



Full wwPDB EM Validation Report ⓘ

Feb 20, 2024 – 04:18 PM EST

PDB ID : 8SIE
EMDB ID : EMD-40507
Title : Pendrin in complex with bicarbonate
Authors : Wang, L.; Hoang, A.; Zhou, M.
Deposited on : 2023-04-16
Resolution : 2.70 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

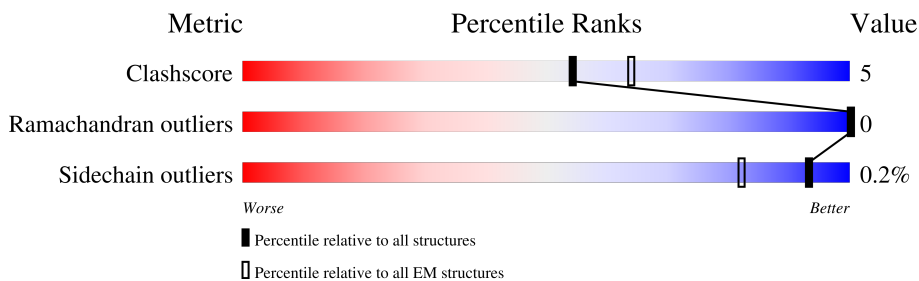
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	C	780	
1	D	780	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	LBN	C	801	X	-	-	-
3	LBN	D	815	X	-	-	-

2 Entry composition [i](#)

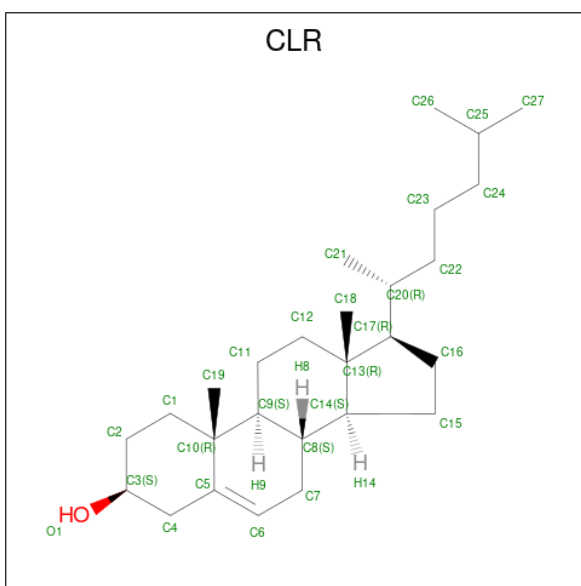
There are 6 unique types of molecules in this entry. The entry contains 10398 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Pendrin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	D	613	Total	C	N	O	S	0	0
			4755	3130	771	836	18		
1	C	613	Total	C	N	O	S	0	0
			4755	3130	771	836	18		

- Molecule 2 is CHOLESTEROL (three-letter code: CLR) (formula: $C_{27}H_{46}O$).



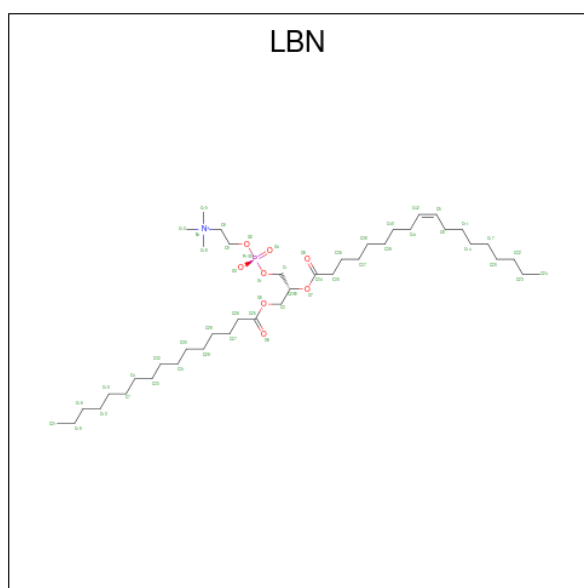
Mol	Chain	Residues	Atoms			AltConf
			Total	C	O	
2	D	1	Total	C	O	0
			28	27	1	
2	D	1	Total	C	O	0
			28	27	1	
2	D	1	Total	C	O	0
			28	27	1	
2	D	1	Total	C	O	0
			28	27	1	
2	D	1	Total	C	O	0
			28	27	1	

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Mol	Chain	Residues	Atoms			AltConf
2	D	1	Total	C	O	0
			28	27	1	
2	C	1	Total	C	O	0
			28	27	1	
2	C	1	Total	C	O	0
			28	27	1	
2	C	1	Total	C	O	0
			28	27	1	
2	C	1	Total	C	O	0
			28	27	1	
2	C	1	Total	C	O	0
			28	27	1	

- Molecule 3 is 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (three-letter code: LBN) (formula: $C_{42}H_{82}NO_8P$).



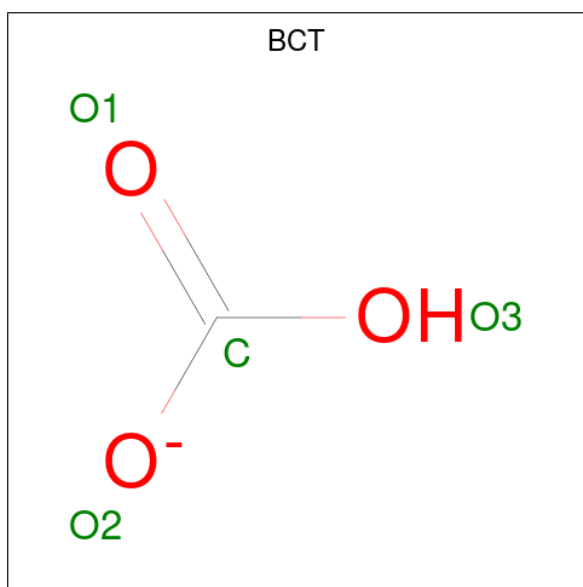
Mol	Chain	Residues	Atoms				AltConf
3	D	1	Total	C	O	P	0
			27	20	6	1	
3	D	1	Total	C	O	P	0
			28	19	8	1	
3	D	1	Total	C			0
			12	12			
3	D	1	Total	C			0
			9	9			

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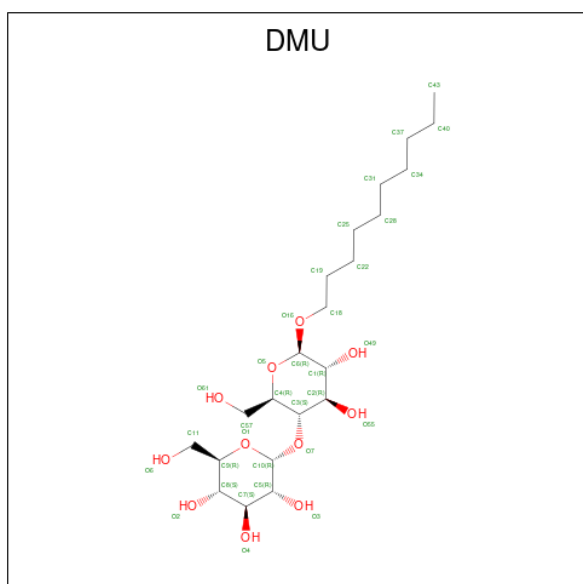
Mol	Chain	Residues	Atoms				AltConf
3	D	1	Total	C			0
			12	12			
3	D	1	Total	C			0
			11	11			
3	D	1	Total	C			0
			12	12			
3	D	1	Total	C			0
			12	12			
3	D	1	Total	C	O	P	0
			43	34	8	1	
3	C	1	Total	C	O	P	0
			43	34	8	1	
3	C	1	Total	C	O	P	0
			27	20	6	1	
3	C	1	Total	C	O	P	0
			28	19	8	1	
3	C	1	Total	C			0
			12	12			
3	C	1	Total	C			0
			9	9			
3	C	1	Total	C			0
			12	12			
3	C	1	Total	C			0
			11	11			
3	C	1	Total	C			0
			12	12			
3	C	1	Total	C			0
			12	12			

- Molecule 4 is BICARBONATE ION (three-letter code: BCT) (formula: CHO_3) (labeled as "Ligand of Interest" by depositor).



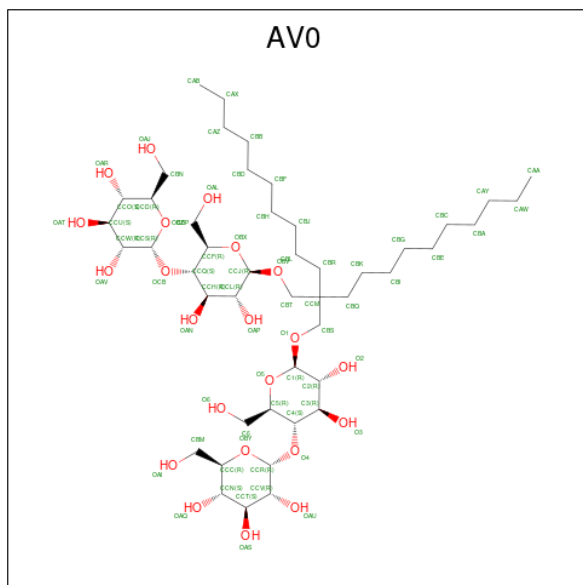
Mol	Chain	Residues	Atoms			AltConf
4	D	1	Total	C	O	0
			4	1	3	
4	D	1	Total	C	O	0
			4	1	3	
4	C	1	Total	C	O	0
			4	1	3	
4	C	1	Total	C	O	0
			4	1	3	

- Molecule 5 is DECYL-BETA-D-MALTOPYRANOSIDE (three-letter code: DMU) (formula: $C_{22}H_{42}O_{11}$).



Mol	Chain	Residues	Atoms			AltConf
5	D	1	Total	C	O	0
			33	22	11	
5	C	1	Total	C	O	0
			33	22	11	

- Molecule 6 is Lauryl Maltose Neopentyl Glycol (three-letter code: AV0) (formula: $C_{47}H_{88}O_{22}$).

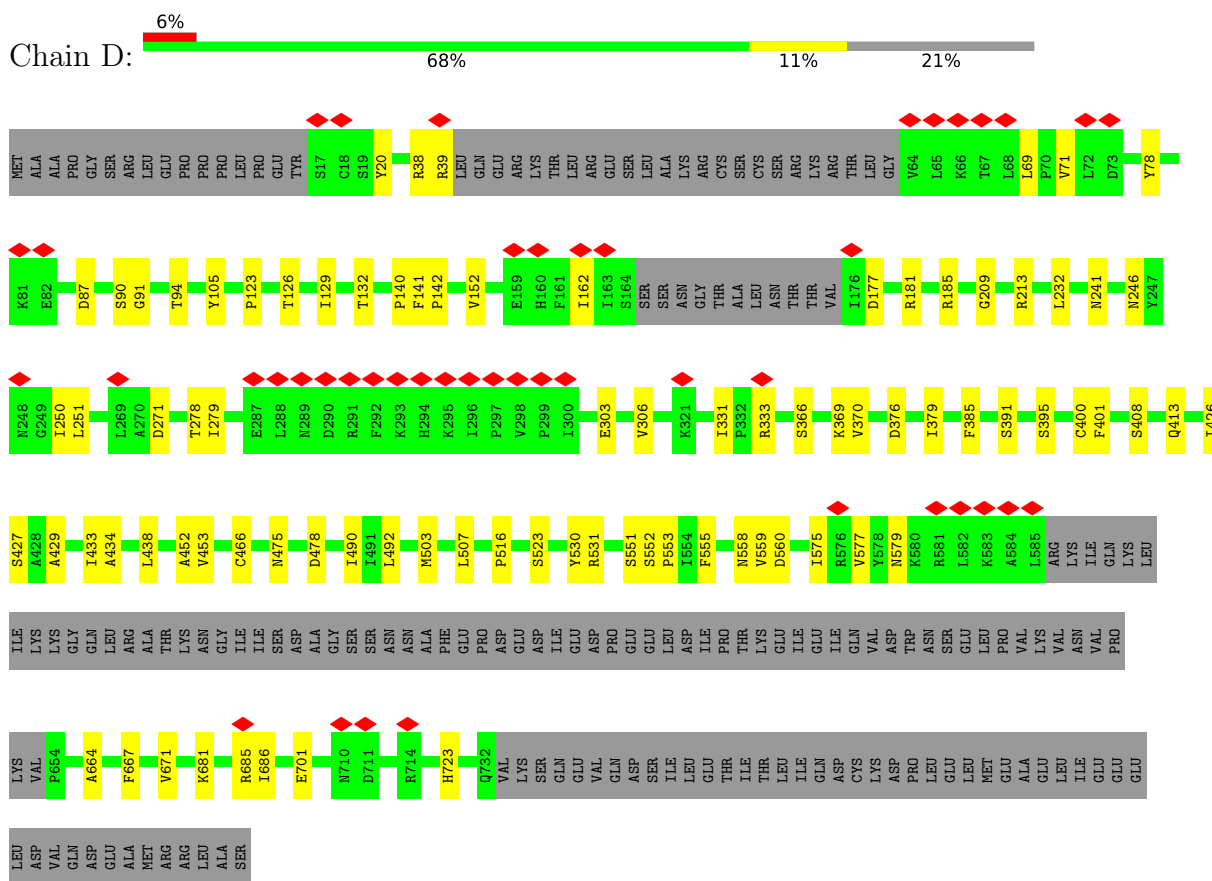


Mol	Chain	Residues	Atoms			AltConf
6	D	1	Total	C	O	0
			69	47	22	
6	C	1	Total	C	O	0
			69	47	22	

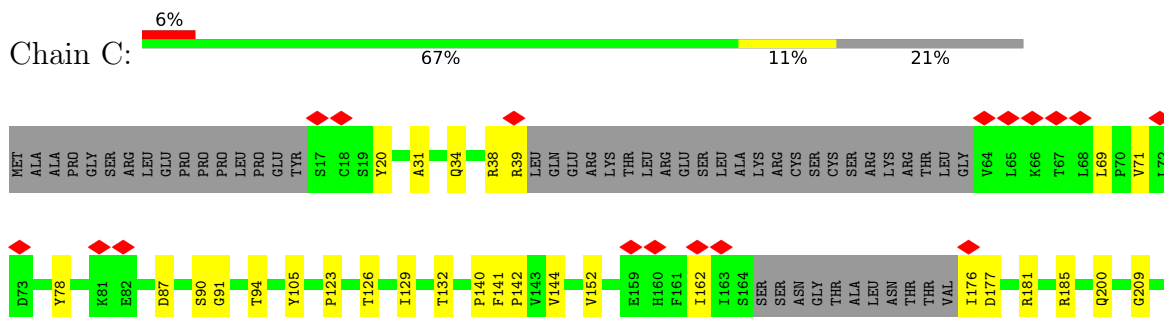
3 Residue-property plots [i](#)

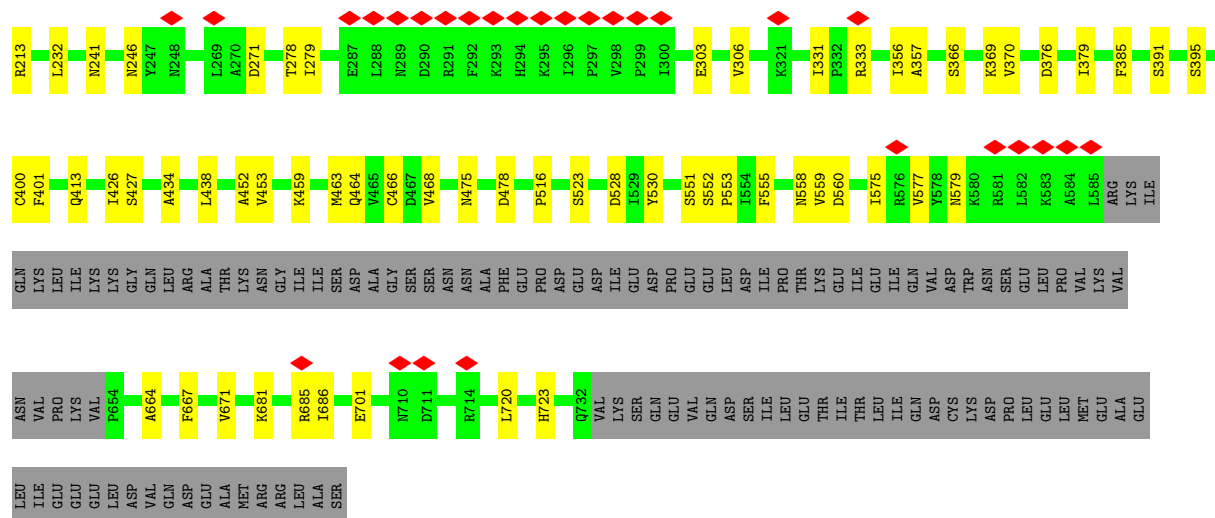
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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



- Molecule 1: Pendrin





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	202035	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	4.232	Depositor
Minimum map value	-2.972	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.148	Depositor
Recommended contour level	0.642	Depositor
Map size (Å)	208.0, 208.0, 208.0	wwPDB
Map dimensions	250, 250, 250	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: LBN, DMU, BCT, AV0, CLR

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	C	0.26	0/4854	0.46	0/6596
1	D	0.26	0/4854	0.46	0/6596
All	All	0.26	0/9708	0.46	0/13192

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](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	4755	0	4954	57	0
1	D	4755	0	4954	54	0
2	C	168	0	276	9	0
2	D	168	0	276	5	0
3	C	166	0	0	0	0
3	D	166	0	0	0	0
4	C	8	0	0	0	0
4	D	8	0	0	1	0
5	C	33	0	41	0	0
5	D	33	0	41	0	0
6	C	69	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	D	69	0	0	0	0
All	All	10398	0	10542	112	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (112) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:553:PRO:O	1:D:558:ASN:ND2	2.18	0.77
1:C:553:PRO:O	1:C:558:ASN:ND2	2.18	0.76
1:C:162:ILE:HD11	1:C:181:ARG:HB2	1.73	0.71
1:D:162:ILE:HD11	1:D:181:ARG:HB2	1.72	0.69
1:C:555:PHE:O	1:C:559:VAL:N	2.27	0.68
1:D:555:PHE:O	1:D:559:VAL:N	2.27	0.66
1:C:105:TYR:HD2	1:C:140:PRO:HB2	1.64	0.63
1:C:90:SER:OG	1:C:413:GLN:O	2.17	0.62
1:D:105:TYR:HD2	1:D:140:PRO:HB2	1.65	0.62
1:D:90:SER:OG	1:D:413:GLN:O	2.19	0.60
1:D:555:PHE:H	1:D:558:ASN:HB2	1.67	0.59
1:C:555:PHE:H	1:C:558:ASN:HB2	1.66	0.59
1:C:553:PRO:HB3	1:C:667:PHE:H	1.67	0.58
1:D:553:PRO:HB3	1:D:667:PHE:H	1.67	0.58
1:C:395:SER:HB3	1:C:400:CYS:HB2	1.86	0.58
1:C:209:GLY:HA2	1:C:385:PHE:HE1	1.68	0.57
1:D:38:ARG:HG2	1:D:39:ARG:H	1.70	0.57
1:D:395:SER:HB3	1:D:400:CYS:HB2	1.86	0.57
1:D:209:GLY:HA2	1:D:385:PHE:HE1	1.68	0.57
1:C:38:ARG:HG2	1:C:39:ARG:H	1.70	0.57
1:D:94:THR:HG23	1:D:427:SER:HB3	1.87	0.56
1:C:434:ALA:HA	1:C:438:LEU:HB2	1.88	0.56
1:D:434:ALA:HA	1:D:438:LEU:HB2	1.89	0.55
1:C:69:LEU:HD13	1:C:132:THR:HG22	1.88	0.55
1:C:279:ILE:HG13	1:C:452:ALA:HB1	1.88	0.55
1:C:94:THR:HG23	1:C:427:SER:HB3	1.88	0.55
1:D:279:ILE:HG13	1:D:452:ALA:HB1	1.88	0.54
1:C:91:GLY:HA3	1:C:426:ILE:HB	1.90	0.54
1:D:69:LEU:HD13	1:D:132:THR:HG22	1.88	0.54
1:D:91:GLY:HA3	1:D:426:ILE:HB	1.89	0.54
1:C:559:VAL:HG21	1:C:671:VAL:HG12	1.90	0.54
1:C:232:LEU:HD11	2:C:804:CLR:H241	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:559:VAL:HG21	1:D:671:VAL:HG12	1.90	0.53
1:D:369:LYS:HG3	1:D:379:ILE:HD11	1.92	0.52
1:C:38:ARG:NH1	1:C:701:GLU:OE1	2.43	0.51
1:D:20:TYR:HE2	1:C:723:HIS:HB3	1.76	0.51
1:D:38:ARG:NH1	1:D:701:GLU:OE1	2.43	0.51
1:D:490:ILE:HD13	2:D:805:CLR:H242	1.91	0.51
1:C:369:LYS:HG3	1:C:379:ILE:HD11	1.92	0.51
1:D:250:ILE:HD12	1:D:492:LEU:HD23	1.92	0.50
1:D:126:THR:HG21	1:D:391:SER:HA	1.94	0.50
1:D:723:HIS:HB3	1:C:20:TYR:HE2	1.76	0.50
1:C:126:THR:HG21	1:C:391:SER:HA	1.94	0.50
1:D:466:CYS:HA	2:D:801:CLR:H212	1.95	0.48
2:C:804:CLR:H25	2:C:804:CLR:H211	1.96	0.47
1:D:71:VAL:HG13	1:D:129:ILE:HA	1.97	0.47
1:D:376:ASP:OD1	1:C:579:ASN:ND2	2.35	0.47
2:C:802:CLR:H162	2:C:802:CLR:H222	1.46	0.47
1:D:241:ASN:ND2	1:D:271:ASP:OD2	2.45	0.47
2:D:802:CLR:H162	2:D:802:CLR:H222	1.58	0.46
2:D:801:CLR:H162	2:D:801:CLR:H222	1.53	0.46
1:C:152:VAL:HG12	1:C:185:ARG:HD3	1.97	0.46
1:C:466:CYS:HA	2:C:802:CLR:H212	1.97	0.46
1:C:123:PRO:HA	1:C:126:THR:HG22	1.97	0.46
1:C:241:ASN:ND2	1:C:271:ASP:OD2	2.48	0.46
1:C:463:MET:SD	2:C:804:CLR:H6	2.55	0.46
1:C:551:SER:HA	1:C:664:ALA:HB3	1.97	0.46
1:D:123:PRO:HA	1:D:126:THR:HG22	1.97	0.45
1:C:71:VAL:HG13	1:C:129:ILE:HA	1.97	0.45
1:C:516:PRO:HB3	1:C:552:SER:HB2	1.97	0.45
1:D:250:ILE:HG22	1:D:251:LEU:HD23	1.98	0.45
1:D:475:ASN:ND2	1:D:478:ASP:OD2	2.48	0.45
1:D:152:VAL:HG12	1:D:185:ARG:HD3	1.97	0.45
1:D:278:THR:HG23	1:D:306:VAL:HG11	1.99	0.45
1:C:78:TYR:OH	1:C:87:ASP:OD2	2.34	0.45
1:D:551:SER:HA	1:D:664:ALA:HB3	1.98	0.45
2:C:803:CLR:H222	2:C:803:CLR:H162	1.67	0.45
1:D:516:PRO:HB3	1:D:552:SER:HB2	1.98	0.45
1:D:78:TYR:OH	1:D:87:ASP:OD2	2.34	0.44
1:C:331:ILE:O	1:C:333:ARG:NH1	2.50	0.44
1:C:366:SER:O	1:C:370:VAL:HG23	2.18	0.44
2:C:802:CLR:H213	2:C:803:CLR:H242	1.99	0.44
1:D:141:PHE:CD1	1:D:142:PRO:HD2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:366:SER:O	1:D:370:VAL:HG23	2.18	0.44
1:D:232:LEU:HD11	2:D:803:CLR:H241	1.99	0.43
1:C:475:ASN:ND2	1:C:478:ASP:OD2	2.51	0.43
1:C:577:VAL:HG23	1:C:686:ILE:HG21	2.00	0.43
2:C:803:CLR:H212	2:C:804:CLR:H42	2.01	0.43
1:C:681:LYS:O	1:C:685:ARG:HG3	2.19	0.43
1:D:303:GLU:HG2	1:D:453:VAL:HG13	2.01	0.43
1:D:503:MET:O	1:D:507:LEU:HD23	2.17	0.43
1:C:464:GLN:O	1:C:468:VAL:HG23	2.18	0.43
1:C:459:LYS:O	1:C:463:MET:HG2	2.18	0.43
1:D:162:ILE:HG21	1:D:177:ASP:H	1.83	0.43
1:D:331:ILE:O	1:D:333:ARG:NH1	2.51	0.43
1:C:278:THR:HG23	1:C:306:VAL:HG11	2.01	0.43
1:D:577:VAL:HG23	1:D:686:ILE:HG21	2.00	0.43
1:D:681:LYS:O	1:D:685:ARG:HG3	2.19	0.43
1:C:162:ILE:HG21	1:C:177:ASP:H	1.83	0.43
1:C:303:GLU:HG2	1:C:453:VAL:HG13	2.00	0.43
1:C:141:PHE:CD1	1:C:142:PRO:HD2	2.54	0.42
1:C:523:SER:HB2	1:C:530:TYR:CE2	2.55	0.42
2:C:804:CLR:H222	2:C:804:CLR:H162	1.43	0.42
1:D:523:SER:HB2	1:D:530:TYR:CE2	2.55	0.42
1:C:140:PRO:HB3	1:C:401:PHE:HE2	1.85	0.42
1:D:579:ASN:ND2	1:C:376:ASP:OD1	2.36	0.42
1:C:123:PRO:HG3	1:C:395:SER:OG	2.20	0.42
1:C:575:ILE:HD12	1:C:575:ILE:H	1.85	0.42
1:C:528:ASP:OD1	1:C:528:ASP:N	2.53	0.41
1:D:123:PRO:HG3	1:D:395:SER:OG	2.20	0.41
1:D:575:ILE:HD12	1:D:575:ILE:H	1.85	0.41
1:D:408:SER:N	4:D:816:BCT:O3	2.47	0.41
1:D:429:ALA:O	1:D:433:ILE:HG12	2.21	0.41
1:D:531:ARG:HH21	1:C:720:LEU:HD22	1.85	0.41
1:C:31:ALA:HA	1:C:34:GLN:HG2	2.03	0.41
1:C:144:VAL:HG13	1:C:356:ILE:HG23	2.03	0.41
1:C:162:ILE:HG21	1:C:176:ILE:HD12	2.02	0.40
1:C:200:GLN:HG3	1:C:357:ALA:HB1	2.03	0.40
1:C:126:THR:CG2	1:C:391:SER:HA	2.52	0.40
1:D:140:PRO:HB3	1:D:401:PHE:HE2	1.86	0.40
1:D:213:ARG:HG2	1:C:560:ASP:OD2	2.22	0.40
1:D:560:ASP:OD2	1:C:213:ARG:HG2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	605/780 (78%)	583 (96%)	22 (4%)	0	100	100
1	D	605/780 (78%)	582 (96%)	23 (4%)	0	100	100
All	All	1210/1560 (78%)	1165 (96%)	45 (4%)	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	C	523/674 (78%)	522 (100%)	1 (0%)	93	98
1	D	523/674 (78%)	522 (100%)	1 (0%)	93	98
All	All	1046/1348 (78%)	1044 (100%)	2 (0%)	93	98

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	246	ASN
1	C	246	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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](#)

38 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	BCT	D	817	-	2,3,3	0.71	0	2,3,3	1.53	0
5	DMU	C	818	-	34,34,34	0.17	0	45,45,45	0.38	1 (2%)
3	LBN	C	811	-	8,8,51	0.20	0	7,7,59	0.11	0
3	LBN	C	801	-	42,42,51	0.40	0	46,47,59	0.42	1 (2%)
2	CLR	D	801	-	31,31,31	0.13	0	48,48,48	0.20	0
2	CLR	D	804	-	31,31,31	0.13	0	48,48,48	0.28	0
4	BCT	C	816	-	2,3,3	0.91	0	2,3,3	0.74	0
2	CLR	C	802	-	31,31,31	0.12	0	48,48,48	0.20	0
3	LBN	C	807	-	26,26,51	0.49	0	29,29,59	0.51	1 (3%)
3	LBN	C	814	-	11,11,51	0.19	0	10,10,59	0.11	0
3	LBN	C	812	-	11,11,51	0.18	0	10,10,59	0.11	0
4	BCT	C	817	-	2,3,3	0.70	0	2,3,3	1.54	1 (50%)
2	CLR	C	804	-	31,31,31	0.13	0	48,48,48	0.21	0
2	CLR	D	805	-	31,31,31	0.12	0	48,48,48	0.25	0
2	CLR	C	809	-	31,31,31	0.11	0	48,48,48	0.19	0
3	LBN	C	815	-	11,11,51	0.17	0	10,10,59	0.11	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	AV0	D	819	-	72,72,72	0.15	0	96,98,98	0.52	1 (1%)
3	LBN	D	810	-	8,8,51	0.20	0	7,7,59	0.11	0
3	LBN	D	811	-	11,11,51	0.18	0	10,10,59	0.11	0
6	AV0	C	819	-	72,72,72	0.14	0	96,98,98	0.52	1 (1%)
4	BCT	D	816	-	2,3,3	0.91	0	2,3,3	0.75	0
2	CLR	D	803	-	31,31,31	0.12	0	48,48,48	0.20	0
3	LBN	D	812	-	10,10,51	0.19	0	9,9,59	0.11	0
2	CLR	D	802	-	31,31,31	0.13	0	48,48,48	0.20	0
3	LBN	C	810	-	11,11,51	0.18	0	10,10,59	0.10	0
2	CLR	C	805	-	31,31,31	0.14	0	48,48,48	0.28	0
3	LBN	C	808	-	27,27,51	0.49	0	31,32,59	0.51	1 (3%)
2	CLR	C	806	-	31,31,31	0.13	0	48,48,48	0.23	0
3	LBN	D	813	-	11,11,51	0.18	0	10,10,59	0.10	0
3	LBN	D	806	-	26,26,51	0.49	0	29,29,59	0.51	1 (3%)
3	LBN	D	815	-	42,42,51	0.40	0	46,47,59	0.42	1 (2%)
2	CLR	D	808	-	31,31,31	0.10	0	48,48,48	0.20	0
3	LBN	D	807	-	27,27,51	0.49	0	31,32,59	0.51	1 (3%)
5	DMU	D	818	-	34,34,34	0.17	0	45,45,45	0.37	0
3	LBN	D	814	-	11,11,51	0.17	0	10,10,59	0.11	0
3	LBN	C	813	-	10,10,51	0.20	0	9,9,59	0.11	0
3	LBN	D	809	-	11,11,51	0.18	0	10,10,59	0.10	0
2	CLR	C	803	-	31,31,31	0.13	0	48,48,48	0.21	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
5	DMU	C	818	-	-	7/19/59/59	0/2/2/2
3	LBN	C	811	-	-	1/6/6/55	-
3	LBN	C	801	-	1/1/4/7	16/44/44/55	-
2	CLR	D	801	-	-	6/10/68/68	0/4/4/4
2	CLR	D	804	-	-	3/10/68/68	0/4/4/4
2	CLR	C	802	-	-	6/10/68/68	0/4/4/4
3	LBN	C	807	-	-	8/25/25/55	-
3	LBN	C	814	-	-	2/9/9/55	-
3	LBN	C	812	-	-	4/9/9/55	-
2	CLR	C	804	-	-	7/10/68/68	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	CLR	D	805	-	-	2/10/68/68	0/4/4/4
2	CLR	C	809	-	-	5/10/68/68	0/4/4/4
3	LBN	C	815	-	-	4/9/9/55	-
6	AV0	D	819	-	-	8/50/130/130	0/4/4/4
3	LBN	D	810	-	-	1/6/6/55	-
3	LBN	D	811	-	-	4/9/9/55	-
6	AV0	C	819	-	-	8/50/130/130	0/4/4/4
2	CLR	D	803	-	-	7/10/68/68	0/4/4/4
3	LBN	D	812	-	-	2/8/8/55	-
2	CLR	D	802	-	-	7/10/68/68	0/4/4/4
3	LBN	C	810	-	-	4/9/9/55	-
2	CLR	C	805	-	-	3/10/68/68	0/4/4/4
3	LBN	C	808	-	-	10/29/29/55	-
2	CLR	C	806	-	-	5/10/68/68	0/4/4/4
3	LBN	D	813	-	-	2/9/9/55	-
3	LBN	D	806	-	-	8/25/25/55	-
3	LBN	D	815	-	1/1/4/7	10/44/44/55	-
2	CLR	D	808	-	-	4/10/68/68	0/4/4/4
3	LBN	D	807	-	-	10/29/29/55	-
5	DMU	D	818	-	-	7/19/59/59	0/2/2/2
3	LBN	D	814	-	-	4/9/9/55	-
3	LBN	C	813	-	-	2/8/8/55	-
3	LBN	D	809	-	-	4/9/9/55	-
2	CLR	C	803	-	-	4/10/68/68	0/4/4/4

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	819	AV0	CBT-OBV-CCJ	2.56	120.02	113.36
6	D	819	AV0	CBT-OBV-CCJ	2.49	119.84	113.36
3	D	815	LBN	O3-P1-O4	2.15	119.11	110.68
3	C	807	LBN	O3-P1-O4	2.15	119.09	110.68
3	C	801	LBN	O3-P1-O4	2.15	119.08	110.68
3	D	806	LBN	O3-P1-O4	2.15	119.08	110.68
3	D	807	LBN	O3-P1-O4	2.14	119.08	110.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	808	LBN	O3-P1-O4	2.14	119.05	110.68
5	C	818	DMU	C18-O16-C6	2.07	117.27	113.84
4	C	817	BCT	O2-C-O1	2.01	124.76	119.55

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	D	815	LBN	C2
3	C	801	LBN	C2

All (185) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	801	CLR	C13-C17-C20-C21
2	C	802	CLR	C13-C17-C20-C21
2	C	802	CLR	C16-C17-C20-C22
2	C	804	CLR	C13-C17-C20-C21
2	C	804	CLR	C13-C17-C20-C22
2	C	804	CLR	C16-C17-C20-C22
3	D	806	LBN	O1-C1-C2-O7
3	D	807	LBN	C1-O1-P1-O2
3	D	807	LBN	C1-O1-P1-O3
3	D	807	LBN	C1-O1-P1-O4
3	D	807	LBN	O8-C34-O7-C2
3	C	801	LBN	C1-O1-P1-O3
3	C	801	LBN	C41-C42-C5-C8
3	C	807	LBN	O1-C1-C2-O7
3	C	808	LBN	C1-O1-P1-O2
3	C	808	LBN	C1-O1-P1-O3
3	C	808	LBN	C1-O1-P1-O4
3	C	808	LBN	O8-C34-O7-C2
5	D	818	DMU	C19-C18-O16-C6
5	C	818	DMU	C19-C18-O16-C6
6	D	819	AV0	C2-C1-O1-CBS
6	D	819	AV0	OBX-CCJ-OBV-CBT
6	C	819	AV0	C2-C1-O1-CBS
6	C	819	AV0	OBX-CCJ-OBV-CBT
6	C	819	AV0	CCL-CCJ-OBV-CBT
2	D	801	CLR	C16-C17-C20-C21
2	D	803	CLR	C16-C17-C20-C21
2	C	802	CLR	C16-C17-C20-C21
2	C	803	CLR	C16-C17-C20-C21

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Mol	Chain	Res	Type	Atoms
2	C	804	CLR	C16-C17-C20-C21
2	D	802	CLR	C13-C17-C20-C21
2	D	803	CLR	C13-C17-C20-C21
2	C	803	CLR	C13-C17-C20-C21
2	D	801	CLR	C16-C17-C20-C22
2	C	802	CLR	C13-C17-C20-C22
2	C	803	CLR	C13-C17-C20-C22
3	D	807	LBN	C35-C34-O7-C2
3	C	808	LBN	C35-C34-O7-C2
2	D	805	CLR	C21-C20-C22-C23
2	C	806	CLR	C21-C20-C22-C23
2	D	802	CLR	C16-C17-C20-C21
2	D	801	CLR	C13-C17-C20-C22
2	D	802	CLR	C13-C17-C20-C22
2	D	803	CLR	C13-C17-C20-C22
3	D	815	LBN	O8-C34-O7-C2
2	D	802	CLR	C16-C17-C20-C22
2	D	803	CLR	C16-C17-C20-C22
2	C	803	CLR	C16-C17-C20-C22
3	D	815	LBN	C35-C34-O7-C2
3	C	801	LBN	C35-C34-O7-C2
6	D	819	AV0	C3-C4-O4-CCR
6	C	819	AV0	C3-C4-O4-CCR
2	D	803	CLR	C17-C20-C22-C23
3	C	801	LBN	O8-C34-O7-C2
5	C	818	DMU	O5-C6-O16-C18
2	C	806	CLR	C17-C20-C22-C23
3	C	807	LBN	C35-C34-O7-C2
2	D	801	CLR	C17-C20-C22-C23
2	D	805	CLR	C17-C20-C22-C23
6	D	819	AV0	CCL-CCJ-OBV-CBT
3	D	806	LBN	C35-C34-O7-C2
2	C	804	CLR	C20-C22-C23-C24
2	D	804	CLR	C17-C20-C22-C23
2	C	804	CLR	C17-C20-C22-C23
2	C	805	CLR	C17-C20-C22-C23
2	D	803	CLR	C21-C20-C22-C23
2	D	803	CLR	C20-C22-C23-C24
2	D	804	CLR	C21-C20-C22-C23
2	C	805	CLR	C21-C20-C22-C23
2	C	802	CLR	C17-C20-C22-C23
2	D	801	CLR	C21-C20-C22-C23

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Mol	Chain	Res	Type	Atoms
5	D	818	DMU	O5-C6-O16-C18
3	D	806	LBN	O8-C34-O7-C2
3	C	807	LBN	O8-C34-O7-C2
3	D	815	LBN	C41-C42-C5-C8
5	D	818	DMU	O16-C18-C19-C22
3	D	815	LBN	C26-C27-C28-C29
3	C	801	LBN	C26-C27-C28-C29
5	C	818	DMU	C19-C22-C25-C28
3	D	810	LBN	C13-C10-C7-C4
3	C	801	LBN	C32-C33-C4-C7
3	C	811	LBN	C13-C10-C7-C4
3	C	814	LBN	C29-C30-C31-C32
3	D	813	LBN	C29-C30-C31-C32
3	D	809	LBN	C26-C27-C28-C29
3	C	810	LBN	C26-C27-C28-C29
3	D	811	LBN	C28-C29-C30-C31
3	C	812	LBN	C28-C29-C30-C31
2	C	804	CLR	C21-C20-C22-C23
3	D	812	LBN	C7-C10-C13-C16
3	C	813	LBN	C7-C10-C13-C16
3	C	801	LBN	C30-C31-C32-C33
3	D	811	LBN	C30-C31-C32-C33
3	C	812	LBN	C30-C31-C32-C33
3	D	807	LBN	C1-C2-C3-O5
3	C	808	LBN	C1-C2-C3-O5
2	D	802	CLR	C17-C20-C22-C23
5	C	818	DMU	O16-C18-C19-C22
5	D	818	DMU	C19-C22-C25-C28
3	C	807	LBN	C11-C14-C17-C20
3	D	806	LBN	C11-C14-C17-C20
3	D	811	LBN	C26-C27-C28-C29
3	C	812	LBN	C26-C27-C28-C29
3	C	813	LBN	C32-C33-C4-C7
2	C	802	CLR	C21-C20-C22-C23
3	C	815	LBN	C26-C27-C28-C29
3	D	814	LBN	C26-C27-C28-C29
3	D	814	LBN	C29-C30-C31-C32
3	D	806	LBN	C41-C42-C5-C8
3	C	807	LBN	C41-C42-C5-C8
3	C	815	LBN	C29-C30-C31-C32
3	D	814	LBN	C30-C31-C32-C33
3	C	815	LBN	C30-C31-C32-C33

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Mol	Chain	Res	Type	Atoms
5	D	818	DMU	O5-C4-C57-O61
5	C	818	DMU	O5-C4-C57-O61
6	D	819	AV0	OAL-CBP-CCF-OBX
6	C	819	AV0	OAL-CBP-CCF-OBX
3	D	815	LBN	C13-C10-C7-C4
3	D	812	LBN	C32-C33-C4-C7
3	D	811	LBN	C29-C30-C31-C32
3	C	812	LBN	C29-C30-C31-C32
3	C	801	LBN	O7-C34-C35-C36
2	D	802	CLR	C21-C20-C22-C23
6	D	819	AV0	C5-C4-O4-CCR
6	C	819	AV0	C5-C4-O4-CCR
6	D	819	AV0	CCF-CCQ-OCB-CCS
6	D	819	AV0	CCH-CCQ-OCB-CCS
3	C	801	LBN	C34-C35-C36-C37
3	C	808	LBN	C26-C27-C28-C29
3	D	807	LBN	C26-C27-C28-C29
3	C	801	LBN	C13-C10-C7-C4
6	C	819	AV0	CCF-CCQ-OCB-CCS
6	C	819	AV0	CCH-CCQ-OCB-CCS
3	C	814	LBN	C28-C29-C30-C31
5	C	818	DMU	O1-C10-O7-C3
3	D	813	LBN	C28-C29-C30-C31
3	C	801	LBN	C35-C36-C37-C38
2	C	809	CLR	C16-C17-C20-C22
2	C	809	CLR	C13-C17-C20-C22
3	D	809	LBN	C29-C30-C31-C32
5	D	818	DMU	O1-C10-O7-C3
5	C	818	DMU	C5-C10-O7-C3
2	C	809	CLR	C13-C17-C20-C21
3	C	810	LBN	C29-C30-C31-C32
5	D	818	DMU	C5-C10-O7-C3
2	C	809	CLR	C21-C20-C22-C23
2	C	809	CLR	C16-C17-C20-C21
3	D	809	LBN	C28-C29-C30-C31
3	C	801	LBN	C33-C4-C7-C10
3	C	810	LBN	C28-C29-C30-C31
3	D	807	LBN	O7-C2-C3-O5
3	C	808	LBN	O7-C2-C3-O5
3	D	815	LBN	O7-C34-C35-C36
2	D	808	CLR	C16-C17-C20-C22
2	D	802	CLR	C20-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
3	D	815	LBN	C3-C2-O7-C34
3	C	801	LBN	C3-C2-O7-C34
3	C	807	LBN	C37-C38-C39-C40
3	C	801	LBN	C1-O1-P1-O4
2	D	808	CLR	C13-C17-C20-C22
3	D	806	LBN	C37-C38-C39-C40
2	D	808	CLR	C13-C17-C20-C21
3	D	809	LBN	C30-C31-C32-C33
3	C	810	LBN	C30-C31-C32-C33
3	C	815	LBN	C28-C29-C30-C31
3	D	814	LBN	C28-C29-C30-C31
2	C	806	CLR	C16-C17-C20-C22
3	D	806	LBN	C35-C36-C37-C38
3	D	815	LBN	C30-C31-C32-C33
3	C	807	LBN	C35-C36-C37-C38
3	D	806	LBN	C42-C5-C8-C11
3	D	815	LBN	C1-O1-P1-O3
3	D	815	LBN	C32-C33-C4-C7
3	C	807	LBN	C42-C5-C8-C11
3	C	801	LBN	O8-C34-C35-C36
3	D	807	LBN	O5-C25-C26-C27
3	C	808	LBN	O5-C25-C26-C27
3	C	801	LBN	C42-C5-C8-C11
2	C	806	CLR	C13-C17-C20-C21
2	D	808	CLR	C16-C17-C20-C21
2	D	804	CLR	C23-C24-C25-C27
2	C	805	CLR	C23-C24-C25-C27
3	D	807	LBN	O6-C25-C26-C27
3	C	808	LBN	O6-C25-C26-C27
2	C	806	CLR	C13-C17-C20-C22

There are no ring outliers.

8 monomers are involved in 15 short contacts:

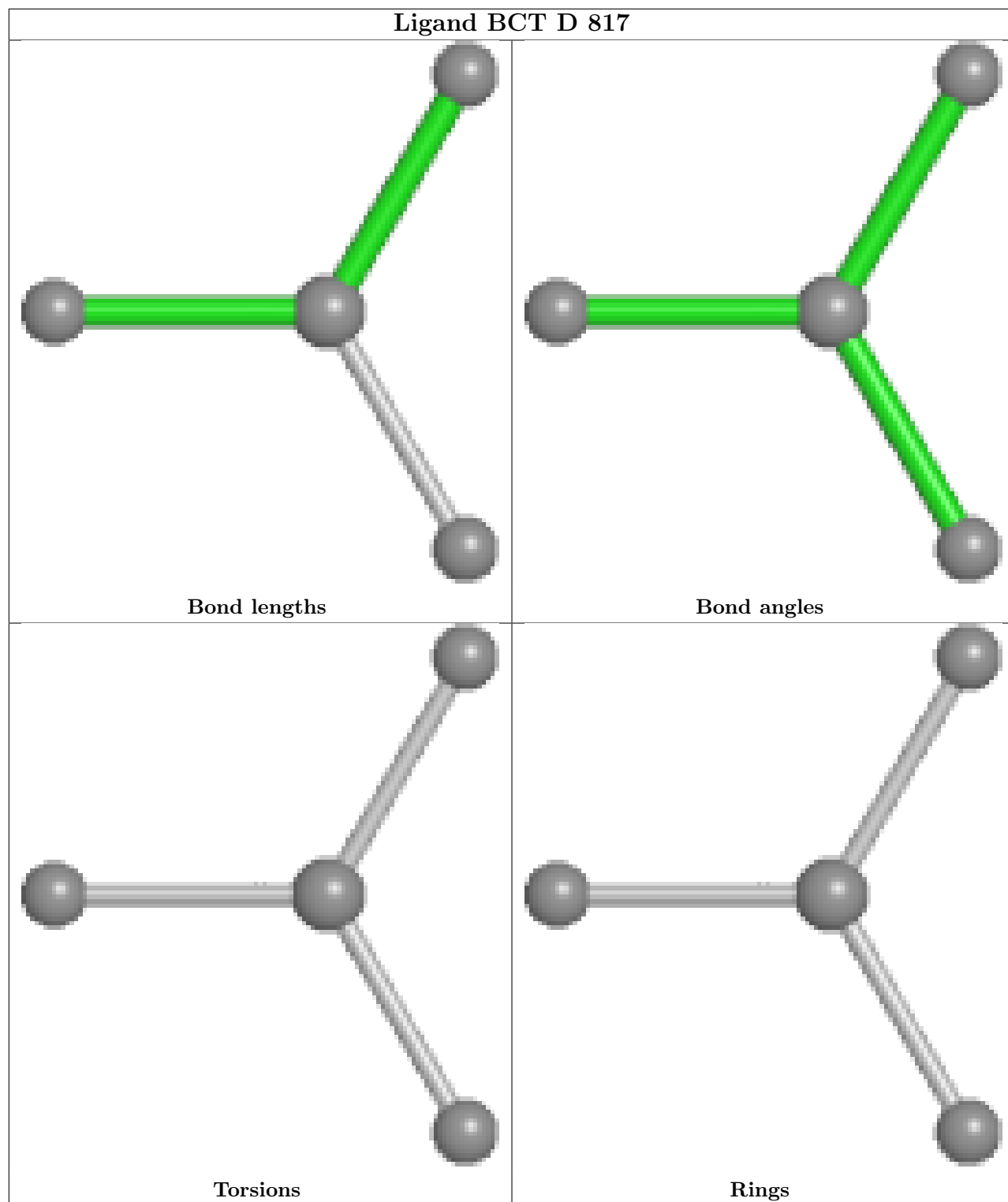
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	801	CLR	2	0
2	C	802	CLR	3	0
2	C	804	CLR	5	0
2	D	805	CLR	1	0
4	D	816	BCT	1	0
2	D	803	CLR	1	0
2	D	802	CLR	1	0

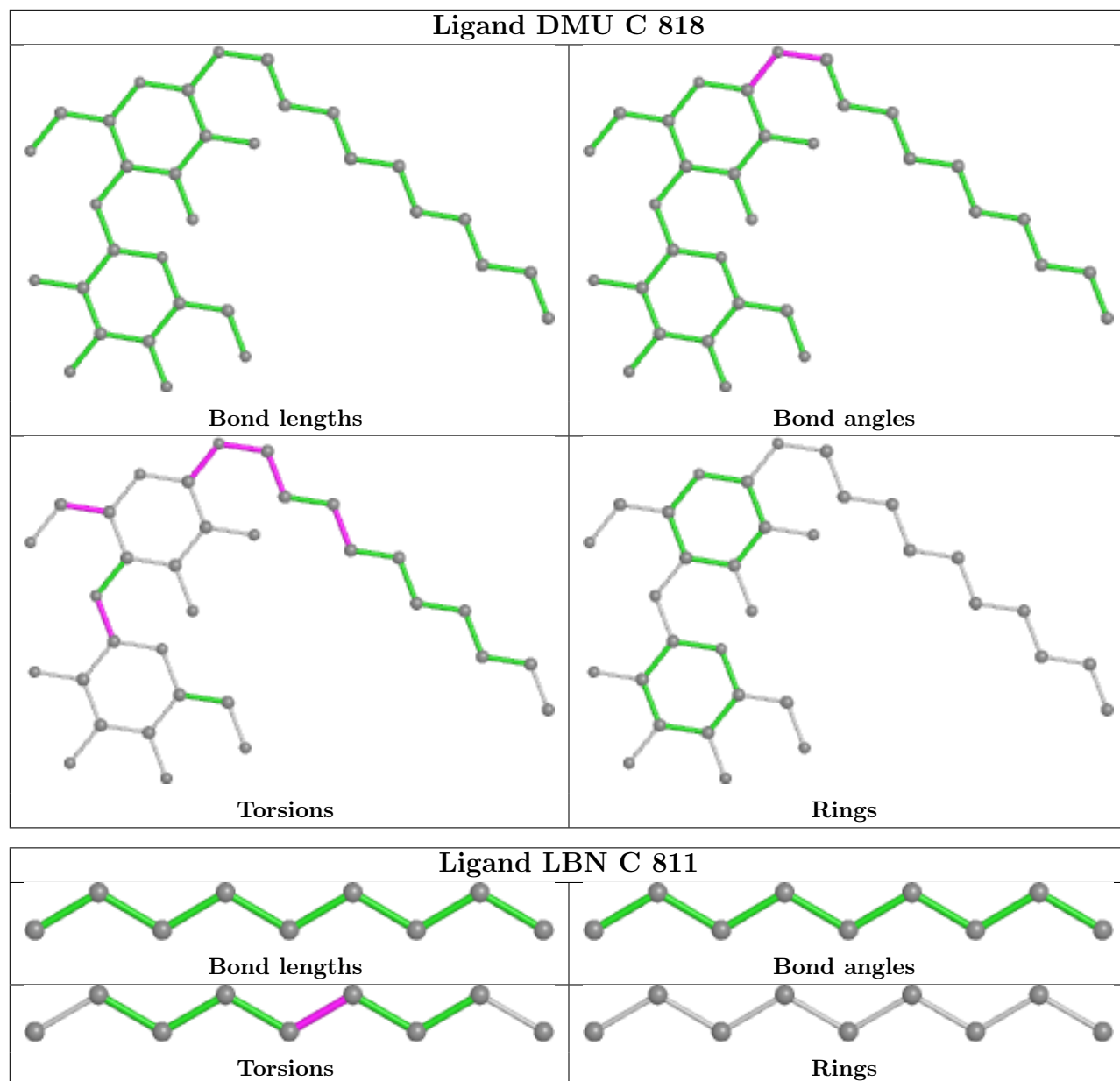
Continued on next page...

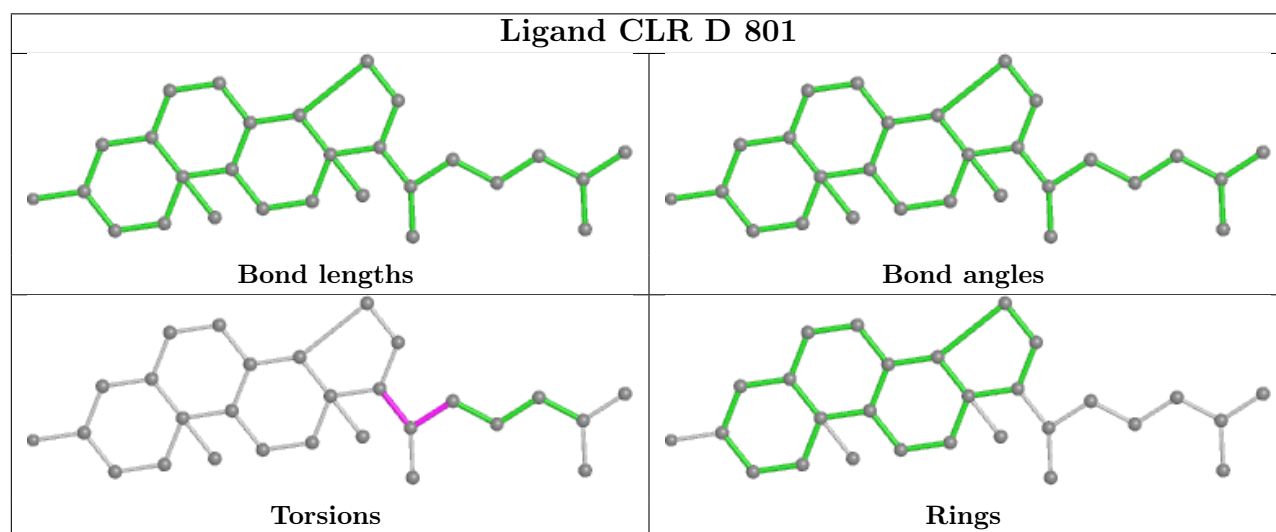
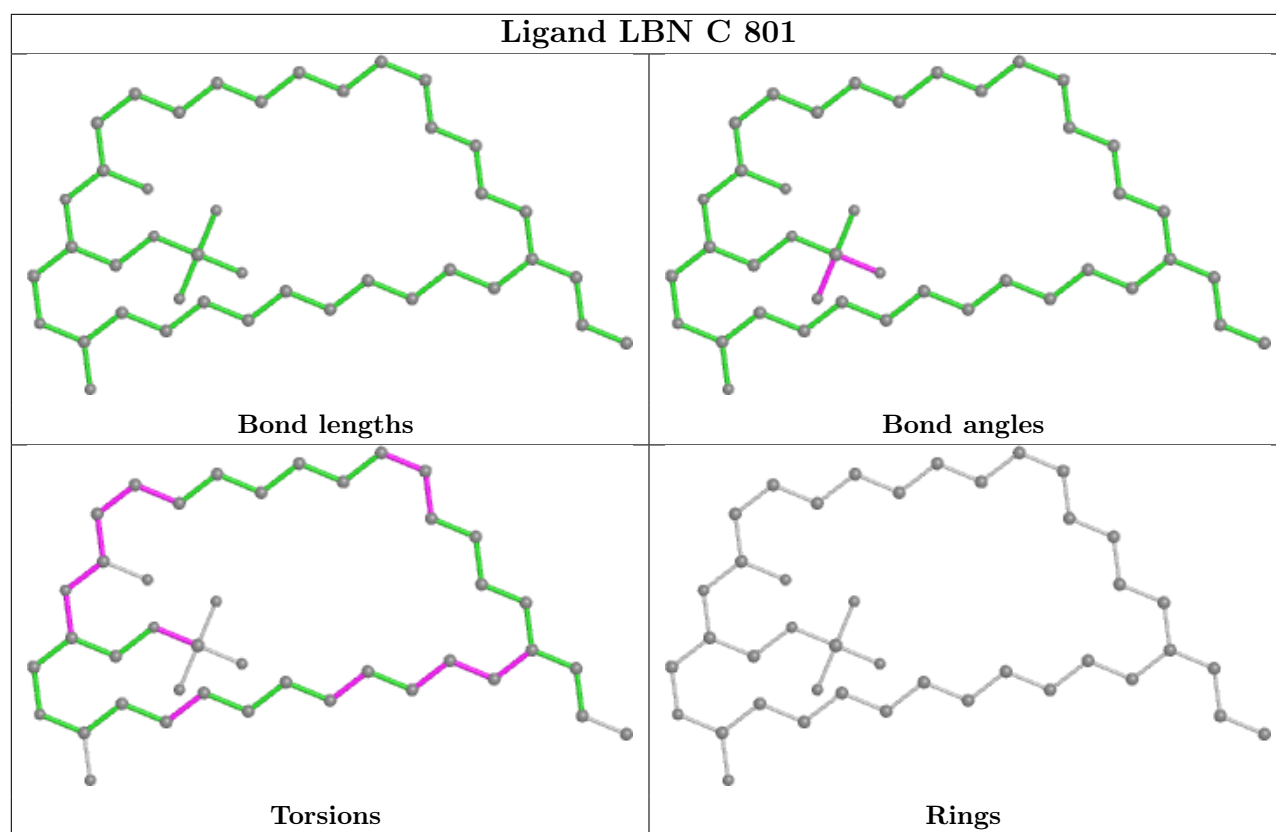
Continued from previous page...

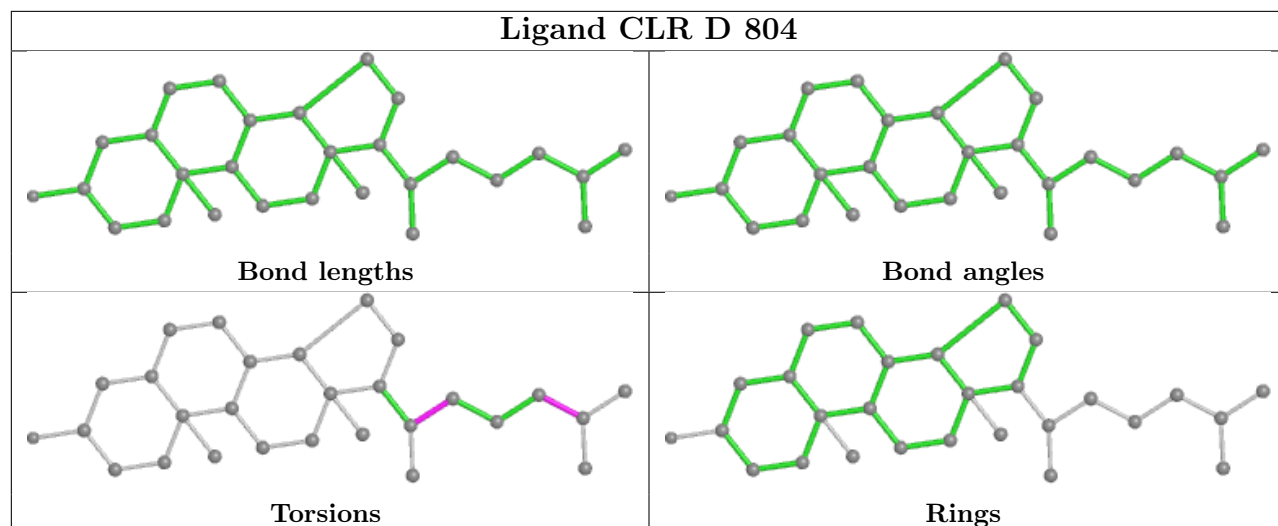
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	803	CLR	3	0

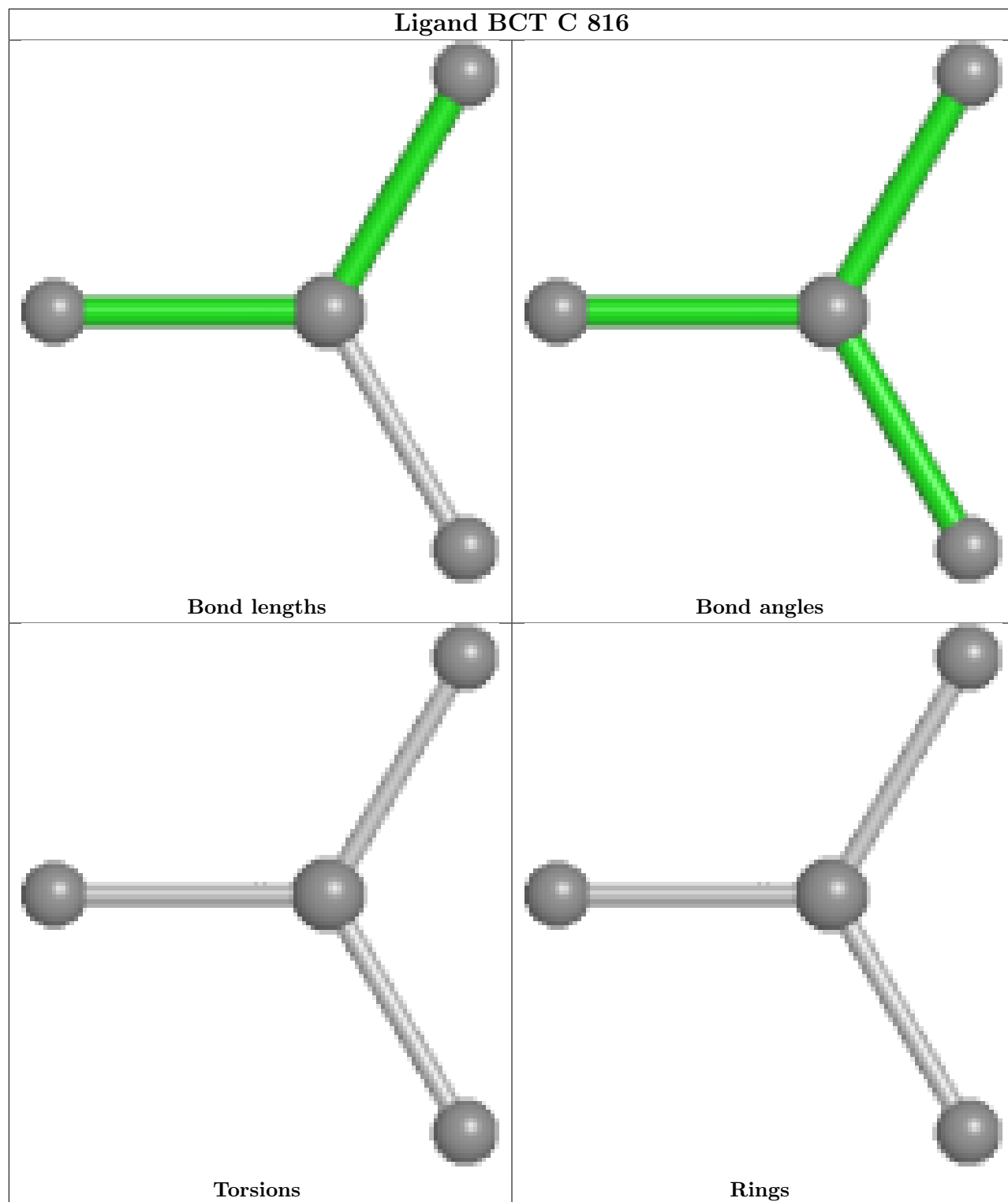
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

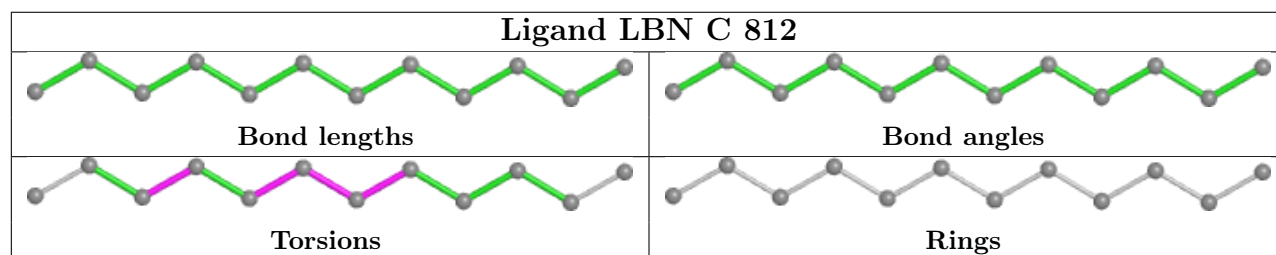
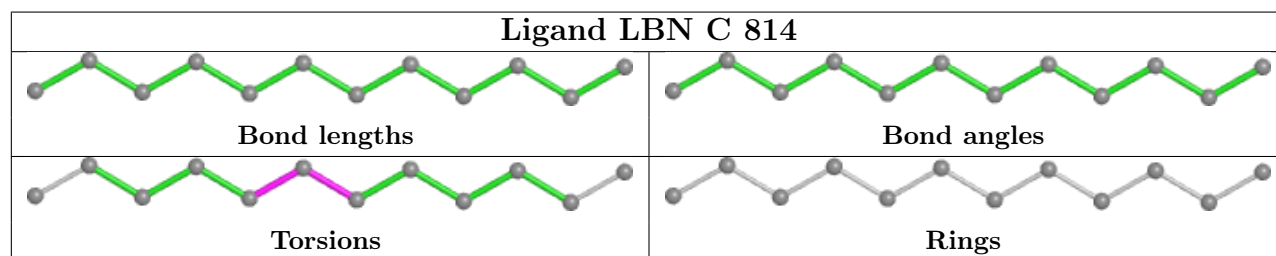
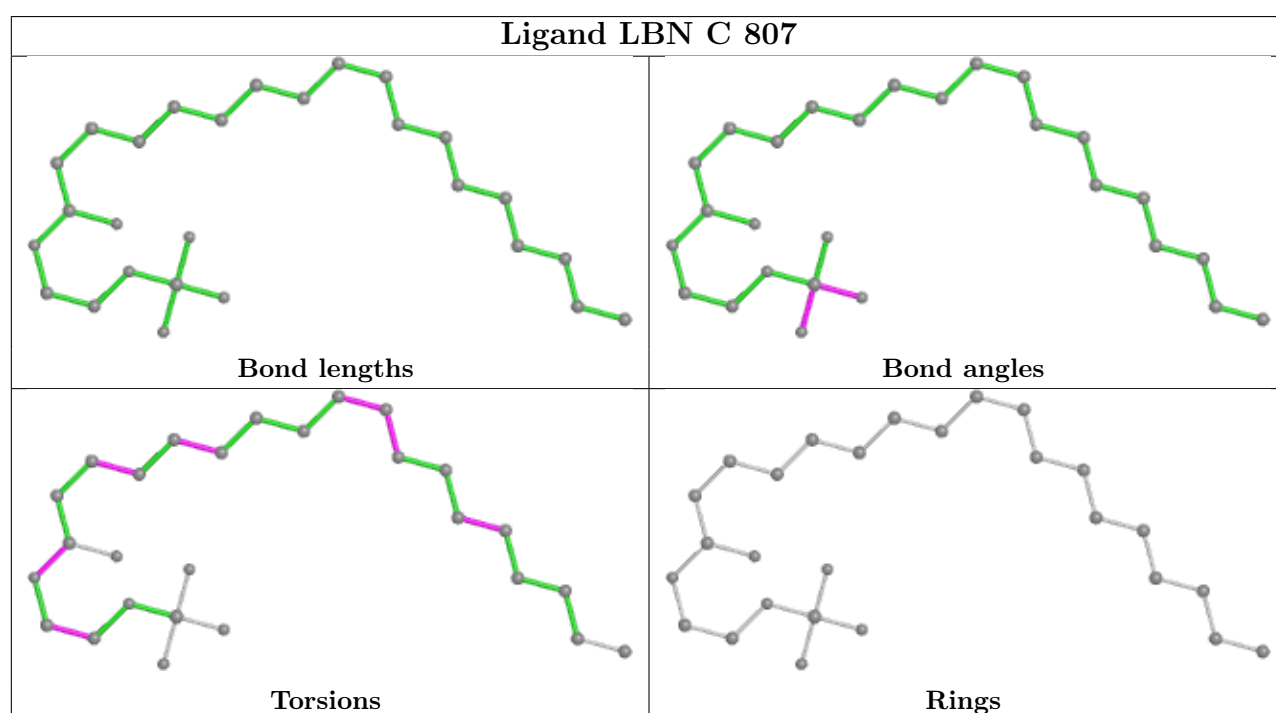
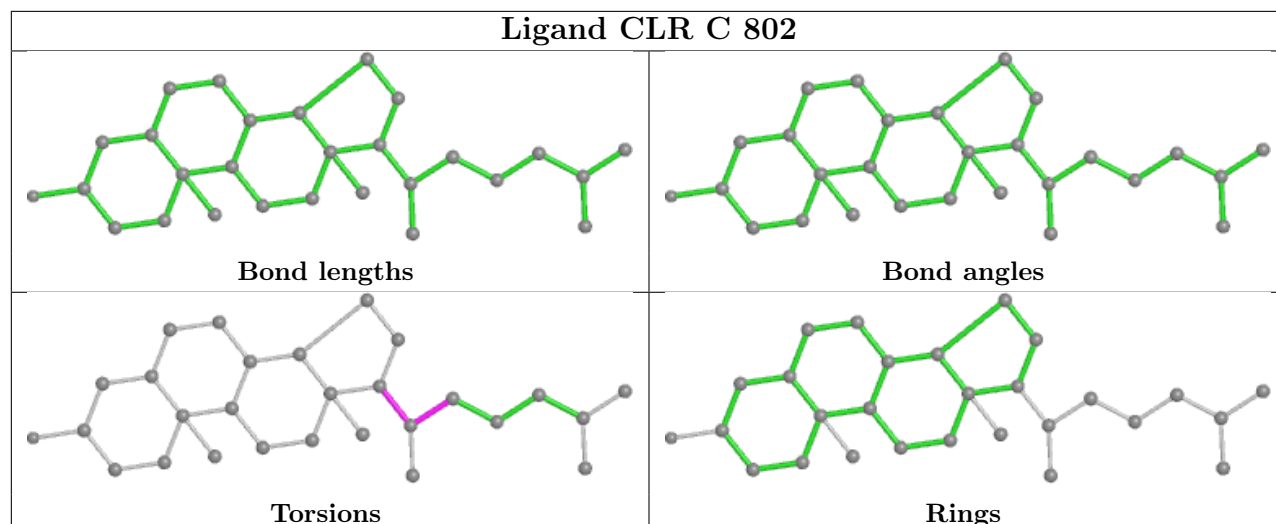


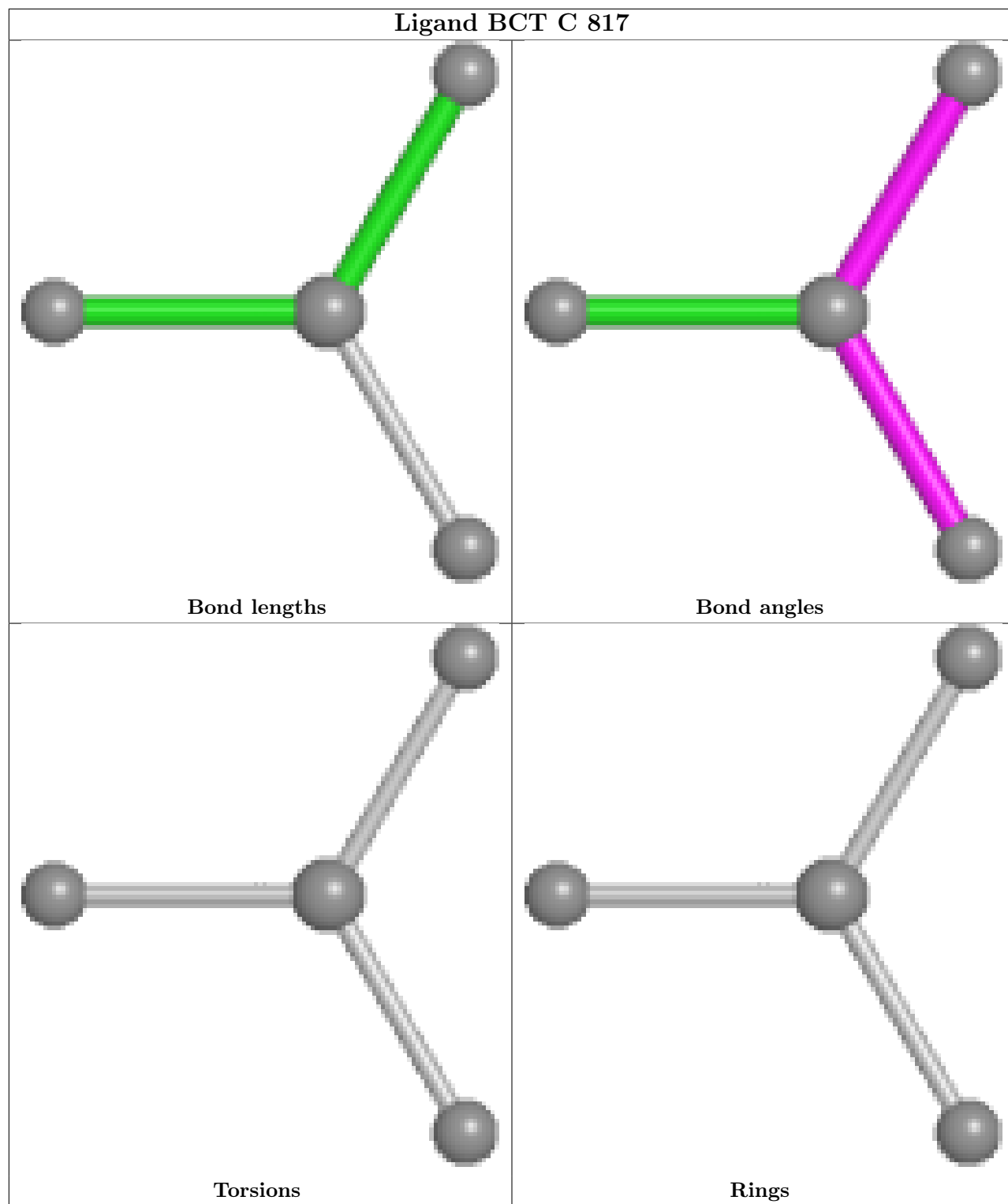


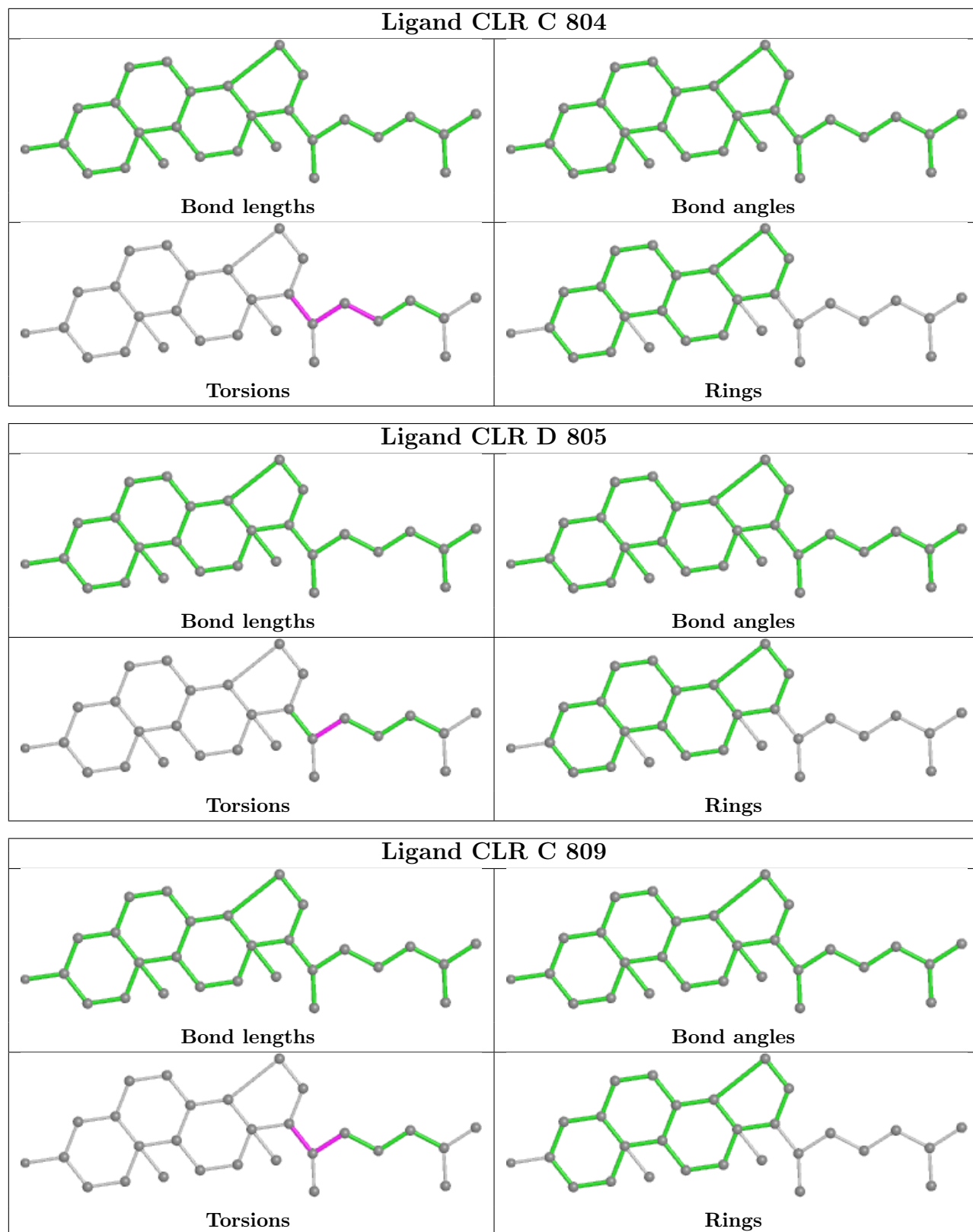


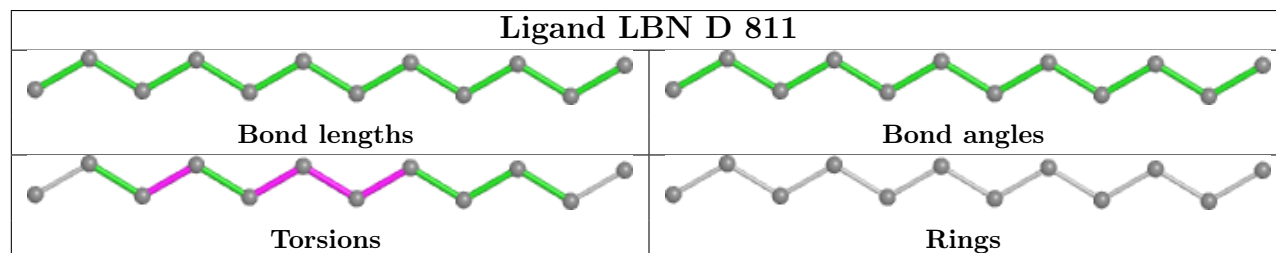
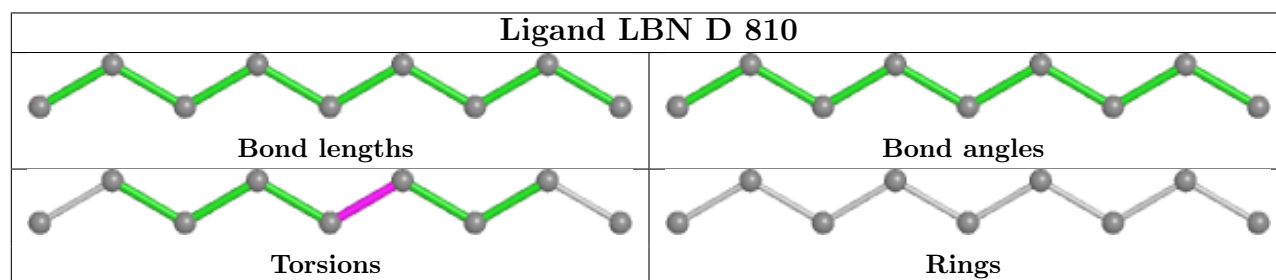
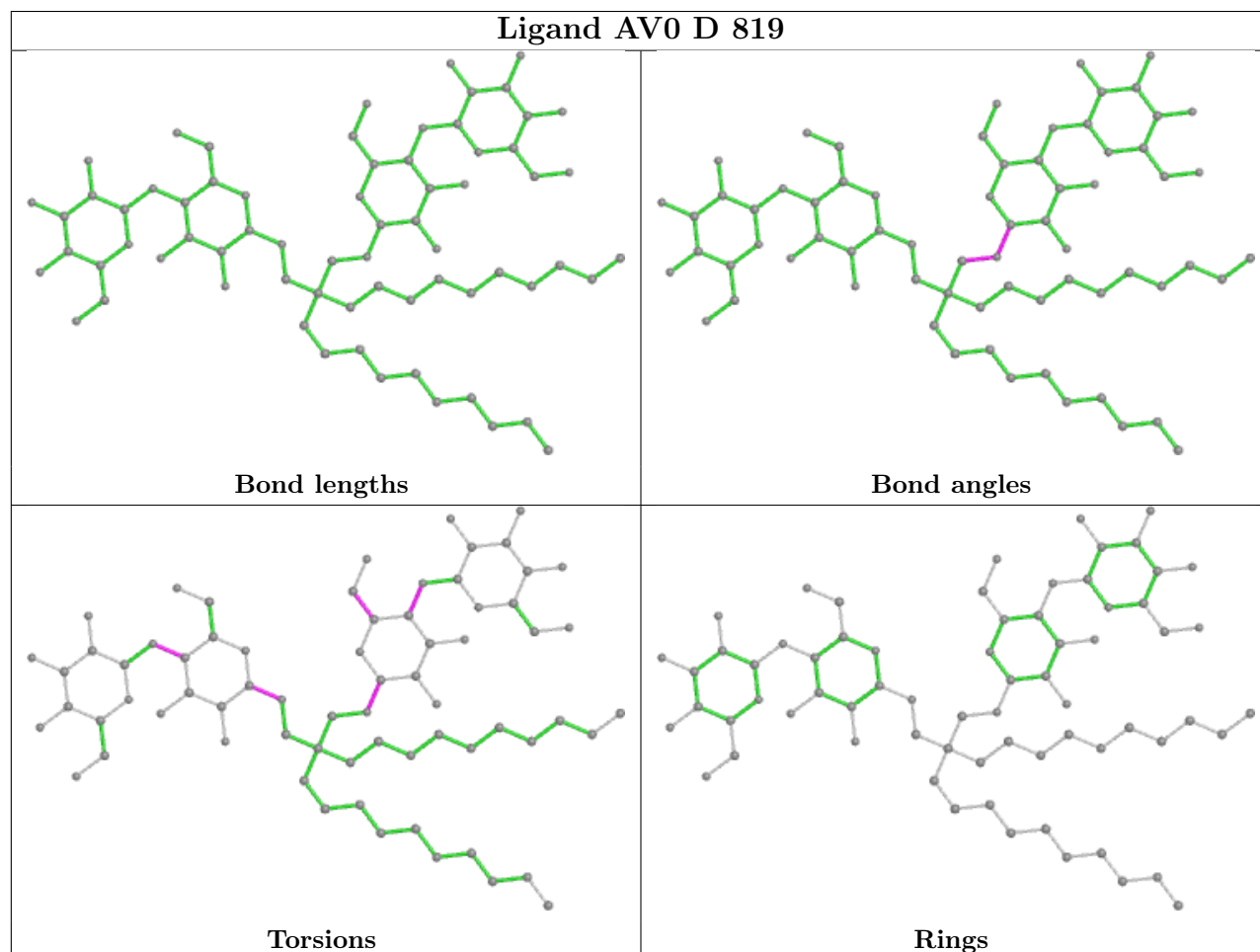
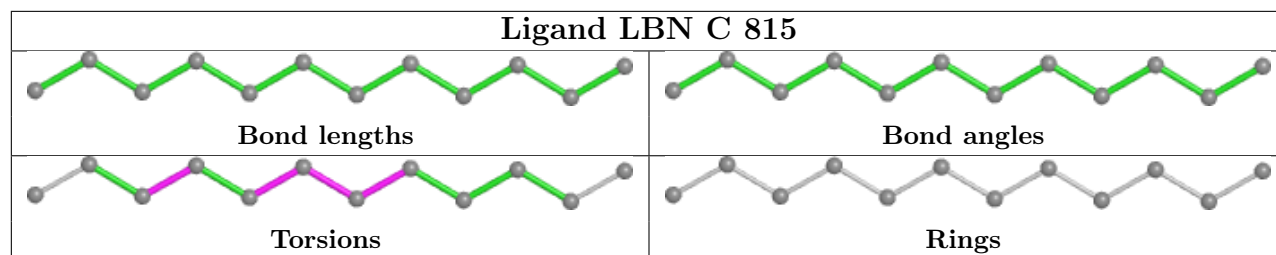


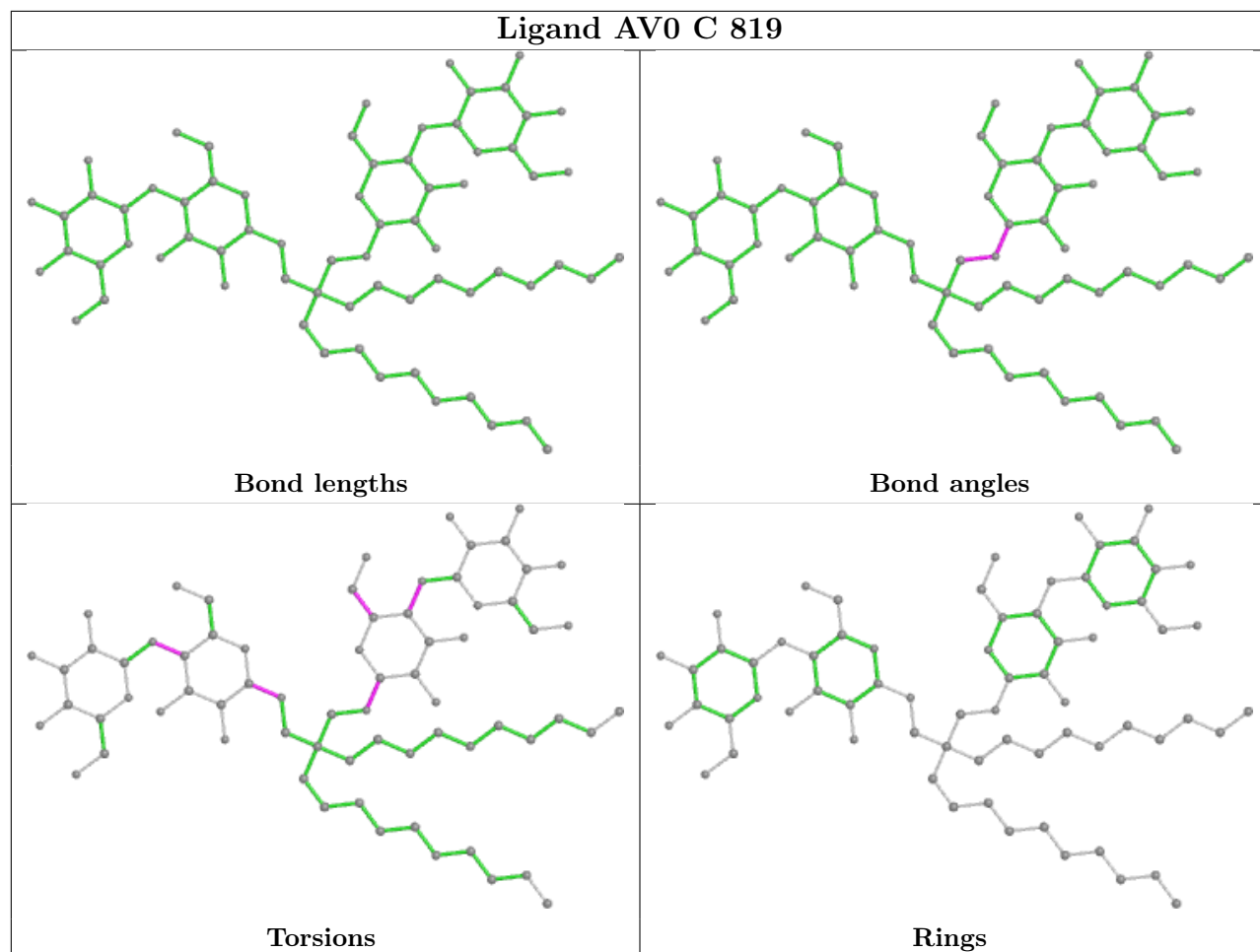


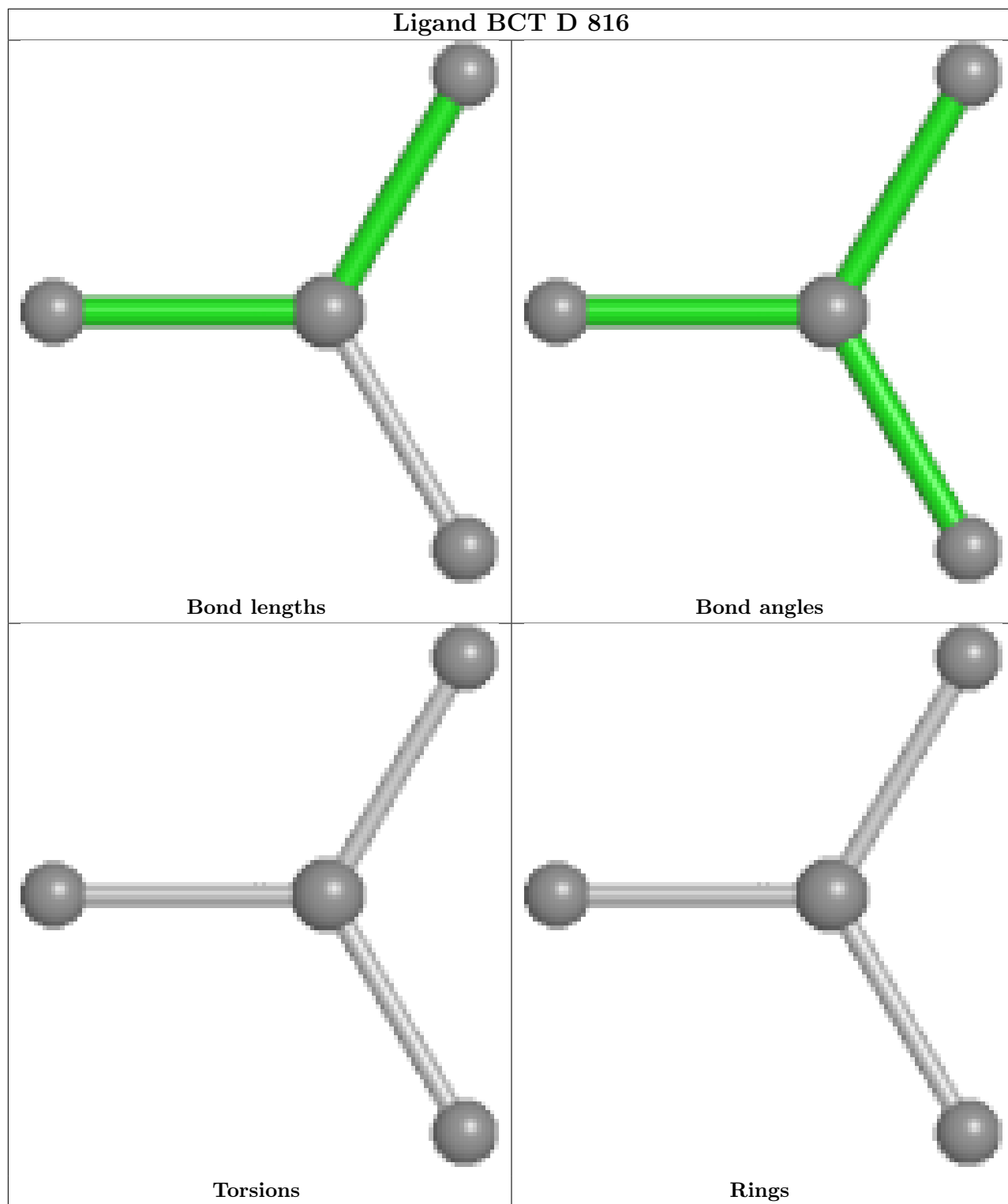


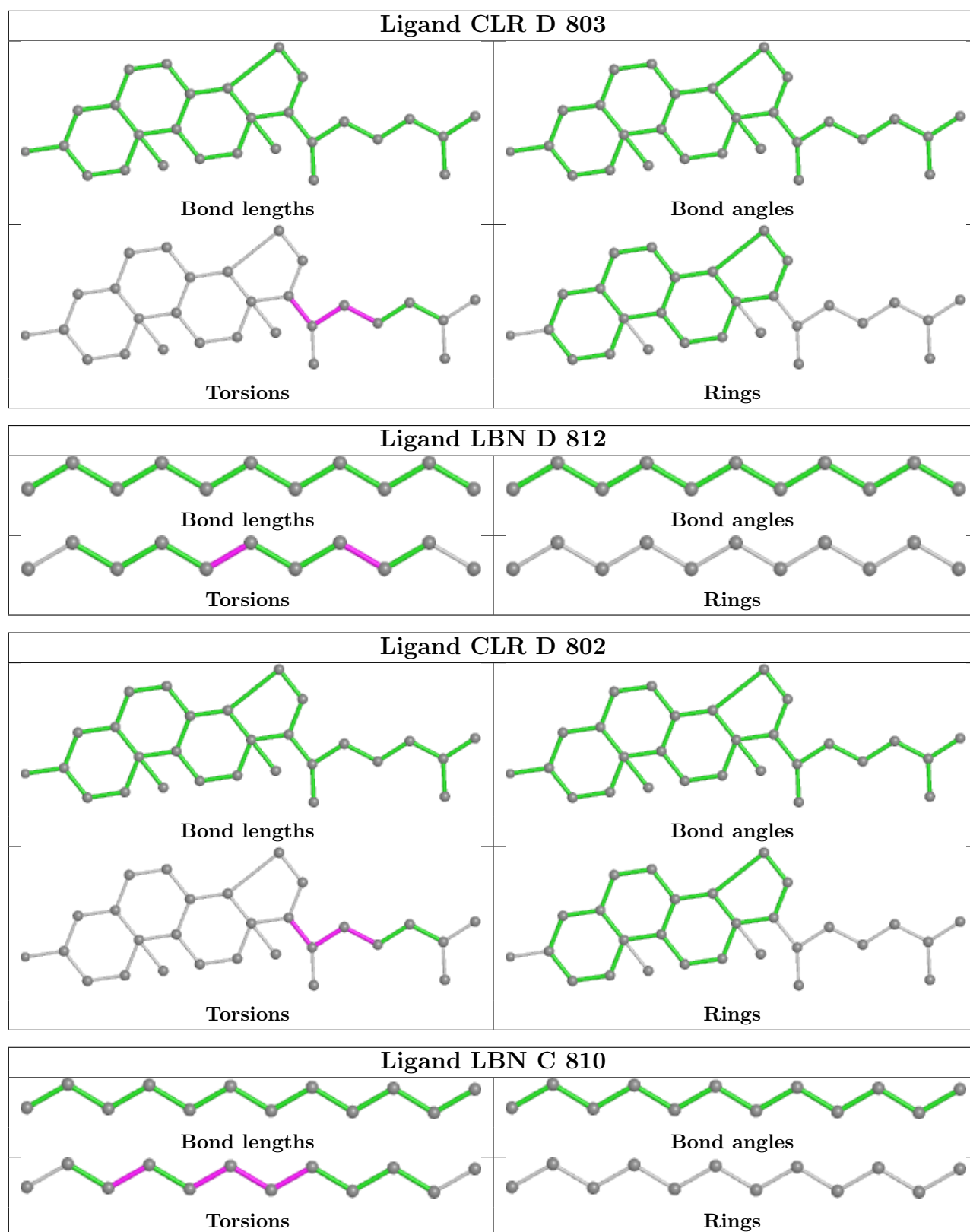


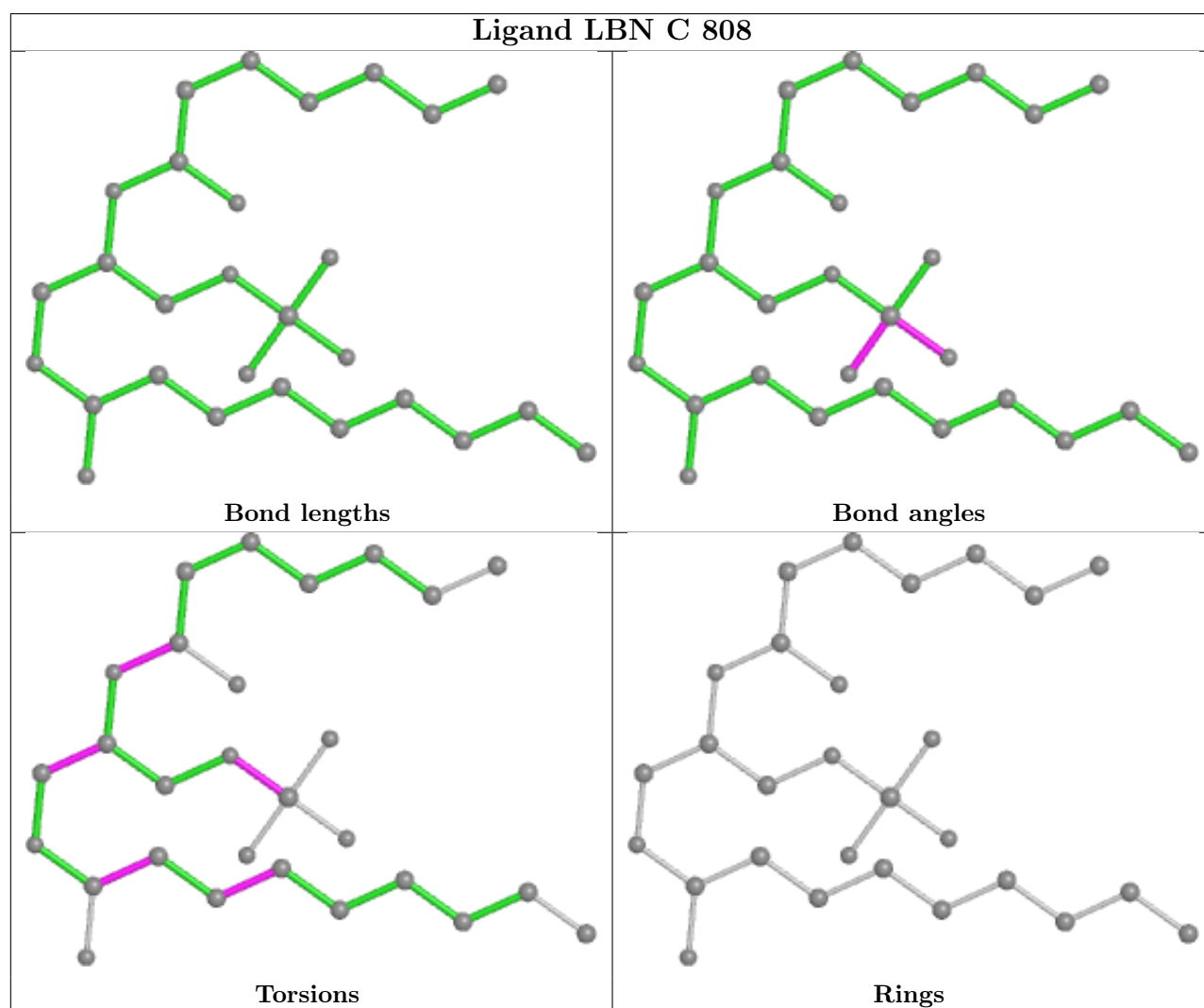
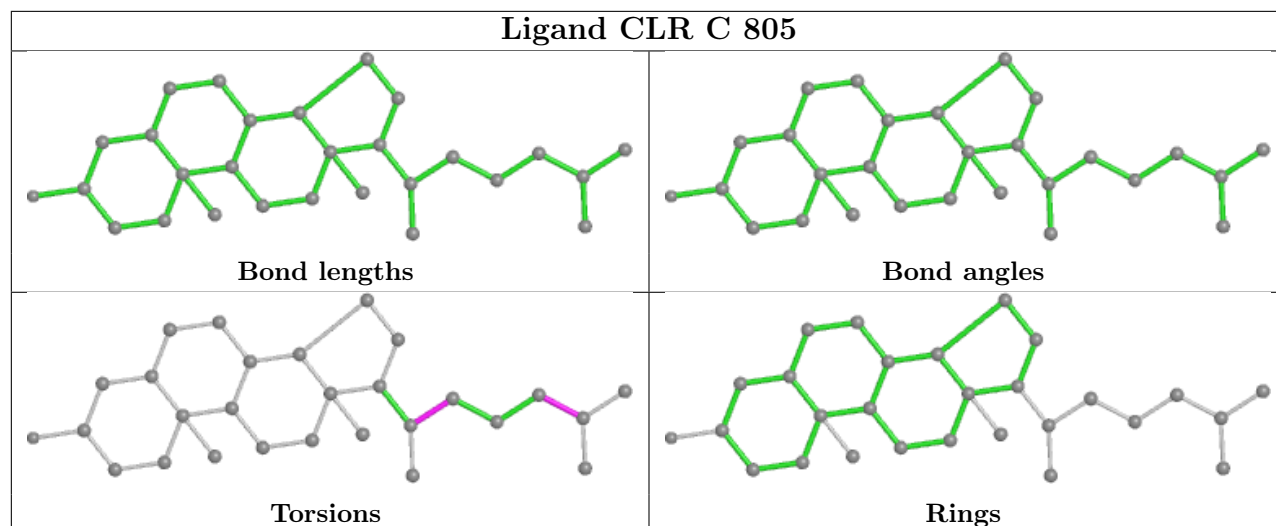


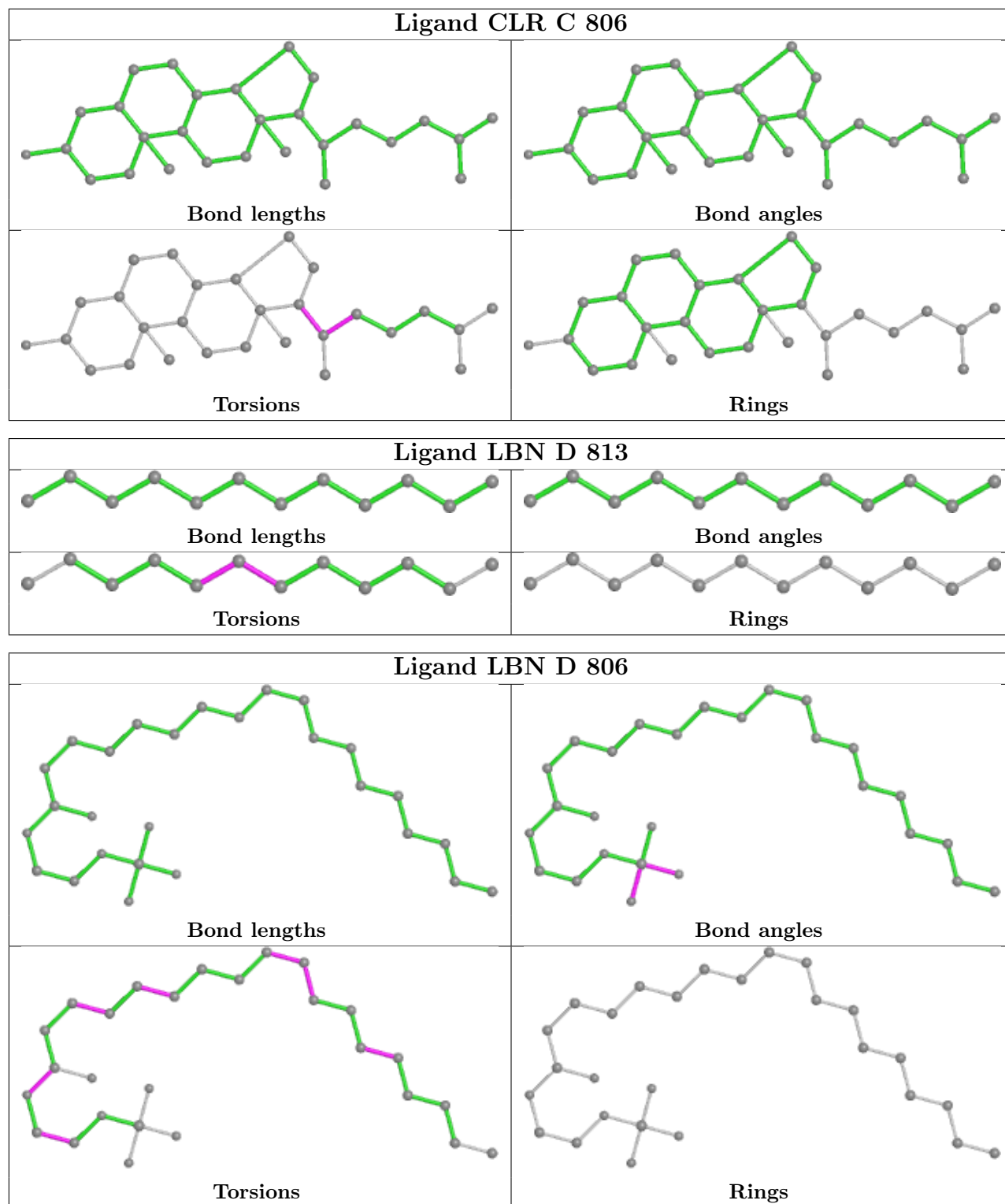


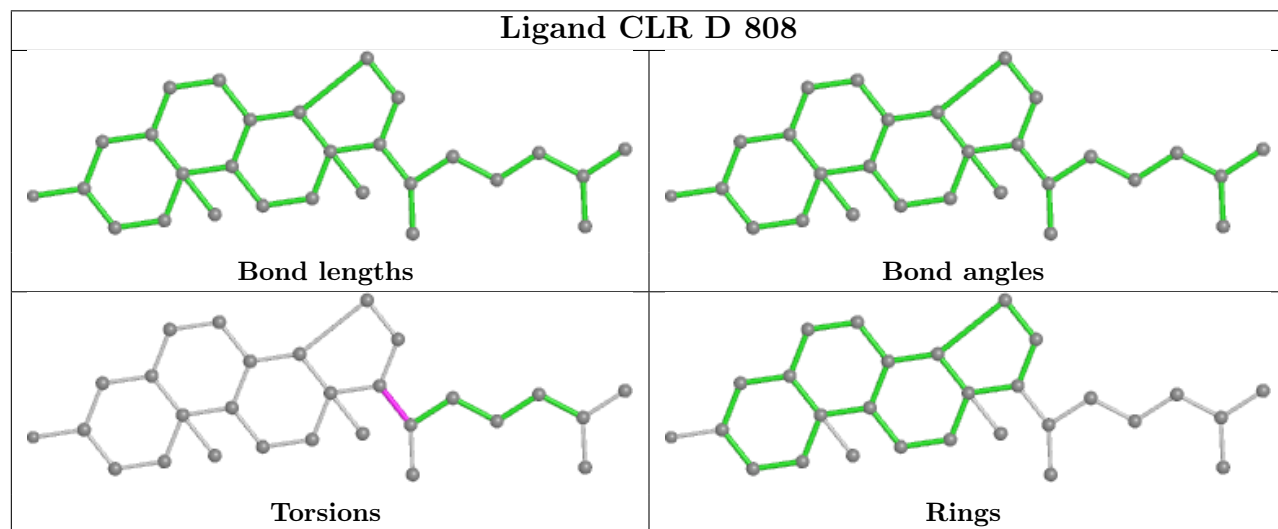
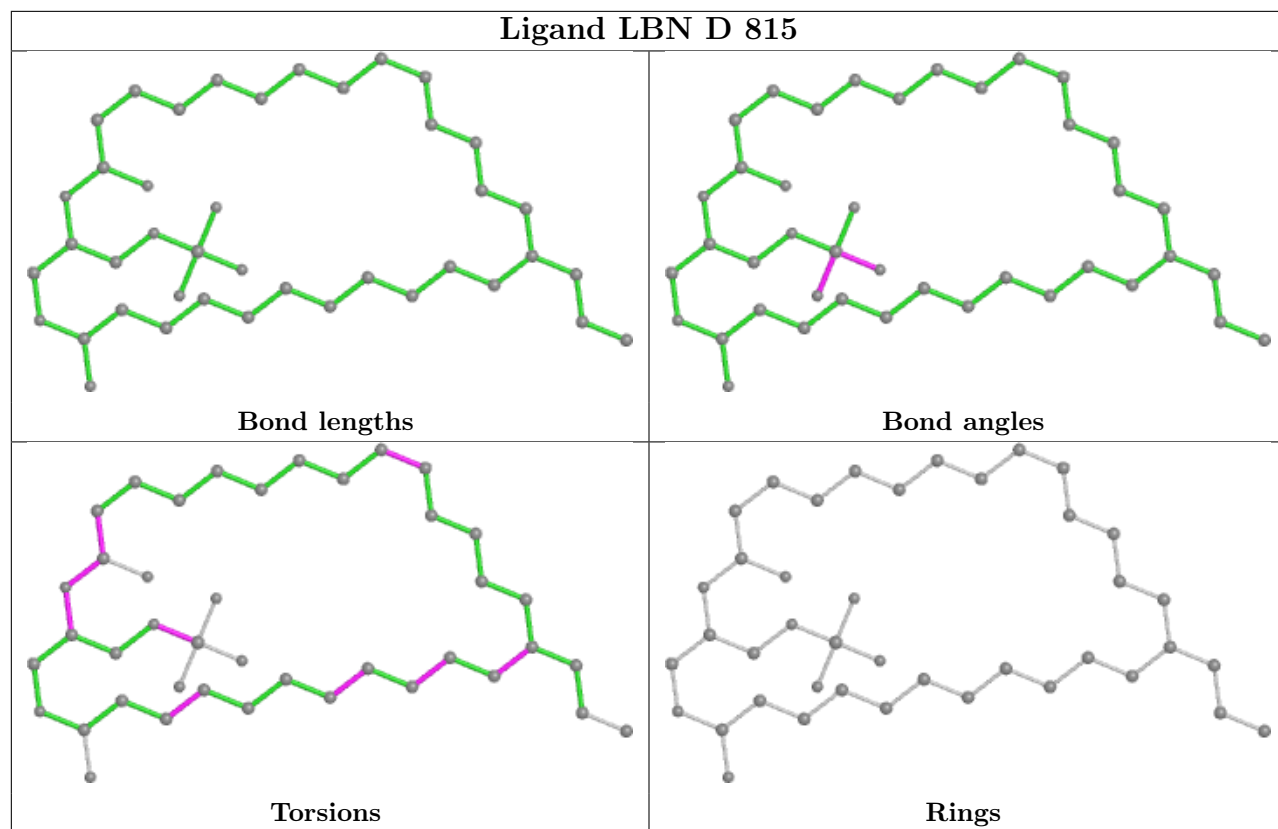


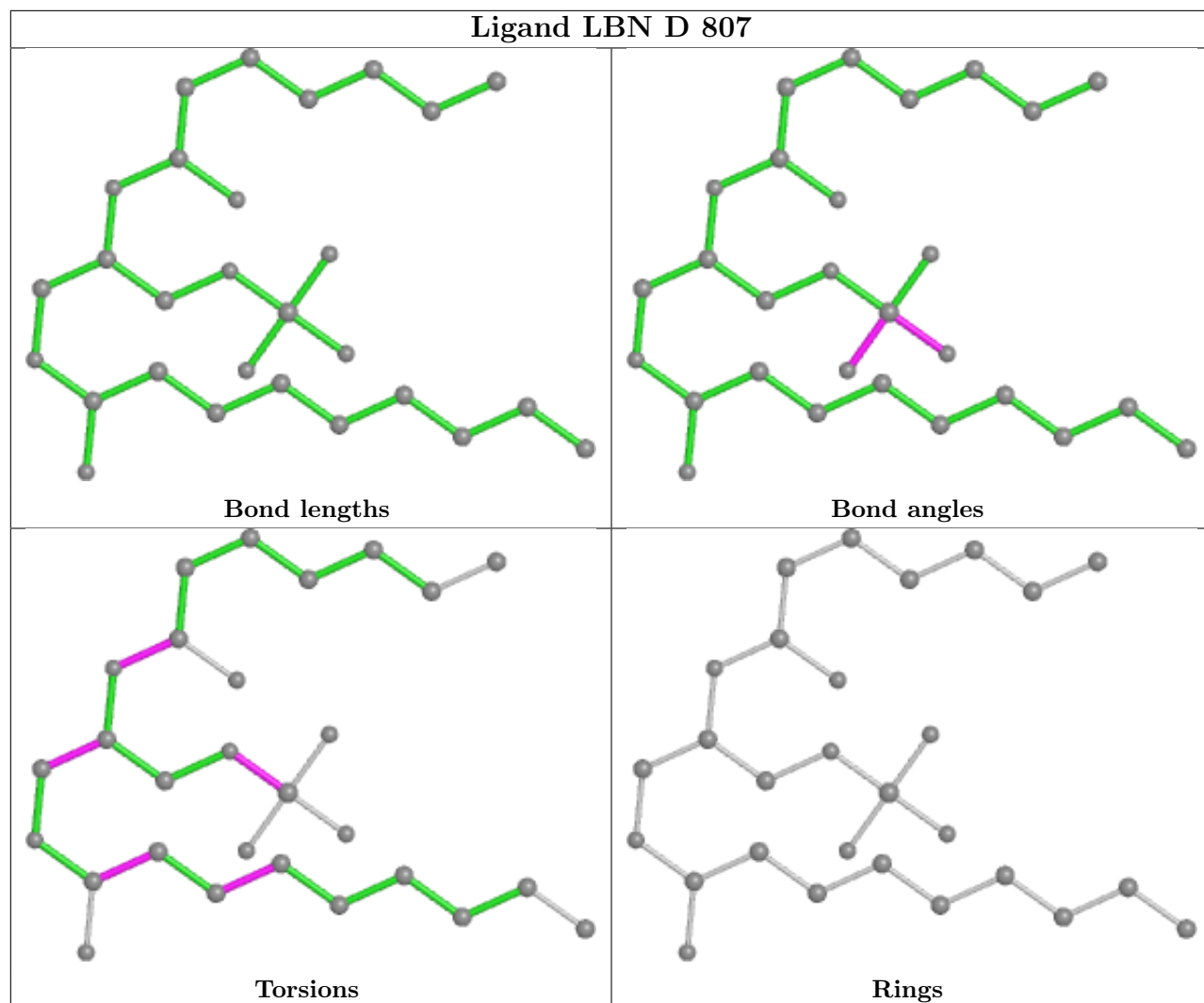


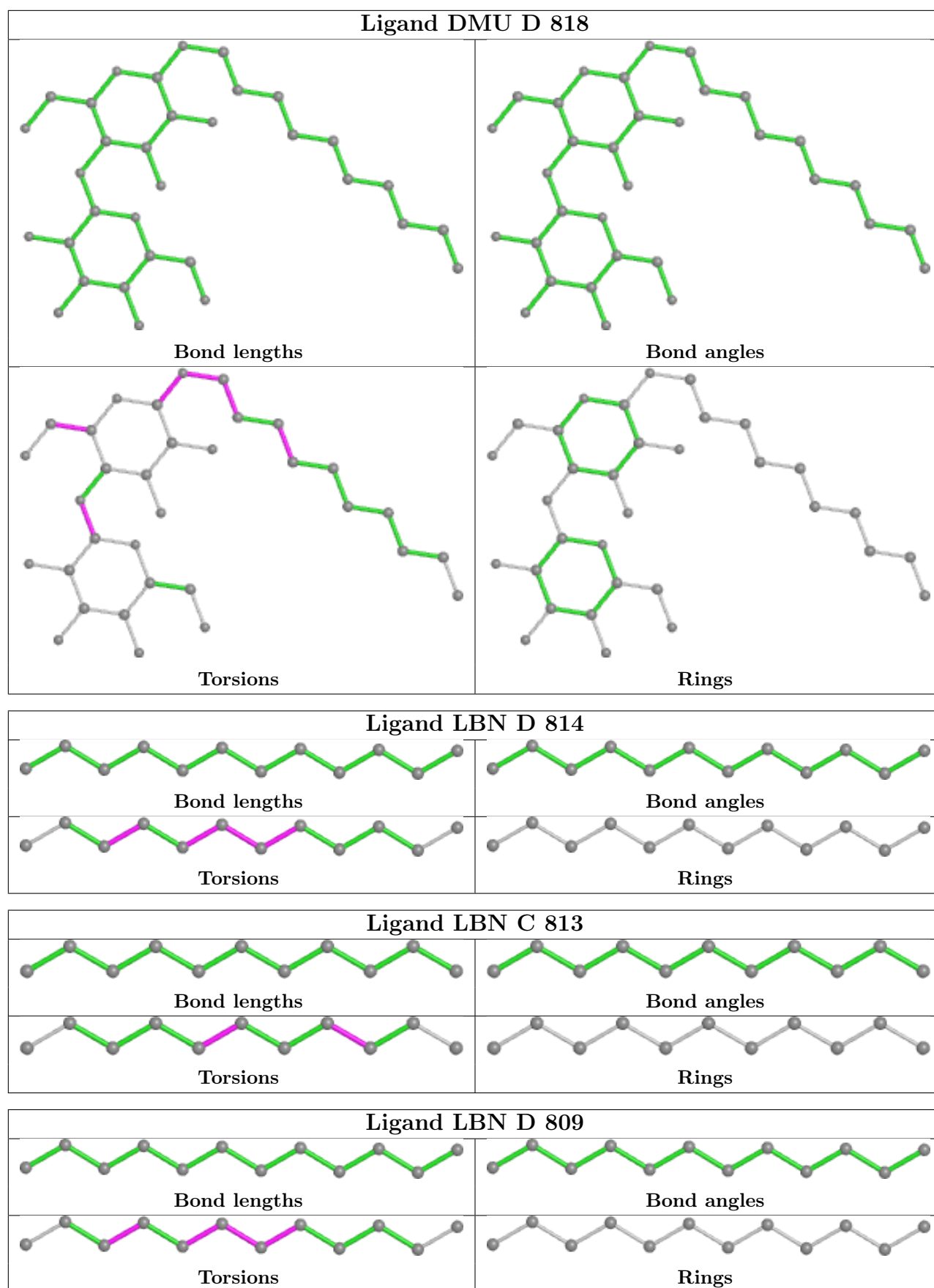


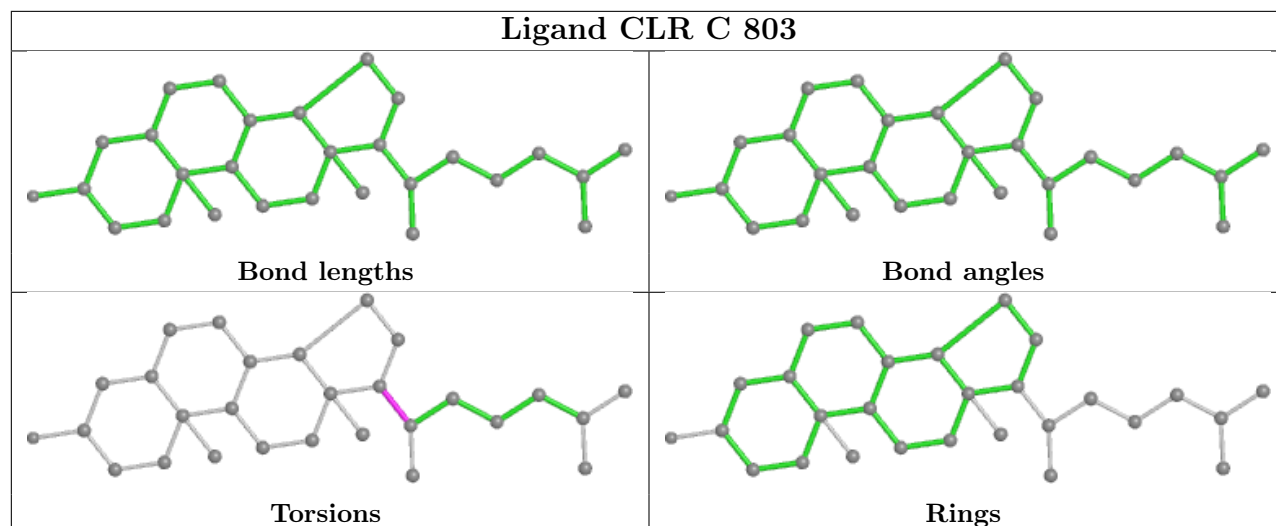












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

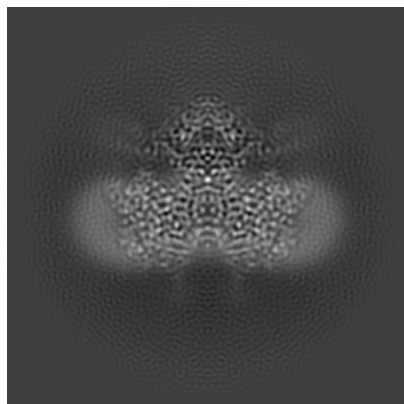
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-40507. These allow visual inspection of the internal detail of the map and identification of artifacts.

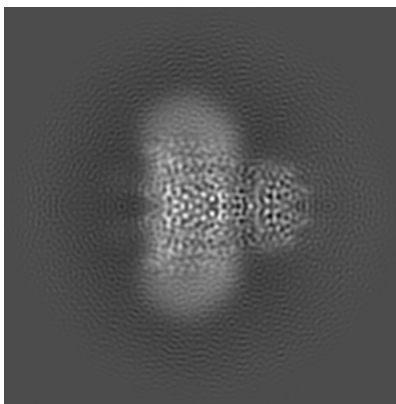
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

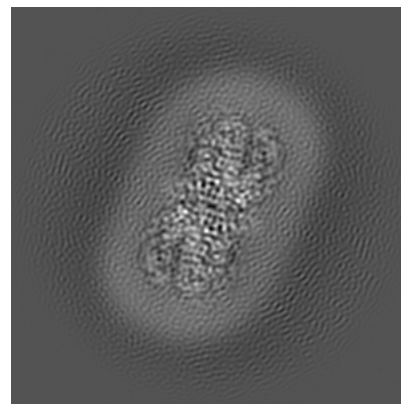
6.1.1 Primary map



X

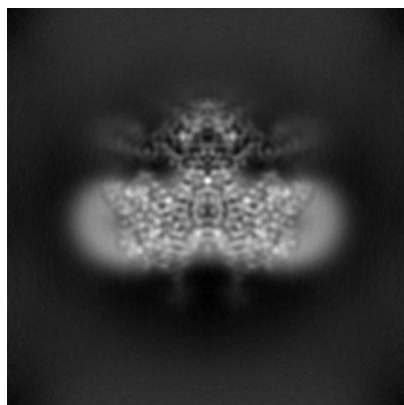


Y

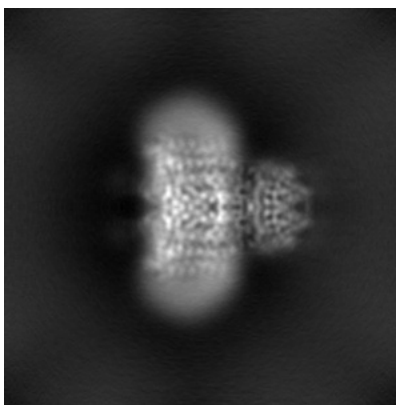


Z

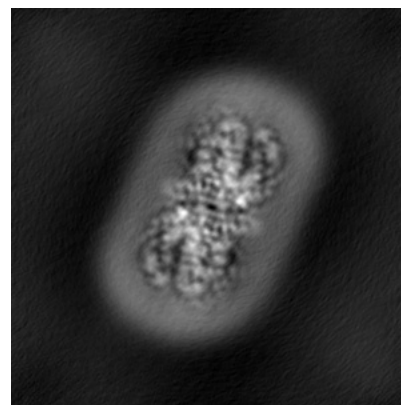
6.1.2 Raw map



X



Y

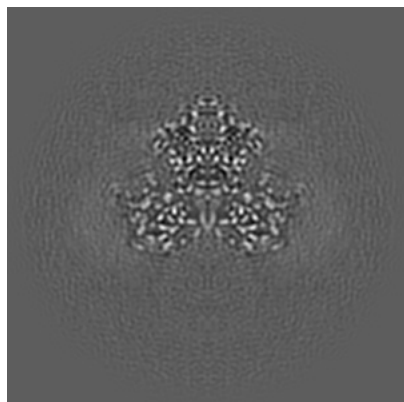


Z

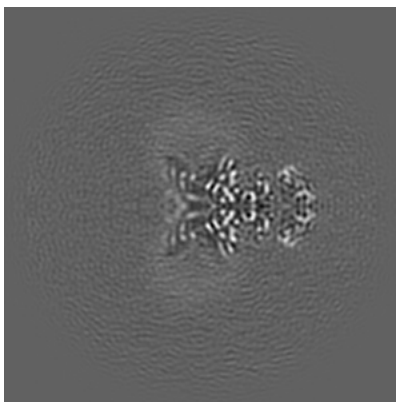
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

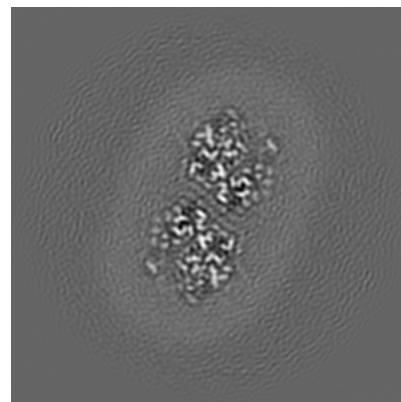
6.2.1 Primary map



X Index: 125

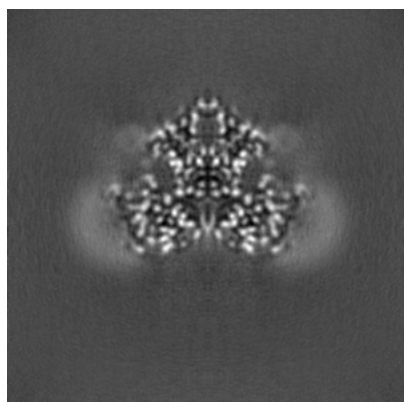


Y Index: 125

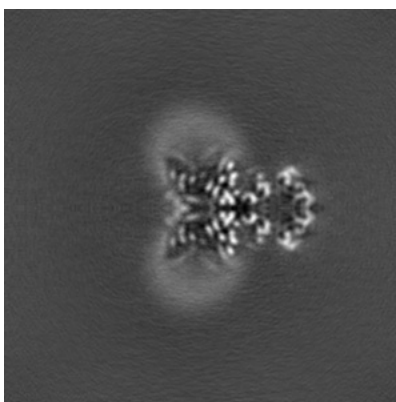


Z Index: 125

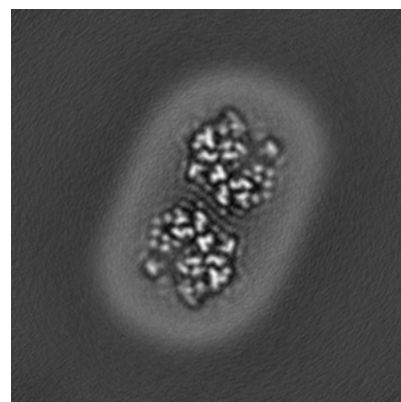
6.2.2 Raw map



X Index: 125



Y Index: 125

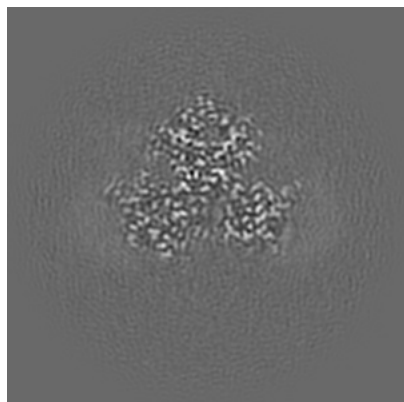


Z Index: 125

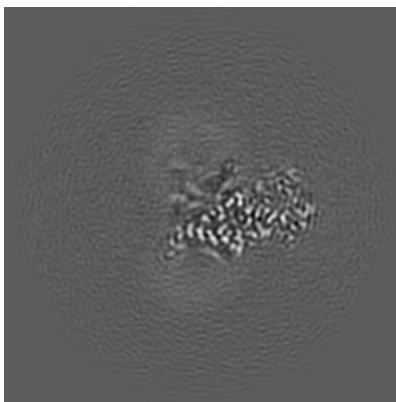
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

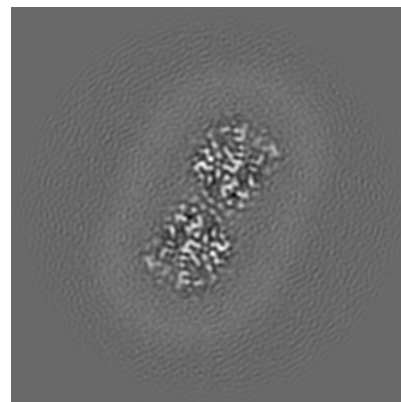
6.3.1 Primary map



X Index: 122

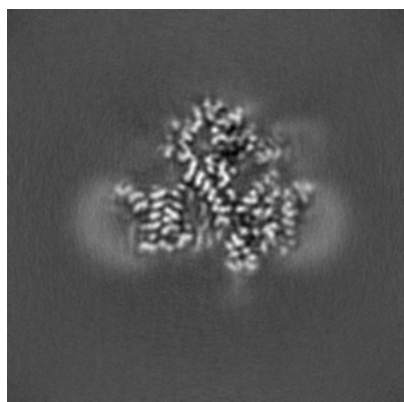


Y Index: 121

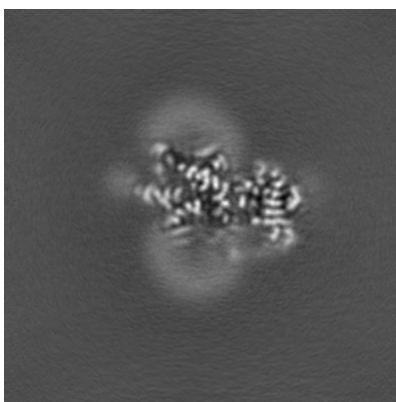


Z Index: 118

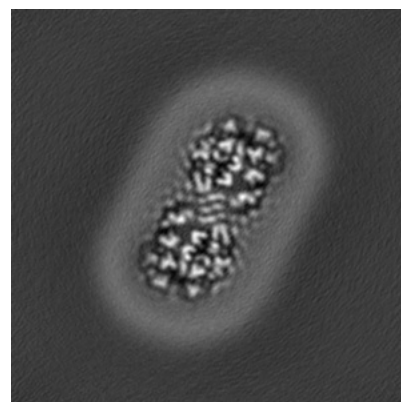
6.3.2 Raw map



X Index: 132



Y Index: 140

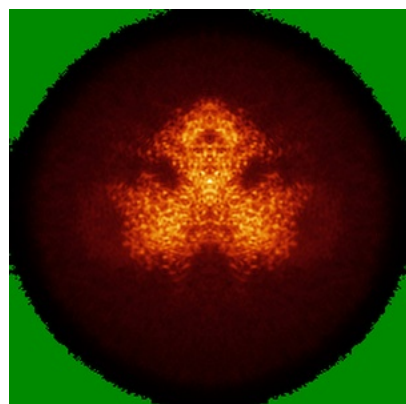


Z Index: 108

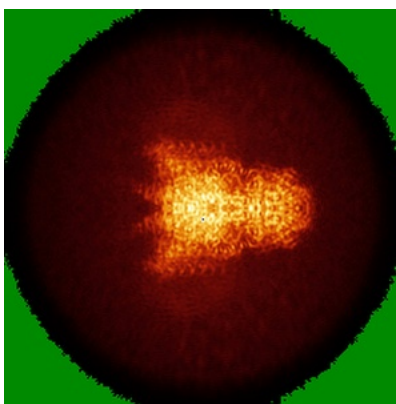
The images above show the largest variance slices of the map in three orthogonal directions.

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

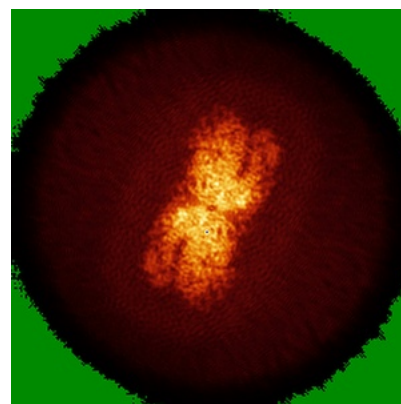
6.4.1 Primary map



X

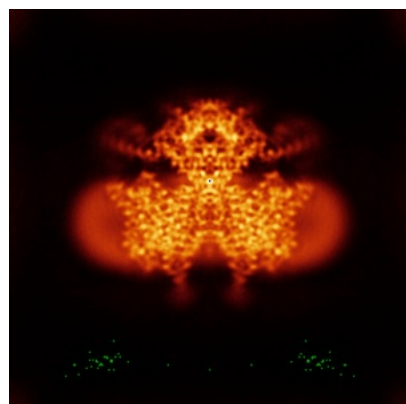


Y

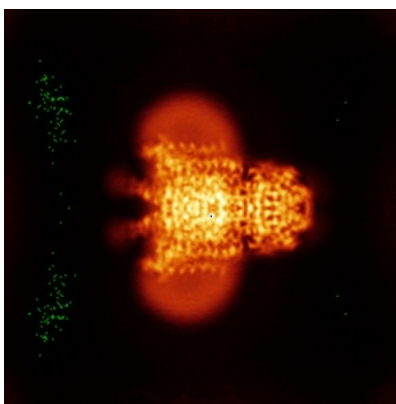


Z

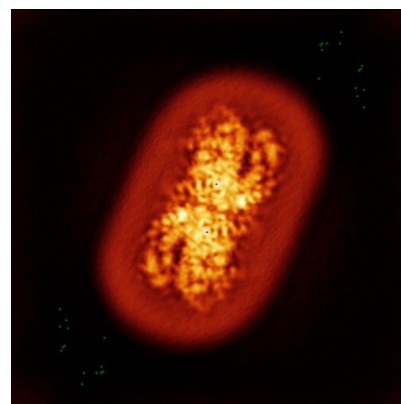
6.4.2 Raw map



X



Y

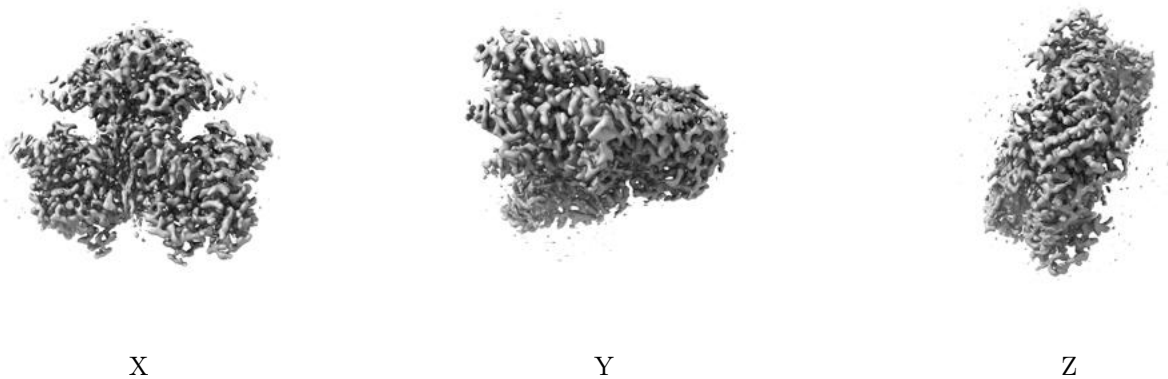


Z

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

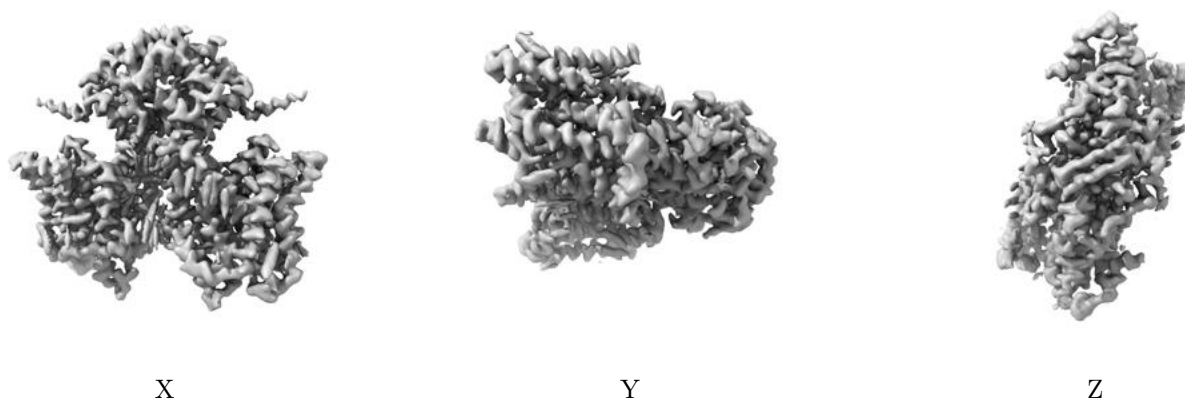
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.642. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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.

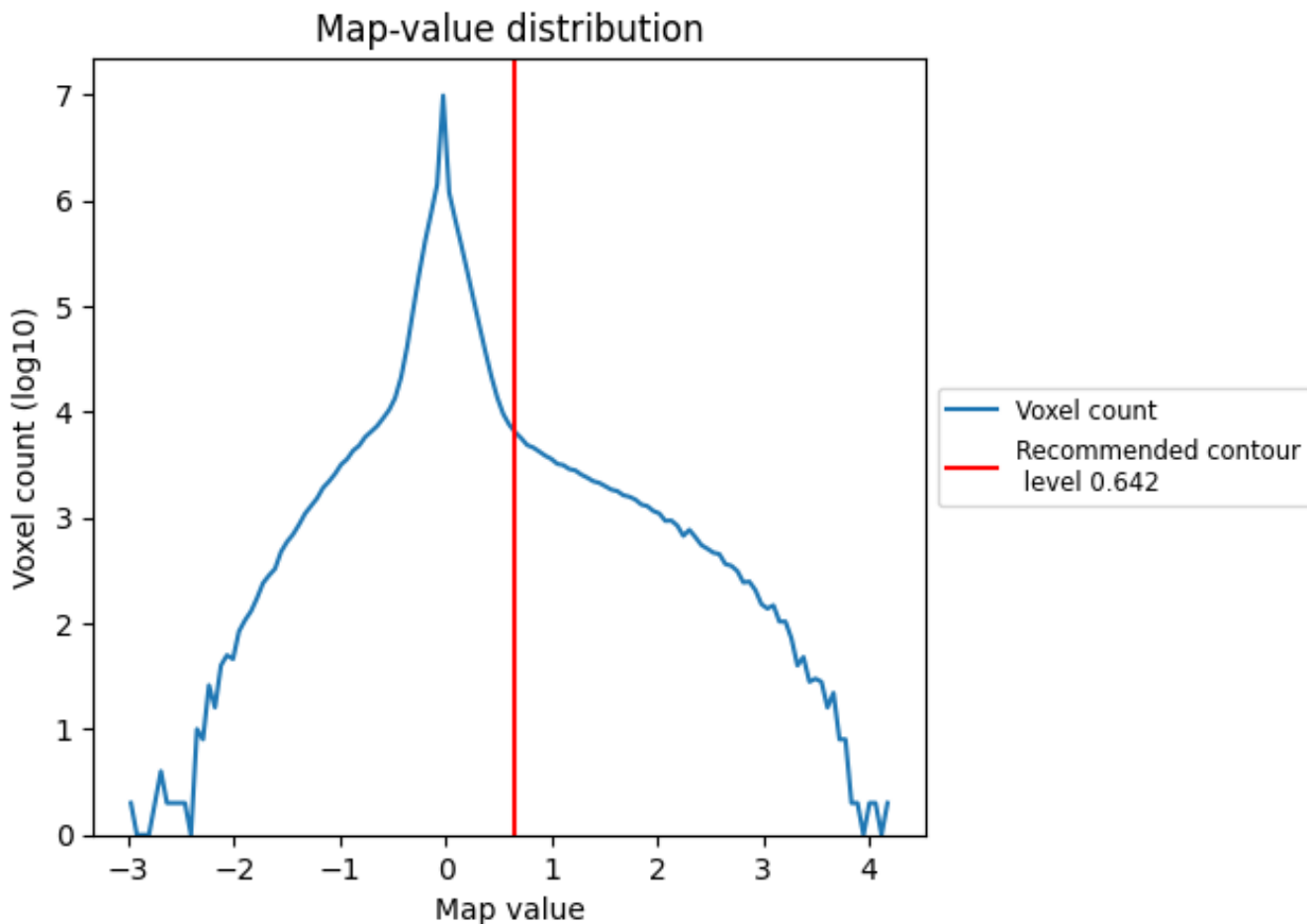
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

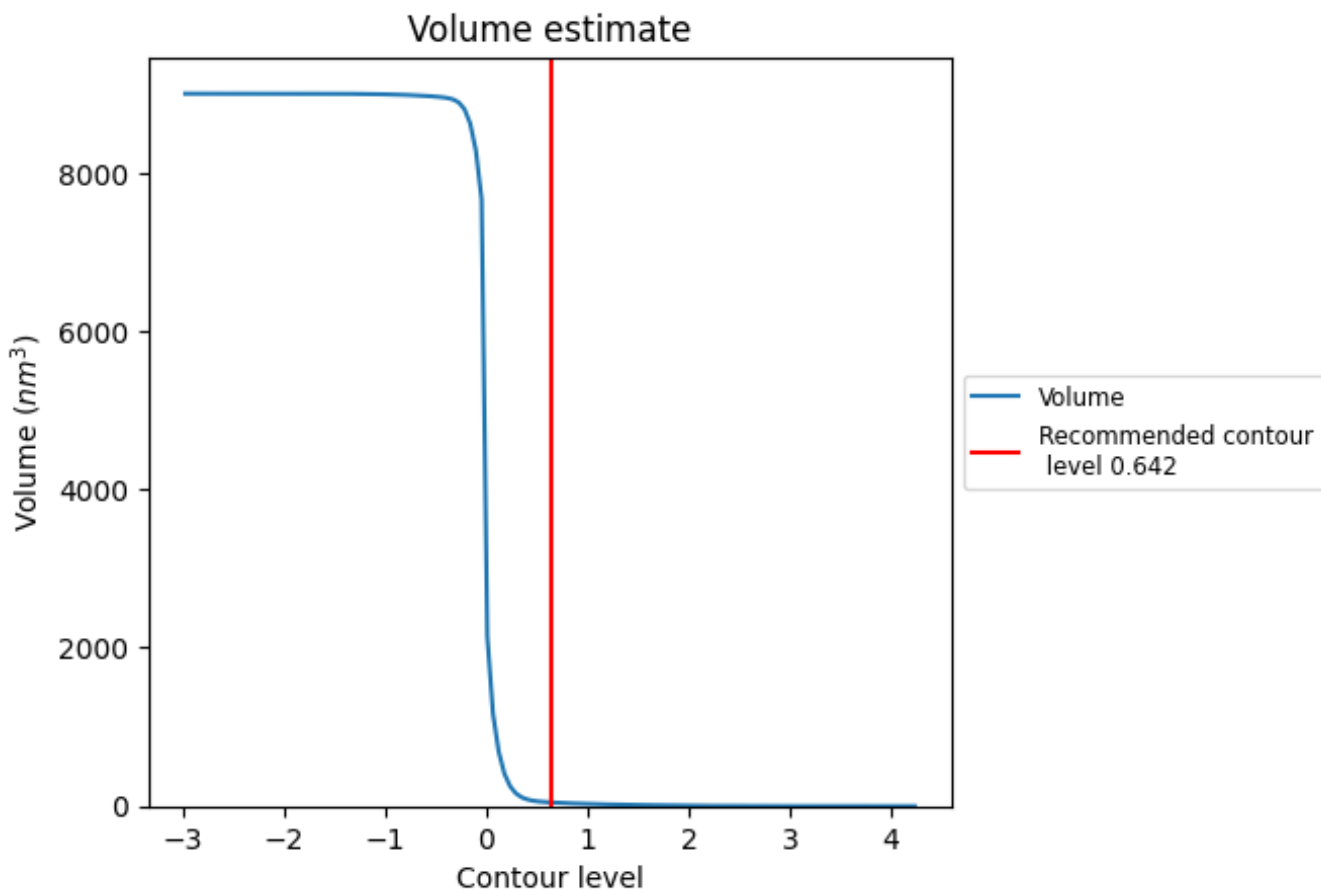
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

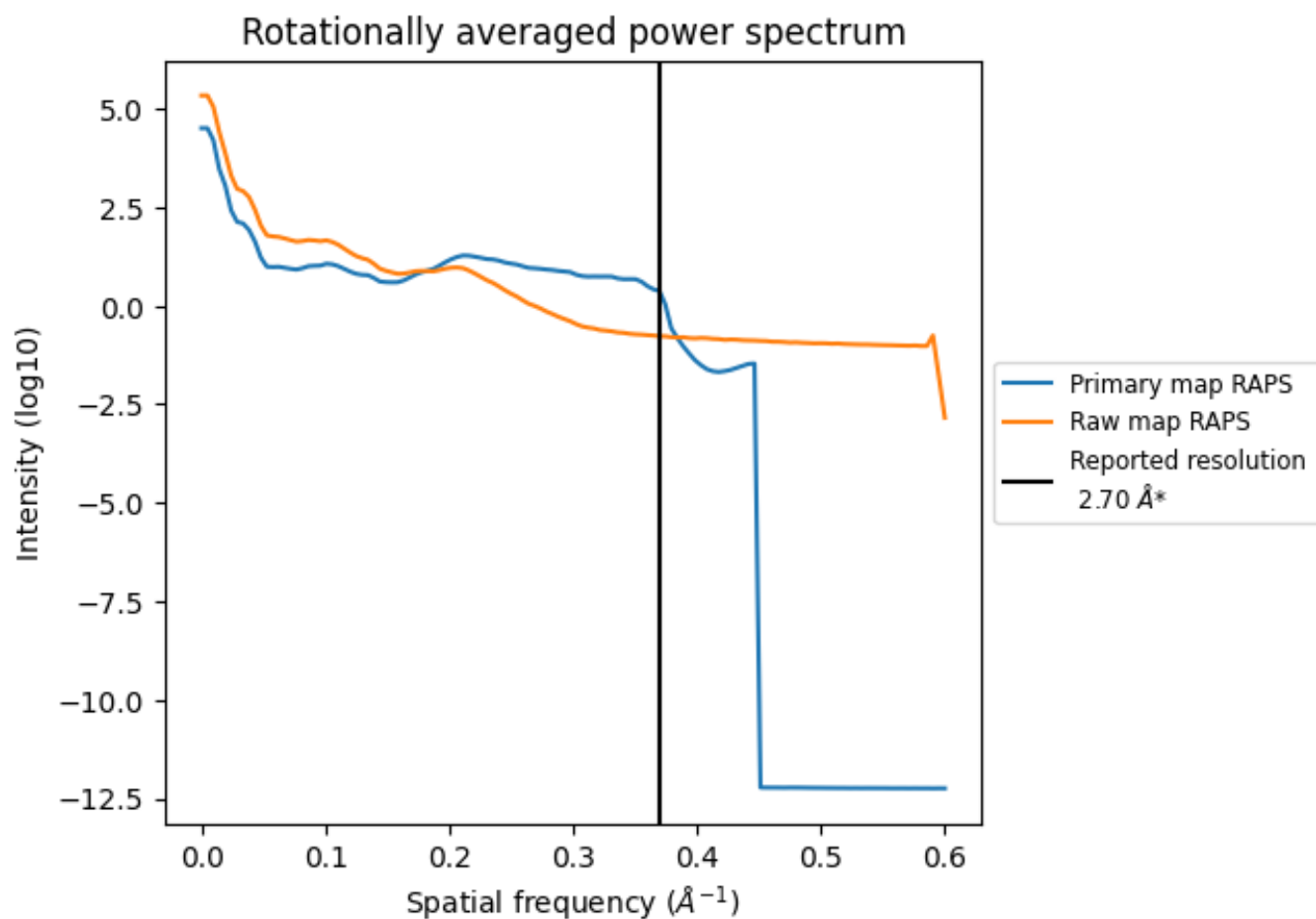
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 47 nm^3 ; this corresponds to an approximate mass of 42 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](#)

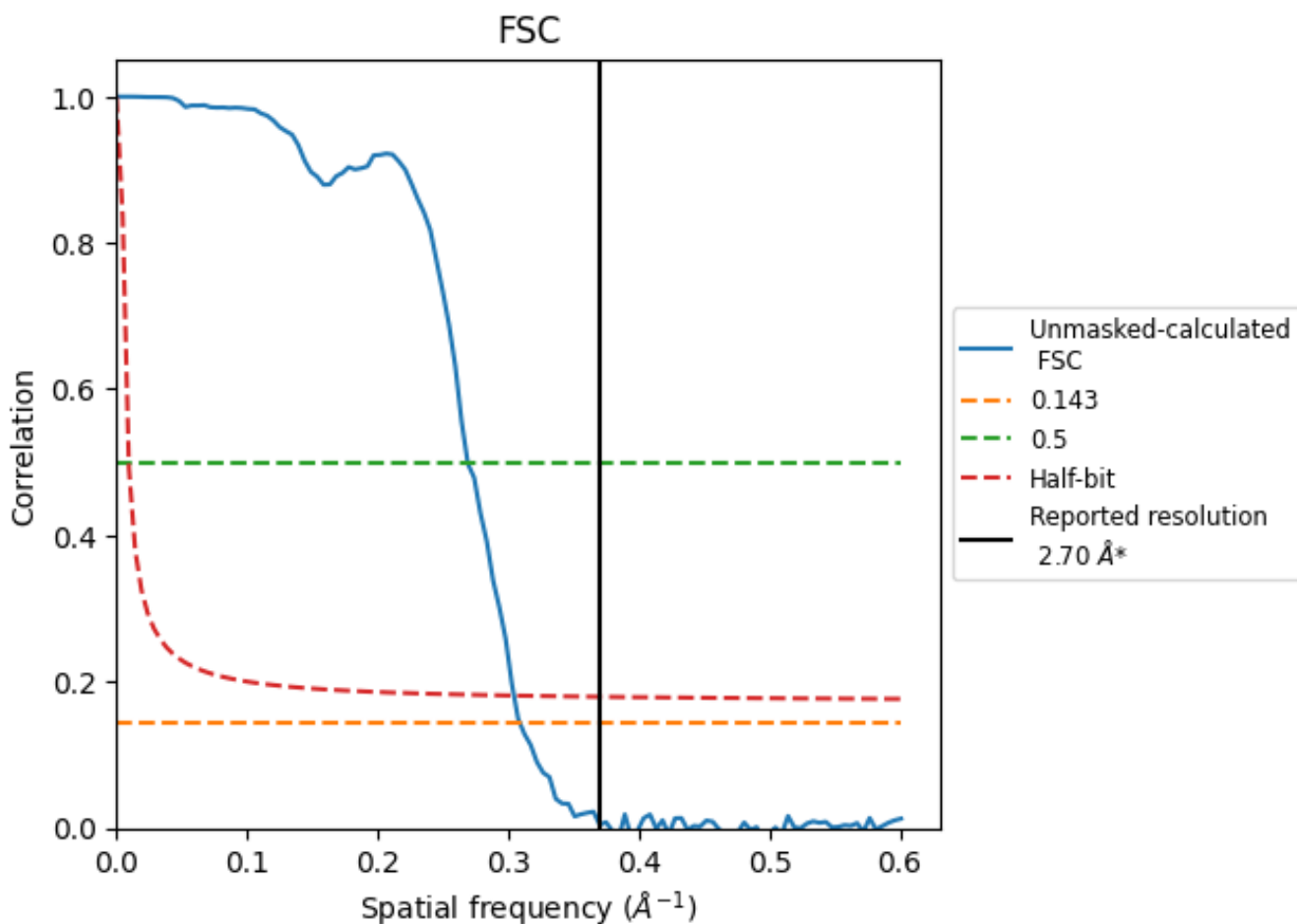


*Reported resolution corresponds to spatial frequency of 0.370 Å⁻¹

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 0.370 Å⁻¹

8.2 Resolution estimates [i](#)

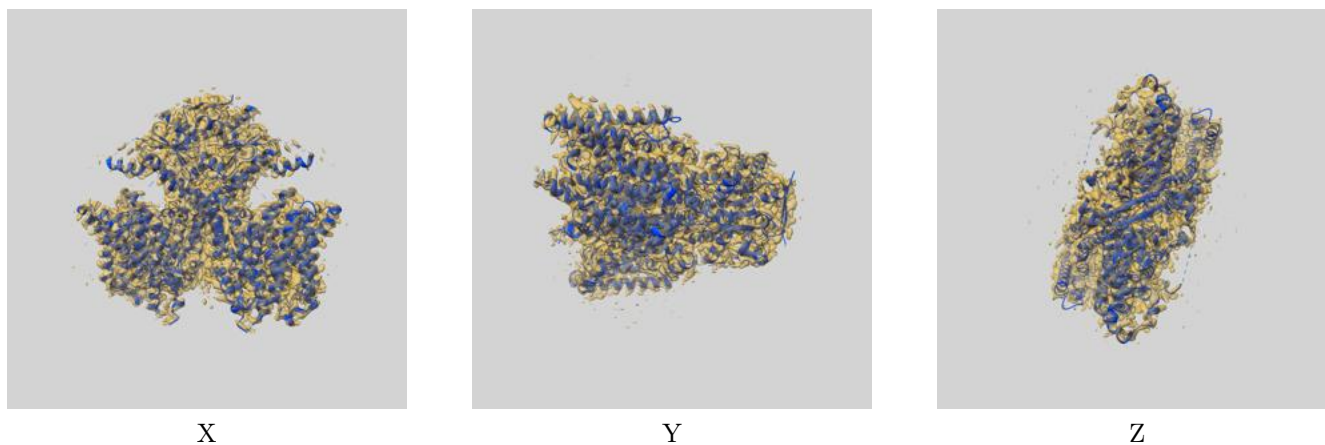
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.24	3.72	3.28

*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 3.24 differs from the reported value 2.7 by more than 10 %

9 Map-model fit [i](#)

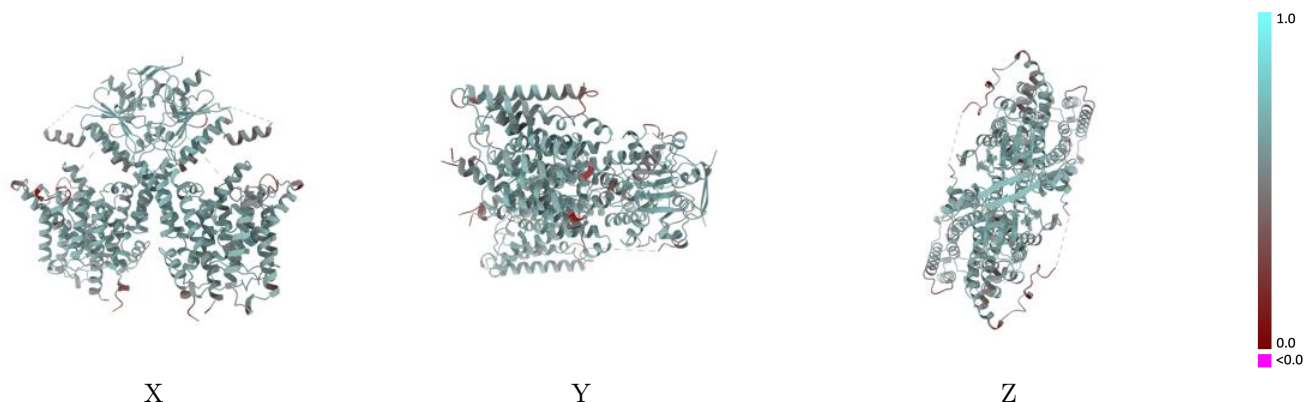
This section contains information regarding the fit between EMDB map EMD-40507 and PDB model 8SIE. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlay [i](#)



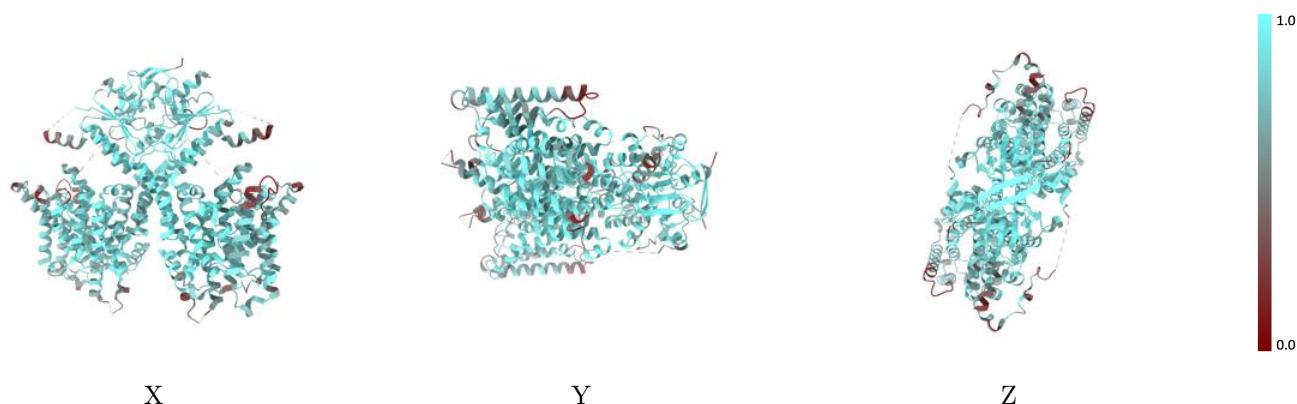
The images above show the 3D surface view of the map at the recommended contour level 0.642 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



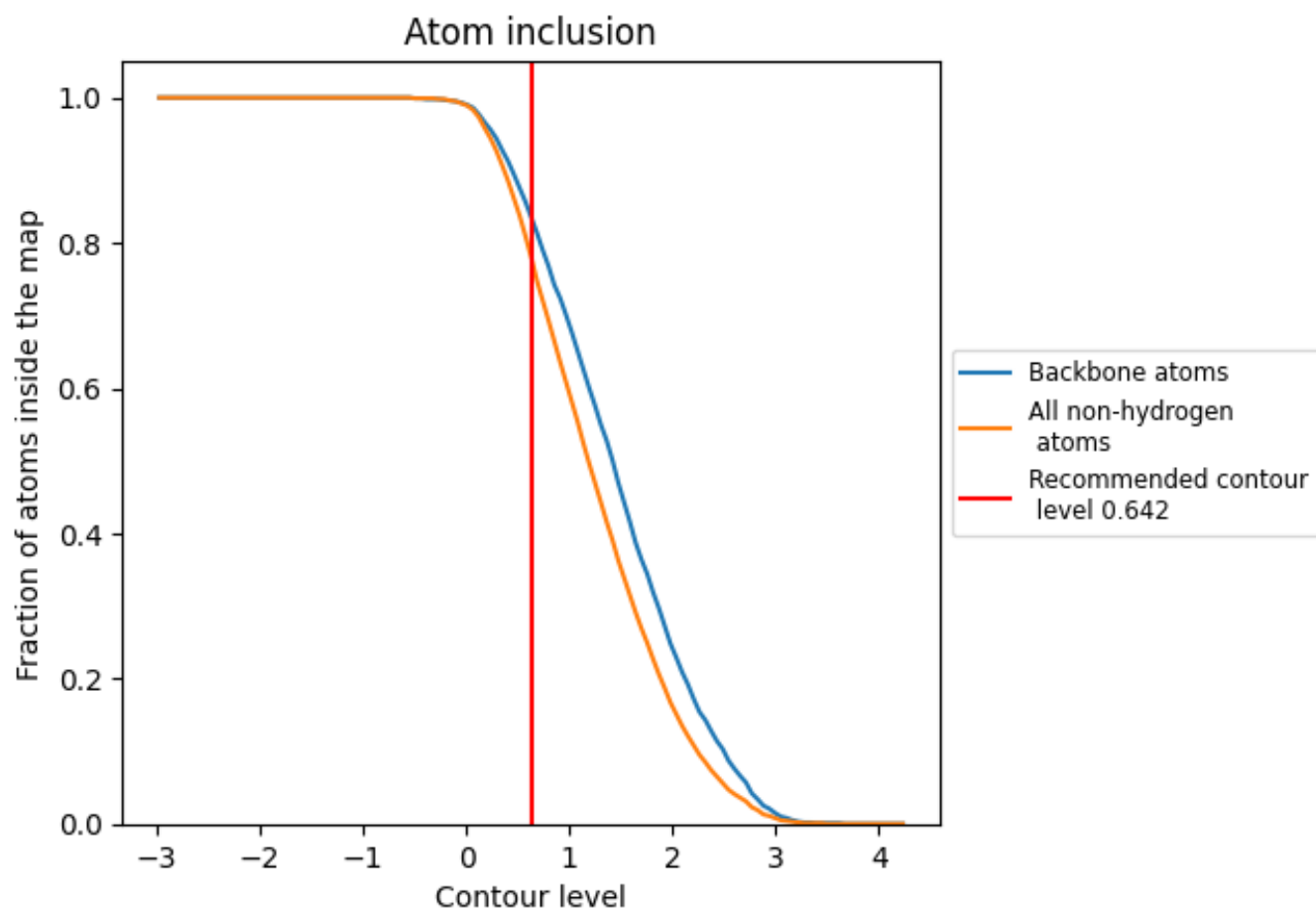
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.642).






9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 77% 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 (0.642) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7740	 0.5740
C	 0.7740	 0.5740
D	 0.7730	 0.5740

