wwPDB EM Validation Summary Report (i)

Oct 6, 2025 – 10:54 am BST

PDB ID	:	9IHP / pdb_00009ihp
EMDB ID	:	EMD-52876
Title	:	Open state without NUQM and with flavoprotein (classification state 3) of Pichia pastoris mitochondrial complex I in cMSP26 nanodiscs
Authors	:	Grba, D.N.; Hirst, J.
Deposited on	:	2025-02-21
Resolution	:	3.34 Å(reported)
Based on initial model	:	9ihr

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 (i) 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 (i)) were used in the production of this report:

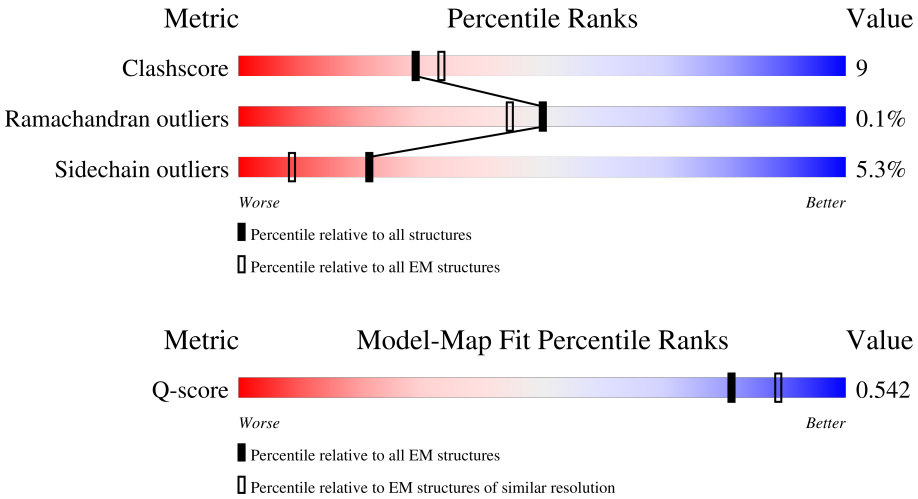
EMDB validation analysis	:	0.0.1.dev129
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.34 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14446 (2.84 - 3.84)

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 <=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	A	141	20%, 61%, 31%, 5%
2	B	204	62%, 23%, 14%
3	C	289	61%, 21%, 17%
4	D	482	63%, 26%, 9%

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Mol	Chain	Length	Quality of chain
5	E	241	26% 47% 27% 24%
6	F	473	38% 58% 34%
7	G	726	5% 67% 26%
8	H	353	7% 72% 26%
9	I	222	66% 18% 14%
10	J	161	6% 68% 25%
11	K	82	7% 72% 22%
12	L	642	74% 25%
13	M	491	73% 25%
14	N	523	77% 19%
15	O	193	5% 88% 11%
16	P	384	11% 68% 25% 7%
17	Q	159	6% 49% 17% 30%
18	R	139	5% 73% 15% 11%
19	S	90	36% 73% 23%
20	T	138	43% 41% 22% 33%
21	U	130	28% 52% 15% 32%
22	V	134	68% 22% 6%
23	W	122	15% 67% 25% 6%
24	X	184	85% 15%
25	Y	216	6% 82% 11% 5%
26	Z	147	82% 14%
27	a	150	5% 73% 26%
28	b	79	5% 80% 18%
29	c	182	9% 71% 27%

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Mol	Chain	Length	Quality of chain
30	d	78	82% 14%
31	e	106	84% 15%
32	f	86	6% 73% 17% 9%
33	g	239	32% 52% 12% 34%
34	h	182	7% 55% 15% 28%
35	i	74	16% 76% 18% 7%
36	j	59	22% 64% 24% 10%
37	k	61	20% 59% 13% 26%
38	l	156	12% 64% 18% 15%
39	m	81	14% 74% 21% 5%
40	n	111	23% 77% 15% 5%
41	o	87	17% 70% 21% 8%
42	p	92	65% 30%
43	q	140	79% 20%

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
44	SF4	F	501	-	-	X	-
44	SF4	I	302	-	-	X	-

2 Entry composition (i)

There are 53 unique types of molecules in this entry. The entry contains 68464 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 NADH-ubiquinone oxidoreductase chain 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	137	1099	745	159	191	4	0	0

- Molecule 2 is a protein called BA75_00622T0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	175	1407	901	241	249	16	0	0

- Molecule 3 is a protein called NUGM (30 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	240	1970	1273	331	361	5	0	0

- Molecule 4 is a protein called NUCM (49 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	440	3536	2259	602	657	18	0	0

- Molecule 5 is a protein called NUHM (24 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	183	1446	920	239	273	14	0	0

- Molecule 6 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	453	Total	C	N	O	S	0	0
			3500	2213	612	654	21		

- Molecule 7 is a protein called NUAM (75 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	696	Total	C	N	O	S	0	0
			5344	3345	939	1037	23		

- Molecule 8 is a protein called NADH-ubiquinone oxidoreductase chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	353	Total	C	N	O	S	0	0
			2809	1903	414	478	14		

- Molecule 9 is a protein called NUIM (TYKY) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	192	Total	C	N	O	S	0	0
			1556	988	259	299	10		

- Molecule 10 is a protein called NADH-ubiquinone oxidoreductase chain 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	155	Total	C	N	O	S	0	0
			1250	836	174	237	3		

- Molecule 11 is a protein called NULM (ND4L) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	80	Total	C	N	O	S	0	0
			617	400	93	118	6		

- Molecule 12 is a protein called NADH-ubiquinone oxidoreductase chain 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	642	Total	C	N	O	S	0	0
			5115	3454	766	866	29		

- Molecule 13 is a protein called NADH-ubiquinone oxidoreductase chain 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	491	Total	C	N	O	S	0	0
			3868	2597	593	663	15		

- Molecule 14 is a protein called NADH-ubiquinone oxidoreductase chain 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	506	Total	C	N	O	S	0	0
			4045	2723	594	714	14		

- Molecule 15 is a protein called NUXM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	193	Total	C	N	O	S	0	0
			1575	1019	257	294	5		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
O	0	ACE	-	acetylation	UNP E1UWB9

- Molecule 16 is a protein called NUEM (39 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	359	Total	C	N	O	S	0	0
			2851	1821	496	531	3		

- Molecule 17 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	112	Total	C	N	O	S	0	0
			924	585	161	176	2		

- Molecule 18 is a protein called NUMM (13 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	124	Total	C	N	O	S	0	0
			978	610	179	186	3		

- Molecule 19 is a protein called NI8M (B8) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
19	S	90	Total	C	N	O	0	0
			697	454	117	126		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	0	ACE	-	acetylation	UNP E1UWD3

- Molecule 20 is a protein called Acyl carrier protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	93	Total	C	N	O	S	0	0
			730	459	116	154	1		

- Molecule 21 is a protein called Acyl carrier protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	U	88	Total	C	N	O	0	0
			681	427	102	152		

- Molecule 22 is a protein called NUFM (B13) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
22	V	126	Total	C	N	O	S	0	0
			1025	658	165	201	1		

- Molecule 23 is a protein called BA75_04796T0.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	W	115	Total	C	N	O	S	0	0
			979	626	177	171	5		

- Molecule 24 is a protein called NADH-ubiquinone oxidoreductase.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	X	184	Total	C	N	O	S	0	0
			1450	905	253	282	10		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
X	0	ACE	-	acetylation	UNP E1UWB8

- Molecule 25 is a protein called NUJM (B14.7) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Y	205	Total	C	N	O	S	0	0
			1578	1012	274	289	3		

- Molecule 26 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z	142	Total	C	N	O	S	0	0
			1176	758	212	202	4		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Z	0	ACE	-	acetylation	UNP E1UWD8

- Molecule 27 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	a	149	Total	C	N	O	S	0	0
			1215	756	228	225	6		

- Molecule 28 is a protein called NI9M (B9) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
28	b	78	Total	C	N	O	S	0	0
			641	419	111	109	2		

- Molecule 29 is a protein called BA75_00589T0.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	c	182	Total	C	N	O	S	0	0
			1418	902	248	266	2		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
c	1	ACE	-	acetylation	UNP E1UWC1

- Molecule 30 is a protein called Pichia pastoris NADH-ubiquinone oxidoreductase subunit NEBM.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	d	75	Total	C	N	O	S	0	0
			616	406	106	103	1		

- Molecule 31 is a protein called BA75_05084T0.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	e	105	Total	C	N	O	S	0	0
			848	531	154	157	6		

- Molecule 32 is a protein called NUTM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
32	f	78	Total	C	N	O	0	0
			642	428	113	101		

- Molecule 33 is a protein called NESM (ESSS) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
33	g	158	Total	C	N	O	S	0	0
			1280	815	210	252	3		

- Molecule 34 is a protein called NUSM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
34	h	131	Total	C	N	O	0	0
			1078	699	183	196		

- Molecule 35 is a protein called NUUM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
35	i	69	Total	C	N	O	S	0	0
			552	358	95	97	2		

- Molecule 36 is a protein called Subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
36	j	53	Total	C	N	O	S	0	0
			460	319	76	64	1		

- Molecule 37 is a protein called NB2M (B12) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
37	k	45	Total	C	N	O	S	0	0
			368	240	71	56	1		

- Molecule 38 is a protein called NIAM (ASHI) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
38	l	132	Total	C	N	O	S	0	0
			1082	706	175	200	1		

- Molecule 39 is a protein called NB5M (B15) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
39	m	77	Total	C	N	O	0	0
			642	418	116	108		

- Molecule 40 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	n	105	Total	C	N	O	S	0	0
			861	550	155	155	1		

- Molecule 41 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	o	80	Total	C	N	O	S	0	0
			682	428	126	122	6		

- Molecule 42 is a protein called NIDM (PDSW) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
42	p	90	Total	C	N	O	S	0	0
			740	457	135	144	4		

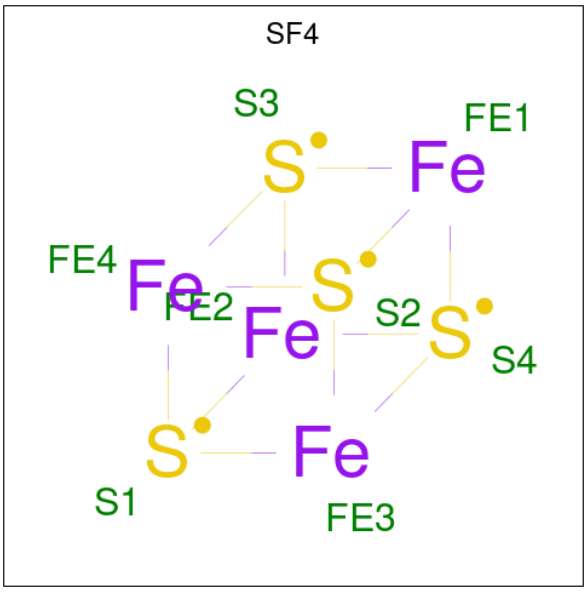
- Molecule 43 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	q	140	Total	C	N	O	S	0	0
			1156	741	201	211	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
q	0	ACE	-	acetylation	UNP E1UWE0

- Molecule 44 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4).



Mol	Chain	Residues	Atoms			AltConf
44	B	1	Total	Fe	S	0
			8	4	4	

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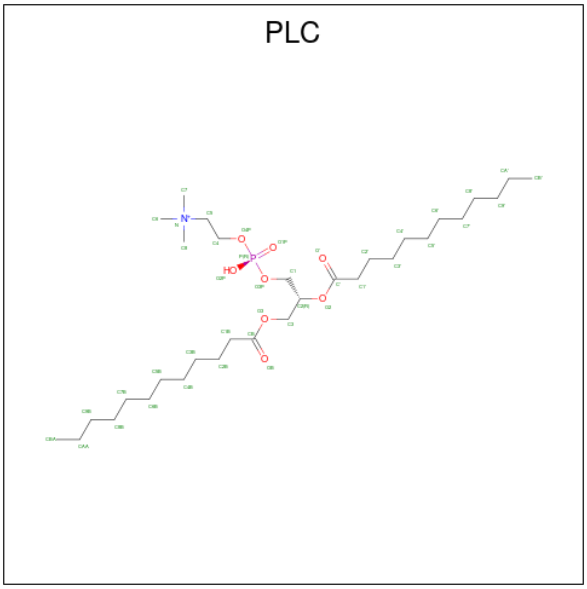
Mol	Chain	Residues	Atoms	AltConf
44	F	1	Total Fe S 8 4 4	0
44	G	1	Total Fe S 8 4 4	0
44	G	1	Total Fe S 8 4 4	0
44	I	1	Total Fe S 8 4 4	0
44	I	1	Total Fe S 8 4 4	0

- Molecule 45 is DIUNDECYL PHOSPHATIDYL CHOLINE (CCD ID: PLC) (formula: $C_{32}H_{65}NO_8P$).



Mol	Chain	Residues	Atoms	AltConf
45	B	1	Total C N O P 31 21 1 8 1	0
45	B	1	Total C N O P 31 21 1 8 1	0
45	H	1	Total C N O P 24 14 1 8 1	0
45	I	1	Total C N O P 42 32 1 8 1	0
45	L	1	Total C N O P 35 25 1 8 1	0
45	L	1	Total C N O P 42 32 1 8 1	0

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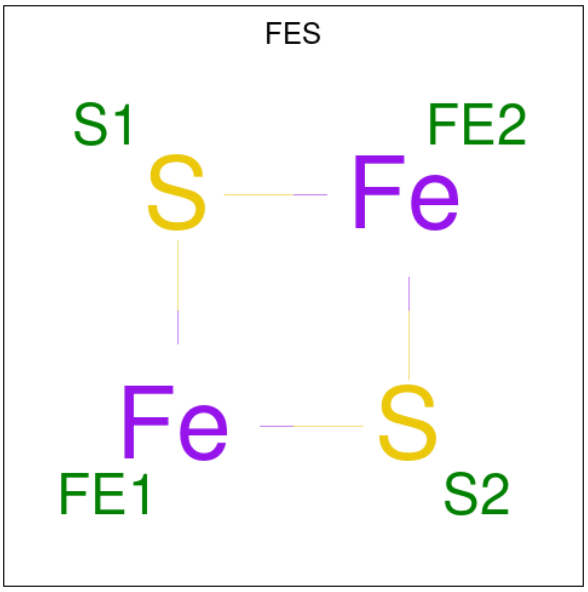
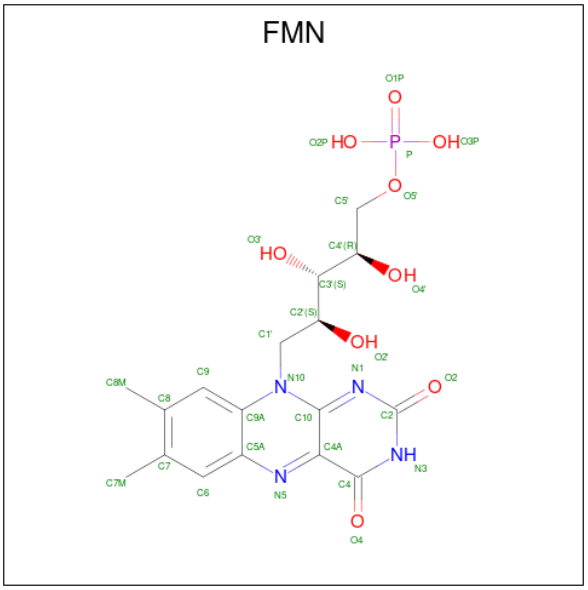
Mol	Chain	Residues	Atoms					AltConf
45	M	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	M	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	N	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	N	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	P	1	Total	C	N	O	P	0
			31	21	1	8	1	
45	Y	1	Total	C	N	O	P	0
			36	26	1	8	1	
45	Z	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	a	1	Total	C	N	O	P	0
			22	12	1	8	1	
45	b	1	Total	C	N	O	P	0
			39	29	1	8	1	
45	h	1	Total	C	N	O	P	0
			39	29	1	8	1	
45	i	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	l	1	Total	C	N	O	P	0
			32	22	1	8	1	
45	m	1	Total	C	N	O	P	0
			36	26	1	8	1	
45	q	1	Total	C	N	O	P	0
			36	26	1	8	1	
45	q	1	Total	C	N	O	P	0
			42	32	1	8	1	

- Molecule 46 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			AltConf
46	E	1	Total	Fe	S	0
			4	2	2	
46	G	1	Total	Fe	S	0
			4	2	2	

- Molecule 47 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

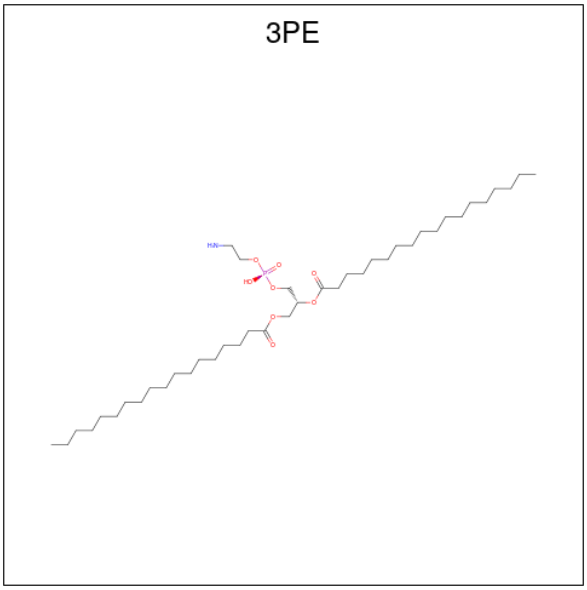


Mol	Chain	Residues	Atoms					AltConf
47	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 48 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	AltConf
48	G	1	Total K 1 1	0

- Molecule 49 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (CCD ID: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms	AltConf
49	H	1	Total C N O P 36 26 1 8 1	0
49	H	1	Total C N O P 31 21 1 8 1	0
49	J	1	Total C N O P 51 41 1 8 1	0
49	L	1	Total C N O P 51 41 1 8 1	0
49	L	1	Total C N O P 51 41 1 8 1	0
49	L	1	Total C N O P 35 25 1 8 1	0
49	L	1	Total C N O P 51 41 1 8 1	0
49	M	1	Total C N O P 46 36 1 8 1	0
49	M	1	Total C N O P 51 41 1 8 1	0
49	N	1	Total C N O P 40 30 1 8 1	0

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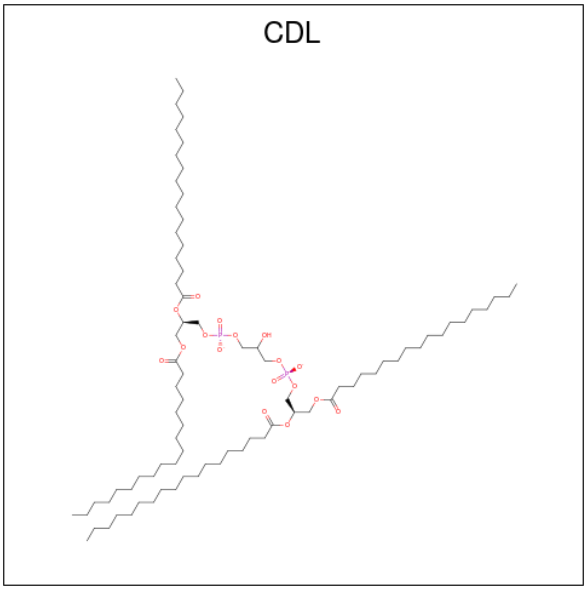
Mol	Chain	Residues	Atoms					AltConf
49	O	1	Total	C	N	O	P	0
			31	21	1	8	1	
49	O	1	Total	C	N	O	P	0
			35	25	1	8	1	
49	b	1	Total	C	N	O	P	0
			40	30	1	8	1	
49	d	1	Total	C	N	O	P	0
			35	25	1	8	1	
49	g	1	Total	C	N	O	P	0
			46	36	1	8	1	
49	j	1	Total	C	N	O	P	0
			27	17	1	8	1	
49	l	1	Total	C	N	O	P	0
			42	32	1	8	1	
49	m	1	Total	C	N	O	P	0
			29	19	1	8	1	
49	m	1	Total	C	N	O	P	0
			25	15	1	8	1	

- Molecule 50 is CARDIOLIPIN (CCD ID: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



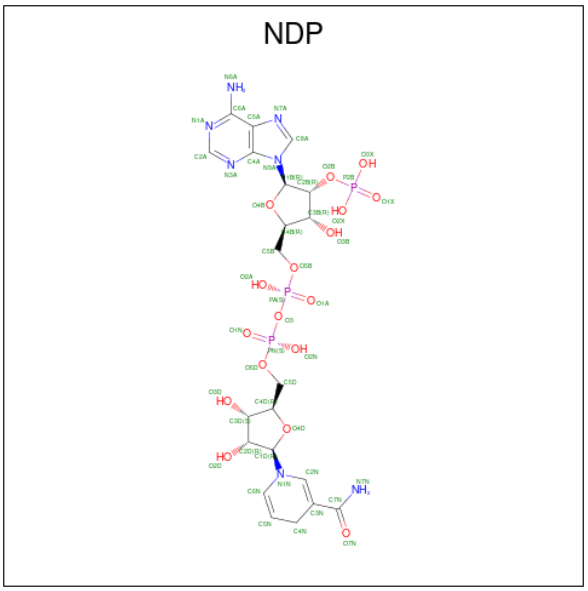
Mol	Chain	Residues	Atoms				AltConf
50	O	1	Total	C	O	P	0
			75	56	17	2	
50	Z	1	Total	C	O	P	0
			49	30	17	2	

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms				AltConf
50	a	1	Total 60	C 41	O 17	P 2	0
50	b	1	Total 59	C 40	O 17	P 2	0

- Molecule 51 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).

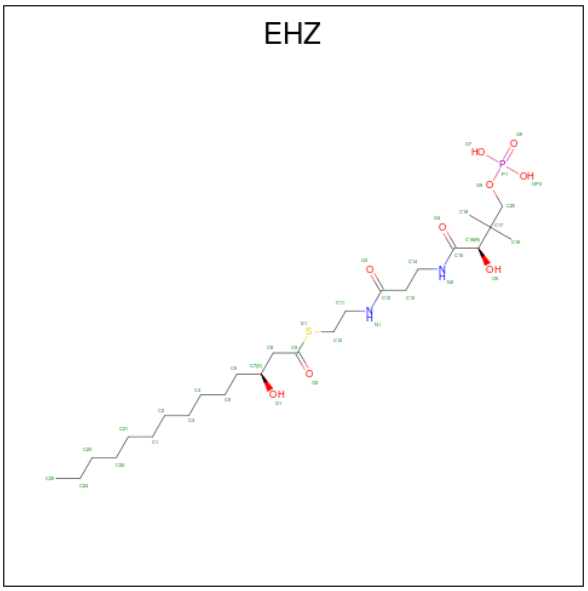


Mol	Chain	Residues	Atoms					AltConf
51	P	1	Total 48	C 21	N 7	O 17	P 3	0

- Molecule 52 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
52	R	1	Total 1	Zn 1	0

- Molecule 53 is {S}-[2-[3-[[(2 {R})-3,3-dimethyl-2-oxidanyl-4-phosphonooxy-butanoyl]amino]propanoylamino]ethyl] (3 {S})-3-oxidanyltetradecanethioate (CCD ID: EHZ) (formula: $C_{25}H_{49}N_2O_9PS$).



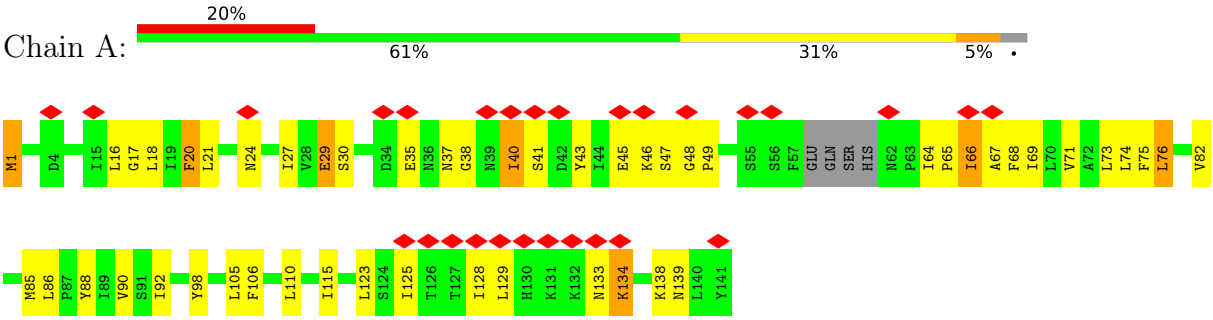
Mol	Chain	Residues	Atoms						AltConf
53	T	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	
53	U	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	

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.

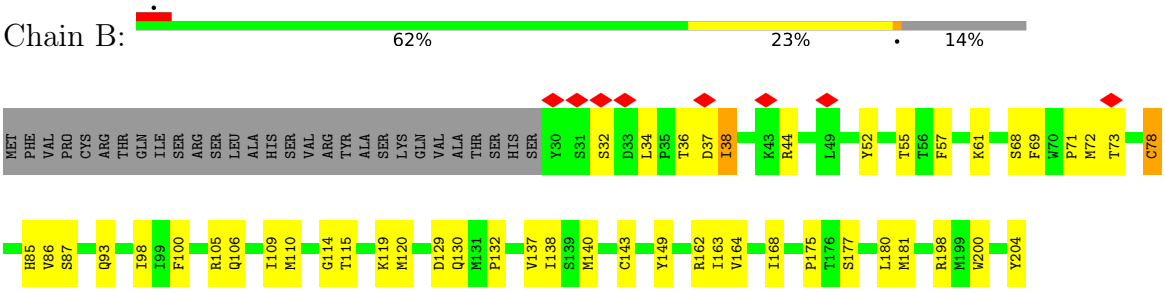
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3

Chain A:



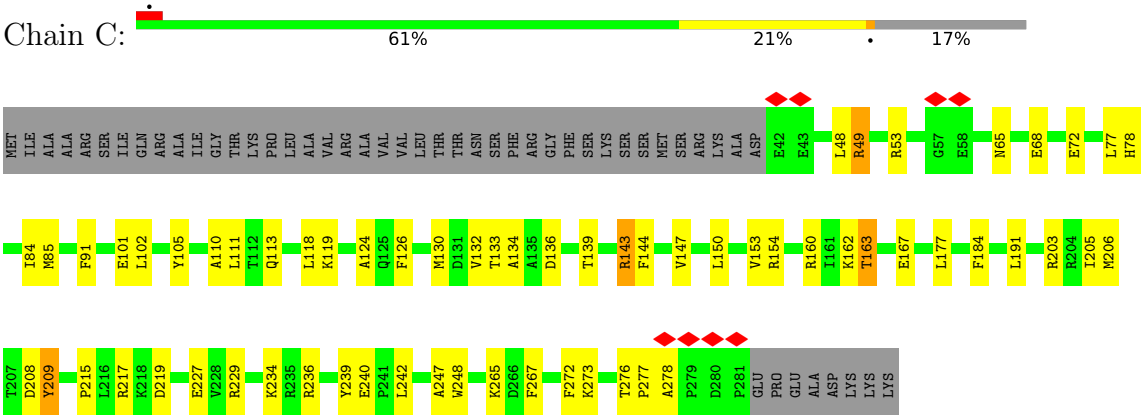
• Molecule 2: BA75_00622T0

Chain B:



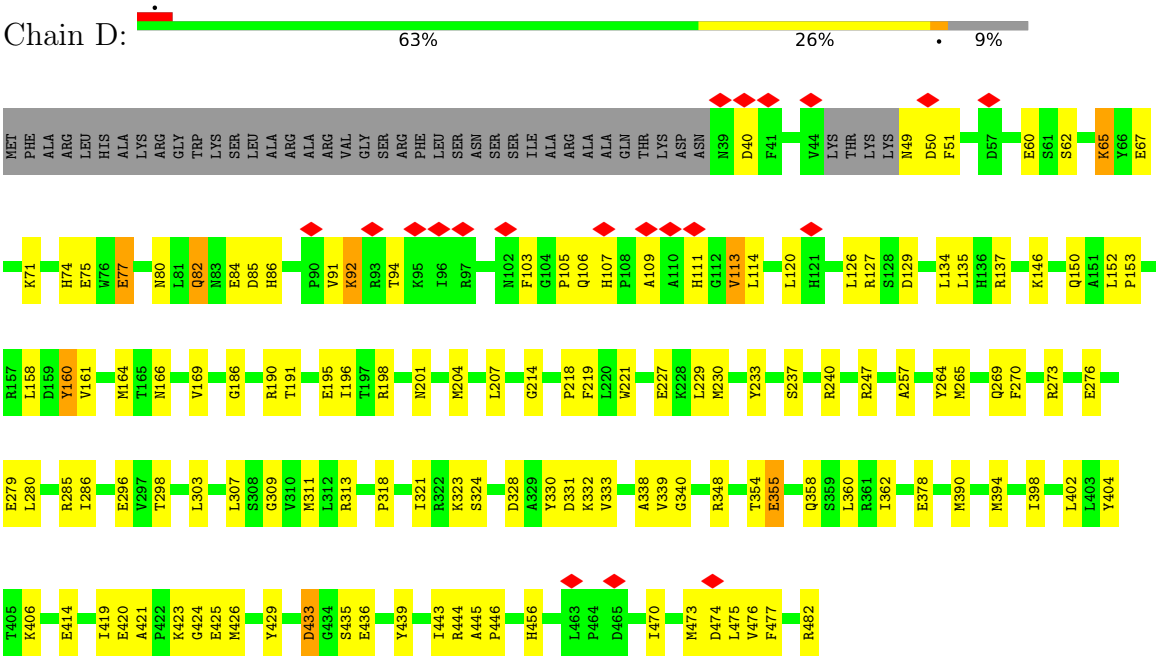
• Molecule 3: NUGM (30 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain C:



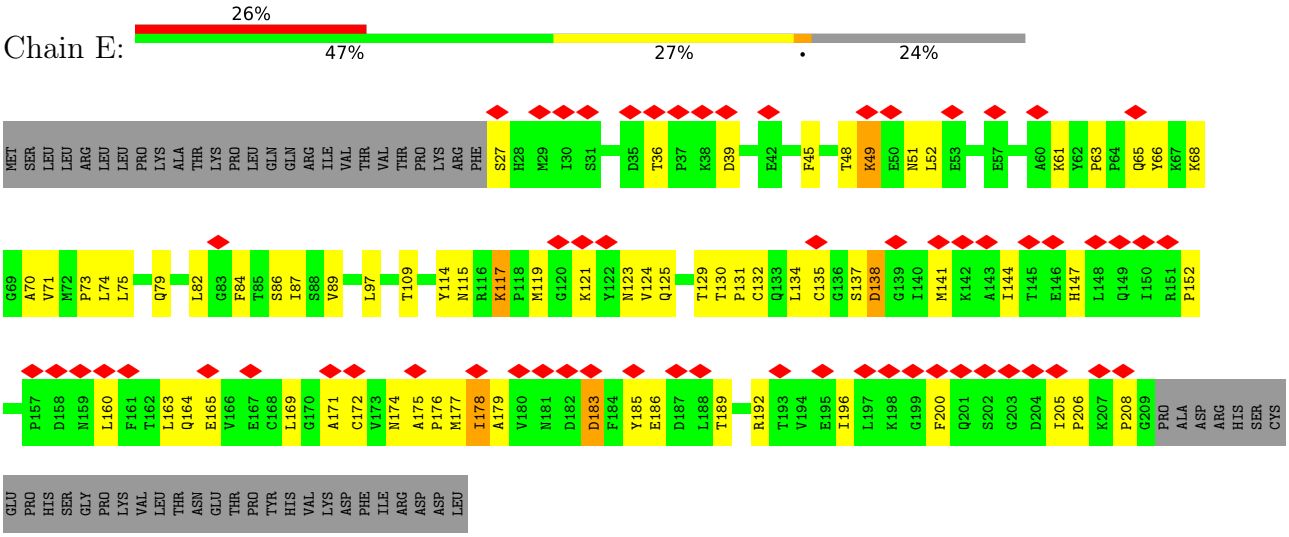
• Molecule 4: NUCM (49 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain D:



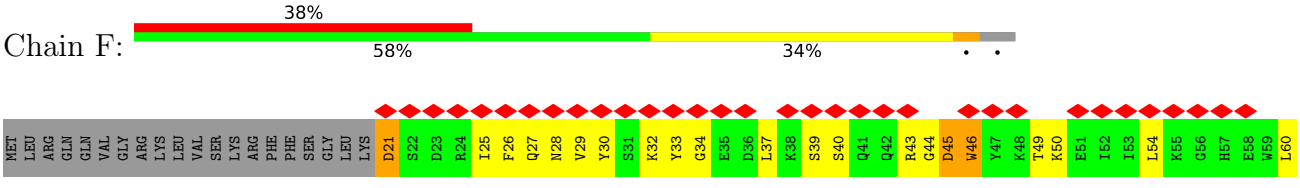
• Molecule 5: NUHM (24 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

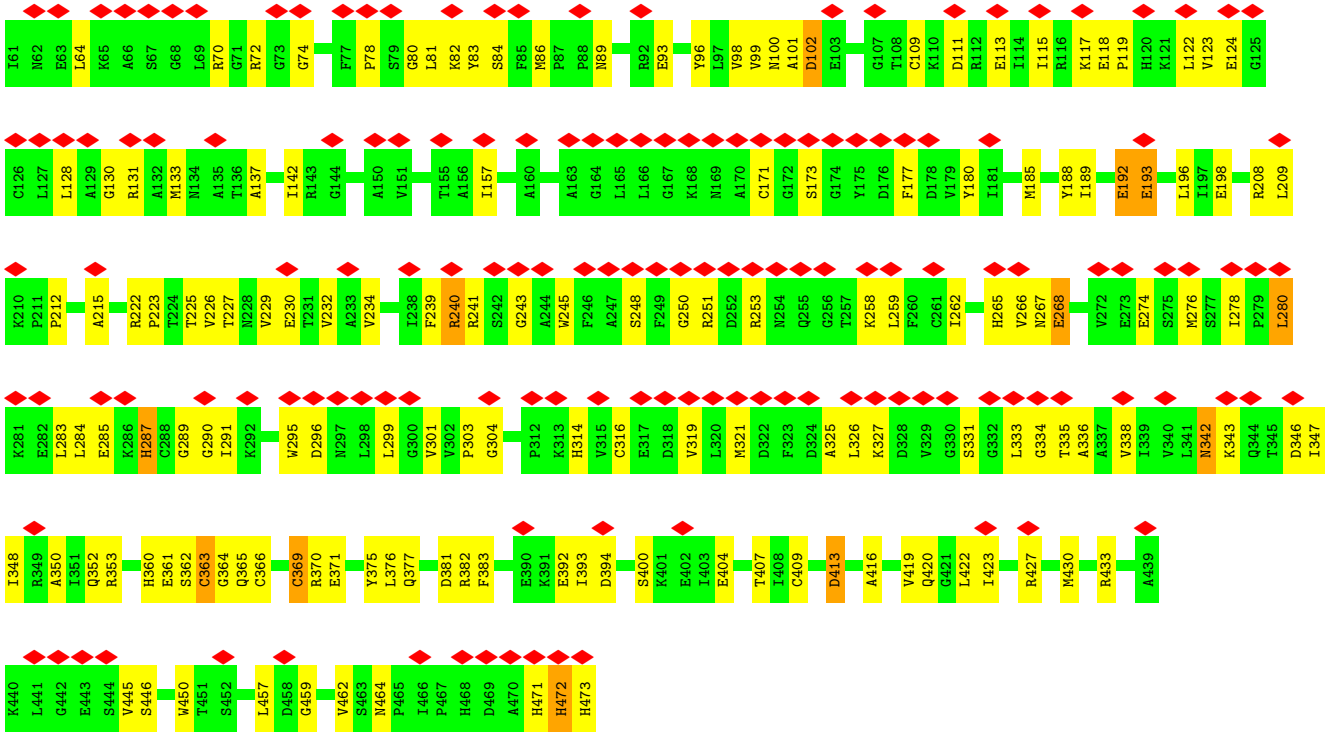
Chain E:



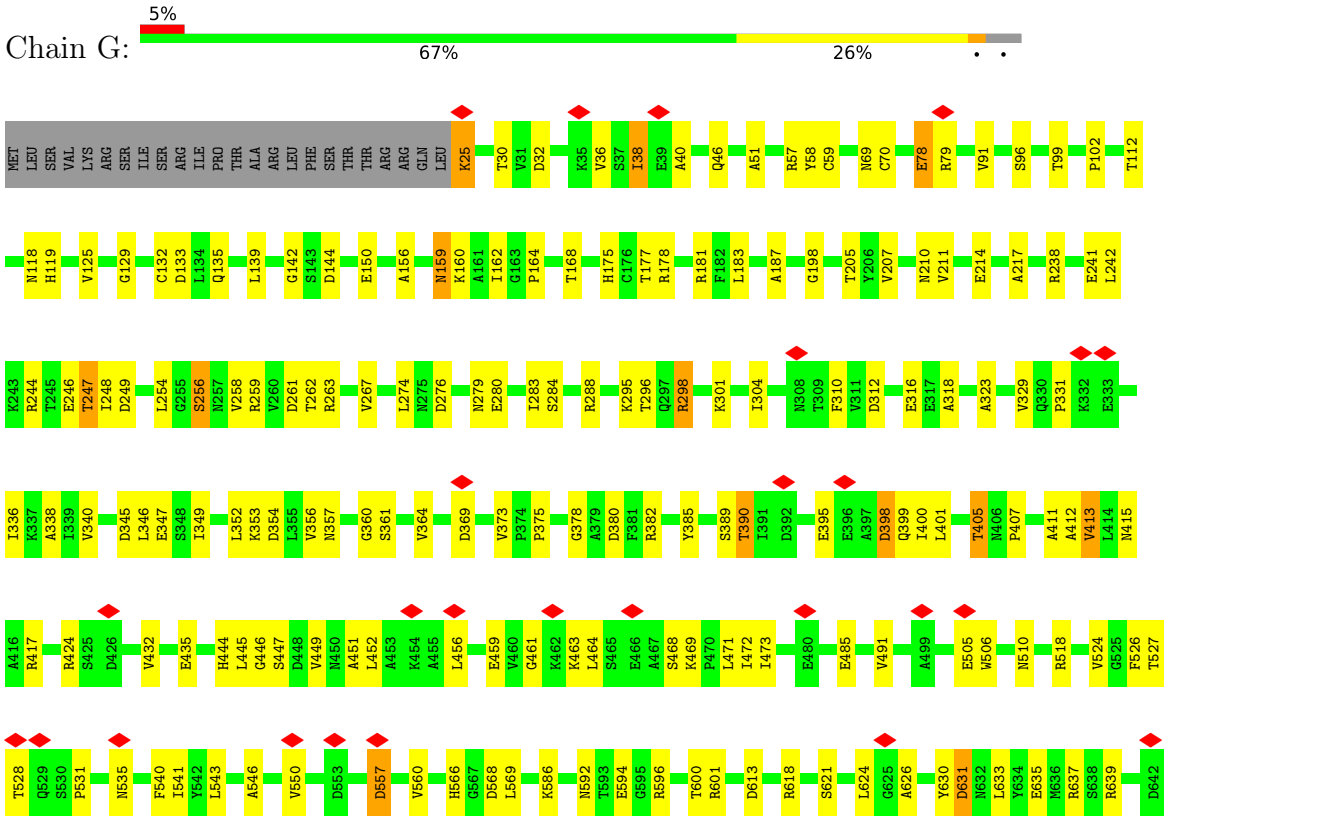
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

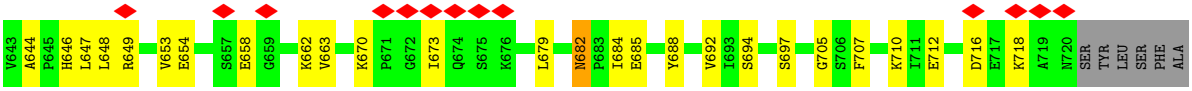
Chain F:



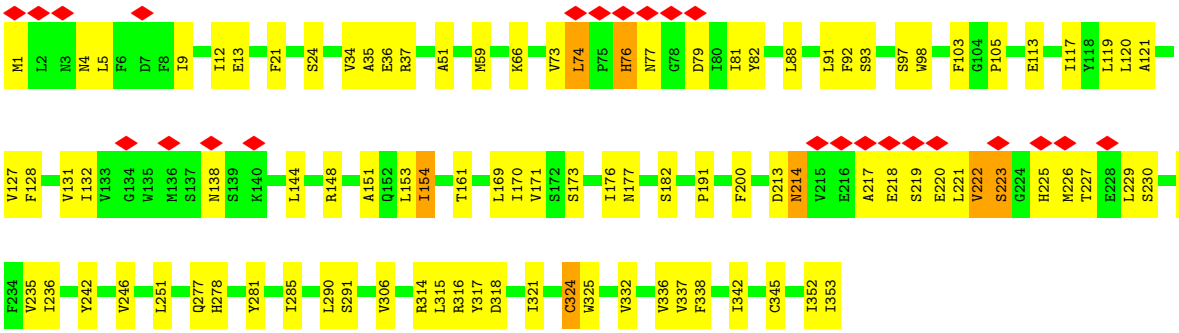


• Molecule 7: NUAM (75 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

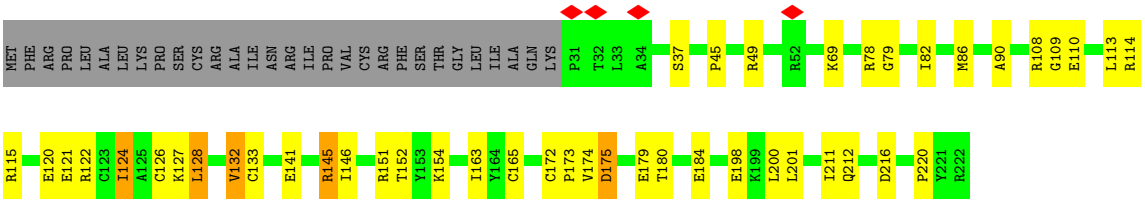




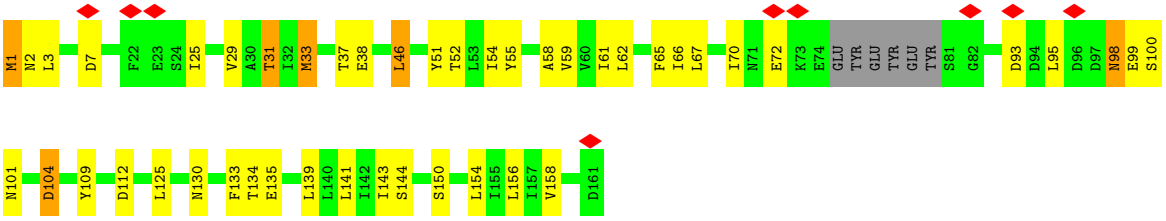
• Molecule 8: NADH-ubiquinone oxidoreductase chain 1



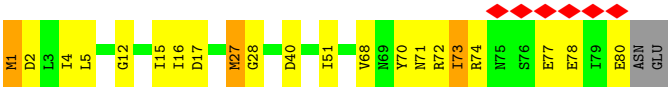
• Molecule 9: NUIM (TYKY) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)



• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

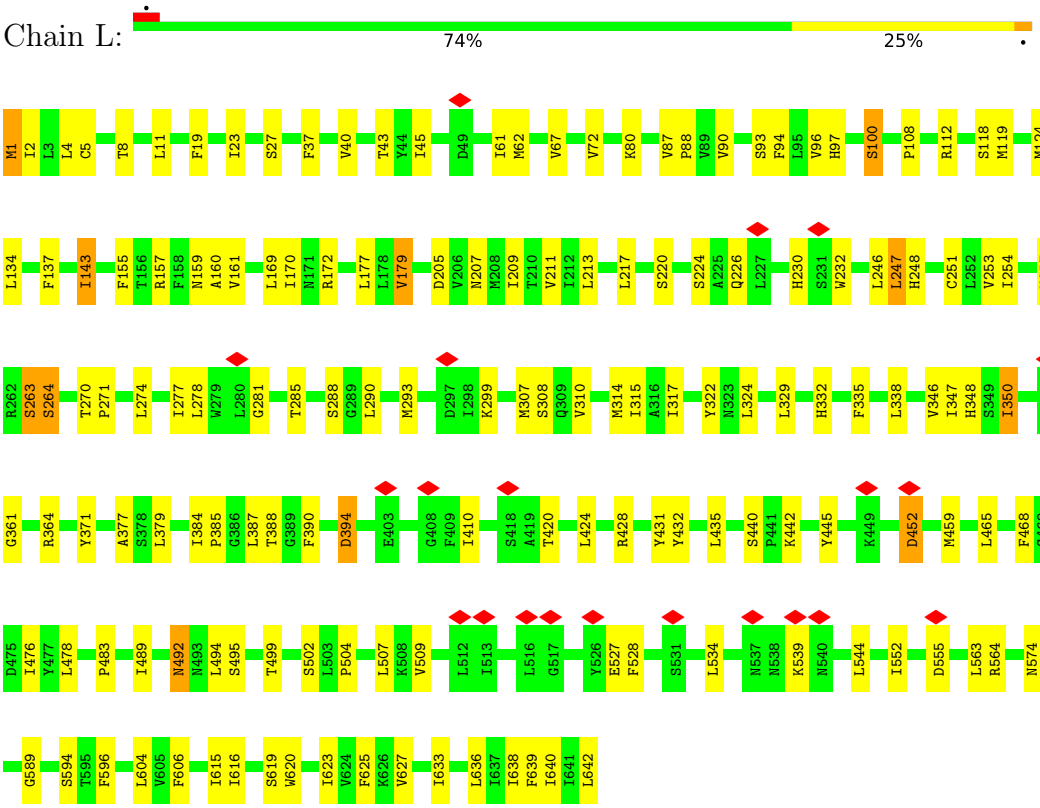


• Molecule 11: NULM (ND4L) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)



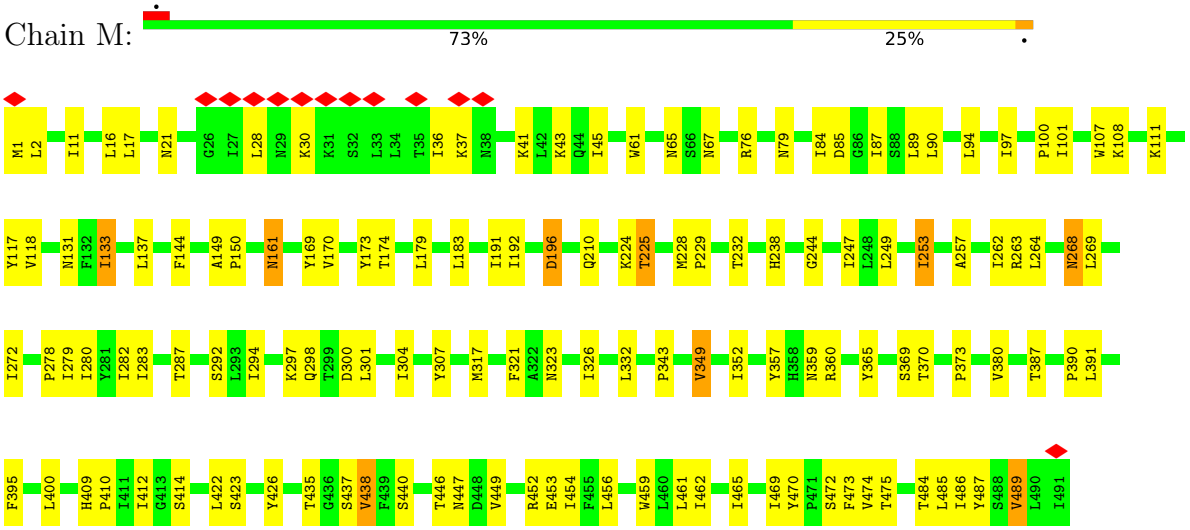
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5

Chain L:



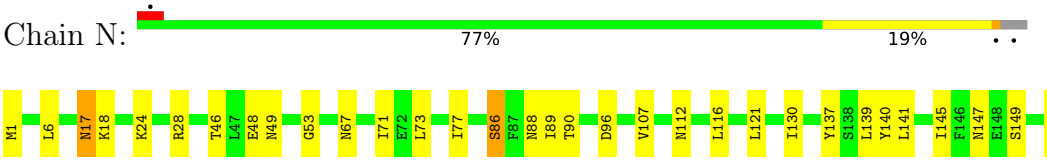
• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

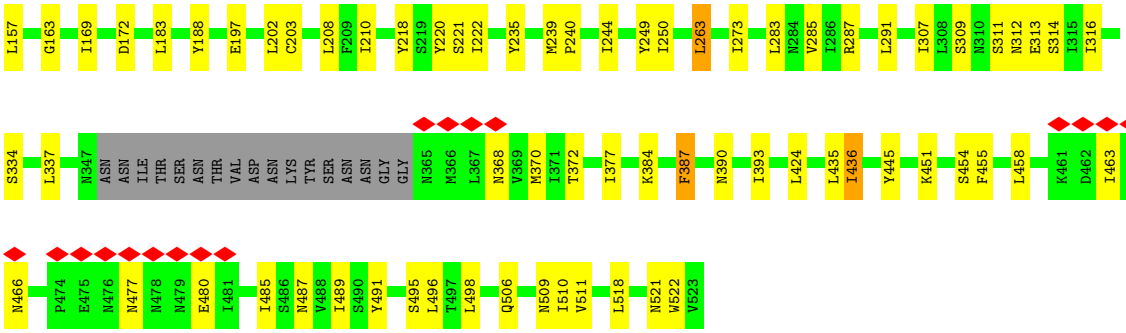
Chain M:



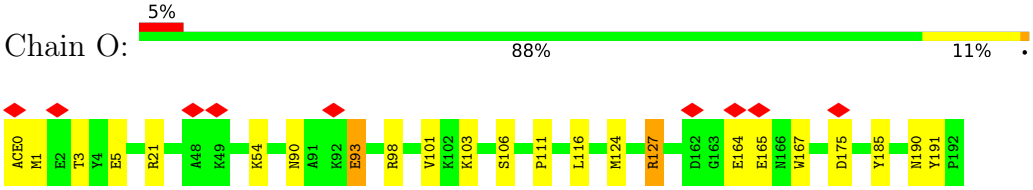
• Molecule 14: NADH-ubiquinone oxidoreductase chain 2

Chain N:

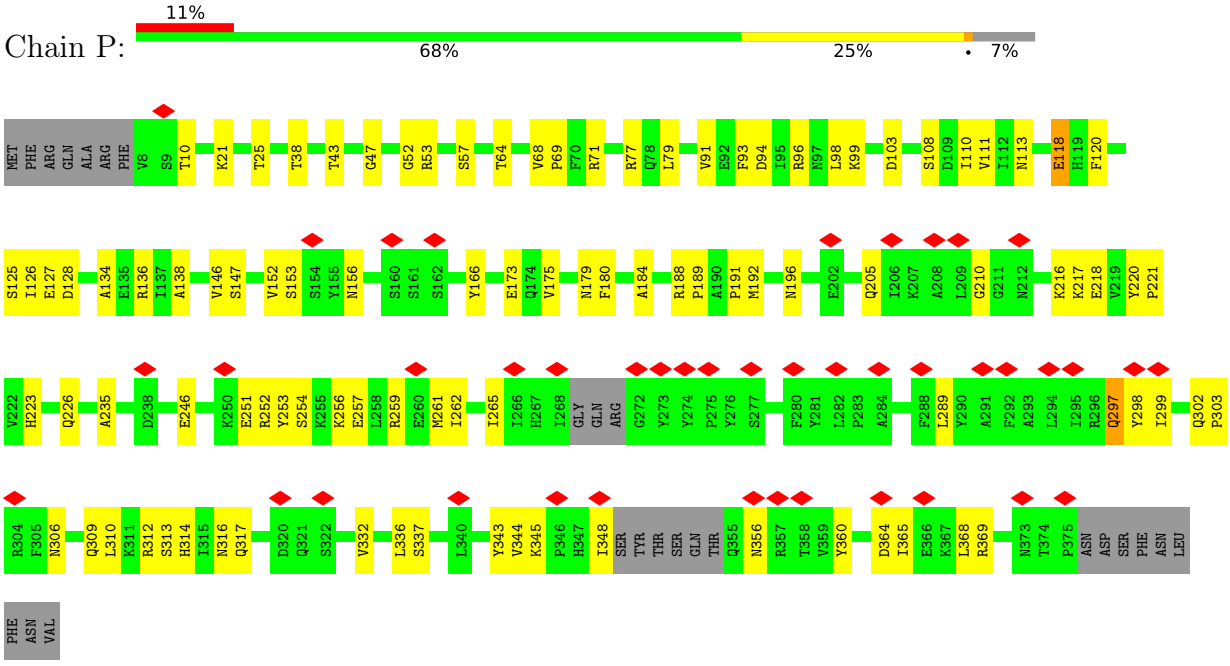




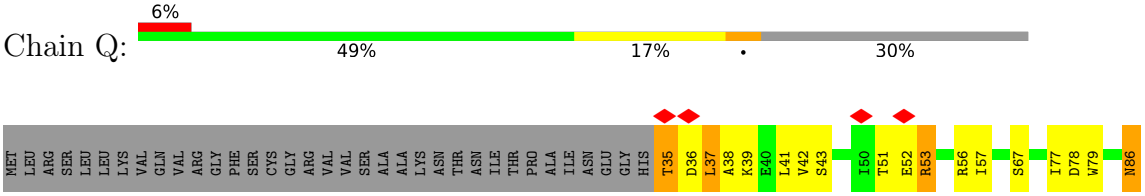
• Molecule 15: NUXM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

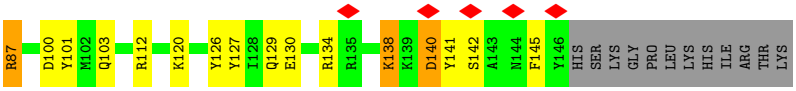


• Molecule 16: NUEM (39 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

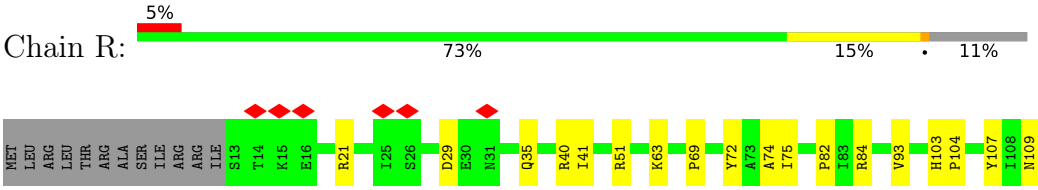


• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

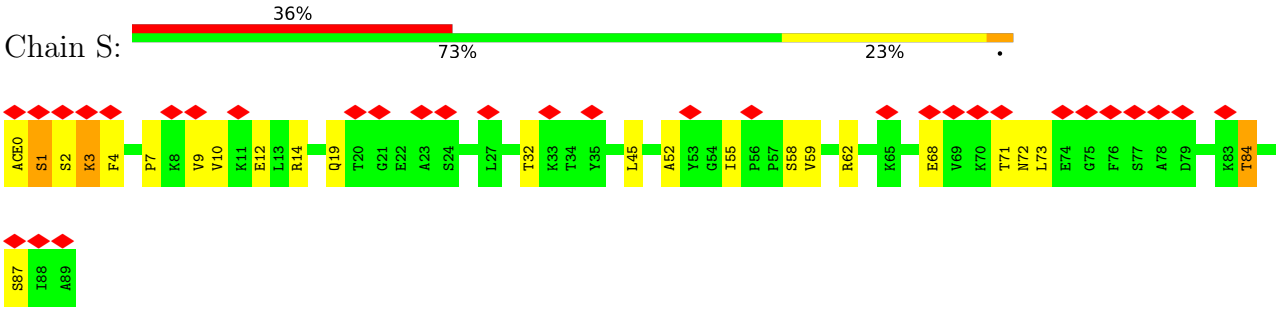




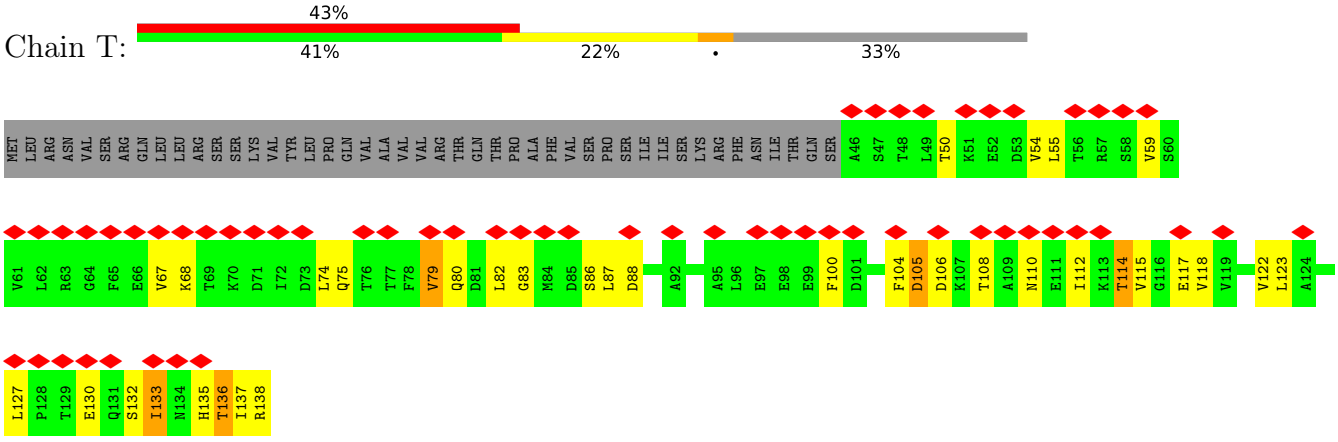
• Molecule 18: NUMM (13 kDa) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)



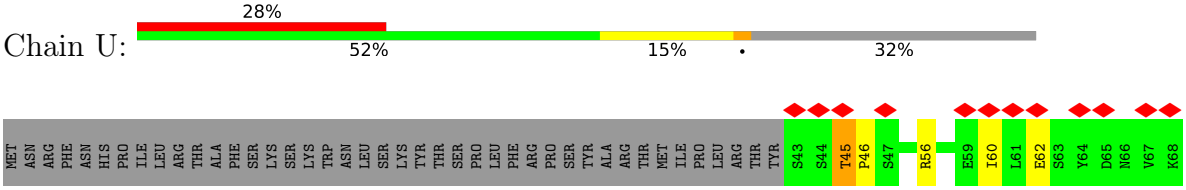
• Molecule 19: NI8M (B8) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

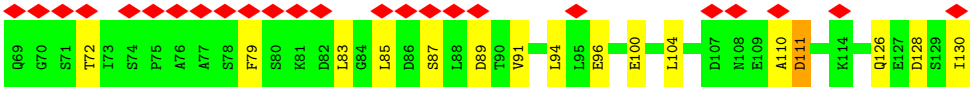


• Molecule 20: Acyl carrier protein



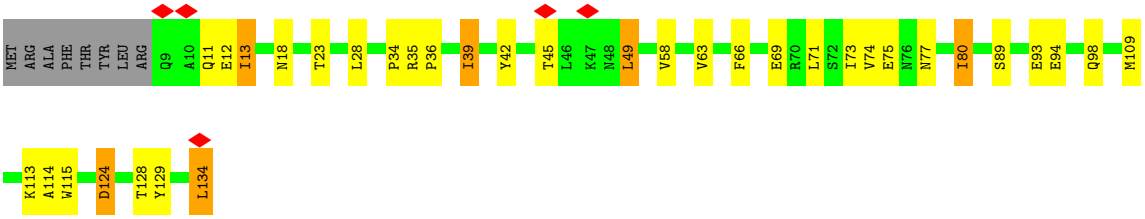
• Molecule 21: Acyl carrier protein





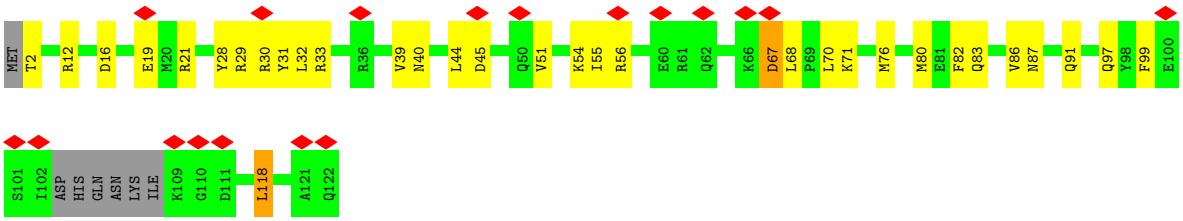
• Molecule 22: NUFM (B13) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain V:



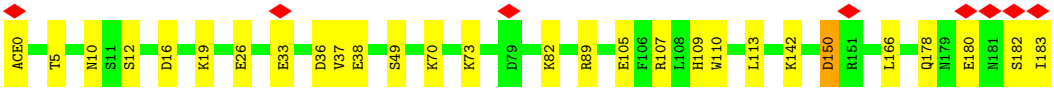
• Molecule 23: BA75_04796T0

Chain W:



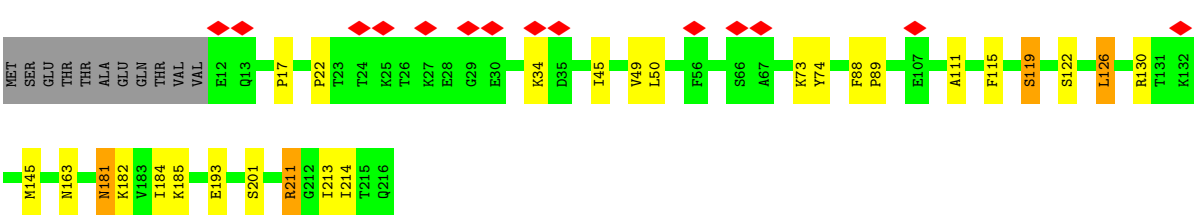
• Molecule 24: NADH-ubiquinone oxidoreductase

Chain X:



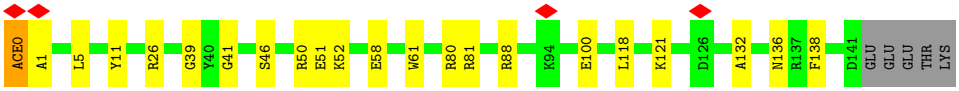
• Molecule 25: NUJM (B14.7) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain Y:

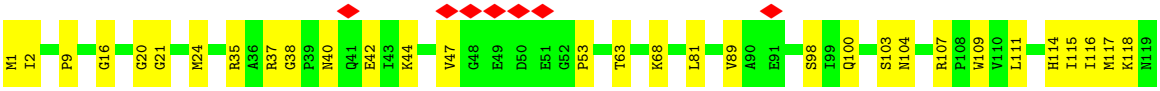


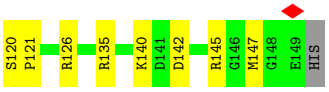
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

Chain Z:

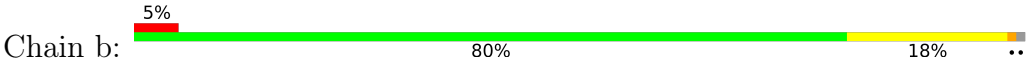


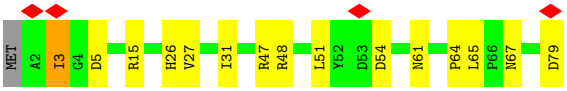
• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1



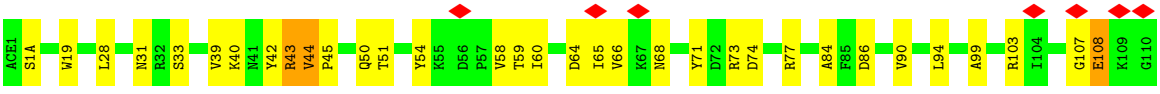


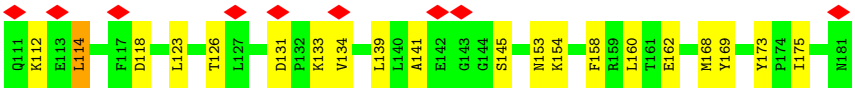
• Molecule 28: NI9M (B9) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)



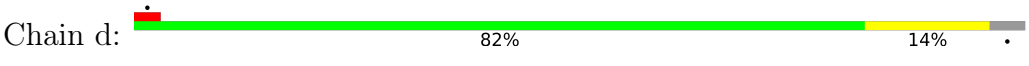


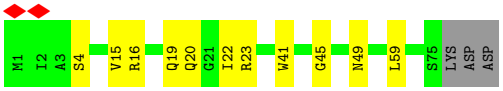
• Molecule 29: BA75_00589T0



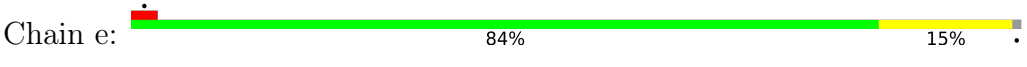


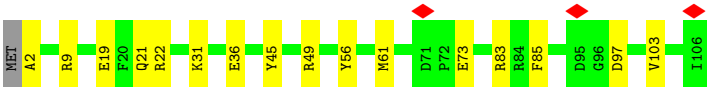
• Molecule 30: Pichia pastoris NADH-ubiquinone oxidoreductase subunit NEBM





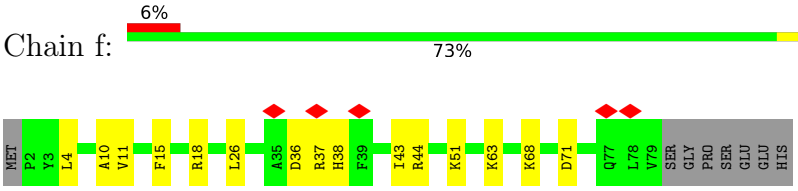
• Molecule 31: BA75_05084T0





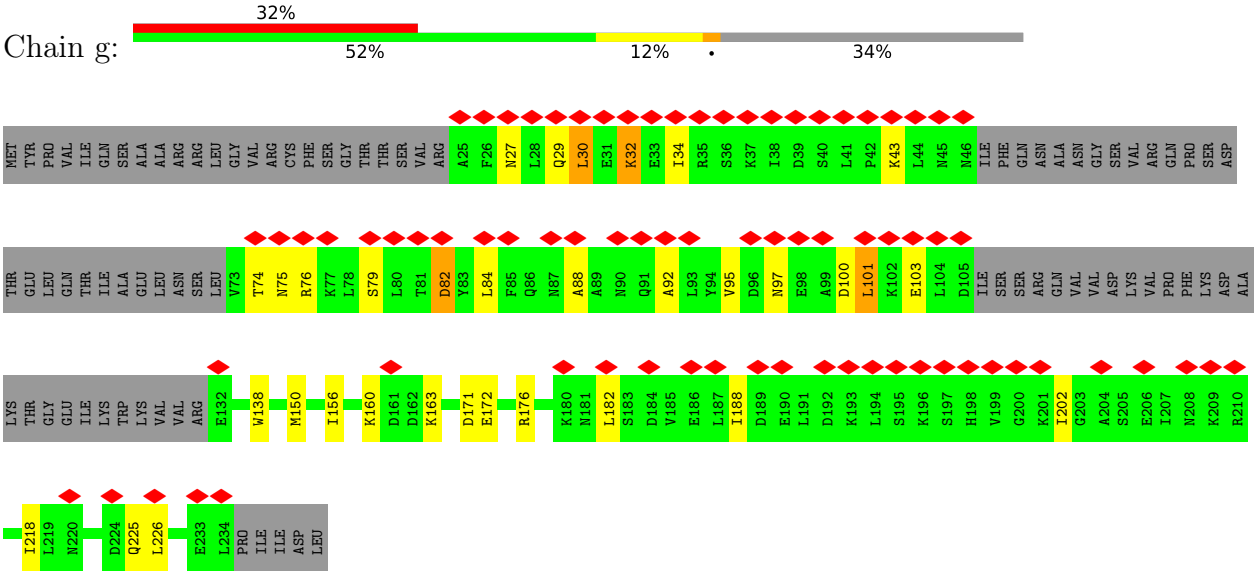
• Molecule 32: NUTM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain f:



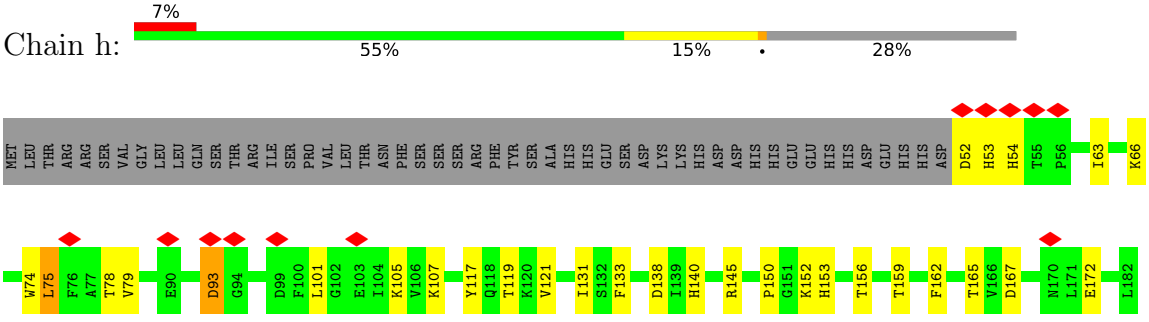
• Molecule 33: NESM (ESSS) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain g:



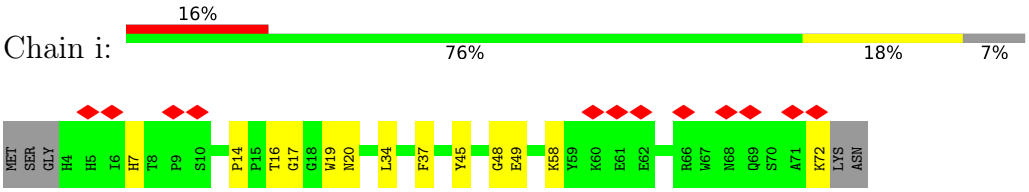
• Molecule 34: NUSM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain h:



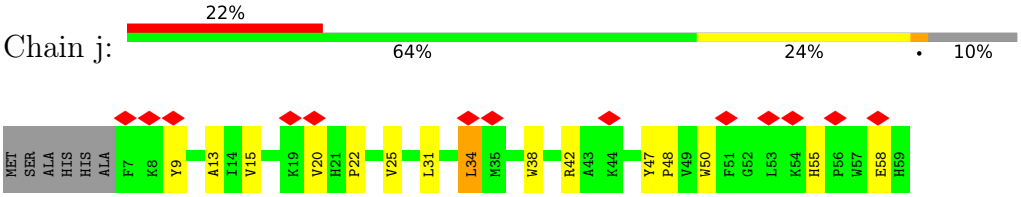
• Molecule 35: NUUM subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain i:



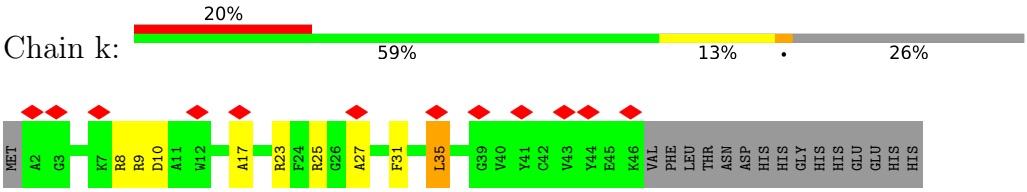
• Molecule 36: Subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain j:



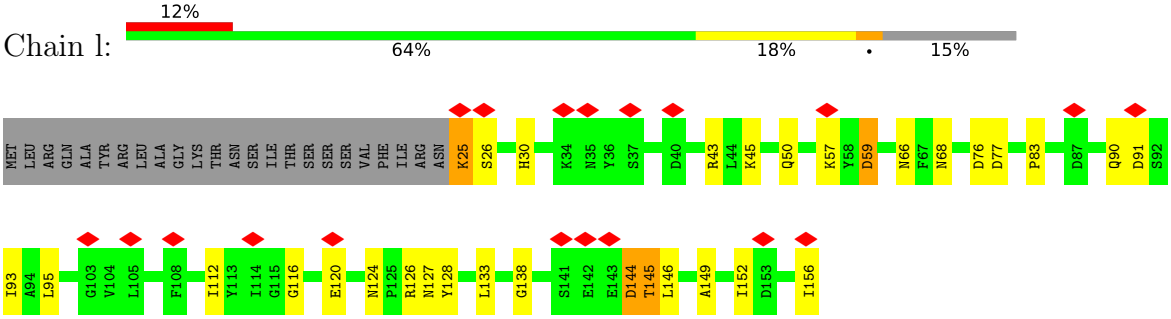
• Molecule 37: NB2M (B12) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain k:



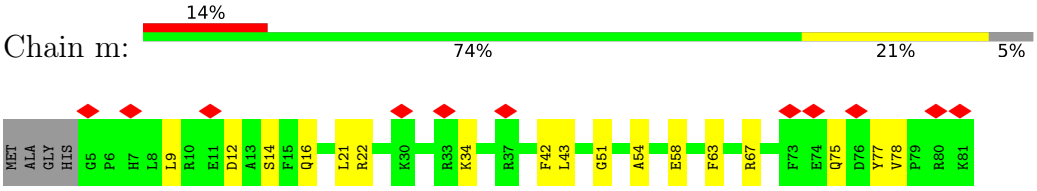
• Molecule 38: NIAM (ASHI) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain l:



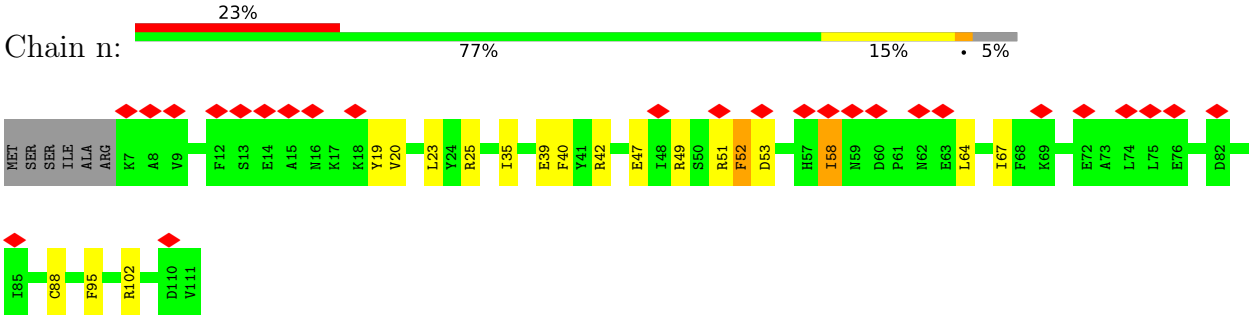
• Molecule 39: NB5M (B15) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain m:



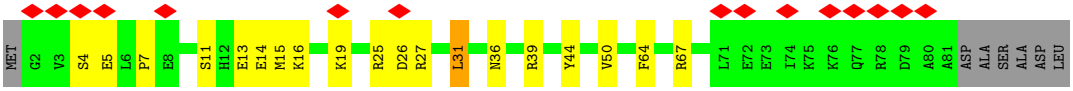
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

Chain n:



• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

Chain o:



• Molecule 42: NIDM (PDSW) subunit of mitochondrial NADH:ubiquinone oxidoreductase (Complex I)

Chain p:

• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit

Chain q:

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	25125	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	47.79	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	130000	Depositor
Image detector	TFS FALCON 4i (4k x 4k)	Depositor
Maximum map value	0.076	Depositor
Minimum map value	-0.027	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	501.66, 501.66, 501.66	wwPDB
Map dimensions	540, 540, 540	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.929, 0.929, 0.929	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 2MR, EHZ, FMN, PLC, ACE, CDL, SF4, ZN, FES, K, FME, NDP, 3PE

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	A	0.24	0/1115	0.34	0/1514
2	B	0.30	0/1450	0.33	0/1969
3	C	0.26	0/2033	0.31	0/2770
4	D	0.29	0/3612	0.33	0/4892
5	E	0.18	0/1480	0.35	0/2008
6	F	0.17	0/3579	0.32	0/4832
7	G	0.23	0/5436	0.32	0/7370
8	H	0.28	0/2880	0.33	0/3939
9	I	0.33	0/1596	0.35	0/2164
10	J	0.28	0/1262	0.35	0/1723
11	K	0.27	0/610	0.28	0/828
12	L	0.25	0/5236	0.31	0/7128
13	M	0.29	0/3940	0.31	0/5379
14	N	0.30	0/4110	0.31	0/5609
15	O	0.30	1/1621 (0.1%)	0.32	0/2199
16	P	0.21	0/2911	0.32	0/3932
17	Q	0.23	0/945	0.28	0/1273
18	R	0.24	0/998	0.29	0/1350
19	S	0.28	1/710 (0.1%)	0.31	0/961
20	T	0.14	0/737	0.29	0/1001
21	U	0.16	0/688	0.28	0/936
22	V	0.21	0/1044	0.31	0/1411
23	W	0.19	0/999	0.30	0/1340
24	X	0.29	1/1475 (0.1%)	0.31	0/1990
25	Y	0.22	0/1615	0.29	0/2175
26	Z	0.32	1/1210 (0.1%)	0.27	0/1639
27	a	0.26	0/1241	0.29	0/1670
28	b	0.22	0/666	0.27	0/911
29	c	0.26	0/1448	0.35	0/1964
30	d	0.24	0/633	0.26	0/854
31	e	0.27	0/865	0.30	0/1158
32	f	0.20	0/663	0.27	0/896

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	g	0.18	0/1293	0.30	0/1735
34	h	0.23	0/1114	0.29	0/1516
35	i	0.20	0/571	0.31	0/777
36	j	0.17	0/484	0.29	0/658
37	k	0.20	0/382	0.29	0/514
38	l	0.19	0/1119	0.32	0/1520
39	m	0.23	0/661	0.28	0/893
40	n	0.17	0/884	0.27	0/1197
41	o	0.18	0/696	0.32	0/933
42	p	0.25	0/756	0.29	0/1020
43	q	0.31	1/1192 (0.1%)	0.32	0/1620
All	All	0.25	5/67960 (0.0%)	0.31	0/92168

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
26	Z	0	ACE	C-N	6.15	1.45	1.33
19	S	0	ACE	C-N	6.05	1.45	1.33
24	X	0	ACE	C-N	6.05	1.45	1.33
15	O	0	ACE	C-N	5.99	1.45	1.33
43	q	0	ACE	C-N	5.91	1.45	1.33

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	A	1099	0	1140	44	0
2	B	1407	0	1372	42	0
3	C	1970	0	1905	52	0
4	D	3536	0	3436	96	0
5	E	1446	0	1435	43	0
6	F	3500	0	3459	116	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	G	5344	0	5332	123	0
8	H	2809	0	2880	62	0
9	I	1556	0	1499	34	0
10	J	1250	0	1274	36	0
11	K	617	0	657	19	0
12	L	5115	0	5338	110	0
13	M	3868	0	4127	93	0
14	N	4045	0	4327	64	0
15	O	1575	0	1523	12	0
16	P	2851	0	2848	62	0
17	Q	924	0	891	26	0
18	R	978	0	964	15	0
19	S	697	0	736	14	0
20	T	730	0	721	20	0
21	U	681	0	664	12	0
22	V	1025	0	1035	20	0
23	W	979	0	980	26	0
24	X	1450	0	1422	20	0
25	Y	1578	0	1567	20	0
26	Z	1176	0	1165	19	0
27	a	1215	0	1197	41	0
28	b	641	0	620	17	0
29	c	1418	0	1452	42	0
30	d	616	0	624	8	0
31	e	848	0	830	16	0
32	f	642	0	640	12	0
33	g	1280	0	1302	21	0
34	h	1078	0	1036	21	0
35	i	552	0	540	11	0
36	j	460	0	455	12	0
37	k	368	0	348	8	0
38	l	1082	0	1033	21	0
39	m	642	0	635	15	0
40	n	861	0	866	14	0
41	o	682	0	677	13	0
42	p	740	0	700	26	0
43	q	1156	0	1115	24	0
44	B	8	0	0	1	0
44	F	8	0	0	3	0
44	G	16	0	0	1	0
44	I	16	0	0	3	0
45	B	62	0	72	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
45	H	24	0	22	0	0
45	I	42	0	64	3	0
45	L	77	0	108	3	0
45	M	84	0	128	3	0
45	N	84	0	128	2	0
45	P	31	0	36	1	0
45	Y	36	0	49	1	0
45	Z	42	0	64	2	0
45	a	22	0	18	0	0
45	b	39	0	55	3	0
45	h	39	0	55	6	0
45	i	42	0	64	9	0
45	l	32	0	38	0	0
45	m	36	0	49	1	0
45	q	78	0	113	7	0
46	E	4	0	0	0	0
46	G	4	0	0	1	0
47	F	31	0	19	2	0
48	G	1	0	0	0	0
49	H	67	0	82	2	0
49	J	51	0	82	3	0
49	L	188	0	290	13	0
49	M	97	0	151	10	0
49	N	40	0	57	1	0
49	O	66	0	80	0	0
49	b	40	0	57	0	0
49	d	35	0	44	1	0
49	g	46	0	69	1	0
49	j	27	0	28	0	0
49	l	42	0	58	2	0
49	m	54	0	56	1	0
50	O	75	0	97	3	0
50	Z	49	0	42	1	0
50	a	60	0	64	8	0
50	b	59	0	62	1	0
51	P	48	0	25	4	0
52	R	1	0	0	0	0
53	T	37	0	0	1	0
53	U	37	0	0	1	0
All	All	68464	0	69193	1258	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 9.

The worst 5 of 1258 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)
18:R:103:HIS:CD2	18:R:121:CYS:SG	2.60	0.93
10:J:31:THR:HG1	27:a:114:HIS:HE2	1.06	0.91
43:q:47:VAL:HG11	43:q:52:GLU:HG3	1.60	0.84
13:M:440:SER:O	40:n:102:ARG:NH2	2.15	0.80
4:D:279:GLU:HB3	9:I:82:ILE:HD13	1.64	0.78

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	A	133/141 (94%)	124 (93%)	9 (7%)	0	100	100
2	B	173/204 (85%)	163 (94%)	10 (6%)	0	100	100
3	C	238/289 (82%)	229 (96%)	9 (4%)	0	100	100
4	D	435/482 (90%)	413 (95%)	22 (5%)	0	100	100
5	E	181/241 (75%)	172 (95%)	9 (5%)	0	100	100
6	F	451/473 (95%)	419 (93%)	31 (7%)	1 (0%)	44	72
7	G	694/726 (96%)	664 (96%)	29 (4%)	1 (0%)	48	76
8	H	351/353 (99%)	333 (95%)	17 (5%)	1 (0%)	37	66
9	I	190/222 (86%)	183 (96%)	7 (4%)	0	100	100
10	J	151/161 (94%)	142 (94%)	8 (5%)	1 (1%)	19	50
11	K	78/82 (95%)	76 (97%)	2 (3%)	0	100	100
12	L	640/642 (100%)	617 (96%)	22 (3%)	1 (0%)	44	72
13	M	489/491 (100%)	471 (96%)	17 (4%)	1 (0%)	44	72
14	N	502/523 (96%)	484 (96%)	17 (3%)	1 (0%)	44	72

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
15	O	191/193 (99%)	185 (97%)	6 (3%)	0	100	100
16	P	353/384 (92%)	342 (97%)	11 (3%)	0	100	100
17	Q	110/159 (69%)	107 (97%)	3 (3%)	0	100	100
18	R	122/139 (88%)	116 (95%)	6 (5%)	0	100	100
19	S	88/90 (98%)	85 (97%)	3 (3%)	0	100	100
20	T	91/138 (66%)	86 (94%)	5 (6%)	0	100	100
21	U	86/130 (66%)	77 (90%)	9 (10%)	0	100	100
22	V	124/134 (92%)	118 (95%)	6 (5%)	0	100	100
23	W	111/122 (91%)	108 (97%)	3 (3%)	0	100	100
24	X	182/184 (99%)	178 (98%)	4 (2%)	0	100	100
25	Y	203/216 (94%)	190 (94%)	13 (6%)	0	100	100
26	Z	140/147 (95%)	133 (95%)	6 (4%)	1 (1%)	19	50
27	a	147/150 (98%)	144 (98%)	3 (2%)	0	100	100
28	b	76/79 (96%)	71 (93%)	5 (7%)	0	100	100
29	c	180/182 (99%)	170 (94%)	10 (6%)	0	100	100
30	d	73/78 (94%)	71 (97%)	2 (3%)	0	100	100
31	e	103/106 (97%)	99 (96%)	4 (4%)	0	100	100
32	f	76/86 (88%)	75 (99%)	1 (1%)	0	100	100
33	g	152/239 (64%)	148 (97%)	4 (3%)	0	100	100
34	h	129/182 (71%)	122 (95%)	7 (5%)	0	100	100
35	i	67/74 (90%)	63 (94%)	4 (6%)	0	100	100
36	j	51/59 (86%)	45 (88%)	6 (12%)	0	100	100
37	k	43/61 (70%)	41 (95%)	2 (5%)	0	100	100
38	l	130/156 (83%)	123 (95%)	6 (5%)	1 (1%)	16	47
39	m	75/81 (93%)	70 (93%)	5 (7%)	0	100	100
40	n	103/111 (93%)	101 (98%)	2 (2%)	0	100	100
41	o	78/87 (90%)	75 (96%)	3 (4%)	0	100	100
42	p	88/92 (96%)	86 (98%)	2 (2%)	0	100	100
43	q	138/140 (99%)	134 (97%)	4 (3%)	0	100	100
All	All	8216/9029 (91%)	7853 (96%)	354 (4%)	9 (0%)	50	76

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	J	2	ASN
38	l	145	THR
6	F	472	HIS
26	Z	1	ALA
13	M	2	LEU

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	A	124/128 (97%)	109 (88%)	15 (12%)	4 17
2	B	154/180 (86%)	151 (98%)	3 (2%)	52 72
3	C	214/254 (84%)	207 (97%)	7 (3%)	33 60
4	D	375/408 (92%)	351 (94%)	24 (6%)	14 41
5	E	163/218 (75%)	151 (93%)	12 (7%)	11 36
6	F	369/387 (95%)	341 (92%)	28 (8%)	11 35
7	G	582/610 (95%)	551 (95%)	31 (5%)	19 47
8	H	307/307 (100%)	284 (92%)	23 (8%)	11 35
9	I	166/192 (86%)	156 (94%)	10 (6%)	16 43
10	J	143/149 (96%)	130 (91%)	13 (9%)	7 28
11	K	70/72 (97%)	66 (94%)	4 (6%)	17 45
12	L	576/576 (100%)	546 (95%)	30 (5%)	19 48
13	M	439/439 (100%)	420 (96%)	19 (4%)	25 53
14	N	474/489 (97%)	458 (97%)	16 (3%)	32 59
15	O	169/169 (100%)	161 (95%)	8 (5%)	22 51
16	P	309/332 (93%)	296 (96%)	13 (4%)	25 54
17	Q	95/135 (70%)	87 (92%)	8 (8%)	9 32
18	R	104/118 (88%)	101 (97%)	3 (3%)	37 63
19	S	77/77 (100%)	73 (95%)	4 (5%)	19 48
20	T	85/128 (66%)	72 (85%)	13 (15%)	2 10

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
21	U	80/120 (67%)	73 (91%)	7 (9%)	8 30
22	V	112/119 (94%)	102 (91%)	10 (9%)	8 29
23	W	107/114 (94%)	104 (97%)	3 (3%)	38 64
24	X	165/165 (100%)	159 (96%)	6 (4%)	30 57
25	Y	163/173 (94%)	156 (96%)	7 (4%)	25 53
26	Z	123/128 (96%)	122 (99%)	1 (1%)	79 87
27	a	128/129 (99%)	126 (98%)	2 (2%)	58 75
28	b	66/67 (98%)	65 (98%)	1 (2%)	60 77
29	c	159/159 (100%)	150 (94%)	9 (6%)	17 45
30	d	62/65 (95%)	62 (100%)	0	100 100
31	e	91/92 (99%)	91 (100%)	0	100 100
32	f	64/71 (90%)	62 (97%)	2 (3%)	35 62
33	g	143/215 (66%)	134 (94%)	9 (6%)	15 42
34	h	118/167 (71%)	109 (92%)	9 (8%)	11 35
35	i	59/63 (94%)	56 (95%)	3 (5%)	20 49
36	j	46/50 (92%)	44 (96%)	2 (4%)	25 53
37	k	32/47 (68%)	31 (97%)	1 (3%)	35 62
38	l	116/137 (85%)	107 (92%)	9 (8%)	10 34
39	m	64/66 (97%)	61 (95%)	3 (5%)	22 51
40	n	95/100 (95%)	92 (97%)	3 (3%)	34 61
41	o	74/79 (94%)	69 (93%)	5 (7%)	13 39
42	p	83/85 (98%)	80 (96%)	3 (4%)	30 57
43	q	125/125 (100%)	120 (96%)	5 (4%)	27 54
All	All	7270/7904 (92%)	6886 (95%)	384 (5%)	21 47

5 of 384 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
14	N	436	ILE
21	U	87	SER
15	O	93	GLU
17	Q	87	ARG
22	V	134	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 77 such sidechains are listed below:

Mol	Chain	Res	Type
25	Y	163	ASN
37	k	4	ASN
26	Z	74	GLN
33	g	198	HIS
42	p	24	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

8 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
14	FME	N	1	14	8,9,10	1.47	1 (12%)	7,9,11	1.41	1 (14%)
4	2MR	D	137	4	10,12,13	2.32	2 (20%)	5,13,15	2.32	1 (20%)
8	FME	H	1	8	8,9,10	1.50	1 (12%)	7,9,11	1.66	1 (14%)
12	FME	L	1	12	8,9,10	1.48	1 (12%)	7,9,11	1.74	2 (28%)
13	FME	M	1	13	8,9,10	1.53	1 (12%)	7,9,11	1.93	3 (42%)
11	FME	K	1	11	8,9,10	1.47	1 (12%)	7,9,11	1.66	3 (42%)
1	FME	A	1	1	8,9,10	1.51	1 (12%)	7,9,11	1.68	1 (14%)
10	FME	J	1	10	8,9,10	1.48	1 (12%)	7,9,11	1.72	2 (28%)

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
14	FME	N	1	14	-	0/7/9/11	-
4	2MR	D	137	4	-	0/10/13/15	-
8	FME	H	1	8	-	3/7/9/11	-
12	FME	L	1	12	-	1/7/9/11	-
13	FME	M	1	13	-	3/7/9/11	-
11	FME	K	1	11	-	3/7/9/11	-
1	FME	A	1	1	-	2/7/9/11	-
10	FME	J	1	10	-	4/7/9/11	-

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	137	2MR	CZ-NH2	5.08	1.44	1.33
4	D	137	2MR	CZ-NE	4.75	1.44	1.34
13	M	1	FME	CN-N	3.68	1.45	1.33
1	A	1	FME	CN-N	3.67	1.45	1.33
8	H	1	FME	CN-N	3.63	1.45	1.33

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	137	2MR	CD-NE-CZ	-4.24	115.46	123.41
13	M	1	FME	CA-N-CN	-2.79	118.54	122.82
8	H	1	FME	CE-SD-CG	2.76	109.88	100.40
1	A	1	FME	CE-SD-CG	2.67	109.56	100.40
10	J	1	FME	CE-SD-CG	2.62	109.40	100.40

There are no chirality outliers.

5 of 16 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1	FME	N-CA-CB-CG
1	A	1	FME	C-CA-CB-CG
8	H	1	FME	N-CA-CB-CG
8	H	1	FME	C-CA-CB-CG
10	J	1	FME	O1-CN-N-CA

There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
12	L	1	FME	2	0
11	K	1	FME	1	0
1	A	1	FME	2	0
10	J	1	FME	2	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 58 ligands modelled in this entry, 2 are monoatomic - leaving 56 for Mogul analysis.

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	$\#\|Z\| > 2$
49	3PE	m	701	-	28,28,50	1.12	4 (14%)	31,33,55	1.12	2 (6%)
45	PLC	B	303	-	30,30,41	0.58	0	36,38,49	0.62	0
45	PLC	N	602	-	41,41,41	0.54	0	47,49,49	0.51	0
49	3PE	L	706	-	50,50,50	0.85	3 (6%)	53,55,55	1.07	2 (3%)
50	CDL	a	201	-	59,59,99	1.12	8 (13%)	65,71,111	1.20	4 (6%)
44	SF4	G	803	7	0,12,12	-	-	-		
44	SF4	I	302	9	0,12,12	-	-	-		
49	3PE	O	202	-	30,30,50	1.09	4 (13%)	33,35,55	1.19	2 (6%)
45	PLC	Y	301	-	35,35,41	0.53	0	41,43,49	0.61	0
44	SF4	F	501	6	0,12,12	-	-	-		
45	PLC	L	702	-	41,41,41	0.53	0	47,49,49	0.57	1 (2%)
49	3PE	M	503	-	45,45,50	0.90	4 (8%)	48,50,55	1.04	2 (4%)
44	SF4	B	301	2	0,12,12	-	-	-		
46	FES	E	301	5	0,4,4	-	-	-		
50	CDL	Z	202	-	48,48,99	1.23	8 (16%)	54,60,111	1.27	4 (7%)
45	PLC	q	401	-	35,35,41	0.56	0	41,43,49	0.60	0
53	EHZ	U	201	21	29,36,37	1.66	5 (17%)	35,44,47	1.63	7 (20%)
44	SF4	G	804	7	0,12,12	-	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
49	3PE	H	403	-	30,30,50	1.10	4 (13%)	33,35,55	1.17	2 (6%)
49	3PE	b	101	-	39,39,50	0.95	4 (10%)	42,44,55	1.17	2 (4%)
50	CDL	O	201	-	74,74,99	0.98	6 (8%)	80,86,111	1.17	4 (5%)
45	PLC	i	101	-	41,41,41	0.53	0	47,49,49	0.55	0
49	3PE	N	601	-	39,39,50	0.98	4 (10%)	42,44,55	1.14	2 (4%)
49	3PE	H	402	-	35,35,50	1.01	4 (11%)	38,40,55	1.04	2 (5%)
49	3PE	L	705	-	34,34,50	1.02	4 (11%)	37,39,55	1.10	2 (5%)
51	NDP	P	501	-	45,52,52	4.25	22 (48%)	53,80,80	2.14	6 (11%)
49	3PE	J	201	-	50,50,50	0.86	4 (8%)	53,55,55	1.12	2 (3%)
45	PLC	b	102	-	38,38,41	0.54	0	44,46,49	0.59	0
53	EHZ	T	201	20	29,36,37	1.72	5 (17%)	35,44,47	1.58	5 (14%)
45	PLC	H	401	-	23,23,41	0.65	0	29,31,49	0.67	0
45	PLC	I	303	-	41,41,41	0.52	0	47,49,49	0.59	0
45	PLC	a	202	-	21,21,41	0.69	0	27,29,49	0.77	1 (3%)
49	3PE	O	203	-	34,34,50	1.02	4 (11%)	37,39,55	1.15	2 (5%)
45	PLC	m	702	-	35,35,41	0.56	0	41,43,49	0.59	1 (2%)
49	3PE	L	703	-	50,50,50	0.85	4 (8%)	53,55,55	1.11	2 (3%)
45	PLC	l	202	-	31,31,41	0.55	0	37,39,49	0.56	0
49	3PE	d	101	-	34,34,50	1.03	4 (11%)	37,39,55	1.16	2 (5%)
47	FMN	F	502	-	33,33,33	2.72	10 (30%)	48,50,50	1.90	14 (29%)
49	3PE	g	301	-	45,45,50	0.90	4 (8%)	48,50,55	1.06	2 (4%)
46	FES	G	801	7	0,4,4	-	-	-		
45	PLC	M	501	-	41,41,41	0.52	0	47,49,49	0.58	1 (2%)
44	SF4	I	301	9	0,12,12	-	-	-		
45	PLC	N	603	-	41,41,41	0.53	0	47,49,49	0.55	1 (2%)
45	PLC	h	201	-	38,38,41	0.54	0	44,46,49	0.55	0
49	3PE	M	504	-	50,50,50	0.85	3 (6%)	53,55,55	1.14	2 (3%)
45	PLC	L	701	-	34,34,41	0.58	0	40,42,49	0.60	0
49	3PE	L	704	-	50,50,50	0.85	4 (8%)	53,55,55	1.16	2 (3%)
49	3PE	m	703	-	24,24,50	1.20	4 (16%)	27,29,55	1.42	2 (7%)
45	PLC	M	502	-	41,41,41	0.50	0	47,49,49	0.53	0
49	3PE	l	201	-	41,41,50	0.95	3 (7%)	44,46,55	1.20	2 (4%)
45	PLC	B	302	-	30,30,41	0.60	0	36,38,49	0.53	0
45	PLC	P	502	-	30,30,41	0.57	0	36,38,49	0.66	0
45	PLC	q	402	-	41,41,41	0.49	0	47,49,49	0.71	1 (2%)
45	PLC	Z	201	-	41,41,41	0.52	0	47,49,49	0.57	0
49	3PE	j	101	-	26,26,50	1.16	4 (15%)	29,31,55	1.22	2 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
50	CDL	b	103	-	58,58,99	1.12	7 (12%)	64,70,111	1.25	4 (6%)

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
49	3PE	m	701	-	-	11/32/32/54	-
45	PLC	B	303	-	-	11/34/34/45	-
45	PLC	N	602	-	-	15/45/45/45	-
49	3PE	L	706	-	-	31/54/54/54	-
50	CDL	a	201	-	-	37/70/70/110	-
49	3PE	O	202	-	-	20/34/34/54	-
44	SF4	G	803	7	-	-	0/6/5/5
44	SF4	I	302	9	-	-	0/6/5/5
45	PLC	Y	301	-	-	14/39/39/45	-
44	SF4	F	501	6	-	-	0/6/5/5
45	PLC	L	702	-	-	15/45/45/45	-
49	3PE	M	503	-	-	26/49/49/54	-
44	SF4	B	301	2	-	-	0/6/5/5
46	FES	E	301	5	-	-	0/1/1/1
50	CDL	Z	202	-	-	29/58/58/110	-
45	PLC	q	401	-	-	21/39/39/45	-
53	EHZ	U	201	21	-	20/42/44/45	-
50	CDL	O	201	-	-	42/85/85/110	-
49	3PE	H	403	-	-	17/34/34/54	-
49	3PE	b	101	-	-	22/43/43/54	-
44	SF4	G	804	7	-	-	0/6/5/5
45	PLC	i	101	-	-	13/45/45/45	-
49	3PE	N	601	-	-	23/43/43/54	-
49	3PE	H	402	-	-	17/39/39/54	-
49	3PE	L	705	-	-	19/38/38/54	-
51	NDP	P	501	-	-	12/30/77/77	0/5/5/5
49	3PE	J	201	-	-	24/54/54/54	-
45	PLC	b	102	-	-	9/42/42/45	-
53	EHZ	T	201	20	-	18/42/44/45	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
45	PLC	H	401	-	-	11/26/26/45	-
45	PLC	I	303	-	-	15/45/45/45	-
45	PLC	a	202	-	-	11/23/23/45	-
49	3PE	O	203	-	-	24/38/38/54	-
45	PLC	m	702	-	-	19/39/39/45	-
49	3PE	L	703	-	-	22/54/54/54	-
45	PLC	l	202	-	-	14/35/35/45	-
49	3PE	d	101	-	-	19/38/38/54	-
47	FMN	F	502	-	-	9/18/18/18	0/3/3/3
49	3PE	g	301	-	-	26/49/49/54	-
46	FES	G	801	7	-	-	0/1/1/1
45	PLC	M	501	-	-	18/45/45/45	-
44	SF4	I	301	9	-	-	0/6/5/5
45	PLC	N	603	-	-	19/45/45/45	-
45	PLC	h	201	-	-	11/42/42/45	-
49	3PE	M	504	-	-	17/54/54/54	-
45	PLC	L	701	-	-	19/38/38/45	-
49	3PE	L	704	-	-	28/54/54/54	-
49	3PE	m	703	-	-	15/27/27/54	-
45	PLC	M	502	-	-	22/45/45/45	-
49	3PE	l	201	-	-	21/45/45/54	-
45	PLC	B	302	-	-	17/34/34/45	-
45	PLC	P	502	-	-	13/34/34/45	-
45	PLC	q	402	-	-	22/45/45/45	-
45	PLC	Z	201	-	-	17/45/45/45	-
49	3PE	j	101	-	-	14/30/30/54	-
50	CDL	b	103	-	-	30/69/69/110	-

The worst 5 of 144 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	P	501	NDP	O4B-C1B	14.53	1.61	1.41
51	P	501	NDP	C6N-C5N	12.10	1.54	1.33
51	P	501	NDP	C7N-N7N	8.26	1.55	1.33
51	P	501	NDP	O4D-C1D	8.03	1.61	1.42
51	P	501	NDP	C2D-C1D	-7.42	1.29	1.53

The worst 5 of 92 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
51	P	501	NDP	C5A-C6A-N6A	8.79	133.71	120.35
51	P	501	NDP	C1B-N9A-C4A	-7.35	113.73	126.64
51	P	501	NDP	N6A-C6A-N1A	-6.41	105.27	118.57
53	T	201	EHZ	C8-C9-S1	5.73	120.71	113.63
49	m	703	3PE	O21-C21-C22	5.37	120.96	111.09

There are no chirality outliers.

5 of 919 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	B	303	PLC	O4P-C4-C5-N
45	B	303	PLC	C5-C4-O4P-P
45	B	303	PLC	C1'-C'-O2-C2
45	B	303	PLC	O'-C'-O2-C2
45	B	303	PLC	C1-O3P-P-O2P

There are no ring outliers.

46 monomers are involved in 108 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
49	m	701	3PE	1	0
45	B	303	PLC	2	0
45	N	602	PLC	1	0
49	L	706	3PE	5	0
50	a	201	CDL	8	0
44	I	302	SF4	2	0
45	Y	301	PLC	1	0
44	F	501	SF4	3	0
45	L	702	PLC	1	0
49	M	503	3PE	3	0
44	B	301	SF4	1	0
50	Z	202	CDL	1	0
45	q	401	PLC	4	0
53	U	201	EHZ	1	0
44	G	804	SF4	1	0
49	H	403	3PE	1	0
50	O	201	CDL	3	0
45	i	101	PLC	9	0
49	N	601	3PE	1	0
49	H	402	3PE	1	0
49	L	705	3PE	1	0

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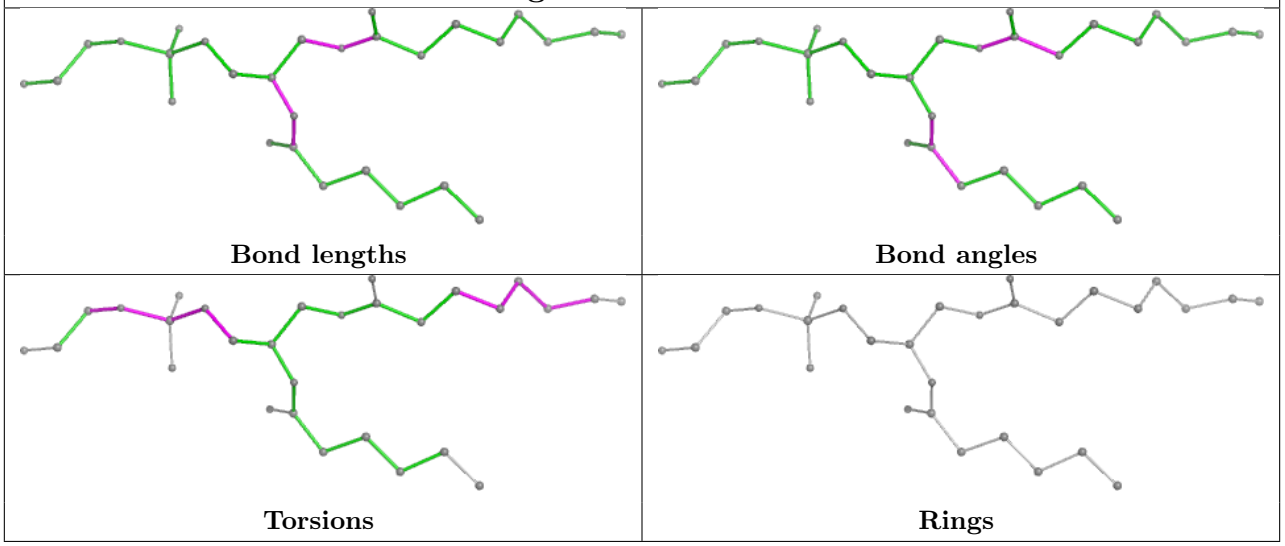
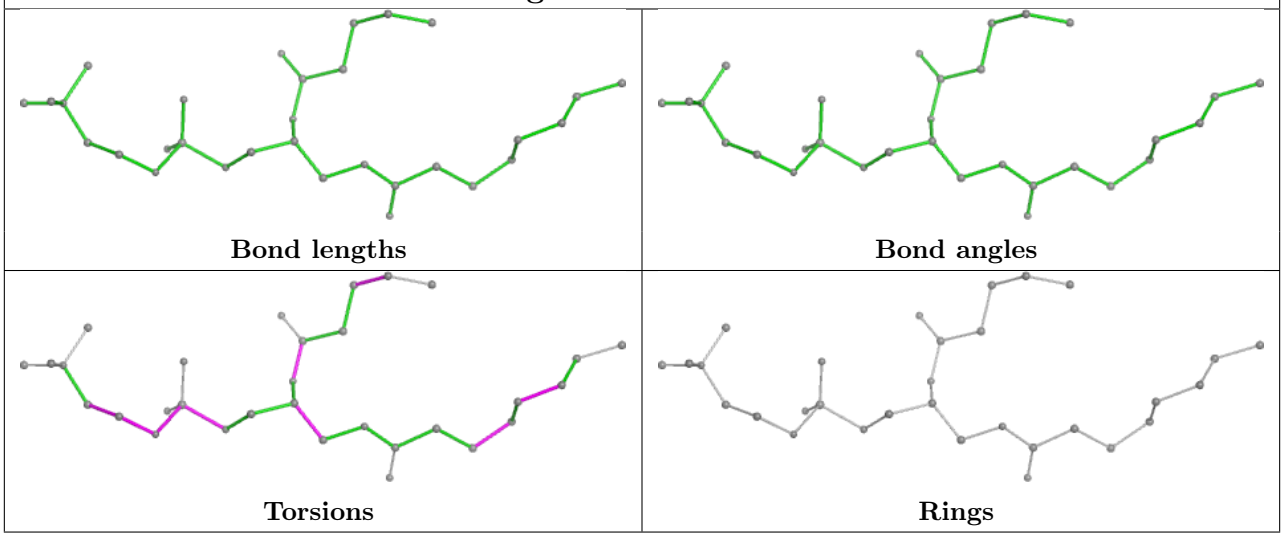
Mol	Chain	Res	Type	Clashes	Symm-Clashes
51	P	501	NDP	4	0
49	J	201	3PE	3	0
45	b	102	PLC	3	0
53	T	201	EHZ	1	0
45	I	303	PLC	3	0
45	m	702	PLC	1	0
49	L	703	3PE	3	0
49	d	101	3PE	1	0
47	F	502	FMN	2	0
49	g	301	3PE	1	0
46	G	801	FES	1	0
45	M	501	PLC	2	0
44	I	301	SF4	1	0
45	N	603	PLC	1	0
45	h	201	PLC	6	0
49	M	504	3PE	7	0
45	L	701	PLC	2	0
49	L	704	3PE	5	0
45	M	502	PLC	1	0
49	l	201	3PE	2	0
45	B	302	PLC	3	0
45	P	502	PLC	1	0
45	q	402	PLC	3	0
45	Z	201	PLC	2	0
50	b	103	CDL	1	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 then 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.

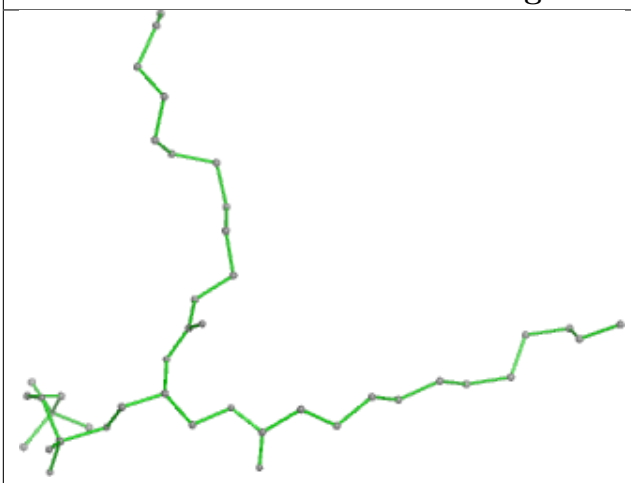
Ligand 3PE m 701



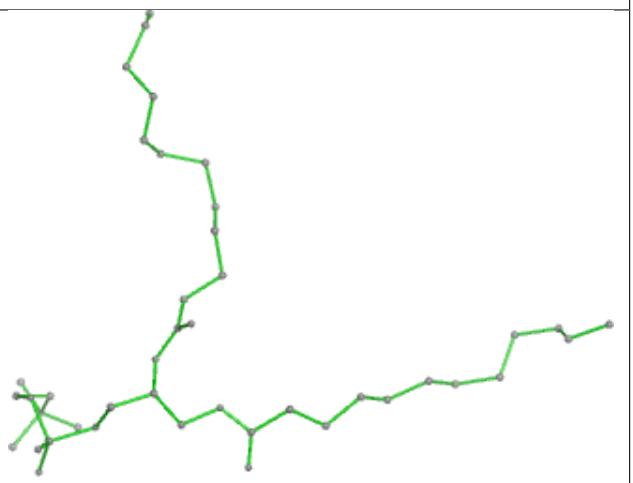
Ligand PLC B 303



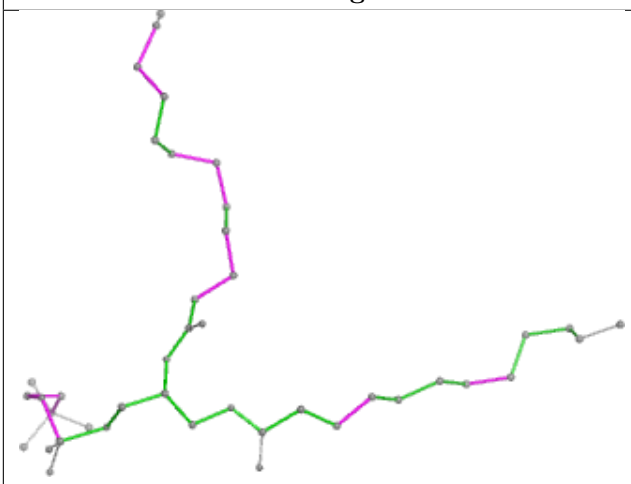
Ligand PLC N 602



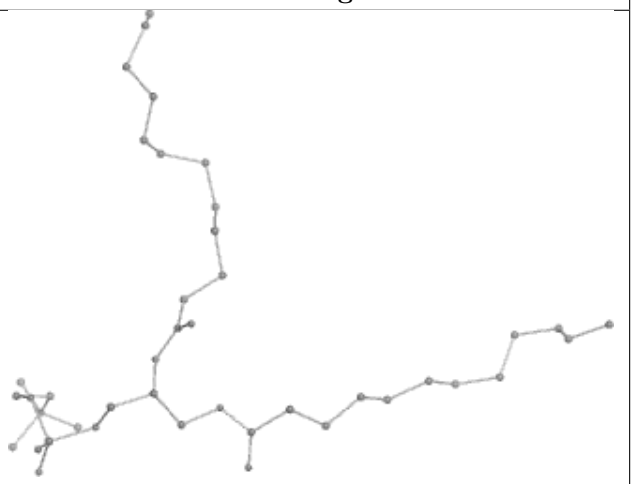
Bond lengths



Bond angles

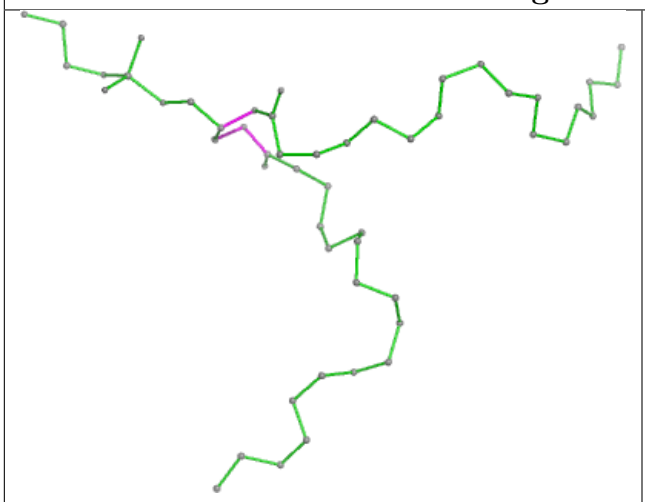


Torsions

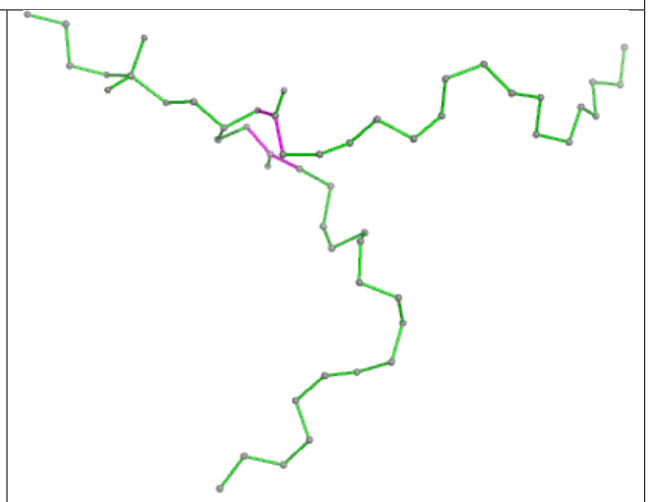


Rings

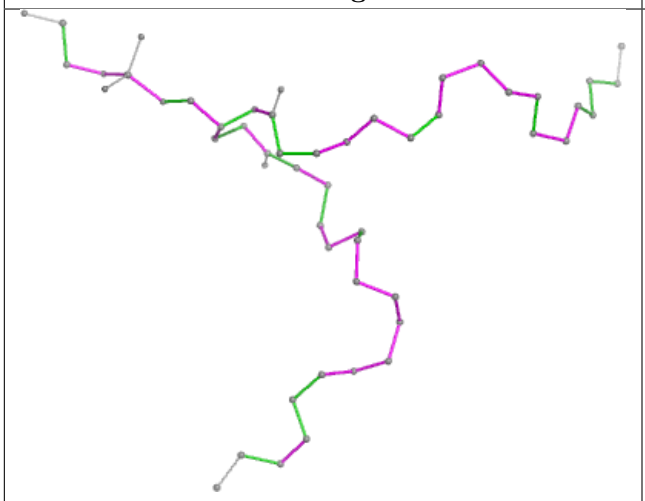
Ligand 3PE L 706



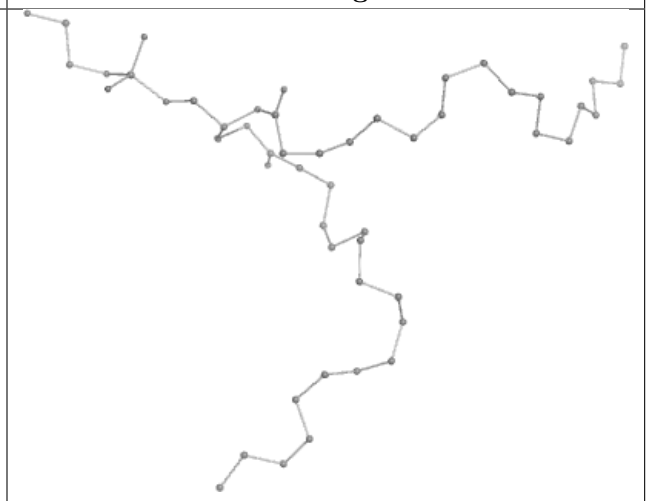
Bond lengths



Bond angles

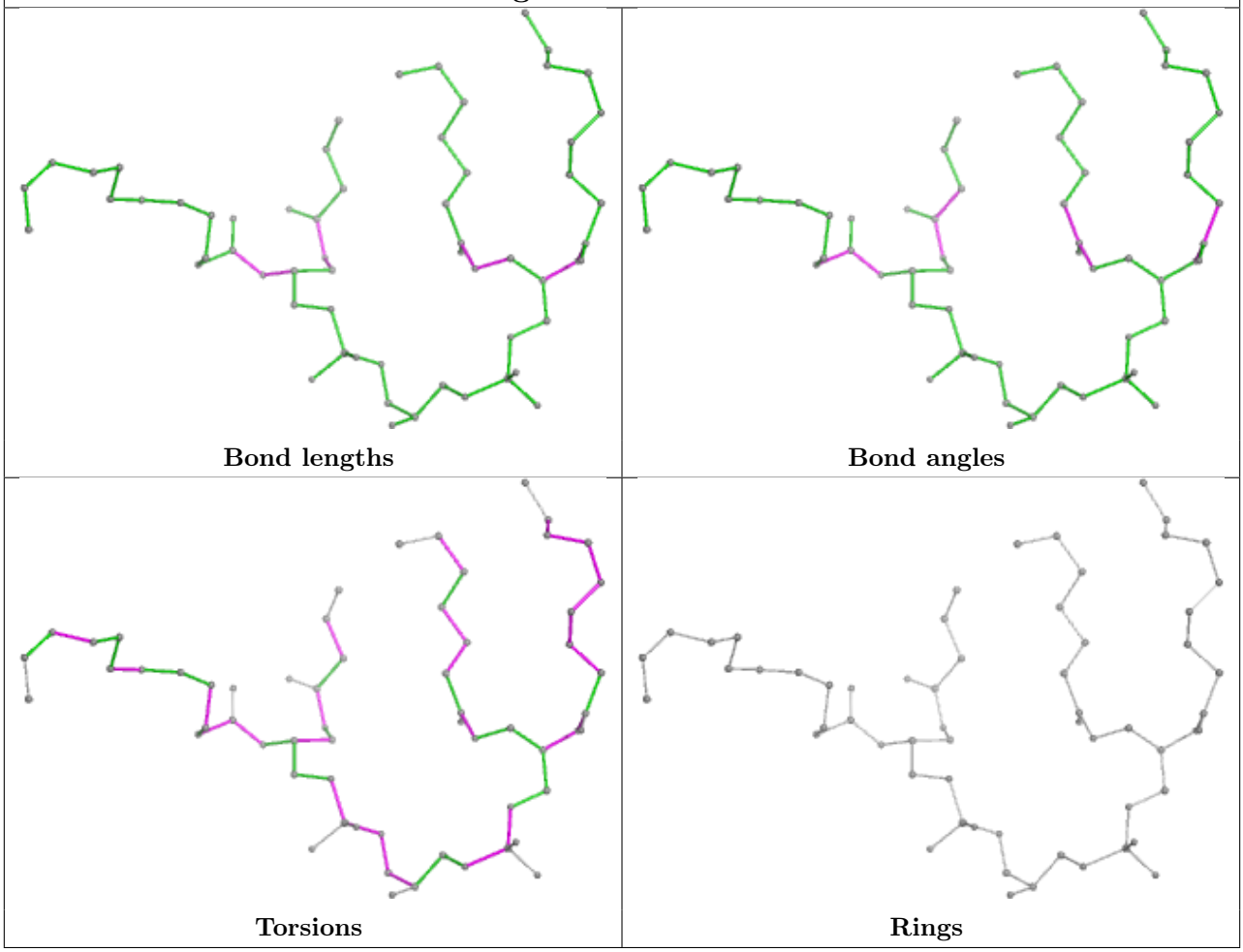


Torsions

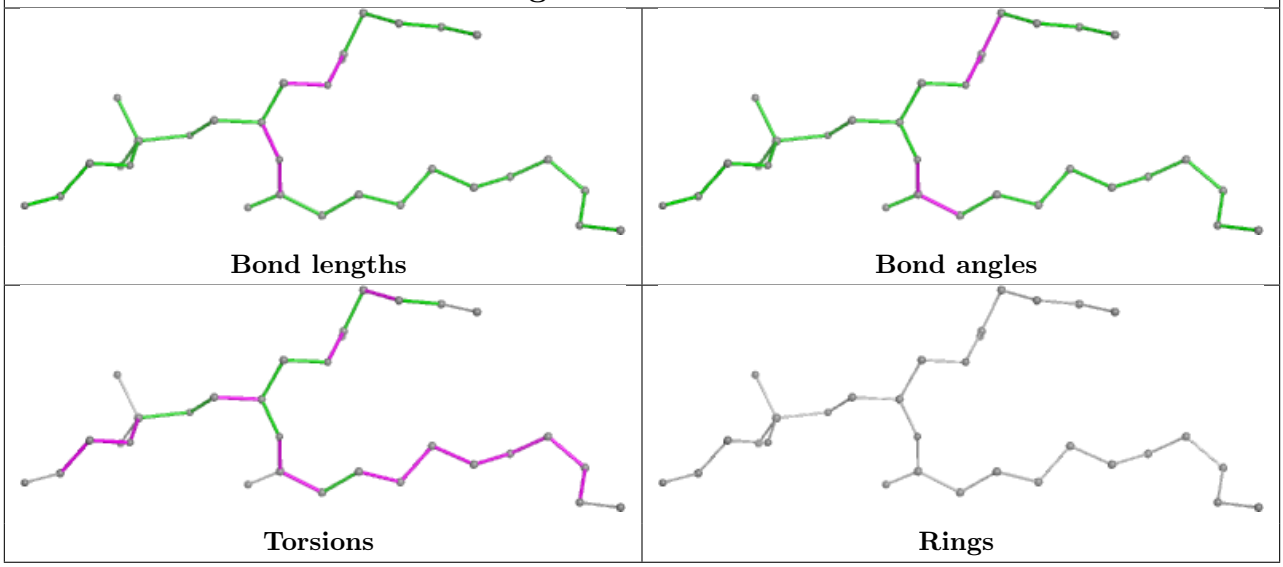


Rings

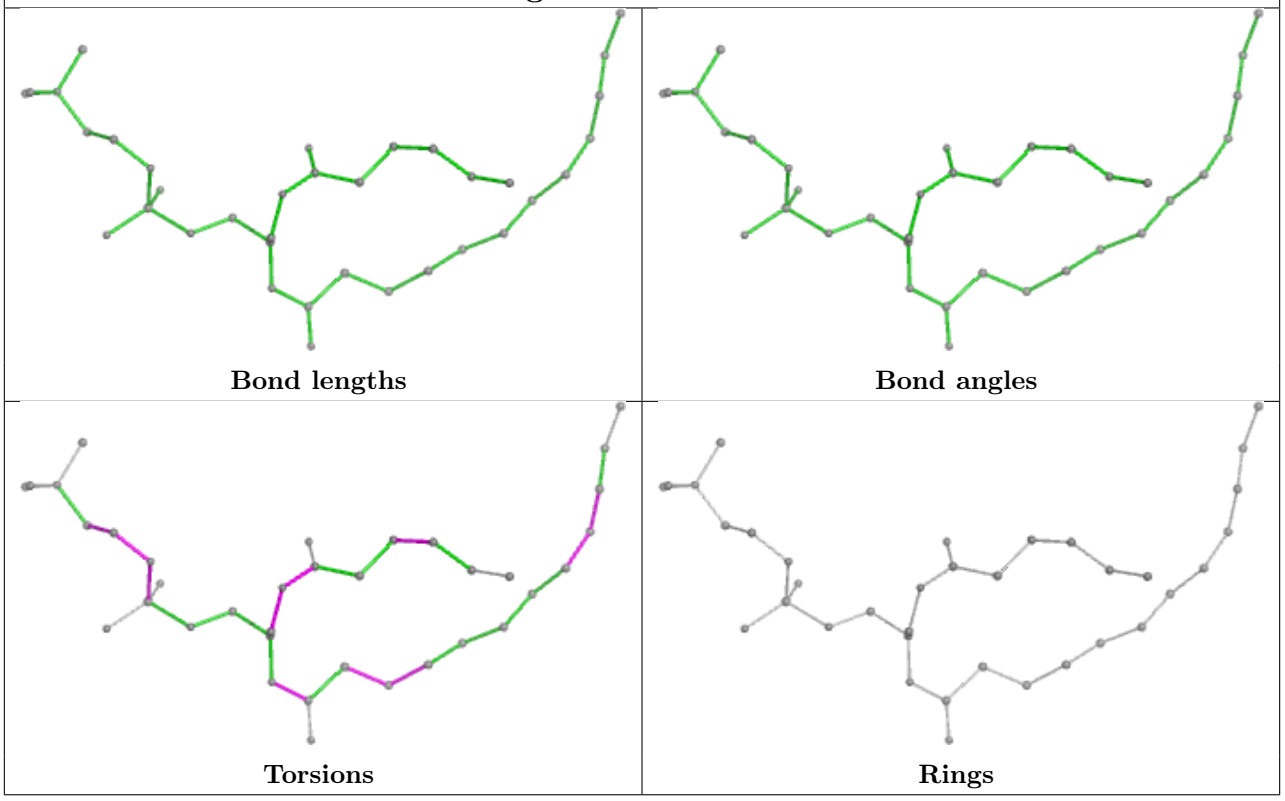
Ligand CDL a 201



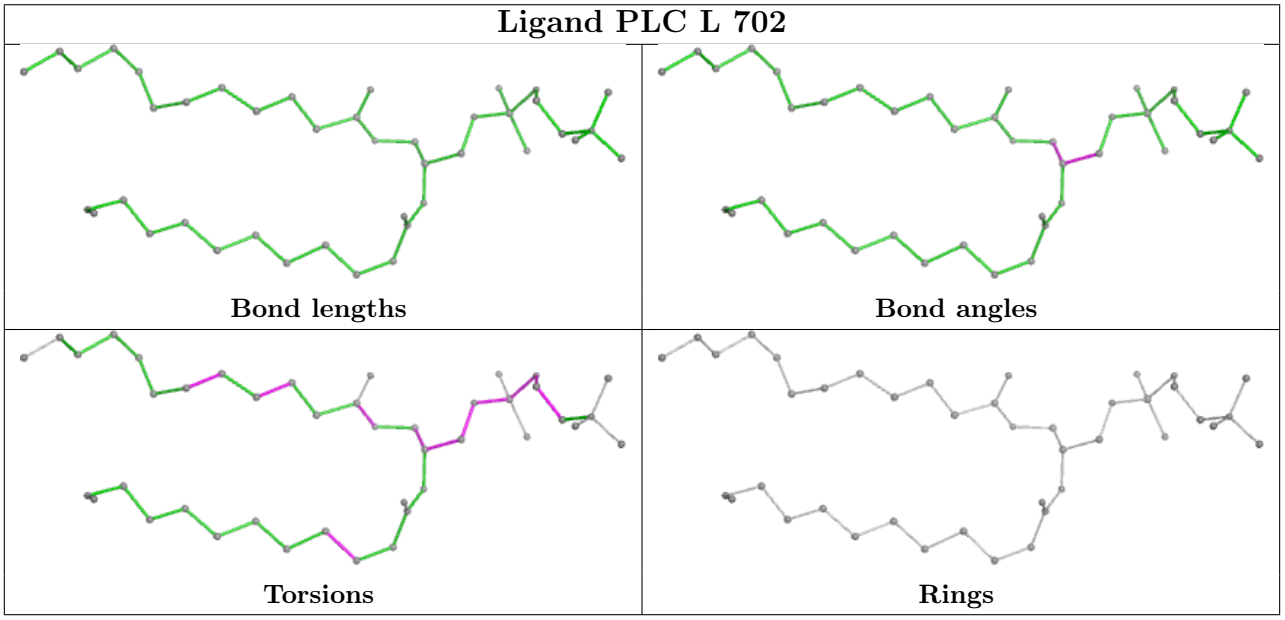
Ligand 3PE O 202



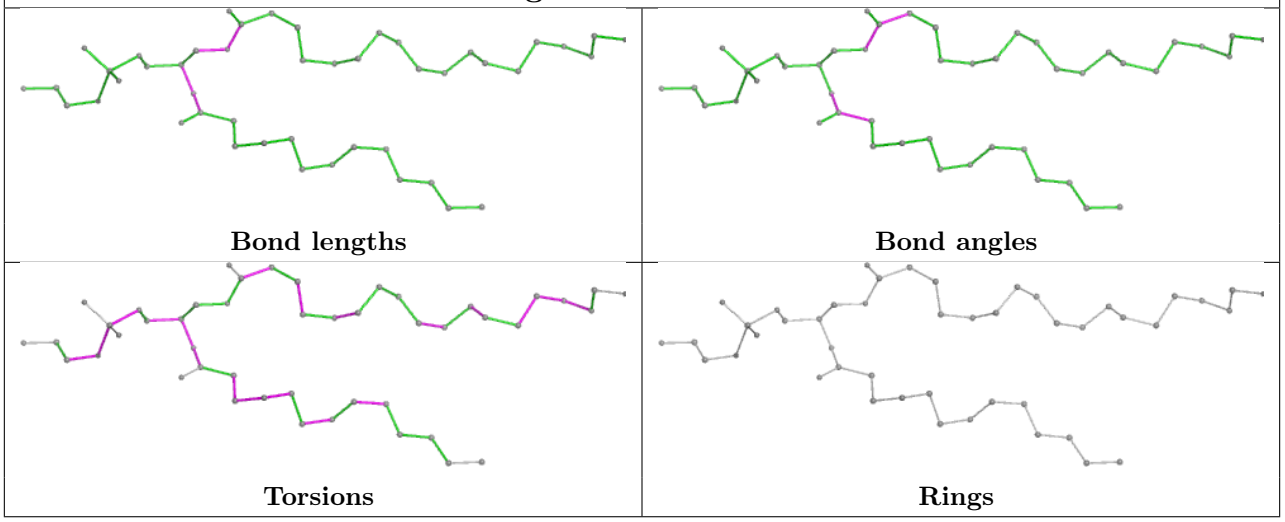
Ligand PLC Y 301



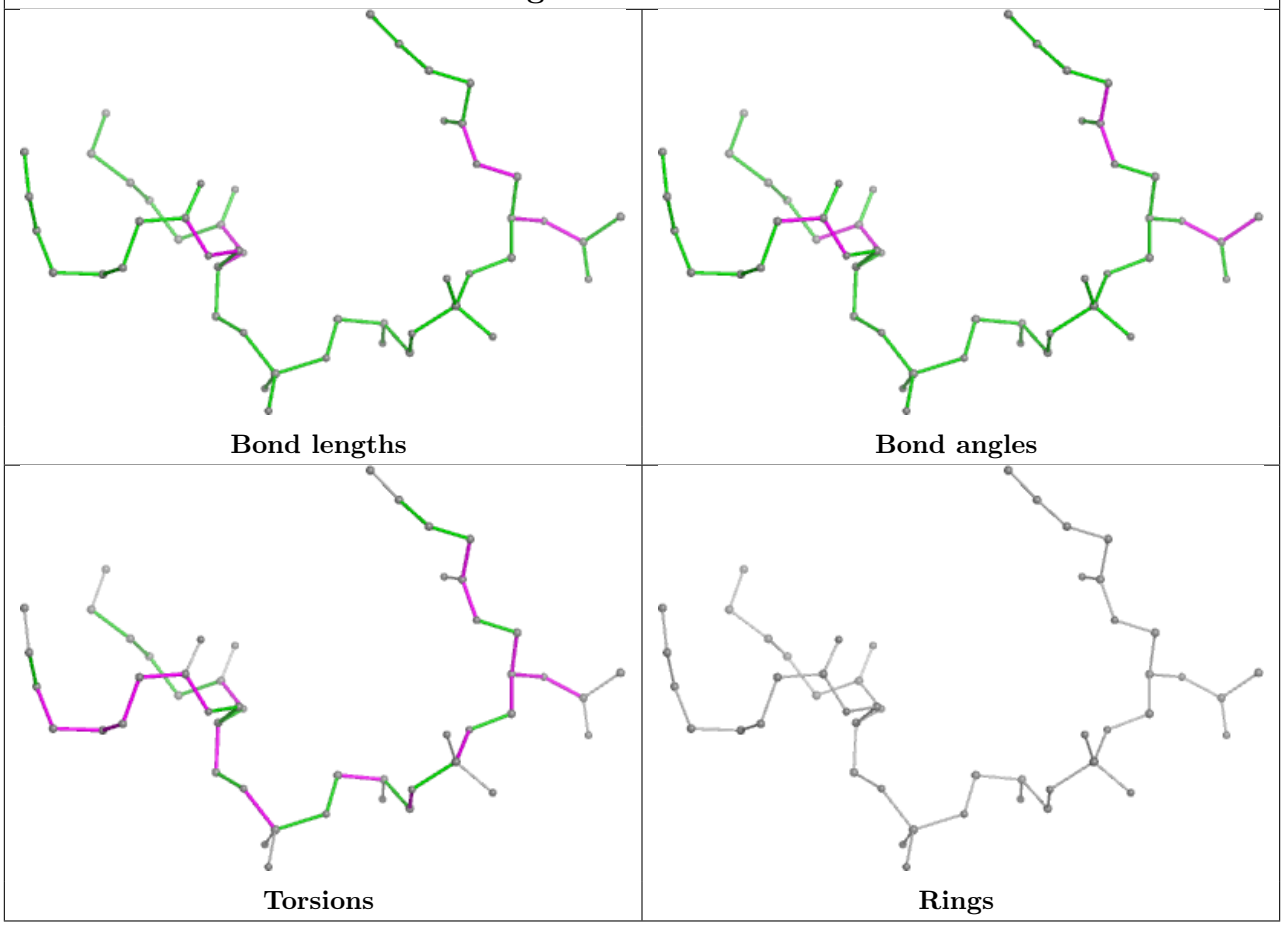
Ligand PLC L 702



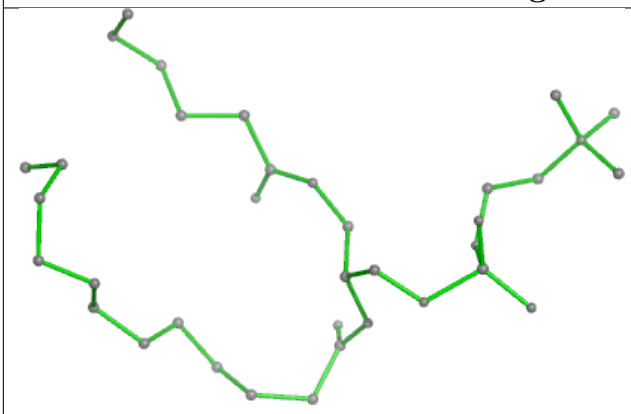
Ligand 3PE M 503



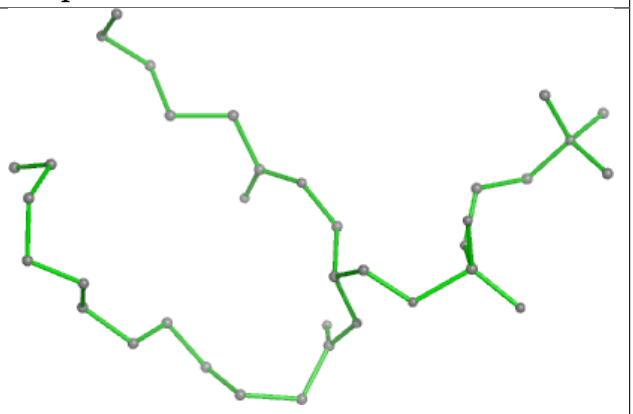
Ligand CDL Z 202



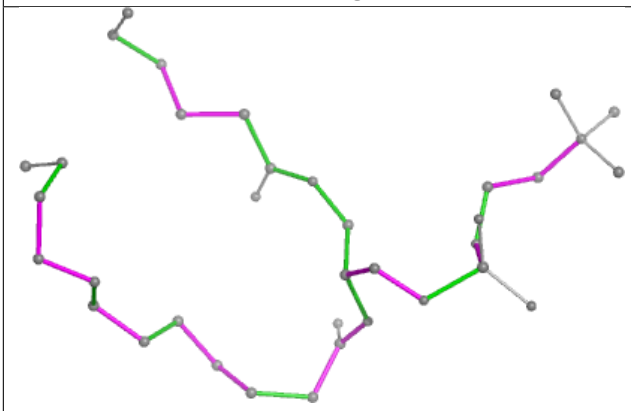
Ligand PLC q 401



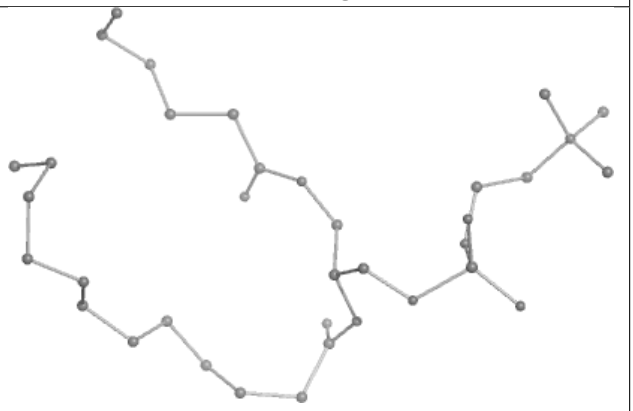
Bond lengths



Bond angles

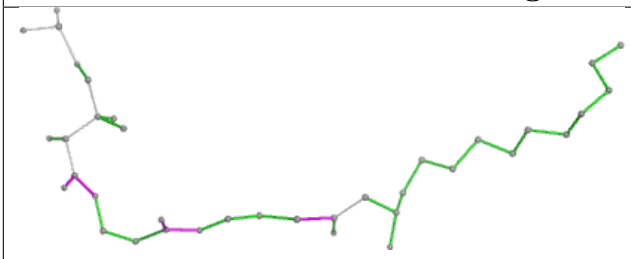


Torsions

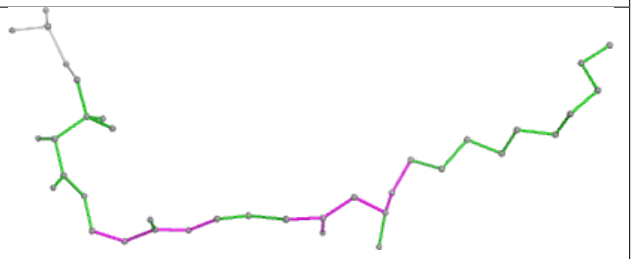


Rings

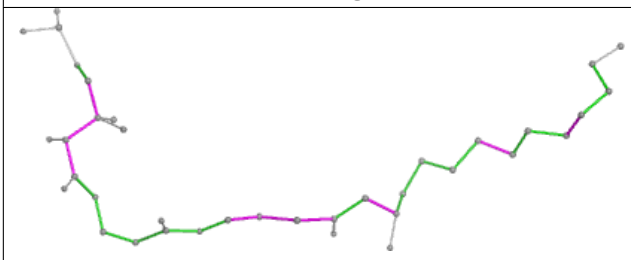
Ligand EHZ U 201



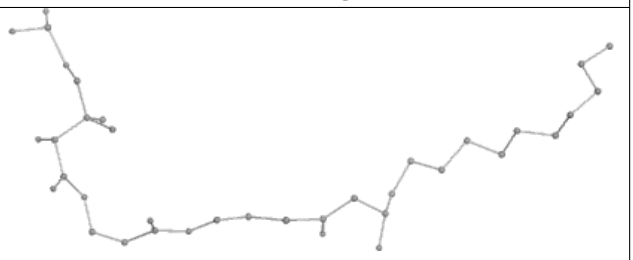
Bond lengths



Bond angles

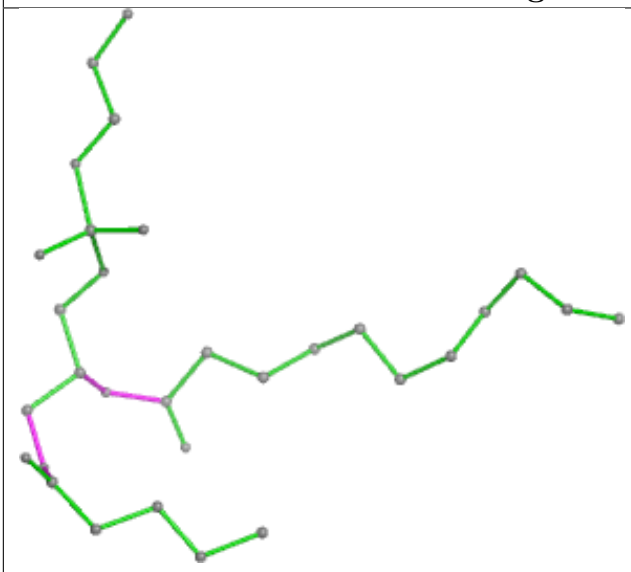


Torsions

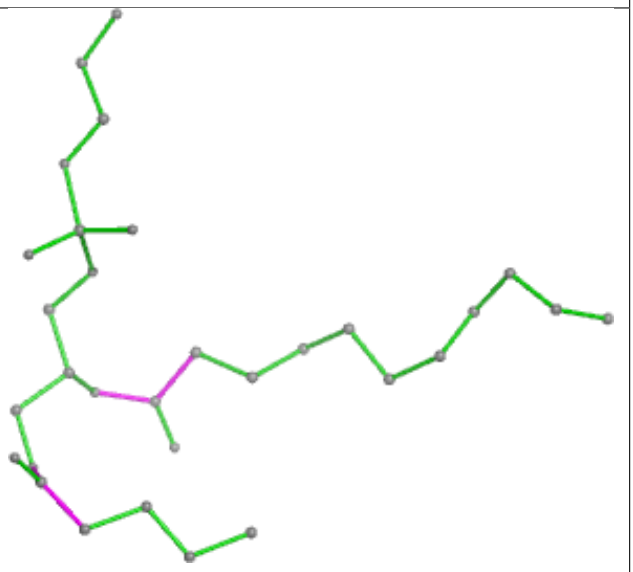


Rings

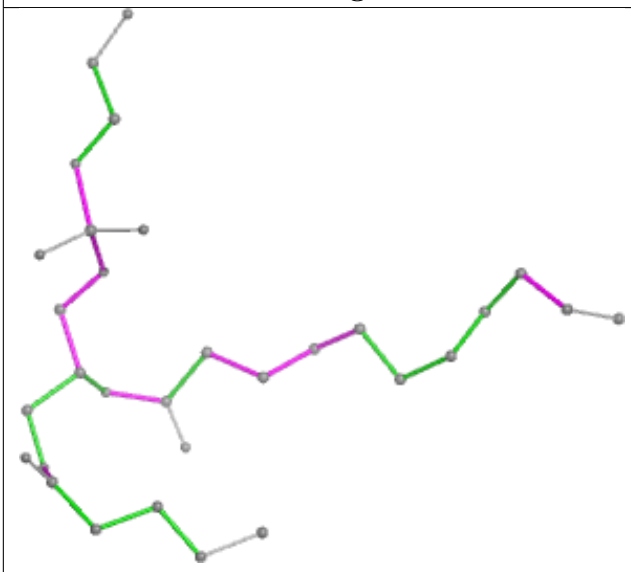
Ligand 3PE H 403



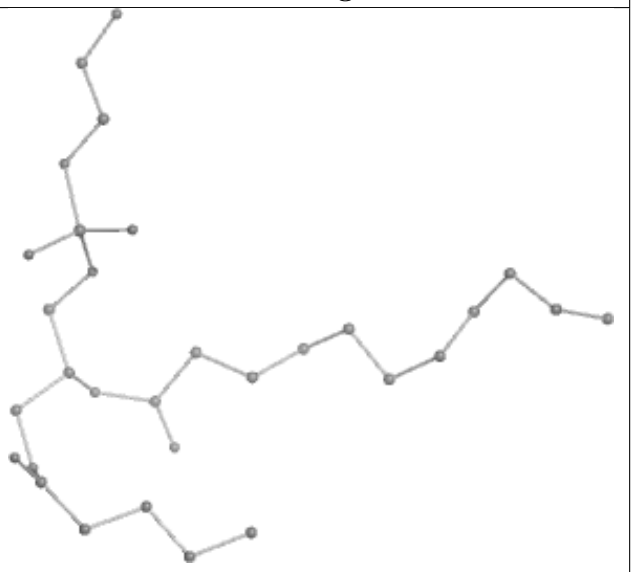
Bond lengths



Bond angles

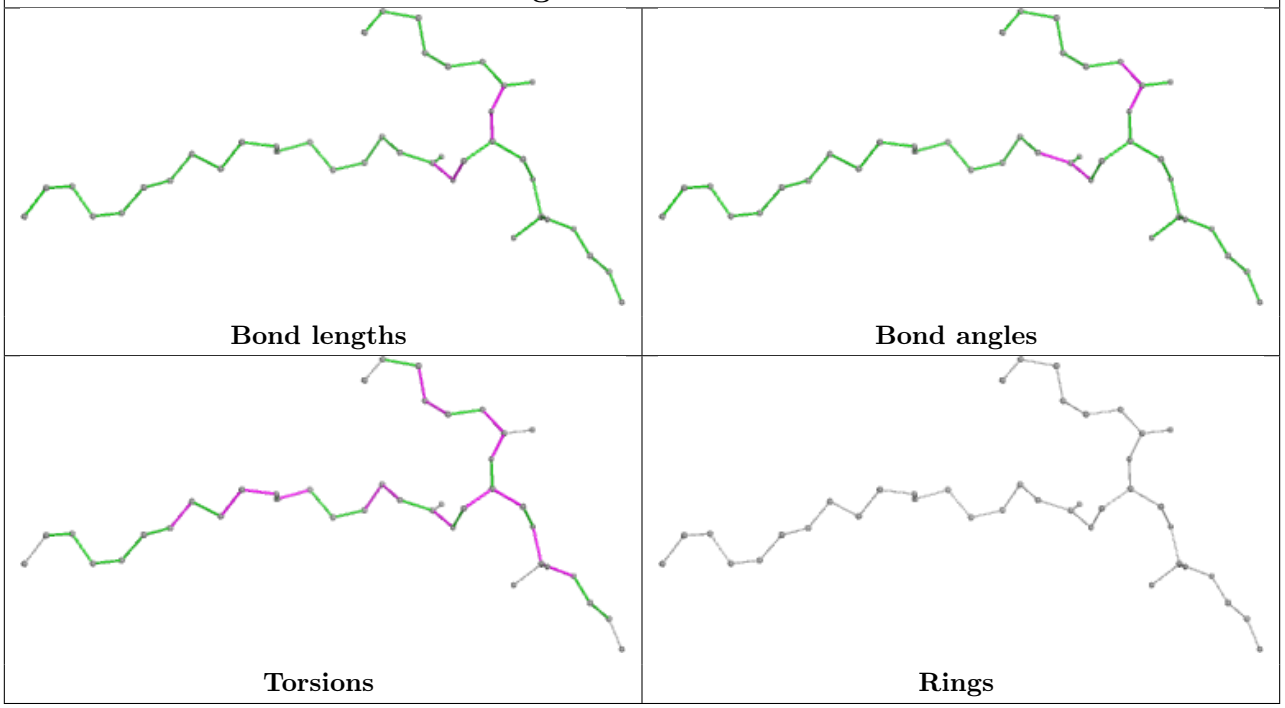


Torsions

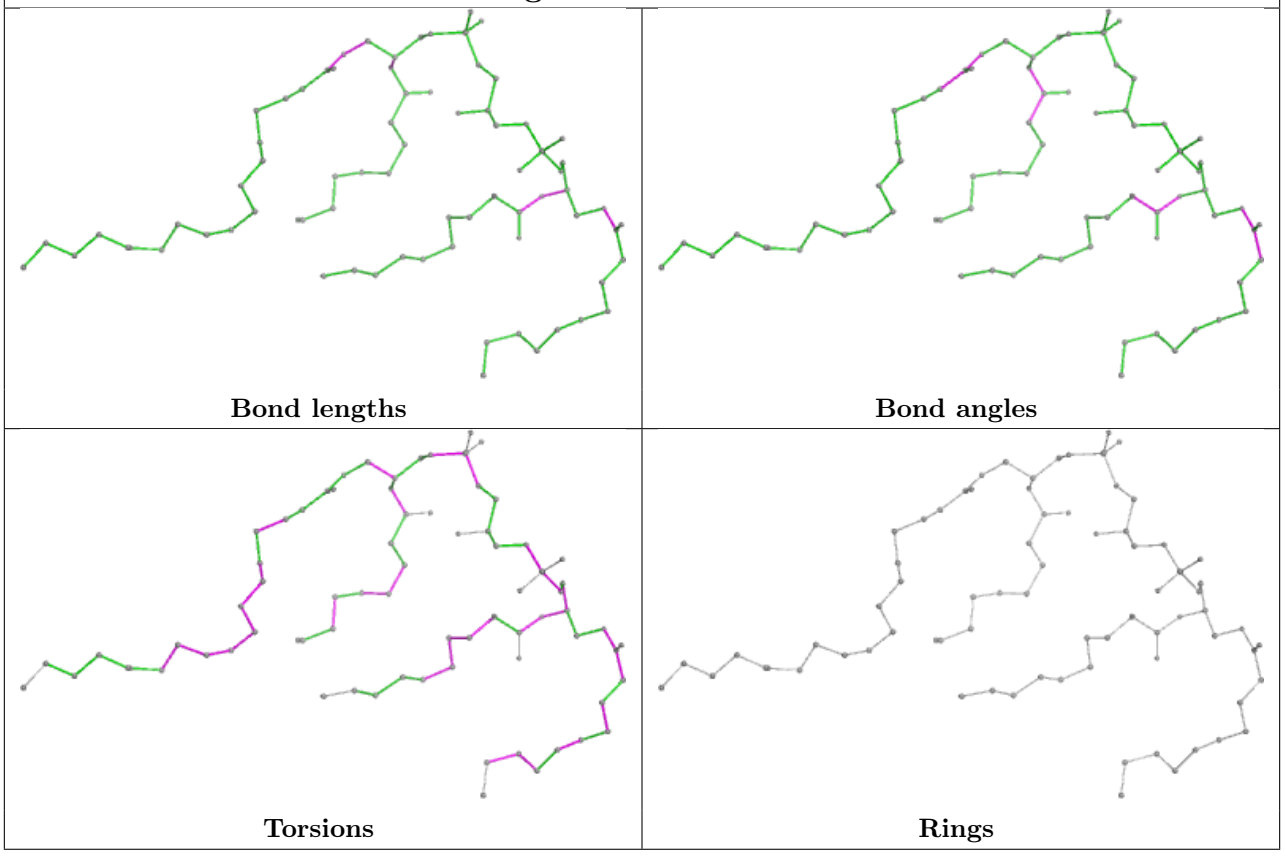


Rings

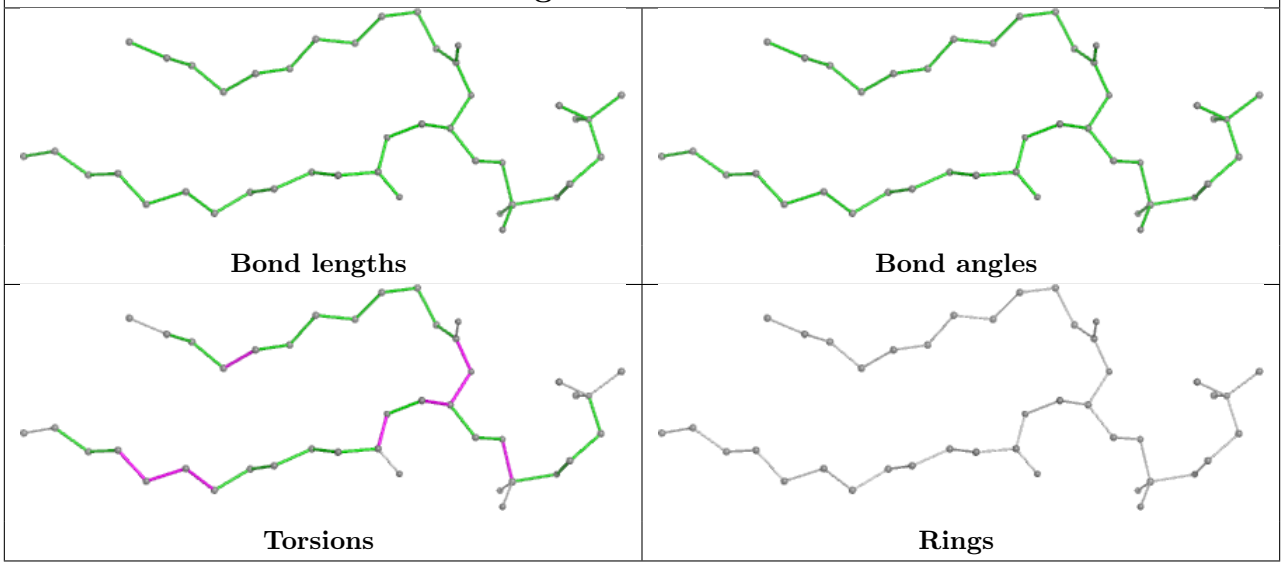
Ligand 3PE b 101



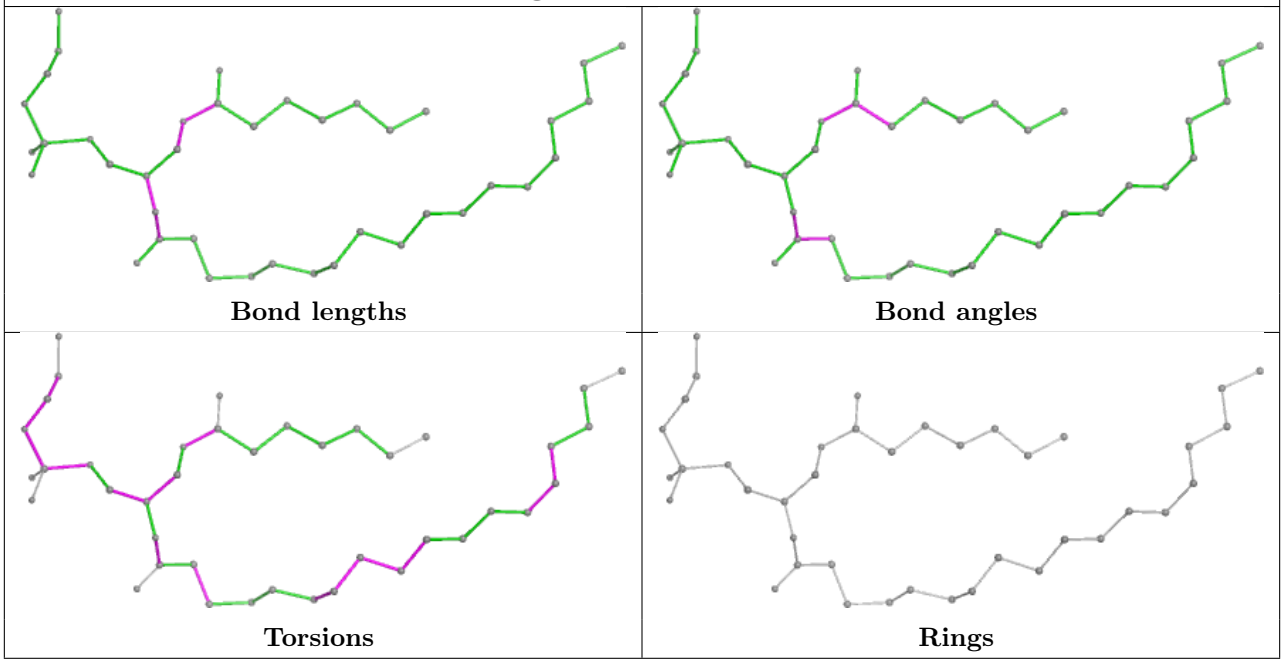
Ligand CDL O 201



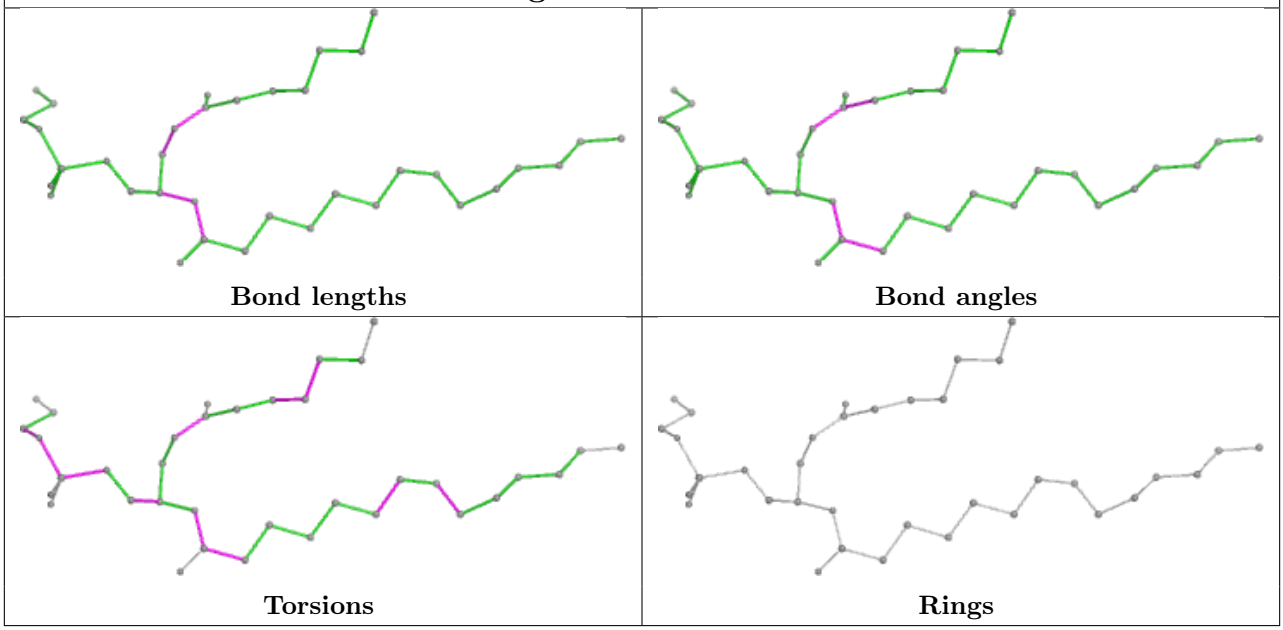
Ligand PLC i 101



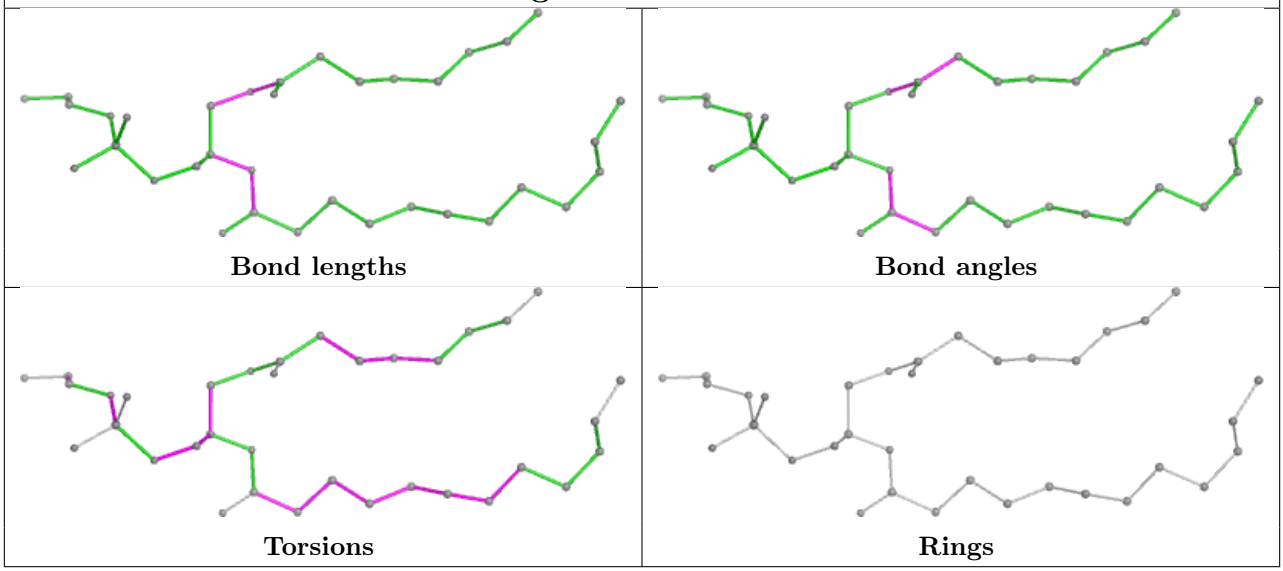
Ligand 3PE N 601



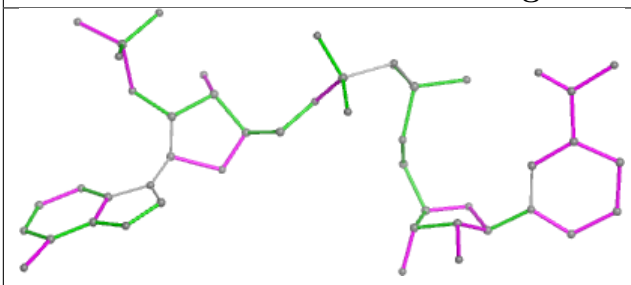
Ligand 3PE H 402



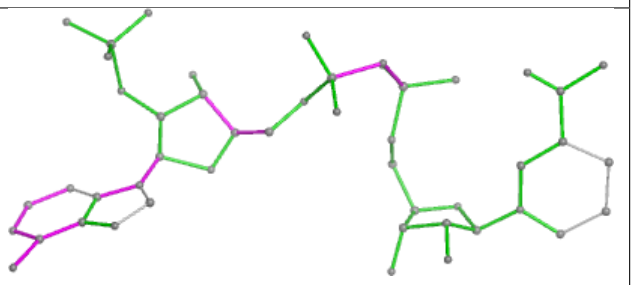
Ligand 3PE L 705



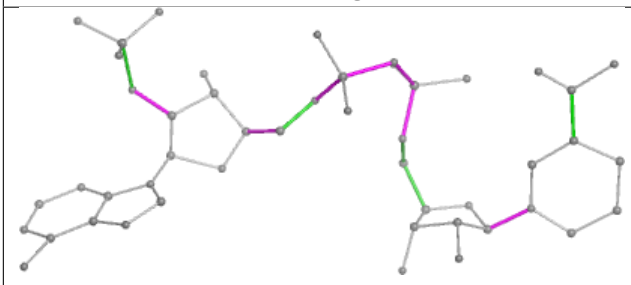
Ligand NDP P 501



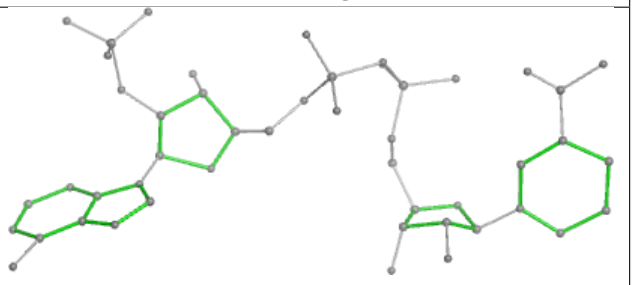
Bond lengths



Bond angles

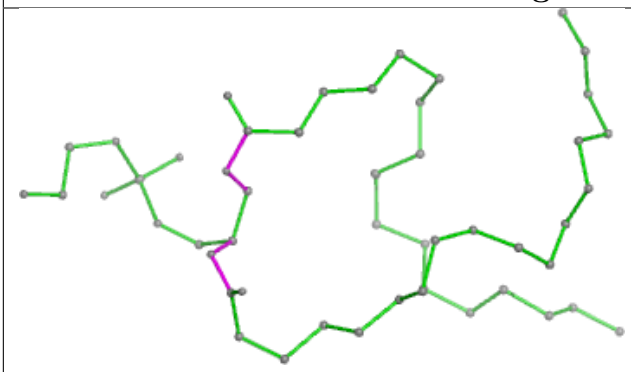


Torsions

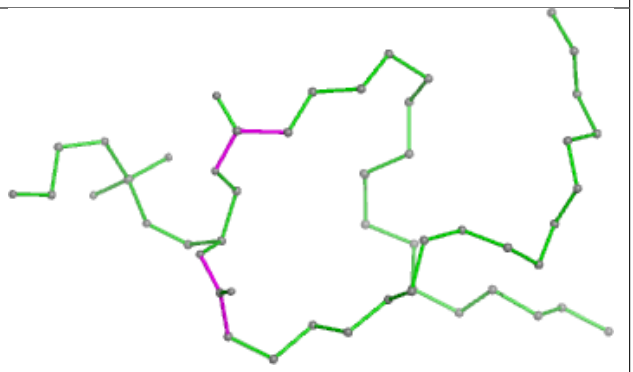


Rings

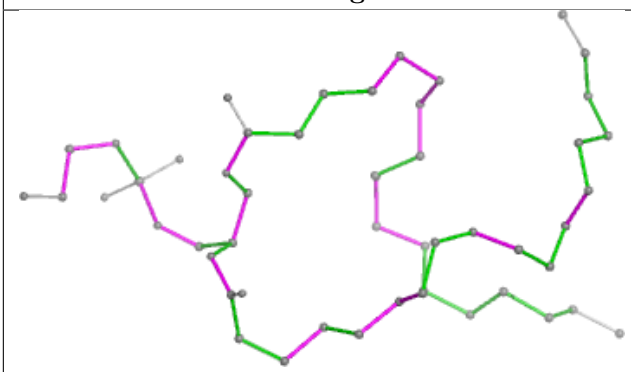
Ligand 3PE J 201



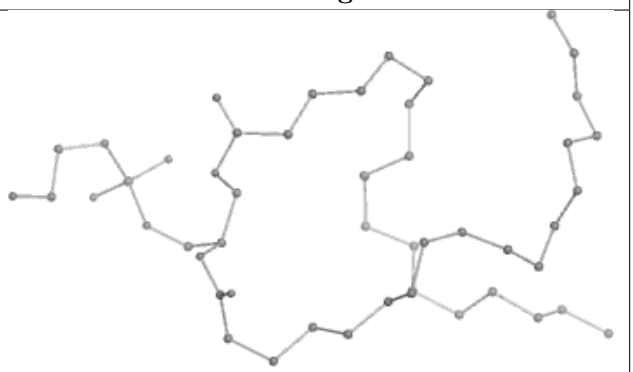
Bond lengths



Bond angles

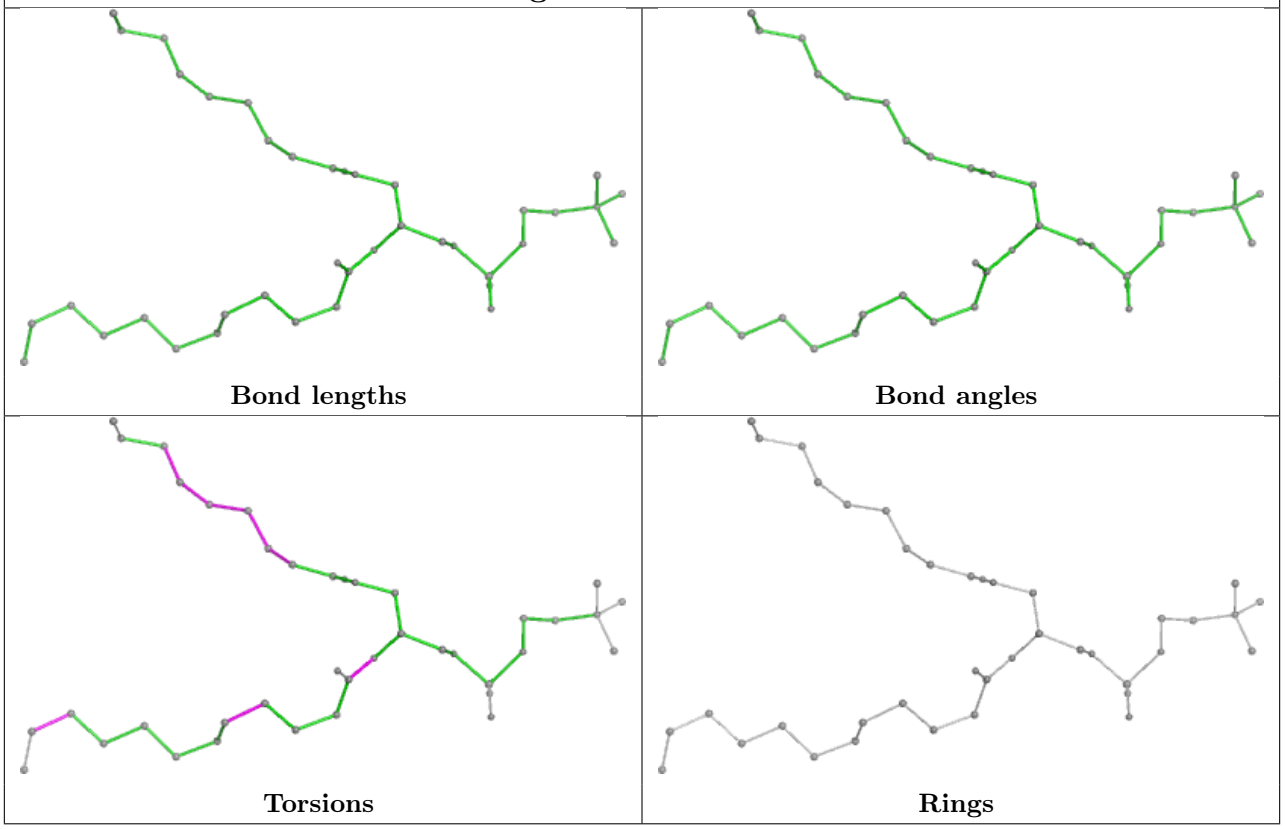


Torsions

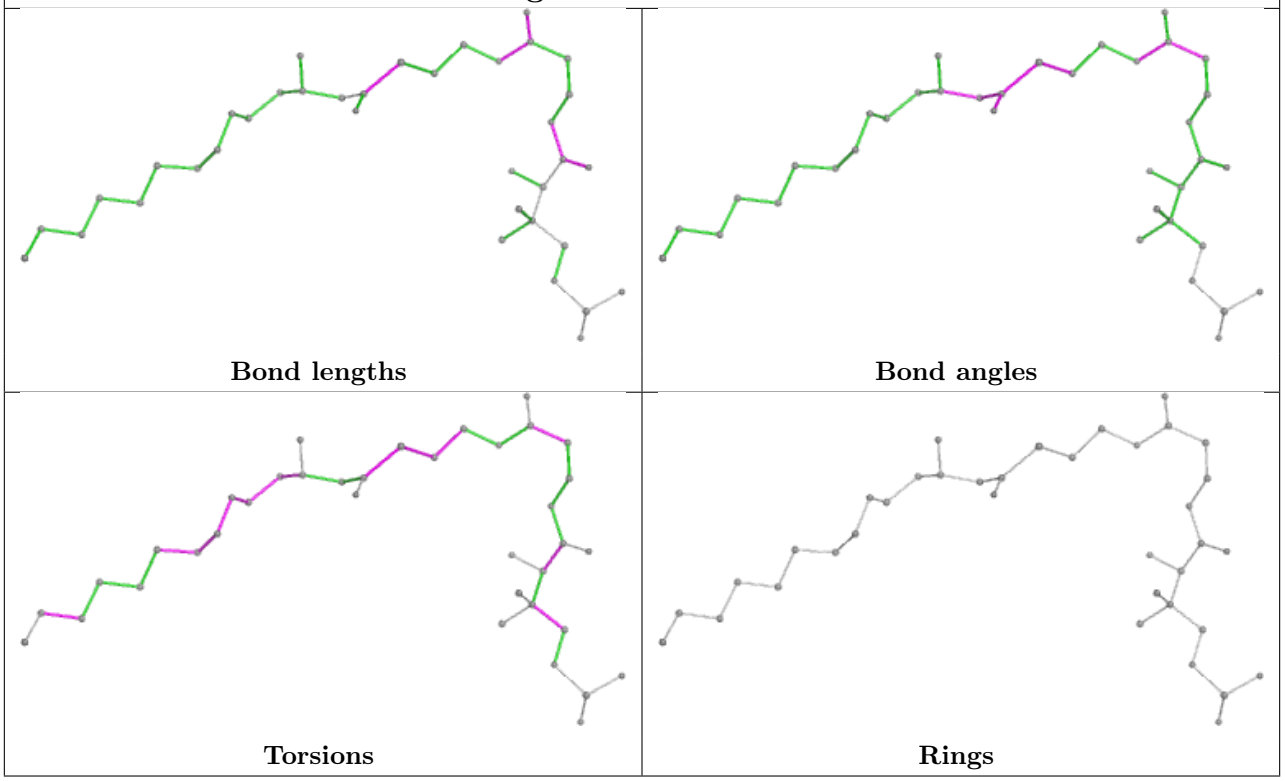


Rings

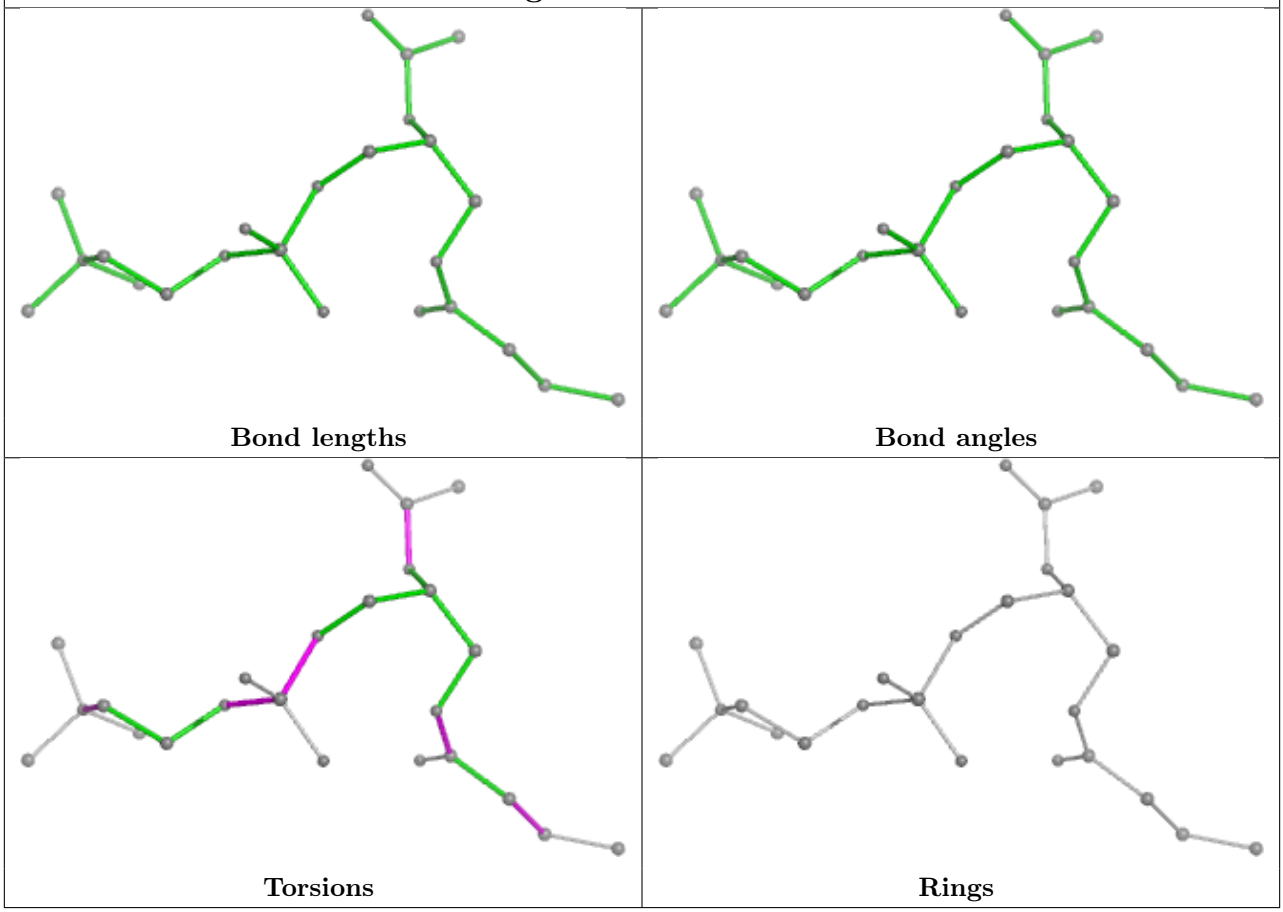
Ligand PLC b 102



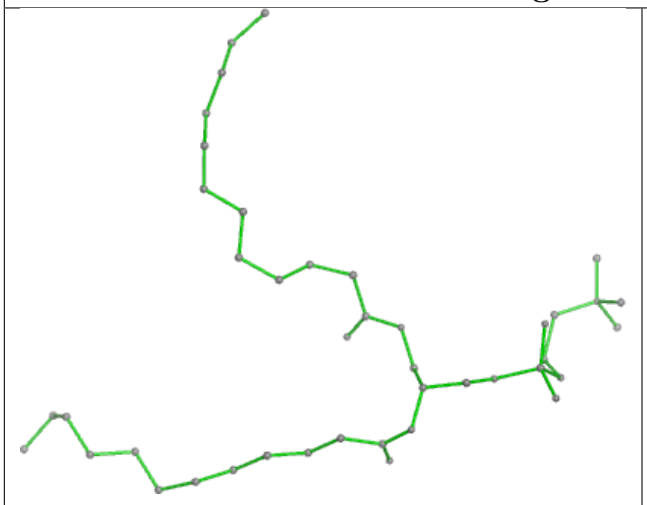
Ligand EHZ T 201



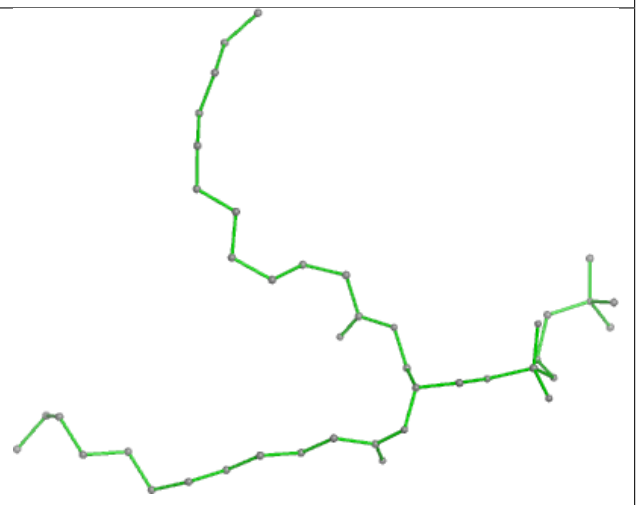
Ligand PLC H 401



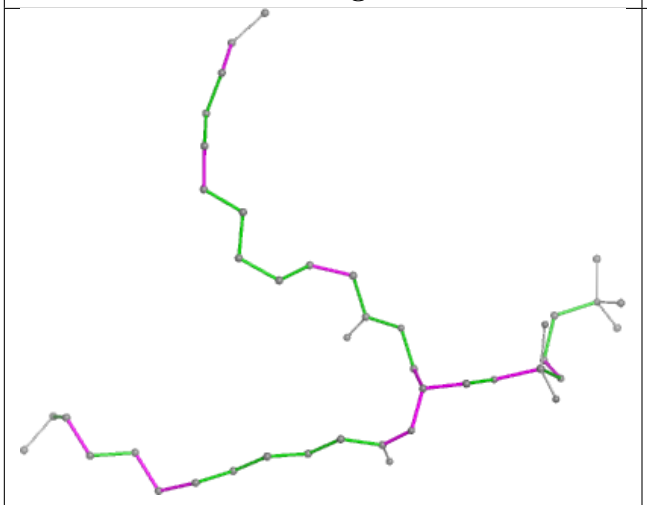
Ligand PLC I 303



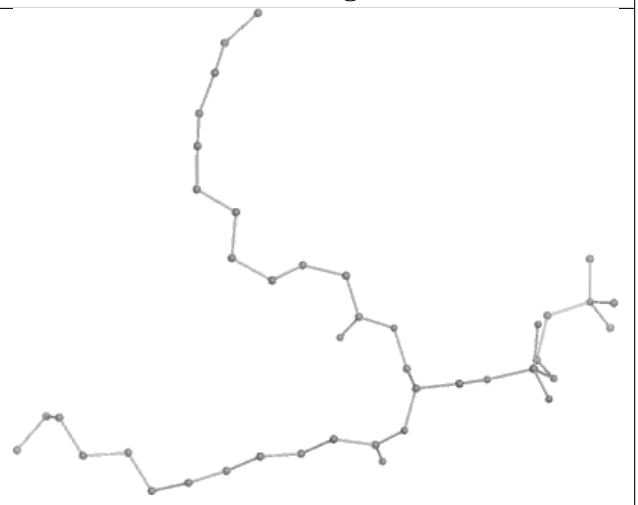
Bond lengths



Bond angles

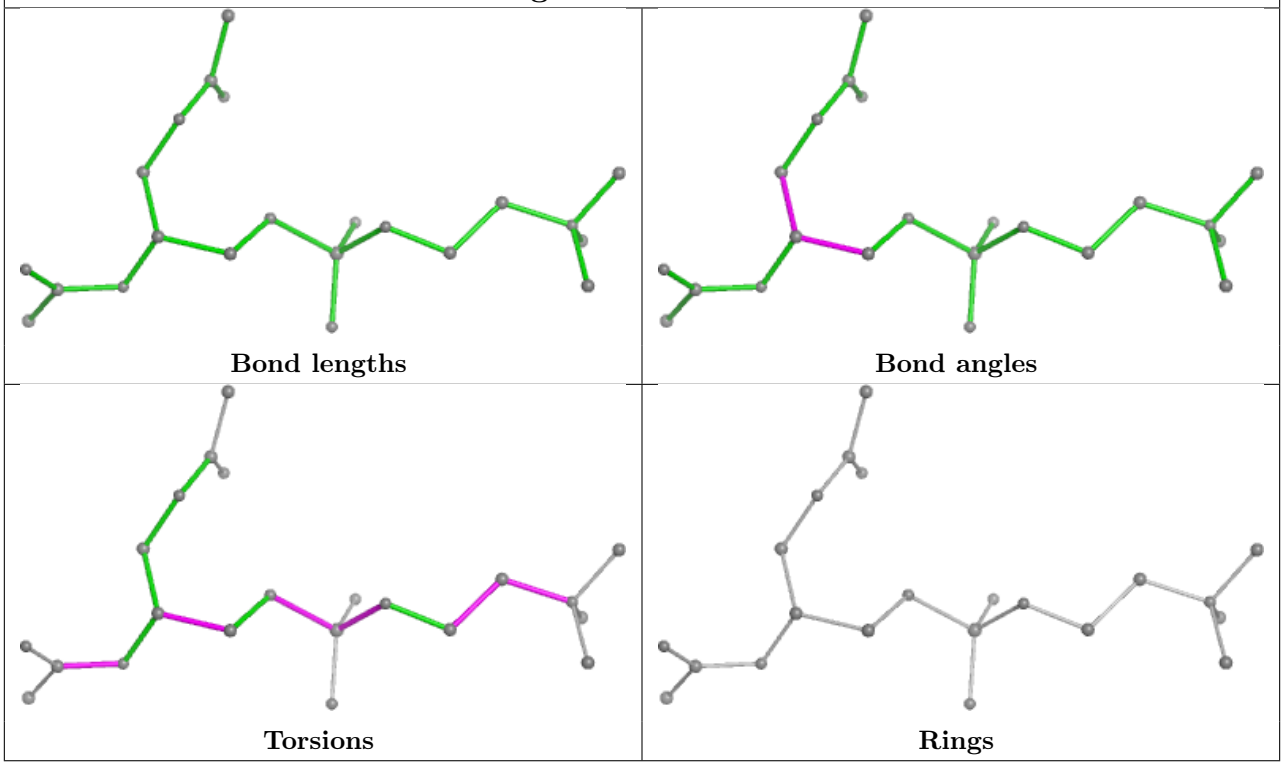


Torsions

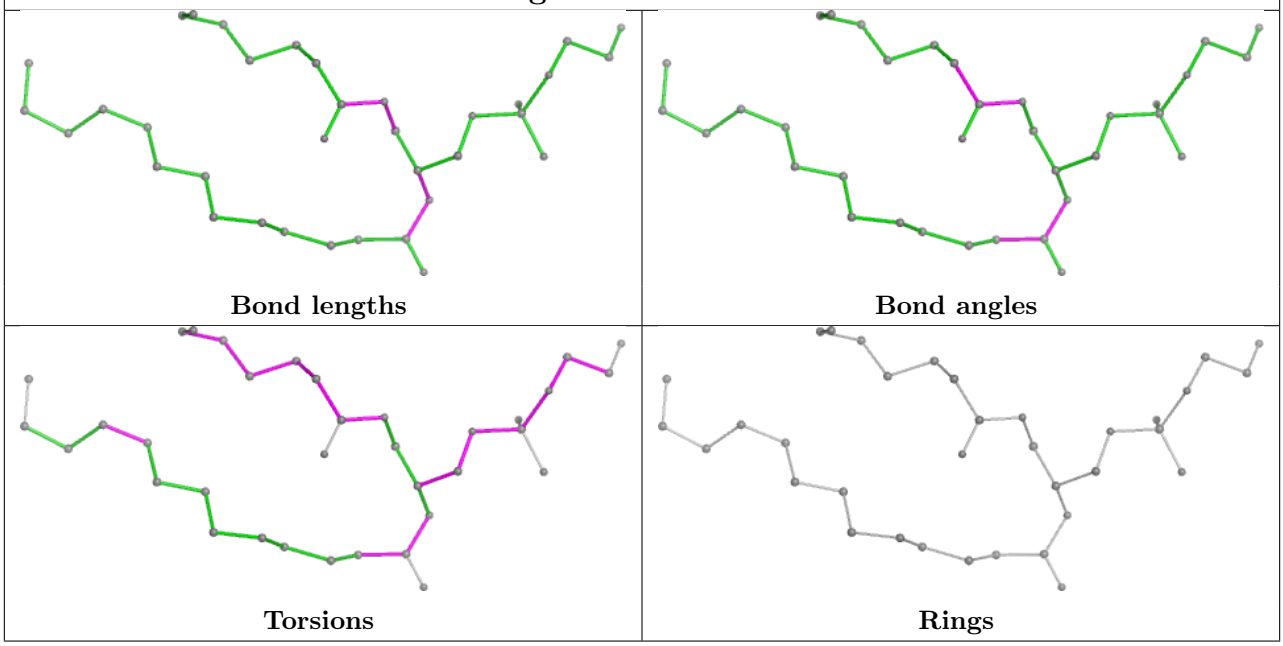


Rings

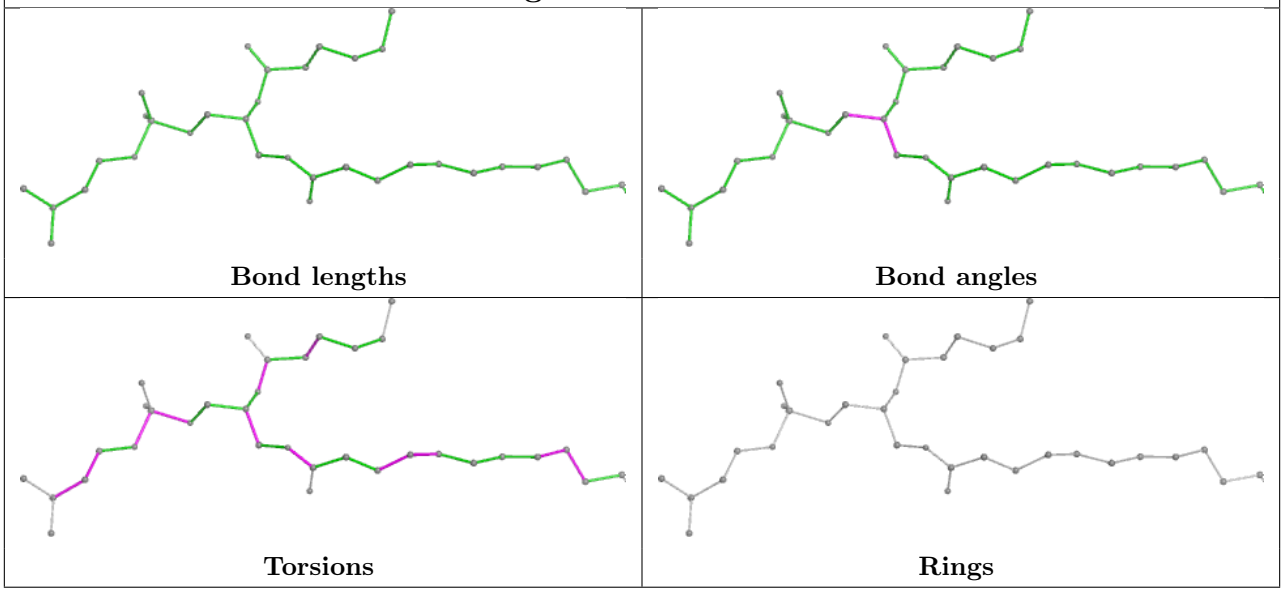
Ligand PLC a 202



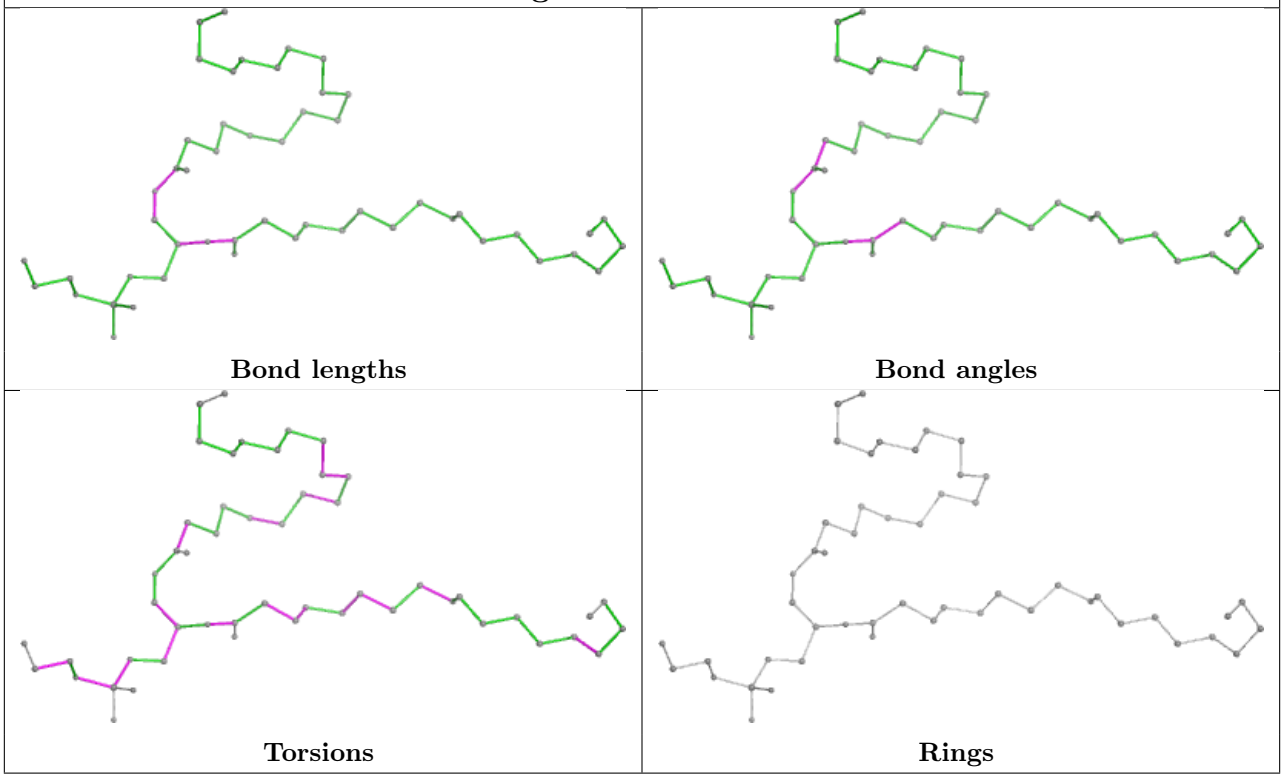
Ligand 3PE O 203



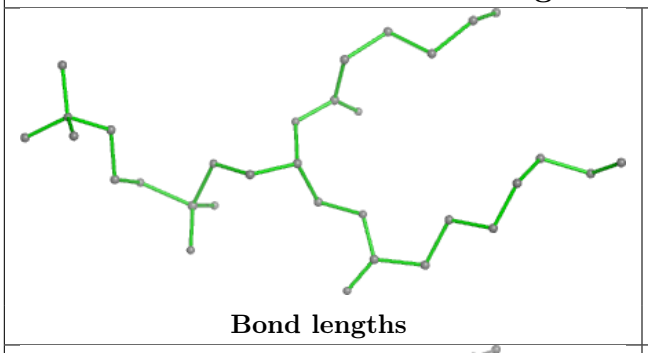
Ligand PLC m 702



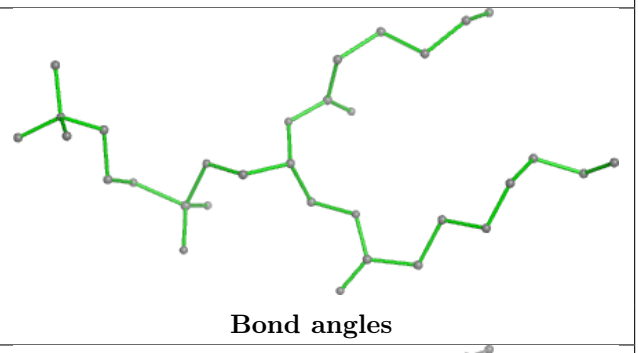
Ligand 3PE L 703



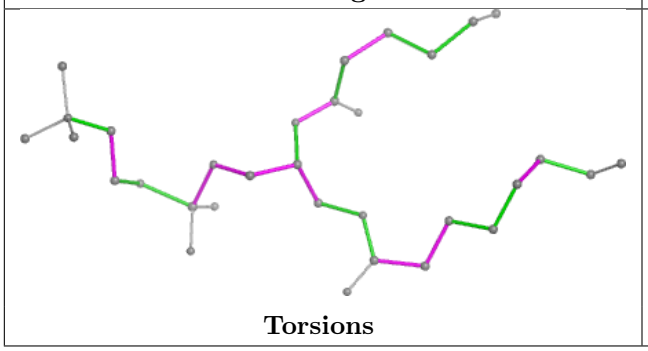
Ligand PLC l 202



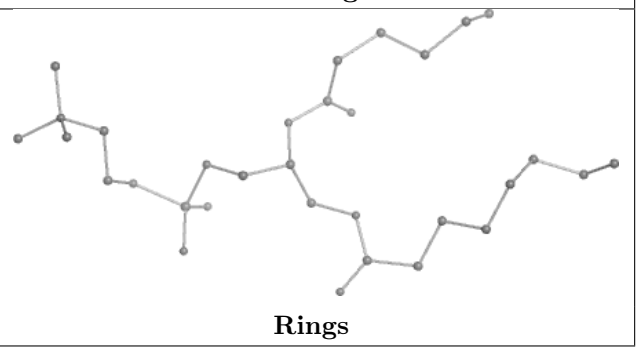
Bond lengths



Bond angles

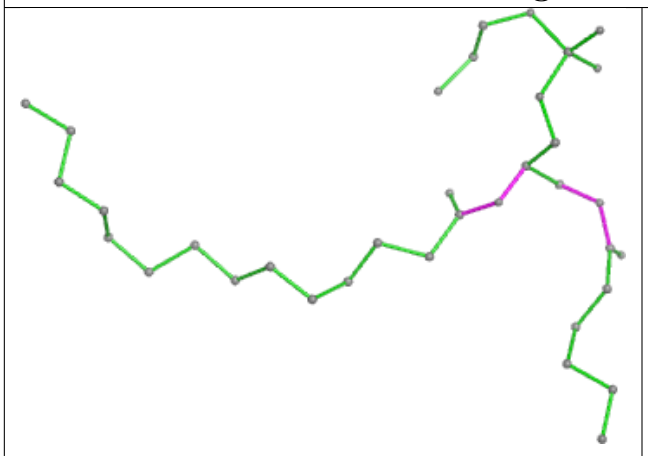


Torsions

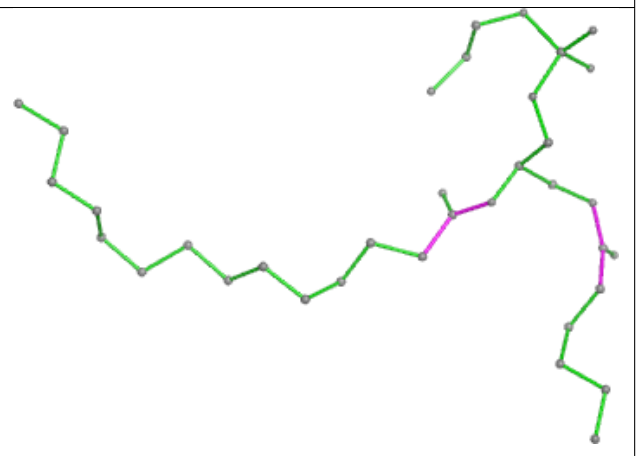


Rings

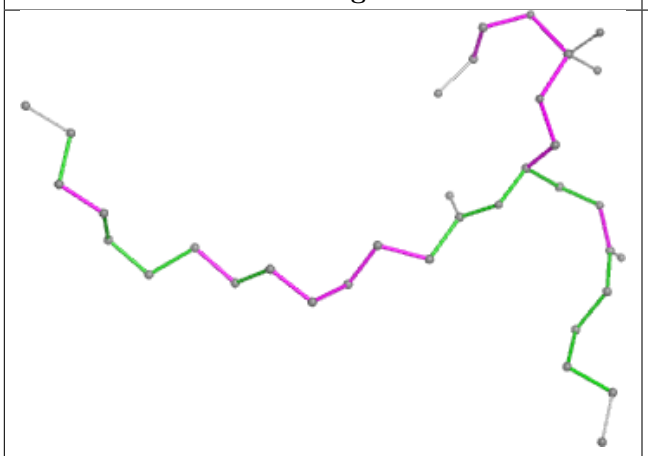
Ligand 3PE d 101



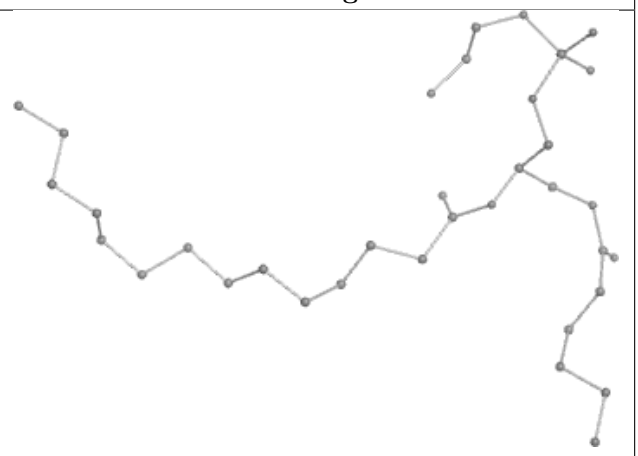
Bond lengths



Bond angles

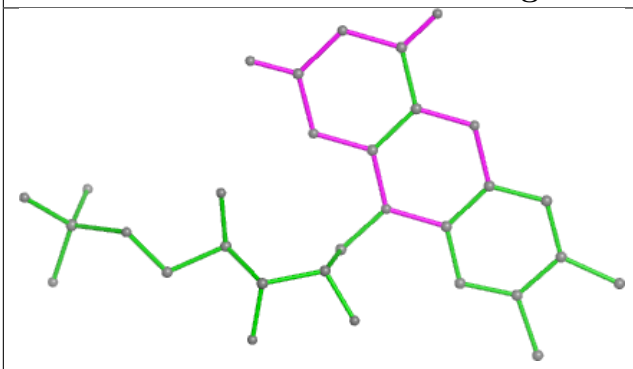


Torsions

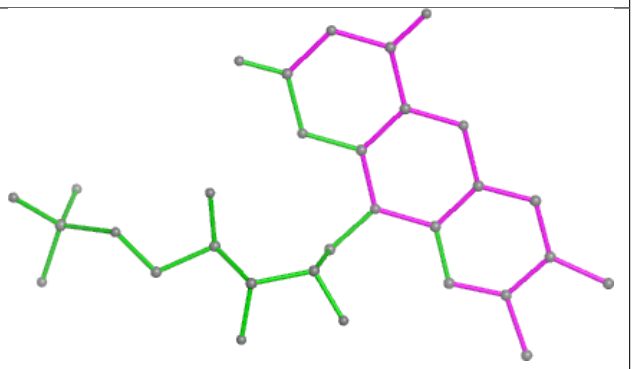


Rings

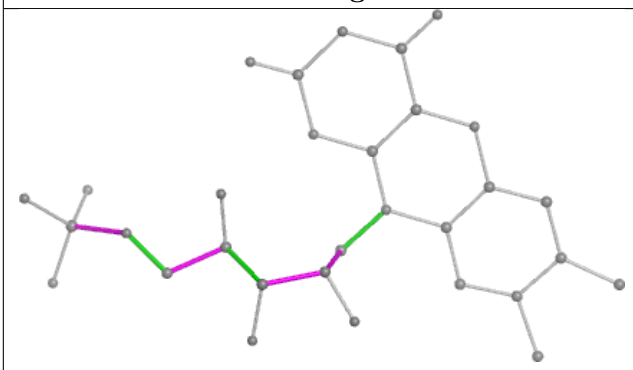
Ligand FMN F 502



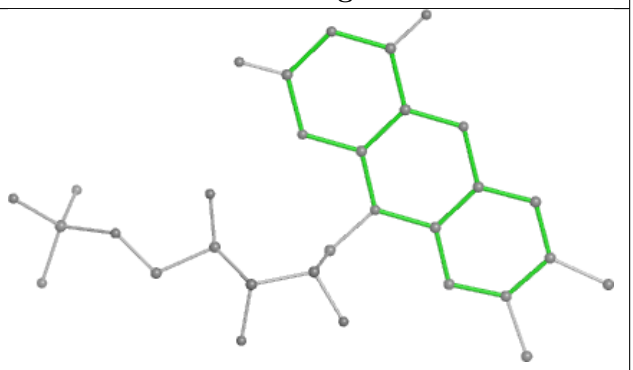
Bond lengths



Bond angles

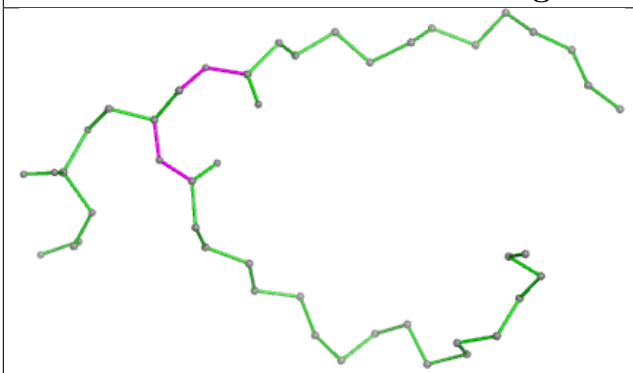


Torsions

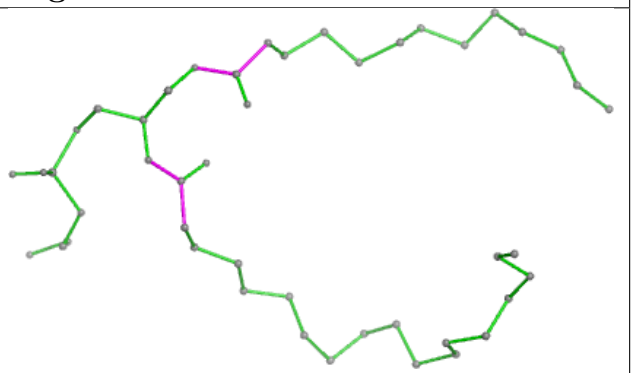


Rings

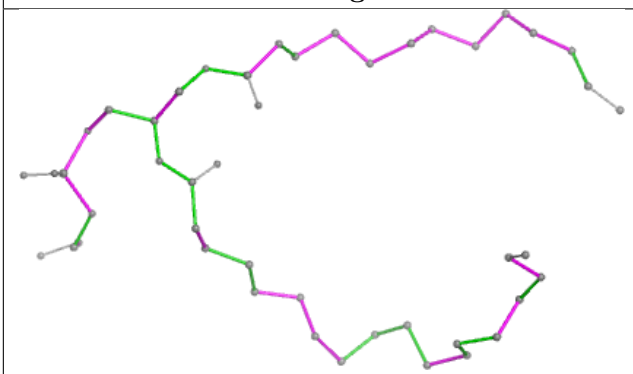
Ligand 3PE g 301



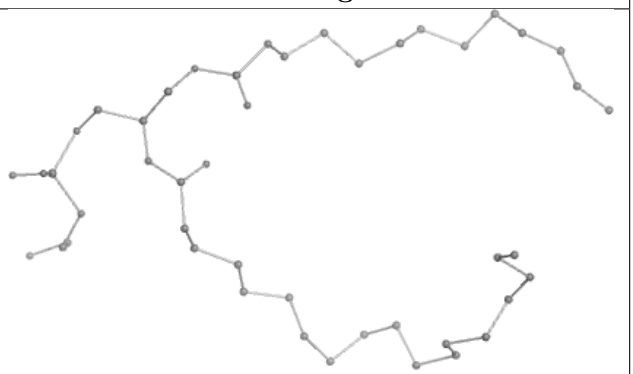
Bond lengths



Bond angles

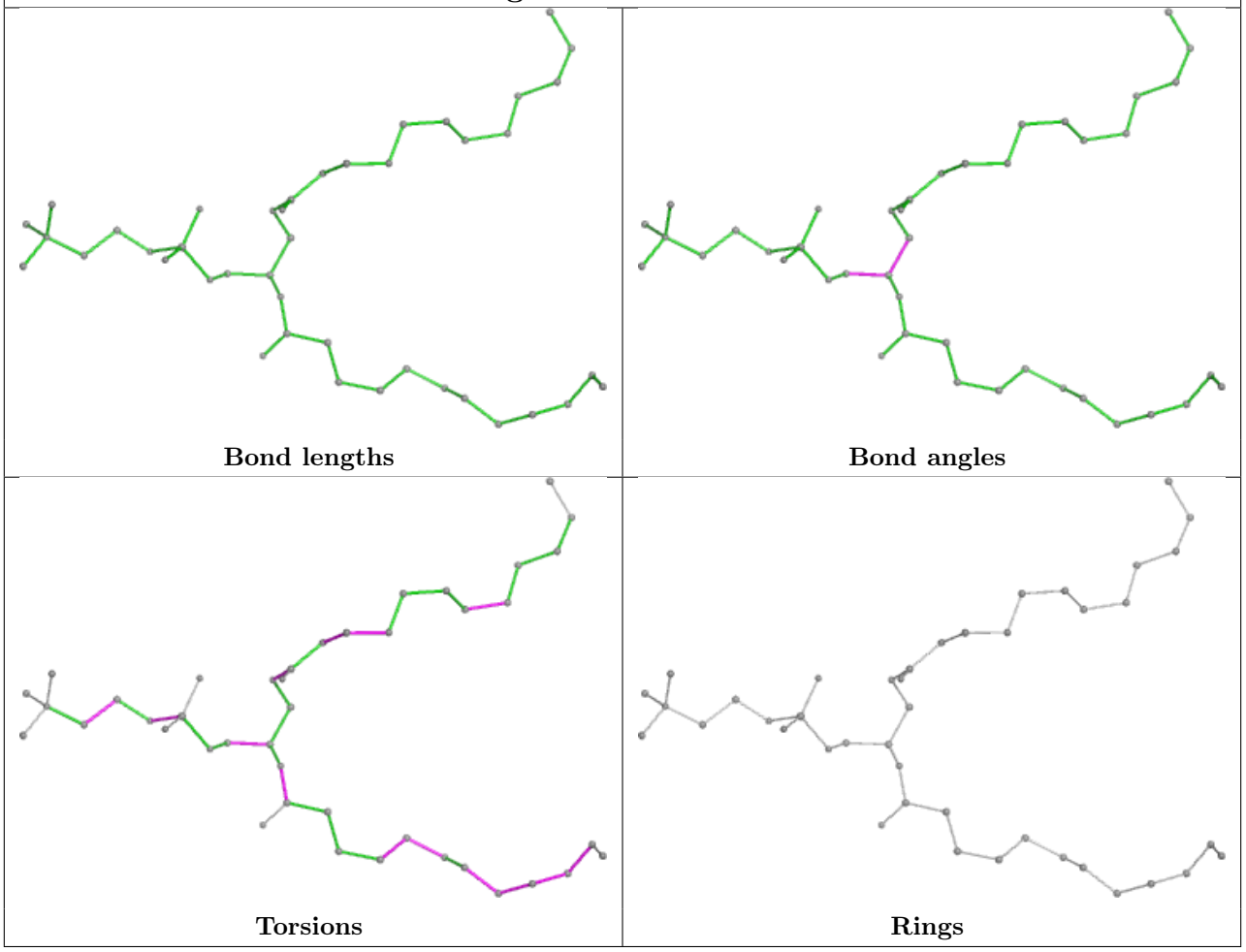


Torsions

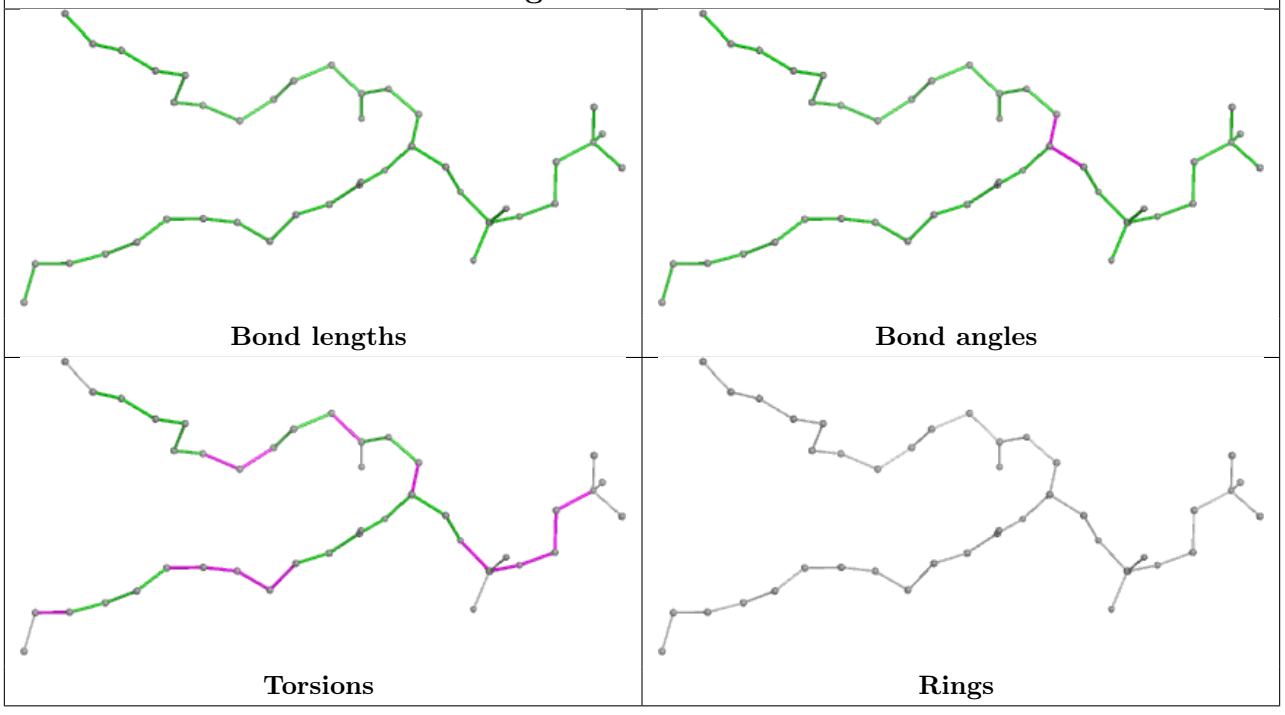


Rings

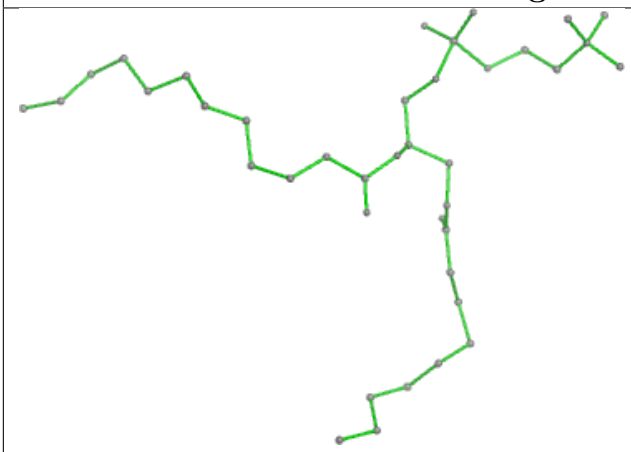
Ligand PLC M 501



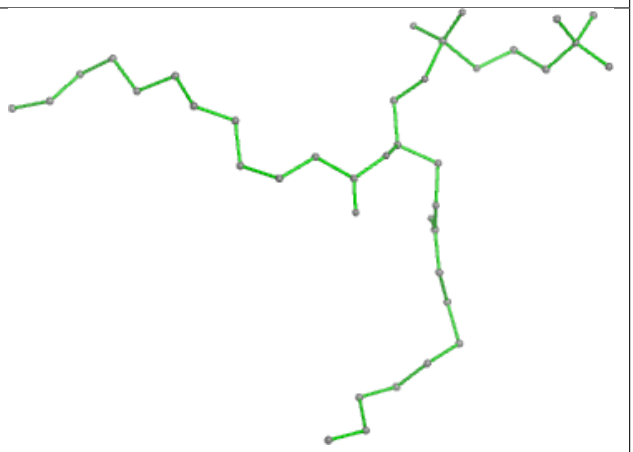
Ligand PLC N 603



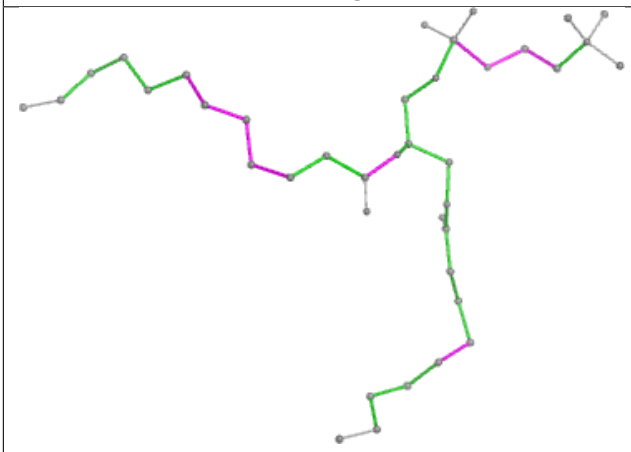
Ligand PLC h 201



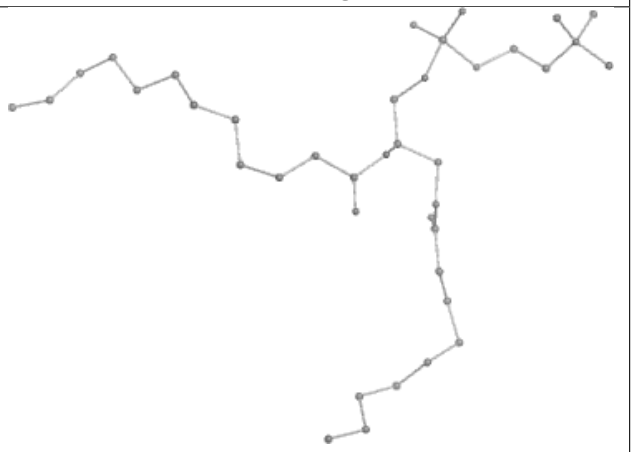
Bond lengths



Bond angles

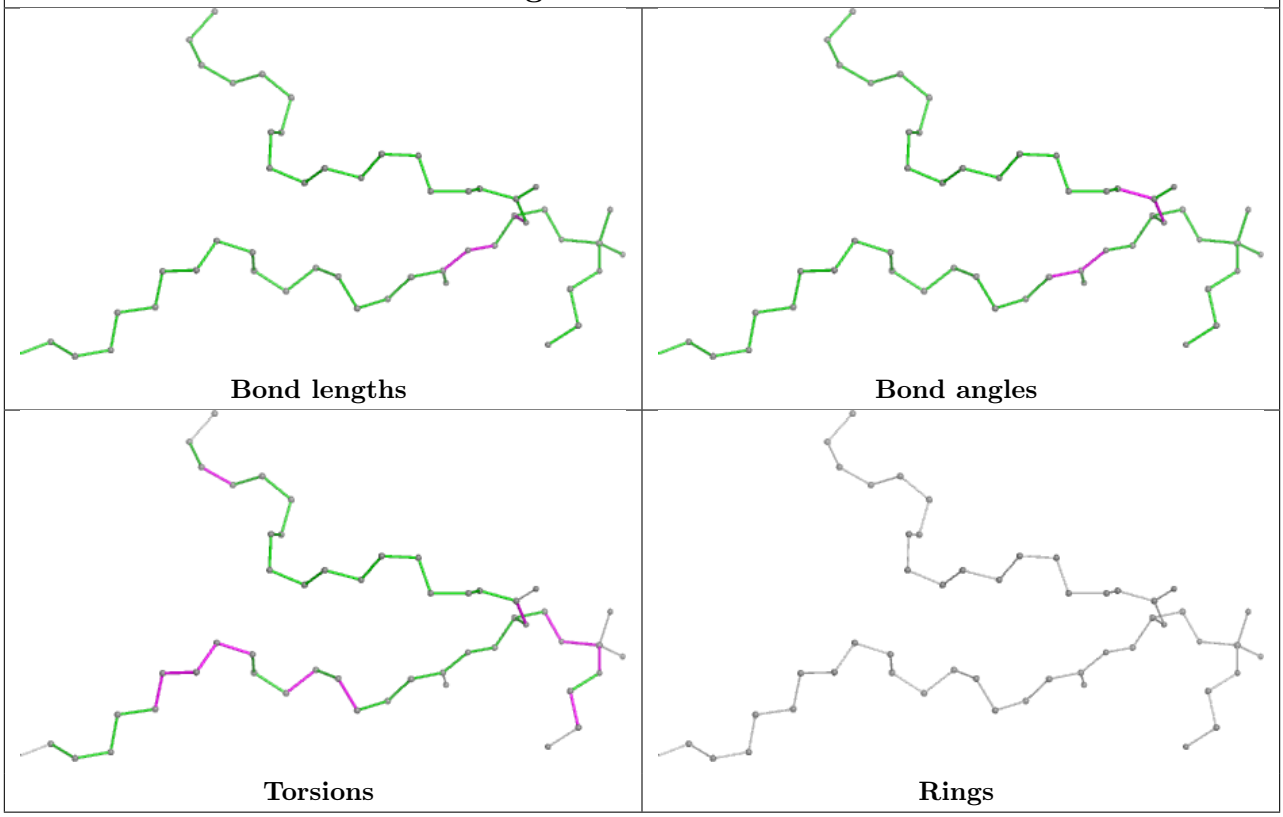


Torsions

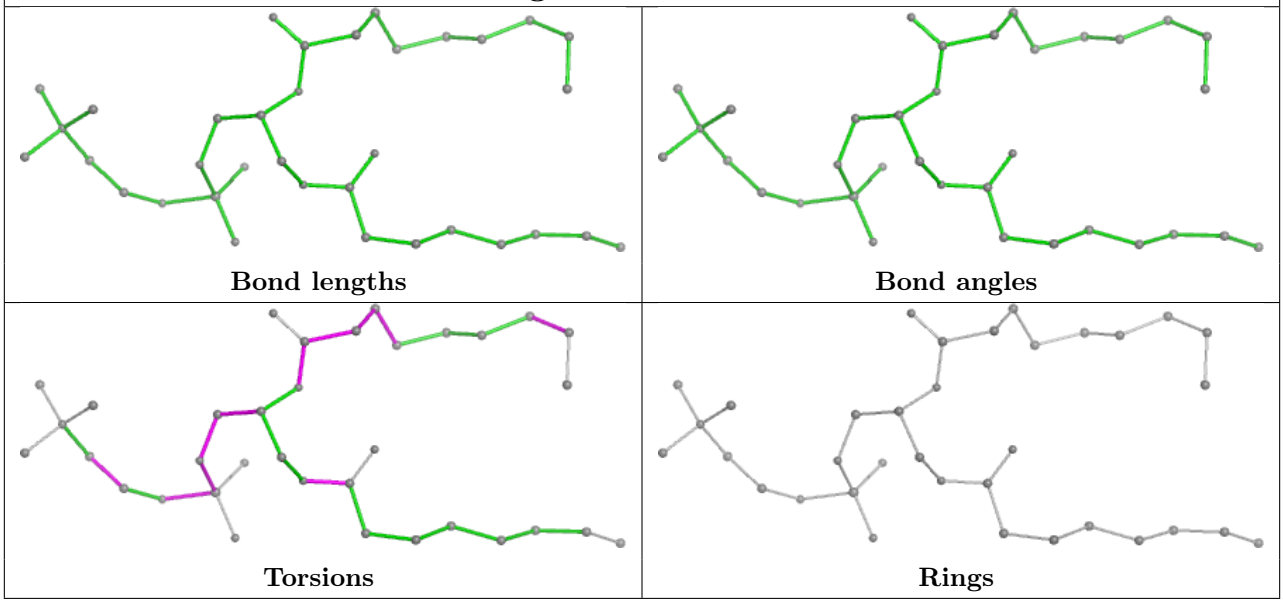


Rings

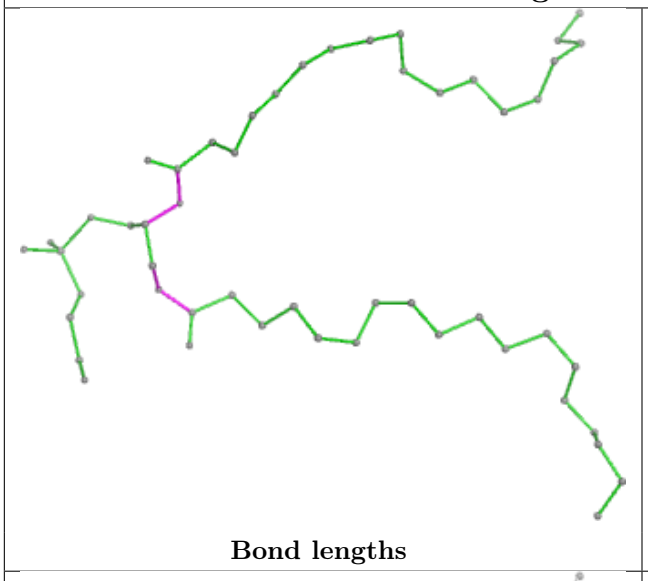
Ligand 3PE M 504



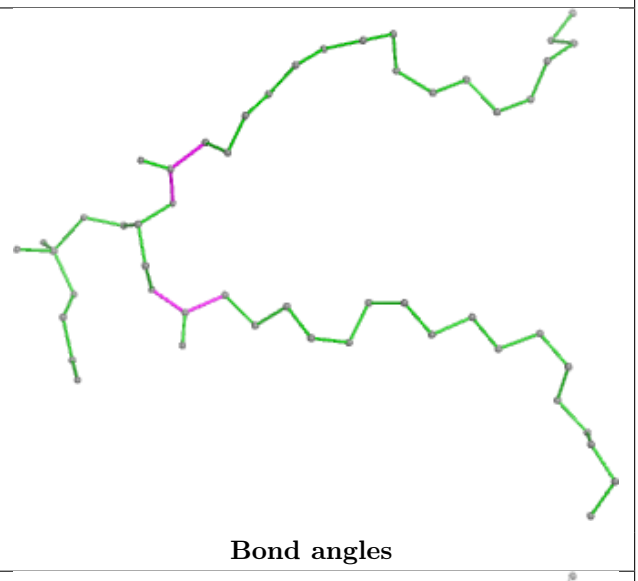
Ligand PLC L 701



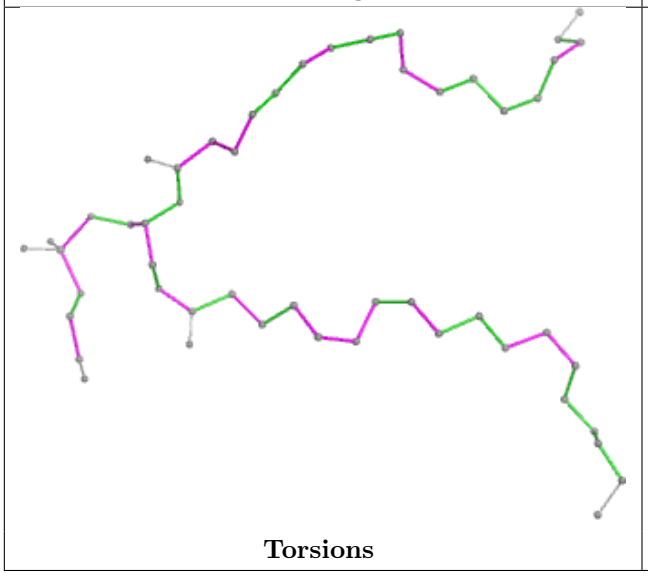
Ligand 3PE L 704



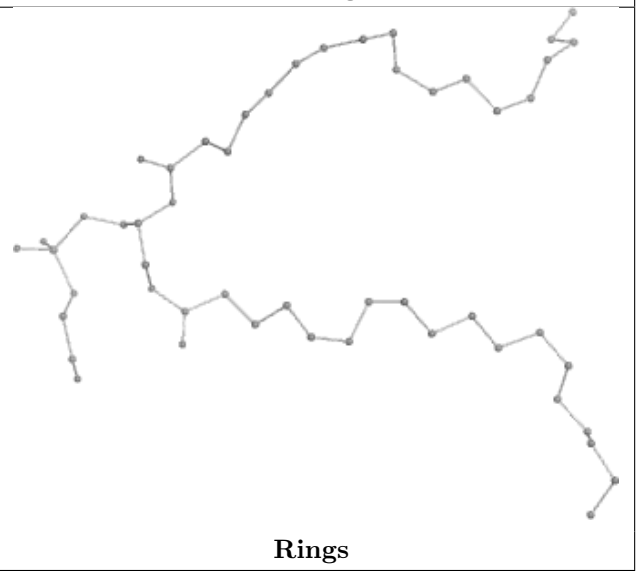
Bond lengths



Bond angles

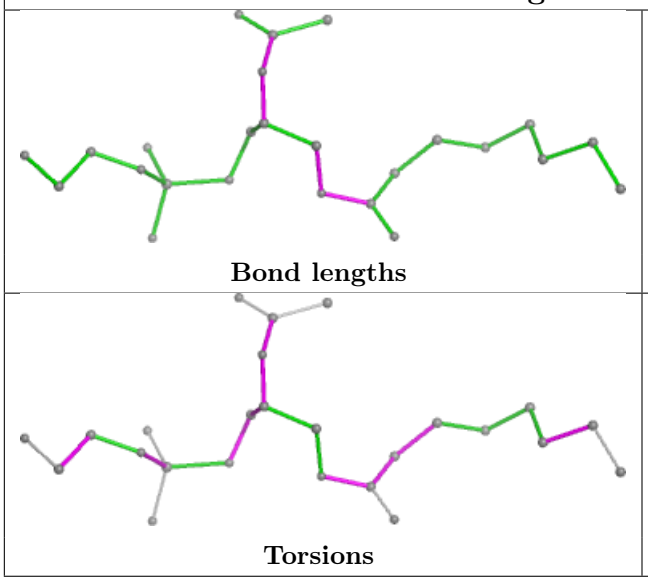


Torsions

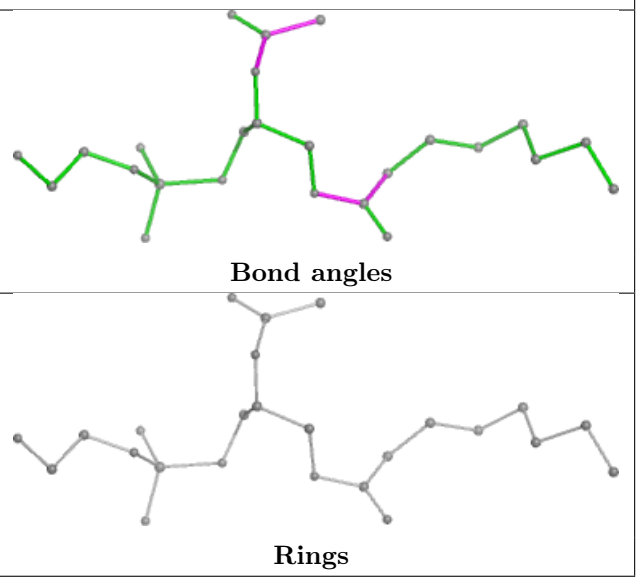


Rings

Ligand 3PE m 703



Bond lengths

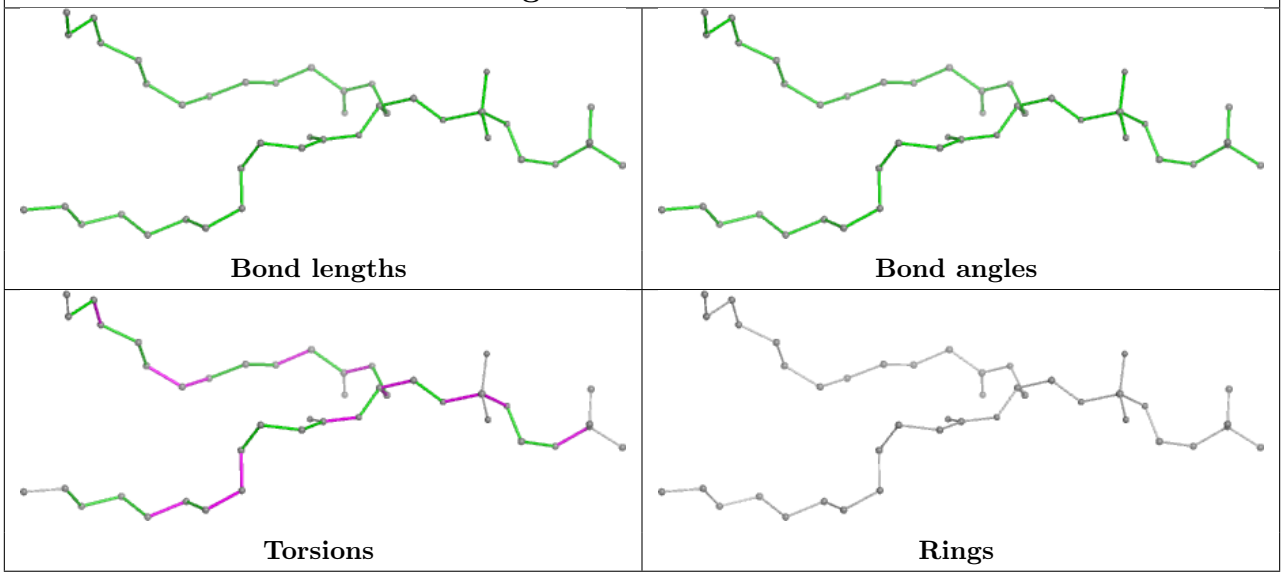


Bond angles

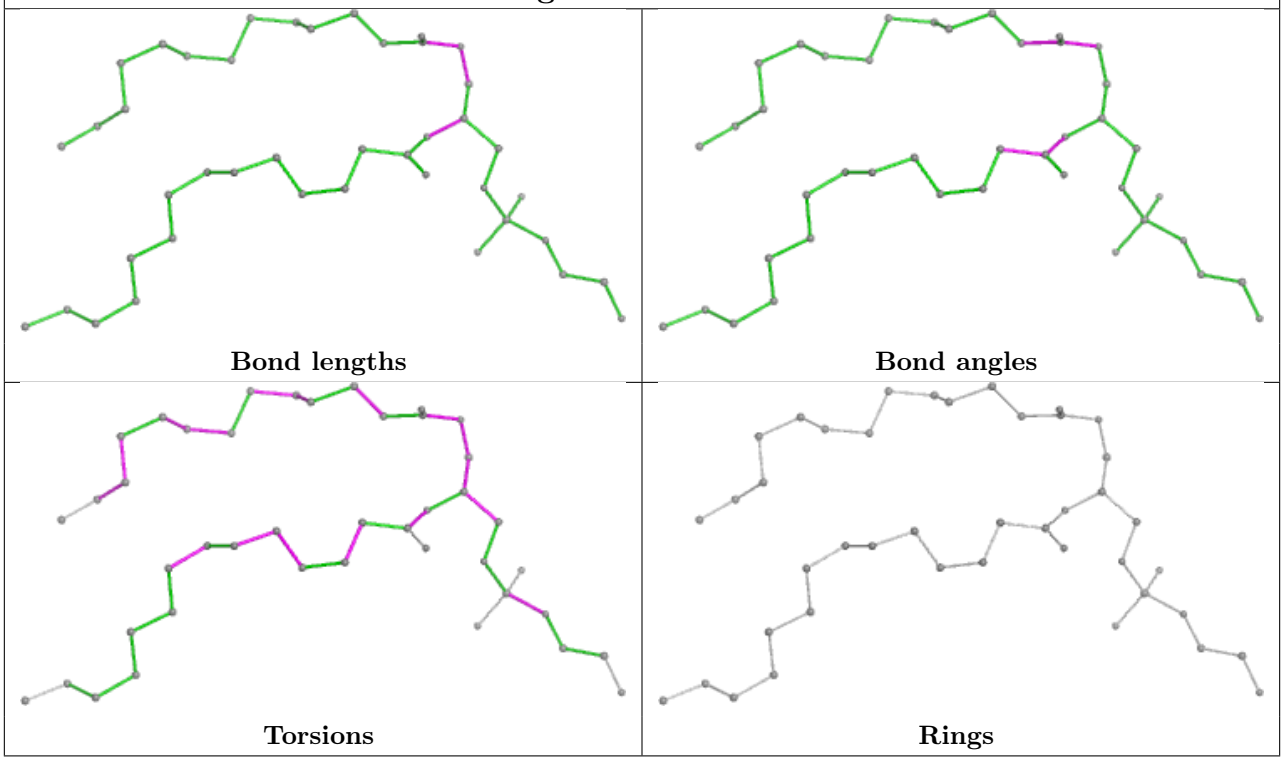
Torsions

Rings

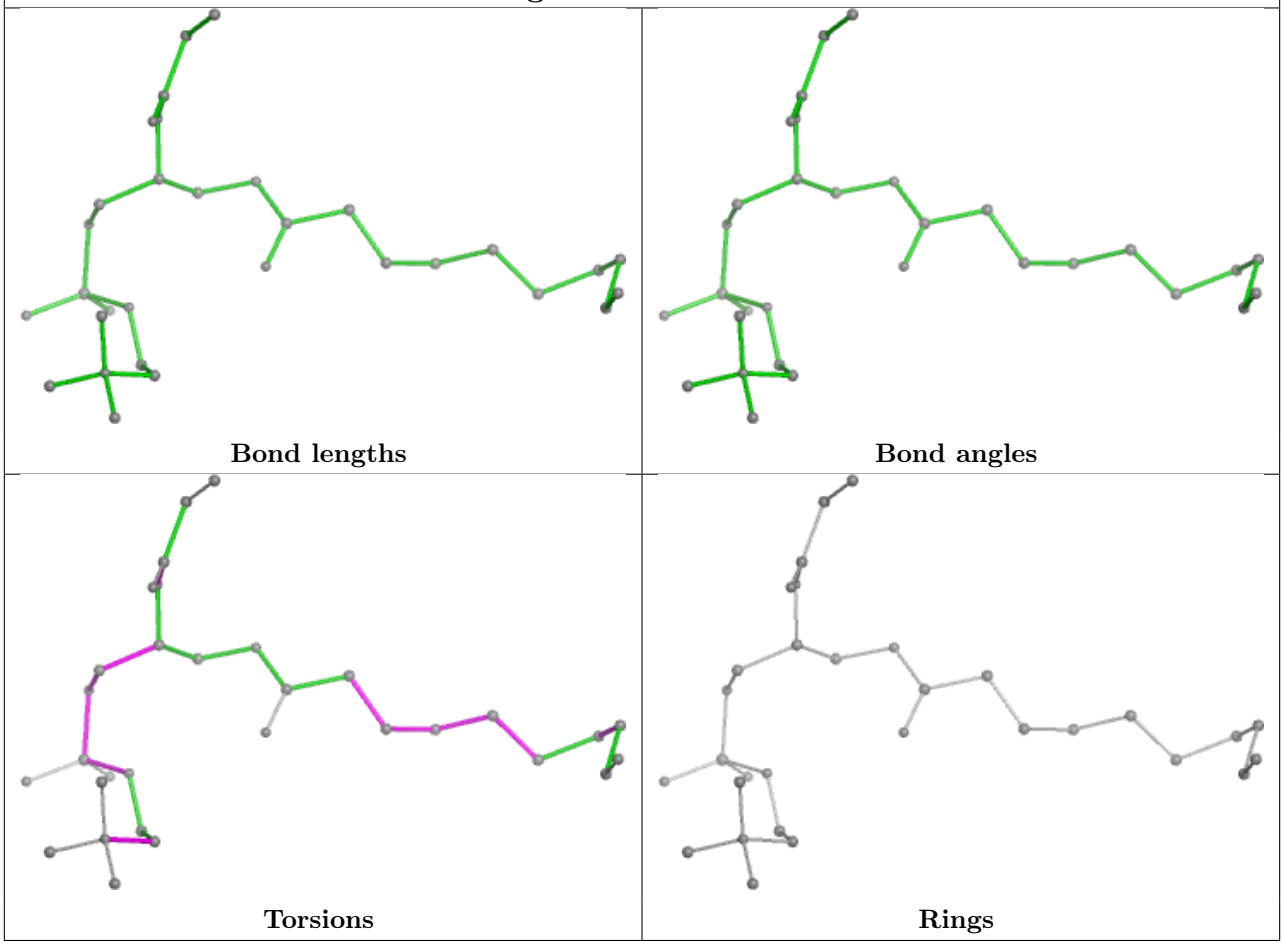
Ligand PLC M 502



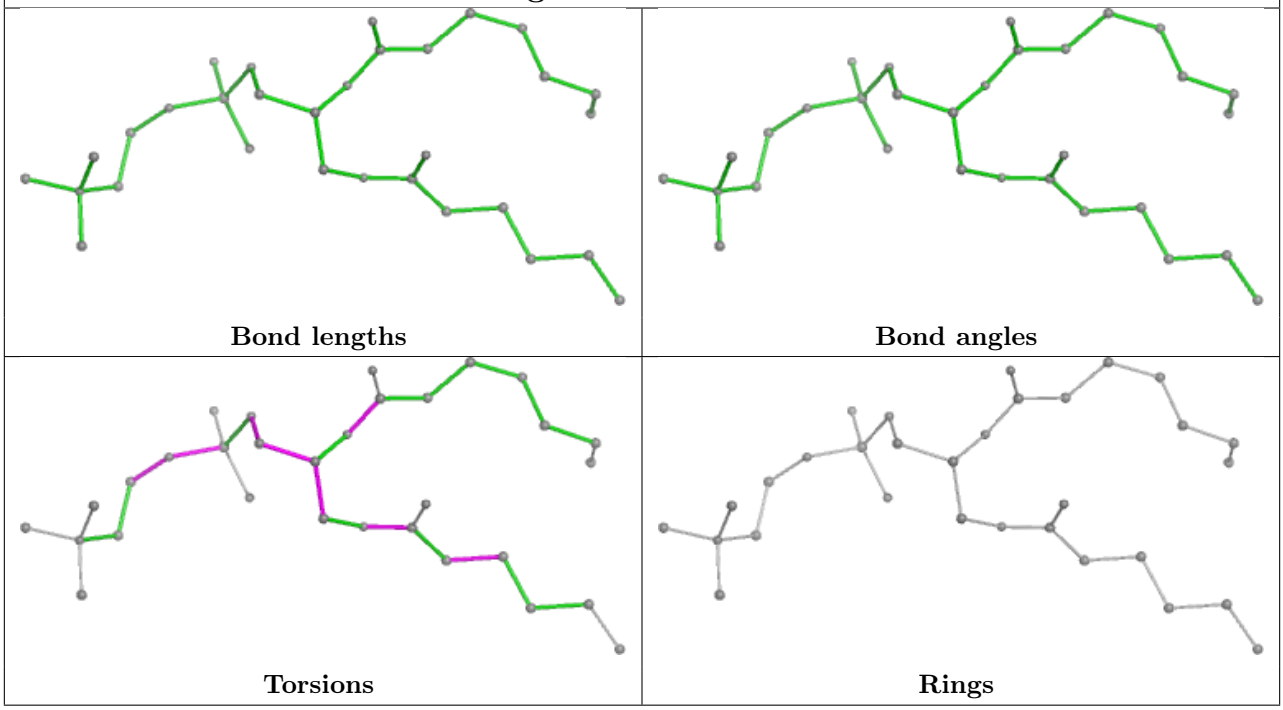
Ligand 3PE l 201



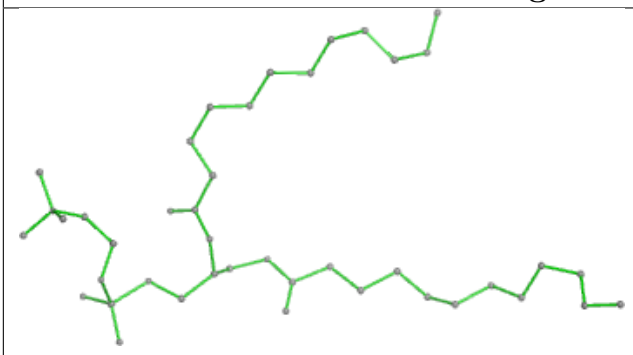
Ligand PLC B 302



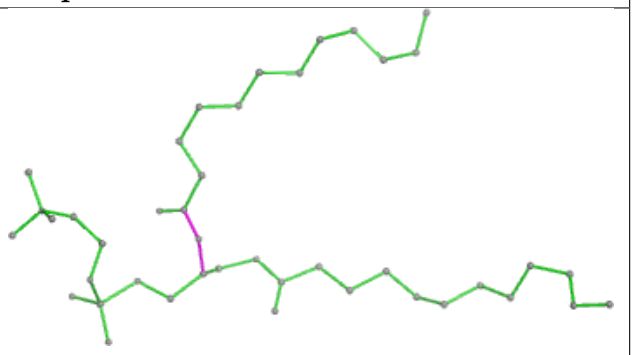
Ligand PLC P 502



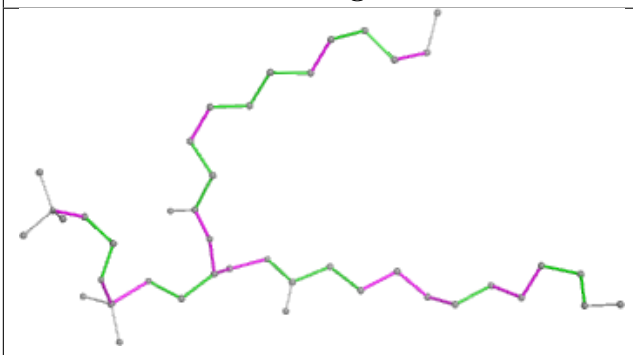
Ligand PLC q 402



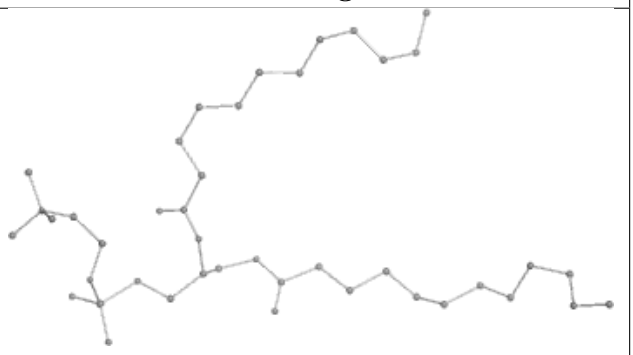
Bond lengths



Bond angles

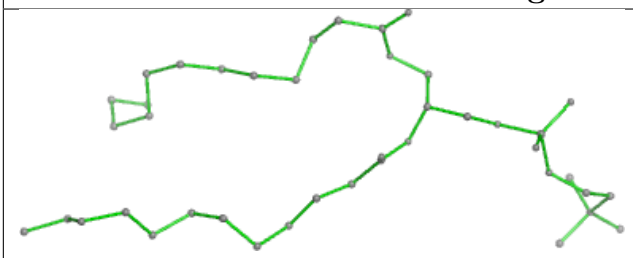


Torsions

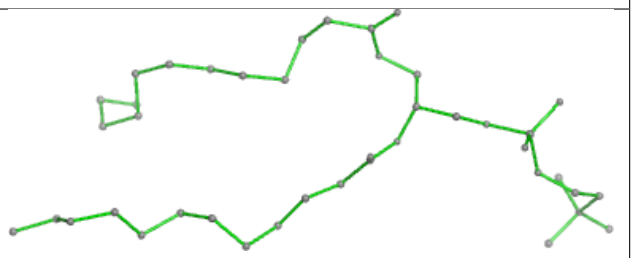


Rings

Ligand PLC Z 201

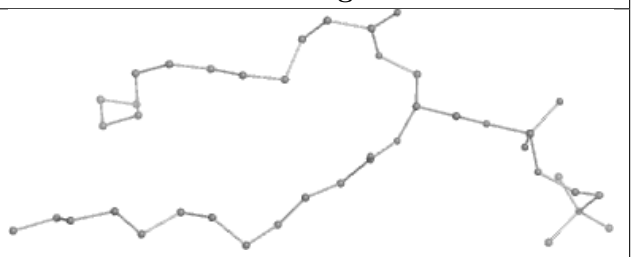


Bond lengths



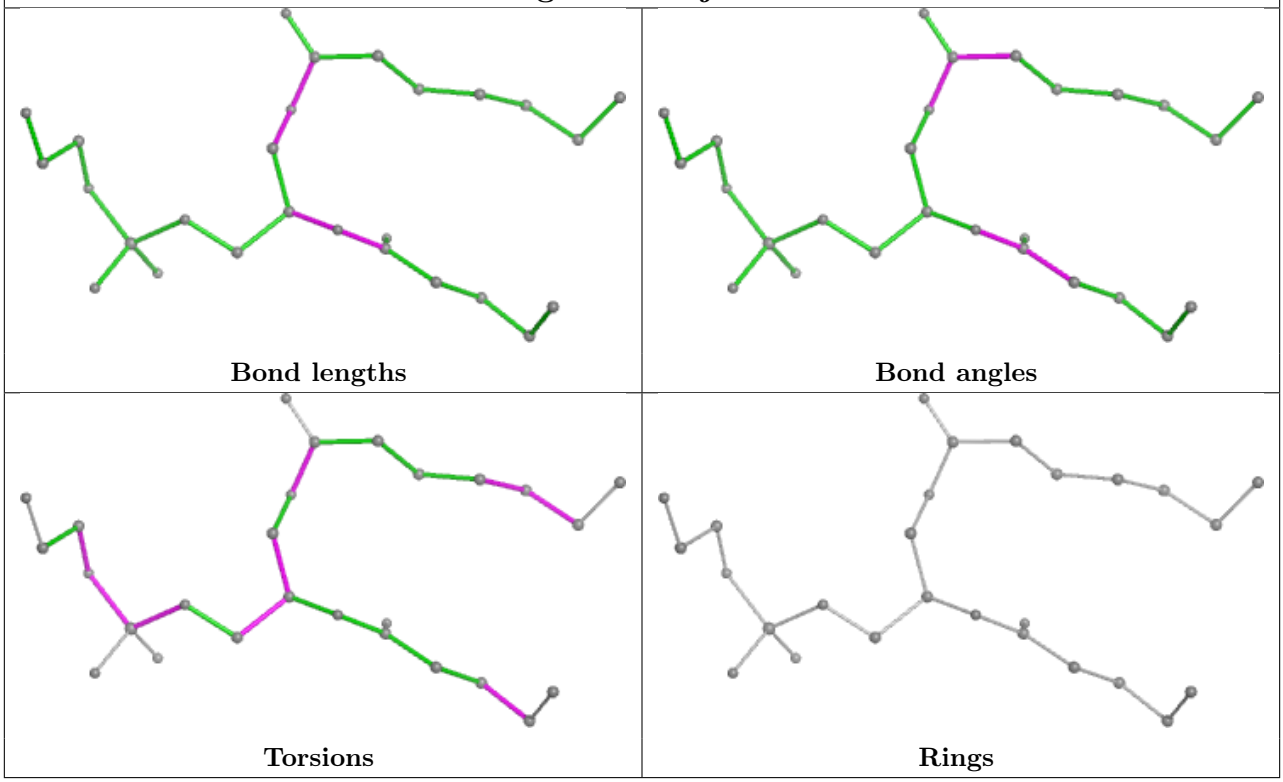
Bond angles

Torsions

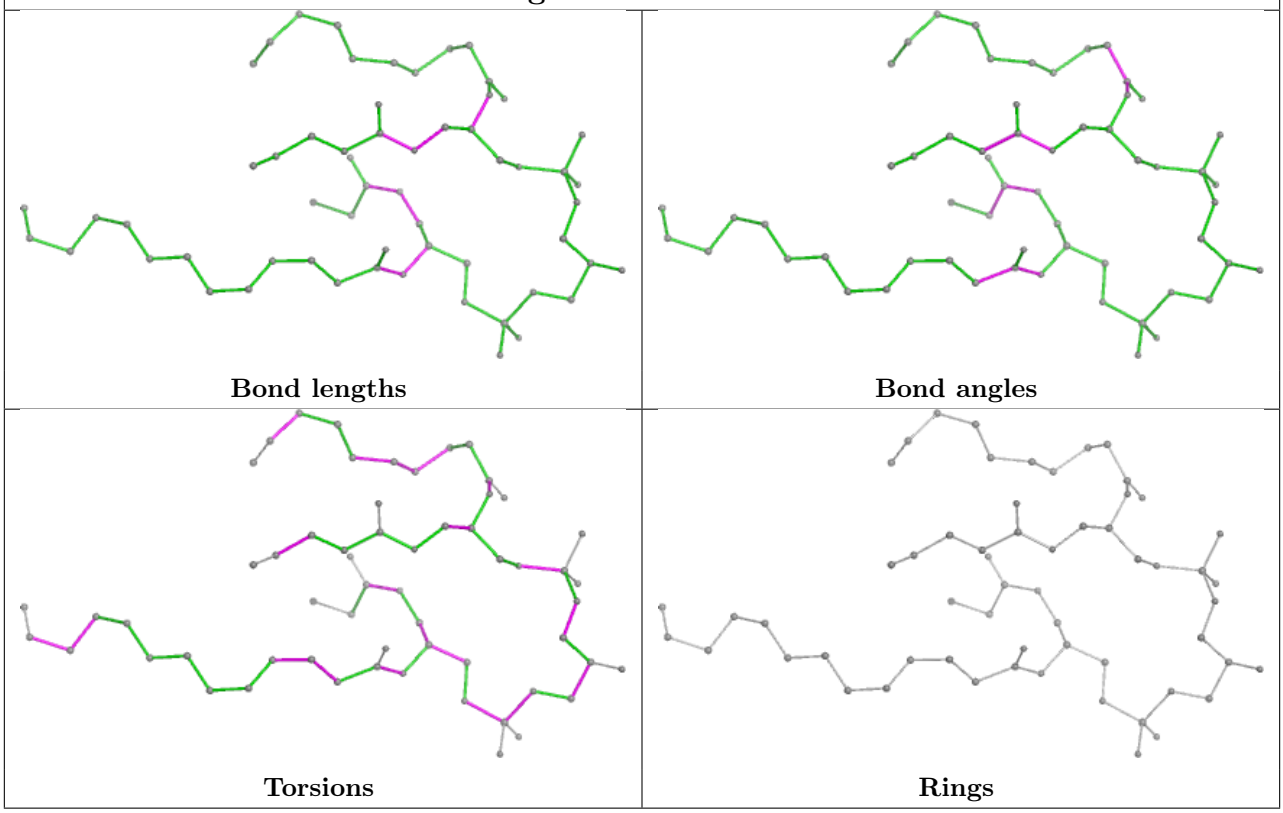


Rings

Ligand 3PE j 101



Ligand CDL b 103



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

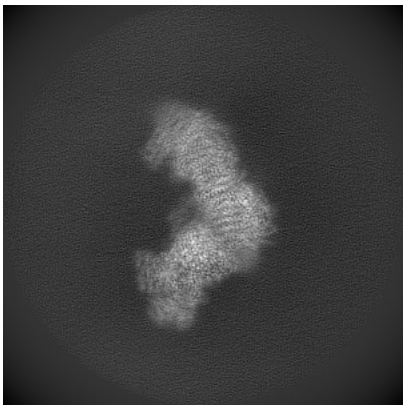
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-52876. These allow visual inspection of the internal detail of the map and identification of artifacts.

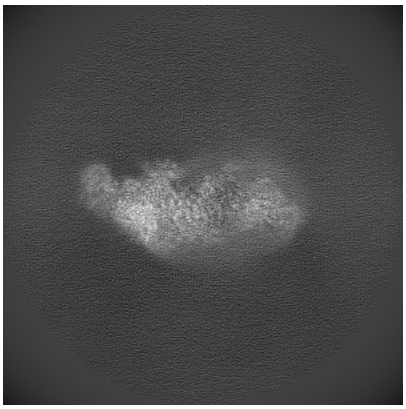
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

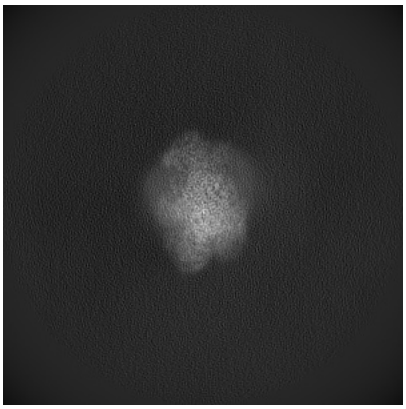
6.1.1 Primary map



X

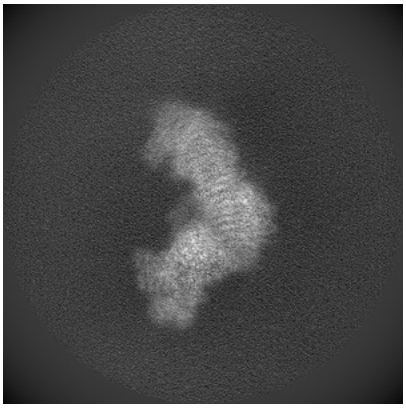


Y

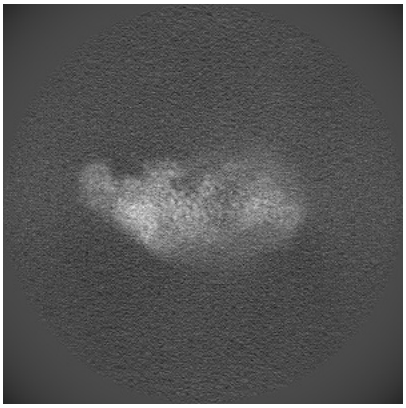


Z

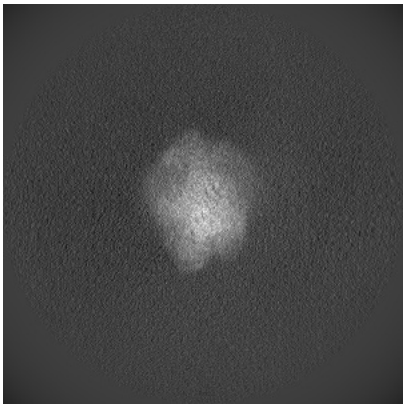
6.1.2 Raw map



X



Y

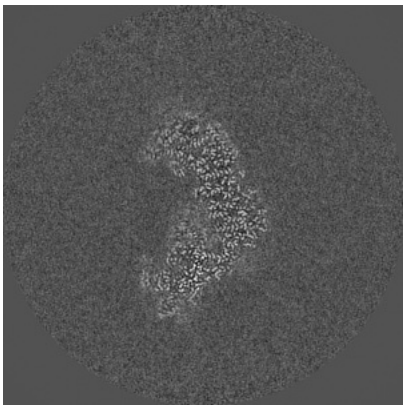


Z

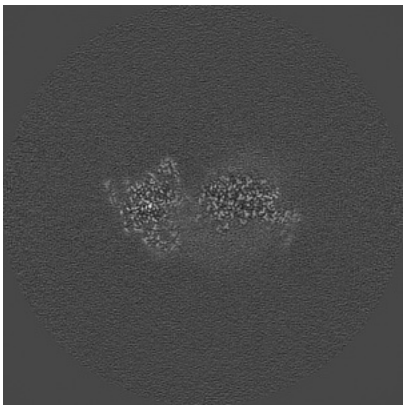
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

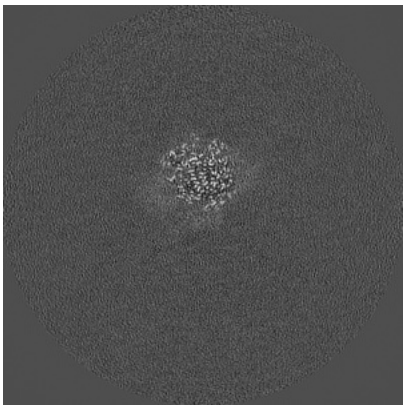
6.2.1 Primary map



X Index: 270

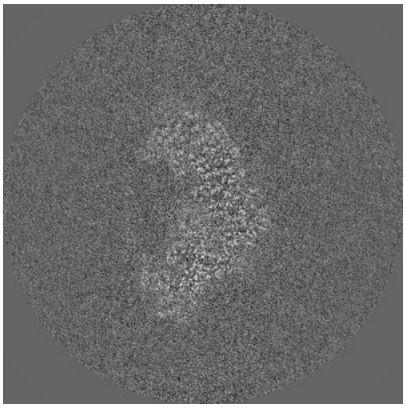


Y Index: 270

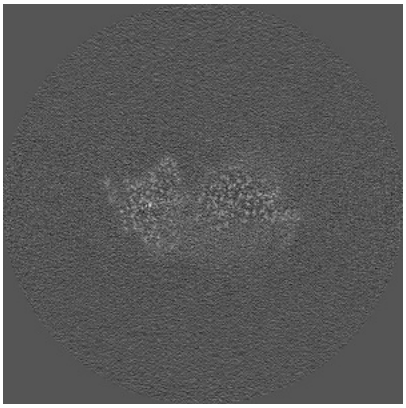


Z Index: 270

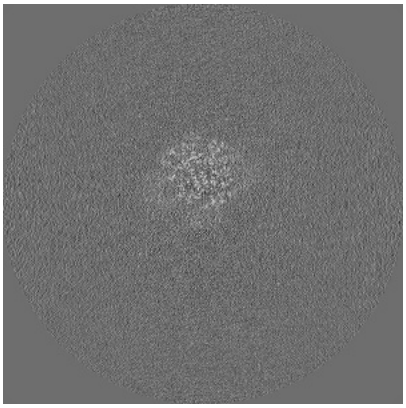
6.2.2 Raw map



X Index: 270



Y Index: 270

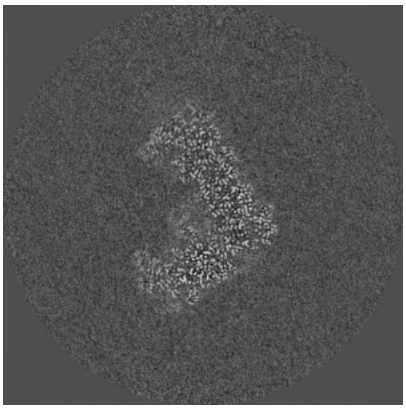


Z Index: 270

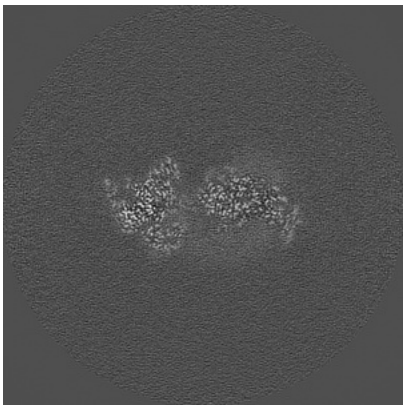
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

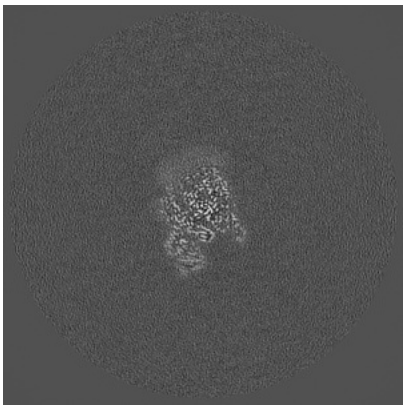
6.3.1 Primary map



X Index: 259

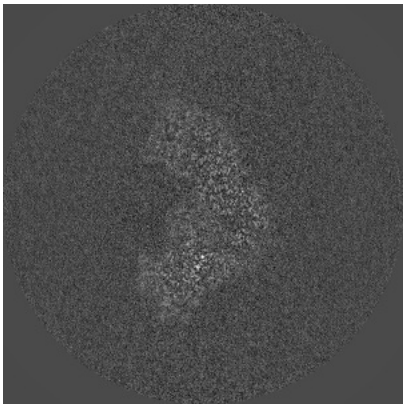


Y Index: 267

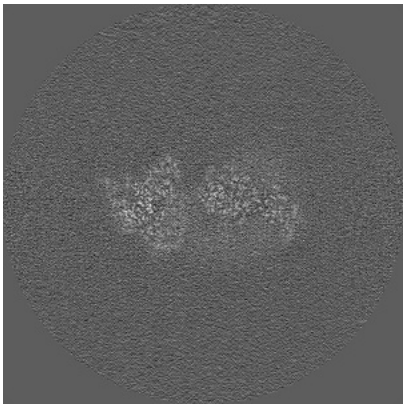


Z Index: 196

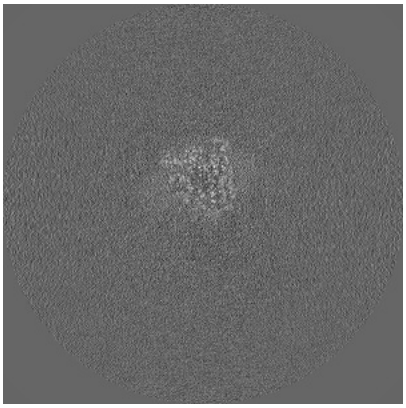
6.3.2 Raw map



X Index: 267



Y Index: 267

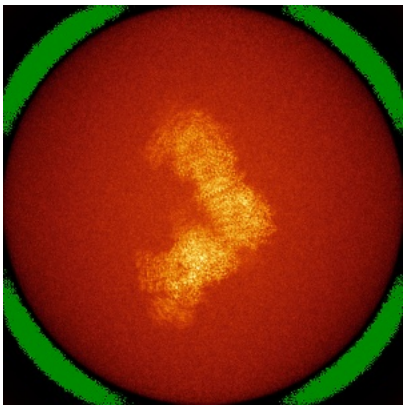


Z Index: 275

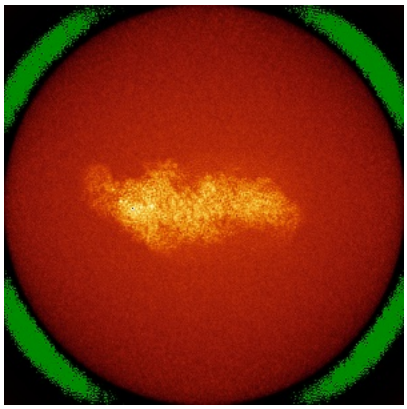
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

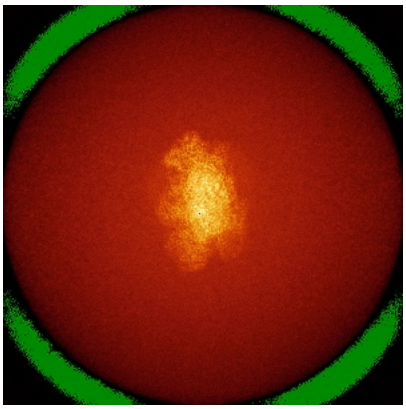
6.4.1 Primary map



X

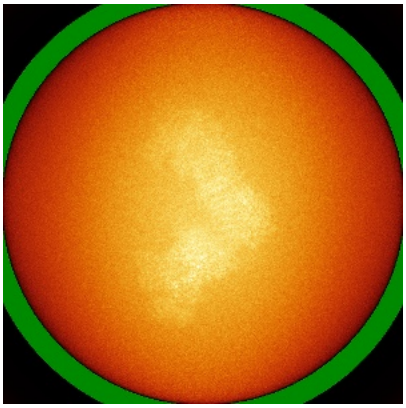


Y

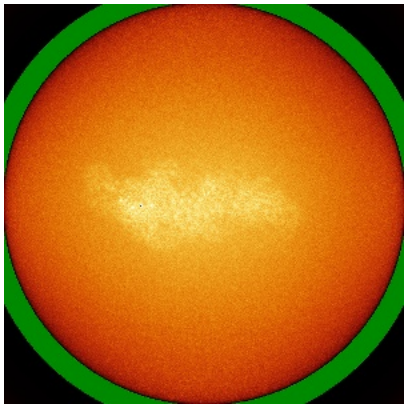


Z

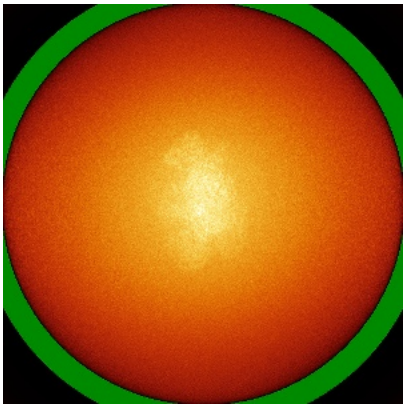
6.4.2 Raw map



X



Y

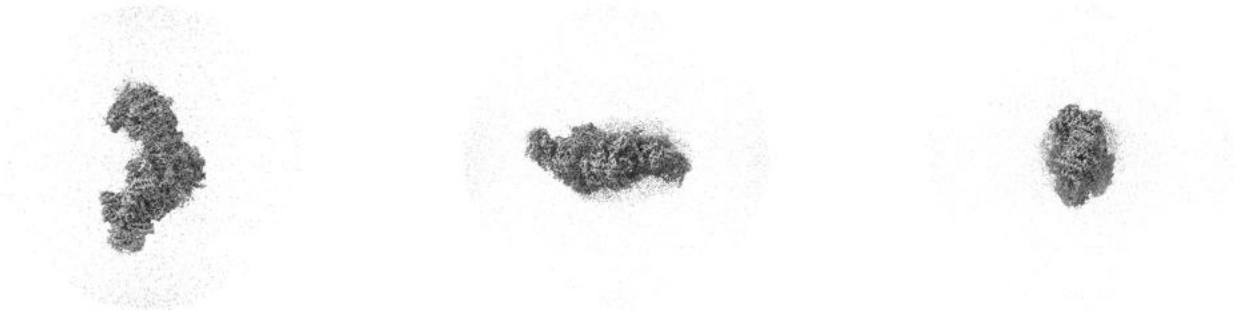


Z

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)

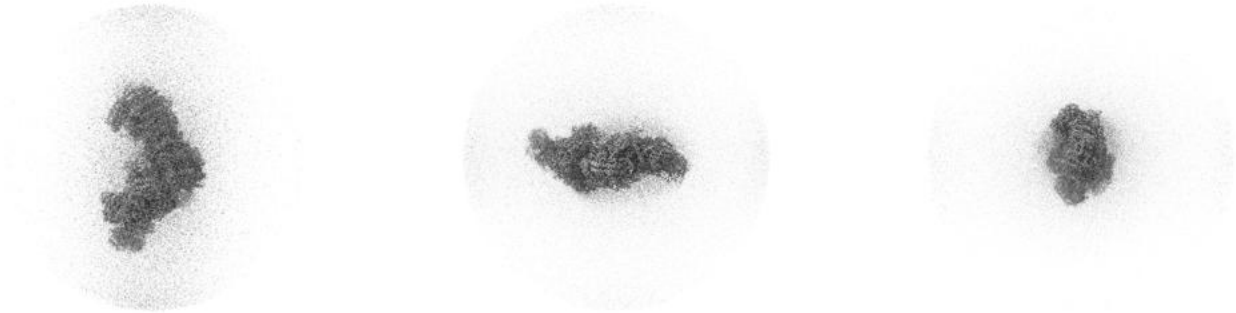
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.01. 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



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.

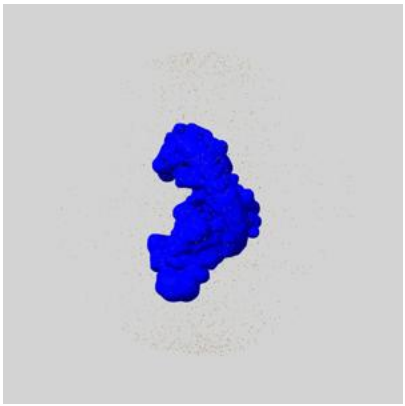
6.6 Mask visualisation

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

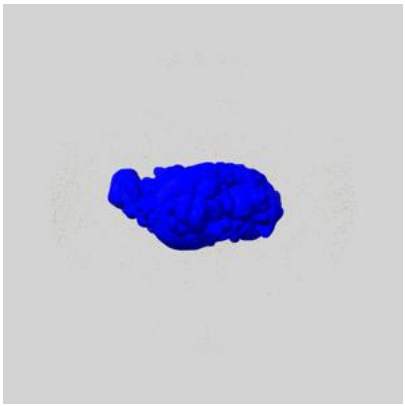
A mask typically either:

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

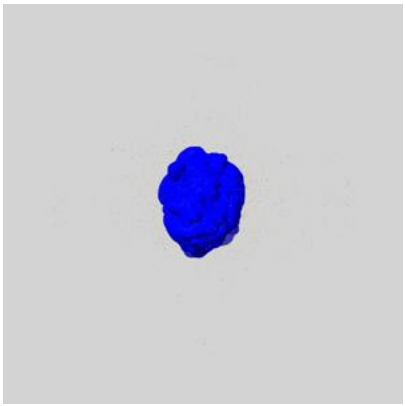
6.6.1 emd_52876_msk_1.map



X



Y

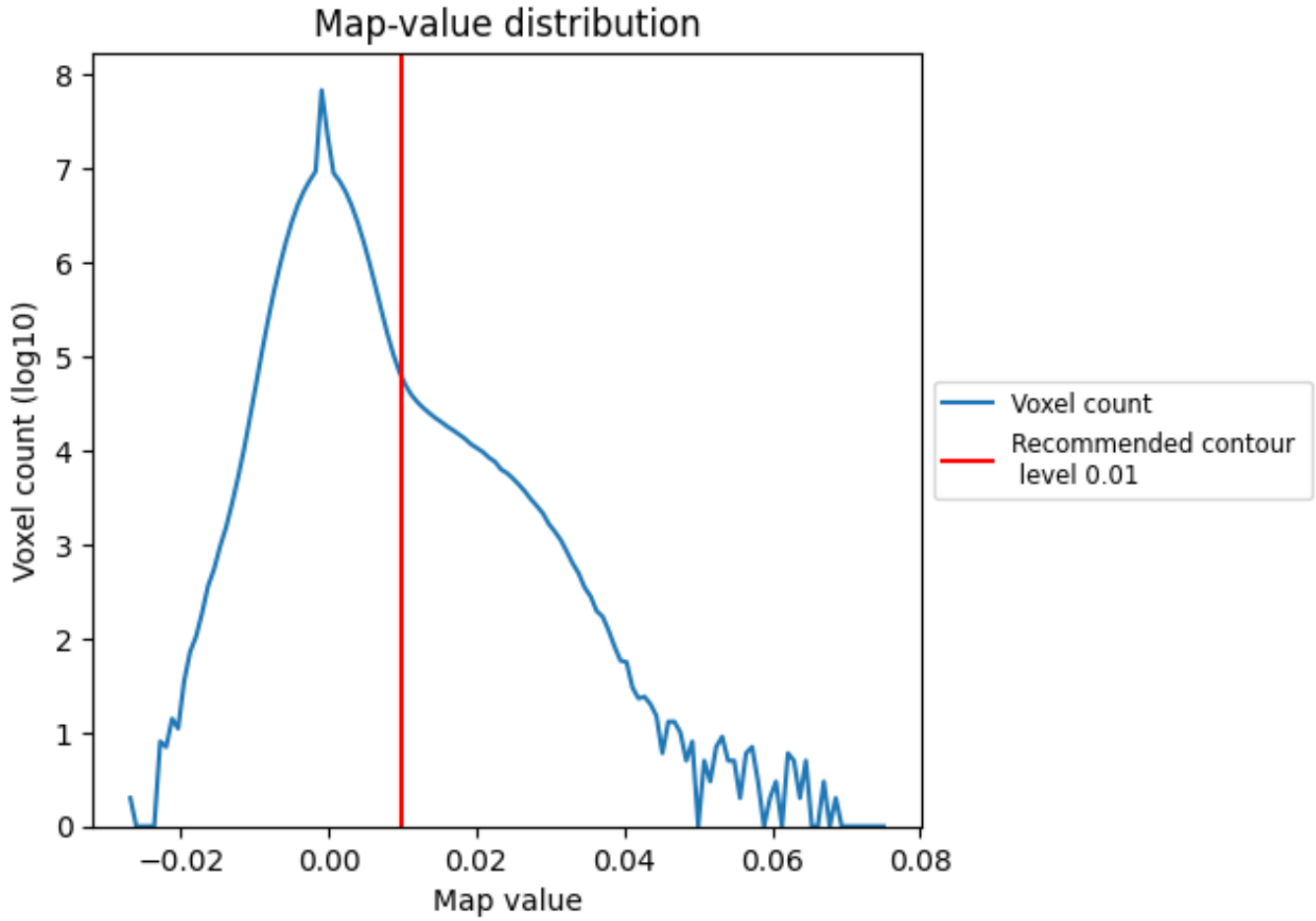


Z

7 Map analysis

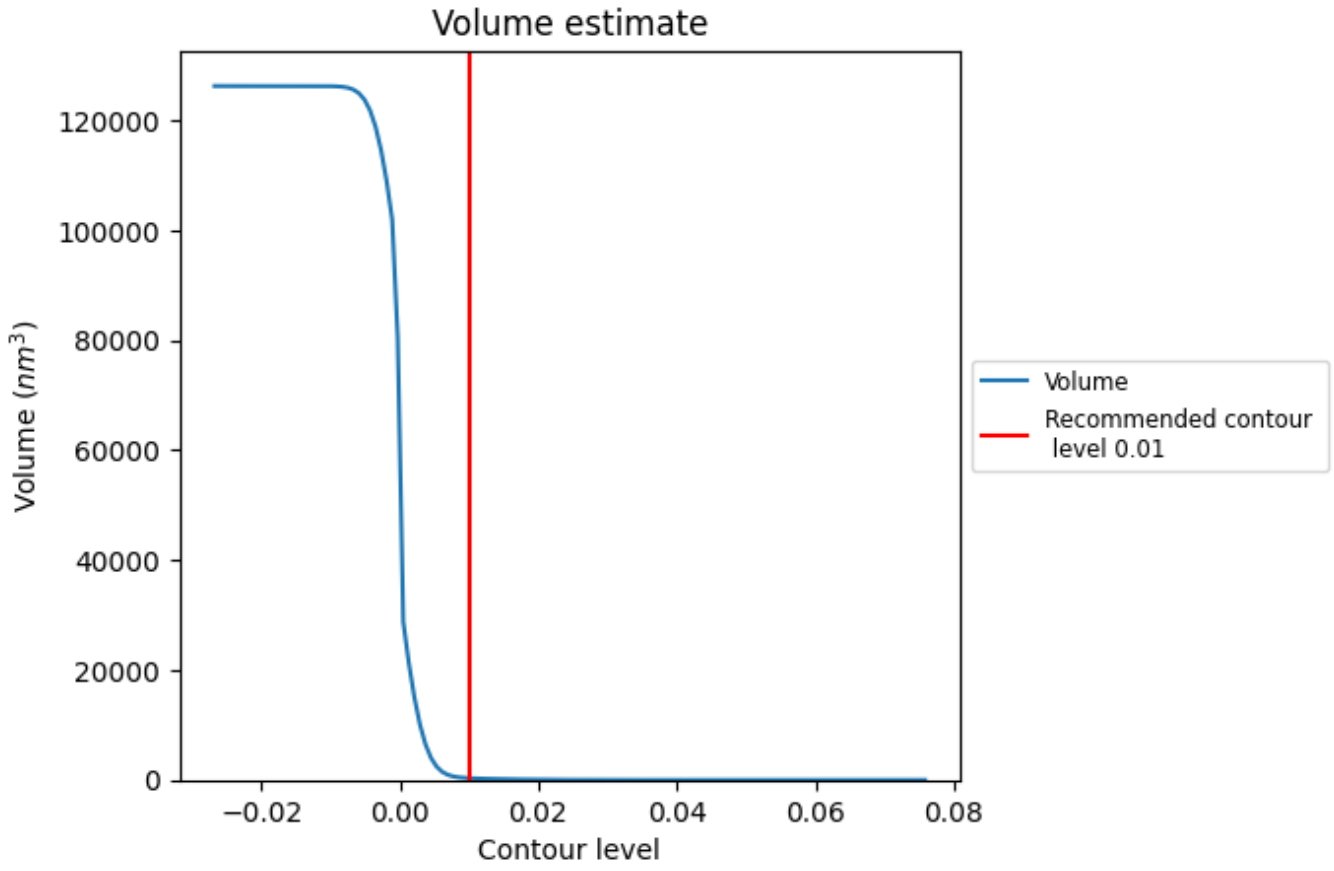
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

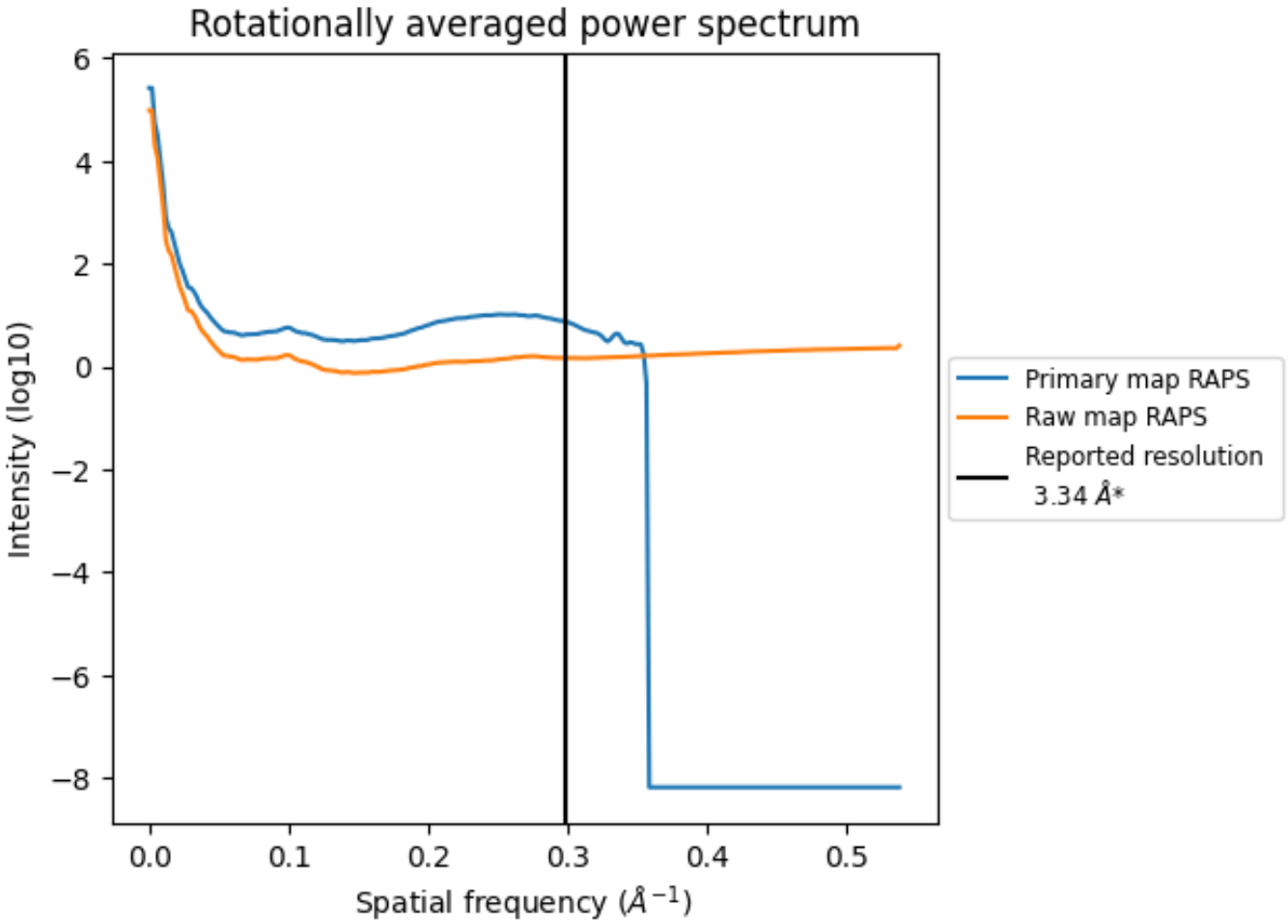
7.2 Volume estimate (i)



The volume at the recommended contour level is 323 nm^3; this corresponds to an approximate mass of 292 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)

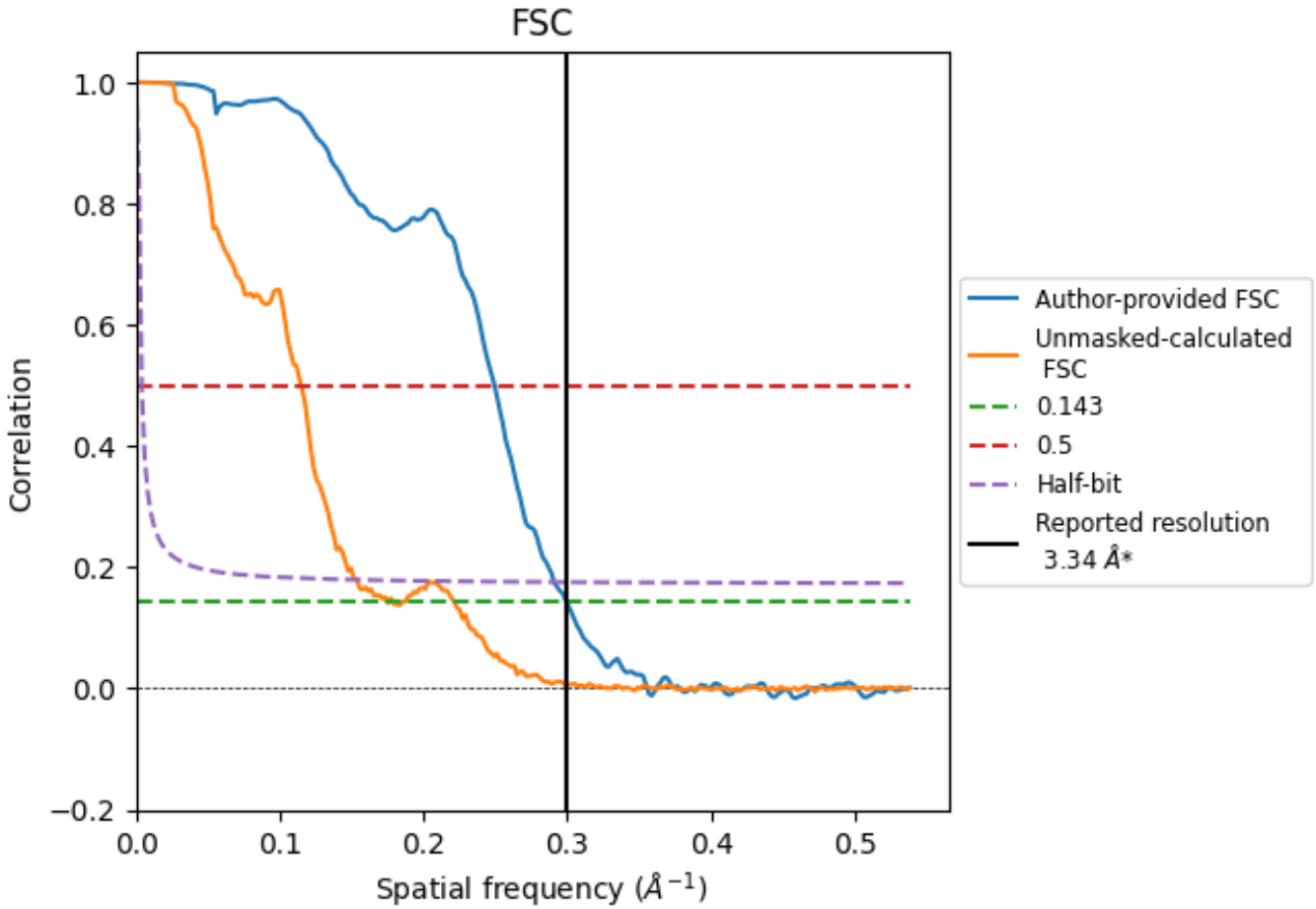


*Reported resolution corresponds to spatial frequency of 0.299 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.299 Å^{-1}

8.2 Resolution estimates (i)

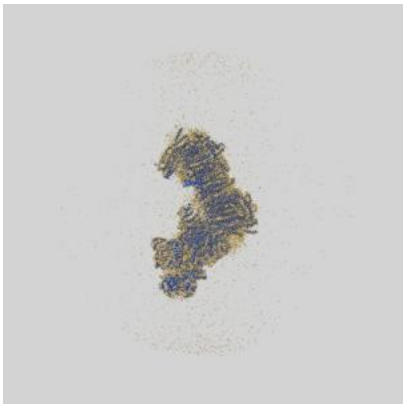
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.34	-	-
Author-provided FSC curve	3.34	4.01	3.44
Unmasked-calculated*	5.71	8.70	6.51

*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 5.71 differs from the reported value 3.34 by more than 10 %

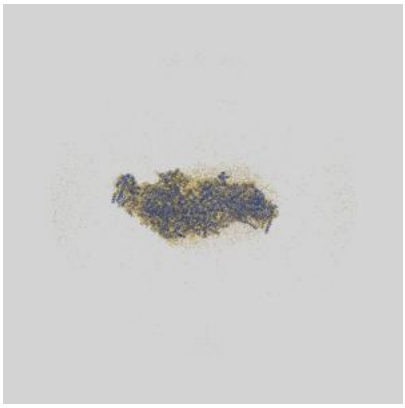
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-52876 and PDB model 9IHP. Per-residue inclusion information can be found in section 3 on page 20.

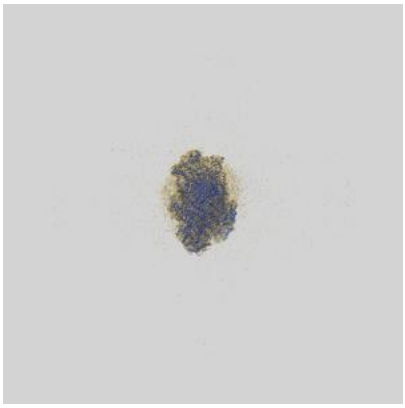
9.1 Map-model overlay



X



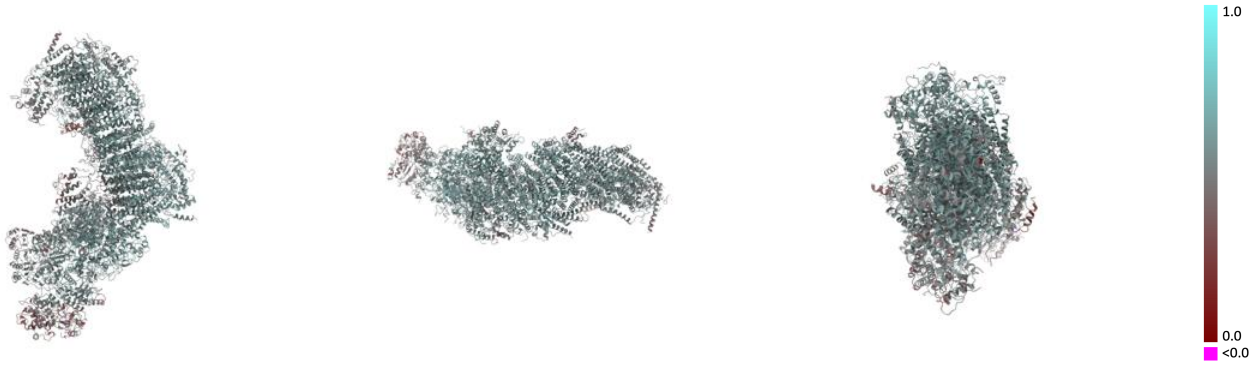
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.01 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.

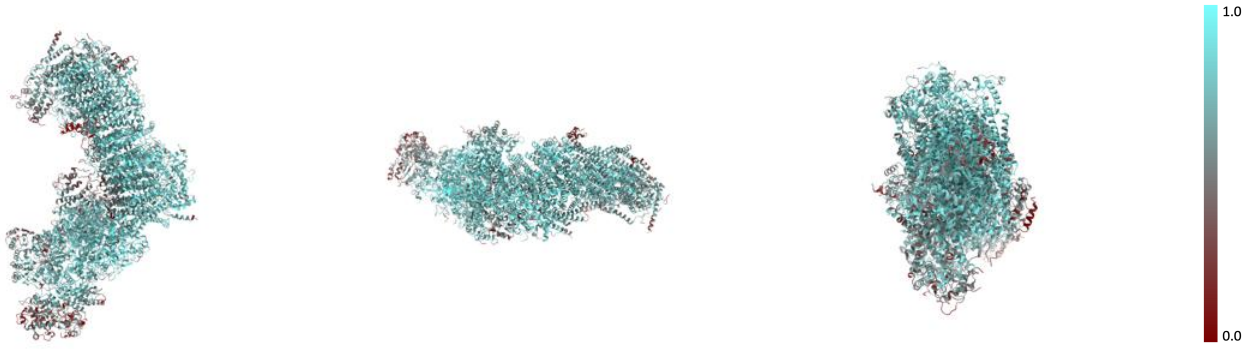
9.2 Q-score mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according 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.

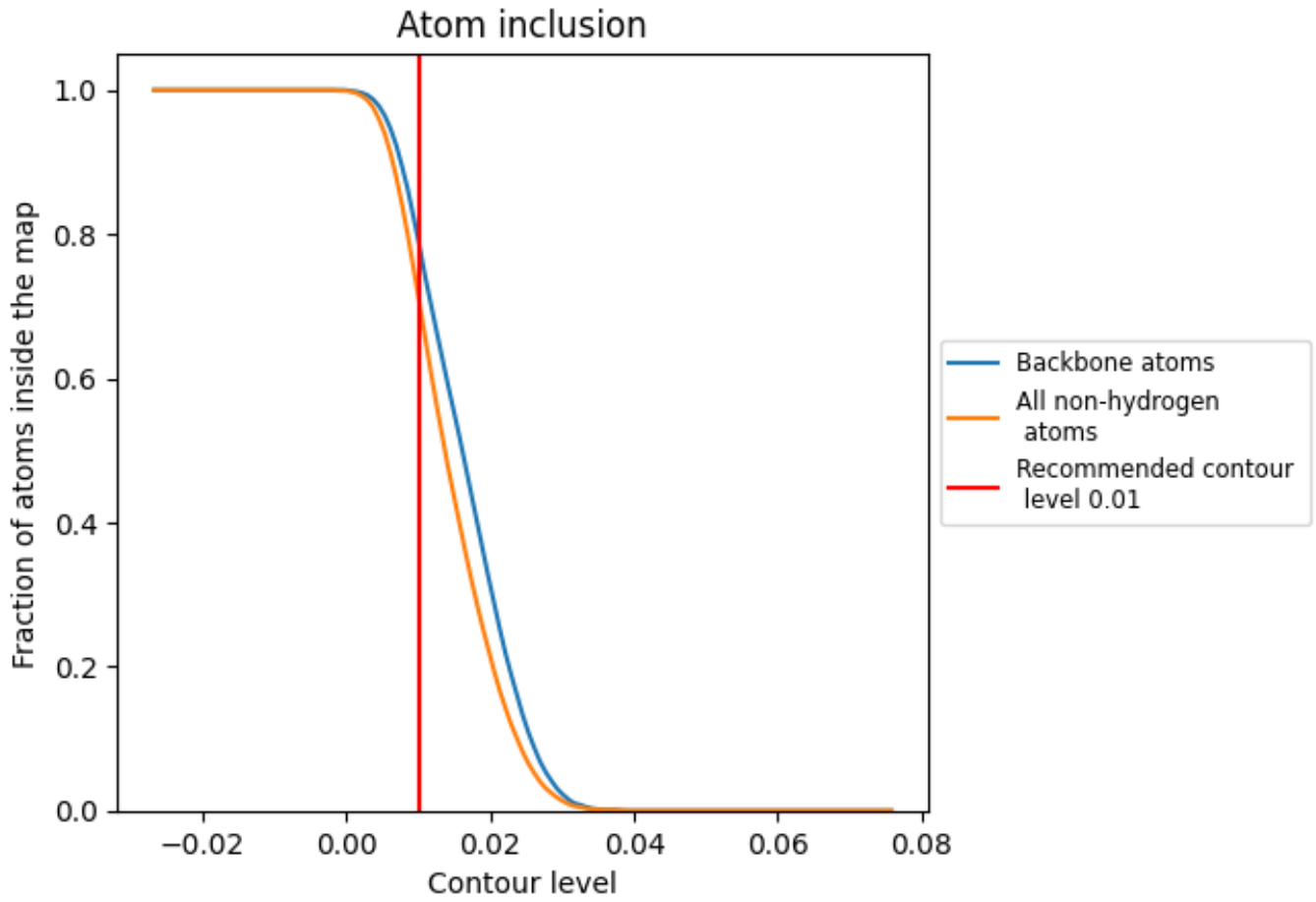
9.3 Atom inclusion mapped to coordinate model



X Y Z

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 (0.01).

9.4 Atom inclusion (i)



At the recommended contour level, 79% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7150	0.5420
A	0.6360	0.5310
B	0.8120	0.5760
C	0.8100	0.5680
D	0.8030	0.5820
E	0.5510	0.4500
F	0.4810	0.4390
G	0.7510	0.5410
H	0.7560	0.5700
I	0.8640	0.5930
J	0.7180	0.5630
K	0.7410	0.5540
L	0.7280	0.5500
M	0.7830	0.5770
N	0.8090	0.5830
O	0.7870	0.5710
P	0.6850	0.5200
Q	0.7040	0.5400
R	0.7730	0.5530
S	0.4770	0.4410
T	0.3640	0.4220
U	0.4460	0.4580
V	0.6970	0.5260
W	0.6710	0.4880
X	0.7950	0.5700
Y	0.7260	0.5520
Z	0.8060	0.5760
a	0.7830	0.5760
b	0.7950	0.5920
c	0.7090	0.5340
d	0.8020	0.5760
e	0.8170	0.5760
f	0.6960	0.5360
g	0.4420	0.4750
h	0.7210	0.5510

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Chain	Atom inclusion	Q-score
i	0.6670	0.5280
j	0.5390	0.4900
k	0.5300	0.4670
l	0.6250	0.5310
m	0.6390	0.5470
n	0.5570	0.4810
o	0.6030	0.4990
p	0.7850	0.5580
q	0.8190	0.5710