



wwPDB EM Validation Summary Report ⓘ

Oct 18, 2023 – 07:26 PM JST

PDB ID : 8IMN
EMDB ID : EMD-35570
Title : Rt1I-Rt1II, Rt2'I-Rt2'II, Rt3I-Rt3II cylinder in cyanobacterial phycobilisome from *Anthocerotibacter panamensis* (Cluster F)
Authors : Wang, C.H.; Yang, C.H.; Wu, H.Y.; Jiang, H.W.; Ho, M.C.; Ho, M.Y.
Deposited on : 2023-03-07
Resolution : 3.07 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

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>.

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

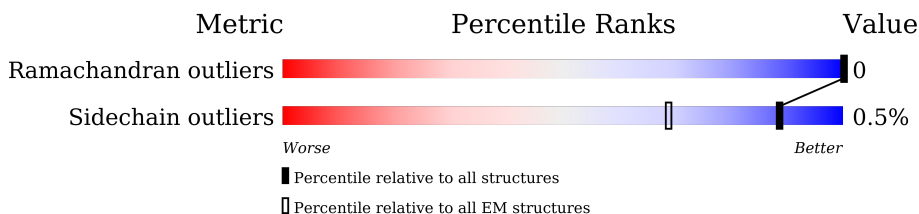
EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (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:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.07 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)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 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 EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	5	1182	
2	A	163	
2	B	163	
2	C	163	
2	D	163	
2	E	163	
2	F	163	
2	N	163	
2	O	163	

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Mol	Chain	Length	Quality of chain
2	P	163	70% 99%
2	Q	163	7% 99%
2	R	163	16% 99%
2	S	163	99%
2	a	163	98%
2	b	163	6% 100%
2	c	163	25% 98%
2	d	163	99%
2	e	163	98%
2	f	163	99%
3	G	172	100%
3	H	172	100%
3	I	172	100%
3	J	172	100%
3	K	172	100%
3	L	172	99%
3	T	172	99%
3	U	172	51% 99%
3	V	172	41% 100%
3	W	172	100%
3	X	172	100%
3	Y	172	100%
3	g	172	99%
3	h	172	18% 99%
3	i	172	22% 100%

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Mol	Chain	Length	Quality of chain
3	j	172	<p>7% 99% 12%</p>
3	k	172	<p>100% 12%</p>
3	l	172	<p>99% 12%</p>
4	M	78	<p>19% 88% 12%</p>
4	Z	78	<p>86% 12%</p>
4	m	78	<p>68% 87% 12%</p>

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 55489 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 CpcN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	5	702	5659	3562	995	1093	9	0	0

- Molecule 2 is a protein called CpcA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	162	1254	799	216	238	1	0	0
2	B	163	1262	804	217	239	2	0	0
2	C	162	1254	799	216	238	1	0	0
2	D	162	1254	799	216	238	1	0	0
2	E	162	1254	799	216	238	1	0	0
2	F	162	1254	799	216	238	1	0	0
2	N	162	1254	799	216	238	1	0	0
2	O	163	1262	804	217	239	2	0	0
2	P	162	1254	799	216	238	1	0	0
2	Q	162	1254	799	216	238	1	0	0
2	R	162	1254	799	216	238	1	0	0
2	S	162	1254	799	216	238	1	0	0
2	a	162	1254	799	216	238	1	0	0
2	b	163	1262	804	217	239	2	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	c	162	Total	C	N	O	S	0	0
			1254	799	216	238	1		
2	d	162	Total	C	N	O	S	0	0
			1254	799	216	238	1		
2	e	162	Total	C	N	O	S	0	0
			1254	799	216	238	1		
2	f	162	Total	C	N	O	S	0	0
			1254	799	216	238	1		

- Molecule 3 is a protein called CpcB.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	H	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	I	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	J	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	K	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	L	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	T	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	U	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	V	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	W	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	X	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	Y	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	g	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	h	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	i	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		

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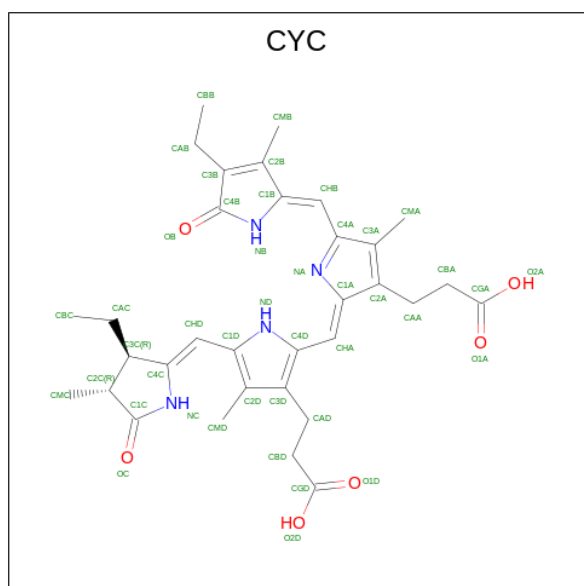
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Mol	Chain	Residues	Atoms					AltConf	Trace
3	j	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	k	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		
3	l	172	Total	C	N	O	S	0	0
			1293	807	226	252	8		

- Molecule 4 is a protein called CpcD.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	M	69	Total	C	N	O	S	0	0
			546	345	101	99	1		
4	Z	69	Total	C	N	O	S	0	0
			546	345	101	99	1		
4	m	69	Total	C	N	O	S	0	0
			546	345	101	99	1		

- Molecule 5 is PHYCOCYANOBILIN (three-letter code: CYC) (formula: $C_{33}H_{40}N_4O_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
5	5	1	Total	C	N	O	0
			43	33	4	6	
5	5	1	Total	C	N	O	0
			43	33	4	6	
5	A	1	Total	C	N	O	0
			43	33	4	6	

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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	B	1	Total 43	C 33	N 4	O 6	0
5	C	1	Total 43	C 33	N 4	O 6	0
5	D	1	Total 43	C 33	N 4	O 6	0
5	E	1	Total 43	C 33	N 4	O 6	0
5	F	1	Total 43	C 33	N 4	O 6	0
5	G	1	Total 43	C 33	N 4	O 6	0
5	G	1	Total 43	C 33	N 4	O 6	0
5	H	1	Total 43	C 33	N 4	O 6	0
5	H	1	Total 43	C 33	N 4	O 6	0
5	I	1	Total 43	C 33	N 4	O 6	0
5	I	1	Total 43	C 33	N 4	O 6	0
5	J	1	Total 43	C 33	N 4	O 6	0
5	J	1	Total 43	C 33	N 4	O 6	0
5	K	1	Total 43	C 33	N 4	O 6	0
5	K	1	Total 43	C 33	N 4	O 6	0
5	L	1	Total 43	C 33	N 4	O 6	0
5	N	1	Total 43	C 33	N 4	O 6	0
5	O	1	Total 43	C 33	N 4	O 6	0
5	P	1	Total 43	C 33	N 4	O 6	0
5	Q	1	Total 43	C 33	N 4	O 6	0
5	R	1	Total 43	C 33	N 4	O 6	0

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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	S	1	43	33	4	6	0
5	T	1	43	33	4	6	0
5	T	1	43	33	4	6	0
5	U	1	43	33	4	6	0
5	U	1	43	33	4	6	0
5	V	1	43	33	4	6	0
5	V	1	43	33	4	6	0
5	W	1	43	33	4	6	0
5	W	1	43	33	4	6	0
5	X	1	43	33	4	6	0
5	X	1	43	33	4	6	0
5	Y	1	43	33	4	6	0
5	Y	1	43	33	4	6	0
5	a	1	43	33	4	6	0
5	b	1	43	33	4	6	0
5	c	1	43	33	4	6	0
5	d	1	43	33	4	6	0
5	e	1	43	33	4	6	0
5	f	1	43	33	4	6	0
5	g	1	43	33	4	6	0
5	g	1	43	33	4	6	0

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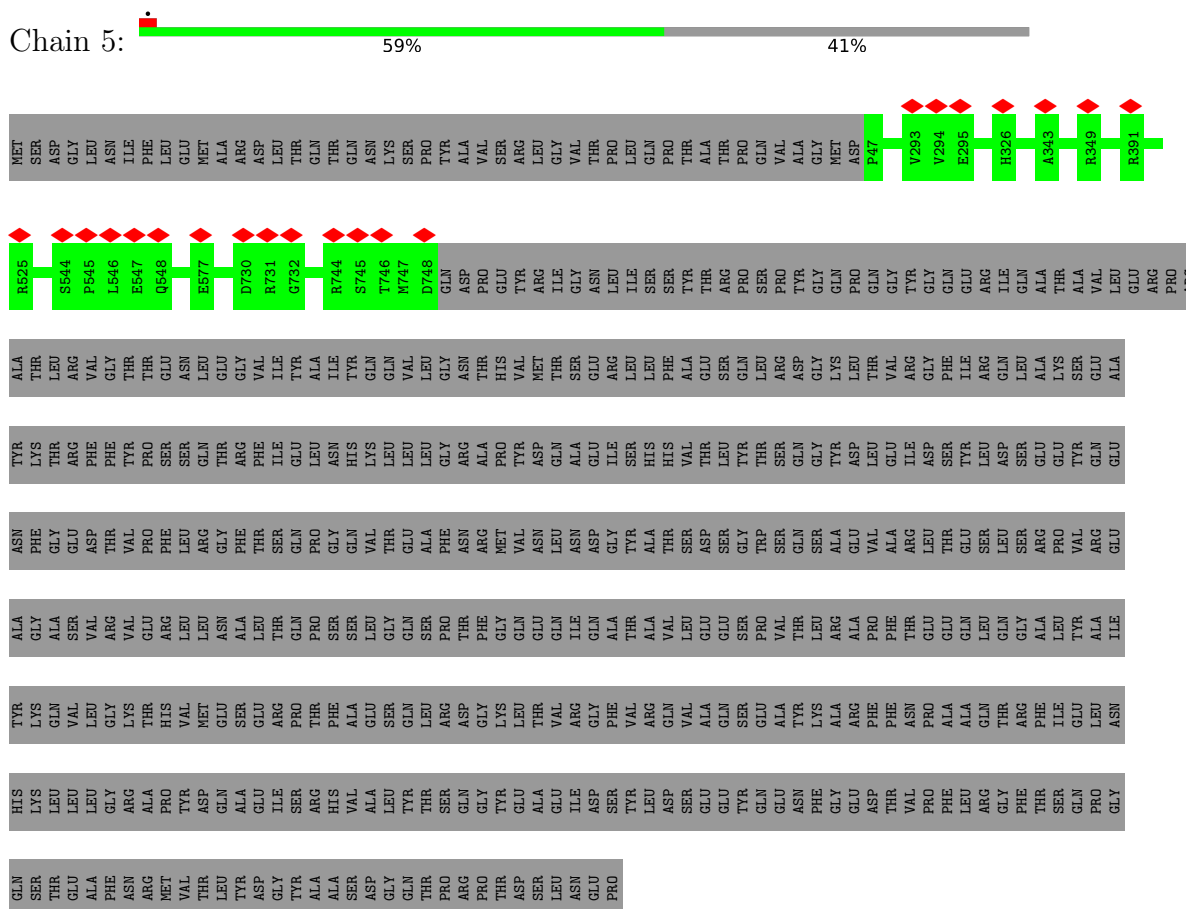
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Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	h	1	Total 43	C 33	N 4	O 6	0
5	h	1	Total 43	C 33	N 4	O 6	0
5	i	1	Total 43	C 33	N 4	O 6	0
5	i	1	Total 43	C 33	N 4	O 6	0
5	j	1	Total 43	C 33	N 4	O 6	0
5	j	1	Total 43	C 33	N 4	O 6	0
5	k	1	Total 43	C 33	N 4	O 6	0
5	k	1	Total 43	C 33	N 4	O 6	0
5	l	1	Total 43	C 33	N 4	O 6	0

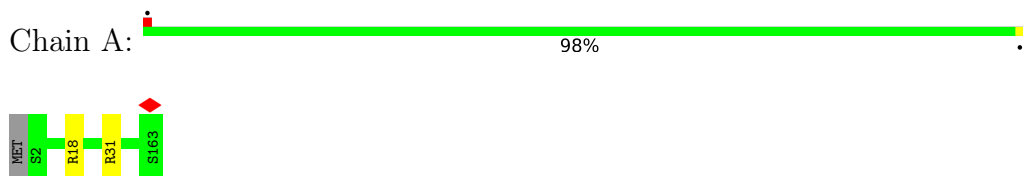
3 Residue-property plots

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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: CpcN

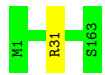


- Molecule 2: CpcA



- Molecule 2: CpcA

Chain B:  99%



• Molecule 2: CpcA

Chain C:  99%



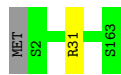
• Molecule 2: CpcA

Chain D:  99%



• Molecule 2: CpcA

Chain E:  99%



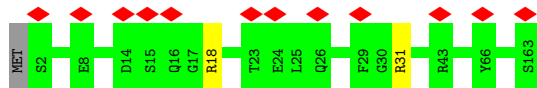
• Molecule 2: CpcA

Chain F:  99%



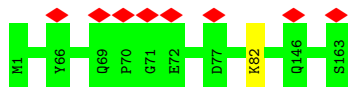
• Molecule 2: CpcA

Chain N:  98% 7%

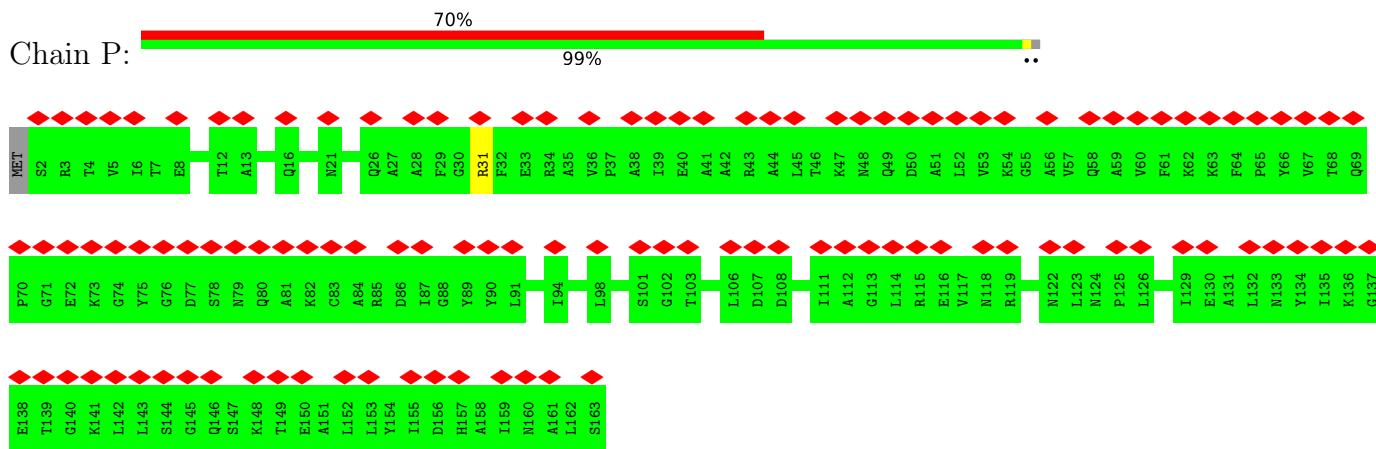


• Molecule 2: CpcA

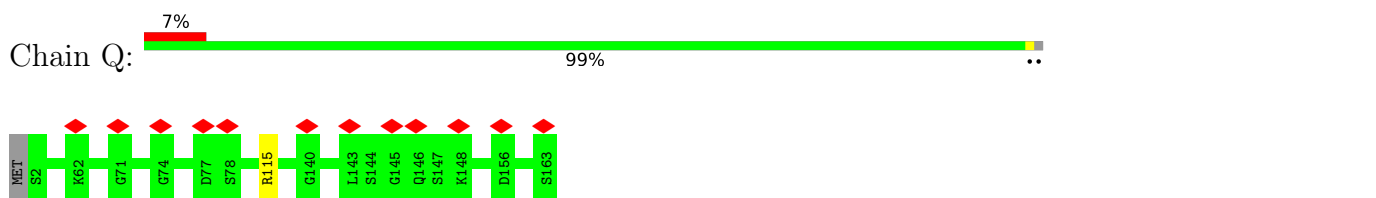
Chain O:  99% 5%



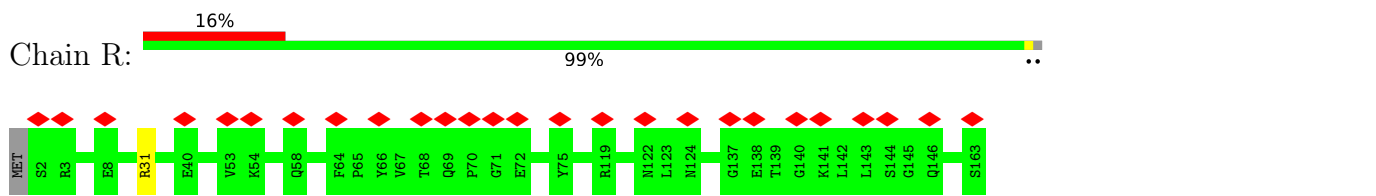
• Molecule 2: CpcA



• Molecule 2: CpcA



• Molecule 2: CpcA



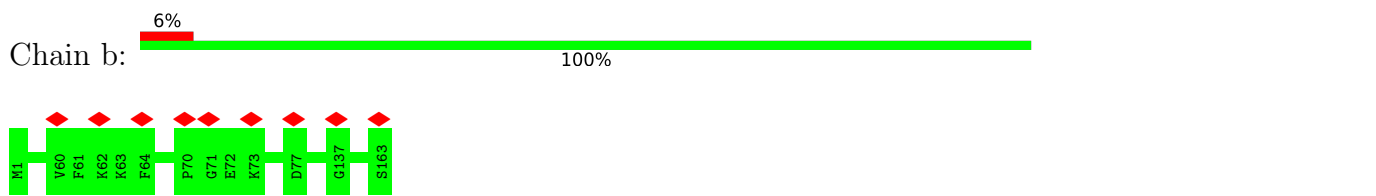
• Molecule 2: CpcA



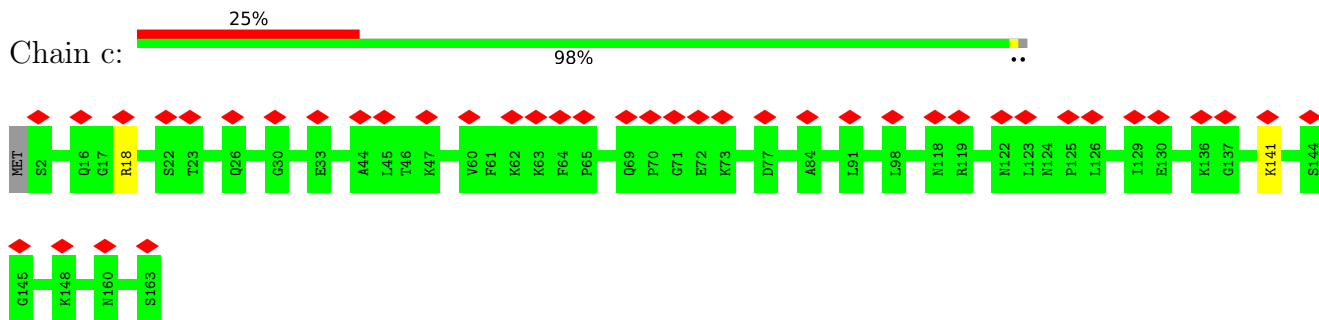
• Molecule 2: CpcA



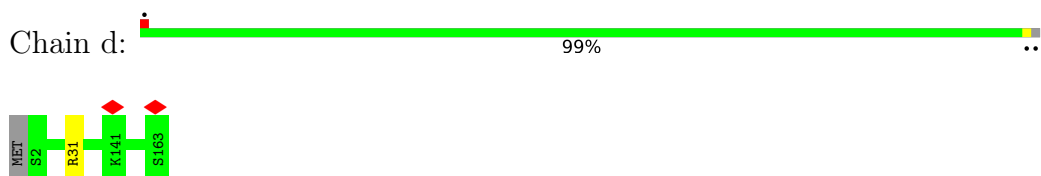
• Molecule 2: CpcA



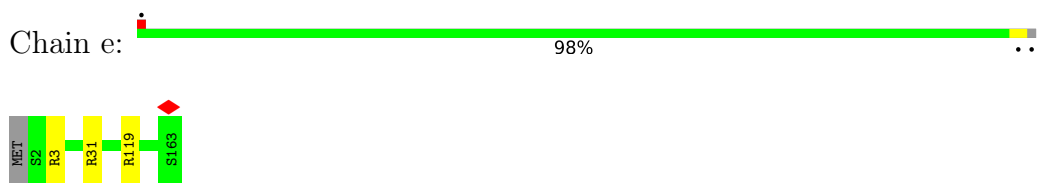
• Molecule 2: CpcA



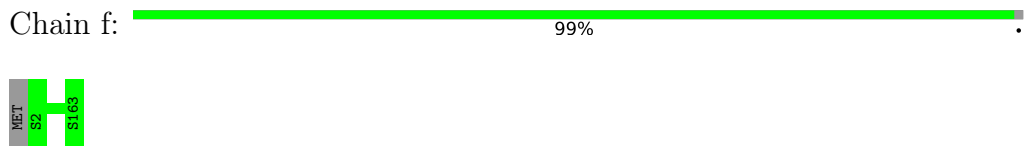
• Molecule 2: CpcA



• Molecule 2: CpcA



• Molecule 2: CpcA

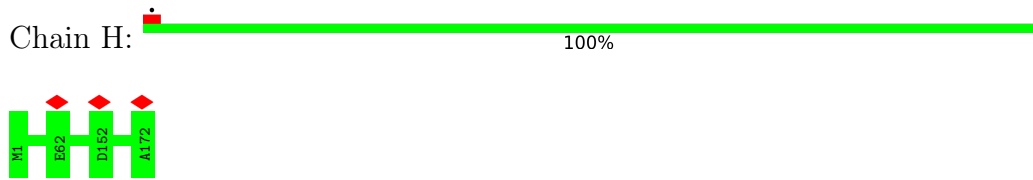


• Molecule 3: CpcB



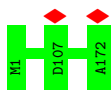
There are no outlier residues recorded for this chain.

• Molecule 3: CpcB



• Molecule 3: CpcB





- Molecule 3: CpcB

Chain J: 100%

There are no outlier residues recorded for this chain.

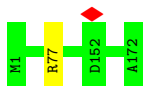
- Molecule 3: CpcB

Chain K: 100%

There are no outlier residues recorded for this chain.

- Molecule 3: CpcB

Chain L: 99%



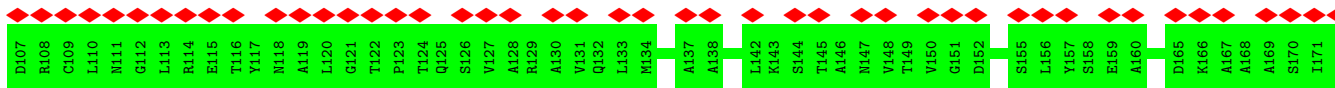
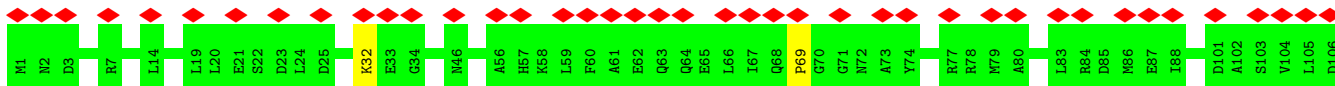
- Molecule 3: CpcB

Chain T: 99%



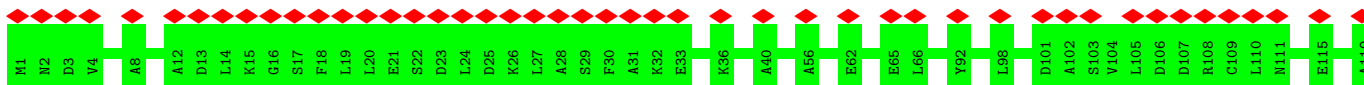
- Molecule 3: CpcB

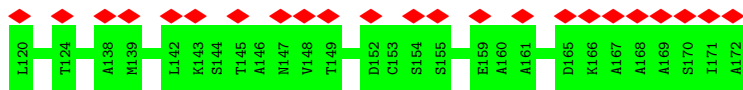
Chain U: 99%



- Molecule 3: CpcB

Chain V: 100%



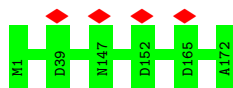


• Molecule 3: CpcB

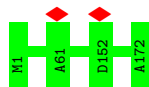


There are no outlier residues recorded for this chain.

• Molecule 3: CpcB



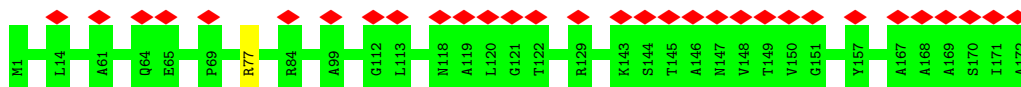
• Molecule 3: CpcB



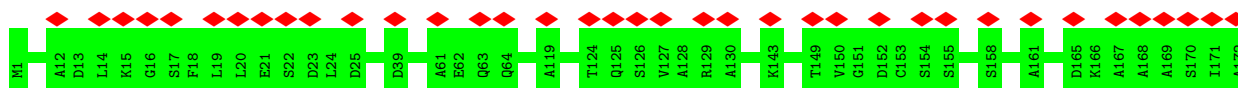
• Molecule 3: CpcB



• Molecule 3: CpcB

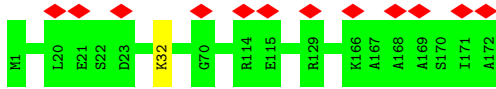


• Molecule 3: CpcB

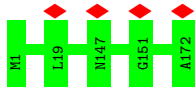


• Molecule 3: CpcB

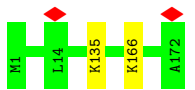




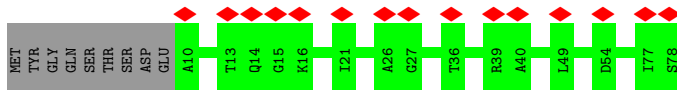
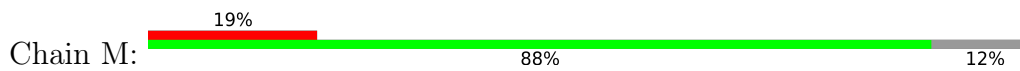
• Molecule 3: CpcB



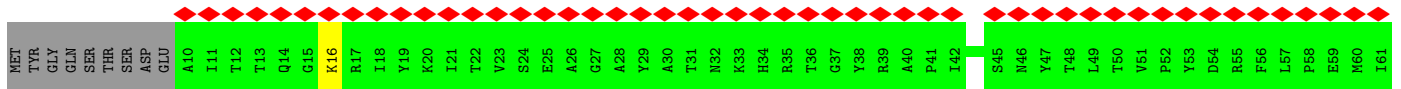
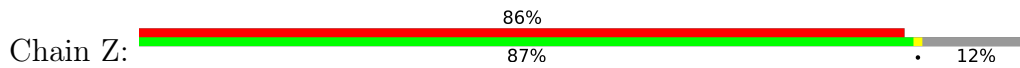
• Molecule 3: CpcB



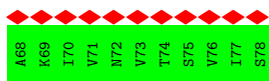
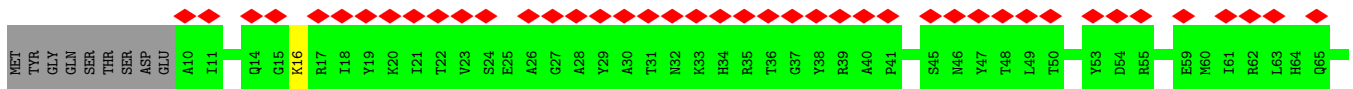
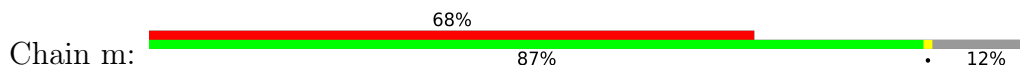
• Molecule 4: CpcD



• Molecule 4: CpcD



• Molecule 4: CpcD



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1109579	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	7.163	Depositor
Minimum map value	-0.037	Depositor
Average map value	0.038	Depositor
Map value standard deviation	0.107	Depositor
Recommended contour level	0.8	Depositor
Map size (\AA)	721.48, 721.48, 721.48	wwPDB
Map dimensions	680, 680, 680	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.061, 1.061, 1.061	Depositor

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: CYC

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	5	0.32	0/5786	0.47	0/7836
2	A	0.33	0/1277	0.47	0/1729
2	B	0.37	0/1285	0.50	0/1739
2	C	0.32	0/1277	0.45	0/1729
2	D	0.38	0/1277	0.48	0/1729
2	E	0.36	0/1277	0.51	0/1729
2	F	0.40	0/1277	0.51	0/1729
2	N	0.34	0/1277	0.48	0/1729
2	O	0.32	0/1285	0.49	0/1739
2	P	0.28	0/1277	0.45	0/1729
2	Q	0.32	0/1277	0.48	0/1729
2	R	0.30	0/1277	0.50	0/1729
2	S	0.45	0/1277	0.49	0/1729
2	a	0.30	0/1277	0.49	0/1729
2	b	0.27	0/1285	0.43	0/1739
2	c	0.27	0/1277	0.44	0/1729
2	d	0.27	0/1277	0.41	0/1729
2	e	0.31	0/1277	0.50	0/1729
2	f	0.36	0/1277	0.53	0/1729
3	G	0.29	0/1310	0.48	0/1772
3	H	0.28	0/1310	0.48	0/1772
3	I	0.28	0/1310	0.42	0/1772
3	J	0.37	0/1310	0.47	0/1772
3	K	0.37	0/1310	0.44	0/1772
3	L	0.36	0/1310	0.47	0/1772
3	T	0.29	0/1310	0.49	0/1772
3	U	0.35	1/1310 (0.1%)	0.62	3/1772 (0.2%)
3	V	0.27	0/1310	0.47	0/1772
3	W	0.37	0/1310	0.48	0/1772
3	X	0.31	0/1310	0.46	0/1772
3	Y	0.34	0/1310	0.46	0/1772
3	g	0.27	0/1310	0.48	0/1772

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
3	h	0.25	0/1310	0.43	0/1772
3	i	0.26	0/1310	0.49	0/1772
3	j	0.29	0/1310	0.48	0/1772
3	k	0.26	0/1310	0.44	0/1772
3	l	0.31	0/1310	0.49	0/1772
4	M	0.25	0/556	0.44	0/753
4	Z	0.26	0/556	0.48	0/753
4	m	0.25	0/556	0.49	0/753
All	All	0.32	1/54044 (0.0%)	0.48	3/73143 (0.0%)

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
2	e	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	U	69	PRO	CG-CD	-6.43	1.29	1.50

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	U	69	PRO	CA-N-CD	-12.63	93.82	111.50
3	U	69	PRO	N-CD-CG	-9.11	89.53	103.20
3	U	69	PRO	CA-CB-CG	-5.34	93.85	104.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	e	3	ARG	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	5	700/1182 (59%)	665 (95%)	35 (5%)	0	100	100
2	A	160/163 (98%)	155 (97%)	5 (3%)	0	100	100
2	B	161/163 (99%)	154 (96%)	7 (4%)	0	100	100
2	C	160/163 (98%)	155 (97%)	5 (3%)	0	100	100
2	D	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	E	160/163 (98%)	153 (96%)	7 (4%)	0	100	100
2	F	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	N	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	O	161/163 (99%)	158 (98%)	3 (2%)	0	100	100
2	P	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	Q	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	R	160/163 (98%)	157 (98%)	3 (2%)	0	100	100
2	S	160/163 (98%)	155 (97%)	5 (3%)	0	100	100
2	a	160/163 (98%)	152 (95%)	8 (5%)	0	100	100
2	b	161/163 (99%)	157 (98%)	4 (2%)	0	100	100
2	c	160/163 (98%)	156 (98%)	4 (2%)	0	100	100
2	d	160/163 (98%)	159 (99%)	1 (1%)	0	100	100
2	e	160/163 (98%)	154 (96%)	6 (4%)	0	100	100
2	f	160/163 (98%)	153 (96%)	7 (4%)	0	100	100
3	G	170/172 (99%)	166 (98%)	4 (2%)	0	100	100
3	H	170/172 (99%)	164 (96%)	6 (4%)	0	100	100
3	I	170/172 (99%)	165 (97%)	5 (3%)	0	100	100
3	J	170/172 (99%)	160 (94%)	10 (6%)	0	100	100
3	K	170/172 (99%)	168 (99%)	2 (1%)	0	100	100
3	L	170/172 (99%)	162 (95%)	8 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	T	170/172 (99%)	165 (97%)	5 (3%)	0	100	100
3	U	170/172 (99%)	167 (98%)	3 (2%)	0	100	100
3	V	170/172 (99%)	169 (99%)	1 (1%)	0	100	100
3	W	170/172 (99%)	161 (95%)	9 (5%)	0	100	100
3	X	170/172 (99%)	168 (99%)	2 (1%)	0	100	100
3	Y	170/172 (99%)	165 (97%)	5 (3%)	0	100	100
3	g	170/172 (99%)	165 (97%)	5 (3%)	0	100	100
3	h	170/172 (99%)	166 (98%)	4 (2%)	0	100	100
3	i	170/172 (99%)	168 (99%)	2 (1%)	0	100	100
3	j	170/172 (99%)	166 (98%)	4 (2%)	0	100	100
3	k	170/172 (99%)	168 (99%)	2 (1%)	0	100	100
3	l	170/172 (99%)	165 (97%)	5 (3%)	0	100	100
4	M	67/78 (86%)	62 (92%)	5 (8%)	0	100	100
4	Z	67/78 (86%)	62 (92%)	5 (8%)	0	100	100
4	m	67/78 (86%)	65 (97%)	2 (3%)	0	100	100
All	All	6844/7446 (92%)	6630 (97%)	214 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	5	594/1003 (59%)	594 (100%)	0	100	100
2	A	128/129 (99%)	126 (98%)	2 (2%)	62	83
2	B	129/129 (100%)	128 (99%)	1 (1%)	81	91
2	C	128/129 (99%)	128 (100%)	0	100	100
2	D	128/129 (99%)	128 (100%)	0	100	100
2	E	128/129 (99%)	127 (99%)	1 (1%)	81	91

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	128/129 (99%)	128 (100%)	0	100	100
2	N	128/129 (99%)	126 (98%)	2 (2%)	62	83
2	O	129/129 (100%)	128 (99%)	1 (1%)	81	91
2	P	128/129 (99%)	127 (99%)	1 (1%)	81	91
2	Q	128/129 (99%)	127 (99%)	1 (1%)	81	91
2	R	128/129 (99%)	127 (99%)	1 (1%)	81	91
2	S	128/129 (99%)	127 (99%)	1 (1%)	81	91
2	a	128/129 (99%)	125 (98%)	3 (2%)	50	75
2	b	129/129 (100%)	129 (100%)	0	100	100
2	c	128/129 (99%)	126 (98%)	2 (2%)	62	83
2	d	128/129 (99%)	127 (99%)	1 (1%)	81	91
2	e	128/129 (99%)	126 (98%)	2 (2%)	62	83
2	f	128/129 (99%)	128 (100%)	0	100	100
3	G	133/133 (100%)	133 (100%)	0	100	100
3	H	133/133 (100%)	133 (100%)	0	100	100
3	I	133/133 (100%)	133 (100%)	0	100	100
3	J	133/133 (100%)	133 (100%)	0	100	100
3	K	133/133 (100%)	133 (100%)	0	100	100
3	L	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	T	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	U	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	V	133/133 (100%)	133 (100%)	0	100	100
3	W	133/133 (100%)	133 (100%)	0	100	100
3	X	133/133 (100%)	133 (100%)	0	100	100
3	Y	133/133 (100%)	133 (100%)	0	100	100
3	g	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	h	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	i	133/133 (100%)	133 (100%)	0	100	100
3	j	133/133 (100%)	132 (99%)	1 (1%)	81	91
3	k	133/133 (100%)	133 (100%)	0	100	100
3	l	133/133 (100%)	131 (98%)	2 (2%)	65	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	M	59/67 (88%)	59 (100%)	0	100	100
4	Z	59/67 (88%)	58 (98%)	1 (2%)	60	82
4	m	59/67 (88%)	58 (98%)	1 (2%)	60	82
All	All	5472/5920 (92%)	5443 (100%)	29 (0%)	89	94

5 of 29 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	Z	16	LYS
3	l	166	LYS
2	a	82	LYS
3	h	77	ARG
2	a	31	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 27 such sidechains are listed below:

Mol	Chain	Res	Type
2	a	49	GLN
2	b	79	ASN
3	k	72	ASN
2	b	49	GLN
2	c	58	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry

54 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	CYC	k	200	-	42,46,46	6.49	25 (59%)	50,67,67	4.40	11 (22%)
5	CYC	j	201	-	42,46,46	6.53	24 (57%)	50,67,67	4.64	11 (22%)
5	CYC	k	201	-	42,46,46	6.60	24 (57%)	50,67,67	4.34	12 (24%)
5	CYC	h	201	-	42,46,46	6.52	24 (57%)	50,67,67	4.70	11 (22%)
5	CYC	U	201	-	42,46,46	6.52	25 (59%)	50,67,67	4.70	11 (22%)
5	CYC	W	200	-	42,46,46	6.45	23 (54%)	50,67,67	4.40	13 (26%)
5	CYC	L	201	-	42,46,46	6.51	24 (57%)	50,67,67	4.58	15 (30%)
5	CYC	d	200	-	42,46,46	6.56	23 (54%)	50,67,67	4.27	10 (20%)
5	CYC	W	201	-	42,46,46	6.48	24 (57%)	50,67,67	4.60	11 (22%)
5	CYC	U	200	-	42,46,46	6.57	25 (59%)	50,67,67	4.28	12 (24%)
5	CYC	I	201	-	42,46,46	6.47	23 (54%)	50,67,67	4.50	12 (24%)
5	CYC	A	200	-	42,46,46	6.44	23 (54%)	50,67,67	4.44	10 (20%)
5	CYC	O	200	-	42,46,46	6.55	25 (59%)	50,67,67	4.69	13 (26%)
5	CYC	V	201	-	42,46,46	6.54	25 (59%)	50,67,67	4.57	9 (18%)
5	CYC	Y	201	-	42,46,46	6.52	25 (59%)	50,67,67	4.39	13 (26%)
5	CYC	X	200	-	42,46,46	6.52	23 (54%)	50,67,67	4.52	13 (26%)
5	CYC	X	201	-	42,46,46	6.55	24 (57%)	50,67,67	4.41	11 (22%)
5	CYC	K	201	-	42,46,46	6.43	23 (54%)	50,67,67	4.62	12 (24%)
5	CYC	I	200	-	42,46,46	6.46	24 (57%)	50,67,67	4.37	10 (20%)
5	CYC	G	201	-	42,46,46	6.57	25 (59%)	50,67,67	4.43	13 (26%)
5	CYC	i	200	-	42,46,46	6.60	25 (59%)	50,67,67	4.22	12 (24%)
5	CYC	S	200	-	42,46,46	6.49	23 (54%)	50,67,67	4.53	13 (26%)
5	CYC	E	200	-	42,46,46	6.46	23 (54%)	50,67,67	4.23	12 (24%)
5	CYC	T	200	-	42,46,46	6.63	24 (57%)	50,67,67	4.28	11 (22%)
5	CYC	h	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.32	10 (20%)
5	CYC	5	1202	-	42,46,46	6.53	25 (59%)	50,67,67	4.49	12 (24%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	CYC	Q	200	-	42,46,46	6.52	24 (57%)	50,67,67	4.42	11 (22%)
5	CYC	C	200	-	42,46,46	6.46	23 (54%)	50,67,67	4.38	10 (20%)
5	CYC	Y	200	-	42,46,46	6.47	23 (54%)	50,67,67	4.30	10 (20%)
5	CYC	l	201	-	42,46,46	6.59	25 (59%)	50,67,67	4.48	13 (26%)
5	CYC	D	200	-	42,46,46	6.38	23 (54%)	50,67,67	4.55	10 (20%)
5	CYC	R	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.55	13 (26%)
5	CYC	J	201	-	42,46,46	6.45	23 (54%)	50,67,67	4.65	12 (24%)
5	CYC	j	200	-	42,46,46	6.49	24 (57%)	50,67,67	4.44	14 (28%)
5	CYC	G	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.29	10 (20%)
5	CYC	f	200	-	42,46,46	6.46	24 (57%)	50,67,67	4.78	10 (20%)
5	CYC	V	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.49	9 (18%)
5	CYC	H	201	-	42,46,46	6.49	24 (57%)	50,67,67	4.54	8 (16%)
5	CYC	P	200	-	42,46,46	6.57	25 (59%)	50,67,67	4.14	9 (18%)
5	CYC	e	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.50	10 (20%)
5	CYC	g	201	-	42,46,46	6.47	24 (57%)	50,67,67	4.67	12 (24%)
5	CYC	F	200	-	42,46,46	6.39	23 (54%)	50,67,67	4.41	12 (24%)
5	CYC	5	1201	-	42,46,46	6.40	23 (54%)	50,67,67	4.32	12 (24%)
5	CYC	H	200	-	42,46,46	6.51	24 (57%)	50,67,67	4.41	12 (24%)
5	CYC	a	200	-	42,46,46	6.58	25 (59%)	50,67,67	4.58	13 (26%)
5	CYC	K	200	-	42,46,46	6.47	23 (54%)	50,67,67	4.50	13 (26%)
5	CYC	N	200	-	42,46,46	6.46	25 (59%)	50,67,67	4.33	12 (24%)
5	CYC	c	200	-	42,46,46	6.60	25 (59%)	50,67,67	4.45	12 (24%)
5	CYC	J	200	-	42,46,46	6.48	23 (54%)	50,67,67	4.47	13 (26%)
5	CYC	b	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.45	10 (20%)
5	CYC	i	201	-	42,46,46	6.60	24 (57%)	50,67,67	4.54	11 (22%)
5	CYC	B	200	-	42,46,46	6.56	24 (57%)	50,67,67	4.61	13 (26%)
5	CYC	T	201	-	42,46,46	6.50	25 (59%)	50,67,67	4.55	12 (24%)
5	CYC	g	200	-	42,46,46	6.63	25 (59%)	50,67,67	4.26	11 (22%)

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
5	CYC	k	200	-	-	11/25/74/74	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	CYC	j	201	-	-	9/25/74/74	0/4/4/4
5	CYC	k	201	-	-	7/25/74/74	0/4/4/4
5	CYC	h	201	-	-	11/25/74/74	0/4/4/4
5	CYC	U	201	-	-	16/25/74/74	0/4/4/4
5	CYC	W	200	-	-	13/25/74/74	0/4/4/4
5	CYC	L	201	-	-	13/25/74/74	0/4/4/4
5	CYC	d	200	-	-	16/25/74/74	0/4/4/4
5	CYC	W	201	-	-	12/25/74/74	0/4/4/4
5	CYC	U	200	-	-	6/25/74/74	0/4/4/4
5	CYC	I	201	-	-	11/25/74/74	0/4/4/4
5	CYC	A	200	-	-	16/25/74/74	0/4/4/4
5	CYC	O	200	-	-	16/25/74/74	0/4/4/4
5	CYC	V	201	-	-	11/25/74/74	0/4/4/4
5	CYC	Y	201	-	-	18/25/74/74	0/4/4/4
5	CYC	X	200	-	-	14/25/74/74	0/4/4/4
5	CYC	X	201	-	-	13/25/74/74	0/4/4/4
5	CYC	K	201	-	-	15/25/74/74	0/4/4/4
5	CYC	I	200	-	-	11/25/74/74	0/4/4/4
5	CYC	G	201	-	-	14/25/74/74	0/4/4/4
5	CYC	i	200	-	-	14/25/74/74	0/4/4/4
5	CYC	S	200	-	-	16/25/74/74	0/4/4/4
5	CYC	E	200	-	-	14/25/74/74	0/4/4/4
5	CYC	T	200	-	-	9/25/74/74	0/4/4/4
5	CYC	h	200	-	-	12/25/74/74	0/4/4/4
5	CYC	5	1202	-	-	11/25/74/74	0/4/4/4
5	CYC	Q	200	-	-	12/25/74/74	0/4/4/4
5	CYC	C	200	-	-	16/25/74/74	0/4/4/4
5	CYC	Y	200	-	-	10/25/74/74	0/4/4/4
5	CYC	l	201	-	-	16/25/74/74	0/4/4/4
5	CYC	D	200	-	-	13/25/74/74	0/4/4/4
5	CYC	R	200	-	-	14/25/74/74	0/4/4/4
5	CYC	J	201	-	-	18/25/74/74	0/4/4/4
5	CYC	j	200	-	-	10/25/74/74	0/4/4/4
5	CYC	G	200	-	-	12/25/74/74	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	CYC	f	200	-	-	16/25/74/74	0/4/4/4
5	CYC	V	200	-	-	11/25/74/74	0/4/4/4
5	CYC	H	201	-	-	18/25/74/74	0/4/4/4
5	CYC	P	200	-	-	11/25/74/74	0/4/4/4
5	CYC	e	200	-	-	17/25/74/74	0/4/4/4
5	CYC	g	201	-	-	15/25/74/74	0/4/4/4
5	CYC	F	200	-	-	14/25/74/74	0/4/4/4
5	CYC	5	1201	-	-	7/25/74/74	0/4/4/4
5	CYC	H	200	-	-	11/25/74/74	0/4/4/4
5	CYC	a	200	-	-	20/25/74/74	0/4/4/4
5	CYC	K	200	-	-	13/25/74/74	0/4/4/4
5	CYC	N	200	-	-	12/25/74/74	0/4/4/4
5	CYC	c	200	-	-	17/25/74/74	0/4/4/4
5	CYC	J	200	-	-	8/25/74/74	0/4/4/4
5	CYC	b	200	-	-	9/25/74/74	0/4/4/4
5	CYC	i	201	-	-	16/25/74/74	0/4/4/4
5	CYC	B	200	-	-	17/25/74/74	0/4/4/4
5	CYC	T	201	-	-	14/25/74/74	0/4/4/4
5	CYC	g	200	-	-	7/25/74/74	0/4/4/4

The worst 5 of 1296 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	T	200	CYC	CHA-C1A	27.21	1.57	1.35
5	g	200	CYC	CHA-C1A	26.85	1.57	1.35
5	V	200	CYC	CHA-C1A	26.85	1.57	1.35
5	i	201	CYC	CHA-C1A	26.79	1.57	1.35
5	O	200	CYC	CHA-C1A	26.76	1.57	1.35

The worst 5 of 620 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	X	200	CYC	OC-C1C-C2C	-22.17	108.55	126.17
5	J	200	CYC	OC-C1C-C2C	-22.07	108.62	126.17
5	K	200	CYC	OC-C1C-C2C	-21.85	108.80	126.17
5	I	201	CYC	OC-C1C-C2C	-21.84	108.81	126.17
5	e	200	CYC	OC-C1C-C2C	-21.31	109.23	126.17

There are no chirality outliers.

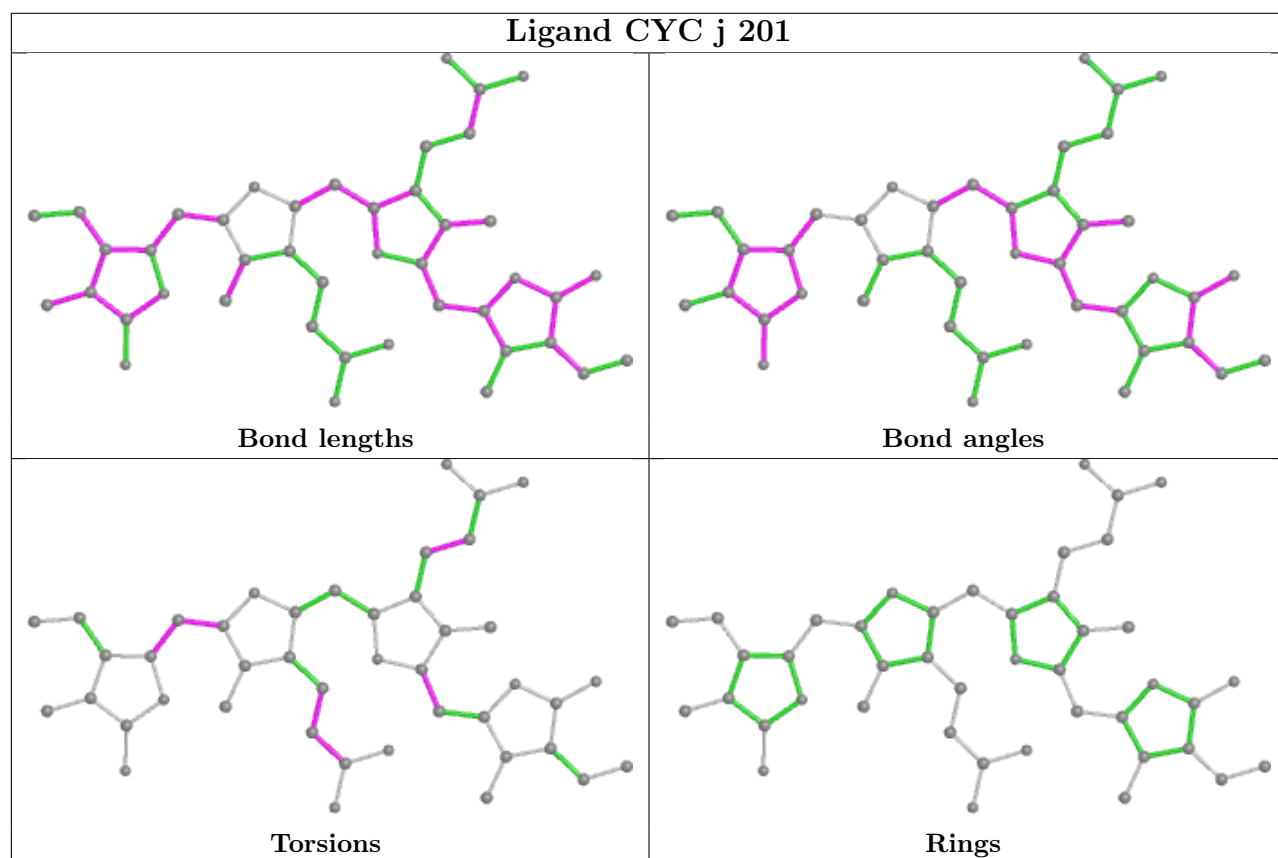
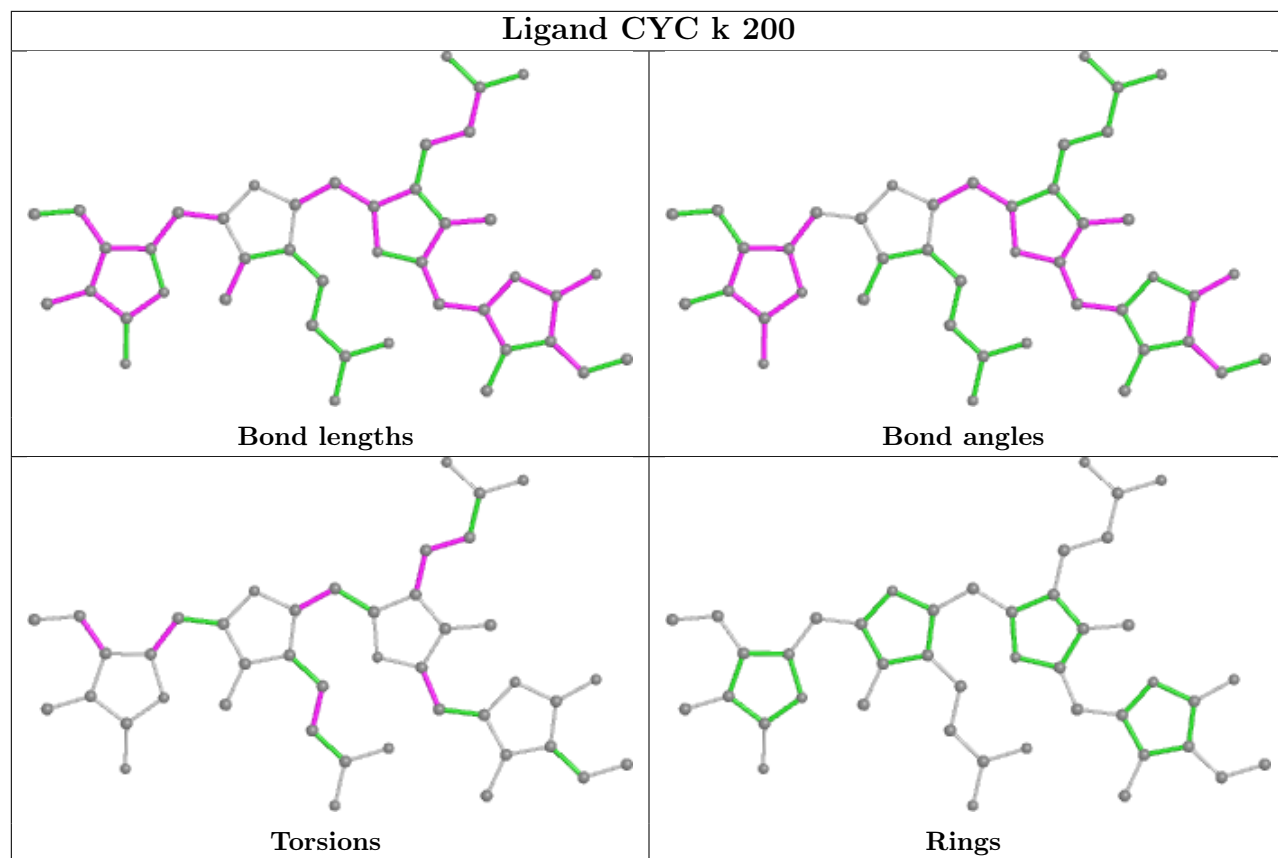
5 of 703 torsion outliers are listed below:

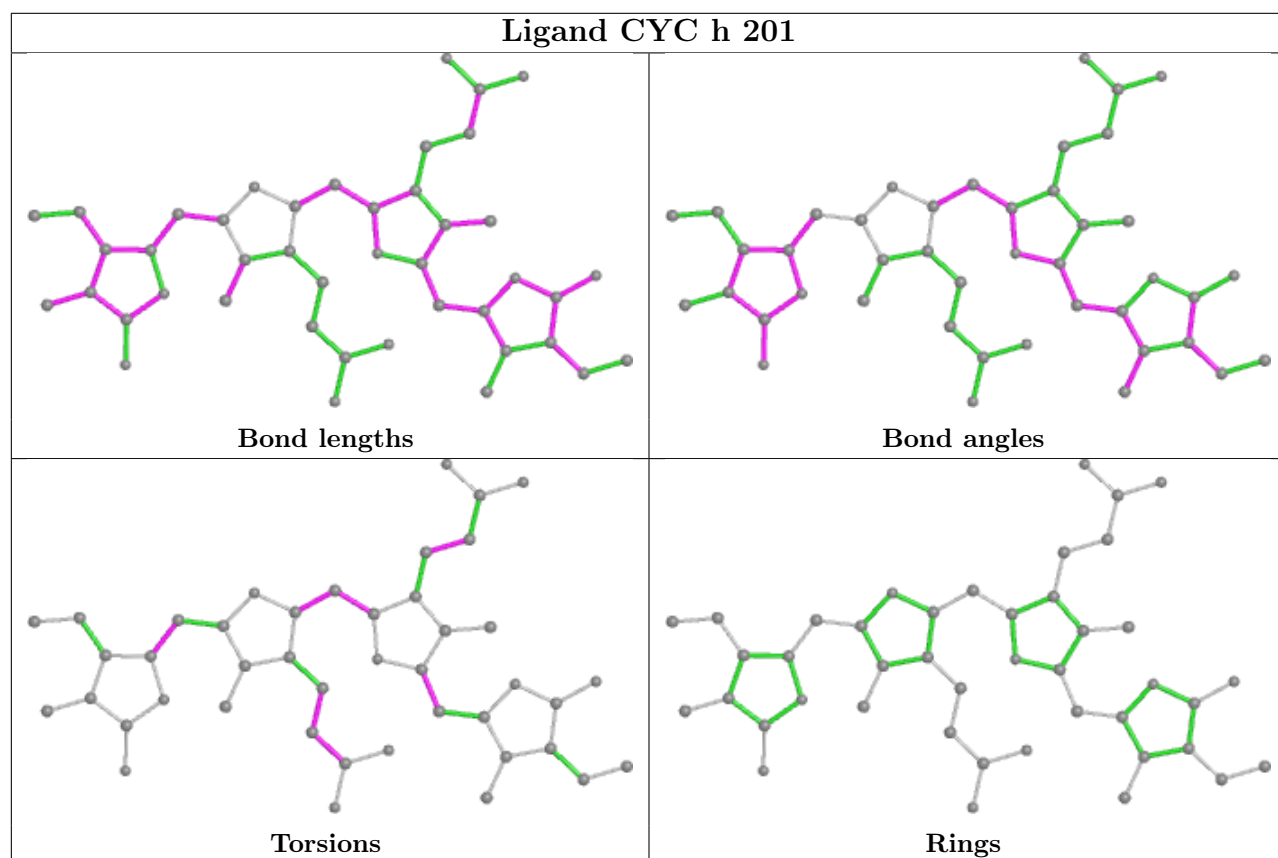
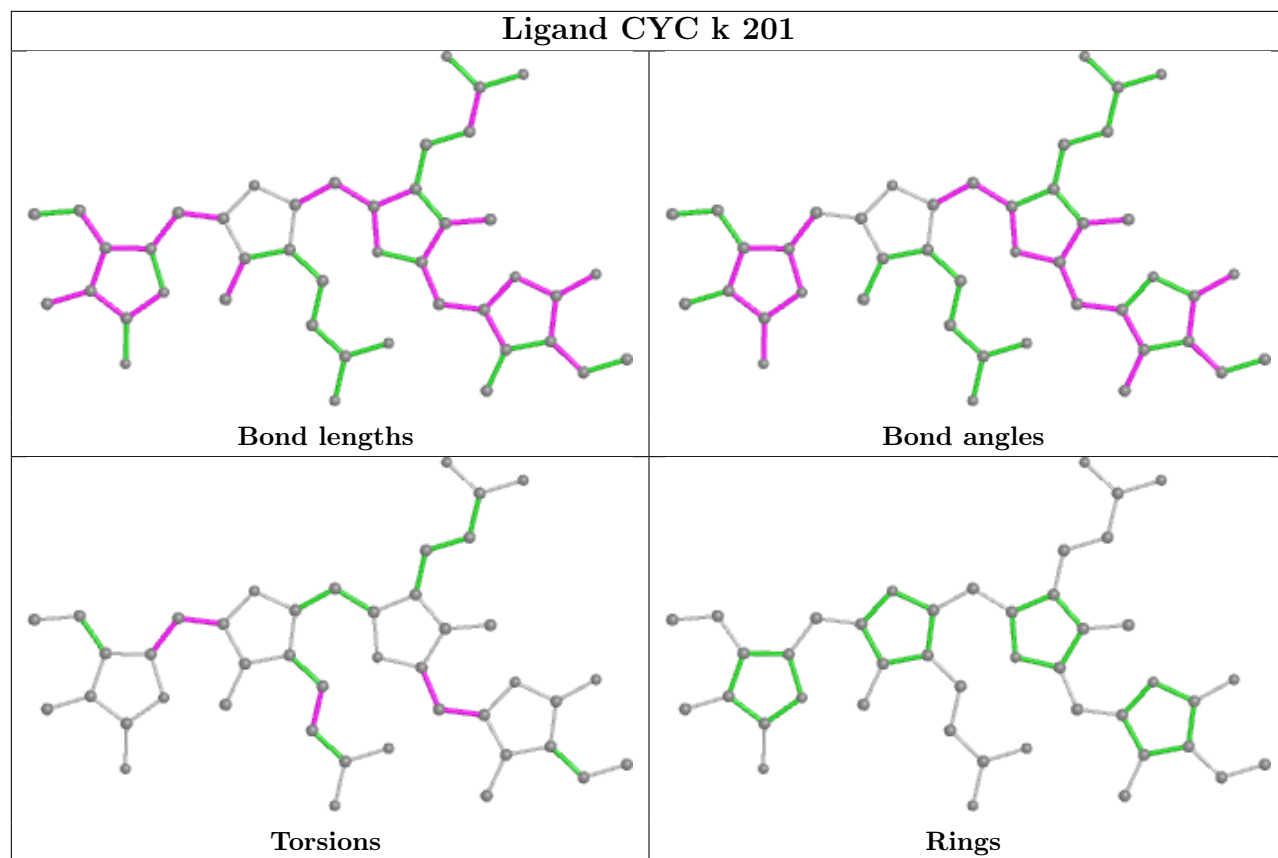
Mol	Chain	Res	Type	Atoms
5	5	1201	CYC	NA-C4A-CHB-C1B
5	5	1201	CYC	C3A-C4A-CHB-C1B
5	5	1201	CYC	C4C-C3C-CAC-CBC
5	5	1201	CYC	NC-C4C-CHD-C1D
5	5	1201	CYC	C2D-C1D-CHD-C4C

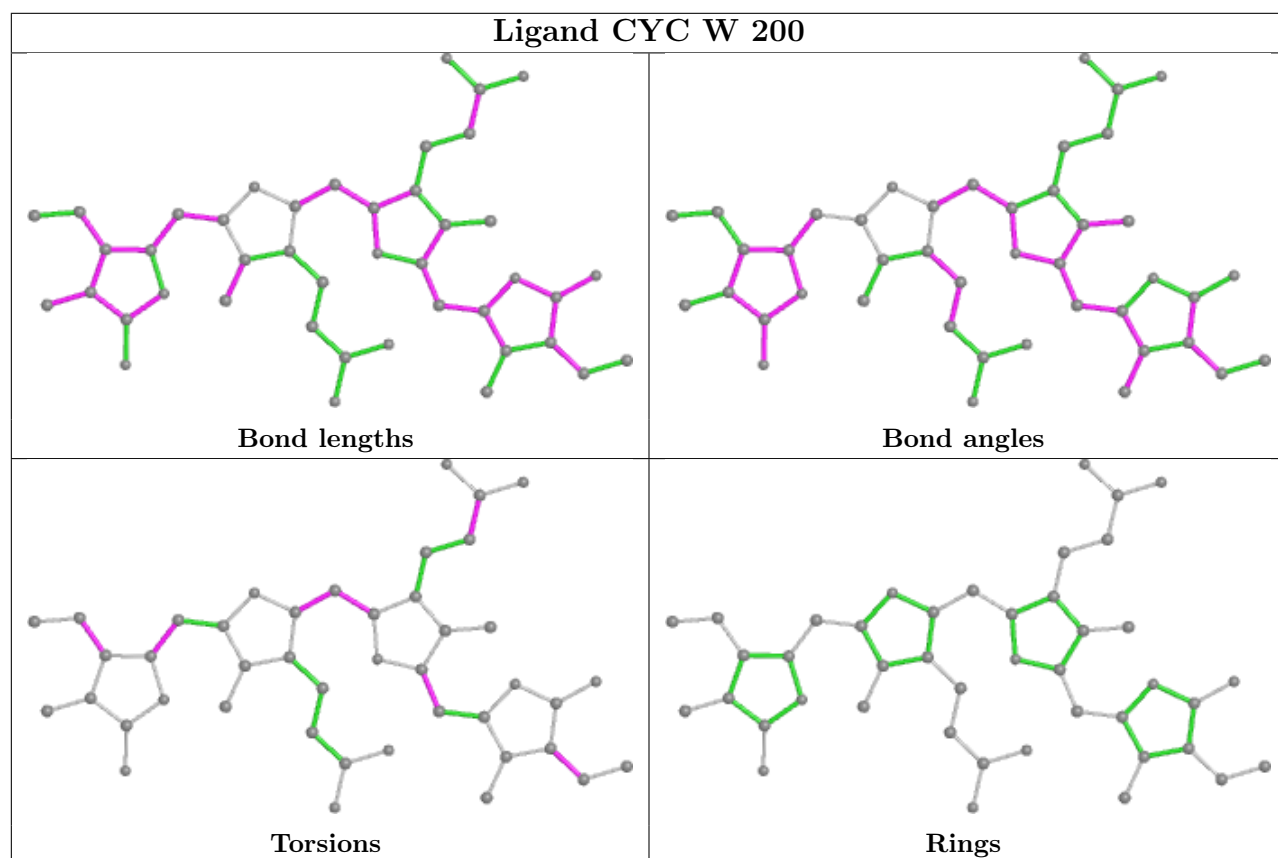
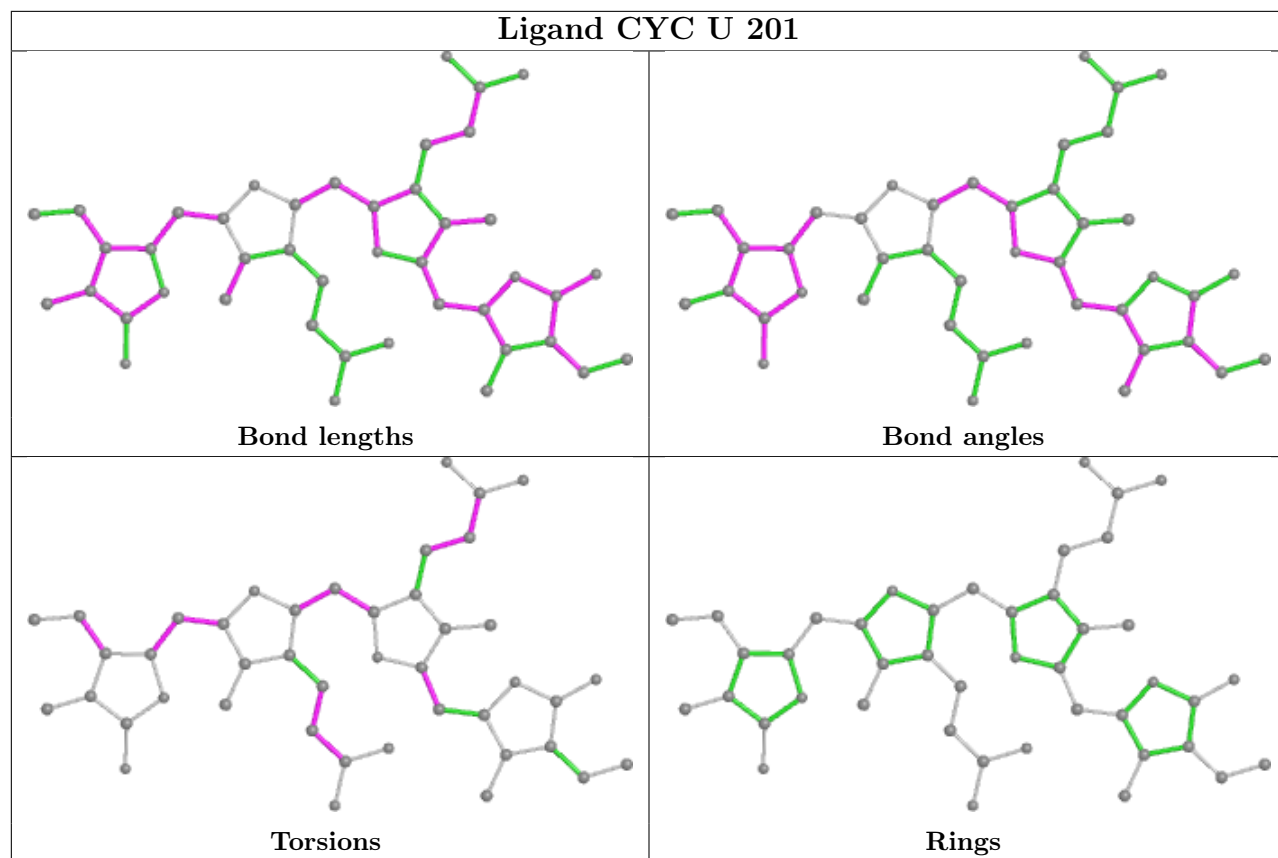
There are no ring outliers.

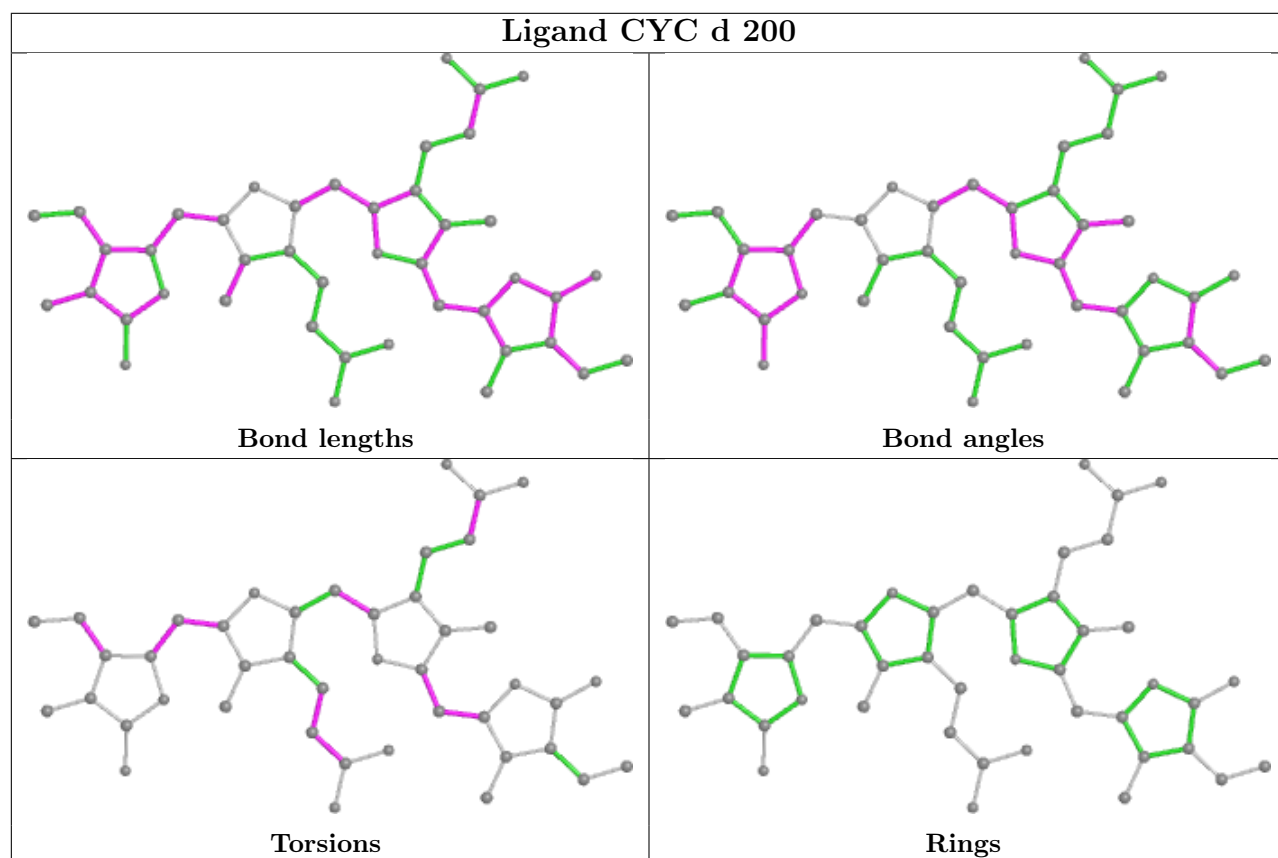
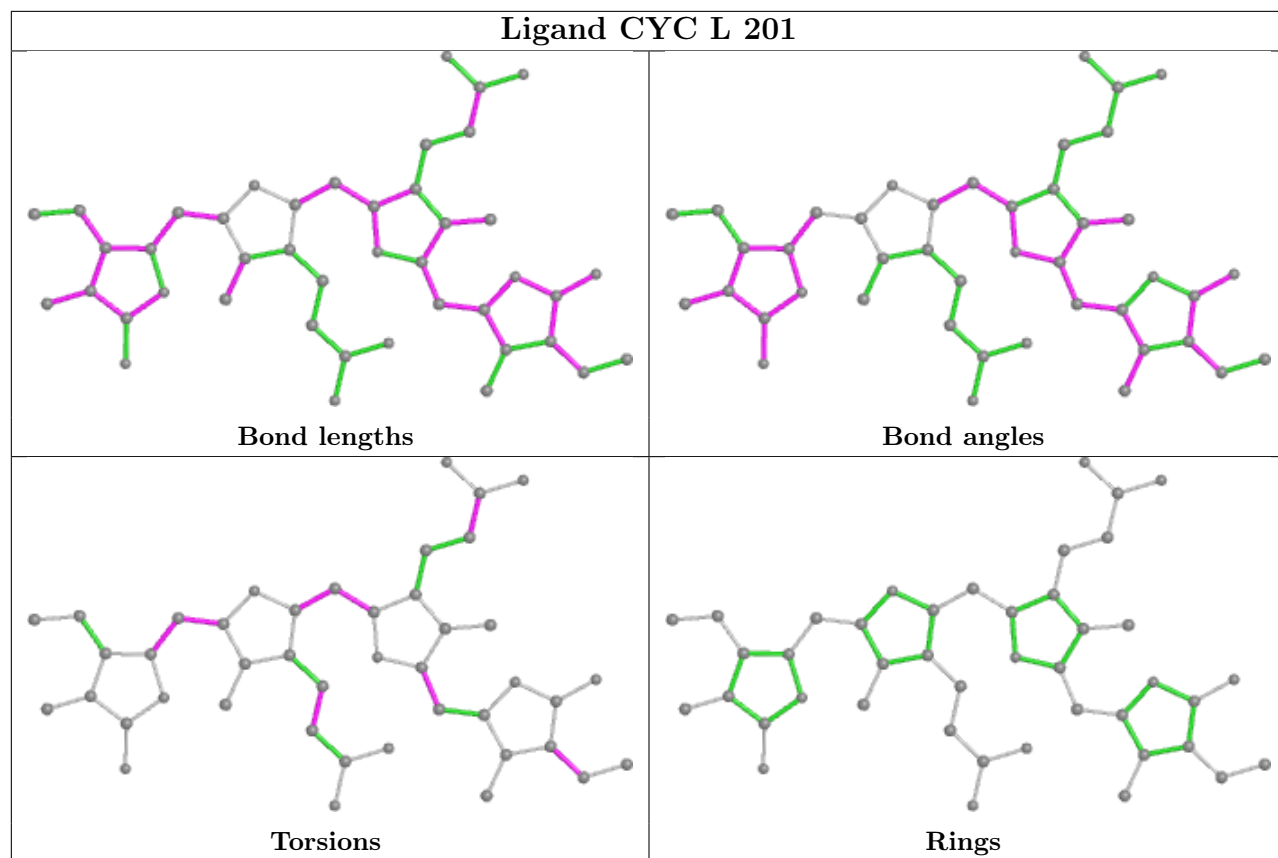
No monomer is involved in short contacts.

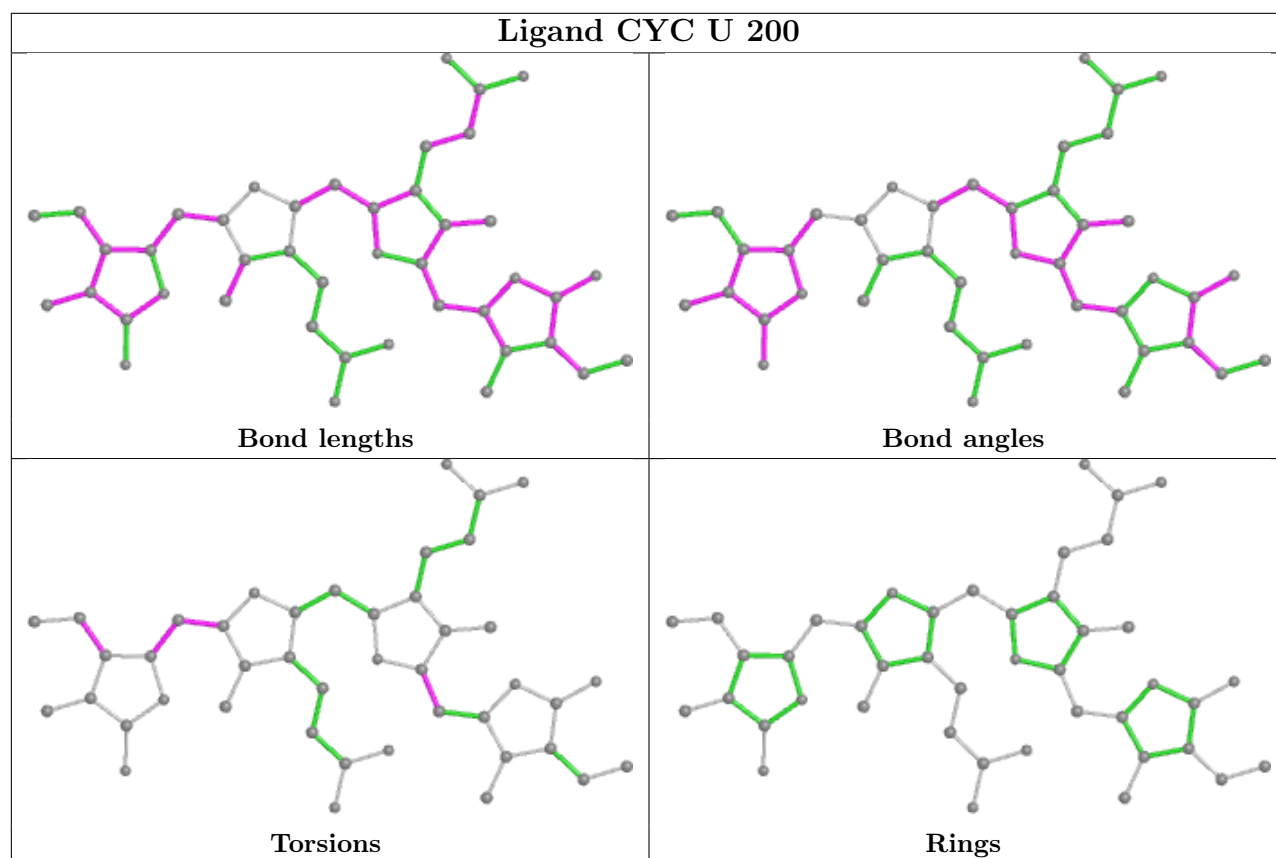
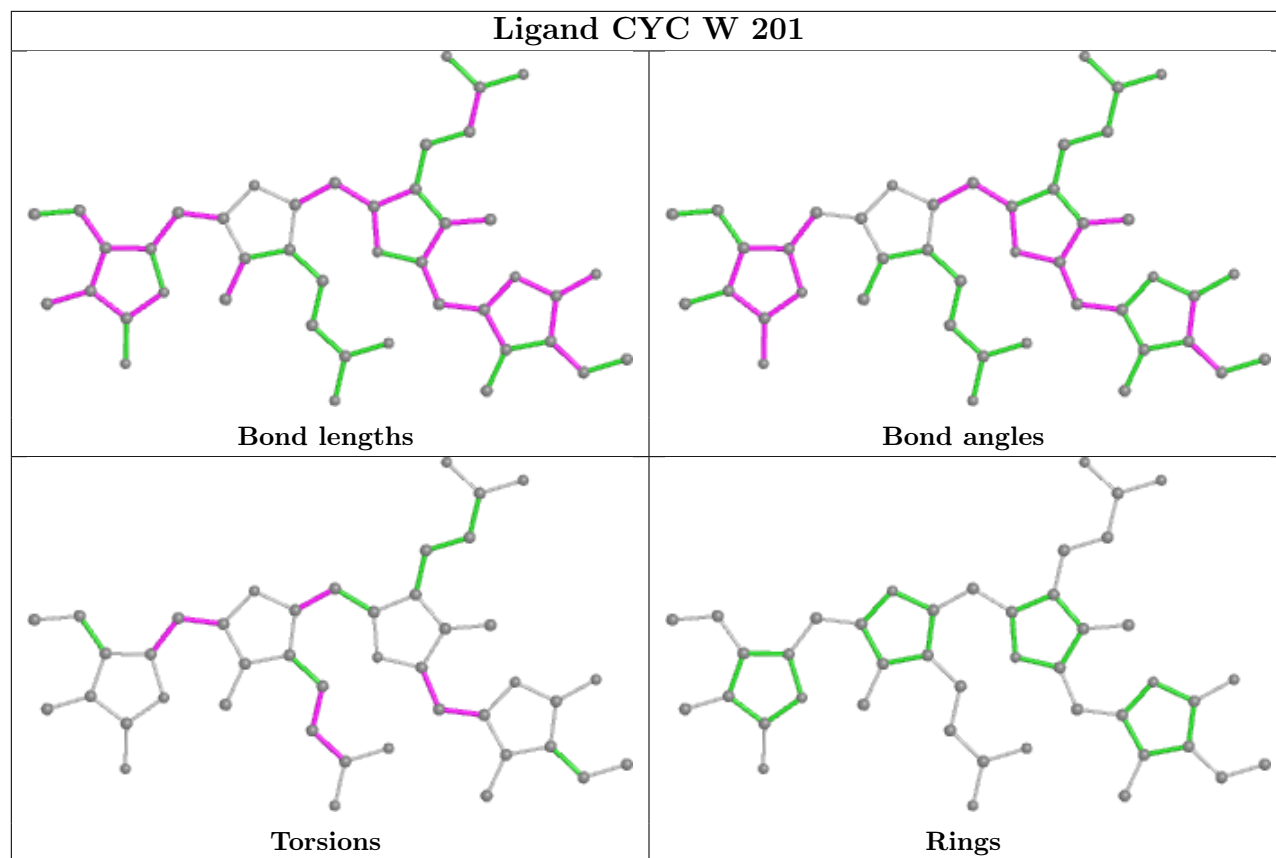
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

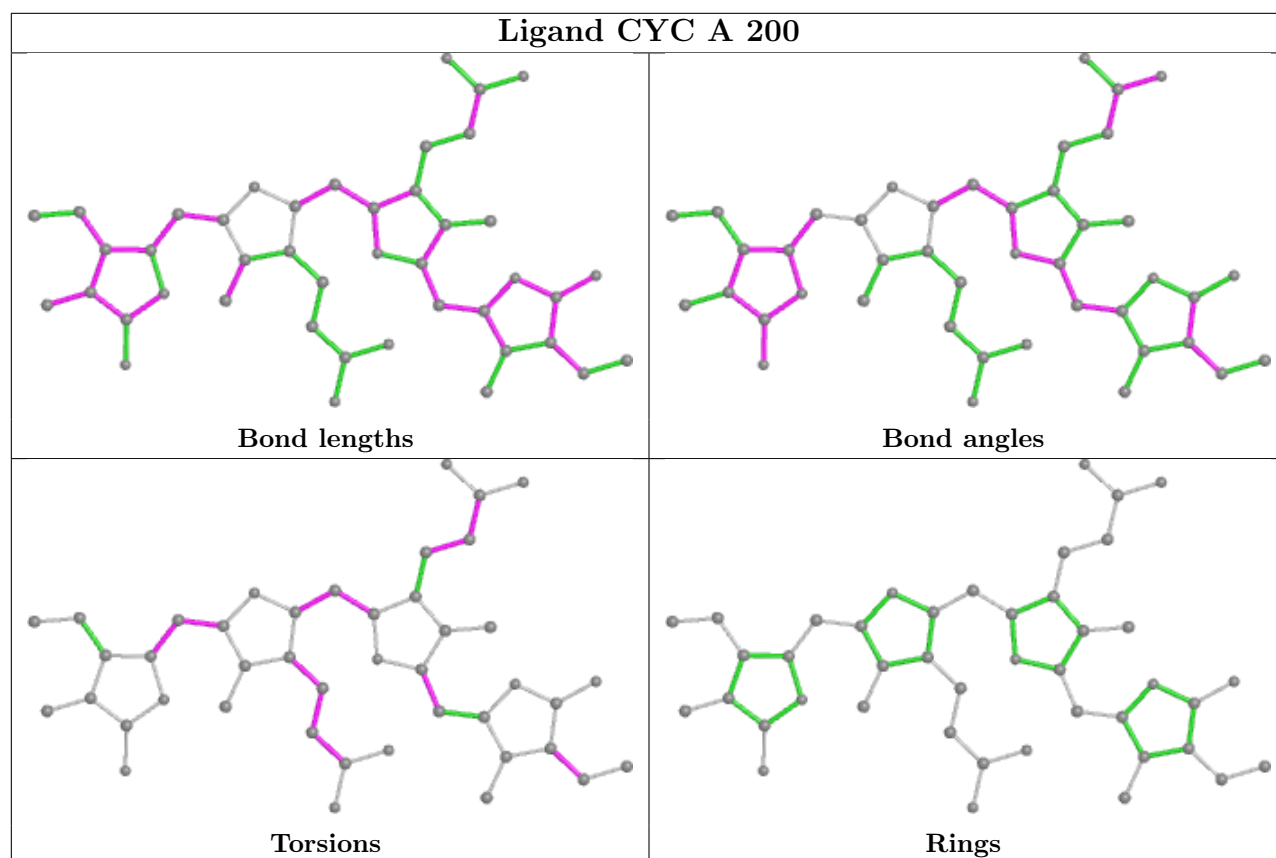
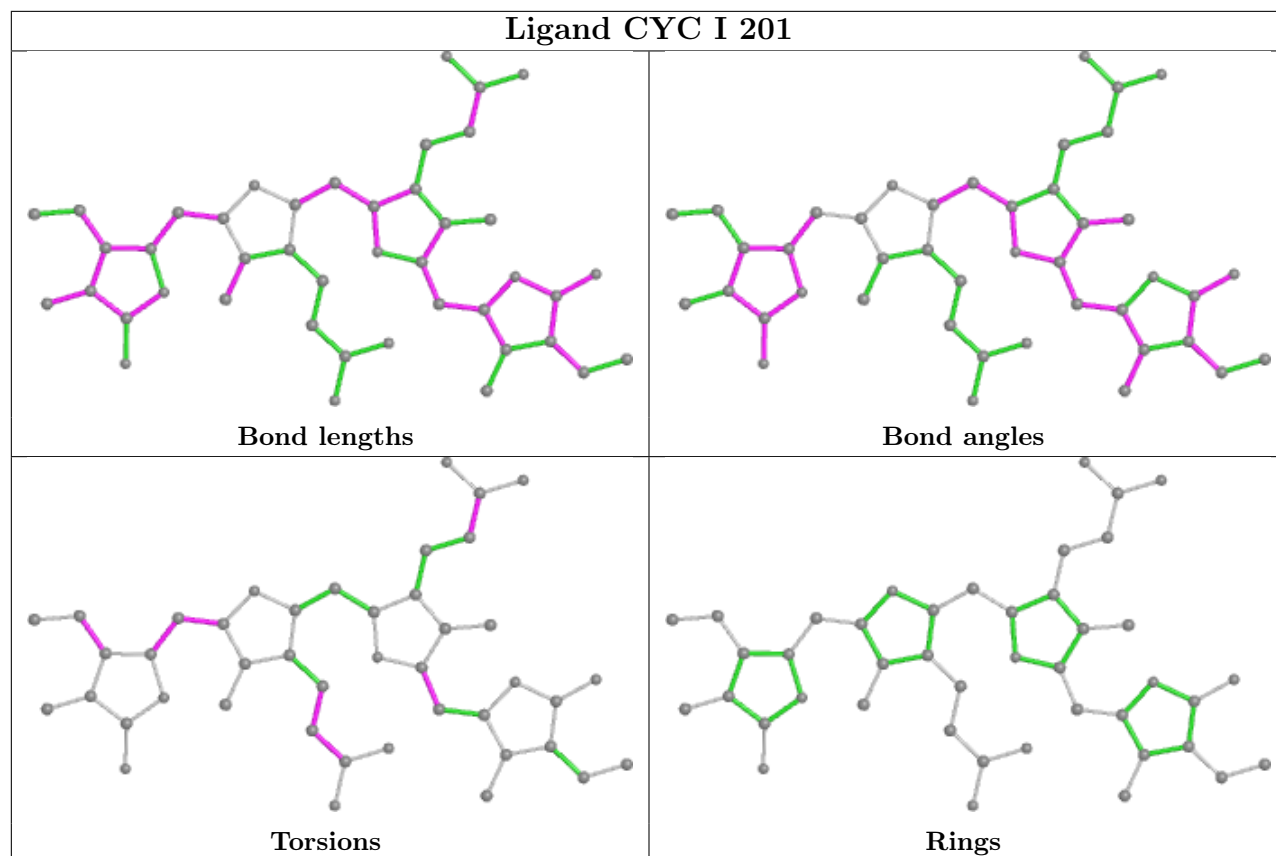


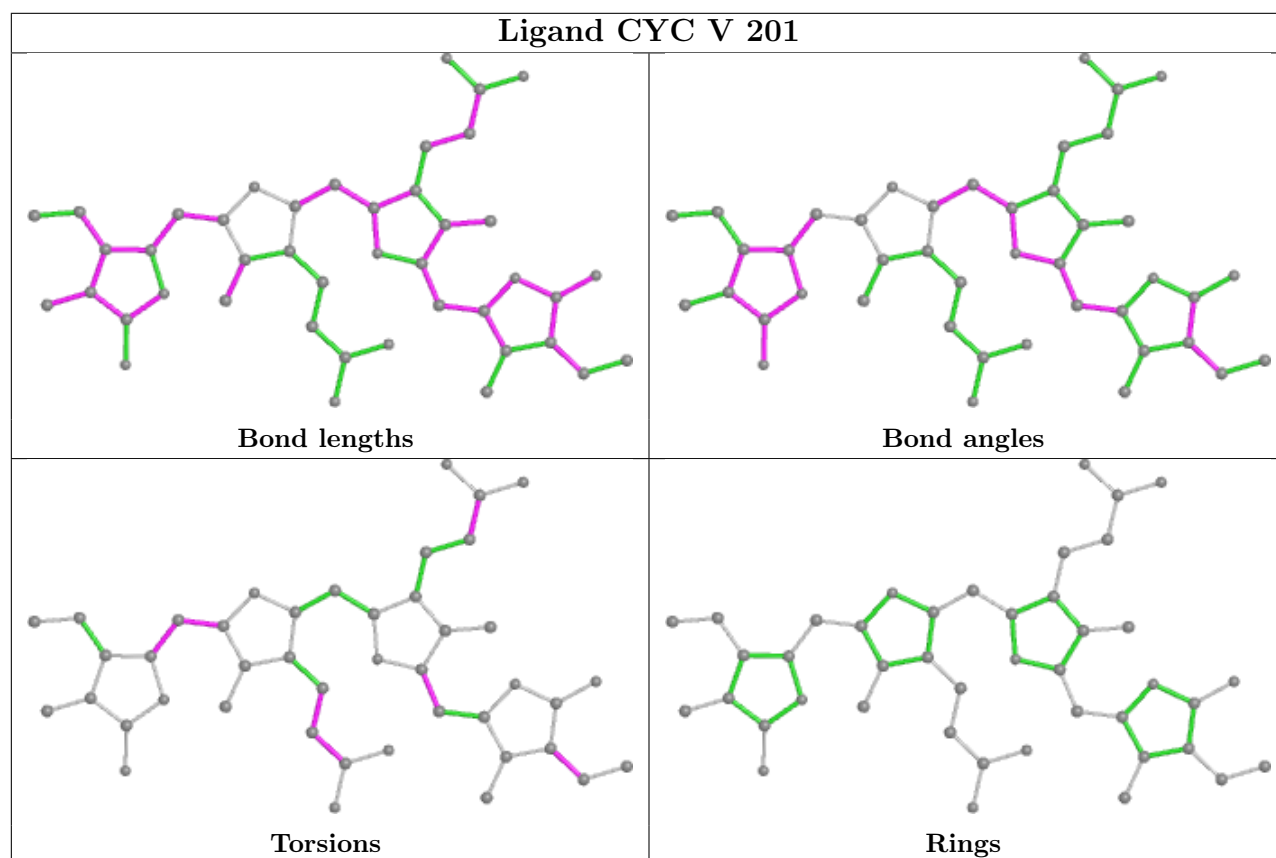
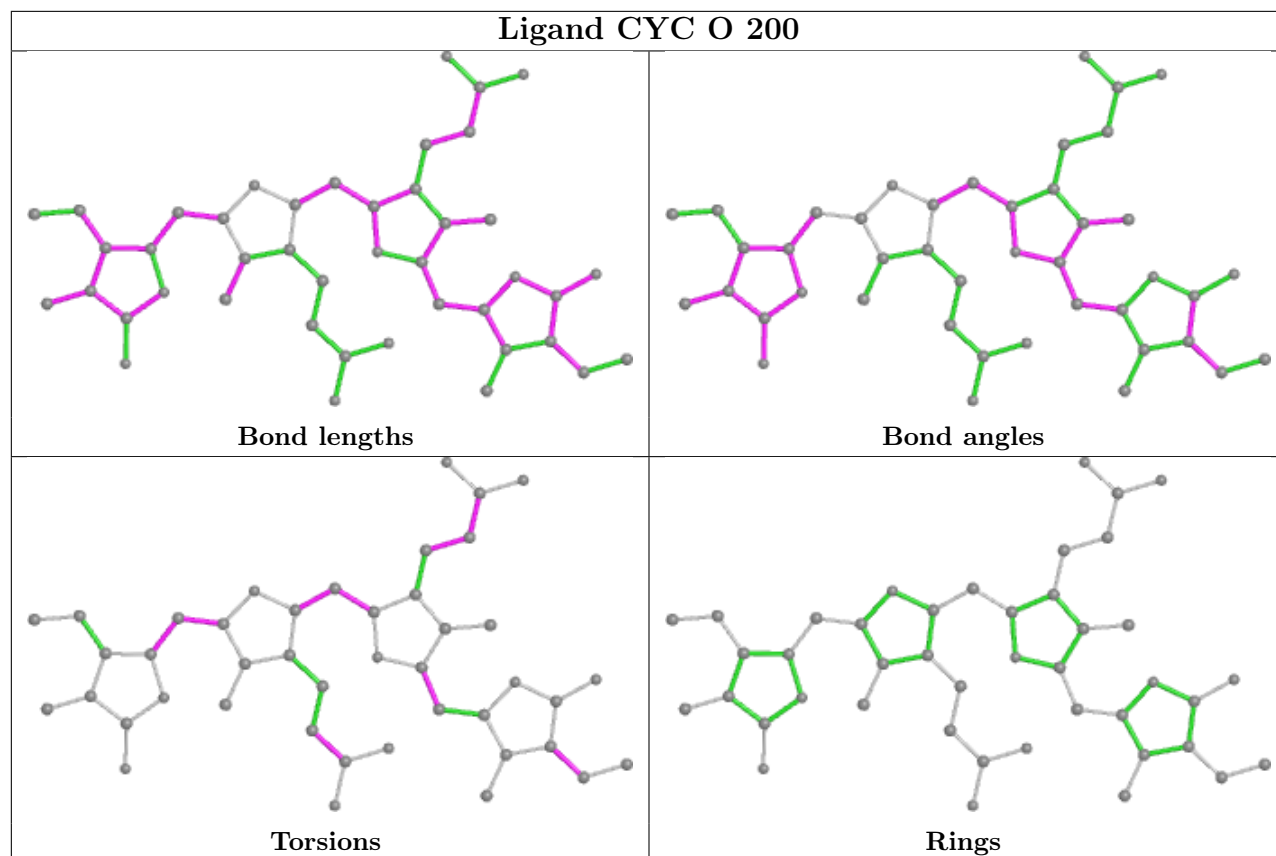


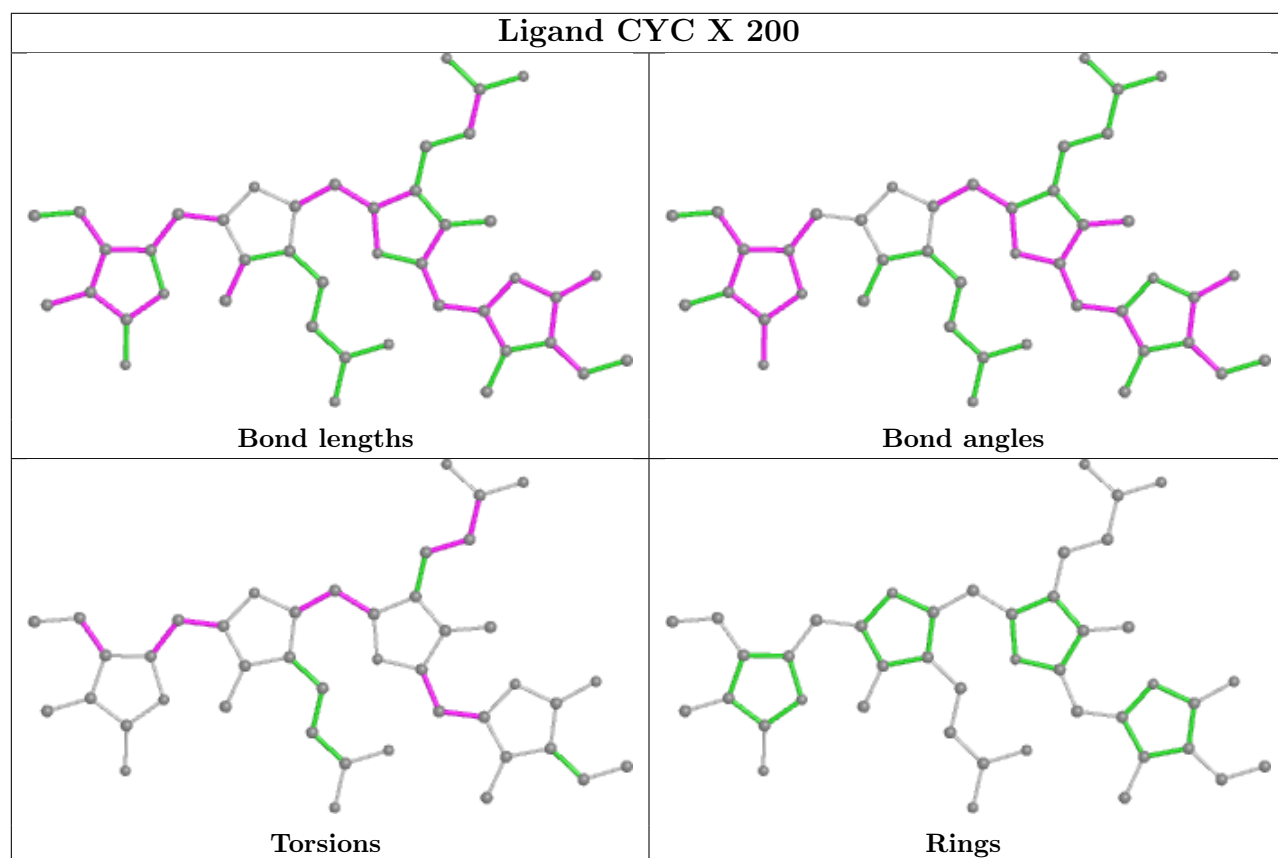
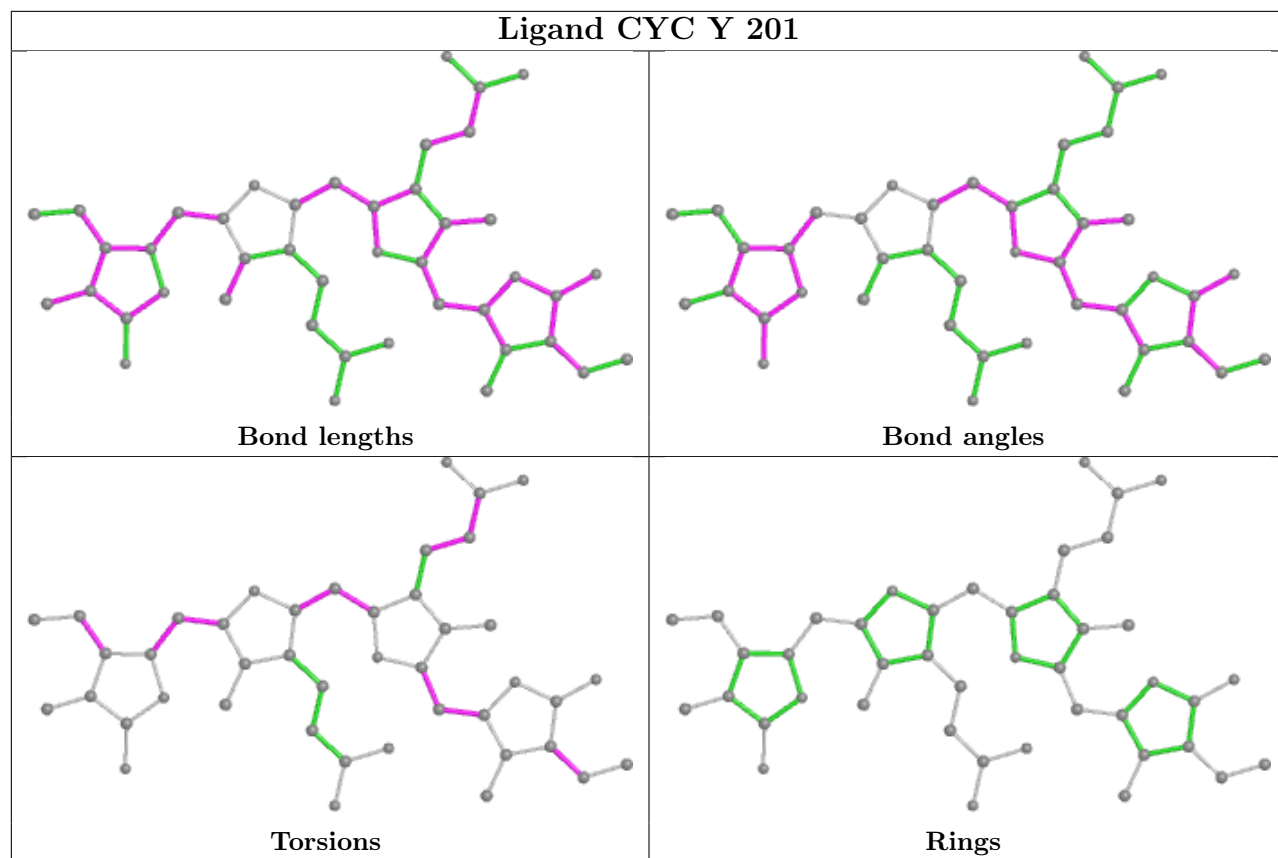


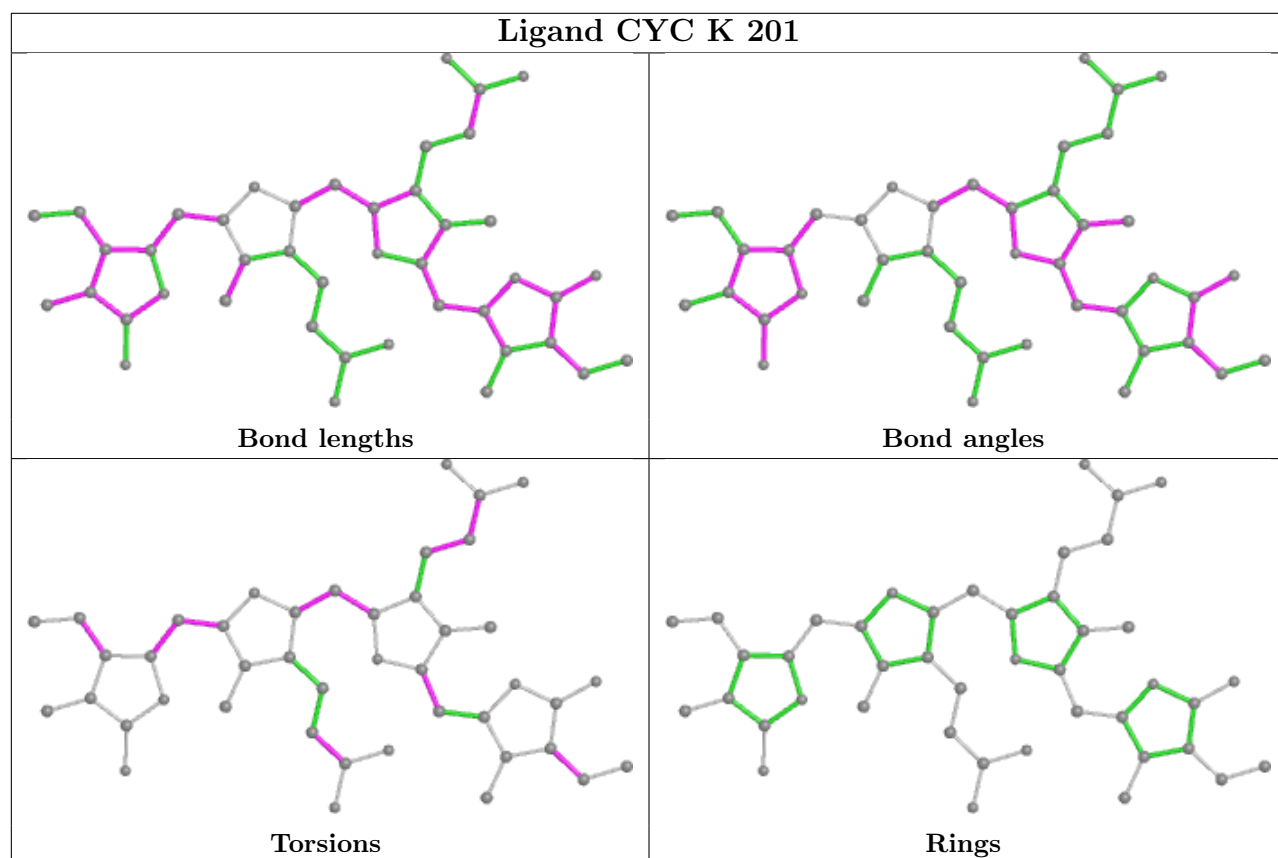
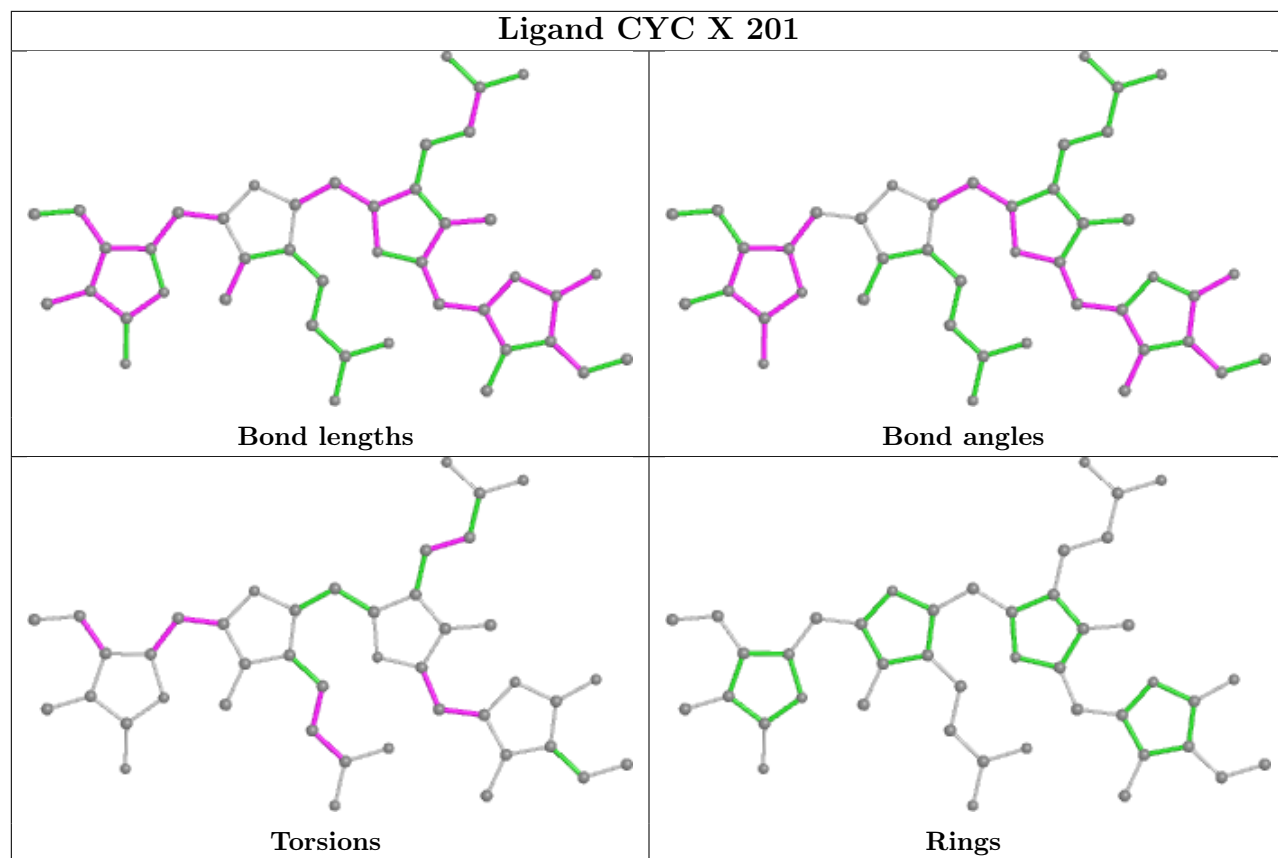


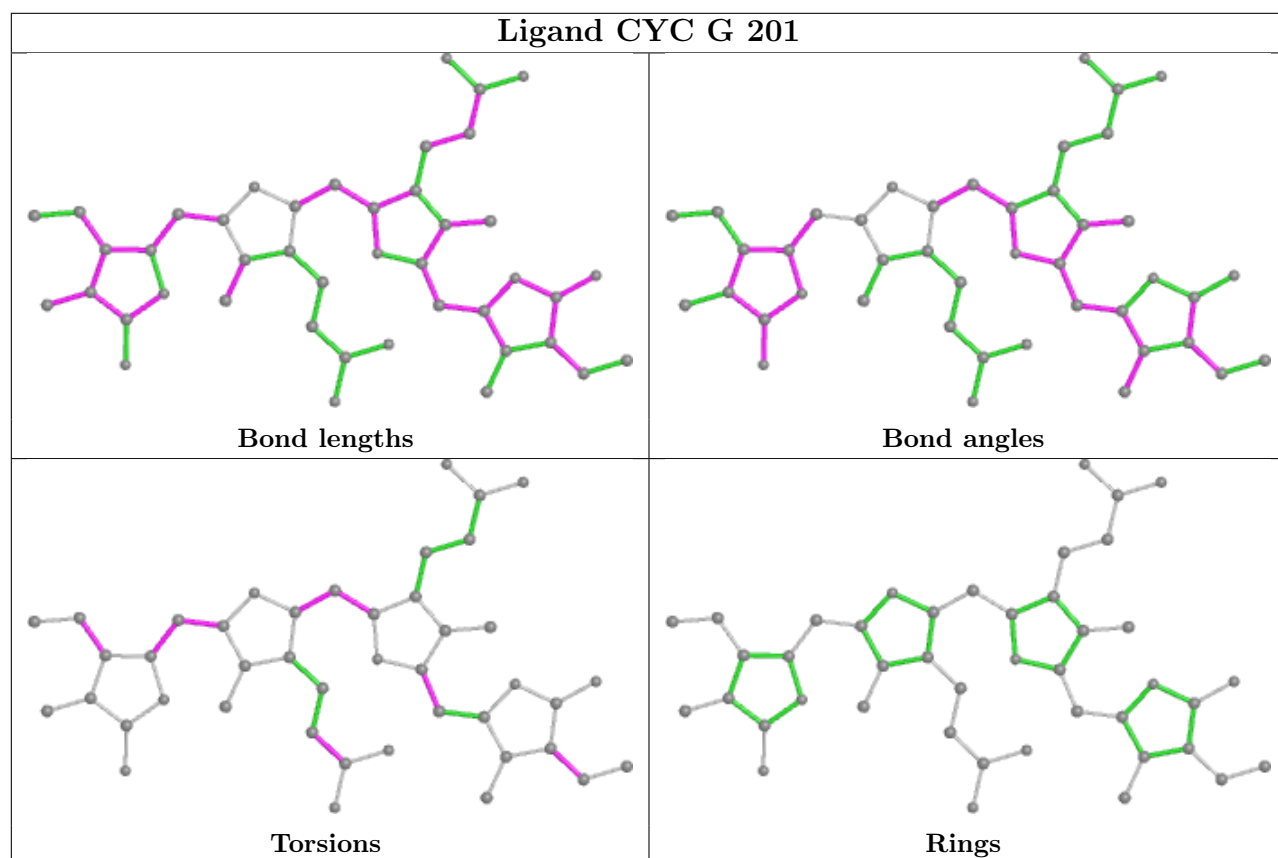
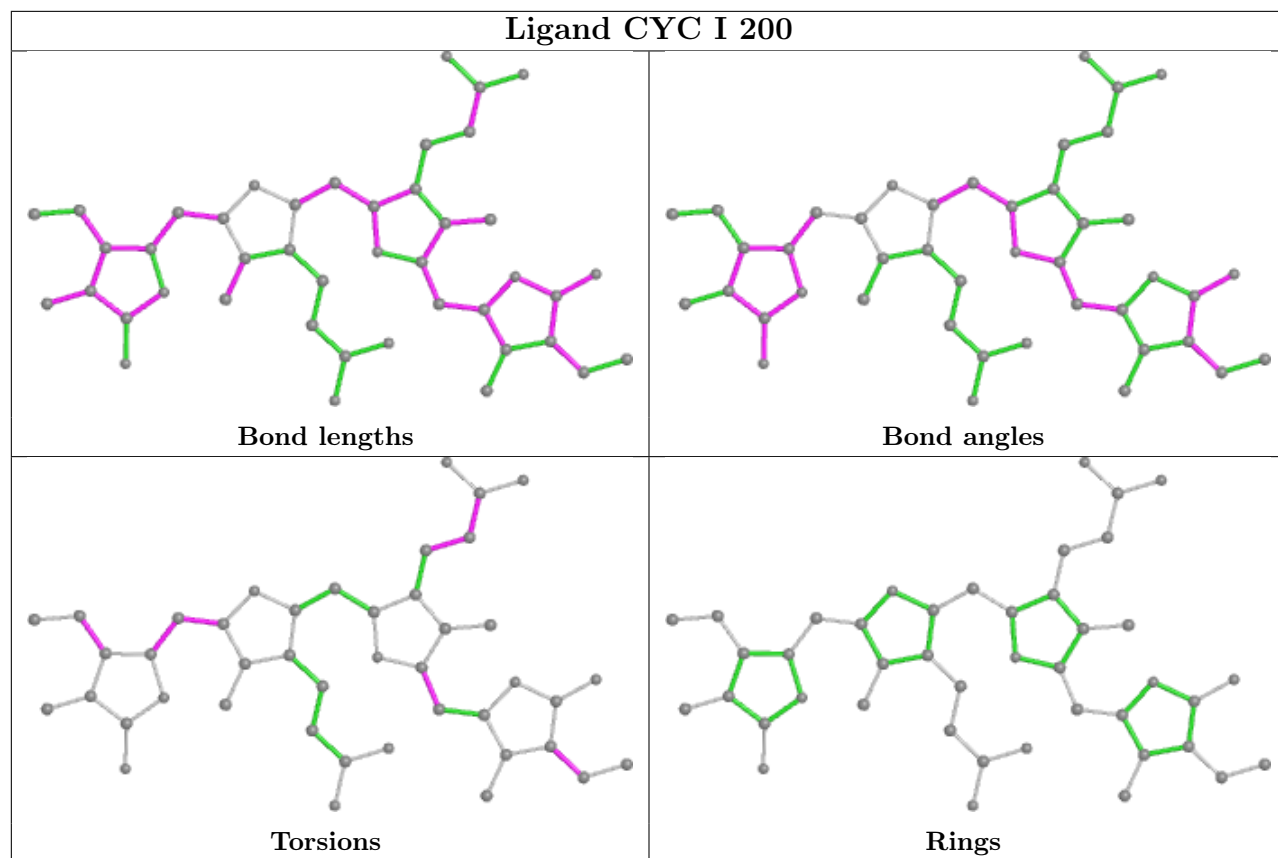


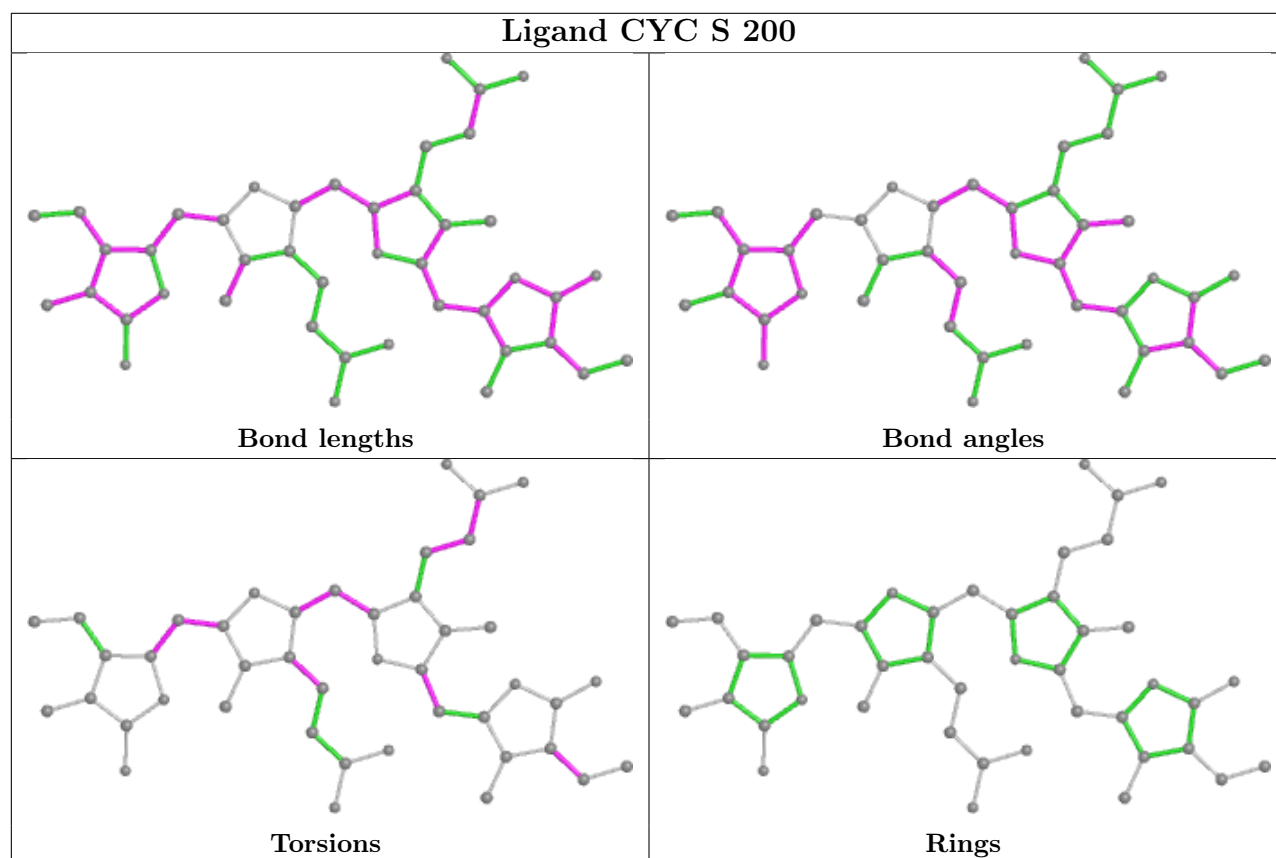
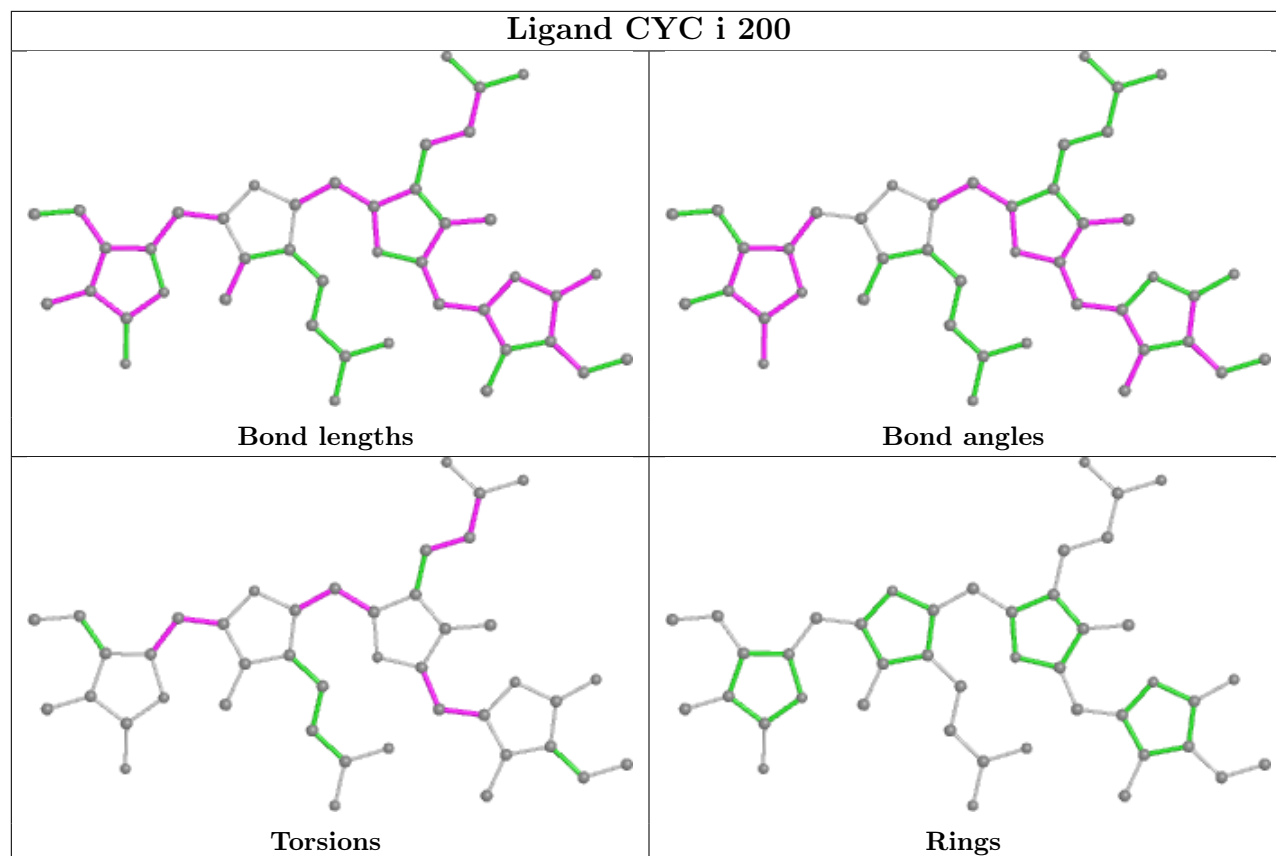


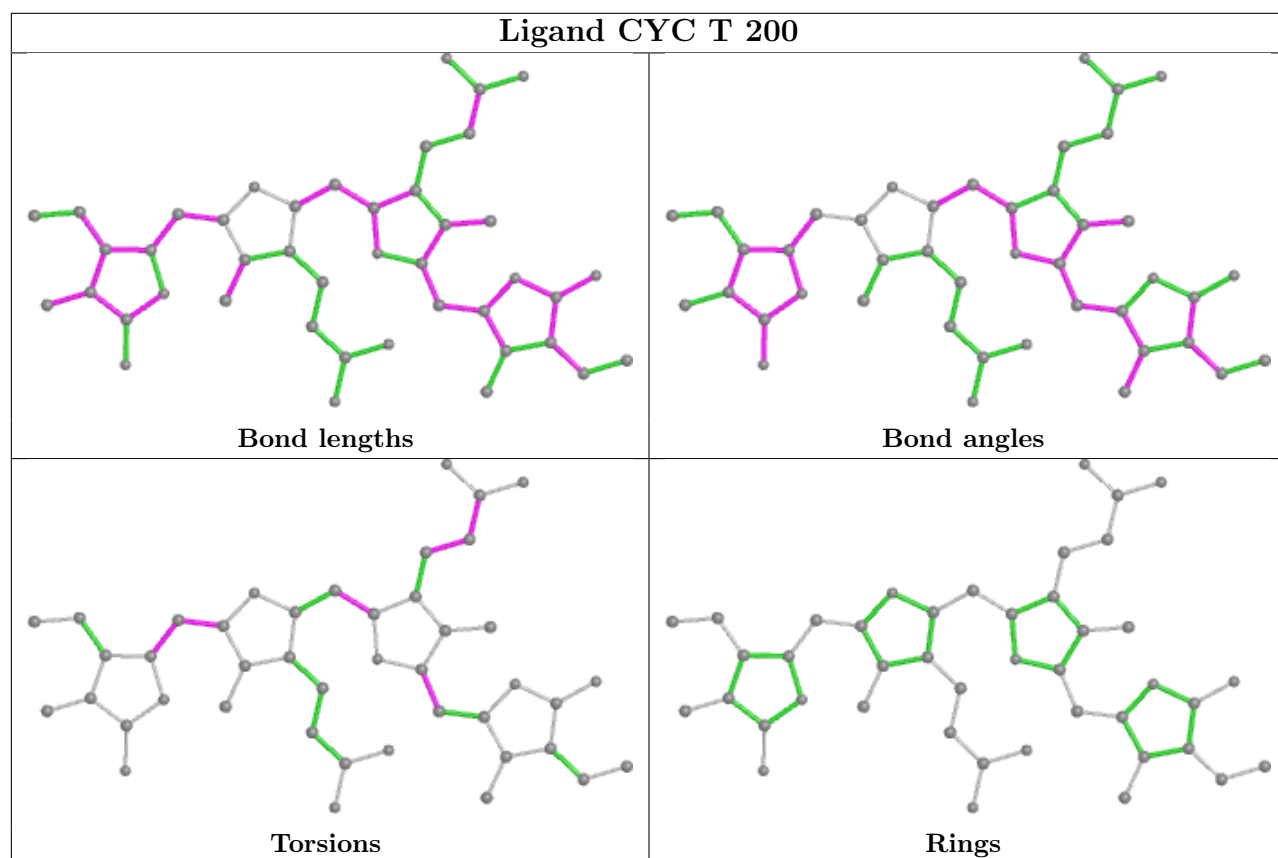
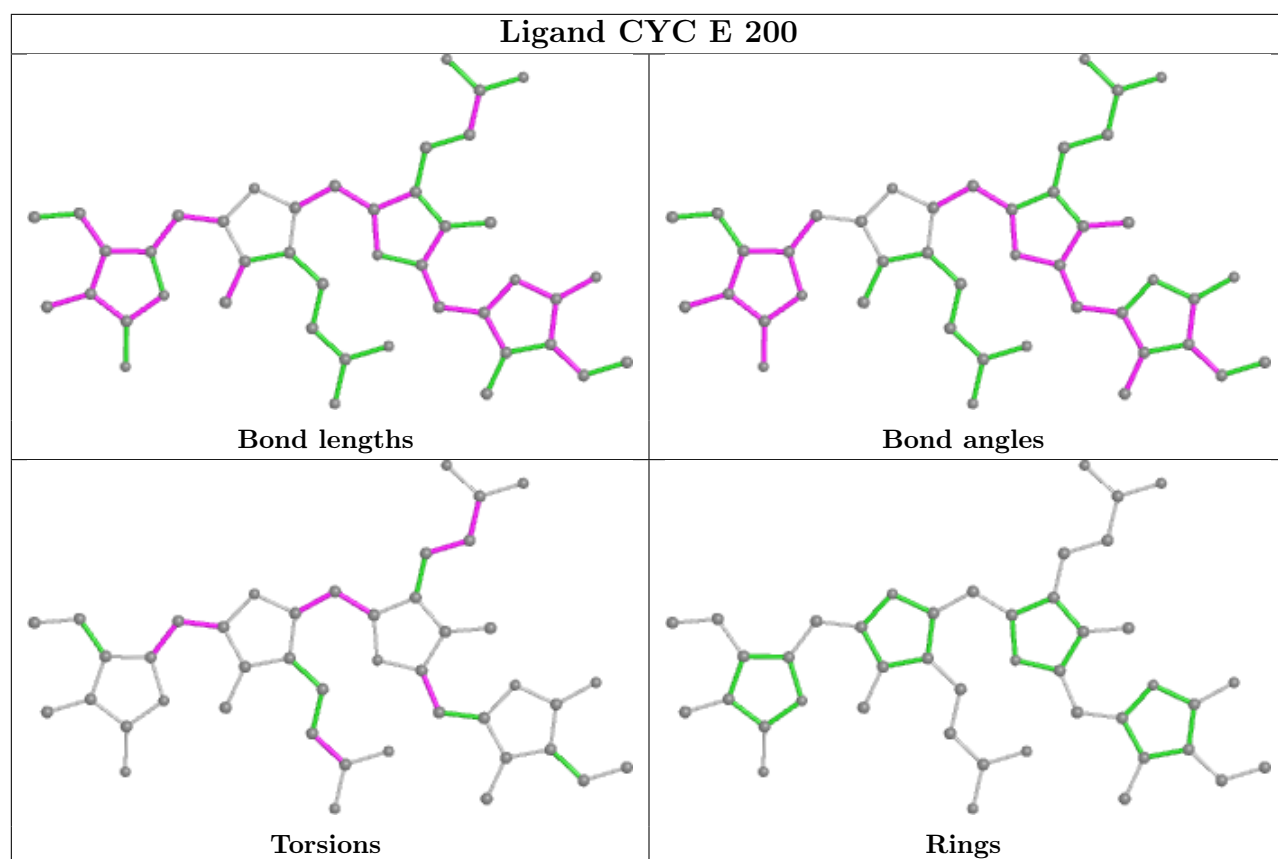


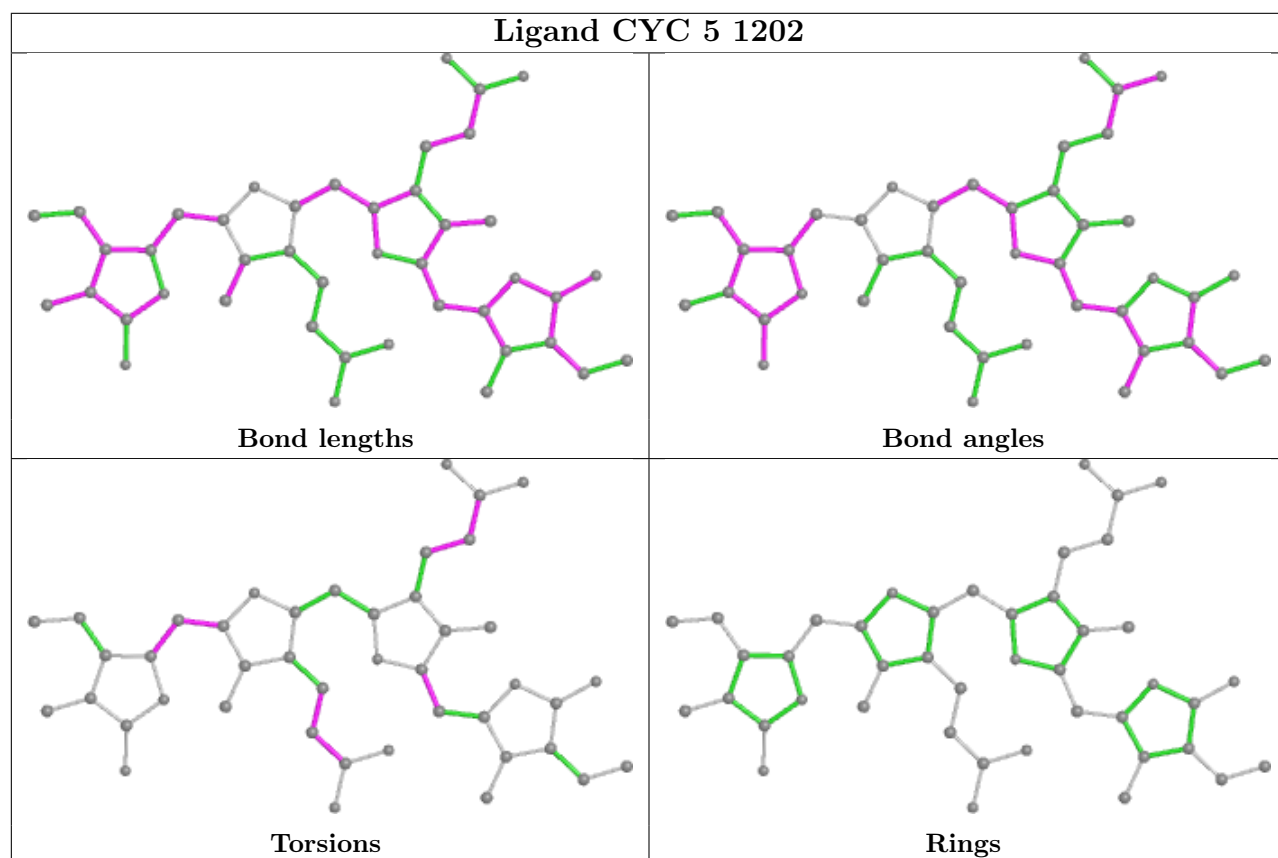
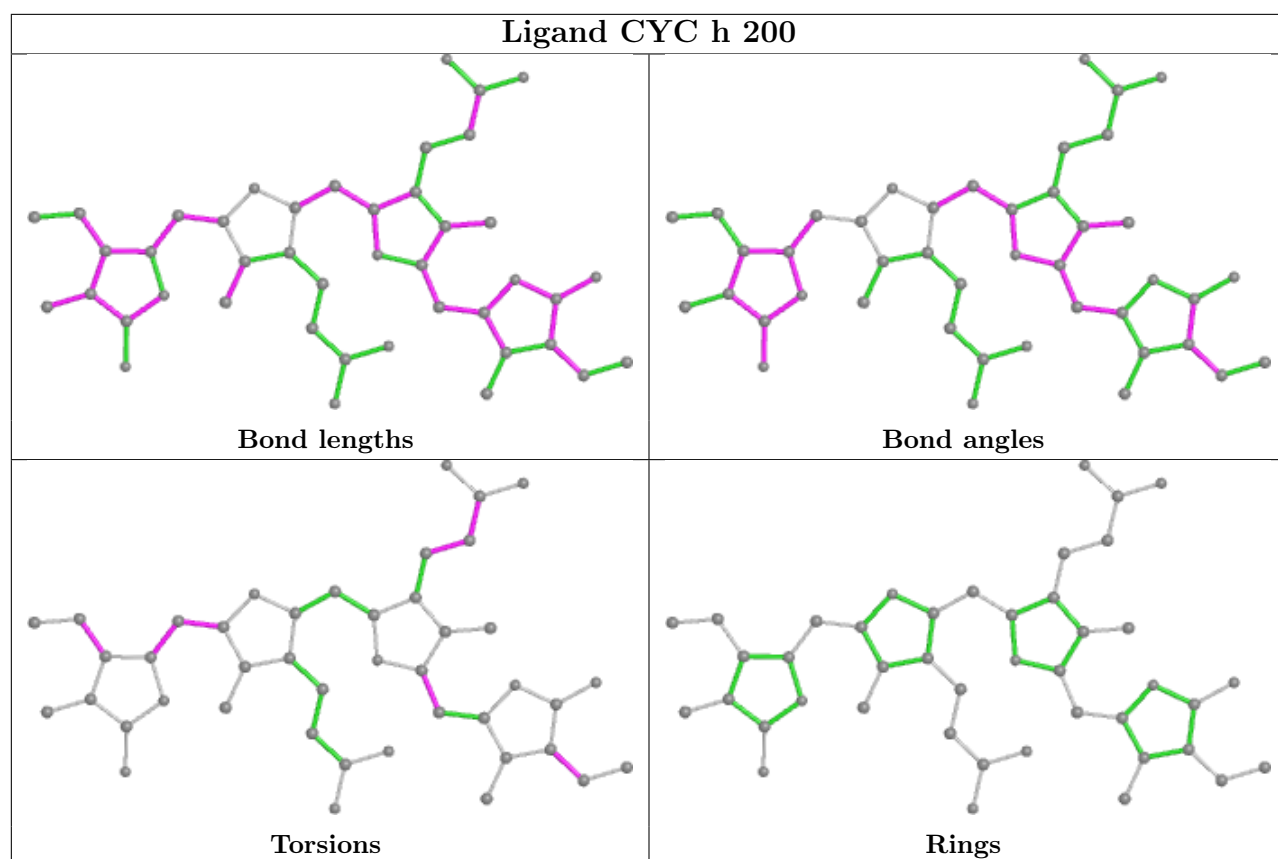


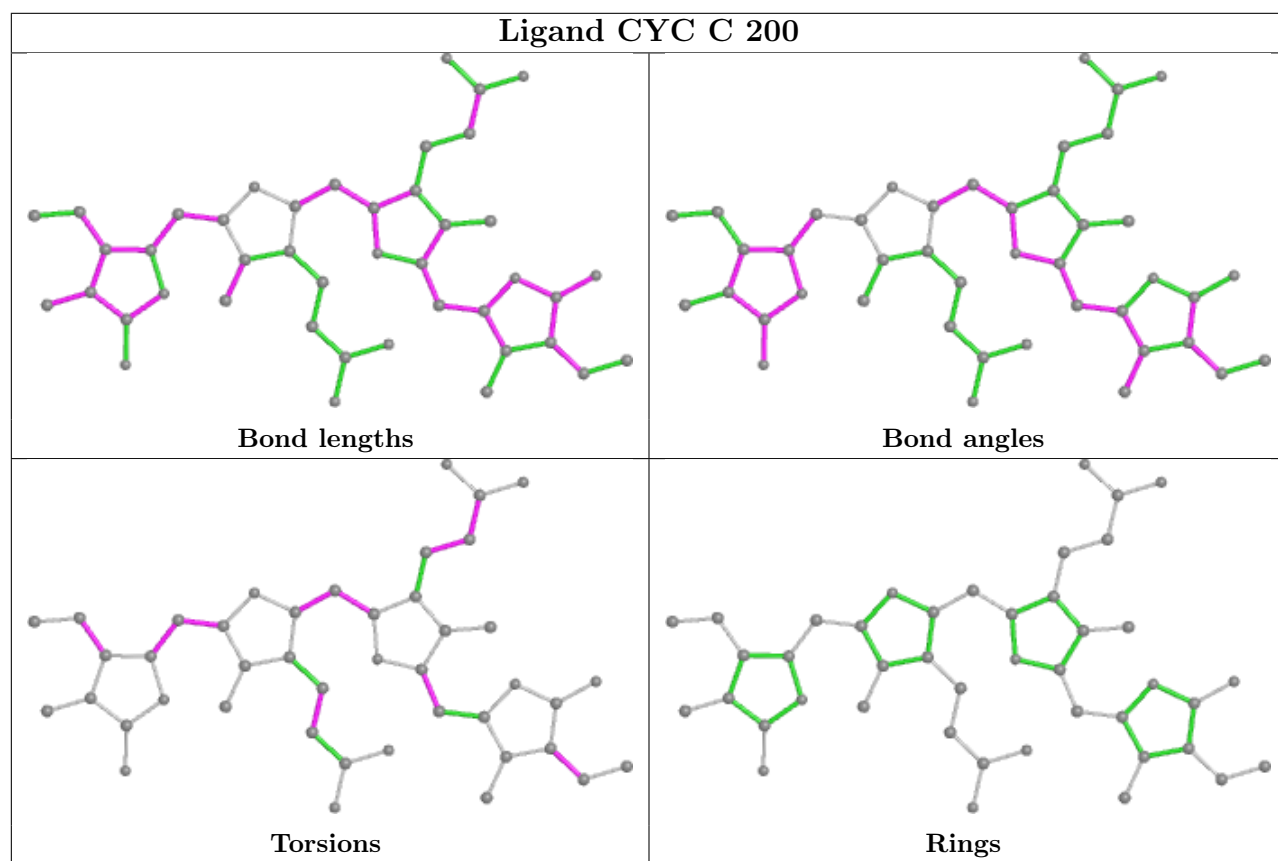
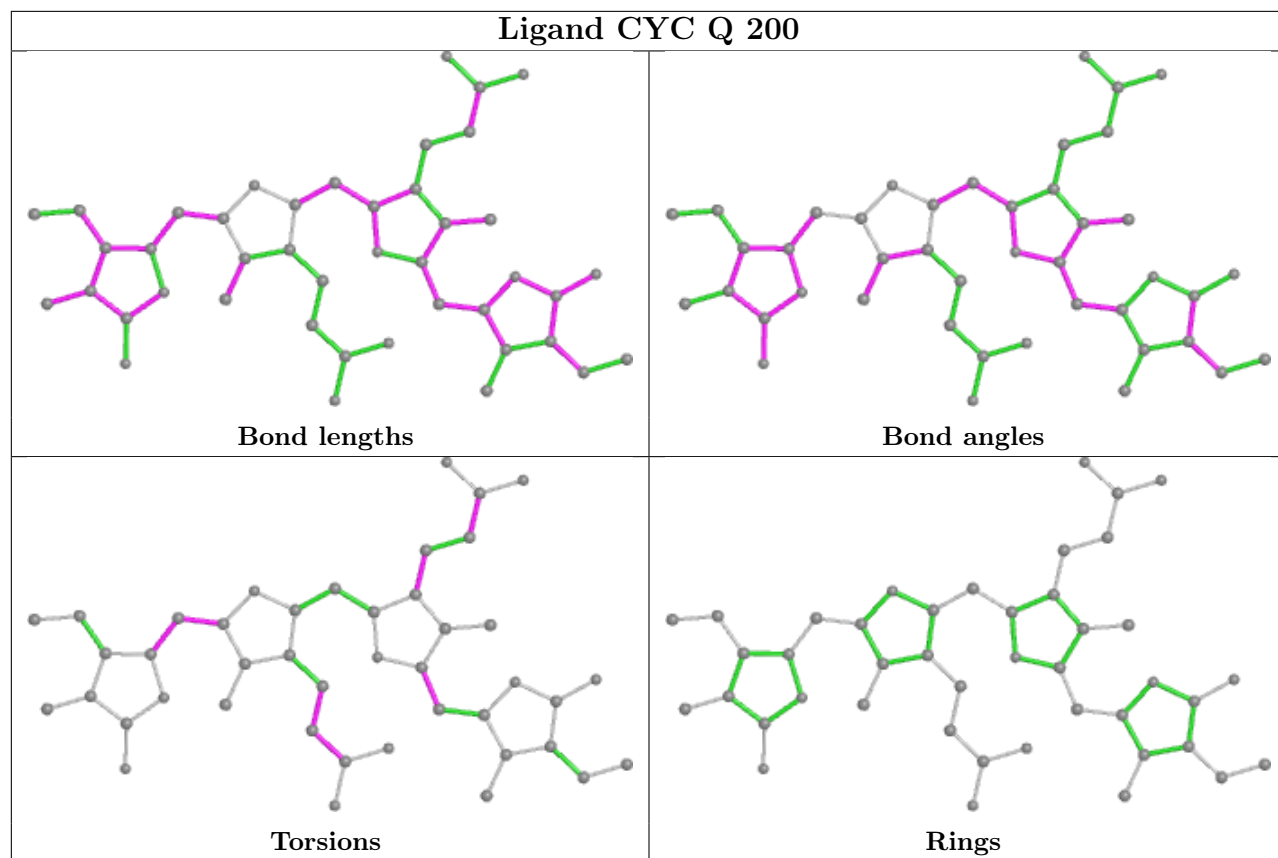


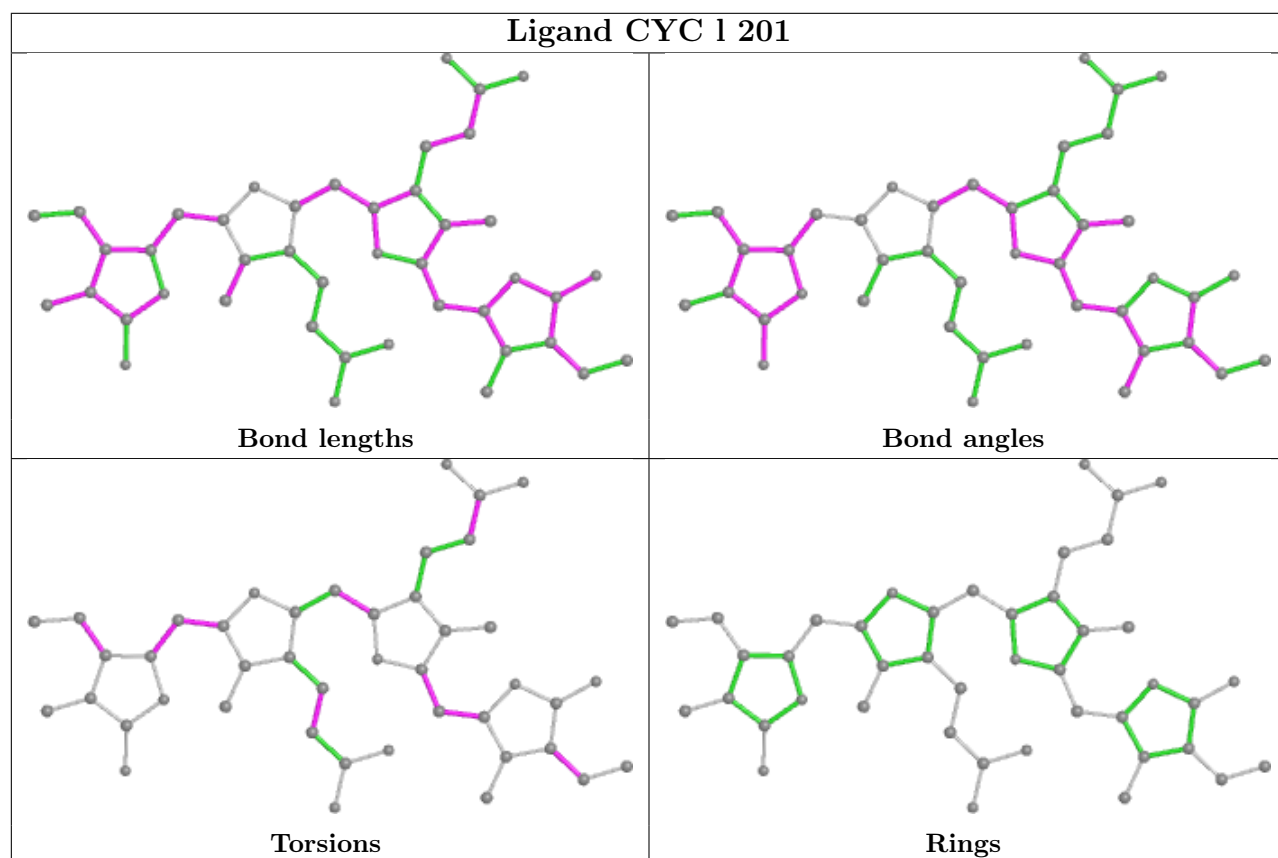
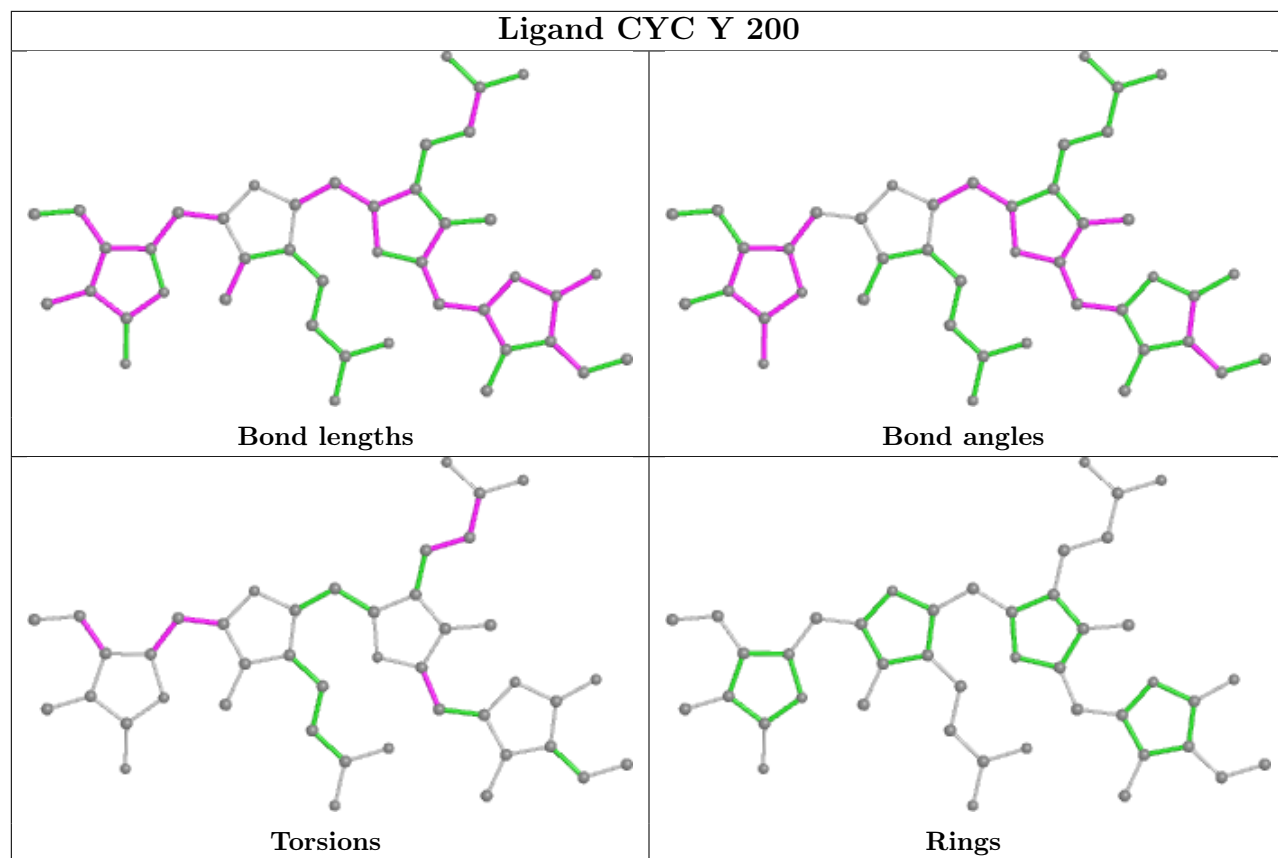


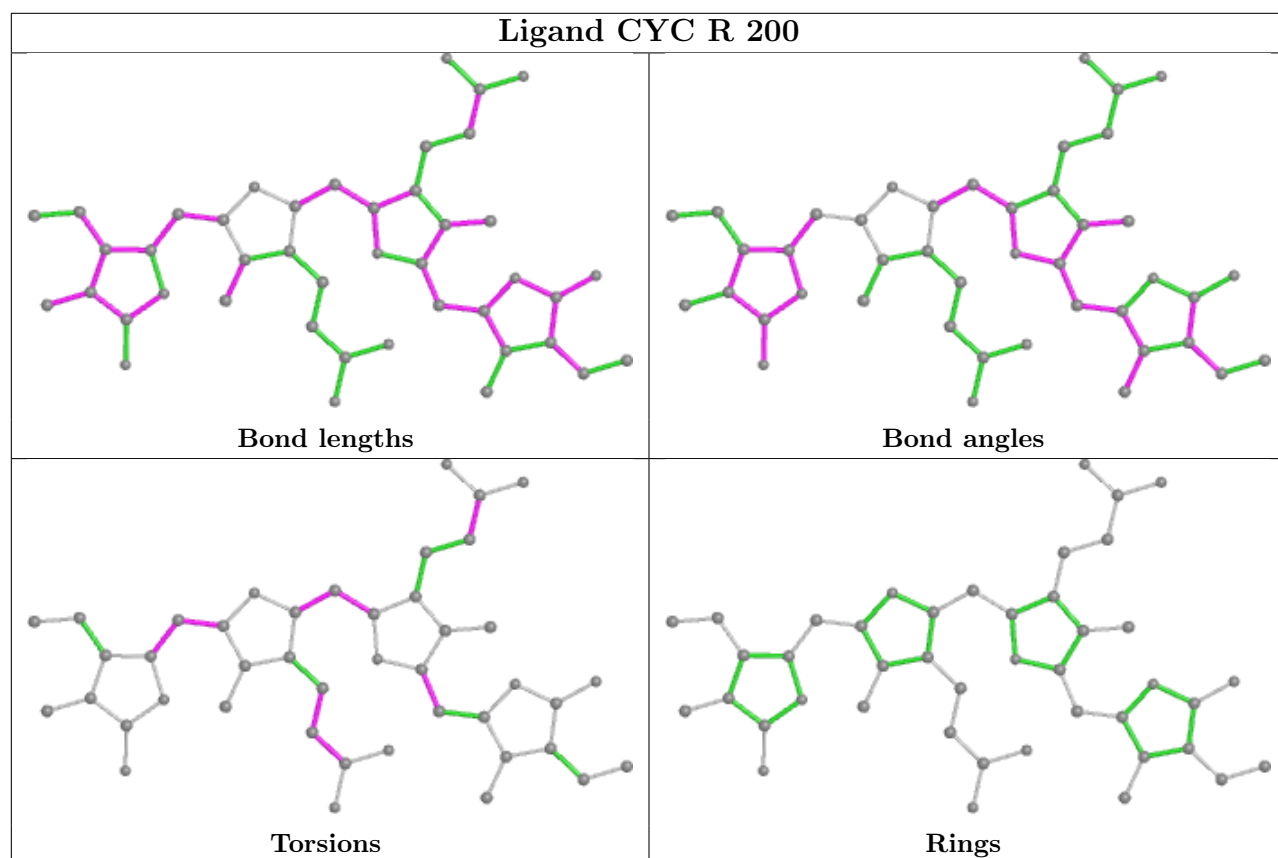
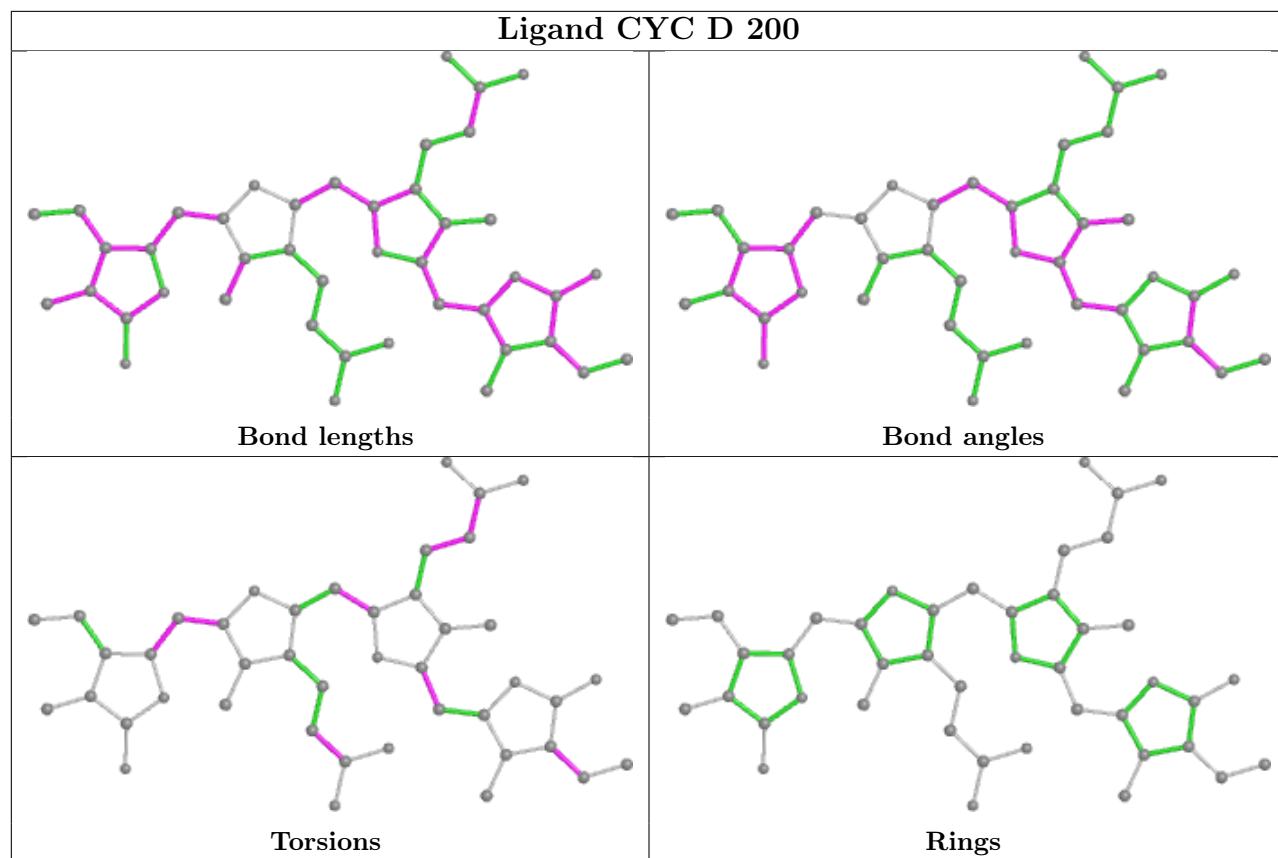


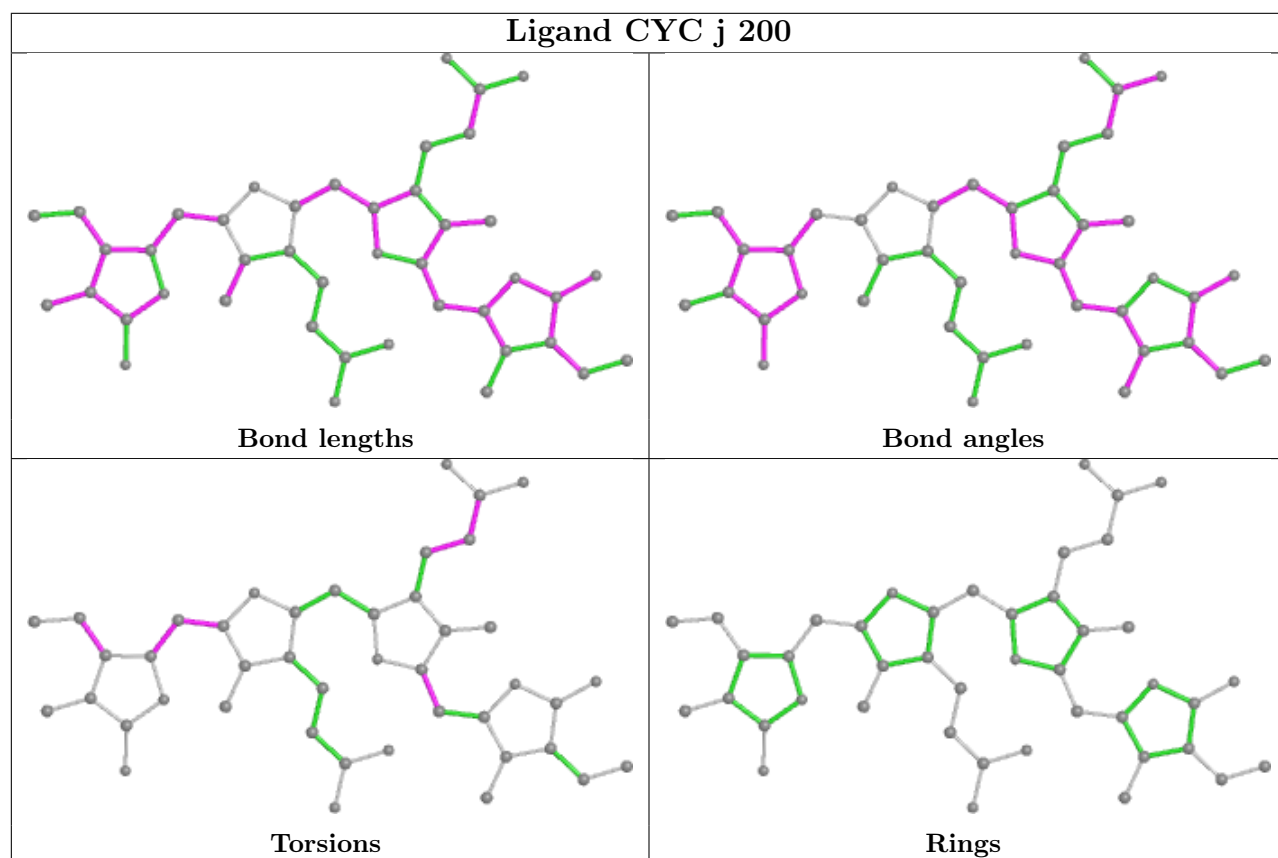
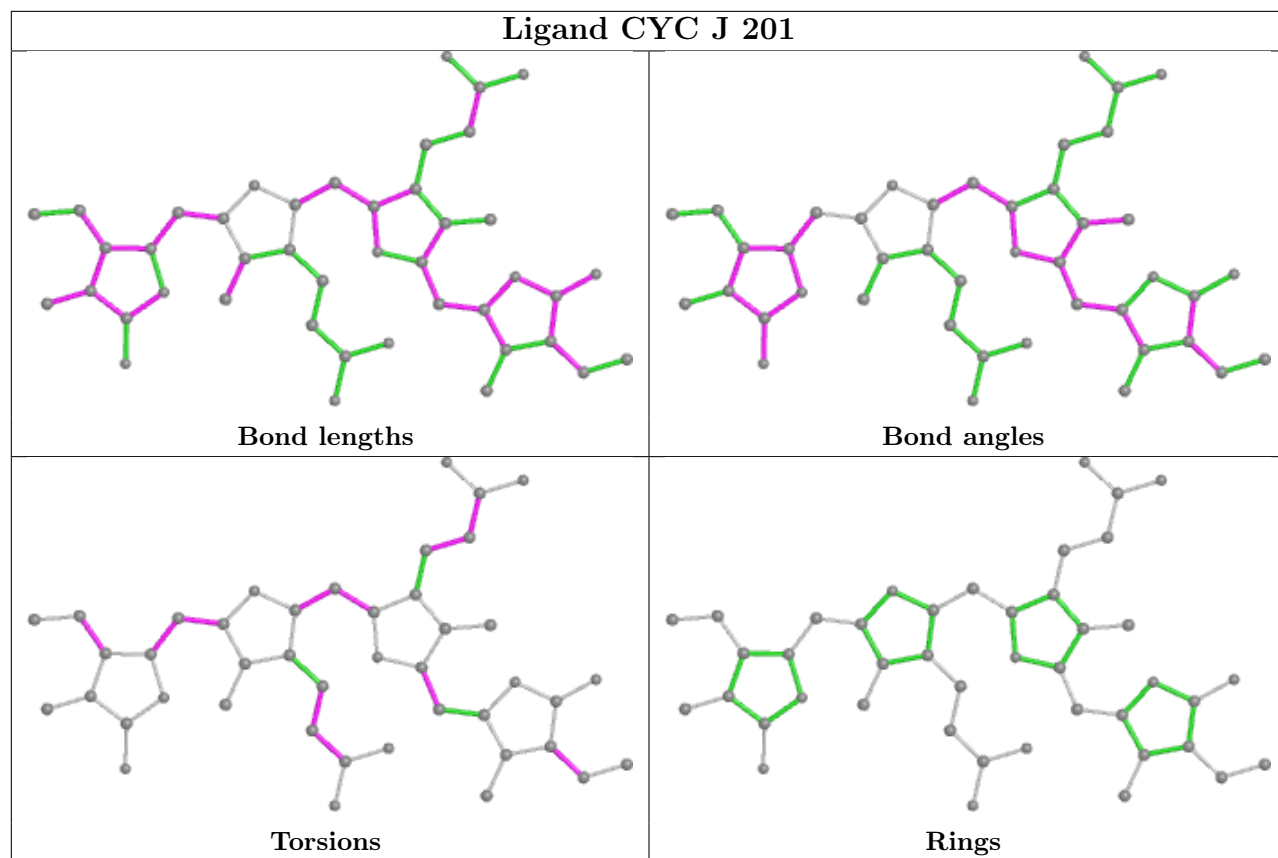


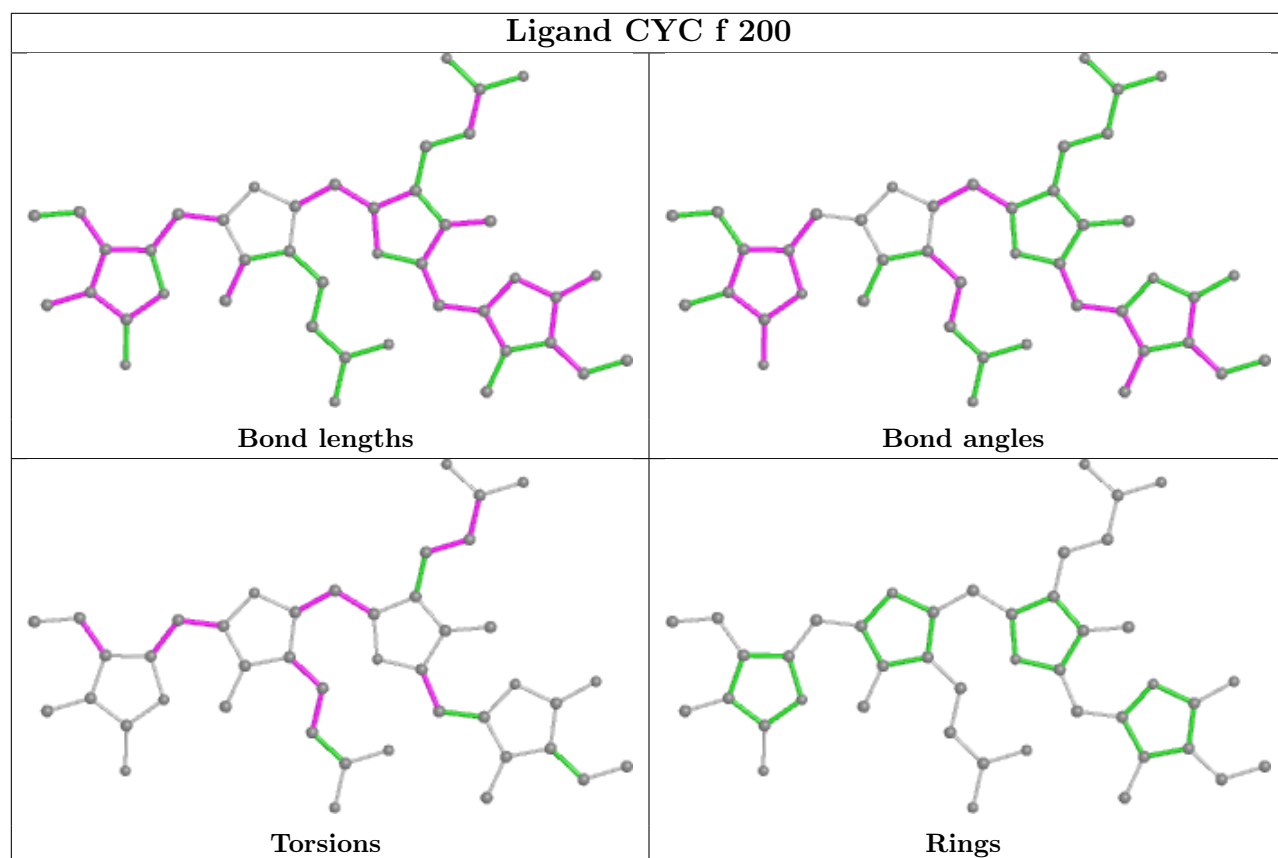
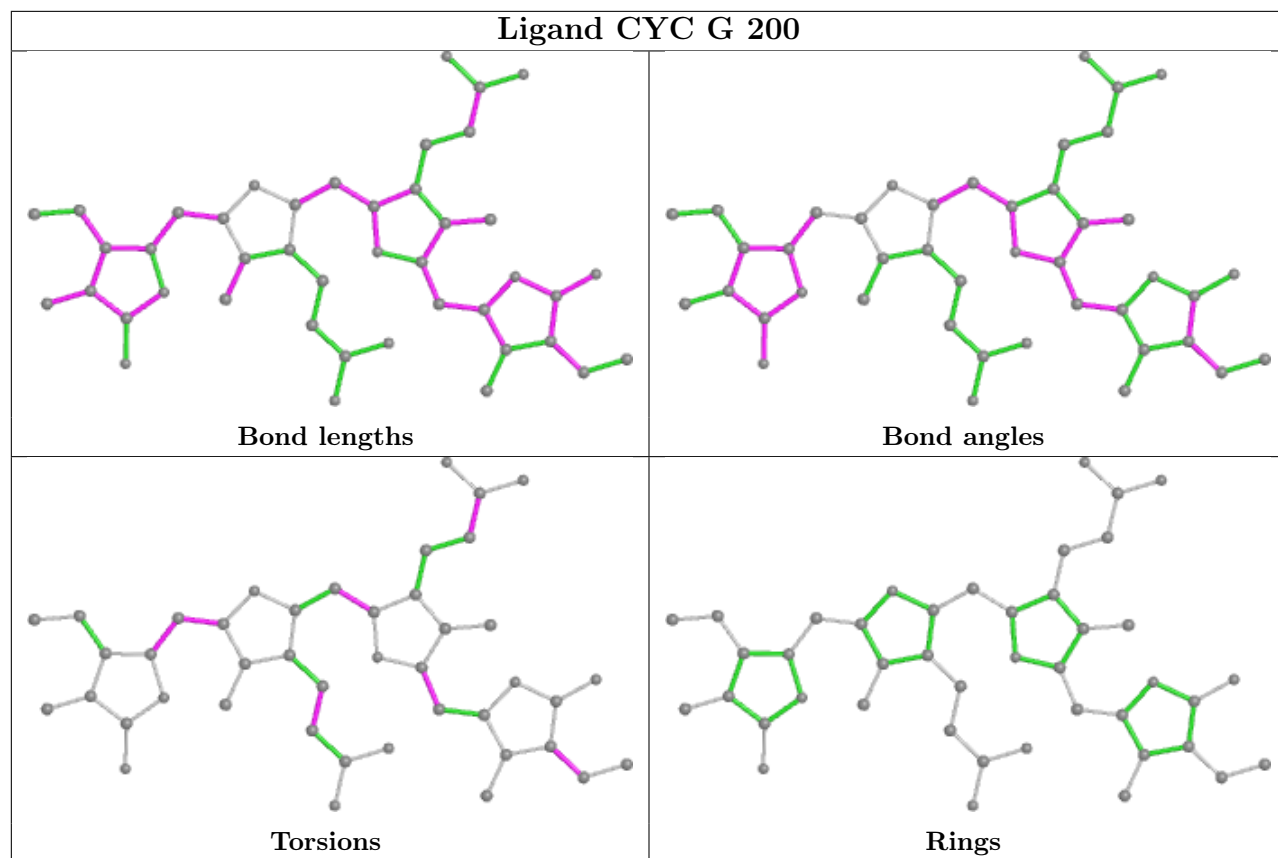


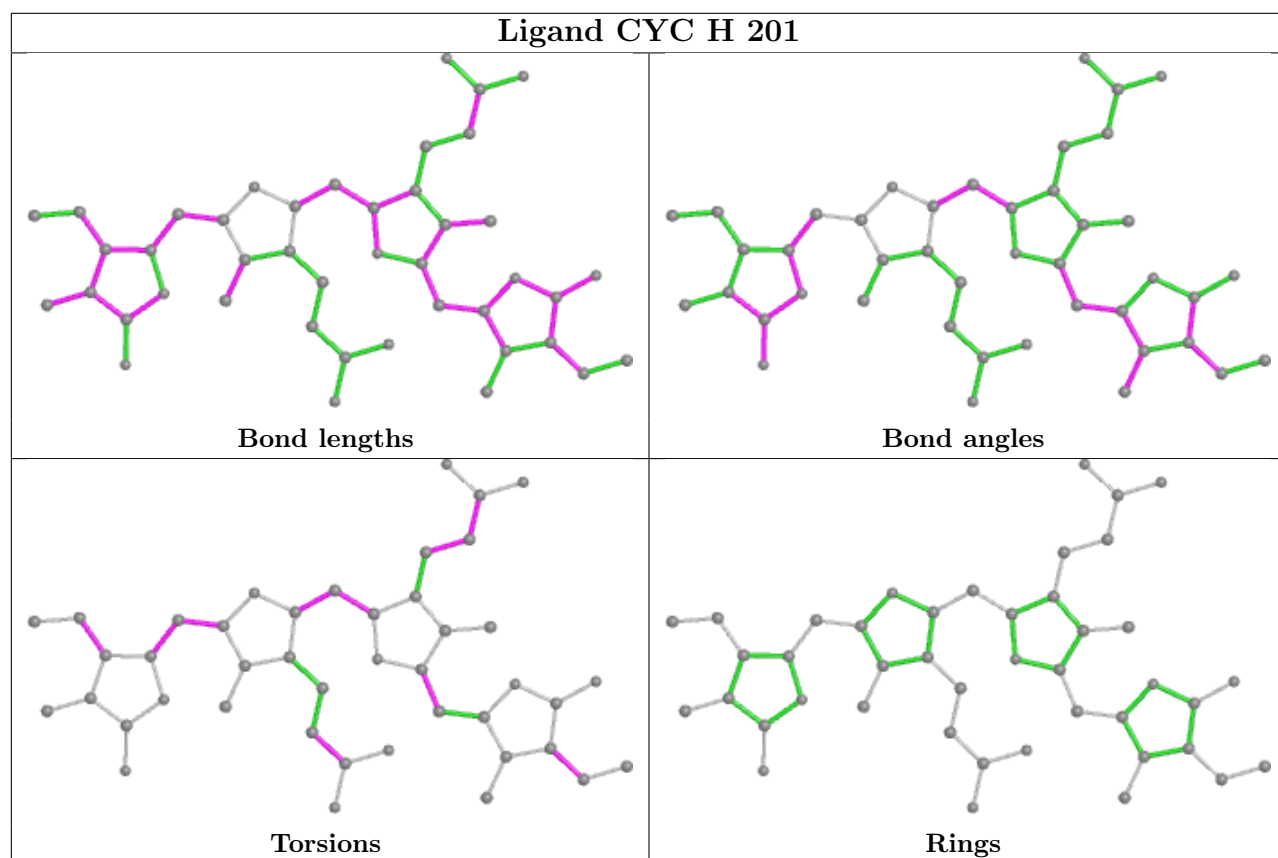
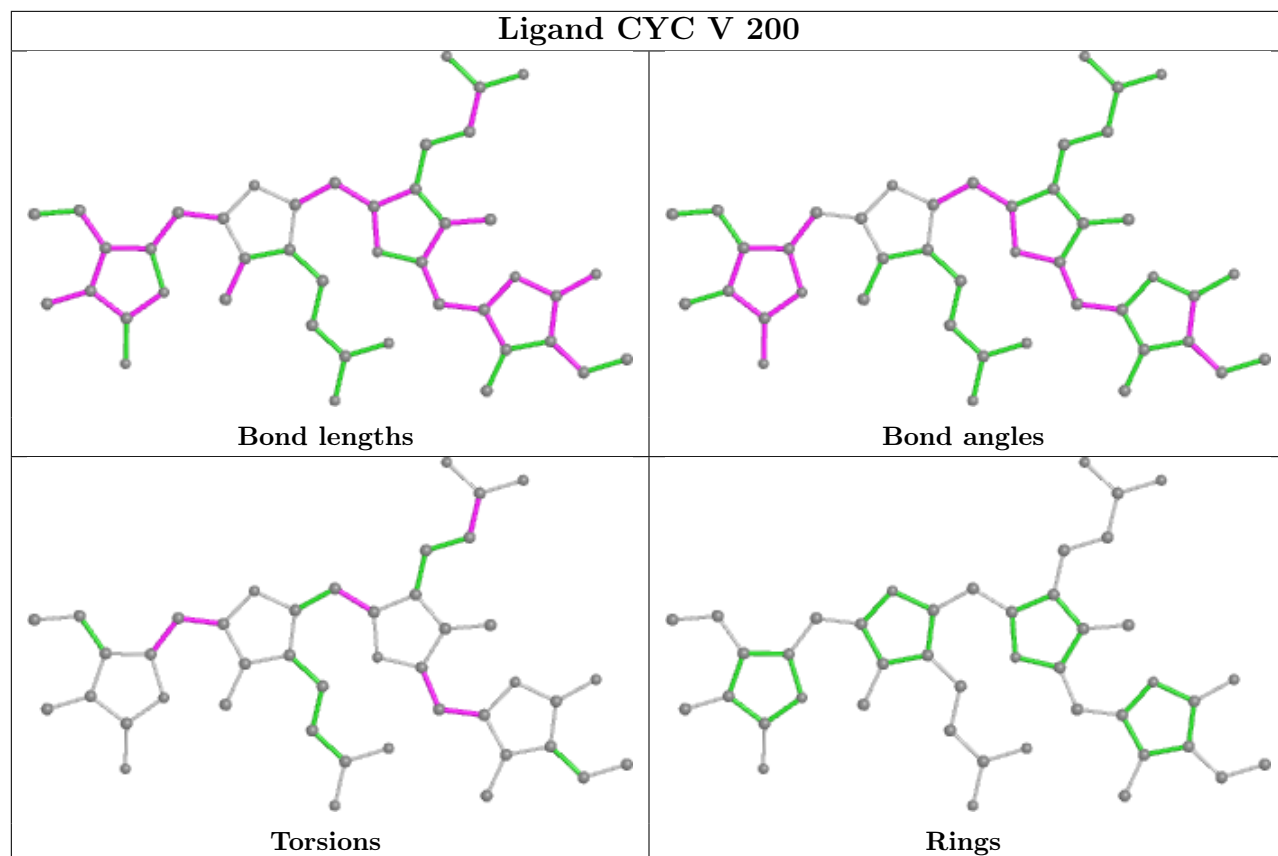


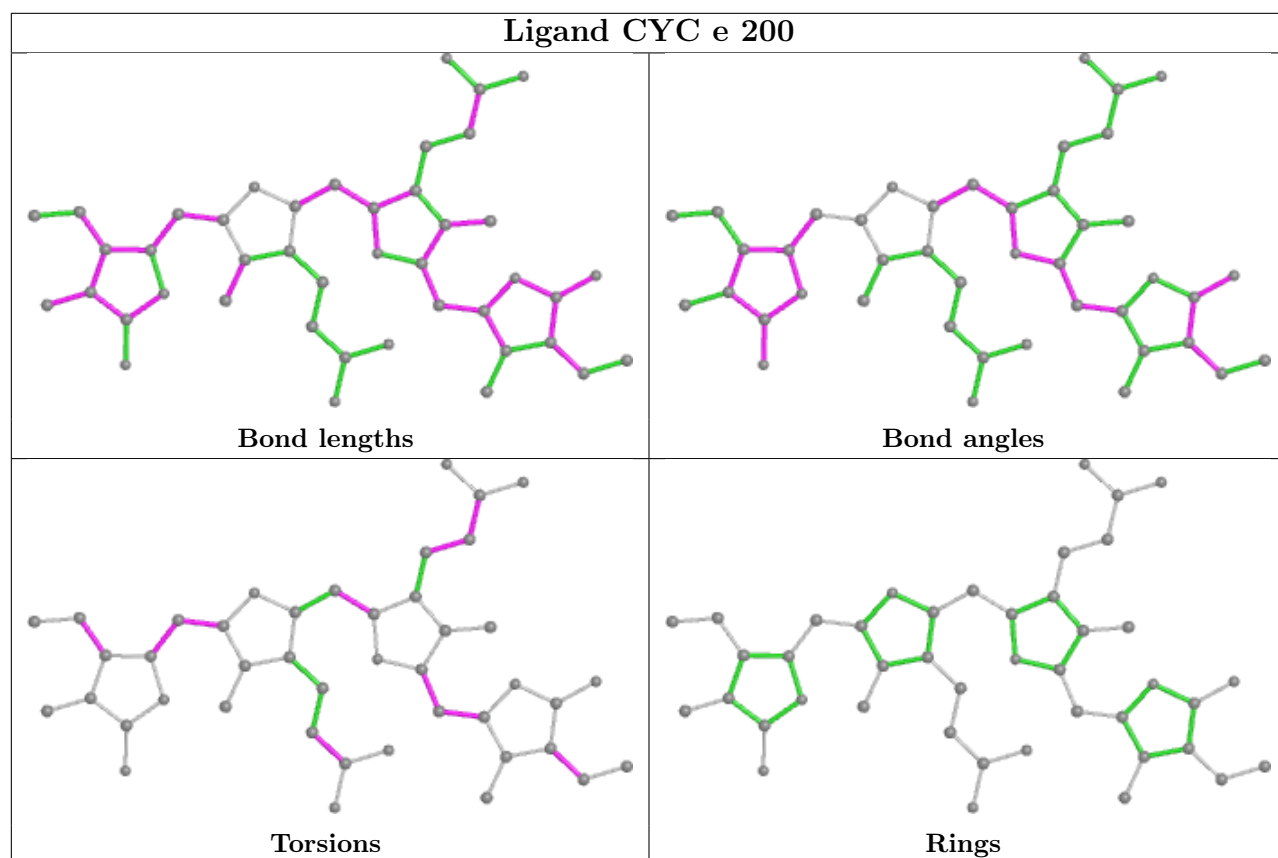
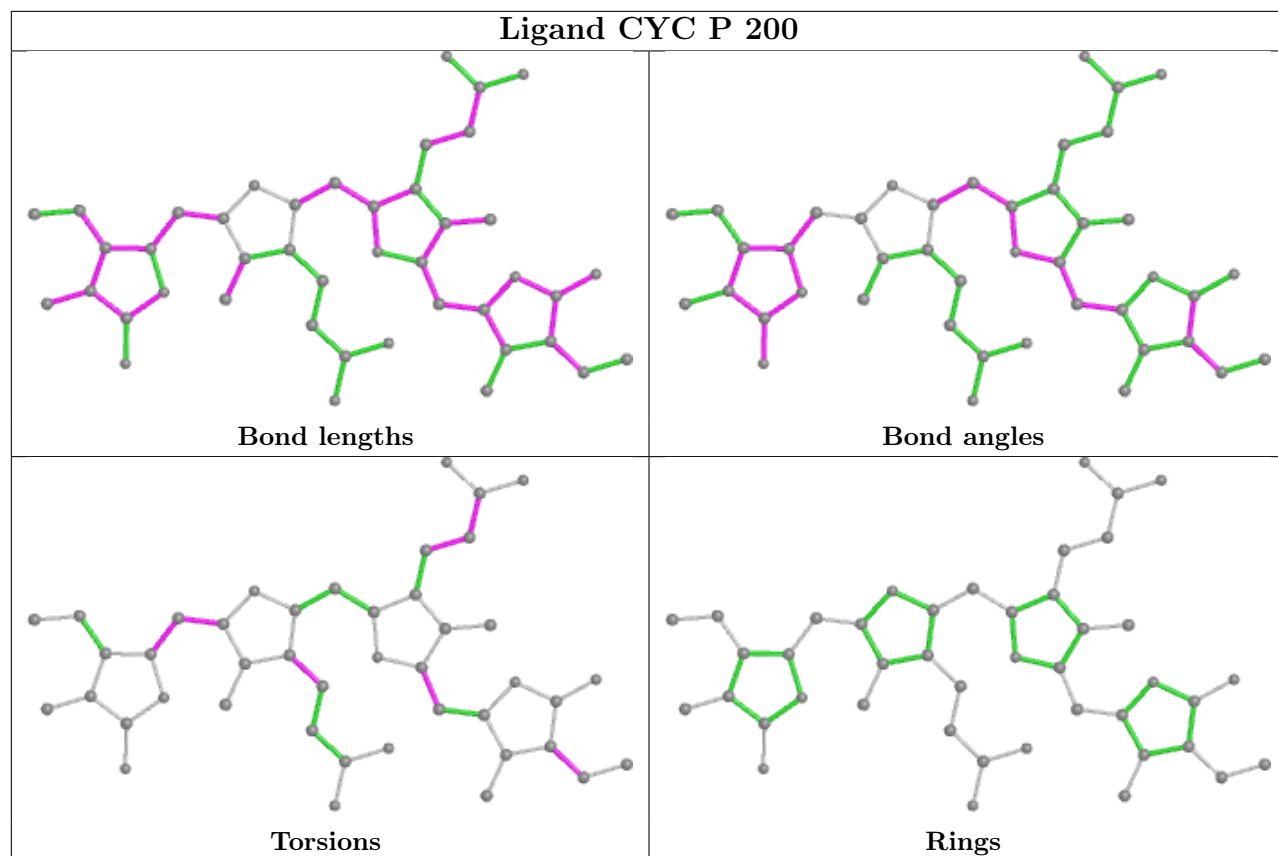


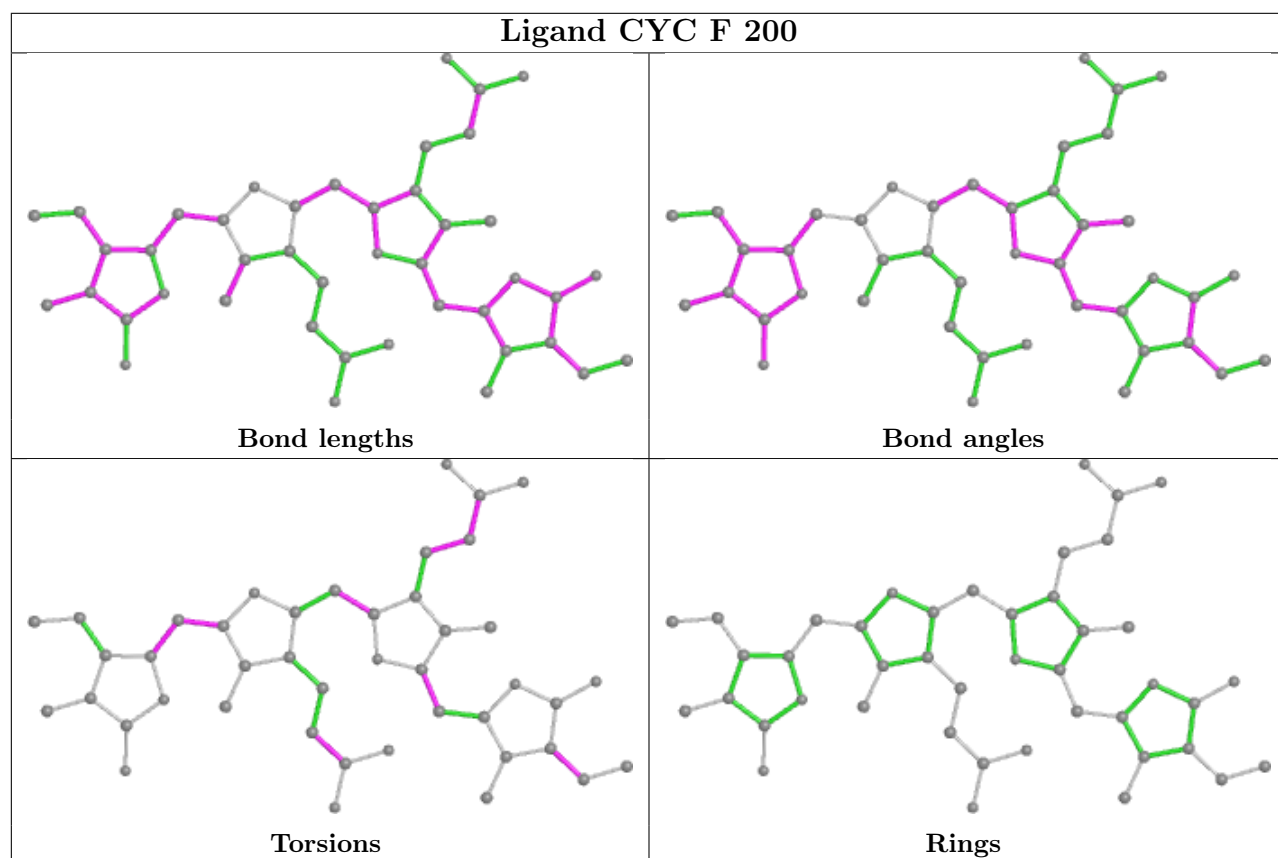
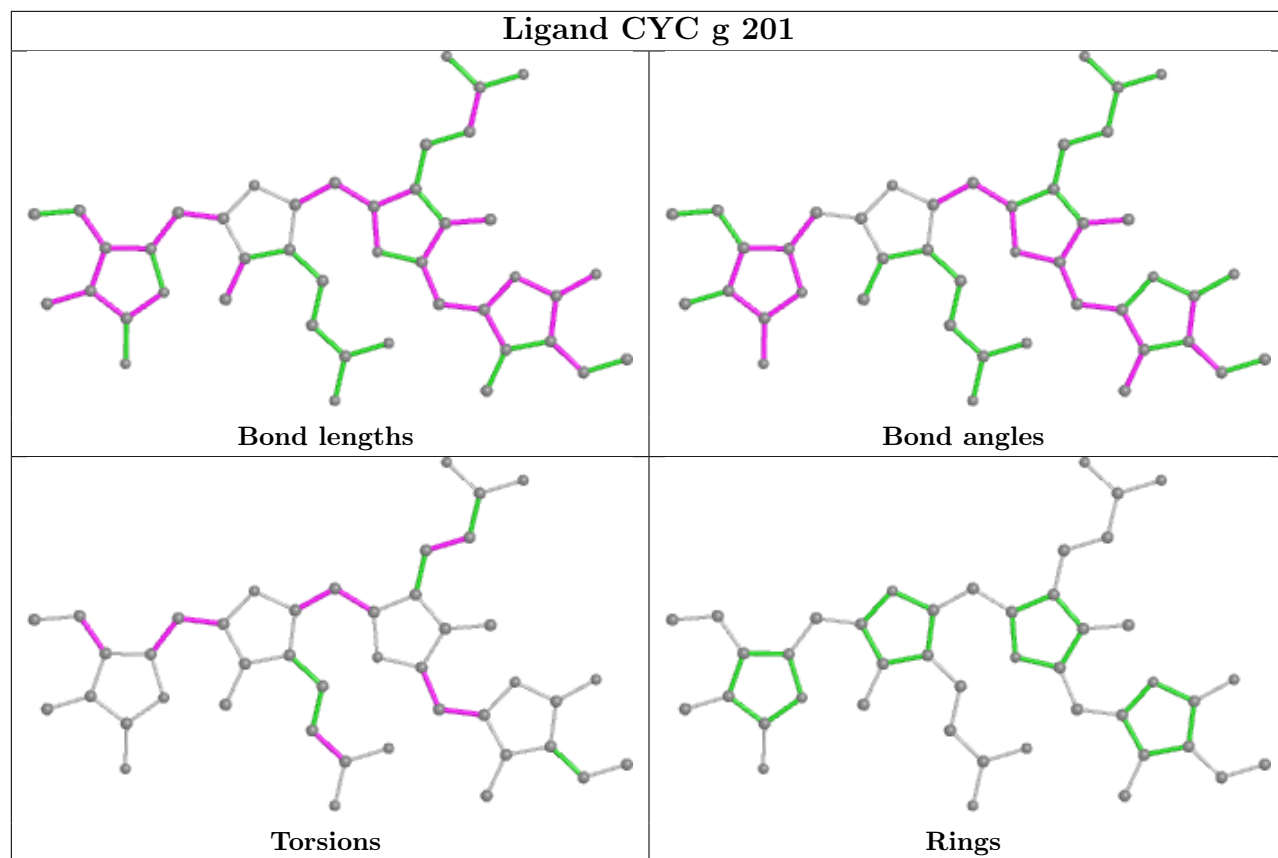


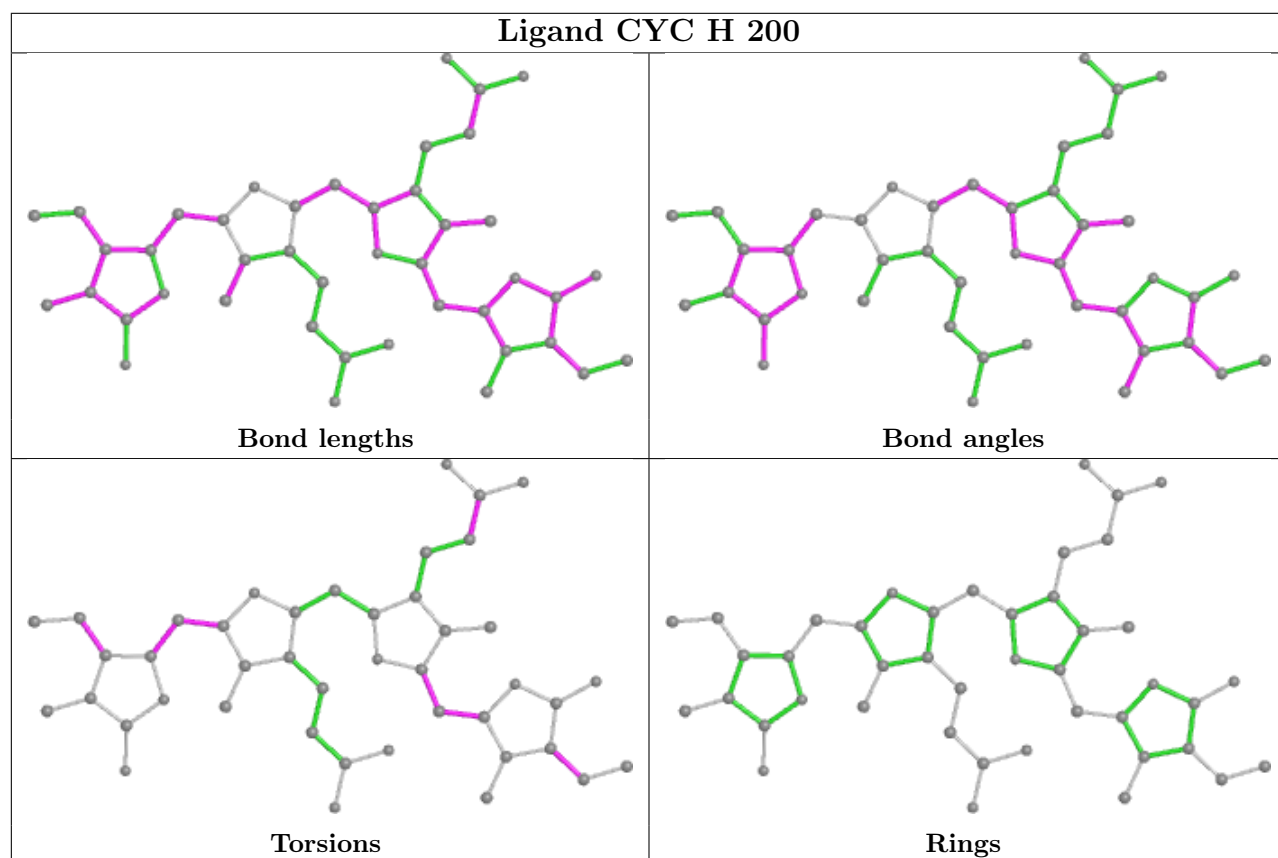
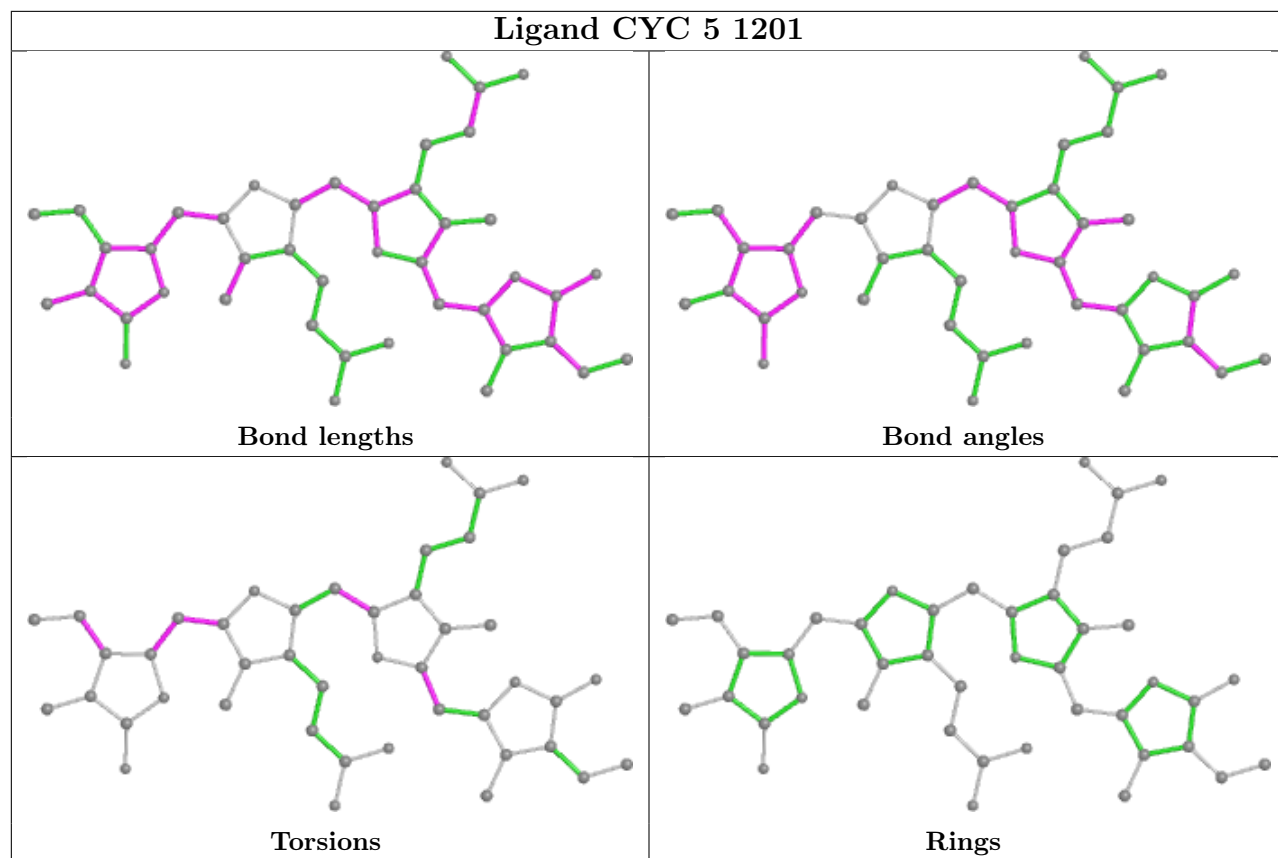


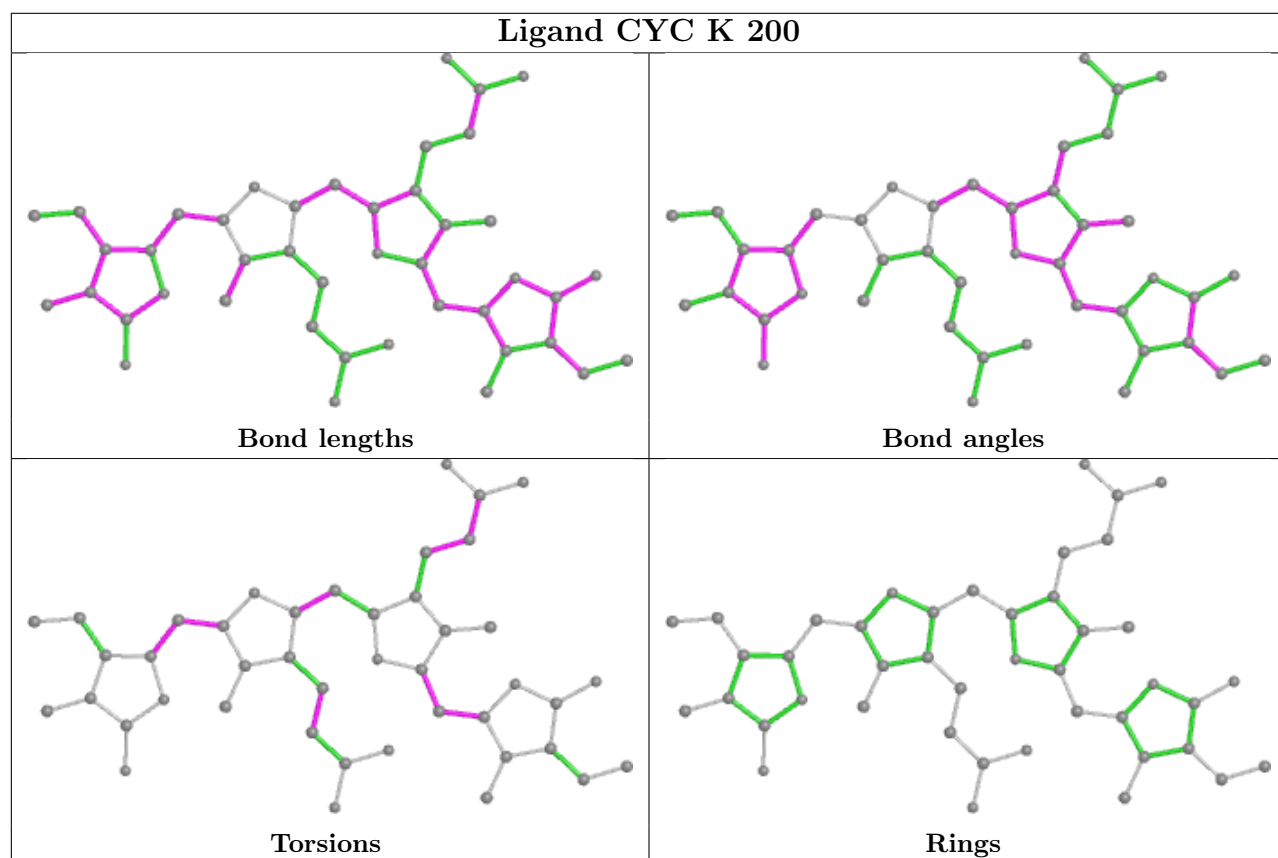
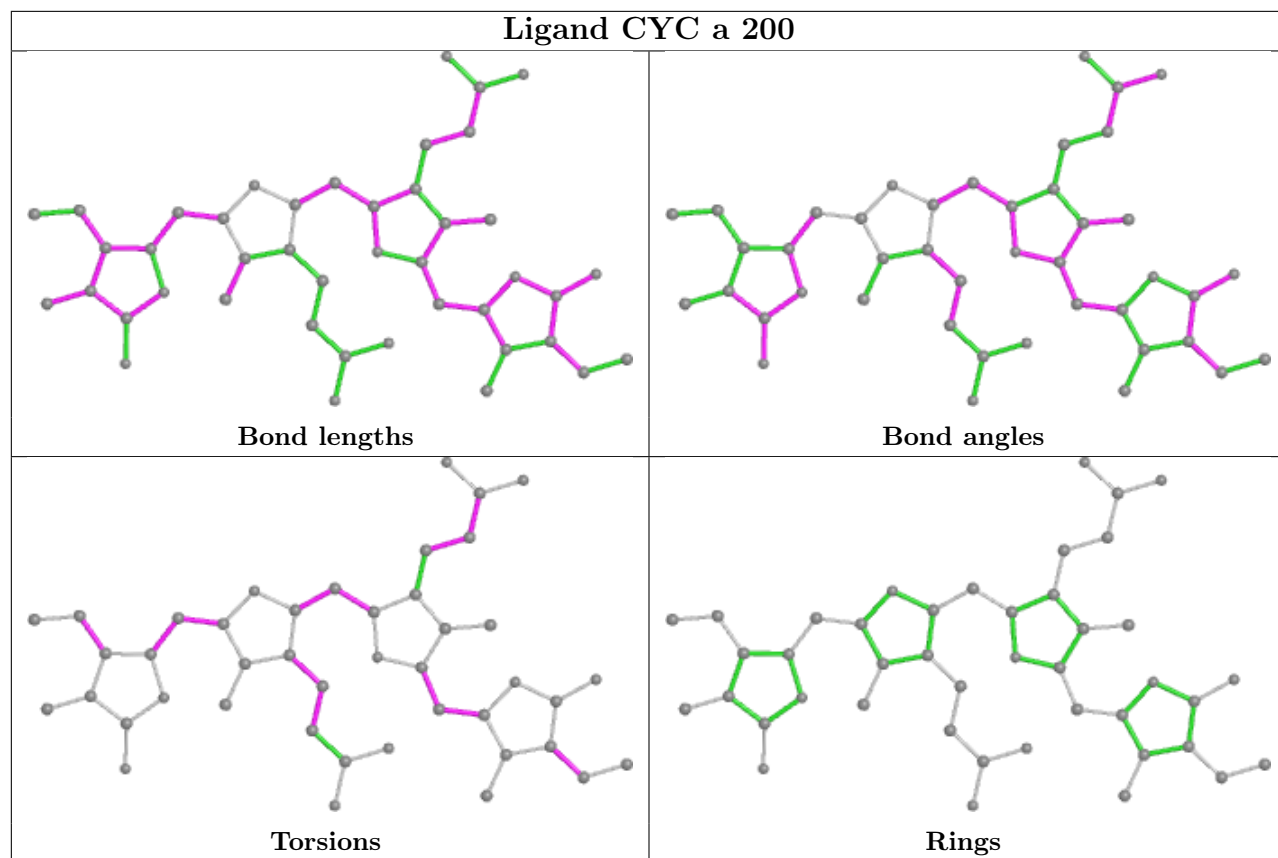


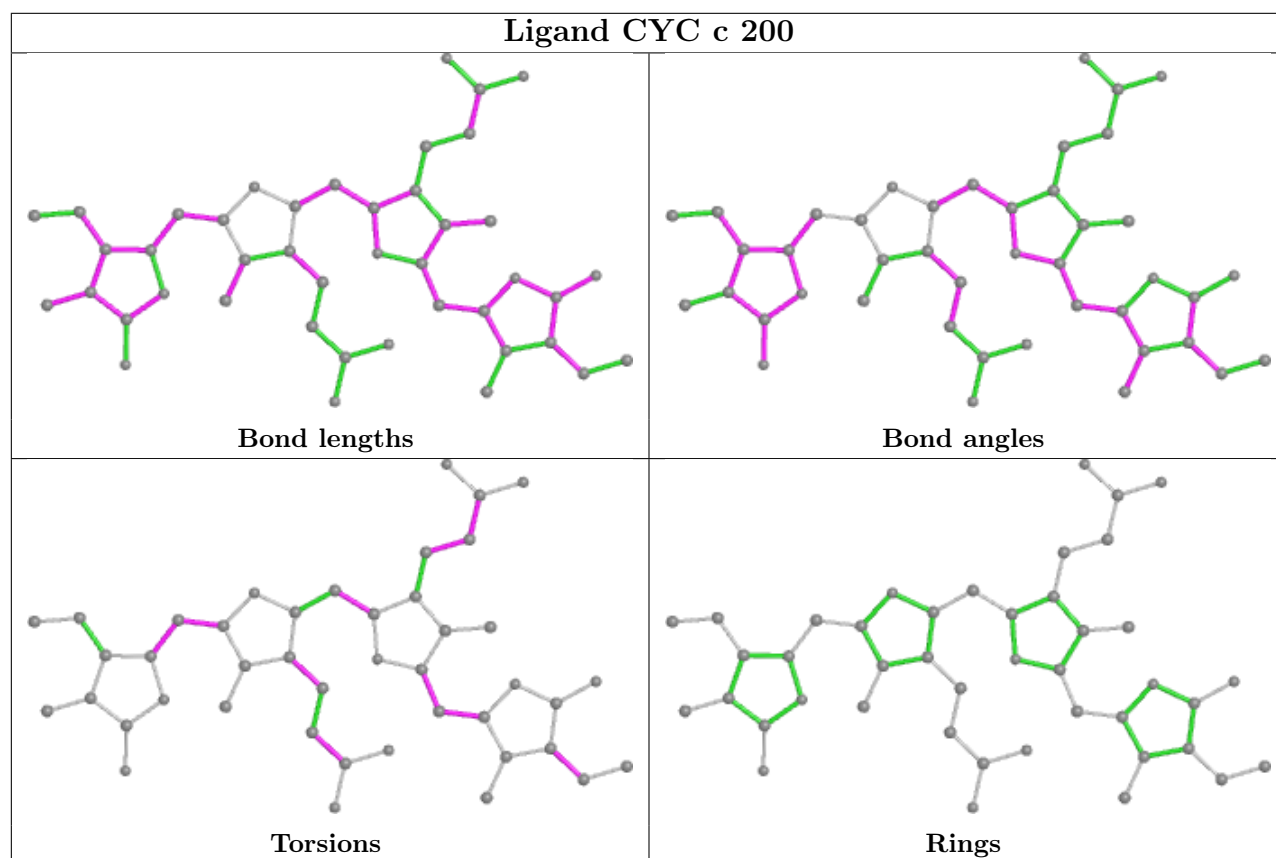
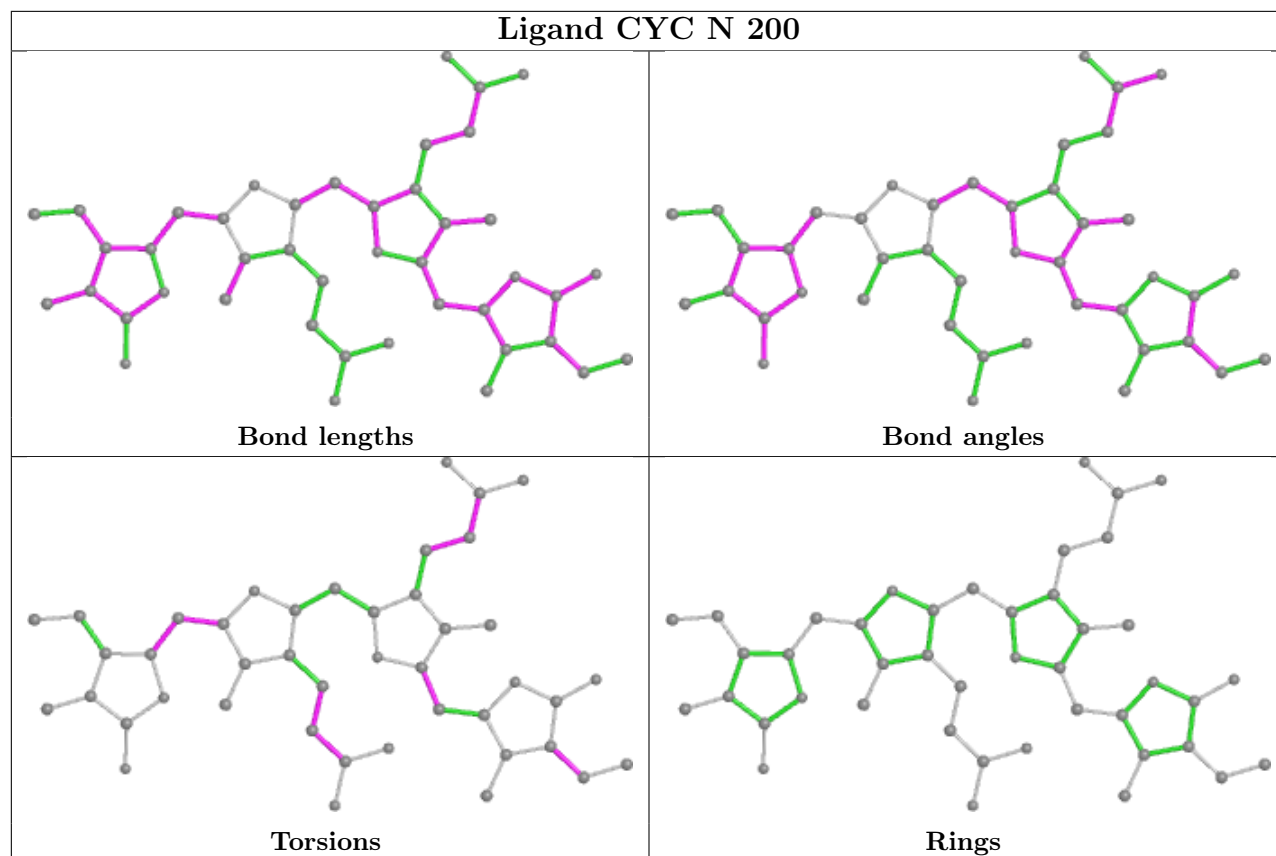


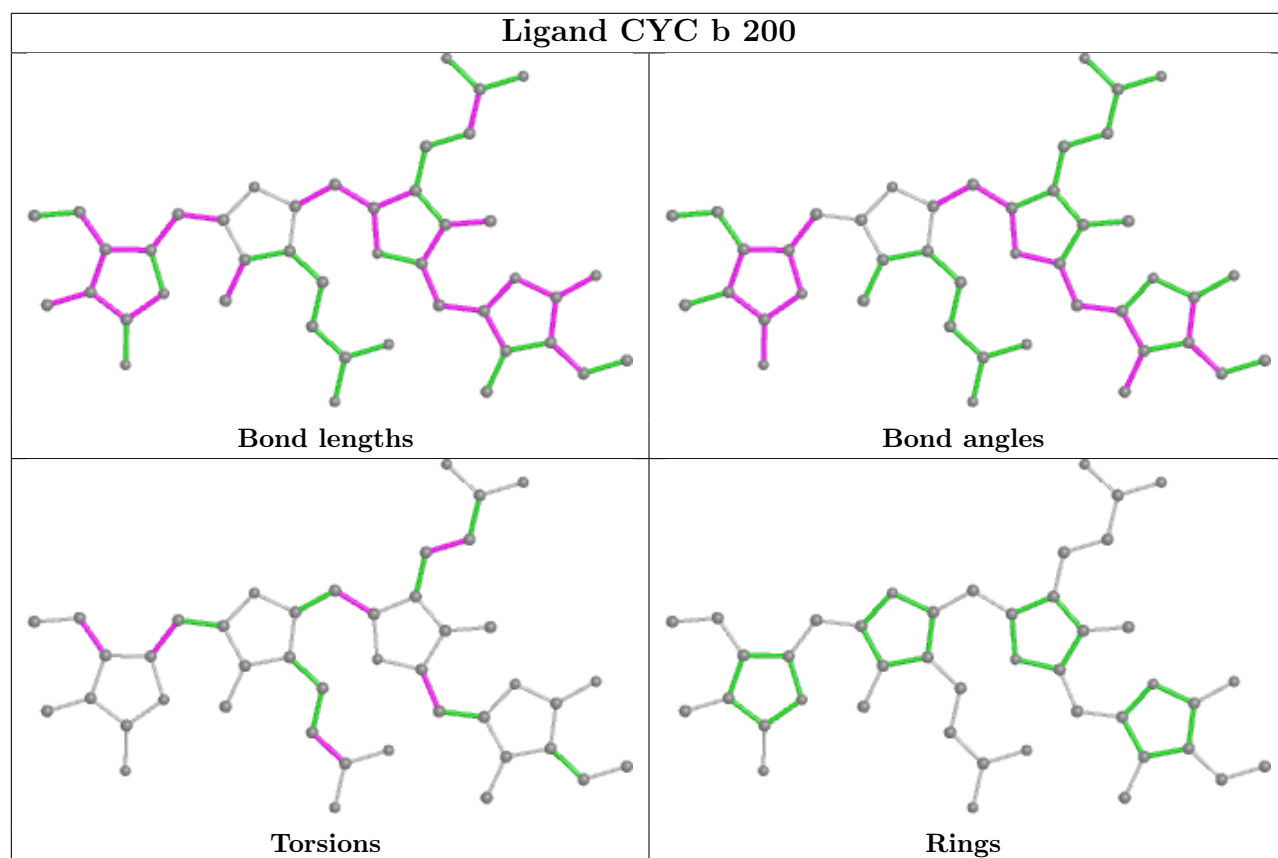
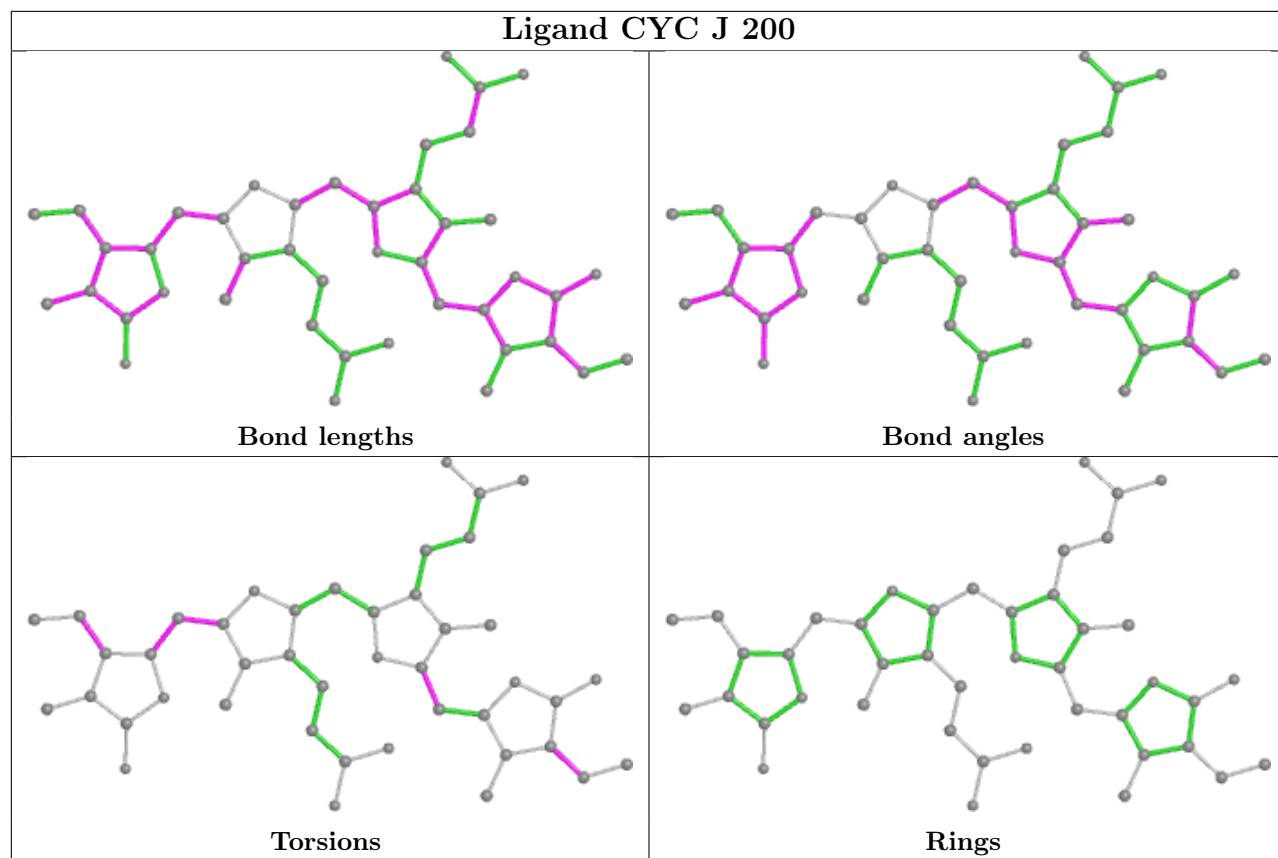


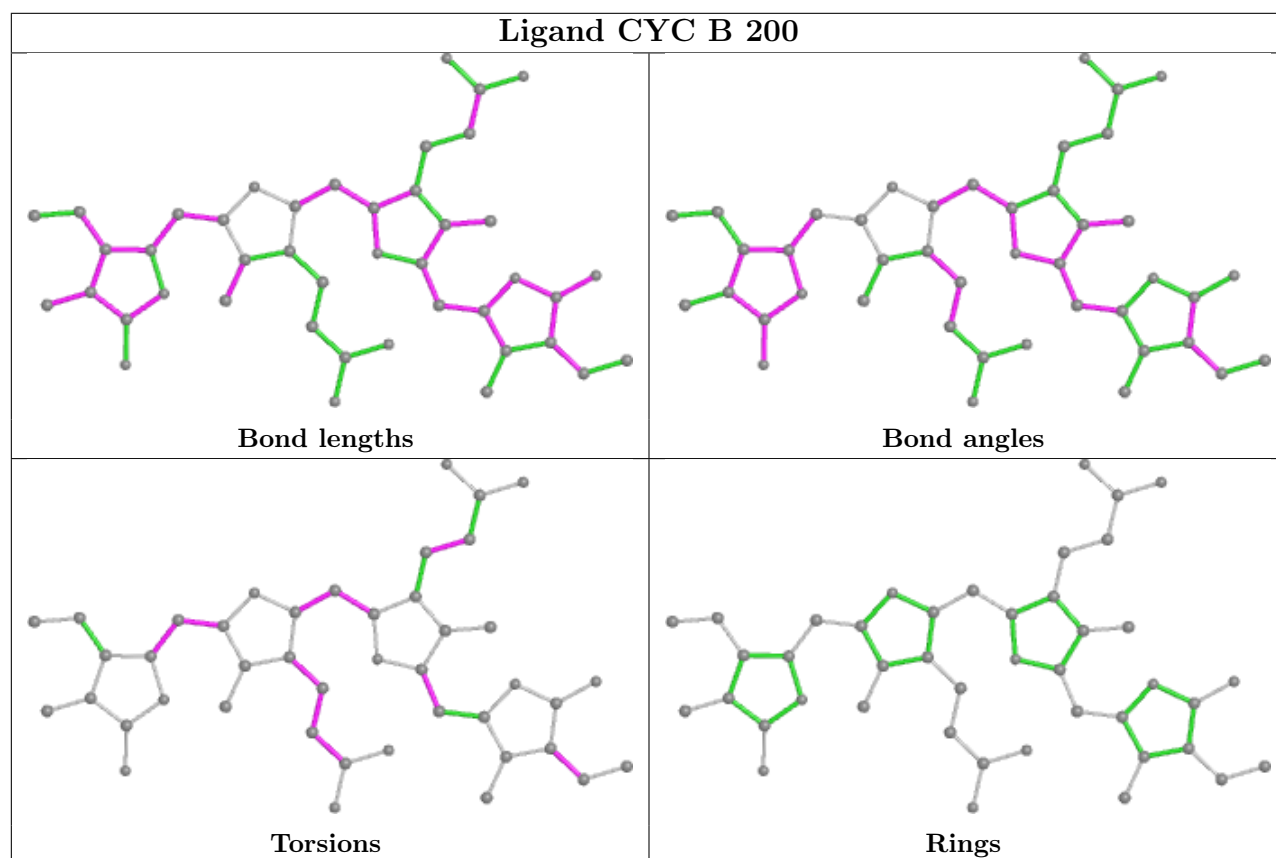
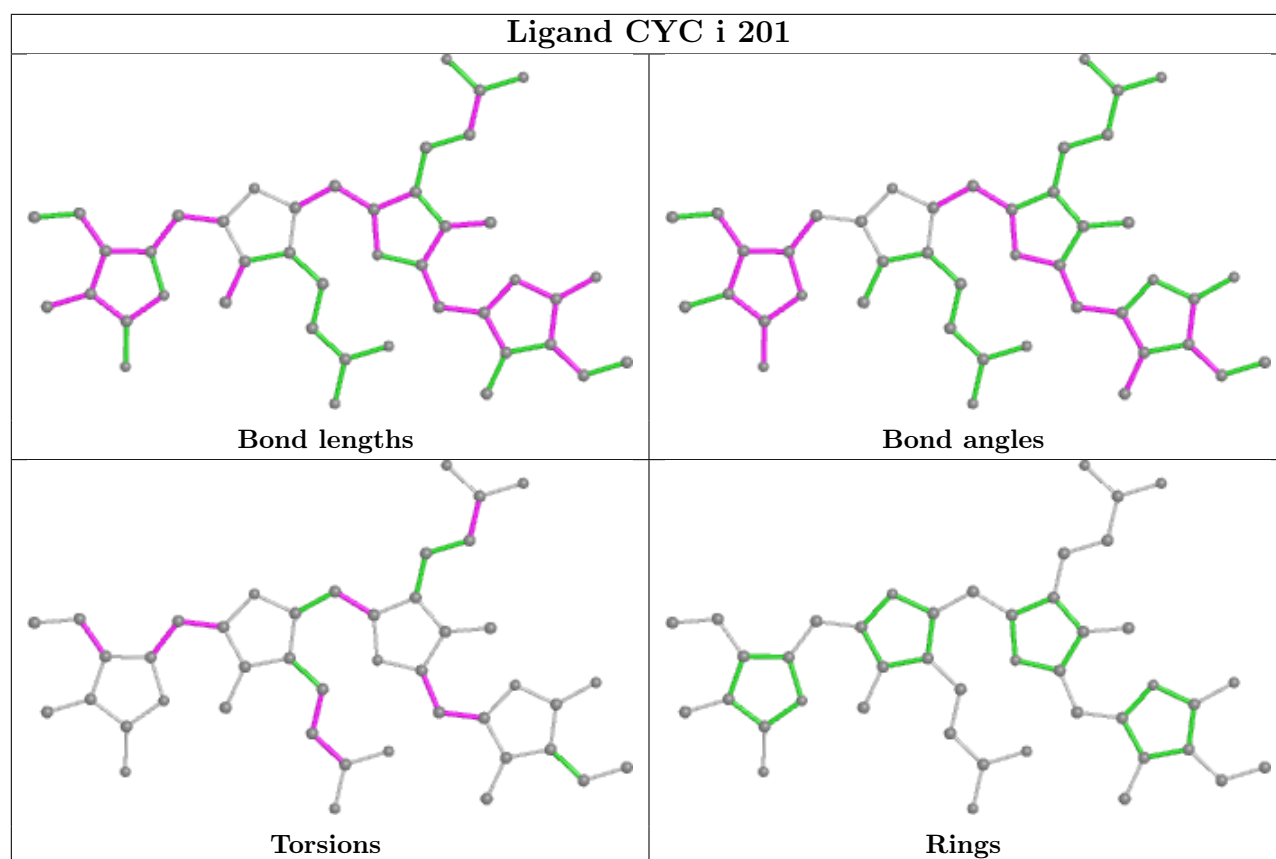


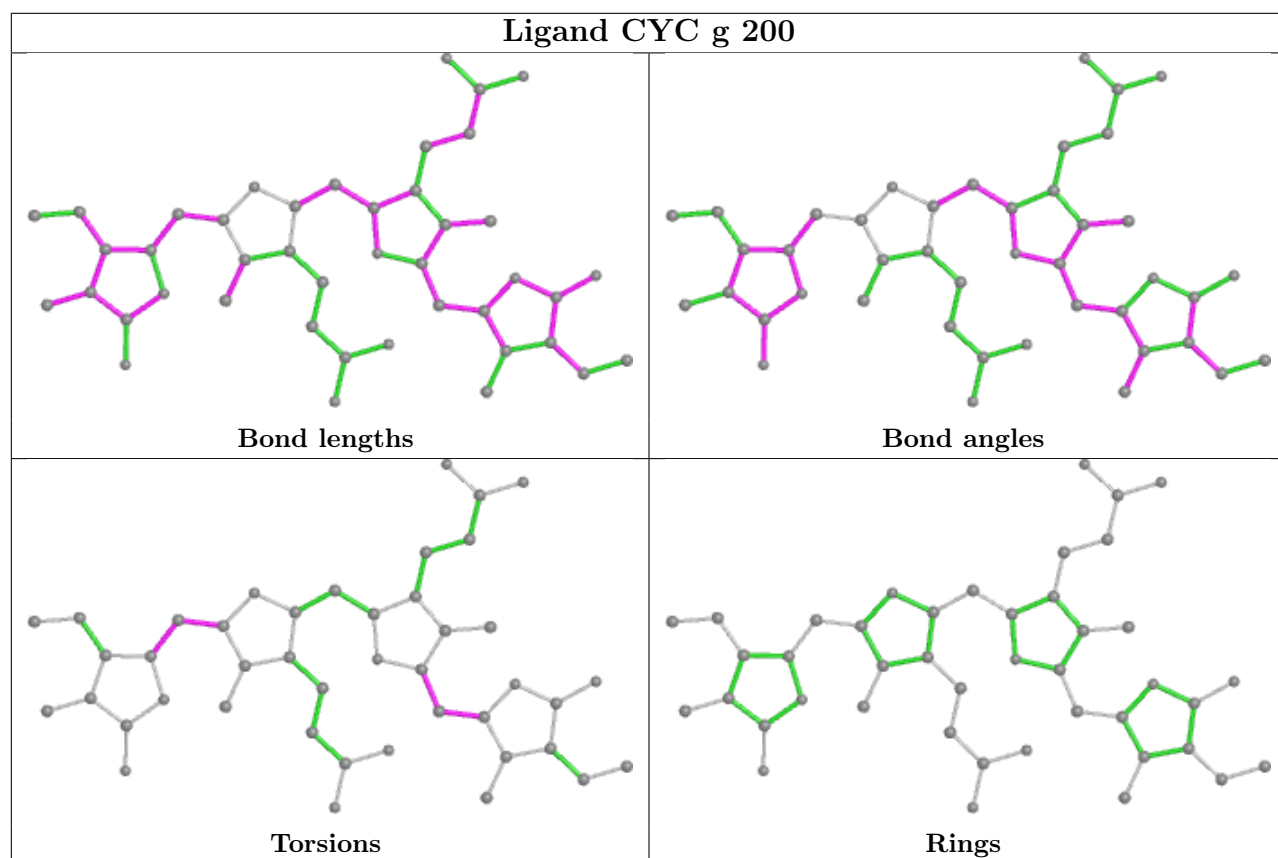
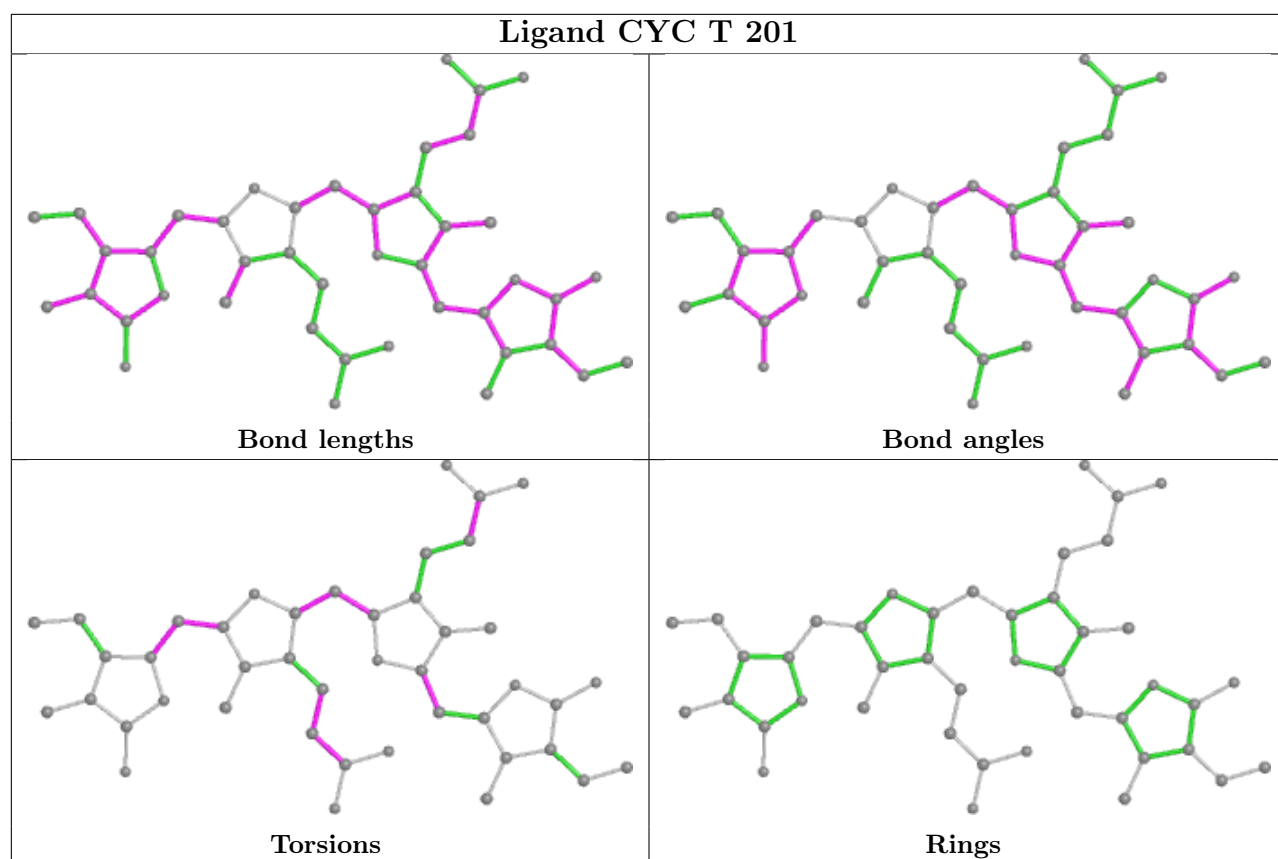












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

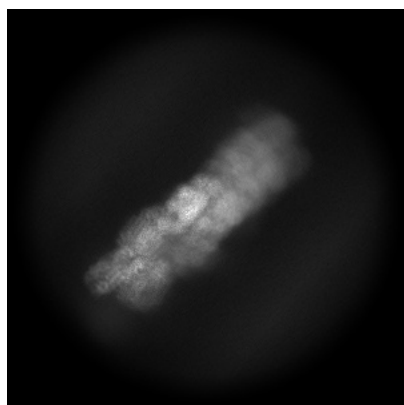
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35570. These allow visual inspection of the internal detail of the map and identification of artifacts.

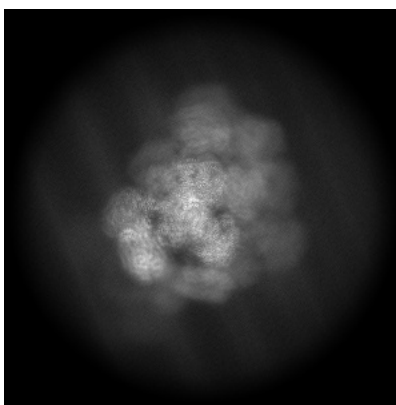
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

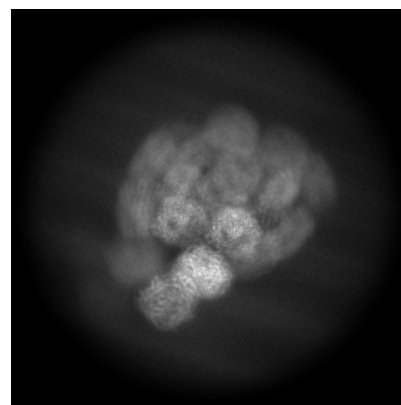
6.1.1 Primary map



X



Y

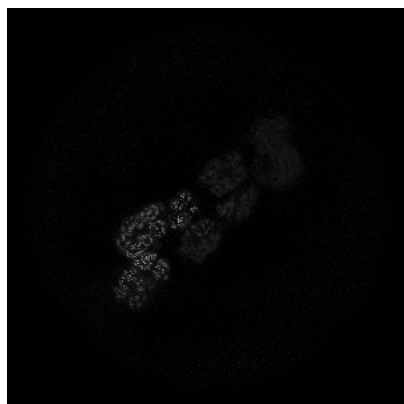


Z

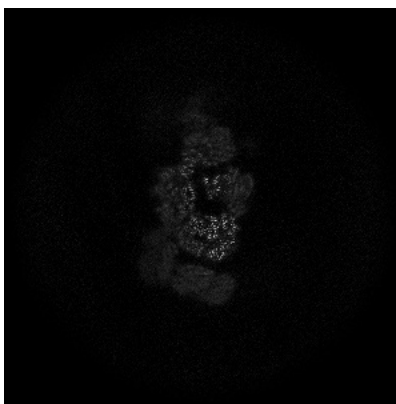
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

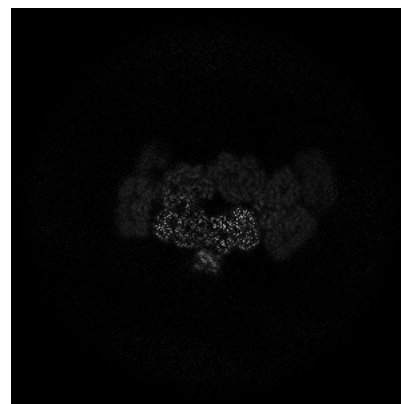
6.2.1 Primary map



X Index: 340



Y Index: 340

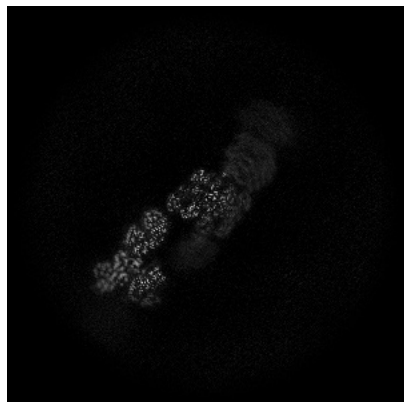


Z Index: 340

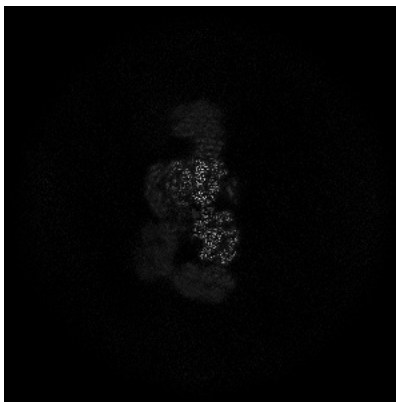
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

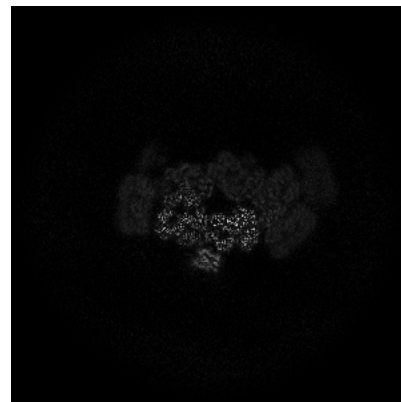
6.3.1 Primary map



X Index: 298



Y Index: 320

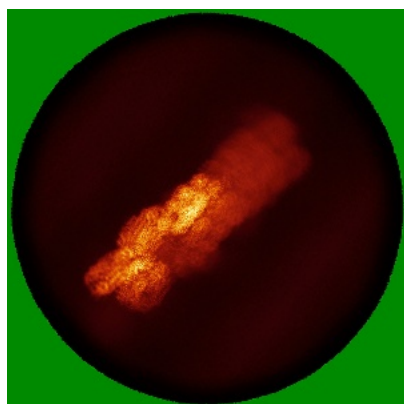


Z Index: 337

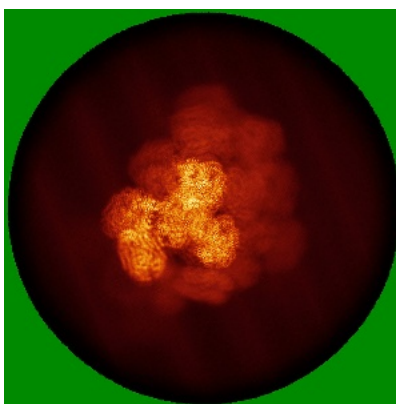
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

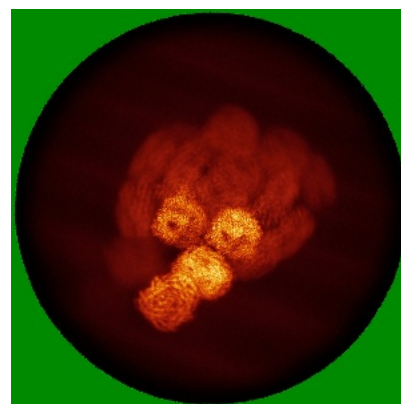
6.4.1 Primary map



X



Y



Z

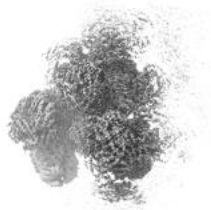
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

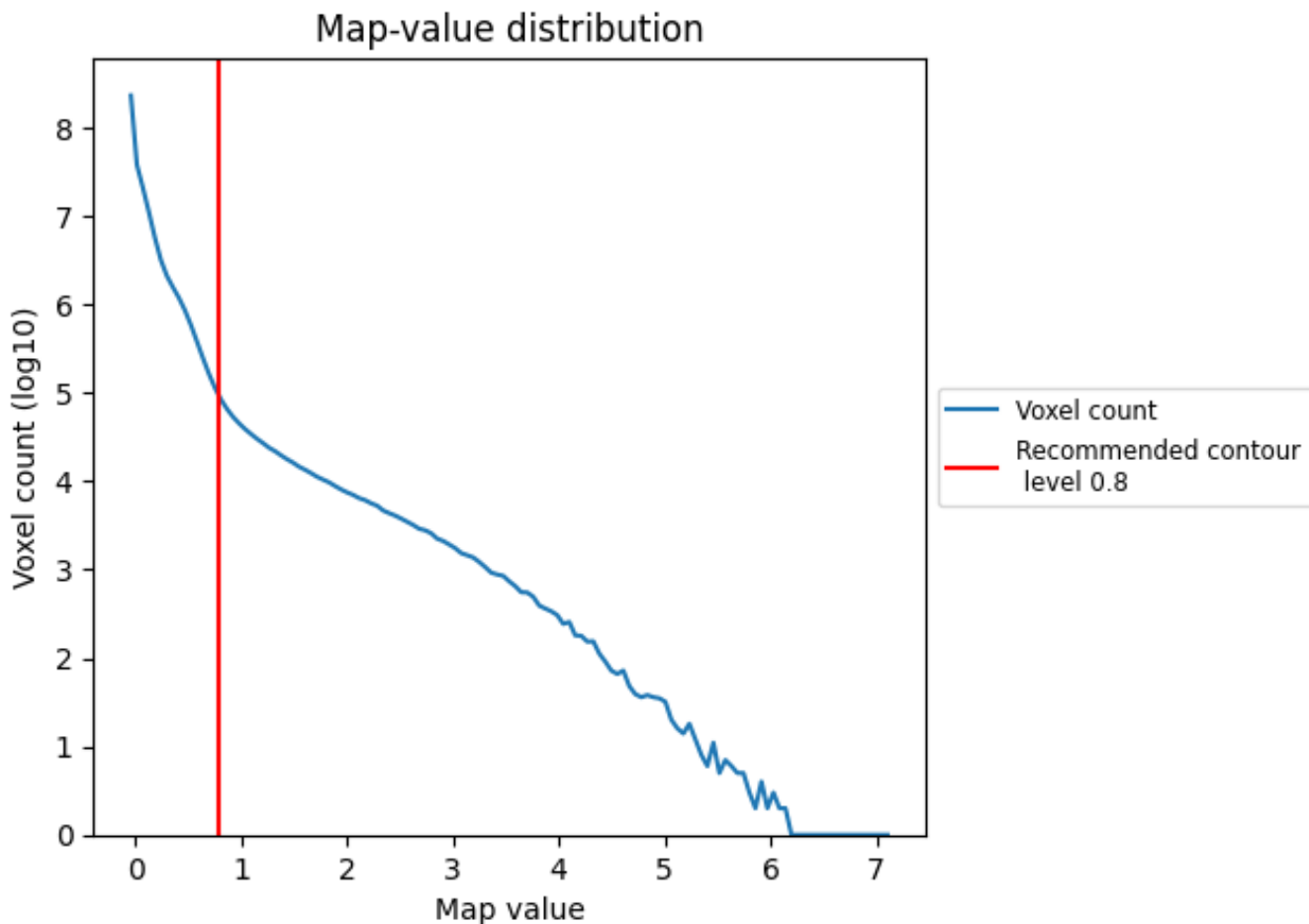
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

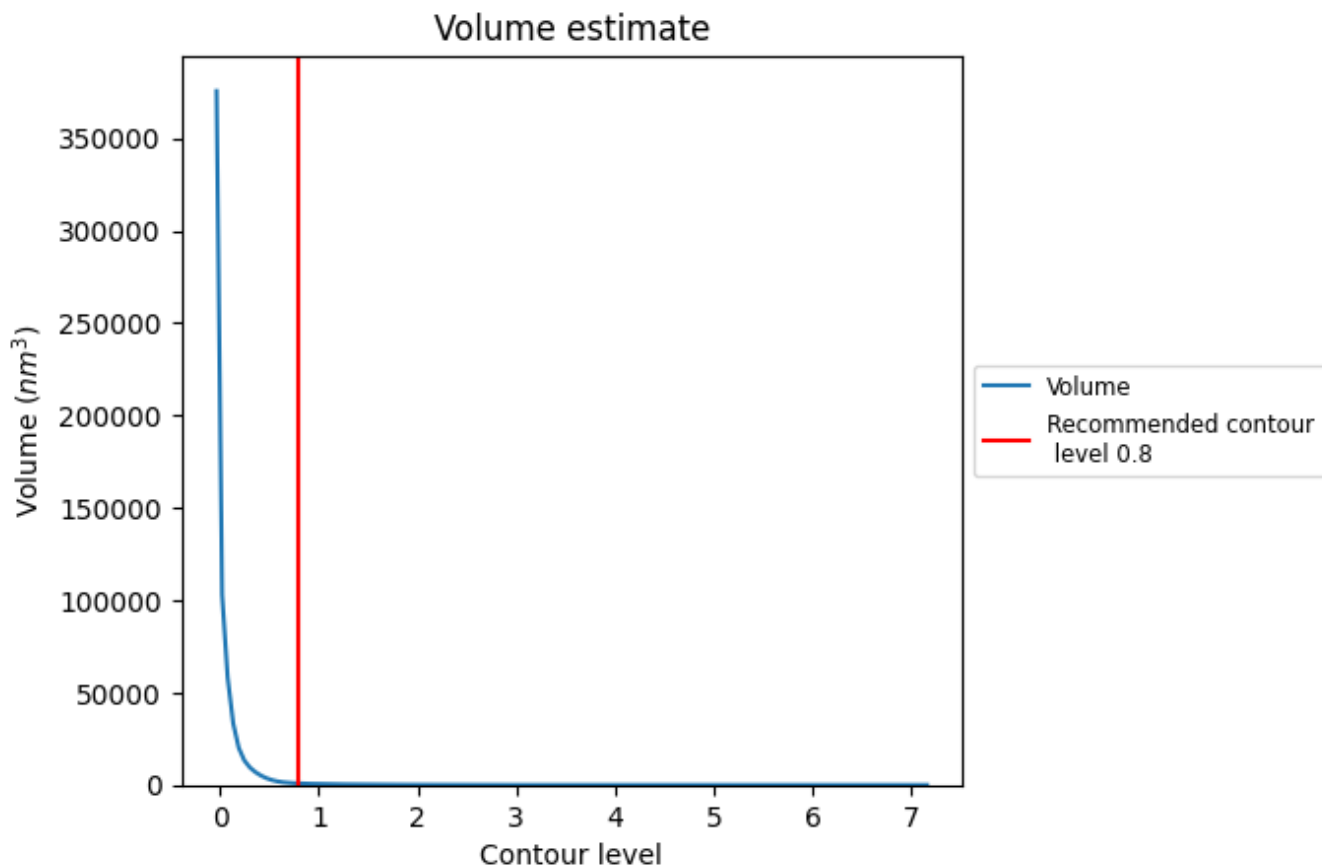
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

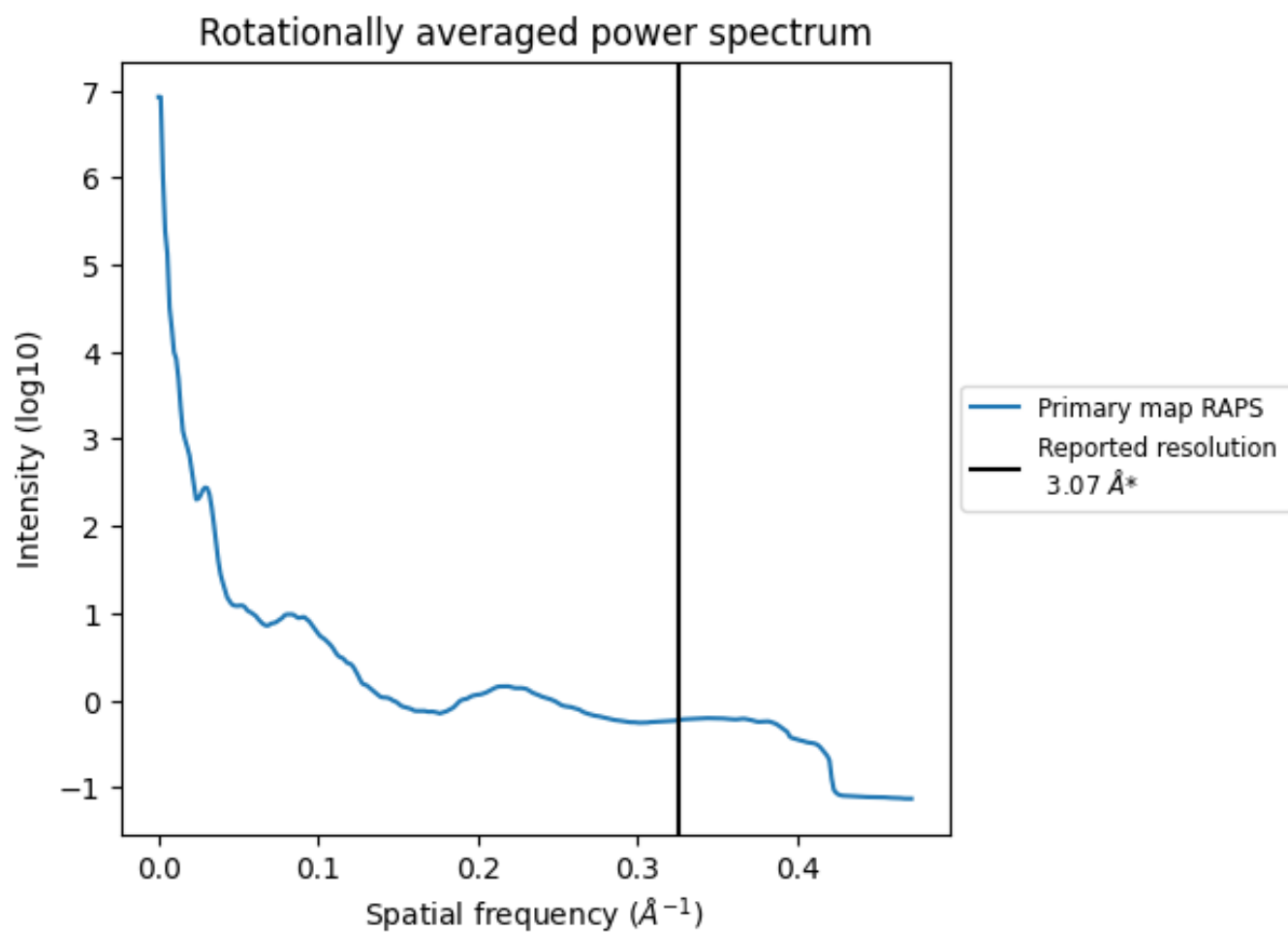
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 815 nm³; this corresponds to an approximate mass of 736 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum i



*Reported resolution corresponds to spatial frequency of 0.326 Å⁻¹

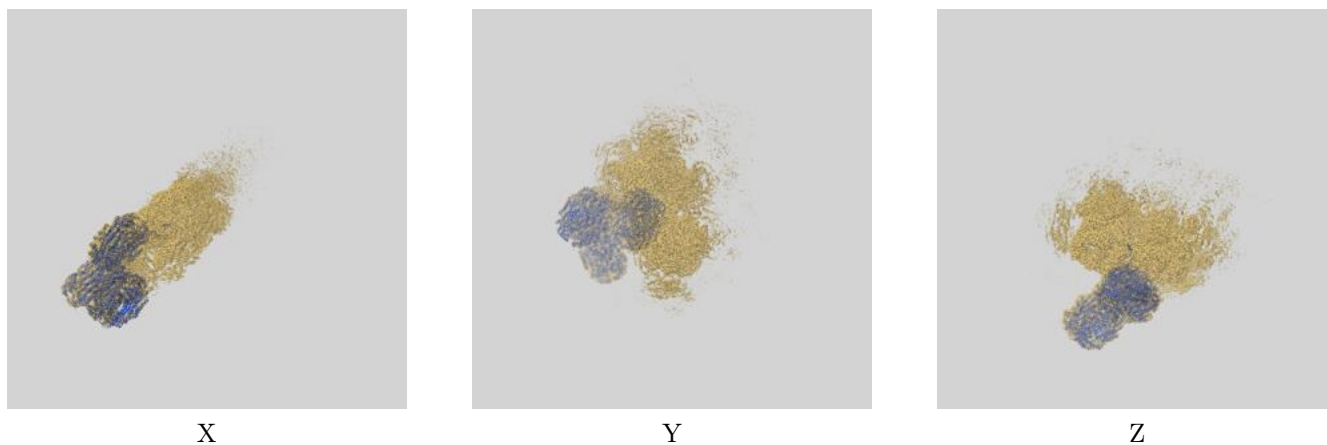
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

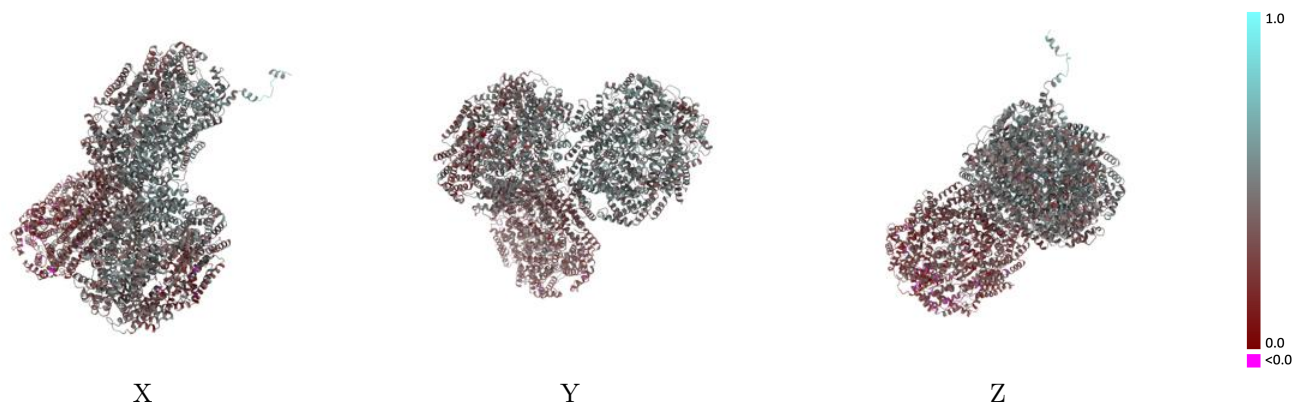
This section contains information regarding the fit between EMDB map EMD-35570 and PDB model 8IMN. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



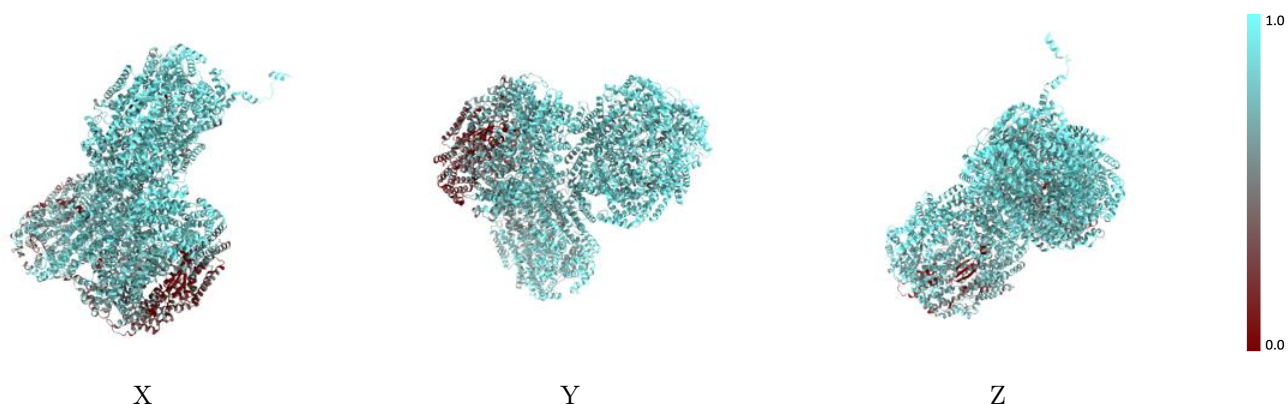
The images above show the 3D surface view of the map at the recommended contour level 0.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



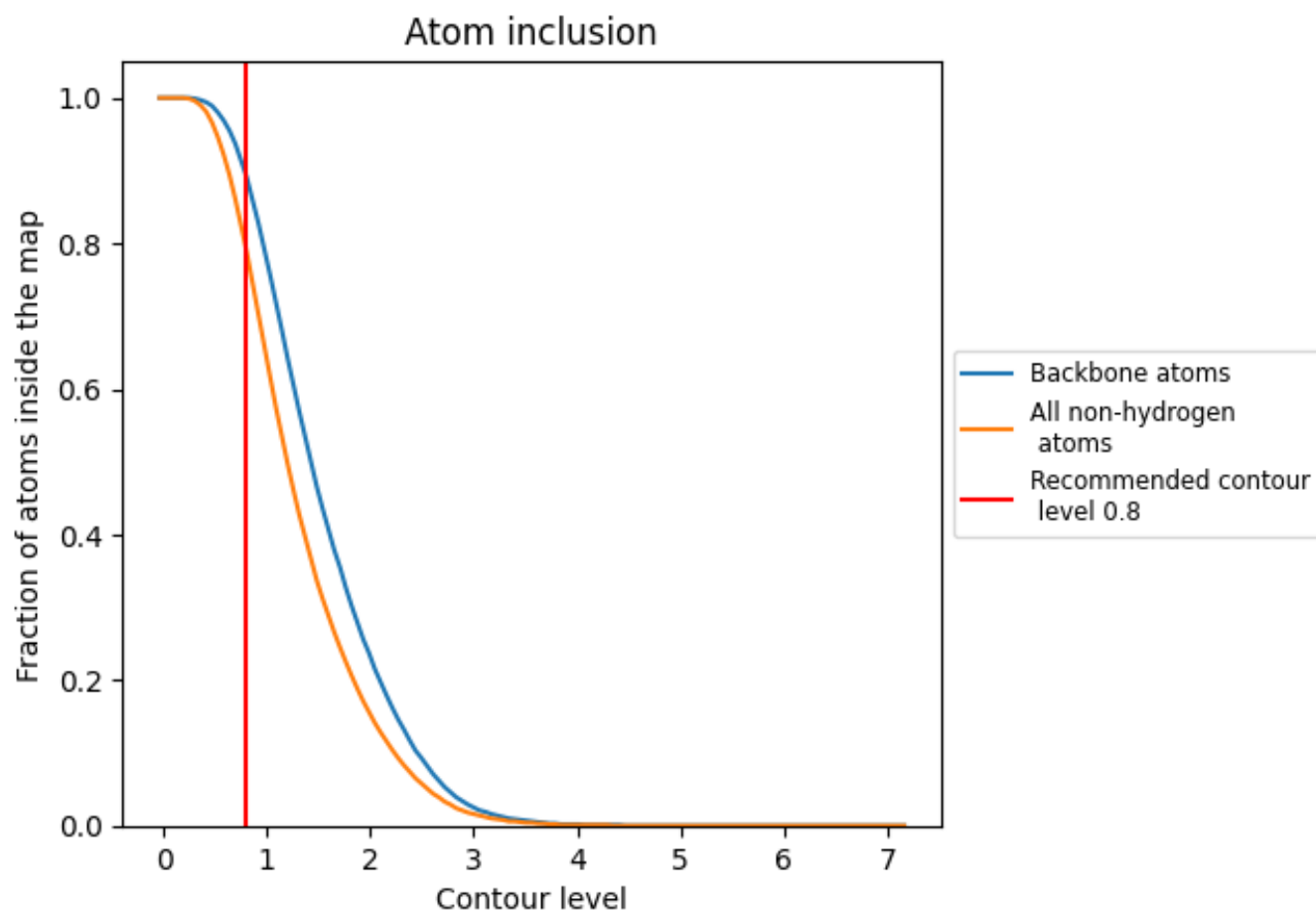
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.8).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 79% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary













The table lists the average atom inclusion at the recommended contour level (0.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7910	 0.3970
5	 0.8500	 0.4540
A	 0.9390	 0.4340
B	 0.9400	 0.4870
C	 0.8590	 0.4420
D	 0.9220	 0.5150
E	 0.9220	 0.4720
F	 0.9100	 0.5040
G	 0.9210	 0.4320
H	 0.8160	 0.4020
I	 0.8720	 0.4500
J	 0.9170	 0.5150
K	 0.9180	 0.5200
L	 0.8680	 0.5080
M	 0.5730	 0.3850
N	 0.7860	 0.4440
O	 0.7730	 0.4600
P	 0.2910	 0.3400
Q	 0.7440	 0.4660
R	 0.6520	 0.4330
S	 0.9270	 0.5170
T	 0.7730	 0.4070
U	 0.4110	 0.3550
V	 0.4600	 0.3910
W	 0.9250	 0.5130
X	 0.7780	 0.4660
Y	 0.8300	 0.4950
Z	 0.0700	 0.3000
a	 0.8620	 0.2810
b	 0.8270	 0.2670
c	 0.6320	 0.2060
d	 0.8700	 0.2620
e	 0.8890	 0.2670
f	 0.9300	 0.3340
g	 0.8680	 0.2740



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Chain	Atom inclusion	Q-score
h	 0.6360	 0.2190
i	 0.6710	 0.2130
j	 0.7710	 0.2990
k	 0.8330	 0.2670
l	 0.8970	 0.3290
m	 0.2480	 0.1930