wwPDB EM Validation Summary Report

Sep 19, 2022 – 06:20 pm BST

PDB ID	:	7QSK
EMDB ID	:	EMD-14132
Title	:	Bovine complex I in lipid nanodisc, Active-Q10
Authors	:	Chung, I.; Bridges, H.R.; Hirst, J.
Deposited on	:	2022-01-13
Resolution	:	2.84 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at http://www.wwpdb.org/validation/2017/FAQs#types.

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

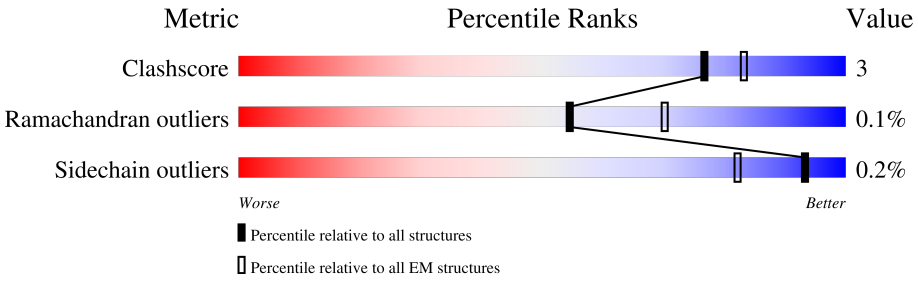
EMDB validation analysis	:	0.0.1.dev8
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.30

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.84 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	115	87% 13%
2	B	216	64% 7% 28%
3	C	266	74% 21%
4	D	463	85% 8% 7%
5	E	249	80% 6% 14%
6	F	464	86% 7% 7%
7	G	727	88% 8%
8	H	318	88% 12%

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Mol	Chain	Length	Quality of chain
9	I	212	79% 17%
10	J	175	93% 7%
11	K	98	86% 14%
12	L	606	91% 9%
13	M	459	91% 9%
14	N	347	92% 8%
15	O	343	90% 7%
16	P	380	83% 7% 10%
17	Q	175	68% 6% 26%
18	R	124	77% 23%
19	S	99	6% 88% 12%
20	T	156	8% 44% 8% 46%
20	U	156	46% 8% 45%
21	V	116	96%
22	W	128	81% 9% 10%
23	X	172	94% 5%
24	Y	141	93% 6%
25	Z	144	88% 10%
26	a	70	100%
27	b	84	99%
28	c	76	64% 36%
29	d	120	99%
30	e	106	92% 7%
31	f	57	18% 98%
32	g	154	63% 35%

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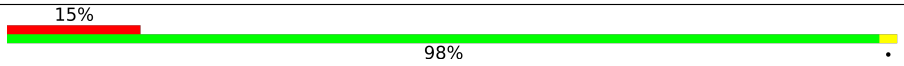
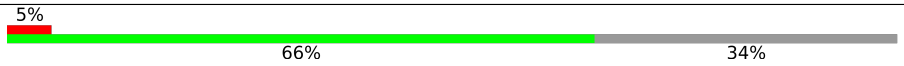
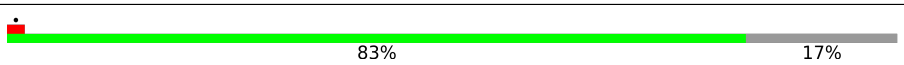
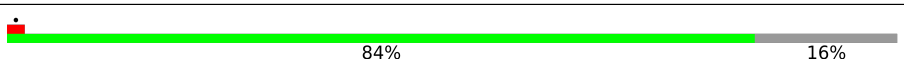
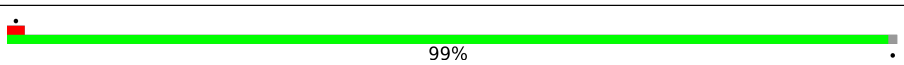
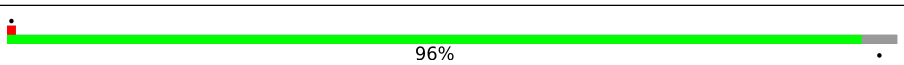
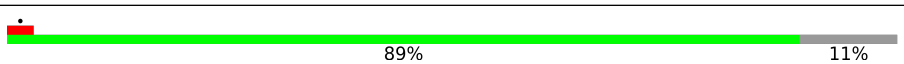
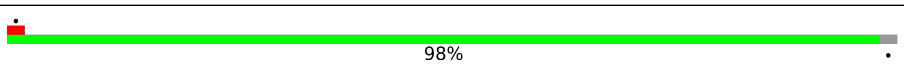
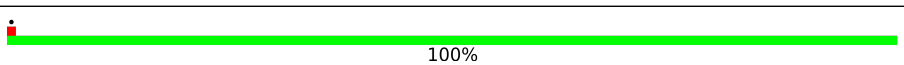
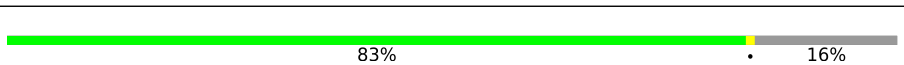
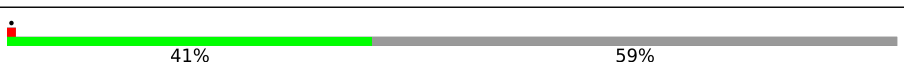
Mol	Chain	Length	Quality of chain
33	h	189	
34	i	127	
35	j	108	
36	k	98	
37	l	186	
38	m	129	
39	n	179	
40	o	137	
41	p	176	
42	q	145	
43	r	113	
44	s	109	

2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 69986 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	115	921	622	133	159	7	0	0

- Molecule 2 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	155	1241	792	224	211	14	0	0

- Molecule 3 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	209	1738	1120	298	317	3	0	0

- Molecule 4 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	430	3459	2209	596	629	25	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	129	ARG	GLN	variant	UNP P17694

- Molecule 5 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	214	Total	C	N	O	S	0	0
			1659	1059	278	312	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	432	Total	C	N	O	S	2	0
			3347	2111	598	618	20		

- Molecule 7 is a protein called NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	699	Total	C	N	O	S	1	0
			5366	3362	934	1030	40		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	318	Total	C	N	O	S	1	0
			2517	1687	386	421	23		

- Molecule 9 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	176	Total	C	N	O	S	0	0
			1414	889	243	270	12		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	175	Total	C	N	O	S	0	0
			1345	906	191	236	12		

- Molecule 11 is a protein called NADH-ubiquinone oxidoreductase chain 4L.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	98	Total	C	N	O	S	0	0
			745	486	112	131	16		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	606	Total	C	N	O	S	0	0
			4802	3195	737	827	43		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	459	Total	C	N	O	S	0	0
			3654	2436	570	609	39		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	347	Total	C	N	O	S	0	0
			2733	1817	416	457	43		

- Molecule 15 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	320	Total	C	N	O	S	0	0
			2589	1662	429	488	10		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
O	255	LYS	ASN	variant	UNP P34942

- Molecule 16 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	342	Total	C	N	O	S	1	0
			2768	1792	489	482	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	129	Total	C	N	O	S	0	0
			1049	659	188	199	3		

- Molecule 18 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	96	Total	C	N	O	S	0	0
			740	454	140	143	3		

- Molecule 19 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	S	87	Total	C	N	O	S	0	0
			700	440	131	127	2		

- Molecule 20 is a protein called Acyl carrier protein, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	85	Total	C	N	O	S	0	0
			688	444	101	138	5		
20	U	86	Total	C	N	O	S	0	0
			693	447	102	139	5		

- Molecule 21 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V	115	Total	C	N	O	S	0	0
			928	600	157	168	3		

- Molecule 22 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W	115	Total	C	N	O	S	0	0
			976	625	181	166	4		

- Molecule 23 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X	171	Total	C	N	O	S	0	0
			1402	887	253	252	10		

- Molecule 24 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	140	Total	C	N	O	S	0	0
			1030	657	176	191	6		

- Molecule 25 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	141	Total	C	N	O	S	0	0
			1152	740	201	202	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
26	a	70	Total	C	N	O	S	0	0
			569	365	104	95	5		

- Molecule 27 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	83	Total	C	N	O	S	0	0
			651	425	109	115	2		

- Molecule 28 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	c	49	Total	C	N	O	0	0
			414	273	70	71		

- Molecule 29 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C2.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d	120	Total	C	N	O	S	0	0
			999	650	172	172	5		

- Molecule 30 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e	99	Total	C	N	O	S	0	0
			829	523	158	142	6		

- Molecule 31 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	f	57	Total	C	N	O	S	0	0
			492	322	86	82	2		

- Molecule 32 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	g	100	Total	C	N	O	S	0	0
			839	539	139	157	4		

- Molecule 33 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	h	138	Total	C	N	O	S	0	0
			1154	759	196	197	2		

- Molecule 34 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	i	127	Total	C	N	O	S	0	0
			1097	722	191	183	1		

- Molecule 35 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	j	71	Total	C	N	O	S	0	0
			597	390	99	107	1		

- Molecule 36 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	k	81	Total	C	N	O	S	0	0
			653	427	110	114	2		

- Molecule 37 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l	156	Total	C	N	O	S	0	0
			1314	850	216	240	8		

- Molecule 38 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	m	128	Total	C	N	O	0	0
			1067	684	188	195		

- Molecule 39 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	n	172	Total	C	N	O	S	0	0
			1492	955	273	257	7		

- Molecule 40 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	o	122	Total	C	N	O	S	0	0
			1048	653	201	185	9		

- Molecule 41 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	p	173	Total	C	N	O	S	0	0
			1453	910	268	267	8		

- Molecule 42 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	q	145	Total	C	N	O	S	0	0
			1209	778	216	210	5		

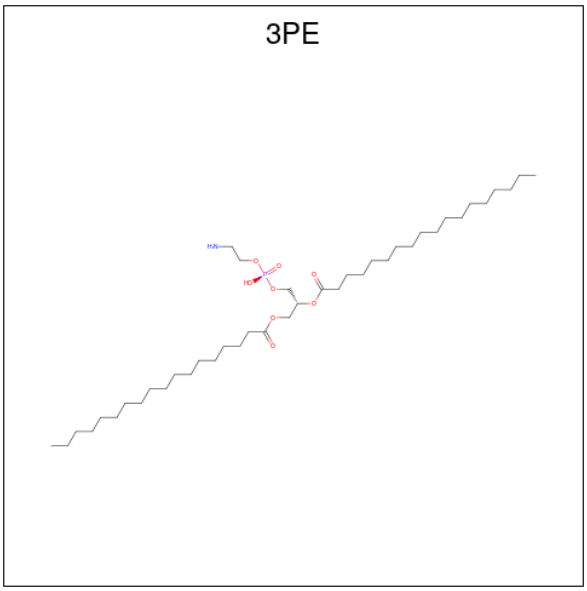
- Molecule 43 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	r	95	Total	C	N	O	S	0	0
			776	490	144	139	3		

- Molecule 44 is a protein called NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	s	45	Total	C	N	O	S	1	0
			391	244	71	75	1		

- Molecule 45 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
45	A	1	Total	C	N	O	P	0
			47	37	1	8	1	
45	H	1	Total	C	N	O	P	0
			36	26	1	8	1	
45	K	1	Total	C	N	O	P	0
			44	34	1	8	1	
45	L	1	Total	C	N	O	P	0
			135	105	3	24	3	
45	L	1	Total	C	N	O	P	0
			135	105	3	24	3	
45	L	1	Total	C	N	O	P	0
			135	105	3	24	3	
45	M	1	Total	C	N	O	P	0
			142	112	3	24	3	

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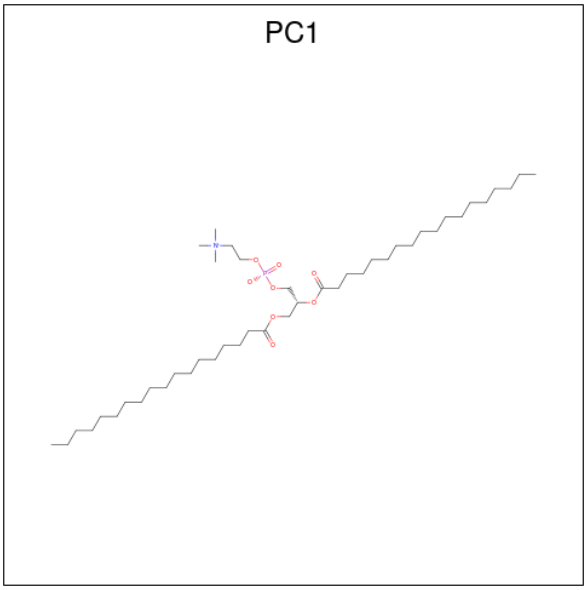
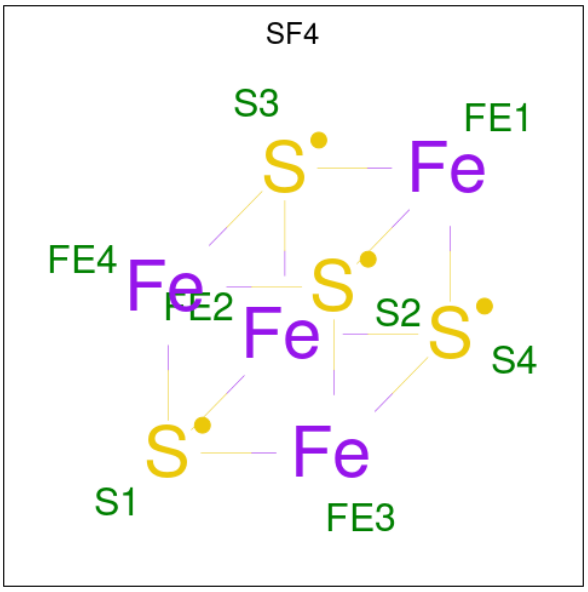
Mol	Chain	Residues	Atoms					AltConf
45	M	1	Total	C	N	O	P	0
			142	112	3	24	3	
45	M	1	Total	C	N	O	P	0
			142	112	3	24	3	
45	N	1	Total	C	N	O	P	0
			51	41	1	8	1	
45	P	1	Total	C	N	O	P	0
			35	25	1	8	1	
45	Y	1	Total	C	N	O	P	0
			161	111	5	40	5	
45	Y	1	Total	C	N	O	P	0
			161	111	5	40	5	
45	Y	1	Total	C	N	O	P	0
			161	111	5	40	5	
45	Y	1	Total	C	N	O	P	0
			161	111	5	40	5	
45	Y	1	Total	C	N	O	P	0
			161	111	5	40	5	
45	d	1	Total	C	N	O	P	0
			49	39	1	8	1	
45	m	1	Total	C	N	O	P	0
			91	71	2	16	2	
45	m	1	Total	C	N	O	P	0
			91	71	2	16	2	

- Molecule 46 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).



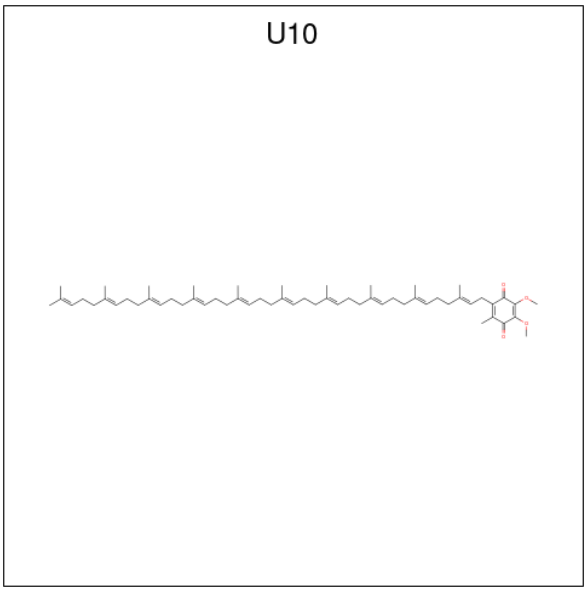
Mol	Chain	Residues	Atoms					AltConf
46	A	1	Total	C	N	O	P	0
			103	73	3	24	3	
46	A	1	Total	C	N	O	P	0
			103	73	3	24	3	
46	A	1	Total	C	N	O	P	0
			103	73	3	24	3	
46	B	1	Total	C	N	O	P	0
			46	36	1	8	1	
46	I	1	Total	C	N	O	P	0
			98	78	2	16	2	
46	I	1	Total	C	N	O	P	0
			98	78	2	16	2	
46	M	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	Y	1	Total	C	N	O	P	0
			46	36	1	8	1	
46	Z	1	Total	C	N	O	P	0
			48	38	1	8	1	
46	d	1	Total	C	N	O	P	0
			39	29	1	8	1	
46	g	1	Total	C	N	O	P	0
			44	34	1	8	1	
46	h	1	Total	C	N	O	P	0
			47	37	1	8	1	
46	q	1	Total	C	N	O	P	0
			97	77	2	16	2	
46	q	1	Total	C	N	O	P	0
			97	77	2	16	2	

- Molecule 47 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



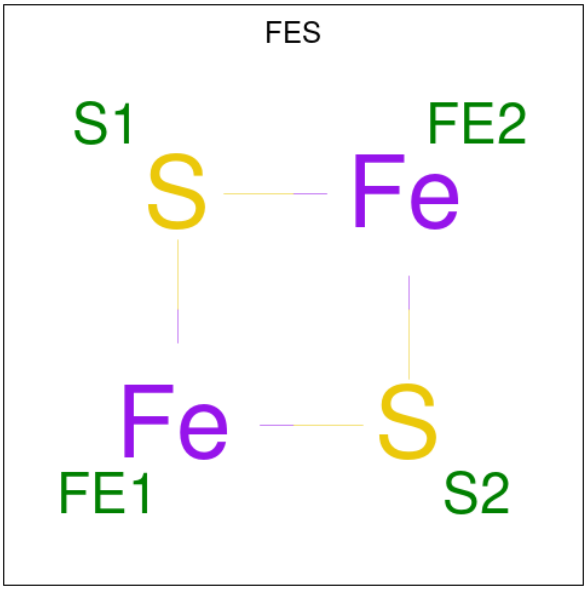
Mol	Chain	Residues	Atoms			AltConf
47	B	1	Total	Fe	S	0
			8	4	4	
47	F	1	Total	Fe	S	0
			8	4	4	
47	G	1	Total	Fe	S	0
			16	8	8	
47	G	1	Total	Fe	S	0
			16	8	8	
47	I	1	Total	Fe	S	0
			16	8	8	
47	I	1	Total	Fe	S	0
			16	8	8	

- Molecule 48 is UBIQUINONE-10 (three-letter code: U10) (formula: $C_{59}H_{90}O_4$) (labeled as "Ligand of Interest" by depositor).



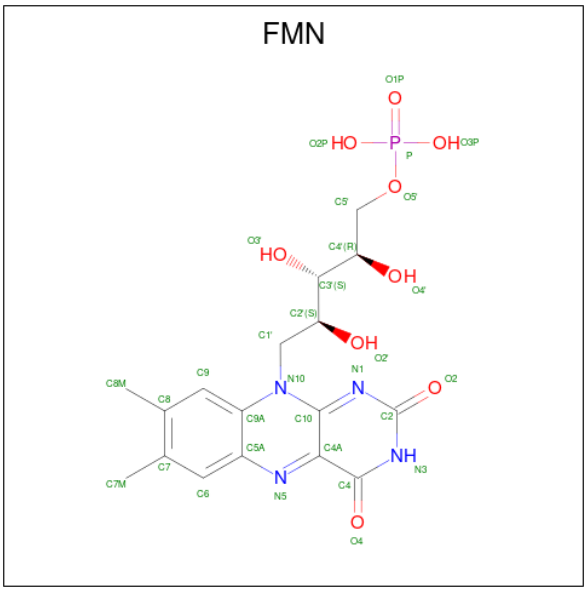
Mol	Chain	Residues	Atoms			AltConf
48	D	1	Total	C	O	0
			63	59	4	

- Molecule 49 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



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

- Molecule 50 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

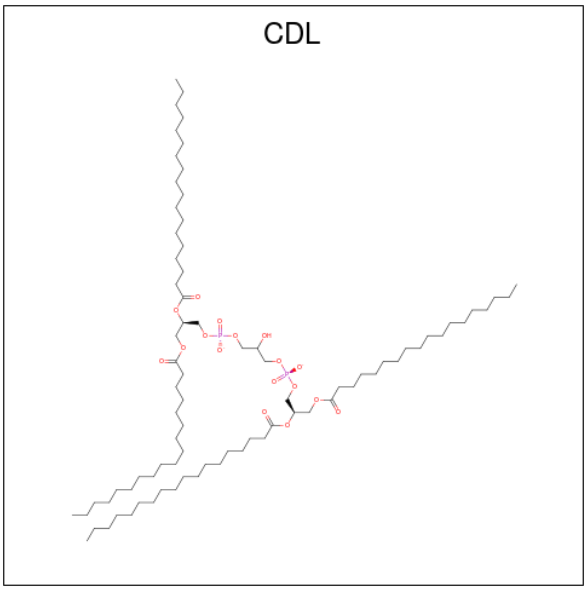


Mol	Chain	Residues	Atoms					AltConf
50	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 51 is POTASSIUM ION (three-letter code: K) (formula: K).

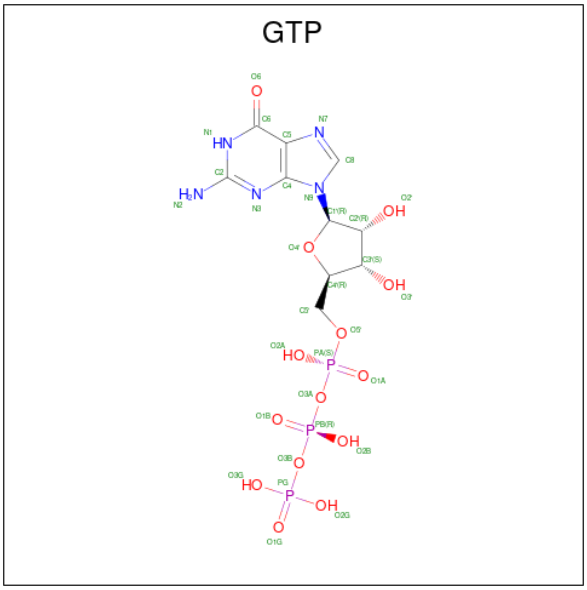
Mol	Chain	Residues	Atoms		AltConf
51	G	1	Total	K	0
			1	1	

- Molecule 52 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				AltConf
52	H	1	Total	C	O	P	0
			51	32	17	2	
52	L	1	Total	C	O	P	0
			76	57	17	2	
52	N	1	Total	C	O	P	0
			62	43	17	2	
52	X	1	Total	C	O	P	0
			86	67	17	2	
52	d	1	Total	C	O	P	0
			65	46	17	2	
52	h	1	Total	C	O	P	0
			80	61	17	2	
52	r	1	Total	C	O	P	0
			61	42	17	2	

- Molecule 53 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).

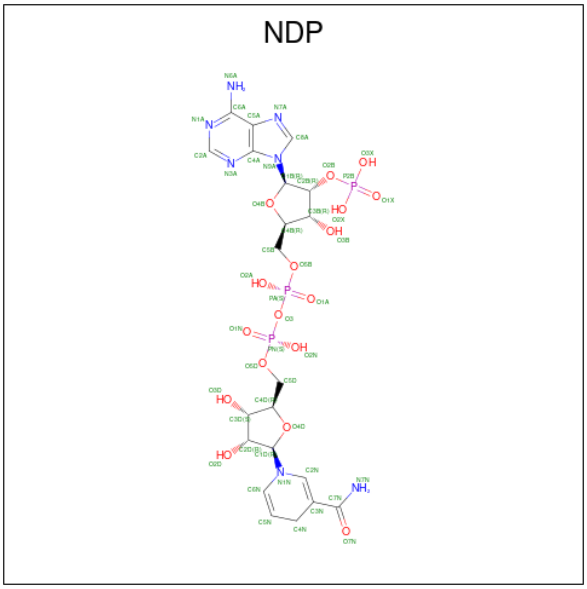


Mol	Chain	Residues	Atoms					AltConf
53	O	1	Total	C	N	O	P	0
			32	10	5	14	3	

- Molecule 54 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	O	1	Total	Mg	0
			1	1	

- Molecule 55 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).

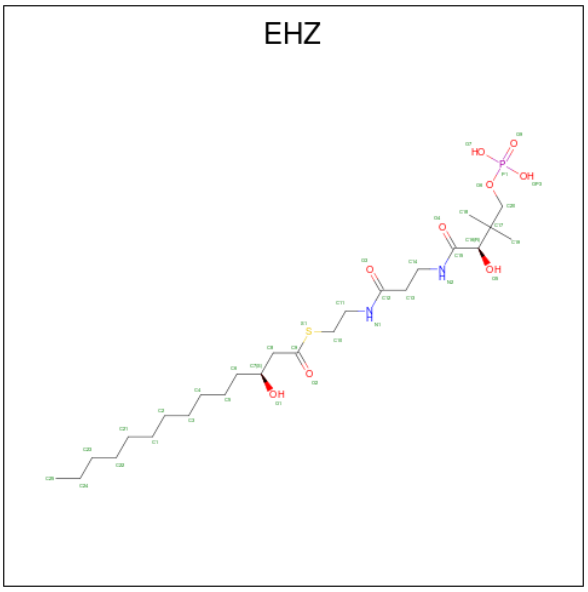


Mol	Chain	Residues	Atoms					AltConf
55	P	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 56 is ZINC ION (three-letter code: ZN) (formula: Zn).

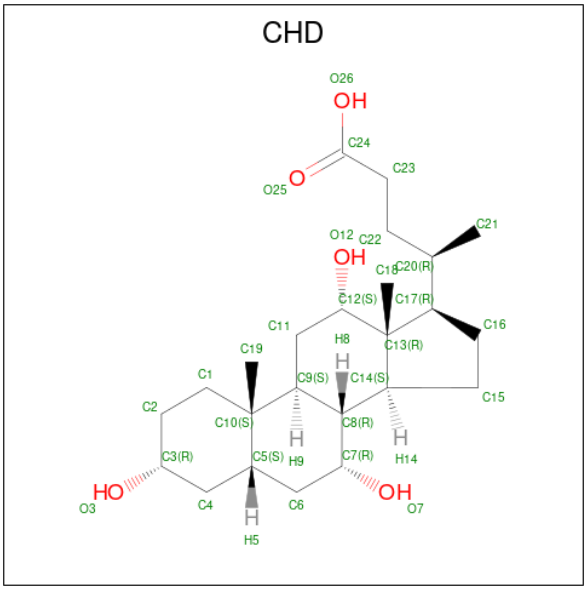
Mol	Chain	Residues	Atoms		AltConf
56	R	1	Total	Zn	0
			1	1	

- Molecule 57 is {S}-[2-[3-[[(2 {R})-3,3-dimethyl-2-oxidanyl-4-phosphonooxy-butanoyl]amino]propanoylamino]ethyl] (3 {S})-3-oxidanyltetradecanethioate (three-letter code: EHZ) (formula: $C_{25}H_{49}N_2O_9PS$).



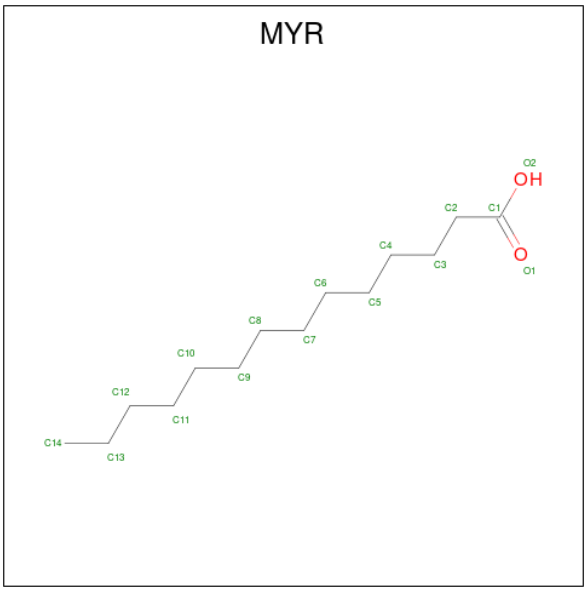
Mol	Chain	Residues	Atoms						AltConf
57	T	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	
57	U	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	

- Molecule 58 is CHOLIC ACID (three-letter code: CHD) (formula: $C_{24}H_{40}O_5$).



Mol	Chain	Residues	Atoms			AltConf
58	i	1	Total	C	O	0
			29	24	5	

- Molecule 59 is MYRISTIC ACID (three-letter code: MYR) (formula: $C_{14}H_{28}O_2$).



Mol	Chain	Residues	Atoms	AltConf
59	o	1	Total C O 15 14 1	0

- Molecule 60 is water.

Mol	Chain	Residues	Atoms	AltConf
60	A	19	Total O 19 19	0
60	B	46	Total O 46 46	0
60	C	42	Total O 42 42	0
60	D	107	Total O 107 107	0
60	E	10	Total O 10 10	0
60	F	42	Total O 42 42	0
60	G	128	Total O 128 128	0
60	H	60	Total O 60 60	0
60	I	52	Total O 52 52	0
60	J	25	Total O 25 25	0
60	K	8	Total O 8 8	0

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Mol	Chain	Residues	Atoms	AltConf
60	L	55	Total O 55 55	0
60	M	61	Total O 61 61	0
60	N	38	Total O 38 38	0
60	O	15	Total O 15 15	0
60	P	41	Total O 41 41	0
60	Q	50	Total O 50 50	0
60	R	11	Total O 11 11	0
60	T	2	Total O 2 2	0
60	U	7	Total O 7 7	0
60	V	5	Total O 5 5	0
60	W	11	Total O 11 11	0
60	X	13	Total O 13 13	0
60	Z	31	Total O 31 31	0
60	a	14	Total O 14 14	0
60	b	2	Total O 2 2	0
60	c	1	Total O 1 1	0
60	d	13	Total O 13 13	0
60	e	13	Total O 13 13	0
60	f	2	Total O 2 2	0
60	g	8	Total O 8 8	0
60	h	16	Total O 16 16	0

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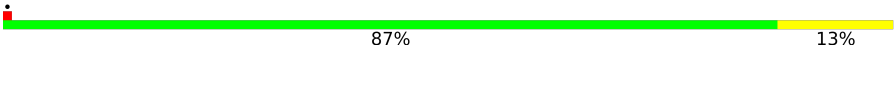
Mol	Chain	Residues	Atoms	AltConf
60	i	4	Total O 4 4	0
60	j	2	Total O 2 2	0
60	k	1	Total O 1 1	0
60	l	10	Total O 10 10	0
60	m	11	Total O 11 11	0
60	n	19	Total O 19 19	0
60	o	5	Total O 5 5	0
60	p	20	Total O 20 20	0
60	q	24	Total O 24 24	0
60	r	13	Total O 13 13	0
60	s	3	Total O 3 3	0

3 Residue-property plots (i)

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

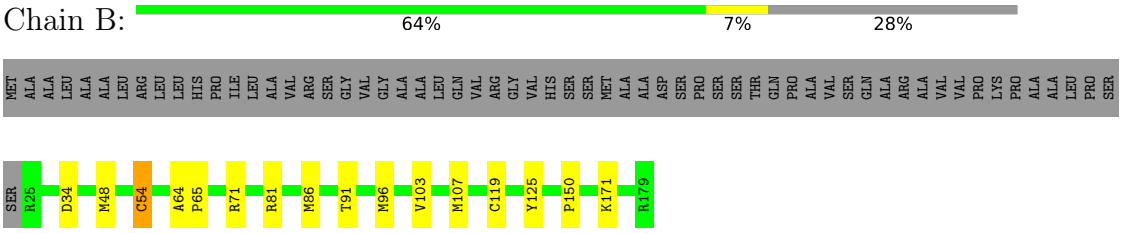
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3

Chain A:



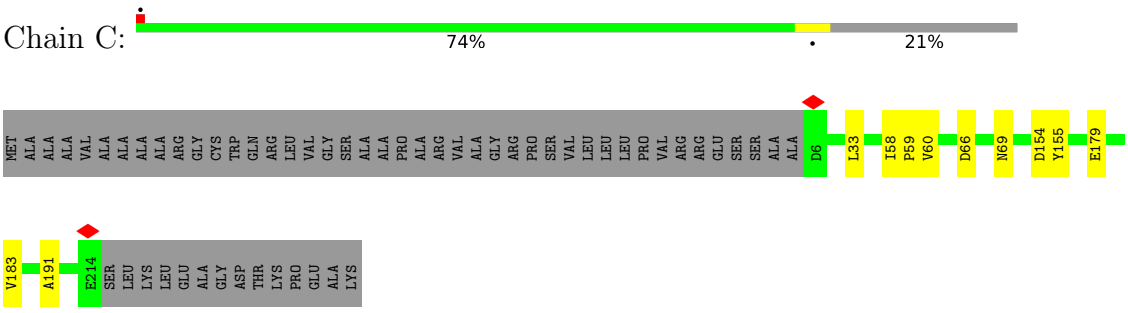
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial

Chain B:



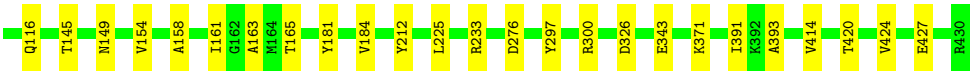
• Molecule 3: NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial

Chain C:



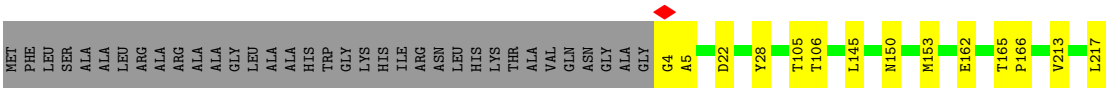
• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial

Chain D:



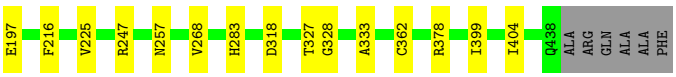
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

Chain E:



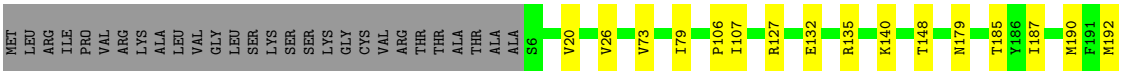
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

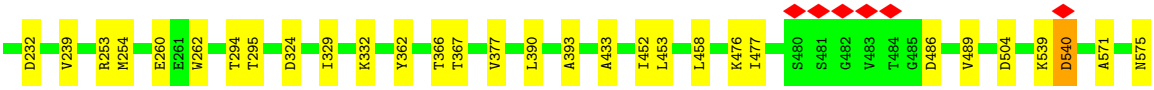
Chain F:

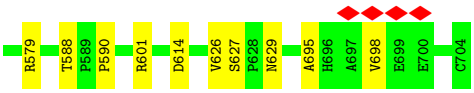


• Molecule 7: NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial

Chain G:





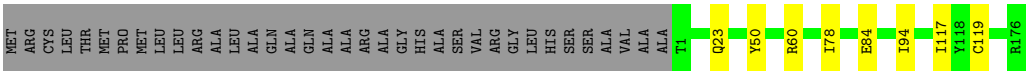


• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

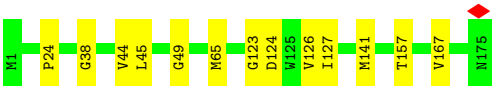
Chain H:

• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial

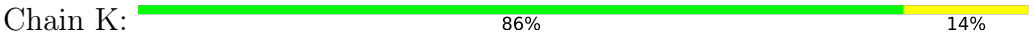
Chain I:



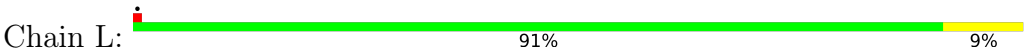
• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

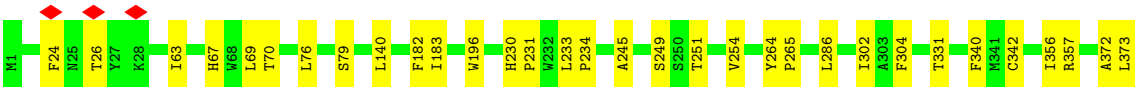


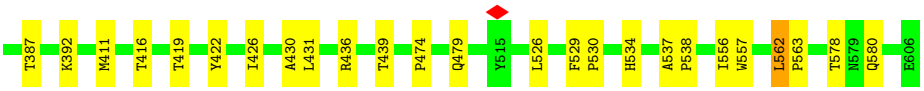
• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L



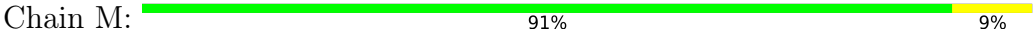
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5

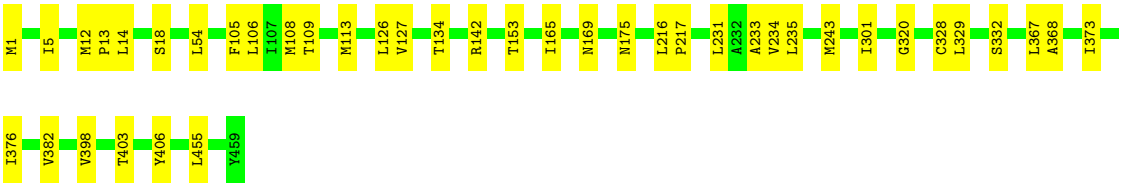




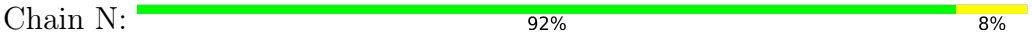


• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

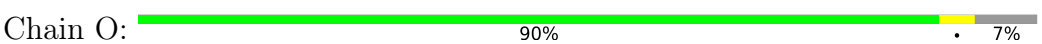


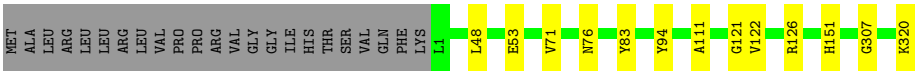


• Molecule 14: NADH-ubiquinone oxidoreductase chain 2



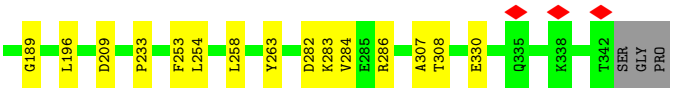
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial





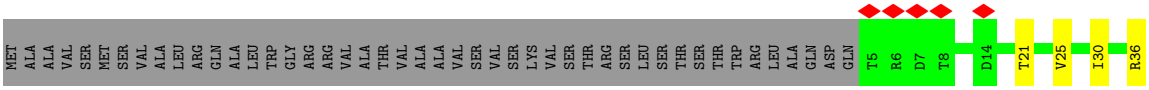
• Molecule 16: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial

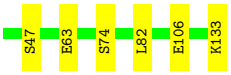
Chain P:



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

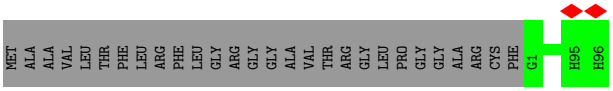
Chain Q:





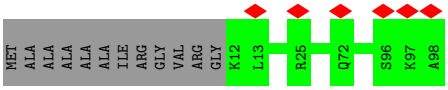
• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

Chain R:



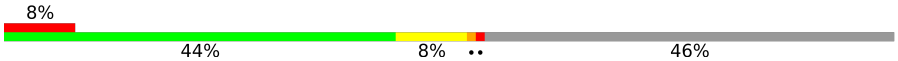
• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

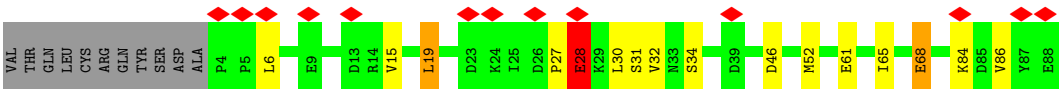
Chain S:



• Molecule 20: Acyl carrier protein, mitochondrial

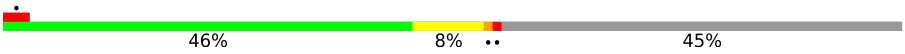
Chain T:

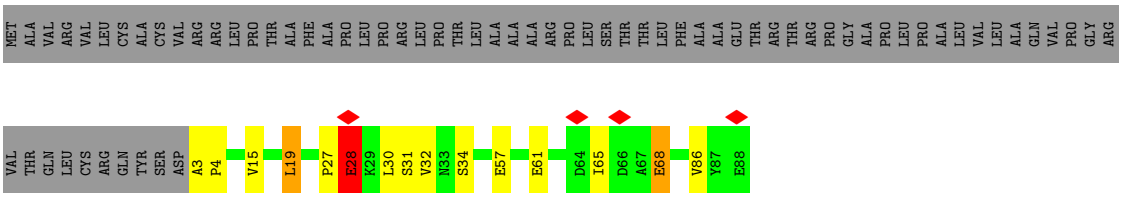




• Molecule 20: Acyl carrier protein, mitochondrial

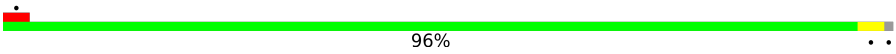
Chain U:

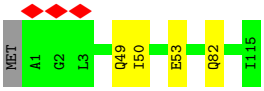




• Molecule 21: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5

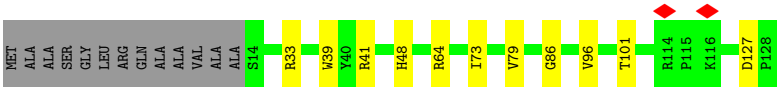
Chain V:





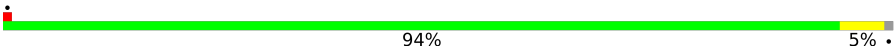
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6

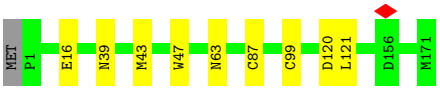
Chain W:



• Molecule 23: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8

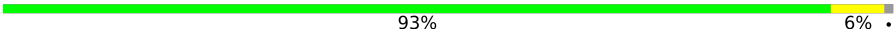
Chain X:

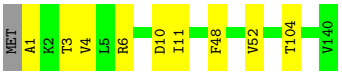




• Molecule 24: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11

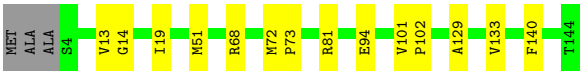
Chain Y:





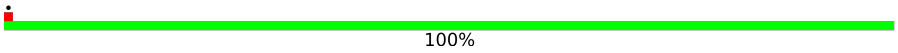
• Molecule 25: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

Chain Z:



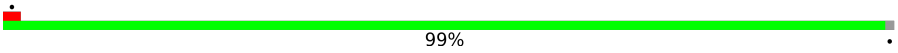
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

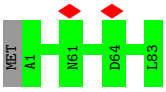
Chain a:



• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3

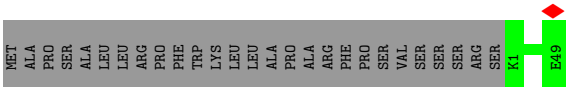
Chain b:





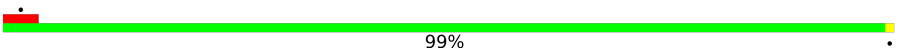
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

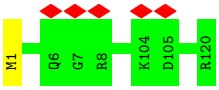
Chain c:



• Molecule 29: NADH dehydrogenase [ubiquinone] 1 subunit C2

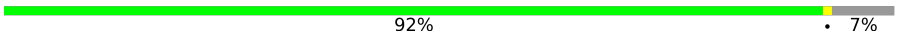
Chain d:

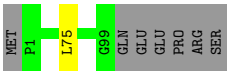




• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

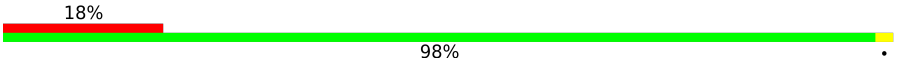
Chain e:

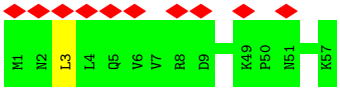




• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1

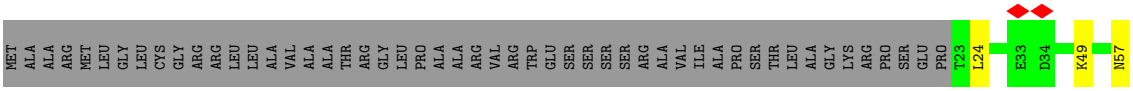
Chain f:





• Molecule 32: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain g:

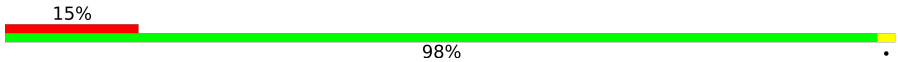


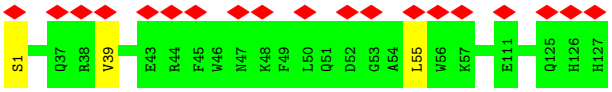
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

Chain h:

• Molecule 34: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

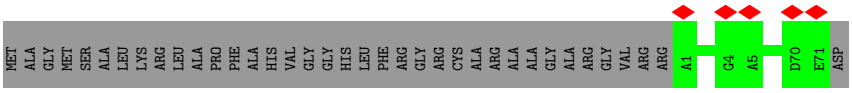
Chain i:





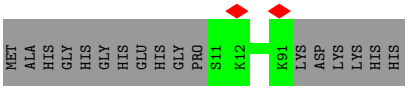
• Molecule 35: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial

Chain j:



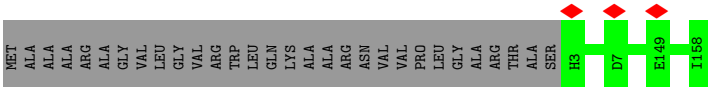
• Molecule 36: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3

Chain k:



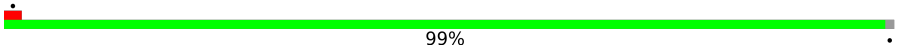
• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

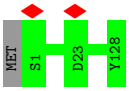
Chain l:



• Molecule 38: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4

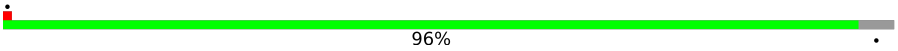
Chain m:

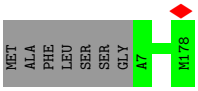




• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

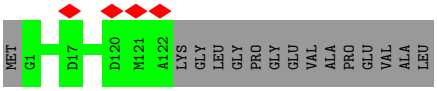
Chain n:





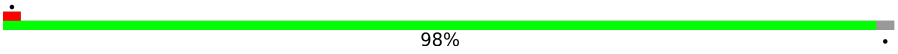
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

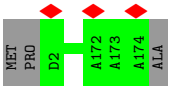
Chain o:



• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

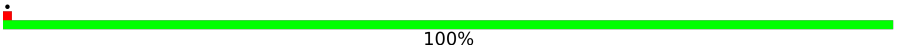
Chain p:





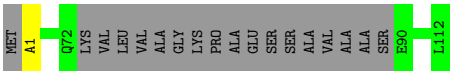
• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

Chain q:



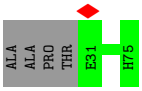
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

Chain r:



• Molecule 44: NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial

Chain s:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	23449	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40.5	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	31.499	Depositor
Minimum map value	-14.518	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.943	Depositor
Recommended contour level	5.0	Depositor
Map size (Å)	479.744, 479.744, 479.744	wwPDB
Map dimensions	640, 640, 640	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.7496, 0.7496, 0.7496	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: SAC, AME, K, FES, 2MR, GTP, MYR, SF4, CHD, EHZ, ZN, FME, FMN, PC1, CDL, MG, U10, NDP, 3PE, AYA

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	0.35	0/936	0.44	0/1281
2	B	0.42	0/1272	0.47	1/1720 (0.1%)
3	C	0.39	0/1789	0.44	0/2436
4	D	0.38	0/3537	0.43	0/4794
5	E	0.36	0/1699	0.44	0/2312
6	F	0.35	0/3424	0.44	0/4627
7	G	0.35	0/5457	0.46	1/7397 (0.0%)
8	H	0.37	0/2579	0.43	0/3524
9	I	0.39	0/1445	0.46	0/1956
10	J	0.37	0/1370	0.42	0/1859
11	K	0.34	0/745	0.47	0/1008
12	L	0.33	0/4920	0.41	0/6694
13	M	0.34	0/3738	0.42	0/5097
14	N	0.34	0/2792	0.42	0/3800
15	O	0.35	0/2651	0.41	0/3587
16	P	0.36	0/2847	0.43	0/3864
17	Q	0.34	0/1072	0.45	0/1449
18	R	0.38	0/753	0.45	0/1014
19	S	0.31	0/711	0.42	0/956
20	T	0.39	0/700	0.66	2/944 (0.2%)
20	U	0.40	0/705	0.67	2/952 (0.2%)
21	V	0.33	0/948	0.37	0/1284
22	W	0.33	0/1000	0.41	0/1344
23	X	0.34	0/1439	0.41	0/1942
24	Y	0.32	0/1042	0.41	0/1414
25	Z	0.35	0/1181	0.42	0/1592
26	a	0.36	0/584	0.39	0/786
27	b	0.33	0/672	0.39	0/923
28	c	0.34	0/427	0.37	0/579
29	d	0.37	0/1018	0.41	0/1375
30	e	0.31	0/850	0.47	2/1136 (0.2%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
31	f	0.34	0/505	0.49	2/681 (0.3%)
32	g	0.37	0/865	0.44	0/1175
33	h	0.35	0/1188	0.40	0/1607
34	i	0.34	0/1127	0.51	3/1534 (0.2%)
35	j	0.33	0/624	0.38	0/855
36	k	0.31	0/672	0.38	0/906
37	l	0.36	0/1369	0.43	0/1873
38	m	0.36	0/1094	0.40	0/1480
39	n	0.33	0/1545	0.38	0/2092
40	o	0.34	0/1073	0.38	0/1437
41	p	0.34	0/1486	0.40	0/2004
42	q	0.37	0/1250	0.44	0/1698
43	r	0.36	0/789	0.43	0/1068
44	s	0.31	0/403	0.41	0/545
All	All	0.35	0/68293	0.43	13/92601 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
4	D	0	1

There are no bond length outliers.

The worst 5 of 13 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	54	CYS	CA-CB-SG	7.25	127.05	114.00
34	i	39	VAL	CG1-CB-CG2	6.92	121.97	110.90
7	G	698	VAL	CG1-CB-CG2	6.56	121.40	110.90
20	U	86	VAL	CG1-CB-CG2	6.53	121.35	110.90
20	T	86	VAL	CG1-CB-CG2	6.52	121.34	110.90

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	D	85	2MR	Mainchain

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	921	0	952	16	0
2	B	1241	0	1251	18	0
3	C	1738	0	1685	8	0
4	D	3459	0	3404	31	0
5	E	1659	0	1664	8	0
6	F	3347	0	3297	21	0
7	G	5366	0	5378	39	0
8	H	2517	0	2631	31	0
9	I	1414	0	1370	9	0
10	J	1345	0	1352	10	0
11	K	745	0	785	13	0
12	L	4802	0	4960	35	0
13	M	3654	0	3852	25	0
14	N	2733	0	2912	20	0
15	O	2589	0	2566	7	0
16	P	2768	0	2782	24	0
17	Q	1049	0	1045	10	0
18	R	740	0	714	0	0
19	S	700	0	719	0	0
20	T	688	0	684	12	0
20	U	693	0	688	8	0
21	V	928	0	972	3	0
22	W	976	0	991	13	0
23	X	1402	0	1381	6	0
24	Y	1030	0	1039	5	0
25	Z	1152	0	1151	13	0
26	a	569	0	568	0	0
27	b	651	0	662	0	0
28	c	414	0	415	0	0
29	d	999	0	988	0	0
30	e	829	0	829	0	0
31	f	492	0	501	0	0
32	g	839	0	790	0	0
33	h	1154	0	1168	0	0
34	i	1097	0	1108	0	0
35	j	597	0	536	0	0
36	k	653	0	639	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
37	l	1314	0	1210	0	0
38	m	1067	0	1067	0	0
39	n	1492	0	1438	0	0
40	o	1048	0	1018	0	0
41	p	1453	0	1425	0	0
42	q	1209	0	1182	0	0
43	r	776	0	782	0	0
44	s	391	0	361	0	0
45	A	47	0	71	0	0
45	H	36	0	46	0	0
45	K	44	0	62	0	0
45	L	135	0	201	1	0
45	M	142	0	212	1	0
45	N	51	0	82	5	0
45	P	35	0	44	0	0
45	Y	161	0	195	1	0
45	d	49	0	75	0	0
45	m	91	0	136	0	0
46	A	103	0	128	1	0
46	B	46	0	66	0	0
46	I	98	0	150	1	0
46	M	35	0	44	0	0
46	Y	46	0	66	0	0
46	Z	48	0	73	6	0
46	d	39	0	52	0	0
46	g	44	0	65	0	0
46	h	47	0	71	0	0
46	q	97	0	145	0	0
47	B	8	0	0	1	0
47	F	8	0	0	0	0
47	G	16	0	0	0	0
47	I	16	0	0	0	0
48	D	63	0	90	2	0
49	E	4	0	0	0	0
49	G	4	0	0	0	0
50	F	31	0	19	1	0
51	G	1	0	0	0	0
52	H	51	0	46	0	0
52	L	76	0	99	0	0
52	N	62	0	68	0	0
52	X	86	0	125	0	0
52	d	65	0	77	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
52	h	80	0	104	0	0
52	r	61	0	66	0	0
53	O	32	0	12	1	0
54	O	1	0	0	0	0
55	P	48	0	26	3	0
56	R	1	0	0	0	0
57	T	37	0	0	2	0
57	U	37	0	0	0	0
58	i	29	0	37	0	0
59	o	15	0	27	0	0
60	A	19	0	0	2	0
60	B	46	0	0	1	0
60	C	42	0	0	0	0
60	D	107	0	0	1	0
60	E	10	0	0	0	0
60	F	42	0	0	2	0
60	G	128	0	0	3	0
60	H	60	0	0	3	0
60	I	52	0	0	1	0
60	J	25	0	0	0	0
60	K	8	0	0	0	0
60	L	55	0	0	2	0
60	M	61	0	0	2	0
60	N	38	0	0	3	0
60	O	15	0	0	0	0
60	P	41	0	0	3	0
60	Q	50	0	0	3	0
60	R	11	0	0	0	0
60	T	2	0	0	1	0
60	U	7	0	0	0	0
60	V	5	0	0	0	0
60	W	11	0	0	1	0
60	X	13	0	0	0	0
60	Z	31	0	0	1	0
60	a	14	0	0	0	0
60	b	2	0	0	0	0
60	c	1	0	0	0	0
60	d	13	0	0	0	0
60	e	13	0	0	0	0
60	f	2	0	0	0	0
60	g	8	0	0	0	0
60	h	16	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
60	i	4	0	0	0	0
60	j	2	0	0	0	0
60	k	1	0	0	0	0
60	l	10	0	0	0	0
60	m	11	0	0	0	0
60	n	19	0	0	0	0
60	o	5	0	0	0	0
60	p	20	0	0	0	0
60	q	24	0	0	0	0
60	r	13	0	0	0	0
60	s	3	0	0	0	0
All	All	69986	0	69692	337	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 3.

The worst 5 of 337 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:67:LEU:HD11	11:K:68:ALA:HB3	1.44	0.96
20:U:31:SER:HG	20:U:34:SER:HG	1.06	0.95
14:N:263:LYS:HG3	60:N:522:HOH:O	1.68	0.94
7:G:433:ALA:O	7:G:476:LYS:NZ	2.02	0.91
12:L:439:THR:OG1	20:U:57:GLU:OE1	1.90	0.90

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	113/115 (98%)	108 (96%)	5 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	153/216 (71%)	146 (95%)	7 (5%)	0	100	100
3	C	207/266 (78%)	203 (98%)	4 (2%)	0	100	100
4	D	427/463 (92%)	411 (96%)	16 (4%)	0	100	100
5	E	212/249 (85%)	204 (96%)	8 (4%)	0	100	100
6	F	432/464 (93%)	420 (97%)	12 (3%)	0	100	100
7	G	698/727 (96%)	669 (96%)	27 (4%)	2 (0%)	41	61
8	H	317/318 (100%)	305 (96%)	12 (4%)	0	100	100
9	I	174/212 (82%)	170 (98%)	4 (2%)	0	100	100
10	J	173/175 (99%)	164 (95%)	8 (5%)	1 (1%)	25	46
11	K	96/98 (98%)	94 (98%)	2 (2%)	0	100	100
12	L	604/606 (100%)	581 (96%)	22 (4%)	1 (0%)	47	69
13	M	457/459 (100%)	452 (99%)	5 (1%)	0	100	100
14	N	345/347 (99%)	333 (96%)	12 (4%)	0	100	100
15	O	318/343 (93%)	315 (99%)	3 (1%)	0	100	100
16	P	341/380 (90%)	332 (97%)	9 (3%)	0	100	100
17	Q	127/175 (73%)	124 (98%)	3 (2%)	0	100	100
18	R	94/124 (76%)	91 (97%)	3 (3%)	0	100	100
19	S	85/99 (86%)	81 (95%)	4 (5%)	0	100	100
20	T	83/156 (53%)	80 (96%)	3 (4%)	0	100	100
20	U	84/156 (54%)	80 (95%)	4 (5%)	0	100	100
21	V	113/116 (97%)	110 (97%)	3 (3%)	0	100	100
22	W	113/128 (88%)	106 (94%)	7 (6%)	0	100	100
23	X	169/172 (98%)	164 (97%)	5 (3%)	0	100	100
24	Y	138/141 (98%)	136 (99%)	2 (1%)	0	100	100
25	Z	139/144 (96%)	134 (96%)	5 (4%)	0	100	100
26	a	68/70 (97%)	67 (98%)	1 (2%)	0	100	100
27	b	81/84 (96%)	79 (98%)	2 (2%)	0	100	100
28	c	47/76 (62%)	47 (100%)	0	0	100	100
29	d	118/120 (98%)	113 (96%)	5 (4%)	0	100	100
30	e	97/106 (92%)	95 (98%)	2 (2%)	0	100	100
31	f	55/57 (96%)	52 (94%)	3 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
32	g	98/154 (64%)	94 (96%)	3 (3%)	1 (1%)	15 31
33	h	136/189 (72%)	133 (98%)	3 (2%)	0	100 100
34	i	125/127 (98%)	122 (98%)	3 (2%)	0	100 100
35	j	69/108 (64%)	67 (97%)	2 (3%)	0	100 100
36	k	79/98 (81%)	76 (96%)	3 (4%)	0	100 100
37	l	154/186 (83%)	148 (96%)	6 (4%)	0	100 100
38	m	126/129 (98%)	119 (94%)	7 (6%)	0	100 100
39	n	170/179 (95%)	168 (99%)	2 (1%)	0	100 100
40	o	120/137 (88%)	115 (96%)	5 (4%)	0	100 100
41	p	171/176 (97%)	169 (99%)	2 (1%)	0	100 100
42	q	143/145 (99%)	141 (99%)	2 (1%)	0	100 100
43	r	91/113 (80%)	87 (96%)	4 (4%)	0	100 100
44	s	44/109 (40%)	42 (96%)	2 (4%)	0	100 100
All	All	8204/9212 (89%)	7947 (97%)	252 (3%)	5 (0%)	54 75

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
7	G	590	PRO
10	J	24	PRO
12	L	562	LEU
7	G	540	ASP
32	g	24	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	100/100 (100%)	100 (100%)	0	100 100
2	B	131/175 (75%)	131 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	C	190/228 (83%)	190 (100%)	0	100	100
4	D	370/392 (94%)	370 (100%)	0	100	100
5	E	183/205 (89%)	183 (100%)	0	100	100
6	F	348/368 (95%)	348 (100%)	0	100	100
7	G	587/608 (96%)	587 (100%)	0	100	100
8	H	275/274 (100%)	275 (100%)	0	100	100
9	I	151/175 (86%)	151 (100%)	0	100	100
10	J	141/141 (100%)	141 (100%)	0	100	100
11	K	85/85 (100%)	84 (99%)	1 (1%)	71	85
12	L	533/533 (100%)	533 (100%)	0	100	100
13	M	412/412 (100%)	412 (100%)	0	100	100
14	N	315/315 (100%)	315 (100%)	0	100	100
15	O	283/303 (93%)	283 (100%)	0	100	100
16	P	297/327 (91%)	297 (100%)	0	100	100
17	Q	116/153 (76%)	116 (100%)	0	100	100
18	R	79/97 (81%)	79 (100%)	0	100	100
19	S	77/82 (94%)	77 (100%)	0	100	100
20	T	79/135 (58%)	73 (92%)	6 (8%)	13	28
20	U	79/135 (58%)	73 (92%)	6 (8%)	13	28
21	V	101/102 (99%)	101 (100%)	0	100	100
22	W	107/114 (94%)	107 (100%)	0	100	100
23	X	154/155 (99%)	154 (100%)	0	100	100
24	Y	101/102 (99%)	101 (100%)	0	100	100
25	Z	120/121 (99%)	120 (100%)	0	100	100
26	a	59/59 (100%)	59 (100%)	0	100	100
27	b	71/72 (99%)	71 (100%)	0	100	100
28	c	45/68 (66%)	45 (100%)	0	100	100
29	d	105/105 (100%)	105 (100%)	0	100	100
30	e	89/96 (93%)	89 (100%)	0	100	100
31	f	54/54 (100%)	54 (100%)	0	100	100
32	g	91/131 (70%)	89 (98%)	2 (2%)	52	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	h	121/158 (77%)	121 (100%)	0	100	100
34	i	120/120 (100%)	120 (100%)	0	100	100
35	j	61/84 (73%)	61 (100%)	0	100	100
36	k	63/76 (83%)	63 (100%)	0	100	100
37	l	140/159 (88%)	140 (100%)	0	100	100
38	m	114/115 (99%)	114 (100%)	0	100	100
39	n	156/161 (97%)	156 (100%)	0	100	100
40	o	110/120 (92%)	110 (100%)	0	100	100
41	p	155/157 (99%)	155 (100%)	0	100	100
42	q	131/131 (100%)	131 (100%)	0	100	100
43	r	85/97 (88%)	85 (100%)	0	100	100
44	s	45/92 (49%)	45 (100%)	0	100	100
All	All	7229/7892 (92%)	7214 (100%)	15 (0%)	93	97

5 of 15 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
20	U	19	LEU
32	g	49	LYS
20	U	28	GLU
32	g	57	ASN
20	U	65	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
6	F	402	HIS
30	e	26	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)

12 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	$\#\|Z\| > 2$
1	FME	A	1	1	8,9,10	0.94	0	7,9,11	1.16	1 (14%)
4	2MR	D	85	4	10,12,13	2.67	4 (40%)	5,13,15	0.84	0
8	FME	H	1	8	8,9,10	0.94	0	7,9,11	0.99	0
29	AME	d	1	29	9,10,11	1.44	1 (11%)	9,11,13	1.60	1 (11%)
13	FME	M	1	13	8,9,10	0.97	0	7,9,11	0.93	1 (14%)
11	FME	K	1	11	8,9,10	0.93	0	7,9,11	0.71	0
10	FME	J	1	10	8,9,10	0.97	0	7,9,11	0.75	0
12	FME	L	1	12	8,9,10	0.94	0	7,9,11	0.67	0
43	AYA	r	1	43	6,7,8	1.26	1 (16%)	5,8,10	1.03	0
34	SAC	i	1	34	7,8,9	0.96	0	8,9,11	1.49	2 (25%)
24	AYA	Y	1	24	6,7,8	1.31	1 (16%)	5,8,10	1.31	1 (20%)
14	FME	N	1	14	8,9,10	0.92	0	7,9,11	1.05	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	FME	A	1	1	-	5/7/9/11	-
4	2MR	D	85	4	-	0/10/13/15	-
8	FME	H	1	8	-	3/7/9/11	-
29	AME	d	1	29	-	4/9/10/12	-
13	FME	M	1	13	-	1/7/9/11	-
11	FME	K	1	11	-	4/7/9/11	-
10	FME	J	1	10	-	4/7/9/11	-
12	FME	L	1	12	-	2/7/9/11	-
43	AYA	r	1	43	-	0/4/6/8	-
34	SAC	i	1	34	-	1/7/8/10	-
24	AYA	Y	1	24	-	0/4/6/8	-
14	FME	N	1	14	-	3/7/9/11	-

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	85	2MR	CZ-NH2	4.85	1.44	1.33
4	D	85	2MR	CZ-NE	4.81	1.44	1.34
4	D	85	2MR	O-C	4.07	1.36	1.19
29	d	1	AME	CT1-N	3.19	1.45	1.34
24	Y	1	AYA	CA-N	-2.65	1.43	1.46

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
24	Y	1	AYA	CB-CA-N	2.71	112.63	109.61
34	i	1	SAC	CA-N-C1A	2.47	127.69	123.15
29	d	1	AME	CE-SD-CG	2.36	108.51	100.40
1	A	1	FME	C-CA-N	2.25	113.80	109.73
34	i	1	SAC	OG-CB-CA	-2.05	105.73	110.97

There are no chirality outliers.

5 of 27 torsion outliers are listed below:

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

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 59 ligands modelled in this entry, 3 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	$\#\|Z\| > 2$
45	3PE	M	901	-	48,48,50	0.87	4 (8%)	51,53,55	1.04	2 (3%)
45	3PE	Y	803	-	29,29,50	1.10	4 (13%)	32,34,55	1.19	2 (6%)
47	SF4	G	802	7	0,12,12	-	-	-		
52	CDL	d	203	-	64,64,99	1.06	7 (10%)	70,76,111	1.09	4 (5%)
59	MYR	o	201	40	14,14,15	0.91	0	13,13,15	0.67	0
50	FMN	F	501	-	33,33,33	1.10	2 (6%)	48,50,50	1.19	6 (12%)
57	EHZ	U	101	20	29,36,37	1.63	5 (17%)	35,44,47	2.72	7 (20%)
45	3PE	Y	804	-	32,32,50	1.05	4 (12%)	35,37,55	1.06	2 (5%)
55	NDP	P	501	-	45,52,52	2.19	4 (8%)	53,80,80	1.73	10 (18%)
46	PC1	I	201	-	53,53,53	0.95	4 (7%)	59,61,61	0.99	2 (3%)
45	3PE	L	704	-	43,43,50	0.93	4 (9%)	46,48,55	1.09	2 (4%)
45	3PE	m	401	-	49,49,50	0.87	4 (8%)	52,54,55	1.10	2 (3%)
46	PC1	q	201	-	47,47,53	1.01	4 (8%)	53,55,61	1.04	2 (3%)
45	3PE	d	201	-	48,48,50	0.87	4 (8%)	51,53,55	1.04	2 (3%)
48	U10	D	701	-	63,63,63	2.67	17 (26%)	76,79,79	1.94	22 (28%)
45	3PE	Y	802	-	39,39,50	0.95	4 (10%)	42,44,55	1.09	2 (4%)
46	PC1	h	202	-	46,46,53	1.01	4 (8%)	52,54,61	1.05	2 (3%)
47	SF4	F	502	6	0,12,12	-	-	-		
46	PC1	d	202	-	38,38,53	1.13	4 (10%)	44,46,61	1.09	2 (4%)
47	SF4	G	801	7	0,12,12	-	-	-		
58	CHD	i	201	-	32,32,32	3.24	10 (31%)	51,51,51	3.36	25 (49%)
47	SF4	B	201	2	0,12,12	-	-	-		
45	3PE	H	601	-	35,35,50	1.03	4 (11%)	38,40,55	1.07	2 (5%)
45	3PE	A	201	-	46,46,50	0.89	4 (8%)	49,51,55	1.06	2 (4%)
47	SF4	I	203	9	0,12,12	-	-	-		
46	PC1	A	203	-	34,34,53	1.17	4 (11%)	40,42,61	1.06	2 (5%)
49	FES	E	301	5	0,4,4	-	-	-		
45	3PE	Y	805	-	26,26,50	1.18	4 (15%)	29,31,55	1.15	2 (6%)
46	PC1	Z	201	-	47,47,53	0.45	0	53,55,61	0.60	2 (3%)
46	PC1	q	202	-	48,48,53	0.98	4 (8%)	54,56,61	1.04	2 (3%)
46	PC1	g	201	-	43,43,53	1.04	4 (9%)	49,51,61	1.08	2 (4%)
53	GTP	O	401	54	26,34,34	2.92	10 (38%)	32,54,54	1.75	11 (34%)
52	CDL	X	201	-	85,85,99	0.93	7 (8%)	91,97,111	1.04	4 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
45	3PE	Y	801	-	30,30,50	1.09	4 (13%)	33,35,55	1.06	2 (6%)
52	CDL	H	602	-	50,50,99	1.20	7 (14%)	56,62,111	1.19	4 (7%)
45	3PE	L	703	-	44,44,50	0.90	4 (9%)	47,49,55	1.05	2 (4%)
46	PC1	I	204	-	43,43,53	1.04	4 (9%)	49,51,61	1.06	2 (4%)
52	CDL	h	201	-	79,79,99	0.96	8 (10%)	85,91,111	1.10	4 (4%)
45	3PE	K	101	-	43,43,50	0.91	4 (9%)	46,48,55	1.15	3 (6%)
46	PC1	A	202	-	34,34,53	1.17	4 (11%)	40,42,61	1.08	2 (5%)
46	PC1	A	204	-	32,32,53	1.23	4 (12%)	38,40,61	1.15	2 (5%)
57	EHZ	T	101	20	29,36,37	1.62	5 (17%)	35,44,47	2.73	7 (20%)
45	3PE	M	902	-	44,44,50	0.91	4 (9%)	47,49,55	1.08	2 (4%)
46	PC1	B	202	-	45,45,53	1.02	4 (8%)	51,53,61	0.99	2 (3%)
46	PC1	Y	806	-	45,45,53	1.01	4 (8%)	51,53,61	1.01	2 (3%)
52	CDL	r	201	-	60,60,99	1.10	8 (13%)	66,72,111	1.16	4 (6%)
49	FES	G	803	7	0,4,4	-	-	-		
47	SF4	I	202	9	0,12,12	-	-	-		
45	3PE	L	701	-	45,45,50	0.90	4 (8%)	48,50,55	1.10	2 (4%)
45	3PE	M	903	-	47,47,50	0.88	4 (8%)	50,52,55	1.06	2 (4%)
52	CDL	L	702	-	75,75,99	1.00	8 (10%)	81,87,111	1.05	4 (4%)
52	CDL	N	402	-	61,61,99	1.09	8 (13%)	67,73,111	1.22	4 (5%)
46	PC1	M	904	-	34,34,53	1.17	4 (11%)	40,42,61	1.06	2 (5%)
45	3PE	N	401	-	50,50,50	0.83	4 (8%)	53,55,55	1.07	2 (3%)
45	3PE	m	402	-	40,40,50	0.95	4 (10%)	43,45,55	1.15	2 (4%)
45	3PE	P	502	-	34,34,50	1.02	4 (11%)	37,39,55	1.23	2 (5%)

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
45	3PE	M	901	-	-	24/52/52/54	-
45	3PE	Y	803	-	-	10/33/33/54	-
52	CDL	d	203	-	-	23/75/75/110	-
59	MYR	o	201	40	-	5/11/12/13	-
47	SF4	G	802	7	-	-	0/6/5/5
50	FMN	F	501	-	-	2/18/18/18	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
57	EHZ	U	101	20	-	14/42/44/45	-
45	3PE	Y	804	-	-	17/36/36/54	-
55	NDP	P	501	-	-	7/30/77/77	0/5/5/5
46	PC1	I	201	-	-	20/57/57/57	-
45	3PE	L	704	-	-	17/47/47/54	-
45	3PE	m	401	-	-	24/53/53/54	-
46	PC1	q	201	-	-	15/51/51/57	-
45	3PE	d	201	-	-	21/52/52/54	-
48	U10	D	701	-	-	30/63/87/87	0/1/1/1
45	3PE	Y	802	-	-	23/43/43/54	-
46	PC1	h	202	-	-	24/50/50/57	-
47	SF4	F	502	6	-	-	0/6/5/5
46	PC1	d	202	-	-	18/42/42/57	-
58	CHD	i	201	-	-	2/9/74/74	0/4/4/4
47	SF4	G	801	7	-	-	0/6/5/5
47	SF4	B	201	2	-	-	0/6/5/5
45	3PE	H	601	-	-	20/39/39/54	-
45	3PE	A	201	-	-	24/50/50/54	-
47	SF4	I	203	9	-	-	0/6/5/5
46	PC1	A	203	-	-	15/38/38/57	-
49	FES	E	301	5	-	-	0/1/1/1
45	3PE	Y	805	-	-	10/30/30/54	-
46	PC1	Z	201	-	-	17/51/51/57	-
46	PC1	q	202	-	-	20/52/52/57	-
46	PC1	g	201	-	-	16/47/47/57	-
53	GTP	O	401	54	-	4/18/38/38	0/3/3/3
52	CDL	X	201	-	-	44/96/96/110	-
45	3PE	Y	801	-	-	25/34/34/54	-
52	CDL	H	602	-	-	28/61/61/110	-
45	3PE	L	703	-	-	22/48/48/54	-
46	PC1	I	204	-	-	19/47/47/57	-
52	CDL	h	201	-	-	32/90/90/110	-
45	3PE	K	101	-	-	23/47/47/54	-
46	PC1	A	202	-	-	22/38/38/57	-
46	PC1	A	204	-	-	14/36/36/57	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
57	EHZ	T	101	20	-	14/42/44/45	-
45	3PE	M	902	-	-	18/48/48/54	-
46	PC1	B	202	-	-	12/49/49/57	-
46	PC1	Y	806	-	-	17/49/49/57	-
52	CDL	r	201	-	-	22/71/71/110	-
49	FES	G	803	7	-	-	0/1/1/1
47	SF4	I	202	9	-	-	0/6/5/5
45	3PE	L	701	-	-	21/49/49/54	-
45	3PE	M	903	-	-	21/51/51/54	-
52	CDL	L	702	-	-	30/86/86/110	-
52	CDL	N	402	-	-	38/71/71/110	-
46	PC1	M	904	-	-	19/38/38/57	-
45	3PE	N	401	-	-	30/54/54/54	-
45	3PE	m	402	-	-	27/44/44/54	-
45	3PE	P	502	-	-	16/38/38/54	-

The worst 5 of 234 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
55	P	501	NDP	P2B-O2B	11.85	1.81	1.59
58	i	201	CHD	C11-C12	8.42	1.67	1.53
53	O	401	GTP	O6-C6	8.28	1.40	1.23
58	i	201	CHD	C16-C15	7.01	1.73	1.54
58	i	201	CHD	C8-C9	6.34	1.66	1.53

The worst 5 of 183 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
57	T	101	EHZ	C14-N2-C15	10.10	140.61	122.59
58	i	201	CHD	C4-C5-C10	10.08	123.36	112.66
57	U	101	EHZ	C14-N2-C15	10.08	140.56	122.59
57	T	101	EHZ	C11-N1-C12	8.55	138.71	122.84
57	U	101	EHZ	C11-N1-C12	8.49	138.61	122.84

There are no chirality outliers.

5 of 936 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	A	201	3PE	C1-O11-P-O12

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Mol	Chain	Res	Type	Atoms
45	A	201	3PE	C1-O11-P-O13
45	A	201	3PE	C1-O11-P-O14
45	A	201	3PE	C11-O13-P-O12
45	A	201	3PE	C11-O13-P-O14

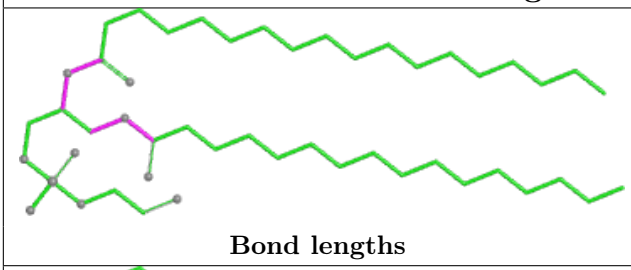
There are no ring outliers.

13 monomers are involved in 26 short contacts:

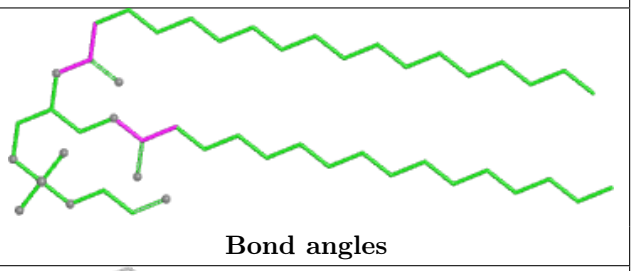
Mol	Chain	Res	Type	Clashes	Symm-Clashes
45	Y	803	3PE	1	0
50	F	501	FMN	1	0
55	P	501	NDP	3	0
46	I	201	PC1	1	0
48	D	701	U10	2	0
47	B	201	SF4	1	0
46	Z	201	PC1	6	0
53	O	401	GTP	1	0
46	A	202	PC1	1	0
57	T	101	EHZ	2	0
45	M	902	3PE	1	0
45	L	701	3PE	1	0
45	N	401	3PE	5	0

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

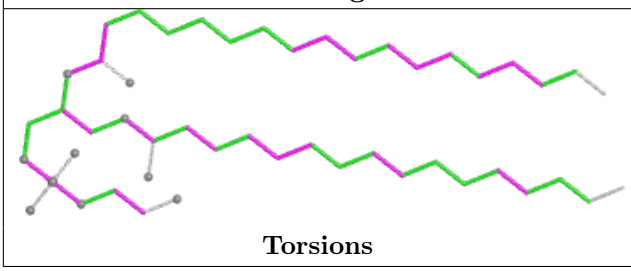
Ligand 3PE M 901



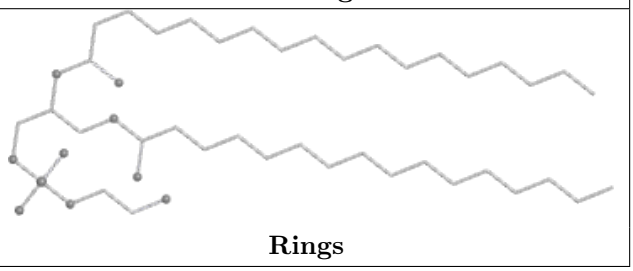
Bond lengths



Bond angles

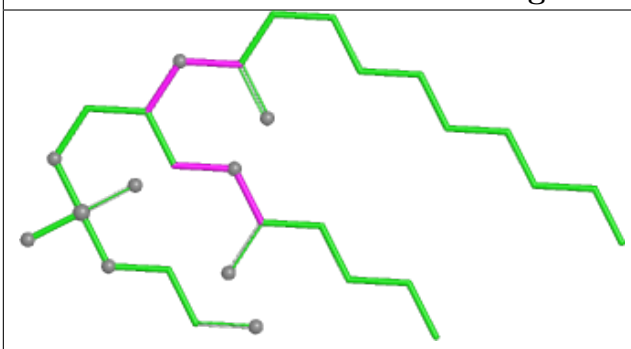


Torsions

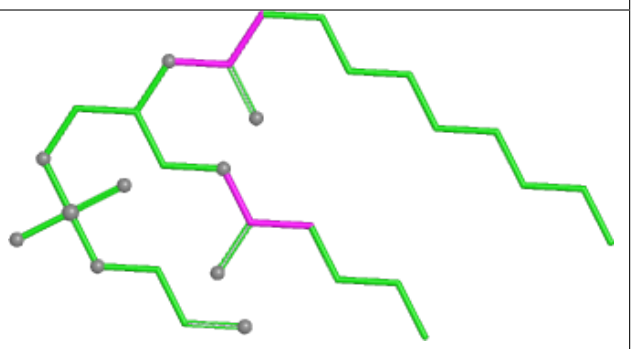


Rings

Ligand 3PE Y 803



Bond lengths



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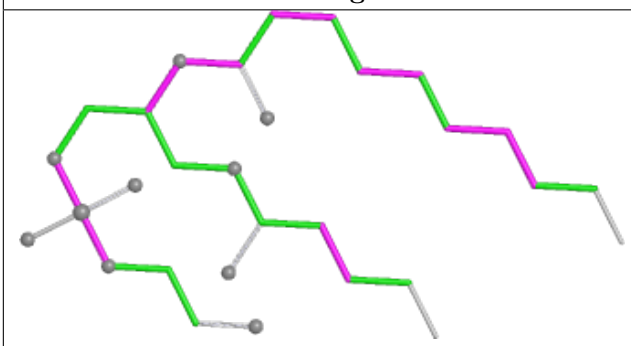

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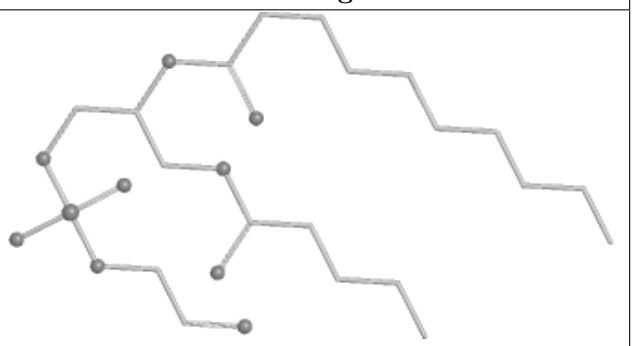
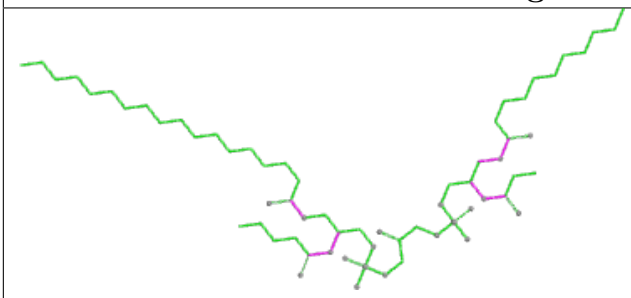


Rings

Ligand CDL d 203



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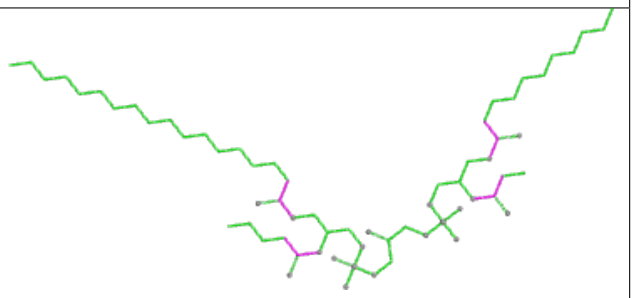

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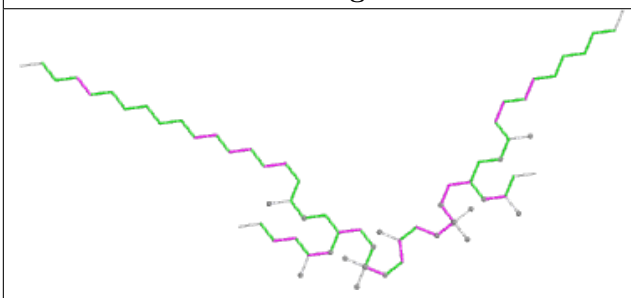
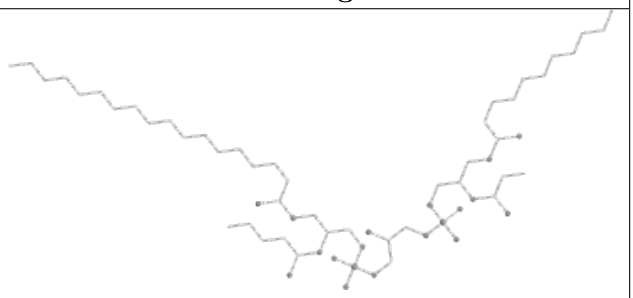
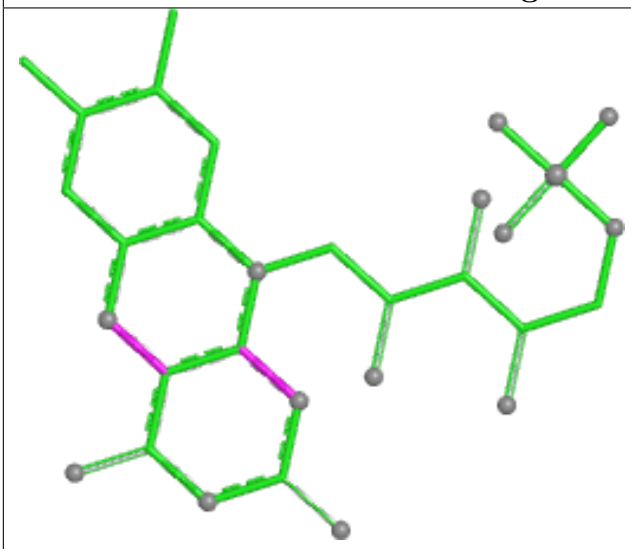


Torsions

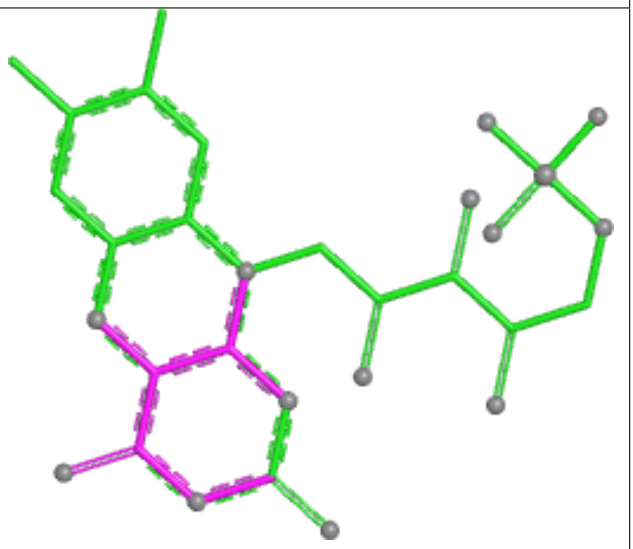


Rings

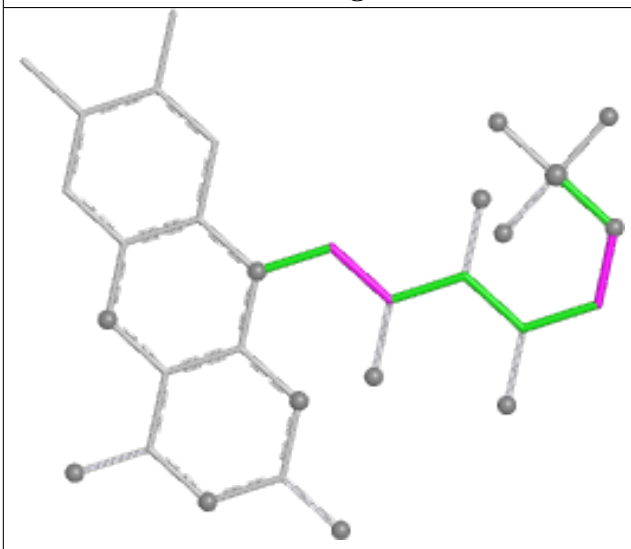
Ligand FMN F 501



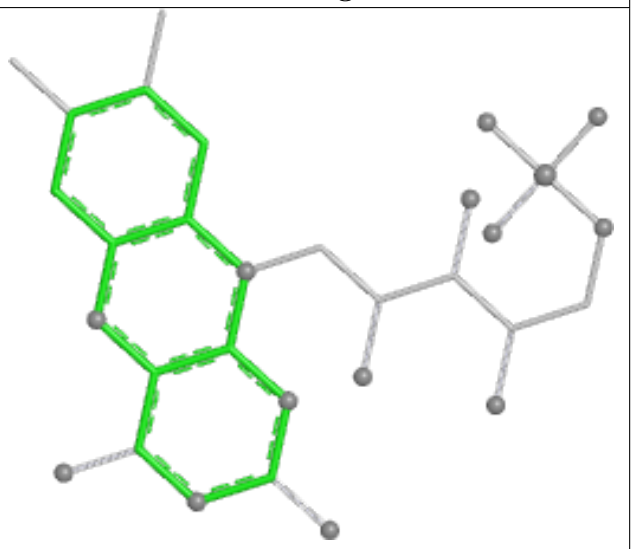
Bond lengths



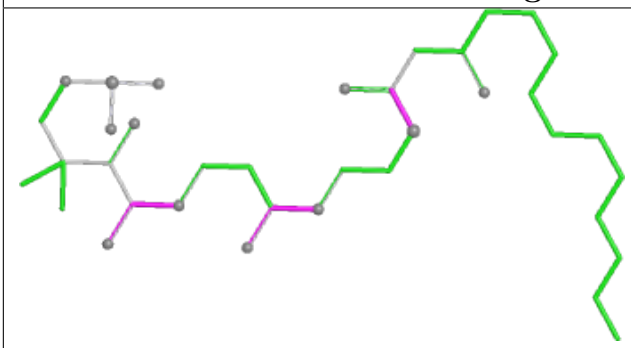
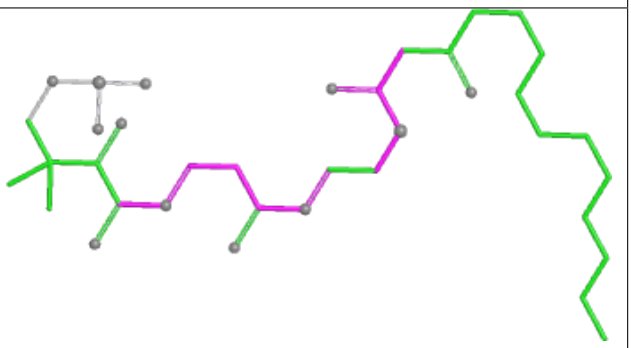
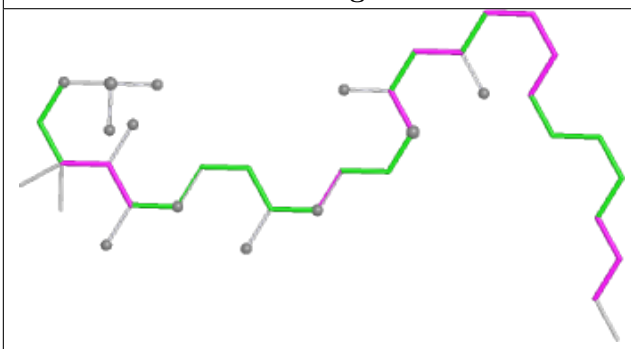
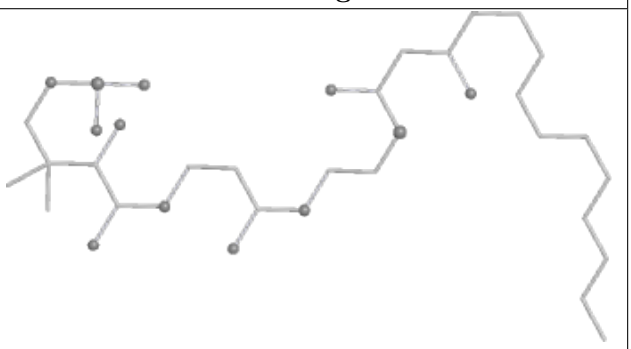
Bond angles

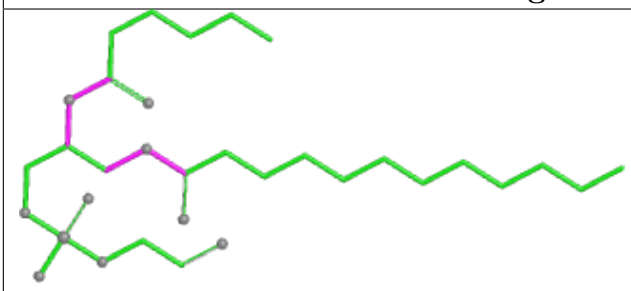
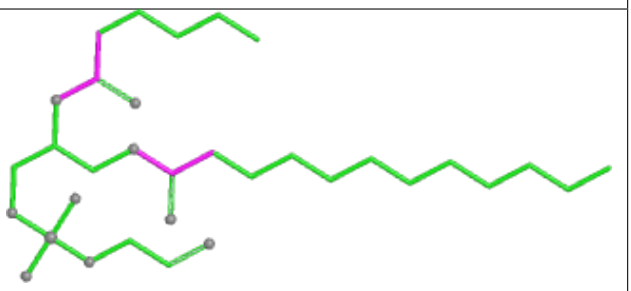
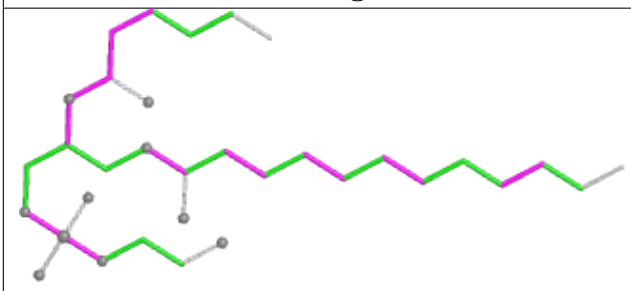
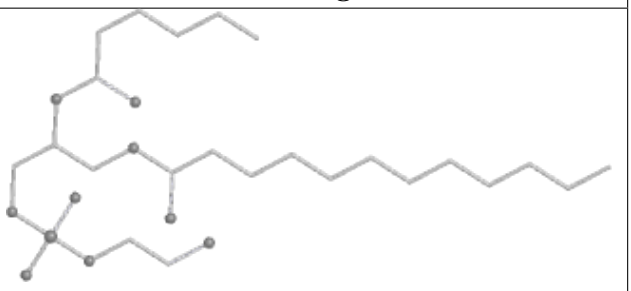


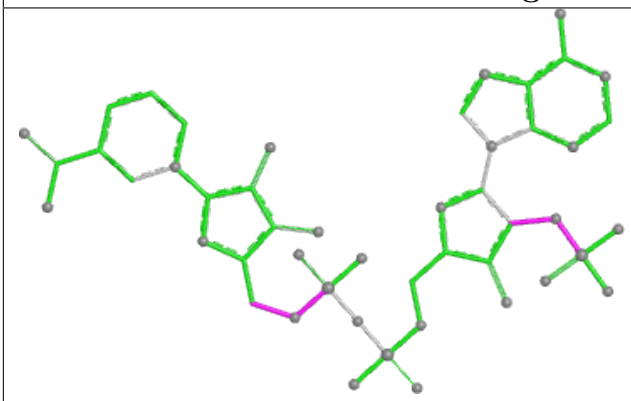
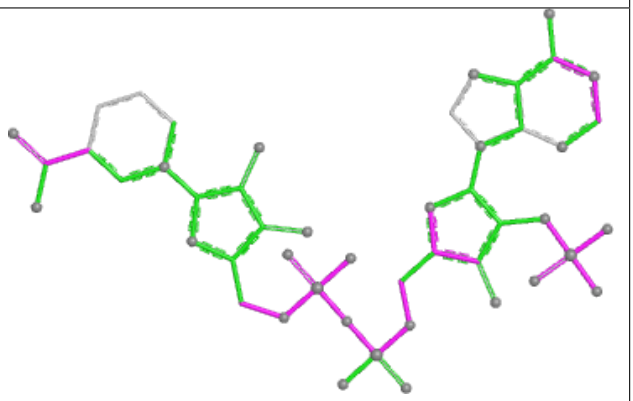
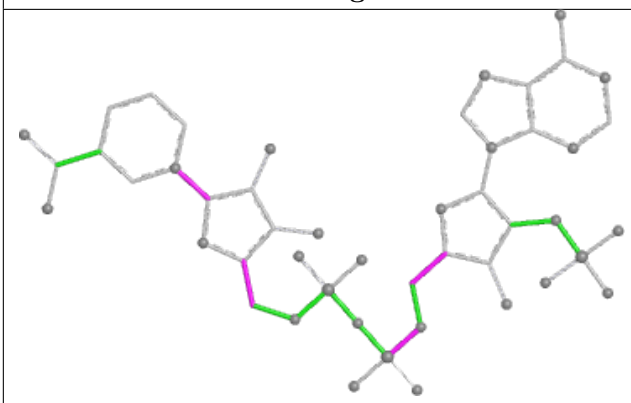
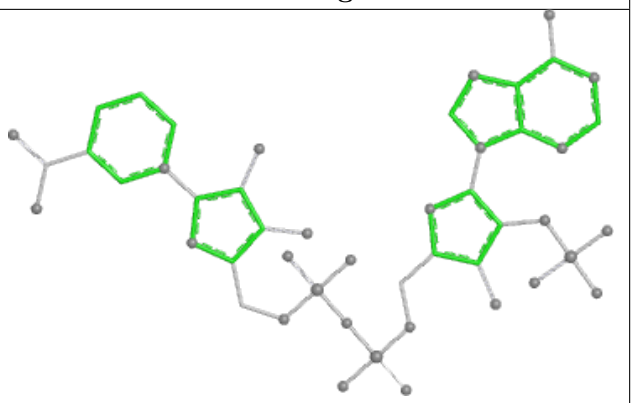
Torsions

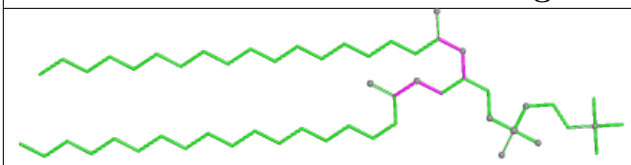
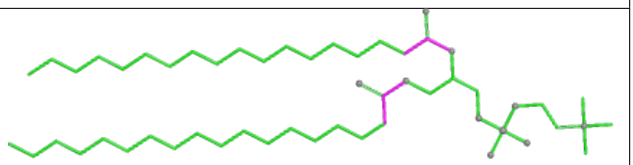
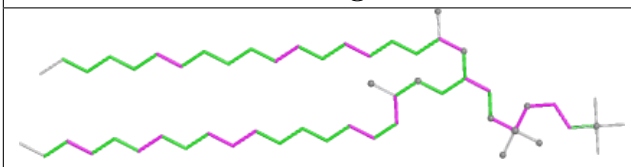
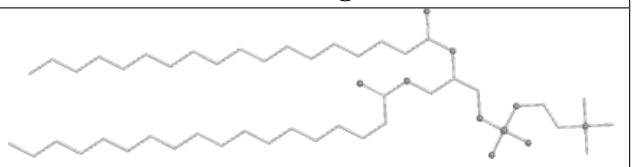


Rings

Ligand EHZ U 101	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE Y 804	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand NDP P 501	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 I 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

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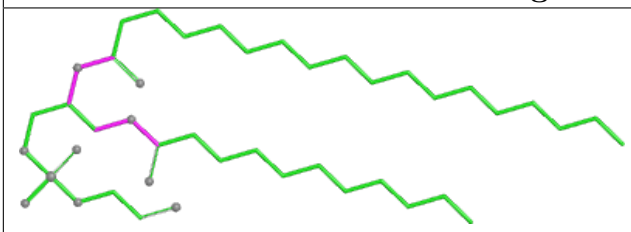
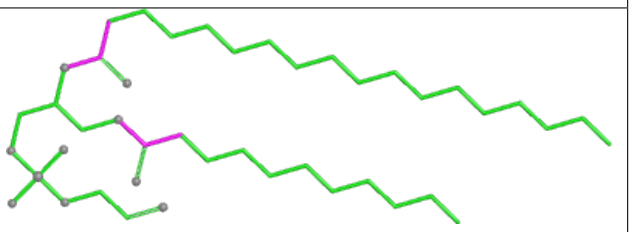
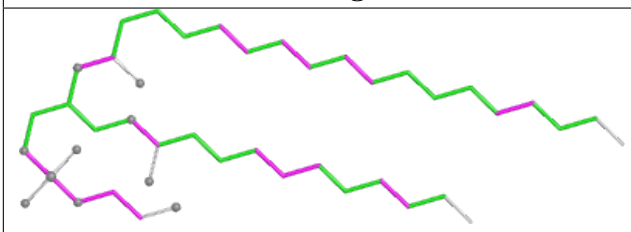
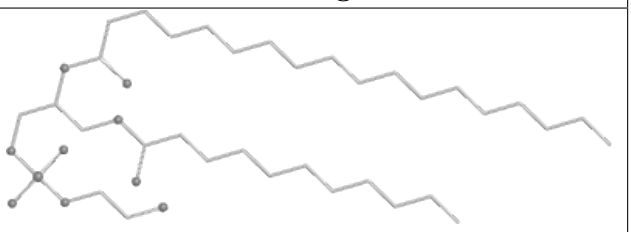
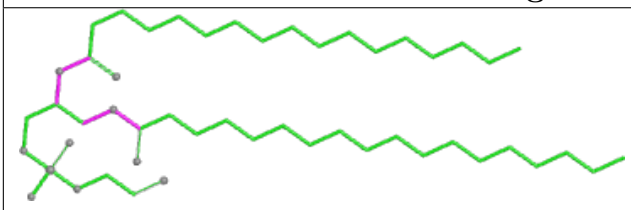
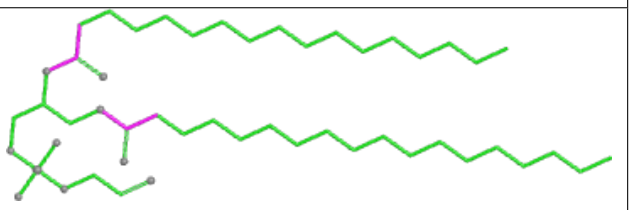
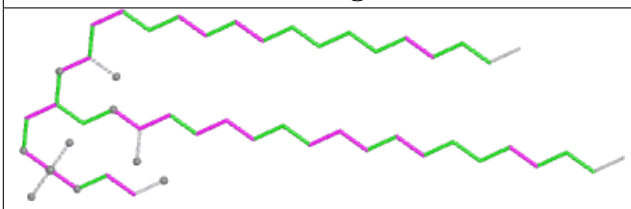
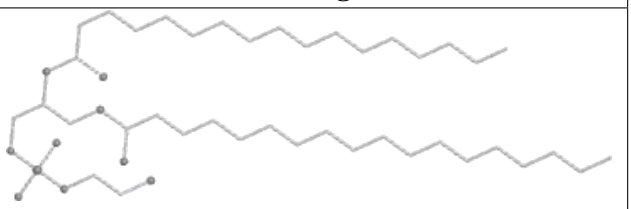
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE m 401	
 Bond lengths	 Bond angles
 Torsions	 Rings

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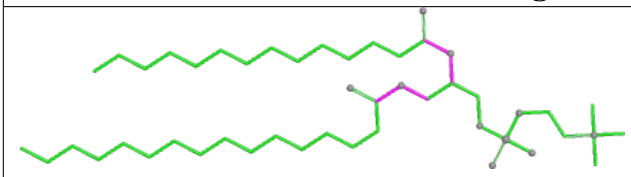
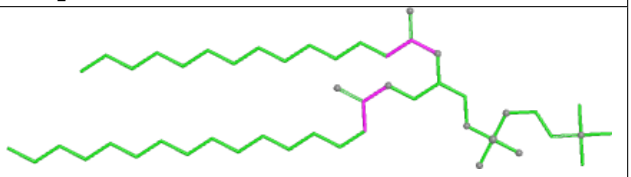
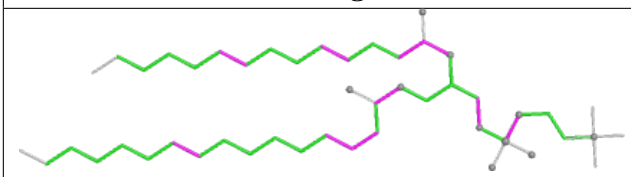
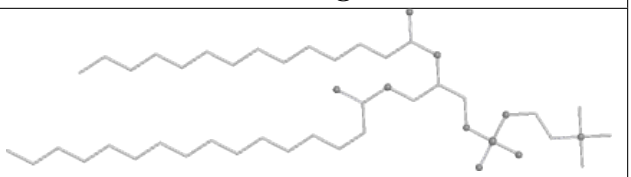
 Bond lengths	 Bond angles
 Torsions	 Rings

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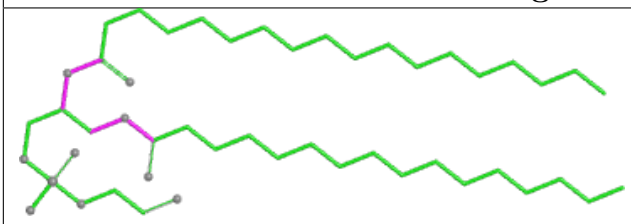
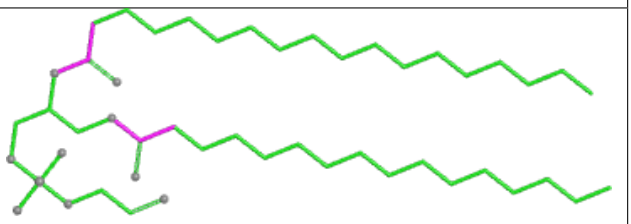
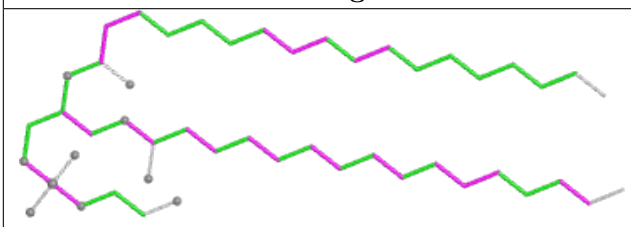
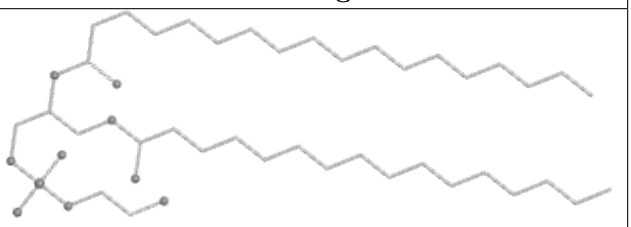
 Bond lengths	 Bond angles
 Torsions	 Rings

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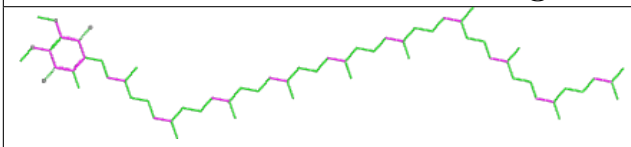
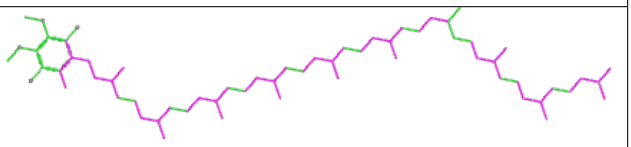
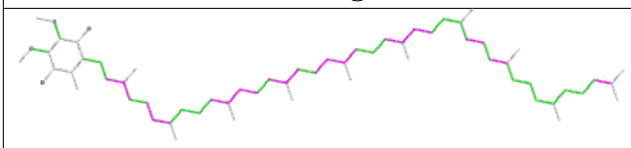
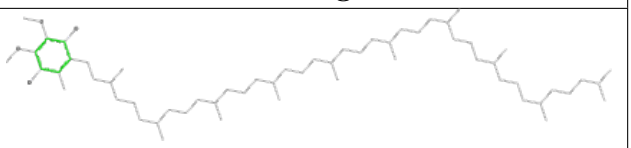
 Bond lengths	 Bond angles
 Torsions	 Rings

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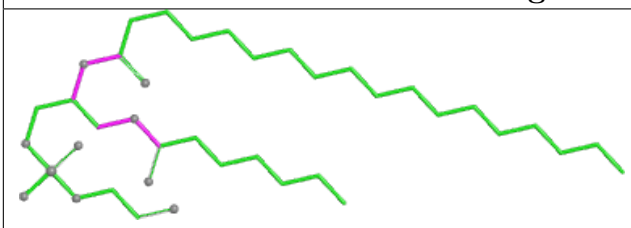
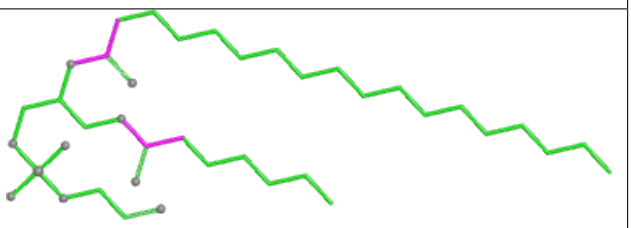
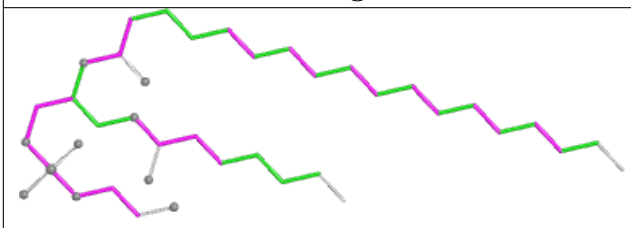
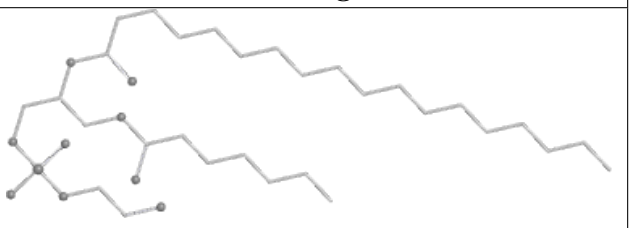
 Bond lengths	 Bond angles
 Torsions	 Rings

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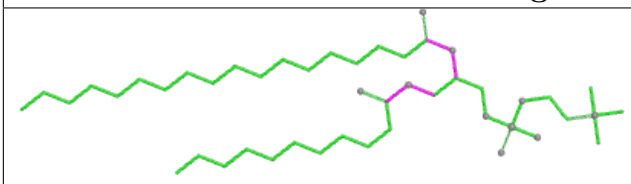
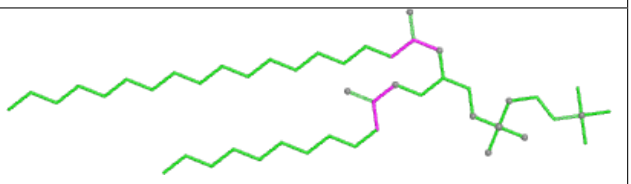
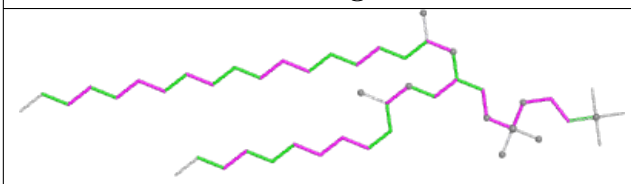
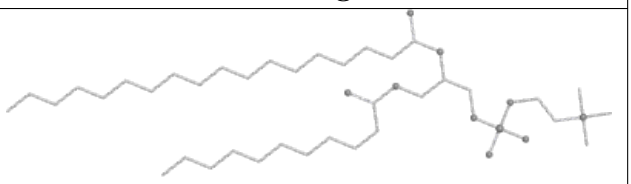
 Bond lengths	 Bond angles
 Torsions	 Rings

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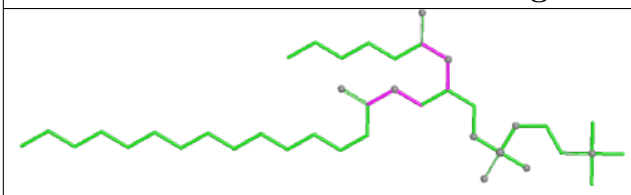
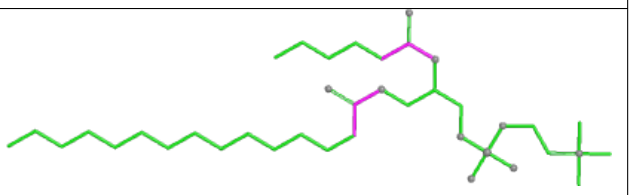
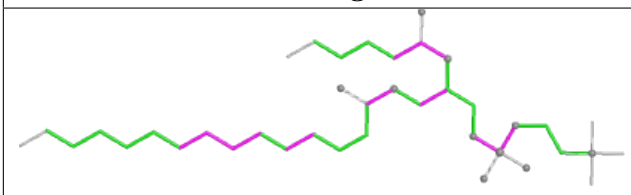
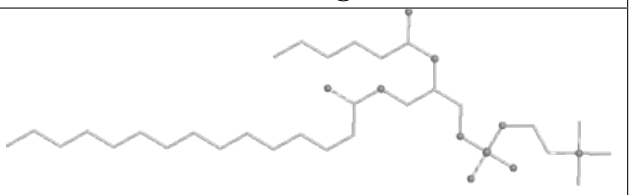
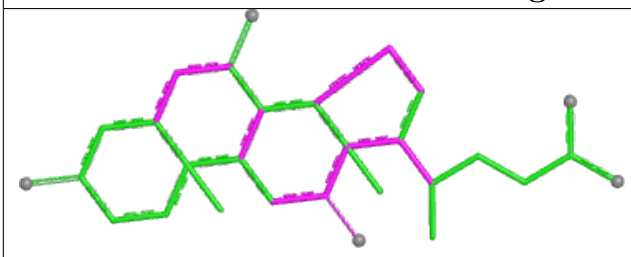
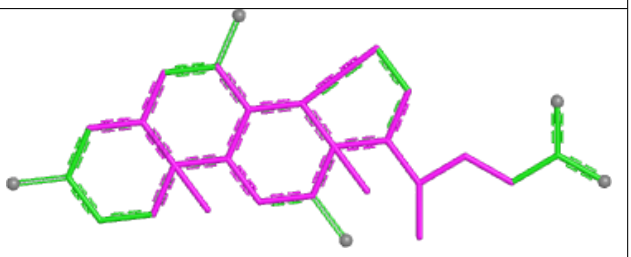
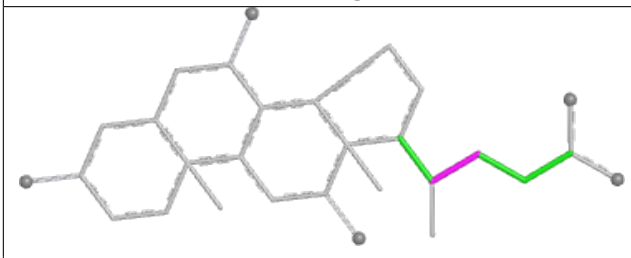
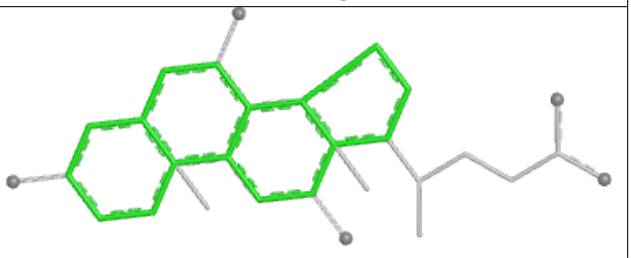
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand CHD i 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

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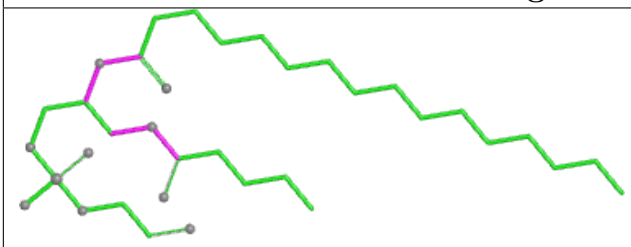
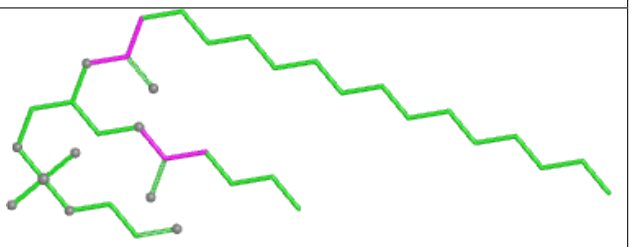
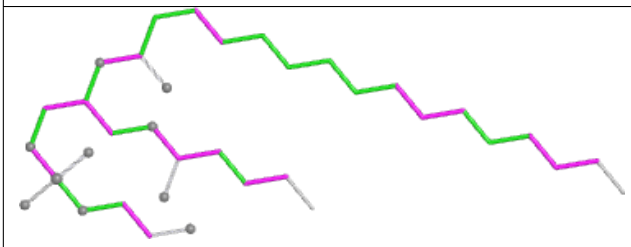
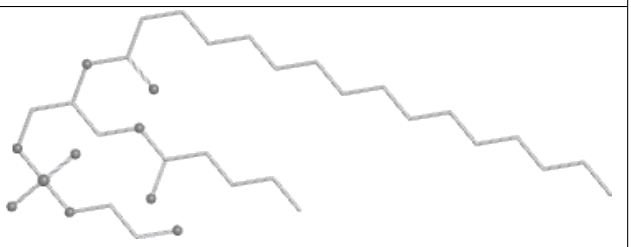
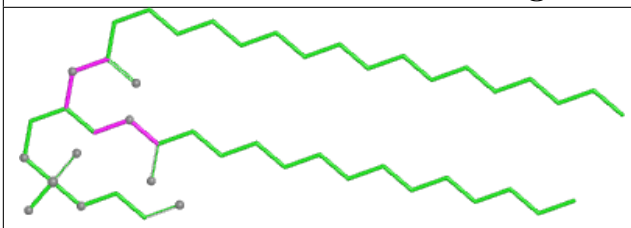
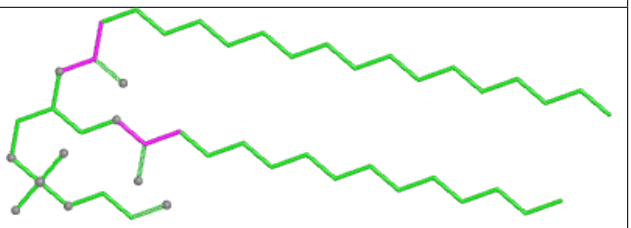
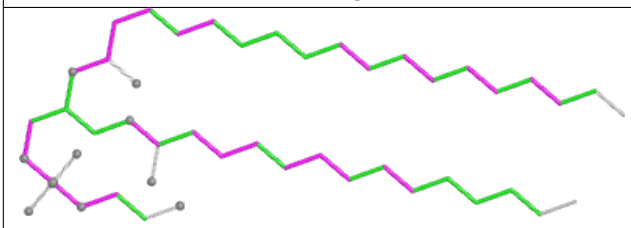
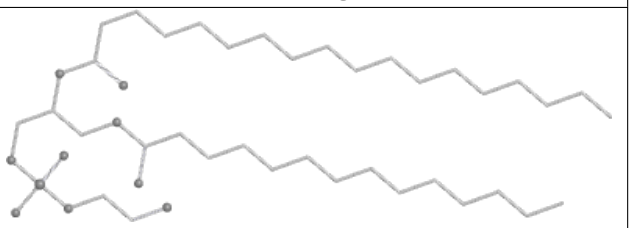
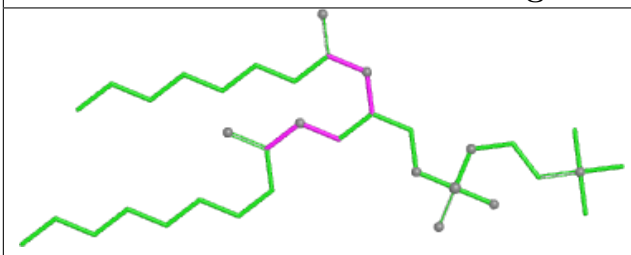
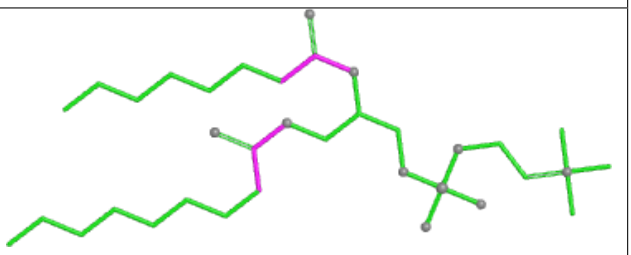
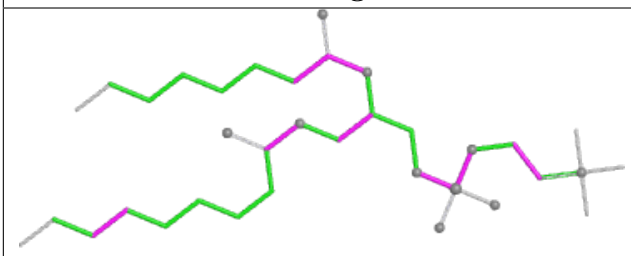
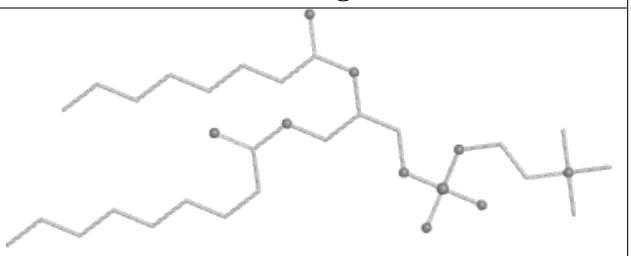
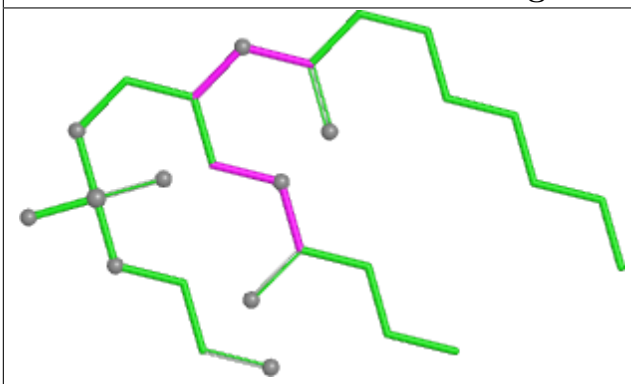
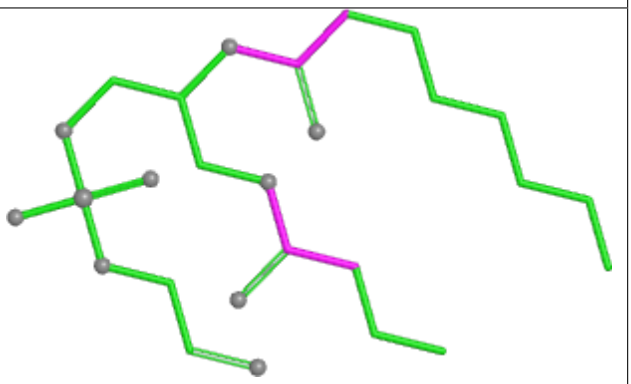
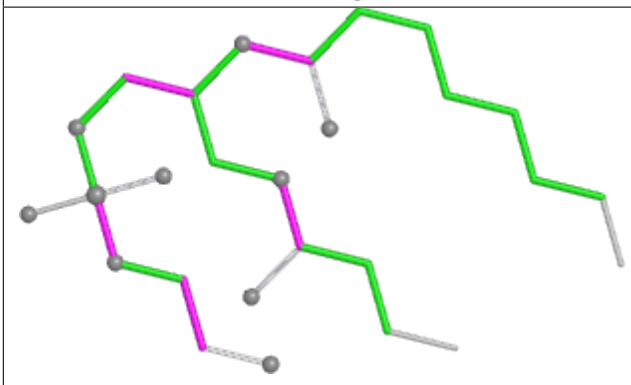
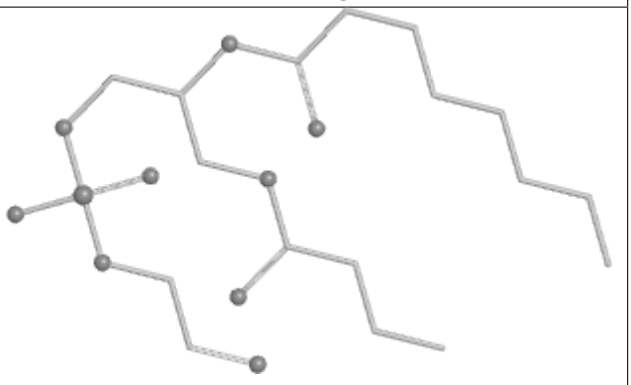
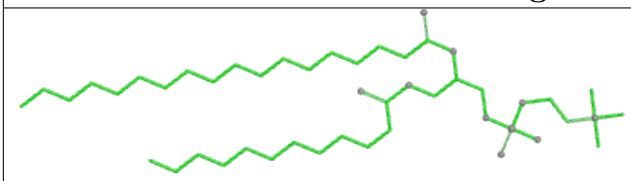
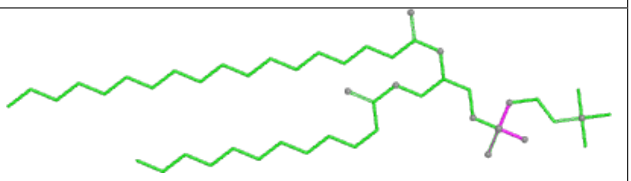
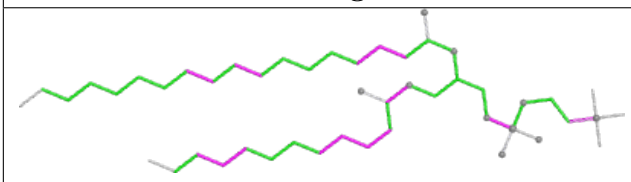
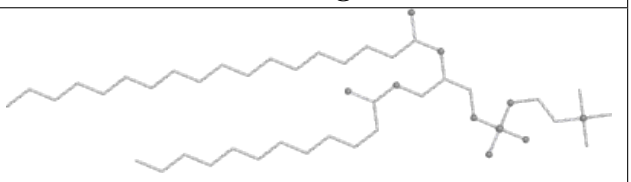
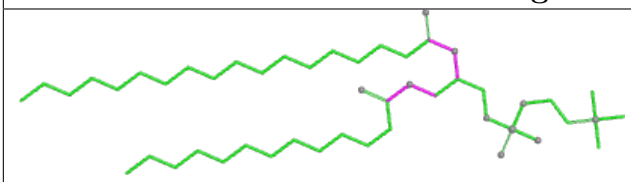
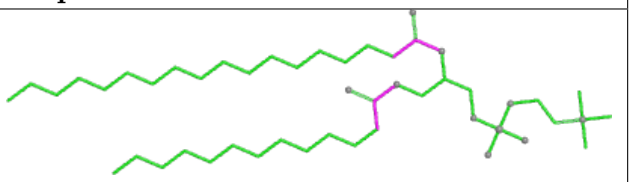
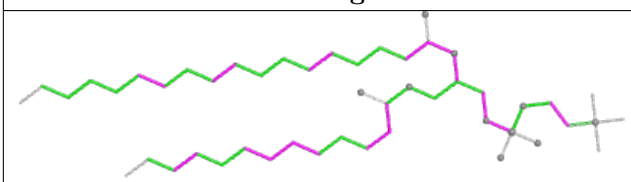
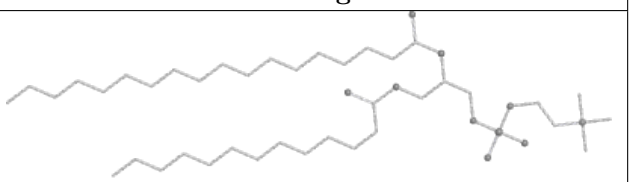
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE A 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 A 203	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE Y 805	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 Z 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 q 202	
 Bond lengths	 Bond angles
 Torsions	 Rings

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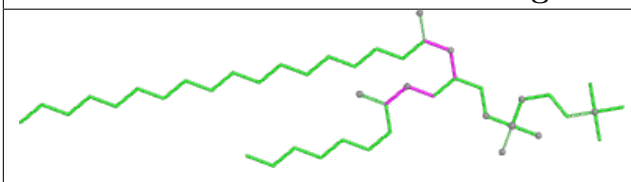
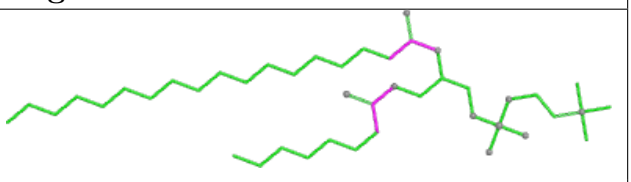
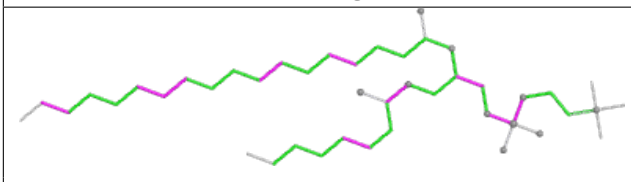
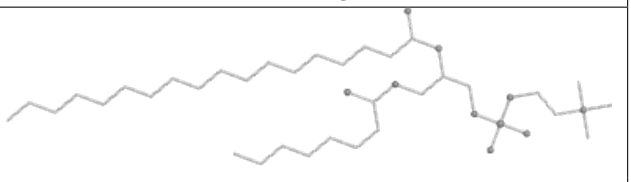
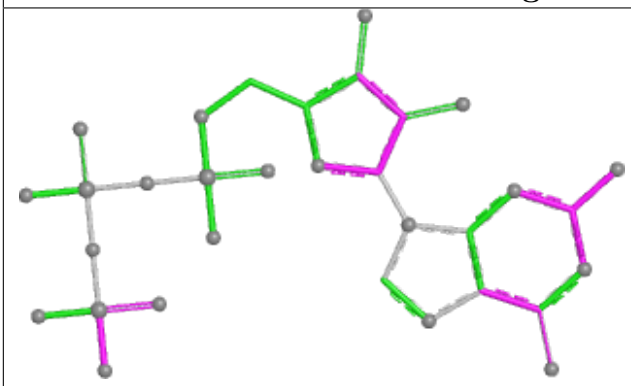
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand GTP O 401



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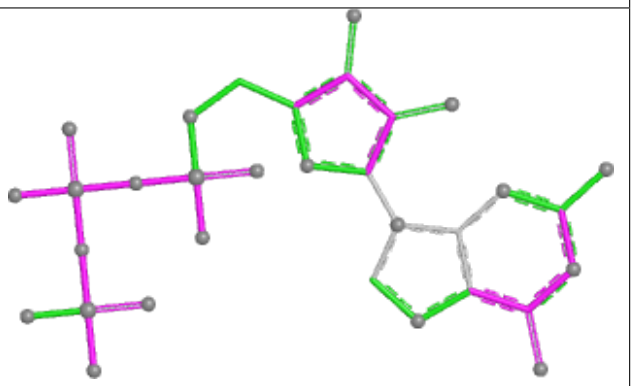

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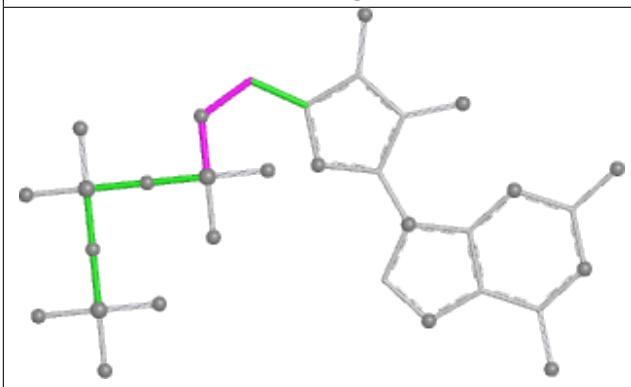

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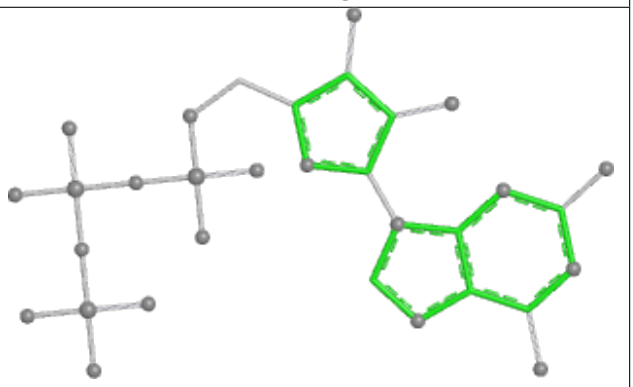
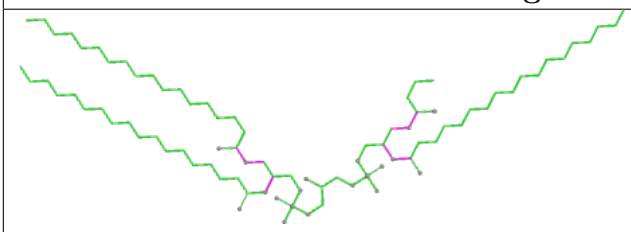


Rings

Ligand CDL X 201



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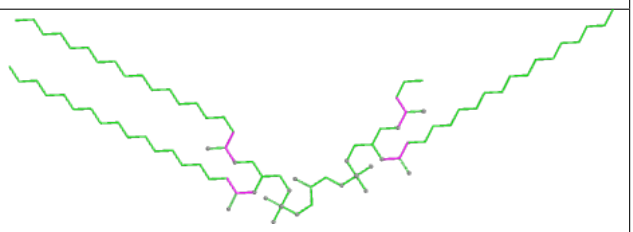

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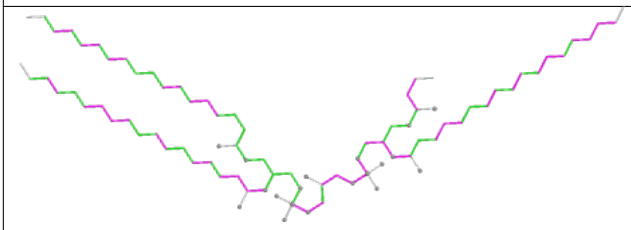

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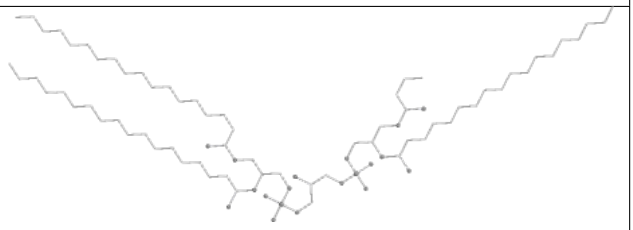
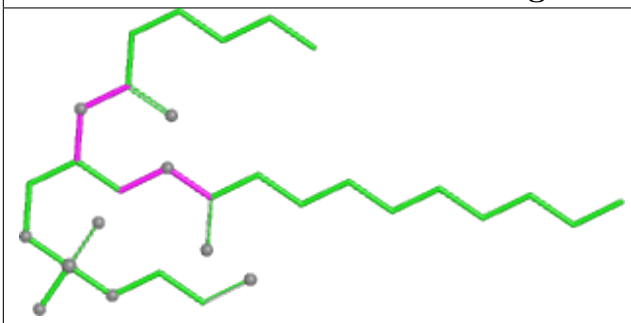
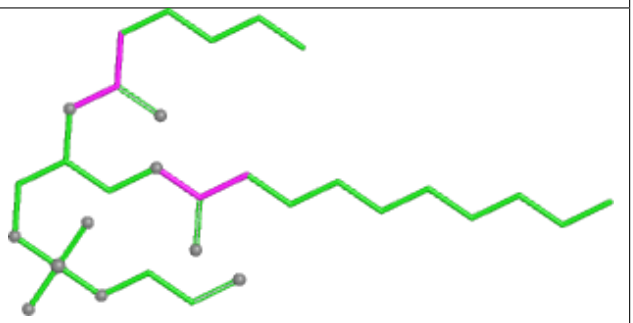
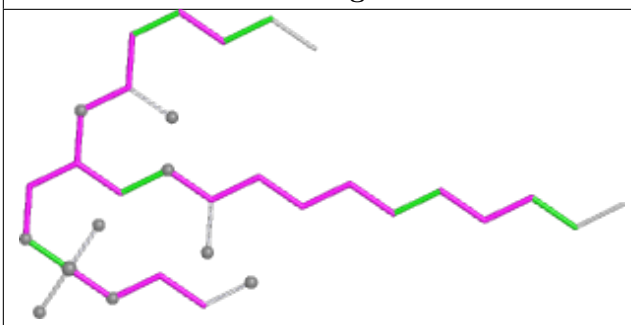
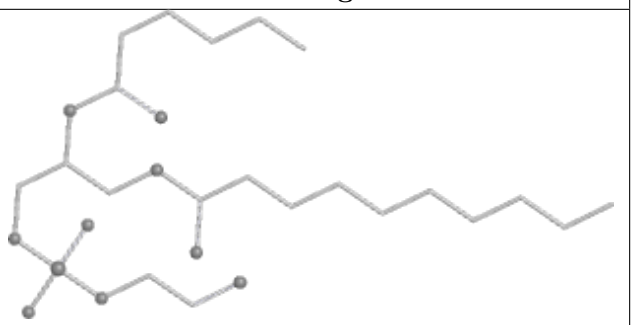


Rings

Ligand 3PE Y 801	
 Bond lengths	 Bond angles
 Torsions	 Rings

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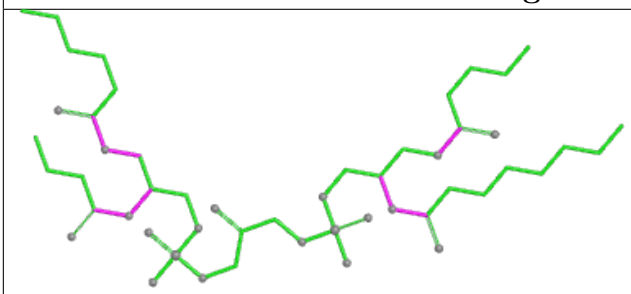
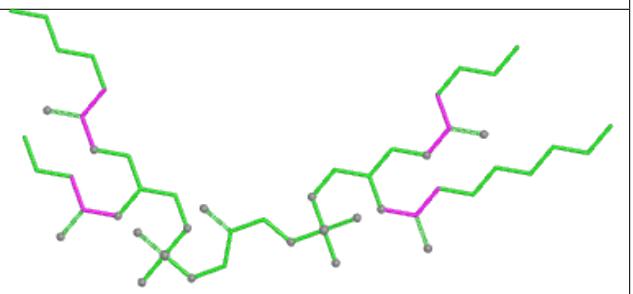
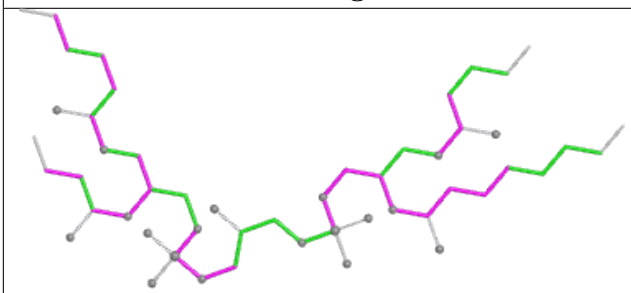
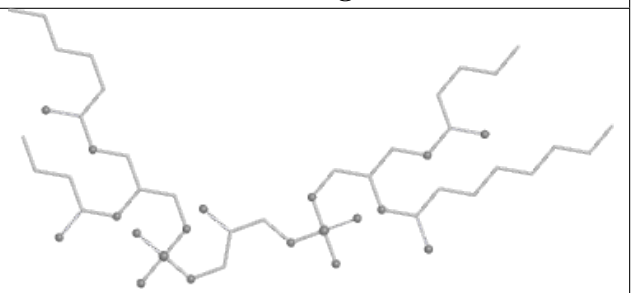
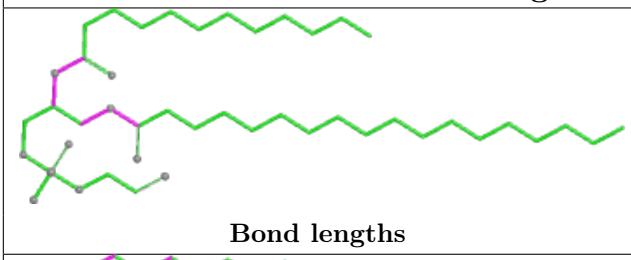
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE L 703



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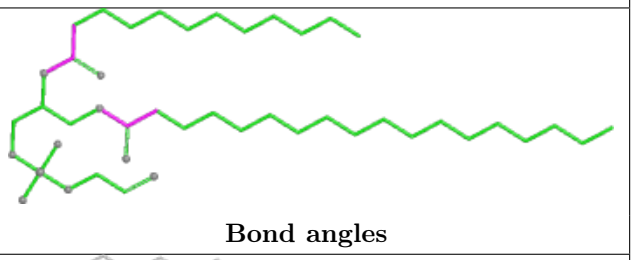

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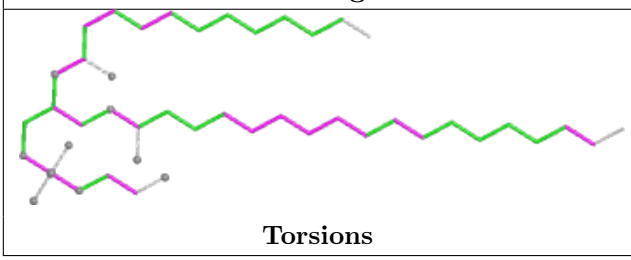

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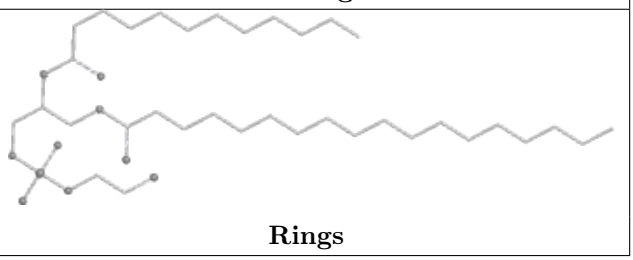
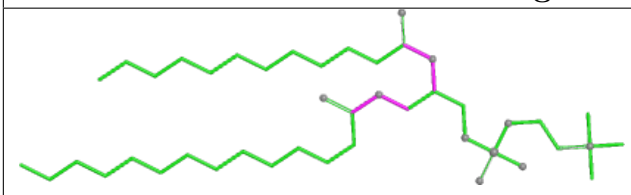


Rings

Ligand PC1 I 204



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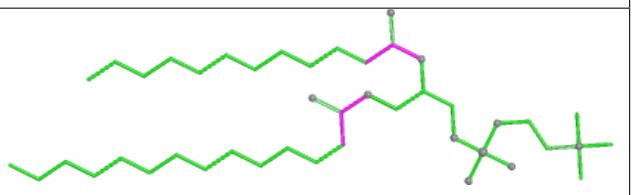

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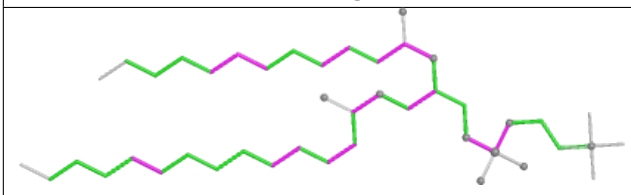

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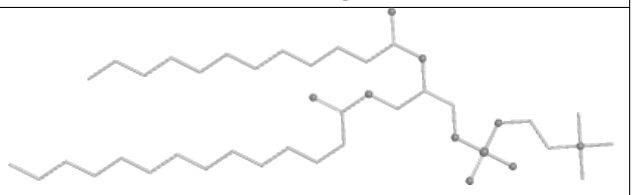
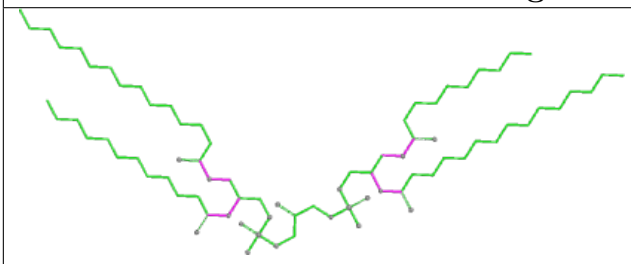


Rings

Ligand CDL h 201



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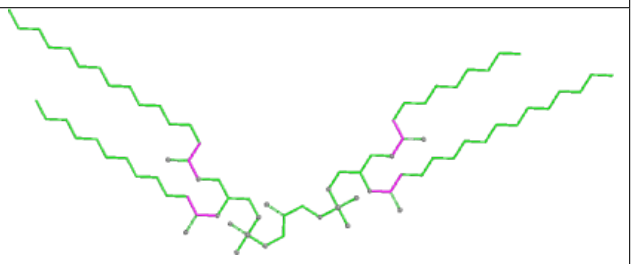

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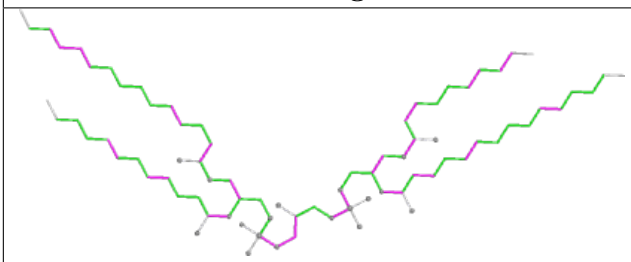

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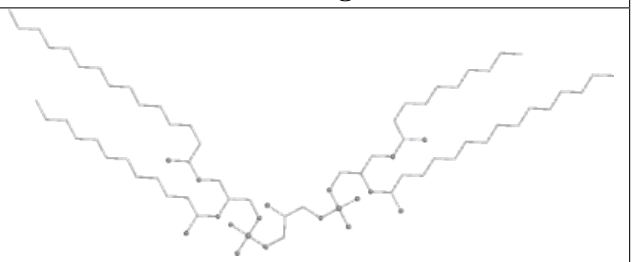
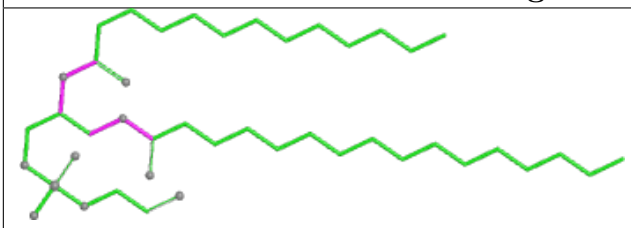
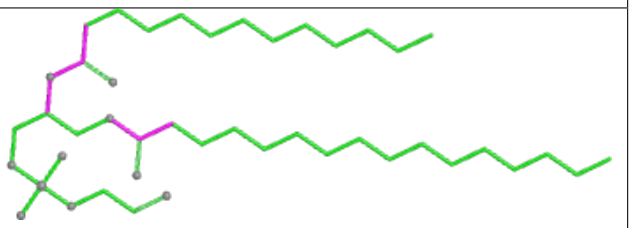
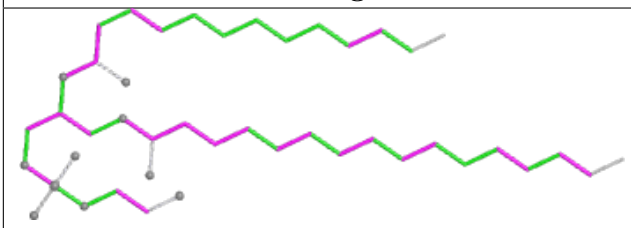
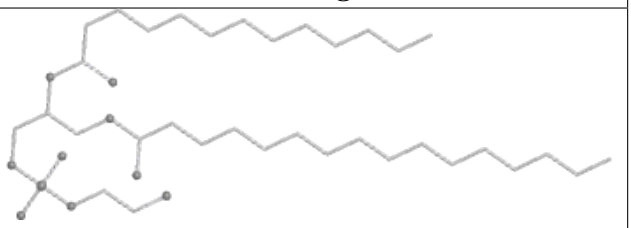
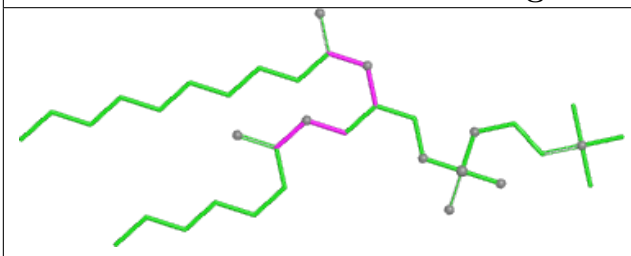
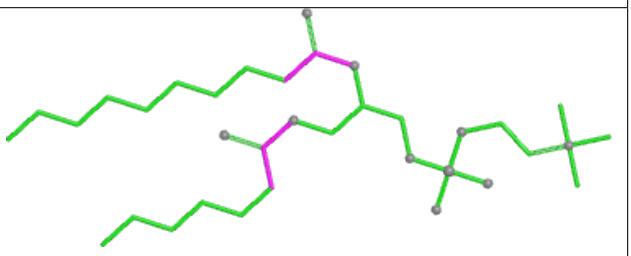
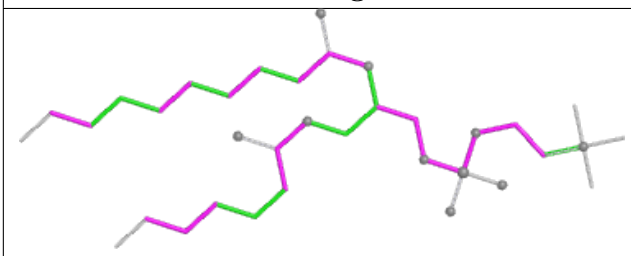
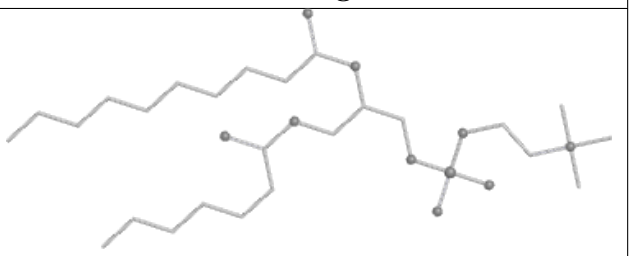


Rings

Ligand 3PE K 101	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 A 202	
 Bond lengths	 Bond angles
 Torsions	 Rings

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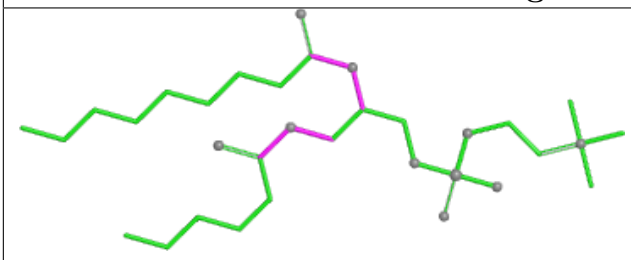
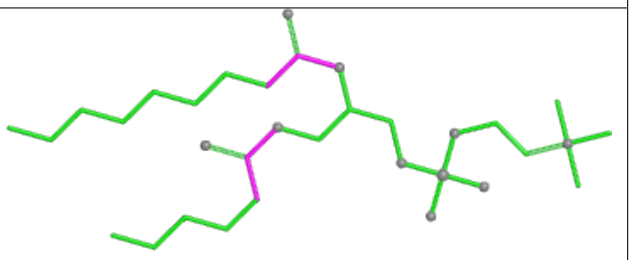
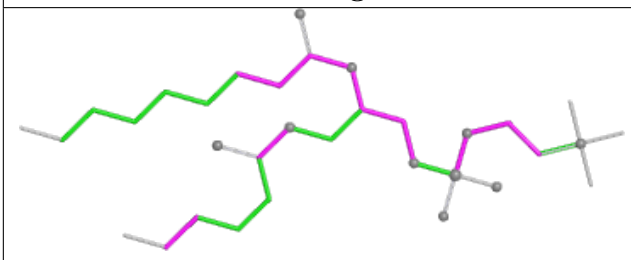
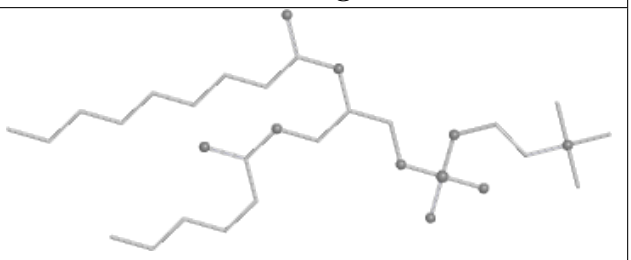
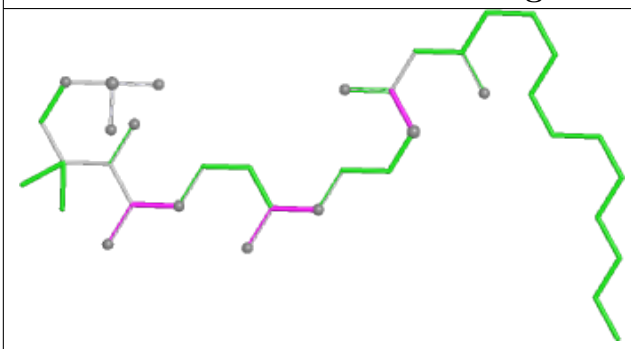
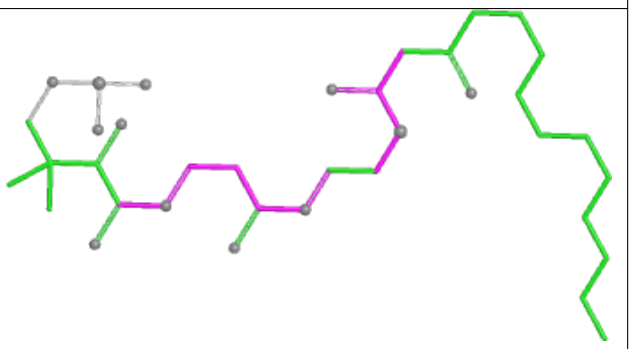
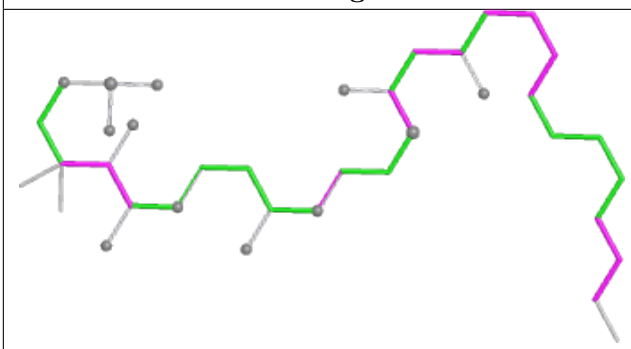
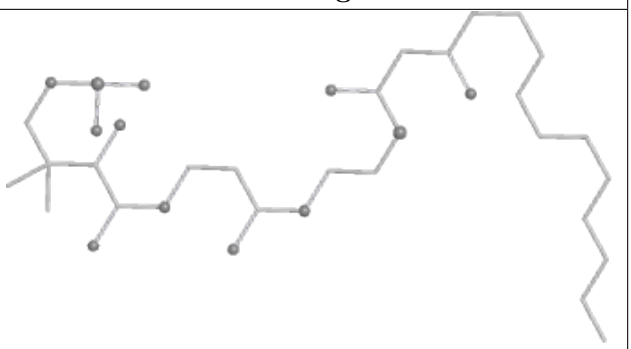
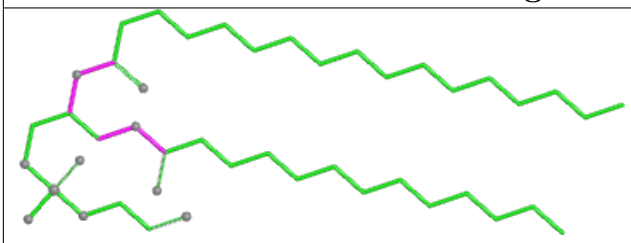
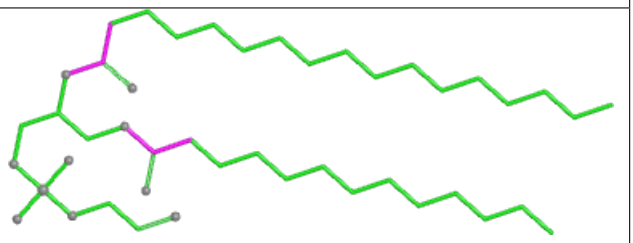
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand EHZ T 101	
 Bond lengths	 Bond angles
 Torsions	 Rings

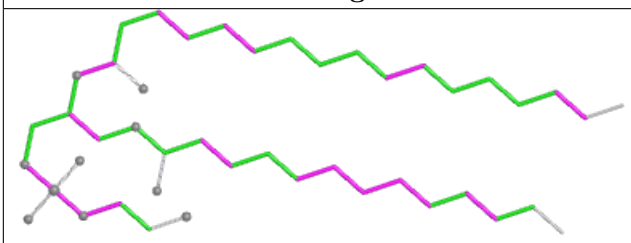
Ligand 3PE M 902



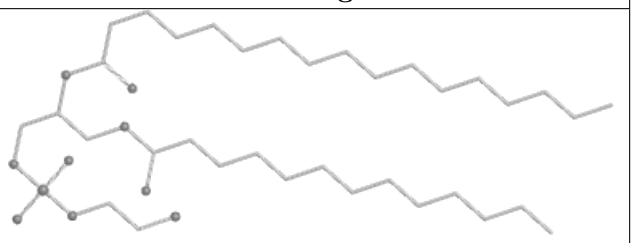
Bond lengths



Bond angles

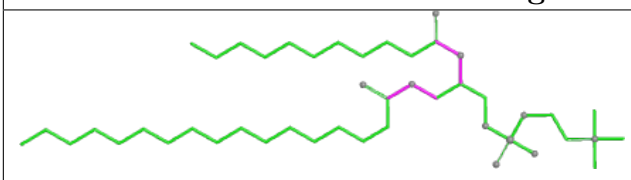


Torsions

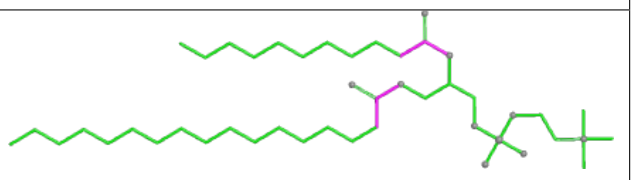


Rings

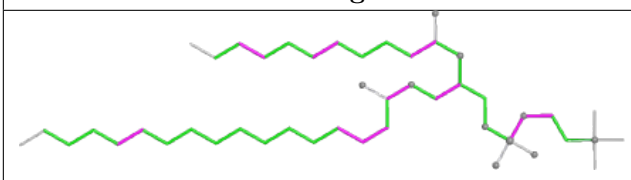
Ligand PC1 B 202



Bond lengths



Bond angles



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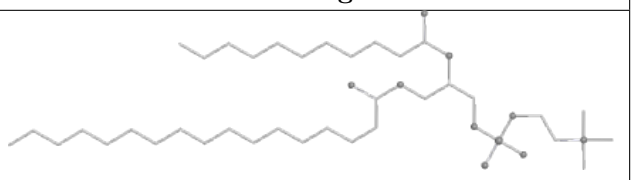
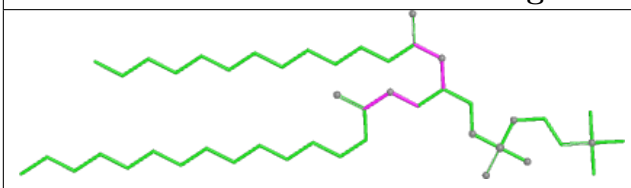
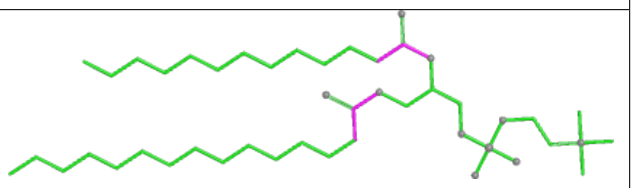


Rings

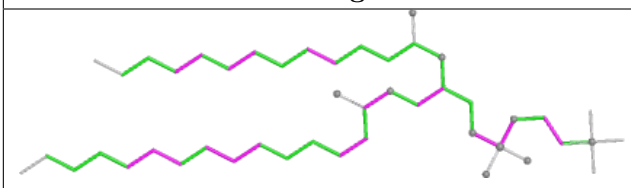
Ligand PC1 Y 806



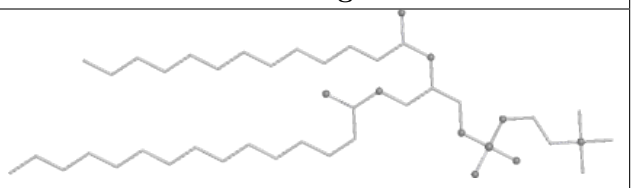
Bond lengths



Bond angles

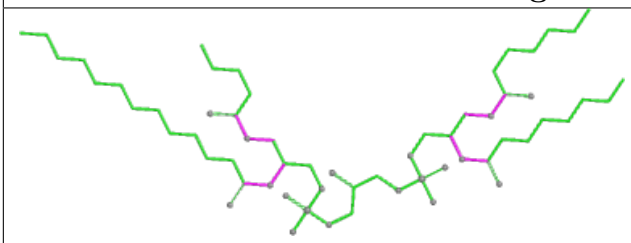


Torsions

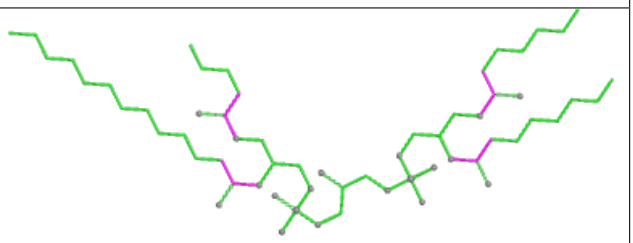


Rings

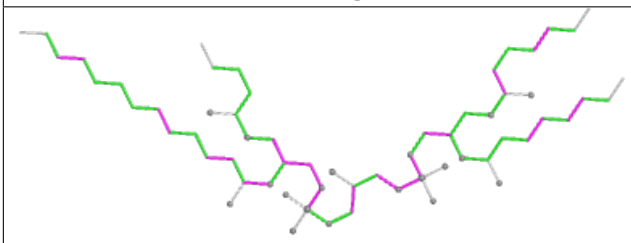
Ligand CDL r 201



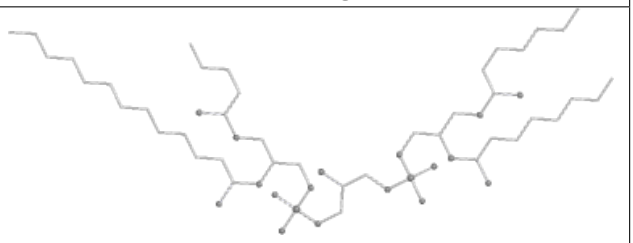
Bond lengths



Bond angles

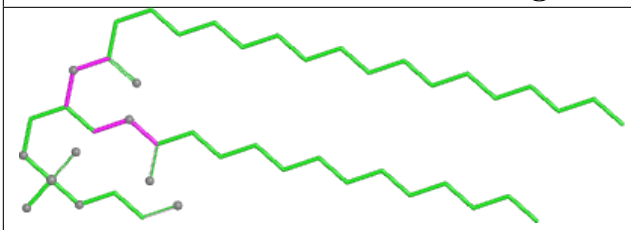


Torsions

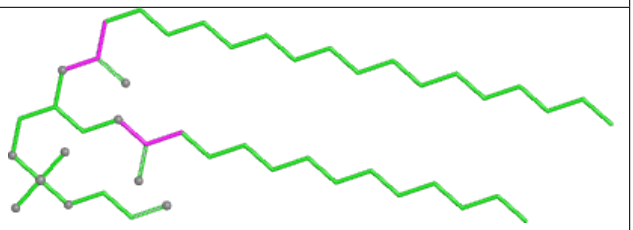


Rings

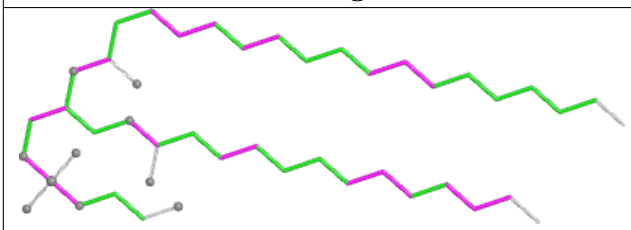
Ligand 3PE L 701



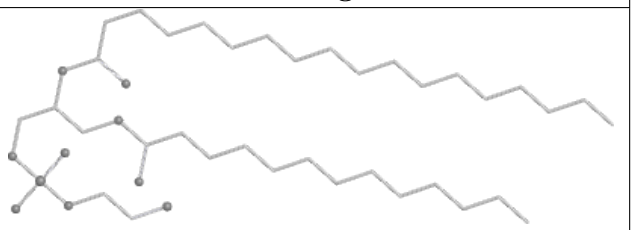
Bond lengths



Bond angles

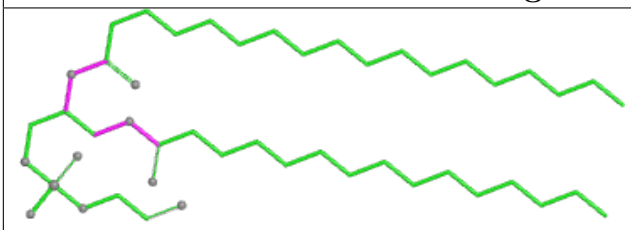


Torsions

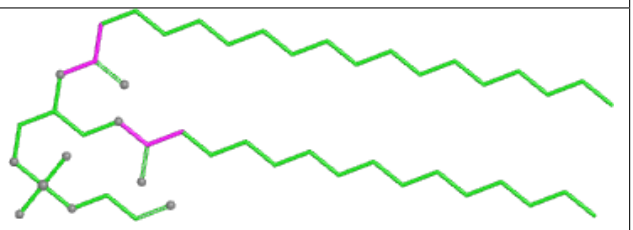


Rings

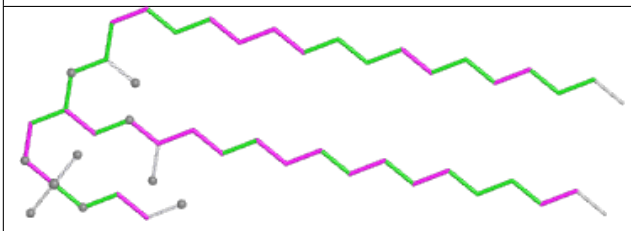
Ligand 3PE M 903



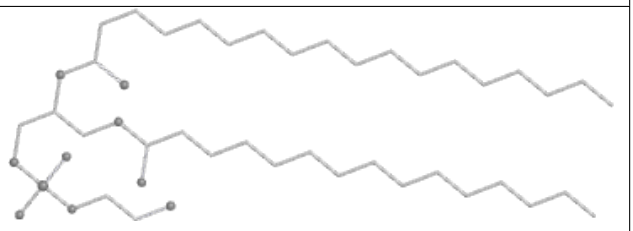
Bond lengths



Bond angles

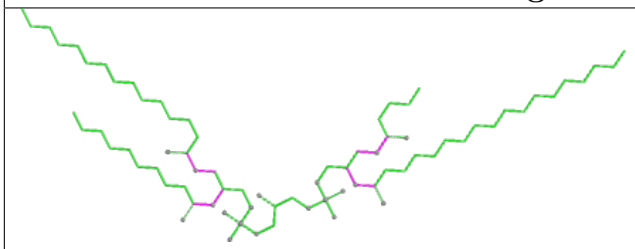


Torsions

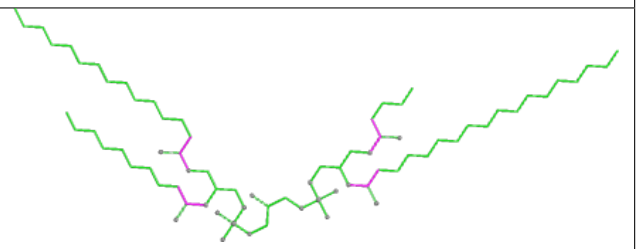


Rings

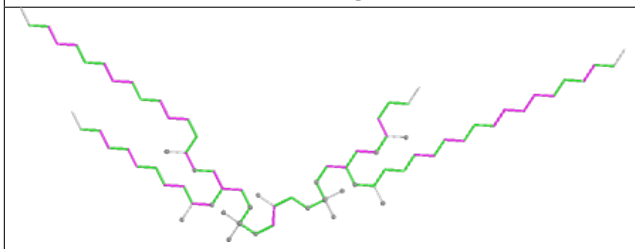
Ligand CDL L 702



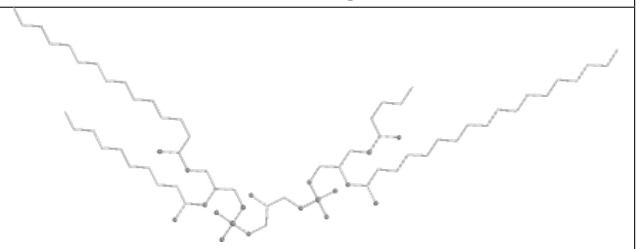
Bond lengths



Bond angles

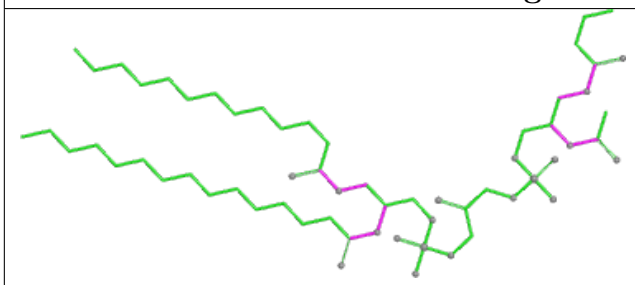


Torsions

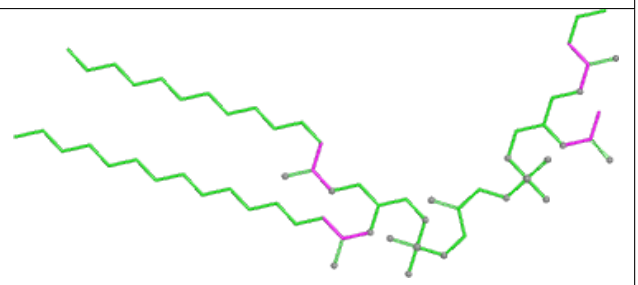


Rings

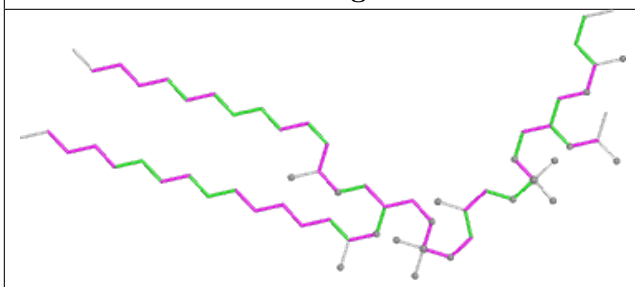
Ligand CDL N 402



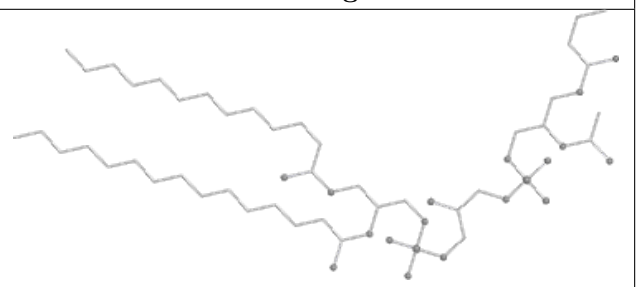
Bond lengths



Bond angles

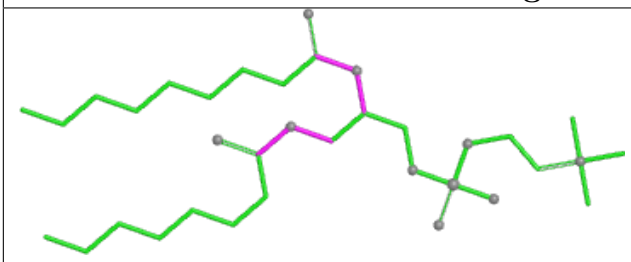


Torsions

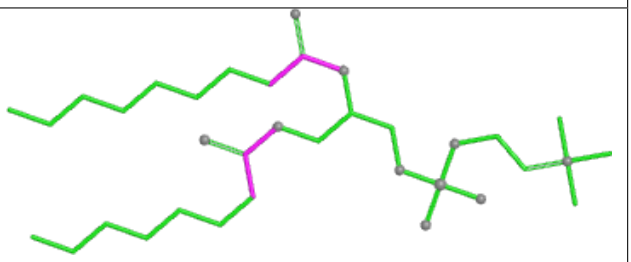


Rings

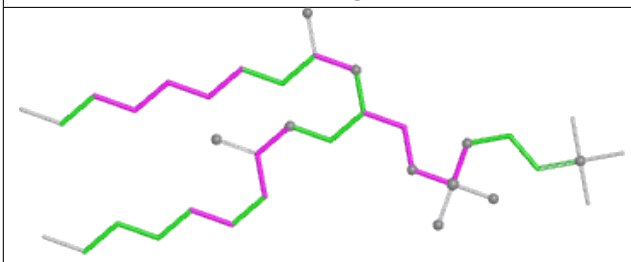
Ligand PC1 M 904



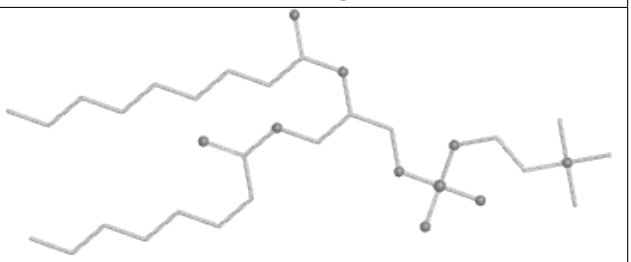
Bond lengths



Bond angles

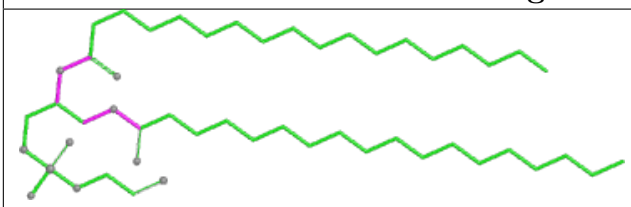


Torsions

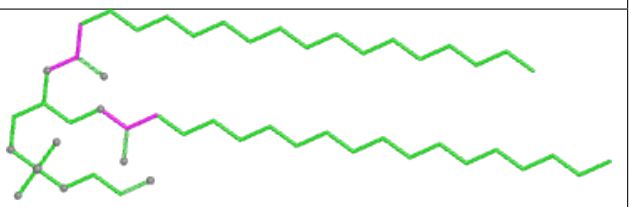


Rings

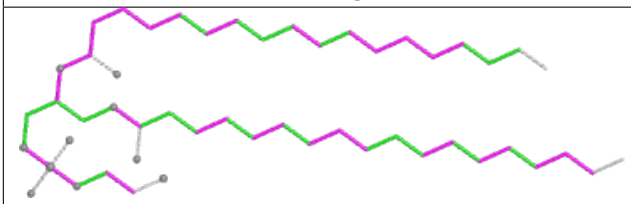
Ligand 3PE N 401



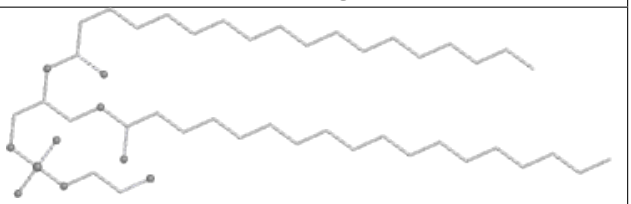
Bond lengths



Bond angles

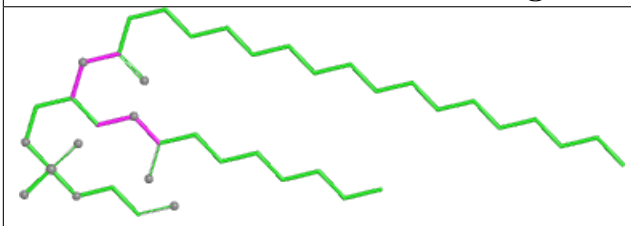


Torsions

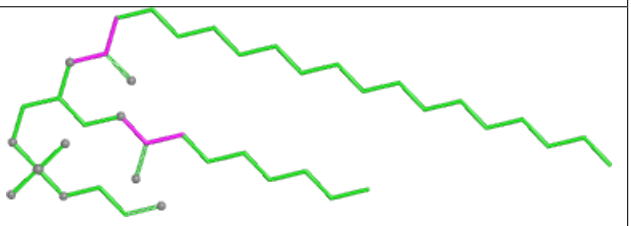


Rings

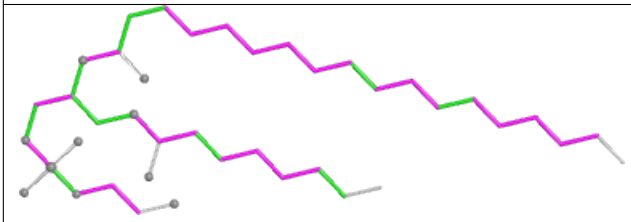
Ligand 3PE m 402



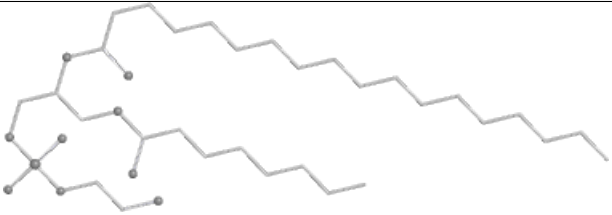
Bond lengths



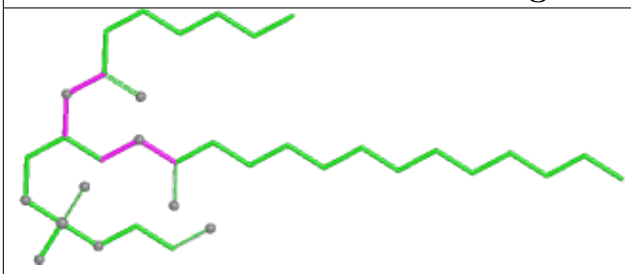
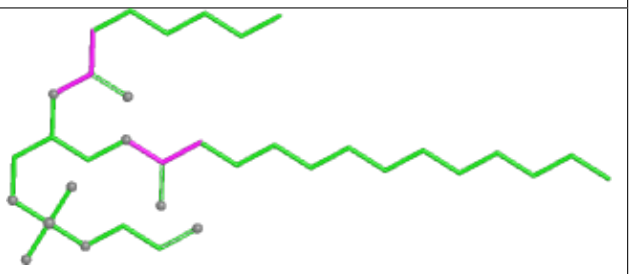
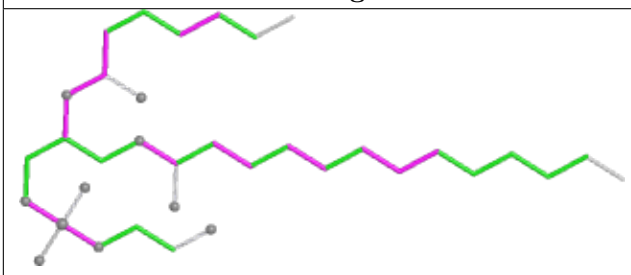
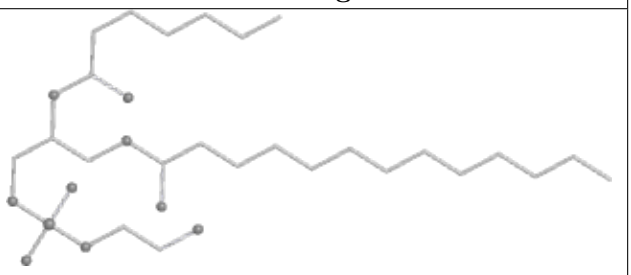
Bond angles



Torsions



Rings

Ligand 3PE P 502	
 Bond lengths	 Bond angles
 Torsions	 Rings

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.

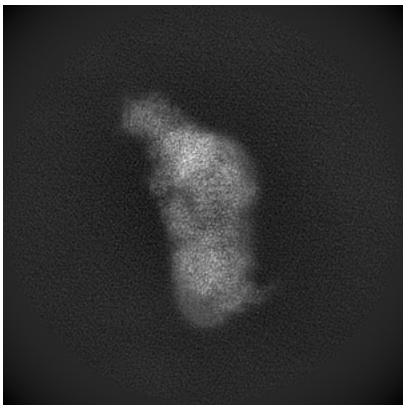
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-14132. These allow visual inspection of the internal detail of the map and identification of artifacts.

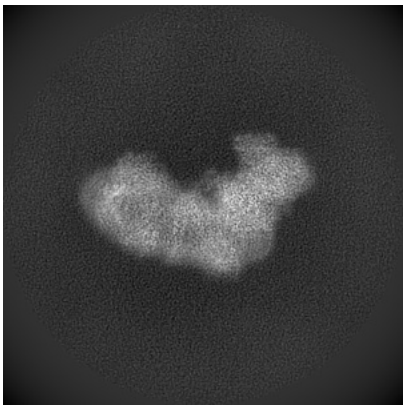
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

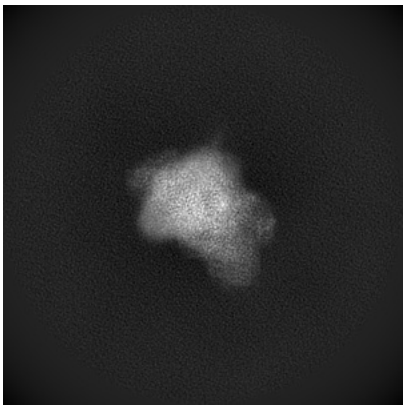
6.1.1 Primary map



X

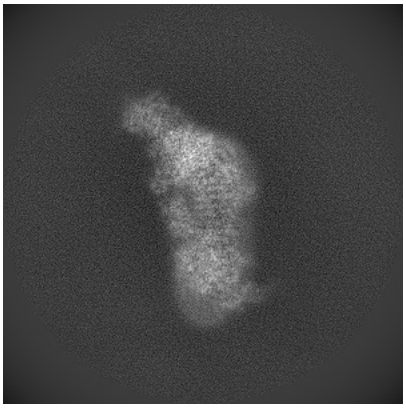


Y

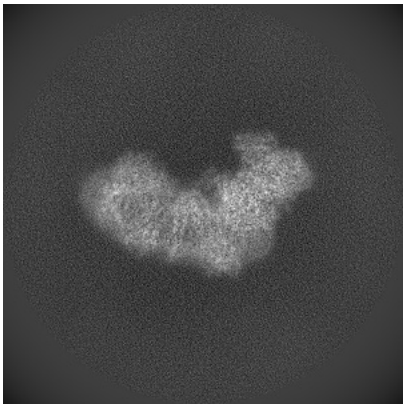


Z

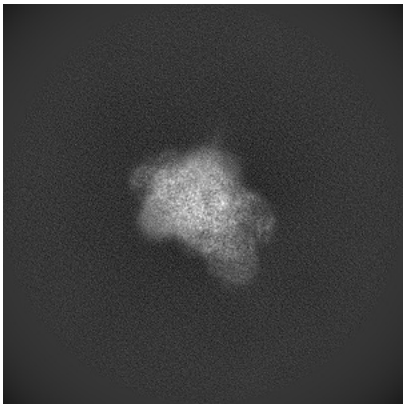
6.1.2 Raw map



X



Y

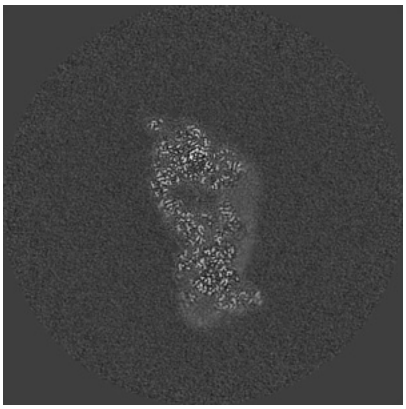


Z

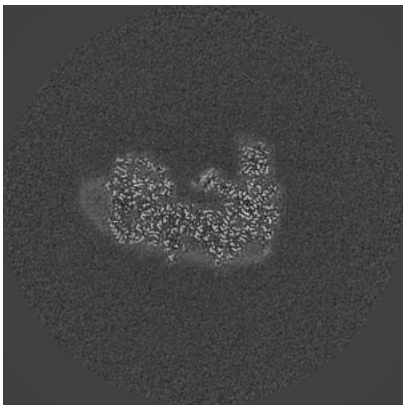
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

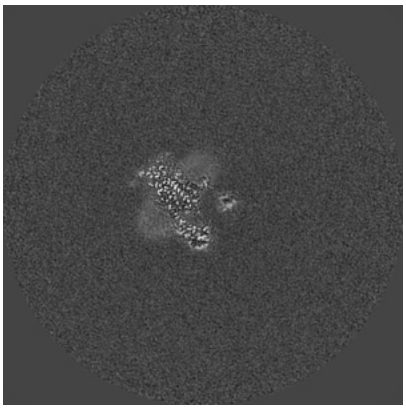
6.2.1 Primary map



X Index: 320

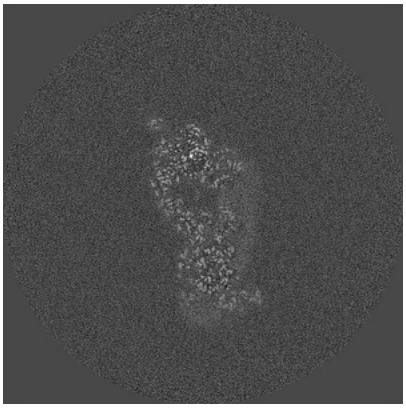


Y Index: 320

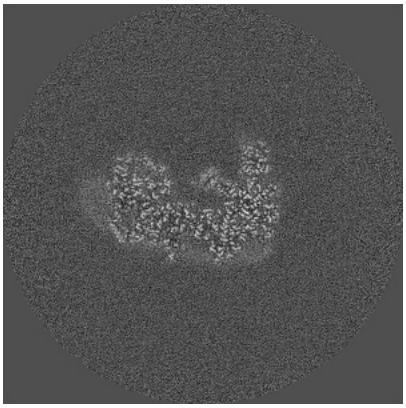


Z Index: 320

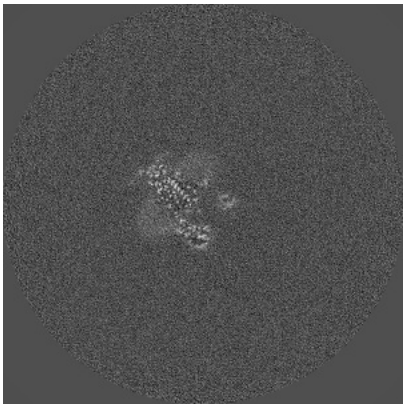
6.2.2 Raw map



X Index: 320



Y Index: 320

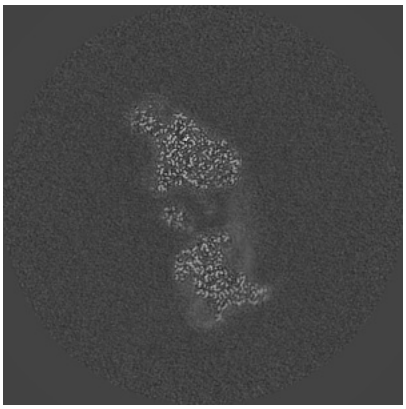


Z Index: 320

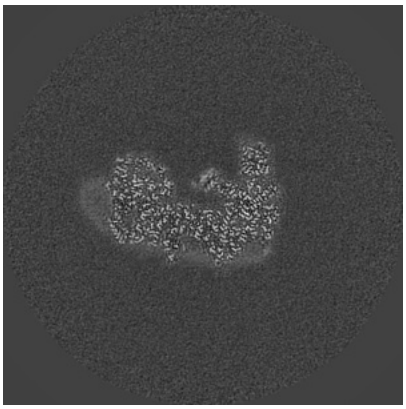
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

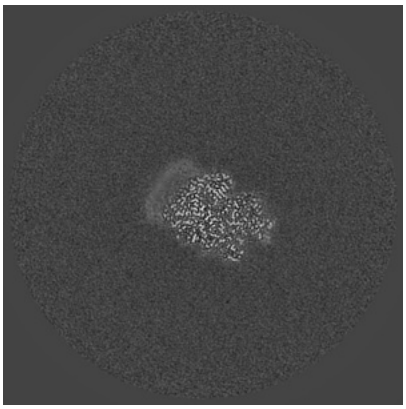
6.3.1 Primary map



X Index: 339

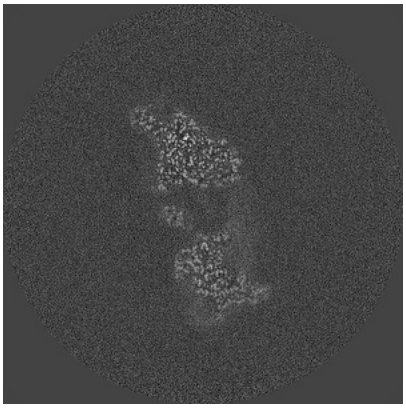


Y Index: 320

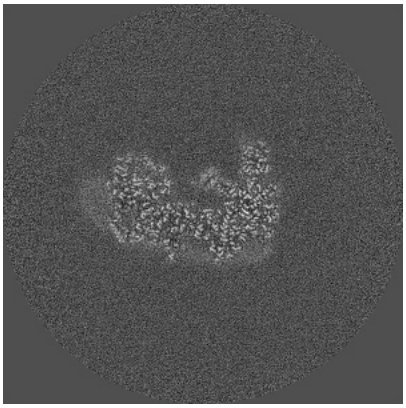


Z Index: 405

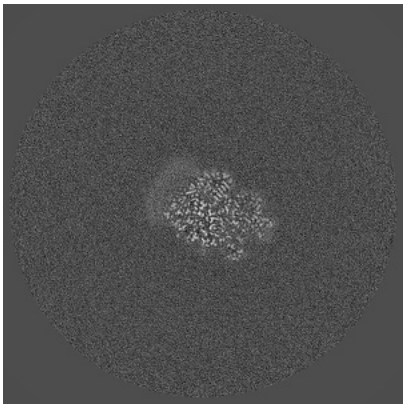
6.3.2 Raw map



X Index: 339



Y Index: 320



Z Index: 404

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

6.4 Orthogonal surface views (i)

6.4.1 Primary map

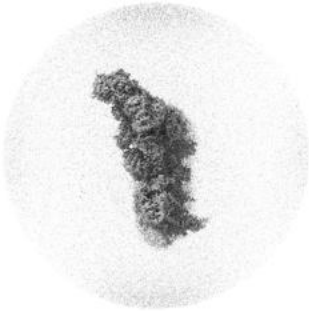
X

Y

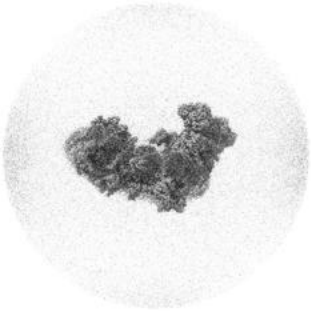
Z

The images above show the 3D surface view of the map at the recommended contour level 5.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

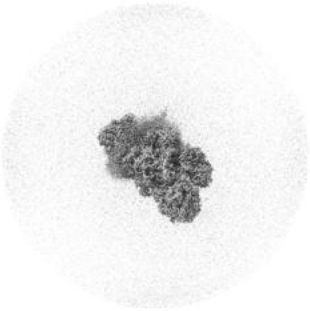
6.4.2 Raw map



X



Y



Z

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

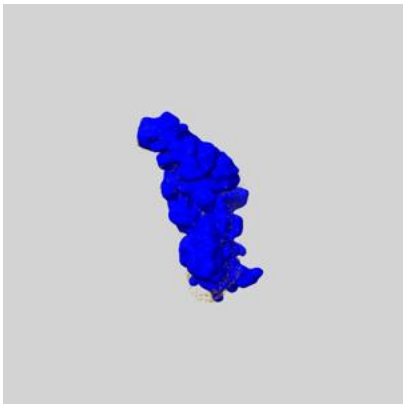
6.5 Mask visualisation (i)

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

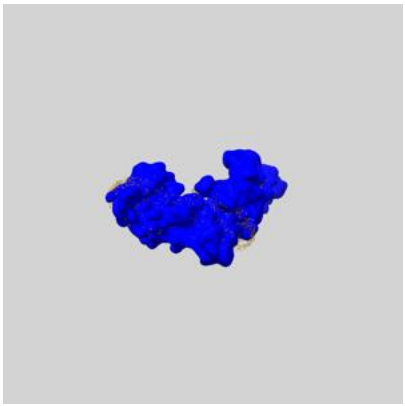
A mask typically either:

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

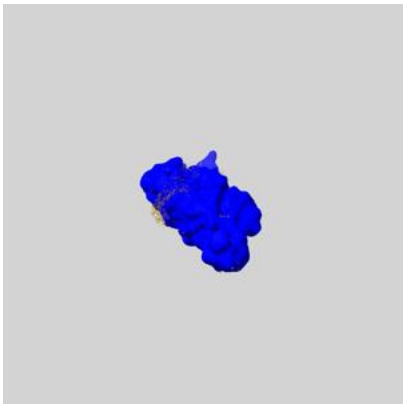
6.5.1 emd_14132_msk_1.map (i)



X



Y

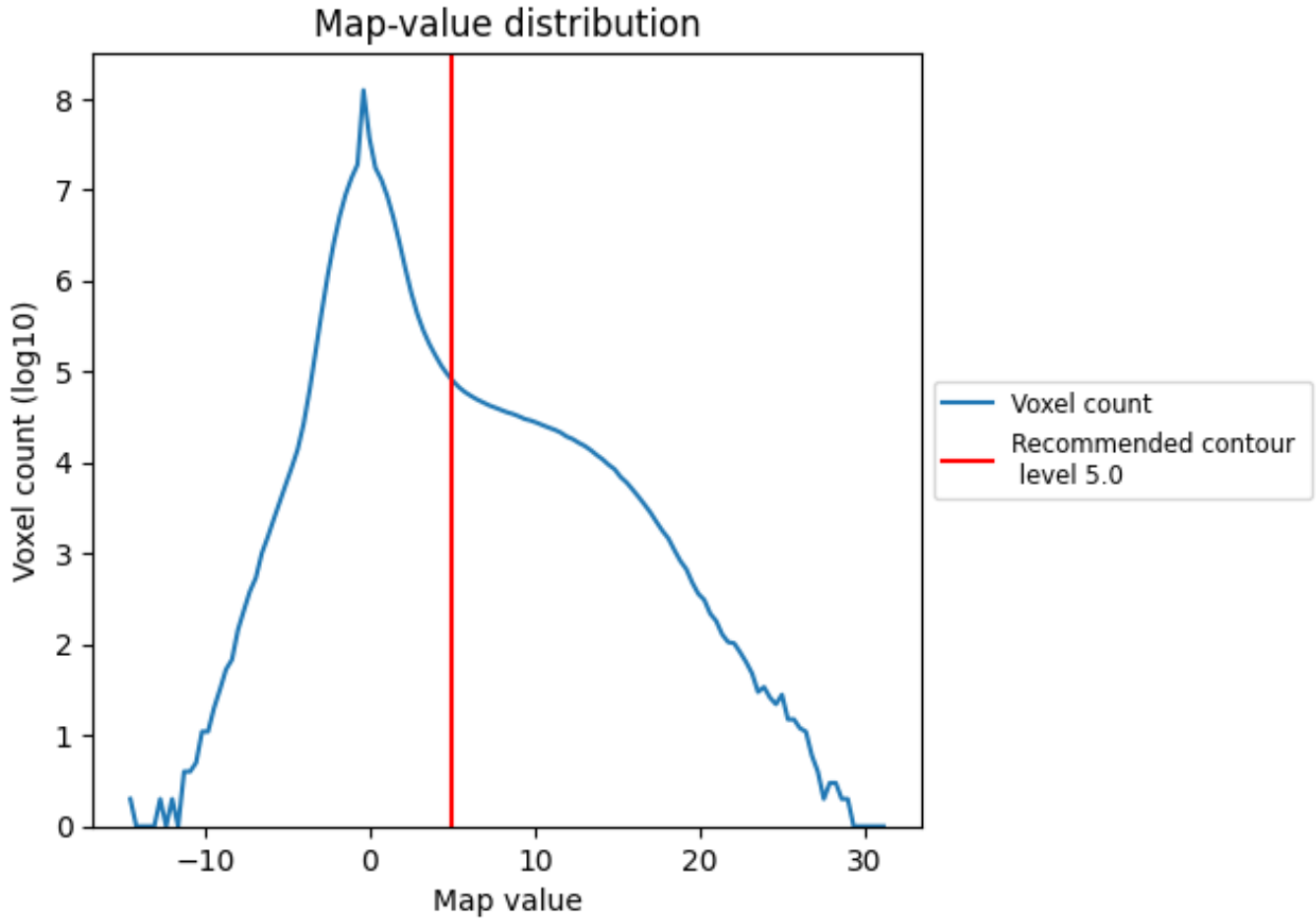


Z

7 Map analysis

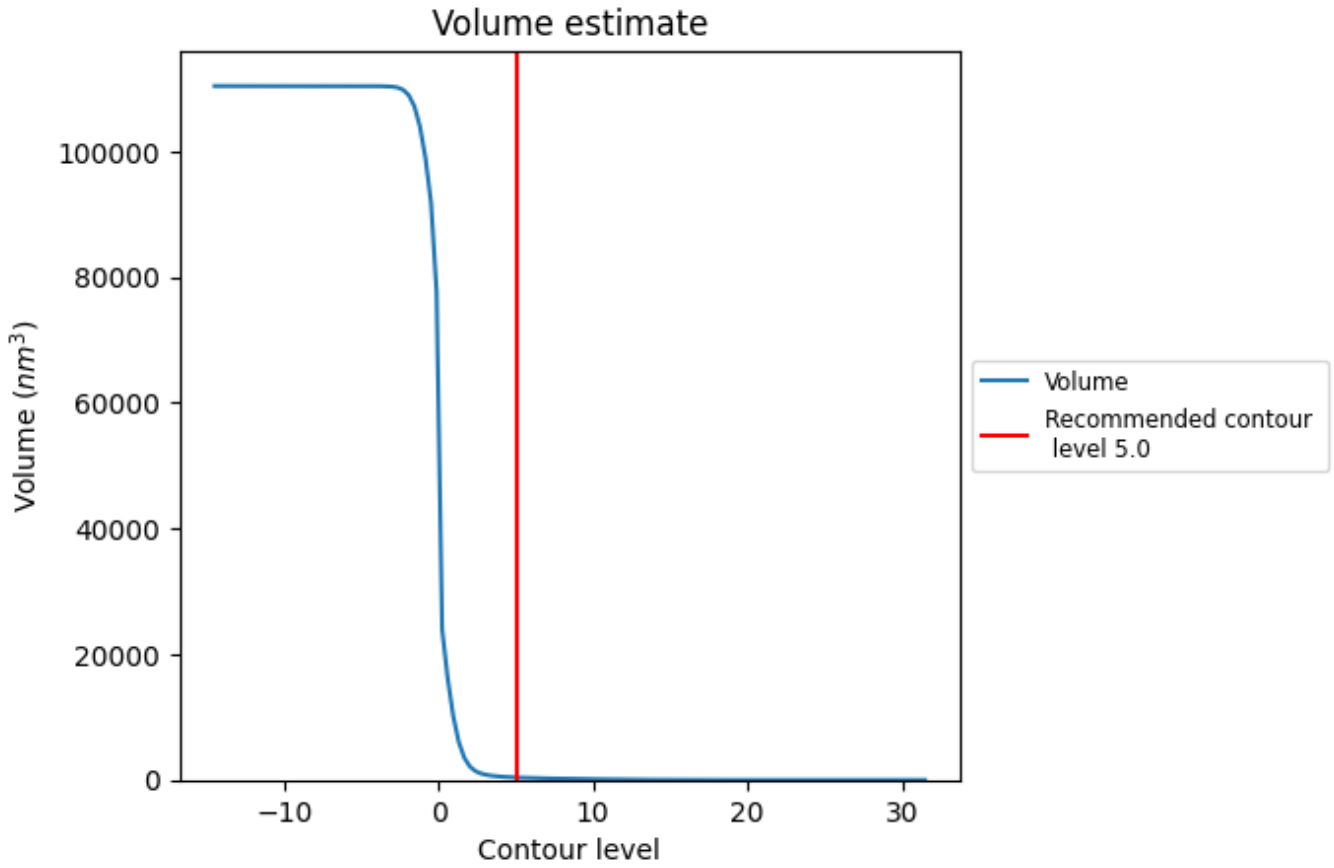
This section contains the results of statistical analysis of the map.

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.

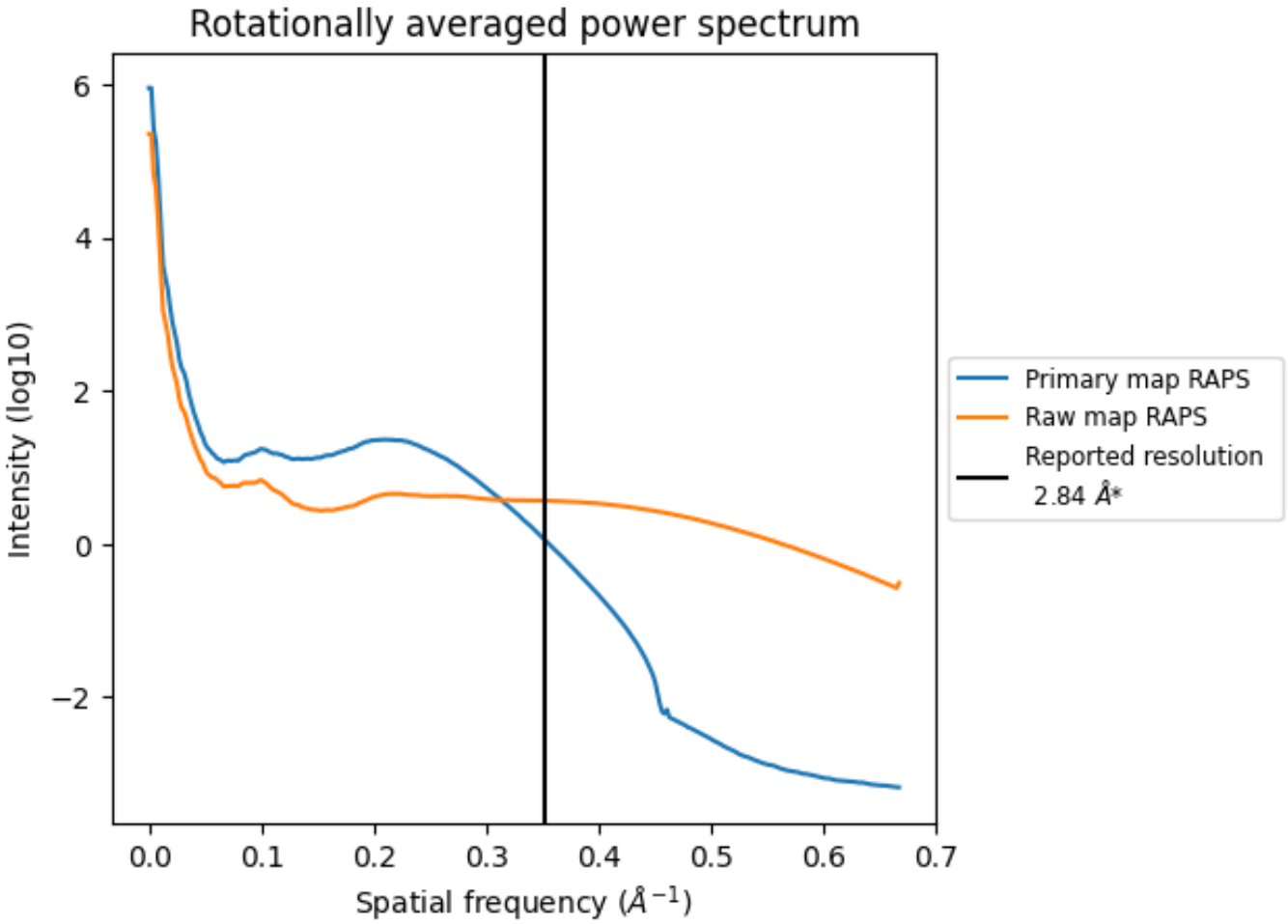
7.2 Volume estimate (i)



The volume at the recommended contour level is 393 nm^3; this corresponds to an approximate mass of 355 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)

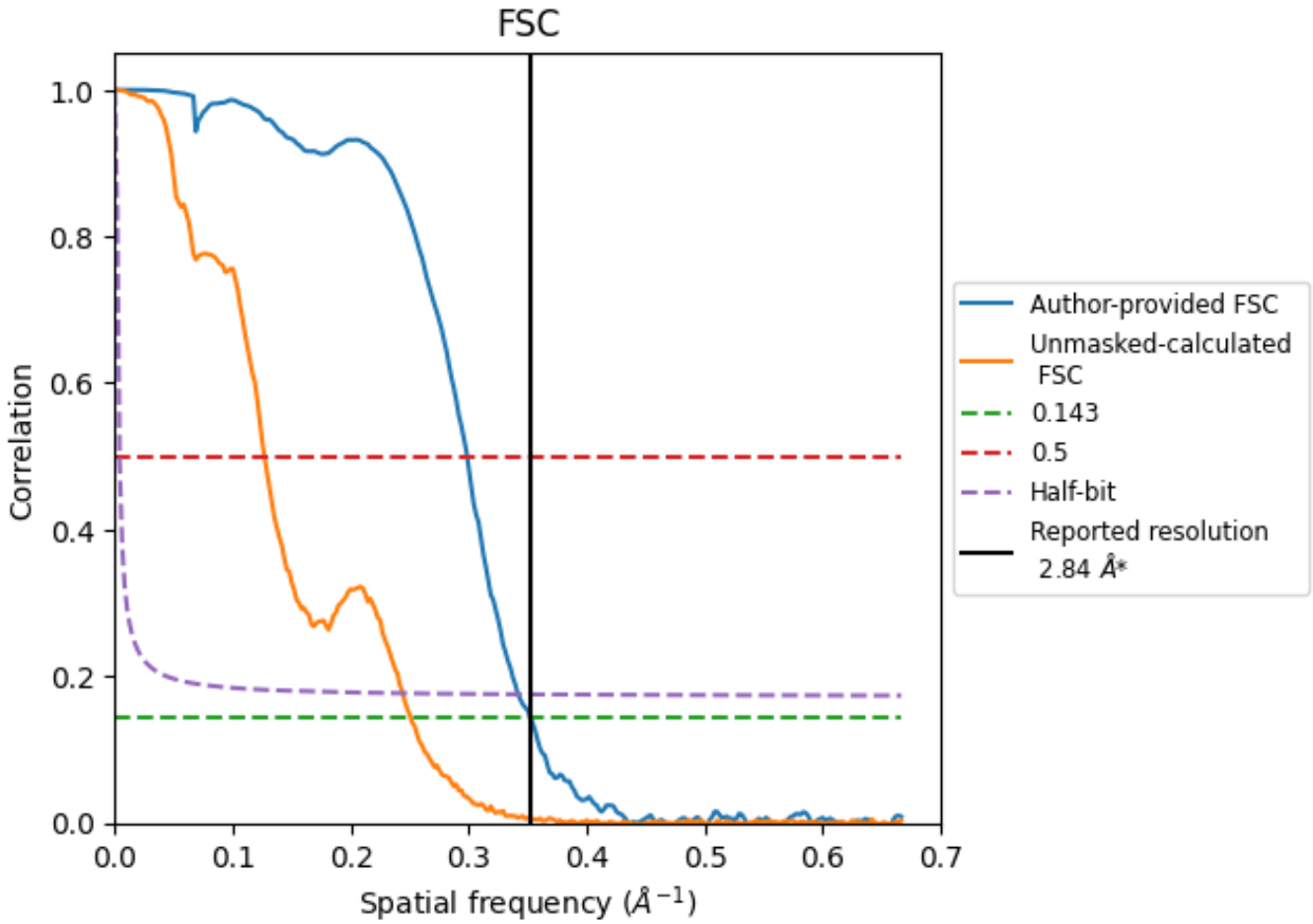


*Reported resolution corresponds to spatial frequency of 0.352 Å^{-1}

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 0.352 Å^{-1}

8.2 Resolution estimates (i)

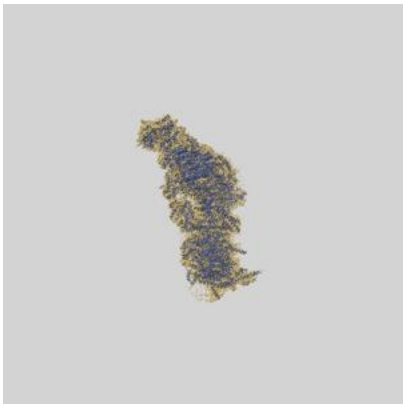
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.84	-	-
Author-provided FSC curve	2.84	3.35	2.92
Unmasked-calculated*	3.98	7.88	4.10

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.98 differs from the reported value 2.84 by more than 10 %

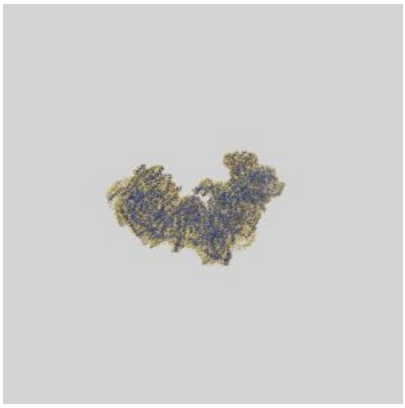
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-14132 and PDB model 7QSK. Per-residue inclusion information can be found in section 3 on page 24.

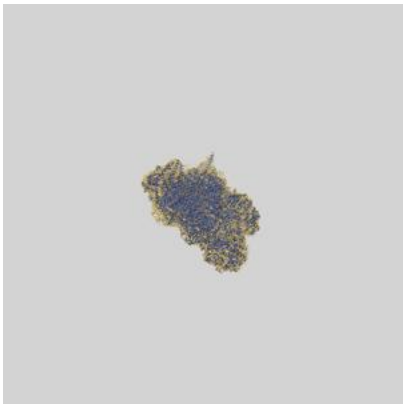
9.1 Map-model overlay



X



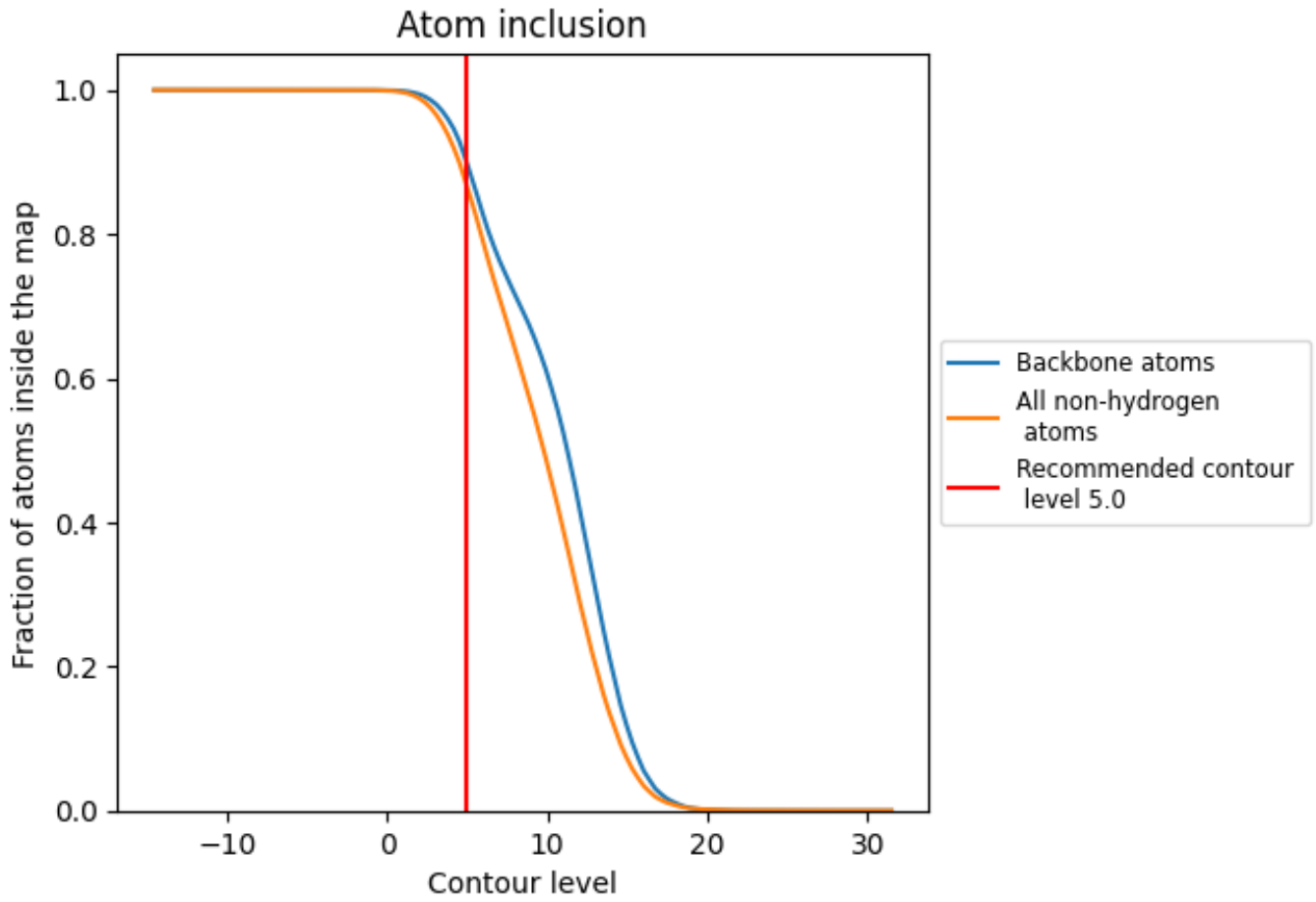
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 5.0 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 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.