Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 02:17 am GMT

PDB ID	:	6RFQ
EMDB ID	:	EMD-4872
Title	:	Cryo-EM structure of a respiratory complex I assembly intermediate with ND-UFAF2
Authors	:	Parey, K.; Vonck, J.
Deposited on	:	2019-04-16
Resolution	:	3.30 Å(reported)

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

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

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

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

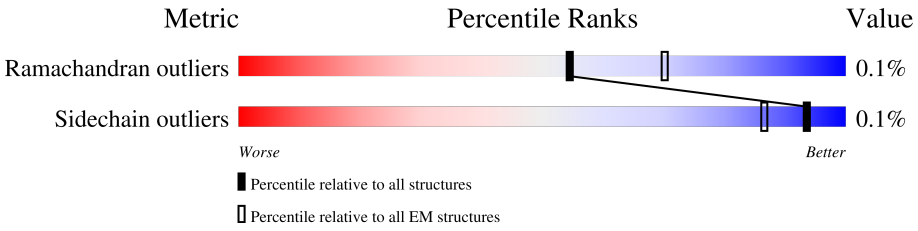
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	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 3.30 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	12% 94% • 5%
2	B	488	22% 89% • 10%
3	C	466	5% 90% • 8%
4	D	87	• 98% ••
5	E	375	15% 68% • 30%
6	F	144	8% 83% • 16%
7	G	281	• 72% • 25%
8	H	243	28% 86% • 12%
9	I	229	6% 83% 17%

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Mol	Chain	Length	Quality of chain
10	J	198	8% 89% 10%
11	K	210	19% 72% 27%
12	L	89	100%
13	O	109	47% 71% 29%
14	P	124	13% 98%
15	Q	132	12% 64% 36%
16	R	109	8% 94%
17	S	249	10% 68% 30%
18	U	172	7% 94% 5%
19	W	123	11% 94%
20	X	169	97%
21	Y	161	6% 75% 24%
22	Z	182	9% 64% 34%
23	a	149	82% 17%
24	b	74	85% 14%
25	c	60	8% 73% 27%
26	d	92	95%
27	e	67	78% 22%
28	f	87	32% 90% 9%
29	g	78	96%
30	i	90	92% 8%
31	j	93	5% 95%
32	k	237	27% 40% 59%
33	n	120	92% 5%
34	1	341	9% 90% 7%

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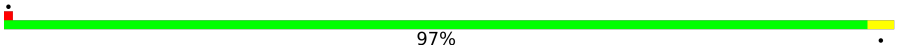
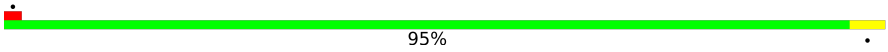
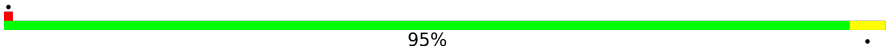
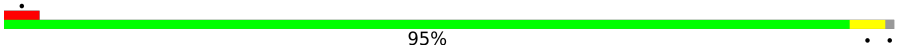
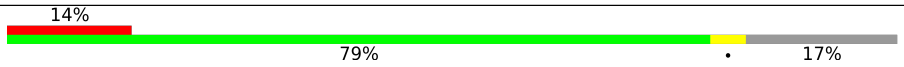
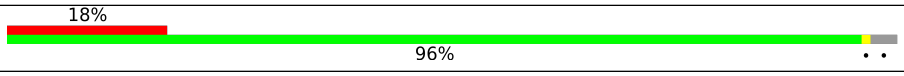
Mol	Chain	Length	Quality of chain
35	2	469	
36	3	128	
37	4	486	
38	5	655	
39	6	185	
40	8	99	
41	9	89	

2 Entry composition (i)

There are 52 unique types of molecules in this entry. The entry contains 62052 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	694	5274	3275	928	1042	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	441	3421	2161	601	635	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	430	3415	2170	583	640	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	263	2075	1315	362	390	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	210	Total	C	N	O	S	0	0
			1739	1119	297	319	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	215	Total	C	N	O	S	0	0
			1680	1054	283	325	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	153	Total	C	N	O	S	0	0
			1190	756	206	214	14		

- 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 Acyl carrier protein ACPM1 of NADH:Ubiquinone Oxidoreductase (Complex I).

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

- Molecule 14 is a protein called Subunit NB4M of protein NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
14	P	123	Total	C	N	O	S	0	0
			1036	667	182	185	2		

- Molecule 15 is a protein called Acyl carrier protein ACPM2 of NADH:Ubiquinone Oxidoreductase (Complex I).

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

- Molecule 16 is a protein called Subunit NI2M of NADH:Ubiquinone Oxidoreductase (Complex I).

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

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

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

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

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

- Molecule 19 is a protein called Subunit NB6M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
19	W	119	Total	C	N	O	S	0	0
			961	615	176	165	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
20	X	168	Total	C	N	O	S	0	0
			1305	845	223	233	4		

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Z	120	Total	C	N	O	S	0	0
			922	589	158	174	1		

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

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

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

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

- Molecule 25 is a protein called Subunit NB2M of NADH:Ubiquinone Oxidoreductase (Complex I).

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

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

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

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

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

- Molecule 28 is a protein called Subunit NI8M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
28	f	79	Total	C	N	O	S	0	0
			620	389	118	112	1		

- Molecule 29 is a protein called Subunit NI9M of NADH:Ubiquinone Oxidoreductase (Complex I).

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

There is a discrepancy between the modelled and reference sequences:

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

- Molecule 30 is a protein called Subunit N7BM of NADH:Ubiquinone Oxidoreductase (Complex I).

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

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

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

- Molecule 32 is a protein called Subunit N7BML assembly factor.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	k	98	Total	C	N	O	0	0
			828	538	148	142		

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

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

- Molecule 34 is a protein called Subunit NU1M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
34	1	318	Total	C	N	O	S	0	0
			2540	1738	369	426	7		

- Molecule 35 is a protein called Subunit NU2M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
35	2	469	Total	C	N	O	S	0	0
			3774	2557	550	655	12		

- Molecule 36 is a protein called Subunit NU3M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
36	3	108	Total	C	N	O	S	0	0
			869	600	127	140	2		

- Molecule 37 is a protein called Subunit NU4M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
37	4	486	Total	C	N	O	S	0	0
			3855	2600	586	654	15		

- Molecule 38 is a protein called Subunit NU5M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
38	5	654	Total	C	N	O	S	0	0
			5197	3479	785	905	28		

- Molecule 39 is a protein called Subunit NU6M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
39	6	183	Total	C	N	O	S	0	0
			1443	979	207	249	8		

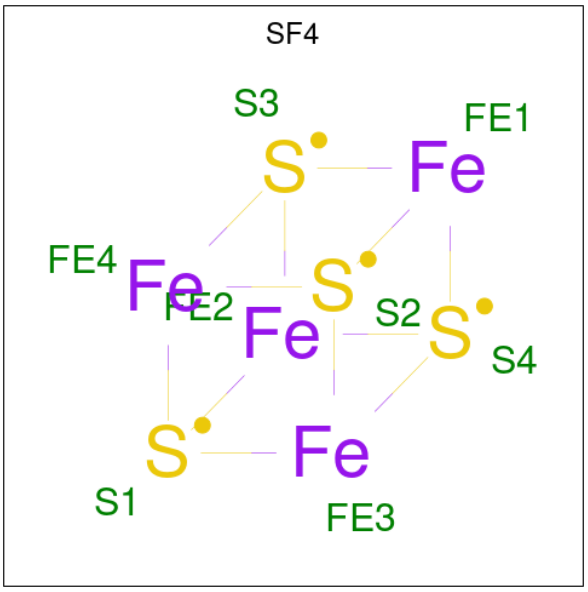
- Molecule 40 is a protein called Subunit NB8M of NADH:Ubiquinone Oxidoreductase (Complex I).

Mol	Chain	Residues	Atoms					AltConf	Trace
40	8	82	Total	C	N	O	S	0	0
			672	426	122	116	8		

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

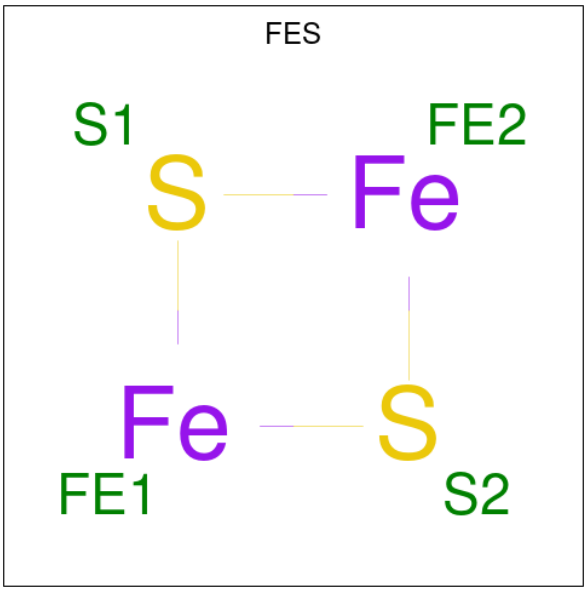
Mol	Chain	Residues	Atoms					AltConf	Trace
41	9	86	Total	C	N	O	S	0	0
			672	422	122	122	6		

- Molecule 42 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



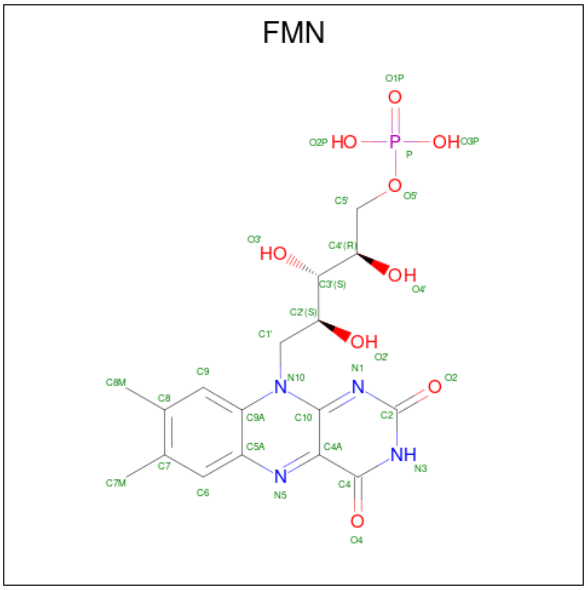
Mol	Chain	Residues	Atoms			AltConf
42	A	1	Total	Fe	S	0
			16	8	8	
42	A	1	Total	Fe	S	0
			16	8	8	
42	B	1	Total	Fe	S	0
			8	4	4	
42	I	1	Total	Fe	S	0
			16	8	8	
42	I	1	Total	Fe	S	0
			16	8	8	
42	K	1	Total	Fe	S	0
			8	4	4	

- Molecule 43 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



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

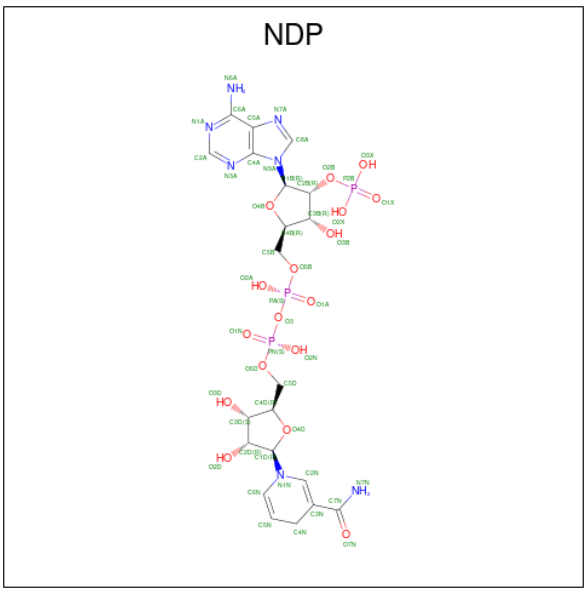
- Molecule 44 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



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

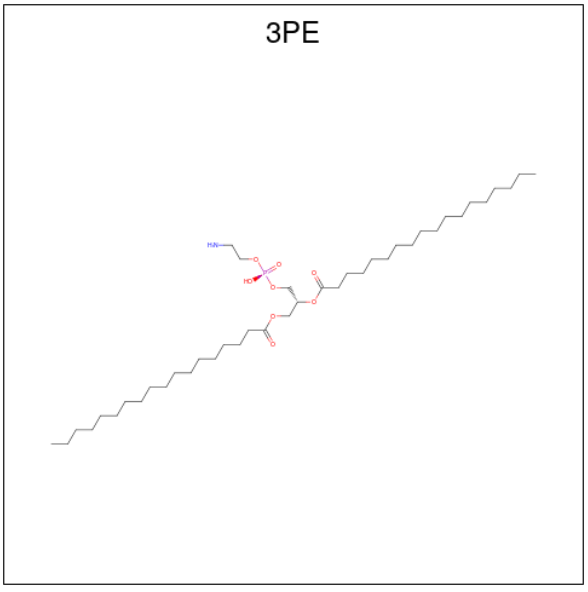
- Molecule 45 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE

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



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

- Molecule 46 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOETHANOLAMINE (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



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

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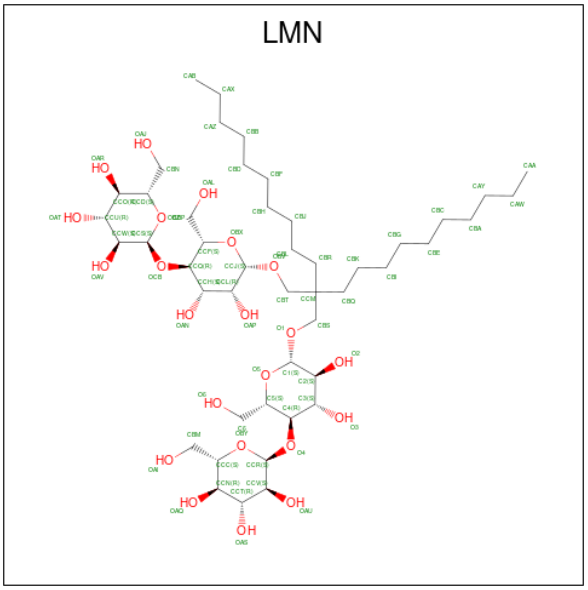
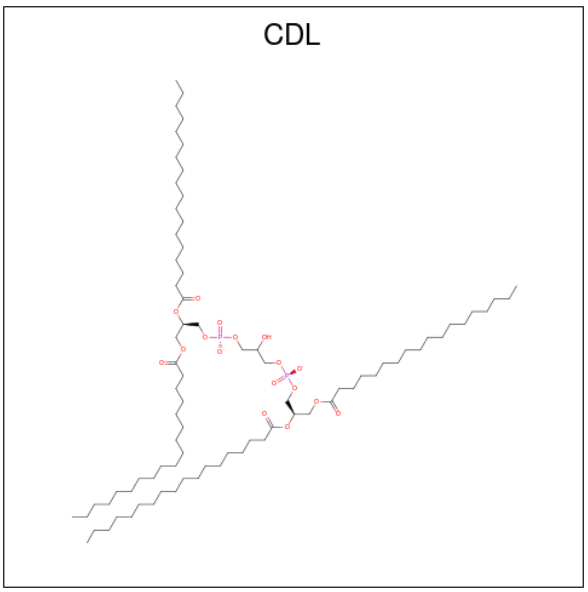
Mol	Chain	Residues	Atoms					AltConf
46	J	1	Total	C	N	O	P	0
			85	65	2	16	2	
46	J	1	Total	C	N	O	P	0
			85	65	2	16	2	
46	g	1	Total	C	N	O	P	0
			43	33	1	8	1	
46	4	1	Total	C	N	O	P	0
			136	106	3	24	3	
46	4	1	Total	C	N	O	P	0
			136	106	3	24	3	
46	4	1	Total	C	N	O	P	0
			136	106	3	24	3	
46	5	1	Total	C	N	O	P	0
			93	73	2	16	2	
46	5	1	Total	C	N	O	P	0
			93	73	2	16	2	
46	6	1	Total	C	N	O	P	0
			36	26	1	8	1	

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



Mol	Chain	Residues	Atoms			AltConf
47	J	1	Total	C	O	0
			69	47	22	
47	j	1	Total	C	O	0
			65	43	22	

- Molecule 48 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).

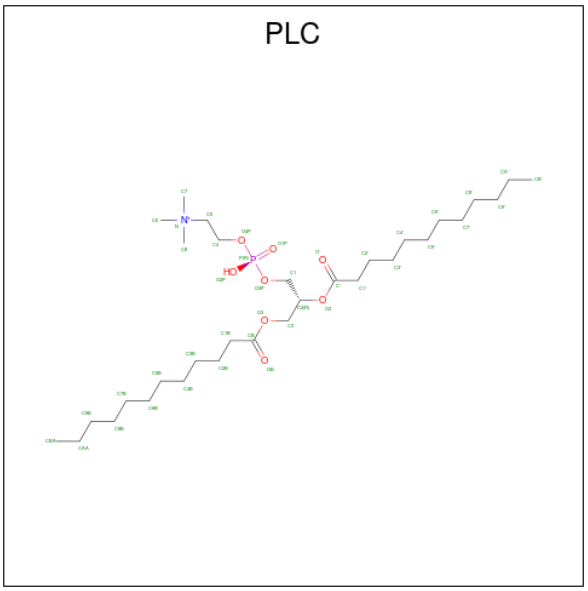


Mol	Chain	Residues	Atoms				AltConf
48	J	1	Total	C	O	P	0
			78	59	17	2	
48	X	1	Total	C	O	P	0
			82	63	17	2	
48	g	1	Total	C	O	P	0
			83	64	17	2	
48	4	1	Total	C	O	P	0
			92	73	17	2	

- Molecule 49 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
49	O	1	Total	C	N	O	P	S	0
			33	22	2	7	1	1	
49	Q	1	Total	C	N	O	P	S	0
			33	22	2	7	1	1	

- Molecule 50 is DIUNDECYL PHOSPHATIDYL CHOLINE (three-letter code: PLC) (formula: $C_{32}H_{65}NO_8P$).



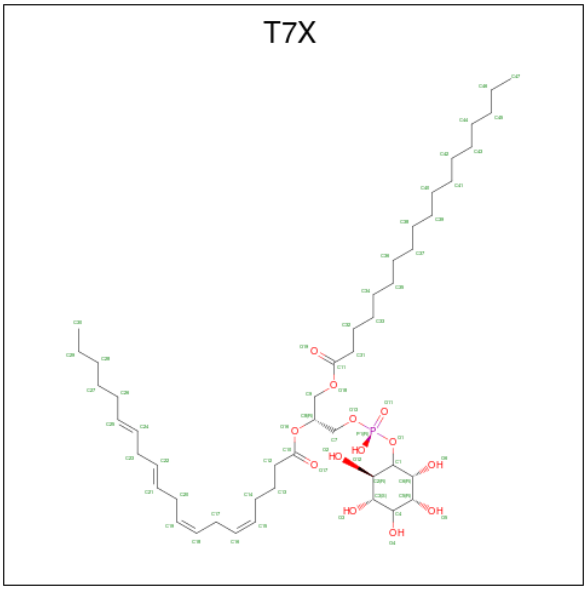
Mol	Chain	Residues	Atoms					AltConf
50	W	1	Total	C	N	O	P	0
			83	63	2	16	2	

Continued on next page...

Continued from previous page...

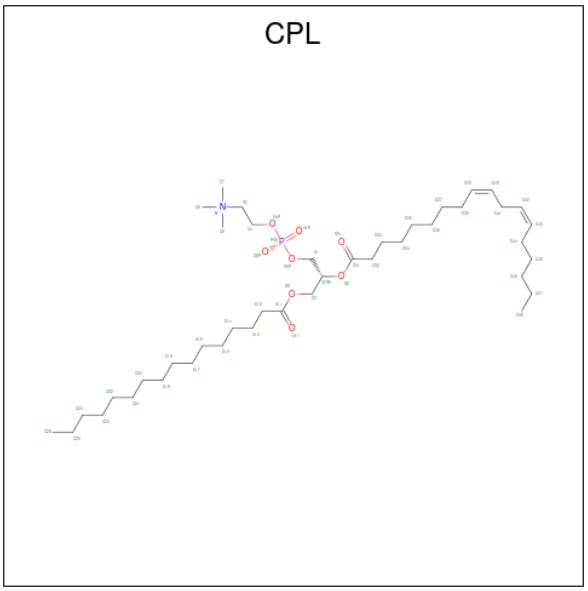
Mol	Chain	Residues	Atoms					AltConf
50	W	1	Total	C	N	O	P	0
			83	63	2	16	2	
50	n	1	Total	C	N	O	P	0
			42	32	1	8	1	
50	5	1	Total	C	N	O	P	0
			31	21	1	8	1	

- Molecule 51 is Phosphatidylinositol (three-letter code: T7X) (formula: $C_{47}H_{83}O_{13}P$).



Mol	Chain	Residues	Atoms				AltConf
51	2	1	Total	C	O	P	0
			100	72	26	2	
51	2	1	Total	C	O	P	0
			100	72	26	2	
51	4	1	Total	C	O	P	0
			43	29	13	1	

- Molecule 52 is 1-PALMITOYL-2-LINOLEOYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: CPL) (formula: $C_{42}H_{80}NO_8P$).



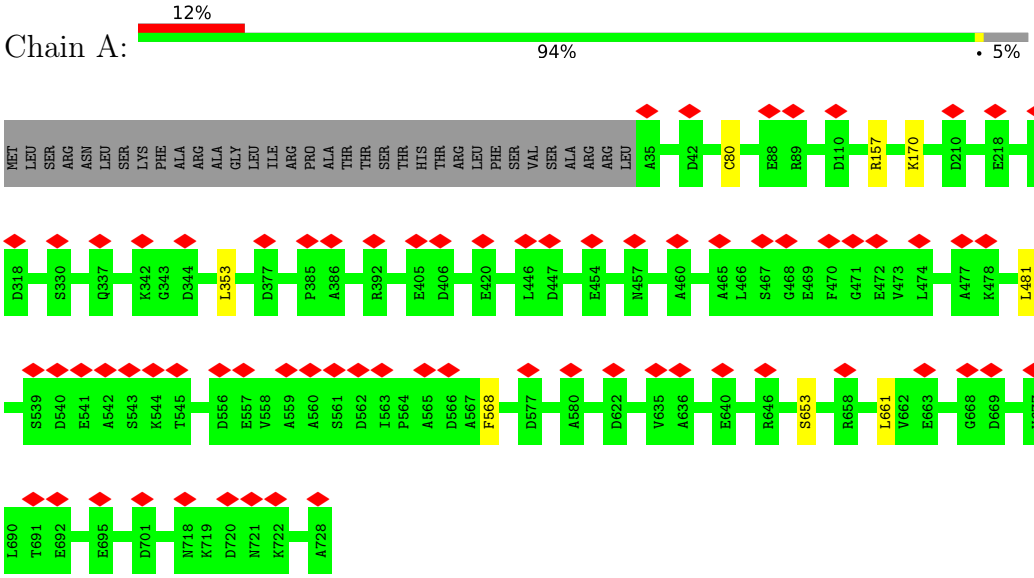
Mol	Chain	Residues	Atoms					AltConf
52	2	1	Total	C	N	O	P	0
			52	42	1	8	1	

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.

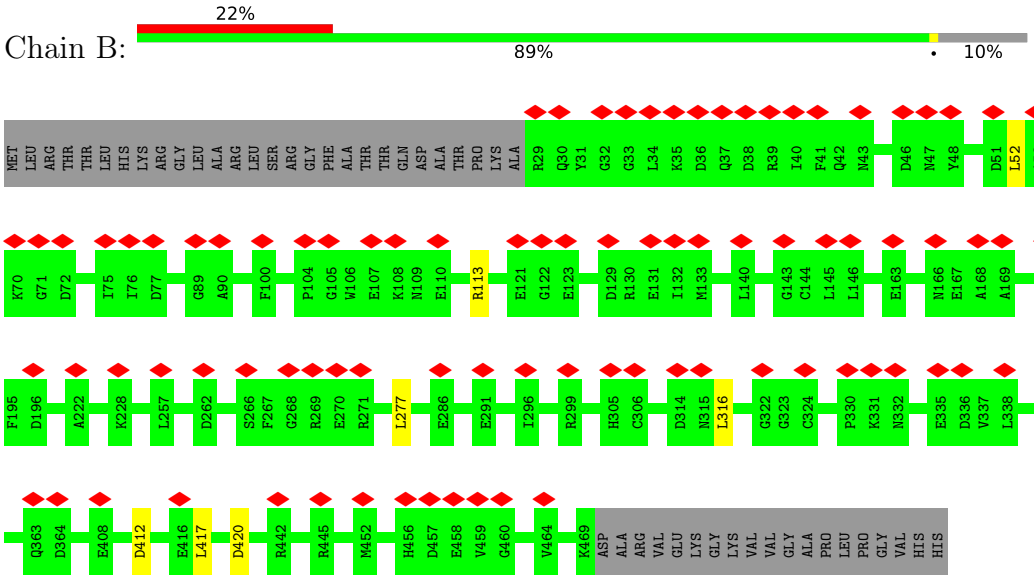
• Molecule 1: Subunit NUAM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain A:



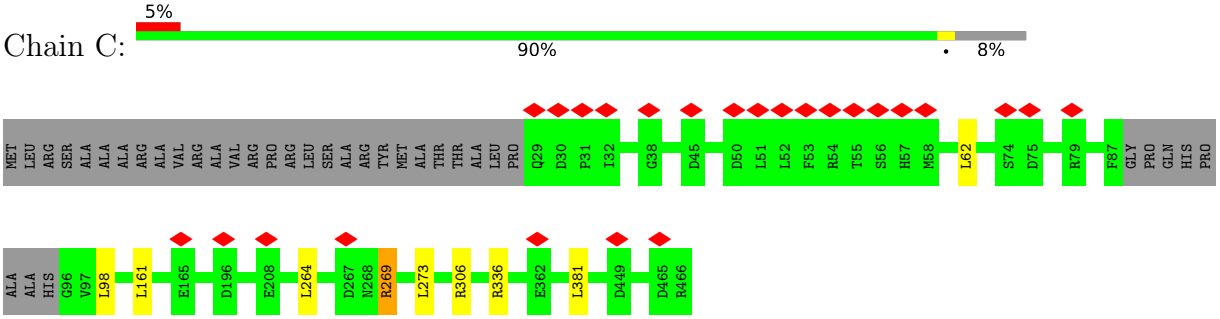
• Molecule 2: Subunit NUBM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain B:



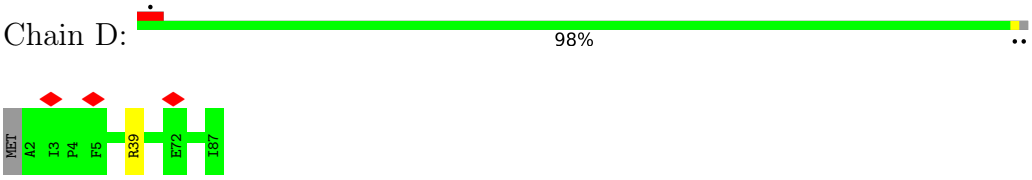
• Molecule 3: Subunit NUCM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain C:



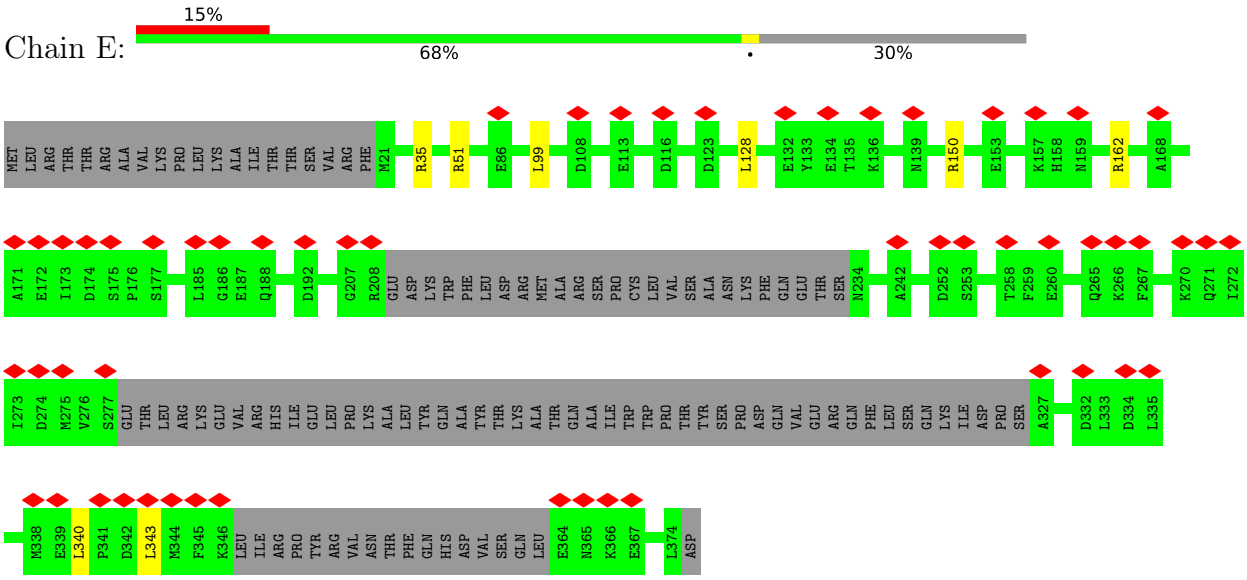
• Molecule 4: Subunit NIMM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain D:



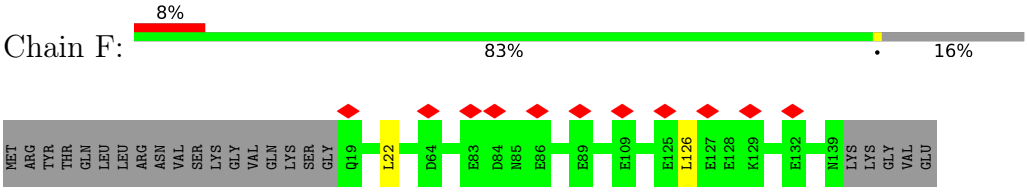
• Molecule 5: Subunit NUEM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain E:



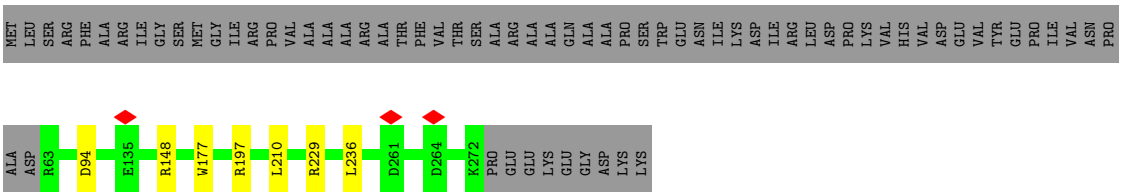
• Molecule 6: Subunit NUFM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain F:



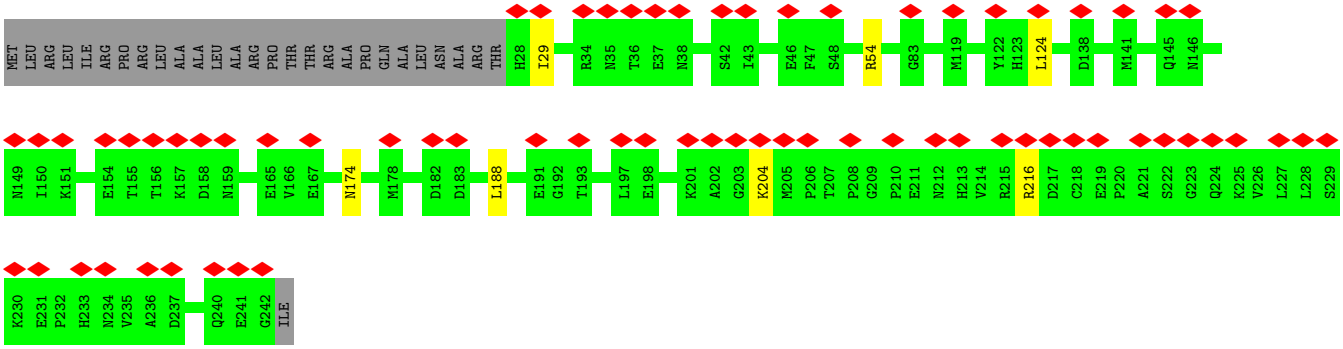
• Molecule 7: Subunit NUGM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain G:



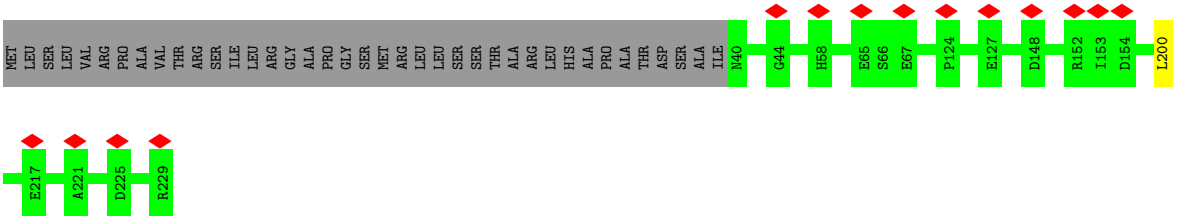
• Molecule 8: Subunit NUHM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain H:



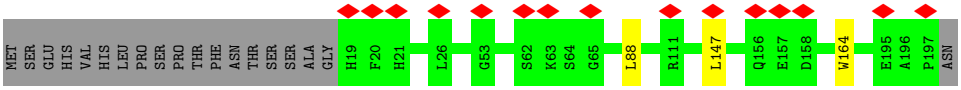
• Molecule 9: Subunit NUIM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain I:



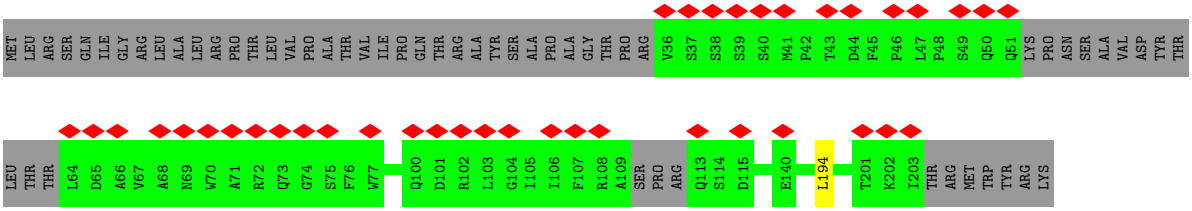
• Molecule 10: Subunit NUJM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain J:



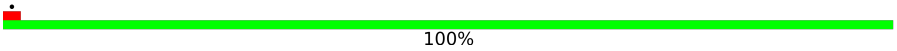
• Molecule 11: Subunit NUKM of NADH:Ubiquinone Oxidoreductase (Complex I)

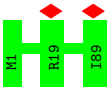
Chain K:



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

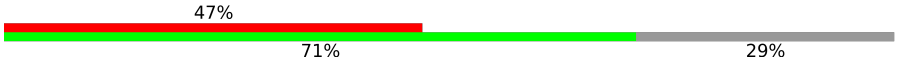
Chain L:

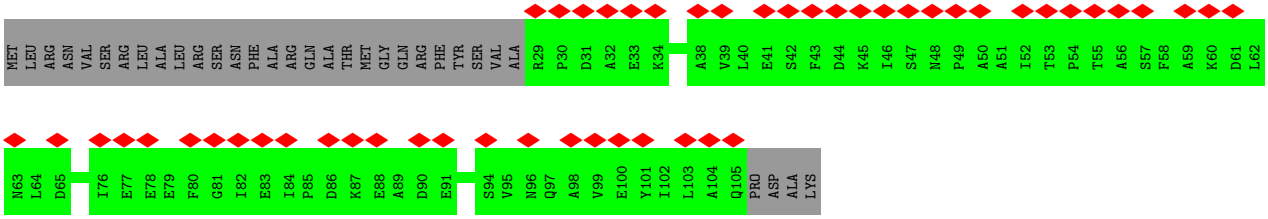




• Molecule 13: Acyl carrier protein ACPM1 of NADH:Ubiquinone Oxidoreductase (Complex I)

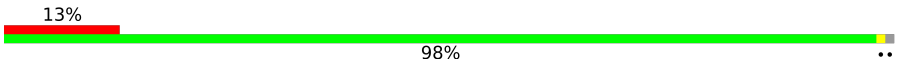
Chain O:

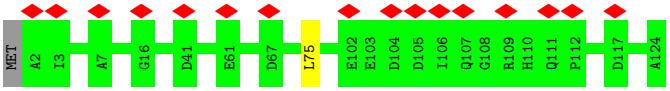




• Molecule 14: Subunit NB4M of protein NADH:Ubiquinone Oxidoreductase (Complex I)

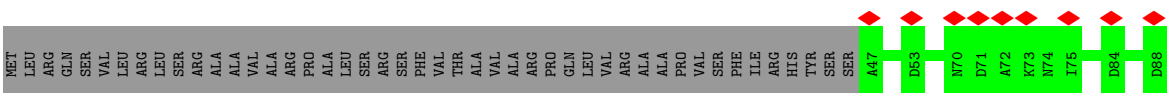
Chain P:





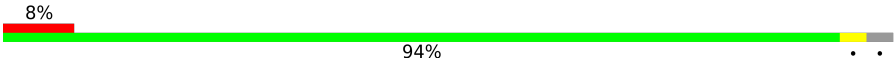
• Molecule 15: Acyl carrier protein ACPM2 of NADH:Ubiquinone Oxidoreductase (Complex I)

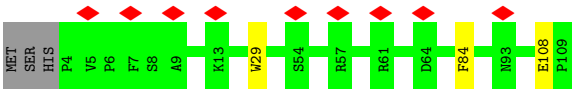
Chain Q:



• Molecule 16: Subunit NI2M of NADH:Ubiquinone Oxidoreductase (Complex I)

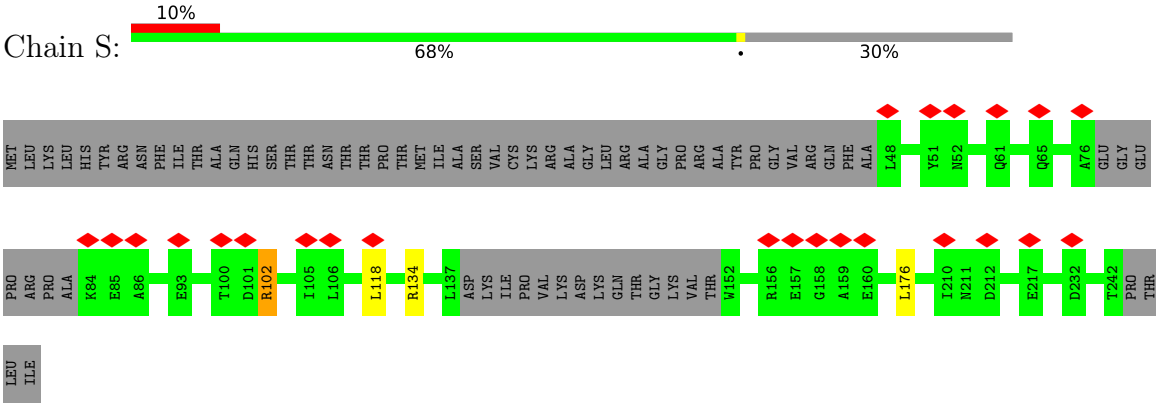
Chain R:





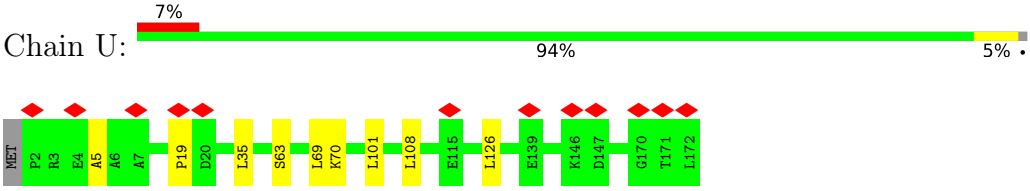
• Molecule 17: Subunit NESM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain S:



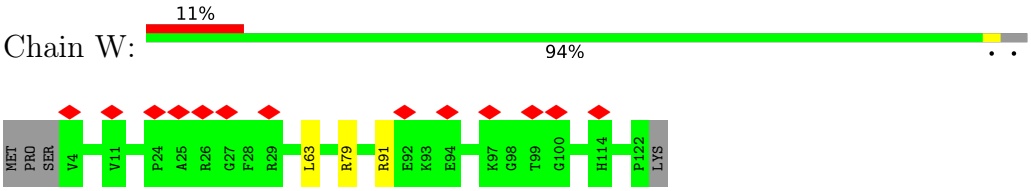
• Molecule 18: Subunit NUPM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain U:



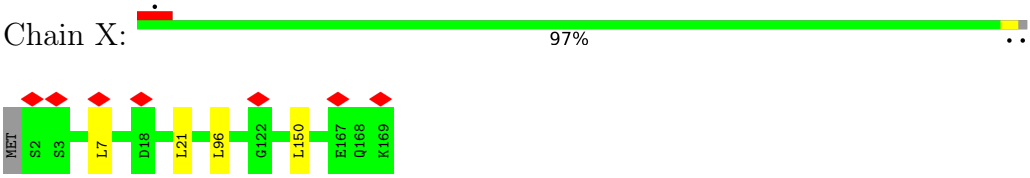
• Molecule 19: Subunit NB6M of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain W:



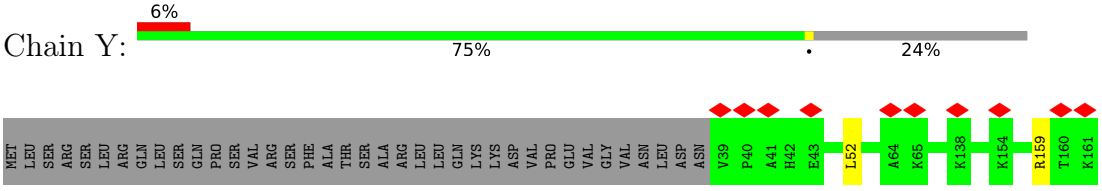
• Molecule 20: Subunit NUXM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain X:



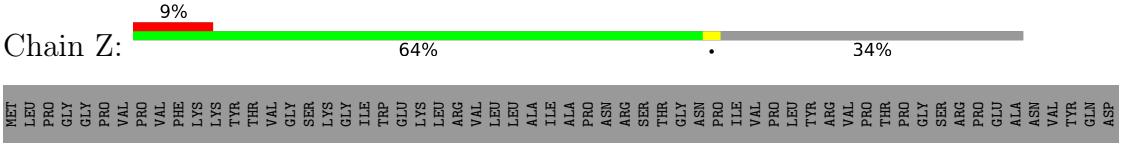
• Molecule 21: Subunit NUYM of NADH:Ubiquinone Oxidoreductase (Complex I)

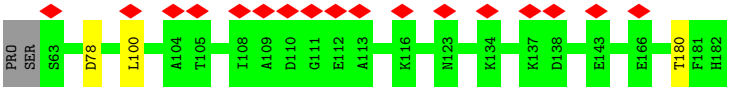
Chain Y:



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

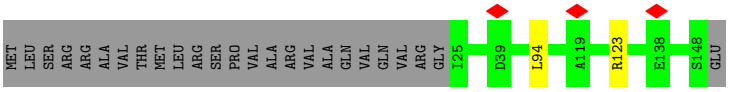
Chain Z:





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

Chain a:

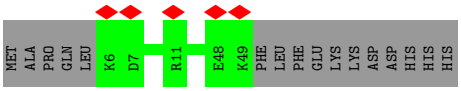


• Molecule 24: Subunit NEBM of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain b:

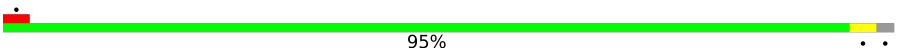
• Molecule 25: Subunit NB2M of NADH:Ubiquinone Oxidoreductase (Complex I)

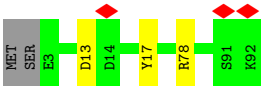
Chain c:



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

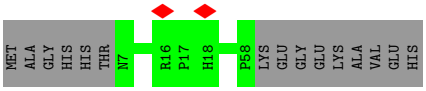
Chain d:





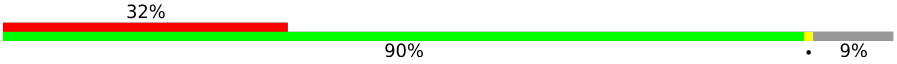
• Molecule 27: Subunit NUVM of NADH:Ubiquinone Oxidoreductase (Complex I)

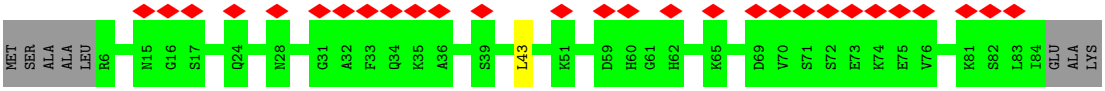
Chain e:



• Molecule 28: Subunit NI8M of NADH:Ubiquinone Oxidoreductase (Complex I)

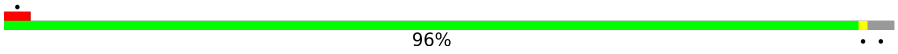
Chain f:

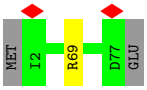




• Molecule 29: Subunit NI9M of NADH:Ubiquinone Oxidoreductase (Complex I)

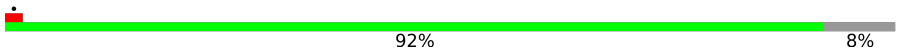
Chain g:

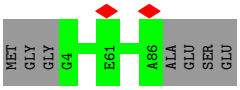




• Molecule 30: Subunit N7BM of NADH:Ubiquinone Oxidoreductase (Complex I)

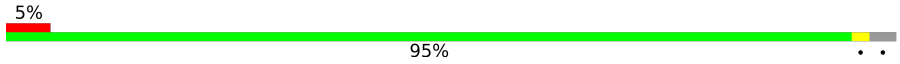
Chain i:

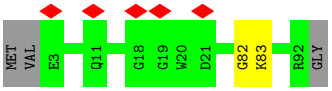




• Molecule 31: Subunit NUUM of NADH:Ubiquinone Oxidoreductase (Complex I)

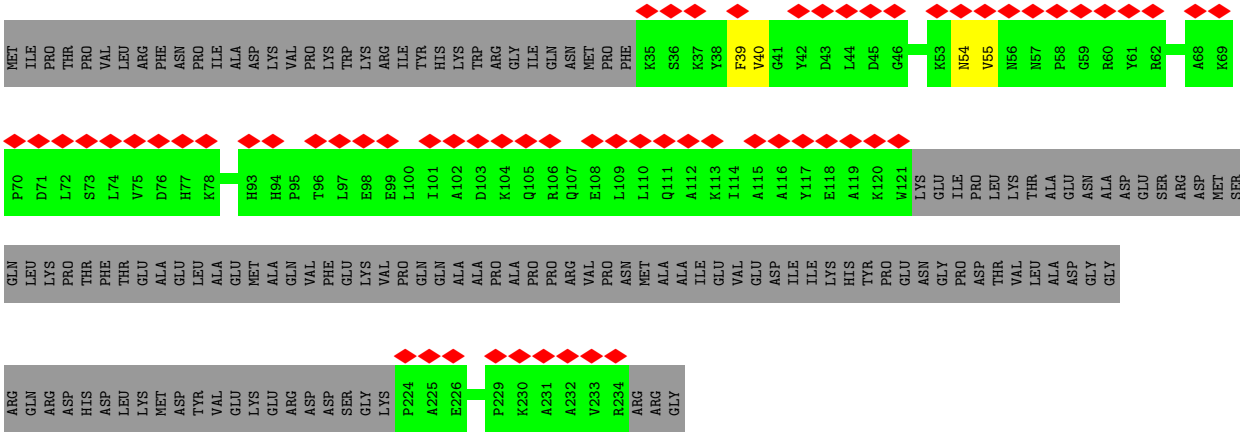
Chain j:





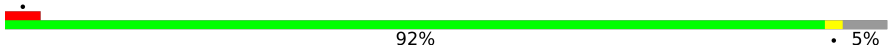
• Molecule 32: Subunit N7BML assembly factor

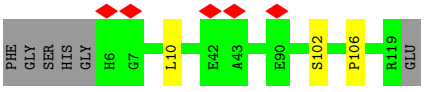
Chain k:



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

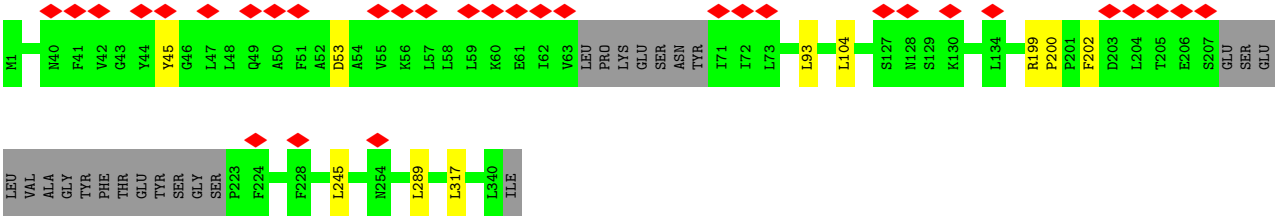
Chain n:





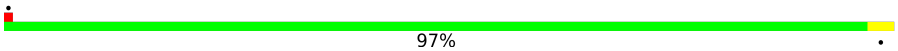
• Molecule 34: Subunit NU1M of NADH:Ubiquinone Oxidoreductase (Complex I)

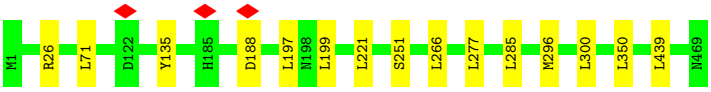
Chain 1:



• Molecule 35: Subunit NU2M of NADH:Ubiquinone Oxidoreductase (Complex I)

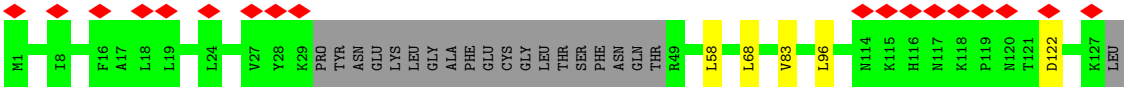
Chain 2:





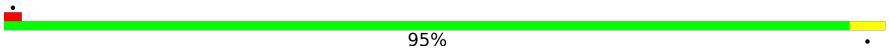
• Molecule 36: Subunit NU3M of NADH:Ubiquinone Oxidoreductase (Complex I)

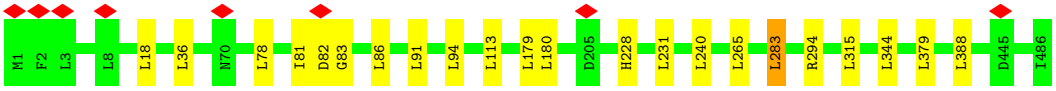
Chain 3:



• Molecule 37: Subunit NU4M of NADH:Ubiquinone Oxidoreductase (Complex I)

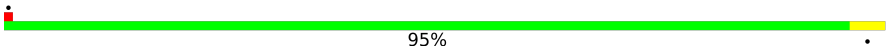
Chain 4:

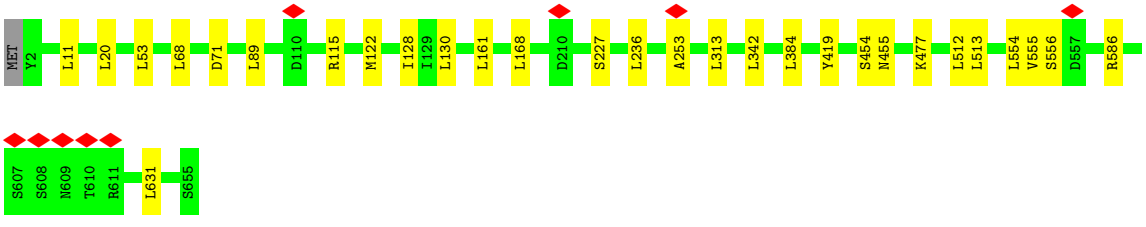




• Molecule 38: Subunit NU5M of NADH:Ubiquinone Oxidoreductase (Complex I)

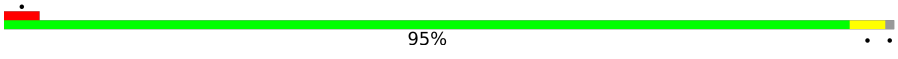
Chain 5:

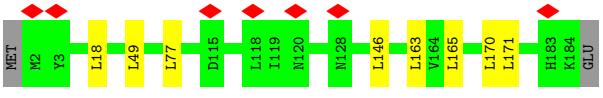




• Molecule 39: Subunit NU6M of NADH:Ubiquinone Oxidoreductase (Complex I)

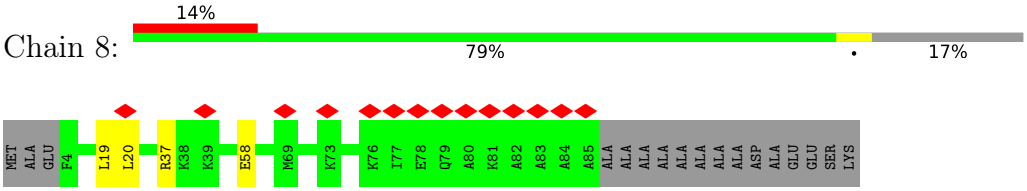
Chain 6:





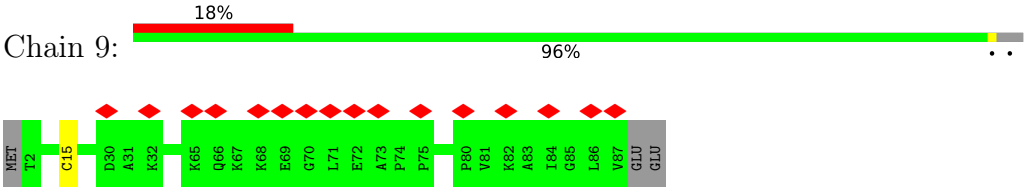
• Molecule 40: Subunit NB8M of NADH:Ubiquinone Oxidoreductase (Complex I)

Chain 8:



• Molecule 41: 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	112418	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	46425	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.202	Depositor
Minimum map value	-0.072	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.021	Depositor
Map size (Å)	491.112, 491.112, 491.112	wwPDB
Map dimensions	456, 456, 456	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.077, 1.077, 1.077	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: LMN, CDL, SF4, FES, NDP, ZMP, FMN, PLC, CPL, 3PE, 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	0.51	2/5368 (0.0%)	0.69	4/7285 (0.1%)
2	B	0.56	5/3496 (0.1%)	0.79	10/4717 (0.2%)
3	C	0.63	0/3492	0.83	8/4729 (0.2%)
4	D	0.56	0/697	0.78	2/940 (0.2%)
5	E	0.48	0/2113	0.78	8/2854 (0.3%)
6	F	0.45	0/1011	0.74	2/1371 (0.1%)
7	G	0.64	0/1793	0.81	5/2441 (0.2%)
8	H	0.40	0/1717	0.69	2/2332 (0.1%)
9	I	0.62	0/1557	0.75	1/2110 (0.0%)
10	J	0.52	1/1362 (0.1%)	0.75	2/1855 (0.1%)
11	K	0.65	0/1220	0.79	1/1656 (0.1%)
12	L	0.60	0/700	0.83	0/947
13	O	0.33	0/598	0.60	0/813
14	P	0.50	0/1061	0.70	2/1427 (0.1%)
15	Q	0.41	0/654	0.66	0/890
16	R	0.53	1/909 (0.1%)	0.72	0/1229
17	S	0.49	0/1454	0.75	3/1960 (0.2%)
18	U	0.52	0/1374	0.81	5/1856 (0.3%)
19	W	0.50	0/984	0.72	2/1327 (0.2%)
20	X	0.57	0/1344	0.71	5/1822 (0.3%)
21	Y	0.51	0/1051	0.69	3/1420 (0.2%)
22	Z	0.46	0/947	0.72	3/1291 (0.2%)
23	a	0.60	0/1064	0.79	3/1439 (0.2%)
24	b	0.48	0/503	0.78	1/679 (0.1%)
25	c	0.48	0/364	0.59	0/491
26	d	0.64	0/776	0.75	0/1043
27	e	0.43	0/456	0.62	0/619
28	f	0.39	0/630	0.71	1/844 (0.1%)
29	g	0.47	0/643	0.64	1/880 (0.1%)
30	i	0.52	0/666	0.65	0/907
31	j	0.52	0/745	0.65	0/1006
32	k	0.46	0/856	0.75	0/1163

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	n	0.58	0/943	0.77	2/1279 (0.2%)
34	1	0.67	0/2608	0.94	10/3558 (0.3%)
35	2	0.78	3/3854 (0.1%)	0.94	14/5252 (0.3%)
36	3	0.56	0/888	0.95	5/1210 (0.4%)
37	4	0.72	1/3949 (0.0%)	0.91	18/5392 (0.3%)
38	5	0.67	2/5327 (0.0%)	0.87	20/7273 (0.3%)
39	6	0.58	0/1468	0.90	8/2003 (0.4%)
40	8	0.59	1/686 (0.1%)	0.76	2/918 (0.2%)
41	9	0.57	1/684 (0.1%)	0.72	0/918
All	All	0.59	17/62012 (0.0%)	0.80	153/84146 (0.2%)

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	1
3	C	0	2
5	E	0	1
7	G	0	1
8	H	0	5
16	R	0	2
17	S	0	1
18	U	0	3
19	W	0	1
22	Z	0	1
26	d	0	1
31	j	0	1
32	k	0	2
34	1	0	2
37	4	0	3
38	5	0	5
40	8	0	1
All	All	0	33

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	113	ARG	NE-CZ	13.65	1.50	1.33
2	B	113	ARG	CZ-NH2	-8.99	1.21	1.33
1	A	80	CYS	CB-SG	-7.53	1.69	1.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
35	2	135	TYR	CB-CG	-7.03	1.41	1.51
2	B	113	ARG	CD-NE	-6.99	1.34	1.46
2	B	113	ARG	CZ-NH1	6.79	1.41	1.33
37	4	294	ARG	CA-CB	-6.71	1.39	1.53
38	5	71	ASP	CB-CG	-6.70	1.37	1.51
35	2	26	ARG	CZ-NH1	6.47	1.41	1.33
38	5	419	TYR	CD1-CE1	-6.19	1.30	1.39
1	A	653	SER	CB-OG	6.07	1.50	1.42
16	R	29	TRP	CB-CG	-5.66	1.40	1.50
40	8	58	GLU	CG-CD	-5.60	1.43	1.51
2	B	113	ARG	CG-CD	5.18	1.65	1.51
35	2	251	SER	CA-CB	-5.05	1.45	1.52
10	J	164	TRP	CG-CD1	-5.04	1.29	1.36
41	9	15	CYS	CB-SG	-5.01	1.73	1.81

All (153) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	113	ARG	NE-CZ-NH1	22.27	131.43	120.30
33	n	10	LEU	C-N-CA	11.35	150.08	121.70
35	2	26	ARG	NE-CZ-NH1	11.26	125.93	120.30
3	C	381	LEU	CA-CB-CG	11.24	141.14	115.30
10	J	147	LEU	CA-CB-CG	10.68	139.87	115.30
2	B	113	ARG	NE-CZ-NH2	-10.21	115.19	120.30
7	G	94	ASP	CB-CG-OD1	9.88	127.19	118.30
38	5	128	ILE	CG1-CB-CG2	-9.86	89.71	111.40
21	Y	159	ARG	NE-CZ-NH2	9.10	124.85	120.30
35	2	277	LEU	CA-CB-CG	9.09	136.22	115.30
4	D	39	ARG	NE-CZ-NH1	9.07	124.84	120.30
1	A	225	LEU	CA-CB-CG	9.03	136.07	115.30
5	E	150	ARG	NE-CZ-NH2	8.96	124.78	120.30
39	6	77	LEU	CA-CB-CG	8.82	135.58	115.30
23	a	123	ARG	NE-CZ-NH2	-8.53	116.04	120.30
35	2	285	LEU	CA-CB-CG	8.46	134.76	115.30
24	b	48	LEU	CA-CB-CG	8.34	134.48	115.30
17	S	102	ARG	NE-CZ-NH1	8.28	124.44	120.30
37	4	388	LEU	CA-CB-CG	8.04	133.78	115.30
36	3	68	LEU	CA-CB-CG	7.98	133.65	115.30
38	5	513	LEU	CA-CB-CG	7.93	133.53	115.30
38	5	68	LEU	CA-CB-CG	7.78	133.20	115.30
2	B	417	LEU	CA-CB-CG	-7.75	97.47	115.30
18	U	101	LEU	CA-CB-CG	7.73	133.07	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	E	340	LEU	CA-CB-CG	7.68	132.95	115.30
35	2	197	LEU	CB-CG-CD1	-7.51	98.23	111.00
37	4	265	LEU	CA-CB-CG	7.50	132.55	115.30
34	1	202	PHE	CB-CG-CD1	7.49	126.05	120.80
34	1	202	PHE	CB-CG-CD2	-7.47	115.57	120.80
20	X	7	LEU	CA-CB-CG	7.45	132.44	115.30
22	Z	100	LEU	CA-CB-CG	7.42	132.38	115.30
35	2	199	LEU	CA-CB-CG	7.32	132.13	115.30
38	5	20	LEU	CB-CG-CD1	-7.30	98.59	111.00
18	U	108	LEU	CA-CB-CG	7.27	132.02	115.30
35	2	350	LEU	CA-CB-CG	7.21	131.89	115.30
3	C	62	LEU	CA-CB-CG	7.17	131.80	115.30
3	C	269	ARG	NE-CZ-NH1	-7.07	116.76	120.30
5	E	128	LEU	CA-CB-CG	6.95	131.28	115.30
40	8	19	LEU	CA-CB-CG	6.91	131.19	115.30
14	P	75	LEU	CB-CG-CD2	-6.86	99.34	111.00
34	1	289	LEU	CB-CG-CD2	-6.85	99.36	111.00
37	4	18	LEU	CA-CB-CG	6.80	130.94	115.30
38	5	53	LEU	CA-CB-CG	6.68	130.68	115.30
21	Y	159	ARG	NE-CZ-NH1	-6.62	116.99	120.30
38	5	342	LEU	CA-CB-CG	6.56	130.39	115.30
19	W	63	LEU	CA-CB-CG	6.56	130.39	115.30
38	5	115	ARG	NE-CZ-NH1	6.53	123.57	120.30
40	8	20	LEU	CA-CB-CG	6.49	130.24	115.30
37	4	86	LEU	CA-CB-CG	6.44	130.10	115.30
19	W	79	ARG	NE-CZ-NH1	-6.43	117.08	120.30
5	E	340	LEU	CB-CG-CD2	6.32	121.75	111.00
37	4	36	LEU	CB-CG-CD1	-6.23	100.41	111.00
20	X	21	LEU	CA-CB-CG	6.20	129.55	115.30
35	2	71	LEU	CA-CB-CG	6.17	129.49	115.30
38	5	161	LEU	CA-CB-CG	6.16	129.46	115.30
1	A	353	LEU	CA-CB-CG	6.14	129.43	115.30
5	E	35	ARG	NE-CZ-NH2	-6.11	117.25	120.30
20	X	96	LEU	CA-CB-CG	6.11	129.35	115.30
38	5	68	LEU	CB-CG-CD1	-6.11	100.61	111.00
37	4	91	LEU	CA-CB-CG	6.06	129.24	115.30
34	1	245	LEU	CA-CB-CG	6.02	129.14	115.30
37	4	315	LEU	CA-CB-CG	5.96	129.00	115.30
39	6	49	LEU	CA-CB-CG	5.95	128.98	115.30
37	4	179	LEU	CA-CB-CG	5.95	128.97	115.30
38	5	631	LEU	CA-CB-CG	5.93	128.94	115.30
1	A	481	LEU	CA-CB-CG	5.93	128.93	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	E	99	LEU	CA-CB-CG	5.92	128.91	115.30
38	5	89	LEU	CB-CG-CD1	-5.90	100.97	111.00
37	4	180	LEU	CA-CB-CG	5.89	128.86	115.30
37	4	240	LEU	CA-CB-CG	5.89	128.86	115.30
2	B	316	LEU	CA-CB-CG	5.88	128.83	115.30
21	Y	52	LEU	CA-CB-CG	5.83	128.71	115.30
35	2	26	ARG	NE-CZ-NH2	-5.83	117.38	120.30
22	Z	78	ASP	CB-CG-OD2	-5.81	113.07	118.30
22	Z	100	LEU	CB-CG-CD2	-5.81	101.12	111.00
33	n	102	SER	C-N-CA	-5.81	107.19	121.70
11	K	194	LEU	CB-CG-CD2	-5.80	101.13	111.00
38	5	384	LEU	CA-CB-CG	5.79	128.63	115.30
39	6	163	LEU	CA-CB-CG	5.79	128.63	115.30
37	4	78	LEU	CA-CB-CG	5.79	128.62	115.30
38	5	122	MET	CA-CB-CG	5.79	123.14	113.30
38	5	313	LEU	CB-CG-CD1	5.78	120.82	111.00
6	F	126	LEU	CA-CB-CG	5.76	128.55	115.30
39	6	171	LEU	CB-CG-CD2	-5.75	101.23	111.00
38	5	130	LEU	CA-CB-CG	5.73	128.48	115.30
28	f	43	LEU	CA-CB-CG	5.71	128.44	115.30
7	G	229	ARG	NE-CZ-NH1	5.69	123.14	120.30
17	S	176	LEU	CA-CB-CG	5.67	128.35	115.30
3	C	161	LEU	CA-CB-CG	5.64	128.26	115.30
34	1	104	LEU	CA-CB-CG	5.62	128.24	115.30
3	C	306	ARG	NE-CZ-NH2	5.61	123.11	120.30
2	B	412	ASP	CB-CG-OD1	5.60	123.34	118.30
38	5	168	LEU	CA-CB-CG	5.60	128.17	115.30
20	X	150	LEU	CA-CB-CG	5.59	128.17	115.30
38	5	122	MET	CG-SD-CE	5.59	109.14	100.20
2	B	277	LEU	CA-CB-CG	5.59	128.15	115.30
38	5	512	LEU	CA-CB-CG	5.58	128.14	115.30
23	a	94	LEU	CA-CB-CG	5.55	128.08	115.30
37	4	113	LEU	CA-CB-CG	5.55	128.06	115.30
38	5	11	LEU	CA-CB-CG	5.54	128.05	115.30
34	1	317	LEU	CB-CG-CD1	-5.53	101.60	111.00
2	B	113	ARG	NH1-CZ-NH2	-5.51	113.34	119.40
39	6	165	LEU	CB-CG-CD1	-5.50	101.64	111.00
35	2	300	LEU	CA-CB-CG	5.48	127.90	115.30
3	C	381	LEU	CB-CG-CD2	5.47	120.29	111.00
36	3	83	VAL	CG1-CB-CG2	-5.45	102.18	110.90
8	H	188	LEU	C-N-CA	5.45	135.32	121.70
35	2	296	MET	CG-SD-CE	-5.44	91.50	100.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	52	LEU	CA-CB-CG	5.43	127.80	115.30
37	4	283	LEU	CA-CB-CG	5.43	127.79	115.30
39	6	146	LEU	CB-CG-CD1	-5.42	101.78	111.00
3	C	264	LEU	CA-CB-CG	5.38	127.68	115.30
7	G	177	TRP	CA-CB-CG	5.38	123.92	113.70
18	U	35	LEU	CA-CB-CG	5.37	127.64	115.30
2	B	113	ARG	CG-CD-NE	-5.36	100.55	111.80
35	2	285	LEU	CB-CG-CD2	-5.35	101.90	111.00
8	H	124	LEU	CA-CB-CG	5.34	127.59	115.30
36	3	96	LEU	CA-CB-CG	5.33	127.56	115.30
1	A	661	LEU	CA-CB-CG	5.32	127.54	115.30
7	G	236	LEU	CA-CB-CG	5.30	127.49	115.30
34	1	93	LEU	CA-CB-CG	5.30	127.50	115.30
39	6	170	LEU	CA-CB-CG	5.30	127.49	115.30
18	U	126	LEU	CA-CB-CG	5.29	127.47	115.30
7	G	210	LEU	CA-CB-CG	5.28	127.44	115.30
5	E	343	LEU	CA-CB-CG	5.27	127.42	115.30
23	a	123	ARG	NE-CZ-NH1	5.26	122.93	120.30
6	F	22	LEU	CA-CB-CG	5.25	127.37	115.30
18	U	69	LEU	CA-CB-CG	5.24	127.34	115.30
35	2	439	LEU	CA-CB-CG	5.23	127.33	115.30
2	B	420	ASP	CB-CG-OD1	5.22	123.00	118.30
37	4	379	LEU	CB-CG-CD2	-5.21	102.13	111.00
5	E	35	ARG	NE-CZ-NH1	5.20	122.90	120.30
36	3	122	ASP	CB-CG-OD2	5.20	122.98	118.30
34	1	53	ASP	CB-CG-OD2	5.20	122.98	118.30
35	2	266	LEU	CA-CB-CG	5.17	127.19	115.30
37	4	94	LEU	CA-CB-CG	5.16	127.18	115.30
3	C	273	LEU	CB-CG-CD2	5.16	119.77	111.00
34	1	317	LEU	CA-CB-CG	5.16	127.16	115.30
36	3	58	LEU	CB-CG-CD1	-5.16	102.23	111.00
17	S	118	LEU	CA-CB-CG	5.16	127.16	115.30
9	I	200	LEU	CA-CB-CG	5.15	127.14	115.30
4	D	39	ARG	CG-CD-NE	5.15	122.61	111.80
39	6	18	LEU	CA-CB-CG	5.10	127.03	115.30
38	5	236	LEU	CB-CG-CD1	-5.08	102.36	111.00
37	4	344	LEU	CB-CG-CD1	-5.08	102.36	111.00
10	J	88	LEU	CA-CB-CG	5.07	126.97	115.30
34	1	45	TYR	CA-CB-CG	5.06	123.01	113.40
37	4	82	ASP	CB-CG-OD1	5.05	122.85	118.30
35	2	221	LEU	CA-CB-CG	-5.04	103.70	115.30
29	g	69	ARG	CA-CB-CG	5.04	124.49	113.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
37	4	231	LEU	CA-CB-CG	5.04	126.89	115.30
20	X	96	LEU	CB-CG-CD1	-5.03	102.45	111.00
14	P	75	LEU	CA-CB-CG	5.02	126.84	115.30

There are no chirality outliers.

All (33) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
34	1	199	ARG	Sidechain
34	1	200	PRO	Peptide
37	4	228	HIS	Peptide
37	4	283	LEU	Peptide
37	4	81	ILE	Peptide
38	5	227	SER	Peptide
38	5	253	ALA	Peptide
38	5	454	SER	Peptide
38	5	554	LEU	Peptide
38	5	586	ARG	Sidechain
40	8	37	ARG	Sidechain
1	A	568	PHE	Peptide
3	C	269	ARG	Sidechain
3	C	336	ARG	Sidechain
5	E	51	ARG	Sidechain
7	G	148	ARG	Sidechain
8	H	174	ASN	Peptide
8	H	204	LYS	Peptide
8	H	216	ARG	Peptide
8	H	29	ILE	Peptide
8	H	54	ARG	Sidechain
16	R	108	GLU	Peptide
16	R	84	PHE	Peptide
17	S	134	ARG	Sidechain
18	U	5	ALA	Peptide
18	U	63	SER	Peptide
18	U	70	LYS	Peptide
19	W	91	ARG	Sidechain
22	Z	180	THR	Peptide
26	d	78	ARG	Sidechain
31	j	82	GLY	Peptide
32	k	39	PHE	Peptide
32	k	54	ASN	Peptide

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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	692/728 (95%)	642 (93%)	50 (7%)	0	100	100
2	B	439/488 (90%)	409 (93%)	30 (7%)	0	100	100
3	C	426/466 (91%)	396 (93%)	30 (7%)	0	100	100
4	D	84/87 (97%)	79 (94%)	5 (6%)	0	100	100
5	E	255/375 (68%)	241 (94%)	14 (6%)	0	100	100
6	F	119/144 (83%)	109 (92%)	10 (8%)	0	100	100
7	G	208/281 (74%)	195 (94%)	13 (6%)	0	100	100
8	H	213/243 (88%)	191 (90%)	22 (10%)	0	100	100
9	I	188/229 (82%)	176 (94%)	12 (6%)	0	100	100
10	J	177/198 (89%)	164 (93%)	13 (7%)	0	100	100
11	K	147/210 (70%)	136 (92%)	11 (8%)	0	100	100
12	L	87/89 (98%)	84 (97%)	3 (3%)	0	100	100
13	O	75/109 (69%)	71 (95%)	4 (5%)	0	100	100
14	P	121/124 (98%)	113 (93%)	8 (7%)	0	100	100
15	Q	83/132 (63%)	80 (96%)	3 (4%)	0	100	100
16	R	104/109 (95%)	93 (89%)	11 (11%)	0	100	100
17	S	168/249 (68%)	156 (93%)	12 (7%)	0	100	100
18	U	169/172 (98%)	153 (90%)	15 (9%)	1 (1%)	25	57
19	W	117/123 (95%)	112 (96%)	5 (4%)	0	100	100
20	X	166/169 (98%)	156 (94%)	10 (6%)	0	100	100
21	Y	121/161 (75%)	113 (93%)	8 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
22	Z	118/182 (65%)	107 (91%)	11 (9%)	0	100	100
23	a	122/149 (82%)	109 (89%)	13 (11%)	0	100	100
24	b	62/74 (84%)	60 (97%)	2 (3%)	0	100	100
25	c	42/60 (70%)	38 (90%)	4 (10%)	0	100	100
26	d	88/92 (96%)	82 (93%)	5 (6%)	1 (1%)	14	45
27	e	50/67 (75%)	49 (98%)	1 (2%)	0	100	100
28	f	77/87 (88%)	67 (87%)	10 (13%)	0	100	100
29	g	74/78 (95%)	64 (86%)	10 (14%)	0	100	100
30	i	81/90 (90%)	77 (95%)	4 (5%)	0	100	100
31	j	88/93 (95%)	81 (92%)	6 (7%)	1 (1%)	14	45
32	k	94/237 (40%)	86 (92%)	6 (6%)	2 (2%)	7	31
33	n	112/120 (93%)	96 (86%)	15 (13%)	1 (1%)	17	48
34	1	312/341 (92%)	292 (94%)	20 (6%)	0	100	100
35	2	467/469 (100%)	436 (93%)	30 (6%)	1 (0%)	47	77
36	3	104/128 (81%)	98 (94%)	6 (6%)	0	100	100
37	4	484/486 (100%)	455 (94%)	28 (6%)	1 (0%)	47	77
38	5	652/655 (100%)	605 (93%)	44 (7%)	3 (0%)	29	61
39	6	181/185 (98%)	166 (92%)	15 (8%)	0	100	100
40	8	80/99 (81%)	75 (94%)	5 (6%)	0	100	100
41	9	84/89 (94%)	78 (93%)	6 (7%)	0	100	100
All	All	7531/8667 (87%)	6990 (93%)	530 (7%)	11 (0%)	54	81

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
32	k	40	VAL
32	k	55	VAL
38	5	555	VAL
38	5	556	SER
35	2	188	ASP
31	j	83	LYS
26	d	17	TYR
38	5	455	ASN
18	U	19	PRO
33	n	106	PRO

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Mol	Chain	Res	Type
37	4	83	GLY

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	566/595 (95%)	563 (100%)	3 (0%)	88 93
2	B	353/389 (91%)	353 (100%)	0	100 100
3	C	369/394 (94%)	368 (100%)	1 (0%)	92 96
4	D	68/69 (99%)	68 (100%)	0	100 100
5	E	225/329 (68%)	224 (100%)	1 (0%)	91 95
6	F	109/129 (84%)	109 (100%)	0	100 100
7	G	188/245 (77%)	187 (100%)	1 (0%)	88 93
8	H	190/212 (90%)	190 (100%)	0	100 100
9	I	156/187 (83%)	156 (100%)	0	100 100
10	J	130/147 (88%)	130 (100%)	0	100 100
11	K	131/180 (73%)	131 (100%)	0	100 100
12	L	77/77 (100%)	77 (100%)	0	100 100
13	O	65/91 (71%)	65 (100%)	0	100 100
14	P	109/110 (99%)	109 (100%)	0	100 100
15	Q	72/111 (65%)	72 (100%)	0	100 100
16	R	97/100 (97%)	97 (100%)	0	100 100
17	S	149/211 (71%)	148 (99%)	1 (1%)	84 90
18	U	147/148 (99%)	147 (100%)	0	100 100
19	W	98/102 (96%)	98 (100%)	0	100 100
20	X	132/133 (99%)	132 (100%)	0	100 100
21	Y	105/140 (75%)	105 (100%)	0	100 100
22	Z	95/148 (64%)	95 (100%)	0	100 100
23	a	108/129 (84%)	108 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
24	b	50/59 (85%)	50 (100%)	0	100 100
25	c	30/45 (67%)	30 (100%)	0	100 100
26	d	83/85 (98%)	82 (99%)	1 (1%)	71 83
27	e	44/55 (80%)	44 (100%)	0	100 100
28	f	68/73 (93%)	68 (100%)	0	100 100
29	g	62/64 (97%)	62 (100%)	0	100 100
30	i	64/68 (94%)	64 (100%)	0	100 100
31	j	71/73 (97%)	71 (100%)	0	100 100
32	k	86/207 (42%)	86 (100%)	0	100 100
33	n	98/102 (96%)	98 (100%)	0	100 100
34	1	282/302 (93%)	282 (100%)	0	100 100
35	2	433/433 (100%)	433 (100%)	0	100 100
36	3	97/114 (85%)	97 (100%)	0	100 100
37	4	434/434 (100%)	434 (100%)	0	100 100
38	5	579/580 (100%)	578 (100%)	1 (0%)	93 97
39	6	165/167 (99%)	165 (100%)	0	100 100
40	8	69/76 (91%)	69 (100%)	0	100 100
41	9	73/76 (96%)	73 (100%)	0	100 100
All	All	6527/7389 (88%)	6518 (100%)	9 (0%)	93 97

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	157	ARG
1	A	170	LYS
1	A	253	LYS
3	C	98	LEU
5	E	162	ARG
7	G	197	ARG
17	S	102	ARG
26	d	13	ASP
38	5	477	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (74) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	147	GLN
1	A	209	ASN
1	A	212	GLN
1	A	240	ASN
1	A	322	ASN
1	A	398	ASN
1	A	724	ASN
2	B	47	ASN
3	C	163	ASN
3	C	284	GLN
3	C	342	GLN
3	C	383	HIS
5	E	76	HIS
5	E	127	ASN
5	E	181	HIS
5	E	365	ASN
5	E	372	HIS
6	F	77	HIS
7	G	67	HIS
8	H	174	ASN
10	J	31	GLN
11	K	158	HIS
16	R	105	ASN
17	S	132	ASN
18	U	17	ASN
18	U	107	GLN
19	W	53	GLN
20	X	13	ASN
20	X	27	HIS
20	X	142	ASN
21	Y	99	GLN
22	Z	182	HIS
23	a	61	GLN
23	a	90	ASN
24	b	51	HIS
25	c	20	ASN
26	d	18	ASN
27	e	23	HIS
29	g	25	HIS
32	k	93	HIS
33	n	64	ASN
34	1	49	GLN
35	2	86	ASN

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Mol	Chain	Res	Type
35	2	185	HIS
35	2	278	GLN
35	2	340	GLN
35	2	385	ASN
35	2	393	ASN
36	3	85	ASN
36	3	120	ASN
37	4	23	ASN
37	4	26	HIS
37	4	103	ASN
37	4	106	ASN
37	4	153	HIS
37	4	197	HIS
37	4	235	HIS
37	4	335	HIS
37	4	424	GLN
37	4	469	GLN
38	5	76	ASN
38	5	100	HIS
38	5	251	HIS
38	5	268	ASN
38	5	491	HIS
38	5	529	ASN
38	5	574	ASN
38	5	578	HIS
38	5	638	ASN
39	6	90	ASN
39	6	120	ASN
39	6	152	ASN
40	8	34	ASN
41	9	36	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

36 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
46	3PE	5	903	-	50,50,50	0.89	3 (6%)	53,55,55	1.17	2 (3%)
42	SF4	K	301	11	0,12,12	-	-	-		
49	ZMP	Q	201	15	26,32,36	1.87	5 (19%)	31,39,45	1.99	8 (25%)
44	FMN	B	502	-	33,33,33	2.87	12 (36%)	48,50,50	1.60	9 (18%)
43	FES	A	803	1	0,4,4	-	-	-		
48	CDL	4	502	-	91,91,99	0.94	8 (8%)	97,103,111	1.18	6 (6%)
48	CDL	X	201	-	81,81,99	0.97	7 (8%)	87,93,111	1.20	5 (5%)
46	3PE	J	203	-	43,43,50	0.91	3 (6%)	46,48,55	1.16	2 (4%)
51	T7X	2	503	-	52,52,61	0.93	4 (7%)	62,64,73	1.27	7 (11%)
42	SF4	B	501	2	0,12,12	-	-	-		
42	SF4	A	801	1	0,12,12	-	-	-		
43	FES	H	301	8	0,4,4	-	-	-		
46	3PE	5	901	-	41,41,50	0.98	3 (7%)	44,46,55	1.19	3 (6%)
50	PLC	5	902	-	30,30,41	1.48	6 (20%)	36,38,49	1.03	3 (8%)
46	3PE	6	301	-	35,35,50	1.01	4 (11%)	38,40,55	1.12	2 (5%)
46	3PE	4	501	-	42,42,50	0.94	3 (7%)	45,47,55	1.23	3 (6%)
52	CPL	2	502	-	51,51,51	0.99	4 (7%)	57,59,59	1.10	3 (5%)
46	3PE	4	505	-	50,50,50	0.82	3 (6%)	53,55,55	1.20	4 (7%)
42	SF4	A	802	1	0,12,12	-	-	-		
48	CDL	J	204	-	77,77,99	1.04	4 (5%)	83,89,111	1.14	8 (9%)
50	PLC	W	402	-	41,41,41	1.29	5 (12%)	47,49,49	1.21	2 (4%)
46	3PE	J	201	-	40,40,50	0.98	3 (7%)	43,45,55	1.29	3 (6%)
47	LMN	j	101	-	68,68,72	1.61	12 (17%)	92,94,98	1.49	16 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
50	PLC	n	1101	-	41,41,41	1.32	5 (12%)	47,49,49	1.05	2 (4%)
50	PLC	W	401	-	40,40,41	1.34	6 (15%)	46,48,49	1.22	3 (6%)
51	T7X	2	501	-	48,48,61	0.95	3 (6%)	57,60,73	1.29	7 (12%)
49	ZMP	O	201	13	26,32,36	1.75	5 (19%)	31,39,45	1.86	8 (25%)
45	NDP	E	401	-	45,52,52	3.97	18 (40%)	53,80,80	2.44	7 (13%)
46	3PE	I	303	-	50,50,50	0.88	4 (8%)	53,55,55	1.36	3 (5%)
46	3PE	g	202	-	42,42,50	0.91	3 (7%)	45,47,55	1.32	2 (4%)
47	LMN	J	202	-	72,72,72	1.50	8 (11%)	96,98,98	1.58	17 (17%)
42	SF4	I	302	9	0,12,12	-	-	-		
42	SF4	I	301	9	0,12,12	-	-	-		
51	T7X	4	504	-	43,43,61	0.96	3 (6%)	53,55,73	1.42	5 (9%)
46	3PE	4	503	-	41,41,50	0.93	3 (7%)	44,46,55	1.13	3 (6%)
48	CDL	g	201	-	82,82,99	0.95	6 (7%)	88,94,111	1.25	5 (5%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
46	3PE	5	903	-	-	19/54/54/54	-
42	SF4	K	301	11	-	-	0/6/5/5
49	ZMP	Q	201	15	-	7/37/39/43	-
44	FMN	B	502	-	-	10/18/18/18	0/3/3/3
48	CDL	4	502	-	-	53/102/102/110	-
43	FES	A	803	1	-	-	0/1/1/1
48	CDL	X	201	-	-	27/92/92/110	-
46	3PE	J	203	-	-	23/47/47/54	-
51	T7X	2	503	-	-	20/47/71/80	0/1/1/1
42	SF4	B	501	2	-	-	0/6/5/5
42	SF4	A	801	1	-	-	0/6/5/5
43	FES	H	301	8	-	-	0/1/1/1
46	3PE	5	901	-	-	21/45/45/54	-
50	PLC	5	902	-	-	18/34/34/45	-
46	3PE	6	301	-	-	21/39/39/54	-
46	3PE	4	501	-	-	22/46/46/54	-
52	CPL	2	502	-	-	26/55/55/55	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
46	3PE	4	505	-	-	23/54/54/54	-
42	SF4	A	802	1	-	-	0/6/5/5
48	CDL	J	204	-	-	21/88/88/110	-
50	PLC	W	402	-	-	24/45/45/45	-
46	3PE	J	201	-	-	21/44/44/54	-
47	LMN	j	101	-	-	20/46/126/130	0/4/4/4
50	PLC	n	1101	-	-	11/45/45/45	-
50	PLC	W	401	-	-	21/44/44/45	-
51	T7X	2	501	-	-	14/43/67/80	0/1/1/1
49	ZMP	O	201	13	-	13/37/39/43	-
45	NDP	E	401	-	-	14/30/77/77	0/5/5/5
46	3PE	I	303	-	-	24/54/54/54	-
46	3PE	g	202	-	-	21/46/46/54	-
47	LMN	J	202	-	-	26/50/130/130	0/4/4/4
42	SF4	I	302	9	-	-	0/6/5/5
42	SF4	I	301	9	-	-	0/6/5/5
51	T7X	4	504	-	-	26/38/62/80	0/1/1/1
46	3PE	4	503	-	-	21/45/45/54	-
48	CDL	g	201	-	-	38/93/93/110	-

All (153) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	E	401	NDP	O4B-C1B	13.50	1.59	1.41
45	E	401	NDP	C6N-C5N	12.22	1.55	1.33
45	E	401	NDP	O4D-C1D	7.56	1.59	1.42
44	B	502	FMN	C4A-N5	7.35	1.45	1.30
45	E	401	NDP	C2D-C1D	-7.27	1.30	1.53
44	B	502	FMN	C10-N1	7.05	1.47	1.33
45	E	401	NDP	O4D-C4D	-6.93	1.29	1.45
45	E	401	NDP	O4B-C4B	-6.58	1.30	1.45
47	j	101	LMN	O1-C1	-5.70	1.30	1.40
47	J	202	LMN	O1-C1	-5.56	1.30	1.40
49	Q	201	ZMP	C13-N1	5.31	1.45	1.33
45	E	401	NDP	C2N-C3N	5.28	1.49	1.34
49	O	201	ZMP	C13-N1	5.19	1.45	1.33
47	j	101	LMN	O5-C1	5.16	1.55	1.41
44	B	502	FMN	C5A-N5	5.08	1.49	1.39
49	O	201	ZMP	C16-N2	5.08	1.44	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
44	B	502	FMN	C2-N1	5.02	1.48	1.36
49	Q	201	ZMP	C16-N2	4.92	1.44	1.33
47	J	202	LMN	O5-C1	4.91	1.54	1.41
44	B	502	FMN	C9A-N10	4.79	1.49	1.41
44	B	502	FMN	C2-N3	4.43	1.49	1.39
48	J	204	CDL	OB8-CB7	4.27	1.45	1.33
45	E	401	NDP	P2B-O2B	4.25	1.67	1.59
48	J	204	CDL	OA8-CA7	4.19	1.45	1.33
48	J	204	CDL	OA6-CA5	4.14	1.46	1.34
45	E	401	NDP	O2D-C2D	4.14	1.52	1.43
48	J	204	CDL	OB6-CB5	4.13	1.45	1.34
44	B	502	FMN	C4-N3	4.11	1.46	1.38
45	E	401	NDP	C4N-C3N	3.90	1.57	1.49
44	B	502	FMN	C10-N10	3.88	1.45	1.37
45	E	401	NDP	C7N-N7N	3.59	1.42	1.33
49	Q	201	ZMP	O3-C16	-3.52	1.16	1.23
50	n	1101	PLC	O2-C'	3.43	1.44	1.34
50	W	401	PLC	O2-C'	3.43	1.44	1.34
50	n	1101	PLC	O3-CB	3.37	1.43	1.33
50	W	402	PLC	O2-C'	3.21	1.43	1.34
50	W	401	PLC	O3-CB	3.17	1.42	1.33
45	E	401	NDP	C6A-N6A	3.15	1.45	1.34
47	j	101	LMN	OBZ-CCS	3.15	1.49	1.41
47	J	202	LMN	O4-C4	3.07	1.51	1.43
50	5	902	PLC	O3-CB	3.05	1.42	1.33
45	E	401	NDP	C6N-N1N	3.04	1.44	1.37
48	X	201	CDL	OA6-CA4	-3.00	1.39	1.46
47	j	101	LMN	CBT-CCM	2.99	1.60	1.53
50	5	902	PLC	O2-C'	2.99	1.42	1.34
47	J	202	LMN	OBY-CCR	2.91	1.49	1.41
48	4	502	CDL	OA6-CA4	-2.90	1.39	1.46
50	W	402	PLC	O3-CB	2.89	1.41	1.33
48	g	201	CDL	OA6-CA4	-2.85	1.39	1.46
46	5	903	3PE	O21-C2	-2.81	1.39	1.46
45	E	401	NDP	C5A-C4A	-2.80	1.33	1.40
48	X	201	CDL	OA8-CA6	-2.77	1.38	1.45
47	j	101	LMN	OBY-CCR	2.76	1.48	1.41
46	J	203	3PE	O21-C2	-2.76	1.39	1.46
46	4	501	3PE	O21-C2	-2.76	1.39	1.46
45	E	401	NDP	C5D-C4D	2.75	1.60	1.51
45	E	401	NDP	C4N-C5N	2.74	1.56	1.48
47	J	202	LMN	CBT-CCM	2.73	1.59	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	g	202	3PE	O21-C21	2.73	1.42	1.34
46	J	201	3PE	O31-C3	-2.72	1.39	1.45
46	4	505	3PE	O21-C2	-2.67	1.39	1.46
48	g	201	CDL	OB6-CB4	-2.67	1.39	1.46
48	4	502	CDL	OB6-CB4	-2.67	1.39	1.46
51	2	503	T7X	O16-C8	-2.66	1.39	1.46
46	5	901	3PE	O21-C2	-2.65	1.40	1.46
49	O	201	ZMP	O3-C16	-2.65	1.18	1.23
44	B	502	FMN	O2-C2	-2.64	1.19	1.24
48	g	201	CDL	OA8-CA7	2.63	1.41	1.33
48	4	502	CDL	OA8-CA7	2.62	1.41	1.33
47	j	101	LMN	CBS-CCM	2.60	1.59	1.53
46	5	901	3PE	O31-C31	2.59	1.40	1.33
51	4	504	T7X	O18-C9	-2.59	1.39	1.45
46	5	903	3PE	O31-C3	-2.58	1.39	1.45
50	5	902	PLC	O2-C2	-2.57	1.40	1.46
48	X	201	CDL	OB6-CB4	-2.56	1.40	1.46
46	4	503	3PE	O21-C2	-2.56	1.40	1.46
44	B	502	FMN	O4-C4	-2.55	1.18	1.23
47	j	101	LMN	O4-C4	2.52	1.50	1.43
47	j	101	LMN	OBZ-CCD	2.52	1.50	1.44
47	J	202	LMN	OBZ-CCS	2.51	1.48	1.41
49	Q	201	ZMP	O2-C13	-2.51	1.18	1.23
46	J	201	3PE	O21-C21	2.49	1.41	1.34
46	J	201	3PE	O21-C2	-2.49	1.40	1.46
50	W	402	PLC	O2-C2	-2.48	1.40	1.46
46	6	301	3PE	O21-C2	-2.48	1.40	1.46
46	I	303	3PE	O31-C3	-2.46	1.39	1.45
51	4	504	T7X	O16-C10	2.45	1.41	1.34
46	4	501	3PE	O31-C3	-2.44	1.39	1.45
52	2	502	CPL	O2-C2	-2.44	1.40	1.46
46	I	303	3PE	O21-C21	2.42	1.41	1.34
48	g	201	CDL	OB8-CB7	2.42	1.40	1.33
46	I	303	3PE	O31-C31	2.39	1.40	1.33
46	I	303	3PE	O21-C2	-2.38	1.40	1.46
49	O	201	ZMP	O2-C13	-2.38	1.18	1.23
46	5	903	3PE	O31-C31	2.38	1.40	1.33
51	2	503	T7X	O18-C11	2.37	1.40	1.33
51	2	501	T7X	O16-C10	2.36	1.41	1.34
46	4	503	3PE	O31-C31	2.35	1.40	1.33
48	4	502	CDL	PA1-OA5	2.34	1.68	1.59
44	B	502	FMN	C7M-C7	2.32	1.55	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	W	401	PLC	P-O3P	2.31	1.68	1.59
46	6	301	3PE	O31-C31	2.31	1.40	1.33
49	O	201	ZMP	C10-S1	2.30	1.81	1.76
46	g	202	3PE	O31-C3	-2.29	1.39	1.45
52	2	502	CPL	O2-C31	2.29	1.40	1.34
47	J	202	LMN	OBY-CCC	2.29	1.49	1.44
45	E	401	NDP	C2A-N3A	2.29	1.35	1.32
50	n	1101	PLC	O2-C2	-2.29	1.40	1.46
51	2	501	T7X	O18-C9	-2.28	1.39	1.45
52	2	502	CPL	O3-C3	-2.28	1.40	1.45
48	X	201	CDL	OB8-CB7	2.28	1.40	1.33
46	5	901	3PE	O21-C21	2.25	1.40	1.34
46	J	203	3PE	O31-C31	2.25	1.39	1.33
51	2	501	T7X	O18-C11	2.25	1.39	1.33
48	4	502	CDL	OB8-CB7	2.24	1.39	1.33
48	4	502	CDL	OA8-CA6	-2.22	1.40	1.45
50	W	401	PLC	O2-C2	-2.19	1.41	1.46
47	J	202	LMN	CBS-CCM	2.19	1.58	1.53
50	W	401	PLC	P-O4P	2.19	1.68	1.59
47	j	101	LMN	OBY-CCC	2.19	1.49	1.44
46	4	505	3PE	O31-C31	2.19	1.39	1.33
51	2	503	T7X	O18-C9	-2.19	1.40	1.45
52	2	502	CPL	O3-C11	2.19	1.39	1.33
49	Q	201	ZMP	C10-S1	2.18	1.81	1.76
50	n	1101	PLC	P-O3P	2.17	1.68	1.59
50	5	902	PLC	P-O3P	2.17	1.68	1.59
48	X	201	CDL	OB8-CB6	-2.17	1.40	1.45
46	6	301	3PE	O21-C21	2.16	1.40	1.34
47	j	101	LMN	OBX-CCJ	2.15	1.47	1.41
50	n	1101	PLC	P-O4P	2.15	1.68	1.59
46	6	301	3PE	O31-C3	-2.14	1.40	1.45
46	4	503	3PE	O21-C21	2.13	1.40	1.34
47	j	101	LMN	OAN-CCH	2.12	1.48	1.43
50	W	402	PLC	P-O3P	2.11	1.67	1.59
51	4	504	T7X	P1-O1	2.10	1.66	1.60
44	B	502	FMN	P-O5'	2.10	1.67	1.60
51	2	503	T7X	O16-C10	2.10	1.40	1.34
50	W	402	PLC	P-O4P	2.10	1.67	1.59
48	g	201	CDL	OA8-CA6	-2.10	1.40	1.45
46	4	501	3PE	O31-C31	2.09	1.39	1.33
48	4	502	CDL	OB8-CB6	-2.08	1.40	1.45
48	4	502	CDL	OB6-CB5	2.08	1.40	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	5	902	PLC	P-O4P	2.07	1.67	1.59
48	X	201	CDL	OA6-CA5	2.07	1.40	1.34
46	J	203	3PE	O31-C3	-2.07	1.40	1.45
45	E	401	NDP	O3B-C3B	-2.06	1.38	1.43
48	X	201	CDL	OB6-CB5	2.04	1.40	1.34
50	W	401	PLC	C8-N	-2.04	1.44	1.50
46	4	505	3PE	O31-C3	-2.03	1.40	1.45
47	j	101	LMN	CBQ-CCM	2.03	1.58	1.54
46	g	202	3PE	O31-C31	2.02	1.39	1.33
48	g	201	CDL	OA6-CA5	2.01	1.40	1.34
50	5	902	PLC	C8-N	-2.00	1.44	1.50

All (148) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	E	401	NDP	C5A-C6A-N6A	10.31	136.02	120.35
45	E	401	NDP	C1B-N9A-C4A	-8.63	111.49	126.64
45	E	401	NDP	N6A-C6A-N1A	-7.26	103.49	118.57
49	Q	201	ZMP	C9-C10-S1	6.27	120.75	113.46
45	E	401	NDP	N3A-C2A-N1A	-6.03	119.25	128.68
47	J	202	LMN	CBR-CBL-CBJ	5.94	130.88	113.19
47	j	101	LMN	CBR-CBL-CBJ	5.93	130.84	113.19
50	W	401	PLC	O2-C'-C1'	5.49	123.33	111.50
50	W	402	PLC	O2-C'-C1'	5.14	122.58	111.50
51	2	501	T7X	O16-C10-C12	4.98	122.23	111.50
46	g	202	3PE	O21-C21-C22	4.88	122.02	111.50
49	O	201	ZMP	C9-C10-S1	4.85	119.10	113.46
44	B	502	FMN	C7M-C7-C6	-4.78	110.65	119.49
51	2	503	T7X	O16-C10-C12	4.55	121.31	111.50
46	5	901	3PE	O21-C21-C22	4.50	121.20	111.50
47	J	202	LMN	O3-C3-C2	-4.48	99.98	110.35
46	I	303	3PE	O21-C21-C22	4.47	121.14	111.50
46	5	903	3PE	O21-C21-C22	4.38	120.94	111.50
48	J	204	CDL	OA6-CA5-C11	4.28	120.73	111.50
46	J	203	3PE	O21-C21-C22	4.28	120.73	111.50
47	J	202	LMN	CCL-CCH-CCQ	4.27	119.44	109.68
46	J	201	3PE	O21-C21-C22	4.25	120.67	111.50
52	2	502	CPL	O2-C31-C32	4.19	120.54	111.50
48	g	201	CDL	OA6-CA5-C11	4.16	120.46	111.50
44	B	502	FMN	C7M-C7-C8	4.14	129.22	120.74
48	X	201	CDL	OB6-CB5-C51	4.06	120.25	111.50
49	Q	201	ZMP	C14-C15-N2	-4.00	103.82	111.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
48	4	502	CDL	OA6-CA5-C11	3.99	120.10	111.50
48	g	201	CDL	OB6-CB5-C51	3.98	120.07	111.50
46	6	301	3PE	O21-C21-C22	3.96	120.04	111.50
46	I	303	3PE	O31-C31-C32	3.87	124.06	111.91
47	j	101	LMN	OAN-CCH-CCL	-3.86	101.42	110.35
46	4	501	3PE	O21-C21-C22	3.84	119.79	111.50
48	4	502	CDL	OB6-CB5-C51	3.84	119.78	111.50
48	J	204	CDL	OB6-CB5-C51	3.78	119.65	111.50
51	4	504	T7X	O16-C10-C12	3.76	119.61	111.50
48	X	201	CDL	CA6-CA4-CA3	-3.76	102.91	111.79
49	O	201	ZMP	O1-C10-C9	-3.74	119.58	123.99
48	X	201	CDL	OA6-CA5-C11	3.69	119.45	111.50
46	4	505	3PE	O21-C21-C22	3.68	119.43	111.50
50	n	1101	PLC	O2-C'-C1'	3.66	119.40	111.50
47	J	202	LMN	CCJ-CCL-CCH	3.56	117.42	110.00
51	4	504	T7X	C12-C13-C14	-3.53	106.93	113.23
49	Q	201	ZMP	O1-C10-C9	-3.51	119.84	123.99
46	4	503	3PE	O21-C21-C22	3.50	119.05	111.50
50	5	902	PLC	O2-C'-C1'	3.36	118.73	111.50
44	B	502	FMN	C4-N3-C2	-3.35	119.45	125.64
48	g	201	CDL	OB8-CB7-C71	3.33	122.36	111.91
48	g	201	CDL	OB8-CB6-CB4	3.33	118.12	108.43
47	j	101	LMN	CCW-CCU-CCO	3.26	116.51	110.82
49	Q	201	ZMP	C15-C14-C13	3.23	117.73	112.36
46	4	501	3PE	C2-O21-C21	-3.22	109.86	117.79
45	E	401	NDP	C5B-C4B-C3B	-3.17	103.29	115.18
49	O	201	ZMP	C19-C18-C17	3.17	114.31	108.82
48	4	502	CDL	OB8-CB7-C71	3.11	121.67	111.91
47	J	202	LMN	O4-C4-C3	3.05	115.39	107.28
47	J	202	LMN	C2-C3-C4	3.01	116.56	109.68
45	E	401	NDP	PN-O3-PA	-3.01	122.50	132.83
50	n	1101	PLC	O3-CB-C1B	2.98	121.25	111.91
49	Q	201	ZMP	C20-C18-C17	2.97	113.97	108.82
46	J	203	3PE	O31-C31-C32	2.97	121.21	111.91
52	2	502	CPL	O3-C11-C12	2.96	121.19	111.91
48	4	502	CDL	OA8-CA7-C31	2.89	120.98	111.91
47	j	101	LMN	OAP-CCL-CCH	-2.87	103.71	110.35
51	2	503	T7X	O18-C11-C31	2.86	120.90	111.91
44	B	502	FMN	O4-C4-C4A	-2.86	119.02	126.60
46	J	201	3PE	O31-C31-C32	2.82	120.76	111.91
46	5	901	3PE	O31-C31-C32	2.80	120.69	111.91
48	J	204	CDL	OA8-CA7-C31	2.79	120.68	111.91

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
49	O	201	ZMP	C15-N2-C16	-2.79	117.61	122.59
51	2	503	T7X	C3-C2-C1	2.78	116.02	109.68
46	4	505	3PE	O31-C31-C32	2.78	120.62	111.91
51	2	503	T7X	C5-C6-C1	2.75	115.97	109.68
51	2	501	T7X	C5-C4-C3	2.75	115.62	110.82
47	J	202	LMN	O5-C1-C2	-2.75	104.53	110.35
47	j	101	LMN	CCV-CCT-CCN	2.74	115.60	110.82
46	5	903	3PE	O31-C31-C32	2.73	120.47	111.91
51	4	504	T7X	C6-C1-C2	2.71	114.77	110.85
49	Q	201	ZMP	C11-S1-C10	2.71	110.30	101.87
46	6	301	3PE	O31-C31-C32	2.70	120.38	111.91
46	4	505	3PE	C2-O21-C21	-2.69	111.16	117.79
51	4	504	T7X	O1-C1-C2	2.69	114.92	108.66
44	B	502	FMN	C4A-C4-N3	2.67	119.97	113.19
47	j	101	LMN	CBL-CBR-CCM	-2.66	108.58	117.16
49	O	201	ZMP	C11-C12-N1	-2.66	106.82	112.42
47	j	101	LMN	CCR-O4-C4	-2.65	111.41	117.96
47	J	202	LMN	OBY-CCC-CCN	2.63	114.48	109.69
51	2	501	T7X	C5-C6-C1	2.62	115.67	109.68
47	J	202	LMN	O5-C5-C4	2.60	115.24	109.75
47	J	202	LMN	CBL-CBR-CCM	-2.60	108.79	117.16
51	2	501	T7X	O18-C11-C31	2.59	120.05	111.91
47	J	202	LMN	CBQ-CBK-CBI	-2.59	105.47	113.19
46	4	503	3PE	O31-C31-C32	2.57	119.97	111.91
46	4	501	3PE	O31-C31-C32	2.56	119.94	111.91
47	j	101	LMN	OCB-CCS-CCW	2.55	114.72	108.10
47	j	101	LMN	O3-C3-C2	-2.54	104.48	110.35
48	J	204	CDL	OB8-CB7-C71	2.51	119.80	111.91
48	g	201	CDL	OA8-CA7-C31	2.51	119.79	111.91
47	J	202	LMN	OCB-CCS-CCW	2.50	114.58	108.10
48	X	201	CDL	OA8-CA7-C31	2.48	119.71	111.91
49	Q	201	ZMP	O1-C10-S1	-2.47	119.40	122.61
50	W	401	PLC	O3-CB-C1B	2.45	119.59	111.91
47	j	101	LMN	CCS-OCB-CCQ	-2.45	111.91	117.96
44	B	502	FMN	C5A-C9A-N10	2.42	120.45	117.95
47	J	202	LMN	O4-CCR-CCV	2.41	114.36	108.10
50	W	402	PLC	O3-CB-C1B	2.41	119.47	111.91
46	4	505	3PE	C24-C23-C22	-2.41	104.54	113.19
47	J	202	LMN	OBX-CCF-CBP	-2.40	100.46	106.44
51	2	503	T7X	C6-C1-C2	2.40	114.32	110.85
49	O	201	ZMP	C14-C15-N2	-2.39	107.08	111.90
47	j	101	LMN	OBY-CCC-CCN	2.38	114.02	109.69

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
49	O	201	ZMP	C17-C16-N2	2.35	121.26	116.58
47	j	101	LMN	OCB-CCQ-CCH	2.35	113.53	107.28
47	J	202	LMN	CCV-CCT-CCN	2.34	114.91	110.82
48	J	204	CDL	CA4-OA6-CA5	-2.34	112.03	117.79
47	J	202	LMN	CCU-CCO-CCD	2.33	114.40	110.24
47	j	101	LMN	CBQ-CBK-CBI	-2.33	106.25	113.19
46	I	303	3PE	O31-C31-O32	-2.32	117.73	123.59
44	B	502	FMN	C9A-C5A-N5	-2.32	119.91	122.43
46	J	201	3PE	C3-C2-C1	-2.29	106.37	111.79
48	X	201	CDL	OB8-CB7-C71	2.27	119.03	111.91
48	4	502	CDL	CA6-CA4-CA3	-2.25	106.46	111.79
48	J	204	CDL	CA6-CA4-CA3	-2.23	106.51	111.79
47	J	202	LMN	CCW-CCU-CCO	2.23	114.72	110.82
46	g	202	3PE	O31-C31-C32	2.19	118.80	111.91
50	5	902	PLC	O3-C3-C2	2.19	114.81	108.43
49	O	201	ZMP	C11-S1-C10	2.19	108.69	101.87
48	J	204	CDL	OA6-CA5-OA7	-2.19	118.42	123.70
50	5	902	PLC	C3-C2-C1	-2.18	106.62	111.79
52	2	502	CPL	C14-C13-C12	-2.14	105.50	113.19
44	B	502	FMN	C4-C4A-C10	2.13	120.37	116.79
46	4	503	3PE	C33-C32-C31	-2.12	105.92	113.62
51	2	501	T7X	C6-C1-C2	2.12	113.91	110.85
50	W	401	PLC	C3-C2-C1	-2.12	106.78	111.79
46	5	901	3PE	C3-C2-C1	-2.11	106.79	111.79
47	j	101	LMN	O4-CCR-CCV	2.10	113.54	108.10
51	4	504	T7X	P1-O1-C1	2.08	126.98	119.41
47	j	101	LMN	OBZ-CCD-CCO	2.06	113.43	109.69
49	Q	201	ZMP	C17-C16-N2	2.06	120.68	116.58
44	B	502	FMN	C5'-C4'-C3'	-2.06	108.23	112.20
51	2	503	T7X	C6-C5-C4	2.05	114.41	110.82
47	j	101	LMN	CCJ-CCL-CCH	2.05	114.25	110.00
51	2	503	T7X	O16-C10-O17	-2.03	118.79	123.70
48	J	204	CDL	CB4-OB6-CB5	-2.02	112.82	117.79
51	2	501	T7X	C4-C3-C2	2.01	114.34	110.82
45	E	401	NDP	C1D-N1N-C6N	-2.01	116.50	120.83
51	2	501	T7X	C32-C31-C11	-2.01	106.31	113.62
48	4	502	CDL	PA1-OA5-CA3	-2.00	109.92	121.68

There are no chirality outliers.

All (605) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
44	B	502	FMN	N10-C1'-C2'-O2'
44	B	502	FMN	N10-C1'-C2'-C3'
44	B	502	FMN	C1'-C2'-C3'-O3'
44	B	502	FMN	C1'-C2'-C3'-C4'
44	B	502	FMN	O2'-C2'-C3'-O3'
44	B	502	FMN	O2'-C2'-C3'-C4'
45	E	401	NDP	C2B-O2B-P2B-O1X
45	E	401	NDP	C2B-O2B-P2B-O3X
45	E	401	NDP	C5D-O5D-PN-O1N
46	I	303	3PE	C1-O11-P-O13
46	I	303	3PE	C1-O11-P-O14
46	I	303	3PE	O13-C11-C12-N
46	I	303	3PE	O21-C2-C3-O31
46	J	201	3PE	C1-O11-P-O12
46	J	201	3PE	O21-C2-C3-O31
46	J	203	3PE	C1-O11-P-O12
46	J	203	3PE	C22-C21-O21-C2
46	g	202	3PE	C1-O11-P-O12
46	g	202	3PE	C1-O11-P-O14
46	g	202	3PE	C11-O13-P-O14
46	g	202	3PE	C22-C21-O21-C2
46	4	501	3PE	C1-O11-P-O12
46	4	501	3PE	C1-O11-P-O14
46	4	501	3PE	C22-C21-O21-C2
46	4	503	3PE	C1-O11-P-O12
46	4	503	3PE	C1-O11-P-O14
46	4	503	3PE	O13-C11-C12-N
46	4	503	3PE	O21-C2-C3-O31
46	4	505	3PE	C1-O11-P-O12
46	4	505	3PE	C1-O11-P-O13
46	4	505	3PE	C1-O11-P-O14
46	4	505	3PE	O22-C21-O21-C2
46	5	901	3PE	C1-O11-P-O12
46	5	901	3PE	C1-O11-P-O14
46	5	901	3PE	O13-C11-C12-N
46	5	903	3PE	C1-O11-P-O12
46	5	903	3PE	C1-O11-P-O14
46	5	903	3PE	O22-C21-O21-C2
46	6	301	3PE	C1-O11-P-O12
46	6	301	3PE	C1-O11-P-O14
46	6	301	3PE	O13-C11-C12-N
47	j	101	LMN	C2-C1-O1-CBS
47	j	101	LMN	O5-C1-O1-CBS

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Mol	Chain	Res	Type	Atoms
47	j	101	LMN	OBX-CCJ-OBV-CBT
48	J	204	CDL	C11-CA5-OA6-CA4
48	J	204	CDL	CB2-OB2-PB2-OB5
48	J	204	CDL	CB3-OB5-PB2-OB2
48	J	204	CDL	CB3-OB5-PB2-OB3
48	J	204	CDL	CB3-OB5-PB2-OB4
48	X	201	CDL	CB2-OB2-PB2-OB4
48	g	201	CDL	CB2-C1-CA2-OA2
48	g	201	CDL	CB3-OB5-PB2-OB2
48	g	201	CDL	CB3-OB5-PB2-OB3
48	g	201	CDL	CB3-OB5-PB2-OB4
48	4	502	CDL	OB7-CB5-OB6-CB4
48	4	502	CDL	C51-CB5-OB6-CB4
49	O	201	ZMP	O4-C17-C18-C21
49	O	201	ZMP	C16-C17-C18-C21
49	O	201	ZMP	O4-C17-C18-C19
49	O	201	ZMP	C16-C17-C18-C19
49	O	201	ZMP	O4-C17-C18-C20
49	O	201	ZMP	C16-C17-C18-C20
49	O	201	ZMP	C12-C11-S1-C10
49	O	201	ZMP	C7-C8-C9-C10
49	Q	201	ZMP	C20-C18-C21-O5
49	Q	201	ZMP	C17-C18-C21-O5
49	Q	201	ZMP	C13-C14-C15-N2
49	Q	201	ZMP	C12-C11-S1-C10
50	W	401	PLC	O4P-C4-C5-N
50	W	401	PLC	C1-O3P-P-O1P
50	W	401	PLC	C4-O4P-P-O2P
50	W	402	PLC	O4P-C4-C5-N
50	W	402	PLC	C1'-C'-O2-C2
50	W	402	PLC	O'-C'-O2-C2
50	n	1101	PLC	C1-O3P-P-O1P
50	n	1101	PLC	C1-O3P-P-O2P
50	5	902	PLC	C4-O4P-P-O1P
51	2	501	T7X	C9-C8-O16-C10
51	2	501	T7X	C12-C10-O16-C8
51	2	501	T7X	C15-C16-C17-C18
51	2	501	T7X	C18-C19-C20-C21
51	2	501	T7X	C22-C23-C24-C25
51	2	503	T7X	C7-O13-P1-O1
51	2	503	T7X	C7-O13-P1-O11
51	2	503	T7X	C7-O13-P1-O12

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Mol	Chain	Res	Type	Atoms
51	2	503	T7X	O19-C11-O18-C9
51	2	503	T7X	C25-C26-C27-C28
51	4	504	T7X	C2-C1-O1-P1
51	4	504	T7X	C6-C1-O1-P1
51	4	504	T7X	C1-O1-P1-O12
51	4	504	T7X	C7-O13-P1-O11
51	4	504	T7X	C12-C10-O16-C8
52	2	502	CPL	O4P-C4-C5-N
52	2	502	CPL	C1-O3P-P-O1P
52	2	502	CPL	C1-O3P-P-O2P
46	I	303	3PE	O32-C31-O31-C3
46	4	505	3PE	O32-C31-O31-C3
48	g	201	CDL	CB4-CB6-OB8-CB7
46	I	303	3PE	C32-C31-O31-C3
51	2	503	T7X	C31-C11-O18-C9
46	4	501	3PE	O32-C31-O31-C3
48	4	502	CDL	OA9-CA7-OA8-CA6
48	4	502	CDL	OB9-CB7-OB8-CB6
47	j	101	LMN	OBY-CCR-O4-C4
47	J	202	LMN	CCW-CCS-OCB-CCQ
46	J	203	3PE	O22-C21-O21-C2
48	J	204	CDL	OA7-CA5-OA6-CA4
48	g	201	CDL	OB7-CB5-OB6-CB4
51	2	501	T7X	O17-C10-O16-C8
51	4	504	T7X	O17-C10-O16-C8
46	4	501	3PE	C32-C31-O31-C3
46	4	505	3PE	C32-C31-O31-C3
48	4	502	CDL	C31-CA7-OA8-CA6
48	4	502	CDL	C71-CB7-OB8-CB6
46	4	505	3PE	C22-C21-O21-C2
46	5	903	3PE	C22-C21-O21-C2
48	g	201	CDL	C51-CB5-OB6-CB4
48	g	201	CDL	OB9-CB7-OB8-CB6
47	J	202	LMN	O5-C5-C6-O6
47	j	101	LMN	OBZ-CCS-OCB-CCQ
47	J	202	LMN	C3-C4-O4-CCR
50	W	402	PLC	C1B-CB-O3-C3
47	j	101	LMN	OAJ-CBN-CCD-OBZ
46	g	202	3PE	O22-C21-O21-C2
46	4	501	3PE	O22-C21-O21-C2
47	J	202	LMN	OBZ-CCS-OCB-CCQ
48	g	201	CDL	O1-C1-CA2-OA2

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Mol	Chain	Res	Type	Atoms
50	W	402	PLC	OB-CB-O3-C3
47	J	202	LMN	OAJ-CBN-CCD-OBZ
46	5	901	3PE	C22-C21-O21-C2
48	4	502	CDL	C11-CA5-OA6-CA4
50	W	401	PLC	C1'-C'-O2-C2
47	J	202	LMN	CAW-CAY-CBA-CBC
47	J	202	LMN	C4-C5-C6-O6
48	g	201	CDL	C71-CB7-OB8-CB6
47	J	202	LMN	OAJ-CBN-CCD-CCO
46	4	501	3PE	C2B-C2C-C2D-C2E
47	j	101	LMN	OAJ-CBN-CCD-CCO
47	J	202	LMN	O5-C1-O1-CBS
47	J	202	LMN	OBX-CCJ-OBV-CBT
45	E	401	NDP	C3B-C2B-O2B-P2B
47	J	202	LMN	CBC-CBE-CBG-CBI
46	5	901	3PE	O22-C21-O21-C2
48	4	502	CDL	OA7-CA5-OA6-CA4
50	W	401	PLC	O'-C'-O2-C2
48	J	204	CDL	C31-CA7-OA8-CA6
52	2	502	CPL	C18-C19-C20-C21
51	4	504	T7X	C1-O1-P1-O13
46	6	301	3PE	C21-C22-C23-C24
50	5	902	PLC	C1B-C2B-C3B-C4B
48	4	502	CDL	O1-C1-CB2-OB2
50	5	902	PLC	C'-C1'-C2'-C3'
46	g	202	3PE	O21-C2-C3-O31
48	4	502	CDL	CA7-C31-C32-C33
46	4	505	3PE	C36-C37-C38-C39
46	g	202	3PE	C31-C32-C33-C34
51	2	501	T7X	C11-C31-C32-C33
51	2	503	T7X	C10-C12-C13-C14
51	2	503	T7X	C11-C31-C32-C33
51	4	504	T7X	C11-C31-C32-C33
48	4	502	CDL	C56-C57-C58-C59
47	J	202	LMN	CBJ-CBL-CBR-CCM
46	J	203	3PE	C31-C32-C33-C34
46	g	202	3PE	C21-C22-C23-C24
46	5	901	3PE	C34-C35-C36-C37
48	J	204	CDL	OA9-CA7-OA8-CA6
44	B	502	FMN	O3'-C3'-C4'-C5'
48	X	201	CDL	C11-CA5-OA6-CA4
46	I	303	3PE	C11-O13-P-O11

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Mol	Chain	Res	Type	Atoms
46	J	203	3PE	C1-O11-P-O13
46	g	202	3PE	C1-O11-P-O13
46	g	202	3PE	C11-O13-P-O11
46	4	501	3PE	C1-O11-P-O13
46	4	503	3PE	C1-O11-P-O13
46	5	901	3PE	C1-O11-P-O13
46	5	903	3PE	C1-O11-P-O13
46	6	301	3PE	C1-O11-P-O13
48	X	201	CDL	CB2-OB2-PB2-OB5
50	W	401	PLC	C4-O4P-P-O3P
50	n	1101	PLC	C1-O3P-P-O4P
50	5	902	PLC	C1-O3P-P-O4P
51	2	501	T7X	C7-O13-P1-O1
51	4	504	T7X	C7-O13-P1-O1
52	2	502	CPL	C1-O3P-P-O4P
47	J	202	LMN	OAI-CBM-CCC-OBY
51	2	501	T7X	C31-C32-C33-C34
48	g	201	CDL	CB5-C51-C52-C53
48	X	201	CDL	OA7-CA5-OA6-CA4
51	2	503	T7X	C12-C13-C14-C15
48	g	201	CDL	CA5-C11-C12-C13
46	I	303	3PE	C37-C38-C39-C3A
46	J	201	3PE	C3D-C3E-C3F-C3G
46	g	202	3PE	C26-C27-C28-C29
46	g	202	3PE	C25-C26-C27-C28
46	4	505	3PE	C23-C24-C25-C26
46	6	301	3PE	C23-C24-C25-C26
49	Q	201	ZMP	C19-C18-C21-O5
46	J	203	3PE	C24-C25-C26-C27
48	J	204	CDL	C75-C76-C77-C78
50	W	402	PLC	C2B-C3B-C4B-C5B
48	g	201	CDL	CB7-C71-C72-C73
46	J	203	3PE	C32-C33-C34-C35
46	4	501	3PE	C29-C2A-C2B-C2C
48	X	201	CDL	C31-C32-C33-C34
50	W	402	PLC	C3B-C4B-C5B-C6B
46	4	505	3PE	C34-C35-C36-C37
48	X	201	CDL	C57-C58-C59-C60
47	J	202	LMN	C2-C1-O1-CBS
50	5	902	PLC	C1B-CB-O3-C3
46	J	203	3PE	C38-C39-C3A-C3B
48	J	204	CDL	C73-C74-C75-C76

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Mol	Chain	Res	Type	Atoms
48	X	201	CDL	C58-C59-C60-C61
48	g	201	CDL	C22-C23-C24-C25
52	2	502	CPL	C19-C20-C21-C22
46	J	203	3PE	C29-C2A-C2B-C2C
46	4	505	3PE	C38-C39-C3A-C3B
52	2	502	CPL	C17-C18-C19-C20
46	I	303	3PE	C28-C29-C2A-C2B
50	W	401	PLC	C1B-C2B-C3B-C4B
51	2	501	T7X	C32-C33-C34-C35
46	4	503	3PE	C33-C34-C35-C36
46	I	303	3PE	C3C-C3D-C3E-C3F
51	2	503	T7X	C33-C34-C35-C36
46	J	203	3PE	C21-C22-C23-C24
46	5	901	3PE	C21-C22-C23-C24
50	W	401	PLC	C'-C1'-C2'-C3'
46	4	501	3PE	C25-C26-C27-C28
48	X	201	CDL	C52-C53-C54-C55
48	4	502	CDL	C51-C52-C53-C54
50	W	402	PLC	C4'-C5'-C6'-C7'
51	2	503	T7X	C35-C36-C37-C38
47	j	101	LMN	C4-C5-C6-O6
46	I	303	3PE	C39-C3A-C3B-C3C
46	J	203	3PE	C23-C24-C25-C26
46	4	505	3PE	C26-C27-C28-C29
46	5	903	3PE	C34-C35-C36-C37
46	5	903	3PE	C3E-C3F-C3G-C3H
46	J	201	3PE	C24-C25-C26-C27
48	X	201	CDL	C35-C36-C37-C38
48	g	201	CDL	C71-C72-C73-C74
48	4	502	CDL	C71-C72-C73-C74
47	j	101	LMN	CAY-CBA-CBC-CBE
48	4	502	CDL	C34-C35-C36-C37
44	B	502	FMN	C2'-C3'-C4'-C5'
48	4	502	CDL	CA5-C11-C12-C13
46	I	303	3PE	C33-C34-C35-C36
46	I	303	3PE	C27-C28-C29-C2A
48	X	201	CDL	C56-C57-C58-C59
48	4	502	CDL	C22-C23-C24-C25
46	6	301	3PE	C29-C2A-C2B-C2C
46	J	201	3PE	C35-C36-C37-C38
48	4	502	CDL	O1-C1-CA2-OA2
46	g	202	3PE	C2D-C2E-C2F-C2G

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Mol	Chain	Res	Type	Atoms
49	Q	201	ZMP	C1-C2-C3-C4
48	4	502	CDL	C42-C43-C44-C45
46	4	501	3PE	C2A-C2B-C2C-C2D
46	6	301	3PE	C34-C35-C36-C37
50	W	402	PLC	C5B-C6B-C7B-C8B
46	4	501	3PE	C36-C37-C38-C39
48	g	201	CDL	C23-C24-C25-C26
46	4	501	3PE	C33-C34-C35-C36
48	4	502	CDL	C75-C76-C77-C78
48	4	502	CDL	C11-C12-C13-C14
51	2	501	T7X	C24-C25-C26-C27
46	g	202	3PE	C36-C37-C38-C39
48	4	502	CDL	C12-C13-C14-C15
51	4	504	T7X	C34-C35-C36-C37
46	I	303	3PE	C31-C32-C33-C34
51	4	504	T7X	C31-C11-O18-C9
46	4	503	3PE	C32-C33-C34-C35
50	W	402	PLC	C'-C1'-C2'-C3'
51	4	504	T7X	C31-C32-C33-C34
47	J	202	LMN	CBI-CBK-CBQ-CCM
48	4	502	CDL	C54-C55-C56-C57
48	g	201	CDL	C11-CA5-OA6-CA4
52	2	502	CPL	C32-C31-O2-C2
51	2	503	T7X	O13-C7-C8-O16
47	J	202	LMN	C5-C4-O4-CCR
46	6	301	3PE	C32-C33-C34-C35
48	g	201	CDL	OA7-CA5-OA6-CA4
52	2	502	CPL	O31-C31-O2-C2
46	4	503	3PE	C36-C37-C38-C39
47	J	202	LMN	CAX-CAZ-CBB-CBD
51	4	504	T7X	C33-C34-C35-C36
50	5	902	PLC	OB-CB-O3-C3
46	J	201	3PE	C1-O11-P-O13
46	5	901	3PE	C11-O13-P-O11
50	5	902	PLC	C4-O4P-P-O3P
46	5	903	3PE	C2A-C2B-C2C-C2D
50	5	902	PLC	C2-C1-O3P-P
48	4	502	CDL	C73-C74-C75-C76
46	4	501	3PE	C28-C29-C2A-C2B
48	X	201	CDL	C71-CB7-OB8-CB6
48	g	201	CDL	C31-C32-C33-C34
48	4	502	CDL	C21-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
48	X	201	CDL	C51-CB5-OB6-CB4
46	I	303	3PE	C1-C2-C3-O31
46	J	203	3PE	C1-C2-C3-O31
46	g	202	3PE	C1-C2-C3-O31
46	4	503	3PE	C1-C2-C3-O31
46	6	301	3PE	C1-C2-C3-O31
50	W	401	PLC	C1-C2-C3-O3
51	4	504	T7X	C7-C8-C9-O18
47	J	202	LMN	CAB-CAX-CAZ-CBB
51	4	504	T7X	O18-C11-C31-C32
46	I	303	3PE	C25-C26-C27-C28
45	E	401	NDP	C1B-C2B-O2B-P2B
47	j	101	LMN	O5-C5-C6-O6
50	W	402	PLC	C8'-C9'-CA'-CB'
46	g	202	3PE	C1-C2-O21-C21
44	B	502	FMN	C2'-C3'-C4'-O4'
48	4	502	CDL	C1-CA2-OA2-PA1
51	2	503	T7X	C34-C35-C36-C37
46	4	501	3PE	O11-C1-C2-O21
51	4	504	T7X	O19-C11-O18-C9
48	4	502	CDL	C15-C16-C17-C18
46	4	505	3PE	C27-C28-C29-C2A
46	5	903	3PE	C37-C38-C39-C3A
47	J	202	LMN	CBB-CBD-CBF-CBH
46	J	203	3PE	O21-C2-C3-O31
46	6	301	3PE	O21-C2-C3-O31
52	2	502	CPL	O2-C2-C3-O3
46	5	903	3PE	C28-C29-C2A-C2B
47	j	101	LMN	CBC-CBE-CBG-CBI
48	X	201	CDL	OB9-CB7-OB8-CB6
46	4	505	3PE	C3B-C3C-C3D-C3E
46	5	903	3PE	C33-C34-C35-C36
48	X	201	CDL	C74-C75-C76-C77
46	4	505	3PE	C3F-C3G-C3H-C3I
48	J	204	CDL	C51-CB5-OB6-CB4
50	5	902	PLC	C1'-C'-O2-C2
51	2	503	T7X	C32-C33-C34-C35
46	5	901	3PE	C29-C2A-C2B-C2C
46	6	301	3PE	C25-C26-C27-C28
48	J	204	CDL	C71-C72-C73-C74
45	E	401	NDP	C2D-C1D-N1N-C6N
50	W	401	PLC	O3P-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
51	2	503	T7X	O13-C7-C8-C9
48	g	201	CDL	C72-C73-C74-C75
46	J	201	3PE	C33-C34-C35-C36
46	4	501	3PE	C37-C38-C39-C3A
46	4	503	3PE	C21-C22-C23-C24
48	g	201	CDL	C76-C77-C78-C79
46	J	201	3PE	C3E-C3F-C3G-C3H
48	4	502	CDL	C39-C40-C41-C42
50	n	1101	PLC	C6'-C7'-C8'-C9'
47	J	202	LMN	OBY-CCR-O4-C4
51	2	501	T7X	C12-C13-C14-C15
50	W	401	PLC	C1B-CB-O3-C3
46	5	901	3PE	C1-C2-C3-O31
48	4	502	CDL	CA3-CA4-CA6-OA8
50	W	402	PLC	C1-C2-C3-O3
50	n	1101	PLC	C1-C2-C3-O3
52	2	502	CPL	C1-C2-C3-O3
48	X	201	CDL	C71-C72-C73-C74
48	4	502	CDL	CB7-C71-C72-C73
48	g	201	CDL	C40-C41-C42-C43
48	4	502	CDL	C35-C36-C37-C38
50	W	401	PLC	C4'-C5'-C6'-C7'
51	4	504	T7X	C1-O1-P1-O11
48	J	204	CDL	C63-C64-C65-C66
46	J	201	3PE	C11-O13-P-O11
46	4	503	3PE	C11-O13-P-O11
52	2	502	CPL	C39-C40-C41-C42
52	2	502	CPL	C40-C41-C42-C43
47	j	101	LMN	CBH-CBJ-CBL-CBR
52	2	502	CPL	C16-C17-C18-C19
48	g	201	CDL	OA5-CA3-CA4-OA6
48	4	502	CDL	CB5-C51-C52-C53
46	4	501	3PE	C35-C36-C37-C38
48	4	502	CDL	C44-C45-C46-C47
50	W	401	PLC	C4B-C5B-C6B-C7B
50	W	401	PLC	O2-C2-C3-O3
50	n	1101	PLC	O2-C2-C3-O3
46	J	203	3PE	C36-C37-C38-C39
46	6	301	3PE	C35-C36-C37-C38
48	4	502	CDL	CB2-C1-CA2-OA2
48	X	201	CDL	OB7-CB5-OB6-CB4
50	5	902	PLC	O'-C'-O2-C2

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Mol	Chain	Res	Type	Atoms
47	j	101	LMN	CBG-CBI-CBK-CBQ
45	E	401	NDP	C4B-C5B-O5B-PA
48	X	201	CDL	C1-CA2-OA2-PA1
48	g	201	CDL	C72-C71-CB7-OB8
48	X	201	CDL	CB7-C71-C72-C73
46	6	301	3PE	C22-C21-O21-C2
46	J	203	3PE	C39-C3A-C3B-C3C
49	O	201	ZMP	C6-C7-C8-C9
50	W	401	PLC	C5'-C6'-C7'-C8'
46	5	901	3PE	O11-C1-C2-C3
48	g	201	CDL	OB5-CB3-CB4-CB6
47	j	101	LMN	CBA-CBC-CBE-CBG
48	J	204	CDL	OB7-CB5-OB6-CB4
50	W	401	PLC	C5B-C6B-C7B-C8B
46	I	303	3PE	O21-C21-C22-C23
46	g	202	3PE	C32-C33-C34-C35
46	6	301	3PE	O22-C21-O21-C2
46	4	505	3PE	C32-C33-C34-C35
46	4	505	3PE	C3C-C3D-C3E-C3F
46	4	505	3PE	C3A-C3B-C3C-C3D
46	J	201	3PE	C1-C2-C3-O31
46	4	505	3PE	C2-C1-O11-P
48	4	502	CDL	CB4-CB3-OB5-PB2
46	4	505	3PE	O11-C1-C2-O21
48	g	201	CDL	OB5-CB3-CB4-OB6
50	W	401	PLC	O3P-C1-C2-O2
48	4	502	CDL	C59-C60-C61-C62
46	5	901	3PE	O21-C2-C3-O31
48	4	502	CDL	OA6-CA4-CA6-OA8
45	E	401	NDP	C5D-O5D-PN-O3
46	I	303	3PE	C23-C24-C25-C26
44	B	502	FMN	O3'-C3'-C4'-O4'
46	I	303	3PE	C3D-C3E-C3F-C3G
50	W	401	PLC	OB-CB-O3-C3
51	4	504	T7X	C10-C12-C13-C14
46	4	503	3PE	C3D-C3E-C3F-C3G
50	W	402	PLC	C1B-C2B-C3B-C4B
50	W	402	PLC	C4B-C5B-C6B-C7B
51	4	504	T7X	C35-C36-C37-C38
45	E	401	NDP	O4D-C1D-N1N-C6N
48	4	502	CDL	CA3-OA5-PA1-OA2
50	W	401	PLC	C1-O3P-P-O4P

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Mol	Chain	Res	Type	Atoms
52	2	502	CPL	C4-O4P-P-O3P
46	I	303	3PE	C1-O11-P-O12
46	I	303	3PE	C11-O13-P-O14
46	J	201	3PE	C1-O11-P-O14
46	J	201	3PE	C11-O13-P-O12
46	J	203	3PE	C1-O11-P-O14
46	4	503	3PE	C11-O13-P-O12
46	5	901	3PE	C11-O13-P-O12
48	J	204	CDL	CB2-OB2-PB2-OB3
48	X	201	CDL	CB2-OB2-PB2-OB3
48	X	201	CDL	CB3-OB5-PB2-OB4
48	4	502	CDL	CB3-OB5-PB2-OB4
50	5	902	PLC	C1-O3P-P-O1P
50	5	902	PLC	C1-O3P-P-O2P
51	2	501	T7X	C7-O13-P1-O12
46	4	501	3PE	O11-C1-C2-C3
46	4	505	3PE	O11-C1-C2-C3
46	6	301	3PE	O11-C1-C2-C3
50	n	1101	PLC	O3P-C1-C2-C3
51	4	504	T7X	O13-C7-C8-C9
46	5	903	3PE	C36-C37-C38-C39
50	W	402	PLC	C1'-C2'-C3'-C4'
46	J	201	3PE	C12-C11-O13-P
46	g	202	3PE	C12-C11-O13-P
51	4	504	T7X	C32-C33-C34-C35
49	O	201	ZMP	C4-C5-C6-C7
46	5	901	3PE	O11-C1-C2-O21
46	5	903	3PE	O11-C1-C2-O21
48	4	502	CDL	OB5-CB3-CB4-OB6
50	n	1101	PLC	O3P-C1-C2-O2
50	5	902	PLC	O3P-C1-C2-O2
51	4	504	T7X	O13-C7-C8-O16
46	5	903	3PE	C29-C2A-C2B-C2C
51	4	504	T7X	C13-C14-C15-C16
46	5	901	3PE	C39-C3A-C3B-C3C
48	g	201	CDL	C41-C42-C43-C44
46	6	301	3PE	O21-C21-C22-C23
48	X	201	CDL	C12-C13-C14-C15
50	n	1101	PLC	O4P-C4-C5-N
50	5	902	PLC	O4P-C4-C5-N
46	J	203	3PE	C26-C27-C28-C29
48	J	204	CDL	C11-C12-C13-C14

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Mol	Chain	Res	Type	Atoms
48	4	502	CDL	C14-C15-C16-C17
48	J	204	CDL	C62-C63-C64-C65
48	X	201	CDL	C13-C14-C15-C16
45	E	401	NDP	O4D-C4D-C5D-O5D
47	j	101	LMN	OAL-CBP-CCF-CCQ
50	W	402	PLC	C2'-C3'-C4'-C5'
47	j	101	LMN	OAI-CBM-CCC-OBY
48	4	502	CDL	C76-C77-C78-C79
48	4	502	CDL	OB5-CB3-CB4-CB6
50	5	902	PLC	O3P-C1-C2-C3
46	J	201	3PE	O31-C31-C32-C33
52	2	502	CPL	O11-C11-O3-C3
48	J	204	CDL	C1-CA2-OA2-PA1
52	2	502	CPL	C12-C11-O3-C3
46	6	301	3PE	O11-C1-C2-O21
47	j	101	LMN	OAL-CBP-CCF-OBX
48	4	502	CDL	C74-C75-C76-C77
46	5	903	3PE	C11-O13-P-O11
46	6	301	3PE	C11-O13-P-O11
48	g	201	CDL	CB2-OB2-PB2-OB5
48	4	502	CDL	CA2-OA2-PA1-OA5
48	4	502	CDL	CB2-OB2-PB2-OB5
48	4	502	CDL	CB3-OB5-PB2-OB2
50	W	402	PLC	C4-O4P-P-O3P
45	E	401	NDP	C2D-C1D-N1N-C2N
48	g	201	CDL	C34-C35-C36-C37
50	n	1101	PLC	C4'-C5'-C6'-C7'
47	J	202	LMN	CBE-CBG-CBI-CBK
50	W	401	PLC	O2-C'-C1'-C2'
48	g	201	CDL	C77-C78-C79-C80
48	4	502	CDL	C55-C56-C57-C58
50	W	401	PLC	C3B-C4B-C5B-C6B
51	2	503	T7X	C13-C14-C15-C16
48	g	201	CDL	OA5-CA3-CA4-CA6
46	4	505	3PE	C22-C23-C24-C25
46	5	901	3PE	C27-C28-C29-C2A
46	5	903	3PE	C1-C2-C3-O31
46	5	903	3PE	C2E-C2F-C2G-C2H
48	X	201	CDL	CB3-OB5-PB2-OB2
51	2	503	T7X	C16-C17-C18-C19
51	4	504	T7X	C15-C16-C17-C18
46	J	201	3PE	C39-C3A-C3B-C3C

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Mol	Chain	Res	Type	Atoms
51	4	504	T7X	O19-C11-C31-C32
48	4	502	CDL	OB6-CB4-CB6-OB8
50	W	402	PLC	O2-C2-C3-O3
51	4	504	T7X	O16-C8-C9-O18
46	g	202	3PE	C27-C28-C29-C2A
45	E	401	NDP	O4D-C1D-N1N-C2N
46	J	203	3PE	C22-C23-C24-C25
46	I	303	3PE	C3A-C3B-C3C-C3D
47	J	202	LMN	CBH-CBJ-CBL-CBR
50	W	402	PLC	C7B-C8B-C9B-CAA
47	J	202	LMN	CBD-CBF-CBH-CBJ
46	4	501	3PE	C34-C35-C36-C37
46	J	201	3PE	C3B-C3C-C3D-C3E
46	4	503	3PE	O11-C1-C2-C3
48	X	201	CDL	C33-C34-C35-C36
50	W	402	PLC	C8B-C9B-CAA-CBA
48	g	201	CDL	C72-C71-CB7-OB9
52	2	502	CPL	C2-C1-O3P-P
48	g	201	CDL	C33-C34-C35-C36
52	2	502	CPL	C42-C43-C44-C45
46	4	501	3PE	C24-C25-C26-C27
48	X	201	CDL	C37-C38-C39-C40
49	O	201	ZMP	N2-C16-C17-O4
46	J	201	3PE	O21-C21-C22-C23
46	5	901	3PE	O21-C21-C22-C23
46	4	501	3PE	C2F-C2G-C2H-C2I
48	X	201	CDL	C21-C22-C23-C24
47	J	202	LMN	CCV-CCR-O4-C4
48	g	201	CDL	C35-C36-C37-C38
46	J	203	3PE	C2A-C2B-C2C-C2D
47	j	101	LMN	CCH-CCQ-OCB-CCS
47	j	101	LMN	CCF-CCQ-OCB-CCS
50	n	1101	PLC	C'-C1'-C2'-C3'
46	5	901	3PE	C25-C26-C27-C28
50	5	902	PLC	C2B-C3B-C4B-C5B
46	4	503	3PE	C27-C28-C29-C2A
49	Q	201	ZMP	C11-C12-N1-C13
52	2	502	CPL	C13-C14-C15-C16
51	2	503	T7X	C24-C25-C26-C27
52	2	502	CPL	C37-C38-C39-C40
52	2	502	CPL	C43-C44-C45-C46
51	2	501	T7X	O13-C7-C8-O16

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Mol	Chain	Res	Type	Atoms
52	2	502	CPL	C35-C36-C37-C38
47	J	202	LMN	CBG-CBI-CBK-CBQ
48	X	201	CDL	C51-C52-C53-C54
50	W	402	PLC	C6'-C7'-C8'-C9'
46	J	203	3PE	O11-C1-C2-C3
46	5	903	3PE	O11-C1-C2-C3
46	4	501	3PE	C22-C23-C24-C25
47	j	101	LMN	CBF-CBH-CBJ-CBL
46	5	903	3PE	O21-C2-C3-O31
48	J	204	CDL	OA6-CA4-CA6-OA8
51	2	503	T7X	O16-C8-C9-O18
46	4	503	3PE	O31-C31-C32-C33
50	W	402	PLC	C2B-C1B-CB-O3
47	J	202	LMN	O1-CBS-CCM-CBR
46	g	202	3PE	O21-C21-C22-C23
46	4	503	3PE	O21-C21-C22-C23
46	J	203	3PE	O31-C31-C32-C33
48	4	502	CDL	C12-C11-CA5-OA6
46	J	201	3PE	C32-C31-O31-C3
48	g	201	CDL	C32-C31-CA7-OA8
46	J	201	3PE	O22-C21-C22-C23
50	5	902	PLC	O2-C'-C1'-C2'
48	g	201	CDL	CB3-CB4-CB6-OB8
51	2	503	T7X	C7-C8-C9-O18
46	J	203	3PE	O32-C31-C32-C33
46	6	301	3PE	O31-C31-C32-C33
50	W	402	PLC	C2B-C1B-CB-OB
45	E	401	NDP	C5B-O5B-PA-O1A
46	I	303	3PE	C11-O13-P-O12
46	4	505	3PE	C11-O13-P-O14
46	5	901	3PE	C11-O13-P-O14
46	6	301	3PE	C11-O13-P-O14
48	4	502	CDL	CA3-OA5-PA1-OA3
48	4	502	CDL	CB2-OB2-PB2-OB3
52	2	502	CPL	C4-O4P-P-O1P
45	E	401	NDP	C3D-C4D-C5D-O5D
46	4	503	3PE	O32-C31-C32-C33
48	4	502	CDL	C12-C11-CA5-OA7
46	J	201	3PE	O11-C1-C2-C3
48	J	204	CDL	C74-C75-C76-C77
46	5	901	3PE	O22-C21-C22-C23
50	5	902	PLC	O'-C'-C1'-C2'

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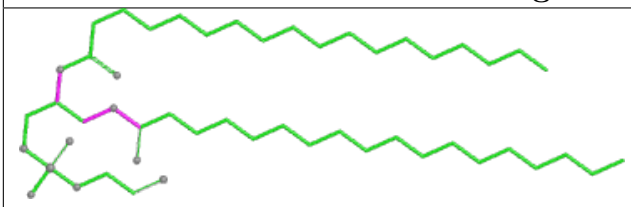
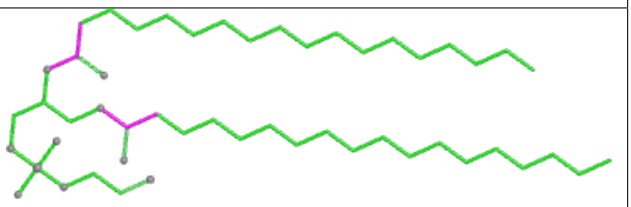
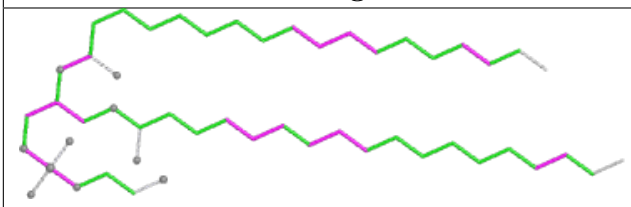
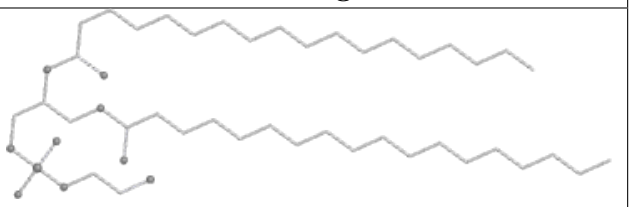
Mol	Chain	Res	Type	Atoms
48	J	204	CDL	C76-C77-C78-C79
46	I	303	3PE	O22-C21-C22-C23
48	4	502	CDL	C32-C33-C34-C35
49	O	201	ZMP	O3-C16-C17-C18
50	W	402	PLC	C5-C4-O4P-P
52	2	502	CPL	C11-C12-C13-C14
46	4	503	3PE	C3B-C3C-C3D-C3E
46	J	203	3PE	C25-C26-C27-C28
46	J	201	3PE	O11-C1-C2-O21
46	4	503	3PE	O11-C1-C2-O21
48	g	201	CDL	C32-C31-CA7-OA9
48	g	201	CDL	C78-C79-C80-C81
46	4	503	3PE	O22-C21-C22-C23
49	O	201	ZMP	C2-C3-C4-C5
46	g	202	3PE	O22-C21-C22-C23
52	2	502	CPL	O3-C11-C12-C13

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 3PE 5 903	
 Bond lengths	 Bond angles
 Torsions	 Rings

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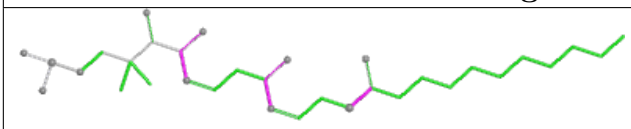
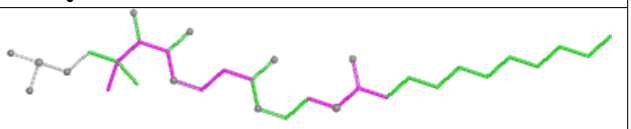
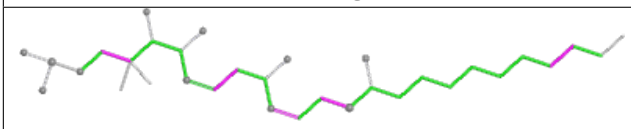
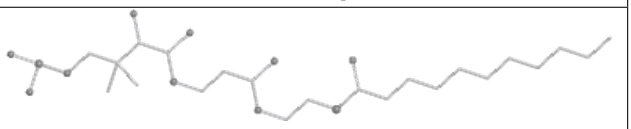
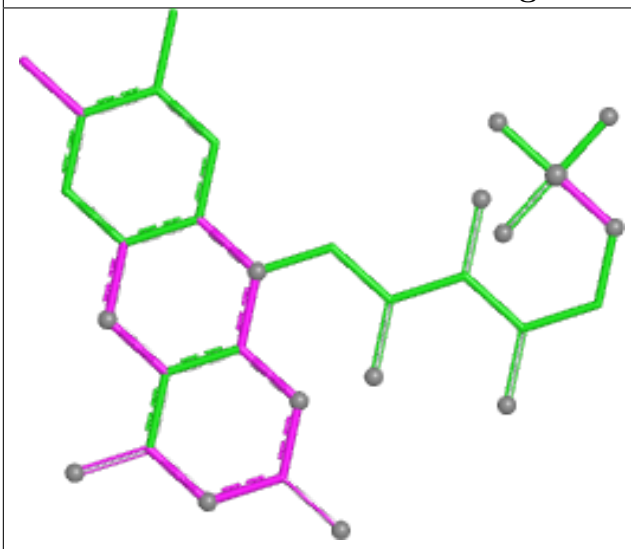
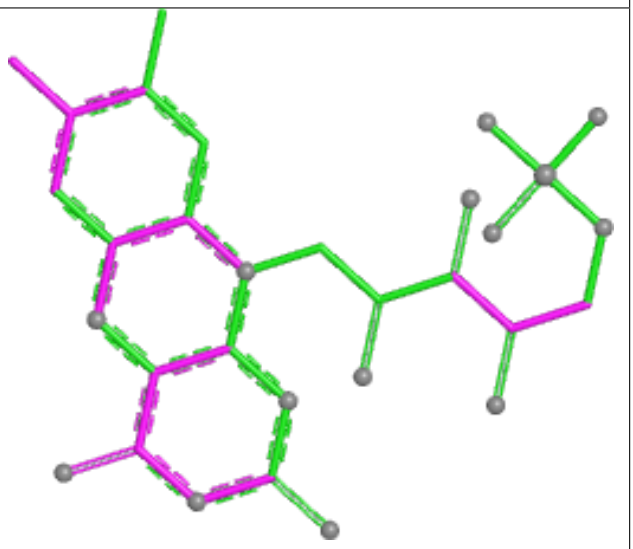
 Bond lengths	 Bond angles
 Torsions	 Rings

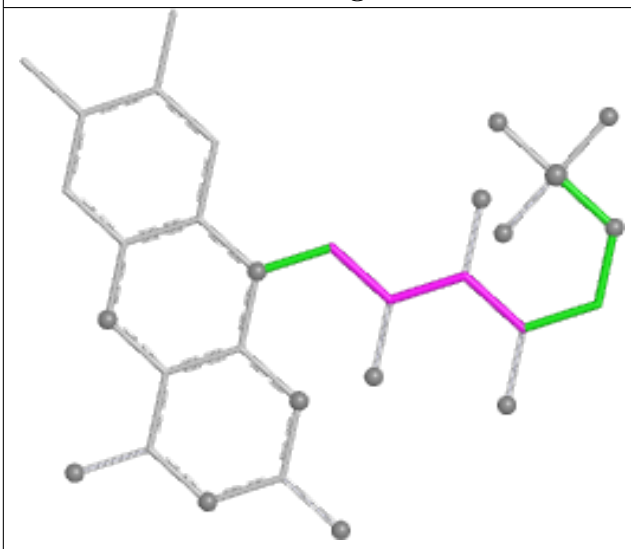
Ligand FMN B 502



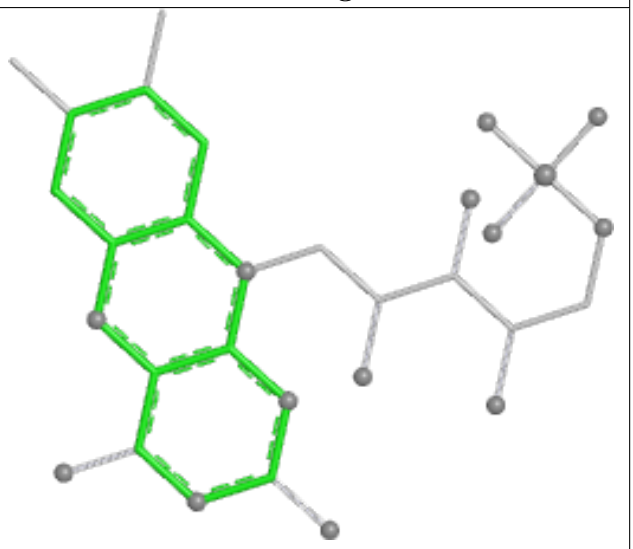
Bond lengths



Bond angles

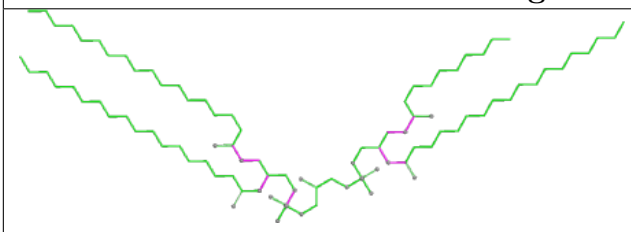


Torsions

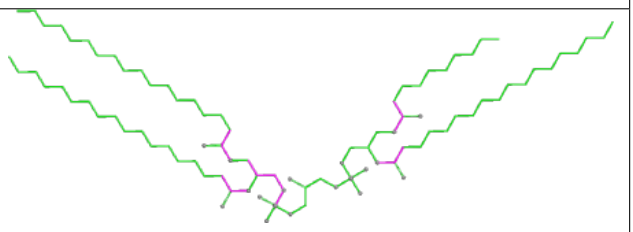


Rings

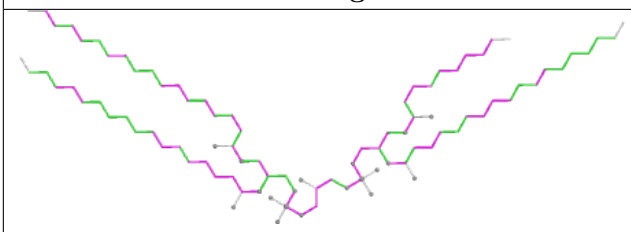
Ligand CDL 4 502



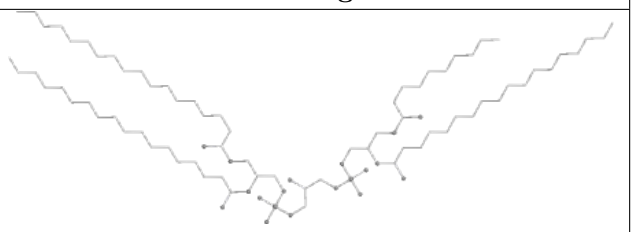
Bond lengths



Bond angles

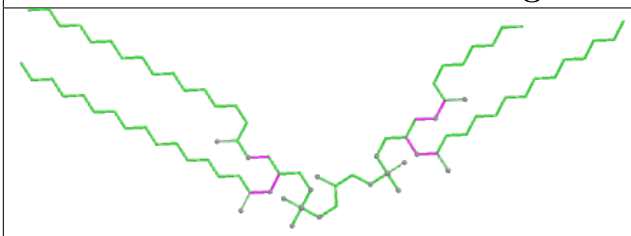


Torsions



Rings

Ligand CDL X 201



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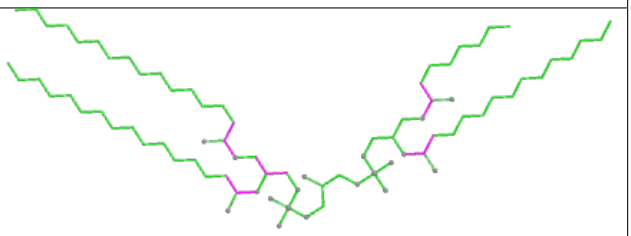
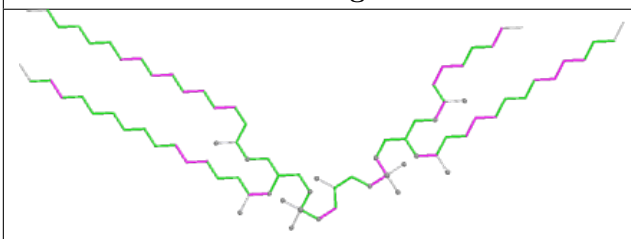
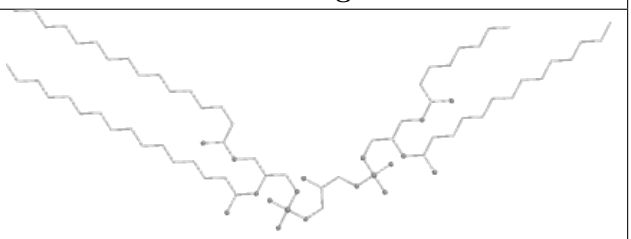


Bond angles

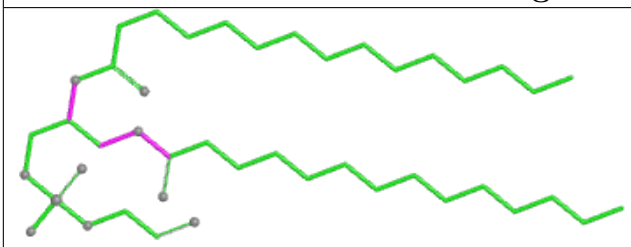


Torsions



Rings

Ligand 3PE J 203



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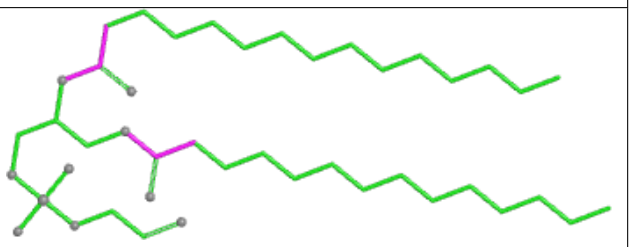
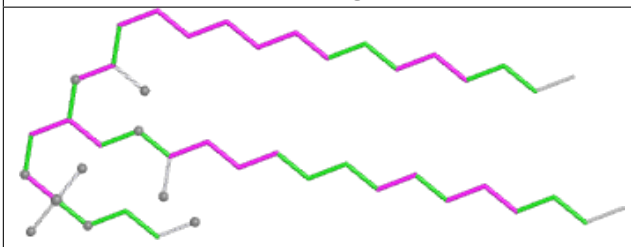
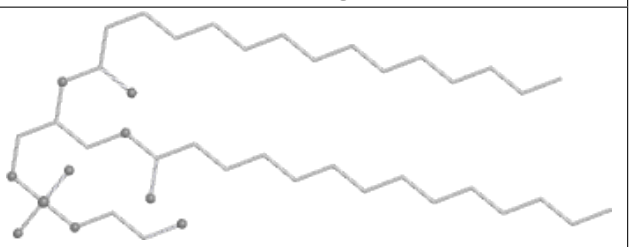


Bond angles

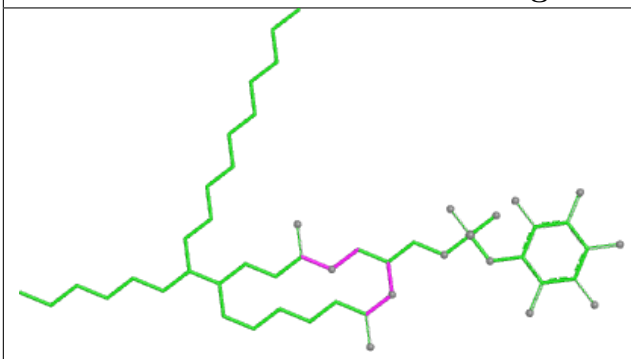


Torsions

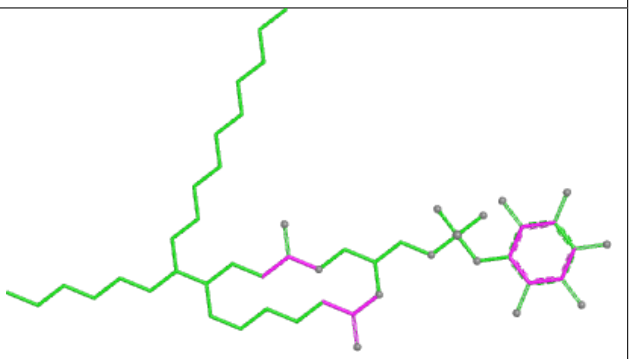


Rings

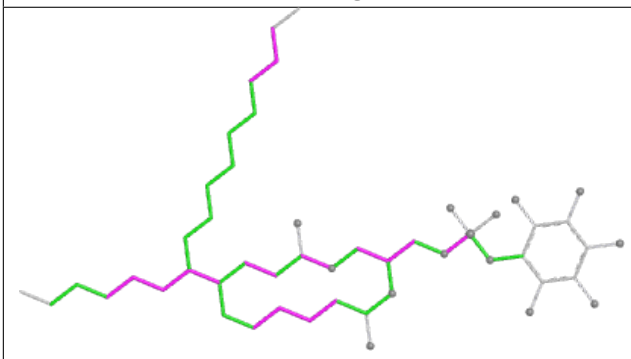
Ligand T7X 2 503



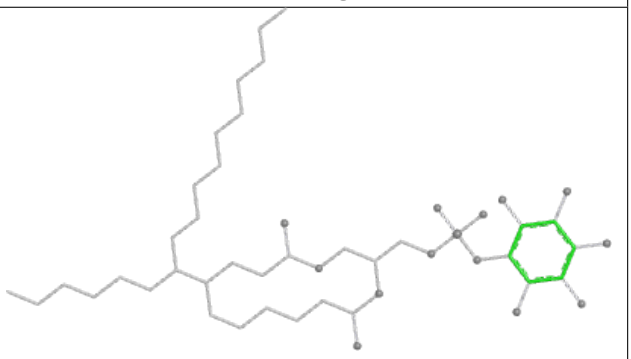
Bond lengths



Bond angles

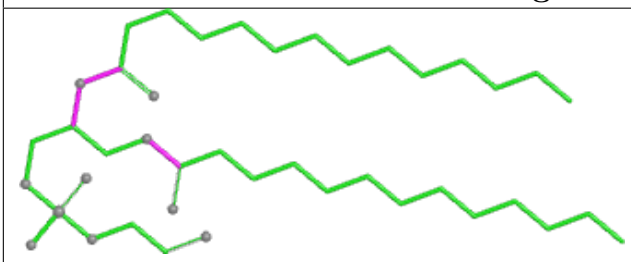


Torsions

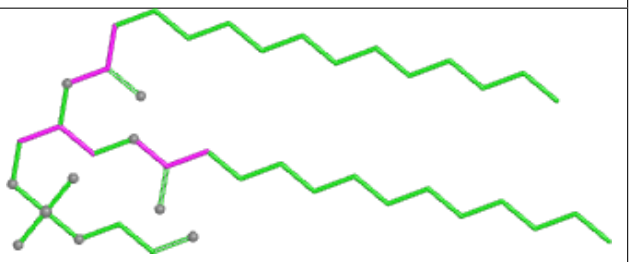


Rings

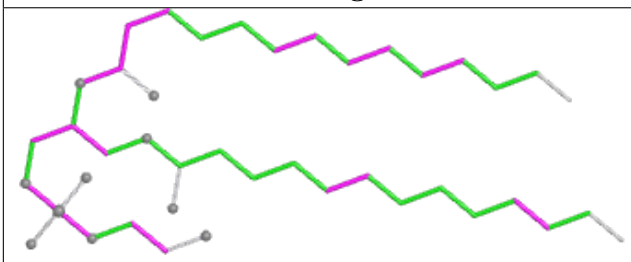
Ligand 3PE 5 901



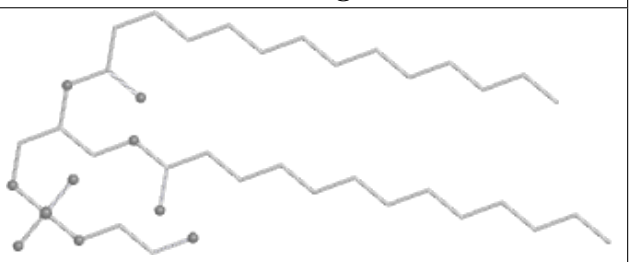
Bond lengths



Bond angles

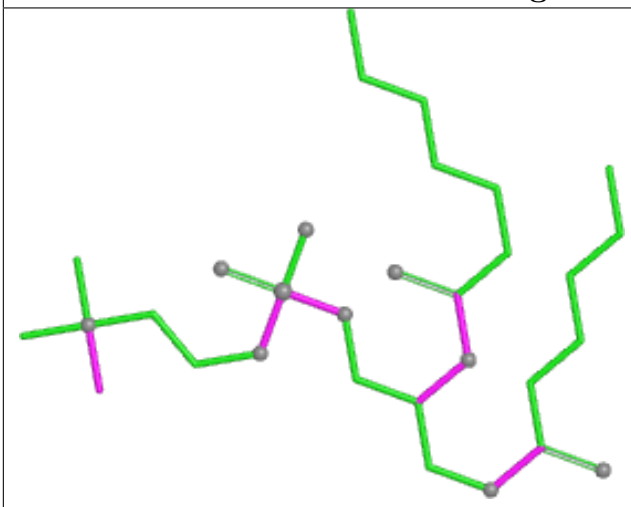


Torsions

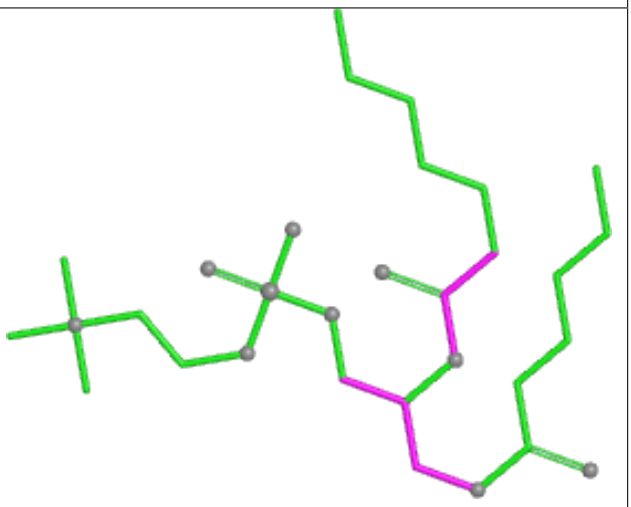


Rings

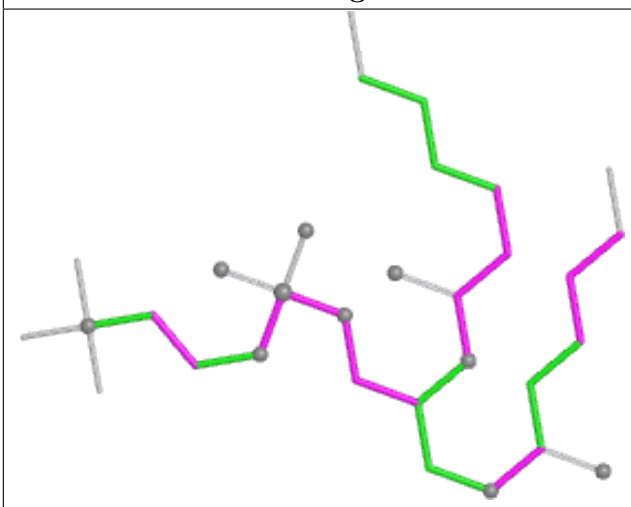
Ligand PLC 5 902



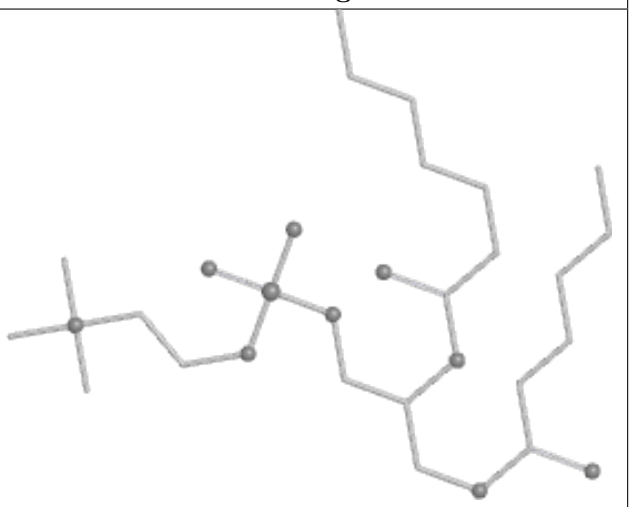
Bond lengths



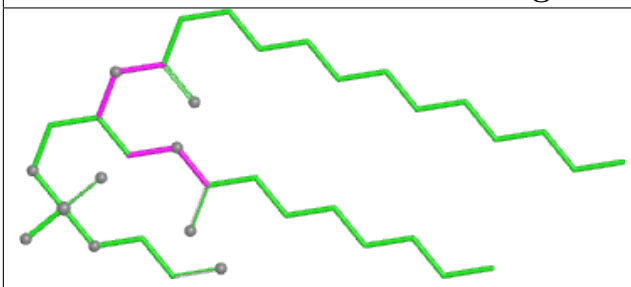
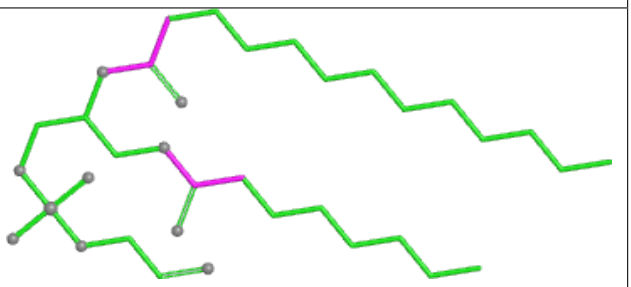
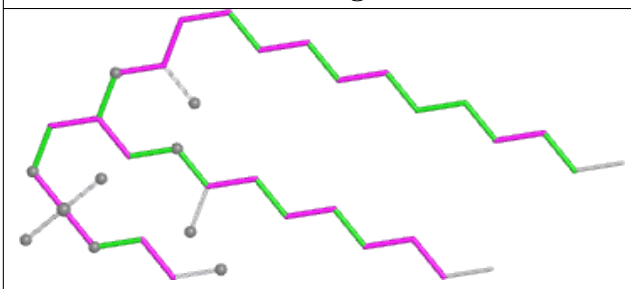
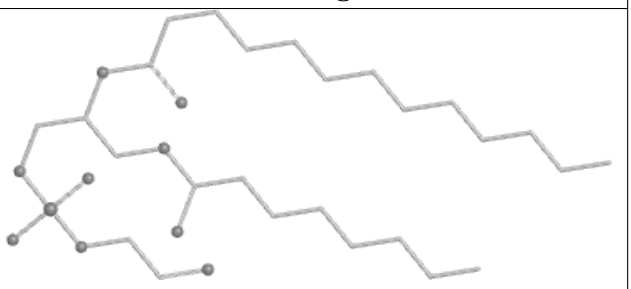
Bond angles

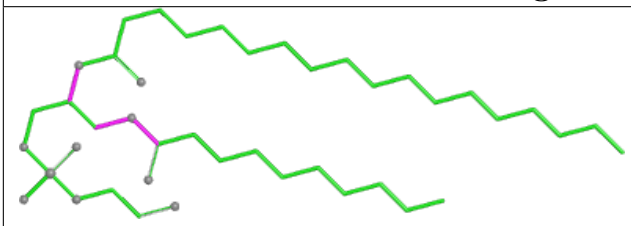
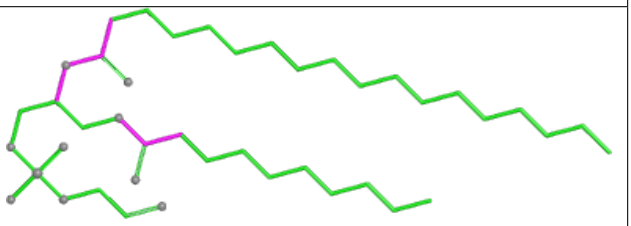
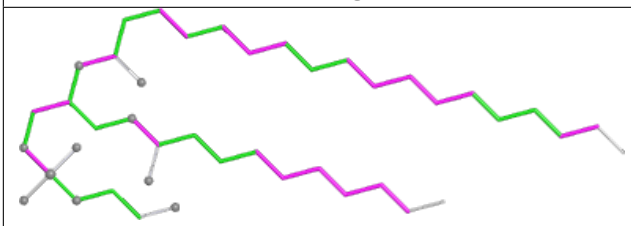
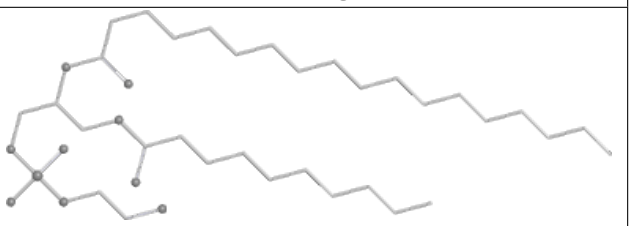


Torsions

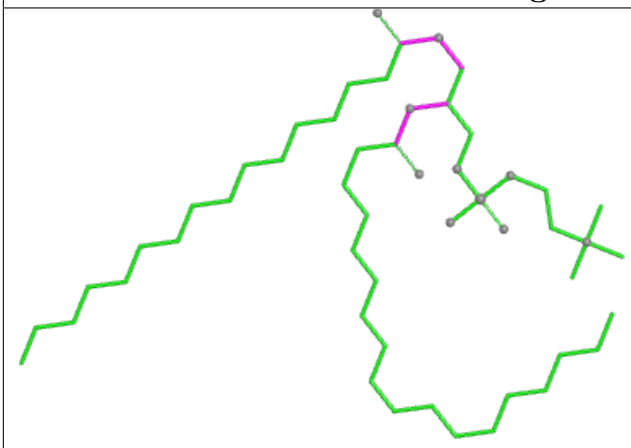


Rings

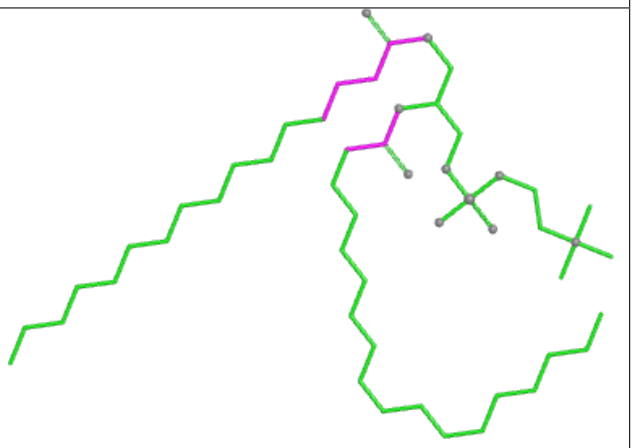
Ligand 3PE 6 301	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE 4 501	
 Bond lengths	 Bond angles
 Torsions	 Rings

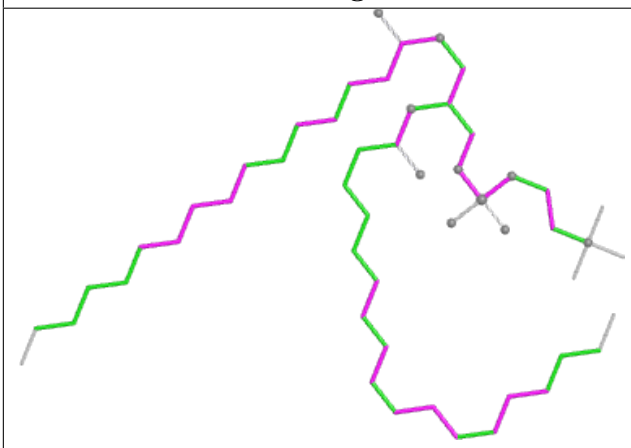
Ligand CPL 2 502



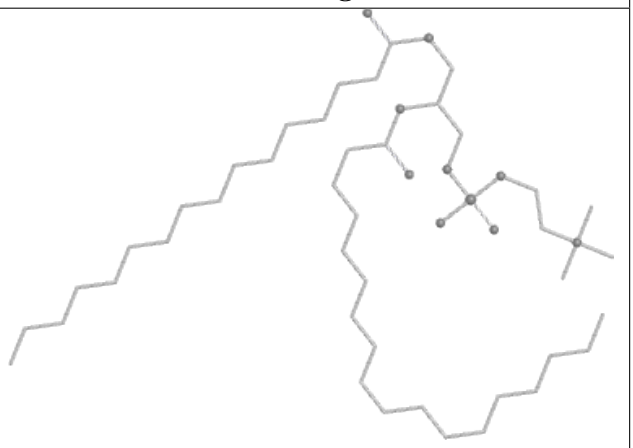
Bond lengths



Bond angles

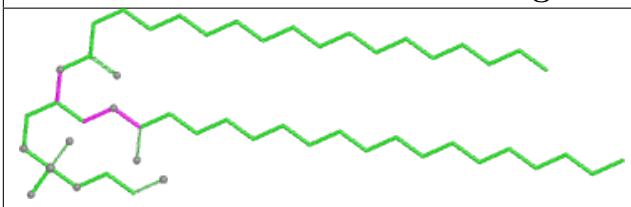


Torsions

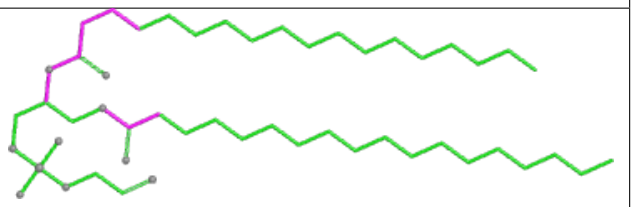


Rings

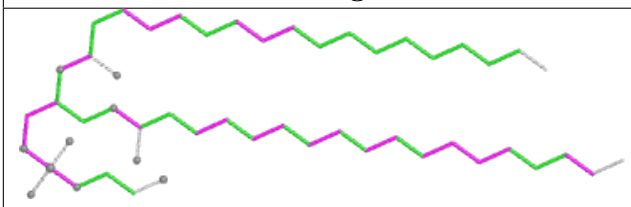
Ligand 3PE 4 505



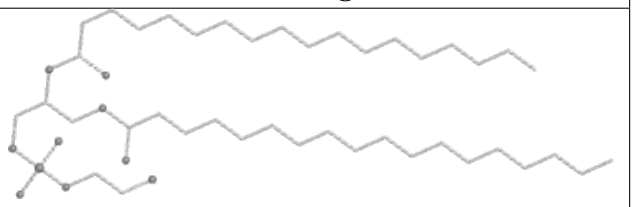
Bond lengths



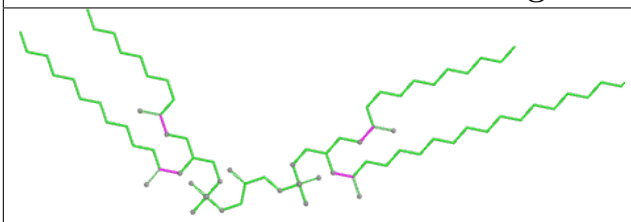
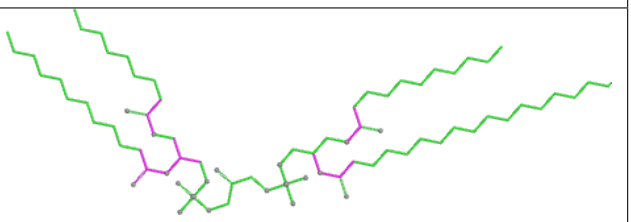
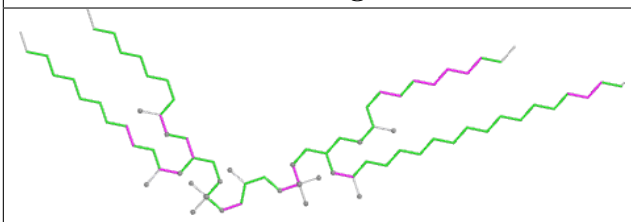
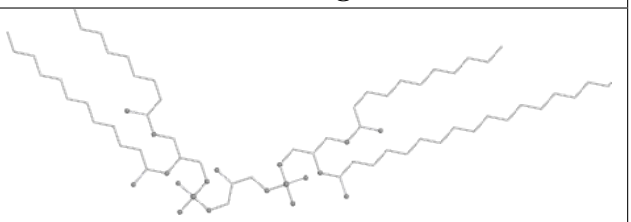
Bond angles



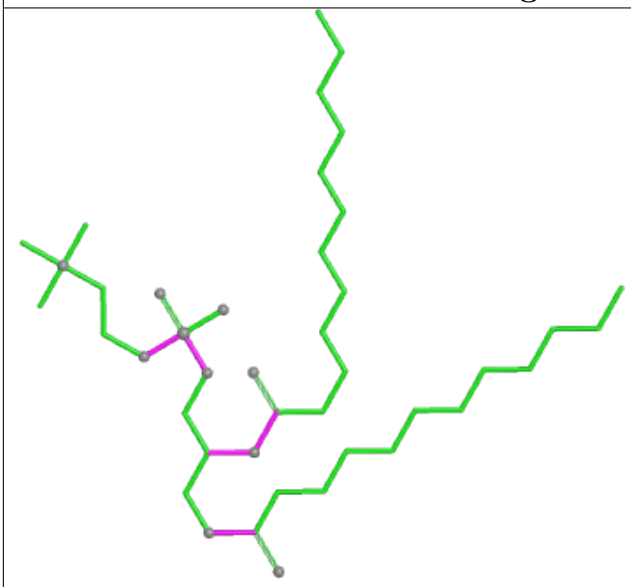
Torsions



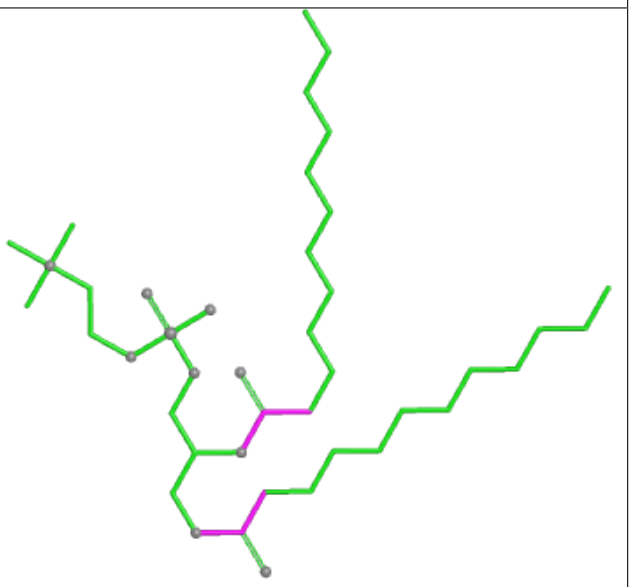
Rings

Ligand CDL J 204	
 Bond lengths	 Bond angles
 Torsions	 Rings

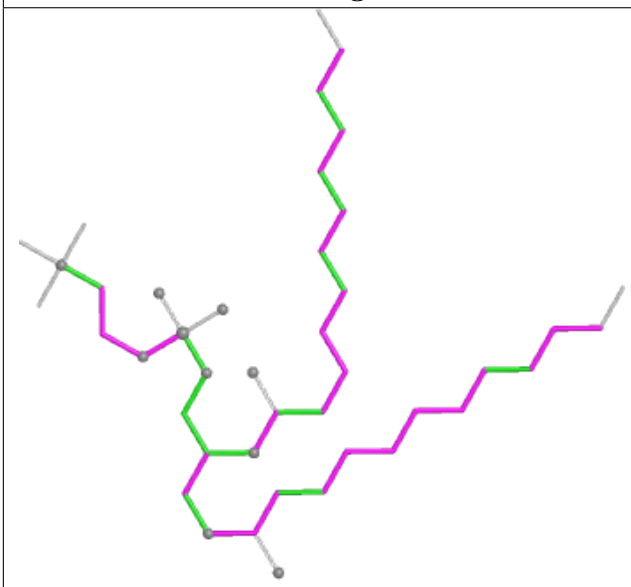
Ligand PLC W 402



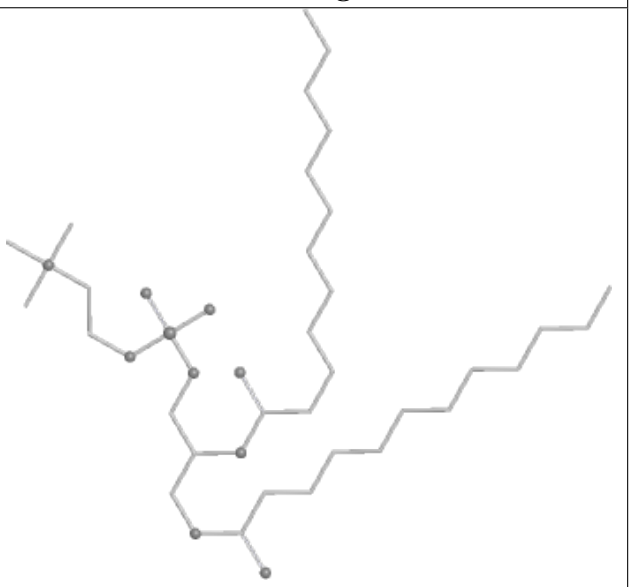
Bond lengths



Bond angles

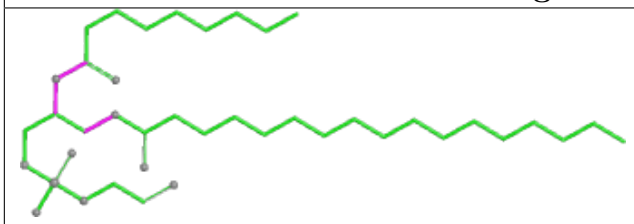


Torsions

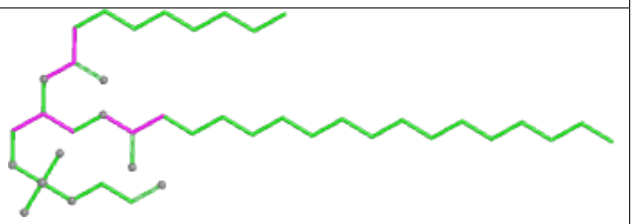


Rings

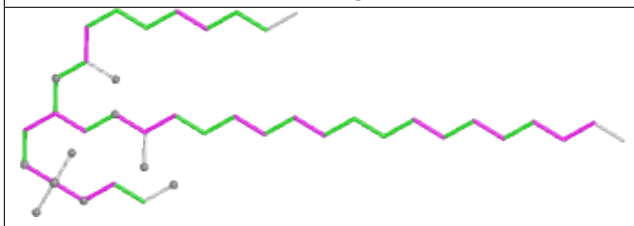
Ligand 3PE J 201



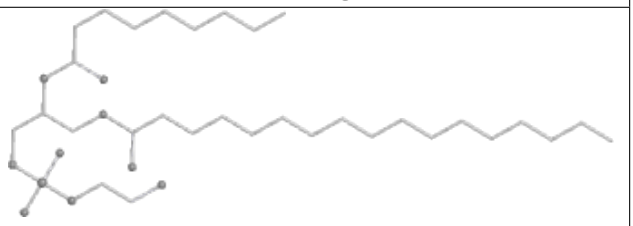
Bond lengths



Bond angles

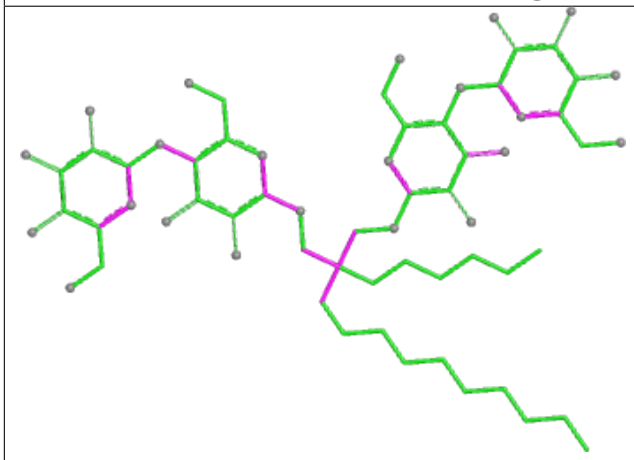


Torsions

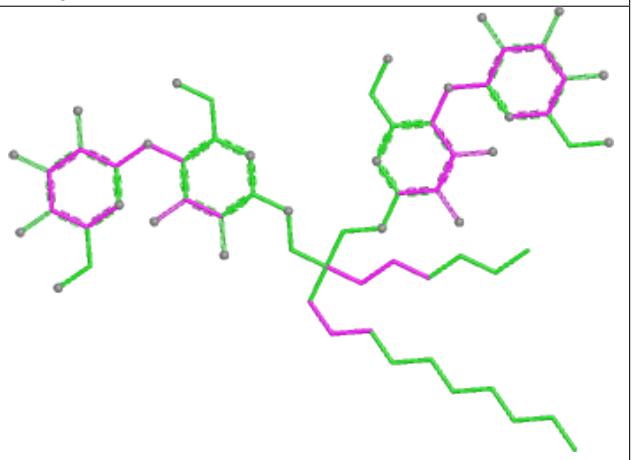


Rings

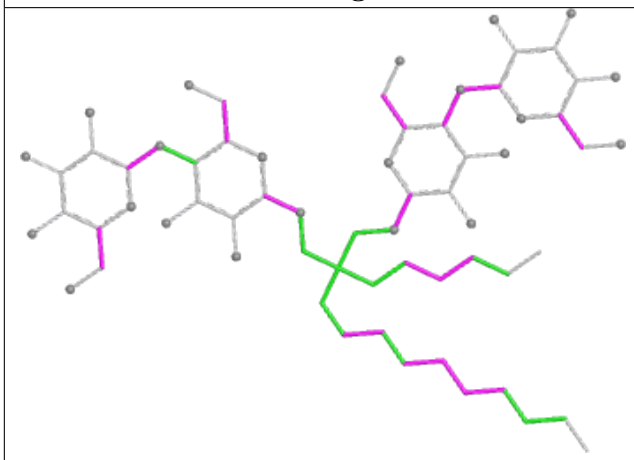
Ligand LMN j 101



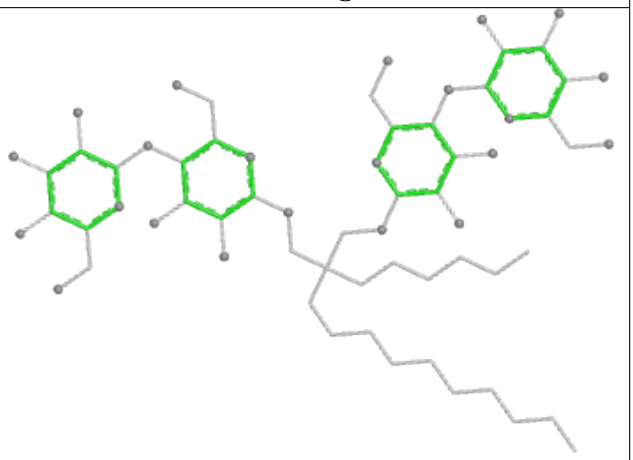
Bond lengths



Bond angles

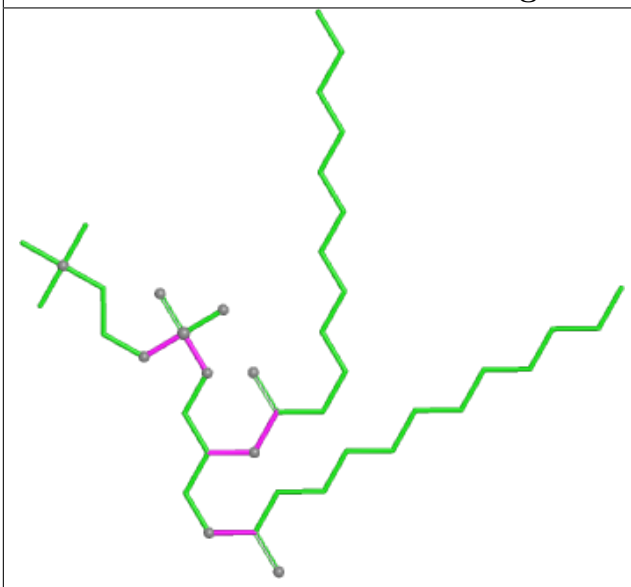


Torsions

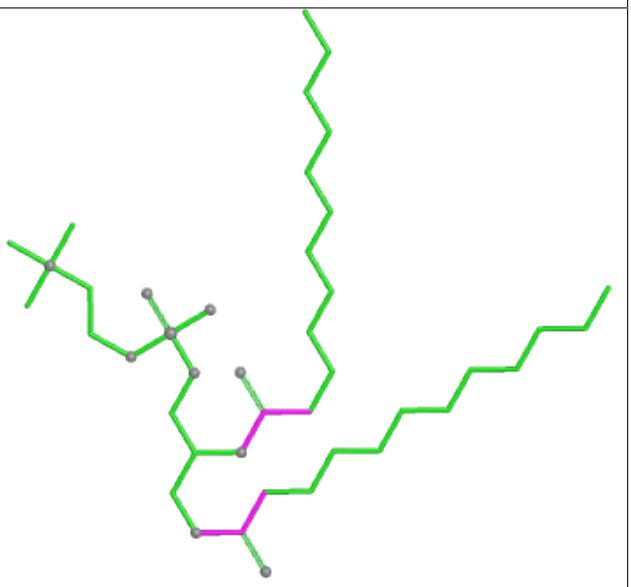


Rings

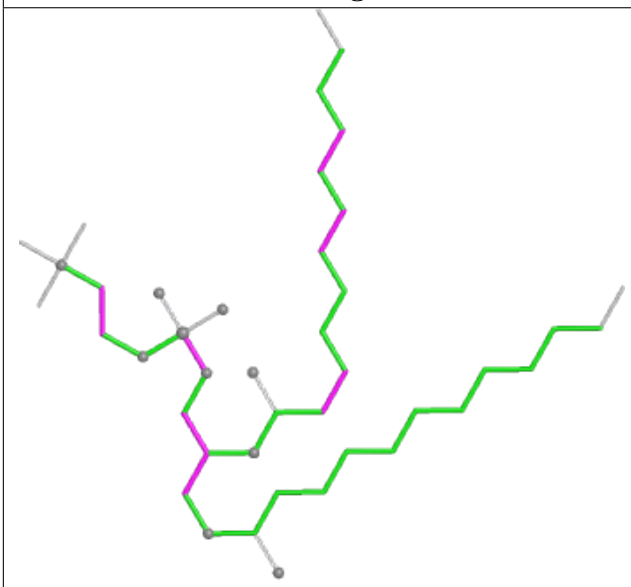
Ligand PLC n 1101



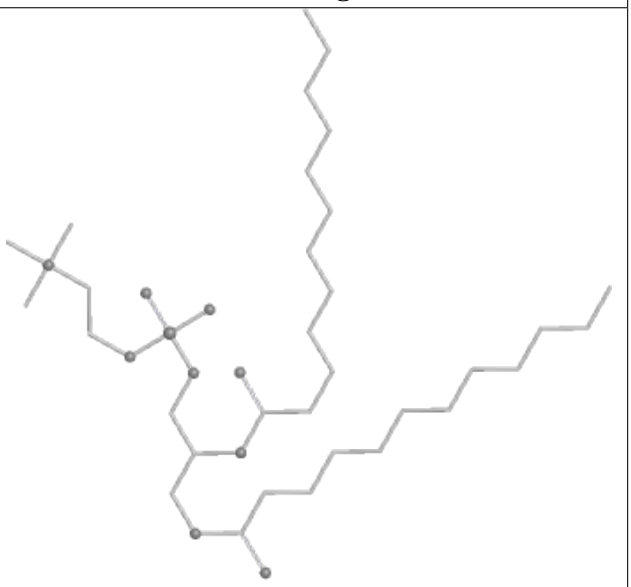
Bond lengths



Bond angles

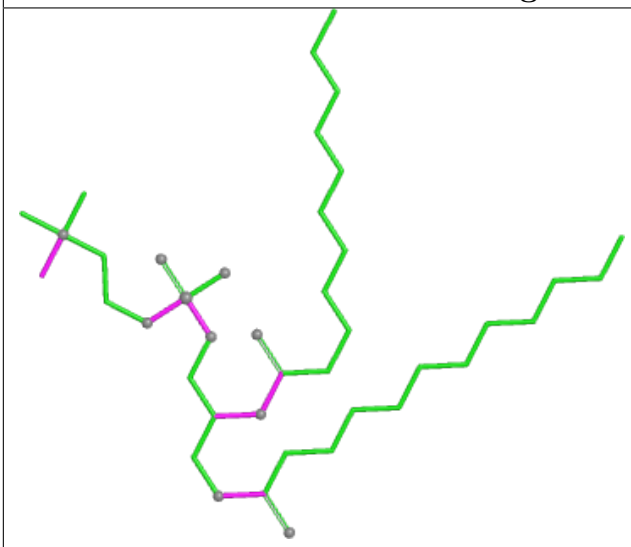


Torsions

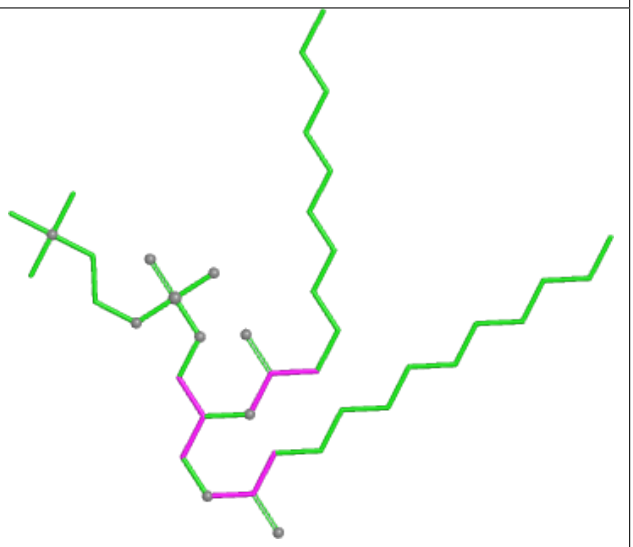


Rings

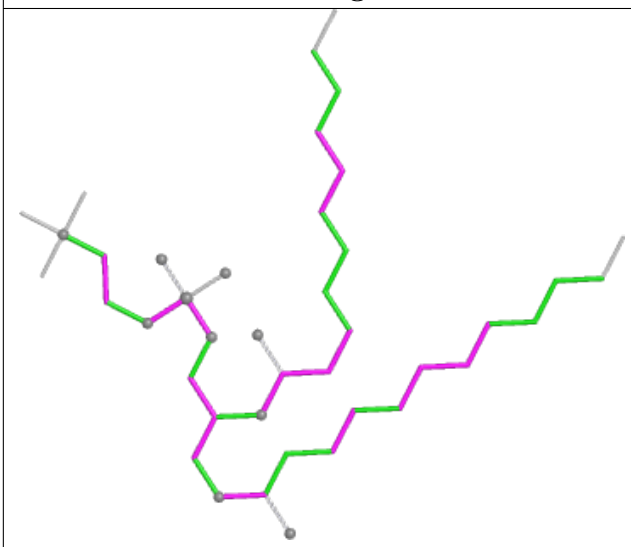
Ligand PLC W 401



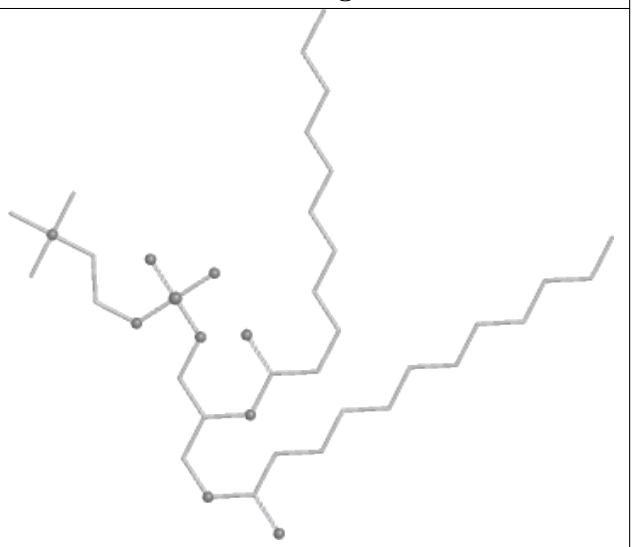
Bond lengths



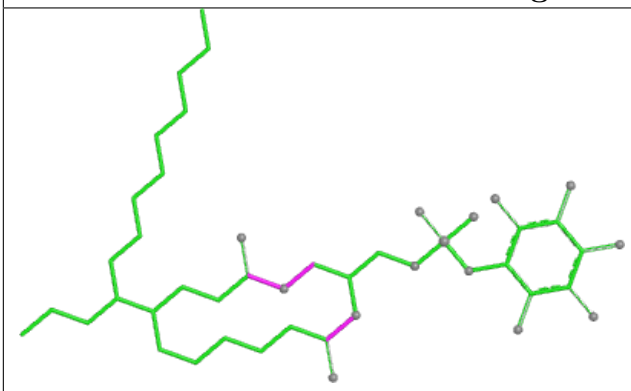
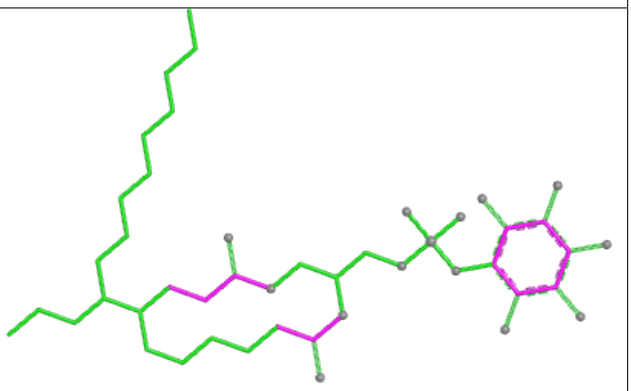
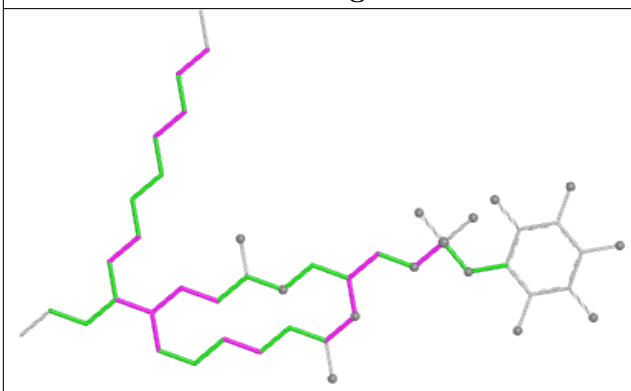
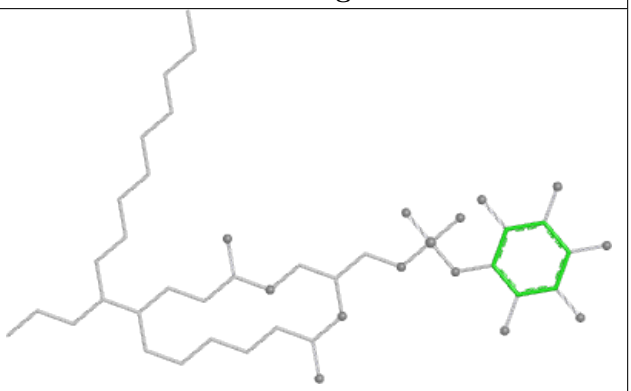
Bond angles

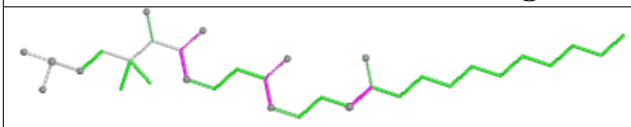
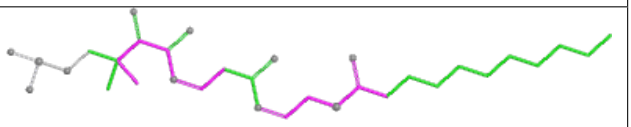
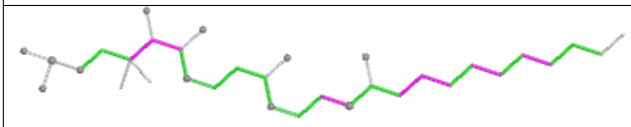
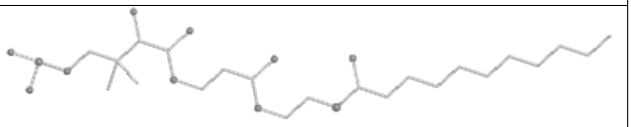


Torsions

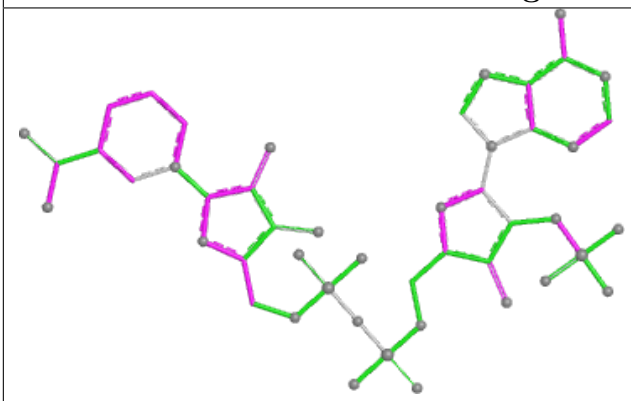


Rings

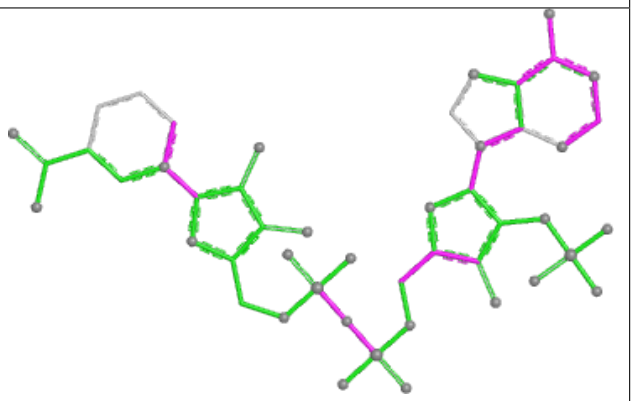
Ligand T7X 2 501	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ZMP O 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

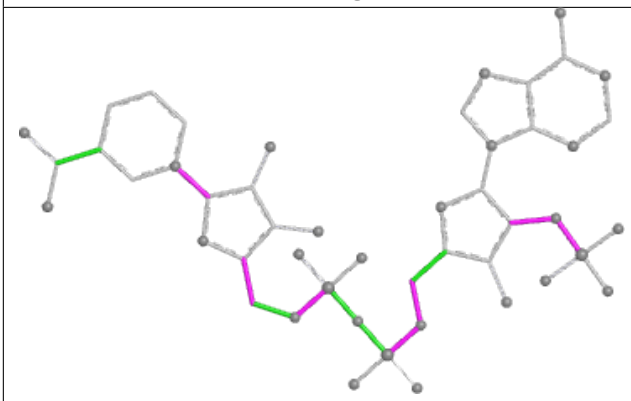
Ligand NDP E 401



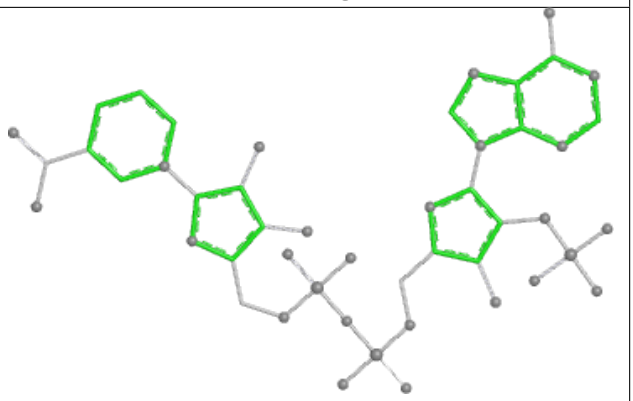
Bond lengths



Bond angles

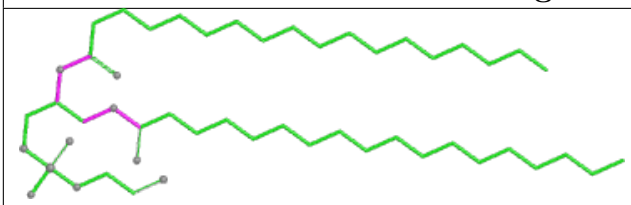


Torsions

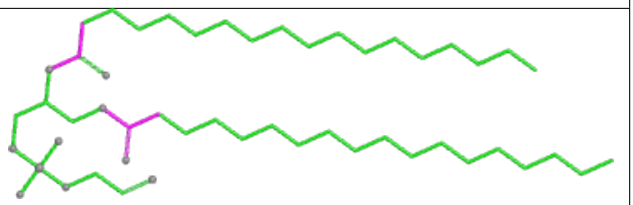


Rings

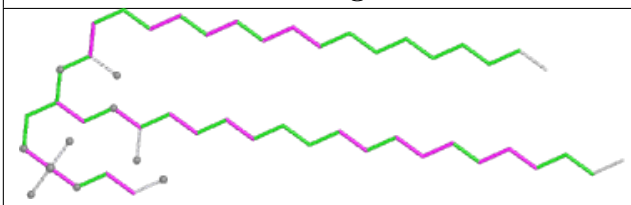
Ligand 3PE I 303



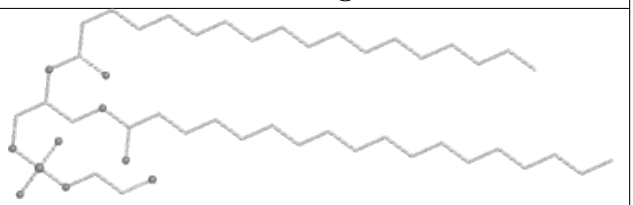
Bond lengths



Bond angles

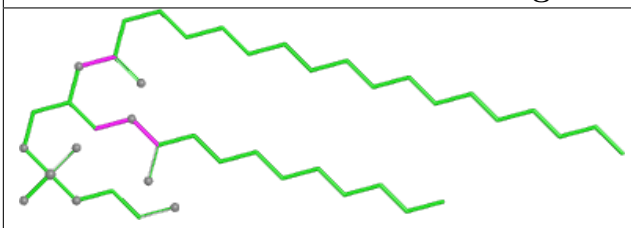


Torsions

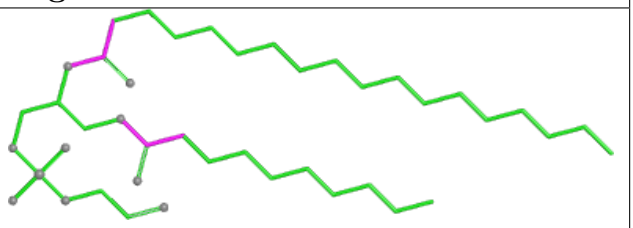


Rings

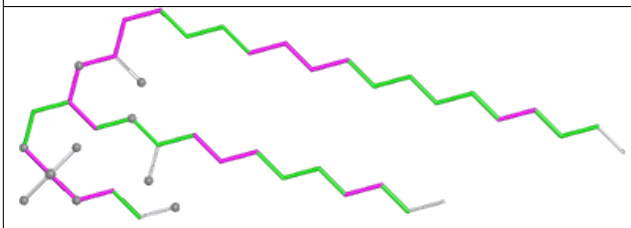
Ligand 3PE g 202



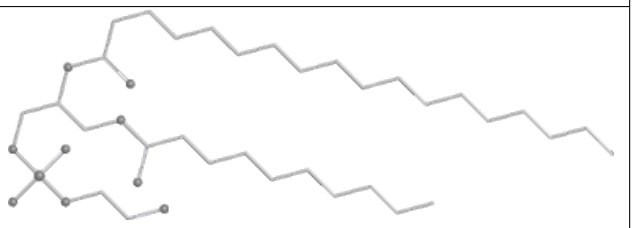
Bond lengths



Bond angles

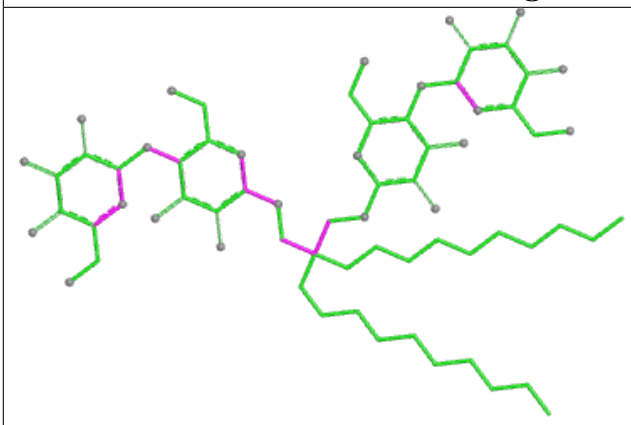


Torsions

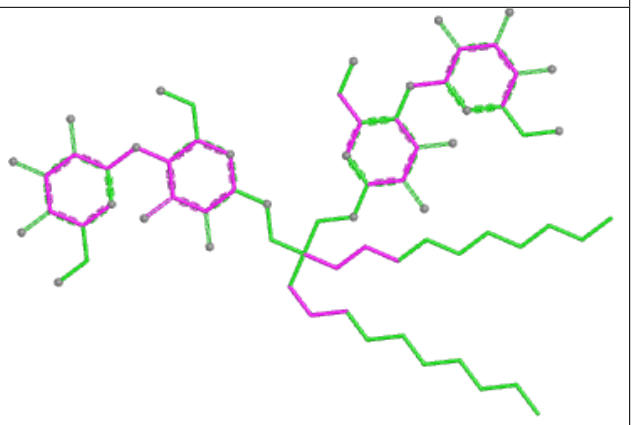


Rings

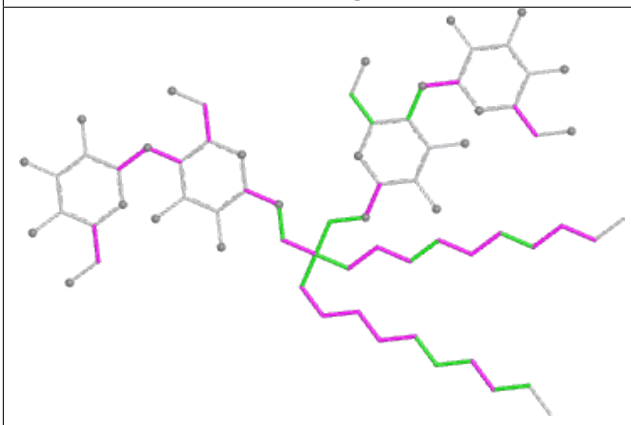
Ligand LMN J 202



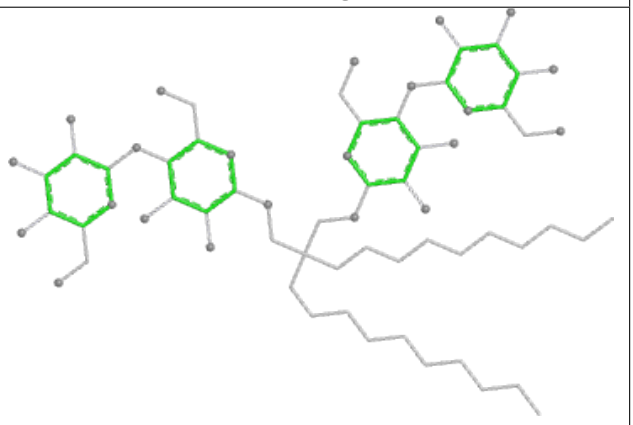
Bond lengths



Bond angles

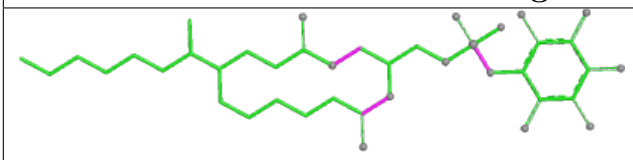


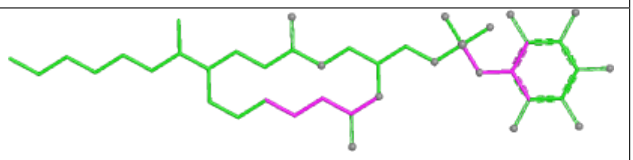
Torsions

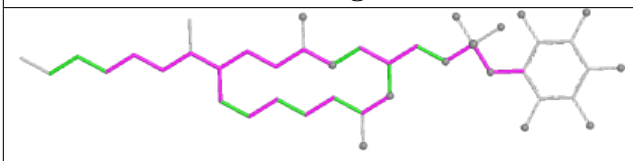


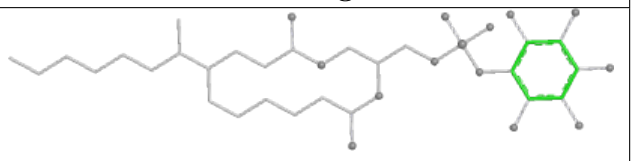
Rings

Ligand T7X 4 504

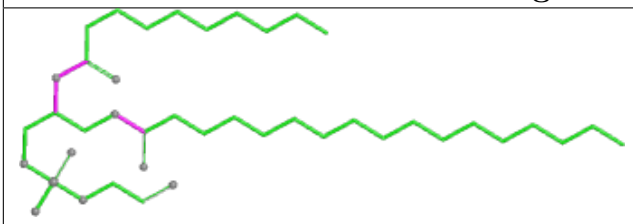

Bond lengths

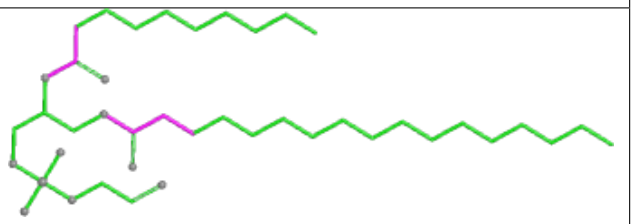

Bond angles

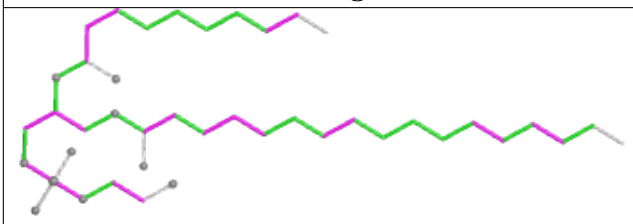

Torsions

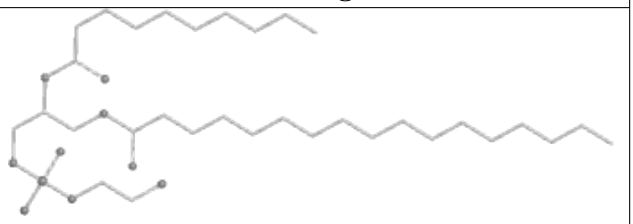

Rings

Ligand 3PE 4 503

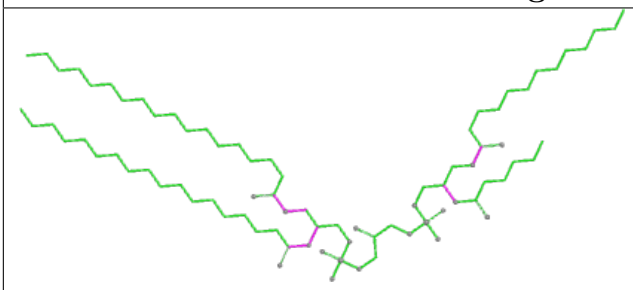

Bond lengths

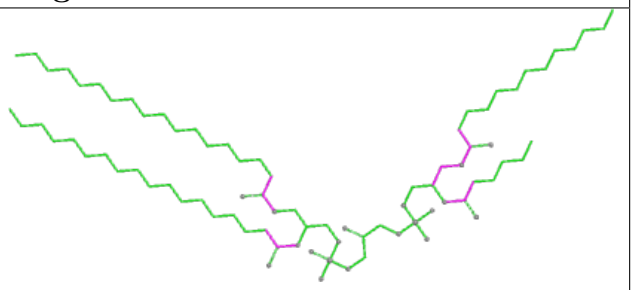

Bond angles

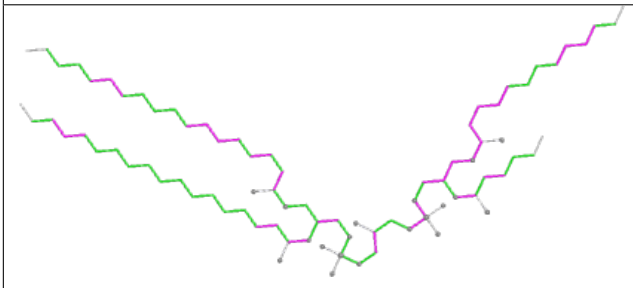

Torsions

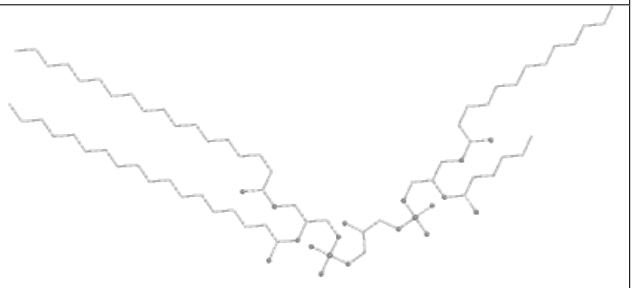

Rings

Ligand CDL g 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.

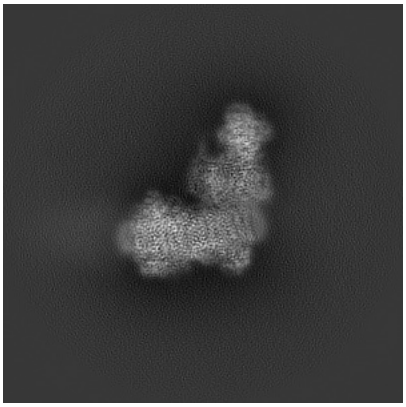
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-4872. These allow visual inspection of the internal detail of the map and identification of artifacts.

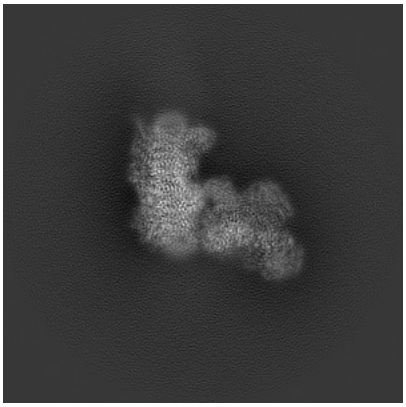
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

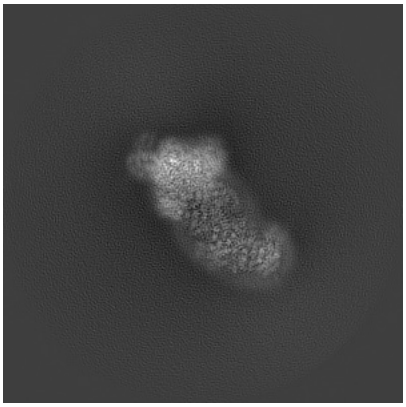
6.1.1 Primary map



X



Y

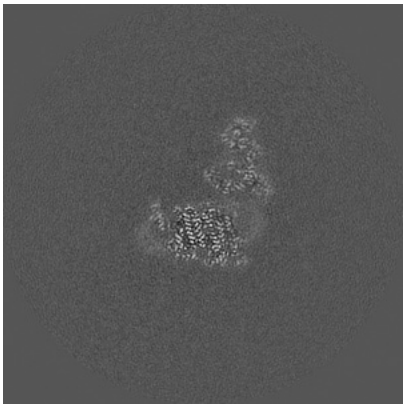


Z

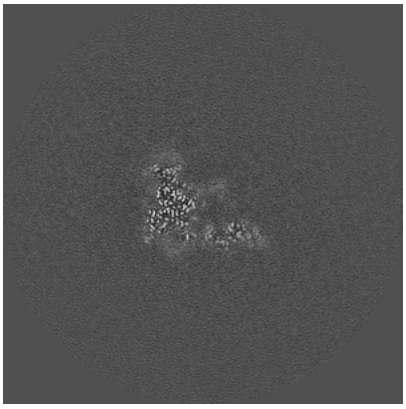
The images above show the map projected in three orthogonal directions.

6.2 Central slices

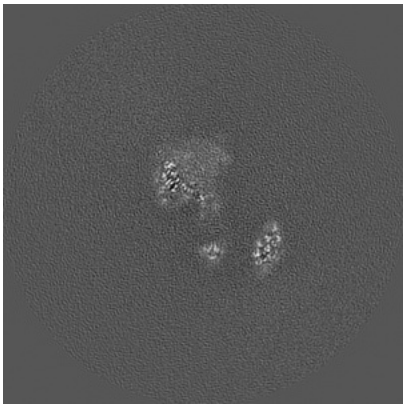
6.2.1 Primary map



X Index: 228



Y Index: 228

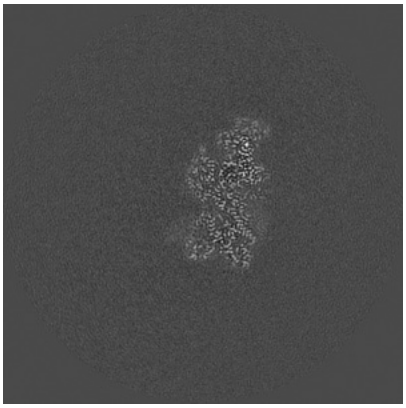


Z Index: 228

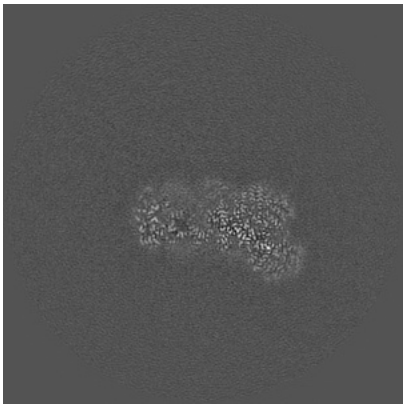
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

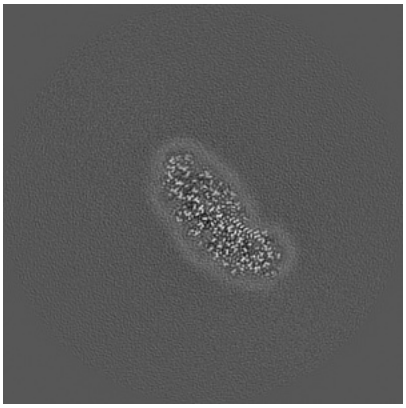
6.3.1 Primary map



X Index: 193



Y Index: 272

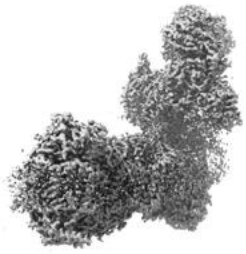


Z Index: 196

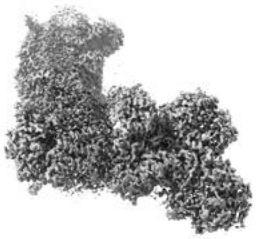
The images above show the largest variance slices of the map in three orthogonal directions.

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 0.021. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

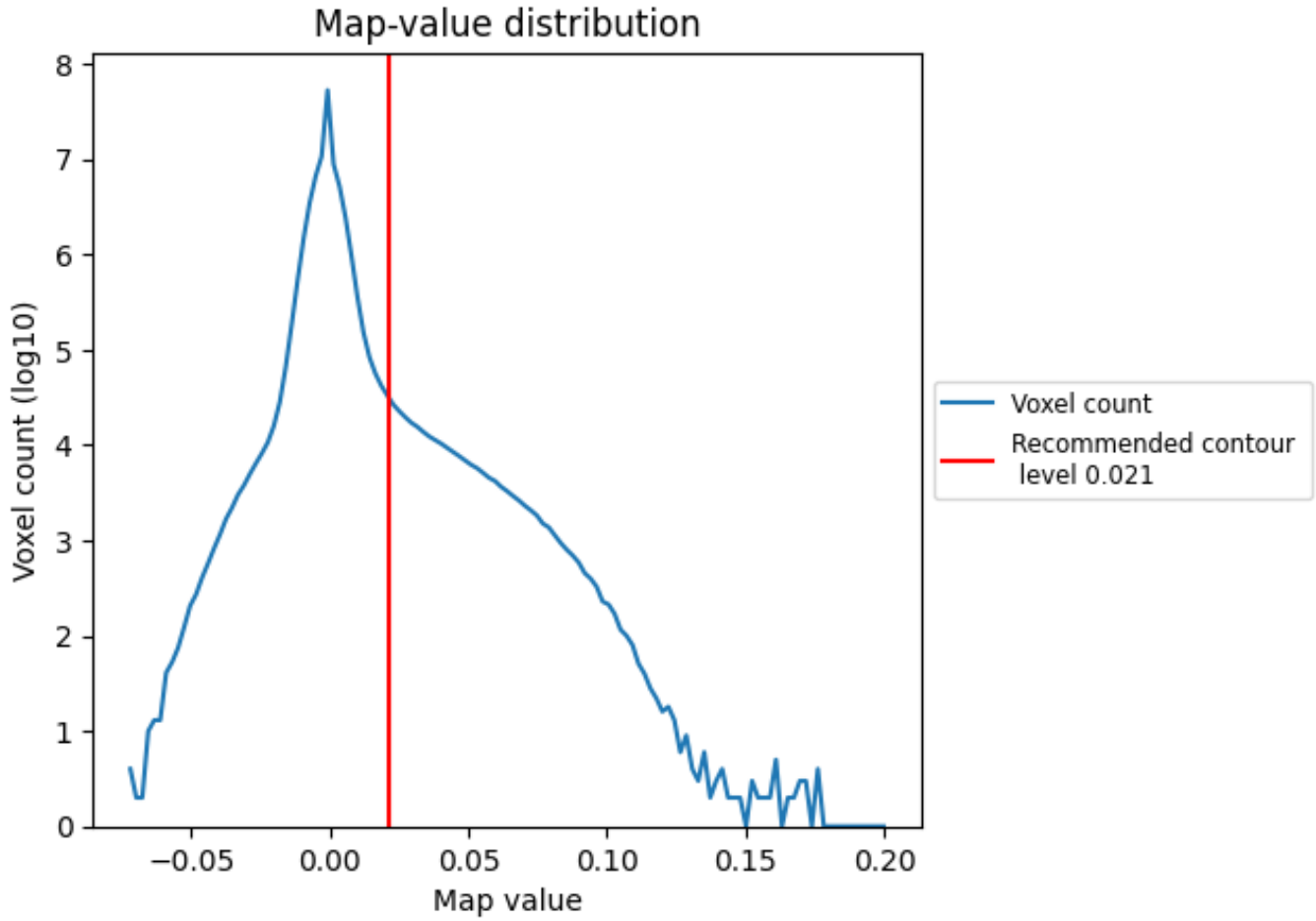
6.5 Mask visualisation (i)

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

7 Map analysis

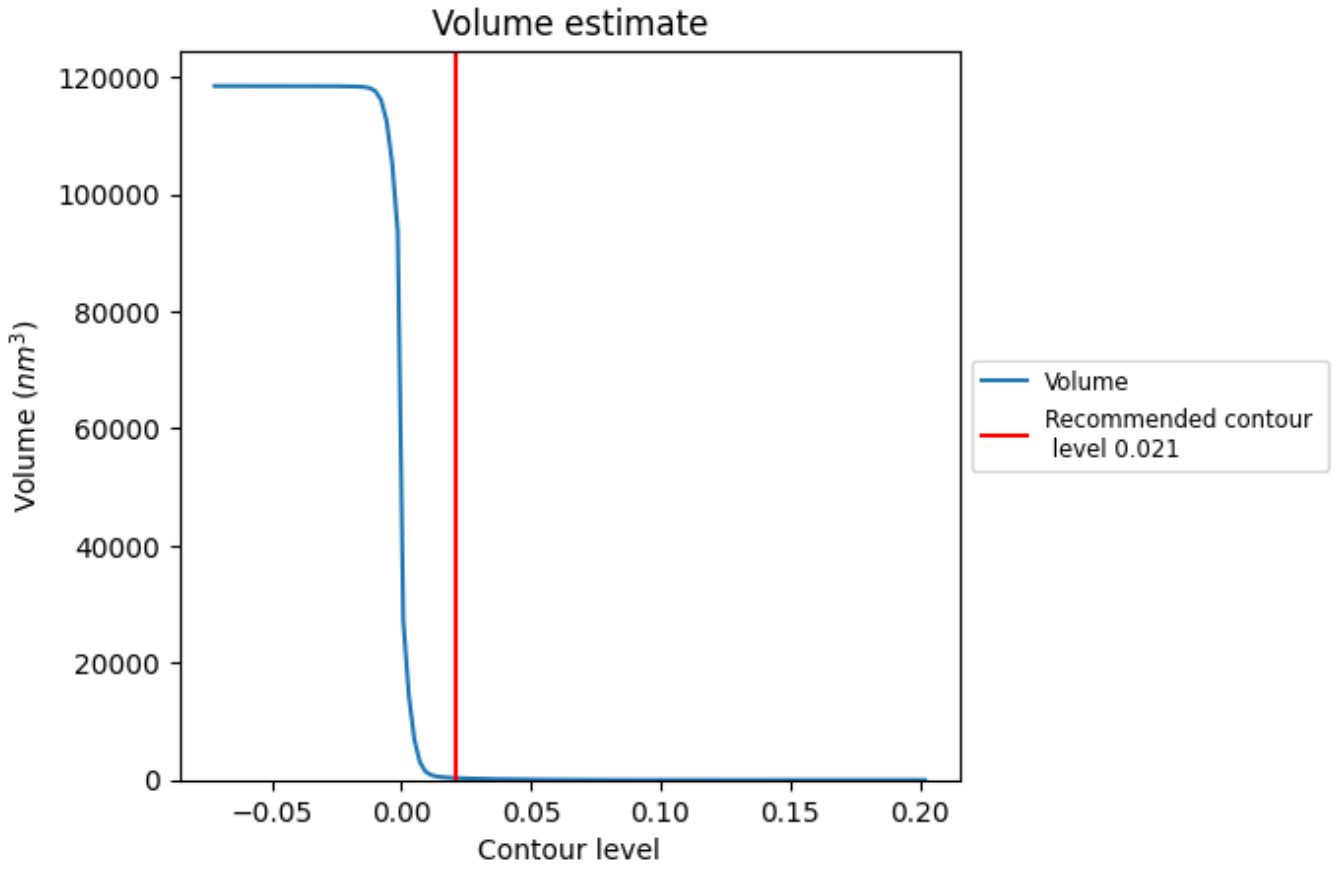
This section contains the results of statistical analysis of the map.

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.

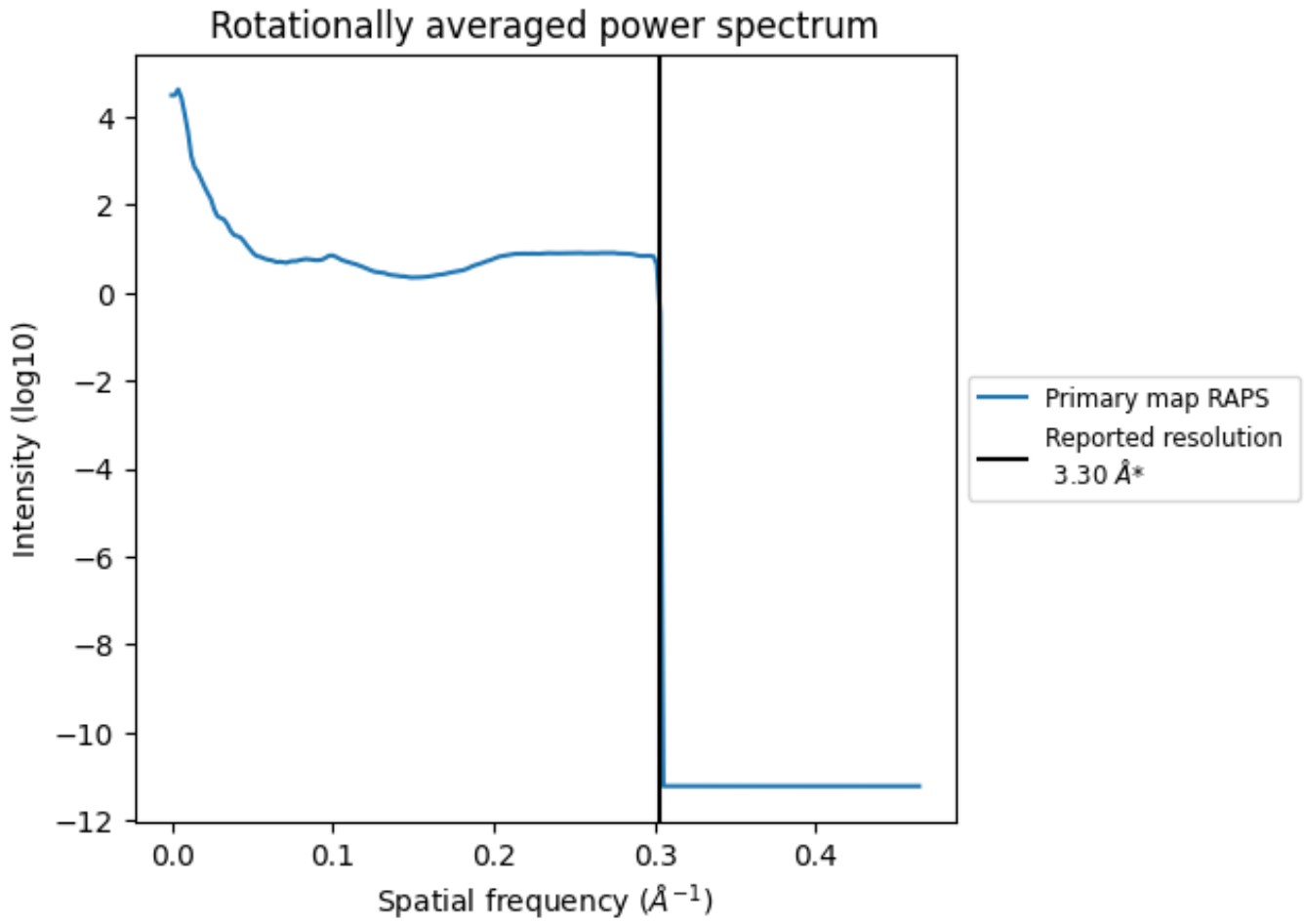
7.2 Volume estimate



The volume at the recommended contour level is 333 nm^3; this corresponds to an approximate mass of 300 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)

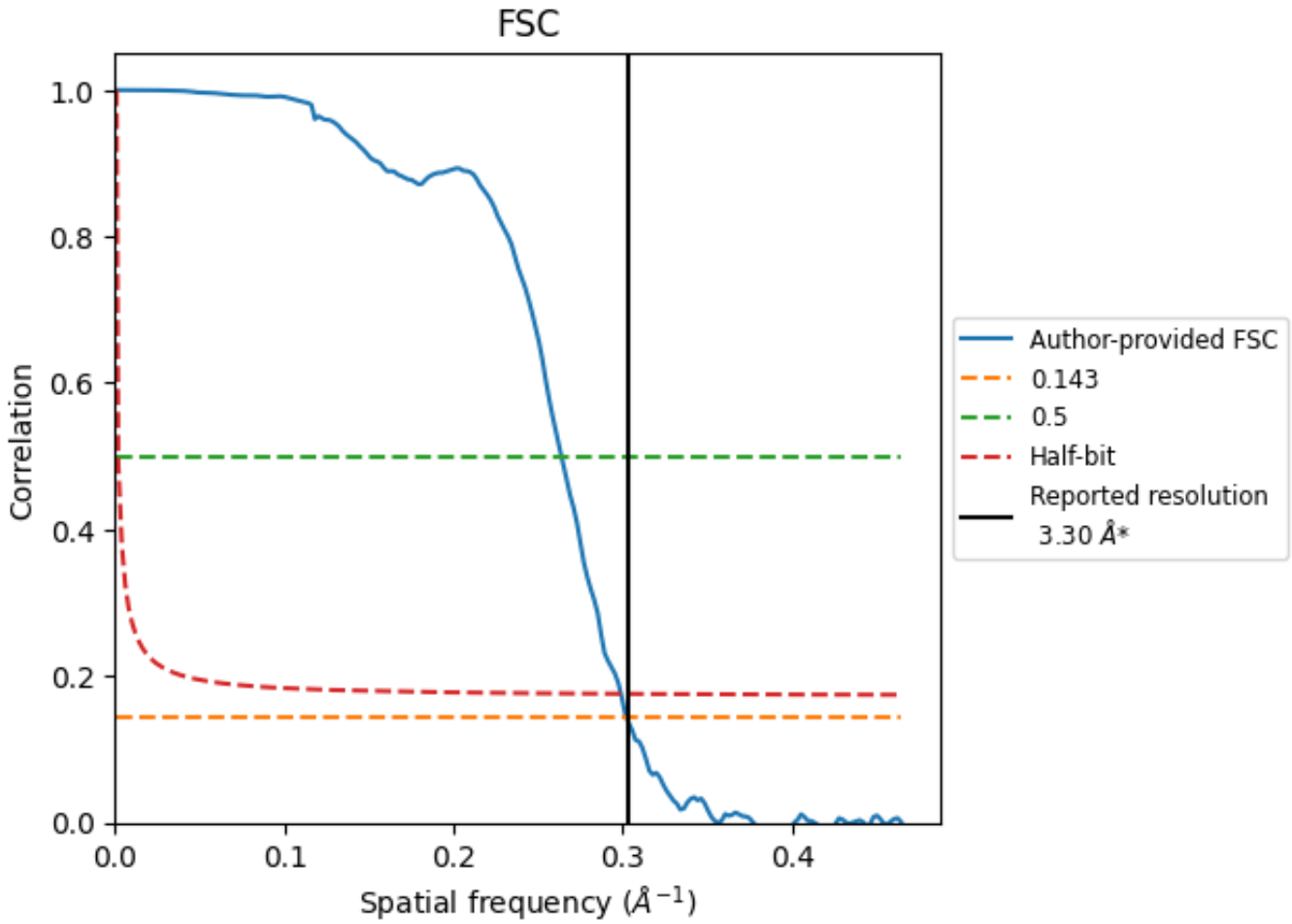


*Reported resolution corresponds to spatial frequency of 0.303 $Å^{-1}$

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 0.303 Å^{-1}

8.2 Resolution estimates (i)

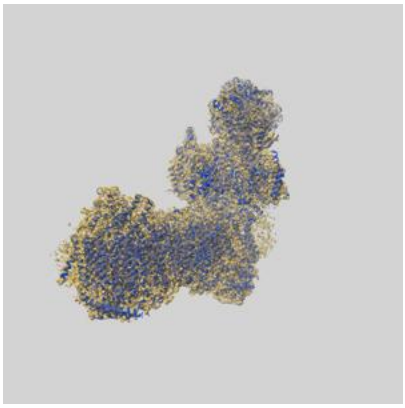
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	3.31	3.79	3.35
Unmasked-calculated*	-	-	-

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

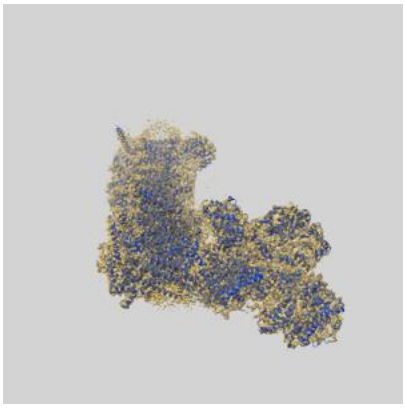
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-4872 and PDB model 6RFQ. Per-residue inclusion information can be found in section 3 on page 20.

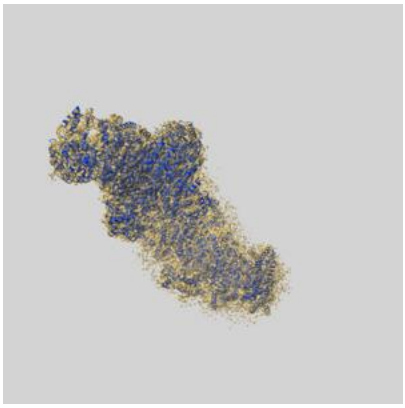
9.1 Map-model overlay



X



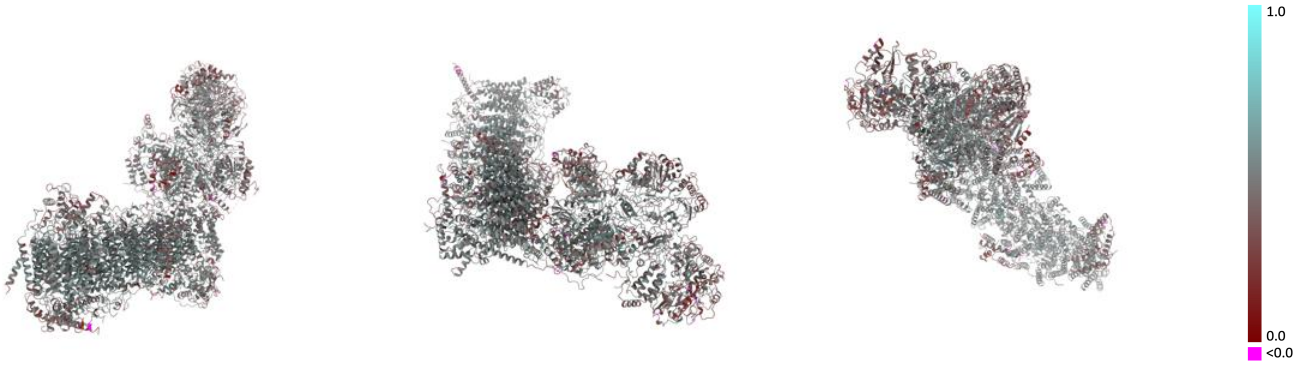
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.021 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.

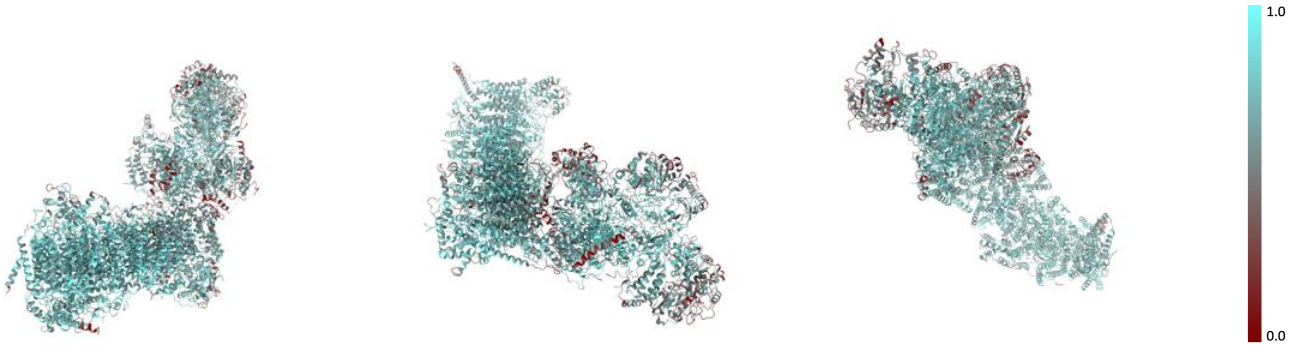
9.2 Q-score mapped to coordinate model (i)



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.

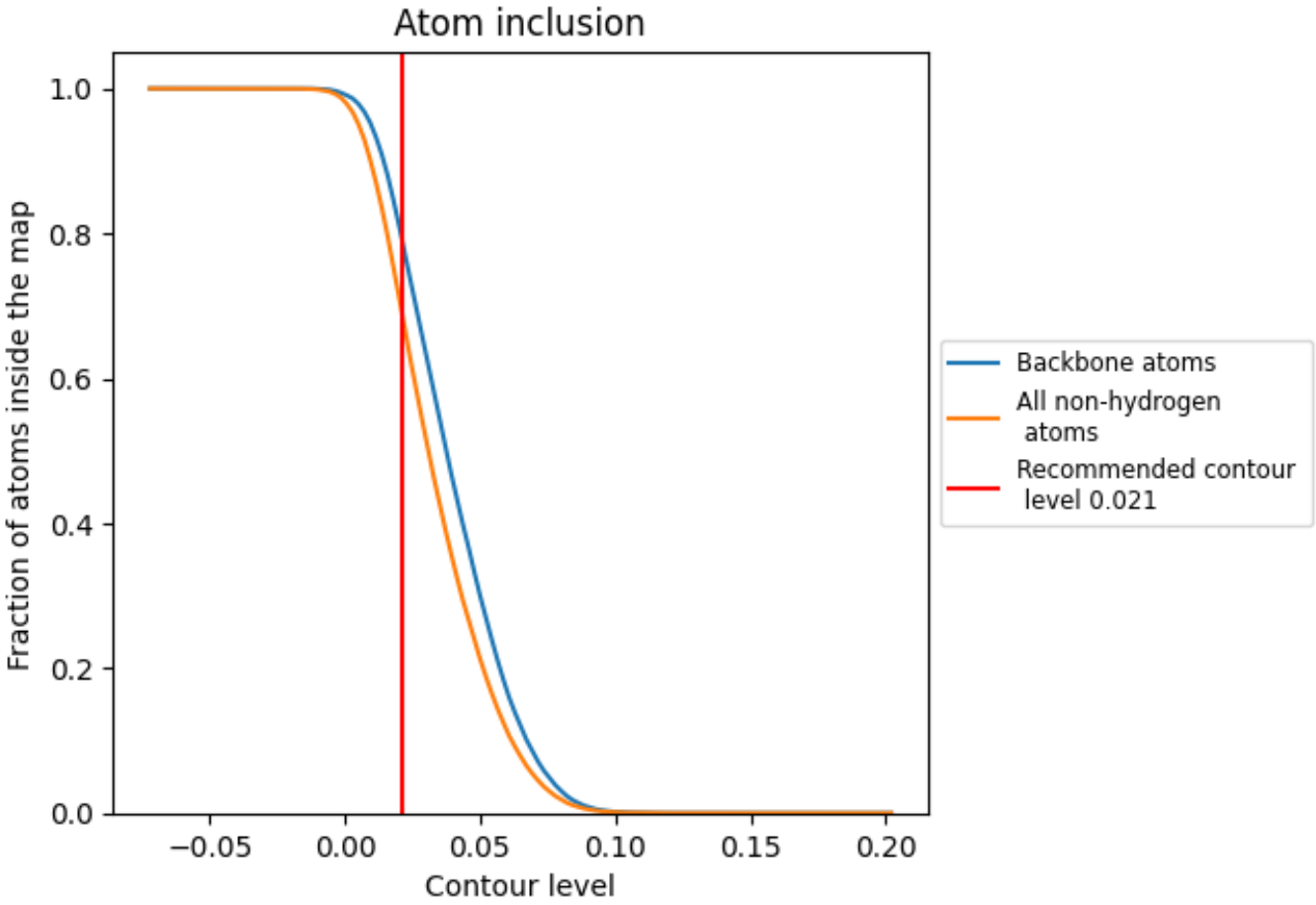
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.021).

9.4 Atom inclusion (i)



At the recommended contour level, 79% of all backbone atoms, 69% 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 (0.021) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6928	0.4610
1	0.6687	0.4590
2	0.8159	0.5260
3	0.6283	0.4540
4	0.7956	0.5180
5	0.7882	0.5070
6	0.6862	0.4790
8	0.6244	0.3730
9	0.6455	0.4420
A	0.6566	0.4430
B	0.5674	0.4070
C	0.7388	0.4810
D	0.7270	0.4740
E	0.5786	0.4320
F	0.6790	0.4350
G	0.7890	0.5030
H	0.5090	0.3680
I	0.7487	0.4830
J	0.7235	0.4610
K	0.6241	0.4520
L	0.7552	0.4760
O	0.3312	0.3060
P	0.6354	0.4270
Q	0.5900	0.3990
R	0.6966	0.4260
S	0.6482	0.3910
U	0.6919	0.4590
W	0.6842	0.4630
X	0.7592	0.4860
Y	0.7062	0.4810
Z	0.6549	0.4430
a	0.7480	0.4430
b	0.7934	0.5000
c	0.6873	0.4150
d	0.7838	0.4840

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Chain	Atom inclusion	Q-score
e	0.6988	0.4640
f	0.4836	0.3600
g	0.7756	0.5230
i	0.7540	0.4620
j	0.7251	0.4790
k	0.3271	0.3570
n	0.7131	0.4680