Full wwPDB EM Validation Report ⓘ

Jul 6, 2024 – 02:39 PM EDT

PDB ID	:	8UEP
EMDB ID	:	EMD-42166
Title	:	In-situ complex I, Active-Q10 (State-alpha)
Authors	:	Zheng, W.; Zhu, J.; Zhang, K.
Deposited on	:	2023-10-02
Resolution	:	3.40 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:

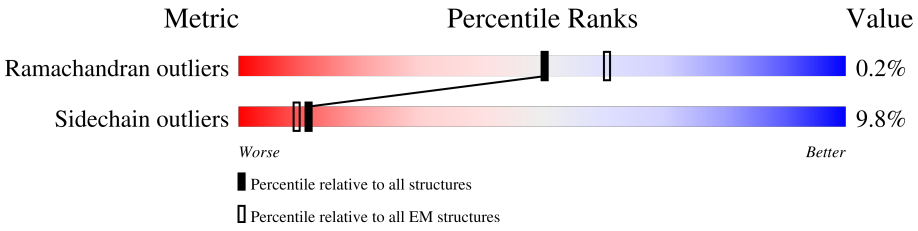
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance

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

The reported resolution of this entry is 3.40 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	13% 86% 13%
2	1B	258	55% 5% 40%
3	1C	264	75% 21%
4	1D	476	5% 84% 6% 10%
5	1E	249	82% 14%
6	1F	464	89% 7%
7	1G	727	90% 6%
8	1H	318	93% 6%
9	1I	239	71% 26%

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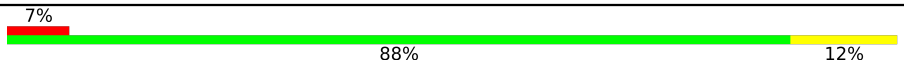
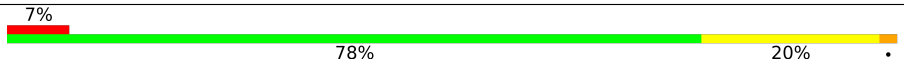
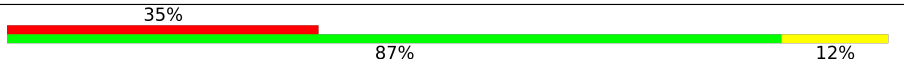
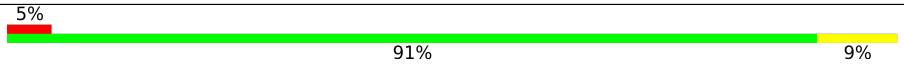
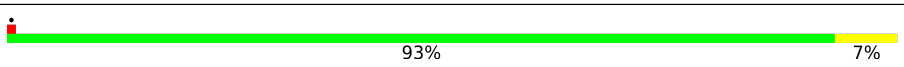
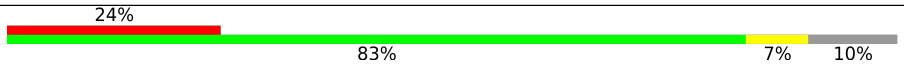
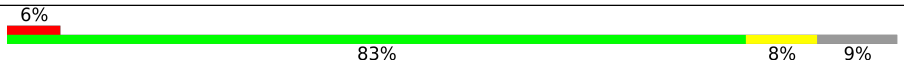
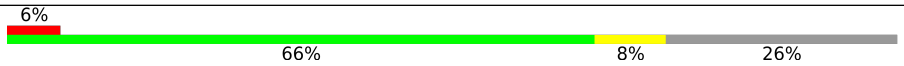
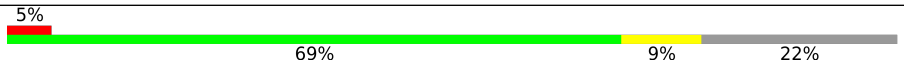
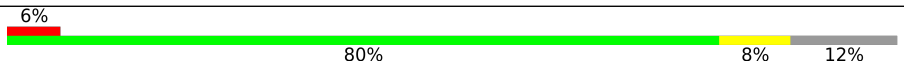
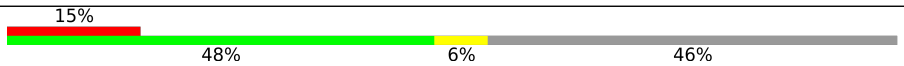
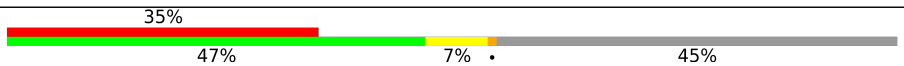
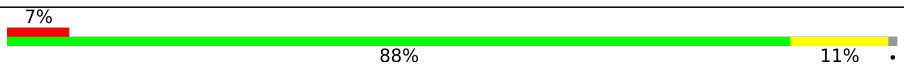
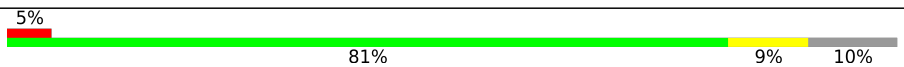
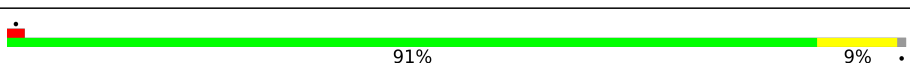
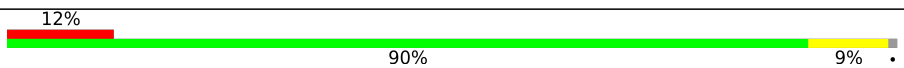
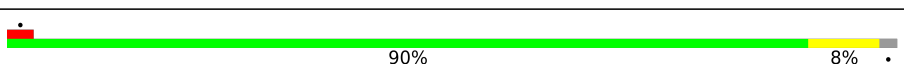
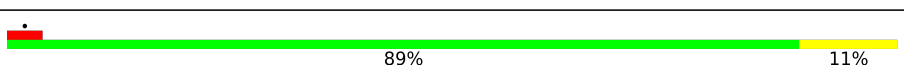
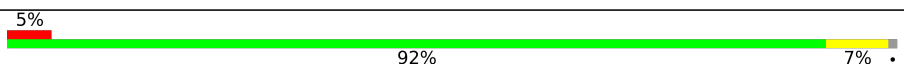
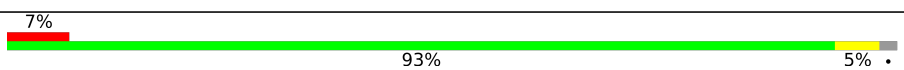
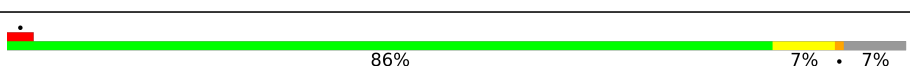
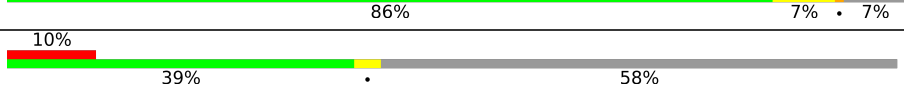
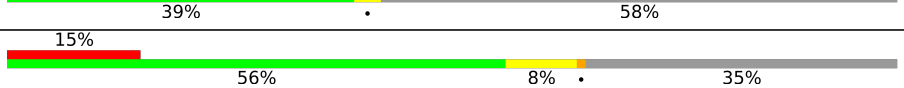
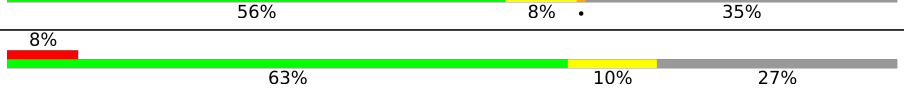
Mol	Chain	Length	Quality of chain
10	1J	175	
11	1K	98	
12	1L	606	
13	1M	459	
14	1N	347	
15	1O	357	
16	1P	377	
17	1Q	175	
18	1R	123	
19	1S	99	
20	1T	156	
20	1U	156	
21	1V	116	
22	1W	128	
23	1X	172	
24	1Y	141	
25	1Z	144	
26	1a	70	
27	1b	84	
28	1c	76	
29	1d	123	
30	1e	106	
31	1f	135	
32	1g	154	
33	1h	189	

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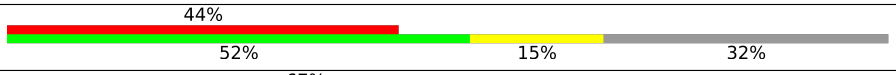
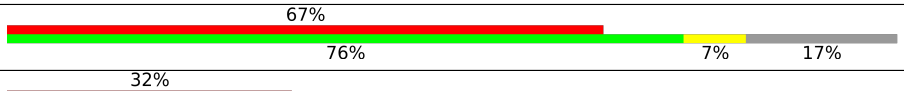
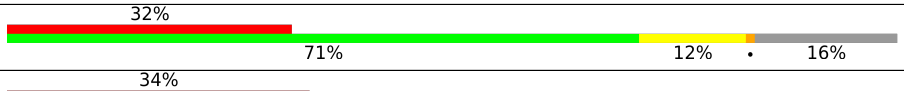
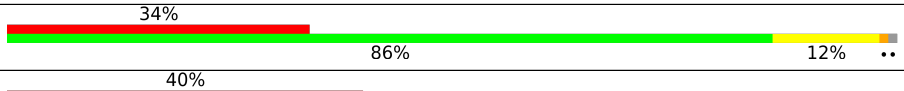
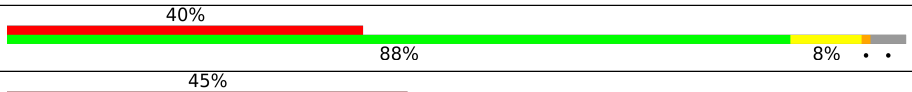
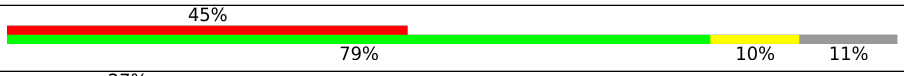
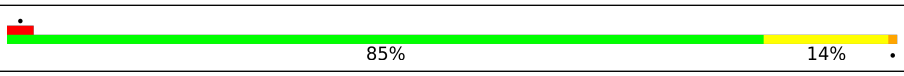
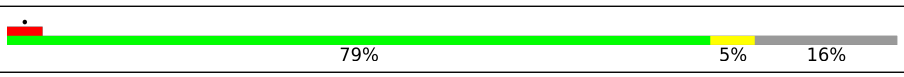
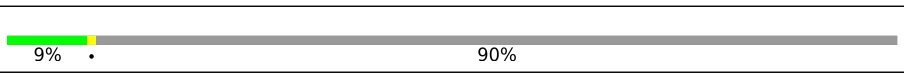
Mol	Chain	Length	Quality of chain
34	1i	128	
35	1j	105	
36	1k	98	
37	1l	186	
38	1m	129	
39	1n	179	
40	1o	137	
41	1p	176	
42	1q	145	
43	1r	114	
44	1s	471	

2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 67436 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	115	916	616	134	159	7	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	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	429	3452	2207	593	628	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		

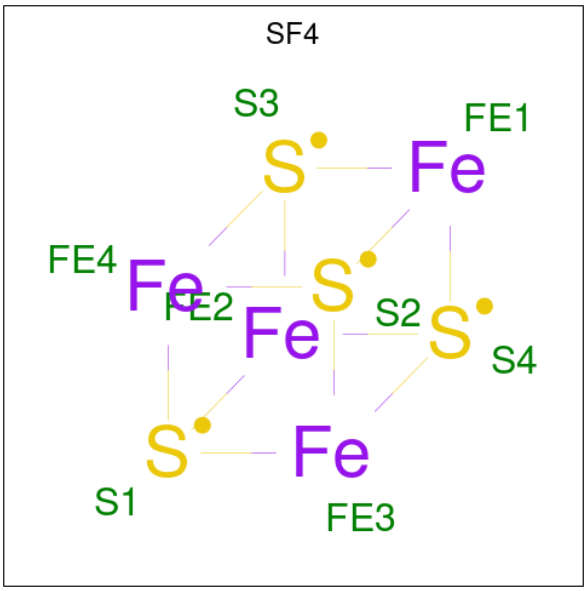
There is a discrepancy between the modelled and reference sequences:

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

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

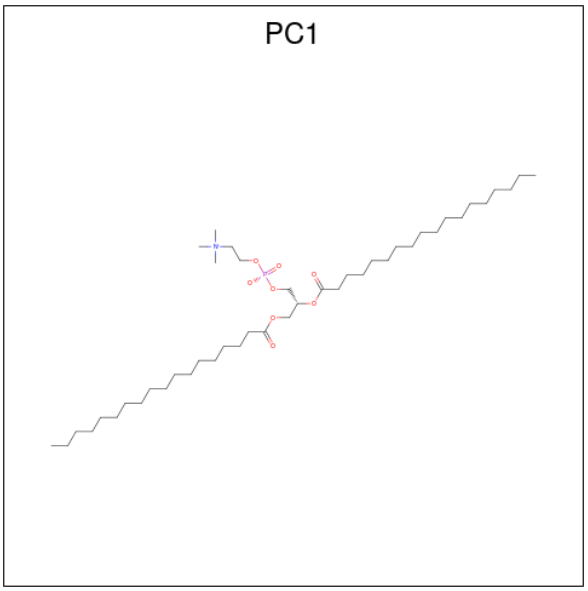
Mol	Chain	Residues	Atoms					AltConf	Trace
44	1s	45	Total	C	N	O	S	0	0
			382	238	70	73	1		

- Molecule 45 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



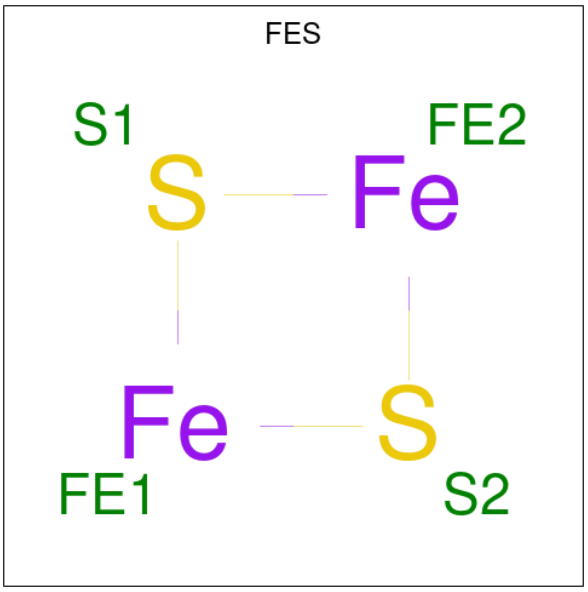
Mol	Chain	Residues	Atoms				AltConf
45	1B	1	Total	Fe	S		0
			8	4	4		
45	1F	1	Total	Fe	S		0
			8	4	4		
45	1G	1	Total	Fe	S		0
			8	4	4		
45	1G	1	Total	Fe	S		0
			8	4	4		
45	1I	1	Total	Fe	S		0
			8	4	4		
45	1I	1	Total	Fe	S		0
			8	4	4		

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



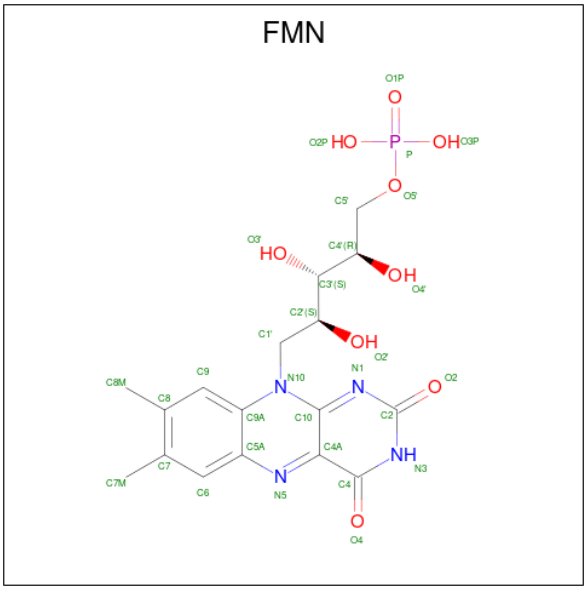
Mol	Chain	Residues	Atoms					AltConf
46	1B	1	Total	C	N	O	P	0
			34	24	1	8	1	
46	1M	1	Total	C	N	O	P	0
			35	25	1	8	1	
46	1Y	1	Total	C	N	O	P	0
			46	36	1	8	1	
46	1d	1	Total	C	N	O	P	0
			39	29	1	8	1	
46	1f	1	Total	C	N	O	P	0
			34	24	1	8	1	
46	1q	1	Total	C	N	O	P	0
			48	38	1	8	1	

- 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: $C_{17}H_{21}N_4O_9P$).

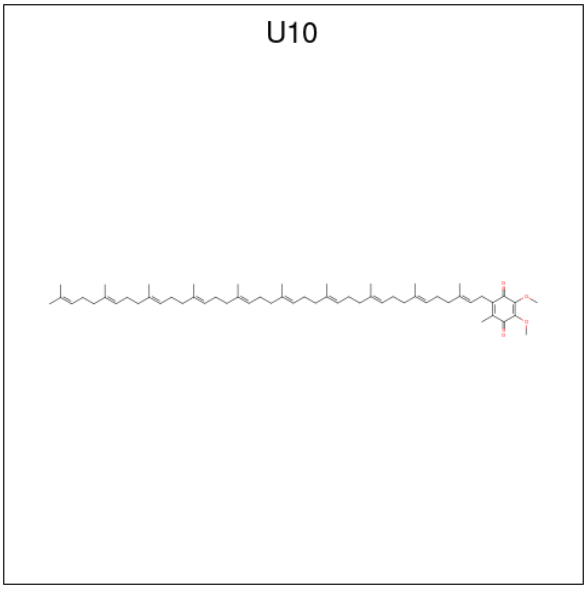


Mol	Chain	Residues	Atoms					AltConf
48	1F	1	Total	C	N	O	P	0
			31	17	4	9	1	

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

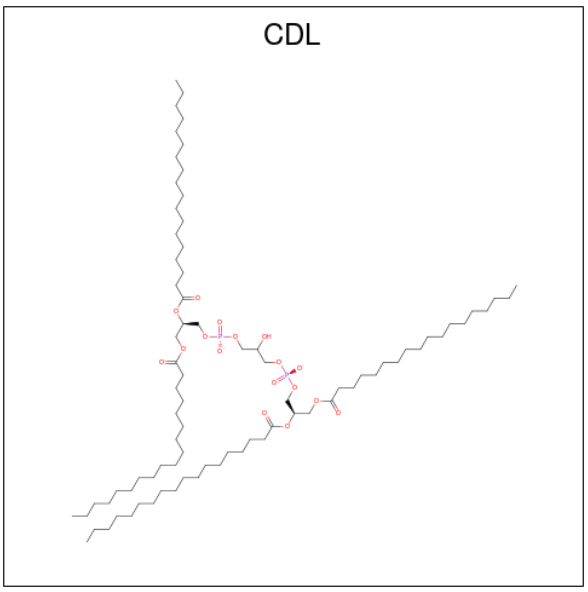
Mol	Chain	Residues	Atoms	AltConf
49	1G	1	Total K 1 1	0

- Molecule 50 is UBIQUINONE-10 (three-letter code: U10) (formula: $C_{59}H_{90}O_4$).



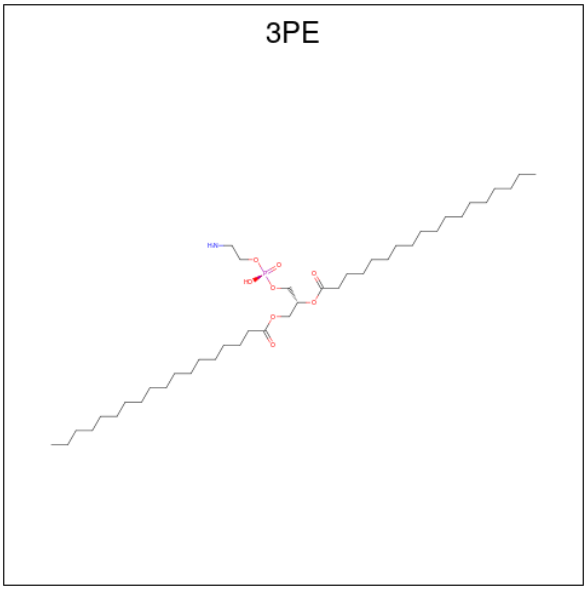
Mol	Chain	Residues	Atoms	AltConf
50	1H	1	Total C O 63 59 4	0

- Molecule 51 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



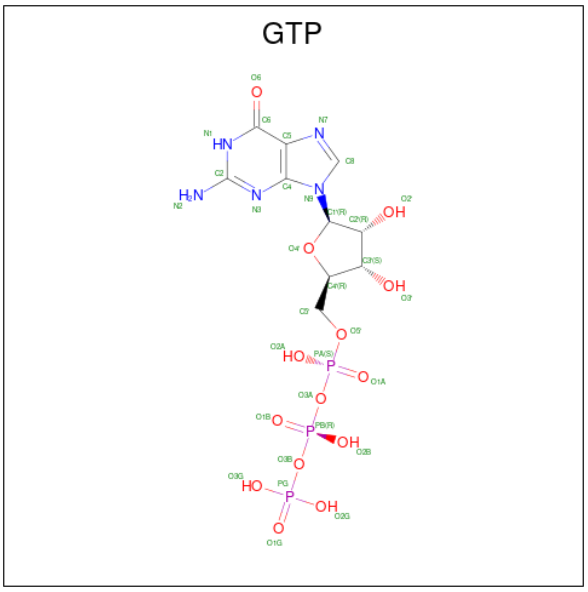
Mol	Chain	Residues	Atoms				AltConf
51	1H	1	Total	C	O	P	0
			51	32	17	2	
51	1N	1	Total	C	O	P	0
			67	48	17	2	
51	1a	1	Total	C	O	P	0
			61	42	17	2	

- Molecule 52 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
52	1L	1	Total	C	N	O	P	0
			42	32	1	8	1	
52	1N	1	Total	C	N	O	P	0
			38	28	1	8	1	
52	1Y	1	Total	C	N	O	P	0
			35	25	1	8	1	
52	1f	1	Total	C	N	O	P	0
			51	41	1	8	1	

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

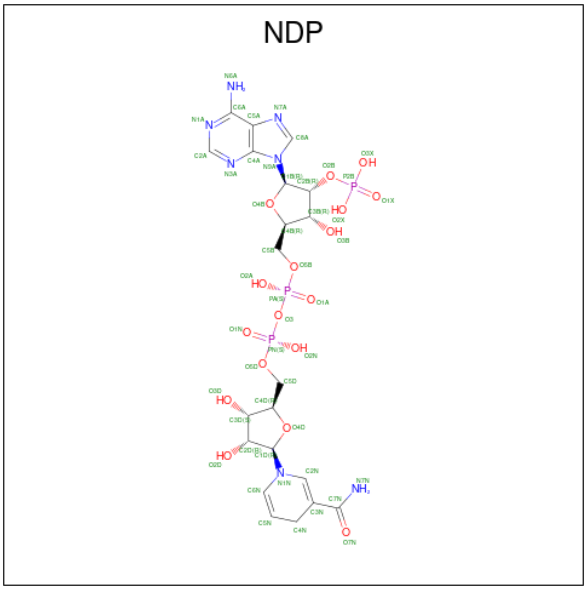


Mol	Chain	Residues	Atoms					AltConf
53	1O	1	Total	C	N	O	P	0
			32	10	5	14	3	

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

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

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

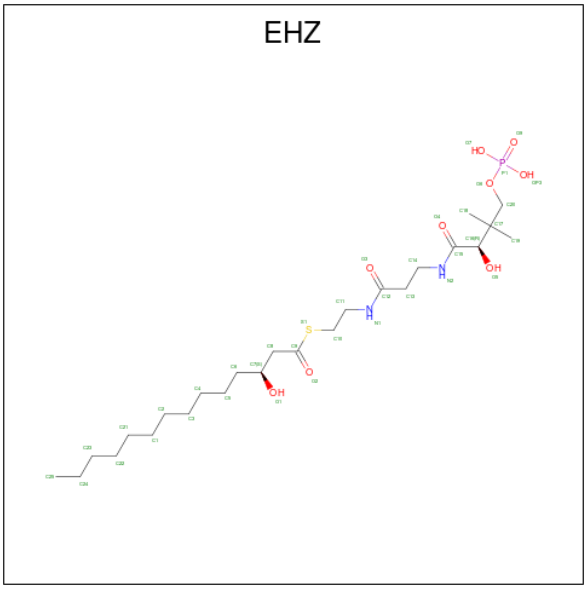


Mol	Chain	Residues	Atoms					AltConf
55	1P	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 56 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

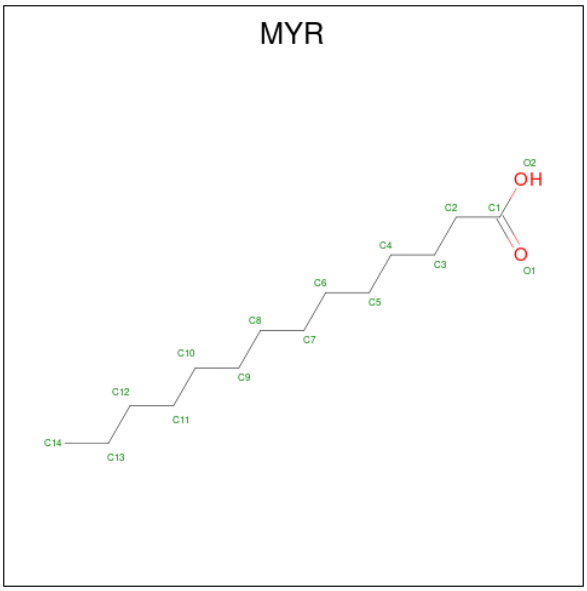
Mol	Chain	Residues	Atoms		AltConf
56	1R	1	Total	Zn	0
			1	1	

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



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

- Molecule 58 is MYRISTIC ACID (three-letter code: MYR) (formula: $C_{14}H_{28}O_2$).



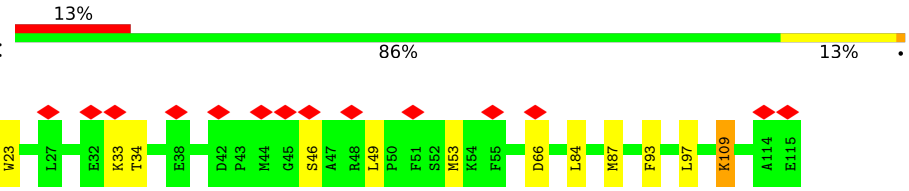
Mol	Chain	Residues	Atoms			AltConf
58	1l	1	Total	C	O	0
			15	14	1	

3 Residue-property plots (i)

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

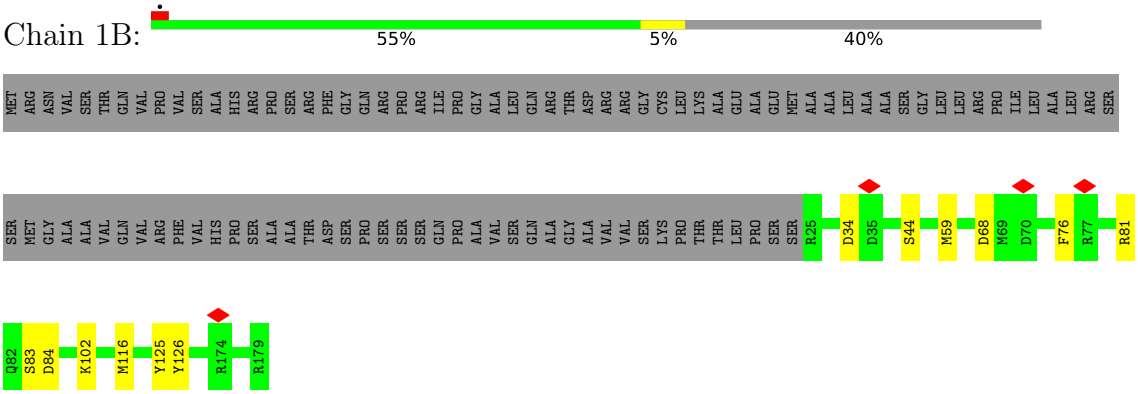
• Molecule 1: NADH-ubiquinone oxidoreductase chain 3

Chain 1A:



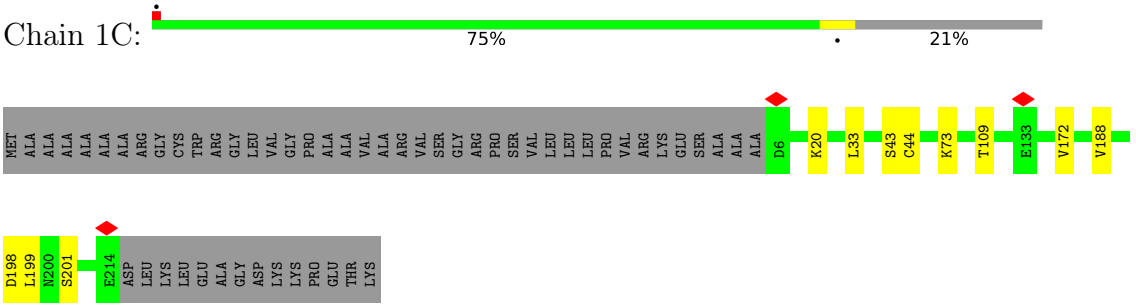
• Molecule 2: NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial

Chain 1B:



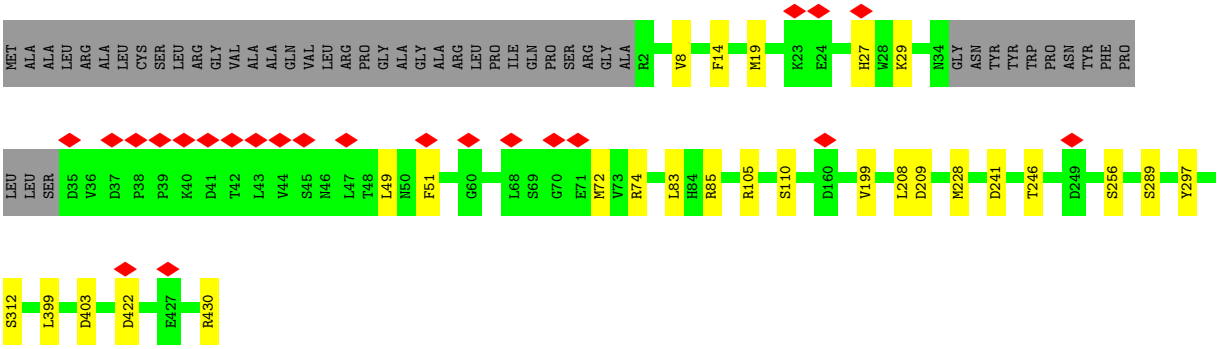
• Molecule 3: NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial

Chain 1C:



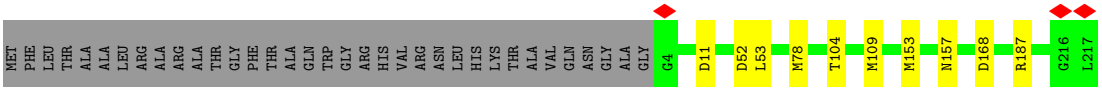
• Molecule 4: NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial

Chain 1D:



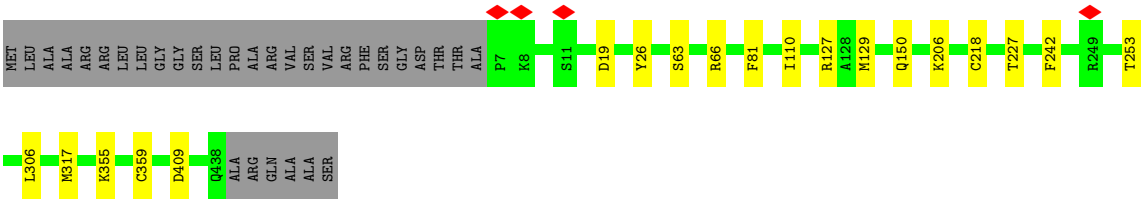
• Molecule 5: NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial

Chain 1E:



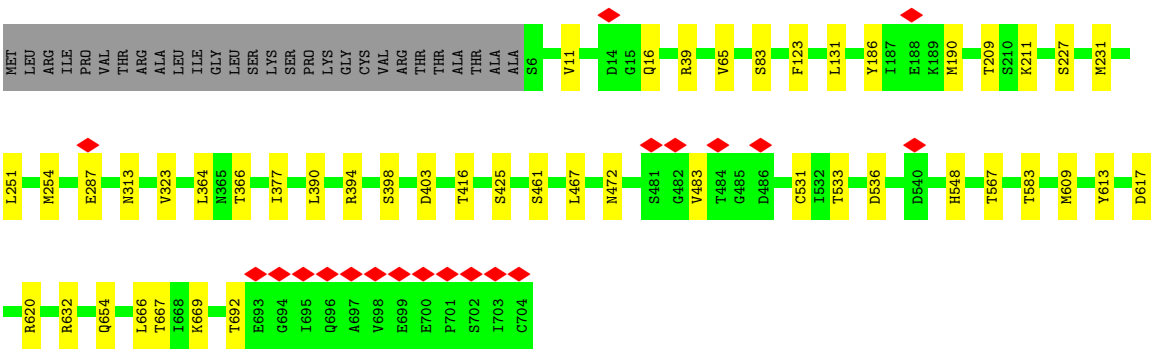
• Molecule 6: NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial

Chain 1F:



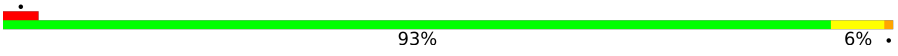
• Molecule 7: NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial

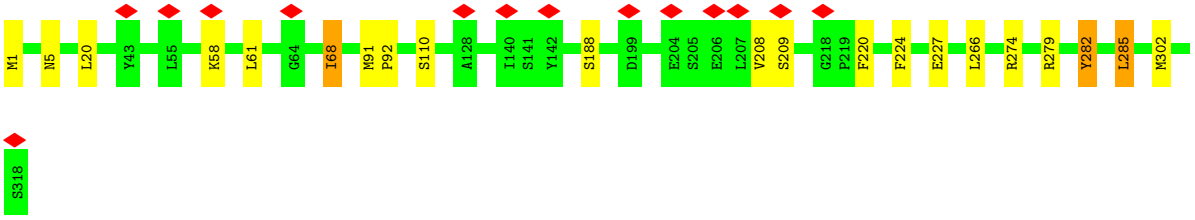
Chain 1G:



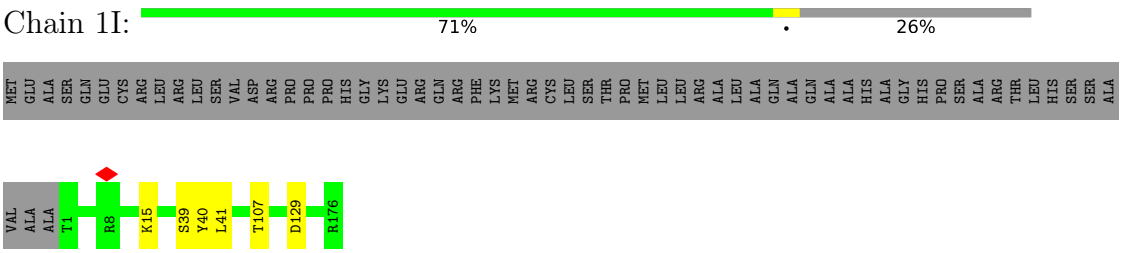
• Molecule 8: NADH-ubiquinone oxidoreductase chain 1

Chain 1H:

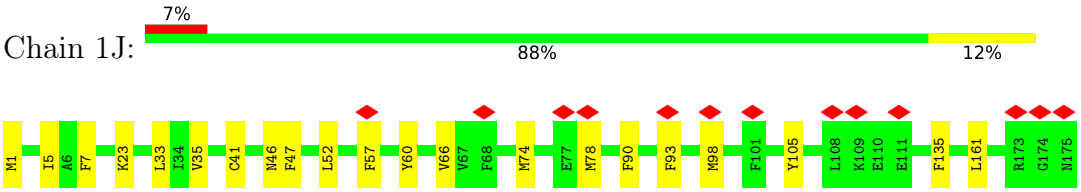




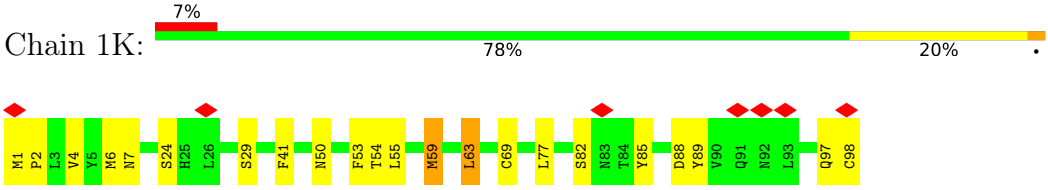
• Molecule 9: NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial



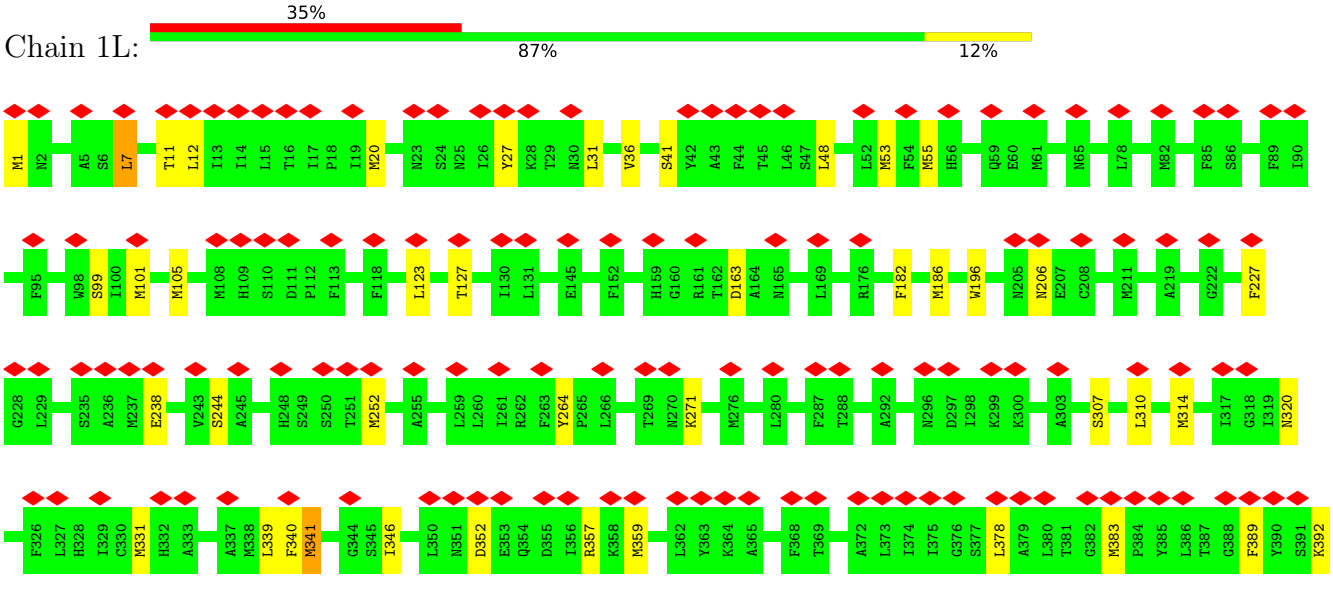
• Molecule 10: NADH-ubiquinone oxidoreductase chain 6

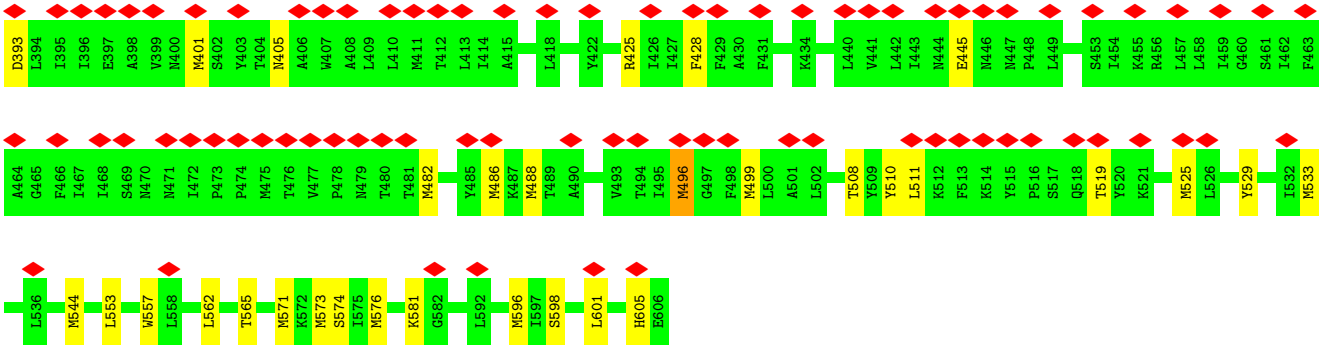


• Molecule 11: NADH-ubiquinone oxidoreductase chain 4L

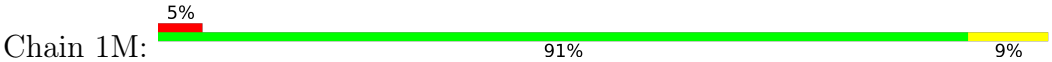


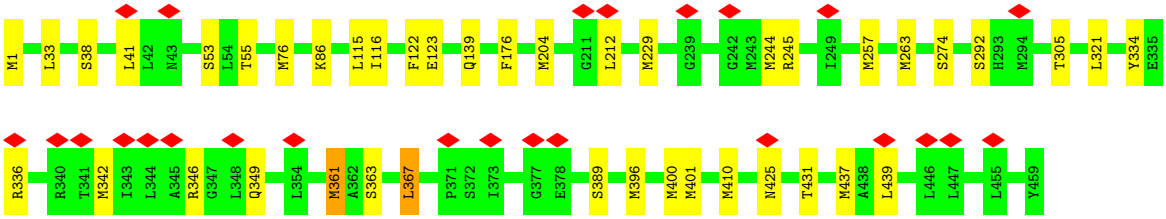
• Molecule 12: NADH-ubiquinone oxidoreductase chain 5



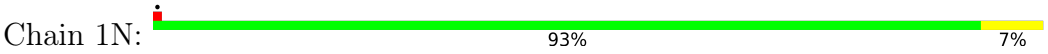


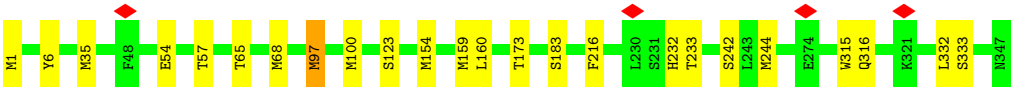
• Molecule 13: NADH-ubiquinone oxidoreductase chain 4



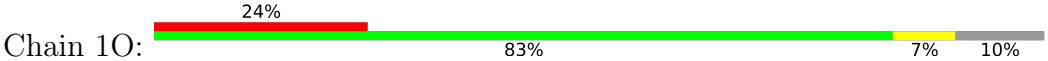


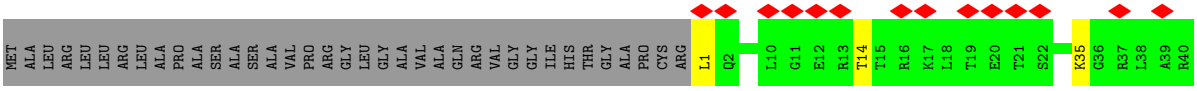
• Molecule 14: NADH-ubiquinone oxidoreductase chain 2

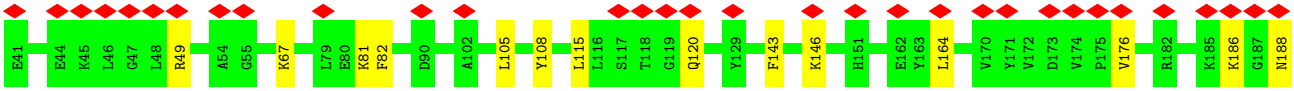


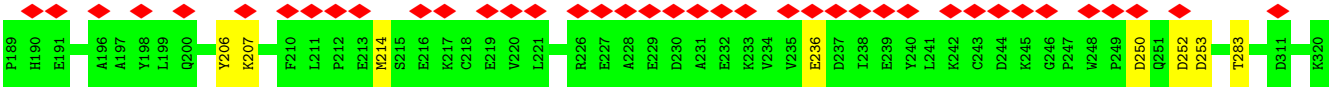


• Molecule 15: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

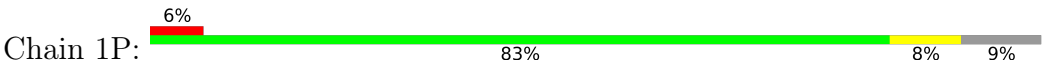


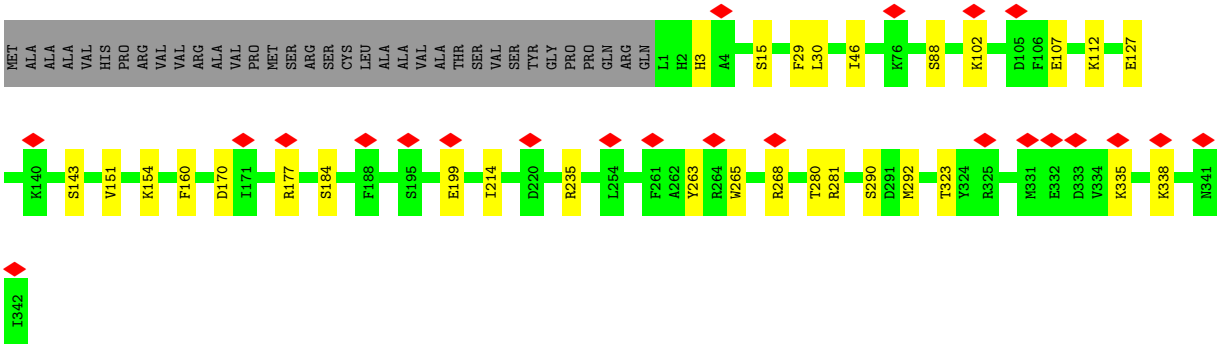




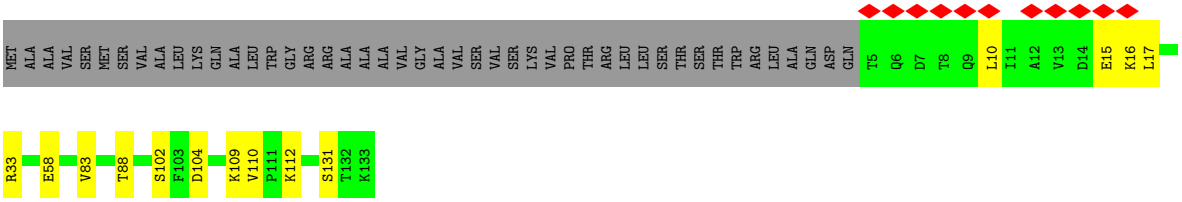


• Molecule 16: NADH:ubiquinone oxidoreductase subunit A9

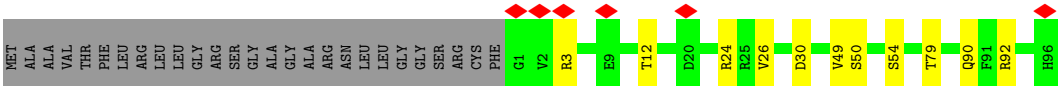




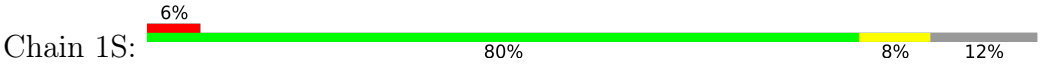
• Molecule 17: NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial

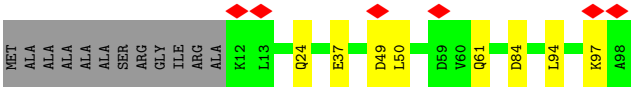


• Molecule 18: NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial

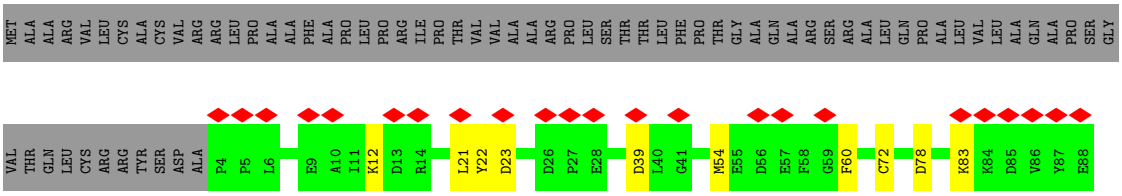


• Molecule 19: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2

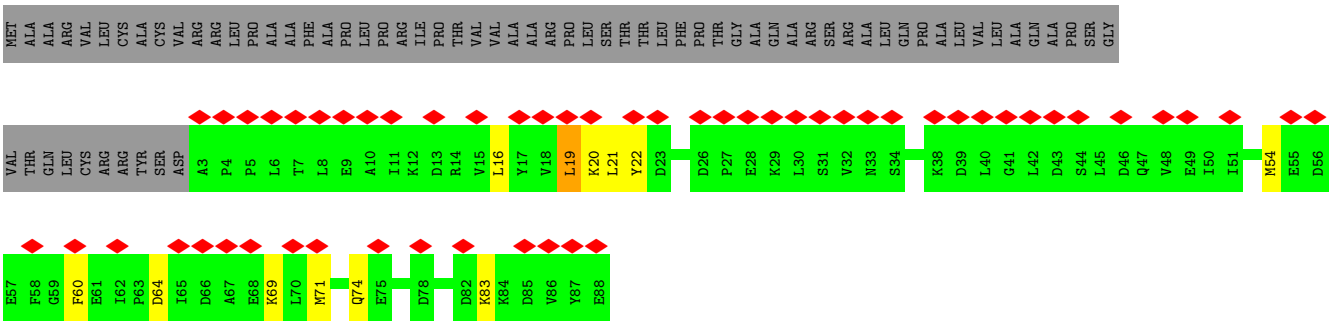




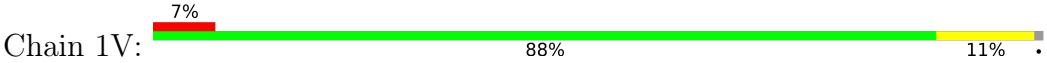
• Molecule 20: NADH:ubiquinone oxidoreductase subunit AB1

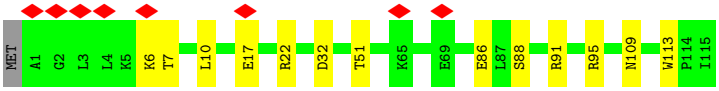


• Molecule 20: NADH:ubiquinone oxidoreductase subunit AB1

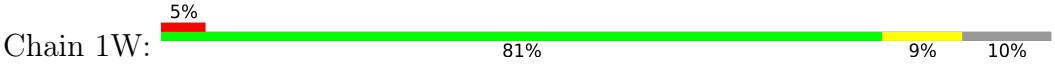


• Molecule 21: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5 isoform X1

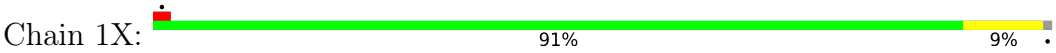


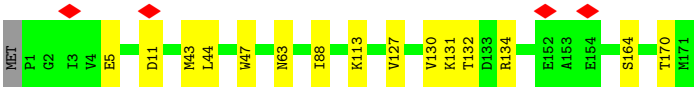


• Molecule 22: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6

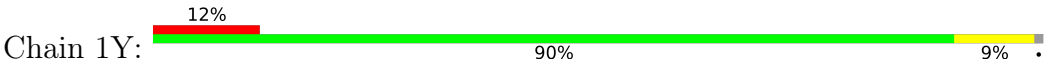


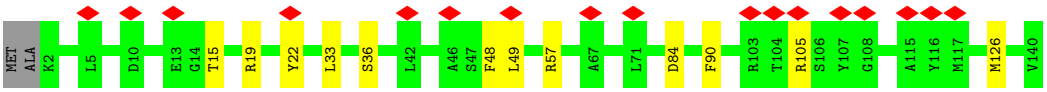
• Molecule 23: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8



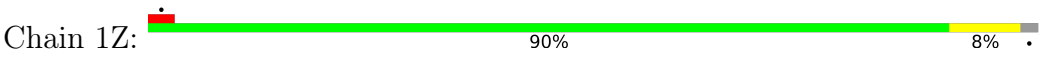


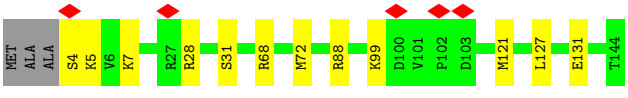
• Molecule 24: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11





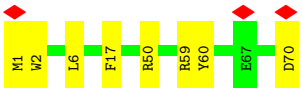
• Molecule 25: NADH:ubiquinone oxidoreductase subunit A13





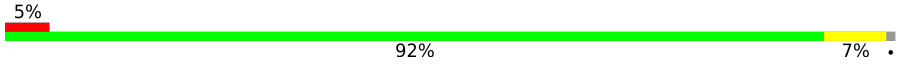
• Molecule 26: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

Chain 1a:



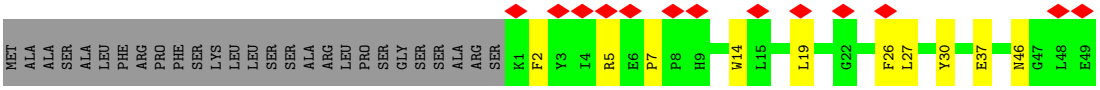
• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3

Chain 1b:



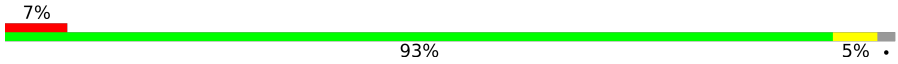
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

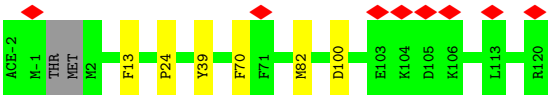
Chain 1c:



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

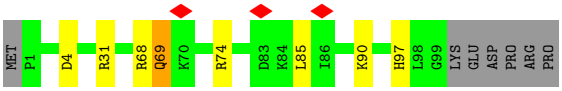
Chain 1d:





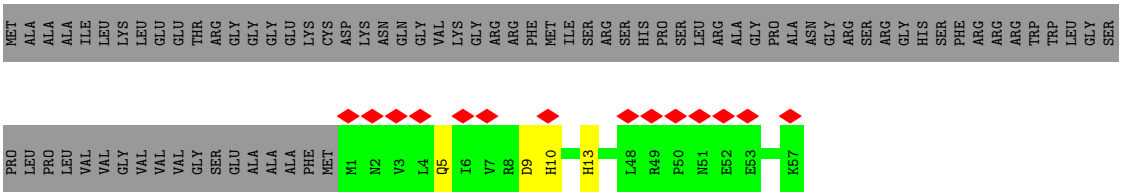
• Molecule 30: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

Chain 1e:



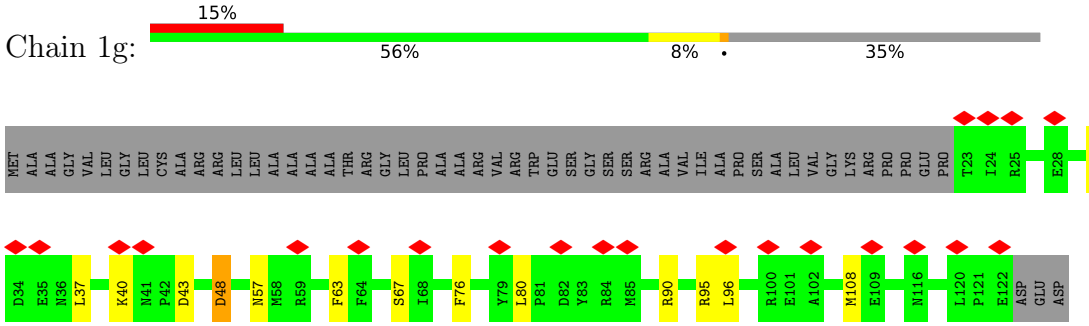
• Molecule 31: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1 [Sus scrofa]

Chain 1f:



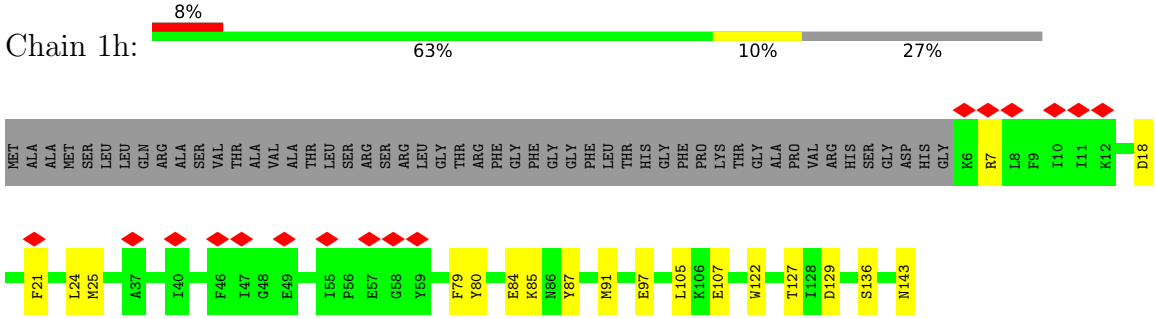
• Molecule 32: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

Chain 1g:



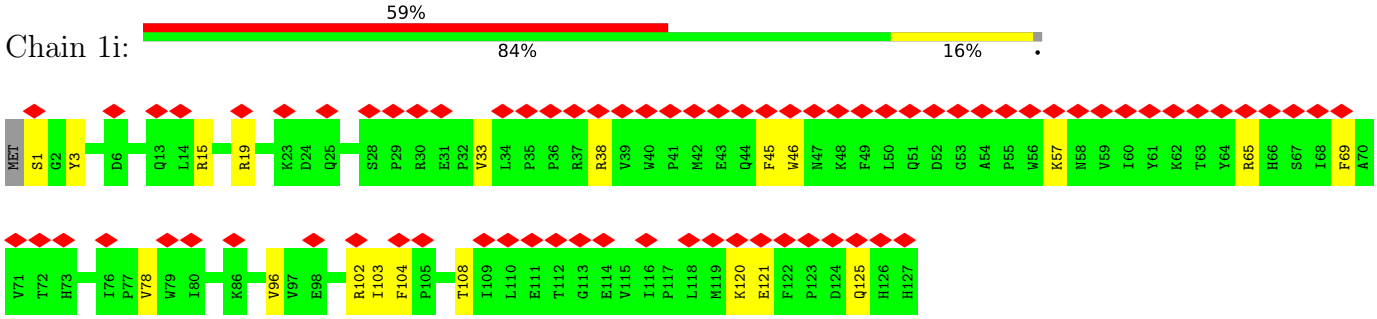
• Molecule 33: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

Chain 1h:



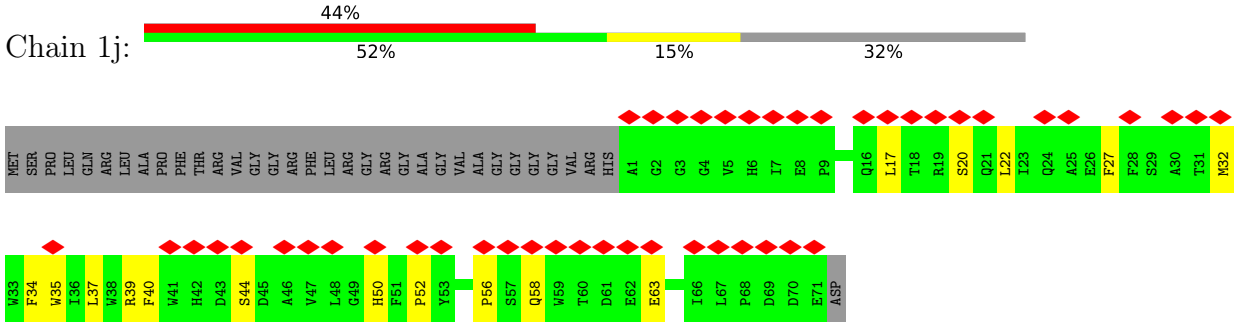
• Molecule 34: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

Chain 1i:



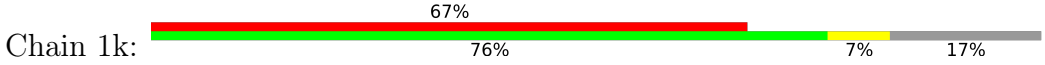
• Molecule 35: NADH:ubiquinone oxidoreductase subunit B2

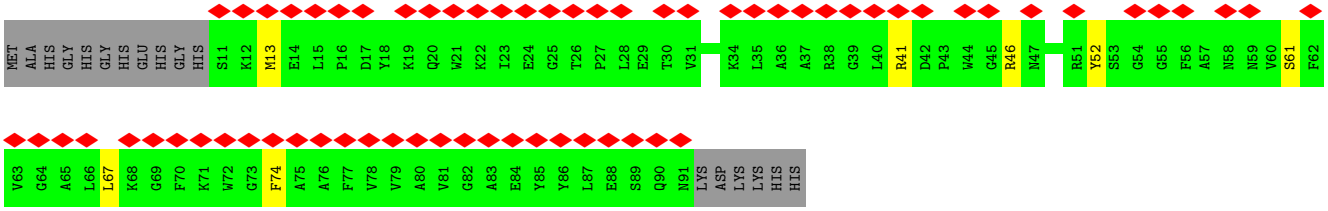
Chain 1j:



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

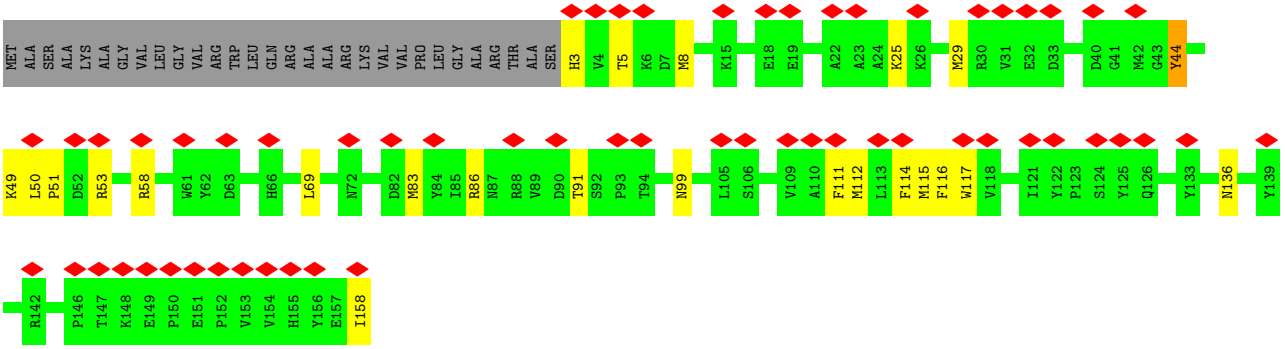
Chain 1k:





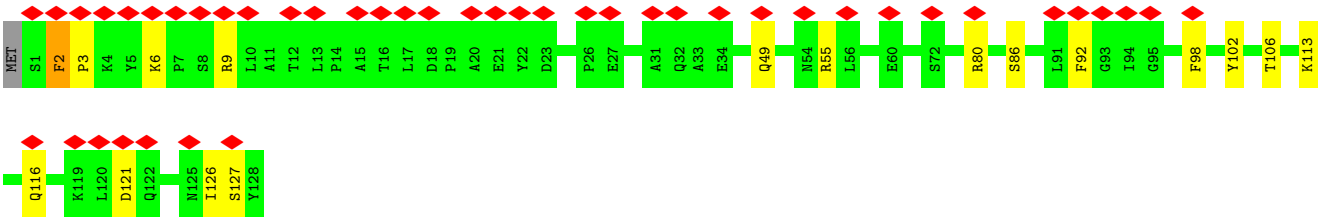
• Molecule 37: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

Chain 1l:



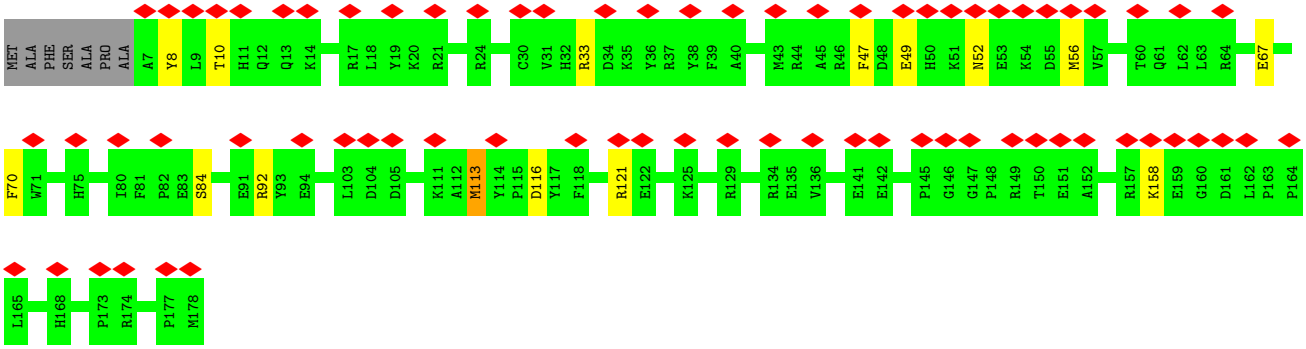
• Molecule 38: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4

Chain 1m:



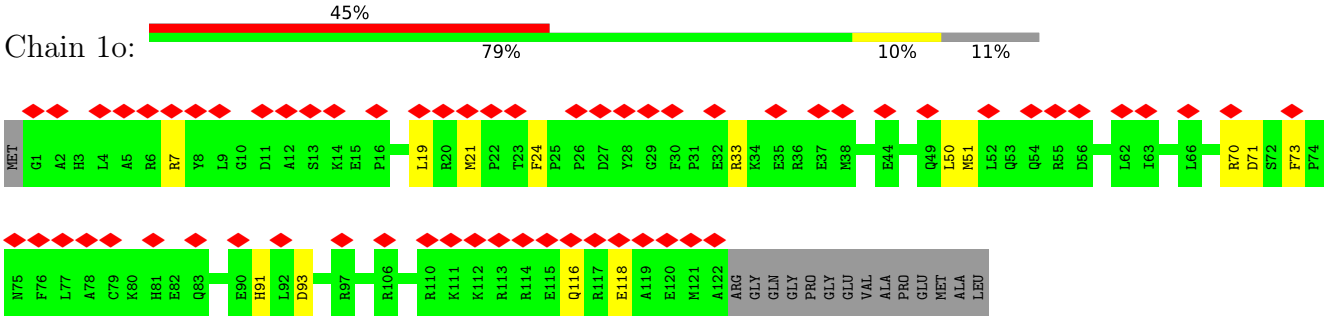
• Molecule 39: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9

Chain 1n:



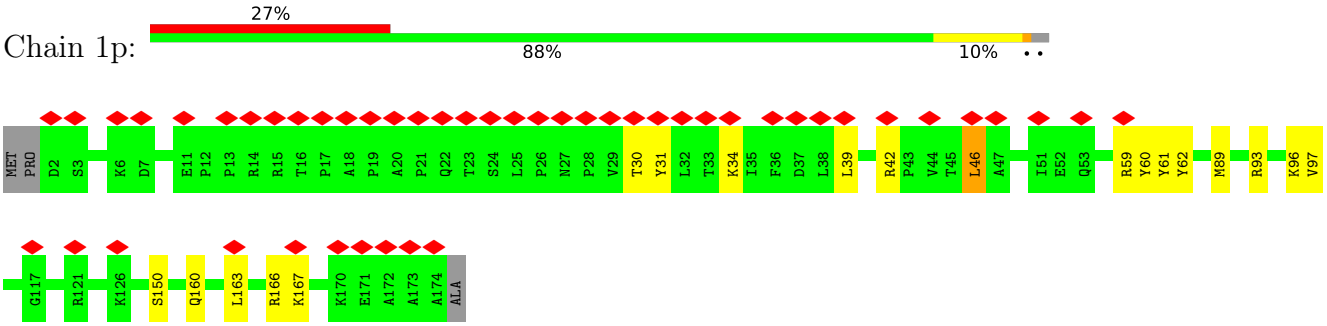
• Molecule 40: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

Chain 1o:



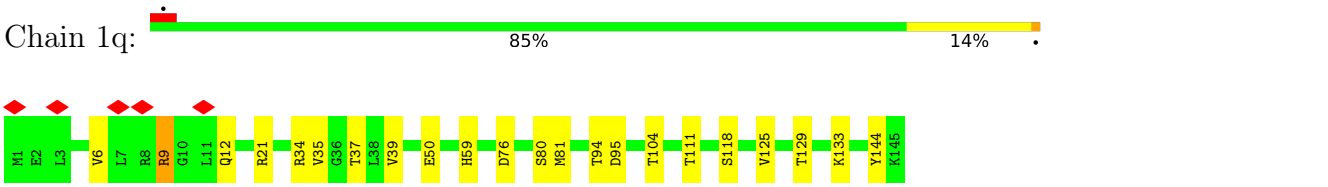
• Molecule 41: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

Chain 1p:



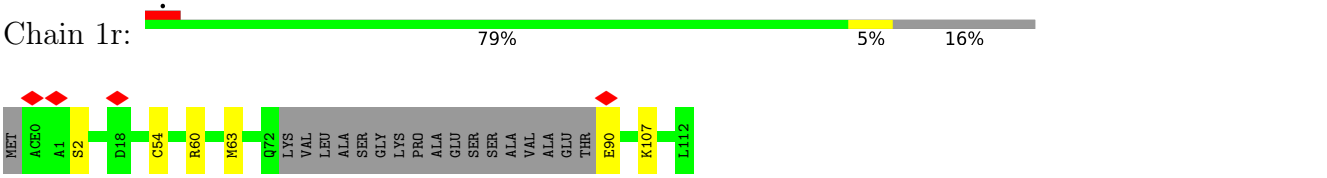
• Molecule 42: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12

Chain 1q:



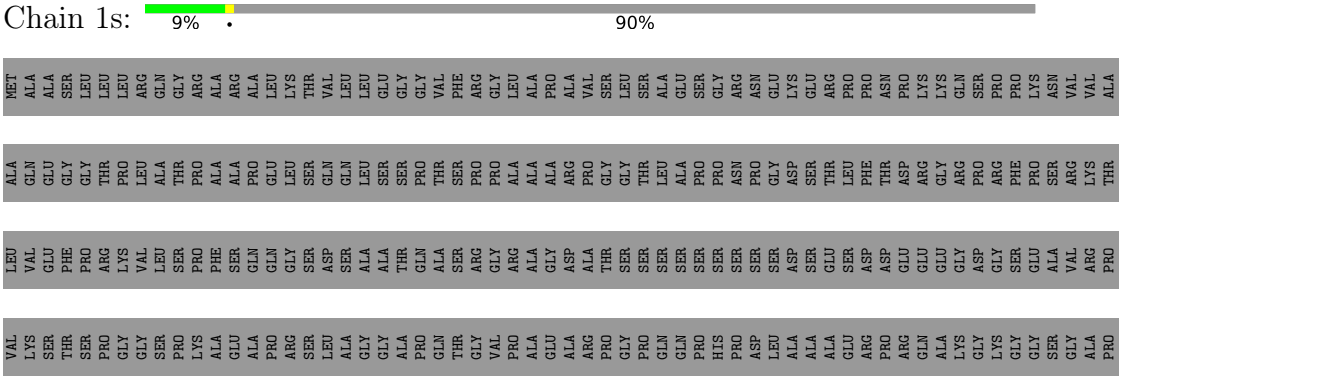
• Molecule 43: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7

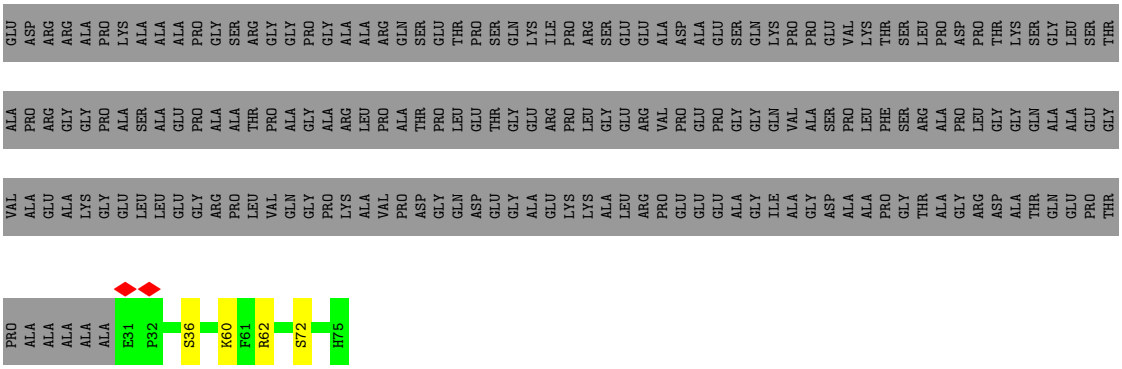
Chain 1r:



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

Chain 1s:




GLU ASP ARG ARG ALA PRO LYS ALA ALA ALA PRO GLY SER ARG GLY GLY PRO GLY ALA ALA ARG GLN SER GLU THR PRO SER GLN LYS ILE PRO ARG SER GLU GLU ALA ASP ALA GLU SER GLN LYS PRO PRO GLU VAL LYS THR SER LEU PRO ASP PRO THR LYS SER GLY LEU SER THR
ALA PRO ARG GLY GLY PRO ALA SER ALA GLU PRO ALA ALA THR PRO ALA GLY ALA ARG LEU PRO ALA THR PRO LEU GLU THR GLY GLU ARG PRO LEU GLY GLU ARG VAL PRO GLU PRO GLY GLY GLN VAL ALA SER PRO LEU PHE SER ARG ALA PRO LEU GLY GLY GLN ALA ALA GLU GLY
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 S36 K60 F61 R62 S72 H75

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	34000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	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 (6k x 4k)	Depositor
Maximum map value	1.137	Depositor
Minimum map value	-0.300	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.12	Depositor
Map size (Å)	556.0, 556.0, 556.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.39, 1.39, 1.39	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.33	0/930	0.61	0/1271
2	1B	0.31	0/1273	0.58	0/1722
3	1C	0.26	0/1791	0.50	0/2439
4	1D	0.28	0/3545	0.55	2/4806 (0.0%)
5	1E	0.27	0/1698	0.50	0/2311
6	1F	0.25	0/3401	0.50	0/4595
7	1G	0.25	0/5451	0.50	0/7387
8	1H	0.30	0/2566	0.56	1/3509 (0.0%)
9	1I	0.29	0/1443	0.55	0/1952
10	1J	0.32	0/1364	0.56	0/1850
11	1K	0.36	0/751	0.72	2/1018 (0.2%)
12	1L	0.29	0/4939	0.65	8/6718 (0.1%)
13	1M	0.28	0/3713	0.59	4/5063 (0.1%)
14	1N	0.29	0/2765	0.58	2/3758 (0.1%)
15	1O	0.29	0/2650	0.55	0/3588
16	1P	0.26	0/2828	0.54	1/3834 (0.0%)
17	1Q	0.31	0/1070	0.62	1/1446 (0.1%)
18	1R	0.26	0/755	0.57	0/1018
19	1S	0.29	0/711	0.71	2/956 (0.2%)
20	1T	0.35	0/701	0.76	2/946 (0.2%)
20	1U	0.31	0/706	0.68	3/954 (0.3%)
21	1V	0.29	0/946	0.53	0/1281
22	1W	0.30	0/995	0.66	1/1340 (0.1%)
23	1X	0.25	0/1436	0.52	0/1938
24	1Y	0.31	0/1037	0.66	1/1404 (0.1%)
25	1Z	0.28	0/1199	0.56	0/1617
26	1a	0.30	0/577	0.59	1/777 (0.1%)
27	1b	0.28	0/664	0.54	0/912
28	1c	0.35	0/430	0.89	5/581 (0.9%)
29	1d	0.29	0/1024	0.57	0/1383
30	1e	0.30	0/836	0.67	2/1118 (0.2%)
31	1f	0.30	0/499	0.71	1/673 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	1g	0.33	0/858	0.75	3/1165 (0.3%)
33	1h	0.28	0/1184	0.58	0/1603
34	1i	0.33	0/1131	0.67	0/1541
35	1j	0.33	0/627	0.81	4/858 (0.5%)
36	1k	0.30	0/668	0.60	1/903 (0.1%)
37	1l	0.30	0/1365	0.65	2/1867 (0.1%)
38	1m	0.93	2/1092 (0.2%)	1.08	5/1481 (0.3%)
39	1n	0.27	0/1549	0.59	1/2098 (0.0%)
40	1o	0.27	0/1069	0.64	0/1430
41	1p	0.27	0/1481	0.62	3/1997 (0.2%)
42	1q	0.37	0/1253	0.68	2/1704 (0.1%)
43	1r	0.29	0/782	0.62	0/1057
44	1s	0.25	0/394	0.54	0/533
All	All	0.31	2/68147 (0.0%)	0.60	60/92402 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
8	1H	0	1
21	1V	0	1
30	1e	0	2
37	1l	0	1
42	1q	0	1
All	All	0	6

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
38	1m	3	PRO	CB-CG	22.47	2.62	1.50
38	1m	3	PRO	CG-CD	-17.98	0.91	1.50

All (60) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
38	1m	3	PRO	CB-CG-CD	-27.30	0.01	106.50
38	1m	3	PRO	CA-N-CD	-13.07	93.20	111.50
38	1m	3	PRO	CA-CB-CG	-11.57	82.01	104.00
38	1m	3	PRO	N-CA-CB	-9.56	91.83	103.30
38	1m	2	PHE	C-N-CD	8.47	146.19	128.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
42	1q	9	ARG	CA-CB-CG	-8.11	95.56	113.40
35	1j	56	PRO	CA-N-CD	-7.90	100.44	111.50
24	1Y	33	LEU	CA-CB-CG	7.88	133.41	115.30
42	1q	9	ARG	CB-CG-CD	7.65	131.50	111.60
4	1D	83	LEU	CA-CB-CG	7.43	132.38	115.30
12	1L	378	LEU	CA-CB-CG	7.22	131.92	115.30
12	1L	123	LEU	CA-CB-CG	7.10	131.63	115.30
35	1j	37	LEU	CA-CB-CG	6.94	131.26	115.30
26	1a	1	MET	CB-CG-SD	6.80	132.81	112.40
30	1e	69	GLN	CA-CB-CG	6.79	128.34	113.40
13	1M	367	LEU	CA-CB-CG	6.72	130.76	115.30
4	1D	72	MET	CG-SD-CE	6.65	110.83	100.20
41	1p	46	LEU	CA-CB-CG	6.61	130.50	115.30
11	1K	63	LEU	CB-CG-CD2	-6.57	99.83	111.00
35	1j	52	PRO	N-CD-CG	-6.55	93.38	103.20
19	1S	94	LEU	CA-CB-CG	6.51	130.26	115.30
22	1W	127	ASP	CB-CG-OD1	6.51	124.16	118.30
31	1f	9	ASP	CB-CG-OD2	6.48	124.13	118.30
28	1c	27	LEU	CA-CB-CG	6.41	130.05	115.30
28	1c	7	PRO	N-CD-CG	-6.40	93.60	103.20
19	1S	49	ASP	CB-CG-OD1	6.40	124.06	118.30
28	1c	19	LEU	CA-CB-CG	6.38	129.97	115.30
32	1g	96	LEU	CA-CB-CG	6.38	129.97	115.30
14	1N	97	MET	CG-SD-CE	-6.32	90.09	100.20
32	1g	48	ASP	CB-CG-OD1	6.21	123.88	118.30
14	1N	332	LEU	CA-CB-CG	6.19	129.54	115.30
41	1p	39	LEU	CA-CB-CG	6.17	129.48	115.30
20	1U	19	LEU	CA-CB-CG	6.14	129.42	115.30
30	1e	4	ASP	CB-CG-OD2	6.07	123.76	118.30
12	1L	48	LEU	CA-CB-CG	6.00	129.09	115.30
16	1P	46	ILE	CG1-CB-CG2	-5.97	98.26	111.40
8	1H	285	LEU	CA-CB-CG	5.97	129.03	115.30
37	1l	112	MET	CB-CG-SD	5.97	130.30	112.40
13	1M	33	LEU	CA-CB-CG	5.89	128.85	115.30
28	1c	27	LEU	CB-CG-CD1	5.86	120.96	111.00
20	1U	16	LEU	CA-CB-CG	5.79	128.63	115.30
20	1U	21	LEU	CA-CB-CG	5.69	128.39	115.30
12	1L	55	MET	CG-SD-CE	5.62	109.20	100.20
37	1l	112	MET	CG-SD-CE	-5.61	91.23	100.20
13	1M	439	LEU	CA-CB-CG	5.61	128.19	115.30
17	1Q	10	LEU	CA-CB-CG	5.60	128.19	115.30
41	1p	163	LEU	CA-CB-CG	5.59	128.15	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
35	1j	52	PRO	CA-N-CD	-5.54	103.74	111.50
28	1c	7	PRO	CA-N-CD	-5.52	103.78	111.50
12	1L	7	LEU	CA-CB-CG	5.47	127.89	115.30
13	1M	361	MET	CA-CB-CG	5.42	122.52	113.30
20	1T	21	LEU	CA-CB-CG	5.35	127.60	115.30
11	1K	59	MET	CA-CB-CG	5.21	122.16	113.30
20	1T	23	ASP	CB-CG-OD1	5.20	122.98	118.30
12	1L	310	LEU	CA-CB-CG	5.19	127.24	115.30
32	1g	80	LEU	CA-CB-CG	5.16	127.16	115.30
12	1L	341	MET	CA-CB-CG	5.14	122.04	113.30
39	1n	113	MET	CA-CB-CG	5.04	121.86	113.30
12	1L	496	MET	CA-CB-CG	5.03	121.85	113.30
36	1k	67	LEU	CA-CB-CG	5.03	126.86	115.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	1H	91	MET	Peptide
21	1V	113	TRP	Peptide
30	1e	69	GLN	Peptide,Sidechain
37	1l	50	LEU	Peptide
42	1q	9	ARG	Sidechain

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	113/115 (98%)	102 (90%)	9 (8%)	2 (2%)	8 32

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	1B	153/258 (59%)	141 (92%)	12 (8%)	0	100	100
3	1C	207/264 (78%)	195 (94%)	12 (6%)	0	100	100
4	1D	427/476 (90%)	409 (96%)	18 (4%)	0	100	100
5	1E	212/249 (85%)	190 (90%)	21 (10%)	1 (0%)	29	61
6	1F	430/464 (93%)	416 (97%)	14 (3%)	0	100	100
7	1G	697/727 (96%)	656 (94%)	39 (6%)	2 (0%)	41	72
8	1H	316/318 (99%)	301 (95%)	11 (4%)	4 (1%)	12	39
9	1I	174/239 (73%)	171 (98%)	3 (2%)	0	100	100
10	1J	173/175 (99%)	161 (93%)	11 (6%)	1 (1%)	25	57
11	1K	96/98 (98%)	92 (96%)	3 (3%)	1 (1%)	15	46
12	1L	604/606 (100%)	550 (91%)	53 (9%)	1 (0%)	47	78
13	1M	457/459 (100%)	436 (95%)	21 (5%)	0	100	100
14	1N	345/347 (99%)	326 (94%)	19 (6%)	0	100	100
15	1O	318/357 (89%)	297 (93%)	21 (7%)	0	100	100
16	1P	340/377 (90%)	318 (94%)	22 (6%)	0	100	100
17	1Q	127/175 (73%)	119 (94%)	8 (6%)	0	100	100
18	1R	94/123 (76%)	92 (98%)	2 (2%)	0	100	100
19	1S	85/99 (86%)	76 (89%)	9 (11%)	0	100	100
20	1T	83/156 (53%)	77 (93%)	6 (7%)	0	100	100
20	1U	84/156 (54%)	82 (98%)	2 (2%)	0	100	100
21	1V	113/116 (97%)	102 (90%)	11 (10%)	0	100	100
22	1W	113/128 (88%)	105 (93%)	8 (7%)	0	100	100
23	1X	169/172 (98%)	162 (96%)	7 (4%)	0	100	100
24	1Y	137/141 (97%)	133 (97%)	4 (3%)	0	100	100
25	1Z	139/144 (96%)	132 (95%)	7 (5%)	0	100	100
26	1a	68/70 (97%)	66 (97%)	2 (3%)	0	100	100
27	1b	81/84 (96%)	75 (93%)	6 (7%)	0	100	100
28	1c	47/76 (62%)	42 (89%)	5 (11%)	0	100	100
29	1d	117/123 (95%)	108 (92%)	9 (8%)	0	100	100
30	1e	97/106 (92%)	90 (93%)	7 (7%)	0	100	100
31	1f	55/135 (41%)	52 (94%)	3 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
32	1g	98/154 (64%)	91 (93%)	7 (7%)	0	100	100
33	1h	136/189 (72%)	129 (95%)	7 (5%)	0	100	100
34	1i	124/128 (97%)	114 (92%)	10 (8%)	0	100	100
35	1j	69/105 (66%)	64 (93%)	5 (7%)	0	100	100
36	1k	79/98 (81%)	76 (96%)	3 (4%)	0	100	100
37	1l	154/186 (83%)	140 (91%)	12 (8%)	2 (1%)	12	39
38	1m	126/129 (98%)	118 (94%)	8 (6%)	0	100	100
39	1n	170/179 (95%)	162 (95%)	8 (5%)	0	100	100
40	1o	120/137 (88%)	113 (94%)	7 (6%)	0	100	100
41	1p	171/176 (97%)	162 (95%)	9 (5%)	0	100	100
42	1q	143/145 (99%)	134 (94%)	9 (6%)	0	100	100
43	1r	90/114 (79%)	87 (97%)	3 (3%)	0	100	100
44	1s	43/471 (9%)	39 (91%)	4 (9%)	0	100	100
All	All	8194/9744 (84%)	7703 (94%)	477 (6%)	14 (0%)	50	78

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	1A	109	LYS
8	1H	68	ILE
8	1H	92	PRO
8	1H	282	TYR
1	1A	46	SER
37	1l	44	TYR
5	1E	157	ASN
7	1G	416	THR
12	1L	562	LEU
8	1H	208	VAL
7	1G	186	TYR
11	1K	2	PRO
37	1l	51	PRO
10	1J	5	ILE

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	99/99 (100%)	85 (86%)	14 (14%)	3 13
2	1B	131/212 (62%)	119 (91%)	12 (9%)	9 31
3	1C	190/227 (84%)	179 (94%)	11 (6%)	20 50
4	1D	371/405 (92%)	346 (93%)	25 (7%)	16 46
5	1E	183/207 (88%)	174 (95%)	9 (5%)	25 55
6	1F	346/368 (94%)	327 (94%)	19 (6%)	21 51
7	1G	588/610 (96%)	543 (92%)	45 (8%)	13 40
8	1H	274/274 (100%)	257 (94%)	17 (6%)	18 48
9	1I	151/201 (75%)	145 (96%)	6 (4%)	31 60
10	1J	140/140 (100%)	121 (86%)	19 (14%)	3 14
11	1K	84/84 (100%)	64 (76%)	20 (24%)	0 2
12	1L	539/539 (100%)	470 (87%)	69 (13%)	4 16
13	1M	408/408 (100%)	369 (90%)	39 (10%)	8 29
14	1N	310/310 (100%)	288 (93%)	22 (7%)	14 44
15	1O	283/307 (92%)	258 (91%)	25 (9%)	10 33
16	1P	296/323 (92%)	267 (90%)	29 (10%)	8 28
17	1Q	117/152 (77%)	104 (89%)	13 (11%)	6 22
18	1R	79/97 (81%)	68 (86%)	11 (14%)	3 13
19	1S	77/82 (94%)	71 (92%)	6 (8%)	12 39
20	1T	79/133 (59%)	71 (90%)	8 (10%)	7 27
20	1U	79/133 (59%)	69 (87%)	10 (13%)	4 16
21	1V	100/101 (99%)	88 (88%)	12 (12%)	5 19
22	1W	107/112 (96%)	97 (91%)	10 (9%)	9 31
23	1X	153/154 (99%)	138 (90%)	15 (10%)	8 28
24	1Y	101/102 (99%)	90 (89%)	11 (11%)	6 23
25	1Z	123/124 (99%)	111 (90%)	12 (10%)	8 28
26	1a	58/58 (100%)	51 (88%)	7 (12%)	5 18
27	1b	69/70 (99%)	63 (91%)	6 (9%)	10 34
28	1c	45/66 (68%)	38 (84%)	7 (16%)	2 11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
29	1d	107/109 (98%)	101 (94%)	6 (6%)	21 51
30	1e	87/94 (93%)	81 (93%)	6 (7%)	15 45
31	1f	54/113 (48%)	51 (94%)	3 (6%)	21 51
32	1g	92/129 (71%)	80 (87%)	12 (13%)	4 16
33	1h	121/158 (77%)	102 (84%)	19 (16%)	2 10
34	1i	119/120 (99%)	100 (84%)	19 (16%)	2 10
35	1j	62/84 (74%)	49 (79%)	13 (21%)	1 3
36	1k	63/76 (83%)	57 (90%)	6 (10%)	8 29
37	1l	141/161 (88%)	120 (85%)	21 (15%)	3 12
38	1m	113/114 (99%)	97 (86%)	16 (14%)	3 13
39	1n	156/160 (98%)	141 (90%)	15 (10%)	8 29
40	1o	110/120 (92%)	96 (87%)	14 (13%)	4 16
41	1p	154/156 (99%)	137 (89%)	17 (11%)	6 23
42	1q	131/131 (100%)	110 (84%)	21 (16%)	2 10
43	1r	85/98 (87%)	79 (93%)	6 (7%)	14 44
44	1s	44/351 (12%)	40 (91%)	4 (9%)	9 32
All	All	7219/8272 (87%)	6512 (90%)	707 (10%)	11 28

All (707) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1A	4	MET
1	1A	15	SER
1	1A	22	PHE
1	1A	23	TRP
1	1A	33	LYS
1	1A	34	THR
1	1A	49	LEU
1	1A	53	MET
1	1A	66	ASP
1	1A	84	LEU
1	1A	87	MET
1	1A	93	PHE
1	1A	97	LEU
1	1A	109	LYS
2	1B	34	ASP

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Mol	Chain	Res	Type
2	1B	44	SER
2	1B	59	MET
2	1B	68	ASP
2	1B	76	PHE
2	1B	81	ARG
2	1B	83	SER
2	1B	84	ASP
2	1B	102	LYS
2	1B	116	MET
2	1B	125	TYR
2	1B	126	TYR
3	1C	20	LYS
3	1C	33	LEU
3	1C	43	SER
3	1C	44	CYS
3	1C	73	LYS
3	1C	109	THR
3	1C	172	VAL
3	1C	188	VAL
3	1C	198	ASP
3	1C	199	LEU
3	1C	201	SER
4	1D	8	VAL
4	1D	14	PHE
4	1D	19	MET
4	1D	27	HIS
4	1D	29	LYS
4	1D	49	LEU
4	1D	51	PHE
4	1D	74	ARG
4	1D	85	ARG
4	1D	105	ARG
4	1D	110	SER
4	1D	199	VAL
4	1D	208	LEU
4	1D	209	ASP
4	1D	228	MET
4	1D	241	ASP
4	1D	246	THR
4	1D	256	SER
4	1D	289	SER
4	1D	297	TYR

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Mol	Chain	Res	Type
4	1D	312	SER
4	1D	399	LEU
4	1D	403	ASP
4	1D	422	ASP
4	1D	430	ARG
5	1E	11	ASP
5	1E	52	ASP
5	1E	53	LEU
5	1E	78	MET
5	1E	104	THR
5	1E	109	MET
5	1E	153	MET
5	1E	168	ASP
5	1E	187	ARG
6	1F	19	ASP
6	1F	26	TYR
6	1F	63	SER
6	1F	66	ARG
6	1F	81	PHE
6	1F	110	ILE
6	1F	127	ARG
6	1F	129	MET
6	1F	150	GLN
6	1F	206	LYS
6	1F	218	CYS
6	1F	227	THR
6	1F	242	PHE
6	1F	253	THR
6	1F	306	LEU
6	1F	317	MET
6	1F	355	LYS
6	1F	359	CYS
6	1F	409	ASP
7	1G	11	VAL
7	1G	16	GLN
7	1G	39	ARG
7	1G	65	VAL
7	1G	83	SER
7	1G	123	PHE
7	1G	131	LEU
7	1G	190	MET
7	1G	209	THR

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Mol	Chain	Res	Type
7	1G	211	LYS
7	1G	227	SER
7	1G	231	MET
7	1G	251	LEU
7	1G	254	MET
7	1G	287	GLU
7	1G	313	ASN
7	1G	323	VAL
7	1G	364	LEU
7	1G	366	THR
7	1G	377	ILE
7	1G	390	LEU
7	1G	394	ARG
7	1G	398	SER
7	1G	403	ASP
7	1G	425	SER
7	1G	461	SER
7	1G	467	LEU
7	1G	472	ASN
7	1G	483	VAL
7	1G	531	CYS
7	1G	533	THR
7	1G	536	ASP
7	1G	548	HIS
7	1G	567	THR
7	1G	583	THR
7	1G	609	MET
7	1G	613	TYR
7	1G	617	ASP
7	1G	620	ARG
7	1G	632	ARG
7	1G	654	GLN
7	1G	666	LEU
7	1G	667	THR
7	1G	669	LYS
7	1G	692	THR
8	1H	5	ASN
8	1H	20	LEU
8	1H	58	LYS
8	1H	61	LEU
8	1H	68	ILE
8	1H	110	SER

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Mol	Chain	Res	Type
8	1H	188	SER
8	1H	209	SER
8	1H	220	PHE
8	1H	224	PHE
8	1H	227	GLU
8	1H	266	LEU
8	1H	274	ARG
8	1H	279	ARG
8	1H	282	TYR
8	1H	285	LEU
8	1H	302	MET
9	1I	15	LYS
9	1I	39	SER
9	1I	40	TYR
9	1I	41	LEU
9	1I	107	THR
9	1I	129	ASP
10	1J	7	PHE
10	1J	23	LYS
10	1J	33	LEU
10	1J	35	VAL
10	1J	41	CYS
10	1J	46	ASN
10	1J	47	PHE
10	1J	52	LEU
10	1J	57	PHE
10	1J	60	TYR
10	1J	66	VAL
10	1J	74	MET
10	1J	78	MET
10	1J	90	PHE
10	1J	93	PHE
10	1J	98	MET
10	1J	105	TYR
10	1J	135	PHE
10	1J	161	LEU
11	1K	4	VAL
11	1K	6	MET
11	1K	7	ASN
11	1K	24	SER
11	1K	29	SER
11	1K	41	PHE

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Mol	Chain	Res	Type
11	1K	50	ASN
11	1K	53	PHE
11	1K	54	THR
11	1K	55	LEU
11	1K	59	MET
11	1K	63	LEU
11	1K	69	CYS
11	1K	77	LEU
11	1K	82	SER
11	1K	85	TYR
11	1K	88	ASP
11	1K	89	TYR
11	1K	97	GLN
11	1K	98	CYS
12	1L	7	LEU
12	1L	11	THR
12	1L	12	LEU
12	1L	20	MET
12	1L	27	TYR
12	1L	31	LEU
12	1L	36	VAL
12	1L	41	SER
12	1L	53	MET
12	1L	99	SER
12	1L	101	MET
12	1L	105	MET
12	1L	127	THR
12	1L	163	ASP
12	1L	182	PHE
12	1L	186	MET
12	1L	196	TRP
12	1L	206	ASN
12	1L	227	PHE
12	1L	238	GLU
12	1L	244	SER
12	1L	252	MET
12	1L	264	TYR
12	1L	271	LYS
12	1L	307	SER
12	1L	314	MET
12	1L	320	ASN
12	1L	331	MET

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Mol	Chain	Res	Type
12	1L	339	LEU
12	1L	340	PHE
12	1L	341	MET
12	1L	346	ILE
12	1L	352	ASP
12	1L	357	ARG
12	1L	359	MET
12	1L	383	MET
12	1L	389	PHE
12	1L	392	LYS
12	1L	393	ASP
12	1L	401	MET
12	1L	405	ASN
12	1L	425	ARG
12	1L	428	PHE
12	1L	445	GLU
12	1L	482	MET
12	1L	486	MET
12	1L	488	MET
12	1L	496	MET
12	1L	499	MET
12	1L	508	THR
12	1L	510	TYR
12	1L	511	LEU
12	1L	519	THR
12	1L	525	MET
12	1L	529	TYR
12	1L	533	MET
12	1L	544	MET
12	1L	553	LEU
12	1L	557	TRP
12	1L	565	THR
12	1L	571	MET
12	1L	573	MET
12	1L	574	SER
12	1L	576	MET
12	1L	581	LYS
12	1L	596	MET
12	1L	598	SER
12	1L	601	LEU
12	1L	605	HIS
13	1M	38	SER

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Mol	Chain	Res	Type
13	1M	41	LEU
13	1M	53	SER
13	1M	55	THR
13	1M	76	MET
13	1M	86	LYS
13	1M	115	LEU
13	1M	116	ILE
13	1M	122	PHE
13	1M	123	GLU
13	1M	139	GLN
13	1M	176	PHE
13	1M	204	MET
13	1M	212	LEU
13	1M	229	MET
13	1M	244	MET
13	1M	245	ARG
13	1M	257	MET
13	1M	263	MET
13	1M	274	SER
13	1M	292	SER
13	1M	305	THR
13	1M	321	LEU
13	1M	334	TYR
13	1M	336	ARG
13	1M	342	MET
13	1M	346	ARG
13	1M	349	GLN
13	1M	361	MET
13	1M	363	SER
13	1M	367	LEU
13	1M	389	SER
13	1M	396	MET
13	1M	400	MET
13	1M	401	MET
13	1M	410	MET
13	1M	425	ASN
13	1M	431	THR
13	1M	437	MET
14	1N	6	TYR
14	1N	35	MET
14	1N	54	GLU
14	1N	57	THR

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Mol	Chain	Res	Type
14	1N	65	THR
14	1N	68	MET
14	1N	97	MET
14	1N	100	MET
14	1N	123	SER
14	1N	154	MET
14	1N	159	MET
14	1N	160	LEU
14	1N	173	THR
14	1N	183	SER
14	1N	216	PHE
14	1N	232	HIS
14	1N	233	THR
14	1N	242	SER
14	1N	244	MET
14	1N	315	TRP
14	1N	316	GLN
14	1N	333	SER
15	1O	1	LEU
15	1O	14	THR
15	1O	35	LYS
15	1O	49	ARG
15	1O	67	LYS
15	1O	81	LYS
15	1O	82	PHE
15	1O	105	LEU
15	1O	108	TYR
15	1O	115	LEU
15	1O	120	GLN
15	1O	143	PHE
15	1O	146	LYS
15	1O	164	LEU
15	1O	176	VAL
15	1O	186	LYS
15	1O	188	ASN
15	1O	206	TYR
15	1O	207	LYS
15	1O	214	MET
15	1O	236	GLU
15	1O	250	ASP
15	1O	252	ASP
15	1O	253	ASP

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Mol	Chain	Res	Type
15	1O	283	THR
16	1P	3	HIS
16	1P	15	SER
16	1P	29	PHE
16	1P	30	LEU
16	1P	88	SER
16	1P	102	LYS
16	1P	107	GLU
16	1P	112	LYS
16	1P	127	GLU
16	1P	143	SER
16	1P	151	VAL
16	1P	154	LYS
16	1P	160	PHE
16	1P	170	ASP
16	1P	177	ARG
16	1P	184	SER
16	1P	199	GLU
16	1P	214	ILE
16	1P	235	ARG
16	1P	263	TYR
16	1P	265	TRP
16	1P	268	ARG
16	1P	280	THR
16	1P	281	ARG
16	1P	290	SER
16	1P	292	MET
16	1P	323	THR
16	1P	335	LYS
16	1P	338	LYS
17	1Q	15	GLU
17	1Q	16	LYS
17	1Q	17	LEU
17	1Q	33	ARG
17	1Q	58	GLU
17	1Q	83	VAL
17	1Q	88	THR
17	1Q	102	SER
17	1Q	104	ASP
17	1Q	109	LYS
17	1Q	110	VAL
17	1Q	112	LYS

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Mol	Chain	Res	Type
17	1Q	131	SER
18	1R	3	ARG
18	1R	12	THR
18	1R	24	ARG
18	1R	26	VAL
18	1R	30	ASP
18	1R	49	VAL
18	1R	50	SER
18	1R	54	SER
18	1R	79	THR
18	1R	90	GLN
18	1R	92	ARG
19	1S	24	GLN
19	1S	37	GLU
19	1S	50	LEU
19	1S	61	GLN
19	1S	84	ASP
19	1S	97	LYS
20	1T	12	LYS
20	1T	22	TYR
20	1T	39	ASP
20	1T	54	MET
20	1T	60	PHE
20	1T	72	CYS
20	1T	78	ASP
20	1T	83	LYS
20	1U	19	LEU
20	1U	20	LYS
20	1U	22	TYR
20	1U	54	MET
20	1U	60	PHE
20	1U	64	ASP
20	1U	69	LYS
20	1U	71	MET
20	1U	74	GLN
20	1U	83	LYS
21	1V	6	LYS
21	1V	7	THR
21	1V	10	LEU
21	1V	17	GLU
21	1V	22	ARG
21	1V	32	ASP

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Mol	Chain	Res	Type
21	1V	51	THR
21	1V	86	GLU
21	1V	88	SER
21	1V	91	ARG
21	1V	95	ARG
21	1V	109	ASN
22	1W	55	SER
22	1W	57	LYS
22	1W	73	VAL
22	1W	80	ASP
22	1W	85	LYS
22	1W	93	THR
22	1W	101	THR
22	1W	104	MET
22	1W	117	ASP
22	1W	126	HIS
23	1X	5	GLU
23	1X	11	ASP
23	1X	43	MET
23	1X	44	LEU
23	1X	47	TRP
23	1X	63	ASN
23	1X	88	ILE
23	1X	113	LYS
23	1X	127	VAL
23	1X	130	VAL
23	1X	131	LYS
23	1X	132	THR
23	1X	134	ARG
23	1X	164	SER
23	1X	170	THR
24	1Y	15	THR
24	1Y	19	ARG
24	1Y	22	TYR
24	1Y	36	SER
24	1Y	48	PHE
24	1Y	49	LEU
24	1Y	57	ARG
24	1Y	84	ASP
24	1Y	90	PHE
24	1Y	105	ARG
24	1Y	126	MET

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Mol	Chain	Res	Type
25	1Z	4	SER
25	1Z	5	LYS
25	1Z	7	LYS
25	1Z	28	ARG
25	1Z	31	SER
25	1Z	68	ARG
25	1Z	72	MET
25	1Z	88	ARG
25	1Z	99	LYS
25	1Z	121	MET
25	1Z	127	LEU
25	1Z	131	GLU
26	1a	2	TRP
26	1a	6	LEU
26	1a	17	PHE
26	1a	50	ARG
26	1a	59	ARG
26	1a	60	TYR
26	1a	70	ASP
27	1b	9	LYS
27	1b	17	VAL
27	1b	43	ARG
27	1b	51	ASN
27	1b	56	LEU
27	1b	62	MET
28	1c	2	PHE
28	1c	5	ARG
28	1c	14	TRP
28	1c	26	PHE
28	1c	30	TYR
28	1c	37	GLU
28	1c	46	ASN
29	1d	13	PHE
29	1d	24	PRO
29	1d	39	TYR
29	1d	70	PHE
29	1d	82	MET
29	1d	100	ASP
30	1e	31	ARG
30	1e	68	ARG
30	1e	74	ARG
30	1e	85	LEU

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Mol	Chain	Res	Type
30	1e	90	LYS
30	1e	97	HIS
31	1f	5	GLN
31	1f	10	HIS
31	1f	13	HIS
32	1g	31	ASP
32	1g	37	LEU
32	1g	40	LYS
32	1g	43	ASP
32	1g	48	ASP
32	1g	57	ASN
32	1g	63	PHE
32	1g	67	SER
32	1g	76	PHE
32	1g	90	ARG
32	1g	95	ARG
32	1g	108	MET
33	1h	7	ARG
33	1h	18	ASP
33	1h	21	PHE
33	1h	24	LEU
33	1h	25	MET
33	1h	79	PHE
33	1h	80	TYR
33	1h	84	GLU
33	1h	85	LYS
33	1h	87	TYR
33	1h	91	MET
33	1h	97	GLU
33	1h	105	LEU
33	1h	107	GLU
33	1h	122	TRP
33	1h	127	THR
33	1h	129	ASP
33	1h	136	SER
33	1h	143	ASN
34	1i	3	TYR
34	1i	15	ARG
34	1i	19	ARG
34	1i	33	VAL
34	1i	38	ARG
34	1i	45	PHE

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Mol	Chain	Res	Type
34	1i	46	TRP
34	1i	57	LYS
34	1i	65	ARG
34	1i	69	PHE
34	1i	78	VAL
34	1i	96	VAL
34	1i	102	ARG
34	1i	103	ILE
34	1i	104	PHE
34	1i	108	THR
34	1i	120	LYS
34	1i	121	GLU
34	1i	125	GLN
35	1j	17	LEU
35	1j	20	SER
35	1j	22	LEU
35	1j	27	PHE
35	1j	32	MET
35	1j	34	PHE
35	1j	35	TRP
35	1j	39	ARG
35	1j	40	PHE
35	1j	44	SER
35	1j	50	HIS
35	1j	58	GLN
35	1j	63	GLU
36	1k	13	MET
36	1k	41	ARG
36	1k	46	ARG
36	1k	52	TYR
36	1k	61	SER
36	1k	74	PHE
37	1l	3	HIS
37	1l	5	THR
37	1l	8	MET
37	1l	25	LYS
37	1l	29	MET
37	1l	44	TYR
37	1l	49	LYS
37	1l	53	ARG
37	1l	58	ARG
37	1l	69	LEU

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Mol	Chain	Res	Type
37	1l	83	MET
37	1l	86	ARG
37	1l	91	THR
37	1l	99	ASN
37	1l	111	PHE
37	1l	114	PHE
37	1l	115	MET
37	1l	116	PHE
37	1l	117	TRP
37	1l	136	ASN
37	1l	158	ILE
38	1m	2	PHE
38	1m	6	LYS
38	1m	9	ARG
38	1m	49	GLN
38	1m	55	ARG
38	1m	80	ARG
38	1m	86	SER
38	1m	92	PHE
38	1m	98	PHE
38	1m	102	TYR
38	1m	106	THR
38	1m	113	LYS
38	1m	116	GLN
38	1m	121	ASP
38	1m	126	ILE
38	1m	127	SER
39	1n	8	TYR
39	1n	10	THR
39	1n	33	ARG
39	1n	47	PHE
39	1n	49	GLU
39	1n	52	ASN
39	1n	56	MET
39	1n	67	GLU
39	1n	70	PHE
39	1n	84	SER
39	1n	92	ARG
39	1n	113	MET
39	1n	116	ASP
39	1n	121	ARG
39	1n	158	LYS

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Mol	Chain	Res	Type
40	1o	7	ARG
40	1o	19	LEU
40	1o	21	MET
40	1o	24	PHE
40	1o	33	ARG
40	1o	50	LEU
40	1o	51	MET
40	1o	70	ARG
40	1o	71	ASP
40	1o	73	PHE
40	1o	91	HIS
40	1o	93	ASP
40	1o	116	GLN
40	1o	118	GLU
41	1p	30	THR
41	1p	31	TYR
41	1p	34	LYS
41	1p	42	ARG
41	1p	46	LEU
41	1p	59	ARG
41	1p	60	TYR
41	1p	61	TYR
41	1p	62	TYR
41	1p	89	MET
41	1p	93	ARG
41	1p	96	LYS
41	1p	97	VAL
41	1p	150	SER
41	1p	160	GLN
41	1p	166	ARG
41	1p	167	LYS
42	1q	6	VAL
42	1q	12	GLN
42	1q	21	ARG
42	1q	34	ARG
42	1q	35	VAL
42	1q	37	THR
42	1q	39	VAL
42	1q	50	GLU
42	1q	59	HIS
42	1q	76	ASP
42	1q	80	SER

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Mol	Chain	Res	Type
42	1q	81	MET
42	1q	94	THR
42	1q	95	ASP
42	1q	104	THR
42	1q	111	THR
42	1q	118	SER
42	1q	125	VAL
42	1q	129	THR
42	1q	133	LYS
42	1q	144	TYR
43	1r	2	SER
43	1r	54	CYS
43	1r	60	ARG
43	1r	63	MET
43	1r	90	GLU
43	1r	107	LYS
44	1s	36	SER
44	1s	60	LYS
44	1s	62	ARG
44	1s	72	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	1A	10	ASN
3	1C	53	HIS
8	1H	5	ASN
9	1I	168	ASN
12	1L	199	GLN
12	1L	320	ASN
12	1L	524	ASN
14	1N	63	GLN
15	1O	92	ASN
15	1O	180	GLN
16	1P	180	ASN
16	1P	203	GLN
16	1P	321	HIS
29	1d	46	ASN
30	1e	44	HIS
30	1e	97	HIS
31	1f	10	HIS
32	1g	36	ASN

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Mol	Chain	Res	Type
32	1g	41	ASN
34	1i	12	GLN
35	1j	13	GLN
38	1m	32	GLN
39	1n	138	GLN
40	1o	53	GLN
40	1o	116	GLN
41	1p	27	ASN
43	1r	8	GLN
43	1r	20	GLN
43	1r	28	GLN
43	1r	35	GLN
43	1r	46	HIS
43	1r	109	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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	$\#\|Z\| > 2$
11	FME	1K	1	11	8,9,10	0.84	0	7,9,11	4.53	2 (28%)
14	FME	1N	1	14	8,9,10	0.52	0	7,9,11	1.03	1 (14%)
8	FME	1H	1	8	8,9,10	0.51	0	7,9,11	1.07	1 (14%)
10	FME	1J	1	10	8,9,10	0.53	0	7,9,11	1.02	1 (14%)
34	SAC	1i	1	-	7,8,9	0.54	0	8,9,11	1.04	1 (12%)
1	FME	1A	1	1	8,9,10	0.52	0	7,9,11	1.19	1 (14%)
12	FME	1L	1	12	8,9,10	0.51	0	7,9,11	0.93	1 (14%)
13	FME	1M	1	13	8,9,10	0.52	0	7,9,11	1.03	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
11	FME	1K	1	11	-	4/7/9/11	-
14	FME	1N	1	14	-	3/7/9/11	-
8	FME	1H	1	8	-	2/7/9/11	-
10	FME	1J	1	10	-	1/7/9/11	-
34	SAC	1i	1	-	-	2/7/8/10	-
1	FME	1A	1	1	-	0/7/9/11	-
12	FME	1L	1	12	-	0/7/9/11	-
13	FME	1M	1	13	-	1/7/9/11	-

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	1K	1	FME	CA-N-CN	-11.67	104.87	122.82
34	1i	1	SAC	O-C-CA	-2.90	117.17	124.78
10	1J	1	FME	O-C-CA	-2.64	117.86	124.78
8	1H	1	FME	O-C-CA	-2.64	117.87	124.78
1	1A	1	FME	O-C-CA	-2.56	118.08	124.78
13	1M	1	FME	O-C-CA	-2.52	118.17	124.78
14	1N	1	FME	O-C-CA	-2.37	118.56	124.78
12	1L	1	FME	O-C-CA	-2.36	118.60	124.78
11	1K	1	FME	O-C-CA	-2.19	119.05	124.78

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	1H	1	FME	O1-CN-N-CA
11	1K	1	FME	O1-CN-N-CA
11	1K	1	FME	O-C-CA-CB
14	1N	1	FME	O1-CN-N-CA
14	1N	1	FME	CB-CA-N-CN
34	1i	1	SAC	C-CA-N-C1A
11	1K	1	FME	N-CA-CB-CG
11	1K	1	FME	C-CA-CB-CG
13	1M	1	FME	C-CA-CB-CG
10	1J	1	FME	N-CA-CB-CG

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Mol	Chain	Res	Type	Atoms
34	1i	1	SAC	CB-CA-N-C1A
8	1H	1	FME	CB-CA-N-CN
14	1N	1	FME	CB-CG-SD-CE

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	SF4	1I	202	9	0,12,12	-	-	-		
53	GTP	1O	401	54	26,34,34	0.95	2 (7%)	32,54,54	0.78	0
46	PC1	1f	101	-	33,33,53	0.29	0	39,41,61	0.37	0
52	3PE	1L	701	-	41,41,50	0.29	0	44,46,55	0.34	0
45	SF4	1F	502	6	0,12,12	-	-	-		
45	SF4	1B	201	2	0,12,12	-	-	-		
45	SF4	1G	802	7	0,12,12	-	-	-		
46	PC1	1M	501	-	34,34,53	0.32	0	40,42,61	0.36	0
46	PC1	1q	201	-	47,47,53	0.28	0	53,55,61	0.32	0
57	EHZ	1n	201	-	29,36,37	0.19	0	35,44,47	1.10	1 (2%)
45	SF4	1G	801	7	0,12,12	-	-	-		
46	PC1	1B	202	-	33,33,53	0.32	0	39,41,61	0.60	0
47	FES	1G	803	7	0,4,4	-	-	-		
52	3PE	1N	401	-	37,37,50	0.30	0	40,42,55	0.42	0
46	PC1	1d	201	-	38,38,53	0.31	0	44,46,61	0.47	0
52	3PE	1Y	202	-	34,34,50	0.36	0	37,39,55	0.84	1 (2%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
52	3PE	1f	102	-	50,50,50	0.28	0	53,55,55	1.02	4 (7%)
51	CDL	1N	402	-	66,66,99	0.30	0	72,78,111	0.38	0
55	NDP	1P	501	-	45,52,52	0.61	0	53,80,80	0.74	2 (3%)
47	FES	1E	301	5	0,4,4	-	-	-		
51	CDL	1H	702	-	50,50,99	0.36	0	56,62,111	0.66	1 (1%)
50	U10	1H	701	-	63,63,63	0.48	0	76,79,79	0.93	4 (5%)
51	CDL	1a	101	-	60,60,99	0.49	0	66,72,111	0.85	3 (4%)
57	EHZ	1W	201	-	29,36,37	0.16	0	35,44,47	1.00	1 (2%)
45	SF4	1I	201	9	0,12,12	-	-	-		
58	MYR	1l	201	-	14,14,15	0.34	0	13,13,15	0.42	0
46	PC1	1Y	201	-	45,45,53	0.28	0	51,53,61	0.35	0
48	FMN	1F	501	-	33,33,33	0.57	0	48,50,50	0.66	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
53	GTP	1O	401	54	-	3/18/38/38	0/3/3/3
45	SF4	1I	202	9	-	-	0/6/5/5
46	PC1	1f	101	-	-	6/36/36/57	-
52	3PE	1L	701	-	-	5/45/45/54	-
45	SF4	1F	502	6	-	-	0/6/5/5
45	SF4	1B	201	2	-	-	0/6/5/5
45	SF4	1G	802	7	-	-	0/6/5/5
46	PC1	1M	501	-	-	0/38/38/57	-
46	PC1	1q	201	-	-	13/51/51/57	-
57	EHZ	1n	201	-	-	8/42/44/45	-
45	SF4	1G	801	7	-	-	0/6/5/5
46	PC1	1B	202	-	-	14/37/37/57	-
52	3PE	1N	401	-	-	11/41/41/54	-
52	3PE	1Y	202	-	-	10/38/38/54	-
46	PC1	1d	201	-	-	10/42/42/57	-
47	FES	1G	803	7	-	-	0/1/1/1
52	3PE	1f	102	-	-	15/54/54/54	-
51	CDL	1N	402	-	-	13/76/76/110	-
55	NDP	1P	501	-	-	4/30/77/77	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
47	FES	1E	301	5	-	-	0/1/1/1
51	CDL	1H	702	-	-	7/61/61/110	-
50	U10	1H	701	-	-	17/63/87/87	0/1/1/1
51	CDL	1a	101	-	-	16/71/71/110	-
57	EHZ	1W	201	-	-	7/42/44/45	-
45	SF4	1I	201	9	-	-	0/6/5/5
58	MYR	1l	201	-	-	0/11/12/13	-
46	PC1	1Y	201	-	-	8/49/49/57	-
48	FMN	1F	501	-	-	1/18/18/18	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	1O	401	GTP	C5-C6	-2.66	1.42	1.47
53	1O	401	GTP	C8-N7	-2.04	1.31	1.35

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
57	1n	201	EHZ	C10-S1-C9	5.91	120.27	101.87
52	1f	102	3PE	O21-C21-C22	5.22	122.76	111.50
57	1W	201	EHZ	C10-S1-C9	4.94	117.24	101.87
50	1H	701	U10	O3-C3-C2	3.50	128.41	116.56
50	1H	701	U10	O4-C4-C5	3.43	128.17	116.56
52	1Y	202	3PE	O21-C21-C22	3.34	118.70	111.50
51	1H	702	CDL	OB6-CB5-C51	3.17	118.34	111.50
50	1H	701	U10	O4-C4-C3	-3.06	112.11	123.64
50	1H	701	U10	O3-C3-C4	-2.96	112.48	123.64
52	1f	102	3PE	O21-C21-O22	-2.84	116.84	123.70
51	1a	101	CDL	OA6-CA4-CA3	2.60	117.82	108.40
51	1a	101	CDL	OA6-CA5-OA7	-2.40	117.90	123.70
52	1f	102	3PE	O21-C2-C3	2.35	116.92	108.40
52	1f	102	3PE	C2-O21-C21	2.26	123.35	117.79
55	1P	501	NDP	C5A-C6A-N6A	2.22	123.73	120.35
55	1P	501	NDP	O4D-C1D-C2D	-2.20	101.83	106.64
51	1a	101	CDL	OA6-CA5-C11	2.20	116.24	111.50

There are no chirality outliers.

All (168) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
46	1B	202	PC1	C11-O13-P-O12
46	1B	202	PC1	C1-O11-P-O12
46	1B	202	PC1	C1-O11-P-O13
46	1B	202	PC1	O32-C31-O31-C3
46	1B	202	PC1	C32-C31-O31-C3
46	1Y	201	PC1	C11-O13-P-O14
46	1Y	201	PC1	C1-O11-P-O14
46	1d	201	PC1	O13-C11-C12-N
46	1d	201	PC1	C2-C1-O11-P
46	1d	201	PC1	O32-C31-O31-C3
46	1d	201	PC1	C32-C31-O31-C3
46	1f	101	PC1	O32-C31-O31-C3
46	1f	101	PC1	C32-C31-O31-C3
46	1q	201	PC1	C11-O13-P-O14
50	1H	701	U10	C34-C36-C37-C38
51	1H	702	CDL	C1-CA2-OA2-PA1
51	1H	702	CDL	CA3-OA5-PA1-OA2
51	1H	702	CDL	CA3-OA5-PA1-OA3
51	1H	702	CDL	OB7-CB5-OB6-CB4
51	1H	702	CDL	C51-CB5-OB6-CB4
51	1N	402	CDL	CB2-OB2-PB2-OB5
51	1a	101	CDL	CA4-CA3-OA5-PA1
51	1a	101	CDL	CB3-OB5-PB2-OB3
52	1Y	202	3PE	C12-C11-O13-P
52	1Y	202	3PE	O22-C21-O21-C2
52	1Y	202	3PE	C22-C21-O21-C2
52	1f	102	3PE	O22-C21-O21-C2
52	1f	102	3PE	C22-C21-O21-C2
57	1W	201	EHZ	O2-C9-S1-C10
57	1W	201	EHZ	C8-C9-S1-C10
57	1n	201	EHZ	C16-C17-C20-O6
57	1n	201	EHZ	O2-C9-S1-C10
57	1n	201	EHZ	C8-C9-S1-C10
52	1L	701	3PE	C2-C1-O11-P
50	1H	701	U10	C30-C29-C31-C32
50	1H	701	U10	C40-C39-C41-C42
50	1H	701	U10	C45-C44-C46-C47
50	1H	701	U10	C28-C29-C31-C32
50	1H	701	U10	C38-C39-C41-C42
50	1H	701	U10	C43-C44-C46-C47
51	1a	101	CDL	CA5-C11-C12-C13
57	1W	201	EHZ	C5-C6-C7-O1
50	1H	701	U10	C4-C3-O3-C3M

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Mol	Chain	Res	Type	Atoms
50	1H	701	U10	C3-C4-O4-C4M
51	1a	101	CDL	O1-C1-CB2-OB2
51	1a	101	CDL	CA7-C31-C32-C33
51	1a	101	CDL	CB3-OB5-PB2-OB2
50	1H	701	U10	C2-C3-O3-C3M
51	1a	101	CDL	CA2-C1-CB2-OB2
57	1n	201	EHZ	C18-C17-C20-O6
57	1n	201	EHZ	C19-C17-C20-O6
52	1f	102	3PE	C2-C1-O11-P
52	1f	102	3PE	O21-C2-C3-O31
52	1Y	202	3PE	O13-C11-C12-N
46	1q	201	PC1	C3A-C3B-C3C-C3D
52	1f	102	3PE	C22-C23-C24-C25
50	1H	701	U10	C5-C4-O4-C4M
46	1q	201	PC1	C32-C33-C34-C35
51	1a	101	CDL	C11-CA5-OA6-CA4
57	1W	201	EHZ	C12-C13-C14-N2
51	1N	402	CDL	OB6-CB4-CB6-OB8
51	1a	101	CDL	OB6-CB4-CB6-OB8
52	1Y	202	3PE	C32-C33-C34-C35
46	1B	202	PC1	C11-O13-P-O11
46	1Y	201	PC1	C1-O11-P-O13
51	1a	101	CDL	OA5-CA3-CA4-CA6
51	1a	101	CDL	CB3-CB4-CB6-OB8
52	1L	701	3PE	C1-C2-C3-O31
52	1N	401	3PE	C1-C2-C3-O31
46	1q	201	PC1	C39-C3A-C3B-C3C
52	1N	401	3PE	O31-C31-C32-C33
51	1N	402	CDL	C55-C56-C57-C58
52	1N	401	3PE	C34-C35-C36-C37
51	1a	101	CDL	OA5-CA3-CA4-OA6
52	1L	701	3PE	O21-C2-C3-O31
52	1f	102	3PE	C27-C28-C29-C2A
46	1d	201	PC1	C35-C36-C37-C38
52	1f	102	3PE	C23-C24-C25-C26
48	1F	501	FMN	C4'-C5'-O5'-P
46	1q	201	PC1	C35-C36-C37-C38
46	1B	202	PC1	C1-C2-C3-O31
51	1N	402	CDL	CB3-CB4-CB6-OB8
46	1Y	201	PC1	C11-O13-P-O11
52	1N	401	3PE	C1-O11-P-O13
52	1Y	202	3PE	C1-O11-P-O13

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Mol	Chain	Res	Type	Atoms
46	1B	202	PC1	O21-C2-C3-O31
51	1a	101	CDL	CB4-CB3-OB5-PB2
52	1N	401	3PE	C21-C22-C23-C24
57	1W	201	EHZ	C21-C22-C23-C24
51	1N	402	CDL	OA5-CA3-CA4-OA6
52	1f	102	3PE	O11-C1-C2-O21
53	1O	401	GTP	PA-O3A-PB-O1B
46	1q	201	PC1	C11-O13-P-O11
46	1f	101	PC1	C35-C36-C37-C38
51	1H	702	CDL	CA4-CA3-OA5-PA1
46	1B	202	PC1	C11-O13-P-O14
46	1B	202	PC1	C1-O11-P-O14
51	1N	402	CDL	CB2-OB2-PB2-OB4
51	1a	101	CDL	CB3-OB5-PB2-OB4
50	1H	701	U10	C9-C11-C12-C13
46	1d	201	PC1	C22-C23-C24-C25
46	1Y	201	PC1	C12-C11-O13-P
46	1d	201	PC1	C12-C11-O13-P
46	1q	201	PC1	C12-C11-O13-P
52	1f	102	3PE	C12-C11-O13-P
46	1Y	201	PC1	O13-C11-C12-N
52	1N	401	3PE	O21-C2-C3-O31
51	1N	402	CDL	CA4-CA3-OA5-PA1
46	1Y	201	PC1	C33-C34-C35-C36
55	1P	501	NDP	C2D-C1D-N1N-C6N
46	1Y	201	PC1	C27-C28-C29-C2A
52	1Y	202	3PE	O11-C1-C2-O21
46	1f	101	PC1	C11-O13-P-O11
51	1N	402	CDL	CA2-OA2-PA1-OA5
51	1N	402	CDL	CB3-OB5-PB2-OB2
51	1a	101	CDL	CA2-OA2-PA1-OA5
52	1N	401	3PE	C11-O13-P-O11
52	1f	102	3PE	C1-C2-C3-O31
55	1P	501	NDP	O4D-C1D-N1N-C6N
46	1B	202	PC1	C31-C32-C33-C34
50	1H	701	U10	C20-C19-C21-C22
46	1q	201	PC1	C37-C38-C39-C3A
46	1d	201	PC1	C1-C2-O21-C21
55	1P	501	NDP	C2D-C1D-N1N-C2N
52	1f	102	3PE	C25-C26-C27-C28
51	1N	402	CDL	OA5-CA3-CA4-CA6
53	1O	401	GTP	O4'-C4'-C5'-O5'

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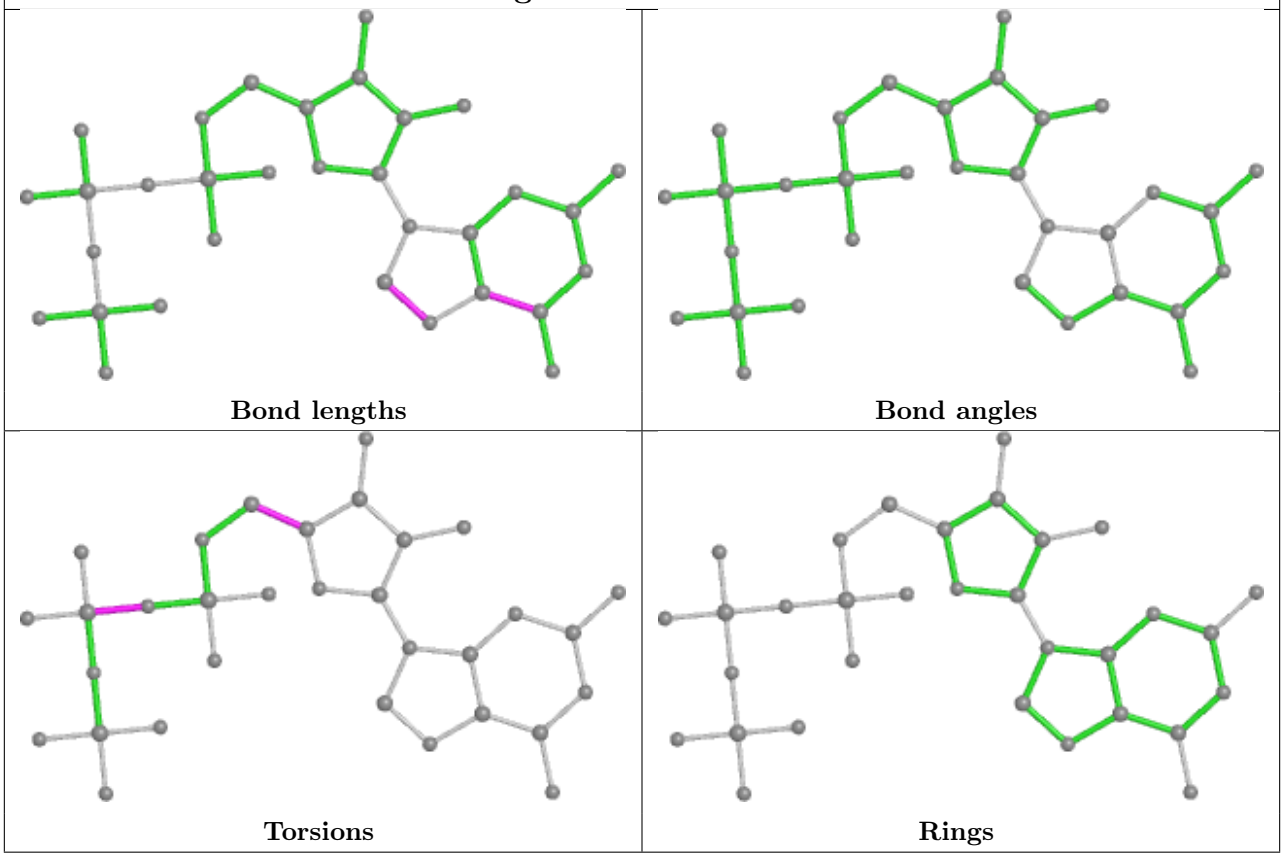
Mol	Chain	Res	Type	Atoms
57	1W	201	EHZ	C11-C10-S1-C9
50	1H	701	U10	C29-C31-C32-C33
50	1H	701	U10	C18-C19-C21-C22
52	1N	401	3PE	O32-C31-C32-C33
52	1N	401	3PE	C37-C38-C39-C3A
57	1W	201	EHZ	C1-C21-C22-C23
46	1B	202	PC1	C2-C1-O11-P
57	1n	201	EHZ	C4-C5-C6-C7
46	1q	201	PC1	O31-C31-C32-C33
52	1f	102	3PE	C26-C27-C28-C29
46	1q	201	PC1	C33-C34-C35-C36
53	1O	401	GTP	PA-O3A-PB-O2B
52	1f	102	3PE	C38-C39-C3A-C3B
50	1H	701	U10	C16-C17-C18-C19
46	1d	201	PC1	C33-C34-C35-C36
46	1q	201	PC1	O32-C31-C32-C33
46	1d	201	PC1	C11-O13-P-O11
46	1f	101	PC1	C11-O13-P-O14
51	1N	402	CDL	CA2-OA2-PA1-OA3
51	1N	402	CDL	CB3-OB5-PB2-OB3
51	1a	101	CDL	CA2-OA2-PA1-OA3
52	1N	401	3PE	C1-O11-P-O14
52	1N	401	3PE	C11-O13-P-O14
52	1Y	202	3PE	C1-O11-P-O14
55	1P	501	NDP	O4B-C4B-C5B-O5B
51	1H	702	CDL	C32-C31-CA7-OA8
57	1n	201	EHZ	C3-C4-C5-C6
50	1H	701	U10	C46-C47-C48-C49
52	1L	701	3PE	C12-C11-O13-P
57	1n	201	EHZ	C21-C1-C2-C3
46	1B	202	PC1	O31-C31-C32-C33
52	1Y	202	3PE	O21-C21-C22-C23
46	1f	101	PC1	C37-C38-C39-C3A
46	1q	201	PC1	C23-C24-C25-C26
52	1L	701	3PE	O21-C21-C22-C23
46	1q	201	PC1	O21-C21-C22-C23
46	1B	202	PC1	O32-C31-C32-C33
52	1Y	202	3PE	O22-C21-C22-C23
52	1f	102	3PE	O21-C21-C22-C23
52	1f	102	3PE	O22-C21-C22-C23
51	1N	402	CDL	C72-C71-CB7-OB8

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.

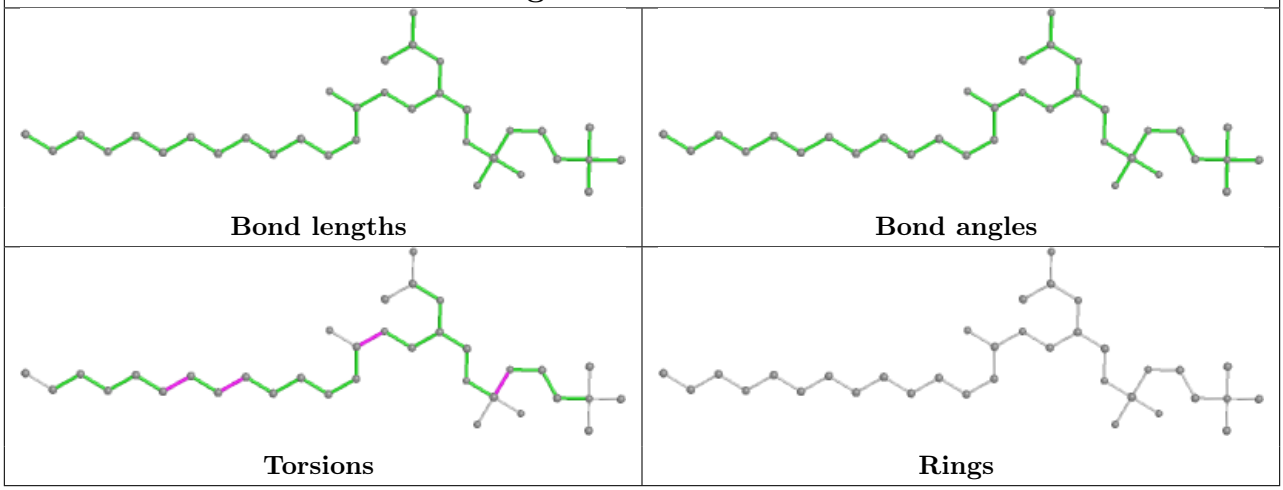
Ligand GTP 1O 401



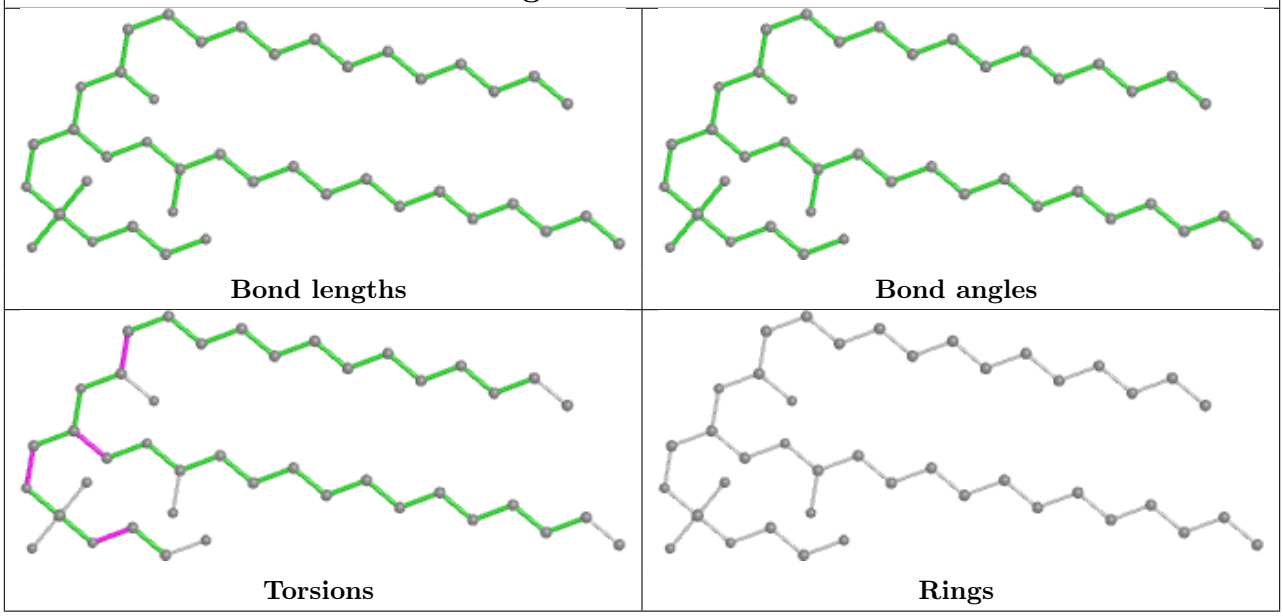
Bond lengths **Bond angles**

Torsions **Rings**

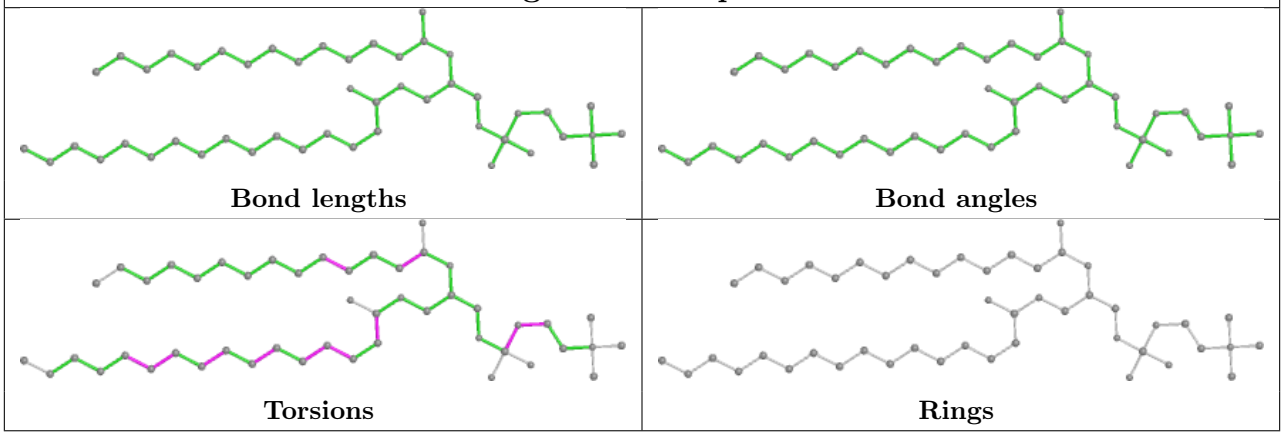
Ligand PC1 1f 101



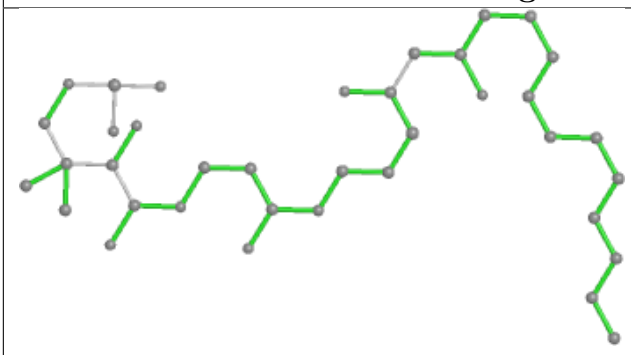
Ligand 3PE 1L 701



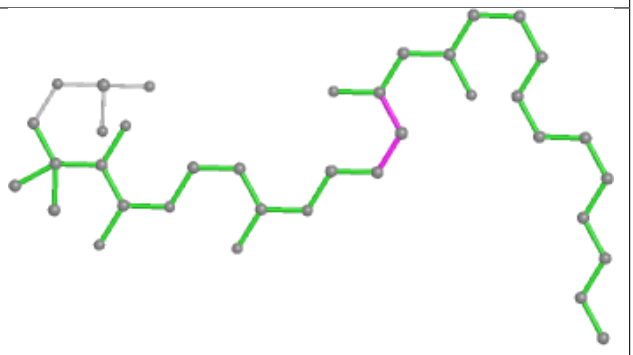
Ligand PC1 1q 201



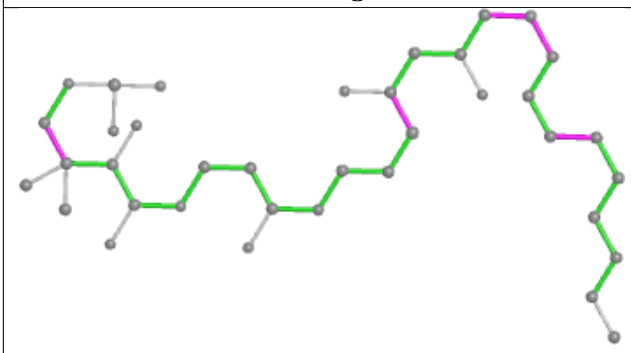
Ligand EHZ 1n 201



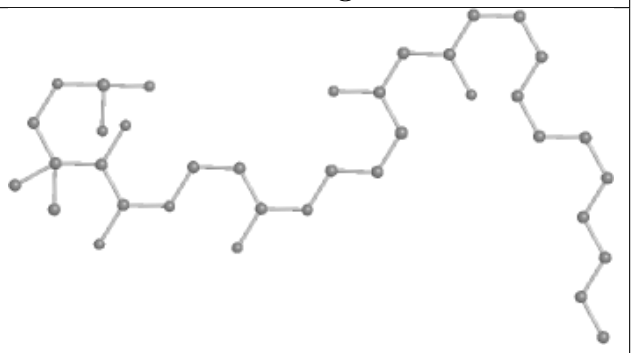
Bond lengths



Bond angles

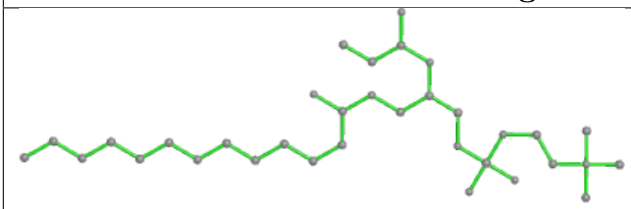


Torsions

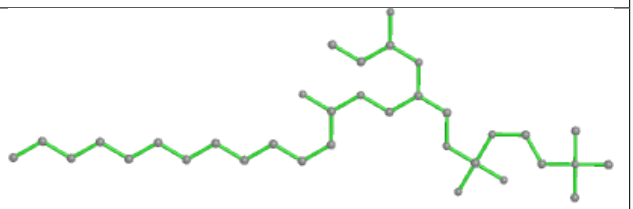


Rings

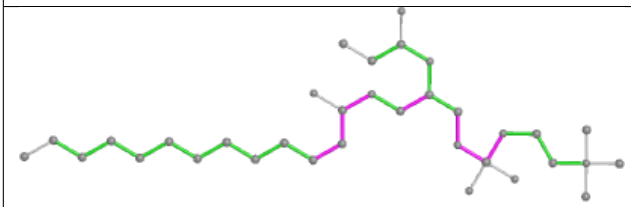
Ligand PC1 1B 202



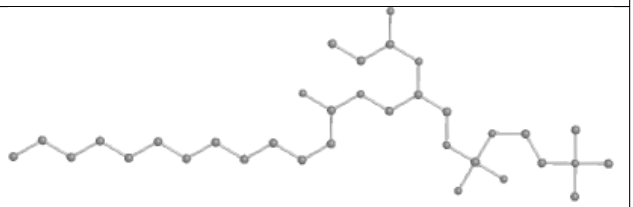
Bond lengths



Bond angles

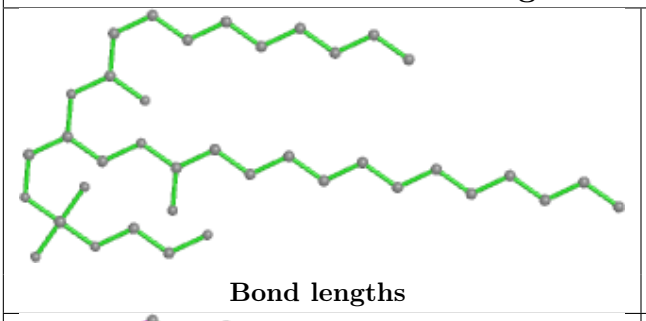


Torsions

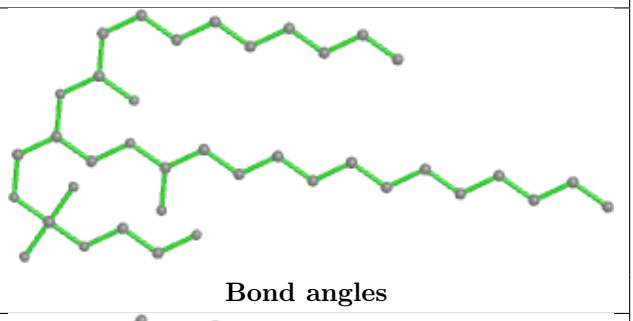


Rings

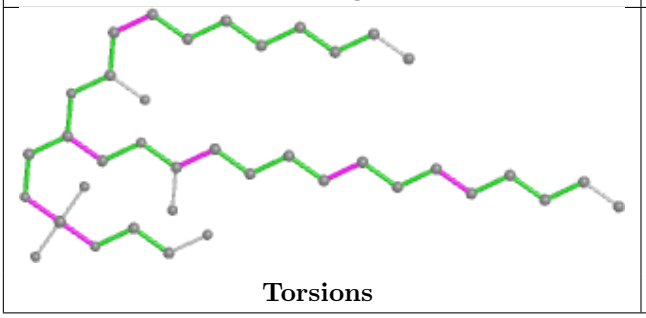
Ligand 3PE 1N 401



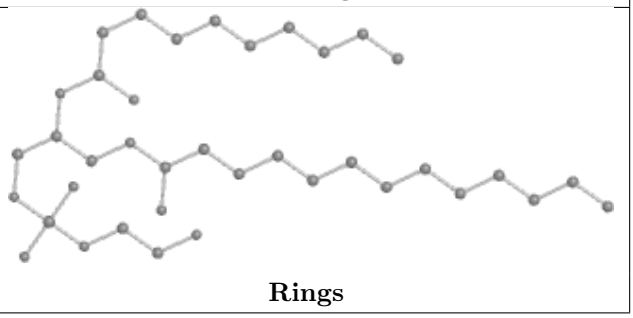
Bond lengths



Bond angles

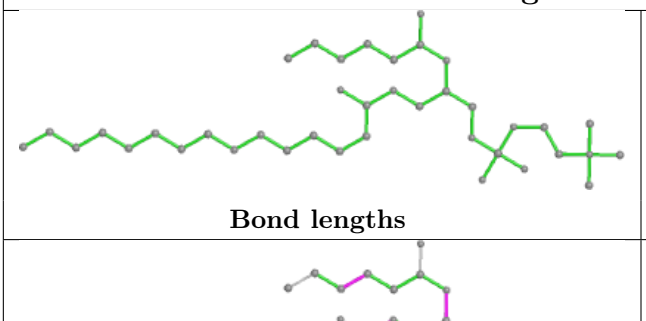


Torsions

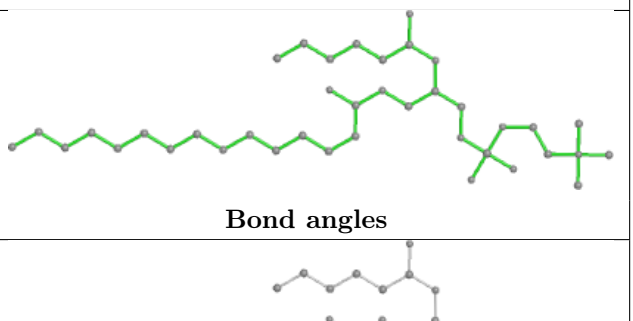


Rings

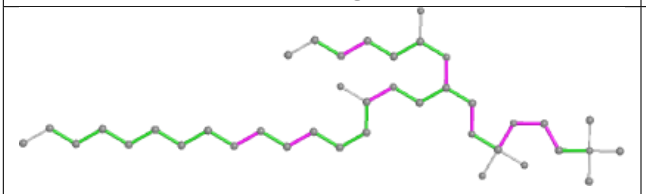
Ligand PC1 1d 201



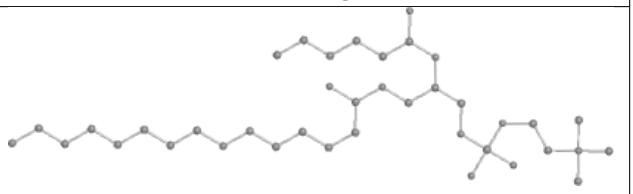
Bond lengths



Bond angles

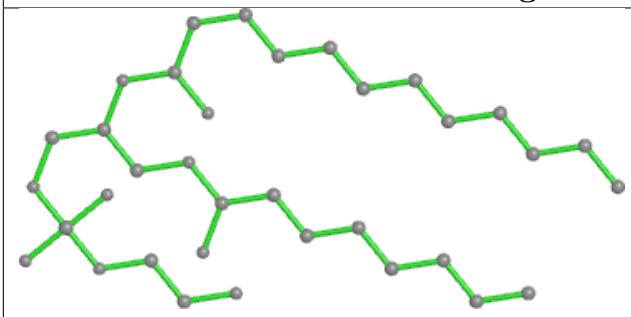


Torsions

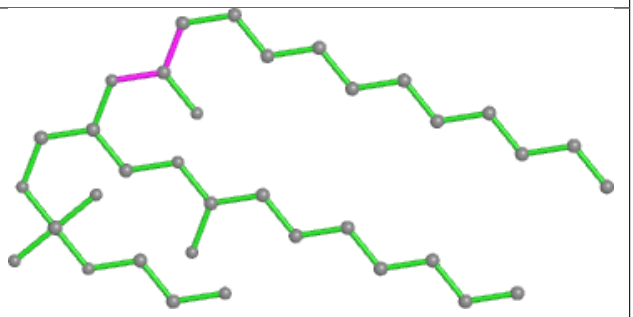


Rings

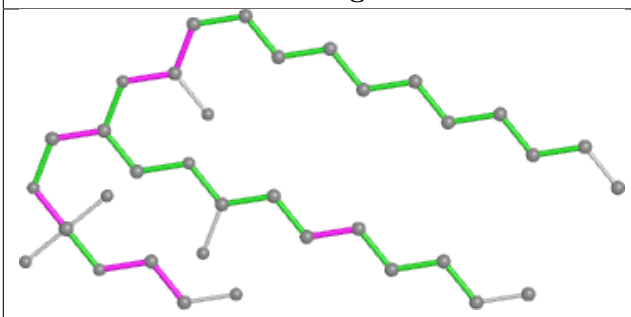
Ligand 3PE 1Y 202



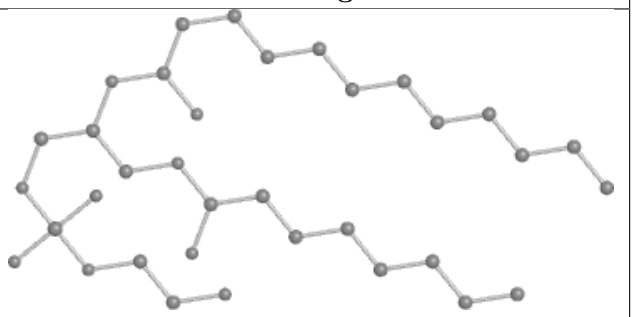
Bond lengths



Bond angles

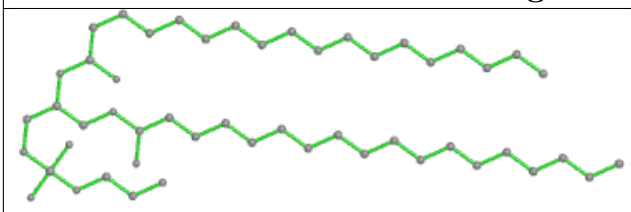


Torsions

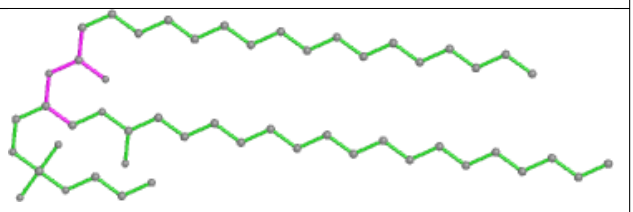


Rings

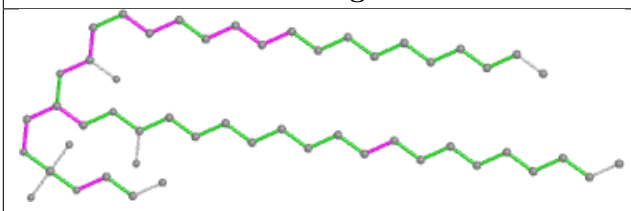
Ligand 3PE 1f 102



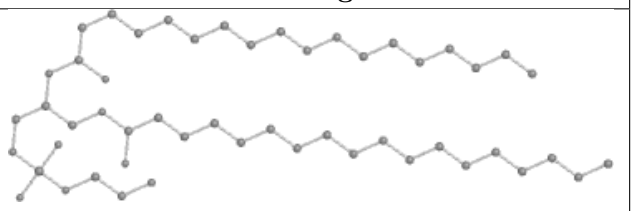
Bond lengths



Bond angles

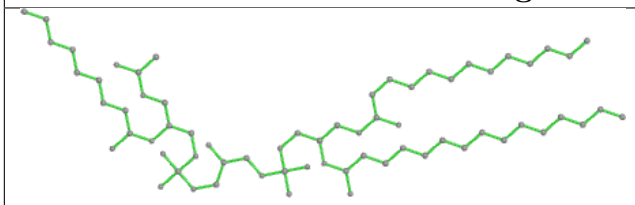


Torsions

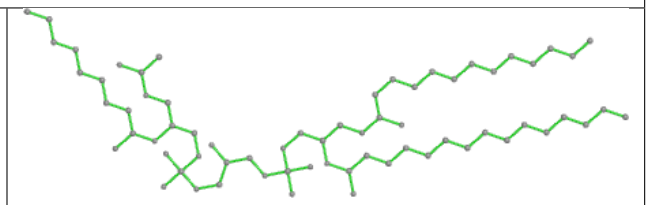


Rings

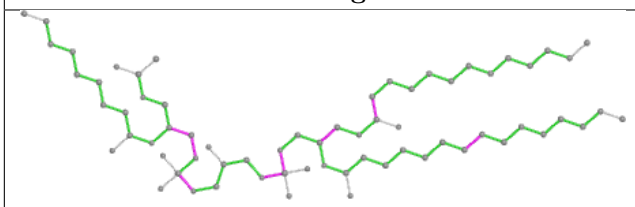
Ligand CDL 1N 402



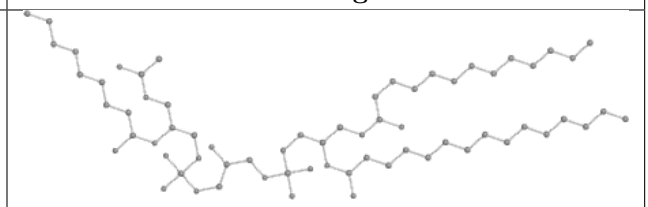
Bond lengths



Bond angles

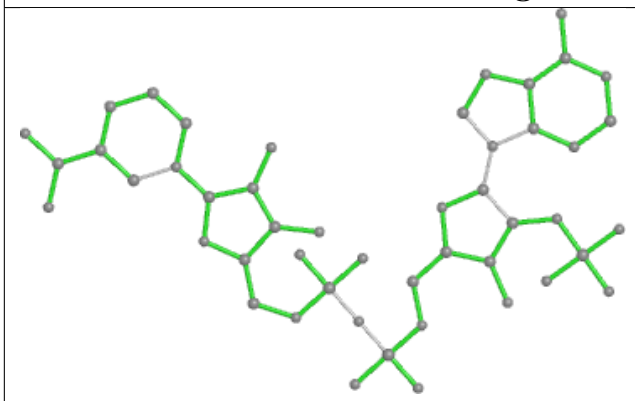


Torsions

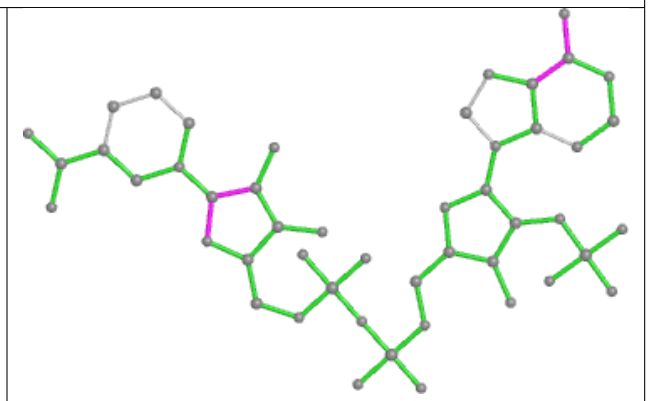


Rings

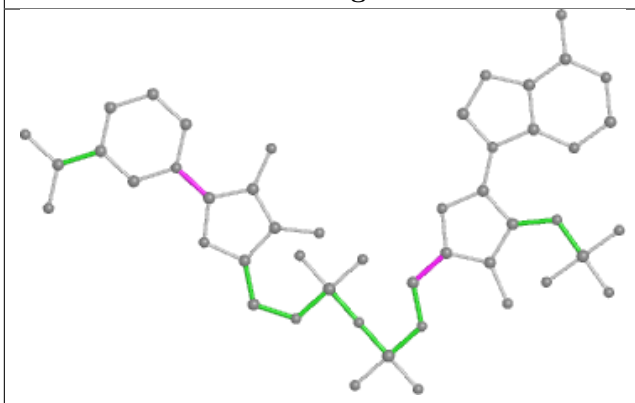
Ligand NDP 1P 501



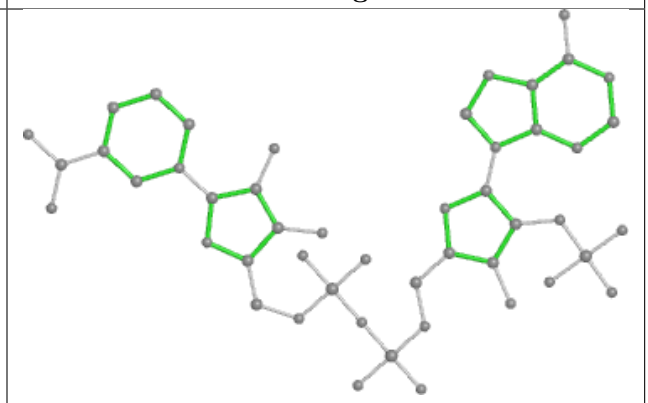
Bond lengths



Bond angles

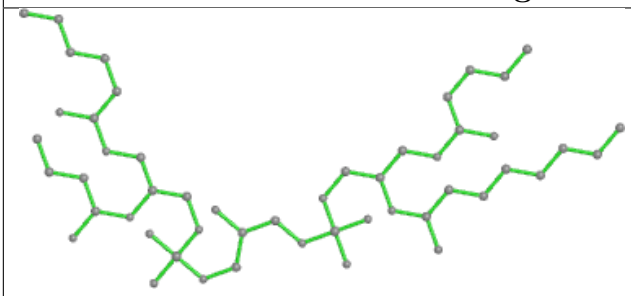


Torsions

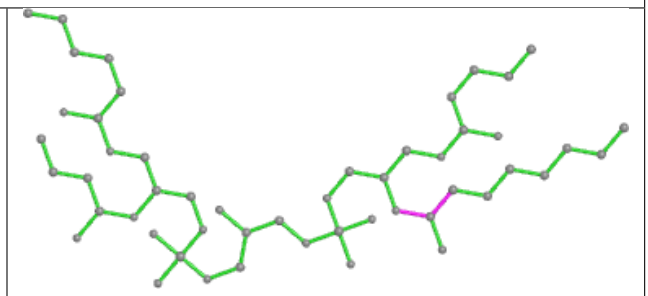


Rings

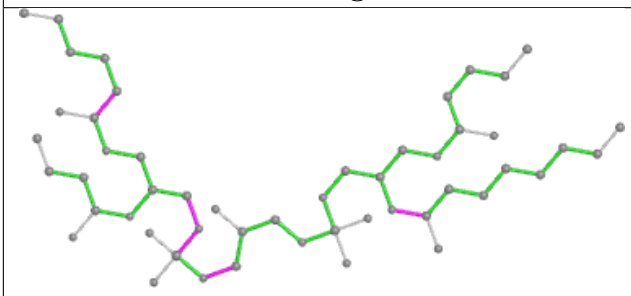
Ligand CDL 1H 702



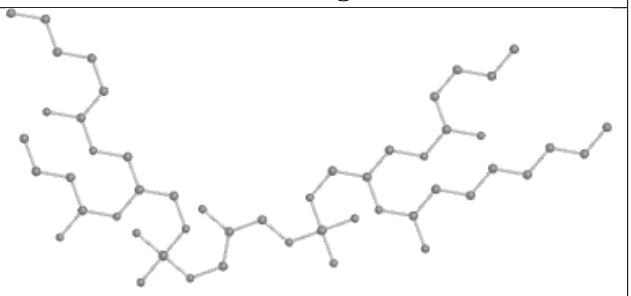
Bond lengths



Bond angles

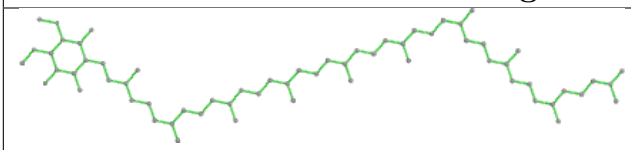


Torsions

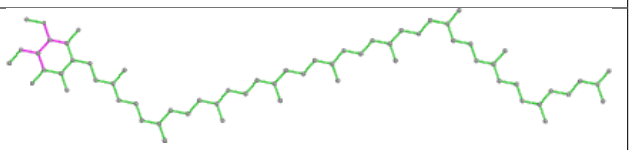


Rings

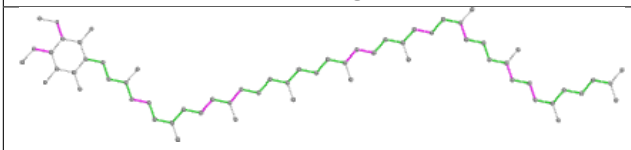
Ligand U10 1H 701



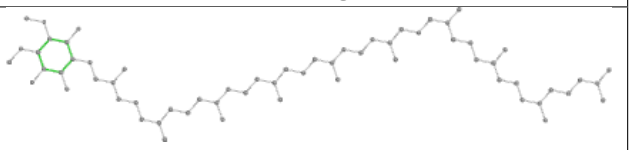
Bond lengths



Bond angles

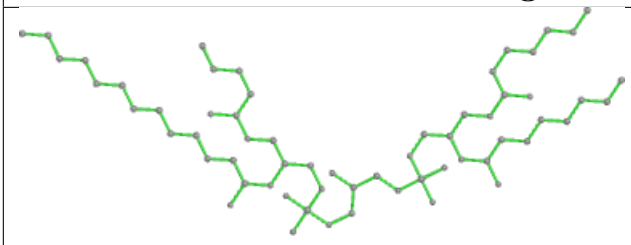


Torsions

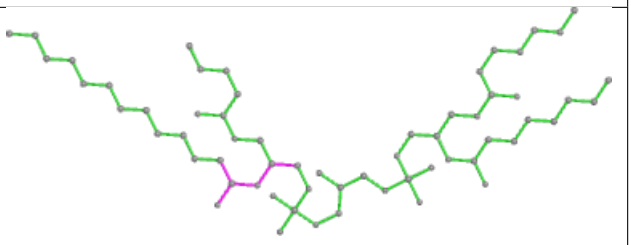


Rings

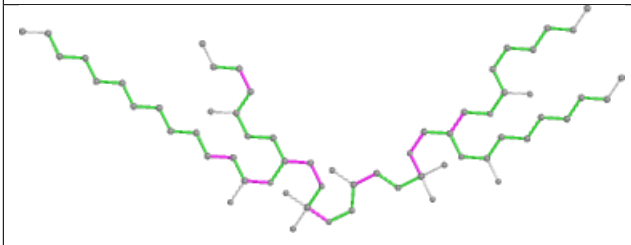
Ligand CDL 1a 101



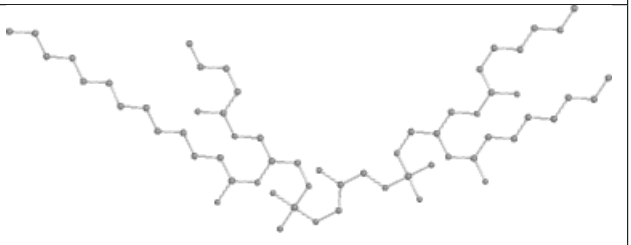
Bond lengths



Bond angles

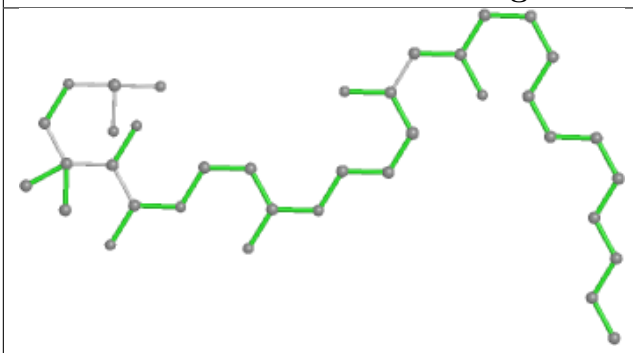


Torsions

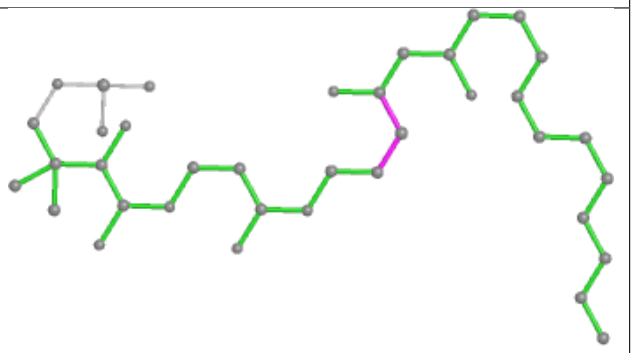


Rings

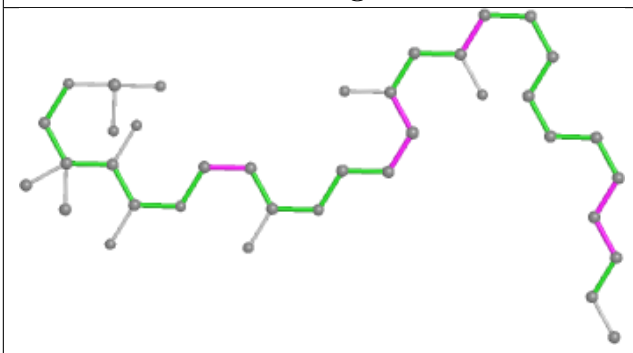
Ligand EHZ 1W 201



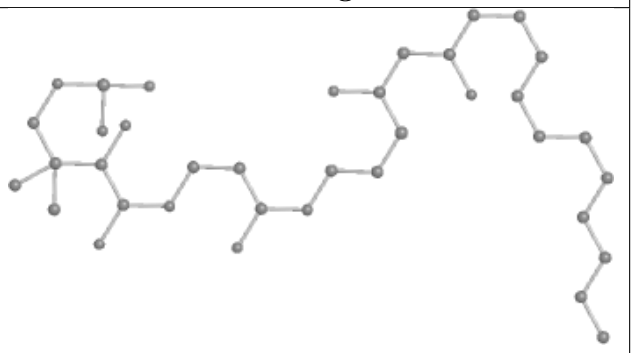
Bond lengths



Bond angles

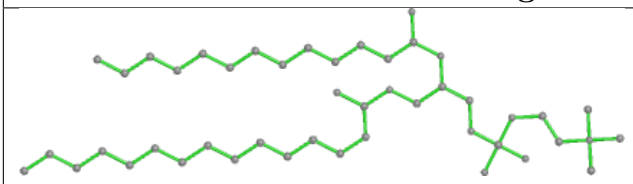


Torsions

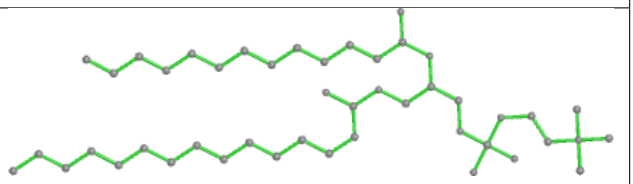


Rings

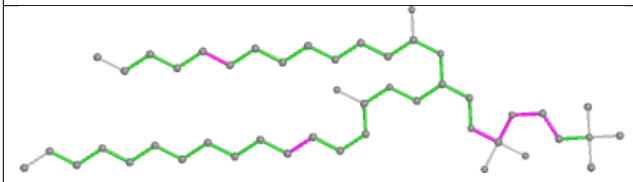
Ligand PC1 1Y 201



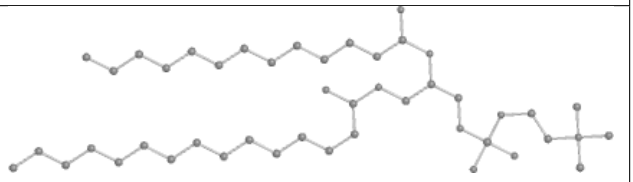
Bond lengths



Bond angles

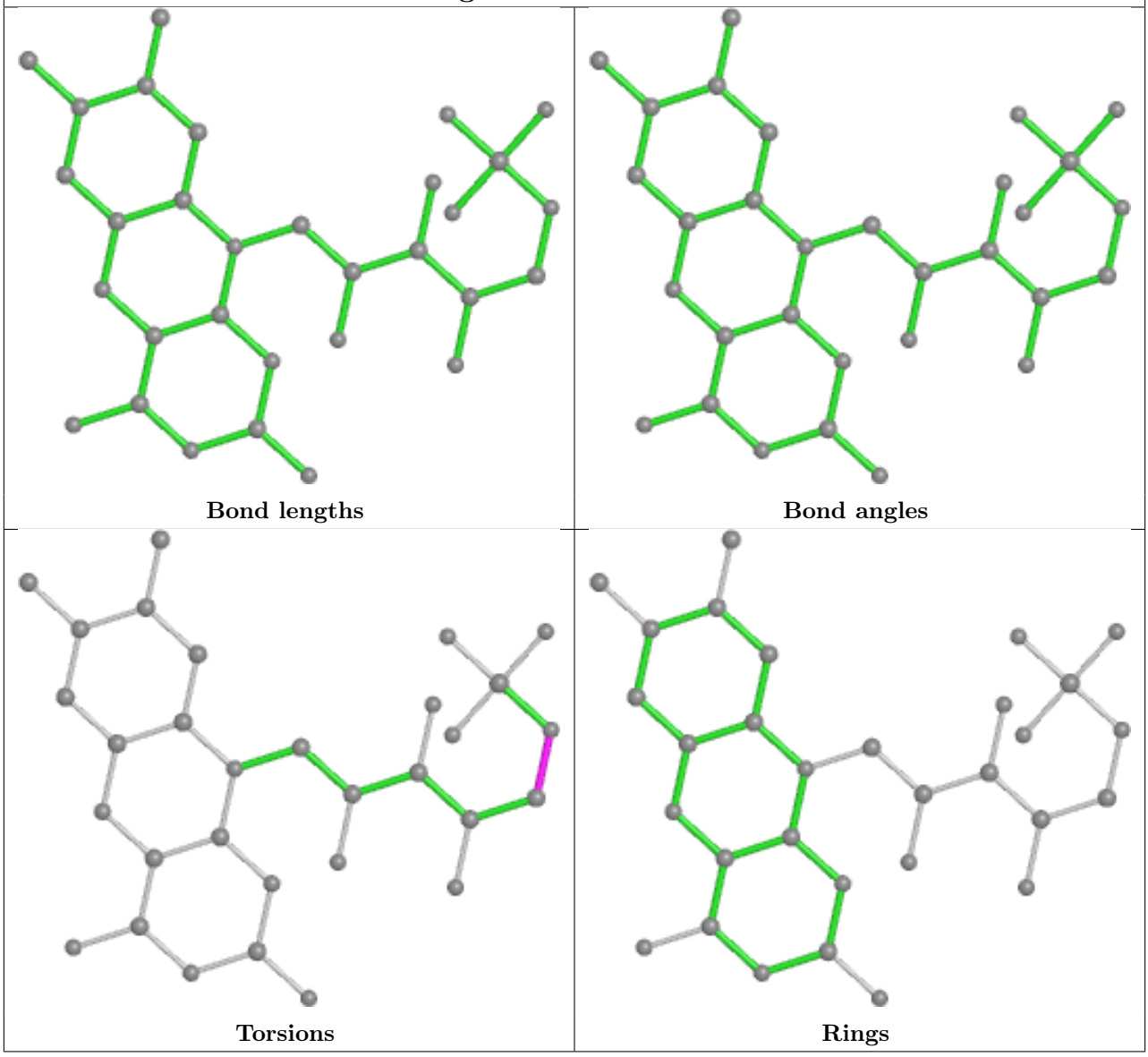


Torsions



Rings

Ligand FMN 1F 501



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
43	1r	1
34	1i	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1r	1:ALA	C	2:SER	N	7.81
1	1i	1:SAC	C	2:GLY	N	3.21

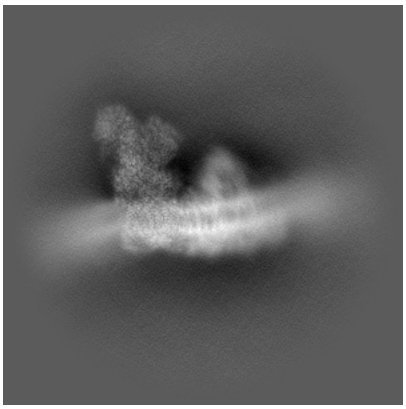
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-42166. These allow visual inspection of the internal detail of the map and identification of artifacts.

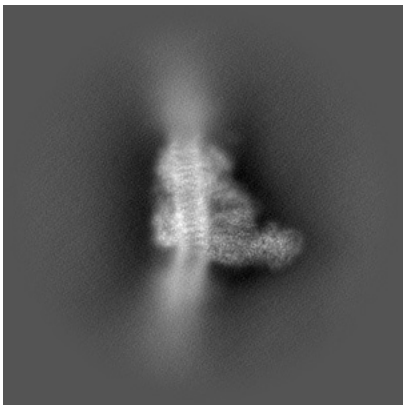
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

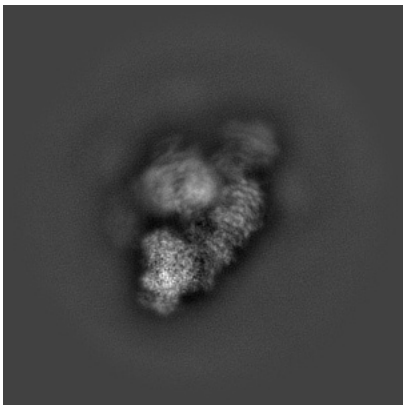
6.1.1 Primary map



X

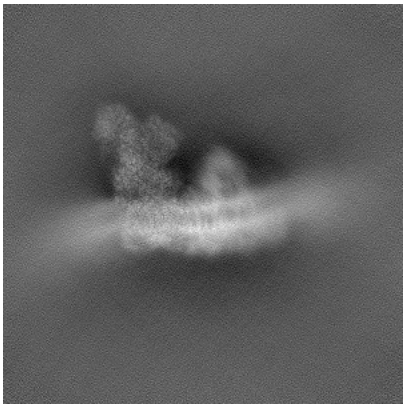


Y

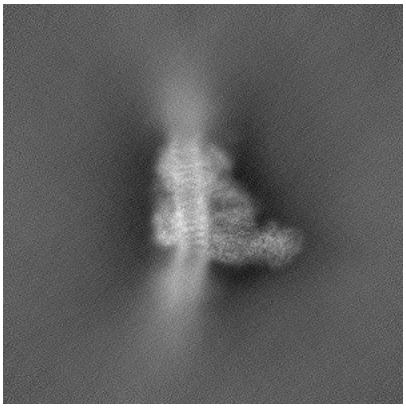


Z

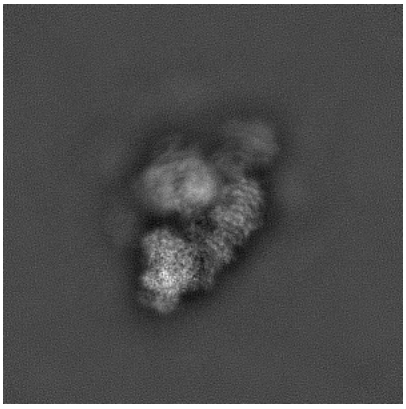
6.1.2 Raw map



X



Y

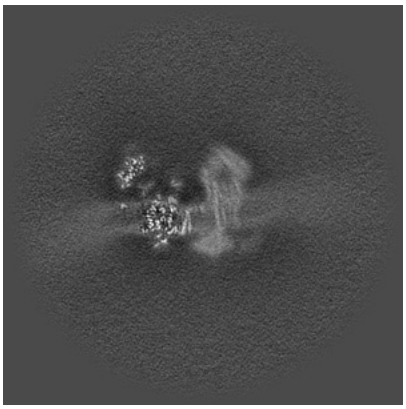


Z

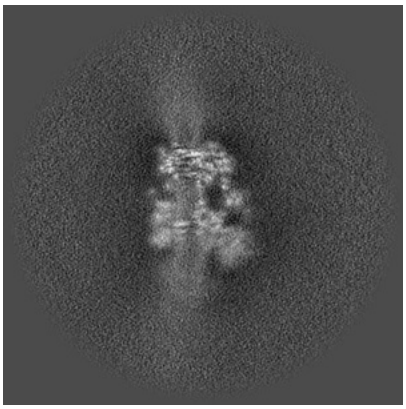
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

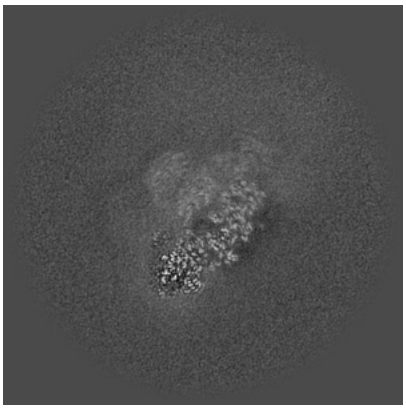
6.2.1 Primary map



X Index: 200

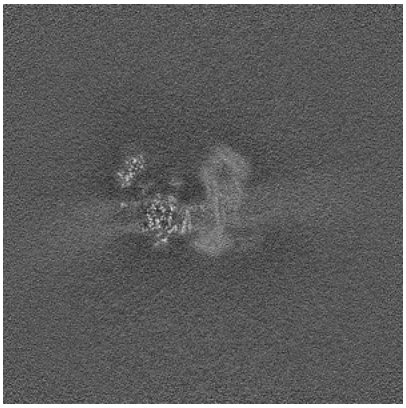


Y Index: 200

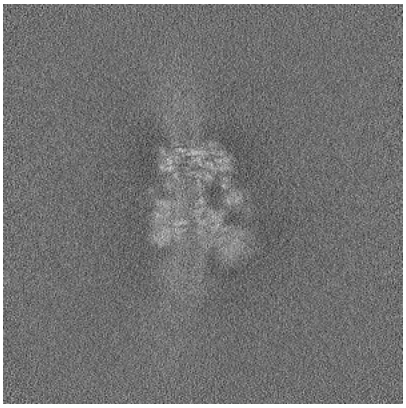


Z Index: 200

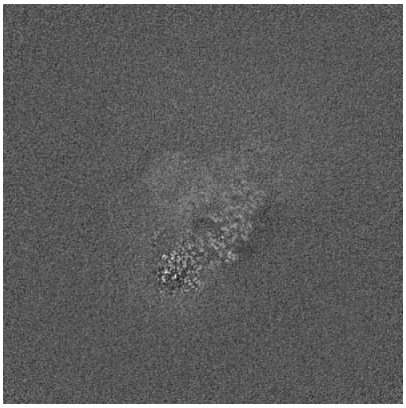
6.2.2 Raw map



X Index: 200



Y Index: 200

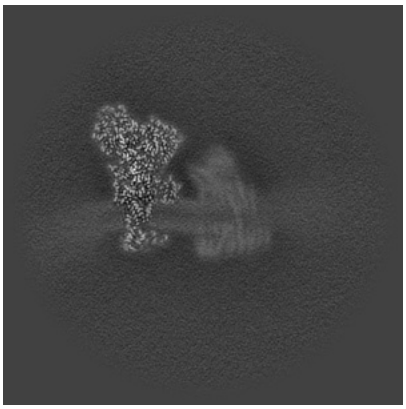


Z Index: 200

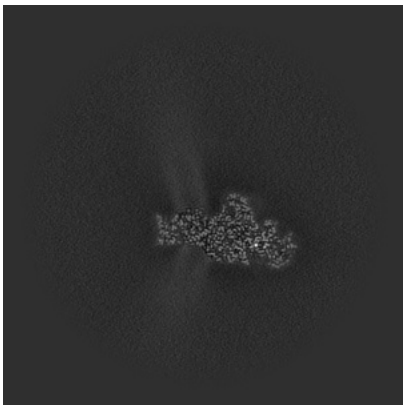
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

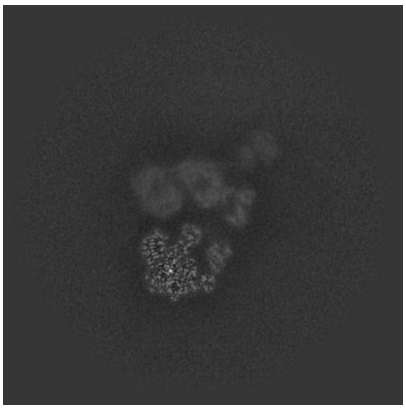
6.3.1 Primary map



X Index: 163

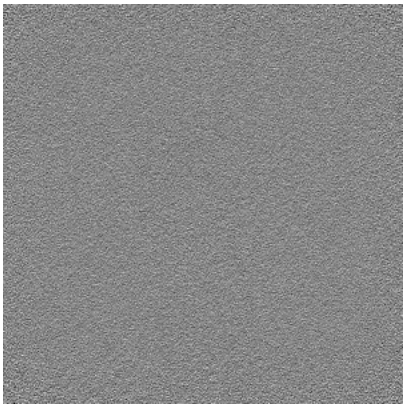


Y Index: 127

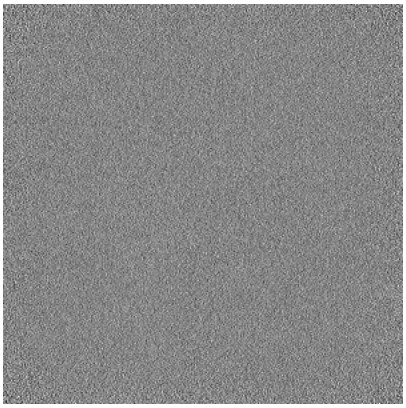


Z Index: 227

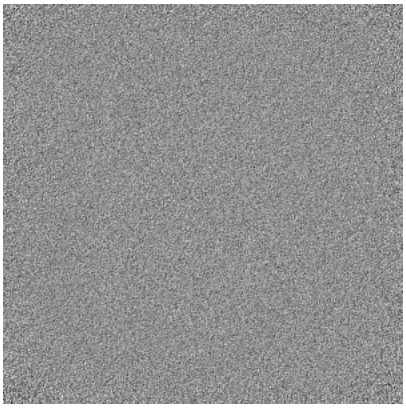
6.3.2 Raw map



X Index: 0



Y Index: 0

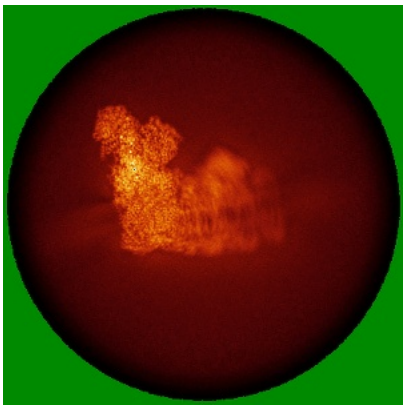


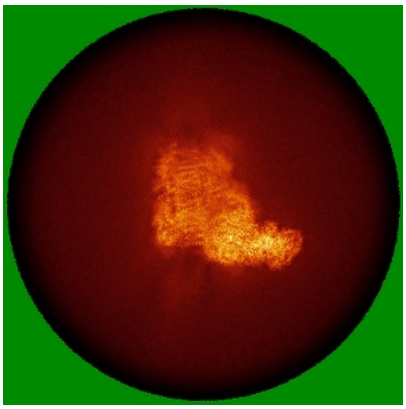
Z Index: 0

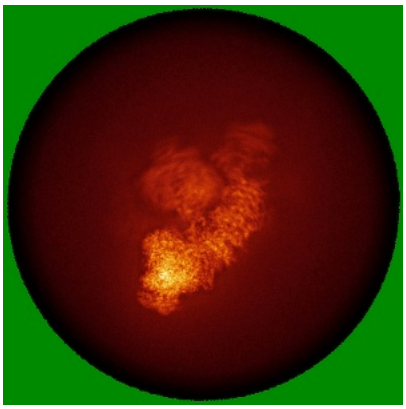
The images above show the largest variance slices of the map in three orthogonal directions.

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

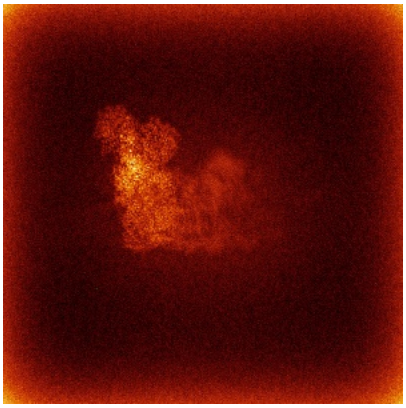
6.4.1 Primary map

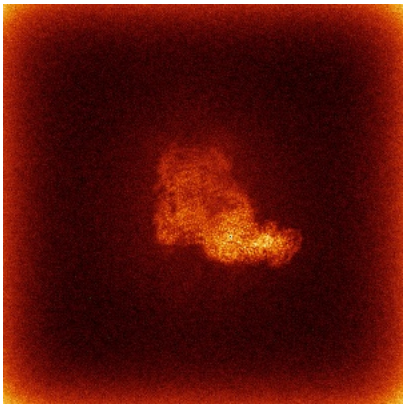

X

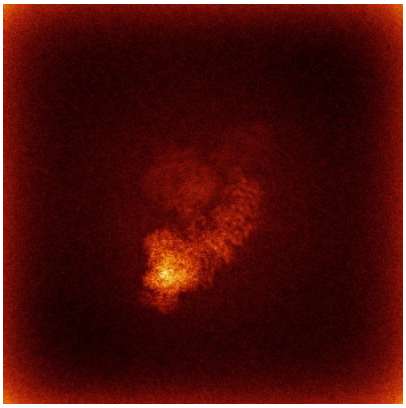

Y


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 0.12. 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.

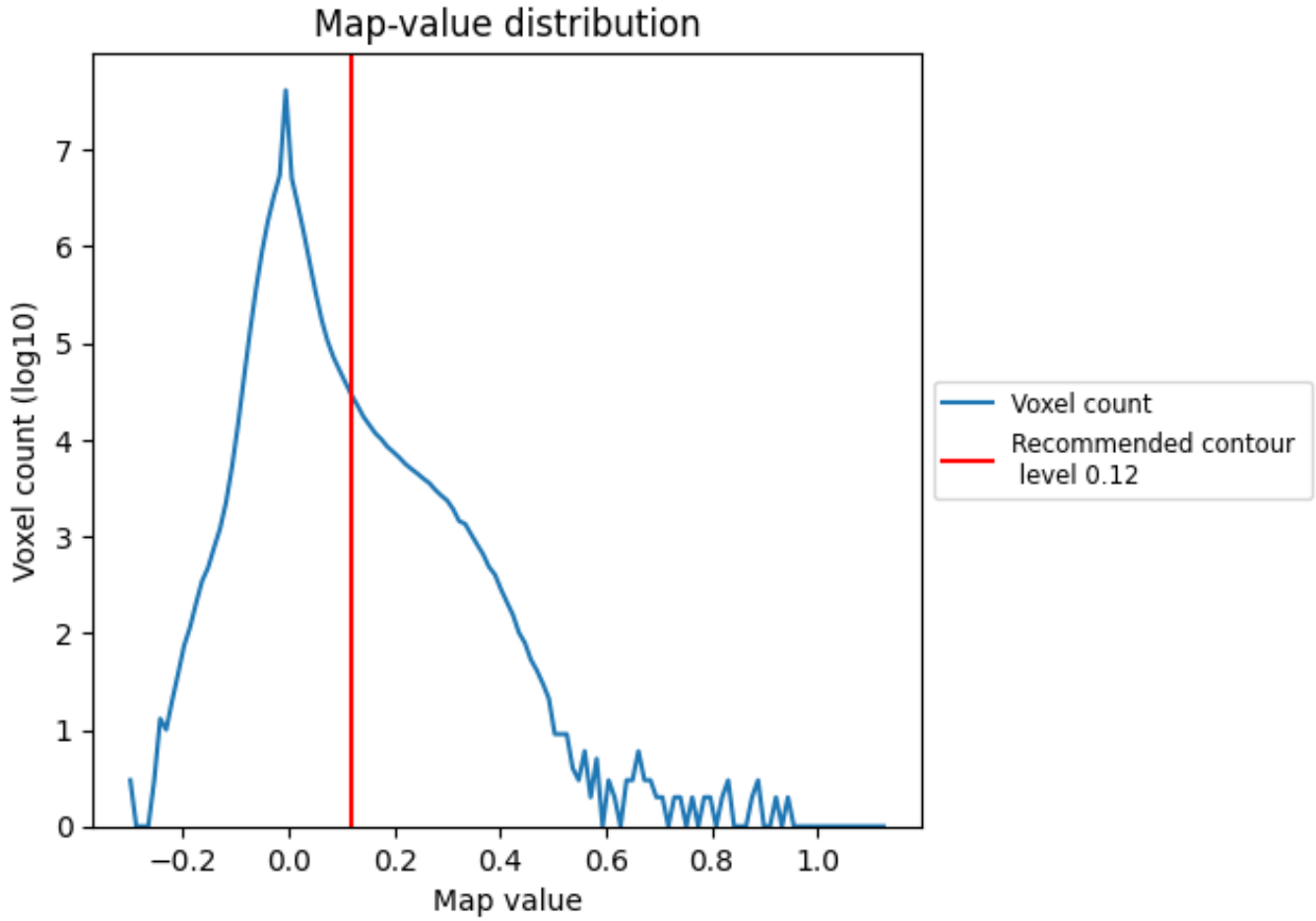
6.6 Mask visualisation (i)

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

7 Map analysis

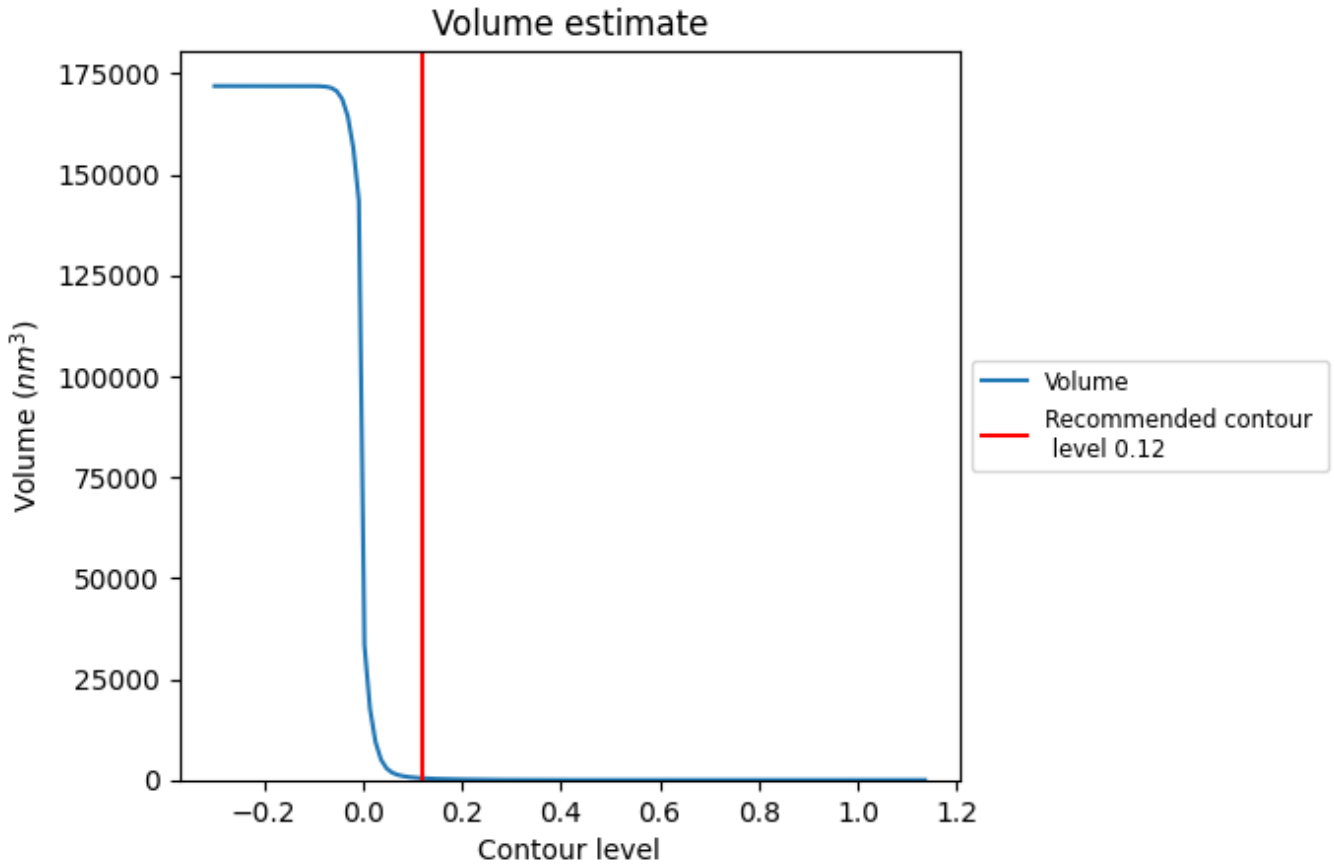
This section contains the results of statistical analysis of the map.

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.

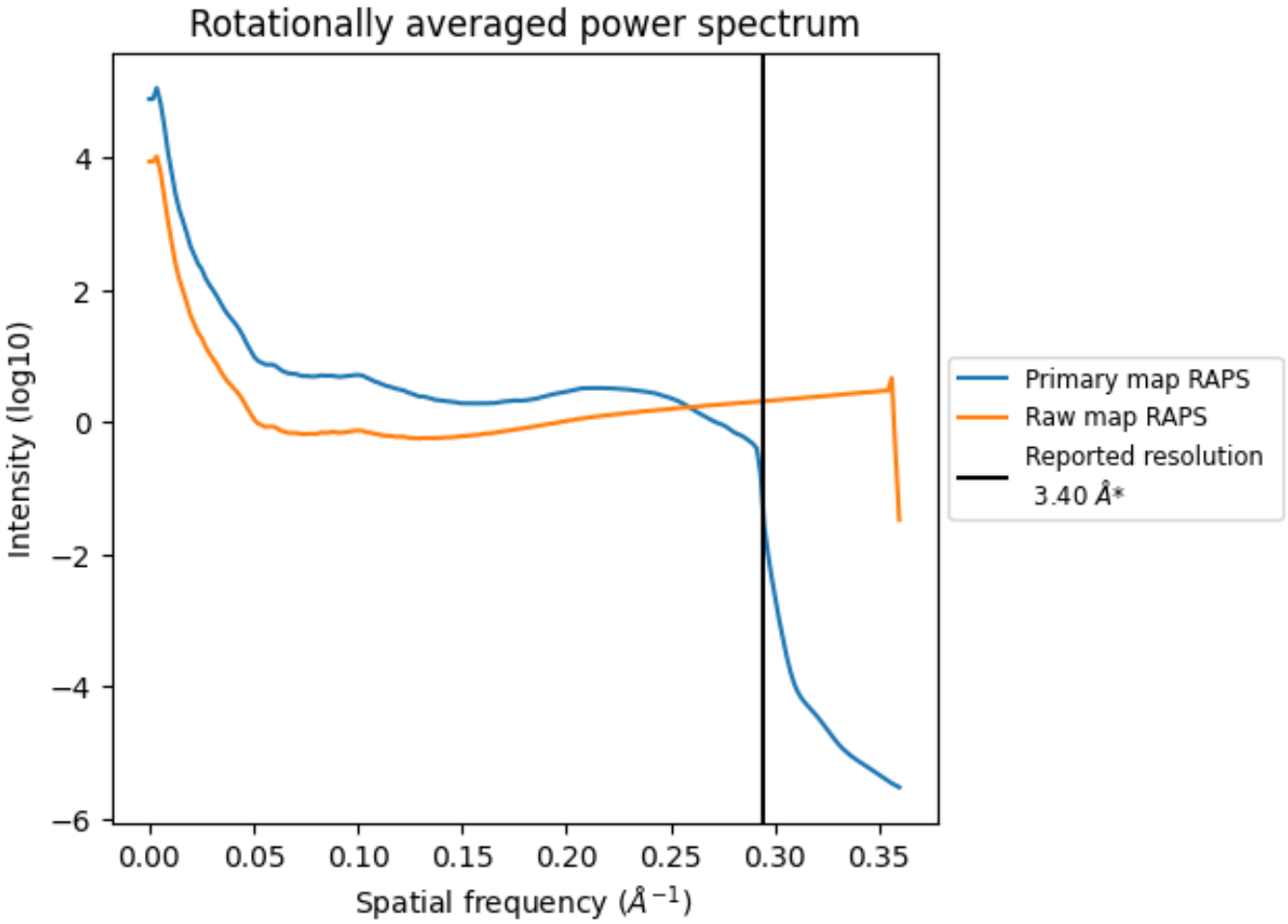
7.2 Volume estimate (i)



The volume at the recommended contour level is 440 nm^3; this corresponds to an approximate mass of 397 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)

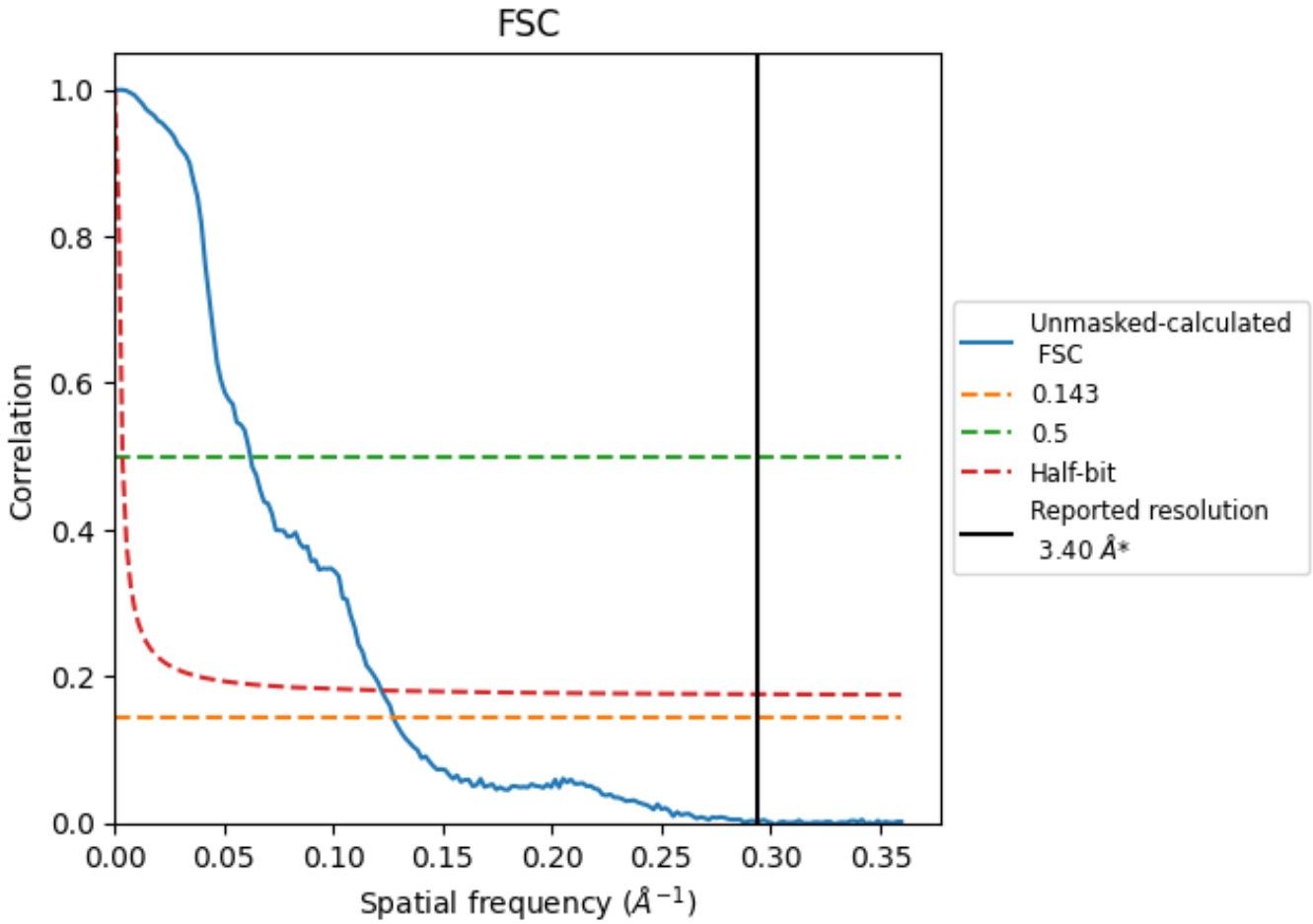


*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

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 0.294 Å^{-1}

8.2 Resolution estimates (i)

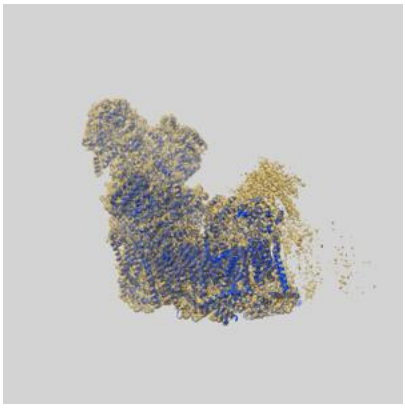
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.84	16.13	8.20

*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 7.84 differs from the reported value 3.4 by more than 10 %

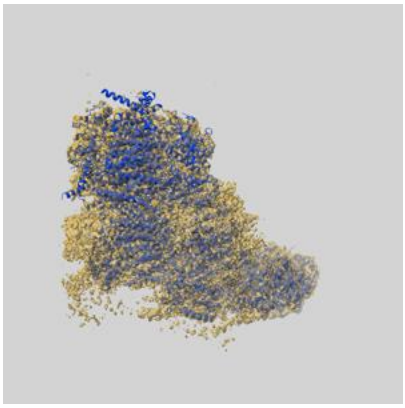
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-42166 and PDB model 8UEP. Per-residue inclusion information can be found in section 3 on page 21.

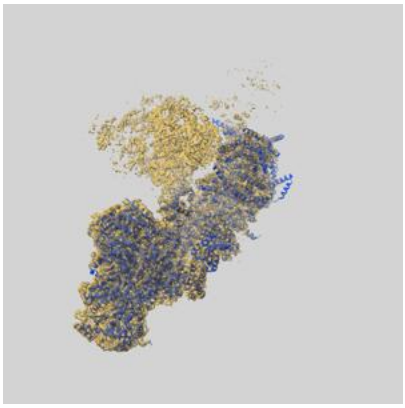
9.1 Map-model overlay



X



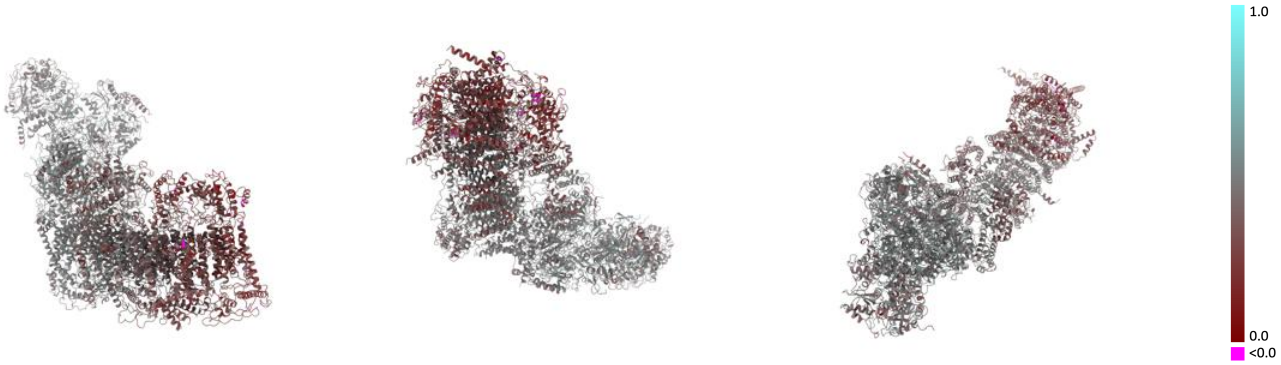
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.12 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.

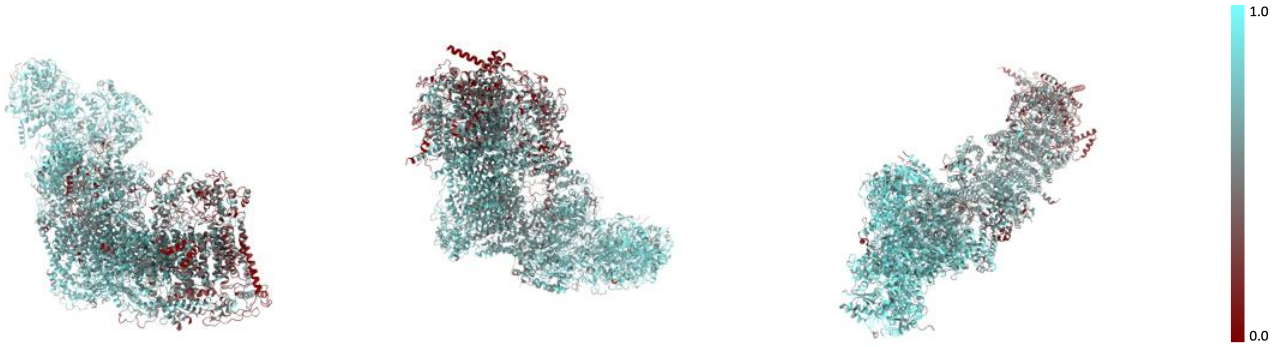
9.2 Q-score mapped to coordinate model (i)



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.

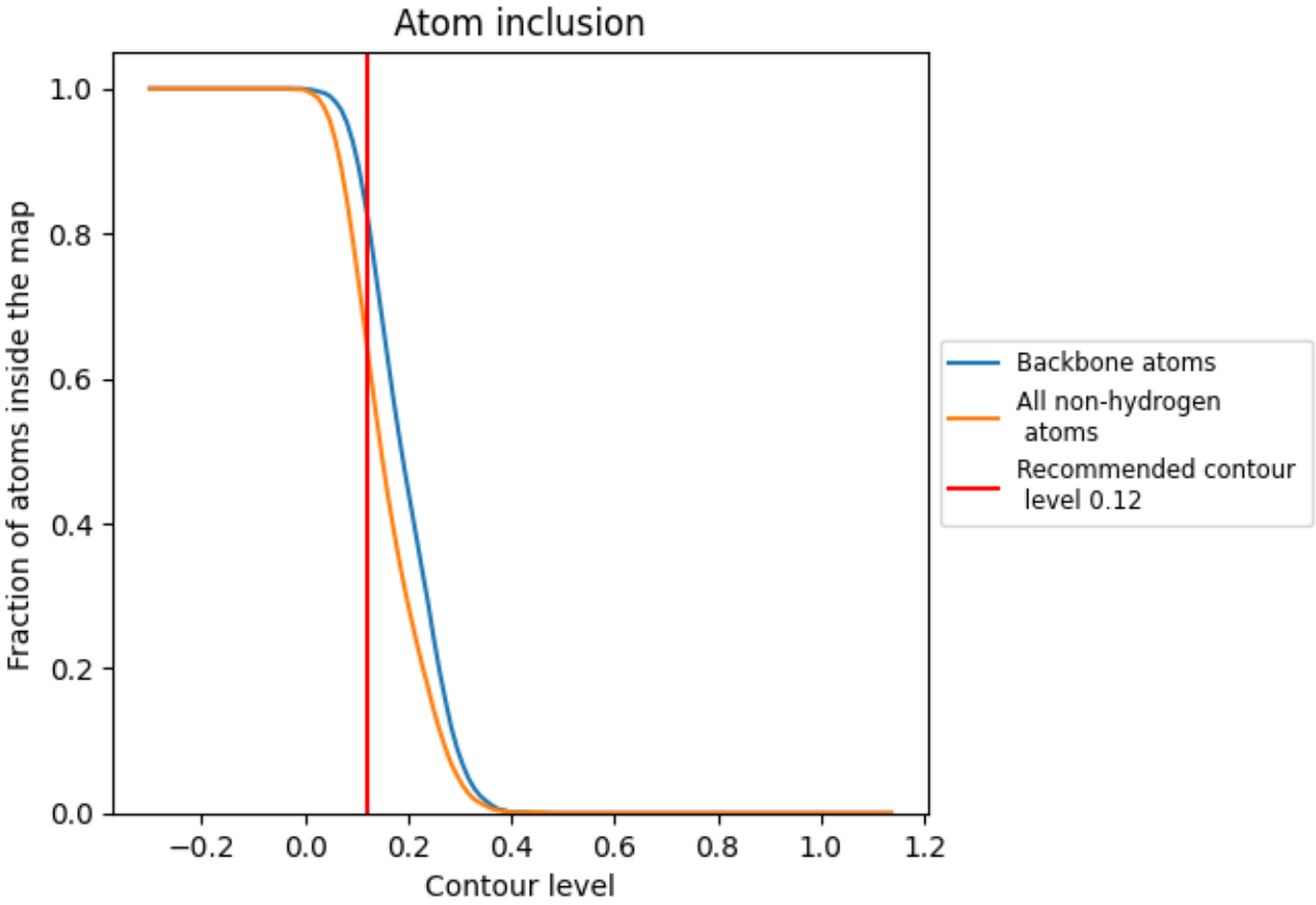
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.12).

9.4 Atom inclusion (i)



At the recommended contour level, 83% of all backbone atoms, 65% 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 (0.12) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6490	0.4130
1A	0.6190	0.4620
1B	0.7530	0.4810
1C	0.7670	0.4940
1D	0.7610	0.4810
1E	0.7770	0.4460
1F	0.7940	0.4480
1G	0.7830	0.4730
1H	0.6630	0.4730
1I	0.8070	0.4910
1J	0.6210	0.4370
1K	0.6650	0.4370
1L	0.4790	0.3010
1M	0.6600	0.4060
1N	0.7080	0.4520
1O	0.5280	0.3750
1P	0.6750	0.4740
1Q	0.6910	0.4670
1R	0.7510	0.4850
1S	0.7610	0.4210
1T	0.5180	0.3760
1U	0.3400	0.2320
1V	0.6910	0.4410
1W	0.6700	0.4500
1X	0.7690	0.4430
1Y	0.5890	0.3600
1Z	0.7630	0.4580
1a	0.7230	0.4470
1b	0.6980	0.4570
1c	0.5370	0.3800
1d	0.6950	0.4330
1e	0.7450	0.4480
1f	0.4430	0.3640
1g	0.5610	0.3530
1h	0.6400	0.3960

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Chain	Atom inclusion	Q-score
1i	0.3070	0.2850
1j	0.3090	0.2890
1k	0.2050	0.2320
1l	0.4730	0.3000
1m	0.4960	0.3020
1n	0.4620	0.2680
1o	0.4200	0.2400
1p	0.5510	0.3410
1q	0.7540	0.4820
1r	0.7780	0.4880
1s	0.7470	0.4190