



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 20, 2022 – 10:10 am BST

PDB ID : 6YK1
Title : Crystal structure of mouse pyridoxal kinase in complex with ATP-gamma-S and artesunate
Authors : Kasaragod, V.B.; Schindelin, H.
Deposited on : 2020-04-05
Resolution : 2.40 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.27
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.27

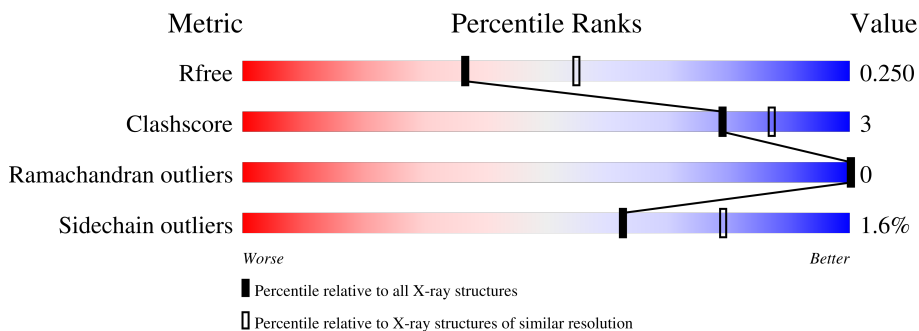
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)

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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	314	
1	B	314	
1	C	314	
1	D	314	

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 19493 atoms, of which 9601 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 Pyridoxal kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	305	4710	1492	2341	412	446	19	0	1	0
1	B	304	4736	1497	2357	414	449	19	0	1	0
1	C	304	4705	1490	2339	409	449	18	0	0	0
1	D	305	4597	1470	2262	399	448	18	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP Q8K183
A	0	PRO	-	expression tag	UNP Q8K183
B	-1	GLY	-	expression tag	UNP Q8K183
B	0	PRO	-	expression tag	UNP Q8K183
C	-1	GLY	-	expression tag	UNP Q8K183
C	0	PRO	-	expression tag	UNP Q8K183
D	-1	GLY	-	expression tag	UNP Q8K183
D	0	PRO	-	expression tag	UNP Q8K183

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



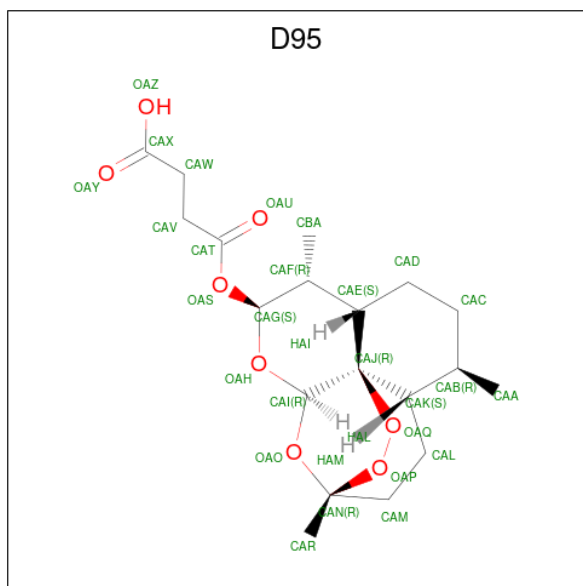
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	H	O	0	0
			14	3	8	3		
2	B	1	Total	C	H	O	0	0
			14	3	8	3		
2	B	1	Total	C	H	O	0	0
			14	3	8	3		
2	C	1	Total	C	H	O	0	0
			14	3	8	3		
2	C	1	Total	C	H	O	0	0
			13	3	7	3		
2	C	1	Total	C	H	O	0	0
			14	3	8	3		

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C₈H₁₈O₅).



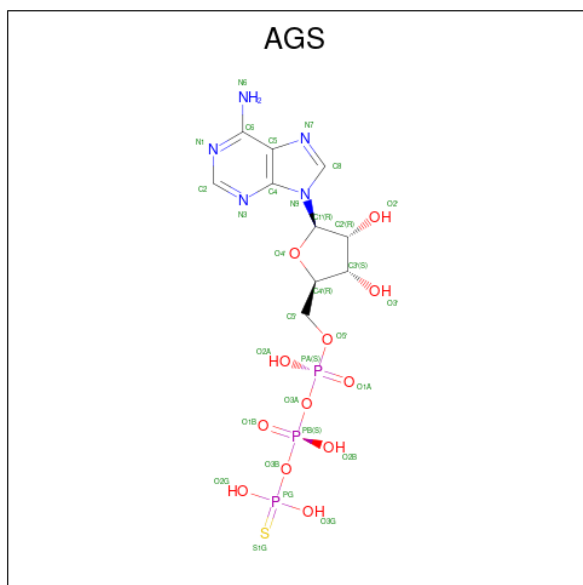
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	A	1	31	8	18	5	0	0

- Molecule 4 is Artesunate (three-letter code: D95) (formula: $C_{19}H_{28}O_8$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
4	A	1	55	19	28	8	0	0

- Molecule 5 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (three-letter code: AGS) (formula: $C_{10}H_{16}N_5O_{12}P_3S$).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
			Total	C	H	N	O	P	S		
5	A	1	Total	C	H	N	O	P	S	0	0
			44	10	13	5	12	3	1		
5	B	1	Total	C	H	N	O	P	S	0	0
			44	10	13	5	12	3	1		
5	C	1	Total	C	H	N	O	P	S	0	0
			44	10	13	5	12	3	1		
5	D	1	Total	C	H	N	O	P	S	0	0
			45	10	14	5	12	3	1		

- Molecule 6 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	A	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	B	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	C	1	Total	C	H	O	0	0
			10	2	6	2		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	C	1	Total	C	H	O	0	0
			10	2	6	2		
6	D	1	Total	C	H	O	0	0
			10	2	6	2		
6	D	1	Total	C	H	O	0	0
			10	2	6	2		
6	D	1	Total	C	H	O	0	0
			10	2	6	2		

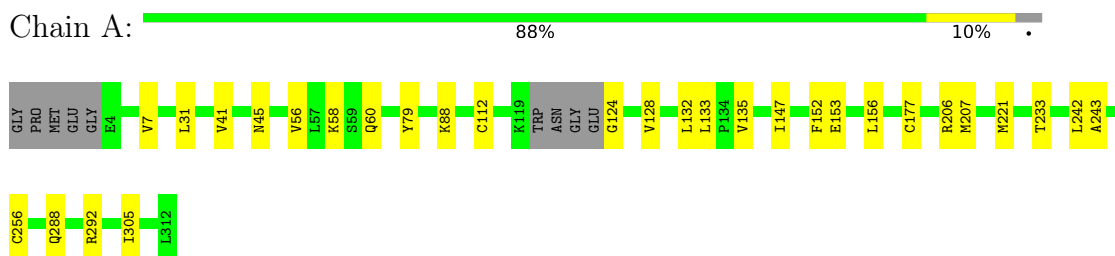
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	41	Total	O	0	0
			41	41		
7	B	60	Total	O	0	0
			60	60		
7	C	26	Total	O	0	0
			26	26		
7	D	12	Total	O	0	0
			12	12		

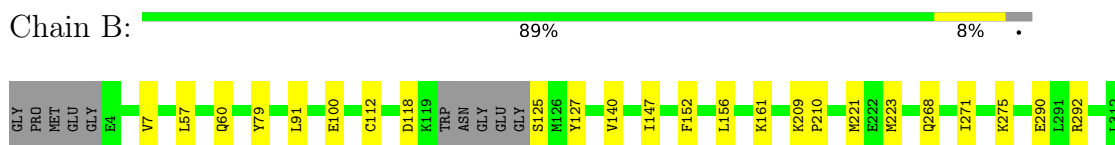
3 Residue-property plots

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. 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. 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.

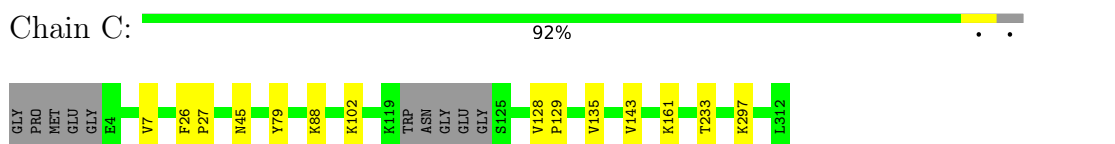
- Molecule 1: Pyridoxal kinase



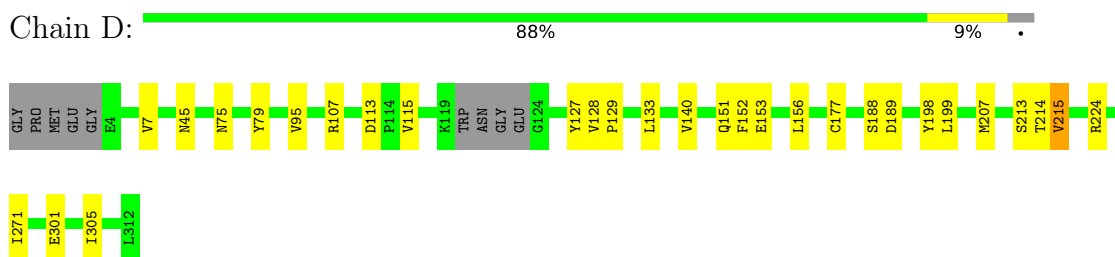
- Molecule 1: Pyridoxal kinase



- Molecule 1: Pyridoxal kinase



- Molecule 1: Pyridoxal kinase



4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	279.38Å 53.04Å 110.15Å 90.00° 91.64° 90.00°	Depositor
Resolution (Å)	47.20 – 2.40 47.20 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.5 (47.20-2.40) 99.6 (47.20-2.40)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.48 (at 2.39Å)	Xtrriage
Refinement program	PHENIX (1.17.1_3660: ???)	Depositor
R, R_{free}	0.209 , 0.254 0.214 , 0.250	Depositor DCC
R_{free} test set	3237 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	55.6	Xtrriage
Anisotropy	0.365	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.015 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	19493	wwPDB-VP
Average B, all atoms (Å ²)	75.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.35% 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: D95, GOL, AGS, EDO, PG4

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	0.75	1/2414 (0.0%)	0.54	0/3268
1	B	0.62	2/2424 (0.1%)	0.55	1/3280 (0.0%)
1	C	0.64	0/2408	0.50	0/3260
1	D	0.48	0/2377	0.48	0/3227
All	All	0.63	3/9623 (0.0%)	0.52	1/13035 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	153	GLU	CD-OE2	-5.30	1.19	1.25
1	B	221[A]	MET	N-CA	5.06	1.56	1.46
1	B	221[B]	MET	N-CA	5.06	1.56	1.46

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	57	LEU	CA-CB-CG	5.60	128.18	115.30

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	2369	2341	2357	17	1
1	B	2379	2357	2373	11	0
1	C	2366	2339	2353	7	0
1	D	2335	2262	2277	16	1
2	A	6	8	8	1	0
2	B	12	16	16	0	0
2	C	18	23	24	0	0
3	A	13	18	18	0	0
4	A	27	28	0	0	0
5	A	31	13	12	1	0
5	B	31	13	12	1	0
5	C	31	13	12	1	0
5	D	31	14	12	1	0
6	A	44	66	65	1	0
6	B	20	30	30	1	0
6	C	28	42	42	0	0
6	D	12	18	18	0	0
7	A	41	0	0	0	0
7	B	60	0	0	1	0
7	C	26	0	0	1	0
7	D	12	0	0	0	0
All	All	9892	9601	9629	54	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 3.

All (54) 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)
5:C:505:AGS:O2B	5:C:505:AGS:S1G	2.29	0.90
1:D:7:VAL:HG22	1:D:79:TYR:HB2	1.67	0.76
1:D:128:VAL:HG22	1:D:129:PRO:HD2	1.67	0.74
5:A:504:AGS:O2G	5:A:504:AGS:O2B	2.05	0.72
2:A:501:GOL:O3	2:A:501:GOL:O1	2.06	0.71
1:C:88:LYS:HG3	1:C:135:VAL:HG21	1.80	0.63
1:D:95:VAL:CG2	1:D:140:VAL:HG22	2.28	0.63
1:B:7:VAL:HG22	1:B:79:TYR:HB2	1.81	0.63
1:A:7:VAL:HG22	1:A:79:TYR:HB2	1.83	0.59
1:D:198:TYR:N	1:D:198:TYR:CD2	2.72	0.58
1:A:58:LYS:HA	1:A:58:LYS:HE3	1.88	0.55
5:B:403:AGS:S1G	5:B:403:AGS:O1B	2.65	0.55
1:B:118:ASP:O	1:B:125:SER:N	2.41	0.53

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:100:GLU:OE1	6:B:408:EDO:O1	2.25	0.52
1:B:91:LEU:HD22	1:B:140:VAL:HG21	1.92	0.52
1:C:128:VAL:HG13	1:C:129:PRO:HD2	1.93	0.52
1:A:133:LEU:HD12	1:A:133:LEU:O	2.11	0.50
1:B:209:LYS:HB3	1:B:210:PRO:HD2	1.93	0.50
1:D:151:GLN:NE2	1:D:189:ASP:OD1	2.44	0.50
1:A:305:ILE:H	1:A:305:ILE:HD12	1.76	0.49
1:D:207:MET:HB2	1:D:215:VAL:HG13	1.95	0.49
1:D:305:ILE:HD12	1:D:305:ILE:H	1.77	0.49
1:D:133:LEU:HD12	1:D:133:LEU:O	2.12	0.49
1:A:58:LYS:HA	1:A:58:LYS:CE	2.43	0.48
1:C:7:VAL:HG22	1:C:79:TYR:HB2	1.96	0.47
1:A:128:VAL:CG2	1:A:132:LEU:HD12	2.45	0.46
1:A:128:VAL:HG21	1:A:132:LEU:HD12	1.97	0.46
1:A:152:PHE:CE2	1:A:156:LEU:HD11	2.51	0.46
1:C:297:LYS:NZ	1:D:301:GLU:OE2	2.38	0.46
1:A:221[B]:MET:SD	1:A:256:CYS:HB3	2.56	0.45
1:D:128:VAL:HG22	1:D:129:PRO:CD	2.43	0.45
1:A:242:LEU:C	1:A:242:LEU:HD23	2.38	0.45
1:D:113:ASP:OD1	5:D:402:AGS:S1G	2.75	0.45
1:C:102:LYS:NZ	1:C:143:VAL:O	2.48	0.45
1:A:288:GLN:O	1:A:292:ARG:NH2	2.50	0.44
1:A:305:ILE:HD12	1:A:305:ILE:N	2.32	0.44
1:B:271:ILE:O	1:B:275:LYS:HG2	2.18	0.44
1:B:290:GLU:O	1:B:292:ARG:NH1	2.50	0.44
1:D:151:GLN:OE1	1:D:188:SER:HB2	2.18	0.43
1:B:161:LYS:NZ	7:B:503:HOH:O	2.51	0.43
1:A:31:LEU:HD13	1:A:243:ALA:CB	2.49	0.43
1:B:112:CYS:O	1:B:147:ILE:HA	2.18	0.43
1:B:268:GLN:O	1:B:271:ILE:HG22	2.19	0.43
1:C:161:LYS:NZ	7:C:602:HOH:O	2.51	0.43
1:B:152:PHE:CE2	1:B:156:LEU:HD11	2.54	0.43
1:D:115:VAL:HA	1:D:153:GLU:OE2	2.19	0.42
1:D:271:ILE:HD12	1:D:271:ILE:HA	1.92	0.42
1:C:26:PHE:HB3	1:C:27:PRO:HD3	2.01	0.42
1:D:213:SER:OG	1:D:214:THR:N	2.50	0.41
1:A:88:LYS:HG3	1:A:135:VAL:HG21	2.03	0.41
1:A:124:GLY:N	6:A:509:EDO:HO1	2.18	0.41
1:A:41:VAL:HG12	1:A:56:VAL:HA	2.03	0.40
1:A:112:CYS:O	1:A:147:ILE:HA	2.22	0.40
1:D:152:PHE:CE2	1:D:156:LEU:HD11	2.56	0.40

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	Interatomic distance (Å)	Clash overlap (Å)
1:A:177:CYS:HG	1:D:177:CYS:SG[2_556]	0.90	0.70

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	302/314 (96%)	293 (97%)	9 (3%)	0	100	100
1	B	301/314 (96%)	294 (98%)	7 (2%)	0	100	100
1	C	300/314 (96%)	290 (97%)	10 (3%)	0	100	100
1	D	301/314 (96%)	289 (96%)	12 (4%)	0	100	100
All	All	1204/1256 (96%)	1166 (97%)	38 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [\(i\)](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	261/273 (96%)	256 (98%)	5 (2%)	57	75
1	B	264/273 (97%)	261 (99%)	3 (1%)	73	87
1	C	262/273 (96%)	260 (99%)	2 (1%)	81	91
1	D	254/273 (93%)	247 (97%)	7 (3%)	43	63

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1041/1092 (95%)	1024 (98%)	17 (2%)	62 79

All (17) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	ASN
1	A	60	GLN
1	A	206	ARG
1	A	207	MET
1	A	233	THR
1	B	60	GLN
1	B	127	TYR
1	B	223	MET
1	C	45	ASN
1	C	233	THR
1	D	45	ASN
1	D	75	ASN
1	D	107	ARG
1	D	127	TYR
1	D	199	LEU
1	D	215	VAL
1	D	224	ARG

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

Mol	Chain	Res	Type
1	A	60	GLN
1	B	60	GLN
1	C	60	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

38 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	EDO	D	404	-	3,3,3	0.47	0	2,2,2	0.30	0
6	EDO	C	506	-	3,3,3	0.46	0	2,2,2	0.31	0
2	GOL	C	503	-	5,5,5	0.87	0	5,5,5	1.01	0
6	EDO	B	408	-	3,3,3	0.44	0	2,2,2	0.56	0
6	EDO	A	508	-	3,3,3	0.46	0	2,2,2	0.33	0
3	PG4	A	502	-	12,12,12	0.52	0	11,11,11	0.28	0
6	EDO	B	406	-	3,3,3	0.47	0	2,2,2	0.26	0
6	EDO	D	401	-	3,3,3	0.46	0	2,2,2	0.28	0
2	GOL	C	502	-	5,5,5	0.87	0	5,5,5	0.96	0
5	AGS	A	504	-	26,33,33	1.91	7 (26%)	26,52,52	1.92	6 (23%)
6	EDO	A	511	-	3,3,3	0.47	0	2,2,2	0.31	0
2	GOL	B	402	-	5,5,5	0.88	0	5,5,5	0.98	0
6	EDO	B	405	-	3,3,3	0.46	0	2,2,2	0.32	0
6	EDO	A	514	-	3,3,3	0.47	0	2,2,2	0.32	0
6	EDO	A	509	-	3,3,3	0.46	0	2,2,2	0.30	0
6	EDO	C	507	-	3,3,3	0.46	0	2,2,2	0.34	0
6	EDO	C	509	-	3,3,3	0.46	0	2,2,2	0.30	0
6	EDO	C	510	-	3,3,3	0.46	0	2,2,2	0.25	0
2	GOL	B	401	-	5,5,5	0.85	0	5,5,5	0.91	0
2	GOL	C	504	-	5,5,5	0.85	0	5,5,5	0.95	0
6	EDO	A	512	-	3,3,3	0.47	0	2,2,2	0.30	0
6	EDO	A	513	-	3,3,3	0.46	0	2,2,2	0.31	0
6	EDO	A	507	-	3,3,3	0.80	0	2,2,2	1.06	0
6	EDO	C	501	-	3,3,3	0.45	0	2,2,2	0.31	0
6	EDO	A	515	-	3,3,3	0.47	0	2,2,2	0.31	0
6	EDO	C	508	-	3,3,3	0.46	0	2,2,2	0.35	0
4	D95	A	503	-	27,30,30	0.37	0	42,47,47	1.29	5 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	AGS	C	505	-	26,33,33	2.03	7 (26%)	26,52,52	1.78	5 (19%)
6	EDO	A	506	-	3,3,3	0.43	0	2,2,2	0.33	0
6	EDO	B	407	-	3,3,3	0.44	0	2,2,2	0.33	0
6	EDO	D	403	-	3,3,3	0.45	0	2,2,2	0.32	0
6	EDO	B	404	-	3,3,3	0.45	0	2,2,2	0.33	0
5	AGS	B	403	-	26,33,33	2.05	8 (30%)	26,52,52	1.75	6 (23%)
2	GOL	A	501	-	5,5,5	0.86	0	5,5,5	0.86	0
6	EDO	A	505	-	3,3,3	0.46	0	2,2,2	0.31	0
6	EDO	A	510	-	3,3,3	0.46	0	2,2,2	0.32	0
5	AGS	D	402	-	26,33,33	1.89	6 (23%)	26,52,52	2.04	5 (19%)
6	EDO	C	511	-	3,3,3	0.46	0	2,2,2	0.27	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
6	EDO	D	404	-	-	0/1/1/1	-
6	EDO	C	506	-	-	0/1/1/1	-
2	GOL	C	503	-	-	2/4/4/4	-
6	EDO	B	408	-	-	0/1/1/1	-
6	EDO	A	508	-	-	0/1/1/1	-
3	PG4	A	502	-	-	3/10/10/10	-
6	EDO	B	406	-	-	1/1/1/1	-
6	EDO	D	401	-	-	0/1/1/1	-
2	GOL	C	502	-	-	2/4/4/4	-
5	AGS	A	504	-	-	2/17/38/38	0/3/3/3
6	EDO	A	511	-	-	0/1/1/1	-
2	GOL	B	402	-	-	2/4/4/4	-
6	EDO	B	405	-	-	0/1/1/1	-
6	EDO	A	514	-	-	0/1/1/1	-
6	EDO	A	509	-	-	0/1/1/1	-
6	EDO	C	507	-	-	0/1/1/1	-
6	EDO	C	509	-	-	0/1/1/1	-
6	EDO	C	510	-	-	1/1/1/1	-
2	GOL	B	401	-	-	0/4/4/4	-
2	GOL	C	504	-	-	0/4/4/4	-
6	EDO	A	512	-	-	1/1/1/1	-
6	EDO	A	513	-	-	0/1/1/1	-
6	EDO	A	507	-	-	0/1/1/1	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	EDO	C	501	-	-	0/1/1/1	-
6	EDO	A	515	-	-	0/1/1/1	-
6	EDO	C	508	-	-	0/1/1/1	-
4	D95	A	503	-	-	3/7/66/66	0/5/4/4
5	AGS	C	505	-	-	5/17/38/38	0/3/3/3
6	EDO	A	506	-	-	0/1/1/1	-
6	EDO	B	407	-	-	0/1/1/1	-
6	EDO	D	403	-	-	0/1/1/1	-
6	EDO	B	404	-	-	1/1/1/1	-
5	AGS	B	403	-	-	4/17/38/38	0/3/3/3
2	GOL	A	501	-	-	0/4/4/4	-
6	EDO	A	505	-	-	0/1/1/1	-
6	EDO	A	510	-	-	0/1/1/1	-
5	AGS	D	402	-	-	5/17/38/38	0/3/3/3
6	EDO	C	511	-	-	0/1/1/1	-

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	D	402	AGS	PG-S1G	5.74	2.03	1.90
5	A	504	AGS	PG-S1G	5.18	2.01	1.90
5	B	403	AGS	PG-S1G	5.05	2.01	1.90
5	C	505	AGS	PG-S1G	4.45	2.00	1.90
5	B	403	AGS	PG-O3G	-4.01	1.42	1.54
5	B	403	AGS	C2'-C1'	-3.93	1.47	1.53
5	C	505	AGS	PG-O3G	-3.89	1.42	1.54
5	C	505	AGS	C2'-C1'	-3.76	1.48	1.53
5	A	504	AGS	PG-O3G	-3.49	1.43	1.54
5	D	402	AGS	PG-O3G	-3.24	1.44	1.54
5	C	505	AGS	C4-N3	-3.09	1.31	1.35
5	D	402	AGS	C2'-C1'	-2.96	1.49	1.53
5	D	402	AGS	O4'-C4'	-2.87	1.38	1.45
5	A	504	AGS	C2'-C1'	-2.82	1.49	1.53
5	B	403	AGS	C4-N3	-2.71	1.31	1.35
5	D	402	AGS	C4-N3	-2.51	1.32	1.35
5	C	505	AGS	C5-N7	-2.49	1.30	1.39
5	A	504	AGS	C4-N3	-2.43	1.32	1.35
5	B	403	AGS	C5-N7	-2.42	1.31	1.39
5	A	504	AGS	C5-N7	-2.36	1.31	1.39
5	B	403	AGS	PA-O2A	-2.33	1.44	1.55
5	B	403	AGS	O4'-C4'	-2.33	1.39	1.45

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	504	AGS	O4'-C4'	-2.31	1.39	1.45
5	A	504	AGS	PA-O2A	-2.23	1.44	1.55
5	C	505	AGS	PA-O2A	-2.21	1.45	1.55
5	D	402	AGS	C5-N7	-2.18	1.31	1.39
5	B	403	AGS	PA-O1A	-2.06	1.43	1.50
5	C	505	AGS	PA-O1A	-2.04	1.43	1.50

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	402	AGS	PA-O3A-PB	-7.36	107.57	132.83
5	A	504	AGS	PA-O3A-PB	-6.41	110.83	132.83
5	C	505	AGS	PA-O3A-PB	-5.36	114.42	132.83
4	A	503	D95	CAI-OAH-CAG	5.35	127.84	115.15
5	B	403	AGS	PA-O3A-PB	-4.38	117.78	132.83
5	B	403	AGS	N3-C2-N1	-3.84	122.68	128.68
5	D	402	AGS	N3-C2-N1	-3.77	122.79	128.68
4	A	503	D95	OAQ-OAP-CAN	3.44	111.56	108.55
5	A	504	AGS	N3-C2-N1	-3.43	123.31	128.68
5	C	505	AGS	O2G-PG-O3B	3.39	115.95	104.64
5	C	505	AGS	N3-C2-N1	-3.10	123.84	128.68
4	A	503	D95	OAP-OAQ-CAJ	3.01	114.26	111.67
5	B	403	AGS	O2G-PG-O3B	2.73	113.76	104.64
5	A	504	AGS	O2B-PB-O1B	2.62	125.21	112.24
5	C	505	AGS	C4-C5-N7	-2.56	106.73	109.40
5	B	403	AGS	C3'-C2'-C1'	2.55	104.81	100.98
5	D	402	AGS	C2'-C3'-C4'	2.53	107.55	102.64
5	A	504	AGS	C2-N1-C6	2.46	122.96	118.75
5	A	504	AGS	O3G-PG-O3B	2.25	112.16	104.64
5	C	505	AGS	C2-N1-C6	2.23	122.57	118.75
4	A	503	D95	OAH-CAI-CAJ	2.21	114.96	112.62
5	D	402	AGS	C4-C5-N7	-2.20	107.11	109.40
5	B	403	AGS	C4-C5-N7	-2.20	107.11	109.40
5	D	402	AGS	C2-N1-C6	2.12	122.39	118.75
5	A	504	AGS	C4-C5-N7	-2.12	107.19	109.40
4	A	503	D95	CAM-CAL-CAK	2.10	119.27	114.72
5	B	403	AGS	C2-N1-C6	2.10	122.34	118.75

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	402	GOL	O1-C1-C2-C3
4	A	503	D95	OAU-CAT-OAS-CAG
5	A	504	AGS	O4'-C4'-C5'-O5'
5	A	504	AGS	C3'-C4'-C5'-O5'
5	C	505	AGS	O4'-C4'-C5'-O5'
5	C	505	AGS	C3'-C4'-C5'-O5'
5	D	402	AGS	C5'-O5'-PA-O2A
5	B	403	AGS	C3'-C4'-C5'-O5'
5	B	403	AGS	O4'-C4'-C5'-O5'
5	D	402	AGS	O4'-C4'-C5'-O5'
5	D	402	AGS	C3'-C4'-C5'-O5'
2	C	502	GOL	O1-C1-C2-C3
2	C	503	GOL	O1-C1-C2-C3
3	A	502	PG4	O3-C5-C6-O4
4	A	503	D95	CAV-CAT-OAS-CAG
2	C	502	GOL	O2-C2-C3-O3
2	C	503	GOL	O1-C1-C2-O2
2	B	402	GOL	O1-C1-C2-O2
5	D	402	AGS	C5'-O5'-PA-O3A
5	B	403	AGS	PB-O3A-PA-O2A
5	D	402	AGS	C5'-O5'-PA-O1A
3	A	502	PG4	O4-C7-C8-O5
6	C	510	EDO	O1-C1-C2-O2
3	A	502	PG4	O2-C3-C4-O3
6	B	404	EDO	O1-C1-C2-O2
5	C	505	AGS	PG-O3B-PB-O2B
5	C	505	AGS	PB-O3B-PG-O3G
4	A	503	D95	CAT-CAV-CAW-CAX
6	A	512	EDO	O1-C1-C2-O2
6	B	406	EDO	O1-C1-C2-O2
5	B	403	AGS	PB-O3A-PA-O1A
5	C	505	AGS	C5'-O5'-PA-O1A

There are no ring outliers.

7 monomers are involved in 7 short contacts:

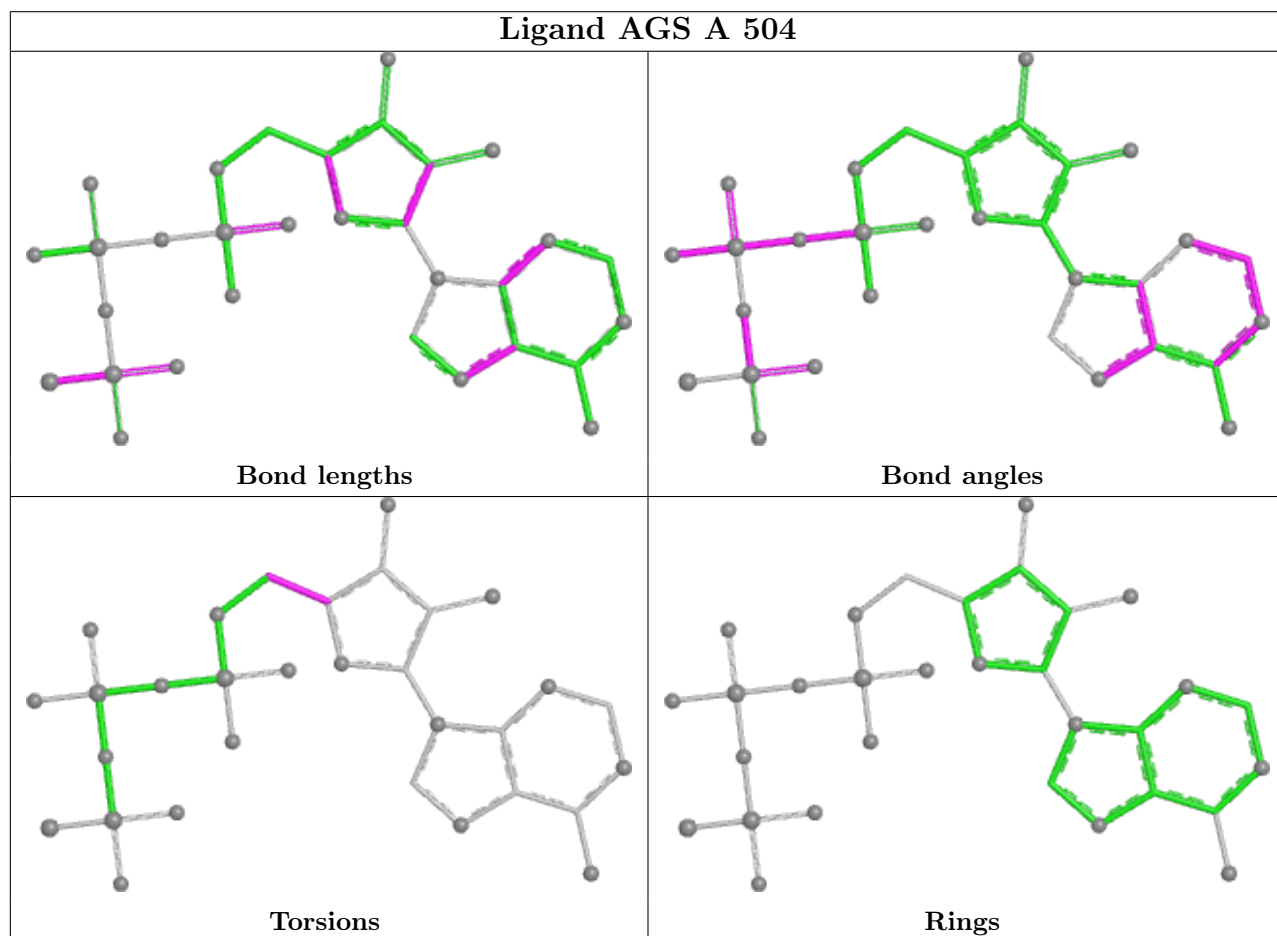
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	408	EDO	1	0
5	A	504	AGS	1	0
6	A	509	EDO	1	0
5	C	505	AGS	1	0
5	B	403	AGS	1	0
2	A	501	GOL	1	0

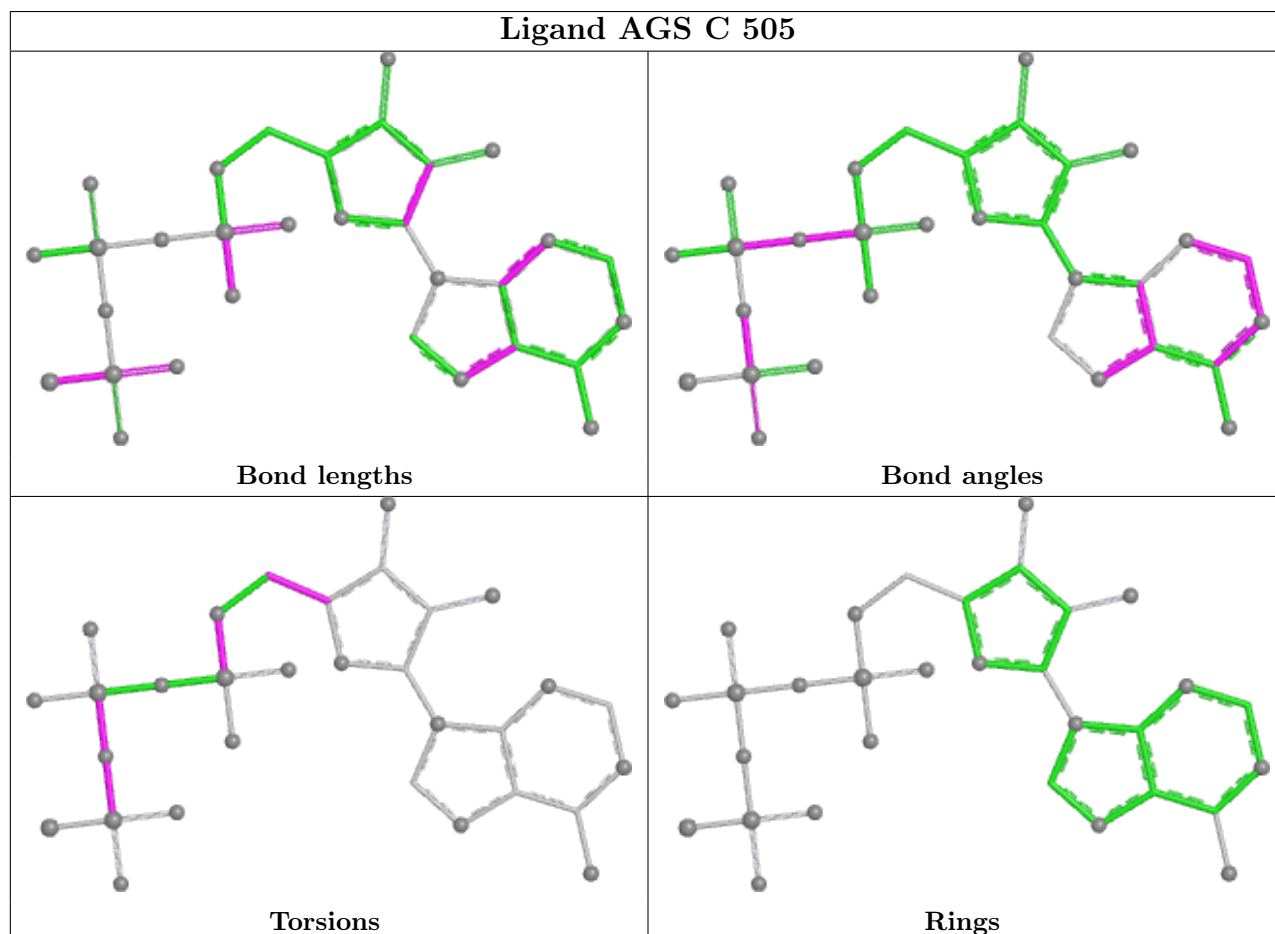
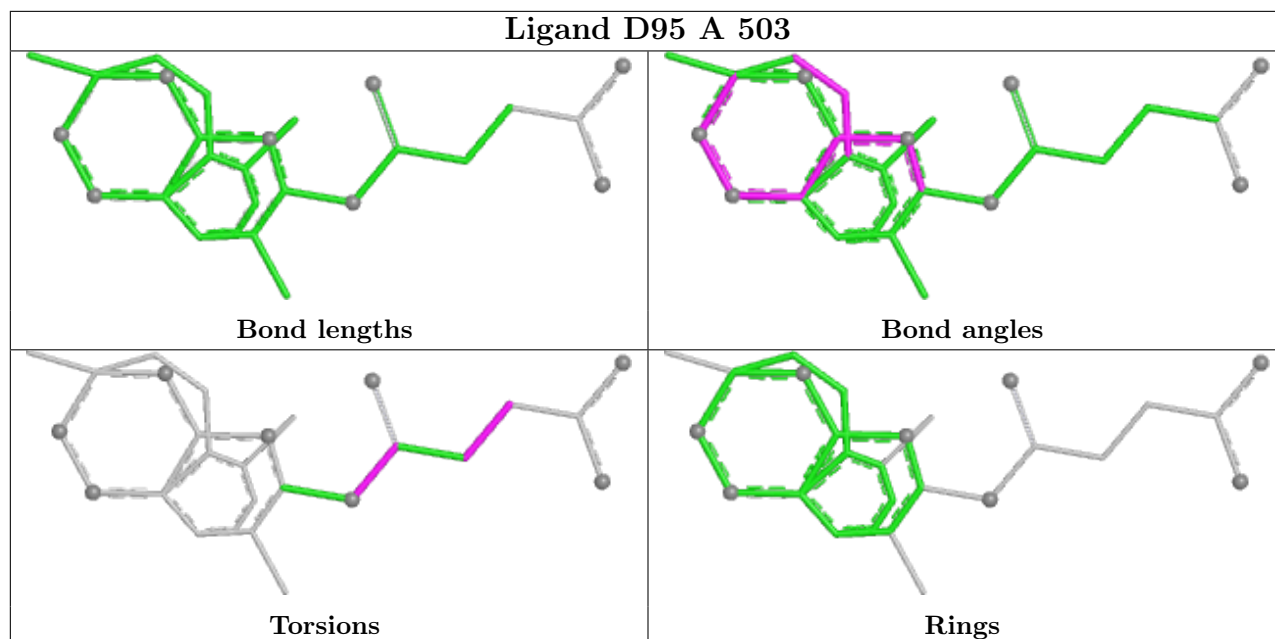
Continued on next page...

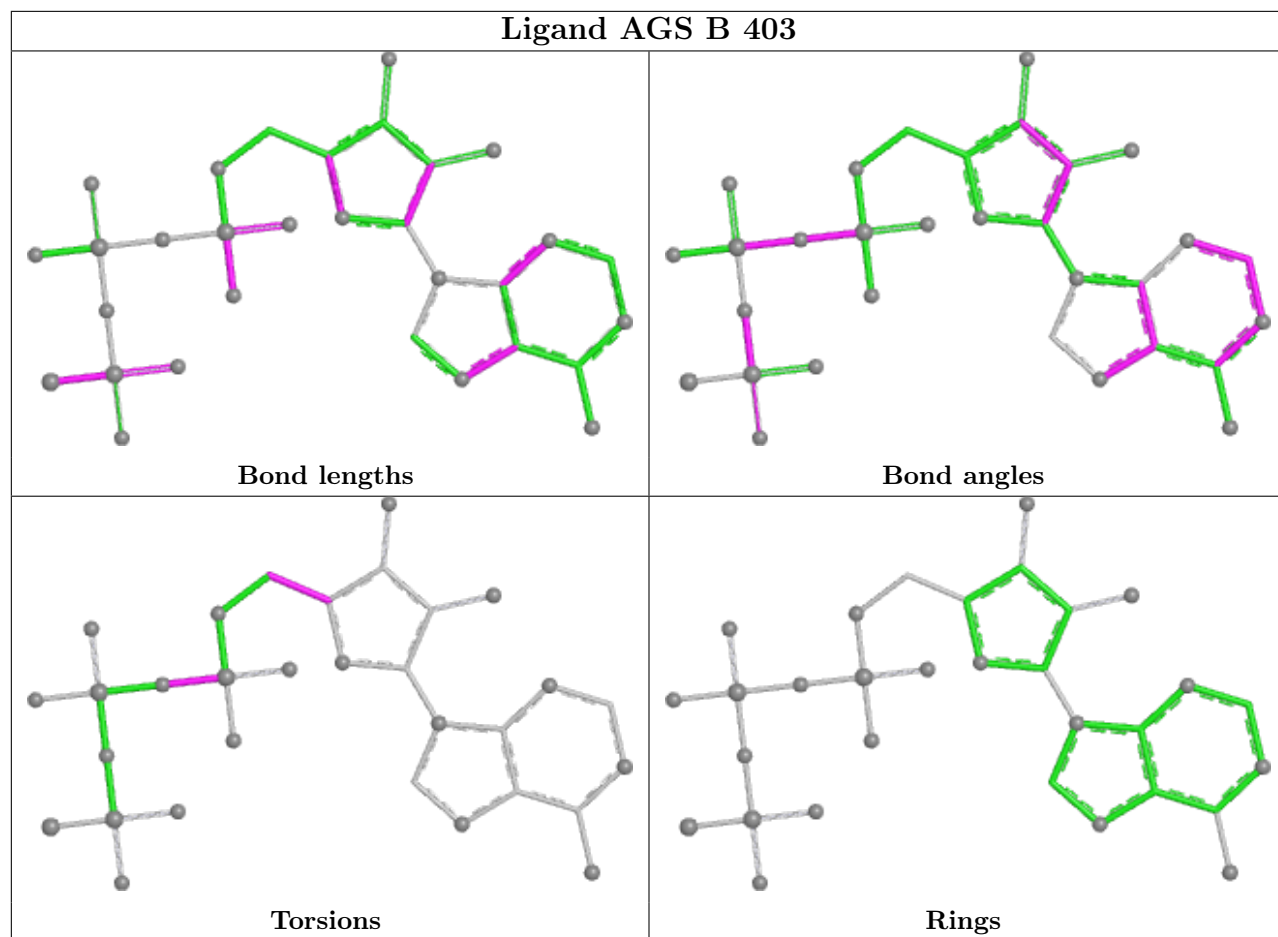
Continued from previous page...

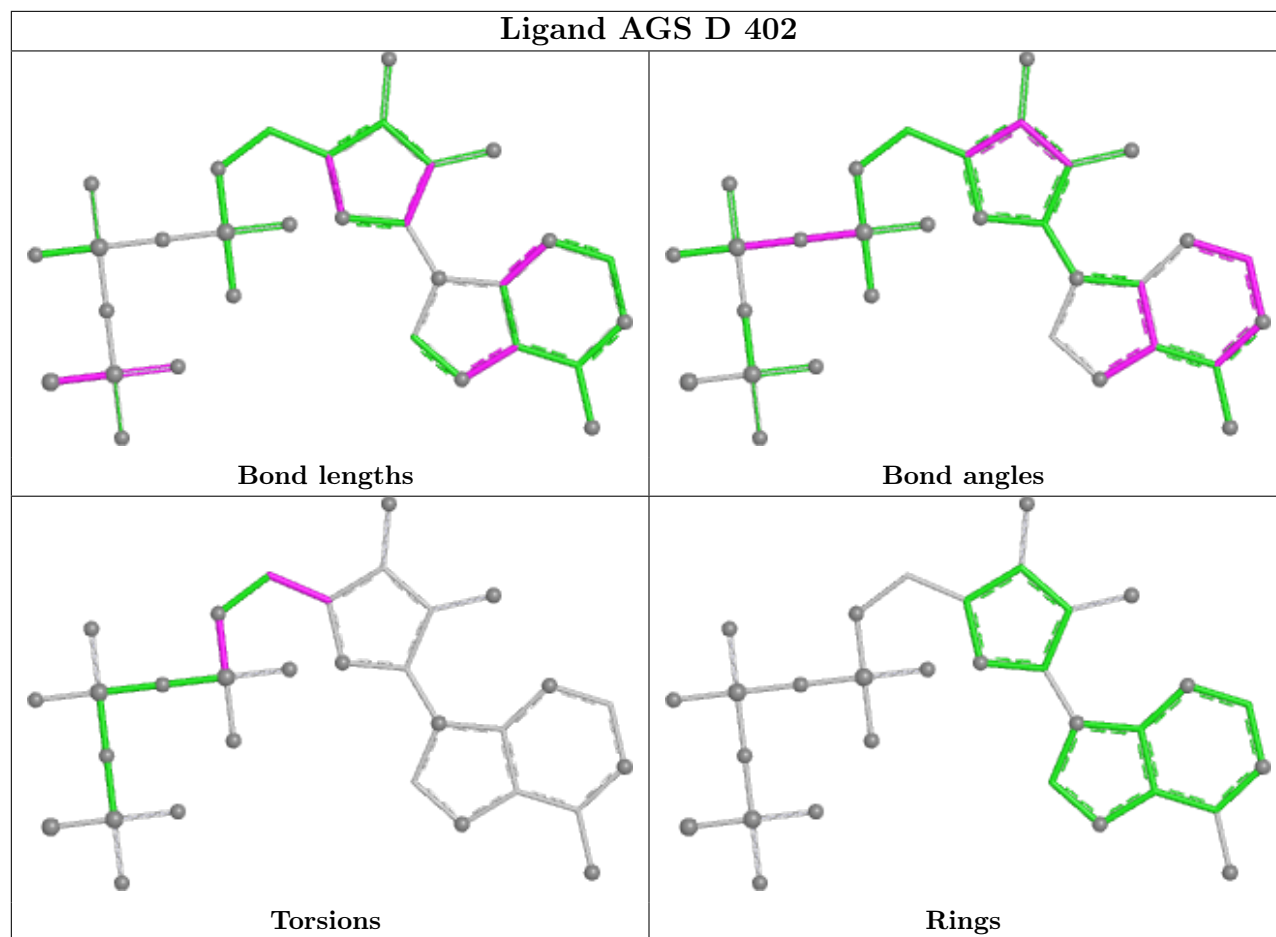
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	402	AGS	1	0

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

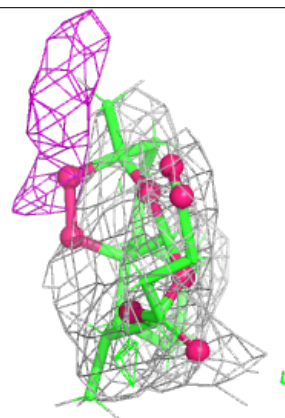
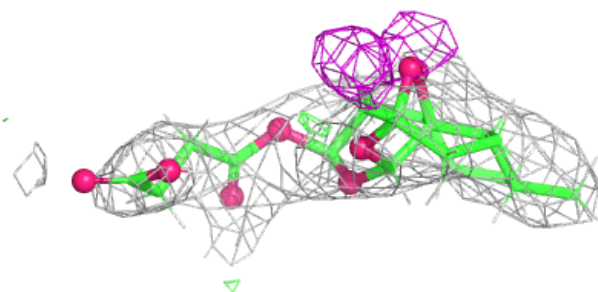
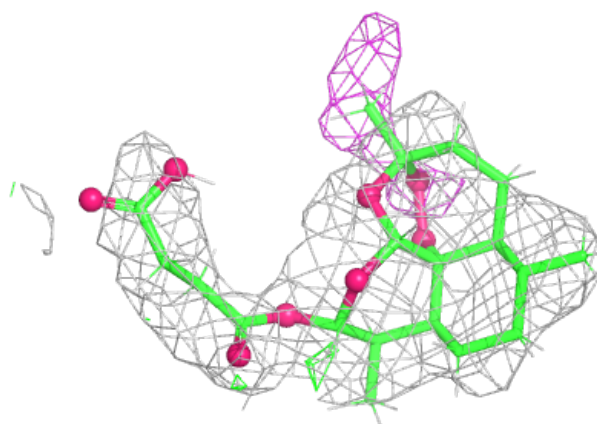
6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

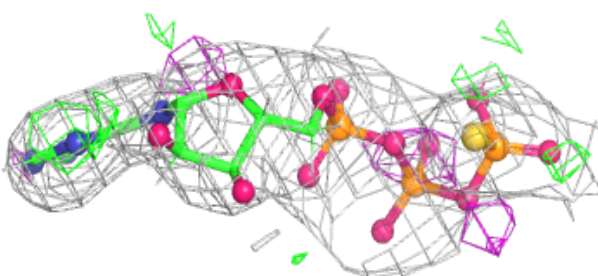
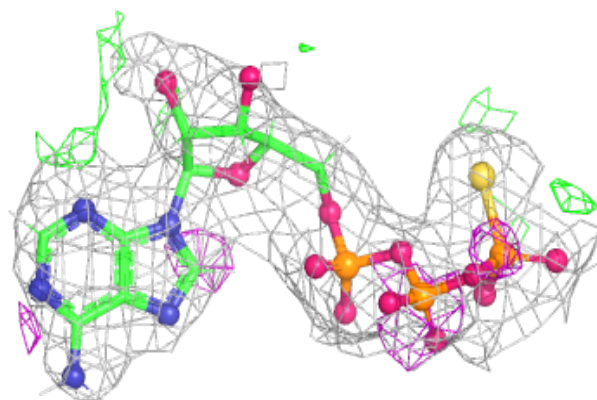
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around D95 A 503:

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

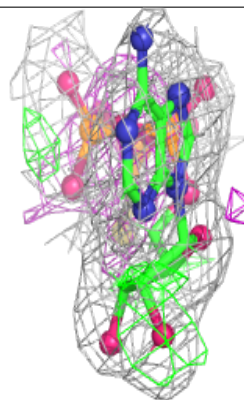
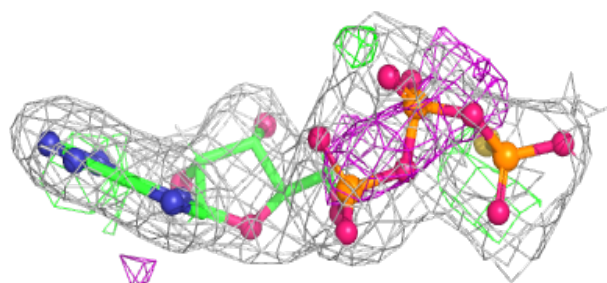
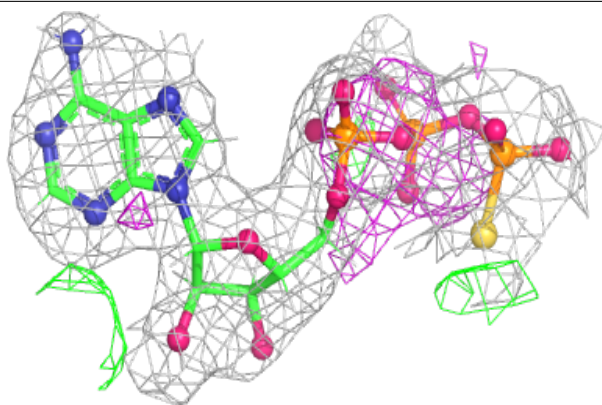
**Electron density around AGS A 504:**

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

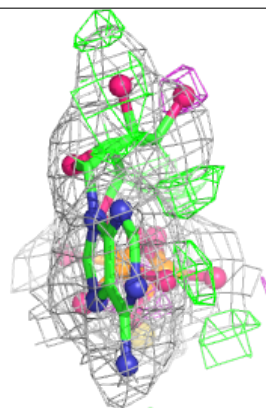
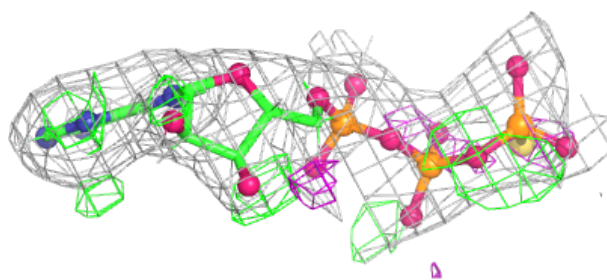
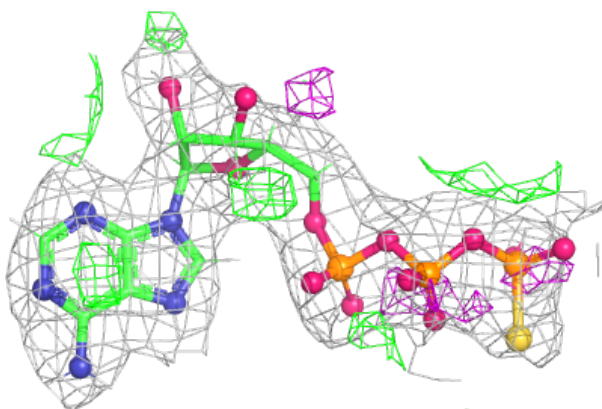


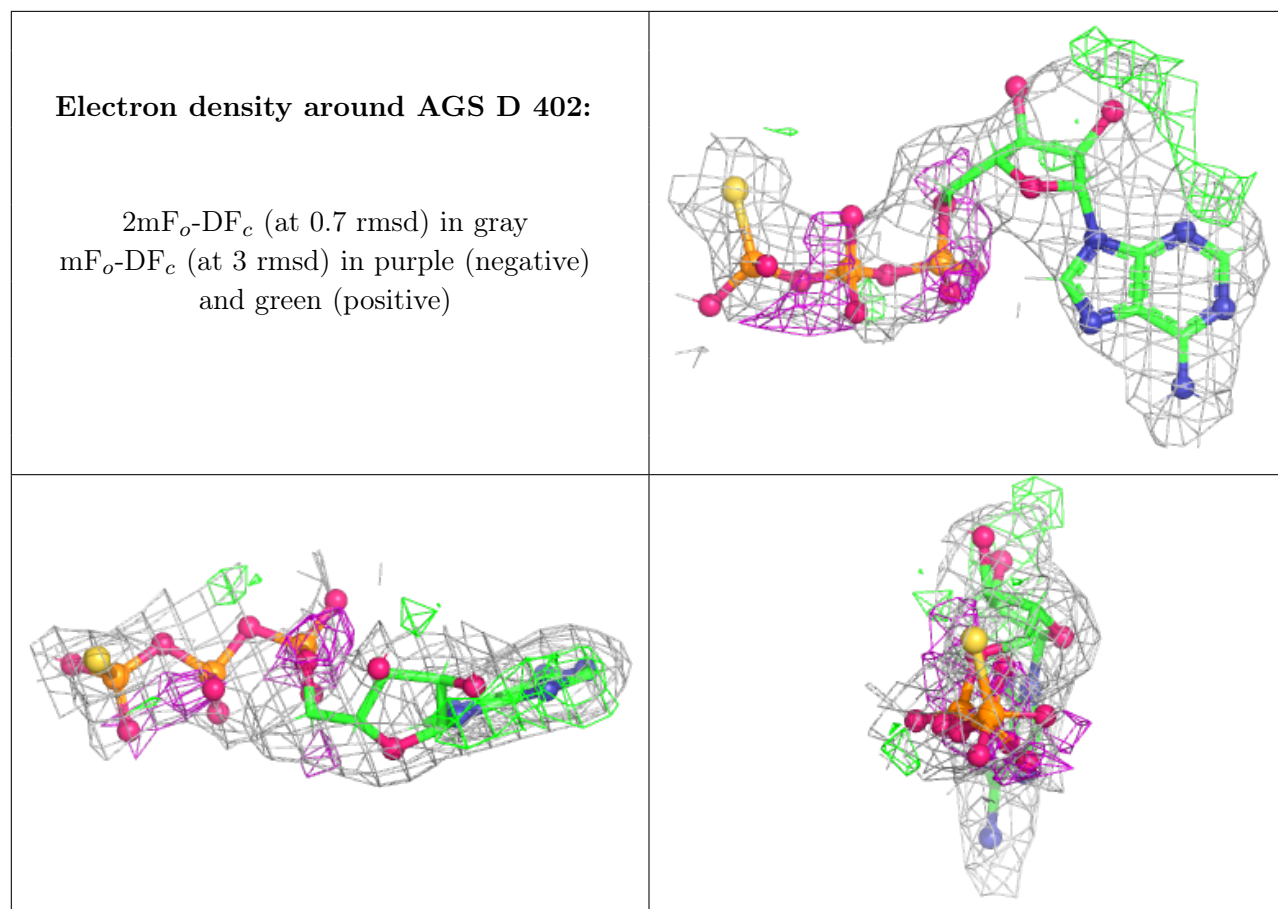
Electron density around AGS B 403:

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

**Electron density around AGS C 505:**

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





6.5 Other polymers [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.