



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 3, 2023 – 06:18 AM EDT

PDB ID : 6OCW
Title : Crystal Structure of Mycobacterium tuberculosis Proteasome in Complex with Phenylimidazole-based Inhibitor A85
Authors : Hsu, H.C.; Li, H.
Deposited on : 2019-03-25
Resolution : 2.60 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : **FAILED**
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.35.1

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

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
5	CIT	H	302	-	X	-	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 48175 atoms, of which 175 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Proteasome subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	218	Total 1688	C 1056	N 310	O 318	S 4	0	1	0
1	B	215	Total 1660	C 1041	N 303	O 312	S 4	0	0	0
1	C	216	Total 1664	C 1043	N 304	O 313	S 4	0	0	0
1	D	215	Total 1655	C 1035	N 303	O 313	S 4	0	0	0
1	E	216	Total 1667	C 1045	N 304	O 314	S 4	0	0	0
1	F	214	Total 1664	C 1042	N 306	O 312	S 4	0	1	0
1	G	216	Total 1662	C 1040	N 304	O 314	S 4	0	0	0
1	O	215	Total 1660	C 1040	N 303	O 313	S 4	0	0	0
1	P	216	Total 1667	C 1045	N 304	O 314	S 4	0	0	0
1	Q	215	Total 1660	C 1041	N 303	O 312	S 4	0	0	0
1	R	215	Total 1657	C 1038	N 303	O 312	S 4	0	0	0
1	S	218	Total 1689	C 1056	N 310	O 319	S 4	0	1	0
1	T	217	Total 1671	C 1047	N 305	O 315	S 4	0	0	0
1	U	216	Total 1664	C 1043	N 304	O 313	S 4	0	0	0

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	9	MET	-	initiating methionine	UNP P9WHU1

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Chain	Residue	Modelled	Actual	Comment	Reference
B	9	MET	-	initiating methionine	UNP P9WHU1
C	9	MET	-	initiating methionine	UNP P9WHU1
D	9	MET	-	initiating methionine	UNP P9WHU1
E	9	MET	-	initiating methionine	UNP P9WHU1
F	9	MET	-	initiating methionine	UNP P9WHU1
G	9	MET	-	initiating methionine	UNP P9WHU1
O	9	MET	-	initiating methionine	UNP P9WHU1
P	9	MET	-	initiating methionine	UNP P9WHU1
Q	9	MET	-	initiating methionine	UNP P9WHU1
R	9	MET	-	initiating methionine	UNP P9WHU1
S	9	MET	-	initiating methionine	UNP P9WHU1
T	9	MET	-	initiating methionine	UNP P9WHU1
U	9	MET	-	initiating methionine	UNP P9WHU1

- Molecule 2 is a protein called Proteasome subunit beta.

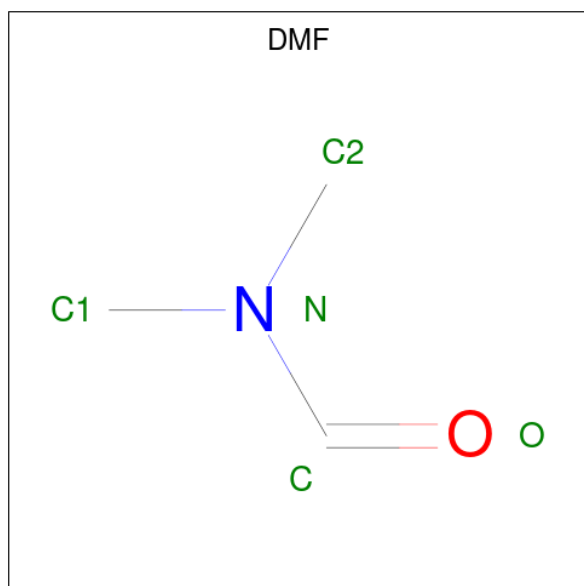
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	222	1638	1027	282	324	5	0	0	0
2	I	222	1638	1027	282	324	5	0	0	0
2	J	222	1638	1027	282	324	5	0	0	0
2	K	223	1642	1029	283	325	5	0	0	0
2	L	223	1642	1029	283	325	5	0	0	0
2	M	222	1638	1027	282	324	5	0	0	0
2	N	223	1642	1029	283	325	5	0	0	0
2	V	223	1642	1029	283	325	5	0	0	0
2	W	223	1642	1029	283	325	5	0	0	0
2	X	222	1638	1027	282	324	5	0	0	0
2	Y	223	1642	1029	283	325	5	0	0	0
2	Z	222	1638	1027	282	324	5	0	0	0
2	a	223	1642	1029	283	325	5	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	b	222	1638	1027	282	324	5	0	0	0

- Molecule 3 is DIMETHYLFORMAMIDE (three-letter code: DMF) (formula: C₃H₇NO).



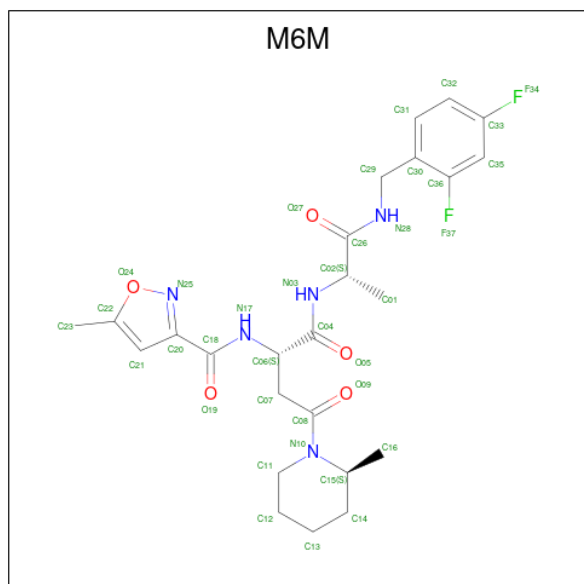
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	H	N	O		
3	A	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	C	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	D	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	E	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	F	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	J	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	O	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	P	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	Q	1	Total 12	C 3	H 7	N 1	O 1	0	0
3	R	1	Total 12	C 3	H 7	N 1	O 1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	R	1	Total	C	H	N	O	0	0
			12	3	7	1	1		
3	S	1	Total	C	H	N	O	0	0
			12	3	7	1	1		
3	T	1	Total	C	H	N	O	0	0
			12	3	7	1	1		
3	U	1	Total	C	H	N	O	0	0
			12	3	7	1	1		
3	a	1	Total	C	H	N	O	0	0
			12	3	7	1	1		

- Molecule 4 is N-{(2S)-1-((2S)-1-[(2,4-difluorobenzyl)amino]-1-oxopropan-2-yl)amino)-4-[(2S)-2-methylpiperidin-1-yl]-1,4-dioxobutan-2-yl}-5-methyl-1,2-oxazole-3-carboxamide (non-preferred name) (three-letter code: M6M) (formula: C₂₅H₃₁F₂N₅O₅).



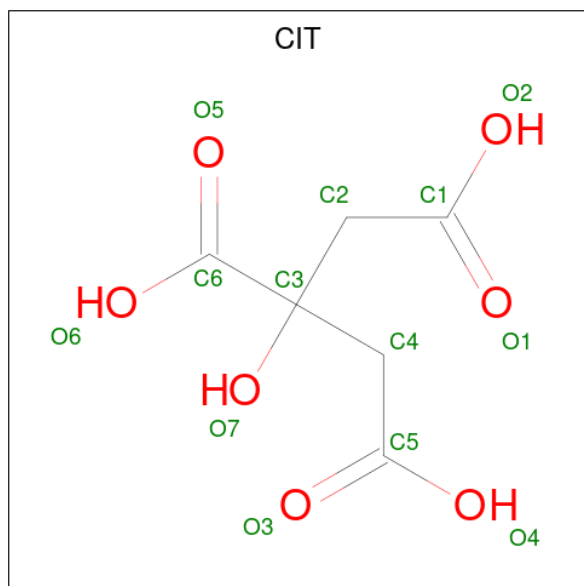
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	H	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	I	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	J	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	K	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	L	1	Total	C	F	N	O	0	0
			37	25	2	5	5		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
4	M	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	N	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	V	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	W	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	X	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	Y	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	Z	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	a	1	Total	C	F	N	O	0	0
			37	25	2	5	5		
4	b	1	Total	C	F	N	O	0	0
			37	25	2	5	5		

- Molecule 5 is CITRIC ACID (three-letter code: CIT) (formula: C₆H₈O₇).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	H	1	Total	C	H	O	0	0
			18	6	5	7		
5	I	1	Total	C	H	O	0	0
			18	6	5	7		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	J	1	Total	C	H	O	0	0
			18	6	5	7		
5	K	1	Total	C	H	O	0	0
			18	6	5	7		
5	L	1	Total	C	H	O	0	0
			18	6	5	7		
5	M	1	Total	C	H	O	0	0
			18	6	5	7		
5	N	1	Total	C	H	O	0	0
			18	6	5	7		
5	V	1	Total	C	H	O	0	0
			18	6	5	7		
5	W	1	Total	C	H	O	0	0
			18	6	5	7		
5	X	1	Total	C	H	O	0	0
			18	6	5	7		
5	Y	1	Total	C	H	O	0	0
			18	6	5	7		
5	Z	1	Total	C	H	O	0	0
			18	6	5	7		
5	a	1	Total	C	H	O	0	0
			18	6	5	7		
5	b	1	Total	C	H	O	0	0
			18	6	5	7		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	20	Total	O	0	0
			20	20		
6	B	18	Total	O	0	0
			18	18		
6	C	19	Total	O	0	0
			19	19		
6	D	20	Total	O	0	0
			20	20		
6	E	19	Total	O	0	0
			19	19		
6	F	17	Total	O	0	0
			17	17		
6	G	32	Total	O	0	0
			32	32		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	H	33	Total 33	O 33	0	0
6	I	42	Total 42	O 42	0	0
6	J	45	Total 45	O 45	0	0
6	K	45	Total 45	O 45	0	0
6	L	45	Total 45	O 45	0	0
6	M	45	Total 45	O 45	0	0
6	N	43	Total 43	O 43	0	0
6	O	24	Total 24	O 24	0	0
6	P	22	Total 22	O 22	0	0
6	Q	35	Total 35	O 35	0	0
6	R	24	Total 24	O 24	0	0
6	S	30	Total 30	O 30	0	0
6	T	19	Total 19	O 19	0	0
6	U	22	Total 22	O 22	0	0
6	V	53	Total 53	O 53	0	0
6	W	47	Total 47	O 47	0	0
6	X	47	Total 47	O 47	0	0
6	Y	42	Total 42	O 42	0	0
6	Z	50	Total 50	O 50	0	0
6	a	38	Total 38	O 38	0	0
6	b	41	Total 41	O 41	0	0

MolProbity and EDS failed to run properly - this section is therefore empty.

3 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	120.18Å 198.65Å 166.35Å 90.00° 103.58° 90.00°	Depositor
Resolution (Å)	42.82 – 2.60	Depositor
% Data completeness (in resolution range)	96.6 (42.82-2.60)	Depositor
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.14 (at 2.61Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.185 , 0.241	Depositor
Wilson B-factor (Å ²)	29.0	Xtriage
Anisotropy	0.358	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	48175	wwPDB-VP
Average B, all atoms (Å ²)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.87% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality [i](#)

4.1 Standard geometry [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains [i](#)

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA [i](#)

MolProbity failed to run properly - this section is therefore empty.

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

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

4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

4.6 Ligand geometry [i](#)

43 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
4	M6M	a	301	-	37,39,39	3.10	13 (35%)	46,54,54	2.67	16 (34%)
5	CIT	J	302	-	12,12,12	1.12	0	17,17,17	1.87	5 (29%)
3	DMF	J	303	-	4,4,4	0.31	0	4,4,4	0.32	0
4	M6M	K	301	-	37,39,39	3.06	14 (37%)	46,54,54	2.48	13 (28%)
4	M6M	N	301	-	37,39,39	3.16	13 (35%)	46,54,54	2.57	16 (34%)
4	M6M	V	301	-	37,39,39	3.08	11 (29%)	46,54,54	2.42	17 (36%)
5	CIT	H	302	-	12,12,12	0.98	0	17,17,17	2.42	9 (52%)
3	DMF	S	301	-	4,4,4	0.31	0	4,4,4	0.37	0
5	CIT	I	302	-	12,12,12	1.11	0	17,17,17	2.12	5 (29%)
5	CIT	a	302	-	12,12,12	1.09	0	17,17,17	1.85	3 (17%)
5	CIT	V	302	-	12,12,12	1.05	0	17,17,17	2.21	8 (47%)
3	DMF	U	301	-	4,4,4	0.42	0	4,4,4	0.60	0
4	M6M	I	301	-	37,39,39	3.07	12 (32%)	46,54,54	2.61	12 (26%)
3	DMF	F	301	-	4,4,4	0.33	0	4,4,4	0.50	0
3	DMF	R	301	-	4,4,4	0.35	0	4,4,4	0.50	0
4	M6M	M	301	-	37,39,39	2.97	12 (32%)	46,54,54	2.73	18 (39%)
4	M6M	L	301	-	37,39,39	2.99	13 (35%)	46,54,54	2.64	12 (26%)
4	M6M	X	301	-	37,39,39	2.88	13 (35%)	46,54,54	2.54	15 (32%)
3	DMF	A	301	-	4,4,4	0.41	0	4,4,4	0.28	0
3	DMF	R	302	-	4,4,4	0.36	0	4,4,4	0.54	0
5	CIT	K	302	-	12,12,12	0.93	0	17,17,17	1.85	3 (17%)
3	DMF	P	301	-	4,4,4	0.44	0	4,4,4	0.71	0
3	DMF	C	301	-	4,4,4	0.37	0	4,4,4	0.45	0
3	DMF	T	301	-	4,4,4	0.41	0	4,4,4	0.44	0
5	CIT	Z	302	-	12,12,12	1.03	0	17,17,17	2.00	6 (35%)
5	CIT	X	302	-	12,12,12	1.21	1 (8%)	17,17,17	1.89	5 (29%)
5	CIT	b	302	-	12,12,12	1.19	1 (8%)	17,17,17	2.18	5 (29%)
3	DMF	O	301	-	4,4,4	0.46	0	4,4,4	0.51	0
5	CIT	Y	302	-	12,12,12	1.20	0	17,17,17	2.08	5 (29%)
4	M6M	Z	301	-	37,39,39	3.08	14 (37%)	46,54,54	2.48	13 (28%)
5	CIT	M	302	-	12,12,12	1.06	0	17,17,17	1.78	6 (35%)
5	CIT	W	302	-	12,12,12	1.23	0	17,17,17	2.68	7 (41%)
3	DMF	a	303	-	4,4,4	0.44	0	4,4,4	0.38	0
4	M6M	b	301	-	37,39,39	3.09	13 (35%)	46,54,54	2.72	16 (34%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	M6M	H	301	-	37,39,39	3.11	14 (37%)	46,54,54	2.54	16 (34%)
3	DMF	Q	301	-	4,4,4	0.42	0	4,4,4	0.64	0
4	M6M	Y	301	-	37,39,39	3.02	12 (32%)	46,54,54	2.41	12 (26%)
4	M6M	J	301	-	37,39,39	3.10	13 (35%)	46,54,54	2.70	16 (34%)
3	DMF	D	301	-	4,4,4	0.36	0	4,4,4	0.29	0
4	M6M	W	301	-	37,39,39	3.04	13 (35%)	46,54,54	2.49	14 (30%)
5	CIT	L	302	-	12,12,12	1.02	0	17,17,17	1.57	2 (11%)
5	CIT	N	302	-	12,12,12	1.01	0	17,17,17	1.61	2 (11%)
3	DMF	E	301	-	4,4,4	0.43	0	4,4,4	0.43	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
4	M6M	a	301	-	-	3/30/44/44	0/3/3/3
5	CIT	J	302	-	-	8/16/16/16	-
3	DMF	J	303	-	-	2/2/2/2	-
4	M6M	K	301	-	-	3/30/44/44	0/3/3/3
4	M6M	N	301	-	-	3/30/44/44	1/3/3/3
4	M6M	V	301	-	-	3/30/44/44	0/3/3/3
5	CIT	H	302	-	-	9/16/16/16	-
3	DMF	S	301	-	-	0/2/2/2	-
5	CIT	I	302	-	-	8/16/16/16	-
5	CIT	a	302	-	-	8/16/16/16	-
5	CIT	V	302	-	-	7/16/16/16	-
3	DMF	U	301	-	-	0/2/2/2	-
4	M6M	I	301	-	-	2/30/44/44	0/3/3/3
3	DMF	F	301	-	-	0/2/2/2	-
3	DMF	R	301	-	-	0/2/2/2	-
4	M6M	M	301	-	-	2/30/44/44	0/3/3/3
4	M6M	L	301	-	-	2/30/44/44	0/3/3/3
4	M6M	X	301	-	-	3/30/44/44	0/3/3/3
3	DMF	A	301	-	-	0/2/2/2	-
3	DMF	R	302	-	-	2/2/2/2	-
5	CIT	K	302	-	-	7/16/16/16	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DMF	P	301	-	-	2/2/2/2	-
3	DMF	C	301	-	-	2/2/2/2	-
3	DMF	T	301	-	-	0/2/2/2	-
5	CIT	Z	302	-	-	10/16/16/16	-
5	CIT	X	302	-	-	6/16/16/16	-
5	CIT	b	302	-	-	6/16/16/16	-
3	DMF	O	301	-	-	0/2/2/2	-
5	CIT	Y	302	-	-	8/16/16/16	-
4	M6M	Z	301	-	-	3/30/44/44	1/3/3/3
5	CIT	M	302	-	-	11/16/16/16	-
5	CIT	W	302	-	-	9/16/16/16	-
3	DMF	a	303	-	-	1/2/2/2	-
4	M6M	b	301	-	-	2/30/44/44	1/3/3/3
4	M6M	H	301	-	-	2/30/44/44	1/3/3/3
3	DMF	Q	301	-	-	2/2/2/2	-
4	M6M	Y	301	-	-	2/30/44/44	1/3/3/3
4	M6M	J	301	-	-	3/30/44/44	0/3/3/3
3	DMF	D	301	-	-	0/2/2/2	-
4	M6M	W	301	-	-	2/30/44/44	1/3/3/3
5	CIT	L	302	-	-	8/16/16/16	-
5	CIT	N	302	-	-	8/16/16/16	-
3	DMF	E	301	-	-	0/2/2/2	-

The worst 5 of 182 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	N	301	M6M	C15-N10	10.16	1.59	1.47
4	V	301	M6M	C15-N10	9.93	1.59	1.47
4	b	301	M6M	C15-N10	9.70	1.59	1.47
4	J	301	M6M	C15-N10	9.50	1.58	1.47
4	I	301	M6M	C15-N10	9.29	1.58	1.47

The worst 5 of 277 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	a	301	M6M	C11-N10-C15	-13.64	91.91	114.92
4	M	301	M6M	C11-N10-C15	-12.62	93.63	114.92
4	I	301	M6M	C11-N10-C15	-12.59	93.67	114.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	L	301	M6M	C11-N10-C15	-12.53	93.79	114.92
4	J	301	M6M	C11-N10-C15	-12.10	94.52	114.92

There are no chirality outliers.

5 of 159 torsion outliers are listed below:

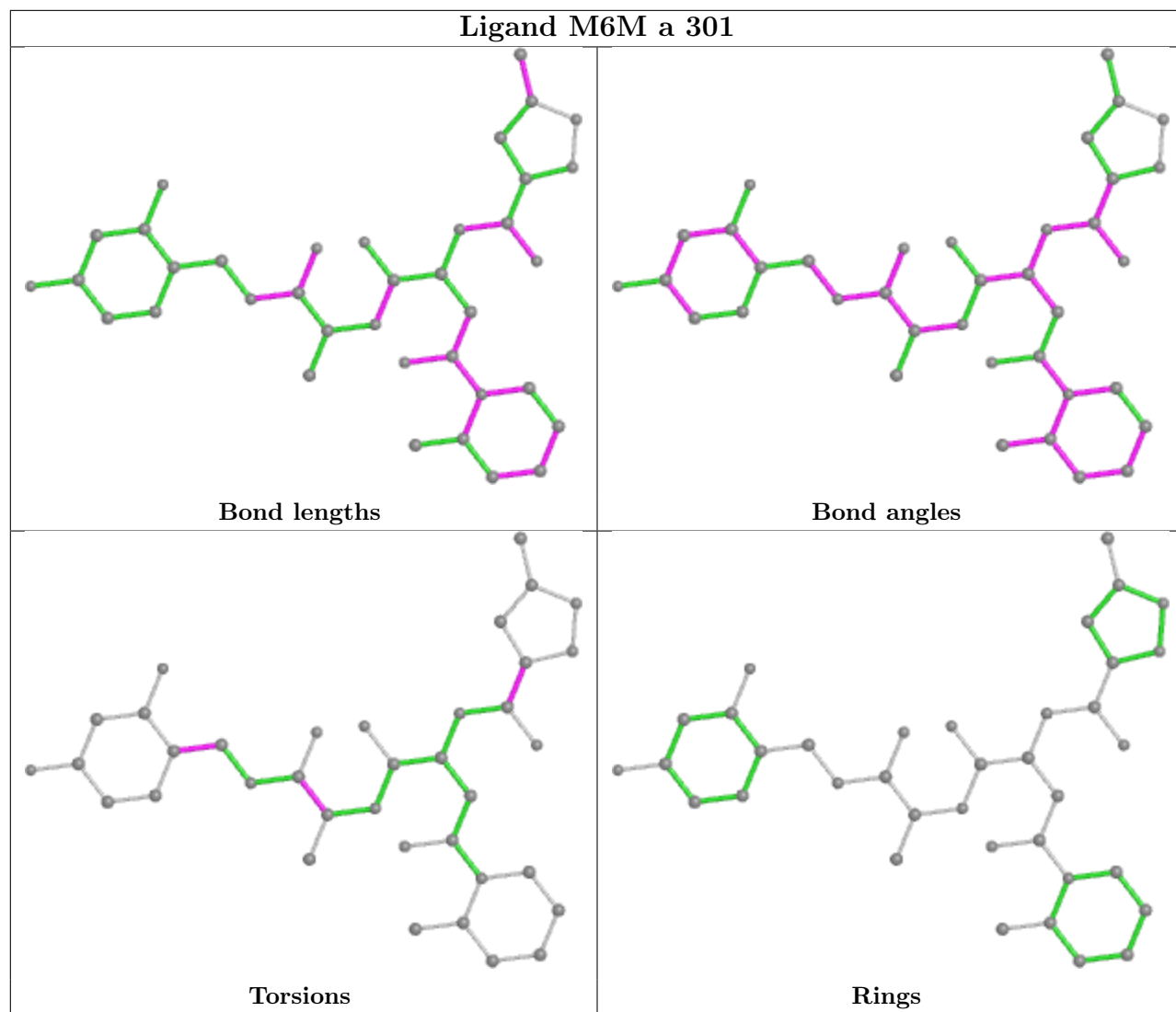
Mol	Chain	Res	Type	Atoms
4	L	301	M6M	O19-C18-C20-C21
4	N	301	M6M	O19-C18-C20-C21
4	W	301	M6M	O19-C18-C20-C21
4	X	301	M6M	O19-C18-C20-C21
4	Y	301	M6M	O19-C18-C20-C21

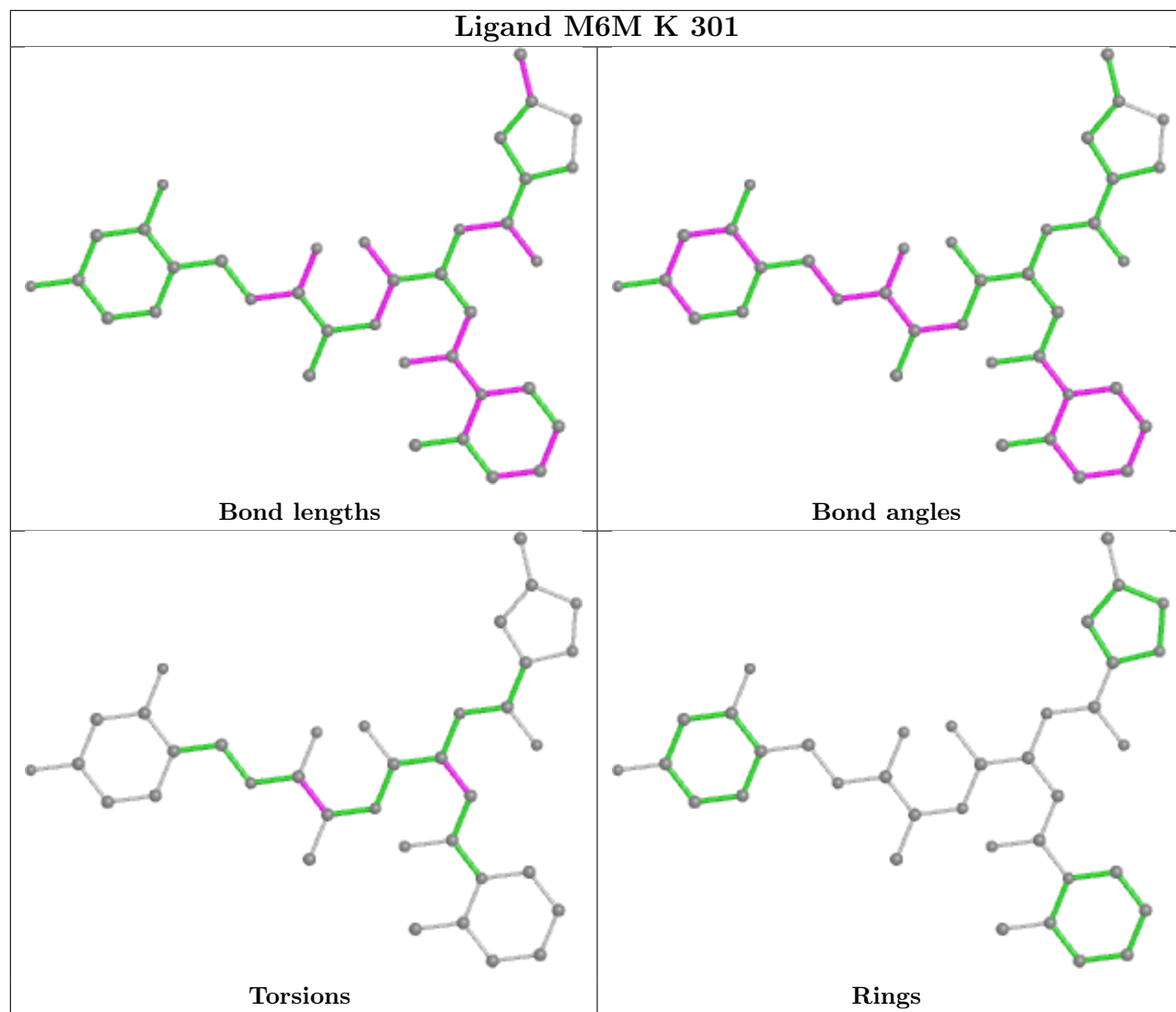
5 of 6 ring outliers are listed below:

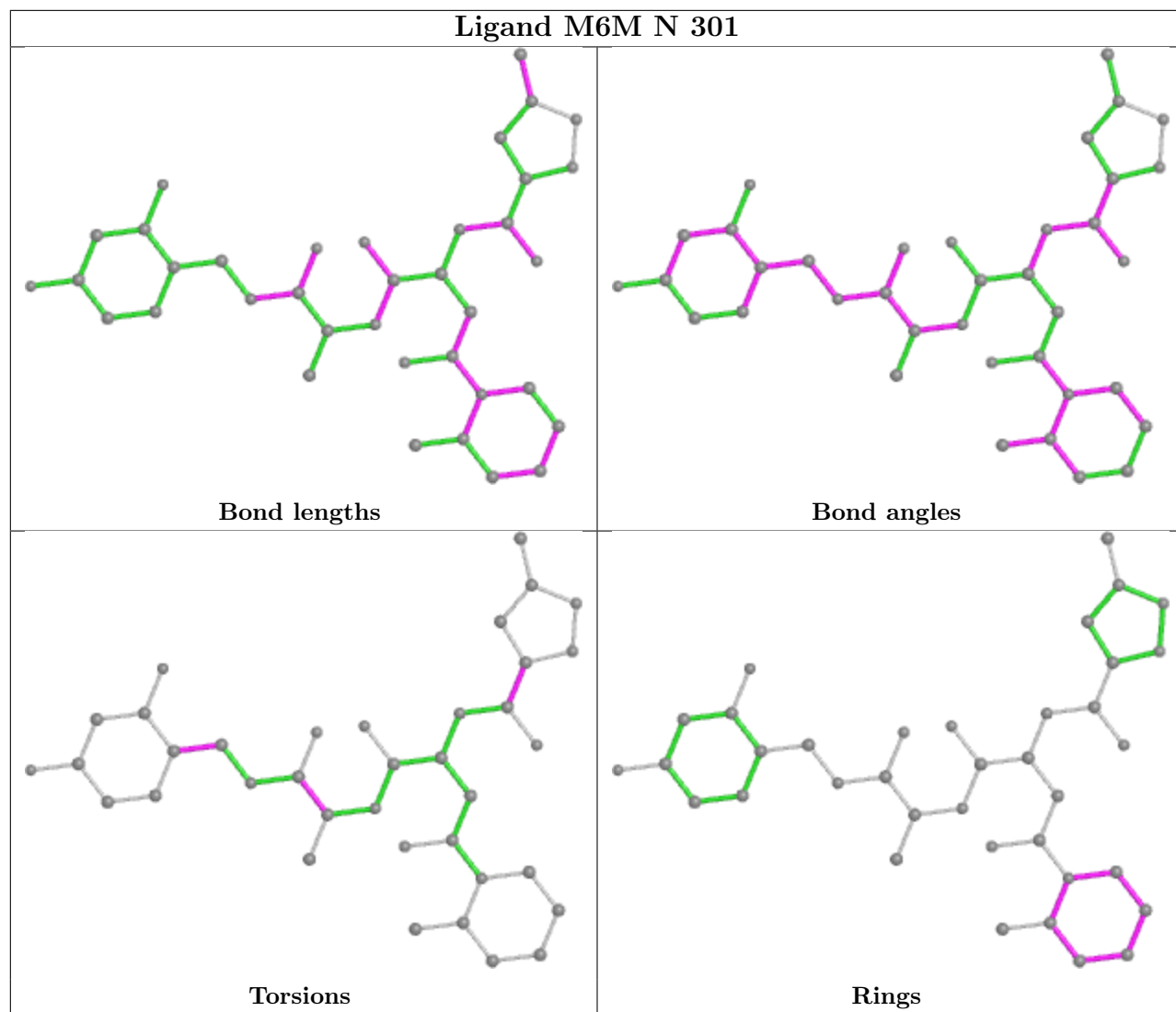
Mol	Chain	Res	Type	Atoms
4	W	301	M6M	C11-C12-C13-C14-C15-N10
4	b	301	M6M	C11-C12-C13-C14-C15-N10
4	N	301	M6M	C11-C12-C13-C14-C15-N10
4	Z	301	M6M	C11-C12-C13-C14-C15-N10
4	Y	301	M6M	C11-C12-C13-C14-C15-N10

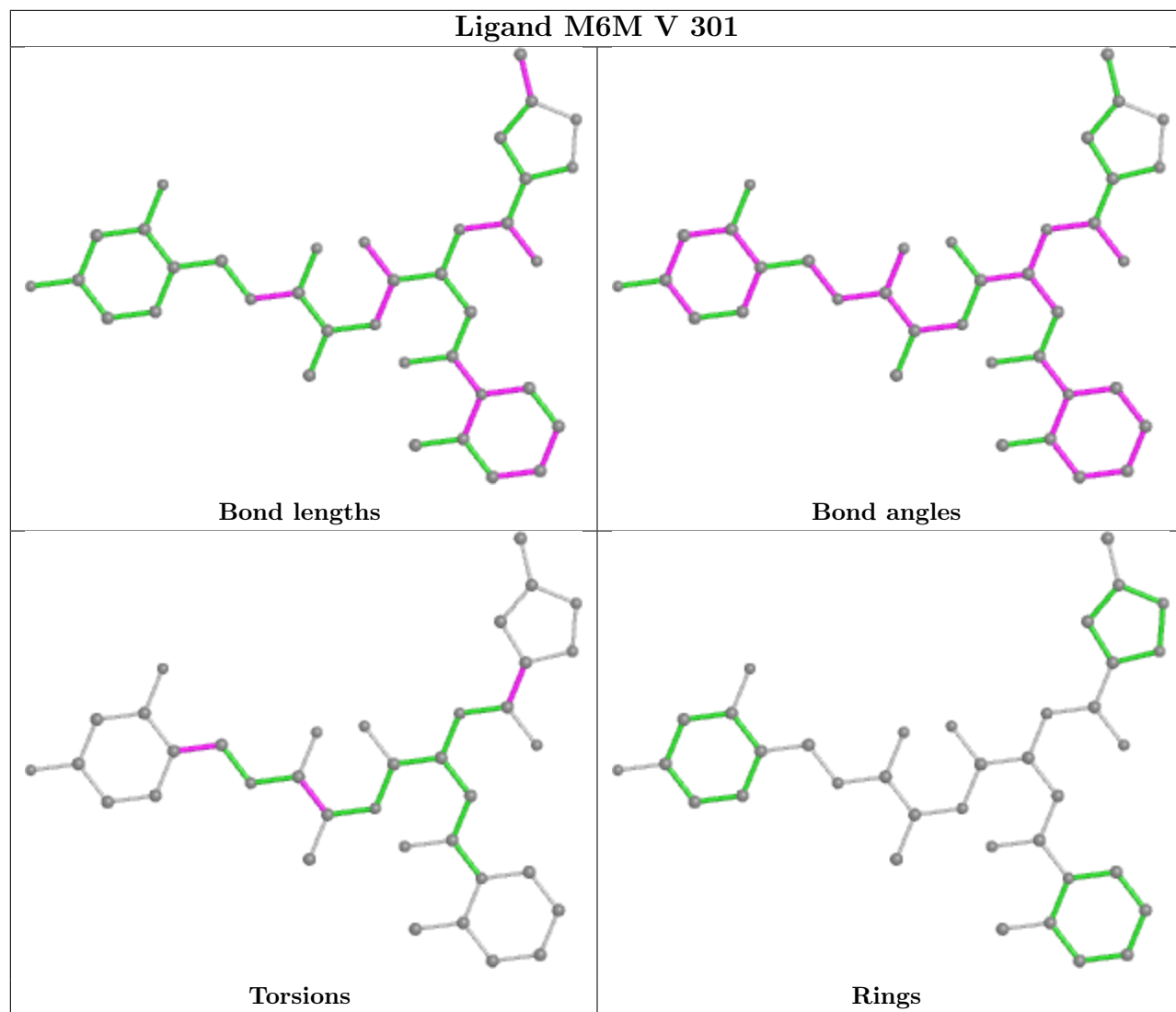
No monomer is involved in short contacts.

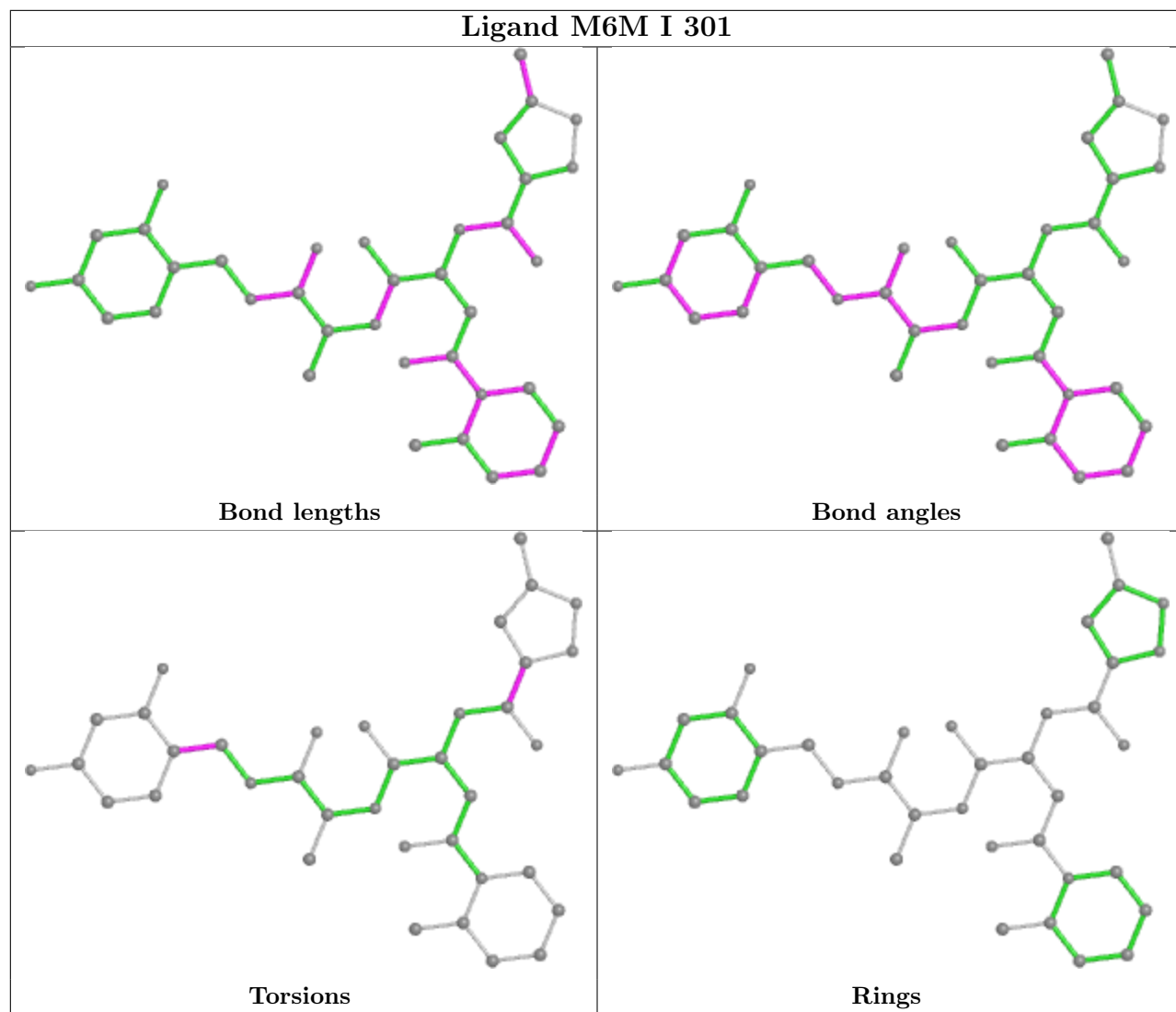
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

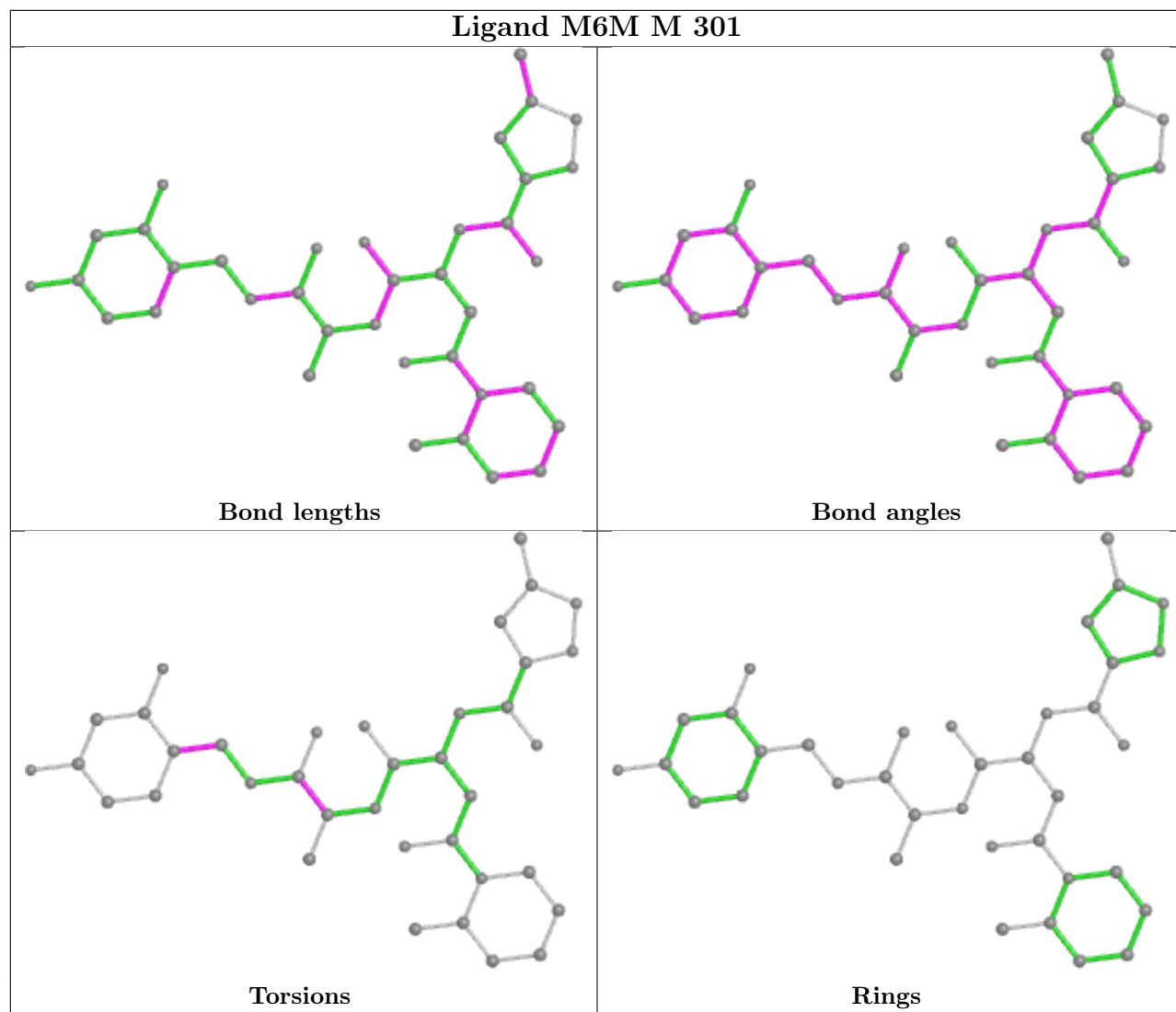


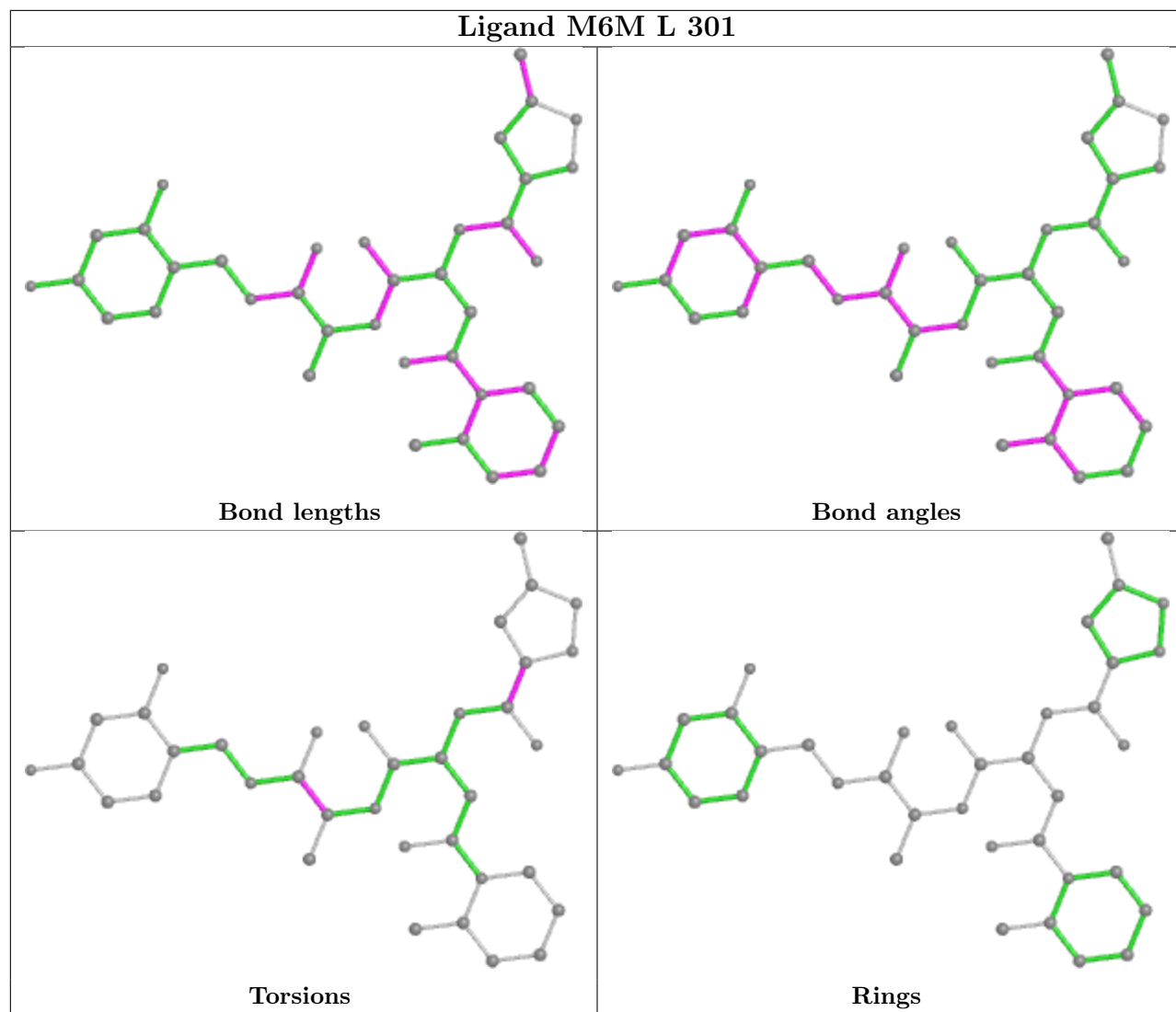


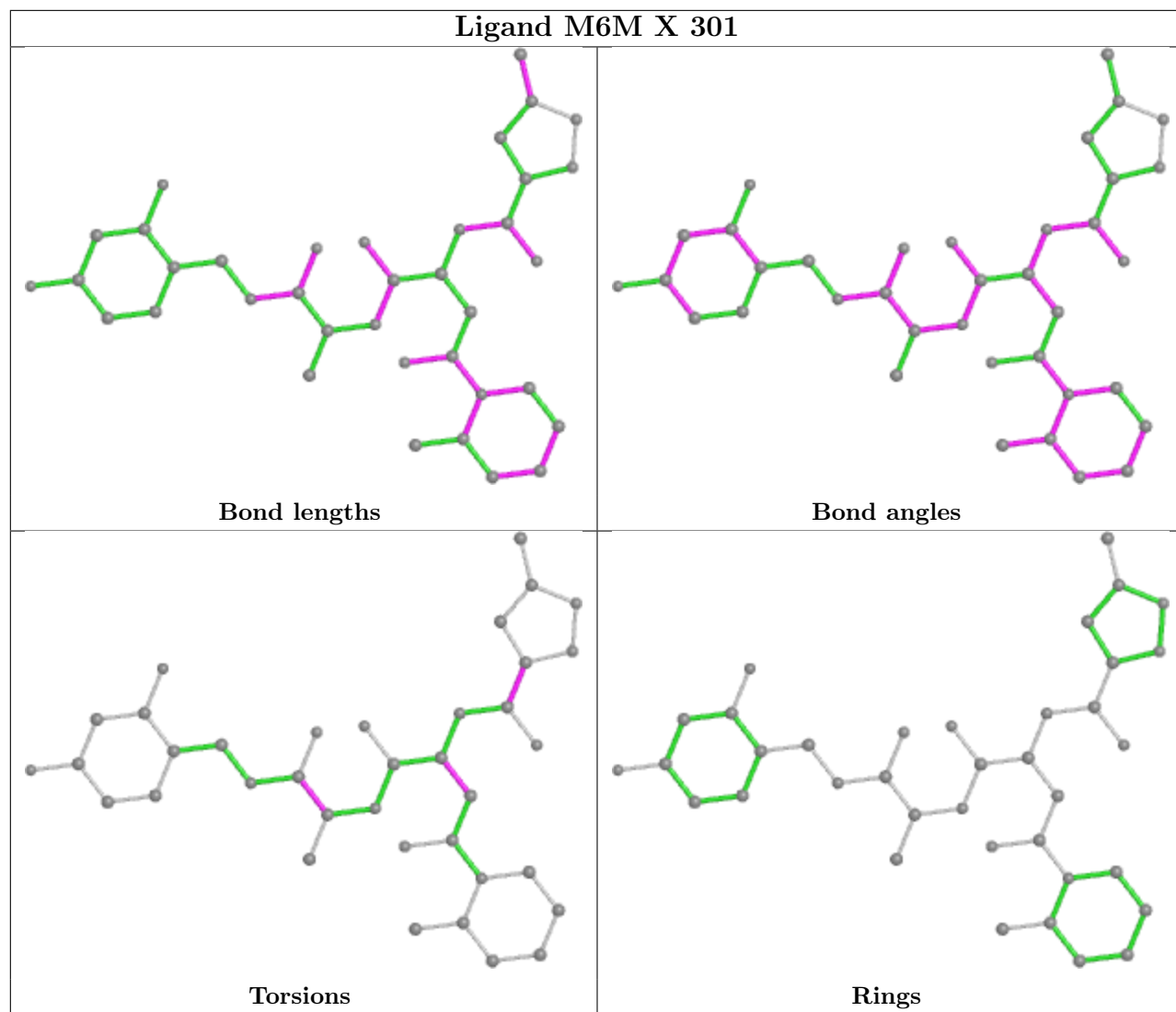


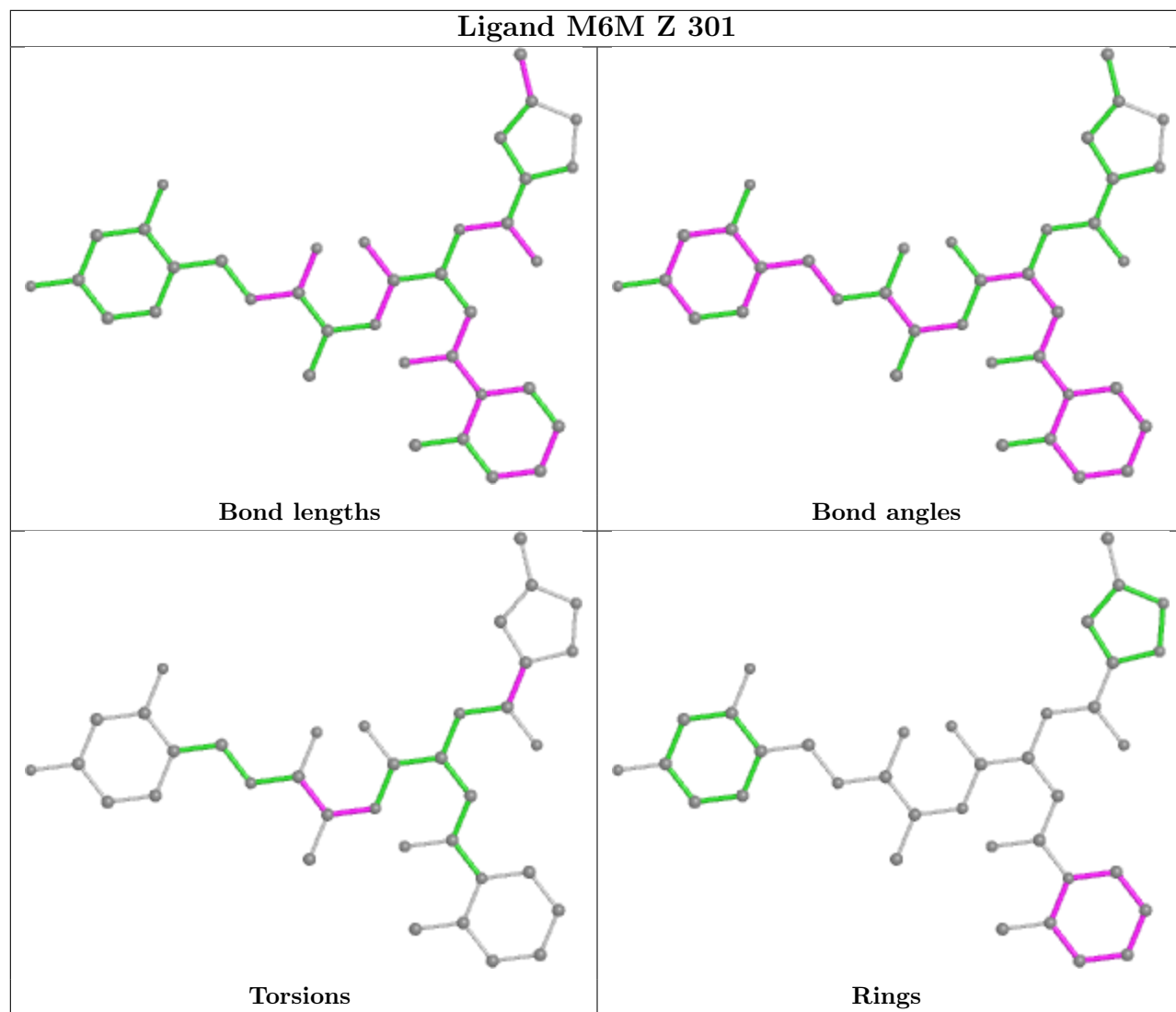


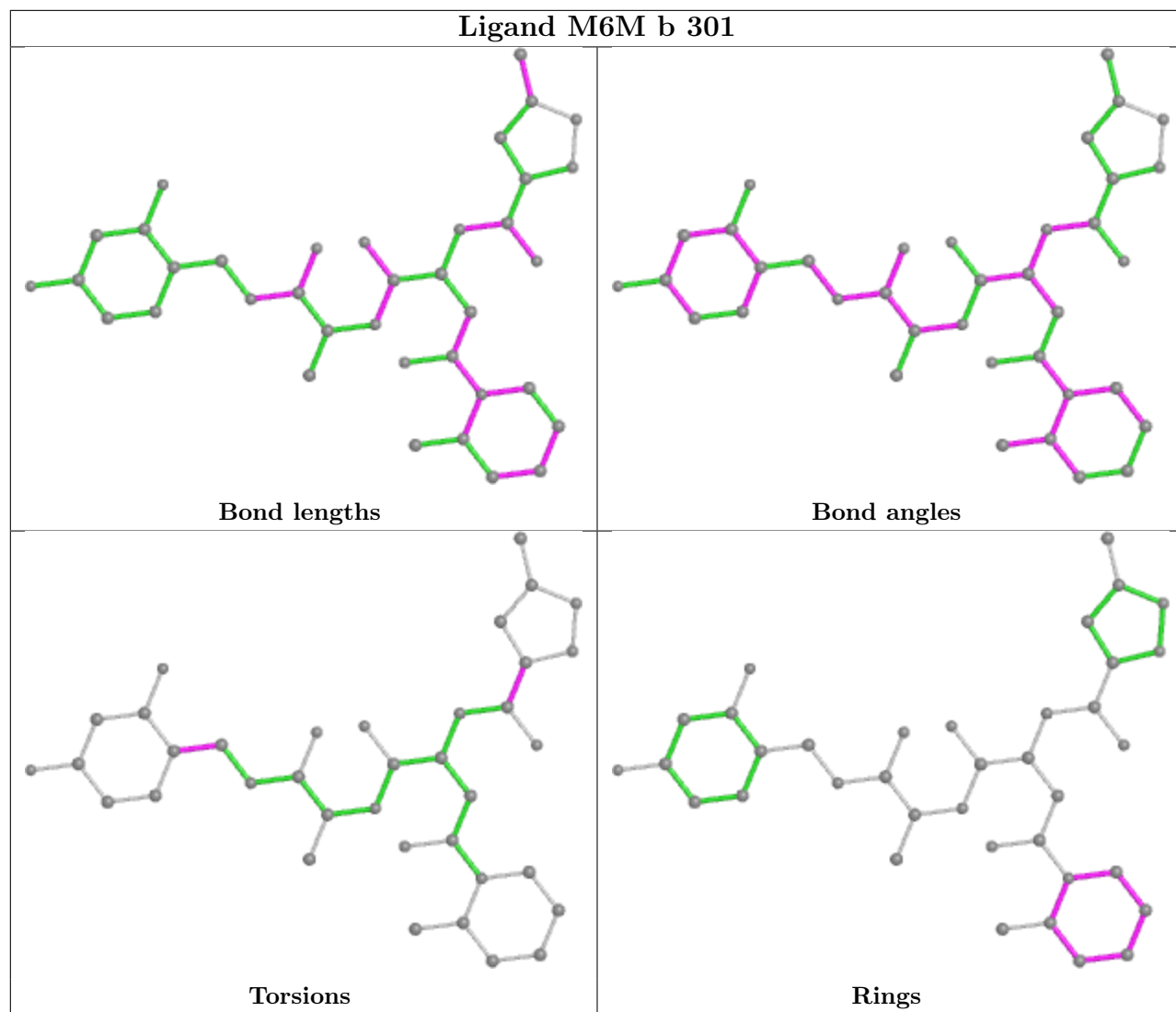


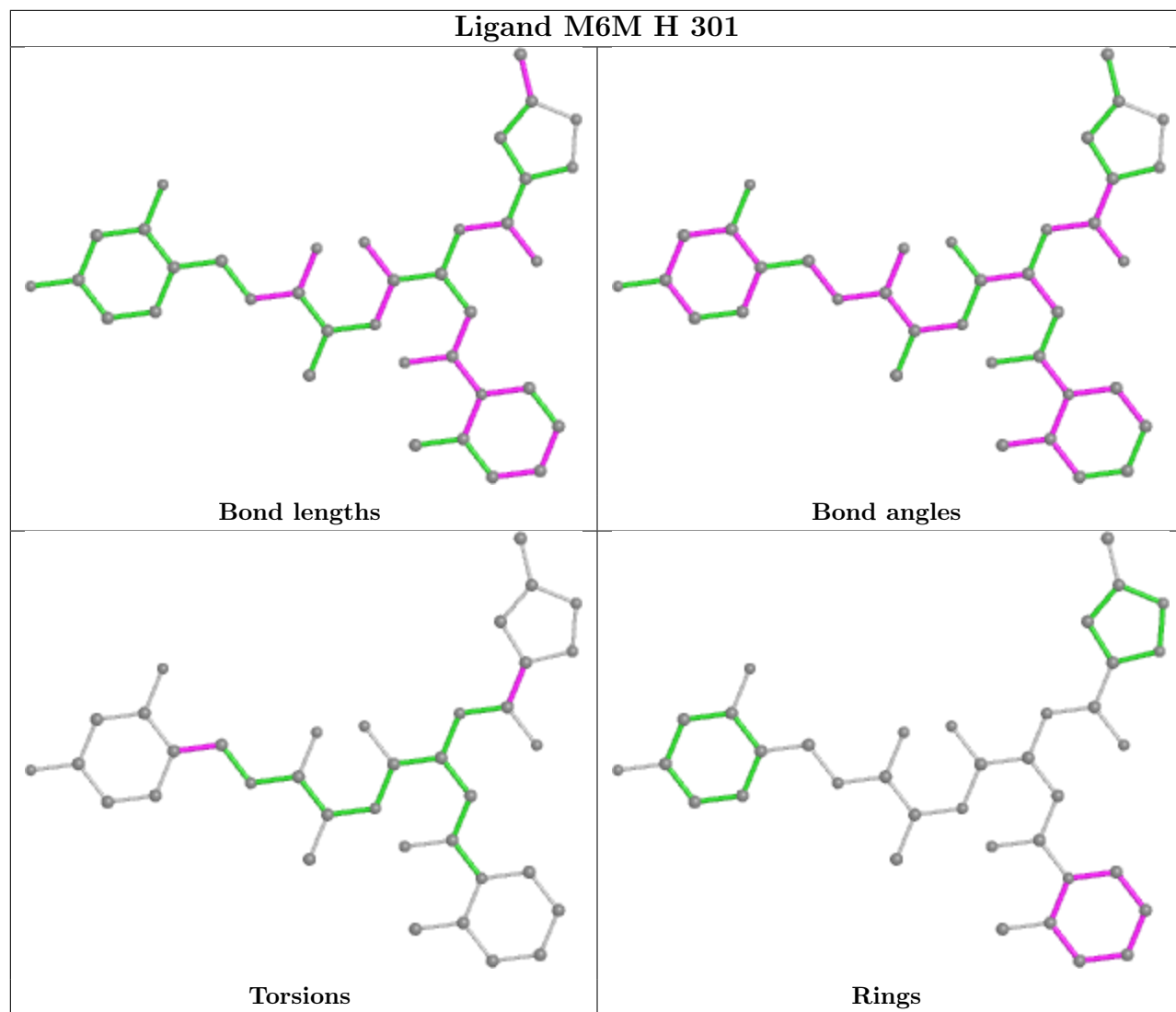


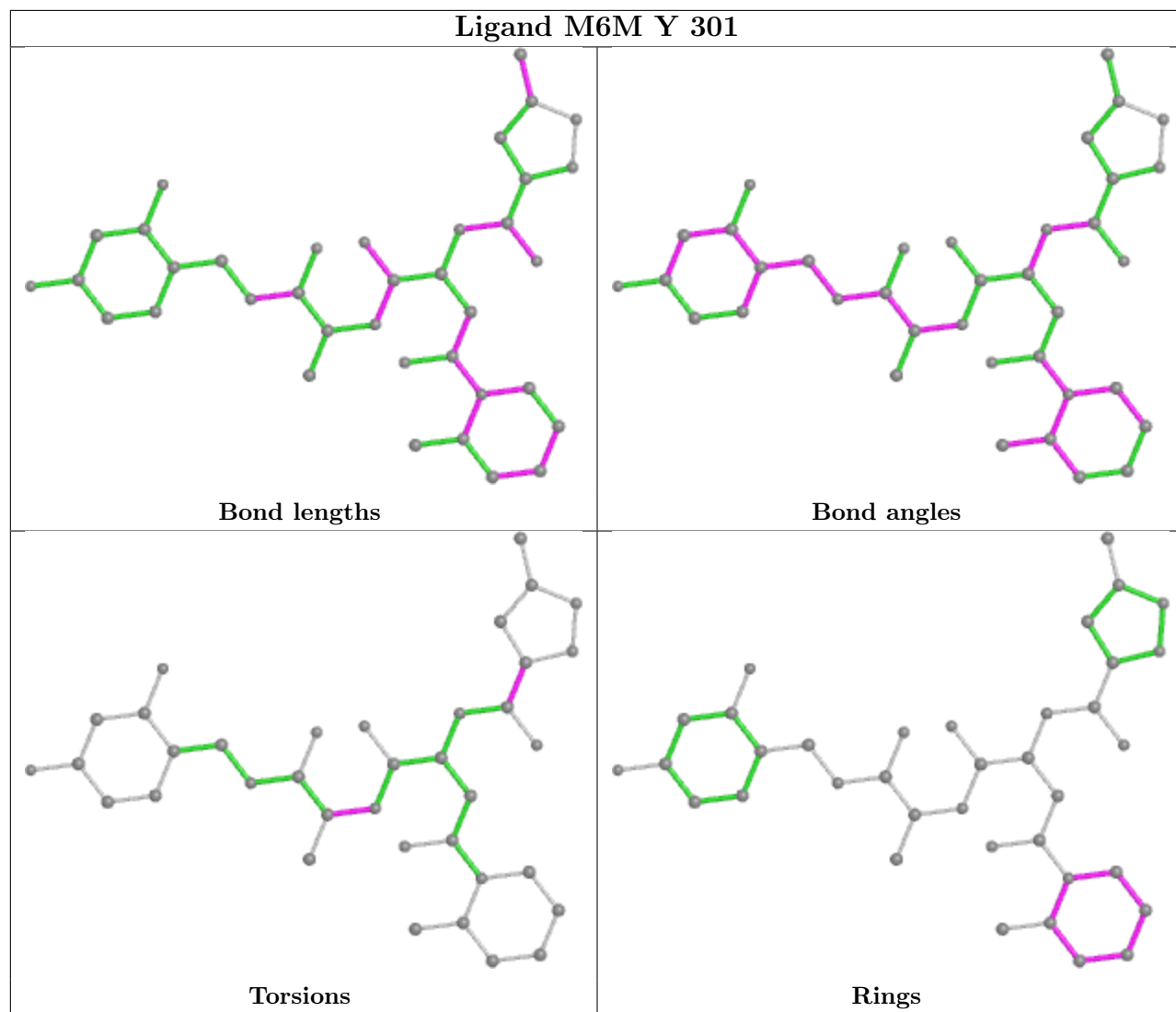


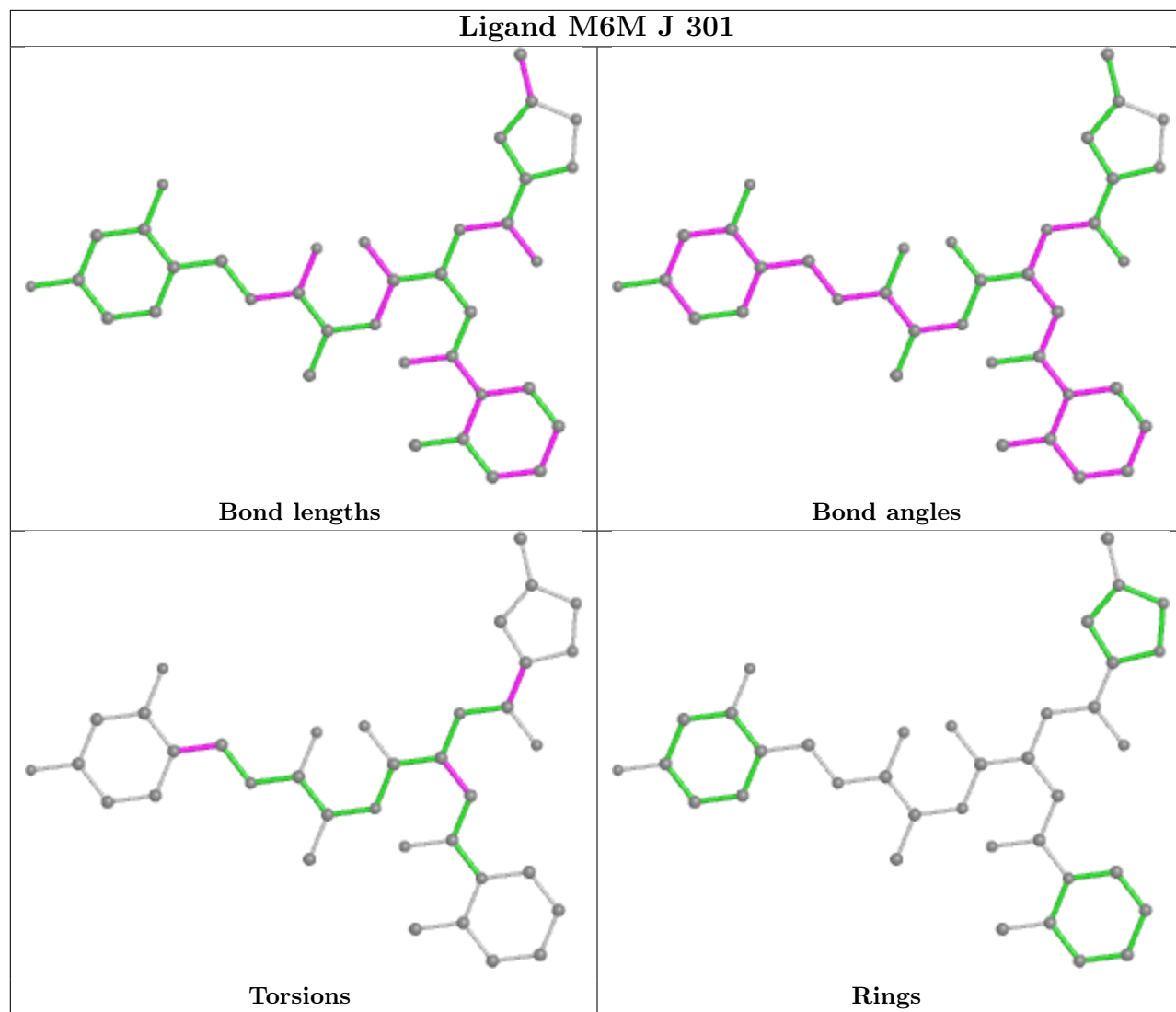


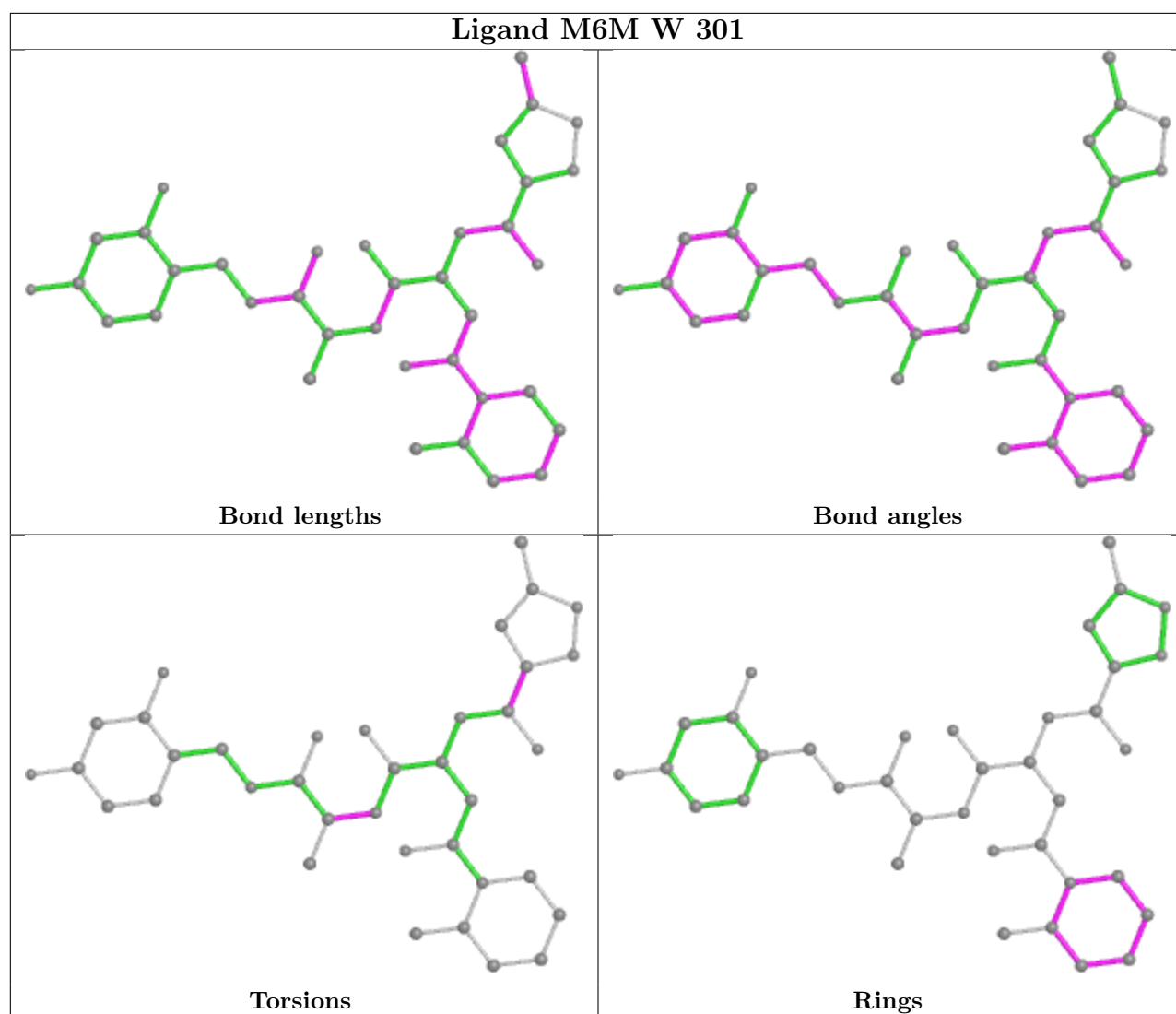












4.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

5 Fit of model and data

5.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

5.2 Non-standard residues in protein, DNA, RNA chains

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

5.4 Ligands

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers

EDS failed to run properly - this section is therefore empty.