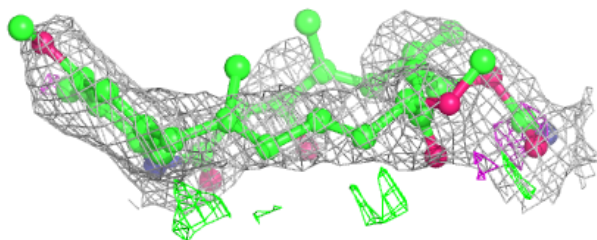
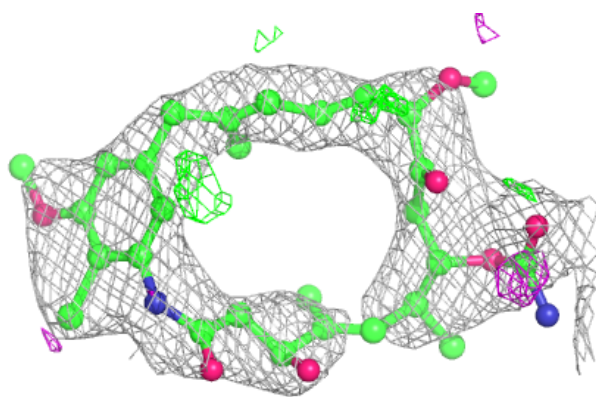
median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	EDO	A	711	4/4	0.64	0.54	48,50,53,55	0
5	EDO	B	707	4/4	0.66	0.65	44,51,56,59	0
5	EDO	B	708	4/4	0.71	0.62	46,49,50,51	0
5	EDO	A	708	4/4	0.81	0.24	47,48,49,54	0
5	EDO	B	709	4/4	0.83	0.38	52,55,56,59	0
5	EDO	A	709	4/4	0.88	0.18	45,50,59,59	0
6	82Z	A	714	37/37	0.89	0.23	40,51,58,63	37
5	EDO	B	706	4/4	0.91	0.33	39,45,45,48	0
8	8CW	B	701	60/60	0.91	0.22	30,41,52,63	60
5	EDO	A	712	4/4	0.92	0.34	39,40,41,41	0
5	EDO	A	713	4/4	0.93	0.48	42,49,49,54	0
4	CP	A	707	8/8	0.94	0.28	63,69,72,74	0
3	SO4	A	704	5/5	0.95	0.18	38,52,61,68	0
5	EDO	A	710	4/4	0.96	0.52	38,39,42,43	0
3	SO4	A	706	5/5	0.96	0.18	57,58,73,75	0
2	FE	B	702	1/1	0.97	0.15	40,40,40,40	0
3	SO4	B	703	5/5	0.97	0.26	61,62,72,76	0
3	SO4	B	705	5/5	0.97	0.09	56,67,68,69	0
3	SO4	A	705	5/5	0.97	0.21	63,63,73,78	0
7	AMP	A	715	23/23	0.98	0.12	32,37,42,46	0
2	FE	A	701	1/1	0.98	0.13	32,32,32,32	0
3	SO4	A	702	5/5	0.99	0.12	40,43,54,61	0
3	SO4	A	703	5/5	0.99	0.11	41,45,47,52	0
3	SO4	B	704	5/5	0.99	0.17	48,56,64,66	0

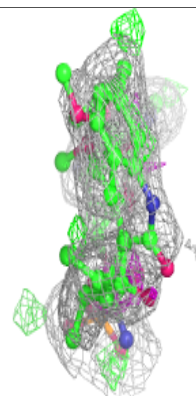
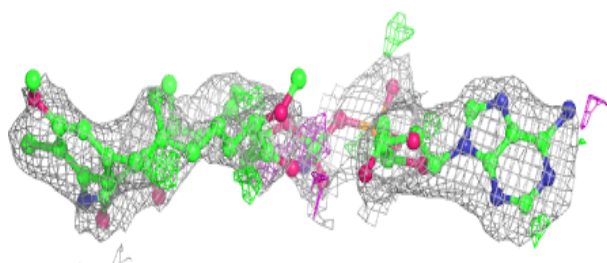
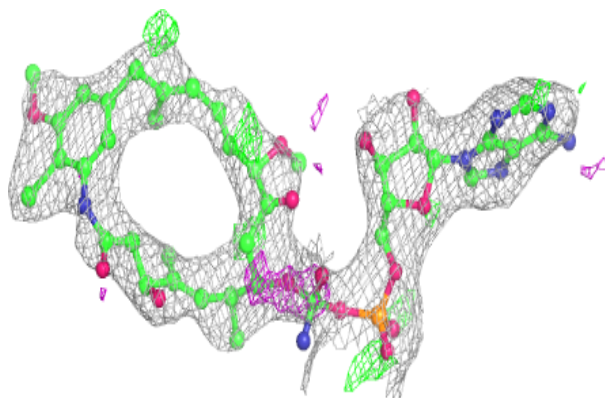
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

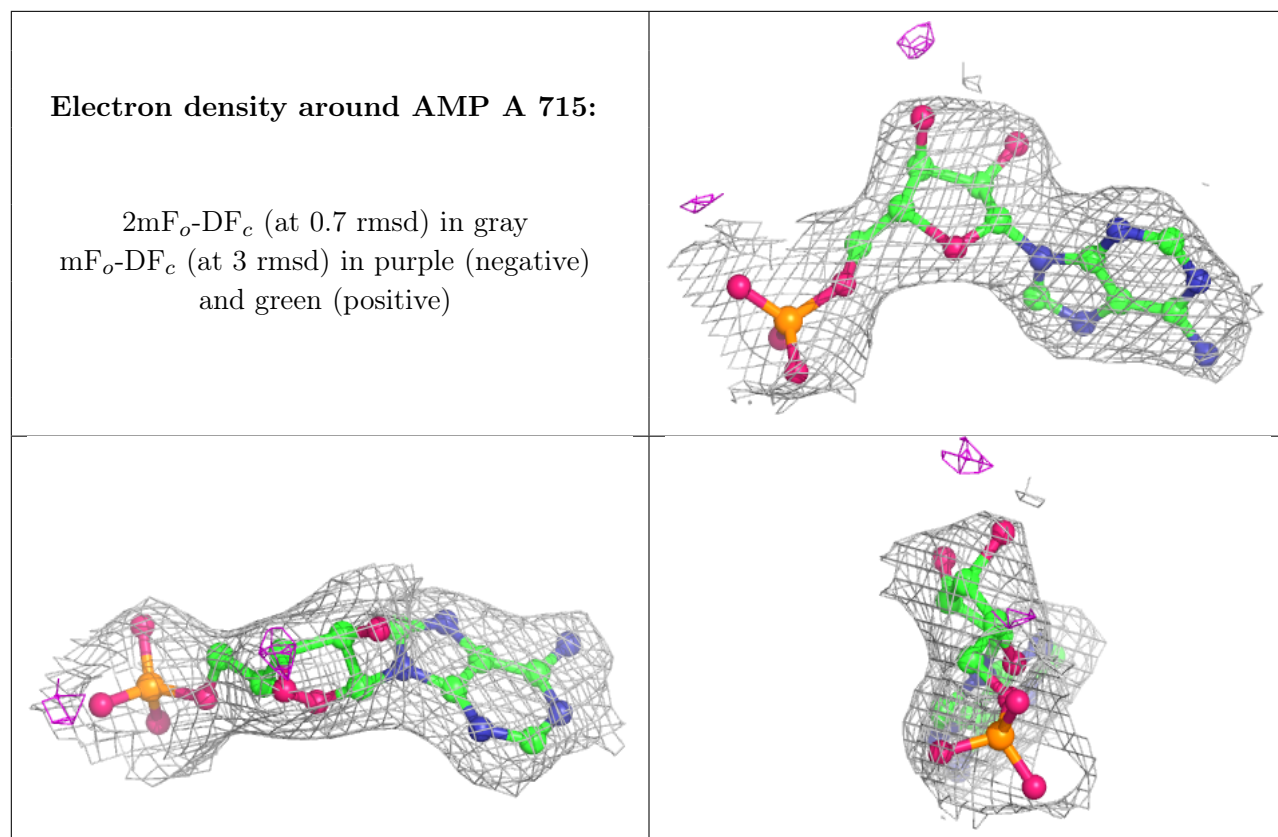
Electron density around 82Z A 714:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around 8CW B 701:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.5 Other polymers [i](#)

There are no such residues in this entry.