



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 7, 2023 – 05:48 AM EDT

PDB ID : 4FOG  
Title : Crystal Structure of Mtb ThyA in Complex with 5-Fluoro-dUMP and 5-methyltetrahydrofolic acid  
Authors : Reddy, M.C.M.; Bruning, J.B.; Harshbarger, W.; Sacchettini, J.C.; TB Structural Genomics Consortium (TBSGC)  
Deposited on : 2012-06-20  
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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
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) : 2.35

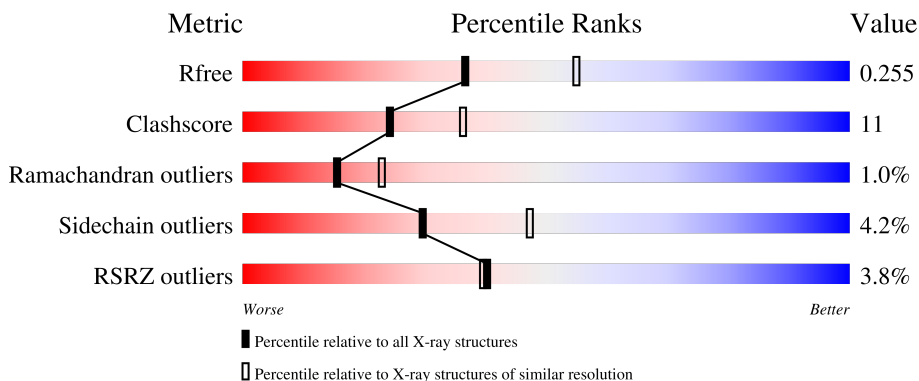
# 1 Overall quality at a glance

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)
RSRZ outliers	127900	3811 (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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	263	 5% 76% 20% ..
1	B	263	 3% 75% 23% ..
1	C	263	 3% 78% 20% .
1	D	263	 3% 81% 17% .

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
2	UFP	B	301	-	-	X	-
2	UFP	C	301	-	-	X	-
2	UFP	D	301	-	-	X	-
3	C2F	C	302	-	-	X	-

## 2 Entry composition [i](#)

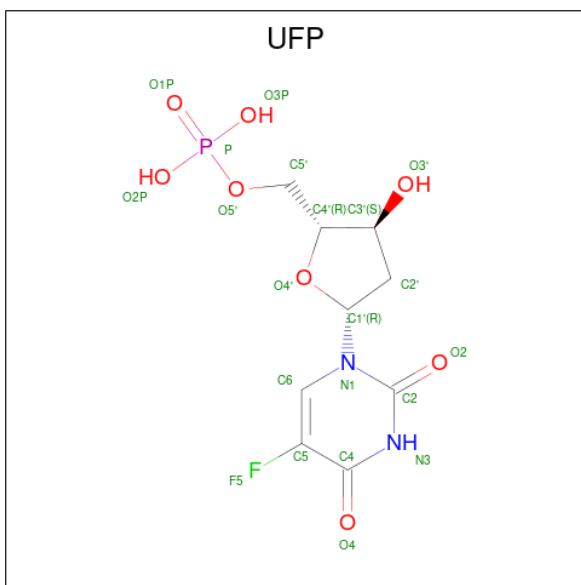
There are 4 unique types of molecules in this entry. The entry contains 8776 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Thymidylate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	260	Total 2047	C 1321	N 348	O 370	S 8	0	1	0
1	B	258	Total 2060	C 1329	N 349	O 375	S 7	0	2	0
1	C	262	Total 2086	C 1344	N 357	O 378	S 7	0	0	0
1	D	263	Total 2102	C 1352	N 360	O 383	S 7	0	2	0

- Molecule 2 is 5-FLUORO-2'-DEOXYURIDINE-5'-MONOPHOSPHATE (three-letter code: UFP) (formula: C<sub>9</sub>H<sub>12</sub>FN<sub>2</sub>O<sub>8</sub>P).



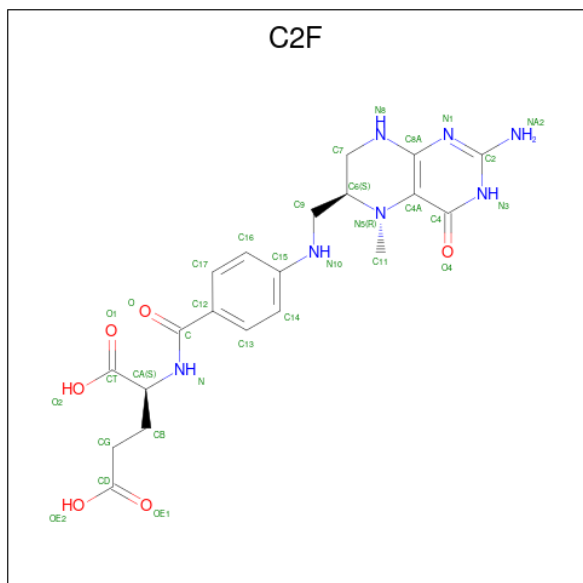
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	F	N	O			P
2	A	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0
2	B	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
2	C	1	Total	C	F	N	O	P	0	0
			21	9	1	2	8	1		
2	D	1	Total	C	F	N	O	P	0	0
			21	9	1	2	8	1		

- Molecule 3 is 5-METHYL-5,6,7,8-TETRAHYDROFOLIC ACID (three-letter code: C2F) (formula: C<sub>20</sub>H<sub>25</sub>N<sub>7</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
3	A	1	Total	C	N	O	0	0
			33	20	7	6		
3	C	1	Total	C	N	O	0	0
			33	20	7	6		
3	D	1	Total	C	N	O	0	0
			33	20	7	6		

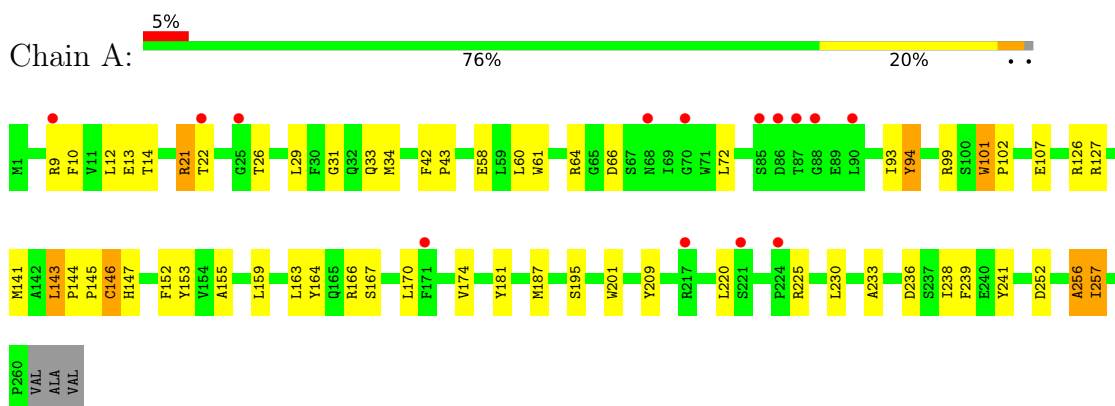
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	61	Total	O	0	0
			61	61		
4	B	81	Total	O	0	0
			81	81		
4	C	72	Total	O	0	0
			72	72		
4	D	84	Total	O	0	0
			84	84		

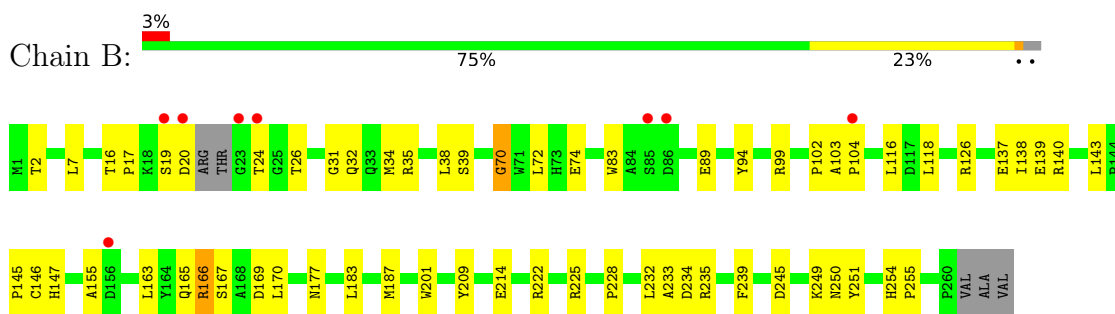
### 3 Residue-property plots [i](#)

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.

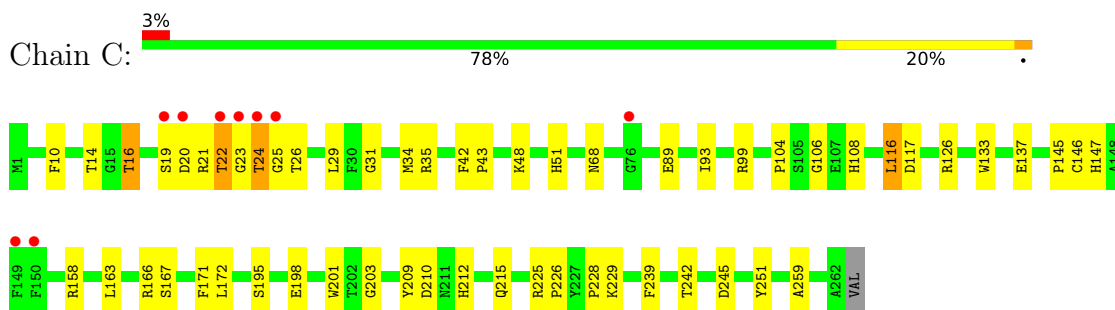
- Molecule 1: Thymidylate synthase



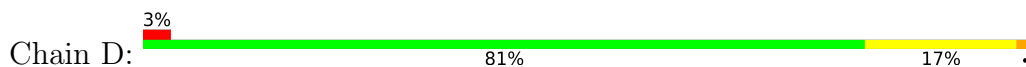
- Molecule 1: Thymidylate synthase

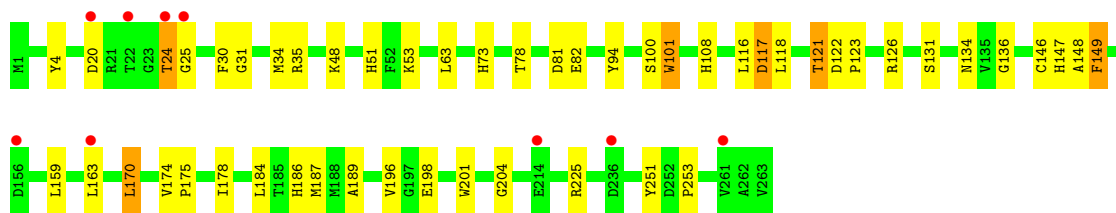


- Molecule 1: Thymidylate synthase



- Molecule 1: Thymidylate synthase





## 4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	184.33Å 82.32Å 125.98Å 90.00° 132.30° 90.00°	Depositor
Resolution (Å)	42.94 – 2.40 42.94 – 2.40	Depositor EDS
% Data completeness (in resolution range)	97.8 (42.94-2.40) 97.8 (42.94-2.40)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.90 (at 2.39Å)	Xtrriage
Refinement program	PHENIX 1.6.4_486	Depositor
R, $R_{free}$	0.211 , 0.260 0.203 , 0.255	Depositor DCC
$R_{free}$ test set	2714 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	44.2	Xtrriage
Anisotropy	0.300	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 51.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.53$ , $\langle L^2 \rangle = 0.36$	Xtrriage
Estimated twinning fraction	0.000 for -h-2*1,-k,l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	8776	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.29% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: C2F, UFP

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	0.41	0/2114	0.55	0/2885
1	B	0.40	0/2129	0.58	0/2903
1	C	0.43	0/2150	0.59	0/2932
1	D	0.41	0/2172	0.58	0/2962
All	All	0.41	0/8565	0.57	0/11682

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2047	0	1933	40	0
1	B	2060	0	1965	45	0
1	C	2086	0	2003	47	0
1	D	2102	0	2011	37	0
2	A	21	0	10	6	0
2	B	21	0	10	12	0
2	C	21	0	10	7	0
2	D	21	0	10	9	0
3	A	33	0	25	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	33	0	25	9	0
3	D	33	0	25	7	0
4	A	61	0	0	3	0
4	B	81	0	0	3	0
4	C	72	0	0	4	0
4	D	84	0	0	2	0
All	All	8776	0	8027	181	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 11.

All (181) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:102:PRO:HG2	1:B:137:GLU:OE2	1.78	0.83
1:D:146:CYS:SG	2:D:301:UFP:C6	2.71	0.78
2:A:301:UFP:C4	3:A:302:C2F:H113	2.15	0.76
1:B:145:PRO:O	1:B:166:ARG:HD3	1.85	0.76
1:A:147:HIS:HD2	1:A:181:TYR:OH	1.68	0.76
2:C:301:UFP:H6	3:C:302:C2F:C4A	2.16	0.75
1:A:170:LEU:HD23	1:A:174:VAL:HG21	1.69	0.74
1:B:177:ASN:HD21	2:B:301:UFP:HN3	1.34	0.73
1:C:22:THR:O	1:C:24:THR:N	2.22	0.73
1:C:146:CYS:HB2	2:C:301:UFP:C5	2.19	0.73
1:A:147:HIS:CD2	1:A:181:TYR:OH	2.43	0.72
3:C:302:C2F:C11	3:C:302:C2F:N10	2.53	0.71
1:D:146:CYS:SG	2:D:301:UFP:N1	2.64	0.71
1:B:103:ALA:HB1	1:B:104:PRO:HD2	1.73	0.70
2:D:301:UFP:N3	3:D:302:C2F:H113	2.07	0.69
1:B:146:CYS:SG	2:B:301:UFP:C6	2.80	0.69
1:C:171:PHE:HD2	1:C:172:LEU:HD12	1.58	0.68
2:D:301:UFP:C4	3:D:302:C2F:H113	2.23	0.68
1:A:146[A]:CYS:SG	2:A:301:UFP:H2'1	2.34	0.67
3:C:302:C2F:N10	3:C:302:C2F:H112	2.10	0.67
3:A:302:C2F:N10	3:A:302:C2F:C11	2.58	0.66
1:A:146[A]:CYS:SG	1:A:167:SER:O	2.52	0.66
1:B:126:ARG:NH2	1:C:20:ASP:OD1	2.29	0.65
1:B:177:ASN:ND2	2:B:301:UFP:HN3	1.95	0.65
1:D:170:LEU:HD13	1:D:174:VAL:HG21	1.78	0.65
2:D:301:UFP:H6	3:D:302:C2F:C4A	2.27	0.64
3:C:302:C2F:C11	3:C:302:C2F:HN1	2.09	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:301:UFP:H6	3:A:302:C2F:C4A	2.31	0.61
1:A:33:GLN:NE2	4:A:461:HOH:O	2.33	0.60
1:B:137:GLU:HG2	1:B:140:ARG:NH2	2.16	0.60
1:C:172:LEU:HD13	1:C:212:HIS:CE1	2.37	0.60
1:C:10:PHE:O	1:C:14:THR:HB	2.01	0.60
1:C:171:PHE:CD2	1:C:172:LEU:HD12	2.36	0.60
1:D:73:HIS:NE2	1:D:81:ASP:OD1	2.32	0.59
1:C:228:PRO:HG3	1:C:251:TYR:HD1	1.66	0.59
1:A:60:LEU:O	1:A:64:ARG:HG3	2.03	0.59
1:A:107:GLU:HB2	4:A:434:HOH:O	2.05	0.56
1:B:35:ARG:NH2	1:C:31:GLY:O	2.37	0.56
1:D:24:THR:OG1	1:D:25:GLY:N	2.38	0.56
1:B:147:HIS:HB2	1:B:163:LEU:HD11	1.88	0.56
1:A:146[B]:CYS:SG	2:A:301:UFP:C6	2.94	0.55
1:B:89:GLU:HG3	4:B:431:HOH:O	2.05	0.55
3:D:302:C2F:N10	3:D:302:C2F:C11	2.70	0.55
1:A:14:THR:HG22	1:A:29:LEU:HD21	1.88	0.55
1:C:108:HIS:HE1	4:C:446:HOH:O	1.89	0.54
1:D:100:SER:HB2	1:D:108:HIS:HB3	1.87	0.54
1:B:234:ASP:O	1:B:235:ARG:HD3	2.08	0.54
1:A:146[A]:CYS:SG	2:A:301:UFP:N1	2.81	0.53
1:D:136:GLY:HA3	4:D:417:HOH:O	2.08	0.53
1:C:146:CYS:SG	2:C:301:UFP:C6	2.97	0.53
1:C:35:ARG:HD3	1:C:198:GLU:OE2	2.09	0.53
1:D:117:ASP:O	1:D:121:THR:HB	2.08	0.53
1:A:61:TRP:CD1	1:A:66:ASP:HB3	2.44	0.53
1:C:228:PRO:HG3	1:C:251:TYR:CD1	2.44	0.53
1:C:68:ASN:HD22	1:C:89:GLU:CD	2.12	0.52
1:B:177:ASN:HD21	2:B:301:UFP:C4	2.22	0.52
1:B:228:PRO:HG3	1:B:251:TYR:HD1	1.75	0.52
1:A:225:ARG:HD3	1:A:252:ASP:O	2.09	0.52
1:A:147:HIS:HB2	1:A:163:LEU:HD11	1.92	0.52
1:B:249:LYS:HB3	1:B:250:ASN:OD1	2.10	0.51
4:A:461:HOH:O	1:D:31:GLY:C	2.49	0.51
1:B:146:CYS:HB2	2:B:301:UFP:C5	2.40	0.51
1:C:108:HIS:CE1	4:C:446:HOH:O	2.62	0.51
1:B:19:SER:O	1:B:20:ASP:HB2	2.11	0.51
1:C:14:THR:HG22	1:C:29:LEU:HD21	1.93	0.51
1:B:233:ALA:HB3	1:B:245:ASP:HB3	1.92	0.51
1:C:146:CYS:CB	2:C:301:UFP:C5	2.89	0.51
1:B:31:GLY:O	1:C:35:ARG:NH2	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:251:TYR:CE2	1:D:253:PRO:HG3	2.46	0.50
2:C:301:UFP:C5	3:C:302:C2F:H113	2.42	0.50
1:C:225:ARG:HB3	1:C:226:PRO:HD2	1.94	0.50
1:A:143:LEU:HD23	1:A:144:PRO:HD2	1.94	0.50
1:B:228:PRO:HG3	1:B:251:TYR:CD1	2.46	0.50
3:C:302:C2F:H112	3:C:302:C2F:HN1	1.75	0.50
1:C:171:PHE:HD2	1:C:172:LEU:CD1	2.25	0.49
1:B:146:CYS:SG	2:B:301:UFP:H6	2.51	0.49
1:B:222:ARG:HG2	1:B:254:HIS:ND1	2.27	0.49
1:C:133:TRP:CZ3	1:C:145:PRO:HD2	2.47	0.49
1:C:166:ARG:HG3	1:C:167:SER:N	2.28	0.49
1:B:139:GLU:HA	1:B:139:GLU:OE1	2.11	0.49
1:D:131:SER:HA	1:D:149:PHE:HB2	1.95	0.48
1:D:147:HIS:HB2	1:D:163:LEU:HD11	1.95	0.48
2:B:301:UFP:O2P	1:C:126:ARG:HD2	2.12	0.48
2:C:301:UFP:F5	3:C:302:C2F:C11	2.52	0.48
1:D:147:HIS:HD2	2:D:301:UFP:O4	1.96	0.48
1:D:78:THR:HB	1:D:81:ASP:OD2	2.13	0.48
1:A:152:PHE:HB3	1:A:159:LEU:HD11	1.96	0.48
1:B:34:MET:HE2	1:B:201:TRP:CE3	2.49	0.48
1:B:99:ARG:CZ	1:B:239:PHE:CE1	2.97	0.48
1:C:172:LEU:HD11	1:C:259:ALA:HB3	1.96	0.47
2:A:301:UFP:C6	3:A:302:C2F:C4A	2.92	0.47
1:C:34:MET:HE2	1:C:201:TRP:CE3	2.48	0.47
1:C:147:HIS:CD2	1:C:147:HIS:H	2.31	0.47
1:D:100:SER:CB	1:D:108:HIS:HB3	2.44	0.47
1:A:21:ARG:HA	1:A:22:THR:HA	1.61	0.47
1:A:187:MET:HE3	1:A:241:TYR:CD1	2.50	0.47
1:B:143:LEU:HD11	4:B:438:HOH:O	2.13	0.47
1:D:159:LEU:HD23	1:D:189:ALA:HB2	1.96	0.47
1:C:22:THR:C	1:C:24:THR:H	2.17	0.47
1:C:31:GLY:HA2	1:C:203:GLY:O	2.14	0.47
1:D:34:MET:HB2	1:D:201:TRP:HB3	1.96	0.47
1:B:169:ASP:H	2:B:301:UFP:H2'2	1.79	0.46
3:D:302:C2F:C11	3:D:302:C2F:O4	2.63	0.46
1:B:146:CYS:HG	2:B:301:UFP:C6	2.28	0.46
1:D:35:ARG:HD3	1:D:198:GLU:OE2	2.16	0.46
1:A:58:GLU:O	1:A:61:TRP:HB3	2.16	0.46
3:A:302:C2F:N10	3:A:302:C2F:H112	2.28	0.46
1:C:20:ASP:CG	1:C:21:ARG:H	2.18	0.46
1:B:70:GLY:O	1:B:74:GLU:HB2	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:21:ARG:HG2	1:C:21:ARG:O	2.16	0.45
1:D:4:TYR:HA	1:D:34:MET:SD	2.56	0.45
1:B:155:ALA:HB1	1:C:16:THR:HG21	1.98	0.45
1:D:101:TRP:C	1:D:101:TRP:CD1	2.90	0.45
1:A:9:ARG:O	1:A:13:GLU:HG3	2.16	0.45
1:A:10:PHE:O	1:A:14:THR:HB	2.16	0.45
1:A:236:ASP:CB	1:C:158:ARG:NH2	2.80	0.44
1:C:104:PRO:C	1:C:106:GLY:H	2.20	0.44
1:A:61:TRP:CE3	1:A:72:LEU:HD11	2.52	0.44
1:A:153:TYR:CE2	1:A:155:ALA:HB2	2.52	0.44
1:A:187:MET:HE3	1:A:238:ILE:HG13	1.99	0.44
1:C:42:PHE:O	1:C:228:PRO:HD2	2.18	0.44
1:C:242:THR:N	1:C:245:ASP:OD2	2.43	0.44
3:C:302:C2F:C11	3:C:302:C2F:O4	2.64	0.44
1:B:165:GLN:NE2	2:B:301:UFP:HN3	2.16	0.44
1:D:174:VAL:N	1:D:175:PRO:CD	2.81	0.44
1:A:167:SER:HG	1:D:126:ARG:HD2	1.82	0.44
1:A:61:TRP:NE1	1:A:66:ASP:HB3	2.33	0.44
3:A:302:C2F:H112	3:A:302:C2F:C15	2.47	0.44
1:D:48:LYS:HD2	4:D:477:HOH:O	2.17	0.44
1:A:233:ALA:HB2	1:C:229:LYS:HD3	1.99	0.44
1:B:16:THR:HA	1:B:17:PRO:HD3	1.87	0.44
1:B:187:MET:HB2	1:B:187:MET:HE3	1.77	0.44
1:C:51:HIS:HB2	4:C:410:HOH:O	2.18	0.43
1:C:99:ARG:CZ	1:C:239:PHE:CE1	3.00	0.43
1:A:166:ARG:HG3	1:A:167:SER:N	2.33	0.43
1:B:104:PRO:HG3	1:C:137:GLU:OE2	2.17	0.43
1:D:149:PHE:C	1:D:149:PHE:CD2	2.91	0.43
2:D:301:UFP:C4	3:D:302:C2F:C11	2.93	0.43
1:B:38:LEU:HD23	1:B:38:LEU:HA	1.87	0.43
1:B:187:MET:HG2	1:B:232:LEU:HD21	2.01	0.43
1:C:20:ASP:HB3	1:C:22:THR:H	1.84	0.43
1:D:186:HIS:CE1	1:D:196:VAL:HG11	2.53	0.43
1:B:222:ARG:NH2	1:B:255:PRO:O	2.48	0.43
1:C:42:PHE:HA	1:C:43:PRO:HD3	1.77	0.43
1:C:48:LYS:HE2	4:C:407:HOH:O	2.18	0.43
1:A:34:MET:HE2	1:A:201:TRP:CD2	2.54	0.43
1:D:51:HIS:CE1	1:D:53:LYS:HB3	2.54	0.43
2:D:301:UFP:C6	3:D:302:C2F:C4A	2.97	0.43
1:A:33:GLN:HA	1:A:201:TRP:O	2.19	0.42
3:A:302:C2F:C11	3:A:302:C2F:O4	2.66	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:141:MET:SD	1:A:145:PRO:HD3	2.60	0.42
1:A:42:PHE:HA	1:A:43:PRO:HD3	1.89	0.42
1:A:164:TYR:CD1	1:D:149:PHE:HZ	2.37	0.42
1:A:93:ILE:O	1:A:94:TYR:C	2.57	0.42
1:B:7:LEU:HD11	1:B:32:GLN:HG3	2.00	0.42
1:C:147:HIS:HB2	1:C:163:LEU:HD11	2.01	0.42
1:B:26:THR:HG22	1:B:209:TYR:HA	2.02	0.42
1:A:99:ARG:CZ	1:A:239:PHE:CE1	3.03	0.42
1:A:31:GLY:O	1:D:35:ARG:NH2	2.53	0.41
1:A:256:ALA:O	1:A:257:ILE:HG13	2.20	0.41
2:C:301:UFP:C6	3:C:302:C2F:C4A	2.92	0.41
1:B:183:LEU:O	1:B:187:MET:HG3	2.19	0.41
1:D:34:MET:HE1	1:D:178:ILE:HD11	2.02	0.41
1:A:126:ARG:NH2	1:D:20:ASP:HB2	2.34	0.41
1:B:167:SER:OG	2:B:301:UFP:O2P	2.31	0.41
1:D:148:ALA:O	1:D:149:PHE:HB3	2.19	0.41
1:D:30:PHE:HA	1:D:204:GLY:O	2.21	0.41
1:D:146:CYS:SG	2:D:301:UFP:C5	3.09	0.41
1:D:184:LEU:O	1:D:187:MET:HB2	2.21	0.41
1:B:83:TRP:CE3	1:B:143:LEU:HD23	2.55	0.41
1:A:101:TRP:HA	1:A:102:PRO:HD3	1.80	0.41
1:C:25:GLY:O	1:C:210:ASP:CB	2.69	0.41
1:D:170:LEU:HD13	1:D:170:LEU:HA	1.86	0.41
1:B:169:ASP:N	2:B:301:UFP:H2'2	2.36	0.40
1:C:116:LEU:HD13	1:C:116:LEU:HA	1.89	0.40
1:C:171:PHE:CZ	1:C:215:GLN:HB3	2.56	0.40
1:D:122:ASP:N	1:D:123:PRO:HD3	2.36	0.40
1:C:26:THR:HG22	1:C:209:TYR:CD2	2.56	0.40
1:D:101:TRP:CH2	1:D:134:ASN:HA	2.56	0.40
1:B:72:LEU:HD12	1:B:72:LEU:HA	1.89	0.40
1:B:214[A]:GLU:HB2	4:B:413:HOH:O	2.22	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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	259/263 (98%)	236 (91%)	18 (7%)	5 (2%)	8	10
1	B	256/263 (97%)	244 (95%)	10 (4%)	2 (1%)	19	29
1	C	260/263 (99%)	247 (95%)	11 (4%)	2 (1%)	19	29
1	D	263/263 (100%)	251 (95%)	11 (4%)	1 (0%)	34	48
All	All	1038/1052 (99%)	978 (94%)	50 (5%)	10 (1%)	15	23

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	94	TYR
1	C	23	GLY
1	D	94	TYR
1	A	94	TYR
1	A	256	ALA
1	C	93	ILE
1	A	209	TYR
1	A	21	ARG
1	A	257	ILE
1	B	70	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	209/224 (93%)	199 (95%)	10 (5%)	25	41
1	B	215/224 (96%)	206 (96%)	9 (4%)	30	47
1	C	218/224 (97%)	211 (97%)	7 (3%)	39	59
1	D	220/224 (98%)	209 (95%)	11 (5%)	24	40
All	All	862/896 (96%)	825 (96%)	37 (4%)	30	46

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	LEU
1	A	26	THR
1	A	101	TRP
1	A	127	ARG
1	A	143	LEU
1	A	146[A]	CYS
1	A	146[B]	CYS
1	A	195	SER
1	A	220	LEU
1	A	230	LEU
1	B	2	THR
1	B	24	THR
1	B	39	SER
1	B	116	LEU
1	B	118	LEU
1	B	138	ILE
1	B	166	ARG
1	B	170	LEU
1	B	225	ARG
1	C	16	THR
1	C	19	SER
1	C	22	THR
1	C	24	THR
1	C	116	LEU
1	C	117	ASP
1	C	195	SER
1	D	24	THR
1	D	63	LEU
1	D	82	GLU
1	D	101	TRP
1	D	116	LEU
1	D	117	ASP
1	D	118	LEU
1	D	121	THR
1	D	149	PHE
1	D	170	LEU
1	D	225	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	147	HIS
1	A	212	HIS

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Mol	Chain	Res	Type
1	B	177	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](#)

7 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
3	C2F	A	302	-	33,35,35	6.77	22 (66%)	35,49,49	2.18	10 (28%)
2	UFP	A	301	-	22,22,22	5.74	11 (50%)	33,33,33	5.23	13 (39%)
3	C2F	C	302	-	33,35,35	6.61	22 (66%)	35,49,49	2.36	12 (34%)
3	C2F	D	302	-	33,35,35	6.60	23 (69%)	35,49,49	2.26	8 (22%)
2	UFP	C	301	-	22,22,22	5.76	13 (59%)	33,33,33	4.86	12 (36%)
2	UFP	B	301	-	22,22,22	5.35	11 (50%)	33,33,33	6.25	13 (39%)
2	UFP	D	301	-	22,22,22	5.61	12 (54%)	33,33,33	5.99	12 (36%)

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
3	C2F	A	302	-	-	4/22/35/35	0/3/3/3
2	UFP	A	301	-	-	3/10/22/22	0/2/2/2
3	C2F	C	302	-	-	8/22/35/35	0/3/3/3
3	C2F	D	302	-	-	5/22/35/35	0/3/3/3
2	UFP	C	301	-	-	5/10/22/22	0/2/2/2
2	UFP	B	301	-	-	2/10/22/22	0/2/2/2
2	UFP	D	301	-	-	4/10/22/22	0/2/2/2

All (114) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	UFP	C6-C5	15.20	1.56	1.33
2	C	301	UFP	C6-C5	14.95	1.55	1.33
2	A	301	UFP	C6-C5	14.78	1.55	1.33
2	B	301	UFP	C6-C5	14.63	1.55	1.33
3	A	302	C2F	C13-C12	12.58	1.60	1.39
3	C	302	C2F	C13-C12	12.34	1.60	1.39
3	A	302	C2F	C16-C15	12.12	1.59	1.39
3	D	302	C2F	C13-C12	12.08	1.60	1.39
3	A	302	C2F	C17-C16	11.84	1.60	1.38
3	C	302	C2F	C16-C15	11.81	1.59	1.39
3	A	302	C2F	C14-C15	11.75	1.59	1.39
3	D	302	C2F	C14-C15	11.72	1.59	1.39
3	D	302	C2F	C17-C16	11.62	1.59	1.38
3	C	302	C2F	C14-C15	11.53	1.58	1.39
3	D	302	C2F	C16-C15	11.50	1.58	1.39
3	A	302	C2F	C14-C13	11.40	1.59	1.38
3	A	302	C2F	C4A-C4	11.34	1.56	1.41
3	C	302	C2F	C17-C16	11.29	1.59	1.38
3	C	302	C2F	C14-C13	11.26	1.59	1.38
3	D	302	C2F	C4A-C4	11.21	1.56	1.41
3	C	302	C2F	C4A-C4	11.11	1.56	1.41
3	D	302	C2F	C14-C13	10.90	1.58	1.38
3	A	302	C2F	C17-C12	10.83	1.57	1.39
3	D	302	C2F	C17-C12	10.64	1.57	1.39
3	D	302	C2F	C2-N3	10.48	1.54	1.35
2	A	301	UFP	O2-C2	10.45	1.42	1.23
2	C	301	UFP	O2-C2	10.38	1.42	1.23
3	C	302	C2F	C2-N3	10.34	1.53	1.35
2	D	301	UFP	O2-C2	10.30	1.41	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	302	C2F	C17-C12	10.15	1.56	1.39
3	A	302	C2F	C2-N3	10.09	1.53	1.35
2	B	301	UFP	O2-C2	9.55	1.40	1.23
2	C	301	UFP	O4-C4	9.45	1.41	1.23
2	A	301	UFP	O4-C4	9.34	1.41	1.23
2	D	301	UFP	O4-C4	8.94	1.40	1.23
2	A	301	UFP	C2-N3	8.80	1.53	1.38
2	C	301	UFP	C4-C5	8.75	1.55	1.44
2	B	301	UFP	O4-C4	8.70	1.40	1.23
2	A	301	UFP	C4-C5	8.67	1.55	1.44
3	A	302	C2F	C8A-N1	8.58	1.50	1.34
2	C	301	UFP	C2-N3	8.56	1.53	1.38
3	C	302	C2F	C8A-N1	8.54	1.50	1.34
3	D	302	C2F	C8A-N1	8.32	1.50	1.34
3	A	302	C2F	C2-N1	8.31	1.50	1.35
2	D	301	UFP	C2-N3	8.16	1.52	1.38
3	C	302	C2F	C2-N1	8.10	1.49	1.35
3	D	302	C2F	C2-N1	8.08	1.49	1.35
2	A	301	UFP	C4-N3	8.05	1.53	1.38
2	D	301	UFP	C4-N3	7.95	1.53	1.38
2	C	301	UFP	C4-N3	7.92	1.53	1.38
2	B	301	UFP	C2-N3	7.89	1.52	1.38
2	B	301	UFP	C4-N3	7.87	1.53	1.38
2	D	301	UFP	C4-C5	7.52	1.53	1.44
3	C	302	C2F	O4-C4	7.12	1.42	1.24
3	D	302	C2F	O4-C4	7.12	1.42	1.24
3	A	302	C2F	O4-C4	6.98	1.42	1.24
3	A	302	C2F	C-N	6.76	1.48	1.34
2	B	301	UFP	C4-C5	6.67	1.52	1.44
3	D	302	C2F	C4-N3	6.58	1.44	1.33
3	A	302	C2F	C4-N3	6.55	1.44	1.33
3	C	302	C2F	C-N	6.52	1.48	1.34
3	C	302	C2F	C2-NA2	6.36	1.46	1.33
3	D	302	C2F	C-N	6.35	1.48	1.34
3	C	302	C2F	C4-N3	6.29	1.44	1.33
3	D	302	C2F	C2-NA2	6.26	1.46	1.33
3	A	302	C2F	C2-NA2	6.25	1.46	1.33
3	A	302	C2F	OE1-CD	6.04	1.42	1.22
3	C	302	C2F	OE1-CD	5.93	1.41	1.22
3	D	302	C2F	OE1-CD	5.89	1.41	1.22
2	A	301	UFP	C2-N1	5.40	1.47	1.38
2	C	301	UFP	C2-N1	5.33	1.47	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	UFP	C2-N1	5.27	1.46	1.38
2	C	301	UFP	P-O1P	5.06	1.66	1.50
2	A	301	UFP	P-O1P	4.75	1.65	1.50
2	B	301	UFP	P-O1P	4.69	1.65	1.50
2	D	301	UFP	P-O1P	4.67	1.65	1.50
2	B	301	UFP	C2-N1	4.62	1.45	1.38
3	A	302	C2F	C7-C6	4.35	1.57	1.52
3	C	302	C2F	C7-C6	4.29	1.57	1.52
2	D	301	UFP	C6-N1	3.79	1.44	1.38
3	A	302	C2F	O2-CT	3.73	1.42	1.30
2	C	301	UFP	C6-N1	3.70	1.44	1.38
3	D	302	C2F	C7-C6	3.69	1.56	1.52
2	A	301	UFP	C6-N1	3.57	1.44	1.38
3	C	302	C2F	O2-CT	3.47	1.41	1.30
2	B	301	UFP	C6-N1	3.39	1.43	1.38
3	D	302	C2F	O2-CT	3.28	1.41	1.30
3	D	302	C2F	OE2-CD	3.21	1.41	1.30
3	A	302	C2F	OE2-CD	3.17	1.41	1.30
3	A	302	C2F	C15-N10	3.11	1.47	1.38
3	C	302	C2F	OE2-CD	3.04	1.40	1.30
3	A	302	C2F	C4A-C8A	2.98	1.47	1.41
3	A	302	C2F	C12-C	2.97	1.56	1.50
3	C	302	C2F	C15-N10	2.96	1.47	1.38
3	D	302	C2F	C4A-C8A	2.93	1.47	1.41
3	C	302	C2F	C4A-C8A	2.89	1.47	1.41
2	C	301	UFP	P-O2P	2.83	1.65	1.54
3	D	302	C2F	C15-N10	2.82	1.46	1.38
2	A	301	UFP	P-O2P	2.73	1.65	1.54
2	B	301	UFP	P-O2P	2.57	1.64	1.54
2	D	301	UFP	P-O2P	2.51	1.64	1.54
3	A	302	C2F	CG-CD	2.41	1.56	1.50
2	A	301	UFP	O4'-C1'	2.27	1.47	1.42
3	C	302	C2F	CG-CD	2.26	1.55	1.50
2	C	301	UFP	O4'-C1'	2.25	1.47	1.42
3	D	302	C2F	C12-C	2.20	1.54	1.50
3	D	302	C2F	CG-CD	2.20	1.55	1.50
3	C	302	C2F	C12-C	2.17	1.54	1.50
2	C	301	UFP	F5-C5	2.08	1.38	1.35
2	B	301	UFP	P-O3P	-2.08	1.46	1.54
3	D	302	C2F	C7-N8	2.05	1.48	1.44
2	C	301	UFP	P-O3P	-2.03	1.47	1.54
2	D	301	UFP	O4'-C1'	2.01	1.46	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	301	UFP	P-O3P	-2.01	1.47	1.54

All (80) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	301	UFP	O4-C4-C5	-22.38	105.54	125.72
2	D	301	UFP	O4-C4-C5	-20.86	106.91	125.72
2	A	301	UFP	O4-C4-C5	-15.67	111.59	125.72
2	C	301	UFP	O4-C4-C5	-15.35	111.87	125.72
2	D	301	UFP	C6-C5-C4	-13.24	110.25	122.60
2	B	301	UFP	C6-C5-C4	-13.21	110.28	122.60
2	A	301	UFP	F5-C5-C6	-13.04	109.28	120.97
2	A	301	UFP	C6-C5-C4	-11.90	111.50	122.60
2	C	301	UFP	C4-N3-C2	-11.85	112.01	127.35
2	D	301	UFP	C4-N3-C2	-11.66	112.25	127.35
2	B	301	UFP	O2-C2-N1	-11.33	107.73	122.79
2	D	301	UFP	F5-C5-C6	-10.56	111.51	120.97
2	B	301	UFP	C4-N3-C2	-10.23	114.10	127.35
2	B	301	UFP	F5-C5-C6	-10.03	111.98	120.97
2	C	301	UFP	C6-C5-C4	-9.78	113.48	122.60
2	C	301	UFP	F5-C5-C6	-9.40	112.55	120.97
2	B	301	UFP	O2-C2-N3	-8.88	104.95	121.50
2	C	301	UFP	O2-C2-N1	-8.53	111.45	122.79
2	D	301	UFP	O2-C2-N1	-8.06	112.07	122.79
2	A	301	UFP	C4-N3-C2	-7.73	117.34	127.35
2	A	301	UFP	O2-C2-N1	-7.52	112.78	122.79
2	B	301	UFP	F5-C5-C4	-7.29	109.64	116.40
3	D	302	C2F	C8A-C4A-C4	7.23	120.09	114.44
2	A	301	UFP	C5-C6-N1	-7.16	112.09	120.62
3	C	302	C2F	C8A-C4A-C4	7.10	119.99	114.44
2	D	301	UFP	C1'-N1-C6	-6.91	108.85	120.77
2	A	301	UFP	F5-C5-C4	-6.88	110.02	116.40
2	B	301	UFP	C1'-N1-C6	-6.69	109.24	120.77
2	D	301	UFP	F5-C5-C4	-6.56	110.31	116.40
3	A	302	C2F	C8A-C4A-C4	6.51	119.53	114.44
2	B	301	UFP	O4-C4-N3	-6.42	107.82	120.12
2	D	301	UFP	C6-N1-C2	-6.22	115.00	121.30
2	C	301	UFP	C1'-N1-C6	-6.03	110.38	120.77
2	D	301	UFP	O4-C4-N3	-5.89	108.82	120.12
2	D	301	UFP	O2-C2-N3	-5.87	110.57	121.50
2	A	301	UFP	O2-C2-N3	-5.84	110.63	121.50
2	A	301	UFP	C1'-N1-C6	-5.72	110.92	120.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	302	C2F	OE2-CD-OE1	-5.69	109.12	123.30
3	A	302	C2F	OE2-CD-OE1	-5.61	109.31	123.30
2	C	301	UFP	O2-C2-N3	-5.60	111.06	121.50
2	D	301	UFP	C5-C6-N1	-5.42	114.16	120.62
3	D	302	C2F	OE2-CD-OE1	-5.41	109.81	123.30
2	C	301	UFP	C5-C6-N1	-5.40	114.19	120.62
2	B	301	UFP	C5-C6-N1	-5.25	114.36	120.62
2	A	301	UFP	O4-C4-N3	-4.83	110.85	120.12
3	D	302	C2F	OE1-CD-CG	-4.20	109.59	123.08
3	C	302	C2F	OE1-CD-CG	-4.19	109.61	123.08
2	C	301	UFP	O4-C4-N3	-4.02	112.41	120.12
3	A	302	C2F	OE1-CD-CG	-3.67	111.28	123.08
2	D	301	UFP	N3-C2-N1	-3.66	110.02	114.89
3	A	302	C2F	N1-C2-N3	-3.58	119.80	125.42
2	A	301	UFP	C5-C4-N3	3.53	116.03	112.56
3	C	302	C2F	N1-C2-N3	-3.49	119.94	125.42
3	D	302	C2F	N1-C2-N3	-3.48	119.96	125.42
2	C	301	UFP	C6-N1-C2	-3.24	118.02	121.30
2	A	301	UFP	N3-C2-N1	3.17	119.10	114.89
3	A	302	C2F	C11-N5-C4A	3.09	117.50	113.30
2	B	301	UFP	C6-N1-C2	-3.08	118.18	121.30
3	C	302	C2F	C6-C9-N10	-2.97	104.48	112.23
2	C	301	UFP	F5-C5-C4	-2.94	113.67	116.40
3	C	302	C2F	C2-N3-C4	2.91	120.55	115.93
2	A	301	UFP	C6-N1-C2	-2.79	118.47	121.30
3	D	302	C2F	C11-N5-C4A	2.66	116.92	113.30
3	D	302	C2F	C2-N3-C4	2.65	120.14	115.93
3	A	302	C2F	C2-N1-C8A	2.58	120.32	114.54
3	A	302	C2F	O2-CT-CA	2.53	121.82	113.40
3	A	302	C2F	C2-N3-C4	2.51	119.92	115.93
2	B	301	UFP	C5-C4-N3	-2.50	110.09	112.56
3	D	302	C2F	C2-N1-C8A	2.43	119.98	114.54
3	A	302	C2F	NA2-C2-N1	2.42	121.02	117.25
2	C	301	UFP	C1'-N1-C2	-2.40	112.92	117.64
3	C	302	C2F	C17-C12-C13	2.33	121.91	118.59
3	C	302	C2F	NA2-C2-N1	2.33	120.88	117.25
3	C	302	C2F	C11-N5-C4A	2.31	116.44	113.30
2	B	301	UFP	C4'-O4'-C1'	-2.25	104.01	109.45
3	C	302	C2F	C2-N1-C8A	2.24	119.56	114.54
3	A	302	C2F	O2-CT-O1	-2.20	119.10	124.09
3	C	302	C2F	O2-CT-O1	-2.18	119.13	124.09
3	C	302	C2F	CG-CB-CA	-2.12	109.19	113.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	302	C2F	C17-C12-C13	2.09	121.57	118.59

There are no chirality outliers.

All (31) torsion outliers are listed below:

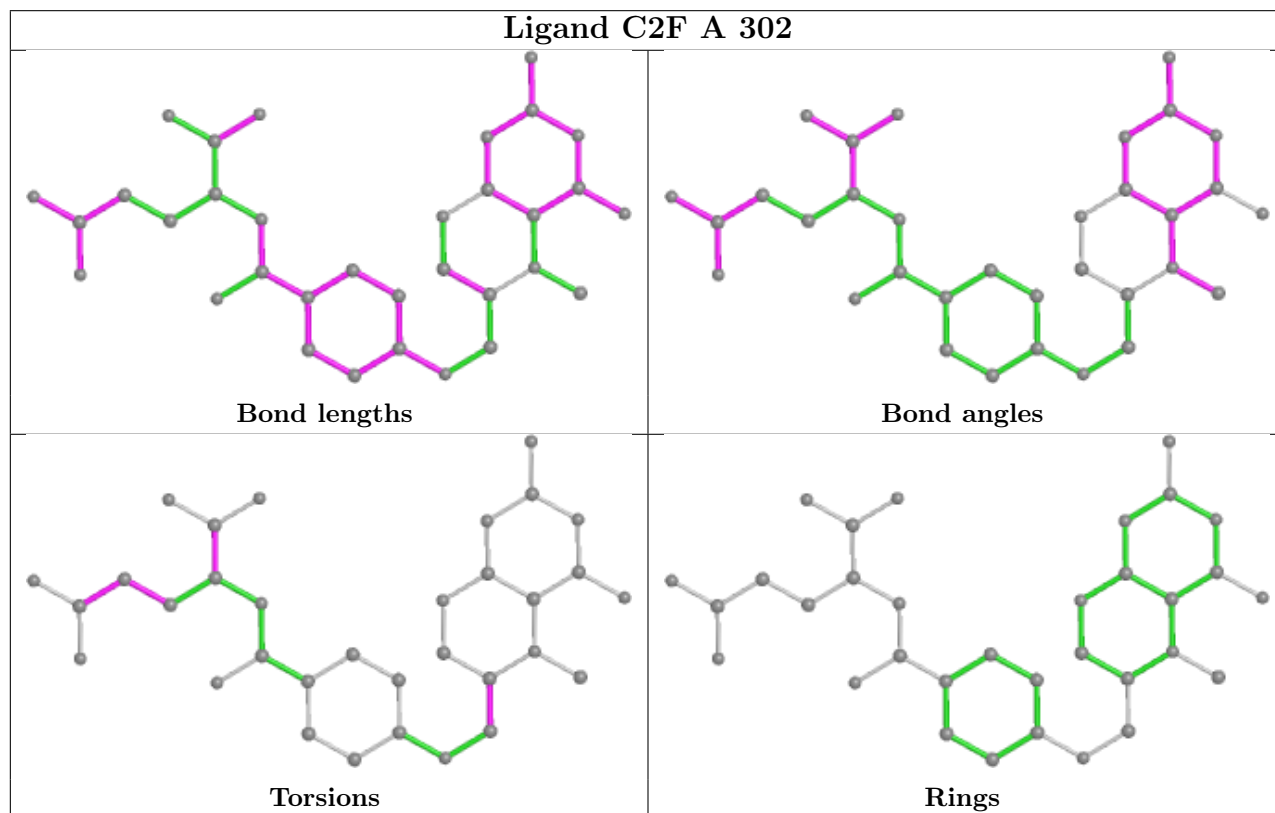
Mol	Chain	Res	Type	Atoms
2	C	301	UFP	O4'-C4'-C5'-O5'
2	D	301	UFP	C5'-O5'-P-O2P
2	D	301	UFP	C5'-O5'-P-O3P
3	A	302	C2F	N5-C6-C9-N10
3	C	302	C2F	N5-C6-C9-N10
3	D	302	C2F	N5-C6-C9-N10
2	B	301	UFP	C2'-C1'-N1-C2
3	C	302	C2F	N-CA-CB-CG
2	D	301	UFP	C2'-C1'-N1-C6
3	C	302	C2F	CT-CA-CB-CG
2	C	301	UFP	C3'-C4'-C5'-O5'
2	C	301	UFP	C2'-C1'-N1-C6
2	A	301	UFP	C2'-C1'-N1-C6
3	A	302	C2F	CA-CB-CG-CD
2	C	301	UFP	C5'-O5'-P-O1P
3	C	302	C2F	N-CA-CT-O2
3	C	302	C2F	C6-C9-N10-C15
3	A	302	C2F	N-CA-CT-O2
2	D	301	UFP	O4'-C4'-C5'-O5'
2	A	301	UFP	C5'-O5'-P-O1P
3	C	302	C2F	O-C-N-CA
3	C	302	C2F	OE1-CD-CG-CB
3	C	302	C2F	OE2-CD-CG-CB
3	D	302	C2F	OE1-CD-CG-CB
3	A	302	C2F	OE2-CD-CG-CB
3	D	302	C2F	C6-C9-N10-C15
2	B	301	UFP	O4'-C4'-C5'-O5'
2	C	301	UFP	C5'-O5'-P-O3P
3	D	302	C2F	OE2-CD-CG-CB
2	A	301	UFP	O4'-C4'-C5'-O5'
3	D	302	C2F	CA-CB-CG-CD

There are no ring outliers.

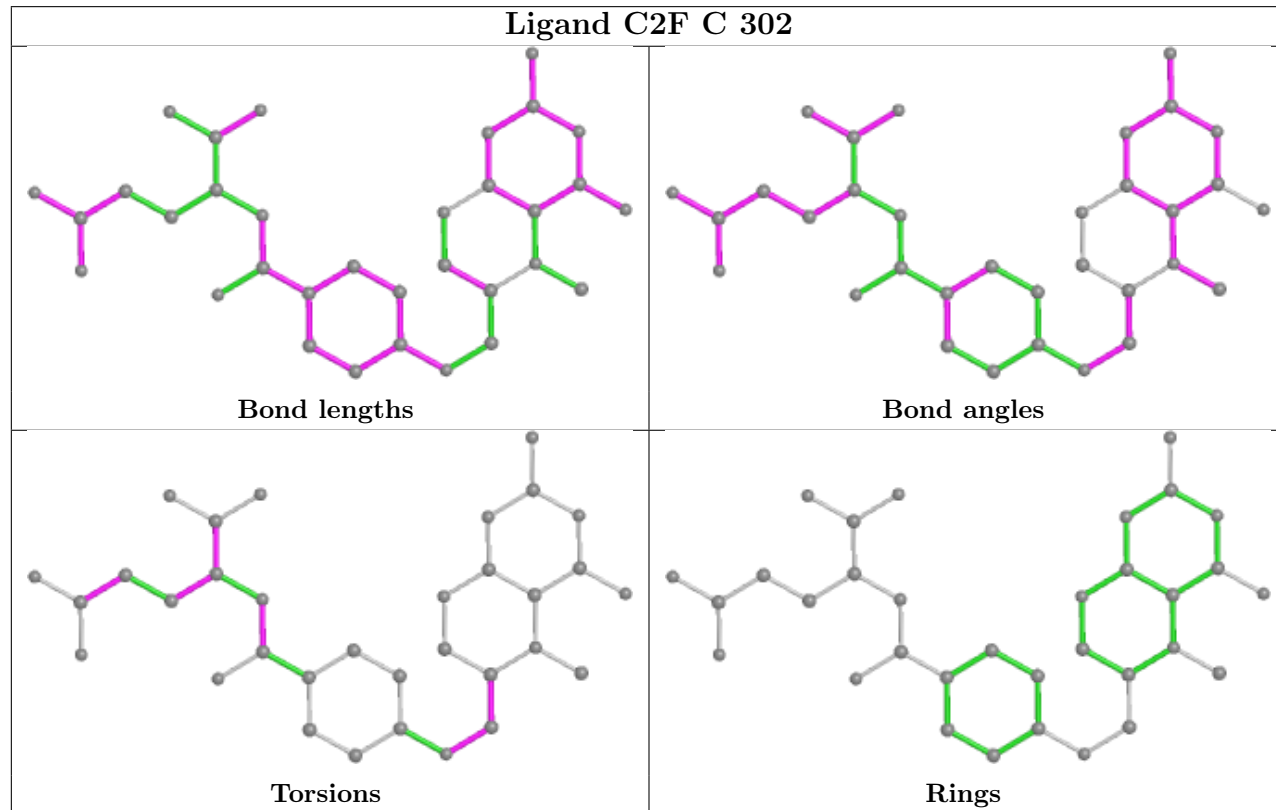
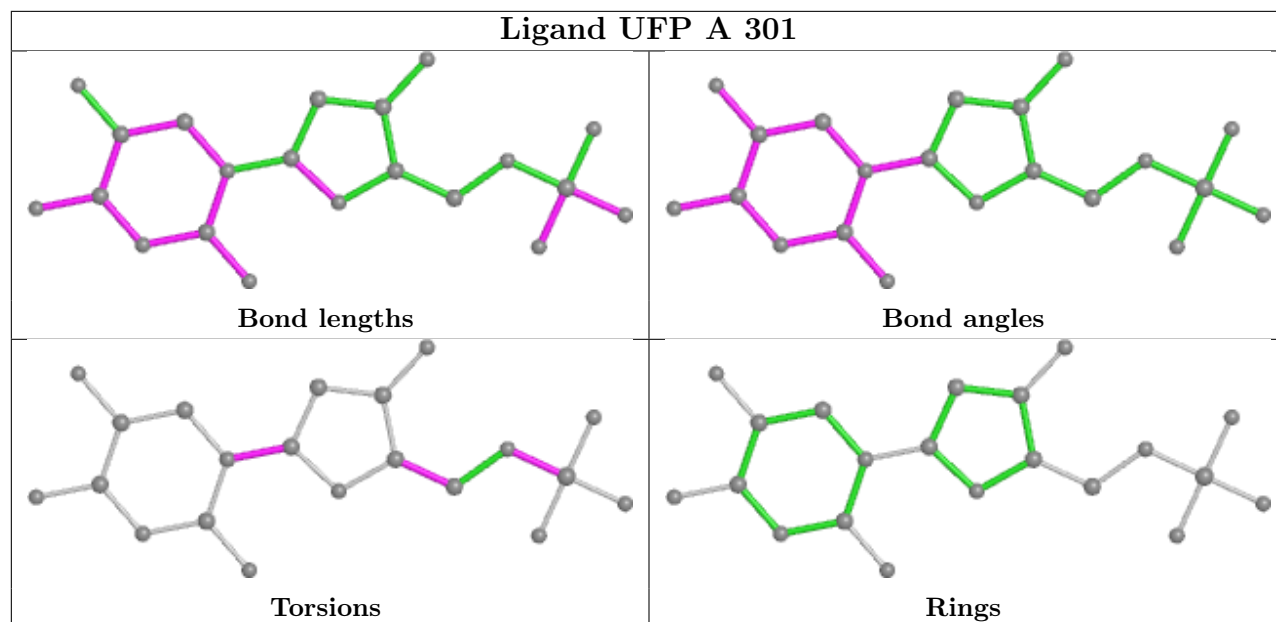
7 monomers are involved in 45 short contacts:

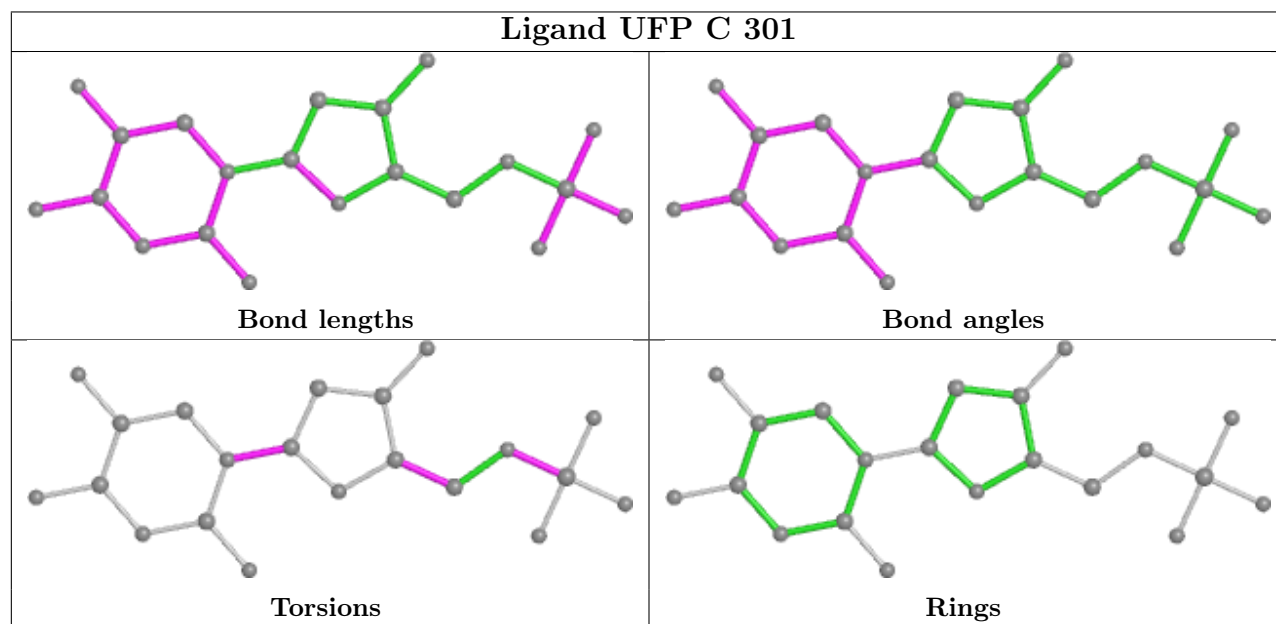
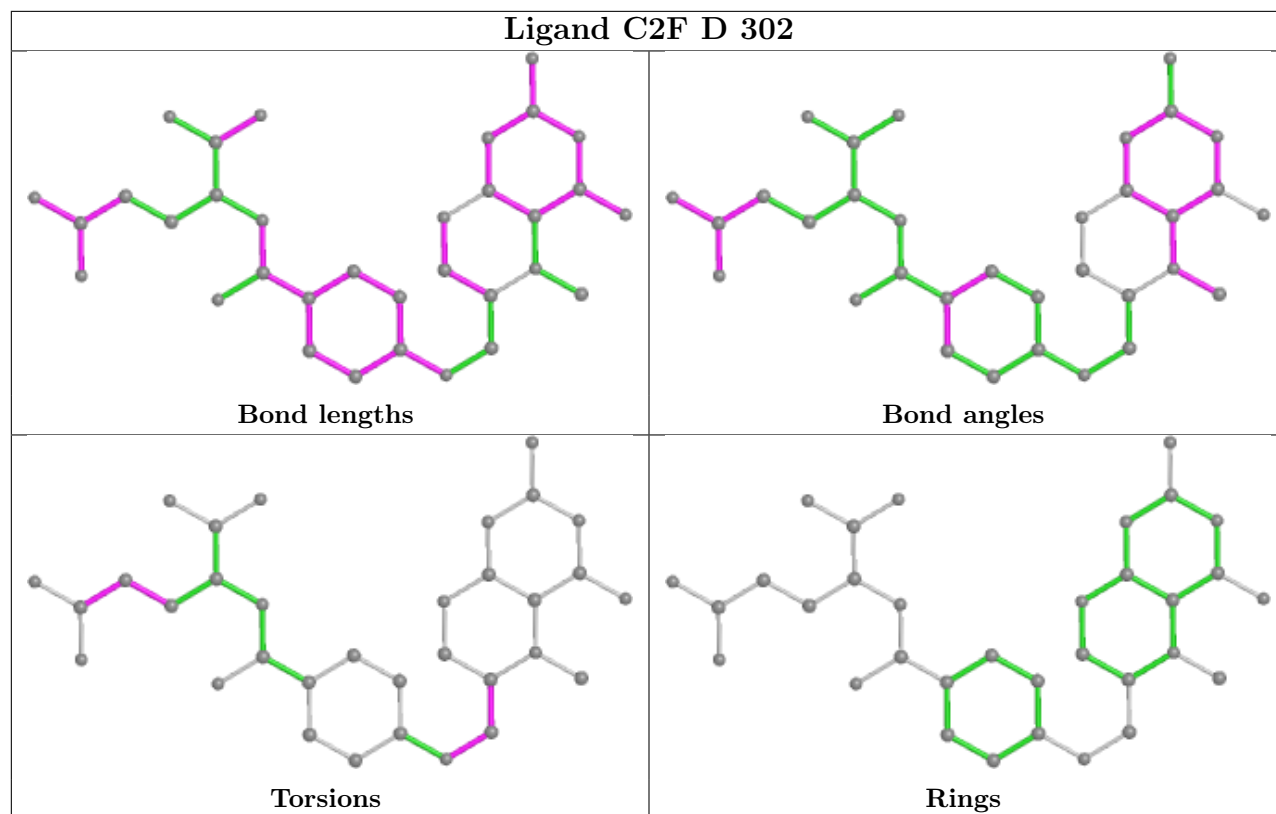
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	302	C2F	7	0
2	A	301	UFP	6	0
3	C	302	C2F	9	0
3	D	302	C2F	7	0
2	C	301	UFP	7	0
2	B	301	UFP	12	0
2	D	301	UFP	9	0

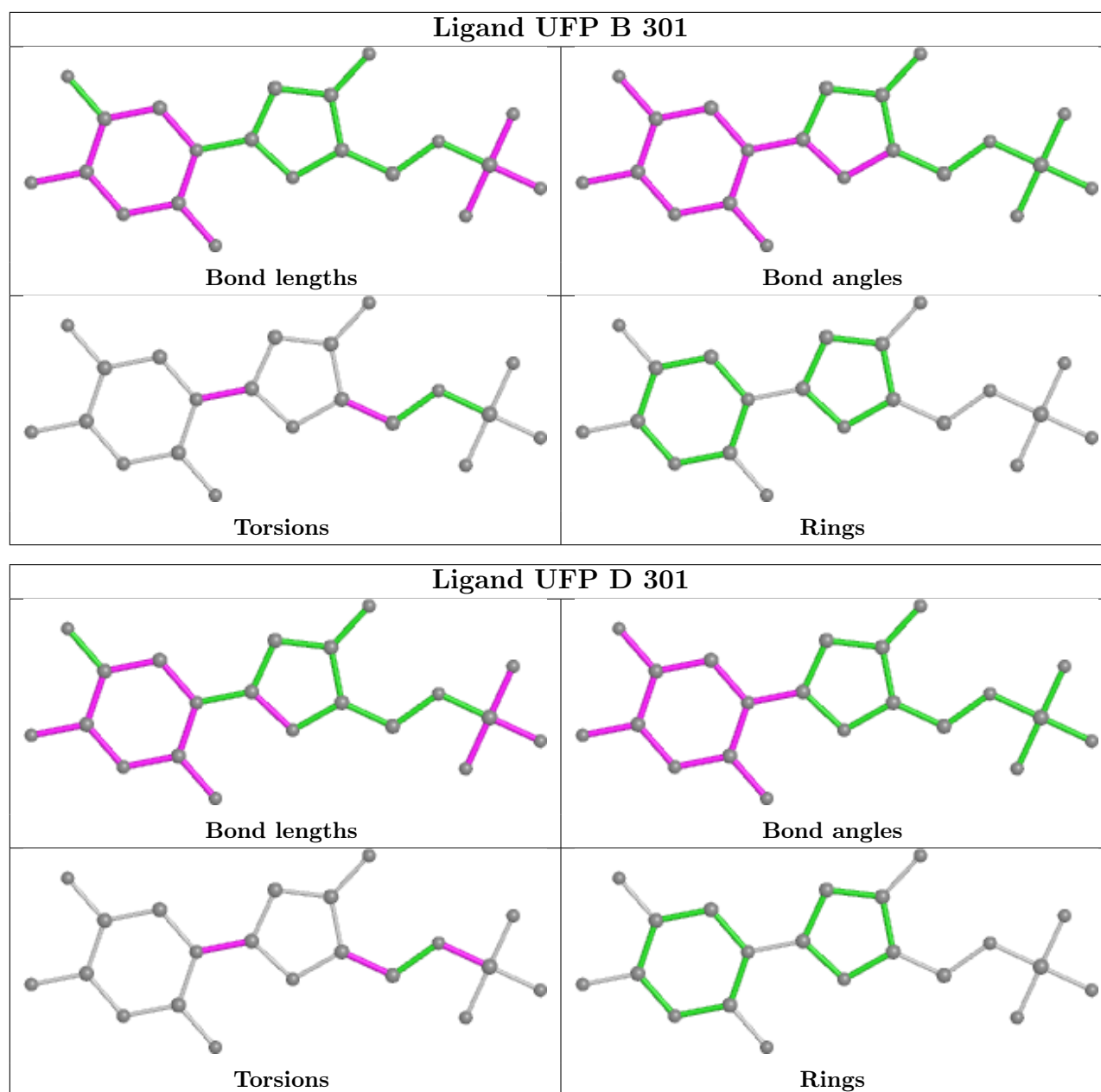
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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











## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	260/263 (98%)	0.16	14 (5%) 25 24	26, 42, 71, 77	0
1	B	258/263 (98%)	0.05	8 (3%) 49 47	26, 41, 61, 80	0
1	C	262/263 (99%)	0.17	9 (3%) 45 44	25, 38, 58, 85	0
1	D	263/263 (100%)	0.10	9 (3%) 45 44	26, 39, 57, 71	0
All	All	1043/1052 (99%)	0.12	40 (3%) 40 39	25, 40, 64, 85	0

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	25	GLY	4.9
1	B	23	GLY	4.9
1	C	23	GLY	4.6
1	C	19	SER	4.0
1	A	224	PRO	4.0
1	B	85	SER	3.8
1	B	20	ASP	3.8
1	C	24	THR	3.8
1	A	22	THR	3.6
1	A	88	GLY	3.4
1	A	217	ARG	3.4
1	C	20	ASP	3.2
1	D	24	THR	3.0
1	B	86	ASP	3.0
1	B	24	THR	2.9
1	B	156	ASP	2.8
1	C	22	THR	2.8
1	B	104	PRO	2.7
1	A	68	ASN	2.7
1	A	70	GLY	2.7
1	B	19	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	25	GLY	2.6
1	A	221	SER	2.6
1	D	22	THR	2.5
1	A	90	LEU	2.4
1	A	86	ASP	2.4
1	C	76	GLY	2.4
1	A	171	PHE	2.3
1	A	87	THR	2.3
1	D	236	ASP	2.3
1	D	214	GLU	2.3
1	C	150	PHE	2.2
1	A	25	GLY	2.2
1	D	261	VAL	2.1
1	A	85	SER	2.1
1	D	156	ASP	2.1
1	D	20	ASP	2.1
1	A	9	ARG	2.1
1	D	163	LEU	2.1
1	C	149	PHE	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, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

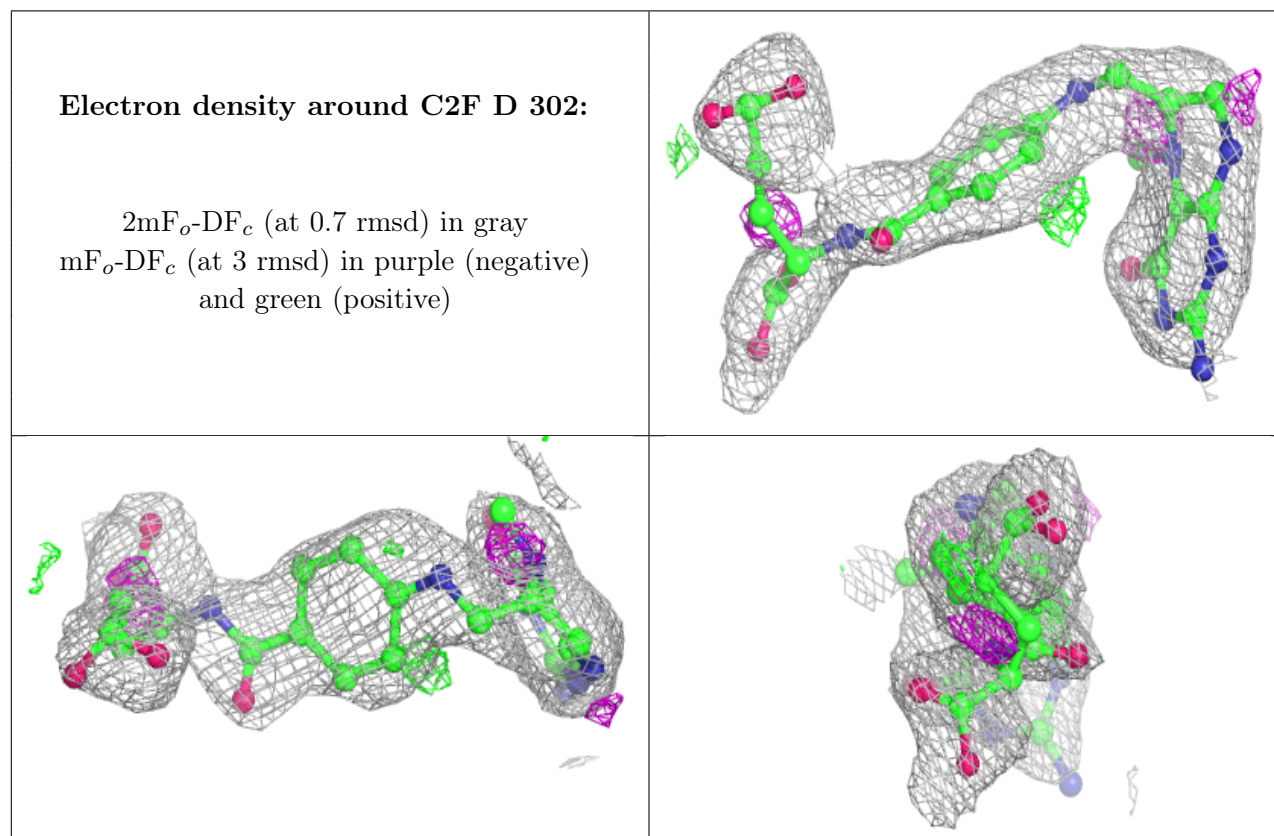
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	C2F	D	302	33/33	0.79	0.23	45,54,69,76	0
3	C2F	A	302	33/33	0.83	0.20	53,62,74,76	0
2	UFP	B	301	21/21	0.85	0.30	34,42,47,49	21
3	C2F	C	302	33/33	0.88	0.21	48,56,66,67	0

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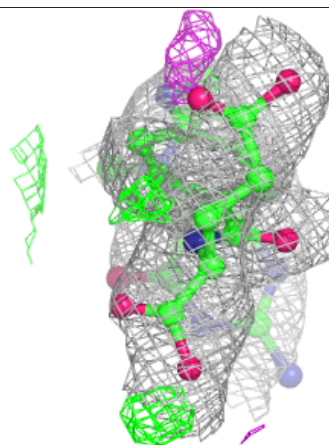
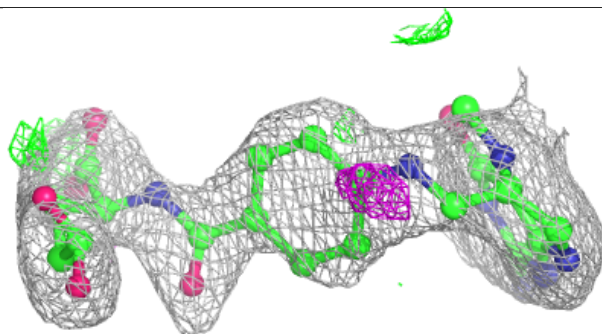
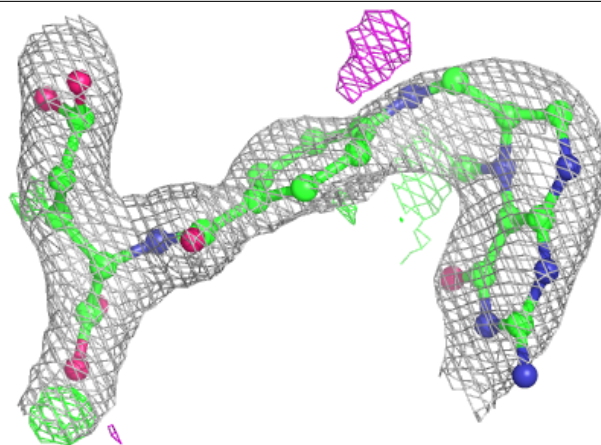
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	UFP	D	301	21/21	0.92	0.25	29,43,47,49	21
2	UFP	C	301	21/21	0.93	0.15	43,51,54,57	0
2	UFP	A	301	21/21	0.94	0.15	47,56,64,68	0

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.

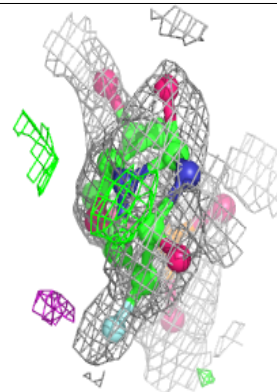
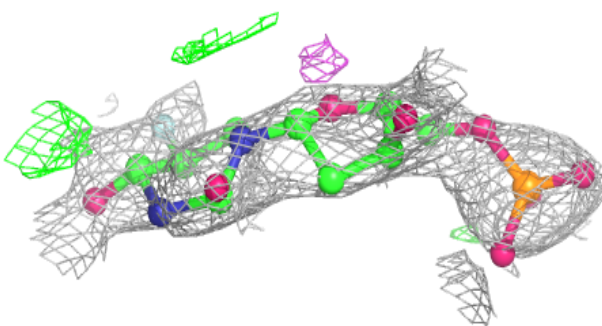
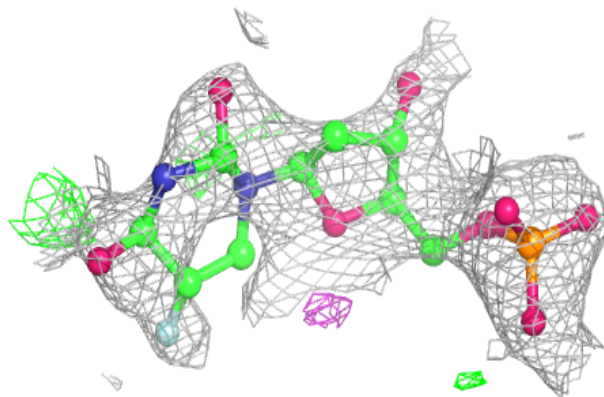


**Electron density around C2F A 302:**

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

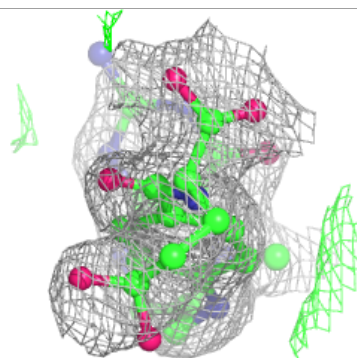
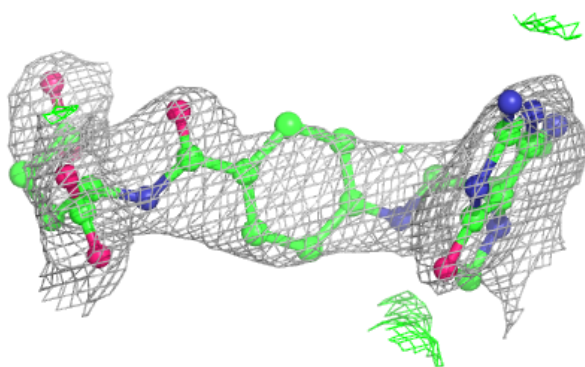
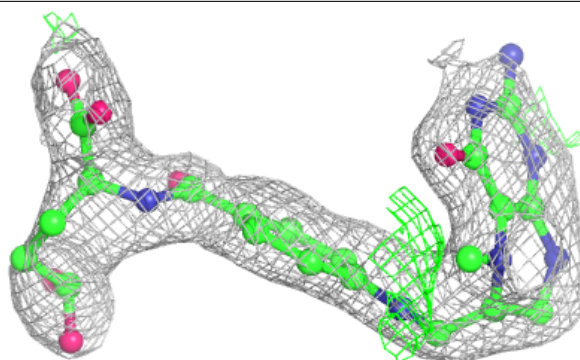
**Electron density around UFP B 301:**

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

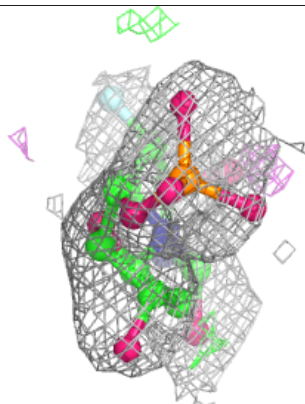
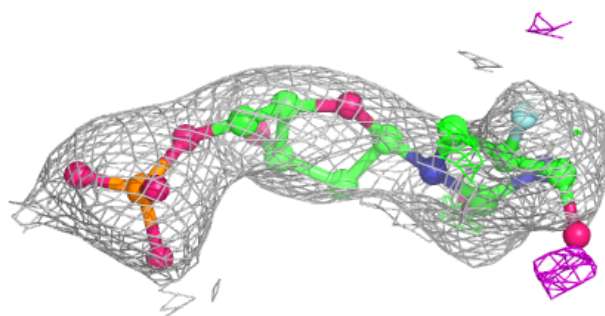
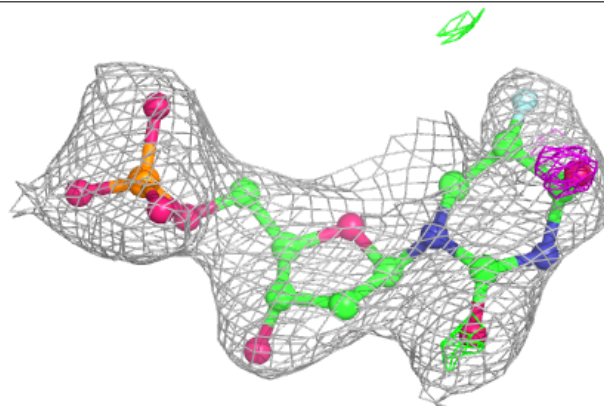


**Electron density around C2F C 302:**

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

**Electron density around UFP D 301:**

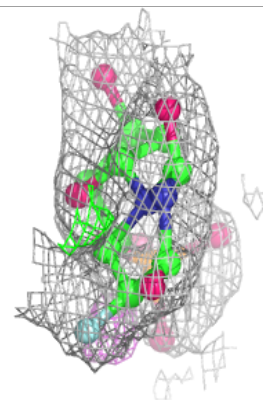
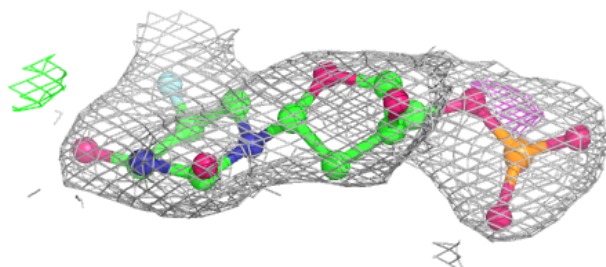
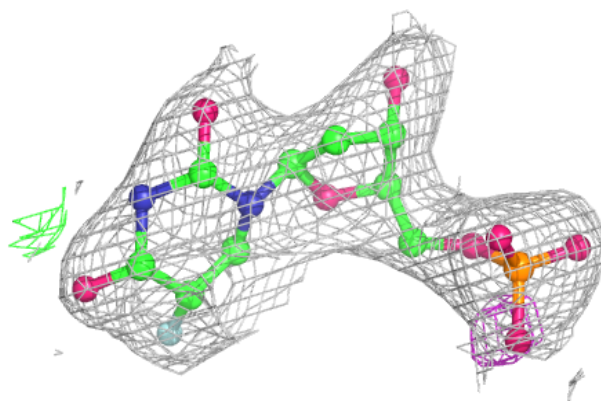
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



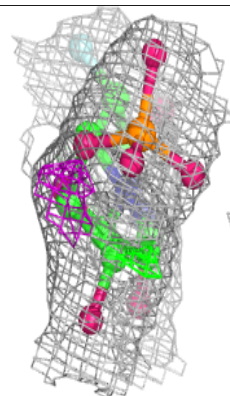
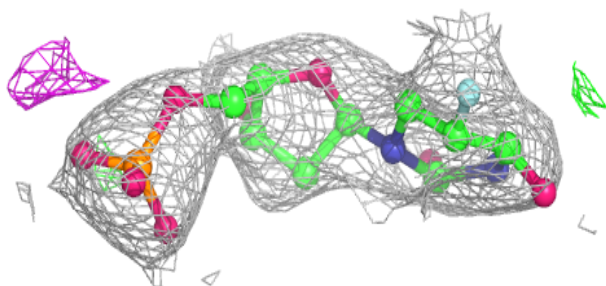
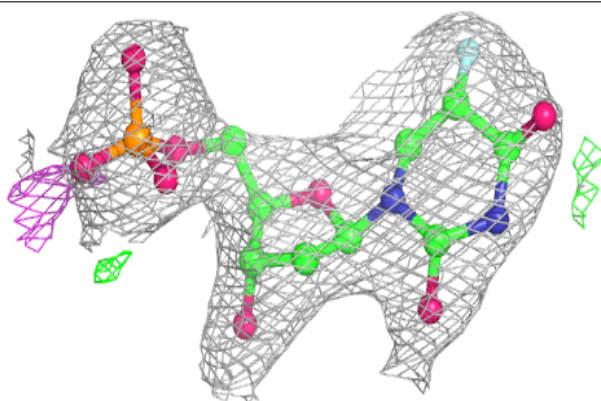


**Electron density around UFP C 301:**

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

**Electron density around UFP 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)



## 6.5 Other polymers [i](#)

There are no such residues in this entry.