



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 09:16 PM JST

PDB ID : 7VZ6  
Title : The crystal structure of Non-hydrolyzing UDPGlcNAc 2-epimerase in complex with UDP-glucose  
Authors : Li, T.L.; Rattinam, R.  
Deposited on : 2021-11-15  
Resolution : 2.09 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 : 2.36  
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

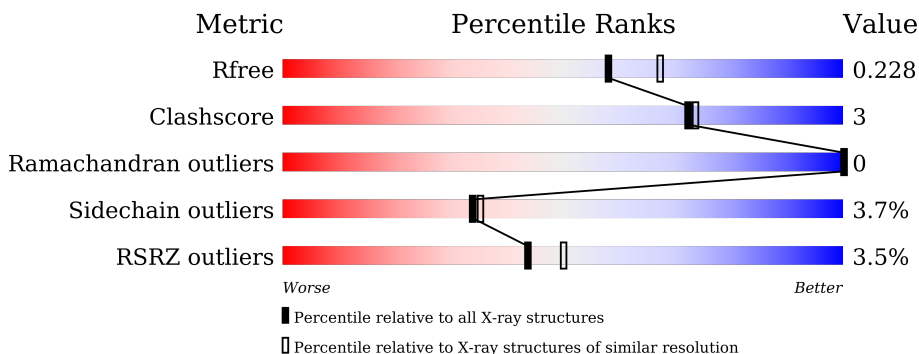
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.09 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.



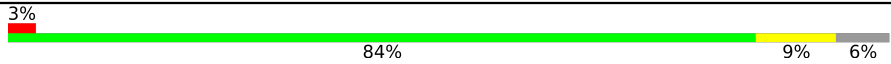

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	386	
1	B	386	
1	C	386	
1	D	386	
1	E	386	
1	F	386	

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Mol	Chain	Length	Quality of chain
1	G	386	 3% 84% 9% 6%
1	H	386	 4% 83% 12% 6%

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 24197 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 Putative UDP-N-acetylglucosamine 2-epimerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	372	Total 2857	C 1791	N 522	O 529	S 15	0	0	0
1	B	357	Total 2758	C 1733	N 503	O 508	S 14	0	0	0
1	C	359	Total 2766	C 1740	N 502	O 510	S 14	0	0	0
1	D	362	Total 2785	C 1750	N 508	O 513	S 14	0	0	0
1	E	367	Total 2817	C 1765	N 511	O 526	S 15	0	0	0
1	F	365	Total 2808	C 1764	N 511	O 518	S 15	0	0	0
1	G	361	Total 2780	C 1745	N 505	O 515	S 15	0	0	0
1	H	369	Total 2832	C 1775	N 516	O 526	S 15	0	0	0

There are 16 discrepancies between the modelled and reference sequences:

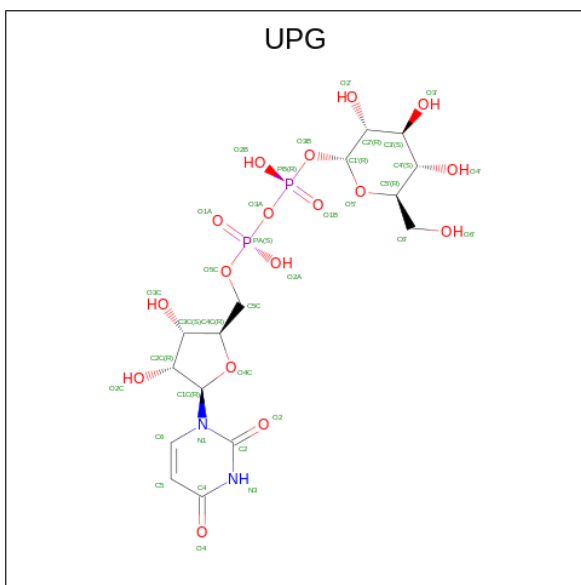
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	SER	-	expression tag	UNP A0A0K1H2R6
A	0	HIS	-	expression tag	UNP A0A0K1H2R6
B	-1	SER	-	expression tag	UNP A0A0K1H2R6
B	0	HIS	-	expression tag	UNP A0A0K1H2R6
C	-1	SER	-	expression tag	UNP A0A0K1H2R6
C	0	HIS	-	expression tag	UNP A0A0K1H2R6
D	-1	SER	-	expression tag	UNP A0A0K1H2R6
D	0	HIS	-	expression tag	UNP A0A0K1H2R6
E	-1	SER	-	expression tag	UNP A0A0K1H2R6
E	0	HIS	-	expression tag	UNP A0A0K1H2R6
F	-1	SER	-	expression tag	UNP A0A0K1H2R6
F	0	HIS	-	expression tag	UNP A0A0K1H2R6
G	-1	SER	-	expression tag	UNP A0A0K1H2R6

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Chain	Residue	Modelled	Actual	Comment	Reference
G	0	HIS	-	expression tag	UNP A0A0K1H2R6
H	-1	SER	-	expression tag	UNP A0A0K1H2R6
H	0	HIS	-	expression tag	UNP A0A0K1H2R6

- Molecule 2 is URIDINE-5'-DIPHOSPHATE-GLUCOSE (three-letter code: UPG) (formula:  $C_{15}H_{24}N_2O_{17}P_2$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
2	A	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	B	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	C	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	D	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	E	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	F	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	G	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	H	1	Total	C	N	O	P	0	0
			36	15	2	17	2		

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Na 1 1	0	0
3	C	1	Total Na 1 1	0	0
3	D	1	Total Na 1 1	0	0
3	E	1	Total Na 1 1	0	0
3	F	1	Total Na 1 1	0	0
3	G	1	Total Na 1 1	0	0
3	H	1	Total Na 1 1	0	0

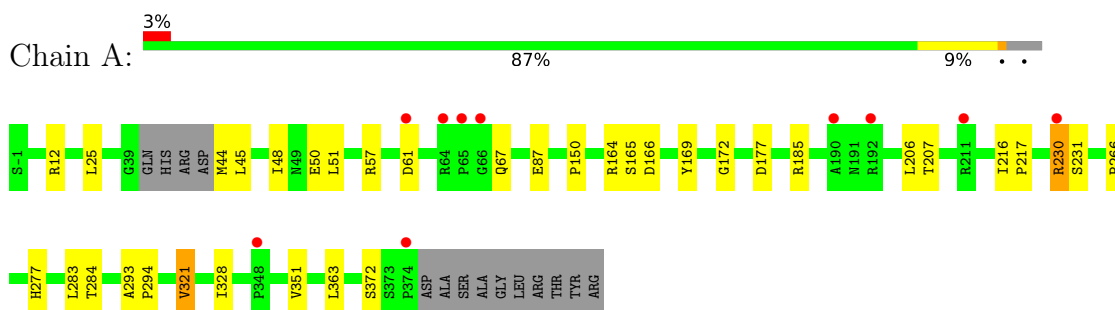
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	235	Total O 235 235	0	0
4	B	149	Total O 149 149	0	0
4	C	197	Total O 197 197	0	0
4	D	231	Total O 231 231	0	0
4	E	214	Total O 214 214	0	0
4	F	149	Total O 149 149	0	0
4	G	144	Total O 144 144	0	0
4	H	180	Total O 180 180	0	0

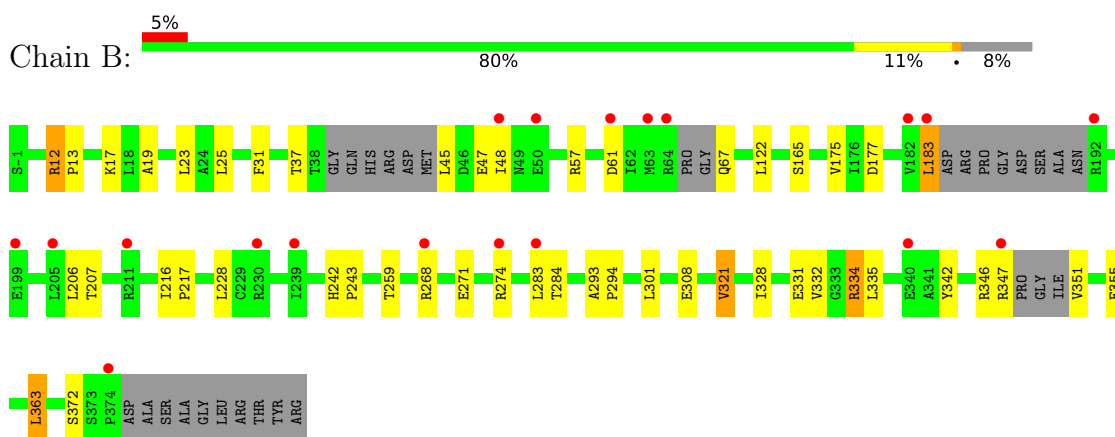
### 3 Residue-property plots [i](#)

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.

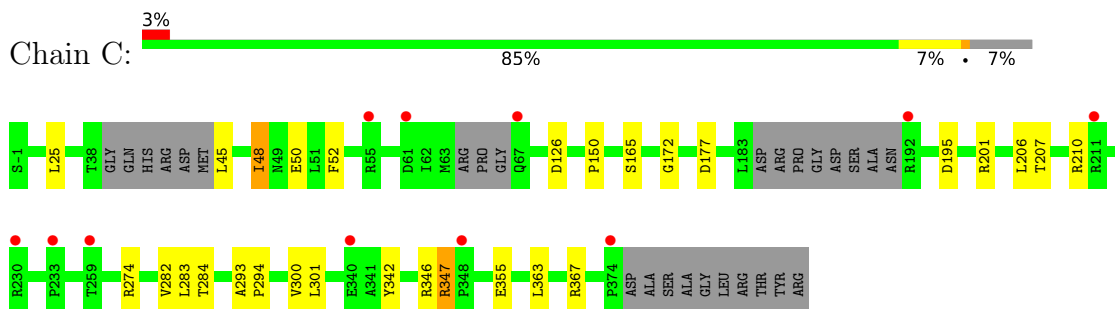
- Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase




- Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

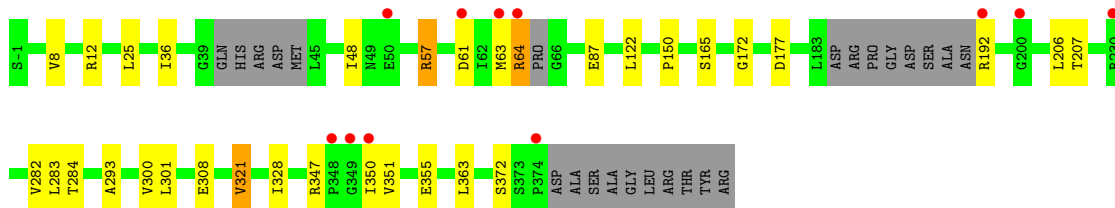


- Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase




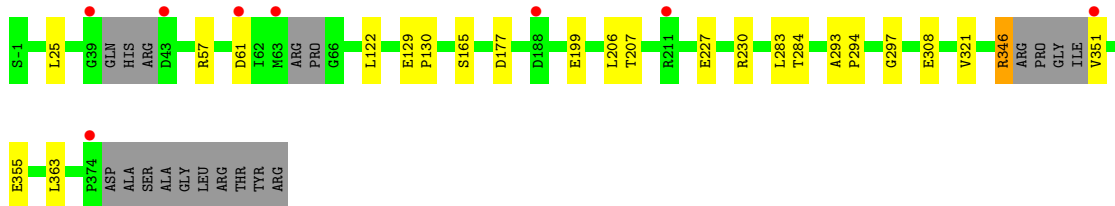
- Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

Chain D: 




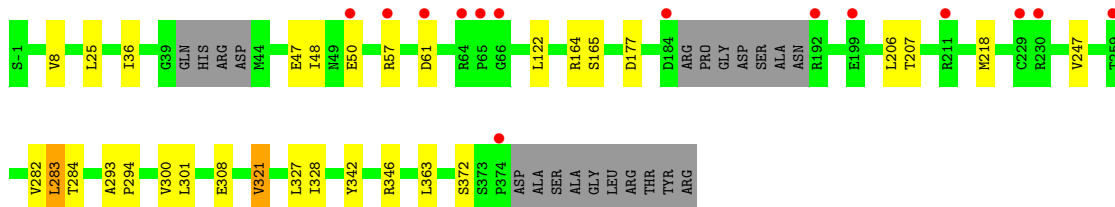
• Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

Chain E: 




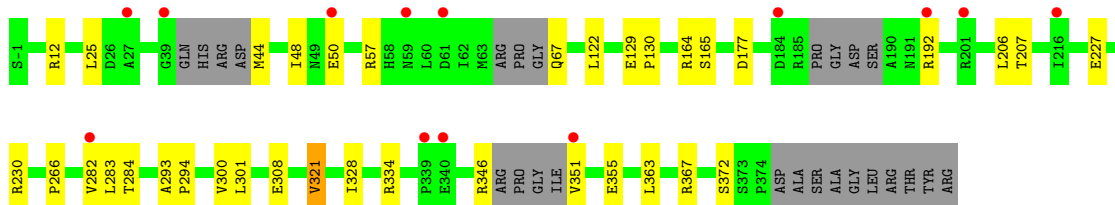
• Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

Chain F: 




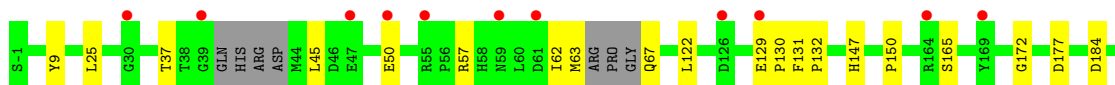
• Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

Chain G: 

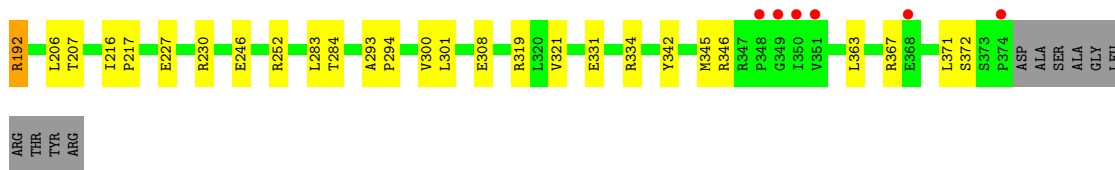


• Molecule 1: Putative UDP-N-acetylglucosamine 2-epimerase

Chain H: 







ARG  
THR  
TYR  
ARG

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	82.83Å 104.94Å 106.84Å 74.87° 72.92° 68.08°	Depositor
Resolution (Å)	21.56 – 2.09 21.55 – 2.09	Depositor EDS
% Data completeness (in resolution range)	95.1 (21.56-2.09) 95.2 (21.55-2.09)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.56 (at 2.09Å)	Xtrriage
Refinement program	PHENIX 5.8.0267	Depositor
R, $R_{free}$	0.201 , 0.228 0.204 , 0.228	Depositor DCC
$R_{free}$ test set	8824 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	24.3	Xtrriage
Anisotropy	0.011	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 47.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	24197	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	30.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.04% of the height of the origin peak. No significant pseudotranslation is detected.*

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

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

## 5 Model quality

### 5.1 Standard geometry

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

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	0.71	0/2909	0.83	0/3954
1	B	0.69	0/2804	0.83	0/3806
1	C	0.69	0/2814	0.82	2/3823 (0.1%)
1	D	0.70	0/2833	0.85	0/3847
1	E	0.71	0/2865	0.83	0/3891
1	F	0.69	0/2858	0.81	0/3883
1	G	0.70	0/2826	0.83	2/3836 (0.1%)
1	H	0.73	0/2882	0.85	0/3916
All	All	0.70	0/22791	0.83	4/30956 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	367	ARG	NE-CZ-NH2	-5.80	117.40	120.30
1	C	210	ARG	NE-CZ-NH1	-5.17	117.72	120.30
1	G	367	ARG	NE-CZ-NH1	5.04	122.82	120.30
1	G	367	ARG	NE-CZ-NH2	-5.03	117.78	120.30

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	2857	0	2888	17	0
1	B	2758	0	2795	40	0
1	C	2766	0	2804	13	0
1	D	2785	0	2823	16	0
1	E	2817	0	2836	8	0
1	F	2808	0	2844	15	0
1	G	2780	0	2809	19	0
1	H	2832	0	2855	26	0
2	A	36	0	22	0	0
2	B	36	0	22	0	0
2	C	36	0	22	0	0
2	D	36	0	22	0	0
2	E	36	0	22	0	0
2	F	36	0	22	0	0
2	G	36	0	22	1	0
2	H	36	0	22	0	0
3	A	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
3	E	1	0	0	0	0
3	F	1	0	0	0	0
3	G	1	0	0	0	0
3	H	1	0	0	0	0
4	A	235	0	0	1	0
4	B	149	0	0	1	0
4	C	197	0	0	0	0
4	D	231	0	0	1	0
4	E	214	0	0	1	0
4	F	149	0	0	2	0
4	G	144	0	0	2	0
4	H	180	0	0	5	0
All	All	24197	0	22830	154	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (154) 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:12:ARG:HG3	1:B:13:PRO:HD3	1.31	1.06
1:B:17:LYS:HE3	1:B:175:VAL:HG11	1.40	1.00
1:B:17:LYS:HE3	1:B:175:VAL:CG1	1.97	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:17:LYS:CE	1:B:175:VAL:CG1	2.46	0.93
1:B:17:LYS:HG2	1:B:175:VAL:HG13	1.53	0.90
1:B:12:ARG:HG3	1:B:13:PRO:CD	2.05	0.86
1:B:17:LYS:CE	1:B:175:VAL:HG11	2.06	0.85
1:B:228:LEU:HD11	1:B:332:VAL:HG11	1.59	0.81
1:F:218:MET:HE3	1:F:247:VAL:HG13	1.62	0.81
1:B:17:LYS:CE	1:B:175:VAL:HG13	2.12	0.78
1:B:228:LEU:CD1	1:B:332:VAL:HG11	2.13	0.78
1:B:17:LYS:CG	1:B:175:VAL:HG13	2.14	0.76
1:B:31:PHE:CE2	1:B:363:LEU:HD22	2.24	0.72
1:B:17:LYS:HE2	1:B:175:VAL:HG13	1.71	0.71
1:B:17:LYS:HE2	1:B:175:VAL:CG1	2.21	0.70
1:G:164:ARG:NH1	4:G:603:HOH:O	2.29	0.66
1:C:45:LEU:O	1:C:48:ILE:HG22	1.95	0.66
1:F:283:LEU:HD22	1:F:301:LEU:HB2	1.78	0.65
1:F:48:ILE:HD13	4:F:698:HOH:O	1.96	0.64
1:C:282:VAL:CG2	1:C:300:VAL:HG22	2.28	0.63
1:D:282:VAL:CG2	1:D:300:VAL:HG22	2.28	0.63
1:F:282:VAL:CG2	1:F:300:VAL:HG22	2.28	0.62
1:B:17:LYS:CG	1:B:175:VAL:CG1	2.78	0.61
1:G:282:VAL:CG2	1:G:300:VAL:HG22	2.31	0.61
1:B:242:HIS:CD2	1:B:243:PRO:HD2	2.37	0.60
1:H:25:LEU:HD23	1:H:363:LEU:HD11	1.83	0.60
1:G:25:LEU:HD23	1:G:363:LEU:HD11	1.84	0.60
1:F:25:LEU:HD23	1:F:363:LEU:HD11	1.84	0.60
1:E:25:LEU:HD23	1:E:363:LEU:HD11	1.83	0.60
1:C:25:LEU:HD23	1:C:363:LEU:HD11	1.82	0.59
1:D:25:LEU:HD23	1:D:363:LEU:HD11	1.84	0.59
1:B:228:LEU:HD21	1:B:332:VAL:CG1	2.33	0.59
1:A:25:LEU:HD23	1:A:363:LEU:HD11	1.84	0.58
1:B:328:ILE:O	1:B:332:VAL:HG12	2.03	0.58
1:D:57:ARG:HD3	1:D:87:GLU:OE1	2.04	0.57
1:G:44:MET:HE1	1:G:266:PRO:CG	2.35	0.57
1:A:44:MET:HE1	1:A:266:PRO:HG2	1.87	0.56
1:G:12:ARG:HG3	1:G:48:ILE:HD11	1.88	0.56
1:C:48:ILE:HD13	1:C:52:PHE:HD2	1.71	0.56
1:G:207:THR:O	1:G:284:THR:HA	2.06	0.56
1:H:283:LEU:HD22	1:H:301:LEU:HB2	1.88	0.56
1:H:227:GLU:HG3	4:H:610:HOH:O	2.06	0.55
1:B:207:THR:O	1:B:284:THR:HA	2.07	0.55
1:D:207:THR:O	1:D:284:THR:HA	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:207:THR:O	1:F:284:THR:HA	2.07	0.55
1:C:207:THR:O	1:C:284:THR:HA	2.07	0.55
1:B:37:THR:HG22	4:B:716:HOH:O	2.07	0.55
1:E:207:THR:O	1:E:284:THR:HA	2.07	0.55
1:G:44:MET:HE2	1:G:266:PRO:CB	2.37	0.54
1:A:207:THR:O	1:A:284:THR:HA	2.07	0.54
1:G:44:MET:CE	1:G:266:PRO:CG	2.85	0.54
1:H:207:THR:O	1:H:284:THR:HA	2.08	0.54
1:B:17:LYS:HG2	1:B:175:VAL:CG1	2.34	0.54
1:G:283:LEU:HD23	1:G:301:LEU:HB2	1.89	0.54
1:B:271:GLU:O	1:B:274:ARG:HG2	2.08	0.54
1:C:283:LEU:HD23	1:C:301:LEU:HB2	1.89	0.54
1:H:63:MET:HB3	1:H:67:GLN:NE2	2.22	0.54
1:B:283:LEU:HD23	1:B:301:LEU:HB2	1.91	0.53
1:G:44:MET:CE	1:G:266:PRO:HG2	2.39	0.53
1:D:12:ARG:HG3	1:D:48:ILE:HD11	1.91	0.53
1:B:25:LEU:HD23	1:B:363:LEU:HD21	1.91	0.52
1:D:283:LEU:HD23	1:D:301:LEU:HB2	1.91	0.52
1:G:44:MET:CE	1:G:266:PRO:CB	2.88	0.52
1:C:195:ASP:OD1	1:C:274:ARG:NH1	2.43	0.51
1:C:282:VAL:HG21	1:C:300:VAL:HG22	1.92	0.51
1:G:67:GLN:HA	4:G:706:HOH:O	2.10	0.51
1:A:12:ARG:HG3	1:A:48:ILE:HD11	1.92	0.50
1:A:57:ARG:NH1	1:A:87:GLU:OE1	2.44	0.50
1:H:331:GLU:HA	1:H:334:ARG:HG2	1.94	0.50
1:F:282:VAL:HG21	1:F:300:VAL:HG22	1.93	0.49
1:B:45:LEU:HG	1:B:47:GLU:OE1	2.12	0.49
1:A:169:TYR:CZ	1:C:347:ARG:NH2	2.81	0.48
1:D:282:VAL:HG21	1:D:300:VAL:HG22	1.94	0.48
1:D:63:MET:O	1:D:64:ARG:HD2	2.13	0.48
1:E:297:GLY:O	1:E:346:ARG:HD2	2.13	0.48
1:H:252:ARG:NH2	4:H:609:HOH:O	2.44	0.47
1:H:192:ARG:H	1:H:192:ARG:HG3	1.54	0.47
1:B:45:LEU:HB3	1:B:48:ILE:HD13	1.97	0.47
1:G:206:LEU:HA	1:G:283:LEU:O	2.15	0.47
1:H:147:HIS:HE1	4:H:749:HOH:O	1.97	0.47
1:H:319:ARG:HD2	1:H:345:MET:SD	2.54	0.47
1:A:216:ILE:HB	1:A:217:PRO:HD3	1.97	0.47
1:G:282:VAL:HG21	1:G:300:VAL:HG22	1.96	0.47
1:H:230:ARG:NE	4:H:610:HOH:O	2.44	0.47
1:B:206:LEU:HA	1:B:283:LEU:O	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:51:LEU:O	1:A:185:ARG:NH1	2.48	0.46
1:A:277:HIS:O	1:A:277:HIS:ND1	2.48	0.46
1:A:230:ARG:CD	1:A:231:SER:N	2.78	0.46
1:H:62:ILE:O	1:H:63:MET:HB3	2.15	0.46
1:F:218:MET:HE1	1:F:247:VAL:HA	1.98	0.46
1:F:206:LEU:HA	1:F:283:LEU:O	2.16	0.46
1:D:206:LEU:HA	1:D:283:LEU:O	2.16	0.45
1:E:206:LEU:HA	1:E:283:LEU:O	2.17	0.45
1:A:206:LEU:HA	1:A:283:LEU:O	2.17	0.45
1:B:19:ALA:O	1:B:23:LEU:HD13	2.17	0.45
1:E:227:GLU:HG3	4:E:693:HOH:O	2.15	0.45
1:C:206:LEU:HA	1:C:283:LEU:O	2.17	0.45
1:H:206:LEU:HA	1:H:283:LEU:O	2.17	0.45
1:C:342:TYR:CE2	1:C:346:ARG:HD2	2.52	0.44
1:D:122:LEU:HB3	1:D:308:GLU:HB3	1.99	0.44
1:F:342:TYR:CE2	1:F:346:ARG:HD2	2.53	0.44
1:A:321:VAL:HG13	1:A:328:ILE:HG12	2.00	0.44
1:A:230:ARG:HD2	1:A:231:SER:N	2.32	0.43
1:D:64:ARG:HD3	4:D:805:HOH:O	2.17	0.43
1:H:184:ASP:O	1:H:184:ASP:OD1	2.37	0.43
1:B:228:LEU:HD21	1:B:332:VAL:HG13	1.99	0.43
1:G:293:ALA:HB3	1:G:294:PRO:HD3	2.00	0.43
1:H:57:ARG:HG2	4:H:676:HOH:O	2.17	0.43
1:H:122:LEU:HB3	1:H:308:GLU:HB3	2.00	0.43
1:B:228:LEU:CD2	1:B:332:VAL:HG11	2.49	0.43
1:C:293:ALA:HB3	1:C:294:PRO:HD3	2.01	0.43
1:G:122:LEU:HB3	1:G:308:GLU:HB3	1.99	0.43
1:A:44:MET:HE3	1:A:44:MET:HB2	1.94	0.42
1:B:122:LEU:HB3	1:B:308:GLU:HB3	2.01	0.42
1:B:48:ILE:HD12	1:B:48:ILE:N	2.35	0.42
1:F:122:LEU:HB3	1:F:308:GLU:HB3	2.01	0.42
1:G:129:GLU:HA	1:G:130:PRO:HA	1.91	0.42
1:B:331:GLU:OE1	1:B:334:ARG:NH2	2.51	0.42
1:F:321:VAL:HG13	1:F:328:ILE:HG12	2.02	0.42
1:A:293:ALA:HB3	1:A:294:PRO:HD3	2.01	0.42
1:B:293:ALA:HB3	1:B:294:PRO:HD3	2.02	0.42
1:F:293:ALA:HB3	1:F:294:PRO:HD3	2.02	0.42
1:G:355:GLU:OE1	1:G:355:GLU:N	2.53	0.42
1:D:321:VAL:HG13	1:D:328:ILE:HG12	2.02	0.42
1:E:122:LEU:HB3	1:E:308:GLU:HB3	2.01	0.42
1:G:321:VAL:HG13	1:G:328:ILE:HG12	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:216:ILE:HG12	4:A:738:HOH:O	2.20	0.42
1:B:342:TYR:CE2	1:B:346:ARG:HD2	2.55	0.41
1:D:150:PRO:O	1:D:172:GLY:HA2	2.21	0.41
1:B:183:LEU:HD12	1:B:183:LEU:HA	1.78	0.41
1:H:129:GLU:HA	1:H:130:PRO:HA	1.91	0.41
1:A:150:PRO:O	1:A:172:GLY:HA2	2.20	0.41
1:D:8:VAL:HA	1:D:36:ILE:O	2.20	0.41
1:H:293:ALA:HB3	1:H:294:PRO:HD3	2.02	0.41
1:E:293:ALA:HB3	1:E:294:PRO:HD3	2.03	0.41
1:B:228:LEU:CD2	1:B:332:VAL:CG1	2.98	0.41
1:H:367:ARG:HA	1:H:371:LEU:HB2	2.03	0.41
1:B:355:GLU:N	1:B:355:GLU:OE1	2.54	0.41
1:C:150:PRO:O	1:C:172:GLY:HA2	2.21	0.41
1:B:321:VAL:HG13	1:B:328:ILE:HG12	2.02	0.41
1:E:129:GLU:HA	1:E:130:PRO:HA	1.90	0.41
1:H:293:ALA:HB3	1:H:300:VAL:CG2	2.50	0.41
1:H:150:PRO:O	1:H:172:GLY:HA2	2.20	0.41
1:D:293:ALA:HB3	1:D:300:VAL:CG2	2.51	0.40
1:H:9:TYR:O	1:H:37:THR:HA	2.21	0.40
1:B:216:ILE:HB	1:B:217:PRO:HD3	2.03	0.40
1:H:131:PHE:HA	1:H:132:PRO:HA	1.87	0.40
1:H:216:ILE:HB	1:H:217:PRO:HD3	2.02	0.40
1:D:355:GLU:OE1	1:D:355:GLU:N	2.54	0.40
1:F:8:VAL:HA	1:F:36:ILE:O	2.22	0.40
2:G:501:UPG:H5C2	2:G:501:UPG:O2B	2.21	0.40
1:H:371:LEU:HD23	1:H:371:LEU:HA	1.97	0.40
1:F:327:LEU:HD21	4:F:712:HOH:O	2.21	0.40
1:H:342:TYR:CE2	1:H:346:ARG:HD2	2.57	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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



Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	368/386 (95%)	363 (99%)	5 (1%)	0	100	100
1	B	347/386 (90%)	342 (99%)	5 (1%)	0	100	100
1	C	351/386 (91%)	346 (99%)	5 (1%)	0	100	100
1	D	354/386 (92%)	349 (99%)	5 (1%)	0	100	100
1	E	359/386 (93%)	356 (99%)	3 (1%)	0	100	100
1	F	359/386 (93%)	353 (98%)	6 (2%)	0	100	100
1	G	351/386 (91%)	347 (99%)	4 (1%)	0	100	100
1	H	363/386 (94%)	359 (99%)	4 (1%)	0	100	100
All	All	2852/3088 (92%)	2815 (99%)	37 (1%)	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	302/313 (96%)	290 (96%)	12 (4%)	31	32
1	B	292/313 (93%)	276 (94%)	16 (6%)	21	19
1	C	293/313 (94%)	285 (97%)	8 (3%)	44	48
1	D	294/313 (94%)	283 (96%)	11 (4%)	34	35
1	E	298/313 (95%)	288 (97%)	10 (3%)	37	39
1	F	297/313 (95%)	287 (97%)	10 (3%)	37	39
1	G	294/313 (94%)	282 (96%)	12 (4%)	30	31
1	H	299/313 (96%)	291 (97%)	8 (3%)	44	48
All	All	2369/2504 (95%)	2282 (96%)	87 (4%)	34	35

All (87) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	LEU
1	A	50	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	61	ASP
1	A	67	GLN
1	A	164	ARG
1	A	165	SER
1	A	166	ASP
1	A	177	ASP
1	A	230	ARG
1	A	321	VAL
1	A	351	VAL
1	A	372	SER
1	B	12	ARG
1	B	57	ARG
1	B	61	ASP
1	B	67	GLN
1	B	165	SER
1	B	177	ASP
1	B	183	LEU
1	B	259	THR
1	B	268	ARG
1	B	321	VAL
1	B	334	ARG
1	B	335	LEU
1	B	347	ARG
1	B	351	VAL
1	B	363	LEU
1	B	372	SER
1	C	48	ILE
1	C	50	GLU
1	C	126	ASP
1	C	165	SER
1	C	177	ASP
1	C	201	ARG
1	C	347	ARG
1	C	355	GLU
1	D	57	ARG
1	D	61	ASP
1	D	64	ARG
1	D	165	SER
1	D	177	ASP
1	D	192	ARG
1	D	321	VAL
1	D	347	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	D	350	ILE
1	D	351	VAL
1	D	372	SER
1	E	57	ARG
1	E	61	ASP
1	E	165	SER
1	E	177	ASP
1	E	199	GLU
1	E	230	ARG
1	E	321	VAL
1	E	346	ARG
1	E	351	VAL
1	E	355	GLU
1	F	47	GLU
1	F	50	GLU
1	F	57	ARG
1	F	61	ASP
1	F	164	ARG
1	F	165	SER
1	F	177	ASP
1	F	283	LEU
1	F	321	VAL
1	F	372	SER
1	G	50	GLU
1	G	57	ARG
1	G	165	SER
1	G	177	ASP
1	G	192	ARG
1	G	227	GLU
1	G	230	ARG
1	G	321	VAL
1	G	334	ARG
1	G	346	ARG
1	G	351	VAL
1	G	372	SER
1	H	45	LEU
1	H	50	GLU
1	H	165	SER
1	H	177	ASP
1	H	192	ARG
1	H	246	GLU
1	H	321	VAL

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Mol	Chain	Res	Type
1	H	372	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	242	HIS
1	C	49	ASN
1	D	180	HIS
1	E	49	ASN
1	E	67	GLN
1	F	58	HIS
1	H	67	GLN
1	H	147	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 [i](#)

Of 15 ligands modelled in this entry, 7 are monoatomic - leaving 8 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	UPG	C	501	-	35,38,38	0.54	0	53,58,58	0.93	3 (5%)
2	UPG	D	501	-	35,38,38	0.57	0	53,58,58	0.89	1 (1%)
2	UPG	F	501	-	35,38,38	0.47	0	53,58,58	0.89	2 (3%)
2	UPG	A	501	-	35,38,38	0.52	0	53,58,58	0.73	0
2	UPG	B	501	-	35,38,38	0.56	0	53,58,58	0.86	1 (1%)
2	UPG	E	501	-	35,38,38	0.69	1 (2%)	53,58,58	0.69	1 (1%)
2	UPG	H	501	-	35,38,38	0.54	0	53,58,58	0.87	3 (5%)
2	UPG	G	501	-	35,38,38	0.49	0	53,58,58	1.04	3 (5%)

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	UPG	C	501	-	-	2/23/59/59	0/3/3/3
2	UPG	D	501	-	-	2/23/59/59	0/3/3/3
2	UPG	F	501	-	-	3/23/59/59	0/3/3/3
2	UPG	A	501	-	-	2/23/59/59	0/3/3/3
2	UPG	B	501	-	-	3/23/59/59	0/3/3/3
2	UPG	E	501	-	-	4/23/59/59	0/3/3/3
2	UPG	H	501	-	-	2/23/59/59	0/3/3/3
2	UPG	G	501	-	-	4/23/59/59	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	501	UPG	C4'-C5'	2.45	1.58	1.53

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	501	UPG	O5'-C1'-O3B	-3.70	106.52	111.36
2	G	501	UPG	PB-O3B-C1'	3.32	132.56	119.74
2	C	501	UPG	PB-O3B-C1'	3.31	132.55	119.74
2	F	501	UPG	PB-O3B-C1'	3.23	132.21	119.74
2	B	501	UPG	O5'-C1'-O3B	-3.08	107.34	111.36
2	H	501	UPG	O5'-C1'-O3B	-3.04	107.39	111.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	501	UPG	PB-O3B-C1'	2.89	130.91	119.74
2	F	501	UPG	O5'-C1'-O3B	-2.60	107.96	111.36
2	C	501	UPG	O2B-PB-O3B	-2.59	96.55	106.78
2	C	501	UPG	O3A-PB-O3B	2.49	107.50	102.48
2	G	501	UPG	O2B-PB-O1B	2.43	124.26	112.24
2	H	501	UPG	O2C-C2C-C1C	2.26	117.58	110.02
2	E	501	UPG	PB-O3B-C1'	2.21	128.27	119.74
2	H	501	UPG	PB-O3B-C1'	2.07	127.75	119.74

There are no chirality outliers.

All (22) torsion outliers are listed below:

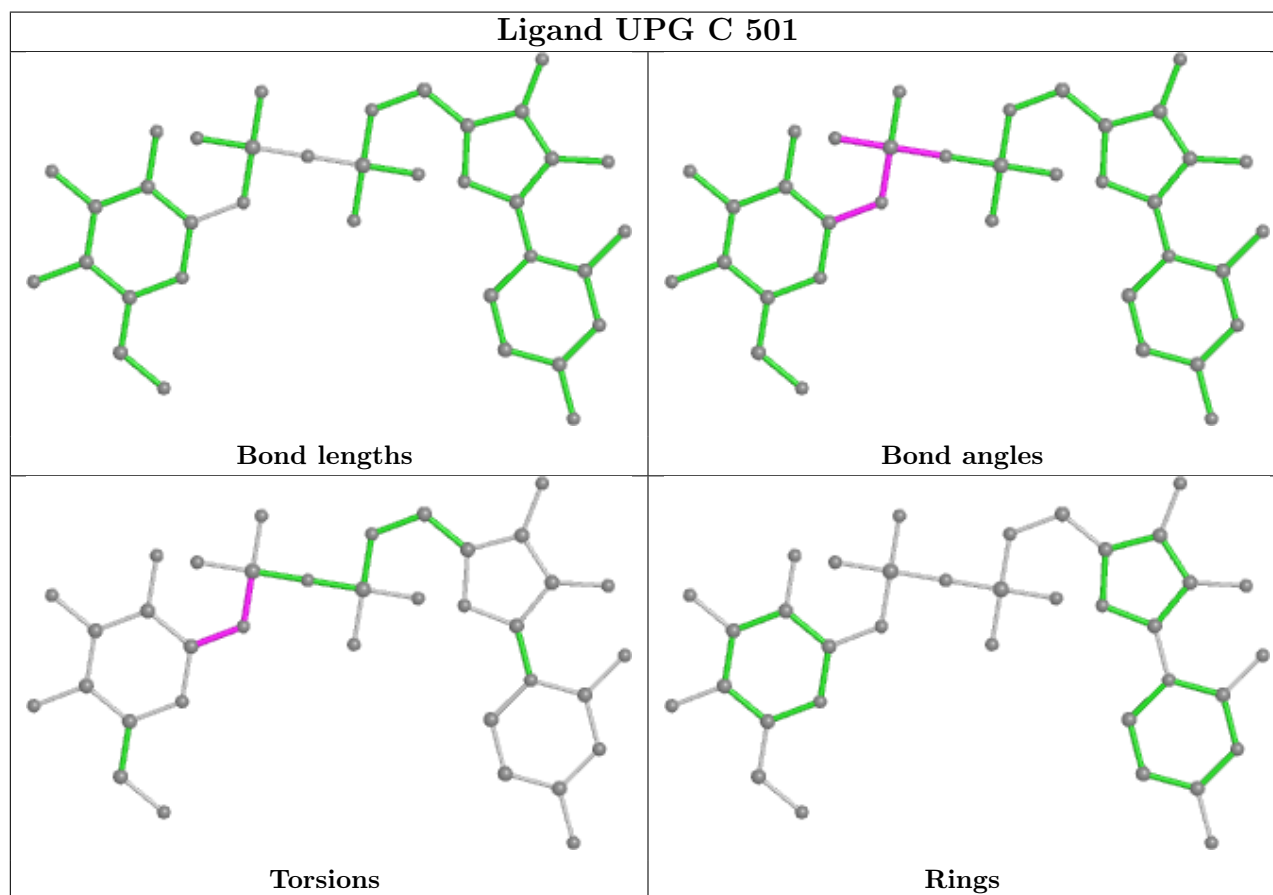
Mol	Chain	Res	Type	Atoms
2	A	501	UPG	O5'-C1'-O3B-PB
2	B	501	UPG	O5'-C1'-O3B-PB
2	C	501	UPG	O5'-C1'-O3B-PB
2	D	501	UPG	O5'-C1'-O3B-PB
2	E	501	UPG	O5'-C1'-O3B-PB
2	F	501	UPG	O5'-C1'-O3B-PB
2	G	501	UPG	O5'-C1'-O3B-PB
2	H	501	UPG	O5'-C1'-O3B-PB
2	E	501	UPG	C1'-O3B-PB-O3A
2	G	501	UPG	C1'-O3B-PB-O3A
2	G	501	UPG	O4C-C4C-C5C-O5C
2	G	501	UPG	C3C-C4C-C5C-O5C
2	B	501	UPG	C1'-O3B-PB-O3A
2	F	501	UPG	C1'-O3B-PB-O3A
2	H	501	UPG	C1'-O3B-PB-O3A
2	A	501	UPG	C1'-O3B-PB-O3A
2	C	501	UPG	C1'-O3B-PB-O3A
2	D	501	UPG	C1'-O3B-PB-O3A
2	E	501	UPG	PB-O3A-PA-O1A
2	E	501	UPG	PB-O3A-PA-O2A
2	F	501	UPG	C1'-O3B-PB-O1B
2	B	501	UPG	C5C-O5C-PA-O1A

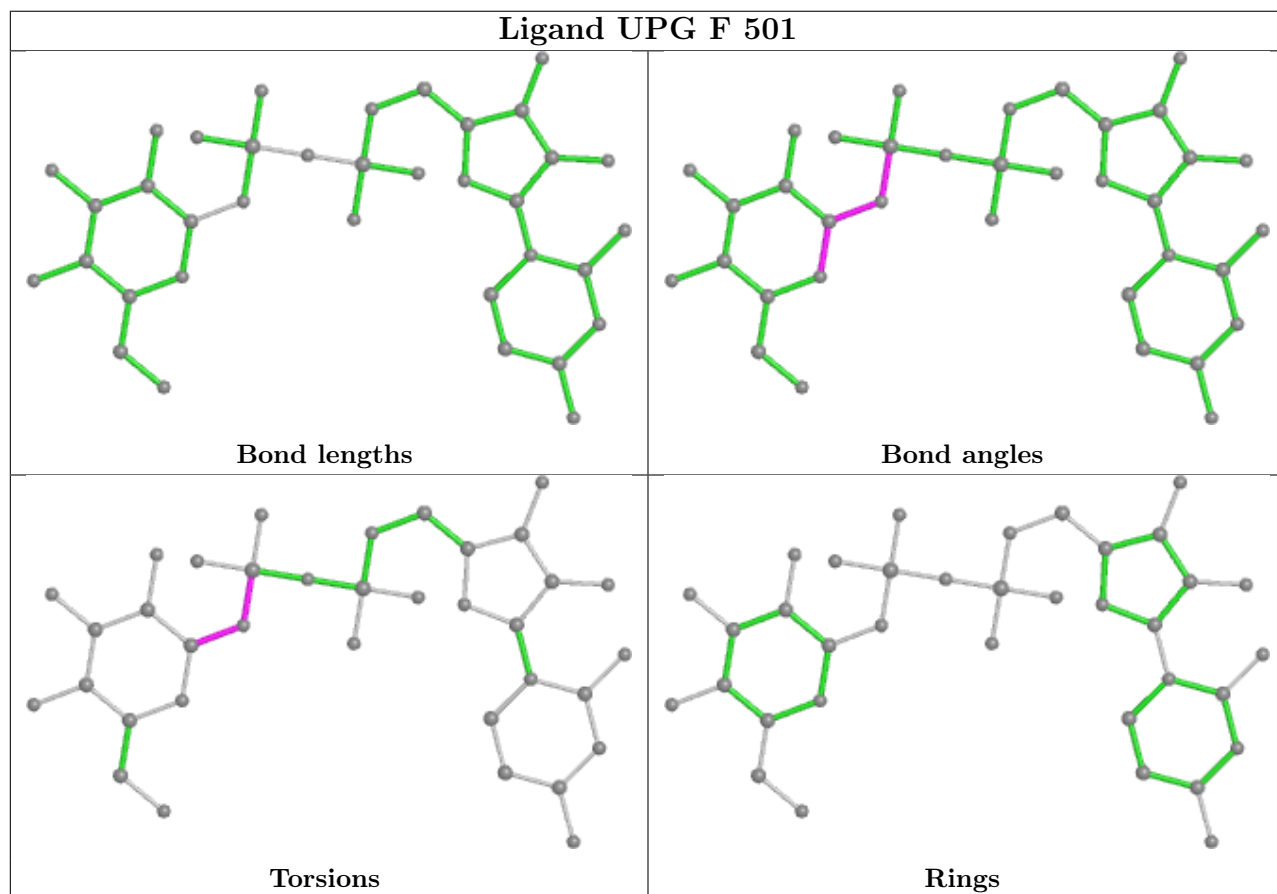
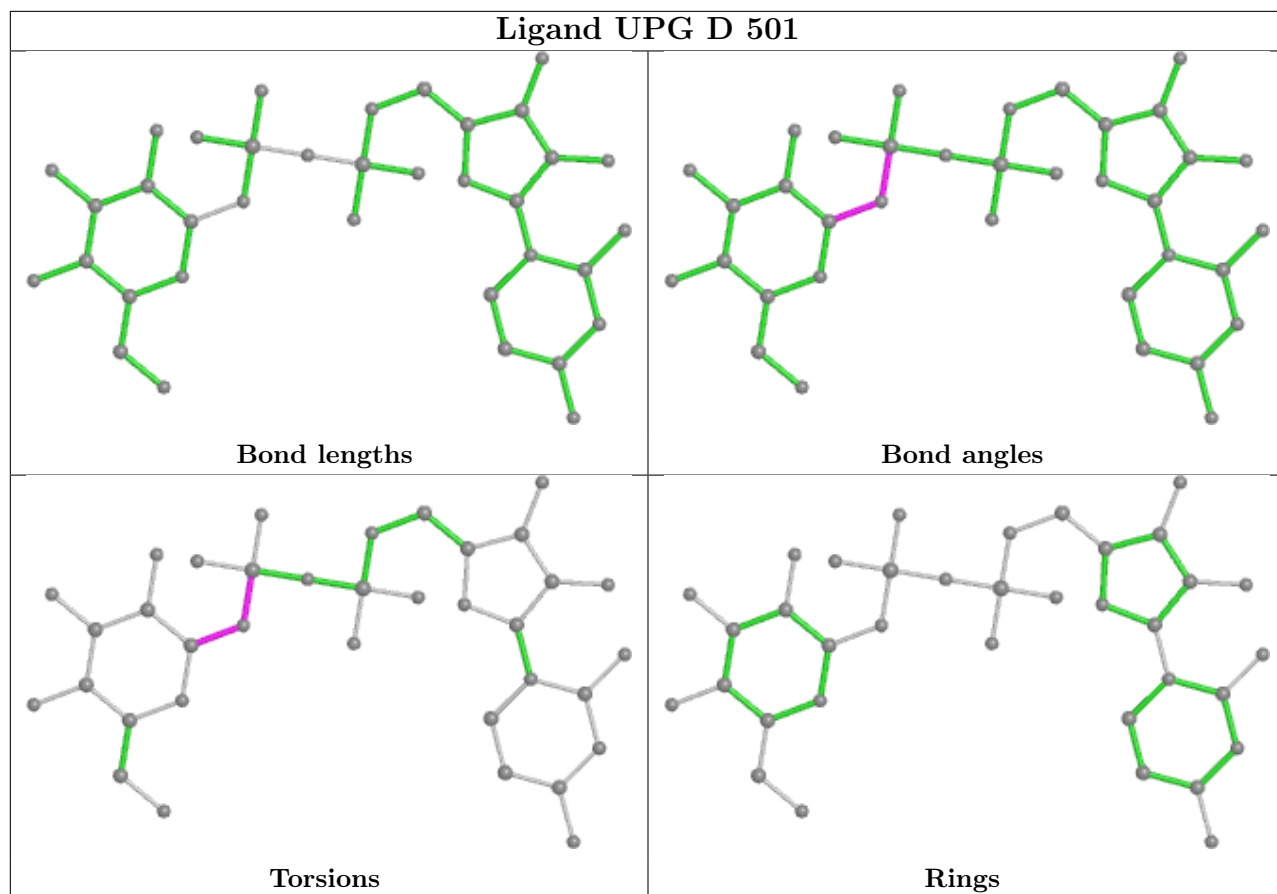
There are no ring outliers.

1 monomer is involved in 1 short contact:

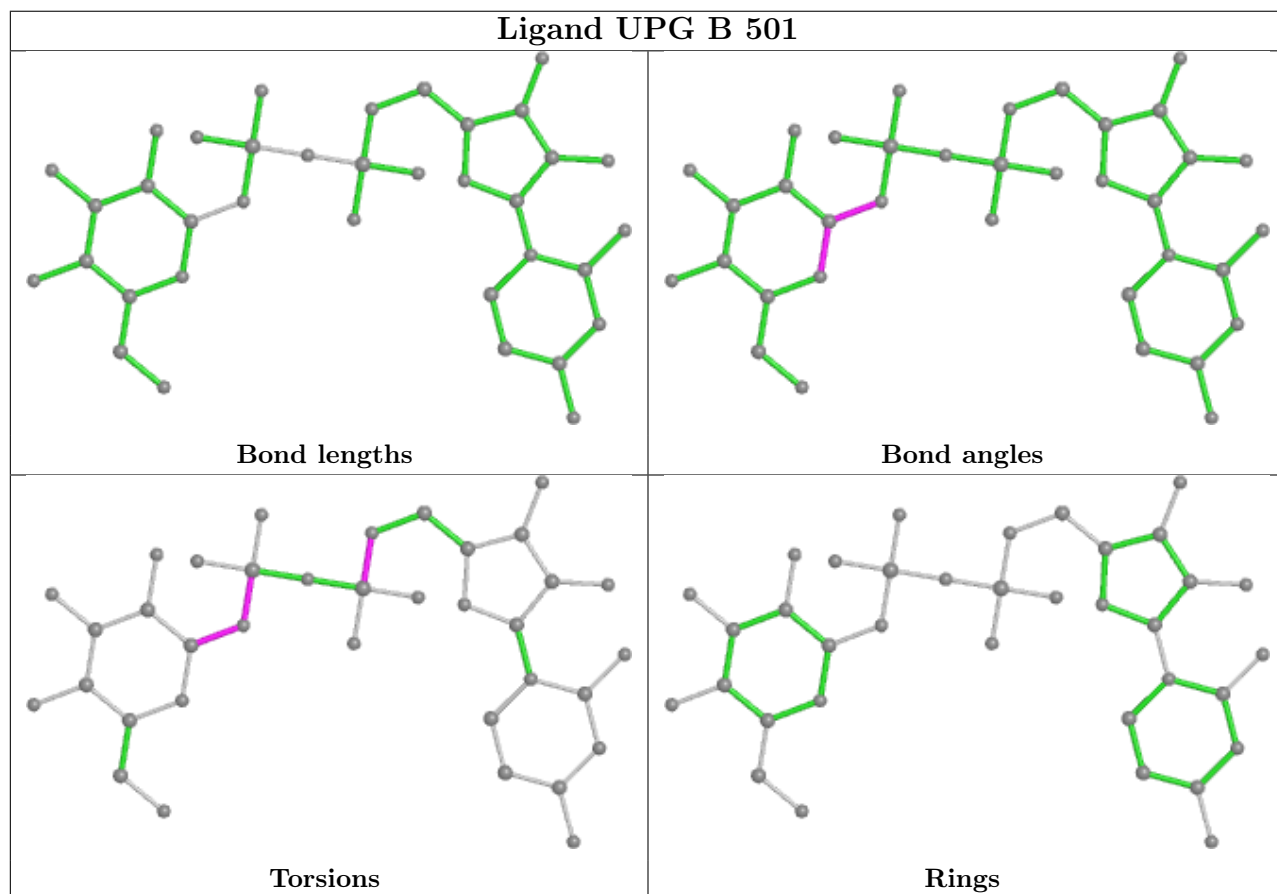
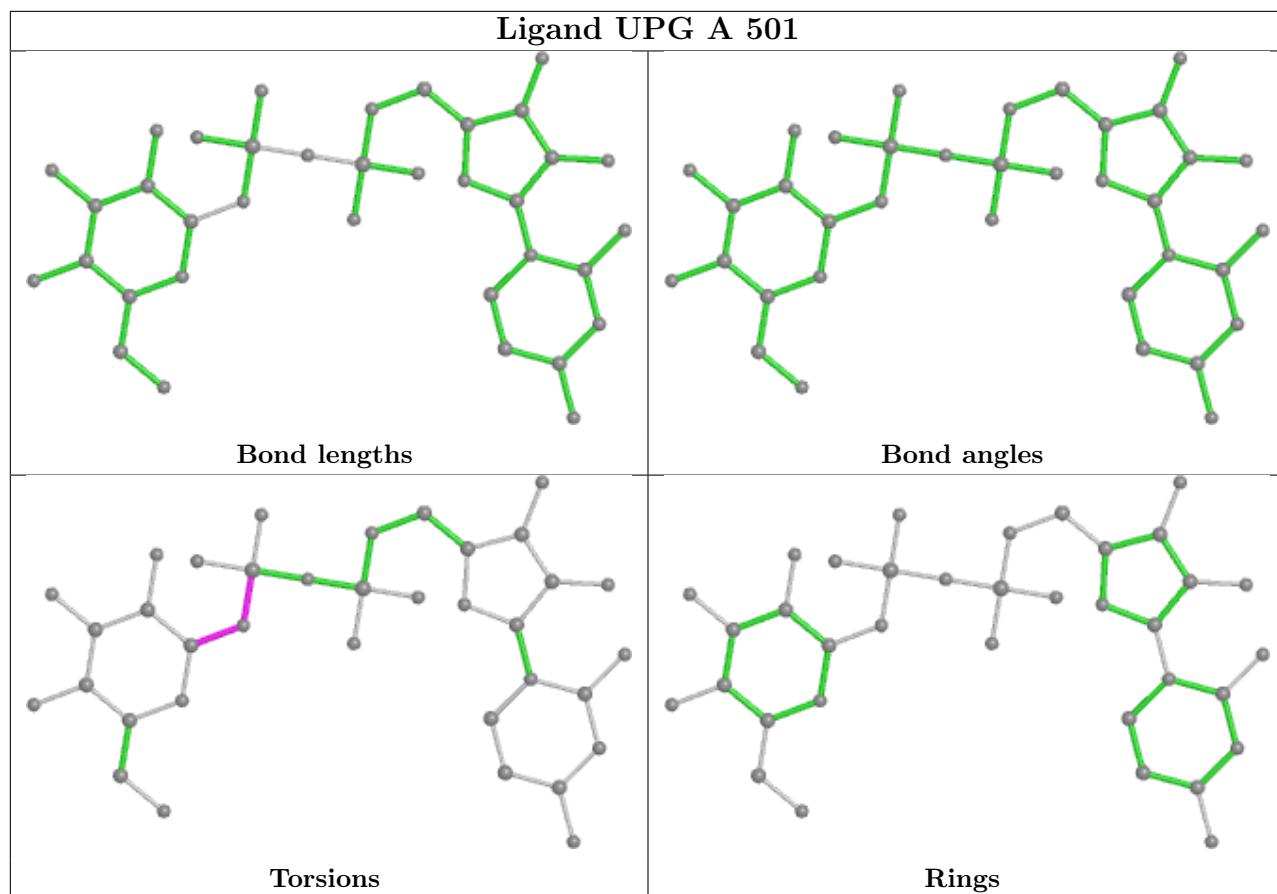
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	501	UPG	1	0

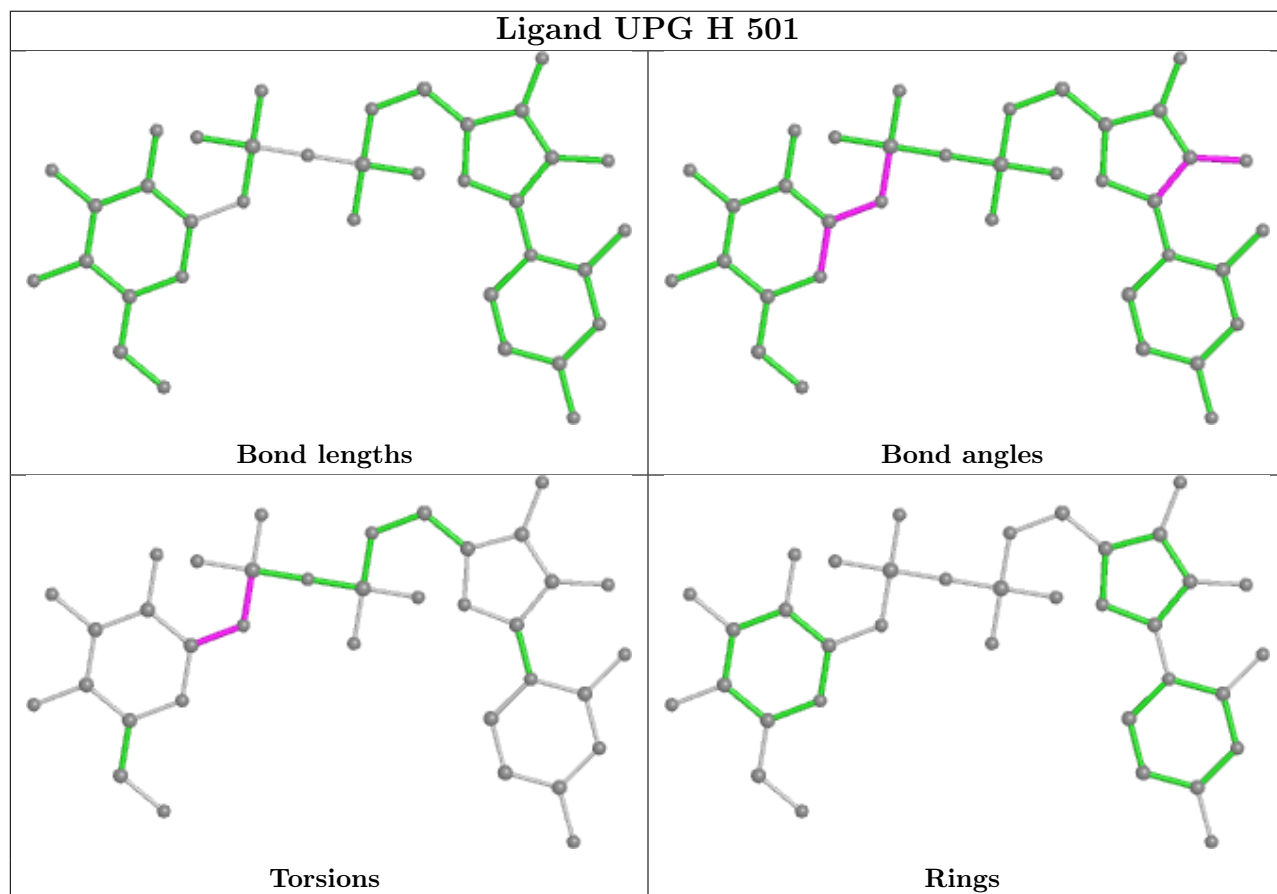
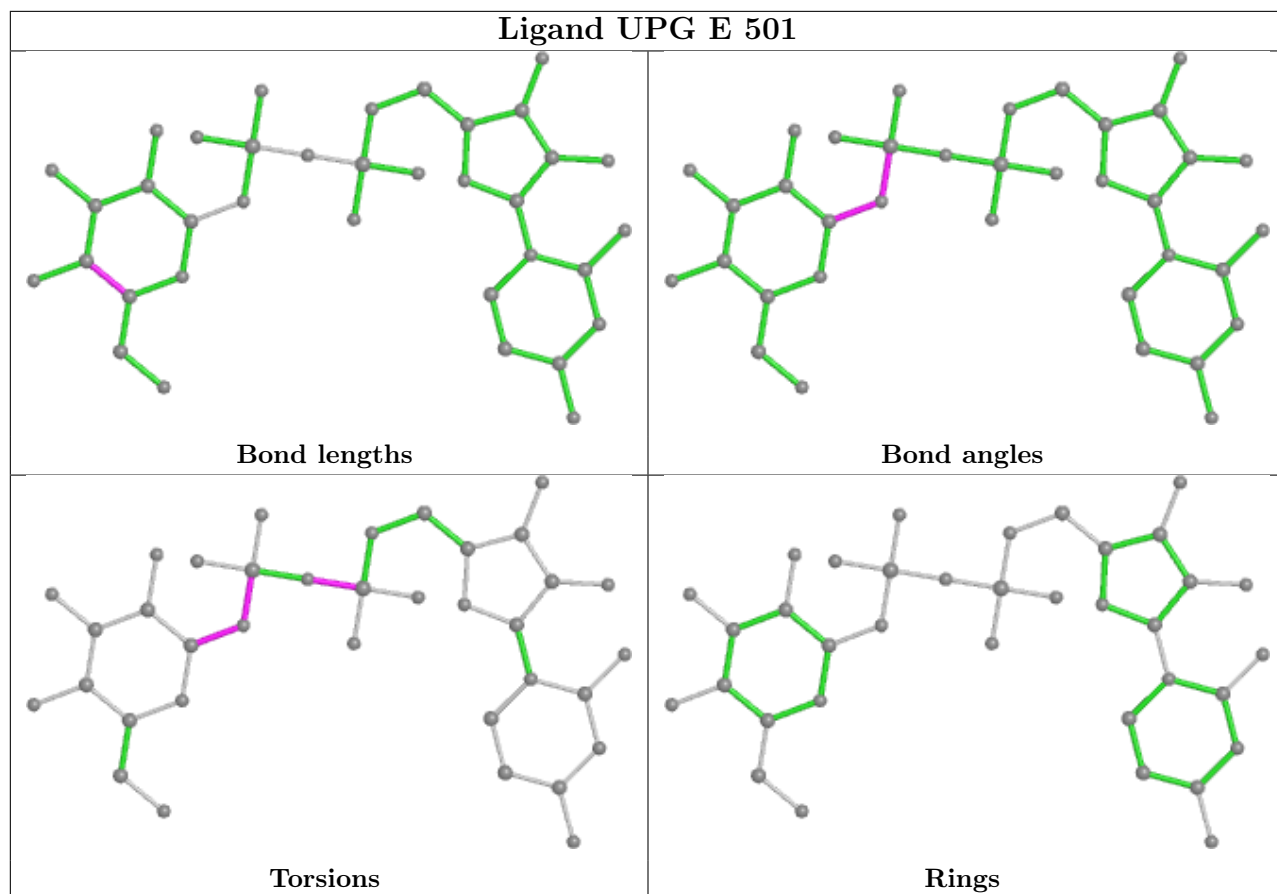
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

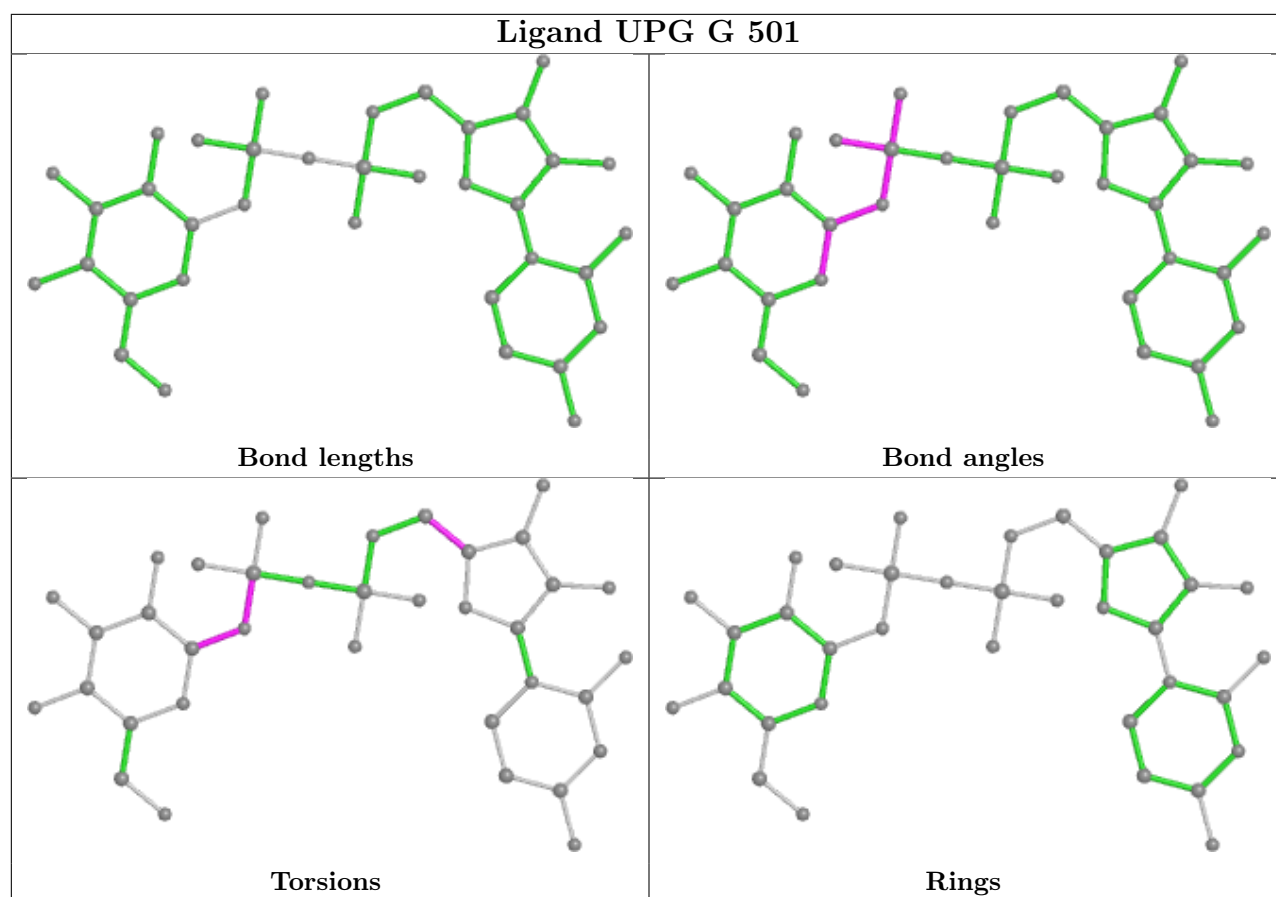












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	372/386 (96%)	-0.06	10 (2%) 54 60	9, 22, 50, 91	0
1	B	357/386 (92%)	0.31	19 (5%) 26 32	12, 34, 60, 84	0
1	C	359/386 (93%)	0.06	11 (3%) 49 55	9, 27, 51, 67	0
1	D	362/386 (93%)	0.01	11 (3%) 50 56	11, 24, 50, 85	0
1	E	367/386 (95%)	-0.10	8 (2%) 62 66	12, 24, 46, 71	0
1	F	365/386 (94%)	0.18	14 (3%) 40 46	14, 31, 59, 88	0
1	G	361/386 (93%)	0.31	13 (3%) 42 49	18, 31, 58, 73	0
1	H	369/386 (95%)	0.27	17 (4%) 32 38	19, 29, 54, 67	0
All	All	2912/3088 (94%)	0.12	103 (3%) 44 50	9, 28, 54, 91	0

All (103) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	65	PRO	5.3
1	A	65	PRO	4.9
1	F	230	ARG	4.8
1	A	66	GLY	4.8
1	D	349	GLY	4.7
1	B	183	LEU	4.5
1	H	374	PRO	4.4
1	E	43	ASP	4.2
1	D	350	ILE	4.0
1	H	348	PRO	3.9
1	D	64	ARG	3.8
1	B	192	ARG	3.8
1	A	190	ALA	3.8
1	H	349	GLY	3.6
1	F	61	ASP	3.4
1	A	61	ASP	3.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	E	63	MET	3.4
1	B	230	ARG	3.4
1	B	268	ARG	3.3
1	F	199	GLU	3.1
1	B	64	ARG	3.0
1	F	192	ARG	3.0
1	E	61	ASP	3.0
1	B	199	GLU	3.0
1	D	374	PRO	3.0
1	B	50	GLU	2.9
1	H	61	ASP	2.9
1	E	351	VAL	2.9
1	A	211	ARG	2.9
1	F	374	PRO	2.7
1	C	348	PRO	2.7
1	C	192	ARG	2.7
1	C	211	ARG	2.7
1	G	351	VAL	2.7
1	A	192	ARG	2.7
1	A	374	PRO	2.7
1	C	230	ARG	2.7
1	H	351	VAL	2.7
1	D	348	PRO	2.7
1	G	39	GLY	2.7
1	G	50	GLU	2.6
1	C	233	PRO	2.6
1	G	184	ASP	2.6
1	C	374	PRO	2.6
1	F	64	ARG	2.5
1	B	61	ASP	2.5
1	G	61	ASP	2.5
1	B	182	VAL	2.5
1	E	374	PRO	2.5
1	H	47	GLU	2.5
1	E	211	ARG	2.5
1	B	48	ILE	2.5
1	D	200	GLY	2.5
1	B	283	LEU	2.4
1	B	374	PRO	2.4
1	C	67	GLN	2.4
1	H	129	GLU	2.4
1	H	39	GLY	2.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	D	61	ASP	2.4
1	F	184	ASP	2.4
1	H	368	GLU	2.4
1	F	259	THR	2.4
1	B	274	ARG	2.4
1	G	340	GLU	2.4
1	A	348	PRO	2.4
1	D	50	GLU	2.4
1	A	64	ARG	2.4
1	F	66	GLY	2.3
1	D	192	ARG	2.3
1	H	55	ARG	2.3
1	H	169	TYR	2.3
1	E	39	GLY	2.3
1	H	350	ILE	2.3
1	G	59	ASN	2.3
1	G	27	ALA	2.2
1	G	216	ILE	2.2
1	B	347	ARG	2.2
1	H	164	ARG	2.2
1	H	50	GLU	2.2
1	C	55	ARG	2.2
1	G	282	VAL	2.2
1	G	201	ARG	2.2
1	B	340	GLU	2.2
1	D	63	MET	2.1
1	G	339	PRO	2.1
1	B	239	ILE	2.1
1	B	211	ARG	2.1
1	D	230	ARG	2.1
1	C	259	THR	2.1
1	H	126	ASP	2.1
1	B	63	MET	2.1
1	C	61	ASP	2.1
1	C	340	GLU	2.1
1	F	211	ARG	2.1
1	G	192	ARG	2.1
1	F	229	CYS	2.1
1	E	188	ASP	2.0
1	H	59	ASN	2.0
1	F	50	GLU	2.0
1	A	230	ARG	2.0

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Mol	Chain	Res	Type	RSRZ
1	H	30	GLY	2.0
1	B	205	LEU	2.0
1	F	57	ARG	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](#)

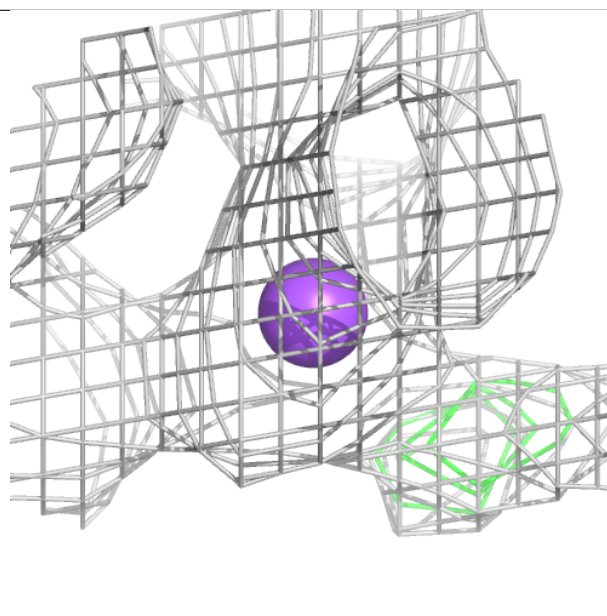
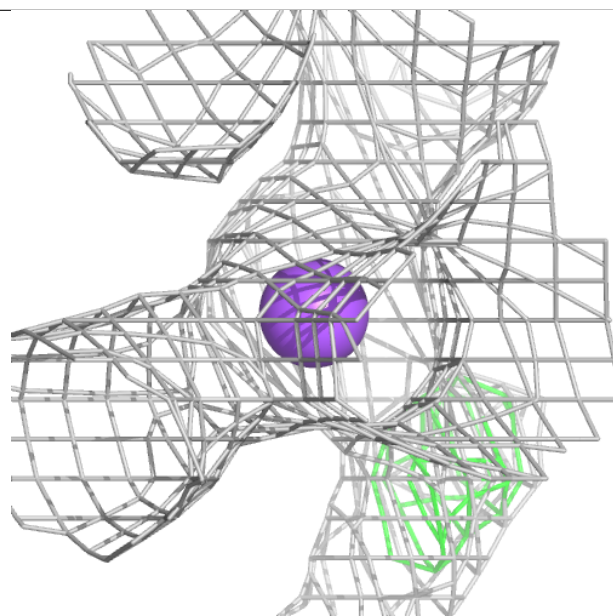
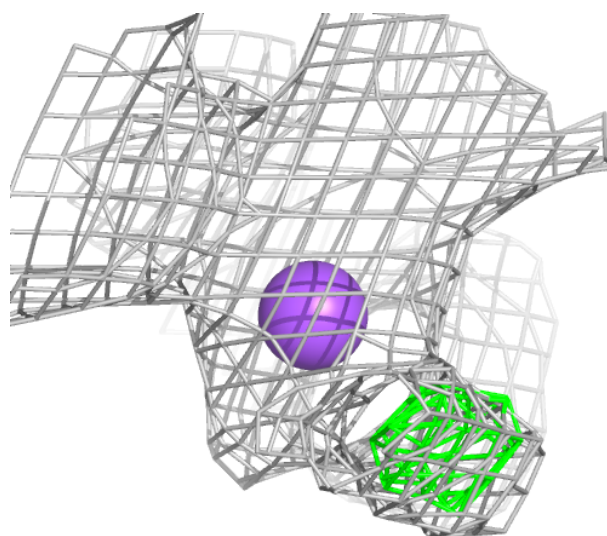
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	NA	G	502	1/1	0.88	0.14	45,45,45,45	0
3	NA	H	502	1/1	0.89	0.17	33,33,33,33	0
3	NA	C	502	1/1	0.91	0.08	27,27,27,27	0
3	NA	D	502	1/1	0.93	0.09	30,30,30,30	0
3	NA	A	502	1/1	0.96	0.19	30,30,30,30	0
2	UPG	F	501	36/36	0.97	0.08	20,24,26,27	0
2	UPG	G	501	36/36	0.97	0.09	19,22,26,31	0
3	NA	E	502	1/1	0.97	0.12	19,19,19,19	0
2	UPG	H	501	36/36	0.97	0.09	18,23,28,30	0
2	UPG	B	501	36/36	0.97	0.08	18,25,28,29	0
2	UPG	C	501	36/36	0.98	0.08	15,20,23,24	0
3	NA	F	502	1/1	0.98	0.08	26,26,26,26	0
2	UPG	D	501	36/36	0.98	0.07	13,17,20,20	0
2	UPG	E	501	36/36	0.98	0.07	15,17,21,22	0
2	UPG	A	501	36/36	0.99	0.07	10,13,15,16	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 NA G 502:**

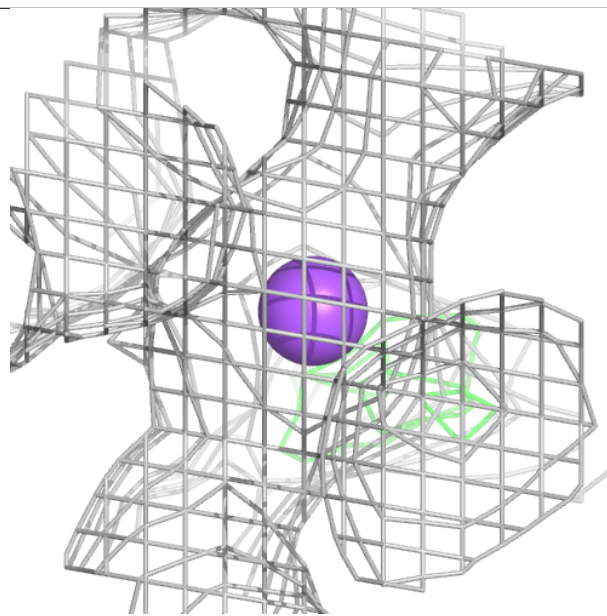
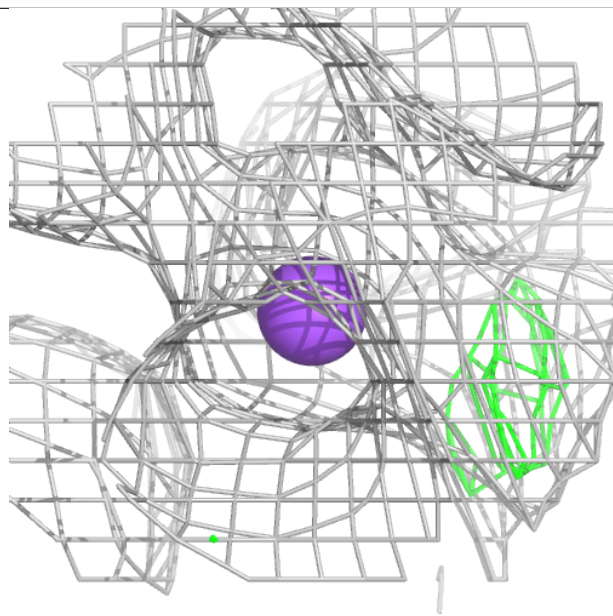
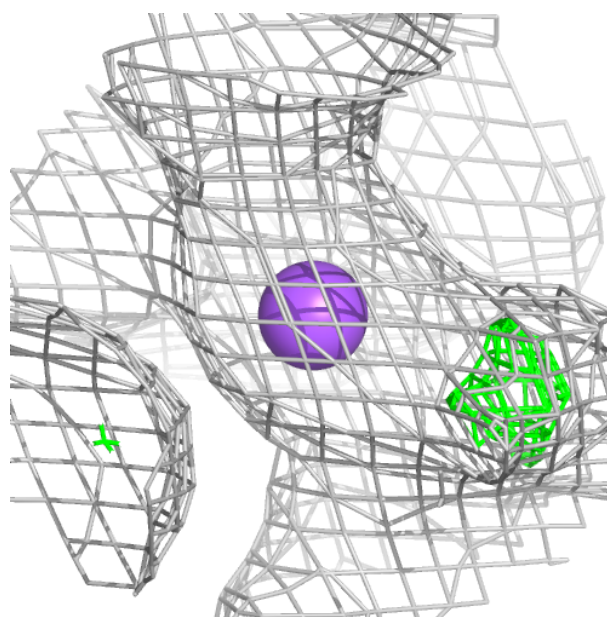
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





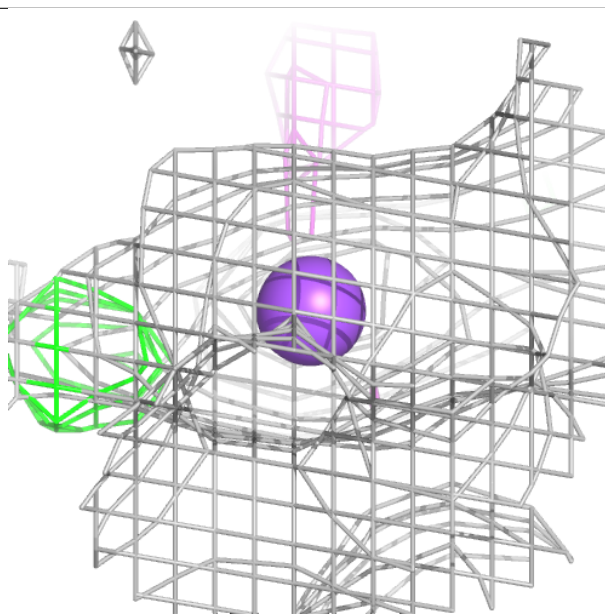
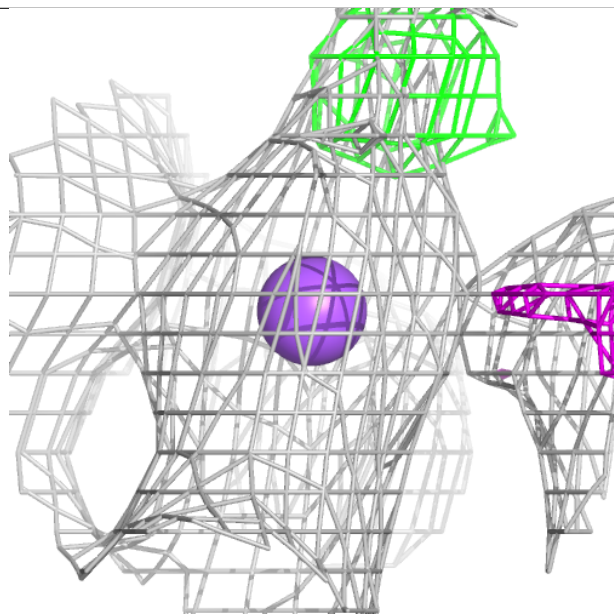
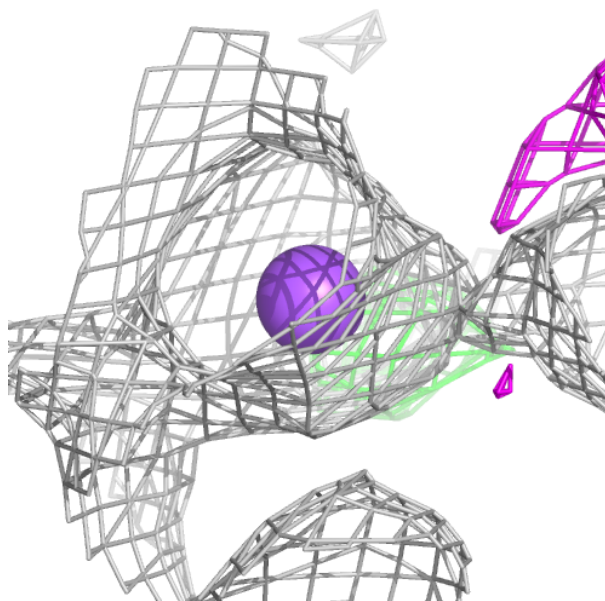
**Electron density around NA H 502:**

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



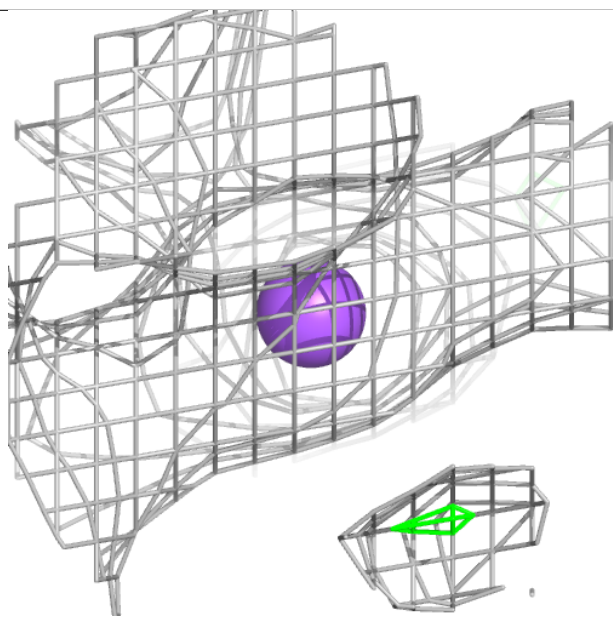
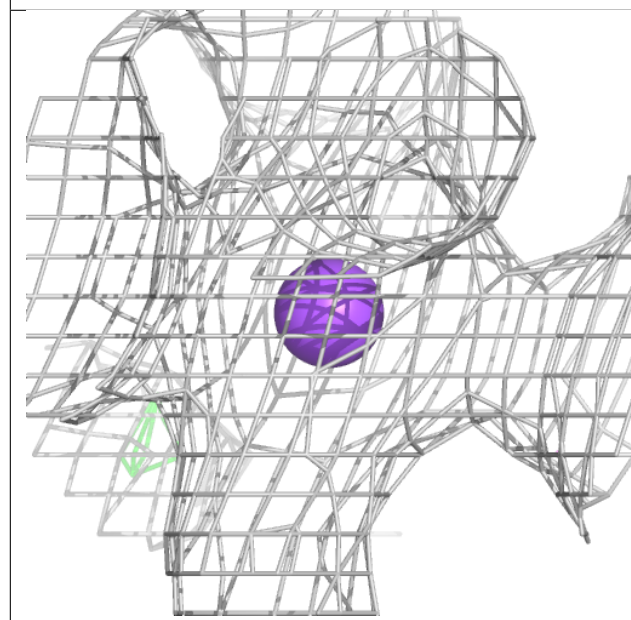
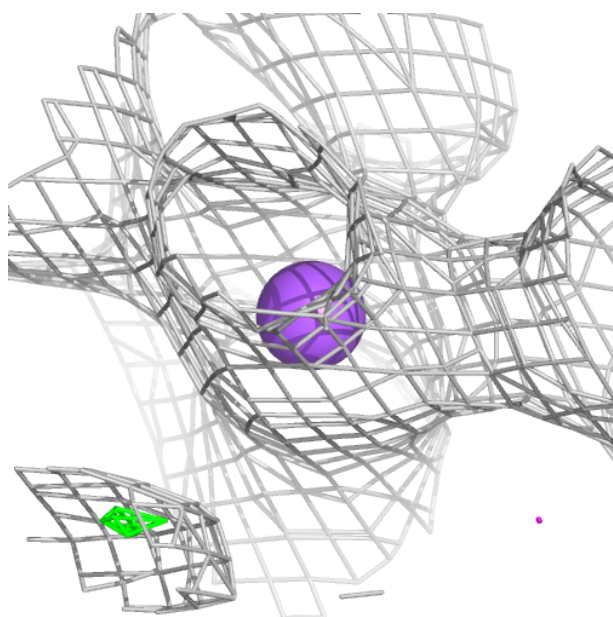
**Electron density around NA C 502:**

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



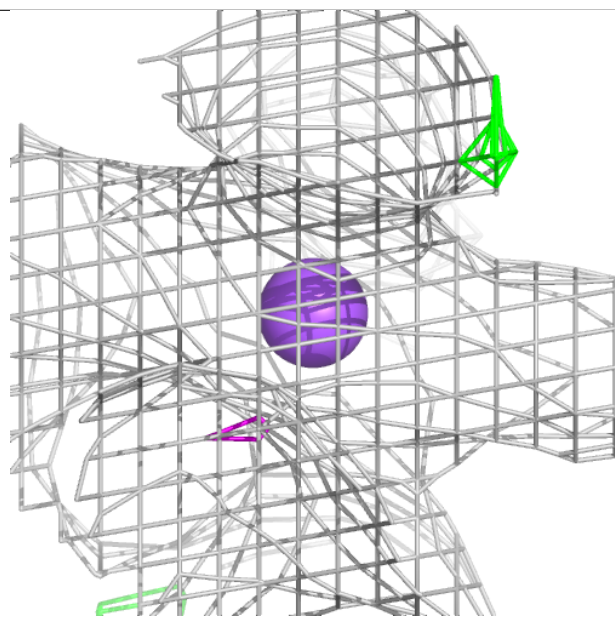
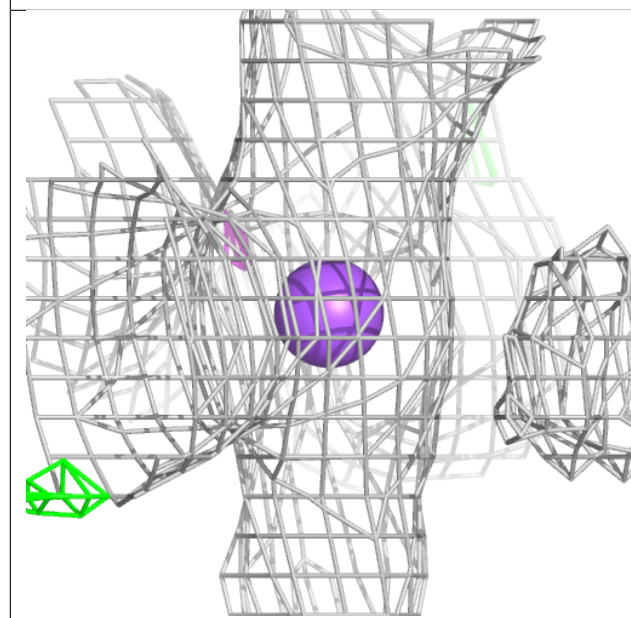
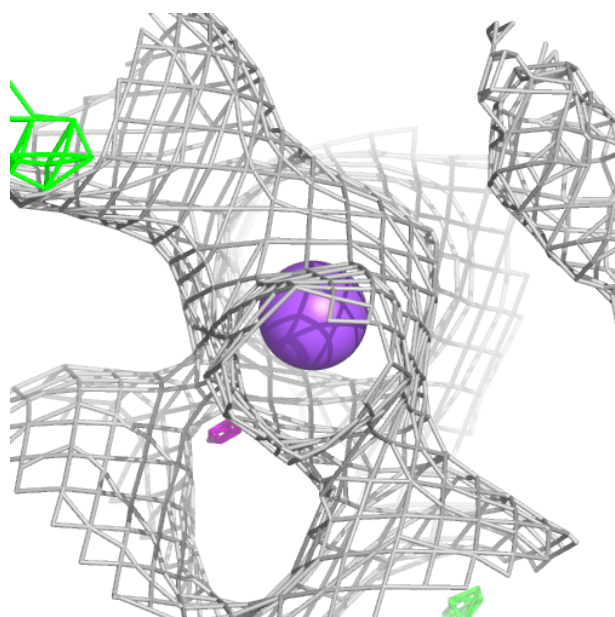
**Electron density around NA D 502:**

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

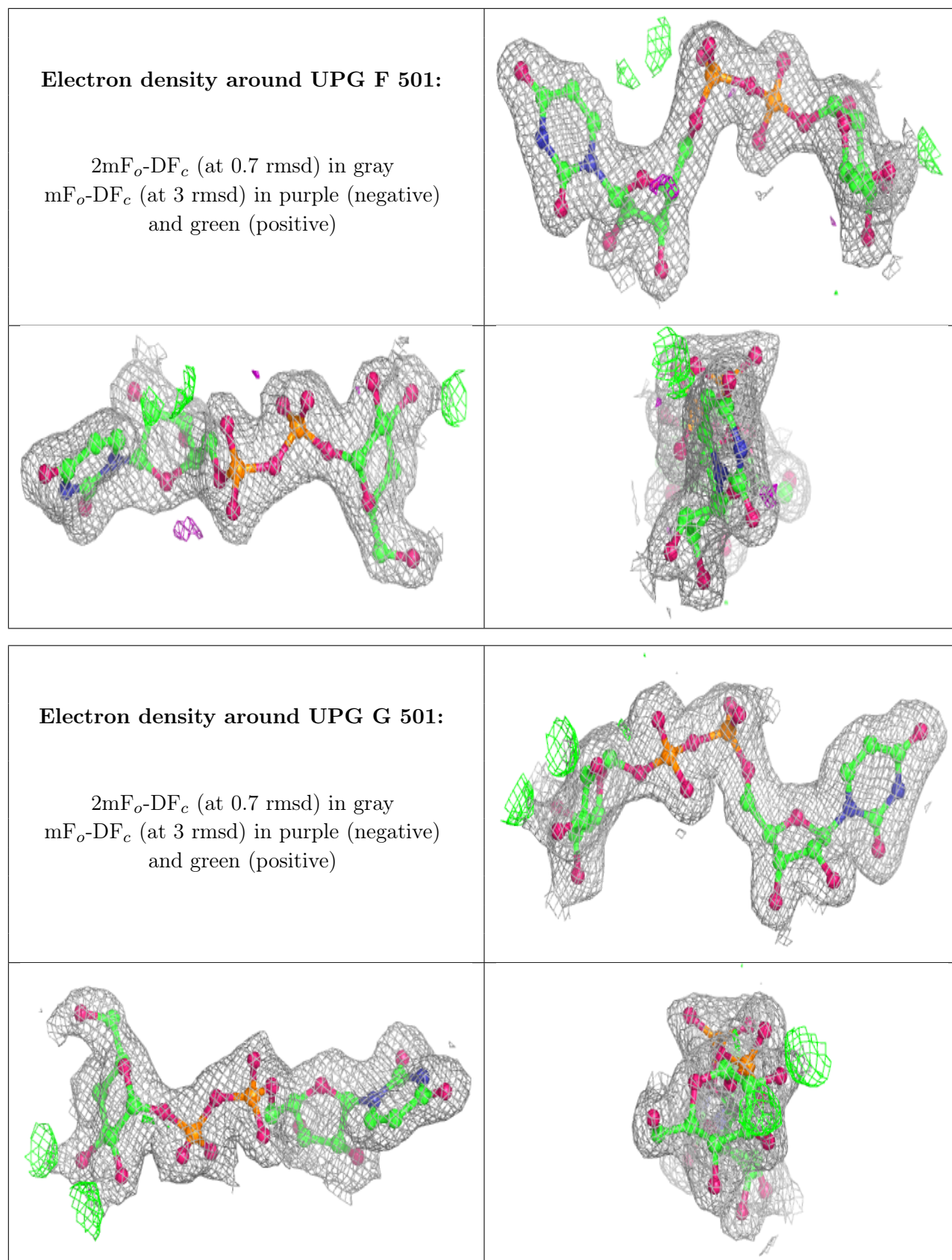


**Electron density around NA A 502:**

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

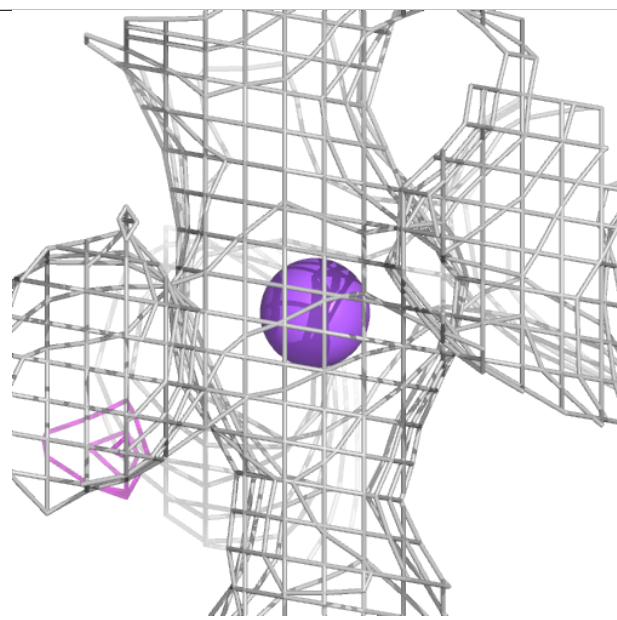
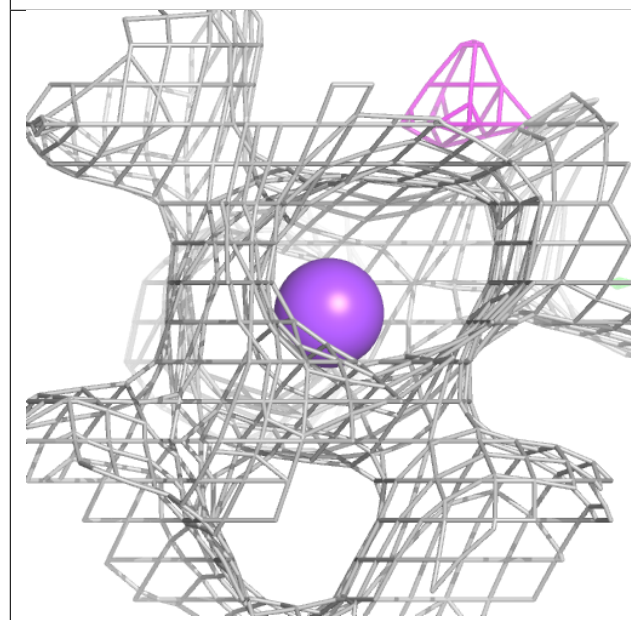
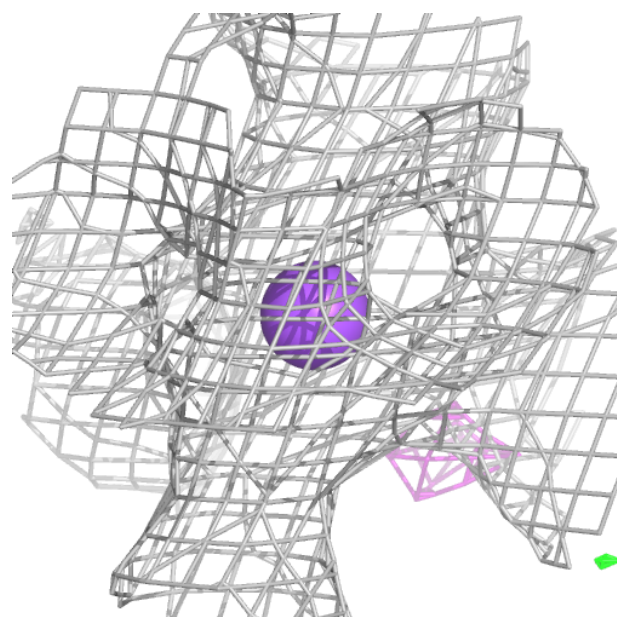






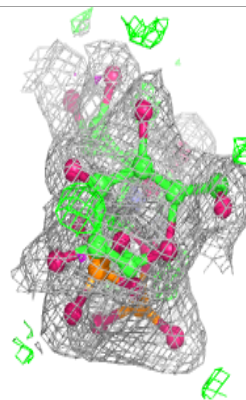
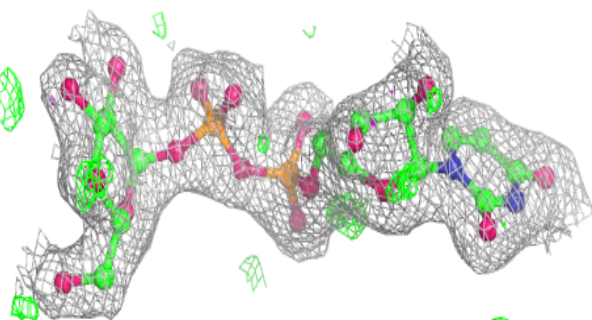
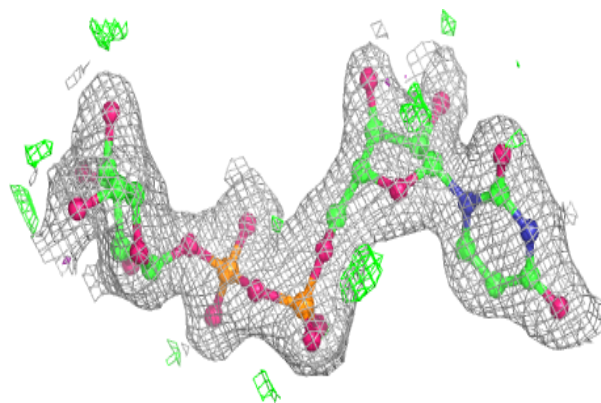
**Electron density around NA E 502:**

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

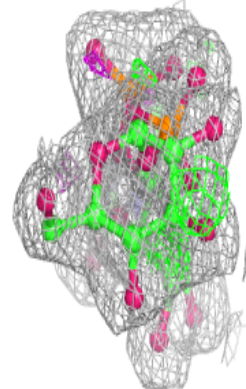
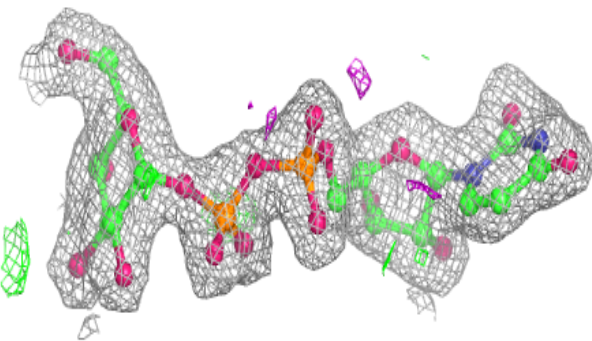
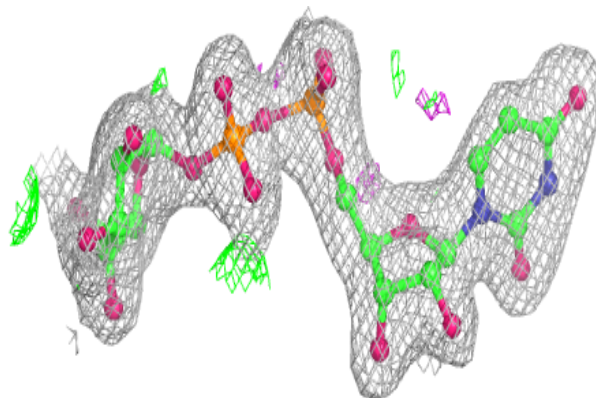


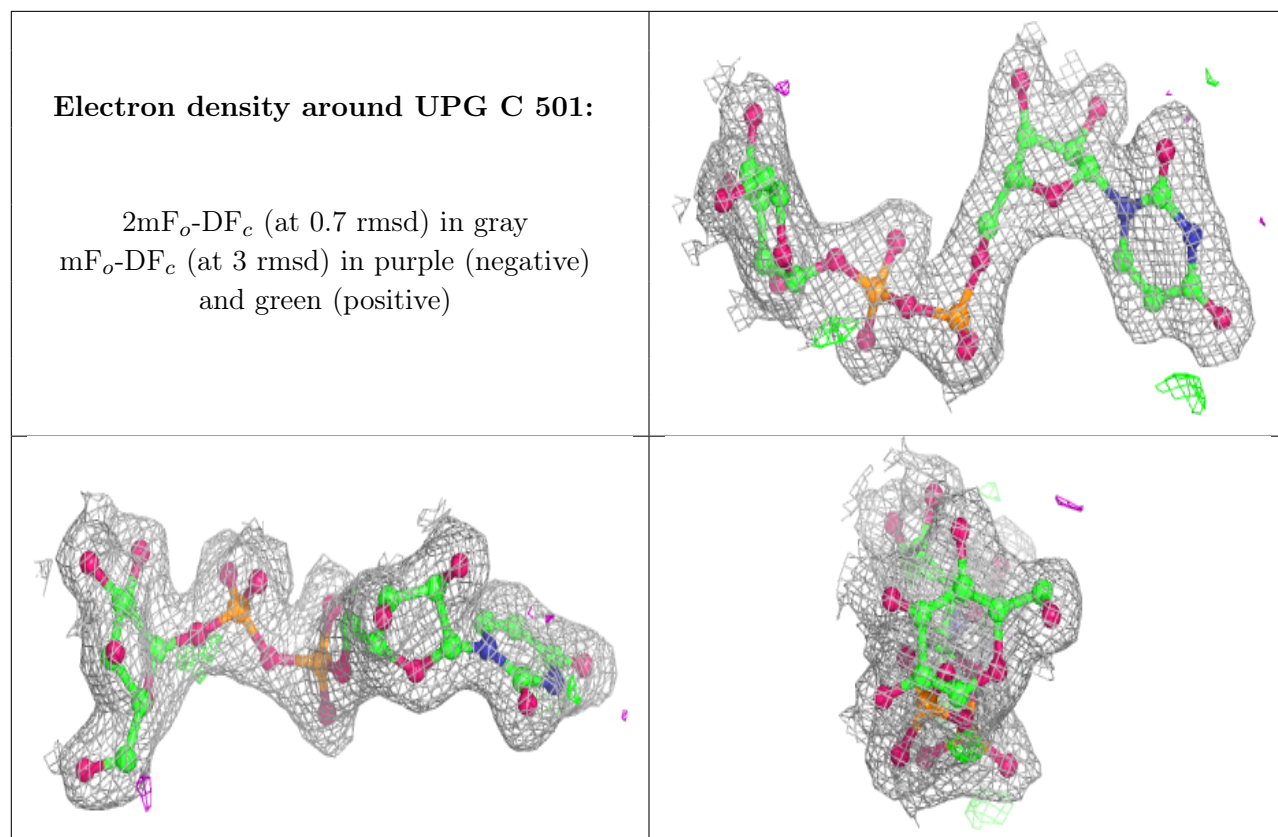
**Electron density around UPG H 501:**

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

**Electron density around UPG B 501:**

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

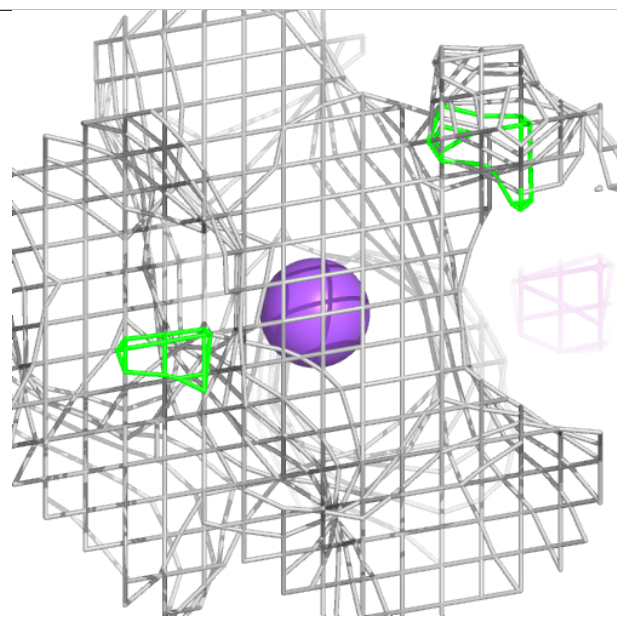
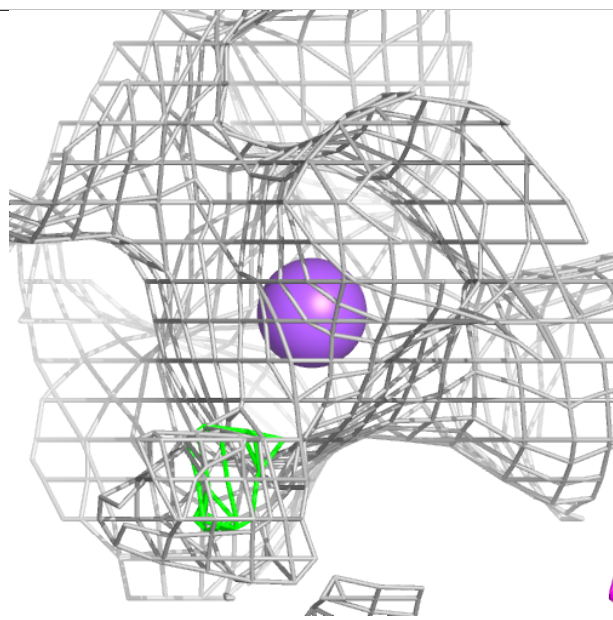
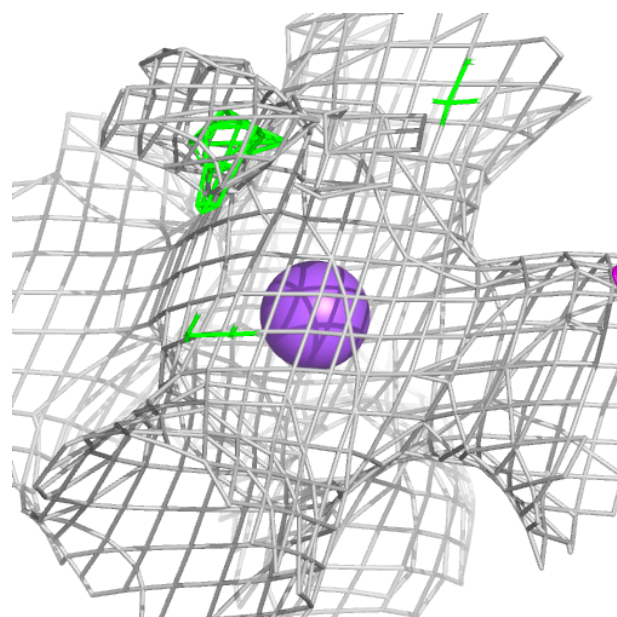






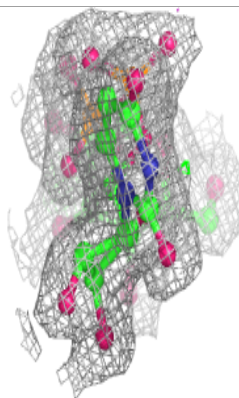
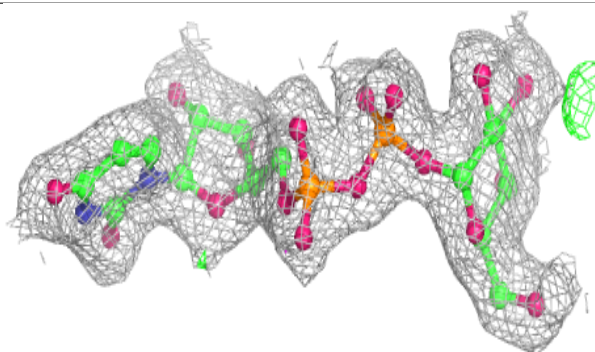
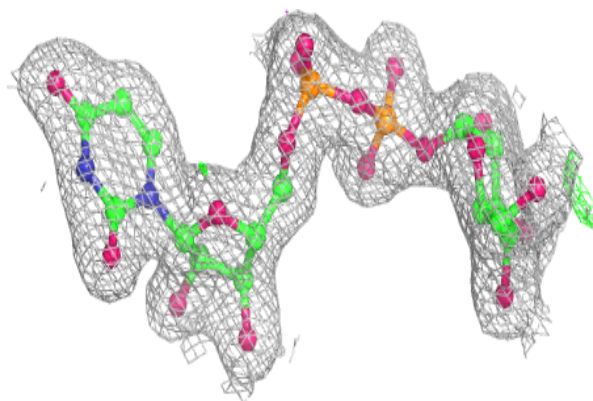
**Electron density around NA F 502:**

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

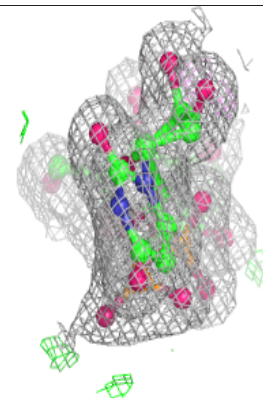
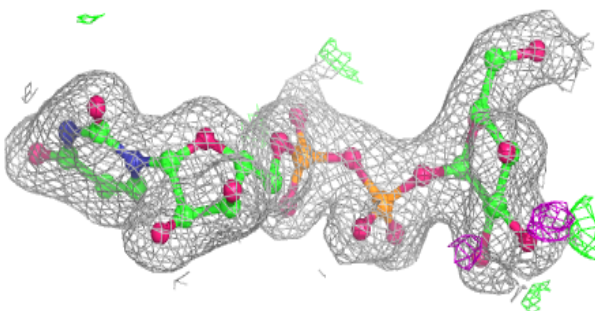
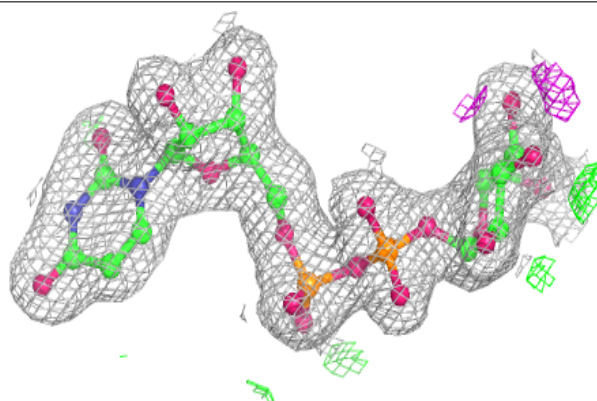


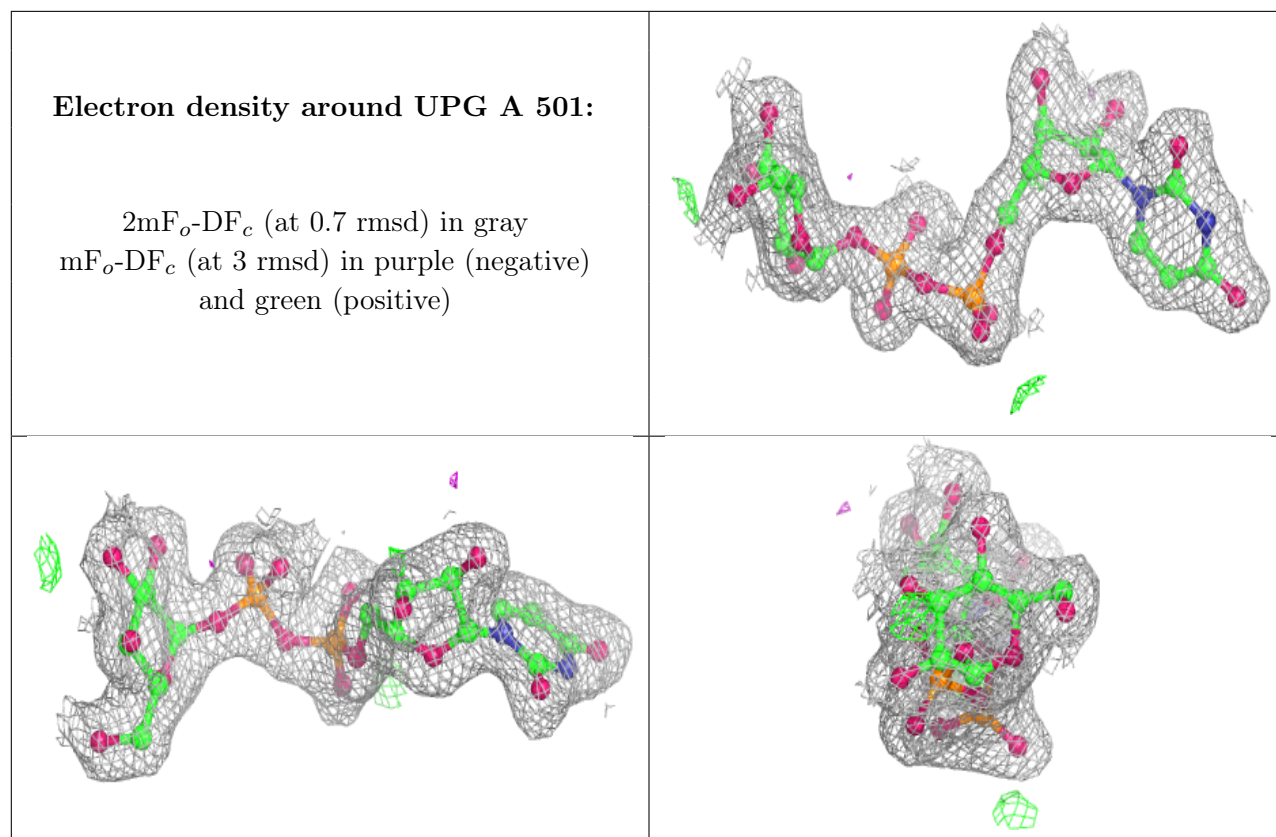
**Electron density around UPG D 501:**

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

**Electron density around UPG E 501:**

$2mF_o-DF_c$  (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.