



wwPDB EM Validation Summary Report ⓘ

Dec 12, 2022 – 01:52 am GMT

PDB ID : 6TMG
EMDB ID : EMD-10520
Title : Cryo-EM structure of Toxoplasma gondii mitochondrial ATP synthase dimer, membrane region model
Authors : Muhleip, A.; Kock Flygaard, R.; Amunts, A.
Deposited on : 2019-12-04
Resolution : 2.80 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:

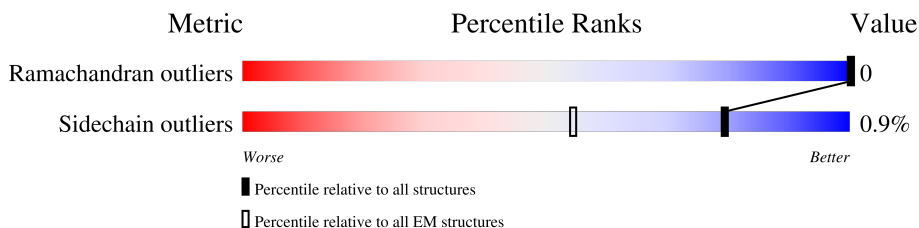
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

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 2.80 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.



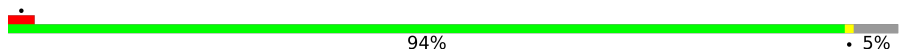

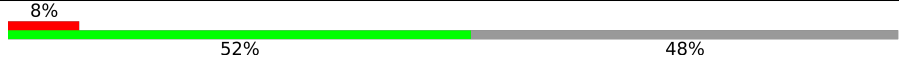
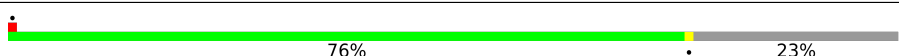
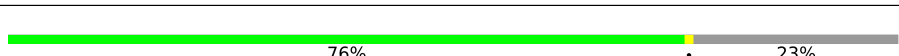
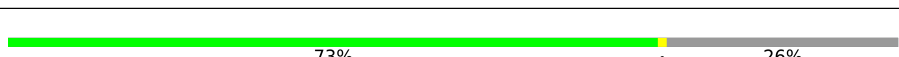
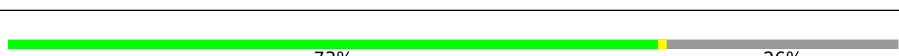
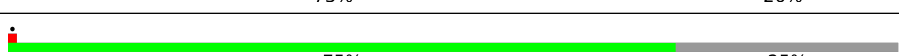
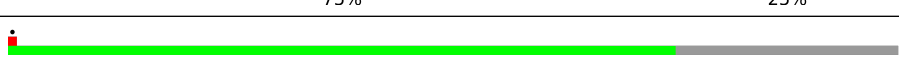

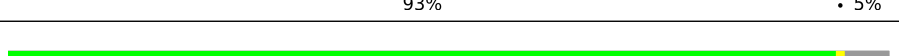
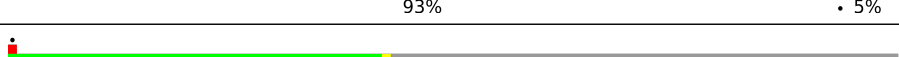

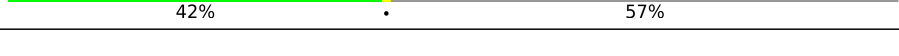
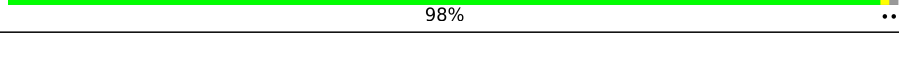
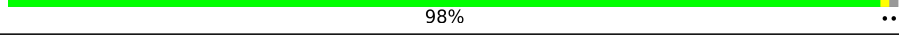



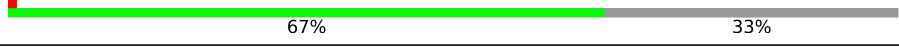

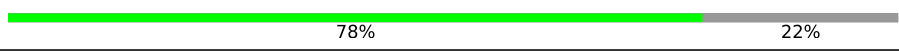
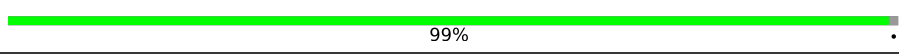
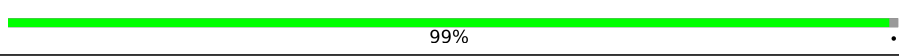
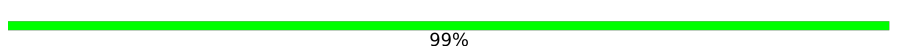
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	Q	134	 7% 96% 5%
1	q	134	 6% 96% 5%
2	I	236	 1% 38% 62%
2	i	236	 1% 38% 62%
3	T	133	 1% 69% 31%
3	t	133	 1% 69% 31%
4	G	252	 44% 56%
4	g	252	 44% 56%
5	O	157	 1% 94% 5%

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Mol	Chain	Length	Quality of chain
5	o	157	 94% 5%
6	K	224	 52% 48% 8%
6	k	224	 52% 48% 8%
7	J	229	 76% 23%
7	j	229	 76% 23%
8	S	128	 73% 26%
8	s	128	 73% 26%
9	U	126	 75% 25%
9	u	126	 75% 25%
10	H	239	 93% 5%
10	h	239	 93% 5%
11	E	325	 42% 57%
11	e	325	 42% 57%
12	X	83	 98%
12	x	83	 98%
13	B	571	 44% 56%
13	b	571	 44% 56%
14	R	134	 67% 33%
14	r	134	 67% 33%
15	P	138	 78% 22%
15	p	138	 78% 22%
16	V	111	 99%
16	v	111	 99%
17	L	208	 99%
17	l	208	 99%

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Mol	Chain	Length	Quality of chain
18	C	398	 30% 69%
18	c	398	 30% 69%
19	D	310	 82% 18%
19	d	310	 82% 18%
20	M	205	 46% 53%
20	m	205	 46% 53%
21	N	166	 7% 96%
21	n	166	 7% 96%
22	F	267	 70% 30%
22	f	267	 70% 30%
23	W	106	 91% 9%
23	w	106	 91% 9%
24	A	536	 5% 69% 31%
24	a	536	 5% 69% 31%

2 Entry composition [i](#)

There are 28 unique types of molecules in this entry. The entry contains 121066 atoms, of which 60518 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 ATPTG11.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	q	133	Total	C	H	N	O	S	0	0
			2119	674	1044	194	202	5		
1	Q	133	Total	C	H	N	O	S	0	0
			2119	674	1044	194	202	5		

- Molecule 2 is a protein called ATPTG7.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	i	90	Total	C	H	N	O	S	0	0
			1386	433	678	136	129	10		
2	I	90	Total	C	H	N	O	S	0	0
			1386	433	678	136	129	10		

- Molecule 3 is a protein called ATPTG14.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
3	t	92	Total	C	H	N	O	S	0	0
			1439	463	716	127	129	4		
3	T	92	Total	C	H	N	O	S	0	0
			1439	463	716	127	129	4		

- Molecule 4 is a protein called ATPTG5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
4	g	112	Total	C	H	N	O	S	0	0
			1732	548	856	152	168	8		
4	G	112	Total	C	H	N	O	S	0	0
			1732	548	856	152	168	8		

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
g	51	VAL	PHE	conflict	UNP S7WD71

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Chain	Residue	Modelled	Actual	Comment	Reference
g	73	CYS	SER	conflict	UNP S7WD71
g	110	LYS	GLU	conflict	UNP S7WD71
g	233	THR	MET	conflict	UNP S7WD71
G	51	VAL	PHE	conflict	UNP S7WD71
G	73	CYS	SER	conflict	UNP S7WD71
G	110	LYS	GLU	conflict	UNP S7WD71
G	233	THR	MET	conflict	UNP S7WD71

- Molecule 5 is a protein called subunit k.

Mol	Chain	Residues	Atoms					AltConf	Trace	
5	o	149	Total	C	H	N	O	S	0	0
			2415	786	1195	210	219	5		
5	O	149	Total	C	H	N	O	S	0	0
			2415	786	1195	210	219	5		

- Molecule 6 is a protein called subunit a.

Mol	Chain	Residues	Atoms					AltConf	Trace	
6	k	117	Total	C	H	N	O	S	0	0
			1904	645	952	145	155	7		
6	K	117	Total	C	H	N	O	S	0	0
			1904	645	952	145	155	7		

- Molecule 7 is a protein called subunit i/j.

Mol	Chain	Residues	Atoms					AltConf	Trace	
7	j	176	Total	C	H	N	O	S	0	0
			2981	1003	1469	261	244	4		
7	J	176	Total	C	H	N	O	S	0	0
			2981	1003	1469	261	244	4		

- Molecule 8 is a protein called ATPTG13.

Mol	Chain	Residues	Atoms					AltConf	Trace	
8	s	95	Total	C	H	N	O	S	0	0
			1570	526	770	130	142	2		
8	S	95	Total	C	H	N	O	S	0	0
			1570	526	770	130	142	2		

- Molecule 9 is a protein called ATPTG15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
9	u	94	1492	482	741	132	133	4	0	0
9	U	94	1492	482	741	132	133	4	0	0

- Molecule 10 is a protein called ATPTG6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
10	h	226	3589	1157	1741	334	348	9	0	0
10	H	226	3589	1157	1741	334	348	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
h	89	ASN	HIS	conflict	UNP A0A125YLR08
H	89	ASN	HIS	conflict	UNP A0A125YLR08

- Molecule 11 is a protein called ATPTG3.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
11	e	140	2179	719	1064	187	204	5	0	0
11	E	140	2179	719	1064	187	204	5	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
e	?	-	LYS	deletion	UNP A0A125YLR0
e	63	PRO	SER	conflict	UNP A0A125YLR0
e	99	LEU	PRO	conflict	UNP A0A125YLR0
e	312	ALA	THR	conflict	UNP A0A125YLR0
E	?	-	LYS	deletion	UNP A0A125YLR0
E	63	PRO	SER	conflict	UNP A0A125YLR0
E	99	LEU	PRO	conflict	UNP A0A125YLR0
E	312	ALA	THR	conflict	UNP A0A125YLR0

- Molecule 12 is a protein called ATPTG17.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
12	x	82	1298	420	639	116	120	3	0	0
12	X	82	1298	420	639	116	120	3	0	0

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
x	77	TRP	-	expression tag	UNP S7W180
x	78	MET	-	expression tag	UNP S7W180
x	79	PHE	-	expression tag	UNP S7W180
x	80	GLY	-	expression tag	UNP S7W180
x	81	ASN	-	expression tag	UNP S7W180
x	82	SER	-	expression tag	UNP S7W180
x	83	TYR	-	expression tag	UNP S7W180
X	77	TRP	-	expression tag	UNP S7W180
X	78	MET	-	expression tag	UNP S7W180
X	79	PHE	-	expression tag	UNP S7W180
X	80	GLY	-	expression tag	UNP S7W180
X	81	ASN	-	expression tag	UNP S7W180
X	82	SER	-	expression tag	UNP S7W180
X	83	TYR	-	expression tag	UNP S7W180

- Molecule 13 is a protein called subunit b.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
13	b	253	4157	1374	2056	328	390	9	0	0
13	B	253	4157	1374	2056	328	390	9	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
b	50	LEU	SER	conflict	UNP S7V2T0
b	474	THR	ALA	conflict	UNP S7V2T0
B	50	LEU	SER	conflict	UNP S7V2T0
B	474	THR	ALA	conflict	UNP S7V2T0

- Molecule 14 is a protein called ATPTG12.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
14	r	90	Total	C	H	N	O	S	0	0
			1485	470	750	128	133	4		
14	R	90	Total	C	H	N	O	S	0	0
			1485	470	750	128	133	4		

- Molecule 15 is a protein called ATPTG10.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
15	p	108	Total	C	H	N	O	S	0	0
			1711	553	847	148	157	6		
15	P	108	Total	C	H	N	O	S	0	0
			1711	553	847	148	157	6		

- Molecule 16 is a protein called subunit f.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
16	v	110	Total	C	H	N	O	S	0	0
			1801	590	888	170	148	5		
16	V	110	Total	C	H	N	O	S	0	0
			1801	590	888	170	148	5		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
v	54	ALA	VAL	conflict	UNP S7UQT7
V	54	ALA	VAL	conflict	UNP S7UQT7

- Molecule 17 is a protein called ATPTG8.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
17	l	207	Total	C	H	N	O	S	0	0
			3273	1013	1647	298	305	10		
17	L	207	Total	C	H	N	O	S	0	0
			3273	1013	1647	298	305	10		

- Molecule 18 is a protein called ATPTG1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
18	c	122	Total	C	H	N	O	S	0	0
			2029	656	999	189	184	1		
18	C	122	Total	C	H	N	O	S	0	0
			2029	656	999	189	184	1		

- Molecule 19 is a protein called ATPTG2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
19	d	254	Total 4046	C 1323	H 1970	N 365	O 380	S 8	0	0
19	D	254	Total 4046	C 1323	H 1970	N 365	O 380	S 8	0	0

- Molecule 20 is a protein called subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
20	m	96	Total 1509	C 501	H 744	N 126	O 131	S 7	0	0
20	M	96	Total 1509	C 501	H 744	N 126	O 131	S 7	0	0

- Molecule 21 is a protein called ATPTG9.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
21	n	160	Total 2451	C 774	H 1204	N 227	O 235	S 11	0	0
21	N	160	Total 2451	C 774	H 1204	N 227	O 235	S 11	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
n	140	SER	ALA	conflict	UNP A0A125YUZ2
N	140	SER	ALA	conflict	UNP A0A125YUZ2

- Molecule 22 is a protein called ATPTG4.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
22	f	188	Total 2867	C 919	H 1425	N 245	O 274	S 4	0	0
22	F	188	Total 2867	C 919	H 1425	N 245	O 274	S 4	0	0

- Molecule 23 is a protein called ATPTG16.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
23	w	96	Total 1509	C 494	H 755	N 127	O 129	S 4	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
23	W	96	1509	494	755	127	129	4	0	0

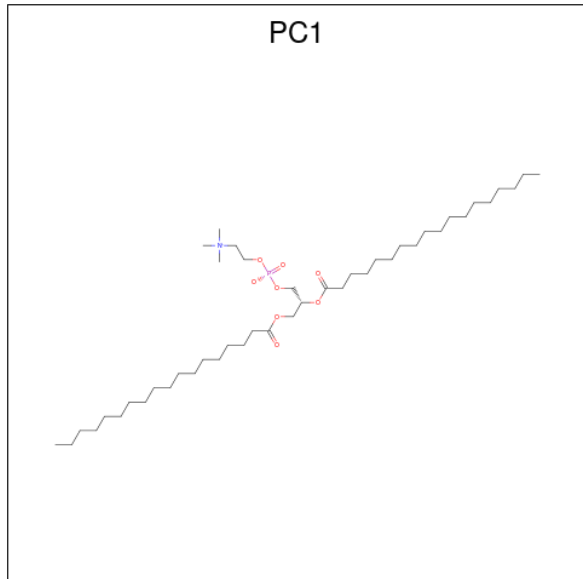
- Molecule 24 is a protein called subunit d.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
24	a	371	5895	1923	2873	523	558	18	0	0
24	A	371	5895	1923	2873	523	558	18	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	351	THR	ALA	conflict	UNP S7V493
A	351	THR	ALA	conflict	UNP S7V493

- Molecule 25 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$) (labeled as "Ligand of Interest" by depositor).



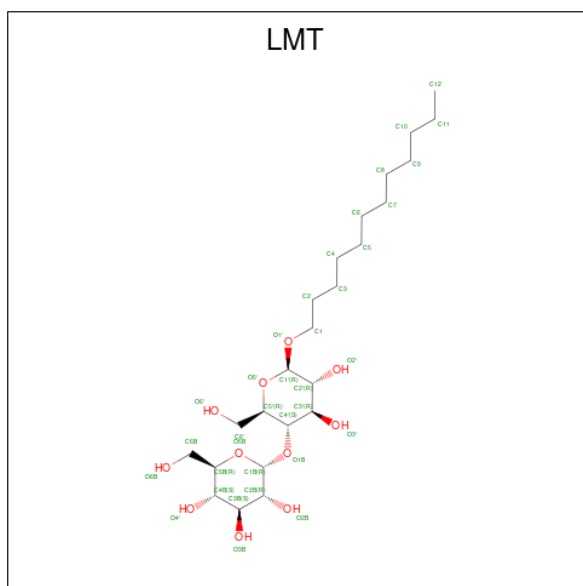
Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
25	o	1	284	88	176	2	16	2	0
25	o	1	284	88	176	2	16	2	0

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Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
25	v	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
25	O	1	Total	C	H	N	O	P	0
			284	88	176	2	16	2	
25	O	1	Total	C	H	N	O	P	0
			284	88	176	2	16	2	
25	V	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	

- Molecule 26 is DODECYL-BETA-D-MALTOSE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).



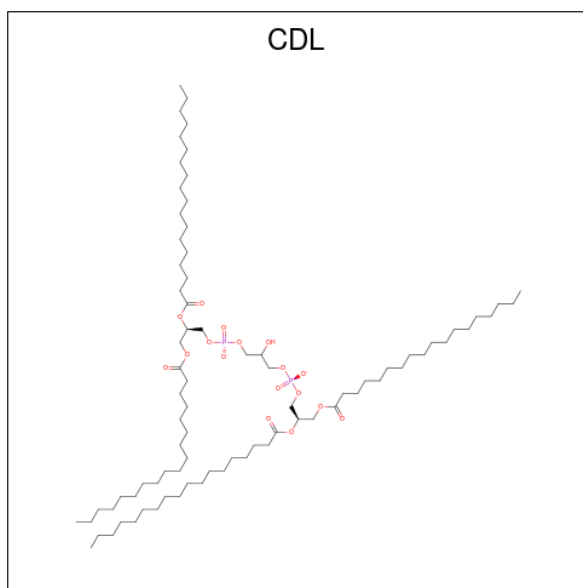
Mol	Chain	Residues	Atoms			AltConf	
			Total	C	H		O
26	o	1	Total	C	H	O	0
			81	24	46	11	
26	h	1	Total	C	H	O	0
			81	24	46	11	
26	x	1	Total	C	H	O	0
			81	24	46	11	
26	c	1	Total	C	H	O	0
			162	48	92	22	
26	c	1	Total	C	H	O	0
			162	48	92	22	
26	d	1	Total	C	H	O	0
			162	48	92	22	
26	d	1	Total	C	H	O	0
			162	48	92	22	

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Mol	Chain	Residues	Atoms				AltConf
			Total	C	H	O	
26	O	1	81	24	46	11	0
26	H	1	81	24	46	11	0
26	X	1	81	24	46	11	0
26	C	1	162	48	92	22	0
26	C	1	162	48	92	22	0
26	D	1	162	48	92	22	0
26	D	1	162	48	92	22	0

- Molecule 27 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$) (labeled as "Ligand of Interest" by depositor).



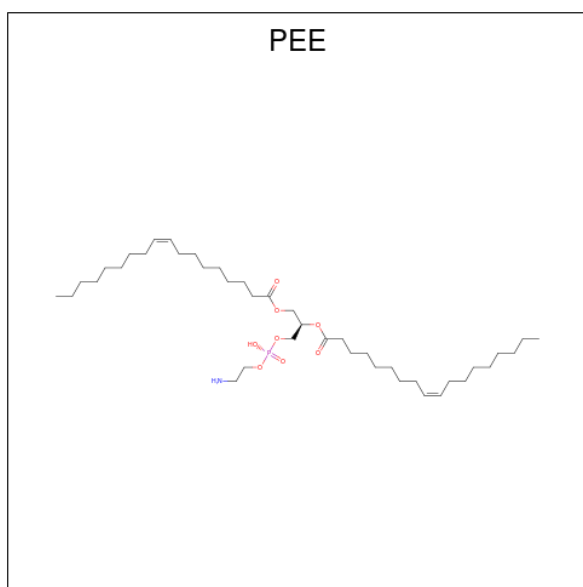
Mol	Chain	Residues	Atoms					AltConf
			Total	C	H	O	P	
27	o	1	256	81	156	17	2	0
27	u	1	256	81	156	17	2	0
27	h	1	256	81	156	17	2	0
27	e	1	256	81	156	17	2	0

Continued on next page...

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Mol	Chain	Residues	Atoms					AltConf
27	b	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	v	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	c	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	d	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	O	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	U	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	H	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	E	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	B	1	Total	C	H	O	P	0
			512	162	312	34	4	
27	B	1	Total	C	H	O	P	0
			512	162	312	34	4	
27	V	1	Total	C	H	O	P	0
			512	162	312	34	4	
27	V	1	Total	C	H	O	P	0
			512	162	312	34	4	
27	C	1	Total	C	H	O	P	0
			256	81	156	17	2	
27	D	1	Total	C	H	O	P	0
			256	81	156	17	2	

- Molecule 28 is 1,2-Dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: $C_{41}H_{78}NO_8P$) (labeled as "Ligand of Interest" by depositor).

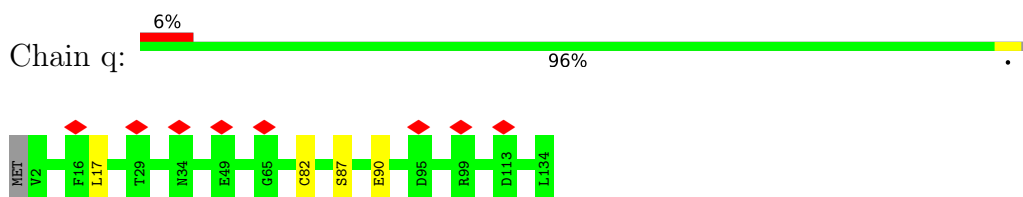


Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
28	j	1	266	82	164	2	16	2	0
28	j	1	266	82	164	2	16	2	0
28	c	1	133	41	82	1	8	1	0
28	J	1	266	82	164	2	16	2	0
28	J	1	266	82	164	2	16	2	0
28	C	1	133	41	82	1	8	1	0

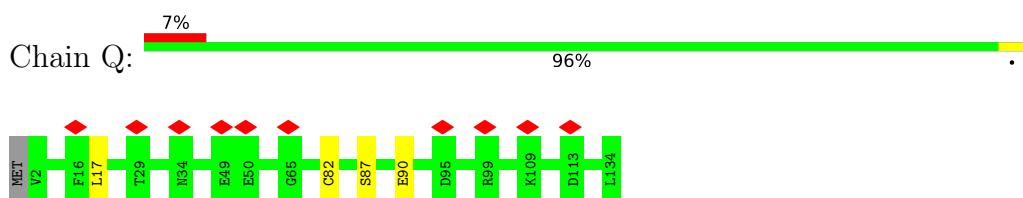
3 Residue-property plots [i](#)

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

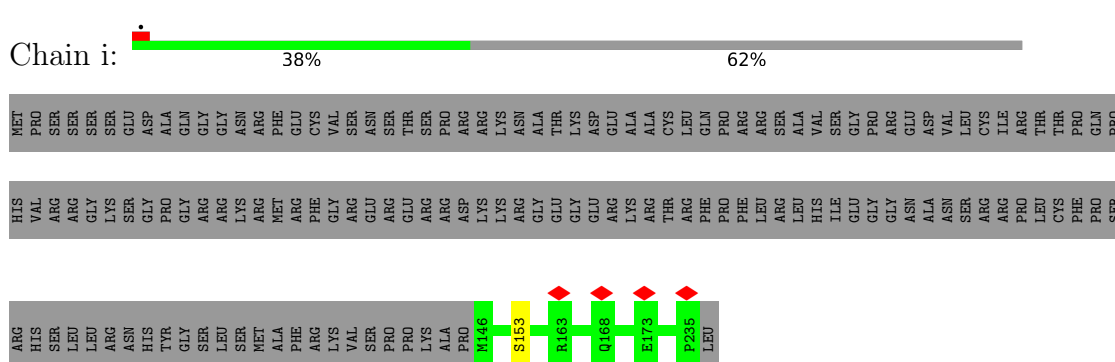
- Molecule 1: ATPTG11



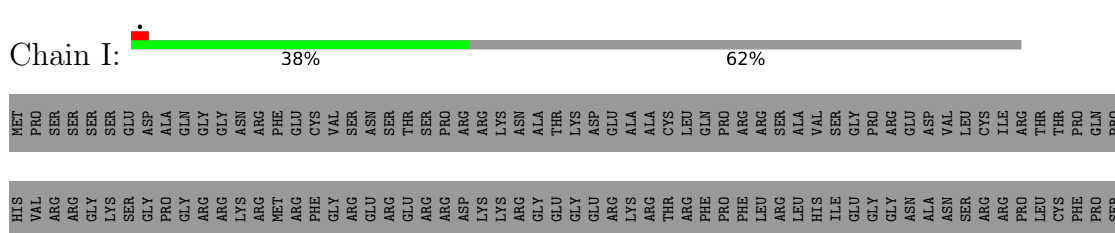
- Molecule 1: ATPTG11

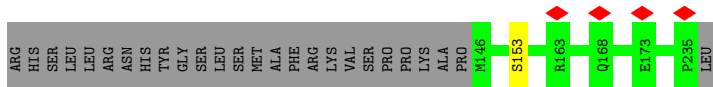


- Molecule 2: ATPTG7

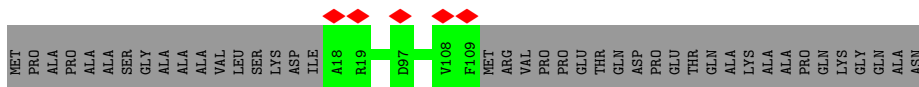


- Molecule 2: ATPTG7

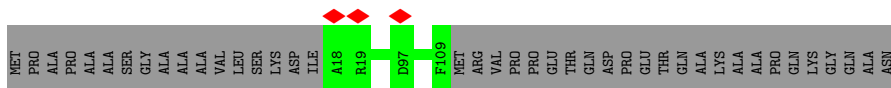




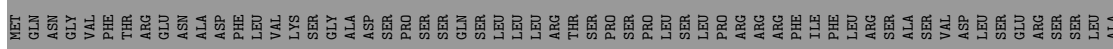
● Molecule 3: ATPTG14



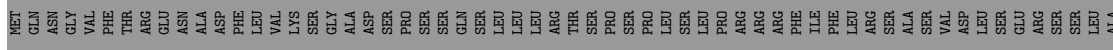
● Molecule 3: ATPTG14



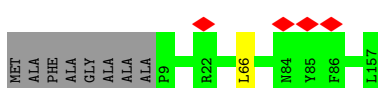
● Molecule 4: ATPTG5



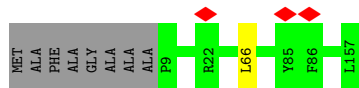
● Molecule 4: ATPTG5



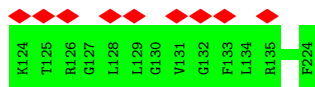
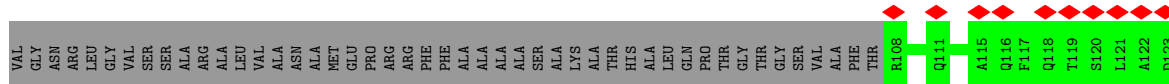
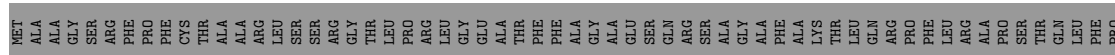
● Molecule 5: subunit k



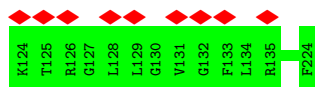
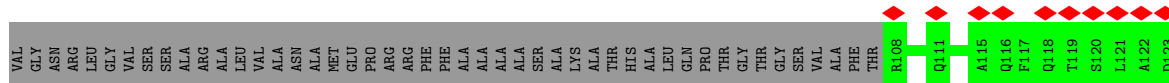
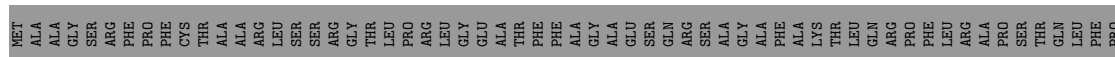
• Molecule 5: subunit k



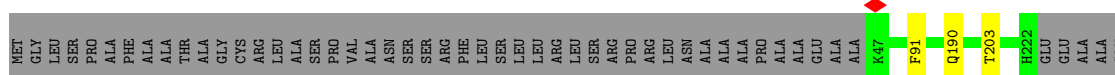
• Molecule 6: subunit a



• Molecule 6: subunit a

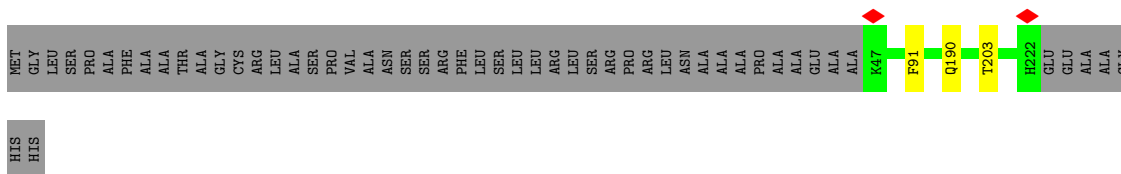


• Molecule 7: subunit i/j

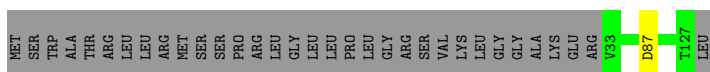


• Molecule 7: subunit i/j

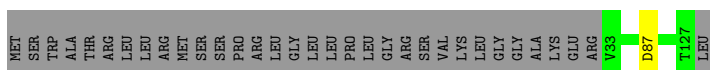




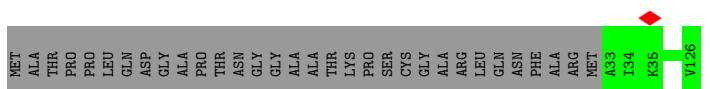
• Molecule 8: ATPTG13



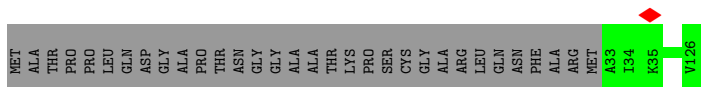
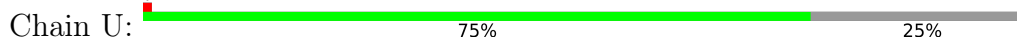
• Molecule 8: ATPTG13



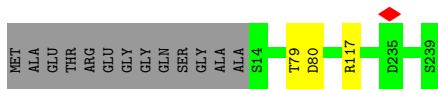
• Molecule 9: ATPTG15



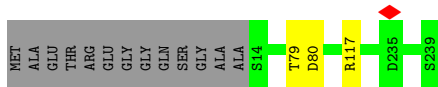
• Molecule 9: ATPTG15



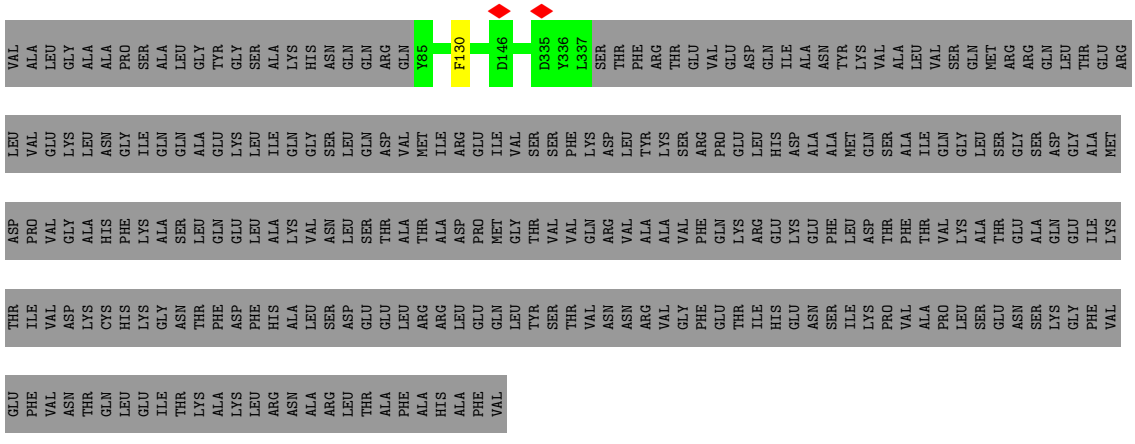
• Molecule 10: ATPTG6



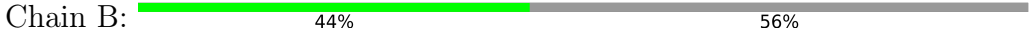
• Molecule 10: ATPTG6



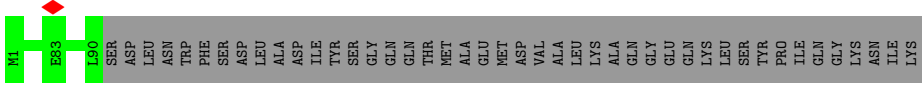
• Molecule 11: ATPTG3



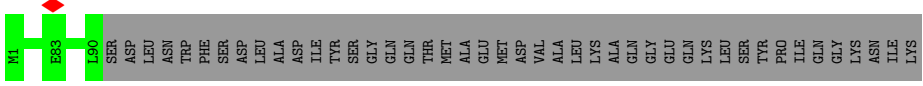
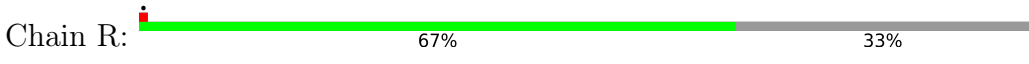
• Molecule 13: subunit b



• Molecule 14: ATPTG12



• Molecule 14: ATPTG12



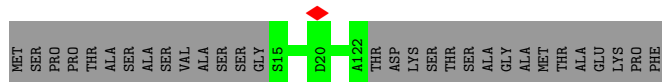
• Molecule 15: ATPTG10

Chain p: 78% 22%



• Molecule 15: ATPTG10

Chain P: 78% 22%



• Molecule 16: subunit f

Chain v: 99%



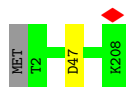
• Molecule 16: subunit f

Chain V: 99%



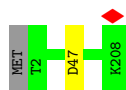
• Molecule 17: ATPTG8

Chain l: 99%



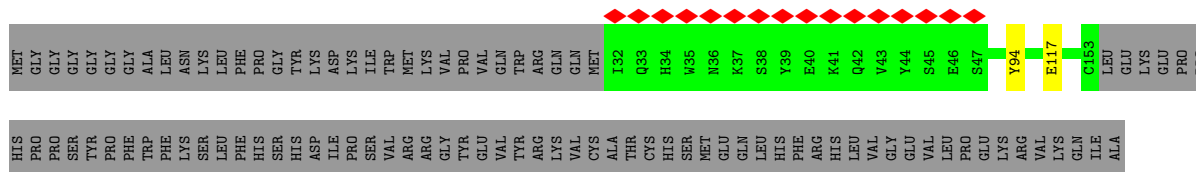
• Molecule 17: ATPTG8

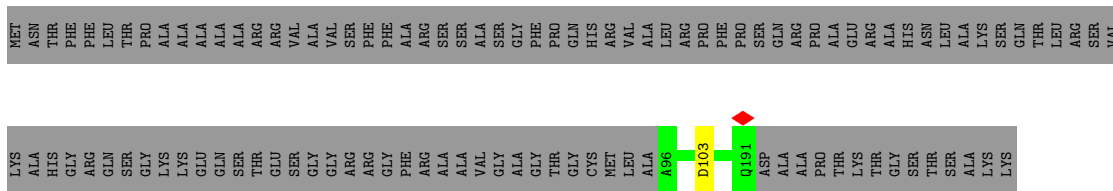
Chain L: 99%



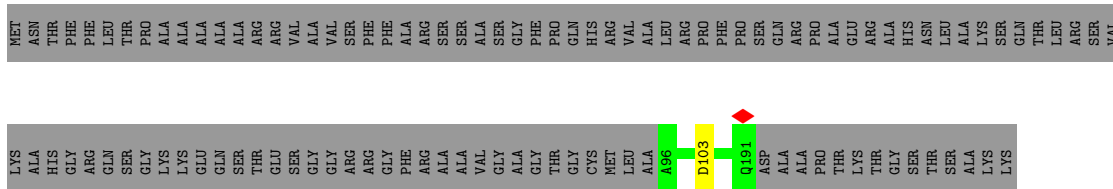
• Molecule 18: ATPTG1

Chain c: 30% 69%

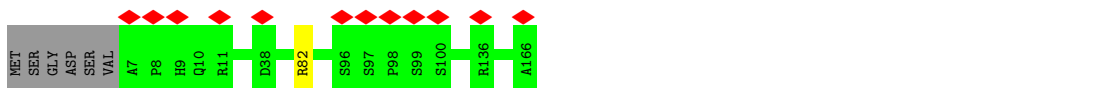




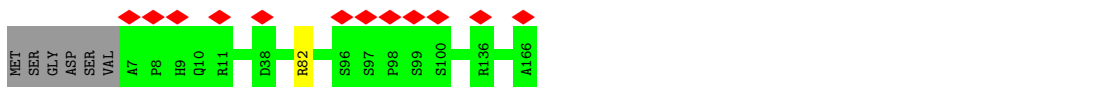
• Molecule 20: subunit 8



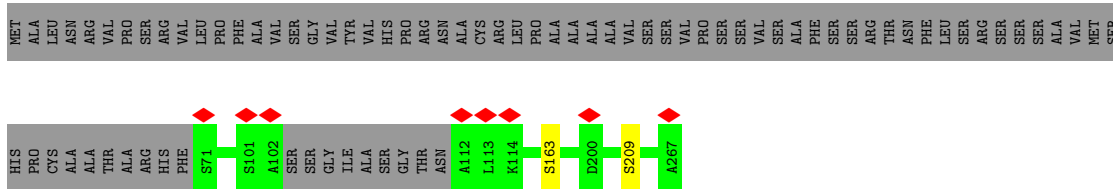
• Molecule 21: ATPTG9



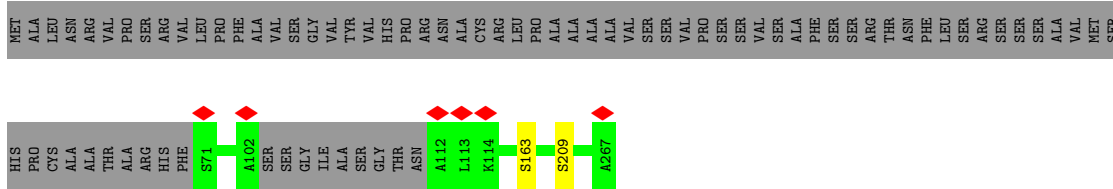
• Molecule 21: ATPTG9



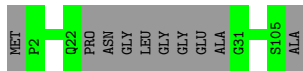
• Molecule 22: ATPTG4



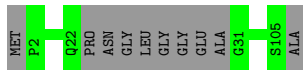
• Molecule 22: ATPTG4



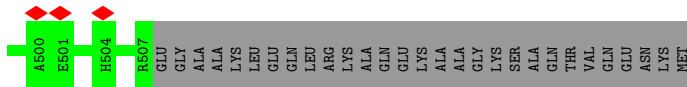
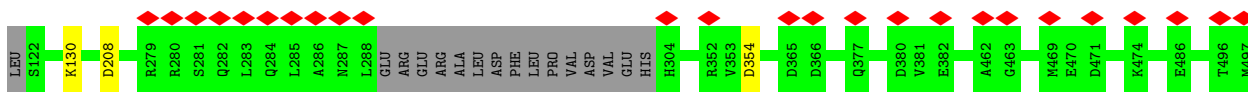
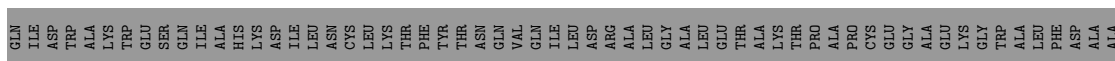
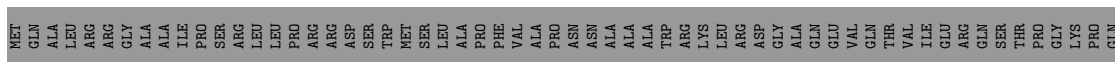
● Molecule 23: ATPTG16

Chain w:  91% 9%

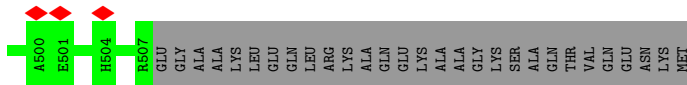
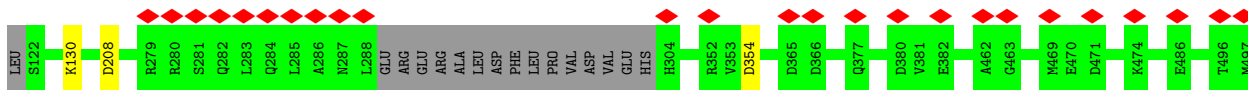
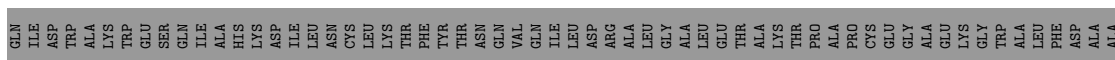
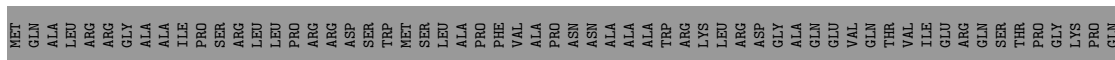
● Molecule 23: ATPTG16

Chain W:  91% 9%

● Molecule 24: subunit d

Chain a:  5% 69% 31%

● Molecule 24: subunit d

Chain A:  5% 69% 31%

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	101505	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 ($e^-/\text{\AA}^2$)	30	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	165000	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.346	Depositor
Minimum map value	-0.157	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.04	Depositor
Map size (Å)	464.8, 464.8, 464.8	wwPDB
Map dimensions	560, 560, 560	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PC1, LMT, CDL, PEE

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	Q	0.28	0/1103	0.41	0/1496
1	q	0.28	0/1103	0.41	0/1496
2	I	0.29	0/719	0.41	0/962
2	i	0.29	0/719	0.41	0/962
3	T	0.28	0/741	0.43	0/1007
3	t	0.28	0/741	0.43	0/1007
4	G	0.29	0/896	0.41	0/1216
4	g	0.29	0/896	0.41	0/1216
5	O	0.33	0/1250	0.43	0/1682
5	o	0.33	0/1250	0.43	0/1682
6	K	0.32	0/981	0.38	0/1321
6	k	0.32	0/981	0.39	0/1321
7	J	0.36	0/1573	0.42	0/2137
7	j	0.36	0/1573	0.42	0/2137
8	S	0.32	0/826	0.41	0/1119
8	s	0.32	0/826	0.41	0/1119
9	U	0.34	0/770	0.41	0/1040
9	u	0.34	0/770	0.41	0/1040
10	H	0.33	0/1902	0.41	0/2575
10	h	0.33	0/1902	0.41	0/2575
11	E	0.34	0/1154	0.42	0/1572
11	e	0.34	0/1154	0.42	0/1572
12	X	0.29	0/678	0.40	0/923
12	x	0.29	0/678	0.40	0/923
13	B	0.33	0/2159	0.40	0/2920
13	b	0.33	0/2159	0.41	0/2920
14	R	0.31	0/750	0.42	0/1008
14	r	0.31	0/750	0.42	0/1008
15	P	0.30	0/888	0.37	0/1202
15	p	0.30	0/888	0.37	0/1202
16	V	0.34	0/944	0.41	0/1280
16	v	0.34	0/944	0.41	0/1280

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
17	L	0.31	0/1651	0.41	0/2227
17	l	0.31	0/1651	0.41	0/2227
18	C	0.33	0/1057	0.40	0/1428
18	c	0.33	0/1057	0.40	0/1428
19	D	0.33	0/2138	0.42	0/2905
19	d	0.33	0/2138	0.42	0/2905
20	M	0.32	0/789	0.41	0/1065
20	m	0.32	0/789	0.41	0/1065
21	N	0.29	0/1280	0.41	0/1734
21	n	0.29	0/1280	0.41	0/1734
22	F	0.30	0/1475	0.42	0/2009
22	f	0.30	0/1475	0.42	0/2009
23	W	0.33	0/778	0.45	0/1057
23	w	0.33	0/778	0.45	0/1057
24	A	0.29	0/3107	0.38	0/4207
24	a	0.29	0/3107	0.38	0/4207
All	All	0.32	0/59218	0.41	0/80184

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

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	Q	131/134 (98%)	128 (98%)	3 (2%)	0	100 100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	q	131/134 (98%)	128 (98%)	3 (2%)	0	100	100
2	I	88/236 (37%)	85 (97%)	3 (3%)	0	100	100
2	i	88/236 (37%)	85 (97%)	3 (3%)	0	100	100
3	T	90/133 (68%)	87 (97%)	3 (3%)	0	100	100
3	t	90/133 (68%)	87 (97%)	3 (3%)	0	100	100
4	G	110/252 (44%)	107 (97%)	3 (3%)	0	100	100
4	g	110/252 (44%)	107 (97%)	3 (3%)	0	100	100
5	O	147/157 (94%)	141 (96%)	6 (4%)	0	100	100
5	o	147/157 (94%)	140 (95%)	7 (5%)	0	100	100
6	K	115/224 (51%)	111 (96%)	4 (4%)	0	100	100
6	k	115/224 (51%)	112 (97%)	3 (3%)	0	100	100
7	J	174/229 (76%)	171 (98%)	3 (2%)	0	100	100
7	j	174/229 (76%)	171 (98%)	3 (2%)	0	100	100
8	S	93/128 (73%)	92 (99%)	1 (1%)	0	100	100
8	s	93/128 (73%)	92 (99%)	1 (1%)	0	100	100
9	U	92/126 (73%)	90 (98%)	2 (2%)	0	100	100
9	u	92/126 (73%)	90 (98%)	2 (2%)	0	100	100
10	H	224/239 (94%)	215 (96%)	9 (4%)	0	100	100
10	h	224/239 (94%)	214 (96%)	10 (4%)	0	100	100
11	E	138/325 (42%)	135 (98%)	3 (2%)	0	100	100
11	e	138/325 (42%)	135 (98%)	3 (2%)	0	100	100
12	X	80/83 (96%)	76 (95%)	4 (5%)	0	100	100
12	x	80/83 (96%)	76 (95%)	4 (5%)	0	100	100
13	B	251/571 (44%)	247 (98%)	4 (2%)	0	100	100
13	b	251/571 (44%)	247 (98%)	4 (2%)	0	100	100
14	R	88/134 (66%)	84 (96%)	4 (4%)	0	100	100
14	r	88/134 (66%)	84 (96%)	4 (4%)	0	100	100
15	P	106/138 (77%)	104 (98%)	2 (2%)	0	100	100
15	p	106/138 (77%)	104 (98%)	2 (2%)	0	100	100
16	V	108/111 (97%)	108 (100%)	0	0	100	100
16	v	108/111 (97%)	108 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	L	205/208 (99%)	200 (98%)	5 (2%)	0	100	100
17	l	205/208 (99%)	200 (98%)	5 (2%)	0	100	100
18	C	120/398 (30%)	114 (95%)	6 (5%)	0	100	100
18	c	120/398 (30%)	114 (95%)	6 (5%)	0	100	100
19	D	250/310 (81%)	247 (99%)	3 (1%)	0	100	100
19	d	250/310 (81%)	247 (99%)	3 (1%)	0	100	100
20	M	94/205 (46%)	88 (94%)	6 (6%)	0	100	100
20	m	94/205 (46%)	89 (95%)	5 (5%)	0	100	100
21	N	158/166 (95%)	154 (98%)	4 (2%)	0	100	100
21	n	158/166 (95%)	154 (98%)	4 (2%)	0	100	100
22	F	184/267 (69%)	176 (96%)	8 (4%)	0	100	100
22	f	184/267 (69%)	176 (96%)	8 (4%)	0	100	100
23	W	92/106 (87%)	88 (96%)	4 (4%)	0	100	100
23	w	92/106 (87%)	88 (96%)	4 (4%)	0	100	100
24	A	367/536 (68%)	356 (97%)	11 (3%)	0	100	100
24	a	367/536 (68%)	356 (97%)	11 (3%)	0	100	100
All	All	7010/10832 (65%)	6808 (97%)	202 (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	Q	119/120 (99%)	115 (97%)	4 (3%)	37	71
1	q	119/120 (99%)	115 (97%)	4 (3%)	37	71
2	I	71/197 (36%)	70 (99%)	1 (1%)	67	90
2	i	71/197 (36%)	70 (99%)	1 (1%)	67	90
3	T	77/106 (73%)	77 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	t	77/106 (73%)	77 (100%)	0	100	100
4	G	93/214 (44%)	93 (100%)	0	100	100
4	g	93/214 (44%)	93 (100%)	0	100	100
5	O	127/129 (98%)	126 (99%)	1 (1%)	81	94
5	o	127/129 (98%)	126 (99%)	1 (1%)	81	94
6	K	100/175 (57%)	100 (100%)	0	100	100
6	k	100/175 (57%)	100 (100%)	0	100	100
7	J	160/195 (82%)	157 (98%)	3 (2%)	57	85
7	j	160/195 (82%)	157 (98%)	3 (2%)	57	85
8	S	86/113 (76%)	85 (99%)	1 (1%)	71	92
8	s	86/113 (76%)	85 (99%)	1 (1%)	71	92
9	U	76/98 (78%)	76 (100%)	0	100	100
9	u	76/98 (78%)	76 (100%)	0	100	100
10	H	197/204 (97%)	194 (98%)	3 (2%)	65	89
10	h	197/204 (97%)	194 (98%)	3 (2%)	65	89
11	E	118/258 (46%)	116 (98%)	2 (2%)	60	87
11	e	118/258 (46%)	116 (98%)	2 (2%)	60	87
12	X	70/71 (99%)	69 (99%)	1 (1%)	67	90
12	x	70/71 (99%)	69 (99%)	1 (1%)	67	90
13	B	227/491 (46%)	226 (100%)	1 (0%)	91	97
13	b	227/491 (46%)	226 (100%)	1 (0%)	91	97
14	R	80/117 (68%)	80 (100%)	0	100	100
14	r	80/117 (68%)	80 (100%)	0	100	100
15	P	91/113 (80%)	91 (100%)	0	100	100
15	p	91/113 (80%)	91 (100%)	0	100	100
16	V	86/87 (99%)	86 (100%)	0	100	100
16	v	86/87 (99%)	86 (100%)	0	100	100
17	L	177/178 (99%)	176 (99%)	1 (1%)	86	96
17	l	177/178 (99%)	176 (99%)	1 (1%)	86	96
18	C	107/338 (32%)	105 (98%)	2 (2%)	57	85
18	c	107/338 (32%)	105 (98%)	2 (2%)	57	85

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
19	D	218/259 (84%)	217 (100%)	1 (0%)	88	96
19	d	218/259 (84%)	217 (100%)	1 (0%)	88	96
20	M	77/156 (49%)	76 (99%)	1 (1%)	69	91
20	m	77/156 (49%)	76 (99%)	1 (1%)	69	91
21	N	138/144 (96%)	137 (99%)	1 (1%)	84	95
21	n	138/144 (96%)	137 (99%)	1 (1%)	84	95
22	F	155/218 (71%)	153 (99%)	2 (1%)	69	91
22	f	155/218 (71%)	153 (99%)	2 (1%)	69	91
23	W	84/89 (94%)	84 (100%)	0	100	100
23	w	84/89 (94%)	84 (100%)	0	100	100
24	A	315/447 (70%)	312 (99%)	3 (1%)	76	93
24	a	315/447 (70%)	312 (99%)	3 (1%)	76	93
All	All	6098/9034 (68%)	6042 (99%)	56 (1%)	79	94

5 of 56 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	Q	17	LEU
24	A	354	ASP
7	J	190	GLN
24	A	208	ASP
20	M	103	ASP

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

Mol	Chain	Res	Type
24	a	310	GLN
2	I	202	GLN
24	A	321	GLN
10	H	209	GLN
22	F	78	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](#)

44 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
27	CDL	H	302	-	99,99,99	0.87	7 (7%)	105,111,111	1.03	4 (3%)
27	CDL	V	201	-	99,99,99	0.87	7 (7%)	105,111,111	1.05	4 (3%)
27	CDL	O	203	-	99,99,99	0.88	7 (7%)	105,111,111	1.05	5 (4%)
26	LMT	c	403	-	36,36,36	1.11	2 (5%)	47,47,47	1.02	1 (2%)
26	LMT	D	401	-	36,36,36	1.14	2 (5%)	47,47,47	0.94	1 (2%)
27	CDL	C	404	-	99,99,99	0.88	7 (7%)	105,111,111	1.04	4 (3%)
26	LMT	c	401	-	36,36,36	1.09	2 (5%)	47,47,47	1.13	2 (4%)
26	LMT	d	401	-	36,36,36	1.14	2 (5%)	47,47,47	0.94	1 (2%)
27	CDL	u	201	-	99,99,99	0.88	7 (7%)	105,111,111	1.05	4 (3%)
26	LMT	d	403	-	36,36,36	1.12	2 (5%)	47,47,47	0.91	0
25	PC1	O	201	-	53,53,53	0.94	3 (5%)	59,61,61	1.04	3 (5%)
28	PEE	j	301	-	50,50,50	1.13	6 (12%)	53,55,55	1.13	3 (5%)
26	LMT	o	202	-	36,36,36	1.12	2 (5%)	47,47,47	0.93	1 (2%)
28	PEE	c	402	-	50,50,50	1.14	6 (12%)	53,55,55	1.05	2 (3%)
27	CDL	c	404	-	99,99,99	0.87	7 (7%)	105,111,111	1.04	4 (3%)
26	LMT	h	301	-	36,36,36	1.13	2 (5%)	47,47,47	0.98	2 (4%)
27	CDL	o	203	-	99,99,99	0.87	7 (7%)	105,111,111	1.05	5 (4%)
25	PC1	o	204	5	53,53,53	0.94	4 (7%)	59,61,61	1.00	2 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
27	CDL	E	401	-	99,99,99	0.87	8 (8%)	105,111,111	1.02	4 (3%)
27	CDL	e	401	-	99,99,99	0.88	8 (8%)	105,111,111	1.02	4 (3%)
28	PEE	J	302	-	50,50,50	1.14	6 (12%)	53,55,55	1.16	3 (5%)
26	LMT	C	403	-	36,36,36	1.11	2 (5%)	47,47,47	1.02	1 (2%)
28	PEE	J	301	-	50,50,50	1.13	6 (12%)	53,55,55	1.13	3 (5%)
25	PC1	o	201	-	53,53,53	0.94	3 (5%)	59,61,61	1.03	3 (5%)
27	CDL	V	202	-	99,99,99	0.89	7 (7%)	105,111,111	1.00	4 (3%)
26	LMT	x	101	-	36,36,36	1.16	3 (8%)	47,47,47	1.05	2 (4%)
27	CDL	U	201	-	99,99,99	0.88	7 (7%)	105,111,111	1.05	4 (3%)
28	PEE	j	302	-	50,50,50	1.14	6 (12%)	53,55,55	1.16	3 (5%)
25	PC1	O	204	5	53,53,53	0.94	4 (7%)	59,61,61	1.00	2 (3%)
27	CDL	b	601	-	99,99,99	0.88	8 (8%)	105,111,111	1.03	4 (3%)
25	PC1	v	202	-	53,53,53	0.96	4 (7%)	59,61,61	0.95	2 (3%)
27	CDL	B	602	-	99,99,99	0.88	8 (8%)	105,111,111	1.03	4 (3%)
27	CDL	D	402	-	99,99,99	0.87	8 (8%)	105,111,111	1.04	4 (3%)
26	LMT	D	403	-	36,36,36	1.12	2 (5%)	47,47,47	0.90	0
27	CDL	B	601	-	99,99,99	0.88	7 (7%)	105,111,111	1.05	4 (3%)
26	LMT	H	301	-	36,36,36	1.13	2 (5%)	47,47,47	0.98	1 (2%)
26	LMT	C	401	-	36,36,36	1.09	2 (5%)	47,47,47	1.13	2 (4%)
26	LMT	O	202	-	36,36,36	1.12	2 (5%)	47,47,47	0.93	1 (2%)
26	LMT	X	101	-	36,36,36	1.17	3 (8%)	47,47,47	1.05	2 (4%)
27	CDL	d	402	-	99,99,99	0.87	8 (8%)	105,111,111	1.04	4 (3%)
28	PEE	C	402	-	50,50,50	1.14	6 (12%)	53,55,55	1.05	2 (3%)
25	PC1	V	203	-	53,53,53	0.96	4 (7%)	59,61,61	0.95	2 (3%)
27	CDL	v	201	-	99,99,99	0.89	7 (7%)	105,111,111	1.00	4 (3%)
27	CDL	h	302	-	99,99,99	0.88	8 (8%)	105,111,111	1.03	4 (3%)

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
27	CDL	H	302	-	-	46/110/110/110	-
27	CDL	V	201	-	-	44/110/110/110	-
27	CDL	O	203	-	-	49/110/110/110	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
26	LMT	c	403	-	-	4/21/61/61	0/2/2/2
26	LMT	D	401	-	-	12/21/61/61	0/2/2/2
27	CDL	C	404	-	-	42/110/110/110	-
26	LMT	c	401	-	-	6/21/61/61	0/2/2/2
26	LMT	d	401	-	-	12/21/61/61	0/2/2/2
27	CDL	u	201	-	-	35/110/110/110	-
26	LMT	d	403	-	-	5/21/61/61	0/2/2/2
25	PC1	O	201	-	-	18/57/57/57	-
28	PEE	j	301	-	-	20/54/54/54	-
26	LMT	o	202	-	-	3/21/61/61	0/2/2/2
28	PEE	c	402	-	-	19/54/54/54	-
27	CDL	c	404	-	-	42/110/110/110	-
26	LMT	h	301	-	-	7/21/61/61	0/2/2/2
27	CDL	o	203	-	-	49/110/110/110	-
25	PC1	o	204	5	-	27/57/57/57	-
27	CDL	E	401	-	-	35/110/110/110	-
27	CDL	e	401	-	-	35/110/110/110	-
28	PEE	J	302	-	-	23/54/54/54	-
26	LMT	C	403	-	-	4/21/61/61	0/2/2/2
28	PEE	J	301	-	-	20/54/54/54	-
25	PC1	o	201	-	-	18/57/57/57	-
27	CDL	V	202	-	-	38/110/110/110	-
26	LMT	x	101	-	-	11/21/61/61	0/2/2/2
27	CDL	U	201	-	-	35/110/110/110	-
28	PEE	j	302	-	-	23/54/54/54	-
25	PC1	O	204	5	-	27/57/57/57	-
27	CDL	b	601	-	-	42/110/110/110	-
25	PC1	v	202	-	-	26/57/57/57	-
27	CDL	B	602	-	-	42/110/110/110	-
27	CDL	D	402	-	-	36/110/110/110	-
26	LMT	D	403	-	-	5/21/61/61	0/2/2/2
27	CDL	B	601	-	-	44/110/110/110	-
26	LMT	H	301	-	-	8/21/61/61	0/2/2/2
26	LMT	C	401	-	-	6/21/61/61	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
26	LMT	O	202	-	-	3/21/61/61	0/2/2/2
26	LMT	X	101	-	-	11/21/61/61	0/2/2/2
27	CDL	d	402	-	-	36/110/110/110	-
28	PEE	C	402	-	-	19/54/54/54	-
25	PC1	V	203	-	-	26/57/57/57	-
27	CDL	v	201	-	-	38/110/110/110	-
27	CDL	h	302	-	-	46/110/110/110	-

The worst 5 of 221 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
28	c	402	PEE	C19-C18	3.73	1.53	1.31
28	J	302	PEE	C39-C38	3.73	1.53	1.31
28	j	302	PEE	C39-C38	3.73	1.53	1.31
28	C	402	PEE	C19-C18	3.73	1.53	1.31
28	c	402	PEE	C39-C38	3.72	1.53	1.31

The worst 5 of 121 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
27	D	402	CDL	OB6-CB5-C51	4.17	120.50	111.50
27	d	402	CDL	OB6-CB5-C51	4.16	120.47	111.50
27	B	602	CDL	OB6-CB5-C51	4.11	120.37	111.50
25	o	204	PC1	O21-C21-C22	4.10	120.34	111.50
27	b	601	CDL	OB6-CB5-C51	4.10	120.33	111.50

There are no chirality outliers.

5 of 1097 torsion outliers are listed below:

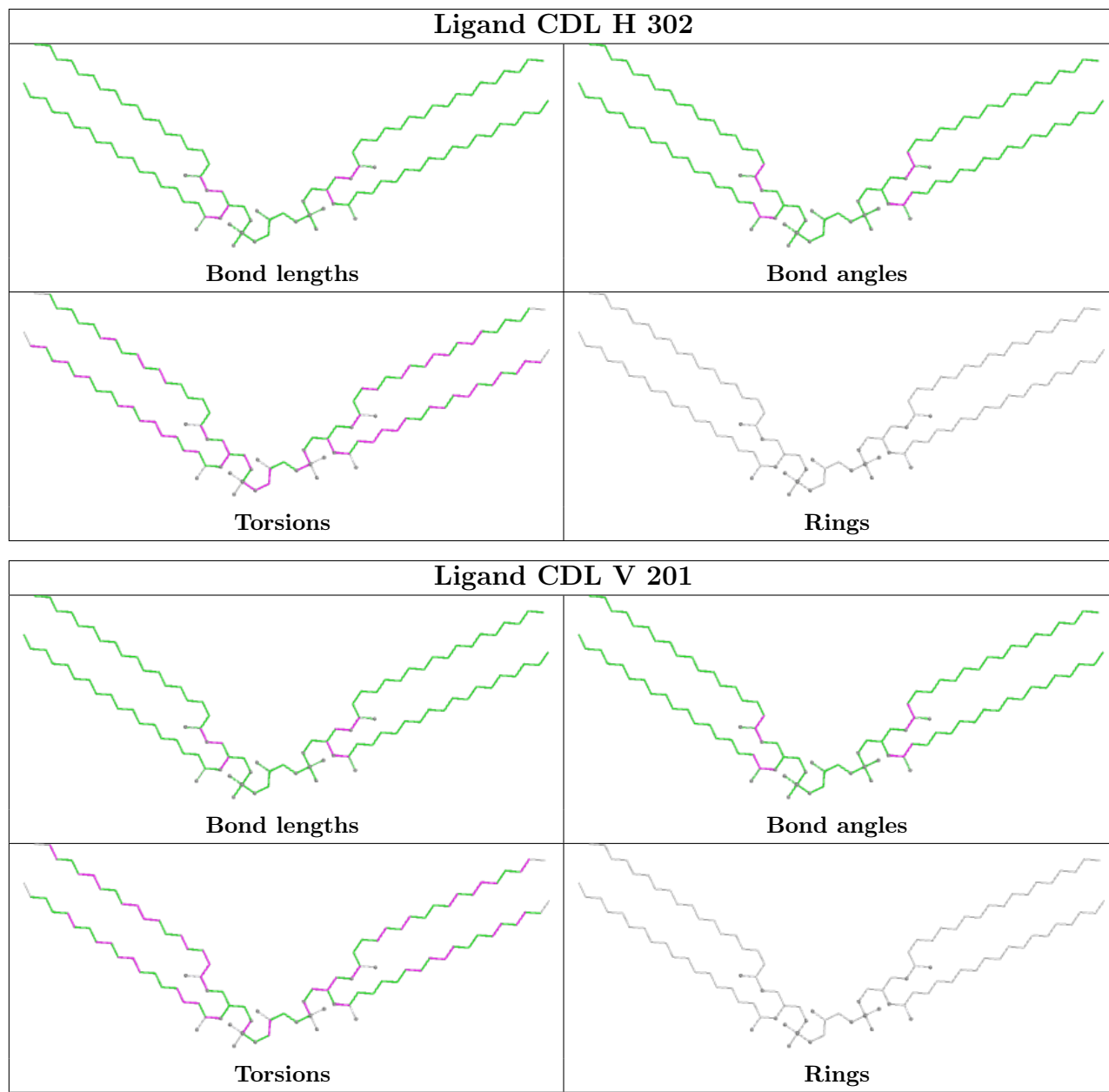
Mol	Chain	Res	Type	Atoms
25	o	201	PC1	O13-C11-C12-N
25	o	201	PC1	C22-C21-O21-C2
25	o	204	PC1	C22-C21-O21-C2
25	v	202	PC1	C1-O11-P-O13
25	v	202	PC1	C12-C11-O13-P

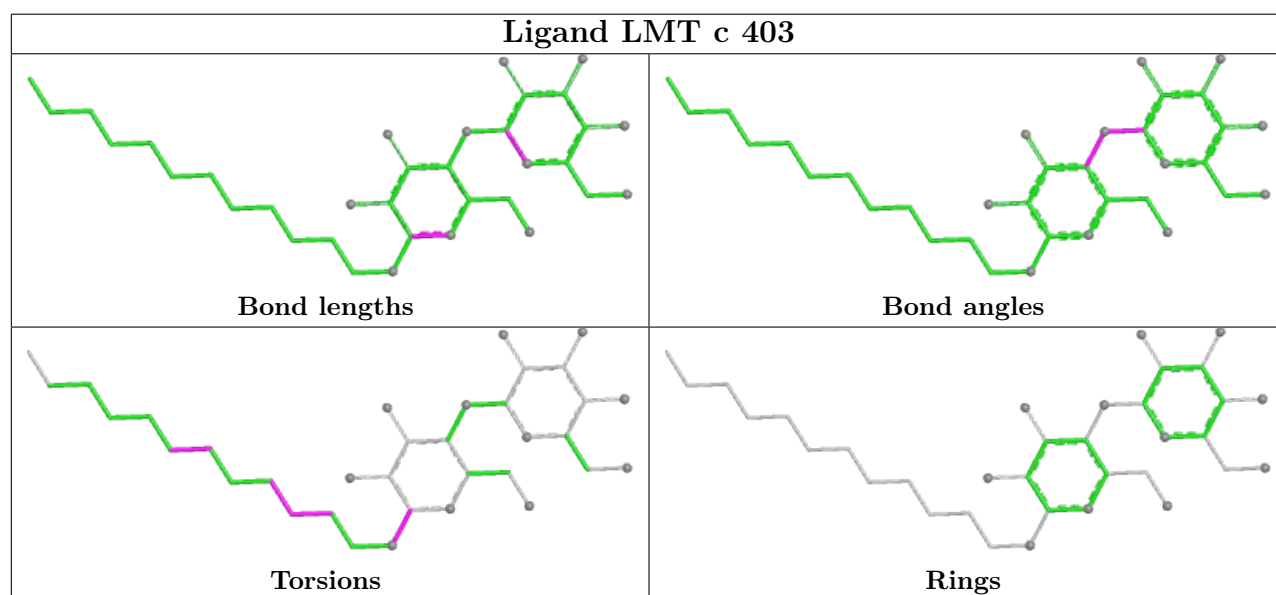
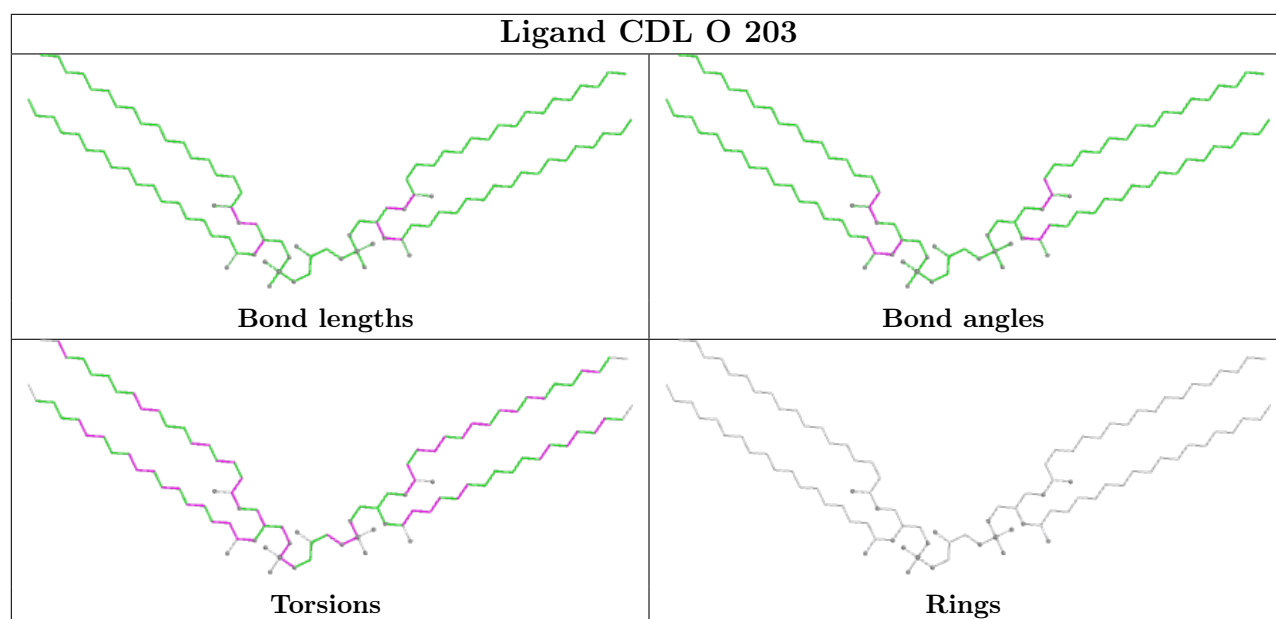
There are no ring outliers.

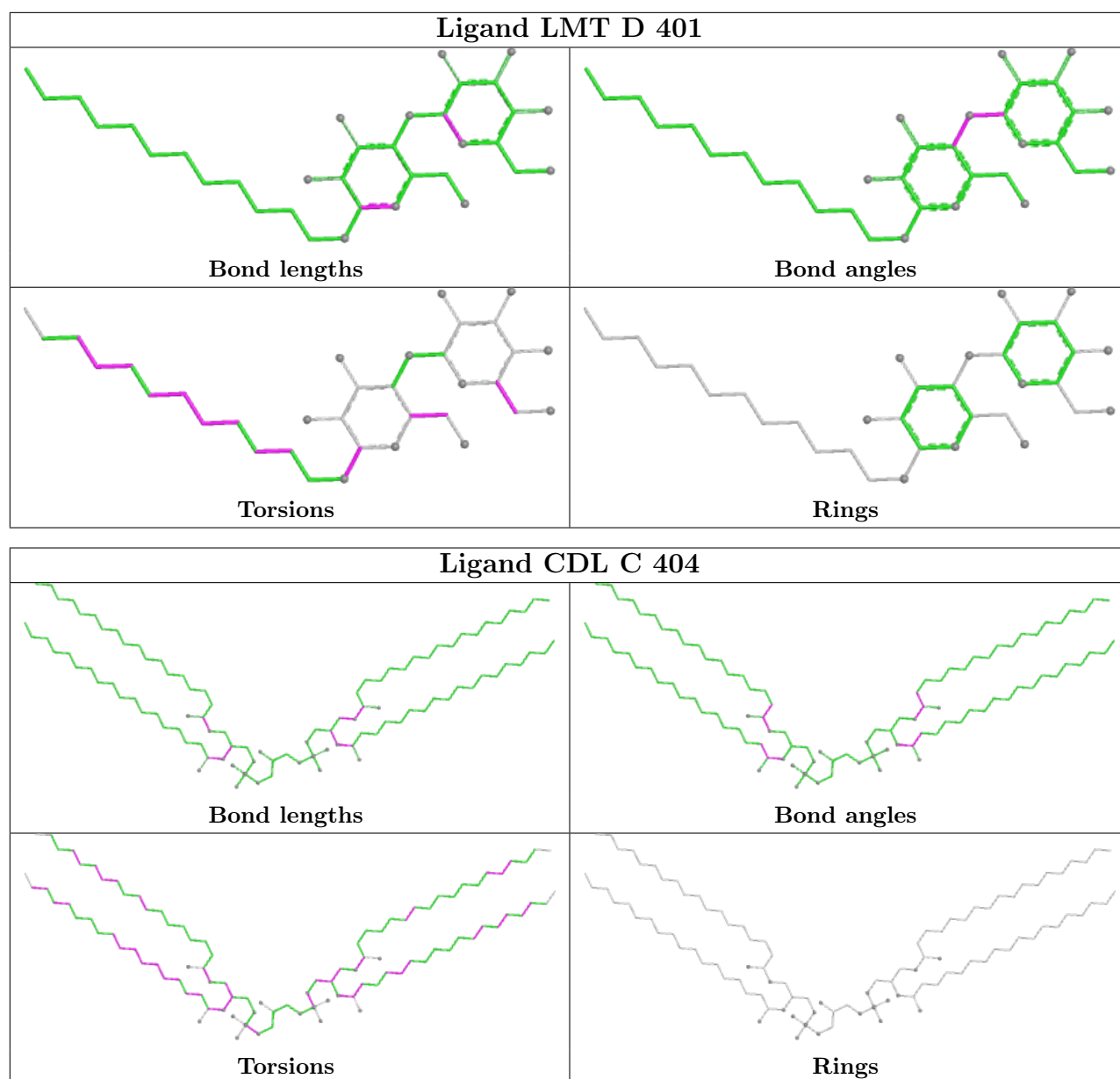
No monomer is involved in short contacts.

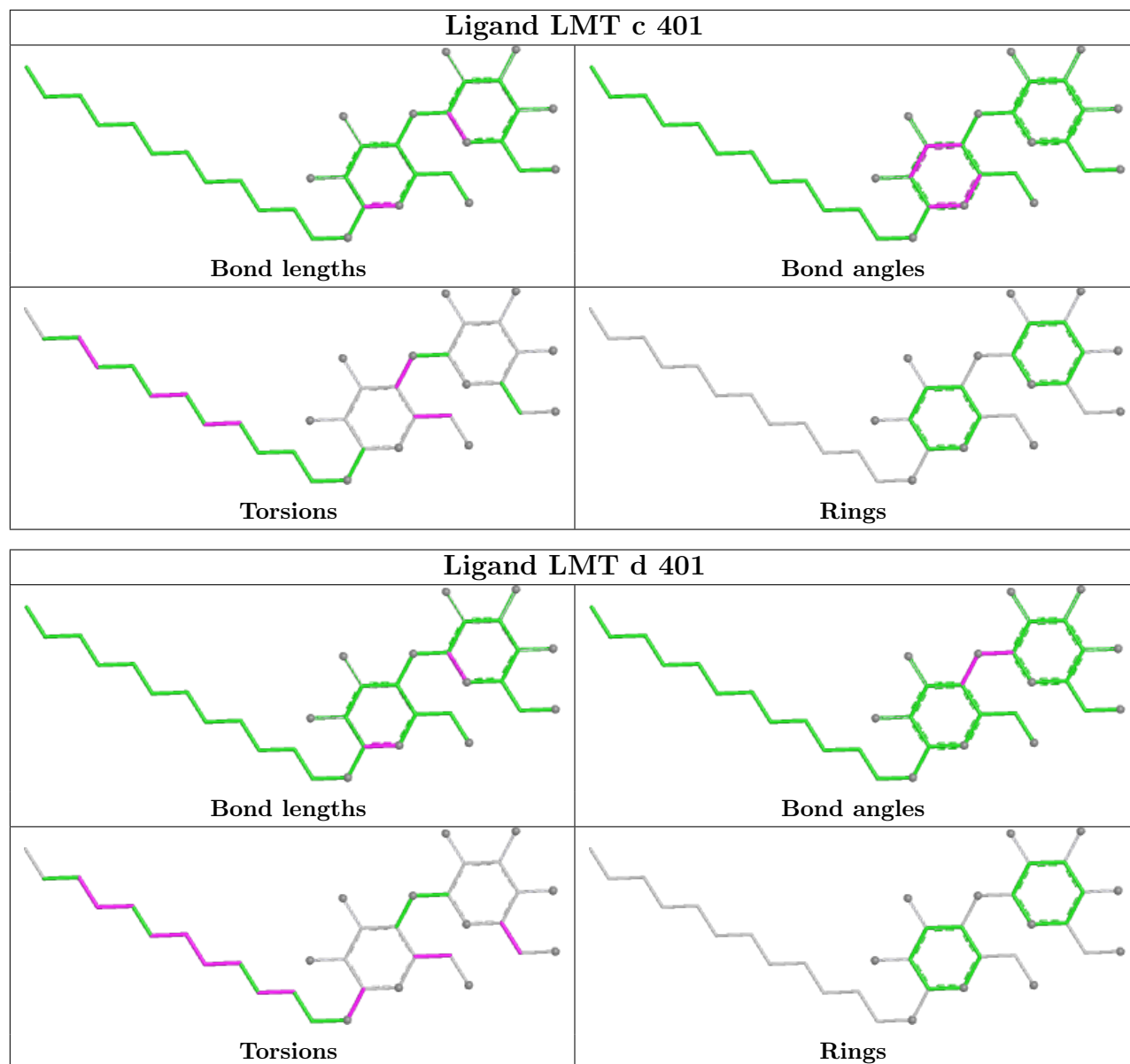
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths,

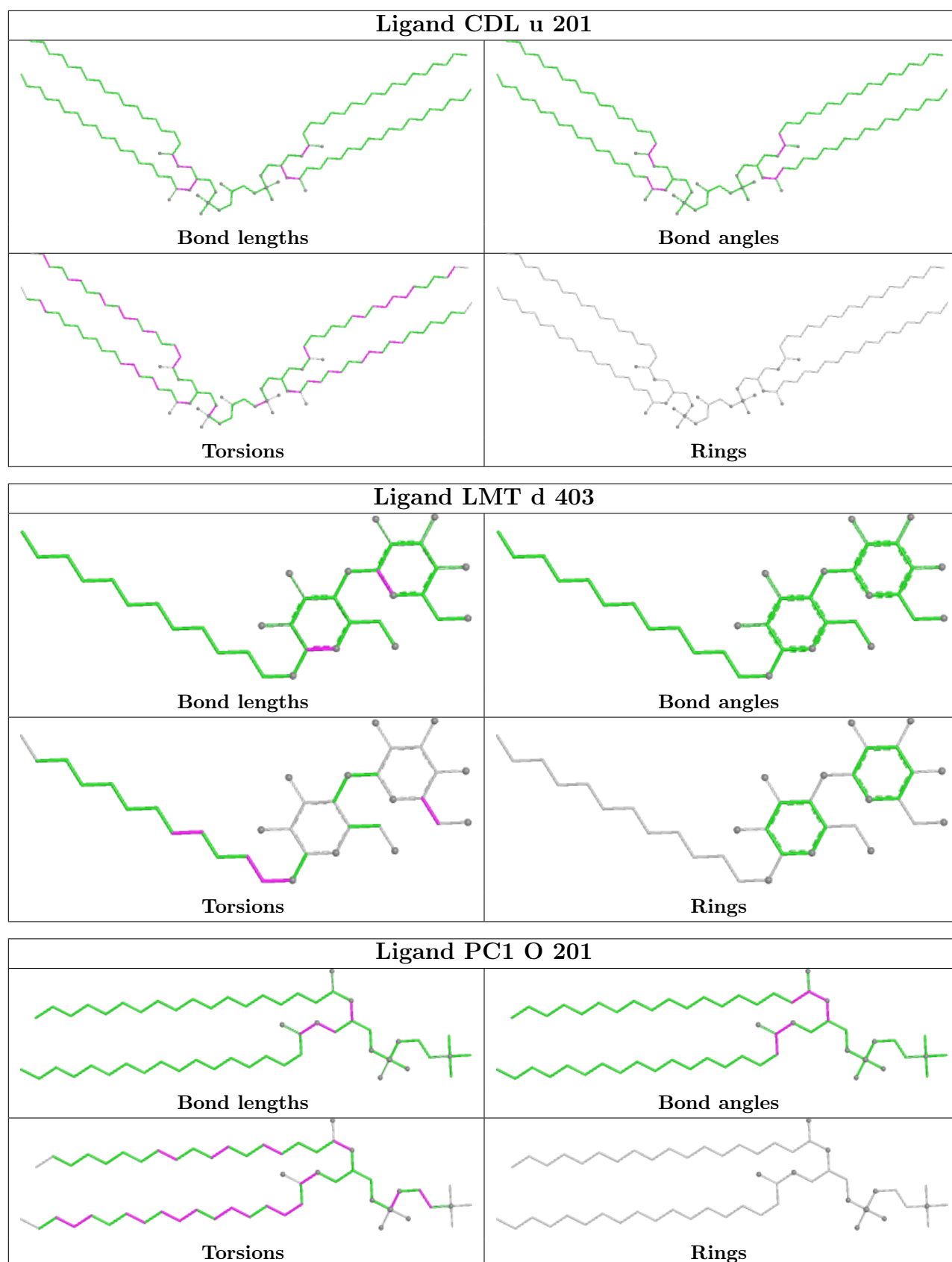
bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 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.

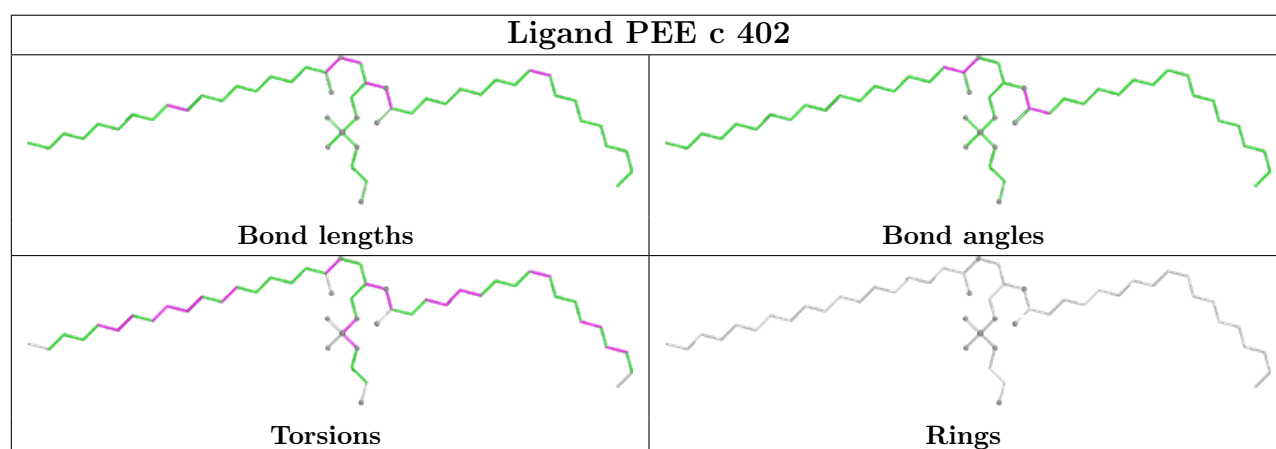
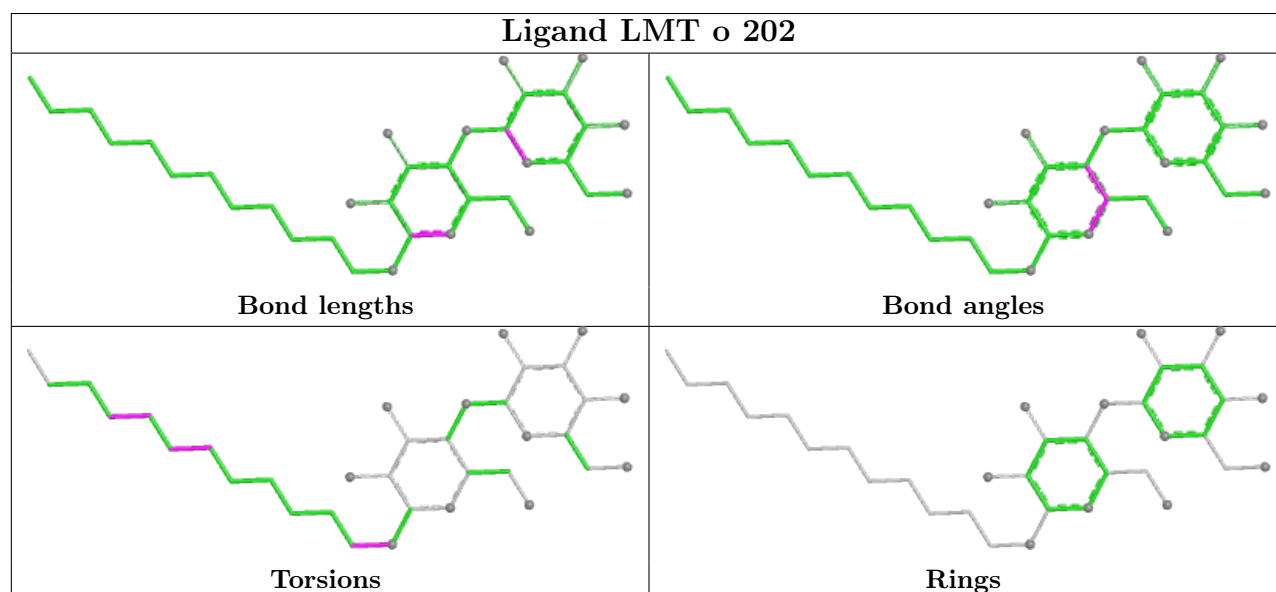
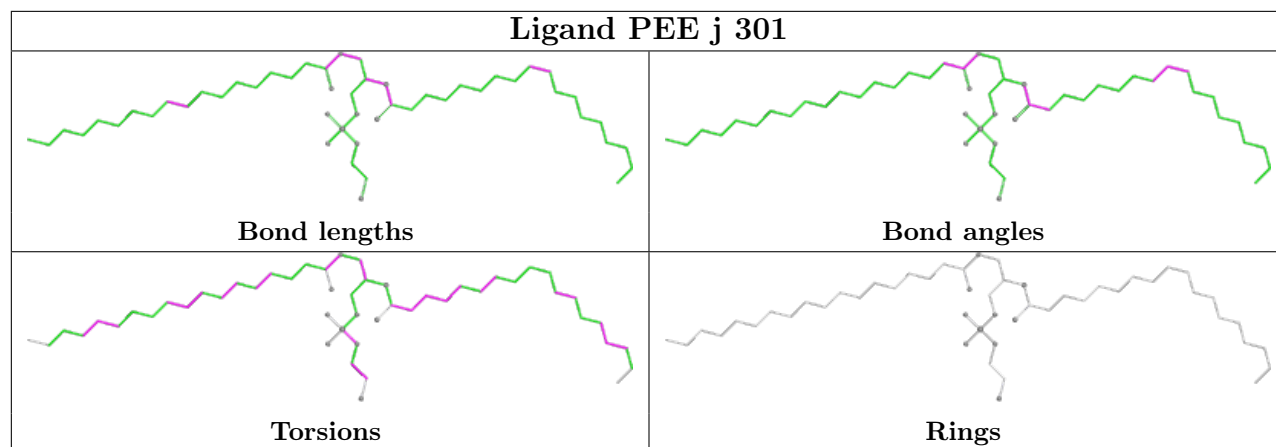


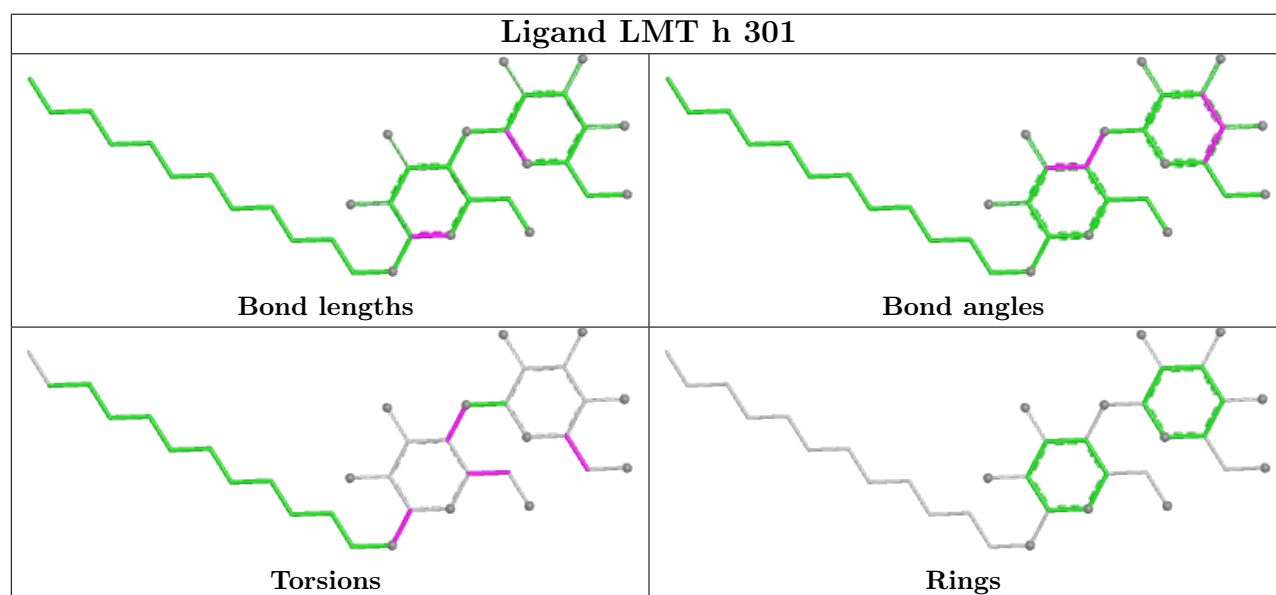
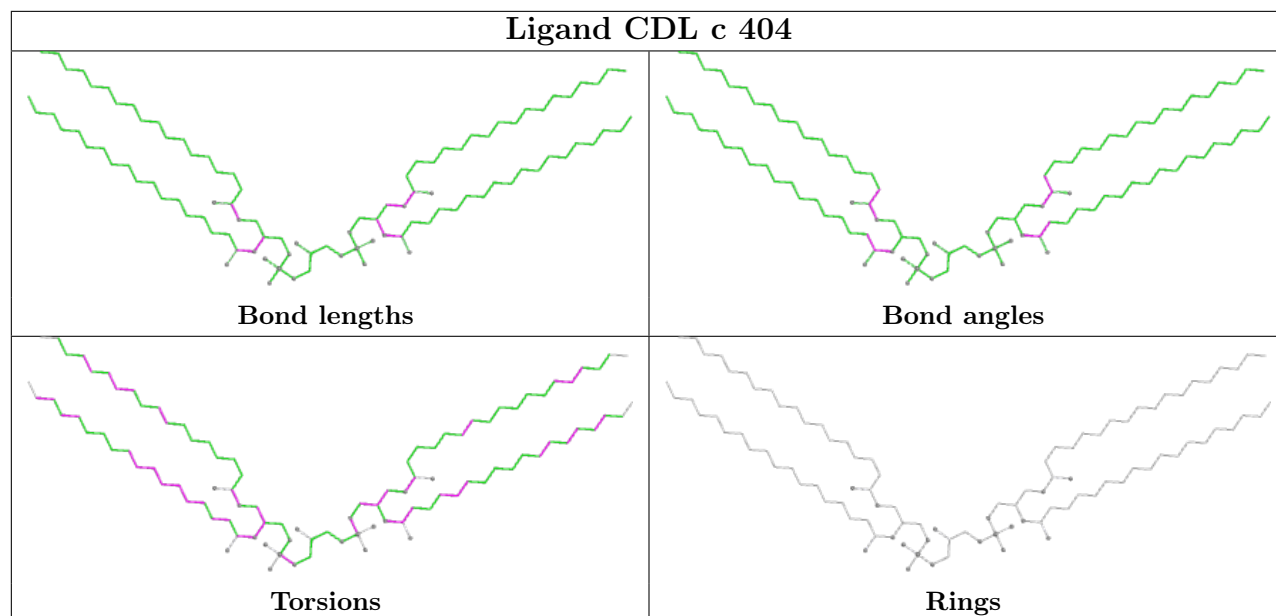


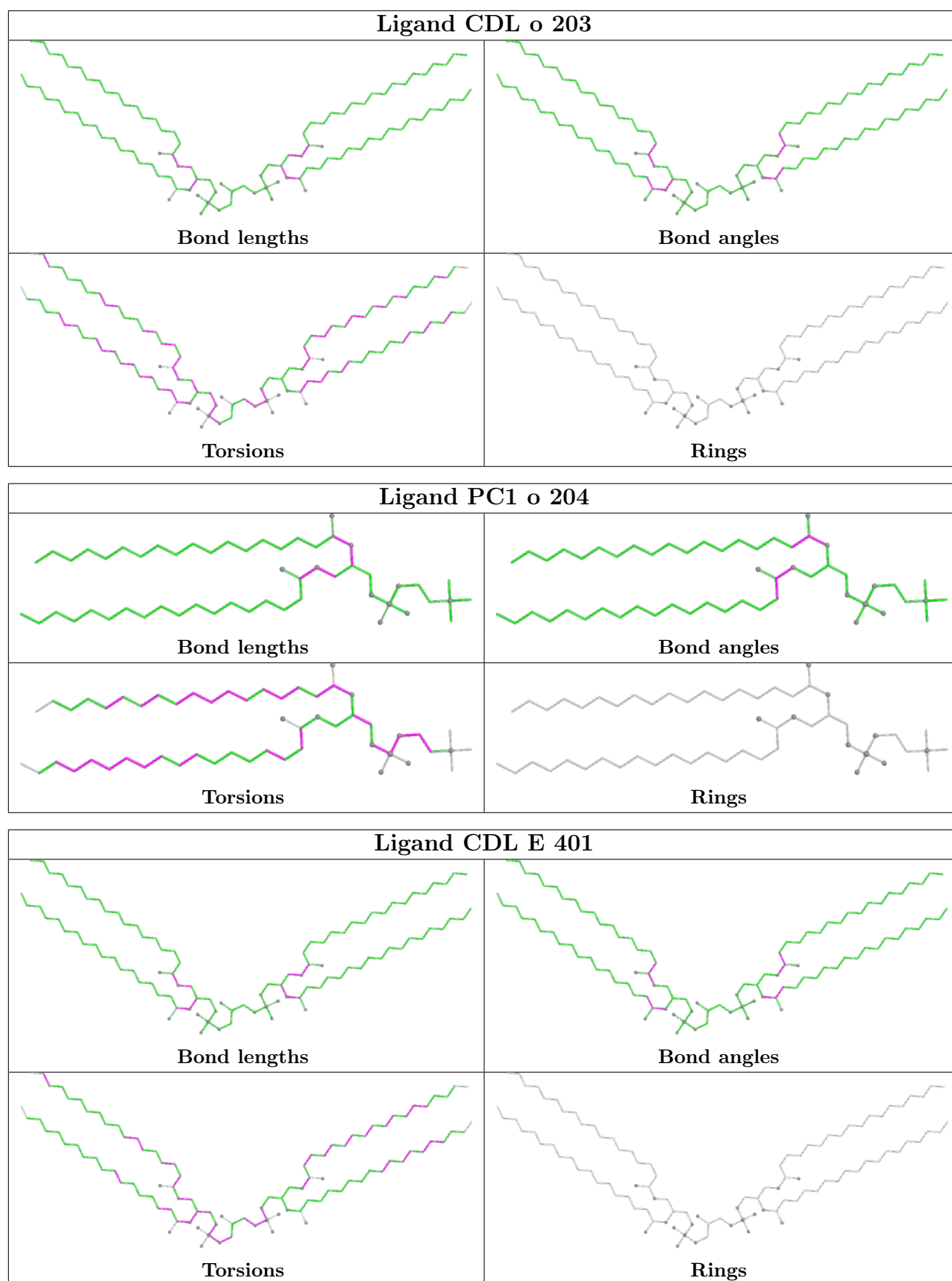


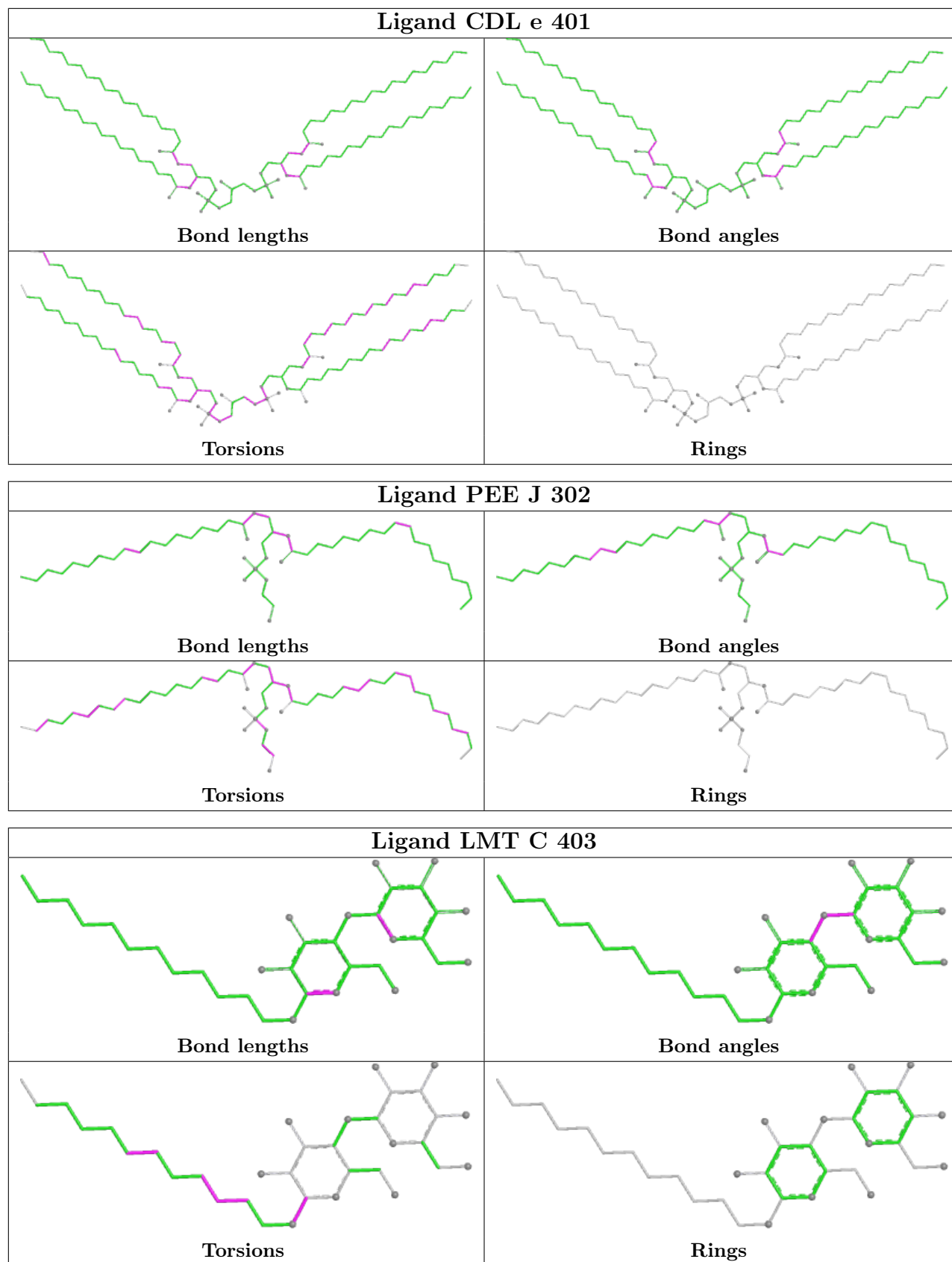


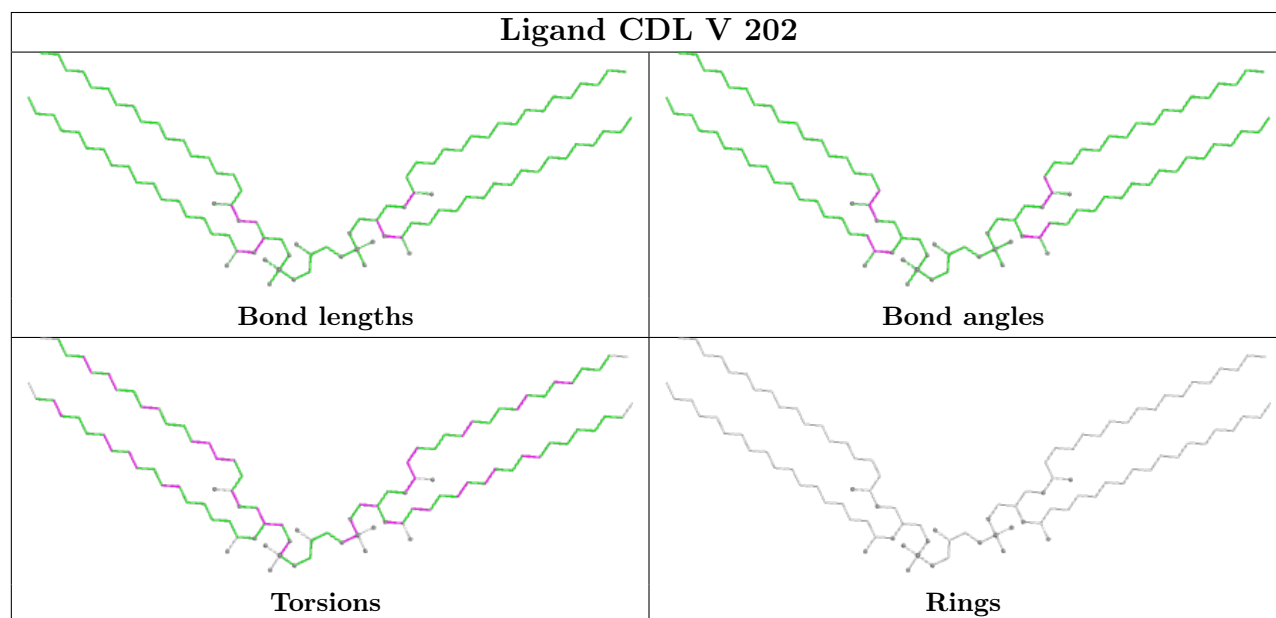
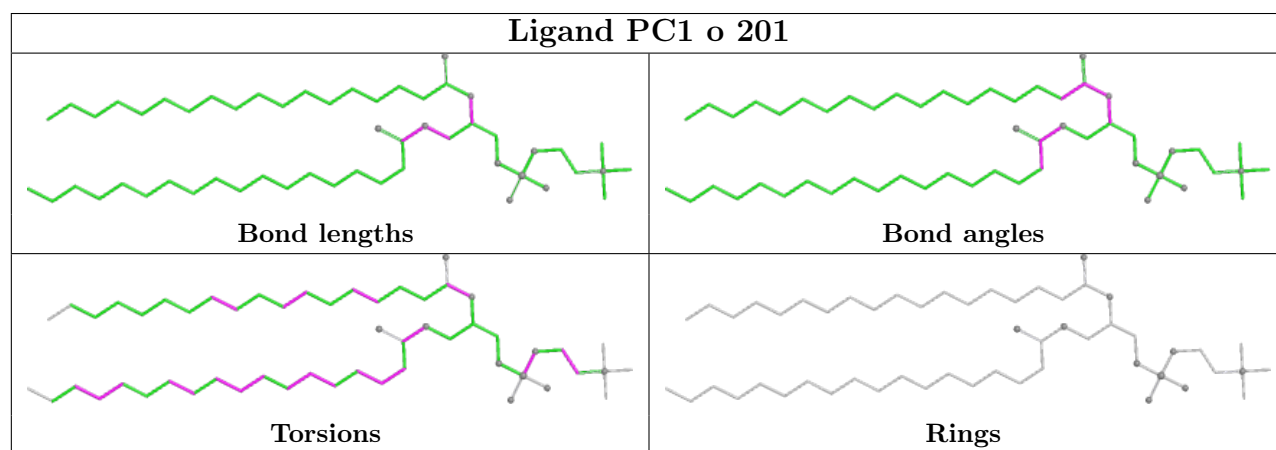
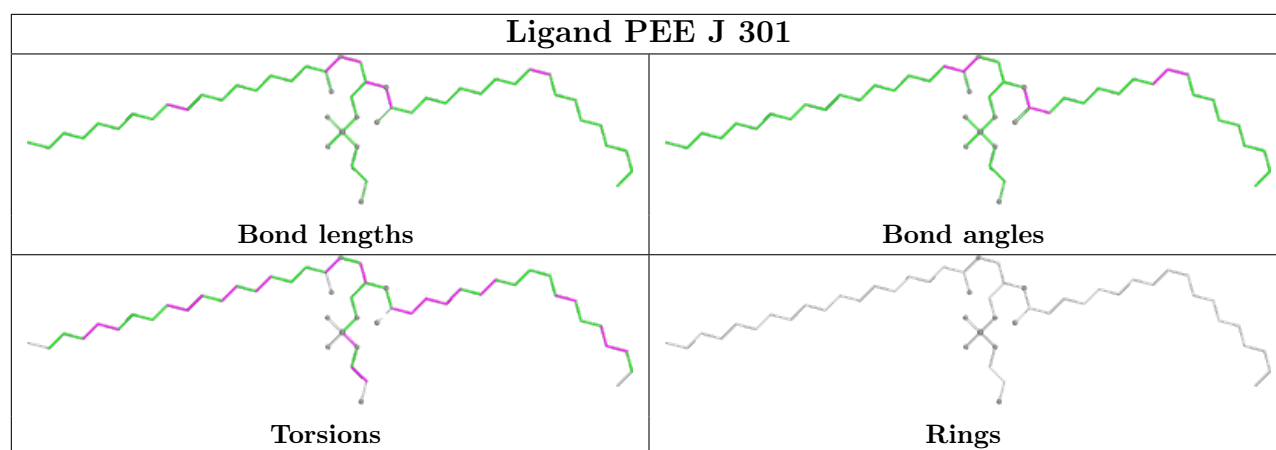


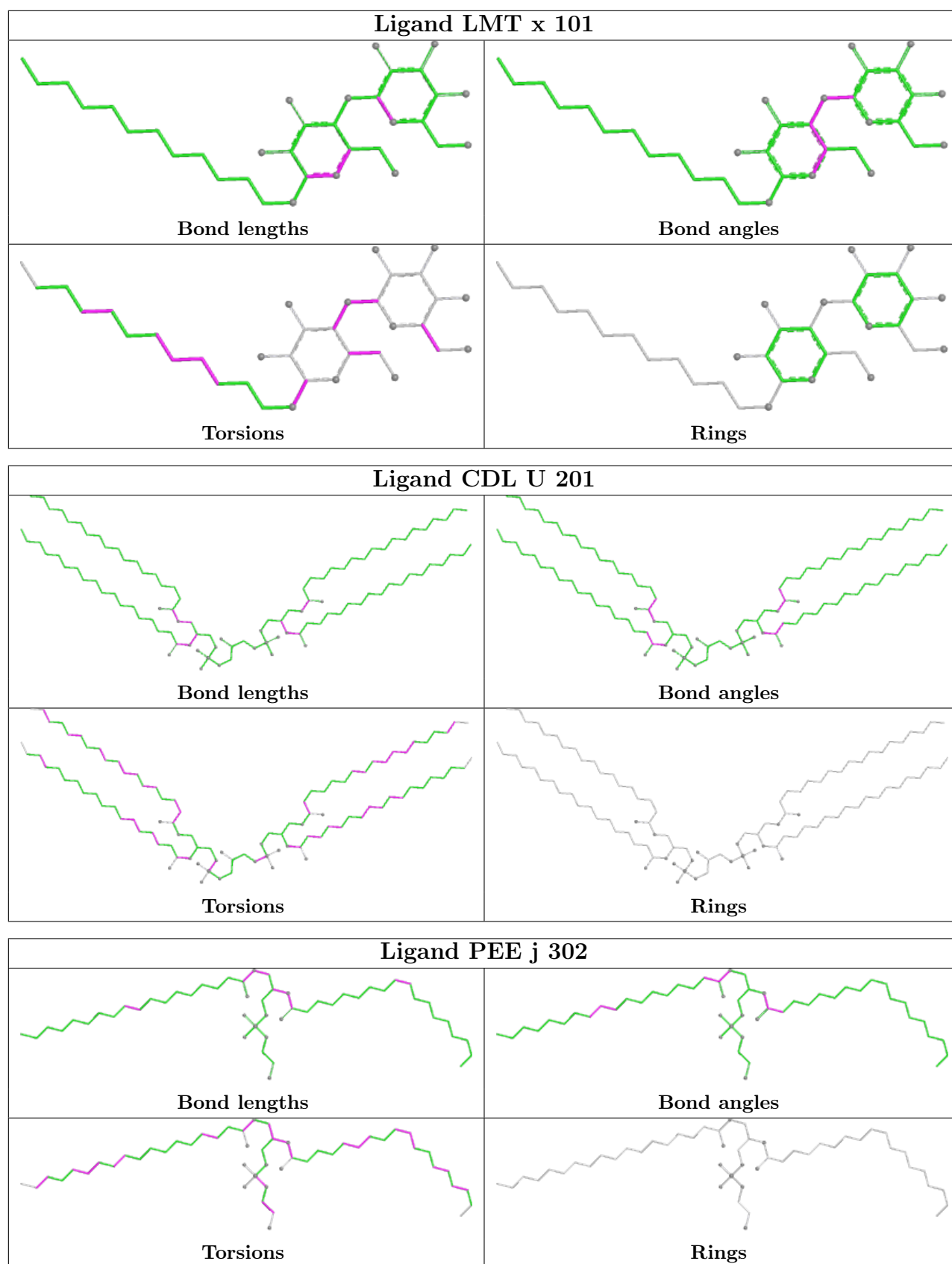


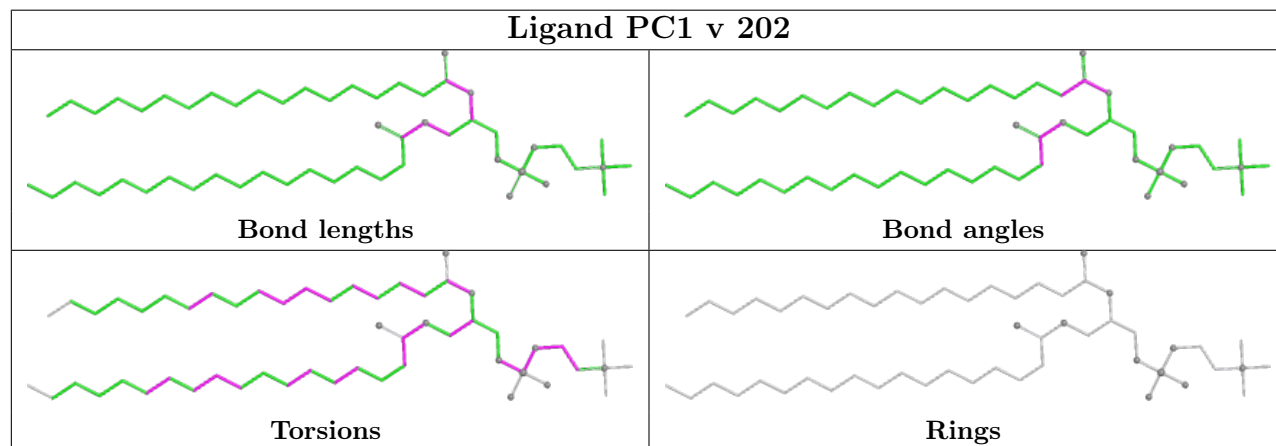
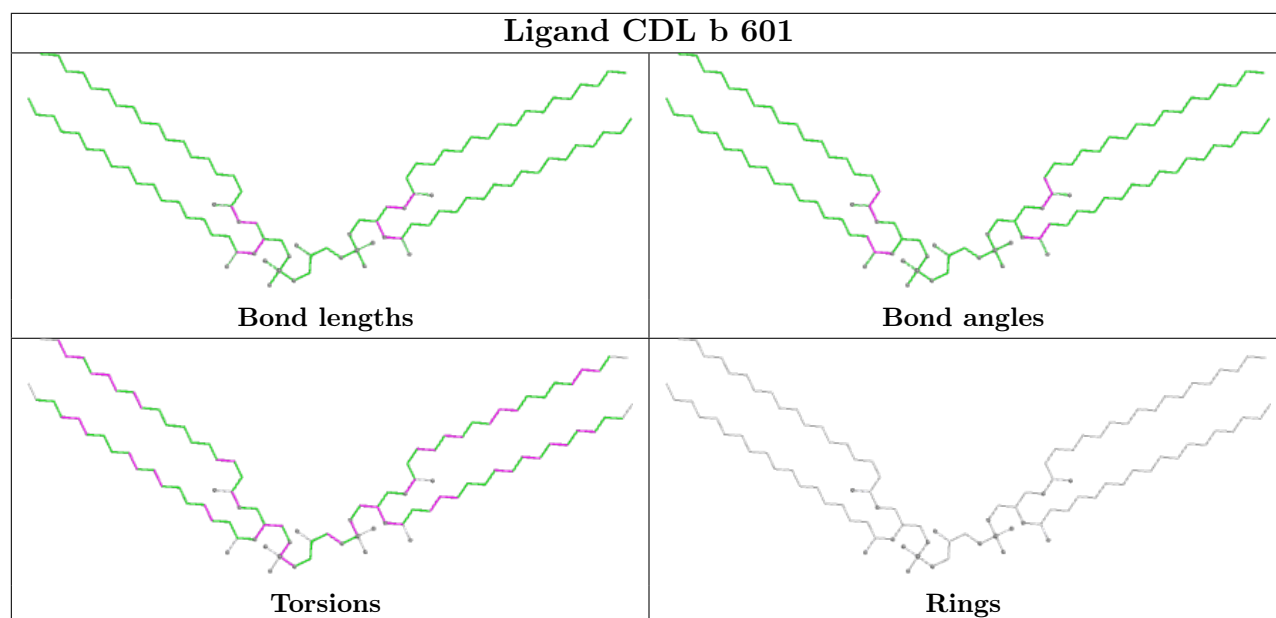
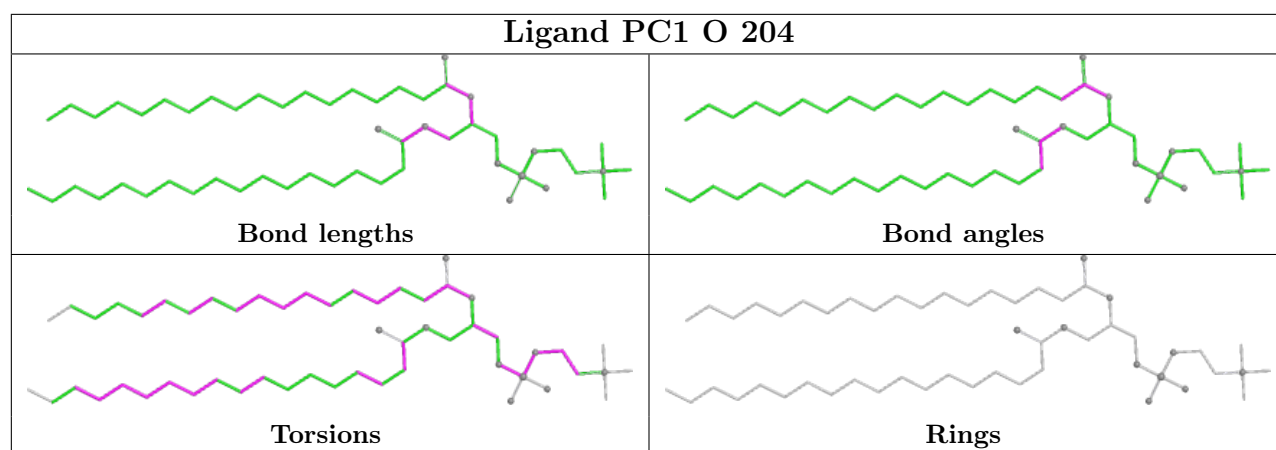


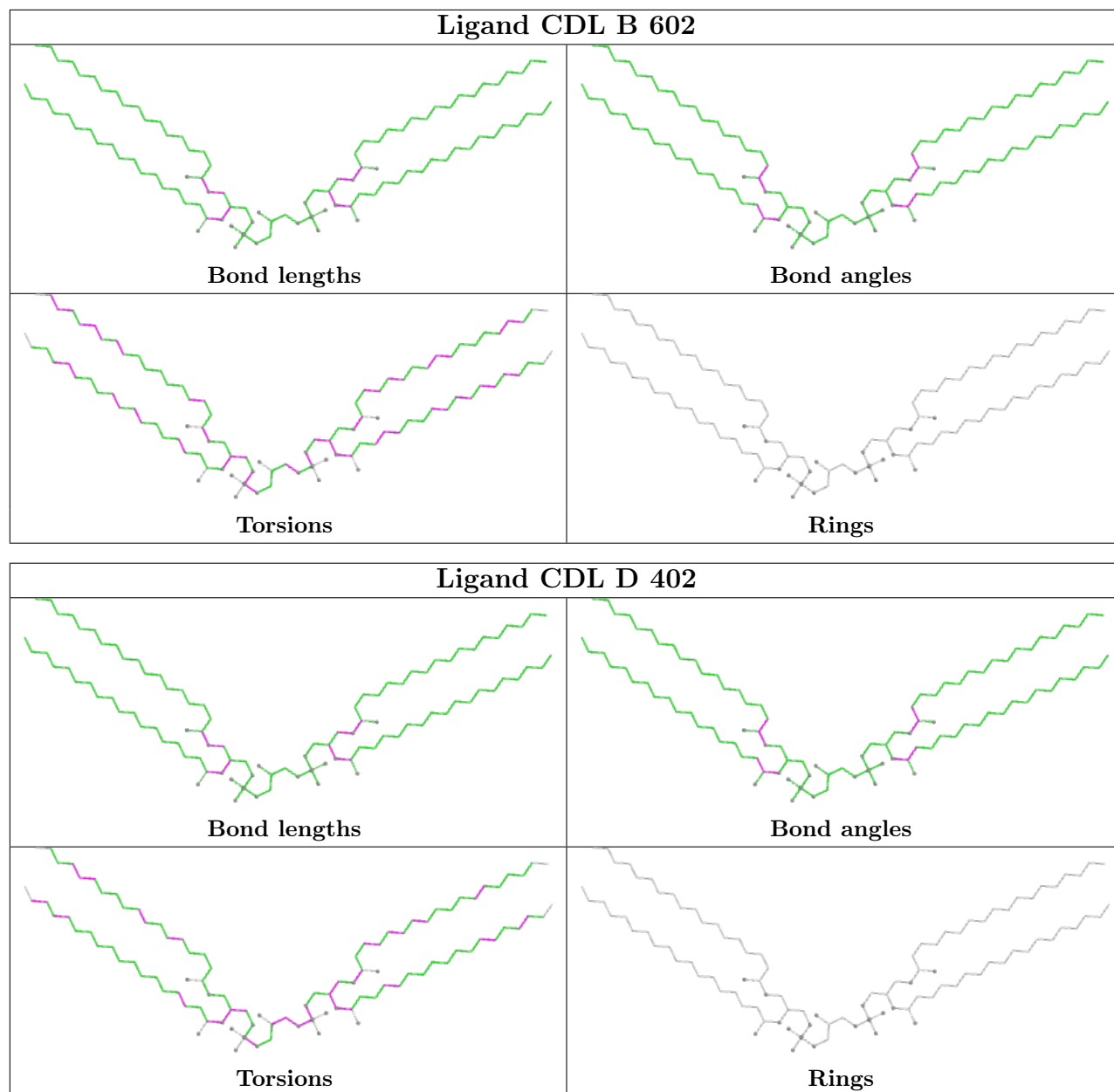


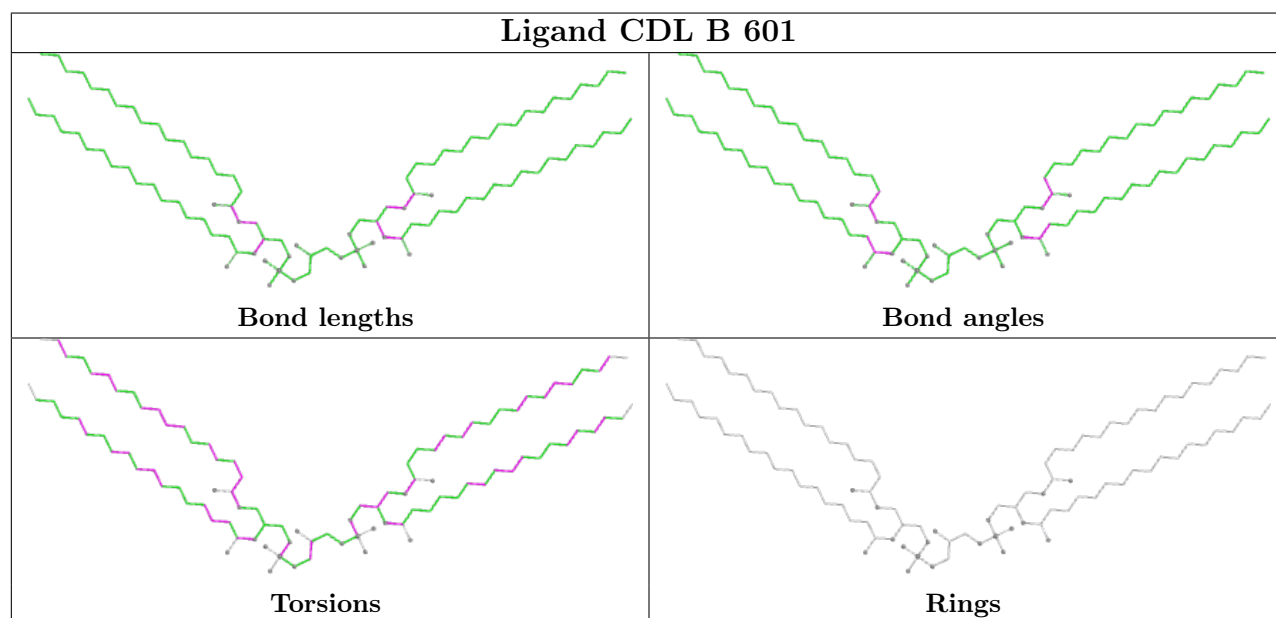
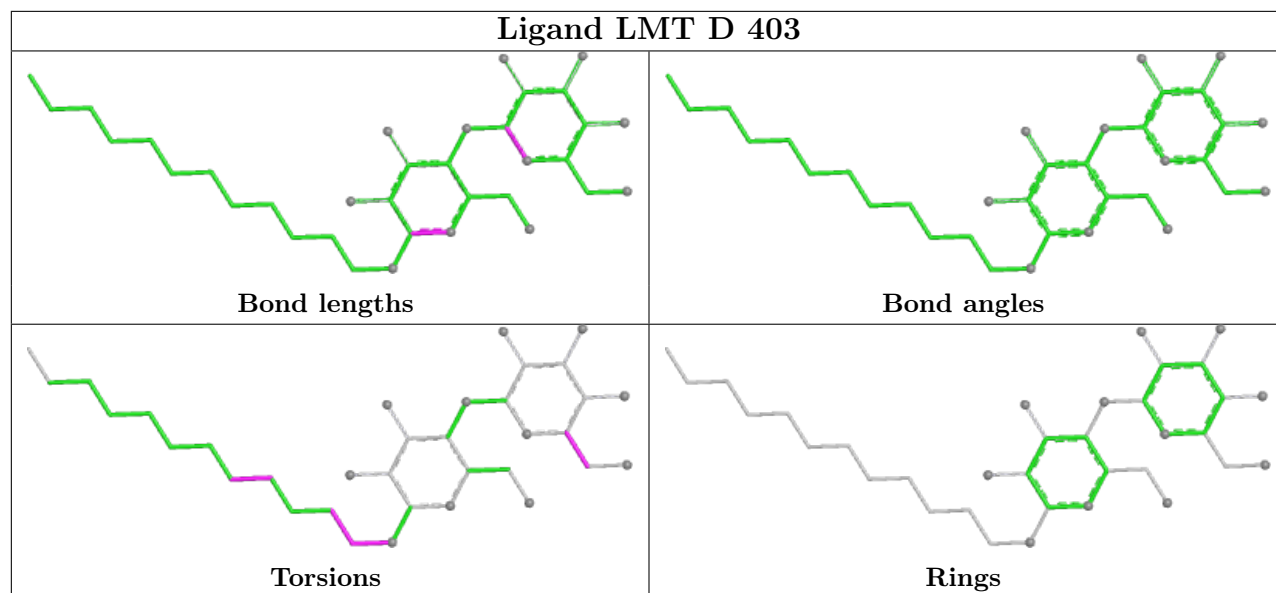


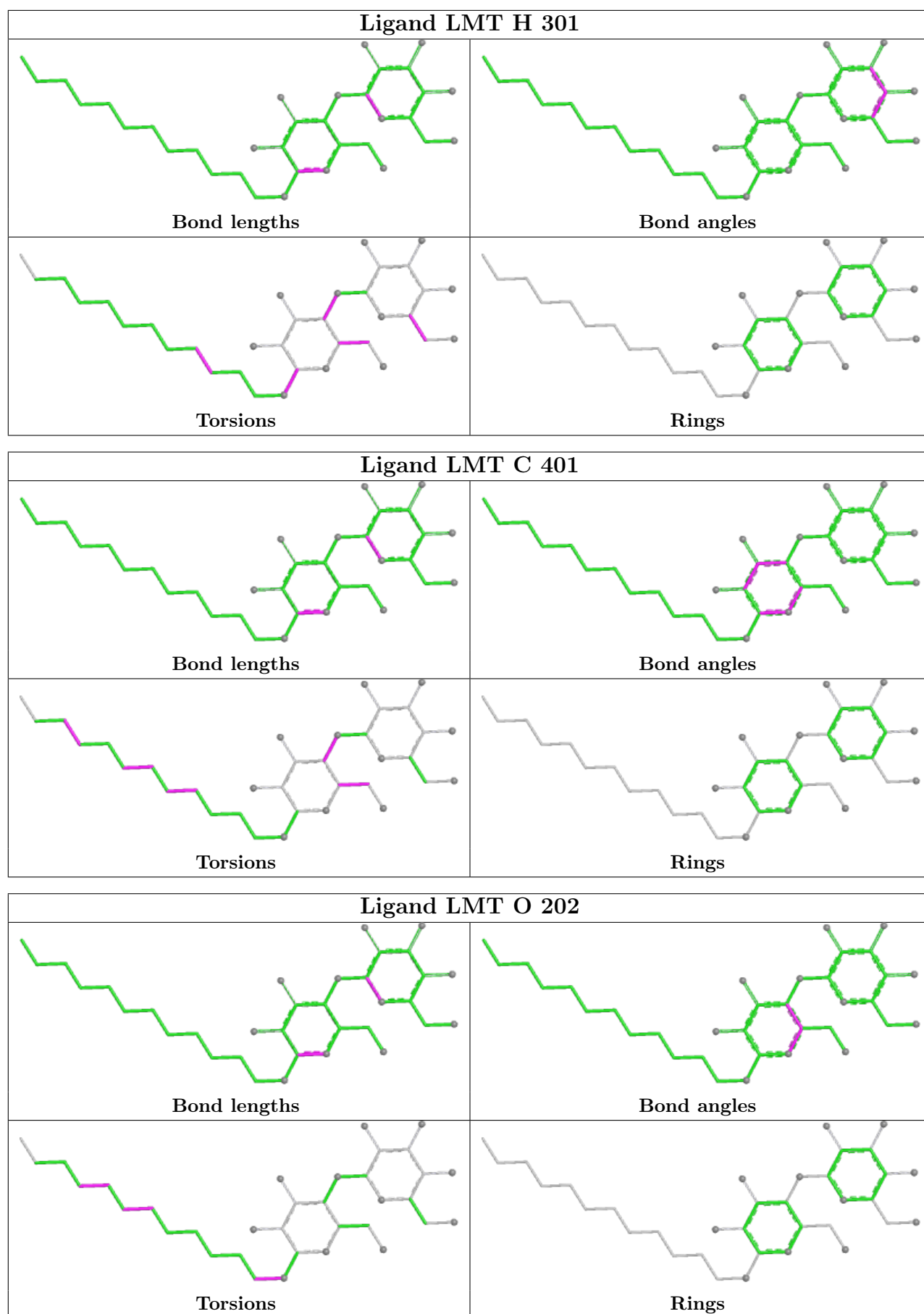


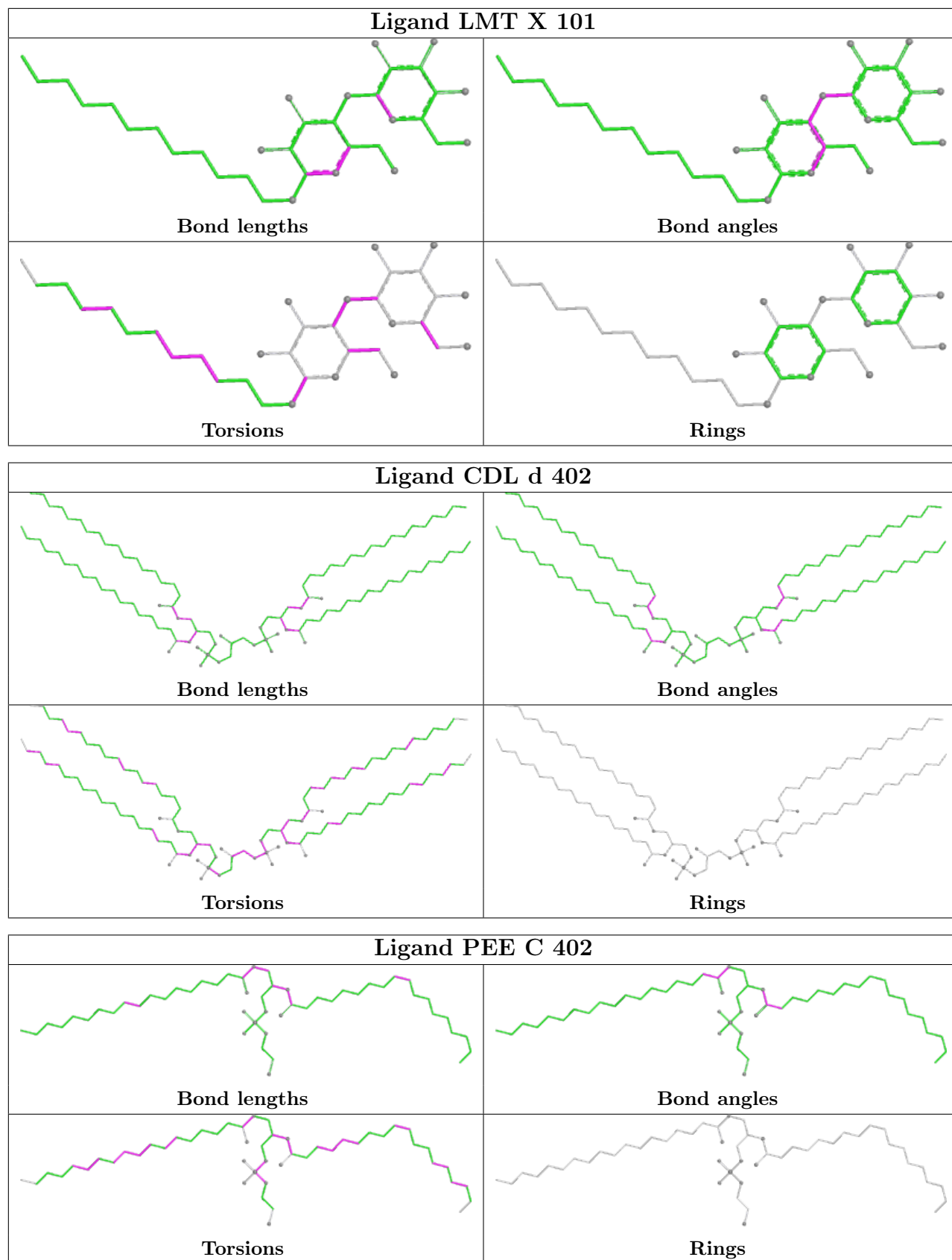


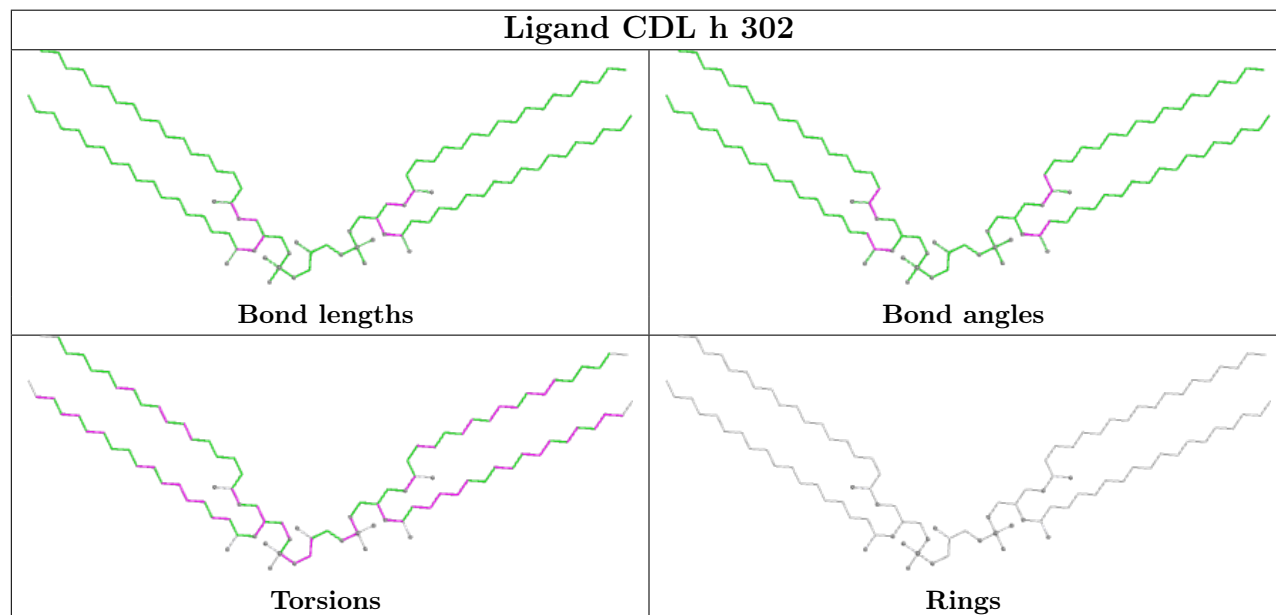
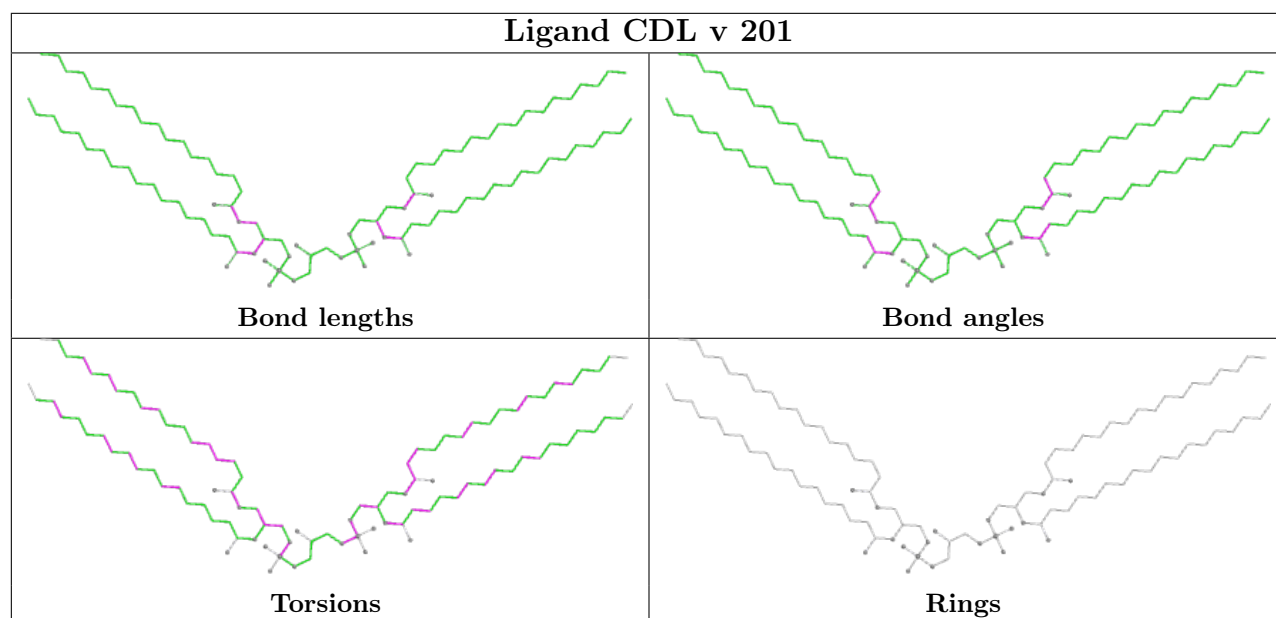
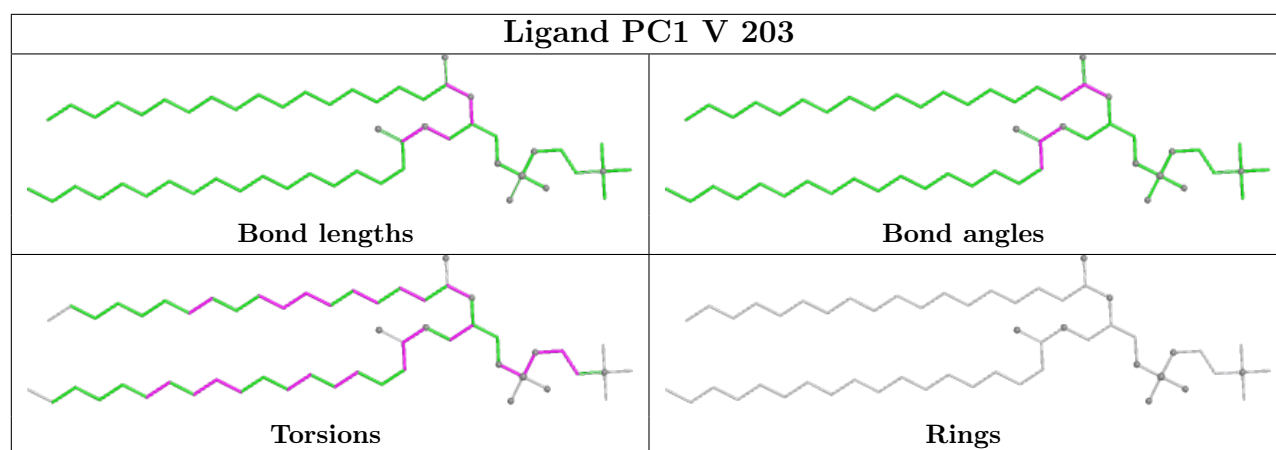












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

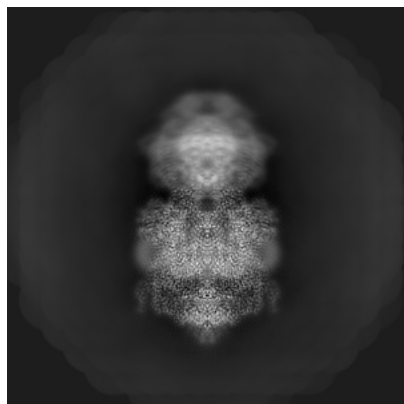
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10520. These allow visual inspection of the internal detail of the map and identification of artifacts.

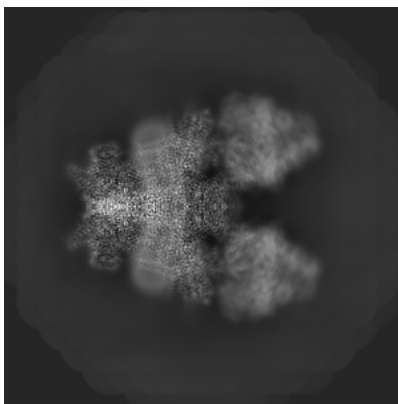
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

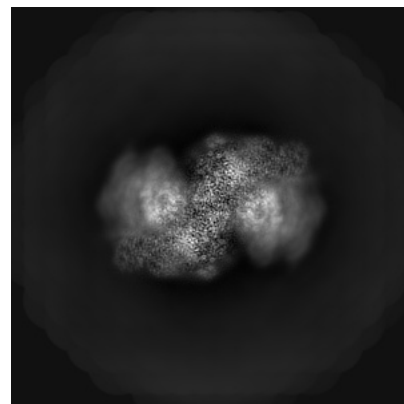
6.1.1 Primary map



X

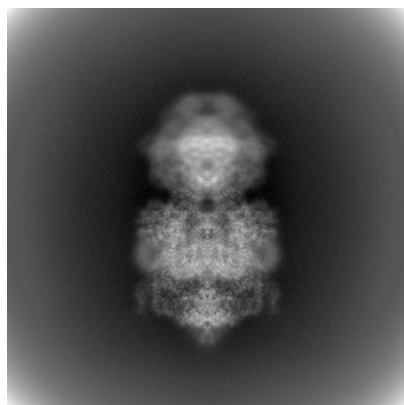


Y

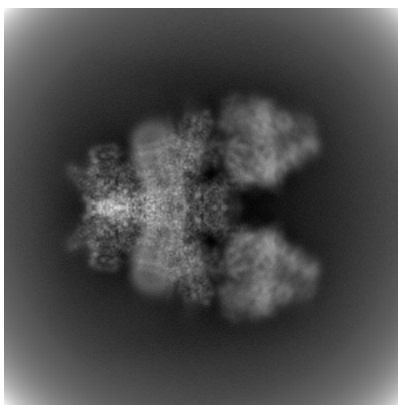


Z

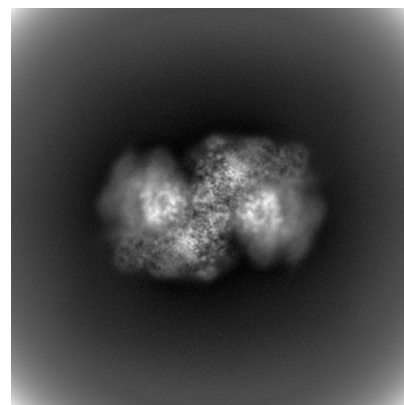
6.1.2 Raw map



X



Y

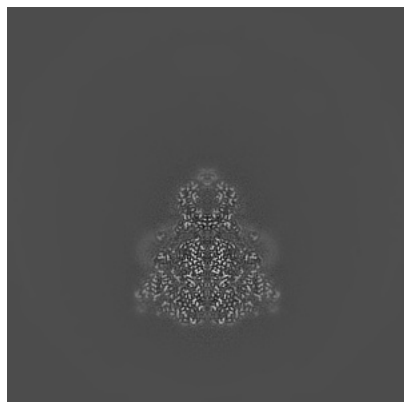


Z

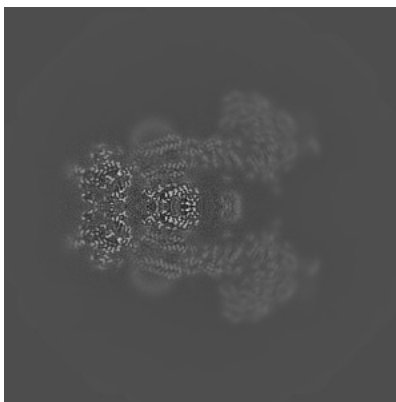
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

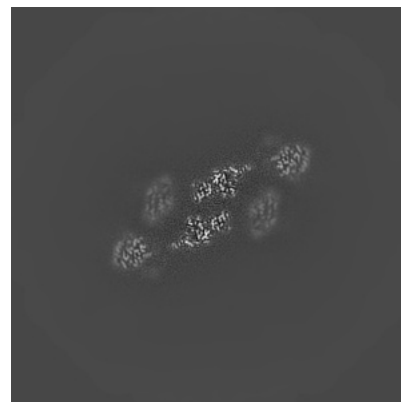
6.2.1 Primary map



X Index: 280

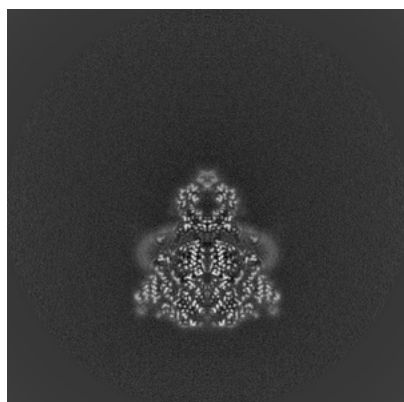


Y Index: 280

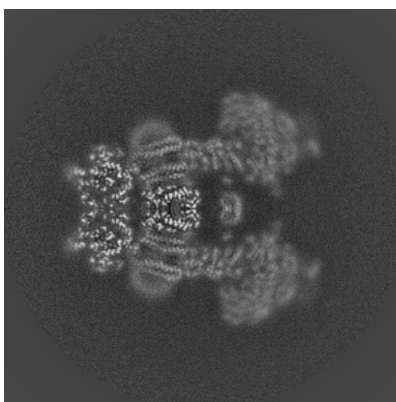


Z Index: 280

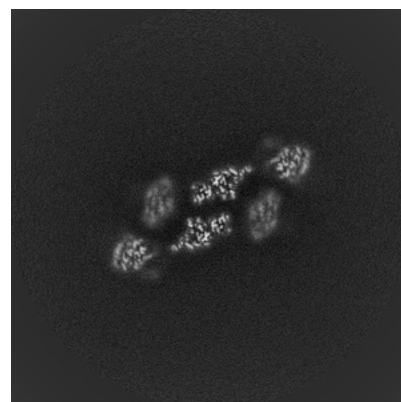
6.2.2 Raw map



X Index: 280



Y Index: 280

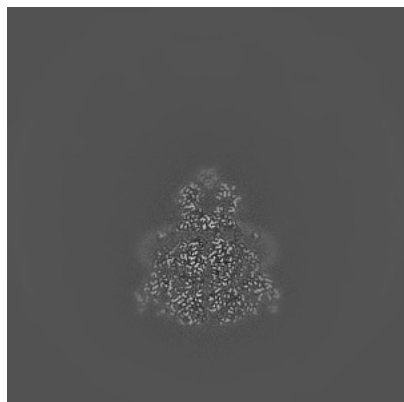


Z Index: 280

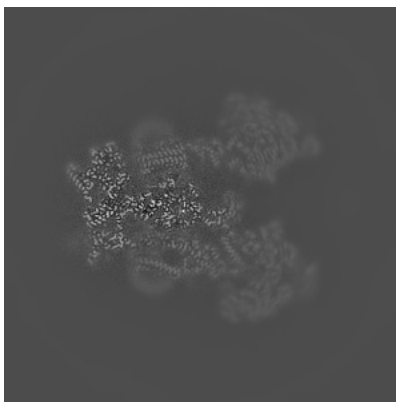
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

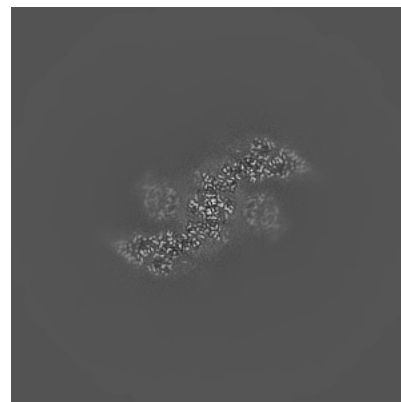
6.3.1 Primary map



X Index: 282

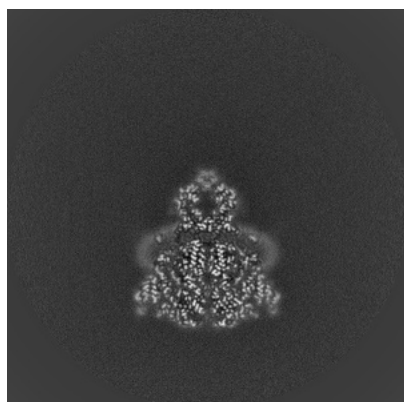


Y Index: 289

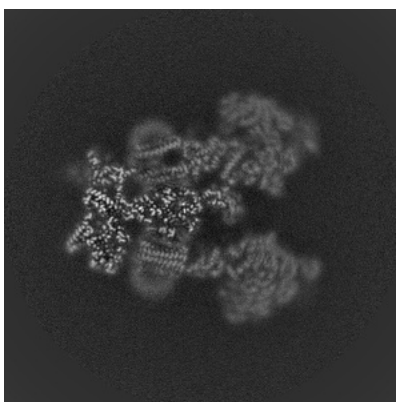


Z Index: 252

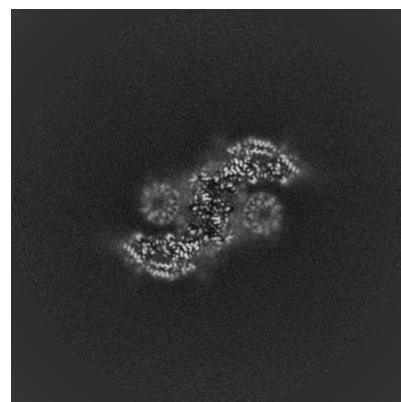
6.3.2 Raw map



X Index: 279



Y Index: 271

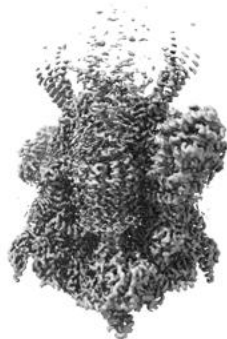


Z Index: 248

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



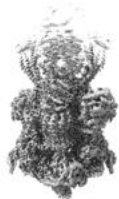
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

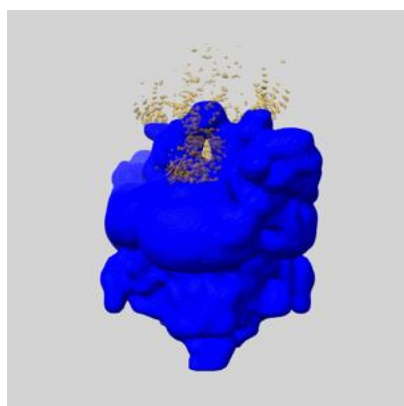
6.5 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

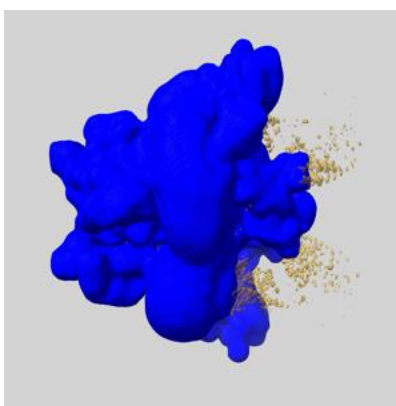
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

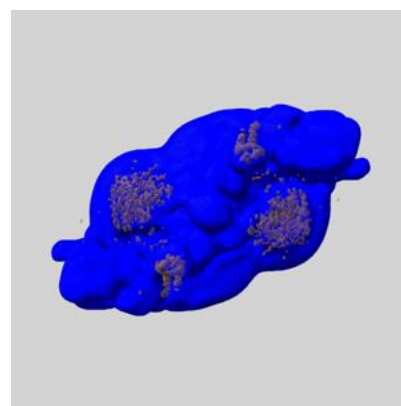
6.5.1 emd_10520_msk_1.map [i](#)



X



Y

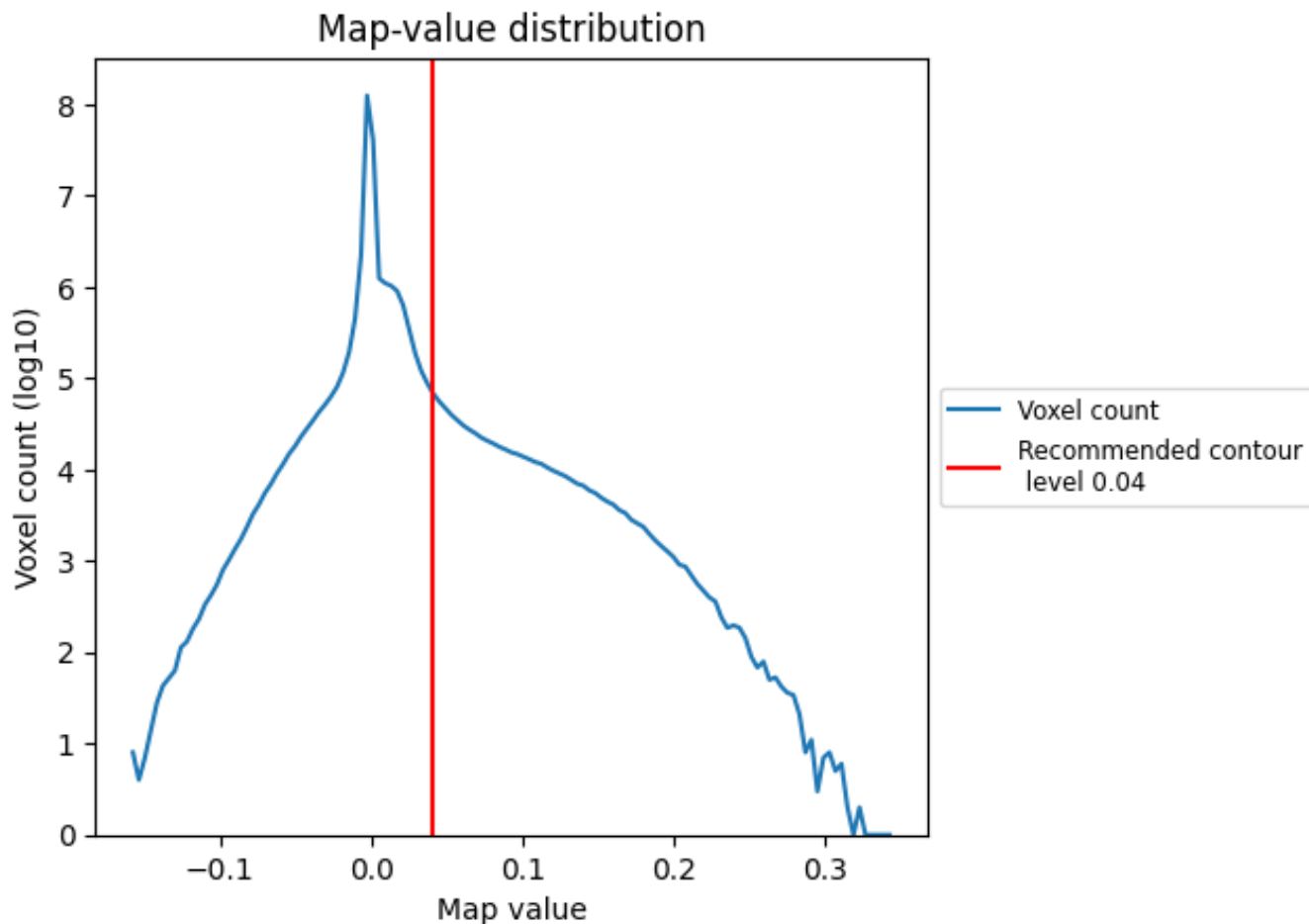


Z

7 Map analysis [i](#)

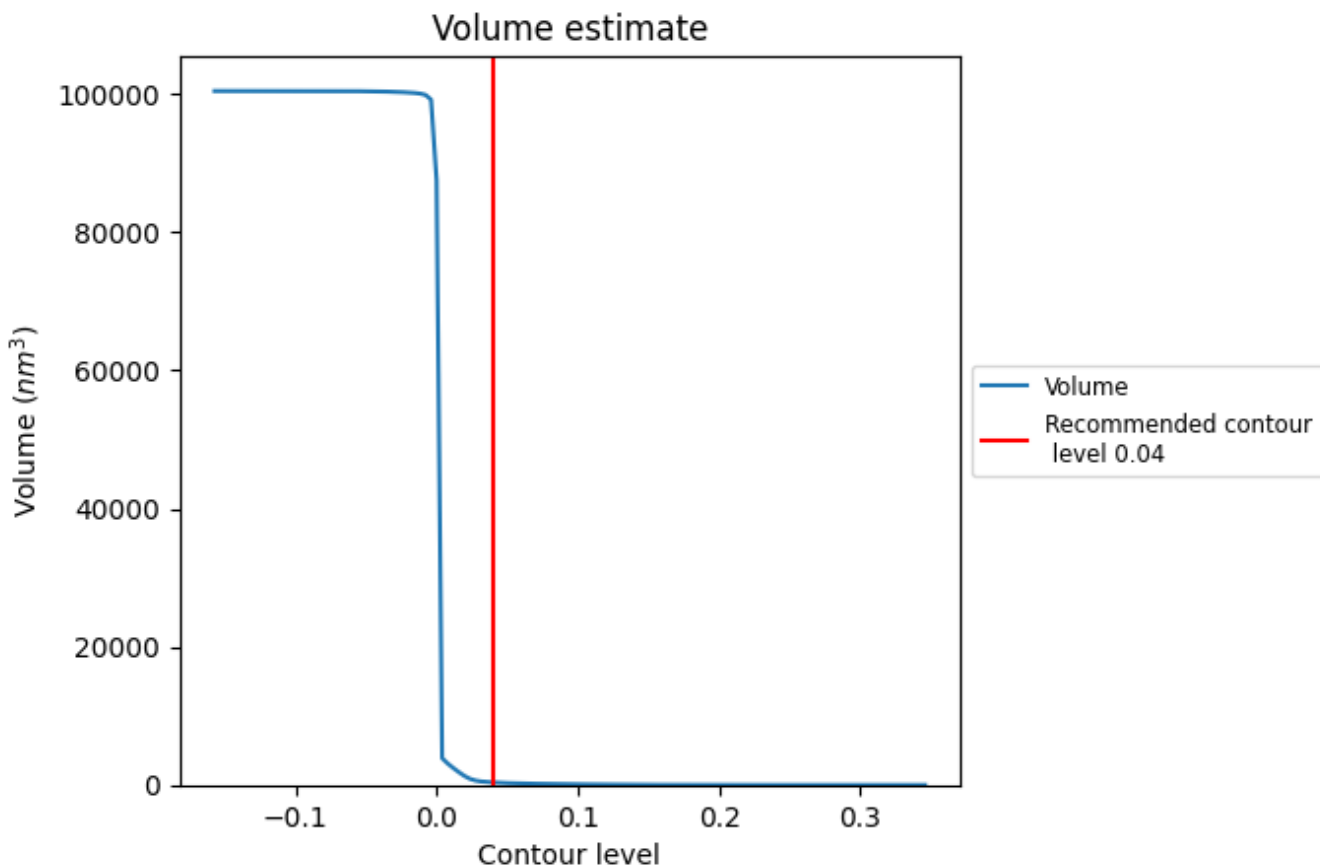
This section contains the results of statistical analysis of the map.

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.

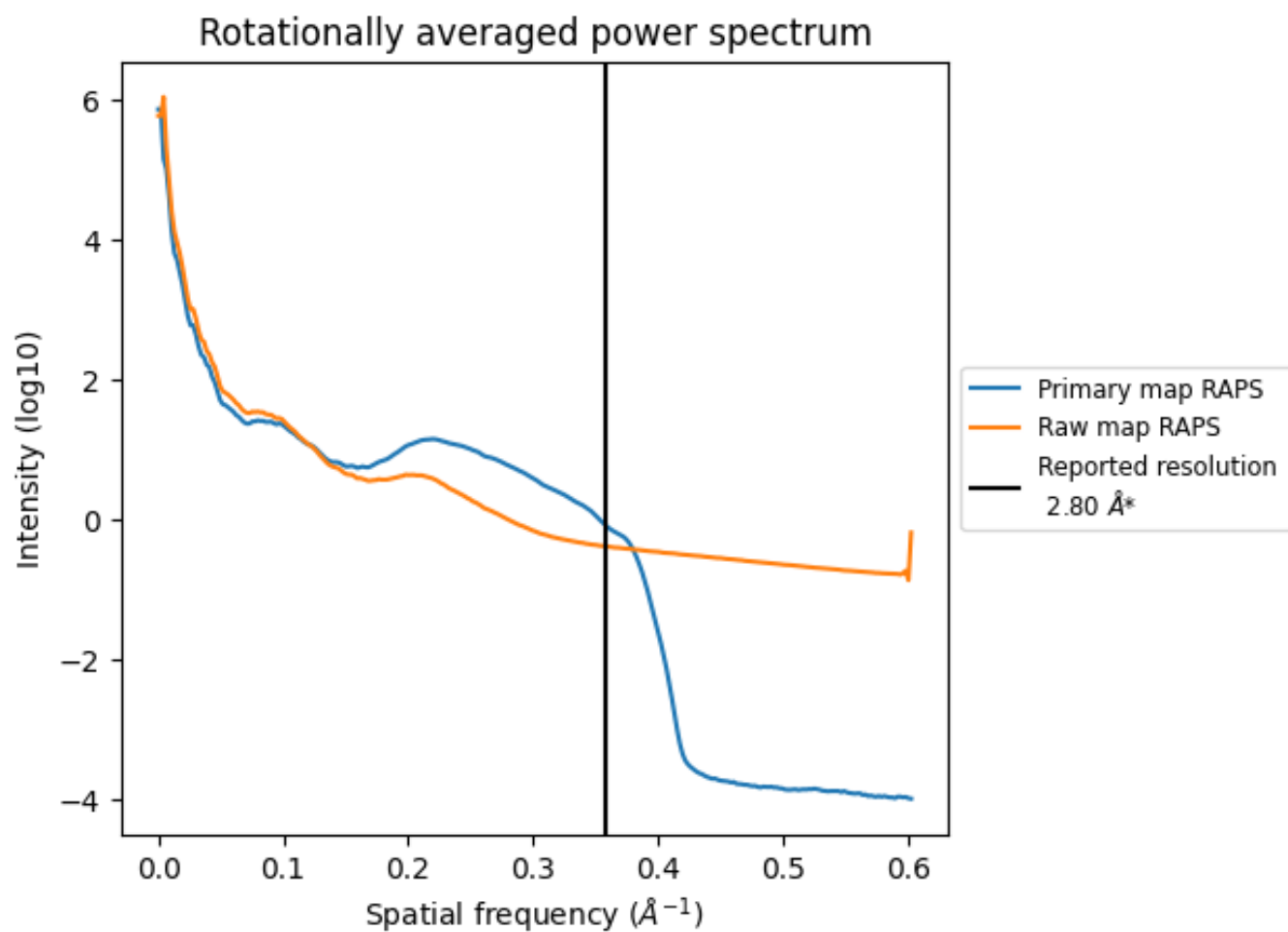
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 365 nm^3 ; this corresponds to an approximate mass of 329 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

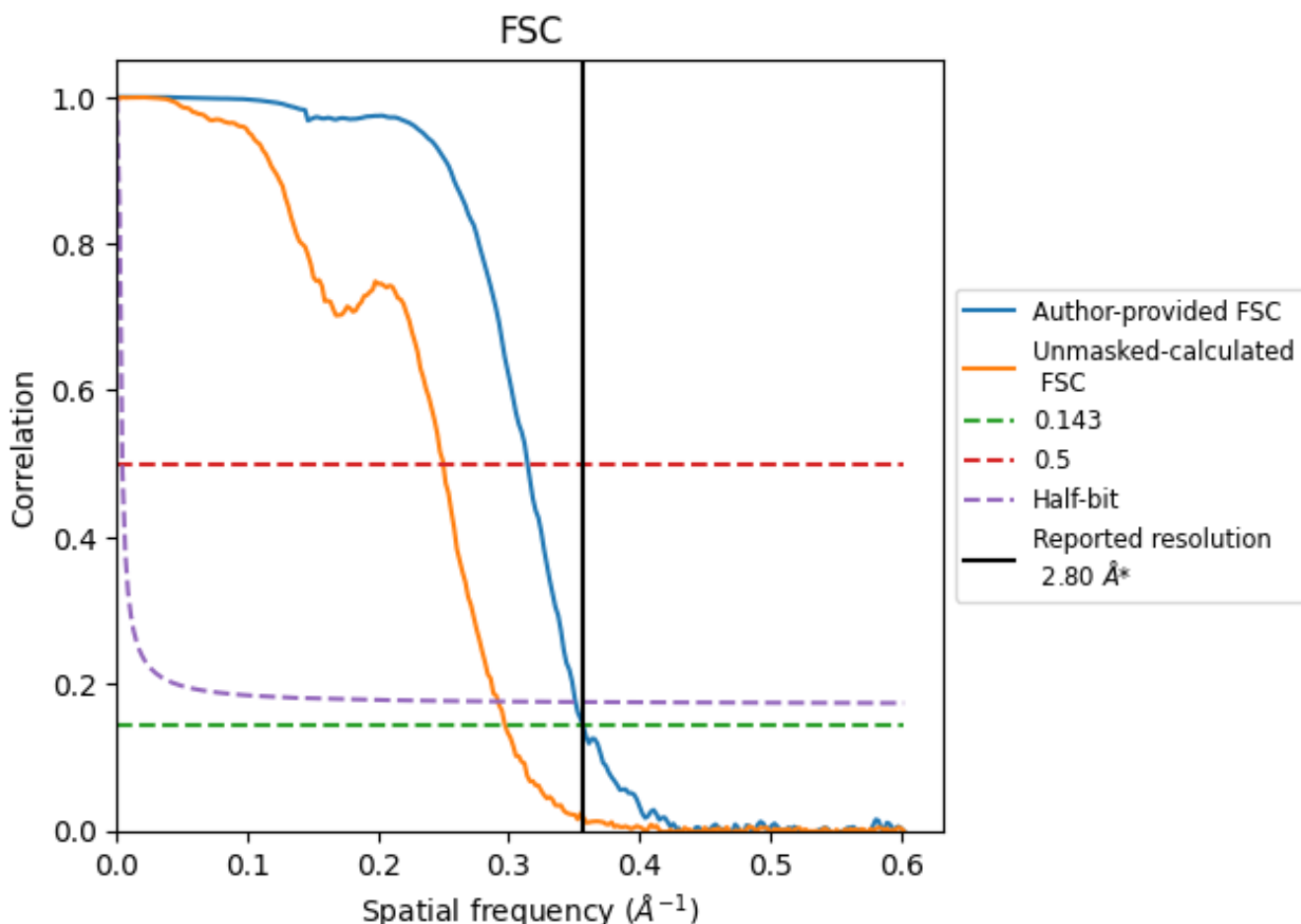


*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

8.2 Resolution estimates [i](#)

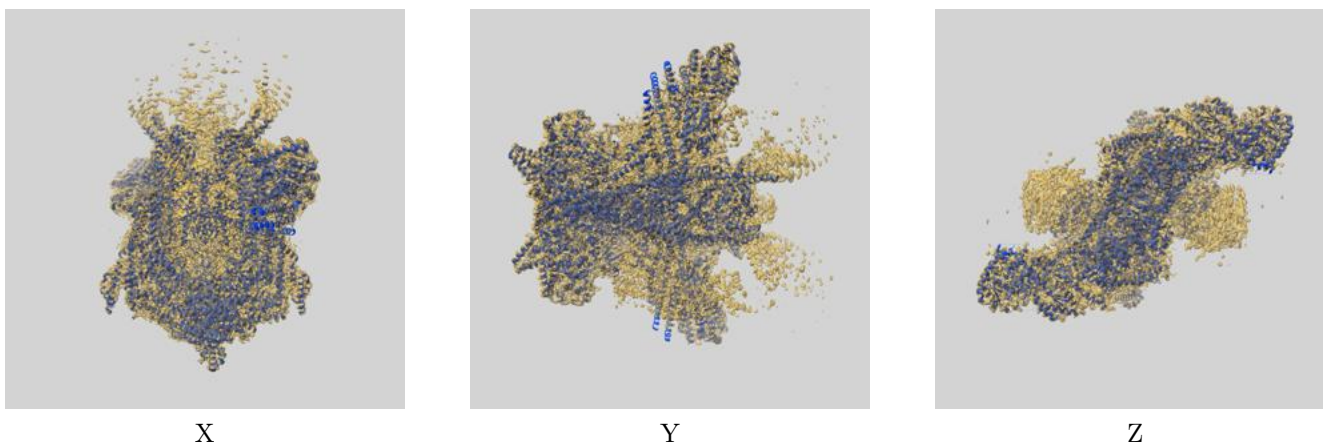
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	2.80	3.18	2.85
Unmasked-calculated*	3.36	4.00	3.43

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.36 differs from the reported value 2.8 by more than 10 %

9 Map-model fit [i](#)

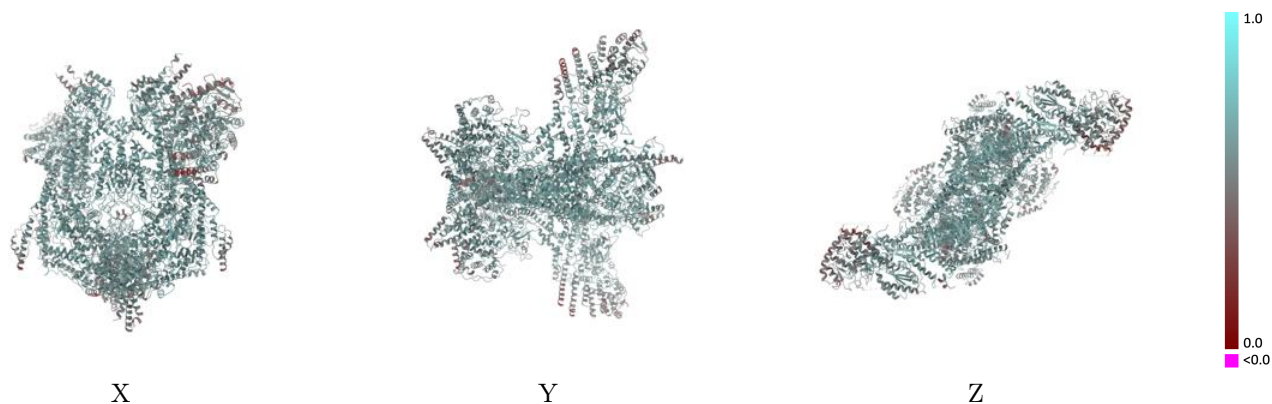
This section contains information regarding the fit between EMDB map EMD-10520 and PDB model 6TMG. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



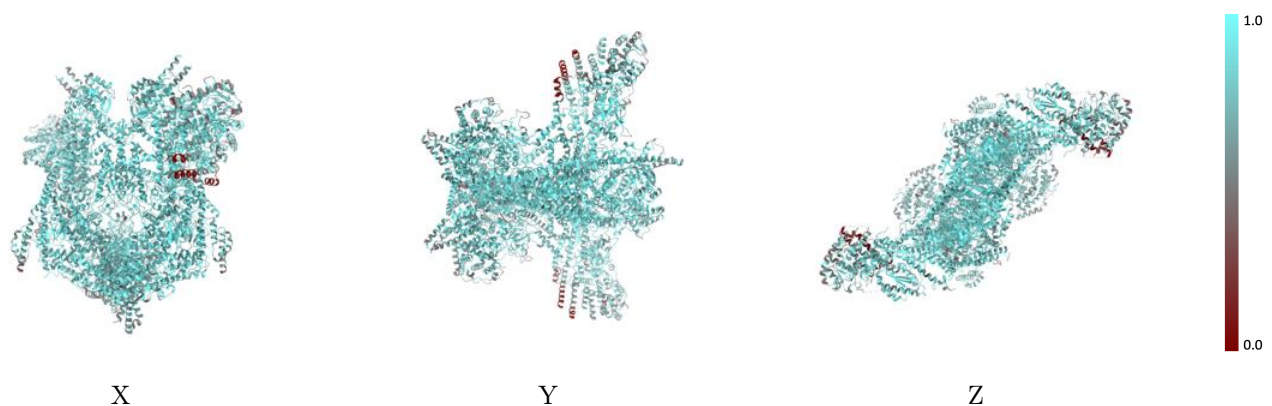
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



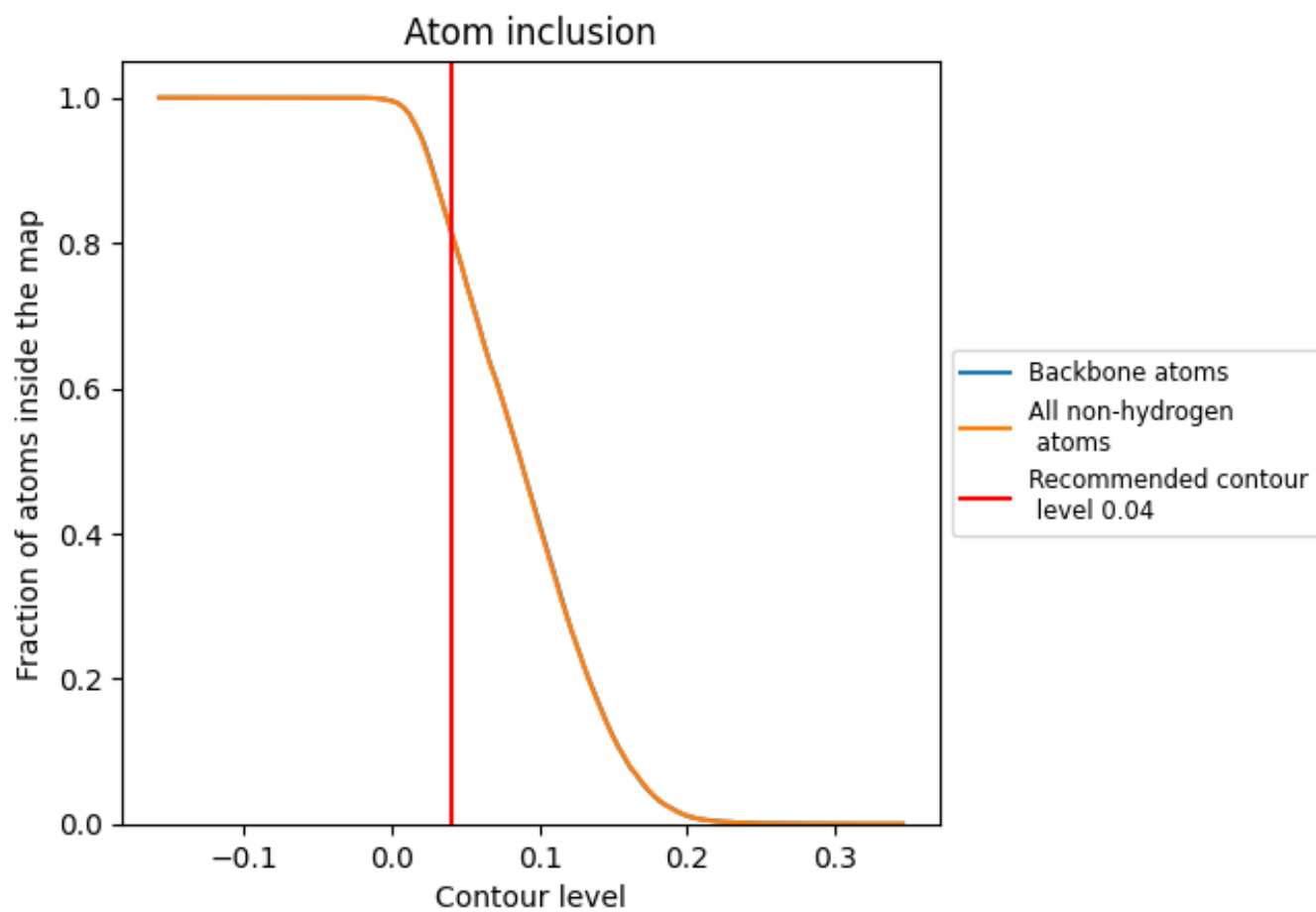
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.04).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 82% of all backbone atoms, 82% 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 (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8169	 0.5890
A	 0.7427	 0.5380
B	 0.8253	 0.5940
C	 0.7290	 0.5550
D	 0.8562	 0.6130
E	 0.8564	 0.6140
F	 0.8181	 0.5770
G	 0.8444	 0.5920
H	 0.8720	 0.6180
I	 0.7613	 0.5490
J	 0.9206	 0.6520
K	 0.7455	 0.5820
L	 0.8645	 0.6020
M	 0.8936	 0.6290
N	 0.7651	 0.5560
O	 0.7934	 0.5800
P	 0.8686	 0.6010
Q	 0.7187	 0.5160
R	 0.8431	 0.5950
S	 0.8355	 0.5860
T	 0.7698	 0.5560
U	 0.8200	 0.5840
V	 0.8286	 0.6100
W	 0.9231	 0.6320
X	 0.8612	 0.6130
a	 0.7407	 0.5390
b	 0.8334	 0.6010
c	 0.7298	 0.5560
d	 0.8567	 0.6120
e	 0.8547	 0.6160
f	 0.8166	 0.5760
g	 0.8503	 0.5940
h	 0.8709	 0.6190
i	 0.7657	 0.5510
j	 0.9232	 0.6510



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
k	 0.7412	 0.5810
l	 0.8633	 0.6010
m	 0.8910	 0.6270
n	 0.7643	 0.5560
o	 0.7941	 0.5830
p	 0.8698	 0.6030
q	 0.7110	 0.5160
r	 0.8375	 0.5930
s	 0.8329	 0.5840
t	 0.7542	 0.5540
u	 0.8225	 0.5860
v	 0.8508	 0.6170
w	 0.9190	 0.6320
x	 0.8582	 0.6110