Full wwPDB EM Validation Report ⓘ

Dec 12, 2022 – 09:02 am GMT

PDB ID	:	6Y79
EMDB ID	:	EMD-10711
Title	:	Cryo-EM structure of a respiratory complex I F89A mutant
Authors	:	Parey, K.
Deposited on	:	2020-02-28
Resolution	:	3.20 Å(reported)
Based on initial model	:	6RFR

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

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

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

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

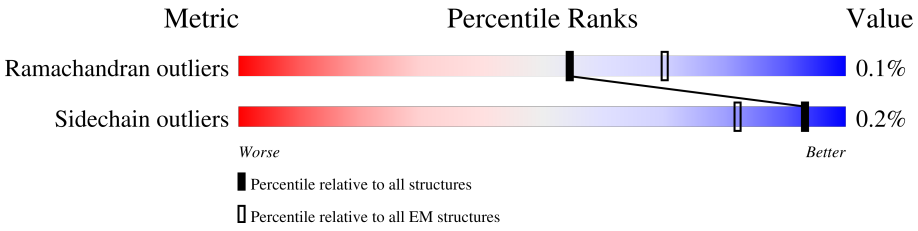
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance

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

The reported resolution of this entry is 3.20 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	728	10% 94% • 5%
2	B	488	16% 92% • 7%
3	C	466	• 90% • 7%
4	D	87	• 99% •
5	E	375	21% 81% • 15%
6	F	144	• 83% • 16%
7	G	281	• 84% • 15%
8	H	243	21% 85% • 11%
9	I	229	• 82% • 17%

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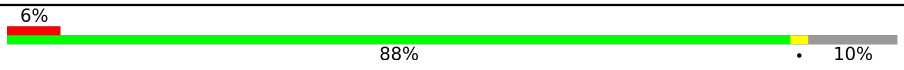
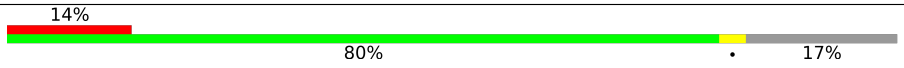
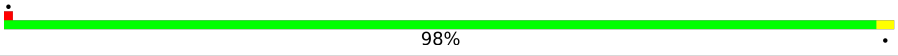
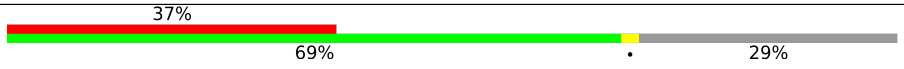
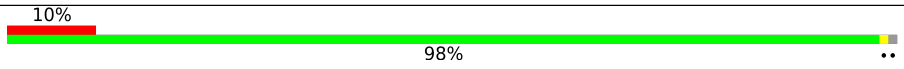
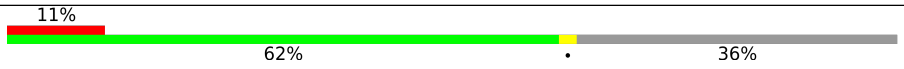
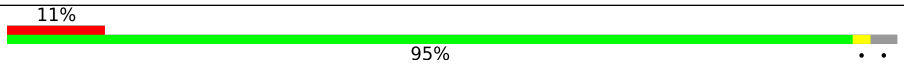
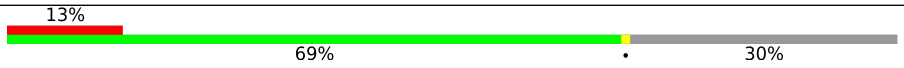
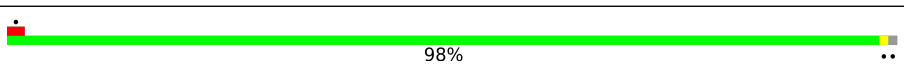
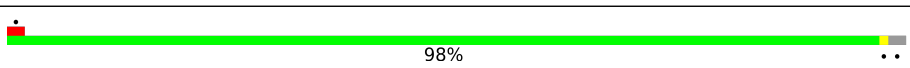
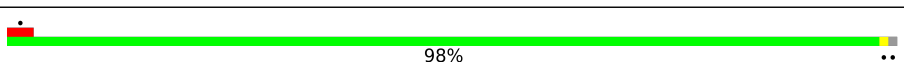
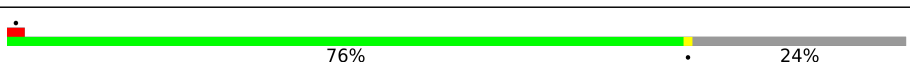
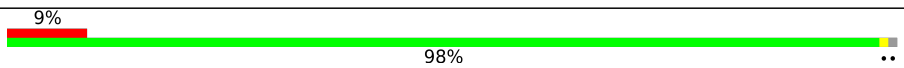
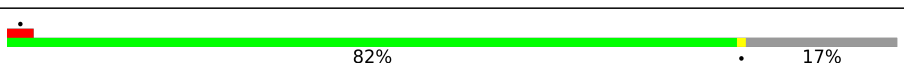
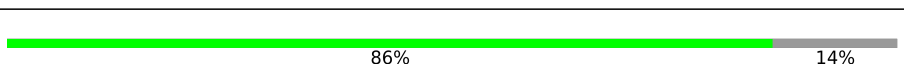
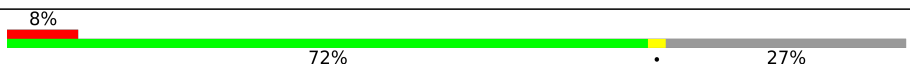
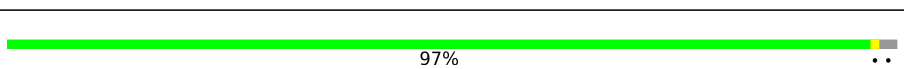
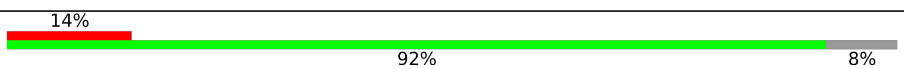
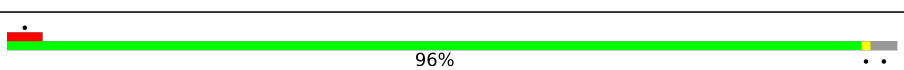
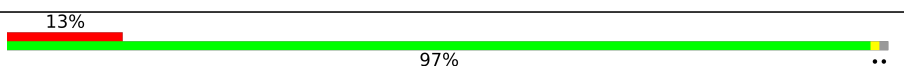
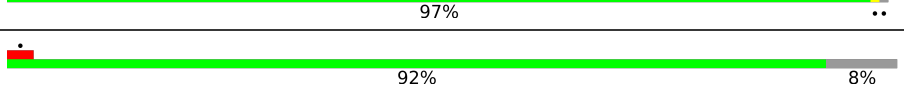
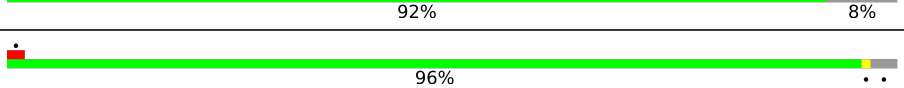
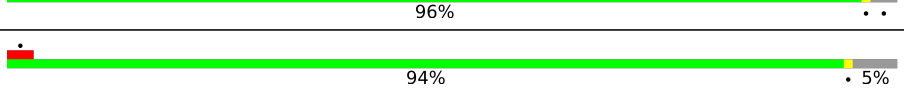
Mol	Chain	Length	Quality of chain
10	J	198	
11	K	210	
12	L	89	
13	M	136	
14	O	109	
15	P	124	
16	Q	132	
17	R	109	
18	S	249	
19	U	172	
20	W	123	
21	X	169	
22	Y	161	
23	Z	182	
24	a	149	
25	b	74	
26	c	60	
27	d	92	
28	e	67	
29	f	87	
30	g	78	
31	h	138	
32	i	90	
33	j	93	
34	n	120	

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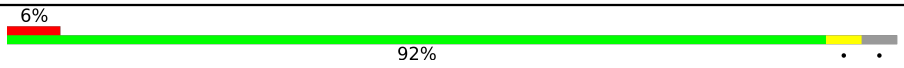
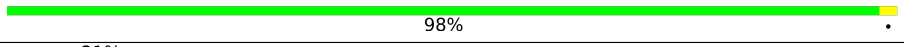
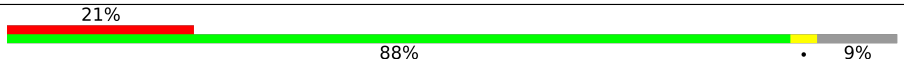
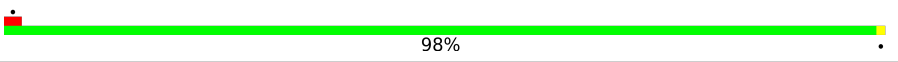
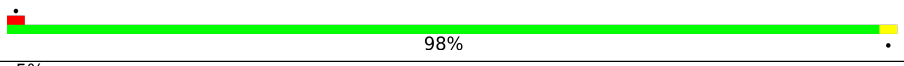
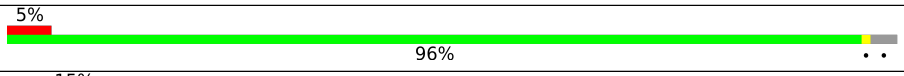
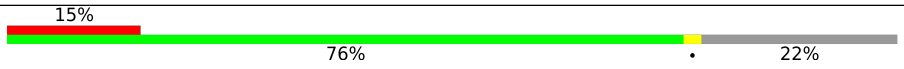
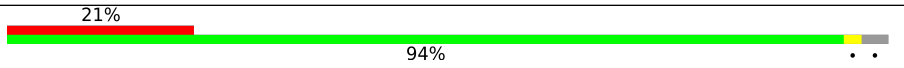
Mol	Chain	Length	Quality of chain
35	1	341	
36	2	469	
37	3	128	
38	4	486	
39	5	655	
40	6	185	
41	8	99	
42	9	89	

2 Entry composition (i)

There are 55 unique types of molecules in this entry. The entry contains 65173 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 Subunit NUAM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	692	5258	3263	926	1040	29	0	0

- Molecule 2 is a protein called Subunit NUBM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	456	3528	2229	621	654	24	0	0

- Molecule 3 is a protein called Subunit NUCM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	433	3426	2177	586	641	22	0	0

- Molecule 4 is a protein called Subunit NIMM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	86	681	432	127	119	3	0	0

- Molecule 5 is a protein called Subunit NUEM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	317	2527	1606	435	478	8	0	0

- Molecule 6 is a protein called Subunit NUFM of NADH:Ubiquinone Oxidoreductase (Com-

plex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	121	Total	C	N	O	S	0	0
			990	629	166	193	2		

- Molecule 7 is a protein called Subunit NUGM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	239	Total	C	N	O	S	0	0
			1978	1272	336	366	4		

- Molecule 8 is a protein called Subunit NUHM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	216	Total	C	N	O	S	0	0
			1688	1060	284	326	18		

- Molecule 9 is a protein called Subunit NUIM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	190	Total	C	N	O	S	0	0
			1519	966	254	289	10		

- Molecule 10 is a protein called Subunit NUJM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	179	Total	C	N	O	S	0	0
			1329	844	241	239	5		

- Molecule 11 is a protein called Subunit NUKM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	175	Total	C	N	O	S	0	0
			1377	874	241	247	15		

- Molecule 12 is a protein called Subunit NULM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	89	Total	C	N	O	S	0	0
			691	464	109	115	3		

- Molecule 13 is a protein called Subunit NUMM of protein NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	117	Total	C	N	O	S	0	0
			912	568	163	176	5		

- Molecule 14 is a protein called Acyl carrier protein ACPM1 of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
14	O	77	Total	C	N	O	0	0
			591	373	93	125		

- Molecule 15 is a protein called Subunit NB4M of protein NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	123	Total	C	N	O	S	0	0
			1030	661	182	185	2		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
P	89	ALA	PHE	conflict	UNP A0A1D8N3C8

- Molecule 16 is a protein called Acyl carrier protein ACPM2 of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	85	Total	C	N	O	S	0	0
			648	405	103	138	2		

- Molecule 17 is a protein called Subunit NI2M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
17	R	106	Total	C	N	O	S	0	0
			884	562	168	151	3		

- Molecule 18 is a protein called Subunit NESM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	174	Total	C	N	O	S	0	0
			1430	920	245	263	2		

- Molecule 19 is a protein called Subunit NUPM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
19	U	171	Total	C	N	O	S	0	0
			1345	847	236	252	10		

- Molecule 20 is a protein called Subunit NB6M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
20	W	121	Total	C	N	O	S	0	0
			974	623	178	168	5		

- Molecule 21 is a protein called Subunit NUXM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
21	X	167	Total	C	N	O	S	0	0
			1296	839	221	232	4		

- Molecule 22 is a protein called Subunit NUYM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Y	123	Total	C	N	O	S	0	0
			1021	651	187	181	2		

- Molecule 23 is a protein called Subunit NUZM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Z	181	Total	C	N	O	S	0	0
			1389	893	240	255	1		

- Molecule 24 is a protein called Subunit NIAM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
24	a	124	Total	C	N	O	S	0	0
			1030	669	165	194	2		

- Molecule 25 is a protein called Subunit NEBM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
25	b	64	Total	C	N	O	0	0
			490	326	83	81		

- Molecule 26 is a protein called Subunit NB2M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
26	c	44	Total	C	N	O	0	0
			353	229	67	57		

- Molecule 27 is a protein called Subunit NIDM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
27	d	90	Total	C	N	O	S	0	0
			760	472	137	148	3		

- Molecule 28 is a protein called Subunit NUVM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
28	e	52	Total	C	N	O	S	0	0
			436	293	75	65	3		

- Molecule 29 is a protein called Subunit NI8M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
29	f	80	Total	C	N	O	S	0	0
			629	394	119	115	1		

- Molecule 30 is a protein called Subunit NI9M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
30	g	76	Total 617	C 405	N 112	O 100	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
g	71	GLY	GLN	conflict	UNP A0A1D8NJR0

- Molecule 31 is a protein called Subunit N7BM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
31	h	136	Total 1130	C 727	N 193	O 208	S 2	0	0

- Molecule 32 is a protein called Subunit NUUM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
32	i	83	Total 646	C 413	N 117	O 115	S 1	0	0

- Molecule 33 is a protein called Subunit NB5M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms				AltConf	Trace
33	j	90	Total 724	C 465	N 132	O 127	0	0

- Molecule 34 is a protein called Subunit NUNM of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
34	n	114	Total 914	C 588	N 156	O 169	S 1	0	0

- Molecule 35 is a protein called Subunit NU1M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
35	1	329	Total 2627	C 1793	N 382	O 445	S 7	0	0

- Molecule 36 is a protein called Subunit NU2M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
36	2	469	Total	C	N	O	S	0	0
			3774	2557	550	655	12		

- Molecule 37 is a protein called Subunit NU3M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
37	3	116	Total	C	N	O	S	0	0
			933	641	137	153	2		

- Molecule 38 is a protein called Subunit NU4M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
38	4	485	Total	C	N	O	S	0	0
			3847	2595	585	653	14		

- Molecule 39 is a protein called Subunit NU5M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
39	5	654	Total	C	N	O	S	0	0
			5197	3479	785	905	28		

- Molecule 40 is a protein called Subunit NU6M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
40	6	180	Total	C	N	O	S	0	0
			1415	959	204	245	7		

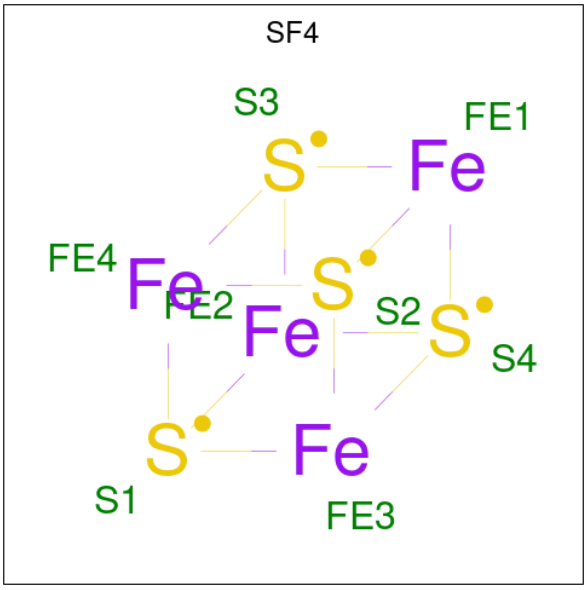
- Molecule 41 is a protein called Subunit NB8M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
41	8	77	Total	C	N	O	S	0	0
			643	408	116	111	8		

- Molecule 42 is a protein called Subunit NIPM of NADH:Ubiquinone Oxidoreductase (Complex I).

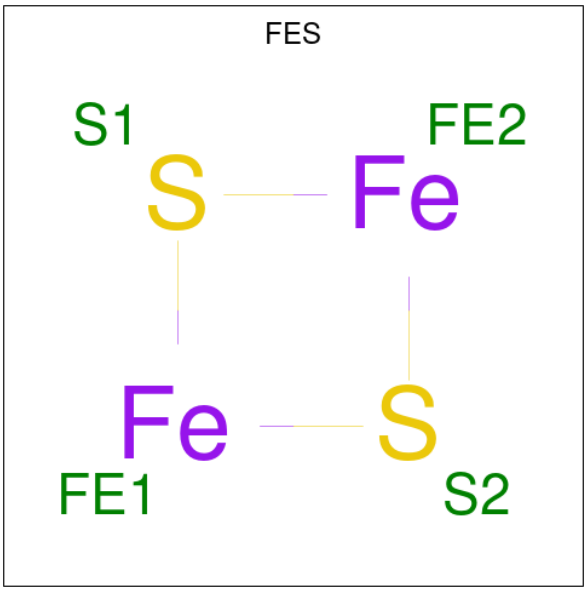
Mol	Chain	Residues	Atoms					AltConf	Trace
42	9	86	Total	C	N	O	S	0	0
			672	422	122	122	6		

- Molecule 43 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



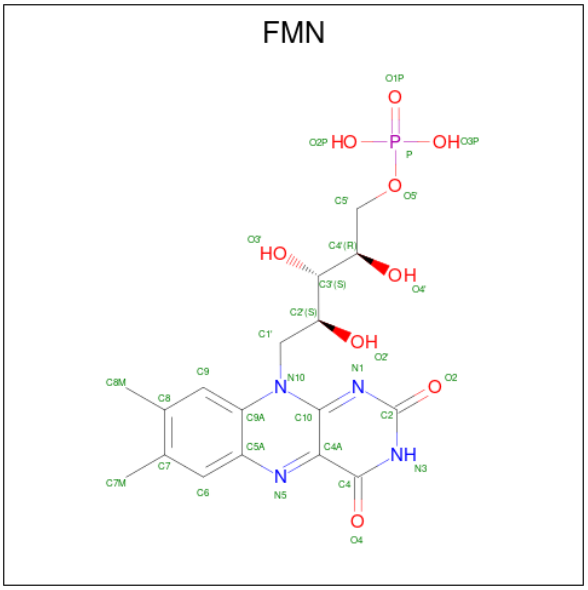
Mol	Chain	Residues	Atoms				AltConf
43	A	1	Total	Fe	S		0
			16	8	8		
43	A	1	Total	Fe	S		0
			16	8	8		
43	B	1	Total	Fe	S		0
			8	4	4		
43	I	1	Total	Fe	S		0
			16	8	8		
43	I	1	Total	Fe	S		0
			16	8	8		
43	K	1	Total	Fe	S		0
			8	4	4		

- Molecule 44 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			AltConf
44	A	1	Total	Fe	S	0
			4	2	2	
44	H	1	Total	Fe	S	0
			4	2	2	

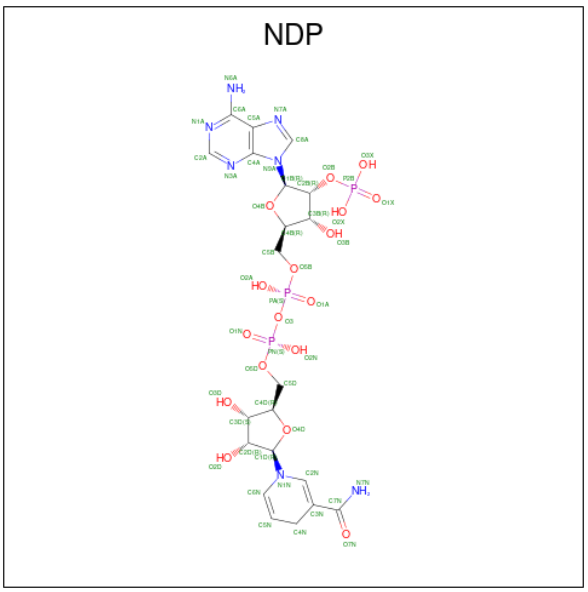
- Molecule 45 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



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

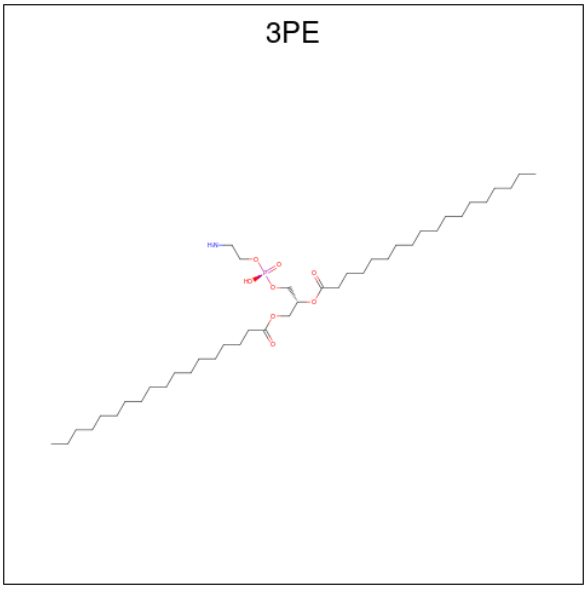
- Molecule 46 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE

PHOSPHATE (three-letter code: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).



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

- Molecule 47 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOETHANOLAMINE (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
47	I	1	Total	C	N	O	P	0
			51	41	1	8	1	

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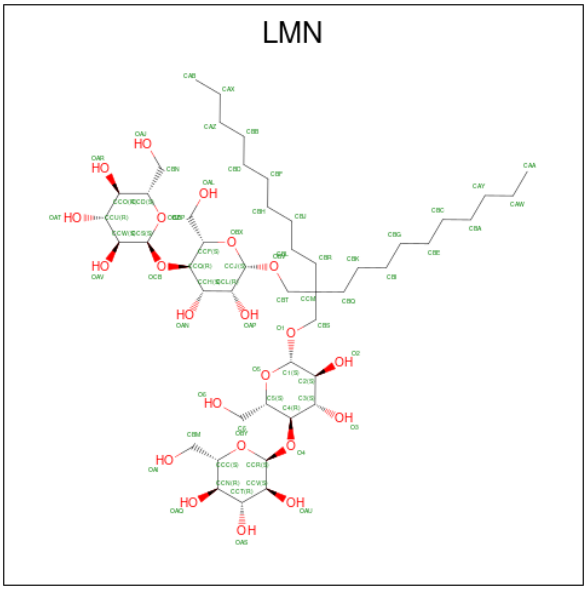
Mol	Chain	Residues	Atoms					AltConf
47	J	1	Total	C	N	O	P	0
			85	65	2	16	2	
47	J	1	Total	C	N	O	P	0
			85	65	2	16	2	
47	S	1	Total	C	N	O	P	0
			42	32	1	8	1	
47	a	1	Total	C	N	O	P	0
			51	41	1	8	1	
47	b	1	Total	C	N	O	P	0
			42	32	1	8	1	
47	i	1	Total	C	N	O	P	0
			42	32	1	8	1	
47	3	1	Total	C	N	O	P	0
			43	33	1	8	1	
47	4	1	Total	C	N	O	P	0
			136	106	3	24	3	
47	4	1	Total	C	N	O	P	0
			136	106	3	24	3	
47	4	1	Total	C	N	O	P	0
			136	106	3	24	3	

- Molecule 48 is Lauryl Maltose Neopentyl Glycol (three-letter code: LMN) (formula: $C_{47}H_{88}O_{22}$).



Mol	Chain	Residues	Atoms			AltConf
48	J	1	Total	C	O	0
			134	90	44	

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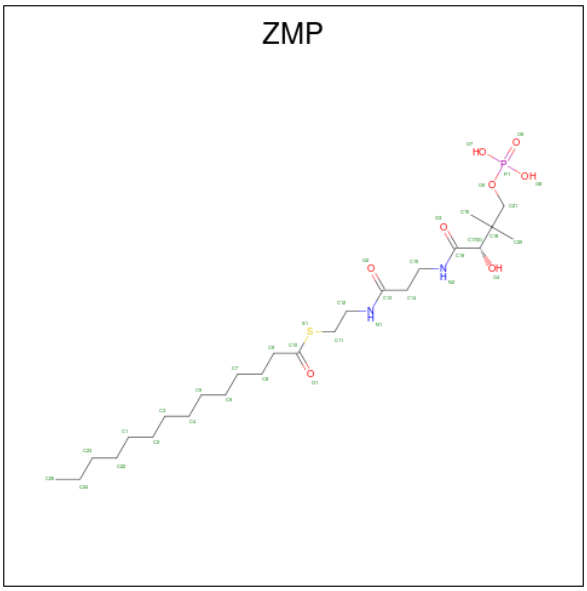
Mol	Chain	Residues	Atoms	AltConf
48	J	1	Total C O 134 90 44	0
48	j	1	Total C O 69 47 22	0

- Molecule 49 is ZINC ION (three-letter code: ZN) (formula: Zn).

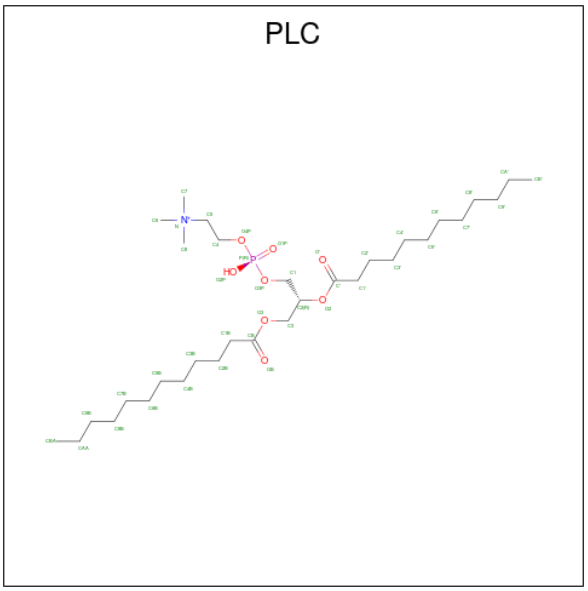
Mol	Chain	Residues	Atoms	AltConf
49	M	1	Total Zn 1 1	0

- Molecule 50 is S-[2-({N-[(2S)-2-hydroxy-3,3-dimethyl-4-(phosphonooxy)butanoyl]-beta-alanyl}amino)ethyl] tetradecanethioate (three-letter code: ZMP) (formula: $C_{25}H_{49}N_2O_8PS$).



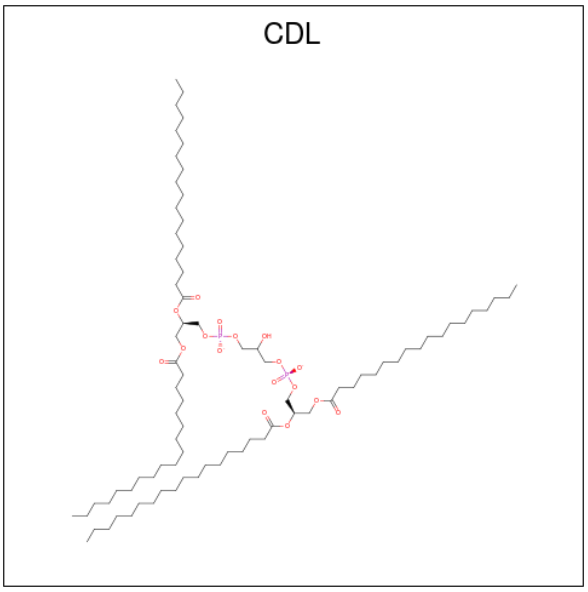
Mol	Chain	Residues	Atoms	AltConf
50	O	1	Total C N O P S 33 22 2 7 1 1	0
50	Q	1	Total C N O P S 33 22 2 7 1 1	0

- Molecule 51 is DIUNDECYL PHOSPHATIDYL CHOLINE (three-letter code: PLC) (formula: $C_{32}H_{65}NO_8P$).



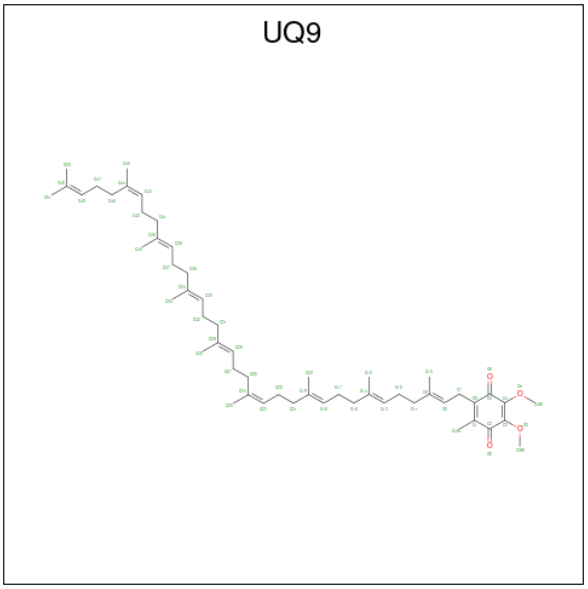
Mol	Chain	Residues	Atoms					AltConf
51	W	1	Total	C	N	O	P	0
			83	63	2	16	2	
51	W	1	Total	C	N	O	P	0
			83	63	2	16	2	
51	1	1	Total	C	N	O	P	0
			77	57	2	16	2	
51	1	1	Total	C	N	O	P	0
			77	57	2	16	2	
51	5	1	Total	C	N	O	P	0
			73	53	2	16	2	
51	5	1	Total	C	N	O	P	0
			73	53	2	16	2	

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



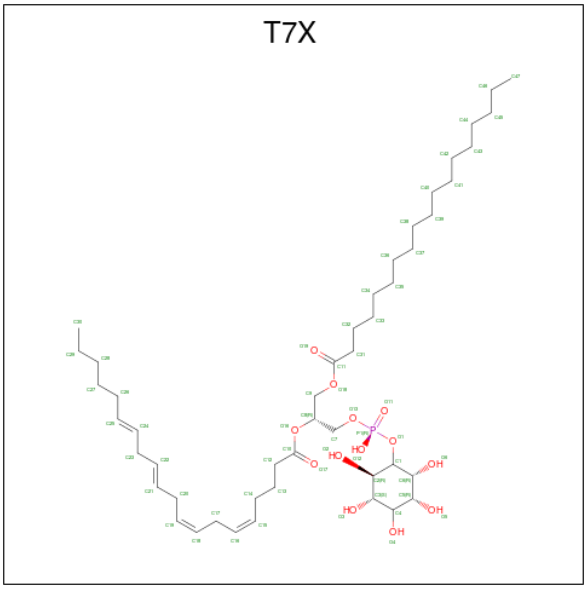
Mol	Chain	Residues	Atoms				AltConf
52	X	1	Total	C	O	P	0
			86	67	17	2	
52	Z	1	Total	C	O	P	0
			76	57	17	2	
52	2	1	Total	C	O	P	0
			83	64	17	2	
52	4	1	Total	C	O	P	0
			92	73	17	2	
52	5	1	Total	C	O	P	0
			78	59	17	2	

- Molecule 53 is Ubiquinone-9 (three-letter code: UQ9) (formula: $C_{54}H_{82}O_4$).



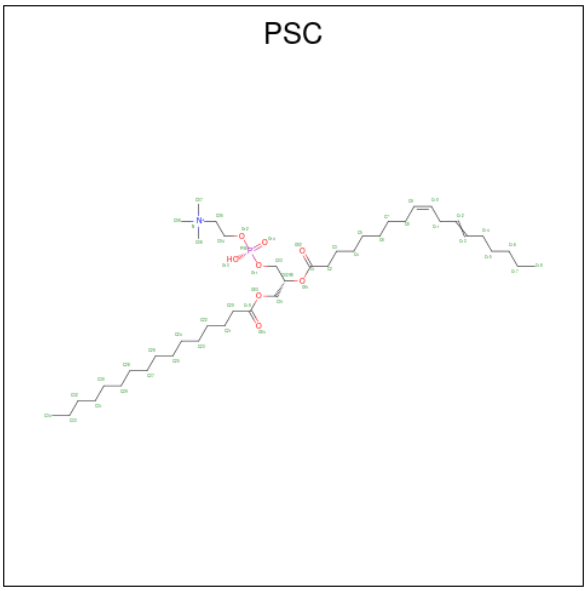
Mol	Chain	Residues	Atoms			AltConf
53	1	1	Total	C	O	0
			35	31	4	

- Molecule 54 is Phosphatidylinositol (three-letter code: T7X) (formula: $C_{47}H_{83}O_{13}P$).



Mol	Chain	Residues	Atoms				AltConf
54	2	1	Total	C	O	P	0
			100	72	26	2	
54	2	1	Total	C	O	P	0
			100	72	26	2	
54	3	1	Total	C	O	P	0
			49	35	13	1	
54	4	1	Total	C	O	P	0
			43	29	13	1	

- Molecule 55 is (7R,17E,20E)-4-HYDROXY-N,N,N-TRIMETHYL-9-OXO-7-[(PALMITOYLOXY)METHYL]-3,5,8-TRIOXA-4-PHOSPHAHEXACOSA-17,20-DIEN-1-AMINIUM 4-OXIDE (three-letter code: PSC) (formula: $C_{42}H_{81}NO_8P$).



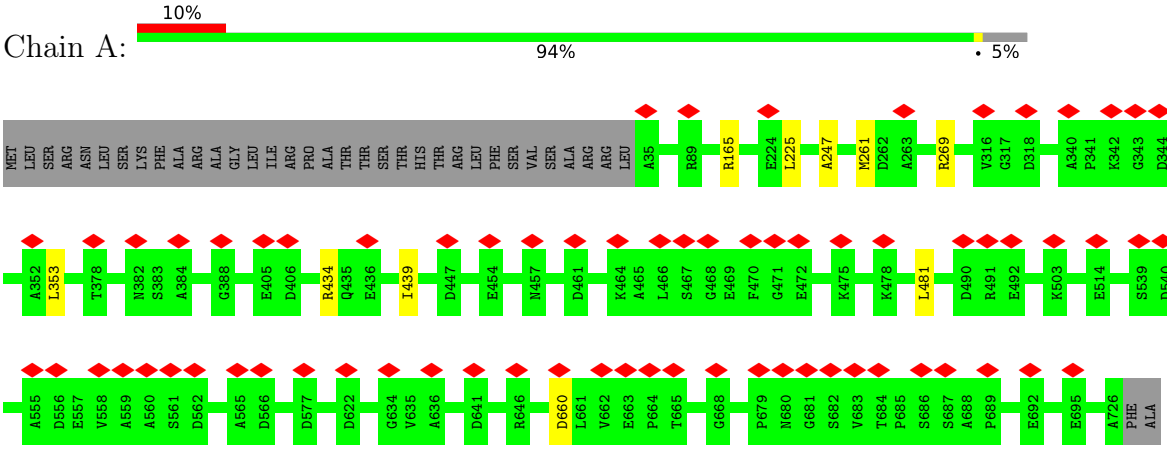
Mol	Chain	Residues	Atoms					AltConf
55	2	1	Total	C	N	O	P	0
			52	42	1	8	1	

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

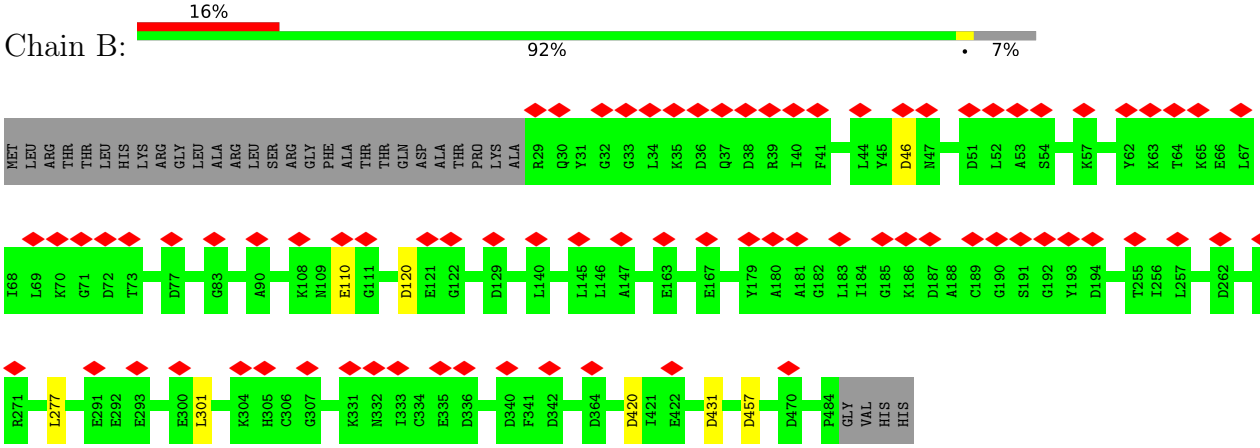
• Molecule 1: Subunit NUAM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain A:



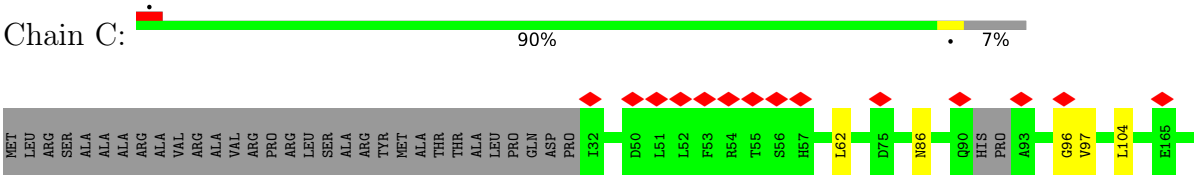
• Molecule 2: Subunit NUBM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain B:



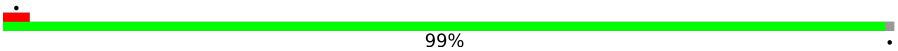
• Molecule 3: Subunit NUCM of NADH:Ubiquinone Oxidoreductase (Complex I)

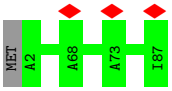
Chain C:



• Molecule 4: Subunit NIMM of NADH:Ubiquinone Oxidoreductase (Complex I)

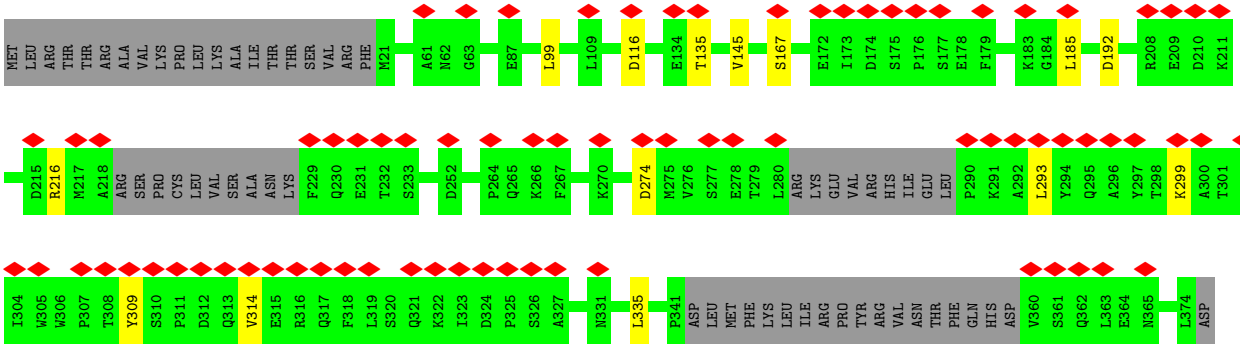
Chain D:





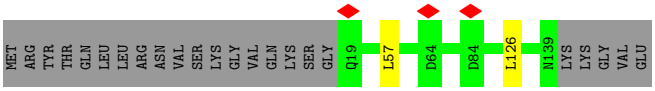
• Molecule 5: Subunit NUEM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain E:



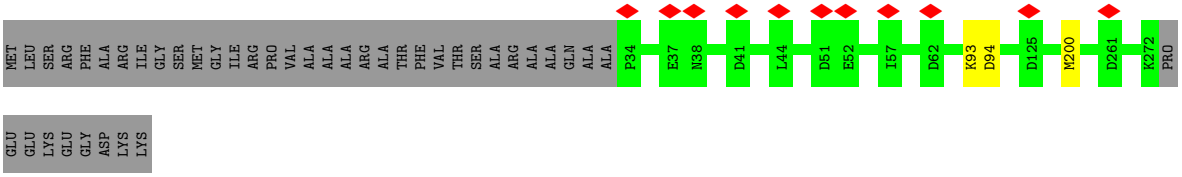
• Molecule 6: Subunit NUFM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain F:



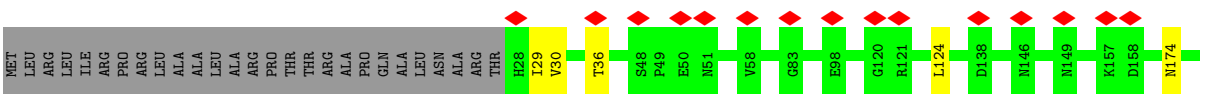
• Molecule 7: Subunit NUGM of NADH:Ubiquinone Oxidoreductase (Complex I)

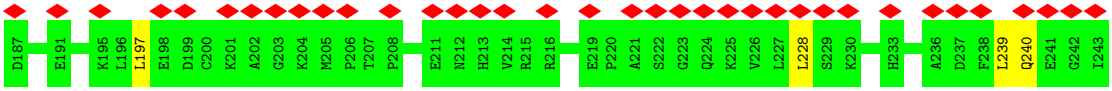
Chain G:



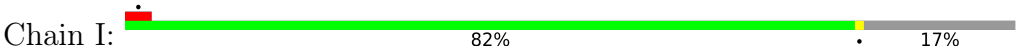
• Molecule 8: Subunit NUHM of NADH:Ubiquinone Oxidoreductase (Complex I)

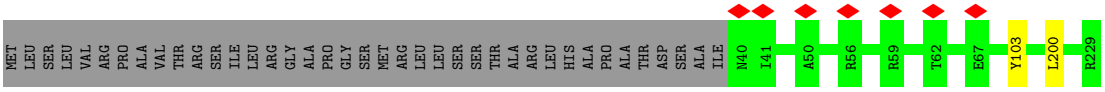
Chain H:



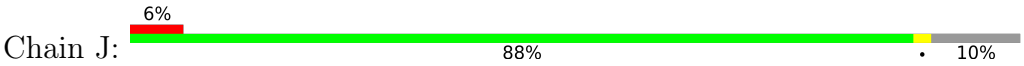


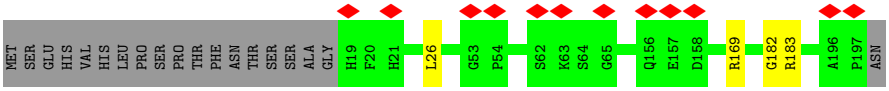
• Molecule 9: Subunit NUIM of NADH:Ubiquinone Oxidoreductase (Complex I)



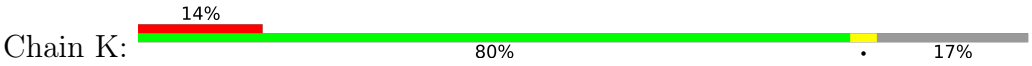


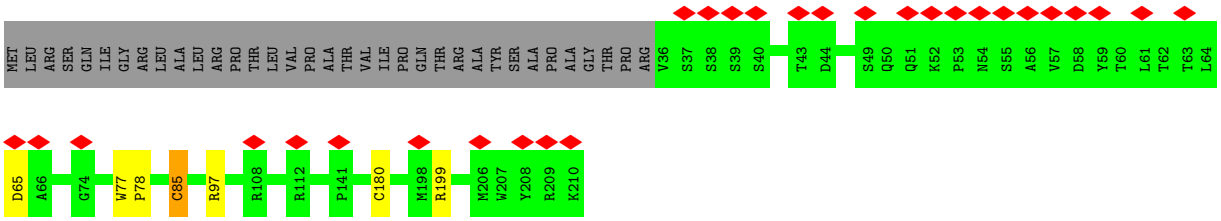
• Molecule 10: Subunit NUJM of NADH:Ubiquinone Oxidoreductase (Complex I)



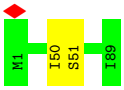


• Molecule 11: Subunit NUKM of NADH:Ubiquinone Oxidoreductase (Complex I)

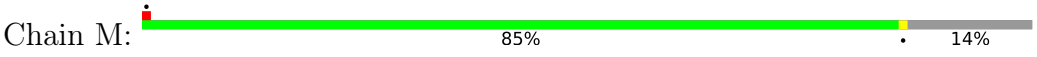


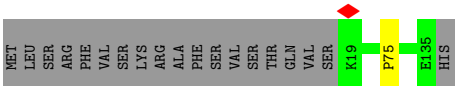


• Molecule 12: Subunit NULM of NADH:Ubiquinone Oxidoreductase (Complex I)

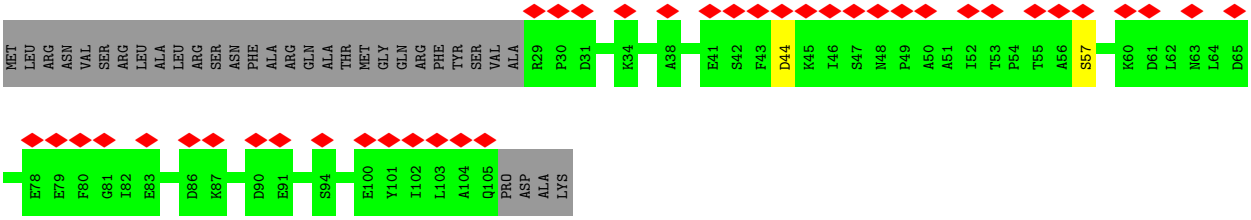


• Molecule 13: Subunit NUMM of protein NADH:Ubiquinone Oxidoreductase (Complex I)

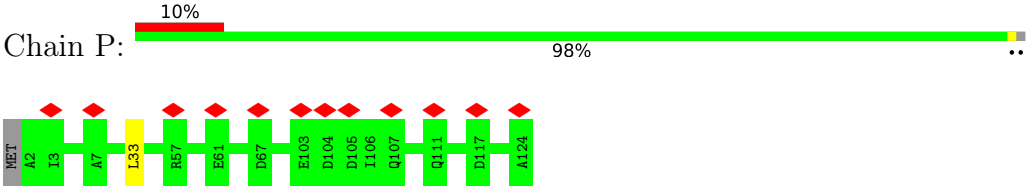




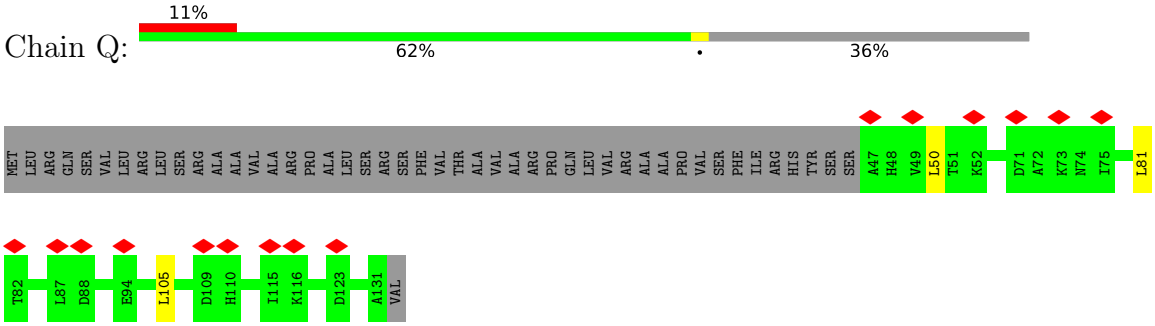
• Molecule 14: Acyl carrier protein ACPM1 of NADH:Ubiquinone Oxidoreductase (Complex I)



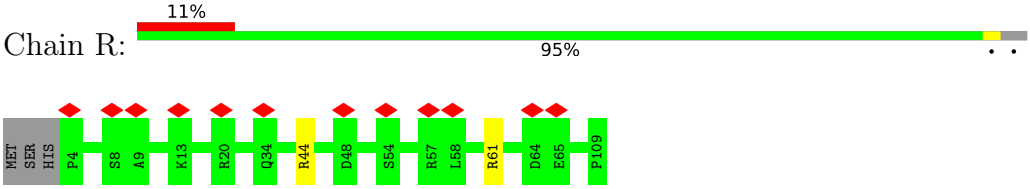
• Molecule 15: Subunit NB4M of protein NADH:Ubiquinone Oxidoreductase (Complex I)



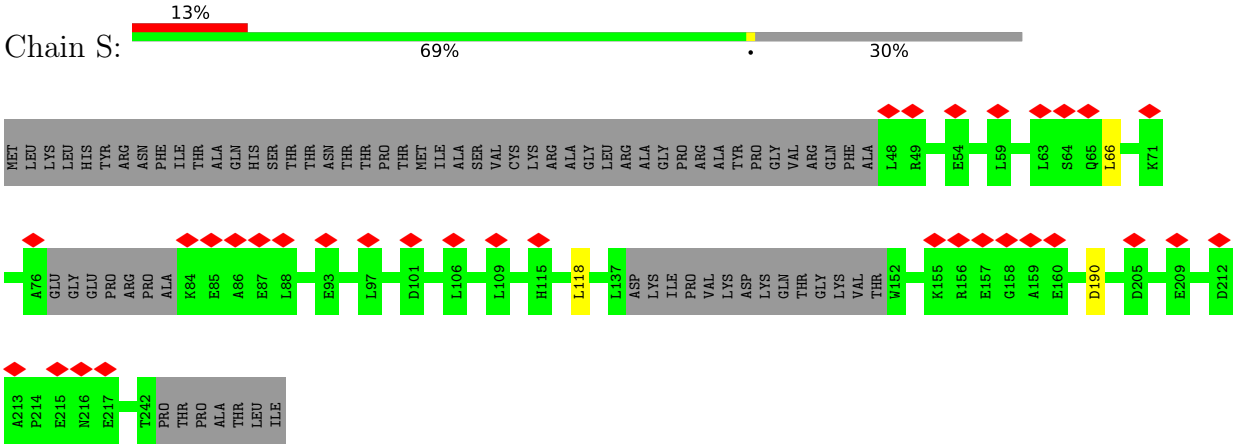
• Molecule 16: Acyl carrier protein ACPM2 of NADH:Ubiquinone Oxidoreductase (Complex I)



• Molecule 17: Subunit NI2M of NADH:Ubiquinone Oxidoreductase (Complex I)

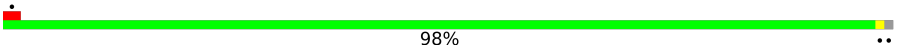


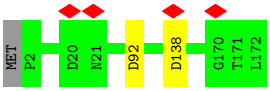
• Molecule 18: Subunit NESM of NADH:Ubiquinone Oxidoreductase (Complex I)



• Molecule 19: Subunit NUPM of NADH:Ubiquinone Oxidoreductase (Complex I)

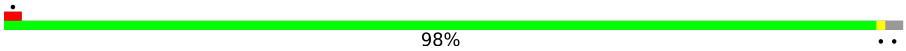
Chain U:

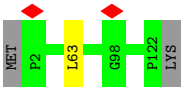




• Molecule 20: Subunit NB6M of NADH:Ubiquinone Oxidoreductase (Complex I)

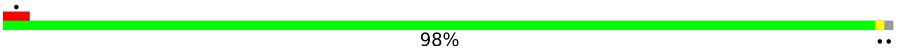
Chain W:

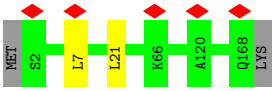




• Molecule 21: Subunit NUXM of NADH:Ubiquinone Oxidoreductase (Complex I)

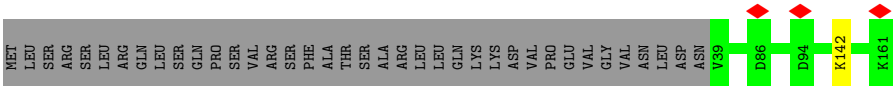
Chain X:





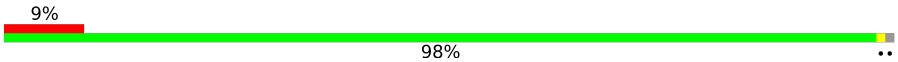
• Molecule 22: Subunit NUYM of NADH:Ubiquinone Oxidoreductase (Complex I)

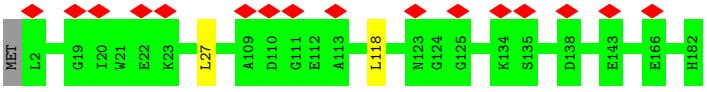
Chain Y:



• Molecule 23: Subunit NUZM of NADH:Ubiquinone Oxidoreductase (Complex I)

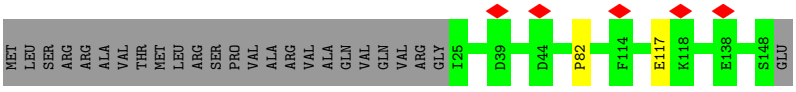
Chain Z:





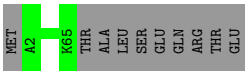
• Molecule 24: Subunit NIAM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain a:



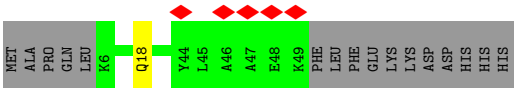
• Molecule 25: Subunit NEBM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain b:



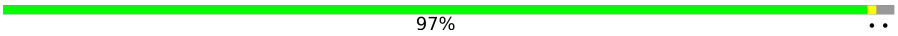
• Molecule 26: Subunit NB2M of NADH:Ubiquinone Oxidoreductase (Complex I)

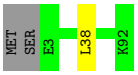
Chain c:



• Molecule 27: Subunit NIDM of NADH:Ubiquinone Oxidoreductase (Complex I)

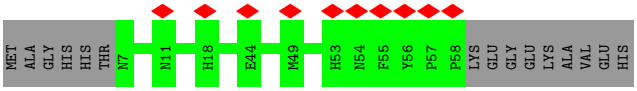
Chain d:





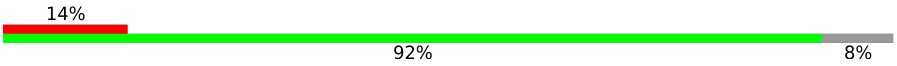
• Molecule 28: Subunit NUVM of NADH:Ubiquinone Oxidoreductase (Complex I)

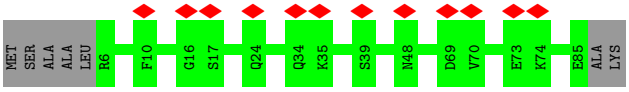
Chain e:



• Molecule 29: Subunit NI8M of NADH:Ubiquinone Oxidoreductase (Complex I)

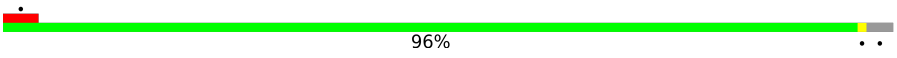
Chain f:

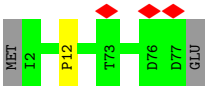




• Molecule 30: Subunit NI9M of NADH:Ubiquinone Oxidoreductase (Complex I)

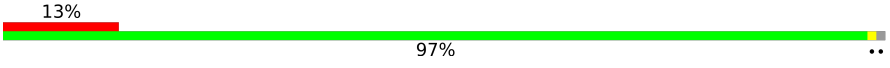
Chain g:

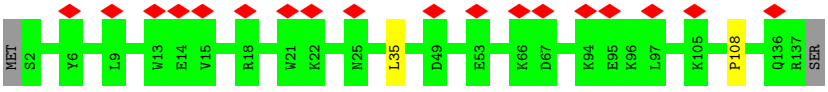




• Molecule 31: Subunit N7BM of NADH:Ubiquinone Oxidoreductase (Complex I)

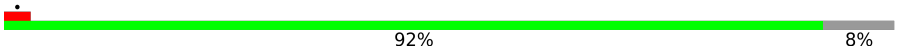
Chain h:

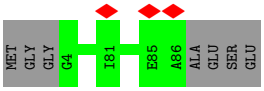




• Molecule 32: Subunit NUUM of NADH:Ubiquinone Oxidoreductase (Complex I)

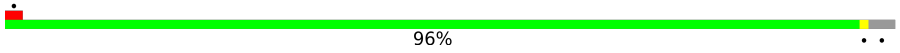
Chain i:

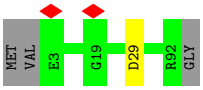




• Molecule 33: Subunit NB5M of NADH:Ubiquinone Oxidoreductase (Complex I)

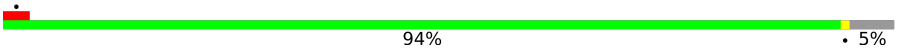
Chain j:

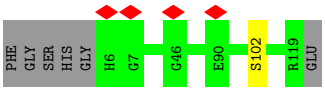




• Molecule 34: Subunit NUNM of NADH:Ubiquinone Oxidoreductase (Complex I)

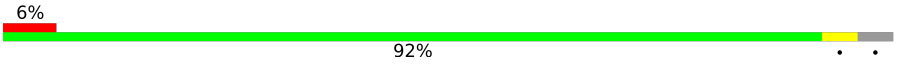
Chain n:

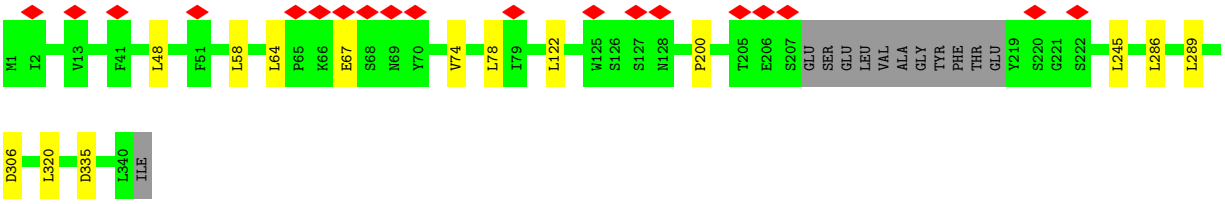




• Molecule 35: Subunit NU1M of NADH:Ubiquinone Oxidoreductase (Complex I)

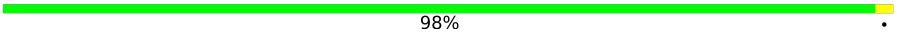
Chain 1:

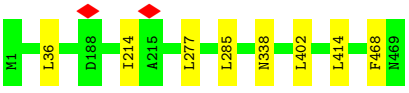




• Molecule 36: Subunit NU2M of NADH:Ubiquinone Oxidoreductase (Complex I)

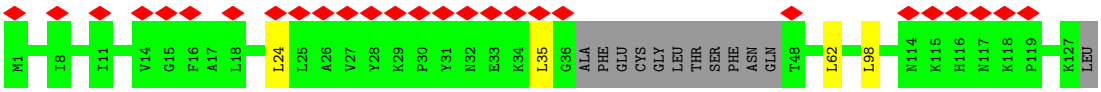
Chain 2:





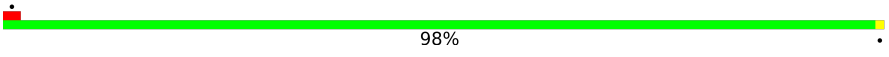
• Molecule 37: Subunit NU3M of NADH:Ubiquinone Oxidoreductase (Complex I)

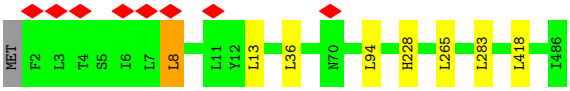
Chain 3:



• Molecule 38: Subunit NU4M of NADH:Ubiquinone Oxidoreductase (Complex I)

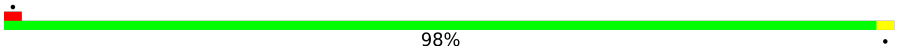
Chain 4:

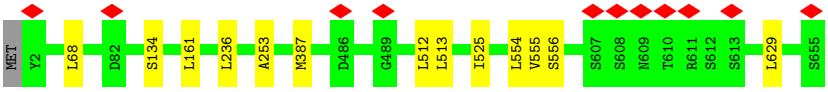




• Molecule 39: Subunit NU5M of NADH:Ubiquinone Oxidoreductase (Complex I)

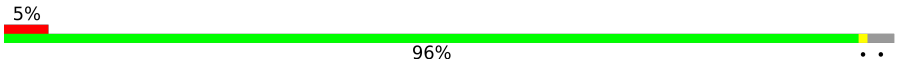
Chain 5:

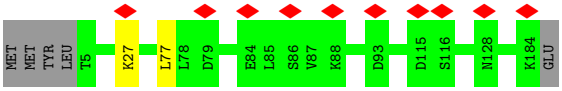




• Molecule 40: Subunit NU6M of NADH:Ubiquinone Oxidoreductase (Complex I)

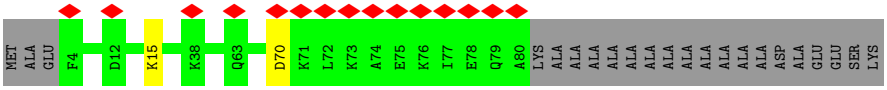
Chain 6:





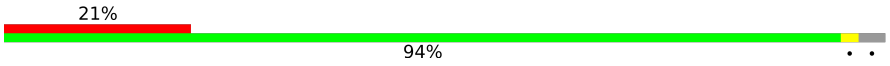
• Molecule 41: Subunit NB8M of NADH:Ubiquinone Oxidoreductase (Complex I)

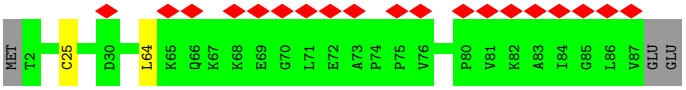
Chain 8:



• Molecule 42: Subunit NIPM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain 9:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	143203	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 ($e^-/Å^2$)	51.8	Depositor
Minimum defocus (nm)	-1500	Depositor
Maximum defocus (nm)	-2500	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.134	Depositor
Minimum map value	-0.070	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.013	Depositor
Map size (Å)	334.80002, 334.80002, 334.80002	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8370001, 0.8370001, 0.8370001	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: PSC, ZN, NDP, ZMP, SF4, FES, UQ9, FMN, 3PE, PLC, LMN, CDL, T7X

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	0.41	0/5351	0.66	5/7262 (0.1%)
2	B	0.50	0/3605	0.78	6/4865 (0.1%)
3	C	0.58	1/3503 (0.0%)	0.78	7/4744 (0.1%)
4	D	0.51	0/697	0.70	0/940
5	E	0.61	6/2580 (0.2%)	0.88	10/3493 (0.3%)
6	F	0.46	0/1011	0.76	2/1371 (0.1%)
7	G	0.55	0/2040	0.70	2/2781 (0.1%)
8	H	0.48	0/1725	0.81	4/2343 (0.2%)
9	I	0.51	0/1557	0.73	3/2110 (0.1%)
10	J	0.46	1/1362 (0.1%)	0.69	1/1855 (0.1%)
11	K	0.62	2/1415 (0.1%)	0.74	2/1925 (0.1%)
12	L	0.47	0/700	0.71	1/947 (0.1%)
13	M	0.45	0/935	0.64	0/1268
14	O	0.65	1/598 (0.2%)	0.93	0/813
15	P	0.53	0/1054	0.77	1/1418 (0.1%)
16	Q	0.55	0/654	0.91	3/890 (0.3%)
17	R	0.45	0/909	0.75	2/1229 (0.2%)
18	S	0.45	0/1454	0.74	3/1960 (0.2%)
19	U	0.55	0/1374	0.72	1/1856 (0.1%)
20	W	0.52	0/998	0.64	2/1346 (0.1%)
21	X	0.46	0/1335	0.65	2/1811 (0.1%)
22	Y	0.47	0/1051	0.63	1/1420 (0.1%)
23	Z	0.42	0/1430	0.71	2/1955 (0.1%)
24	a	0.46	0/1064	0.67	0/1439
25	b	0.37	0/503	0.60	0/679
26	c	0.41	0/364	0.62	0/491
27	d	0.50	0/776	0.66	1/1043 (0.1%)
28	e	0.40	0/456	0.69	0/619
29	f	0.64	0/639	0.86	0/856
30	g	0.40	0/643	0.59	0/880
31	h	0.52	0/1168	0.74	1/1589 (0.1%)
32	i	0.55	0/666	0.69	0/907

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	j	0.41	0/745	0.63	2/1006 (0.2%)
34	n	0.44	0/943	0.66	1/1279 (0.1%)
35	1	0.50	0/2699	0.85	12/3684 (0.3%)
36	2	0.58	0/3854	0.78	6/5252 (0.1%)
37	3	0.55	0/954	0.88	4/1300 (0.3%)
38	4	0.52	0/3941	0.77	9/5382 (0.2%)
39	5	0.49	0/5327	0.73	7/7273 (0.1%)
40	6	0.47	0/1439	0.85	2/1964 (0.1%)
41	8	0.53	0/657	0.87	2/879 (0.2%)
42	9	0.52	0/684	0.75	1/918 (0.1%)
All	All	0.51	11/64860 (0.0%)	0.75	108/88042 (0.1%)

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
1	A	0	5
2	B	0	1
3	C	0	2
8	H	0	3
10	J	0	1
11	K	0	3
13	M	0	1
14	O	0	1
24	a	0	1
26	c	0	1
35	1	0	2
36	2	0	2
38	4	0	1
39	5	0	4
All	All	0	28

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	K	78	PRO	N-CA	13.54	1.70	1.47
5	E	309	TYR	CD1-CE1	7.95	1.51	1.39
5	E	145	VAL	CB-CG1	-7.51	1.37	1.52
14	O	57	SER	CB-OG	-6.99	1.33	1.42
11	K	77	TRP	C-N	5.90	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	314	VAL	CB-CG1	5.55	1.64	1.52
5	E	309	TYR	CG-CD2	-5.54	1.31	1.39
3	C	220	VAL	CB-CG1	-5.49	1.41	1.52
5	E	309	TYR	CZ-OH	-5.49	1.28	1.37
10	J	169	ARG	C-N	-5.41	1.21	1.34
5	E	167	SER	CB-OG	5.38	1.49	1.42

All (108) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
40	6	27	LYS	C-N-CA	13.91	156.47	121.70
3	C	258	LEU	CB-CG-CD2	-10.34	93.42	111.00
39	5	161	LEU	CB-CG-CD1	-9.19	95.38	111.00
38	4	265	LEU	CA-CB-CG	9.03	136.06	115.30
16	Q	81	LEU	CB-CG-CD2	-8.82	96.01	111.00
35	1	64	LEU	CA-CB-CG	8.22	134.20	115.30
5	E	116	ASP	CB-CG-OD1	7.99	125.49	118.30
5	E	335	LEU	CA-CB-CG	7.97	133.63	115.30
11	K	78	PRO	CA-N-CD	-7.75	100.65	111.50
38	4	36	LEU	CB-CG-CD1	-7.74	97.84	111.00
6	F	126	LEU	CA-CB-CG	7.72	133.06	115.30
3	C	62	LEU	CA-CB-CG	7.58	132.74	115.30
38	4	8	LEU	CA-CB-CG	7.55	132.66	115.30
35	1	48	LEU	CA-CB-CG	7.50	132.55	115.30
17	R	61	ARG	NE-CZ-NH1	-7.46	116.57	120.30
39	5	629	LEU	CA-CB-CG	7.44	132.42	115.30
2	B	420	ASP	CB-CG-OD1	7.41	124.97	118.30
9	I	200	LEU	CA-CB-CG	7.38	132.28	115.30
36	2	414	LEU	CB-CG-CD1	-7.25	98.67	111.00
5	E	185	LEU	CA-CB-CG	7.22	131.90	115.30
21	X	7	LEU	CA-CB-CG	7.03	131.47	115.30
36	2	277	LEU	CA-CB-CG	6.98	131.36	115.30
38	4	418	LEU	CA-CB-CG	6.97	131.34	115.30
35	1	122	LEU	CA-CB-CG	6.95	131.29	115.30
5	E	293	LEU	CA-CB-CG	6.90	131.18	115.30
37	3	24	LEU	CA-CB-CG	6.87	131.09	115.30
23	Z	118	LEU	CA-CB-CG	6.85	131.06	115.30
35	1	335	ASP	CB-CG-OD1	6.85	124.46	118.30
42	9	64	LEU	CA-CB-CG	6.82	130.99	115.30
2	B	120	ASP	CB-CG-OD1	6.77	124.39	118.30
33	j	29	ASP	CB-CG-OD1	6.77	124.39	118.30
38	4	13	LEU	CA-CB-CG	6.71	130.73	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
36	2	36	LEU	CA-CB-CG	6.70	130.70	115.30
8	H	228	LEU	CA-CB-CG	6.63	130.54	115.30
1	A	261	MET	CA-CB-CG	6.53	124.39	113.30
5	E	116	ASP	CB-CG-OD2	-6.41	112.53	118.30
35	1	320	LEU	CB-CG-CD2	-6.40	100.13	111.00
18	S	190	ASP	CB-CG-OD1	6.21	123.89	118.30
41	8	15	LYS	CA-CB-CG	6.16	126.95	113.40
22	Y	142	LYS	CD-CE-NZ	-6.10	97.67	111.70
34	n	102	SER	C-N-CA	-6.09	106.46	121.70
18	S	66	LEU	CB-CG-CD1	-6.06	100.70	111.00
5	E	299	LYS	CA-CB-CG	6.03	126.68	113.40
38	4	36	LEU	CA-CB-CG	6.00	129.11	115.30
39	5	513	LEU	CA-CB-CG	5.98	129.06	115.30
16	Q	50	LEU	CA-CB-CG	5.98	129.04	115.30
8	H	124	LEU	CA-CB-CG	5.94	128.97	115.30
2	B	277	LEU	CB-CG-CD1	-5.92	100.93	111.00
35	1	289	LEU	CB-CG-CD2	-5.89	100.99	111.00
23	Z	27	LEU	CA-CB-CG	5.87	128.81	115.30
36	2	468	PHE	CB-CG-CD1	5.87	124.91	120.80
20	W	63	LEU	CB-CG-CD2	-5.85	101.05	111.00
37	3	98	LEU	CA-CB-CG	-5.83	101.89	115.30
39	5	236	LEU	CA-CB-CG	5.83	128.70	115.30
41	8	70	ASP	CB-CG-OD1	5.80	123.52	118.30
5	E	216	ARG	NE-CZ-NH1	-5.80	117.40	120.30
12	L	50	ILE	CB-CA-C	-5.75	100.10	111.60
2	B	301	LEU	CB-CG-CD1	-5.75	101.23	111.00
39	5	629	LEU	CB-CG-CD2	-5.72	101.27	111.00
27	d	38	LEU	CB-CG-CD2	-5.72	101.28	111.00
6	F	57	LEU	CB-CG-CD2	-5.70	101.32	111.00
5	E	274	ASP	CB-CG-OD2	5.68	123.41	118.30
38	4	283	LEU	CA-CB-CG	5.67	128.34	115.30
3	C	417	ASP	CB-CG-OD1	5.65	123.39	118.30
37	3	62	LEU	CA-CB-CG	5.65	128.30	115.30
10	J	26	LEU	CA-CB-CG	5.63	128.24	115.30
35	1	245	LEU	CA-CB-CG	5.63	128.24	115.30
35	1	78	LEU	CA-CB-CG	-5.62	102.36	115.30
35	1	74	VAL	CG1-CB-CG2	-5.55	102.01	110.90
35	1	286	LEU	CA-CB-CG	5.55	128.06	115.30
3	C	196	ASP	CB-CG-OD1	5.54	123.29	118.30
18	S	118	LEU	CA-CB-CG	5.54	128.05	115.30
35	1	306	ASP	CB-CG-OD1	-5.48	113.36	118.30
7	G	200	MET	CA-CB-CG	5.48	122.61	113.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	H	240	GLN	C-N-CA	5.48	135.40	121.70
1	A	353	LEU	CA-CB-CG	5.45	127.83	115.30
37	3	35	LEU	CB-CG-CD1	-5.43	101.77	111.00
1	A	481	LEU	CA-CB-CG	5.42	127.76	115.30
36	2	402	LEU	CA-CB-CG	5.40	127.72	115.30
38	4	418	LEU	CB-CG-CD1	-5.39	101.84	111.00
38	4	94	LEU	CA-CB-CG	5.37	127.66	115.30
39	5	68	LEU	CA-CB-CG	5.34	127.59	115.30
17	R	44	ARG	NE-CZ-NH2	-5.33	117.64	120.30
39	5	512	LEU	CA-CB-CG	5.29	127.47	115.30
5	E	192	ASP	CB-CG-OD1	5.29	123.06	118.30
3	C	264	LEU	CA-CB-CG	5.28	127.44	115.30
21	X	21	LEU	CA-CB-CG	5.27	127.42	115.30
33	j	29	ASP	CB-CG-OD2	-5.25	113.57	118.30
31	h	35	LEU	CA-CB-CG	-5.25	103.23	115.30
20	W	63	LEU	CA-CB-CG	5.23	127.34	115.30
9	I	103	TYR	CA-CB-CG	-5.21	103.51	113.40
3	C	420	GLU	C-N-CA	5.20	134.69	121.70
19	U	92	ASP	CB-CG-OD2	-5.20	113.62	118.30
8	H	197	LEU	CA-CB-CG	-5.19	103.36	115.30
1	A	660	ASP	CB-CG-OD1	5.18	122.96	118.30
2	B	46	ASP	CB-CG-OD1	5.15	122.94	118.30
5	E	99	LEU	CA-CB-CG	5.15	127.14	115.30
35	1	58	LEU	CB-CG-CD2	5.15	119.75	111.00
1	A	225	LEU	CA-CB-CG	5.14	127.12	115.30
40	6	77	LEU	CA-CB-CG	5.13	127.11	115.30
3	C	104	LEU	CA-CB-CG	5.10	127.04	115.30
36	2	285	LEU	CA-CB-CG	5.08	126.98	115.30
15	P	33	LEU	CB-CG-CD1	-5.06	102.39	111.00
9	I	200	LEU	CB-CG-CD2	-5.06	102.40	111.00
16	Q	105	LEU	CA-CB-CG	5.05	126.93	115.30
11	K	65	ASP	CB-CG-OD2	-5.04	113.77	118.30
2	B	110	GLU	CA-CB-CG	5.01	124.43	113.40
7	G	93	LYS	N-CA-C	-5.01	97.47	111.00

There are no chirality outliers.

All (28) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
35	1	200	PRO	Peptide
35	1	67	GLU	Peptide
36	2	214	ILE	Peptide

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Mol	Chain	Res	Type	Group
36	2	338	ASN	Peptide
38	4	228	HIS	Peptide
39	5	134	SER	Peptide
39	5	253	ALA	Peptide
39	5	387	MET	Peptide
39	5	554	LEU	Peptide
1	A	165	ARG	Sidechain
1	A	247	ALA	Peptide
1	A	269	ARG	Sidechain
1	A	434	ARG	Sidechain
1	A	439	ILE	Peptide
2	B	457	ASP	Peptide
3	C	86	ASN	Peptide
3	C	96	GLY	Peptide
8	H	174	ASN	Peptide
8	H	239	LEU	Peptide
8	H	29	ILE	Peptide
10	J	182	GLY	Peptide
11	K	180	CYS	Peptide
11	K	199	ARG	Sidechain
11	K	97	ARG	Sidechain
13	M	75	PRO	Peptide
14	O	44	ASP	Peptide
24	a	117	GLU	Peptide
26	c	18	GLN	Peptide

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	690/728 (95%)	641 (93%)	49 (7%)	0	100	100
2	B	454/488 (93%)	424 (93%)	30 (7%)	0	100	100
3	C	429/466 (92%)	402 (94%)	26 (6%)	1 (0%)	47	79
4	D	84/87 (97%)	77 (92%)	7 (8%)	0	100	100
5	E	309/375 (82%)	291 (94%)	18 (6%)	0	100	100
6	F	119/144 (83%)	112 (94%)	7 (6%)	0	100	100
7	G	237/281 (84%)	228 (96%)	8 (3%)	1 (0%)	34	69
8	H	214/243 (88%)	194 (91%)	19 (9%)	1 (0%)	29	67
9	I	188/229 (82%)	179 (95%)	9 (5%)	0	100	100
10	J	177/198 (89%)	169 (96%)	8 (4%)	0	100	100
11	K	173/210 (82%)	161 (93%)	11 (6%)	1 (1%)	25	64
12	L	87/89 (98%)	86 (99%)	1 (1%)	0	100	100
13	M	115/136 (85%)	104 (90%)	11 (10%)	0	100	100
14	O	75/109 (69%)	69 (92%)	6 (8%)	0	100	100
15	P	121/124 (98%)	118 (98%)	3 (2%)	0	100	100
16	Q	83/132 (63%)	82 (99%)	1 (1%)	0	100	100
17	R	104/109 (95%)	96 (92%)	8 (8%)	0	100	100
18	S	168/249 (68%)	160 (95%)	8 (5%)	0	100	100
19	U	169/172 (98%)	161 (95%)	8 (5%)	0	100	100
20	W	119/123 (97%)	114 (96%)	5 (4%)	0	100	100
21	X	165/169 (98%)	160 (97%)	5 (3%)	0	100	100
22	Y	121/161 (75%)	117 (97%)	4 (3%)	0	100	100
23	Z	179/182 (98%)	167 (93%)	12 (7%)	0	100	100
24	a	122/149 (82%)	114 (93%)	8 (7%)	0	100	100
25	b	62/74 (84%)	61 (98%)	1 (2%)	0	100	100
26	c	42/60 (70%)	37 (88%)	5 (12%)	0	100	100
27	d	88/92 (96%)	86 (98%)	2 (2%)	0	100	100
28	e	50/67 (75%)	49 (98%)	1 (2%)	0	100	100
29	f	78/87 (90%)	73 (94%)	5 (6%)	0	100	100
30	g	74/78 (95%)	70 (95%)	3 (4%)	1 (1%)	11	46
31	h	134/138 (97%)	126 (94%)	7 (5%)	1 (1%)	22	61
32	i	81/90 (90%)	74 (91%)	7 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
33	j	88/93 (95%)	81 (92%)	7 (8%)	0	100	100
34	n	112/120 (93%)	102 (91%)	10 (9%)	0	100	100
35	1	325/341 (95%)	306 (94%)	19 (6%)	0	100	100
36	2	467/469 (100%)	449 (96%)	18 (4%)	0	100	100
37	3	112/128 (88%)	103 (92%)	9 (8%)	0	100	100
38	4	483/486 (99%)	464 (96%)	19 (4%)	0	100	100
39	5	652/655 (100%)	624 (96%)	26 (4%)	2 (0%)	41	74
40	6	178/185 (96%)	169 (95%)	9 (5%)	0	100	100
41	8	75/99 (76%)	71 (95%)	4 (5%)	0	100	100
42	9	84/89 (94%)	76 (90%)	8 (10%)	0	100	100
All	All	7887/8704 (91%)	7447 (94%)	432 (6%)	8 (0%)	54	83

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	97	VAL
7	G	94	ASP
11	K	85	CYS
39	5	555	VAL
31	h	108	PRO
8	H	30	VAL
39	5	556	SER
30	g	12	PRO

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	565/595 (95%)	565 (100%)	0	100	100
2	B	364/389 (94%)	363 (100%)	1 (0%)	92	96
3	C	368/394 (93%)	367 (100%)	1 (0%)	92	96

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	D	68/69 (99%)	68 (100%)	0	100	100
5	E	274/329 (83%)	273 (100%)	1 (0%)	91	95
6	F	109/129 (84%)	109 (100%)	0	100	100
7	G	216/245 (88%)	216 (100%)	0	100	100
8	H	191/212 (90%)	190 (100%)	1 (0%)	88	95
9	I	156/187 (83%)	156 (100%)	0	100	100
10	J	130/147 (88%)	129 (99%)	1 (1%)	81	93
11	K	152/180 (84%)	151 (99%)	1 (1%)	84	94
12	L	77/77 (100%)	76 (99%)	1 (1%)	69	87
13	M	97/115 (84%)	97 (100%)	0	100	100
14	O	65/91 (71%)	65 (100%)	0	100	100
15	P	108/109 (99%)	108 (100%)	0	100	100
16	Q	72/111 (65%)	72 (100%)	0	100	100
17	R	97/100 (97%)	97 (100%)	0	100	100
18	S	149/211 (71%)	149 (100%)	0	100	100
19	U	147/148 (99%)	146 (99%)	1 (1%)	84	94
20	W	100/102 (98%)	100 (100%)	0	100	100
21	X	131/133 (98%)	131 (100%)	0	100	100
22	Y	105/140 (75%)	105 (100%)	0	100	100
23	Z	147/148 (99%)	147 (100%)	0	100	100
24	a	108/129 (84%)	107 (99%)	1 (1%)	78	91
25	b	50/59 (85%)	50 (100%)	0	100	100
26	c	30/45 (67%)	30 (100%)	0	100	100
27	d	83/85 (98%)	83 (100%)	0	100	100
28	e	44/55 (80%)	44 (100%)	0	100	100
29	f	69/73 (94%)	69 (100%)	0	100	100
30	g	62/64 (97%)	62 (100%)	0	100	100
31	h	121/123 (98%)	121 (100%)	0	100	100
32	i	64/68 (94%)	64 (100%)	0	100	100
33	j	71/73 (97%)	71 (100%)	0	100	100
34	n	98/102 (96%)	98 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
35	1	292/302 (97%)	292 (100%)	0	100 100
36	2	433/433 (100%)	433 (100%)	0	100 100
37	3	104/114 (91%)	104 (100%)	0	100 100
38	4	433/434 (100%)	432 (100%)	1 (0%)	93 98
39	5	579/580 (100%)	578 (100%)	1 (0%)	93 98
40	6	162/167 (97%)	162 (100%)	0	100 100
41	8	68/76 (90%)	68 (100%)	0	100 100
42	9	73/76 (96%)	72 (99%)	1 (1%)	67 86
All	All	6832/7419 (92%)	6820 (100%)	12 (0%)	93 98

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	431	ASP
3	C	466	ARG
5	E	135	THR
8	H	36	THR
10	J	183	ARG
11	K	85	CYS
12	L	51	SER
19	U	138	ASP
24	a	82	PRO
38	4	8	LEU
39	5	525	ILE
42	9	25	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (63) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	127	GLN
1	A	285	HIS
1	A	398	ASN
1	A	696	ASN
3	C	77	ASN
3	C	120	HIS
4	D	33	ASN
4	D	60	GLN
5	E	62	ASN

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Mol	Chain	Res	Type
5	E	137	ASN
5	E	170	ASN
5	E	180	ASN
5	E	237	HIS
6	F	108	HIS
7	G	38	ASN
8	H	38	ASN
8	H	40	ASN
8	H	91	ASN
8	H	174	ASN
8	H	224	GLN
9	I	210	ASN
11	K	100	GLN
11	K	158	HIS
12	L	43	ASN
14	O	97	GLN
17	R	34	GLN
17	R	38	GLN
17	R	50	ASN
18	S	113	ASN
18	S	211	ASN
19	U	127	ASN
20	W	53	GLN
21	X	142	ASN
21	X	161	HIS
22	Y	109	GLN
24	a	52	ASN
26	c	25	ASN
31	h	25	ASN
31	h	55	HIS
31	h	91	ASN
32	i	78	HIS
33	j	73	GLN
34	n	95	HIS
35	1	310	ASN
36	2	185	HIS
36	2	227	ASN
37	3	22	ASN
38	4	153	HIS
38	4	193	ASN
38	4	196	ASN
38	4	424	GLN

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Mol	Chain	Res	Type
38	4	444	ASN
38	4	480	ASN
39	5	25	GLN
39	5	66	ASN
39	5	335	HIS
39	5	491	HIS
39	5	496	ASN
39	5	529	ASN
39	5	552	GLN
39	5	638	ASN
40	6	143	ASN
41	8	10	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 44 ligands modelled in this entry, 1 is monoatomic - leaving 43 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	$\#\|Z\| > 2$
46	NDP	E	401	-	45,52,52	4.02	19 (42%)	53,80,80	2.23	5 (9%)
43	SF4	I	502	9	0,12,12	-	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
43	SF4	B	501	2	0,12,12	-	-	-		
52	CDL	X	201	-	85,85,99	0.65	1 (1%)	91,97,111	0.86	4 (4%)
47	3PE	4	503	-	41,41,50	1.04	3 (7%)	44,46,55	1.26	3 (6%)
44	FES	A	803	1	0,4,4	-	-	-		
48	LMN	J	202	-	72,72,72	1.62	12 (16%)	96,98,98	1.93	28 (29%)
43	SF4	I	503	9	0,12,12	-	-	-		
50	ZMP	O	201	14	26,32,36	1.80	5 (19%)	31,39,45	1.87	6 (19%)
54	T7X	2	502	-	48,48,61	1.00	4 (8%)	57,60,73	1.42	9 (15%)
47	3PE	I	501	-	50,50,50	0.88	3 (6%)	53,55,55	1.05	3 (5%)
51	PLC	W	202	-	41,41,41	1.30	4 (9%)	47,49,49	0.99	3 (6%)
52	CDL	4	502	-	91,91,99	0.92	5 (5%)	97,103,111	1.14	6 (6%)
47	3PE	J	201	-	40,40,50	0.94	3 (7%)	43,45,55	1.07	2 (4%)
51	PLC	1	403	-	34,34,41	1.47	7 (20%)	40,42,49	1.24	3 (7%)
47	3PE	i	101	-	41,41,50	0.95	4 (9%)	44,46,55	1.21	2 (4%)
52	CDL	2	501	-	82,82,99	0.48	0	88,94,111	0.67	3 (3%)
47	3PE	3	201	-	42,42,50	0.29	0	45,47,55	0.35	0
43	SF4	A	802	1	0,12,12	-	-	-		
54	T7X	4	505	-	43,43,61	0.69	1 (2%)	53,55,73	1.34	8 (15%)
52	CDL	5	701	-	77,77,99	1.01	7 (9%)	83,89,111	1.25	5 (6%)
50	ZMP	Q	201	16	26,32,36	1.73	7 (26%)	31,39,45	2.31	8 (25%)
53	UQ9	1	402	-	35,35,58	2.48	13 (37%)	42,45,73	2.10	15 (35%)
51	PLC	5	702	-	41,41,41	1.31	5 (12%)	47,49,49	1.13	2 (4%)
47	3PE	b	201	-	41,41,50	0.93	3 (7%)	44,46,55	1.19	2 (4%)
45	FMN	B	502	-	33,33,33	2.94	14 (42%)	48,50,50	1.70	11 (22%)
47	3PE	4	504	-	50,50,50	0.85	4 (8%)	53,55,55	1.19	3 (5%)
52	CDL	Z	201	-	75,75,99	1.00	8 (10%)	81,87,111	1.16	6 (7%)
55	PSC	2	503	-	51,51,51	1.02	4 (7%)	57,59,59	1.07	3 (5%)
51	PLC	5	703	-	30,30,41	1.48	5 (16%)	36,38,49	1.08	3 (8%)
47	3PE	a	201	-	50,50,50	0.87	4 (8%)	53,55,55	1.11	3 (5%)
43	SF4	K	301	11	0,12,12	-	-	-		
47	3PE	J	203	-	43,43,50	0.95	4 (9%)	46,48,55	1.31	3 (6%)
47	3PE	4	501	-	42,42,50	0.93	4 (9%)	45,47,55	1.11	2 (4%)
47	3PE	S	501	-	41,41,50	0.93	4 (9%)	44,46,55	1.08	1 (2%)
51	PLC	1	401	-	41,41,41	1.32	4 (9%)	47,49,49	1.18	3 (6%)
48	LMN	J	204	-	68,68,72	1.60	14 (20%)	92,94,98	1.46	14 (15%)
43	SF4	A	801	1	0,12,12	-	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
48	LMN	j	101	-	72,72,72	1.62	11 (15%)	96,98,98	1.79	19 (19%)
54	T7X	2	504	-	52,52,61	0.53	0	62,64,73	0.97	4 (6%)
44	FES	H	301	8	0,4,4	-	-	-		
54	T7X	3	202	-	49,49,61	0.96	5 (10%)	59,61,73	1.47	7 (11%)
51	PLC	W	201	-	40,40,41	1.32	5 (12%)	46,48,49	1.12	2 (4%)

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
46	NDP	E	401	-	-	11/30/77/77	0/5/5/5
52	CDL	X	201	-	-	41/96/96/110	-
43	SF4	B	501	2	-	-	0/6/5/5
43	SF4	I	502	9	-	-	0/6/5/5
44	FES	H	301	8	-	-	0/1/1/1
47	3PE	4	503	-	-	14/45/45/54	-
44	FES	A	803	1	-	-	0/1/1/1
48	LMN	J	202	-	-	26/50/130/130	0/4/4/4
50	ZMP	O	201	14	-	5/37/39/43	-
43	SF4	I	503	9	-	-	0/6/5/5
54	T7X	2	502	-	-	12/43/67/80	0/1/1/1
47	3PE	I	501	-	-	23/54/54/54	-
51	PLC	W	202	-	-	18/45/45/45	-
52	CDL	4	502	-	-	45/102/102/110	-
47	3PE	J	201	-	-	9/44/44/54	-
51	PLC	1	403	-	-	8/38/38/45	-
47	3PE	i	101	-	-	20/45/45/54	-
52	CDL	2	501	-	-	26/93/93/110	-
47	3PE	3	201	-	-	4/46/46/54	-
54	T7X	4	505	-	-	24/38/62/80	0/1/1/1
43	SF4	A	802	1	-	-	0/6/5/5
52	CDL	5	701	-	-	35/88/88/110	-
53	UQ9	1	402	-	-	6/30/54/81	0/1/1/1
51	PLC	5	702	-	-	21/45/45/45	-
47	3PE	b	201	-	-	13/45/45/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
45	FMN	B	502	-	-	13/18/18/18	0/3/3/3
47	3PE	4	504	-	-	25/54/54/54	-
52	CDL	Z	201	-	-	32/86/86/110	-
55	PSC	2	503	-	-	25/55/55/55	-
51	PLC	5	703	-	-	11/34/34/45	-
47	3PE	a	201	-	-	10/54/54/54	-
43	SF4	K	301	11	-	-	0/6/5/5
47	3PE	J	203	-	-	21/47/47/54	-
47	3PE	4	501	-	-	8/46/46/54	-
47	3PE	S	501	-	-	18/45/45/54	-
51	PLC	1	401	-	-	16/45/45/45	-
48	LMN	J	204	-	-	17/46/126/130	0/4/4/4
43	SF4	A	801	1	-	-	0/6/5/5
48	LMN	j	101	-	-	30/50/130/130	0/4/4/4
54	T7X	2	504	-	-	14/47/71/80	0/1/1/1
50	ZMP	Q	201	16	-	13/37/39/43	-
54	T7X	3	202	-	-	13/44/68/80	0/1/1/1
51	PLC	W	201	-	-	16/44/44/45	-

All (196) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	E	401	NDP	O4B-C1B	14.10	1.60	1.41
46	E	401	NDP	C6N-C5N	12.29	1.55	1.33
53	1	402	UQ9	C6-C1	9.45	1.52	1.35
46	E	401	NDP	O4D-C1D	7.86	1.60	1.42
45	B	502	FMN	C4A-N5	7.84	1.46	1.30
46	E	401	NDP	C2D-C1D	-7.00	1.31	1.53
45	B	502	FMN	C10-N1	6.92	1.47	1.33
46	E	401	NDP	O4D-C4D	-6.79	1.29	1.45
46	E	401	NDP	O4B-C4B	-6.27	1.31	1.45
48	J	202	LMN	O1-C1	-5.80	1.30	1.40
48	j	101	LMN	O1-C1	-5.70	1.30	1.40
50	O	201	ZMP	C16-N2	5.45	1.45	1.33
45	B	502	FMN	C5A-N5	5.37	1.49	1.39
46	E	401	NDP	C2N-C3N	5.25	1.49	1.34
50	O	201	ZMP	C13-N1	5.25	1.45	1.33
48	J	204	LMN	O5-C1	5.20	1.55	1.41
48	J	204	LMN	O1-C1	-5.19	1.31	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	Q	201	ZMP	C13-N1	5.06	1.44	1.33
48	j	101	LMN	O5-C1	4.95	1.54	1.41
48	J	202	LMN	O5-C1	4.93	1.54	1.41
45	B	502	FMN	C2-N1	4.88	1.48	1.36
50	Q	201	ZMP	C16-N2	4.84	1.44	1.33
45	B	502	FMN	C9A-N10	4.70	1.49	1.41
46	E	401	NDP	P2B-O2B	4.50	1.67	1.59
46	E	401	NDP	O2D-C2D	4.38	1.53	1.43
45	B	502	FMN	C10-N10	4.25	1.46	1.37
45	B	502	FMN	C2-N3	4.20	1.48	1.39
46	E	401	NDP	C4N-C3N	4.06	1.57	1.49
45	B	502	FMN	C4-N3	3.99	1.46	1.38
53	1	402	UQ9	C7-C8	3.92	1.56	1.50
53	1	402	UQ9	C4-C3	3.91	1.52	1.36
51	W	202	PLC	O2-C'	3.80	1.45	1.34
48	J	202	LMN	O4-C4	3.62	1.53	1.43
48	J	202	LMN	CCV-CCT	-3.61	1.43	1.52
48	J	202	LMN	CCT-CCN	3.52	1.61	1.52
51	5	702	PLC	O2-C'	3.47	1.44	1.34
51	1	403	PLC	O2-C'	3.44	1.44	1.34
51	W	201	PLC	O2-C'	3.44	1.44	1.34
53	1	402	UQ9	C11-C9	3.42	1.58	1.51
48	j	101	LMN	CBS-CCM	3.39	1.61	1.53
51	1	403	PLC	O3-CB	3.38	1.43	1.33
46	E	401	NDP	C7N-N7N	3.37	1.42	1.33
51	W	201	PLC	O3-CB	3.37	1.43	1.33
51	1	401	PLC	O3-CB	3.33	1.43	1.33
51	1	401	PLC	O2-C'	3.31	1.43	1.34
51	5	702	PLC	O3-CB	3.30	1.43	1.33
46	E	401	NDP	C6A-N6A	3.27	1.46	1.34
47	I	501	3PE	O21-C2	-3.26	1.38	1.46
48	j	101	LMN	OBY-CCR	3.18	1.50	1.41
51	5	703	PLC	O3-CB	3.16	1.42	1.33
51	W	202	PLC	O3-CB	3.13	1.42	1.33
46	E	401	NDP	C6N-N1N	3.09	1.45	1.37
48	j	101	LMN	CBR-CCM	3.08	1.59	1.54
48	j	101	LMN	CBT-CCM	3.02	1.60	1.53
48	J	202	LMN	OBZ-CCS	3.02	1.49	1.41
48	J	204	LMN	CBS-CCM	2.98	1.60	1.53
48	j	101	LMN	O4-C4	2.97	1.51	1.43
48	J	204	LMN	CBT-CCM	2.96	1.60	1.53
48	j	101	LMN	CBQ-CCM	2.93	1.59	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	J	201	3PE	O21-C2	-2.89	1.39	1.46
48	j	101	LMN	OBZ-CCS	2.87	1.49	1.41
51	5	703	PLC	O2-C2	-2.86	1.39	1.46
47	a	201	3PE	O21-C2	-2.86	1.39	1.46
51	5	703	PLC	O2-C'	2.86	1.42	1.34
47	4	503	3PE	O31-C31	2.84	1.41	1.33
45	B	502	FMN	O4-C4	-2.84	1.18	1.23
47	4	503	3PE	O21-C21	2.83	1.42	1.34
53	1	402	UQ9	C21-C19	2.83	1.57	1.51
48	J	204	LMN	OBZ-CCS	2.82	1.49	1.41
53	1	402	UQ9	C16-C14	2.79	1.57	1.51
52	4	502	CDL	OA6-CA4	-2.77	1.39	1.46
52	5	701	CDL	OB6-CB4	-2.77	1.39	1.46
52	4	502	CDL	OB6-CB4	-2.74	1.39	1.46
46	E	401	NDP	C5D-C4D	2.74	1.60	1.51
45	B	502	FMN	O2-C2	-2.74	1.19	1.24
47	b	201	3PE	O21-C2	-2.73	1.39	1.46
52	Z	201	CDL	OB8-CB7	2.73	1.41	1.33
46	E	401	NDP	C4N-C5N	2.73	1.56	1.48
53	1	402	UQ9	O4-C4M	-2.71	1.38	1.45
55	2	503	PSC	O03-C01	-2.69	1.39	1.45
47	i	101	3PE	O21-C2	-2.68	1.39	1.46
47	4	504	3PE	O21-C2	-2.65	1.40	1.46
48	J	204	LMN	OBY-CCR	2.65	1.48	1.41
47	J	203	3PE	O21-C2	-2.64	1.40	1.46
47	4	501	3PE	O21-C2	-2.62	1.40	1.46
48	J	204	LMN	OBX-CCJ	2.62	1.48	1.41
54	2	502	T7X	P1-O1	2.62	1.67	1.60
55	2	503	PSC	O01-C1	2.61	1.41	1.34
54	3	202	T7X	O16-C10	2.60	1.41	1.34
52	4	502	CDL	OA8-CA7	2.58	1.40	1.33
53	1	402	UQ9	O2-C2	-2.58	1.17	1.23
46	E	401	NDP	C5A-C4A	-2.55	1.34	1.40
52	5	701	CDL	OA8-CA7	2.55	1.40	1.33
52	Z	201	CDL	OA8-CA7	2.54	1.40	1.33
46	E	401	NDP	C2A-N3A	2.54	1.36	1.32
47	b	201	3PE	O31-C3	-2.54	1.39	1.45
47	a	201	3PE	O31-C3	-2.53	1.39	1.45
52	Z	201	CDL	OB6-CB5	2.53	1.41	1.34
48	J	202	LMN	OBY-CCR	2.52	1.48	1.41
53	1	402	UQ9	C6-C5	2.51	1.53	1.46
51	1	401	PLC	O2-C2	-2.51	1.40	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	4	504	3PE	O31-C3	-2.51	1.39	1.45
53	1	402	UQ9	C26-C24	2.51	1.56	1.51
52	5	701	CDL	OA6-CA5	2.51	1.41	1.34
52	4	502	CDL	OB8-CB7	2.47	1.40	1.33
54	3	202	T7X	O16-C8	-2.47	1.40	1.46
51	W	201	PLC	O2-C2	-2.47	1.40	1.46
52	5	701	CDL	OB8-CB7	2.46	1.40	1.33
48	J	202	LMN	OAQ-CCN	2.46	1.48	1.43
52	5	701	CDL	OB6-CB5	2.44	1.41	1.34
48	J	204	LMN	O4-C4	2.44	1.50	1.43
48	J	202	LMN	OBZ-CCD	2.44	1.50	1.44
47	i	101	3PE	O31-C3	-2.43	1.39	1.45
50	Q	201	ZMP	O2-C13	-2.42	1.18	1.23
48	J	204	LMN	OBX-CCF	2.41	1.50	1.44
52	Z	201	CDL	OA6-CA5	2.41	1.41	1.34
47	J	203	3PE	O31-C31	2.40	1.40	1.33
52	5	701	CDL	OA6-CA4	-2.40	1.40	1.46
54	3	202	T7X	O18-C11	2.39	1.40	1.33
54	2	502	T7X	O16-C10	2.38	1.41	1.34
54	2	502	T7X	O18-C11	2.37	1.40	1.33
51	1	403	PLC	O2-C2	-2.36	1.40	1.46
50	O	201	ZMP	C10-S1	2.36	1.81	1.76
47	S	501	3PE	O21-C2	-2.36	1.40	1.46
47	i	101	3PE	O31-C31	2.36	1.40	1.33
45	B	502	FMN	C5'-C4'	-2.34	1.48	1.51
51	5	703	PLC	P-O4P	2.34	1.68	1.59
47	4	501	3PE	O31-C3	-2.34	1.39	1.45
53	1	402	UQ9	O5-C5	-2.34	1.18	1.23
52	Z	201	CDL	OB6-CB4	-2.33	1.40	1.46
51	1	403	PLC	C8-N	-2.31	1.43	1.50
48	J	202	LMN	CBS-CCM	2.31	1.58	1.53
51	5	703	PLC	P-O3P	2.29	1.68	1.59
47	S	501	3PE	O31-C3	-2.29	1.39	1.45
48	j	101	LMN	OBZ-CCD	2.28	1.49	1.44
48	J	202	LMN	CBT-CCM	2.28	1.58	1.53
48	J	204	LMN	CBR-CCM	2.27	1.58	1.54
50	O	201	ZMP	O3-C16	-2.27	1.18	1.23
50	O	201	ZMP	O2-C13	-2.26	1.18	1.23
47	S	501	3PE	O21-C21	2.26	1.40	1.34
47	4	503	3PE	O21-C2	-2.25	1.41	1.46
51	5	702	PLC	P-O4P	2.24	1.68	1.59
52	5	701	CDL	OA8-CA6	-2.23	1.40	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	J	203	3PE	O21-C21	2.23	1.40	1.34
47	4	501	3PE	O31-C31	2.22	1.39	1.33
47	a	201	3PE	O21-C21	2.22	1.40	1.34
51	5	702	PLC	O2-C2	-2.22	1.41	1.46
55	2	503	PSC	O01-C02	-2.21	1.41	1.46
47	a	201	3PE	O31-C31	2.21	1.39	1.33
51	W	201	PLC	P-O3P	2.21	1.68	1.59
47	4	504	3PE	O21-C21	2.20	1.40	1.34
51	5	702	PLC	P-O3P	2.19	1.68	1.59
51	1	403	PLC	P-O3P	2.19	1.68	1.59
48	j	101	LMN	OBY-CCC	2.19	1.49	1.44
51	W	202	PLC	P-O4P	2.18	1.68	1.59
47	4	504	3PE	O31-C31	2.18	1.39	1.33
48	J	204	LMN	OCB-CCQ	2.18	1.49	1.43
50	Q	201	ZMP	C10-S1	2.18	1.81	1.76
53	1	402	UQ9	O3-C3M	-2.17	1.40	1.45
54	3	202	T7X	P1-O1	2.17	1.66	1.60
47	J	201	3PE	O31-C31	2.17	1.39	1.33
47	I	501	3PE	O31-C3	-2.17	1.40	1.45
47	S	501	3PE	O31-C31	2.16	1.39	1.33
51	1	403	PLC	P-O4P	2.15	1.68	1.59
52	4	502	CDL	OA8-CA6	-2.15	1.40	1.45
45	B	502	FMN	O2'-C2'	-2.14	1.38	1.43
47	4	501	3PE	O21-C21	2.14	1.40	1.34
54	2	502	T7X	O18-C9	-2.13	1.40	1.45
53	1	402	UQ9	C22-C23	2.12	1.57	1.50
46	E	401	NDP	PA-O2A	-2.12	1.45	1.55
50	Q	201	ZMP	C9-C10	2.12	1.53	1.50
51	W	202	PLC	P-O3P	2.12	1.67	1.59
46	E	401	NDP	PA-O5B	2.12	1.67	1.59
47	J	203	3PE	O31-C3	-2.11	1.40	1.45
45	B	502	FMN	O3'-C3'	-2.11	1.38	1.43
48	J	204	LMN	CBQ-CCM	2.11	1.58	1.54
51	1	401	PLC	P-O4P	2.10	1.67	1.59
54	3	202	T7X	O18-C9	-2.10	1.40	1.45
54	4	505	T7X	C31-C11	-2.10	1.44	1.50
48	J	202	LMN	O5-C5	2.09	1.49	1.44
47	I	501	3PE	O31-C31	2.09	1.39	1.33
52	Z	201	CDL	OB8-CB6	-2.09	1.40	1.45
47	J	201	3PE	O31-C3	-2.08	1.40	1.45
52	Z	201	CDL	OA8-CA6	-2.08	1.40	1.45
52	X	201	CDL	OA9-CA7	-2.07	1.16	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	Q	201	ZMP	O5-C21	-2.07	1.39	1.44
48	J	204	LMN	OBY-CCC	2.06	1.49	1.44
47	i	101	3PE	O21-C21	2.06	1.40	1.34
51	W	201	PLC	P-O4P	2.05	1.67	1.59
55	2	503	PSC	O03-C19	2.03	1.39	1.33
47	b	201	3PE	O21-C21	2.03	1.40	1.34
50	Q	201	ZMP	O3-C16	-2.02	1.19	1.23
52	Z	201	CDL	OA6-CA4	-2.01	1.41	1.46
45	B	502	FMN	C4A-C4	2.01	1.51	1.44
48	J	204	LMN	OAN-CCH	2.01	1.47	1.43
51	1	403	PLC	C1'-C'	2.00	1.56	1.50

All (201) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	E	401	NDP	C5A-C6A-N6A	9.62	134.97	120.35
50	Q	201	ZMP	C14-C15-N2	-8.64	94.46	111.90
48	j	101	LMN	CBR-CBL-CBJ	7.32	134.98	113.19
46	E	401	NDP	C1B-N9A-C4A	-7.19	114.02	126.64
48	J	202	LMN	CBM-CCC-CCN	-6.71	97.30	113.00
46	E	401	NDP	N6A-C6A-N1A	-6.68	104.71	118.57
48	J	204	LMN	CBR-CBL-CBJ	6.27	131.88	113.19
50	O	201	ZMP	C9-C10-S1	5.86	120.28	113.46
54	4	505	T7X	O16-C10-C12	5.59	123.55	111.50
47	J	203	3PE	O21-C21-C22	5.46	123.28	111.50
46	E	401	NDP	N3A-C2A-N1A	-5.46	120.14	128.68
50	Q	201	ZMP	C9-C10-S1	5.41	119.75	113.46
51	1	401	PLC	O2-C'-C1'	5.31	122.94	111.50
52	5	701	CDL	OA6-CA5-C11	5.22	122.75	111.50
48	J	202	LMN	CBR-CBL-CBJ	5.16	128.57	113.19
51	1	403	PLC	O2-C'-C1'	5.09	122.47	111.50
48	j	101	LMN	C2-C3-C4	5.00	121.09	109.68
48	j	101	LMN	OBX-CCF-CBP	-4.92	94.21	106.44
48	j	101	LMN	OBX-CCJ-OBV	-4.69	98.87	109.97
54	3	202	T7X	C12-C13-C14	-4.52	105.18	113.23
45	B	502	FMN	C7M-C7-C6	-4.39	111.38	119.49
54	2	502	T7X	C12-C13-C14	-4.30	105.56	113.23
50	O	201	ZMP	C11-C12-N1	-4.30	103.38	112.42
47	i	101	3PE	O21-C21-C22	4.29	120.74	111.50
48	j	101	LMN	OCB-CCS-CCW	4.27	119.15	108.10
53	1	402	UQ9	C8-C7-C6	-4.25	100.57	112.05
53	1	402	UQ9	C15-C14-C13	-4.25	112.77	123.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
48	J	202	LMN	CCR-CCV-CCT	4.20	118.73	110.00
51	5	702	PLC	O2-C'-C1'	4.18	120.52	111.50
47	S	501	3PE	O21-C21-C22	4.14	120.43	111.50
54	3	202	T7X	C6-C1-C2	4.09	116.75	110.85
53	1	402	UQ9	C12-C13-C14	-4.06	117.88	127.66
48	J	202	LMN	O3-C3-C2	-4.03	101.03	110.35
53	1	402	UQ9	C7-C8-C9	-4.01	120.11	126.79
55	2	503	PSC	O01-C1-C2	3.98	120.07	111.50
47	b	201	3PE	O21-C21-C22	3.93	119.97	111.50
53	1	402	UQ9	C12-C11-C9	-3.92	100.09	112.98
52	4	502	CDL	OB6-CB5-C51	3.91	119.92	111.50
47	4	503	3PE	O31-C31-C32	3.85	123.99	111.91
53	1	402	UQ9	C17-C18-C19	-3.84	118.41	127.66
54	3	202	T7X	C5-C6-C1	3.80	118.35	109.68
45	B	502	FMN	C4-N3-C2	-3.79	118.63	125.64
50	Q	201	ZMP	C20-C18-C17	3.78	115.38	108.82
48	J	202	LMN	OBZ-CCD-CCO	3.78	116.56	109.69
48	J	202	LMN	OCB-CCQ-CCF	-3.78	99.10	109.45
47	4	503	3PE	O21-C21-C22	3.73	119.54	111.50
53	1	402	UQ9	C15-C14-C16	3.66	121.43	115.27
52	X	201	CDL	OB6-CB5-C51	3.63	119.32	111.50
52	Z	201	CDL	OA6-CA5-C11	3.61	119.28	111.50
54	2	502	T7X	C3-C2-C1	3.48	117.63	109.68
50	O	201	ZMP	O1-C10-C9	-3.47	119.89	123.99
54	2	504	T7X	C5-C4-C3	3.46	116.86	110.82
45	B	502	FMN	C7M-C7-C8	3.44	127.78	120.74
47	4	501	3PE	O21-C21-C22	3.43	118.90	111.50
51	5	703	PLC	O2-C'-C1'	3.42	118.88	111.50
48	J	202	LMN	CCJ-CCL-CCH	3.40	117.07	110.00
52	4	502	CDL	OB8-CB7-C71	3.40	122.57	111.91
48	J	202	LMN	O4-CCR-CCV	3.39	116.89	108.10
54	3	202	T7X	O16-C10-C12	3.36	118.75	111.50
48	J	202	LMN	CCL-CCH-CCQ	3.36	117.36	109.68
48	j	101	LMN	OCB-CCQ-CCF	3.36	118.65	109.45
47	4	504	3PE	O21-C21-C22	3.35	118.71	111.50
48	j	101	LMN	CBP-CCF-CCQ	3.34	123.03	113.33
45	B	502	FMN	P-O5'-C5'	-3.33	109.12	118.30
48	J	202	LMN	CCS-OBZ-CCD	3.32	120.21	113.69
52	Z	201	CDL	OB6-CB5-C51	3.25	118.51	111.50
51	W	201	PLC	O2-C'-C1'	3.23	118.47	111.50
47	J	203	3PE	O31-C31-C32	3.21	121.99	111.91
45	B	502	FMN	O4-C4-C4A	-3.20	118.12	126.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
48	J	202	LMN	CBQ-CBK-CBI	-3.17	103.74	113.19
48	J	204	LMN	CCJ-OBX-CCF	3.15	119.86	113.69
47	I	501	3PE	O31-C31-C32	3.12	121.69	111.91
45	B	502	FMN	C4A-C4-N3	3.12	121.11	113.19
47	a	201	3PE	O21-C21-C22	3.09	118.17	111.50
47	a	201	3PE	C3-C2-C1	-3.09	104.49	111.79
52	4	502	CDL	OA6-CA5-C11	3.07	118.13	111.50
52	4	502	CDL	OA8-CA7-C31	3.05	121.49	111.91
53	1	402	UQ9	C22-C23-C24	-3.05	120.31	127.66
54	3	202	T7X	O18-C11-C31	3.05	121.47	111.91
51	5	702	PLC	O3-CB-C1B	3.03	121.43	111.91
47	4	504	3PE	C3-C2-C1	-3.01	104.66	111.79
54	2	502	T7X	O16-C10-C12	3.00	117.97	111.50
54	4	505	T7X	O16-C8-C7	2.98	119.20	108.40
53	1	402	UQ9	C25-C24-C26	2.98	120.28	115.27
48	J	204	LMN	CCW-CCU-CCO	2.96	115.99	110.82
48	J	202	LMN	OCB-CCS-CCW	-2.96	100.44	108.10
48	j	101	LMN	O4-CCR-CCV	2.92	115.66	108.10
51	W	201	PLC	O3-CB-C1B	2.92	121.07	111.91
48	J	202	LMN	OAS-CCT-CCV	-2.91	103.63	110.35
52	5	701	CDL	OB8-CB7-C71	2.89	120.97	111.91
47	i	101	3PE	O31-C31-C32	2.88	120.96	111.91
48	j	101	LMN	C1-O5-C5	-2.88	108.04	113.69
51	1	403	PLC	O3-CB-C1B	2.87	120.93	111.91
48	J	202	LMN	C2-C3-C4	2.85	116.19	109.68
47	4	501	3PE	O31-C31-C32	2.85	120.84	111.91
54	2	502	T7X	C8-O16-C10	2.84	124.77	117.79
48	J	204	LMN	C2-C3-C4	2.82	116.12	109.68
48	j	101	LMN	OBY-CCC-CCN	2.81	114.80	109.69
48	J	202	LMN	O5-C5-C4	2.80	115.65	109.75
47	J	201	3PE	O21-C21-C22	2.79	117.52	111.50
45	B	502	FMN	C10-N1-C2	2.77	122.44	116.90
48	J	202	LMN	OAQ-CCN-CCT	2.76	116.74	110.35
52	5	701	CDL	CA6-CA4-CA3	-2.75	105.28	111.79
50	Q	201	ZMP	O1-C10-C9	-2.75	120.75	123.99
48	J	204	LMN	CCJ-CCL-CCH	2.74	115.69	110.00
54	2	502	T7X	C4-C3-C2	2.73	115.59	110.82
47	J	201	3PE	O31-C31-C32	2.70	120.39	111.91
51	W	202	PLC	O2-C'-C1'	2.69	117.31	111.50
52	2	501	CDL	OB6-CB4-CB6	2.67	118.08	108.40
54	3	202	T7X	C4-C3-C2	2.67	115.49	110.82
48	J	202	LMN	OCB-CCQ-CCH	2.67	114.37	107.28

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
52	Z	201	CDL	OA8-CA7-C31	2.66	120.27	111.91
48	J	204	LMN	CCL-CCH-CCQ	2.66	115.75	109.68
45	B	502	FMN	C4A-C10-N1	-2.65	118.58	124.73
54	2	504	T7X	O16-C10-C12	2.64	117.20	111.50
54	2	502	T7X	O18-C11-C31	2.64	120.19	111.91
48	J	202	LMN	O4-C4-C3	2.63	114.29	107.28
48	J	202	LMN	CBN-CCD-CCO	-2.63	106.83	113.00
48	J	204	LMN	OBY-CCC-CCN	2.63	114.47	109.69
48	J	202	LMN	OBY-CCC-CCN	2.63	114.46	109.69
52	5	701	CDL	OA8-CA7-C31	2.59	120.05	111.91
52	X	201	CDL	OB6-CB4-CB6	2.58	117.75	108.40
48	j	101	LMN	CCW-CCU-CCO	2.58	115.33	110.82
48	J	204	LMN	O3-C3-C2	-2.58	104.39	110.35
54	2	502	T7X	O6-C6-C5	-2.56	104.42	110.35
50	Q	201	ZMP	C11-C12-N1	-2.56	107.04	112.42
47	b	201	3PE	C33-C32-C31	-2.56	104.33	113.62
54	4	505	T7X	O1-P1-O11	-2.55	99.89	109.47
54	3	202	T7X	C3-C2-C1	2.54	115.48	109.68
54	2	502	T7X	C5-C4-C3	2.51	115.21	110.82
54	2	504	T7X	C6-C1-C2	-2.51	107.23	110.85
47	J	203	3PE	O21-C21-O22	-2.51	117.64	123.70
51	W	202	PLC	C2-O2-C'	2.50	123.95	117.79
52	2	501	CDL	OB6-CB4-CB3	-2.48	99.44	108.40
48	J	202	LMN	OBY-CCC-CBM	2.46	112.56	106.44
48	J	202	LMN	CCS-CCW-CCU	-2.46	104.88	110.00
50	O	201	ZMP	C15-N2-C16	-2.44	118.24	122.59
50	Q	201	ZMP	C15-C14-C13	2.42	116.39	112.36
50	Q	201	ZMP	O1-C10-S1	-2.40	119.49	122.61
48	j	101	LMN	CCJ-OBX-CCF	2.40	118.40	113.69
54	4	505	T7X	C6-C1-C2	2.39	114.30	110.85
51	5	703	PLC	O3-CB-C1B	2.37	119.35	111.91
54	2	502	T7X	P1-O1-C1	2.36	128.01	119.41
48	J	204	LMN	OCB-CCQ-CCF	2.36	115.92	109.45
52	4	502	CDL	CB4-OB6-CB5	-2.36	111.98	117.79
52	5	701	CDL	OB6-CB5-C51	2.36	116.58	111.50
51	1	401	PLC	O3-CB-C1B	2.35	119.30	111.91
53	1	402	UQ9	C17-C16-C14	-2.35	105.23	112.98
51	W	202	PLC	O3-CB-C1B	2.35	119.28	111.91
47	4	504	3PE	O31-C31-C32	2.34	119.24	111.91
46	E	401	NDP	C3N-C2N-N1N	-2.33	119.78	123.10
48	J	202	LMN	O5-C1-C2	-2.32	105.43	110.35
50	O	201	ZMP	C17-C16-N2	2.32	121.19	116.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
48	J	202	LMN	OAN-CCH-CCL	-2.31	105.00	110.35
53	1	402	UQ9	C16-C14-C13	2.31	125.80	121.12
48	j	101	LMN	OBZ-CCD-CCO	2.30	113.88	109.69
48	J	204	LMN	CBQ-CBK-CBI	-2.30	106.33	113.19
47	I	501	3PE	O21-C21-C22	2.30	116.45	111.50
48	j	101	LMN	CBS-O1-C1	2.29	119.31	113.36
48	J	202	LMN	CCU-CCO-CCD	2.28	114.31	110.24
48	j	101	LMN	CCR-OBY-CCC	2.28	118.16	113.69
48	J	204	LMN	CBL-CBR-CCM	-2.27	109.84	117.16
52	X	201	CDL	OB2-PB2-OB3	-2.27	100.18	109.07
48	J	204	LMN	CCR-CCV-CCT	2.27	114.73	110.00
53	1	402	UQ9	C27-C26-C24	-2.26	110.93	114.62
48	J	204	LMN	CCV-CCT-CCN	2.26	114.76	110.82
52	Z	201	CDL	OB8-CB7-C71	2.25	118.98	111.91
51	1	401	PLC	O2-C'-O'	-2.24	118.30	123.70
48	j	101	LMN	CCL-CCH-CCQ	2.23	114.77	109.68
48	J	202	LMN	OBY-CCR-CCV	-2.23	105.63	110.35
48	J	202	LMN	OBX-CCJ-CCL	2.22	115.04	110.35
53	1	402	UQ9	C20-C19-C21	2.21	119.00	115.27
55	2	503	PSC	C03-C02-C01	-2.21	106.57	111.79
53	1	402	UQ9	C11-C12-C13	-2.16	104.77	111.88
54	2	504	T7X	O13-P1-O11	-2.15	100.67	109.07
50	O	201	ZMP	O1-C10-S1	-2.15	119.83	122.61
48	j	101	LMN	OBV-CCJ-CCL	2.12	111.62	108.30
45	B	502	FMN	O3P-P-O5'	2.12	112.38	106.73
48	J	204	LMN	O5-C1-C2	-2.12	105.86	110.35
51	5	703	PLC	C2-O2-C'	-2.12	112.58	117.79
54	4	505	T7X	O17-C10-C12	-2.10	115.54	123.73
52	2	501	CDL	OB2-PB2-OB3	-2.10	100.88	109.07
54	4	505	T7X	O4-C4-C5	-2.09	105.51	110.35
48	J	202	LMN	CBL-CBR-CCM	-2.09	110.43	117.16
50	Q	201	ZMP	C20-C18-C19	-2.09	104.92	109.17
55	2	503	PSC	O03-C19-C20	2.08	118.44	111.91
47	I	501	3PE	C24-C23-C22	-2.07	105.75	113.19
48	j	101	LMN	C1-C2-C3	2.07	114.30	110.00
51	1	403	PLC	O2-C'-O'	-2.07	118.71	123.70
52	X	201	CDL	OB4-PB2-OB3	2.06	122.40	112.24
47	a	201	3PE	C34-C33-C32	-2.05	105.81	113.19
52	4	502	CDL	OB6-CB5-OB7	-2.05	118.76	123.70
48	j	101	LMN	C3-C4-C5	2.05	115.62	110.93
47	4	503	3PE	O31-C31-O32	-2.04	118.44	123.59
52	Z	201	CDL	OA6-CA4-CA3	2.04	115.79	108.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	B	502	FMN	C10-C4A-N5	-2.04	120.53	124.86
54	4	505	T7X	C5-C4-C3	-2.03	107.28	110.82
54	4	505	T7X	O12-P1-O11	2.02	122.22	112.24
45	B	502	FMN	C9A-C5A-N5	-2.00	120.25	122.43
53	1	402	UQ9	C10-C9-C8	-2.00	118.54	123.68
52	Z	201	CDL	CB6-CB4-CB3	-2.00	107.06	111.79

There are no chirality outliers.

All (643) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	B	502	FMN	N10-C1'-C2'-O2'
45	B	502	FMN	N10-C1'-C2'-C3'
45	B	502	FMN	C1'-C2'-C3'-O3'
45	B	502	FMN	C1'-C2'-C3'-C4'
45	B	502	FMN	O3'-C3'-C4'-O4'
45	B	502	FMN	O3'-C3'-C4'-C5'
45	B	502	FMN	C5'-O5'-P-O2P
45	B	502	FMN	C5'-O5'-P-O3P
46	E	401	NDP	C4B-C5B-O5B-PA
46	E	401	NDP	O4B-C4B-C5B-O5B
46	E	401	NDP	C3B-C4B-C5B-O5B
47	I	501	3PE	O13-C11-C12-N
47	J	201	3PE	C1-O11-P-O12
47	J	201	3PE	C1-O11-P-O14
47	J	203	3PE	O22-C21-O21-C2
47	S	501	3PE	C1-O11-P-O12
47	S	501	3PE	C1-O11-P-O13
47	S	501	3PE	C1-O11-P-O14
47	S	501	3PE	C11-O13-P-O11
47	S	501	3PE	C11-O13-P-O12
47	S	501	3PE	C11-O13-P-O14
47	S	501	3PE	O13-C11-C12-N
47	a	201	3PE	O13-C11-C12-N
47	i	101	3PE	C11-O13-P-O12
47	i	101	3PE	C11-O13-P-O14
47	i	101	3PE	O13-C11-C12-N
47	4	503	3PE	C11-O13-P-O11
47	4	503	3PE	C11-O13-P-O14
47	4	503	3PE	O32-C31-O31-C3
47	4	503	3PE	C32-C31-O31-C3
47	4	504	3PE	C1-O11-P-O12

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Mol	Chain	Res	Type	Atoms
47	4	504	3PE	C1-O11-P-O14
48	J	202	LMN	O5-C1-O1-CBS
48	J	202	LMN	O1-CBS-CCM-CBQ
48	j	101	LMN	O5-C1-O1-CBS
48	j	101	LMN	CBL-CBR-CCM-CBQ
48	j	101	LMN	CBL-CBR-CCM-CBS
48	j	101	LMN	CBL-CBR-CCM-CBT
48	j	101	LMN	OBV-CBT-CCM-CBQ
48	j	101	LMN	OBV-CBT-CCM-CBR
48	j	101	LMN	OBX-CCJ-OBV-CBT
48	j	101	LMN	CCL-CCJ-OBV-CBT
50	O	201	ZMP	S1-C11-C12-N1
50	Q	201	ZMP	O4-C17-C18-C21
50	Q	201	ZMP	C16-C17-C18-C21
50	Q	201	ZMP	O4-C17-C18-C19
50	Q	201	ZMP	C16-C17-C18-C19
50	Q	201	ZMP	O4-C17-C18-C20
50	Q	201	ZMP	C16-C17-C18-C20
50	Q	201	ZMP	C12-C11-S1-C10
50	Q	201	ZMP	O1-C10-S1-C11
50	Q	201	ZMP	C9-C10-S1-C11
51	W	202	PLC	O4P-C4-C5-N
51	1	401	PLC	C1'-C'-O2-C2
51	1	401	PLC	O'-C'-O2-C2
51	1	401	PLC	C1-O3P-P-O1P
51	1	401	PLC	C4-O4P-P-O3P
51	1	403	PLC	C1'-C'-O2-C2
51	1	403	PLC	O'-C'-O2-C2
51	5	702	PLC	O2-C2-C3-O3
51	5	702	PLC	C1'-C'-O2-C2
51	5	702	PLC	C1-O3P-P-O2P
51	5	703	PLC	C1'-C'-O2-C2
51	5	703	PLC	C4-O4P-P-O1P
52	Z	201	CDL	C11-CA5-OA6-CA4
52	Z	201	CDL	CB3-OB5-PB2-OB3
52	Z	201	CDL	CB3-OB5-PB2-OB4
52	2	501	CDL	CA2-OA2-PA1-OA3
52	2	501	CDL	CB2-OB2-PB2-OB3
52	2	501	CDL	CB2-OB2-PB2-OB5
52	2	501	CDL	CB3-OB5-PB2-OB3
52	4	502	CDL	CA3-OA5-PA1-OA3
52	4	502	CDL	CA3-OA5-PA1-OA4

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Mol	Chain	Res	Type	Atoms
52	4	502	CDL	CB2-OB2-PB2-OB3
52	4	502	CDL	CB2-OB2-PB2-OB4
52	4	502	CDL	CB3-OB5-PB2-OB3
52	4	502	CDL	OB7-CB5-OB6-CB4
52	5	701	CDL	C11-CA5-OA6-CA4
53	1	402	UQ9	C20-C19-C21-C22
53	1	402	UQ9	C18-C19-C21-C22
54	2	502	T7X	C7-O13-P1-O1
54	2	502	T7X	C7-O13-P1-O12
54	2	502	T7X	C18-C19-C20-C21
54	3	202	T7X	C2-C1-O1-P1
54	3	202	T7X	C6-C1-O1-P1
54	3	202	T7X	C7-O13-P1-O11
54	4	505	T7X	C2-C1-O1-P1
54	4	505	T7X	C6-C1-O1-P1
54	4	505	T7X	C7-O13-P1-O1
54	4	505	T7X	C8-C7-O13-P1
55	2	503	PSC	C03-O11-P-O13
55	2	503	PSC	C03-O11-P-O14
55	2	503	PSC	C02-C03-O11-P
55	2	503	PSC	O12-C04-C05-N
52	4	502	CDL	OA9-CA7-OA8-CA6
52	5	701	CDL	OA9-CA7-OA8-CA6
54	2	504	T7X	O19-C11-O18-C9
54	4	505	T7X	O19-C11-O18-C9
48	j	101	LMN	C4-C5-C6-O6
52	4	502	CDL	C31-CA7-OA8-CA6
52	5	701	CDL	C31-CA7-OA8-CA6
54	2	504	T7X	C31-C11-O18-C9
54	4	505	T7X	C31-C11-O18-C9
54	3	202	T7X	O19-C11-O18-C9
48	j	101	LMN	CCV-CCR-O4-C4
51	5	703	PLC	O'-C'-O2-C2
52	Z	201	CDL	OA7-CA5-OA6-CA4
52	4	502	CDL	OA7-CA5-OA6-CA4
52	5	701	CDL	OA7-CA5-OA6-CA4
52	4	502	CDL	C71-CB7-OB8-CB6
54	3	202	T7X	C31-C11-O18-C9
47	J	203	3PE	C22-C21-O21-C2
52	4	502	CDL	C11-CA5-OA6-CA4
52	4	502	CDL	C51-CB5-OB6-CB4
48	j	101	LMN	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
53	1	402	UQ9	C15-C14-C16-C17
52	Z	201	CDL	C31-CA7-OA8-CA6
48	J	202	LMN	OAJ-CBN-CCD-OBZ
48	J	204	LMN	CCF-CCQ-OCB-CCS
51	5	702	PLC	O'-C'-O2-C2
47	J	203	3PE	O32-C31-O31-C3
52	4	502	CDL	OB9-CB7-OB8-CB6
48	j	101	LMN	OAJ-CBN-CCD-OBZ
48	j	101	LMN	OAJ-CBN-CCD-CCO
52	X	201	CDL	O1-C1-CA2-OA2
52	4	502	CDL	O1-C1-CB2-OB2
47	J	203	3PE	C32-C31-O31-C3
47	i	101	3PE	C22-C21-O21-C2
48	J	202	LMN	CBC-CBE-CBG-CBI
47	4	501	3PE	C2E-C2F-C2G-C2H
48	j	101	LMN	OBV-CBT-CCM-CBS
45	B	502	FMN	O2'-C2'-C3'-C4'
45	B	502	FMN	C2'-C3'-C4'-O4'
52	2	501	CDL	C1-CB2-OB2-PB2
48	J	202	LMN	OAJ-CBN-CCD-CCO
48	J	202	LMN	OAI-CBM-CCC-OBY
52	Z	201	CDL	OA9-CA7-OA8-CA6
48	J	202	LMN	OBX-CCJ-OBV-CBT
46	E	401	NDP	C3B-C2B-O2B-P2B
47	I	501	3PE	C3B-C3C-C3D-C3E
48	J	202	LMN	O5-C5-C6-O6
48	J	204	LMN	CCV-CCR-O4-C4
52	X	201	CDL	C58-C59-C60-C61
52	X	201	CDL	C54-C55-C56-C57
52	X	201	CDL	CB2-C1-CA2-OA2
52	4	502	CDL	CA2-C1-CB2-OB2
47	i	101	3PE	O22-C21-O21-C2
52	X	201	CDL	C71-CB7-OB8-CB6
48	J	202	LMN	OAI-CBM-CCC-CCN
48	J	204	LMN	OBY-CCR-O4-C4
47	I	501	3PE	C26-C27-C28-C29
48	j	101	LMN	OAL-CBP-CCF-CCQ
52	X	201	CDL	O1-C1-CB2-OB2
53	1	402	UQ9	C13-C14-C16-C17
54	4	505	T7X	C12-C10-O16-C8
47	J	203	3PE	C21-C22-C23-C24
48	j	101	LMN	OAL-CBP-CCF-OBX

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Mol	Chain	Res	Type	Atoms
47	i	101	3PE	C31-C32-C33-C34
47	4	504	3PE	C21-C22-C23-C24
51	W	201	PLC	CB-C1B-C2B-C3B
48	J	202	LMN	CCH-CCQ-OCB-CCS
48	J	204	LMN	CBJ-CBL-CBR-CCM
48	j	101	LMN	CBJ-CBL-CBR-CCM
51	5	703	PLC	C'-C1'-C2'-C3'
52	2	501	CDL	CB7-C71-C72-C73
54	4	505	T7X	C11-C31-C32-C33
52	X	201	CDL	OB9-CB7-OB8-CB6
48	J	204	LMN	O5-C1-O1-CBS
48	J	204	LMN	OBX-CCJ-OBV-CBT
53	1	402	UQ9	C9-C11-C12-C13
54	2	504	T7X	C17-C18-C19-C20
45	B	502	FMN	C2'-C3'-C4'-C5'
55	2	503	PSC	C2-C1-O01-C02
47	J	203	3PE	C1-O11-P-O13
47	J	203	3PE	C11-O13-P-O11
47	4	504	3PE	C1-O11-P-O13
51	5	702	PLC	C1-O3P-P-O4P
52	X	201	CDL	CA3-OA5-PA1-OA2
52	Z	201	CDL	CA2-OA2-PA1-OA5
52	Z	201	CDL	CB3-OB5-PB2-OB2
52	2	501	CDL	CA2-OA2-PA1-OA5
52	4	502	CDL	CA3-OA5-PA1-OA2
52	4	502	CDL	CB2-OB2-PB2-OB5
52	4	502	CDL	CB3-OB5-PB2-OB2
55	2	503	PSC	C03-O11-P-O12
48	J	204	LMN	CAW-CAY-CBA-CBC
48	J	204	LMN	C4-C5-C6-O6
54	4	505	T7X	C10-C12-C13-C14
47	4	504	3PE	O22-C21-O21-C2
54	4	505	T7X	O17-C10-O16-C8
55	2	503	PSC	O02-C1-O01-C02
55	2	503	PSC	C20-C19-O03-C01
48	J	202	LMN	CCF-CCQ-OCB-CCS
52	2	501	CDL	C38-C39-C40-C41
45	B	502	FMN	O2'-C2'-C3'-O3'
47	4	503	3PE	C22-C21-O21-C2
47	4	504	3PE	C22-C21-O21-C2
52	X	201	CDL	C38-C39-C40-C41
51	W	202	PLC	C4'-C5'-C6'-C7'

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Mol	Chain	Res	Type	Atoms
52	5	701	CDL	C76-C77-C78-C79
52	Z	201	CDL	CA3-CA4-OA6-CA5
47	4	503	3PE	O22-C21-O21-C2
47	I	501	3PE	C21-C22-C23-C24
52	X	201	CDL	C31-C32-C33-C34
48	J	202	LMN	C2-C1-O1-CBS
48	J	204	LMN	C2-C1-O1-CBS
48	j	101	LMN	C2-C1-O1-CBS
47	i	101	3PE	C34-C35-C36-C37
51	W	202	PLC	C3'-C4'-C5'-C6'
52	2	501	CDL	C43-C44-C45-C46
47	4	501	3PE	C2D-C2E-C2F-C2G
52	5	701	CDL	C32-C33-C34-C35
47	4	504	3PE	C3C-C3D-C3E-C3F
52	5	701	CDL	C11-C12-C13-C14
47	4	504	3PE	C23-C24-C25-C26
51	5	702	PLC	C'-C1'-C2'-C3'
47	S	501	3PE	C3D-C3E-C3F-C3G
52	4	502	CDL	C33-C34-C35-C36
48	J	202	LMN	CBI-CBK-CBQ-CCM
47	J	203	3PE	C39-C3A-C3B-C3C
47	4	501	3PE	O13-C11-C12-N
47	4	504	3PE	O13-C11-C12-N
52	Z	201	CDL	C73-C74-C75-C76
51	1	403	PLC	CB-C1B-C2B-C3B
52	4	502	CDL	CA7-C31-C32-C33
46	E	401	NDP	C1B-C2B-O2B-P2B
47	S	501	3PE	C3C-C3D-C3E-C3F
47	S	501	3PE	C22-C23-C24-C25
47	I	501	3PE	C32-C31-O31-C3
47	4	504	3PE	C3B-C3C-C3D-C3E
52	5	701	CDL	C62-C63-C64-C65
47	I	501	3PE	C37-C38-C39-C3A
51	5	702	PLC	C3B-C4B-C5B-C6B
47	I	501	3PE	C3D-C3E-C3F-C3G
48	j	101	LMN	OAI-CBM-CCC-OBY
47	I	501	3PE	C3C-C3D-C3E-C3F
48	j	101	LMN	CAW-CAY-CBA-CBC
55	2	503	PSC	C5-C6-C7-C8
52	Z	201	CDL	C38-C39-C40-C41
47	J	203	3PE	C2A-C2B-C2C-C2D
52	Z	201	CDL	C15-C16-C17-C18

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Mol	Chain	Res	Type	Atoms
52	Z	201	CDL	C18-C19-C20-C21
55	2	503	PSC	O04-C19-O03-C01
47	J	203	3PE	C31-C32-C33-C34
52	2	501	CDL	CA2-C1-CB2-OB2
52	5	701	CDL	C73-C74-C75-C76
47	I	501	3PE	O32-C31-O31-C3
52	4	502	CDL	C59-C60-C61-C62
47	4	501	3PE	C32-C31-O31-C3
48	j	101	LMN	CBF-CBH-CBJ-CBL
52	Z	201	CDL	CB5-C51-C52-C53
55	2	503	PSC	C1-C2-C3-C4
51	W	202	PLC	C1B-CB-O3-C3
52	X	201	CDL	C73-C74-C75-C76
52	4	502	CDL	C41-C42-C43-C44
52	5	701	CDL	C74-C75-C76-C77
47	i	101	3PE	C21-C22-C23-C24
51	W	201	PLC	C1'-C'-O2-C2
47	b	201	3PE	O11-C1-C2-O21
51	W	201	PLC	O'-C'-O2-C2
48	J	202	LMN	C4-C5-C6-O6
48	J	202	LMN	CAY-CBA-CBC-CBE
52	2	501	CDL	C73-C74-C75-C76
47	i	101	3PE	C33-C34-C35-C36
48	j	101	LMN	CCH-CCQ-OCB-CCS
55	2	503	PSC	C23-C24-C25-C26
48	j	101	LMN	CAZ-CBB-CBD-CBF
55	2	503	PSC	C7-C8-C9-C10
47	J	201	3PE	C1-O11-P-O13
47	i	101	3PE	C11-O13-P-O11
47	4	504	3PE	C11-O13-P-O11
52	4	502	CDL	CA2-OA2-PA1-OA5
48	J	202	LMN	C3-C4-O4-CCR
51	5	703	PLC	CB-C1B-C2B-C3B
52	4	502	CDL	C1-CA2-OA2-PA1
52	5	701	CDL	OB5-CB3-CB4-CB6
47	I	501	3PE	C33-C34-C35-C36
52	4	502	CDL	C19-C20-C21-C22
51	1	401	PLC	C4B-C5B-C6B-C7B
54	4	505	T7X	C32-C33-C34-C35
47	4	501	3PE	O32-C31-O31-C3
52	2	501	CDL	C22-C23-C24-C25
51	W	201	PLC	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
52	4	502	CDL	C44-C45-C46-C47
47	I	501	3PE	C2C-C2D-C2E-C2F
52	2	501	CDL	C20-C21-C22-C23
52	Z	201	CDL	C55-C56-C57-C58
51	W	202	PLC	C8'-C9'-CA'-CB'
47	i	101	3PE	C32-C33-C34-C35
51	W	201	PLC	C5B-C6B-C7B-C8B
52	X	201	CDL	CA4-CA6-OA8-CA7
47	I	501	3PE	C3F-C3G-C3H-C3I
47	4	504	3PE	C3F-C3G-C3H-C3I
54	3	202	T7X	C12-C13-C14-C15
54	4	505	T7X	C12-C13-C14-C15
51	W	202	PLC	OB-CB-O3-C3
52	5	701	CDL	C60-C61-C62-C63
47	J	203	3PE	C34-C35-C36-C37
50	Q	201	ZMP	C20-C18-C21-O5
47	J	203	3PE	C35-C36-C37-C38
47	J	203	3PE	C38-C39-C3A-C3B
52	5	701	CDL	C16-C17-C18-C19
47	4	504	3PE	C2D-C2E-C2F-C2G
52	Z	201	CDL	C74-C75-C76-C77
47	I	501	3PE	O11-C1-C2-O21
52	5	701	CDL	OA5-CA3-CA4-OA6
48	J	202	LMN	C5-C4-O4-CCR
47	J	201	3PE	C37-C38-C39-C3A
52	4	502	CDL	C42-C43-C44-C45
52	X	201	CDL	OA6-CA4-CA6-OA8
54	2	504	T7X	O16-C8-C9-O18
47	S	501	3PE	C35-C36-C37-C38
48	J	204	LMN	CAA-CAW-CAY-CBA
54	2	502	T7X	C6-C1-O1-P1
51	W	202	PLC	C6B-C7B-C8B-C9B
52	X	201	CDL	C13-C14-C15-C16
46	E	401	NDP	PN-O3-PA-O1A
50	O	201	ZMP	C22-C1-C2-C3
47	4	504	3PE	C31-C32-C33-C34
51	5	702	PLC	C1B-C2B-C3B-C4B
52	Z	201	CDL	C72-C73-C74-C75
51	W	202	PLC	C3B-C4B-C5B-C6B
47	b	201	3PE	O11-C1-C2-C3
47	i	101	3PE	O11-C1-C2-C3
47	J	203	3PE	C28-C29-C2A-C2B

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Mol	Chain	Res	Type	Atoms
48	j	101	LMN	CCF-CCQ-OCB-CCS
52	Z	201	CDL	CA5-C11-C12-C13
48	j	101	LMN	CBB-CBD-CBF-CBH
52	X	201	CDL	C71-C72-C73-C74
52	2	501	CDL	O1-C1-CB2-OB2
51	5	703	PLC	C1B-C2B-C3B-C4B
48	J	204	LMN	O5-C5-C6-O6
52	5	701	CDL	C12-C11-CA5-OA6
54	3	202	T7X	C10-C12-C13-C14
52	5	701	CDL	C56-C57-C58-C59
51	5	702	PLC	C1B-CB-O3-C3
47	i	101	3PE	C1-C2-C3-O31
51	5	702	PLC	C1-C2-C3-O3
52	X	201	CDL	CB3-CB4-CB6-OB8
52	Z	201	CDL	CB3-CB4-CB6-OB8
52	Z	201	CDL	C20-C21-C22-C23
52	Z	201	CDL	C53-C54-C55-C56
52	X	201	CDL	C17-C18-C19-C20
52	Z	201	CDL	C14-C15-C16-C17
52	4	502	CDL	C74-C75-C76-C77
54	2	502	T7X	C22-C23-C24-C25
54	2	504	T7X	C16-C17-C18-C19
54	2	504	T7X	C21-C22-C23-C24
54	3	202	T7X	C15-C16-C17-C18
54	3	202	T7X	C18-C19-C20-C21
55	2	503	PSC	C9-C10-C11-C12
47	4	501	3PE	C31-C32-C33-C34
47	4	503	3PE	C37-C38-C39-C3A
48	J	202	LMN	CBD-CBF-CBH-CBJ
47	a	201	3PE	C34-C35-C36-C37
48	J	204	LMN	CBF-CBH-CBJ-CBL
47	S	501	3PE	C39-C3A-C3B-C3C
52	5	701	CDL	C51-C52-C53-C54
55	2	503	PSC	C25-C26-C27-C28
52	5	701	CDL	C12-C13-C14-C15
47	i	101	3PE	O21-C2-C3-O31
51	W	201	PLC	O2-C2-C3-O3
52	Z	201	CDL	OB6-CB4-CB6-OB8
54	4	505	T7X	O16-C8-C9-O18
52	4	502	CDL	CB2-C1-CA2-OA2
52	X	201	CDL	C18-C19-C20-C21
55	2	503	PSC	O03-C19-C20-C21

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Mol	Chain	Res	Type	Atoms
52	4	502	CDL	C37-C38-C39-C40
51	5	702	PLC	OB-CB-O3-C3
48	J	202	LMN	CBF-CBH-CBJ-CBL
51	W	201	PLC	C1'-C2'-C3'-C4'
48	J	202	LMN	CBH-CBJ-CBL-CBR
52	Z	201	CDL	OB5-CB3-CB4-CB6
47	4	504	3PE	C38-C39-C3A-C3B
47	J	203	3PE	C23-C24-C25-C26
47	a	201	3PE	C29-C2A-C2B-C2C
52	2	501	CDL	C51-C52-C53-C54
52	X	201	CDL	C31-CA7-OA8-CA6
51	W	201	PLC	O2-C'-C1'-C2'
47	4	503	3PE	C3D-C3E-C3F-C3G
51	1	403	PLC	C1'-C2'-C3'-C4'
52	5	701	CDL	C31-C32-C33-C34
47	S	501	3PE	C34-C35-C36-C37
51	W	201	PLC	C4B-C5B-C6B-C7B
47	b	201	3PE	C31-C32-C33-C34
52	4	502	CDL	CB5-C51-C52-C53
51	5	703	PLC	C2'-C3'-C4'-C5'
47	i	101	3PE	O11-C1-C2-O21
52	Z	201	CDL	OB5-CB3-CB4-OB6
52	5	701	CDL	OB5-CB3-CB4-OB6
52	X	201	CDL	C34-C35-C36-C37
52	X	201	CDL	CA2-C1-CB2-OB2
47	S	501	3PE	C25-C26-C27-C28
52	X	201	CDL	OA9-CA7-OA8-CA6
47	4	503	3PE	O21-C2-C3-O31
46	E	401	NDP	C2B-O2B-P2B-O3X
48	J	202	LMN	O1-CBS-CCM-CBR
54	2	502	T7X	C2-C1-O1-P1
54	2	504	T7X	C2-C1-O1-P1
47	4	504	3PE	C2A-C2B-C2C-C2D
52	5	701	CDL	OB7-CB5-OB6-CB4
47	i	101	3PE	C23-C24-C25-C26
52	4	502	CDL	C12-C13-C14-C15
52	Z	201	CDL	C71-C72-C73-C74
51	W	202	PLC	C7'-C8'-C9'-CA'
47	a	201	3PE	C33-C34-C35-C36
52	X	201	CDL	C60-C61-C62-C63
52	Z	201	CDL	CB7-C71-C72-C73
54	2	504	T7X	C11-C31-C32-C33

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Mol	Chain	Res	Type	Atoms
47	I	501	3PE	C3E-C3F-C3G-C3H
47	b	201	3PE	C11-O13-P-O11
51	1	401	PLC	C1-O3P-P-O4P
51	1	403	PLC	C4-O4P-P-O3P
52	5	701	CDL	CA3-OA5-PA1-OA2
47	i	101	3PE	C39-C3A-C3B-C3C
52	X	201	CDL	C1-CB2-OB2-PB2
47	J	203	3PE	C1-O11-P-O14
47	J	203	3PE	C11-O13-P-O12
47	a	201	3PE	C1-O11-P-O12
47	a	201	3PE	C1-O11-P-O14
47	a	201	3PE	C11-O13-P-O12
47	4	504	3PE	C11-O13-P-O12
47	4	504	3PE	C11-O13-P-O14
51	W	201	PLC	C4-O4P-P-O1P
51	1	403	PLC	C1-O3P-P-O1P
51	5	702	PLC	C1-O3P-P-O1P
51	5	702	PLC	C4-O4P-P-O2P
52	X	201	CDL	CA3-OA5-PA1-OA3
52	Z	201	CDL	CA2-OA2-PA1-OA4
52	2	501	CDL	CA2-OA2-PA1-OA4
52	4	502	CDL	CA2-OA2-PA1-OA4
52	4	502	CDL	CB3-OB5-PB2-OB4
52	5	701	CDL	CB2-OB2-PB2-OB4
54	2	502	T7X	C7-O13-P1-O11
54	4	505	T7X	C7-O13-P1-O11
47	I	501	3PE	O11-C1-C2-C3
47	3	201	3PE	O11-C1-C2-C3
52	X	201	CDL	OB5-CB3-CB4-CB6
52	5	701	CDL	OA5-CA3-CA4-CA6
54	2	502	T7X	O13-C7-C8-C9
52	4	502	CDL	C51-C52-C53-C54
47	4	501	3PE	C29-C2A-C2B-C2C
52	4	502	CDL	C58-C59-C60-C61
47	S	501	3PE	C12-C11-O13-P
47	4	503	3PE	C12-C11-O13-P
51	5	703	PLC	C5-C4-O4P-P
52	2	501	CDL	CB5-C51-C52-C53
48	J	202	LMN	CBG-CBI-CBK-CBQ
48	J	204	LMN	CBH-CBJ-CBL-CBR
47	4	503	3PE	C31-C32-C33-C34
52	X	201	CDL	CA5-C11-C12-C13

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Mol	Chain	Res	Type	Atoms
54	3	202	T7X	O13-C7-C8-O16
51	1	401	PLC	C1B-C2B-C3B-C4B
47	S	501	3PE	C36-C37-C38-C39
47	4	503	3PE	C1-C2-C3-O31
51	1	401	PLC	O4P-C4-C5-N
51	1	403	PLC	O4P-C4-C5-N
51	5	702	PLC	O4P-C4-C5-N
51	5	703	PLC	O4P-C4-C5-N
52	4	502	CDL	CA3-CA4-CA6-OA8
52	X	201	CDL	OB6-CB4-CB6-OB8
52	4	502	CDL	OA6-CA4-CA6-OA8
50	Q	201	ZMP	C2-C3-C4-C5
51	5	702	PLC	C1'-C2'-C3'-C4'
47	b	201	3PE	C2A-C2B-C2C-C2D
50	O	201	ZMP	C1-C2-C3-C4
52	4	502	CDL	C54-C55-C56-C57
51	W	202	PLC	C8B-C9B-CAA-CBA
55	2	503	PSC	C29-C30-C31-C32
47	4	504	3PE	C2F-C2G-C2H-C2I
46	E	401	NDP	O4D-C1D-N1N-C6N
51	W	201	PLC	C4-C5-N-C8
48	J	204	LMN	CAY-CBA-CBC-CBE
46	E	401	NDP	O4D-C4D-C5D-O5D
47	b	201	3PE	C2C-C2D-C2E-C2F
54	4	505	T7X	C34-C35-C36-C37
52	X	201	CDL	CA3-CA4-OA6-CA5
52	2	501	CDL	CB6-CB4-OB6-CB5
54	3	202	T7X	O13-C7-C8-C9
47	I	501	3PE	O22-C21-O21-C2
52	2	501	CDL	C13-C14-C15-C16
52	X	201	CDL	C56-C57-C58-C59
52	4	502	CDL	C1-CB2-OB2-PB2
52	5	701	CDL	CB5-C51-C52-C53
48	J	204	LMN	CCH-CCQ-OCB-CCS
47	a	201	3PE	C32-C33-C34-C35
51	W	202	PLC	C6'-C7'-C8'-C9'
47	3	201	3PE	C22-C21-O21-C2
47	I	501	3PE	C27-C28-C29-C2A
47	a	201	3PE	C1-O11-P-O13
47	4	501	3PE	C11-O13-P-O11
51	W	201	PLC	C1-O3P-P-O4P
51	W	202	PLC	C1-O3P-P-O4P

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Mol	Chain	Res	Type	Atoms
51	W	202	PLC	C4-O4P-P-O3P
52	2	501	CDL	CB3-OB5-PB2-OB2
54	2	504	T7X	C7-O13-P1-O1
55	2	503	PSC	C04-O12-P-O11
54	2	504	T7X	C6-C1-O1-P1
54	2	504	T7X	C1-O1-P1-O13
47	I	501	3PE	C22-C21-O21-C2
51	W	201	PLC	C4-C5-N-C6
47	J	201	3PE	O22-C21-O21-C2
47	4	503	3PE	C34-C35-C36-C37
47	4	503	3PE	C3A-C3B-C3C-C3D
52	5	701	CDL	C12-C11-CA5-OA7
48	j	101	LMN	CBD-CBF-CBH-CBJ
52	X	201	CDL	C63-C64-C65-C66
52	4	502	CDL	C34-C35-C36-C37
52	5	701	CDL	C17-C18-C19-C20
47	b	201	3PE	C2-C1-O11-P
51	5	702	PLC	C8B-C9B-CAA-CBA
47	J	203	3PE	C29-C2A-C2B-C2C
47	I	501	3PE	C34-C35-C36-C37
54	4	505	T7X	C35-C36-C37-C38
47	4	504	3PE	O11-C1-C2-O21
52	X	201	CDL	C72-C73-C74-C75
51	W	202	PLC	C1B-C2B-C3B-C4B
51	1	401	PLC	CB-C1B-C2B-C3B
52	X	201	CDL	C51-C52-C53-C54
46	E	401	NDP	C2D-C1D-N1N-C6N
47	I	501	3PE	C3A-C3B-C3C-C3D
51	W	202	PLC	C2B-C3B-C4B-C5B
51	1	401	PLC	C3B-C4B-C5B-C6B
51	5	703	PLC	C1-C2-C3-O3
52	5	701	CDL	CB2-C1-CA2-OA2
51	1	401	PLC	C1'-C2'-C3'-C4'
50	Q	201	ZMP	C19-C18-C21-O5
52	4	502	CDL	O1-C1-CA2-OA2
47	4	504	3PE	C32-C31-O31-C3
48	J	202	LMN	O1-CBS-CCM-CBT
54	2	502	T7X	C9-C8-O16-C10
51	W	201	PLC	C4-C5-N-C7
51	1	401	PLC	C8'-C9'-CA'-CB'
54	2	504	T7X	C24-C25-C26-C27
47	4	504	3PE	C33-C34-C35-C36

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Mol	Chain	Res	Type	Atoms
52	Z	201	CDL	C31-C32-C33-C34
48	j	101	LMN	CAB-CAX-CAZ-CBB
51	1	401	PLC	C2'-C3'-C4'-C5'
52	5	701	CDL	C51-CB5-OB6-CB4
51	5	702	PLC	C2'-C3'-C4'-C5'
48	J	202	LMN	CAW-CAY-CBA-CBC
50	O	201	ZMP	C12-C11-S1-C10
52	X	201	CDL	C74-C75-C76-C77
54	2	502	T7X	C32-C33-C34-C35
47	a	201	3PE	C26-C27-C28-C29
47	4	504	3PE	O32-C31-O31-C3
48	J	202	LMN	OBY-CCR-O4-C4
52	4	502	CDL	C56-C57-C58-C59
48	J	204	LMN	CBD-CBF-CBH-CBJ
54	4	505	T7X	C16-C17-C18-C19
52	2	501	CDL	C18-C19-C20-C21
47	J	201	3PE	C39-C3A-C3B-C3C
47	i	101	3PE	C29-C2A-C2B-C2C
47	J	201	3PE	C22-C21-O21-C2
47	4	504	3PE	C3E-C3F-C3G-C3H
55	2	503	PSC	C20-C21-C22-C23
50	Q	201	ZMP	C5-C6-C7-C8
48	j	101	LMN	OBY-CCR-O4-C4
47	S	501	3PE	C37-C38-C39-C3A
55	2	503	PSC	C4-C5-C6-C7
47	b	201	3PE	C32-C33-C34-C35
51	5	703	PLC	O2-C2-C3-O3
54	4	505	T7X	C33-C34-C35-C36
47	S	501	3PE	C38-C39-C3A-C3B
48	j	101	LMN	C3-C4-O4-CCR
53	1	402	UQ9	C12-C11-C9-C10
54	2	502	T7X	O17-C10-O16-C8
52	2	501	CDL	CA3-OA5-PA1-OA2
52	5	701	CDL	CB2-OB2-PB2-OB5
47	J	201	3PE	O21-C21-C22-C23
52	5	701	CDL	C72-C71-CB7-OB8
48	J	204	LMN	CBC-CBE-CBG-CBI
51	5	702	PLC	O2-C'-C1'-C2'
47	I	501	3PE	O31-C31-C32-C33
47	b	201	3PE	O31-C31-C32-C33
54	4	505	T7X	C13-C14-C15-C16
51	5	702	PLC	C3'-C4'-C5'-C6'

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Mol	Chain	Res	Type	Atoms
45	B	502	FMN	C5'-O5'-P-O1P
54	4	505	T7X	C7-C8-C9-O18
47	J	203	3PE	O11-C1-C2-O21
54	4	505	T7X	O13-C7-C8-O16
52	2	501	CDL	C76-C77-C78-C79
47	b	201	3PE	O21-C21-C22-C23
47	3	201	3PE	O22-C21-O21-C2
51	1	401	PLC	O2-C'-C1'-C2'
52	5	701	CDL	C34-C35-C36-C37
52	X	201	CDL	C12-C11-CA5-OA6
54	2	504	T7X	O18-C11-C31-C32
55	2	503	PSC	O01-C1-C2-C3
47	4	504	3PE	C26-C27-C28-C29
55	2	503	PSC	O03-C01-C02-O01
51	W	201	PLC	O'-C'-C1'-C2'
55	2	503	PSC	O04-C19-C20-C21
47	i	101	3PE	O21-C21-C22-C23
47	b	201	3PE	C38-C39-C3A-C3B
48	j	101	LMN	CBH-CBJ-CBL-CBR
51	W	202	PLC	C2B-C1B-CB-O3
52	2	501	CDL	C12-C11-CA5-OA6
54	4	505	T7X	O18-C11-C31-C32
52	X	201	CDL	C52-C53-C54-C55
47	J	201	3PE	O22-C21-C22-C23
52	X	201	CDL	C32-C31-CA7-OA8
52	X	201	CDL	C51-CB5-OB6-CB4
50	O	201	ZMP	C2-C3-C4-C5
51	W	202	PLC	C2B-C1B-CB-OB
55	2	503	PSC	O02-C1-C2-C3
54	2	504	T7X	O19-C11-C31-C32
47	J	203	3PE	C1-C2-C3-O31
51	1	403	PLC	C1-O3P-P-O4P
47	b	201	3PE	O32-C31-C32-C33
52	2	501	CDL	C41-C42-C43-C44
52	Z	201	CDL	C32-C31-CA7-OA8
47	I	501	3PE	O32-C31-C32-C33
52	X	201	CDL	C32-C31-CA7-OA9
51	W	201	PLC	C1-O3P-P-O1P
51	1	401	PLC	C4-O4P-P-O2P
52	4	502	CDL	CA2-OA2-PA1-OA3
52	5	701	CDL	CA2-OA2-PA1-OA3
52	5	701	CDL	CA3-OA5-PA1-OA3

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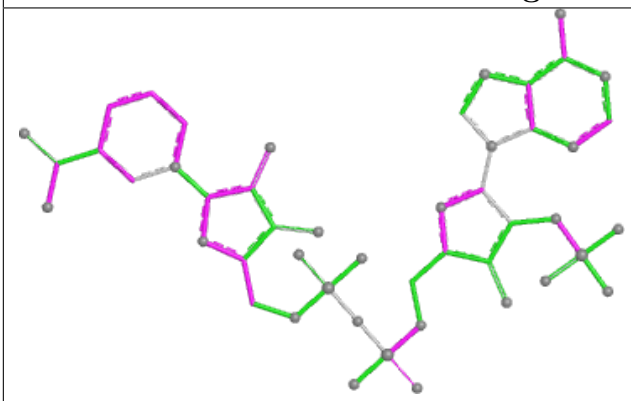
Mol	Chain	Res	Type	Atoms
48	J	202	LMN	CCV-CCR-O4-C4
51	5	702	PLC	O'-C'-C1'-C2'
55	2	503	PSC	C6-C7-C8-C9
51	1	401	PLC	O'-C'-C1'-C2'
52	4	502	CDL	C52-C53-C54-C55
47	i	101	3PE	O22-C21-C22-C23
52	X	201	CDL	C12-C11-CA5-OA7
52	5	701	CDL	C72-C71-CB7-OB9
51	W	202	PLC	C1-C2-O2-C'
51	5	702	PLC	C5-C4-O4P-P
54	4	505	T7X	C7-C8-O16-C10
52	2	501	CDL	C12-C11-CA5-OA7
54	2	502	T7X	C24-C25-C26-C27
47	J	203	3PE	O31-C31-C32-C33
52	Z	201	CDL	CB4-CB6-OB8-CB7
54	3	202	T7X	O16-C10-C12-C13
47	3	201	3PE	O11-C1-C2-O21
47	b	201	3PE	O22-C21-C22-C23
46	E	401	NDP	O4D-C1D-N1N-C2N
52	X	201	CDL	C41-C42-C43-C44
54	4	505	T7X	O19-C11-C31-C32
52	Z	201	CDL	C32-C31-CA7-OA9
54	3	202	T7X	O17-C10-C12-C13
47	I	501	3PE	O21-C21-C22-C23

There are no ring outliers.

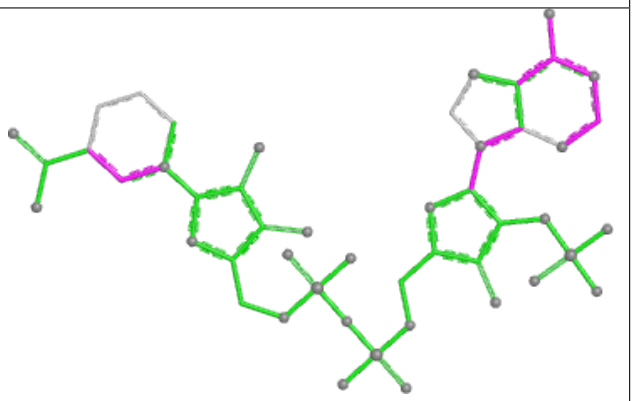
No monomer is involved in short contacts.

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

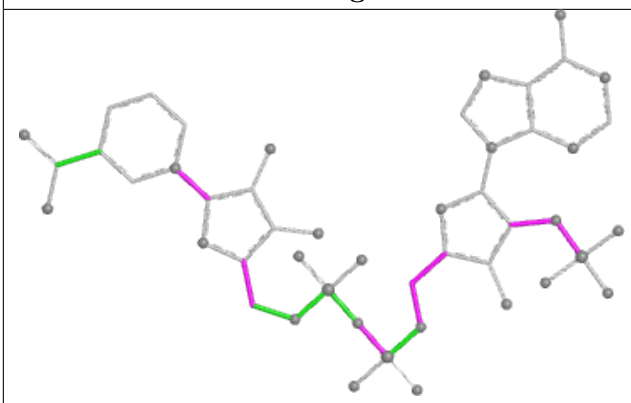
Ligand NDP E 401



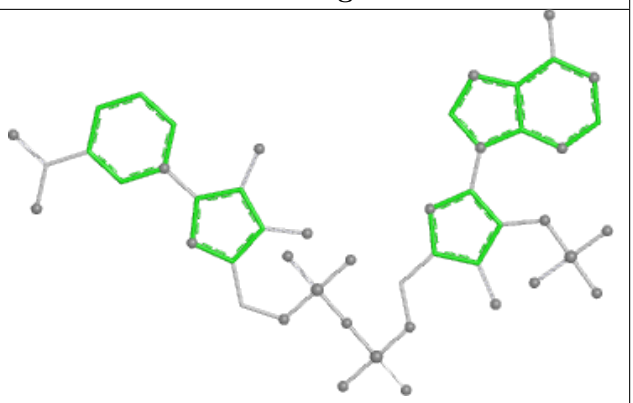
Bond lengths



Bond angles

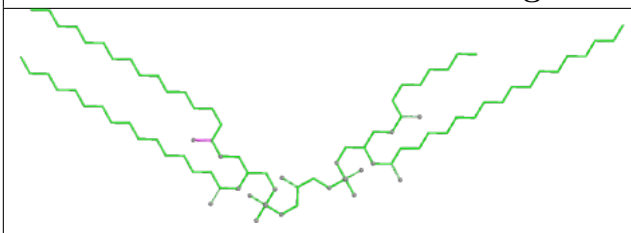


Torsions

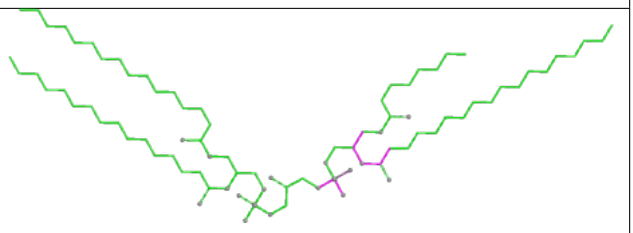


Rings

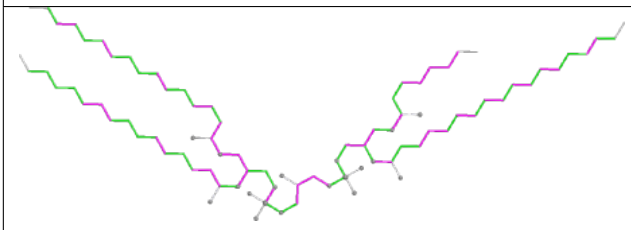
Ligand CDL X 201



Bond lengths



Bond angles



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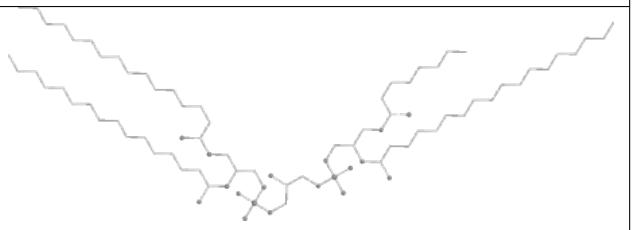
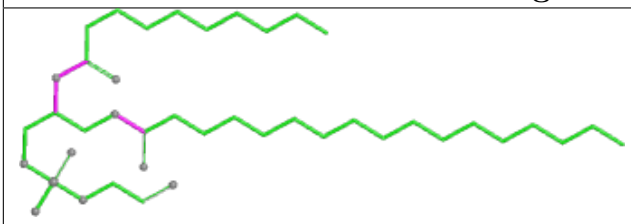
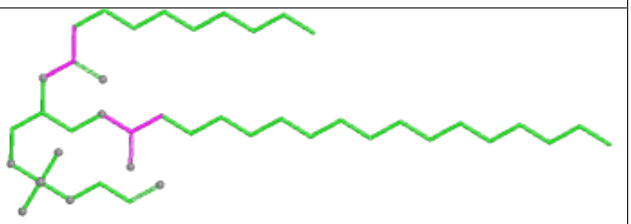


Rings

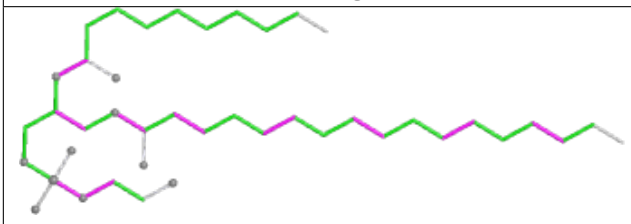
Ligand 3PE 4 503



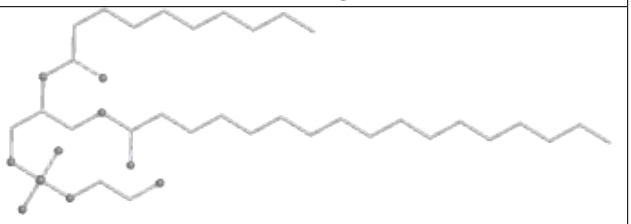
Bond lengths



Bond angles

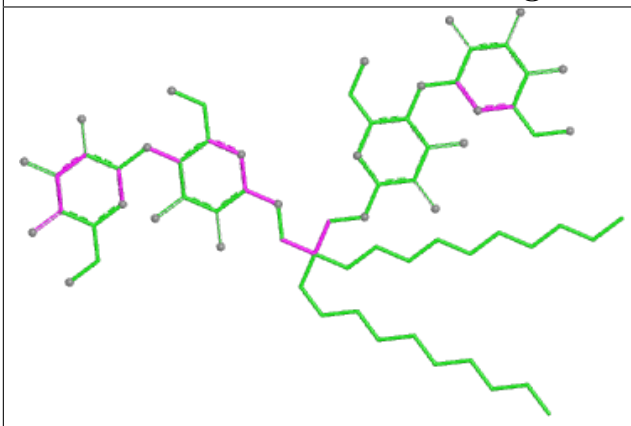


Torsions

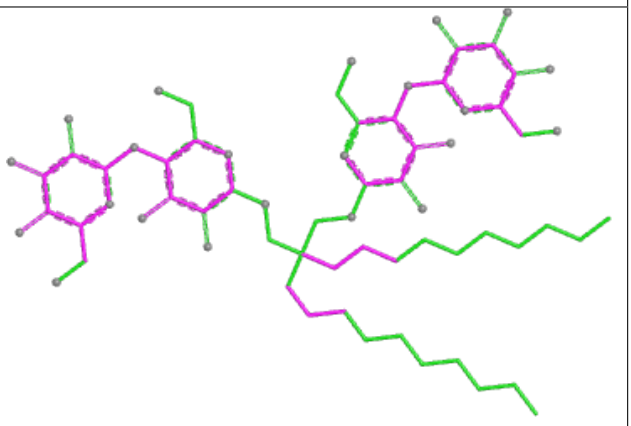


Rings

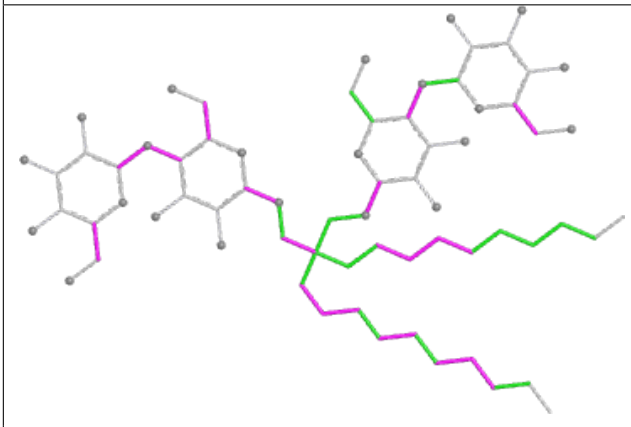
Ligand LMN J 202



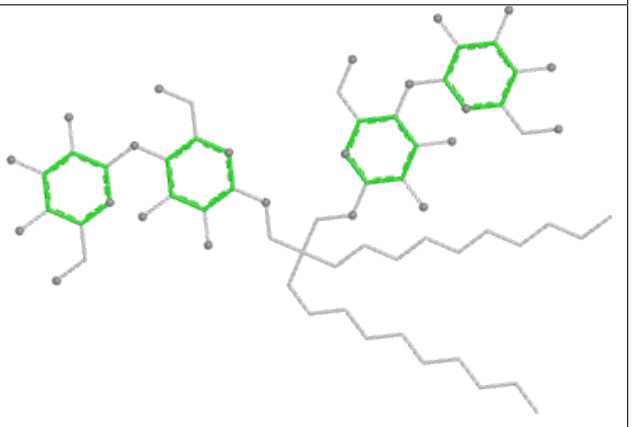
Bond lengths



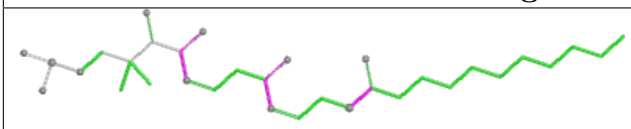
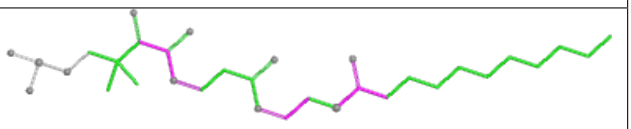
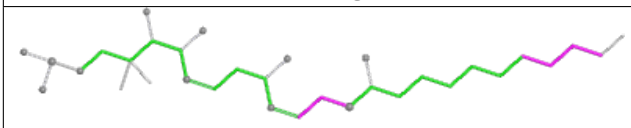
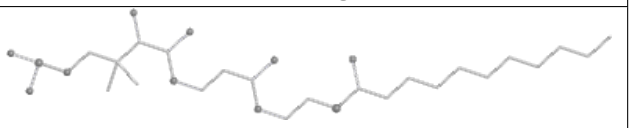
Bond angles

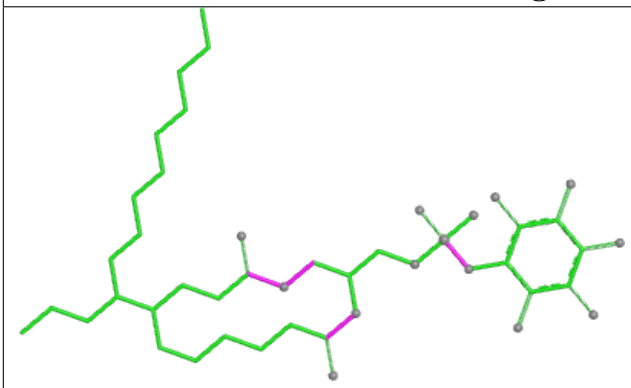
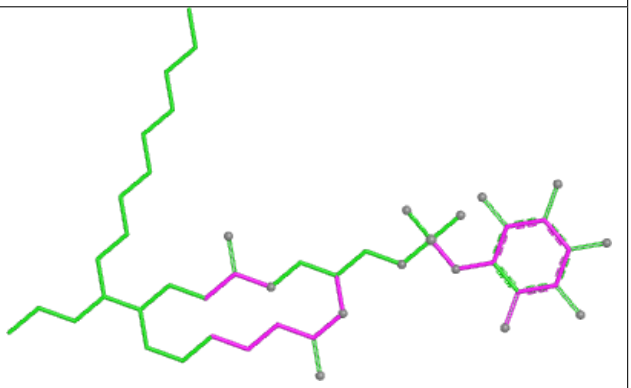
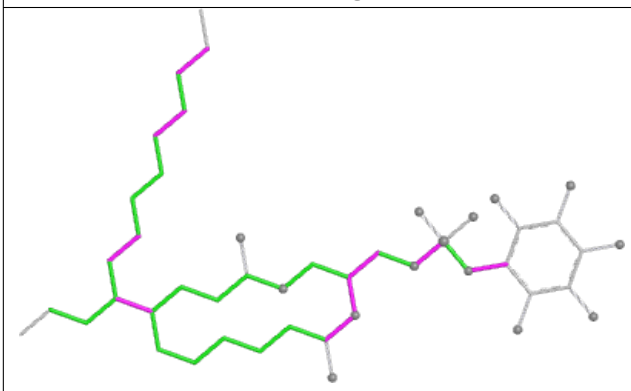
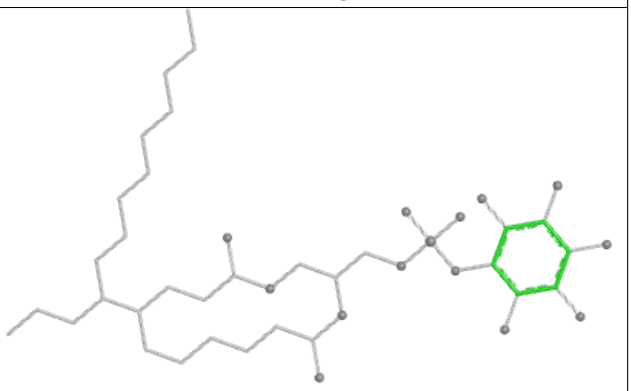


Torsions



Rings

Ligand ZMP O 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand T7X 2 502	
 Bond lengths	 Bond angles
 Torsions	 Rings

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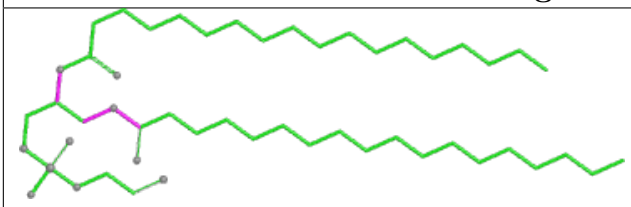
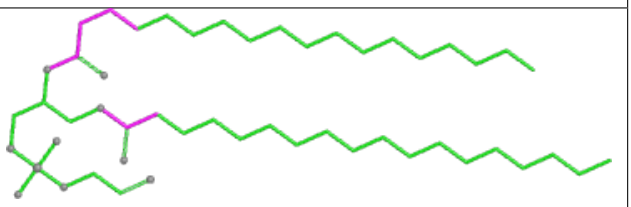
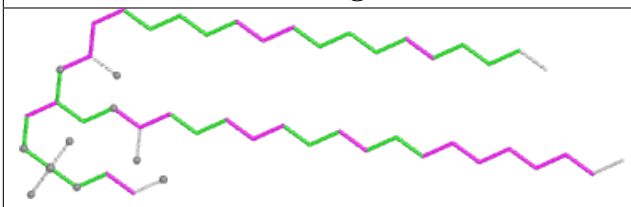
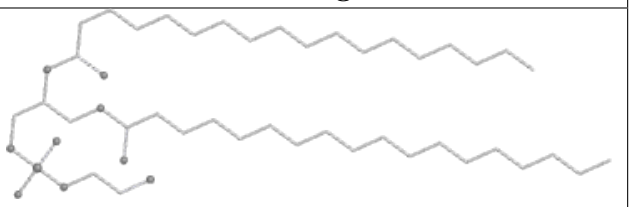
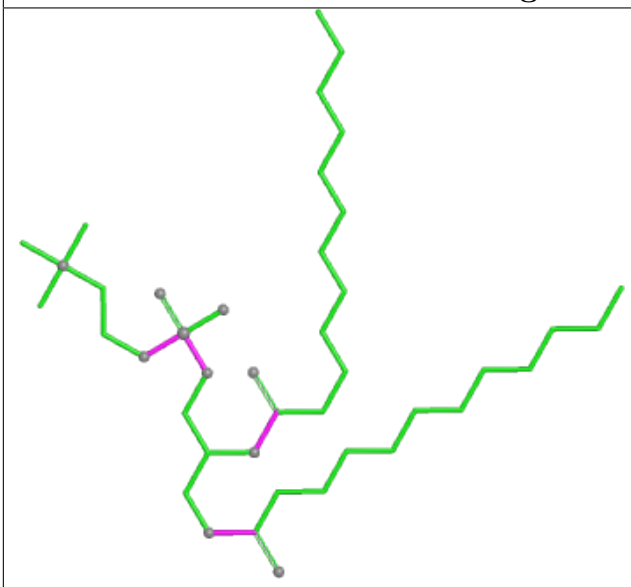
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PLC W 202



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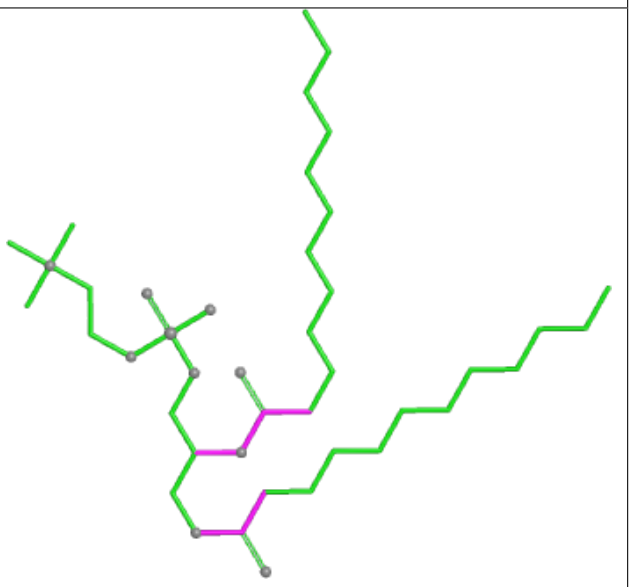
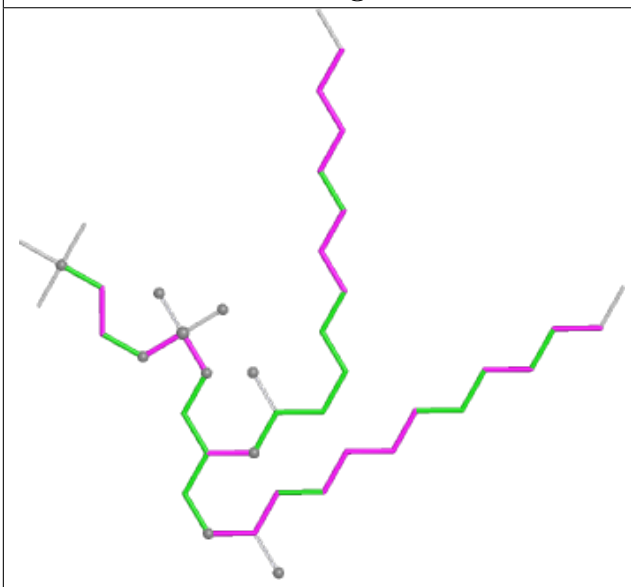


Bond angles



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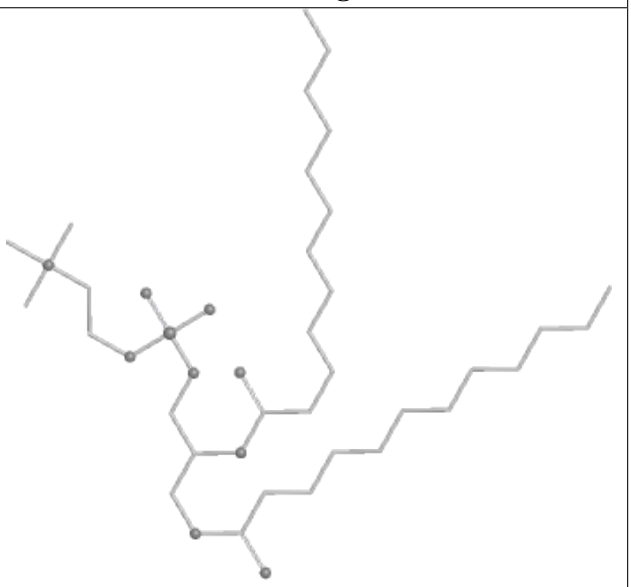
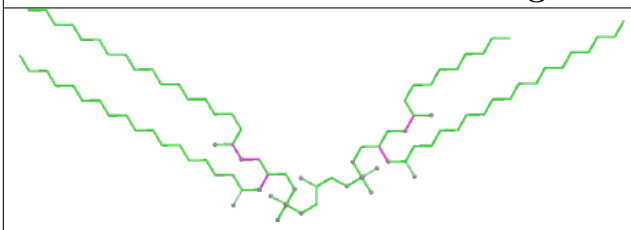
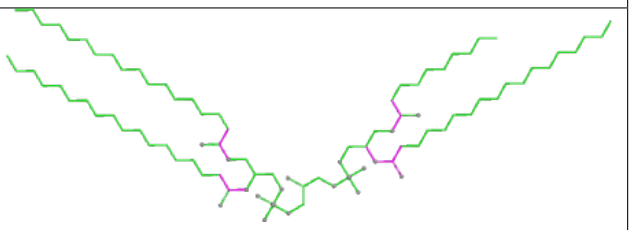
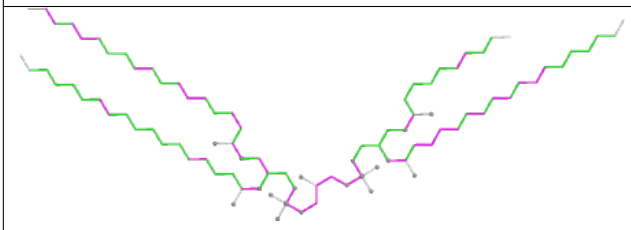
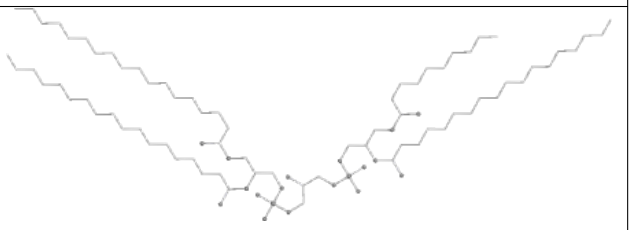


Rings

Ligand CDL 4 502	
 Bond lengths	 Bond angles
 Torsions	 Rings

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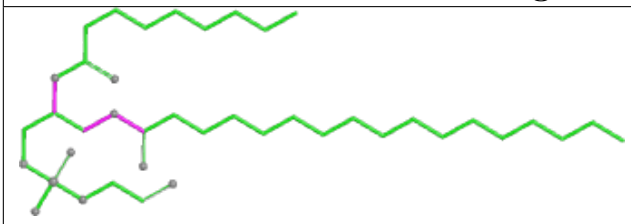
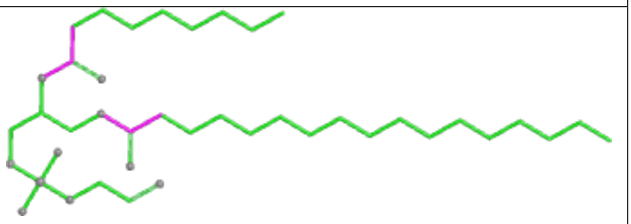
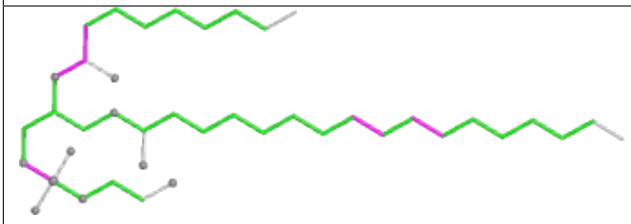
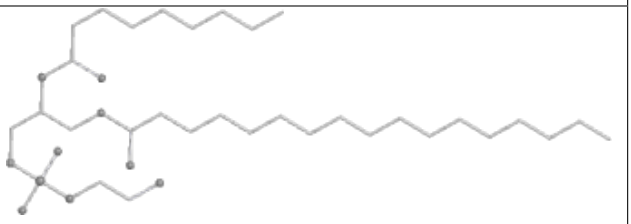
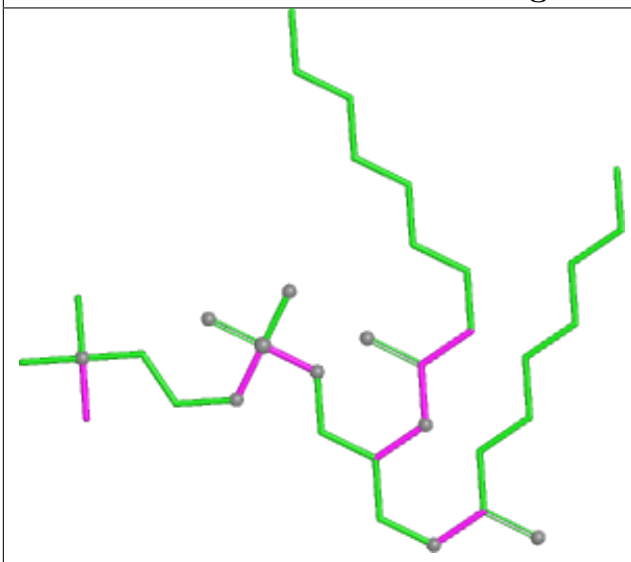
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PLC 1 403



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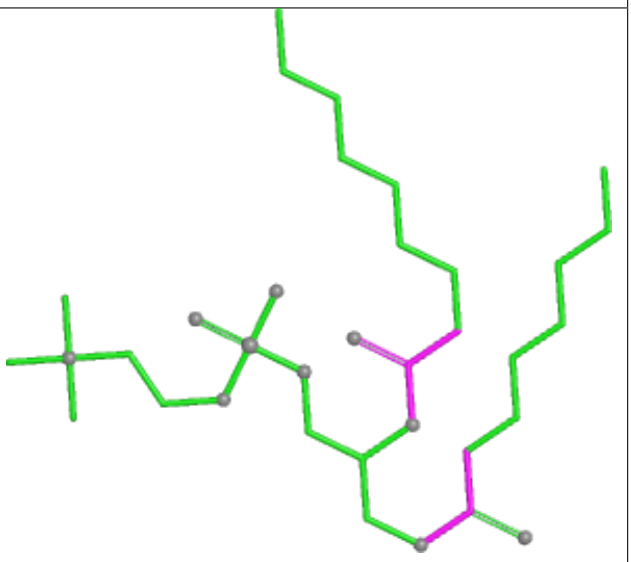
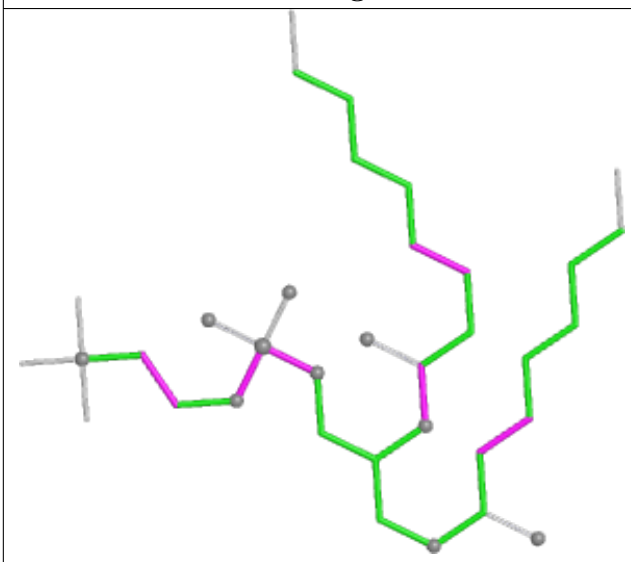


Bond angles



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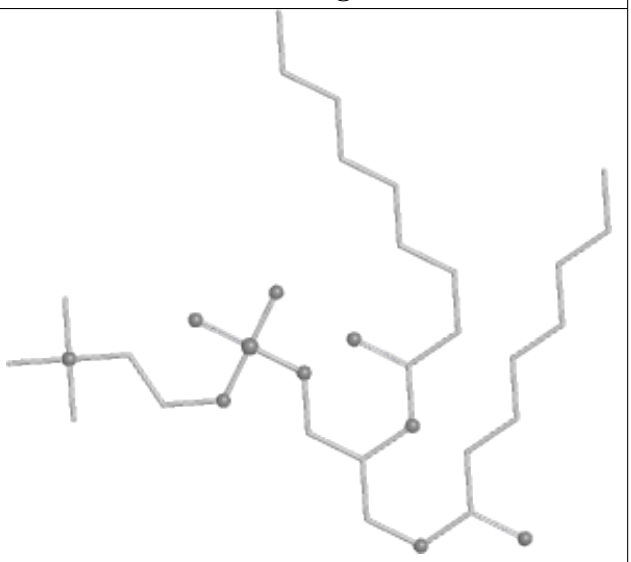
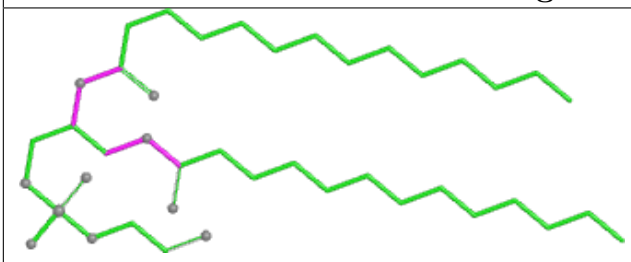


Rings

Ligand 3PE i 101



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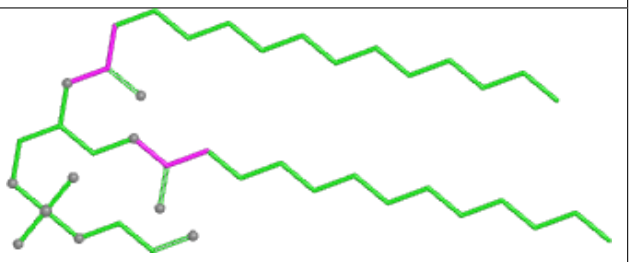
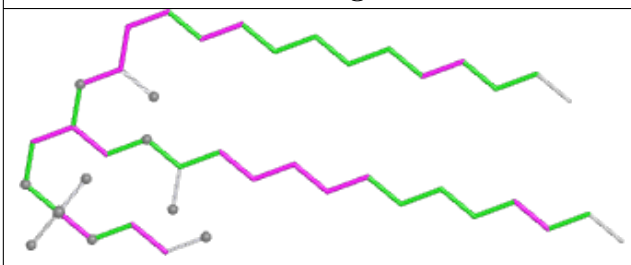


Bond angles



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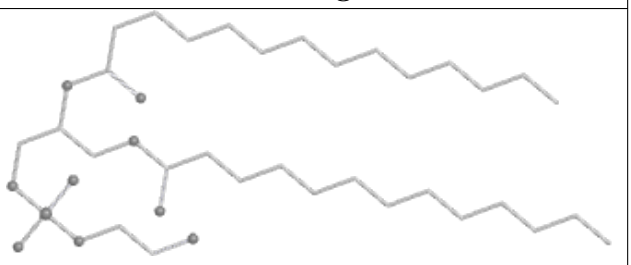
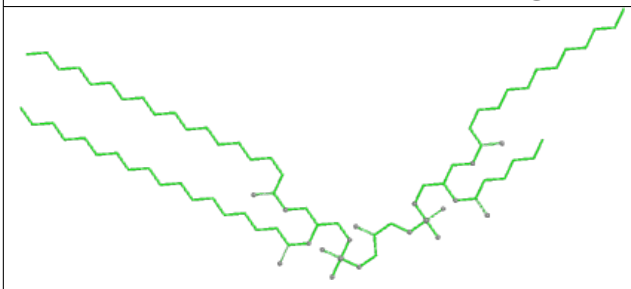


Rings

Ligand CDL 2 501



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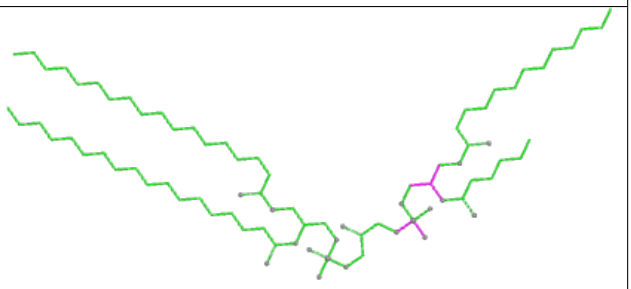

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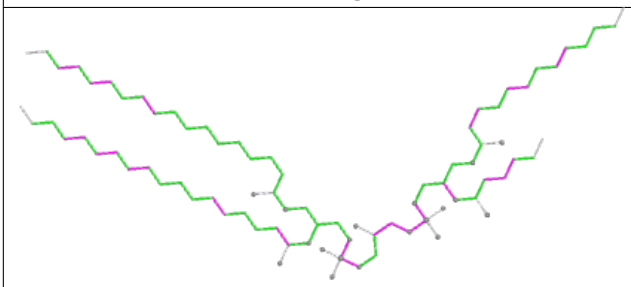

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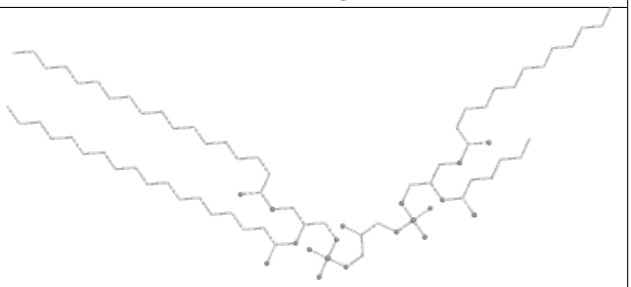
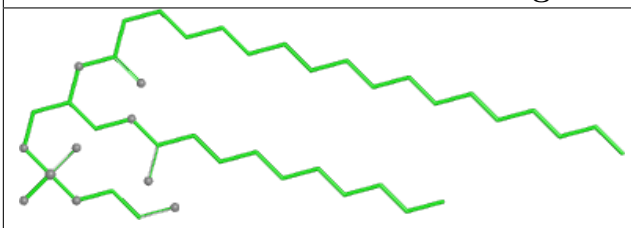


Rings

Ligand 3PE 3 201



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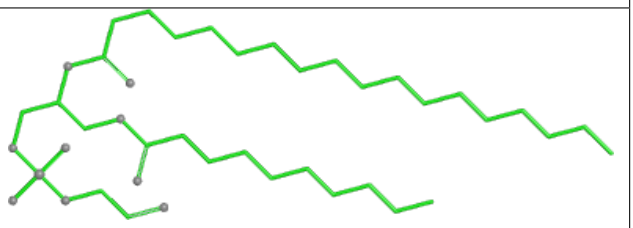

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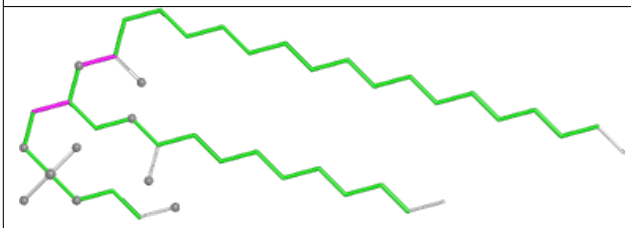

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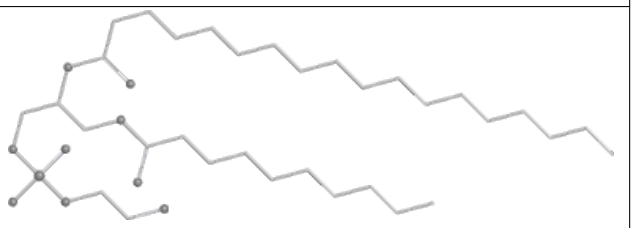
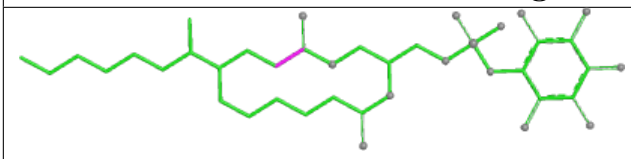


Rings

Ligand T7X 4 505



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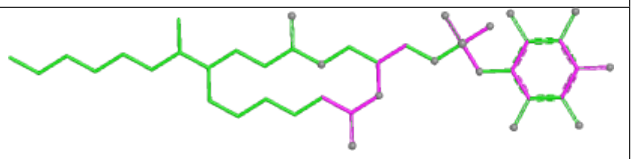

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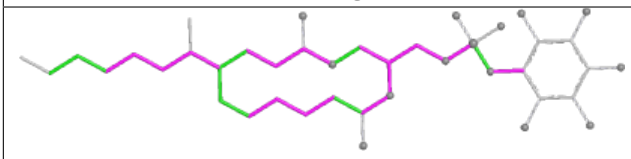

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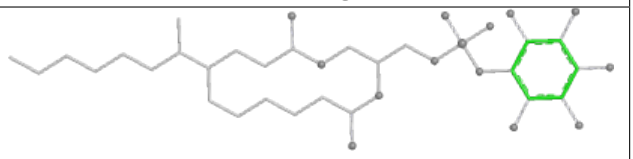
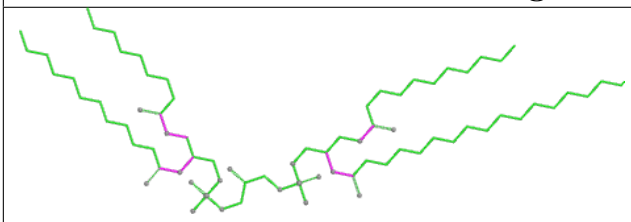


Rings

Ligand CDL 5 701



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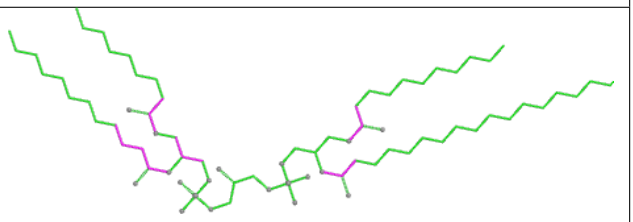
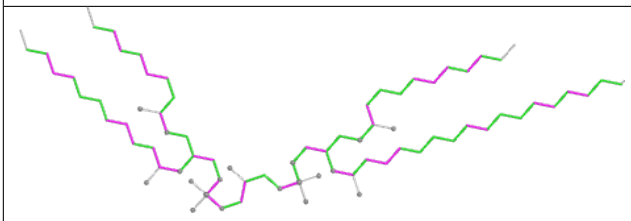


Bond angles



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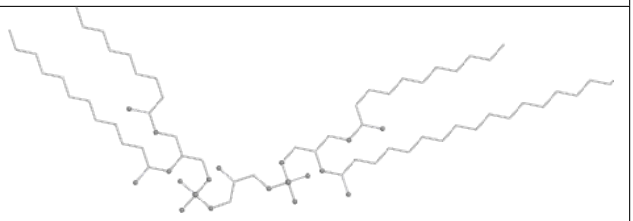
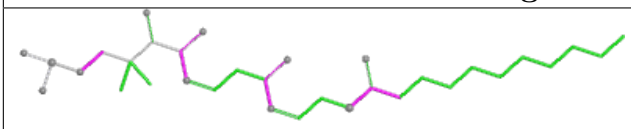
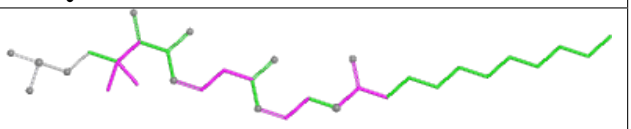
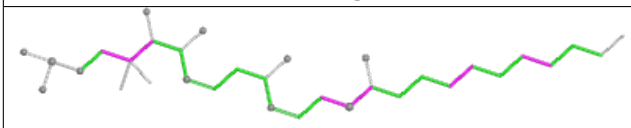
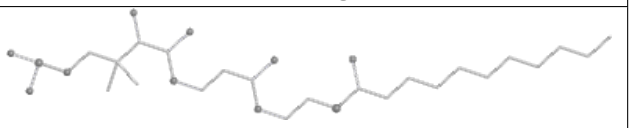
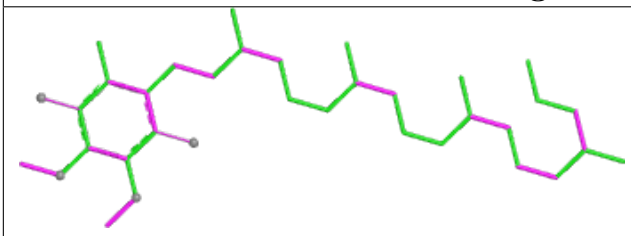
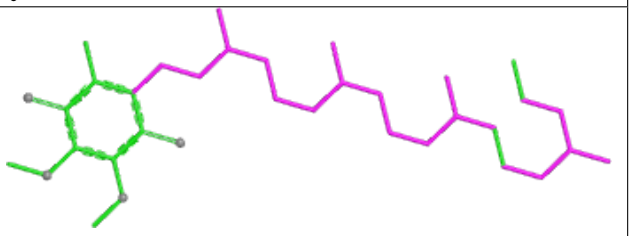
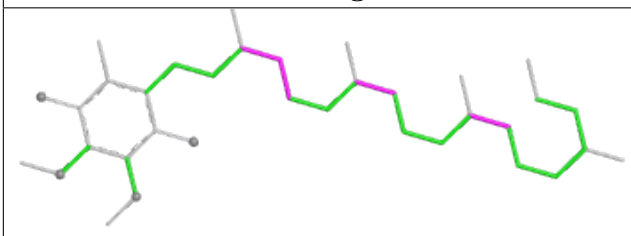
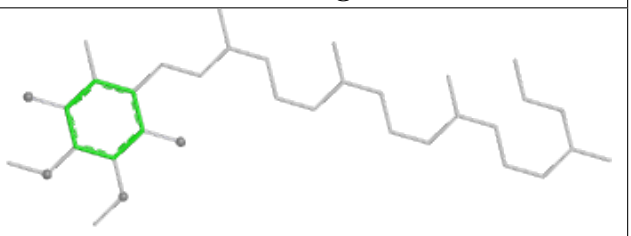
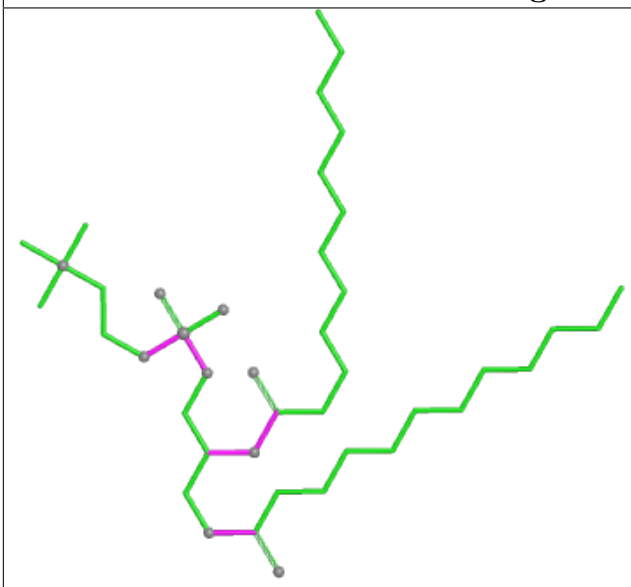


Rings

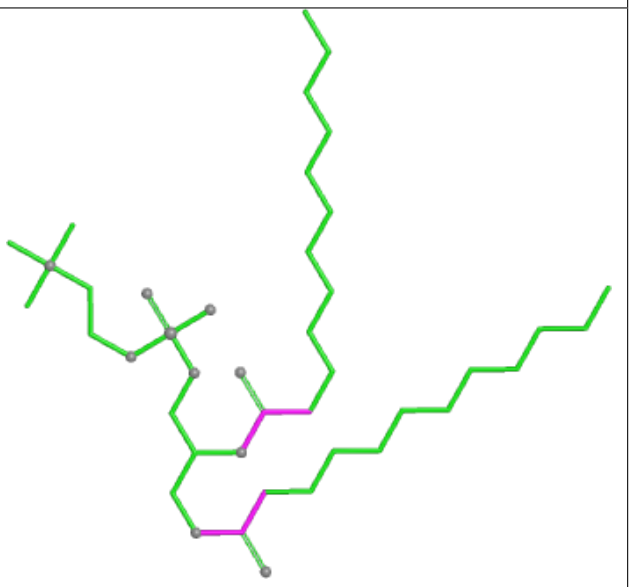
Ligand ZMP Q 201	
	
Bond lengths	**Bond angles**
	
Torsions	**Rings**

Ligand UQ9 1 402	
	
Bond lengths	**Bond angles**
	
Torsions	**Rings**

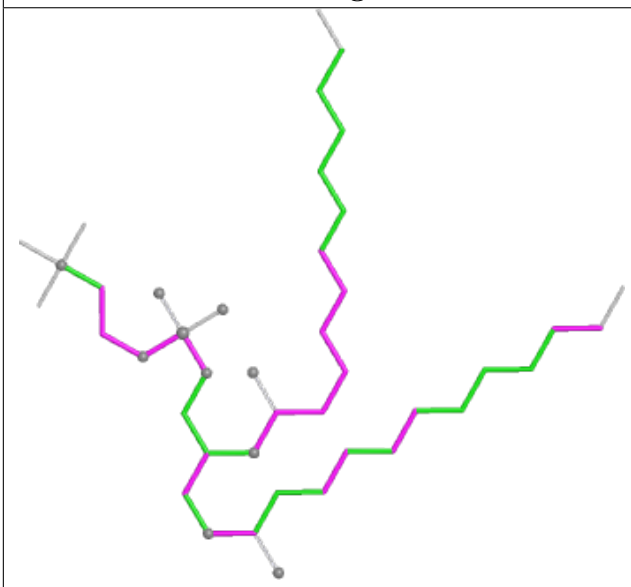
Ligand PLC 5 702



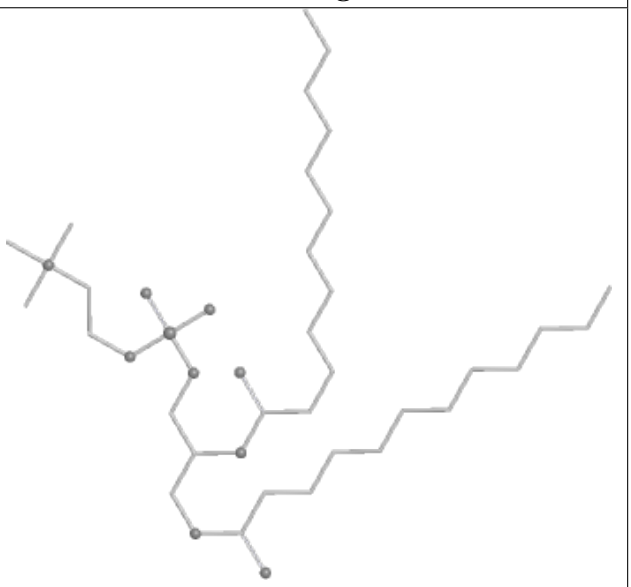
Bond lengths



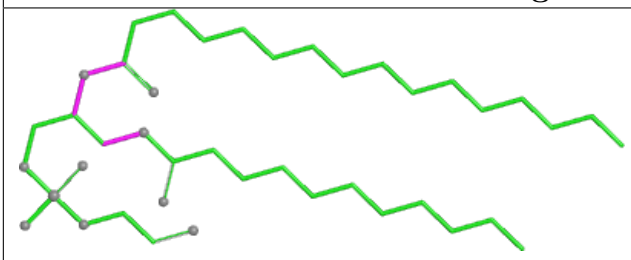
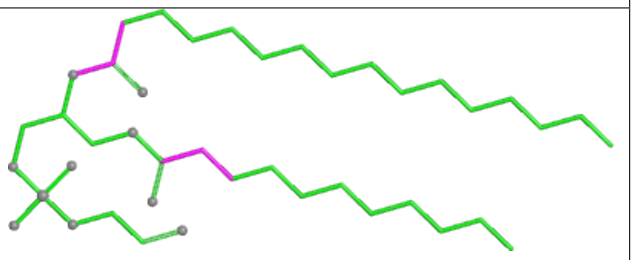
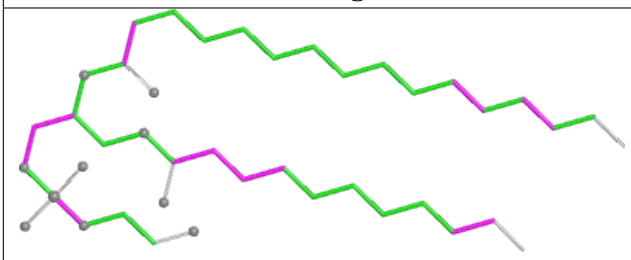
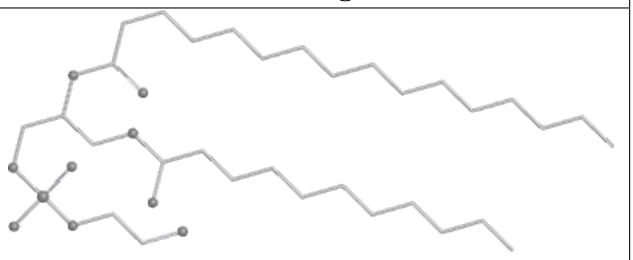
Bond angles



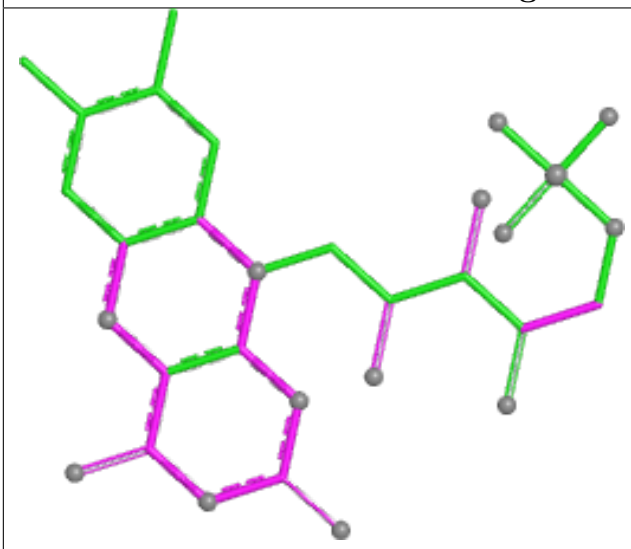
Torsions



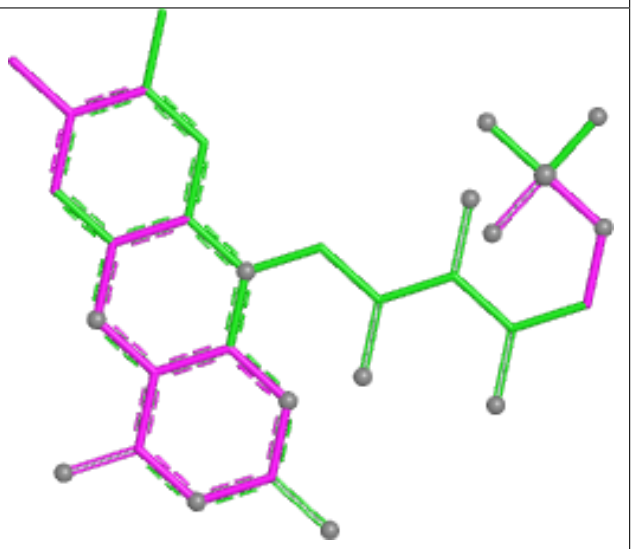
Rings

Ligand 3PE b 201	
	
Bond lengths	**Bond angles**
	
Torsions	**Rings**

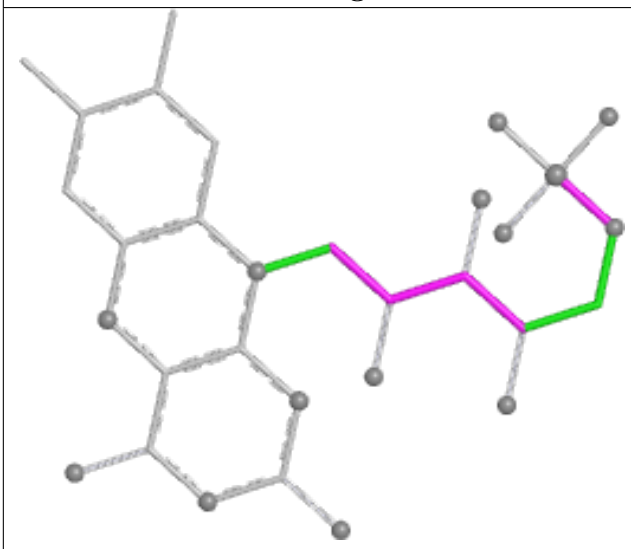
Ligand FMN B 502



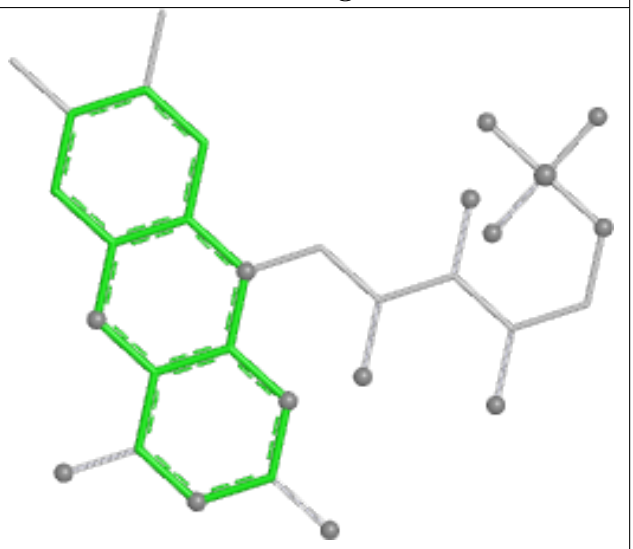
Bond lengths



Bond angles

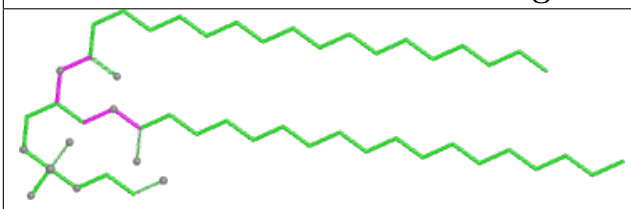


Torsions



Rings

Ligand 3PE 4 504



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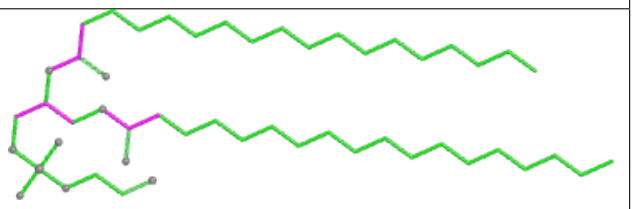
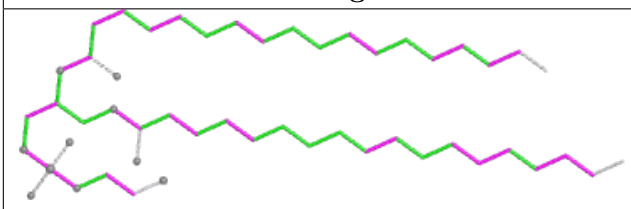
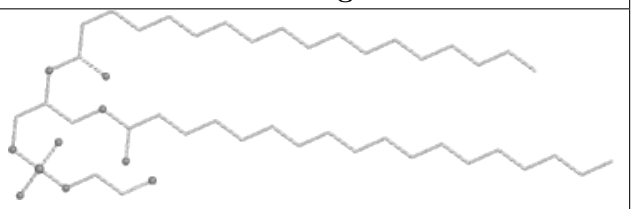


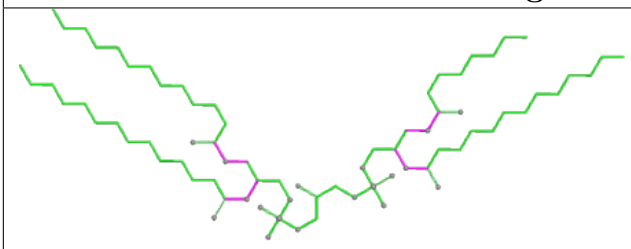
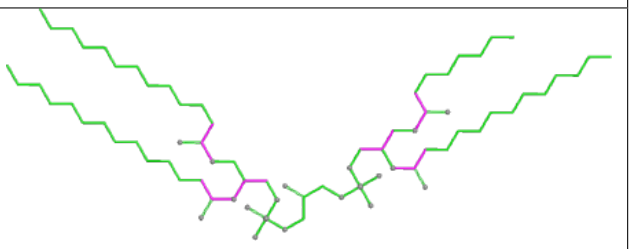
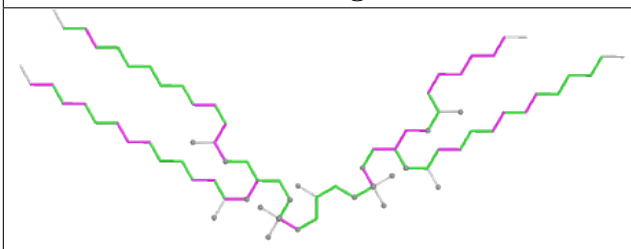
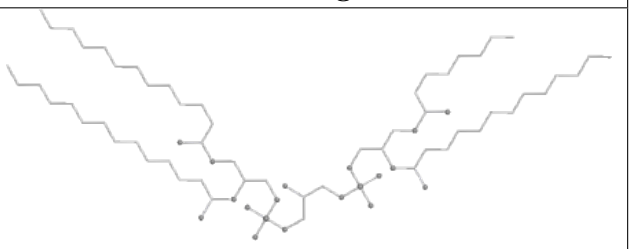
Bond angles

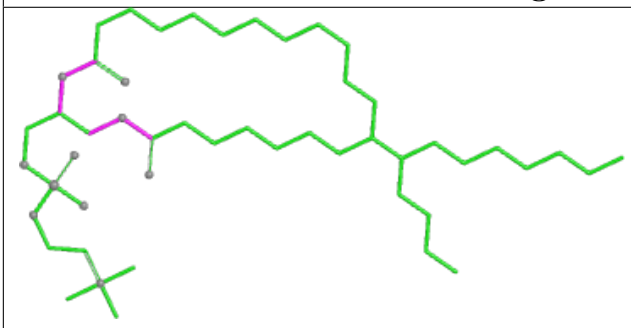
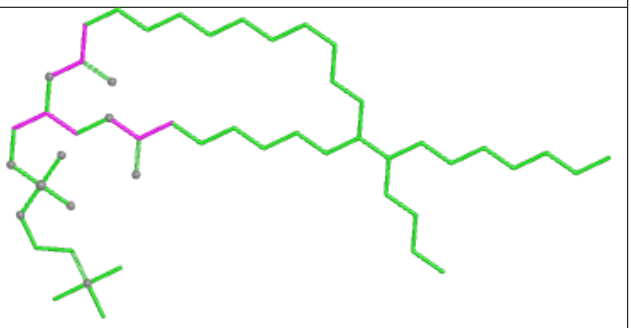
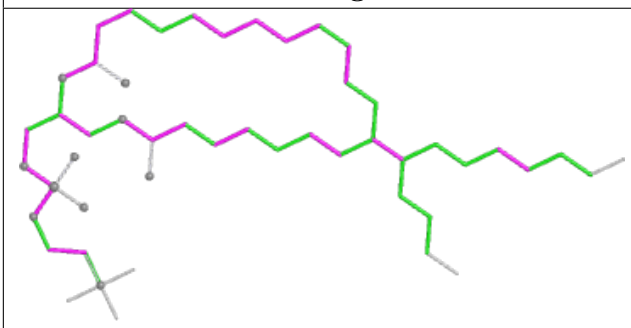
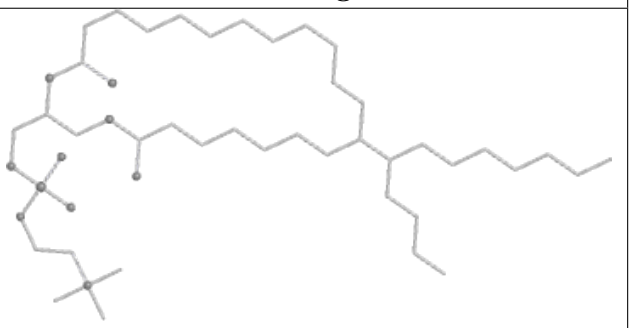


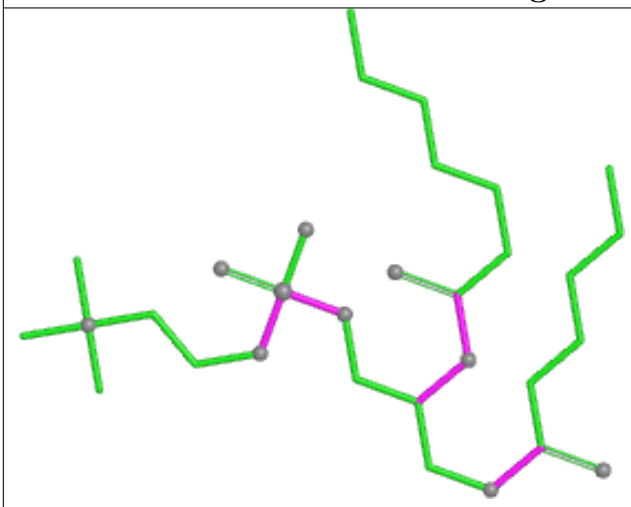
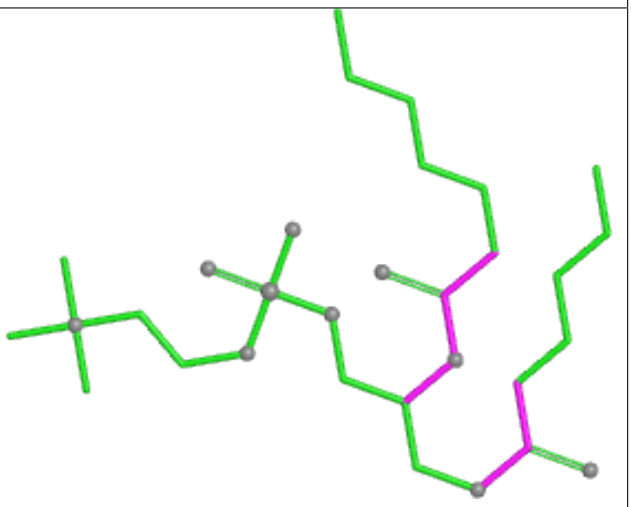
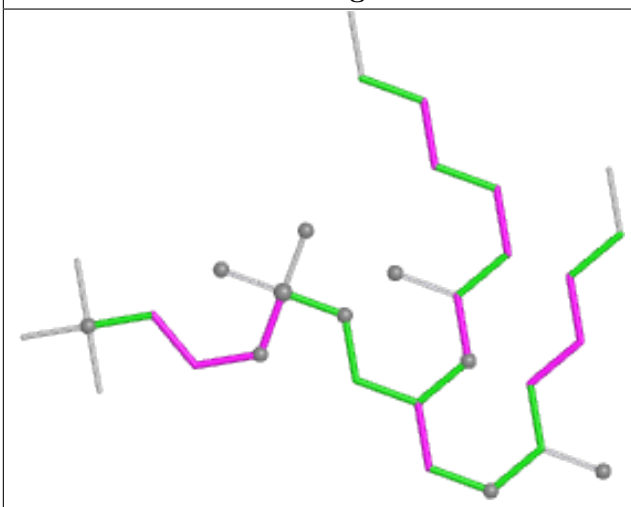
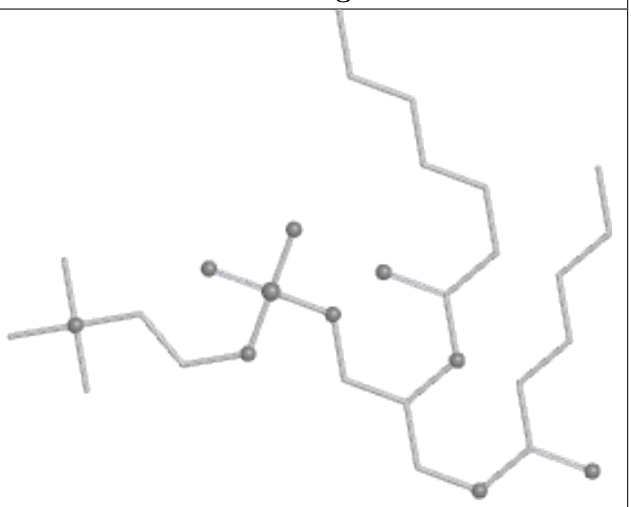
Torsions

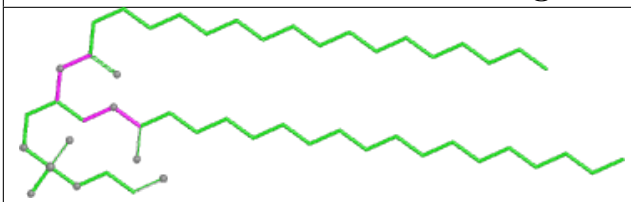
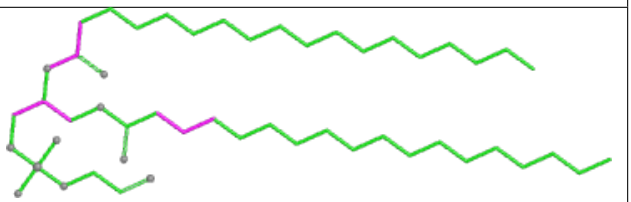
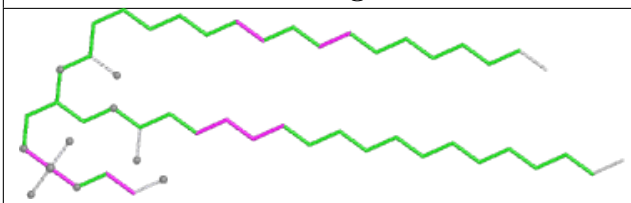
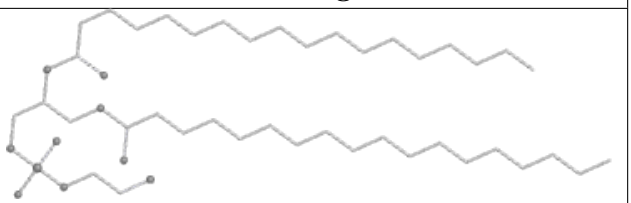


Rings

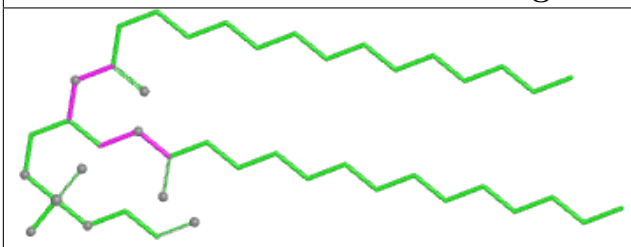
Ligand CDL Z 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PSC 2 503	
 Bond lengths	 Bond angles
 Torsions	 Rings

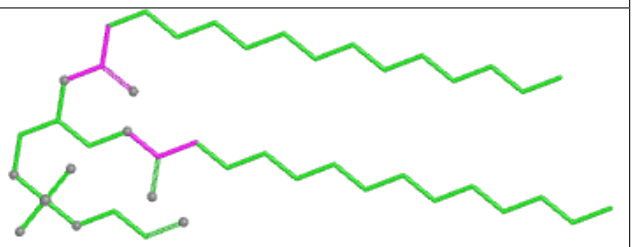
Ligand PLC 5 703	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE a 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

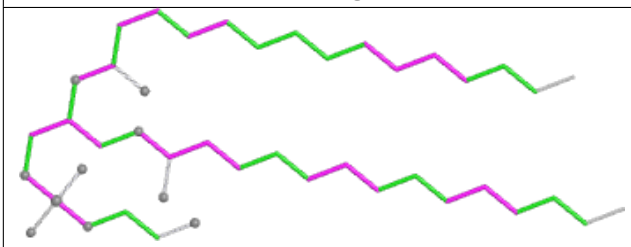
Ligand 3PE J 203



Bond lengths



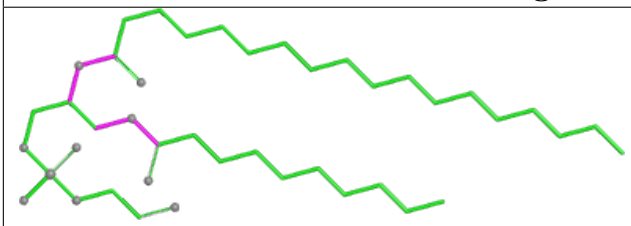
Bond angles



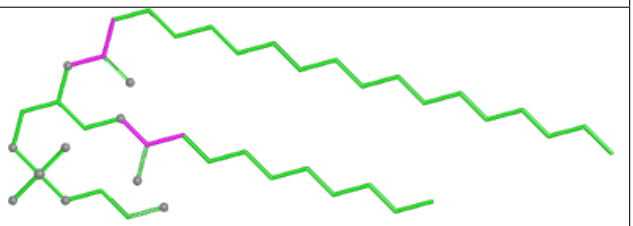
Torsions

Rings

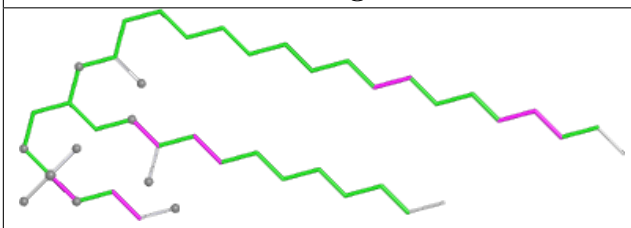
Ligand 3PE 4 501



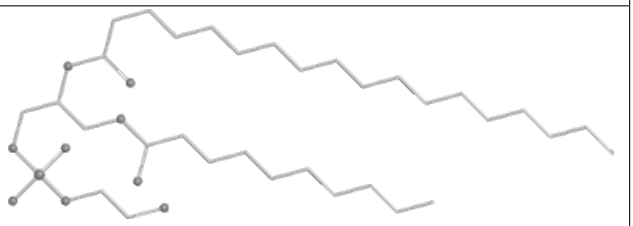
Bond lengths



Bond angles

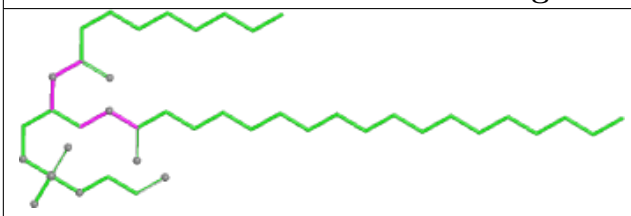


Torsions

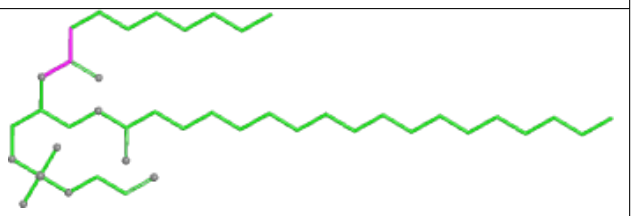


Rings

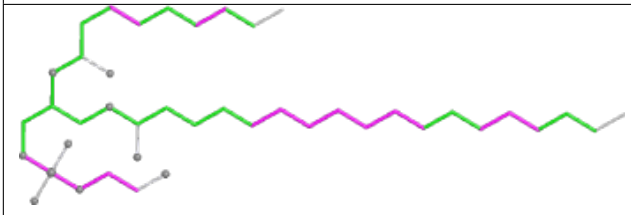
Ligand 3PE S 501



Bond lengths



Bond angles



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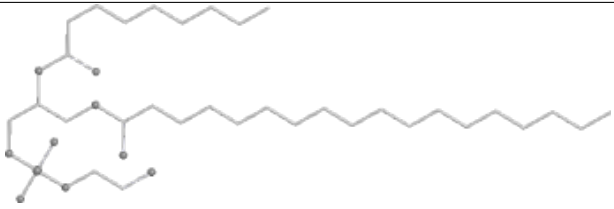
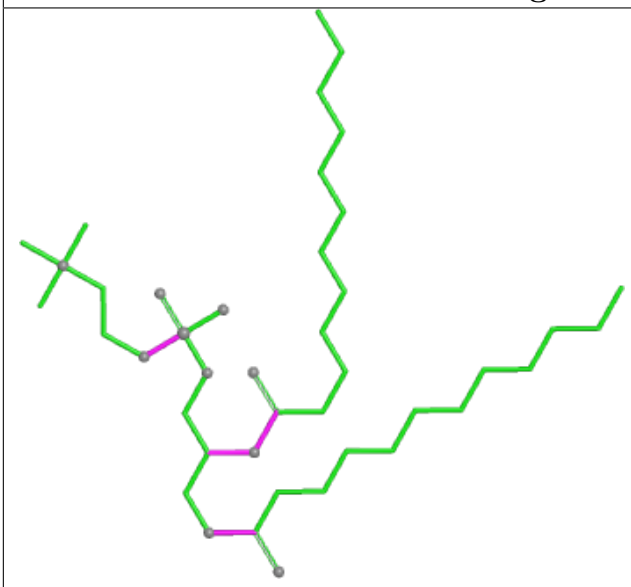
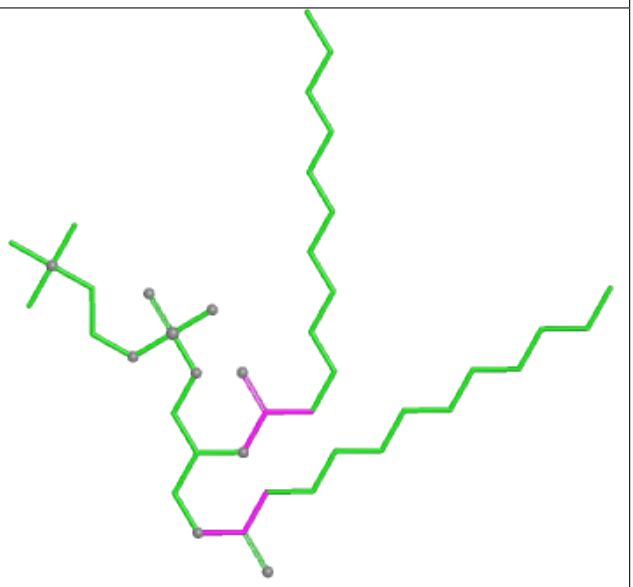


Rings

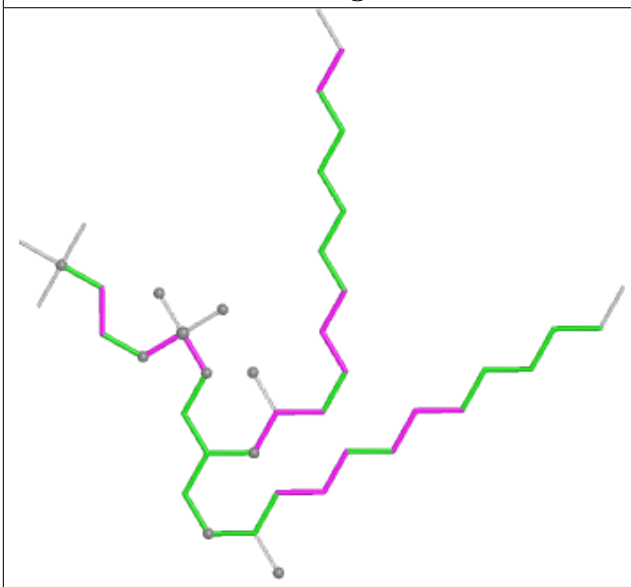
Ligand PLC 1 401



Bond lengths



Bond angles



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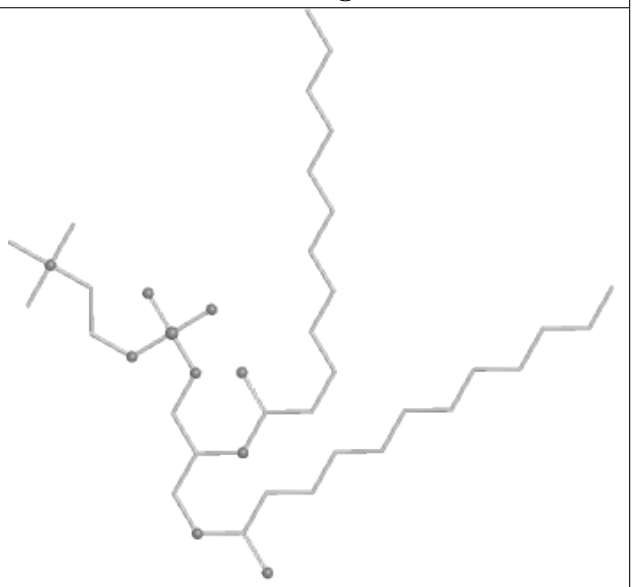
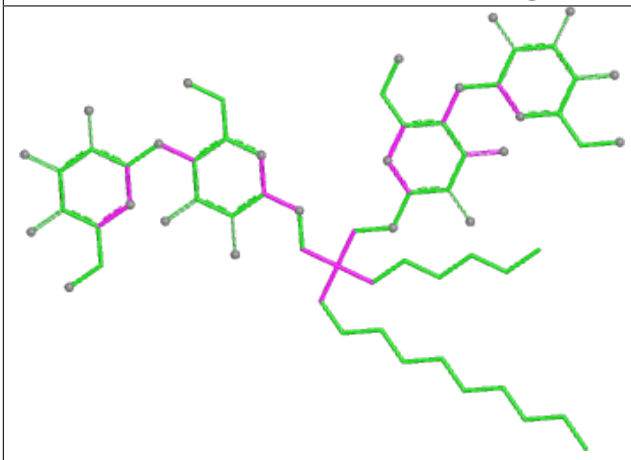


Rings

Ligand LMN J 204



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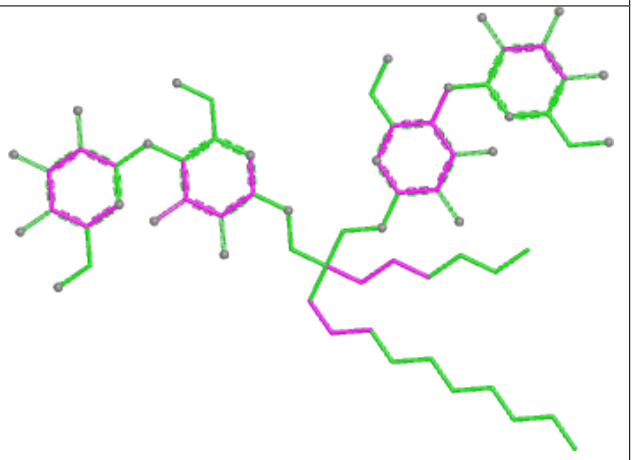
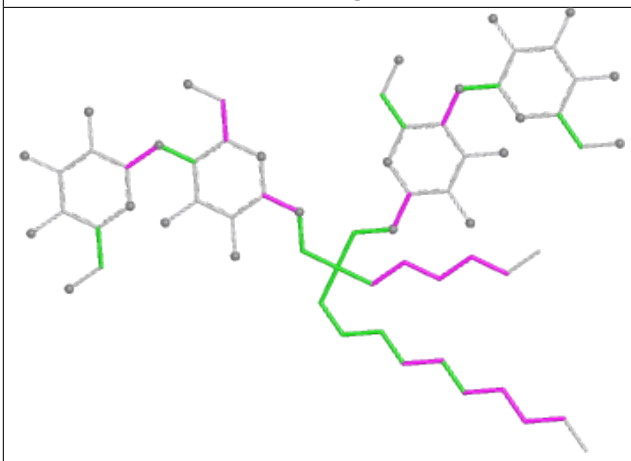


Bond angles



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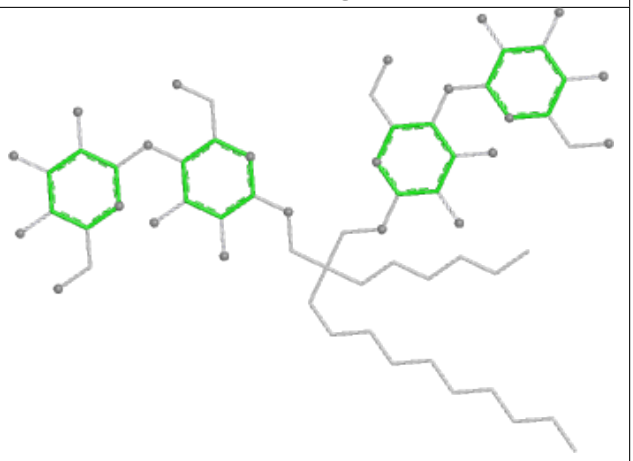
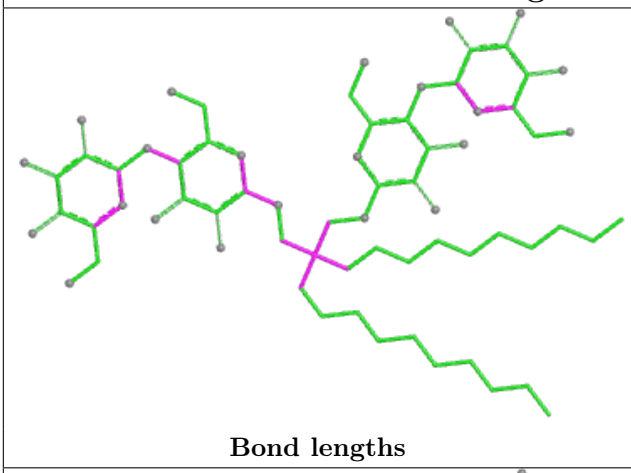
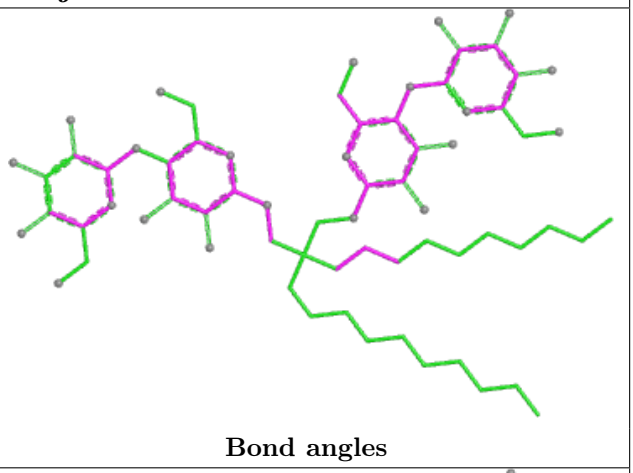


Rings

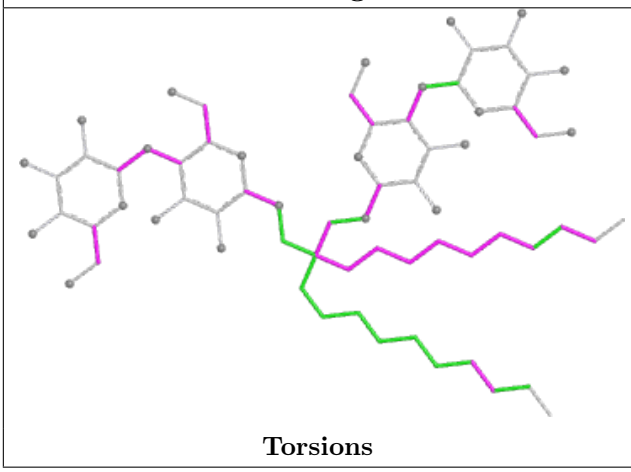
Ligand LMN j 101



Bond lengths



Bond angles



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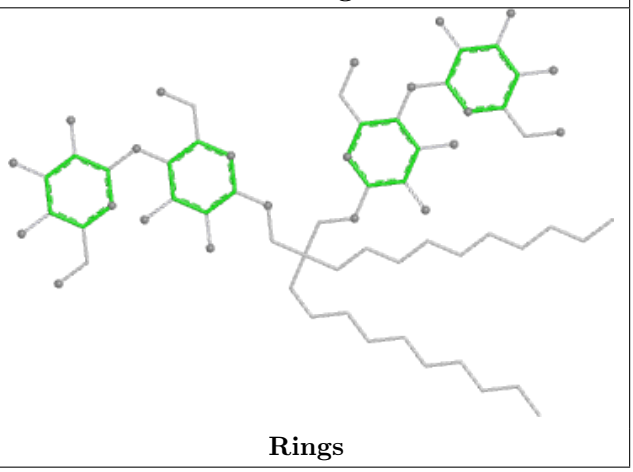
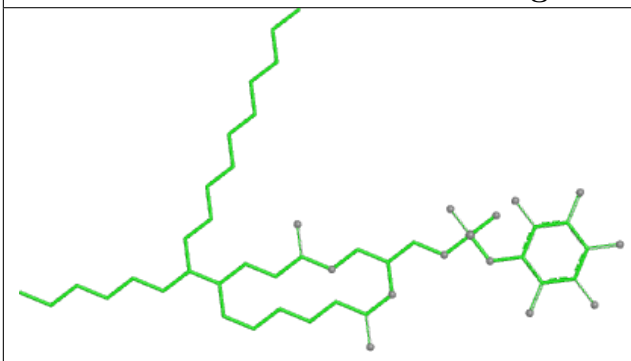
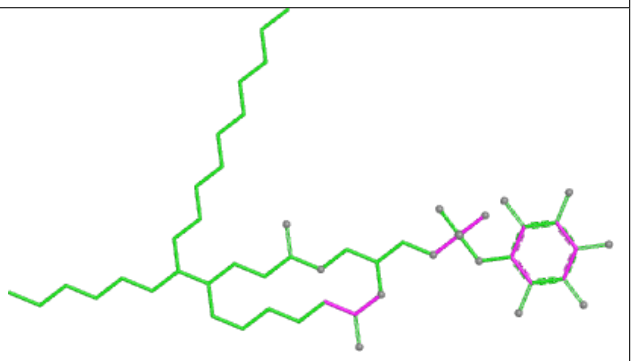


Rings

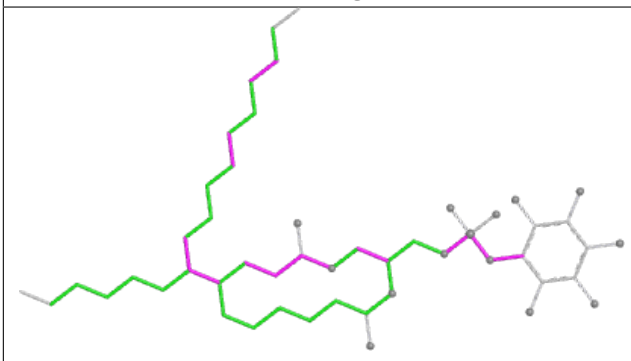
Ligand T7X 2 504



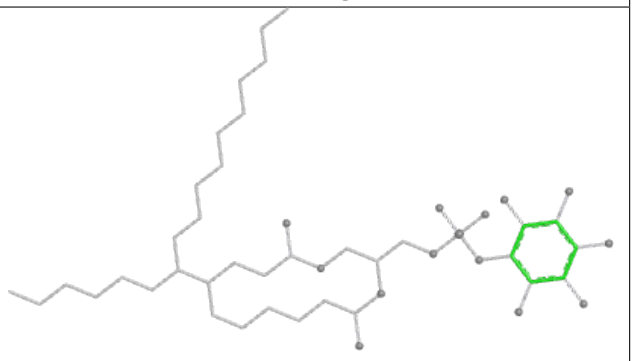
Bond lengths



Bond angles

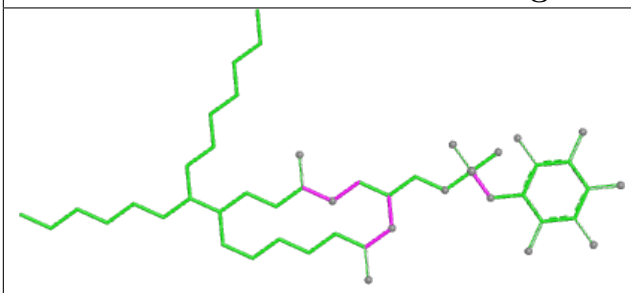


Torsions

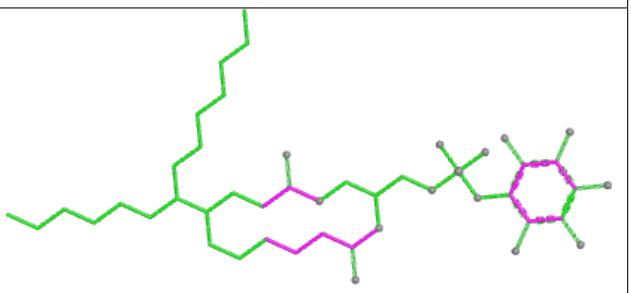


Rings

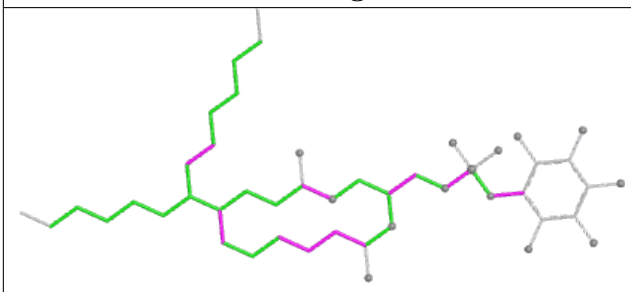
Ligand T7X 3 202



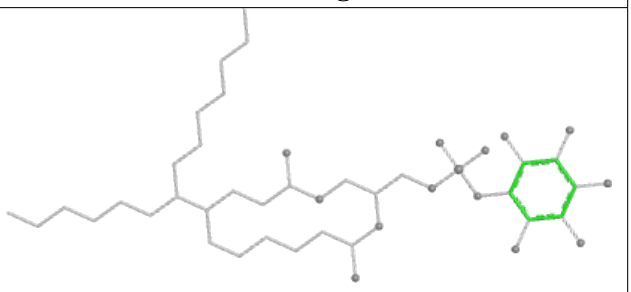
Bond lengths



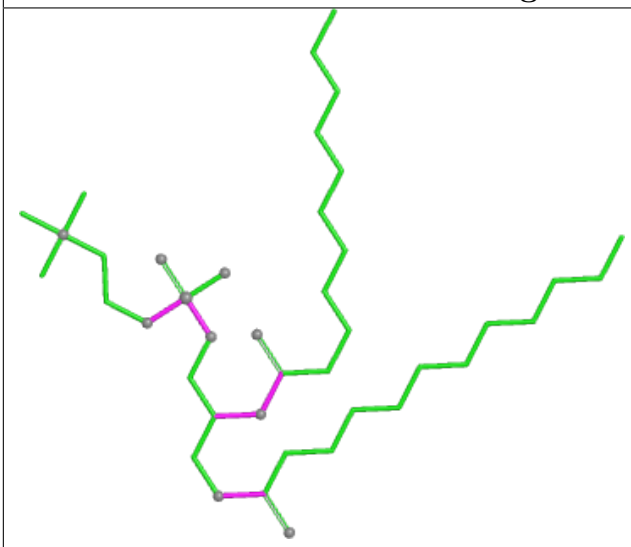
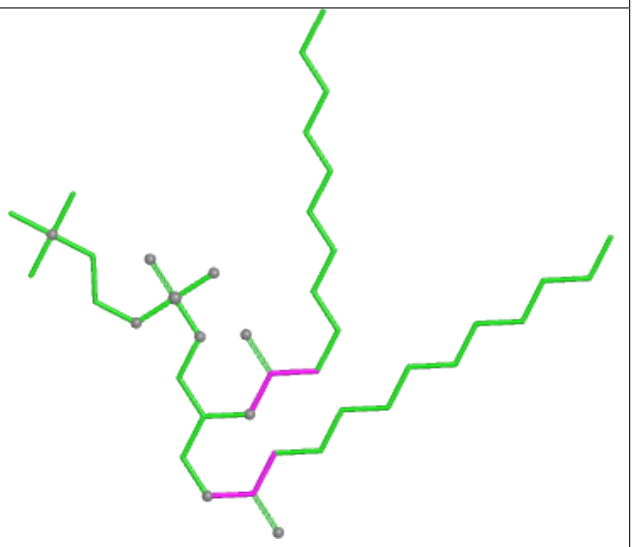
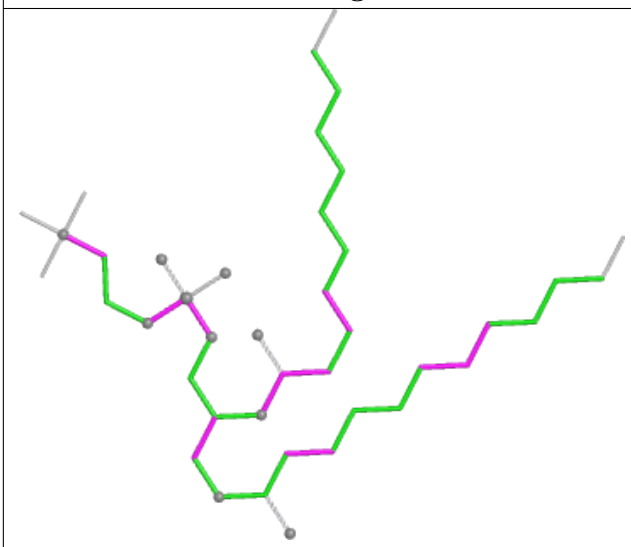
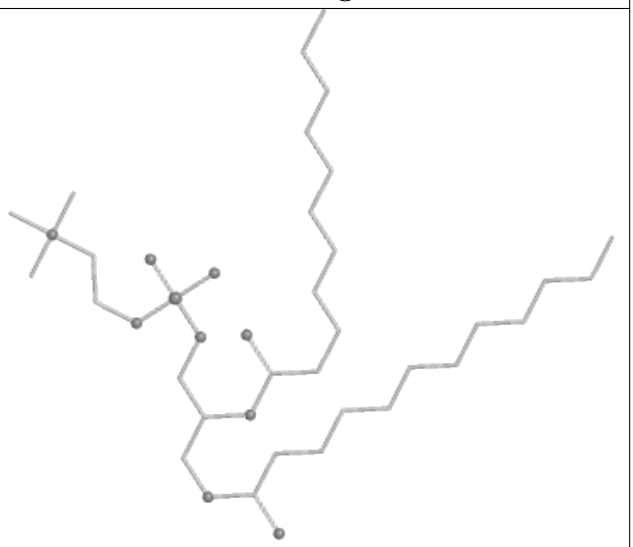
Bond angles



Torsions



Rings

Ligand PLC W 201	
 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.

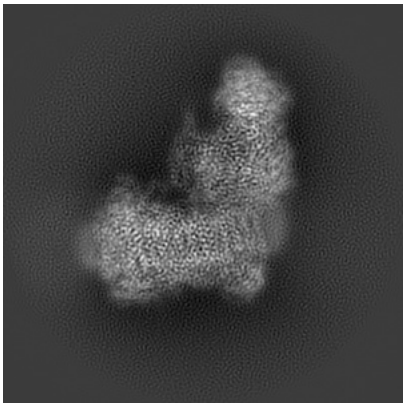
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-10711. These allow visual inspection of the internal detail of the map and identification of artifacts.

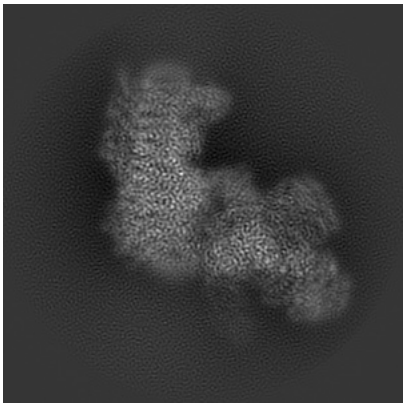
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

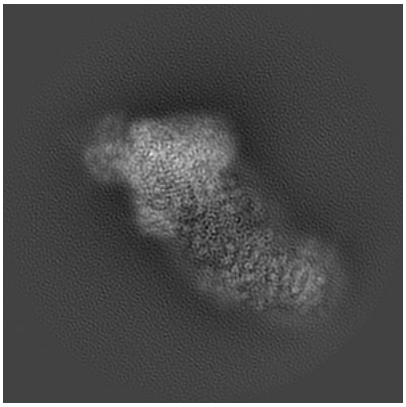
6.1.1 Primary map



X



Y

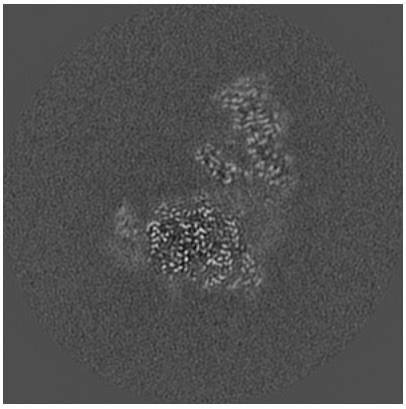


Z

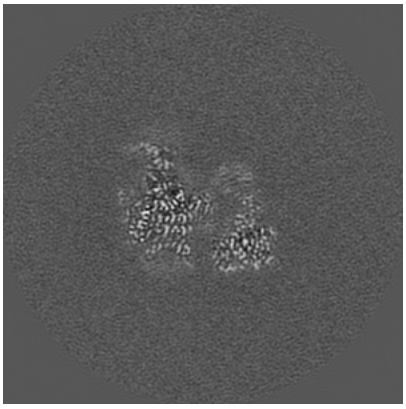
The images above show the map projected in three orthogonal directions.

6.2 Central slices

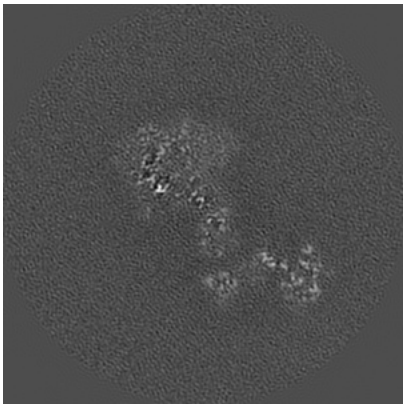
6.2.1 Primary map



X Index: 200



Y Index: 200

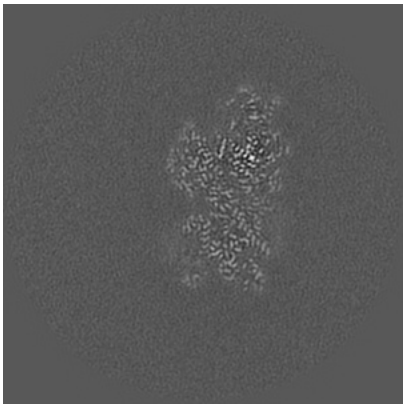


Z Index: 200

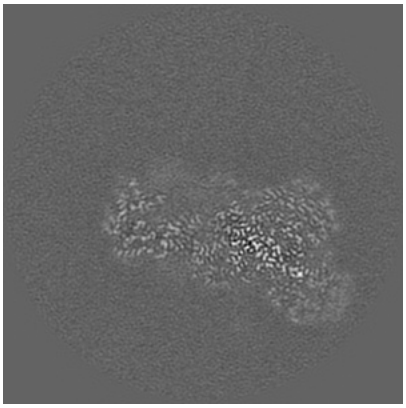
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

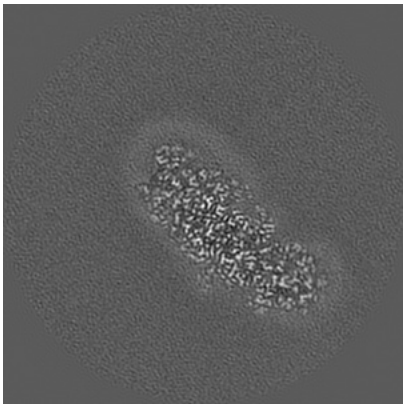
6.3.1 Primary map



X Index: 159



Y Index: 244

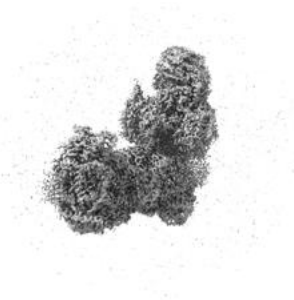


Z Index: 174

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

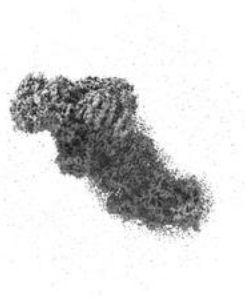
6.4 Orthogonal surface views (i)

6.4.1 Primary map



X

Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.013. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

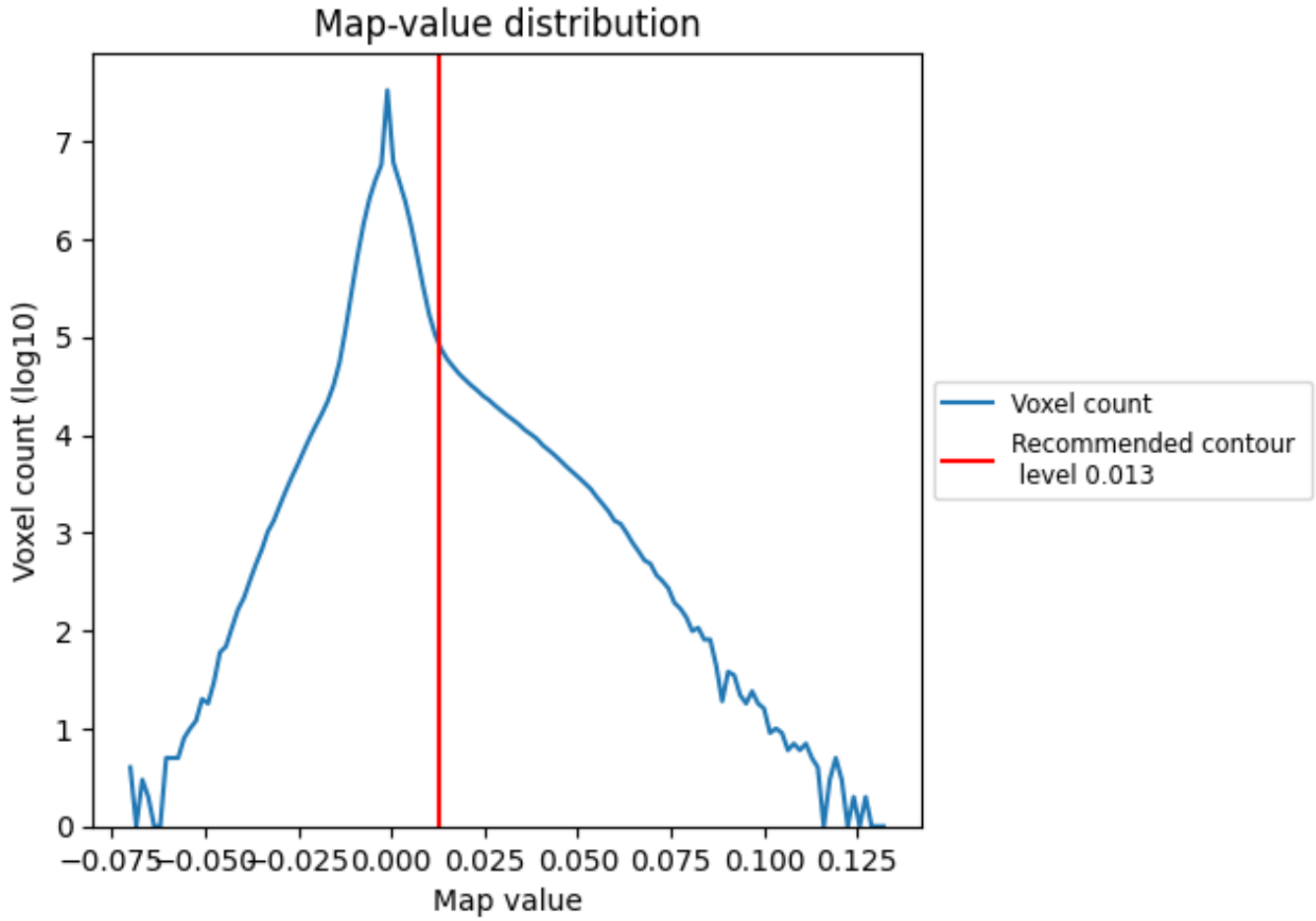
6.5 Mask visualisation (i)

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

7 Map analysis

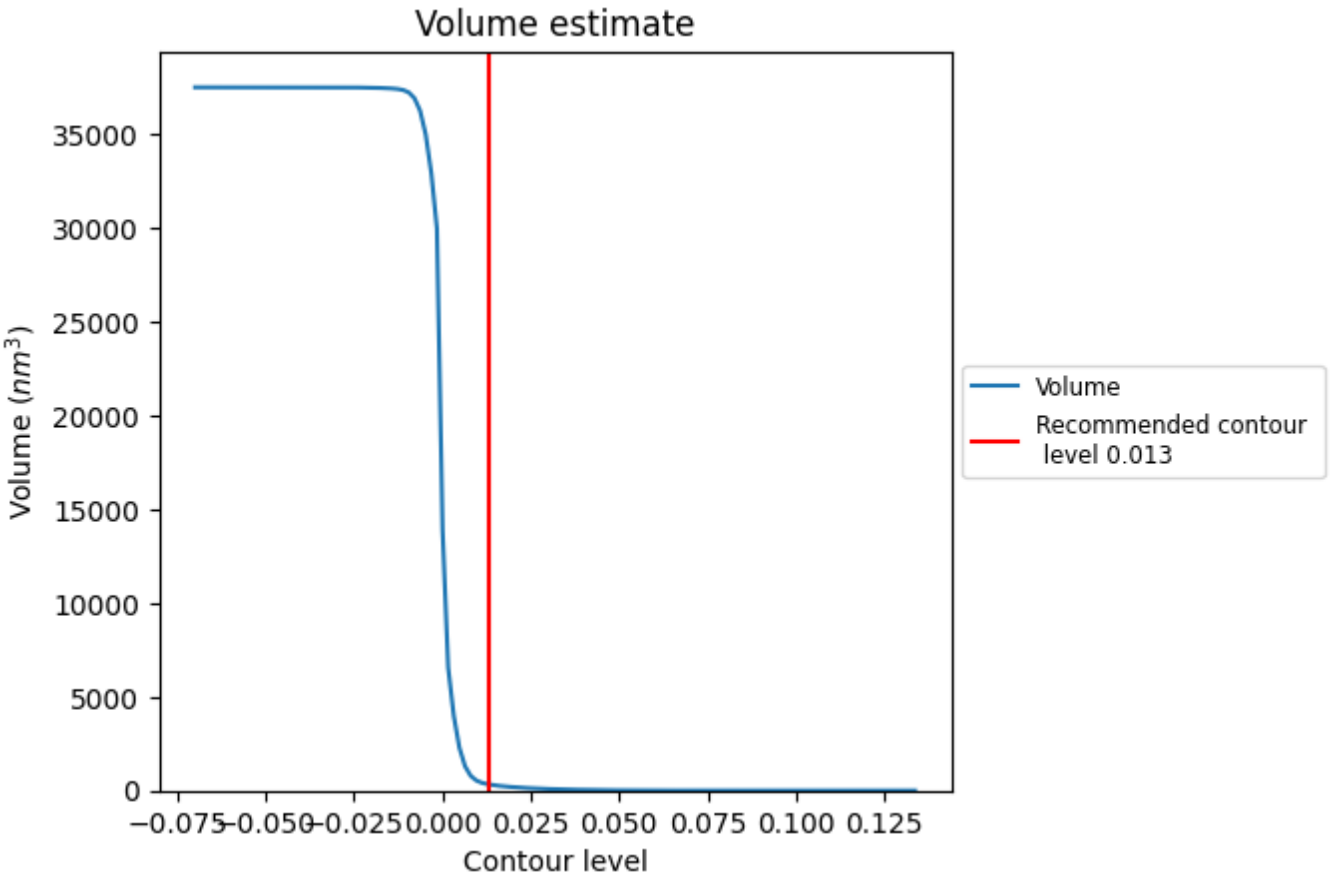
This section contains the results of statistical analysis of the map.

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.

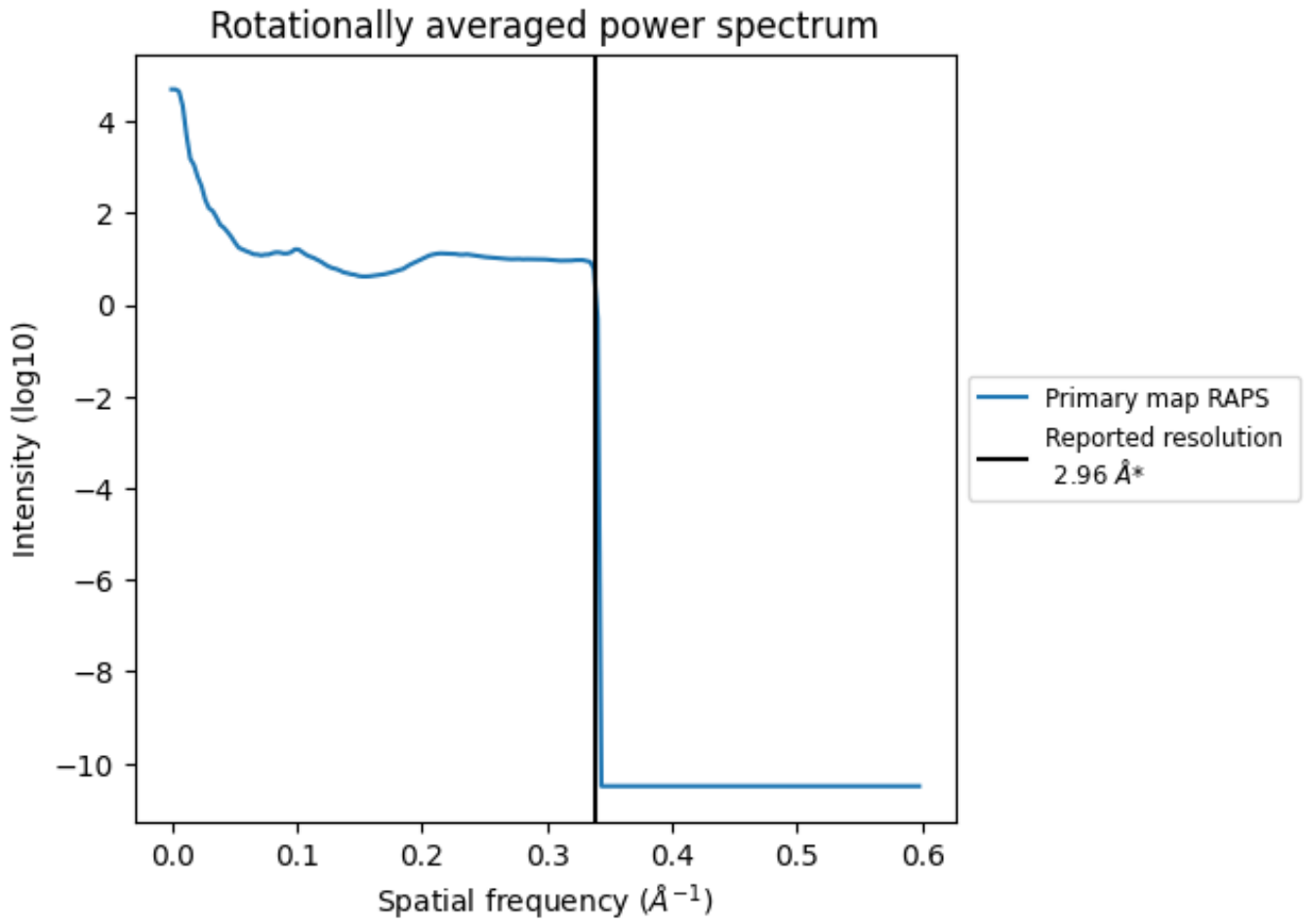
7.2 Volume estimate



The volume at the recommended contour level is 333 nm^3; this corresponds to an approximate mass of 301 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)

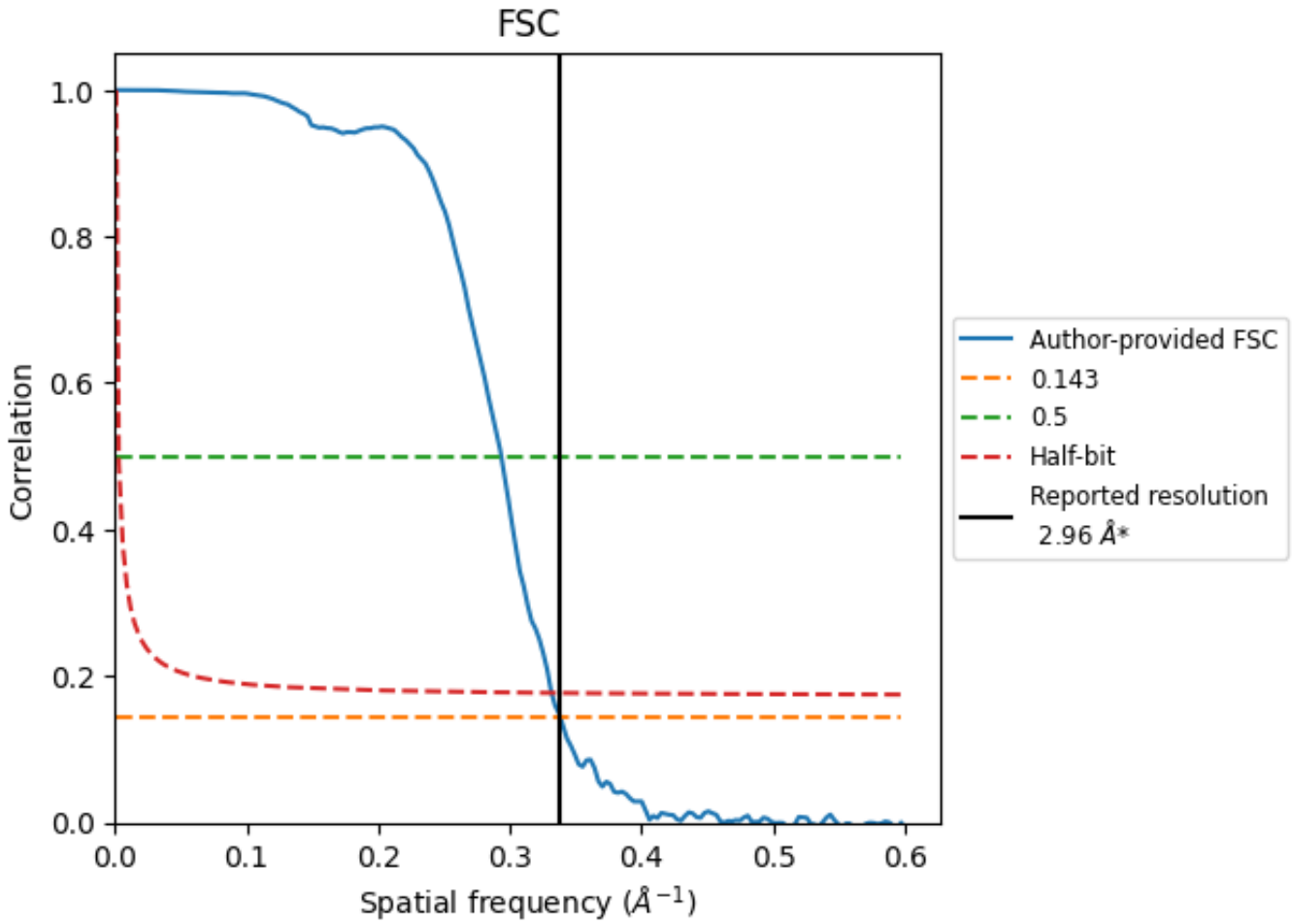


*Reported resolution corresponds to spatial frequency of 0.338 Å^{-1}

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 0.338 Å^{-1}

8.2 Resolution estimates (i)

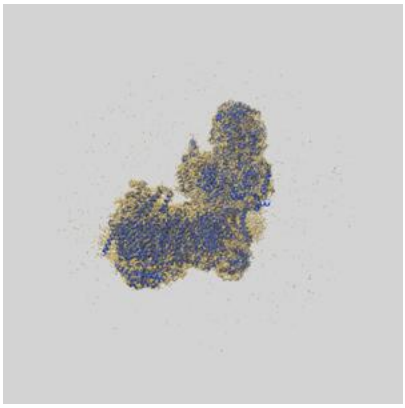
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.96	-	-
Author-provided FSC curve	2.95	3.41	3.01
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

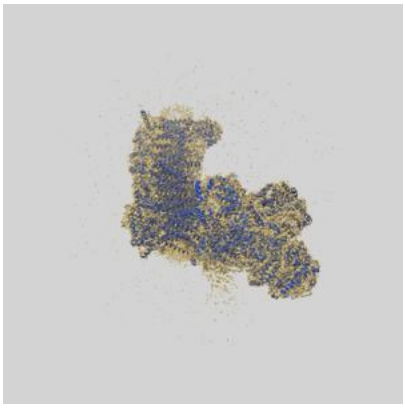
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-10711 and PDB model 6Y79. Per-residue inclusion information can be found in section 3 on page 21.

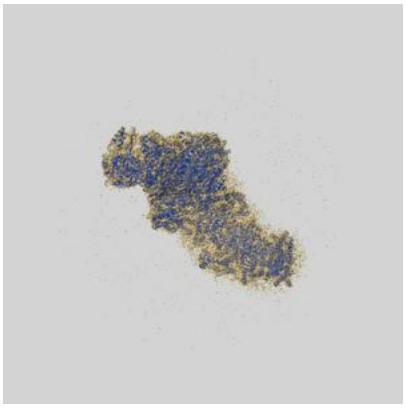
9.1 Map-model overlay



X



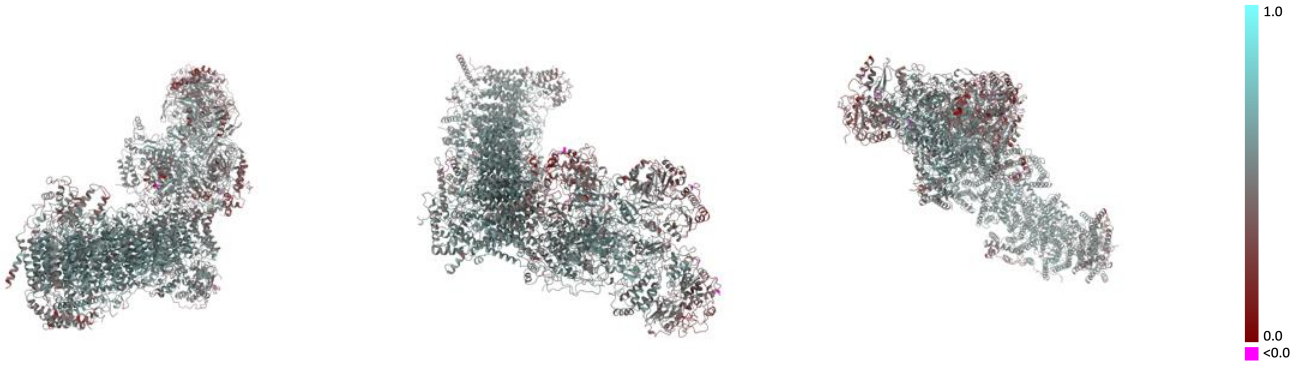
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.013 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

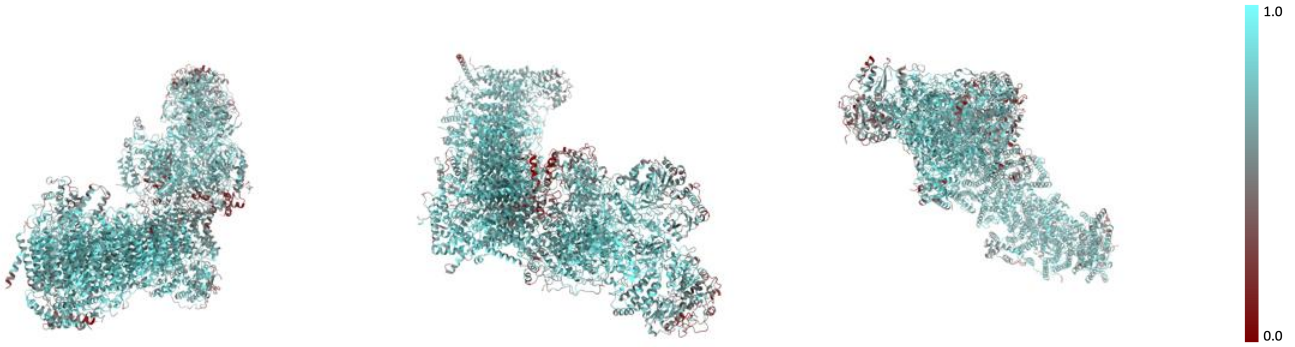
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

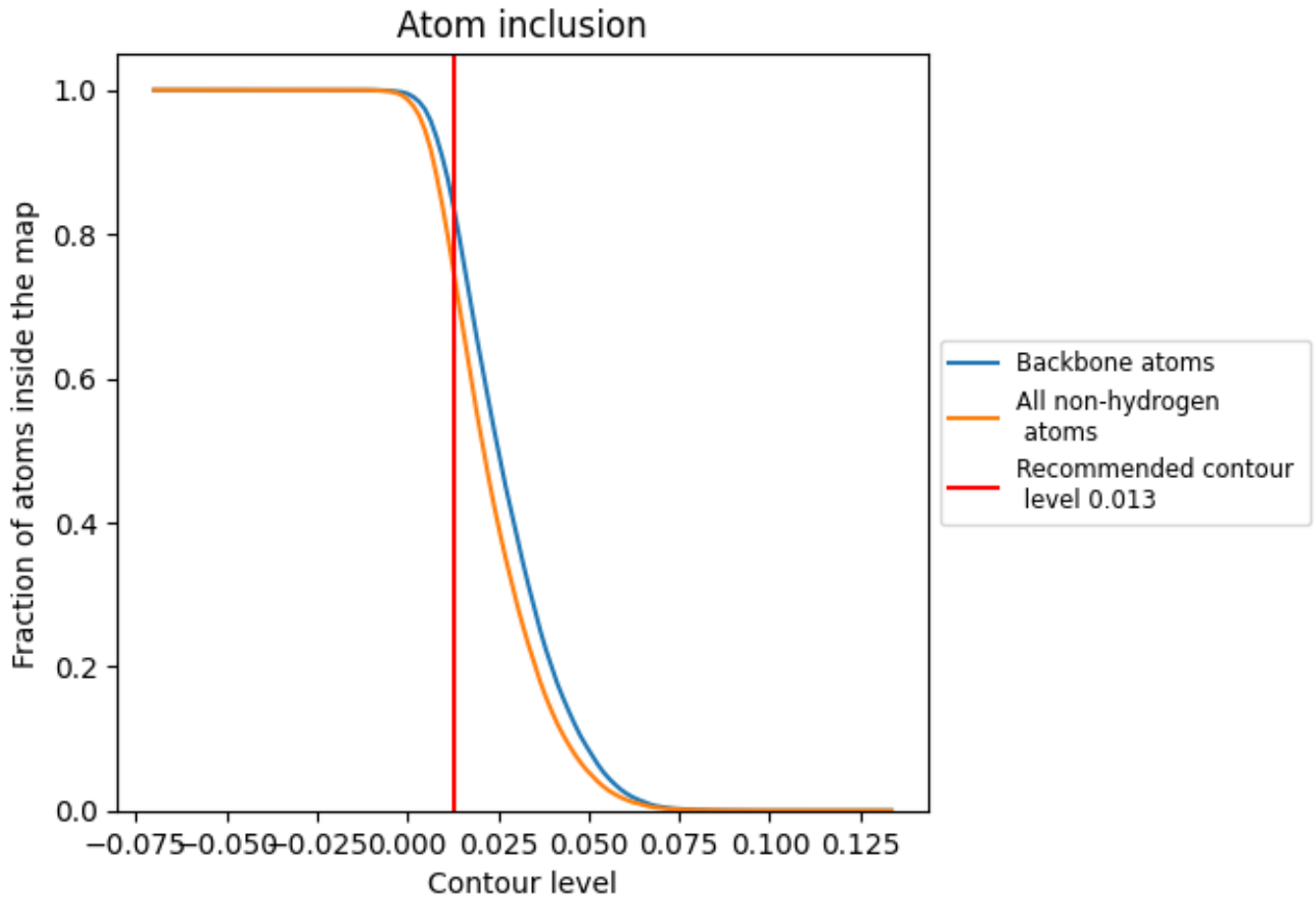
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.013).

9.4 Atom inclusion (i)



At the recommended contour level, 83% of all backbone atoms, 74% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.013) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7395	0.5050
1	0.7210	0.5160
2	0.8892	0.5870
3	0.6207	0.4840
4	0.8668	0.5810
5	0.8026	0.5500
6	0.7541	0.5340
8	0.6166	0.4360
9	0.6455	0.4770
A	0.7031	0.4450
B	0.6197	0.4310
C	0.8325	0.5500
D	0.7466	0.5110
E	0.5736	0.4060
F	0.7456	0.5090
G	0.8299	0.5570
H	0.5816	0.4270
I	0.8123	0.5120
J	0.7426	0.5310
K	0.6783	0.4590
L	0.8274	0.5580
M	0.7829	0.5110
O	0.4216	0.3240
P	0.7227	0.4990
Q	0.5619	0.4290
R	0.6779	0.4640
S	0.6360	0.4490
U	0.7358	0.5100
W	0.7478	0.5200
X	0.8204	0.5570
Y	0.8028	0.5380
Z	0.6962	0.5090
a	0.7228	0.5080
b	0.8612	0.5740
c	0.6372	0.4420

Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
d	0.8081	0.5300
e	0.5859	0.4580
f	0.5883	0.4050
g	0.7940	0.5220
h	0.6837	0.5010
i	0.7754	0.5190
j	0.7591	0.5210
n	0.7519	0.5140