



wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 02:03 AM EST

PDB ID : 7M20
EMDB ID : EMD-23627
Title : 18-mer HeLa-tubulin rings in complex with Cryptophycin 1
Authors : Eren, E.
Deposited on : 2021-03-15
Resolution : 3.84 Å (reported)
Based on initial model : 6S8L

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.dev43
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 : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

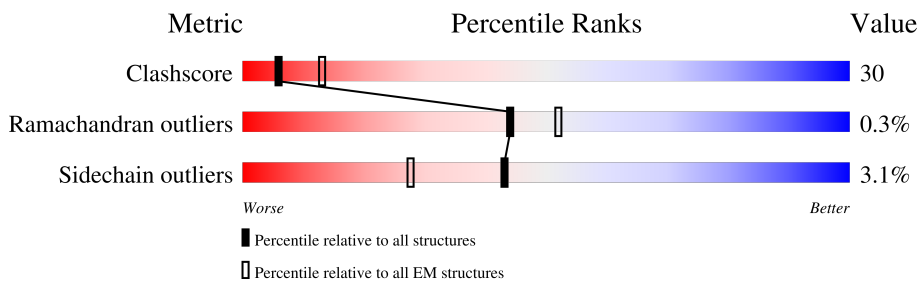
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.84 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.




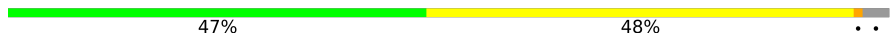


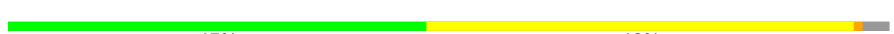

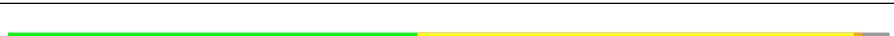
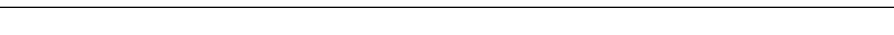
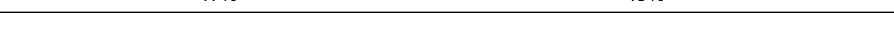
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	B	450	
1	D	450	
1	F	450	
1	H	450	
1	J	450	
1	L	450	
1	N	450	
1	P	450	
1	R	450	

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Mol	Chain	Length	Quality of chain	
2	A	451		..
2	C	451		..
2	E	451		..
2	G	451		..
2	I	451		..
2	K	451		..
2	M	451		..
2	O	451		..
2	Q	451		..

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
3	GDP	B	1101	-	-	X	-
3	GDP	D	1101	-	-	X	-
3	GDP	F	1101	-	-	X	-
3	GDP	H	1101	-	-	X	-
3	GDP	J	1101	-	-	X	-
3	GDP	L	1101	-	-	X	-
3	GDP	N	1101	-	-	X	-
3	GDP	P	1101	-	-	X	-
3	GDP	R	1101	-	-	X	-

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 60705 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 Tubulin beta-3 chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	429	3314	2083	566	640	25	0	0
1	D	429	3314	2083	566	640	25	0	0
1	F	429	3314	2083	566	640	25	0	0
1	H	429	3314	2083	566	640	25	0	0
1	J	429	3314	2083	566	640	25	0	0
1	L	429	3314	2083	566	640	25	0	0
1	N	429	3314	2083	566	640	25	0	0
1	P	429	3314	2083	566	640	25	0	0
1	R	429	3314	2083	566	640	25	0	0

- Molecule 2 is a protein called Tubulin alpha-1B chain.

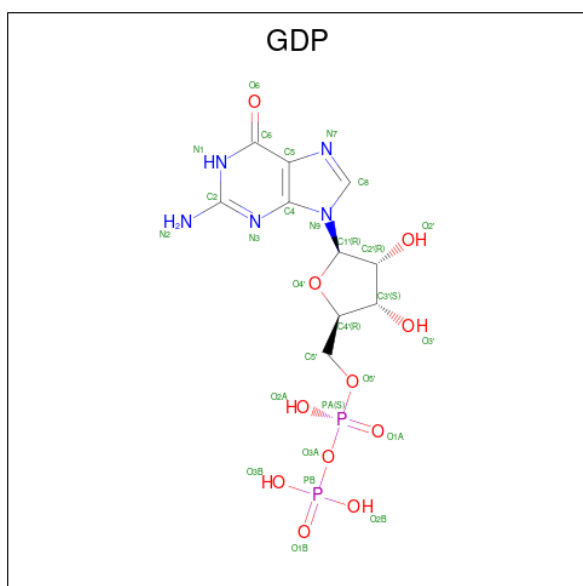
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	436	3325	2109	564	632	20	0	0
2	C	436	3325	2109	564	632	20	0	0
2	E	436	3325	2109	564	632	20	0	0
2	G	436	3325	2109	564	632	20	0	0
2	I	436	3325	2109	564	632	20	0	0
2	K	436	3325	2109	564	632	20	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	M	436	Total 3325	C 2109	N 564	O 632	S 20	0	0
2	O	436	Total 3325	C 2109	N 564	O 632	S 20	0	0
2	Q	436	Total 3325	C 2109	N 564	O 632	S 20	0	0

- Molecule 3 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).



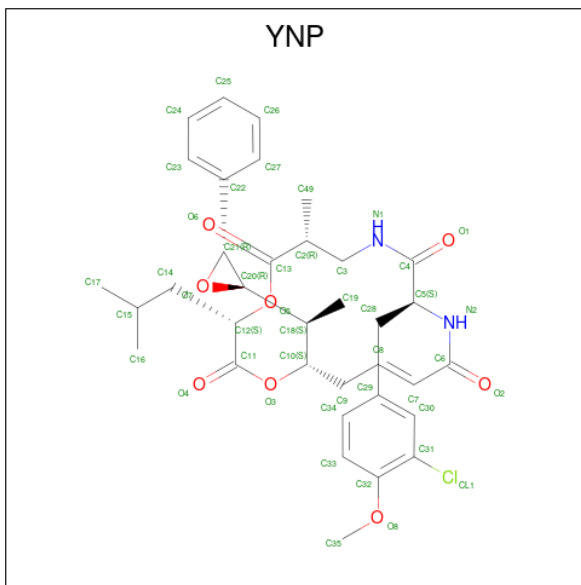
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
3	B	1	Total 28	C 10	N 5	O 11	P 2	0
3	D	1	Total 28	C 10	N 5	O 11	P 2	0
3	F	1	Total 28	C 10	N 5	O 11	P 2	0
3	H	1	Total 28	C 10	N 5	O 11	P 2	0
3	J	1	Total 28	C 10	N 5	O 11	P 2	0
3	L	1	Total 28	C 10	N 5	O 11	P 2	0
3	N	1	Total 28	C 10	N 5	O 11	P 2	0
3	P	1	Total 28	C 10	N 5	O 11	P 2	0

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Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
3	R	1	28	10	5	11	2	0

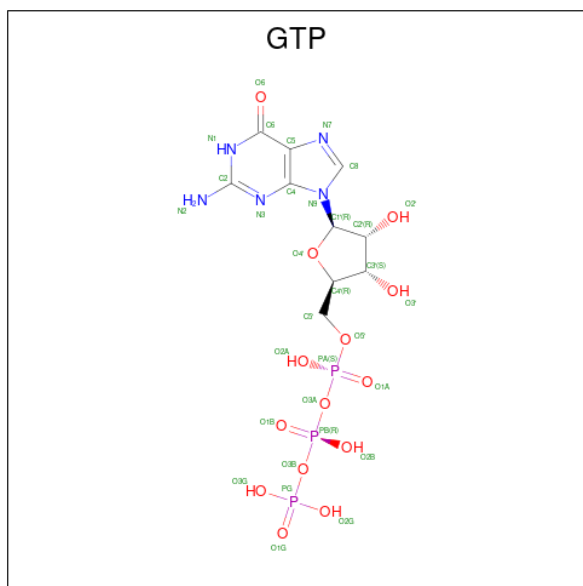
- Molecule 4 is Cryptophycin 1 (three-letter code: YNP) (formula: $C_{35}H_{43}ClN_2O_8$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	Cl	N	O	
4	A	1	46	35	1	2	8	0
4	C	1	46	35	1	2	8	0
4	E	1	46	35	1	2	8	0
4	G	1	46	35	1	2	8	0
4	I	1	46	35	1	2	8	0
4	K	1	46	35	1	2	8	0
4	M	1	46	35	1	2	8	0
4	O	1	46	35	1	2	8	0
4	Q	1	46	35	1	2	8	0

- Molecule 5 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula:

C₁₀H₁₆N₅O₁₄P₃).

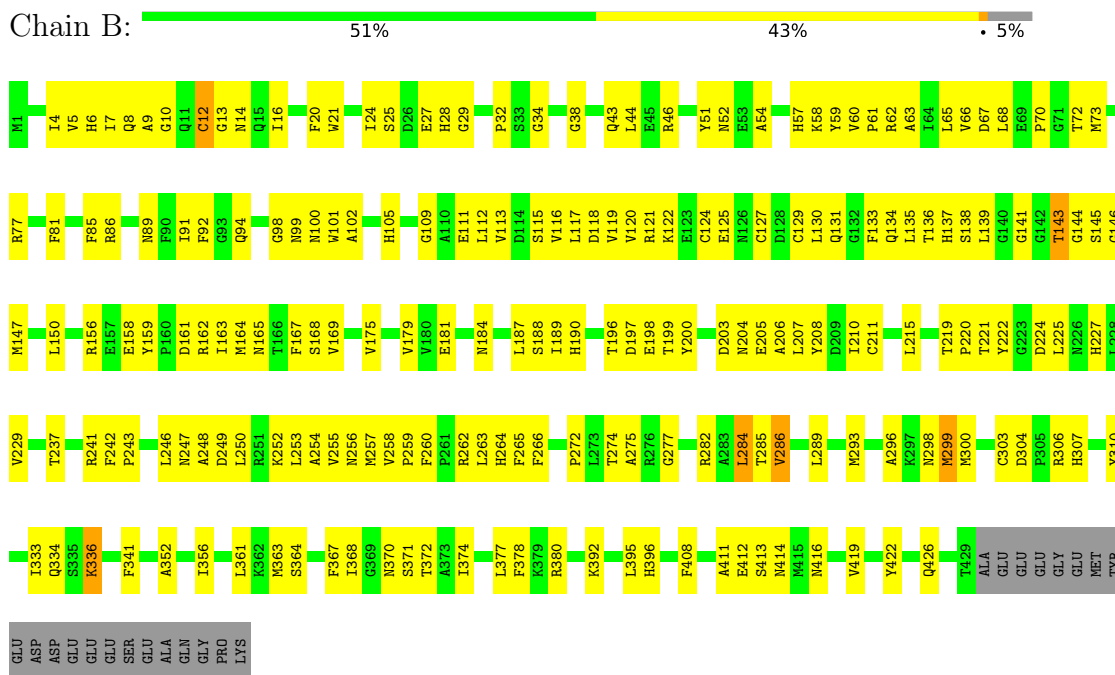


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
5	A	1	Total 32	C 10	N 5	O 14	P 3	0
5	C	1	Total 32	C 10	N 5	O 14	P 3	0
5	E	1	Total 32	C 10	N 5	O 14	P 3	0
5	G	1	Total 32	C 10	N 5	O 14	P 3	0
5	I	1	Total 32	C 10	N 5	O 14	P 3	0
5	K	1	Total 32	C 10	N 5	O 14	P 3	0
5	M	1	Total 32	C 10	N 5	O 14	P 3	0
5	O	1	Total 32	C 10	N 5	O 14	P 3	0
5	Q	1	Total 32	C 10	N 5	O 14	P 3	0

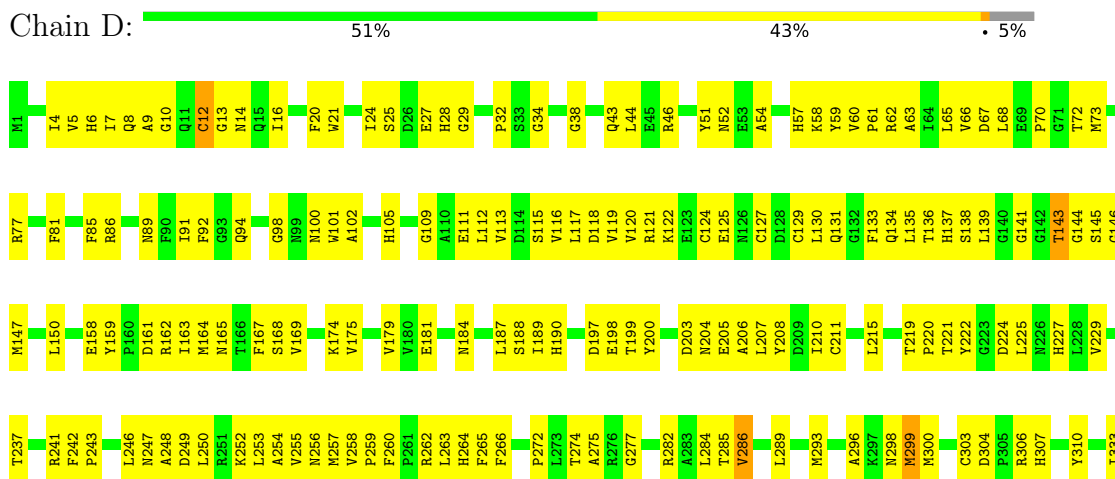
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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: Tubulin beta-3 chain

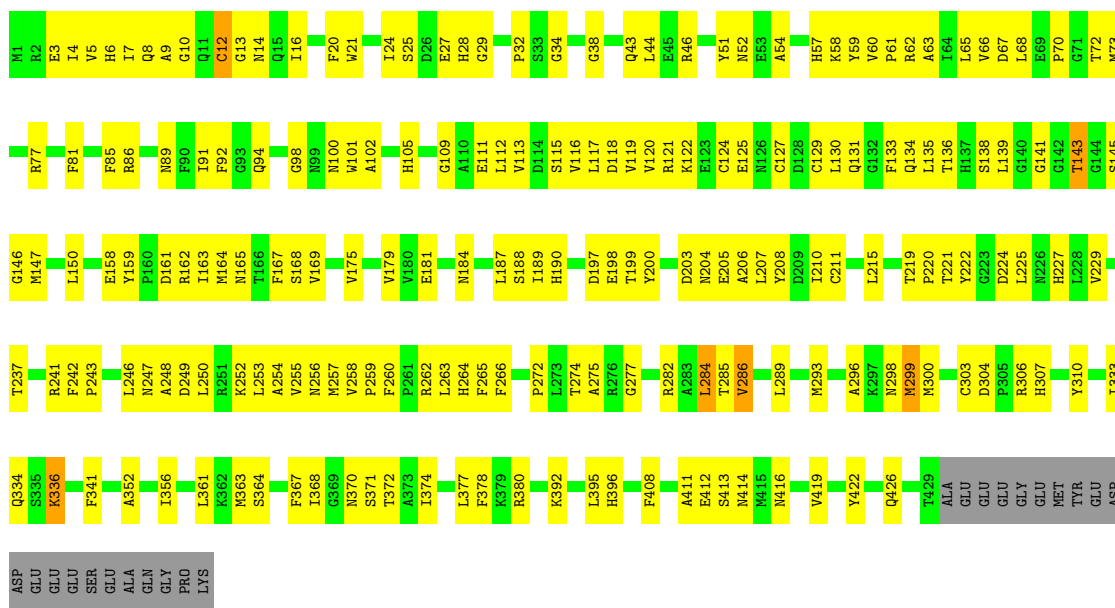


- Molecule 1: Tubulin beta-3 chain

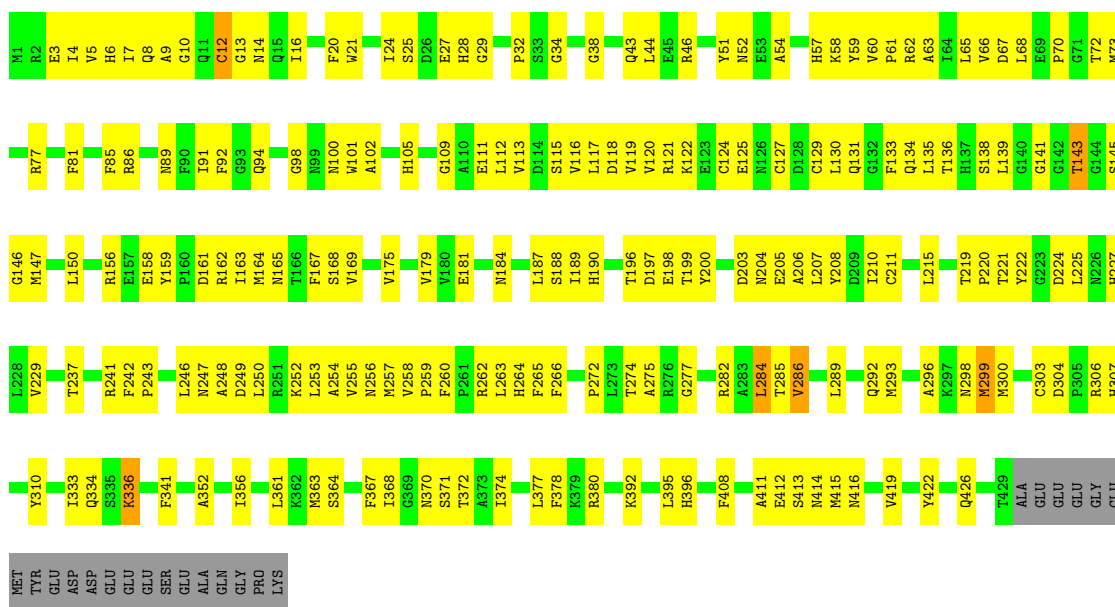




• Molecule 1: Tubulin beta-3 chain

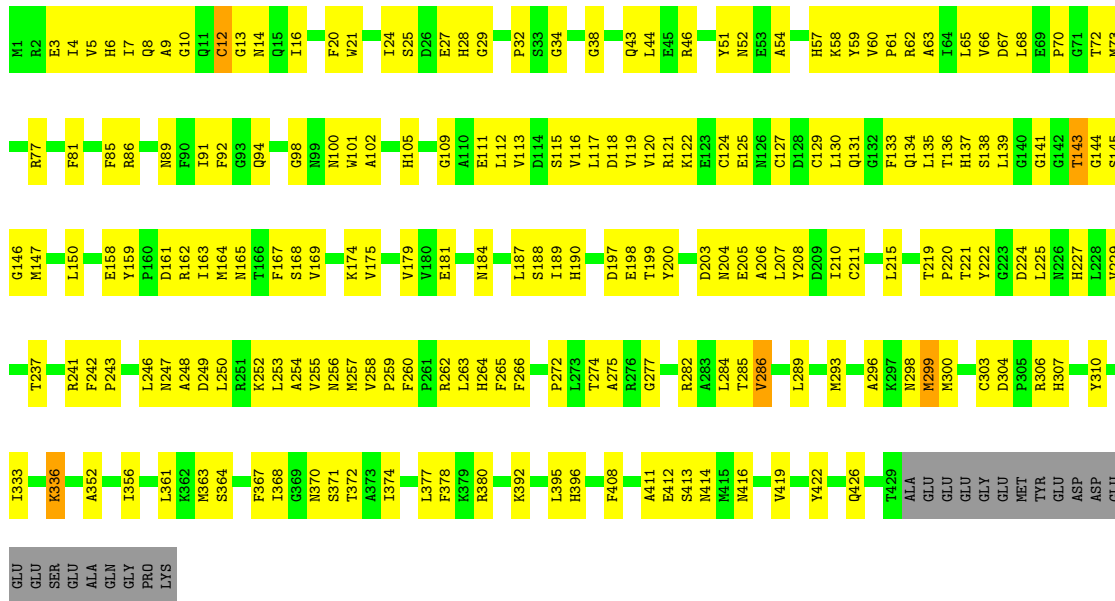


• Molecule 1: Tubulin beta-3 chain



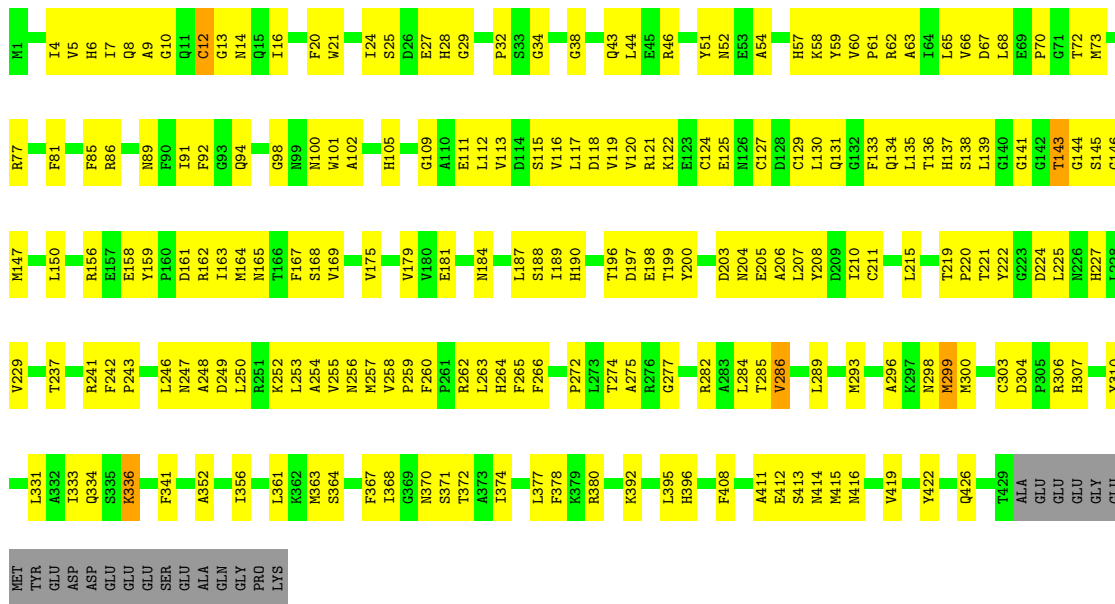
• Molecule 1: Tubulin beta-3 chain

Chain J: 52% 43% 5%



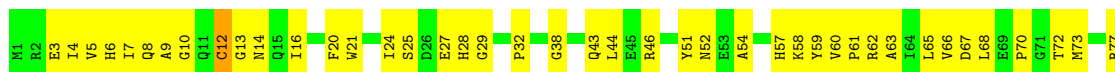
• Molecule 1: Tubulin beta-3 chain

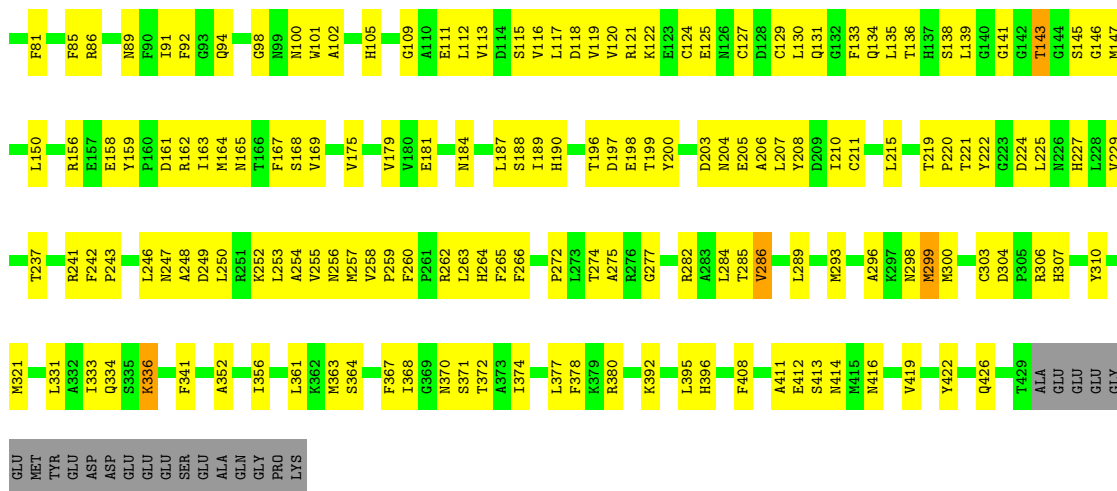
Chain L: 51% 44% 5%



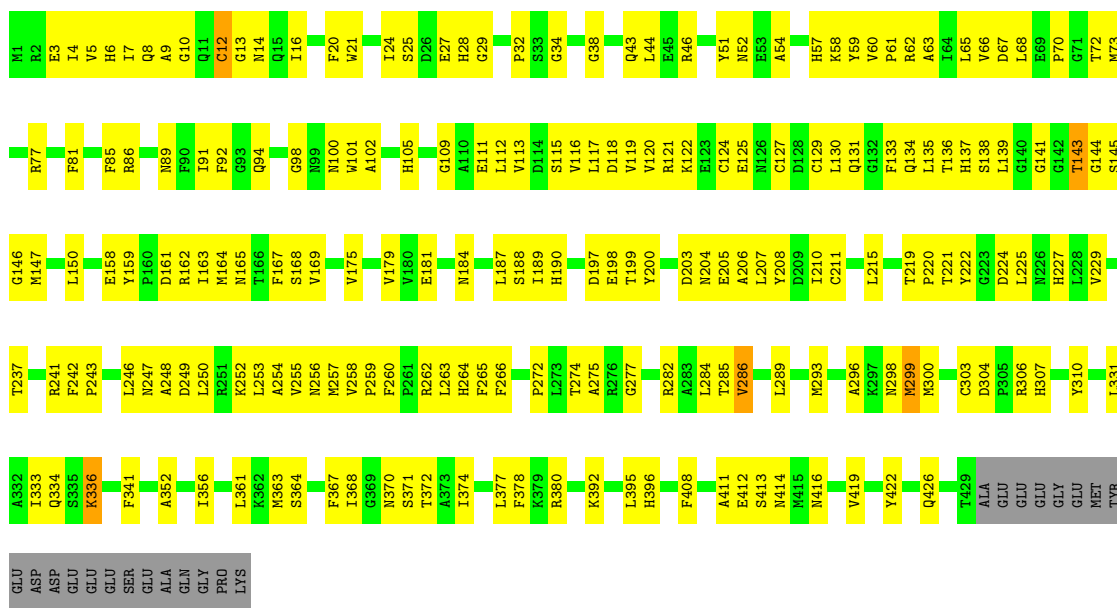
• Molecule 1: Tubulin beta-3 chain

Chain N: 51% 43% 5%

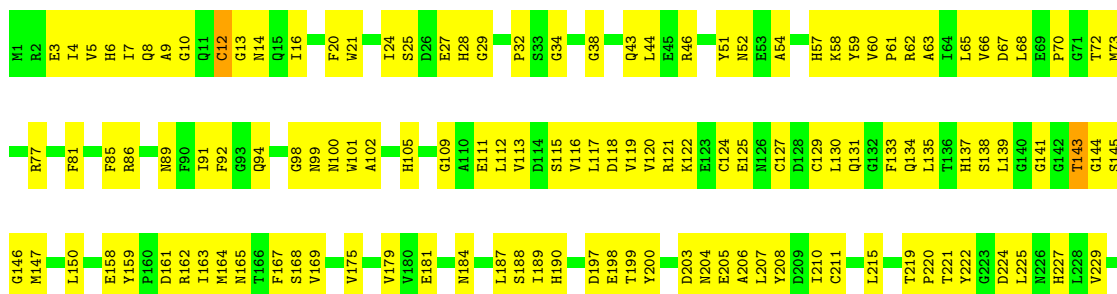




• Molecule 1: Tubulin beta-3 chain

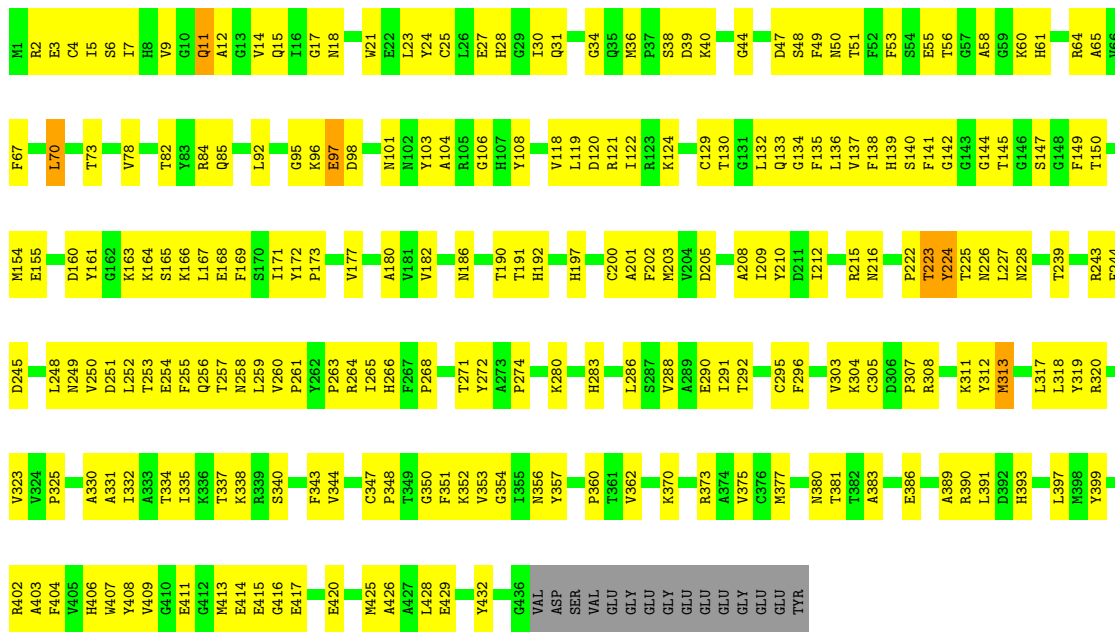


• Molecule 1: Tubulin beta-3 chain

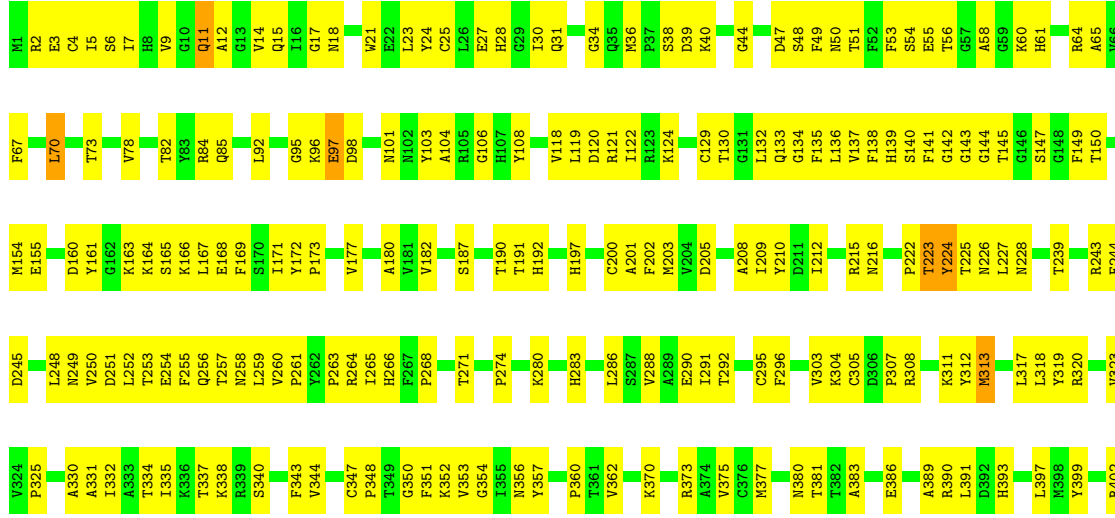




• Molecule 2: Tubulin alpha-1B chain

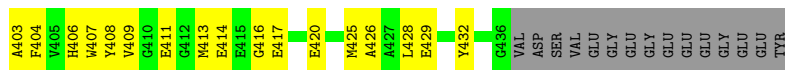
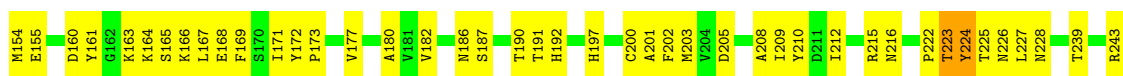
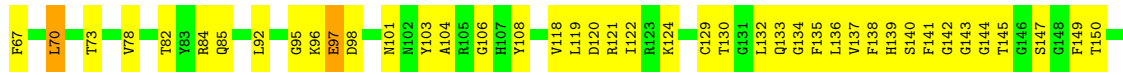
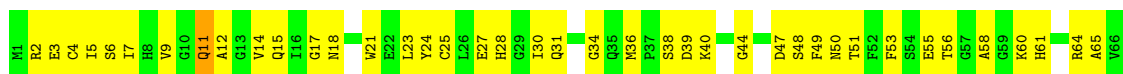


• Molecule 2: Tubulin alpha-1B chain

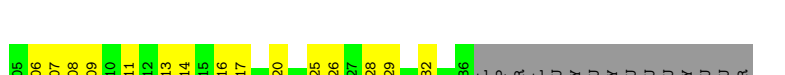
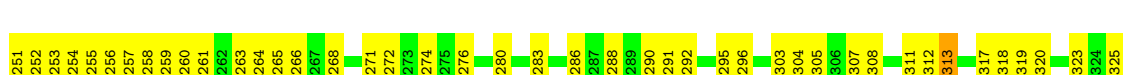




• Molecule 2: Tubulin alpha-1B chain

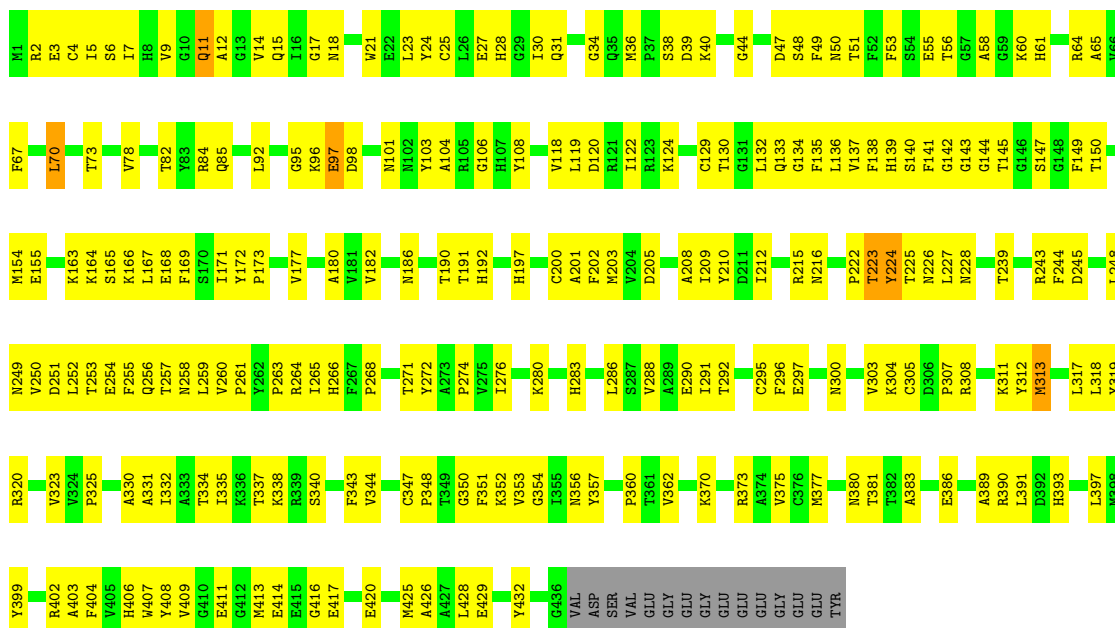


• Molecule 2: Tubulin alpha-1B chain



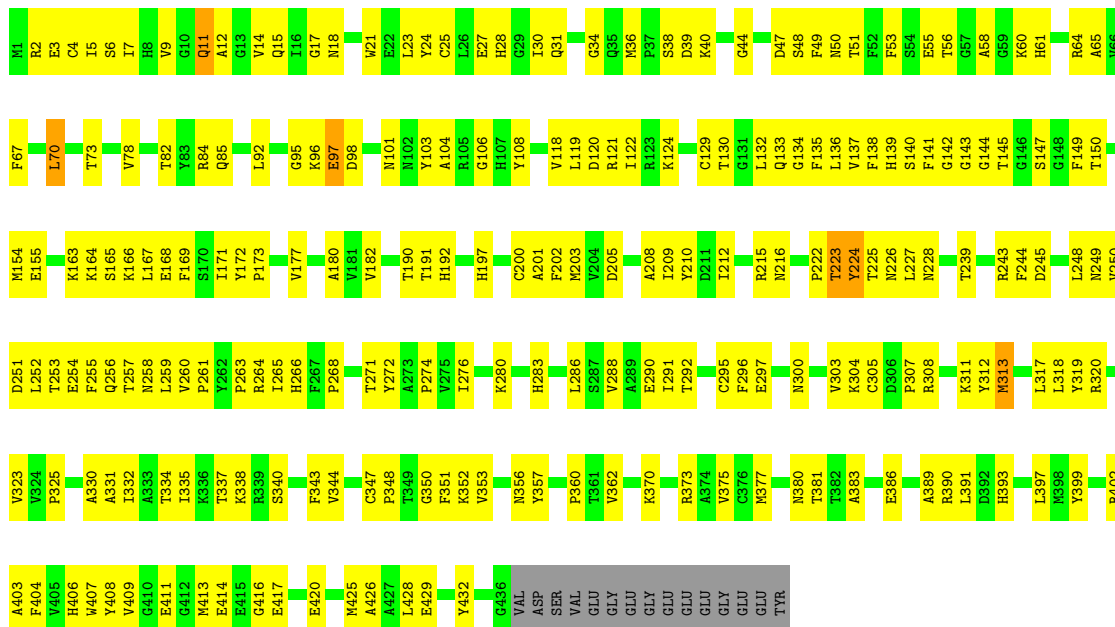
• Molecule 2: Tubulin alpha-1B chain

Chain I: 



• Molecule 2: Tubulin alpha-1B chain

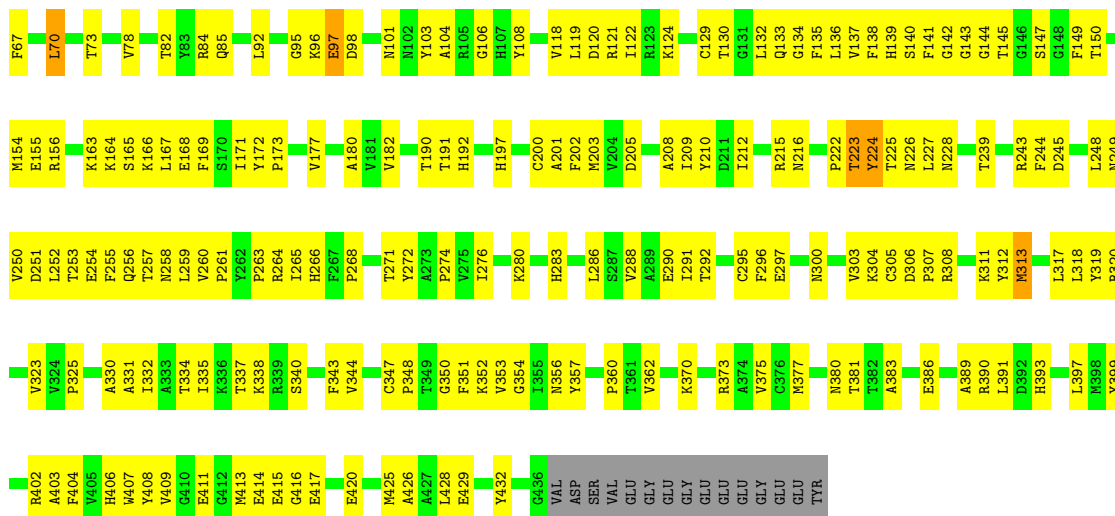
Chain K: 



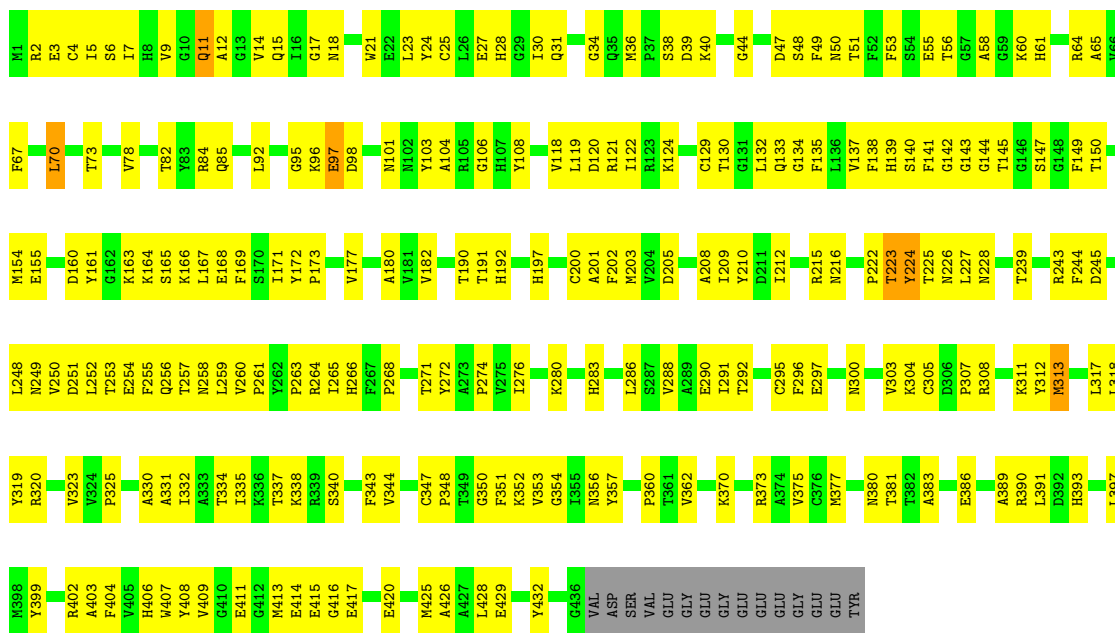
• Molecule 2: Tubulin alpha-1B chain

Chain M: 

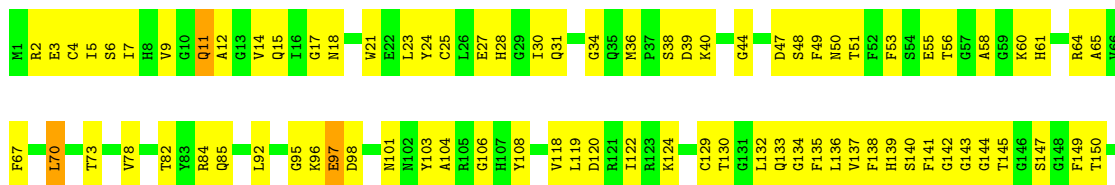




• Molecule 2: Tubulin alpha-1B chain



• Molecule 2: Tubulin alpha-1B chain



M164	M165	K163	K164	S165	K166	L167	E168	F169	S170	I171	Y172	P173	V177	A180	W181	V182	S187	T190	T191	H192	H197	C200	A201	F202	M203	V204	D205	A208	I209	Y210	D211	I212	R215	N216	P222	T223	Y224	T225	N226	L227	N228	T239	R243	F244	D245	L248			
N249	V250	D251	L252	T253	E254	F255	Q256	T257	N258	L259	V260	P261	Y262	P263	R264	I265	H266	F267	P268	T271	Y272	A273	P274	K280	H283	L286	S287	V288	A289	E290	I291	T292	C295	F296	E297	N300	V303	K304	C305	D306	P307	R308	K311	Y312	M313	L317	L318	Y319	R320
V323	V324	P325	A330	A331	I332	A333	T334	I335	K336	T337	K338	R339	S340	F343	V344	C347	P348	T349	G350	F351	K352	V353	G354	I355	N356	Y357	P360	T361	V362	K370	R373	A374	V375	C376	M377	N380	T381	T382	A383	E386	A389	R390	L391	D392	H393	L397	M398	Y399	
R402	A403	F404	V405	H406	W407	Y408	V409	G410	E411	G412	M413	E414	E415	G416	E417	E420	M425	A426	A427	L428	E429	Y432	G436	VAL	ASP	SER	VAL	GLU	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	TYR					

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C9	Depositor
Number of particles used	14468	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	66	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	130000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, YNP, GDP

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	B	0.39	0/3386	0.57	0/4593
1	D	0.39	0/3386	0.57	0/4593
1	F	0.39	0/3386	0.57	0/4593
1	H	0.39	0/3386	0.57	0/4593
1	J	0.39	0/3386	0.57	0/4593
1	L	0.39	0/3386	0.57	0/4593
1	N	0.39	0/3386	0.57	0/4593
1	P	0.39	0/3386	0.57	0/4593
1	R	0.39	0/3386	0.57	0/4593
2	A	0.41	0/3401	0.58	0/4630
2	C	0.41	0/3401	0.58	0/4630
2	E	0.41	0/3401	0.58	0/4630
2	G	0.41	0/3401	0.58	0/4630
2	I	0.41	0/3401	0.58	0/4630
2	K	0.41	0/3401	0.58	0/4630
2	M	0.41	0/3401	0.58	0/4630
2	O	0.41	0/3401	0.58	0/4630
2	Q	0.41	0/3401	0.58	0/4630
All	All	0.40	0/61083	0.57	0/83007

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	B	3314	0	3169	188	0
1	D	3314	0	3169	185	0
1	F	3314	0	3169	189	0
1	H	3314	0	3169	191	0
1	J	3314	0	3169	186	0
1	L	3314	0	3169	187	0
1	N	3314	0	3169	186	0
1	P	3314	0	3169	185	0
1	R	3314	0	3169	186	0
2	A	3325	0	3190	222	0
2	C	3325	0	3190	222	0
2	E	3325	0	3190	222	0
2	G	3325	0	3190	218	0
2	I	3325	0	3190	222	0
2	K	3325	0	3190	214	0
2	M	3325	0	3190	220	0
2	O	3325	0	3190	223	0
2	Q	3325	0	3190	220	0
3	B	28	0	12	9	0
3	D	28	0	12	9	0
3	F	28	0	12	9	0
3	H	28	0	12	9	0
3	J	28	0	12	9	0
3	L	28	0	12	9	0
3	N	28	0	12	9	0
3	P	28	0	12	9	0
3	R	28	0	12	9	0
4	A	46	0	0	3	0
4	C	46	0	0	3	0
4	E	46	0	0	3	0
4	G	46	0	0	3	0
4	I	46	0	0	3	0
4	K	46	0	0	3	0
4	M	46	0	0	3	0
4	O	46	0	0	2	0
4	Q	46	0	0	3	0
5	A	32	0	12	5	0
5	C	32	0	12	5	0
5	E	32	0	12	5	0
5	G	32	0	12	5	0
5	I	32	0	12	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	K	32	0	12	4	0
5	M	32	0	12	4	0
5	O	32	0	12	5	0
5	Q	32	0	12	5	0
All	All	60705	0	57447	3513	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 30.

The worst 5 of 3513 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:N:258:VAL:CG1	2:O:407:TRP:HE1	1.59	1.17
1:B:258:VAL:CG1	2:C:407:TRP:HE1	1.59	1.16
2:A:407:TRP:HE1	1:R:258:VAL:CG1	1.59	1.16
1:H:258:VAL:CG1	2:I:407:TRP:HE1	1.58	1.16
1:F:258:VAL:HG13	2:G:407:TRP:HE1	1.09	1.16

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 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	B	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
1	D	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
1	F	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
1	H	427/450 (95%)	379 (89%)	47 (11%)	1 (0%)	47	78
1	J	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
1	L	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	N	427/450 (95%)	379 (89%)	47 (11%)	1 (0%)	47	78
1	P	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
1	R	427/450 (95%)	380 (89%)	46 (11%)	1 (0%)	47	78
2	A	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	C	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	E	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	G	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	I	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	K	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	M	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	O	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
2	Q	434/451 (96%)	383 (88%)	49 (11%)	2 (0%)	29	66
All	All	7749/8109 (96%)	6865 (89%)	857 (11%)	27 (0%)	44	74

5 of 27 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	224	TYR
2	C	224	TYR
2	E	224	TYR
2	G	224	TYR
2	I	224	TYR

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	B	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	D	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	F	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	H	357/386 (92%)	344 (96%)	13 (4%)	35	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	J	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	L	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	N	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	P	357/386 (92%)	344 (96%)	13 (4%)	35	62
1	R	357/386 (92%)	344 (96%)	13 (4%)	35	62
2	A	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	C	348/379 (92%)	340 (98%)	8 (2%)	50	71
2	E	348/379 (92%)	340 (98%)	8 (2%)	50	71
2	G	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	I	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	K	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	M	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	O	348/379 (92%)	339 (97%)	9 (3%)	46	69
2	Q	348/379 (92%)	339 (97%)	9 (3%)	46	69
All	All	6345/6885 (92%)	6149 (97%)	196 (3%)	43	65

5 of 196 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	298	ASN
2	M	11	GLN
1	L	336	LYS
1	N	12	CYS
2	M	272	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 81 such sidechains are listed below:

Mol	Chain	Res	Type
1	N	414	ASN
2	O	197	HIS
2	M	15	GLN
1	P	292	GLN
1	R	414	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

27 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$
3	GDP	J	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
3	GDP	B	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
5	GTP	C	502	-	26,34,34	0.97	2 (7%)	32,54,54	0.83	0
4	YNP	O	501	-	49,49,49	2.77	14 (28%)	59,68,68	4.47	17 (28%)
5	GTP	I	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0
5	GTP	K	502	-	26,34,34	0.97	2 (7%)	32,54,54	0.83	0
5	GTP	A	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0
3	GDP	L	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
4	YNP	M	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.47	16 (27%)
5	GTP	M	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0
5	GTP	E	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0
4	YNP	A	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.46	16 (27%)
4	YNP	K	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.45	17 (28%)
5	GTP	G	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	YNP	Q	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.46	16 (27%)
4	YNP	G	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.46	15 (25%)
3	GDP	N	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
3	GDP	H	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
4	YNP	C	501	-	49,49,49	2.77	14 (28%)	59,68,68	4.45	16 (27%)
4	YNP	I	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.46	17 (28%)
5	GTP	Q	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	0
3	GDP	D	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
3	GDP	R	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.27	3 (10%)
4	YNP	E	501	-	49,49,49	2.76	14 (28%)	59,68,68	4.46	16 (27%)
3	GDP	P	1101	-	24,30,30	1.09	2 (8%)	30,47,47	1.26	3 (10%)
3	GDP	F	1101	-	24,30,30	1.10	2 (8%)	30,47,47	1.26	3 (10%)
5	GTP	O	502	-	26,34,34	0.98	2 (7%)	32,54,54	0.83	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
3	GDP	J	1101	-	-	4/12/32/32	0/3/3/3
3	GDP	B	1101	-	-	4/12/32/32	0/3/3/3
5	GTP	C	502	-	-	4/18/38/38	0/3/3/3
4	YNP	O	501	-	-	30/57/62/62	0/3/4/4
5	GTP	I	502	-	-	4/18/38/38	0/3/3/3
5	GTP	K	502	-	-	4/18/38/38	0/3/3/3
5	GTP	A	502	-	-	4/18/38/38	0/3/3/3
3	GDP	L	1101	-	-	4/12/32/32	0/3/3/3
4	YNP	M	501	-	-	32/57/62/62	0/3/4/4
5	GTP	M	502	-	-	4/18/38/38	0/3/3/3
5	GTP	E	502	-	-	4/18/38/38	0/3/3/3
4	YNP	A	501	-	-	31/57/62/62	0/3/4/4
4	YNP	K	501	-	-	30/57/62/62	0/3/4/4
5	GTP	G	502	-	-	4/18/38/38	0/3/3/3
4	YNP	Q	501	-	-	33/57/62/62	0/3/4/4
4	YNP	G	501	-	-	30/57/62/62	0/3/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GDP	N	1101	-	-	4/12/32/32	0/3/3/3
3	GDP	H	1101	-	-	4/12/32/32	0/3/3/3
4	YNP	C	501	-	-	32/57/62/62	0/3/4/4
4	YNP	I	501	-	-	31/57/62/62	0/3/4/4
5	GTP	Q	502	-	-	4/18/38/38	0/3/3/3
3	GDP	D	1101	-	-	4/12/32/32	0/3/3/3
3	GDP	R	1101	-	-	4/12/32/32	0/3/3/3
4	YNP	E	501	-	-	32/57/62/62	0/3/4/4
3	GDP	P	1101	-	-	4/12/32/32	0/3/3/3
3	GDP	F	1101	-	-	4/12/32/32	0/3/3/3
5	GTP	O	502	-	-	4/18/38/38	0/3/3/3

The worst 5 of 162 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	501	YNP	O1-C4	8.66	1.40	1.23
4	Q	501	YNP	O1-C4	8.66	1.40	1.23
4	K	501	YNP	O1-C4	8.65	1.40	1.23
4	A	501	YNP	O1-C4	8.64	1.40	1.23
4	O	501	YNP	O1-C4	8.64	1.40	1.23

The worst 5 of 173 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	O	501	YNP	C3-N1-C4	25.02	170.45	122.67
4	C	501	YNP	C3-N1-C4	24.94	170.28	122.67
4	G	501	YNP	C3-N1-C4	24.91	170.24	122.67
4	E	501	YNP	C3-N1-C4	24.91	170.22	122.67
4	M	501	YNP	C3-N1-C4	24.91	170.22	122.67

There are no chirality outliers.

5 of 353 torsion outliers are listed below:

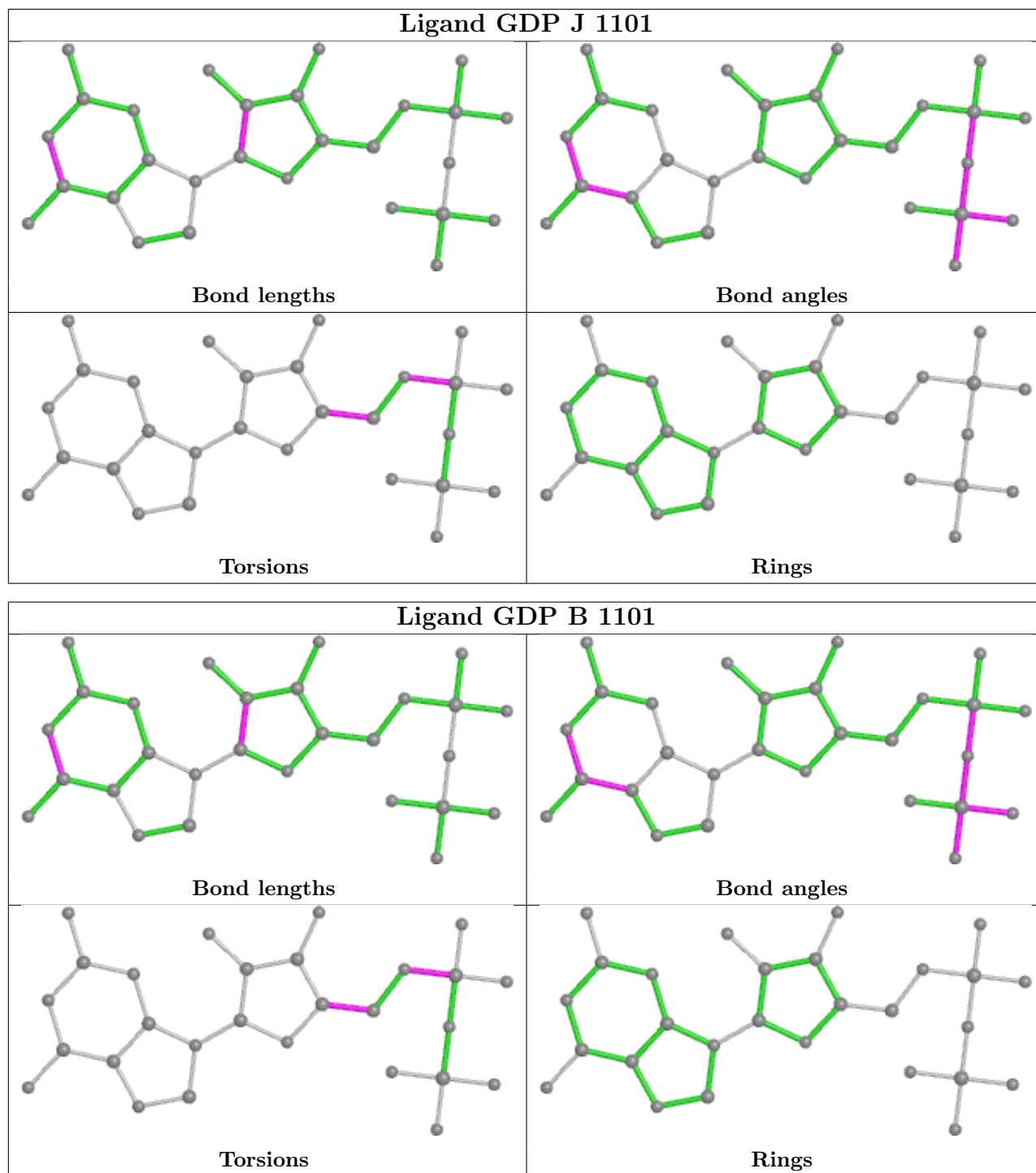
Mol	Chain	Res	Type	Atoms
3	B	1101	GDP	C5'-O5'-PA-O3A
3	B	1101	GDP	C5'-O5'-PA-O2A
3	B	1101	GDP	C3'-C4'-C5'-O5'
3	D	1101	GDP	C5'-O5'-PA-O3A
3	D	1101	GDP	C5'-O5'-PA-O2A

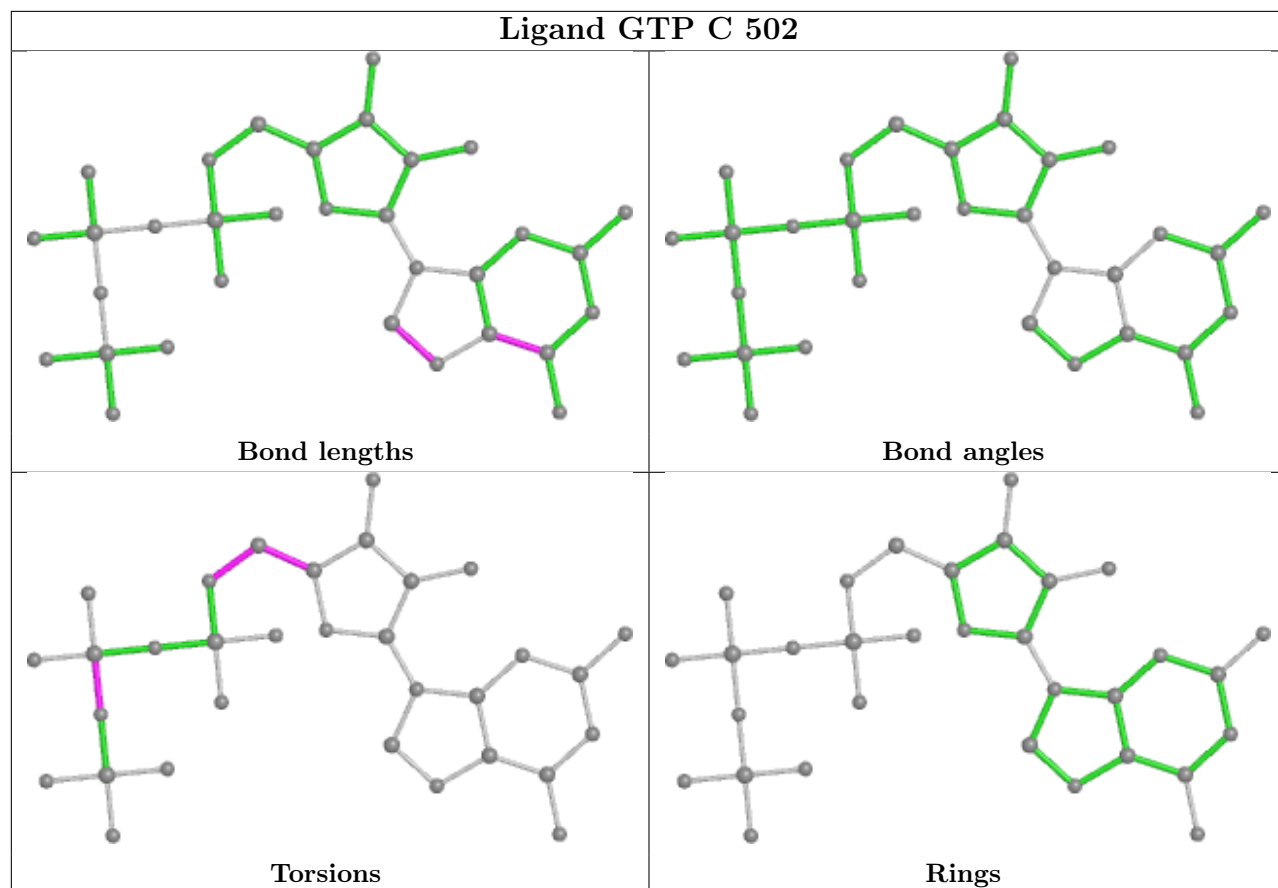
There are no ring outliers.

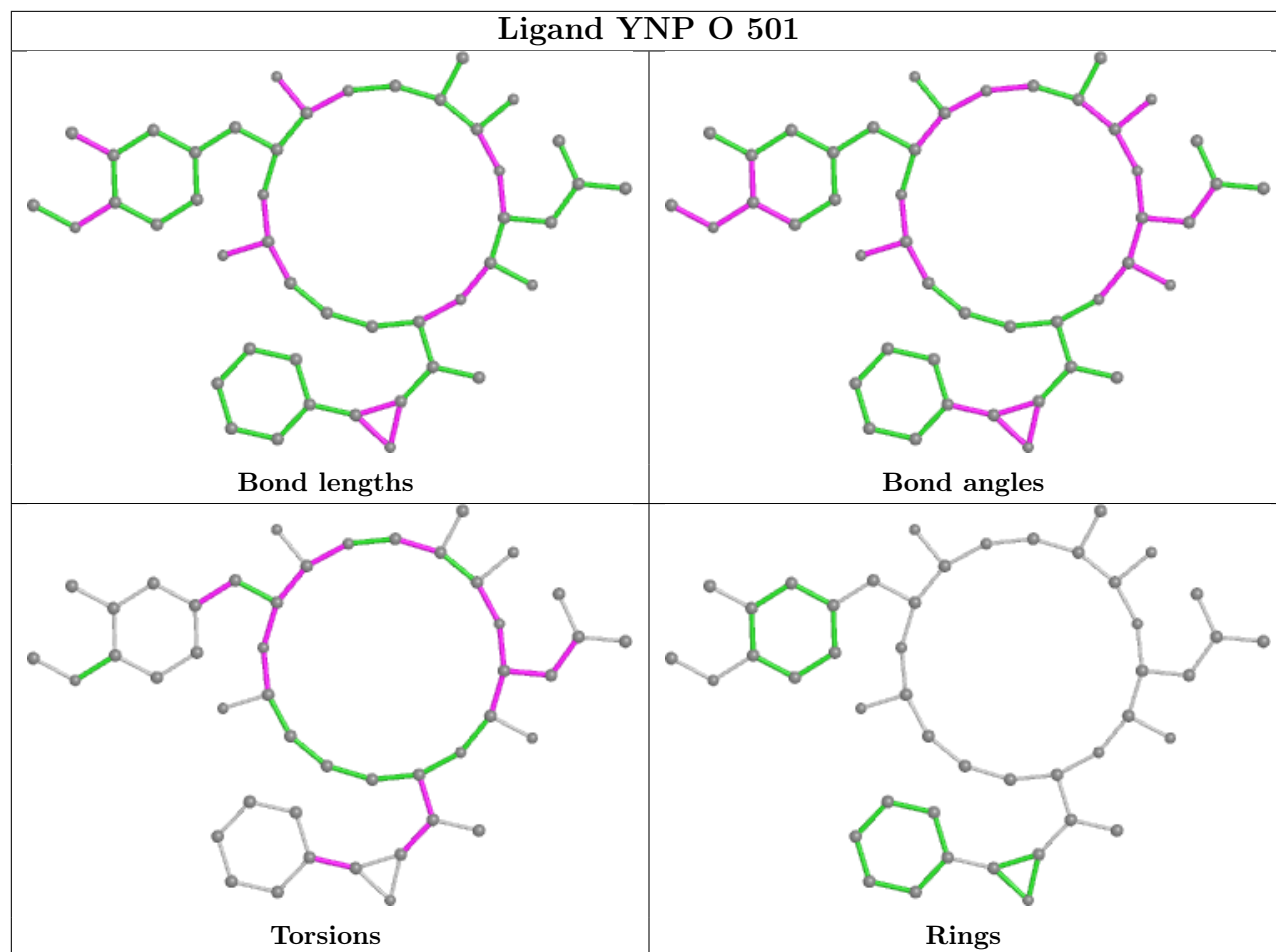
27 monomers are involved in 150 short contacts:

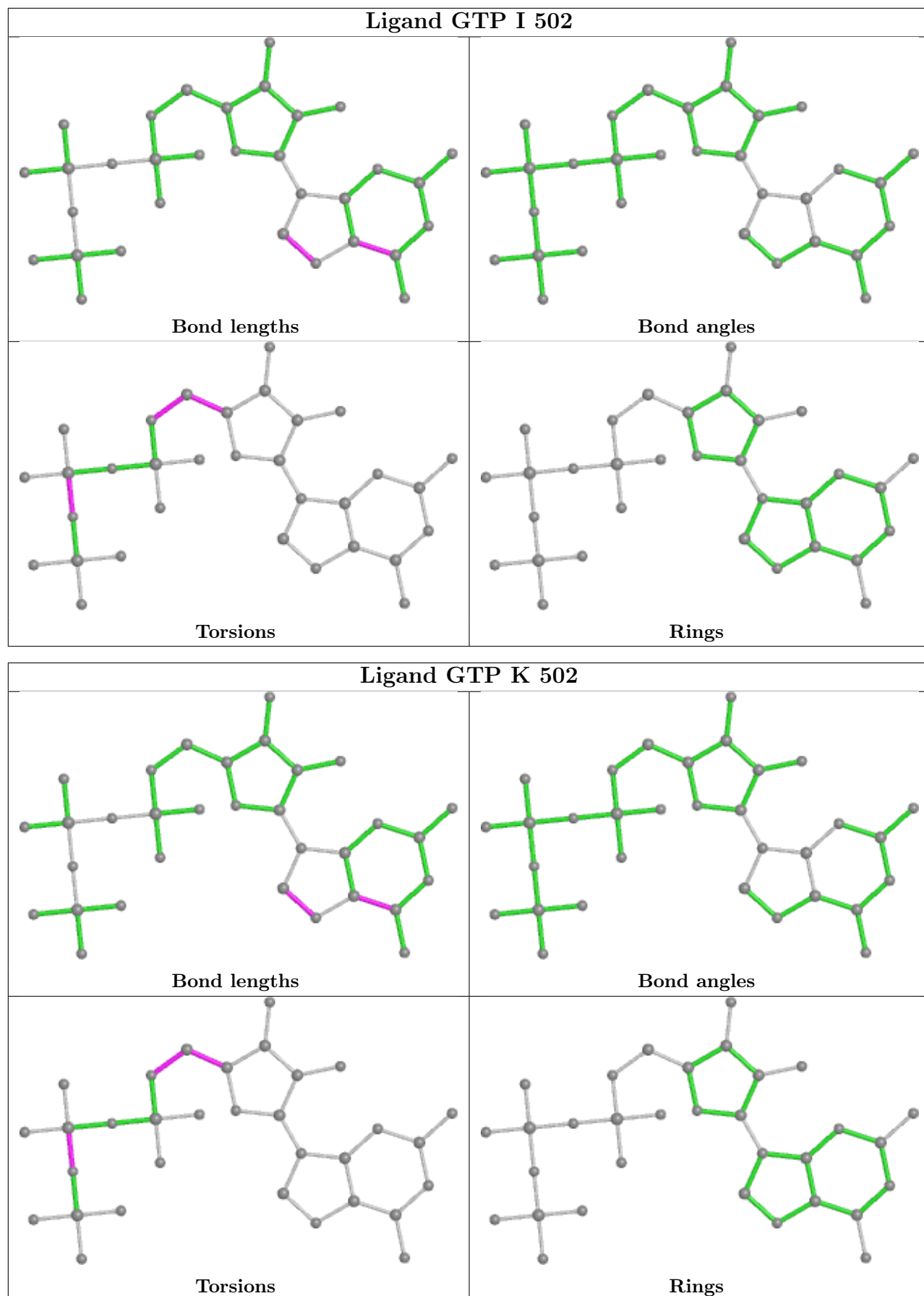
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	J	1101	GDP	9	0
3	B	1101	GDP	9	0
5	C	502	GTP	5	0
4	O	501	YNP	2	0
5	I	502	GTP	5	0
5	K	502	GTP	4	0
5	A	502	GTP	5	0
3	L	1101	GDP	9	0
4	M	501	YNP	3	0
5	M	502	GTP	4	0
5	E	502	GTP	5	0
4	A	501	YNP	3	0
4	K	501	YNP	3	0
5	G	502	GTP	5	0
4	Q	501	YNP	3	0
4	G	501	YNP	3	0
3	N	1101	GDP	9	0
3	H	1101	GDP	9	0
4	C	501	YNP	3	0
4	I	501	YNP	3	0
5	Q	502	GTP	5	0
3	D	1101	GDP	9	0
3	R	1101	GDP	9	0
4	E	501	YNP	3	0
3	P	1101	GDP	9	0
3	F	1101	GDP	9	0
5	O	502	GTP	5	0

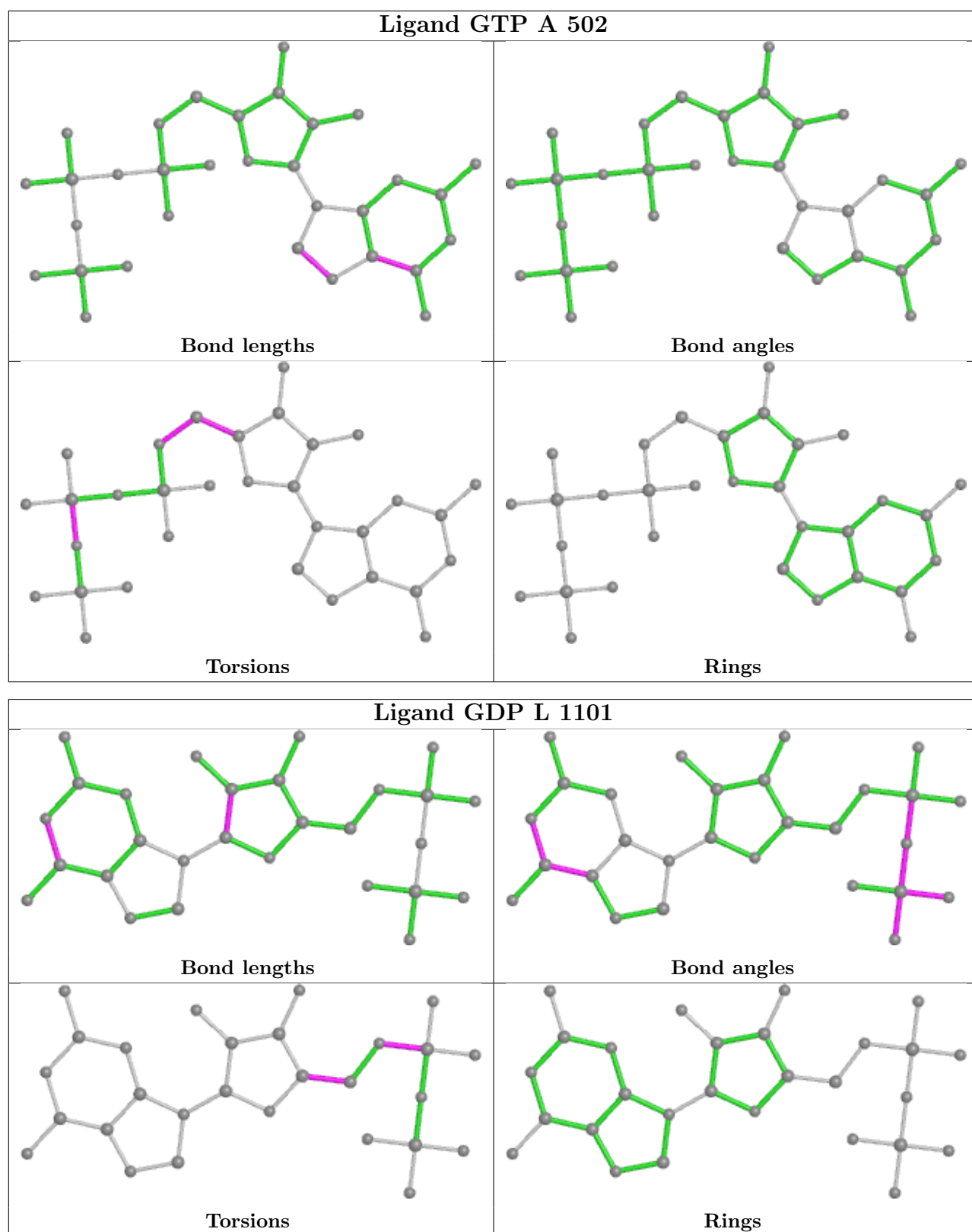
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

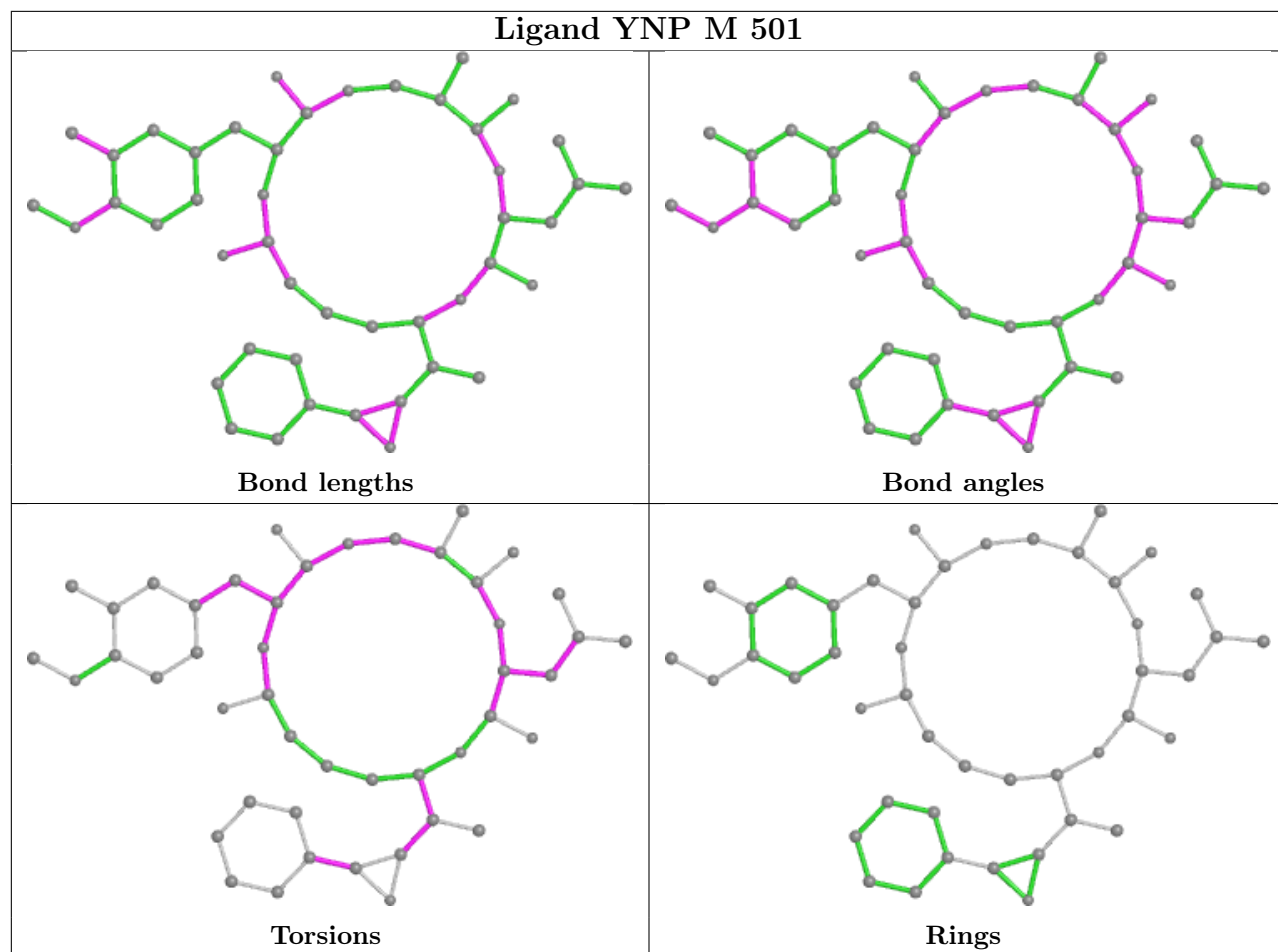


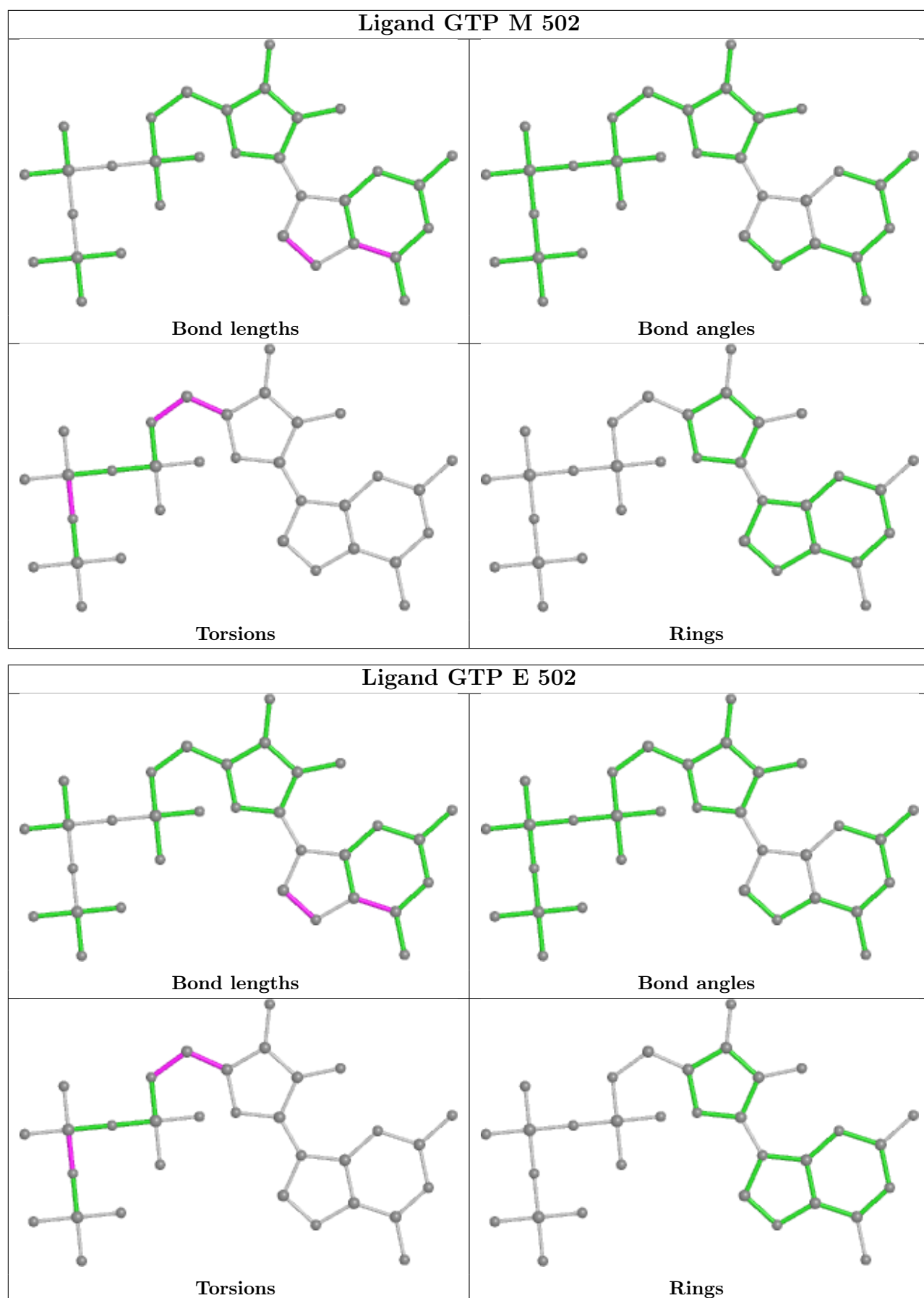


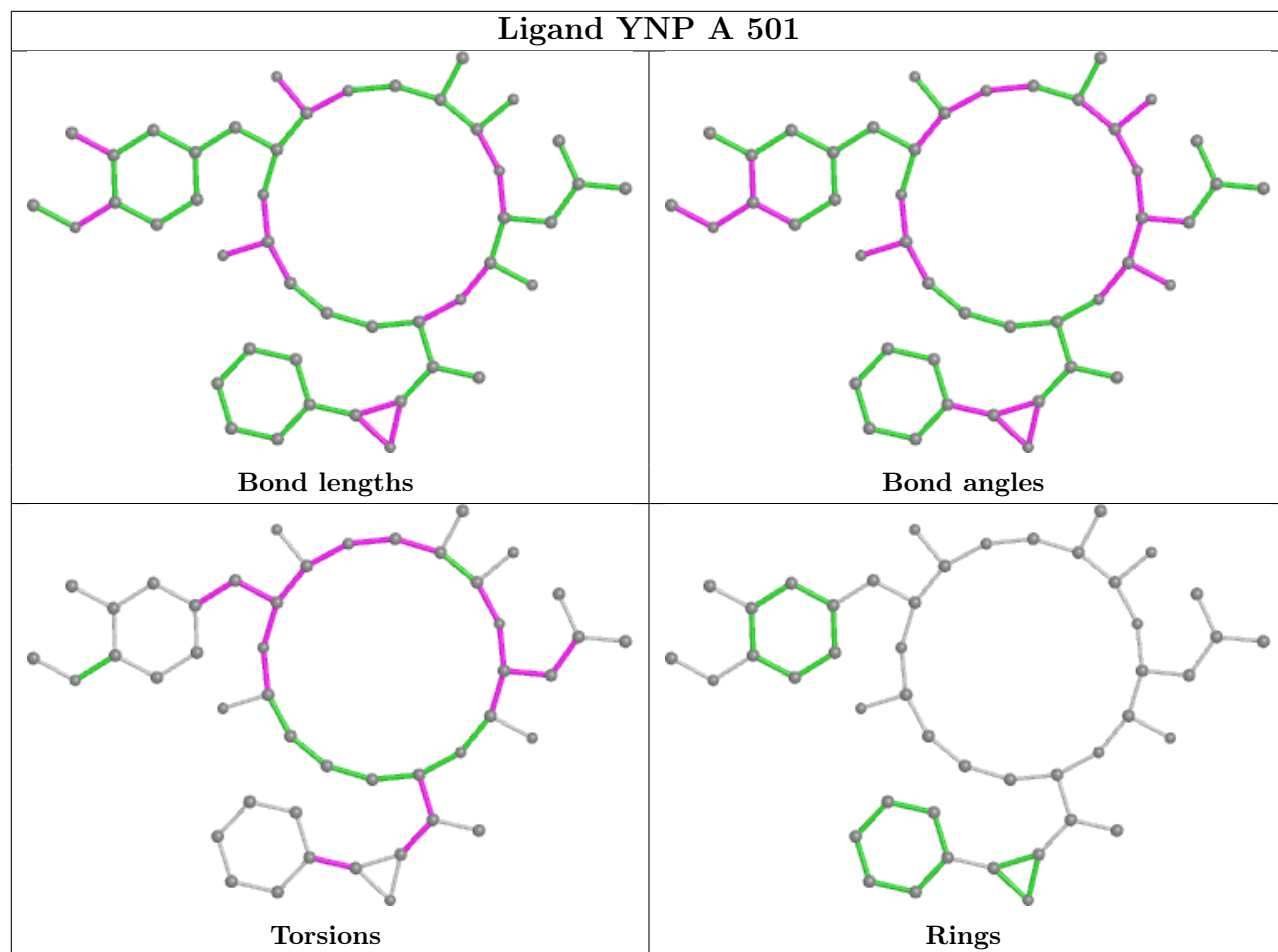


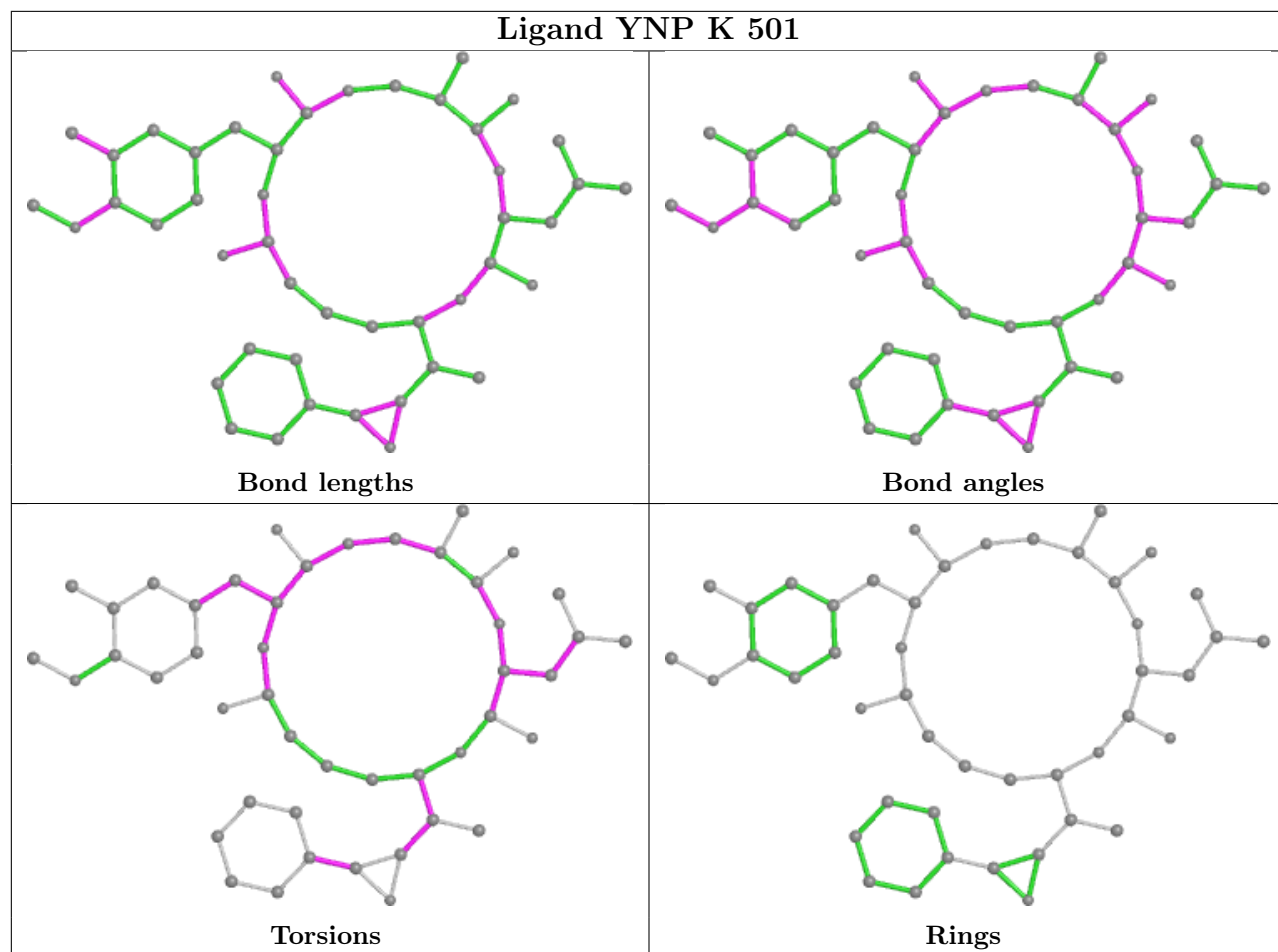


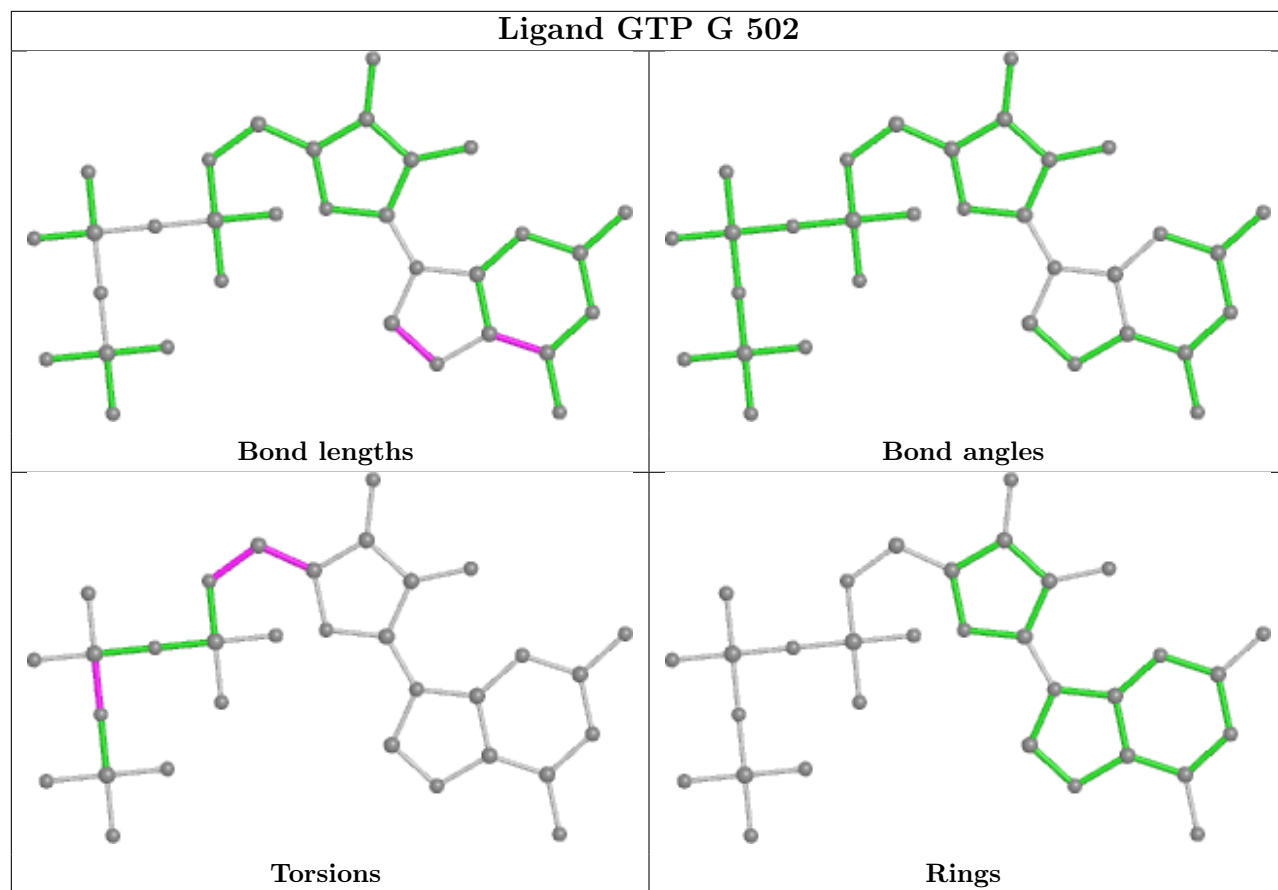


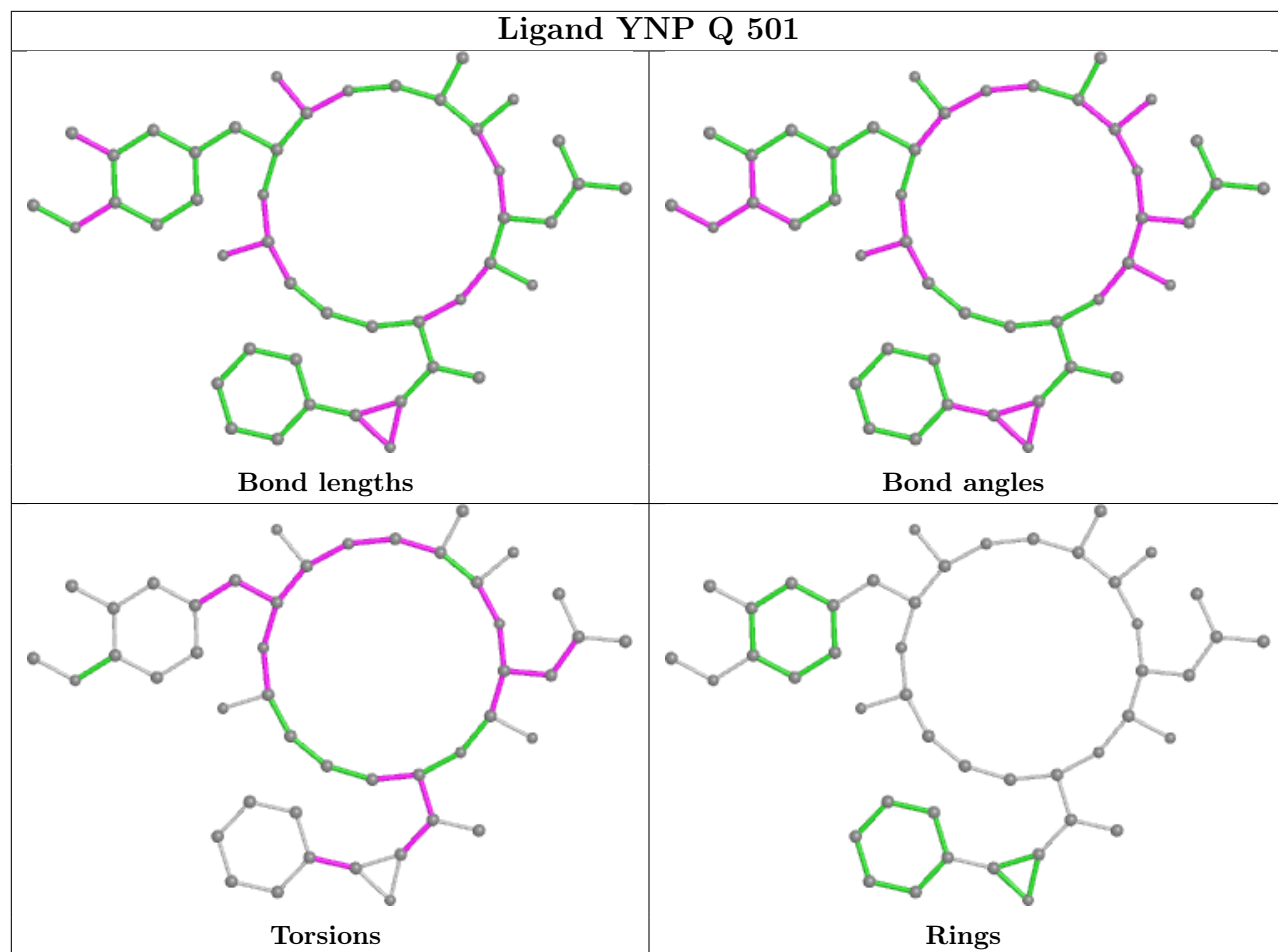


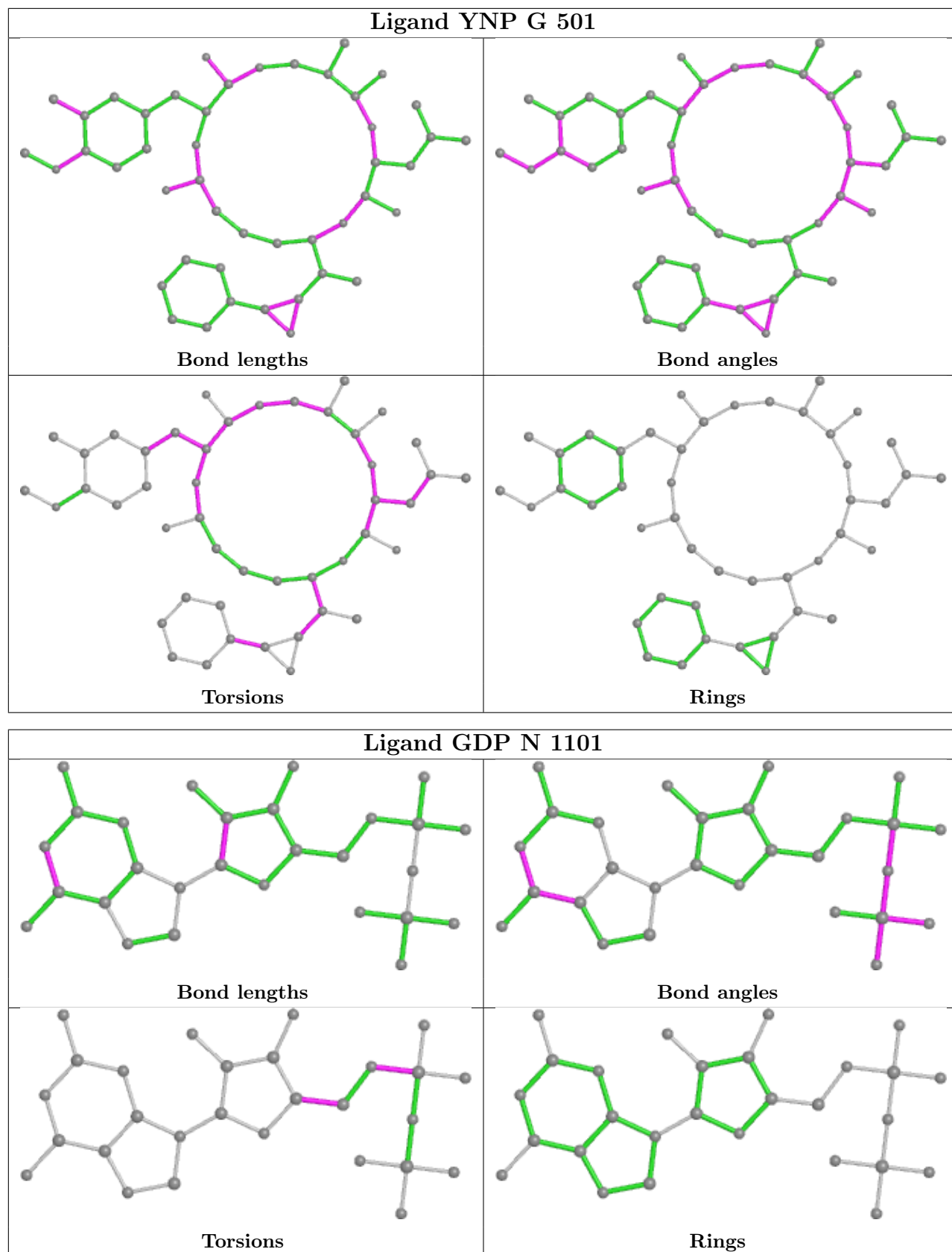


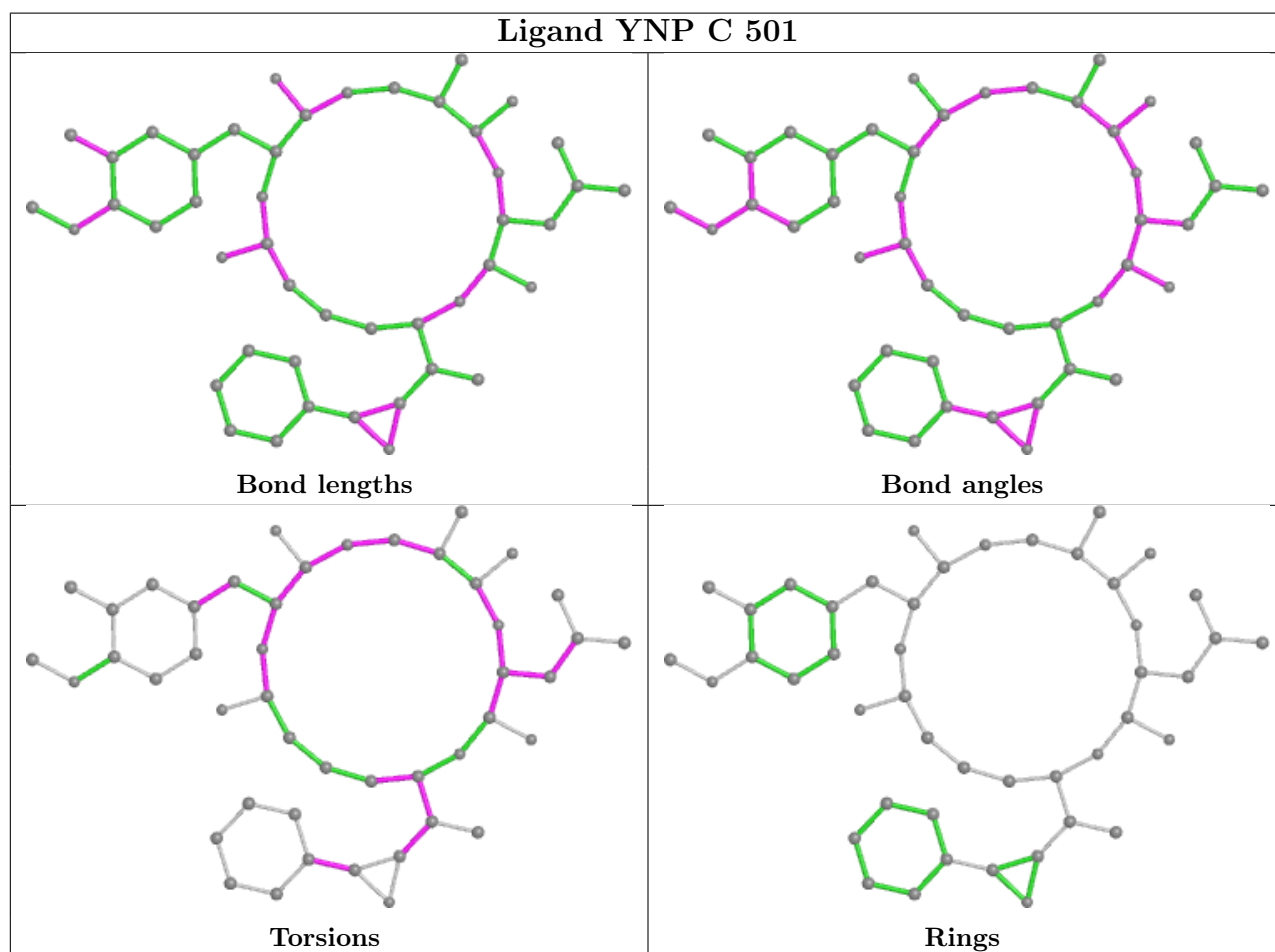
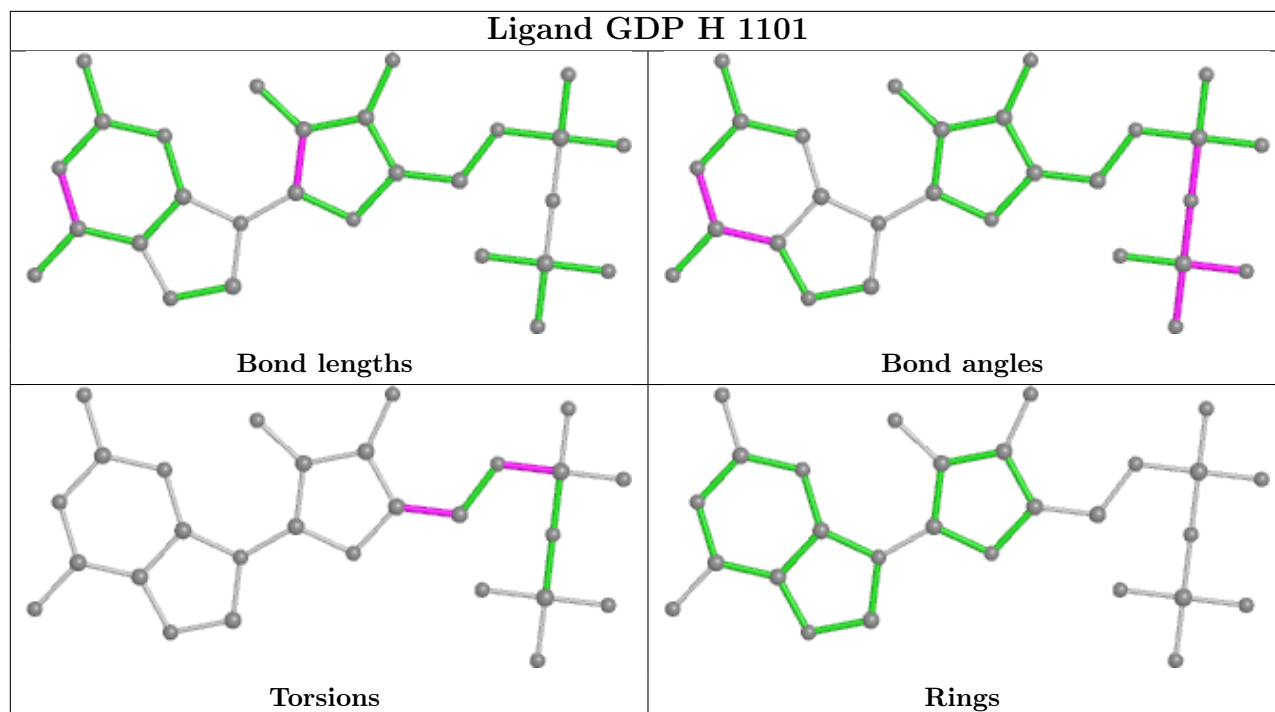


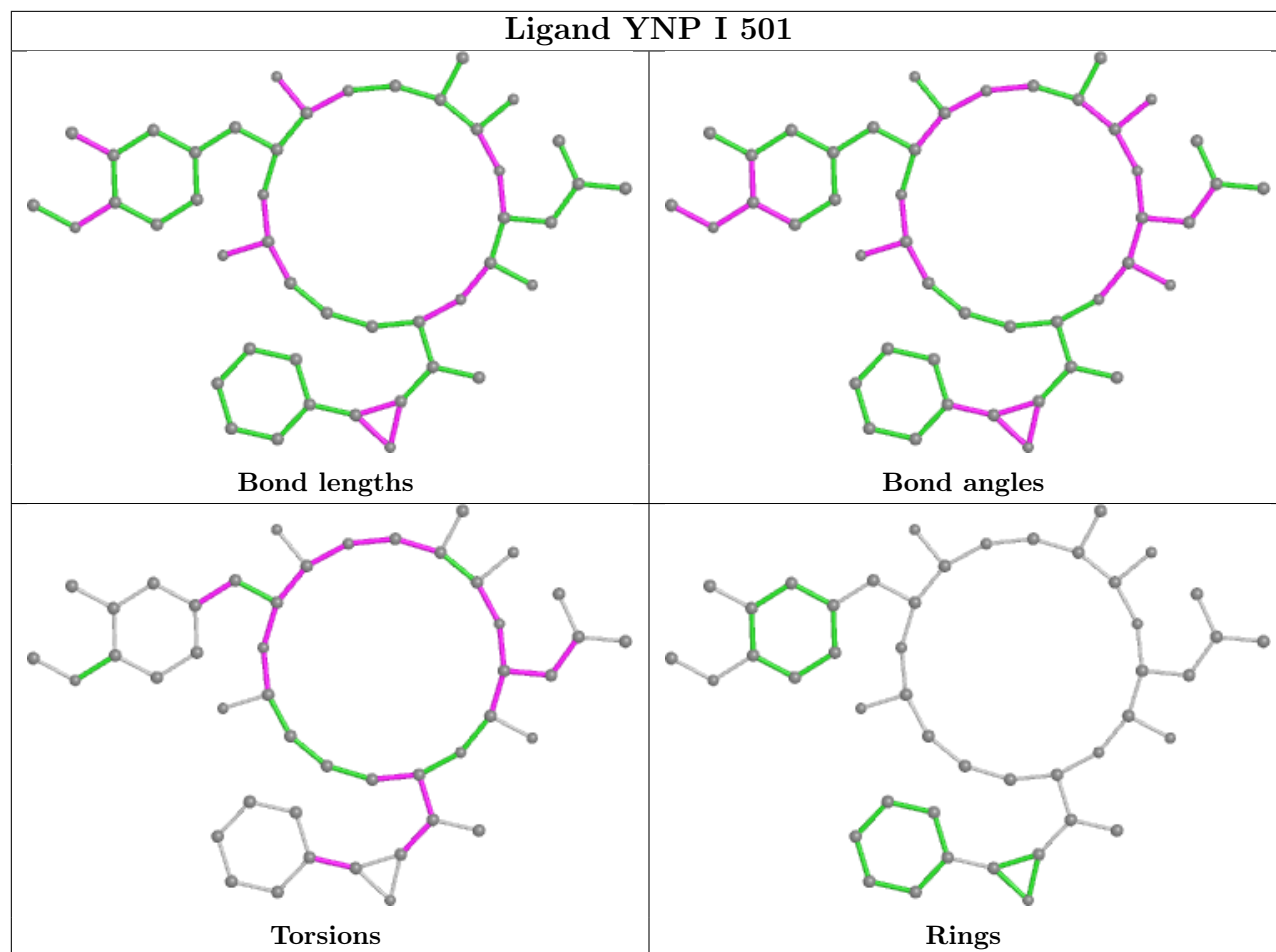


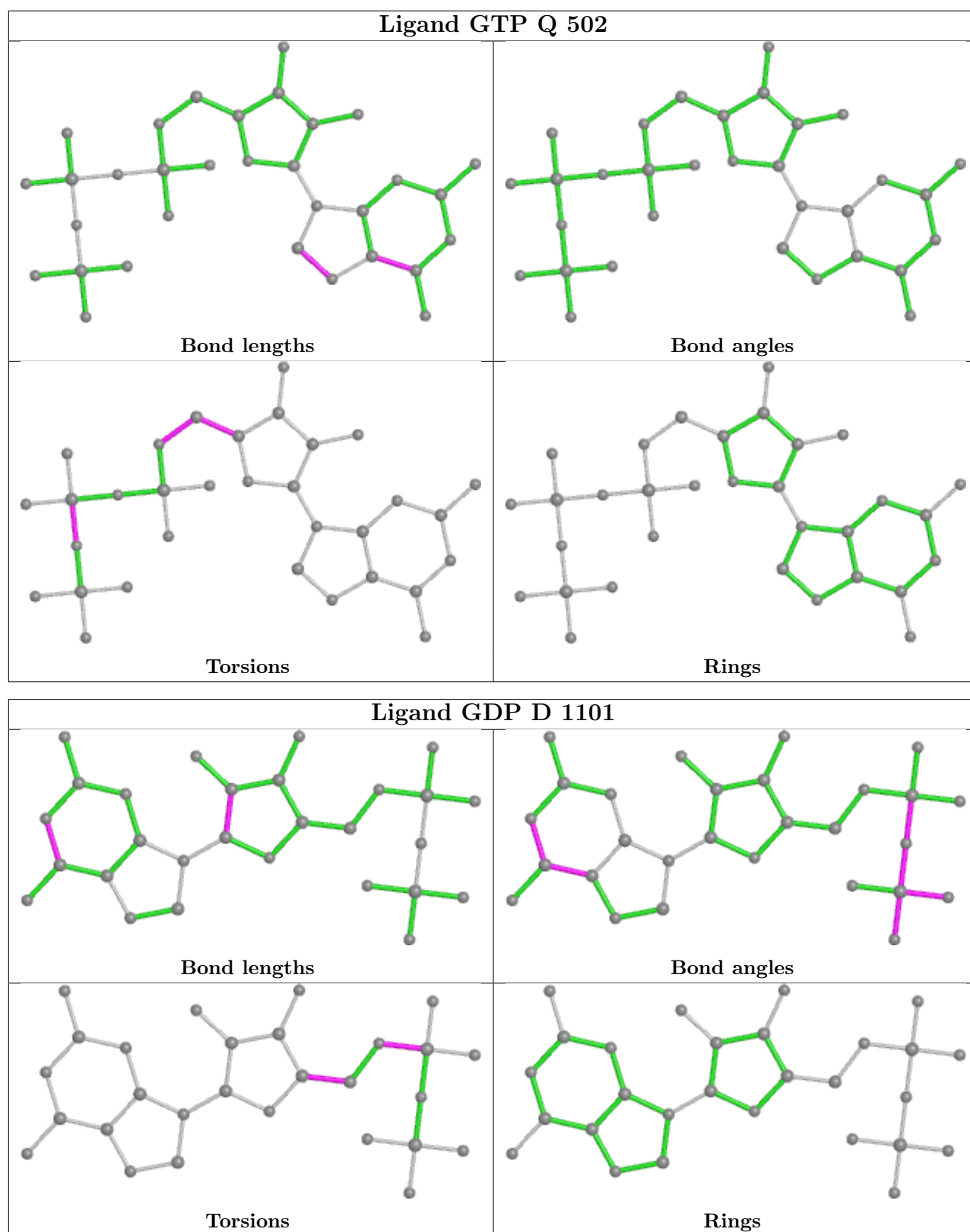


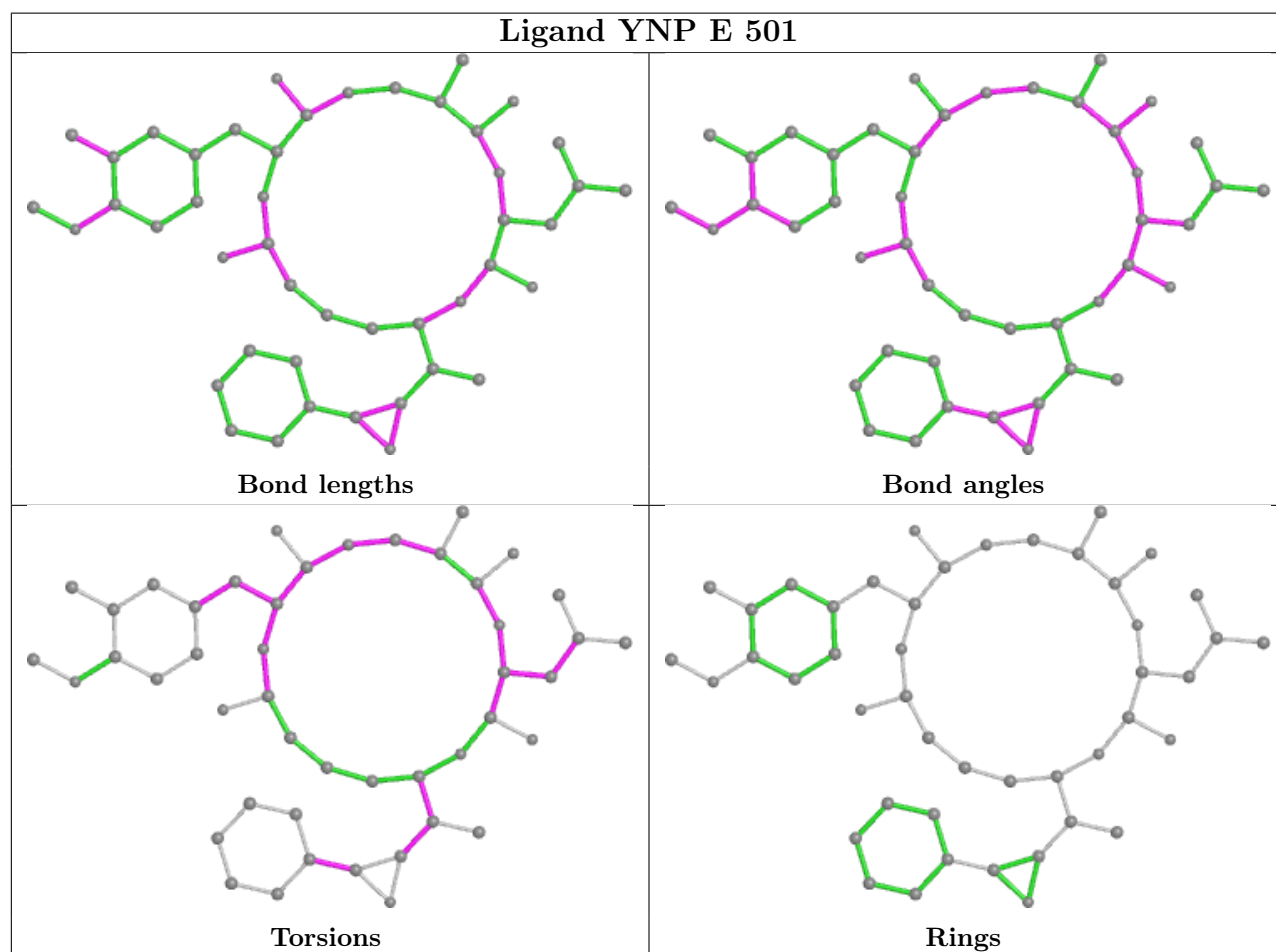
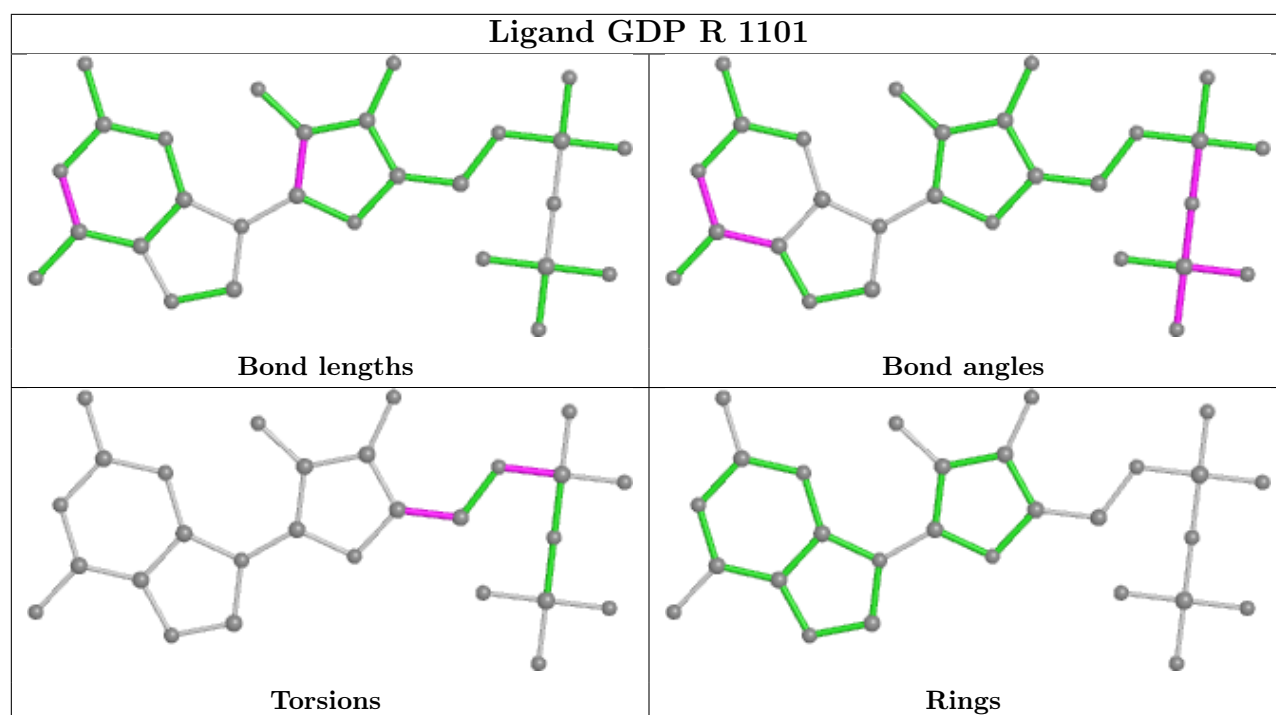


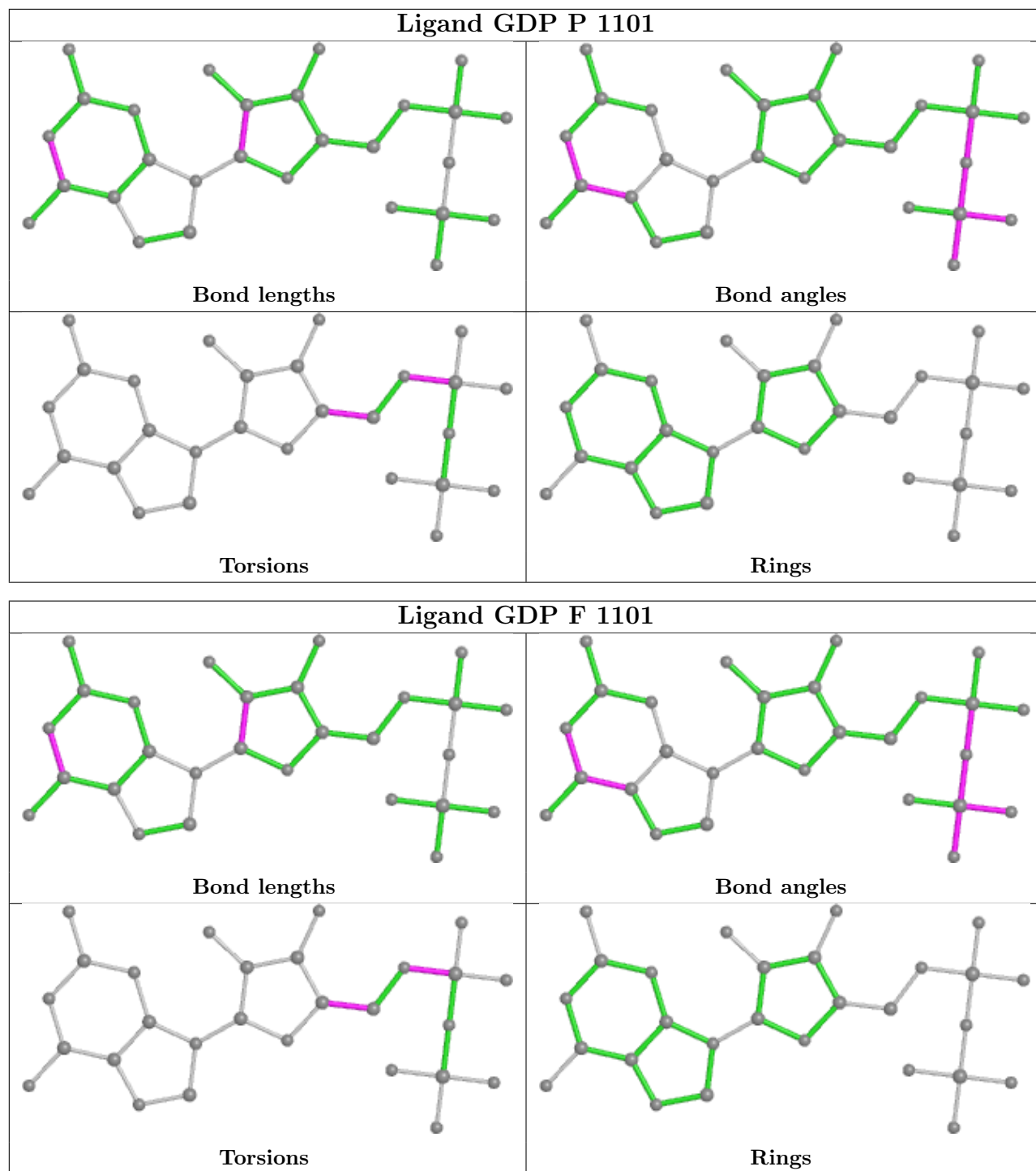


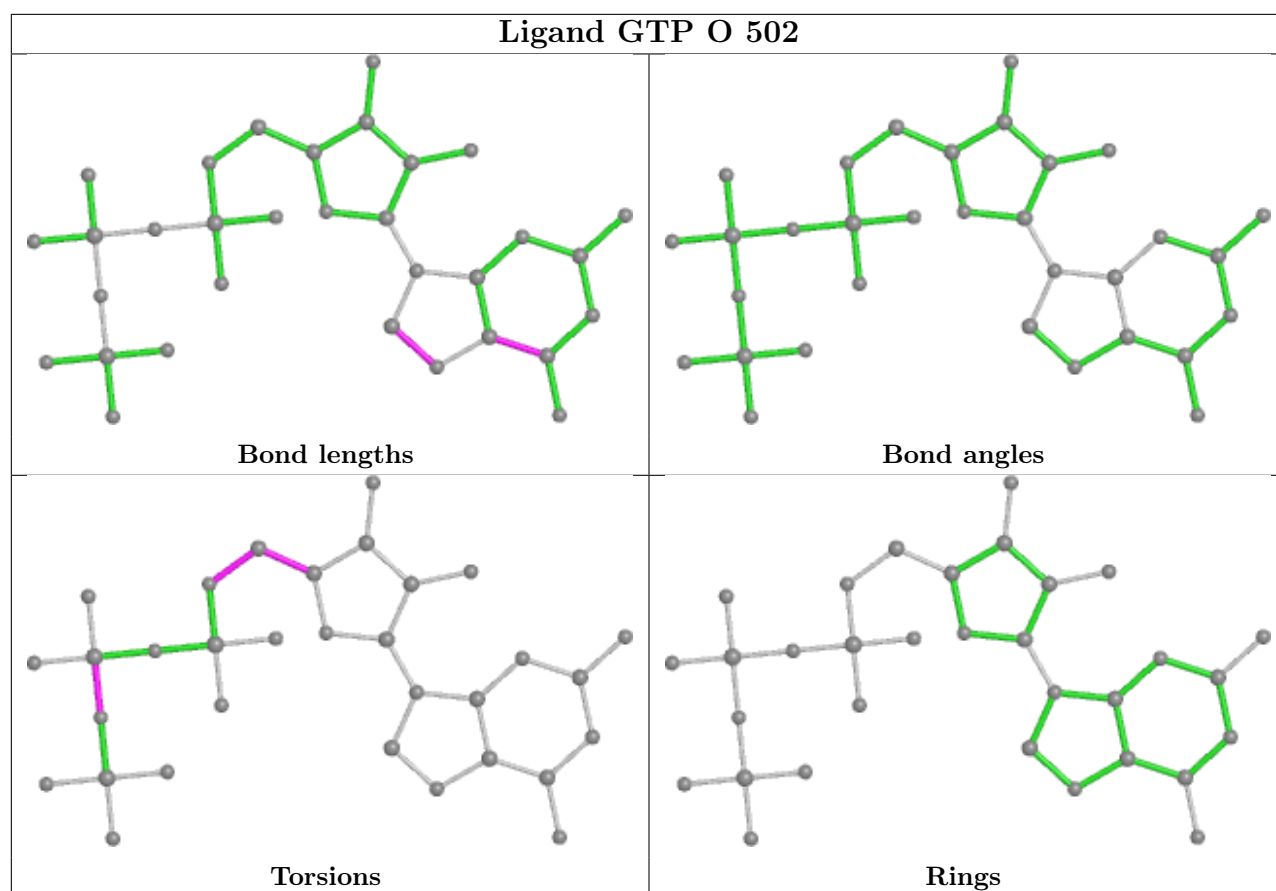












5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

6 Map visualisation

This section contains visualisations of the EMDB entry EMD-23627. 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

This section was not generated.

6.2 Central slices

This section was not generated.

6.3 Largest variance slices

This section was not generated.

6.4 Orthogonal surface views

This section was not generated.

6.5 Mask visualisation

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

7 Map analysis

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

7.1 Map-value distribution

This section was not generated.

7.2 Volume estimate versus contour level

This section was not generated.

7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

8 Fourier-Shell correlation

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

9 Map-model fit

This section was not generated.