



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 07:39 PM JST

PDB ID : 7XTO
Title : Structure of CIA2 reveal the Mechanism of soil bacterial derived chlorinase
Authors : Liu, Y.H.; Liu, Y.; Li, Y.
Deposited on : 2022-05-17
Resolution : 2.48 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

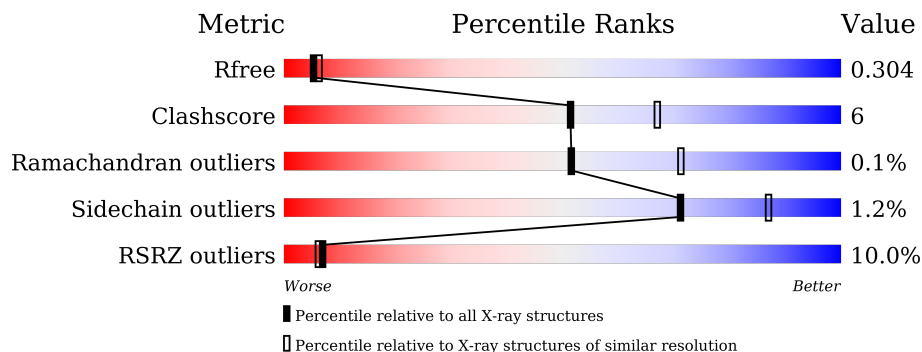
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.48 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	5857 (2.50-2.46)
Clashscore	141614	6594 (2.50-2.46)
Ramachandran outliers	138981	6469 (2.50-2.46)
Sidechain outliers	138945	6471 (2.50-2.46)
RSRZ outliers	127900	5738 (2.50-2.46)

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	276	
1	B	276	
1	C	276	
1	D	276	
1	E	276	
1	F	276	

2 Entry composition [i](#)

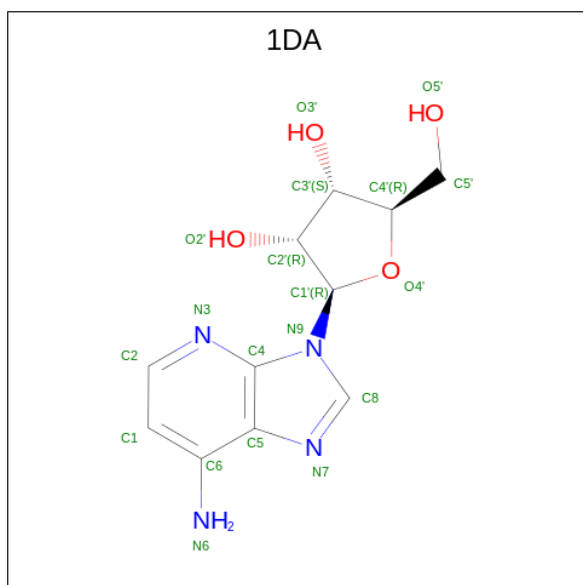
There are 3 unique types of molecules in this entry. The entry contains 10672 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 soil bacterial derived chlorinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	245	Total 1706	C 1083	N 293	O 322	S 8	0	0	0
1	C	248	Total 1711	C 1084	N 293	O 326	S 8	0	0	0
1	D	248	Total 1747	C 1106	N 303	O 330	S 8	0	0	0
1	B	252	Total 1752	C 1113	N 299	O 332	S 8	0	0	0
1	E	247	Total 1705	C 1076	N 298	O 323	S 8	0	0	0
1	F	244	Total 1698	C 1075	N 293	O 322	S 8	0	0	0

- Molecule 2 is 1-DEAZA-ADENOSINE (three-letter code: 1DA) (formula: $C_{11}H_{14}N_4O_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			19	11	4	4		
2	C	1	Total	C	N	O	0	0
			19	11	4	4		
2	D	1	Total	C	N	O	0	0
			19	11	4	4		
2	B	1	Total	C	N	O	0	0
			19	11	4	4		
2	E	1	Total	C	N	O	0	0
			19	11	4	4		
2	F	1	Total	C	N	O	0	0
			19	11	4	4		

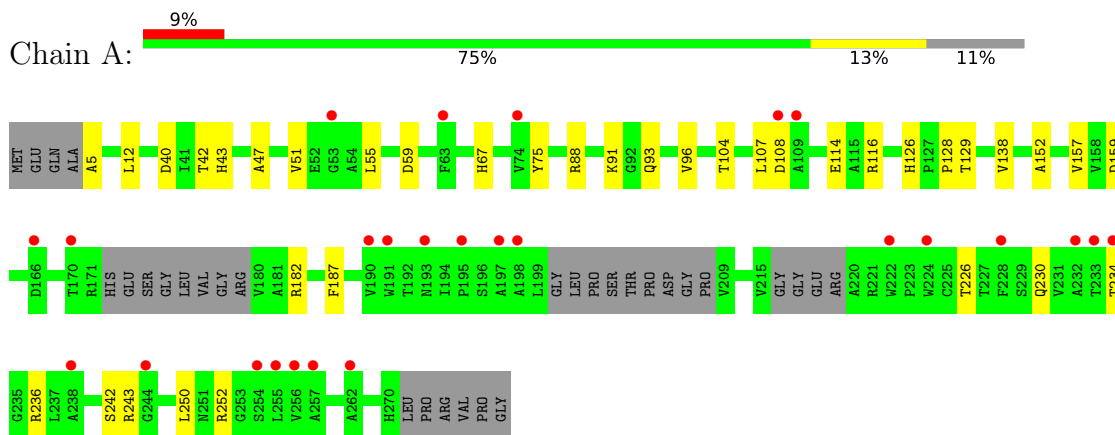
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	37	Total	O	0	0
			37	37		
3	C	39	Total	O	0	0
			39	39		
3	D	56	Total	O	0	0
			56	56		
3	B	28	Total	O	0	0
			28	28		
3	E	31	Total	O	0	0
			31	31		
3	F	48	Total	O	0	0
			48	48		

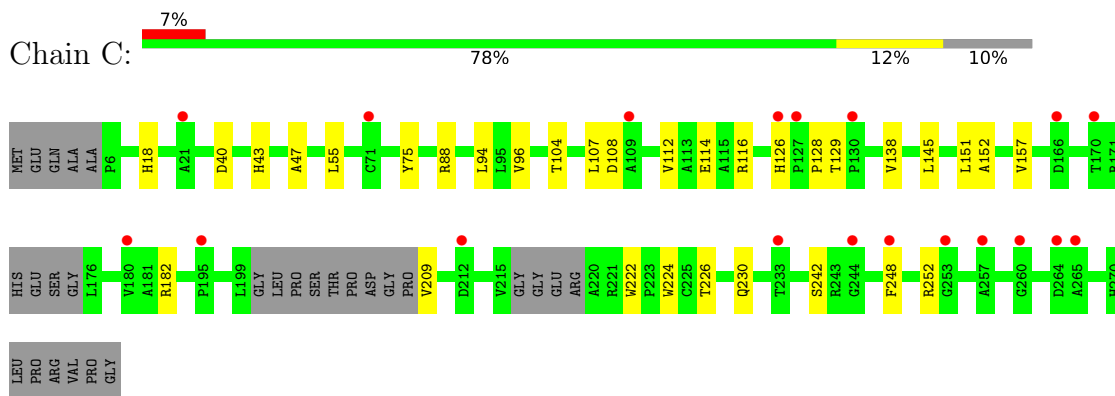
3 Residue-property plots [i](#)

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.

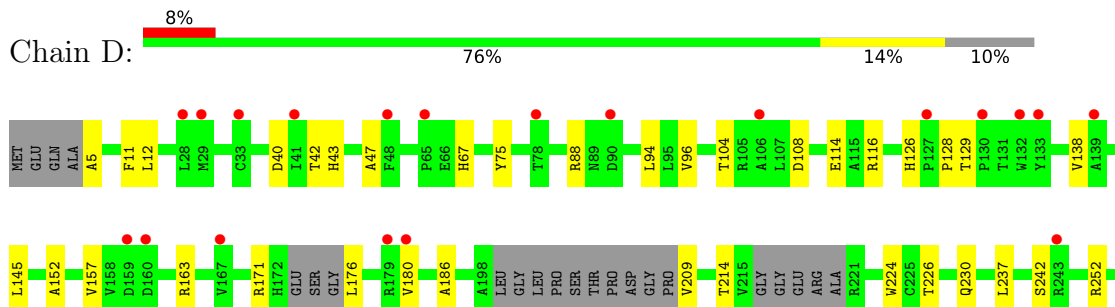
- Molecule 1: soil bacterial derived chlorinase

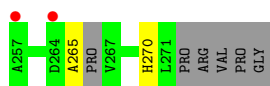


- Molecule 1: soil bacterial derived chlorinase

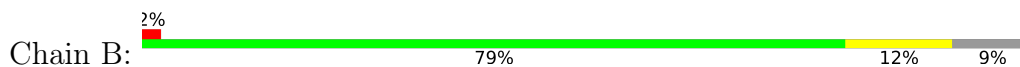


- Molecule 1: soil bacterial derived chlorinase

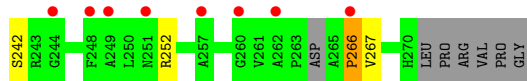
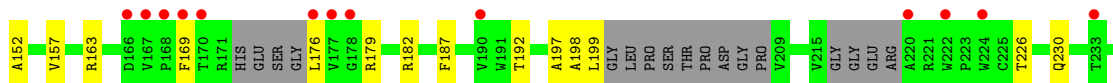
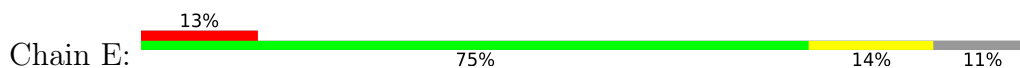




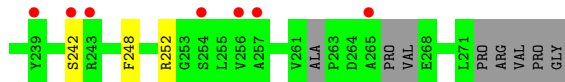
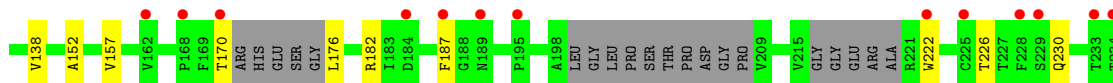
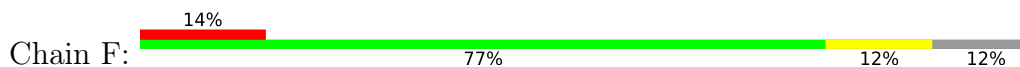
- Molecule 1: soil bacterial derived chlorinase



- Molecule 1: soil bacterial derived chlorinase



- Molecule 1: soil bacterial derived chlorinase



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	181.38Å 104.42Å 124.97Å 90.00° 108.88° 90.00°	Depositor
Resolution (Å)	24.99 – 2.48 66.07 – 2.48	Depositor EDS
% Data completeness (in resolution range)	86.8 (24.99-2.48) 87.2 (66.07-2.48)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.63 (at 2.48Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.278 , 0.304 0.278 , 0.304	Depositor DCC
R_{free} test set	3353 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å ²)	36.1	Xtrriage
Anisotropy	0.856	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 79.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	10672	wwPDB-VP
Average B, all atoms (Å ²)	44.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 56.41 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.7473e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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 i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section:
1DA

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	0.30	0/1745	0.59	1/2407 (0.0%)
1	B	0.30	0/1792	0.59	1/2473 (0.0%)
1	C	0.29	0/1750	0.58	1/2417 (0.0%)
1	D	0.32	0/1785	0.59	1/2460 (0.0%)
1	E	0.34	0/1744	0.61	2/2404 (0.1%)
1	F	0.31	0/1735	0.59	1/2389 (0.0%)
All	All	0.31	0/10551	0.59	7/14550 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1
1	E	0	1
All	All	0	2

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	266	PRO	N-CA-C	5.83	127.26	112.10
1	F	47	ALA	C-N-CA	5.06	134.35	121.70
1	B	47	ALA	C-N-CA	5.06	134.35	121.70
1	E	47	ALA	C-N-CA	5.06	134.35	121.70
1	C	47	ALA	C-N-CA	5.06	134.34	121.70
1	A	47	ALA	C-N-CA	5.04	134.30	121.70
1	D	47	ALA	C-N-CA	5.04	134.29	121.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	198	ALA	Mainchain
1	E	198	ALA	Mainchain

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	1706	0	1578	21	0
1	B	1752	0	1625	19	0
1	C	1711	0	1570	20	0
1	D	1747	0	1639	20	0
1	E	1705	0	1554	19	0
1	F	1698	0	1552	23	0
2	A	19	0	14	1	0
2	B	19	0	14	2	0
2	C	19	0	14	1	0
2	D	19	0	14	2	0
2	E	19	0	14	2	0
2	F	19	0	14	1	0
3	A	37	0	0	0	0
3	B	28	0	0	0	0
3	C	39	0	0	1	0
3	D	56	0	0	0	0
3	E	31	0	0	0	1
3	F	48	0	0	0	1
All	All	10672	0	9602	113	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 6.

All (113) 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:F:103:LEU:HB3	1:F:107:LEU:HD23	1.52	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:88:ARG:NH2	1:E:114:GLU:OE1	2.07	0.86
1:E:129:THR:HG21	1:F:242:SER:HA	1.58	0.84
1:C:252:ARG:NH1	3:C:401:HOH:O	2.12	0.83
1:A:129:THR:HG21	1:C:242:SER:HA	1.60	0.82
1:A:59:ASP:OD2	1:A:243:ARG:NE	2.12	0.81
1:D:209:VAL:HG23	1:D:224:TRP:HB3	1.63	0.80
1:C:94:LEU:HD23	1:C:145:LEU:HD13	1.67	0.77
1:A:242:SER:HA	1:D:129:THR:HG21	1.66	0.76
1:B:242:SER:HA	1:F:129:THR:HG21	1.67	0.76
1:D:88:ARG:NH2	1:D:114:GLU:OE1	2.19	0.76
2:A:301:1DA:H1	1:C:252:ARG:H	1.49	0.75
1:B:129:THR:HG21	1:E:242:SER:HA	1.68	0.73
2:E:301:1DA:H1	1:F:252:ARG:H	1.54	0.72
1:C:129:THR:HG21	1:D:242:SER:HA	1.70	0.72
1:D:108:ASP:OD1	1:D:163:ARG:NH1	2.22	0.72
1:E:108:ASP:OD1	1:E:163:ARG:NH2	2.25	0.69
1:B:252:ARG:H	2:F:301:1DA:H1	1.58	0.68
1:A:88:ARG:NH2	1:A:114:GLU:OE1	2.29	0.66
1:A:252:ARG:H	2:D:301:1DA:H1	1.60	0.66
1:C:209:VAL:HG23	1:C:224:TRP:HB3	1.78	0.66
1:E:226:THR:N	1:E:230:GLN:OE1	2.30	0.65
1:F:226:THR:N	1:F:230:GLN:OE1	2.30	0.65
1:B:226:THR:N	1:B:230:GLN:OE1	2.30	0.65
1:D:126:HIS:O	1:D:128:PRO:HD3	1.99	0.63
1:F:126:HIS:O	1:F:128:PRO:HD3	1.98	0.63
1:A:126:HIS:O	1:A:128:PRO:HD3	1.98	0.63
1:B:126:HIS:O	1:B:128:PRO:HD3	1.98	0.63
1:A:226:THR:N	1:A:230:GLN:OE1	2.30	0.63
1:C:126:HIS:O	1:C:128:PRO:HD3	1.98	0.63
1:C:226:THR:N	1:C:230:GLN:OE1	2.30	0.62
2:C:301:1DA:H1	1:D:252:ARG:H	1.65	0.62
1:E:126:HIS:O	1:E:128:PRO:HD3	1.98	0.62
2:B:301:1DA:H1	1:E:252:ARG:H	1.64	0.62
1:D:226:THR:N	1:D:230:GLN:OE1	2.30	0.62
1:B:186:ALA:HB2	1:F:18:HIS:CE1	2.34	0.61
1:F:103:LEU:HB3	1:F:107:LEU:CD2	2.29	0.60
1:B:96:VAL:HG12	1:B:138:VAL:HG13	1.83	0.60
1:A:96:VAL:HG12	1:A:138:VAL:HG13	1.83	0.60
1:C:96:VAL:HG12	1:C:138:VAL:HG13	1.83	0.59
1:D:171:ARG:HA	1:D:176:LEU:HD12	1.83	0.59
1:E:96:VAL:HG12	1:E:138:VAL:HG13	1.83	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:96:VAL:HG12	1:F:138:VAL:HG13	1.83	0.59
1:D:96:VAL:HG12	1:D:138:VAL:HG13	1.83	0.59
1:B:7:ARG:NH1	1:B:94:LEU:HD13	2.18	0.58
1:F:103:LEU:O	1:F:107:LEU:HD23	2.04	0.57
1:C:88:ARG:HH21	1:C:151:LEU:HD23	1.69	0.57
1:D:94:LEU:HD23	1:D:145:LEU:HB3	1.86	0.57
1:E:197:ALA:C	1:E:199:LEU:H	2.11	0.54
1:A:40:ASP:OD1	1:A:43:HIS:NE2	2.37	0.54
1:F:87:VAL:HG11	1:F:107:LEU:HD11	1.90	0.54
1:C:107:LEU:HD13	1:C:112:VAL:HG22	1.91	0.52
1:F:55:LEU:HB3	1:F:182:ARG:HD2	1.92	0.52
1:A:91:LYS:HE2	1:A:93:GLN:NE2	2.25	0.51
1:F:107:LEU:HD12	1:F:112:VAL:HG22	1.92	0.51
1:D:180:VAL:CG1	1:D:265:ALA:H	2.24	0.51
1:B:176:LEU:HB2	1:B:269:VAL:HB	1.92	0.50
1:E:40:ASP:OD1	1:E:43:HIS:NE2	2.37	0.50
1:C:40:ASP:OD1	1:C:43:HIS:NE2	2.38	0.49
1:B:5:ALA:O	1:B:67:HIS:NE2	2.43	0.49
1:F:40:ASP:OD1	1:F:43:HIS:NE2	2.37	0.49
1:B:118:VAL:HA	1:B:154:VAL:HG13	1.95	0.49
1:C:55:LEU:HB3	1:C:182:ARG:HD2	1.95	0.49
1:C:222:TRP:CD2	1:C:248:PHE:HD2	2.31	0.49
1:B:55:LEU:HB3	1:B:182:ARG:HD2	1.95	0.49
1:E:55:LEU:HB3	1:E:182:ARG:HD2	1.94	0.49
1:B:108:ASP:OD1	1:B:163:ARG:NH1	2.46	0.48
1:B:186:ALA:HB2	1:F:18:HIS:HE1	1.76	0.48
1:C:88:ARG:NH2	1:C:114:GLU:OE1	2.47	0.48
1:B:40:ASP:OD1	1:B:43:HIS:NE2	2.38	0.48
1:C:18:HIS:HE1	1:D:186:ALA:HB2	1.78	0.48
1:D:40:ASP:OD1	1:D:43:HIS:NE2	2.38	0.46
1:A:55:LEU:HB3	1:A:182:ARG:HD2	1.98	0.46
1:F:170:THR:O	1:F:176:LEU:HA	2.16	0.46
1:B:116:ARG:NE	1:B:152:ALA:HA	2.31	0.46
1:A:107:LEU:HD23	1:A:107:LEU:HA	1.72	0.45
1:F:5:ALA:O	1:F:67:HIS:NE2	2.44	0.45
1:D:5:ALA:O	1:D:67:HIS:NE2	2.45	0.45
1:C:116:ARG:NE	1:C:152:ALA:HA	2.31	0.45
1:A:116:ARG:NE	1:A:152:ALA:HA	2.31	0.45
1:D:116:ARG:NE	1:D:152:ALA:HA	2.31	0.45
1:F:116:ARG:NE	1:F:152:ALA:HA	2.31	0.45
1:A:116:ARG:NH1	1:A:157:VAL:HG23	2.32	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:116:ARG:NE	1:E:152:ALA:HA	2.31	0.45
1:B:116:ARG:NH1	1:B:157:VAL:HG23	2.32	0.44
1:A:187:PHE:CZ	2:D:301:1DA:H2'	2.53	0.44
1:E:116:ARG:NH1	1:E:157:VAL:HG23	2.32	0.44
1:C:116:ARG:NH1	1:C:157:VAL:HG23	2.32	0.44
2:E:301:1DA:H2'	1:F:187:PHE:CZ	2.52	0.44
1:F:116:ARG:NH1	1:F:157:VAL:HG23	2.32	0.44
1:D:116:ARG:NH1	1:D:157:VAL:HG23	2.32	0.44
1:F:107:LEU:HD13	1:F:107:LEU:HA	1.80	0.44
2:B:301:1DA:H2'	1:E:187:PHE:CZ	2.52	0.44
1:E:169:PHE:CE2	1:E:176:LEU:HD22	2.53	0.43
1:D:214:THR:HG23	1:D:270:HIS:NE2	2.33	0.43
1:B:104:THR:O	1:B:108:ASP:OD2	2.37	0.43
1:A:104:THR:O	1:A:108:ASP:OD2	2.37	0.43
1:D:104:THR:O	1:D:108:ASP:OD2	2.37	0.43
1:F:104:THR:O	1:F:108:ASP:OD2	2.37	0.42
1:E:104:THR:O	1:E:108:ASP:OD2	2.37	0.42
1:C:104:THR:O	1:C:108:ASP:OD2	2.37	0.42
1:A:51:VAL:O	1:A:55:LEU:HG	2.20	0.42
1:E:46:PRO:HD2	1:E:52:GLU:HG2	2.01	0.42
1:A:236:ARG:HA	1:A:250:LEU:HD23	2.02	0.42
1:C:222:TRP:CE3	1:C:248:PHE:HD2	2.38	0.42
1:B:233:THR:HG22	1:B:234:THR:HG23	2.02	0.41
1:A:5:ALA:O	1:A:67:HIS:NE2	2.48	0.40
1:A:234:THR:O	1:A:250:LEU:HD22	2.20	0.40
1:A:12:LEU:HA	1:A:42:THR:O	2.22	0.40
1:D:12:LEU:HA	1:D:42:THR:O	2.22	0.40
1:E:12:LEU:HA	1:E:42:THR:O	2.22	0.40
1:E:179:ARG:O	1:E:192:THR:HA	2.21	0.40
1:F:222:TRP:CD2	1:F:248:PHE:HD2	2.39	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)
3:E:421:HOH:O	3:F:440:HOH:O[4_555]	2.17	0.03

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	237/276 (86%)	230 (97%)	7 (3%)	0	100	100
1	B	244/276 (88%)	237 (97%)	7 (3%)	0	100	100
1	C	240/276 (87%)	232 (97%)	8 (3%)	0	100	100
1	D	238/276 (86%)	231 (97%)	7 (3%)	0	100	100
1	E	237/276 (86%)	227 (96%)	8 (3%)	2 (1%)	19	33
1	F	232/276 (84%)	225 (97%)	7 (3%)	0	100	100
All	All	1428/1656 (86%)	1382 (97%)	44 (3%)	2 (0%)	51	71

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	266	PRO
1	E	267	VAL

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	161/217 (74%)	159 (99%)	2 (1%)	71	87
1	B	166/217 (76%)	164 (99%)	2 (1%)	71	87
1	C	161/217 (74%)	160 (99%)	1 (1%)	86	94
1	D	170/217 (78%)	167 (98%)	3 (2%)	59	80
1	E	158/217 (73%)	155 (98%)	3 (2%)	57	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	159/217 (73%)	158 (99%)	1 (1%)	86	94
All	All	975/1302 (75%)	963 (99%)	12 (1%)	71	87

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	75	TYR
1	A	159	ASP
1	C	75	TYR
1	D	11	PHE
1	D	75	TYR
1	D	237	LEU
1	B	11	PHE
1	B	75	TYR
1	E	11	PHE
1	E	18	HIS
1	E	75	TYR
1	F	75	TYR

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

Mol	Chain	Res	Type
1	F	18	HIS

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

6 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
2	1DA	D	301	-	18,21,21	1.17	2 (11%)	19,31,31	1.65	5 (26%)
2	1DA	A	301	-	18,21,21	1.17	2 (11%)	19,31,31	1.65	5 (26%)
2	1DA	B	301	-	18,21,21	1.18	2 (11%)	19,31,31	1.65	5 (26%)
2	1DA	E	301	-	18,21,21	1.17	2 (11%)	19,31,31	1.65	5 (26%)
2	1DA	F	301	-	18,21,21	1.17	2 (11%)	19,31,31	1.65	5 (26%)
2	1DA	C	301	-	18,21,21	1.17	2 (11%)	19,31,31	1.65	5 (26%)

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
2	1DA	D	301	-	-	2/2/22/22	0/3/3/3
2	1DA	A	301	-	-	2/2/22/22	0/3/3/3
2	1DA	B	301	-	-	2/2/22/22	0/3/3/3
2	1DA	E	301	-	-	2/2/22/22	0/3/3/3
2	1DA	F	301	-	-	2/2/22/22	0/3/3/3
2	1DA	C	301	-	-	2/2/22/22	0/3/3/3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	301	1DA	C6-C5	-2.32	1.38	1.42
2	D	301	1DA	C6-C5	-2.32	1.38	1.42
2	B	301	1DA	C6-C5	-2.32	1.38	1.42
2	A	301	1DA	C6-C5	-2.32	1.38	1.42
2	C	301	1DA	C6-C5	-2.32	1.38	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	1DA	C6-C5	-2.32	1.38	1.42
2	B	301	1DA	C6-N6	2.25	1.45	1.38
2	D	301	1DA	C6-N6	2.25	1.45	1.38
2	A	301	1DA	C6-N6	2.25	1.45	1.38
2	C	301	1DA	C6-N6	2.25	1.45	1.38
2	E	301	1DA	C6-N6	2.25	1.45	1.38
2	F	301	1DA	C6-N6	2.25	1.45	1.38

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	1DA	C5-C6-N6	3.47	124.68	118.07
2	F	301	1DA	C5-C6-N6	3.46	124.67	118.07
2	B	301	1DA	C5-C6-N6	3.46	124.67	118.07
2	D	301	1DA	C5-C6-N6	3.46	124.67	118.07
2	C	301	1DA	C5-C6-N6	3.46	124.67	118.07
2	A	301	1DA	C5-C6-N6	3.46	124.67	118.07
2	B	301	1DA	C1-C2-N3	-3.09	119.80	124.58
2	C	301	1DA	C1-C2-N3	-3.08	119.80	124.58
2	F	301	1DA	C1-C2-N3	-3.08	119.80	124.58
2	D	301	1DA	C1-C2-N3	-3.08	119.81	124.58
2	A	301	1DA	C1-C2-N3	-3.08	119.81	124.58
2	E	301	1DA	C1-C2-N3	-3.08	119.81	124.58
2	B	301	1DA	C2-N3-C4	2.70	120.12	116.77
2	E	301	1DA	C2-N3-C4	2.70	120.12	116.77
2	C	301	1DA	C2-N3-C4	2.70	120.12	116.77
2	D	301	1DA	C2-N3-C4	2.70	120.12	116.77
2	F	301	1DA	C2-N3-C4	2.70	120.12	116.77
2	A	301	1DA	C2-N3-C4	2.69	120.11	116.77
2	E	301	1DA	C1'-N9-C4	-2.57	122.13	126.64
2	D	301	1DA	C1'-N9-C4	-2.57	122.13	126.64
2	B	301	1DA	C1'-N9-C4	-2.57	122.13	126.64
2	A	301	1DA	C1'-N9-C4	-2.57	122.13	126.64
2	C	301	1DA	C1'-N9-C4	-2.57	122.13	126.64
2	F	301	1DA	C1'-N9-C4	-2.56	122.14	126.64
2	B	301	1DA	C1-C6-N6	-2.55	115.26	120.36
2	E	301	1DA	C1-C6-N6	-2.55	115.26	120.36
2	A	301	1DA	C1-C6-N6	-2.55	115.27	120.36
2	F	301	1DA	C1-C6-N6	-2.55	115.27	120.36
2	C	301	1DA	C1-C6-N6	-2.55	115.27	120.36
2	D	301	1DA	C1-C6-N6	-2.55	115.27	120.36

There are no chirality outliers.

All (12) torsion outliers are listed below:

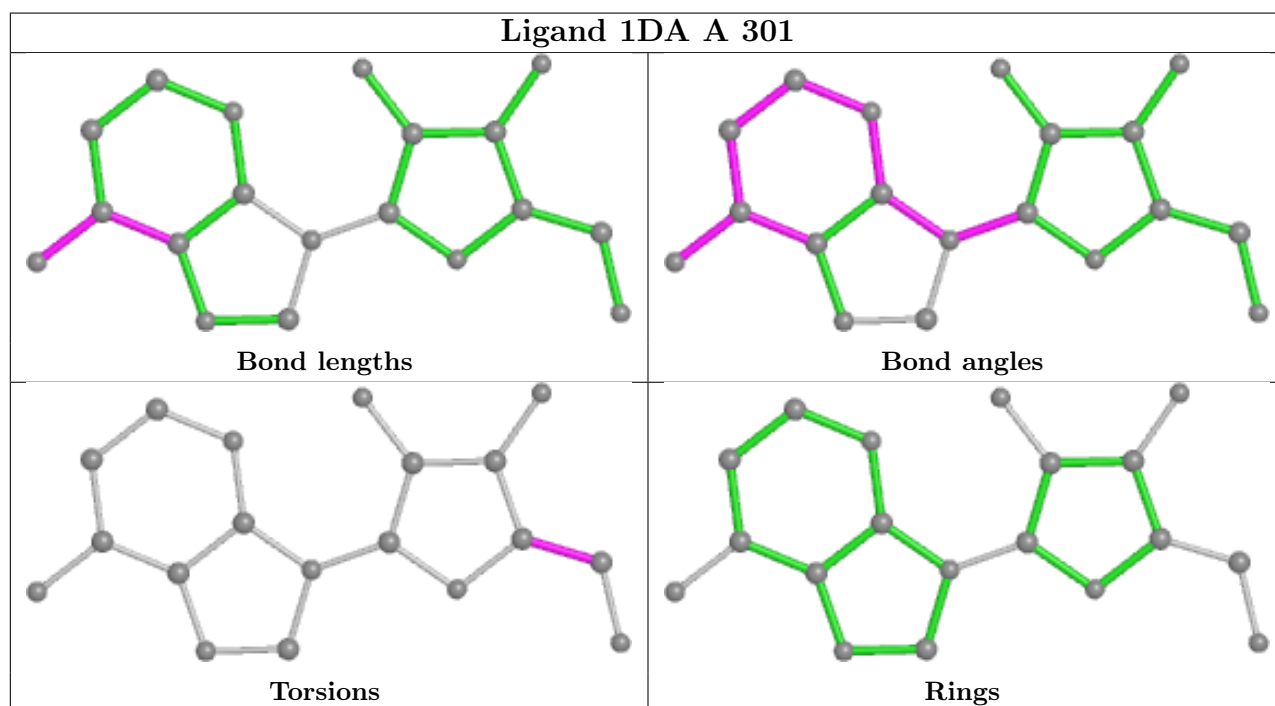
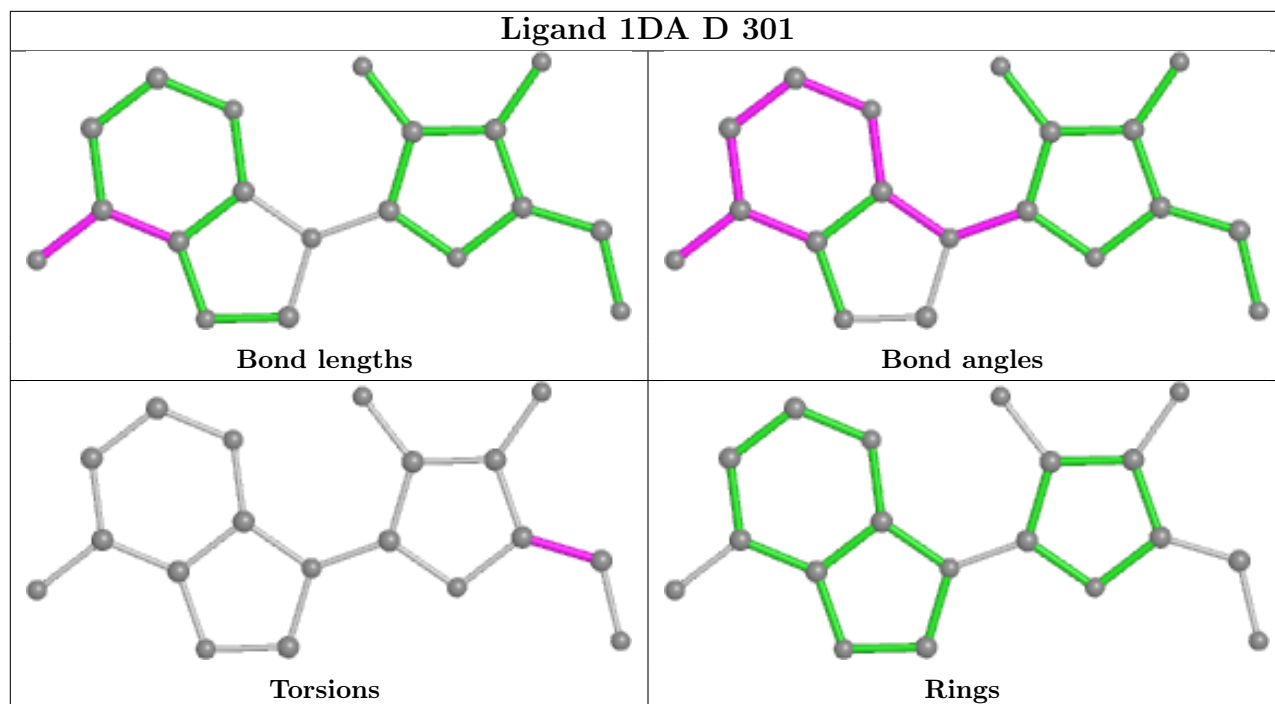
Mol	Chain	Res	Type	Atoms
2	A	301	1DA	O4'-C4'-C5'-O5'
2	C	301	1DA	O4'-C4'-C5'-O5'
2	D	301	1DA	O4'-C4'-C5'-O5'
2	B	301	1DA	O4'-C4'-C5'-O5'
2	E	301	1DA	O4'-C4'-C5'-O5'
2	F	301	1DA	O4'-C4'-C5'-O5'
2	A	301	1DA	C3'-C4'-C5'-O5'
2	C	301	1DA	C3'-C4'-C5'-O5'
2	D	301	1DA	C3'-C4'-C5'-O5'
2	B	301	1DA	C3'-C4'-C5'-O5'
2	E	301	1DA	C3'-C4'-C5'-O5'
2	F	301	1DA	C3'-C4'-C5'-O5'

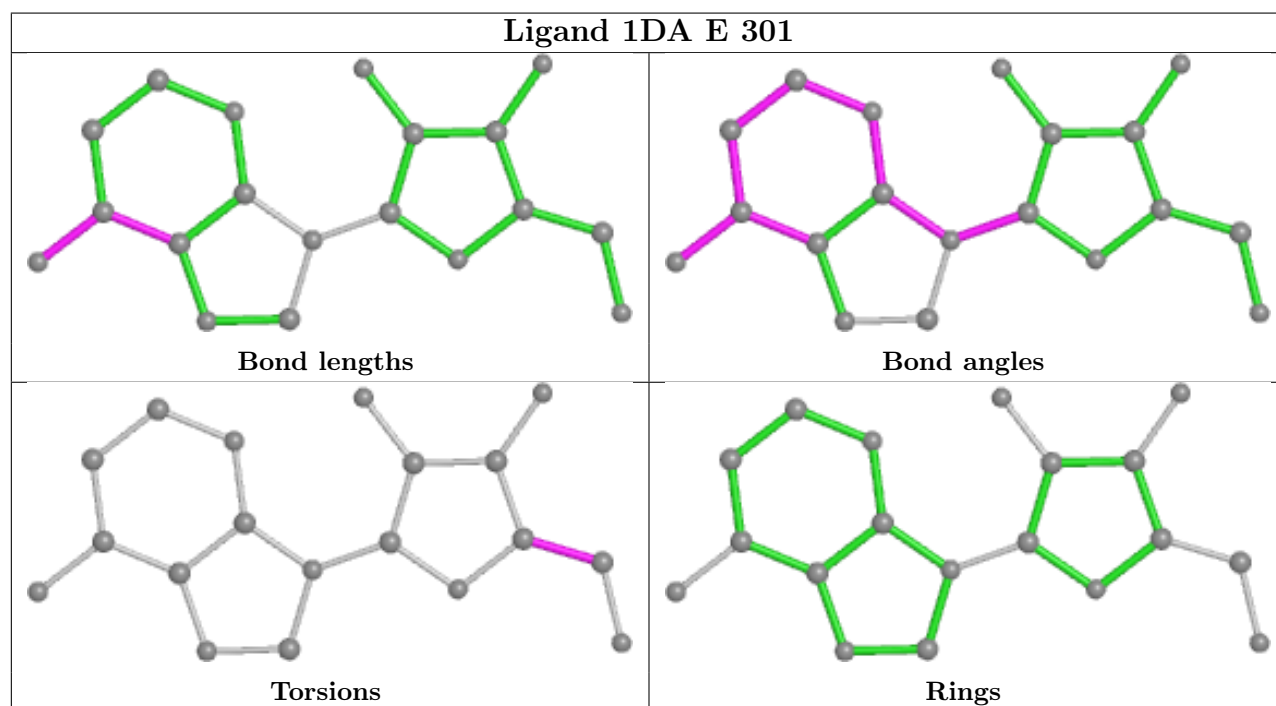
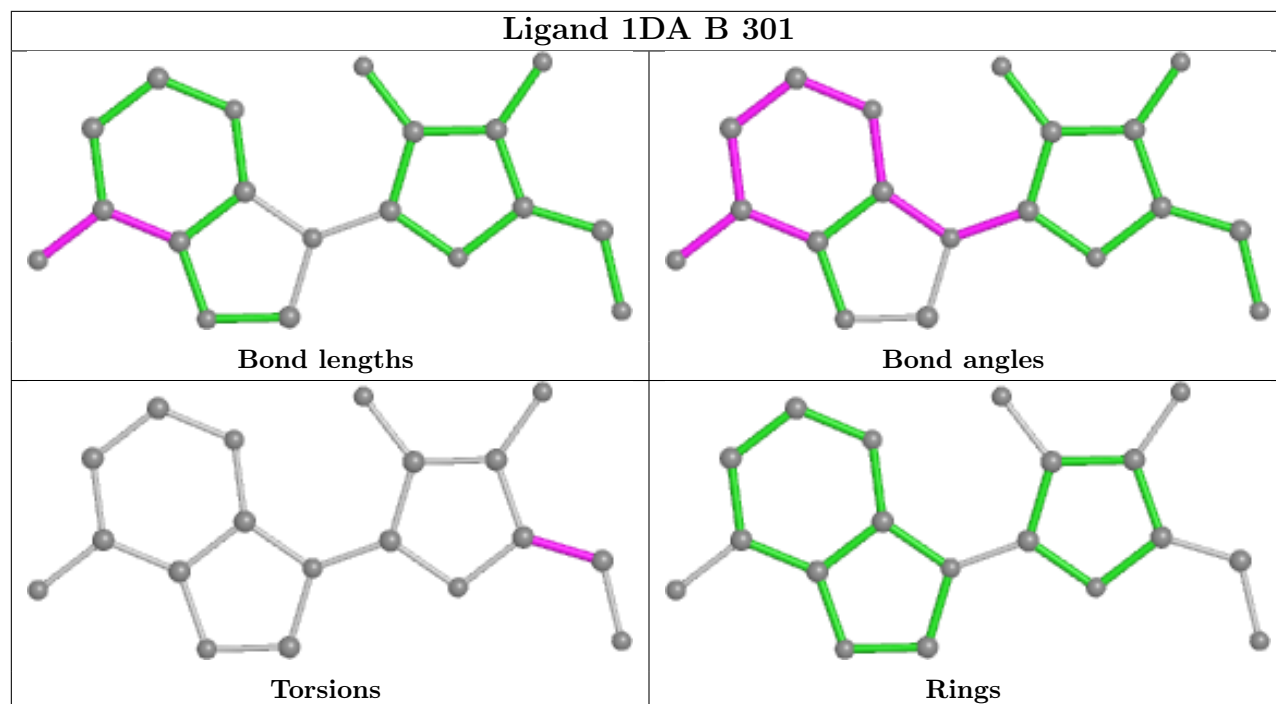
There are no ring outliers.

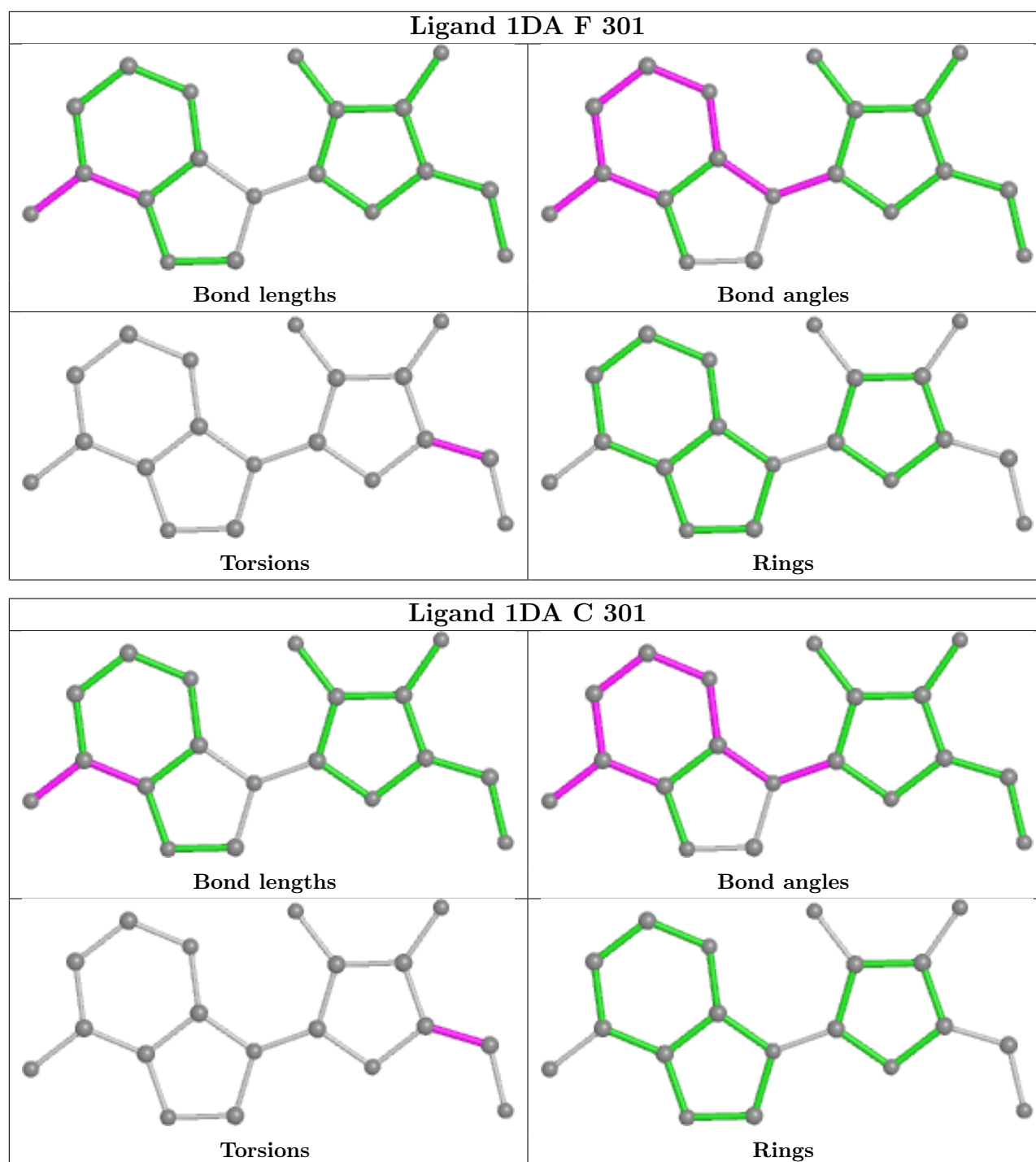
6 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	301	1DA	2	0
2	A	301	1DA	1	0
2	B	301	1DA	2	0
2	E	301	1DA	2	0
2	F	301	1DA	1	0
2	C	301	1DA	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, 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	245/276 (88%)	1.00	26 (10%) 6 5	24, 40, 71, 100	0
1	B	252/276 (91%)	0.63	5 (1%) 65 67	24, 40, 75, 93	0
1	C	248/276 (89%)	0.87	19 (7%) 13 13	24, 40, 75, 112	0
1	D	248/276 (89%)	1.04	22 (8%) 9 9	24, 40, 74, 94	0
1	E	247/276 (89%)	1.09	36 (14%) 2 2	24, 40, 73, 94	0
1	F	244/276 (88%)	1.16	40 (16%) 1 1	24, 40, 73, 112	0
All	All	1484/1656 (89%)	0.96	148 (9%) 7 6	24, 40, 74, 112	0

All (148) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	127	PRO	6.1
1	C	126	HIS	5.5
1	F	234	THR	4.8
1	A	257	ALA	4.6
1	F	257	ALA	4.3
1	D	127	PRO	4.0
1	F	239	TYR	3.8
1	A	254	SER	3.8
1	E	248	PHE	3.7
1	F	122	ALA	3.6
1	E	178	GLY	3.5
1	A	255	LEU	3.5
1	E	167	VAL	3.4
1	D	132	TRP	3.4
1	E	166	ASP	3.3
1	F	184	ASP	3.2
1	E	127	PRO	3.2
1	F	242	SER	3.2
1	C	170	THR	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	106	ALA	3.1
1	E	249	ALA	3.1
1	F	233	THR	3.1
1	E	109	ALA	3.1
1	F	109	ALA	3.1
1	E	224	TRP	3.1
1	C	109	ALA	3.1
1	D	179	ARG	3.1
1	A	166	ASP	3.0
1	E	169	PHE	3.0
1	D	78	THR	3.0
1	A	233	THR	3.0
1	D	167	VAL	3.0
1	F	126	HIS	3.0
1	E	176	LEU	3.0
1	E	266	PRO	3.0
1	F	170	THR	2.9
1	D	257	ALA	2.9
1	C	253	GLY	2.9
1	E	170	THR	2.9
1	F	87	VAL	2.9
1	F	130	PRO	2.9
1	C	166	ASP	2.9
1	E	257	ALA	2.9
1	D	180	VAL	2.8
1	A	109	ALA	2.8
1	A	262	ALA	2.8
1	F	254	SER	2.8
1	D	130	PRO	2.8
1	F	132	TRP	2.8
1	C	21	ALA	2.8
1	A	191	TRP	2.7
1	C	195	PRO	2.7
1	C	244	GLY	2.7
1	A	108	ASP	2.7
1	E	78	THR	2.7
1	E	251	ASN	2.7
1	F	105	ARG	2.7
1	E	73	TYR	2.7
1	A	195	PRO	2.7
1	A	222	TRP	2.7
1	D	48	PHE	2.7

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Mol	Chain	Res	Type	RSRZ
1	E	260	GLY	2.7
1	E	177	VAL	2.6
1	F	265	ALA	2.6
1	A	228	PHE	2.6
1	A	224	TRP	2.6
1	F	195	PRO	2.6
1	A	190	VAL	2.6
1	E	262	ALA	2.6
1	F	21	ALA	2.6
1	D	133	TYR	2.6
1	F	229	SER	2.6
1	D	159	ASP	2.6
1	A	234	THR	2.6
1	E	168	PRO	2.6
1	F	92	GLY	2.6
1	F	187	PHE	2.5
1	C	264	ASP	2.5
1	D	160	ASP	2.5
1	E	108	ASP	2.5
1	D	33	CYS	2.5
1	A	197	ALA	2.5
1	F	101	GLY	2.5
1	E	81	GLY	2.5
1	E	137	VAL	2.4
1	D	264	ASP	2.4
1	E	104	THR	2.4
1	C	180	VAL	2.4
1	F	112	VAL	2.4
1	F	162	VAL	2.4
1	B	79	GLY	2.4
1	E	129	THR	2.4
1	E	102	LEU	2.4
1	E	220	ALA	2.4
1	F	115	ALA	2.4
1	B	132	TRP	2.4
1	E	222	TRP	2.4
1	F	68	THR	2.4
1	E	244	GLY	2.4
1	A	63	PHE	2.4
1	B	78	THR	2.4
1	D	90	ASP	2.4
1	A	198	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	D	28	LEU	2.4
1	A	256	VAL	2.3
1	F	102	LEU	2.3
1	C	127	PRO	2.3
1	F	222	TRP	2.3
1	A	238	ALA	2.3
1	A	244	GLY	2.3
1	F	256	VAL	2.3
1	A	193	ASN	2.3
1	F	41	ILE	2.3
1	D	41	ILE	2.2
1	E	107	LEU	2.2
1	F	189	ASN	2.2
1	A	232	ALA	2.2
1	D	139	ALA	2.2
1	C	257	ALA	2.2
1	F	228	PHE	2.2
1	C	130	PRO	2.2
1	F	124	MET	2.2
1	E	126	HIS	2.1
1	E	75	TYR	2.1
1	F	133	TYR	2.1
1	A	53	GLY	2.1
1	A	170	THR	2.1
1	F	48	PHE	2.1
1	E	63	PHE	2.1
1	C	212	ASP	2.1
1	A	74	VAL	2.1
1	F	225	CYS	2.1
1	D	65	PRO	2.1
1	B	191	TRP	2.1
1	C	233	THR	2.1
1	E	233	THR	2.1
1	F	71	CYS	2.1
1	C	248	PHE	2.1
1	E	124	MET	2.1
1	F	168	PRO	2.1
1	B	264	ASP	2.1
1	C	260	GLY	2.1
1	D	243	ARG	2.1
1	C	265	ALA	2.0
1	E	190	VAL	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	71	CYS	2.0
1	F	243	ARG	2.0
1	D	29	MET	2.0

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](#)

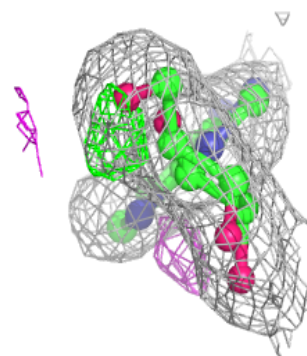
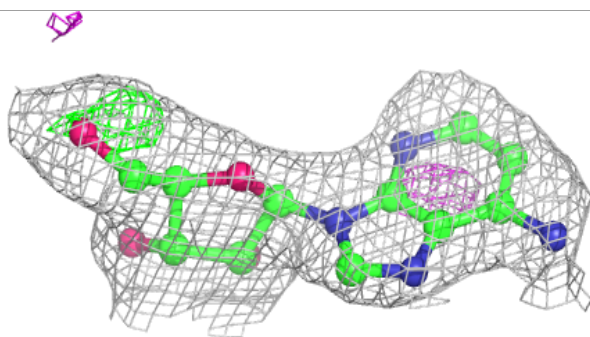
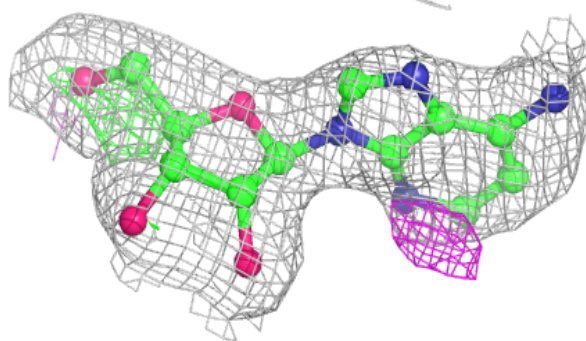
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	1DA	D	301	19/19	0.86	0.26	20,35,53,69	0
2	1DA	E	301	19/19	0.86	0.24	20,35,53,69	0
2	1DA	B	301	19/19	0.87	0.22	20,35,53,69	0
2	1DA	A	301	19/19	0.90	0.25	20,35,53,69	0
2	1DA	F	301	19/19	0.90	0.24	20,35,53,69	0
2	1DA	C	301	19/19	0.91	0.24	20,35,53,69	0

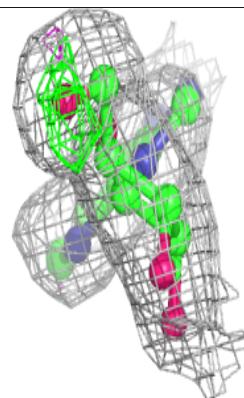
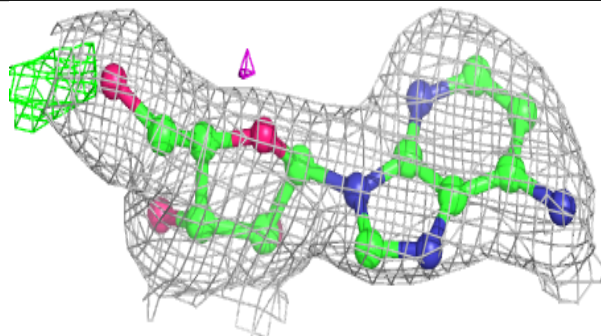
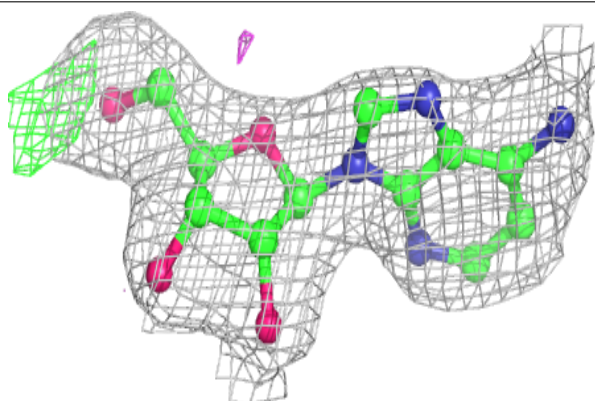
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around 1DA D 301:

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

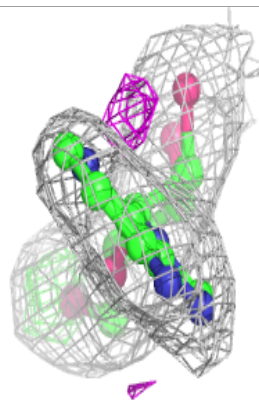
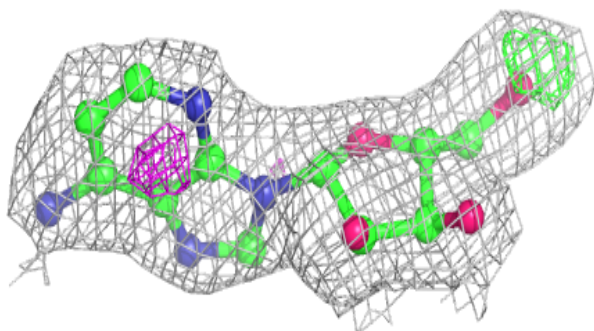
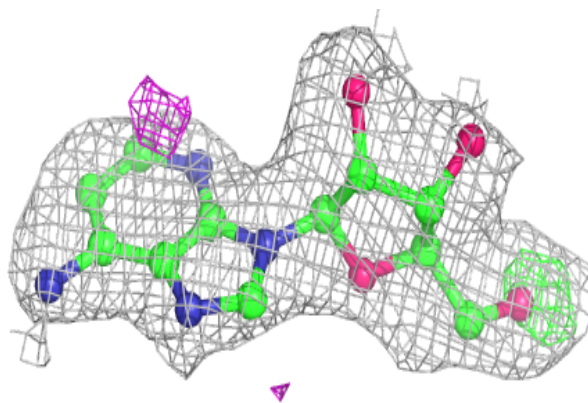
**Electron density around 1DA E 301:**

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

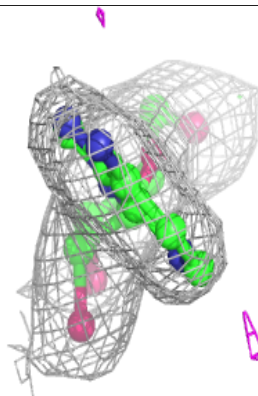
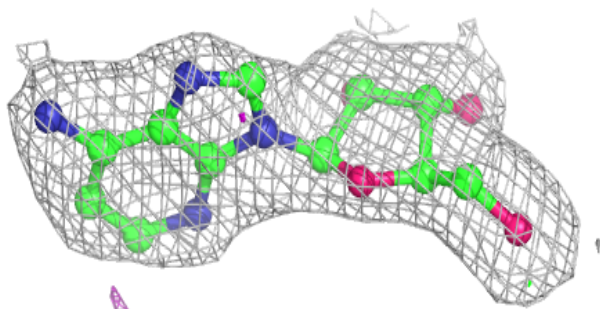
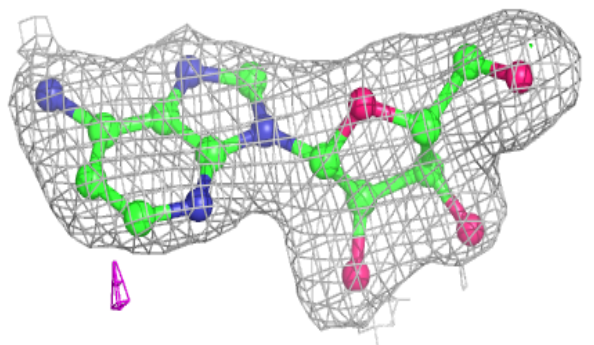


Electron density around 1DA B 301:

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

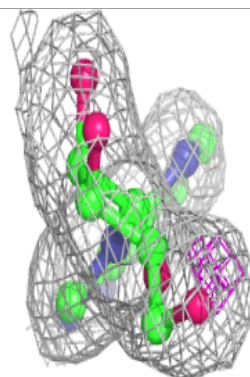
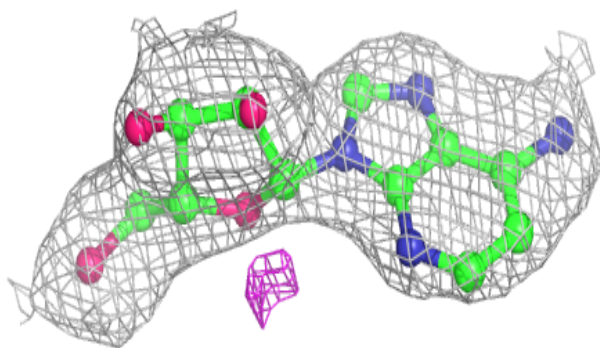
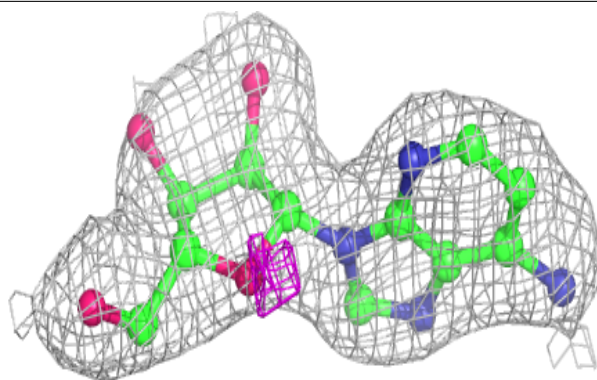
**Electron density around 1DA A 301:**

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

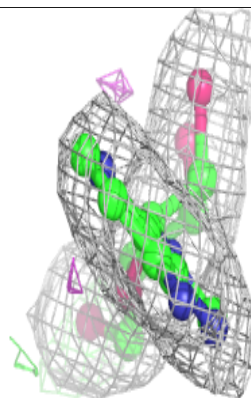
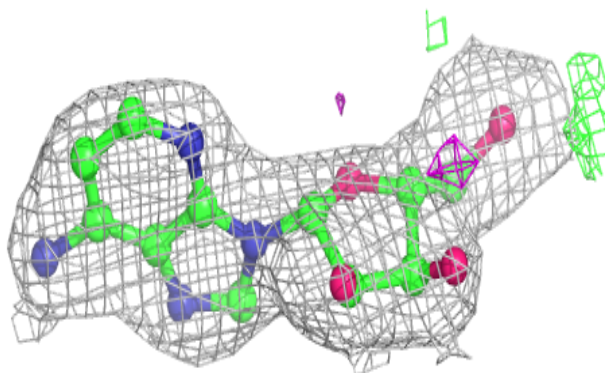
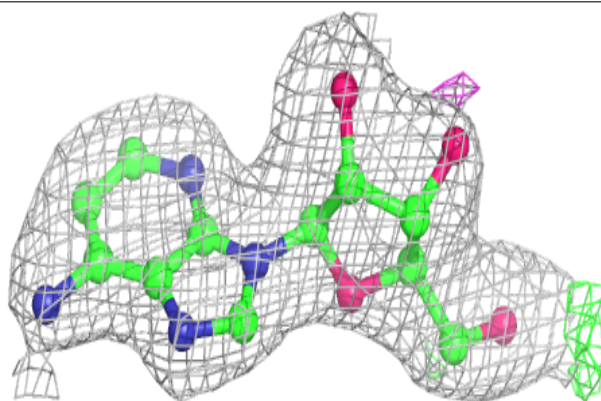


Electron density around 1DA F 301:

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

**Electron density around 1DA C 301:**

$2mF_o-DF_c$ (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.