



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 30, 2023 – 03:07 PM JST

PDB ID : 5B3S  
Title : Bovine heart cytochrome c oxidase in the carbon monoxide-bound mixed-valence state at 1.68 angstrom resolution (50 K)  
Authors : Shimada, A.; Shinzawa-Ito, K.; Yoshikawa, S.; Tsukihara, T.  
Deposited on : 2016-03-11  
Resolution : 1.68 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 : 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

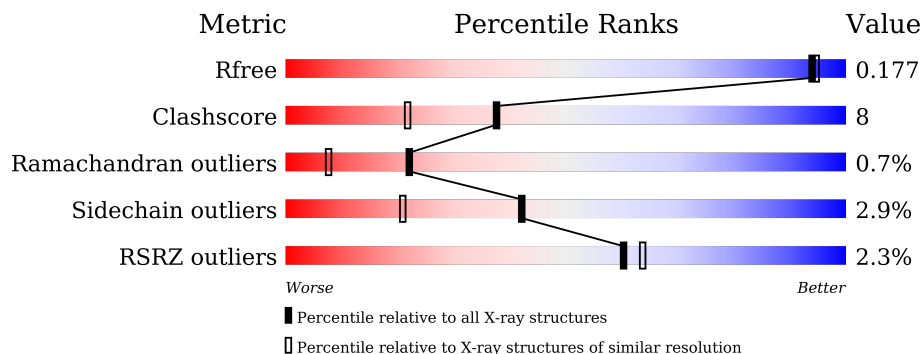
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.68 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	6780 (1.70-1.66)
Clashscore	141614	7310 (1.70-1.66)
Ramachandran outliers	138981	7173 (1.70-1.66)
Sidechain outliers	138945	7172 (1.70-1.66)
RSRZ outliers	127900	6661 (1.70-1.66)

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	514	89% (green), 10% (yellow), 1% (orange), 0% (red)
1	N	514	87% (green), 13% (yellow), 0% (orange), 0% (red)
2	B	227	82% (green), 16% (yellow), 1% (orange), 1% (red)
2	O	227	81% (green), 18% (yellow), 1% (orange), 1% (red)
3	C	259	92% (green), 8% (yellow), 0% (orange), 0% (red)
3	P	259	86% (green), 14% (yellow), 0% (orange), 0% (red)

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Mol	Chain	Length	Quality of chain
4	D	144	
4	Q	144	
5	E	105	
5	R	105	
6	F	94	
6	S	94	
7	G	84	
7	T	84	
8	H	79	
8	U	79	
9	I	73	
9	V	73	
10	J	58	
10	W	58	
11	K	49	
11	X	49	
12	L	46	
12	Y	46	
13	M	43	
13	Z	43	

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
20	EDO	A	622	-	-	X	X
20	EDO	M	103	-	-	X	-
20	EDO	N	618	-	-	X	-

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<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
20	EDO	U	101	-	-	X	-
27	DMU	K	104	-	-	-	X
27	DMU	K	105	-	-	-	X
27	DMU	K	106	-	-	-	X
9	SAC	V	1	-	-	-	X

## 2 Entry composition [i](#)

There are 30 unique types of molecules in this entry. The entry contains 34917 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 Cytochrome c oxidase subunit 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	514	Total	C	N	O	S	0	39	0
			4192	2793	644	712	43			
1	N	514	Total	C	N	O	S	0	36	0
			4182	2787	641	712	42			

- Molecule 2 is a protein called Cytochrome c oxidase subunit 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	227	Total	C	N	O	S	0	12	0
			1858	1207	283	348	20			
2	O	227	Total	C	N	O	S	0	11	0
			1856	1205	286	346	19			

- Molecule 3 is a protein called Cytochrome c oxidase subunit 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	259	Total	C	N	O	S	0	7	0
			2124	1419	337	355	13			
3	P	259	Total	C	N	O	S	0	8	0
			2126	1420	337	355	14			

- Molecule 4 is a protein called Cytochrome c oxidase subunit 4 isoform 1, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	144	Total	C	N	O	S	0	2	0
			1207	786	199	218	4			
4	Q	144	Total	C	N	O	S	0	1	0
			1201	780	199	218	4			

- Molecule 5 is a protein called Cytochrome c oxidase subunit 5A, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	105	Total	C	N	O	S	0	0	0
			852	544	144	162	2			
5	R	105	Total	C	N	O	S	0	0	0
			852	544	144	162	2			

- Molecule 6 is a protein called Cytochrome c oxidase subunit 5B, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	94	Total	C	N	O	S	0	2	0
			721	446	128	142	5			
6	S	94	Total	C	N	O	S	0	0	0
			716	444	127	140	5			

- Molecule 7 is a protein called Cytochrome c oxidase subunit 6A2, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
7	G	84	Total	C	N	O	P	S	0	0	0
			676	431	129	114	1	1			
7	T	84	Total	C	N	O	P	S	0	0	0
			676	431	129	114	1	1			

- Molecule 8 is a protein called Cytochrome c oxidase subunit 6B1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	79	Total	C	N	O	S	0	0	0
			662	417	121	119	5			
8	U	79	Total	C	N	O	S	0	0	0
			662	417	121	119	5			

- Molecule 9 is a protein called Cytochrome c oxidase subunit 6C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	I	73	Total	C	N	O	S	0	0	0
			601	390	107	100	4			
9	V	73	Total	C	N	O	S	0	0	0
			601	390	107	100	4			

- Molecule 10 is a protein called Cytochrome c oxidase subunit 7A1, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	J	58	Total	C	N	O	S	0	0	0
			461	297	78	83	3			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	W	58	Total	C	N	O	S	0	0	0
			461	297	78	83	3			

- Molecule 11 is a protein called Cytochrome c oxidase subunit 7B, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	K	49	Total	C	N	O	S	0	0	0
			385	250	65	68	2			
11	X	49	Total	C	N	O	S	0	0	0
			385	250	65	68	2			

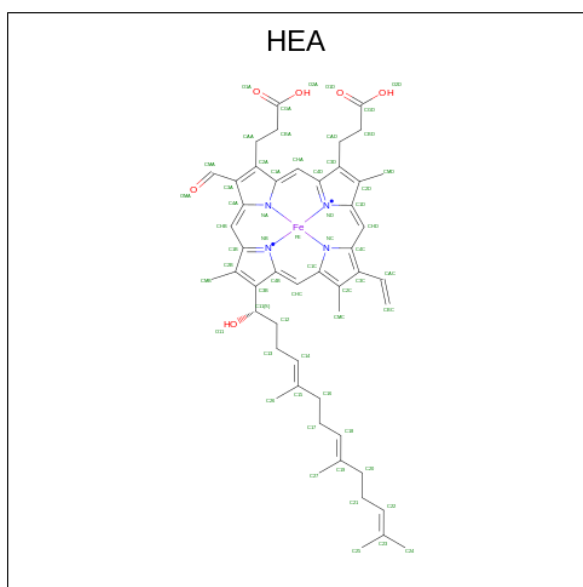
- Molecule 12 is a protein called Cytochrome c oxidase subunit 7C, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
12	L	46	Total	C	N	O	S	0	1	0
			382	255	64	60	3			
12	Y	46	Total	C	N	O	S	0	1	0
			382	255	64	60	3			

- Molecule 13 is a protein called Cytochrome c oxidase subunit 8B, mitochondrial.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
13	M	43	Total	C	N	O	0	0	0
			335	223	53	59			
13	Z	43	Total	C	N	O	0	0	0
			336	223	53	60			

- Molecule 14 is HEME-A (three-letter code: HEA) (formula: C<sub>49</sub>H<sub>56</sub>FeN<sub>4</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
14	A	1	Total	C	Fe	N	O	0	1
			79	67	1	4	7		
14	A	1	Total	C	Fe	N	O	0	0
			60	49	1	4	6		
14	N	1	Total	C	Fe	N	O	0	1
			79	67	1	4	7		
14	N	1	Total	C	Fe	N	O	0	0
			60	49	1	4	6		

- Molecule 15 is COPPER (II) ION (three-letter code: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
15	A	1	Total	Cu	0	0
			1	1		
15	N	1	Total	Cu	0	0
			1	1		

- Molecule 16 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

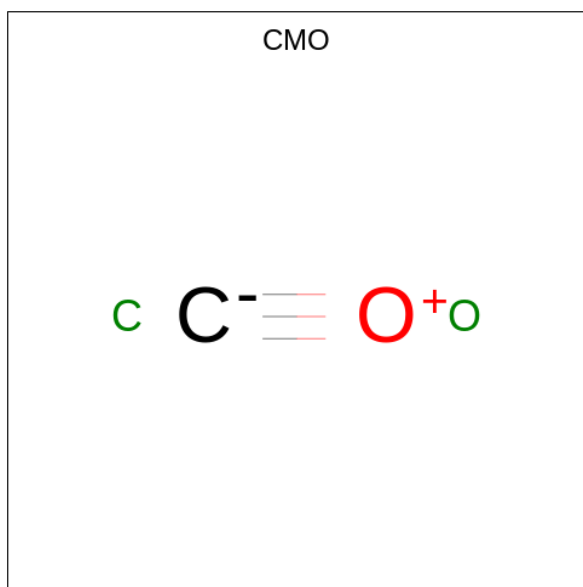
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
16	A	1	Total	Mg	0	0
			1	1		
16	N	1	Total	Mg	0	0
			1	1		

- Molecule 17 is SODIUM ION (three-letter code: NA) (formula: Na).



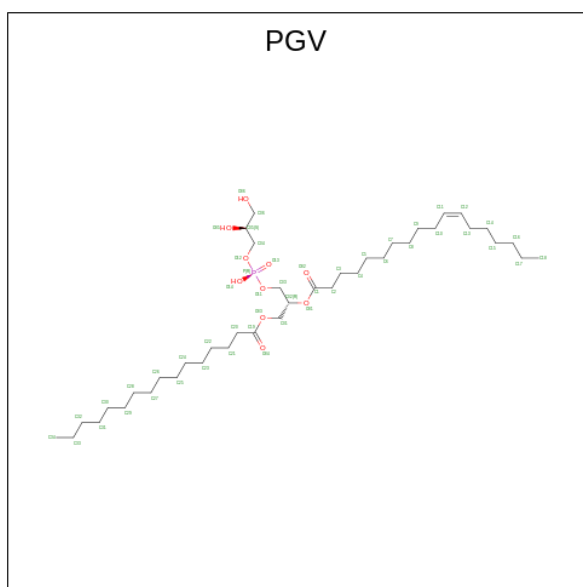
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
17	A	1	Total	Na	0	0
			1	1		
17	N	1	Total	Na	0	0
			1	1		

- Molecule 18 is CARBON MONOXIDE (three-letter code: CMO) (formula: CO).



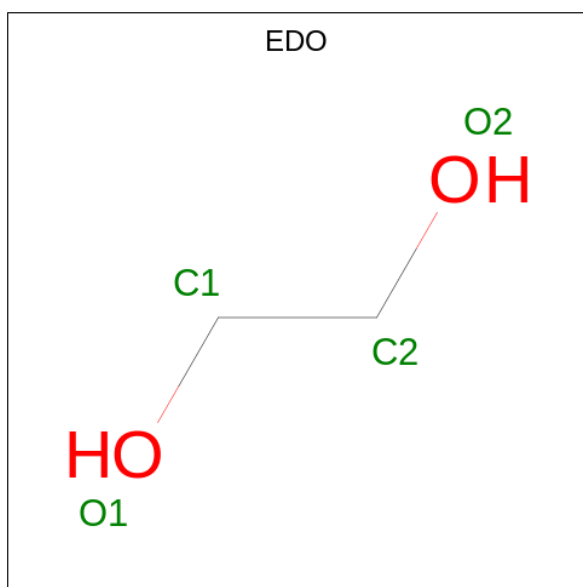
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
18	A	1	Total	C	O	0	1
			4	2	2		
18	N	1	Total	C	O	0	1
			4	2	2		

- Molecule 19 is (1R)-2-{{[(2S)-2,3-DIHYDROXYPROPYL]OXY}(HYDROXY)PHOSPHORYL]OXY}-1-[(PALMITOYLOXY)METHYL]ETHYL (11E)-OCTADEC-11-ENOATE (three-letter code: PGV) (formula: C<sub>40</sub>H<sub>77</sub>O<sub>10</sub>P).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
19	A	1	48	37	10	1	0	0
19	A	1	51	40	10	1	0	0
19	C	1	50	39	10	1	0	0
19	C	1	51	40	10	1	0	0
19	G	1	51	40	10	1	0	0
19	N	1	51	40	10	1	0	0
19	N	1	51	40	10	1	0	0
19	P	1	51	40	10	1	0	0

- Molecule 20 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0
20	A	1	Total C O 4 2 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
20	B	1	Total 4	C 2	O 2	0	0
20	B	1	Total 4	C 2	O 2	0	0
20	B	1	Total 4	C 2	O 2	0	0
20	B	1	Total 4	C 2	O 2	0	0
20	B	1	Total 4	C 2	O 2	0	0
20	B	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	C	1	Total 4	C 2	O 2	0	0
20	D	1	Total 4	C 2	O 2	0	0
20	D	1	Total 4	C 2	O 2	0	0
20	D	1	Total 4	C 2	O 2	0	0
20	D	1	Total 4	C 2	O 2	0	0
20	D	1	Total 4	C 2	O 2	0	0
20	E	1	Total 4	C 2	O 2	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
20	E	1	Total 4	C 2	O 2	0	0
20	E	1	Total 4	C 2	O 2	0	0
20	F	1	Total 4	C 2	O 2	0	0
20	F	1	Total 4	C 2	O 2	0	0
20	F	1	Total 4	C 2	O 2	0	0
20	F	1	Total 4	C 2	O 2	0	0
20	F	1	Total 4	C 2	O 2	0	0
20	G	1	Total 4	C 2	O 2	0	0
20	G	1	Total 4	C 2	O 2	0	0
20	I	1	Total 4	C 2	O 2	0	0
20	J	1	Total 4	C 2	O 2	0	0
20	J	1	Total 4	C 2	O 2	0	0
20	L	1	Total 4	C 2	O 2	0	0
20	M	1	Total 4	C 2	O 2	0	0
20	M	1	Total 4	C 2	O 2	0	0
20	M	1	Total 4	C 2	O 2	0	0
20	M	1	Total 4	C 2	O 2	0	0
20	N	1	Total 4	C 2	O 2	0	0
20	N	1	Total 4	C 2	O 2	0	0
20	N	1	Total 4	C 2	O 2	0	0
20	N	1	Total 4	C 2	O 2	0	0

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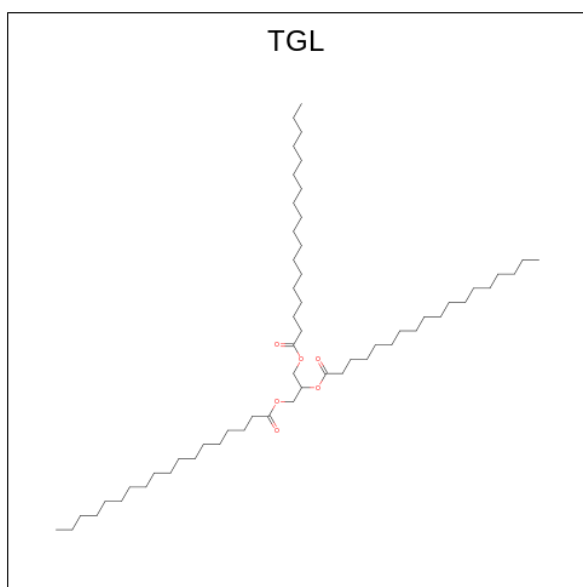
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	N	1	Total	C	O	0	0
			4	2	2		
20	O	1	Total	C	O	0	0
			4	2	2		
20	O	1	Total	C	O	0	0
			4	2	2		
20	O	1	Total	C	O	0	0
			4	2	2		
20	O	1	Total	C	O	0	0
			4	2	2		
20	P	1	Total	C	O	0	0
			4	2	2		
20	P	1	Total	C	O	0	0
			4	2	2		
20	P	1	Total	C	O	0	0
			4	2	2		
20	P	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
20	P	1	Total	C	O	0	0
			4	2	2		
20	P	1	Total	C	O	0	0
			4	2	2		
20	Q	1	Total	C	O	0	0
			4	2	2		
20	Q	1	Total	C	O	0	0
			4	2	2		
20	Q	1	Total	C	O	0	0
			4	2	2		
20	R	1	Total	C	O	0	0
			4	2	2		
20	R	1	Total	C	O	0	0
			4	2	2		
20	S	1	Total	C	O	0	0
			4	2	2		
20	S	1	Total	C	O	0	0
			4	2	2		
20	S	1	Total	C	O	0	0
			4	2	2		
20	S	1	Total	C	O	0	0
			4	2	2		
20	S	1	Total	C	O	0	0
			4	2	2		
20	T	1	Total	C	O	0	0
			4	2	2		
20	T	1	Total	C	O	0	0
			4	2	2		
20	U	1	Total	C	O	0	0
			4	2	2		
20	V	1	Total	C	O	0	0
			4	2	2		
20	Y	1	Total	C	O	0	0
			4	2	2		

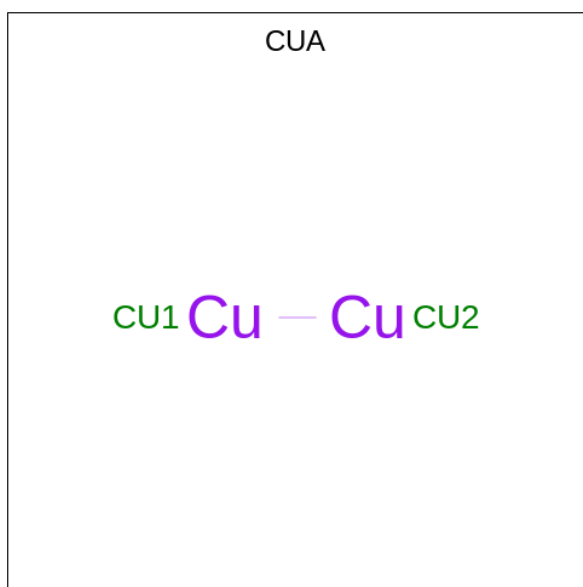
- Molecule 21 is TRISTEAROYLGLYCEROL (three-letter code: TGL) (formula: C<sub>57</sub>H<sub>110</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
21	B	1	Total	C	O	0	0
			63	57	6		
21	B	1	Total	C	O	0	0
			63	57	6		
21	L	1	Total	C	O	0	0
			60	54	6		
21	N	1	Total	C	O	0	0
			63	57	6		
21	Q	1	Total	C	O	0	0
			63	57	6		
21	Y	1	Total	C	O	0	0
			63	57	6		

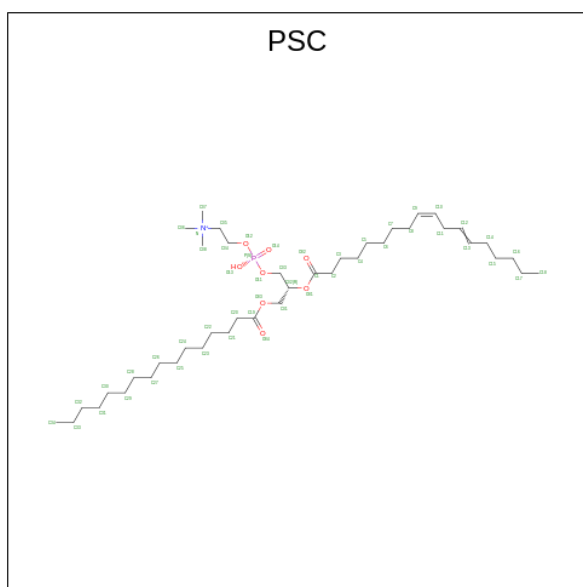
- Molecule 22 is DINUCLEAR COPPER ION (three-letter code: CUA) (formula: Cu<sub>2</sub>).





Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
22	B	1	Total Cu 2 2	0	0
22	O	1	Total Cu 2 2	0	0

- Molecule 23 is (7R,17E,20E)-4-HYDROXY-N,N,N-TRIMETHYL-9-OXO-7-[(PALMITO YLOXY)METHYL]-3,5,8-TRIOXA-4-PHOSPHAHEXACOSA-17,20-DIEN-1-AMINIUM 4-OXIDE (three-letter code: PSC) (formula: C<sub>42</sub>H<sub>81</sub>NO<sub>8</sub>P).



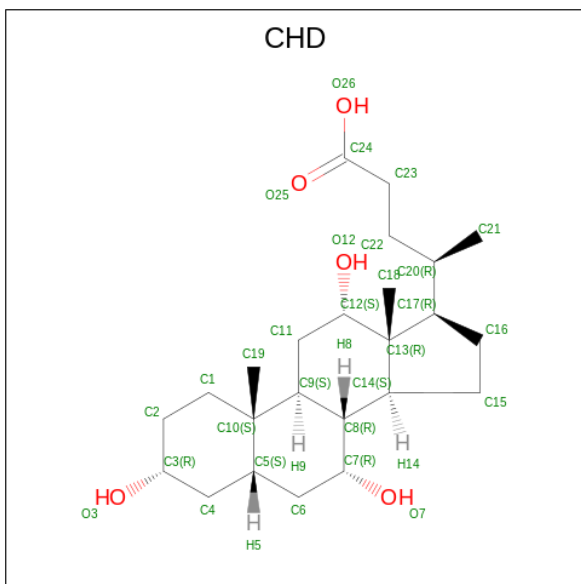
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
23	B	1	Total C N O P 51 41 1 8 1	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
23	O	1	Total	C	O	P	0	0
			46	37	8	1		

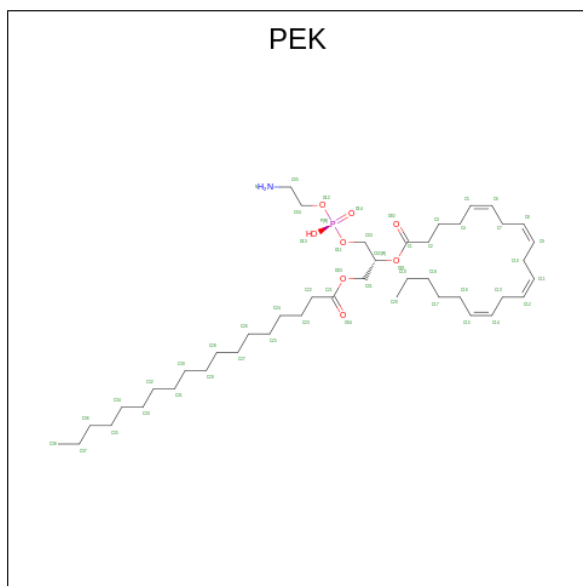
- Molecule 24 is CHOLIC ACID (three-letter code: CHD) (formula:  $C_{24}H_{40}O_5$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
24	C	1	Total	C	O	0	0
			29	24	5		
24	G	1	Total	C	O	0	0
			29	24	5		
24	J	1	Total	C	O	0	0
			29	24	5		
24	J	1	Total	C	O	0	0
			29	24	5		
24	P	1	Total	C	O	0	0
			29	24	5		
24	P	1	Total	C	O	0	0
			29	24	5		
24	T	1	Total	C	O	0	0
			29	24	5		
24	W	1	Total	C	O	0	0
			29	24	5		
24	Y	1	Total	C	O	0	0
			29	24	5		

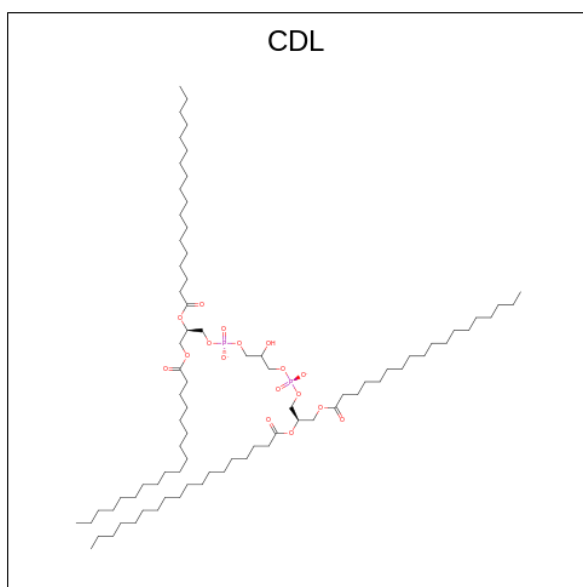
- Molecule 25 is (1S)-2-[[[2-AMINOETHOXY)(HYDROXY)PHOSPHORYL]OXY}-1-[(STEAROYLOXY)METHYL]ETHYL (5E,8E,11E,14E)-ICOSA-5,8,11,14-TETRAENOATE

(three-letter code: PEK) (formula: C<sub>43</sub>H<sub>78</sub>NO<sub>8</sub>P).



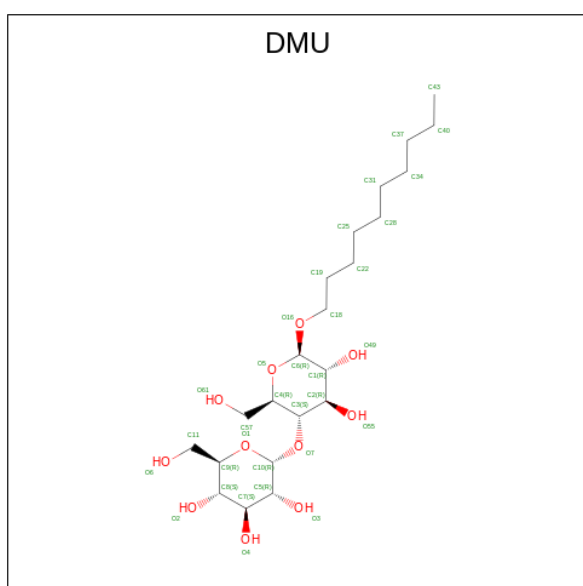
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
25	C	1	Total	C	N	O	P	0	0
			53	43	1	8	1		
25	C	1	Total	C	N	O	P	0	0
			53	43	1	8	1		
25	P	1	Total	C	N	O	P	0	0
			48	38	1	8	1		
25	P	1	Total	C	N	O	P	0	0
			45	35	1	8	1		
25	P	1	Total	C	N	O	P	0	0
			53	43	1	8	1		
25	T	1	Total	C	N	O	P	0	0
			44	34	1	8	1		

- Molecule 26 is CARDIOLIPIN (three-letter code: CDL) (formula: C<sub>81</sub>H<sub>156</sub>O<sub>17</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
26	C	1	92	78	13	1	0	0
26	G	1	99	80	17	2	0	0
26	P	1	84	72	11	1	0	0
26	T	1	96	77	17	2	0	0

- Molecule 27 is DECYL-BETA-D-MALTOPYRANOSIDE (three-letter code: DMU) (formula:  $C_{22}H_{42}O_{11}$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
27	C	1	Total 33	C 22	O 11	0	0
27	C	1	Total 33	C 22	O 11	0	0
27	G	1	Total 33	C 22	O 11	0	0
27	K	1	Total 21	C 16	O 5	0	0
27	K	1	Total 22	C 16	O 6	0	0
27	K	1	Total 33	C 22	O 11	0	0
27	K	1	Total 33	C 22	O 11	0	0
27	K	1	Total 33	C 22	O 11	0	0
27	K	1	Total 33	C 22	O 11	0	0
27	L	1	Total 33	C 22	O 11	0	0
27	M	1	Total 33	C 22	O 11	0	0
27	M	1	Total 33	C 22	O 11	0	0
27	O	1	Total 32	C 21	O 11	0	0
27	P	1	Total 33	C 22	O 11	0	0
27	P	1	Total 33	C 22	O 11	0	0
27	P	1	Total 33	C 22	O 11	0	0
27	T	1	Total 22	C 16	O 6	0	0
27	X	1	Total 33	C 22	O 11	0	0
27	X	1	Total 33	C 22	O 11	0	0
27	X	1	Total 22	C 16	O 6	0	0
27	X	1	Total 33	C 22	O 11	0	0
27	X	1	Total 22	C 16	O 6	0	0

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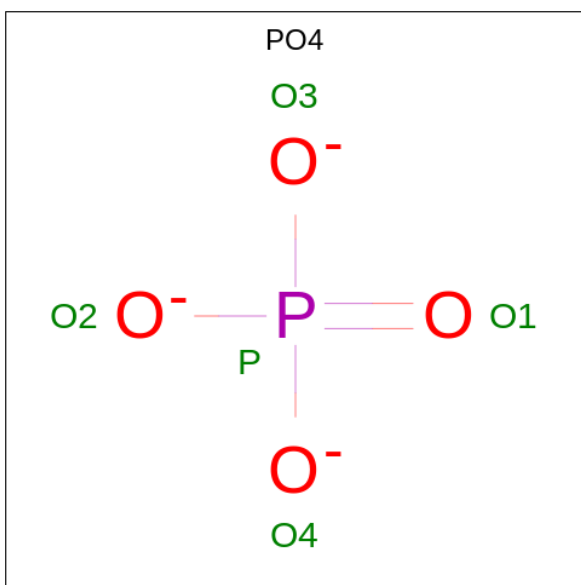
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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
27	Z	1	Total	C	O	0	0
			33	22	11		

- Molecule 28 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
28	F	1	Total	Zn	0	0
			1	1		
28	S	1	Total	Zn	0	0
			1	1		

- Molecule 29 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
29	H	1	Total	O	P	0	0
			5	4	1		
29	U	1	Total	O	P	0	0
			5	4	1		

- Molecule 30 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
30	A	260	Total	O	0	4
			261	261		
30	B	220	Total	O	0	3
			222	222		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
30	C	154	Total O 154 154	0	0
30	D	189	Total O 189 189	0	0
30	E	145	Total O 145 145	0	0
30	F	149	Total O 149 149	0	0
30	G	93	Total O 93 93	0	0
30	H	92	Total O 92 92	0	0
30	I	67	Total O 67 67	0	0
30	J	44	Total O 44 44	0	0
30	K	41	Total O 41 41	0	0
30	L	45	Total O 45 45	0	1
30	M	28	Total O 28 28	0	0
30	N	263	Total O 264 264	0	4
30	O	181	Total O 183 183	0	5
30	P	145	Total O 145 145	0	0
30	Q	113	Total O 113 113	0	0
30	R	100	Total O 100 100	0	0
30	S	135	Total O 135 135	0	0
30	T	77	Total O 77 77	0	0
30	U	87	Total O 87 87	0	0
30	V	62	Total O 62 62	0	0
30	W	47	Total O 47 47	0	1

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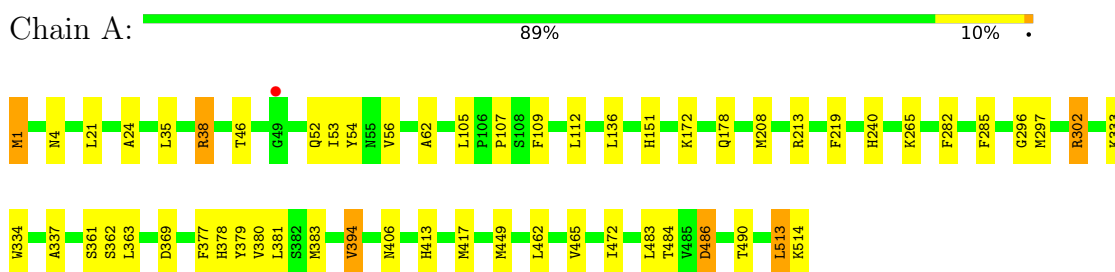
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
30	X	29	Total O 29 29	0	0
30	Y	38	Total O 38 38	0	1
30	Z	25	Total O 25 25	0	2



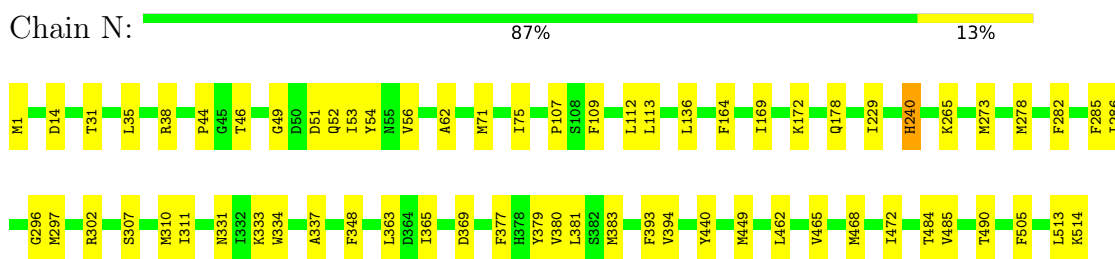
### 3 Residue-property plots [i](#)

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.

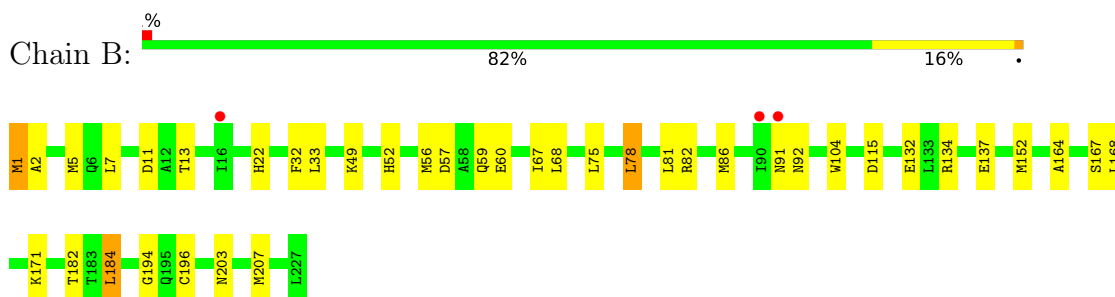
- Molecule 1: Cytochrome c oxidase subunit 1



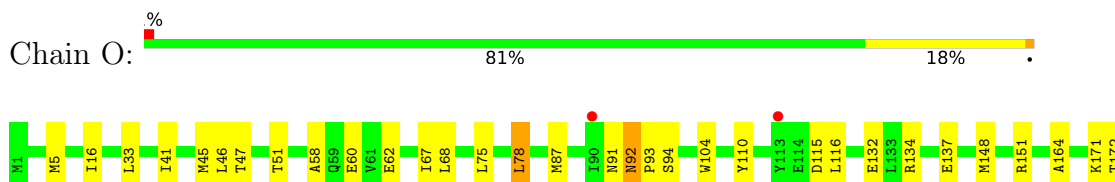
- Molecule 1: Cytochrome c oxidase subunit 1



- Molecule 2: Cytochrome c oxidase subunit 2



- Molecule 2: Cytochrome c oxidase subunit 2





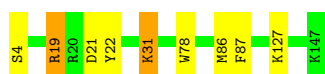
- Molecule 3: Cytochrome c oxidase subunit 3



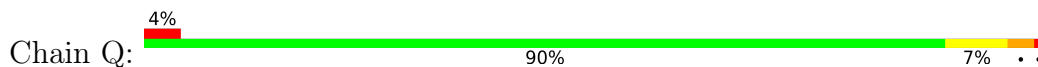
- Molecule 3: Cytochrome c oxidase subunit 3



- Molecule 4: Cytochrome c oxidase subunit 4 isoform 1, mitochondrial



- Molecule 4: Cytochrome c oxidase subunit 4 isoform 1, mitochondrial



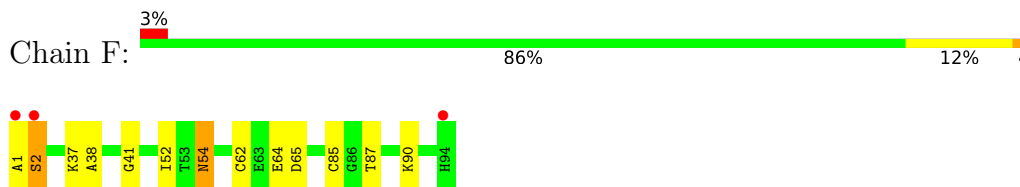
- Molecule 5: Cytochrome c oxidase subunit 5A, mitochondrial



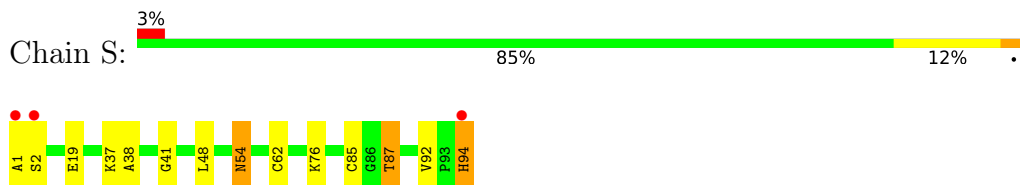
- Molecule 5: Cytochrome c oxidase subunit 5A, mitochondrial



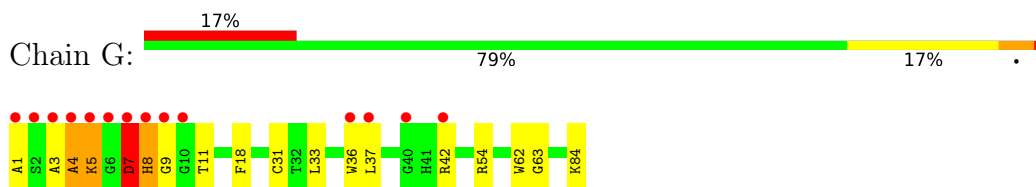
- Molecule 6: Cytochrome c oxidase subunit 5B, mitochondrial



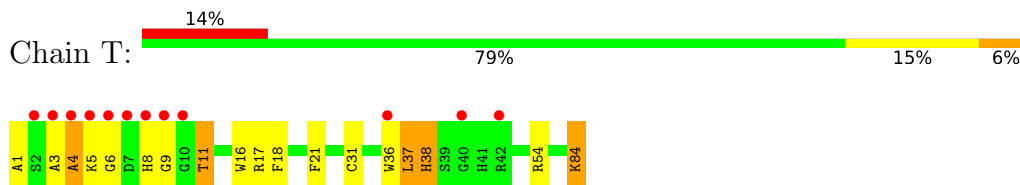
- Molecule 6: Cytochrome c oxidase subunit 5B, mitochondrial



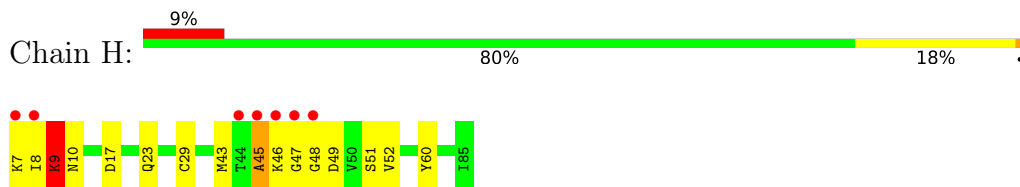
- Molecule 7: Cytochrome c oxidase subunit 6A2, mitochondrial



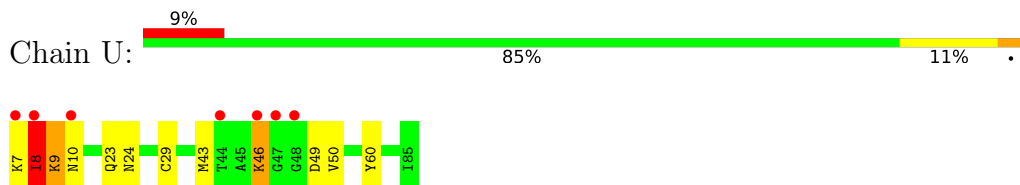
- Molecule 7: Cytochrome c oxidase subunit 6A2, mitochondrial



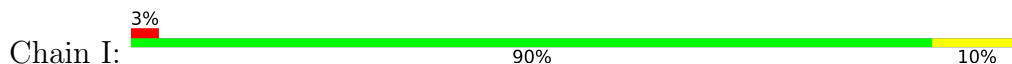
- Molecule 8: Cytochrome c oxidase subunit 6B1



- Molecule 8: Cytochrome c oxidase subunit 6B1

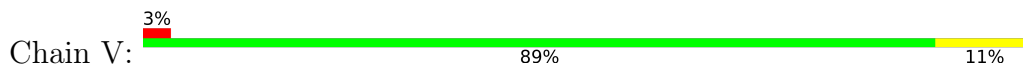


- Molecule 9: Cytochrome c oxidase subunit 6C

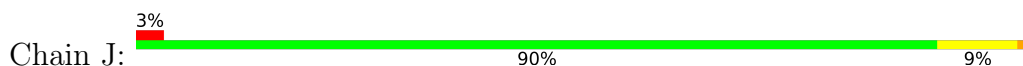




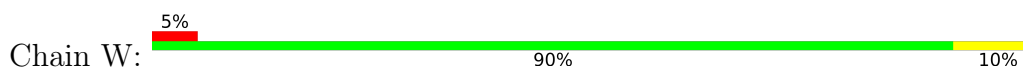
- Molecule 9: Cytochrome c oxidase subunit 6C



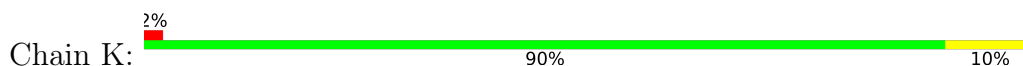
- Molecule 10: Cytochrome c oxidase subunit 7A1, mitochondrial



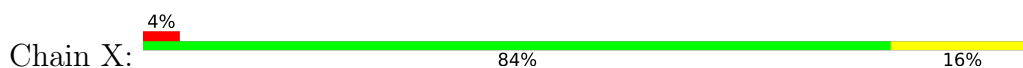
- Molecule 10: Cytochrome c oxidase subunit 7A1, mitochondrial



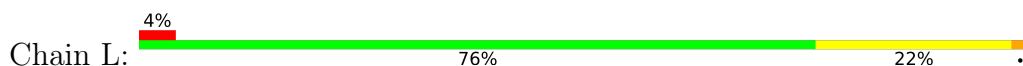
- Molecule 11: Cytochrome c oxidase subunit 7B, mitochondrial



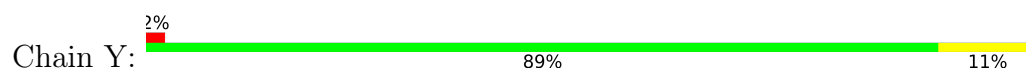
- Molecule 11: Cytochrome c oxidase subunit 7B, mitochondrial



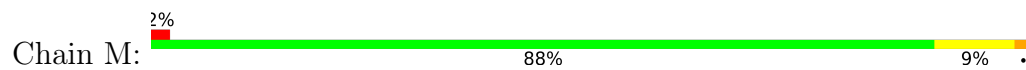
- Molecule 12: Cytochrome c oxidase subunit 7C, mitochondrial



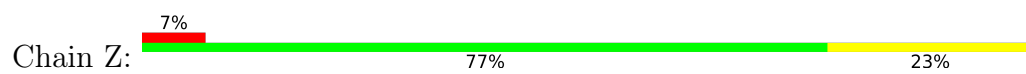
- Molecule 12: Cytochrome c oxidase subunit 7C, mitochondrial



- Molecule 13: Cytochrome c oxidase subunit 8B, mitochondrial



- Molecule 13: Cytochrome c oxidase subunit 8B, mitochondrial



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	181.49Å 203.30Å 177.48Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.62 – 1.68 135.39 – 1.68	Depositor EDS
% Data completeness (in resolution range)	99.8 (39.62-1.68) 99.9 (135.39-1.68)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.83 (at 1.68Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, $R_{free}$	0.153 , 0.177 0.153 , 0.177	Depositor DCC
$R_{free}$ test set	37040 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	23.6	Xtrriage
Anisotropy	0.723	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 78.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.007 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	34917	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.16% 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: CDL, PGV, CMO, FME, NA, ZN, EDO, CHD, SAC, PSC, TGL, PO4, TPO, MG, CUA, DMU, HEA, CU, PEK

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	0.83	4/4460 (0.1%)	0.85	9/6086 (0.1%)
1	N	0.79	0/4433	0.81	3/6050 (0.0%)
2	B	0.75	0/1958	0.89	7/2667 (0.3%)
2	O	0.66	0/1953	0.79	1/2660 (0.0%)
3	C	0.73	0/2251	0.72	1/3077 (0.0%)
3	P	0.73	0/2259	0.73	0/3087
4	D	0.69	0/1252	0.71	0/1688
4	Q	0.54	0/1240	0.68	3/1672 (0.2%)
5	E	0.64	0/871	0.73	1/1182 (0.1%)
5	R	0.56	0/871	0.65	0/1182
6	F	0.68	0/747	0.75	0/1014
6	S	0.66	0/732	0.76	0/993
7	G	0.71	1/691 (0.1%)	0.77	0/937
7	T	0.62	1/691 (0.1%)	0.75	0/937
8	H	0.70	0/682	0.72	1/921 (0.1%)
8	U	0.67	0/682	0.71	0/921
9	I	0.59	0/605	0.68	0/802
9	V	0.55	0/605	0.65	0/802
10	J	0.54	0/472	0.64	0/636
10	W	0.49	0/472	0.63	0/636
11	K	0.58	0/399	0.65	0/546
11	X	0.57	0/399	0.62	0/546
12	L	0.75	0/401	0.70	0/536
12	Y	0.60	0/401	0.61	0/536
13	M	0.70	0/345	0.72	0/470
13	Z	0.56	0/346	0.63	0/470
All	All	0.71	6/30218 (0.0%)	0.76	26/41054 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected

by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	N	0	1
4	Q	0	1
All	All	0	3

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	36	TRP	CB-CG	6.33	1.61	1.50
1	A	394[A]	VAL	CB-CG2	-5.80	1.40	1.52
1	A	394[B]	VAL	CB-CG2	-5.80	1.40	1.52
1	A	362[A]	SER	CB-OG	-5.27	1.35	1.42
1	A	362[B]	SER	CB-OG	-5.27	1.35	1.42

The worst 5 of 26 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	N	71	MET	CG-SD-CE	-11.62	81.61	100.20
1	N	310	MET	CG-SD-CE	-7.90	87.56	100.20
1	A	302[A]	ARG	NE-CZ-NH1	-7.58	116.51	120.30
1	A	302[B]	ARG	NE-CZ-NH1	-7.58	116.51	120.30
4	Q	20	ARG	NE-CZ-NH2	-6.79	116.90	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	240	HIS	Sidechain
1	N	240	HIS	Sidechain
4	Q	8	SER	Peptide

## 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	4192	0	4170	59	0
1	N	4182	0	4161	65	0
2	B	1858	0	1867	26	0
2	O	1856	0	1863	26	0
3	C	2124	0	2032	18	0
3	P	2126	0	2033	35	0
4	D	1207	0	1197	12	0
4	Q	1201	0	1192	14	0
5	E	852	0	845	2	0
5	R	852	0	845	5	0
6	F	721	0	702	11	0
6	S	716	0	697	15	0
7	G	676	0	644	12	0
7	T	676	0	643	18	0
8	H	662	0	623	12	0
8	U	662	0	623	10	0
9	I	601	0	613	9	0
9	V	601	0	613	3	0
10	J	461	0	459	9	0
10	W	461	0	459	7	0
11	K	385	0	366	4	0
11	X	385	0	366	7	0
12	L	382	0	381	19	0
12	Y	382	0	381	6	0
13	M	335	0	352	8	0
13	Z	336	0	352	8	0
14	A	139	0	111	8	0
14	N	139	0	111	8	0
15	A	1	0	0	0	0
15	N	1	0	0	0	0
16	A	1	0	0	0	0
16	N	1	0	0	0	0
17	A	1	0	0	0	0
17	N	1	0	0	0	0
18	A	4	0	0	0	0
18	N	4	0	0	0	0
19	A	99	0	143	4	0
19	C	101	0	147	5	0
19	G	51	0	76	6	0
19	N	102	0	152	6	0
19	P	51	0	76	3	0
20	A	56	0	84	10	0
20	B	24	0	36	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
20	C	36	0	54	1	0
20	D	20	0	30	1	0
20	E	12	0	18	0	0
20	F	20	0	30	1	0
20	G	8	0	12	0	0
20	I	4	0	6	0	0
20	J	8	0	12	1	0
20	L	4	0	6	3	0
20	M	16	0	24	6	0
20	N	68	0	102	15	0
20	O	16	0	24	0	0
20	P	24	0	36	0	0
20	Q	12	0	18	1	0
20	R	8	0	12	1	0
20	S	20	0	30	1	0
20	T	8	0	12	0	0
20	U	4	0	6	4	0
20	V	4	0	5	2	0
20	Y	4	0	6	0	0
21	B	126	0	220	18	0
21	L	60	0	101	13	0
21	N	63	0	110	2	0
21	Q	63	0	110	6	0
21	Y	63	0	110	9	0
22	B	2	0	0	0	0
22	O	2	0	0	0	0
23	B	51	0	75	13	0
23	O	46	0	62	4	0
24	C	29	0	39	0	0
24	G	29	0	39	0	0
24	J	58	0	78	3	0
24	P	58	0	78	2	0
24	T	29	0	39	0	0
24	W	29	0	38	1	0
24	Y	29	0	39	1	0
25	C	106	0	154	11	0
25	P	146	0	202	12	0
25	T	44	0	56	4	0
26	C	92	0	149	3	0
26	G	99	0	151	20	0
26	P	84	0	130	10	0
26	T	96	0	142	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
27	C	66	0	84	12	0
27	G	33	0	42	8	0
27	K	175	0	229	7	0
27	L	33	0	42	7	0
27	M	66	0	84	2	0
27	O	32	0	37	1	0
27	P	99	0	126	17	0
27	T	22	0	31	1	0
27	X	143	0	188	10	0
27	Z	33	0	42	3	0
28	F	1	0	0	0	0
28	S	1	0	0	0	0
29	H	5	0	0	0	0
29	U	5	0	0	0	0
30	A	261	0	0	17	0
30	B	222	0	0	3	0
30	C	154	0	0	4	0
30	D	189	0	0	2	0
30	E	145	0	0	1	0
30	F	149	0	0	6	0
30	G	93	0	0	2	0
30	H	92	0	0	2	0
30	I	67	0	0	4	0
30	J	44	0	0	1	0
30	K	41	0	0	0	0
30	L	45	0	0	4	0
30	M	28	0	0	0	0
30	N	264	0	0	11	0
30	O	183	0	0	6	0
30	P	145	0	0	4	0
30	Q	113	0	0	1	0
30	R	100	0	0	1	0
30	S	135	0	0	6	0
30	T	77	0	0	5	0
30	U	87	0	0	1	0
30	V	62	0	0	2	0
30	W	47	0	0	0	0
30	X	29	0	0	1	0
30	Y	38	0	0	1	0
30	Z	25	0	0	0	0
All	All	34917	0	32885	500	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 8.

The worst 5 of 500 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)
30:N:911:HOH:O	2:O:87:MET:SD	2.25	0.94
8:U:24:ASN:HD21	20:U:101:EDO:H21	1.32	0.92
7:T:37:LEU:HD23	26:T:103:CDL:H371	1.56	0.87
12:L:20:ARG:HH22	21:L:101:TGL:HC61	1.39	0.85
23:B:303:PSC:H21	23:B:303:PSC:H212	1.60	0.81

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	552/514 (107%)	539 (98%)	13 (2%)	0	100	100
1	N	549/514 (107%)	535 (97%)	14 (3%)	0	100	100
2	B	237/227 (104%)	232 (98%)	4 (2%)	1 (0%)	34	17
2	O	236/227 (104%)	229 (97%)	6 (2%)	1 (0%)	34	17
3	C	264/259 (102%)	259 (98%)	5 (2%)	0	100	100
3	P	265/259 (102%)	260 (98%)	5 (2%)	0	100	100
4	D	144/144 (100%)	140 (97%)	4 (3%)	0	100	100
4	Q	143/144 (99%)	136 (95%)	5 (4%)	2 (1%)	11	2
5	E	103/105 (98%)	102 (99%)	0	1 (1%)	15	3
5	R	103/105 (98%)	102 (99%)	0	1 (1%)	15	3
6	F	94/94 (100%)	92 (98%)	1 (1%)	1 (1%)	14	3
6	S	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
7	G	81/84 (96%)	72 (89%)	4 (5%)	5 (6%)	1	0

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	T	81/84 (96%)	72 (89%)	5 (6%)	4 (5%)	2	0
8	H	77/79 (98%)	71 (92%)	2 (3%)	4 (5%)	2	0
8	U	77/79 (98%)	69 (90%)	6 (8%)	2 (3%)	5	0
9	I	71/73 (97%)	70 (99%)	1 (1%)	0	100	100
9	V	71/73 (97%)	69 (97%)	1 (1%)	1 (1%)	11	2
10	J	56/58 (97%)	56 (100%)	0	0	100	100
10	W	56/58 (97%)	56 (100%)	0	0	100	100
11	K	47/49 (96%)	46 (98%)	1 (2%)	0	100	100
11	X	47/49 (96%)	46 (98%)	1 (2%)	0	100	100
12	L	45/46 (98%)	44 (98%)	1 (2%)	0	100	100
12	Y	45/46 (98%)	44 (98%)	1 (2%)	0	100	100
13	M	41/43 (95%)	41 (100%)	0	0	100	100
13	Z	41/43 (95%)	40 (98%)	1 (2%)	0	100	100
All	All	3618/3550 (102%)	3513 (97%)	82 (2%)	23 (1%)	22	10

5 of 23 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	F	2	SER
7	G	4	ALA
7	G	8	HIS
7	T	5	LYS
8	U	8	ILE

### 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	463/426 (109%)	457 (99%)	6 (1%)	69	54
1	N	460/426 (108%)	455 (99%)	5 (1%)	73	61
2	B	222/210 (106%)	210 (95%)	12 (5%)	22	6

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	O	221/210 (105%)	209 (95%)	12 (5%)	22	6
3	C	231/224 (103%)	227 (98%)	4 (2%)	60	43
3	P	232/224 (104%)	229 (99%)	3 (1%)	69	54
4	D	130/128 (102%)	127 (98%)	3 (2%)	50	30
4	Q	129/128 (101%)	125 (97%)	4 (3%)	40	18
5	E	92/92 (100%)	91 (99%)	1 (1%)	73	61
5	R	92/92 (100%)	90 (98%)	2 (2%)	52	32
6	F	80/78 (103%)	77 (96%)	3 (4%)	33	12
6	S	78/78 (100%)	73 (94%)	5 (6%)	17	4
7	G	67/67 (100%)	61 (91%)	6 (9%)	9	1
7	T	67/67 (100%)	62 (92%)	5 (8%)	13	2
8	H	71/71 (100%)	67 (94%)	4 (6%)	21	6
8	U	71/71 (100%)	67 (94%)	4 (6%)	21	6
9	I	57/57 (100%)	56 (98%)	1 (2%)	59	40
9	V	57/57 (100%)	55 (96%)	2 (4%)	36	15
10	J	49/49 (100%)	48 (98%)	1 (2%)	55	36
10	W	49/49 (100%)	48 (98%)	1 (2%)	55	36
11	K	39/39 (100%)	37 (95%)	2 (5%)	24	7
11	X	39/39 (100%)	37 (95%)	2 (5%)	24	7
12	L	40/39 (103%)	39 (98%)	1 (2%)	47	26
12	Y	40/39 (103%)	39 (98%)	1 (2%)	47	26
13	M	37/37 (100%)	35 (95%)	2 (5%)	22	6
13	Z	37/37 (100%)	33 (89%)	4 (11%)	6	1
All	All	3150/3034 (104%)	3054 (97%)	96 (3%)	42	20

5 of 96 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	O	91	ASN
5	R	79	LYS
2	O	110	TYR
3	P	230	ASN
6	S	87	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 26 such sidechains are listed below:

Mol	Chain	Res	Type
2	O	103	GLN
3	P	68	GLN
9	V	8	GLN
2	O	195	GLN
4	Q	109	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](#)

8 non-standard protein/DNA/RNA residues 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	$\# Z  > 2$
1	FME	N	1	1	8,9,10	0.51	0	7,9,11	1.47	2 (28%)
2	FME	B	1	2	8,9,10	0.90	0	7,9,11	1.68	1 (14%)
9	SAC	V	1	9	7,8,9	0.55	0	8,9,11	1.23	2 (25%)
7	TPO	T	11	7	8,10,11	1.34	1 (12%)	10,14,16	1.08	2 (20%)
2	FME	O	1	2	8,9,10	0.85	0	7,9,11	1.12	0
1	FME	A	1	1	8,9,10	0.57	0	7,9,11	1.86	3 (42%)
7	TPO	G	11	7	8,10,11	1.32	1 (12%)	10,14,16	1.04	0
9	SAC	I	1	9	7,8,9	0.64	0	8,9,11	1.06	0

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
1	FME	N	1	1	-	2/7/9/11	-
2	FME	B	1	2	-	0/7/9/11	-
9	SAC	V	1	9	-	2/7/8/10	-
7	TPO	T	11	7	-	4/9/11/13	-
2	FME	O	1	2	-	0/7/9/11	-
1	FME	A	1	1	-	3/7/9/11	-
7	TPO	G	11	7	-	5/9/11/13	-
9	SAC	I	1	9	-	2/7/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	T	11	TPO	P-O1P	2.75	1.59	1.50
7	G	11	TPO	P-O1P	2.70	1.59	1.50

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1	FME	CG-CB-CA	-3.19	104.08	112.95
1	A	1	FME	CE-SD-CG	3.12	111.10	100.40
1	N	1	FME	CE-SD-CG	2.80	110.03	100.40
7	T	11	TPO	CG2-CB-CA	2.34	117.78	113.16
9	V	1	SAC	O-C-CA	-2.28	118.81	124.78

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1	FME	N-CA-CB-CG
7	G	11	TPO	N-CA-CB-CG2
7	G	11	TPO	N-CA-CB-OG1
7	G	11	TPO	C-CA-CB-CG2
7	G	11	TPO	O-C-CA-CB

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1	FME	1	0
7	T	11	TPO	1	0
1	A	1	FME	1	0



## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 176 ligands modelled in this entry, 8 are monoatomic - leaving 168 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
21	TGL	N	608	-	62,62,62	1.04	3 (4%)	65,65,65	1.25	5 (7%)
20	EDO	O	306	-	3,3,3	0.55	0	2,2,2	0.23	0
27	DMU	T	104	-	22,22,34	0.51	0	27,27,45	1.12	3 (11%)
20	EDO	B	306	-	3,3,3	0.81	0	2,2,2	0.13	0
21	TGL	B	301	-	62,62,62	1.10	3 (4%)	65,65,65	1.40	6 (9%)
24	CHD	J	102	-	32,32,32	0.71	0	51,51,51	1.87	12 (23%)
24	CHD	P	301	-	32,32,32	0.95	1 (3%)	51,51,51	1.25	5 (9%)
20	EDO	I	101	-	3,3,3	0.56	0	2,2,2	1.02	0
24	CHD	J	101	-	32,32,32	0.62	0	51,51,51	1.48	11 (21%)
20	EDO	M	105	-	3,3,3	0.72	0	2,2,2	0.29	0
14	HEA	N	601[C]	-	57,57,67	1.65	7 (12%)	61,89,103	2.21	24 (39%)
27	DMU	K	101	-	21,21,34	0.51	0	24,25,45	1.26	4 (16%)
20	EDO	P	311	-	3,3,3	0.50	0	2,2,2	0.25	0
20	EDO	S	106	-	3,3,3	0.40	0	2,2,2	0.76	0
24	CHD	C	301	-	32,32,32	0.93	2 (6%)	51,51,51	1.31	4 (7%)
20	EDO	N	617	-	3,3,3	0.53	0	2,2,2	0.85	0
20	EDO	Y	103	-	3,3,3	0.60	0	2,2,2	0.26	0
27	DMU	K	104	-	34,34,34	0.66	1 (2%)	45,45,45	1.29	5 (11%)
22	CUA	O	301	2	0,1,1	-	-	-	-	-
20	EDO	N	611	-	3,3,3	0.79	0	2,2,2	0.52	0
20	EDO	B	310	-	3,3,3	0.35	0	2,2,2	0.40	0
20	EDO	Q	203	-	3,3,3	0.69	0	2,2,2	0.14	0
20	EDO	F	104	-	3,3,3	0.71	0	2,2,2	0.19	0
20	EDO	M	102	-	3,3,3	0.46	0	2,2,2	0.69	0
20	EDO	R	202	-	3,3,3	0.59	0	2,2,2	0.47	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
20	EDO	B	308	-	3,3,3	0.77	0	2,2,2	0.39	0
24	CHD	G	103	-	32,32,32	0.86	0	51,51,51	1.40	11 (21%)
20	EDO	S	102	-	3,3,3	0.80	0	2,2,2	0.49	0
27	DMU	X	204	-	34,34,34	0.59	1 (2%)	45,45,45	0.99	2 (4%)
20	EDO	A	617	-	3,3,3	0.22	0	2,2,2	1.08	0
27	DMU	L	102	-	34,34,34	0.66	0	45,45,45	2.23	21 (46%)
20	EDO	D	205	-	3,3,3	0.54	0	2,2,2	0.13	0
20	EDO	A	610	-	3,3,3	0.99	0	2,2,2	0.54	0
20	EDO	P	315	-	3,3,3	0.50	0	2,2,2	0.39	0
20	EDO	F	105	-	3,3,3	0.80	0	2,2,2	0.31	0
20	EDO	S	104	-	3,3,3	0.61	0	2,2,2	0.12	0
20	EDO	A	618	-	3,3,3	0.81	0	2,2,2	0.74	0
20	EDO	M	103	-	3,3,3	0.41	0	2,2,2	0.68	0
20	EDO	A	609	-	3,3,3	0.74	0	2,2,2	0.47	0
26	CDL	C	306	-	90,90,99	1.52	15 (16%)	96,97,111	1.93	17 (17%)
18	CMO	A	606[B]	15	0,1,1	-	-	-	-	-
20	EDO	V	101	-	3,3,3	0.61	0	2,2,2	1.25	0
25	PEK	C	303	-	52,52,52	1.12	2 (3%)	55,57,57	1.44	5 (9%)
20	EDO	O	307	-	3,3,3	0.60	0	2,2,2	0.14	0
24	CHD	Y	101	-	32,32,32	0.71	0	51,51,51	2.16	16 (31%)
20	EDO	S	103	-	3,3,3	0.86	0	2,2,2	0.60	0
20	EDO	U	101	-	3,3,3	0.64	0	2,2,2	0.37	0
20	EDO	L	103	-	3,3,3	0.67	0	2,2,2	0.42	0
19	PGV	N	607	-	50,50,50	1.01	2 (4%)	53,56,56	1.24	8 (15%)
20	EDO	T	106	-	3,3,3	0.53	0	2,2,2	0.20	0
20	EDO	N	618	-	3,3,3	0.78	0	2,2,2	0.52	0
27	DMU	P	307	-	34,34,34	0.65	1 (2%)	45,45,45	1.61	11 (24%)
20	EDO	T	105	-	3,3,3	0.75	0	2,2,2	0.83	0
20	EDO	P	314	-	3,3,3	0.89	0	2,2,2	0.31	0
20	EDO	C	311	-	3,3,3	0.42	0	2,2,2	0.65	0
20	EDO	C	312	-	3,3,3	0.80	0	2,2,2	0.16	0
20	EDO	A	611	-	3,3,3	0.73	0	2,2,2	0.56	0
20	EDO	Q	204	-	3,3,3	0.47	0	2,2,2	0.67	0
14	HEA	N	602	1	57,67,67	1.51	13 (22%)	61,103,103	1.76	17 (27%)
20	EDO	J	104	-	3,3,3	0.41	0	2,2,2	0.31	0
20	EDO	N	623	-	3,3,3	0.65	0	2,2,2	0.24	0
21	TGL	Y	102	-	62,62,62	1.08	3 (4%)	65,65,65	1.24	6 (9%)
20	EDO	C	309	-	3,3,3	0.74	0	2,2,2	0.11	0
26	CDL	G	101	-	98,98,99	1.38	12 (12%)	104,110,111	1.42	10 (9%)
19	PGV	A	608	-	50,50,50	0.85	3 (6%)	53,56,56	1.13	3 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
21	TGL	Q	201	-	62,62,62	1.03	3 (4%)	65,65,65	1.18	5 (7%)
20	EDO	B	309	-	3,3,3	0.72	0	2,2,2	0.73	0
27	DMU	X	203	-	22,22,34	0.63	0	27,27,45	1.30	4 (14%)
20	EDO	N	620	-	3,3,3	0.85	0	2,2,2	0.20	0
20	EDO	A	621	-	3,3,3	0.72	0	2,2,2	0.40	0
20	EDO	S	105	-	3,3,3	0.68	0	2,2,2	0.10	0
20	EDO	D	201	-	3,3,3	0.53	0	2,2,2	0.70	0
20	EDO	O	304	-	3,3,3	0.84	0	2,2,2	0.57	0
14	HEA	A	602	1	57,67,67	1.44	7 (12%)	61,103,103	1.99	23 (37%)
20	EDO	R	201	-	3,3,3	0.33	0	2,2,2	1.08	0
25	PEK	P	304	-	52,52,52	1.07	2 (3%)	55,57,57	1.49	8 (14%)
27	DMU	X	201	-	34,34,34	0.62	0	45,45,45	1.38	6 (13%)
20	EDO	A	613	-	3,3,3	0.38	0	2,2,2	0.56	0
20	EDO	N	616	-	3,3,3	0.34	0	2,2,2	0.11	0
20	EDO	N	612	-	3,3,3	0.58	0	2,2,2	0.11	0
20	EDO	E	201	-	3,3,3	0.43	0	2,2,2	0.36	0
20	EDO	A	616	-	3,3,3	0.50	0	2,2,2	0.51	0
29	PO4	H	101	-	4,4,4	0.77	0	6,6,6	0.53	0
20	EDO	P	313	-	3,3,3	0.43	0	2,2,2	1.14	0
23	PSC	O	302	-	45,45,51	1.23	3 (6%)	48,50,59	1.85	8 (16%)
20	EDO	N	615	-	3,3,3	0.62	0	2,2,2	0.49	0
20	EDO	C	315	-	3,3,3	0.60	0	2,2,2	0.19	0
20	EDO	N	621	-	3,3,3	0.65	0	2,2,2	0.28	0
20	EDO	M	104	-	3,3,3	0.35	0	2,2,2	0.45	0
20	EDO	N	625	-	3,3,3	0.62	0	2,2,2	0.54	0
26	CDL	T	103	-	95,95,99	1.39	12 (12%)	101,107,111	1.61	19 (18%)
20	EDO	A	615	-	3,3,3	0.56	0	2,2,2	0.11	0
21	TGL	B	304	-	62,62,62	1.05	3 (4%)	65,65,65	1.25	10 (15%)
24	CHD	T	101	-	32,32,32	0.92	0	51,51,51	1.39	9 (17%)
20	EDO	Q	202	-	3,3,3	0.42	0	2,2,2	0.27	0
27	DMU	Z	101	-	34,34,34	0.49	0	45,45,45	1.62	9 (20%)
20	EDO	N	610	-	3,3,3	0.48	0	2,2,2	0.49	0
27	DMU	C	308	-	34,34,34	0.65	1 (2%)	45,45,45	1.78	7 (15%)
27	DMU	G	102	-	34,34,34	0.77	0	45,45,45	2.08	14 (31%)
25	PEK	C	302	-	52,52,52	0.85	2 (3%)	55,57,57	1.18	3 (5%)
27	DMU	K	105	-	34,34,34	0.60	0	45,45,45	1.73	10 (22%)
19	PGV	N	609	-	50,50,50	0.97	3 (6%)	53,56,56	1.10	4 (7%)
20	EDO	C	313	-	3,3,3	0.55	0	2,2,2	0.56	0
27	DMU	P	309	-	34,34,34	0.80	1 (2%)	45,45,45	2.07	16 (35%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
20	EDO	O	305	-	3,3,3	0.62	0	2,2,2	0.51	0
29	PO4	U	102	-	4,4,4	0.70	0	6,6,6	0.56	0
18	CMO	N	606[B]	15	0,1,1	-	-	-	-	-
19	PGV	P	305	-	50,50,50	0.65	1 (2%)	53,56,56	1.18	5 (9%)
27	DMU	K	102	-	22,22,34	0.49	0	27,27,45	1.40	5 (18%)
24	CHD	P	308	-	32,32,32	0.80	0	51,51,51	1.89	14 (27%)
20	EDO	D	202	-	3,3,3	0.49	0	2,2,2	0.29	0
20	EDO	G	106	-	3,3,3	0.76	0	2,2,2	0.87	0
18	CMO	A	606[A]	-	0,1,1	-	-	-	-	-
20	EDO	P	312	-	3,3,3	0.56	0	2,2,2	0.14	0
20	EDO	G	105	-	3,3,3	0.75	0	2,2,2	0.57	0
20	EDO	E	202	-	3,3,3	0.55	0	2,2,2	0.32	0
19	PGV	G	104	-	50,50,50	1.14	2 (4%)	53,56,56	1.34	5 (9%)
20	EDO	A	622	-	3,3,3	0.76	0	2,2,2	0.42	0
27	DMU	K	106	-	34,34,34	1.06	2 (5%)	45,45,45	1.71	14 (31%)
21	TGL	L	101	-	59,59,62	1.17	3 (5%)	62,62,65	1.44	9 (14%)
20	EDO	C	314	-	3,3,3	0.59	0	2,2,2	0.24	0
23	PSC	B	303	-	50,50,51	1.20	3 (6%)	56,58,59	1.46	7 (12%)
20	EDO	N	624	-	3,3,3	0.80	0	2,2,2	0.31	0
14	HEA	A	601[A]	-	57,67,67	1.54	10 (17%)	61,103,103	1.87	20 (32%)
25	PEK	T	102	-	43,43,52	1.18	2 (4%)	46,48,57	1.56	5 (10%)
20	EDO	N	613	-	3,3,3	0.80	0	2,2,2	0.45	0
20	EDO	E	203	-	3,3,3	0.54	0	2,2,2	0.61	0
20	EDO	C	310	-	3,3,3	0.34	0	2,2,2	1.17	0
14	HEA	N	601[A]	-	57,67,67	1.31	7 (12%)	61,103,103	1.74	16 (26%)
14	HEA	A	601[C]	-	57,57,67	1.98	11 (19%)	61,89,103	2.50	25 (40%)
27	DMU	X	202	-	34,34,34	0.64	1 (2%)	45,45,45	2.36	15 (33%)
27	DMU	O	303	-	31,31,34	0.54	0	36,38,45	2.92	16 (44%)
19	PGV	C	305	-	50,50,50	1.26	2 (4%)	53,56,56	1.77	9 (16%)
20	EDO	A	612	-	3,3,3	0.42	0	2,2,2	0.45	0
20	EDO	B	305	-	3,3,3	0.66	0	2,2,2	0.27	0
20	EDO	J	103	-	3,3,3	0.64	0	2,2,2	0.15	0
27	DMU	P	316	-	34,34,34	1.20	3 (8%)	45,45,45	2.29	12 (26%)
24	CHD	W	101	-	32,32,32	0.86	0	51,51,51	3.54	23 (45%)
25	PEK	P	302	-	47,47,52	1.18	2 (4%)	50,52,57	1.44	5 (10%)
20	EDO	F	102	-	3,3,3	0.74	0	2,2,2	0.42	0
27	DMU	K	103	-	34,34,34	0.53	0	45,45,45	1.12	3 (6%)
25	PEK	P	303	-	44,44,52	0.77	1 (2%)	47,49,57	1.30	5 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
20	EDO	N	626	-	3,3,3	0.49	0	2,2,2	0.31	0
20	EDO	A	619	-	3,3,3	0.60	0	2,2,2	0.28	0
20	EDO	N	622	-	3,3,3	0.63	0	2,2,2	0.12	0
20	EDO	B	307	-	3,3,3	0.77	0	2,2,2	0.08	0
26	CDL	P	306	-	79,82,99	1.49	12 (15%)	82,87,111	1.58	11 (13%)
27	DMU	X	205	-	22,22,34	0.70	1 (4%)	27,27,45	0.67	0
20	EDO	D	204	-	3,3,3	0.78	0	2,2,2	0.41	0
20	EDO	F	106	-	3,3,3	0.63	0	2,2,2	0.16	0
20	EDO	N	619	-	3,3,3	0.29	0	2,2,2	0.90	0
20	EDO	A	614	-	3,3,3	0.41	0	2,2,2	0.50	0
20	EDO	A	620	-	3,3,3	0.70	0	2,2,2	0.12	0
19	PGV	A	607	-	47,47,50	1.06	2 (4%)	50,53,56	1.08	4 (8%)
20	EDO	F	103	-	3,3,3	0.69	0	2,2,2	0.62	0
22	CUA	B	302	2	0,1,1	-	-	-	-	-
27	DMU	M	106	-	34,34,34	0.86	1 (2%)	45,45,45	1.90	13 (28%)
27	DMU	C	307	-	34,34,34	0.47	0	45,45,45	0.92	2 (4%)
20	EDO	C	317	-	3,3,3	0.51	0	2,2,2	0.39	0
20	EDO	D	203	-	3,3,3	0.64	0	2,2,2	0.34	0
18	CMO	N	606[A]	-	0,1,1	-	-	-	-	-
19	PGV	C	304	-	49,49,50	0.70	1 (2%)	52,55,56	0.87	2 (3%)
20	EDO	P	310	-	3,3,3	0.90	0	2,2,2	0.23	0
20	EDO	N	614	-	3,3,3	0.56	0	2,2,2	0.06	0
20	EDO	C	316	-	3,3,3	0.49	0	2,2,2	0.17	0
27	DMU	M	101	-	34,34,34	0.59	1 (2%)	45,45,45	1.12	3 (6%)

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
21	TGL	N	608	-	-	20/65/65/65	-
20	EDO	O	306	-	-	0/1/1/1	-
27	DMU	T	104	-	-	10/13/33/59	0/1/1/2
20	EDO	B	306	-	-	0/1/1/1	-
21	TGL	B	301	-	-	18/65/65/65	-
24	CHD	J	102	-	-	4/9/74/74	0/4/4/4
24	CHD	P	301	-	-	2/9/74/74	0/4/4/4
20	EDO	I	101	-	-	1/1/1/1	-
24	CHD	J	101	-	-	4/9/74/74	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
20	EDO	M	105	-	-	1/1/1/1	-
14	HEA	N	601[C]	-	-	6/32/60/76	-
27	DMU	K	101	-	-	10/13/29/59	0/1/1/2
20	EDO	P	311	-	-	0/1/1/1	-
20	EDO	S	106	-	-	0/1/1/1	-
24	CHD	C	301	-	-	1/9/74/74	0/4/4/4
20	EDO	N	617	-	-	1/1/1/1	-
20	EDO	Y	103	-	-	1/1/1/1	-
27	DMU	K	104	-	-	6/19/59/59	0/2/2/2
20	EDO	N	611	-	-	0/1/1/1	-
20	EDO	B	310	-	-	0/1/1/1	-
20	EDO	Q	203	-	-	1/1/1/1	-
20	EDO	F	104	-	-	0/1/1/1	-
20	EDO	M	102	-	-	1/1/1/1	-
20	EDO	R	202	-	-	0/1/1/1	-
20	EDO	B	308	-	-	0/1/1/1	-
24	CHD	G	103	-	-	2/9/74/74	0/4/4/4
20	EDO	S	102	-	-	0/1/1/1	-
27	DMU	X	204	-	-	11/19/59/59	0/2/2/2
20	EDO	A	617	-	-	1/1/1/1	-
27	DMU	L	102	-	-	14/19/59/59	0/2/2/2
20	EDO	D	205	-	-	0/1/1/1	-
20	EDO	A	610	-	-	0/1/1/1	-
20	EDO	P	315	-	-	1/1/1/1	-
20	EDO	F	105	-	-	1/1/1/1	-
20	EDO	S	104	-	-	0/1/1/1	-
20	EDO	A	618	-	-	0/1/1/1	-
20	EDO	M	103	-	-	0/1/1/1	-
20	EDO	A	609	-	-	0/1/1/1	-
26	CDL	C	306	-	-	54/94/94/110	-
20	EDO	V	101	-	-	1/1/1/1	-
25	PEK	C	303	-	-	22/56/56/56	-
20	EDO	O	307	-	-	0/1/1/1	-
24	CHD	Y	101	-	-	3/9/74/74	0/4/4/4
20	EDO	S	103	-	-	0/1/1/1	-
20	EDO	U	101	-	-	1/1/1/1	-
20	EDO	L	103	-	-	0/1/1/1	-
19	PGV	N	607	-	-	24/55/55/55	-
20	EDO	T	106	-	-	0/1/1/1	-
20	EDO	N	618	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
27	DMU	P	307	-	-	5/19/59/59	0/2/2/2
20	EDO	T	105	-	-	0/1/1/1	-
20	EDO	P	314	-	-	0/1/1/1	-
20	EDO	C	311	-	-	1/1/1/1	-
20	EDO	C	312	-	-	0/1/1/1	-
20	EDO	A	611	-	-	1/1/1/1	-
20	EDO	Q	204	-	-	1/1/1/1	-
14	HEA	N	602	1	-	4/32/76/76	-
20	EDO	J	104	-	-	1/1/1/1	-
20	EDO	N	623	-	-	0/1/1/1	-
21	TGL	Y	102	-	-	35/65/65/65	-
20	EDO	C	309	-	-	0/1/1/1	-
26	CDL	G	101	-	-	39/109/109/110	-
19	PGV	A	608	-	-	10/55/55/55	-
21	TGL	Q	201	-	-	23/65/65/65	-
20	EDO	B	309	-	-	1/1/1/1	-
27	DMU	X	203	-	-	8/13/33/59	0/1/1/2
20	EDO	N	620	-	-	1/1/1/1	-
20	EDO	A	621	-	-	0/1/1/1	-
20	EDO	S	105	-	-	0/1/1/1	-
20	EDO	D	201	-	-	1/1/1/1	-
20	EDO	O	304	-	-	0/1/1/1	-
14	HEA	A	602	1	-	4/32/76/76	-
20	EDO	R	201	-	-	0/1/1/1	-
25	PEK	P	304	-	-	23/56/56/56	-
27	DMU	X	201	-	-	12/19/59/59	0/2/2/2
20	EDO	A	613	-	-	0/1/1/1	-
20	EDO	N	616	-	-	0/1/1/1	-
20	EDO	N	612	-	-	1/1/1/1	-
20	EDO	E	201	-	-	0/1/1/1	-
20	EDO	A	616	-	-	0/1/1/1	-
20	EDO	P	313	-	-	1/1/1/1	-
23	PSC	O	302	-	-	17/49/49/55	-
20	EDO	N	615	-	-	0/1/1/1	-
20	EDO	C	315	-	-	0/1/1/1	-
20	EDO	N	621	-	-	0/1/1/1	-
20	EDO	M	104	-	-	0/1/1/1	-
20	EDO	N	625	-	-	1/1/1/1	-
26	CDL	T	103	-	-	41/106/106/110	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
20	EDO	A	615	-	-	0/1/1/1	-
21	TGL	B	304	-	-	25/65/65/65	-
24	CHD	T	101	-	-	2/9/74/74	0/4/4/4
20	EDO	Q	202	-	-	0/1/1/1	-
27	DMU	Z	101	-	-	4/19/59/59	0/2/2/2
20	EDO	N	610	-	-	0/1/1/1	-
27	DMU	C	308	-	-	8/19/59/59	0/2/2/2
27	DMU	G	102	-	-	12/19/59/59	0/2/2/2
25	PEK	C	302	-	-	13/56/56/56	-
27	DMU	K	105	-	-	7/19/59/59	0/2/2/2
19	PGV	N	609	-	-	6/55/55/55	-
20	EDO	C	313	-	-	0/1/1/1	-
27	DMU	P	309	-	-	10/19/59/59	0/2/2/2
20	EDO	O	305	-	-	1/1/1/1	-
19	PGV	P	305	-	-	10/55/55/55	-
27	DMU	K	102	-	-	7/13/33/59	0/1/1/2
24	CHD	P	308	-	-	5/9/74/74	0/4/4/4
20	EDO	D	202	-	-	0/1/1/1	-
20	EDO	G	106	-	-	0/1/1/1	-
20	EDO	P	312	-	-	0/1/1/1	-
20	EDO	G	105	-	-	0/1/1/1	-
20	EDO	E	202	-	-	1/1/1/1	-
19	PGV	G	104	-	-	17/55/55/55	-
20	EDO	A	622	-	-	1/1/1/1	-
27	DMU	K	106	-	-	9/19/59/59	0/2/2/2
21	TGL	L	101	-	-	33/62/62/65	-
20	EDO	C	314	-	-	1/1/1/1	-
23	PSC	B	303	-	-	28/54/54/55	-
20	EDO	N	624	-	-	0/1/1/1	-
14	HEA	A	601[A]	-	-	4/32/76/76	-
25	PEK	T	102	-	-	25/47/47/56	-
20	EDO	N	613	-	-	0/1/1/1	-
20	EDO	E	203	-	-	0/1/1/1	-
20	EDO	C	310	-	-	1/1/1/1	-
14	HEA	N	601[A]	-	-	3/32/76/76	-
14	HEA	A	601[C]	-	-	6/32/60/76	-
27	DMU	X	202	-	-	13/19/59/59	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
27	DMU	O	303	-	-	12/27/47/59	0/1/1/2
19	PGV	C	305	-	-	15/55/55/55	-
20	EDO	A	612	-	-	1/1/1/1	-
20	EDO	B	305	-	-	0/1/1/1	-
20	EDO	J	103	-	-	0/1/1/1	-
27	DMU	P	316	-	-	10/19/59/59	0/2/2/2
24	CHD	W	101	-	-	9/9/74/74	0/4/4/4
25	PEK	P	302	-	-	19/51/51/56	-
20	EDO	F	102	-	-	0/1/1/1	-
27	DMU	K	103	-	-	10/19/59/59	0/2/2/2
25	PEK	P	303	-	-	7/48/48/56	-
20	EDO	N	626	-	-	0/1/1/1	-
20	EDO	A	619	-	-	0/1/1/1	-
20	EDO	N	622	-	-	0/1/1/1	-
20	EDO	B	307	-	-	0/1/1/1	-
26	CDL	P	306	-	-	30/83/85/110	-
27	DMU	X	205	-	-	3/13/33/59	0/1/1/2
20	EDO	D	204	-	-	0/1/1/1	-
20	EDO	F	106	-	-	1/1/1/1	-
20	EDO	N	619	-	-	0/1/1/1	-
20	EDO	A	614	-	-	0/1/1/1	-
20	EDO	A	620	-	-	1/1/1/1	-
19	PGV	A	607	-	-	23/52/52/55	-
20	EDO	F	103	-	-	0/1/1/1	-
27	DMU	M	106	-	-	9/19/59/59	0/2/2/2
27	DMU	C	307	-	-	6/19/59/59	0/2/2/2
20	EDO	C	317	-	-	1/1/1/1	-
20	EDO	D	203	-	-	0/1/1/1	-
19	PGV	C	304	-	-	10/54/54/55	-
20	EDO	P	310	-	-	0/1/1/1	-
20	EDO	N	614	-	-	0/1/1/1	-
20	EDO	C	316	-	-	0/1/1/1	-
27	DMU	M	101	-	-	5/19/59/59	0/2/2/2

The worst 5 of 174 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	A	601[C]	HEA	C18-C19	9.76	1.56	1.33
14	N	601[C]	HEA	C18-C19	7.95	1.52	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	C	305	PGV	O03-C19	5.86	1.50	1.33
25	C	303	PEK	O03-C21	5.46	1.49	1.33
26	C	306	CDL	OA8-CA7	5.41	1.49	1.33

The worst 5 of 609 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
14	A	601[C]	HEA	C13-C12-C11	-9.28	100.41	114.35
24	W	101	CHD	C14-C8-C9	-8.95	97.43	109.71
24	W	101	CHD	C10-C9-C8	8.73	121.20	111.82
26	C	306	CDL	OA8-CA6-CA4	8.43	132.98	108.43
24	W	101	CHD	C11-C12-C13	7.47	118.92	111.24

There are no chirality outliers.

5 of 877 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
14	A	601[C]	HEA	C17-C18-C19-C20
14	A	601[C]	HEA	C17-C18-C19-C27
19	A	607	PGV	C03-O11-P-O12
19	A	607	PGV	C03-O11-P-O13
19	A	607	PGV	C03-O11-P-O14

There are no ring outliers.

80 monomers are involved in 292 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
21	N	608	TGL	2	0
27	T	104	DMU	1	0
21	B	301	TGL	7	0
24	J	102	CHD	2	0
24	J	101	CHD	1	0
20	M	105	EDO	1	0
20	N	617	EDO	3	0
27	K	104	DMU	1	0
20	B	310	EDO	1	0
27	X	204	DMU	1	0
20	A	617	EDO	3	0
27	L	102	DMU	7	0
20	S	104	EDO	1	0
20	M	103	EDO	5	0

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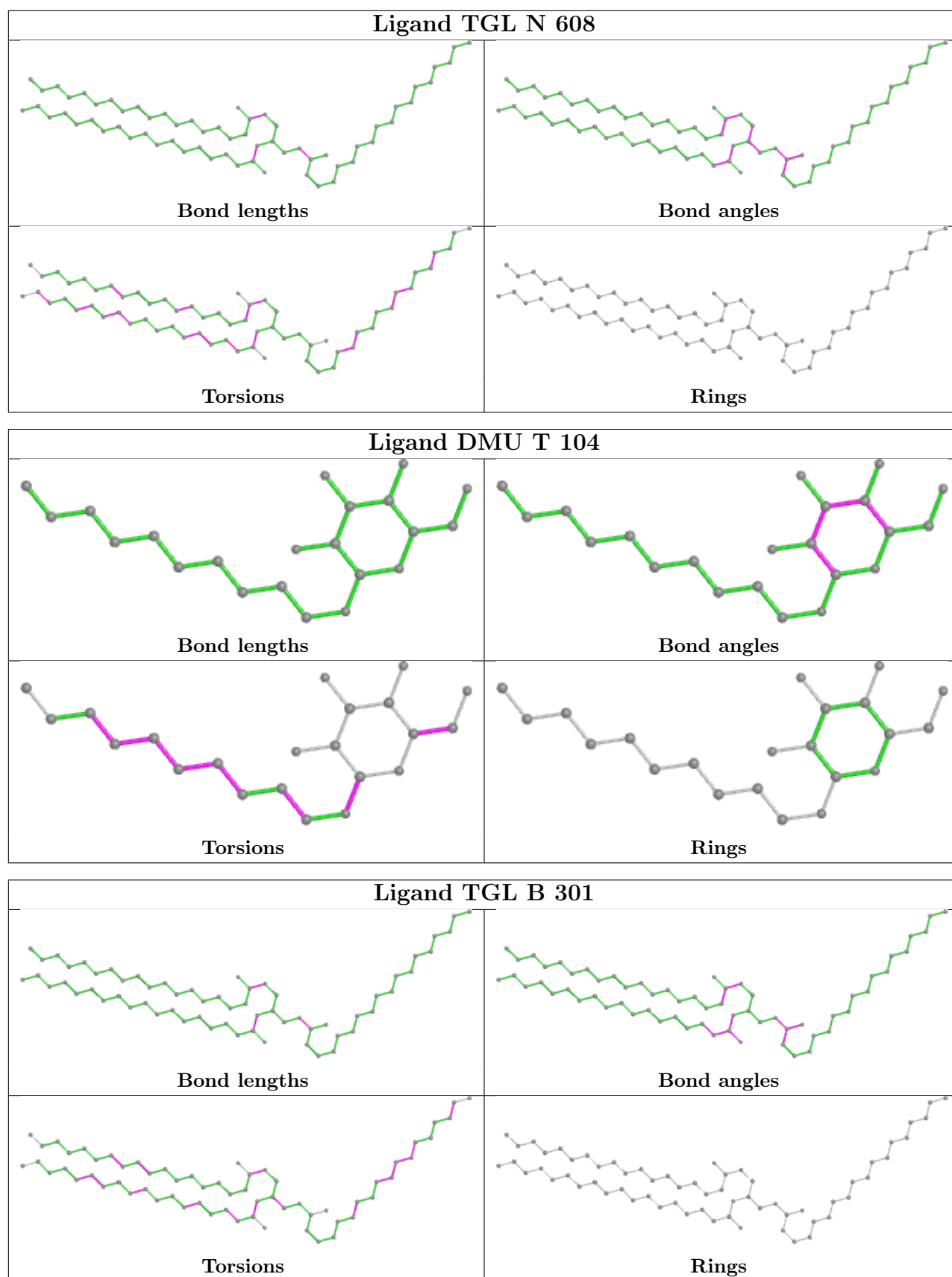
Mol	Chain	Res	Type	Clashes	Symm-Clashes
26	C	306	CDL	3	0
20	V	101	EDO	2	0
25	C	303	PEK	6	0
24	Y	101	CHD	1	0
20	U	101	EDO	4	0
20	L	103	EDO	3	0
19	N	607	PGV	6	0
20	N	618	EDO	5	0
27	P	307	DMU	5	0
20	A	611	EDO	1	0
20	Q	204	EDO	1	0
14	N	602	HEA	4	0
20	J	104	EDO	1	0
21	Y	102	TGL	9	0
26	G	101	CDL	20	0
21	Q	201	TGL	6	0
20	B	309	EDO	1	0
27	X	203	DMU	3	0
20	A	621	EDO	1	0
14	A	602	HEA	3	0
20	R	201	EDO	1	0
25	P	304	PEK	6	0
27	X	201	DMU	2	0
20	A	613	EDO	1	0
20	N	616	EDO	2	0
20	N	612	EDO	2	0
23	O	302	PSC	4	0
20	C	315	EDO	1	0
20	N	625	EDO	2	0
26	T	103	CDL	16	0
21	B	304	TGL	11	0
20	Q	202	EDO	1	0
27	Z	101	DMU	3	0
27	C	308	DMU	7	0
27	G	102	DMU	8	0
25	C	302	PEK	5	0
27	K	105	DMU	1	0
27	P	309	DMU	4	0
19	P	305	PGV	3	0
27	K	102	DMU	1	0
24	P	308	CHD	2	0
20	D	202	EDO	1	0

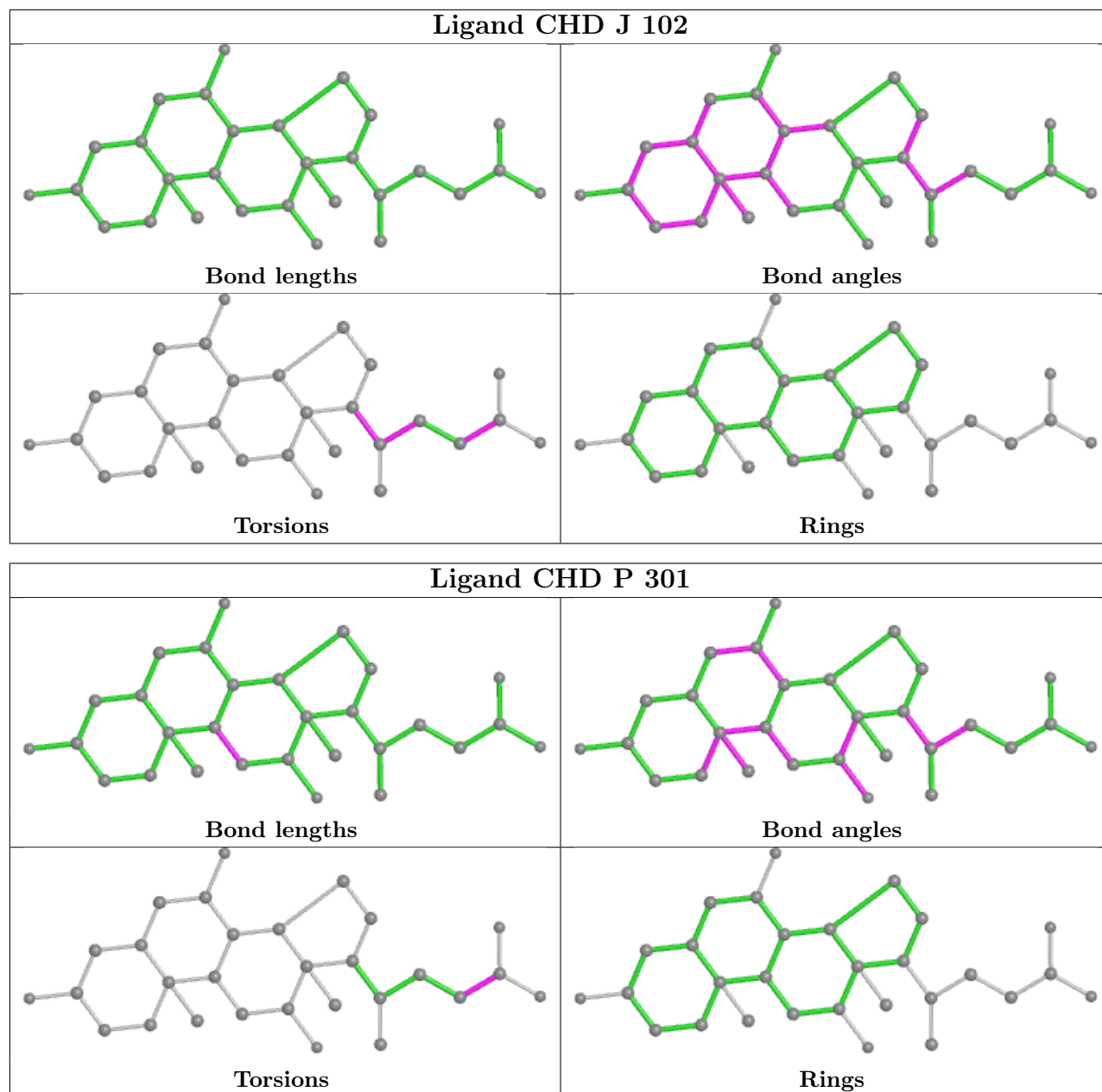
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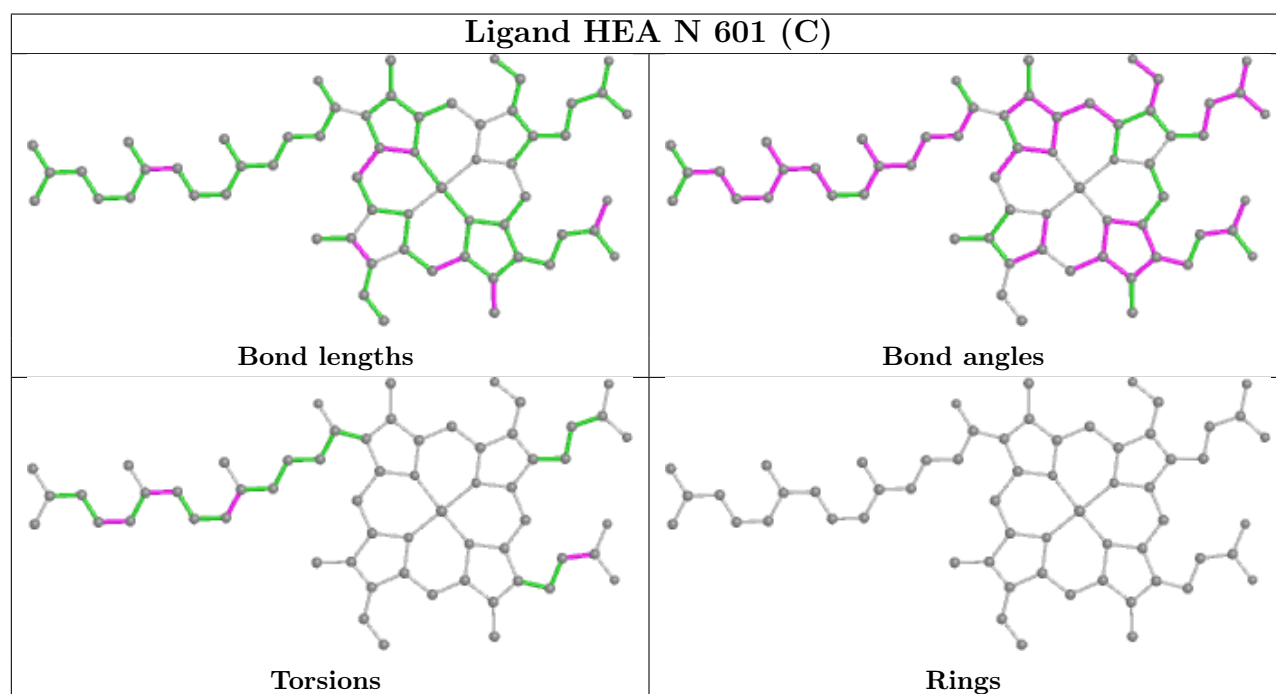
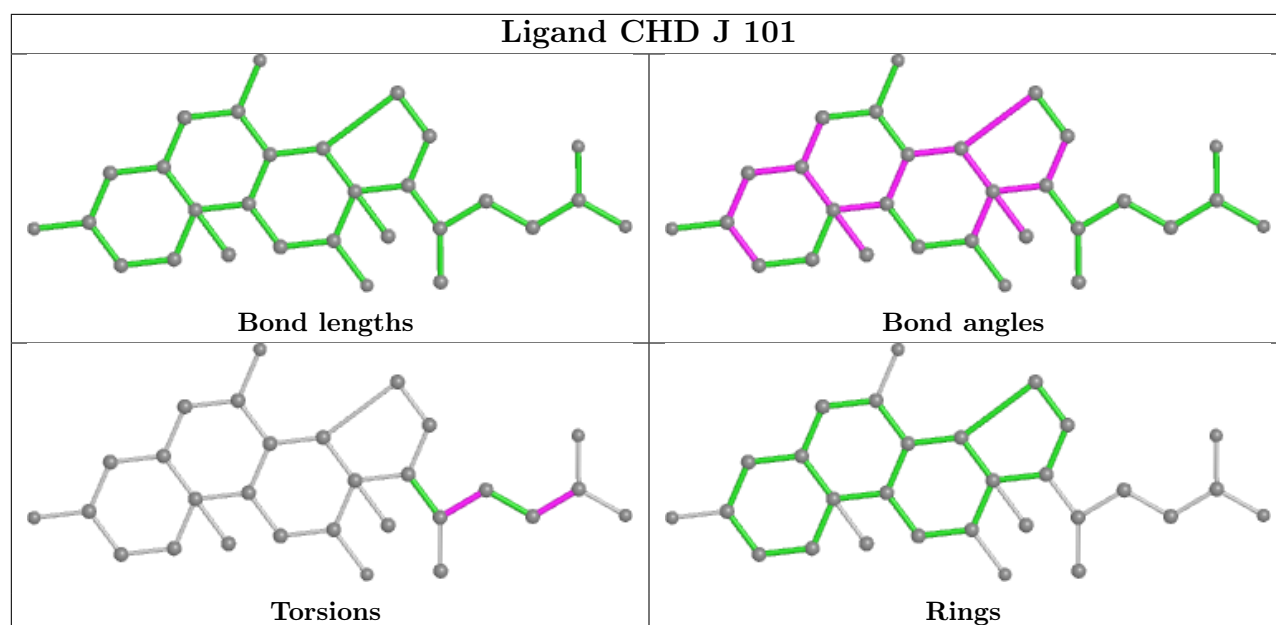
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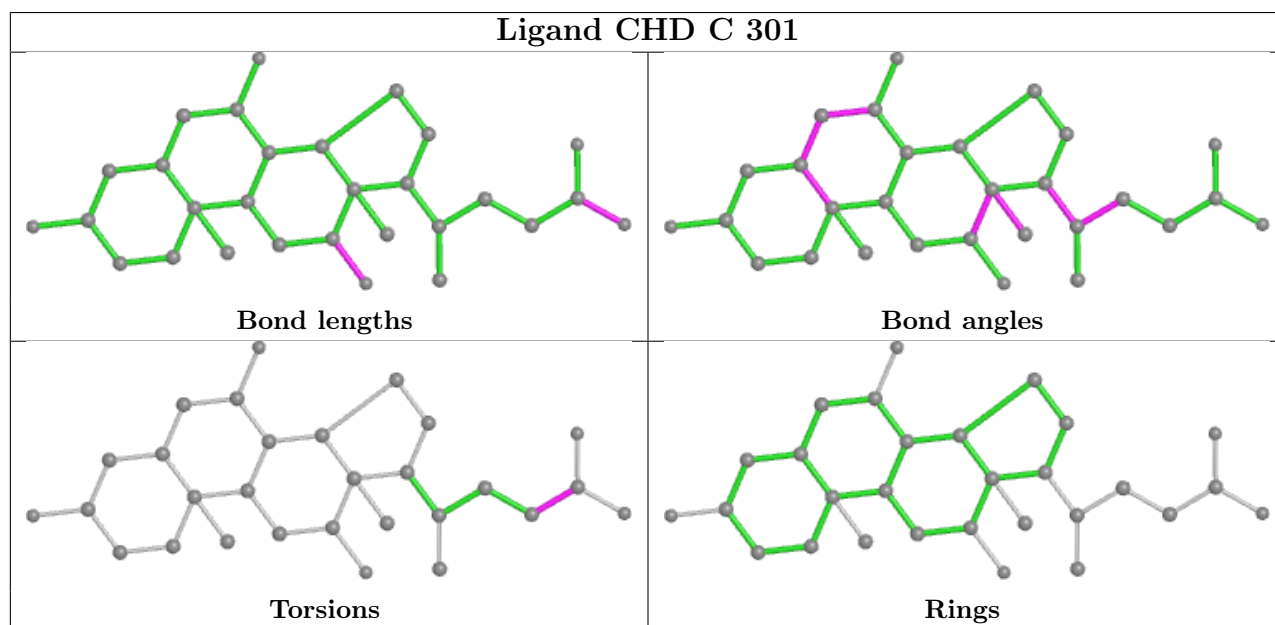
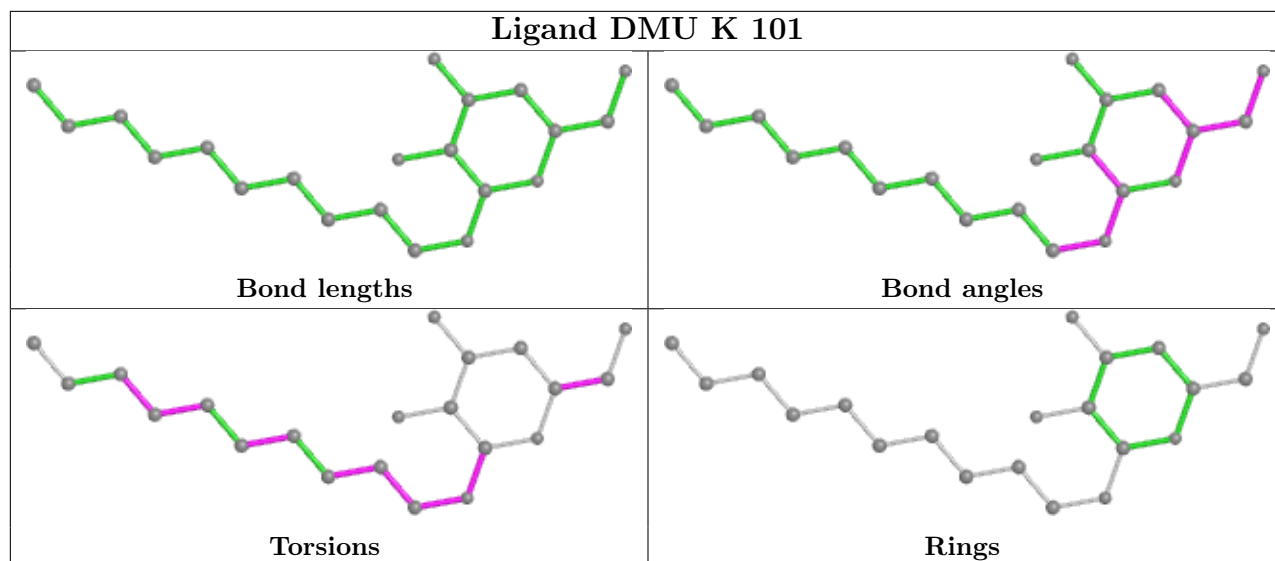
Mol	Chain	Res	Type	Clashes	Symm-Clashes
19	G	104	PGV	6	0
20	A	622	EDO	4	0
27	K	106	DMU	5	0
21	L	101	TGL	13	0
23	B	303	PSC	13	0
14	A	601[A]	HEA	3	0
25	T	102	PEK	4	0
14	N	601[A]	HEA	2	0
14	A	601[C]	HEA	1	0
27	X	202	DMU	4	0
27	O	303	DMU	1	0
19	C	305	PGV	4	0
27	P	316	DMU	8	0
24	W	101	CHD	1	0
25	P	302	PEK	6	0
27	K	103	DMU	1	0
20	N	626	EDO	2	0
26	P	306	CDL	10	0
27	X	205	DMU	1	0
20	F	106	EDO	1	0
19	A	607	PGV	4	0
27	M	106	DMU	2	0
27	C	307	DMU	5	0
19	C	304	PGV	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.

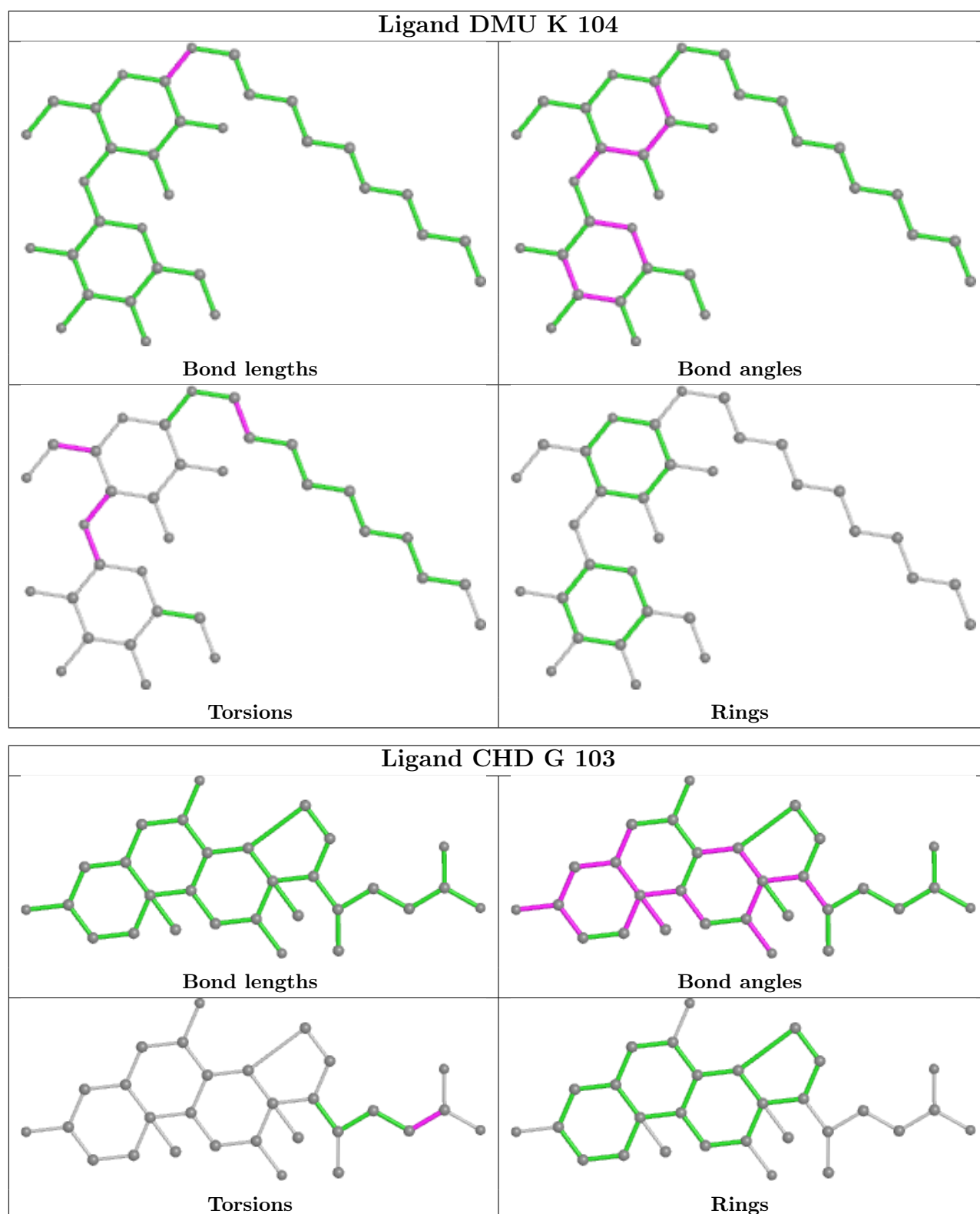


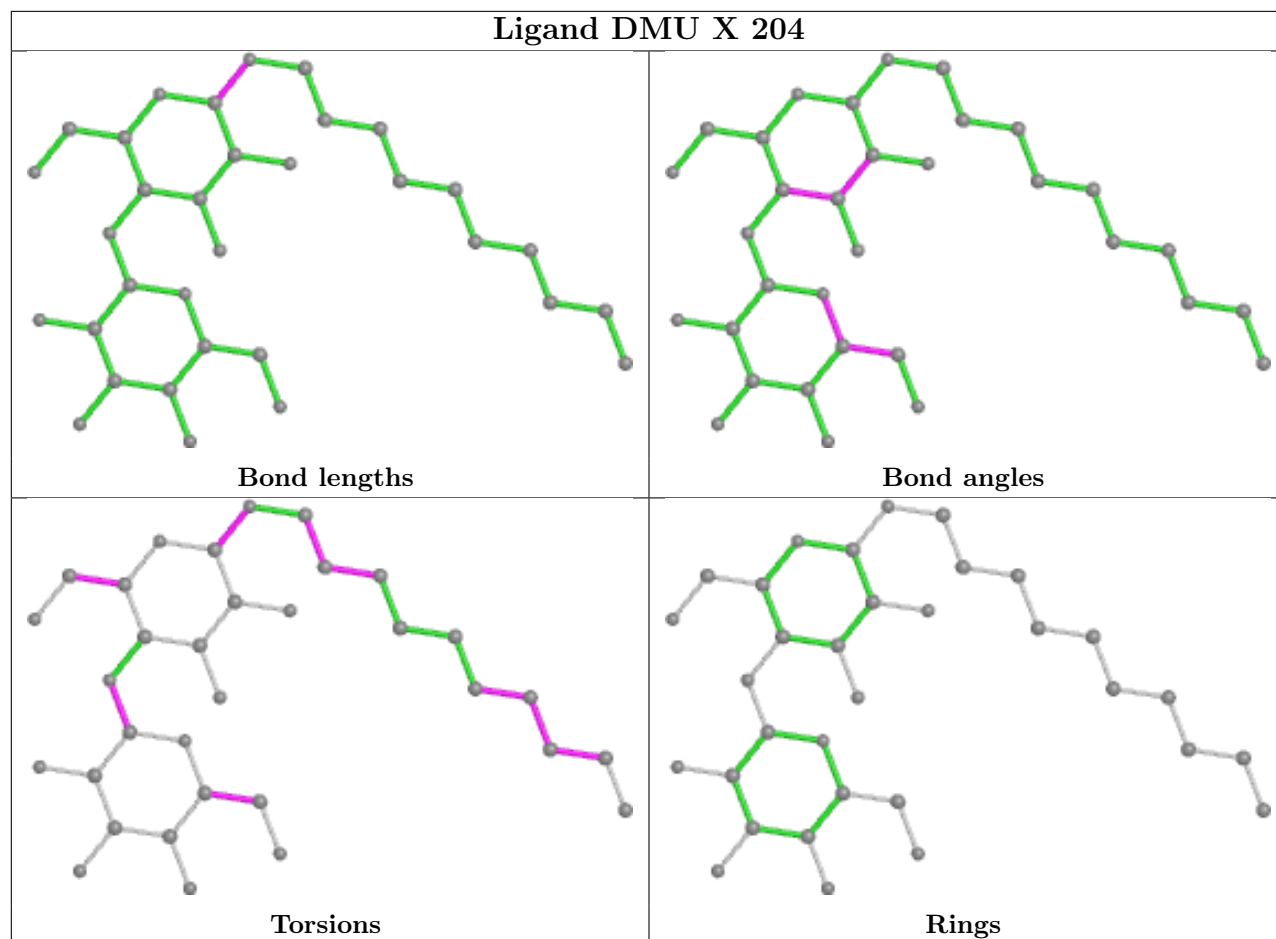


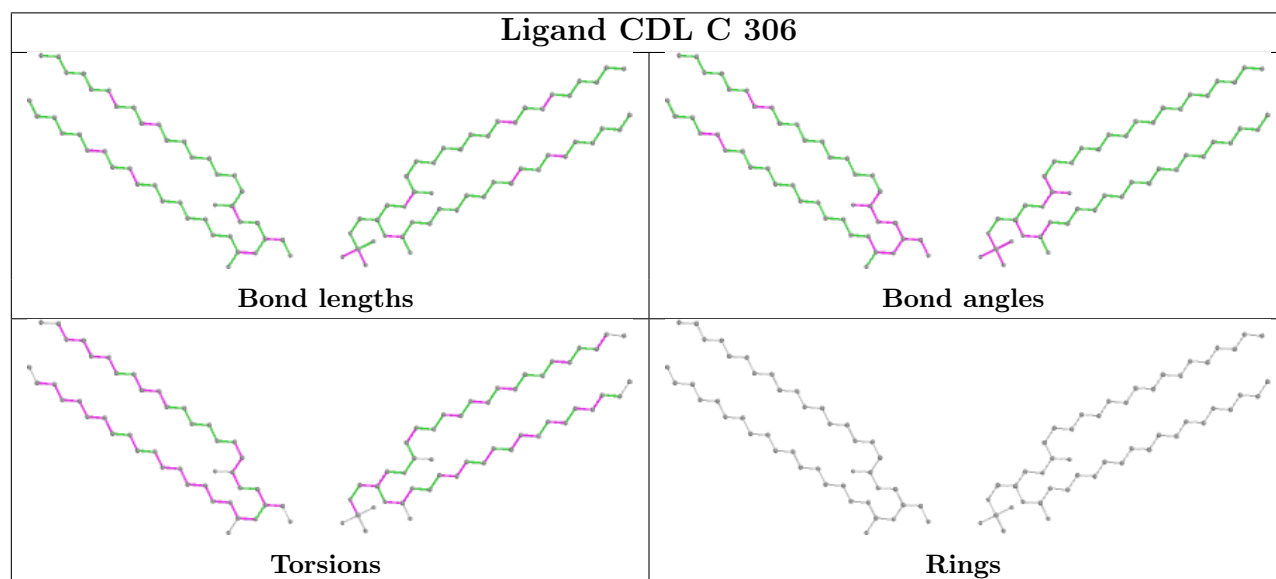
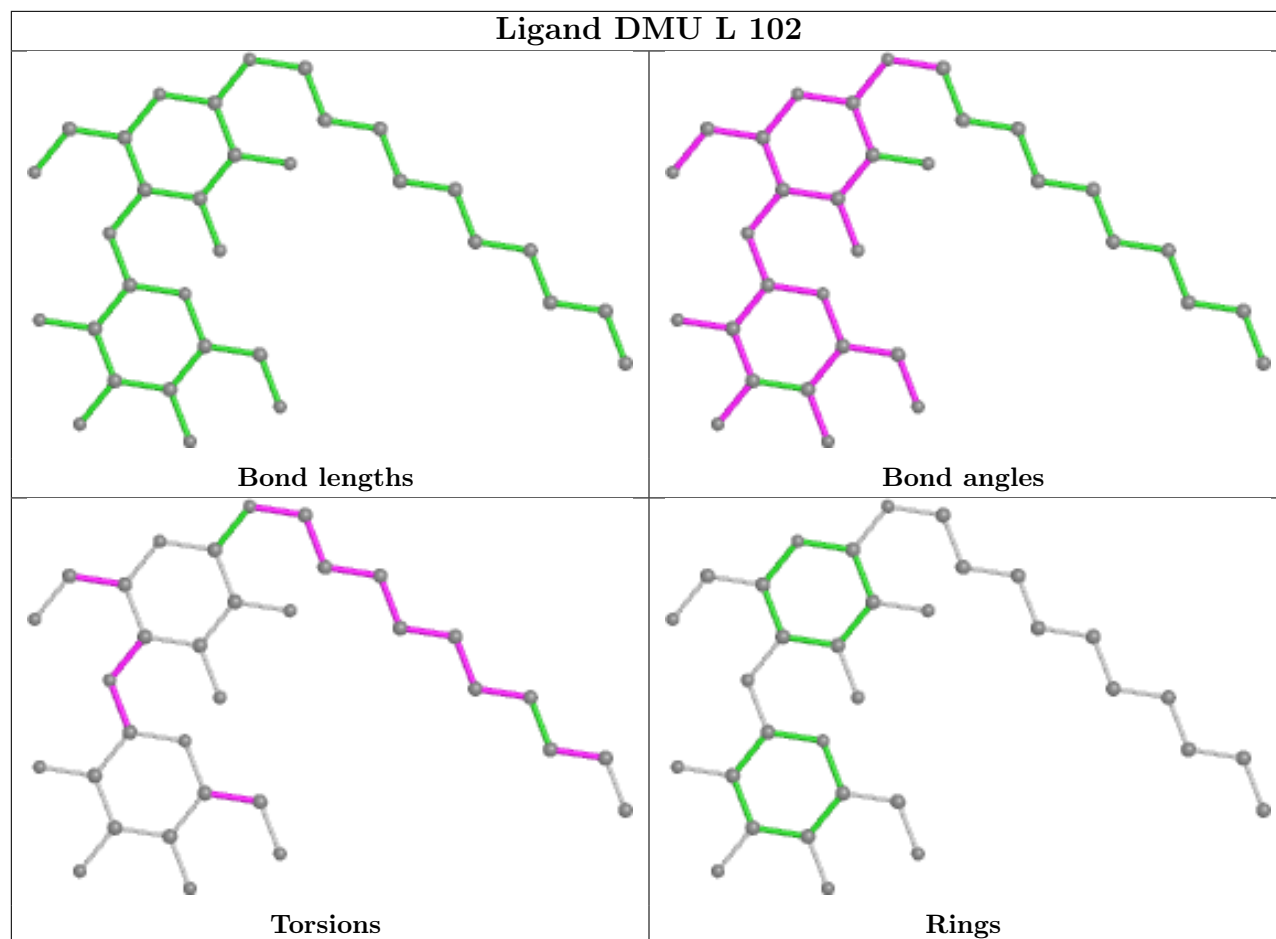


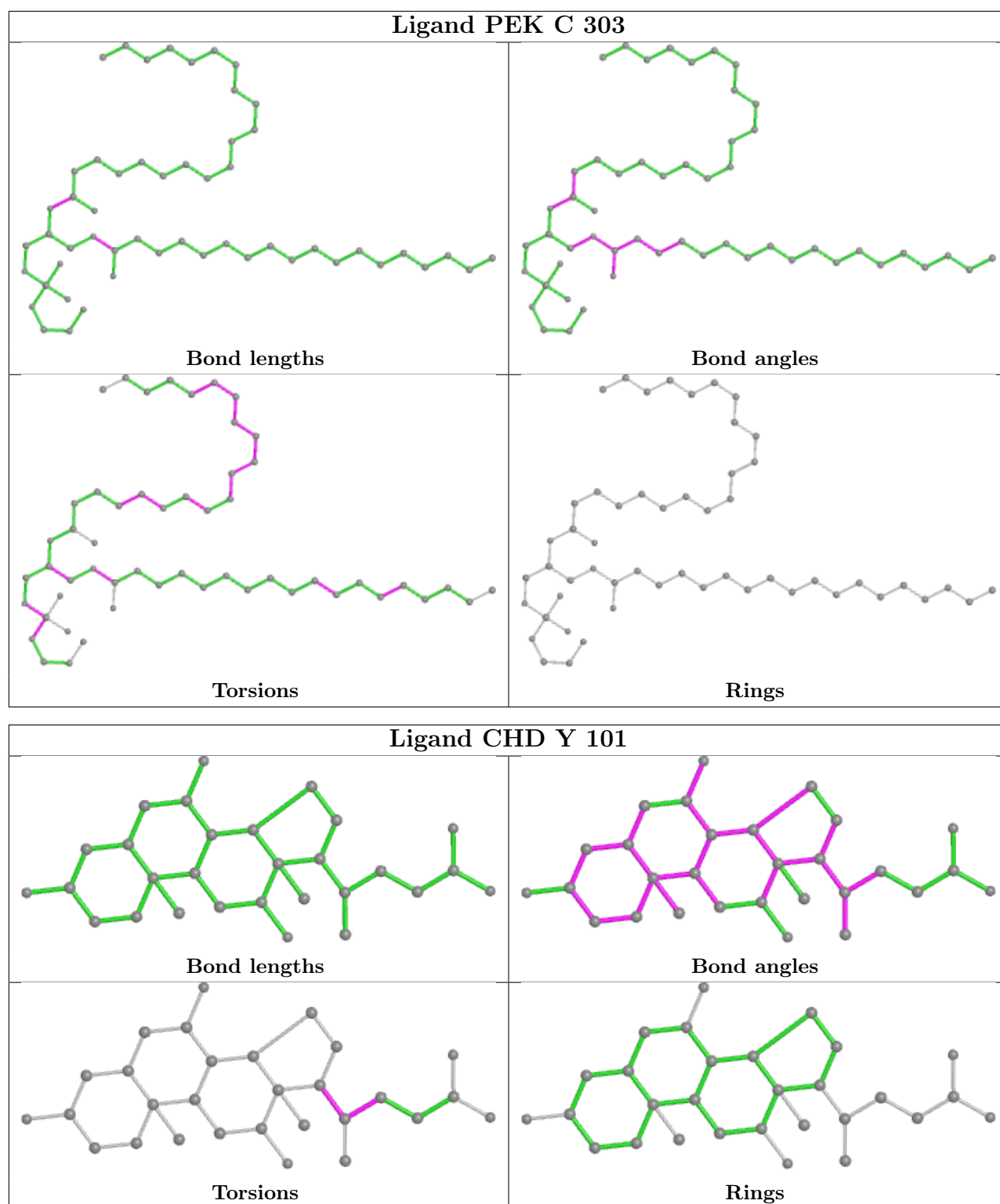


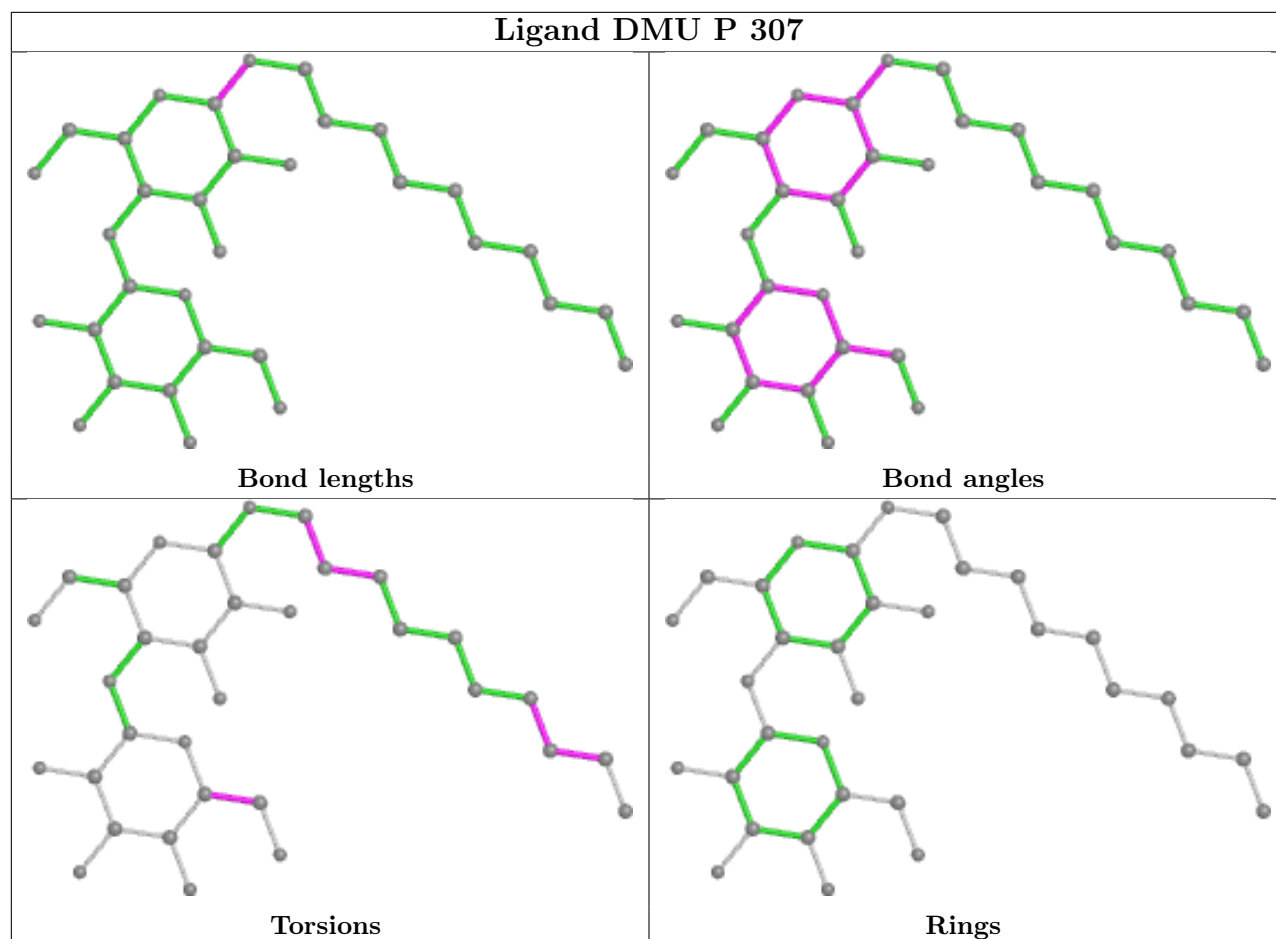
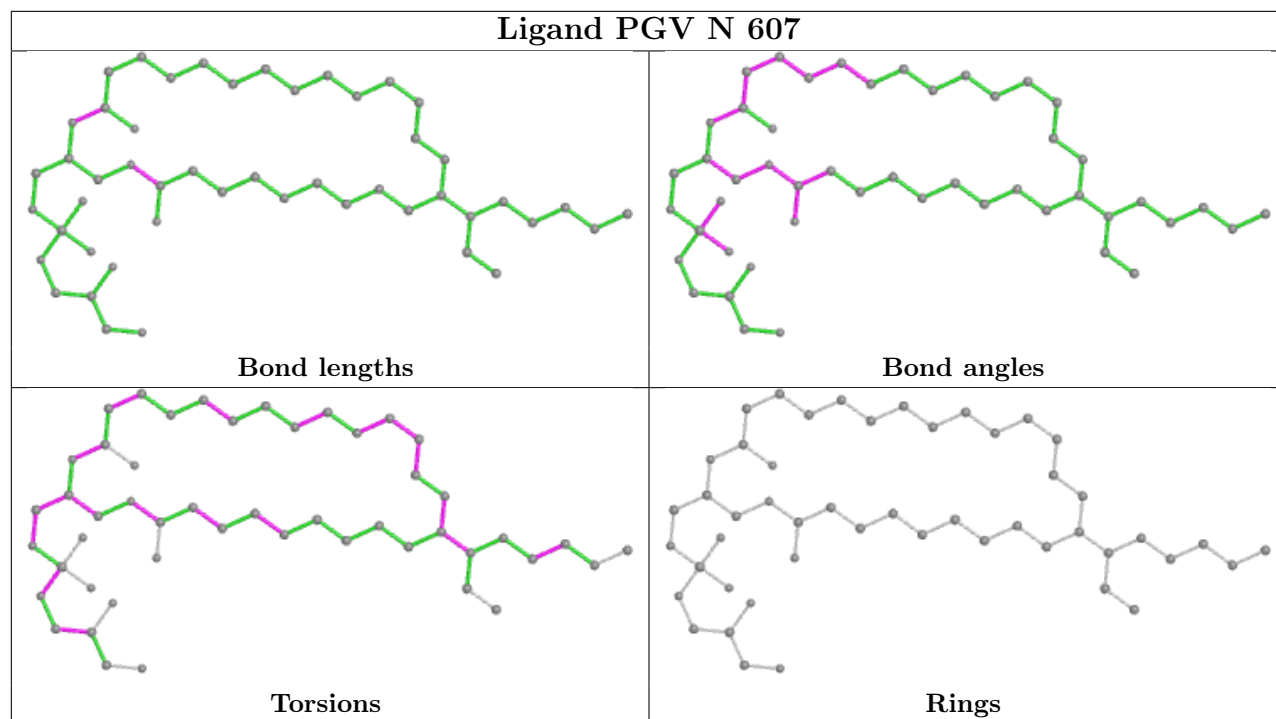


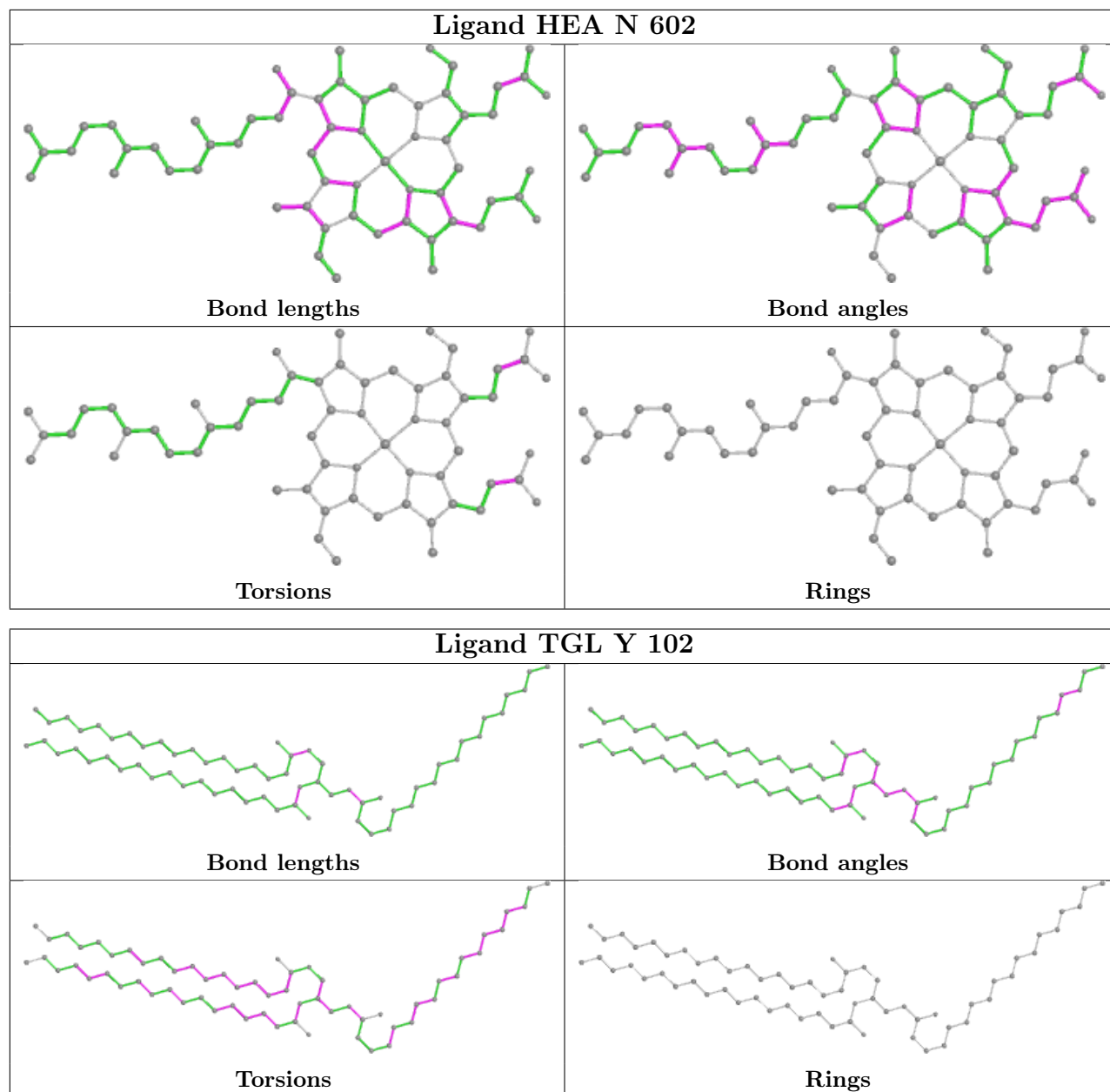


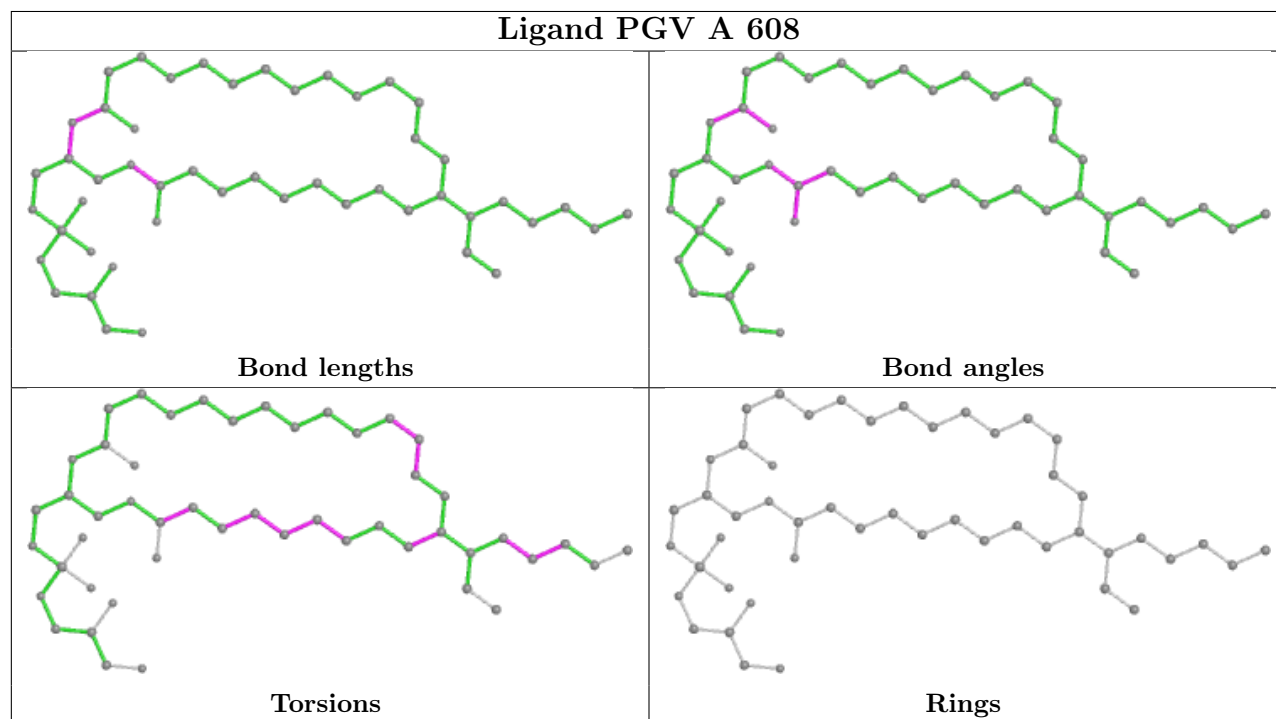
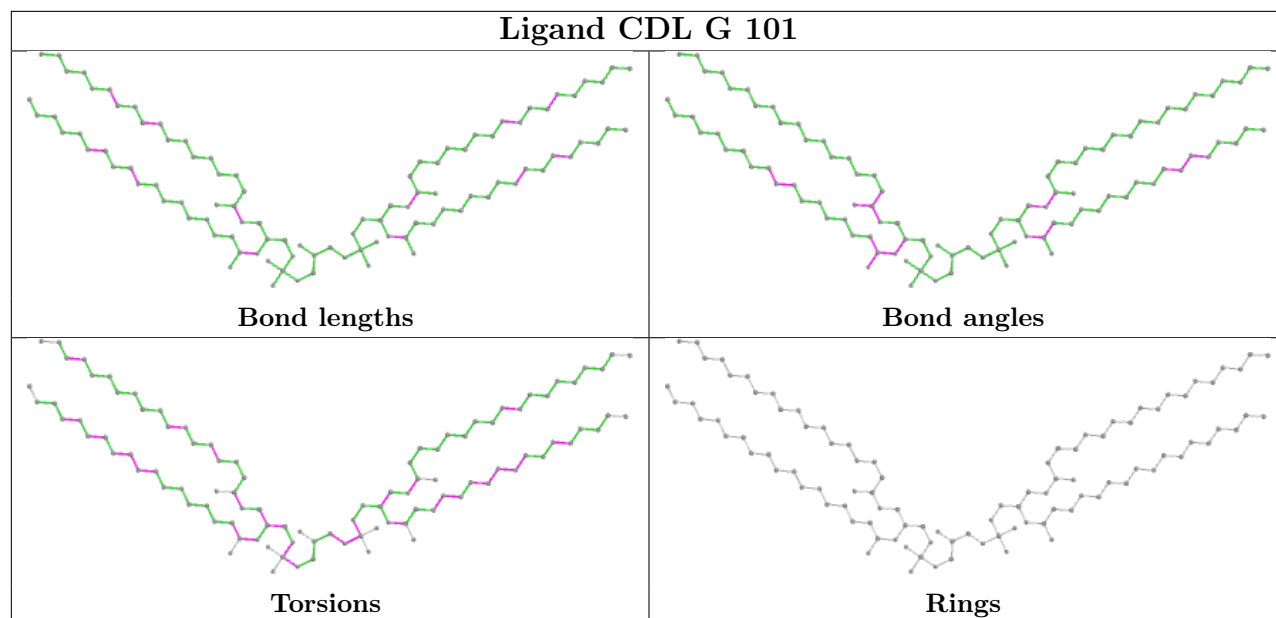


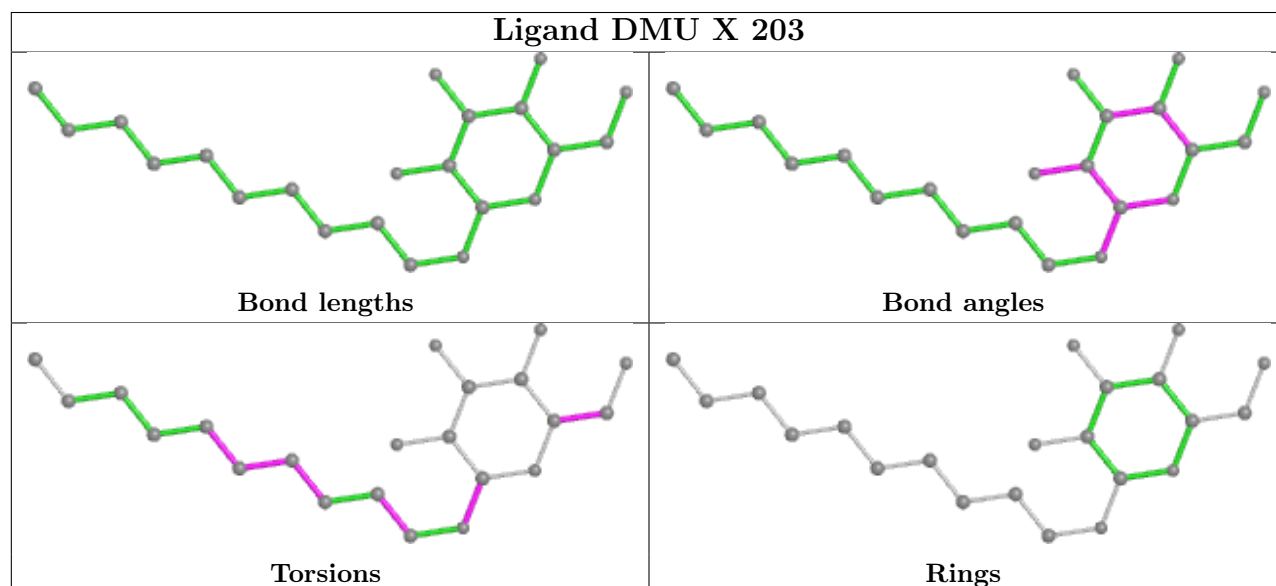
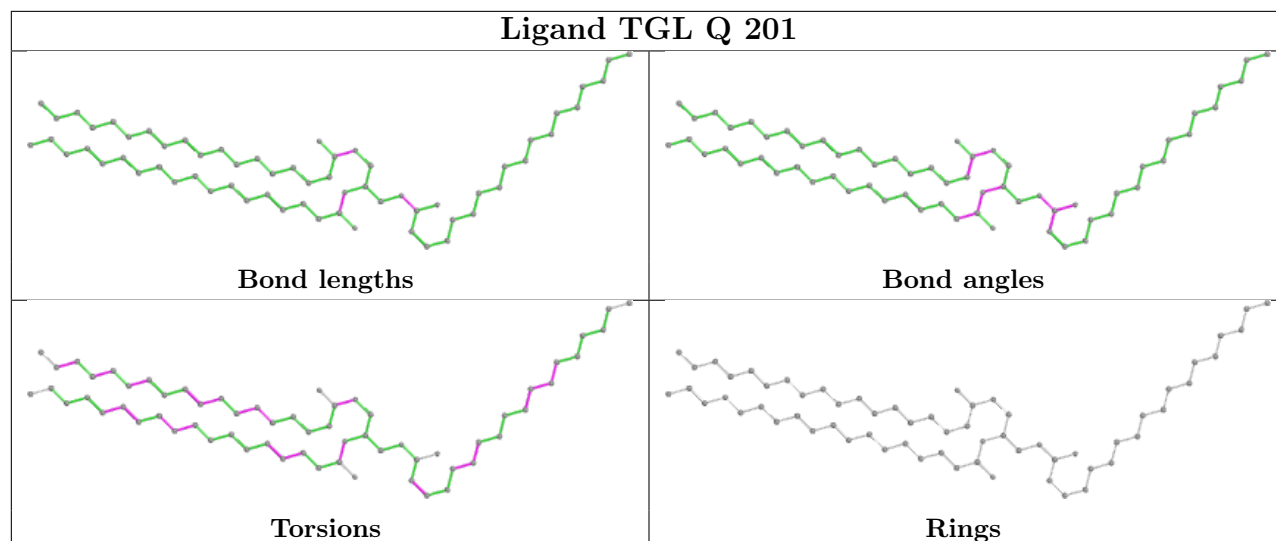




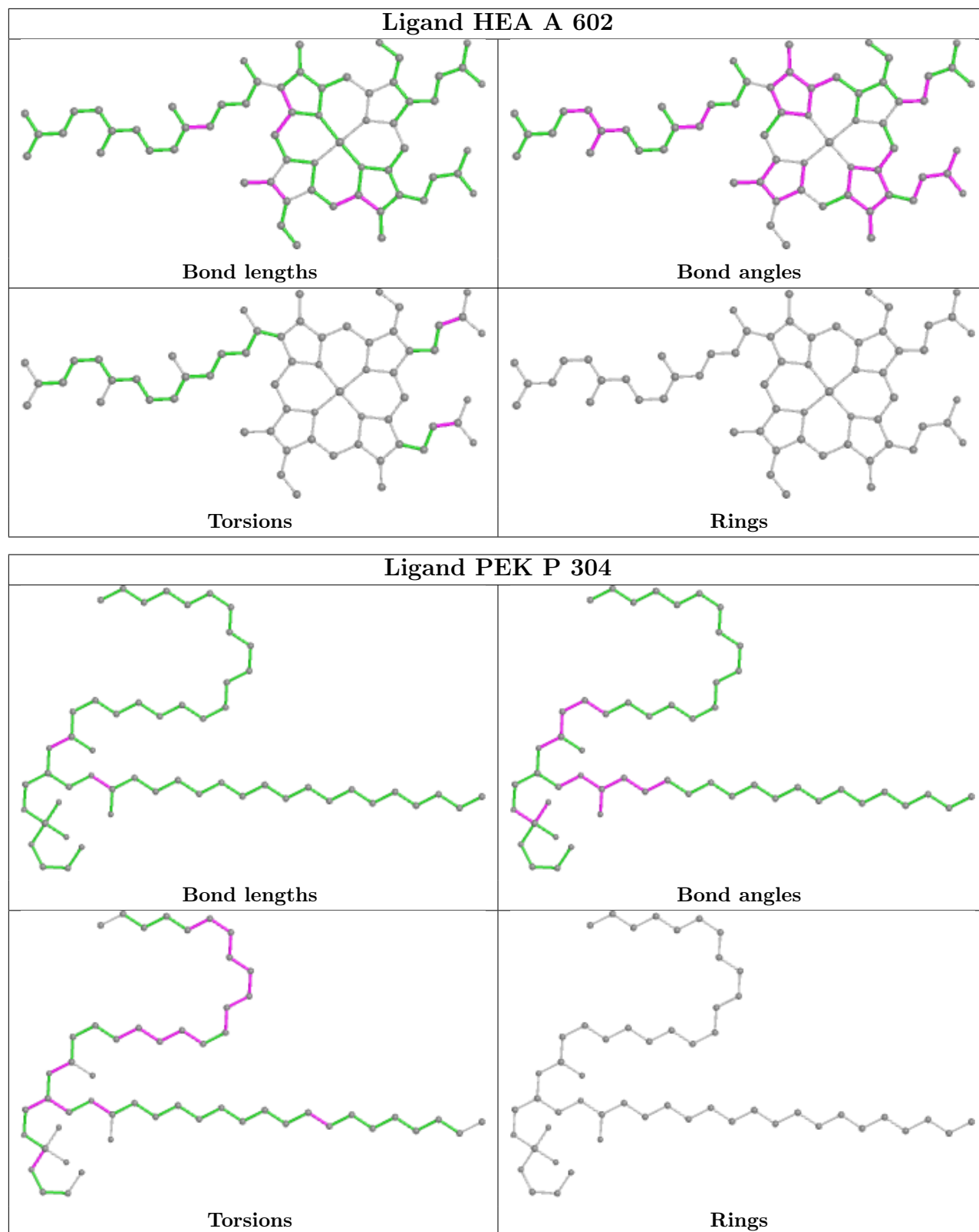


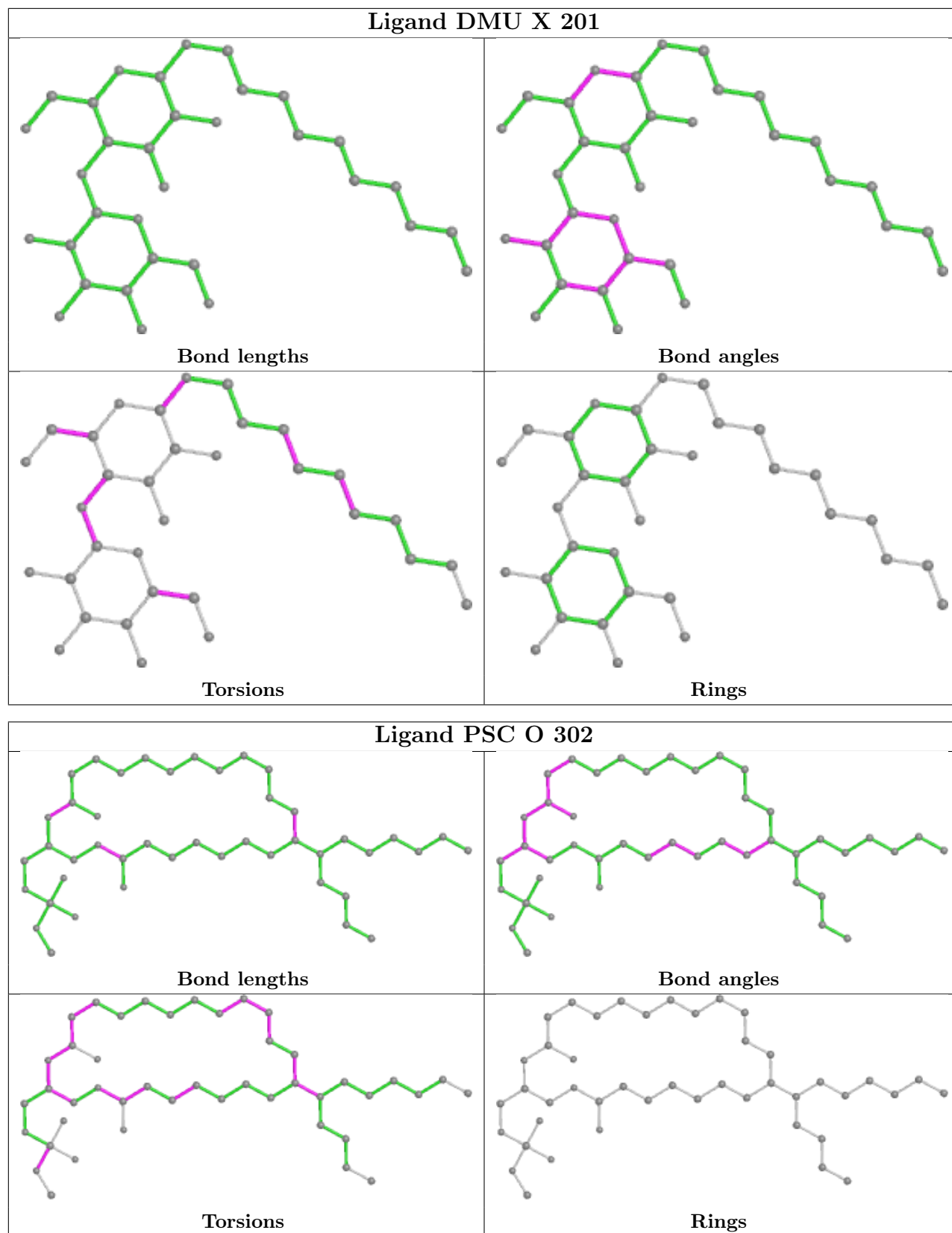


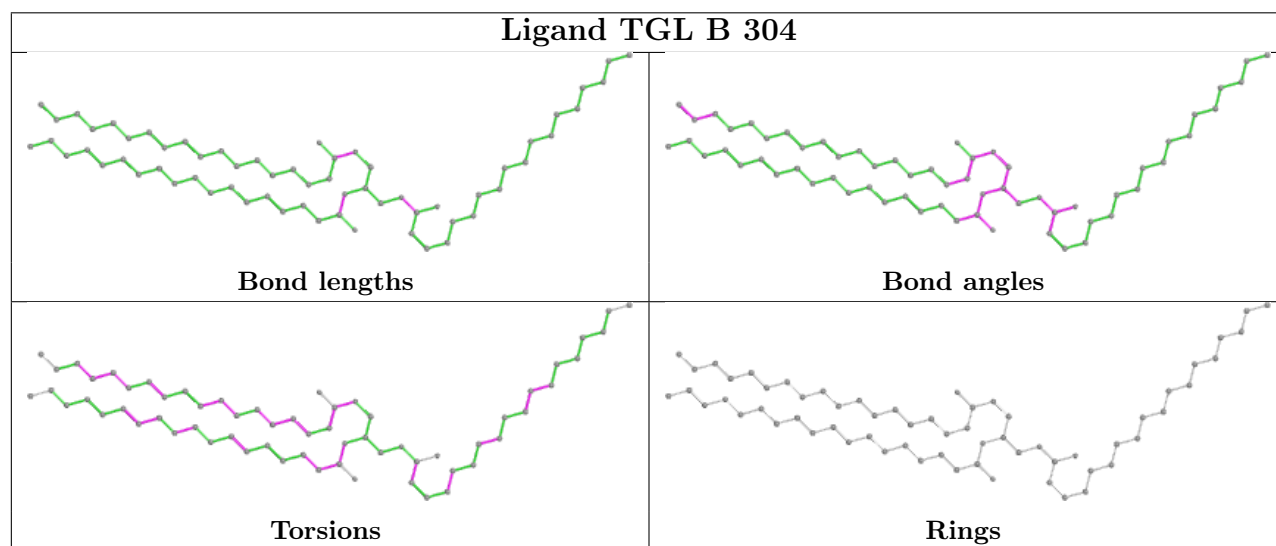
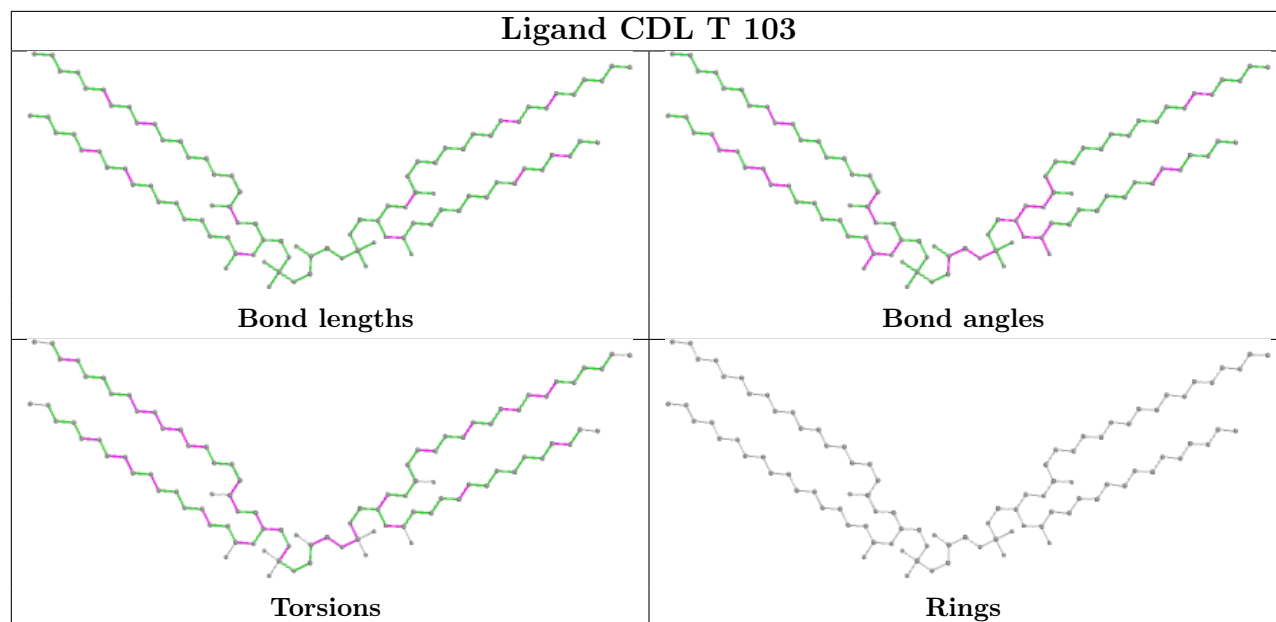


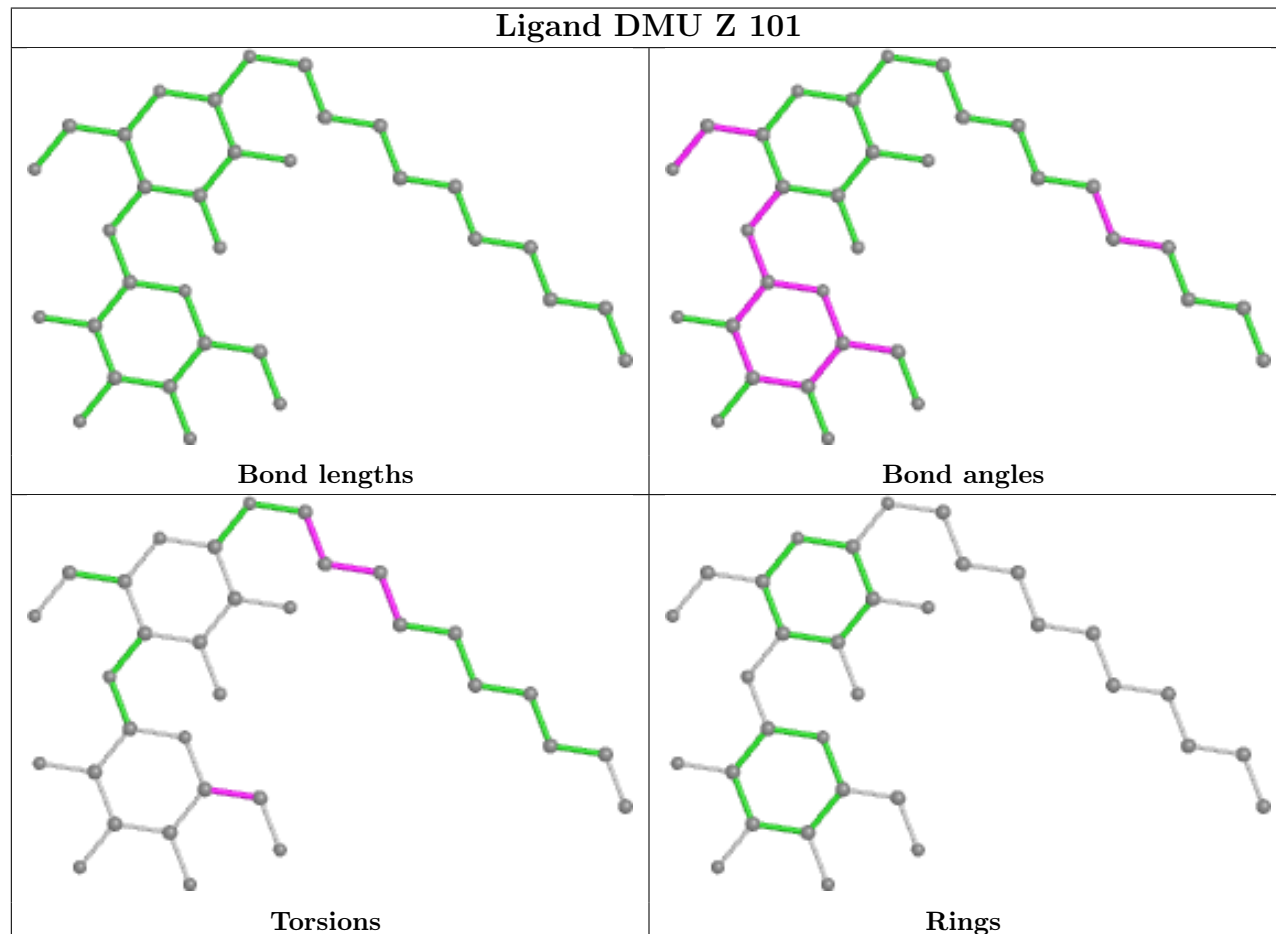
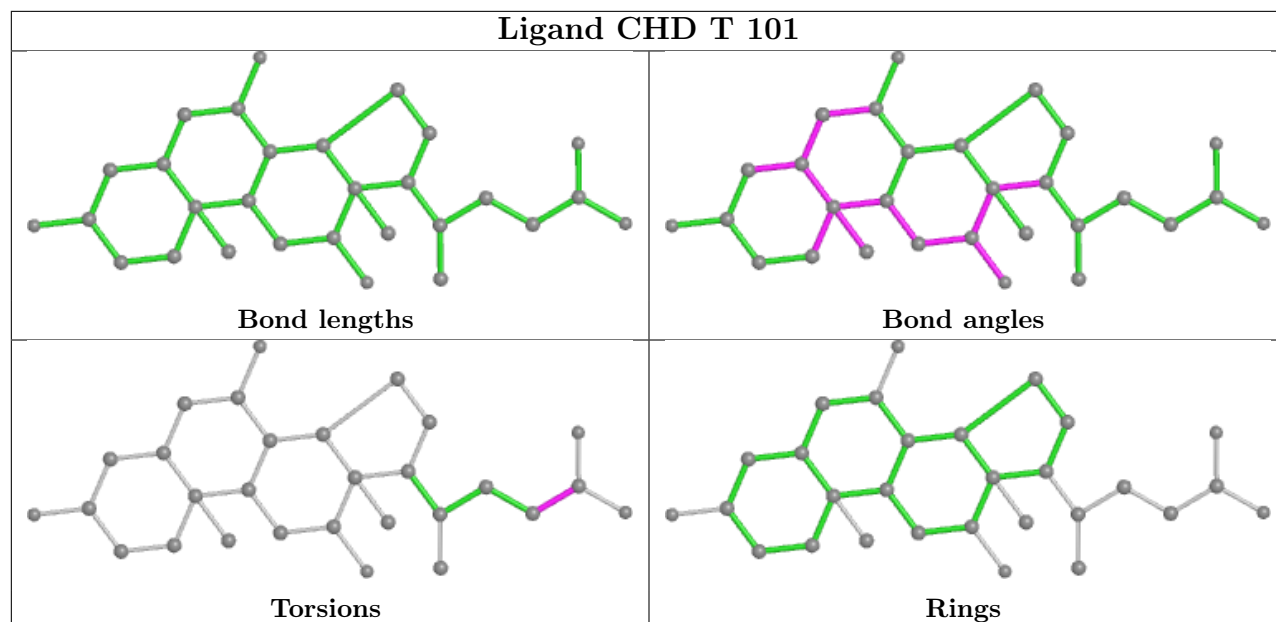


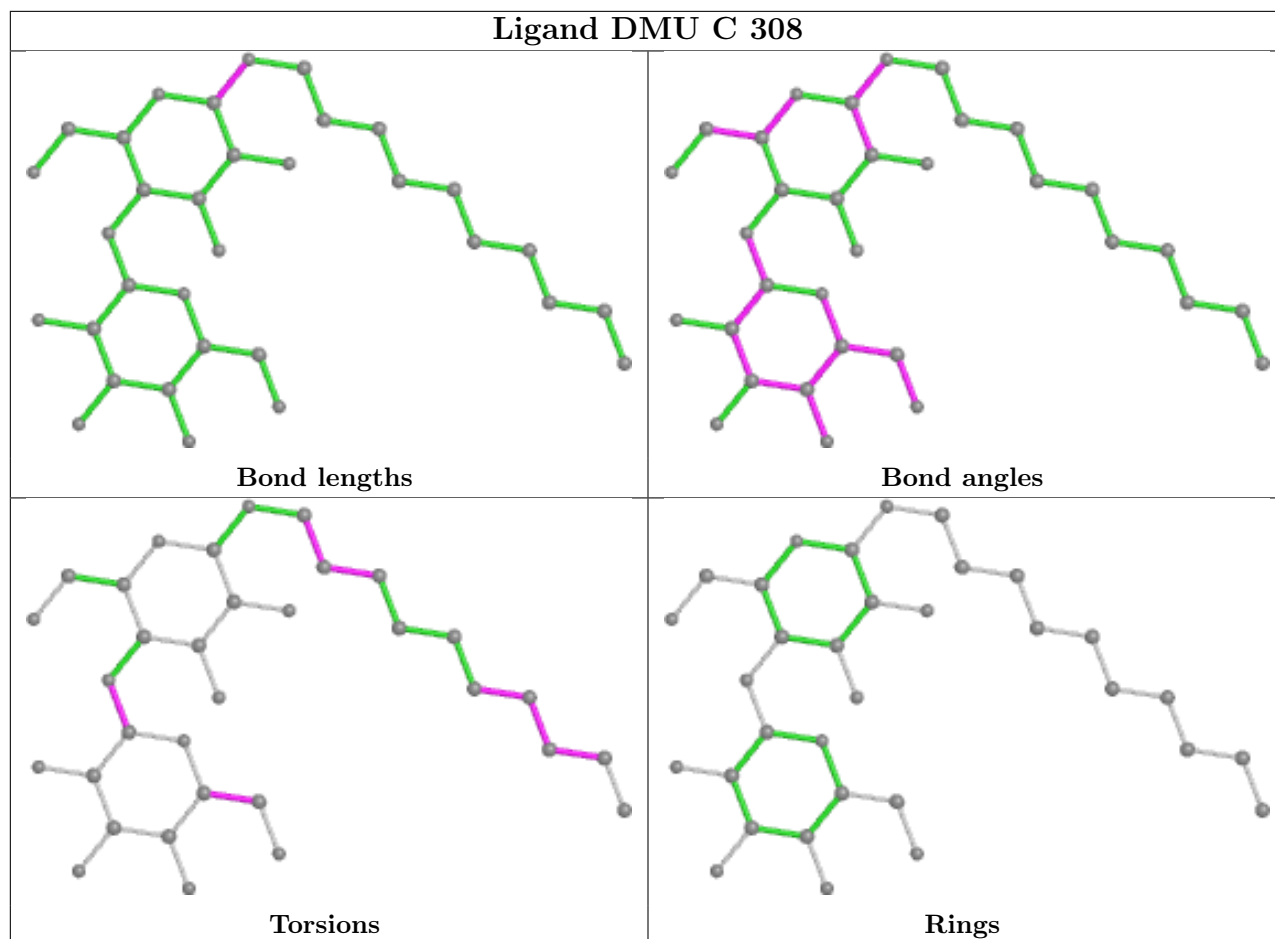


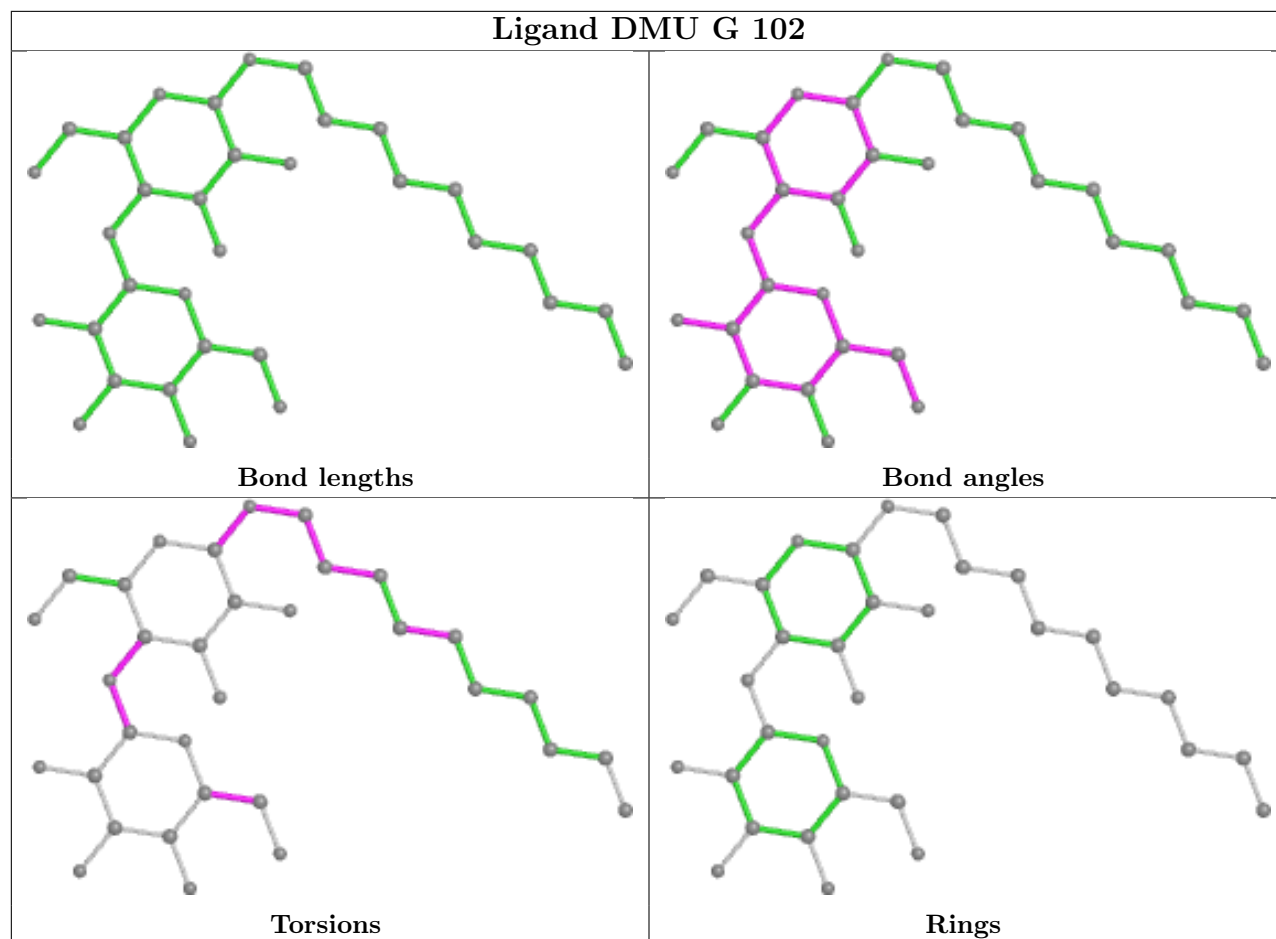


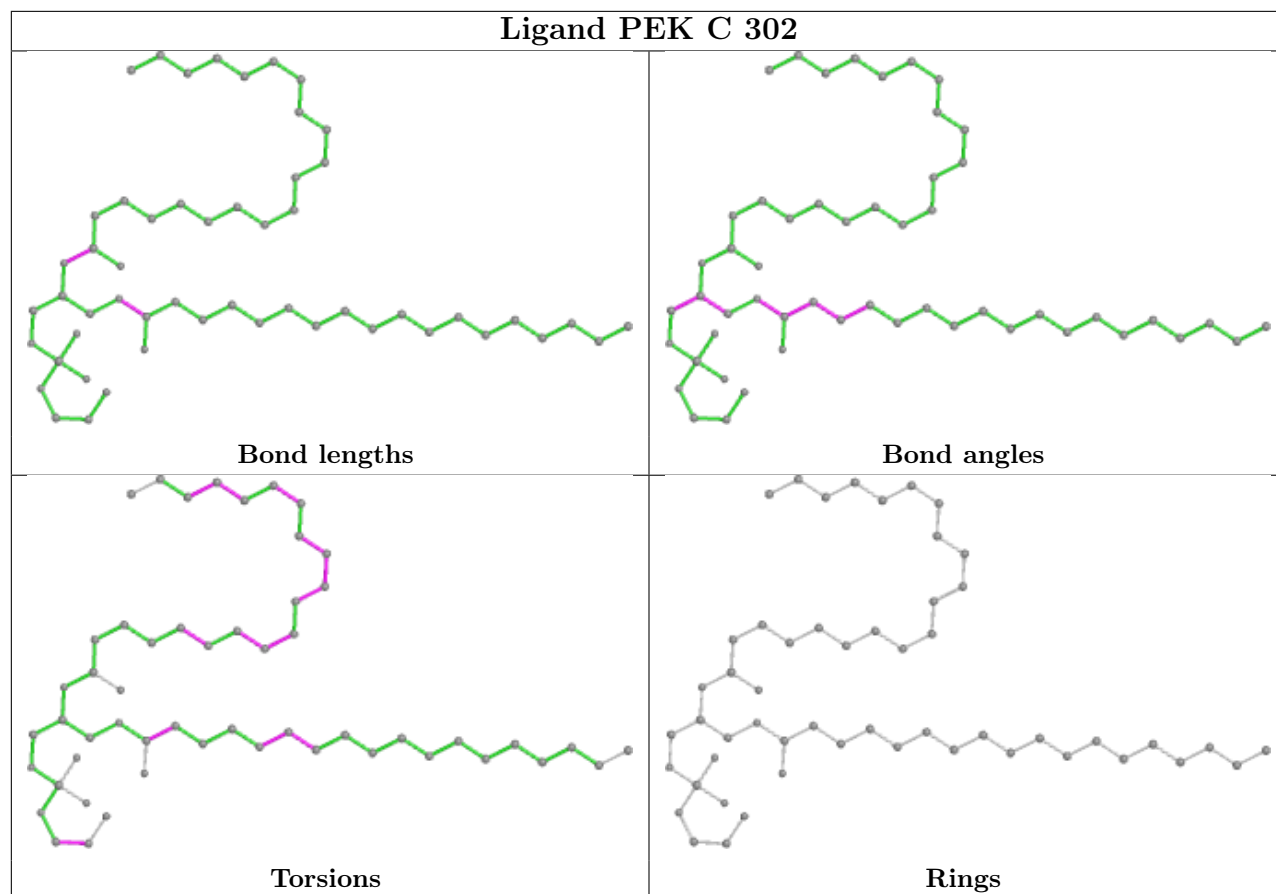


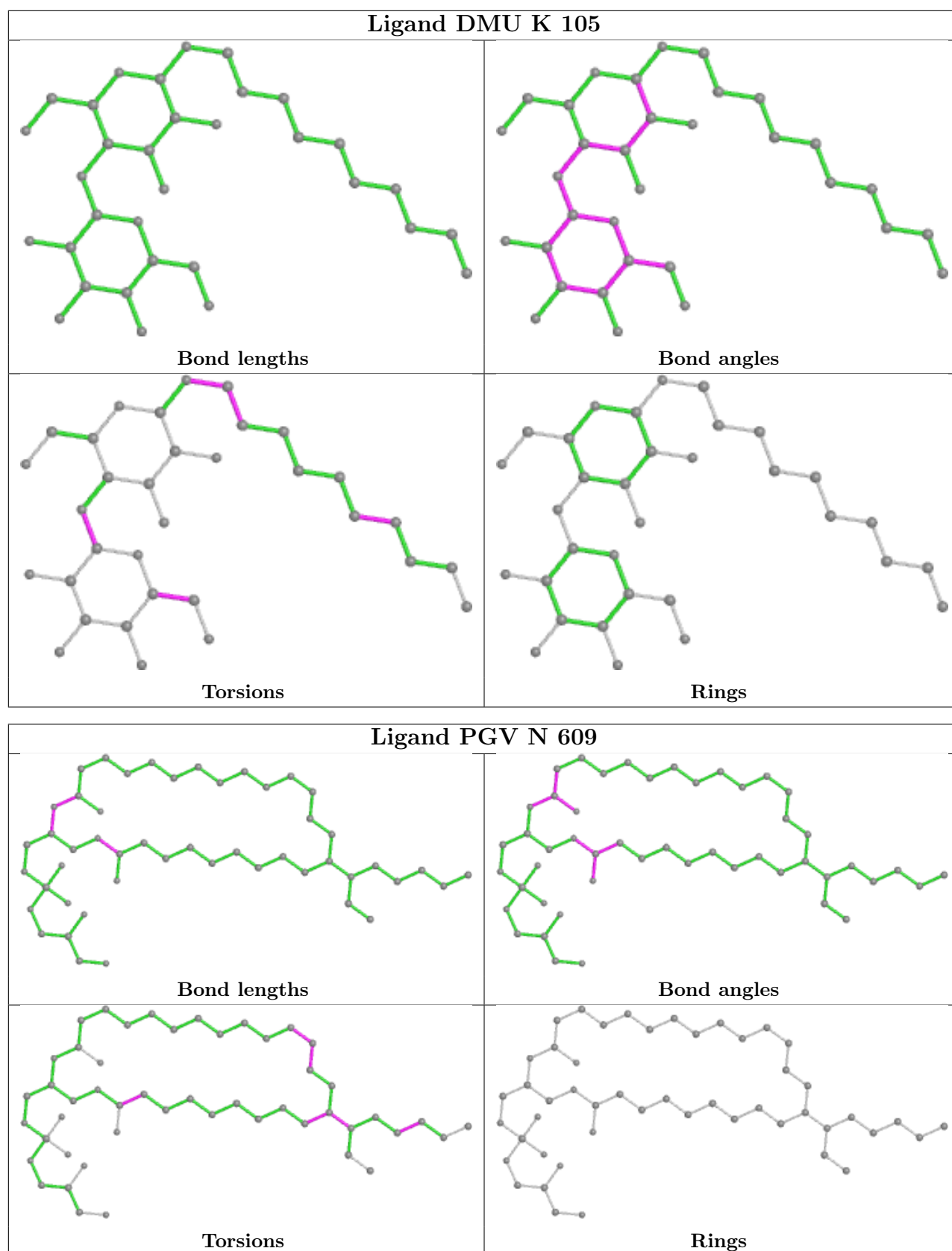




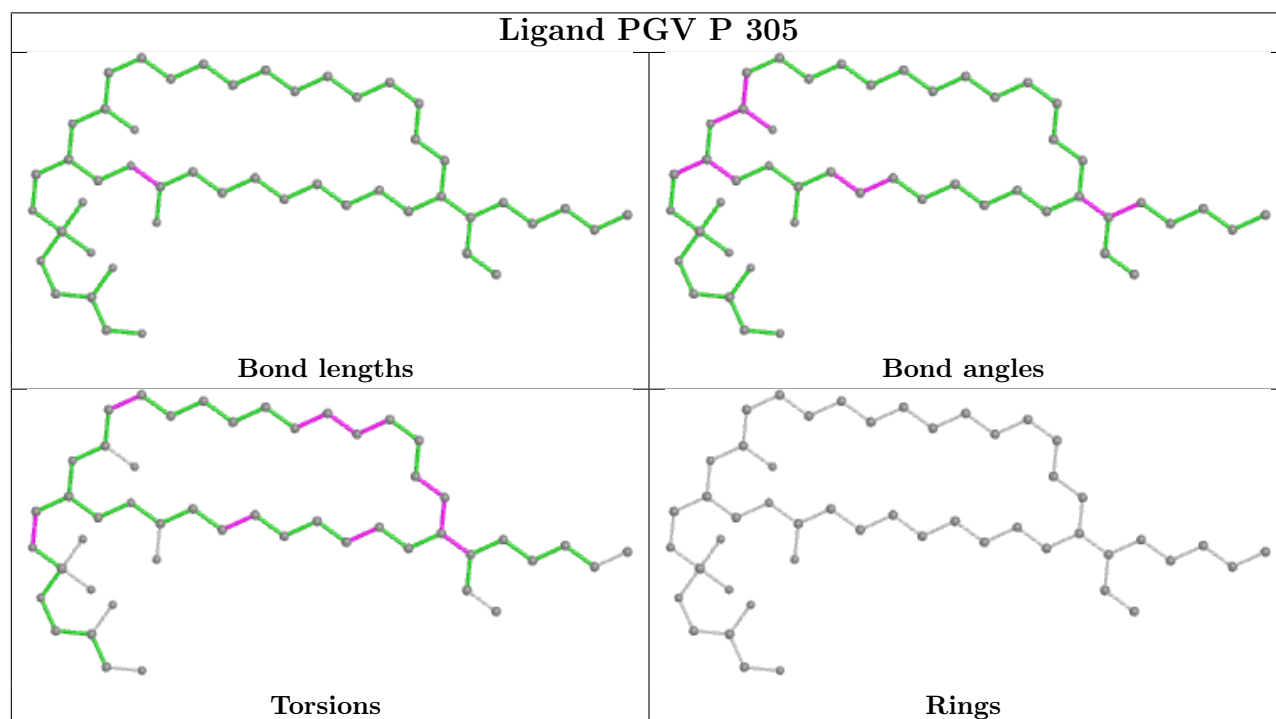
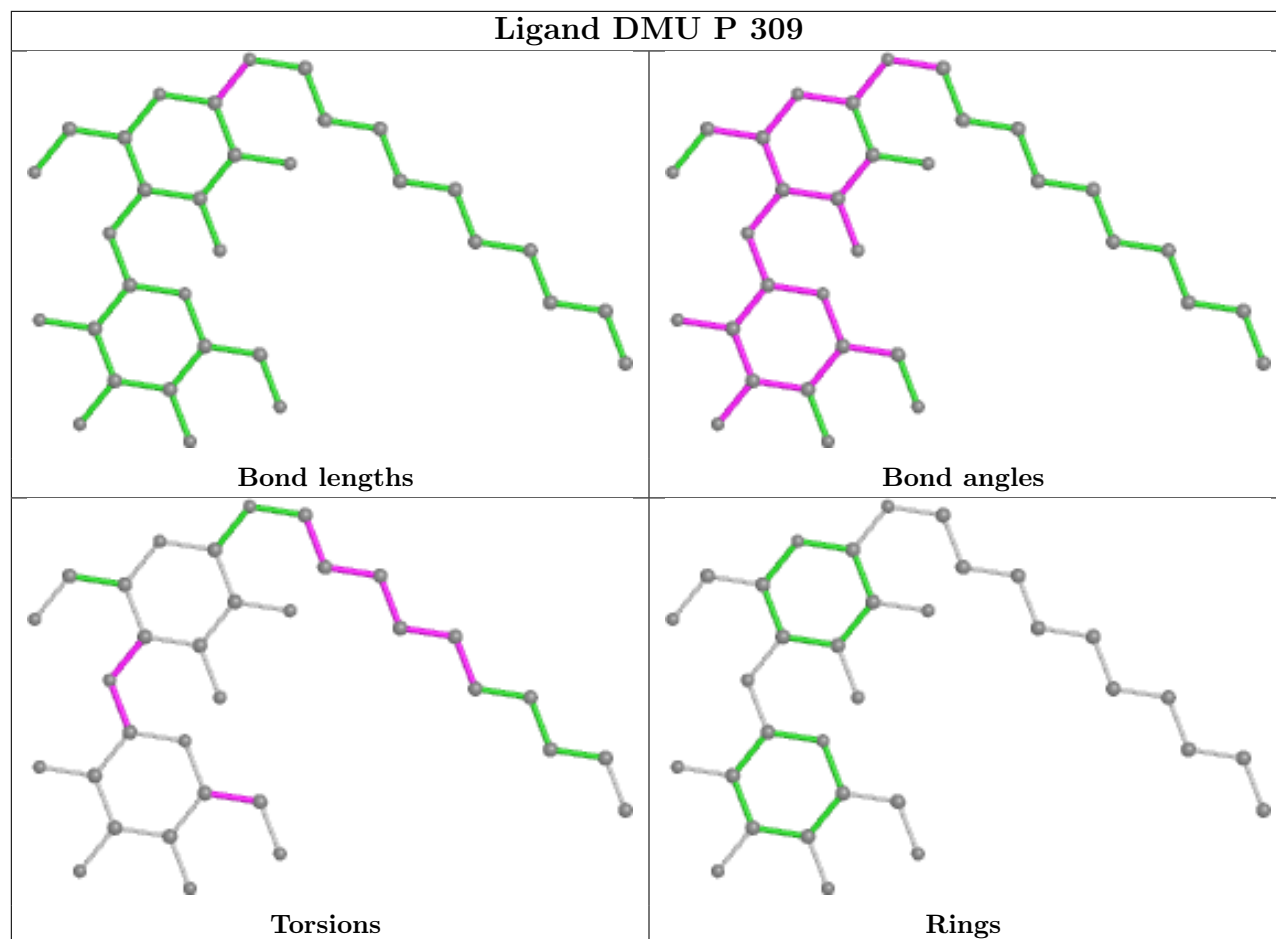


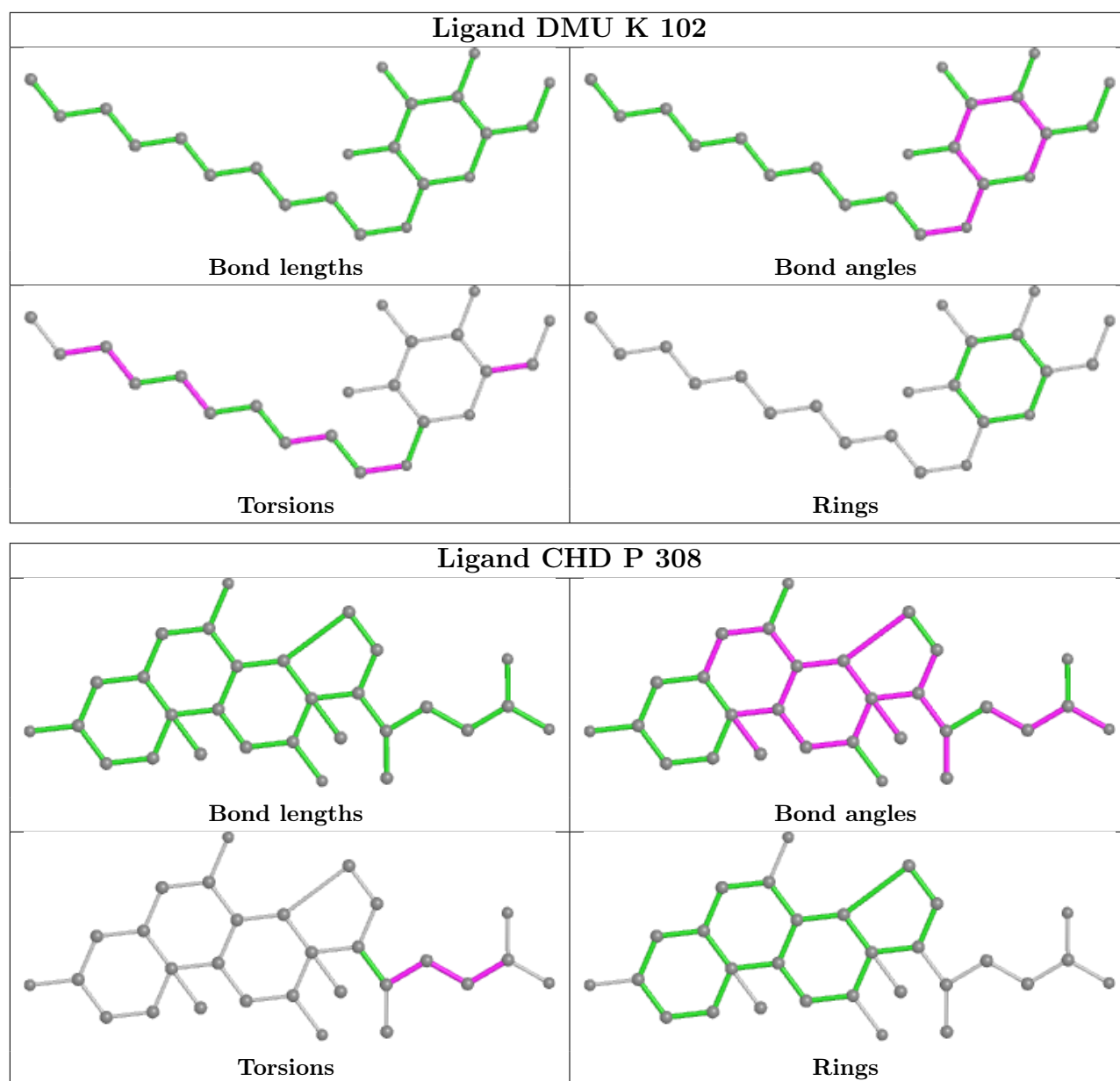


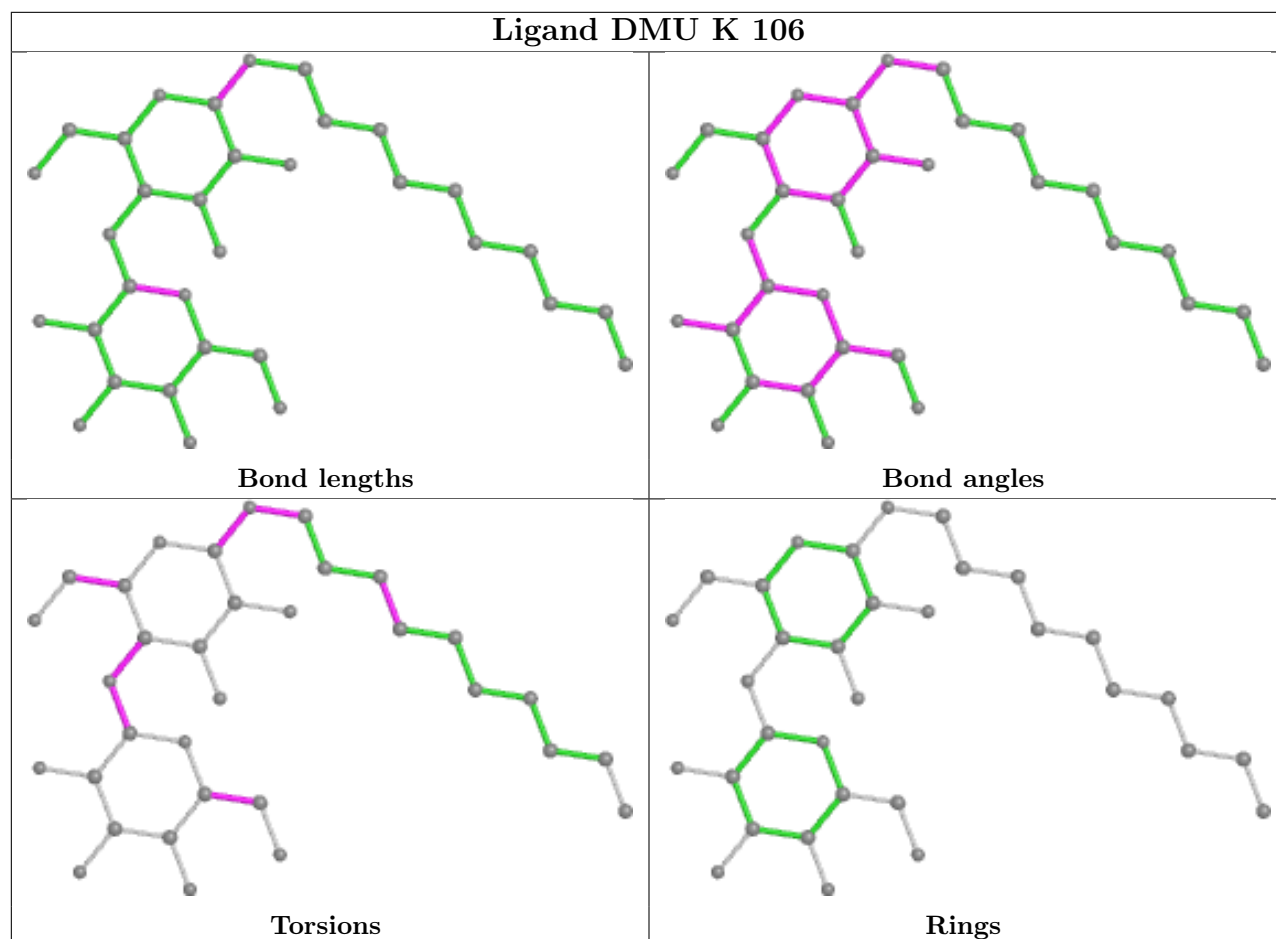
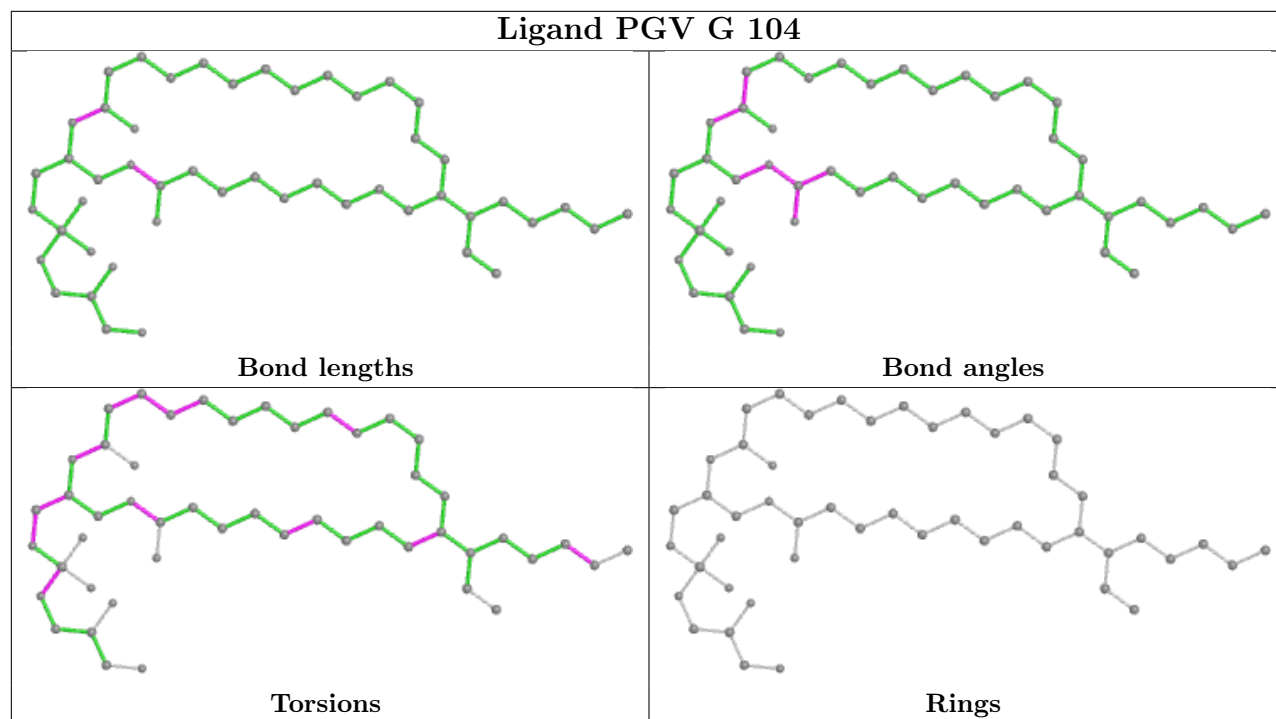


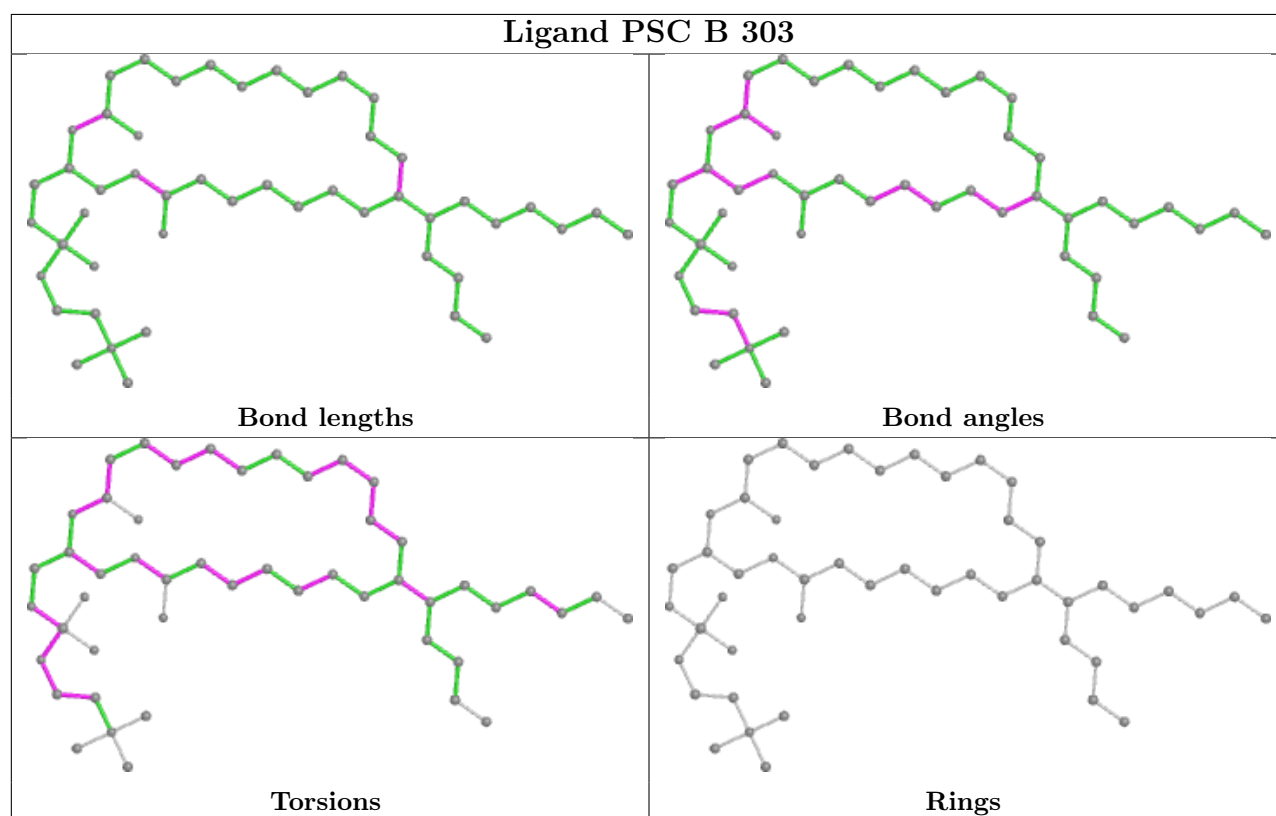
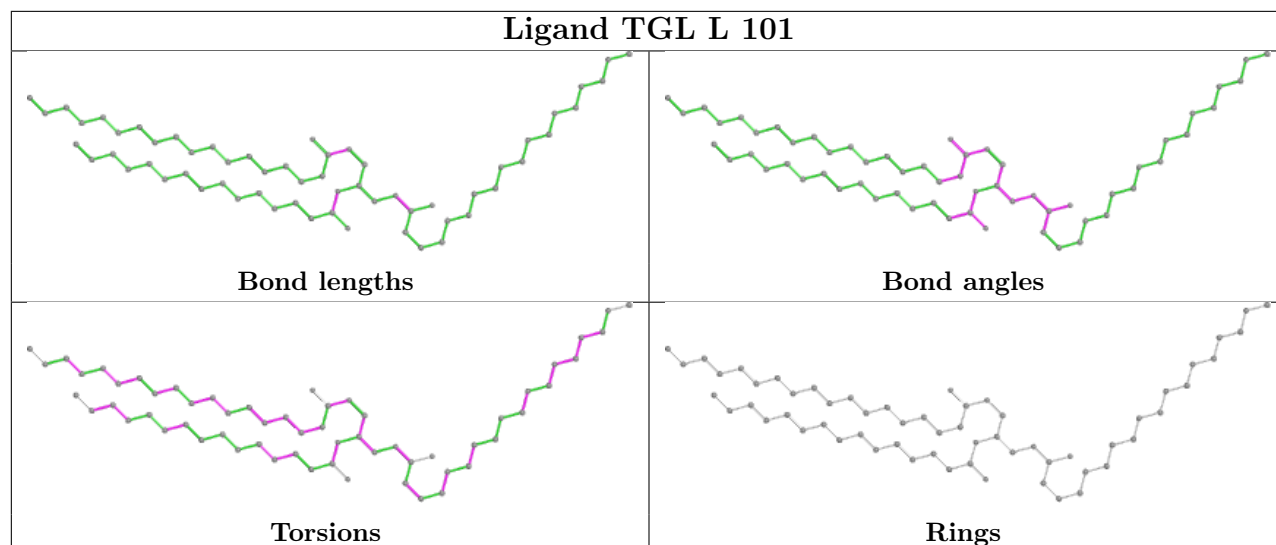


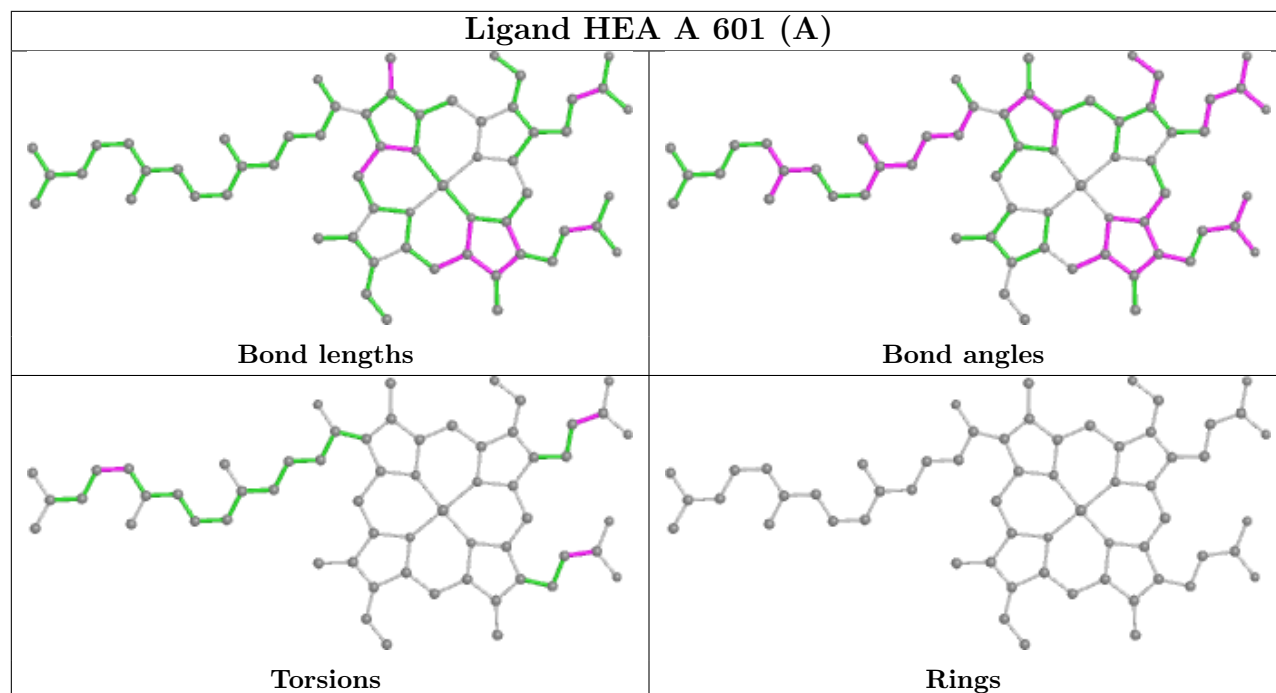


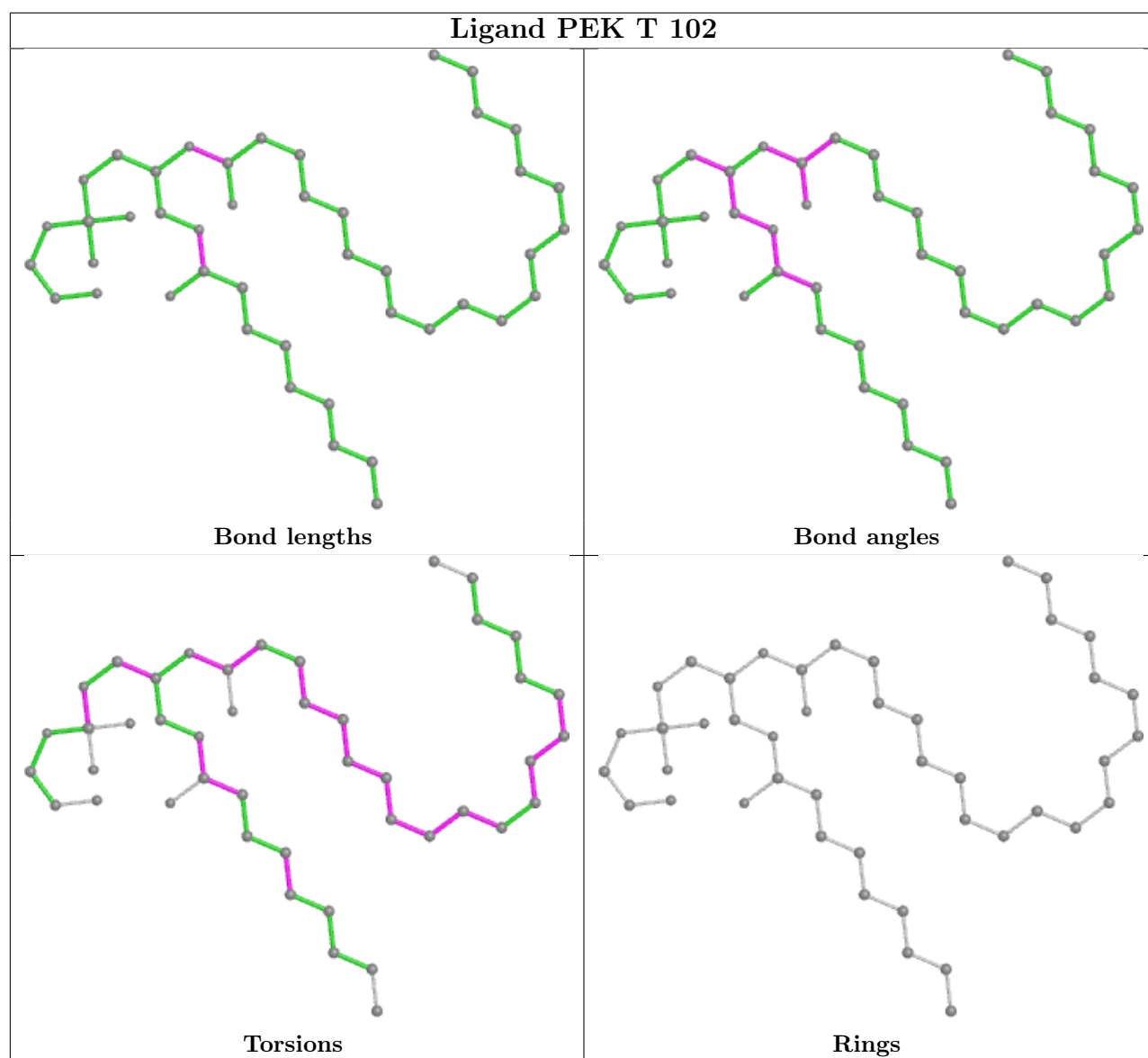


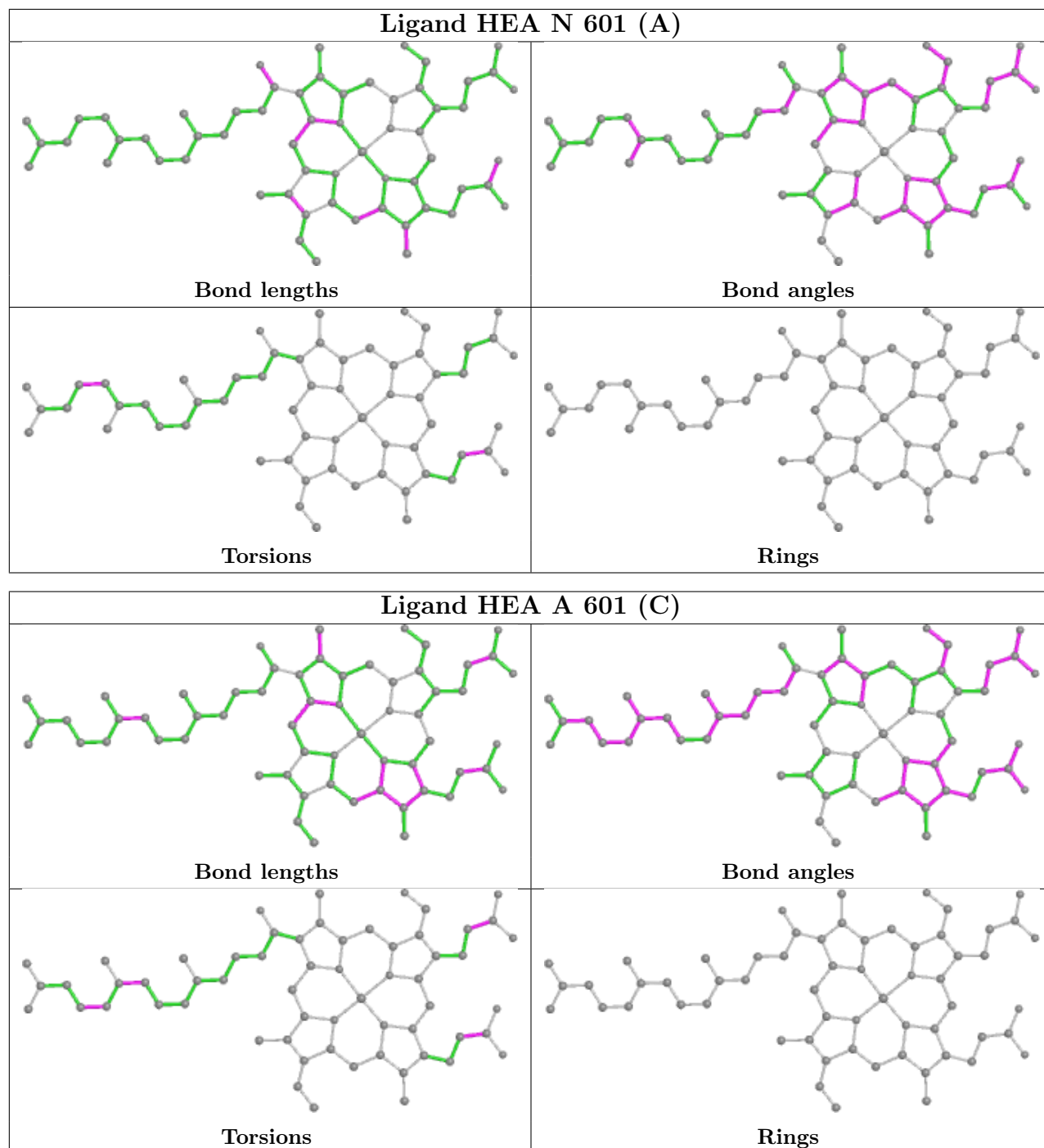


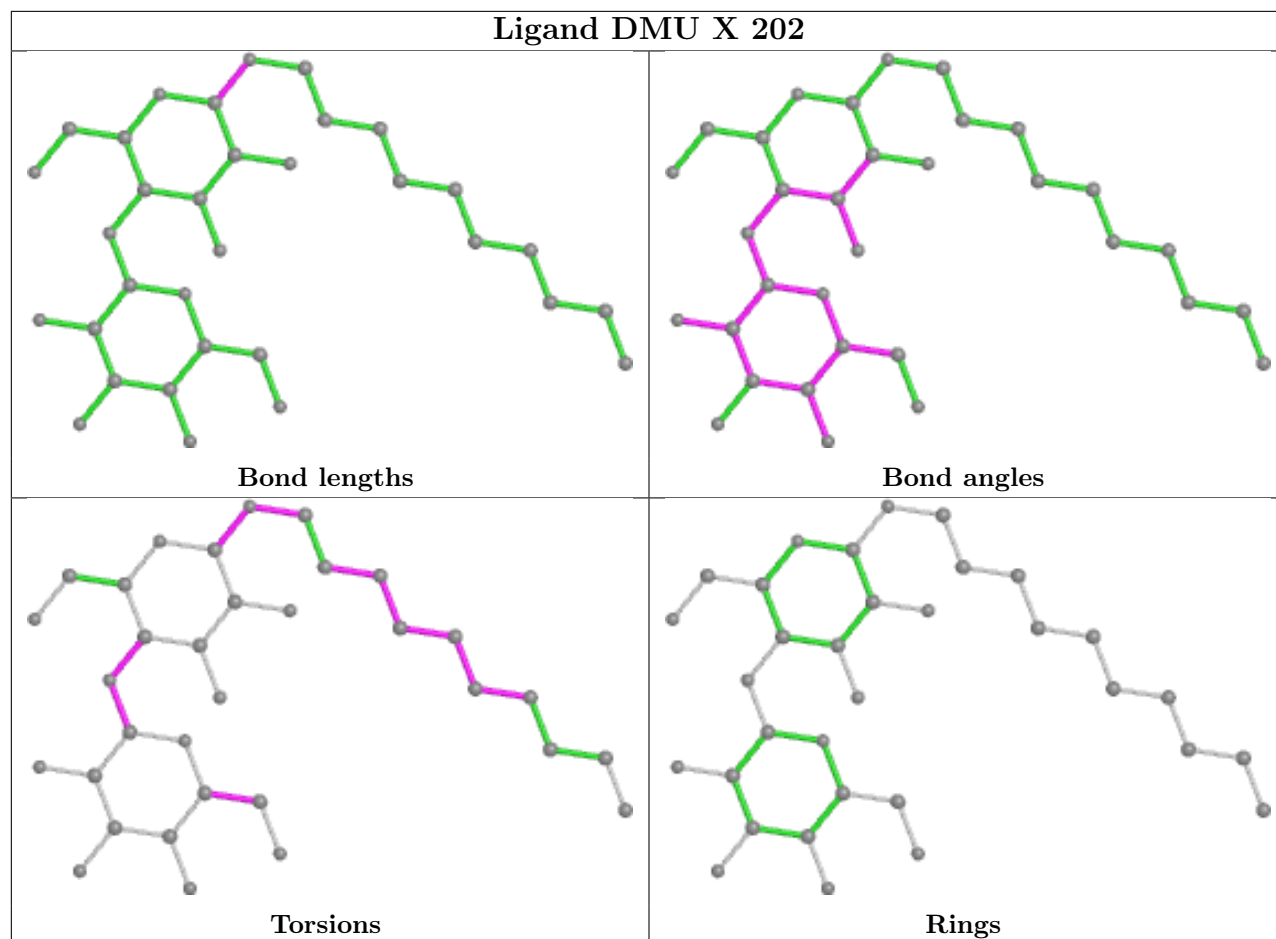




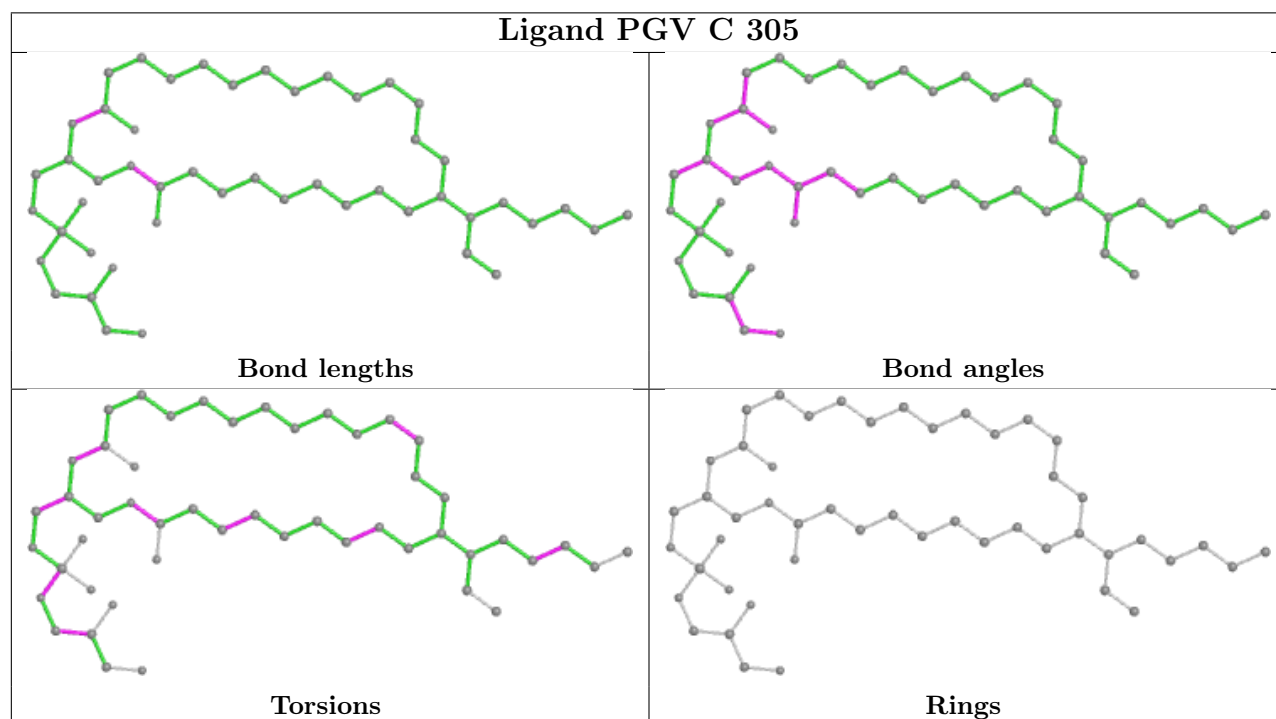
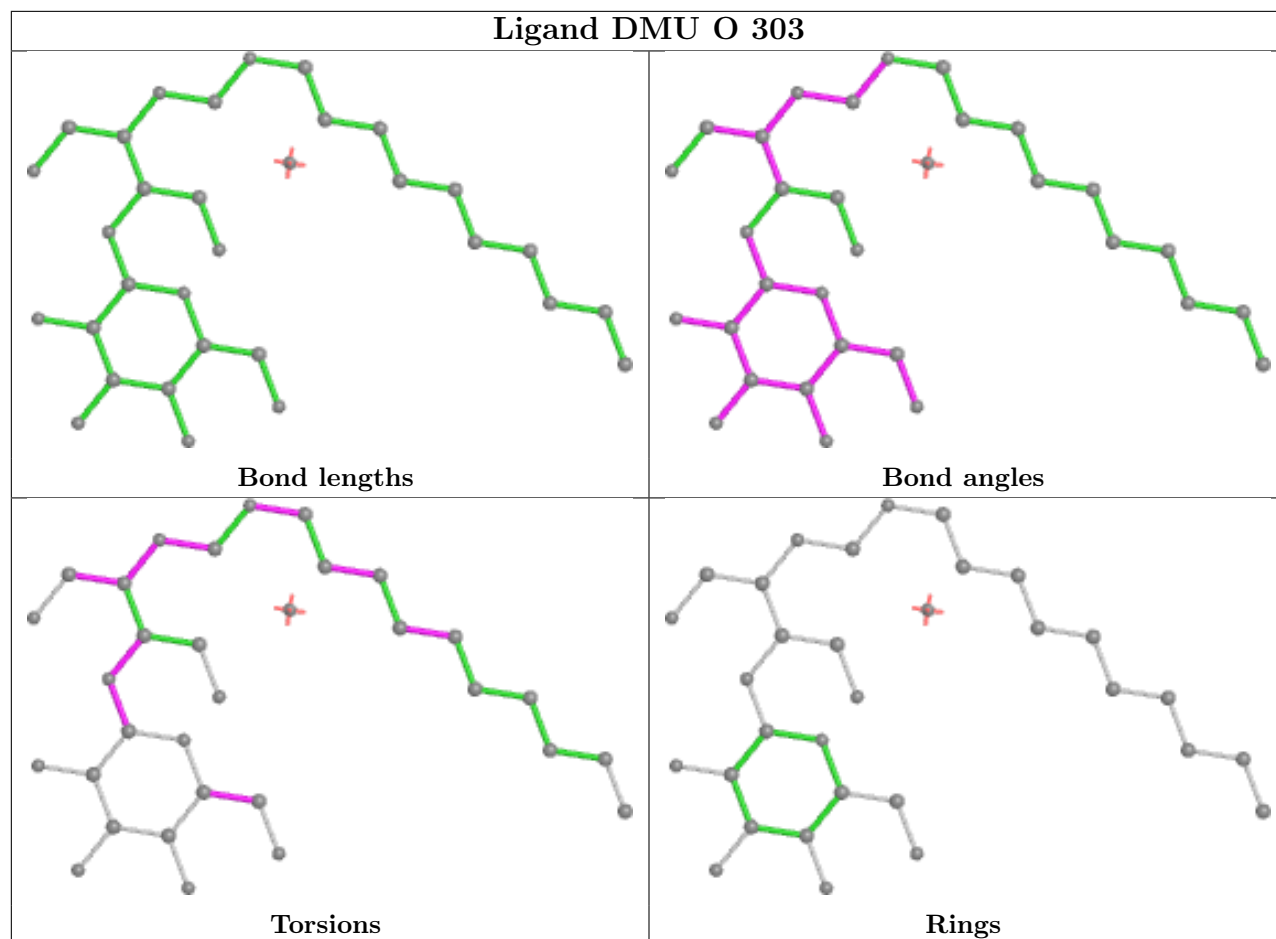


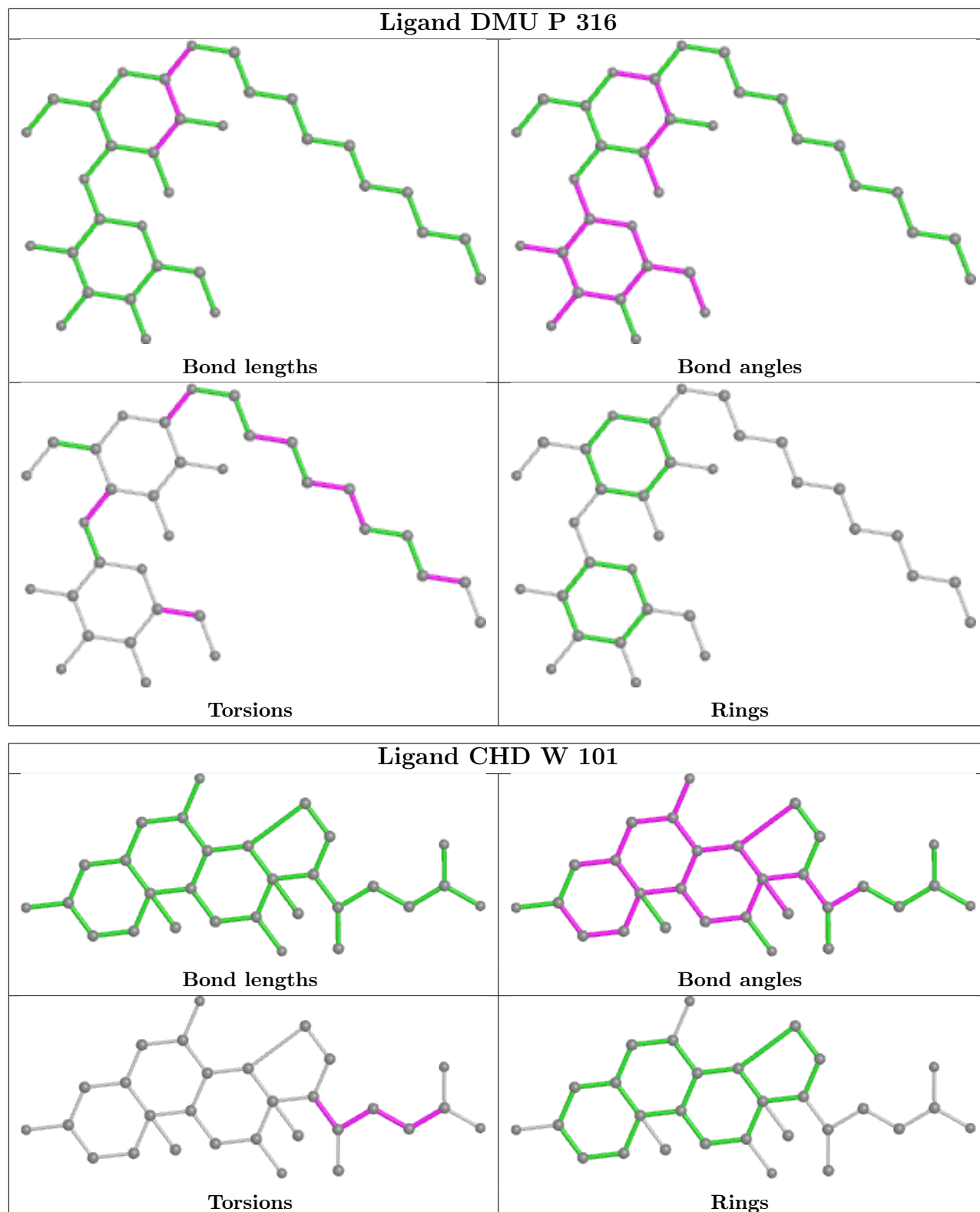


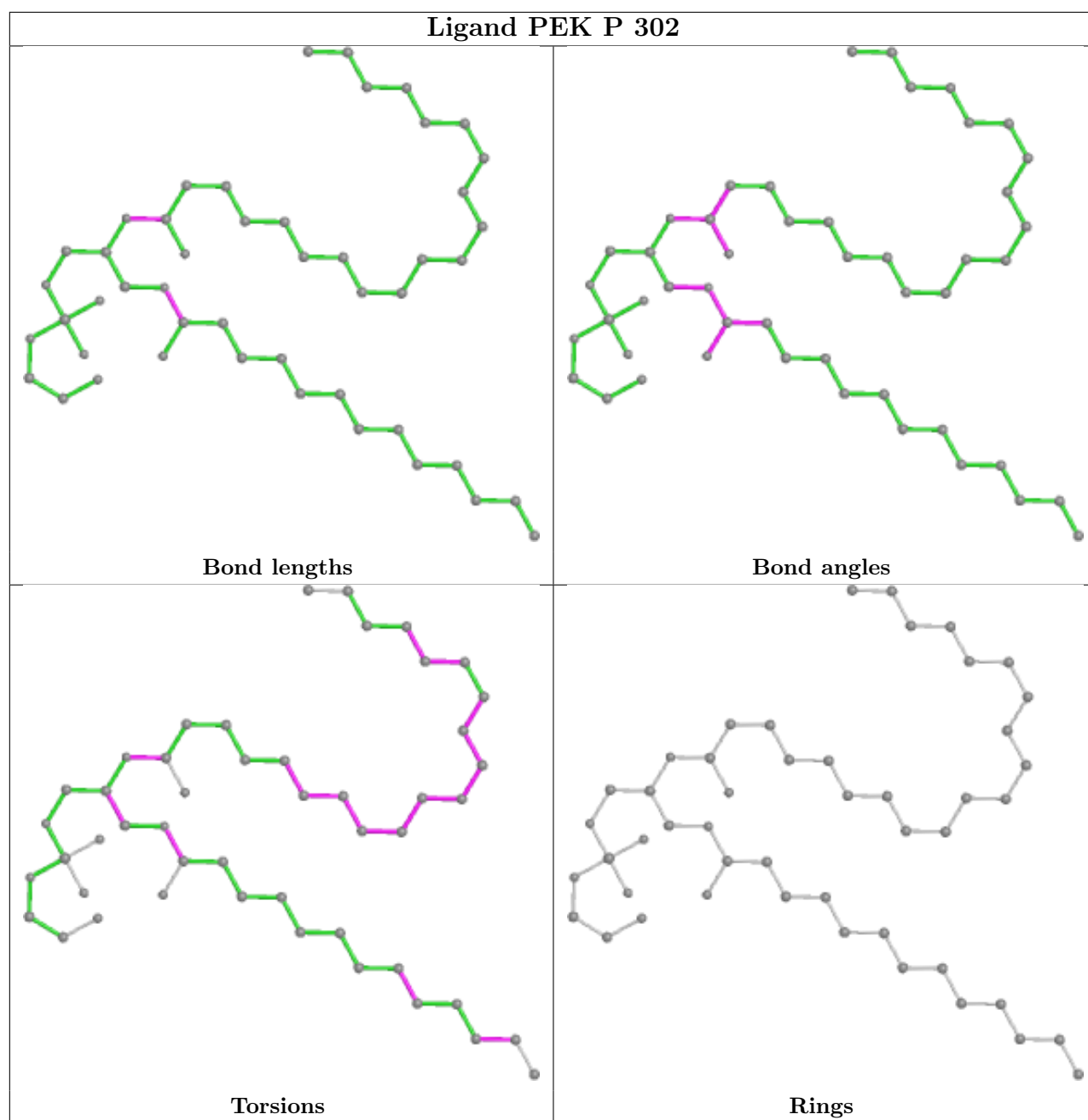


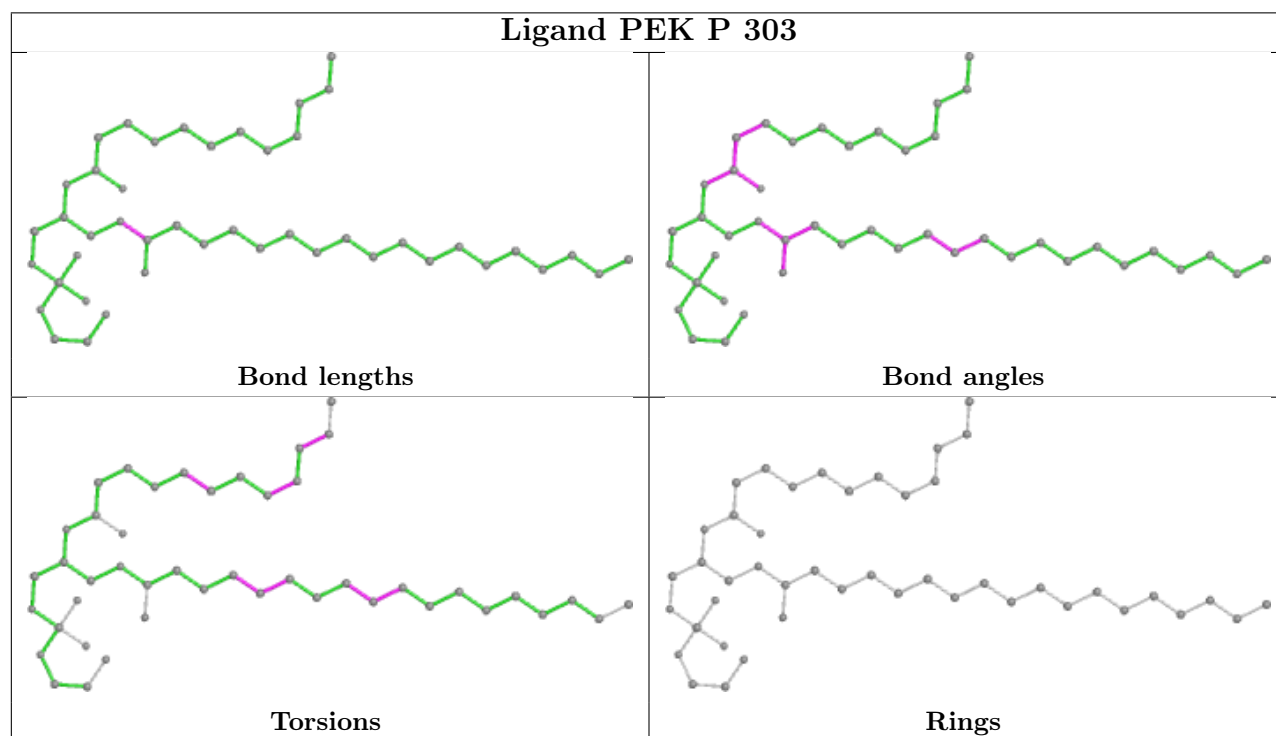
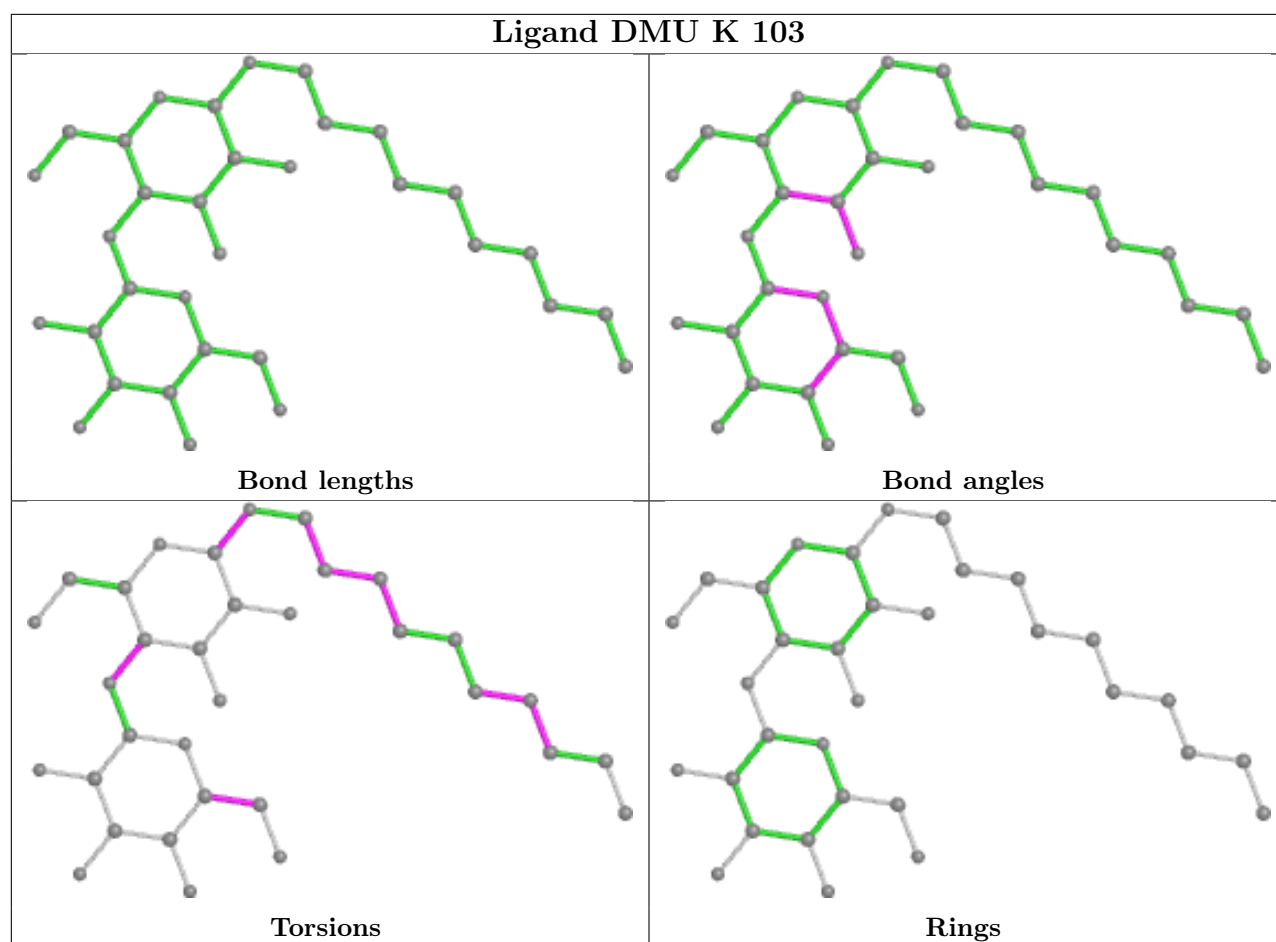


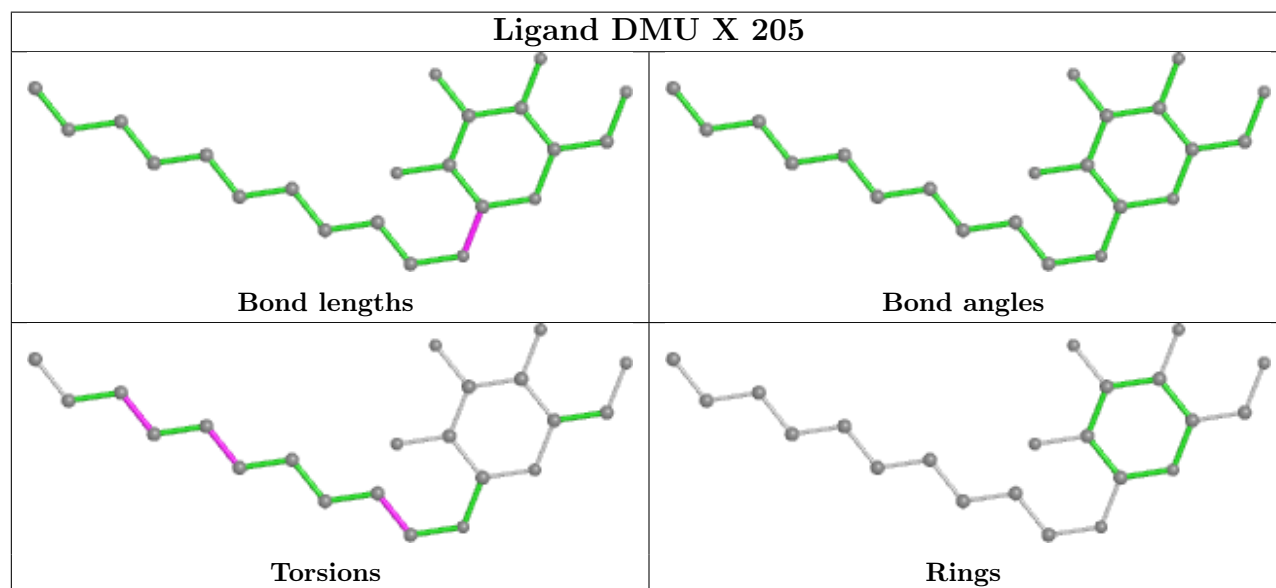
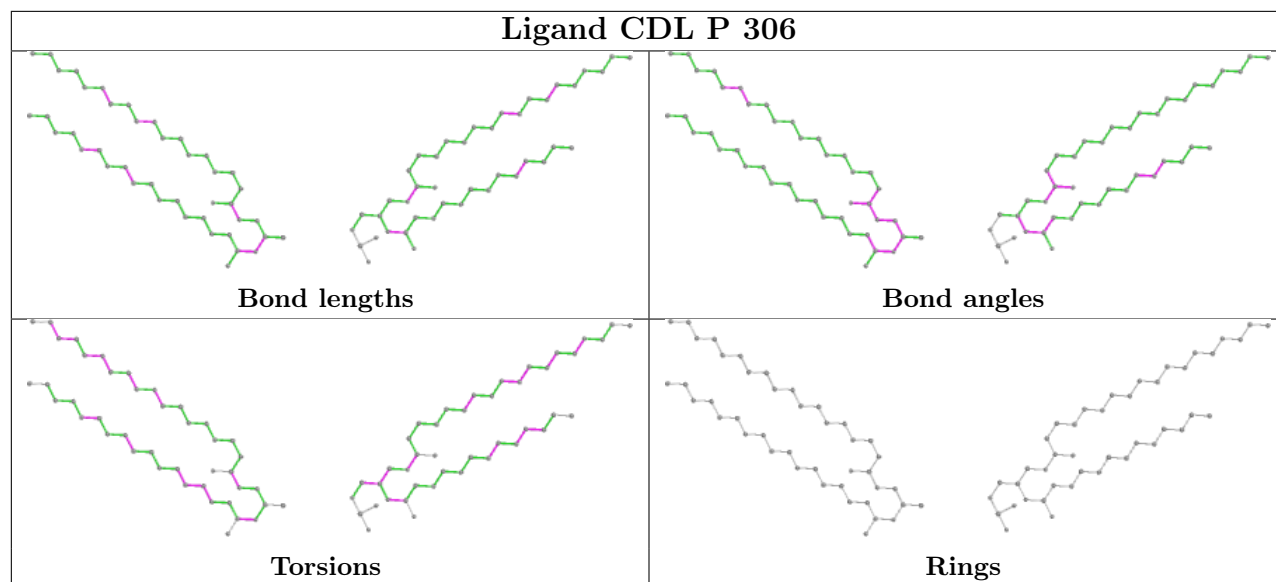


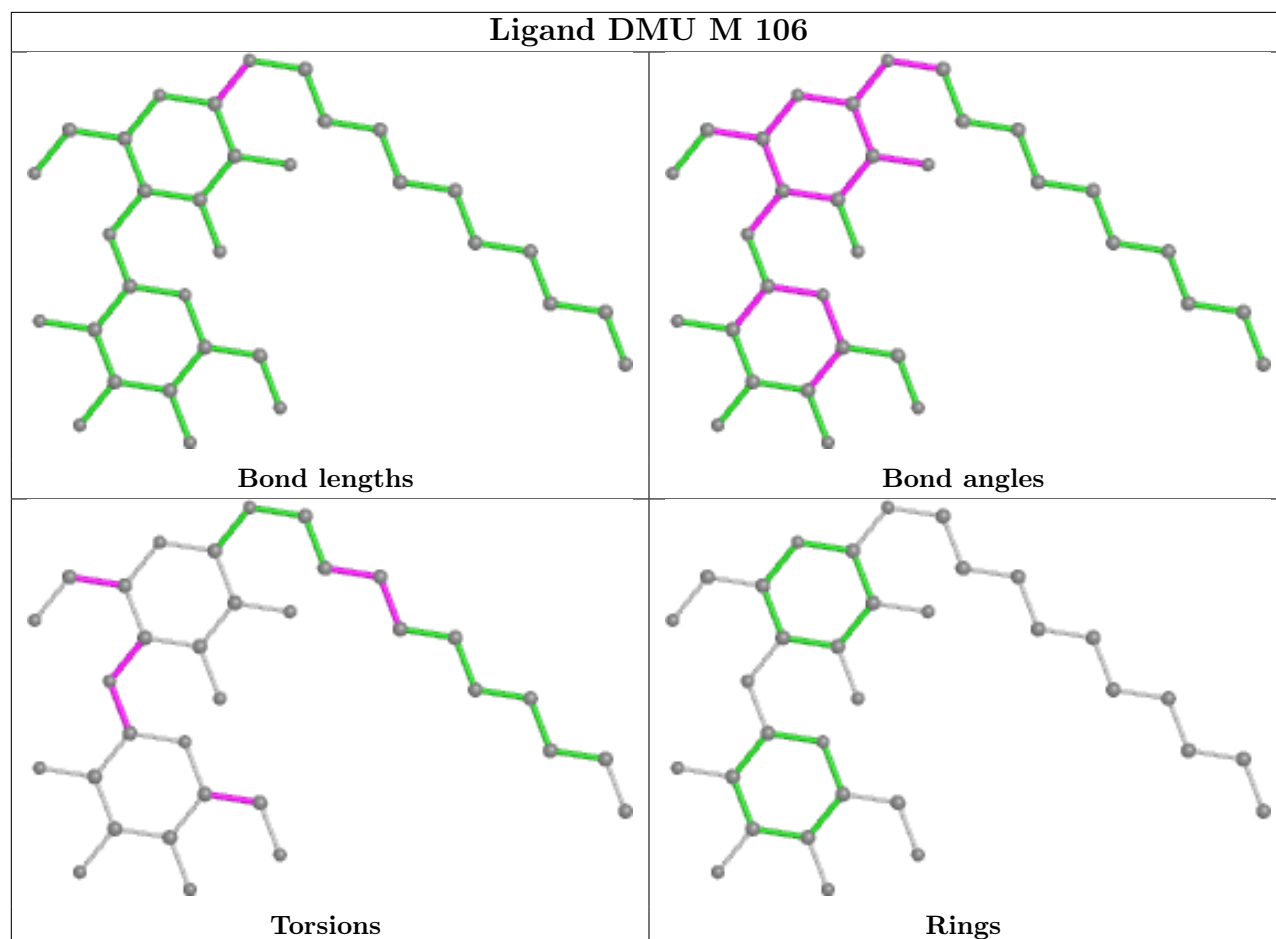
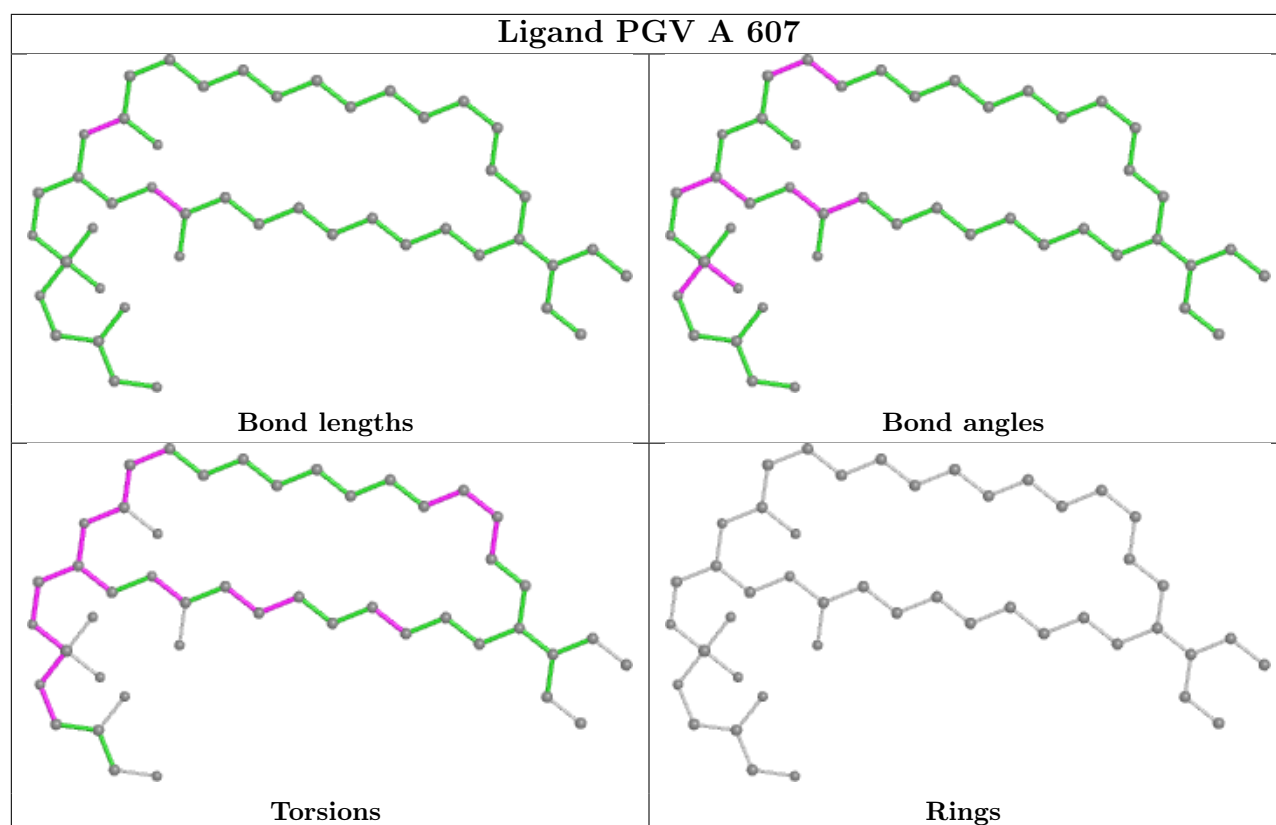


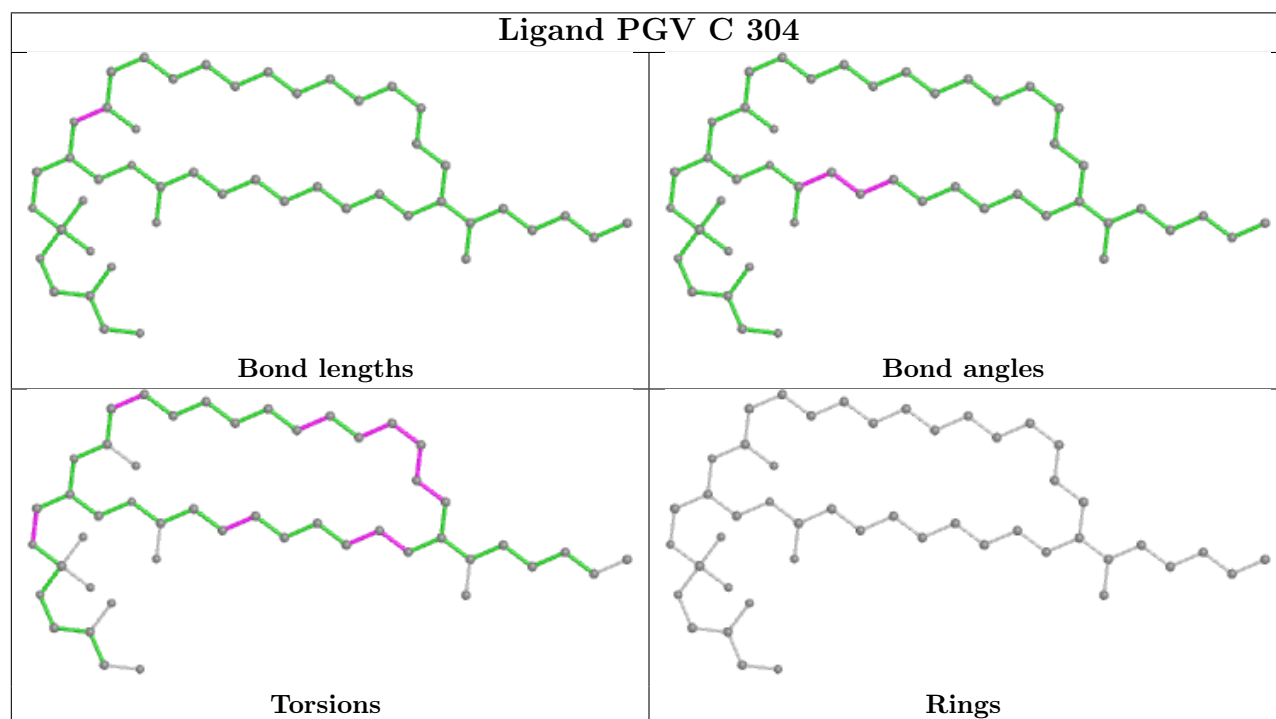
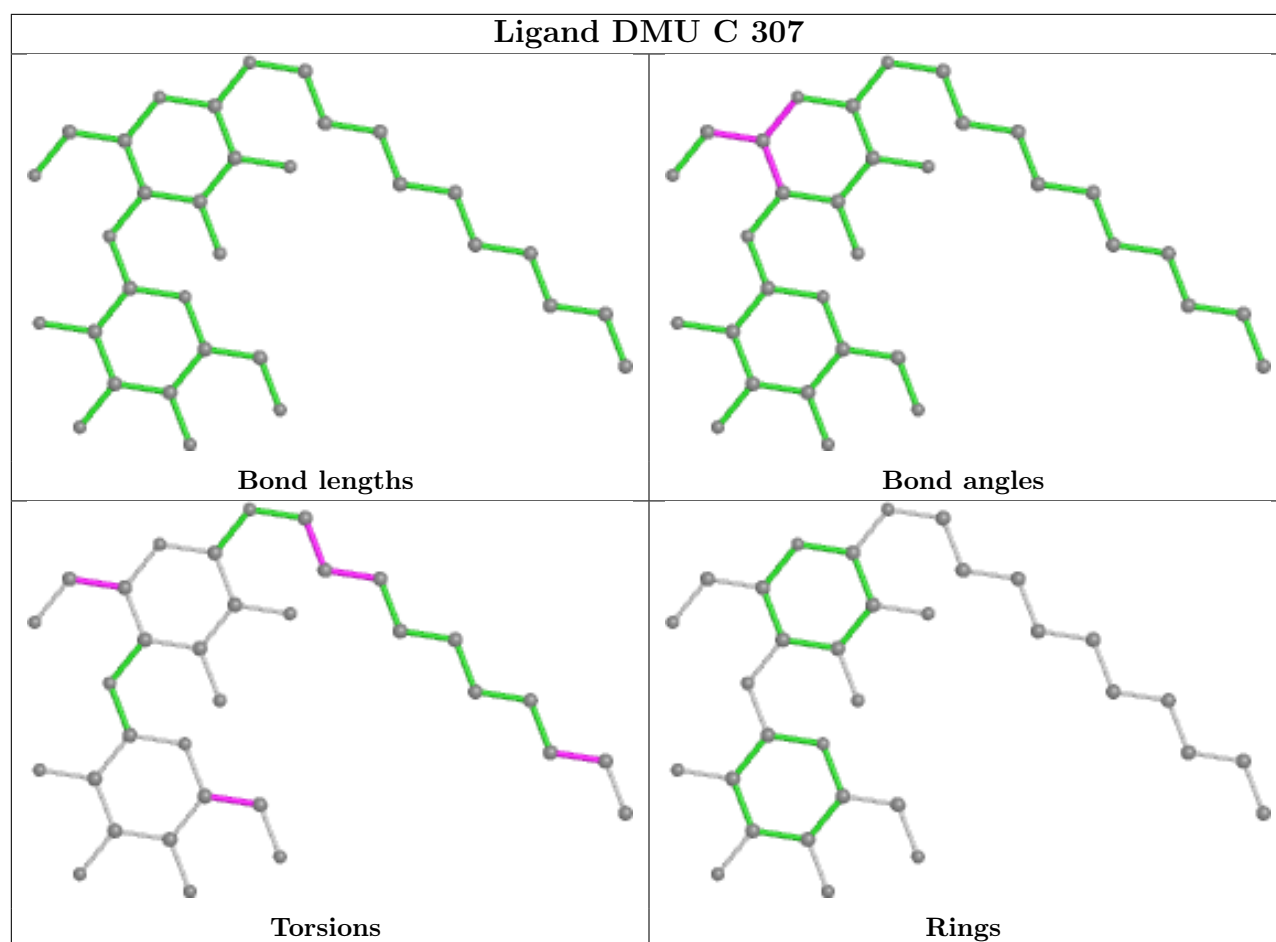


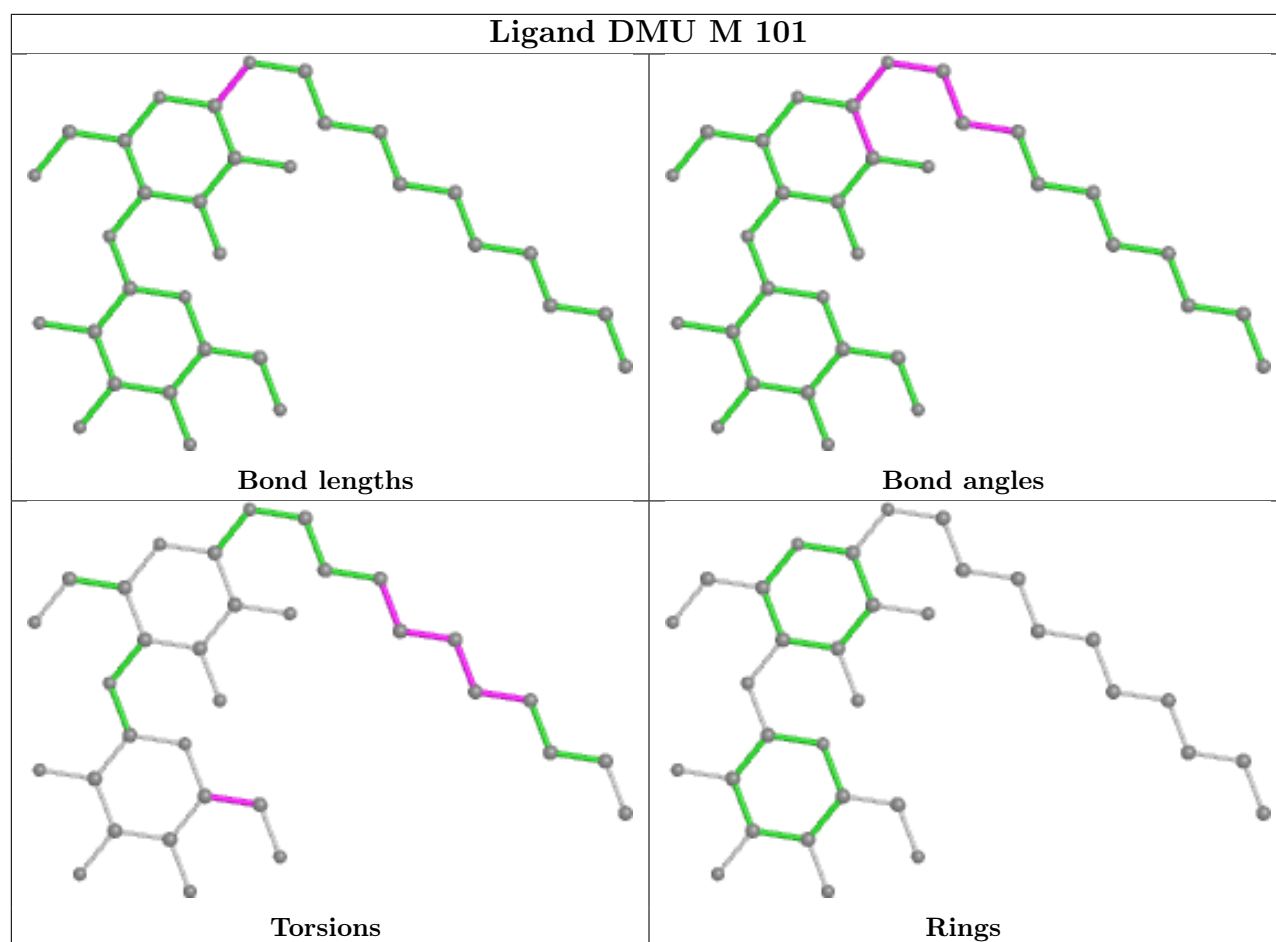












## 5.7 Other polymers [\(i\)](#)

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	513/514 (99%)	-0.22	1 (0%) 95 95	19, 23, 31, 89	0
1	N	513/514 (99%)	-0.28	0 100 100	19, 26, 34, 78	0
2	B	226/227 (99%)	-0.25	3 (1%) 77 80	22, 30, 53, 128	0
2	O	226/227 (99%)	-0.28	2 (0%) 84 87	25, 33, 70, 109	0
3	C	259/259 (100%)	-0.28	0 100 100	21, 26, 41, 102	0
3	P	259/259 (100%)	-0.32	1 (0%) 92 93	21, 27, 41, 93	0
4	D	144/144 (100%)	-0.41	0 100 100	25, 33, 54, 97	0
4	Q	144/144 (100%)	0.20	6 (4%) 36 38	30, 46, 96, 266	0
5	E	105/105 (100%)	-0.41	1 (0%) 82 85	26, 32, 64, 139	0
5	R	105/105 (100%)	-0.28	2 (1%) 66 70	27, 38, 76, 133	0
6	F	94/94 (100%)	-0.14	3 (3%) 47 50	22, 34, 64, 125	0
6	S	94/94 (100%)	-0.05	3 (3%) 47 50	22, 32, 63, 150	0
7	G	83/84 (98%)	0.74	14 (16%) 1 1	25, 35, 135, 234	0
7	T	83/84 (98%)	0.57	12 (14%) 2 2	24, 36, 122, 189	0
8	H	79/79 (100%)	0.10	7 (8%) 9 10	26, 37, 112, 126	0
8	U	79/79 (100%)	0.15	7 (8%) 9 10	30, 39, 111, 141	0
9	I	72/73 (98%)	-0.14	2 (2%) 53 55	29, 43, 76, 96	0
9	V	72/73 (98%)	0.05	2 (2%) 53 55	28, 50, 89, 234	0
10	J	58/58 (100%)	-0.08	2 (3%) 45 48	27, 38, 87, 134	0
10	W	58/58 (100%)	-0.10	3 (5%) 27 28	28, 39, 98, 181	0
11	K	49/49 (100%)	-0.24	1 (2%) 65 69	29, 37, 57, 67	0
11	X	49/49 (100%)	-0.03	2 (4%) 37 39	35, 45, 79, 82	0
12	L	46/46 (100%)	-0.25	2 (4%) 35 37	24, 29, 53, 124	0
12	Y	46/46 (100%)	-0.24	1 (2%) 62 65	28, 35, 61, 120	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
13	M	43/43 (100%)	-0.09	1 (2%) 60 64	25, 29, 70, 121	0
13	Z	43/43 (100%)	0.02	3 (6%) 16 17	32, 38, 81, 170	0
All	All	3542/3550 (99%)	-0.16	81 (2%) 60 64	19, 30, 72, 266	0

The worst 5 of 81 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	Q	4	SER	14.3
7	G	3	ALA	13.4
4	Q	6	VAL	12.9
6	S	2	SER	11.4
4	Q	5	VAL	10.5

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
7	TPO	G	11	11/12	0.27	0.35	139,175,198,204	0
9	SAC	V	1	9/10	0.49	0.54	167,216,240,253	0
9	SAC	I	1	9/10	0.62	0.29	113,144,171,199	0
7	TPO	T	11	11/12	0.67	0.28	55,128,192,194	0
1	FME	N	1	10/11	0.95	0.09	35,41,72,108	0
1	FME	A	1	10/11	0.97	0.07	34,44,63,88	0
2	FME	O	1	10/11	0.97	0.09	32,34,39,104	0
2	FME	B	1	10/11	0.98	0.10	28,29,36,113	0

## 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
27	DMU	K	104	33/33	0.47	0.46	74,126,182,201	0
27	DMU	X	204	33/33	0.51	0.37	63,144,182,202	0
27	DMU	P	316	33/33	0.60	0.31	53,60,74,79	0
27	DMU	K	106	33/33	0.63	0.45	43,88,108,118	0
27	DMU	K	103	33/33	0.64	0.27	55,114,190,202	0
20	EDO	N	620	4/4	0.66	0.22	46,53,64,68	0
27	DMU	M	106	33/33	0.66	0.32	49,76,103,112	0
27	DMU	X	203	22/33	0.67	0.24	64,96,171,186	0
20	EDO	B	308	4/4	0.68	0.15	45,45,66,70	0
25	PEK	P	304	53/53	0.69	0.29	42,77,136,186	0
27	DMU	G	102	33/33	0.69	0.22	54,105,156,157	0
20	EDO	F	106	4/4	0.69	0.13	44,52,65,74	0
27	DMU	X	205	22/33	0.70	0.32	65,104,160,162	0
20	EDO	G	106	4/4	0.71	0.17	35,45,83,104	0
19	PGV	G	104	51/51	0.71	0.23	40,82,127,155	0
27	DMU	X	201	33/33	0.72	0.34	53,106,180,192	0
27	DMU	X	202	33/33	0.72	0.30	43,142,216,227	0
27	DMU	K	101	21/33	0.72	0.30	41,110,189,196	0
27	DMU	P	309	33/33	0.72	0.25	31,78,157,181	0
24	CHD	J	102	29/29	0.72	0.33	52,94,162,199	0
20	EDO	A	622	4/4	0.73	0.52	46,55,59,71	0
25	PEK	T	102	44/53	0.73	0.29	43,96,157,183	0
24	CHD	P	308	29/29	0.73	0.30	56,77,138,177	0
26	CDL	T	103	96/100	0.74	0.25	45,82,125,176	0
24	CHD	W	101	29/29	0.74	0.35	46,119,204,206	0
26	CDL	G	101	99/100	0.75	0.28	36,85,129,181	0
20	EDO	C	315	4/4	0.75	0.13	42,65,69,70	0
27	DMU	K	105	33/33	0.75	0.43	47,125,201,217	0
20	EDO	A	610	4/4	0.76	0.17	34,47,71,82	0
25	PEK	P	302	48/53	0.76	0.24	43,76,148,161	0
27	DMU	K	102	22/33	0.76	0.29	53,109,188,214	0
20	EDO	A	615	4/4	0.77	0.18	50,58,69,100	0
25	PEK	C	303	53/53	0.77	0.28	40,78,139,158	0
27	DMU	O	303	32/33	0.78	0.20	42,102,173,202	0
20	EDO	Q	203	4/4	0.78	0.21	53,60,62,90	0
19	PGV	C	305	51/51	0.78	0.23	42,80,129,135	0
19	PGV	N	607	51/51	0.78	0.27	43,79,130,161	0
27	DMU	L	102	33/33	0.79	0.21	54,103,152,159	0
21	TGL	B	304	63/63	0.79	0.20	26,66,132,168	0
27	DMU	C	307	33/33	0.80	0.23	48,109,157,171	0
27	DMU	P	307	33/33	0.80	0.22	52,103,149,183	0
20	EDO	N	612	4/4	0.80	0.19	45,59,71,81	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
20	EDO	T	106	4/4	0.81	0.23	44,62,75,86	0
20	EDO	L	103	4/4	0.81	0.29	33,64,68,80	0
21	TGL	Q	201	63/63	0.81	0.19	44,74,134,171	0
24	CHD	J	101	29/29	0.81	0.28	56,80,126,169	0
23	PSC	O	302	46/52	0.82	0.25	32,76,132,166	0
24	CHD	Y	101	29/29	0.82	0.28	67,92,145,156	0
23	PSC	B	303	51/52	0.82	0.28	39,79,158,184	0
20	EDO	D	203	4/4	0.83	0.14	45,56,56,60	0
20	EDO	C	316	4/4	0.83	0.13	51,55,65,78	0
27	DMU	C	308	33/33	0.83	0.26	28,76,162,192	0
20	EDO	O	306	4/4	0.84	0.11	43,54,61,70	0
20	EDO	A	616	4/4	0.84	0.20	45,51,54,55	0
20	EDO	S	104	4/4	0.84	0.43	59,108,114,122	0
20	EDO	N	626	4/4	0.85	0.40	60,67,68,69	0
26	CDL	C	306	92/100	0.85	0.21	40,77,112,123	0
21	TGL	Y	102	63/63	0.85	0.21	40,73,135,230	0
26	CDL	P	306	84/100	0.85	0.23	37,79,134,142	0
20	EDO	M	105	4/4	0.85	0.35	41,50,55,99	0
20	EDO	I	101	4/4	0.86	0.18	39,49,57,69	0
20	EDO	C	317	4/4	0.86	0.12	48,65,69,69	0
19	PGV	A	607	48/51	0.86	0.21	31,60,116,157	0
20	EDO	P	312	4/4	0.87	0.15	49,63,65,77	0
20	EDO	P	315	4/4	0.87	0.13	57,59,84,96	0
21	TGL	L	101	60/63	0.87	0.20	31,62,180,229	0
20	EDO	N	615	4/4	0.87	0.26	56,57,58,67	0
20	EDO	A	620	4/4	0.87	0.17	43,54,56,84	0
20	EDO	P	311	4/4	0.88	0.12	54,71,82,98	0
20	EDO	D	202	4/4	0.88	0.18	54,67,104,106	0
27	DMU	T	104	22/33	0.88	0.15	50,84,149,169	0
21	TGL	N	608	63/63	0.88	0.17	40,76,128,162	0
27	DMU	Z	101	33/33	0.88	0.13	36,50,67,70	0
20	EDO	M	103	4/4	0.89	0.19	40,72,86,94	0
20	EDO	P	314	4/4	0.89	0.14	34,40,42,42	0
20	EDO	J	103	4/4	0.89	0.26	49,51,69,73	0
27	DMU	M	101	33/33	0.89	0.11	33,43,61,83	0
20	EDO	E	203	4/4	0.90	0.09	40,55,56,65	0
20	EDO	Q	204	4/4	0.90	0.19	45,50,55,56	0
20	EDO	O	307	4/4	0.90	0.14	44,51,62,77	0
20	EDO	C	312	4/4	0.90	0.10	31,40,46,69	0
21	TGL	B	301	63/63	0.90	0.15	37,65,131,160	0
20	EDO	N	618	4/4	0.90	0.16	30,37,43,48	0
20	EDO	B	306	4/4	0.90	0.11	29,42,43,56	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
20	EDO	A	613	4/4	0.90	0.23	60,63,78,80	0
20	EDO	R	201	4/4	0.91	0.13	62,63,82,93	0
20	EDO	B	309	4/4	0.91	0.11	32,55,55,70	0
20	EDO	J	104	4/4	0.91	0.22	42,61,62,75	0
20	EDO	U	101	4/4	0.91	0.25	38,44,54,65	0
29	PO4	U	102	5/5	0.91	0.22	52,53,95,97	0
20	EDO	D	201	4/4	0.92	0.10	47,47,59,72	0
20	EDO	D	204	4/4	0.92	0.24	36,41,53,81	0
20	EDO	M	102	4/4	0.92	0.06	52,58,71,72	0
20	EDO	A	614	4/4	0.92	0.13	46,67,71,71	0
20	EDO	N	622	4/4	0.92	0.13	44,52,53,58	0
20	EDO	M	104	4/4	0.92	0.16	50,65,66,70	0
20	EDO	F	105	4/4	0.92	0.20	42,43,47,68	0
20	EDO	N	614	4/4	0.93	0.10	46,48,63,86	0
20	EDO	C	311	4/4	0.93	0.10	71,76,87,88	0
20	EDO	V	101	4/4	0.93	0.28	19,38,52,86	0
20	EDO	C	313	4/4	0.93	0.11	39,62,68,79	0
20	EDO	P	313	4/4	0.93	0.18	52,62,63,68	0
20	EDO	N	619	4/4	0.93	0.17	39,48,54,63	0
24	CHD	C	301	29/29	0.94	0.08	24,27,35,38	0
20	EDO	Y	103	4/4	0.94	0.21	48,52,65,81	0
20	EDO	S	106	4/4	0.94	0.13	36,51,71,84	0
20	EDO	A	621	4/4	0.94	0.15	39,39,48,49	0
25	PEK	P	303	45/53	0.94	0.12	26,42,78,93	0
20	EDO	N	624	4/4	0.95	0.14	32,33,47,92	0
20	EDO	N	613	4/4	0.95	0.11	36,38,42,44	0
20	EDO	N	617	4/4	0.95	0.20	32,38,48,75	0
20	EDO	F	104	4/4	0.95	0.07	33,36,44,57	0
20	EDO	P	310	4/4	0.95	0.12	33,36,37,40	0
24	CHD	P	301	29/29	0.95	0.07	23,29,34,36	0
24	CHD	G	103	29/29	0.96	0.08	21,24,30,37	0
20	EDO	T	105	4/4	0.96	0.09	28,31,36,38	0
20	EDO	O	304	4/4	0.96	0.09	29,29,30,31	0
20	EDO	O	305	4/4	0.96	0.13	37,48,52,54	0
20	EDO	B	307	4/4	0.96	0.10	34,45,48,48	0
20	EDO	R	202	4/4	0.96	0.10	40,42,43,45	0
20	EDO	C	314	4/4	0.96	0.23	43,62,63,92	0
20	EDO	C	309	4/4	0.96	0.09	30,33,33,35	0
20	EDO	N	625	4/4	0.97	0.27	33,44,48,82	0
20	EDO	B	305	4/4	0.97	0.09	22,26,27,29	0
20	EDO	A	611	4/4	0.97	0.13	30,38,39,68	0
20	EDO	S	103	4/4	0.97	0.12	29,30,30,35	0

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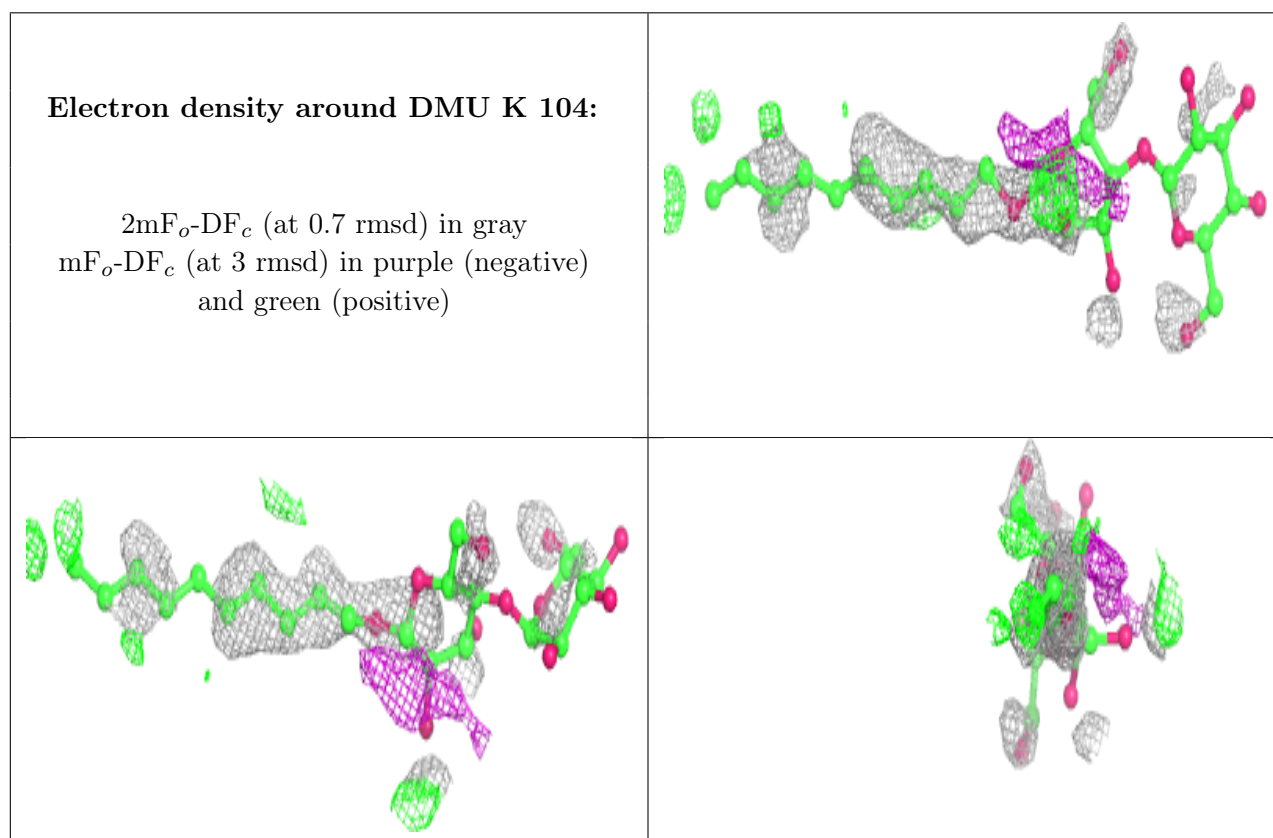
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
20	EDO	A	618	4/4	0.97	0.12	26,28,30,34	0
19	PGV	N	609	51/51	0.97	0.11	22,29,65,89	0
20	EDO	N	616	4/4	0.97	0.18	33,35,55,74	0
20	EDO	D	205	4/4	0.97	0.11	35,40,61,70	0
20	EDO	E	202	4/4	0.97	0.08	36,40,42,43	0
19	PGV	P	305	51/51	0.97	0.11	22,31,85,100	0
20	EDO	F	103	4/4	0.97	0.12	27,29,33,35	0
24	CHD	T	101	29/29	0.97	0.07	22,25,30,40	0
20	EDO	N	621	4/4	0.97	0.12	31,40,41,43	0
20	EDO	B	310	4/4	0.97	0.20	41,47,47,55	0
25	PEK	C	302	53/53	0.97	0.12	25,40,84,114	0
29	PO4	H	101	5/5	0.97	0.20	52,61,77,97	0
19	PGV	C	304	50/51	0.97	0.10	22,30,86,98	0
20	EDO	A	609	4/4	0.98	0.09	22,23,24,27	0
14	HEA	N	602	60/60	0.98	0.09	18,22,27,30	0
14	HEA	A	601[A]	60/60	0.98	0.10	17,20,33,36	18
20	EDO	N	623	4/4	0.98	0.11	35,39,42,48	0
20	EDO	S	105	4/4	0.98	0.08	33,37,41,44	0
20	EDO	A	612	4/4	0.98	0.10	28,38,78,85	0
19	PGV	A	608	51/51	0.98	0.10	22,28,69,77	0
14	HEA	A	601[B]	52/60	0.98	0.10	17,20,26,34	10
14	HEA	A	601[C]	51/60	0.98	0.10	17,20,32,33	9
20	EDO	E	201	4/4	0.98	0.08	39,40,42,43	0
20	EDO	N	610	4/4	0.98	0.11	22,27,28,30	0
20	EDO	N	611	4/4	0.98	0.07	25,26,28,30	0
14	HEA	A	602	60/60	0.98	0.08	18,20,26,31	0
20	EDO	C	310	4/4	0.98	0.10	27,32,44,57	0
20	EDO	A	617	4/4	0.98	0.14	29,36,37,88	0
14	HEA	N	601[A]	60/60	0.98	0.10	21,24,34,40	18
20	EDO	A	619	4/4	0.98	0.19	27,38,40,46	0
14	HEA	N	601[B]	52/60	0.98	0.10	20,23,30,36	10
20	EDO	Q	202	4/4	0.98	0.10	28,46,50,69	0
20	EDO	G	105	4/4	0.98	0.07	27,30,34,34	0
14	HEA	N	601[C]	51/60	0.98	0.10	20,23,29,37	9
18	CMO	N	606[B]	2/2	0.99	0.20	17,17,17,20	2
16	MG	A	604	1/1	0.99	0.05	20,20,20,20	0
16	MG	N	604	1/1	0.99	0.05	21,21,21,21	0
17	NA	A	605	1/1	0.99	0.09	24,24,24,24	0
17	NA	N	605	1/1	0.99	0.07	29,29,29,29	0
18	CMO	A	606[A]	2/2	0.99	0.20	17,17,17,18	2
20	EDO	F	102	4/4	0.99	0.09	22,23,24,25	0
18	CMO	A	606[B]	2/2	0.99	0.20	16,16,16,16	2

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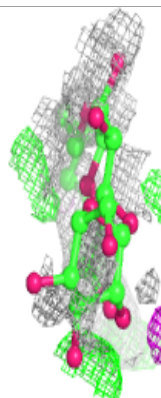
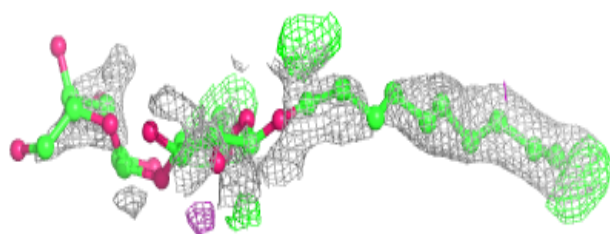
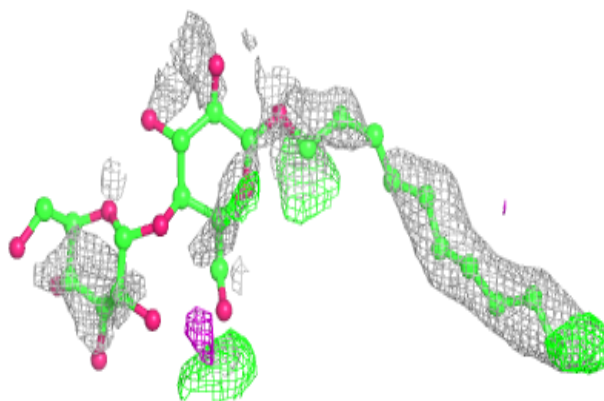
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
28	ZN	S	101	1/1	0.99	0.11	26,26,26,26	0
20	EDO	S	102	4/4	0.99	0.08	22,23,24,24	0
18	CMO	N	606[A]	2/2	0.99	0.20	19,19,19,19	2
22	CUA	O	301	2/2	1.00	0.11	25,25,25,26	0
28	ZN	F	101	1/1	1.00	0.10	26,26,26,26	0
15	CU	A	603	1/1	1.00	0.13	21,21,21,21	0
15	CU	N	603	1/1	1.00	0.14	22,22,22,22	0
22	CUA	B	302	2/2	1.00	0.12	22,22,22,23	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.

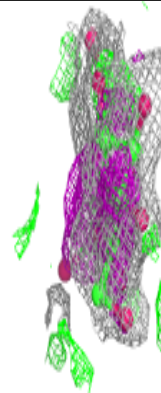
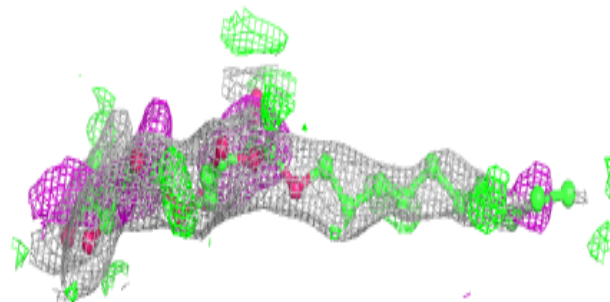
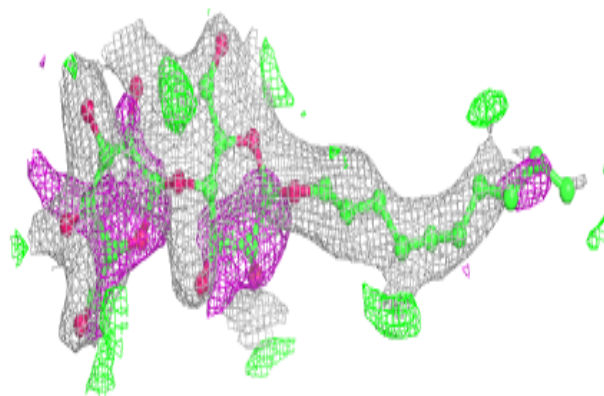


**Electron density around DMU X 204:**

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

**Electron density around DMU P 316:**

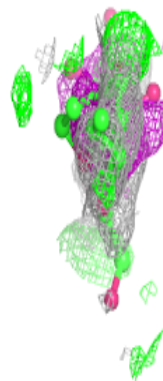
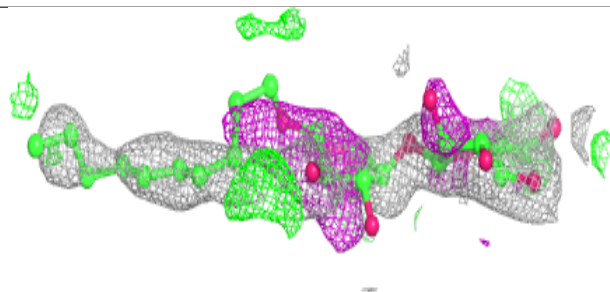
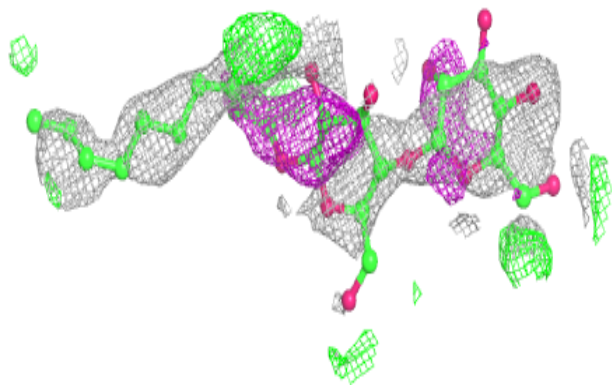
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



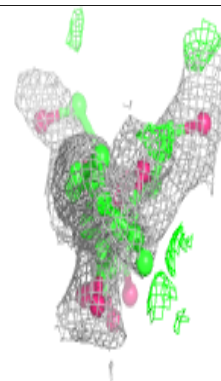
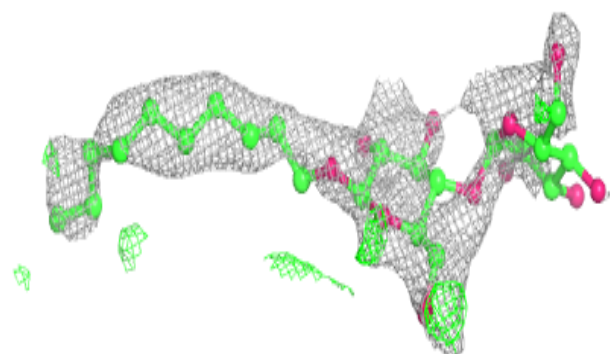
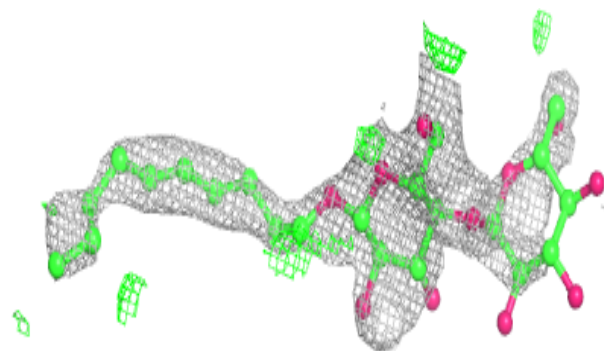


**Electron density around DMU K 106:**

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

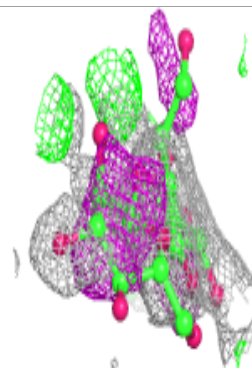
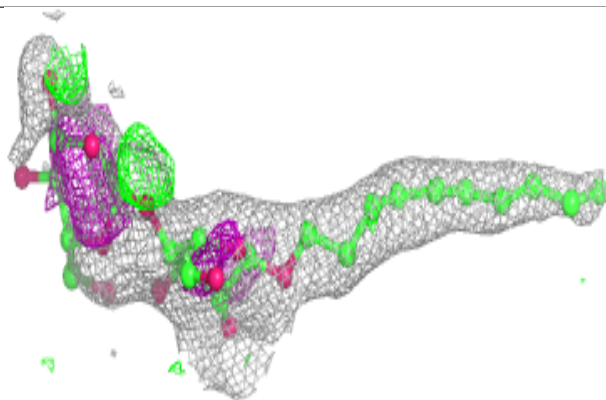
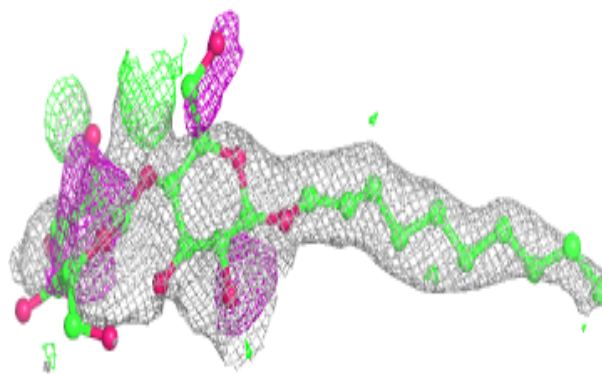
**Electron density around DMU K 103:**

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

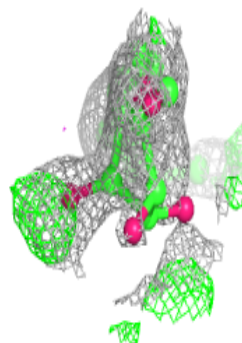
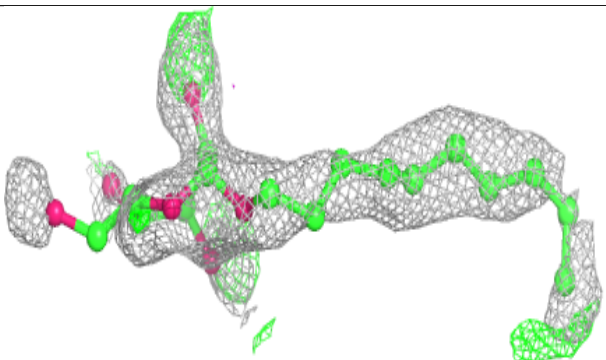
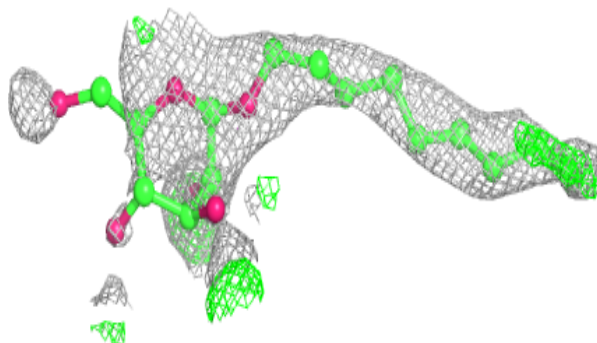


**Electron density around DMU M 106:**

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

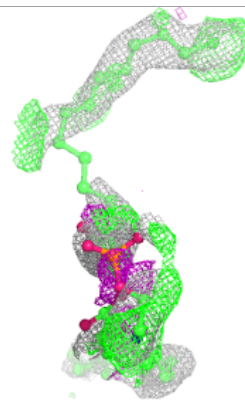
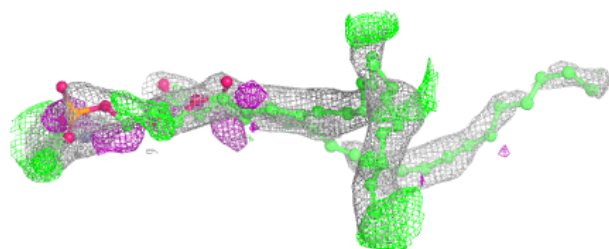
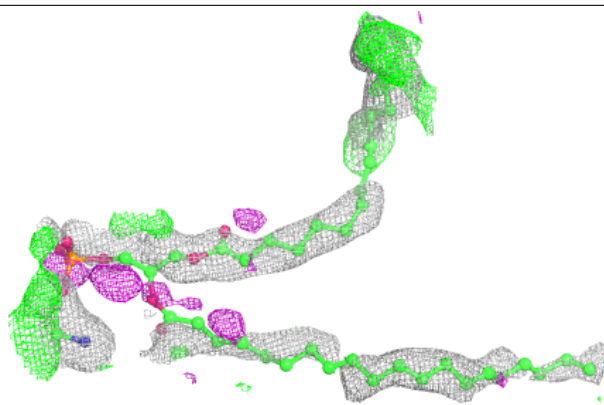
**Electron density around DMU X 203:**

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

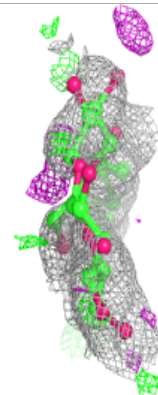
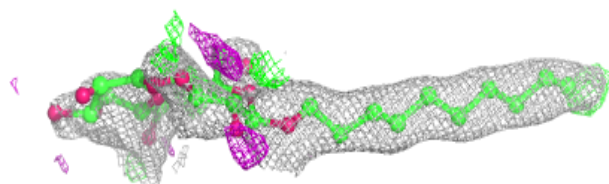
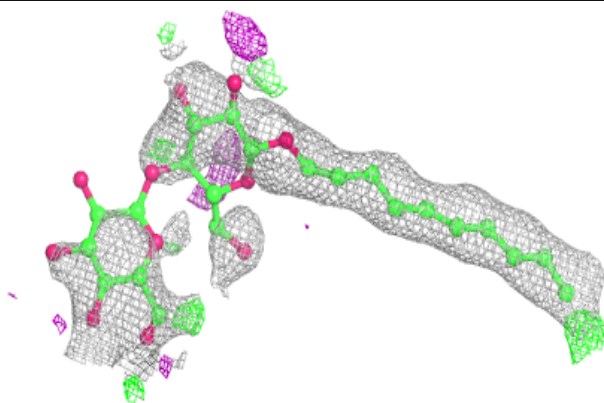


**Electron density around PEK P 304:**

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

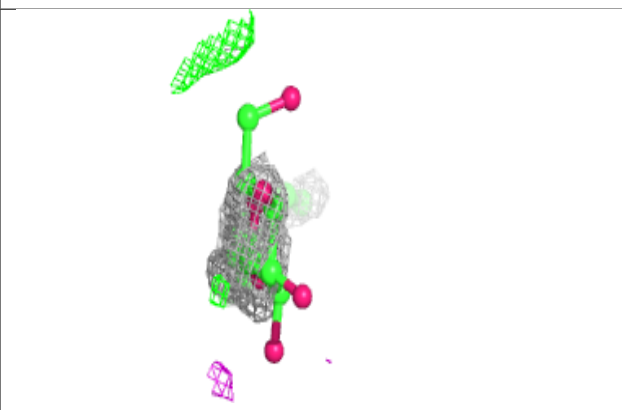
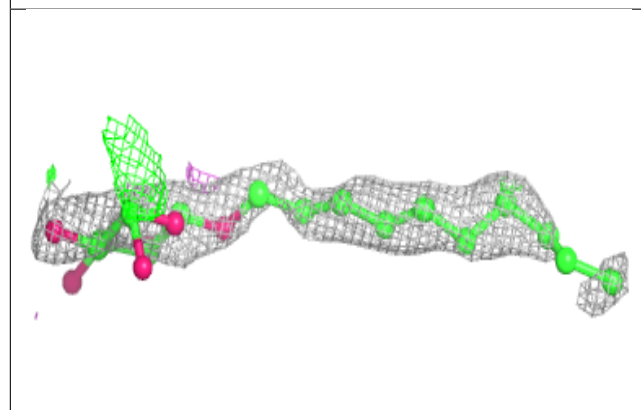
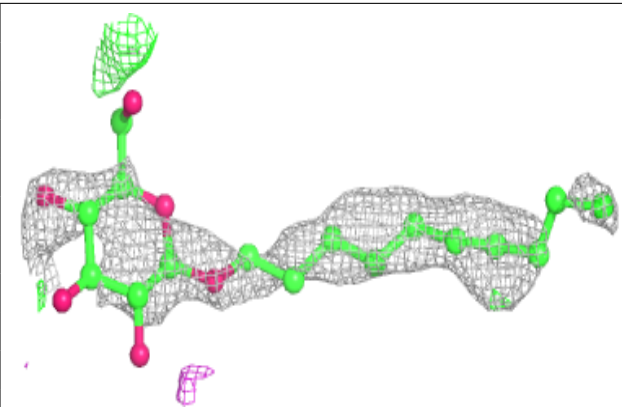
**Electron density around DMU G 102:**

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

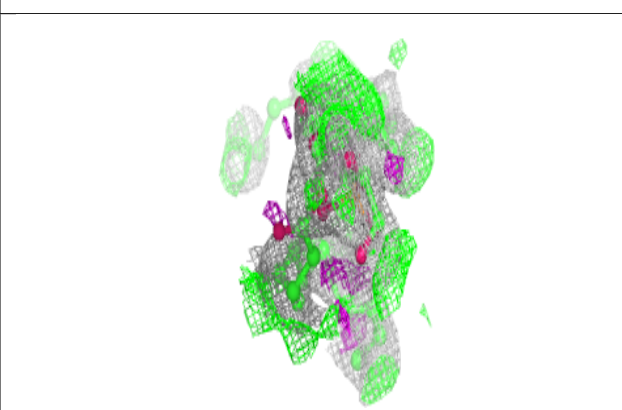
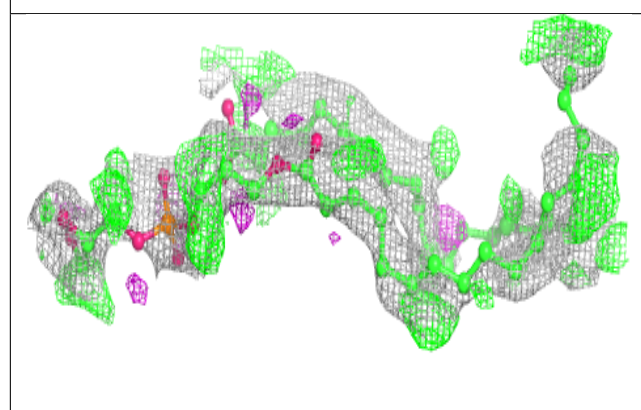
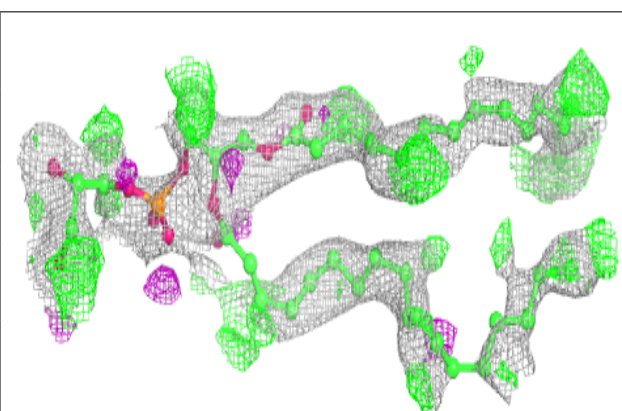


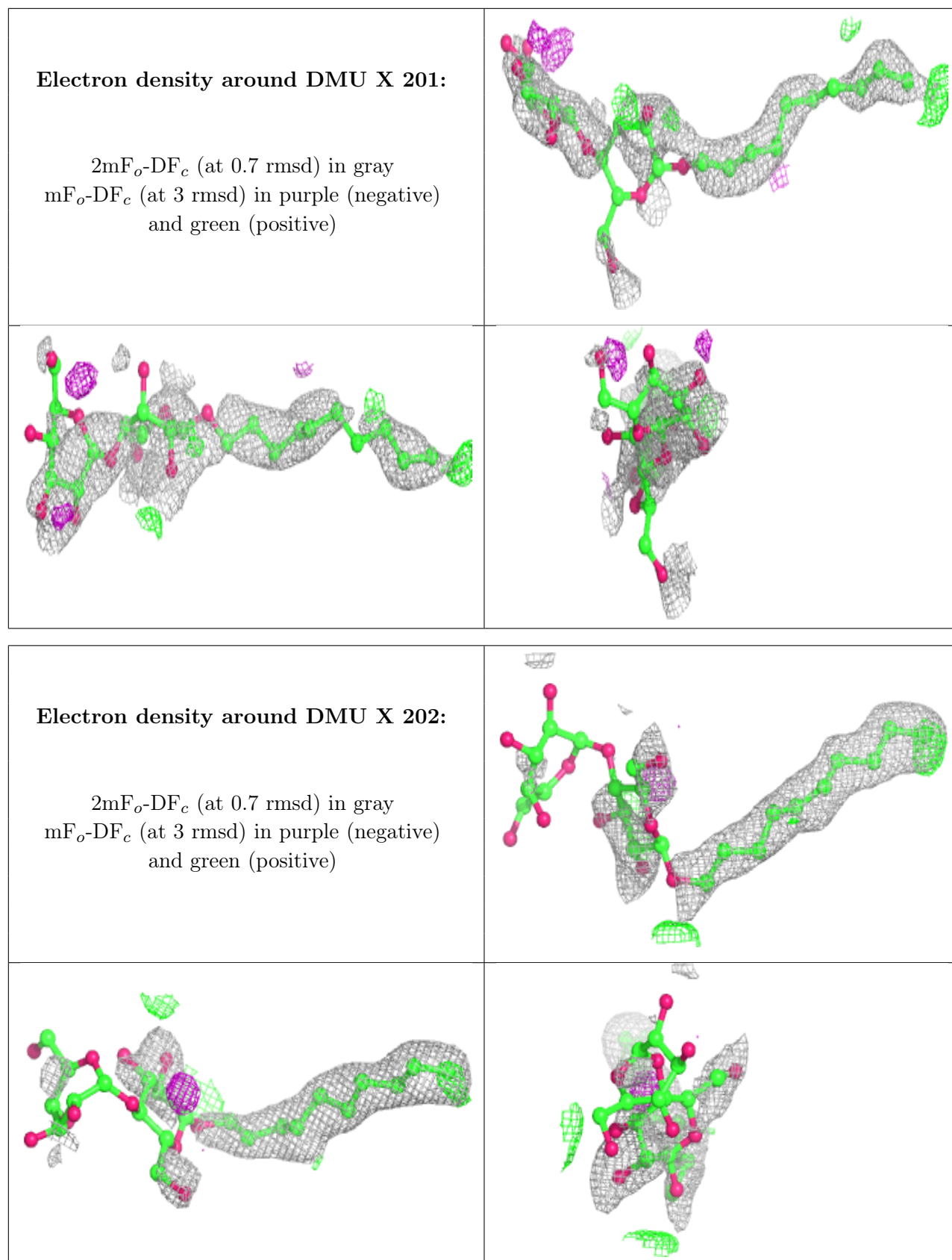
**Electron density around DMU X 205:**

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

**Electron density around PGV G 104:**

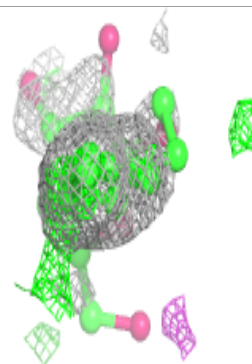
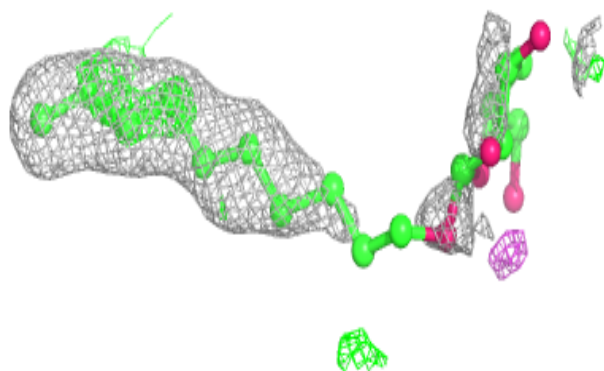
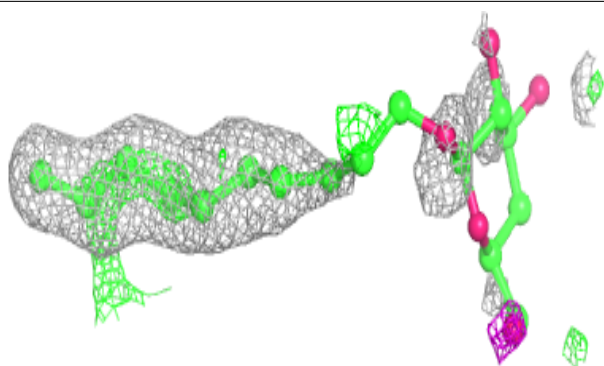
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



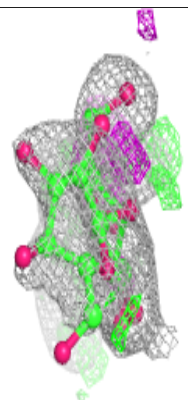
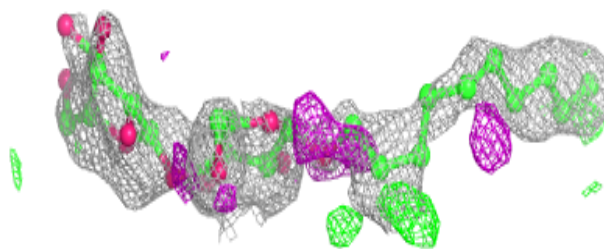
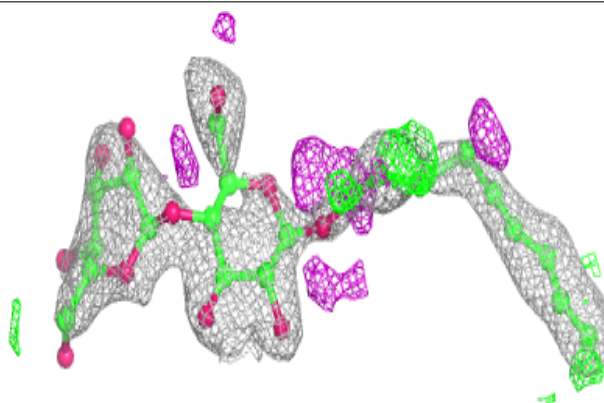


**Electron density around DMU K 101:**

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

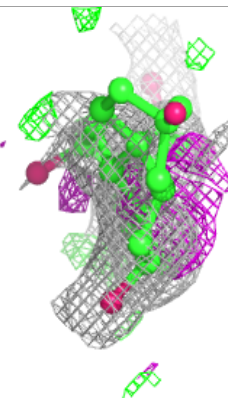
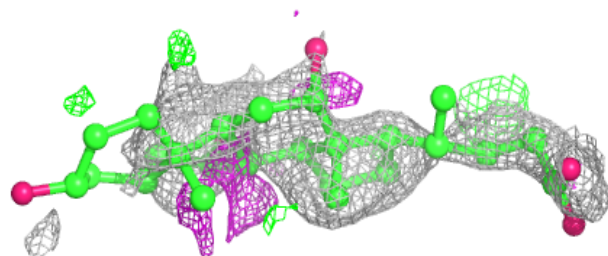
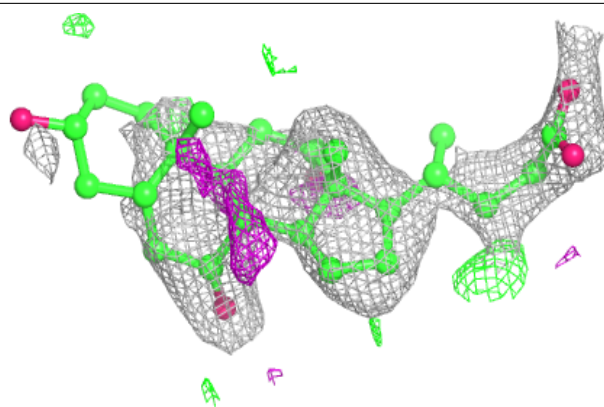
**Electron density around DMU P 309:**

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

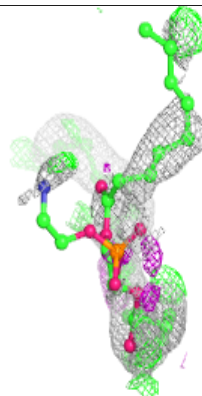
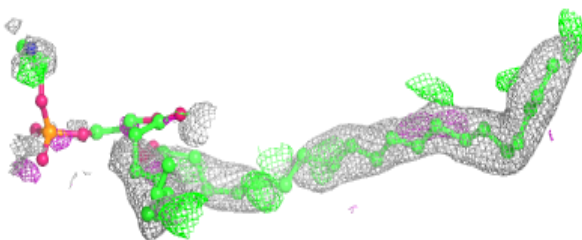
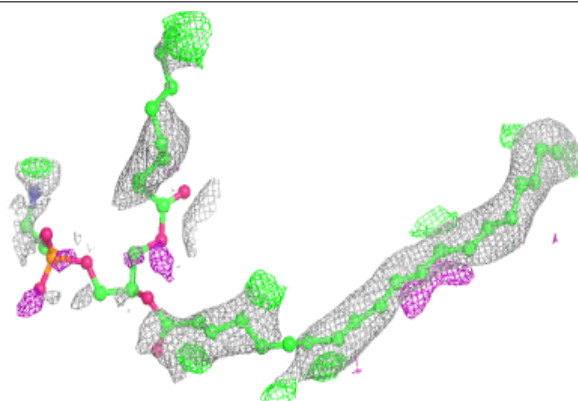


**Electron density around CHD J 102:**

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

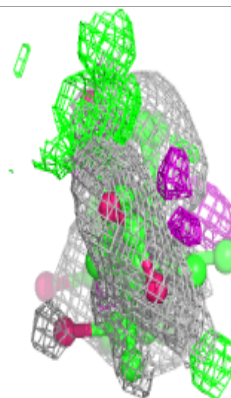
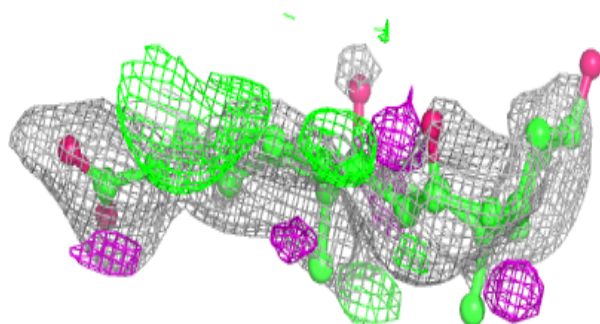
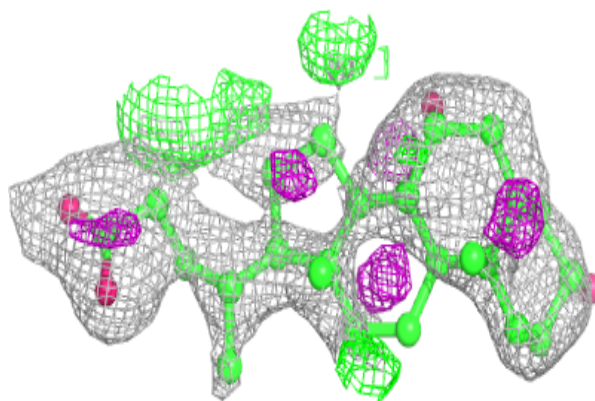
**Electron density around PEK T 102:**

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

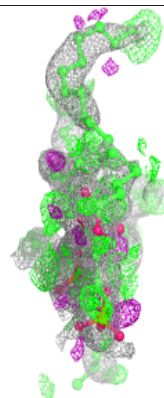
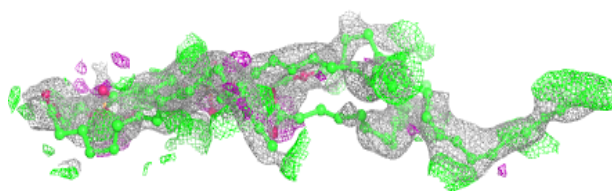
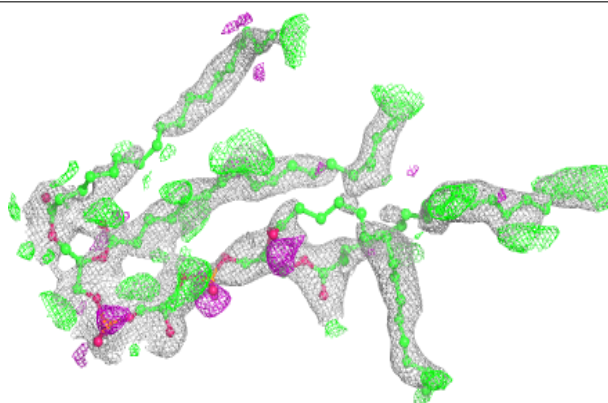


**Electron density around CHD P 308:**

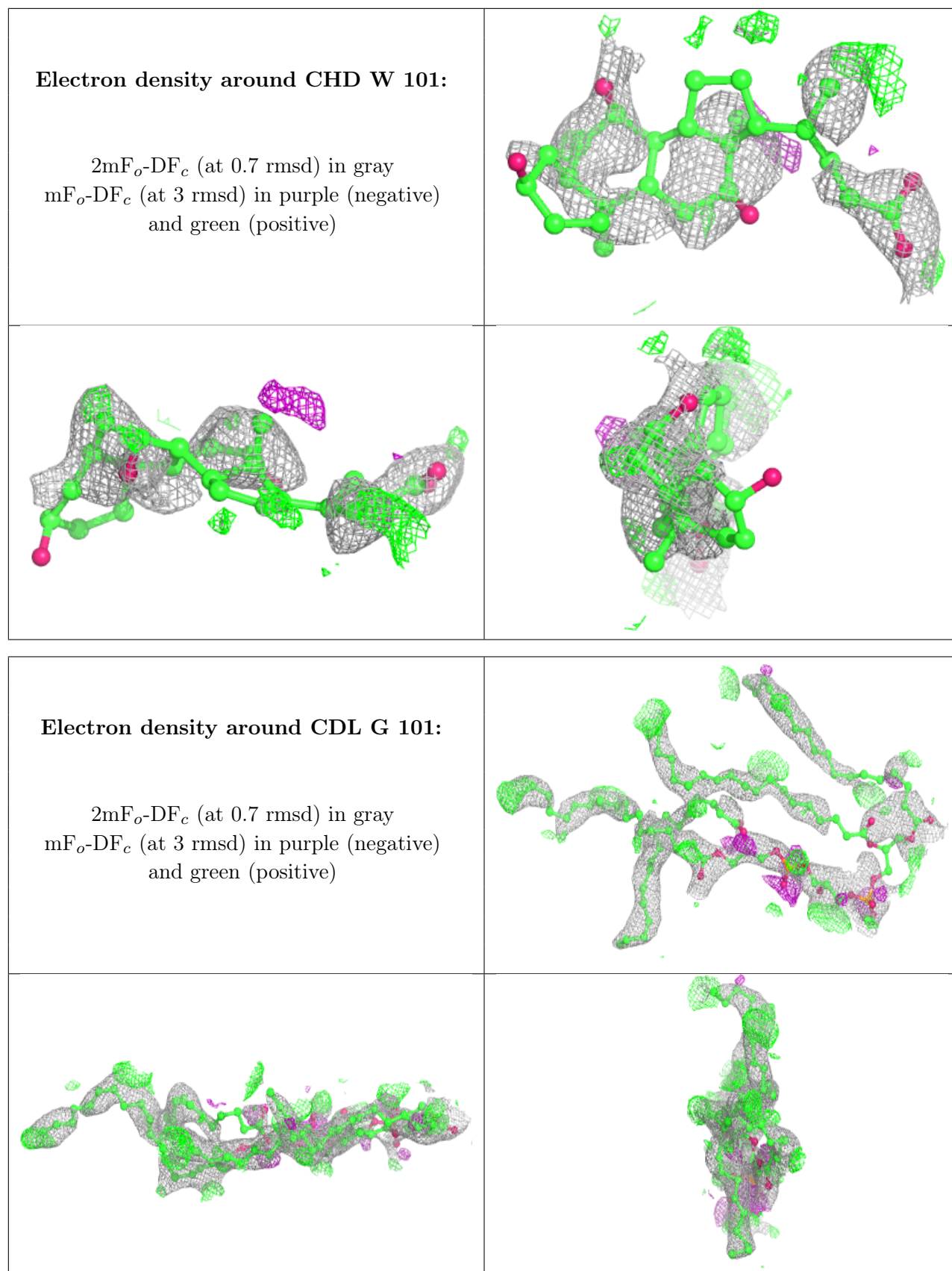
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

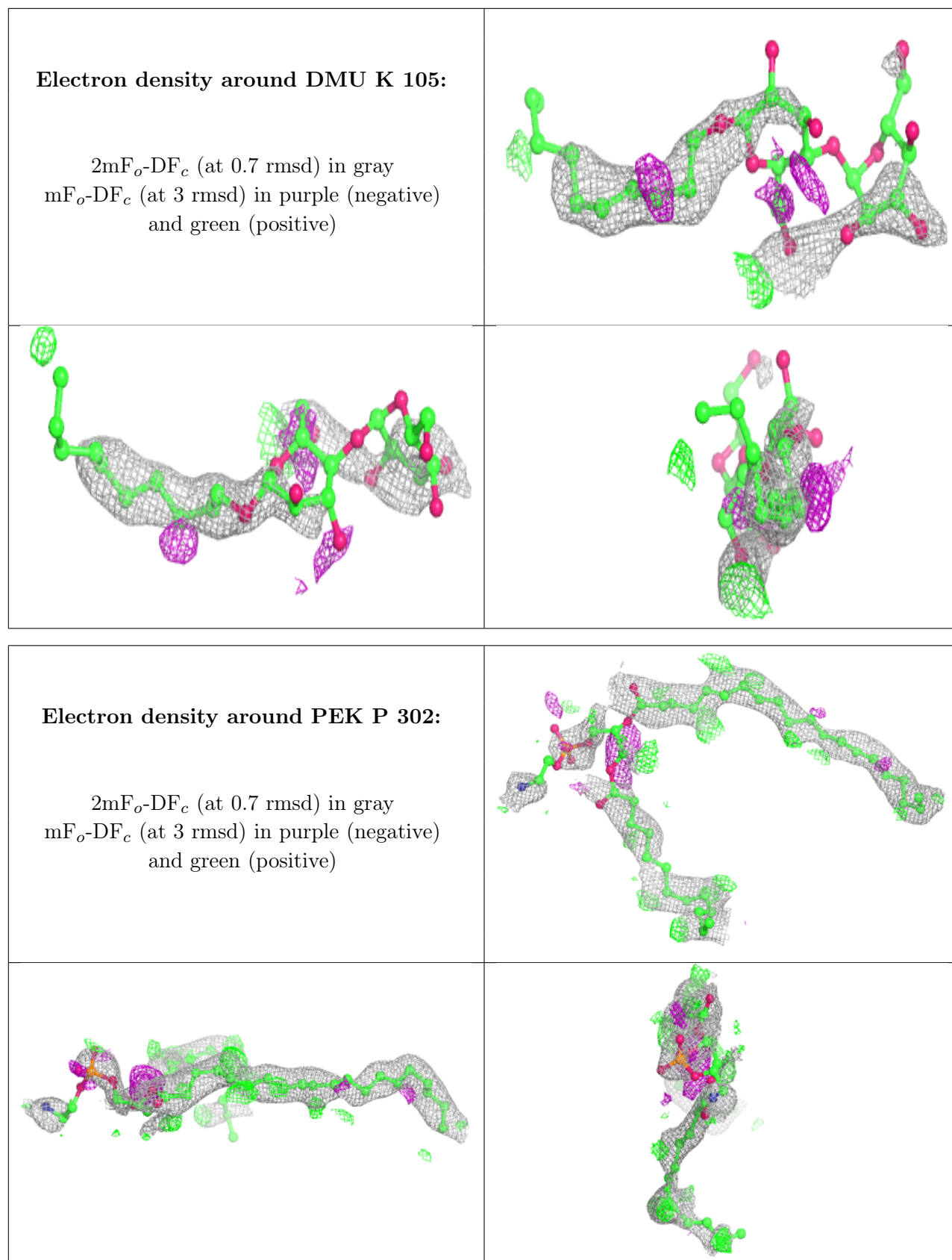
**Electron density around CDL T 103:**

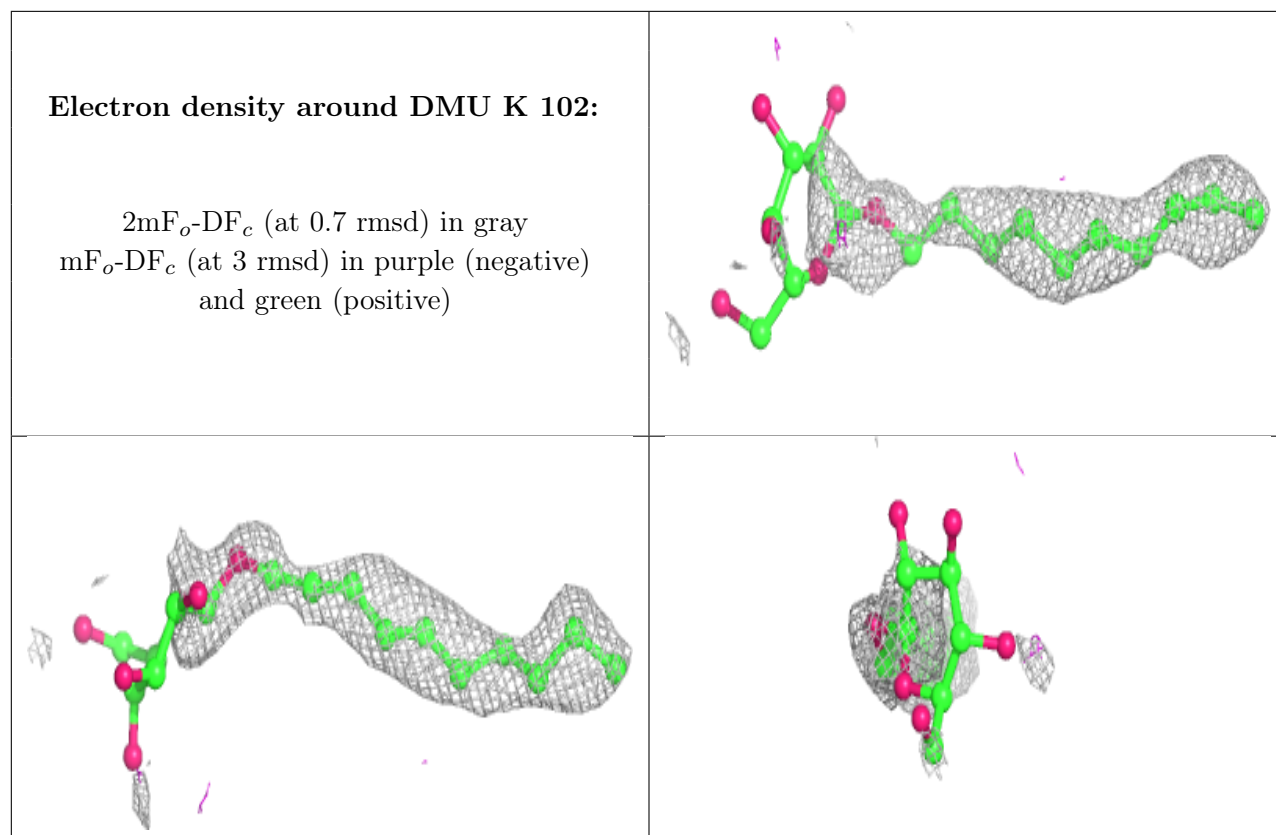
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

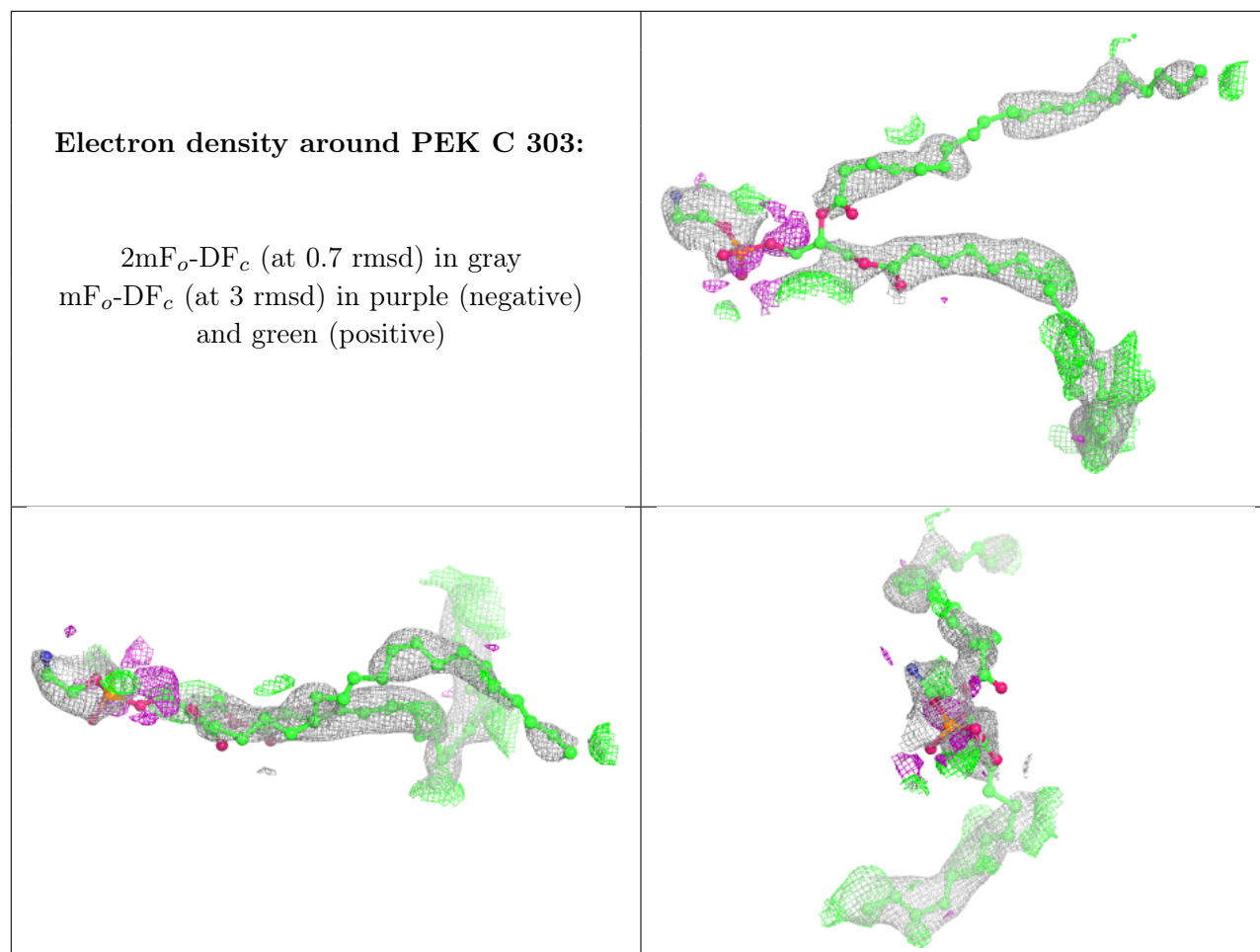






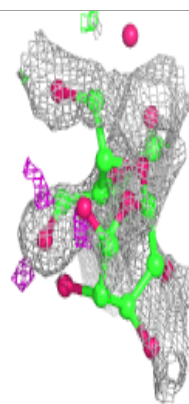
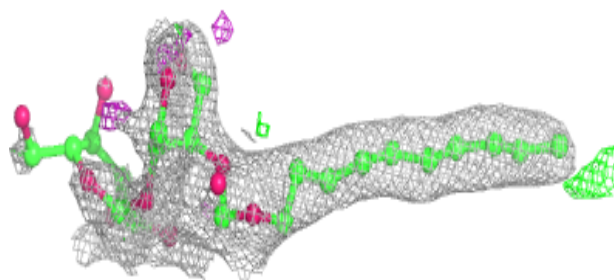
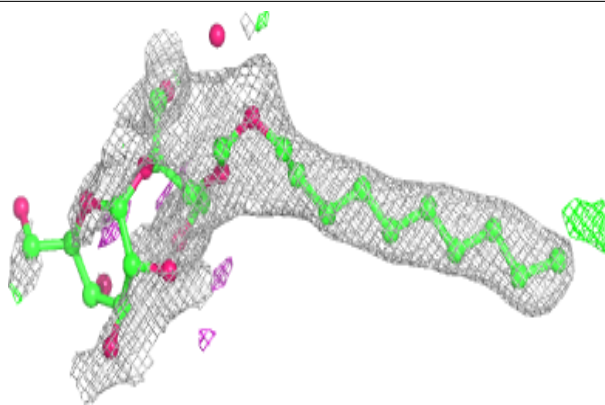




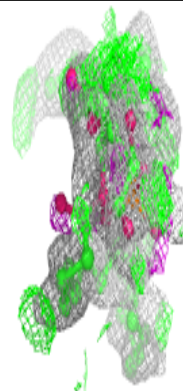
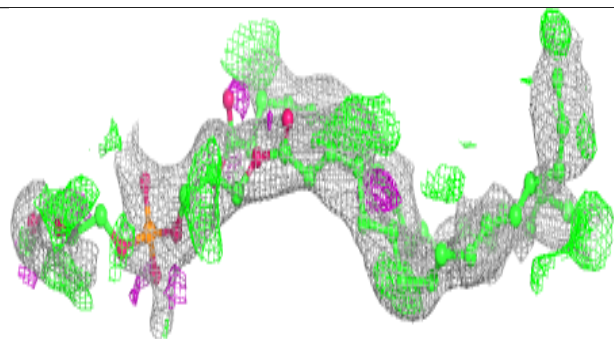
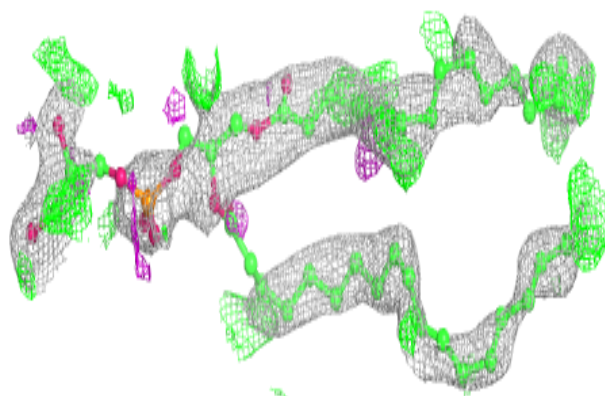


**Electron density around DMU O 303:**

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

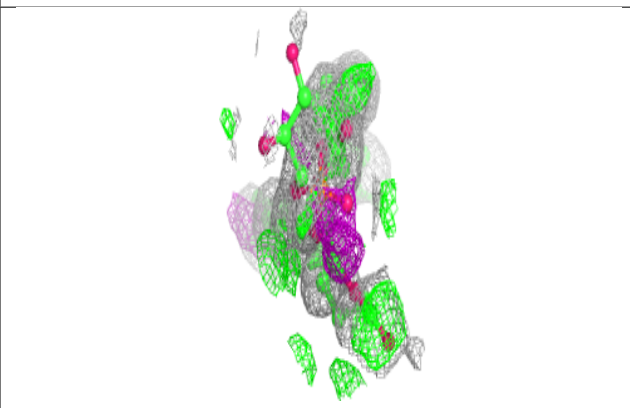
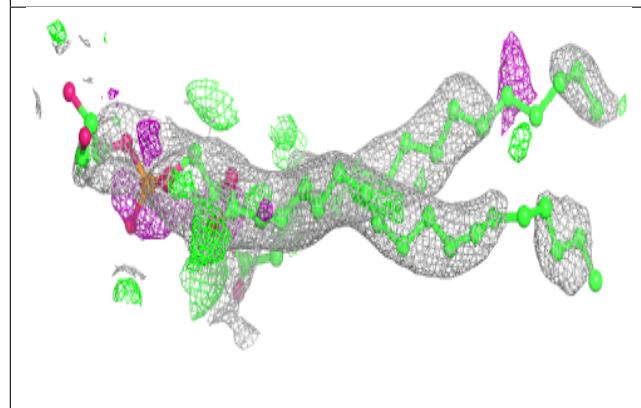
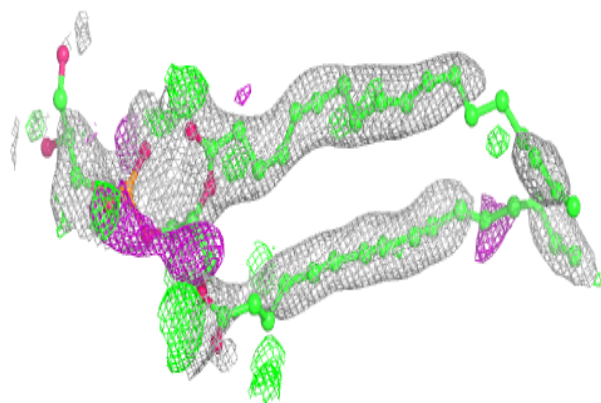
**Electron density around PGV C 305:**

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

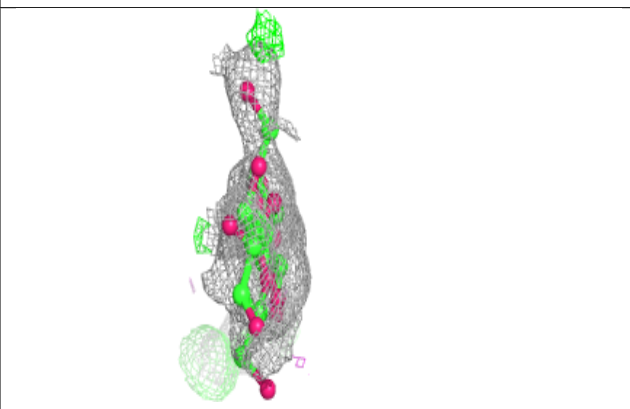
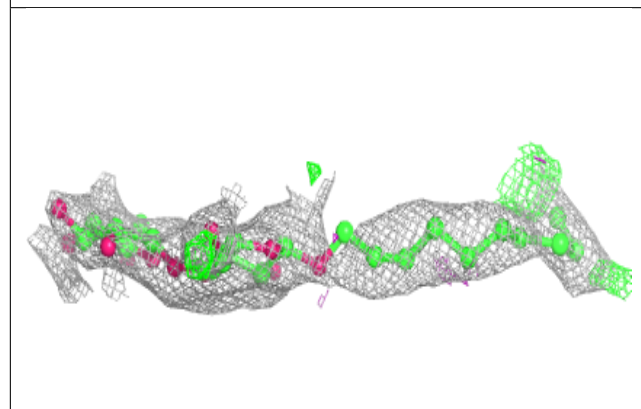
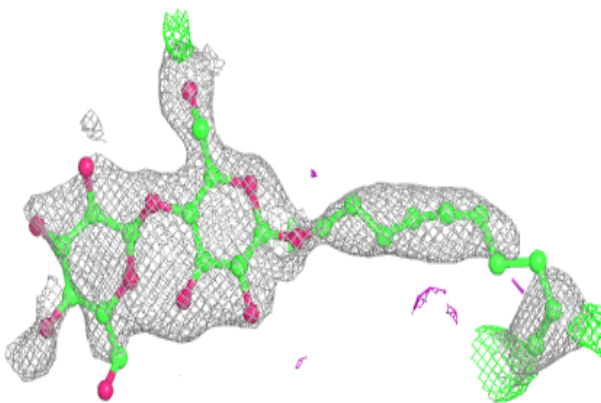


**Electron density around PGV N 607:**

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

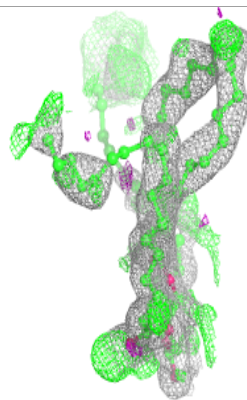
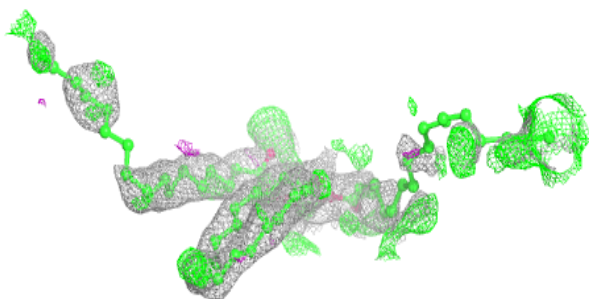
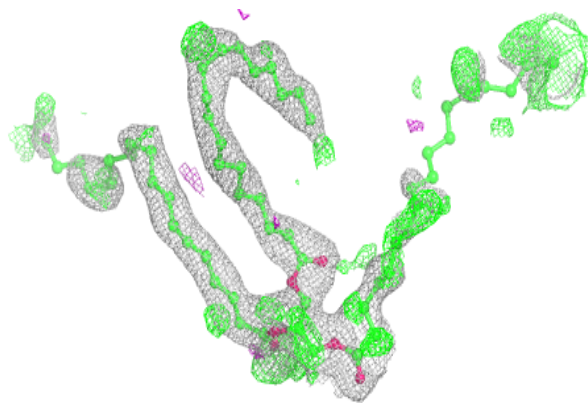
**Electron density around DMU L 102:**

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

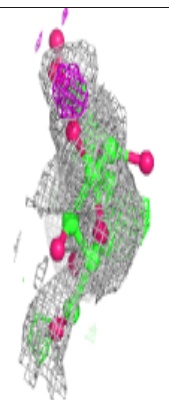
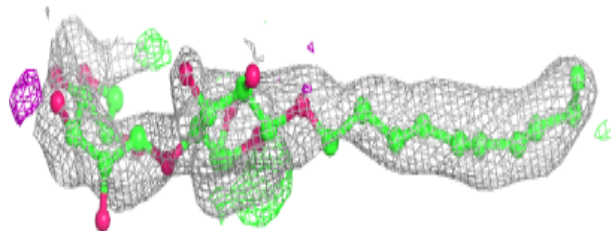
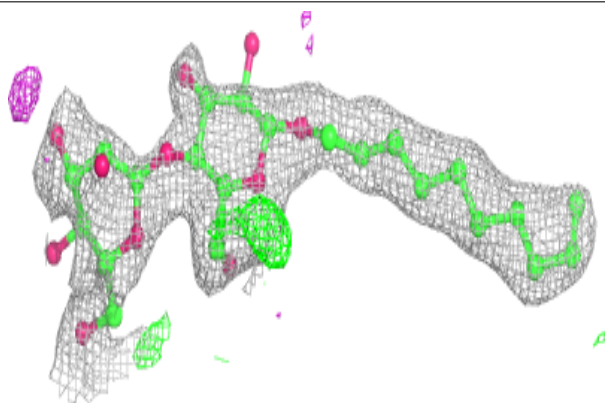


**Electron density around TGL B 304:**

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

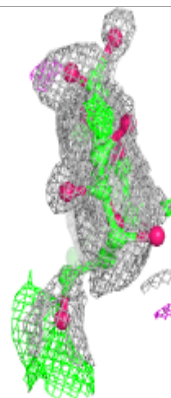
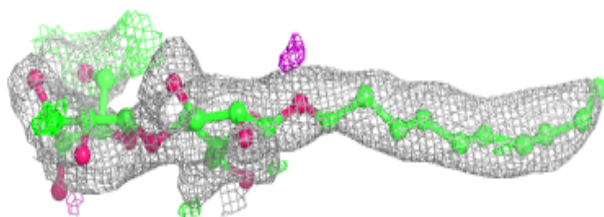
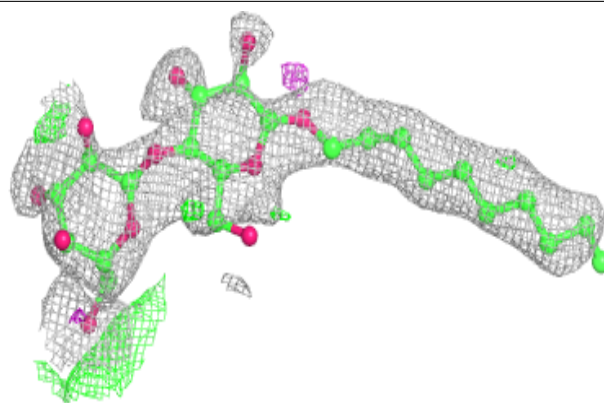
**Electron density around DMU C 307:**

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

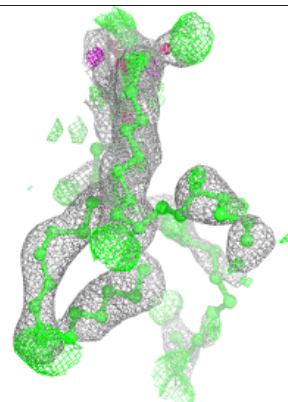
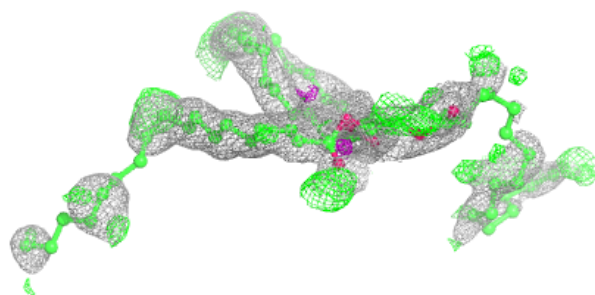
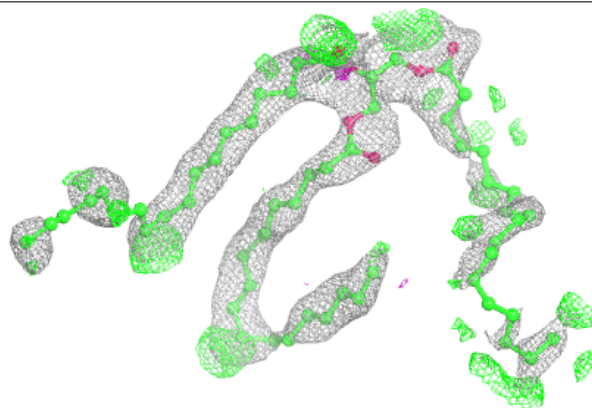


**Electron density around DMU P 307:**

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

**Electron density around TGL Q 201:**

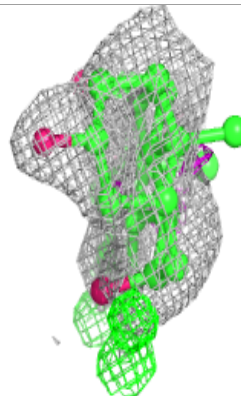
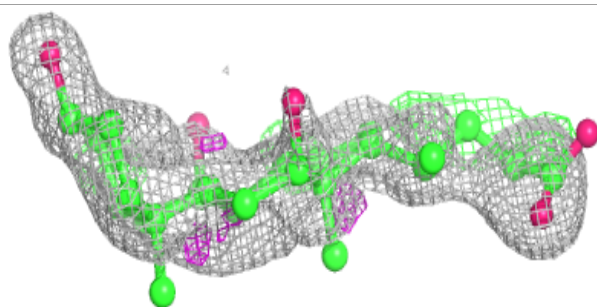
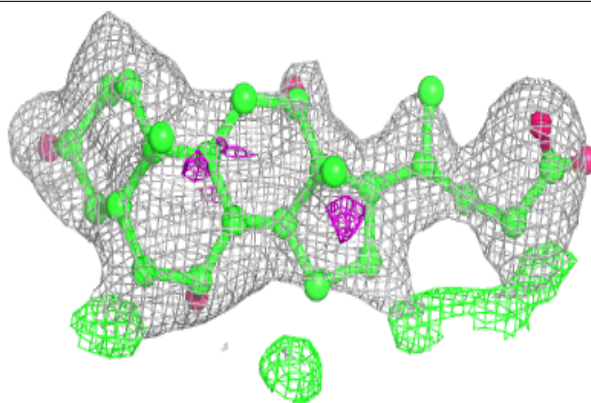
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



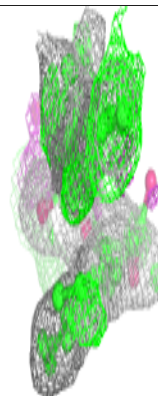
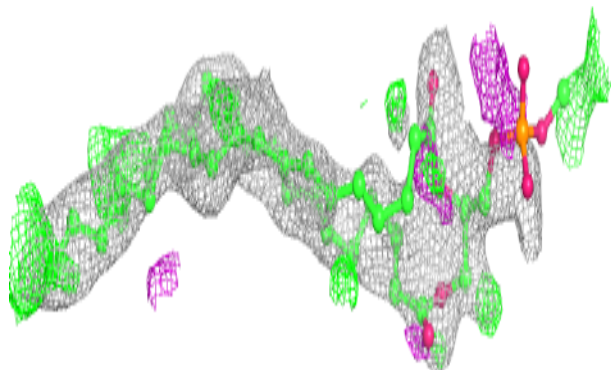
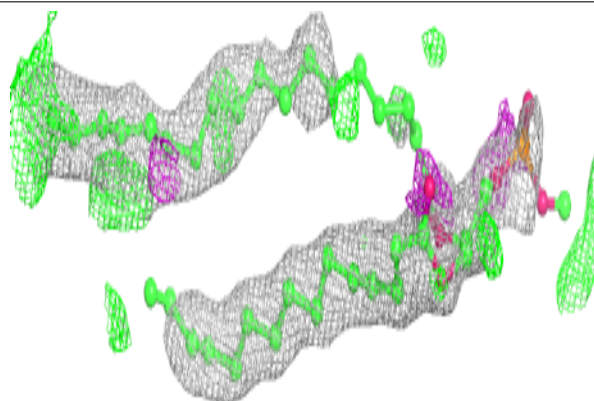


**Electron density around CHD J 101:**

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

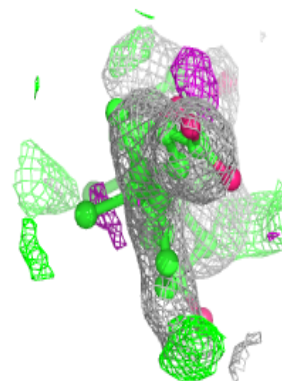
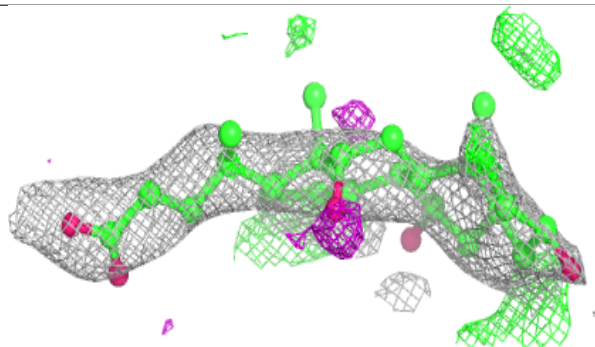
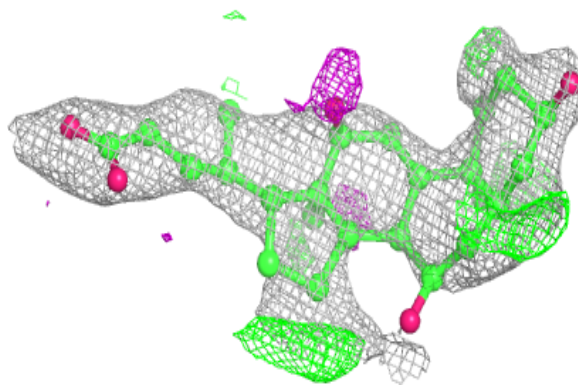
**Electron density around PSC O 302:**

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

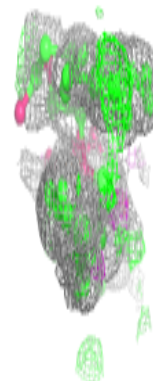
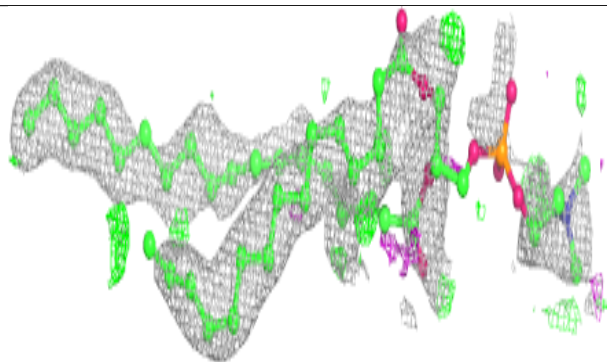
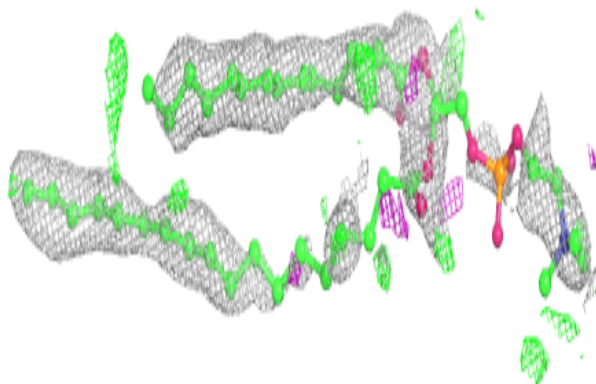


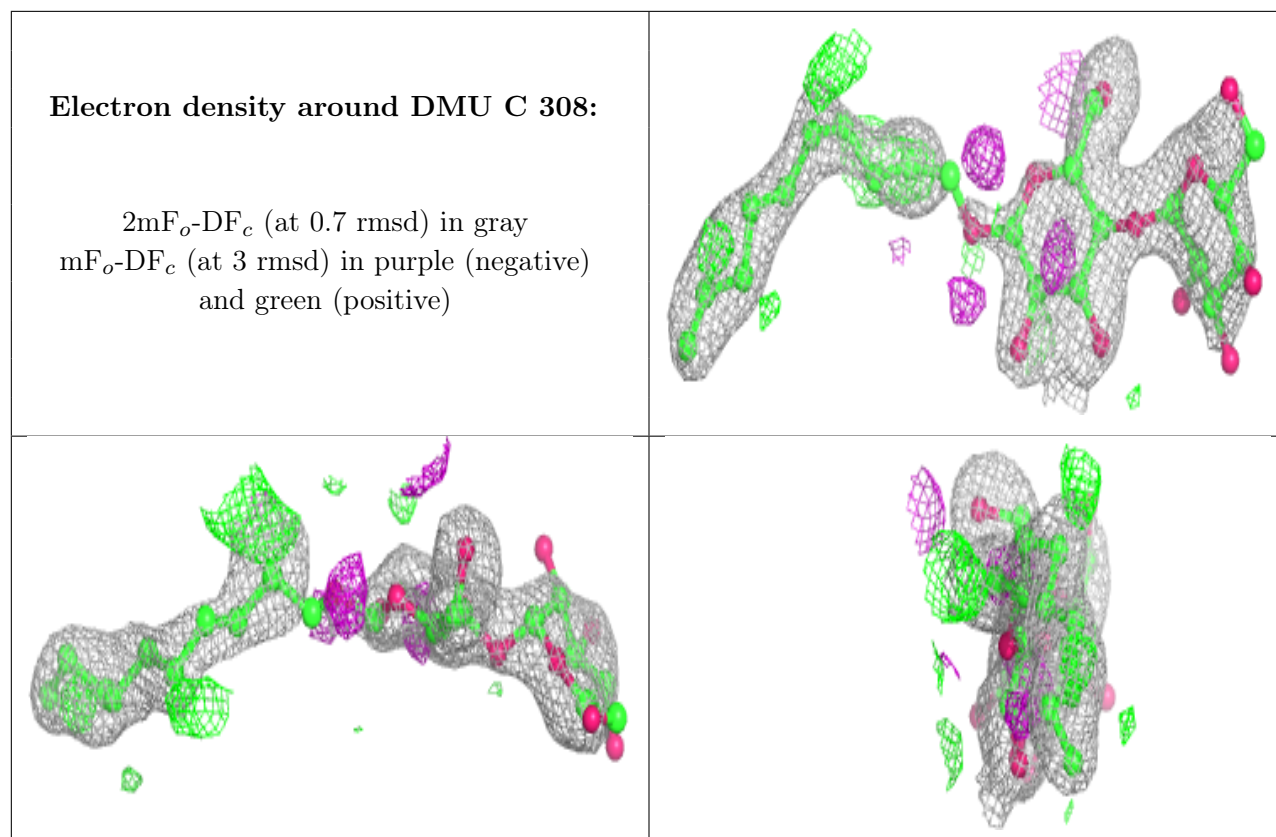
**Electron density around CHD Y 101:**

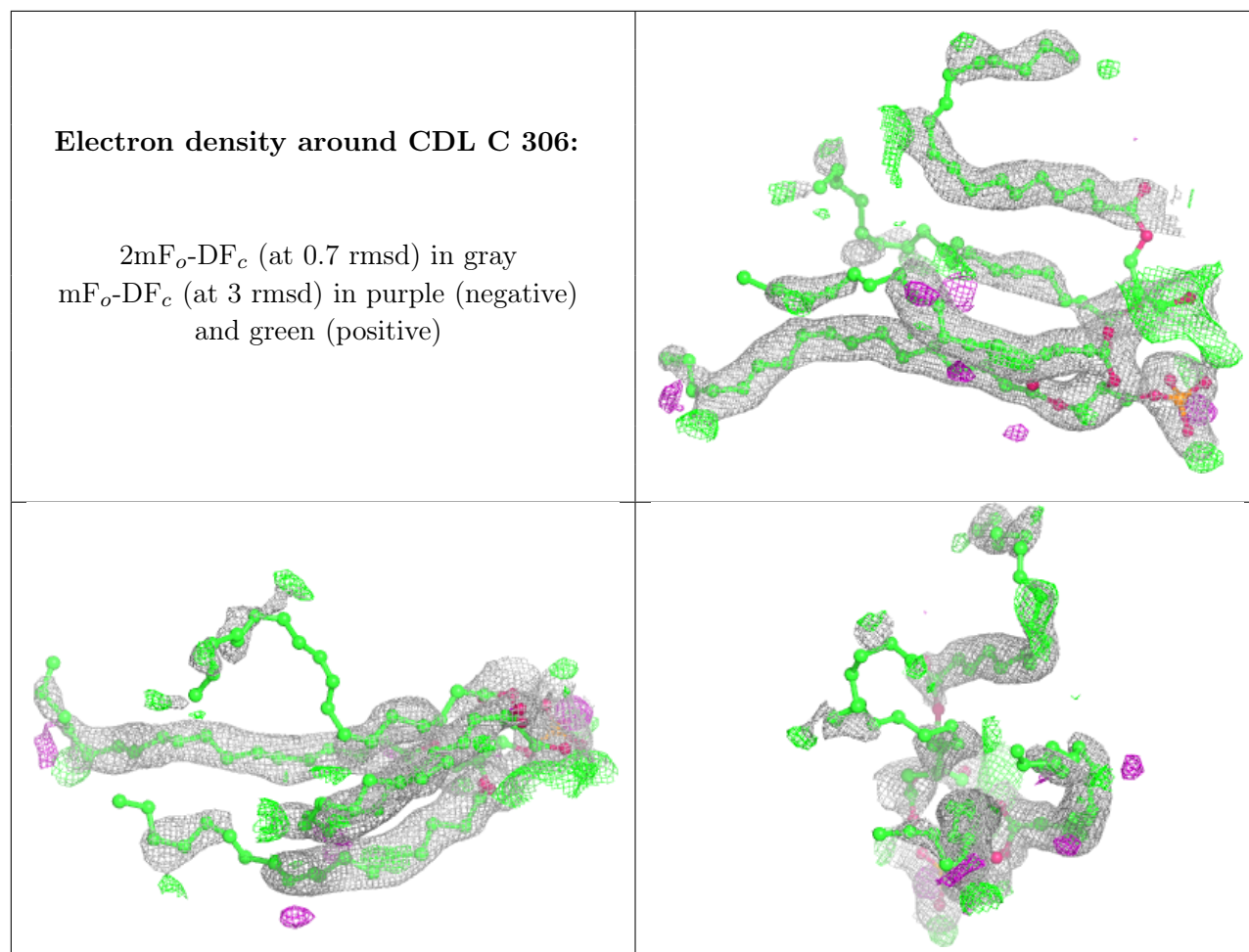
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

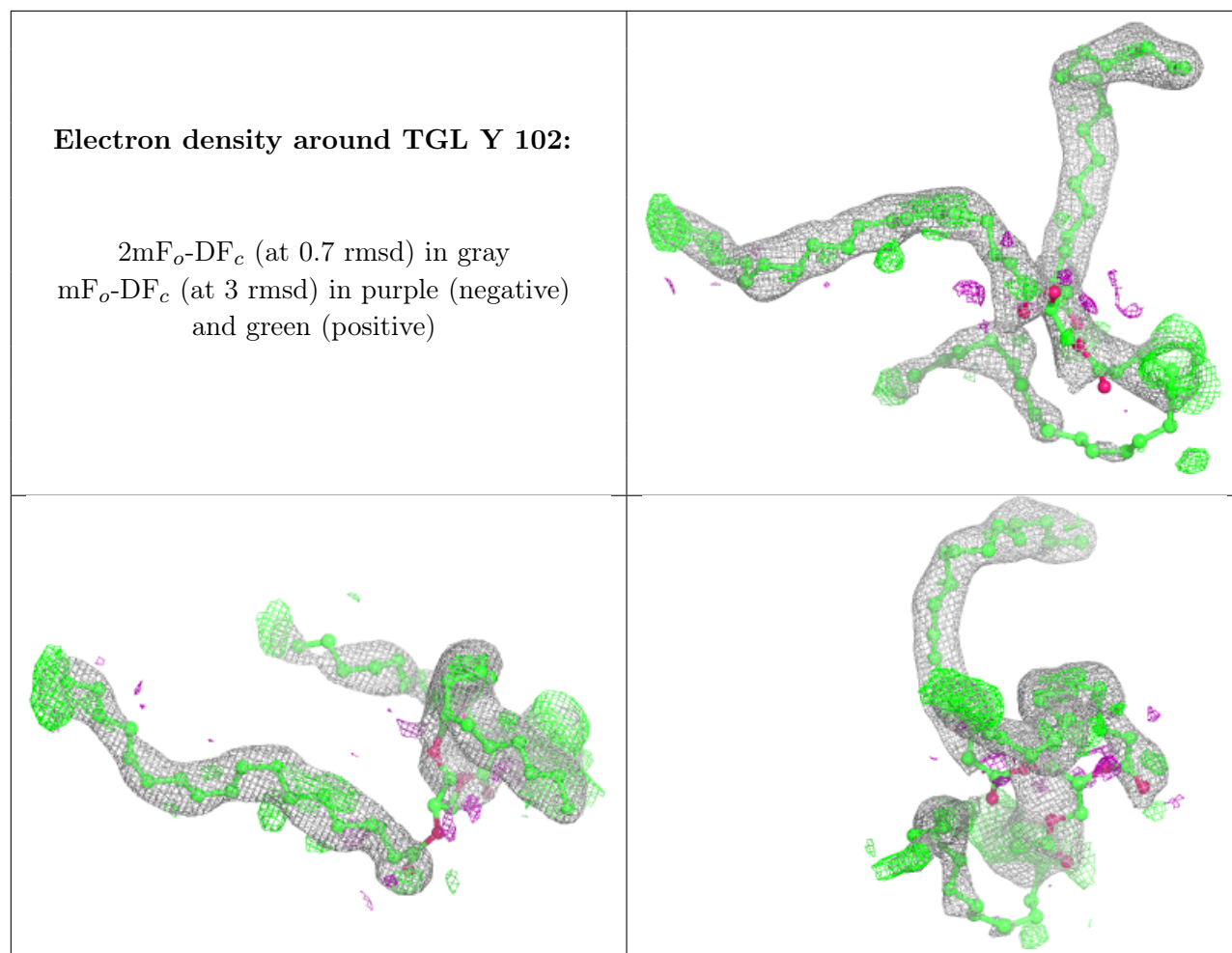
**Electron density around PSC B 303:**

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



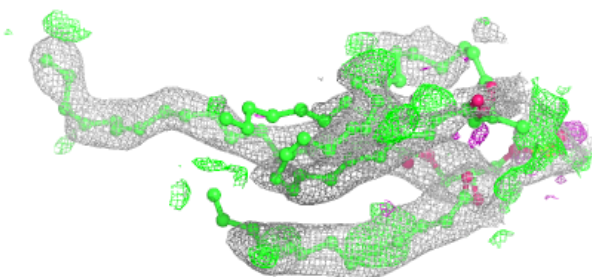
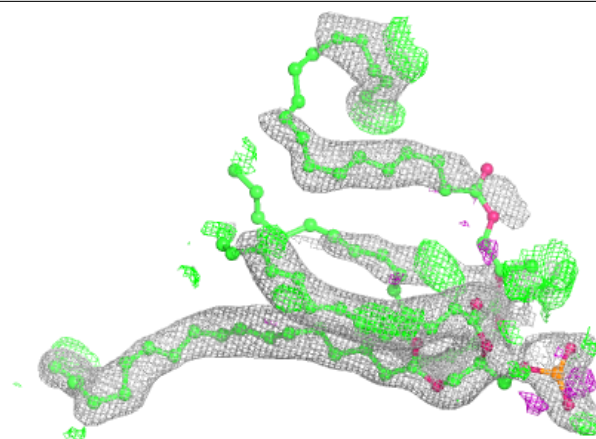




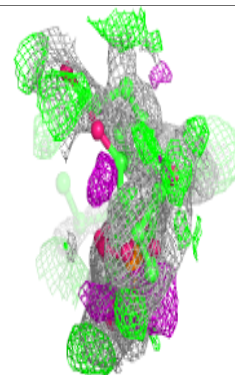
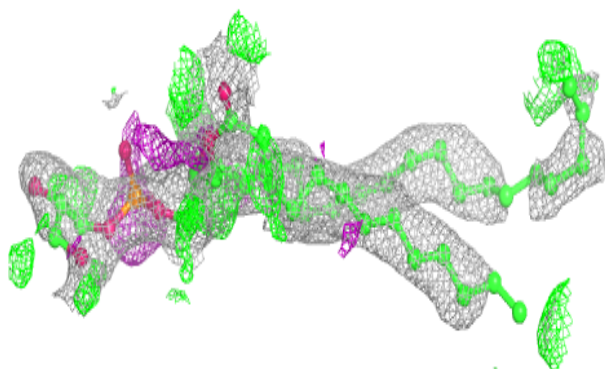
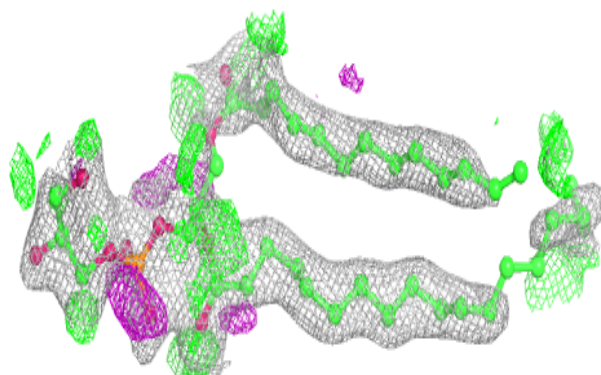


**Electron density around CDL P 306:**

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

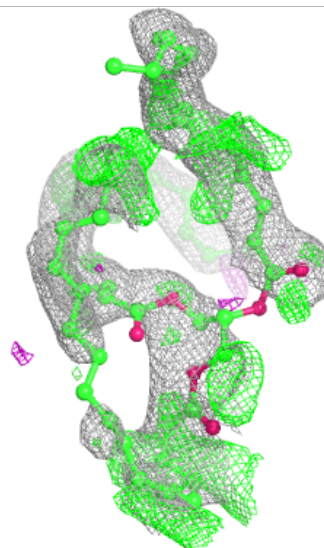
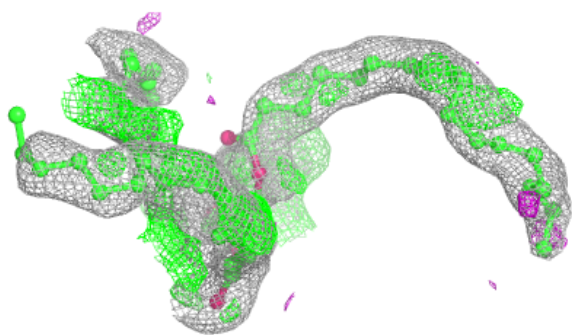
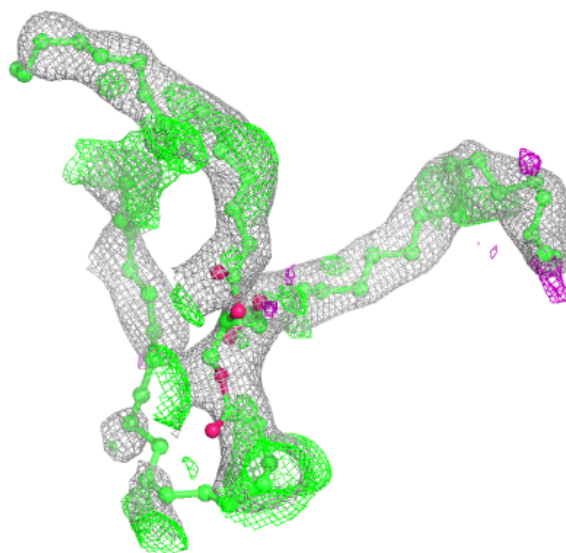
**Electron density around PGV A 607:**

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



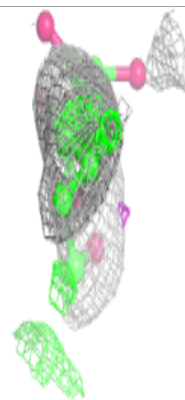
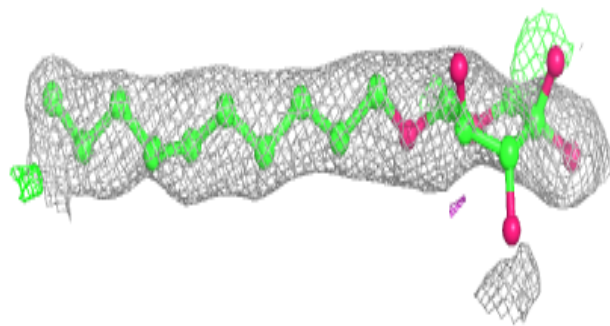
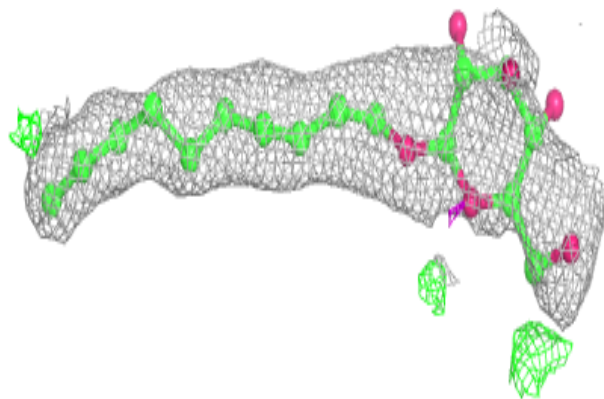
**Electron density around TGL L 101:**

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

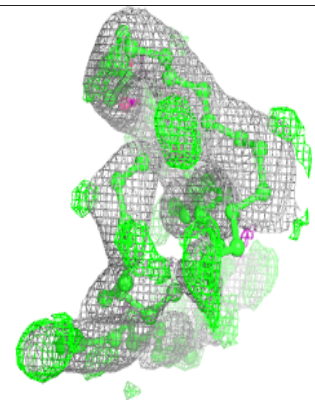
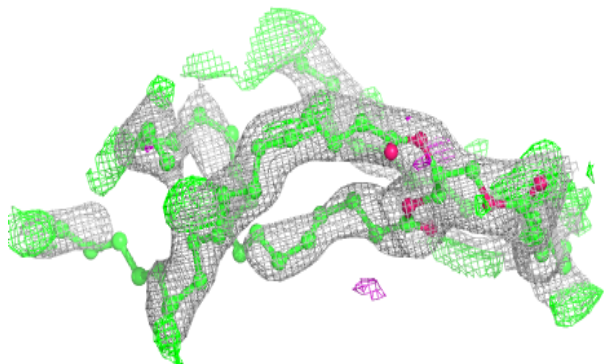
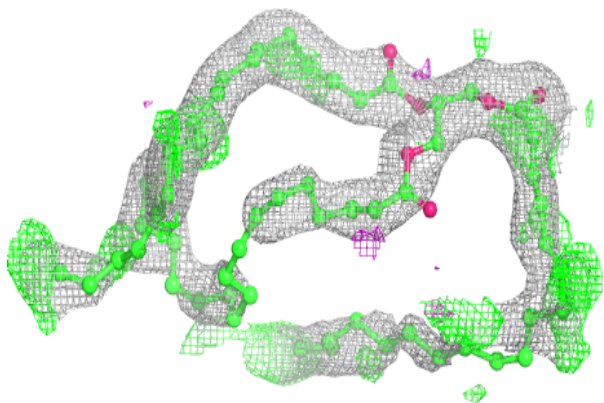


**Electron density around DMU T 104:**

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

**Electron density around TGL N 608:**

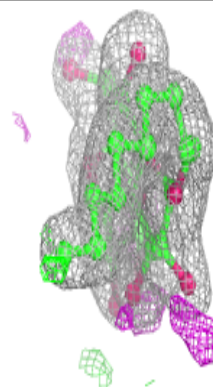
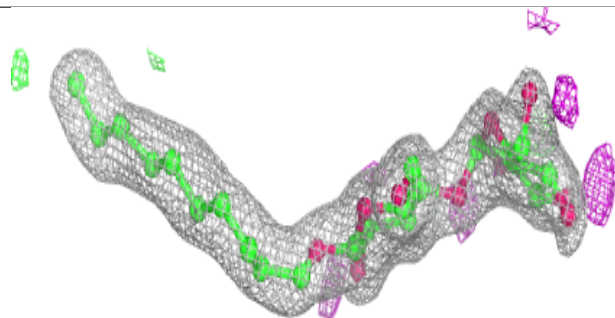
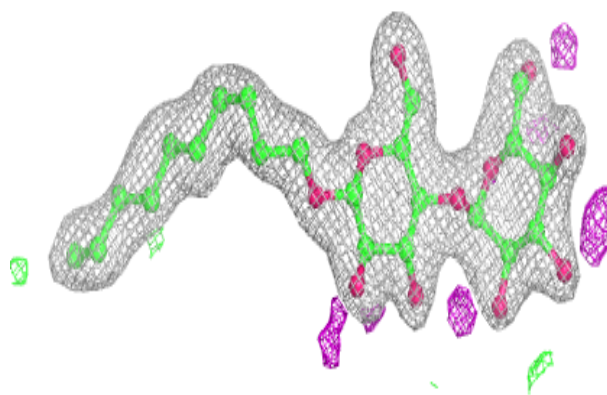
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



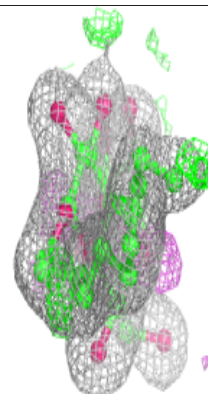
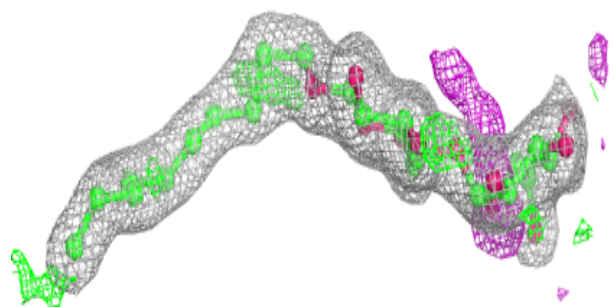
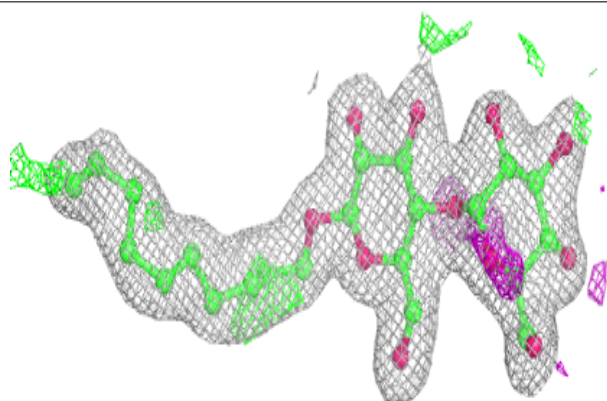


**Electron density around DMU Z 101:**

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

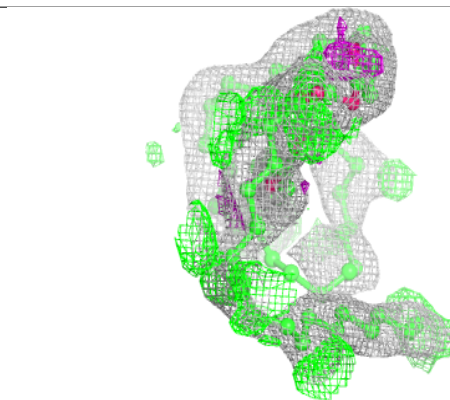
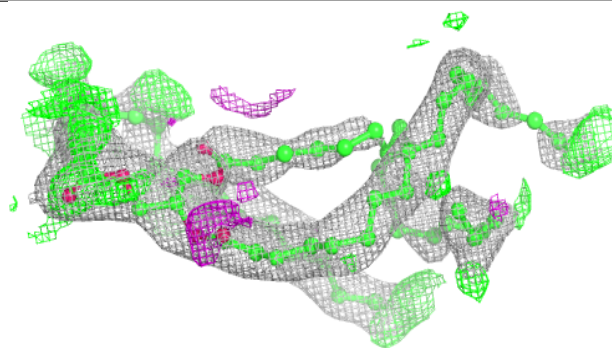
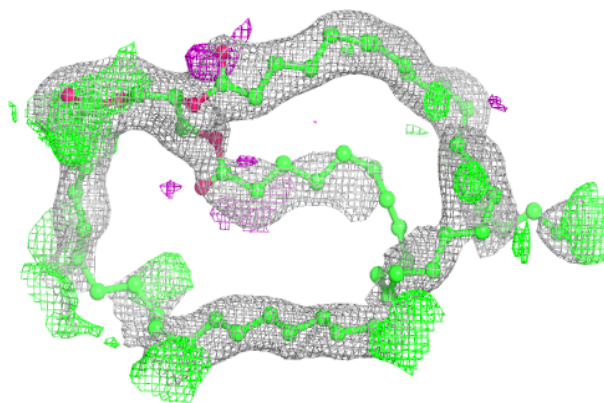
**Electron density around DMU M 101:**

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

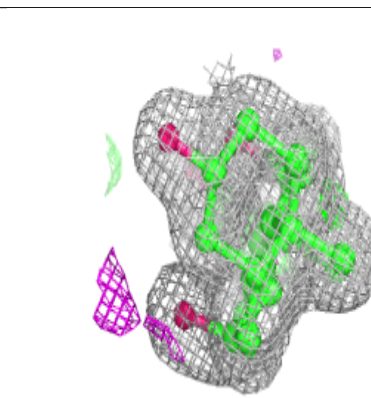
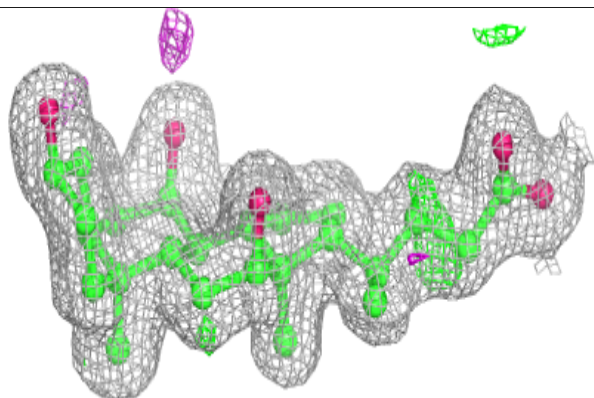
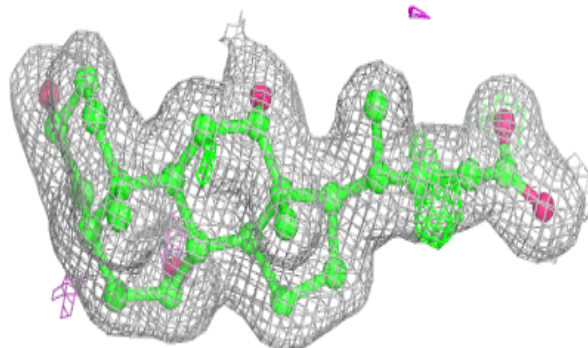


**Electron density around TGL B 301:**

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

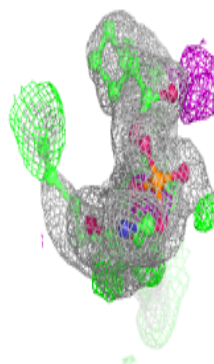
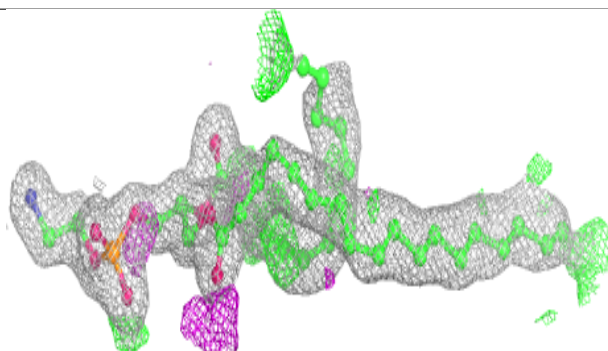
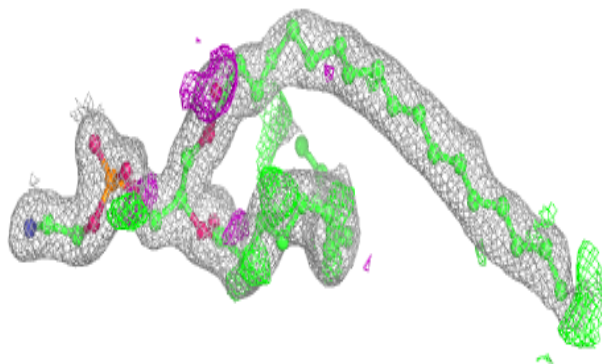
**Electron density around CHD C 301:**

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

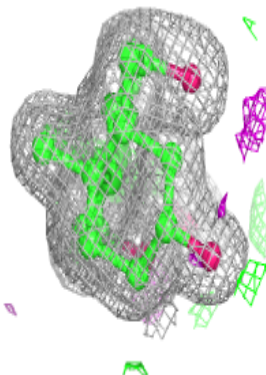
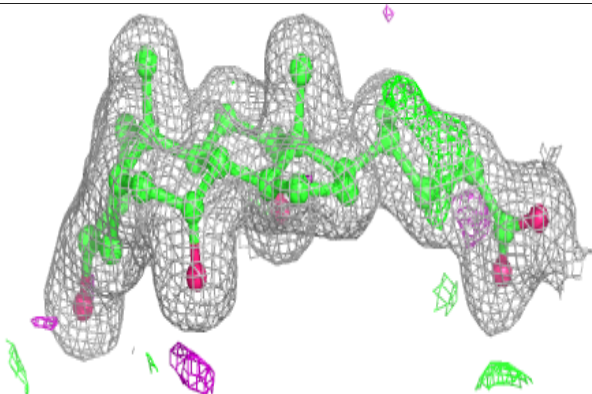
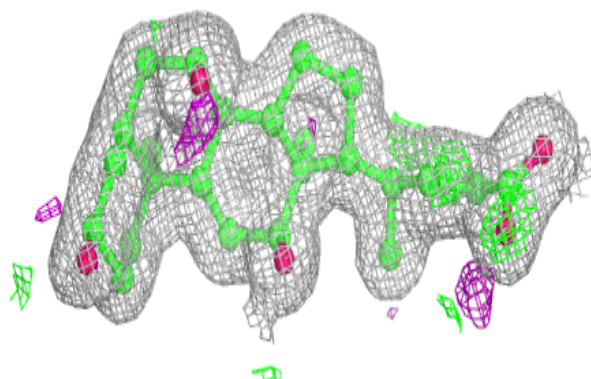


**Electron density around PEK P 303:**

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

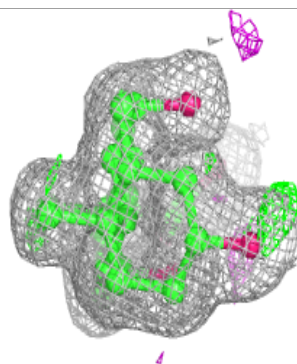
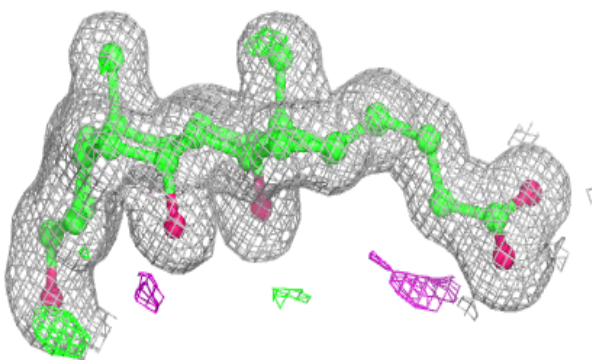
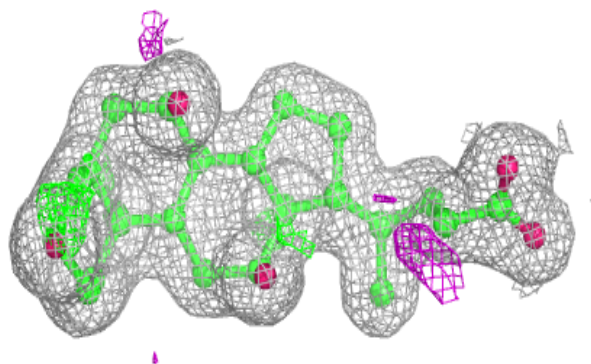
**Electron density around CHD P 301:**

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

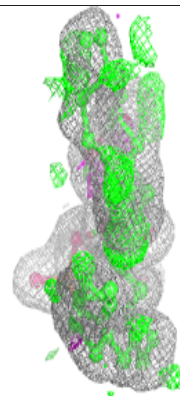
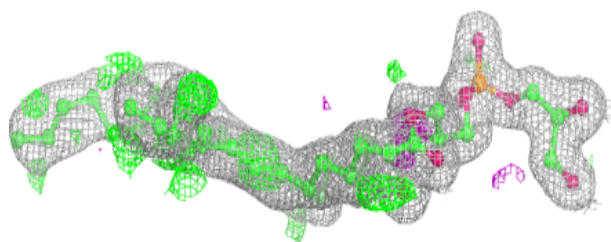
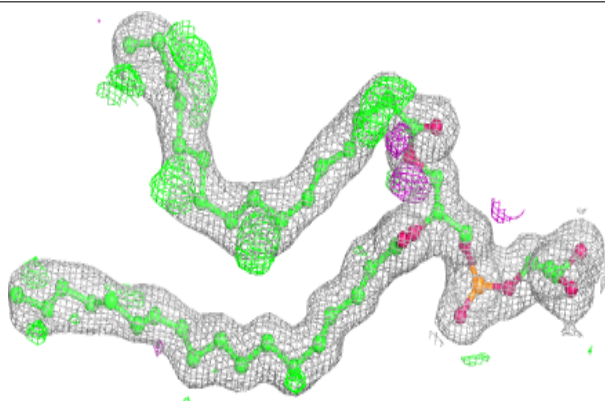


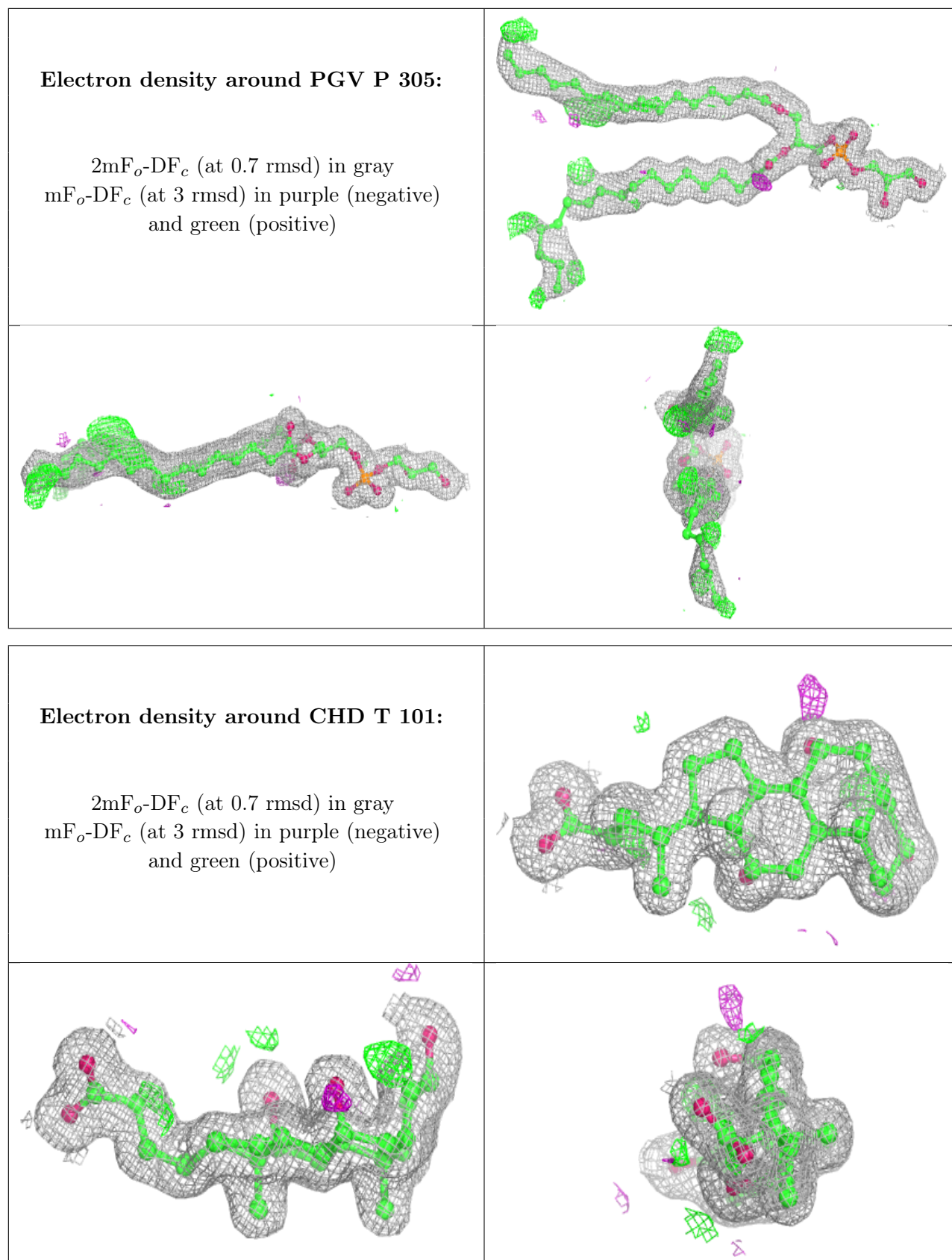
**Electron density around CHD G 103:**

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

**Electron density around PGV N 609:**

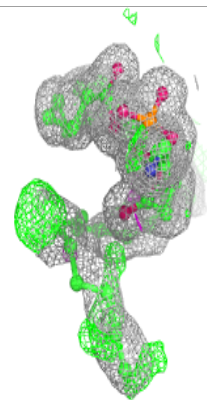
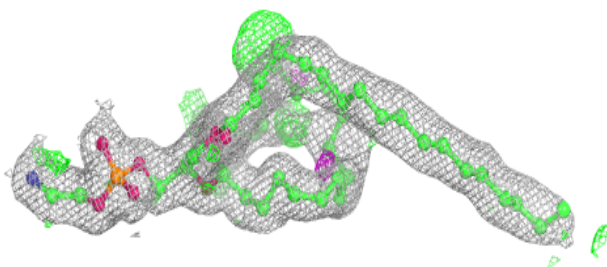
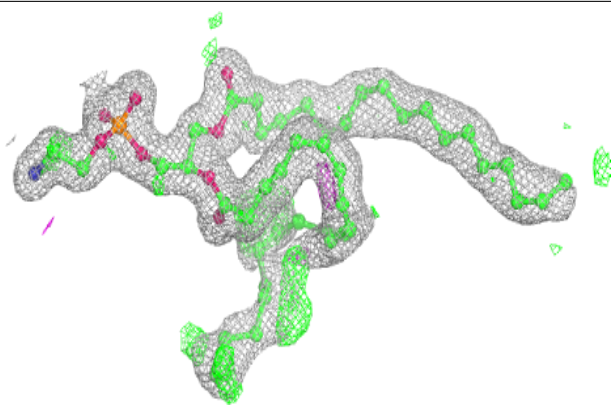
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



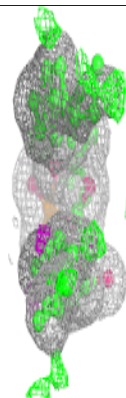
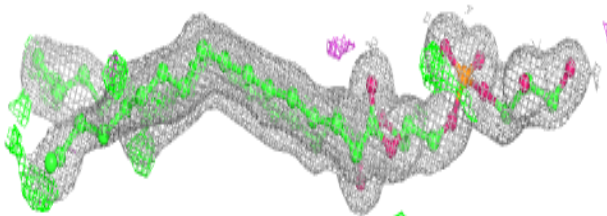
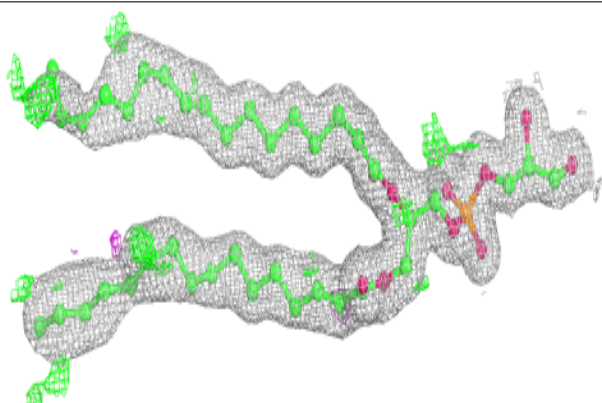


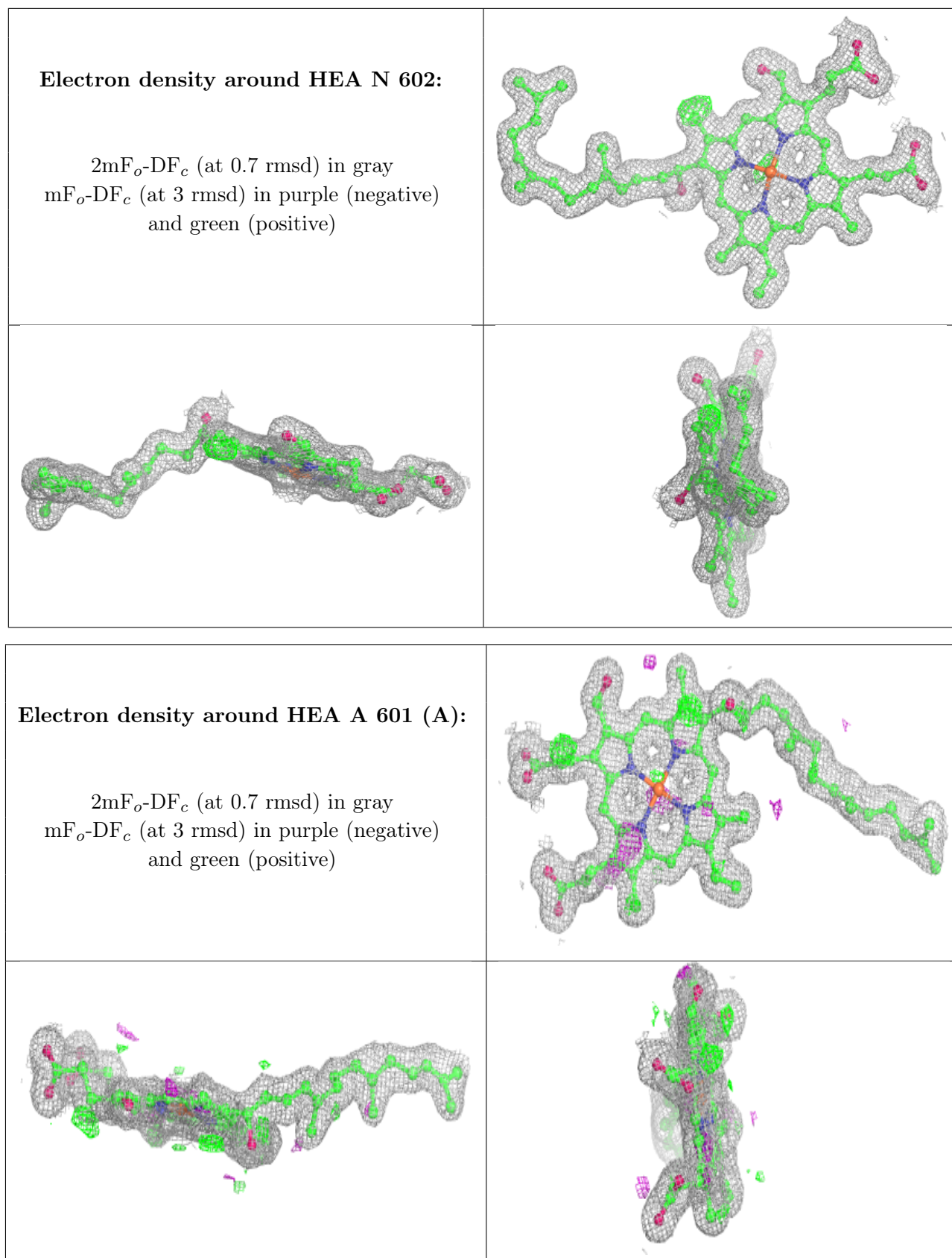
**Electron density around PEK C 302:**

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

**Electron density around PGV C 304:**

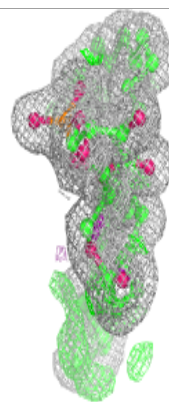
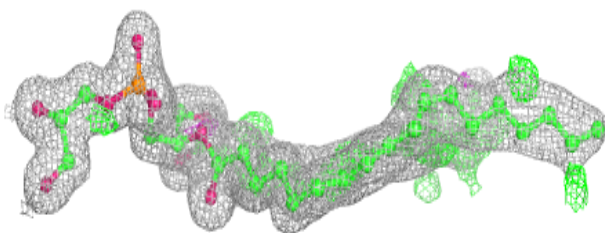
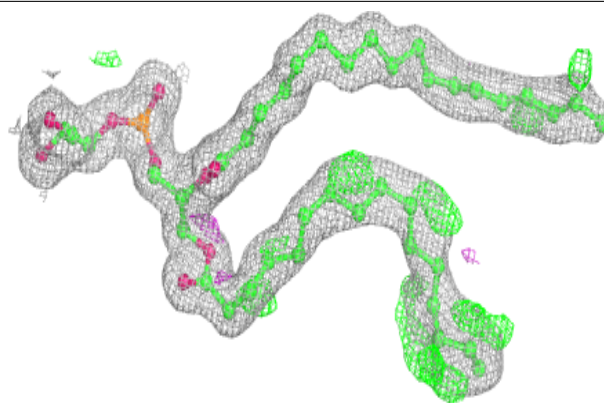
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



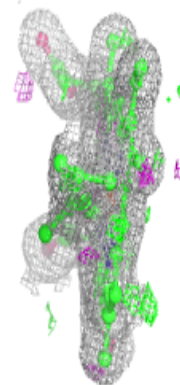
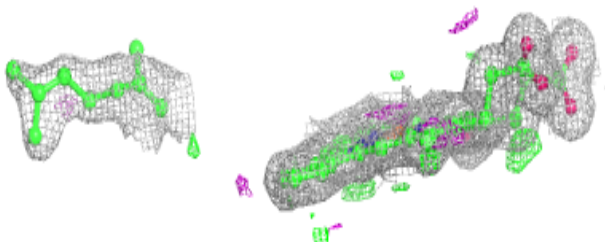
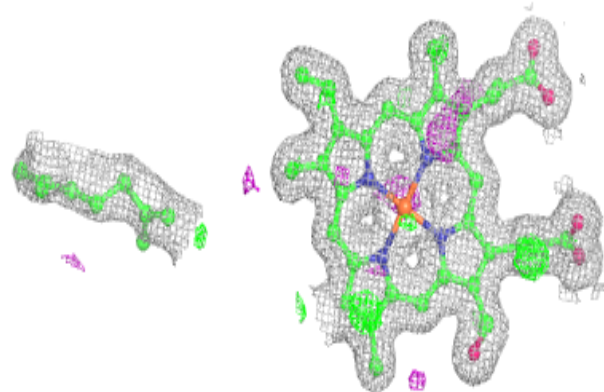


**Electron density around PGV A 608:**

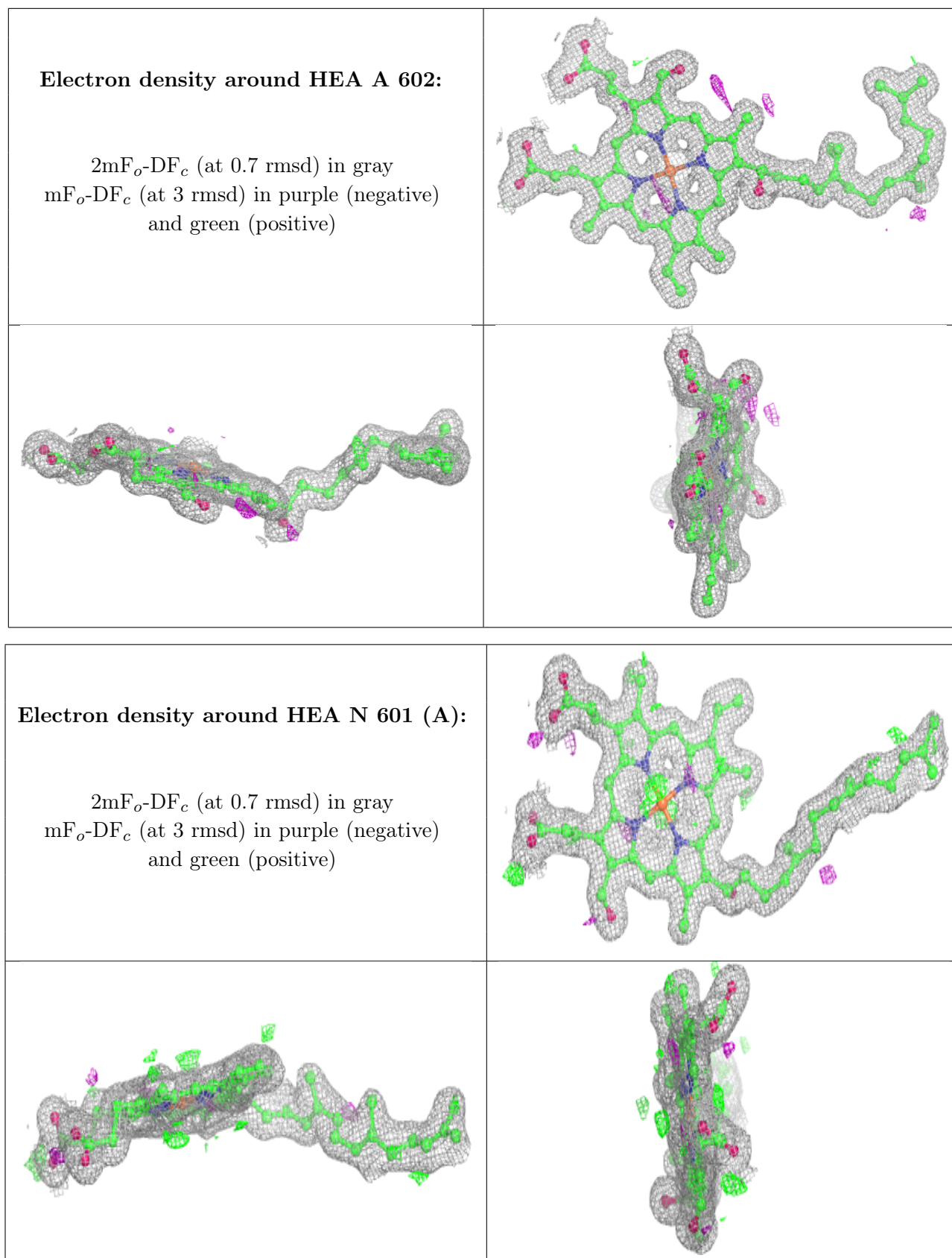
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

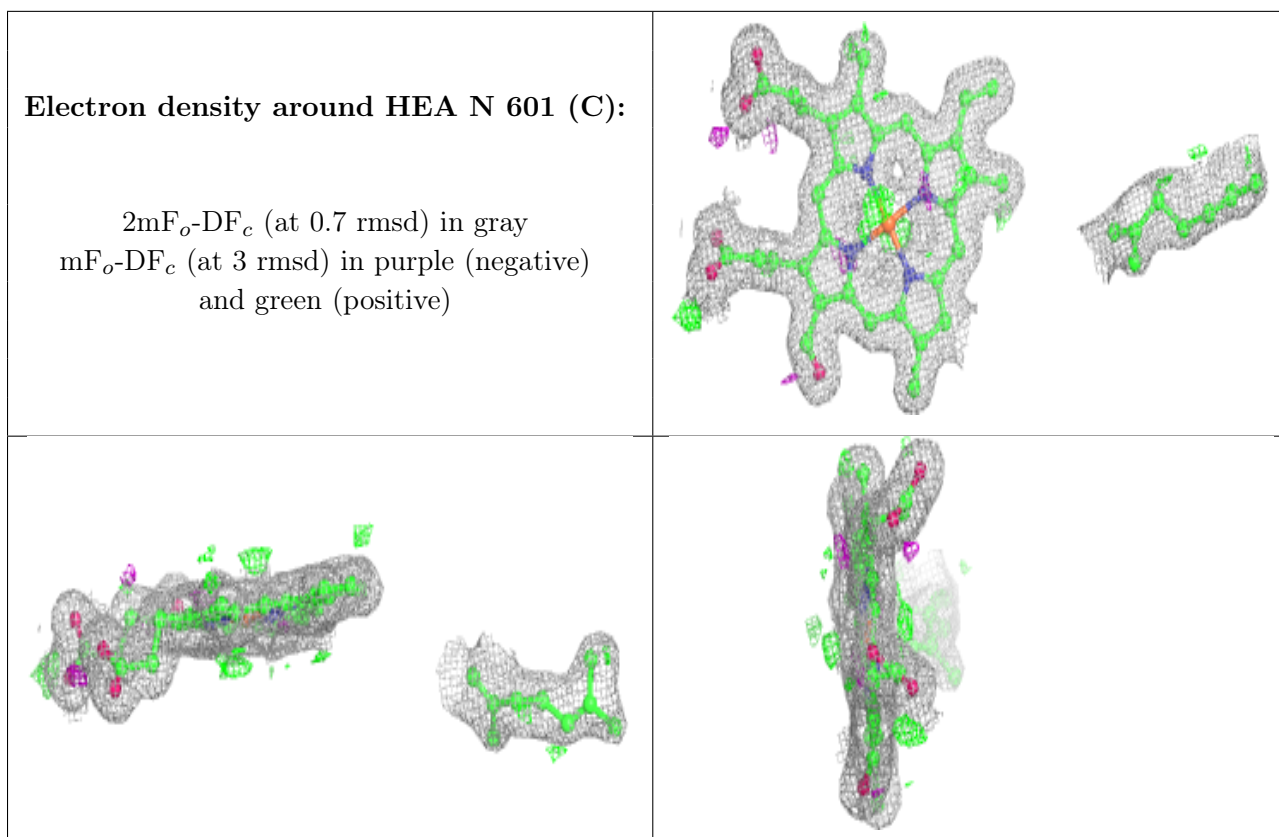
**Electron density around HEA A 601 (C):**

$2mF_o-DF_c$  (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.