



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 24, 2024 – 11:52 AM EDT

PDB ID : 7JNT  
Title : CRYSTAL STRUCTURE OF RHO-ASSOCIATED PROTEIN KINASE 2 (ROCK2) IN COMPLEX WITH A POTENT AND SELECTIVE DUAL ROCK INHIBITOR  
Authors : Muckelbauer, J.K.  
Deposited on : 2020-08-05  
Resolution : 2.21 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.

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	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
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)	:	2.37.1

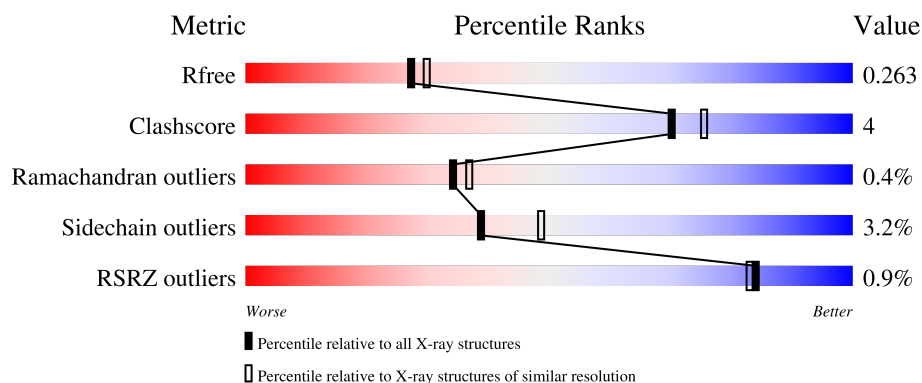
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.21 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	5912 (2.24-2.20)
Clashscore	141614	6646 (2.24-2.20)
Ramachandran outliers	138981	6543 (2.24-2.20)
Sidechain outliers	138945	6544 (2.24-2.20)
RSRZ outliers	127900	5797 (2.24-2.20)

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	399	<div> <div>2%</div> <div>84%</div> <div>10%</div> <div>6%</div> </div>
1	B	399	<div> <div>%</div> <div>84%</div> <div>10%</div> <div>6%</div> </div>
1	C	399	<div> <div>%</div> <div>86%</div> <div>10%</div> <div>.</div> </div>
1	D	399	<div> <div>%</div> <div>80%</div> <div>10%</div> <div>10%</div> </div>

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Mol	Chain	Length	Quality of chain
1	E	399	<div><div><div>%</div><div><div></div><div>86%</div><div>10%</div><div></div></div><div></div></div></div>
1	F	399	<div><div><div></div><div>87%</div><div>9%</div><div></div></div><div></div></div>
1	G	399	<div><div><div>%</div><div><div></div><div>88%</div><div>9%</div><div></div></div><div></div></div></div>
1	H	399	<div><div><div>%</div><div><div></div><div>85%</div><div>11%</div><div></div></div><div></div></div></div>

## 2 Entry composition

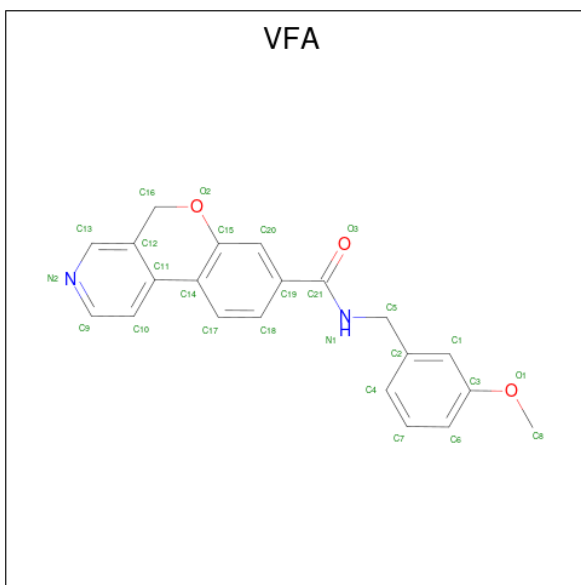
There are 5 unique types of molecules in this entry. The entry contains 24387 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Rho-associated protein kinase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	377	Total	C	N	O	S	0	0	0
			2894	1867	477	532	18			
1	B	376	Total	C	N	O	S	0	0	0
			2956	1899	487	551	19			
1	C	386	Total	C	N	O	S	0	0	0
			3038	1946	506	567	19			
1	D	360	Total	C	N	O	S	0	0	0
			2755	1782	458	499	16			
1	E	384	Total	C	N	O	S	0	0	0
			2981	1914	491	556	20			
1	F	385	Total	C	N	O	S	0	0	0
			2992	1927	489	556	20			
1	G	388	Total	C	N	O	S	0	0	0
			2997	1919	498	560	20			
1	H	386	Total	C	N	O	S	0	0	0
			3010	1933	498	559	20			

- Molecule 2 is N-[(3-methoxyphenyl)methyl]-5H-[1]benzopyrano[3,4-c]pyridine-8-carboxamide (three-letter code: VFA) (formula: C<sub>21</sub>H<sub>18</sub>N<sub>2</sub>O<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	1
			52	42	4	6		
2	B	1	Total	C	N	O	0	1
			52	42	4	6		
2	C	1	Total	C	N	O	0	1
			52	42	4	6		
2	D	1	Total	C	N	O	0	1
			52	42	4	6		
2	E	1	Total	C	N	O	0	1
			52	42	4	6		
2	F	1	Total	C	N	O	0	1
			52	42	4	6		
2	G	1	Total	C	N	O	0	1
			52	42	4	6		
2	H	1	Total	C	N	O	0	1
			52	42	4	6		

- Molecule 3 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	D	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	E	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	F	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	G	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	H	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Cl	0	0
			1	1		
4	C	1	Total	Cl	0	0
			1	1		
4	F	1	Total	Cl	0	0
			1	1		

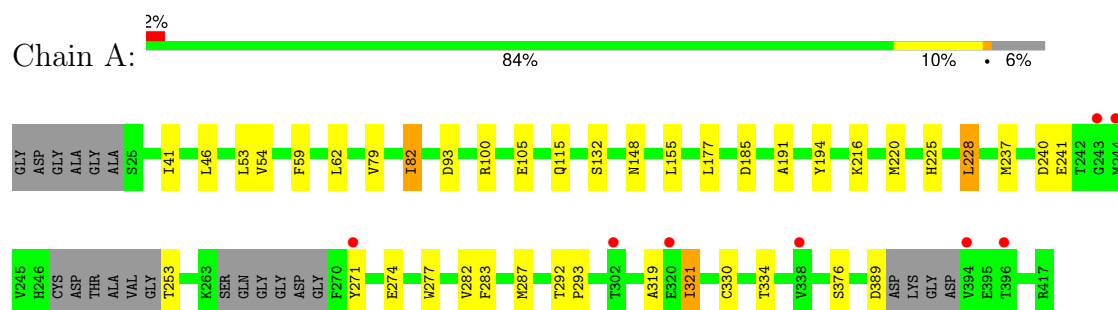
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	11	Total 11	O 11	0	0
5	B	32	Total 32	O 32	0	0
5	C	55	Total 55	O 55	0	0
5	D	17	Total 17	O 17	0	0
5	E	45	Total 45	O 45	0	0
5	F	46	Total 46	O 46	0	0
5	G	21	Total 21	O 21	0	0
5	H	46	Total 46	O 46	0	0

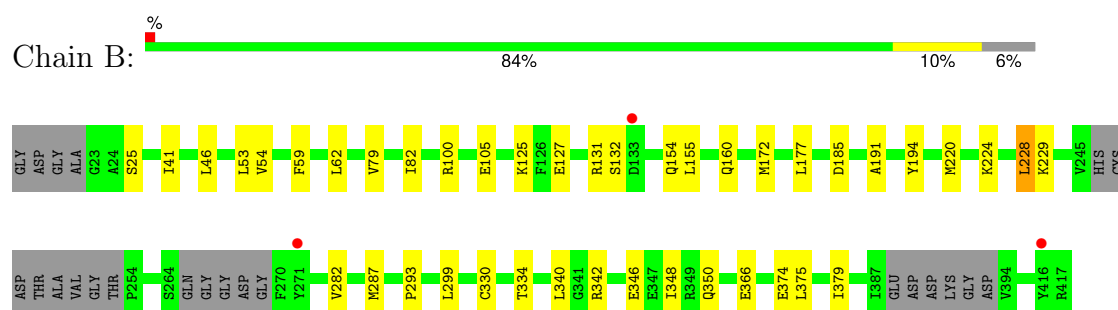
### 3 Residue-property plots [i](#)

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.

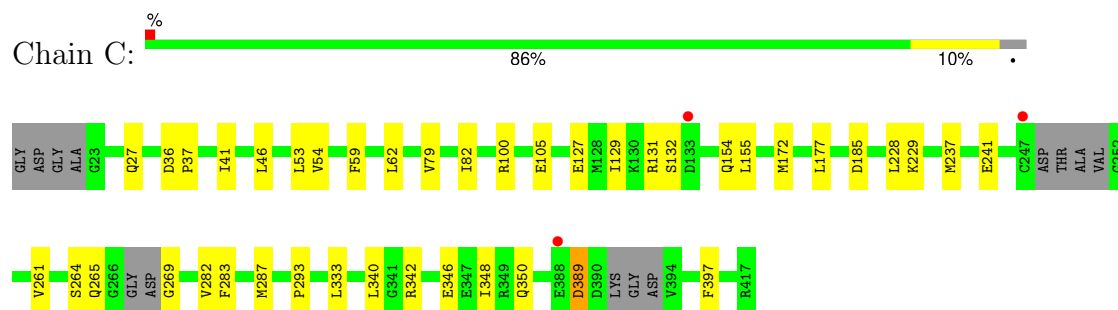
#### • Molecule 1: Rho-associated protein kinase 2



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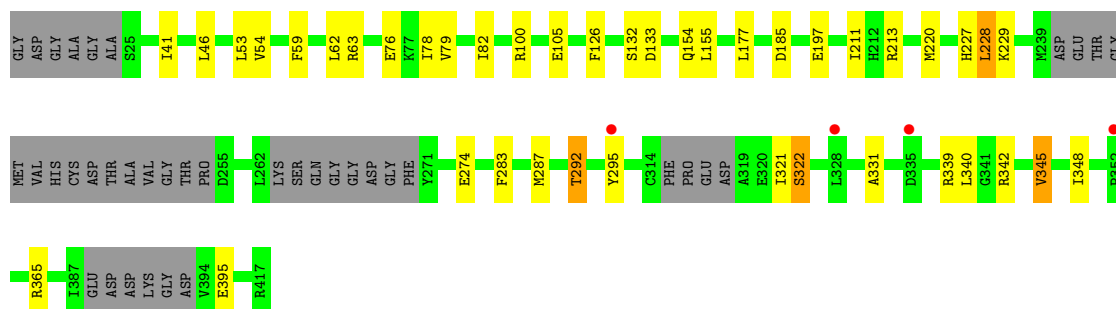
#### • Molecule 1: Rho-associated protein kinase 2



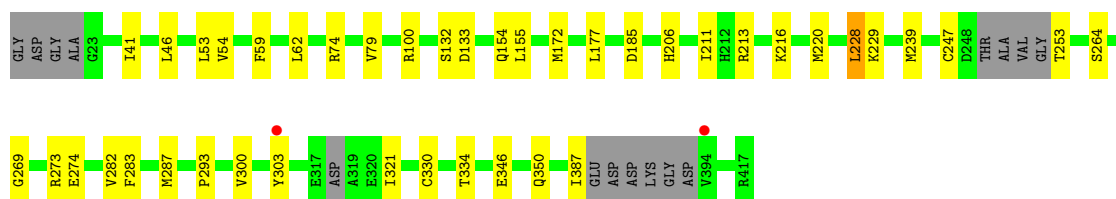
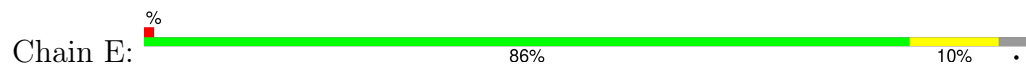
#### • Molecule 1: Rho-associated protein kinase 2



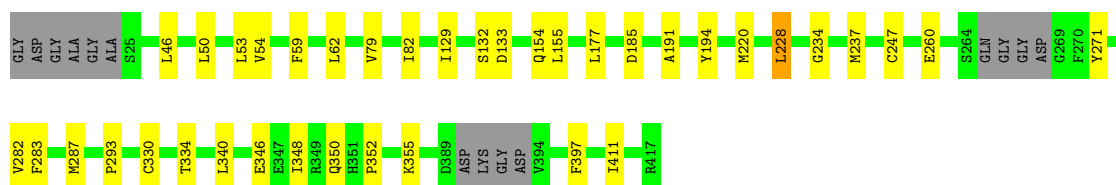
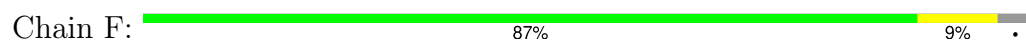




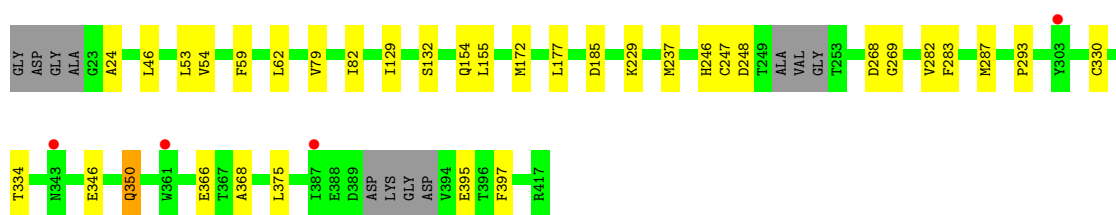
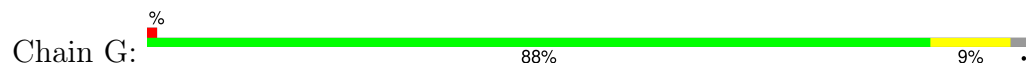
- Molecule 1: Rho-associated protein kinase 2



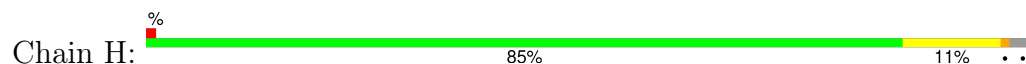
- Molecule 1: Rho-associated protein kinase 2



- Molecule 1: Rho-associated protein kinase 2



- Molecule 1: Rho-associated protein kinase 2





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	93.62Å 100.99Å 102.89Å 83.11° 73.53° 78.38°	Depositor
Resolution (Å)	98.44 – 2.21 98.70 – 2.21	Depositor EDS
% Data completeness (in resolution range)	60.1 (98.44-2.21) 60.1 (98.70-2.21)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.75 (at 2.22Å)	Xtriage
Refinement program	BUSTER 2.11.7 (6-FEB-2020)	Depositor
R, $R_{free}$	0.211 , 0.249 0.216 , 0.263	Depositor DCC
$R_{free}$ test set	865 reflections (0.82%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	53.4	Xtriage
Anisotropy	0.007	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 36.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	24387	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.27% 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: VFA, CL, MES

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	0.40	0/2967	0.55	0/4039
1	B	0.42	0/3029	0.57	0/4110
1	C	0.45	0/3111	0.58	0/4218
1	D	0.42	0/2824	0.57	0/3839
1	E	0.43	0/3056	0.58	0/4153
1	F	0.42	0/3068	0.57	0/4170
1	G	0.41	0/3074	0.56	0/4177
1	H	0.45	0/3086	0.57	0/4192
All	All	0.43	0/24215	0.57	0/32898

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	2894	0	2659	24	0
1	B	2956	0	2755	26	0
1	C	3038	0	2856	25	0
1	D	2755	0	2513	26	0
1	E	2981	0	2748	25	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	2992	0	2776	24	0
1	G	2997	0	2725	19	0
1	H	3010	0	2801	27	0
2	A	52	0	0	0	0
2	B	52	0	0	0	0
2	C	52	0	0	0	0
2	D	52	0	0	0	0
2	E	52	0	0	0	0
2	F	52	0	0	0	0
2	G	52	0	0	0	0
2	H	52	0	0	0	0
3	A	12	0	13	0	0
3	D	12	0	13	1	0
3	E	12	0	13	1	0
3	F	12	0	13	2	0
3	G	12	0	13	0	0
3	H	12	0	13	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	F	1	0	0	0	0
5	A	11	0	0	0	0
5	B	32	0	0	0	0
5	C	55	0	0	0	0
5	D	17	0	0	0	0
5	E	45	0	0	0	0
5	F	46	0	0	0	0
5	G	21	0	0	0	0
5	H	46	0	0	0	0
All	All	24387	0	21911	164	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 4.

The worst 5 of 164 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:125:LYS:HZ1	1:B:160:GLN:NE2	1.61	0.98
1:D:292:THR:HB	1:D:295:TYR:HB2	1.54	0.88
1:F:133:ASP:OD2	3:F:503:MES:H72	1.78	0.82
1:A:376:SER:HB2	1:C:241:GLU:HB2	1.64	0.80
1:A:41:ILE:HD13	1:B:82:ILE:HD11	1.62	0.80

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	369/399 (92%)	359 (97%)	9 (2%)	1 (0%)	41	45
1	B	368/399 (92%)	359 (98%)	8 (2%)	1 (0%)	41	45
1	C	378/399 (95%)	367 (97%)	10 (3%)	1 (0%)	41	45
1	D	350/399 (88%)	339 (97%)	9 (3%)	2 (1%)	25	25
1	E	376/399 (94%)	368 (98%)	7 (2%)	1 (0%)	41	45
1	F	379/399 (95%)	370 (98%)	8 (2%)	1 (0%)	41	45
1	G	382/399 (96%)	371 (97%)	8 (2%)	3 (1%)	19	18
1	H	380/399 (95%)	368 (97%)	9 (2%)	3 (1%)	19	18
All	All	2982/3192 (93%)	2901 (97%)	68 (2%)	13 (0%)	34	37

5 of 13 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	322	SER
1	D	132	SER
1	G	247	CYS
1	H	343	ASN
1	A	132	SER

### 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	287/347 (83%)	274 (96%)	13 (4%)	27	33
1	B	302/347 (87%)	293 (97%)	9 (3%)	41	51
1	C	314/347 (90%)	304 (97%)	10 (3%)	39	49
1	D	264/347 (76%)	257 (97%)	7 (3%)	44	55
1	E	301/347 (87%)	291 (97%)	10 (3%)	38	47
1	F	304/347 (88%)	297 (98%)	7 (2%)	50	62
1	G	298/347 (86%)	289 (97%)	9 (3%)	41	51
1	H	307/347 (88%)	297 (97%)	10 (3%)	38	47
All	All	2377/2776 (86%)	2302 (97%)	75 (3%)	39	49

5 of 75 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	155	LEU
1	H	237	MET
1	G	237	MET
1	H	100	ARG
1	C	155	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	227	HIS
1	E	70	ASN
1	H	225	HIS
1	G	70	ASN
1	G	358	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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 25 ligands modelled in this entry, 3 are monoatomic - leaving 22 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	VFA	G	501[A]	-	29,29,29	0.12	0	40,40,40	0.73	2 (5%)
3	MES	D	502	-	12,12,12	0.73	0	15,16,16	0.38	0
2	VFA	H	501[A]	-	29,29,29	0.18	0	40,40,40	0.74	2 (5%)
2	VFA	D	501[A]	-	29,29,29	0.16	0	40,40,40	0.67	2 (5%)
3	MES	F	503	-	12,12,12	0.74	0	15,16,16	0.77	0
3	MES	E	502	-	12,12,12	0.76	0	15,16,16	0.62	0
2	VFA	B	501[A]	-	29,29,29	0.17	0	40,40,40	0.86	2 (5%)
2	VFA	A	501[B]	-	29,29,29	0.16	0	40,40,40	0.75	2 (5%)
3	MES	G	502	-	12,12,12	0.76	0	15,16,16	0.31	0
2	VFA	A	501[A]	-	29,29,29	0.13	0	40,40,40	0.80	2 (5%)
2	VFA	E	501[B]	-	29,29,29	0.12	0	40,40,40	0.82	2 (5%)
2	VFA	F	501[B]	-	29,29,29	0.10	0	40,40,40	0.69	2 (5%)
3	MES	A	502	-	12,12,12	0.74	0	15,16,16	0.36	0
2	VFA	C	501[B]	-	29,29,29	0.13	0	40,40,40	0.72	2 (5%)
2	VFA	B	501[B]	-	29,29,29	0.13	0	40,40,40	0.71	1 (2%)
2	VFA	G	501[B]	-	29,29,29	0.15	0	40,40,40	0.77	2 (5%)
3	MES	H	502	-	12,12,12	0.75	0	15,16,16	0.30	0
2	VFA	E	501[A]	-	29,29,29	0.14	0	40,40,40	0.88	2 (5%)
2	VFA	D	501[B]	-	29,29,29	0.12	0	40,40,40	0.71	2 (5%)
2	VFA	H	501[B]	-	29,29,29	0.12	0	40,40,40	0.68	1 (2%)
2	VFA	F	501[A]	-	29,29,29	0.16	0	40,40,40	0.79	2 (5%)
2	VFA	C	501[A]	-	29,29,29	0.11	0	40,40,40	0.66	2 (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	VFA	G	501[A]	-	-	0/11/20/20	0/4/4/4
3	MES	D	502	-	-	3/6/14/14	0/1/1/1
2	VFA	H	501[A]	-	-	0/11/20/20	0/4/4/4
2	VFA	D	501[A]	-	-	0/11/20/20	0/4/4/4
3	MES	F	503	-	-	1/6/14/14	0/1/1/1
3	MES	E	502	-	-	4/6/14/14	0/1/1/1
2	VFA	B	501[A]	-	-	0/11/20/20	0/4/4/4
2	VFA	A	501[B]	-	-	0/11/20/20	0/4/4/4
3	MES	G	502	-	-	3/6/14/14	0/1/1/1
2	VFA	A	501[A]	-	-	0/11/20/20	0/4/4/4
2	VFA	E	501[B]	-	-	0/11/20/20	0/4/4/4
2	VFA	F	501[B]	-	-	0/11/20/20	0/4/4/4
3	MES	A	502	-	-	0/6/14/14	0/1/1/1
2	VFA	C	501[B]	-	-	0/11/20/20	0/4/4/4
2	VFA	B	501[B]	-	-	0/11/20/20	0/4/4/4
2	VFA	G	501[B]	-	-	0/11/20/20	0/4/4/4
3	MES	H	502	-	-	5/6/14/14	0/1/1/1
2	VFA	E	501[A]	-	-	0/11/20/20	0/4/4/4
2	VFA	D	501[B]	-	-	0/11/20/20	0/4/4/4
2	VFA	H	501[B]	-	-	0/11/20/20	0/4/4/4
2	VFA	F	501[A]	-	-	0/11/20/20	0/4/4/4
2	VFA	C	501[A]	-	-	0/11/20/20	0/4/4/4

There are no bond length outliers.

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501[A]	VFA	O2-C16-C12	3.55	118.66	111.56
2	E	501[A]	VFA	O2-C16-C12	3.53	118.62	111.56
2	A	501[B]	VFA	O2-C16-C12	3.11	117.77	111.56
2	F	501[A]	VFA	O2-C16-C12	2.98	117.52	111.56
2	G	501[B]	VFA	O2-C16-C12	2.94	117.43	111.56

There are no chirality outliers.

5 of 16 torsion outliers are listed below:

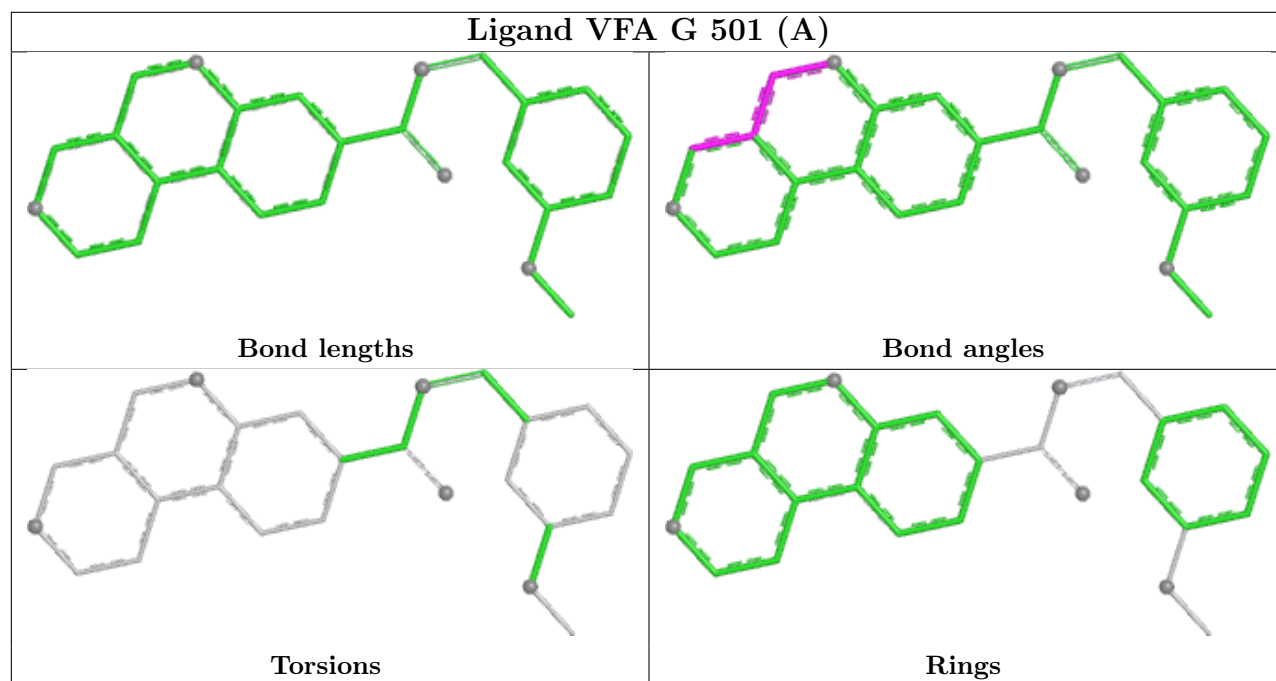
Mol	Chain	Res	Type	Atoms
3	E	502	MES	C7-C8-S-O2S
3	H	502	MES	C7-C8-S-O1S
3	H	502	MES	C7-C8-S-O2S
3	H	502	MES	C7-C8-S-O3S
3	D	502	MES	C7-C8-S-O3S

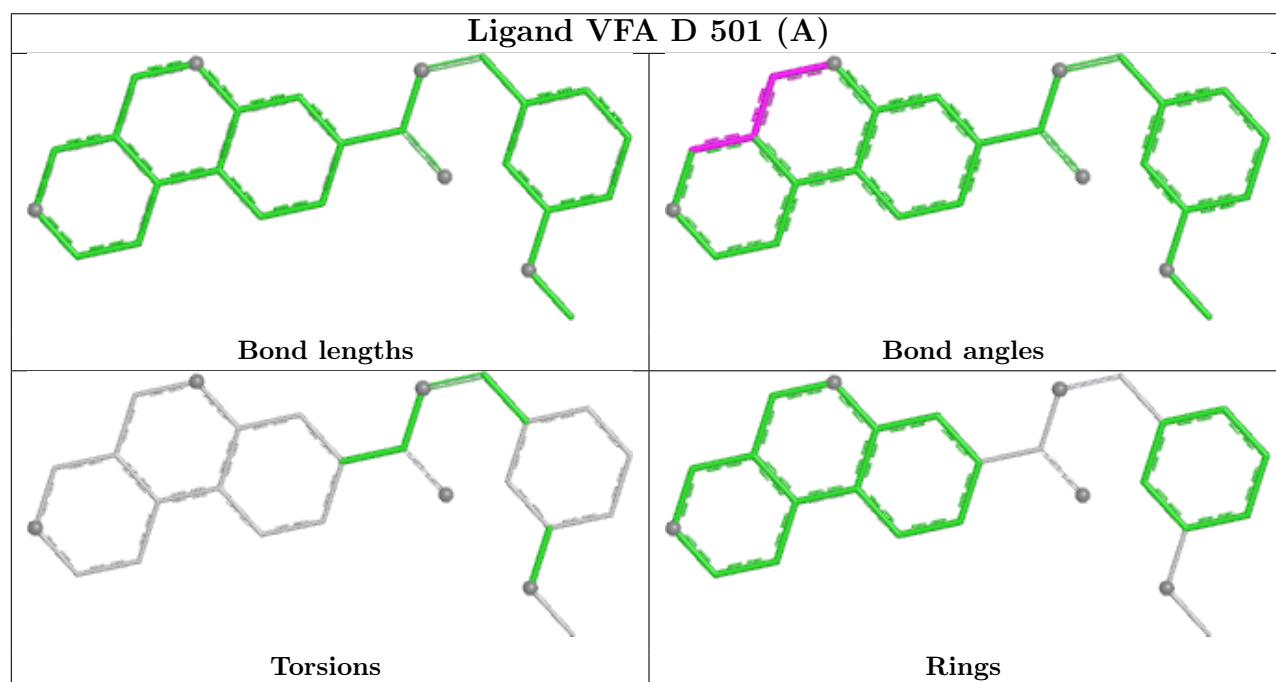
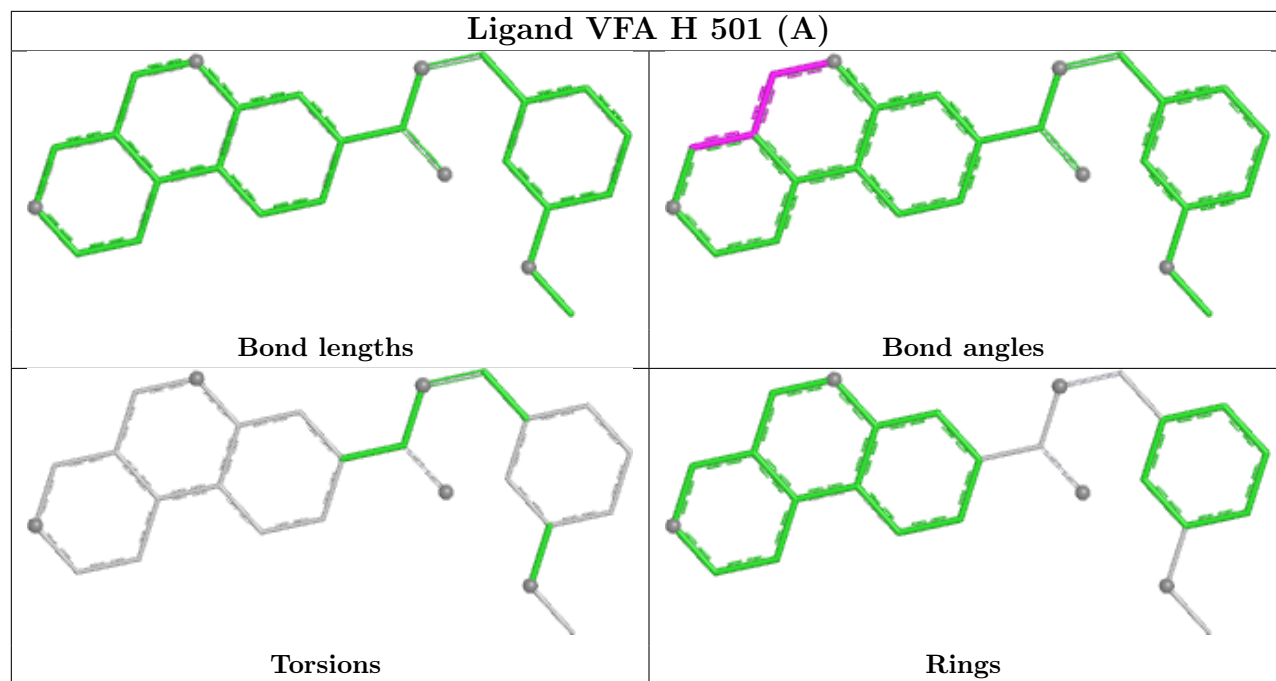
There are no ring outliers.

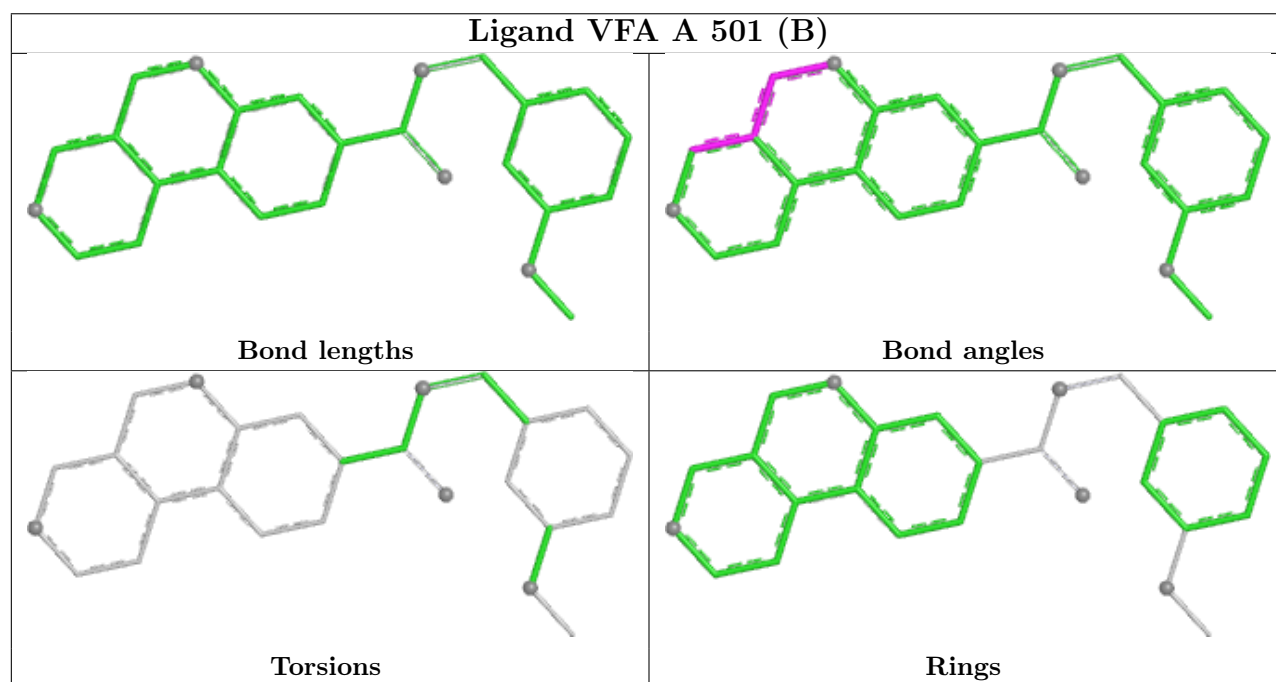
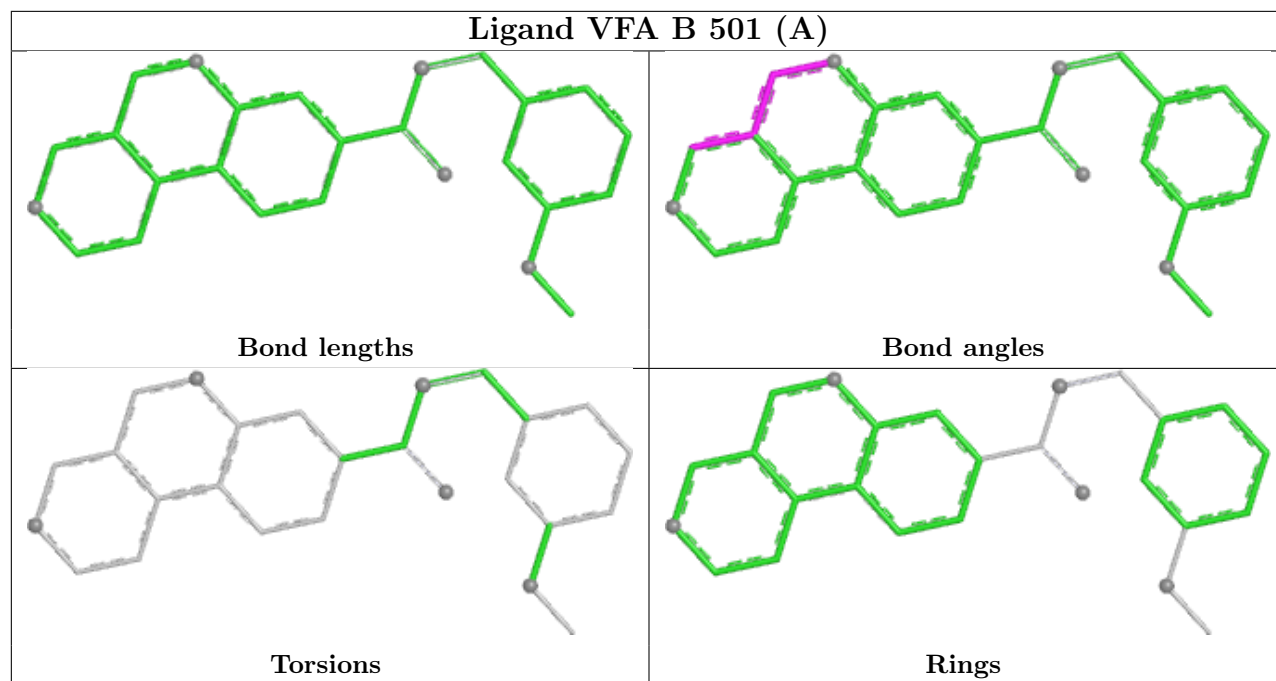
3 monomers are involved in 4 short contacts:

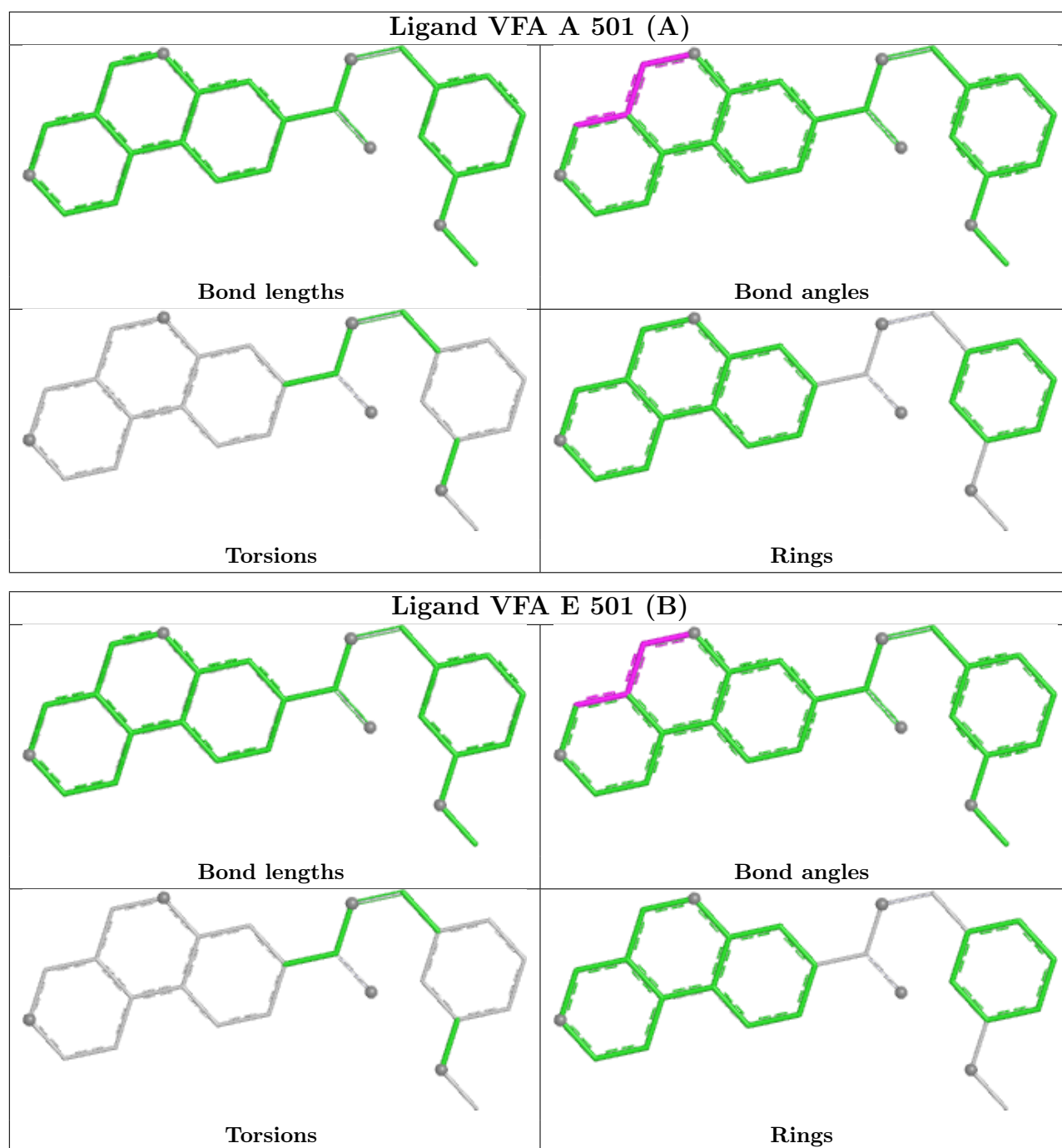
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	502	MES	1	0
3	F	503	MES	2	0
3	E	502	MES	1	0

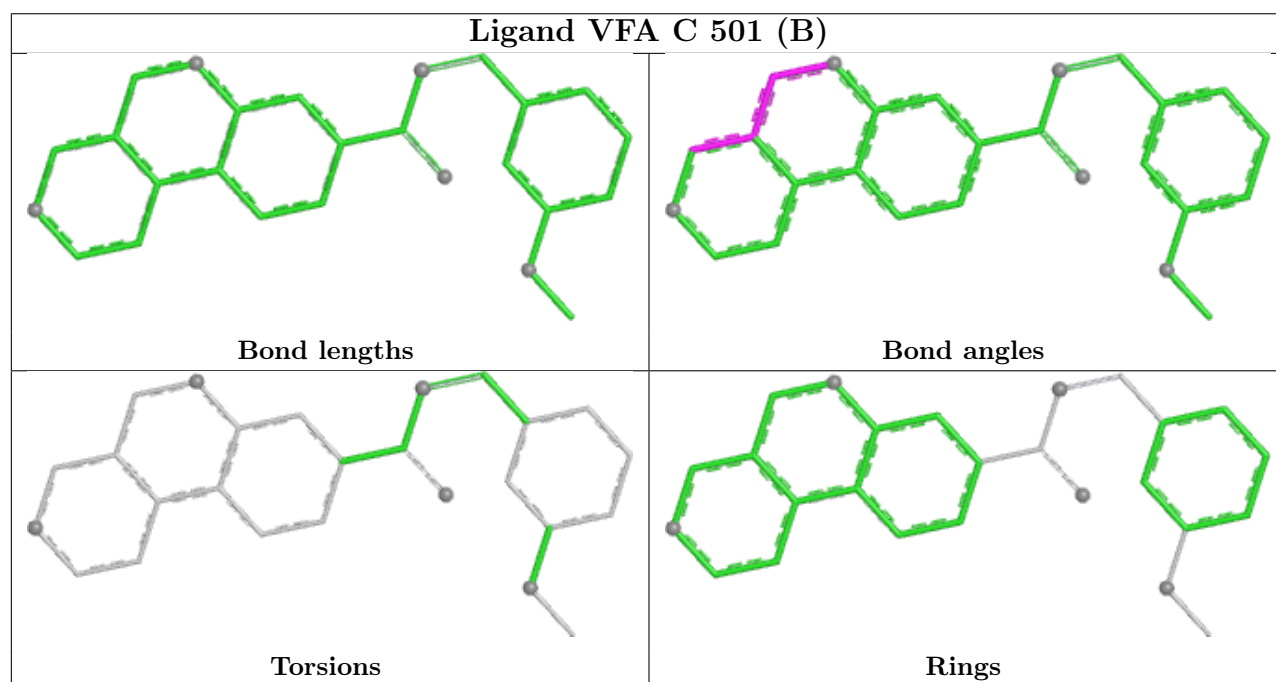
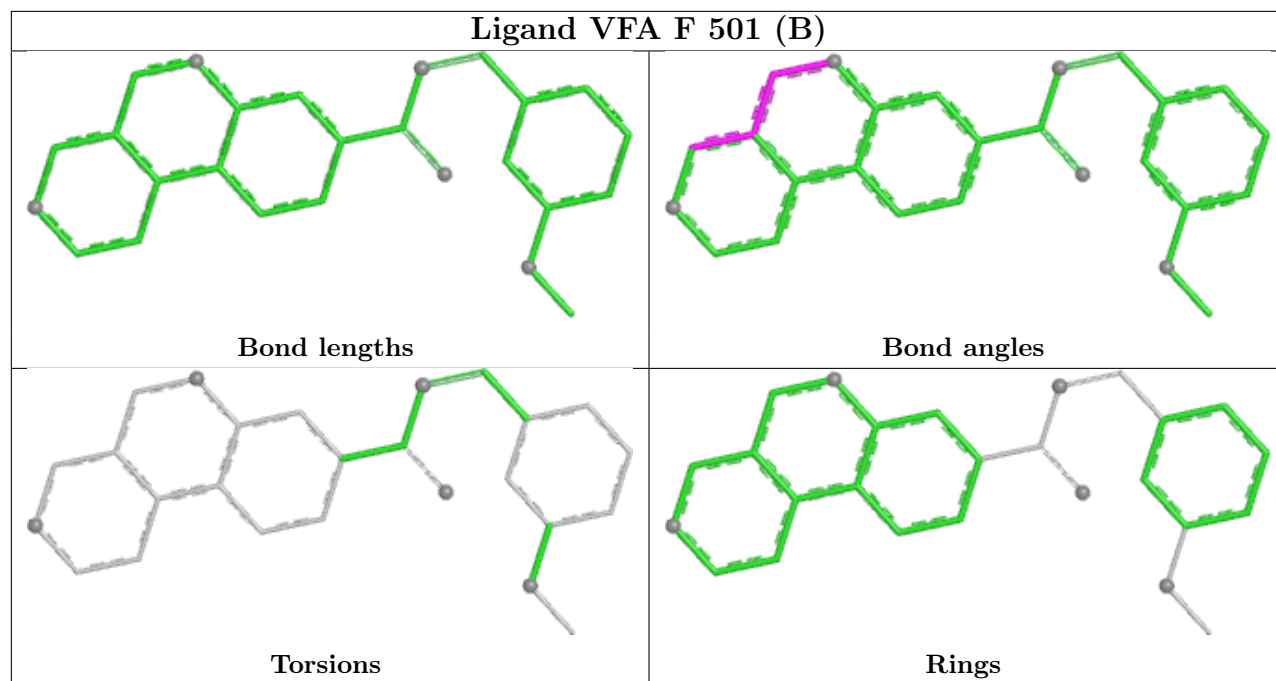
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

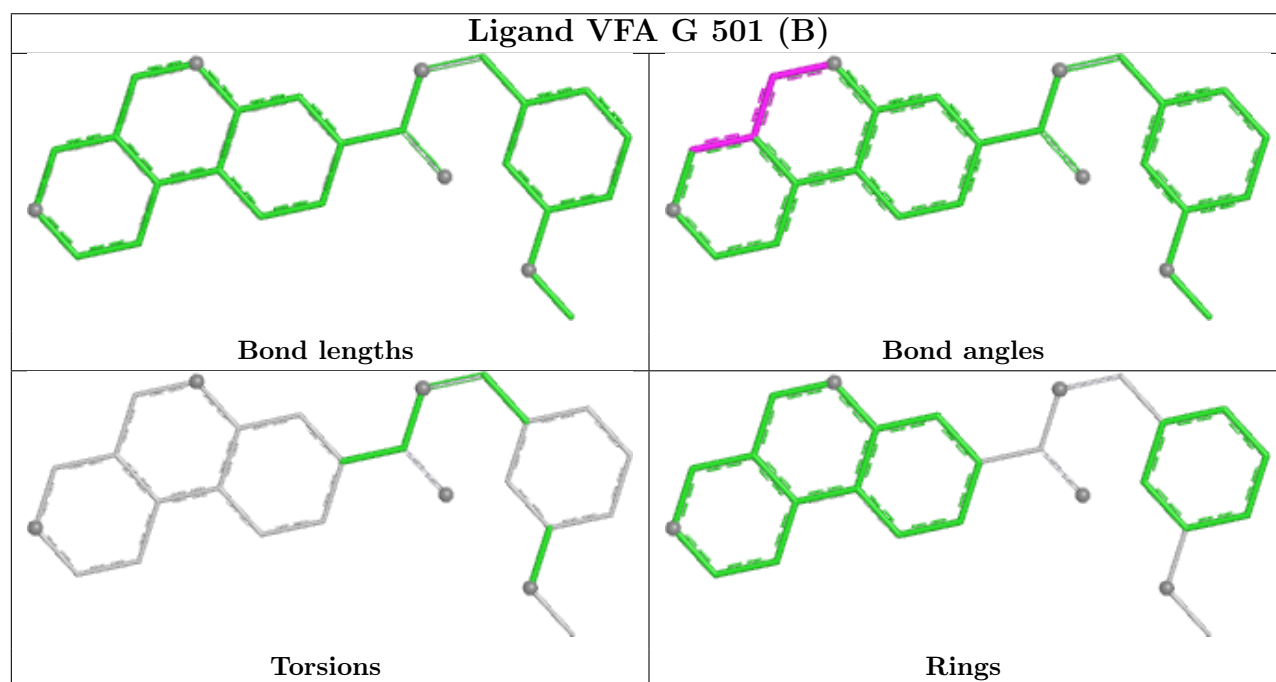
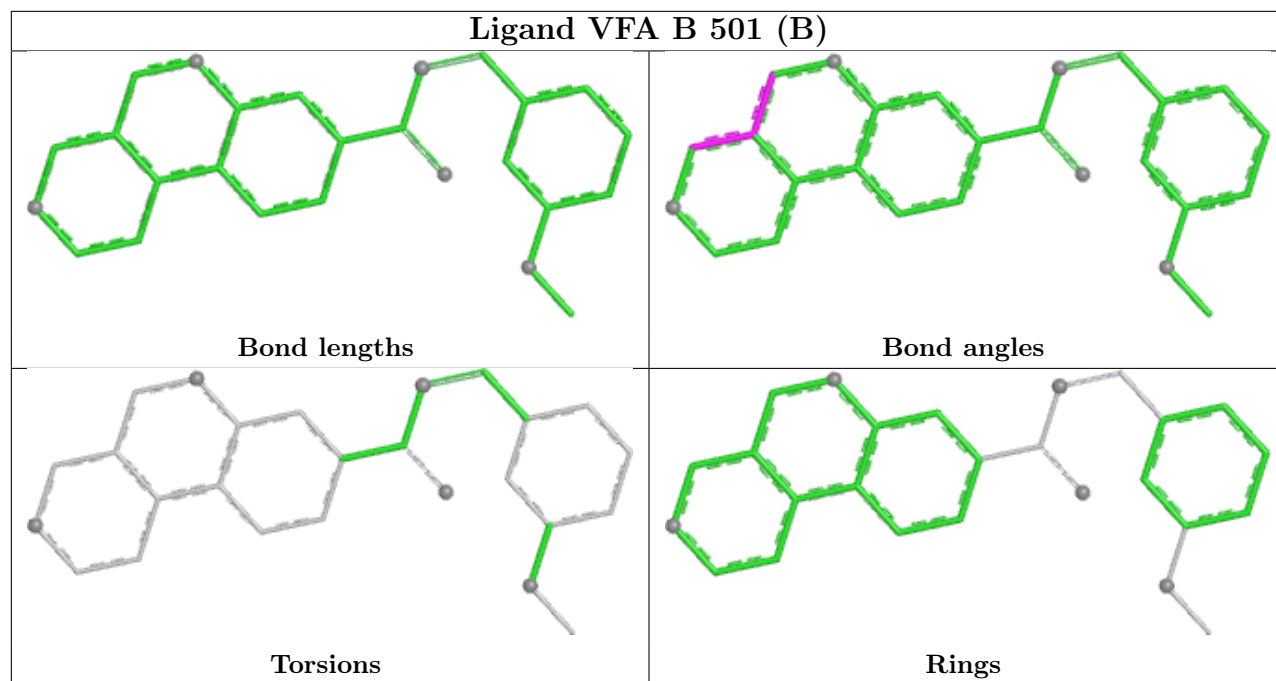


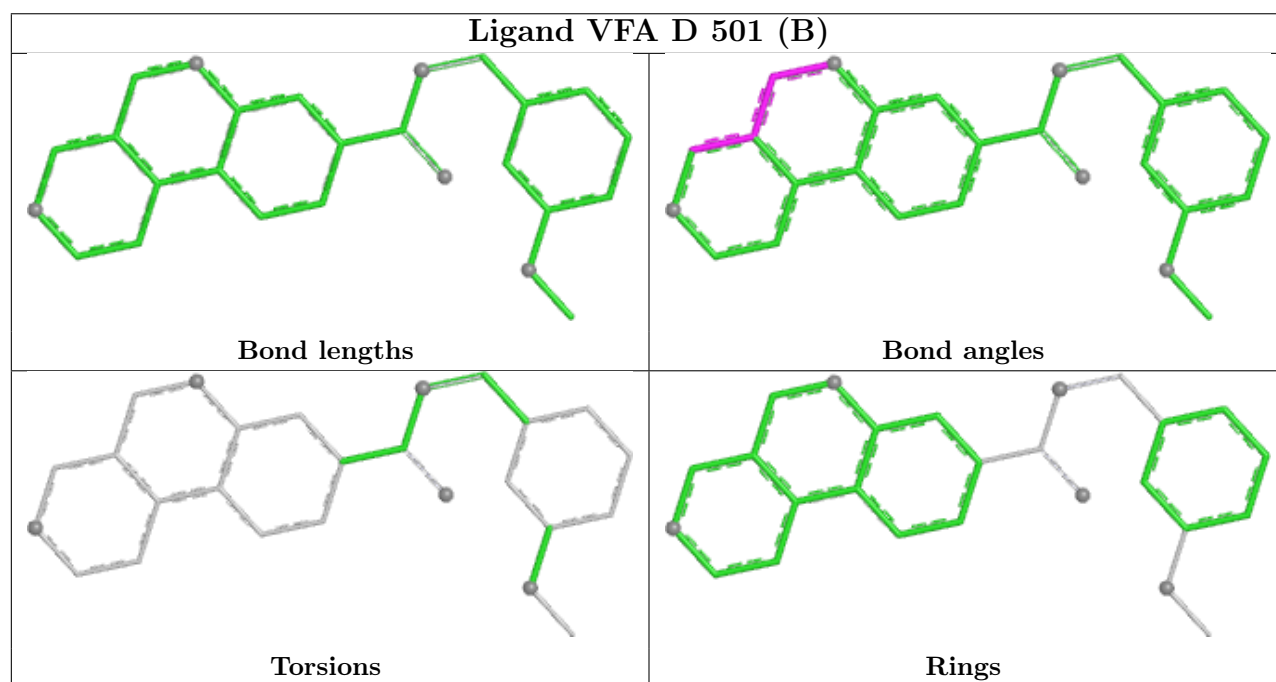
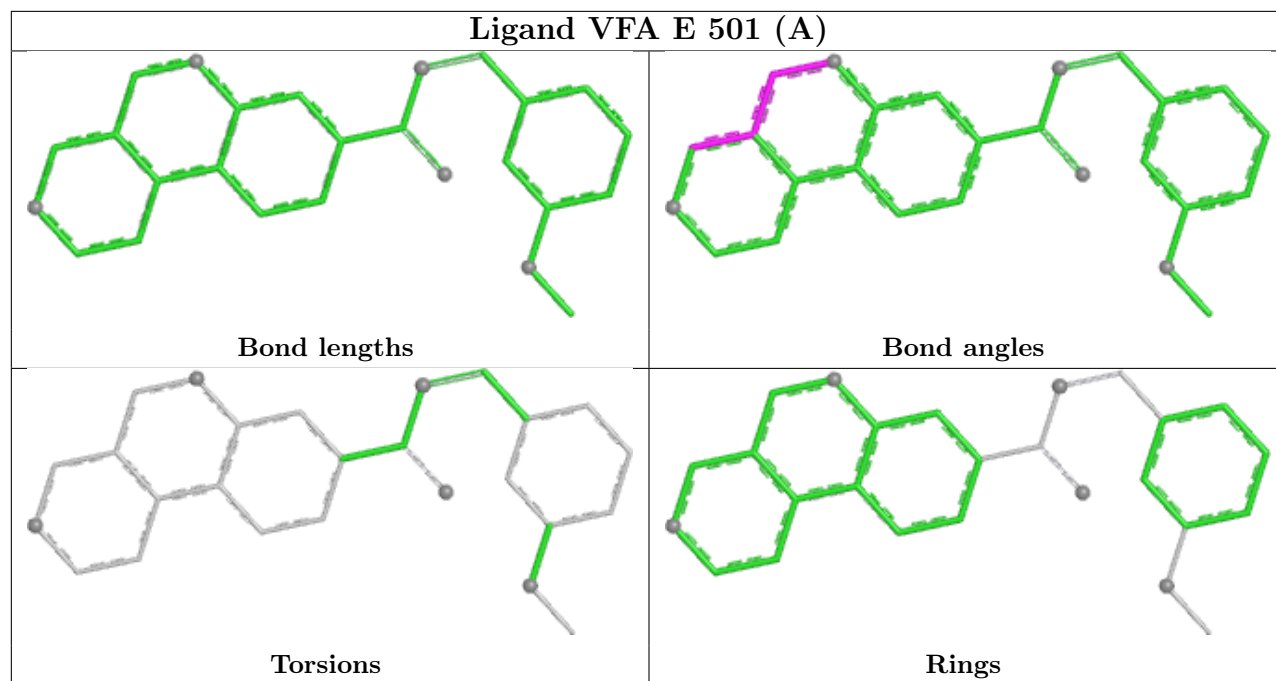




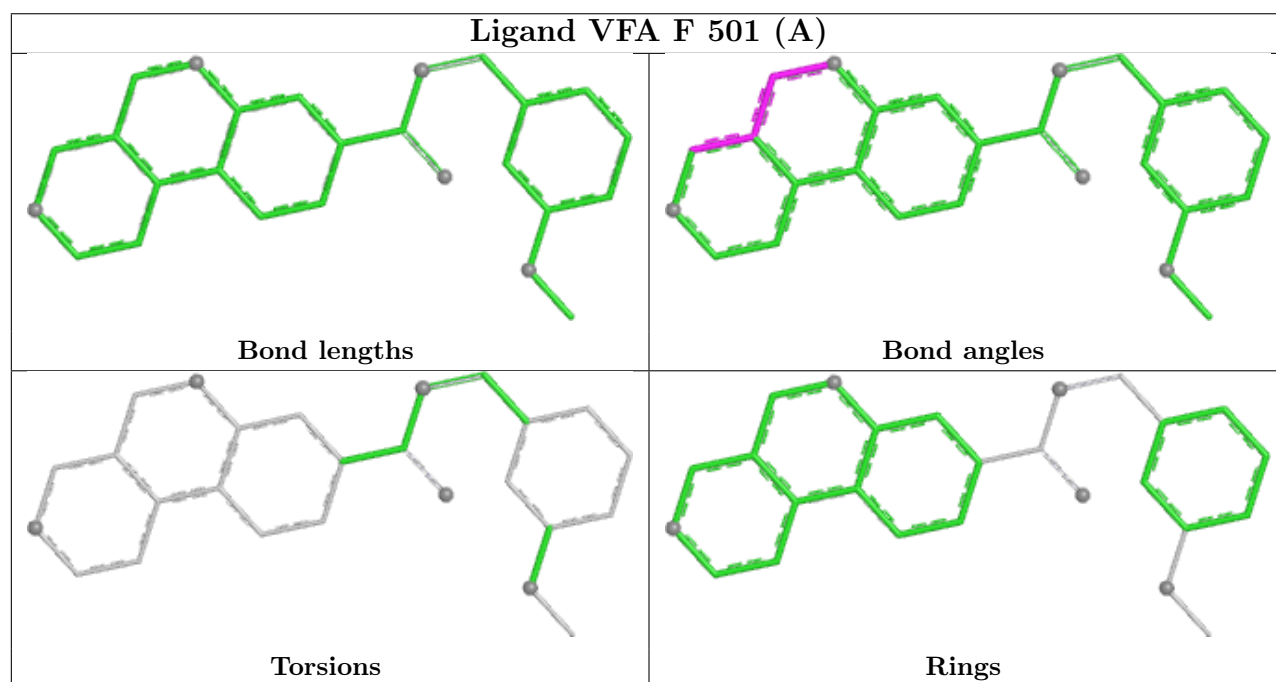
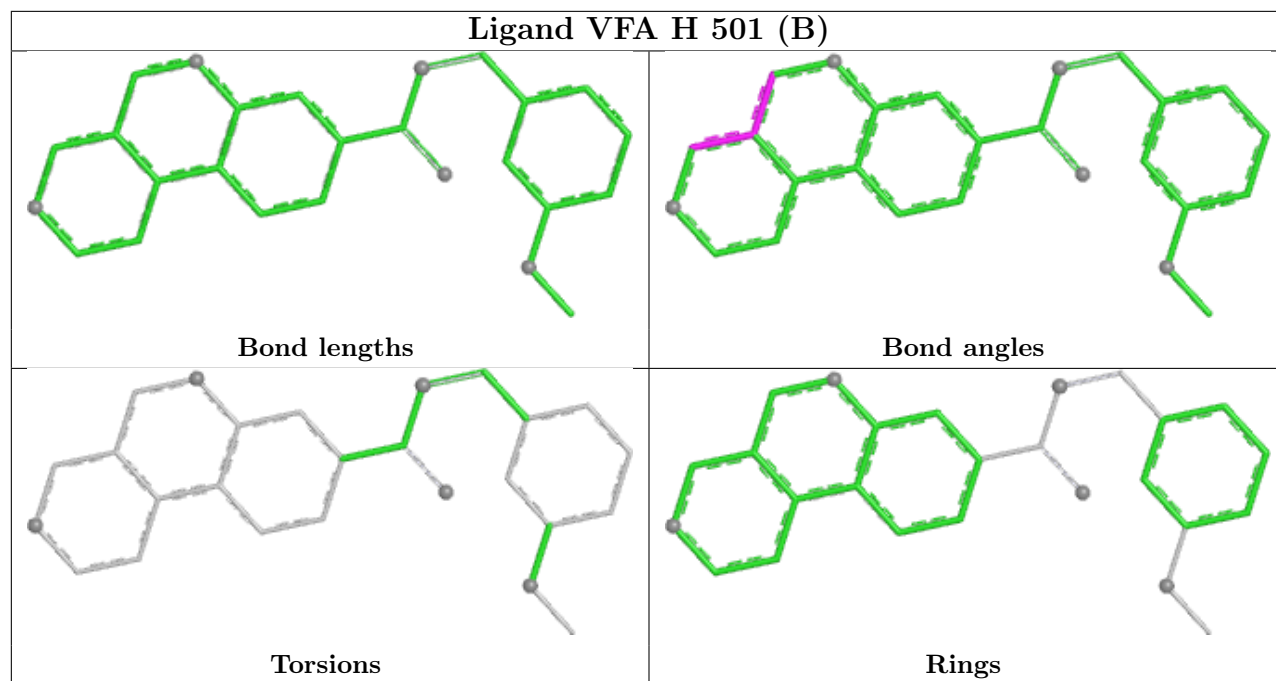


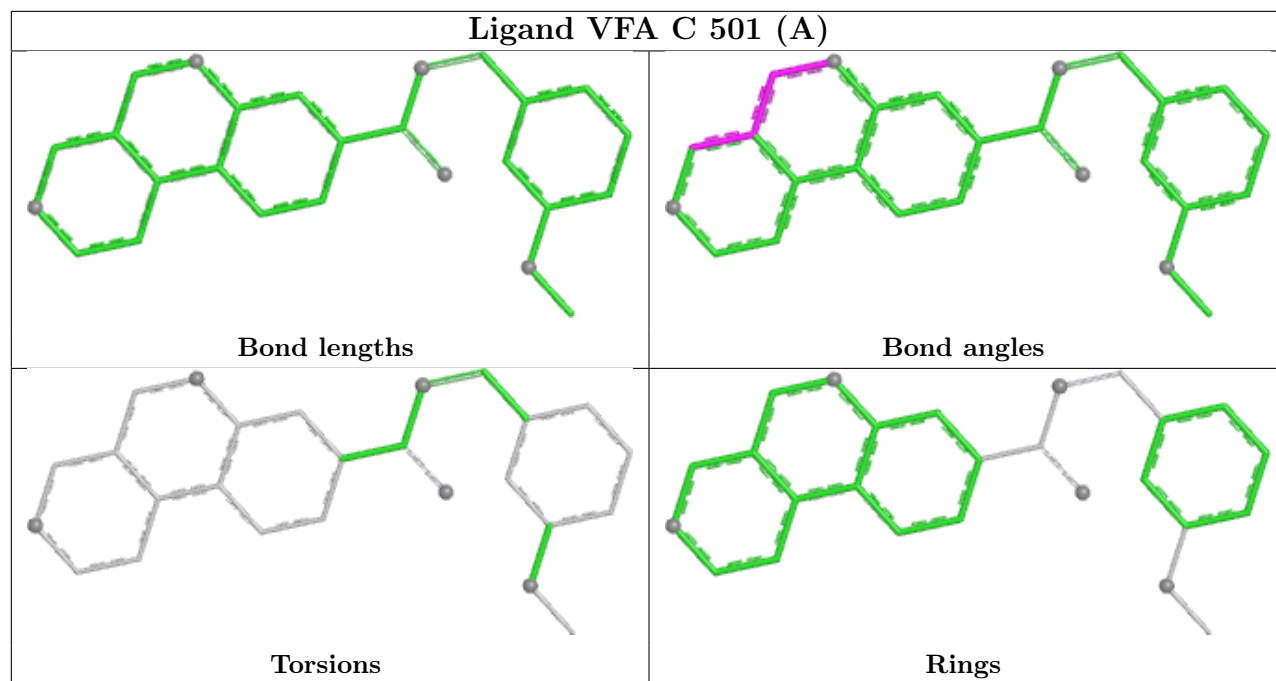












## 5.7 Other polymers [i](#)

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 [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	377/399 (94%)	0.06	8 (2%) 63 61	43, 63, 94, 102	0
1	B	376/399 (94%)	-0.12	3 (0%) 86 85	36, 55, 81, 89	0
1	C	386/399 (96%)	-0.09	3 (0%) 86 85	28, 47, 72, 93	0
1	D	360/399 (90%)	-0.05	4 (1%) 80 79	35, 59, 98, 112	0
1	E	384/399 (96%)	-0.12	2 (0%) 91 90	39, 53, 74, 96	0
1	F	385/399 (96%)	-0.21	0 100 100	34, 51, 75, 90	0
1	G	388/399 (97%)	-0.00	4 (1%) 82 81	38, 58, 84, 97	0
1	H	386/399 (96%)	-0.11	3 (0%) 86 85	35, 54, 80, 95	0
All	All	3042/3192 (95%)	-0.08	27 (0%) 84 83	28, 55, 86, 112	0

The worst 5 of 27 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	320	GLU	4.8
1	A	244	MET	3.6
1	E	394	VAL	3.2
1	G	303	TYR	3.1
1	A	302	THR	2.7

### 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 ⓘ

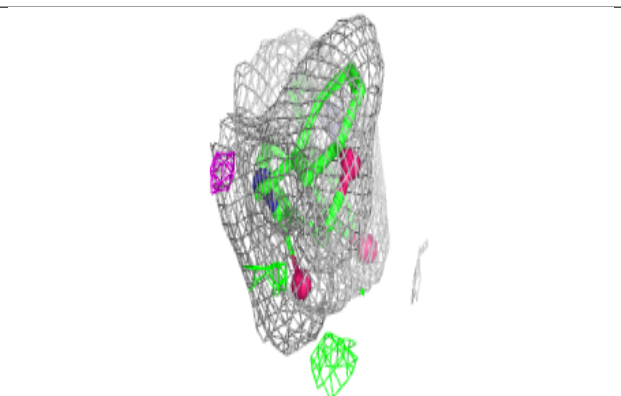
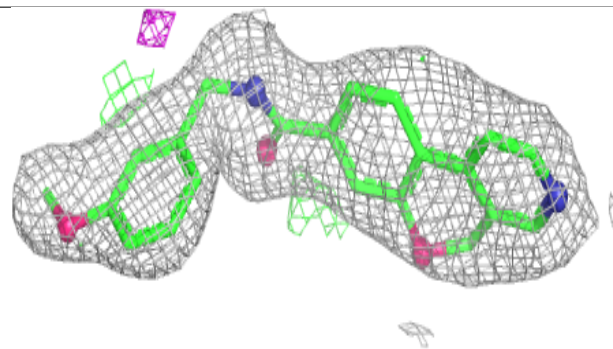
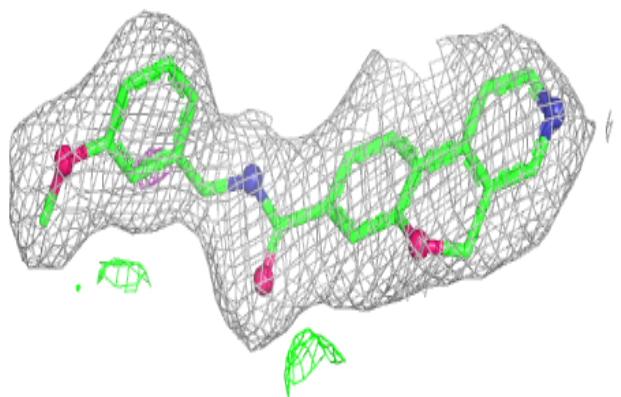
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	MES	A	502	12/12	0.91	0.16	87,88,89,89	0
3	MES	E	502	12/12	0.91	0.24	98,98,99,99	0
4	CL	B	502	1/1	0.91	0.13	74,74,74,74	0
3	MES	G	502	12/12	0.93	0.15	86,87,90,90	0
2	VFA	H	501[B]	26/26	0.95	0.13	70,71,72,72	26
2	VFA	H	501[A]	26/26	0.95	0.13	26,27,28,28	26
3	MES	H	502	12/12	0.95	0.12	65,66,70,70	0
3	MES	D	502	12/12	0.95	0.14	83,83,84,84	0
4	CL	C	502	1/1	0.95	0.14	70,70,70,70	0
3	MES	F	503	12/12	0.96	0.16	66,67,68,68	0
2	VFA	B	501[B]	26/26	0.96	0.13	49,51,51,51	26
2	VFA	D	501[A]	26/26	0.96	0.15	29,33,35,35	26
2	VFA	D	501[B]	26/26	0.96	0.15	54,56,56,56	26
2	VFA	B	501[A]	26/26	0.96	0.13	39,40,41,41	26
2	VFA	E	501[A]	26/26	0.97	0.14	33,35,36,36	26
2	VFA	E	501[B]	26/26	0.97	0.14	38,39,39,39	26
2	VFA	C	501[A]	26/26	0.97	0.15	35,39,39,40	26
2	VFA	C	501[B]	26/26	0.97	0.15	35,39,40,40	26
2	VFA	A	501[A]	26/26	0.97	0.15	54,54,55,55	26
2	VFA	A	501[B]	26/26	0.97	0.15	34,34,36,37	26
2	VFA	G	501[A]	26/26	0.98	0.13	40,41,42,42	26
2	VFA	G	501[B]	26/26	0.98	0.13	38,39,40,40	26
2	VFA	F	501[A]	26/26	0.98	0.13	22,23,24,24	26
2	VFA	F	501[B]	26/26	0.98	0.13	73,74,74,74	26
4	CL	F	502	1/1	0.98	0.15	75,75,75,75	0

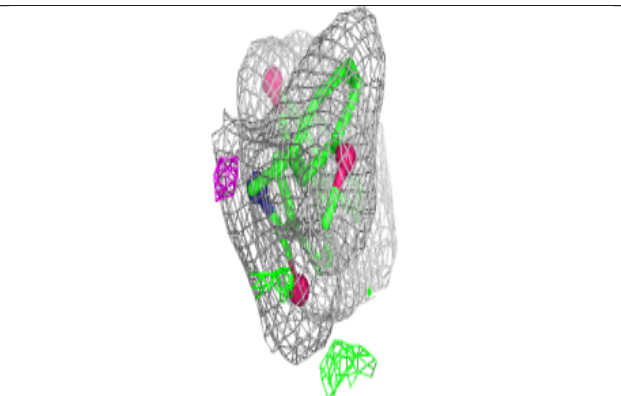
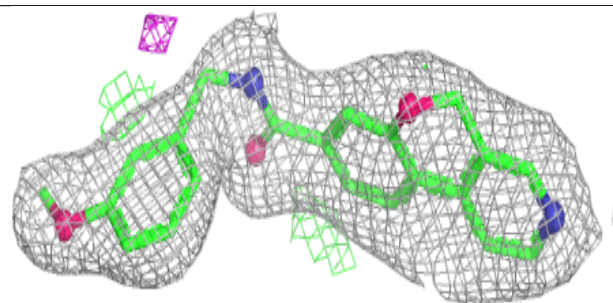
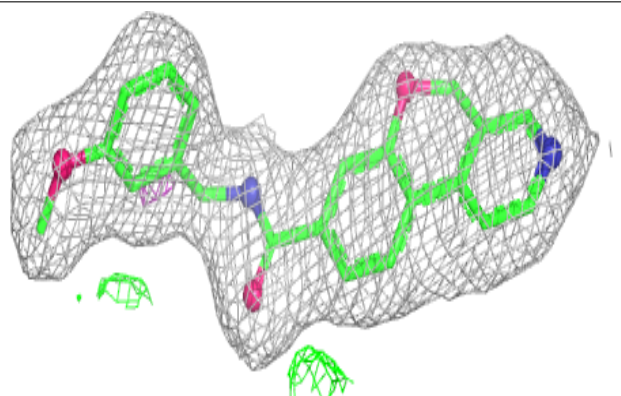
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around VFA H 501 (B):**

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

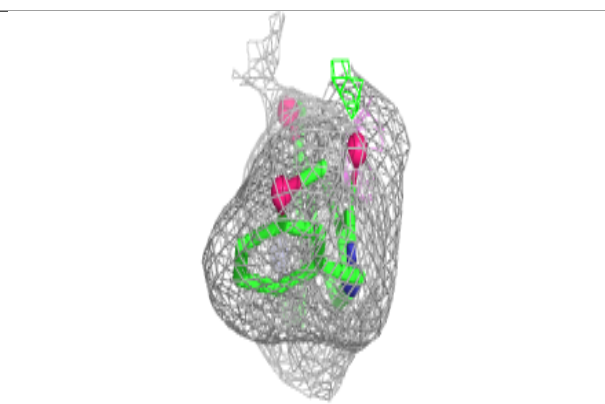
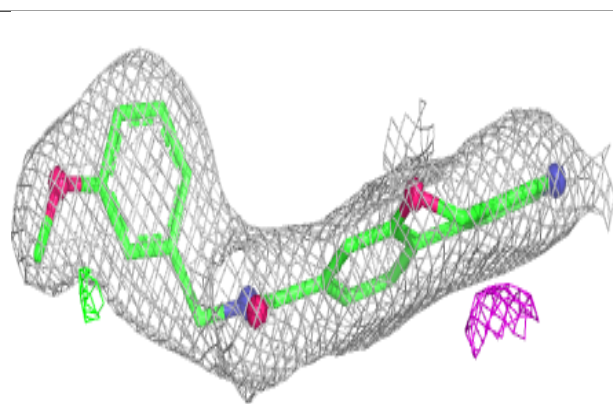
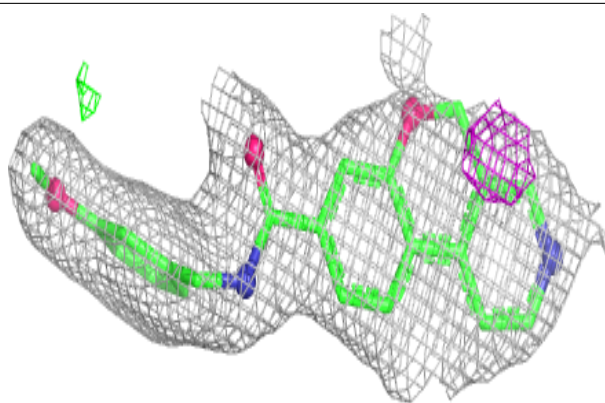
**Electron density around VFA H 501 (A):**

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

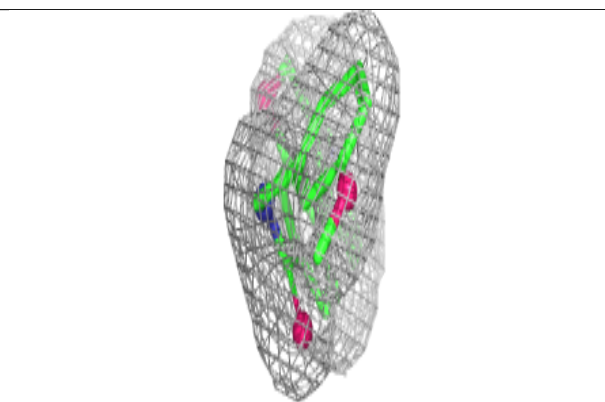
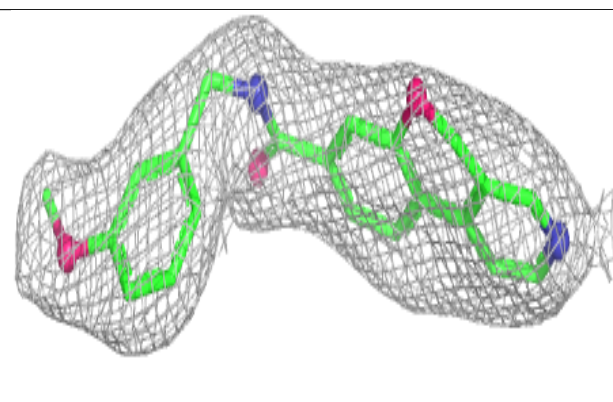
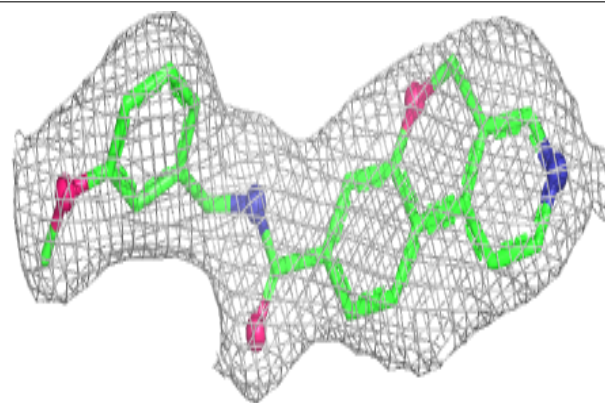


**Electron density around VFA B 501 (B):**

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

**Electron density around VFA D 501 (A):**

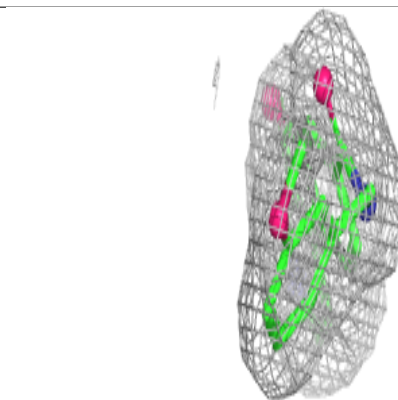
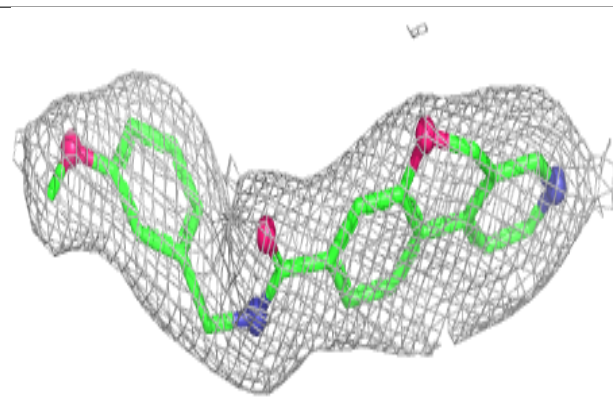
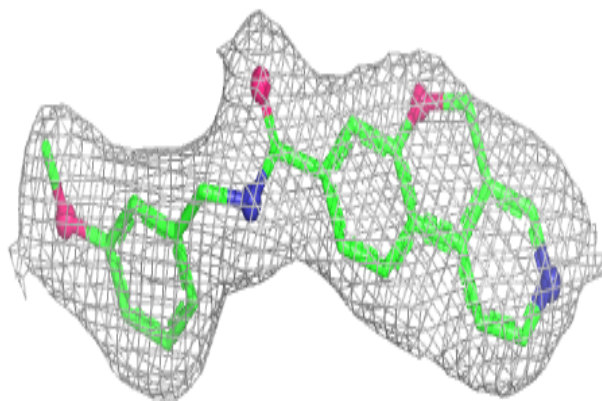
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



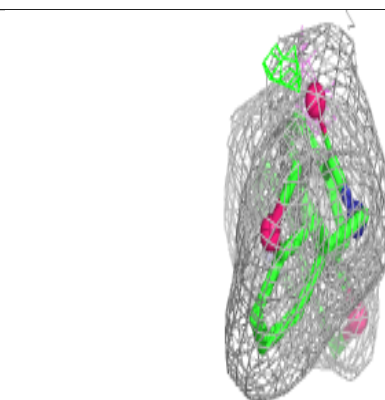
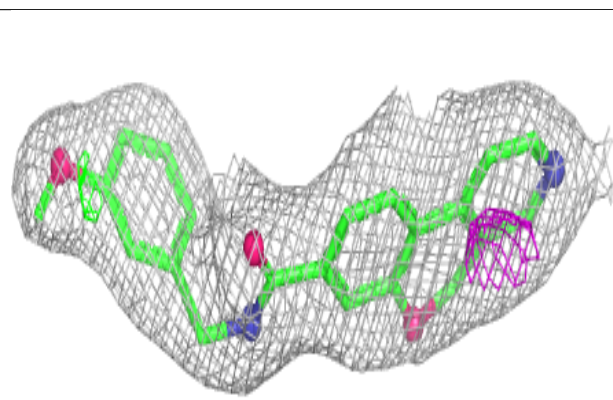
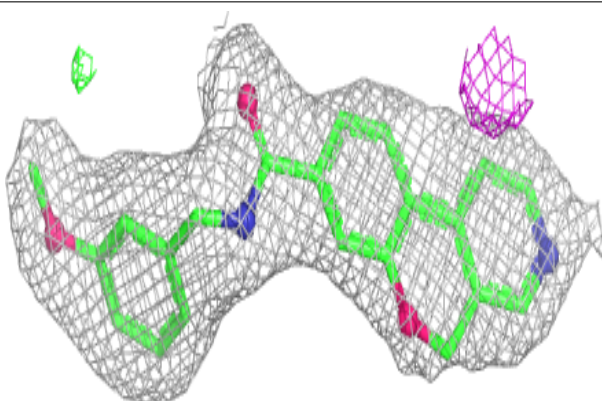


**Electron density around VFA D 501 (B):**

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

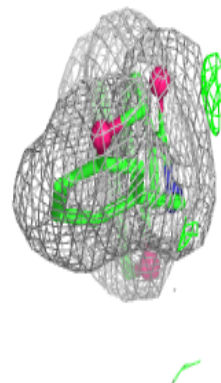
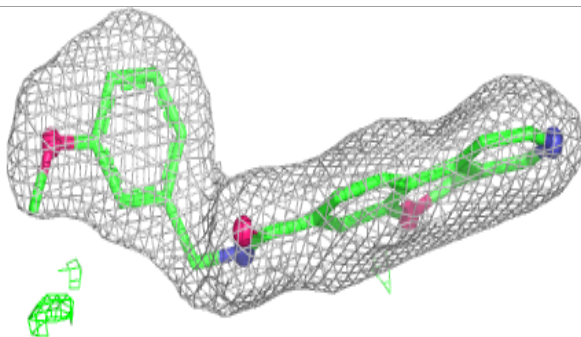
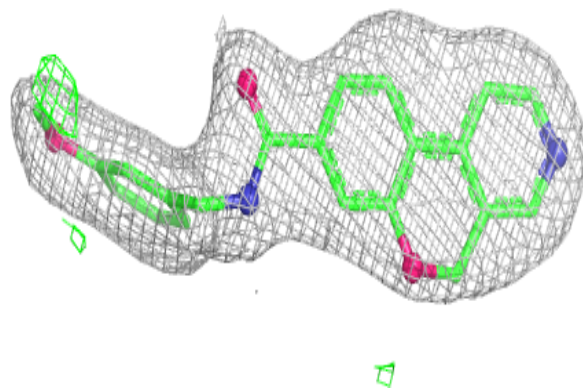
**Electron density around VFA B 501 (A):**

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

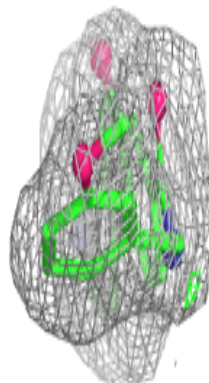
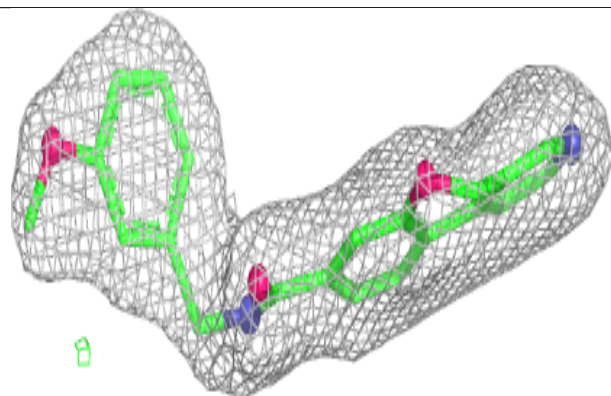
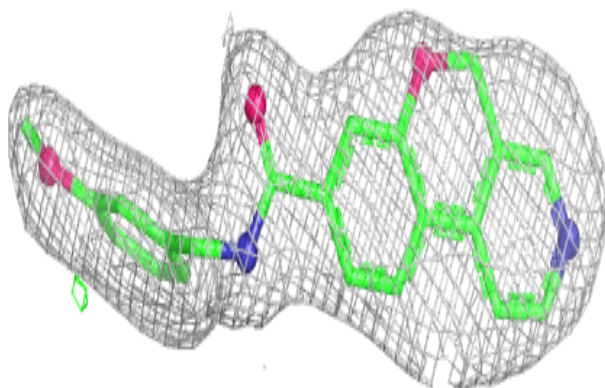


**Electron density around VFA E 501 (A):**

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

**Electron density around VFA E 501 (B):**

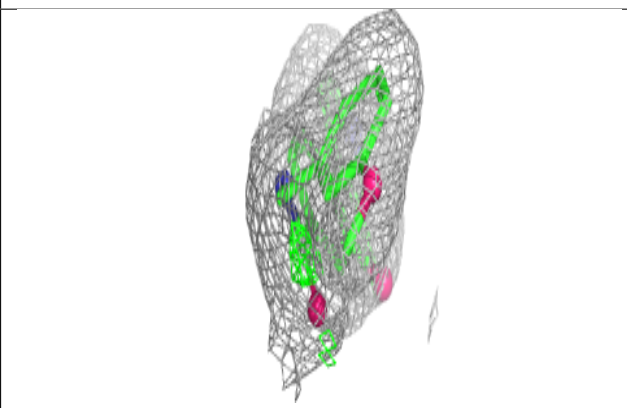
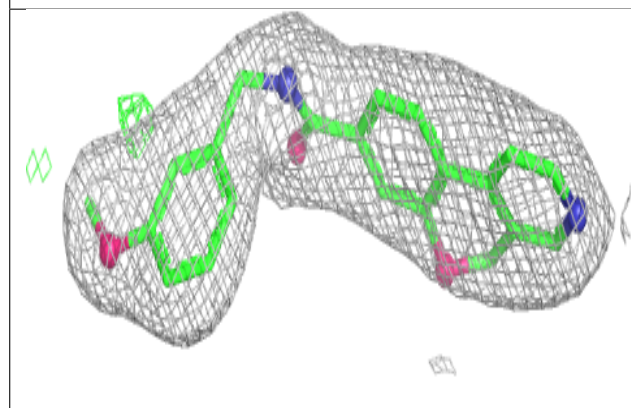
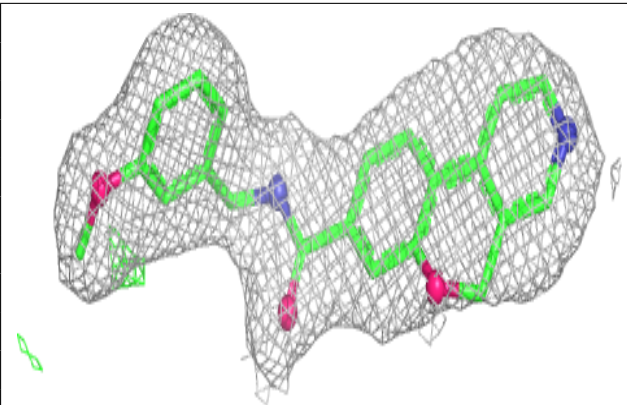
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



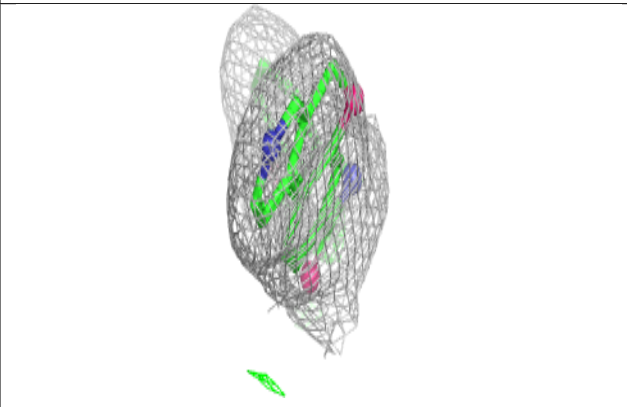
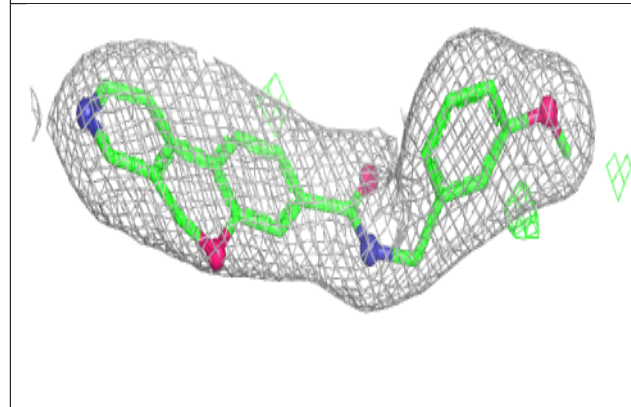
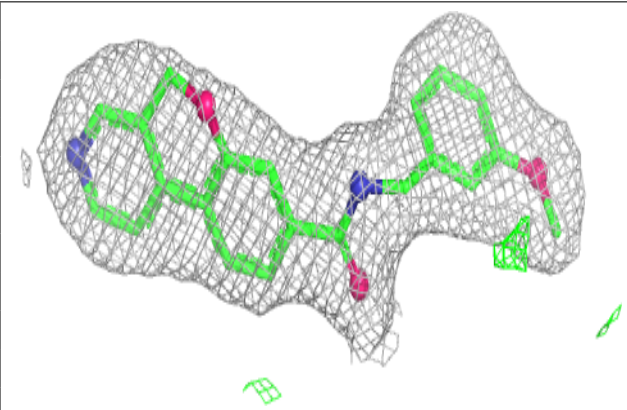


**Electron density around VFA C 501 (A):**

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

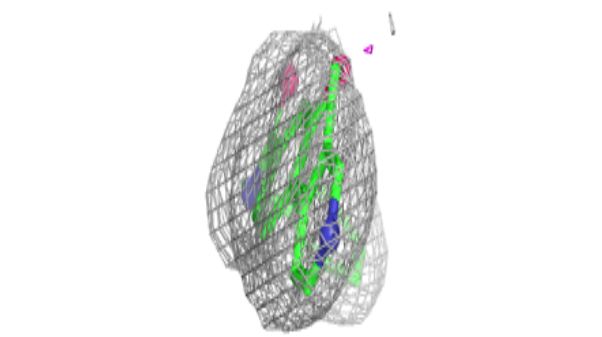
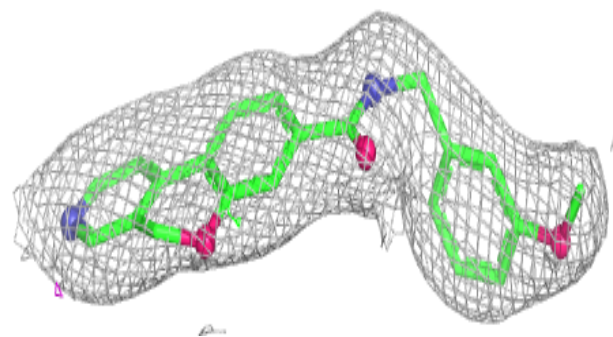
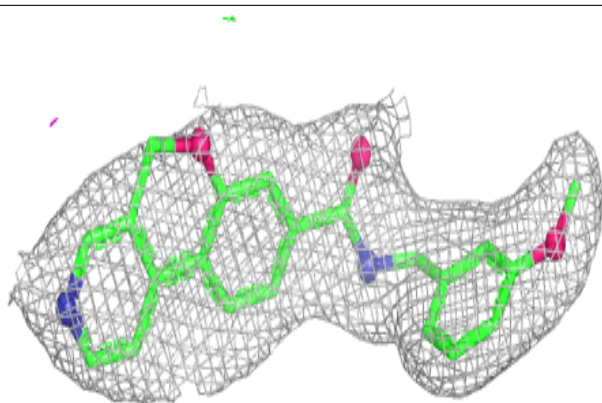
**Electron density around VFA C 501 (B):**

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

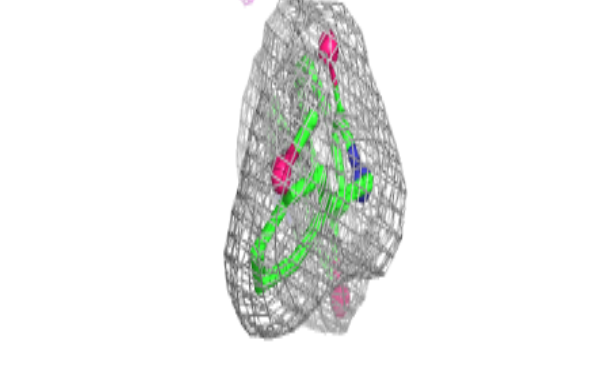
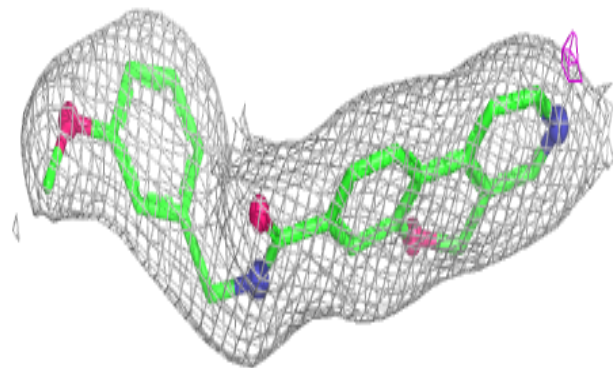
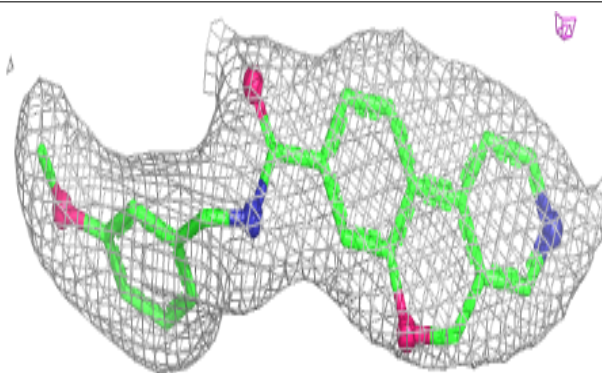


**Electron density around VFA A 501 (A):**

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

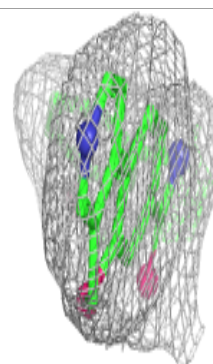
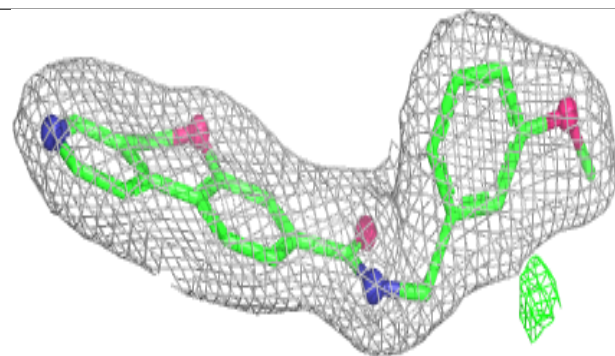
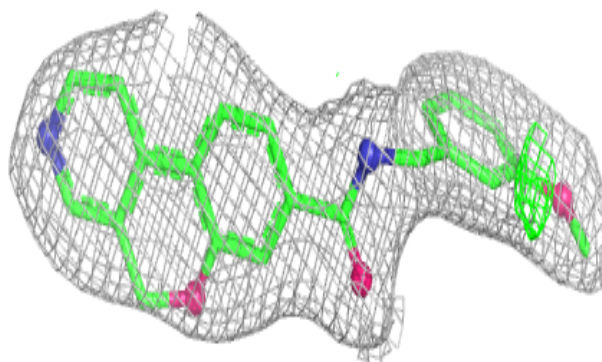
**Electron density around VFA A 501 (B):**

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

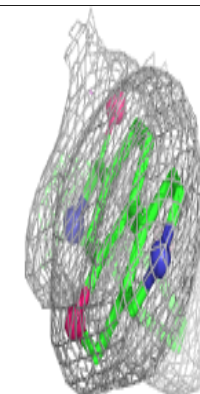
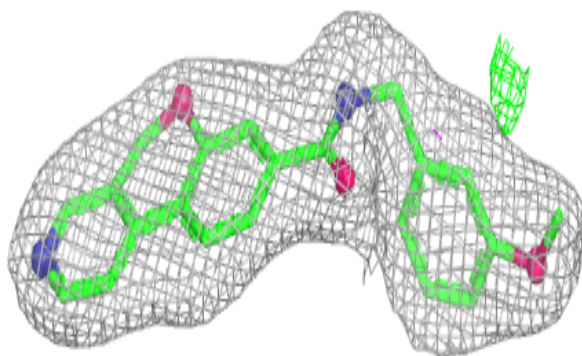
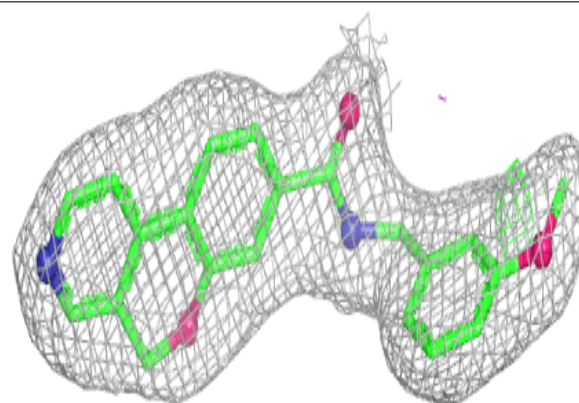


**Electron density around VFA G 501 (A):**

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

**Electron density around VFA G 501 (B):**

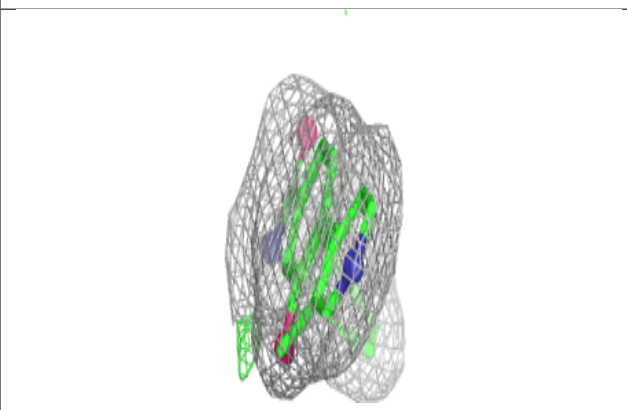
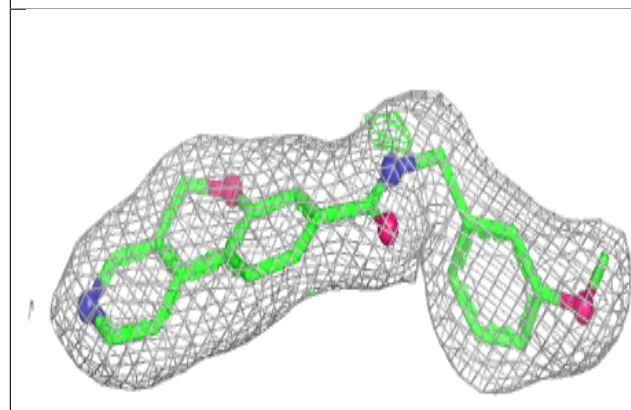
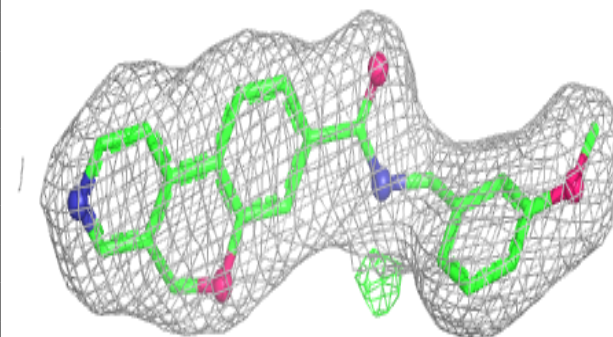
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



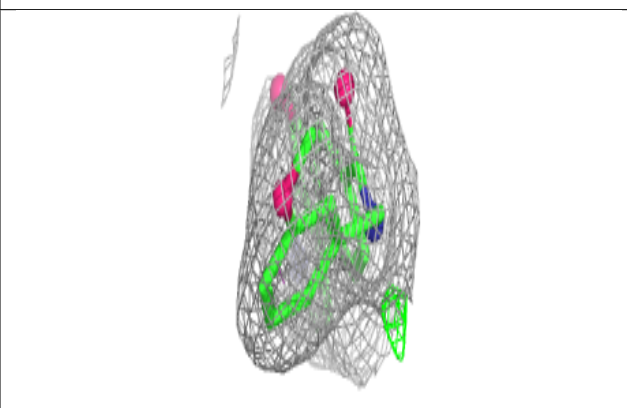
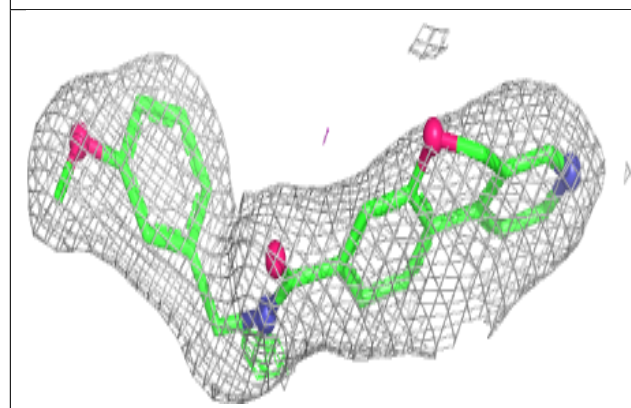
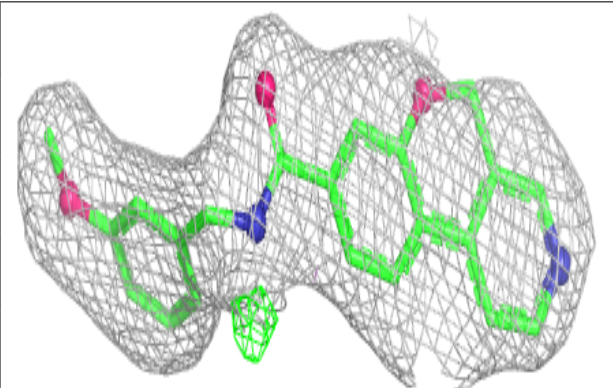


**Electron density around VFA F 501 (A):**

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

**Electron density around VFA F 501 (B):**

$2mF_o-DF_c$  (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.