Full wwPDB EM Validation Report

Mar 9, 2026 – 04:53 pm GMT

PDB ID	:	9SMH / pdb_00009smh
EMDB ID	:	EMD-55032
Title	:	Reduced bovine complex I in lipid nanodisc, NADH-active-DDM
Authors	:	Chung, I.; Hirst, J.
Deposited on	:	2025-09-08
Resolution	:	2.61 Å(reported)
Based on initial model	:	7QSK

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:

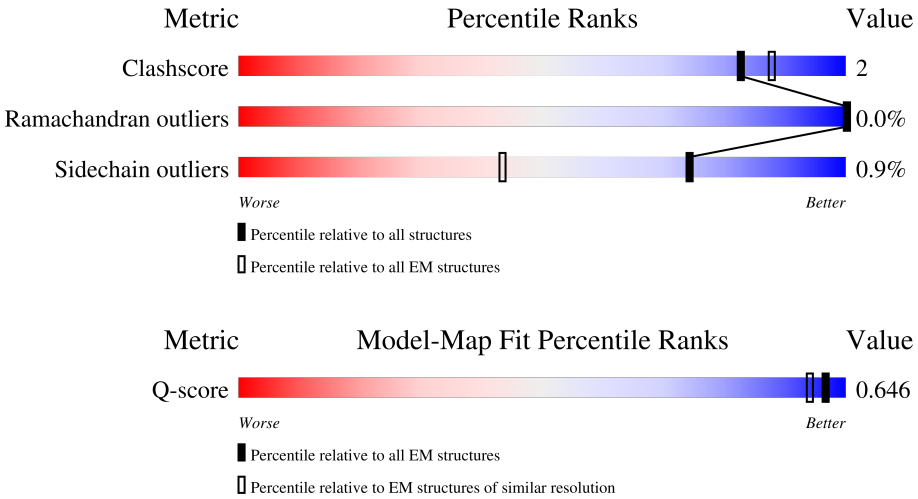
EMDB validation analysis	:	0.0.1.dev132
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.48.1

1 Overall quality at a glance

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

The reported resolution of this entry is 2.61 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	8735 (2.11 - 3.11)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	115	89% 11%
2	B	216	68% 5% 27%
3	C	266	75% • 22%
4	D	463	88% 5% 7%

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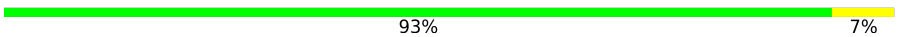
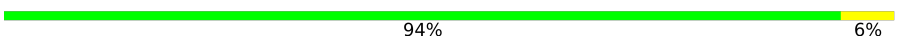
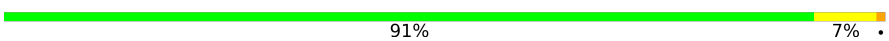
Mol	Chain	Length	Quality of chain
5	E	249	
6	F	464	
7	G	727	
8	H	318	
9	I	212	
10	J	175	
11	K	98	
12	L	606	
13	M	459	
14	N	347	
15	O	343	
16	P	380	
17	Q	175	
18	R	124	
19	S	99	
20	T	156	
20	U	156	
21	V	116	
22	W	128	
23	X	172	
24	Y	141	
25	Z	144	
26	a	70	
27	b	84	
28	c	76	

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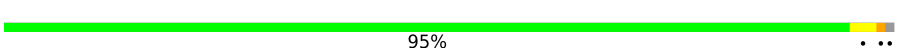
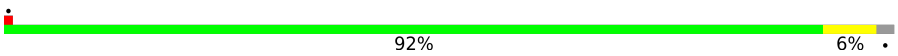
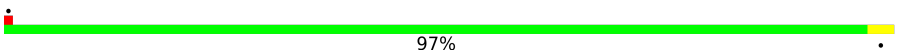
Mol	Chain	Length	Quality of chain
29	d	121	
30	e	106	
31	f	57	
32	g	154	
33	h	189	
34	i	128	
35	j	108	
36	k	98	
37	l	186	
38	m	129	
39	n	179	
40	o	137	
41	p	176	
42	q	145	
43	r	113	
44	s	109	

2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 68600 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called NADH-ubiquinone oxidoreductase chain 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	115	921	622	133	159	7	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	158	1261	803	227	217	14	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	208	1730	1116	297	314	3	0	0

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

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

There is a discrepancy between the modelled and reference sequences:

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	216	Total	C	N	O	S	0	0
			1668	1064	280	314	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	432	Total	C	N	O	S	0	0
			3324	2094	594	616	20		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	690	Total	C	N	O	S	0	0
			5288	3312	922	1015	39		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	318	Total	C	N	O	S	0	0
			2509	1681	385	420	23		

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

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

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

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

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

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

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

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

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

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

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

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

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

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

There is a discrepancy between the modelled and reference sequences:

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	342	Total	C	N	O	S	0	0
			2754	1781	487	481	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	128	Total	C	N	O	S	0	0
			1042	655	187	197	3		

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	85	Total	C	N	O	S	0	0
			688	444	101	138	5		
20	U	88	Total	C	N	O	S	0	0
			707	454	104	144	5		

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	141	Total	C	N	O	S	0	0
			1030	657	176	191	6		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Y	1	ACE	-	acetylation	UNP Q8HXG6

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d	121	Total	C	N	O	S	0	0
			999	650	172	172	5		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
d	1	ACE	-	acetylation	UNP Q02827

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

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e	100	Total	C	N	O	S	0	0
			838	528	160	144	6		

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
32	g	101	Total	C	N	O	S	0	0
			847	543	140	160	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
33	h	141	Total	C	N	O	S	0	0
			1176	771	201	202	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
34	i	128	Total	C	N	O	S	0	0
			1097	722	191	183	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
i	1	ACE	-	acetylation	UNP Q02367

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

Mol	Chain	Residues	Atoms					AltConf	Trace
35	j	67	Total	C	N	O	S	0	0
			580	381	95	103	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
36	k	80	Total	C	N	O	S	0	0
			644	421	108	113	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l	155	Total	C	N	O	S	0	0
			1304	844	213	239	8		

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

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

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
43	r	97	Total	C	N	O	S	0	0
			785	496	146	140	3		

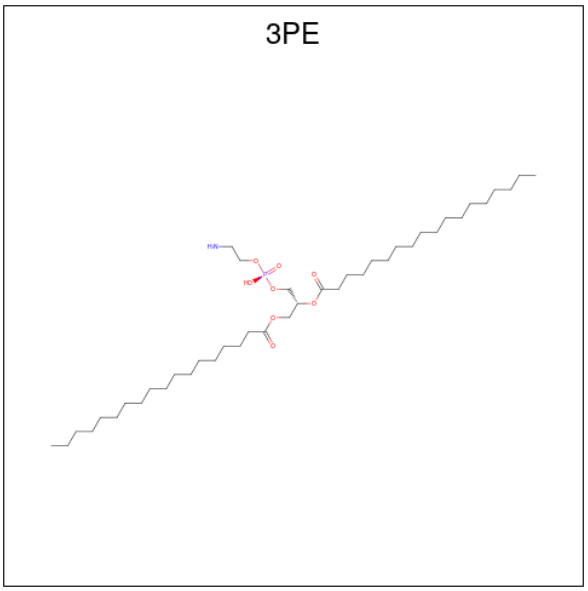
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
r	1	ACE	-	acetylation	UNP Q05752

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

Mol	Chain	Residues	Atoms					AltConf	Trace
44	s	44	Total	C	N	O	S	0	0
			371	233	66	71	1		

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



Mol	Chain	Residues	Atoms					AltConf
45	A	1	Total	C	N	O	P	0
			47	37	1	8	1	
45	D	1	Total	C	N	O	P	0
			49	39	1	8	1	
45	H	1	Total	C	N	O	P	0
			34	24	1	8	1	
45	I	1	Total	C	N	O	P	0
			45	35	1	8	1	
45	K	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	L	1	Total	C	N	O	P	0
			45	35	1	8	1	
45	L	1	Total	C	N	O	P	0
			44	34	1	8	1	
45	L	1	Total	C	N	O	P	0
			41	31	1	8	1	
45	M	1	Total	C	N	O	P	0
			43	33	1	8	1	
45	N	1	Total	C	N	O	P	0
			41	31	1	8	1	
45	N	1	Total	C	N	O	P	0
			31	21	1	8	1	
45	P	1	Total	C	N	O	P	0
			35	25	1	8	1	
45	Y	1	Total	C	N	O	P	0
			31	21	1	8	1	
45	Y	1	Total	C	N	O	P	0
			40	30	1	8	1	

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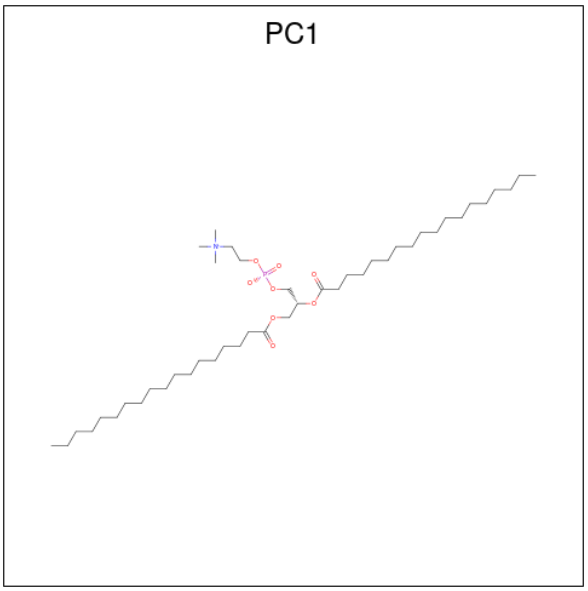
Mol	Chain	Residues	Atoms					AltConf
45	Y	1	Total	C	N	O	P	0
			27	17	1	8	1	
45	d	1	Total	C	N	O	P	0
			49	39	1	8	1	
45	m	1	Total	C	N	O	P	0
			39	29	1	8	1	

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



Mol	Chain	Residues	Atoms					AltConf
46	A	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	B	1	Total	C	N	O	P	0
			46	36	1	8	1	
46	H	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	H	1	Total	C	N	O	P	0
			44	34	1	8	1	
46	I	1	Total	C	N	O	P	0
			40	30	1	8	1	
46	M	1	Total	C	N	O	P	0
			42	32	1	8	1	
46	N	1	Total	C	N	O	P	0
			39	29	1	8	1	
46	P	1	Total	C	N	O	P	0
			33	23	1	8	1	

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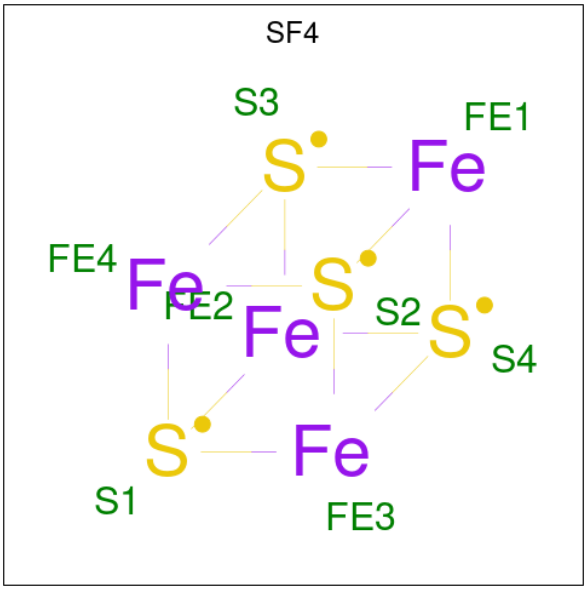
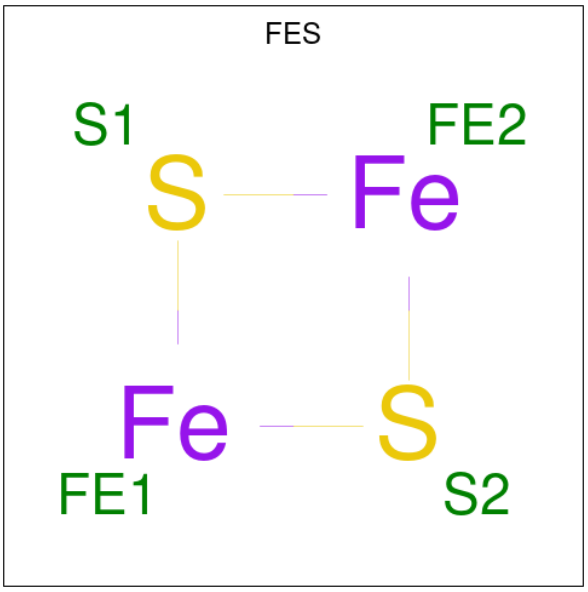
Mol	Chain	Residues	Atoms					AltConf
46	h	1	Total	C	N	O	P	0
			44	34	1	8	1	
46	q	1	Total	C	N	O	P	0
			44	34	1	8	1	
46	q	1	Total	C	N	O	P	0
			49	39	1	8	1	

- Molecule 47 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4).



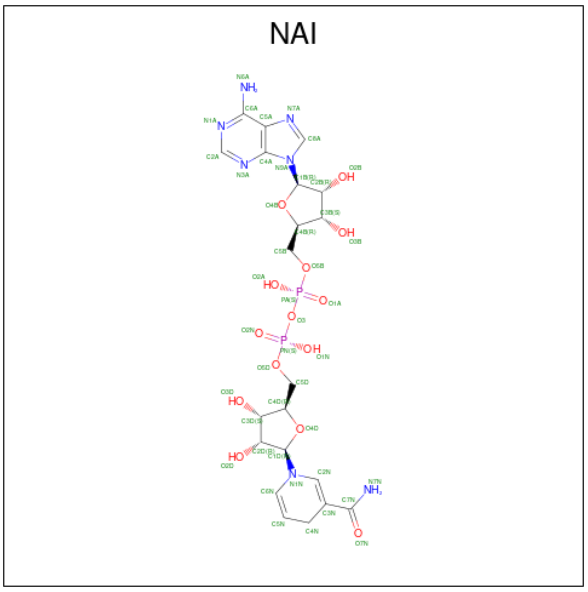
Mol	Chain	Residues	Atoms			AltConf
47	B	1	Total	Fe	S	0
			8	4	4	
47	F	1	Total	Fe	S	0
			8	4	4	
47	G	1	Total	Fe	S	0
			8	4	4	
47	G	1	Total	Fe	S	0
			8	4	4	
47	I	1	Total	Fe	S	0
			8	4	4	
47	I	1	Total	Fe	S	0
			8	4	4	

- Molecule 48 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).



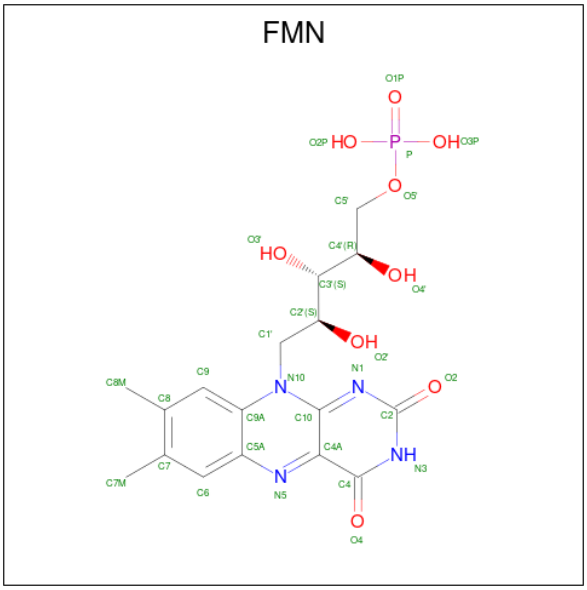
Mol	Chain	Residues	Atoms			AltConf
48	E	1	Total	Fe	S	0
			4	2	2	
48	G	1	Total	Fe	S	0
			4	2	2	

- Molecule 49 is 1,4-DIHYDRONICOTINAMIDE ADENINE DINUCLEOTIDE (CCD ID: NAI) (formula: $C_{21}H_{29}N_7O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
49	F	1	Total	C	N	O	P	0
			44	21	7	14	2	

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

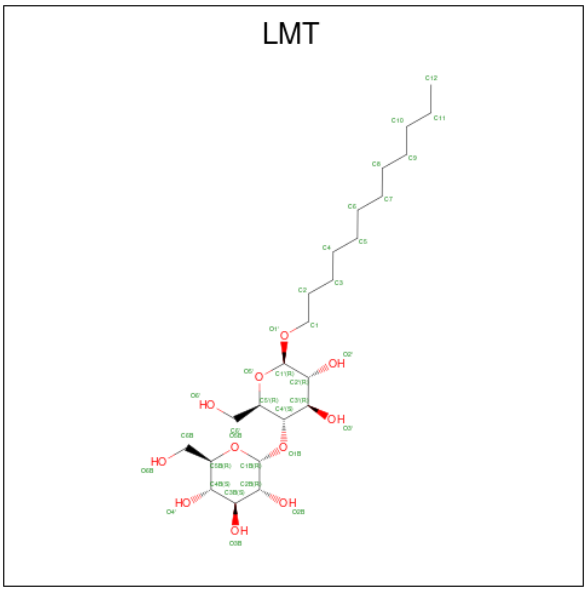


Mol	Chain	Residues	Atoms					AltConf
50	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 51 is POTASSIUM ION (CCD ID: K) (formula: K).

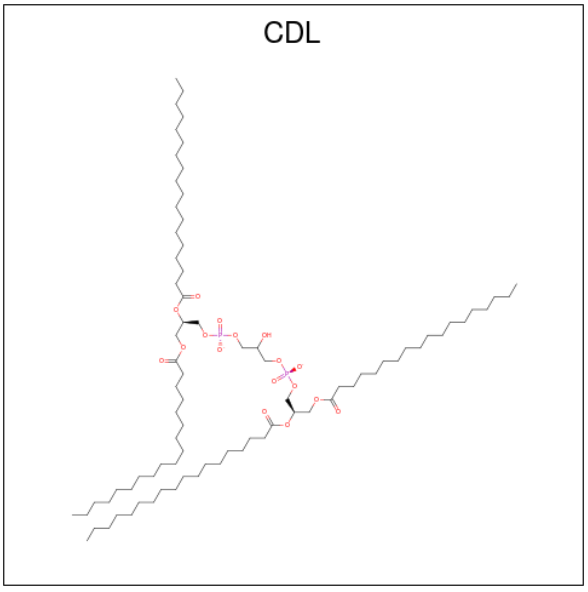
Mol	Chain	Residues	Atoms		AltConf
51	G	1	Total	K	0
			1	1	

- Molecule 52 is DODECYL-BETA-D-MALTOSIDE (CCD ID: LMT) (formula: $C_{24}H_{46}O_{11}$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
52	H	1	Total	C	O	0
			35	24	11	

- Molecule 53 is CARDIOLIPIN (CCD ID: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				AltConf
53	H	1	Total	C	O	P	0
			66	47	17	2	
53	L	1	Total	C	O	P	0
			69	50	17	2	
53	M	1	Total	C	O	P	0
			78	59	17	2	

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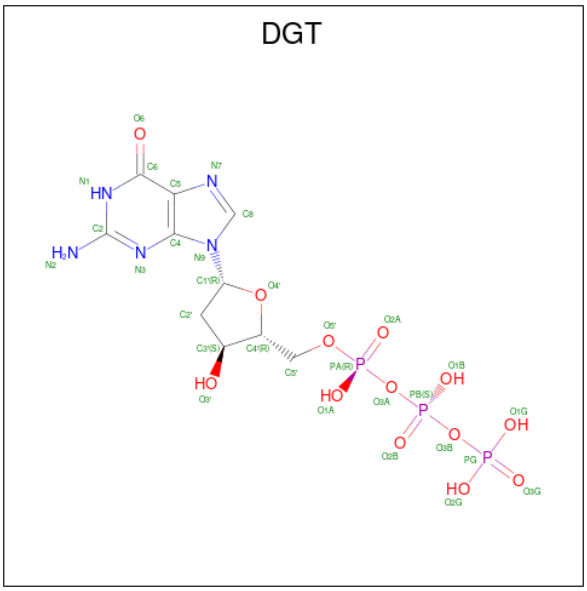
Mol	Chain	Residues	Atoms				AltConf
53	X	1	Total	C	O	P	0
			86	67	17	2	
53	d	1	Total	C	O	P	0
			65	46	17	2	
53	h	1	Total	C	O	P	0
			78	59	17	2	
53	q	1	Total	C	O	P	0
			61	42	17	2	

- Molecule 54 is 2'-DEOXYGUANOSINE-5'-TRIPHOSPHATE (CCD ID: DGT) (formula: $C_{10}H_{16}N_5O_{13}P_3$).

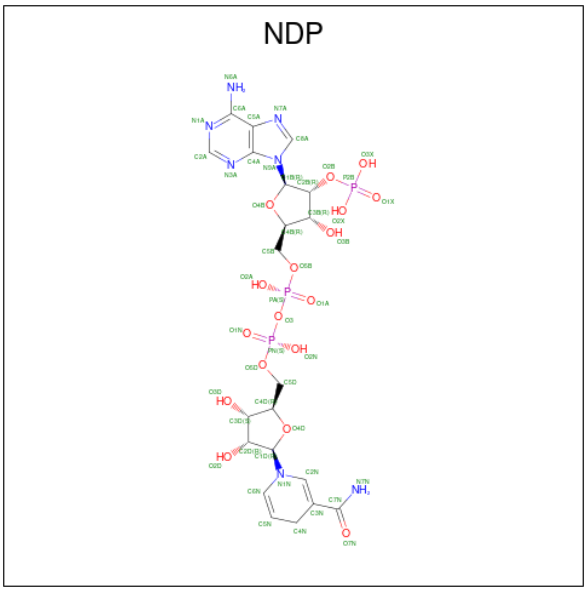


Mol	Chain	Residues	Atoms					AltConf
54	O	1	Total	C	N	O	P	0
			31	10	5	13	3	

- Molecule 55 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

- Molecule 56 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).

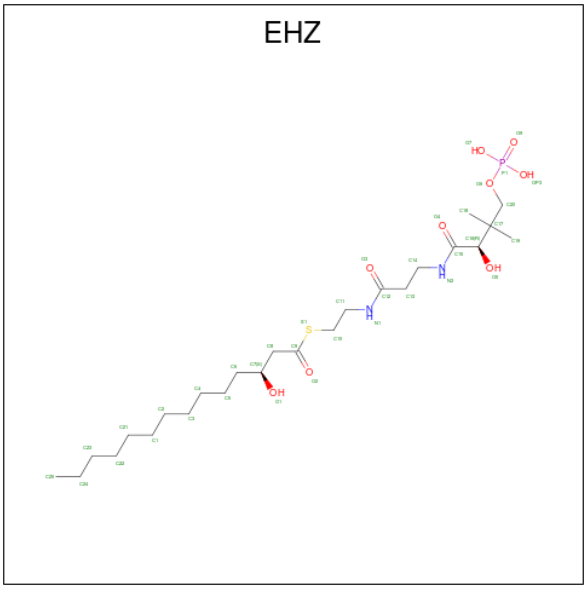


Mol	Chain	Residues	Atoms					AltConf
56	P	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 57 is ZINC ION (CCD ID: ZN) (formula: Zn).

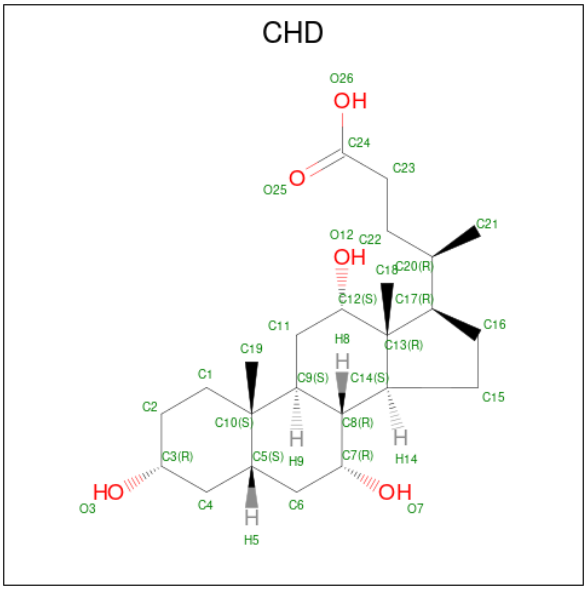
Mol	Chain	Residues	Atoms		AltConf
57	R	1	Total	Zn	0
			1	1	

- Molecule 58 is {S}-[2-[3-[[(2 {R})-3,3-dimethyl-2-oxidanyl-4-phosphonooxy-butanoyl]amino]propanoylamino]ethyl] (3 {S})-3-oxidanyltetradecanethioate (CCD ID: EHZ) (formula: $C_{25}H_{49}N_2O_9PS$).



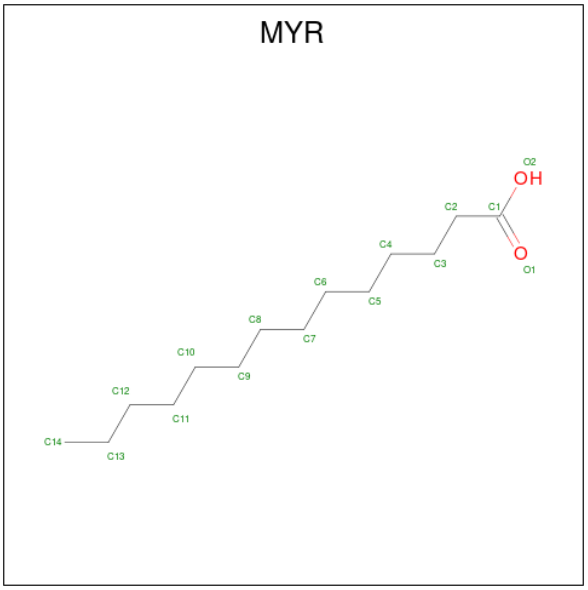
Mol	Chain	Residues	Atoms						AltConf
58	T	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	
58	U	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	

- Molecule 59 is CHOLIC ACID (CCD ID: CHD) (formula: $C_{24}H_{40}O_5$).



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

- Molecule 60 is MYRISTIC ACID (CCD ID: MYR) (formula: $C_{14}H_{28}O_2$).



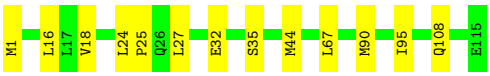
Mol	Chain	Residues	Atoms			AltConf
60	o	1	Total	C	O	0
			15	14	1	

3 Residue-property plots (i)

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

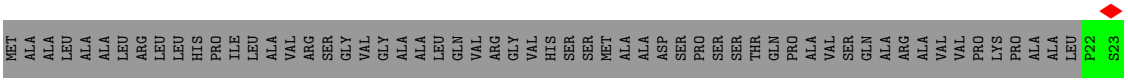
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3

Chain A:



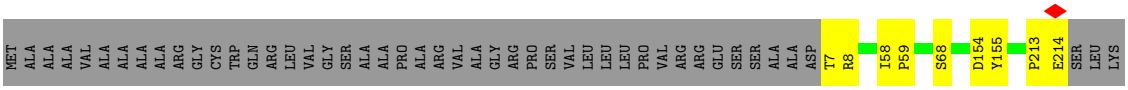
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial

Chain B:



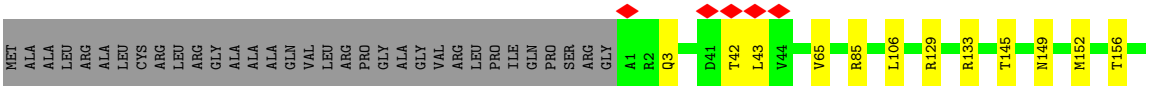
• Molecule 3: NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial

Chain C:



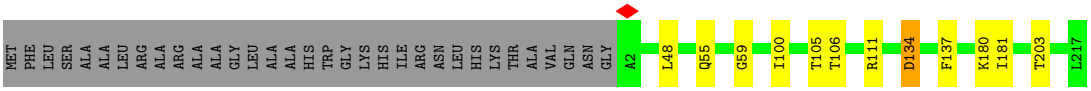
• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial

Chain D:



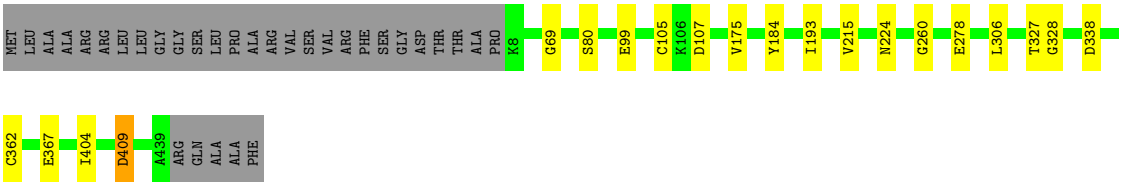
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

Chain E:



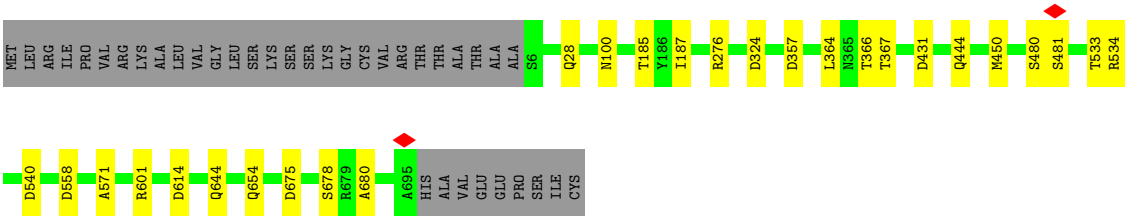
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

Chain F:



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

Chain G:

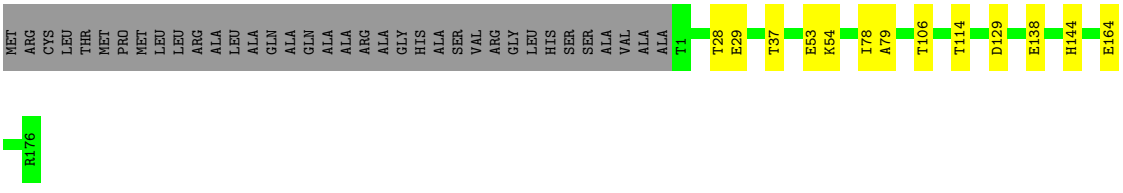


• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

Chain H:

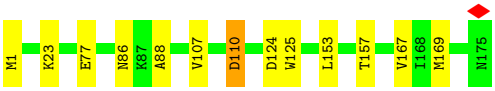
• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial

Chain I:



• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

Chain J:

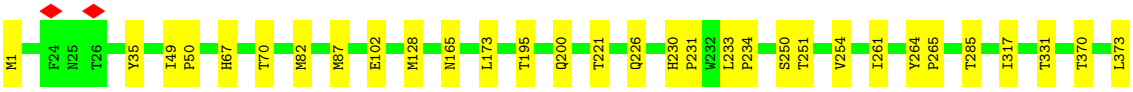


• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L

Chain K:

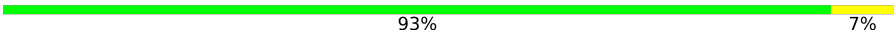
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5

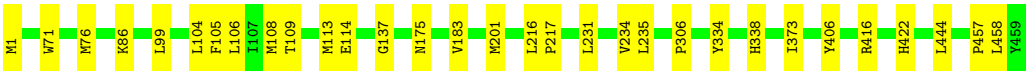
Chain L:



• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

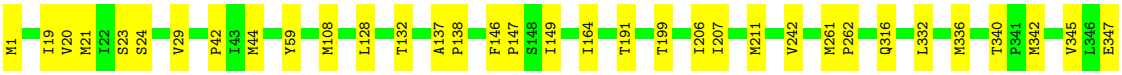
Chain M:





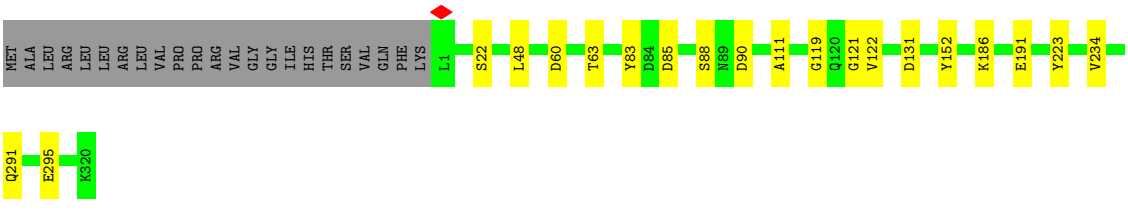
• Molecule 14: NADH-ubiquinone oxidoreductase chain 2

Chain N:



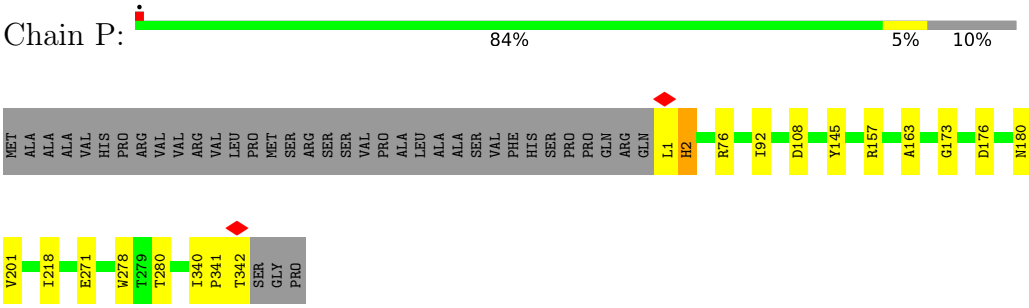
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

Chain O:



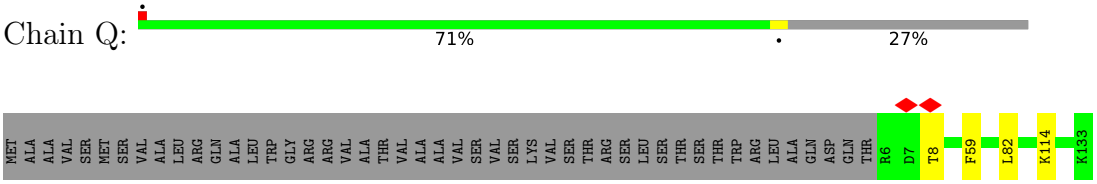
• Molecule 16: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial

Chain P:



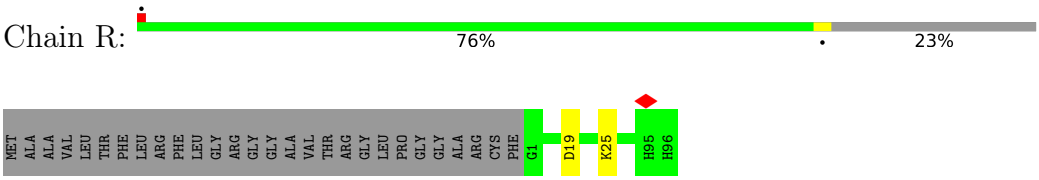
• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

Chain Q:



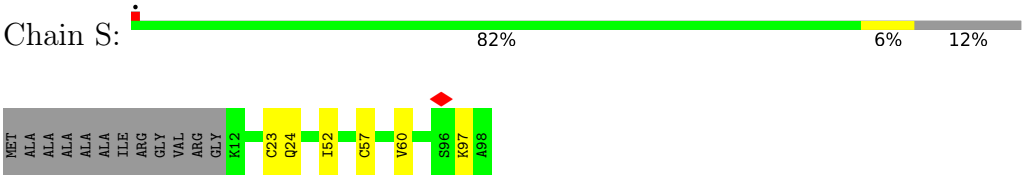
• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

Chain R:



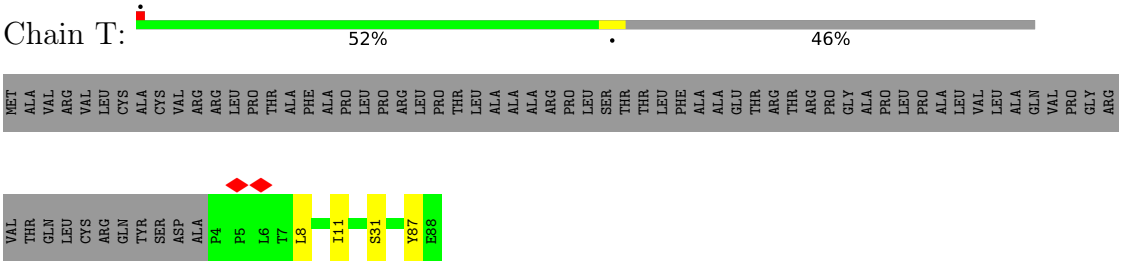
• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

Chain S:



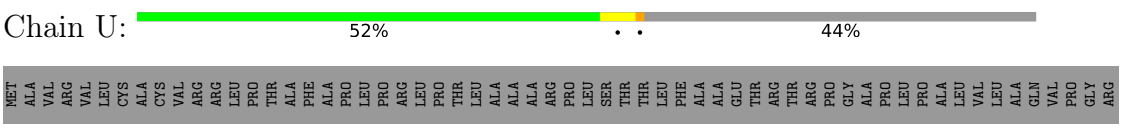
• Molecule 20: Acyl carrier protein, mitochondrial

Chain T:



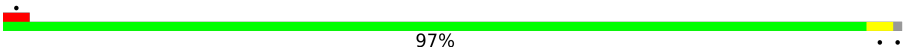
• Molecule 20: Acyl carrier protein, mitochondrial

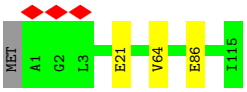
Chain U:



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

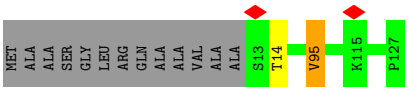
Chain V:





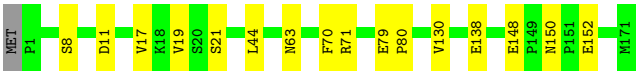
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6

Chain W:



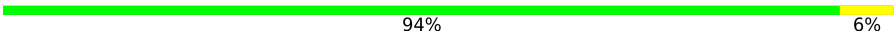
• Molecule 23: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8

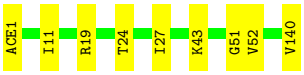
Chain X:



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

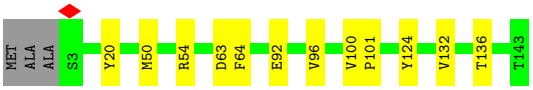
Chain Y:





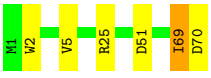
• Molecule 25: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

Chain Z:



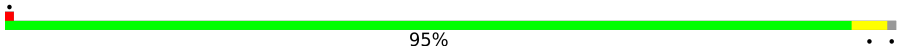
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

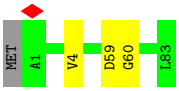
Chain a:



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

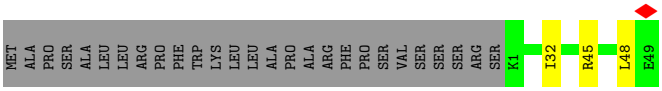
Chain b:





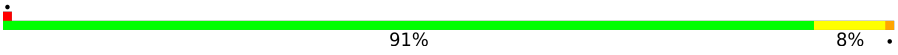
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

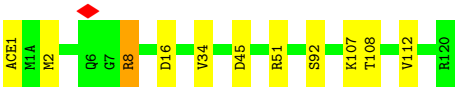
Chain c:



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

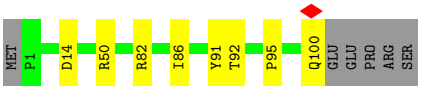
Chain d:





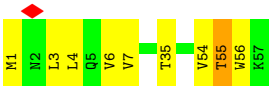
• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

Chain e:



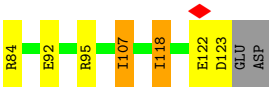
• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1

Chain f:



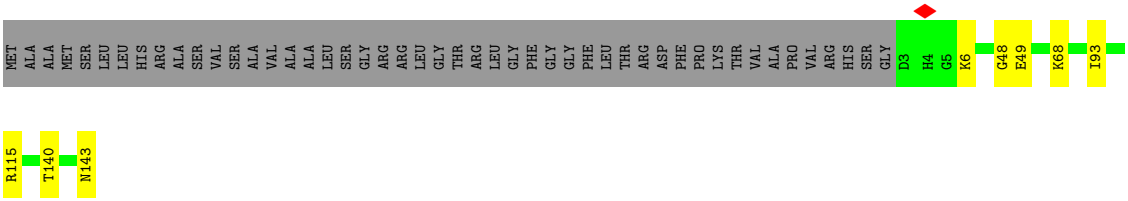
• Molecule 32: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain g:



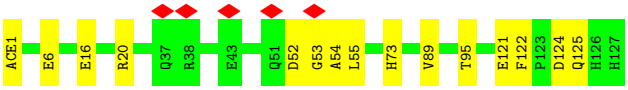
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

Chain h:



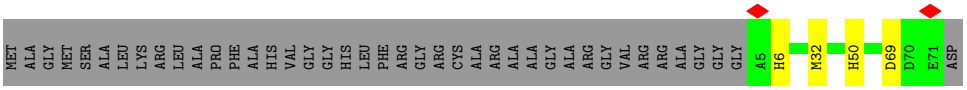
• Molecule 34: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

Chain i:



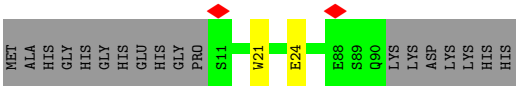
• Molecule 35: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial

Chain j:



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

Chain k:

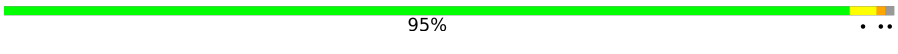


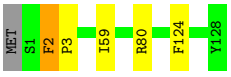
• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

Chain l:

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

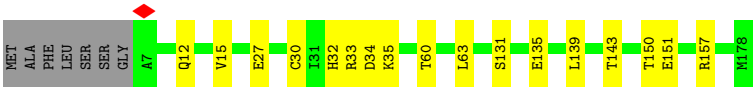
Chain m:





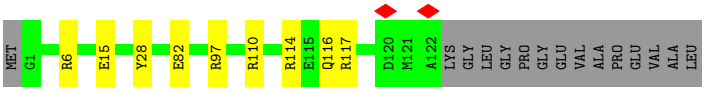
• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

Chain n:



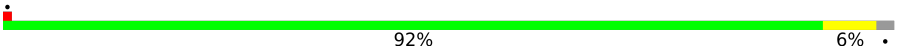
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

Chain o:



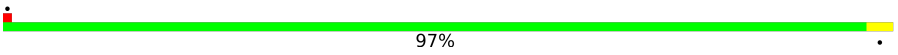
• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

Chain p:



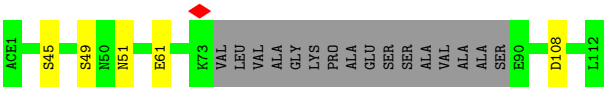
• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

Chain q:



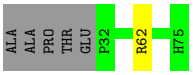
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

Chain r:



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

Chain s:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	29360	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40.29	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2300	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	34.320	Depositor
Minimum map value	-12.362	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.947	Depositor
Recommended contour level	4.5	Depositor
Map size (Å)	482.40002, 482.40002, 482.40002	wwPDB
Map dimensions	640, 640, 640	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.75375, 0.75375, 0.75375	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAI, SF4, PC1, CDL, DGT, CHD, FMN, ACE, MYR, EHZ, WYK, FES, FME, LMT, 2MR, 3PE, K, ZN, MG, NDP

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	0.09	0/936	0.25	0/1281
2	B	0.11	0/1280	0.29	0/1730
3	C	0.10	0/1781	0.26	0/2425
4	D	0.10	0/3537	0.27	0/4794
5	E	0.11	0/1708	0.31	0/2324
6	F	0.09	0/3398	0.28	0/4591
7	G	0.10	0/5376	0.29	0/7286
8	H	0.11	0/2571	0.28	0/3513
9	I	0.10	0/1445	0.26	0/1956
10	J	0.08	0/1370	0.24	0/1859
11	K	0.08	0/745	0.23	0/1008
12	L	0.10	0/4920	0.29	0/6694
13	M	0.09	0/3738	0.26	0/5097
14	N	0.09	0/2792	0.24	0/3800
15	O	0.11	0/2651	0.26	0/3587
16	P	0.11	0/2831	0.28	0/3841
17	Q	0.10	0/1065	0.27	0/1439
18	R	0.13	0/753	0.29	0/1014
19	S	0.11	0/711	0.32	0/956
20	T	0.13	0/700	0.37	0/944
20	U	0.12	0/719	0.30	0/971
21	V	0.11	0/948	0.28	0/1284
22	W	0.09	0/1000	0.29	0/1344
23	X	0.10	0/1439	0.28	0/1942
24	Y	0.19	1/1048 (0.1%)	0.28	0/1423
25	Z	0.11	0/1181	0.28	0/1592
26	a	0.11	0/584	0.25	0/786
27	b	0.12	0/672	0.28	0/923
28	c	0.13	0/427	0.26	0/579
29	d	0.20	1/1027 (0.1%)	0.36	1/1387 (0.1%)
30	e	0.11	0/859	0.33	1/1148 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
31	f	0.14	0/505	0.34	0/681
32	g	0.10	0/873	0.31	0/1186
33	h	0.09	0/1211	0.25	0/1638
34	i	0.19	1/1134 (0.1%)	0.32	0/1544
35	j	0.12	0/607	0.35	0/833
36	k	0.10	0/663	0.28	0/895
37	l	0.12	0/1358	0.31	0/1858
38	m	0.11	0/1094	0.27	0/1480
39	n	0.10	0/1545	0.28	0/2092
40	o	0.09	0/1073	0.29	0/1437
41	p	0.10	0/1486	0.31	0/2004
42	q	0.11	0/1250	0.26	0/1698
43	r	0.21	0/804	0.29	0/1088
44	s	0.10	0/383	0.26	0/518
All	All	0.11	3/68198 (0.0%)	0.28	2/92470 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
29	d	1	ACE	C-N	5.05	1.45	1.34
24	Y	1	ACE	C-N	5.02	1.45	1.34
34	i	1	ACE	C-N	5.02	1.45	1.34

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
29	d	107	LYS	CD-CE-NZ	-7.65	87.41	111.90
30	e	86	ILE	N-CA-C	-5.57	107.39	111.90

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	77	WYK	Mainchain

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	921	0	952	9	0
2	B	1261	0	1256	6	0
3	C	1730	0	1681	8	0
4	D	3459	0	3404	15	0
5	E	1668	0	1672	7	0
6	F	3324	0	3279	14	0
7	G	5288	0	5309	16	0
8	H	2509	0	2621	16	0
9	I	1414	0	1370	7	0
10	J	1345	0	1352	10	0
11	K	745	0	785	7	0
12	L	4802	0	4960	25	0
13	M	3654	0	3852	22	0
14	N	2733	0	2912	23	0
15	O	2589	0	2565	12	0
16	P	2754	0	2773	14	0
17	Q	1042	0	1038	2	0
18	R	740	0	714	1	0
19	S	700	0	719	3	0
20	T	688	0	684	1	0
20	U	707	0	700	4	0
21	V	928	0	972	1	0
22	W	976	0	991	2	0
23	X	1402	0	1379	11	0
24	Y	1030	0	1039	7	0
25	Z	1152	0	1151	10	0
26	a	569	0	568	6	0
27	b	651	0	662	1	0
28	c	414	0	415	2	0
29	d	999	0	988	5	0
30	e	838	0	837	6	0
31	f	492	0	501	5	0
32	g	847	0	794	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
33	h	1176	0	1182	6	0
34	i	1097	0	1108	8	0
35	j	580	0	519	3	0
36	k	644	0	626	2	0
37	l	1304	0	1203	7	0
38	m	1067	0	1067	4	0
39	n	1492	0	1438	9	0
40	o	1048	0	1016	7	0
41	p	1453	0	1425	9	0
42	q	1209	0	1182	2	0
43	r	785	0	795	4	0
44	s	371	0	344	1	0
45	A	47	0	71	0	0
45	D	49	0	75	0	0
45	H	34	0	42	4	0
45	I	45	0	67	0	0
45	K	42	0	58	0	0
45	L	130	0	188	1	0
45	M	43	0	60	1	0
45	N	72	0	92	0	0
45	P	35	0	44	6	0
45	Y	98	0	121	6	0
45	d	49	0	75	1	0
45	m	39	0	52	0	0
46	A	35	0	44	2	0
46	B	46	0	66	0	0
46	H	79	0	106	4	0
46	I	40	0	54	2	0
46	M	42	0	61	0	0
46	N	39	0	52	3	0
46	P	33	0	40	2	0
46	h	44	0	62	0	0
46	q	93	0	137	0	0
47	B	8	0	0	0	0
47	F	8	0	0	0	0
47	G	16	0	0	0	0
47	I	16	0	0	0	0
48	E	4	0	0	0	0
48	G	4	0	0	0	0
49	F	44	0	25	2	0
50	F	31	0	19	2	0
51	G	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
52	H	35	0	46	3	0
53	H	66	0	79	1	0
53	L	69	0	82	0	0
53	M	78	0	103	3	0
53	X	86	0	125	1	0
53	d	65	0	77	3	0
53	h	78	0	100	2	0
53	q	61	0	66	7	0
54	O	31	0	12	1	0
55	O	1	0	0	0	0
56	P	48	0	26	1	0
57	R	1	0	0	0	0
58	T	37	0	0	0	0
58	U	37	0	0	1	0
59	i	29	0	38	1	0
60	o	15	0	27	0	0
All	All	68600	0	69192	318	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (318) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
35:j:69:ASP:O	40:o:114:ARG:NH2	2.10	0.85
1:A:67:LEU:HD11	11:K:68:ALA:HB3	1.56	0.85
15:O:83:TYR:HH	54:O:401:DGT:HO3'	1.21	0.83
15:O:22:SER:OG	15:O:119:GLY:O	1.97	0.82
9:I:54:LYS:NZ	9:I:138:GLU:OE2	2.17	0.78
23:X:8:SER:OG	23:X:11:ASP:OD1	2.02	0.77
24:Y:52:VAL:HG22	45:Y:803:3PE:H261	1.67	0.76
7:G:366:THR:O	7:G:367:THR:OG1	2.04	0.75
32:g:25:ARG:O	32:g:25:ARG:NE	2.20	0.74
53:M:501:CDL:OA5	53:M:501:CDL:O1	2.07	0.73
8:H:274:ARG:NH2	52:H:402:LMT:O6'	2.22	0.73
34:i:6:GLU:OE2	39:n:157:ARG:NH2	2.22	0.71
4:D:335:ARG:NH2	9:I:129:ASP:OD1	2.22	0.71
58:U:101:EHZ:O7	39:n:12:GLN:NE2	2.23	0.71
12:L:102:GLU:OE1	12:L:456:ARG:NH2	2.24	0.71
33:h:140:THR:O	33:h:143:ASN:ND2	2.24	0.70
34:i:55:LEU:HD13	34:i:55:LEU:O	1.92	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:457:PRO:O	32:g:84:ARG:NH2	2.25	0.70
12:L:35:TYR:HH	34:i:73:HIS:HE2	0.72	0.68
15:O:186:LYS:NZ	15:O:191:GLU:OE2	2.24	0.68
29:d:2:MET:O	29:d:8:ARG:NH1	2.27	0.67
33:h:48:GLY:O	41:p:60:TYR:OH	2.09	0.66
9:I:53:GLU:OE2	42:q:34:ARG:NH2	2.29	0.66
8:H:253:GLU:OE2	26:a:25:ARG:NH2	2.30	0.65
18:R:19:ASP:O	18:R:25:LYS:NZ	2.30	0.65
11:K:37:MET:HE3	11:K:67:ALA:HB2	1.80	0.62
7:G:601:ARG:NH2	7:G:614:ASP:OD1	2.32	0.62
7:G:644:GLN:N	7:G:644:GLN:OE1	2.32	0.62
16:P:76:ARG:NH2	16:P:108:ASP:OD2	2.33	0.61
13:M:105:PHE:O	13:M:109:THR:OG1	2.14	0.60
40:o:6:ARG:NE	40:o:15:GLU:OE2	2.33	0.60
8:H:18:ALA:O	8:H:21:THR:OG1	2.20	0.60
8:H:265:LEU:HB3	45:H:403:3PE:H2C1	1.83	0.60
12:L:67:HIS:NE2	12:L:70:THR:OG1	2.31	0.59
23:X:148:GLU:N	23:X:148:GLU:OE1	2.32	0.59
10:J:23:LYS:NZ	11:K:18:GLY:O	2.34	0.59
20:U:88:GLU:OE2	33:h:6:LYS:NZ	2.33	0.59
4:D:145:THR:HG1	4:D:181:TYR:HH	1.47	0.59
37:l:39:ASP:OD1	38:m:80:ARG:NH1	2.34	0.58
16:P:187:TRP:CE3	45:P:403:3PE:H252	2.38	0.58
59:i:201:CHD:H212	59:i:201:CHD:H12	1.84	0.58
5:E:111:ARG:NH1	6:F:260:GLY:O	2.36	0.58
24:Y:43:LYS:NZ	45:Y:801:3PE:O14	2.33	0.58
23:X:21:SER:OG	26:a:51:ASP:OD2	2.21	0.58
35:j:69:ASP:OD1	40:o:114:ARG:NH2	2.37	0.57
14:N:19:ILE:O	14:N:23:SER:OG	2.20	0.57
25:Z:92:GLU:OE1	30:e:91:TYR:OH	2.14	0.57
1:A:32:GLU:O	1:A:35:SER:OG	2.23	0.57
10:J:86:ASN:OD1	10:J:88:ALA:N	2.38	0.57
12:L:485:TYR:O	12:L:489:THR:OG1	2.22	0.57
32:g:122:GLU:O	32:g:123:ASP:HB2	2.05	0.57
30:e:95:PRO:CB	30:e:100:GLN:HG3	2.34	0.56
4:D:159:LEU:HD21	52:H:402:LMT:H41	1.87	0.56
32:g:66:PHE:HD1	32:g:70:LEU:HD12	1.69	0.56
8:H:236:ILE:HG23	8:H:259:PHE:HZ	1.71	0.56
6:F:184:TYR:OH	49:F:501:NAI:H5N	2.06	0.55
14:N:199:THR:HG21	14:N:347:GLU:HG3	1.88	0.55
16:P:278:TRP:CZ2	45:P:403:3PE:H241	2.41	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:105:THR:HG22	5:E:106:THR:H	1.71	0.55
8:H:195:ARG:HD3	8:H:231:ILE:HD11	1.89	0.55
23:X:17:VAL:HG12	23:X:19:VAL:HG22	1.88	0.55
40:o:28:TYR:OH	40:o:110:ARG:NH1	2.39	0.55
1:A:18:VAL:HG12	46:H:401:PC1:H321	1.89	0.55
1:A:108:GLN:HB2	10:J:169:MET:HE1	1.89	0.55
4:D:42:THR:HG22	4:D:42:THR:O	2.07	0.55
53:M:501:CDL:H731	14:N:242:VAL:HG11	1.89	0.54
31:f:54:VAL:O	31:f:55:THR:CB	2.55	0.54
39:n:131:SER:OG	39:n:135:GLU:OE2	2.18	0.54
14:N:21:MET:HE1	46:N:403:PC1:H3A2	1.90	0.54
46:P:401:PC1:O22	46:P:401:PC1:H32	2.06	0.54
24:Y:51:GLY:HA3	45:Y:803:3PE:H222	1.88	0.54
10:J:157:THR:HG21	11:K:62:ILE:HD12	1.88	0.54
10:J:167:VAL:HG22	14:N:42:PRO:HG3	1.90	0.54
15:O:131:ASP:OD1	15:O:152:TYR:OH	2.23	0.54
53:q:203:CDL:H541	53:q:203:CDL:H751	1.89	0.54
13:M:108:MET:HE1	53:X:201:CDL:H222	1.88	0.54
15:O:291:GLN:NE2	15:O:295:GLU:OE2	2.38	0.53
14:N:199:THR:HG21	14:N:347:GLU:CG	2.39	0.53
22:W:14:THR:O	22:W:14:THR:HG22	2.06	0.53
20:U:47:GLN:NE2	20:U:70:LEU:O	2.41	0.53
39:n:34:ASP:OD1	39:n:35:LYS:N	2.41	0.53
2:B:45:LEU:HD22	2:B:85:VAL:CG2	2.39	0.53
37:l:90:ASP:OD1	37:l:91:THR:N	2.42	0.53
9:I:114:THR:HG21	9:I:144:HIS:CE1	2.43	0.53
53:q:203:CDL:H751	53:q:203:CDL:H562	1.90	0.53
32:g:23:THR:OG1	32:g:24:LEU:N	2.40	0.53
37:l:66:HIS:O	37:l:70:ARG:N	2.41	0.53
16:P:157:ARG:NH1	16:P:163:ALA:O	2.42	0.52
29:d:45:ASP:OD1	29:d:51:ARG:NH2	2.41	0.52
13:M:422:HIS:HB2	38:m:59:ILE:HD12	1.91	0.52
25:Z:96:VAL:HG21	30:e:82:ARG:HG3	1.90	0.52
6:F:224:ASN:ND2	50:F:503:FMN:O2	2.42	0.52
46:H:401:PC1:O13	46:H:401:PC1:H133	2.10	0.52
46:I:201:PC1:H152	46:I:201:PC1:O13	2.10	0.52
10:J:77:GLU:OE2	11:K:25:HIS:NE2	2.36	0.52
16:P:1:LEU:O	16:P:2:HIS:CB	2.58	0.51
13:M:183:VAL:O	41:p:152:ARG:NH2	2.42	0.51
53:q:203:CDL:H722	53:q:203:CDL:C34	2.41	0.51
13:M:104:LEU:HG	13:M:108:MET:HE2	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:175:VAL:O	44:s:62:ARG:NH1	2.40	0.51
14:N:128:LEU:O	14:N:132:THR:OG1	2.28	0.51
13:M:71:TRP:CZ3	32:g:69:VAL:HG11	2.45	0.51
12:L:173:LEU:HD23	45:L:703:3PE:H322	1.92	0.51
20:T:8:LEU:HD23	20:T:8:LEU:O	2.10	0.51
31:f:6:VAL:HG23	31:f:7:VAL:HG23	1.92	0.51
33:h:49:GLU:OE1	33:h:68:LYS:NZ	2.43	0.50
12:L:370:THR:HG23	12:L:431:LEU:HD13	1.93	0.50
14:N:206:ILE:HD11	46:N:403:PC1:H352	1.92	0.50
16:P:271:GLU:HG2	16:P:280:THR:HG22	1.93	0.50
3:C:8:ARG:O	4:D:129:ARG:NH2	2.40	0.50
8:H:2:PHE:CE2	8:H:6:ILE:HD11	2.47	0.50
31:f:35:THR:HG22	31:f:56:TRP:CH2	2.46	0.50
45:P:403:3PE:H2	45:P:403:3PE:H232	1.94	0.50
25:Z:20:TYR:OH	43:r:108:ASP:OD2	2.24	0.50
37:l:5:THR:OG1	37:l:7:ASP:OD1	2.21	0.50
8:H:265:LEU:CB	45:H:403:3PE:H2C1	2.42	0.50
13:M:113:MET:HE3	13:M:175:ASN:OD1	2.12	0.50
4:D:133:ARG:NH1	4:D:319:PRO:O	2.44	0.49
37:l:68:ASP:N	37:l:68:ASP:OD1	2.43	0.49
40:o:82:GLU:N	40:o:82:GLU:OE1	2.45	0.49
4:D:159:LEU:HD21	52:H:402:LMT:C4	2.42	0.49
7:G:276:ARG:NH1	7:G:680:ALA:O	2.46	0.49
53:H:404:CDL:CA5	53:H:404:CDL:OA8	2.60	0.49
39:n:30:CYS:O	39:n:32:HIS:N	2.45	0.49
15:O:85:ASP:OD1	15:O:85:ASP:N	2.45	0.49
1:A:27:LEU:HD12	46:H:401:PC1:H131	1.94	0.48
12:L:251:THR:O	12:L:254:VAL:HG22	2.13	0.48
3:C:8:ARG:NH1	43:r:61:GLU:OE2	2.44	0.48
14:N:332:LEU:HD13	45:d:201:3PE:C3G	2.44	0.48
25:Z:124:TYR:HB3	25:Z:132:VAL:HG22	1.95	0.48
3:C:213:PRO:O	3:C:214:GLU:HB2	2.14	0.48
14:N:316:GLN:OE1	15:O:63:THR:OG1	2.32	0.48
16:P:92:ILE:HD11	16:P:218:ILE:HD11	1.96	0.48
40:o:116:GLN:OE1	40:o:117:ARG:N	2.46	0.48
4:D:3:GLN:NE2	13:M:137:GLY:O	2.41	0.48
8:H:23:VAL:HG11	8:H:268:MET:HE1	1.96	0.48
8:H:179:TRP:N	8:H:180:PRO:CD	2.77	0.48
16:P:341:PRO:O	16:P:342:THR:C	2.57	0.48
17:Q:59:PHE:CE1	17:Q:82:LEU:HD23	2.49	0.48
25:Z:96:VAL:HG21	30:e:82:ARG:CG	2.44	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
31:f:54:VAL:O	31:f:55:THR:OG1	2.31	0.48
4:D:193:TYR:OH	4:D:201:GLN:O	2.21	0.47
14:N:21:MET:CE	46:N:403:PC1:H3A2	2.44	0.47
34:i:89:VAL:O	34:i:95:THR:OG1	2.23	0.47
39:n:139:LEU:O	39:n:143:THR:OG1	2.23	0.47
10:J:110:ASP:OD1	10:J:110:ASP:N	2.48	0.47
13:M:306:PRO:HA	13:M:458:LEU:HD22	1.95	0.47
12:L:128:MET:HG2	12:L:251:THR:HG22	1.97	0.47
46:P:401:PC1:H142	46:P:401:PC1:O13	2.15	0.47
45:P:403:3PE:H242	45:P:403:3PE:O21	2.14	0.47
23:X:79:GLU:HB2	23:X:80:PRO:HD3	1.97	0.47
53:h:201:CDL:H781	53:h:201:CDL:H191	1.95	0.47
7:G:654:GLN:OE1	7:G:654:GLN:N	2.48	0.47
8:H:207:LEU:O	8:H:209:SER:N	2.48	0.46
14:N:108:MET:HE1	14:N:191:THR:OG1	2.16	0.46
41:p:16:THR:HG23	41:p:16:THR:O	2.15	0.46
5:E:100:ILE:HD11	5:E:137:PHE:CD1	2.50	0.46
8:H:87:ILE:N	8:H:88:PRO:CD	2.78	0.46
53:M:501:CDL:H1O1	53:M:501:CDL:PA1	2.38	0.46
32:g:107:ILE:CG2	41:p:134:VAL:HG22	2.45	0.46
41:p:105:ILE:HG13	41:p:134:VAL:HG21	1.98	0.46
53:q:203:CDL:H562	53:q:203:CDL:C76	2.45	0.46
24:Y:11:ILE:HD12	24:Y:19:ARG:NH2	2.30	0.46
13:M:113:MET:HE1	33:h:93:ILE:HG21	1.98	0.46
6:F:278:GLU:OE1	6:F:278:GLU:N	2.49	0.46
6:F:409:ASP:OD1	6:F:409:ASP:N	2.47	0.46
14:N:207:ILE:HG22	14:N:211:MET:HE2	1.98	0.46
29:d:34:VAL:HG22	53:d:202:CDL:C47	2.46	0.46
11:K:1:FME:HE1	11:K:9:MET:HE1	1.98	0.46
26:a:5:VAL:HG12	26:a:5:VAL:O	2.16	0.46
31:f:1:MET:SD	31:f:1:MET:N	2.88	0.46
3:C:213:PRO:O	3:C:214:GLU:CB	2.63	0.45
14:N:146:PHE:HA	14:N:149:ILE:HD12	1.98	0.45
26:a:2:TRP:HH2	53:q:203:CDL:H542	1.81	0.45
24:Y:140:VAL:O	33:h:115:ARG:NH1	2.48	0.45
46:A:202:PC1:H352	46:A:202:PC1:H382	1.89	0.45
19:S:57:CYS:O	19:S:60:VAL:HG22	2.16	0.45
2:B:91:THR:HA	2:B:119:CYS:HB3	1.98	0.45
10:J:124:ASP:OD2	11:K:2:SER:OG	2.16	0.45
34:i:16:GLU:OE2	34:i:20:ARG:NH1	2.50	0.45
12:L:165:ASN:OD1	13:M:416:ARG:NH1	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:8:ARG:NH2	43:r:61:GLU:OE2	2.49	0.45
12:L:373:LEU:HD23	12:L:431:LEU:HD11	1.99	0.45
45:Y:801:3PE:H31	45:Y:801:3PE:H222	1.97	0.45
27:b:59:ASP:OD1	27:b:60:GLY:N	2.50	0.45
7:G:534:ARG:NH2	7:G:558:ASP:OD2	2.50	0.45
12:L:230:HIS:N	12:L:231:PRO:CD	2.80	0.45
23:X:71:ARG:NH2	26:a:70:ASP:OD1	2.43	0.45
41:p:20:SER:O	41:p:20:SER:OG	2.29	0.45
50:F:503:FMN:HM73	50:F:503:FMN:HM81	1.55	0.45
16:P:176:ASP:OD1	16:P:180:ASN:ND2	2.50	0.45
5:E:105:THR:HG22	5:E:106:THR:N	2.31	0.44
6:F:306:LEU:C	6:F:306:LEU:HD12	2.42	0.44
22:W:95:VAL:HG12	22:W:95:VAL:O	2.17	0.44
7:G:28:GLN:NE2	17:Q:114:LYS:O	2.48	0.44
12:L:221:THR:HG23	12:L:226:GLN:HB2	1.98	0.44
14:N:207:ILE:HD13	14:N:262:PRO:HD3	2.00	0.44
15:O:111:ALA:HB1	15:O:122:VAL:HG21	1.99	0.44
23:X:70:PHE:CB	26:a:69:ILE:HD13	2.48	0.44
43:r:45:SER:O	43:r:51:ASN:ND2	2.48	0.44
4:D:149:ASN:OD1	4:D:371:LYS:NZ	2.48	0.44
9:I:164:GLU:OE2	42:q:87:HIS:ND1	2.47	0.44
4:D:152:MET:O	4:D:156:THR:OG1	2.24	0.44
13:M:216:LEU:HB3	13:M:217:PRO:HD3	1.99	0.44
23:X:150:ASN:OD1	30:e:50:ARG:NH1	2.51	0.44
4:D:106:LEU:O	4:D:427:GLU:N	2.51	0.44
8:H:311:THR:O	25:Z:54:ARG:NH2	2.50	0.44
28:c:45:ARG:NH2	29:d:16:ASP:OD2	2.45	0.44
6:F:327:THR:OG1	6:F:328:GLY:N	2.51	0.44
8:H:311:THR:OG1	25:Z:50:MET:SD	2.74	0.44
12:L:537:ALA:HB3	12:L:538:PRO:HD3	2.00	0.44
14:N:342:MET:O	14:N:345:VAL:HG22	2.18	0.44
15:O:60:ASP:OD1	15:O:60:ASP:N	2.51	0.44
16:P:201:VAL:HG13	16:P:340:ILE:HD12	1.99	0.44
16:P:145:TYR:OH	56:P:402:NDP:O2D	2.31	0.44
34:i:122:PHE:O	34:i:125:GLN:NE2	2.45	0.44
25:Z:63:ASP:OD1	25:Z:64:PHE:N	2.51	0.43
12:L:49:ILE:HB	12:L:50:PRO:HD3	1.99	0.43
12:L:375:VAL:HG22	35:j:32:MET:SD	2.58	0.43
34:i:52:ASP:OD1	34:i:52:ASP:N	2.50	0.43
2:B:69:MET:HE3	2:B:74:VAL:HG12	2.00	0.43
6:F:193:ILE:HG23	6:F:215:VAL:HA	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:28:THR:OG1	46:I:201:PC1:O14	2.30	0.43
13:M:373:ILE:HD11	13:M:444:LEU:HD12	2.01	0.43
15:O:48:LEU:HD22	15:O:121:GLY:HA3	2.01	0.43
45:H:403:3PE:H2F2	45:H:403:3PE:H2C2	1.82	0.43
10:J:153:LEU:O	10:J:157:THR:HG23	2.19	0.43
23:X:152:GLU:OE1	23:X:152:GLU:N	2.51	0.43
32:g:66:PHE:CD1	32:g:70:LEU:HD12	2.53	0.43
7:G:480:SER:O	7:G:481:SER:OG	2.24	0.43
7:G:675:ASP:OD1	7:G:678:SER:OG	2.27	0.43
13:M:106:LEU:HD13	13:M:234:VAL:HG11	1.99	0.43
32:g:118:ILE:HG21	41:p:162:MET:HE1	2.01	0.43
36:k:24:GLU:OE1	36:k:24:GLU:N	2.51	0.43
1:A:95:ILE:HG21	8:H:302:MET:HG3	2.00	0.43
7:G:366:THR:HB	7:G:450:MET:HE3	2.01	0.43
12:L:230:HIS:N	12:L:231:PRO:HD3	2.33	0.43
14:N:24:SER:OG	30:e:14:ASP:OD1	2.37	0.43
7:G:357:ASP:OD1	19:S:52:ILE:N	2.50	0.43
12:L:264:TYR:N	12:L:265:PRO:CD	2.82	0.43
13:M:406:TYR:CD1	13:M:406:TYR:C	2.97	0.43
5:E:181:ILE:O	5:E:181:ILE:CD1	2.66	0.43
16:P:278:TRP:CH2	45:P:403:3PE:H241	2.54	0.43
6:F:367:GLU:OE1	7:G:100:ASN:ND2	2.45	0.43
7:G:185:THR:O	7:G:187:ILE:N	2.51	0.43
24:Y:27:ILE:HB	45:Y:802:3PE:H2F2	2.01	0.43
53:h:201:CDL:H142	53:h:201:CDL:H772	2.01	0.43
7:G:324:ASP:CB	7:G:571:ALA:HB1	2.49	0.42
13:M:201:MET:HG3	45:M:502:3PE:H2F2	2.01	0.42
37:l:149:GLU:OE1	37:l:149:GLU:N	2.52	0.42
13:M:231:LEU:HD23	13:M:235:LEU:HD12	2.00	0.42
12:L:331:THR:HB	12:L:387:THR:HG22	2.00	0.42
20:U:17:TYR:OH	36:k:21:TRP:NE1	2.49	0.42
53:q:203:CDL:H731	53:q:203:CDL:C54	2.50	0.42
2:B:42:ARG:O	2:B:164:GLN:NE2	2.50	0.42
32:g:92:GLU:OE2	32:g:95:ARG:NH2	2.52	0.42
6:F:338:ASP:OD1	6:F:338:ASP:C	2.63	0.42
5:E:134:ASP:OD1	5:E:134:ASP:N	2.51	0.42
12:L:405:ASN:OD1	12:L:407:TRP:N	2.52	0.42
12:L:195:THR:HG21	12:L:200:GLN:HB3	2.01	0.42
15:O:88:SER:OG	15:O:90:ASP:OD1	2.34	0.42
2:B:69:MET:HE1	2:B:76:PHE:CE2	2.54	0.42
12:L:514:HIS:O	12:L:514:HIS:ND1	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:N:44:MET:HE1	14:N:59:TYR:CD2	2.55	0.42
12:L:82:MET:HB3	12:L:87:MET:HE3	2.02	0.41
38:m:124:PHE:HA	41:p:135:VAL:HG11	2.02	0.41
3:C:68:SER:N	21:V:86:GLU:OE1	2.49	0.41
9:I:79:ALA:HB2	9:I:106:THR:HG23	2.01	0.41
10:J:125:TRP:HB2	25:Z:136:THR:HG21	2.02	0.41
39:n:15:VAL:HG22	39:n:63:LEU:HD13	2.01	0.41
6:F:99:GLU:OE2	6:F:107:ASP:N	2.53	0.41
15:O:223:TYR:CE2	15:O:234:VAL:HG13	2.55	0.41
23:X:44:LEU:HD22	23:X:130:VAL:CG1	2.50	0.41
53:d:202:CDL:HB62	53:d:202:CDL:OA7	2.20	0.41
39:n:150:THR:HG22	39:n:151:GLU:N	2.35	0.41
7:G:431:ASP:N	7:G:431:ASP:OD1	2.53	0.41
16:P:185:ILE:O	16:P:185:ILE:HG22	2.21	0.41
38:m:2:PHE:CB	38:m:3:PRO:HA	2.50	0.41
41:p:98:ASP:OD2	41:p:141:ARG:NH1	2.54	0.41
4:D:165:THR:OG1	8:H:275:ALA:O	2.29	0.41
6:F:362:CYS:HB3	6:F:404:ILE:HD12	2.02	0.41
13:M:76:MET:CE	13:M:99:LEU:HD22	2.50	0.41
13:M:216:LEU:HD23	13:M:216:LEU:C	2.46	0.41
14:N:261:MET:HG3	14:N:340:THR:HG23	2.02	0.41
14:N:336:MET:HE1	53:d:202:CDL:H461	2.03	0.41
20:U:33:ASN:OD1	20:U:33:ASN:N	2.53	0.41
3:C:58:ILE:HB	3:C:59:PRO:HD3	2.01	0.41
13:M:373:ILE:HD11	13:M:444:LEU:CD1	2.51	0.41
16:P:173:GLY:N	16:P:176:ASP:HB3	2.36	0.41
45:P:403:3PE:H231	45:P:403:3PE:H261	1.81	0.41
23:X:138:GLU:OE1	23:X:138:GLU:N	2.41	0.41
29:d:108:THR:O	29:d:112:VAL:HG23	2.21	0.41
7:G:324:ASP:HB2	7:G:571:ALA:HB1	2.03	0.41
1:A:24:LEU:N	1:A:25:PRO:CD	2.84	0.41
2:B:45:LEU:O	2:B:74:VAL:HA	2.21	0.41
3:C:154:ASP:OD1	3:C:155:TYR:N	2.54	0.41
12:L:422:TYR:CD1	12:L:422:TYR:C	2.98	0.41
13:M:334:TYR:O	13:M:338:HIS:N	2.49	0.41
14:N:137:ALA:HB3	14:N:138:PRO:HD3	2.03	0.41
28:c:48:LEU:C	28:c:48:LEU:HD23	2.46	0.41
53:q:203:CDL:H751	53:q:203:CDL:C56	2.50	0.41
1:A:90:MET:SD	46:A:202:PC1:H332	2.61	0.41
14:N:146:PHE:N	14:N:147:PRO:CD	2.84	0.41
24:Y:24:THR:HG22	45:Y:802:3PE:H2H1	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:i:53:GLY:O	34:i:54:ALA:HB3	2.20	0.41
12:L:233:LEU:HB3	12:L:234:PRO:HD3	2.03	0.40
37:l:128:VAL:HG22	40:o:97:ARG:HB3	2.03	0.40
4:D:417:ILE:O	4:D:420:THR:HG22	2.21	0.40
6:F:69:GLY:O	49:F:501:NAI:H2N	2.21	0.40
45:H:403:3PE:H2A2	45:H:403:3PE:H271	1.91	0.40
46:H:405:PC1:O14	46:H:405:PC1:H133	2.22	0.40
25:Z:100:VAL:O	25:Z:101:PRO:C	2.64	0.40
12:L:261:ILE:HG13	12:L:317:ILE:HD11	2.04	0.40
14:N:20:VAL:HG13	14:N:29:VAL:HG13	2.03	0.40
1:A:44:MET:HE1	4:D:65:VAL:HG13	2.03	0.40
5:E:55:GLN:O	5:E:59:GLY:N	2.47	0.40
19:S:23:CYS:SG	19:S:24:GLN:N	2.94	0.40
39:n:27:GLU:OE2	39:n:33:ARG:NH1	2.51	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	113/115 (98%)	110 (97%)	3 (3%)	0	100	100
2	B	155/216 (72%)	151 (97%)	4 (3%)	0	100	100
3	C	206/266 (77%)	203 (98%)	3 (2%)	0	100	100
4	D	427/463 (92%)	418 (98%)	9 (2%)	0	100	100
5	E	214/249 (86%)	208 (97%)	6 (3%)	0	100	100
6	F	430/464 (93%)	426 (99%)	4 (1%)	0	100	100
7	G	688/727 (95%)	676 (98%)	12 (2%)	0	100	100
8	H	316/318 (99%)	309 (98%)	7 (2%)	0	100	100
9	I	174/212 (82%)	171 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	J	173/175 (99%)	167 (96%)	6 (4%)	0	100	100
11	K	96/98 (98%)	95 (99%)	1 (1%)	0	100	100
12	L	604/606 (100%)	583 (96%)	21 (4%)	0	100	100
13	M	457/459 (100%)	455 (100%)	2 (0%)	0	100	100
14	N	345/347 (99%)	339 (98%)	6 (2%)	0	100	100
15	O	318/343 (93%)	312 (98%)	6 (2%)	0	100	100
16	P	340/380 (90%)	336 (99%)	3 (1%)	1 (0%)	37	57
17	Q	126/175 (72%)	122 (97%)	4 (3%)	0	100	100
18	R	94/124 (76%)	93 (99%)	1 (1%)	0	100	100
19	S	85/99 (86%)	84 (99%)	1 (1%)	0	100	100
20	T	83/156 (53%)	83 (100%)	0	0	100	100
20	U	86/156 (55%)	84 (98%)	2 (2%)	0	100	100
21	V	113/116 (97%)	112 (99%)	1 (1%)	0	100	100
22	W	113/128 (88%)	111 (98%)	1 (1%)	1 (1%)	14	29
23	X	169/172 (98%)	166 (98%)	3 (2%)	0	100	100
24	Y	139/141 (99%)	139 (100%)	0	0	100	100
25	Z	139/144 (96%)	136 (98%)	3 (2%)	0	100	100
26	a	68/70 (97%)	68 (100%)	0	0	100	100
27	b	81/84 (96%)	78 (96%)	3 (4%)	0	100	100
28	c	47/76 (62%)	47 (100%)	0	0	100	100
29	d	119/121 (98%)	117 (98%)	1 (1%)	1 (1%)	16	32
30	e	98/106 (92%)	96 (98%)	2 (2%)	0	100	100
31	f	55/57 (96%)	53 (96%)	1 (2%)	1 (2%)	7	13
32	g	99/154 (64%)	95 (96%)	4 (4%)	0	100	100
33	h	139/189 (74%)	137 (99%)	2 (1%)	0	100	100
34	i	126/128 (98%)	119 (94%)	7 (6%)	0	100	100
35	j	65/108 (60%)	62 (95%)	3 (5%)	0	100	100
36	k	78/98 (80%)	77 (99%)	1 (1%)	0	100	100
37	l	153/186 (82%)	150 (98%)	3 (2%)	0	100	100
38	m	126/129 (98%)	126 (100%)	0	0	100	100
39	n	170/179 (95%)	166 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
40	o	120/137 (88%)	118 (98%)	2 (2%)	0	100	100
41	p	171/176 (97%)	171 (100%)	0	0	100	100
42	q	143/145 (99%)	142 (99%)	1 (1%)	0	100	100
43	r	93/113 (82%)	90 (97%)	3 (3%)	0	100	100
44	s	42/109 (38%)	42 (100%)	0	0	100	100
All	All	8196/9214 (89%)	8043 (98%)	149 (2%)	4 (0%)	100	100

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
16	P	2	HIS
31	f	55	THR
29	d	8	ARG
22	W	95	VAL

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	100/100 (100%)	99 (99%)	1 (1%)	73	87
2	B	133/174 (76%)	131 (98%)	2 (2%)	60	80
3	C	189/228 (83%)	188 (100%)	1 (0%)	86	95
4	D	370/392 (94%)	369 (100%)	1 (0%)	91	97
5	E	183/205 (89%)	179 (98%)	4 (2%)	47	70
6	F	345/368 (94%)	342 (99%)	3 (1%)	75	89
7	G	578/608 (95%)	574 (99%)	4 (1%)	81	92
8	H	274/274 (100%)	273 (100%)	1 (0%)	89	96
9	I	151/175 (86%)	148 (98%)	3 (2%)	50	73
10	J	141/141 (100%)	139 (99%)	2 (1%)	62	81
11	K	85/85 (100%)	84 (99%)	1 (1%)	67	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
12	L	533/533 (100%)	527 (99%)	6 (1%)	70 86
13	M	412/412 (100%)	410 (100%)	2 (0%)	86 95
14	N	315/315 (100%)	314 (100%)	1 (0%)	91 97
15	O	283/303 (93%)	283 (100%)	0	100 100
16	P	296/327 (90%)	296 (100%)	0	100 100
17	Q	115/153 (75%)	114 (99%)	1 (1%)	75 89
18	R	79/97 (81%)	79 (100%)	0	100 100
19	S	77/82 (94%)	76 (99%)	1 (1%)	65 83
20	T	79/135 (58%)	76 (96%)	3 (4%)	28 52
20	U	81/135 (60%)	78 (96%)	3 (4%)	29 53
21	V	101/102 (99%)	99 (98%)	2 (2%)	50 73
22	W	107/114 (94%)	107 (100%)	0	100 100
23	X	154/155 (99%)	153 (99%)	1 (1%)	84 94
24	Y	101/101 (100%)	101 (100%)	0	100 100
25	Z	120/121 (99%)	120 (100%)	0	100 100
26	a	59/59 (100%)	58 (98%)	1 (2%)	56 77
27	b	71/72 (99%)	70 (99%)	1 (1%)	62 81
28	c	45/68 (66%)	44 (98%)	1 (2%)	47 70
29	d	106/106 (100%)	105 (99%)	1 (1%)	75 89
30	e	90/96 (94%)	89 (99%)	1 (1%)	70 86
31	f	54/54 (100%)	52 (96%)	2 (4%)	29 53
32	g	92/131 (70%)	90 (98%)	2 (2%)	47 70
33	h	123/158 (78%)	123 (100%)	0	100 100
34	i	121/121 (100%)	119 (98%)	2 (2%)	56 77
35	j	61/84 (73%)	59 (97%)	2 (3%)	33 57
36	k	62/76 (82%)	62 (100%)	0	100 100
37	l	139/159 (87%)	138 (99%)	1 (1%)	81 92
38	m	114/115 (99%)	113 (99%)	1 (1%)	75 89
39	n	156/161 (97%)	155 (99%)	1 (1%)	84 94
40	o	110/120 (92%)	110 (100%)	0	100 100
41	p	155/157 (99%)	154 (99%)	1 (1%)	84 94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
42	q	131/131 (100%)	129 (98%)	2 (2%)	60 80
43	r	86/96 (90%)	85 (99%)	1 (1%)	67 84
44	s	43/92 (47%)	43 (100%)	0	100 100
All	All	7220/7891 (92%)	7157 (99%)	63 (1%)	74 89

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	LEU
2	B	54	CYS
2	B	75	VAL
3	C	7	THR
4	D	43	LEU
5	E	48	LEU
5	E	134	ASP
5	E	180	LYS
5	E	203	THR
6	F	80	SER
6	F	105	CYS
6	F	409	ASP
7	G	364	LEU
7	G	444	GLN
7	G	533	THR
7	G	540	ASP
8	H	24	GLU
9	I	29	GLU
9	I	37	THR
9	I	78	ILE
10	J	107	VAL
10	J	110	ASP
11	K	82	SER
12	L	250	SER
12	L	285	THR
12	L	381	THR
12	L	393	ASP
12	L	554	ASP
12	L	565	THR
13	M	86	LYS
13	M	114	GLU
14	N	164	ILE
17	Q	8	THR

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Mol	Chain	Res	Type
19	S	97	LYS
20	T	11	ILE
20	T	31	SER
20	T	87	TYR
20	U	33	ASN
20	U	48	VAL
20	U	66	ASP
21	V	21	GLU
21	V	64	VAL
23	X	63	ASN
26	a	69	ILE
27	b	4	VAL
28	c	32	ILE
29	d	92	SER
30	e	92	THR
31	f	3	LEU
31	f	4	LEU
32	g	107	ILE
32	g	118	ILE
34	i	121	GLU
34	i	124	ASP
35	j	6	HIS
35	j	50	HIS
37	l	16	THR
38	m	2	PHE
39	n	60	THR
41	p	24	SER
42	q	4	LEU
42	q	145	LYS
43	r	49	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (46) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	160	HIS
3	C	192	GLN
4	D	46	ASN
4	D	55	HIS
4	D	201	GLN
5	E	42	HIS
5	E	214	GLN
6	F	264	ASN

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Mol	Chain	Res	Type
6	F	421	HIS
7	G	311	GLN
7	G	535	GLN
7	G	640	ASN
8	H	47	GLN
11	K	52	HIS
12	L	56	HIS
12	L	269	ASN
12	L	296	ASN
12	L	434	GLN
12	L	580	GLN
13	M	83	HIS
13	M	139	GLN
14	N	91	ASN
14	N	134	GLN
14	N	268	GLN
15	O	141	GLN
15	O	287	HIS
16	P	87	HIS
19	S	92	ASN
20	T	33	ASN
21	V	75	GLN
22	W	69	ASN
22	W	125	HIS
23	X	34	GLN
23	X	76	HIS
29	d	97	HIS
31	f	30	ASN
34	i	12	GLN
34	i	25	GLN
34	i	51	GLN
37	l	126	GLN
39	n	11	HIS
39	n	77	GLN
40	o	49	GLN
41	p	64	HIS
41	p	148	HIS
42	q	5	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

9 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
12	FME	L	1	12	8,9,10	1.52	1 (12%)	7,9,11	1.61	2 (28%)
11	FME	K	1	11	8,9,10	1.50	1 (12%)	7,9,11	1.64	1 (14%)
13	FME	M	1	13	8,9,10	1.51	1 (12%)	7,9,11	1.65	1 (14%)
4	2MR	D	85	4	10,12,13	2.45	2 (20%)	5,13,15	1.27	1 (20%)
14	FME	N	1	14	8,9,10	1.51	1 (12%)	7,9,11	1.68	2 (28%)
1	FME	A	1	1	8,9,10	1.51	1 (12%)	7,9,11	1.69	2 (28%)
10	FME	J	1	10	8,9,10	1.52	1 (12%)	7,9,11	1.54	2 (28%)
2	WYK	B	77	2	9,11,12	2.54	2 (22%)	7,13,15	0.59	0
8	FME	H	1	8	8,9,10	1.51	1 (12%)	7,9,11	1.72	2 (28%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
12	FME	L	1	12	-	3/7/9/11	-
11	FME	K	1	11	-	1/7/9/11	-
13	FME	M	1	13	-	1/7/9/11	-
4	2MR	D	85	4	-	0/10/13/15	-
14	FME	N	1	14	-	1/7/9/11	-
1	FME	A	1	1	-	4/7/9/11	-
10	FME	J	1	10	-	4/7/9/11	-
2	WYK	B	77	2	-	1/10/11/13	-
8	FME	H	1	8	-	3/7/9/11	-

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	77	WYK	CZ-NE	6.74	1.46	1.33
4	D	85	2MR	CZ-NH2	5.34	1.45	1.33
4	D	85	2MR	CZ-NE	5.28	1.45	1.34
13	M	1	FME	CN-N	3.69	1.45	1.33
12	L	1	FME	CN-N	3.68	1.45	1.33
10	J	1	FME	CN-N	3.67	1.45	1.33
11	K	1	FME	CN-N	3.67	1.45	1.33
8	H	1	FME	CN-N	3.67	1.45	1.33
14	N	1	FME	CN-N	3.65	1.45	1.33
1	A	1	FME	CN-N	3.63	1.45	1.33
2	B	77	WYK	CZ-NH2	-2.18	1.25	1.34

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	M	1	FME	CE-SD-CG	2.81	110.04	100.40
14	N	1	FME	CE-SD-CG	2.77	109.93	100.40
8	H	1	FME	CE-SD-CG	2.76	109.87	100.40
11	K	1	FME	CE-SD-CG	2.64	109.47	100.40
1	A	1	FME	CE-SD-CG	2.63	109.45	100.40
12	L	1	FME	CE-SD-CG	2.58	109.28	100.40
10	J	1	FME	CE-SD-CG	2.38	108.59	100.40
1	A	1	FME	O1-CN-N	-2.10	119.75	125.27
14	N	1	FME	O1-CN-N	-2.07	119.82	125.27
4	D	85	2MR	CD-NE-CZ	-2.03	119.61	123.41
8	H	1	FME	O1-CN-N	-2.02	119.94	125.27
10	J	1	FME	O1-CN-N	-2.02	119.96	125.27
12	L	1	FME	O1-CN-N	-2.01	119.97	125.27

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1	FME	O1-CN-N-CA
1	A	1	FME	C-CA-CB-CG
1	A	1	FME	O-C-CA-CB
8	H	1	FME	C-CA-CB-CG
10	J	1	FME	O1-CN-N-CA
10	J	1	FME	N-CA-CB-CG
11	K	1	FME	O1-CN-N-CA
12	L	1	FME	O1-CN-N-CA
12	L	1	FME	CA-CB-CG-SD

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Mol	Chain	Res	Type	Atoms
14	N	1	FME	O1-CN-N-CA
8	H	1	FME	CA-CB-CG-SD
2	B	77	WYK	CA-CB-CG-OH
1	A	1	FME	N-CA-CB-CG
10	J	1	FME	CB-CG-SD-CE
13	M	1	FME	C-CA-CB-CG
8	H	1	FME	N-CA-CB-CG
10	J	1	FME	C-CA-CB-CG
12	L	1	FME	CB-CA-N-CN

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	K	1	FME	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 55 ligands modelled in this entry, 3 are monoatomic - leaving 52 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
47	SF4	G	803	7	0,12,12	-	-	-		
45	3PE	A	201	-	46,46,50	0.90	4 (8%)	49,51,55	0.96	2 (4%)
53	CDL	L	702	-	68,68,99	1.08	7 (10%)	74,80,111	1.02	4 (5%)
46	PC1	q	201	-	43,43,53	1.41	6 (13%)	49,51,61	1.02	2 (4%)
54	DGT	O	401	55	26,33,33	3.30	14 (53%)	32,52,52	1.52	7 (21%)
46	PC1	H	405	-	43,43,53	1.41	6 (13%)	49,51,61	0.91	2 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
45	3PE	M	502	-	42,42,50	0.94	4 (9%)	45,47,55	1.04	2 (4%)
53	CDL	M	501	-	77,77,99	1.03	7 (9%)	83,89,111	1.16	4 (4%)
45	3PE	L	704	-	40,40,50	0.96	4 (10%)	43,45,55	1.08	2 (4%)
46	PC1	H	401	-	34,34,53	1.51	6 (17%)	40,42,61	1.02	2 (5%)
60	MYR	o	201	40	14,14,15	0.45	0	13,13,15	0.88	0
45	3PE	K	101	-	41,41,50	0.95	4 (9%)	44,46,55	1.07	2 (4%)
45	3PE	P	403	-	34,34,50	1.02	4 (11%)	37,39,55	1.20	2 (5%)
45	3PE	Y	801	-	30,30,50	1.09	4 (13%)	33,35,55	1.13	2 (6%)
58	EHZ	U	101	20	29,36,37	1.70	5 (17%)	35,44,47	1.46	4 (11%)
45	3PE	Y	803	-	26,26,50	1.17	4 (15%)	29,31,55	1.24	2 (6%)
45	3PE	N	402	-	30,30,50	1.10	4 (13%)	33,35,55	1.07	2 (6%)
45	3PE	m	201	-	38,38,50	0.99	4 (10%)	41,43,55	1.17	2 (4%)
45	3PE	N	401	-	40,40,50	0.97	4 (10%)	43,45,55	1.19	2 (4%)
53	CDL	X	201	-	85,85,99	0.98	7 (8%)	91,97,111	1.11	4 (4%)
47	SF4	F	502	6	0,12,12	-	-	-		
46	PC1	P	401	-	32,32,53	1.56	6 (18%)	38,40,61	1.02	2 (5%)
45	3PE	L	703	-	43,43,50	0.93	4 (9%)	46,48,55	1.01	2 (4%)
46	PC1	I	201	-	39,39,53	1.46	6 (15%)	45,47,61	1.02	2 (4%)
50	FMN	F	503	-	33,33,33	2.81	10 (30%)	48,50,50	1.73	15 (31%)
46	PC1	B	202	-	45,45,53	1.38	6 (13%)	51,53,61	0.96	2 (3%)
46	PC1	N	403	-	38,38,53	1.46	6 (15%)	44,46,61	1.15	2 (4%)
53	CDL	H	404	-	65,65,99	1.08	7 (10%)	71,77,111	1.05	4 (5%)
46	PC1	h	202	-	43,43,53	1.40	6 (13%)	49,51,61	1.10	2 (4%)
47	SF4	I	202	9	0,12,12	-	-	-		
47	SF4	I	203	9	0,12,12	-	-	-		
46	PC1	q	202	-	48,48,53	1.36	6 (12%)	54,56,61	1.11	2 (3%)
59	CHD	i	201	-	32,32,32	3.24	10 (31%)	51,51,51	1.89	11 (21%)
45	3PE	d	201	-	48,48,50	0.89	4 (8%)	51,53,55	0.99	2 (3%)
45	3PE	Y	802	-	39,39,50	0.96	4 (10%)	42,44,55	1.07	2 (4%)
53	CDL	d	202	-	64,64,99	1.10	7 (10%)	70,76,111	1.13	4 (5%)
53	CDL	q	203	-	60,60,99	1.14	7 (11%)	66,72,111	1.10	4 (6%)
45	3PE	H	403	-	33,33,50	1.04	4 (12%)	36,38,55	1.14	2 (5%)
46	PC1	M	503	-	41,41,53	1.40	6 (14%)	47,49,61	1.03	2 (4%)
48	FES	E	301	5	0,4,4	-	-	-		
45	3PE	L	701	-	44,44,50	0.91	4 (9%)	47,49,55	1.07	2 (4%)
47	SF4	B	201	2	0,12,12	-	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
58	EHZ	T	101	20	29,36,37	1.72	5 (17%)	35,44,47	1.41	2 (5%)
45	3PE	I	204	-	44,44,50	0.91	4 (9%)	47,49,55	1.17	3 (6%)
45	3PE	D	901	-	48,48,50	0.88	4 (8%)	51,53,55	1.03	2 (3%)
46	PC1	A	202	-	34,34,53	1.52	6 (17%)	40,42,61	1.05	2 (5%)
53	CDL	h	201	-	77,77,99	1.02	7 (9%)	83,89,111	1.15	5 (6%)
52	LMT	H	402	-	36,36,36	1.16	2 (5%)	47,47,47	1.50	8 (17%)
56	NDP	P	402	-	45,52,52	4.29	23 (51%)	53,80,80	2.08	5 (9%)
47	SF4	G	801	7	0,12,12	-	-	-		
49	NAI	F	501	-	42,48,48	4.73	19 (45%)	47,73,73	1.69	6 (12%)
48	FES	G	804	7	0,4,4	-	-	-		

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
47	SF4	G	803	7	-	-	0/6/5/5
45	3PE	A	201	-	-	16/50/50/54	-
46	PC1	q	201	-	-	21/47/47/57	-
54	DGT	O	401	55	-	10/18/34/34	0/3/3/3
46	PC1	H	405	-	-	22/47/47/57	-
45	3PE	M	502	-	-	17/46/46/54	-
53	CDL	M	501	-	-	42/88/88/110	-
45	3PE	L	704	-	-	22/44/44/54	-
46	PC1	H	401	-	-	12/38/38/57	-
60	MYR	o	201	40	-	2/11/12/13	-
45	3PE	K	101	-	-	17/45/45/54	-
45	3PE	P	403	-	-	21/38/38/54	-
45	3PE	Y	801	-	-	21/34/34/54	-
58	EHZ	U	101	20	-	9/42/44/45	-
47	SF4	G	801	7	-	-	0/6/5/5
45	3PE	Y	803	-	-	16/30/30/54	-
45	3PE	N	402	-	-	18/34/34/54	-
45	3PE	m	201	-	-	24/42/42/54	-
45	3PE	N	401	-	-	22/44/44/54	-
53	CDL	X	201	-	-	44/96/96/110	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
47	SF4	F	502	6	-	-	0/6/5/5
46	PC1	P	401	-	-	12/36/36/57	-
45	3PE	L	703	-	-	20/47/47/54	-
46	PC1	I	201	-	-	16/43/43/57	-
50	FMN	F	503	-	-	7/18/18/18	0/3/3/3
46	PC1	B	202	-	-	15/49/49/57	-
46	PC1	N	403	-	-	20/42/42/57	-
53	CDL	H	404	-	-	33/76/76/110	-
46	PC1	h	202	-	-	23/47/47/57	-
47	SF4	I	202	9	-	-	0/6/5/5
47	SF4	I	203	9	-	-	0/6/5/5
46	PC1	q	202	-	-	19/52/52/57	-
59	CHD	i	201	-	-	2/9/74/74	0/4/4/4
45	3PE	d	201	-	-	27/52/52/54	-
45	3PE	Y	802	-	-	21/43/43/54	-
53	CDL	d	202	-	-	34/75/75/110	-
53	CDL	q	203	-	-	26/71/71/110	-
45	3PE	H	403	-	-	13/37/37/54	-
46	PC1	M	503	-	-	15/45/45/57	-
48	FES	E	301	5	-	-	0/1/1/1
45	3PE	L	701	-	-	18/48/48/54	-
47	SF4	B	201	2	-	-	0/6/5/5
58	EHZ	T	101	20	-	23/42/44/45	-
45	3PE	I	204	-	-	19/48/48/54	-
45	3PE	D	901	-	-	21/52/52/54	-
46	PC1	A	202	-	-	21/38/38/57	-
53	CDL	h	201	-	-	35/88/88/110	-
52	LMT	H	402	-	-	12/21/61/61	0/2/2/2
56	NDP	P	402	-	-	4/30/77/77	0/5/5/5
53	CDL	L	702	-	-	30/79/79/110	-
49	NAI	F	501	-	-	8/25/72/72	0/5/5/5
48	FES	G	804	7	-	-	0/1/1/1

All (271) bond length outliers are listed below:

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
49	F	501	NAI	O4B-C1B	15.17	1.62	1.41
49	F	501	NAI	C2B-C1B	-15.07	1.30	1.53
56	P	402	NDP	O4B-C1B	14.92	1.61	1.41
56	P	402	NDP	C6N-C5N	12.09	1.54	1.33
49	F	501	NAI	C6N-C5N	11.05	1.53	1.33
59	i	201	CHD	C11-C12	8.99	1.68	1.53
49	F	501	NAI	O4D-C1D	8.40	1.61	1.42
56	P	402	NDP	C7N-N7N	8.28	1.55	1.33
56	P	402	NDP	O4D-C1D	8.21	1.61	1.42
54	O	401	DGT	C2'-C3'	-7.62	1.32	1.52
50	F	503	FMN	C4A-N5	7.27	1.44	1.30
56	P	402	NDP	C2D-C1D	-7.11	1.30	1.53
59	i	201	CHD	C16-C15	7.04	1.73	1.54
49	F	501	NAI	C2D-C1D	-6.77	1.31	1.53
50	F	503	FMN	C10-N1	6.64	1.46	1.33
49	F	501	NAI	O4D-C4D	-6.50	1.30	1.45
56	P	402	NDP	O4D-C4D	-6.44	1.30	1.45
49	F	501	NAI	C2N-C3N	6.37	1.52	1.34
49	F	501	NAI	O4B-C4B	-6.16	1.31	1.45
59	i	201	CHD	C13-C17	6.07	1.65	1.55
56	P	402	NDP	P2B-O2B	5.61	1.69	1.59
58	T	101	EHZ	C12-N1	5.47	1.45	1.33
54	O	401	DGT	C2-N3	5.47	1.46	1.33
59	i	201	CHD	C8-C9	5.46	1.64	1.53
58	T	101	EHZ	C15-N2	5.44	1.45	1.33
58	U	101	EHZ	C15-N2	5.40	1.45	1.33
59	i	201	CHD	C20-C17	-5.39	1.45	1.54
54	O	401	DGT	O4'-C4'	5.39	1.57	1.45
58	U	101	EHZ	C12-N1	5.34	1.45	1.33
54	O	401	DGT	O4'-C1'	-5.24	1.30	1.42
50	F	503	FMN	C5A-N5	5.23	1.49	1.39
50	F	503	FMN	C9A-N10	5.16	1.50	1.41
59	i	201	CHD	O12-C12	-5.11	1.35	1.43
56	P	402	NDP	O4B-C4B	-5.10	1.33	1.45
54	O	401	DGT	C4-N3	5.07	1.49	1.37
50	F	503	FMN	C2-N1	4.87	1.48	1.36
56	P	402	NDP	C2N-C3N	4.80	1.48	1.34
54	O	401	DGT	C2-N2	4.79	1.45	1.34
59	i	201	CHD	C6-C5	4.71	1.61	1.53
49	F	501	NAI	C7N-N7N	4.58	1.45	1.33
50	F	503	FMN	C2-N3	4.31	1.49	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	i	201	CHD	C15-C14	4.10	1.62	1.54
56	P	402	NDP	O7N-C7N	-4.01	1.15	1.24
56	P	402	NDP	O2D-C2D	4.00	1.52	1.43
46	q	202	PC1	O31-C31	3.94	1.44	1.33
59	i	201	CHD	C6-C7	3.93	1.59	1.52
50	F	503	FMN	C4-N3	3.91	1.46	1.38
54	O	401	DGT	C2'-C1'	3.91	1.63	1.52
46	N	403	PC1	O31-C31	3.88	1.44	1.33
56	P	402	NDP	C6A-N6A	3.88	1.48	1.34
46	B	202	PC1	O31-C31	3.85	1.44	1.33
50	F	503	FMN	C10-N10	3.84	1.45	1.37
46	h	202	PC1	O31-C31	3.84	1.44	1.33
46	I	201	PC1	O31-C31	3.82	1.44	1.33
46	P	401	PC1	O31-C31	3.82	1.44	1.33
46	q	201	PC1	O31-C31	3.80	1.44	1.33
54	O	401	DGT	C5'-C4'	-3.80	1.39	1.51
54	O	401	DGT	C6-N1	3.79	1.43	1.37
46	A	202	PC1	O31-C31	3.78	1.44	1.33
46	H	405	PC1	O31-C31	3.73	1.44	1.33
46	M	503	PC1	O31-C31	3.70	1.44	1.33
46	H	401	PC1	O31-C31	3.67	1.44	1.33
46	P	401	PC1	O21-C21	3.64	1.44	1.34
46	q	201	PC1	O21-C21	3.61	1.44	1.34
46	h	202	PC1	O21-C21	3.61	1.44	1.34
46	q	202	PC1	O21-C21	3.60	1.44	1.34
46	I	201	PC1	O21-C21	3.57	1.44	1.34
46	A	202	PC1	O21-C21	3.56	1.44	1.34
46	H	401	PC1	O21-C21	3.56	1.44	1.34
46	N	403	PC1	O21-C21	3.53	1.44	1.34
46	H	405	PC1	O21-C21	3.53	1.44	1.34
46	M	503	PC1	O21-C21	3.50	1.44	1.34
56	P	402	NDP	C5A-C4A	-3.49	1.31	1.40
46	B	202	PC1	O21-C21	3.43	1.44	1.34
56	P	402	NDP	C4N-C3N	3.38	1.56	1.49
52	H	402	LMT	O5B-C1B	3.24	1.50	1.41
49	F	501	NAI	C6N-N1N	3.19	1.45	1.37
49	F	501	NAI	C6A-N6A	3.18	1.45	1.34
54	O	401	DGT	C5-C6	3.17	1.53	1.47
52	H	402	LMT	O5'-C1'	3.09	1.49	1.41
50	F	503	FMN	O2-C2	-2.97	1.18	1.24
49	F	501	NAI	O3D-C3D	-2.95	1.36	1.43
49	F	501	NAI	O3B-C3B	-2.94	1.36	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
49	F	501	NAI	O2B-C2B	2.92	1.49	1.43
49	F	501	NAI	O2D-C2D	2.89	1.49	1.43
56	P	402	NDP	C2A-N3A	2.88	1.36	1.32
53	M	501	CDL	OB8-CB7	2.86	1.41	1.33
56	P	402	NDP	C4N-C5N	2.85	1.56	1.48
54	O	401	DGT	C2-N1	2.77	1.44	1.37
53	d	202	CDL	OB8-CB7	2.71	1.41	1.33
53	X	201	CDL	OB8-CB7	2.71	1.41	1.33
53	h	201	CDL	OB8-CB7	2.69	1.41	1.33
53	L	702	CDL	OB8-CB7	2.69	1.41	1.33
54	O	401	DGT	O3'-C3'	2.68	1.49	1.43
53	q	203	CDL	OB8-CB7	2.68	1.41	1.33
53	H	404	CDL	OB8-CB7	2.67	1.41	1.33
49	F	501	NAI	C5A-C4A	-2.63	1.34	1.40
53	L	702	CDL	OA6-CA4	-2.60	1.40	1.46
53	h	201	CDL	OA6-CA4	-2.60	1.40	1.46
53	q	203	CDL	OA6-CA4	-2.60	1.40	1.46
53	X	201	CDL	OB6-CB5	2.60	1.41	1.34
45	M	502	3PE	O21-C2	-2.59	1.40	1.46
46	H	405	PC1	O21-C2	-2.59	1.40	1.46
50	F	503	FMN	O4-C4	-2.57	1.18	1.23
53	M	501	CDL	OA6-CA4	-2.55	1.40	1.46
46	M	503	PC1	O21-C2	-2.55	1.40	1.46
45	H	403	3PE	O21-C2	-2.54	1.40	1.46
46	B	202	PC1	O21-C2	-2.54	1.40	1.46
53	d	202	CDL	OA6-CA4	-2.52	1.40	1.46
45	I	204	3PE	O21-C2	-2.52	1.40	1.46
46	q	201	PC1	O21-C2	-2.52	1.40	1.46
58	T	101	EHZ	C9-S1	2.51	1.82	1.76
45	m	201	3PE	O31-C31	2.51	1.40	1.33
46	I	201	PC1	O21-C2	-2.51	1.40	1.46
56	P	402	NDP	O3D-C3D	-2.50	1.37	1.43
53	M	501	CDL	OB6-CB5	2.49	1.41	1.34
54	O	401	DGT	C5-C4	-2.49	1.36	1.43
45	K	101	3PE	O21-C2	-2.48	1.40	1.46
45	A	201	3PE	O21-C2	-2.48	1.40	1.46
45	L	704	3PE	O21-C2	-2.48	1.40	1.46
53	d	202	CDL	OB6-CB5	2.47	1.41	1.34
46	N	403	PC1	O21-C2	-2.47	1.40	1.46
53	q	203	CDL	OB6-CB5	2.47	1.41	1.34
56	P	402	NDP	C6N-N1N	2.47	1.43	1.37
45	D	901	3PE	O31-C31	2.47	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	L	701	3PE	O21-C2	-2.46	1.40	1.46
56	P	402	NDP	O3B-C3B	-2.46	1.37	1.43
58	U	101	EHZ	C9-S1	2.46	1.82	1.76
53	X	201	CDL	OA8-CA7	2.46	1.40	1.33
46	A	202	PC1	O21-C2	-2.46	1.40	1.46
45	Y	802	3PE	O21-C2	-2.45	1.40	1.46
53	L	702	CDL	OA8-CA7	2.45	1.40	1.33
45	d	201	3PE	O31-C31	2.45	1.40	1.33
45	N	401	3PE	O21-C2	-2.45	1.40	1.46
45	L	701	3PE	O31-C31	2.45	1.40	1.33
45	M	502	3PE	O31-C31	2.45	1.40	1.33
53	X	201	CDL	OA6-CA4	-2.44	1.40	1.46
53	d	202	CDL	OA8-CA7	2.44	1.40	1.33
46	H	401	PC1	O21-C2	-2.44	1.40	1.46
45	Y	803	3PE	O21-C2	-2.44	1.40	1.46
53	L	702	CDL	OB6-CB4	-2.44	1.40	1.46
56	P	402	NDP	C7N-C3N	2.44	1.53	1.48
53	h	201	CDL	OB6-CB5	2.44	1.41	1.34
53	L	702	CDL	OB6-CB5	2.43	1.41	1.34
53	h	201	CDL	OB6-CB4	-2.43	1.40	1.46
45	H	403	3PE	O31-C31	2.43	1.40	1.33
53	H	404	CDL	OB6-CB4	-2.42	1.40	1.46
53	d	202	CDL	OB6-CB4	-2.42	1.40	1.46
45	K	101	3PE	O31-C31	2.41	1.40	1.33
53	H	404	CDL	OB6-CB5	2.41	1.41	1.34
53	h	201	CDL	OA8-CA7	2.41	1.40	1.33
53	q	203	CDL	OB6-CB4	-2.41	1.40	1.46
46	h	202	PC1	P-O11	2.41	1.69	1.59
53	M	501	CDL	OB6-CB4	-2.41	1.40	1.46
45	A	201	3PE	O31-C31	2.40	1.40	1.33
45	N	402	3PE	O31-C31	2.40	1.40	1.33
45	L	703	3PE	O21-C2	-2.40	1.40	1.46
45	N	401	3PE	O31-C31	2.40	1.40	1.33
46	h	202	PC1	O21-C2	-2.40	1.40	1.46
45	Y	802	3PE	O31-C31	2.40	1.40	1.33
53	q	203	CDL	OA8-CA7	2.40	1.40	1.33
53	M	501	CDL	OA8-CA7	2.39	1.40	1.33
45	Y	803	3PE	O31-C31	2.39	1.40	1.33
45	P	403	3PE	O31-C31	2.39	1.40	1.33
46	P	401	PC1	P-O11	2.38	1.68	1.59
45	Y	801	3PE	O31-C31	2.38	1.40	1.33
45	d	201	3PE	O21-C2	-2.37	1.40	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	m	201	3PE	O21-C2	-2.37	1.40	1.46
45	I	204	3PE	O31-C31	2.37	1.40	1.33
46	A	202	PC1	P-O11	2.36	1.68	1.59
45	L	704	3PE	O31-C31	2.36	1.40	1.33
46	I	201	PC1	P-O11	2.36	1.68	1.59
46	q	202	PC1	C22-C21	2.35	1.57	1.50
46	P	401	PC1	O21-C2	-2.35	1.40	1.46
49	F	501	NAI	O7N-C7N	-2.35	1.18	1.24
46	q	201	PC1	C22-C21	2.33	1.57	1.50
46	B	202	PC1	P-O11	2.33	1.68	1.59
53	H	404	CDL	OA8-CA7	2.33	1.40	1.33
46	q	202	PC1	P-O11	2.33	1.68	1.59
45	L	703	3PE	O31-C31	2.32	1.40	1.33
45	N	402	3PE	O21-C21	2.32	1.40	1.34
58	T	101	EHZ	O4-C15	-2.32	1.18	1.23
46	H	401	PC1	P-O11	2.31	1.68	1.59
56	P	402	NDP	PA-O5B	2.31	1.68	1.59
46	q	201	PC1	P-O11	2.30	1.68	1.59
46	H	401	PC1	C22-C21	2.30	1.57	1.50
46	h	202	PC1	C22-C21	2.30	1.57	1.50
46	A	202	PC1	C22-C21	2.30	1.57	1.50
46	M	503	PC1	P-O11	2.30	1.68	1.59
56	P	402	NDP	P2B-O1X	2.30	1.57	1.50
46	q	202	PC1	O21-C2	-2.29	1.40	1.46
46	M	503	PC1	C22-C21	2.28	1.57	1.50
46	H	405	PC1	P-O11	2.28	1.68	1.59
45	P	403	3PE	O21-C2	-2.27	1.40	1.46
46	I	201	PC1	C22-C21	2.27	1.57	1.50
45	Y	801	3PE	O21-C2	-2.26	1.40	1.46
45	Y	801	3PE	O21-C21	2.26	1.40	1.34
46	N	403	PC1	C22-C21	2.26	1.57	1.50
46	N	403	PC1	P-O11	2.25	1.68	1.59
46	H	405	PC1	C22-C21	2.24	1.57	1.50
45	Y	803	3PE	O21-C21	2.23	1.40	1.34
45	D	901	3PE	O21-C21	2.22	1.40	1.34
45	L	703	3PE	O21-C21	2.22	1.40	1.34
45	L	703	3PE	O31-C3	-2.22	1.40	1.45
45	N	401	3PE	O21-C21	2.22	1.40	1.34
49	F	501	NAI	C2A-N3A	2.22	1.35	1.32
46	P	401	PC1	C22-C21	2.22	1.57	1.50
45	D	901	3PE	O21-C2	-2.22	1.41	1.46
58	U	101	EHZ	O4-C15	-2.21	1.19	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	X	201	CDL	OA6-CA5	2.21	1.40	1.34
45	D	901	3PE	O31-C3	-2.21	1.40	1.45
53	H	404	CDL	OA6-CA4	-2.21	1.41	1.46
59	i	201	CHD	C13-C12	-2.21	1.51	1.54
58	T	101	EHZ	O3-C12	-2.21	1.18	1.23
45	Y	802	3PE	O21-C21	2.20	1.40	1.34
45	A	201	3PE	O21-C21	2.20	1.40	1.34
53	q	203	CDL	OA8-CA6	-2.19	1.40	1.45
45	d	201	3PE	O21-C21	2.19	1.40	1.34
45	K	101	3PE	O31-C3	-2.18	1.40	1.45
53	d	202	CDL	OA8-CA6	-2.18	1.40	1.45
58	U	101	EHZ	O3-C12	-2.18	1.18	1.23
53	M	501	CDL	OA8-CA6	-2.18	1.40	1.45
45	m	201	3PE	O21-C21	2.18	1.40	1.34
46	B	202	PC1	C22-C21	2.17	1.57	1.50
45	N	401	3PE	O31-C3	-2.17	1.40	1.45
53	h	201	CDL	OA8-CA6	-2.16	1.40	1.45
46	q	201	PC1	P-O13	2.16	1.68	1.59
53	L	702	CDL	OA6-CA5	2.16	1.40	1.34
45	H	403	3PE	O21-C21	2.15	1.40	1.34
54	O	401	DGT	O6-C6	-2.15	1.18	1.23
45	P	403	3PE	O21-C21	2.14	1.40	1.34
45	L	704	3PE	O21-C21	2.14	1.40	1.34
46	A	202	PC1	P-O13	2.14	1.68	1.59
49	F	501	NAI	C7N-C3N	2.14	1.53	1.48
56	P	402	NDP	C5B-C4B	2.14	1.58	1.51
46	I	201	PC1	P-O13	2.14	1.67	1.59
53	M	501	CDL	OA6-CA5	2.14	1.40	1.34
53	H	404	CDL	OA8-CA6	-2.13	1.40	1.45
53	q	203	CDL	OA6-CA5	2.13	1.40	1.34
45	L	704	3PE	O31-C3	-2.13	1.40	1.45
45	L	701	3PE	O21-C21	2.13	1.40	1.34
45	N	402	3PE	O31-C3	-2.12	1.40	1.45
45	I	204	3PE	O31-C3	-2.12	1.40	1.45
45	M	502	3PE	O21-C21	2.12	1.40	1.34
45	K	101	3PE	O21-C21	2.12	1.40	1.34
46	q	202	PC1	P-O13	2.11	1.67	1.59
53	X	201	CDL	OA8-CA6	-2.11	1.40	1.45
46	H	405	PC1	P-O13	2.10	1.67	1.59
53	H	404	CDL	OA6-CA5	2.10	1.40	1.34
45	N	402	3PE	O21-C2	-2.10	1.41	1.46
46	P	401	PC1	P-O13	2.10	1.67	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	X	201	CDL	OB6-CB4	-2.09	1.41	1.46
46	B	202	PC1	P-O13	2.09	1.67	1.59
46	H	401	PC1	P-O13	2.09	1.67	1.59
45	H	403	3PE	O31-C3	-2.08	1.40	1.45
45	Y	802	3PE	O31-C3	-2.08	1.40	1.45
45	I	204	3PE	O21-C21	2.08	1.40	1.34
46	h	202	PC1	P-O13	2.08	1.67	1.59
46	M	503	PC1	P-O13	2.08	1.67	1.59
53	d	202	CDL	OA6-CA5	2.07	1.40	1.34
45	Y	803	3PE	O31-C3	-2.07	1.40	1.45
45	Y	801	3PE	O31-C3	-2.07	1.40	1.45
46	N	403	PC1	P-O13	2.06	1.67	1.59
53	h	201	CDL	OA6-CA5	2.06	1.40	1.34
45	A	201	3PE	O31-C3	-2.05	1.40	1.45
45	d	201	3PE	O31-C3	-2.03	1.40	1.45
45	M	502	3PE	O31-C3	-2.02	1.40	1.45
45	L	701	3PE	O31-C3	-2.02	1.40	1.45
45	P	403	3PE	O31-C3	-2.02	1.40	1.45
53	L	702	CDL	OA8-CA6	-2.02	1.40	1.45
45	m	201	3PE	O31-C3	-2.01	1.40	1.45

All (144) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
56	P	402	NDP	C5A-C6A-N6A	8.77	133.68	120.35
56	P	402	NDP	C1B-N9A-C4A	-7.27	113.87	126.64
49	F	501	NAI	C5A-C6A-N6A	6.69	130.52	120.35
56	P	402	NDP	N6A-C6A-N1A	-6.16	105.78	118.57
56	P	402	NDP	N3A-C2A-N1A	-5.47	120.13	128.68
49	F	501	NAI	N3A-C2A-N1A	-5.46	120.14	128.68
58	U	101	EHZ	C8-C9-S1	5.12	119.96	113.63
45	N	401	3PE	O21-C21-C22	5.03	122.34	111.50
59	i	201	CHD	C17-C13-C12	4.99	122.22	117.67
50	F	503	FMN	C9-C8-C7	4.63	126.30	119.67
58	T	101	EHZ	C8-C9-S1	4.62	119.34	113.63
59	i	201	CHD	C14-C13-C12	4.60	111.69	107.40
53	X	201	CDL	OA6-CA5-C11	4.57	121.34	111.50
45	Y	803	3PE	O21-C21-C22	4.53	121.26	111.50
59	i	201	CHD	C18-C13-C12	-4.51	104.47	109.07
52	H	402	LMT	C1-O1'-C1'	4.48	121.28	113.84
45	m	201	3PE	O21-C21-C22	4.45	121.09	111.50
45	P	403	3PE	O21-C21-C22	4.44	121.06	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
50	F	503	FMN	C7M-C7-C6	4.43	127.68	119.49
53	h	201	CDL	OA6-CA5-C11	4.41	121.01	111.50
49	F	501	NAI	N6A-C6A-N1A	-4.36	109.52	118.57
46	q	202	PC1	O21-C21-C22	4.35	120.88	111.50
46	N	403	PC1	O21-C21-C22	4.29	120.75	111.50
53	M	501	CDL	OA6-CA5-C11	4.27	120.71	111.50
45	Y	801	3PE	O21-C21-C22	4.20	120.56	111.50
53	M	501	CDL	OB6-CB5-C51	4.20	120.56	111.50
45	I	204	3PE	O21-C21-C22	4.20	120.55	111.50
46	h	202	PC1	O21-C21-C22	4.17	120.50	111.50
46	A	202	PC1	O21-C21-C22	4.14	120.43	111.50
53	q	203	CDL	OB6-CB5-C51	4.11	120.36	111.50
45	D	901	3PE	O21-C21-C22	4.04	120.21	111.50
53	X	201	CDL	OB6-CB5-C51	3.98	120.07	111.50
52	H	402	LMT	O1'-C1'-C2'	3.96	114.49	108.30
53	d	202	CDL	OA6-CA5-C11	3.96	120.04	111.50
45	K	101	3PE	O21-C21-C22	3.94	119.98	111.50
46	q	201	PC1	O21-C21-C22	3.93	119.96	111.50
53	h	201	CDL	OB6-CB5-C51	3.91	119.93	111.50
46	P	401	PC1	O21-C21-C22	3.91	119.93	111.50
45	L	701	3PE	O21-C21-C22	3.90	119.92	111.50
46	M	503	PC1	O21-C21-C22	3.90	119.91	111.50
46	B	202	PC1	O21-C21-C22	3.80	119.68	111.50
53	L	702	CDL	OB6-CB5-C51	3.74	119.57	111.50
45	d	201	3PE	O21-C21-C22	3.74	119.56	111.50
46	H	401	PC1	O21-C21-C22	3.73	119.54	111.50
45	N	402	3PE	O21-C21-C22	3.72	119.52	111.50
53	q	203	CDL	OA6-CA5-C11	3.71	119.50	111.50
46	I	201	PC1	O21-C21-C22	3.70	119.48	111.50
46	H	405	PC1	O21-C21-C22	3.64	119.35	111.50
45	Y	802	3PE	O21-C21-C22	3.64	119.35	111.50
45	L	704	3PE	O21-C21-C22	3.62	119.31	111.50
59	i	201	CHD	C17-C13-C14	3.60	103.72	100.09
53	H	404	CDL	OA6-CA5-C11	3.59	119.23	111.50
52	H	402	LMT	O5'-C5'-C4'	3.57	117.28	109.75
45	L	703	3PE	O21-C21-C22	3.57	119.20	111.50
59	i	201	CHD	C11-C12-C13	3.51	114.85	111.24
45	H	403	3PE	O21-C21-C22	3.49	119.03	111.50
54	O	401	DGT	C5-C6-N1	3.44	120.03	113.95
45	M	502	3PE	O21-C21-C22	3.43	118.89	111.50
58	T	101	EHZ	C10-S1-C9	3.41	112.50	101.87
45	A	201	3PE	O21-C21-C22	3.40	118.83	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
53	H	404	CDL	OB6-CB5-C51	3.39	118.81	111.50
59	i	201	CHD	C13-C17-C20	-3.35	115.49	119.50
52	H	402	LMT	C3'-C4'-C5'	3.35	118.60	110.93
50	F	503	FMN	C8M-C8-C7	-3.33	113.92	120.74
45	H	403	3PE	O31-C31-C32	3.32	120.08	111.38
53	d	202	CDL	OB6-CB5-C51	3.30	120.01	110.80
53	L	702	CDL	OA6-CA5-C11	3.22	118.45	111.50
50	F	503	FMN	C4-N3-C2	-3.21	119.70	125.64
53	M	501	CDL	OB8-CB7-C71	3.18	121.90	111.91
46	q	202	PC1	O31-C31-C32	3.16	121.82	111.91
45	P	403	3PE	O31-C31-C32	3.13	121.75	111.91
45	m	201	3PE	O31-C31-C32	3.03	121.43	111.91
52	H	402	LMT	C1B-O1B-C4'	-2.99	110.57	117.96
54	O	401	DGT	C2-N1-C6	-2.96	119.65	125.10
59	i	201	CHD	C18-C13-C17	-2.93	106.63	111.21
56	P	402	NDP	PN-O3-PA	-2.83	123.12	132.83
46	h	202	PC1	O31-C31-C32	2.83	120.78	111.91
45	I	204	3PE	O31-C31-C32	2.81	120.74	111.91
45	d	201	3PE	O31-C31-C32	2.81	120.74	111.91
45	L	701	3PE	O31-C31-C32	2.81	120.72	111.91
54	O	401	DGT	PA-O3A-PB	-2.80	123.20	132.83
46	N	403	PC1	O31-C31-C32	2.79	120.67	111.91
45	Y	803	3PE	O31-C31-C32	2.76	120.55	111.91
50	F	503	FMN	C4A-C10-N10	2.75	120.49	116.48
54	O	401	DGT	C8-N7-C5	2.74	108.22	102.99
59	i	201	CHD	C21-C20-C22	-2.73	106.09	110.36
53	d	202	CDL	OB8-CB7-C71	2.72	120.44	111.91
45	M	502	3PE	O31-C31-C32	2.72	120.44	111.91
45	L	704	3PE	O31-C31-C32	2.70	120.40	111.91
53	X	201	CDL	OB8-CB7-C71	2.70	120.37	111.91
50	F	503	FMN	C6-C7-C8	-2.69	115.81	119.67
53	h	201	CDL	OA8-CA7-C31	2.69	120.35	111.91
46	A	202	PC1	O31-C31-C32	2.68	120.33	111.91
46	P	401	PC1	O31-C31-C32	2.68	120.31	111.91
46	I	201	PC1	O31-C31-C32	2.67	120.30	111.91
45	N	401	3PE	O31-C31-C32	2.62	120.12	111.91
53	L	702	CDL	OA8-CA7-C31	2.61	120.08	111.91
53	L	702	CDL	OB8-CB7-C71	2.57	119.98	111.91
49	F	501	NAI	PN-O3-PA	-2.57	124.00	132.83
46	H	401	PC1	O31-C31-C32	2.54	119.88	111.91
59	i	201	CHD	C23-C22-C20	-2.52	109.92	114.52
50	F	503	FMN	C4A-C4-N3	2.52	119.58	113.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	N	402	3PE	O31-C31-C32	2.50	119.76	111.91
59	i	201	CHD	C18-C13-C14	-2.50	107.31	111.21
52	H	402	LMT	C2'-C3'-C4'	2.49	115.36	109.68
45	Y	802	3PE	O31-C31-C32	2.48	119.68	111.91
53	M	501	CDL	OA8-CA7-C31	2.47	119.66	111.91
45	K	101	3PE	O31-C31-C32	2.46	119.63	111.91
49	F	501	NAI	C3D-C2D-C1D	2.45	106.09	101.43
50	F	503	FMN	O4-C4-C4A	-2.43	120.14	126.60
53	h	201	CDL	OB8-CB7-C71	2.43	119.54	111.91
46	M	503	PC1	O31-C31-C32	2.42	119.51	111.91
45	A	201	3PE	O31-C31-C32	2.42	119.49	111.91
53	q	203	CDL	OB8-CB7-C71	2.41	119.47	111.91
45	D	901	3PE	O31-C31-C32	2.41	119.47	111.91
45	L	703	3PE	O31-C31-C32	2.40	119.44	111.91
54	O	401	DGT	PB-O3B-PG	-2.40	124.60	132.83
45	Y	801	3PE	O31-C31-C32	2.40	119.42	111.91
52	H	402	LMT	O5B-C5B-C4B	2.39	114.04	109.69
58	U	101	EHZ	C10-S1-C9	2.39	109.30	101.87
53	X	201	CDL	OA8-CA7-C31	2.37	119.34	111.91
46	B	202	PC1	O31-C31-C32	2.37	119.33	111.91
52	H	402	LMT	C3B-C4B-C5B	2.34	114.41	110.24
50	F	503	FMN	C9A-C5A-N5	-2.34	119.89	122.43
53	h	201	CDL	CA4-OA6-CA5	-2.33	112.06	117.79
50	F	503	FMN	C6-C5A-C9A	2.32	122.22	118.94
45	I	204	3PE	C2-O21-C21	-2.32	112.08	117.79
50	F	503	FMN	C10-C4A-N5	-2.32	119.94	124.86
46	q	201	PC1	O31-C31-C32	2.31	119.16	111.91
53	d	202	CDL	OA8-CA7-C31	2.31	119.16	111.91
53	H	404	CDL	OB8-CB7-C71	2.28	119.06	111.91
58	U	101	EHZ	C13-C12-N1	2.24	120.20	116.42
53	q	203	CDL	OA8-CA7-C31	2.23	118.90	111.91
54	O	401	DGT	O6-C6-C5	-2.21	120.05	124.37
49	F	501	NAI	C4D-O4D-C1D	-2.21	104.59	109.47
59	i	201	CHD	C6-C5-C4	-2.21	108.65	111.19
53	H	404	CDL	OA8-CA7-C31	2.19	118.78	111.91
54	O	401	DGT	C2'-C1'-N9	-2.15	109.30	114.27
50	F	503	FMN	C4-C4A-C10	2.10	120.31	116.79
50	F	503	FMN	C7M-C7-C8	-2.06	116.51	120.74
50	F	503	FMN	C4A-C10-N1	-2.05	119.98	124.73
46	H	405	PC1	O31-C31-C32	2.02	118.25	111.91
50	F	503	FMN	C5A-C9A-N10	2.00	120.02	117.95
58	U	101	EHZ	C7-C8-C9	-2.00	109.33	113.89

There are no chirality outliers.

All (850) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	D	901	3PE	C1-O11-P-O14
45	D	901	3PE	O11-C1-C2-O21
45	D	901	3PE	C3-C2-O21-C21
45	D	901	3PE	C22-C21-O21-C2
45	I	204	3PE	C1-O11-P-O12
45	I	204	3PE	C1-O11-P-O14
45	I	204	3PE	C11-O13-P-O14
45	I	204	3PE	C22-C21-O21-C2
45	L	703	3PE	C11-O13-P-O11
45	L	703	3PE	C22-C21-O21-C2
45	L	704	3PE	C1-O11-P-O14
45	L	704	3PE	O13-C11-C12-N
45	M	502	3PE	C1-O11-P-O12
45	M	502	3PE	C1-O11-P-O13
45	M	502	3PE	C1-O11-P-O14
45	N	401	3PE	C1-O11-P-O12
45	N	401	3PE	O22-C21-O21-C2
45	N	401	3PE	C22-C21-O21-C2
45	N	402	3PE	C1-O11-P-O12
45	N	402	3PE	C1-O11-P-O14
45	N	402	3PE	C11-O13-P-O12
45	N	402	3PE	C2-C1-O11-P
45	P	403	3PE	C1-O11-P-O12
45	P	403	3PE	O13-C11-C12-N
45	P	403	3PE	O22-C21-O21-C2
45	P	403	3PE	C22-C21-O21-C2
45	Y	801	3PE	C11-O13-P-O14
45	Y	801	3PE	C12-C11-O13-P
45	Y	801	3PE	C22-C21-O21-C2
45	Y	802	3PE	C1-O11-P-O12
45	Y	802	3PE	C1-O11-P-O14
45	Y	803	3PE	C1-O11-P-O12
45	Y	803	3PE	C1-O11-P-O14
45	Y	803	3PE	O13-C11-C12-N
45	Y	803	3PE	O22-C21-O21-C2
45	d	201	3PE	C11-O13-P-O11
45	d	201	3PE	C11-O13-P-O14
45	d	201	3PE	C12-C11-O13-P
45	d	201	3PE	O11-C1-C2-O21
45	m	201	3PE	C1-O11-P-O14

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Mol	Chain	Res	Type	Atoms
45	m	201	3PE	C22-C21-O21-C2
46	A	202	PC1	C1-O11-P-O14
46	A	202	PC1	O13-C11-C12-N
46	A	202	PC1	O22-C21-O21-C2
46	H	401	PC1	O13-C11-C12-N
46	H	405	PC1	C11-O13-P-O12
46	H	405	PC1	C11-O13-P-O14
46	H	405	PC1	C1-O11-P-O12
46	H	405	PC1	C1-O11-P-O13
46	I	201	PC1	O21-C2-C3-O31
46	N	403	PC1	C1-O11-P-O12
46	N	403	PC1	C1-O11-P-O14
46	P	401	PC1	C1-O11-P-O12
46	P	401	PC1	C1-O11-P-O14
46	P	401	PC1	C2-C1-O11-P
46	h	202	PC1	C11-O13-P-O14
46	h	202	PC1	C1-O11-P-O14
46	h	202	PC1	C2-C1-O11-P
46	q	201	PC1	C11-O13-P-O12
46	q	201	PC1	C11-O13-P-O14
46	q	201	PC1	C1-O11-P-O12
46	q	201	PC1	C1-O11-P-O14
46	q	201	PC1	C2-C1-O11-P
46	q	201	PC1	C22-C21-O21-C2
46	q	202	PC1	O13-C11-C12-N
46	q	202	PC1	C3-C2-O21-C21
46	q	202	PC1	O22-C21-O21-C2
49	F	501	NAI	C5B-O5B-PA-O3
52	H	402	LMT	C2-C1-O1'-C1'
53	H	404	CDL	CA3-OA5-PA1-OA4
53	H	404	CDL	C11-CA5-OA6-CA4
53	H	404	CDL	C1-CB2-OB2-PB2
53	H	404	CDL	CB2-OB2-PB2-OB3
53	H	404	CDL	CB2-OB2-PB2-OB4
53	H	404	CDL	CB2-OB2-PB2-OB5
53	H	404	CDL	CB3-OB5-PB2-OB3
53	H	404	CDL	C51-CB5-OB6-CB4
53	L	702	CDL	CB3-OB5-PB2-OB3
53	L	702	CDL	CB4-CB3-OB5-PB2
53	M	501	CDL	C1-CA2-OA2-PA1
53	M	501	CDL	CA2-OA2-PA1-OA3
53	M	501	CDL	CA2-OA2-PA1-OA4

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Mol	Chain	Res	Type	Atoms
53	M	501	CDL	CA2-OA2-PA1-OA5
53	M	501	CDL	C11-CA5-OA6-CA4
53	M	501	CDL	CB2-OB2-PB2-OB3
53	M	501	CDL	CB2-OB2-PB2-OB4
53	M	501	CDL	CB2-OB2-PB2-OB5
53	M	501	CDL	OB9-CB7-OB8-CB6
53	M	501	CDL	C71-CB7-OB8-CB6
53	X	201	CDL	CA2-OA2-PA1-OA3
53	X	201	CDL	CA3-OA5-PA1-OA2
53	X	201	CDL	CA3-OA5-PA1-OA3
53	X	201	CDL	CA3-OA5-PA1-OA4
53	X	201	CDL	CB2-OB2-PB2-OB3
53	X	201	CDL	CB2-OB2-PB2-OB4
53	X	201	CDL	CB2-OB2-PB2-OB5
53	X	201	CDL	C51-CB5-OB6-CB4
53	d	202	CDL	CA2-OA2-PA1-OA3
53	d	202	CDL	CA3-OA5-PA1-OA3
53	d	202	CDL	CB2-OB2-PB2-OB3
53	d	202	CDL	CB2-OB2-PB2-OB4
53	d	202	CDL	CB3-OB5-PB2-OB3
53	h	201	CDL	CA2-OA2-PA1-OA3
53	h	201	CDL	C51-CB5-OB6-CB4
53	q	203	CDL	C11-CA5-OA6-CA4
53	q	203	CDL	CB2-OB2-PB2-OB5
53	q	203	CDL	CB3-OB5-PB2-OB3
54	O	401	DGT	PB-O3A-PA-O5'
54	O	401	DGT	C5'-O5'-PA-O2A
56	P	402	NDP	C2B-O2B-P2B-O1X
58	T	101	EHZ	C6-C7-C8-C9
58	T	101	EHZ	S1-C10-C11-N1
58	T	101	EHZ	C11-C10-S1-C9
58	T	101	EHZ	C12-C13-C14-N2
58	T	101	EHZ	C15-C16-C17-C18
58	T	101	EHZ	C15-C16-C17-C19
58	T	101	EHZ	C15-C16-C17-C20
58	T	101	EHZ	O5-C16-C17-C18
58	T	101	EHZ	C16-C17-C20-O6
58	U	101	EHZ	S1-C10-C11-N1
58	U	101	EHZ	O2-C9-S1-C10
58	U	101	EHZ	C8-C9-S1-C10
45	P	403	3PE	O32-C31-O31-C3
45	Y	802	3PE	O32-C31-O31-C3

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Mol	Chain	Res	Type	Atoms
45	d	201	3PE	O32-C31-O31-C3
53	L	702	CDL	OB9-CB7-OB8-CB6
46	q	202	PC1	C2-C3-O31-C31
45	Y	802	3PE	C32-C31-O31-C3
53	L	702	CDL	C71-CB7-OB8-CB6
45	D	901	3PE	O32-C31-O31-C3
45	K	101	3PE	O32-C31-O31-C3
45	L	703	3PE	O32-C31-O31-C3
45	Y	801	3PE	O32-C31-O31-C3
45	m	201	3PE	O32-C31-O31-C3
46	N	403	PC1	O32-C31-O31-C3
46	h	202	PC1	O32-C31-O31-C3
46	q	201	PC1	O32-C31-O31-C3
46	q	202	PC1	O32-C31-O31-C3
45	D	901	3PE	O22-C21-O21-C2
45	I	204	3PE	O22-C21-O21-C2
45	L	703	3PE	O22-C21-O21-C2
45	m	201	3PE	O22-C21-O21-C2
46	q	201	PC1	O22-C21-O21-C2
53	H	404	CDL	OA7-CA5-OA6-CA4
53	H	404	CDL	OB7-CB5-OB6-CB4
53	M	501	CDL	OA7-CA5-OA6-CA4
53	X	201	CDL	OB7-CB5-OB6-CB4
53	h	201	CDL	OB7-CB5-OB6-CB4
53	q	203	CDL	OA7-CA5-OA6-CA4
45	D	901	3PE	C32-C31-O31-C3
45	K	101	3PE	C32-C31-O31-C3
45	L	703	3PE	C32-C31-O31-C3
45	P	403	3PE	C32-C31-O31-C3
45	Y	801	3PE	C32-C31-O31-C3
45	d	201	3PE	C32-C31-O31-C3
45	m	201	3PE	C32-C31-O31-C3
46	M	503	PC1	C32-C31-O31-C3
46	N	403	PC1	C32-C31-O31-C3
53	X	201	CDL	C71-CB7-OB8-CB6
45	Y	803	3PE	C22-C21-O21-C2
46	A	202	PC1	C22-C21-O21-C2
46	q	202	PC1	C22-C21-O21-C2
46	A	202	PC1	O32-C31-O31-C3
46	A	202	PC1	C32-C31-O31-C3
46	H	401	PC1	C32-C31-O31-C3
46	h	202	PC1	C32-C31-O31-C3

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Mol	Chain	Res	Type	Atoms
46	q	201	PC1	C32-C31-O31-C3
46	q	202	PC1	C32-C31-O31-C3
45	Y	801	3PE	O22-C21-O21-C2
46	M	503	PC1	O32-C31-O31-C3
53	X	201	CDL	OB9-CB7-OB8-CB6
53	L	702	CDL	O1-C1-CB2-OB2
53	M	501	CDL	O1-C1-CB2-OB2
53	h	201	CDL	O1-C1-CB2-OB2
46	P	401	PC1	C32-C31-O31-C3
53	H	404	CDL	C31-CA7-OA8-CA6
53	d	202	CDL	C11-CA5-OA6-CA4
53	L	702	CDL	CA5-C11-C12-C13
52	H	402	LMT	O5'-C5'-C6'-O6'
53	H	404	CDL	OA9-CA7-OA8-CA6
54	O	401	DGT	O4'-C4'-C5'-O5'
46	A	202	PC1	C2-C1-O11-P
46	H	401	PC1	O32-C31-O31-C3
46	P	401	PC1	O32-C31-O31-C3
53	M	501	CDL	CA2-C1-CB2-OB2
53	X	201	CDL	CA2-C1-CB2-OB2
53	d	202	CDL	OA7-CA5-OA6-CA4
45	N	402	3PE	C32-C31-O31-C3
46	I	201	PC1	C32-C31-O31-C3
46	M	503	PC1	C32-C33-C34-C35
53	X	201	CDL	OA5-CA3-CA4-OA6
53	X	201	CDL	O1-C1-CB2-OB2
53	d	202	CDL	O1-C1-CA2-OA2
52	H	402	LMT	C2'-C1'-O1'-C1
45	Y	802	3PE	C2B-C2C-C2D-C2E
53	M	501	CDL	CA5-C11-C12-C13
45	N	402	3PE	O32-C31-O31-C3
46	I	201	PC1	O32-C31-O31-C3
53	h	201	CDL	CB5-C51-C52-C53
53	M	501	CDL	CA7-C31-C32-C33
53	X	201	CDL	CB5-C51-C52-C53
53	h	201	CDL	CB7-C71-C72-C73
54	O	401	DGT	C3'-C4'-C5'-O5'
53	M	501	CDL	CB5-C51-C52-C53
53	q	203	CDL	CA5-C11-C12-C13
53	q	203	CDL	CB5-C51-C52-C53
52	H	402	LMT	O5B-C1B-O1B-C4'
52	H	402	LMT	C2B-C1B-O1B-C4'

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Mol	Chain	Res	Type	Atoms
45	P	403	3PE	C31-C32-C33-C34
46	N	403	PC1	C2-C3-O31-C31
45	D	901	3PE	C1-O11-P-O13
45	I	204	3PE	C1-O11-P-O13
45	K	101	3PE	C1-O11-P-O13
45	L	703	3PE	C1-O11-P-O13
45	M	502	3PE	C11-O13-P-O11
45	N	401	3PE	C1-O11-P-O13
45	N	402	3PE	C1-O11-P-O13
45	N	402	3PE	C11-O13-P-O11
45	P	403	3PE	C1-O11-P-O13
45	Y	801	3PE	C1-O11-P-O13
45	Y	802	3PE	C1-O11-P-O13
45	Y	803	3PE	C1-O11-P-O13
45	Y	803	3PE	C11-O13-P-O11
45	d	201	3PE	C1-O11-P-O13
45	m	201	3PE	C1-O11-P-O13
46	A	202	PC1	C1-O11-P-O13
46	H	405	PC1	C11-O13-P-O11
46	I	201	PC1	C11-O13-P-O11
46	N	403	PC1	C1-O11-P-O13
46	P	401	PC1	C1-O11-P-O13
46	h	202	PC1	C1-O11-P-O13
46	q	201	PC1	C11-O13-P-O11
46	q	201	PC1	C1-O11-P-O13
53	H	404	CDL	CA3-OA5-PA1-OA2
53	L	702	CDL	CB2-OB2-PB2-OB5
53	L	702	CDL	CB3-OB5-PB2-OB2
53	X	201	CDL	CA2-OA2-PA1-OA5
53	d	202	CDL	CA2-OA2-PA1-OA5
53	d	202	CDL	CA3-OA5-PA1-OA2
53	d	202	CDL	CB2-OB2-PB2-OB5
53	h	201	CDL	CA2-OA2-PA1-OA5
53	L	702	CDL	CA2-C1-CB2-OB2
45	M	502	3PE	C22-C21-O21-C2
46	H	401	PC1	C22-C21-O21-C2
49	F	501	NAI	C3D-C4D-C5D-O5D
45	A	201	3PE	C34-C35-C36-C37
45	Y	801	3PE	C32-C33-C34-C35
46	P	401	PC1	C22-C23-C24-C25
53	X	201	CDL	C59-C60-C61-C62
53	X	201	CDL	C63-C64-C65-C66

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Mol	Chain	Res	Type	Atoms
53	d	202	CDL	C76-C77-C78-C79
53	h	201	CDL	C51-C52-C53-C54
60	o	201	MYR	C3-C4-C5-C6
58	T	101	EHZ	C18-C17-C20-O6
58	T	101	EHZ	C19-C17-C20-O6
45	L	701	3PE	C38-C39-C3A-C3B
45	m	201	3PE	C2C-C2D-C2E-C2F
53	L	702	CDL	C53-C54-C55-C56
45	M	502	3PE	O22-C21-O21-C2
46	H	401	PC1	O22-C21-O21-C2
45	D	901	3PE	C22-C23-C24-C25
45	M	502	3PE	C2C-C2D-C2E-C2F
45	d	201	3PE	C38-C39-C3A-C3B
45	d	201	3PE	C28-C29-C2A-C2B
53	M	501	CDL	C53-C54-C55-C56
46	H	401	PC1	O11-C1-C2-O21
45	L	701	3PE	C33-C34-C35-C36
45	K	101	3PE	C38-C39-C3A-C3B
46	B	202	PC1	C3A-C3B-C3C-C3D
53	h	201	CDL	C52-C53-C54-C55
46	q	202	PC1	C23-C24-C25-C26
58	U	101	EHZ	C3-C4-C5-C6
46	N	403	PC1	C35-C36-C37-C38
45	L	701	3PE	C26-C27-C28-C29
53	L	702	CDL	C51-C52-C53-C54
53	M	501	CDL	C55-C56-C57-C58
53	M	501	CDL	C75-C76-C77-C78
53	X	201	CDL	C53-C54-C55-C56
53	q	203	CDL	C12-C13-C14-C15
53	H	404	CDL	C51-C52-C53-C54
45	L	703	3PE	C29-C2A-C2B-C2C
46	H	405	PC1	C34-C35-C36-C37
46	h	202	PC1	C24-C25-C26-C27
45	D	901	3PE	C2D-C2E-C2F-C2G
45	L	701	3PE	C36-C37-C38-C39
45	Y	802	3PE	C24-C25-C26-C27
46	N	403	PC1	C34-C35-C36-C37
53	d	202	CDL	C34-C35-C36-C37
53	h	201	CDL	C39-C40-C41-C42
45	N	401	3PE	C29-C2A-C2B-C2C
45	Y	802	3PE	C28-C29-C2A-C2B
45	d	201	3PE	C2A-C2B-C2C-C2D

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Mol	Chain	Res	Type	Atoms
60	o	201	MYR	C11-C10-C9-C8
45	N	401	3PE	O13-C11-C12-N
45	D	901	3PE	C2B-C2C-C2D-C2E
45	I	204	3PE	C37-C38-C39-C3A
46	h	202	PC1	C26-C27-C28-C29
53	M	501	CDL	C80-C81-C82-C83
53	h	201	CDL	C14-C15-C16-C17
45	N	401	3PE	C32-C31-O31-C3
53	h	201	CDL	C31-CA7-OA8-CA6
53	X	201	CDL	CB4-CB6-OB8-CB7
45	M	502	3PE	C23-C24-C25-C26
45	d	201	3PE	C27-C28-C29-C2A
46	q	201	PC1	C29-C2A-C2B-C2C
53	X	201	CDL	C11-CA5-OA6-CA4
53	h	201	CDL	C11-CA5-OA6-CA4
53	q	203	CDL	C51-CB5-OB6-CB4
53	L	702	CDL	C11-C12-C13-C14
53	X	201	CDL	C57-C58-C59-C60
53	h	201	CDL	C57-C58-C59-C60
45	A	201	3PE	C23-C24-C25-C26
45	N	402	3PE	C31-C32-C33-C34
45	Y	802	3PE	C22-C23-C24-C25
53	L	702	CDL	C39-C40-C41-C42
53	h	201	CDL	C17-C18-C19-C20
53	q	203	CDL	OB7-CB5-OB6-CB4
52	H	402	LMT	C4-C5-C6-C7
53	h	201	CDL	C34-C35-C36-C37
46	N	403	PC1	C21-C22-C23-C24
45	K	101	3PE	C29-C2A-C2B-C2C
53	L	702	CDL	C37-C38-C39-C40
45	Y	802	3PE	C22-C21-O21-C2
46	I	201	PC1	C22-C21-O21-C2
46	q	202	PC1	C2D-C2E-C2F-C2G
53	X	201	CDL	C19-C20-C21-C22
53	h	201	CDL	C73-C74-C75-C76
53	h	201	CDL	OA9-CA7-OA8-CA6
45	m	201	3PE	C21-C22-C23-C24
53	H	404	CDL	C57-C58-C59-C60
45	N	401	3PE	O32-C31-O31-C3
53	d	202	CDL	C77-C78-C79-C80
53	X	201	CDL	OA7-CA5-OA6-CA4
45	N	402	3PE	C23-C24-C25-C26

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Mol	Chain	Res	Type	Atoms
53	H	404	CDL	CB5-C51-C52-C53
53	q	203	CDL	CA7-C31-C32-C33
53	M	501	CDL	C73-C74-C75-C76
53	M	501	CDL	C81-C82-C83-C84
45	L	701	3PE	C3A-C3B-C3C-C3D
45	H	403	3PE	C22-C21-O21-C2
45	K	101	3PE	C22-C21-O21-C2
45	L	704	3PE	C22-C21-O21-C2
46	H	405	PC1	C22-C21-O21-C2
46	h	202	PC1	C22-C21-O21-C2
45	N	401	3PE	O11-C1-C2-O21
53	h	201	CDL	OA5-CA3-CA4-OA6
45	K	101	3PE	C32-C33-C34-C35
45	K	101	3PE	C22-C23-C24-C25
46	q	202	PC1	C24-C25-C26-C27
45	H	403	3PE	O22-C21-O21-C2
46	H	405	PC1	O22-C21-O21-C2
46	I	201	PC1	O22-C21-O21-C2
46	h	202	PC1	O22-C21-O21-C2
53	h	201	CDL	OA7-CA5-OA6-CA4
45	M	502	3PE	C37-C38-C39-C3A
53	X	201	CDL	C55-C56-C57-C58
46	q	201	PC1	O21-C2-C3-O31
53	H	404	CDL	C53-C54-C55-C56
58	U	101	EHZ	C1-C2-C3-C4
46	M	503	PC1	C25-C26-C27-C28
52	H	402	LMT	C5-C6-C7-C8
45	K	101	3PE	O22-C21-O21-C2
45	Y	802	3PE	O22-C21-O21-C2
53	M	501	CDL	C51-CB5-OB6-CB4
53	h	201	CDL	C36-C37-C38-C39
45	Y	801	3PE	C11-O13-P-O11
46	B	202	PC1	C11-O13-P-O11
53	X	201	CDL	CB4-CB3-OB5-PB2
45	N	401	3PE	C2A-C2B-C2C-C2D
45	I	204	3PE	O11-C1-C2-C3
45	d	201	3PE	O11-C1-C2-C3
46	H	401	PC1	O11-C1-C2-C3
53	X	201	CDL	OA5-CA3-CA4-CA6
46	A	202	PC1	C31-C32-C33-C34
53	H	404	CDL	C12-C13-C14-C15
53	X	201	CDL	C38-C39-C40-C41

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Mol	Chain	Res	Type	Atoms
53	h	201	CDL	C11-C12-C13-C14
45	I	204	3PE	C2C-C2D-C2E-C2F
45	N	401	3PE	C22-C23-C24-C25
45	N	401	3PE	C1-C2-C3-O31
45	N	402	3PE	C1-C2-C3-O31
46	I	201	PC1	C1-C2-C3-O31
46	q	201	PC1	C1-C2-C3-O31
53	H	404	CDL	C63-C64-C65-C66
53	d	202	CDL	C39-C40-C41-C42
45	m	201	3PE	C2B-C2C-C2D-C2E
53	L	702	CDL	C35-C36-C37-C38
53	d	202	CDL	C75-C76-C77-C78
45	d	201	3PE	C2F-C2G-C2H-C2I
46	A	202	PC1	C36-C37-C38-C39
45	L	704	3PE	C3B-C3C-C3D-C3E
45	m	201	3PE	C24-C25-C26-C27
54	O	401	DGT	PB-O3B-PG-O3G
53	M	501	CDL	C31-CA7-OA8-CA6
53	d	202	CDL	C31-CA7-OA8-CA6
45	L	703	3PE	C22-C23-C24-C25
46	M	503	PC1	C2F-C2G-C2H-C2I
46	h	202	PC1	C27-C28-C29-C2A
53	M	501	CDL	C12-C13-C14-C15
45	P	403	3PE	C3-C2-O21-C21
53	L	702	CDL	C36-C37-C38-C39
53	X	201	CDL	C34-C35-C36-C37
52	H	402	LMT	C6-C7-C8-C9
46	q	202	PC1	O11-C1-C2-O21
45	L	704	3PE	C35-C36-C37-C38
53	H	404	CDL	OB6-CB4-CB6-OB8
45	d	201	3PE	C34-C35-C36-C37
45	L	704	3PE	O22-C21-O21-C2
53	M	501	CDL	OB7-CB5-OB6-CB4
58	T	101	EHZ	O5-C16-C17-C19
45	d	201	3PE	C22-C23-C24-C25
53	d	202	CDL	C73-C74-C75-C76
45	L	704	3PE	O21-C21-C22-C23
45	K	101	3PE	C23-C24-C25-C26
45	m	201	3PE	C22-C23-C24-C25
53	H	404	CDL	CA7-C31-C32-C33
53	h	201	CDL	CA2-C1-CB2-OB2
45	m	201	3PE	C31-C32-C33-C34

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Mol	Chain	Res	Type	Atoms
45	D	901	3PE	O11-C1-C2-C3
45	N	401	3PE	O11-C1-C2-C3
45	P	403	3PE	O11-C1-C2-C3
46	A	202	PC1	O11-C1-C2-C3
46	h	202	PC1	O11-C1-C2-C3
46	q	202	PC1	O11-C1-C2-C3
53	h	201	CDL	OA5-CA3-CA4-CA6
53	q	203	CDL	OA5-CA3-CA4-CA6
53	X	201	CDL	C36-C37-C38-C39
45	d	201	3PE	C26-C27-C28-C29
46	H	405	PC1	C2-C1-O11-P
46	H	405	PC1	C29-C2A-C2B-C2C
53	H	404	CDL	C55-C56-C57-C58
45	L	704	3PE	C29-C2A-C2B-C2C
45	L	701	3PE	C22-C23-C24-C25
45	d	201	3PE	C1-C2-C3-O31
46	A	202	PC1	C1-C2-C3-O31
53	h	201	CDL	CB3-CB4-CB6-OB8
53	q	203	CDL	CA3-CA4-CA6-OA8
53	h	201	CDL	C76-C77-C78-C79
45	Y	802	3PE	C2D-C2E-C2F-C2G
45	I	204	3PE	C33-C34-C35-C36
45	Y	801	3PE	C34-C35-C36-C37
46	I	201	PC1	C38-C39-C3A-C3B
53	q	203	CDL	C19-C20-C21-C22
45	L	704	3PE	C1-O11-P-O13
46	M	503	PC1	C1-O11-P-O13
53	H	404	CDL	CB3-OB5-PB2-OB2
53	h	201	CDL	CA3-OA5-PA1-OA2
53	q	203	CDL	CB3-OB5-PB2-OB2
45	I	204	3PE	O11-C1-C2-O21
45	L	701	3PE	O11-C1-C2-O21
45	M	502	3PE	O11-C1-C2-O21
45	N	402	3PE	O11-C1-C2-O21
45	P	403	3PE	O11-C1-C2-O21
46	H	405	PC1	O11-C1-C2-O21
53	L	702	CDL	OA5-CA3-CA4-OA6
53	M	501	CDL	OB5-CB3-CB4-OB6
53	q	203	CDL	OB5-CB3-CB4-OB6
46	h	202	PC1	C33-C34-C35-C36
53	M	501	CDL	C78-C79-C80-C81
53	M	501	CDL	OA9-CA7-OA8-CA6

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Mol	Chain	Res	Type	Atoms
53	d	202	CDL	OA9-CA7-OA8-CA6
45	L	701	3PE	C29-C2A-C2B-C2C
46	H	405	PC1	C33-C34-C35-C36
45	L	704	3PE	C34-C35-C36-C37
45	I	204	3PE	O21-C2-C3-O31
45	d	201	3PE	O21-C2-C3-O31
46	H	405	PC1	O21-C2-C3-O31
53	h	201	CDL	OB6-CB4-CB6-OB8
53	q	203	CDL	OA6-CA4-CA6-OA8
53	M	501	CDL	C32-C33-C34-C35
45	P	403	3PE	C38-C39-C3A-C3B
46	q	201	PC1	C23-C24-C25-C26
46	q	202	PC1	O31-C31-C32-C33
53	q	203	CDL	C18-C19-C20-C21
58	U	101	EHZ	C21-C1-C2-C3
45	Y	801	3PE	C2-C1-O11-P
53	d	202	CDL	C33-C34-C35-C36
45	N	401	3PE	C33-C34-C35-C36
53	d	202	CDL	C44-C45-C46-C47
58	T	101	EHZ	O2-C9-S1-C10
46	h	202	PC1	C21-C22-C23-C24
45	A	201	3PE	C27-C28-C29-C2A
45	N	401	3PE	C38-C39-C3A-C3B
45	m	201	3PE	C2D-C2E-C2F-C2G
53	L	702	CDL	C15-C16-C17-C18
53	h	201	CDL	C55-C56-C57-C58
45	Y	801	3PE	O11-C1-C2-C3
46	N	403	PC1	O11-C1-C2-C3
53	M	501	CDL	OA5-CA3-CA4-CA6
53	d	202	CDL	C36-C37-C38-C39
45	N	401	3PE	C21-C22-C23-C24
58	T	101	EHZ	C3-C4-C5-C6
58	T	101	EHZ	N2-C15-C16-O5
53	L	702	CDL	C32-C33-C34-C35
53	M	501	CDL	C71-C72-C73-C74
46	B	202	PC1	C25-C26-C27-C28
45	L	704	3PE	C1-C2-O21-C21
45	Y	801	3PE	C3-C2-O21-C21
53	H	404	CDL	CA6-CA4-OA6-CA5
46	I	201	PC1	C25-C26-C27-C28
50	F	503	FMN	O2'-C2'-C3'-C4'
45	H	403	3PE	C2-C1-O11-P

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Mol	Chain	Res	Type	Atoms
45	Y	802	3PE	C2-C1-O11-P
46	H	405	PC1	C1-C2-C3-O31
46	N	403	PC1	C1-C2-C3-O31
53	L	702	CDL	C12-C13-C14-C15
45	A	201	3PE	O11-C1-C2-O21
45	Y	801	3PE	O11-C1-C2-O21
46	A	202	PC1	O11-C1-C2-O21
46	N	403	PC1	O11-C1-C2-O21
46	h	202	PC1	O11-C1-C2-O21
53	q	203	CDL	OA5-CA3-CA4-OA6
45	P	403	3PE	O21-C21-C22-C23
52	H	402	LMT	C4B-C5B-C6B-O6B
45	K	101	3PE	C33-C34-C35-C36
53	d	202	CDL	CB2-C1-CA2-OA2
54	O	401	DGT	PB-O3B-PG-O1G
58	U	101	EHZ	O3-C12-C13-C14
53	q	203	CDL	C31-C32-C33-C34
45	L	704	3PE	O21-C2-C3-O31
45	N	401	3PE	O21-C2-C3-O31
45	Y	802	3PE	O21-C2-C3-O31
46	A	202	PC1	O21-C2-C3-O31
46	N	403	PC1	O21-C2-C3-O31
53	X	201	CDL	C31-C32-C33-C34
58	U	101	EHZ	N1-C12-C13-C14
49	F	501	NAI	O4D-C4D-C5D-O5D
45	m	201	3PE	C23-C24-C25-C26
45	L	701	3PE	C3C-C3D-C3E-C3F
45	L	703	3PE	C24-C25-C26-C27
45	Y	802	3PE	C29-C2A-C2B-C2C
45	D	901	3PE	C25-C26-C27-C28
53	M	501	CDL	C84-C85-C86-C87
46	h	202	PC1	C11-O13-P-O11
49	F	501	NAI	O4D-C1D-N1N-C2N
56	P	402	NDP	O4D-C1D-N1N-C6N
53	d	202	CDL	C72-C73-C74-C75
46	q	202	PC1	C21-C22-C23-C24
46	H	405	PC1	C32-C33-C34-C35
50	F	503	FMN	C4'-C5'-O5'-P
45	L	704	3PE	C26-C27-C28-C29
45	D	901	3PE	C1-O11-P-O12
45	K	101	3PE	C1-O11-P-O12
45	K	101	3PE	C1-O11-P-O14

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Mol	Chain	Res	Type	Atoms
45	L	703	3PE	C1-O11-P-O12
45	L	703	3PE	C1-O11-P-O14
45	M	502	3PE	C11-O13-P-O12
45	M	502	3PE	C11-O13-P-O14
45	N	401	3PE	C1-O11-P-O14
45	N	402	3PE	C11-O13-P-O14
45	Y	801	3PE	C1-O11-P-O12
45	Y	801	3PE	C1-O11-P-O14
45	Y	803	3PE	C11-O13-P-O14
45	d	201	3PE	C1-O11-P-O12
45	d	201	3PE	C1-O11-P-O14
45	m	201	3PE	C1-O11-P-O12
46	A	202	PC1	C1-O11-P-O12
46	B	202	PC1	C11-O13-P-O12
46	B	202	PC1	C1-O11-P-O14
46	H	405	PC1	C1-O11-P-O14
46	I	201	PC1	C11-O13-P-O12
46	I	201	PC1	C11-O13-P-O14
46	I	201	PC1	C1-O11-P-O14
46	M	503	PC1	C11-O13-P-O12
49	F	501	NAI	C5B-O5B-PA-O1A
49	F	501	NAI	C5B-O5B-PA-O2A
53	L	702	CDL	CB2-OB2-PB2-OB3
53	L	702	CDL	CB2-OB2-PB2-OB4
53	M	501	CDL	CA3-OA5-PA1-OA4
53	X	201	CDL	CA2-OA2-PA1-OA4
53	d	202	CDL	CA2-OA2-PA1-OA4
53	d	202	CDL	CA3-OA5-PA1-OA4
53	h	201	CDL	CA2-OA2-PA1-OA4
53	q	203	CDL	CA2-OA2-PA1-OA3
45	L	704	3PE	C31-C32-C33-C34
45	M	502	3PE	O11-C1-C2-C3
45	N	402	3PE	O11-C1-C2-C3
53	M	501	CDL	OB5-CB3-CB4-CB6
53	d	202	CDL	OA5-CA3-CA4-CA6
46	q	201	PC1	C27-C28-C29-C2A
45	Y	803	3PE	O31-C31-C32-C33
53	h	201	CDL	C13-C14-C15-C16
53	X	201	CDL	C17-C18-C19-C20
45	I	204	3PE	C12-C11-O13-P
45	M	502	3PE	C12-C11-O13-P
45	Y	803	3PE	C12-C11-O13-P

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Mol	Chain	Res	Type	Atoms
46	A	202	PC1	C12-C11-O13-P
46	H	405	PC1	C12-C11-O13-P
46	h	202	PC1	C12-C11-O13-P
45	A	201	3PE	C25-C26-C27-C28
45	N	402	3PE	C34-C35-C36-C37
53	q	203	CDL	C17-C18-C19-C20
53	q	203	CDL	C73-C74-C75-C76
45	M	502	3PE	C32-C33-C34-C35
45	L	703	3PE	O11-C1-C2-O21
46	M	503	PC1	O11-C1-C2-O21
53	M	501	CDL	OA5-CA3-CA4-OA6
46	H	405	PC1	C37-C38-C39-C3A
46	N	403	PC1	C36-C37-C38-C39
53	q	203	CDL	C53-C54-C55-C56
45	P	403	3PE	C23-C24-C25-C26
46	I	201	PC1	C33-C34-C35-C36
52	H	402	LMT	C4'-C5'-C6'-O6'
45	d	201	3PE	C37-C38-C39-C3A
53	M	501	CDL	C11-C12-C13-C14
45	Y	802	3PE	C1-C2-C3-O31
45	m	201	3PE	C1-C2-C3-O31
58	T	101	EHZ	O5-C16-C17-C20
58	U	101	EHZ	C5-C6-C7-C8
45	N	402	3PE	O21-C2-C3-O31
45	m	201	3PE	O21-C2-C3-O31
50	F	503	FMN	C2'-C3'-C4'-O4'
45	K	101	3PE	C34-C35-C36-C37
45	L	704	3PE	C23-C24-C25-C26
45	P	403	3PE	C36-C37-C38-C39
46	P	401	PC1	C32-C33-C34-C35
45	H	403	3PE	C2B-C2C-C2D-C2E
56	P	402	NDP	O4D-C4D-C5D-O5D
45	K	101	3PE	O21-C21-C22-C23
45	Y	802	3PE	C32-C33-C34-C35
45	Y	802	3PE	C27-C28-C29-C2A
46	H	401	PC1	C3-C2-O21-C21
53	H	404	CDL	CB3-CB4-OB6-CB5
45	A	201	3PE	O11-C1-C2-C3
45	L	703	3PE	O11-C1-C2-C3
46	M	503	PC1	O11-C1-C2-C3
50	F	503	FMN	O3'-C3'-C4'-C5'
53	h	201	CDL	C16-C17-C18-C19

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Mol	Chain	Res	Type	Atoms
46	P	401	PC1	O21-C21-C22-C23
45	d	201	3PE	C32-C33-C34-C35
45	m	201	3PE	C2-C1-O11-P
53	d	202	CDL	CB4-CB3-OB5-PB2
53	X	201	CDL	C15-C16-C17-C18
45	L	704	3PE	C28-C29-C2A-C2B
45	d	201	3PE	C24-C25-C26-C27
46	B	202	PC1	C26-C27-C28-C29
53	L	702	CDL	C56-C57-C58-C59
45	A	201	3PE	O21-C21-C22-C23
45	M	502	3PE	O21-C21-C22-C23
45	Y	802	3PE	O21-C21-C22-C23
46	B	202	PC1	O21-C21-C22-C23
46	B	202	PC1	C23-C24-C25-C26
53	h	201	CDL	C32-C33-C34-C35
46	q	201	PC1	C36-C37-C38-C39
45	H	403	3PE	C1-O11-P-O13
45	I	204	3PE	C11-O13-P-O11
45	Y	802	3PE	C11-O13-P-O11
46	q	202	PC1	C1-O11-P-O13
53	M	501	CDL	CA3-OA5-PA1-OA2
53	X	201	CDL	CB3-OB5-PB2-OB2
45	L	703	3PE	C25-C26-C27-C28
45	Y	803	3PE	C2-C3-O31-C31
46	N	403	PC1	C37-C38-C39-C3A
46	H	401	PC1	C1-C2-C3-O31
53	H	404	CDL	CB3-CB4-CB6-OB8
53	q	203	CDL	CB3-CB4-CB6-OB8
45	H	403	3PE	O31-C31-C32-C33
45	L	701	3PE	C22-C21-O21-C2
46	B	202	PC1	C34-C35-C36-C37
45	d	201	3PE	C35-C36-C37-C38
49	F	501	NAI	PN-O3-PA-O2A
54	O	401	DGT	PG-O3B-PB-O2B
53	q	203	CDL	C52-C51-CB5-OB6
45	L	701	3PE	C2-C1-O11-P
53	d	202	CDL	C1-CA2-OA2-PA1
45	N	401	3PE	O21-C21-C22-C23
45	A	201	3PE	C2E-C2F-C2G-C2H
45	Y	801	3PE	C33-C34-C35-C36
45	P	403	3PE	C33-C34-C35-C36
45	L	701	3PE	O11-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
45	L	703	3PE	O13-C11-C12-N
53	H	404	CDL	OA5-CA3-CA4-OA6
46	B	202	PC1	C3B-C3C-C3D-C3E
45	A	201	3PE	C24-C25-C26-C27
46	H	401	PC1	C33-C34-C35-C36
46	h	202	PC1	C2B-C2C-C2D-C2E
45	H	403	3PE	O32-C31-C32-C33
45	Y	801	3PE	O21-C2-C3-O31
45	Y	803	3PE	O21-C2-C3-O31
46	B	202	PC1	C39-C3A-C3B-C3C
50	F	503	FMN	O2'-C2'-C3'-O3'
46	N	403	PC1	C22-C23-C24-C25
46	A	202	PC1	C35-C36-C37-C38
58	T	101	EHZ	C2-C3-C4-C5
53	H	404	CDL	C14-C15-C16-C17
53	X	201	CDL	C37-C38-C39-C40
45	L	704	3PE	C1-C2-C3-O31
45	M	502	3PE	C1-C2-C3-O31
53	L	702	CDL	CB2-C1-CA2-OA2
45	L	701	3PE	O22-C21-O21-C2
53	M	501	CDL	C77-C78-C79-C80
53	d	202	CDL	C71-C72-C73-C74
45	L	703	3PE	C3-C2-O21-C21
45	N	402	3PE	C1-C2-O21-C21
46	P	401	PC1	C3-C2-O21-C21
53	X	201	CDL	CB6-CB4-OB6-CB5
53	H	404	CDL	C33-C34-C35-C36
46	P	401	PC1	O11-C1-C2-O21
53	H	404	CDL	C15-C16-C17-C18
53	X	201	CDL	CB7-C71-C72-C73
53	d	202	CDL	C35-C36-C37-C38
53	X	201	CDL	C11-C12-C13-C14
45	D	901	3PE	C35-C36-C37-C38
45	D	901	3PE	C37-C38-C39-C3A
45	Y	802	3PE	C2A-C2B-C2C-C2D
46	A	202	PC1	C21-C22-C23-C24
59	i	201	CHD	C22-C23-C24-O25
46	M	503	PC1	C2B-C2C-C2D-C2E
59	i	201	CHD	C22-C23-C24-O26
46	q	201	PC1	C35-C36-C37-C38
50	F	503	FMN	C2'-C3'-C4'-C5'
46	H	405	PC1	C26-C27-C28-C29

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Mol	Chain	Res	Type	Atoms
46	q	202	PC1	C36-C37-C38-C39
45	L	704	3PE	O22-C21-C22-C23
45	P	403	3PE	O31-C31-C32-C33
45	A	201	3PE	C36-C37-C38-C39
45	d	201	3PE	C3A-C3B-C3C-C3D
45	L	703	3PE	C27-C28-C29-C2A
46	M	503	PC1	C29-C2A-C2B-C2C
53	M	501	CDL	C51-C52-C53-C54
46	M	503	PC1	C27-C28-C29-C2A
45	m	201	3PE	O21-C21-C22-C23
46	P	401	PC1	C25-C26-C27-C28
52	H	402	LMT	O1'-C1-C2-C3
45	D	901	3PE	C3A-C3B-C3C-C3D
45	P	403	3PE	C34-C35-C36-C37
53	M	501	CDL	C33-C34-C35-C36
46	H	405	PC1	O11-C1-C2-C3
53	q	203	CDL	OB5-CB3-CB4-CB6
58	T	101	EHZ	O4-C15-C16-O5
45	A	201	3PE	C2D-C2E-C2F-C2G
46	A	202	PC1	C33-C34-C35-C36
45	A	201	3PE	C2-C1-O11-P
45	L	701	3PE	O21-C21-C22-C23
45	d	201	3PE	O31-C31-C32-C33
58	T	101	EHZ	C2-C1-C21-C22
45	L	703	3PE	C23-C24-C25-C26
53	d	202	CDL	C32-C33-C34-C35
58	T	101	EHZ	C5-C6-C7-O1
45	m	201	3PE	C28-C29-C2A-C2B
53	H	404	CDL	CA2-OA2-PA1-OA5
45	D	901	3PE	C38-C39-C3A-C3B
46	I	201	PC1	C32-C33-C34-C35
45	Y	801	3PE	O21-C21-C22-C23
46	N	403	PC1	O31-C31-C32-C33
45	A	201	3PE	C2B-C2C-C2D-C2E
45	m	201	3PE	C27-C28-C29-C2A
53	L	702	CDL	C55-C56-C57-C58
58	T	101	EHZ	C8-C9-S1-C10
45	H	403	3PE	O21-C21-C22-C23
46	q	201	PC1	O21-C21-C22-C23
53	L	702	CDL	C12-C11-CA5-OA6
45	H	403	3PE	C2A-C2B-C2C-C2D
45	N	401	3PE	C36-C37-C38-C39

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Mol	Chain	Res	Type	Atoms
58	T	101	EHZ	C10-C11-N1-C12
45	d	201	3PE	C3B-C3C-C3D-C3E
53	H	404	CDL	C52-C51-CB5-OB6
53	h	201	CDL	C71-C72-C73-C74
45	I	204	3PE	C23-C24-C25-C26
46	h	202	PC1	C2C-C2D-C2E-C2F
45	H	403	3PE	C1-C2-C3-O31
45	I	204	3PE	C1-C2-C3-O31
45	Y	801	3PE	C1-C2-C3-O31
46	I	201	PC1	O11-C1-C2-O21
45	N	401	3PE	O31-C31-C32-C33
46	q	202	PC1	O32-C31-C32-C33
45	D	901	3PE	C33-C34-C35-C36
46	q	202	PC1	C29-C2A-C2B-C2C
46	M	503	PC1	C2D-C2E-C2F-C2G
45	m	201	3PE	C26-C27-C28-C29
46	h	202	PC1	C31-C32-C33-C34
53	L	702	CDL	O1-C1-CA2-OA2
58	T	101	EHZ	O1-C7-C8-C9
45	L	704	3PE	O31-C31-C32-C33
53	L	702	CDL	OA5-CA3-CA4-CA6
45	D	901	3PE	O31-C31-C32-C33
46	A	202	PC1	O31-C31-C32-C33
45	L	704	3PE	C33-C34-C35-C36
53	X	201	CDL	C24-C25-C26-C27
45	A	201	3PE	O31-C31-C32-C33
45	L	701	3PE	O31-C31-C32-C33
46	H	401	PC1	O31-C31-C32-C33
54	O	401	DGT	C5'-O5'-PA-O3A
45	L	704	3PE	C37-C38-C39-C3A
50	F	503	FMN	O3'-C3'-C4'-O4'
46	N	403	PC1	O21-C21-C22-C23
53	X	201	CDL	O1-C1-CA2-OA2
56	P	402	NDP	O4B-C4B-C5B-O5B
49	F	501	NAI	PN-O3-PA-O1A
54	O	401	DGT	PA-O3A-PB-O1B
45	H	403	3PE	O22-C21-C22-C23
53	L	702	CDL	C12-C11-CA5-OA7
46	B	202	PC1	C28-C29-C2A-C2B
45	L	701	3PE	O22-C21-C22-C23
46	q	201	PC1	O22-C21-C22-C23
45	I	204	3PE	C32-C33-C34-C35

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Mol	Chain	Res	Type	Atoms
45	L	703	3PE	C26-C27-C28-C29
45	Y	803	3PE	C32-C31-O31-C3
46	A	202	PC1	O32-C31-C32-C33
46	N	403	PC1	O32-C31-C32-C33
45	L	704	3PE	O32-C31-C32-C33
45	m	201	3PE	O31-C31-C32-C33
46	B	202	PC1	O31-C31-C32-C33
46	M	503	PC1	C11-O13-P-O11
53	H	404	CDL	C52-C51-CB5-OB7
45	D	901	3PE	O32-C31-C32-C33
45	A	201	3PE	C1-O11-P-O14
45	H	403	3PE	C1-O11-P-O14
45	L	701	3PE	C1-O11-P-O14
45	P	403	3PE	C11-O13-P-O14
46	q	202	PC1	C1-O11-P-O14
53	X	201	CDL	CB3-OB5-PB2-OB3
45	L	703	3PE	C34-C35-C36-C37
45	N	401	3PE	O32-C31-C32-C33
45	K	101	3PE	C26-C27-C28-C29
46	h	202	PC1	O31-C31-C32-C33
53	L	702	CDL	C52-C51-CB5-OB6
45	H	403	3PE	C2D-C2E-C2F-C2G
53	d	202	CDL	C43-C44-C45-C46
45	A	201	3PE	O32-C31-C32-C33
45	Y	801	3PE	O22-C21-C22-C23
45	N	402	3PE	C3-C2-O21-C21
45	P	403	3PE	C12-C11-O13-P
46	I	201	PC1	C12-C11-O13-P
46	q	201	PC1	C12-C11-O13-P
45	P	403	3PE	O22-C21-C22-C23
46	M	503	PC1	C23-C24-C25-C26
53	h	201	CDL	C54-C55-C56-C57
46	H	405	PC1	O21-C21-C22-C23
52	H	402	LMT	C11-C10-C9-C8
45	Y	803	3PE	O32-C31-O31-C3
45	Y	803	3PE	O21-C21-C22-C23
46	H	401	PC1	O32-C31-C32-C33
54	O	401	DGT	PG-O3B-PB-O3A
45	I	204	3PE	O21-C21-C22-C23
46	h	202	PC1	O21-C21-C22-C23
53	M	501	CDL	C52-C51-CB5-OB6
45	L	701	3PE	O32-C31-C32-C33

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Mol	Chain	Res	Type	Atoms
45	m	201	3PE	O32-C31-C32-C33
46	B	202	PC1	O32-C31-C32-C33
45	K	101	3PE	O31-C31-C32-C33
53	d	202	CDL	C52-C51-CB5-OB6
45	Y	803	3PE	O22-C21-C22-C23
46	N	403	PC1	O22-C21-C22-C23
45	I	204	3PE	O22-C21-C22-C23
46	H	405	PC1	O22-C21-C22-C23
46	B	202	PC1	C35-C36-C37-C38
53	X	201	CDL	C12-C11-CA5-OA6
53	X	201	CDL	C35-C36-C37-C38
46	h	202	PC1	O32-C31-C32-C33

There are no ring outliers.

27 monomers are involved in 60 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
54	O	401	DGT	1	0
46	H	405	PC1	1	0
45	M	502	3PE	1	0
53	M	501	CDL	3	0
46	H	401	PC1	3	0
45	P	403	3PE	6	0
45	Y	801	3PE	2	0
58	U	101	EHZ	1	0
45	Y	803	3PE	2	0
53	X	201	CDL	1	0
46	P	401	PC1	2	0
45	L	703	3PE	1	0
46	I	201	PC1	2	0
50	F	503	FMN	2	0
46	N	403	PC1	3	0
53	H	404	CDL	1	0
59	i	201	CHD	1	0
45	d	201	3PE	1	0
45	Y	802	3PE	2	0
53	d	202	CDL	3	0
53	q	203	CDL	7	0
45	H	403	3PE	4	0
46	A	202	PC1	2	0
53	h	201	CDL	2	0
52	H	402	LMT	3	0

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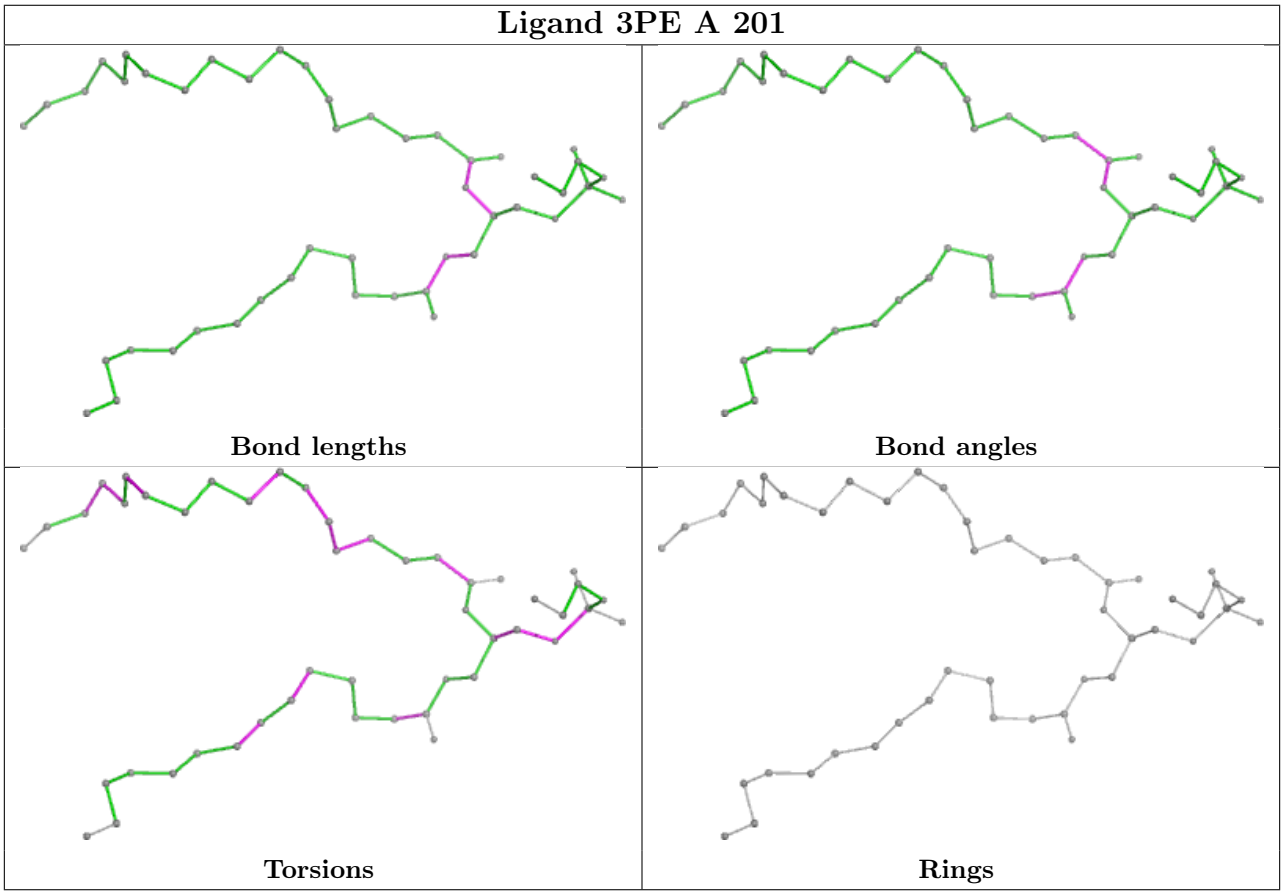
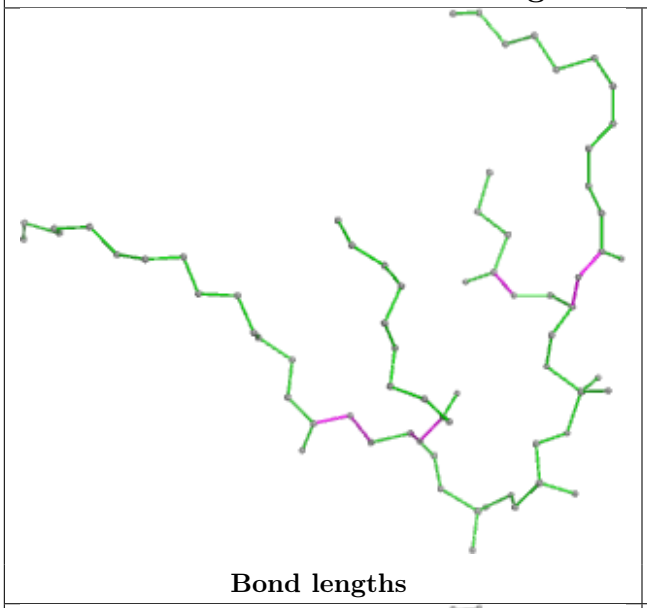
Mol	Chain	Res	Type	Clashes	Symm-Clashes
56	P	402	NDP	1	0
49	F	501	NAI	2	0

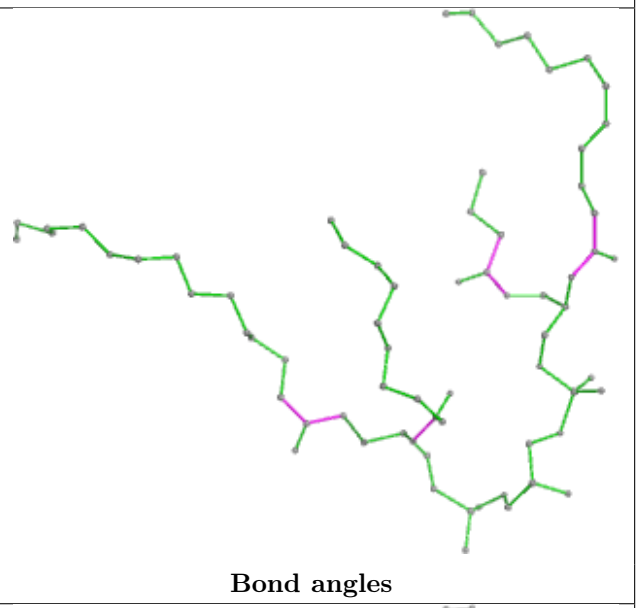
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



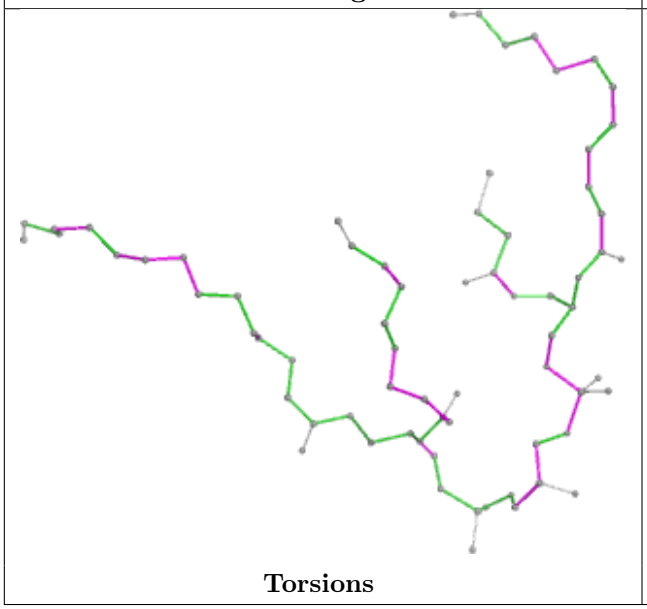
Ligand CDL L 702



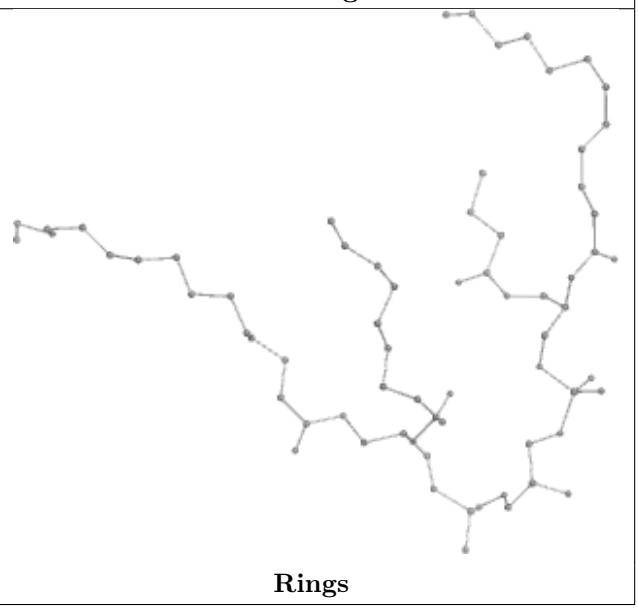
Bond lengths



Bond angles

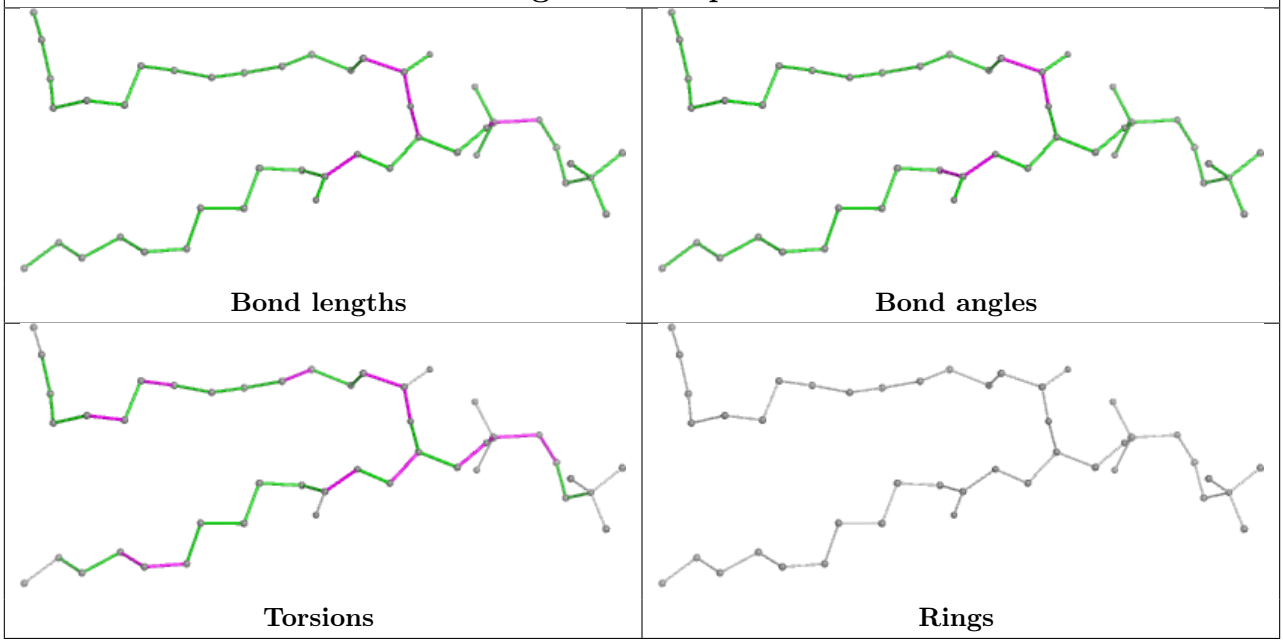


Torsions

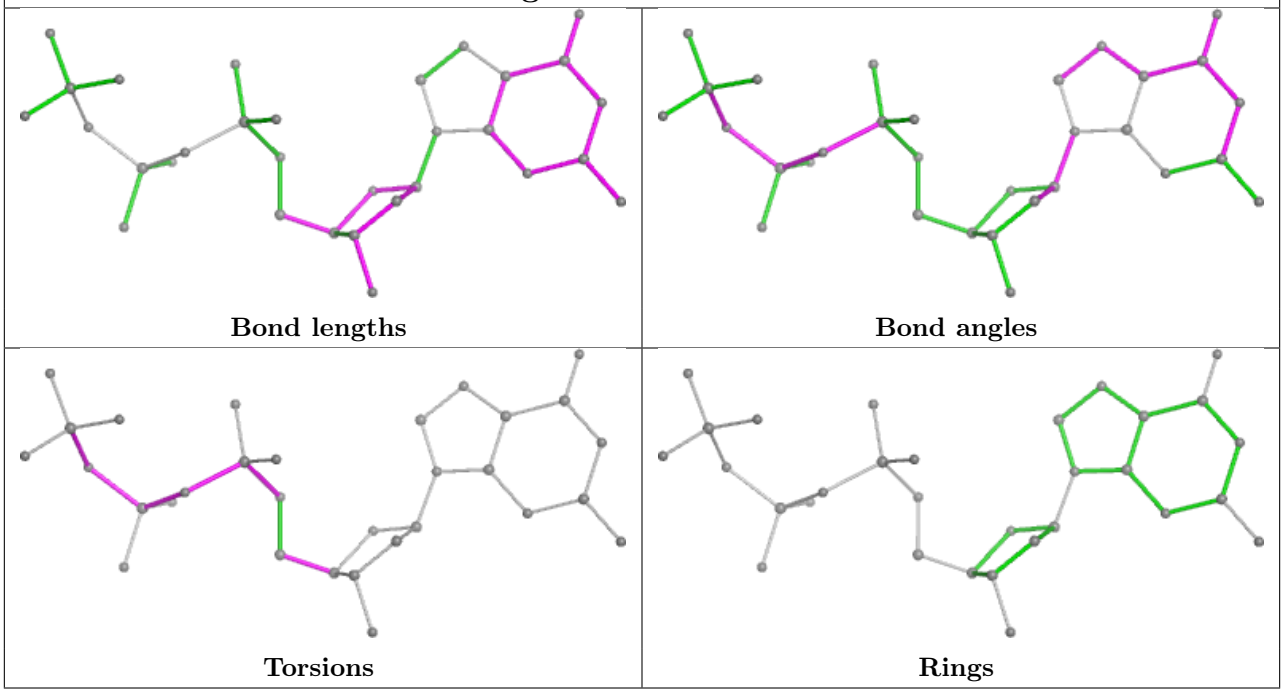


Rings

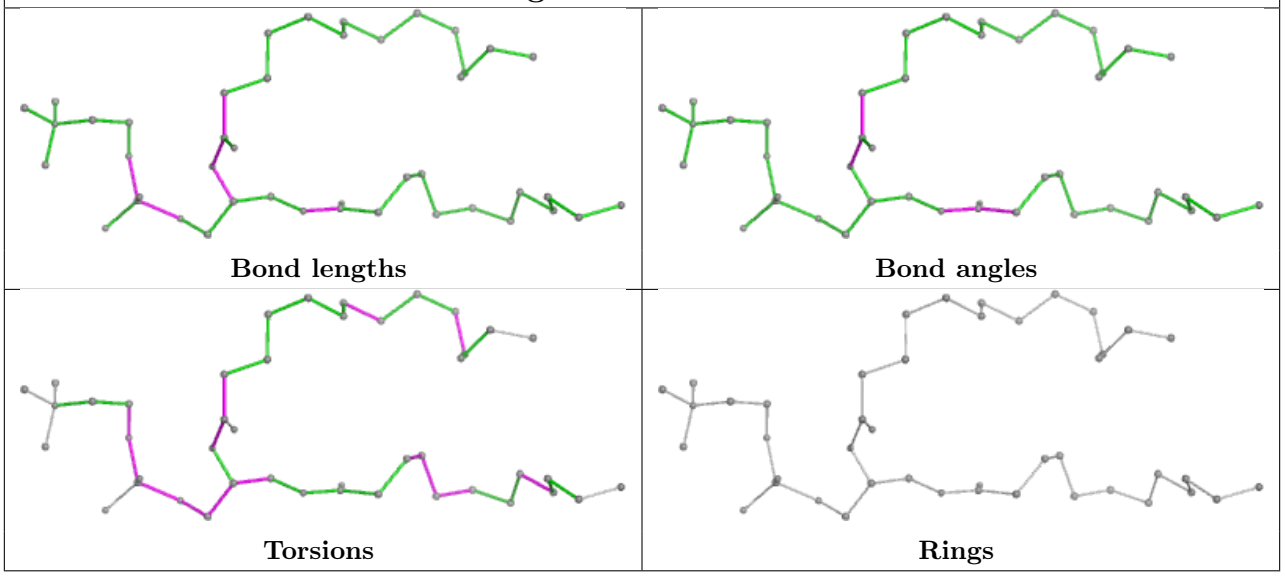
Ligand PC1 q 201



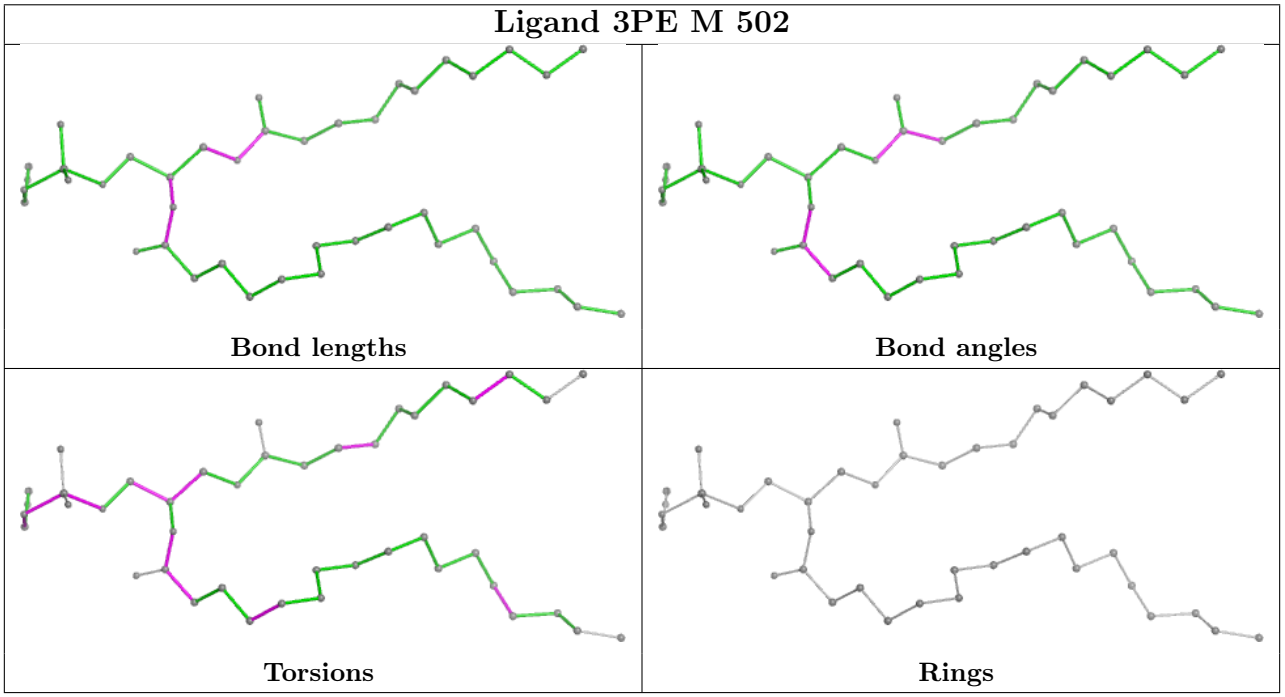
Ligand DGT O 401



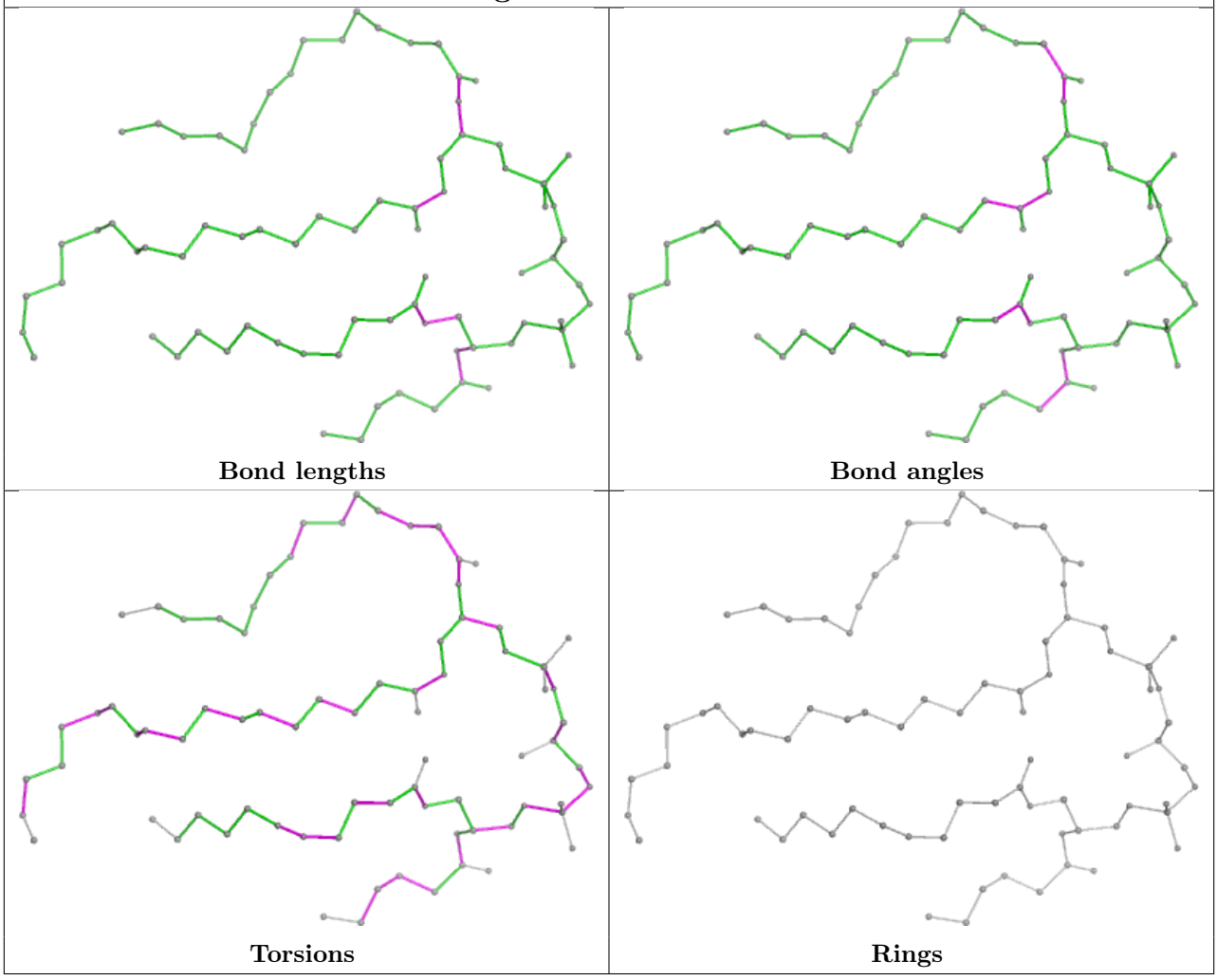
Ligand PC1 H 405



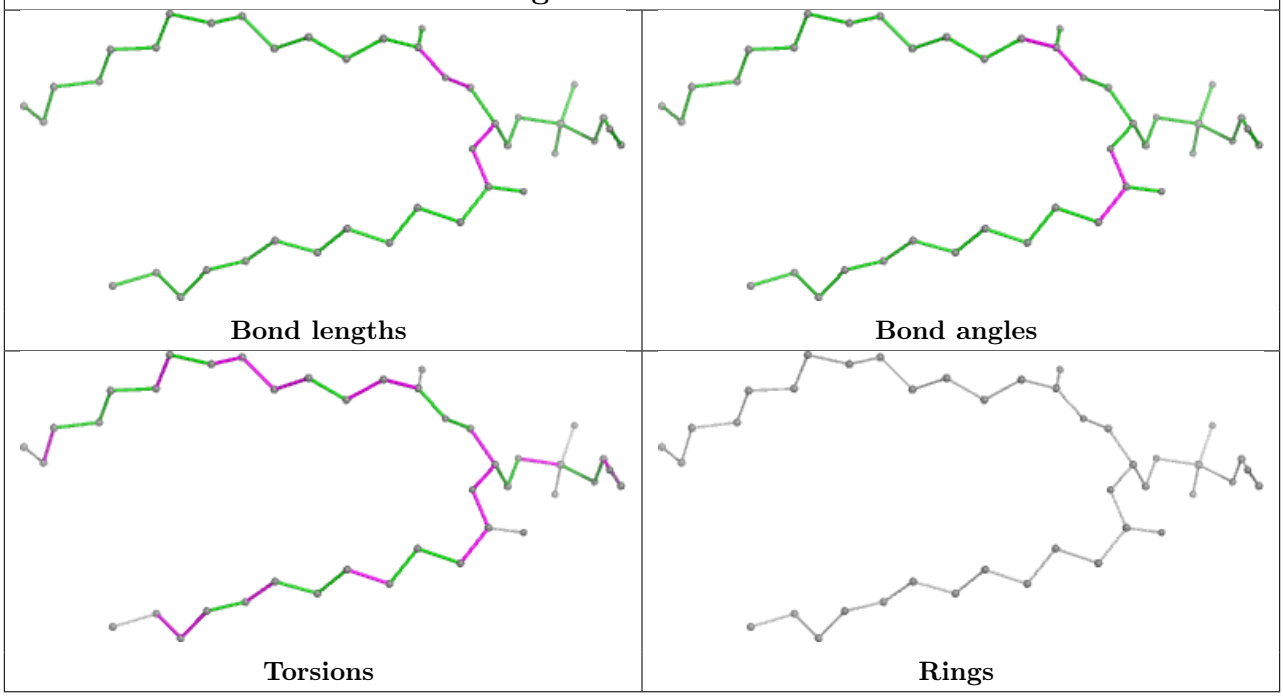
Ligand 3PE M 502



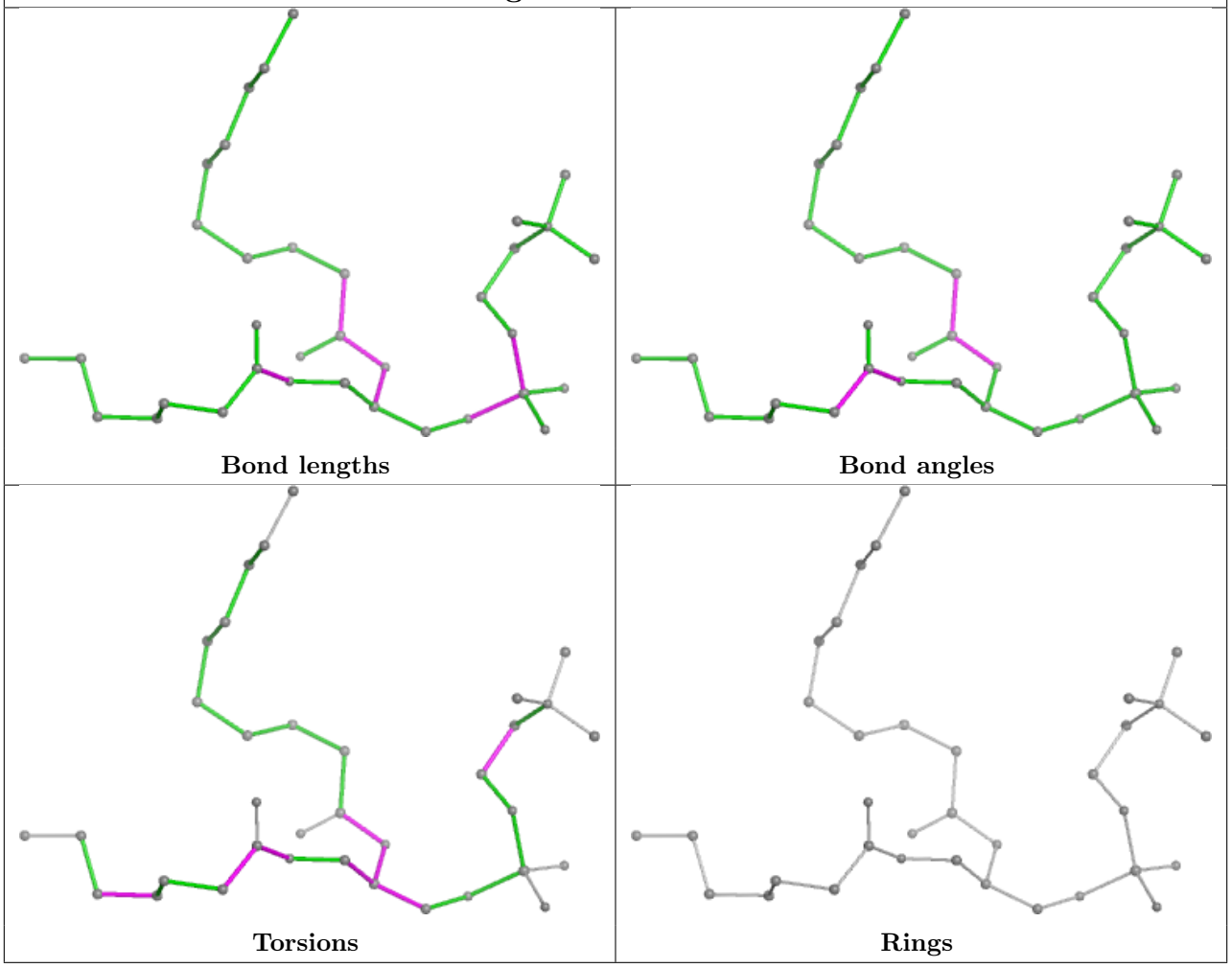
Ligand CDL M 501



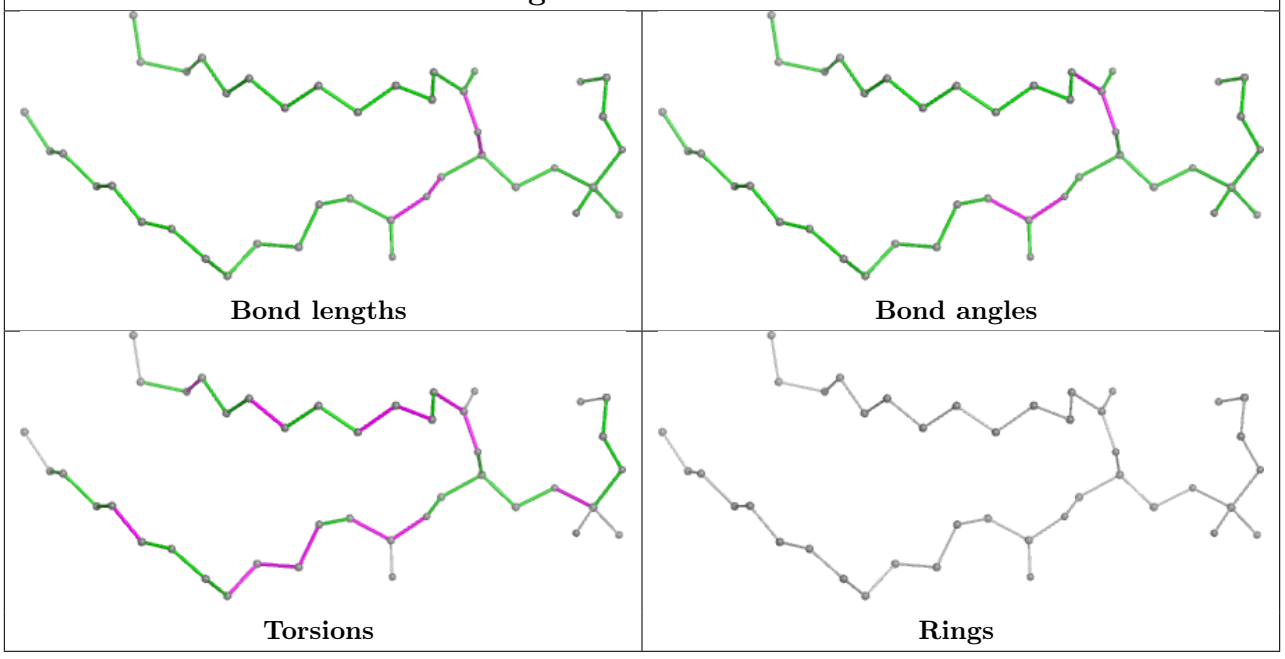
Ligand 3PE L 704



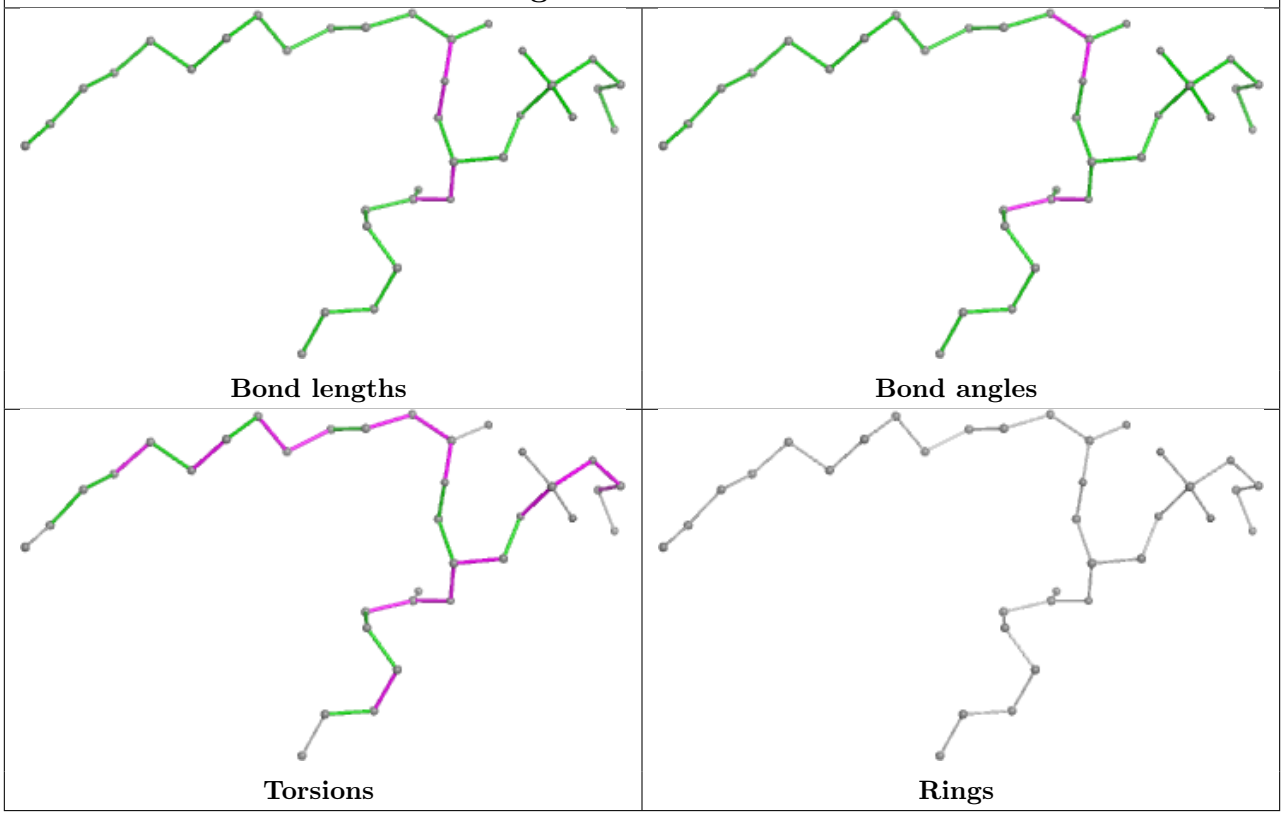
Ligand PC1 H 401



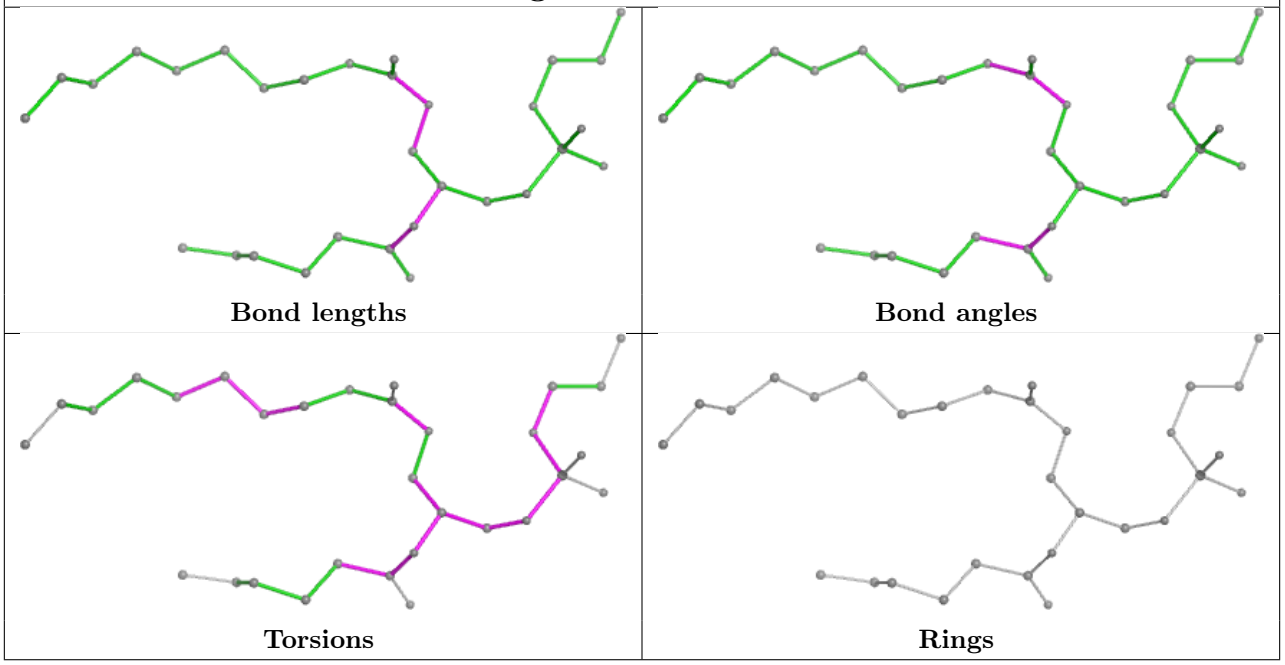
Ligand 3PE K 101



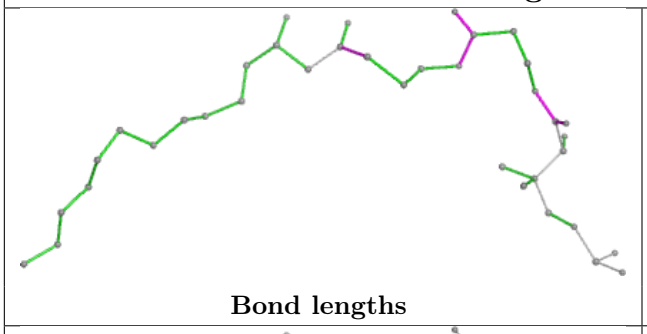
Ligand 3PE P 403



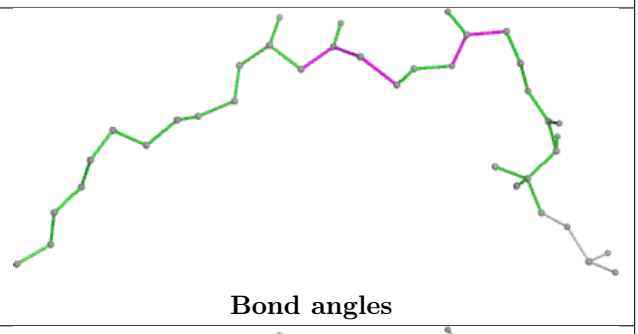
Ligand 3PE Y 801



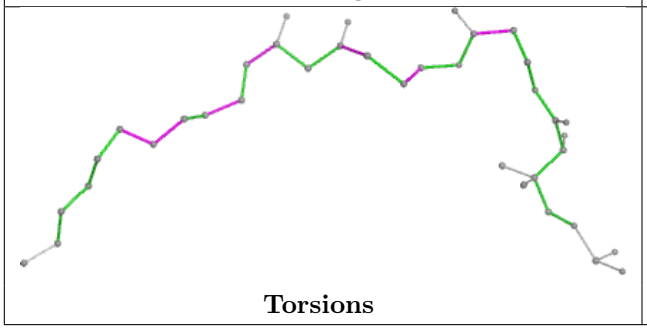
Ligand EHZ U 101



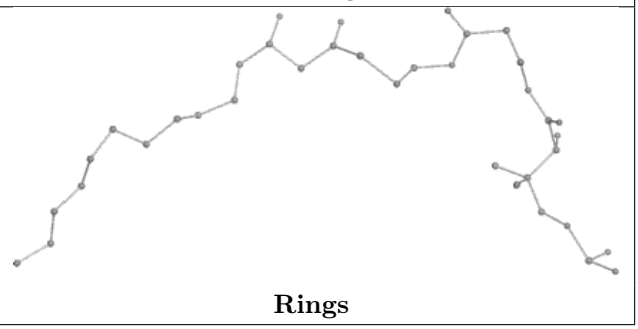
Bond lengths



Bond angles

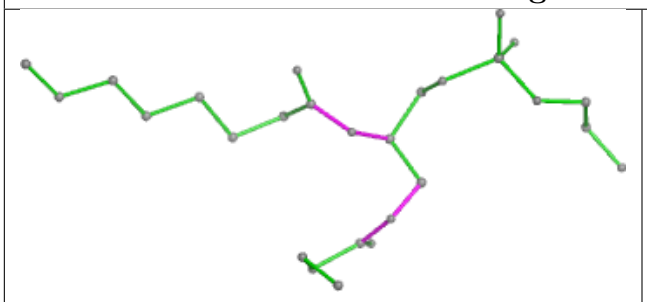


Torsions

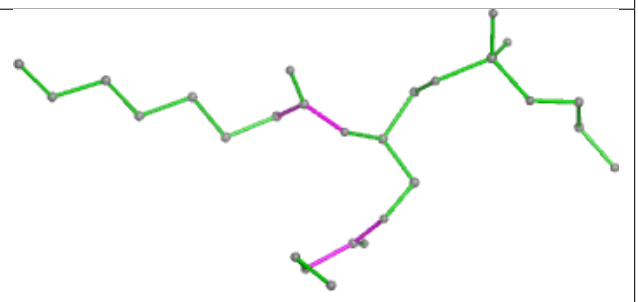


Rings

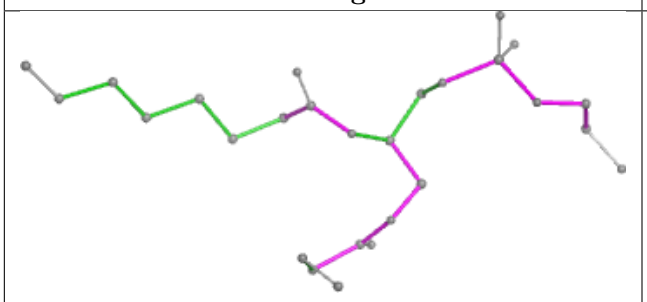
Ligand 3PE Y 803



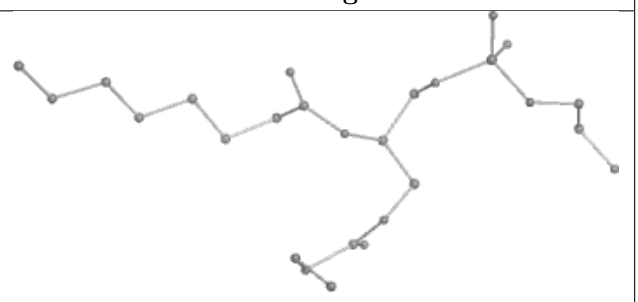
Bond lengths



Bond angles

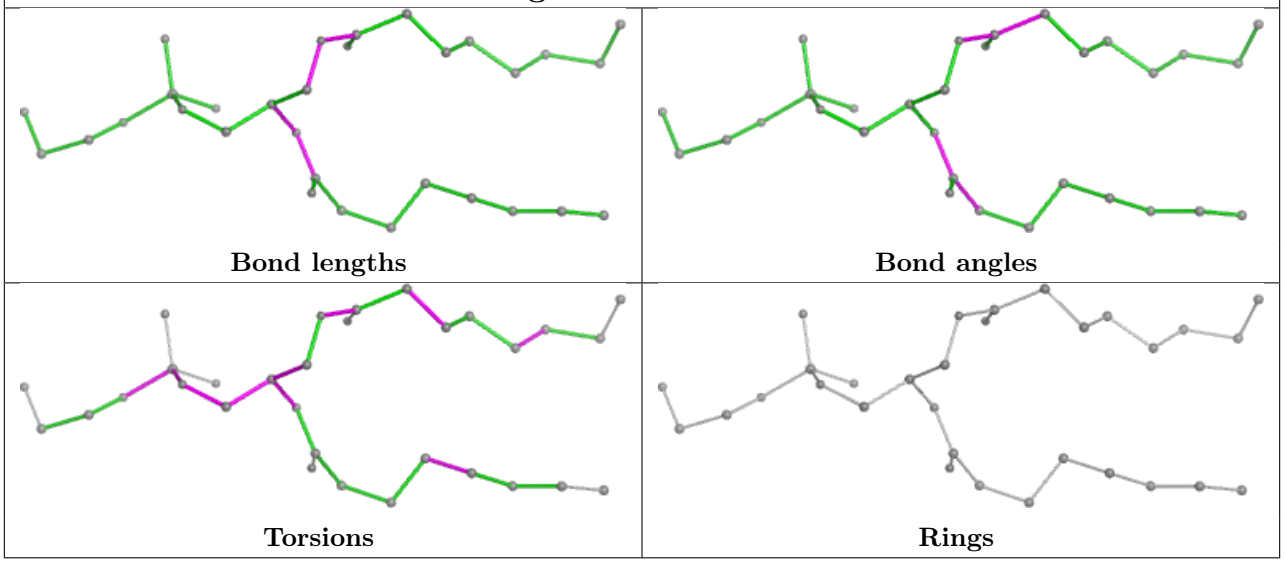


Torsions

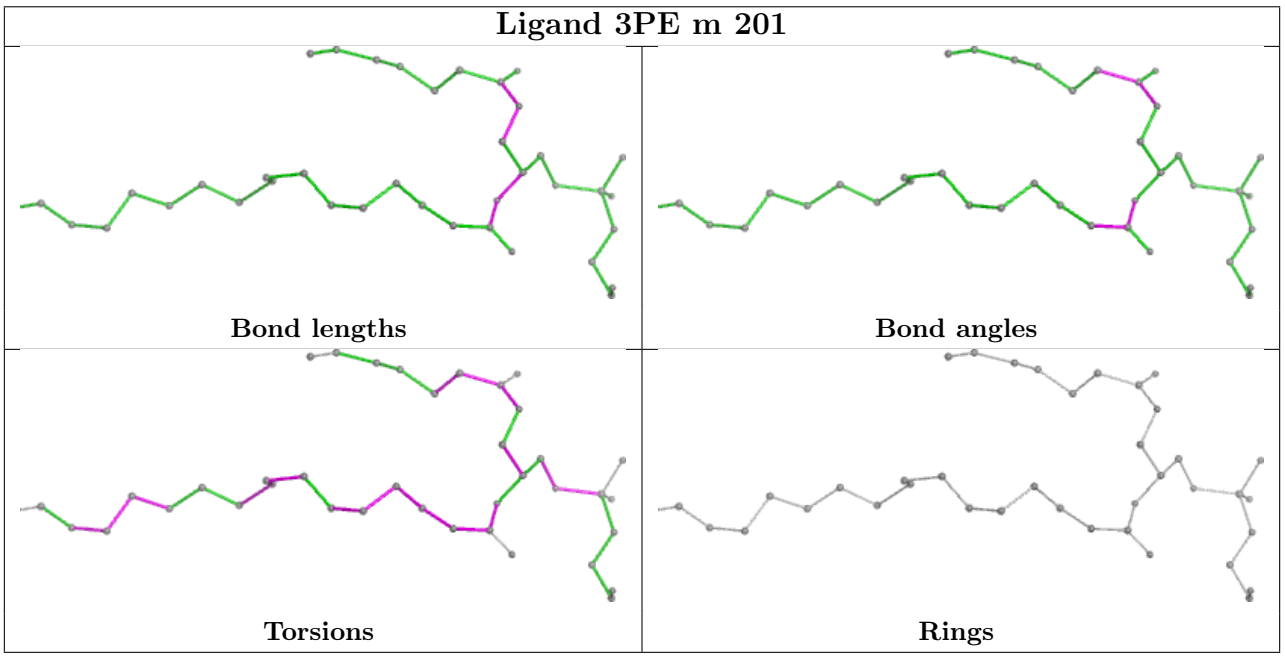


Rings

Ligand 3PE N 402



Ligand 3PE m 201



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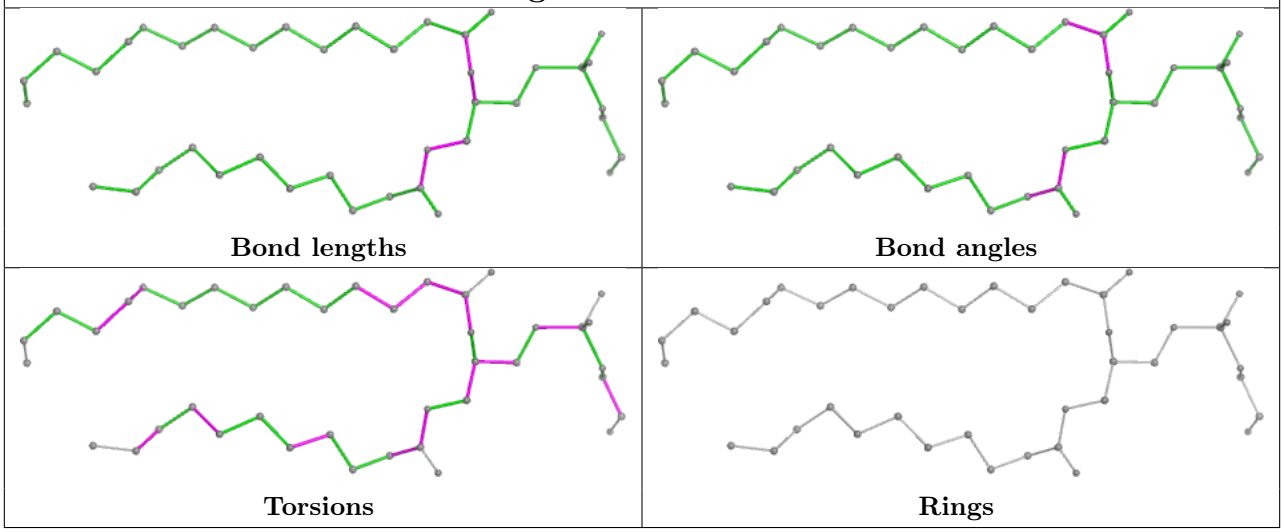
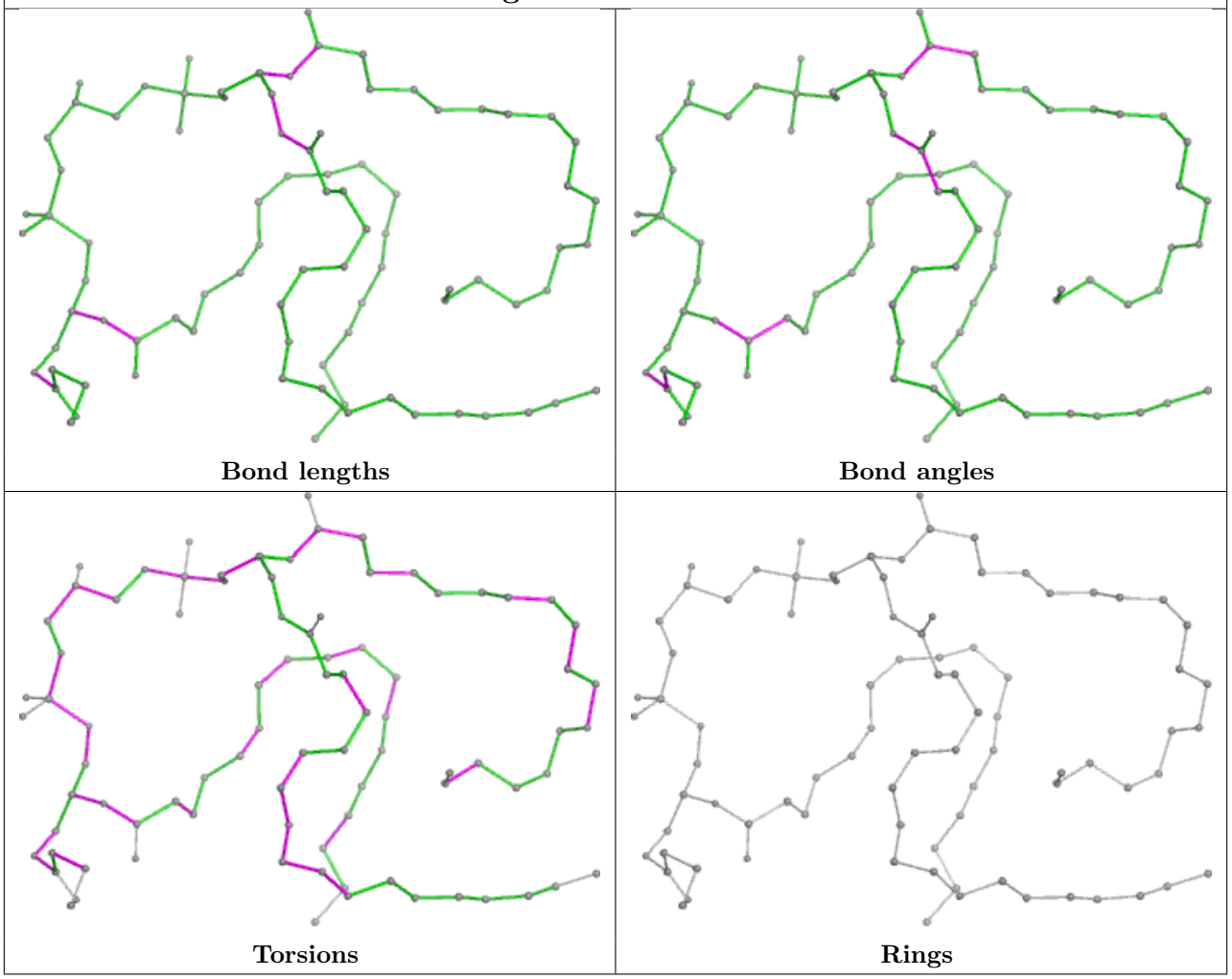
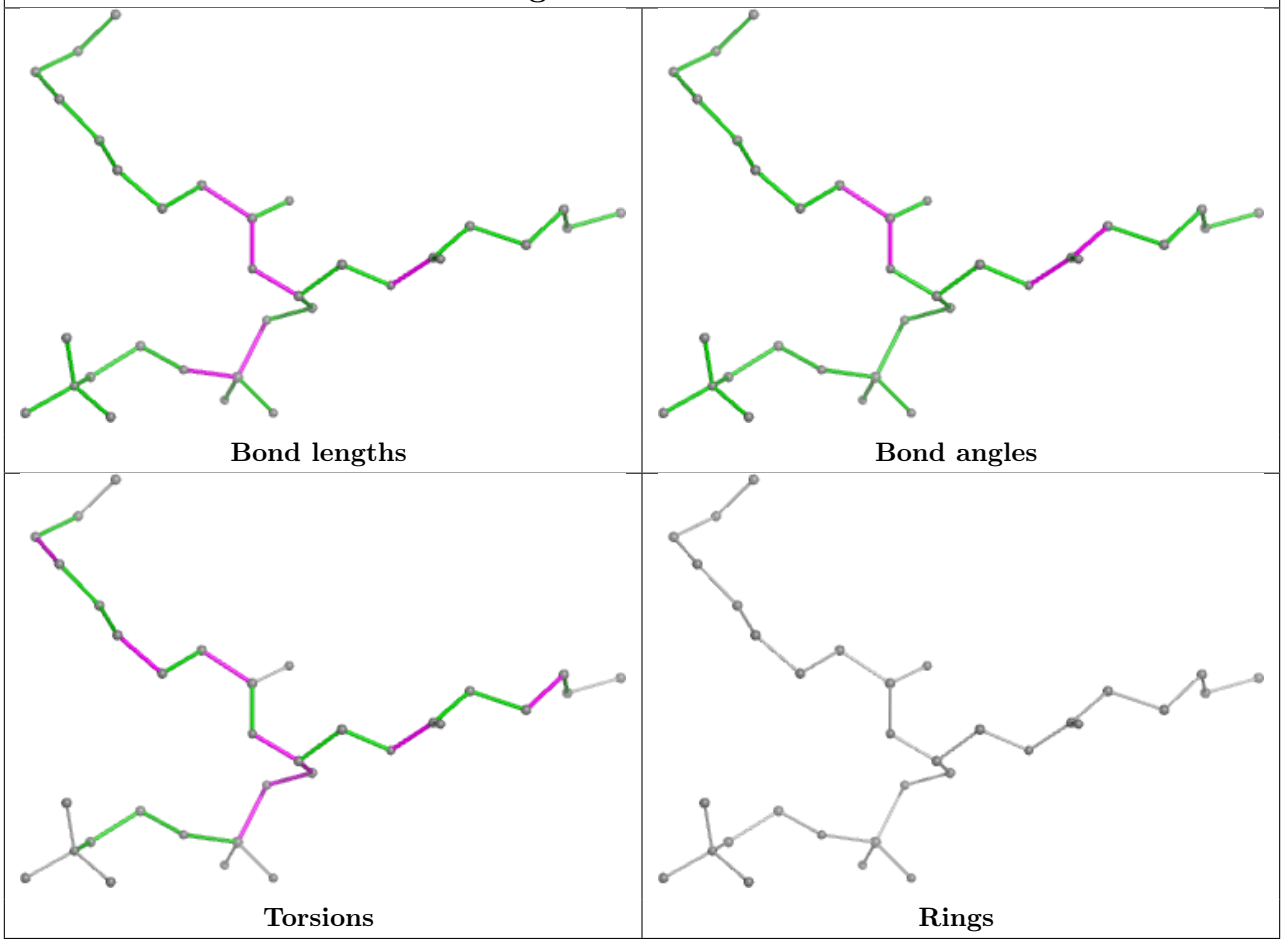


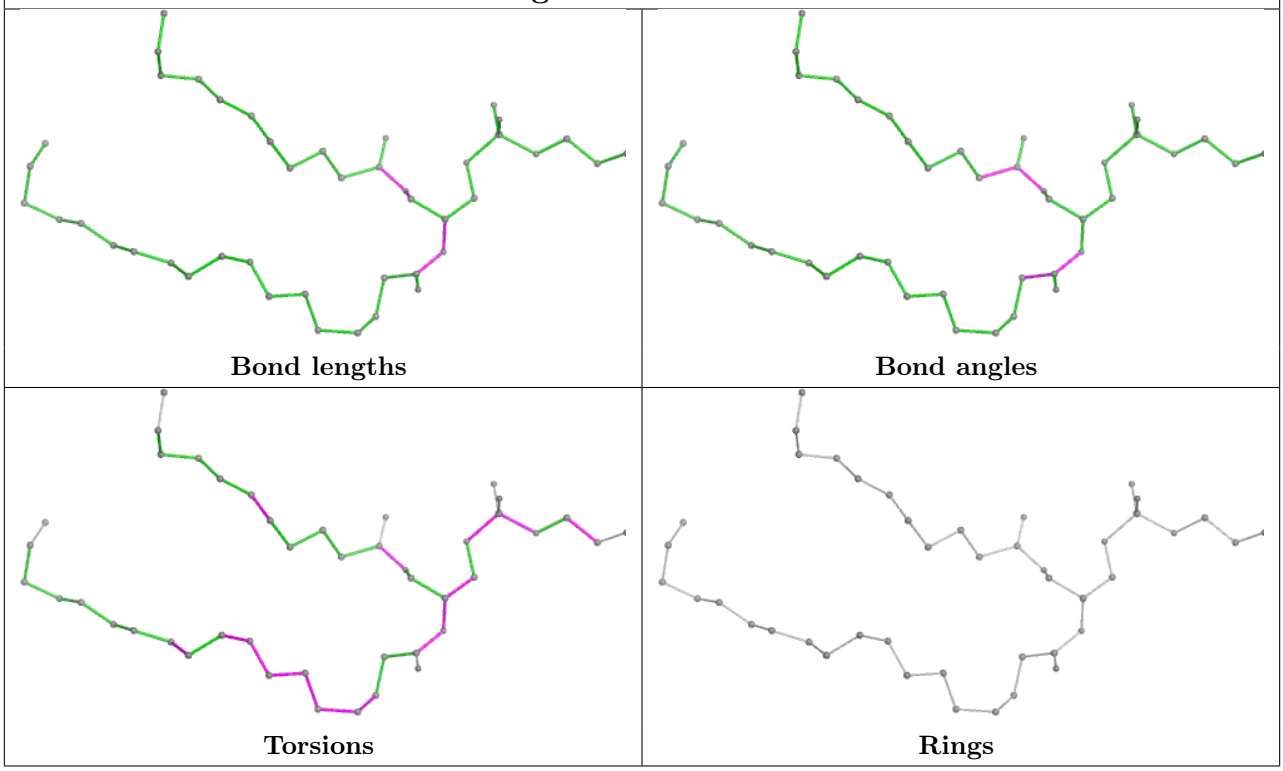
Ligand CDL X 201



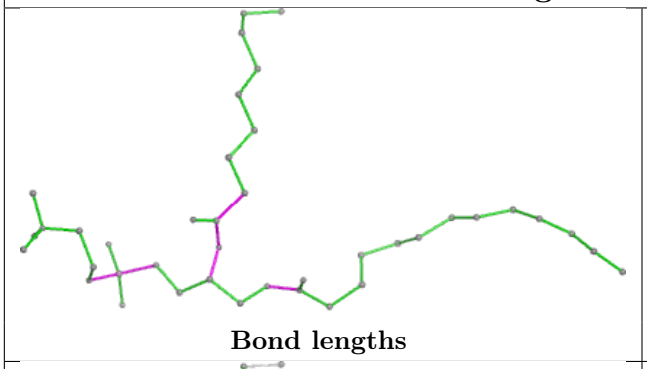
Ligand PC1 P 401



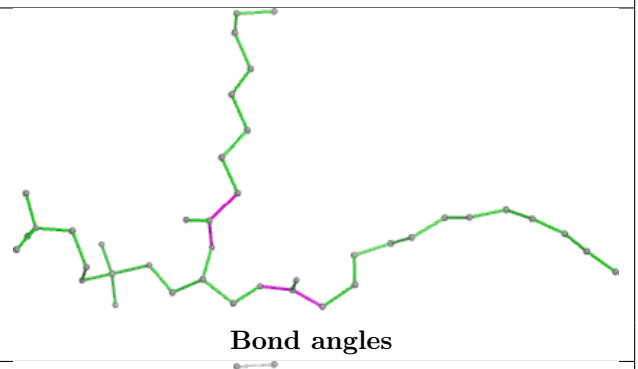
Ligand 3PE L 703



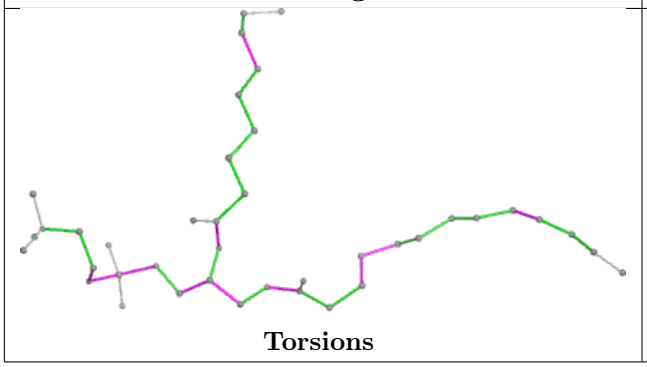
Ligand PC1 I 201



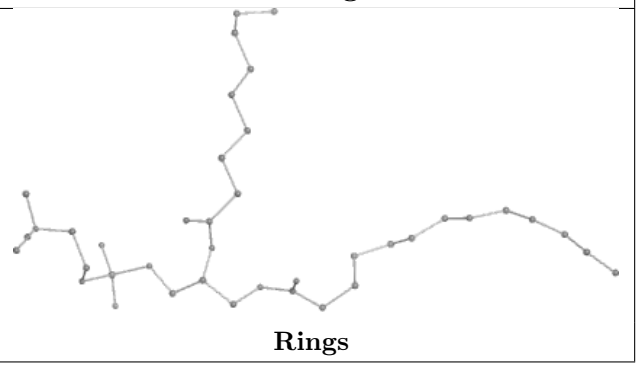
Bond lengths



Bond angles

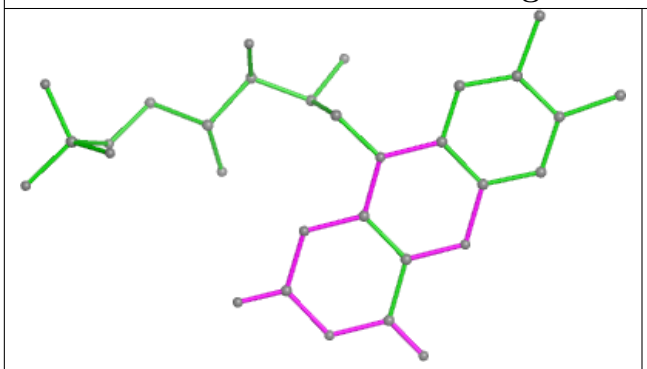


Torsions

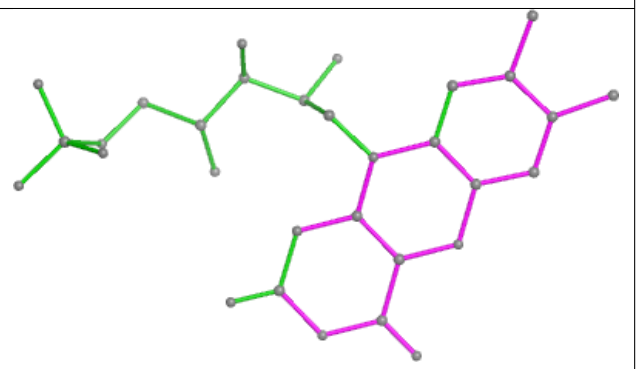


Rings

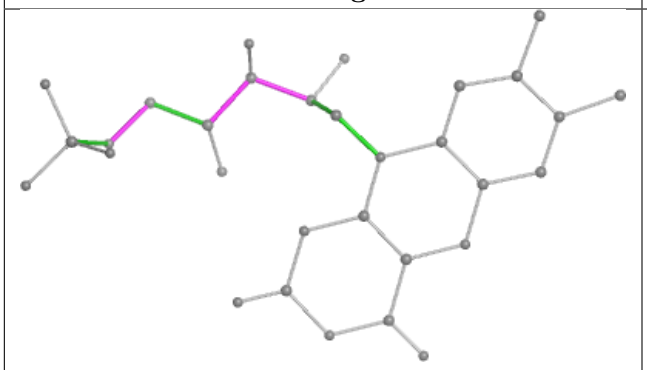
Ligand FMN F 503



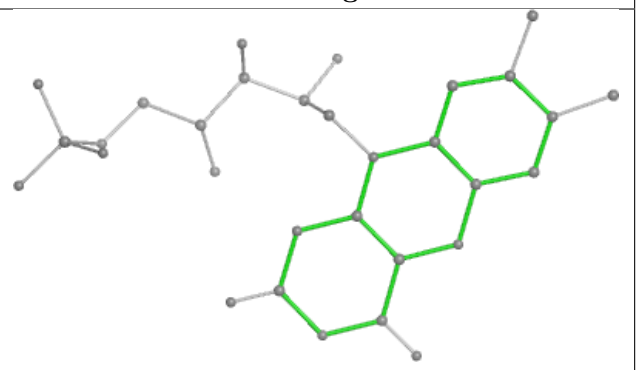
Bond lengths



Bond angles

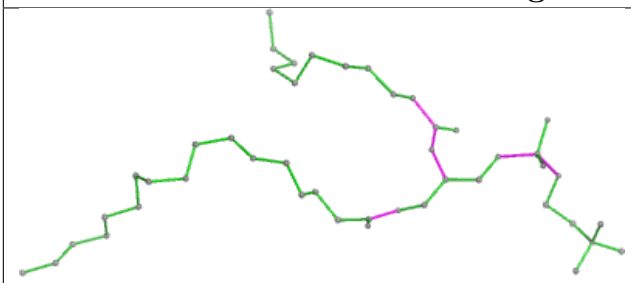


Torsions

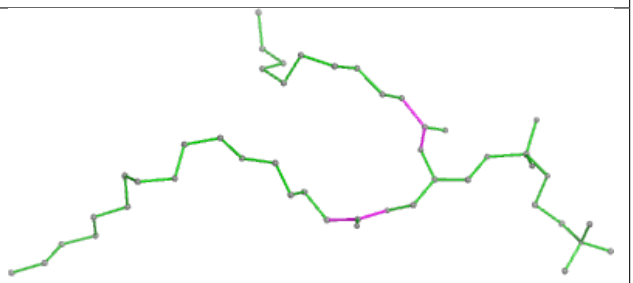


Rings

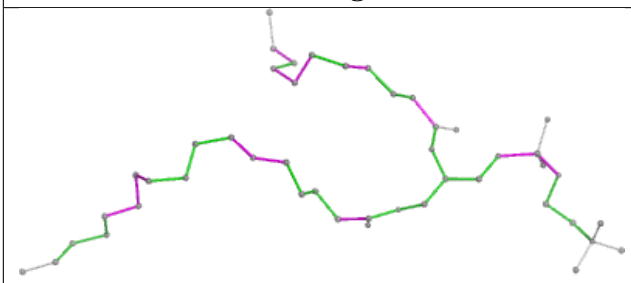
Ligand PC1 B 202



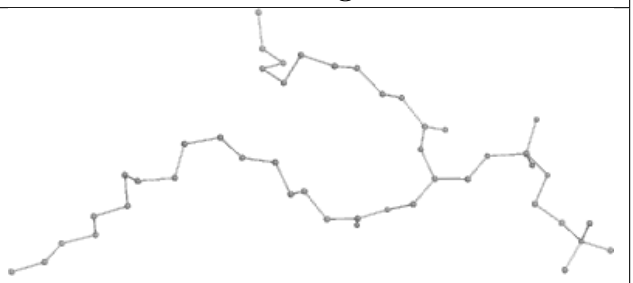
Bond lengths



Bond angles

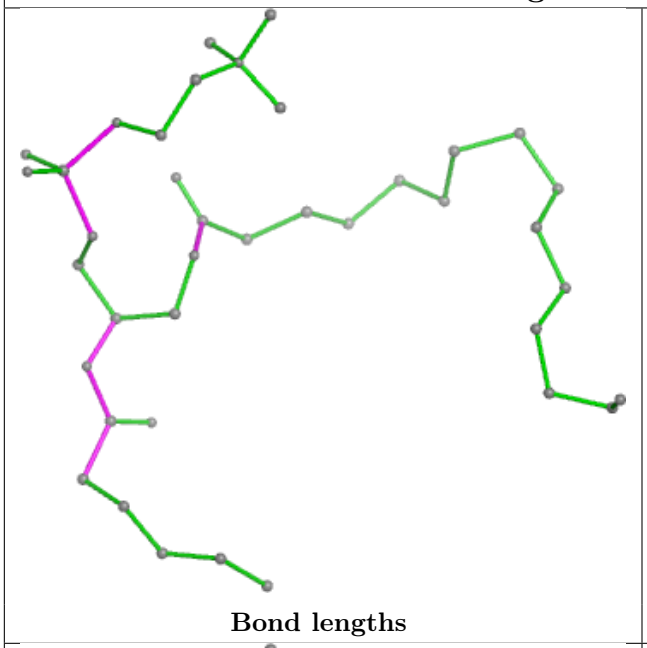


Torsions

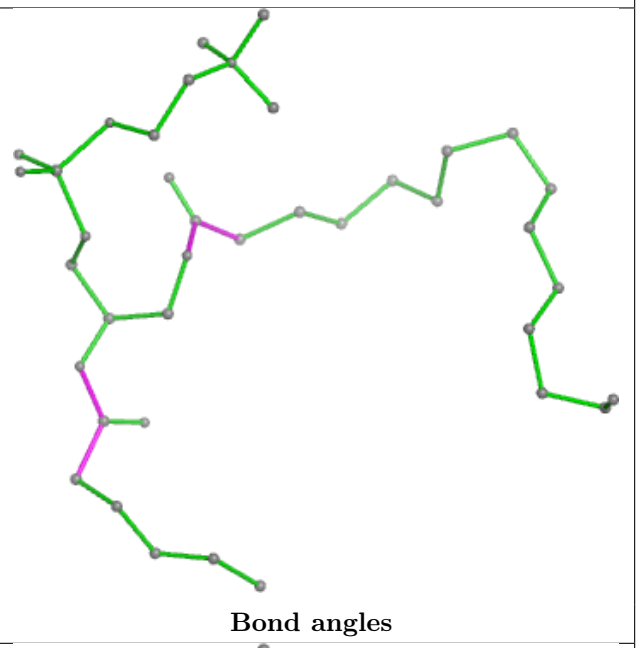


Rings

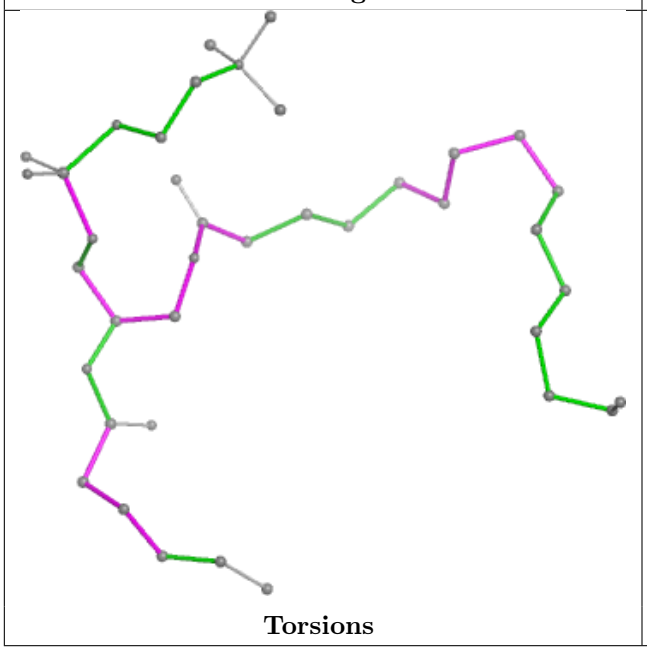
Ligand PC1 N 403



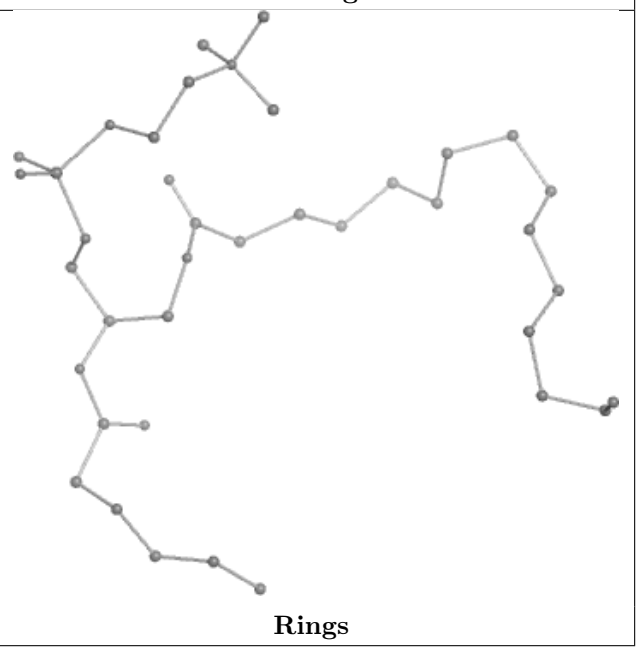
Bond lengths



Bond angles

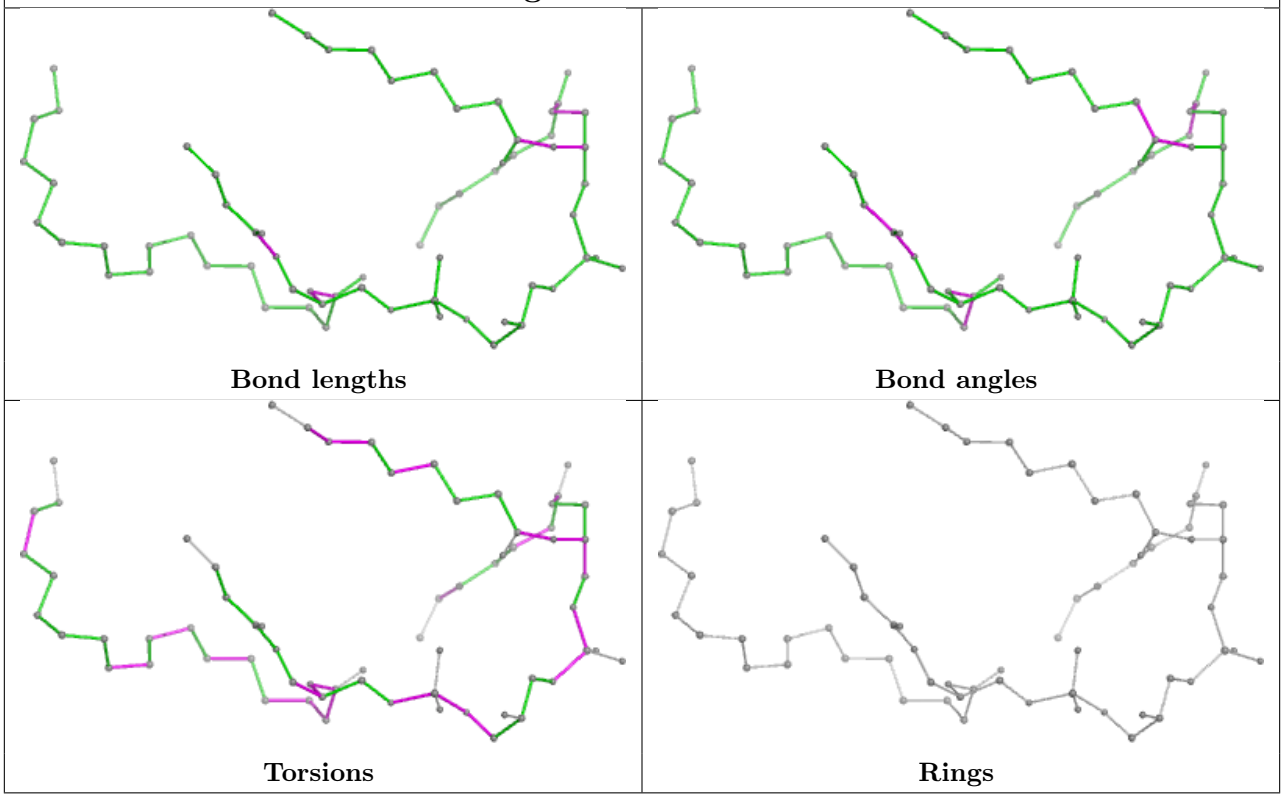


Torsions

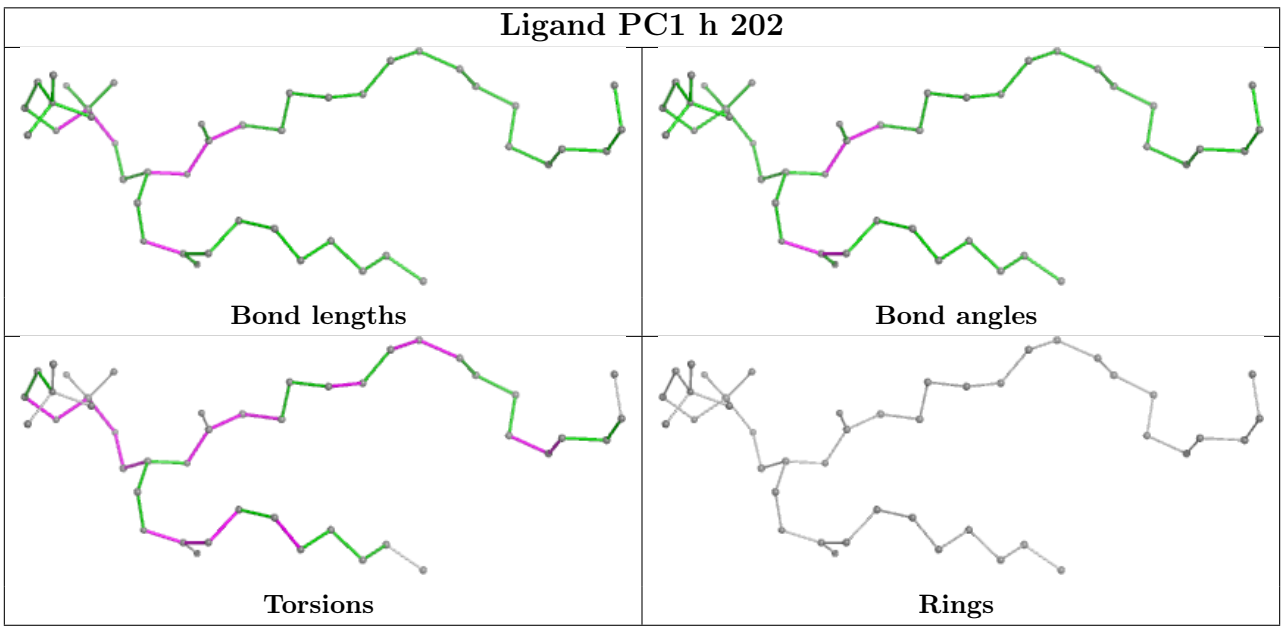


Rings

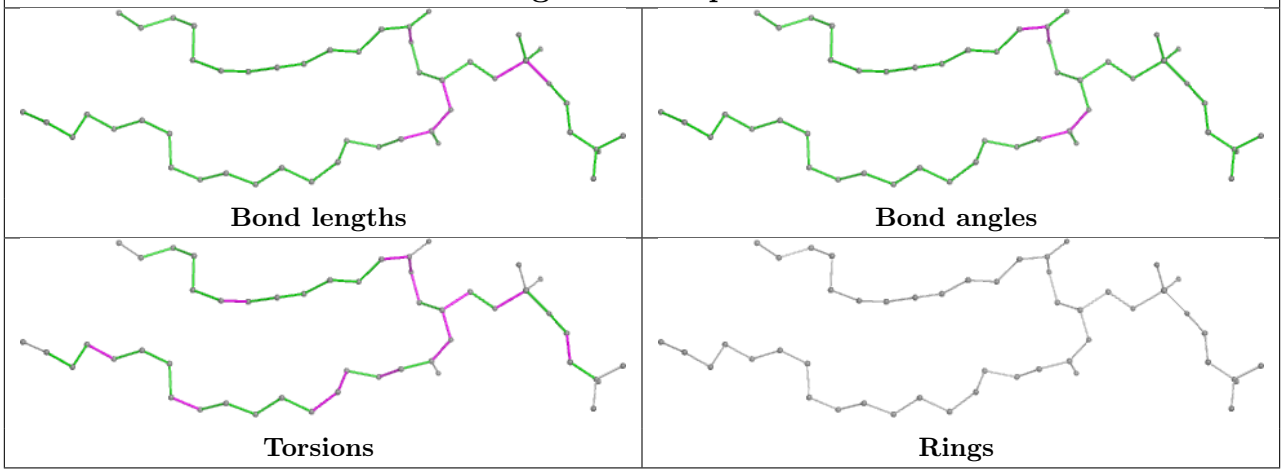
Ligand CDL H 404



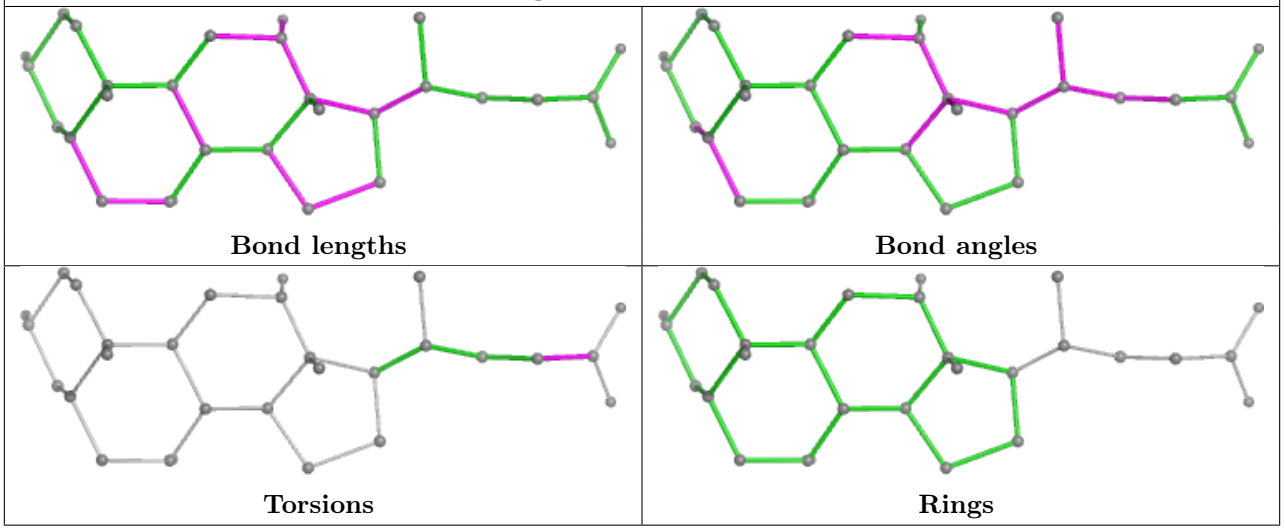
Ligand PC1 h 202



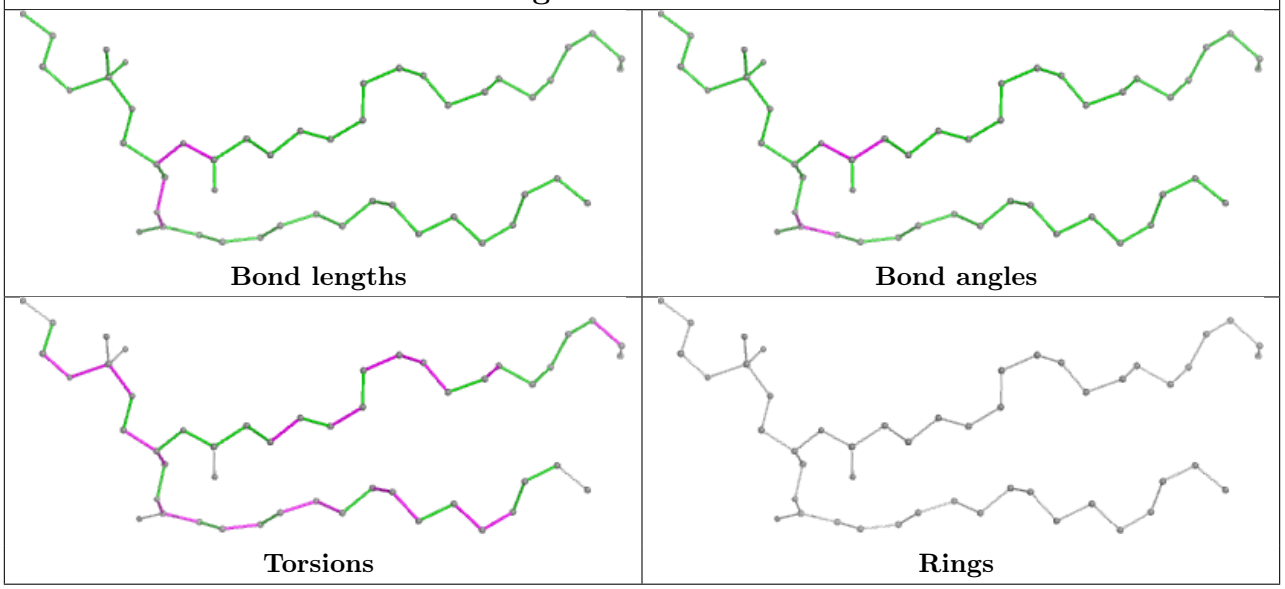
Ligand PC1 q 202



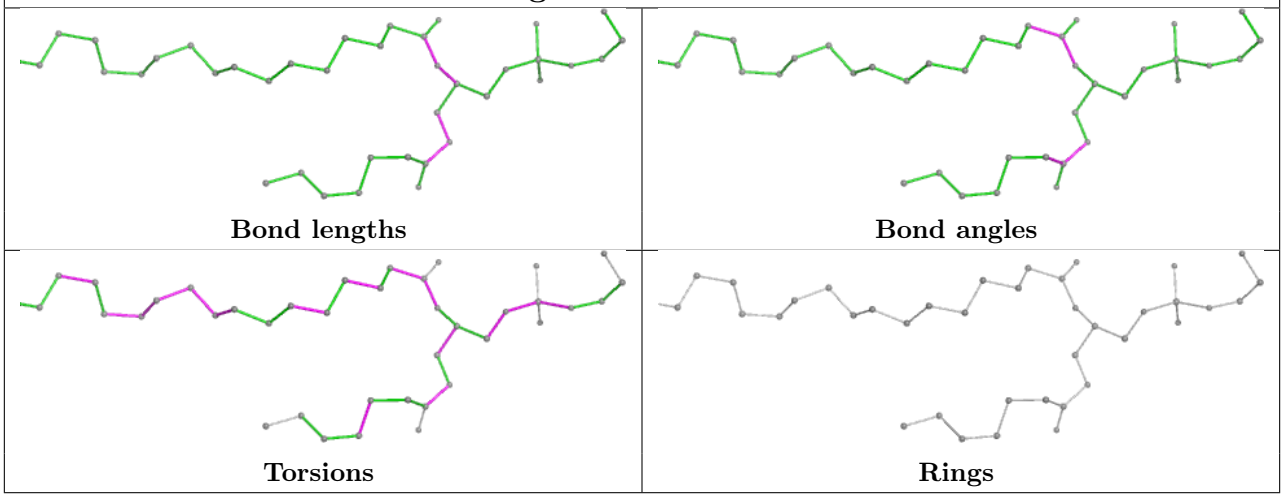
Ligand CHD i 201



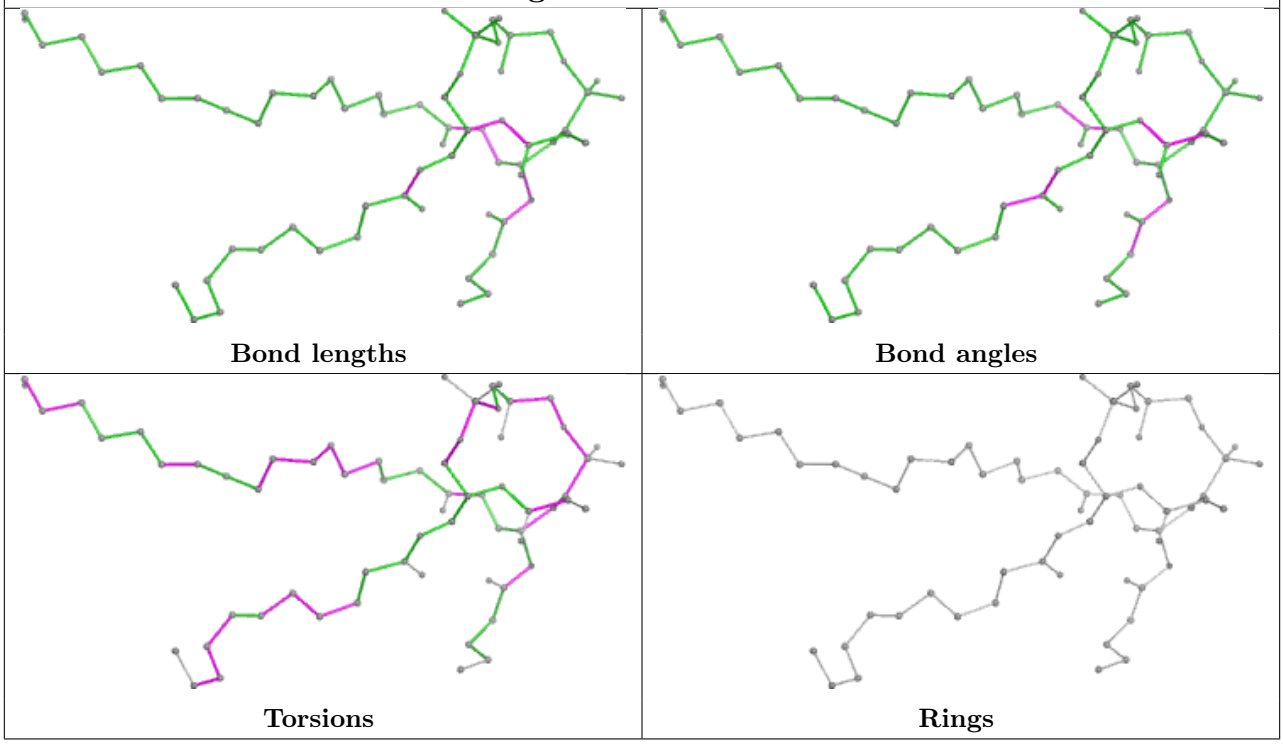
Ligand 3PE d 201



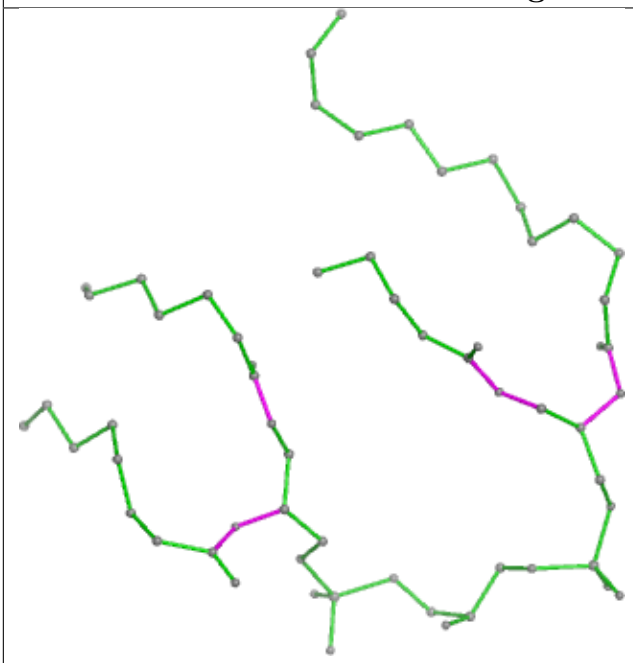
Ligand 3PE Y 802



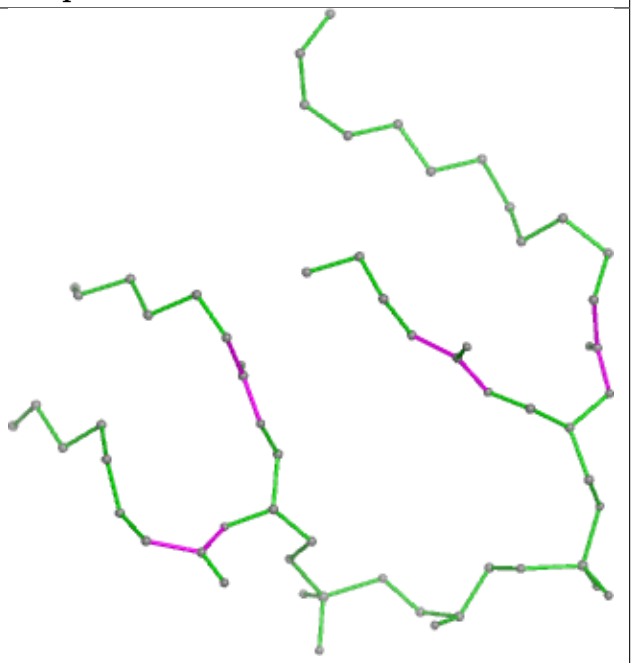
Ligand CDL d 202



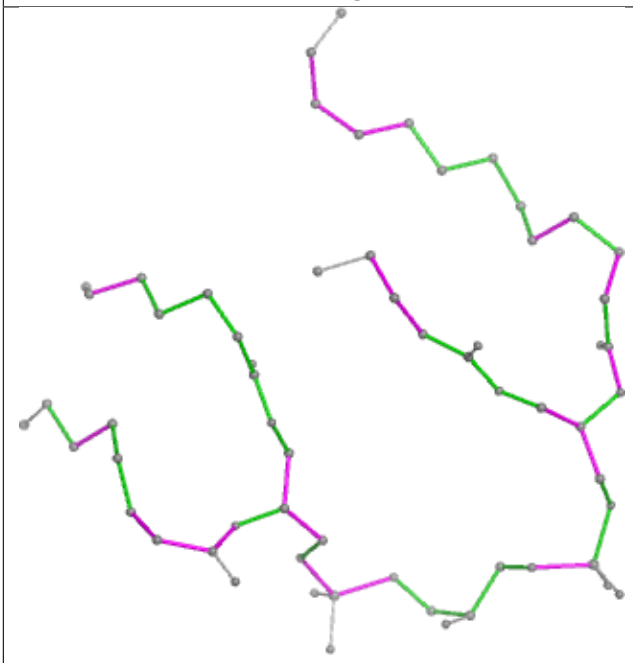
Ligand CDL q 203



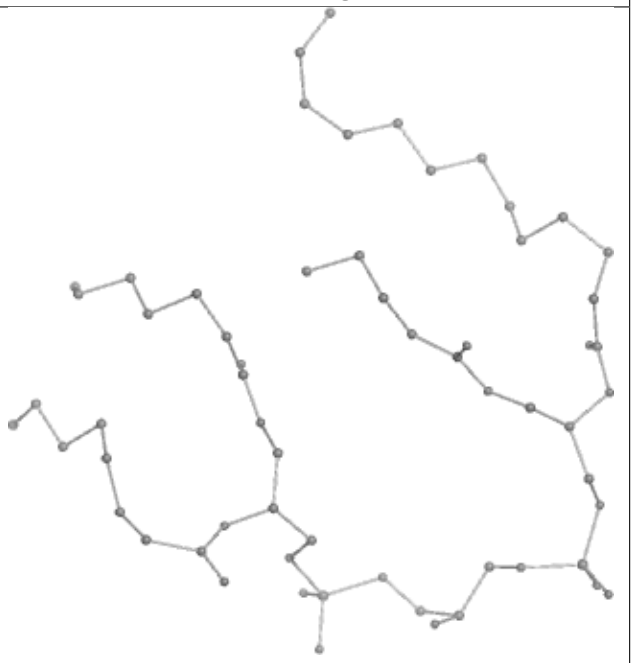
Bond lengths



Bond angles

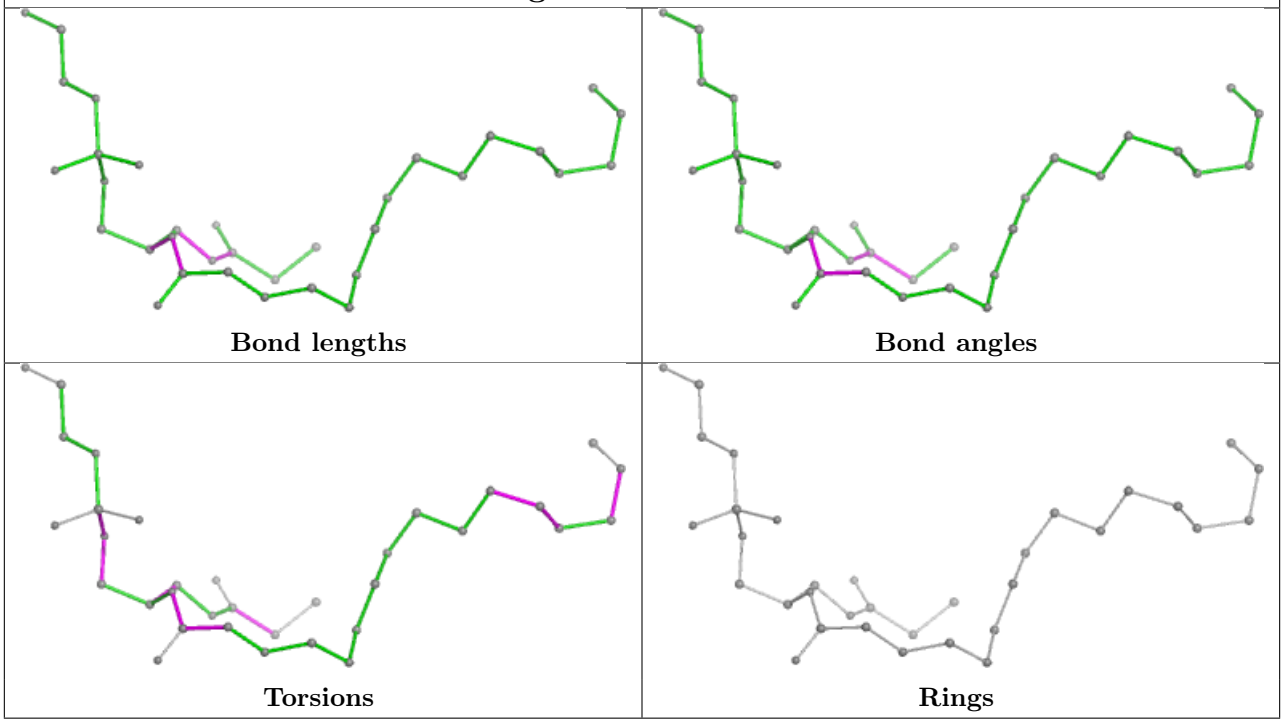


Torsions

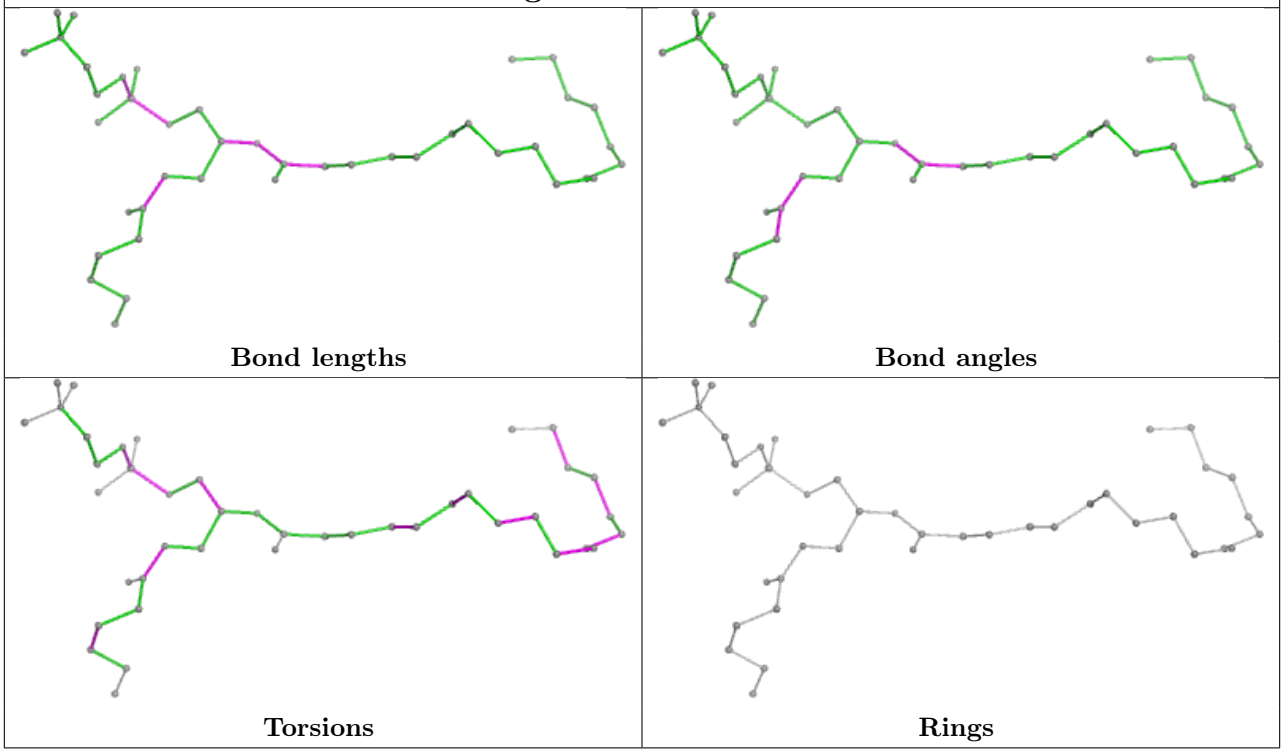


Rings

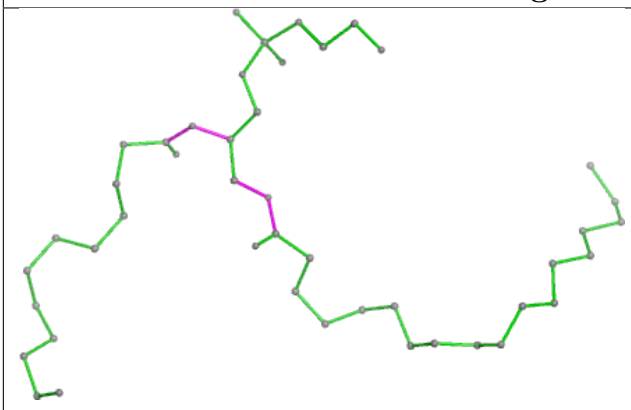
Ligand 3PE H 403



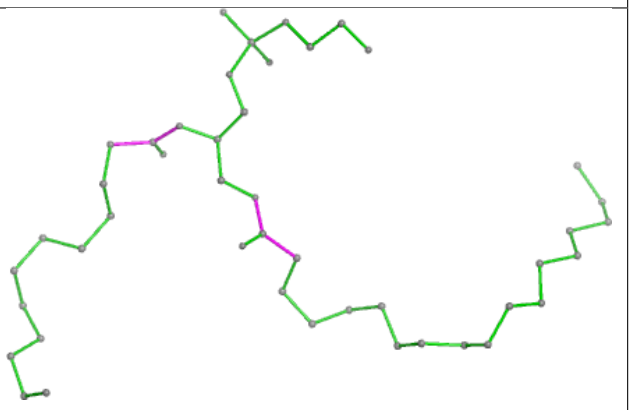
Ligand PC1 M 503



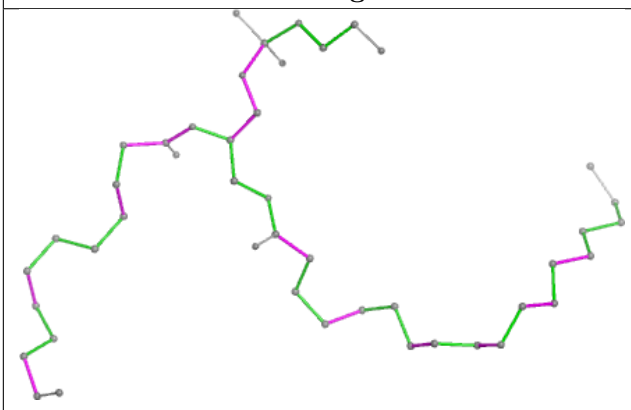
Ligand 3PE L 701



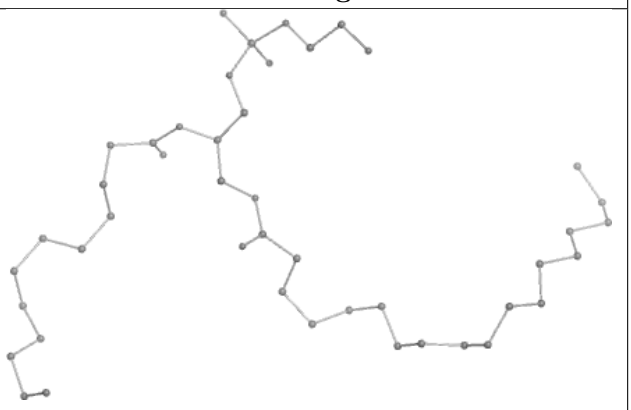
Bond lengths



Bond angles

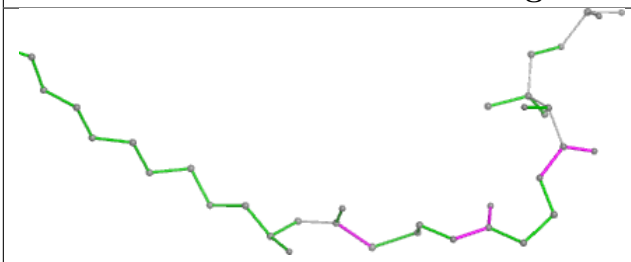


Torsions

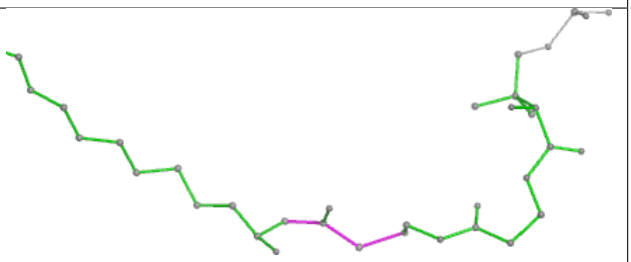


Rings

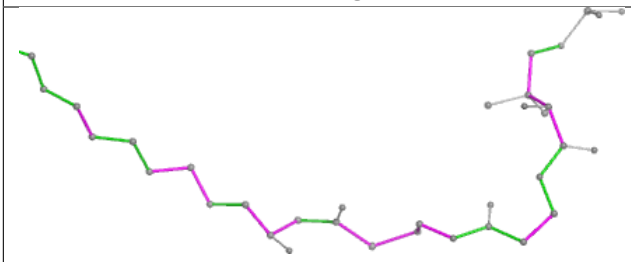
Ligand EHZ T 101



Bond lengths



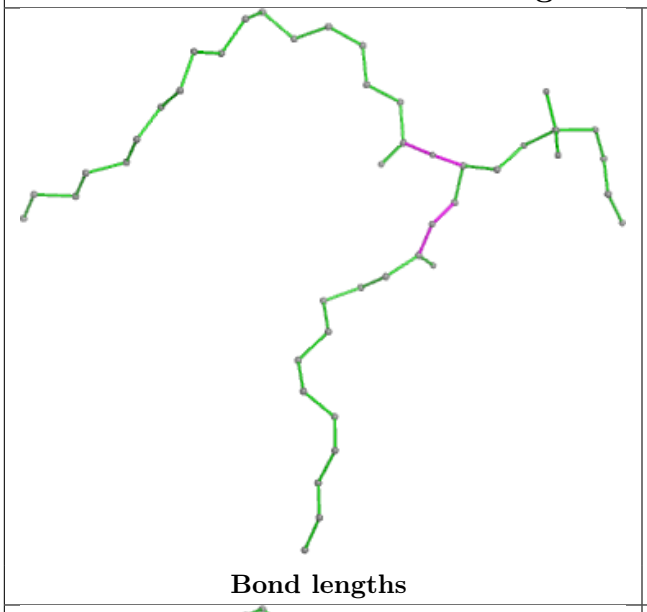
Bond angles



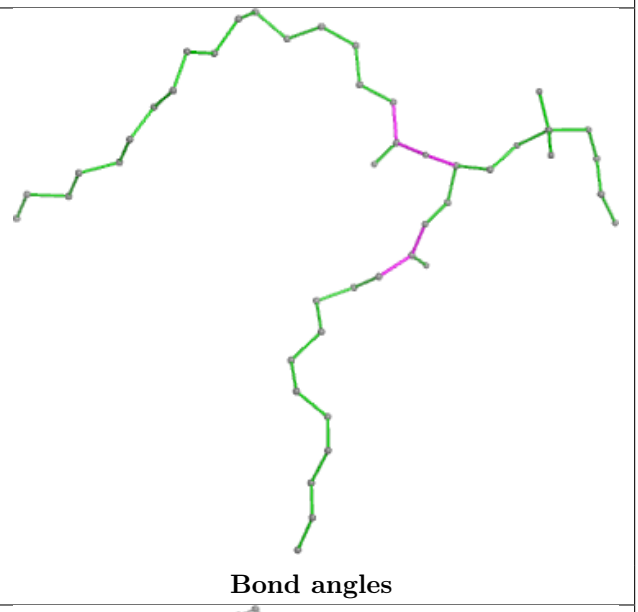
Torsions

Rings

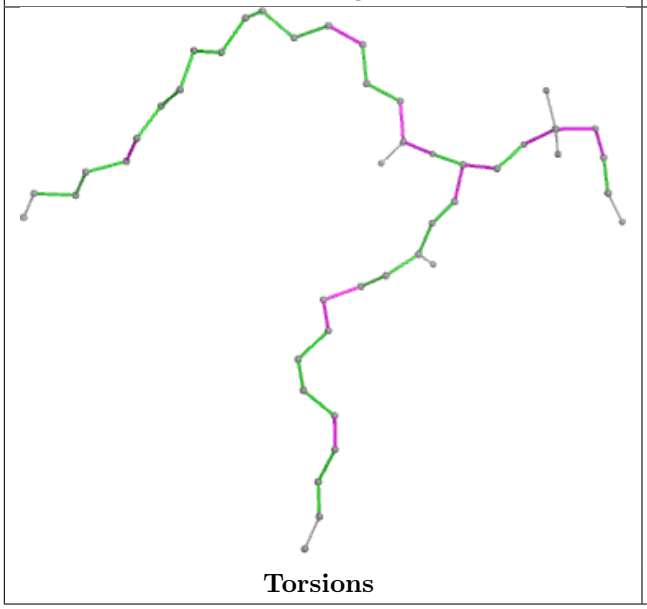
Ligand 3PE I 204



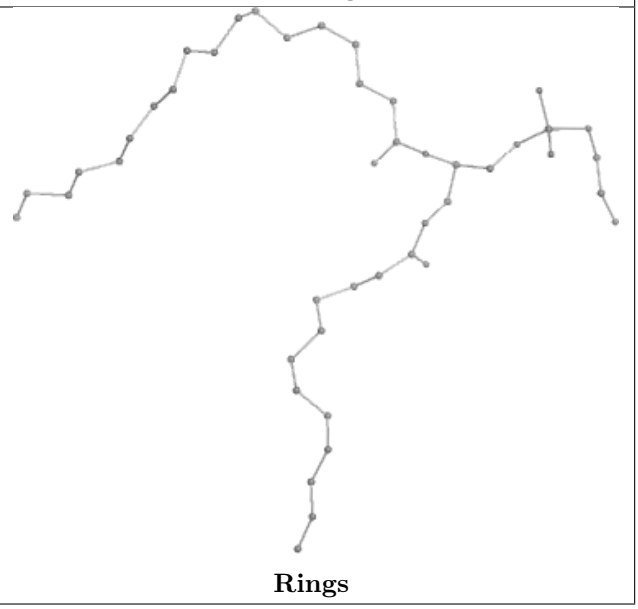
Bond lengths



Bond angles

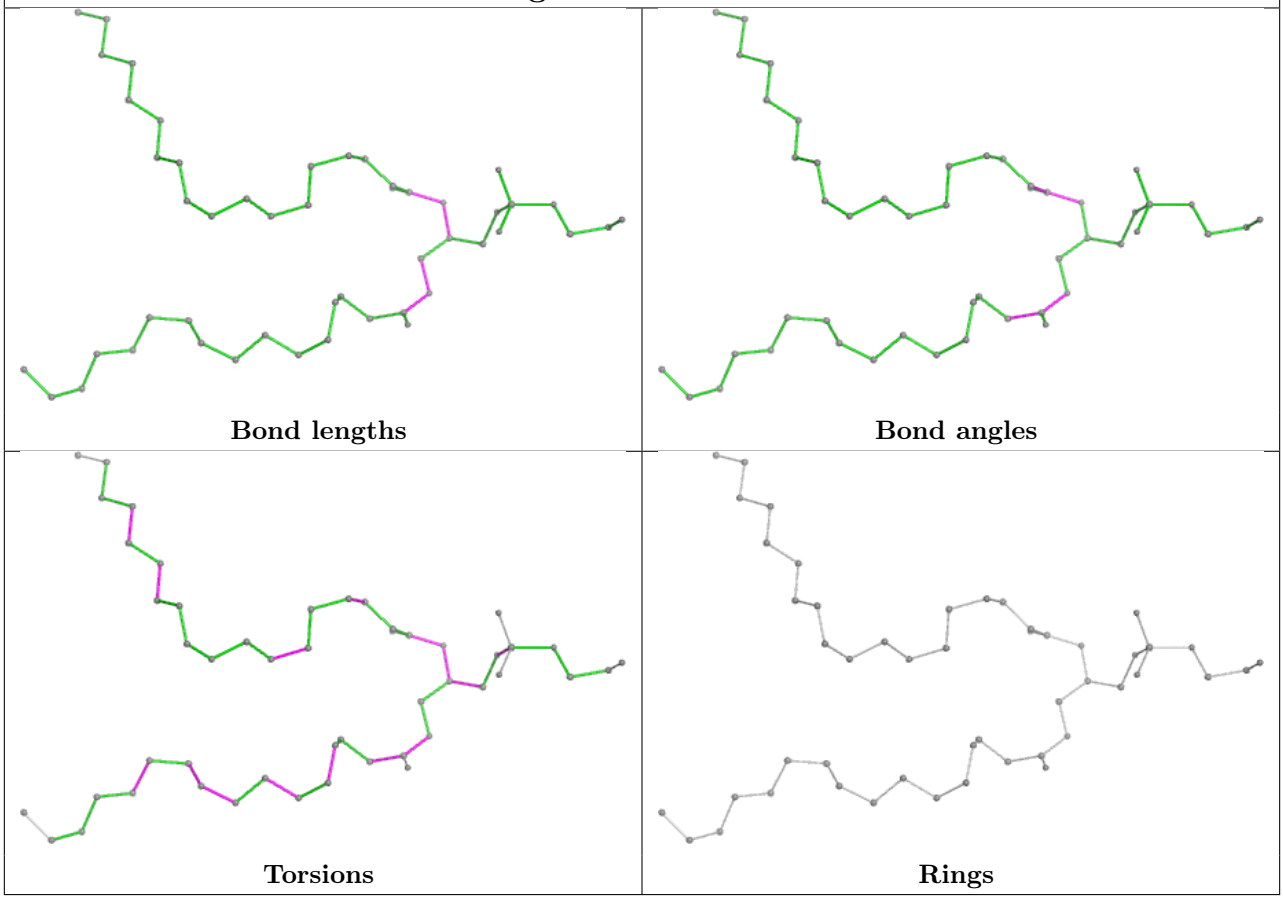


Torsions

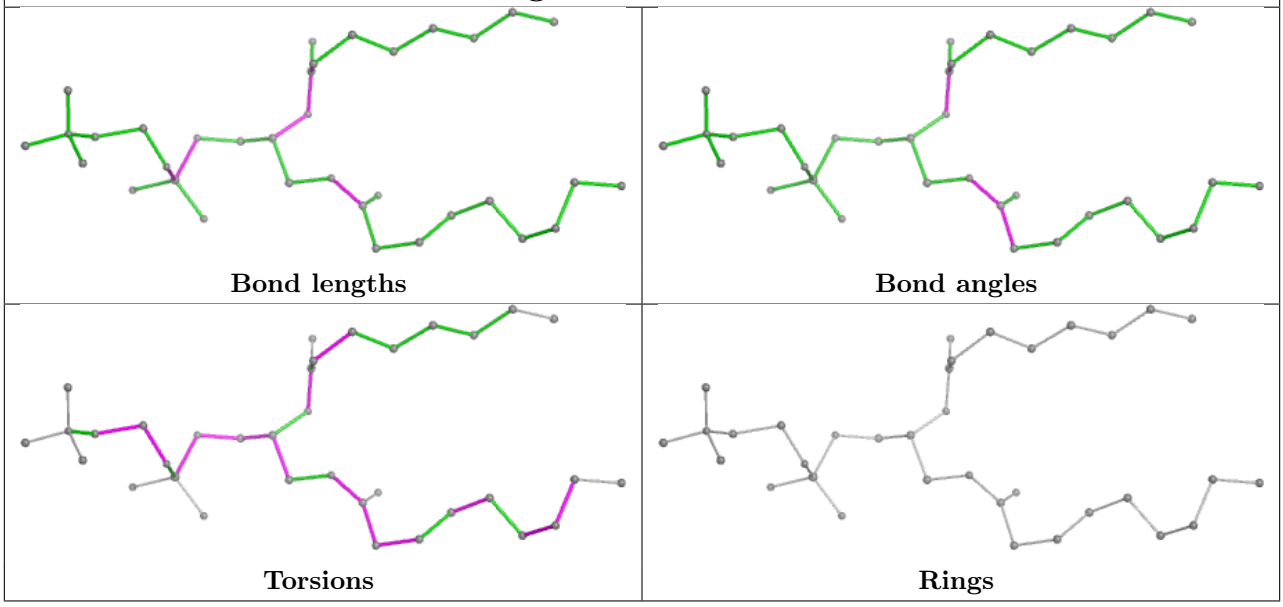


Rings

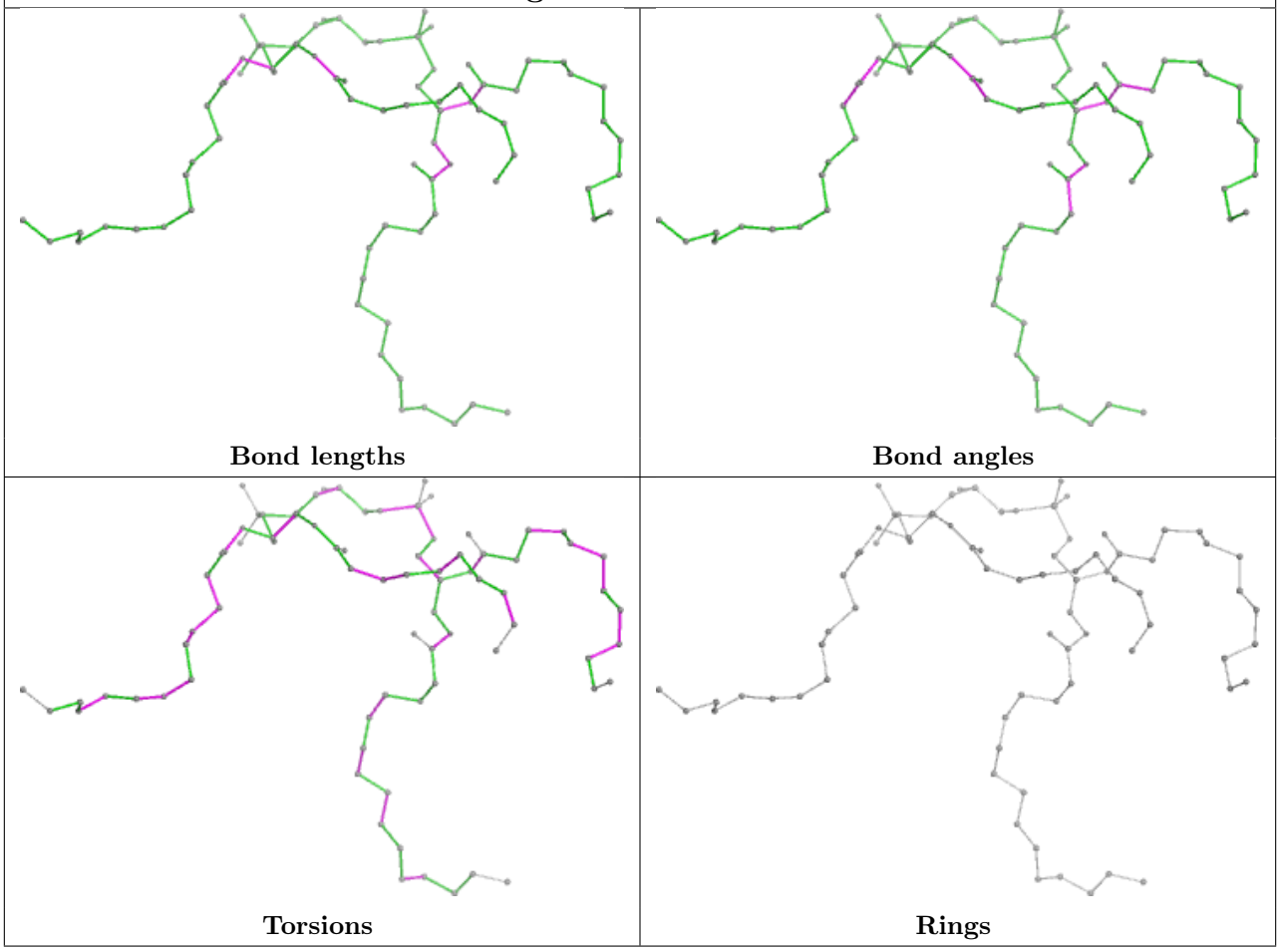
Ligand 3PE D 901



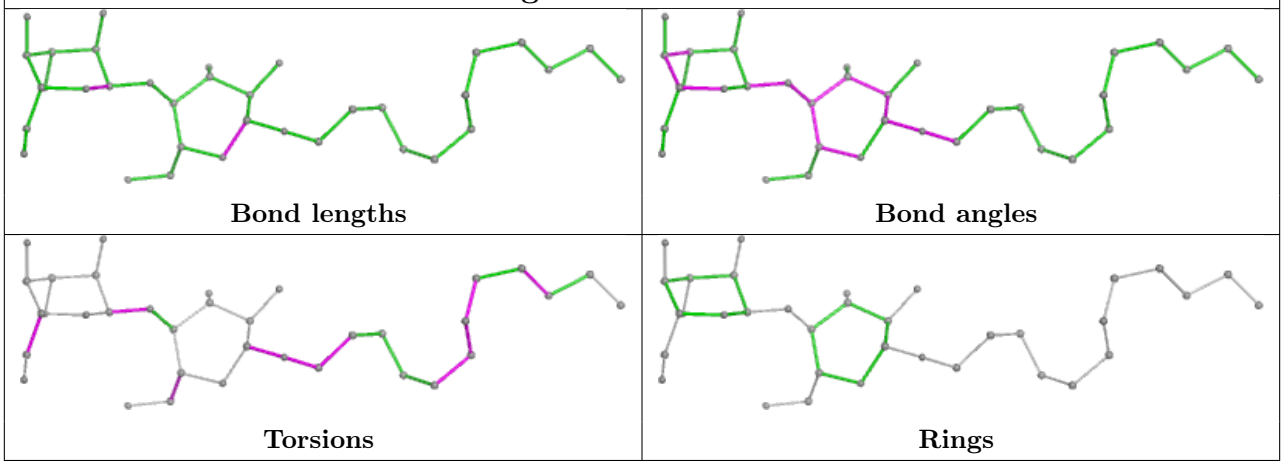
Ligand PC1 A 202



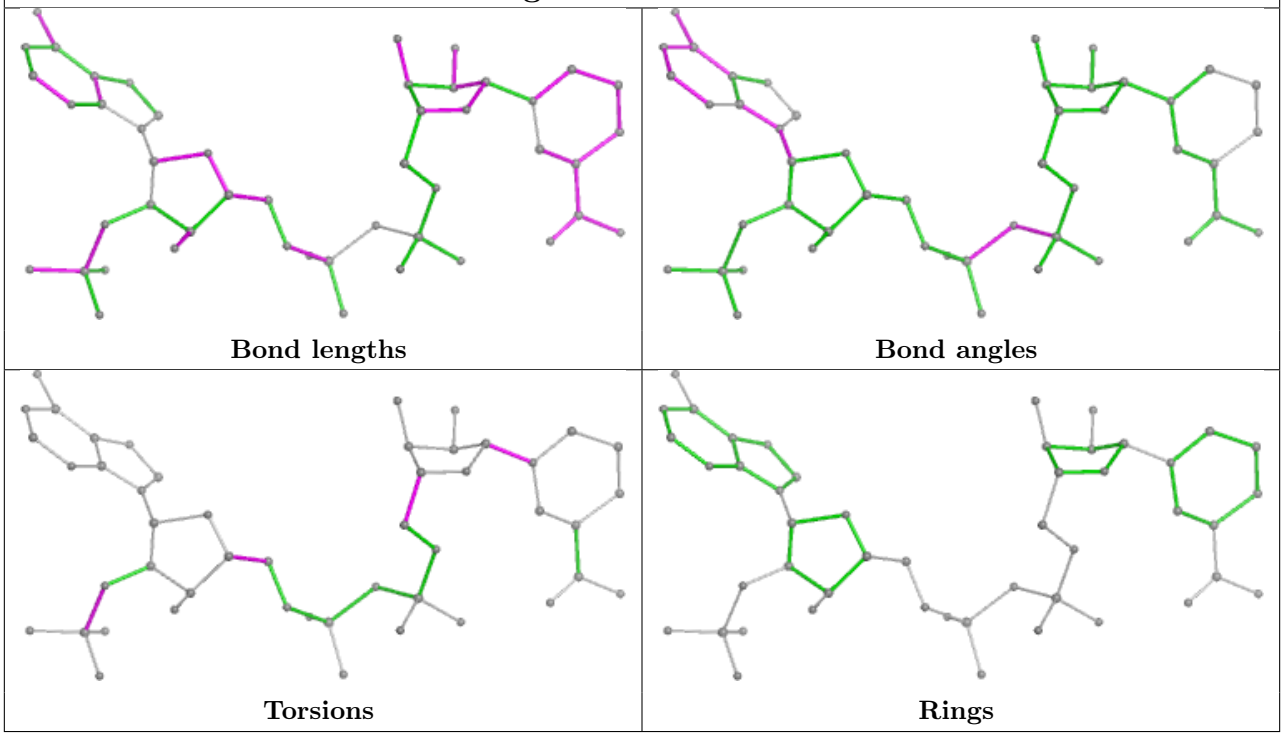
Ligand CDL h 201



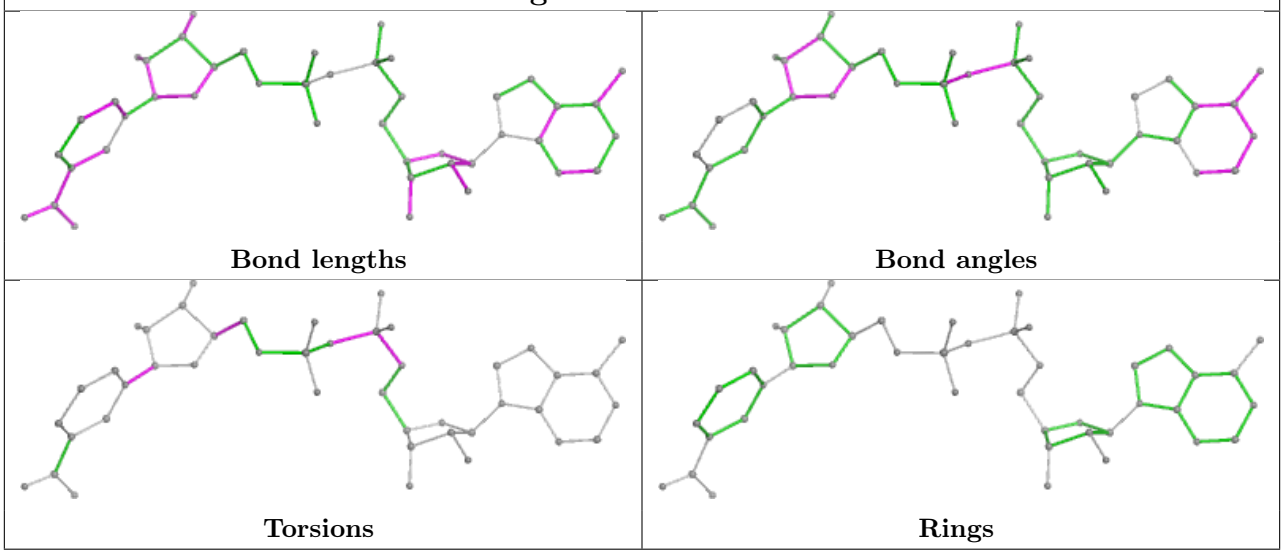
Ligand LMT H 402



Ligand NDP P 402



Ligand NAI F 501



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.

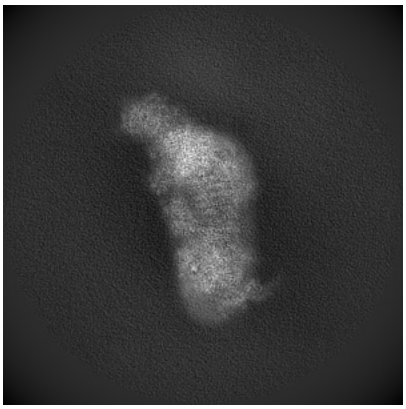
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-55032. These allow visual inspection of the internal detail of the map and identification of artifacts.

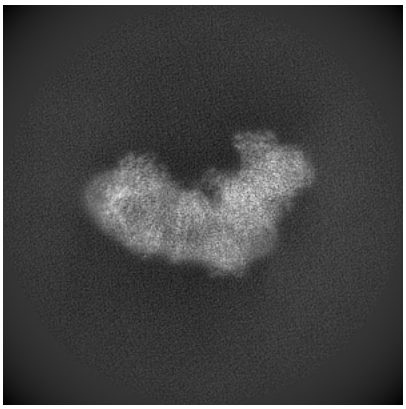
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

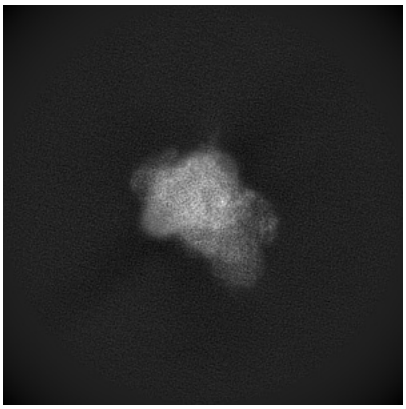
6.1.1 Primary map



X

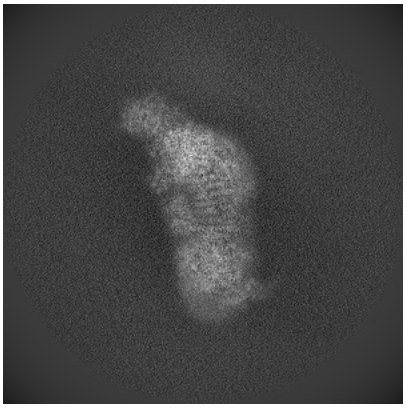


Y

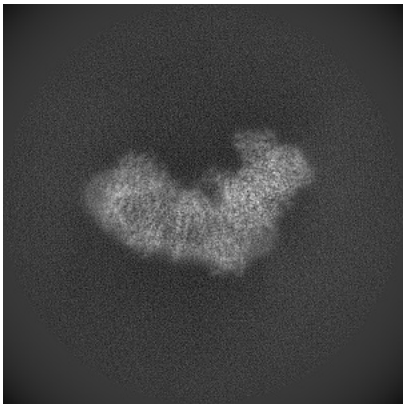


Z

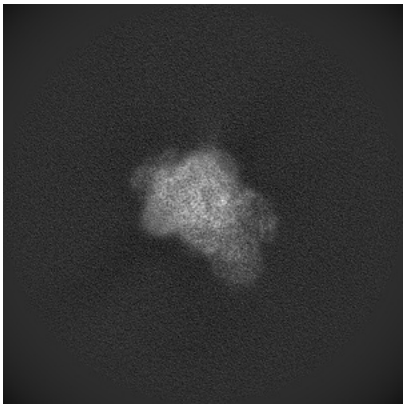
6.1.2 Raw map



X



Y

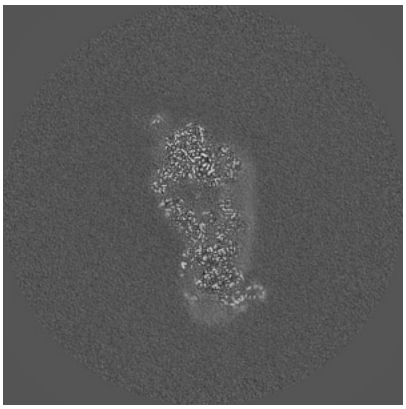


Z

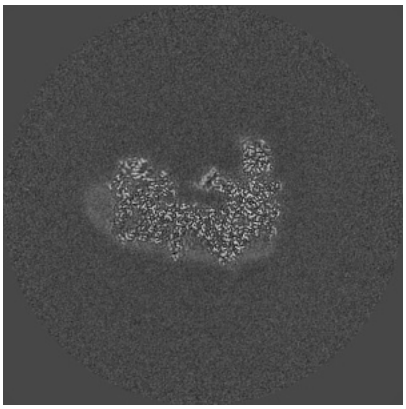
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

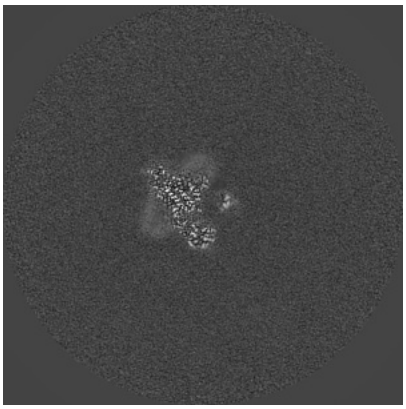
6.2.1 Primary map



X Index: 320

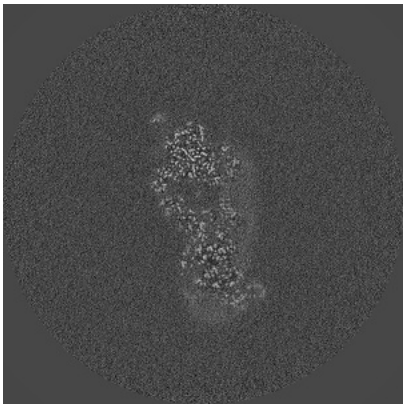


Y Index: 320

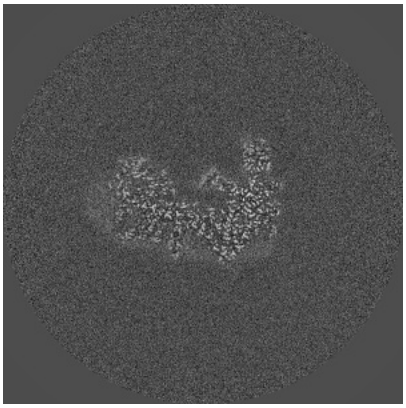


Z Index: 320

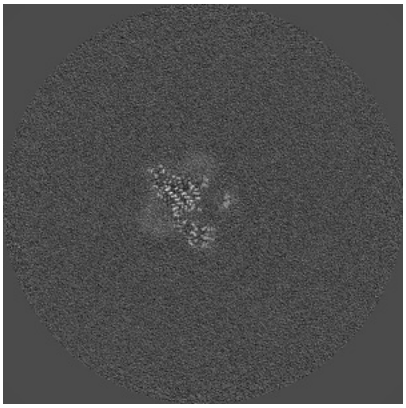
6.2.2 Raw map



X Index: 320



Y Index: 320

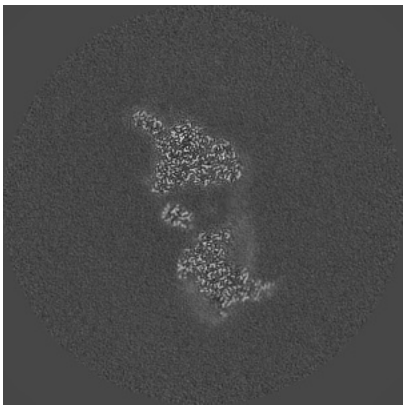


Z Index: 320

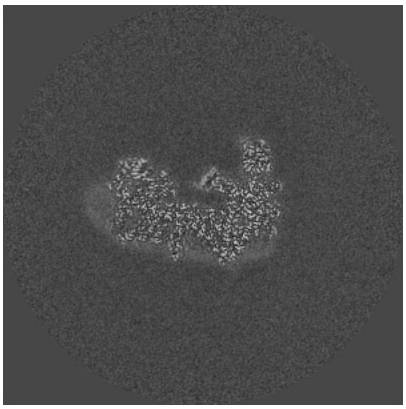
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

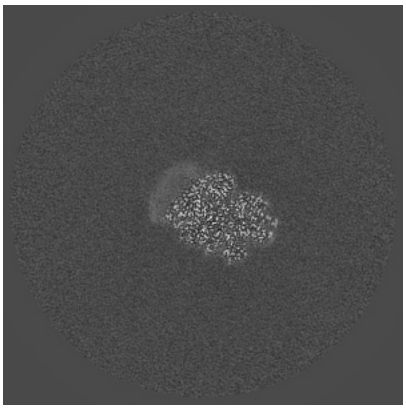
6.3.1 Primary map



X Index: 337

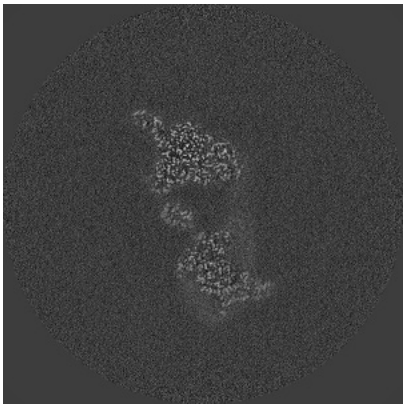


Y Index: 320

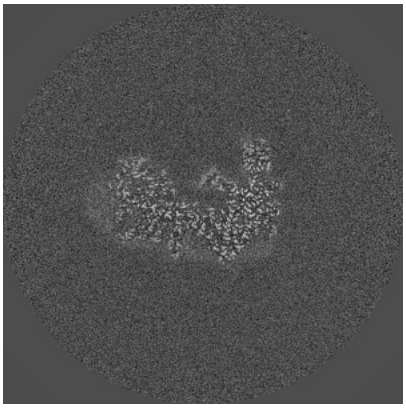


Z Index: 409

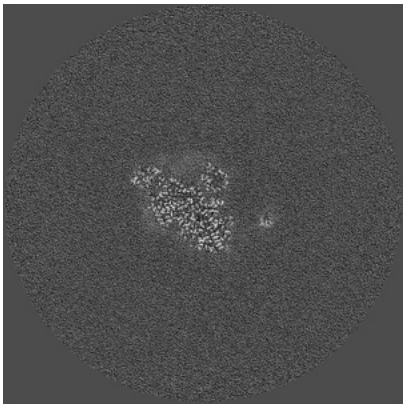
6.3.2 Raw map



X Index: 336



Y Index: 320

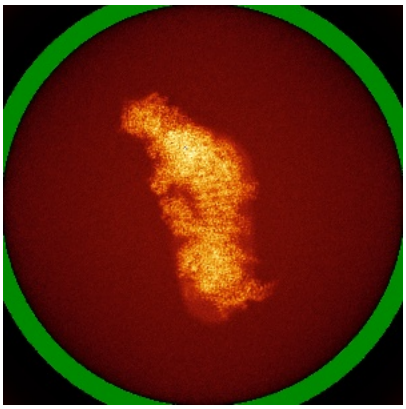


Z Index: 371

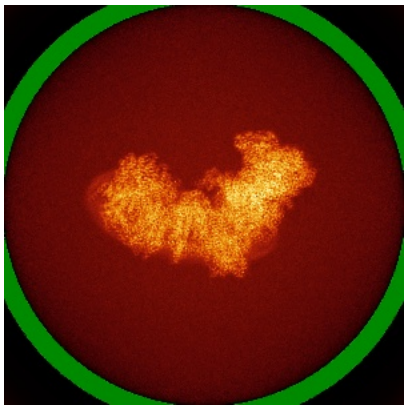
The images above show the largest variance slices of the map in three orthogonal directions.

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

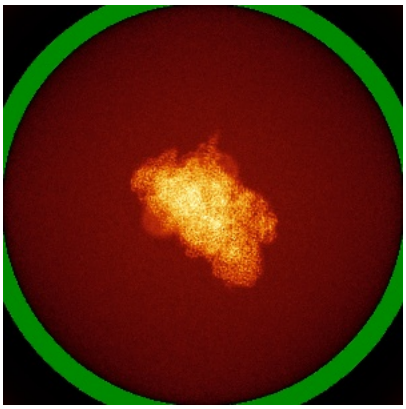
6.4.1 Primary map



X

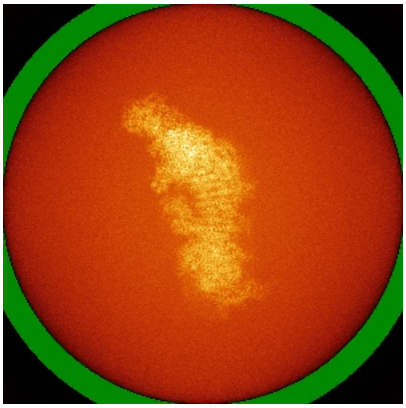


Y

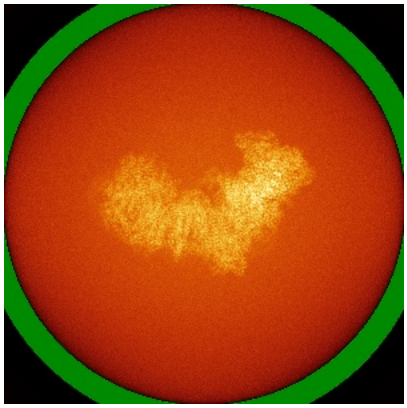


Z

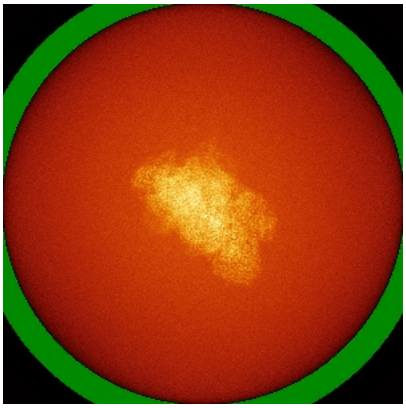
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

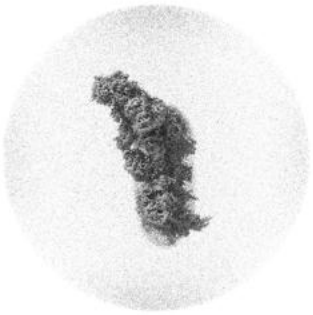
X

Y

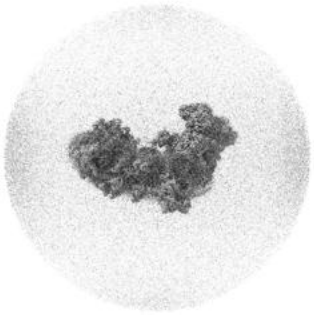
Z

The images above show the 3D surface view of the map at the recommended contour level 4.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

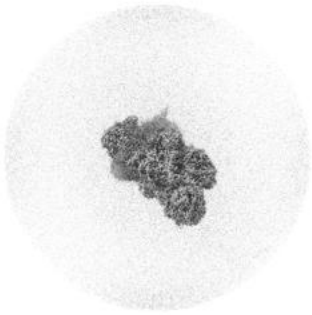
6.5.2 Raw map



X



Y



Z

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

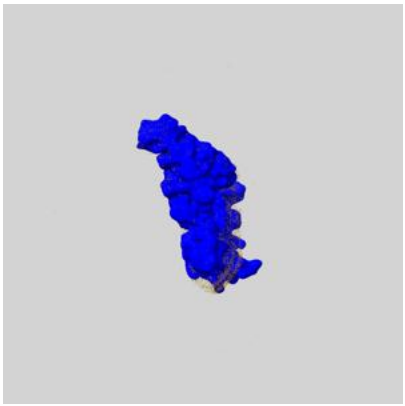
6.6 Mask visualisation

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

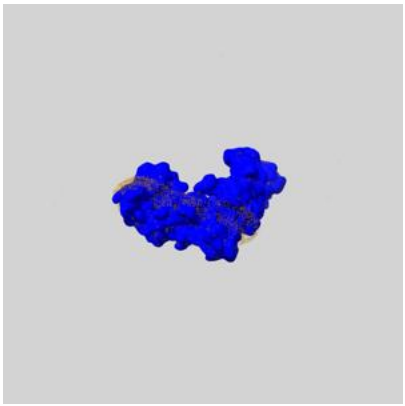
A mask typically either:

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

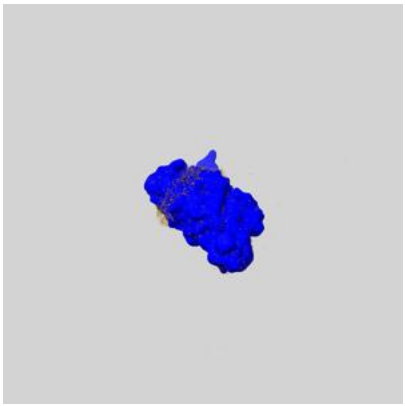
6.6.1 emd_55032_msk_1.map



X



Y

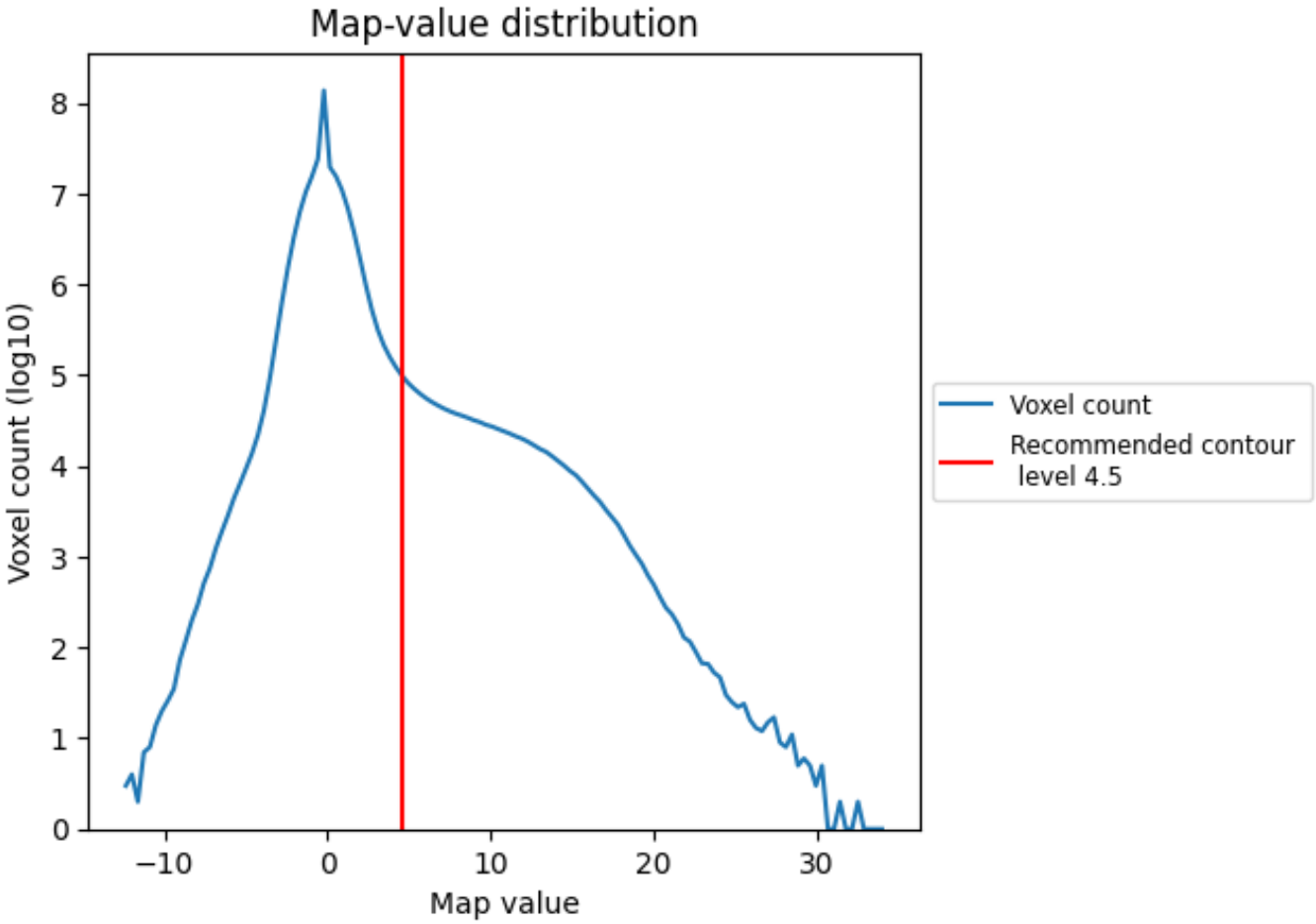


Z

7 Map analysis

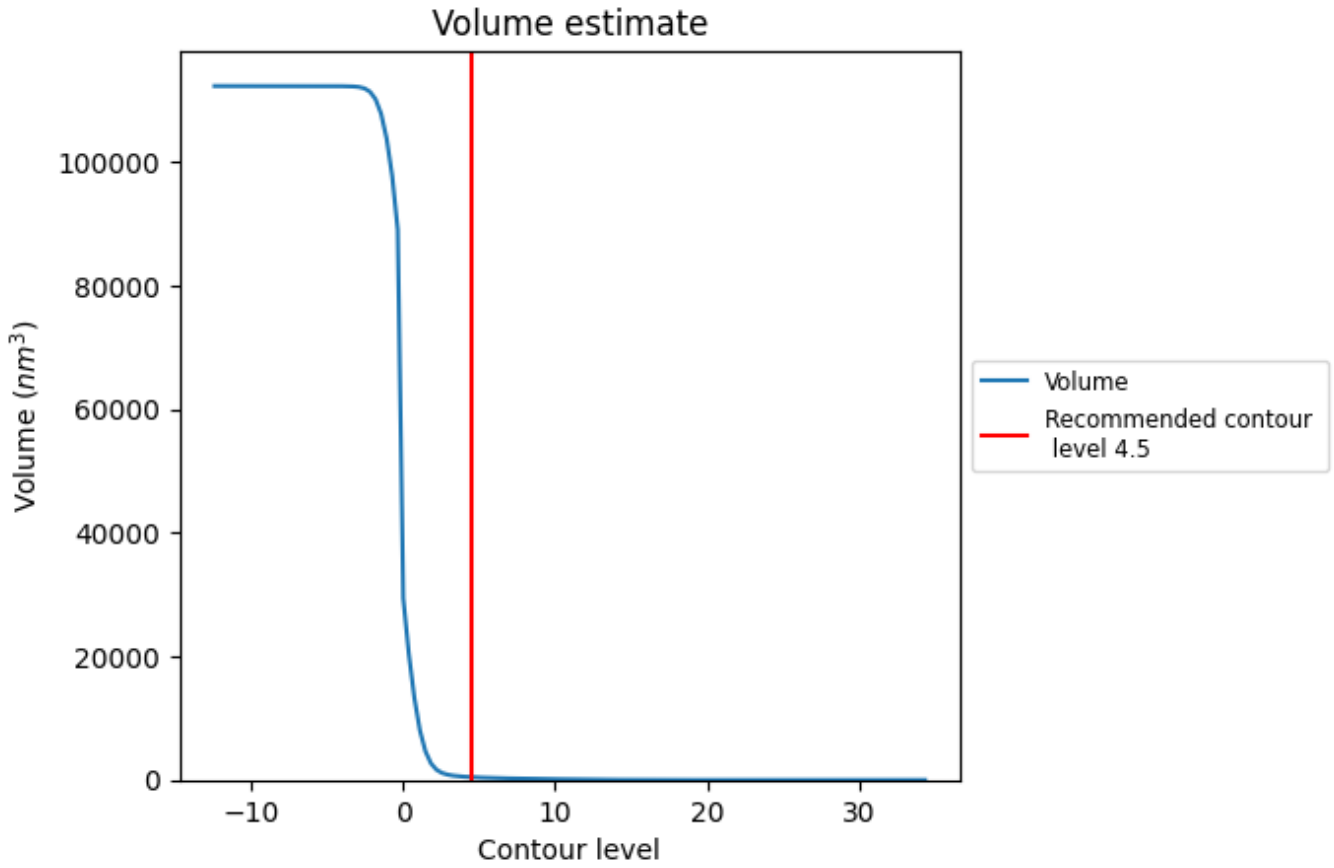
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

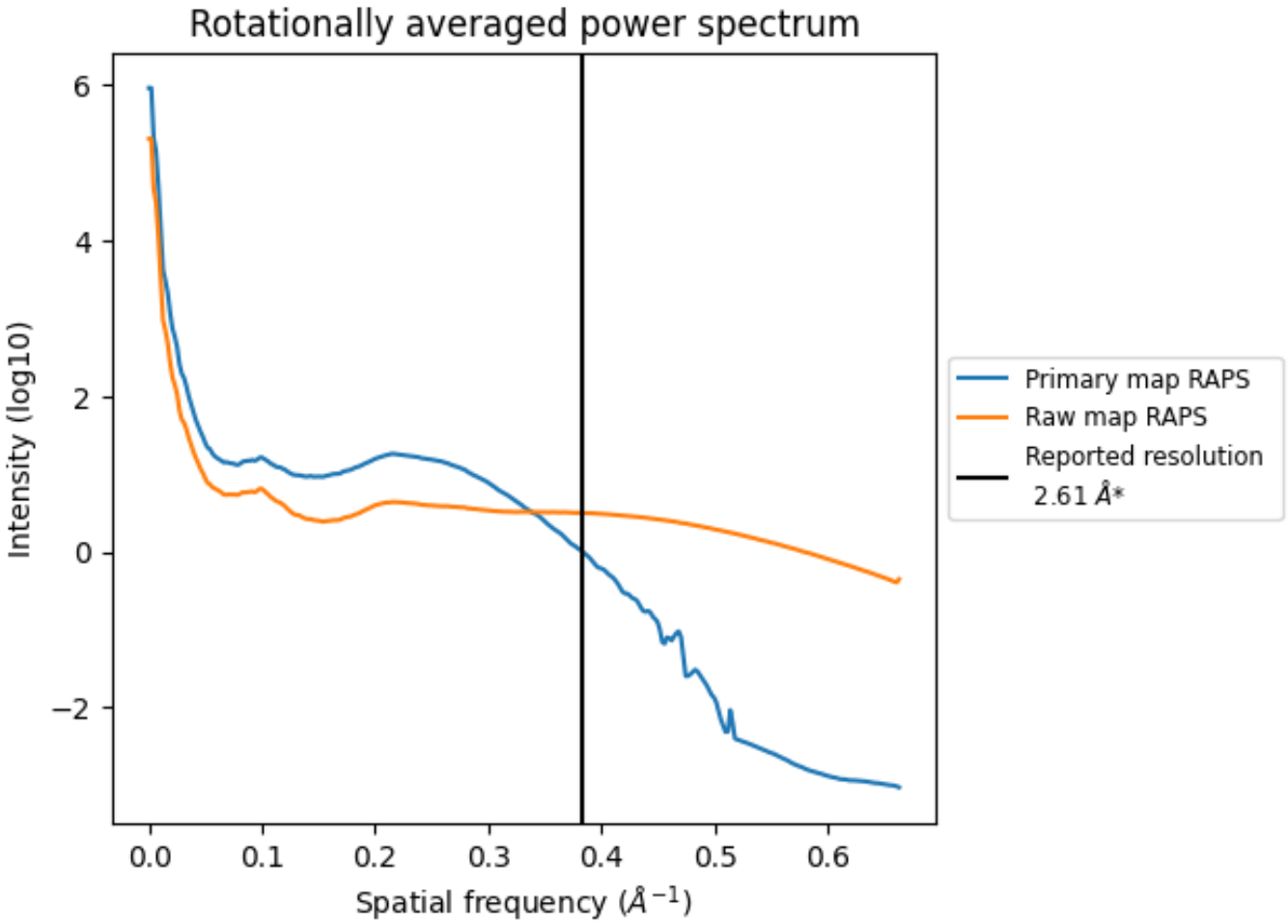
7.2 Volume estimate



The volume at the recommended contour level is 454 nm^3; this corresponds to an approximate mass of 410 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)

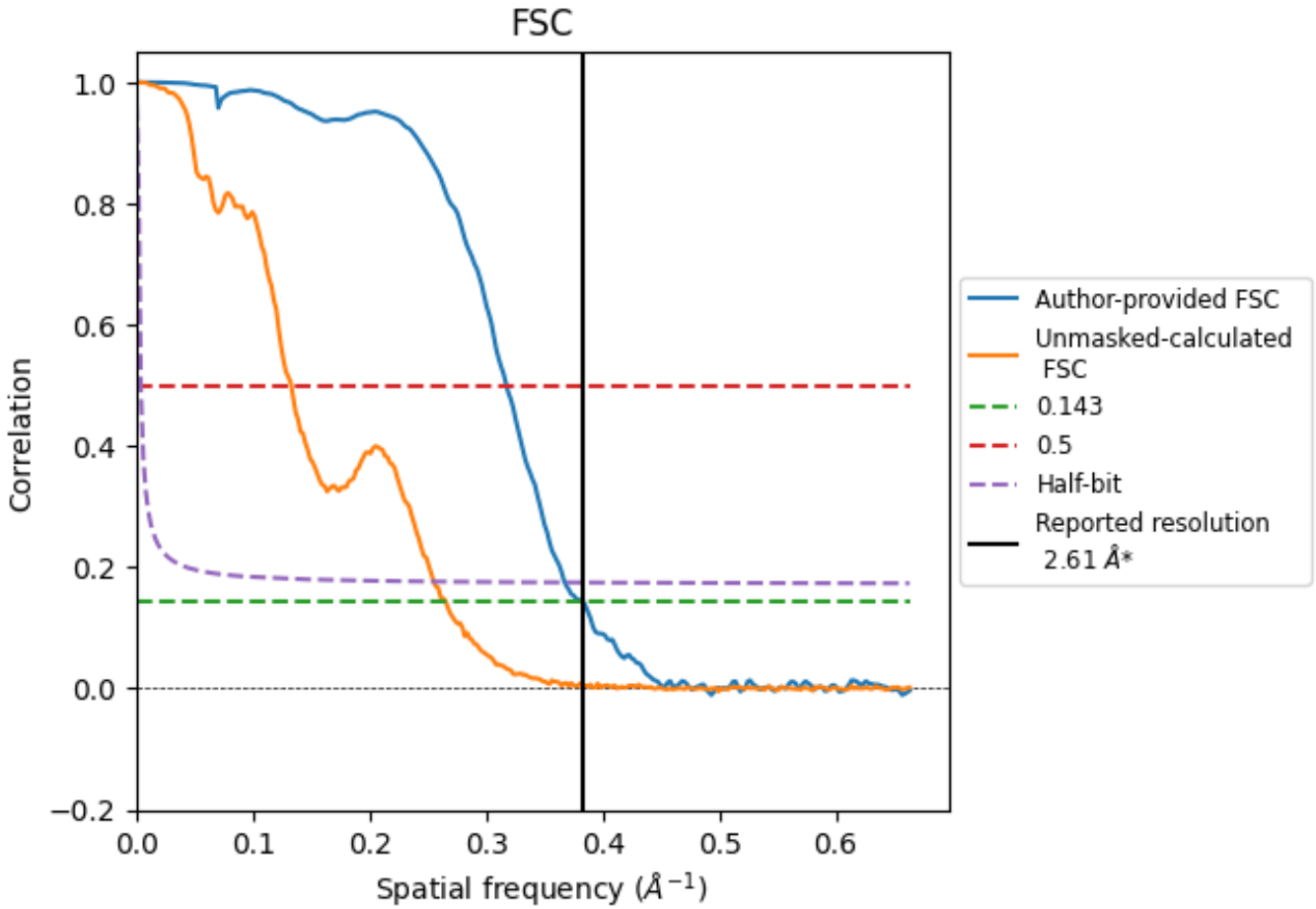


*Reported resolution corresponds to spatial frequency of 0.383 Å^{-1}

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 0.383 $Å^{-1}$

8.2 Resolution estimates (i)

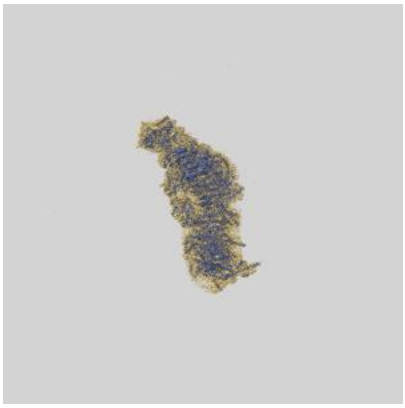
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.61	-	-
Author-provided FSC curve	2.61	3.15	2.72
Unmasked-calculated*	3.77	7.52	3.92

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.77 differs from the reported value 2.61 by more than 10 %

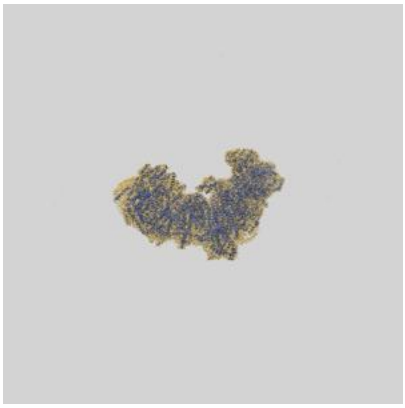
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-55032 and PDB model 9SMH. Per-residue inclusion information can be found in section 3 on page 23.

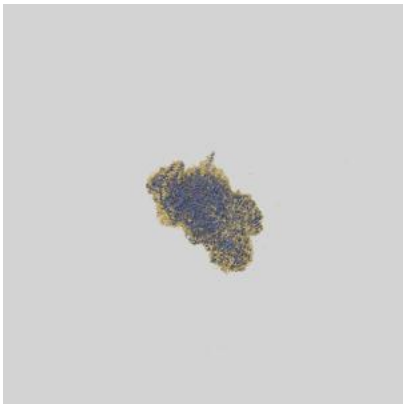
9.1 Map-model overlay



X



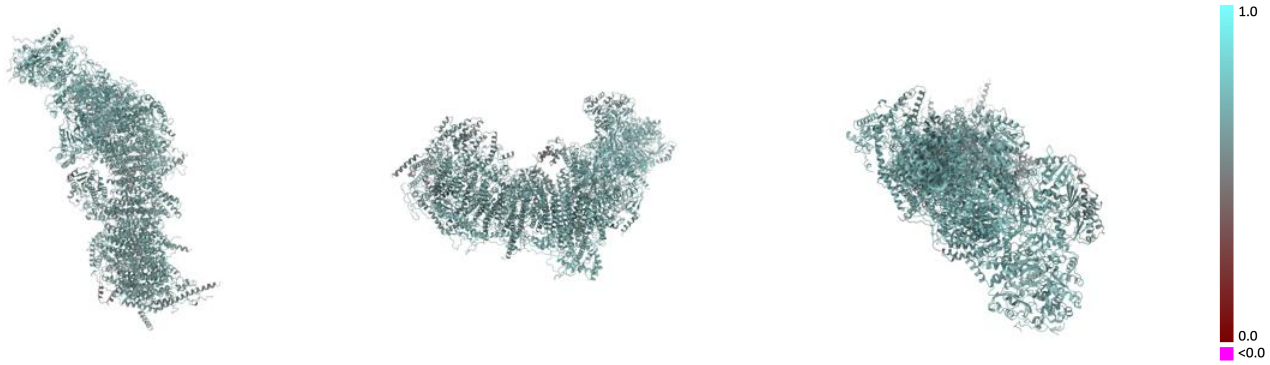
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.5 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.

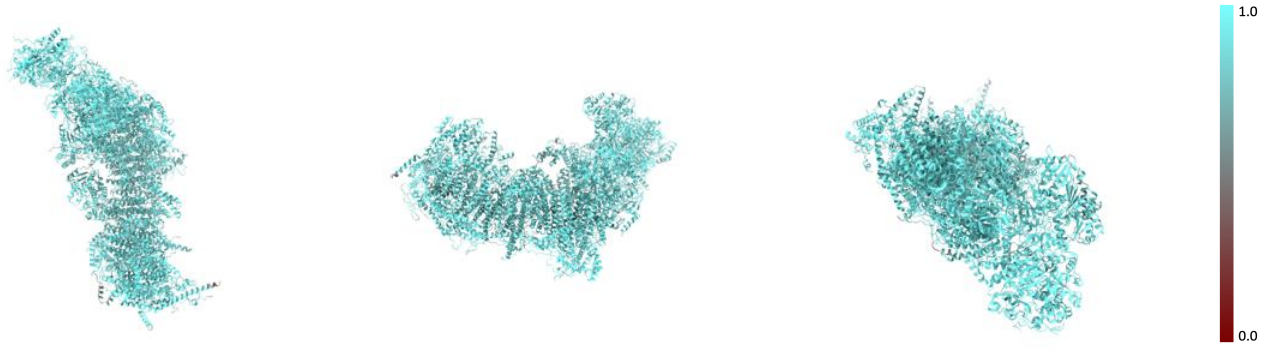
9.2 Q-score mapped to coordinate model (i)



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.

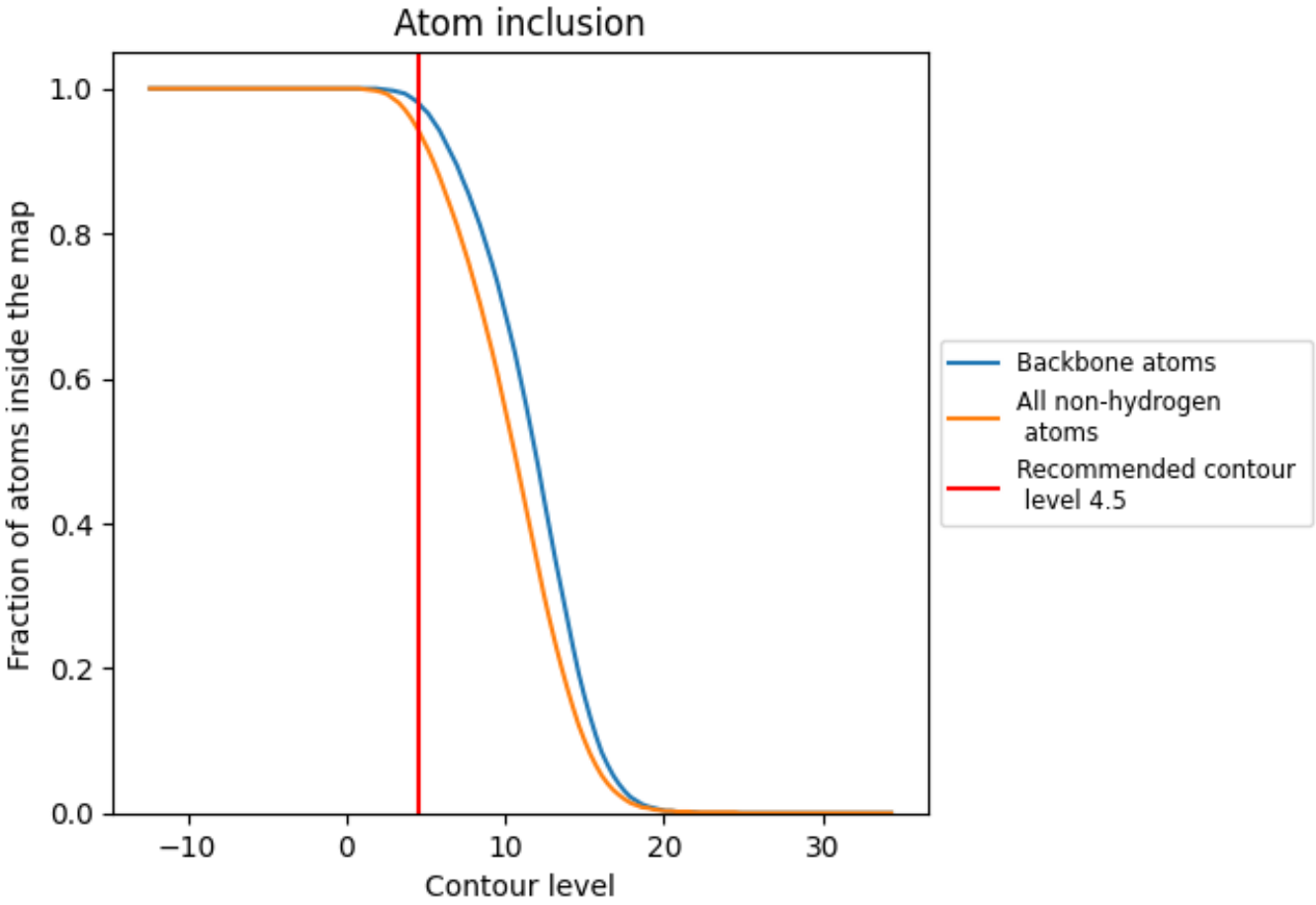
9.3 Atom inclusion mapped to coordinate model (i)



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 (4.5).

9.4 Atom inclusion (i)



At the recommended contour level, 98% of all backbone atoms, 94% 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 (4.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9440	0.6460
A	0.9520	0.6700
B	0.9760	0.6950
C	0.9730	0.6930
D	0.9710	0.6920
E	0.9500	0.6340
F	0.9670	0.6540
G	0.9550	0.6550
H	0.9700	0.6810
I	0.9780	0.6950
J	0.9560	0.6660
K	0.9720	0.6770
L	0.9530	0.6380
M	0.9800	0.6770
N	0.9810	0.6820
O	0.9270	0.6160
P	0.9420	0.6520
Q	0.9450	0.6720
R	0.9320	0.6600
S	0.8990	0.5760
T	0.7970	0.5290
U	0.9010	0.5690
V	0.9150	0.6400
W	0.9270	0.6460
X	0.9210	0.6390
Y	0.9180	0.6230
Z	0.9500	0.6540
a	0.9820	0.6640
b	0.9180	0.6190
c	0.9010	0.6170
d	0.9230	0.6460
e	0.9200	0.6400
f	0.8560	0.6020
g	0.9190	0.6320
h	0.9350	0.6430

Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
i	0.8480	0.5590
j	0.8990	0.5630
k	0.8790	0.5550
l	0.9310	0.6150
m	0.9150	0.6170
n	0.9150	0.5890
o	0.8860	0.5590
p	0.9360	0.6300
q	0.9270	0.6560
r	0.9470	0.6540
s	0.9480	0.6250