Full wwPDB EM Validation Report ⓘ

Jul 6, 2024 – 02:04 PM EDT

PDB ID	:	8UET
EMDB ID	:	EMD-42170
Title	:	In-situ complex I, Deactive class02
Authors	:	Zheng, W.; Zhu, J.; Zhang, K.
Deposited on	:	2023-10-02
Resolution	:	3.70 Å(reported)

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

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

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

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

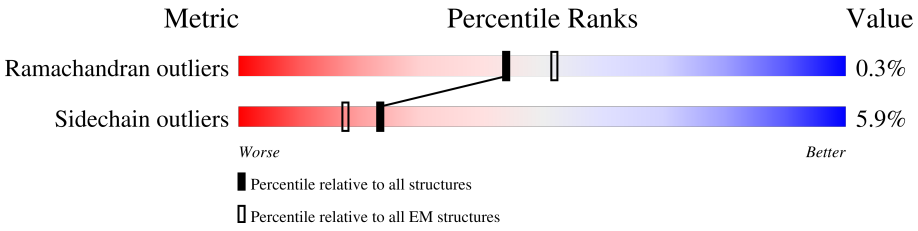
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.70 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	1A	115	23% 70% 5% 24%
2	1B	258	16% 56% · 40%
3	1C	264	39% 75% · 21%
4	1D	476	28% 85% · 12%
5	1E	249	85% 82% · 14%
6	1F	464	91% 88% 5% 7%
7	1G	727	66% 88% 8% ·
8	1H	318	13% 95% 5%
9	1I	239	10% 69% 5% 26%

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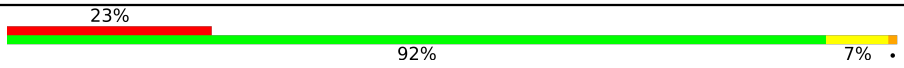
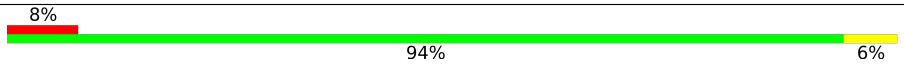
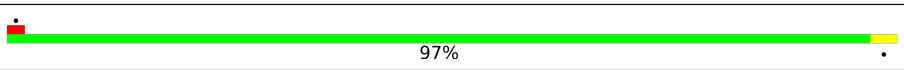
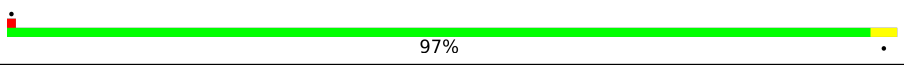
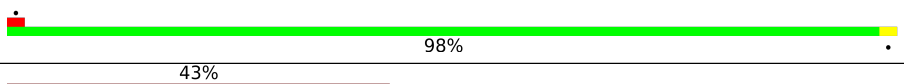
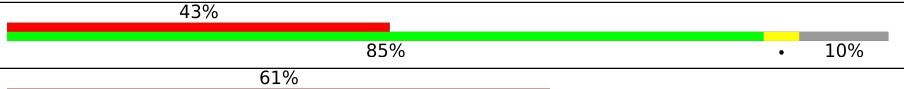
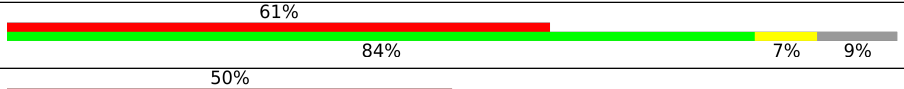
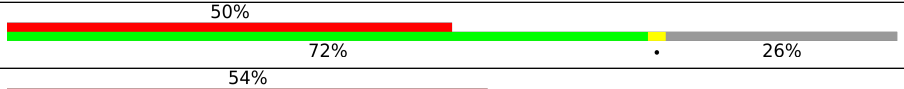
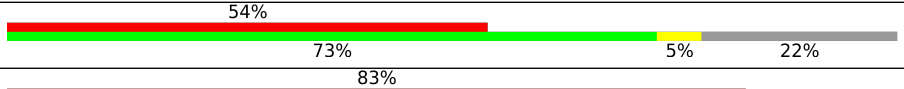
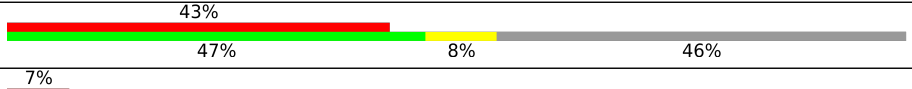
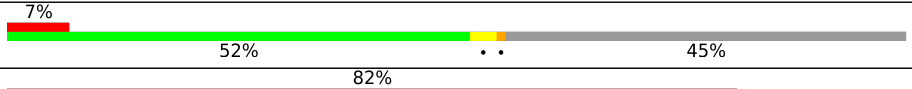
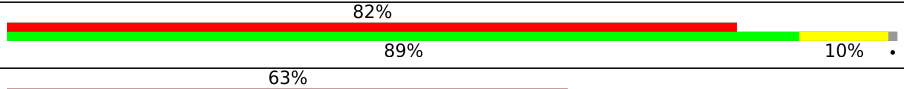
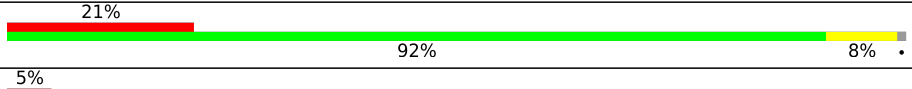
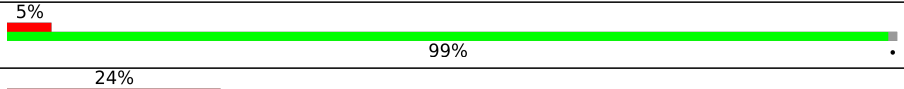
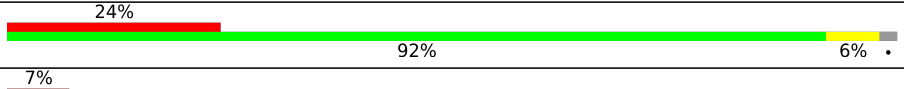
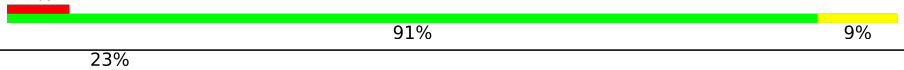
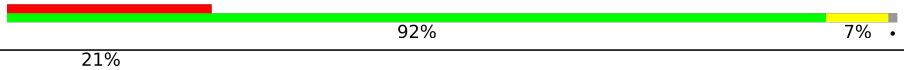
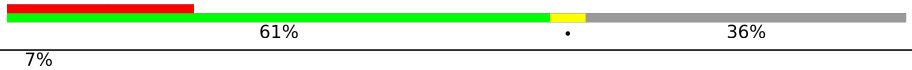
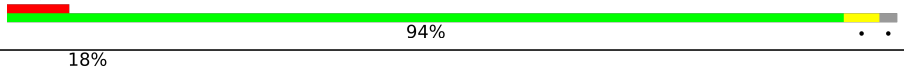
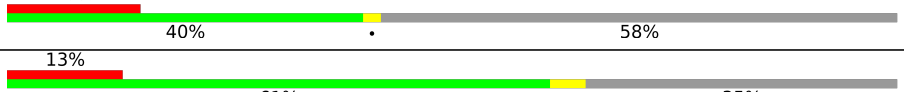
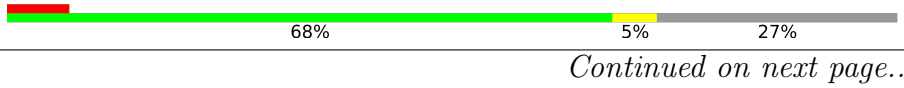
Mol	Chain	Length	Quality of chain
10	1J	175	
11	1K	98	
12	1L	606	
13	1M	459	
14	1N	347	
15	1O	357	
16	1P	377	
17	1Q	175	
18	1R	123	
19	1S	99	
20	1T	156	
20	1U	156	
21	1V	116	
22	1W	128	
23	1X	172	
24	1Y	141	
25	1Z	144	
26	1a	70	
27	1b	84	
28	1c	76	
29	1d	123	
30	1e	106	
31	1f	135	
32	1g	154	
33	1h	189	

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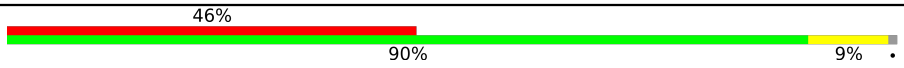
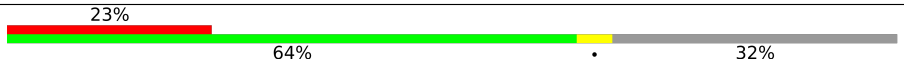
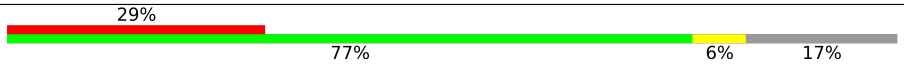
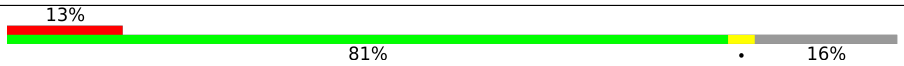
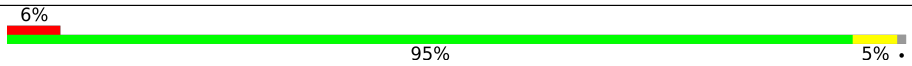
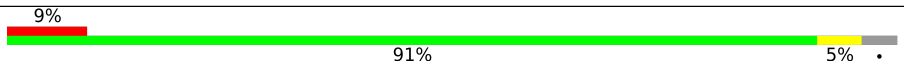
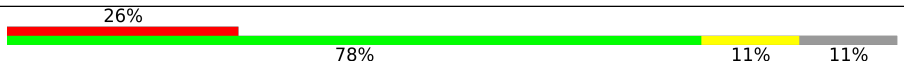
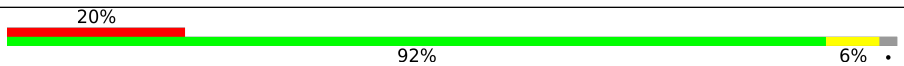
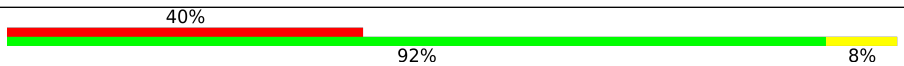
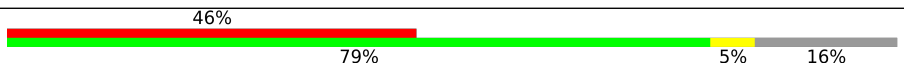
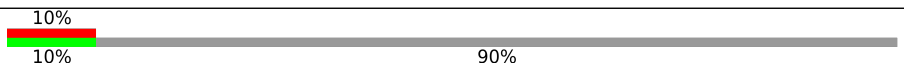
Mol	Chain	Length	Quality of chain
34	1i	128	
35	1j	105	
36	1k	98	
37	1l	186	
38	1m	129	
39	1n	179	
40	1o	137	
41	1p	176	
42	1q	145	
43	1r	114	
44	1s	471	

2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 67180 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	1A	87	700	479	100	116	5	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	1B	155	1242	791	226	211	14	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	1C	209	1740	1125	297	316	2	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1C	104	GLN	ARG	conflict	UNP A0A286ZNN4
1C	154	GLY	ASP	conflict	UNP A0A286ZNN4

- 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	1D	418	3376	2159	577	616	24	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1D	0	GLY	GLU	conflict	UNP A0A8D0QM68

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

Mol	Chain	Residues	Atoms					AltConf	Trace
5	1E	214	Total	C	N	O	S	0	0
			1658	1058	278	312	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
6	1F	432	Total	C	N	O	S	0	0
			3325	2100	592	613	20		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	1G	699	Total	C	N	O	S	0	0
			5362	3360	933	1029	40		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	1H	318	Total	C	N	O	S	0	0
			2504	1673	385	425	21		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
9	1I	176	Total	C	N	O	S	0	0
			1412	887	243	269	13		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
10	1J	175	Total	C	N	O	S	0	0
			1339	898	190	238	13		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
11	1K	98	Total	C	N	O	S	0	0
			750	494	113	129	14		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
12	1L	606	Total	C	N	O	S	0	0
			4818	3195	746	826	51		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
13	1M	459	Total	C	N	O	S	0	0
			3632	2411	572	610	39		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
14	1N	347	Total	C	N	O	S	0	0
			2712	1783	420	463	46		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
15	1O	320	Total	C	N	O	S	0	0
			2590	1649	440	491	10		

- Molecule 16 is a protein called NADH:ubiquinone oxidoreductase subunit A9.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	1P	342	Total	C	N	O	S	0	0
			2751	1783	481	478	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
17	1Q	129	Total	C	N	O	S	0	0
			1047	659	186	199	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
18	1R	96	Total	C	N	O	S	0	0
			741	452	140	146	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
19	1S	87	Total	C	N	O	S	0	0
			700	440	131	127	2		

- Molecule 20 is a protein called NADH:ubiquinone oxidoreductase subunit AB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	1T	85	Total	C	N	O	S	0	0
			689	445	101	138	5		
20	1U	86	Total	C	N	O	S	0	0
			694	448	102	139	5		

- Molecule 21 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5 isoform X1.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	1V	115	Total	C	N	O	S	0	0
			927	599	157	168	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	1W	115	Total	C	N	O	S	0	0
			971	619	179	168	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
23	1X	171	Total	C	N	O	S	0	0
			1398	887	250	251	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
24	1Y	139	Total	C	N	O	S	0	0
			1016	648	173	189	6		

- Molecule 25 is a protein called NADH:ubiquinone oxidoreductase subunit A13.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	1Z	141	Total	C	N	O	S	0	0
			1168	752	202	205	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
26	1a	70	Total	C	N	O	S	0	0
			562	361	101	94	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
27	1b	83	Total	C	N	O	S	0	0
			643	417	110	115	1		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
28	1c	49	Total	C	N	O	0	0
			417	276	71	70		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
29	1d	121	Total	C	N	O	S	0	0
			996	648	172	170	6		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1d	-2	ACE	-	acetylation	UNP A0A480JRW3

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

Mol	Chain	Residues	Atoms					AltConf	Trace
30	1e	99	Total	C	N	O	S	0	0
			816	519	151	140	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
31	1f	57	Total	C	N	O	S	0	0
			487	316	89	80	2		

There are 29 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1f	-77	MET	-	initiating methionine	UNP A0A8D1IZ33
1f	-76	ALA	-	expression tag	UNP A0A8D1IZ33
1f	-75	ALA	-	expression tag	UNP A0A8D1IZ33
1f	-74	ALA	-	expression tag	UNP A0A8D1IZ33
1f	-73	ILE	-	expression tag	UNP A0A8D1IZ33
1f	-72	LEU	-	expression tag	UNP A0A8D1IZ33
1f	-71	LYS	-	expression tag	UNP A0A8D1IZ33
1f	-70	LEU	-	expression tag	UNP A0A8D1IZ33
1f	-69	GLU	-	expression tag	UNP A0A8D1IZ33
1f	-68	GLU	-	expression tag	UNP A0A8D1IZ33
1f	-67	THR	-	expression tag	UNP A0A8D1IZ33
1f	-66	ARG	-	expression tag	UNP A0A8D1IZ33
1f	-65	GLY	-	expression tag	UNP A0A8D1IZ33
1f	-64	GLY	-	expression tag	UNP A0A8D1IZ33
1f	-63	GLY	-	expression tag	UNP A0A8D1IZ33
1f	-62	GLU	-	expression tag	UNP A0A8D1IZ33
1f	-61	LYS	-	expression tag	UNP A0A8D1IZ33
1f	-60	CYS	-	expression tag	UNP A0A8D1IZ33
1f	-59	ASP	-	expression tag	UNP A0A8D1IZ33
1f	-58	LYS	-	expression tag	UNP A0A8D1IZ33
1f	-57	ASN	-	expression tag	UNP A0A8D1IZ33
1f	-56	GLN	-	expression tag	UNP A0A8D1IZ33
1f	-55	GLY	-	expression tag	UNP A0A8D1IZ33
1f	-54	VAL	-	expression tag	UNP A0A8D1IZ33
1f	-53	LYS	-	expression tag	UNP A0A8D1IZ33
1f	-52	GLY	-	expression tag	UNP A0A8D1IZ33
1f	-51	ARG	-	expression tag	UNP A0A8D1IZ33
1f	-50	ARG	-	expression tag	UNP A0A8D1IZ33
1f	-49	PHE	-	expression tag	UNP A0A8D1IZ33

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

Mol	Chain	Residues	Atoms					AltConf	Trace
32	1g	100	Total	C	N	O	S	0	0
			835	535	138	158	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
33	1h	138	Total	C	N	O	S	0	0
			1151	754	195	199	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
34	1i	127	Total	C	N	O	S	0	0
			1100	723	194	181	2		

- Molecule 35 is a protein called NADH:ubiquinone oxidoreductase subunit B2.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	1j	71	Total	C	N	O	S	0	0
			601	394	99	107	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
36	1k	81	Total	C	N	O	S	0	0
			649	422	110	116	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
37	1l	156	Total	C	N	O	S	0	0
			1310	847	213	242	8		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
38	1m	128	Total	C	N	O	0	0
			1062	691	182	189		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
39	1n	172	Total	C	N	O	S	0	0
			1495	956	273	258	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
40	1o	122	Total	C	N	O	S	0	0
			1045	650	198	187	10		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
41	1p	173	Total	C	N	O	S	0	0
			1449	908	263	270	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
42	1q	145	Total	C	N	O	S	0	0
			1212	775	219	213	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
43	1r	96	Total	C	N	O	S	0	0
			767	483	144	137	3		

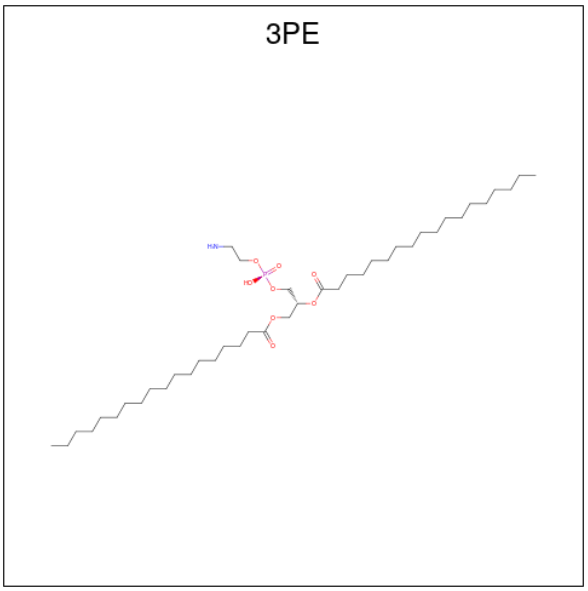
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1r	0	ACE	-	insertion	UNP A0A8W4F7N8

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

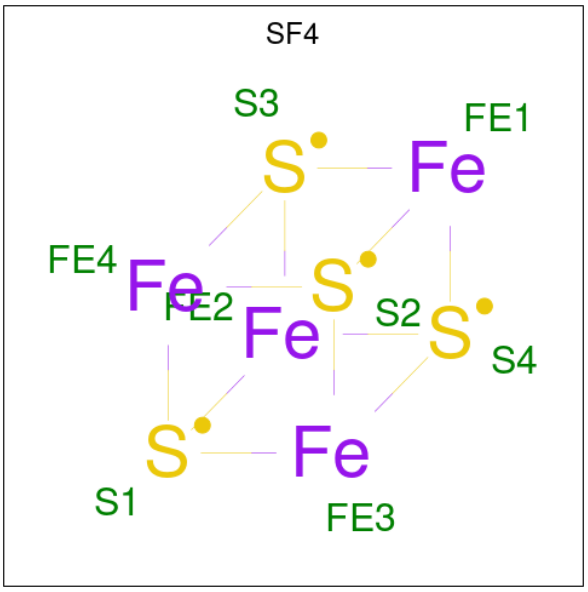
Mol	Chain	Residues	Atoms					AltConf	Trace
44	1s	45	Total	C	N	O	S	0	0
			382	238	70	73	1		

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



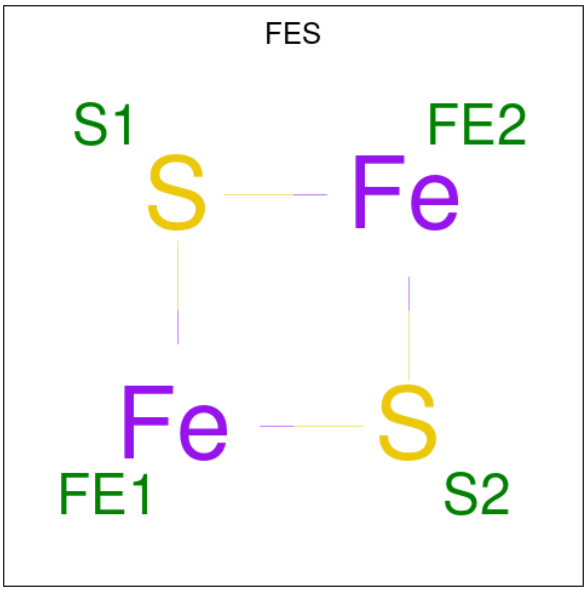
Mol	Chain	Residues	Atoms					AltConf
45	1A	1	Total	C	N	O	P	0
			47	37	1	8	1	
45	1L	1	Total	C	N	O	P	0
			46	36	1	8	1	
45	1L	1	Total	C	N	O	P	0
			31	21	1	8	1	
45	1L	1	Total	C	N	O	P	0
			42	32	1	8	1	
45	1N	1	Total	C	N	O	P	0
			51	41	1	8	1	
45	1Y	1	Total	C	N	O	P	0
			51	41	1	8	1	

- Molecule 46 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



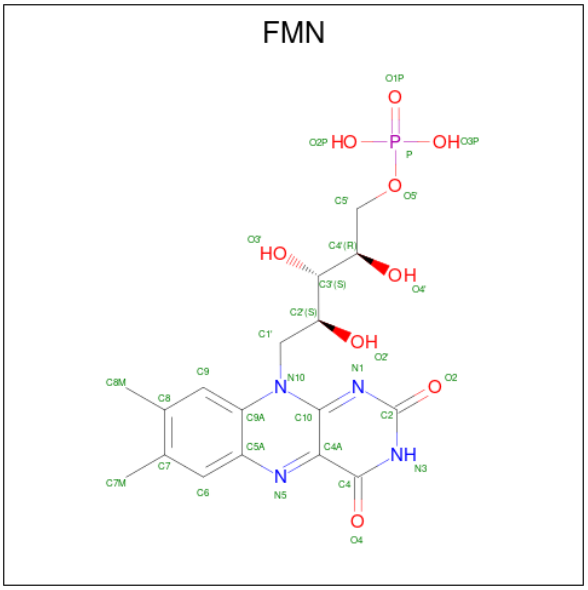
Mol	Chain	Residues	Atoms	AltConf
46	1B	1	Total Fe S 8 4 4	0
46	1F	1	Total Fe S 8 4 4	0
46	1G	1	Total Fe S 8 4 4	0
46	1G	1	Total Fe S 8 4 4	0
46	1I	1	Total Fe S 8 4 4	0
46	1I	1	Total Fe S 8 4 4	0

- Molecule 47 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			AltConf
47	1E	1	Total	Fe	S	0
			4	2	2	
47	1G	1	Total	Fe	S	0
			4	2	2	

- Molecule 48 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).

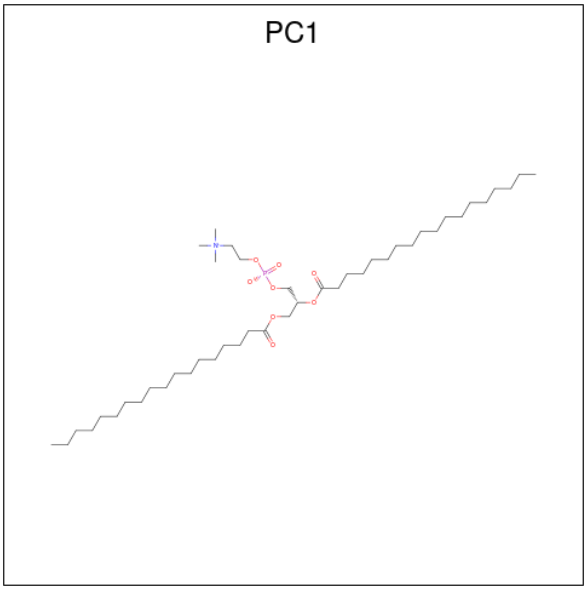


Mol	Chain	Residues	Atoms					AltConf
48	1F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 49 is POTASSIUM ION (three-letter code: K) (formula: K).

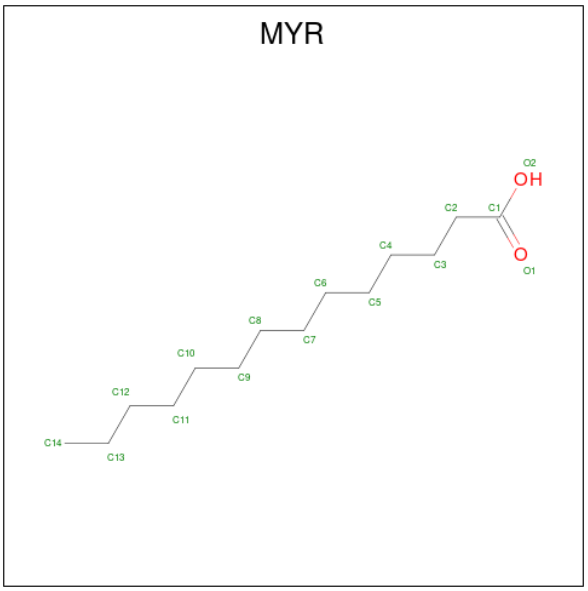
Mol	Chain	Residues	Atoms	AltConf
49	1G	1	Total K 1 1	0

- Molecule 50 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$).



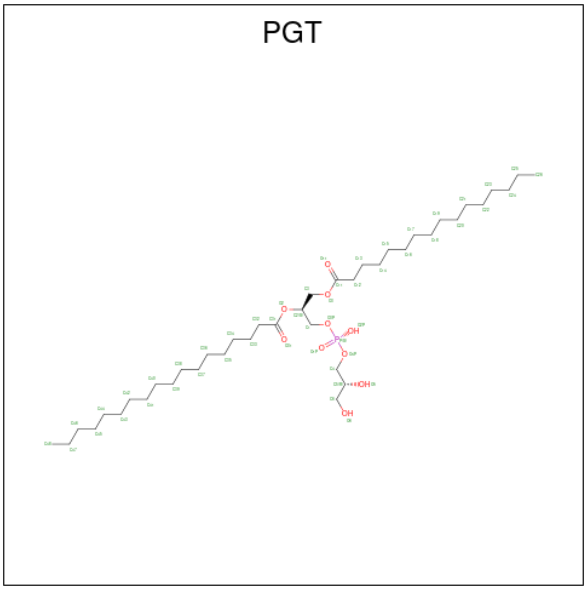
Mol	Chain	Residues	Atoms	AltConf
50	1H	1	Total C N O P 54 44 1 8 1	0
50	1I	1	Total C N O P 44 34 1 8 1	0
50	1J	1	Total C N O P 35 25 1 8 1	0
50	1M	1	Total C N O P 44 34 1 8 1	0
50	1f	1	Total C N O P 46 36 1 8 1	0

- Molecule 51 is MYRISTIC ACID (three-letter code: MYR) (formula: $C_{14}H_{28}O_2$).



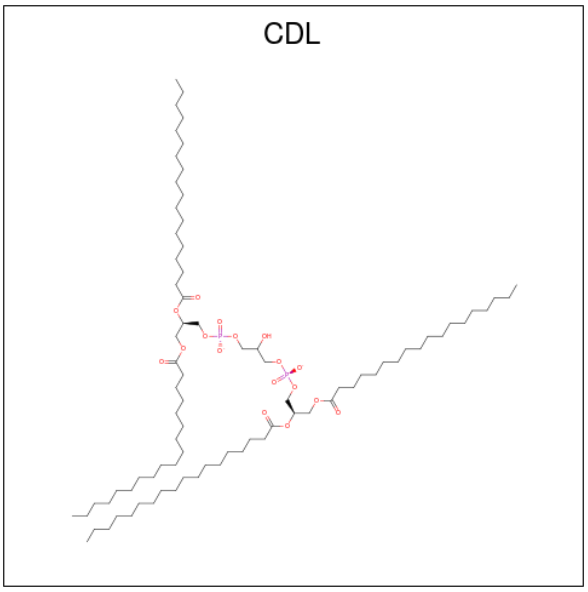
Mol	Chain	Residues	Atoms			AltConf
51	1L	1	Total	C	O	0
			15	14	1	

- Molecule 52 is (1S)-2-{[{[(2R)-2,3-DIHYDROXYPROPYL]OXY}(HYDROXY)PHOSPHORYL]OXY}-1-[(PALMITOYLOXY)METHYL]ETHYL STEARATE (three-letter code: PGT) (formula: $C_{40}H_{79}O_{10}P$).



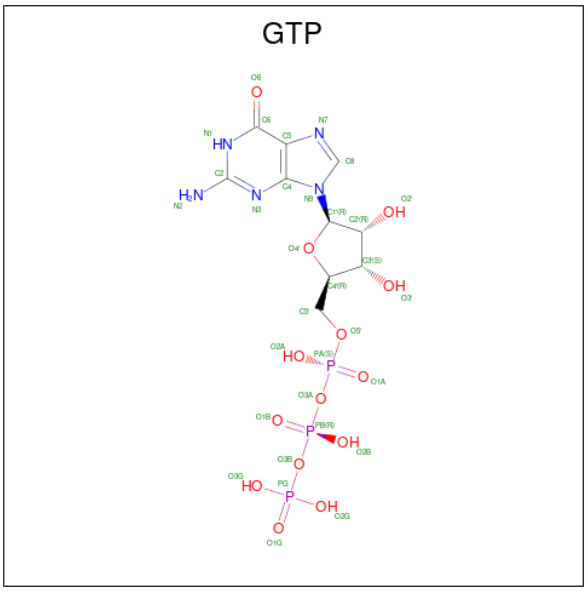
Mol	Chain	Residues	Atoms				AltConf
52	1M	1	Total	C	O	P	0
			51	40	10	1	

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



Mol	Chain	Residues	Atoms				AltConf
53	1N	1	Total	C	O	P	0
			77	58	17	2	
53	1a	1	Total	C	O	P	0
			61	42	17	2	

- Molecule 54 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).

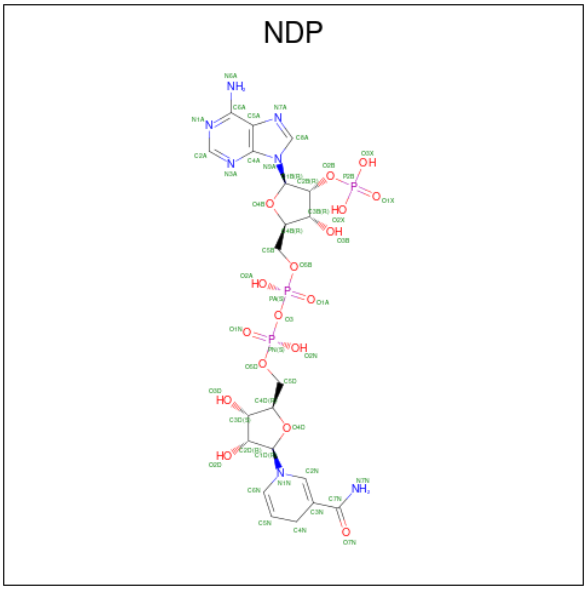


Mol	Chain	Residues	Atoms					AltConf
54	1O	1	Total	C	N	O	P	0
			32	10	5	14	3	

- Molecule 55 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

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

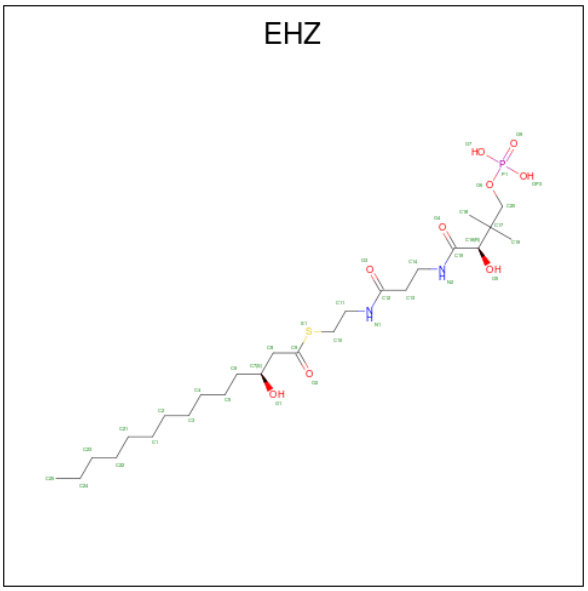


Mol	Chain	Residues	Atoms					AltConf
56	1P	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 57 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
57	1R	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 (three-letter code: EHZ) (formula: $C_{25}H_{49}N_2O_9PS$).



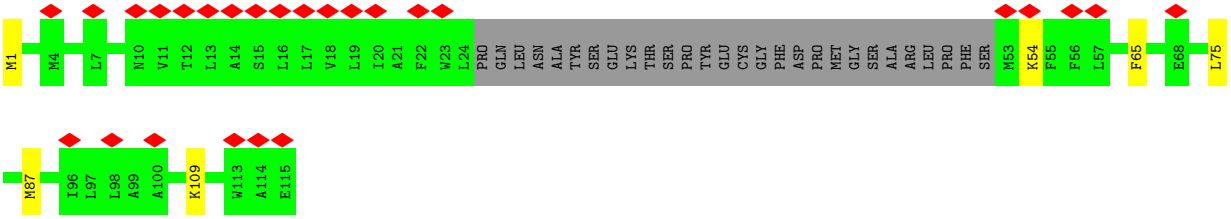
Mol	Chain	Residues	Atoms						AltConf
58	1W	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	
58	1n	1	Total	C	N	O	P	S	0
			37	25	2	8	1	1	

3 Residue-property plots (i)

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

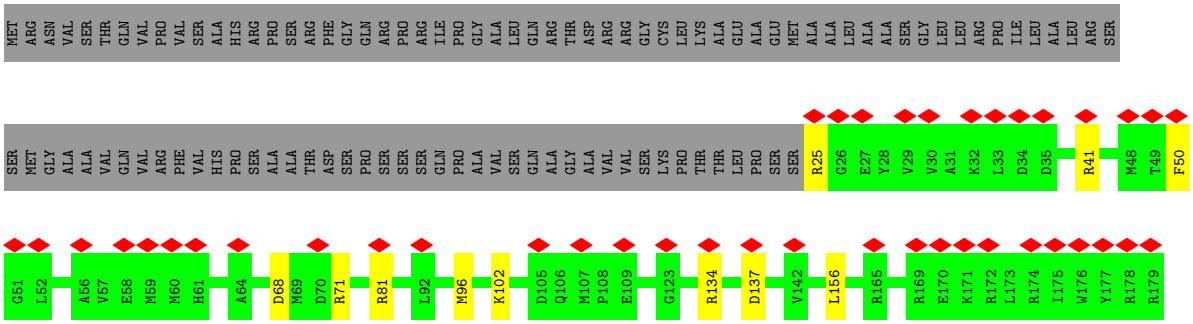
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3

Chain 1A:



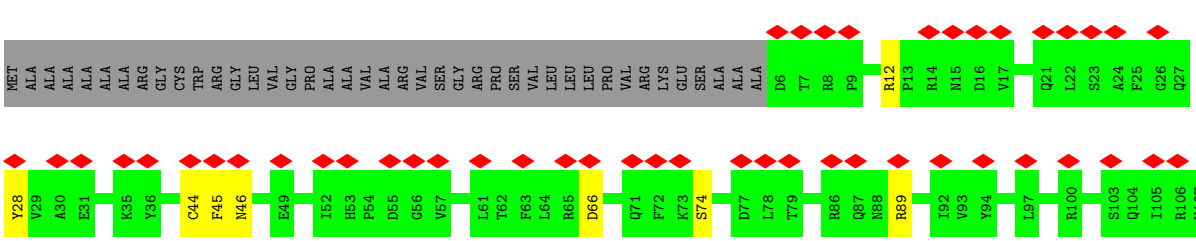
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial

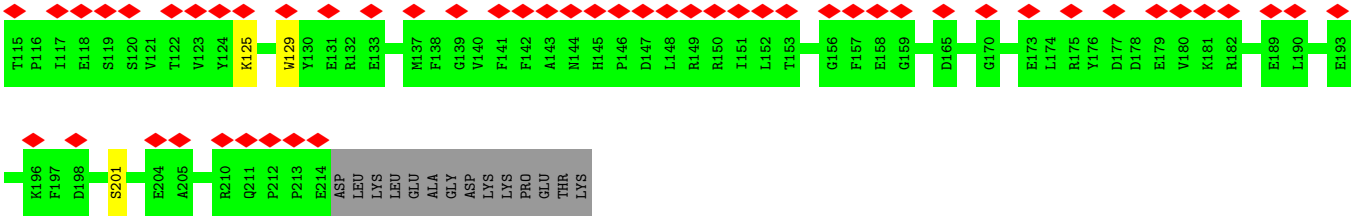
Chain 1B:



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

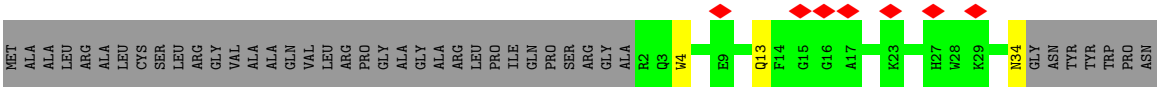
Chain 1C:

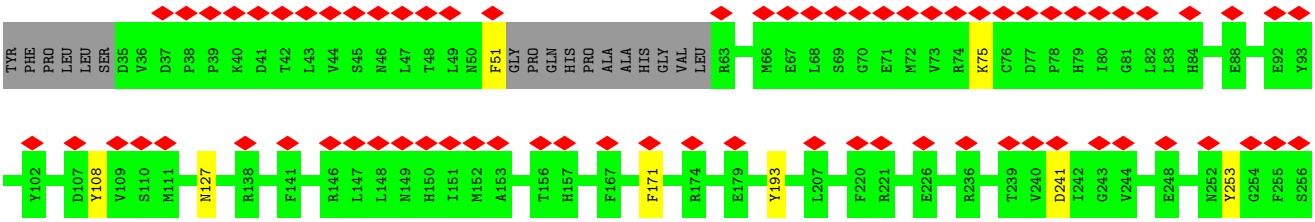




• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial

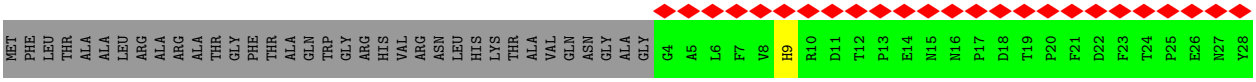
Chain 1D:

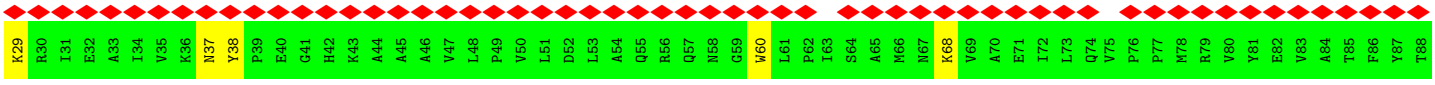


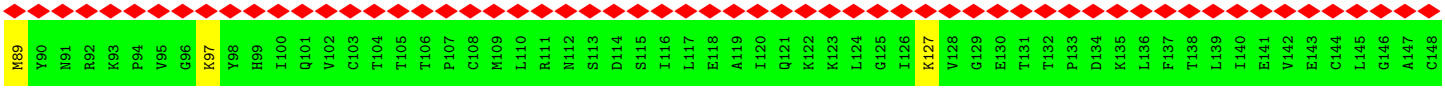


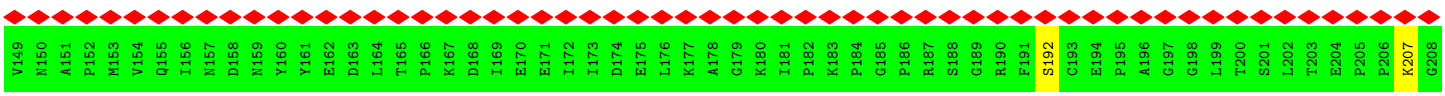
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

Chain 1E:



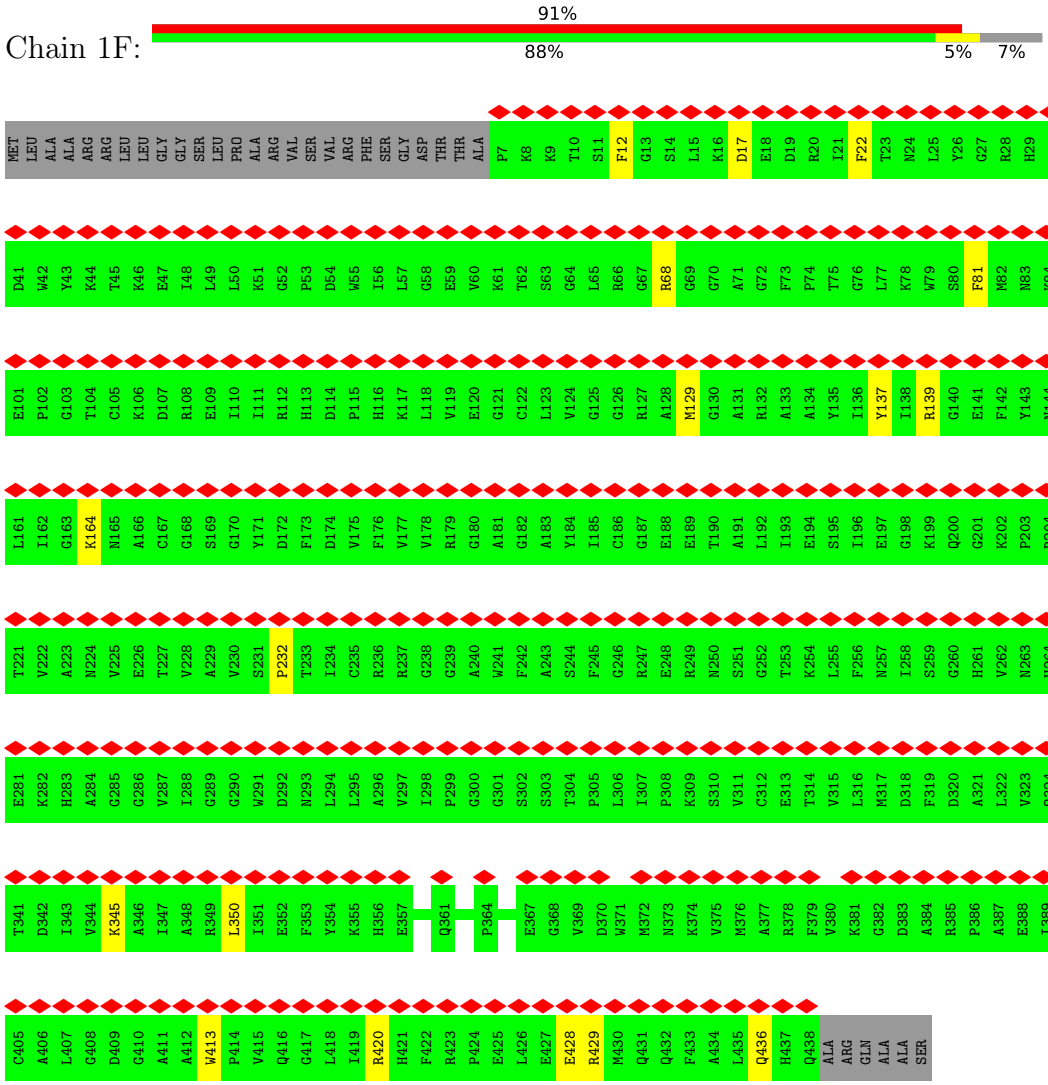






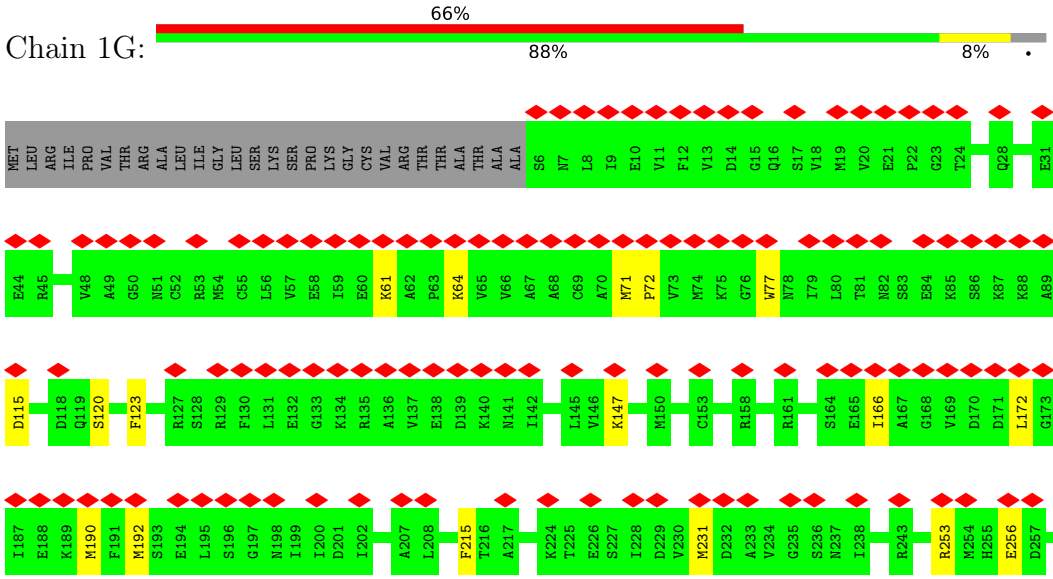
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

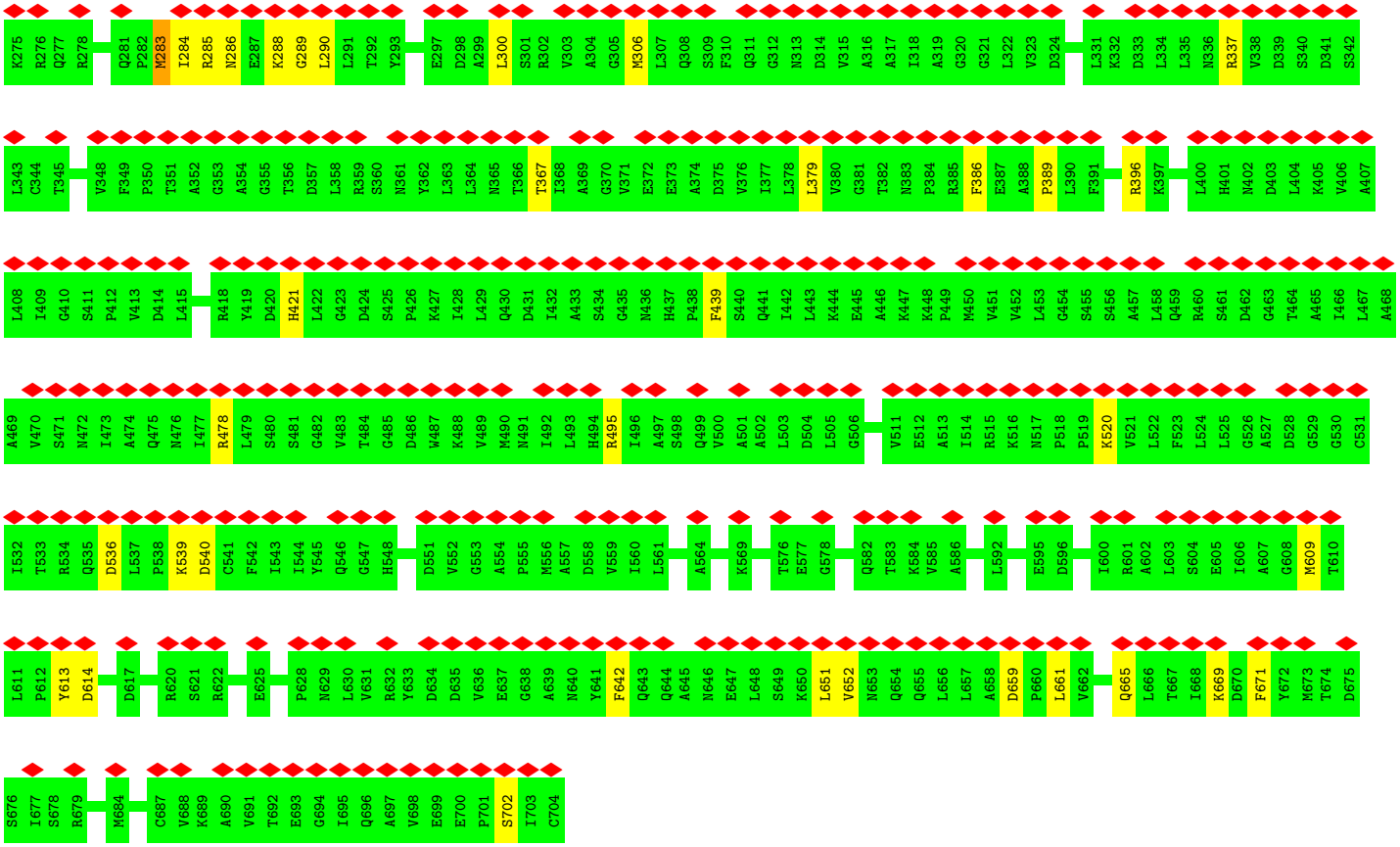
Chain 1F:



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

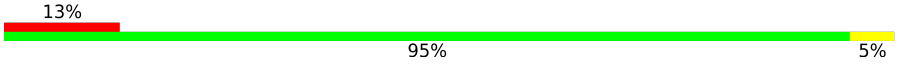
Chain 1G:

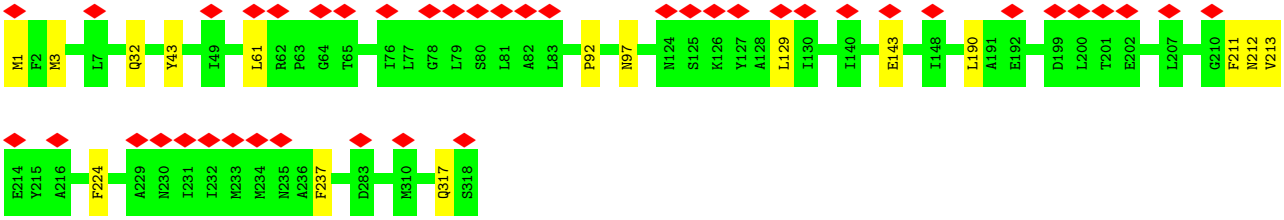




• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

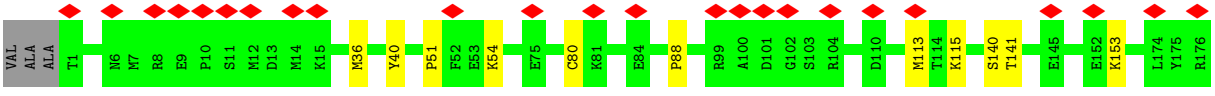
Chain 1H:





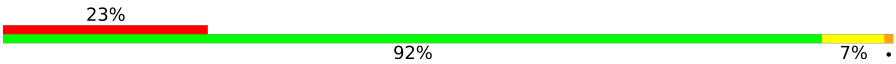
• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial

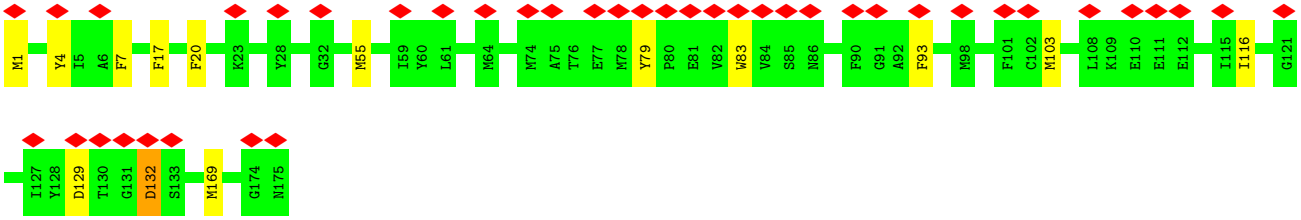
Chain 1I:



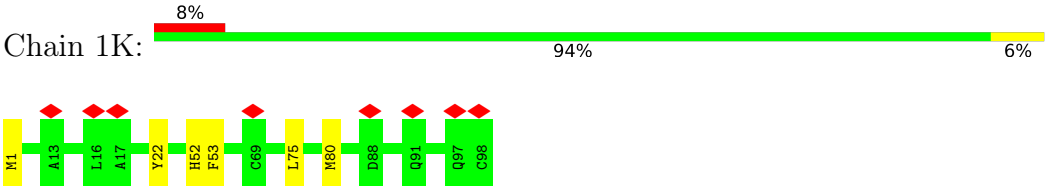
• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

Chain 1J:

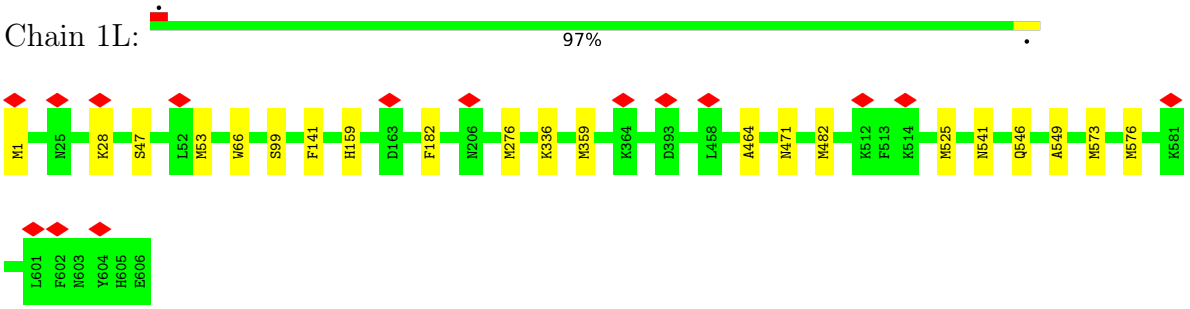




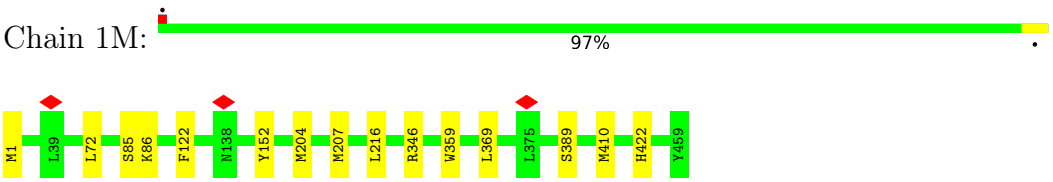
• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L



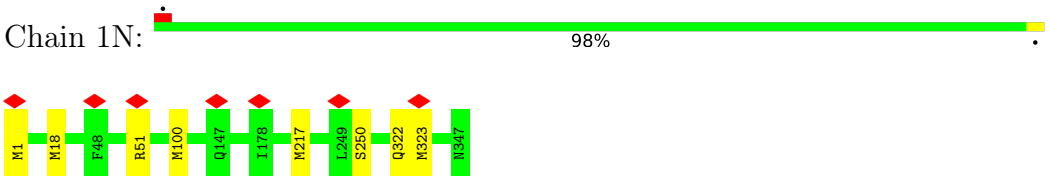
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5



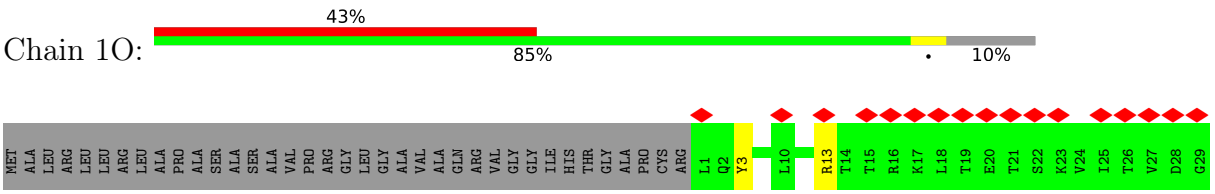
• Molecule 13: NADH-ubiquinone oxidoreductase chain 4

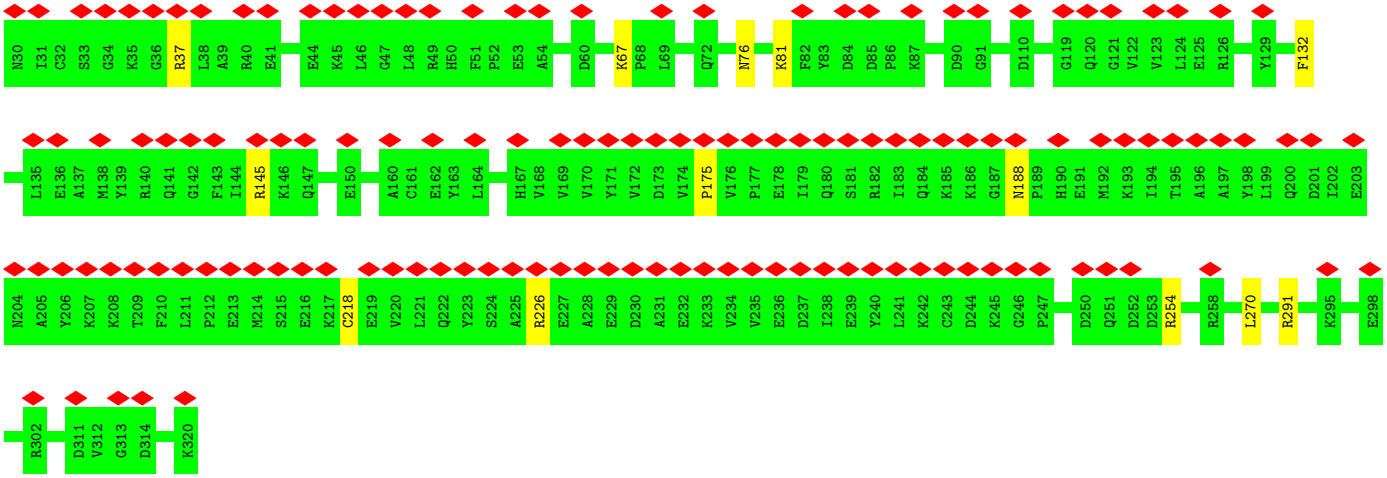


• Molecule 14: NADH-ubiquinone oxidoreductase chain 2



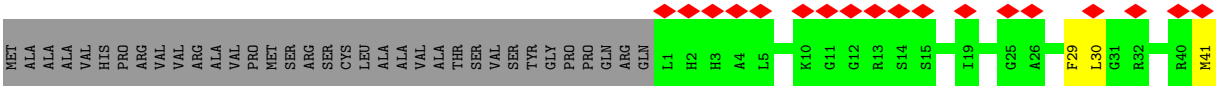
• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial





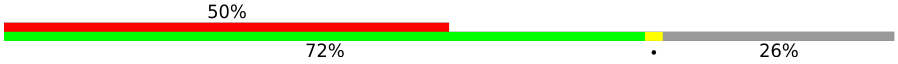
• Molecule 16: NADH:ubiquinone oxidoreductase subunit A9

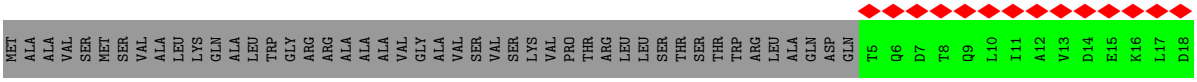
Chain 1P:

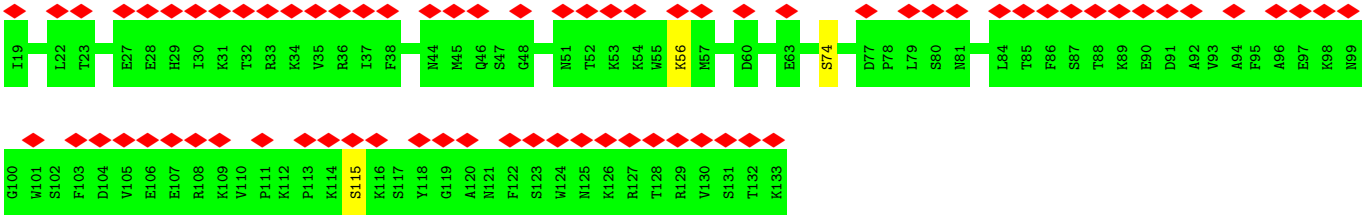


• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

Chain 1Q:

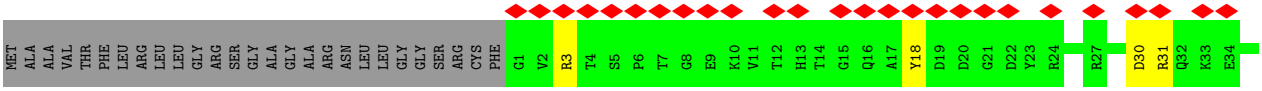


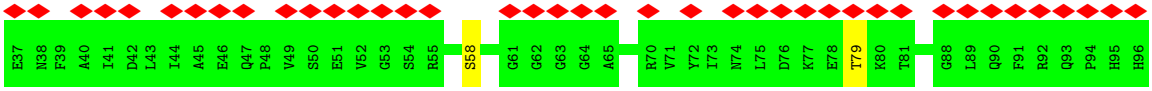




• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

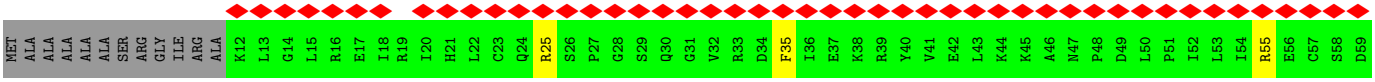
Chain 1R:

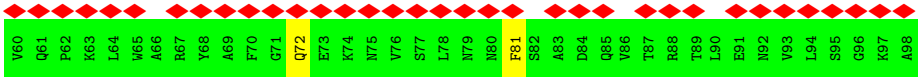




• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

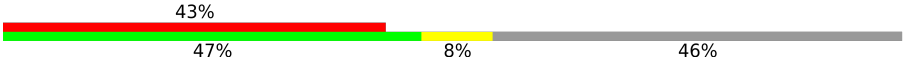
Chain 1S:

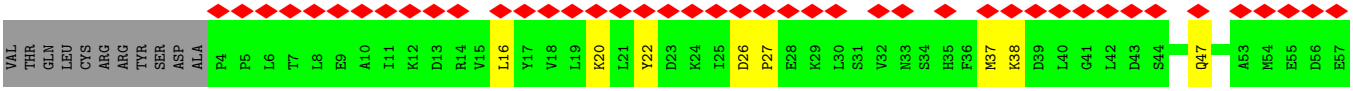


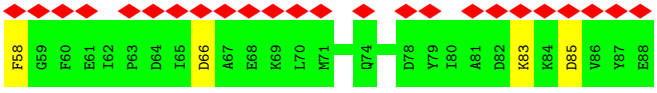


• Molecule 20: NADH:ubiquinone oxidoreductase subunit AB1

Chain 1T:

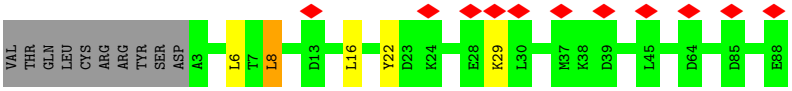






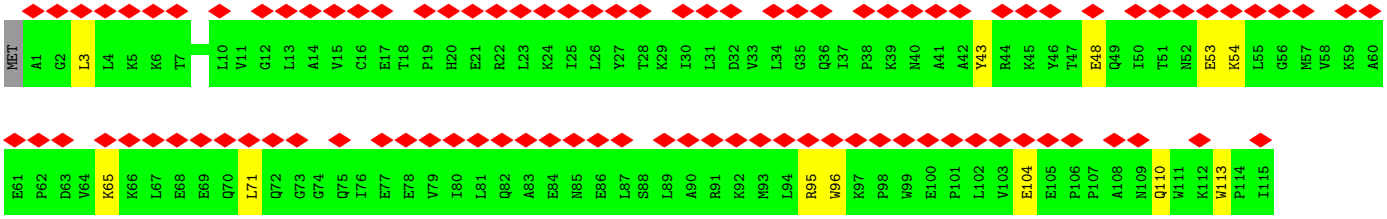
• Molecule 20: NADH:ubiquinone oxidoreductase subunit AB1

Chain 1U:



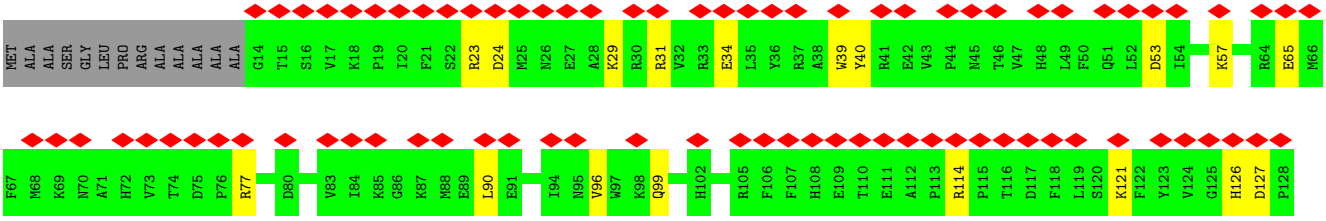
• Molecule 21: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5 isoform X1

Chain 1V:



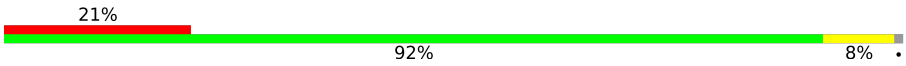
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6

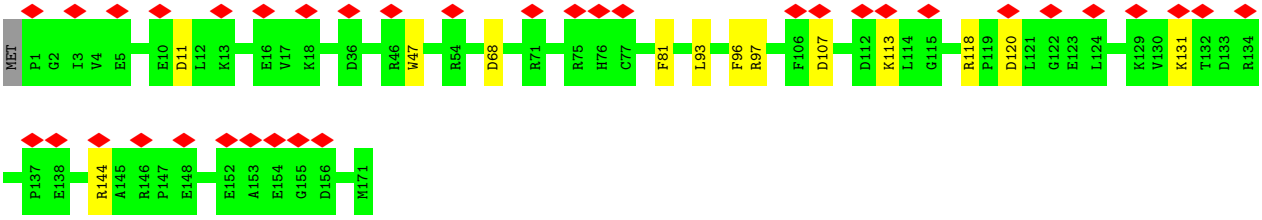
Chain 1W:



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

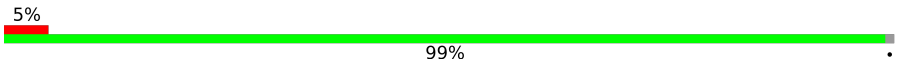
Chain 1X:

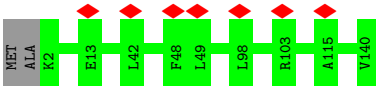




• Molecule 24: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11

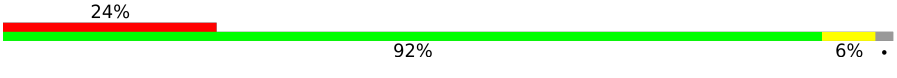
Chain 1Y:

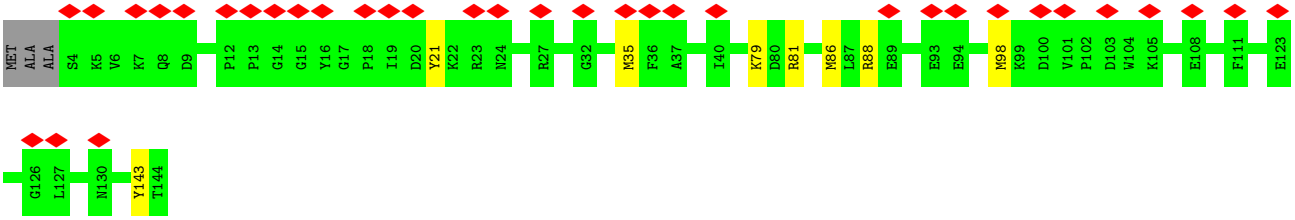




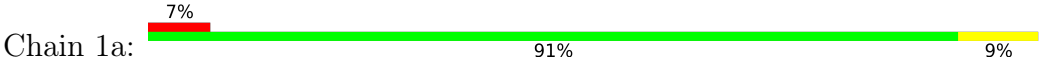
• Molecule 25: NADH:ubiquinone oxidoreductase subunit A13

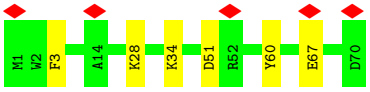
Chain 1Z:



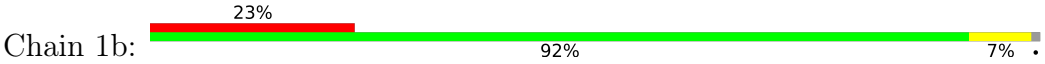


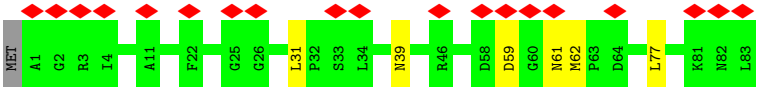
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1



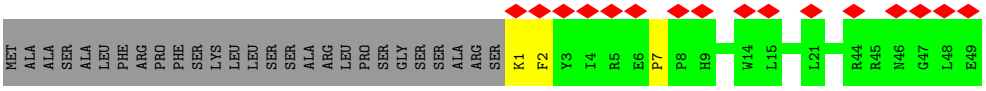


• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3

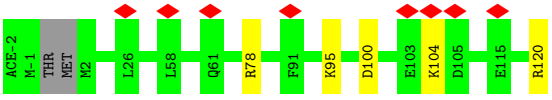




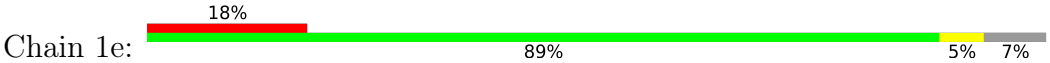
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

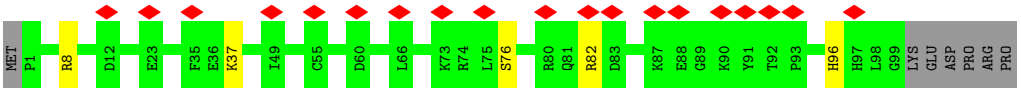


• Molecule 29: NADH dehydrogenase [ubiquinone] 1 subunit C2

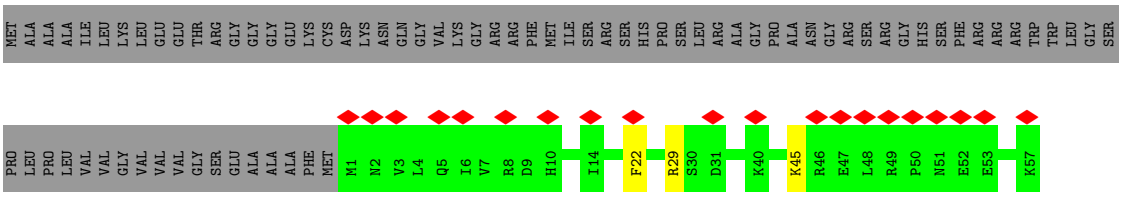


• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5



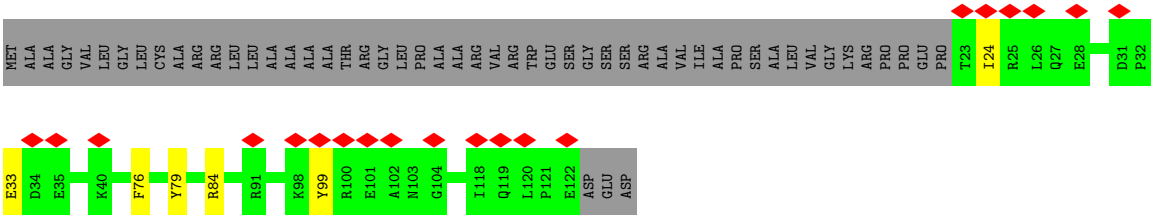


• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1 [Sus scrofa]



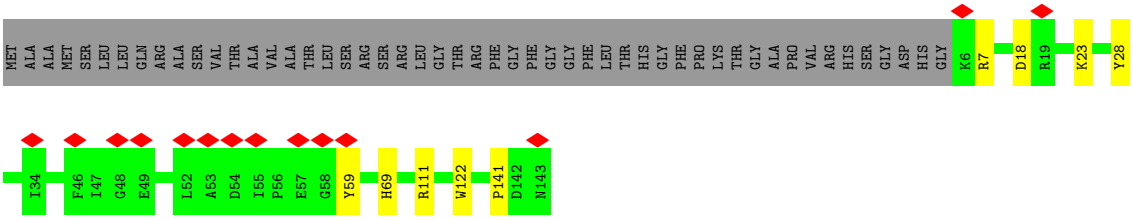
• Molecule 32: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain 1g:



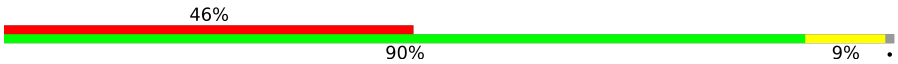
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

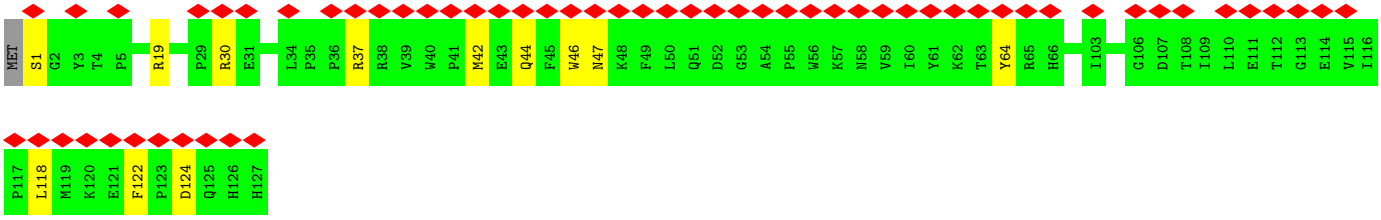
Chain 1h:



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

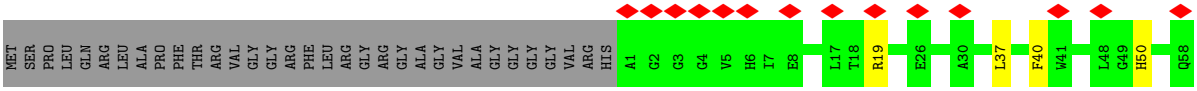
Chain 1i:

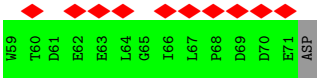




• Molecule 35: NADH:ubiquinone oxidoreductase subunit B2

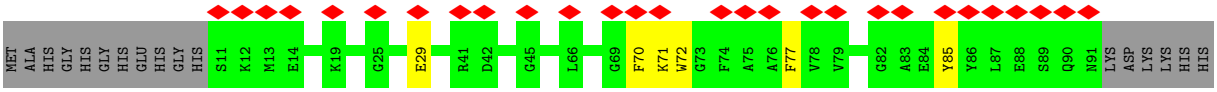
Chain 1j:





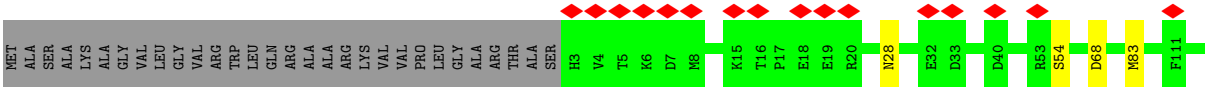
• Molecule 36: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3

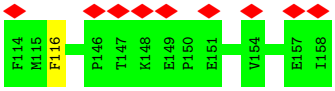
Chain 1k:



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

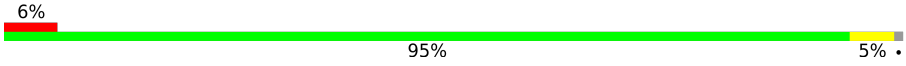
Chain 1l:

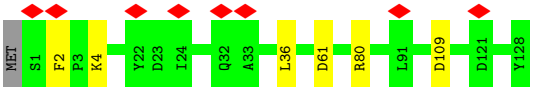




• Molecule 38: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4

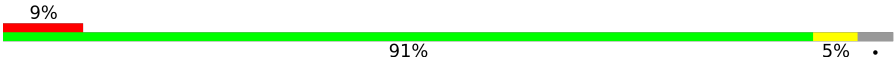
Chain 1m:





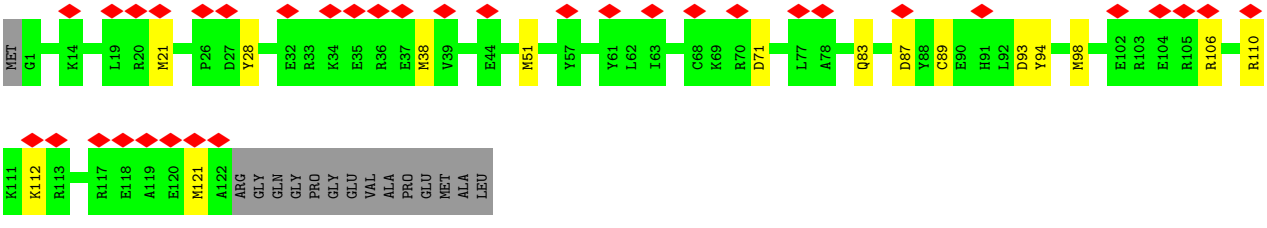
• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

Chain 1n:



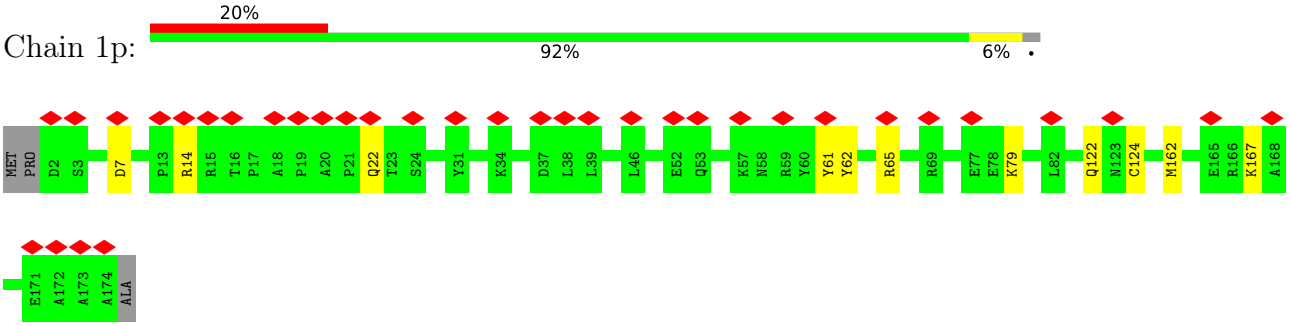
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

Chain 1o:



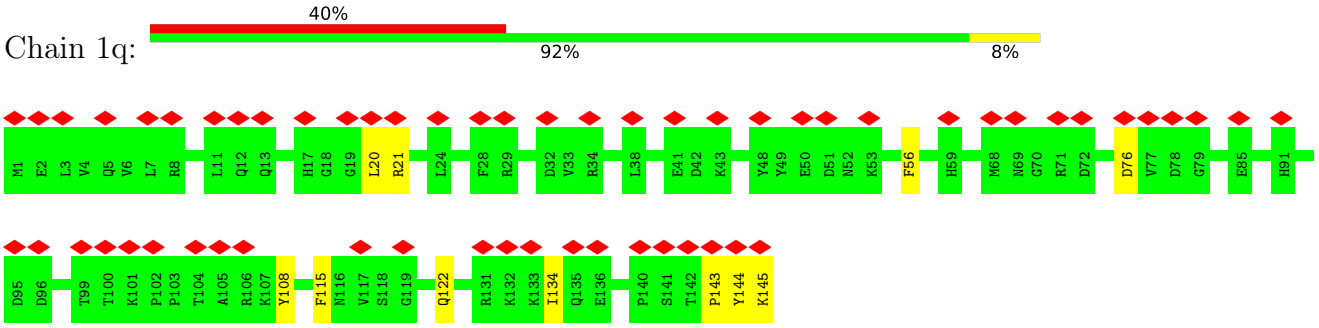
• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

Chain 1p:



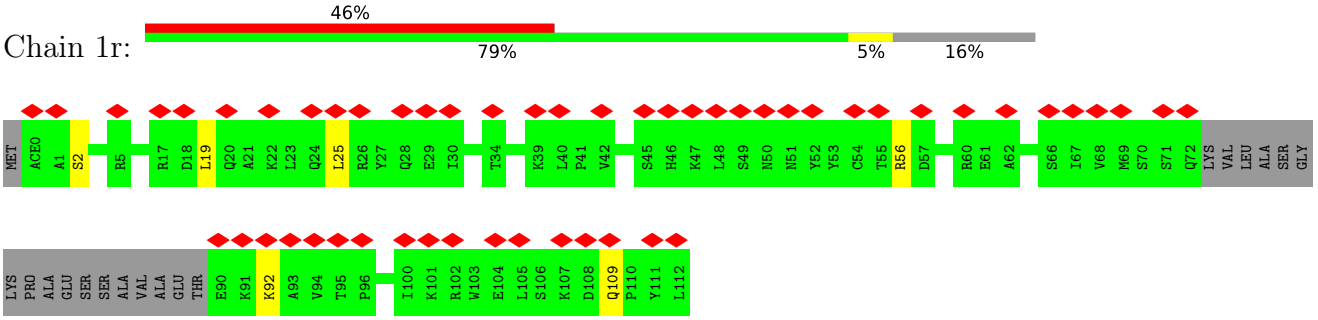
• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

Chain 1q:



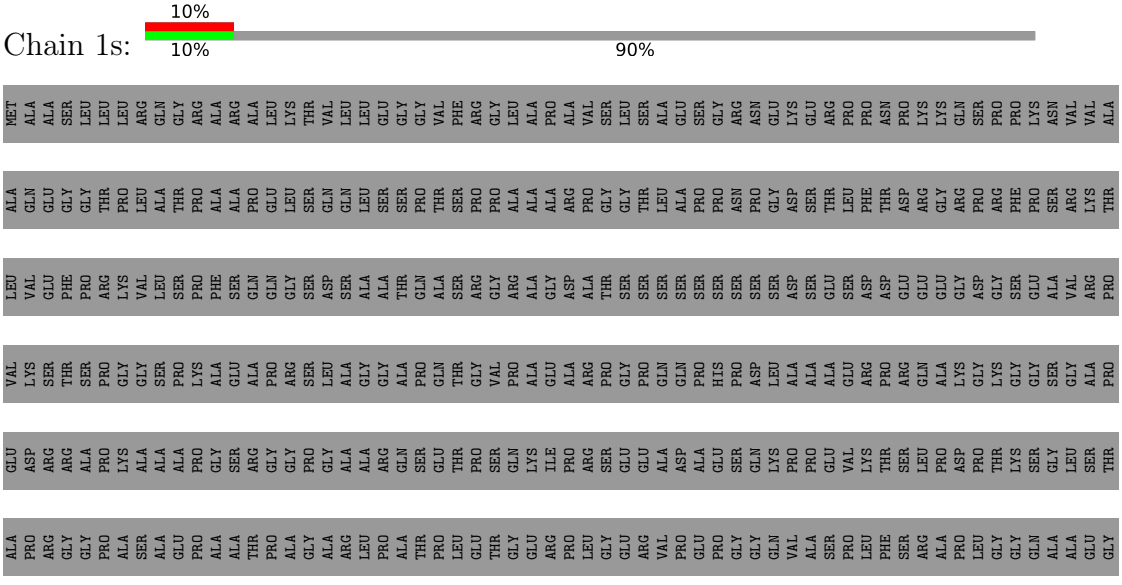
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

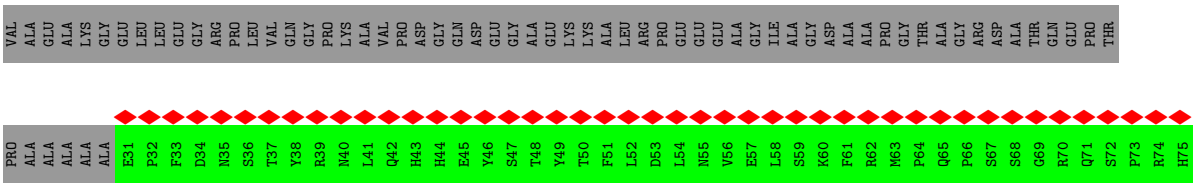
Chain 1r:



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

Chain 1s:




VAL ALA GLU ALA LYS GLY GLU LEU LEU GLU GLY ARG PRO LEU VAL GLN GLY PRO LYS ALA VAL PRO ASP GLY GLN ASP GLU GLY ALA GLU LYS LYS ALA LEU ARG PRO GLU GLU GLU ALA GLY ILE ALA GLY ASP ALA ALA PRO GLY THR ALA GLY ARG ASP ALA THR GLN GLU PRO THR
PRO ALA ALA ALA ALA ALA E31 P32 F33 D34 N35 S36 T37 Y38 R39 N40 L41 Q42 H43 H44 E45 Y46 S47 T48 Y49 T50 F51 L52 D53 L54 N55 V56 E57 L58 S59 K60 F61 R62 M63 P64 Q65 P66 S67 S68 G69 R70 Q71 S72 P73 R74 H75

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	45000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1300	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.935	Depositor
Minimum map value	-0.432	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.026	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	425.6, 425.6, 425.6	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.33, 1.33, 1.33	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, CDL, PGT, SAC, FES, K, MG, EHZ, PC1, SF4, ZN, FME, FMN, MYR, ACE, 3PE, 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	1A	0.25	0/705	0.51	0/963
2	1B	0.32	0/1273	0.60	0/1722
3	1C	0.30	0/1791	0.56	0/2439
4	1D	0.30	0/3464	0.54	0/4692
5	1E	0.27	0/1698	0.52	0/2311
6	1F	0.26	0/3401	0.53	1/4595 (0.0%)
7	1G	0.29	1/5451 (0.0%)	0.60	5/7387 (0.1%)
8	1H	0.29	0/2566	0.54	0/3509
9	1I	0.38	0/1443	0.69	3/1952 (0.2%)
10	1J	0.29	0/1364	0.55	1/1850 (0.1%)
11	1K	0.29	0/751	0.58	0/1018
12	1L	0.28	0/4939	0.49	0/6718
13	1M	0.27	0/3713	0.48	0/5063
14	1N	0.27	0/2765	0.51	0/3758
15	1O	0.27	0/2650	0.53	1/3588 (0.0%)
16	1P	0.28	0/2828	0.56	1/3834 (0.0%)
17	1Q	0.29	0/1070	0.60	0/1446
18	1R	0.28	0/755	0.56	0/1018
19	1S	0.28	0/711	0.71	1/956 (0.1%)
20	1T	0.33	0/701	0.72	2/946 (0.2%)
20	1U	0.27	0/706	0.55	1/954 (0.1%)
21	1V	0.26	0/946	0.59	0/1281
22	1W	0.30	0/995	0.63	0/1340
23	1X	0.26	0/1436	0.52	0/1938
24	1Y	0.29	0/1037	0.48	0/1404
25	1Z	0.28	0/1199	0.54	0/1617
26	1a	0.28	0/577	0.52	0/777
27	1b	0.29	0/664	0.55	0/912
28	1c	0.28	0/430	0.57	1/581 (0.2%)
29	1d	0.29	0/1024	0.52	0/1383
30	1e	0.27	0/836	0.53	0/1118
31	1f	0.24	0/499	0.62	0/673

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	1g	0.28	0/858	0.56	0/1165
33	1h	0.34	0/1184	0.63	2/1603 (0.1%)
34	1i	0.28	0/1131	0.58	0/1541
35	1j	0.25	0/627	0.51	0/858
36	1k	0.27	0/668	0.52	0/903
37	1l	0.27	0/1365	0.50	0/1867
38	1m	0.28	0/1092	0.53	1/1481 (0.1%)
39	1n	0.27	0/1549	0.52	0/2098
40	1o	0.28	0/1069	0.55	0/1430
41	1p	0.27	0/1481	0.52	0/1997
42	1q	0.32	0/1253	0.64	2/1704 (0.1%)
43	1r	0.29	0/782	0.65	0/1057
44	1s	0.25	0/394	0.52	0/533
All	All	0.28	1/67841 (0.0%)	0.55	22/91980 (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
6	1F	0	1
7	1G	0	2
13	1M	0	1
21	1V	0	1
All	All	0	5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	1G	389	PRO	CG-CD	-5.26	1.33	1.50

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
33	1h	141	PRO	CA-N-CD	-10.69	96.53	111.50
9	1I	51	PRO	CA-N-CD	-10.46	96.86	111.50
9	1I	51	PRO	N-CD-CG	-9.48	88.98	103.20
20	1T	27	PRO	CA-N-CD	-9.46	98.26	111.50
7	1G	389	PRO	CA-N-CD	-8.39	99.75	111.50
9	1I	51	PRO	CA-CB-CG	-8.37	88.11	104.00
15	1O	175	PRO	CA-N-CD	-7.58	100.89	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	1G	389	PRO	N-CD-CG	-6.87	92.89	103.20
33	1h	141	PRO	N-CD-CG	-6.85	92.93	103.20
19	1S	25	ARG	CA-CB-CG	6.23	127.11	113.40
6	1F	232	PRO	CA-N-CD	-6.09	102.97	111.50
7	1G	289	GLY	N-CA-C	6.04	128.19	113.10
7	1G	290	LEU	CA-CB-CG	5.64	128.26	115.30
20	1T	27	PRO	N-CD-CG	-5.62	94.76	103.20
7	1G	283	MET	CA-CB-CG	5.61	122.84	113.30
16	1P	48	PRO	CA-N-CD	-5.59	103.68	111.50
20	1U	8	LEU	CA-CB-CG	5.44	127.82	115.30
42	1q	76	ASP	CB-CG-OD1	5.39	123.16	118.30
42	1q	143	PRO	CA-N-CD	-5.35	104.01	111.50
10	1J	132	ASP	CB-CG-OD1	5.34	123.11	118.30
28	1c	7	PRO	CA-N-CD	-5.20	104.22	111.50
38	1m	36	LEU	CA-CB-CG	5.19	127.25	115.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
6	1F	206	LYS	Peptide
7	1G	284	ILE	Peptide
7	1G	286	ASN	Peptide
13	1M	207	MET	Peptide
21	1V	113	TRP	Peptide

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	1A	83/115 (72%)	78 (94%)	3 (4%)	2 (2%)	6 35
2	1B	153/258 (59%)	140 (92%)	13 (8%)	0	100 100
3	1C	207/264 (78%)	192 (93%)	15 (7%)	0	100 100
4	1D	414/476 (87%)	380 (92%)	34 (8%)	0	100 100
5	1E	212/249 (85%)	193 (91%)	19 (9%)	0	100 100
6	1F	430/464 (93%)	397 (92%)	33 (8%)	0	100 100
7	1G	697/727 (96%)	620 (89%)	71 (10%)	6 (1%)	17 54
8	1H	316/318 (99%)	290 (92%)	24 (8%)	2 (1%)	25 62
9	1I	174/239 (73%)	164 (94%)	10 (6%)	0	100 100
10	1J	173/175 (99%)	160 (92%)	12 (7%)	1 (1%)	25 62
11	1K	96/98 (98%)	90 (94%)	6 (6%)	0	100 100
12	1L	604/606 (100%)	557 (92%)	44 (7%)	3 (0%)	29 66
13	1M	457/459 (100%)	436 (95%)	20 (4%)	1 (0%)	47 78
14	1N	345/347 (99%)	326 (94%)	19 (6%)	0	100 100
15	1O	318/357 (89%)	288 (91%)	30 (9%)	0	100 100
16	1P	340/377 (90%)	304 (89%)	35 (10%)	1 (0%)	41 74
17	1Q	127/175 (73%)	115 (91%)	12 (9%)	0	100 100
18	1R	94/123 (76%)	83 (88%)	10 (11%)	1 (1%)	14 50
19	1S	85/99 (86%)	77 (91%)	8 (9%)	0	100 100
20	1T	83/156 (53%)	76 (92%)	7 (8%)	0	100 100
20	1U	84/156 (54%)	79 (94%)	5 (6%)	0	100 100
21	1V	113/116 (97%)	99 (88%)	14 (12%)	0	100 100
22	1W	113/128 (88%)	106 (94%)	6 (5%)	1 (1%)	17 54
23	1X	169/172 (98%)	160 (95%)	9 (5%)	0	100 100
24	1Y	137/141 (97%)	129 (94%)	8 (6%)	0	100 100
25	1Z	139/144 (96%)	126 (91%)	13 (9%)	0	100 100
26	1a	68/70 (97%)	63 (93%)	5 (7%)	0	100 100
27	1b	81/84 (96%)	77 (95%)	4 (5%)	0	100 100
28	1c	47/76 (62%)	45 (96%)	2 (4%)	0	100 100
29	1d	117/123 (95%)	109 (93%)	8 (7%)	0	100 100
30	1e	97/106 (92%)	94 (97%)	3 (3%)	0	100 100
31	1f	55/135 (41%)	47 (86%)	8 (14%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
32	1g	98/154 (64%)	89 (91%)	8 (8%)	1 (1%)	15 51
33	1h	136/189 (72%)	132 (97%)	4 (3%)	0	100 100
34	1i	124/128 (97%)	113 (91%)	11 (9%)	0	100 100
35	1j	69/105 (66%)	63 (91%)	5 (7%)	1 (1%)	11 45
36	1k	79/98 (81%)	73 (92%)	6 (8%)	0	100 100
37	1l	154/186 (83%)	141 (92%)	13 (8%)	0	100 100
38	1m	126/129 (98%)	116 (92%)	10 (8%)	0	100 100
39	1n	170/179 (95%)	163 (96%)	7 (4%)	0	100 100
40	1o	120/137 (88%)	117 (98%)	3 (2%)	0	100 100
41	1p	171/176 (97%)	168 (98%)	3 (2%)	0	100 100
42	1q	143/145 (99%)	131 (92%)	11 (8%)	1 (1%)	22 59
43	1r	90/114 (79%)	82 (91%)	8 (9%)	0	100 100
44	1s	43/471 (9%)	37 (86%)	6 (14%)	0	100 100
All	All	8151/9744 (84%)	7525 (92%)	605 (7%)	21 (0%)	44 74

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	1A	109	LYS
7	1G	652	VAL
7	1G	671	PHE
8	1H	92	PRO
12	1L	464	ALA
13	1M	85	SER
16	1P	222	ASP
18	1R	79	THR
32	1g	24	ILE
1	1A	75	LEU
8	1H	213	VAL
10	1J	116	ILE
12	1L	549	ALA
7	1G	166	ILE
7	1G	256	GLU
7	1G	72	PRO
12	1L	159	HIS
42	1q	134	ILE
7	1G	367	THR

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Mol	Chain	Res	Type
35	1j	50	HIS
22	1W	96	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	1A	75/99 (76%)	72 (96%)	3 (4%)	31	60
2	1B	131/212 (62%)	120 (92%)	11 (8%)	11	40
3	1C	190/227 (84%)	179 (94%)	11 (6%)	20	52
4	1D	364/405 (90%)	351 (96%)	13 (4%)	35	63
5	1E	183/207 (88%)	172 (94%)	11 (6%)	19	50
6	1F	346/368 (94%)	326 (94%)	20 (6%)	20	52
7	1G	588/610 (96%)	542 (92%)	46 (8%)	12	42
8	1H	274/274 (100%)	261 (95%)	13 (5%)	26	56
9	1I	151/201 (75%)	141 (93%)	10 (7%)	16	48
10	1J	140/140 (100%)	128 (91%)	12 (9%)	10	39
11	1K	84/84 (100%)	79 (94%)	5 (6%)	19	50
12	1L	539/539 (100%)	522 (97%)	17 (3%)	39	65
13	1M	408/408 (100%)	396 (97%)	12 (3%)	42	66
14	1N	310/310 (100%)	303 (98%)	7 (2%)	50	71
15	1O	283/307 (92%)	269 (95%)	14 (5%)	25	56
16	1P	296/323 (92%)	273 (92%)	23 (8%)	12	42
17	1Q	117/152 (77%)	114 (97%)	3 (3%)	46	69
18	1R	79/97 (81%)	74 (94%)	5 (6%)	18	49
19	1S	77/82 (94%)	73 (95%)	4 (5%)	23	55
20	1T	79/133 (59%)	68 (86%)	11 (14%)	3	20
20	1U	79/133 (59%)	74 (94%)	5 (6%)	18	49
21	1V	100/101 (99%)	89 (89%)	11 (11%)	6	29

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
22	1W	107/112 (96%)	90 (84%)	17 (16%)	2 16
23	1X	153/154 (99%)	140 (92%)	13 (8%)	10 40
24	1Y	101/102 (99%)	101 (100%)	0	100 100
25	1Z	123/124 (99%)	115 (94%)	8 (6%)	17 48
26	1a	58/58 (100%)	52 (90%)	6 (10%)	7 31
27	1b	69/70 (99%)	63 (91%)	6 (9%)	10 38
28	1c	45/66 (68%)	43 (96%)	2 (4%)	28 58
29	1d	107/109 (98%)	102 (95%)	5 (5%)	26 56
30	1e	87/94 (93%)	82 (94%)	5 (6%)	20 52
31	1f	54/113 (48%)	51 (94%)	3 (6%)	21 53
32	1g	92/129 (71%)	87 (95%)	5 (5%)	22 54
33	1h	121/158 (77%)	113 (93%)	8 (7%)	16 48
34	1i	119/120 (99%)	108 (91%)	11 (9%)	9 36
35	1j	62/84 (74%)	59 (95%)	3 (5%)	25 56
36	1k	63/76 (83%)	57 (90%)	6 (10%)	8 34
37	1l	141/161 (88%)	136 (96%)	5 (4%)	36 63
38	1m	113/114 (99%)	108 (96%)	5 (4%)	28 58
39	1n	156/160 (98%)	147 (94%)	9 (6%)	20 52
40	1o	110/120 (92%)	95 (86%)	15 (14%)	3 21
41	1p	154/156 (99%)	143 (93%)	11 (7%)	14 45
42	1q	131/131 (100%)	123 (94%)	8 (6%)	18 50
43	1r	85/98 (87%)	79 (93%)	6 (7%)	14 45
44	1s	44/351 (12%)	44 (100%)	0	100 100
All	All	7188/8272 (87%)	6764 (94%)	424 (6%)	23 51

All (424) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1A	54	LYS
1	1A	65	PHE
1	1A	87	MET
2	1B	25	ARG
2	1B	41	ARG
2	1B	50	PHE

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Mol	Chain	Res	Type
2	1B	68	ASP
2	1B	71	ARG
2	1B	81	ARG
2	1B	96	MET
2	1B	102	LYS
2	1B	134	ARG
2	1B	137	ASP
2	1B	156	LEU
3	1C	12	ARG
3	1C	28	TYR
3	1C	44	CYS
3	1C	45	PHE
3	1C	46	ASN
3	1C	66	ASP
3	1C	74	SER
3	1C	89	ARG
3	1C	125	LYS
3	1C	129	TRP
3	1C	201	SER
4	1D	4	TRP
4	1D	13	GLN
4	1D	34	ASN
4	1D	51	PHE
4	1D	75	LYS
4	1D	108	TYR
4	1D	127	ASN
4	1D	171	PHE
4	1D	193	TYR
4	1D	241	ASP
4	1D	253	TYR
4	1D	388	ARG
4	1D	389	CYS
5	1E	9	HIS
5	1E	29	LYS
5	1E	37	ASN
5	1E	38	TYR
5	1E	60	TRP
5	1E	68	LYS
5	1E	89	MET
5	1E	97	LYS
5	1E	127	LYS
5	1E	192	SER

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Mol	Chain	Res	Type
5	1E	207	LYS
6	1F	12	PHE
6	1F	17	ASP
6	1F	22	PHE
6	1F	31	TRP
6	1F	68	ARG
6	1F	81	PHE
6	1F	129	MET
6	1F	137	TYR
6	1F	139	ARG
6	1F	148	ASN
6	1F	157	TYR
6	1F	164	LYS
6	1F	345	LYS
6	1F	350	LEU
6	1F	402	HIS
6	1F	413	TRP
6	1F	420	ARG
6	1F	428	GLU
6	1F	429	ARG
6	1F	436	GLN
7	1G	32	LYS
7	1G	36	GLN
7	1G	61	LYS
7	1G	64	LYS
7	1G	71	MET
7	1G	77	TRP
7	1G	115	ASP
7	1G	120	SER
7	1G	123	PHE
7	1G	147	LYS
7	1G	172	LEU
7	1G	177	ARG
7	1G	190	MET
7	1G	192	MET
7	1G	215	PHE
7	1G	231	MET
7	1G	253	ARG
7	1G	262	TRP
7	1G	271	TYR
7	1G	283	MET
7	1G	285	ARG

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Mol	Chain	Res	Type
7	1G	288	LYS
7	1G	300	LEU
7	1G	306	MET
7	1G	337	ARG
7	1G	379	LEU
7	1G	386	PHE
7	1G	396	ARG
7	1G	421	HIS
7	1G	439	PHE
7	1G	478	ARG
7	1G	495	ARG
7	1G	520	LYS
7	1G	536	ASP
7	1G	539	LYS
7	1G	540	ASP
7	1G	609	MET
7	1G	613	TYR
7	1G	614	ASP
7	1G	642	PHE
7	1G	651	LEU
7	1G	659	ASP
7	1G	661	LEU
7	1G	665	GLN
7	1G	669	LYS
7	1G	702	SER
8	1H	3	MET
8	1H	32	GLN
8	1H	43	TYR
8	1H	61	LEU
8	1H	97	ASN
8	1H	129	LEU
8	1H	143	GLU
8	1H	190	LEU
8	1H	211	PHE
8	1H	212	ASN
8	1H	224	PHE
8	1H	237	PHE
8	1H	317	GLN
9	1I	36	MET
9	1I	40	TYR
9	1I	54	LYS
9	1I	80	CYS

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Mol	Chain	Res	Type
9	1I	88	PRO
9	1I	113	MET
9	1I	115	LYS
9	1I	140	SER
9	1I	141	THR
9	1I	153	LYS
10	1J	4	TYR
10	1J	7	PHE
10	1J	17	PHE
10	1J	20	PHE
10	1J	55	MET
10	1J	79	TYR
10	1J	83	TRP
10	1J	93	PHE
10	1J	103	MET
10	1J	129	ASP
10	1J	132	ASP
10	1J	169	MET
11	1K	22	TYR
11	1K	52	HIS
11	1K	53	PHE
11	1K	75	LEU
11	1K	80	MET
12	1L	28	LYS
12	1L	47	SER
12	1L	53	MET
12	1L	66	TRP
12	1L	99	SER
12	1L	141	PHE
12	1L	182	PHE
12	1L	276	MET
12	1L	336	LYS
12	1L	359	MET
12	1L	471	ASN
12	1L	482	MET
12	1L	525	MET
12	1L	541	ASN
12	1L	546	GLN
12	1L	573	MET
12	1L	576	MET
13	1M	72	LEU
13	1M	86	LYS

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Mol	Chain	Res	Type
13	1M	122	PHE
13	1M	152	TYR
13	1M	204	MET
13	1M	216	LEU
13	1M	346	ARG
13	1M	359	TRP
13	1M	369	LEU
13	1M	389	SER
13	1M	410	MET
13	1M	422	HIS
14	1N	18	MET
14	1N	51	ARG
14	1N	100	MET
14	1N	217	MET
14	1N	250	SER
14	1N	322	GLN
14	1N	323	MET
15	1O	3	TYR
15	1O	13	ARG
15	1O	37	ARG
15	1O	67	LYS
15	1O	76	ASN
15	1O	81	LYS
15	1O	132	PHE
15	1O	145	ARG
15	1O	188	ASN
15	1O	218	CYS
15	1O	226	ARG
15	1O	254	ARG
15	1O	270	LEU
15	1O	291	ARG
16	1P	29	PHE
16	1P	30	LEU
16	1P	41	MET
16	1P	49	TYR
16	1P	50	ARG
16	1P	57	MET
16	1P	73	TRP
16	1P	82	ARG
16	1P	89	ASN
16	1P	107	GLU
16	1P	115	HIS

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Mol	Chain	Res	Type
16	1P	122	LYS
16	1P	154	LYS
16	1P	181	TYR
16	1P	182	PHE
16	1P	209	ASP
16	1P	239	PHE
16	1P	240	ASP
16	1P	250	TYR
16	1P	281	ARG
16	1P	291	ASP
16	1P	316	GLU
16	1P	335	LYS
17	1Q	56	LYS
17	1Q	74	SER
17	1Q	115	SER
18	1R	3	ARG
18	1R	18	TYR
18	1R	30	ASP
18	1R	31	ARG
18	1R	58	SER
19	1S	35	PHE
19	1S	55	ARG
19	1S	72	GLN
19	1S	81	PHE
20	1T	16	LEU
20	1T	20	LYS
20	1T	22	TYR
20	1T	26	ASP
20	1T	37	MET
20	1T	38	LYS
20	1T	47	GLN
20	1T	58	PHE
20	1T	66	ASP
20	1T	83	LYS
20	1T	85	ASP
20	1U	6	LEU
20	1U	8	LEU
20	1U	16	LEU
20	1U	22	TYR
20	1U	29	LYS
21	1V	3	LEU
21	1V	43	TYR

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Mol	Chain	Res	Type
21	1V	48	GLU
21	1V	53	GLU
21	1V	54	LYS
21	1V	65	LYS
21	1V	71	LEU
21	1V	95	ARG
21	1V	96	TRP
21	1V	104	GLU
21	1V	110	GLN
22	1W	23	ARG
22	1W	24	ASP
22	1W	29	LYS
22	1W	31	ARG
22	1W	34	GLU
22	1W	39	TRP
22	1W	40	TYR
22	1W	53	ASP
22	1W	57	LYS
22	1W	65	GLU
22	1W	77	ARG
22	1W	90	LEU
22	1W	99	GLN
22	1W	114	ARG
22	1W	121	LYS
22	1W	126	HIS
22	1W	127	ASP
23	1X	11	ASP
23	1X	47	TRP
23	1X	68	ASP
23	1X	81	PHE
23	1X	93	LEU
23	1X	96	PHE
23	1X	97	ARG
23	1X	107	ASP
23	1X	113	LYS
23	1X	118	ARG
23	1X	120	ASP
23	1X	131	LYS
23	1X	144	ARG
25	1Z	21	TYR
25	1Z	35	MET
25	1Z	79	LYS

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Mol	Chain	Res	Type
25	1Z	81	ARG
25	1Z	86	MET
25	1Z	88	ARG
25	1Z	98	MET
25	1Z	143	TYR
26	1a	3	PHE
26	1a	28	LYS
26	1a	34	LYS
26	1a	51	ASP
26	1a	60	TYR
26	1a	67	GLU
27	1b	31	LEU
27	1b	39	ASN
27	1b	59	ASP
27	1b	61	ASN
27	1b	62	MET
27	1b	77	LEU
28	1c	1	LYS
28	1c	2	PHE
29	1d	78	ARG
29	1d	95	LYS
29	1d	100	ASP
29	1d	104	LYS
29	1d	120	ARG
30	1e	8	ARG
30	1e	37	LYS
30	1e	76	SER
30	1e	82	ARG
30	1e	96	HIS
31	1f	22	PHE
31	1f	29	ARG
31	1f	45	LYS
32	1g	33	GLU
32	1g	76	PHE
32	1g	79	TYR
32	1g	84	ARG
32	1g	99	TYR
33	1h	7	ARG
33	1h	18	ASP
33	1h	23	LYS
33	1h	28	TYR
33	1h	59	TYR

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Mol	Chain	Res	Type
33	1h	69	HIS
33	1h	111	ARG
33	1h	122	TRP
34	1i	19	ARG
34	1i	30	ARG
34	1i	37	ARG
34	1i	42	MET
34	1i	44	GLN
34	1i	46	TRP
34	1i	47	ASN
34	1i	64	TYR
34	1i	118	LEU
34	1i	122	PHE
34	1i	124	ASP
35	1j	19	ARG
35	1j	37	LEU
35	1j	40	PHE
36	1k	29	GLU
36	1k	70	PHE
36	1k	71	LYS
36	1k	72	TRP
36	1k	77	PHE
36	1k	85	TYR
37	1l	28	ASN
37	1l	54	SER
37	1l	68	ASP
37	1l	83	MET
37	1l	116	PHE
38	1m	2	PHE
38	1m	4	LYS
38	1m	61	ASP
38	1m	80	ARG
38	1m	109	ASP
39	1n	11	HIS
39	1n	24	ARG
39	1n	100	GLU
39	1n	137	LYS
39	1n	138	GLN
39	1n	141	GLU
39	1n	149	ARG
39	1n	158	LYS
39	1n	178	MET

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Mol	Chain	Res	Type
40	1o	21	MET
40	1o	28	TYR
40	1o	38	MET
40	1o	51	MET
40	1o	71	ASP
40	1o	83	GLN
40	1o	87	ASP
40	1o	89	CYS
40	1o	93	ASP
40	1o	94	TYR
40	1o	98	MET
40	1o	106	ARG
40	1o	110	ARG
40	1o	112	LYS
40	1o	121	MET
41	1p	7	ASP
41	1p	14	ARG
41	1p	22	GLN
41	1p	61	TYR
41	1p	62	TYR
41	1p	65	ARG
41	1p	79	LYS
41	1p	122	GLN
41	1p	124	CYS
41	1p	162	MET
41	1p	167	LYS
42	1q	20	LEU
42	1q	21	ARG
42	1q	56	PHE
42	1q	108	TYR
42	1q	115	PHE
42	1q	122	GLN
42	1q	144	TYR
42	1q	145	LYS
43	1r	2	SER
43	1r	19	LEU
43	1r	25	LEU
43	1r	56	ARG
43	1r	92	LYS
43	1r	109	GLN

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

Mol	Chain	Res	Type
2	1B	162	GLN
3	1C	38	GLN
3	1C	95	ASN
3	1C	211	GLN
4	1D	34	ASN
6	1F	24	ASN
7	1G	237	ASN
7	1G	255	HIS
7	1G	517	ASN
8	1H	284	GLN
9	1I	150	ASN
11	1K	94	ASN
12	1L	248	HIS
12	1L	506	ASN
13	1M	103	GLN
14	1N	36	ASN
14	1N	134	GLN
14	1N	319	HIS
15	1O	204	ASN
15	1O	257	HIS
15	1O	265	ASN
16	1P	2	HIS
16	1P	203	GLN
16	1P	321	HIS
17	1Q	6	GLN
17	1Q	46	GLN
17	1Q	50	ASN
19	1S	24	GLN
21	1V	70	GLN
21	1V	85	ASN
22	1W	102	HIS
23	1X	150	ASN
27	1b	45	ASN
29	1d	61	GLN
29	1d	117	HIS
33	1h	124	GLN
38	1m	74	ASN
38	1m	78	ASN
39	1n	65	GLN
40	1o	46	ASN
41	1p	55	HIS
41	1p	58	ASN
41	1p	122	GLN

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Mol	Chain	Res	Type
41	1p	123	ASN
43	1r	24	GLN
44	1s	75	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	FME	1A	1	1	8,9,10	0.51	0	7,9,11	0.99	1 (14%)
11	FME	1K	1	11	8,9,10	0.52	0	7,9,11	1.00	1 (14%)
34	SAC	1i	1	-	7,8,9	0.53	0	8,9,11	1.08	1 (12%)
8	FME	1H	1	8	8,9,10	0.61	0	7,9,11	1.06	1 (14%)
12	FME	1L	1	12	8,9,10	0.51	0	7,9,11	1.05	1 (14%)
10	FME	1J	1	10	8,9,10	0.52	0	7,9,11	0.96	1 (14%)
14	FME	1N	1	14	8,9,10	0.50	0	7,9,11	0.94	1 (14%)
13	FME	1M	1	13	8,9,10	0.51	0	7,9,11	1.02	1 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	FME	1A	1	1	-	0/7/9/11	-
11	FME	1K	1	11	-	1/7/9/11	-
34	SAC	1i	1	-	-	2/7/8/10	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	FME	1H	1	8	-	1/7/9/11	-
12	FME	1L	1	12	-	0/7/9/11	-
10	FME	1J	1	10	-	2/7/9/11	-
14	FME	1N	1	14	-	0/7/9/11	-
13	FME	1M	1	13	-	1/7/9/11	-

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
34	1i	1	SAC	O-C-CA	-2.98	116.97	124.78
11	1K	1	FME	O-C-CA	-2.62	117.92	124.78
8	1H	1	FME	O-C-CA	-2.61	117.95	124.78
12	1L	1	FME	O-C-CA	-2.58	118.02	124.78
10	1J	1	FME	O-C-CA	-2.54	118.13	124.78
13	1M	1	FME	O-C-CA	-2.47	118.32	124.78
14	1N	1	FME	O-C-CA	-2.44	118.39	124.78
1	1A	1	FME	O-C-CA	-2.42	118.43	124.78

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	1H	1	FME	O1-CN-N-CA
10	1J	1	FME	N-CA-CB-CG
11	1K	1	FME	N-CA-CB-CG
34	1i	1	SAC	CB-CA-N-C1A
10	1J	1	FME	C-CA-CB-CG
13	1M	1	FME	C-CA-CB-CG
34	1i	1	SAC	C-CA-N-C1A

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 31 ligands modelled in this entry, 3 are monoatomic - leaving 28 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
45	3PE	1L	703	-	30,30,50	0.36	0	33,35,55	0.59	0
45	3PE	1N	401	-	50,50,50	0.27	0	53,55,55	0.40	0
45	3PE	1A	201	-	46,46,50	0.28	0	49,51,55	0.39	0
46	SF4	1F	502	6	0,12,12	-	-	-		
46	SF4	1I	202	9	0,12,12	-	-	-		
54	GTP	1O	401	55	26,34,34	0.96	2 (7%)	32,54,54	0.88	1 (3%)
50	PC1	1I	203	-	43,43,53	0.29	0	49,51,61	0.39	0
53	CDL	1a	101	-	60,60,99	0.33	0	66,72,111	0.41	0
45	3PE	1L	702	-	45,45,50	0.29	0	48,50,55	0.32	0
50	PC1	1M	502	-	43,43,53	0.29	0	49,51,61	0.44	0
53	CDL	1N	402	-	76,76,99	0.30	0	82,88,111	0.36	0
50	PC1	1H	401	-	53,53,53	0.27	0	59,61,61	0.32	0
50	PC1	1f	101	-	45,45,53	0.27	0	51,53,61	0.34	0
46	SF4	1G	802	7	0,12,12	-	-	-		
47	FES	1G	803	7	0,4,4	-	-	-		
47	FES	1E	301	5	0,4,4	-	-	-		
46	SF4	1I	201	9	0,12,12	-	-	-		
45	3PE	1Y	201	-	50,50,50	0.27	0	53,55,55	0.42	0
48	FMN	1F	501	-	33,33,33	0.57	0	48,50,50	0.65	0
58	EHZ	1n	201	-	29,36,37	0.16	0	35,44,47	1.29	2 (5%)
52	PGT	1M	501	-	50,50,50	0.49	0	53,56,56	0.48	0
46	SF4	1G	801	7	0,12,12	-	-	-		
46	SF4	1B	201	2	0,12,12	-	-	-		
56	NDP	1P	501	-	45,52,52	0.61	0	53,80,80	0.72	1 (1%)
51	MYR	1L	701	-	14,14,15	0.33	0	13,13,15	0.38	0
45	3PE	1L	704	-	41,41,50	0.30	0	44,46,55	1.29	5 (11%)
58	EHZ	1W	201	-	29,36,37	0.18	0	35,44,47	1.12	1 (2%)
50	PC1	1J	201	-	34,34,53	0.32	0	40,42,61	0.32	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
45	3PE	1L	703	-	-	8/34/34/54	-
45	3PE	1N	401	-	-	9/54/54/54	-
45	3PE	1A	201	-	-	3/50/50/54	-
46	SF4	1F	502	6	-	-	0/6/5/5
46	SF4	1I	202	9	-	-	0/6/5/5
54	GTP	1O	401	55	-	3/18/38/38	0/3/3/3
50	PC1	1I	203	-	-	6/47/47/57	-
53	CDL	1a	101	-	-	13/71/71/110	-
45	3PE	1L	702	-	-	2/49/49/54	-
50	PC1	1M	502	-	-	8/47/47/57	-
53	CDL	1N	402	-	-	9/87/87/110	-
50	PC1	1H	401	-	-	5/57/57/57	-
50	PC1	1f	101	-	-	7/49/49/57	-
46	SF4	1G	802	7	-	-	0/6/5/5
47	FES	1G	803	7	-	-	0/1/1/1
47	FES	1E	301	5	-	-	0/1/1/1
48	FMN	1F	501	-	-	2/18/18/18	0/3/3/3
45	3PE	1Y	201	-	-	9/54/54/54	-
46	SF4	1I	201	9	-	-	0/6/5/5
58	EHZ	1n	201	-	-	13/42/44/45	-
52	PGT	1M	501	-	-	23/55/55/55	-
46	SF4	1G	801	7	-	-	0/6/5/5
46	SF4	1B	201	2	-	-	0/6/5/5
56	NDP	1P	501	-	-	9/30/77/77	0/5/5/5
51	MYR	1L	701	-	-	1/11/12/13	-
45	3PE	1L	704	-	-	7/45/45/54	-
58	EHZ	1W	201	-	-	6/42/44/45	-
50	PC1	1J	201	-	-	5/38/38/57	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
54	1O	401	GTP	C5-C6	-2.60	1.42	1.47
54	1O	401	GTP	C8-N7	-2.08	1.31	1.35

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	1L	704	3PE	O21-C21-C22	6.45	125.41	111.50
58	1W	201	EHZ	C10-S1-C9	6.15	121.03	101.87
58	1n	201	EHZ	C10-S1-C9	6.11	120.90	101.87
58	1n	201	EHZ	C14-C13-C12	3.06	117.46	112.36
54	1O	401	GTP	O4'-C1'-C2'	-2.73	102.93	106.93
45	1L	704	3PE	O21-C21-O22	-2.71	117.16	123.70
45	1L	704	3PE	C2-O21-C21	2.55	124.07	117.79
45	1L	704	3PE	O21-C2-C3	2.19	116.34	108.40
56	1P	501	NDP	C5A-C6A-N6A	2.16	123.64	120.35
45	1L	704	3PE	O21-C2-C1	2.04	115.77	108.40

There are no chirality outliers.

All (148) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	1L	703	3PE	C1-O11-P-O14
45	1L	703	3PE	O32-C31-O31-C3
45	1L	703	3PE	C32-C31-O31-C3
45	1L	703	3PE	O22-C21-O21-C2
45	1L	703	3PE	C22-C21-O21-C2
45	1L	704	3PE	O22-C21-O21-C2
45	1L	704	3PE	C22-C21-O21-C2
45	1N	401	3PE	C1-O11-P-O14
45	1Y	201	3PE	C1-O11-P-O14
50	1I	203	PC1	C11-O13-P-O14
50	1I	203	PC1	C11-O13-P-O11
50	1J	201	PC1	C1-O11-P-O14
50	1J	201	PC1	C1-O11-P-O13
50	1M	502	PC1	C1-O11-P-O14
50	1f	101	PC1	O32-C31-O31-C3
50	1f	101	PC1	C32-C31-O31-C3
52	1M	501	PGT	O31-C31-O2-C2
52	1M	501	PGT	C1-O3P-P-O1P
52	1M	501	PGT	C5-C4-O4P-P
52	1M	501	PGT	C4-C5-C6-O6
52	1M	501	PGT	O5-C5-C6-O6
52	1M	501	PGT	O11-C11-O3-C3
52	1M	501	PGT	C12-C11-O3-C3
53	1a	101	CDL	CA3-OA5-PA1-OA3
53	1a	101	CDL	CB3-OB5-PB2-OB3
53	1a	101	CDL	CB4-CB3-OB5-PB2
56	1P	501	NDP	C5B-O5B-PA-O1A
56	1P	501	NDP	C5B-O5B-PA-O2A

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Mol	Chain	Res	Type	Atoms
56	1P	501	NDP	C5B-O5B-PA-O3
56	1P	501	NDP	C4B-C5B-O5B-PA
56	1P	501	NDP	O4D-C4D-C5D-O5D
56	1P	501	NDP	O4D-C1D-N1N-C6N
58	1W	201	EHZ	C16-C17-C20-O6
58	1W	201	EHZ	O2-C9-S1-C10
58	1W	201	EHZ	C8-C9-S1-C10
58	1n	201	EHZ	S1-C10-C11-N1
58	1n	201	EHZ	N2-C15-C16-C17
58	1n	201	EHZ	N2-C15-C16-O5
58	1n	201	EHZ	O4-C15-C16-C17
58	1n	201	EHZ	O4-C15-C16-O5
58	1n	201	EHZ	C15-C16-C17-C18
58	1n	201	EHZ	C15-C16-C17-C19
58	1n	201	EHZ	C15-C16-C17-C20
58	1n	201	EHZ	O2-C9-S1-C10
58	1n	201	EHZ	C8-C9-S1-C10
52	1M	501	PGT	C32-C31-O2-C2
56	1P	501	NDP	O4B-C4B-C5B-O5B
45	1Y	201	3PE	C2-C1-O11-P
58	1n	201	EHZ	C13-C14-N2-C15
53	1N	402	CDL	OA6-CA4-CA6-OA8
56	1P	501	NDP	C3D-C4D-C5D-O5D
52	1M	501	PGT	C4-O4P-P-O3P
52	1M	501	PGT	C15-C16-C17-C18
58	1W	201	EHZ	C18-C17-C20-O6
58	1W	201	EHZ	C19-C17-C20-O6
52	1M	501	PGT	C14-C15-C16-C17
52	1M	501	PGT	C40-C41-C42-C43
52	1M	501	PGT	C34-C35-C36-C37
50	1f	101	PC1	C35-C36-C37-C38
52	1M	501	PGT	C44-C45-C46-C47
50	1I	203	PC1	O21-C2-C3-O31
50	1H	401	PC1	C24-C25-C26-C27
52	1M	501	PGT	C22-C23-C24-C25
50	1M	502	PC1	C1-O11-P-O13
45	1Y	201	3PE	C35-C36-C37-C38
50	1I	203	PC1	C1-C2-C3-O31
45	1L	704	3PE	O11-C1-C2-O21
50	1M	502	PC1	O11-C1-C2-C3
45	1N	401	3PE	O31-C31-C32-C33
45	1Y	201	3PE	C3C-C3D-C3E-C3F

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Mol	Chain	Res	Type	Atoms
53	1N	402	CDL	CA3-CA4-CA6-OA8
52	1M	501	PGT	C1-O3P-P-O4P
53	1N	402	CDL	C75-C76-C77-C78
52	1M	501	PGT	C21-C22-C23-C24
45	1A	201	3PE	O21-C2-C3-O31
53	1a	101	CDL	CA4-CA3-OA5-PA1
50	1I	203	PC1	C32-C33-C34-C35
53	1N	402	CDL	OA5-CA3-CA4-CA6
58	1n	201	EHZ	C2-C1-C21-C22
50	1H	401	PC1	C1-C2-C3-O31
45	1N	401	3PE	C2-C3-O31-C31
45	1Y	201	3PE	O11-C1-C2-O21
50	1M	502	PC1	O11-C1-C2-O21
50	1H	401	PC1	O21-C2-C3-O31
50	1J	201	PC1	O21-C2-C3-O31
53	1a	101	CDL	OB6-CB4-CB6-OB8
53	1N	402	CDL	C32-C33-C34-C35
45	1N	401	3PE	C1-O11-P-O13
45	1Y	201	3PE	C1-O11-P-O13
53	1a	101	CDL	CA3-OA5-PA1-OA2
45	1N	401	3PE	C2-C1-O11-P
45	1L	704	3PE	C1-O11-P-O14
50	1M	502	PC1	C1-O11-P-O12
52	1M	501	PGT	C4-O4P-P-O1P
45	1Y	201	3PE	C12-C11-O13-P
52	1M	501	PGT	C33-C34-C35-C36
48	1F	501	FMN	N10-C1'-C2'-O2'
53	1N	402	CDL	C55-C56-C57-C58
45	1N	401	3PE	C34-C35-C36-C37
45	1L	703	3PE	C31-C32-C33-C34
50	1J	201	PC1	O13-C11-C12-N
53	1N	402	CDL	CB2-C1-CA2-OA2
53	1a	101	CDL	C52-C51-CB5-OB6
50	1H	401	PC1	O31-C31-C32-C33
45	1L	703	3PE	C1-O11-P-O13
50	1I	203	PC1	C1-O11-P-O13
50	1f	101	PC1	C11-O13-P-O11
53	1a	101	CDL	CB2-OB2-PB2-OB5
45	1L	704	3PE	C1-C2-C3-O31
54	1O	401	GTP	PG-O3B-PB-O1B
52	1M	501	PGT	C2-C1-O3P-P
45	1L	702	3PE	C33-C34-C35-C36

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Mol	Chain	Res	Type	Atoms
45	1Y	201	3PE	O11-C1-C2-C3
45	1A	201	3PE	C32-C33-C34-C35
52	1M	501	PGT	O2-C2-C3-O3
45	1L	704	3PE	C1-C2-O21-C21
50	1M	502	PC1	C25-C26-C27-C28
45	1N	401	3PE	C3A-C3B-C3C-C3D
58	1W	201	EHZ	C11-C10-S1-C9
53	1a	101	CDL	CB2-C1-CA2-OA2
54	1O	401	GTP	C4'-C5'-O5'-PA
45	1A	201	3PE	C1-C2-C3-O31
53	1N	402	CDL	OA5-CA3-CA4-OA6
53	1N	402	CDL	C53-C54-C55-C56
50	1M	502	PC1	C31-C32-C33-C34
45	1Y	201	3PE	C24-C25-C26-C27
53	1a	101	CDL	CB3-OB5-PB2-OB2
58	1n	201	EHZ	C12-C13-C14-N2
53	1a	101	CDL	CB3-CB4-CB6-OB8
45	1N	401	3PE	O11-C1-C2-O21
45	1N	401	3PE	C39-C3A-C3B-C3C
45	1L	702	3PE	C37-C38-C39-C3A
52	1M	501	PGT	C19-C20-C21-C22
54	1O	401	GTP	PG-O3B-PB-O2B
56	1P	501	NDP	PN-O3-PA-O2A
50	1f	101	PC1	C3C-C3D-C3E-C3F
45	1L	704	3PE	C22-C23-C24-C25
45	1L	703	3PE	C32-C33-C34-C35
50	1J	201	PC1	C1-C2-C3-O31
52	1M	501	PGT	C1-C2-C3-O3
50	1f	101	PC1	C11-O13-P-O14
53	1a	101	CDL	CB2-OB2-PB2-OB3
51	1L	701	MYR	C5-C6-C7-C8
53	1a	101	CDL	C12-C13-C14-C15
50	1f	101	PC1	C2-C1-O11-P
48	1F	501	FMN	N10-C1'-C2'-C3'
50	1H	401	PC1	C3E-C3F-C3G-C3H
50	1M	502	PC1	O31-C31-C32-C33

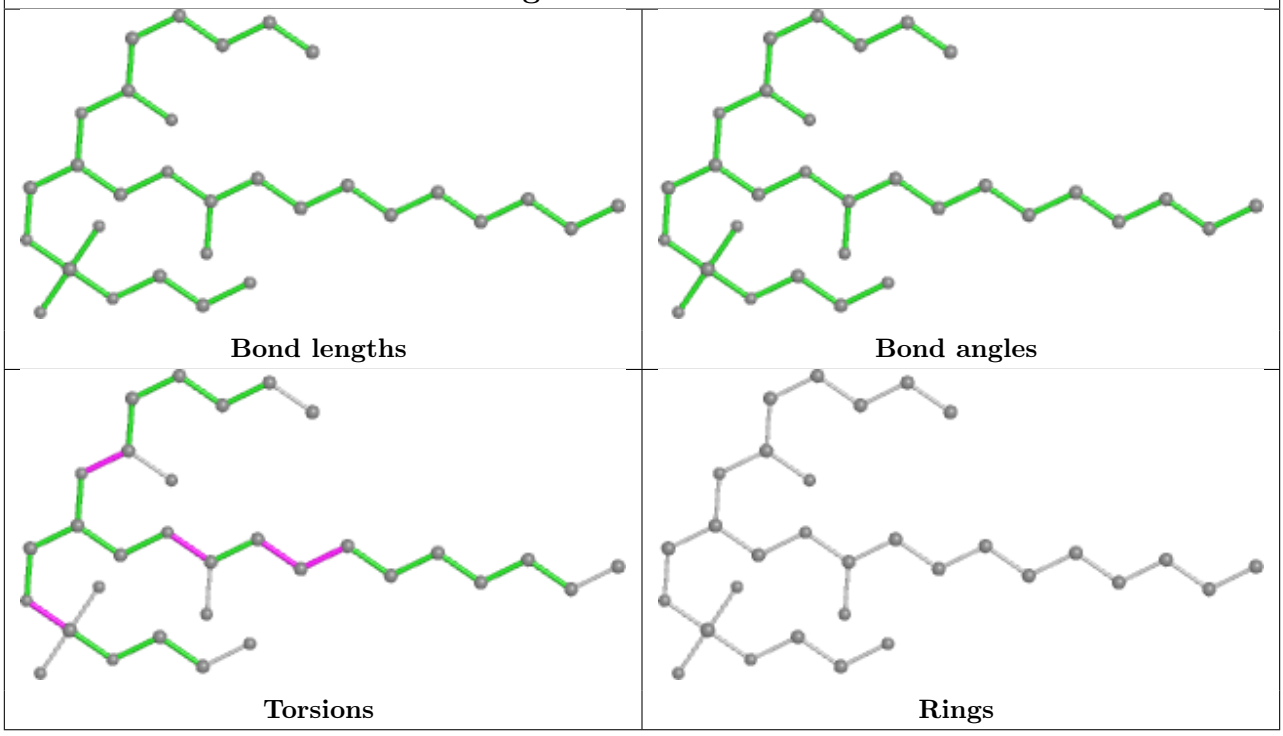
There are no ring outliers.

No monomer is involved in short contacts.

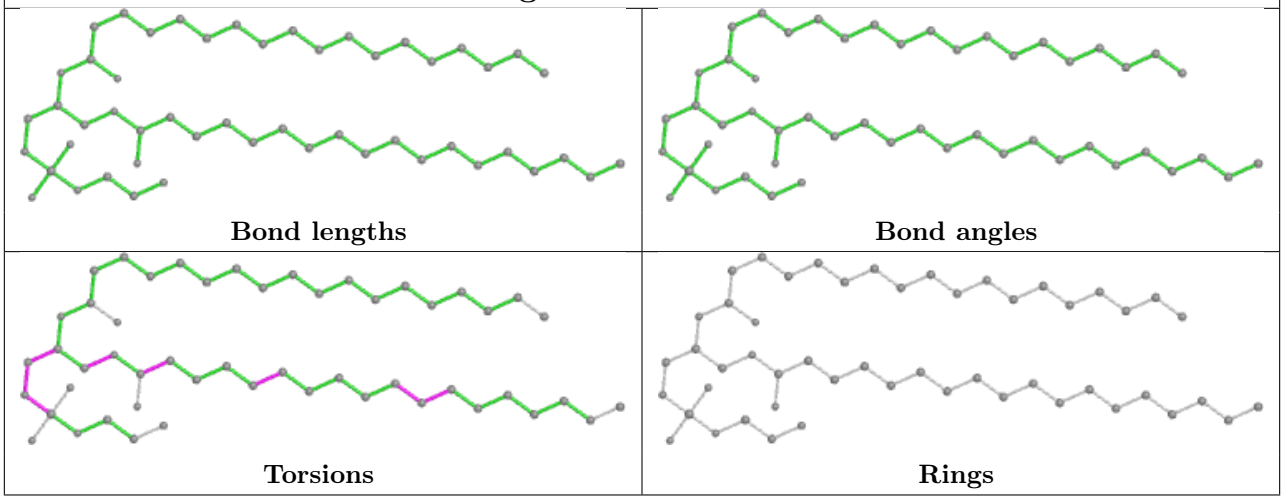
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

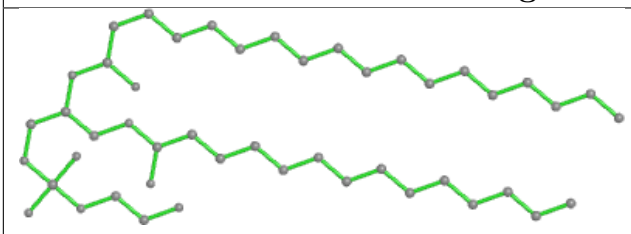
Ligand 3PE 1L 703



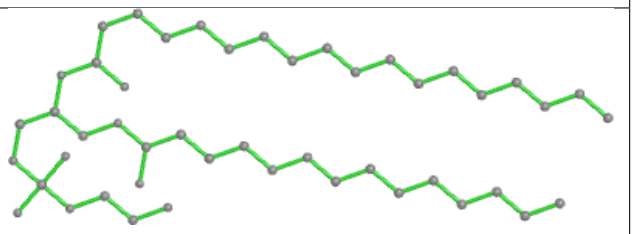
Ligand 3PE 1N 401



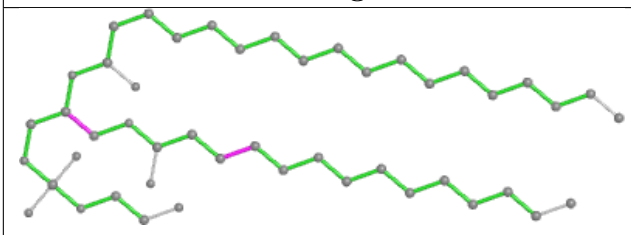
Ligand 3PE 1A 201



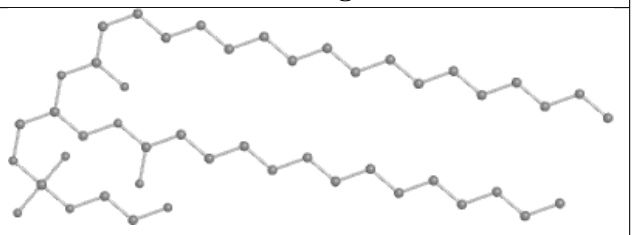
Bond lengths



Bond angles

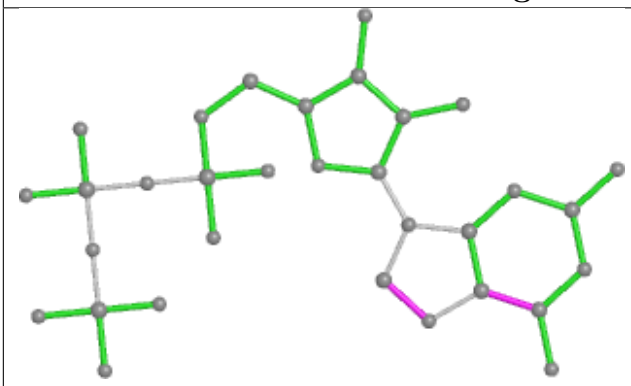


Torsions

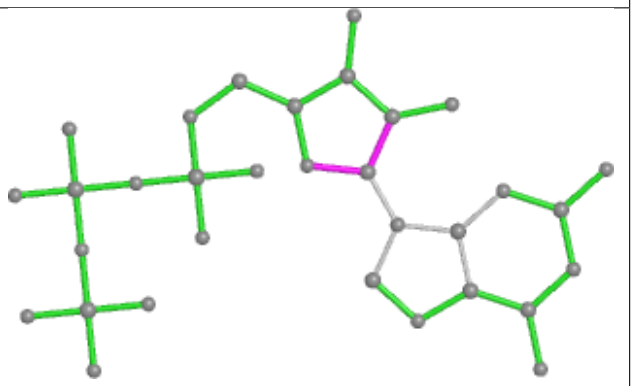


Rings

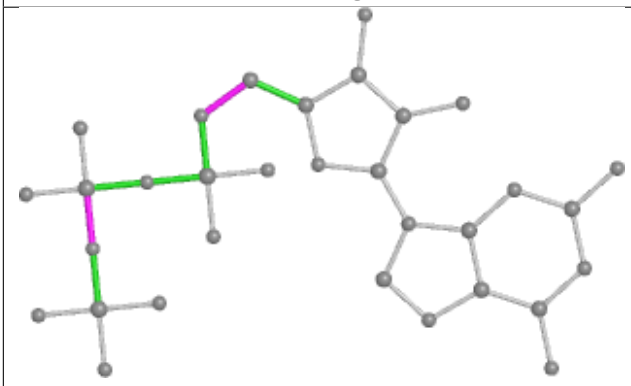
Ligand GTP 1O 401



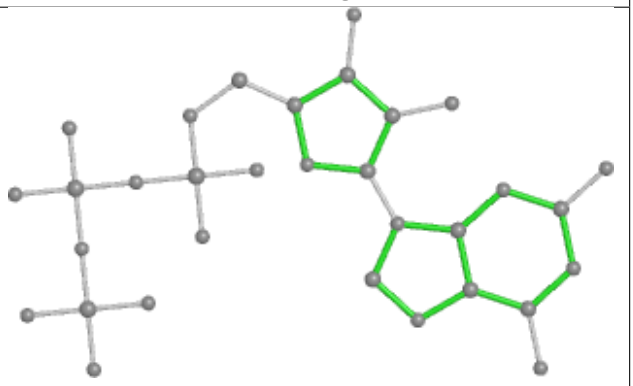
Bond lengths



Bond angles

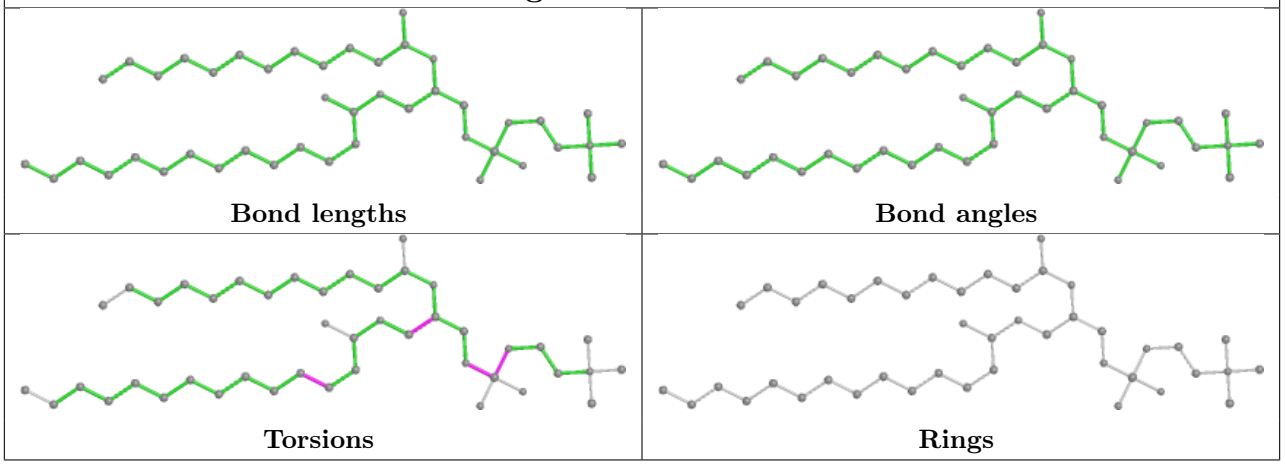


Torsions

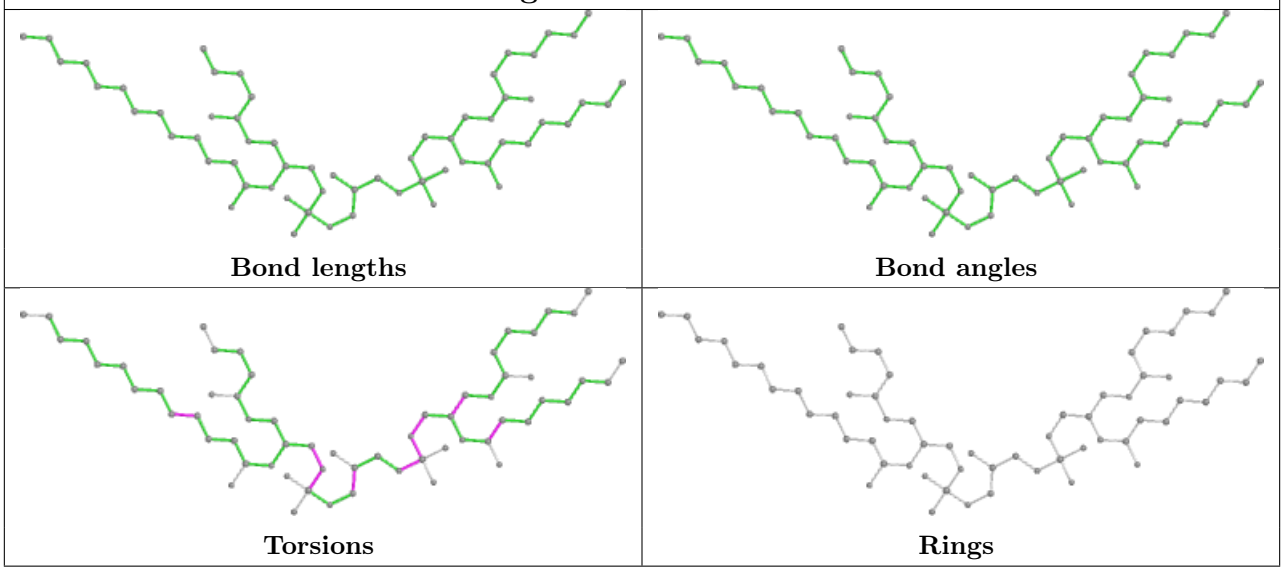


Rings

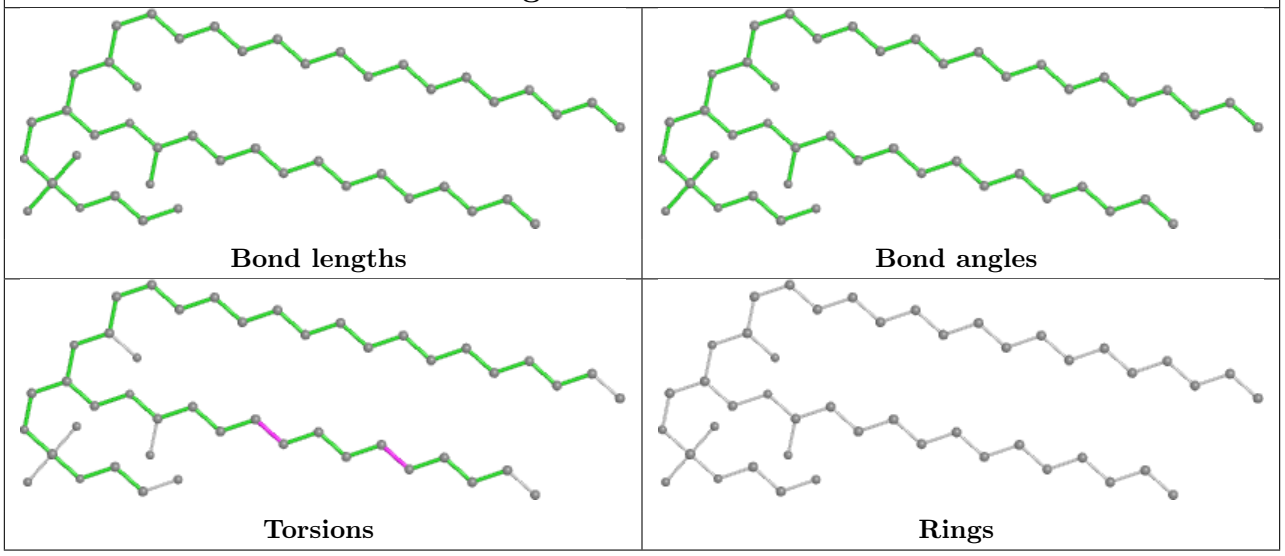
Ligand PC1 1I 203



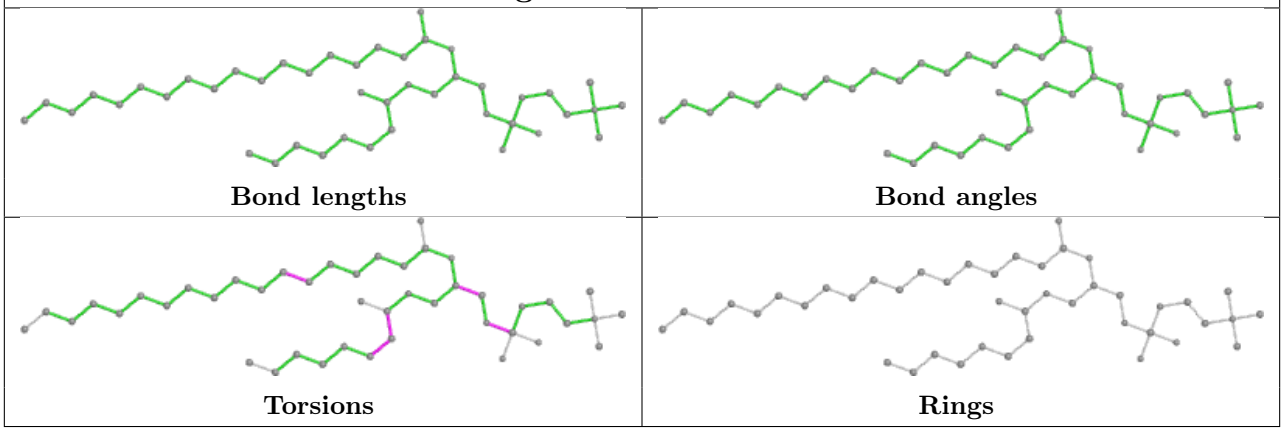
Ligand CDL 1a 101



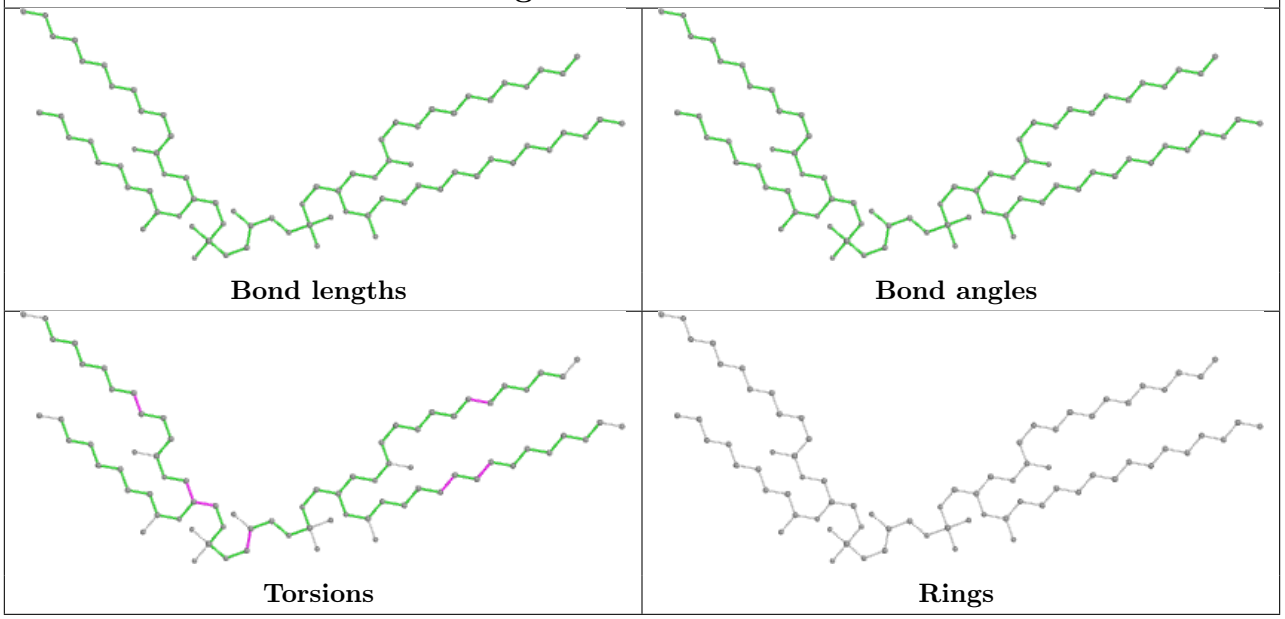
Ligand 3PE 1L 702



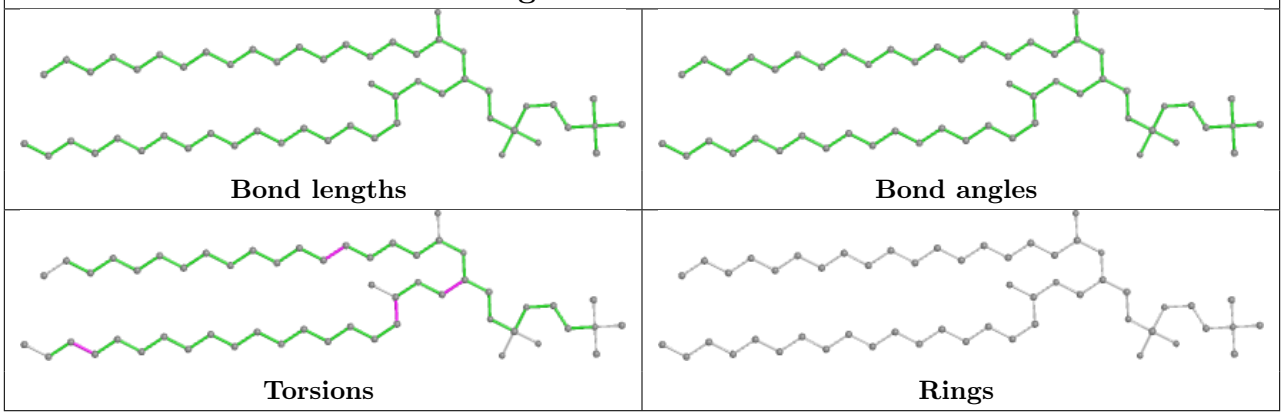
Ligand PC1 1M 502



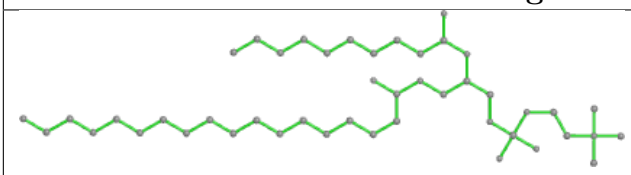
Ligand CDL 1N 402



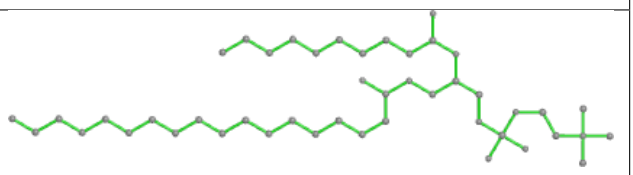
Ligand PC1 1H 401



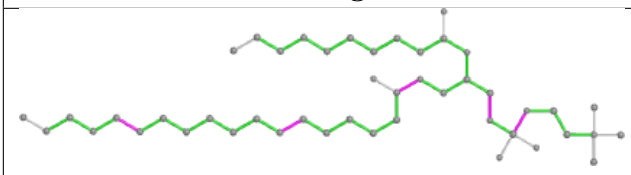
Ligand PC1 1f 101



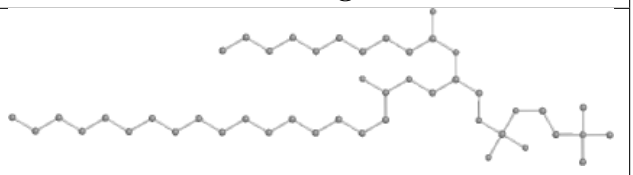
Bond lengths



Bond angles

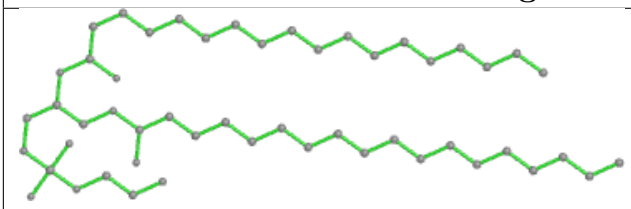


Torsions

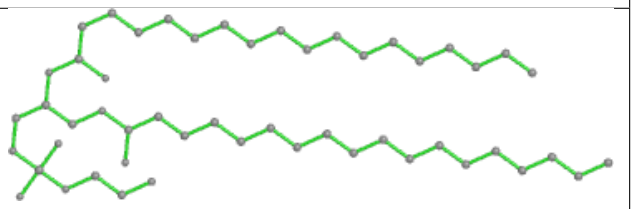


Rings

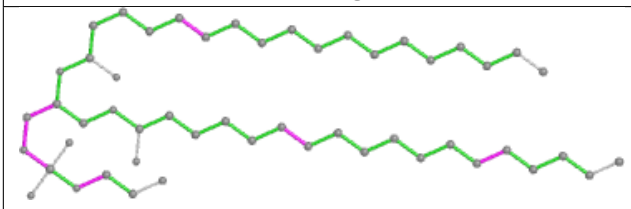
Ligand 3PE 1Y 201



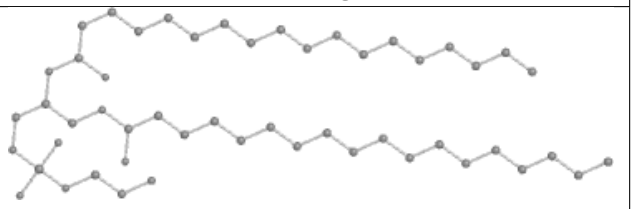
Bond lengths



Bond angles

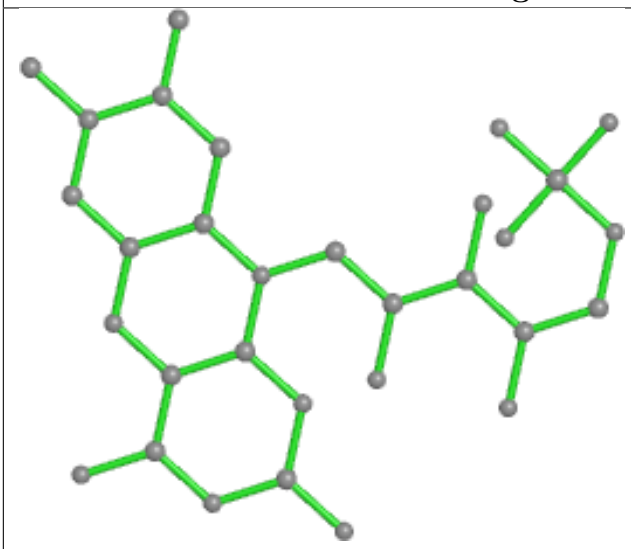


Torsions

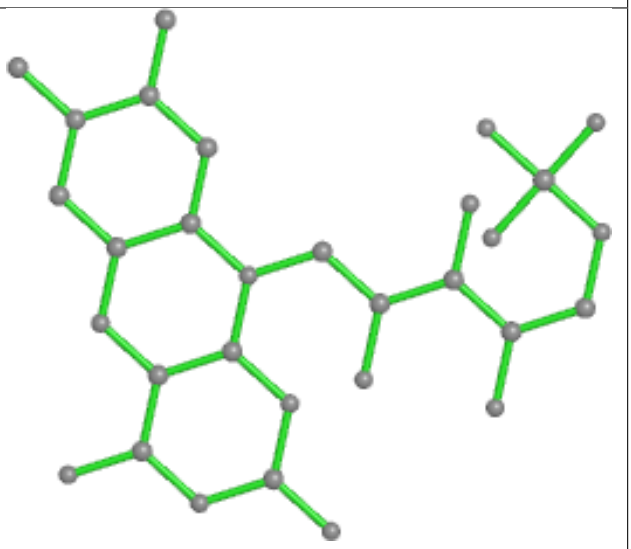


Rings

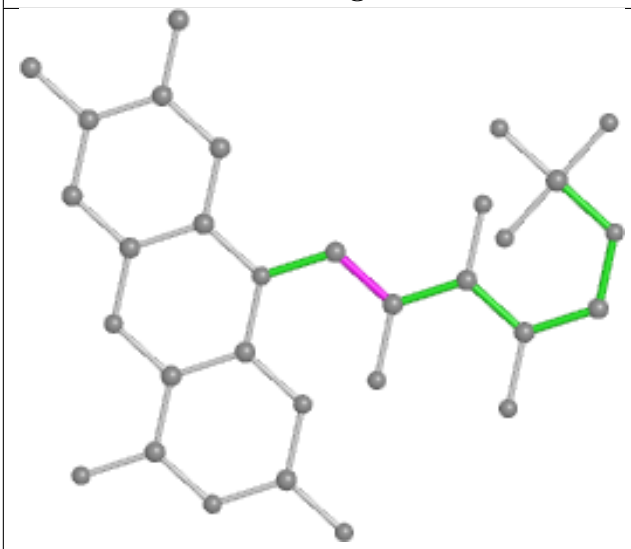
Ligand FMN 1F 501



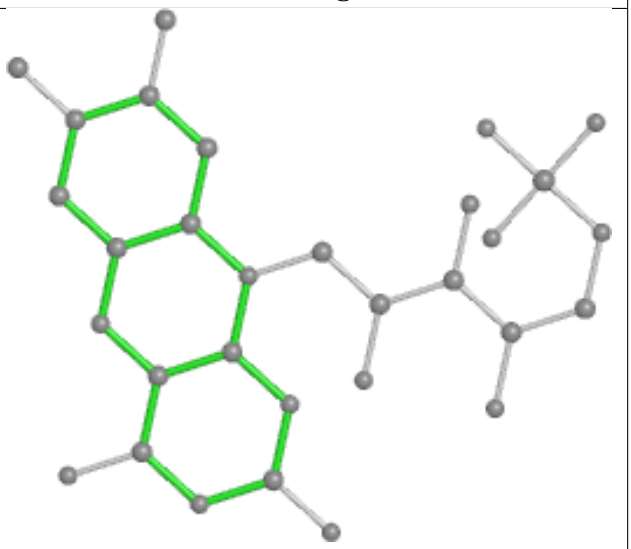
Bond lengths



Bond angles

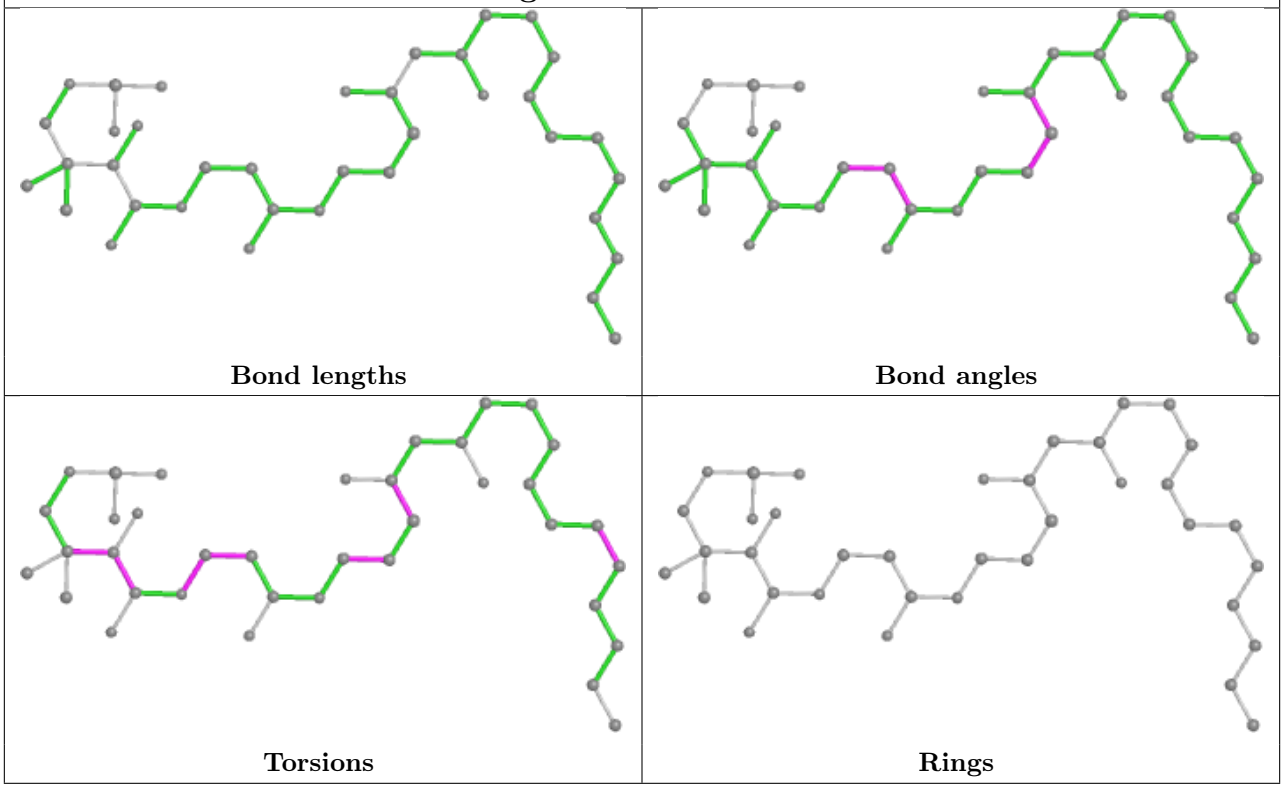


Torsions

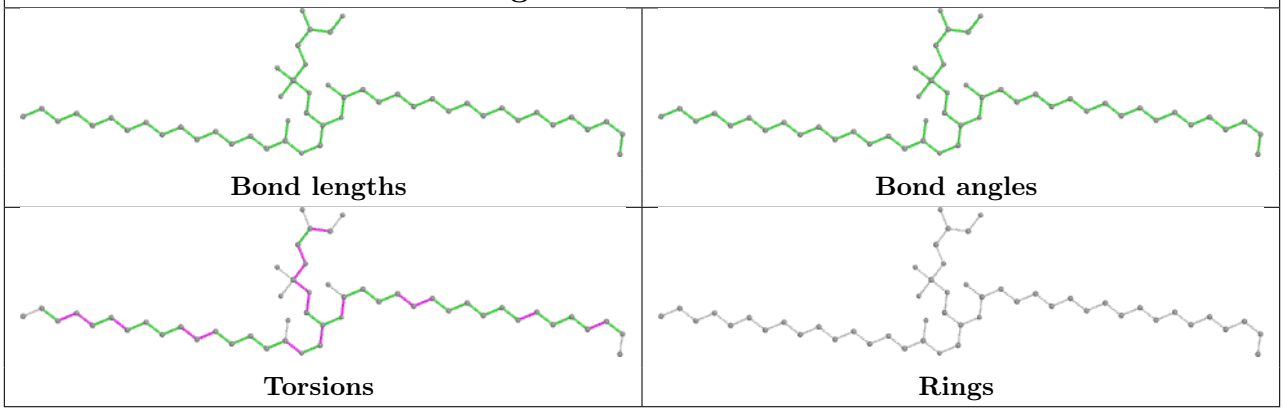


Rings

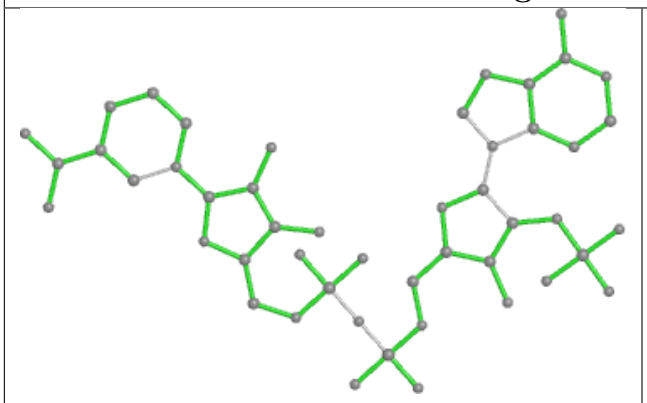
Ligand EHZ 1n 201



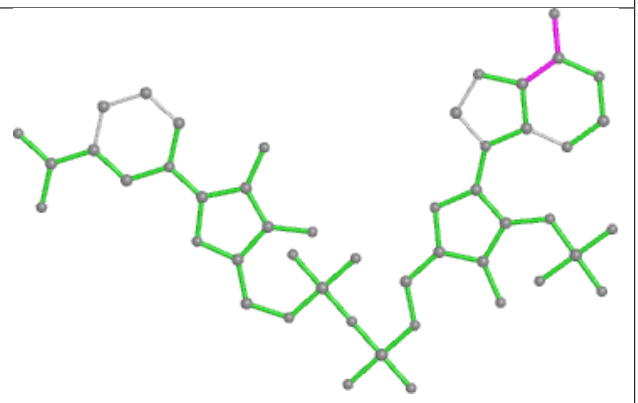
Ligand PGT 1M 501



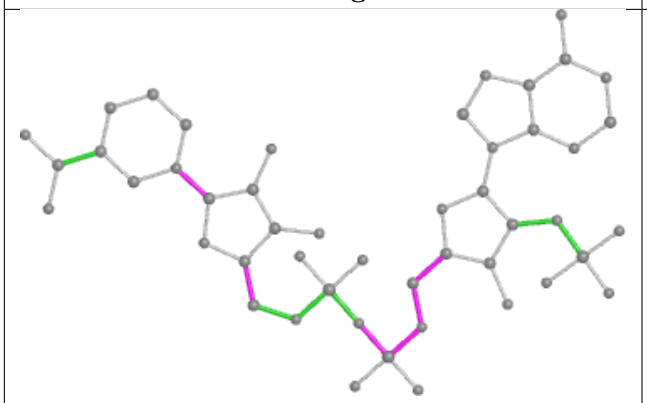
Ligand NDP 1P 501



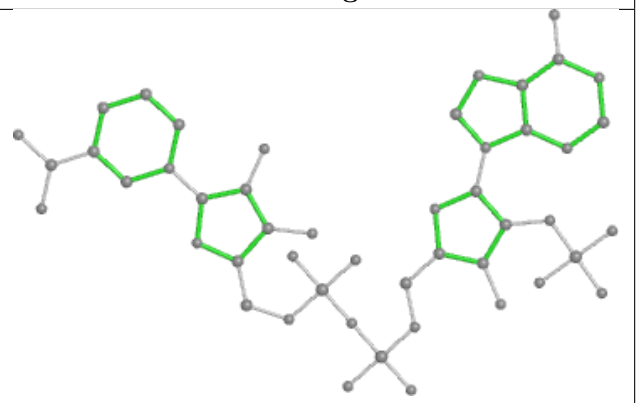
Bond lengths



Bond angles

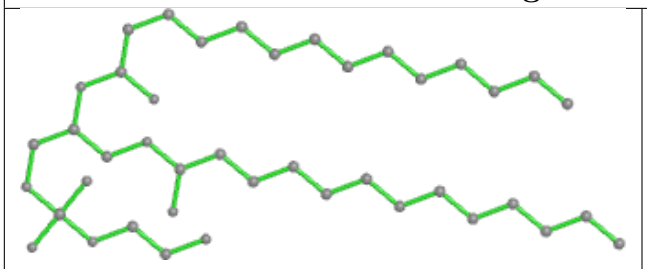


Torsions

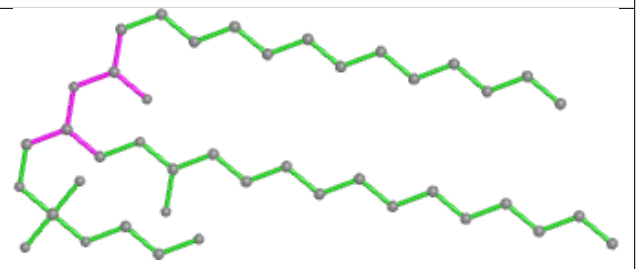


Rings

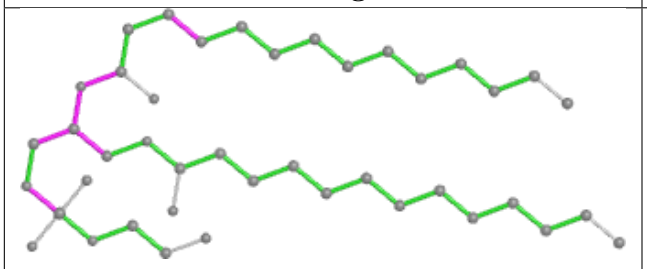
Ligand 3PE 1L 704



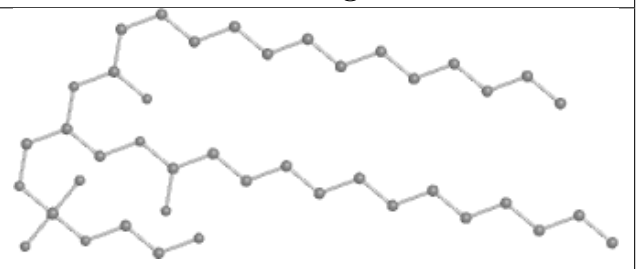
Bond lengths



Bond angles

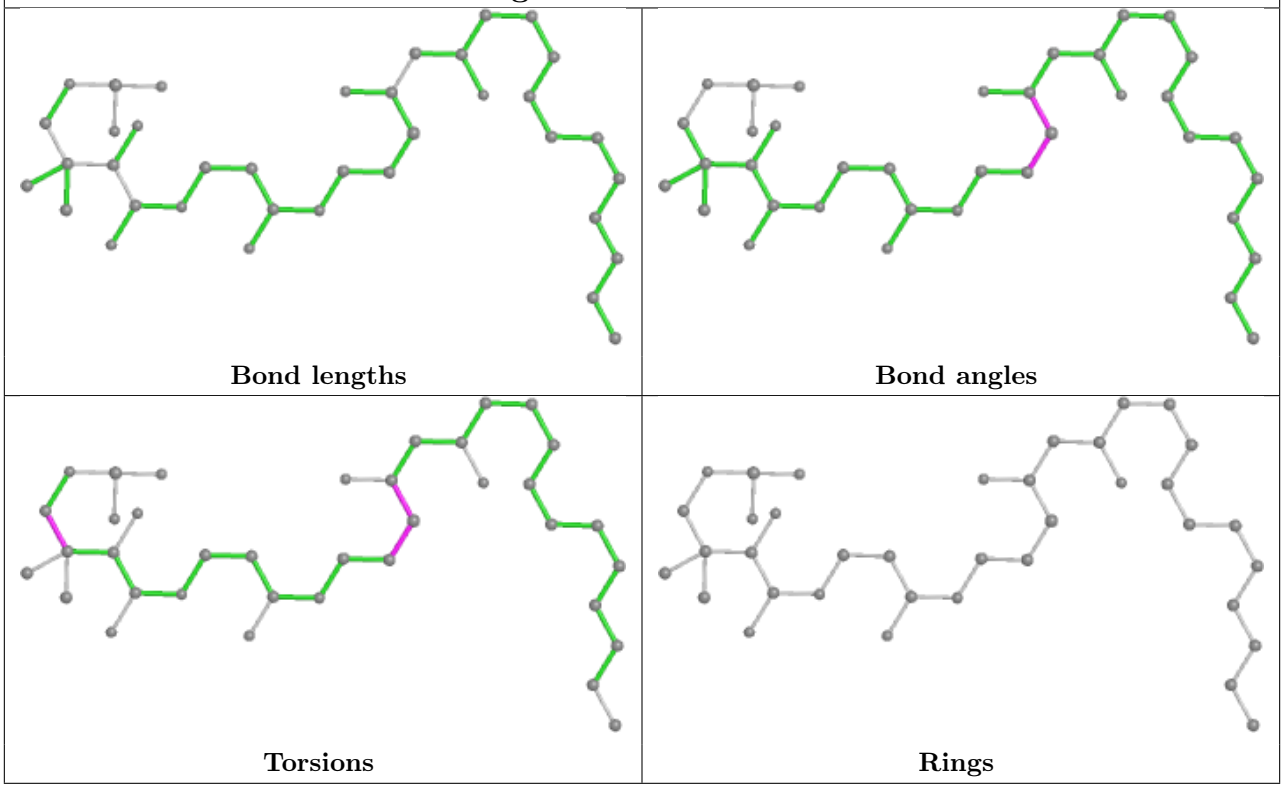


Torsions

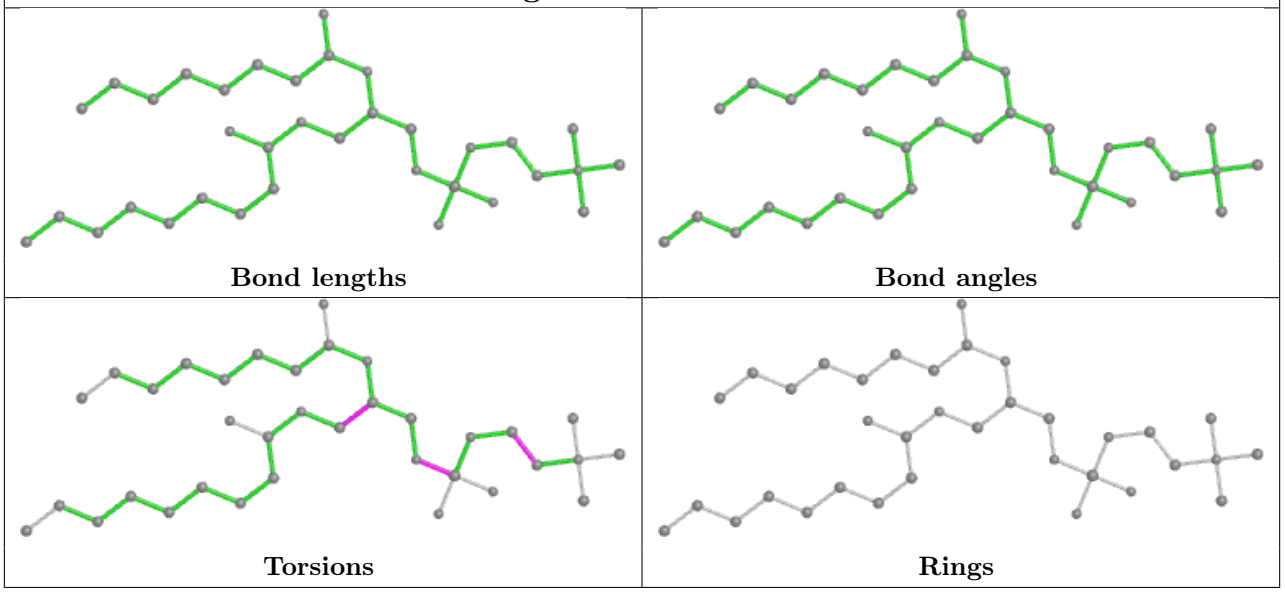


Rings

Ligand EHZ 1W 201



Ligand PC1 1J 201



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
34	1i	1
43	1r	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1i	1:SAC	C	2:GLY	N	3.33
1	1r	1:ALA	C	2:SER	N	2.79

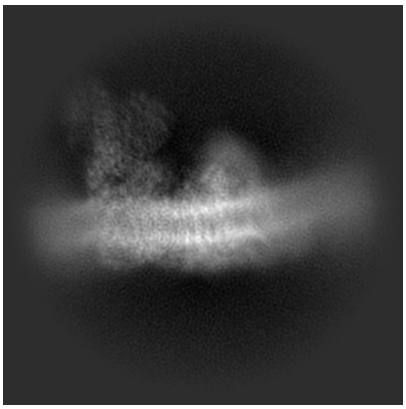
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-42170. These allow visual inspection of the internal detail of the map and identification of artifacts.

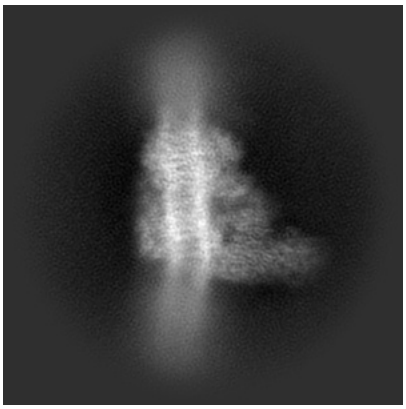
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

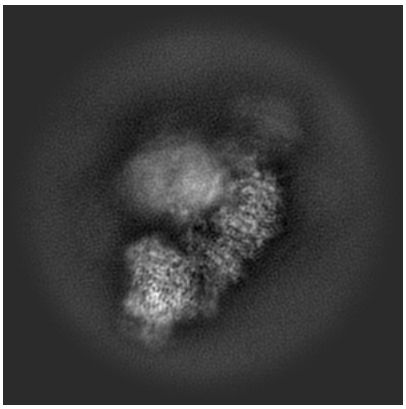
6.1.1 Primary map



X

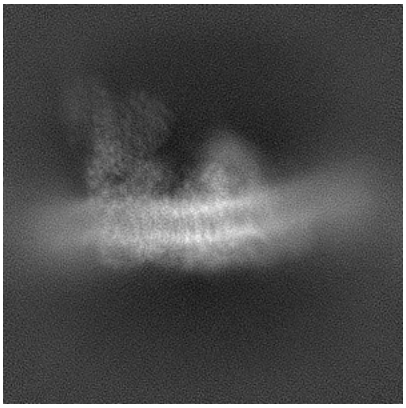


Y

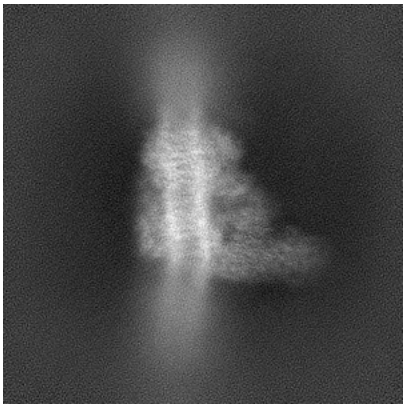


Z

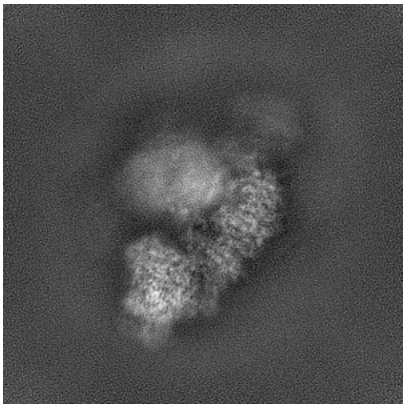
6.1.2 Raw map



X



Y

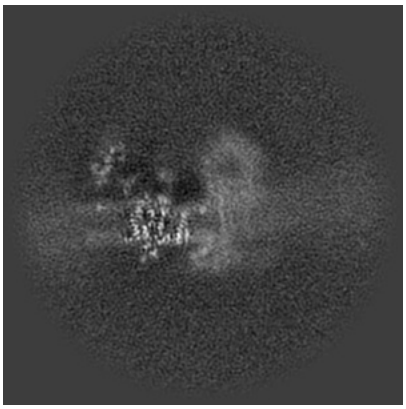


Z

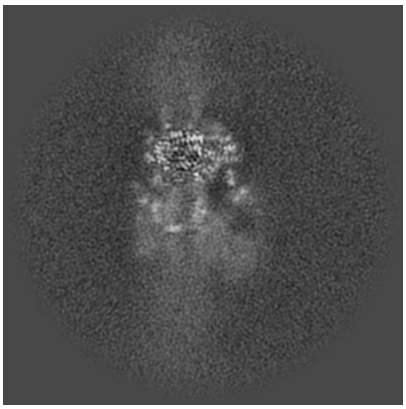
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

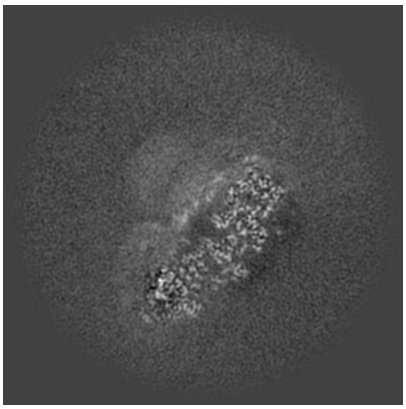
6.2.1 Primary map



X Index: 160



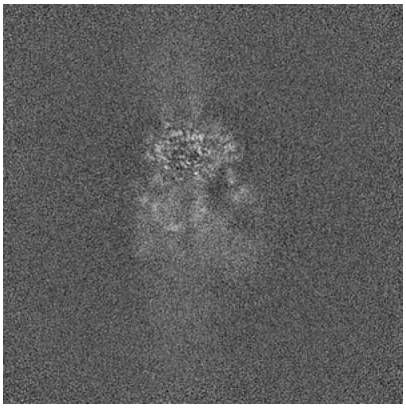
Y Index: 160



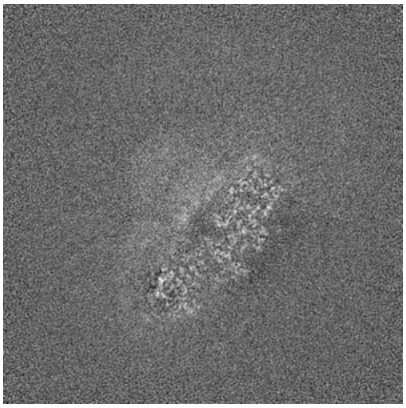
Z Index: 160

6.2.2 Raw map

X Index: 160



Y Index: 160

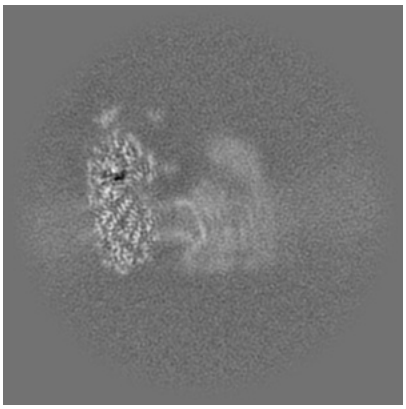


Z Index: 160

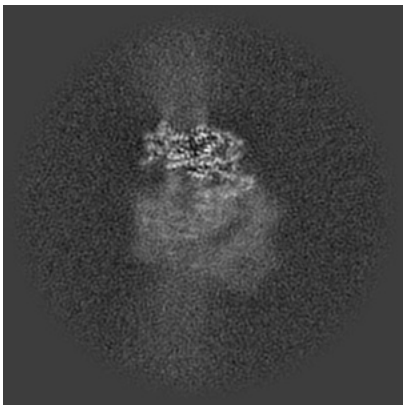
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

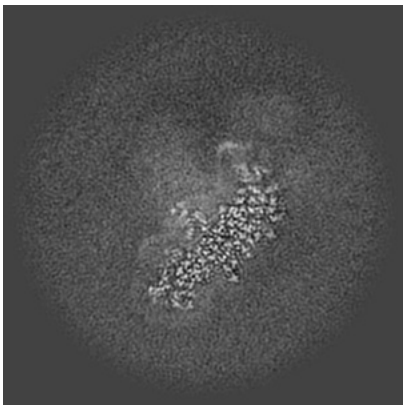
6.3.1 Primary map



X Index: 140

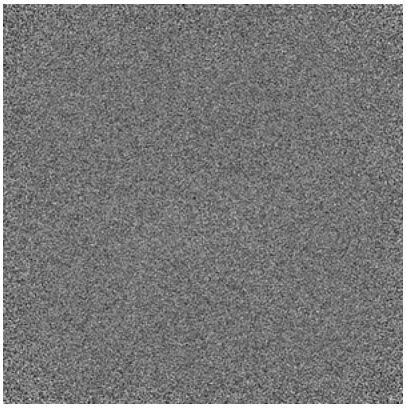


Y Index: 172

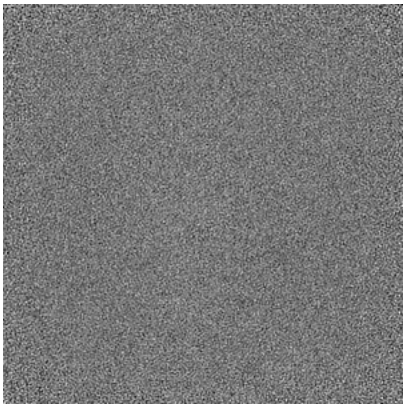


Z Index: 134

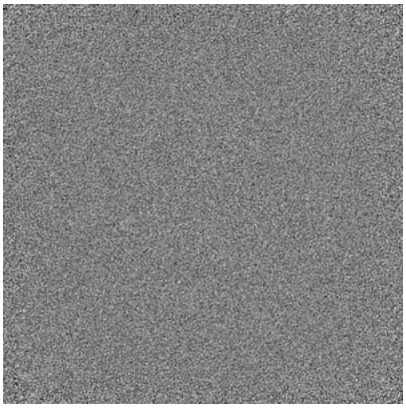
6.3.2 Raw map



X Index: 0



Y Index: 0

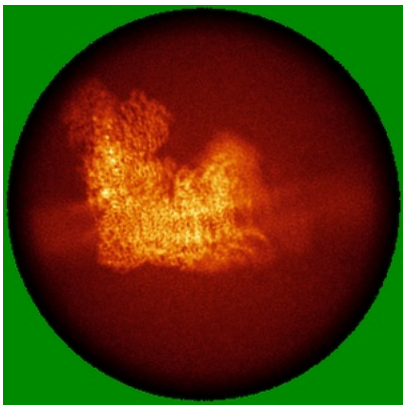


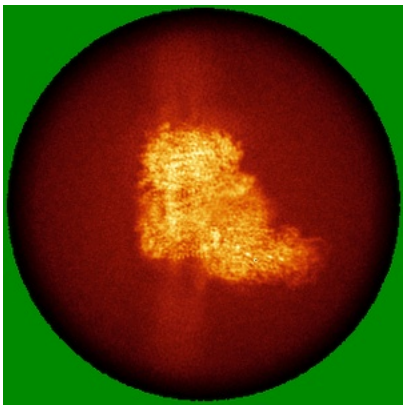
Z Index: 0

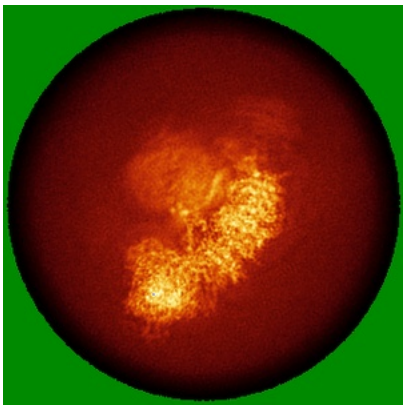
The images above show the largest variance slices of the map in three orthogonal directions.

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

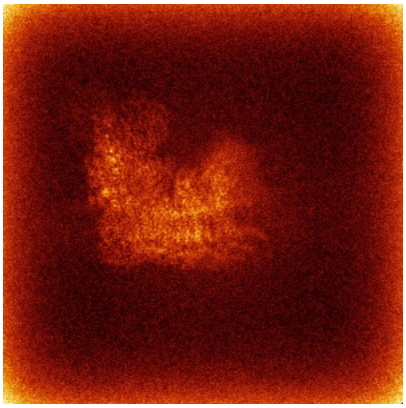
6.4.1 Primary map

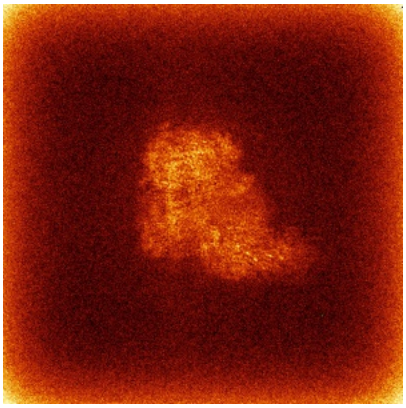

X

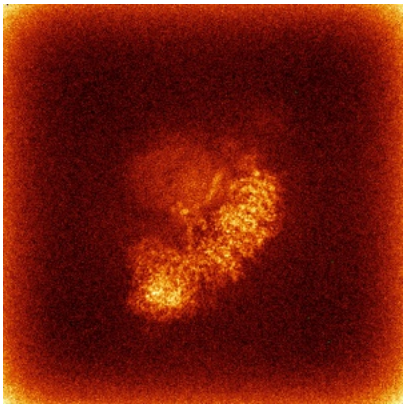

Y


Z

6.4.2 Raw map


X


Y


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. 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.

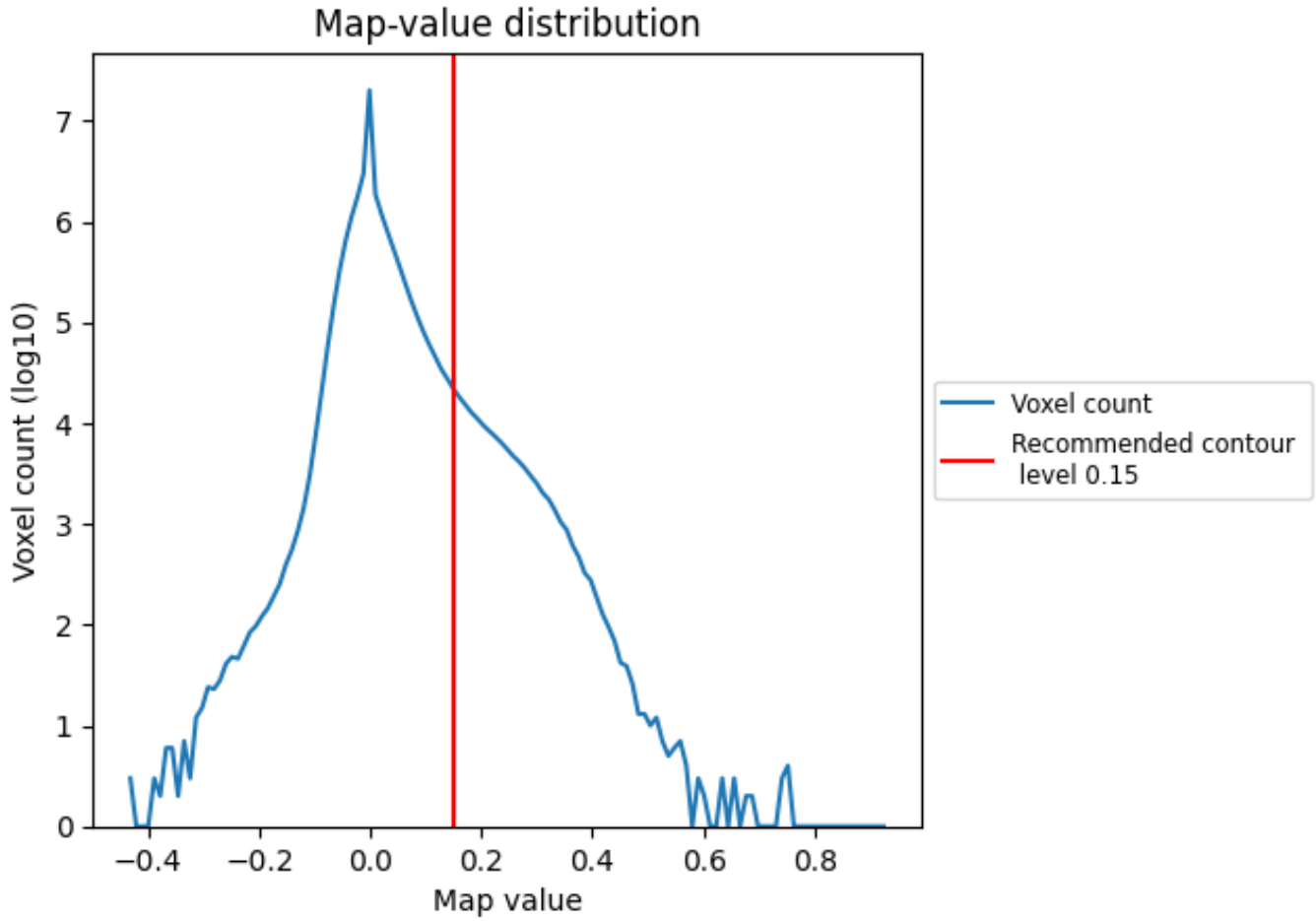
6.6 Mask visualisation (i)

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

7 Map analysis

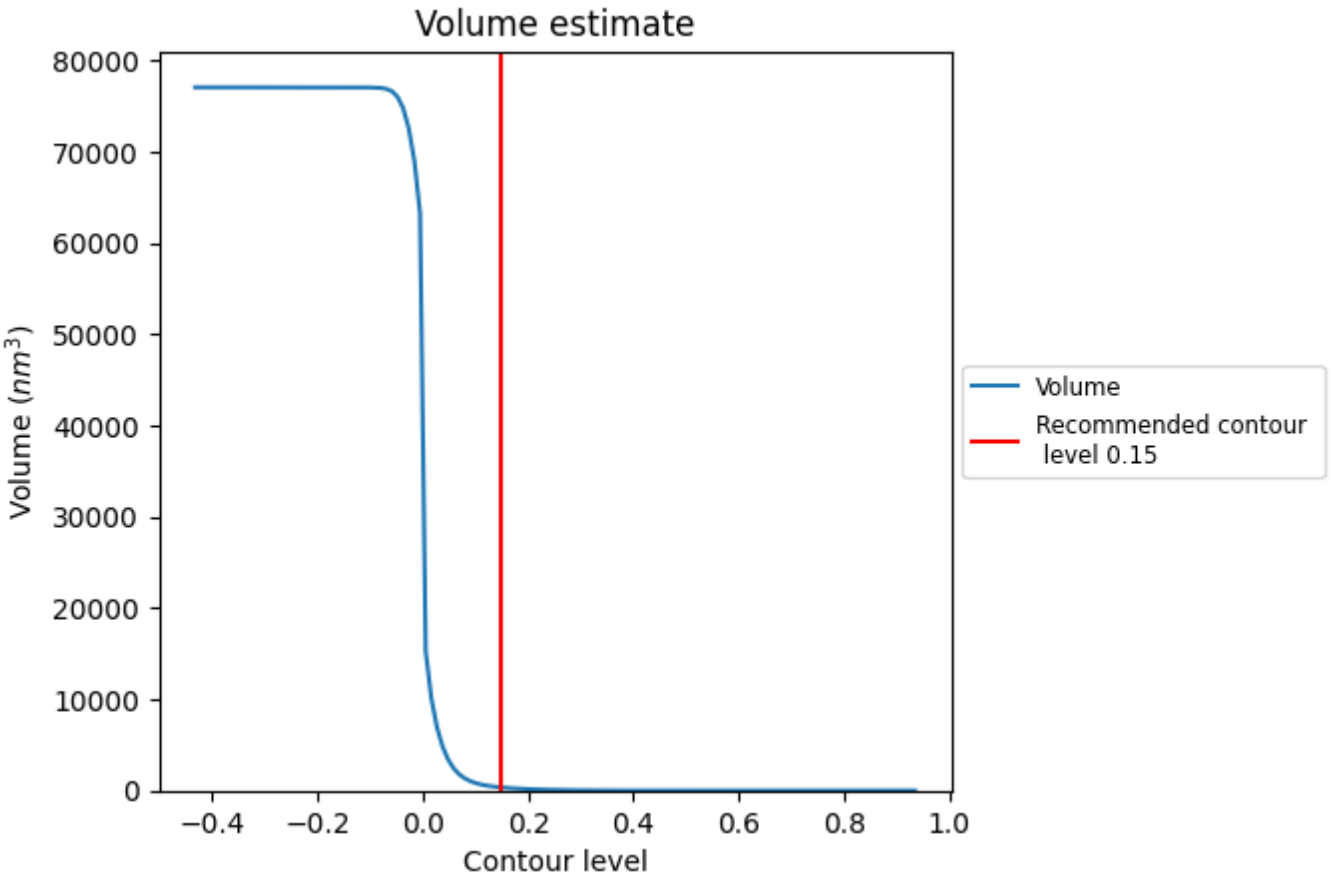
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

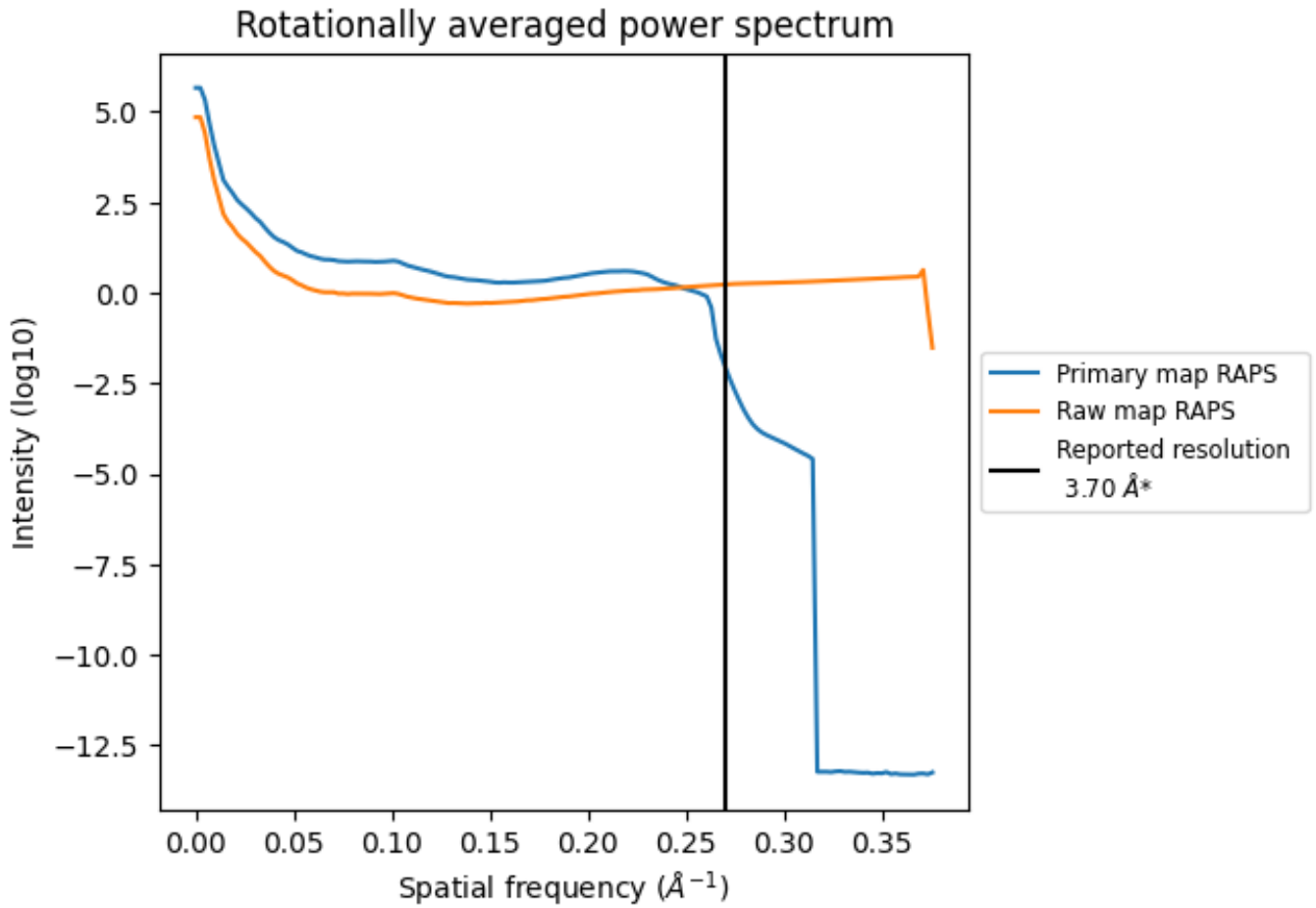
7.2 Volume estimate



The volume at the recommended contour level is 337 nm^3; this corresponds to an approximate mass of 304 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)

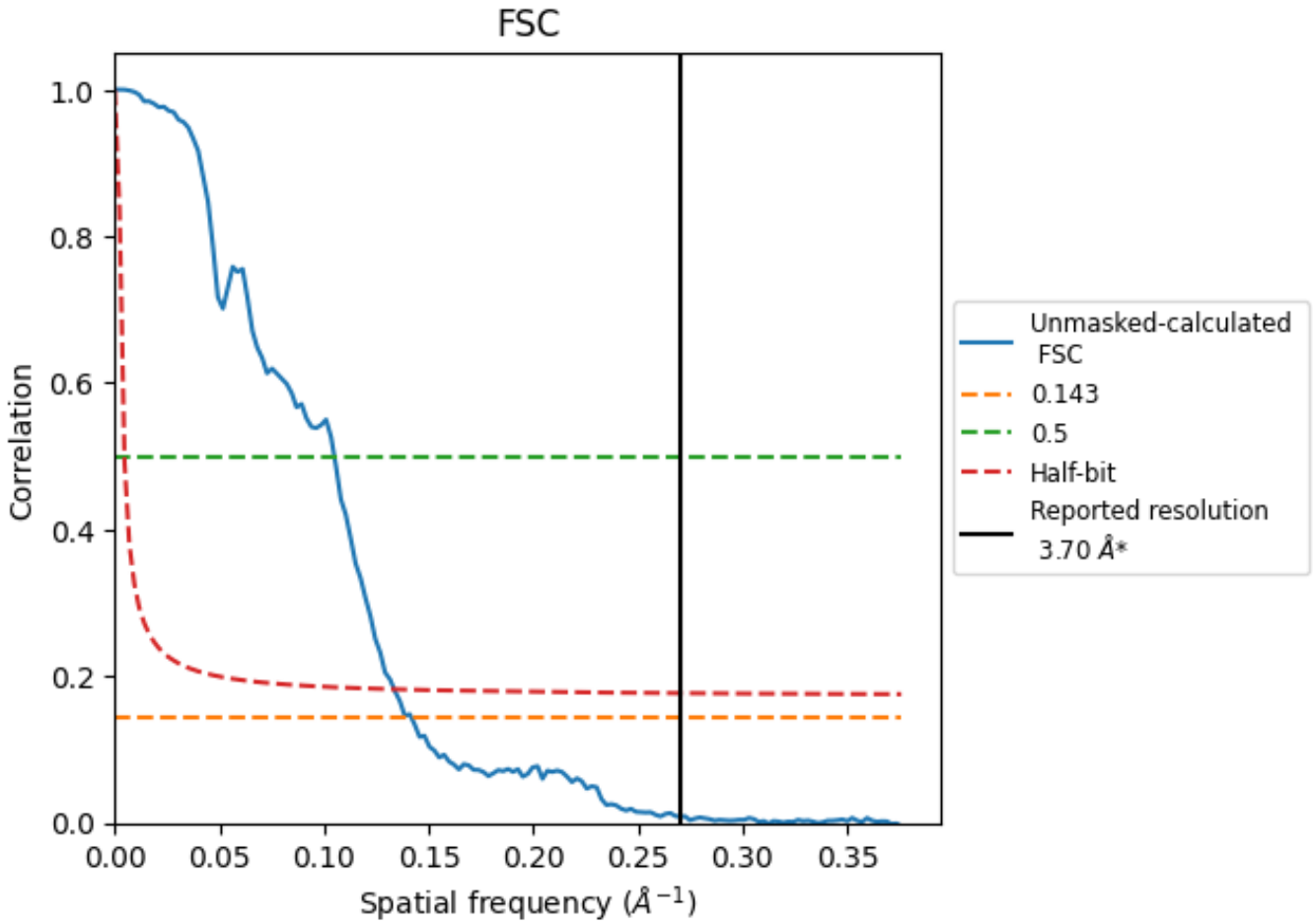


*Reported resolution corresponds to spatial frequency of 0.270 $Å^{-1}$

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 0.270 Å^{-1}

8.2 Resolution estimates (i)

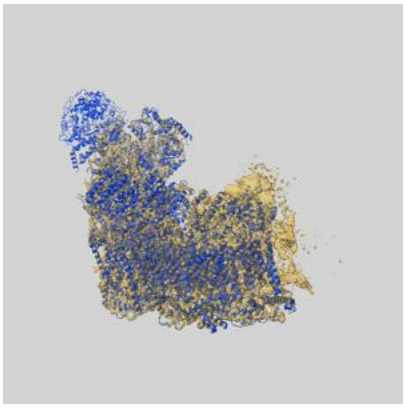
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.05	9.53	7.49

*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 7.05 differs from the reported value 3.7 by more than 10 %

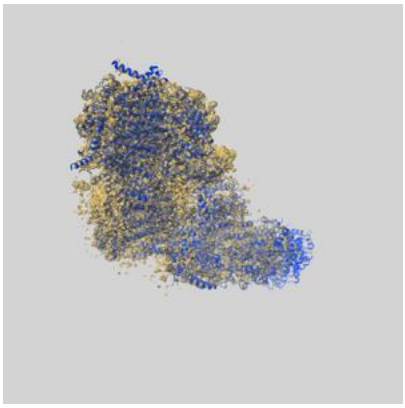
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-42170 and PDB model 8UET. Per-residue inclusion information can be found in section 3 on page 21.

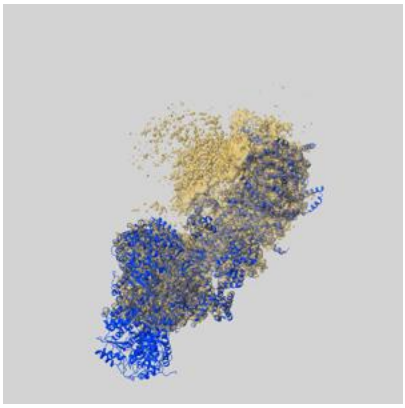
9.1 Map-model overlay



X



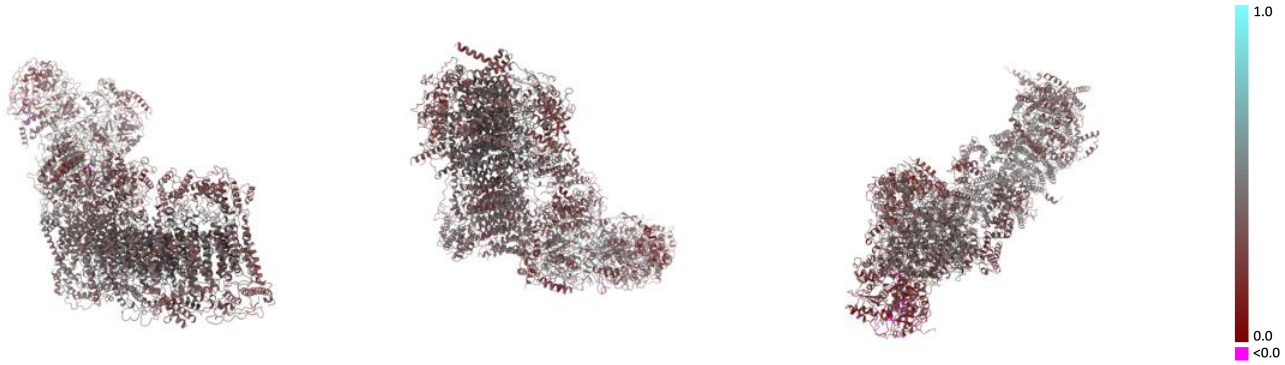
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

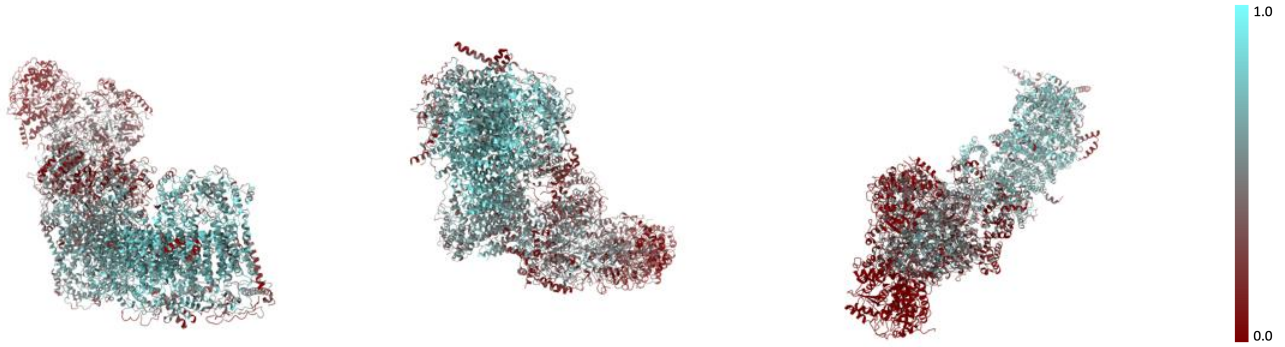
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

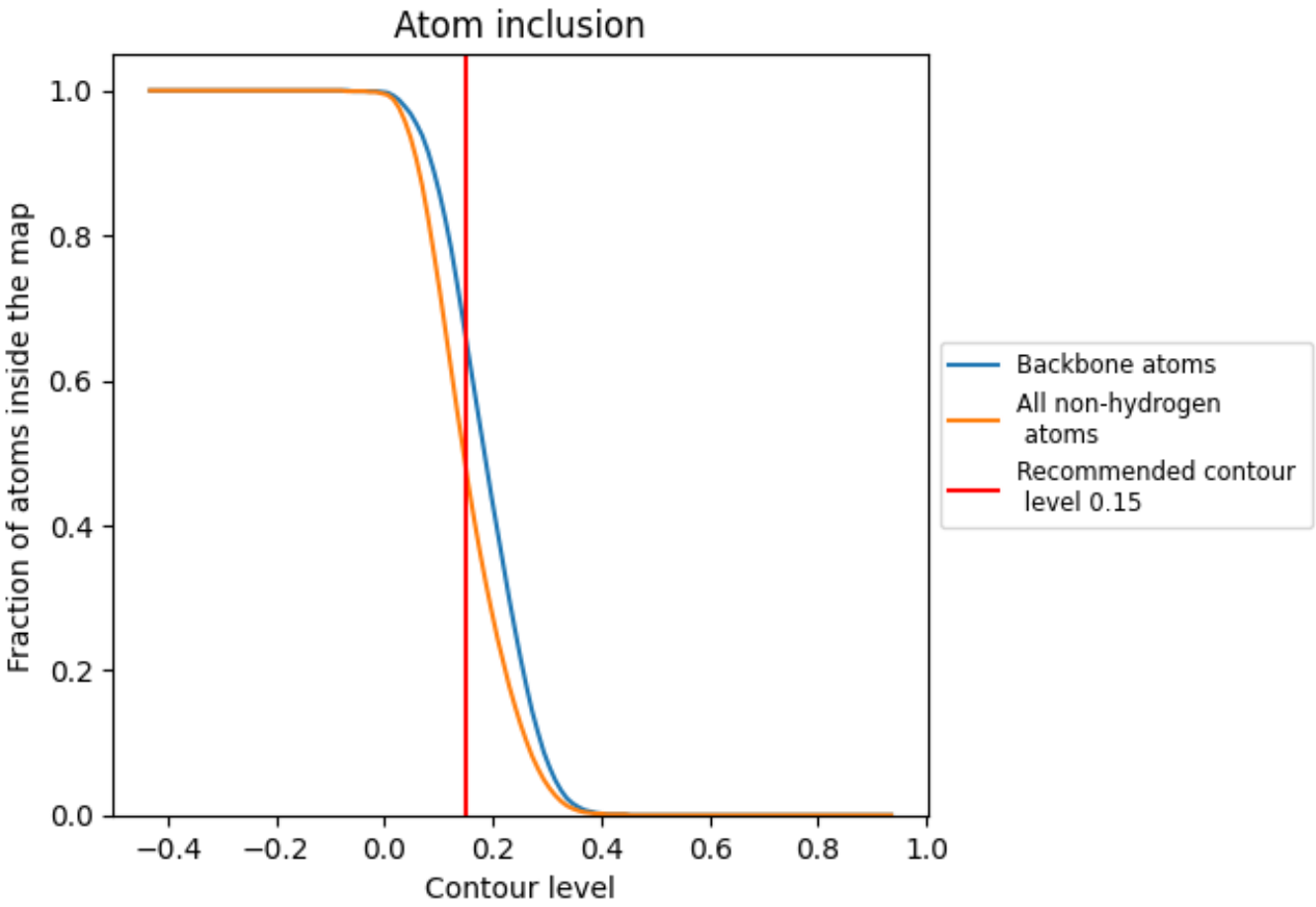
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.15).

9.4 Atom inclusion (i)



At the recommended contour level, 66% of all backbone atoms, 48% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4800	0.3770
1A	0.4830	0.4010
1B	0.5470	0.4180
1C	0.3960	0.4030
1D	0.4800	0.3900
1E	0.0280	0.2870
1F	0.0360	0.2590
1G	0.2840	0.3580
1H	0.6170	0.4070
1I	0.5820	0.4160
1J	0.5090	0.3870
1K	0.6140	0.4060
1L	0.7190	0.4070
1M	0.7590	0.4370
1N	0.6800	0.4280
1O	0.3880	0.3560
1P	0.2990	0.3370
1Q	0.3150	0.3830
1R	0.2950	0.4120
1S	0.1410	0.2900
1T	0.2340	0.2780
1U	0.6150	0.3370
1V	0.2060	0.3380
1W	0.3060	0.3340
1X	0.5480	0.4050
1Y	0.6740	0.3790
1Z	0.5480	0.4150
1a	0.6110	0.4090
1b	0.5370	0.4110
1c	0.4680	0.3690
1d	0.6670	0.4240
1e	0.5960	0.4280
1f	0.4620	0.3840
1g	0.6020	0.3950
1h	0.6730	0.4090

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Chain	Atom inclusion	Q-score
1i	0.3890	0.3470
1j	0.5240	0.3740
1k	0.5120	0.3590
1l	0.6540	0.3980
1m	0.7090	0.3890
1n	0.6720	0.3670
1o	0.5030	0.3170
1p	0.6070	0.3830
1q	0.4470	0.4090
1r	0.3790	0.4020
1s	0.0000	0.2520