



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 25, 2020 – 11:54 am BST

PDB ID : 4Q0D  
Title : Crystal structure of TS-DHFR from *Cryptosporidium hominis* in complex with NADPH, FdUMP, methotrexate and 2-amino-4-oxo-4,7-dihydro-pyrrolo[2,3-d]pyrimidine-methyl-phenyl-L-glutamic acid.  
Authors : Kumar, V.P.; Anderson, K.S.  
Deposited on : 2014-04-01  
Resolution : 3.45 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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.

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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 : 2.11  
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) : 2.11

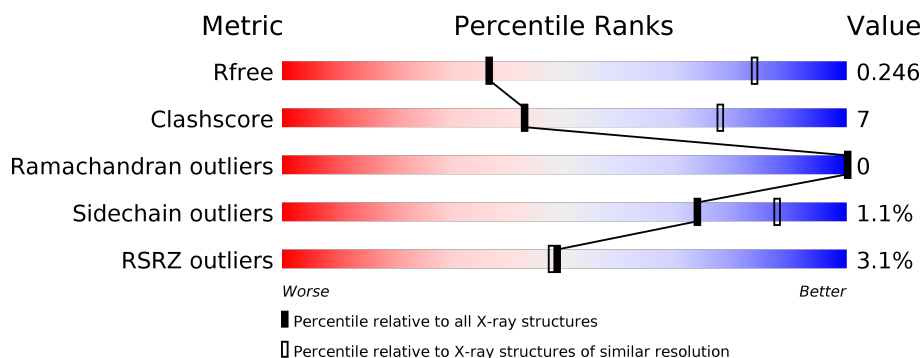
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 3.45 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	1278 (3.50-3.38)
Clashscore	141614	1361 (3.50-3.38)
Ramachandran outliers	138981	1327 (3.50-3.38)
Sidechain outliers	138945	1328 (3.50-3.38)
RSRZ outliers	127900	1192 (3.50-3.38)

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 on 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	521	<div> <div>0%</div> <div> <div></div> <div>78%</div> <div>19%</div> <div>..</div> </div> </div>
1	B	521	<div> <div>2%</div> <div> <div></div> <div>80%</div> <div>17%</div> <div>..</div> </div> </div>
1	C	521	<div> <div>4%</div> <div> <div></div> <div>79%</div> <div>17%</div> <div>..</div> </div> </div>
1	D	521	<div> <div>6%</div> <div> <div></div> <div>81%</div> <div>16%</div> <div>..</div> </div> </div>
1	E	521	<div> <div>2%</div> <div> <div></div> <div>78%</div> <div>19%</div> <div>..</div> </div> </div>

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	2XB	B	603	X	-	-	-

## 2 Entry composition i

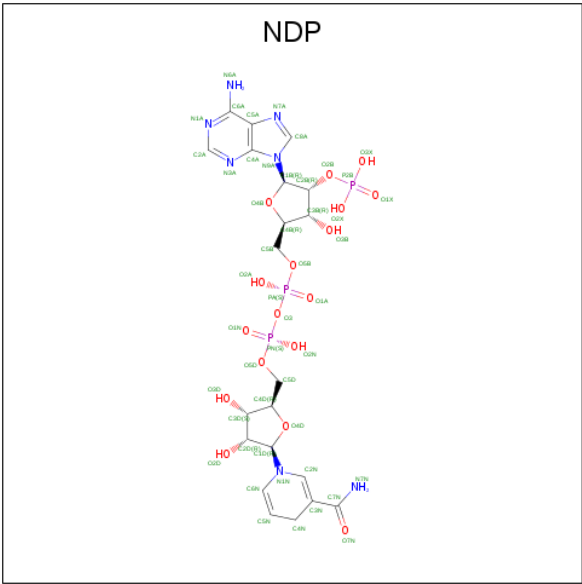
There are 5 unique types of molecules in this entry. The entry contains 21345 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Bifunctional dihydrofolate reductase-thymidylate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	E	508	Total	C	N	O	S	0	0	0
			4137	2644	695	776	22			
1	A	508	Total	C	N	O	S	0	0	0
			4137	2644	695	776	22			
1	B	508	Total	C	N	O	S	0	0	0
			4137	2644	695	776	22			
1	C	508	Total	C	N	O	S	0	0	0
			4137	2644	695	776	22			
1	D	508	Total	C	N	O	S	0	0	0
			4137	2644	695	776	22			

- Molecule 2 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NDP) (formula: C<sub>21</sub>H<sub>30</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).



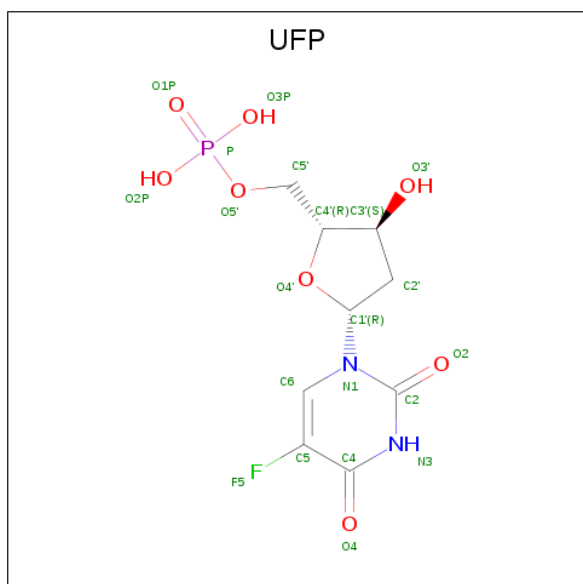
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	E	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

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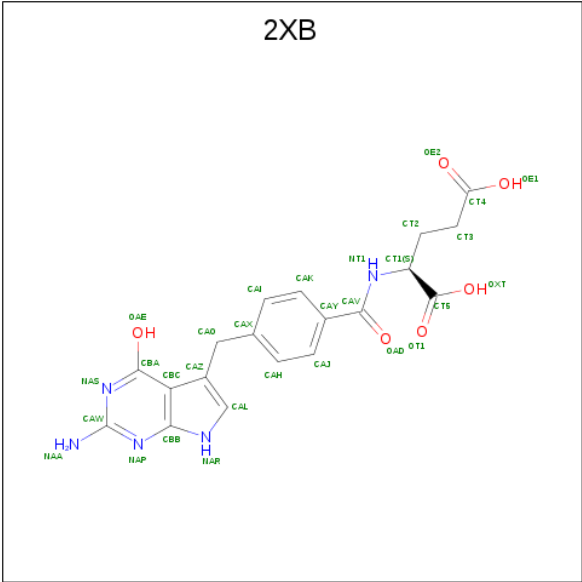
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	C	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 3 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).



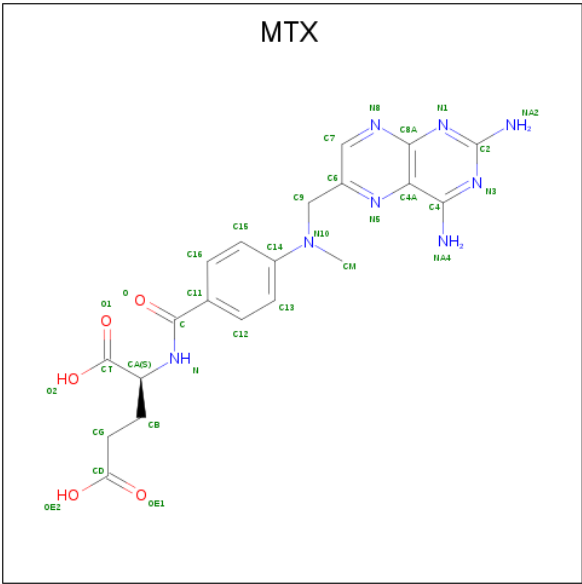
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	E	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0
3	A	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0
3	B	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0
3	C	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0
3	D	1	Total 21	C 9	F 1	N 2	O 8	P 1	0	0

- Molecule 4 is N-{4-[(2-amino-4-hydroxy-7H-pyrrolo[2,3-d]pyrimidin-5-yl)methyl]benzoyl}-L-glutamic acid (three-letter code: 2XB) (formula: C<sub>19</sub>H<sub>19</sub>N<sub>5</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	E	1	Total	C	N	O	0	0
			30	19	5	6		
4	A	1	Total	C	N	O	0	0
			30	19	5	6		
4	B	1	Total	C	N	O	0	0
			30	19	5	6		
4	C	1	Total	C	N	O	0	0
			30	19	5	6		
4	D	1	Total	C	N	O	0	0
			30	19	5	6		

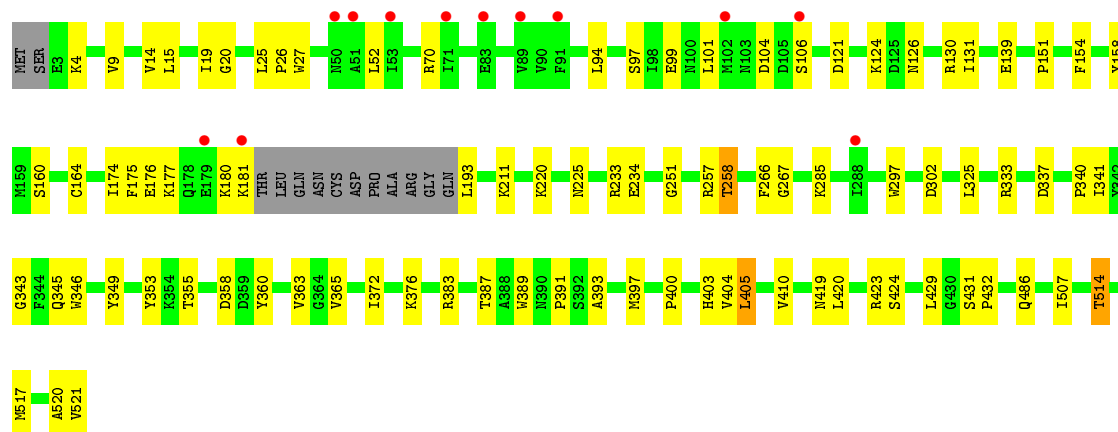
- Molecule 5 is METHOTREXATE (three-letter code: MTX) (formula: C<sub>20</sub>H<sub>22</sub>N<sub>8</sub>O<sub>5</sub>).



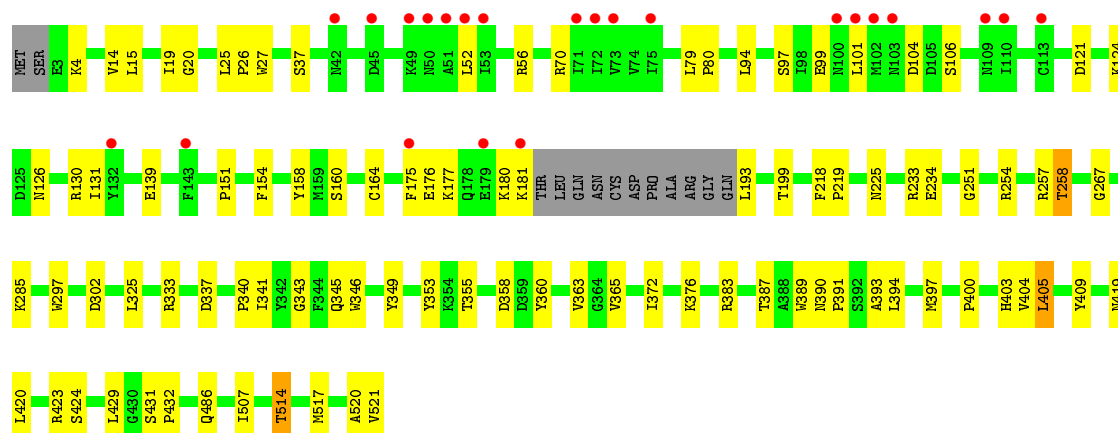
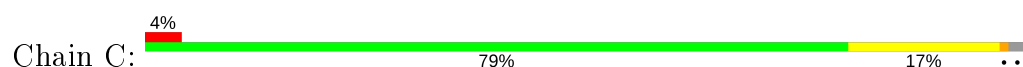
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	E	1	Total 33	C 20	N 8	O 5	0	0
5	A	1	Total 33	C 20	N 8	O 5	0	0
5	B	1	Total 33	C 20	N 8	O 5	0	0
5	C	1	Total 33	C 20	N 8	O 5	0	0
5	D	1	Total 33	C 20	N 8	O 5	0	0



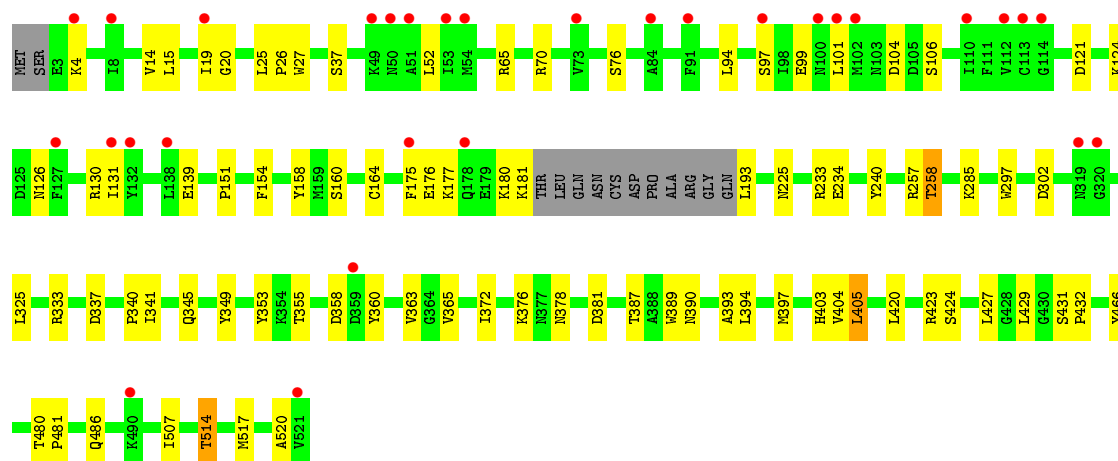
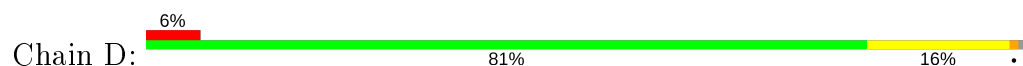




● Molecule 1: Bifunctional dihydrofolate reductase-thymidylate synthase



● Molecule 1: Bifunctional dihydrofolate reductase-thymidylate synthase



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	213.61Å 115.03Å 217.64Å 90.00° 93.92° 90.00°	Depositor
Resolution (Å)	48.94 – 3.45 48.94 – 3.45	Depositor EDS
% Data completeness (in resolution range)	90.2 (48.94-3.45) 83.6 (48.94-3.45)	Depositor EDS
$R_{merge}$	0.14	Depositor
$R_{sym}$	0.14	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.78 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, $R_{free}$	0.217 , 0.242 0.221 , 0.246	Depositor DCC
$R_{free}$ test set	2024 reflections (3.22%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	69.7	Xtriage
Anisotropy	0.422	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 55.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	21345	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	81.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.08% 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: UFP, NDP, MTX, 2XB

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	0.22	0/4232	0.40	0/5718
1	B	0.22	0/4232	0.40	0/5718
1	C	0.22	0/4232	0.40	0/5718
1	D	0.22	0/4232	0.40	0/5718
1	E	0.22	0/4232	0.40	0/5718
All	All	0.22	0/21160	0.40	0/28590

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	4137	0	4070	70	0
1	B	4137	0	4070	60	0
1	C	4137	0	4070	63	0
1	D	4137	0	4070	50	0
1	E	4137	0	4070	71	0
2	A	48	0	26	2	0
2	B	48	0	26	1	0
2	C	48	0	26	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	48	0	26	2	0
2	E	48	0	26	3	0
3	A	21	0	10	0	0
3	B	21	0	10	2	0
3	C	21	0	10	1	0
3	D	21	0	10	2	0
3	E	21	0	10	2	0
4	A	30	0	17	1	0
4	B	30	0	17	0	0
4	C	30	0	17	0	0
4	D	30	0	16	0	0
4	E	30	0	17	0	0
5	A	33	0	20	4	0
5	B	33	0	20	4	0
5	C	33	0	20	2	0
5	D	33	0	20	2	0
5	E	33	0	20	5	0
All	All	21345	0	20714	285	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 7.

The worst 5 of 285 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:C:20:GLY:HA2	1:C:26:PRO:HD3	1.67	0.77
1:D:20:GLY:HA2	1:D:26:PRO:HD3	1.67	0.77
1:E:20:GLY:HA2	1:E:26:PRO:HD3	1.67	0.76
1:A:20:GLY:HA2	1:A:26:PRO:HD3	1.67	0.76
1:E:400:PRO:HG2	1:A:383:ARG:HE	1.50	0.76

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	504/521 (97%)	483 (96%)	21 (4%)	0	100	100
1	B	504/521 (97%)	483 (96%)	21 (4%)	0	100	100
1	C	504/521 (97%)	483 (96%)	21 (4%)	0	100	100
1	D	504/521 (97%)	483 (96%)	21 (4%)	0	100	100
1	E	504/521 (97%)	482 (96%)	22 (4%)	0	100	100
All	All	2520/2605 (97%)	2414 (96%)	106 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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	458/470 (97%)	453 (99%)	5 (1%)	73	88
1	B	458/470 (97%)	453 (99%)	5 (1%)	73	88
1	C	458/470 (97%)	453 (99%)	5 (1%)	73	88
1	D	458/470 (97%)	453 (99%)	5 (1%)	73	88
1	E	458/470 (97%)	453 (99%)	5 (1%)	73	88
All	All	2290/2350 (97%)	2265 (99%)	25 (1%)	73	88

5 of 25 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	193	LEU
1	B	405	LEU
1	D	405	LEU
1	B	258	THR
1	B	514	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 18 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	306	ASN
1	B	345	GLN
1	C	422	GLN
1	A	419	ASN
1	A	422	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

20 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	NDP	D	601	-	45,52,52	1.93	11 (24%)	53,80,80	1.15	6 (11%)
3	UFP	E	602	-	19,22,22	1.15	1 (5%)	24,33,33	1.93	3 (12%)
3	UFP	C	602	-	19,22,22	1.17	1 (5%)	24,33,33	1.90	3 (12%)
5	MTX	A	604	-	29,35,35	1.78	6 (20%)	38,49,49	1.93	10 (26%)
4	2XB	B	603	-	26,32,32	2.14	6 (23%)	27,45,45	2.49	6 (22%)
5	MTX	B	604	-	29,35,35	1.75	6 (20%)	38,49,49	2.03	13 (34%)
4	2XB	A	603	-	26,32,32	2.15	6 (23%)	27,45,45	2.38	6 (22%)
2	NDP	E	601	-	45,52,52	1.93	11 (24%)	53,80,80	1.19	7 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	UFP	D	602	-	19,22,22	1.16	1 (5%)	24,33,33	1.87	3 (12%)
2	NDP	A	601	-	45,52,52	1.94	11 (24%)	53,80,80	1.17	6 (11%)
3	UFP	B	602	-	19,22,22	1.14	1 (5%)	24,33,33	1.92	3 (12%)
2	NDP	C	601	-	45,52,52	1.93	11 (24%)	53,80,80	1.17	6 (11%)
4	2XB	D	603	-	26,32,32	2.15	5 (19%)	27,45,45	2.48	6 (22%)
3	UFP	A	602	-	19,22,22	1.17	1 (5%)	24,33,33	1.91	3 (12%)
2	NDP	B	601	-	45,52,52	1.95	11 (24%)	53,80,80	1.15	6 (11%)
4	2XB	C	603	-	26,32,32	2.17	6 (23%)	27,45,45	2.28	6 (22%)
5	MTX	E	604	-	29,35,35	1.77	6 (20%)	38,49,49	1.99	11 (28%)
5	MTX	C	604	-	29,35,35	1.76	6 (20%)	38,49,49	1.93	12 (31%)
5	MTX	D	604	-	29,35,35	1.76	6 (20%)	38,49,49	1.91	11 (28%)
4	2XB	E	603	-	26,32,32	2.15	6 (23%)	27,45,45	2.37	7 (25%)

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	NDP	D	601	-	-	6/30/77/77	0/5/5/5
3	UFP	E	602	-	-	5/7/22/22	0/2/2/2
3	UFP	C	602	-	-	2/7/22/22	0/2/2/2
5	MTX	A	604	-	-	4/19/25/25	0/3/3/3
5	MTX	B	604	-	-	1/19/25/25	0/3/3/3
4	2XB	A	603	-	-	3/15/21/21	0/3/3/3
2	NDP	E	601	-	-	8/30/77/77	0/5/5/5
5	MTX	D	604	-	-	8/19/25/25	0/3/3/3
3	UFP	D	602	-	-	2/7/22/22	0/2/2/2
4	2XB	B	603	-	1/1/4/5	2/15/21/21	0/3/3/3
3	UFP	B	602	-	-	2/7/22/22	0/2/2/2
2	NDP	C	601	-	-	7/30/77/77	0/5/5/5
4	2XB	D	603	-	-	9/15/21/21	0/3/3/3
3	UFP	A	602	-	-	2/7/22/22	0/2/2/2
2	NDP	B	601	-	-	5/30/77/77	0/5/5/5
4	2XB	C	603	-	-	2/15/21/21	0/3/3/3
5	MTX	E	604	-	-	7/19/25/25	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	MTX	C	604	-	-	6/19/25/25	0/3/3/3
2	NDP	A	601	-	-	5/30/77/77	0/5/5/5
4	2XB	E	603	-	-	2/15/21/21	0/3/3/3

The worst 5 of 119 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	603	2XB	CAW-NAS	5.99	1.46	1.35
4	C	603	2XB	CAW-NAS	5.92	1.45	1.35
4	B	603	2XB	CAW-NAS	5.88	1.45	1.35
4	A	603	2XB	CAW-NAS	5.87	1.45	1.35
4	E	603	2XB	CAW-NAS	5.86	1.45	1.35

The worst 5 of 134 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	603	2XB	CT2-CT1-NT1	7.25	120.75	110.19
3	E	602	UFP	C4-N3-C2	7.11	121.15	115.14
3	B	602	UFP	C4-N3-C2	7.06	121.10	115.14
3	A	602	UFP	C4-N3-C2	6.96	121.02	115.14
3	C	602	UFP	C4-N3-C2	6.93	121.00	115.14

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	B	603	2XB	CT1

5 of 88 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	601	NDP	C3B-C4B-C5B-O5B
3	E	602	UFP	C5'-O5'-P-O2P
3	E	602	UFP	C5'-O5'-P-O3P
3	C	602	UFP	O4'-C4'-C5'-O5'
5	A	604	MTX	CT-CA-CB-CG

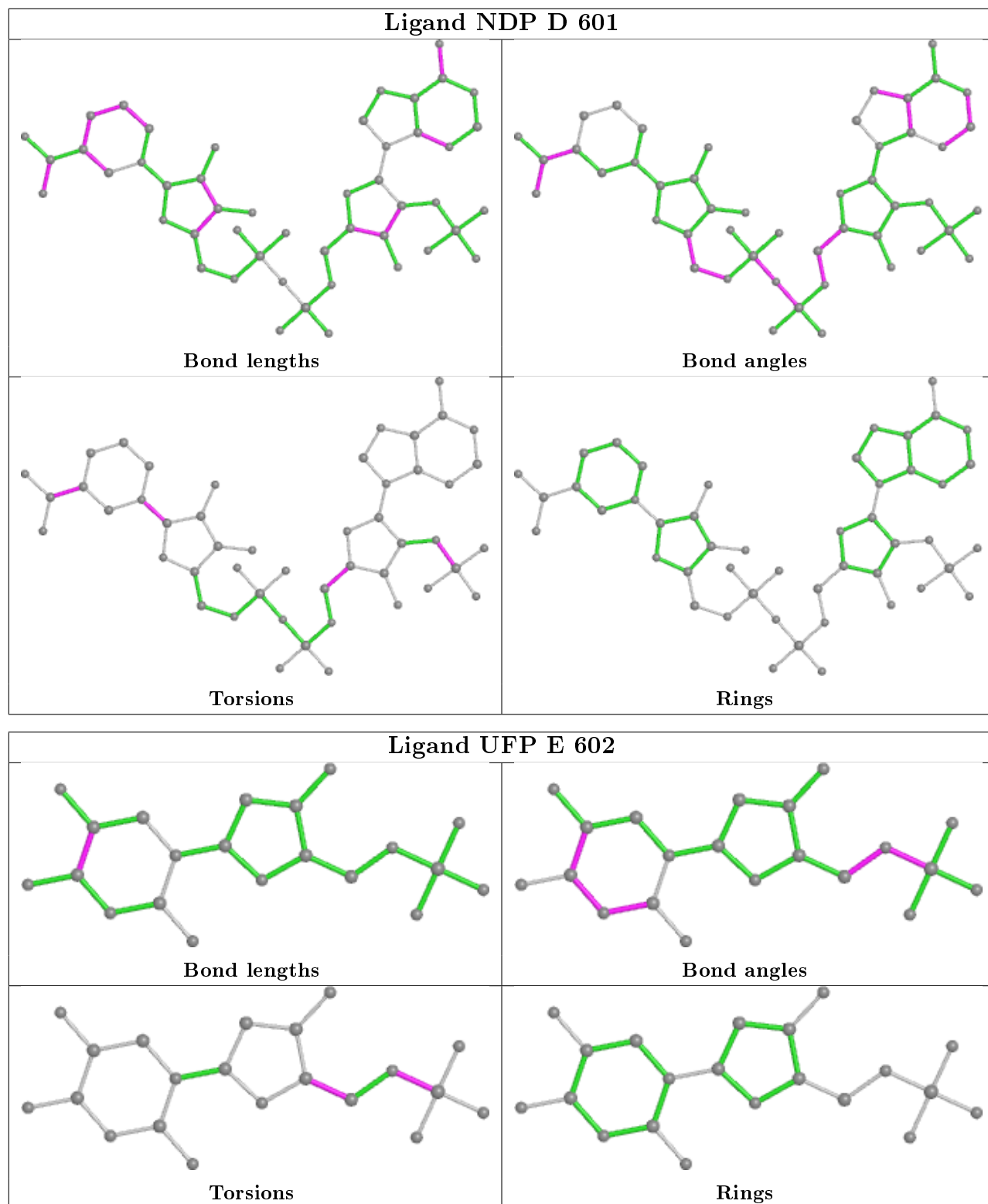
There are no ring outliers.

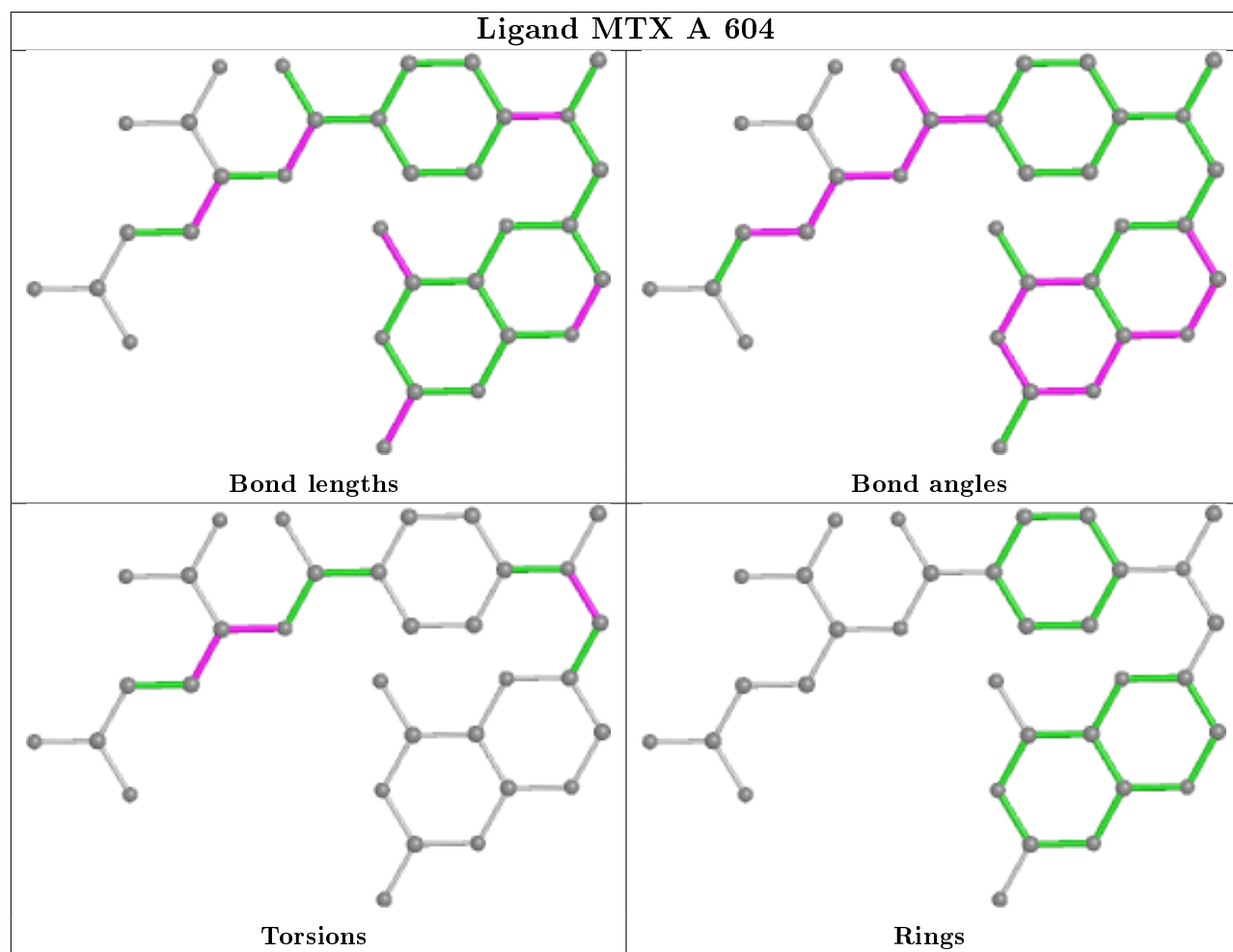
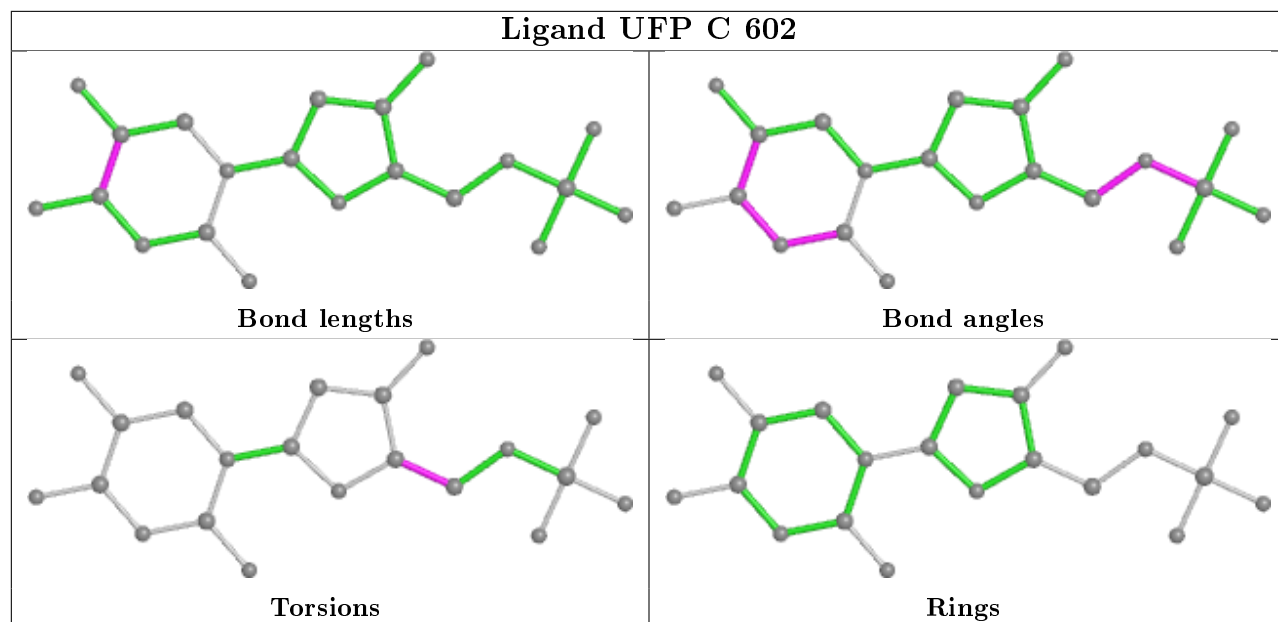
15 monomers are involved in 35 short contacts:



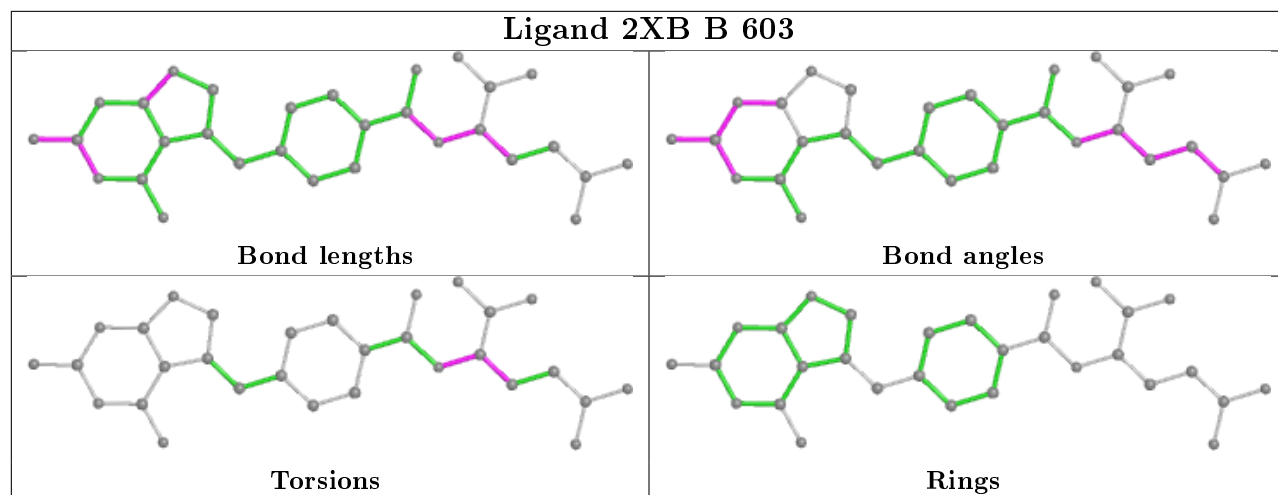
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	601	NDP	2	0
3	E	602	UFP	2	0
3	C	602	UFP	1	0
5	A	604	MTX	4	0
5	B	604	MTX	4	0
4	A	603	2XB	1	0
2	E	601	NDP	3	0
3	D	602	UFP	2	0
2	A	601	NDP	2	0
3	B	602	UFP	2	0
2	C	601	NDP	2	0
2	B	601	NDP	1	0
5	E	604	MTX	5	0
5	C	604	MTX	2	0
5	D	604	MTX	2	0

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.

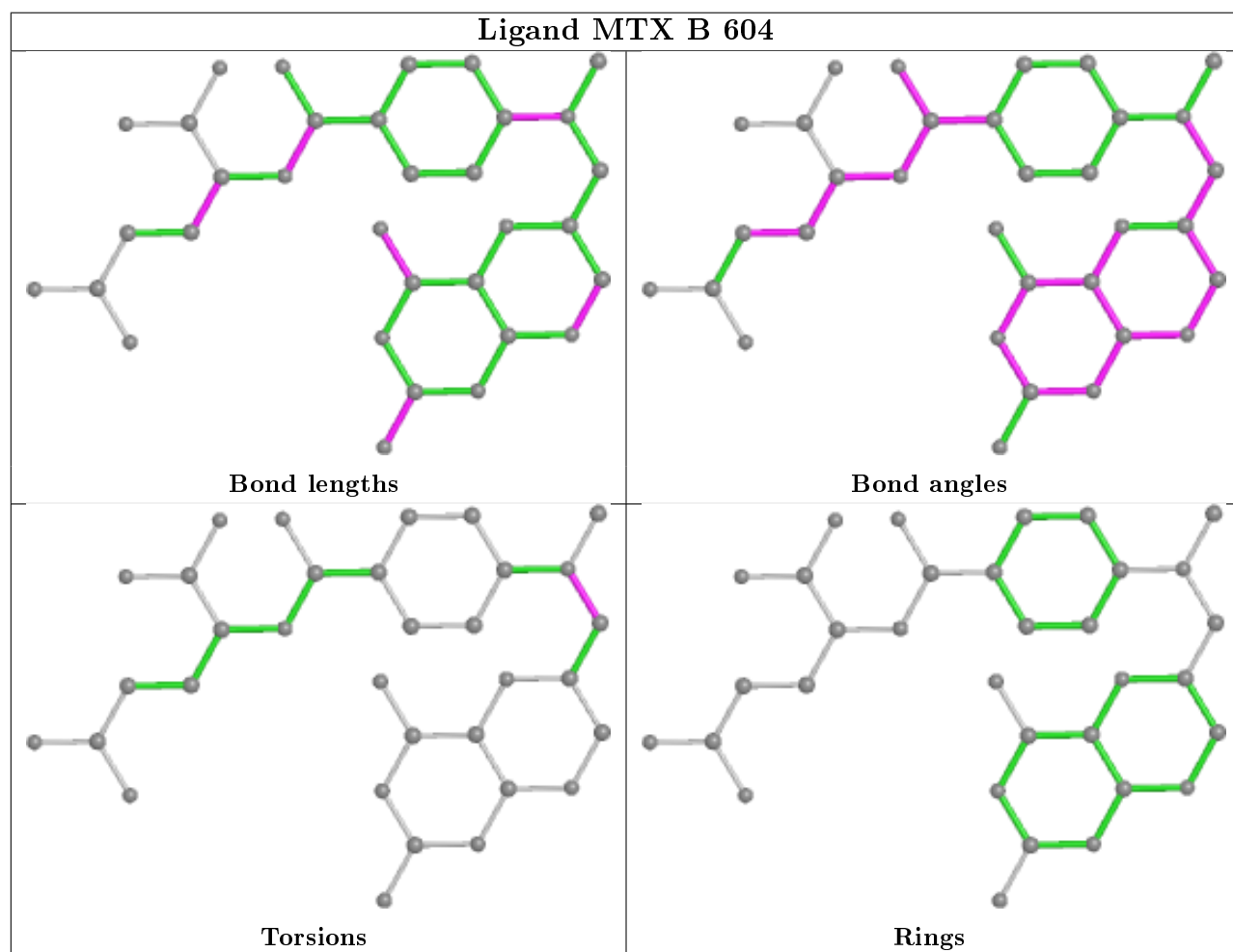




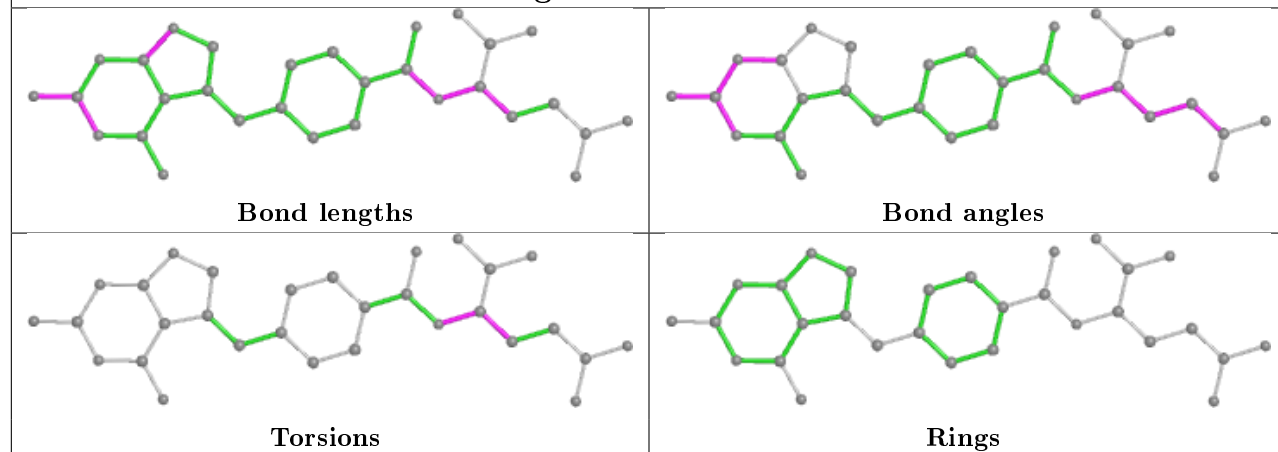
## Ligand 2XB B 603



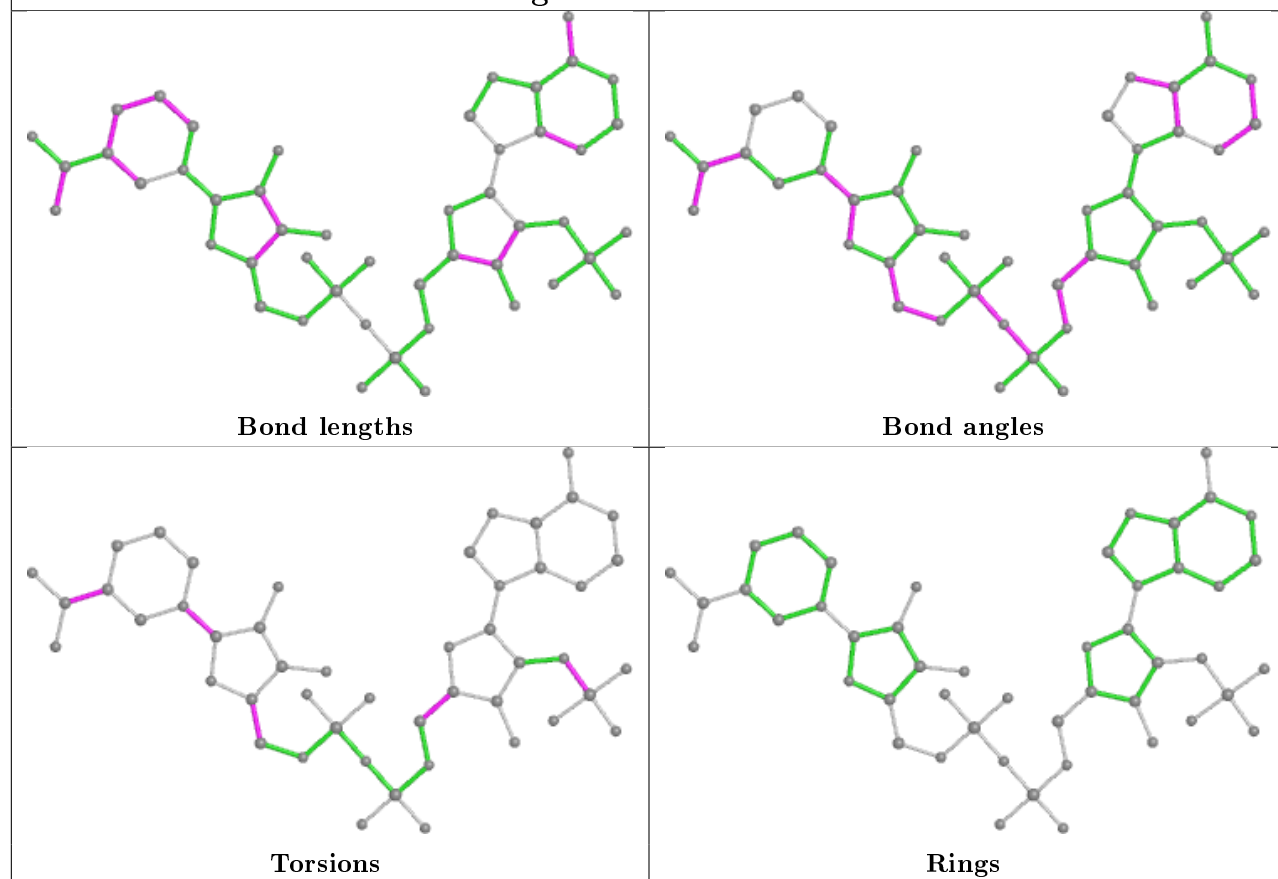
## Ligand MTX B 604

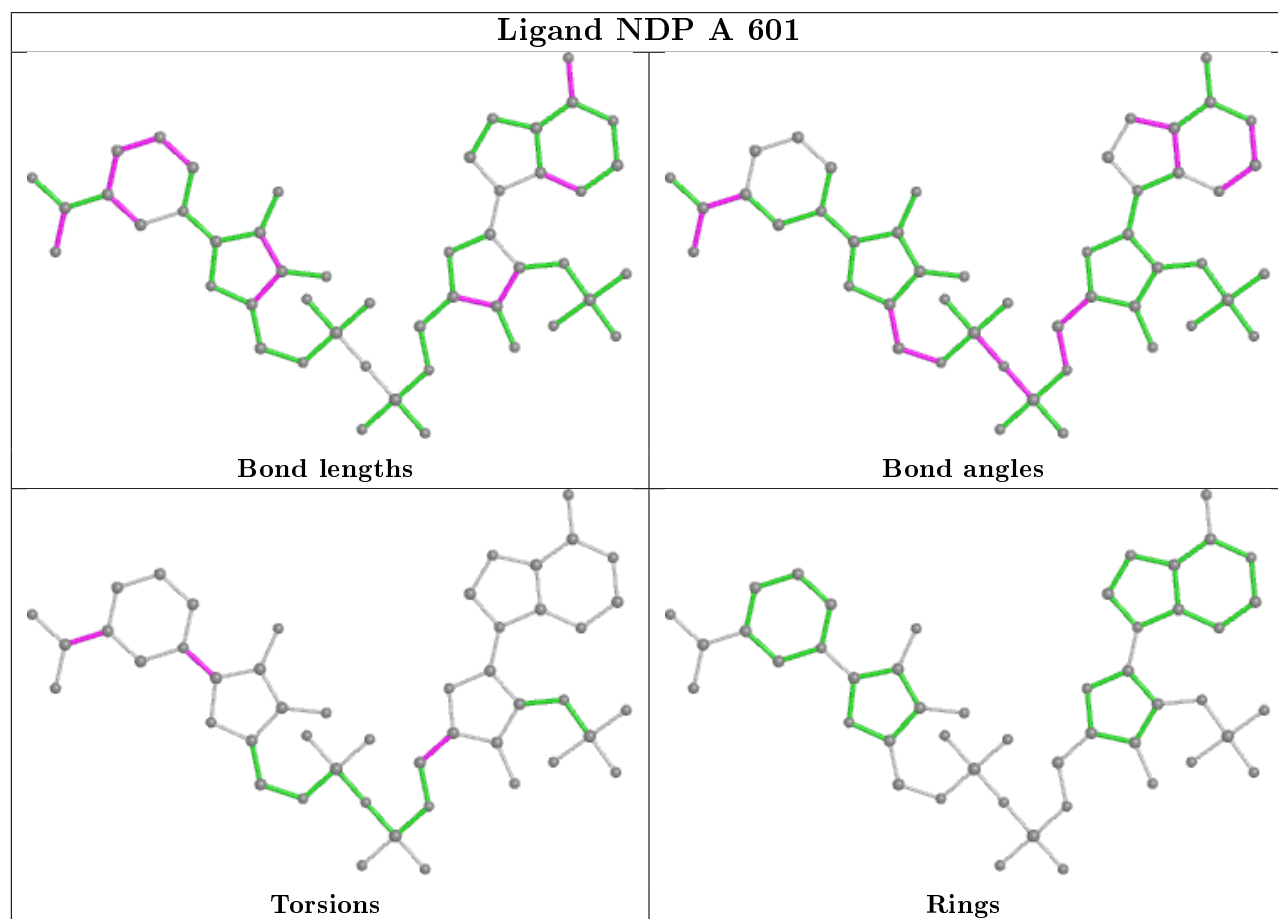
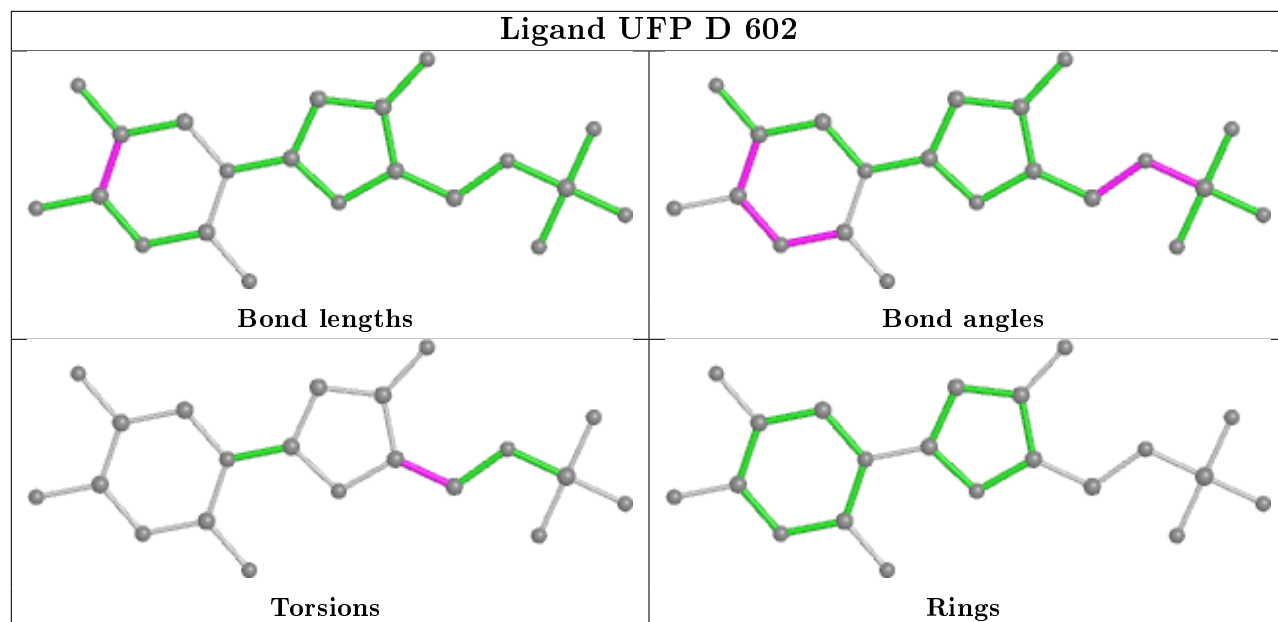


## Ligand 2XB A 603

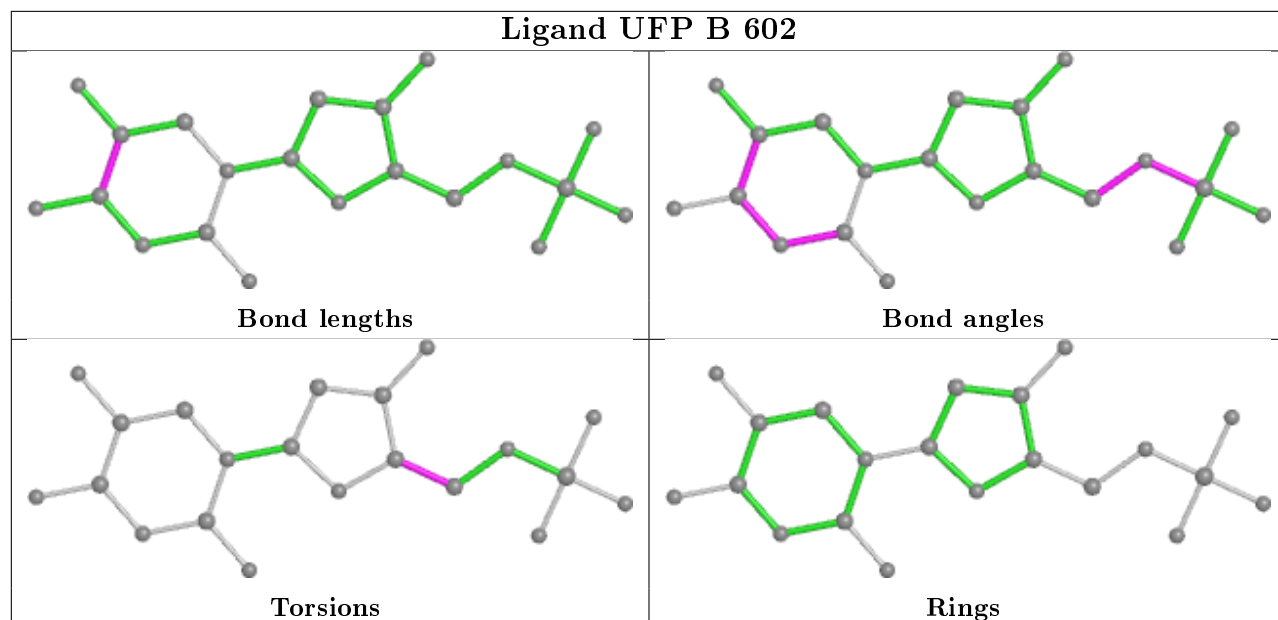


## Ligand NDP E 601

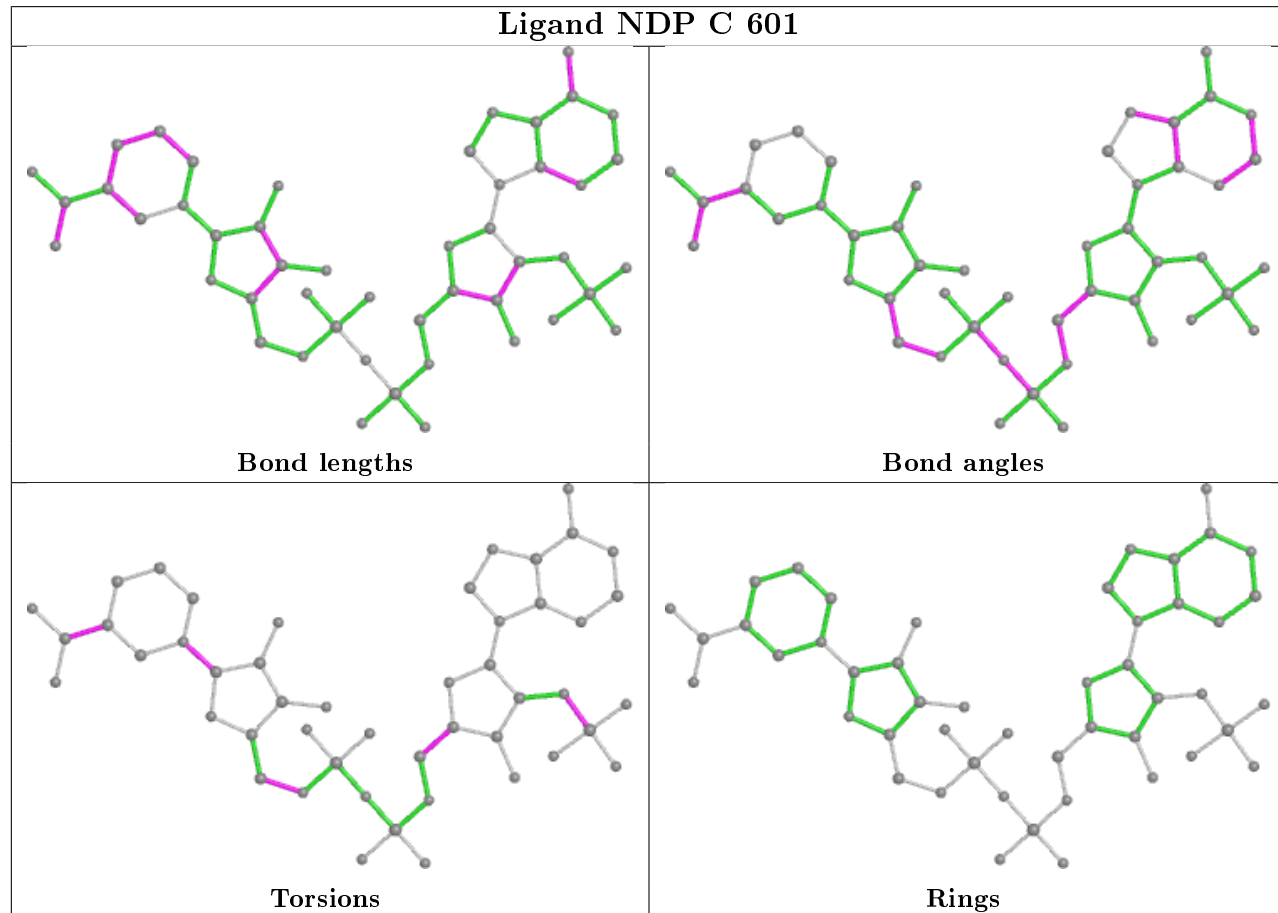




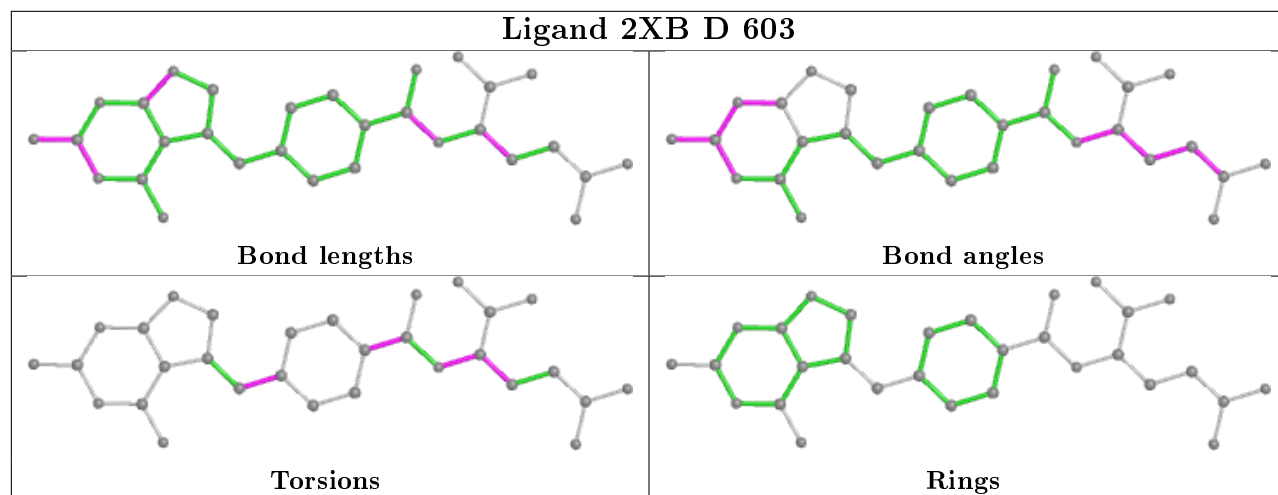
## Ligand UFP B 602



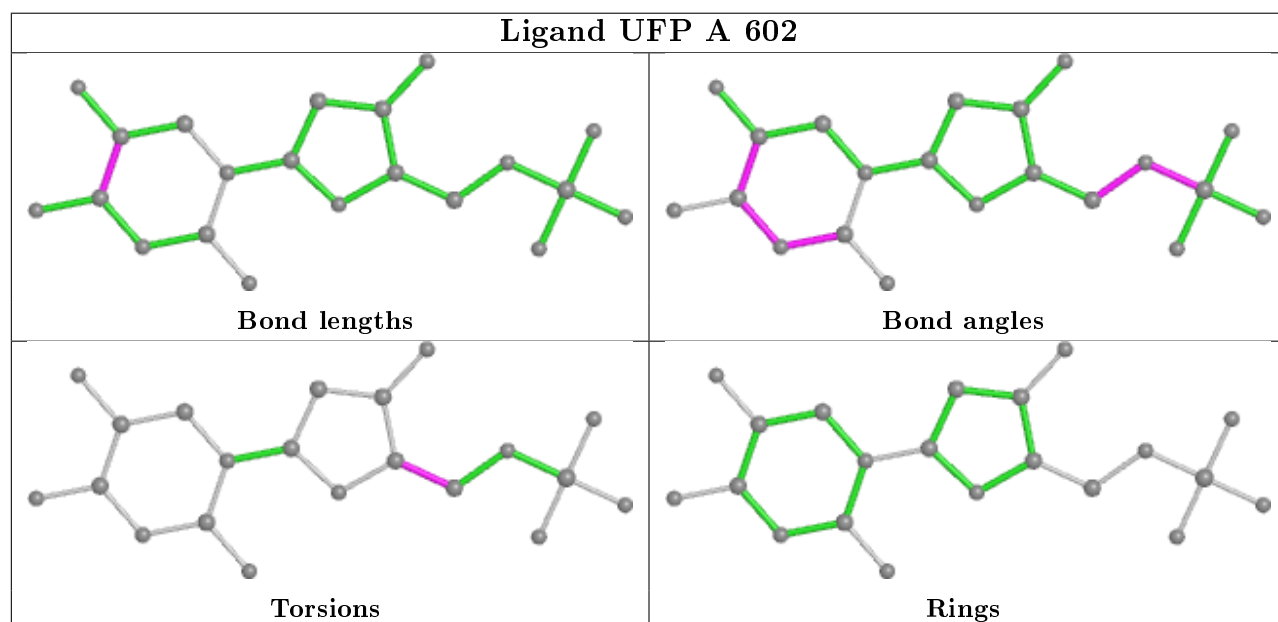
## Ligand NDP C 601



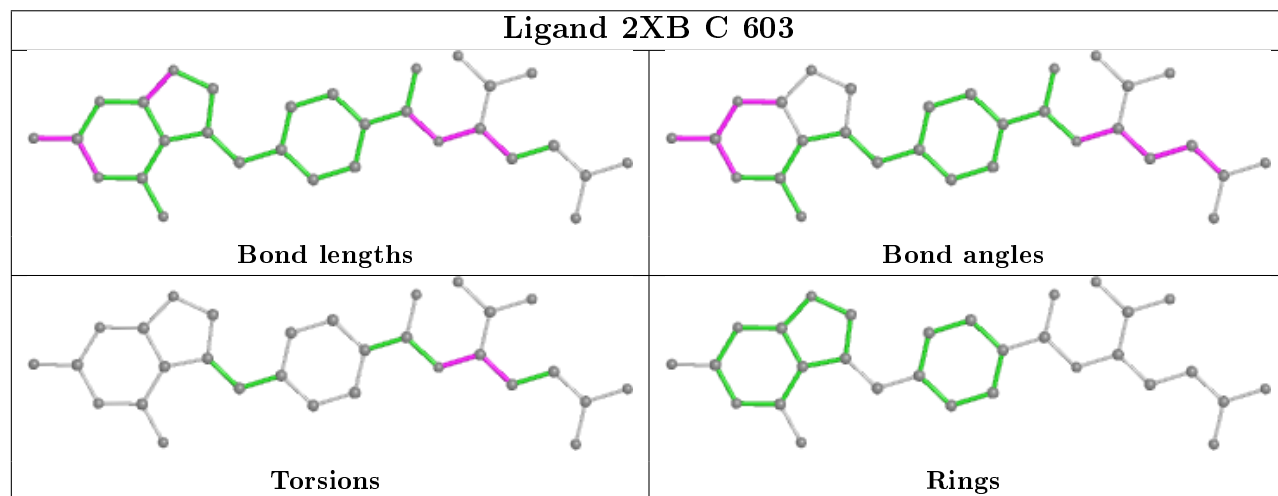
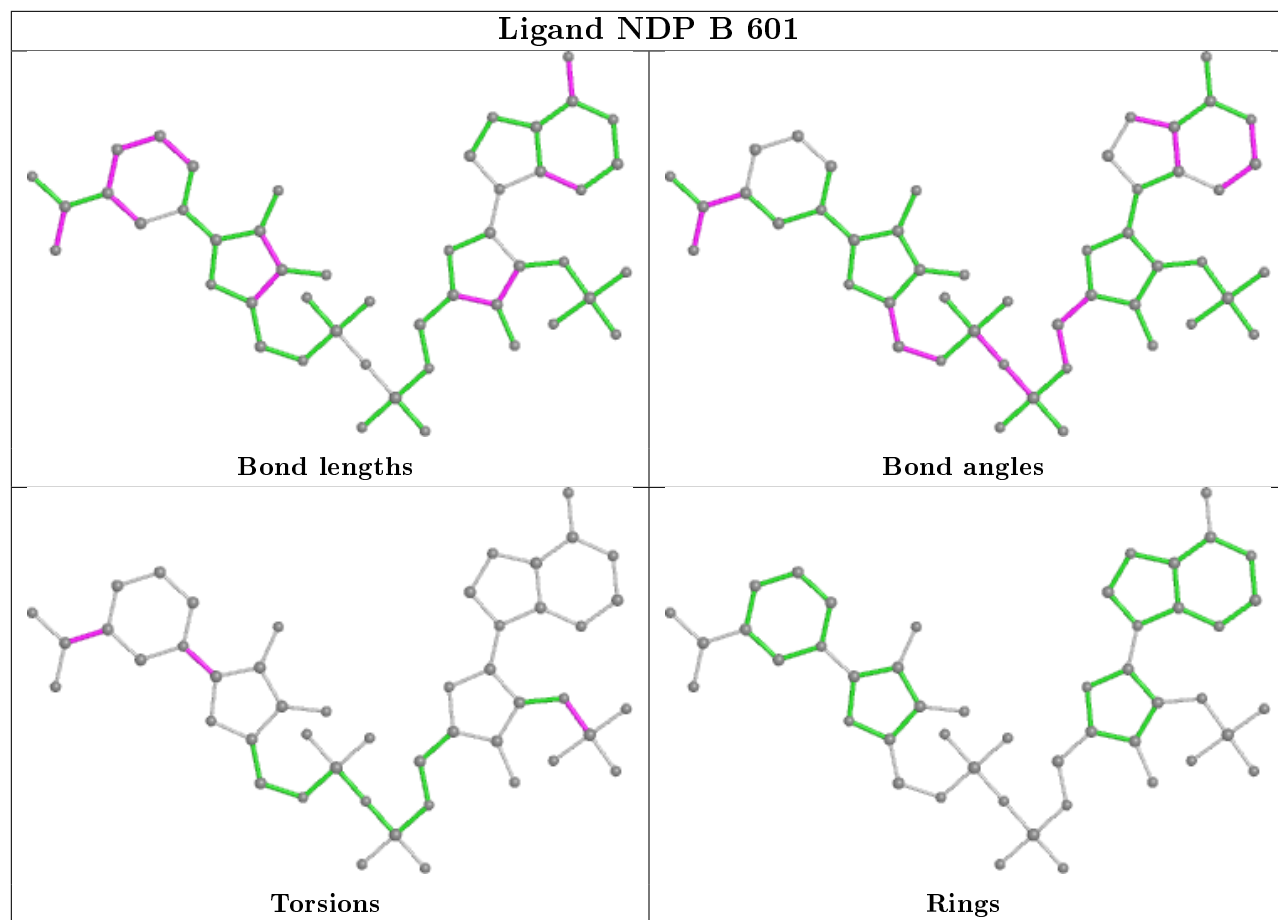
## Ligand 2XB D 603

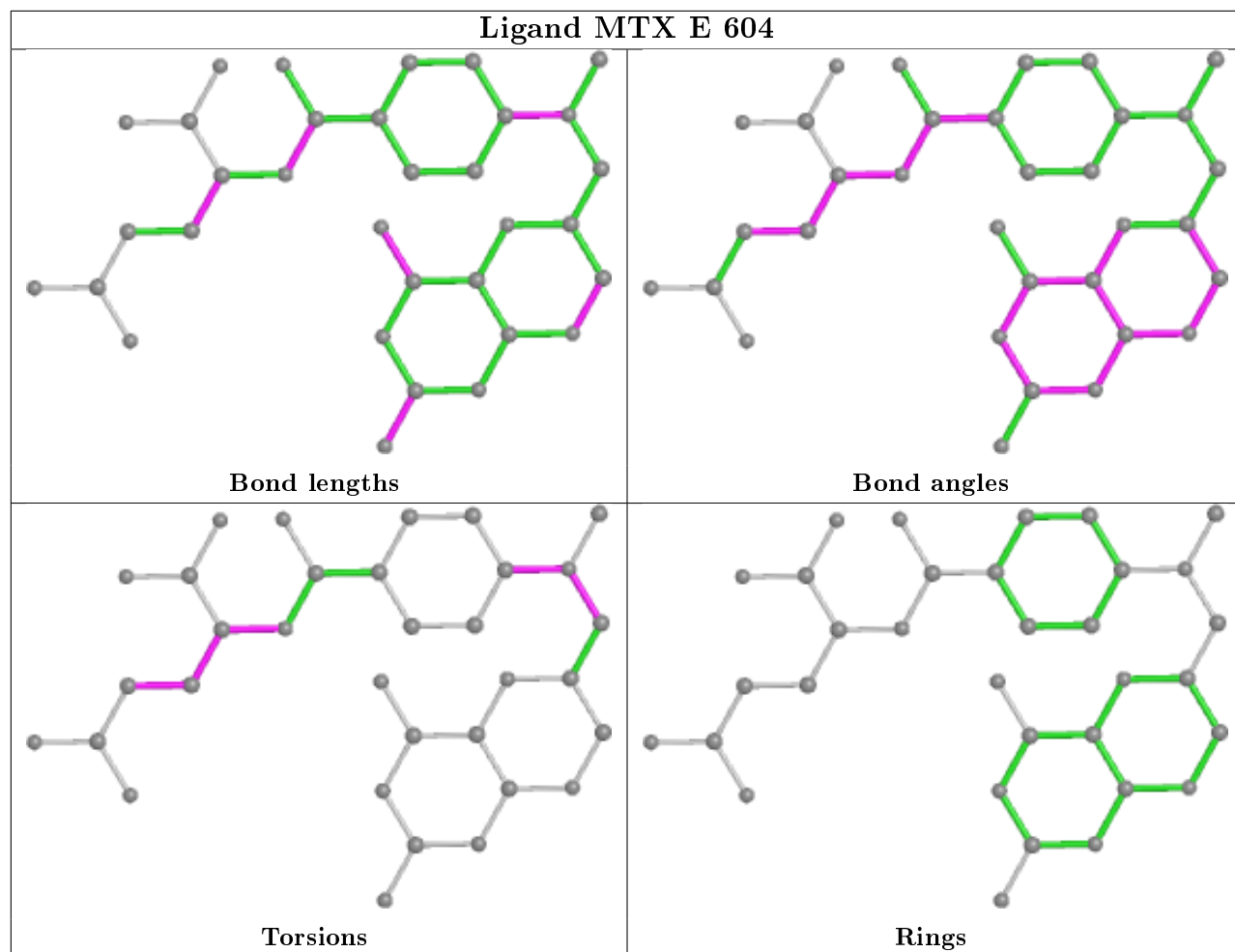


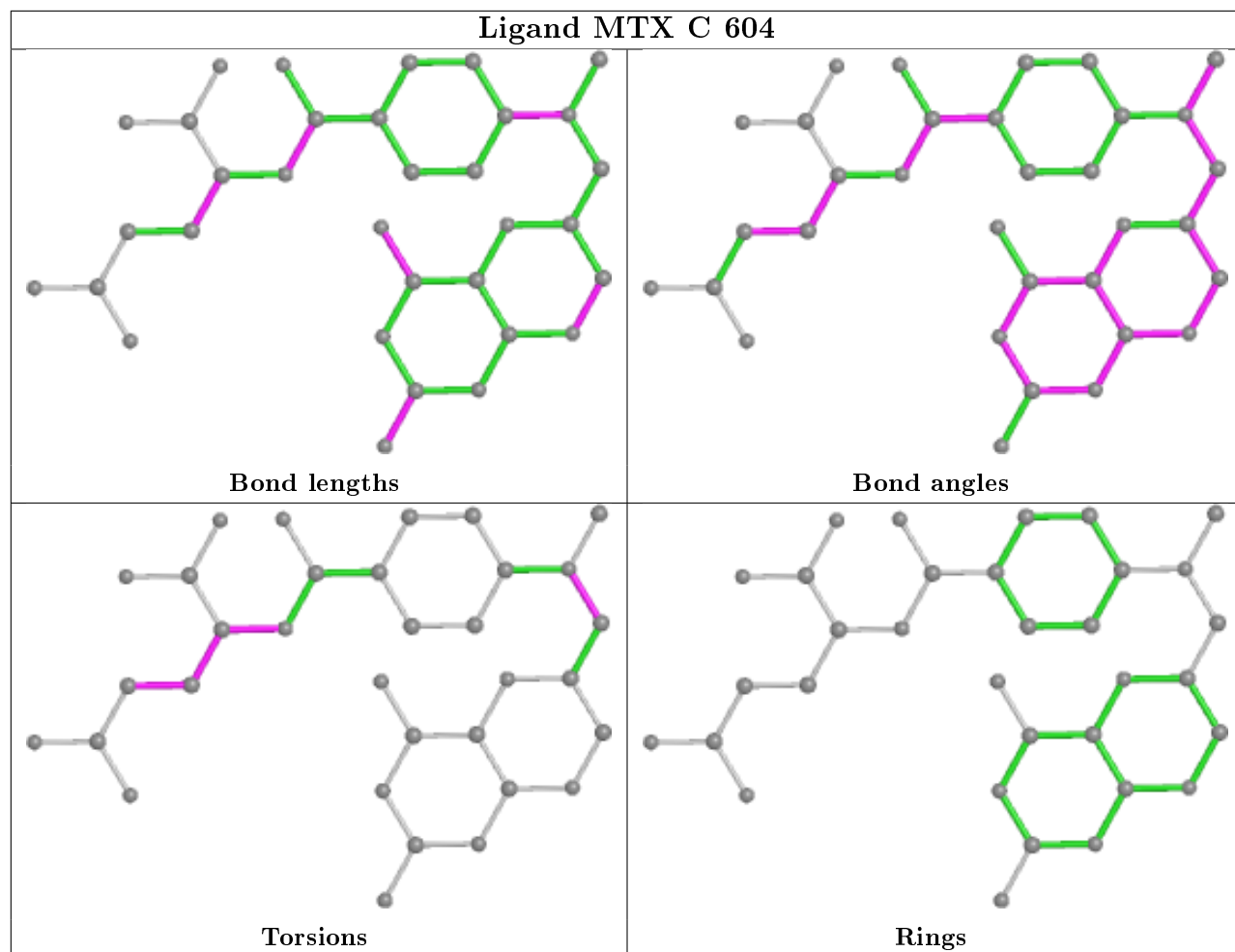
## Ligand UFP A 602

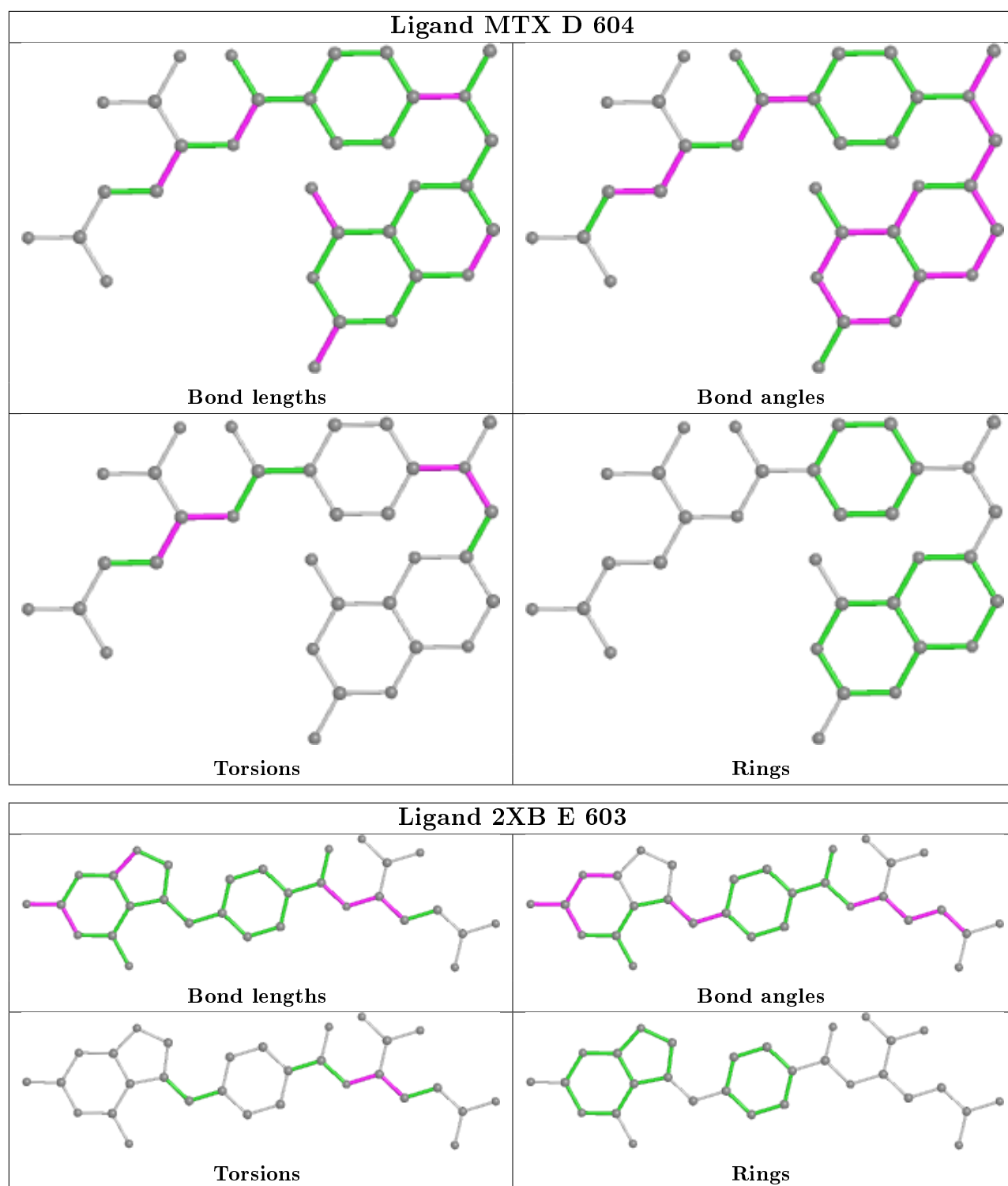












## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	508/521 (97%)	0.15	7 (1%) 75 72	28, 68, 105, 187	0
1	B	508/521 (97%)	0.20	12 (2%) 59 57	51, 79, 115, 202	0
1	C	508/521 (97%)	0.21	23 (4%) 33 32	42, 77, 126, 187	0
1	D	508/521 (97%)	0.49	30 (5%) 22 24	63, 104, 144, 188	0
1	E	508/521 (97%)	0.07	8 (1%) 72 70	27, 63, 100, 190	0
All	All	2540/2605 (97%)	0.22	80 (3%) 49 48	27, 77, 130, 202	0

The worst 5 of 80 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	102	MET	4.6
1	C	181	LYS	4.4
1	A	179	GLU	4.4
1	C	101	LEU	3.8
1	C	50	ASN	3.8

### 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 carbohydrates 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,

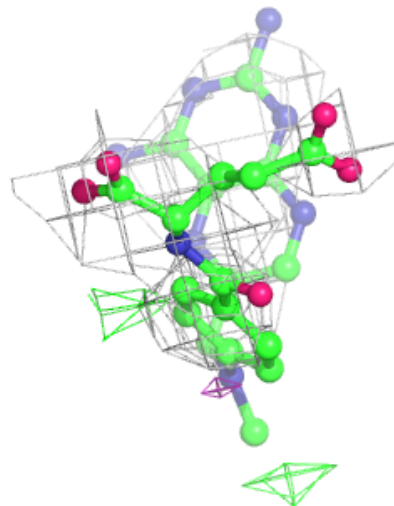
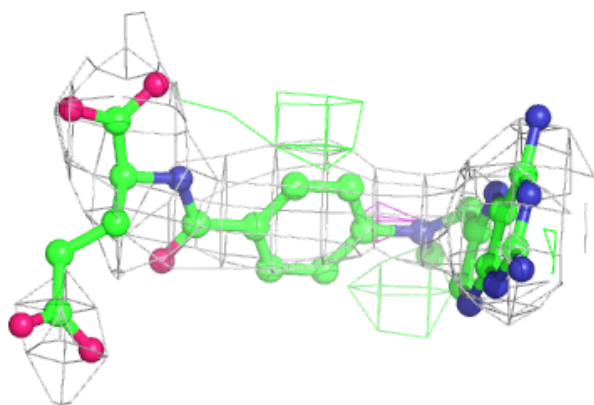
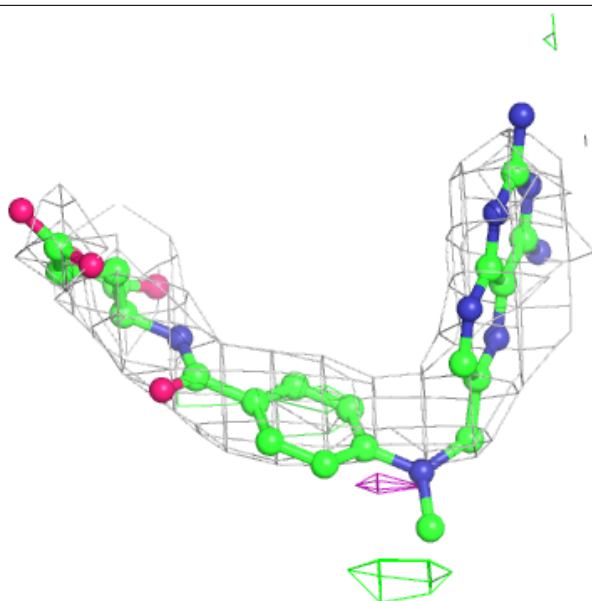
median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
5	MTX	D	604	33/33	0.84	0.38	93,100,110,115	0
4	2XB	D	603	30/30	0.85	0.38	108,116,130,135	0
4	2XB	B	603	30/30	0.85	0.38	80,88,102,108	0
4	2XB	A	603	30/30	0.86	0.35	69,77,91,97	0
5	MTX	C	604	33/33	0.87	0.31	79,88,95,99	0
4	2XB	C	603	30/30	0.88	0.31	60,68,82,88	0
5	MTX	B	604	33/33	0.89	0.27	64,72,86,91	0
5	MTX	E	604	33/33	0.89	0.26	54,61,81,84	0
4	2XB	E	603	30/30	0.89	0.36	55,63,77,83	0
3	UFP	D	602	21/21	0.91	0.18	108,118,125,144	0
3	UFP	B	602	21/21	0.91	0.22	78,87,95,113	0
5	MTX	A	604	33/33	0.91	0.24	55,63,68,70	0
3	UFP	E	602	21/21	0.91	0.23	60,70,78,96	0
3	UFP	A	602	21/21	0.92	0.22	65,75,83,101	0
2	NDP	C	601	48/48	0.92	0.21	97,108,112,117	0
2	NDP	D	601	48/48	0.92	0.21	88,99,103,108	0
2	NDP	A	601	48/48	0.93	0.18	54,66,70,75	0
2	NDP	B	601	48/48	0.94	0.17	75,86,90,95	0
3	UFP	C	602	21/21	0.94	0.22	66,75,83,101	0
2	NDP	E	601	48/48	0.95	0.16	59,70,74,80	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 MTX D 604:**

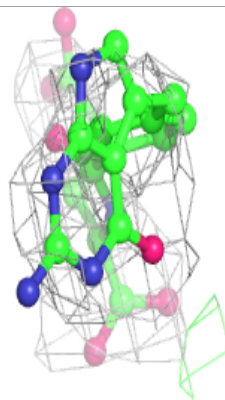
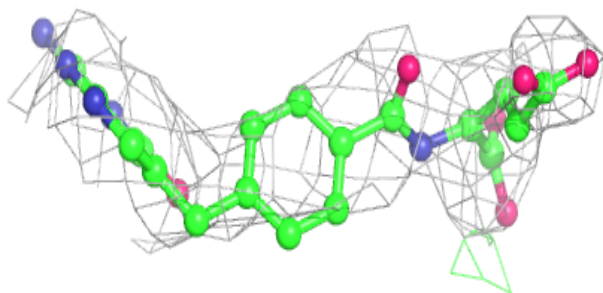
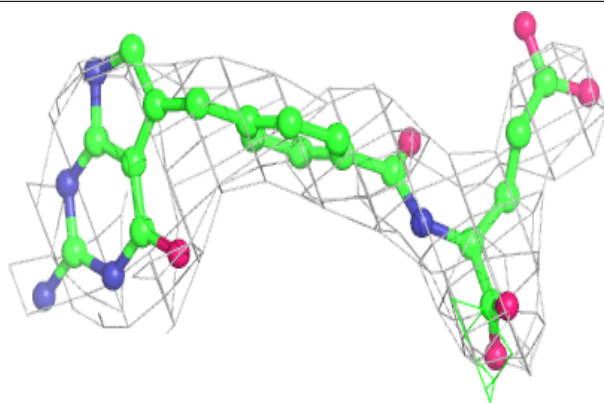
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



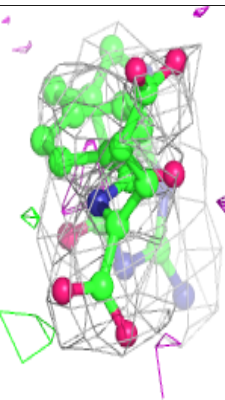
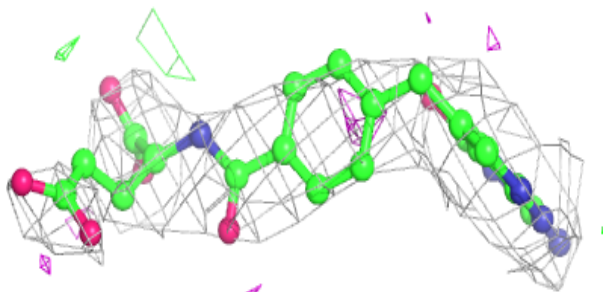
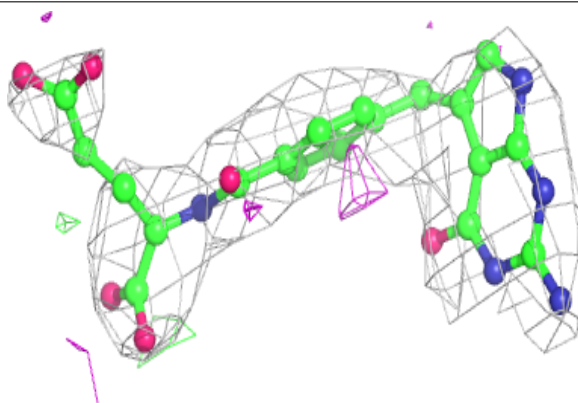


**Electron density around 2XB D 603:**

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

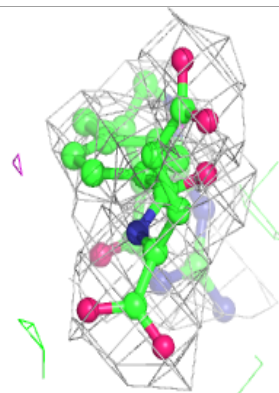
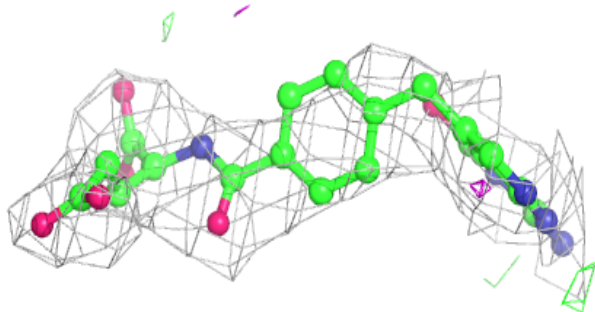
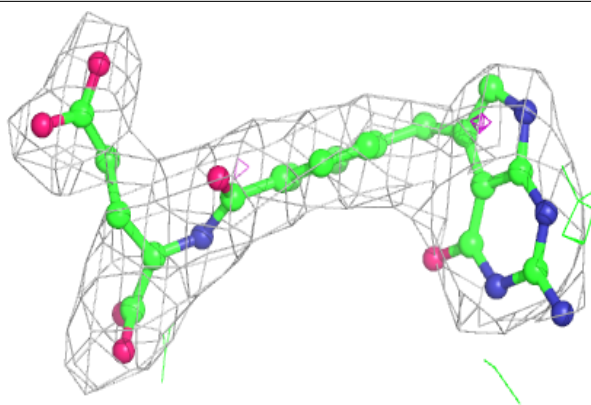
**Electron density around 2XB B 603:**

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



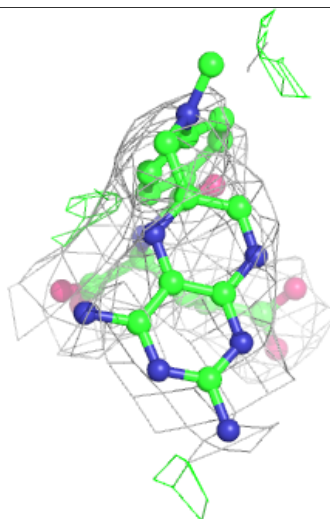
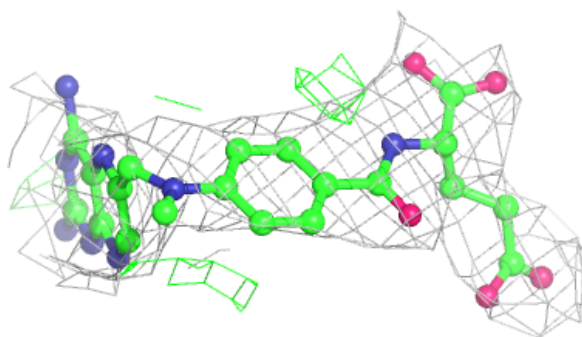
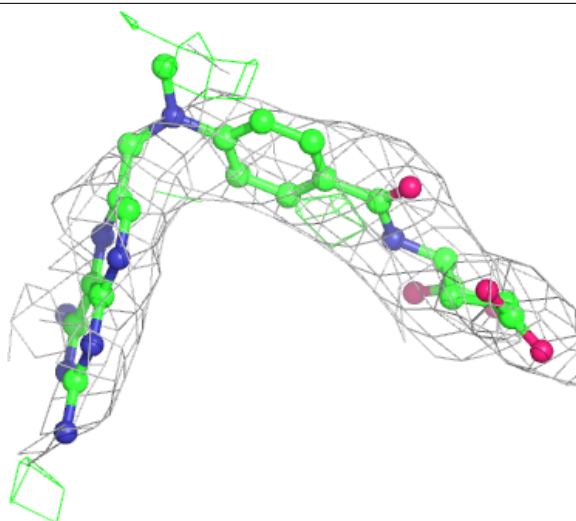
**Electron density around 2XB A 603:**

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and green (positive)



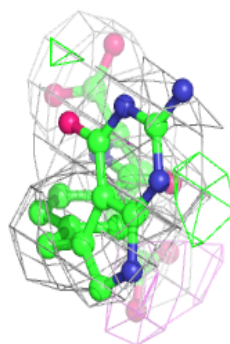
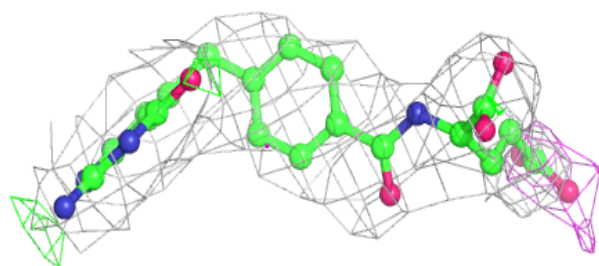
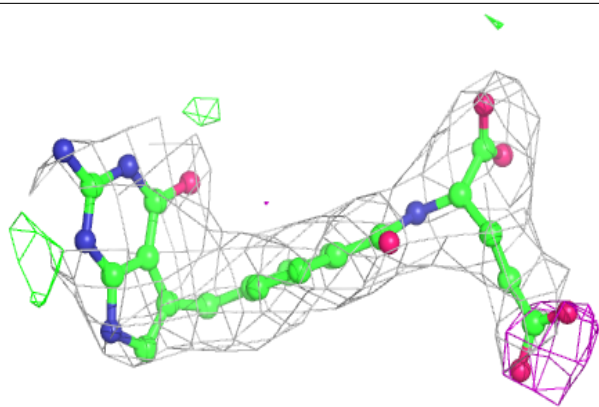
**Electron density around MTX C 604:**

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and green (positive)



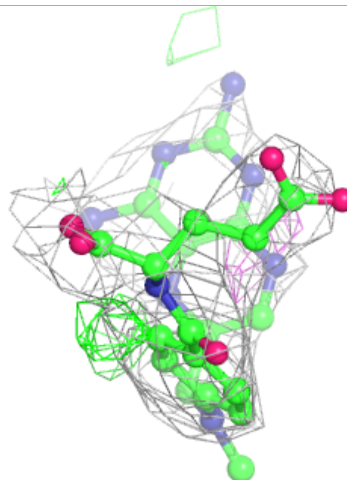
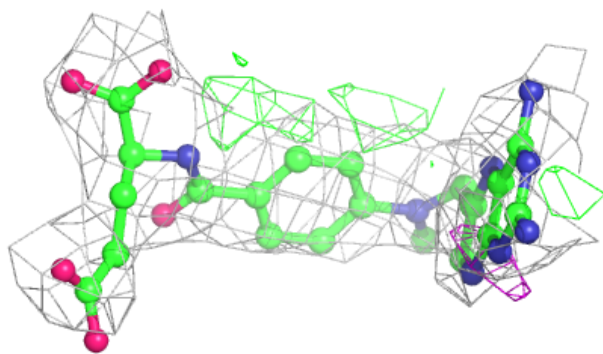
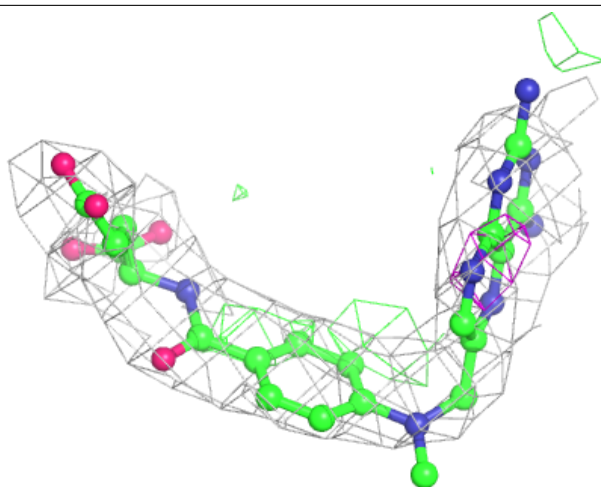
**Electron density around 2XB C 603:**

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and green (positive)



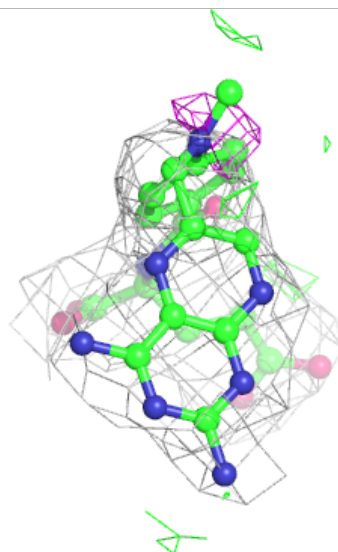
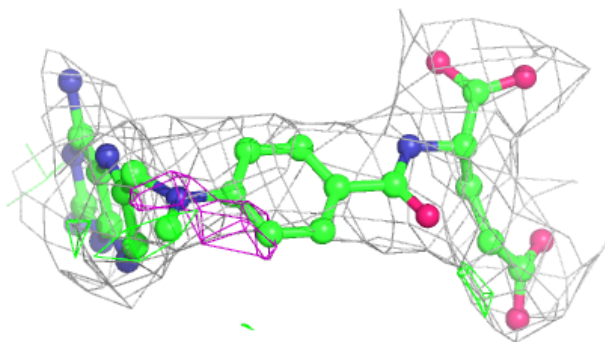
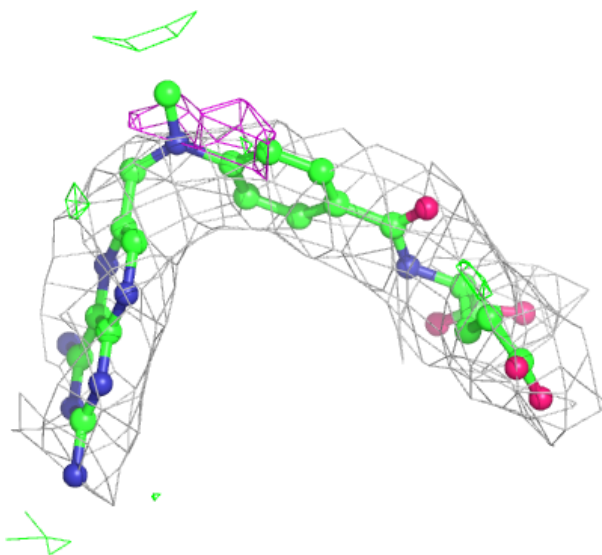
**Electron density around MTX B 604:**

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and green (positive)



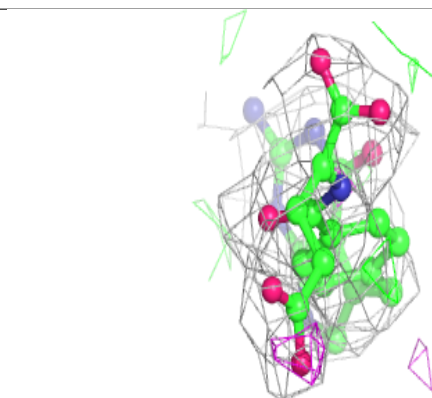
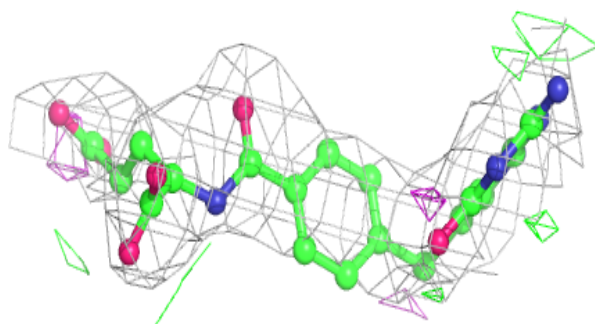
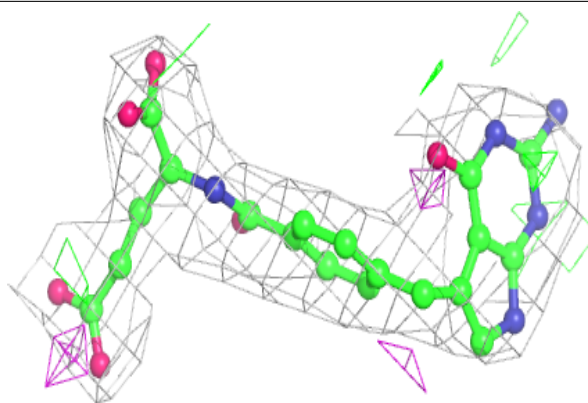
**Electron density around MTX E 604:**

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and green (positive)

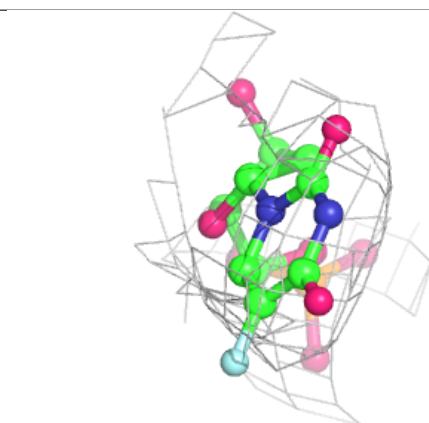
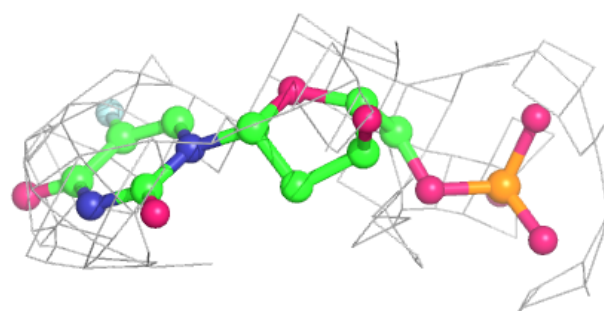
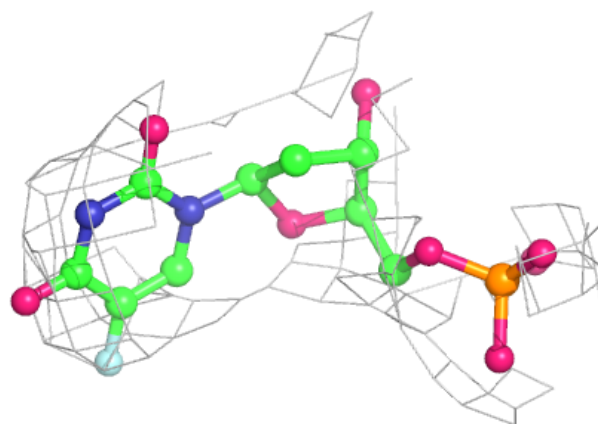


**Electron density around 2XB E 603:**

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

**Electron density around UFP D 602:**

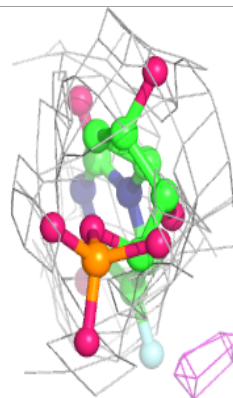
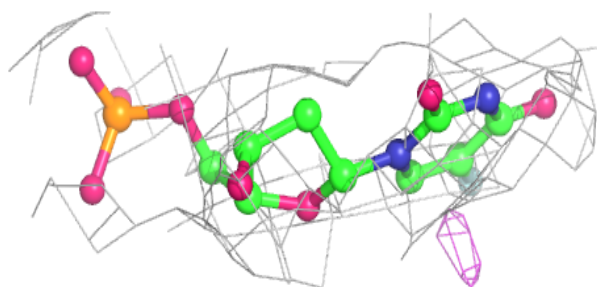
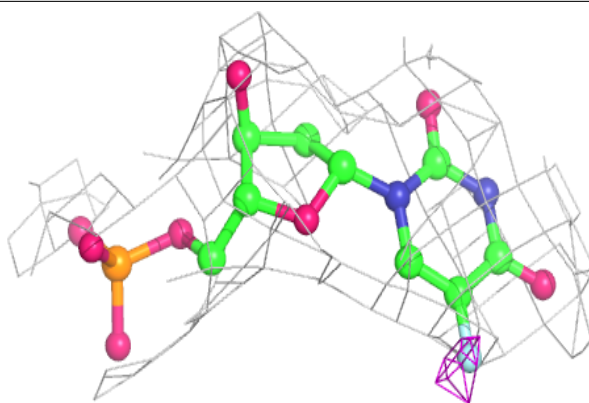
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around UFP B 602:**

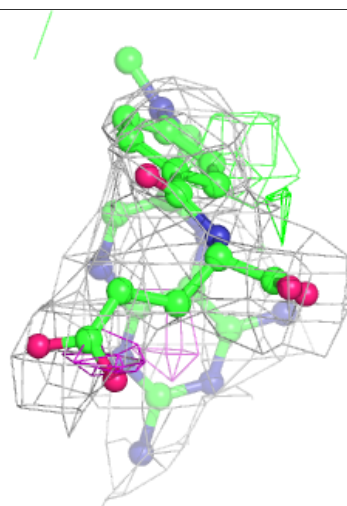
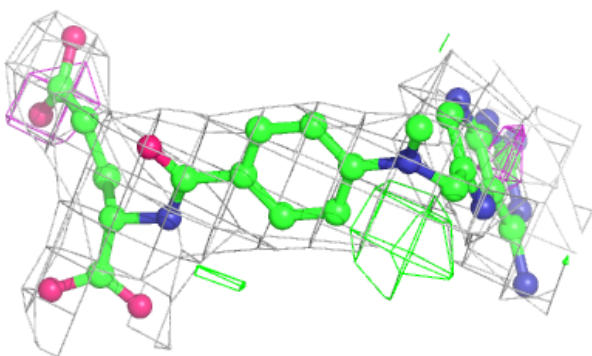
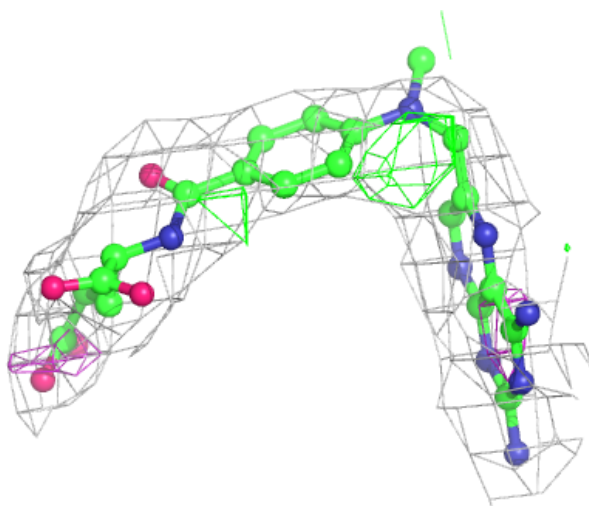
$2mF_o - DF_c$  (at 0.7 rmsd) in gray  
 $mF_o - DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





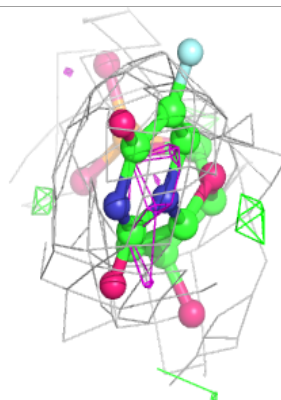
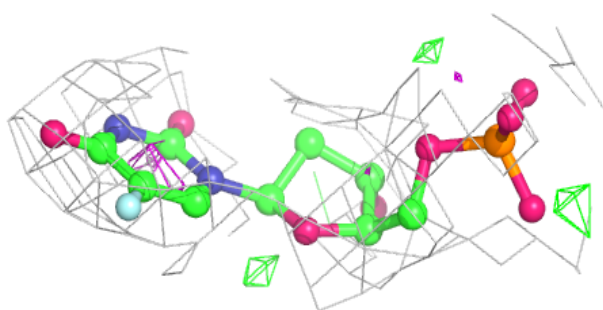
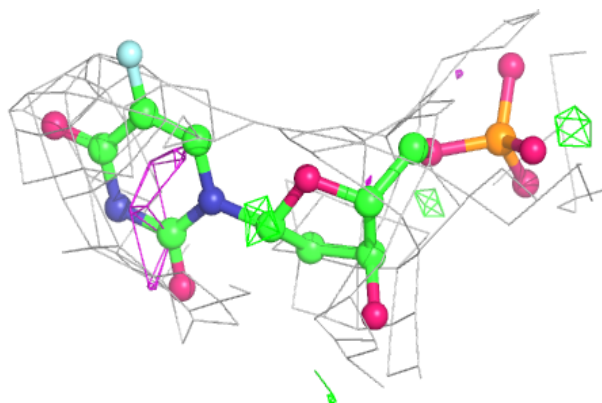
**Electron density around MTX A 604:**

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

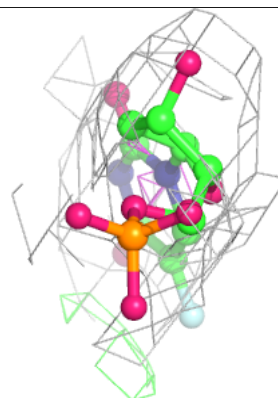
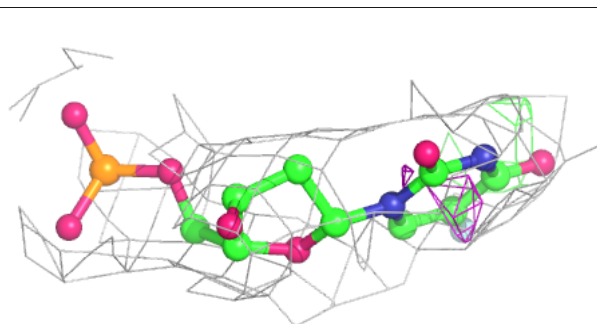
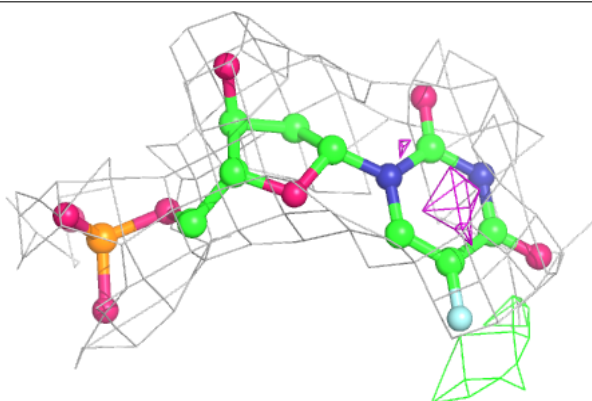


**Electron density around UFP E 602:**

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

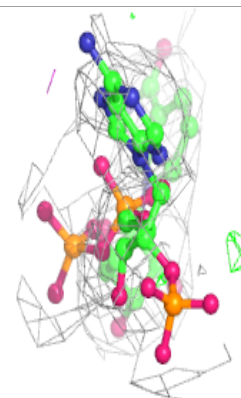
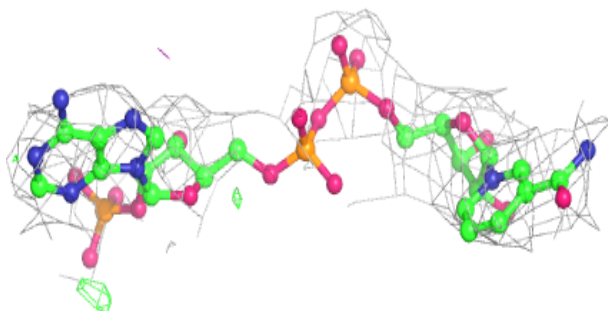
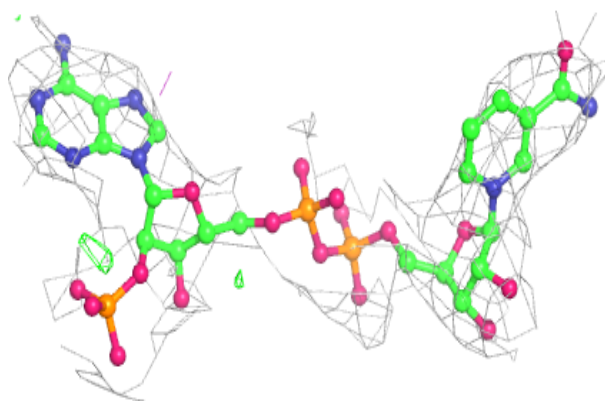
**Electron density around UFP A 602:**

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

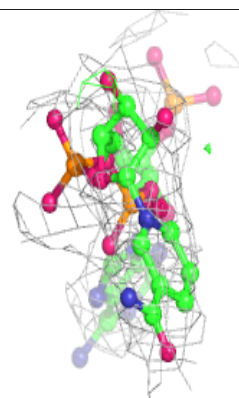
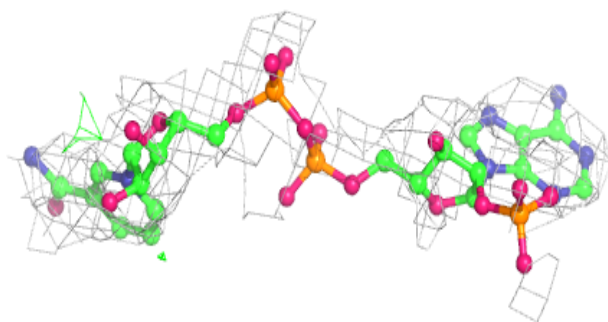
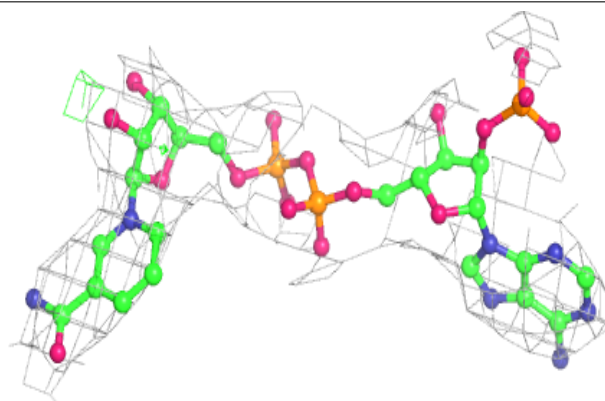


**Electron density around NDP C 601:**

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

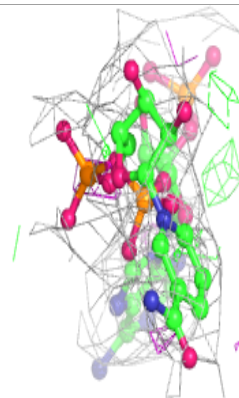
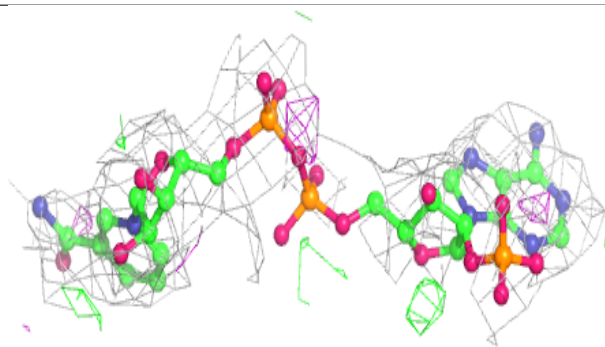
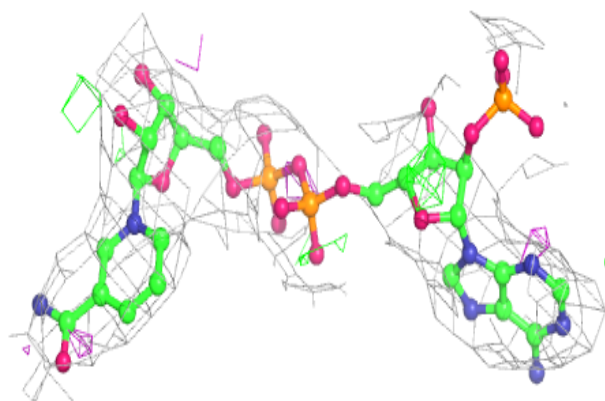
**Electron density around NDP D 601:**

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

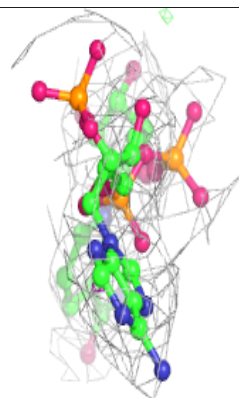
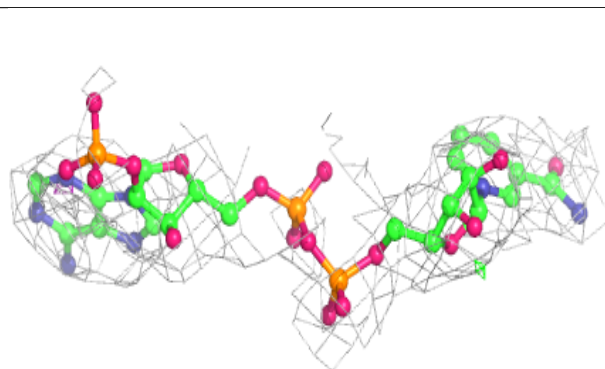
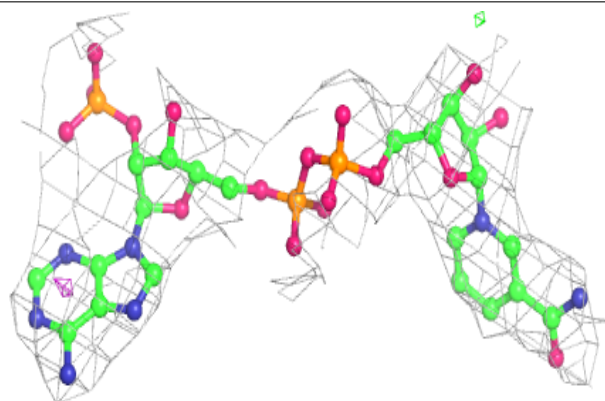


**Electron density around NDP A 601:**

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

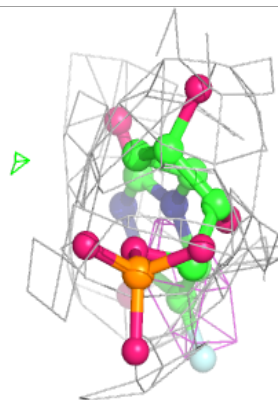
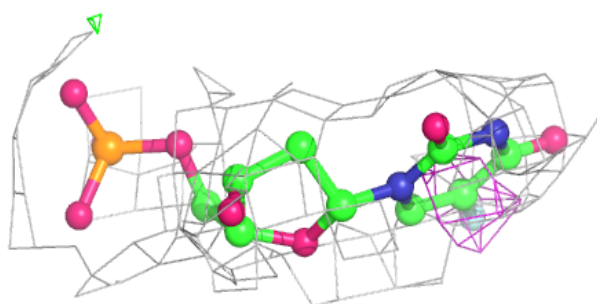
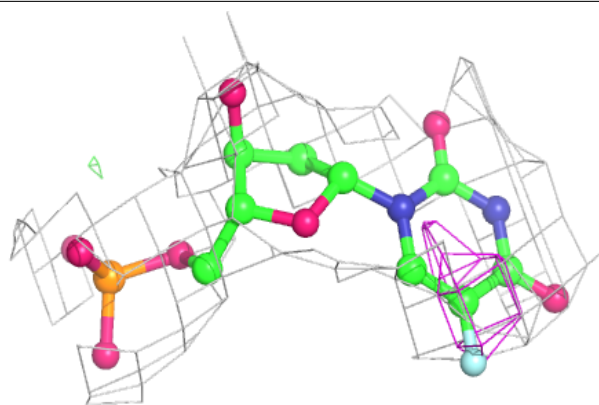
**Electron density around NDP B 601:**

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

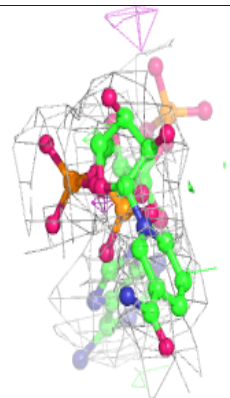
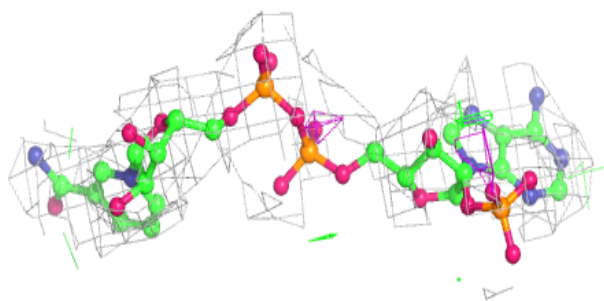
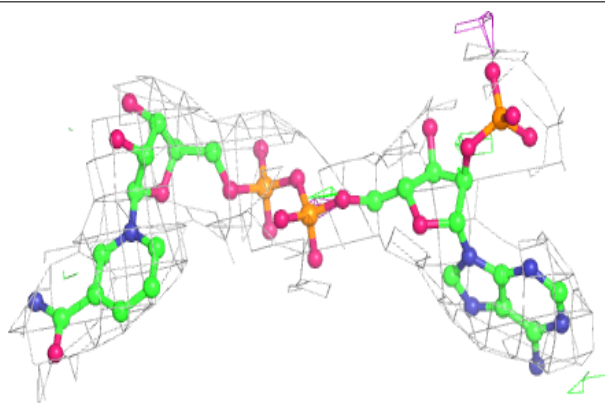


**Electron density around UFP C 602:**

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

**Electron density around NDP E 601:**

$2mF_o-DF_c$  (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.