wwPDB EM Validation Summary Report (i)

Nov 28, 2022 – 11:10 PM JST

PDB ID	:	7VBP
EMDB ID	:	EMD-31884
Title	:	Membrane arm of deactive state CI from DQ-NADH dataset
Authors	:	Gu, J.K.; Yang, M.J.
Deposited on	:	2021-09-01
Resolution	:	2.80 Å(reported)

This is a wwPDB EM Validation Summary 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 (i) 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 (i)) were used in the production of this report:

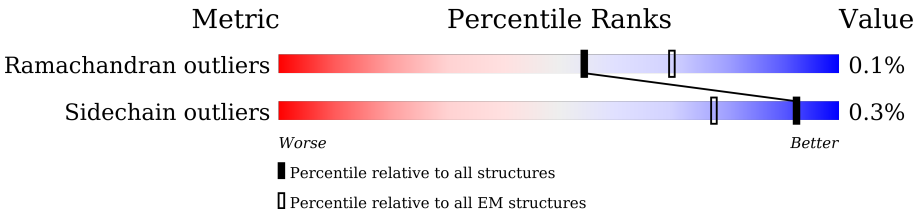
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.80 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	Q	40	48% 98%
2	S	70	6% 100%
3	U	83	11% 100%
4	V	140	73% 98%
5	W	113	5% 100%
6	X	88	7% 100%
7	Y	70	27% 100%
8	Z	84	26% 100%
9	a	140	100%

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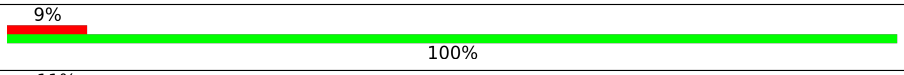
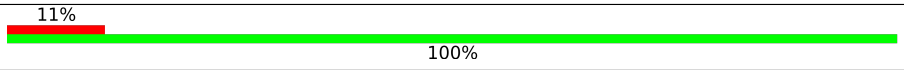
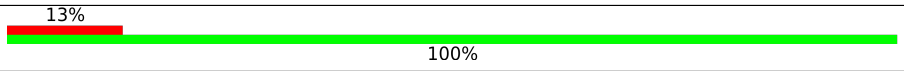
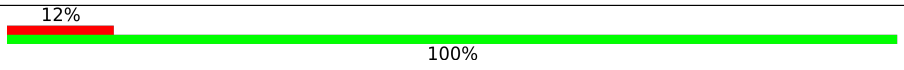
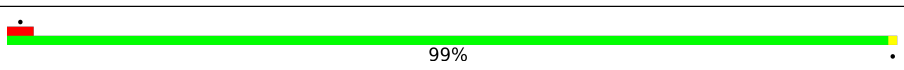
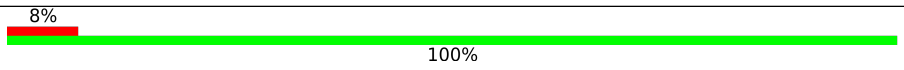
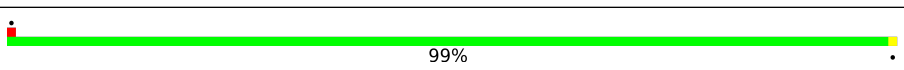
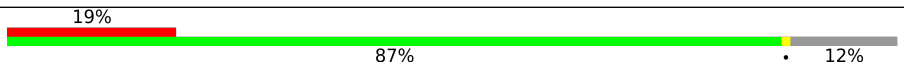
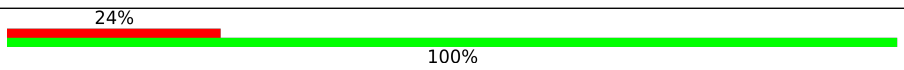
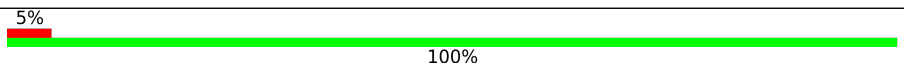
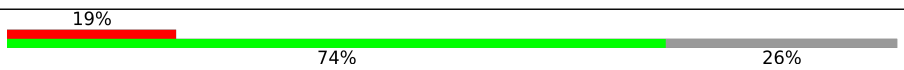
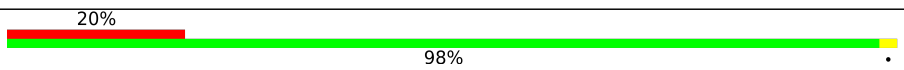
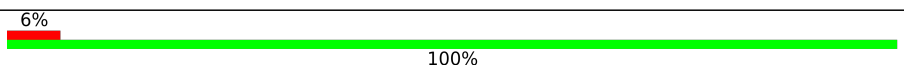
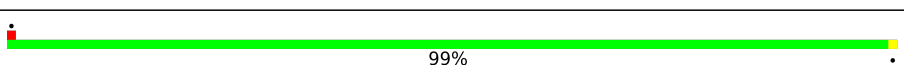
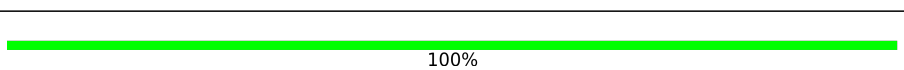
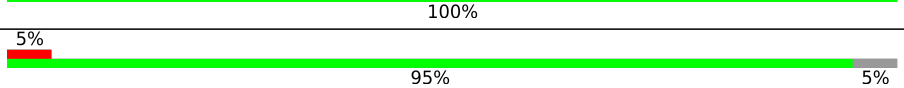
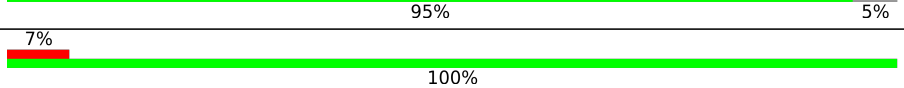
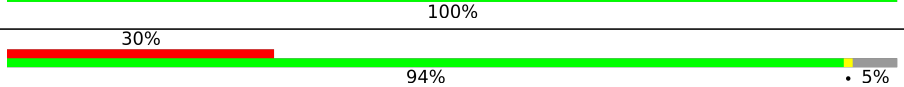
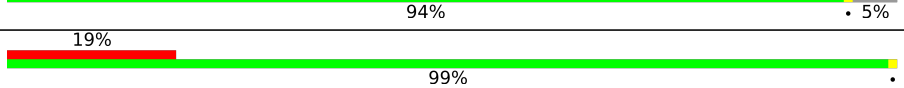
Mol	Chain	Length	Quality of chain
10	b	126	
11	c	156	
12	d	175	
13	e	107	
14	f	42	
15	g	121	
16	h	105	
17	i	347	
18	j	113	
19	k	98	
20	l	603	
21	m	175	
22	n	56	
23	o	128	
24	p	178	
25	r	459	
26	s	318	
27	u	171	
28	v	131	
29	w	320	

2 Entry composition (i)

There are 36 unique types of molecules in this entry. The entry contains 39022 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 dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	Q	40	Total	C	N	O	S	0	0
			333	217	56	59	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
2	S	70	Total	C	N	O	S	0	0
			567	364	104	94	5		

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

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

- Molecule 4 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	V	140	Total	C	N	O	S	0	0
			1021	651	174	190	6		

- Molecule 5 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	W	113	Total	C	N	O	S	0	0
			949	614	160	167	8		

- Molecule 6 is a protein called Acyl carrier protein, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	X	88	Total	C	N	O	S	0	0
			707	455	104	143	5		

- Molecule 7 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	Y	70	Total	C	N	O	S	0	0
			600	393	98	108	1		

- Molecule 8 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	Z	84	Total	C	N	O	S	0	0
			674	437	116	120	1		

- Molecule 9 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	a	140	Total	C	N	O	S	0	0
			1165	762	199	201	3		

- Molecule 10 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	b	103	Total	C	N	O	S	0	0
			879	573	158	147	1		

- Molecule 11 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	c	156	Total	C	N	O	S	0	0
			1315	853	213	241	8		

- Molecule 12 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	d	175	Total	C	N	O	S	0	0
			1461	916	265	272	8		

- Molecule 13 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	e	107	Total	C	N	O	S	0	0
			890	568	145	173	4		

- Molecule 14 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	f	42	Total	C	N	O	0	0
			342	225	58	59		

- Molecule 15 is a protein called NADH dehydrogenase [ubiquinone] 1 subunit C2.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	g	121	Total	C	N	O	S	0	0
			1000	650	173	171	6		

- Molecule 16 is a protein called NADH dehydrogenase [ubiquinone] iron-sulfur protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	h	105	Total	C	N	O	S	0	0
			867	550	161	150	6		

- Molecule 17 is a protein called NADH-ubiquinone oxidoreductase chain 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	i	347	Total	C	N	O	S	0	0
			2710	1782	420	462	46		

- Molecule 18 is a protein called NADH-ubiquinone oxidoreductase chain 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	j	99	Total	C	N	O	S	0	0
			800	545	118	132	5		

- Molecule 19 is a protein called NADH-ubiquinone oxidoreductase chain 4L.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	k	98	Total	C	N	O	S	0	0
			748	493	113	128	14		

- Molecule 20 is a protein called NADH-ubiquinone oxidoreductase chain 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	l	603	Total	C	N	O	S	0	0
			4761	3155	740	817	49		

- Molecule 21 is a protein called NADH-ubiquinone oxidoreductase chain 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	m	129	Total	C	N	O	S	0	0
			939	628	137	166	8		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	n	56	Total	C	N	O	S	0	0
			479	311	88	79	1		

- Molecule 23 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	o	128	Total	C	N	O	0	0
			1062	691	182	189		

- Molecule 24 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	p	178	Total	C	N	O	S	0	0
			1534	982	279	265	8		

- Molecule 25 is a protein called NADH-ubiquinone oxidoreductase chain 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	r	459	Total	C	N	O	S	0	0
			3631	2412	572	609	38		

- Molecule 26 is a protein called NADH-ubiquinone oxidoreductase chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	s	303	Total	C	N	O	S	0	0
			2394	1607	369	397	21		

- Molecule 27 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	u	171	Total	C	N	O	S	0	0
			1398	887	250	251	10		

- Molecule 28 is a protein called NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	v	124	Total	C	N	O	S	0	0
			1022	639	192	182	9		

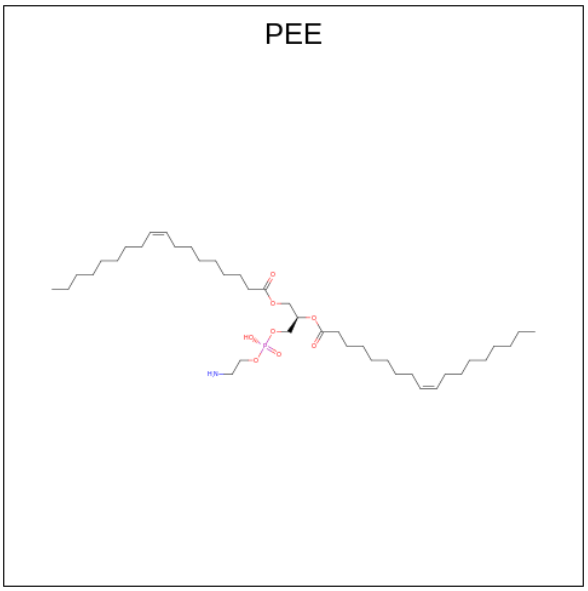
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
v	1	MYR	-	acetylation	UNP F1SCH1

- Molecule 29 is a protein called NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial.

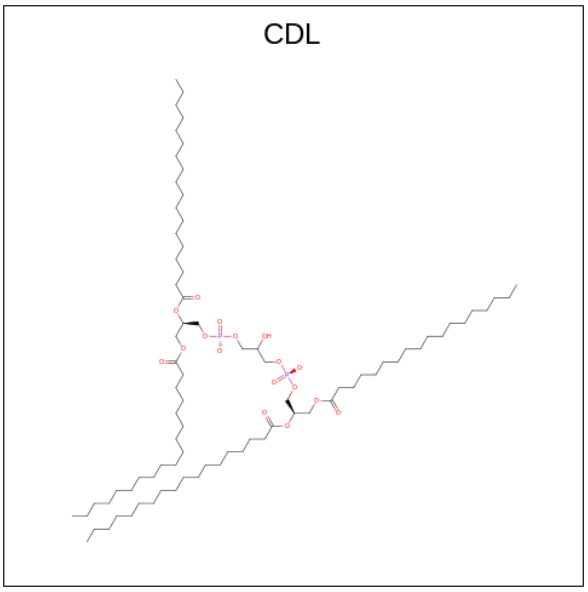
Mol	Chain	Residues	Atoms					AltConf	Trace
29	w	320	Total	C	N	O	S	0	0
			2586	1646	439	491	10		

- Molecule 30 is 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: $C_{41}H_{78}NO_8P$) (labeled as "Ligand of Interest" by depositor).



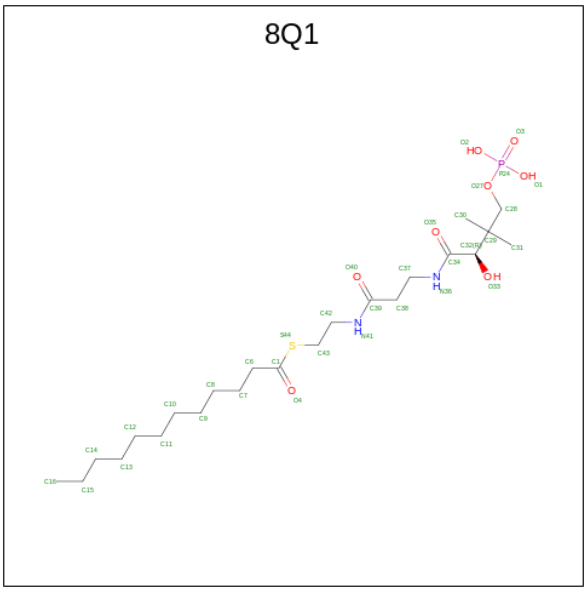
Mol	Chain	Residues	Atoms					AltConf
30	Q	1	Total	C	N	O	P	0
			47	37	1	8	1	
30	U	1	Total	C	N	O	P	0
			51	41	1	8	1	
30	b	1	Total	C	N	O	P	0
			46	36	1	8	1	
30	l	1	Total	C	N	O	P	0
			46	36	1	8	1	
30	m	1	Total	C	N	O	P	0
			41	31	1	8	1	
30	r	1	Total	C	N	O	P	0
			41	31	1	8	1	
30	s	1	Total	C	N	O	P	0
			51	41	1	8	1	

- Molecule 31 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$) (labeled as "Ligand of Interest" by depositor).



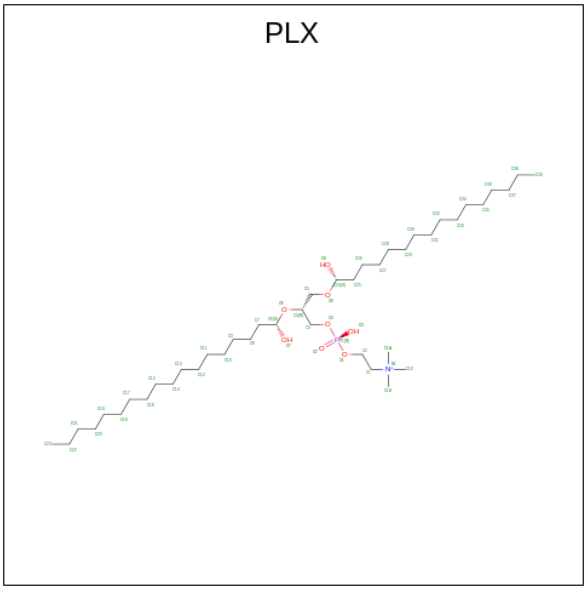
Mol	Chain	Residues	Atoms				AltConf
31	V	1	Total	C	O	P	0
			71	52	17	2	
31	a	1	Total	C	O	P	0
			91	72	17	2	
31	g	1	Total	C	O	P	0
			62	43	17	2	
31	l	1	Total	C	O	P	0
			199	161	34	4	
31	l	1	Total	C	O	P	0
			199	161	34	4	
31	r	1	Total	C	O	P	0
			100	81	17	2	

- Molecule 32 is S-[2-({N-[(2R)-2-hydroxy-3,3-dimethyl-4-(phosphonooxy)butanoyl]-beta-alanyl}amino)ethyl] dodecanethioate (three-letter code: 8Q1) (formula: $C_{23}H_{45}N_2O_8PS$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
32	X	1	Total	C	N	O	P	S	0
			35	23	2	8	1	1	

- Molecule 33 is (9R,11S)-9-({[(1S)-1-HYDROXYHEXADECYL]OXY}METHYL)-2,2-DIMETHYL-5,7,10-TRIOXA-2LAMBDA 5 -AZA-6LAMBDA 5 -PHOSPHAOCTACOSANE-6,6,11-TRIOL (three-letter code: PLX) (formula: $C_{42}H_{89}NO_8P$) (labeled as "Ligand of Interest" by depositor).



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

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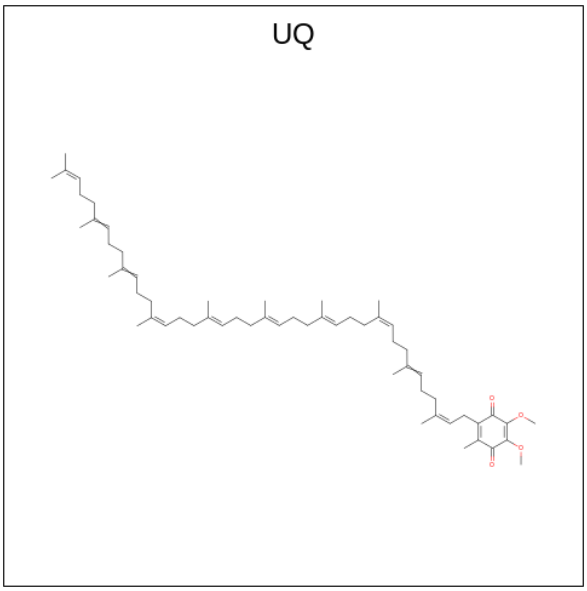
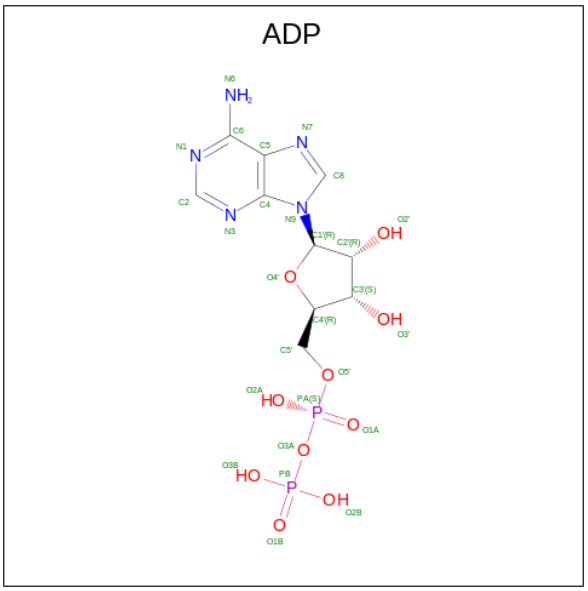
Mol	Chain	Residues	Atoms					AltConf
33	g	1	Total	C	N	O	P	0
			52	42	1	8	1	
33	m	1	Total	C	N	O	P	0
			52	42	1	8	1	
33	r	1	Total	C	N	O	P	0
			104	84	2	16	2	
33	r	1	Total	C	N	O	P	0
			104	84	2	16	2	

- Molecule 34 is Coenzyme Q10, (2Z,6E,10Z,14E,18E,22E,26Z)-isomer (three-letter code: UQ) (formula: $C_{59}H_{90}O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
34	s	1	Total	C	O	0
			28	24	4	

- Molecule 35 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
35	w	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 36 is water.

Mol	Chain	Residues	Atoms		AltConf
36	Q	6	Total	O	0
			6	6	
36	S	3	Total	O	0
			3	3	
36	U	3	Total	O	0
			3	3	
36	V	2	Total	O	0
			2	2	
36	W	1	Total	O	0
			1	1	
36	a	2	Total	O	0
			2	2	
36	c	2	Total	O	0
			2	2	
36	d	3	Total	O	0
			3	3	
36	e	2	Total	O	0
			2	2	
36	h	4	Total	O	0
			4	4	
36	i	66	Total	O	0
			66	66	

Continued on next page...

Continued from previous page...

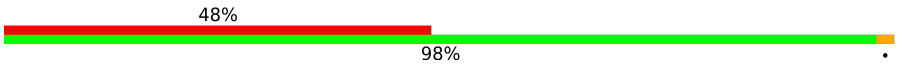
Mol	Chain	Residues	Atoms	AltConf
36	j	14	Total O 14 14	0
36	k	16	Total O 16 16	0
36	l	55	Total O 55 55	0
36	m	10	Total O 10 10	0
36	n	1	Total O 1 1	0
36	p	2	Total O 2 2	0
36	r	86	Total O 86 86	0
36	s	68	Total O 68 68	0
36	w	3	Total O 3 3	0

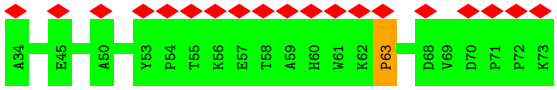
3 Residue-property plots (i)

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 dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial

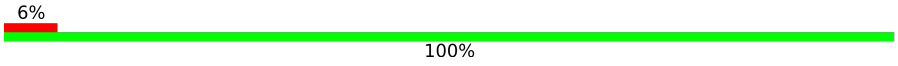
Chain Q:

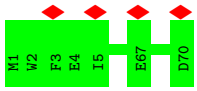




• Molecule 2: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1

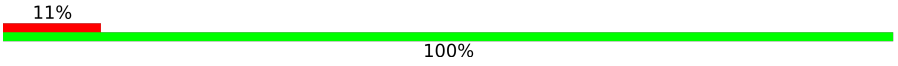
Chain S:

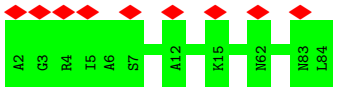




• Molecule 3: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3

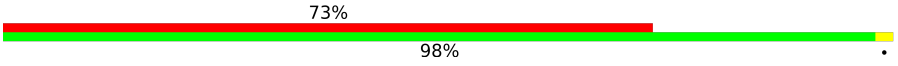
Chain U:

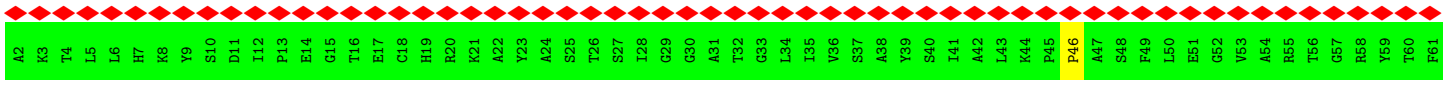


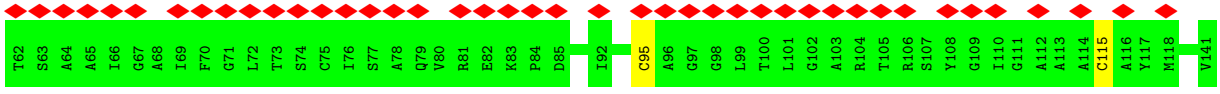


• Molecule 4: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11

Chain V:

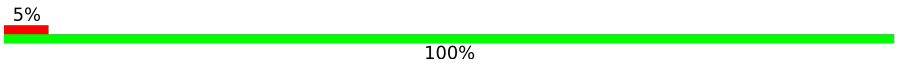


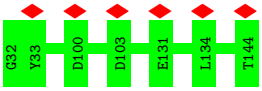




• Molecule 5: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13

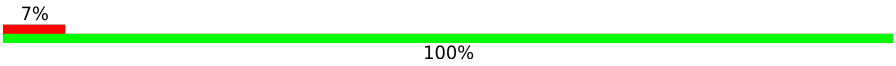
Chain W:

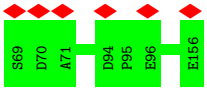




• Molecule 6: Acyl carrier protein, mitochondrial

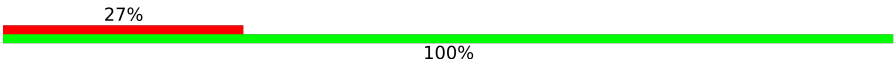
Chain X:

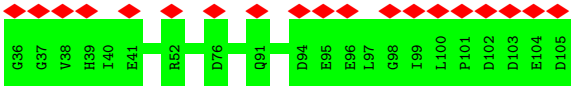




• Molecule 7: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 2, mitochondrial

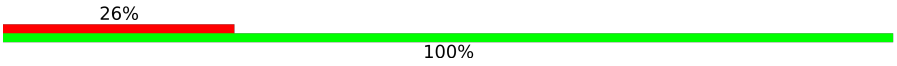
Chain Y:

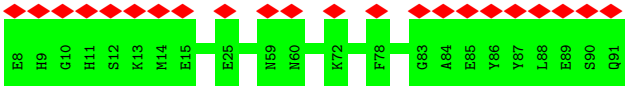




• Molecule 8: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3

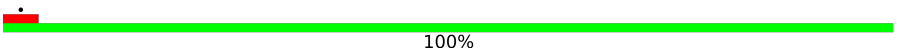
Chain Z:

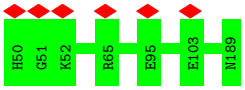




• Molecule 9: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial

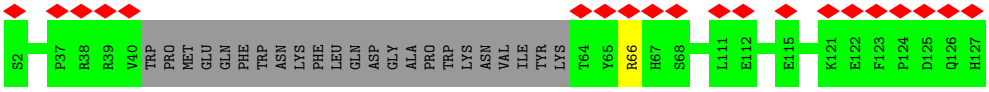
Chain a:





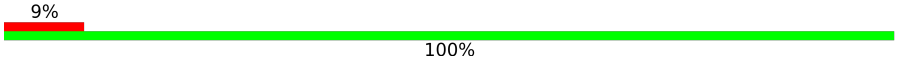
• Molecule 10: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6

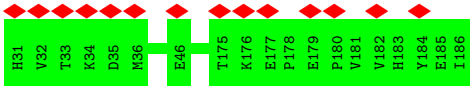
Chain b:



• Molecule 11: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial

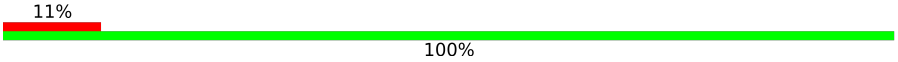
Chain c:

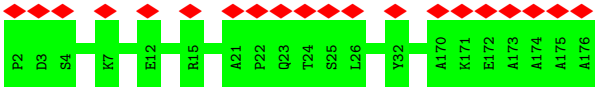




• Molecule 12: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10

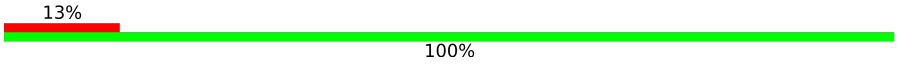
Chain d:

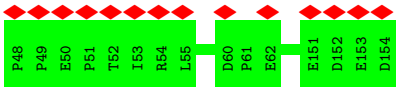




• Molecule 13: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial

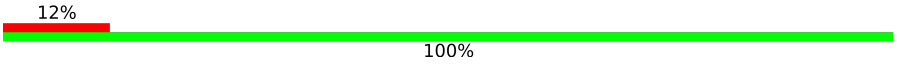
Chain e:

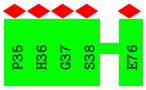




• Molecule 14: NADH dehydrogenase [ubiquinone] 1 subunit C1, mitochondrial

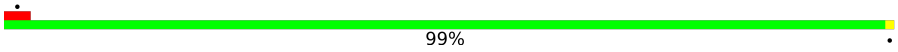
Chain f:

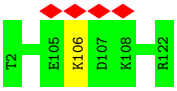




• Molecule 15: NADH dehydrogenase [ubiquinone] 1 subunit C2

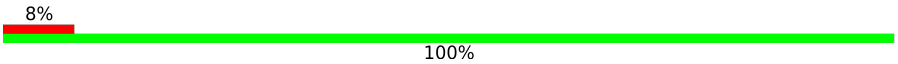
Chain g:

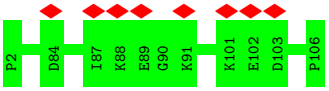




• Molecule 16: NADH dehydrogenase [ubiquinone] iron-sulfur protein 5

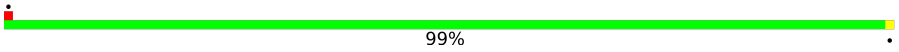
Chain h:

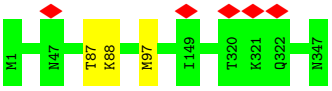




• Molecule 17: NADH-ubiquinone oxidoreductase chain 2

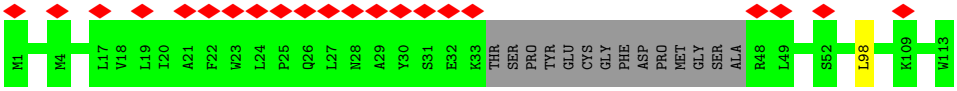
Chain i:



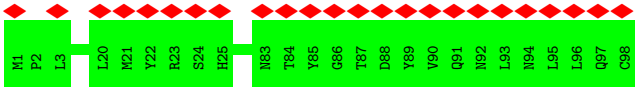


• Molecule 18: NADH-ubiquinone oxidoreductase chain 3

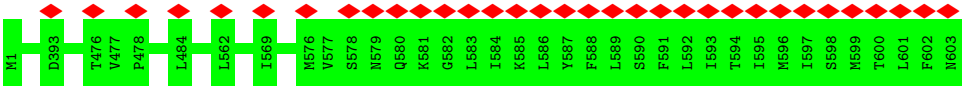
Chain j:



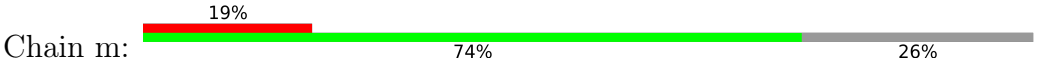
• Molecule 19: NADH-ubiquinone oxidoreductase chain 4L

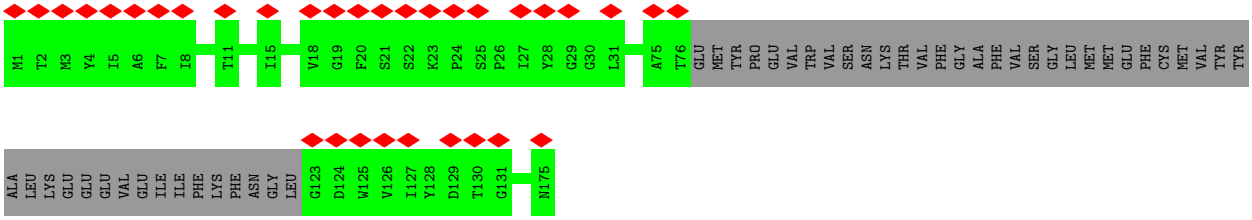


• Molecule 20: NADH-ubiquinone oxidoreductase chain 5

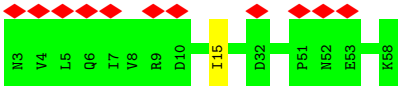


• Molecule 21: NADH-ubiquinone oxidoreductase chain 6

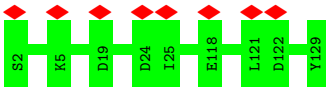




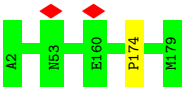
• Molecule 22: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1



• Molecule 23: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4

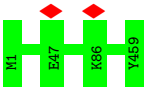


• Molecule 24: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9



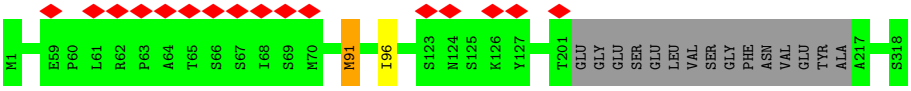
• Molecule 25: NADH-ubiquinone oxidoreductase chain 4

Chain r:



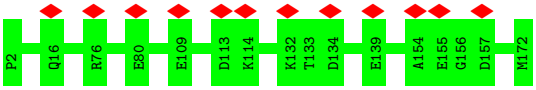
• Molecule 26: NADH-ubiquinone oxidoreductase chain 1

Chain s:



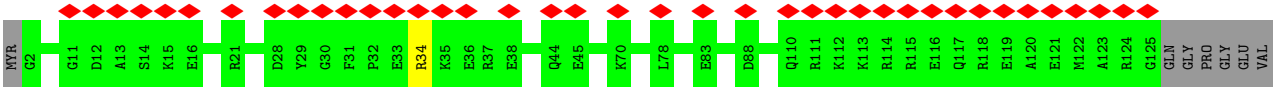
• Molecule 27: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8

Chain u:



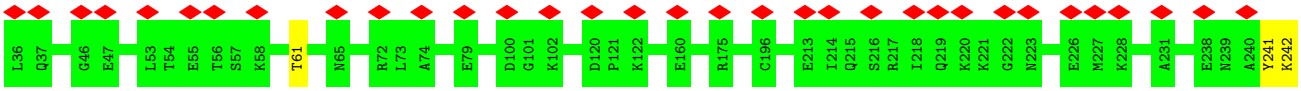
• Molecule 28: NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7

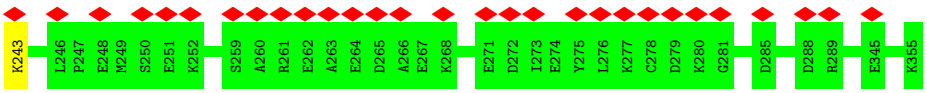
Chain v:



• Molecule 29: NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial

Chain w:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	387112	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1300	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.067	Depositor
Minimum map value	-0.043	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.0123	Depositor
Map size (Å)	274.9952, 274.9952, 274.9952	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.5371, 0.5371, 0.5371	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: PEE, 8Q1, CDL, UQ, ADP, PLX

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	Q	0.53	1/350 (0.3%)	0.98	2/483 (0.4%)
2	S	0.28	0/582	0.49	0/783
3	U	0.26	0/664	0.47	0/912
4	V	0.37	2/1042 (0.2%)	0.55	1/1411 (0.1%)
5	W	0.28	0/973	0.51	0/1312
6	X	0.29	0/719	0.45	0/972
7	Y	0.27	0/626	0.47	0/857
8	Z	0.26	0/695	0.45	0/939
9	a	0.30	0/1199	0.50	0/1623
10	b	0.28	0/906	0.55	0/1232
11	c	0.30	0/1371	0.46	0/1875
12	d	0.29	0/1494	0.52	0/2015
13	e	0.29	0/916	0.49	0/1246
14	f	0.26	0/350	0.45	0/473
15	g	0.31	0/1031	0.51	0/1394
16	h	0.27	0/889	0.50	0/1190
17	i	0.27	0/2773	0.47	0/3768
18	j	0.28	0/819	0.54	1/1117 (0.1%)
19	k	0.29	0/759	0.55	0/1029
20	l	0.29	0/4889	0.48	0/6652
21	m	0.32	0/959	0.50	0/1300
22	n	0.27	0/491	0.54	0/663
23	o	0.29	0/1092	0.53	0/1481
24	p	0.32	0/1590	0.53	0/2155
25	r	0.29	0/3723	0.49	0/5078
26	s	0.29	0/2464	0.50	0/3369
27	u	0.31	0/1436	0.52	0/1938
28	v	0.28	0/1046	0.55	0/1404
29	w	0.27	0/2646	0.49	0/3584
All	All	0.29	3/38494 (0.0%)	0.51	4/52255 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
26	s	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	Q	63	PRO	CG-CD	-7.97	1.24	1.50
4	V	115	CYS	CB-SG	6.50	1.93	1.82
4	V	95	CYS	CB-SG	-5.40	1.73	1.81

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	Q	63	PRO	N-CD-CG	-13.21	83.39	103.20
1	Q	63	PRO	CA-CB-CG	-12.39	80.46	104.00
4	V	95	CYS	CA-CB-SG	9.05	130.28	114.00
18	j	98	LEU	CA-CB-CG	5.70	128.42	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
26	s	91	MET	Peptide

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	Q	38/40 (95%)	36 (95%)	2 (5%)	0	100	100
2	S	68/70 (97%)	65 (96%)	3 (4%)	0	100	100
3	U	81/83 (98%)	77 (95%)	4 (5%)	0	100	100
4	V	138/140 (99%)	132 (96%)	5 (4%)	1 (1%)	22	53
5	W	111/113 (98%)	109 (98%)	2 (2%)	0	100	100
6	X	86/88 (98%)	84 (98%)	2 (2%)	0	100	100
7	Y	68/70 (97%)	64 (94%)	4 (6%)	0	100	100
8	Z	82/84 (98%)	78 (95%)	4 (5%)	0	100	100
9	a	138/140 (99%)	134 (97%)	4 (3%)	0	100	100
10	b	99/126 (79%)	93 (94%)	6 (6%)	0	100	100
11	c	154/156 (99%)	146 (95%)	8 (5%)	0	100	100
12	d	173/175 (99%)	172 (99%)	1 (1%)	0	100	100
13	e	105/107 (98%)	101 (96%)	4 (4%)	0	100	100
14	f	40/42 (95%)	38 (95%)	2 (5%)	0	100	100
15	g	119/121 (98%)	115 (97%)	4 (3%)	0	100	100
16	h	103/105 (98%)	100 (97%)	3 (3%)	0	100	100
17	i	345/347 (99%)	334 (97%)	10 (3%)	1 (0%)	41	72
18	j	95/113 (84%)	90 (95%)	5 (5%)	0	100	100
19	k	96/98 (98%)	90 (94%)	6 (6%)	0	100	100
20	l	601/603 (100%)	574 (96%)	27 (4%)	0	100	100
21	m	125/175 (71%)	111 (89%)	14 (11%)	0	100	100
22	n	54/56 (96%)	54 (100%)	0	0	100	100
23	o	126/128 (98%)	119 (94%)	7 (6%)	0	100	100
24	p	176/178 (99%)	167 (95%)	8 (4%)	1 (1%)	25	56
25	r	457/459 (100%)	444 (97%)	13 (3%)	0	100	100
26	s	299/318 (94%)	285 (95%)	14 (5%)	0	100	100
27	u	169/171 (99%)	162 (96%)	7 (4%)	0	100	100
28	v	122/131 (93%)	113 (93%)	9 (7%)	0	100	100
29	w	318/320 (99%)	301 (95%)	17 (5%)	0	100	100
All	All	4586/4757 (96%)	4388 (96%)	195 (4%)	3 (0%)	54	81

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
17	i	87	THR
4	V	46	PRO
24	p	174	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	Q	34/34 (100%)	33 (97%)	1 (3%)	42 76
2	S	58/58 (100%)	58 (100%)	0	100 100
3	U	69/69 (100%)	69 (100%)	0	100 100
4	V	101/101 (100%)	101 (100%)	0	100 100
5	W	99/99 (100%)	99 (100%)	0	100 100
6	X	80/81 (99%)	80 (100%)	0	100 100
7	Y	63/63 (100%)	63 (100%)	0	100 100
8	Z	65/65 (100%)	65 (100%)	0	100 100
9	a	122/122 (100%)	122 (100%)	0	100 100
10	b	98/119 (82%)	97 (99%)	1 (1%)	76 93
11	c	141/141 (100%)	141 (100%)	0	100 100
12	d	155/155 (100%)	155 (100%)	0	100 100
13	e	99/99 (100%)	99 (100%)	0	100 100
14	f	35/38 (92%)	35 (100%)	0	100 100
15	g	108/108 (100%)	107 (99%)	1 (1%)	78 94
16	h	93/93 (100%)	93 (100%)	0	100 100
17	i	311/311 (100%)	309 (99%)	2 (1%)	86 96
18	j	88/99 (89%)	88 (100%)	0	100 100
19	k	85/85 (100%)	85 (100%)	0	100 100
20	l	529/537 (98%)	529 (100%)	0	100 100
21	m	97/141 (69%)	97 (100%)	0	100 100
22	n	53/53 (100%)	52 (98%)	1 (2%)	57 85

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	o	113/113 (100%)	113 (100%)	0	100	100
24	p	159/159 (100%)	159 (100%)	0	100	100
25	r	410/410 (100%)	410 (100%)	0	100	100
26	s	263/275 (96%)	261 (99%)	2 (1%)	81	94
27	u	153/153 (100%)	153 (100%)	0	100	100
28	v	103/115 (90%)	102 (99%)	1 (1%)	76	93
29	w	282/283 (100%)	278 (99%)	4 (1%)	67	90
All	All	4066/4179 (97%)	4053 (100%)	13 (0%)	92	98

5 of 13 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
26	s	96	ILE
28	v	34	ARG
29	w	243	LYS
29	w	241	TYR
29	w	242	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
25	r	26	ASN
25	r	251	ASN
28	v	4	HIS
17	i	268	GLN
20	l	541	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

21 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
33	PLX	a	202	-	51,51,51	0.62	0	55,59,59	0.69	0
30	PEE	U	101	-	50,50,50	1.16	6 (12%)	53,55,55	0.95	2 (3%)
30	PEE	b	201	-	45,45,50	1.22	6 (13%)	48,50,55	0.97	2 (4%)
33	PLX	m	201	-	51,51,51	1.14	4 (7%)	55,59,59	0.60	1 (1%)
32	8Q1	X	201	-	31,34,34	2.04	6 (19%)	40,43,43	1.70	10 (25%)
35	ADP	w	401	-	24,29,29	3.12	6 (25%)	29,45,45	1.40	4 (13%)
33	PLX	r	503	-	51,51,51	1.13	3 (5%)	55,59,59	0.59	1 (1%)
30	PEE	Q	101	-	46,46,50	1.19	5 (10%)	49,51,55	1.00	2 (4%)
30	PEE	m	202	-	40,40,50	1.15	5 (12%)	43,45,55	0.98	2 (4%)
30	PEE	l	703	-	45,45,50	1.22	6 (13%)	48,50,55	1.00	2 (4%)
30	PEE	r	501	-	40,40,50	1.15	5 (12%)	43,45,55	0.98	2 (4%)
31	CDL	V	201	-	70,70,99	1.21	8 (11%)	76,82,111	0.96	4 (5%)
31	CDL	a	201	-	90,90,99	0.96	4 (4%)	96,102,111	1.06	5 (5%)
30	PEE	s	401	-	50,50,50	1.16	6 (12%)	53,55,55	0.97	2 (3%)
31	CDL	l	702	-	99,99,99	1.08	9 (9%)	105,111,111	0.86	4 (3%)
33	PLX	g	201	-	51,51,51	1.11	3 (5%)	55,59,59	0.68	1 (1%)
31	CDL	l	701	-	98,98,99	1.08	8 (8%)	104,110,111	0.89	4 (3%)
31	CDL	g	202	-	61,61,99	1.17	4 (6%)	67,73,111	1.12	4 (5%)
34	UQ	s	402	-	28,28,63	3.26	7 (25%)	34,37,79	2.91	11 (32%)
33	PLX	r	502	-	51,51,51	1.14	4 (7%)	55,59,59	0.61	1 (1%)
31	CDL	r	504	-	99,99,99	1.08	8 (8%)	105,111,111	0.84	4 (3%)

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
33	PLX	a	202	-	-	10/55/55/55	-
30	PEE	U	101	-	-	26/54/54/54	-
30	PEE	b	201	-	-	34/49/49/54	-
33	PLX	m	201	-	-	28/55/55/55	-
32	8Q1	X	201	-	-	19/41/41/41	-
35	ADP	w	401	-	-	3/12/32/32	0/3/3/3
33	PLX	r	503	-	-	36/55/55/55	-
30	PEE	Q	101	-	-	22/50/50/54	-
30	PEE	m	202	-	-	21/44/44/54	-
30	PEE	l	703	-	-	26/49/49/54	-
30	PEE	r	501	-	-	27/44/44/54	-
31	CDL	V	201	-	-	39/81/81/110	-
31	CDL	a	201	-	-	28/101/101/110	-
30	PEE	s	401	-	-	27/54/54/54	-
31	CDL	l	702	-	-	59/110/110/110	-
33	PLX	g	201	-	-	26/55/55/55	-
31	CDL	l	701	-	-	57/109/109/110	-
31	CDL	g	202	-	-	19/72/72/110	-
34	UQ	s	402	-	-	10/21/45/87	0/1/1/1
33	PLX	r	502	-	-	30/55/55/55	-
31	CDL	r	504	-	-	61/110/110/110	-

The worst 5 of 113 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
34	s	402	UQ	C13-C14	9.25	1.55	1.33
35	w	401	ADP	C3'-C4'	-8.92	1.30	1.53
34	s	402	UQ	C8-C9	8.88	1.54	1.33
34	s	402	UQ	C18-C19	8.23	1.56	1.32
35	w	401	ADP	O4'-C4'	7.77	1.62	1.45

The worst 5 of 68 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
34	s	402	UQ	C7-C8-C9	-10.22	109.78	126.79
34	s	402	UQ	C12-C13-C14	-6.06	113.07	127.66
34	s	402	UQ	C11-C9-C8	-4.99	111.03	121.12
32	X	201	8Q1	C6-C1-S44	4.93	119.20	113.46
34	s	402	UQ	C10-C9-C8	-4.60	111.88	123.68

There are no chirality outliers.

5 of 608 torsion outliers are listed below:

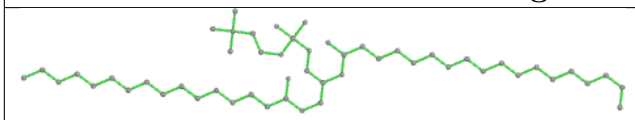
Mol	Chain	Res	Type	Atoms
30	Q	101	PEE	C4-O4P-P-O3P
30	Q	101	PEE	C4-O4P-P-O2P
30	Q	101	PEE	C4-O4P-P-O1P
30	U	101	PEE	C19-C20-C21-C22
30	U	101	PEE	C11-C10-O2-C2

There are no ring outliers.

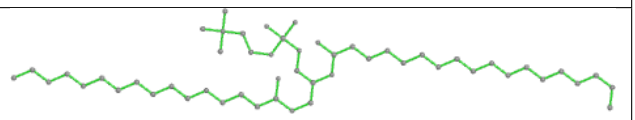
No monomer is involved in short contacts.

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.

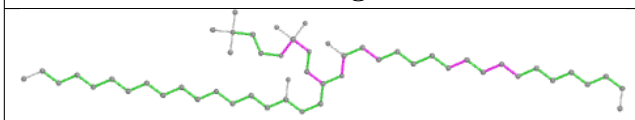
Ligand PLX a 202



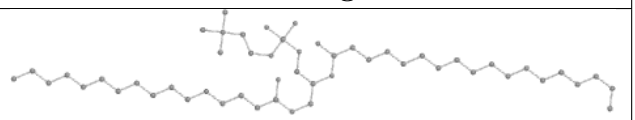
Bond lengths



Bond angles

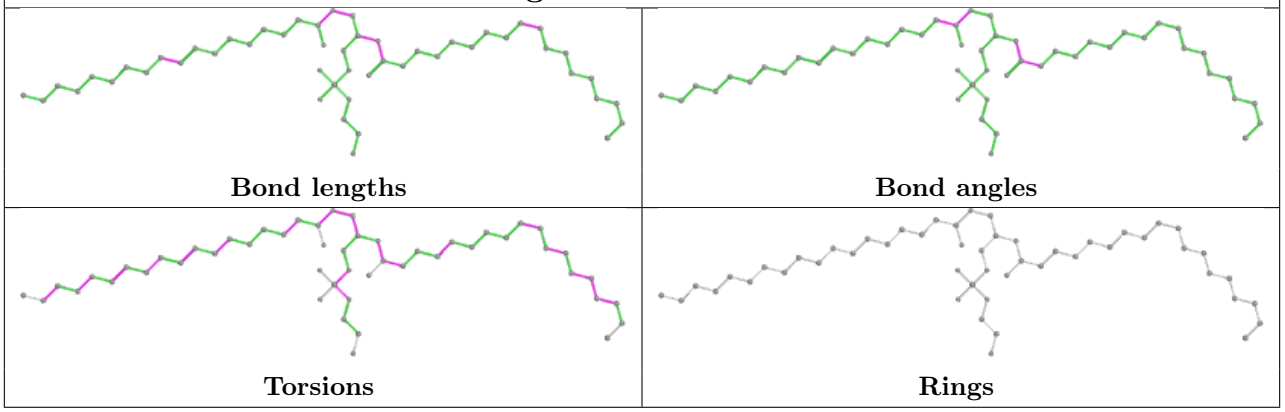


Torsions



Rings

Ligand PEE U 101



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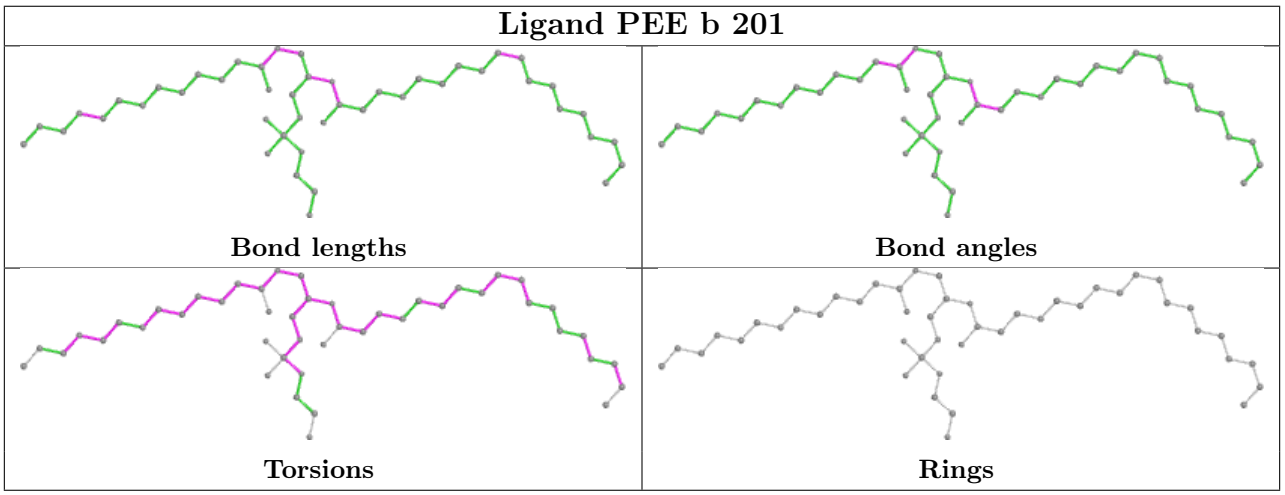
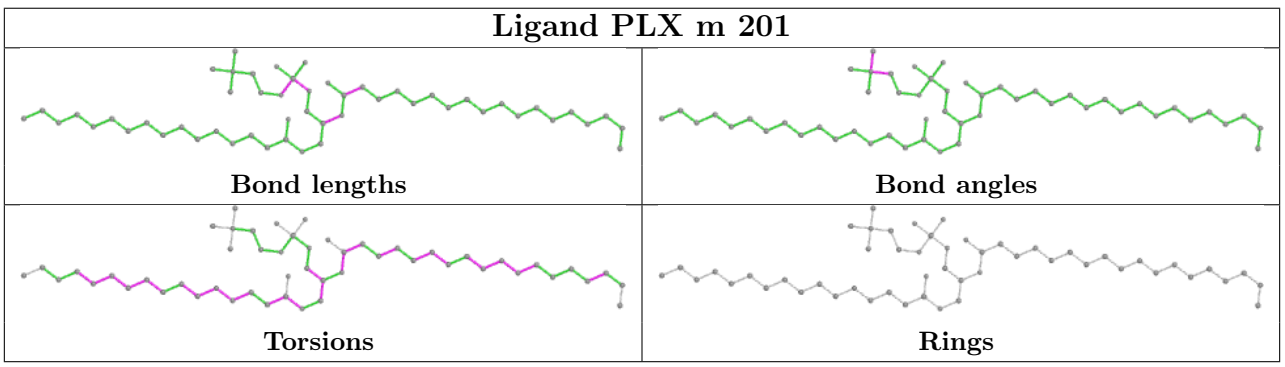
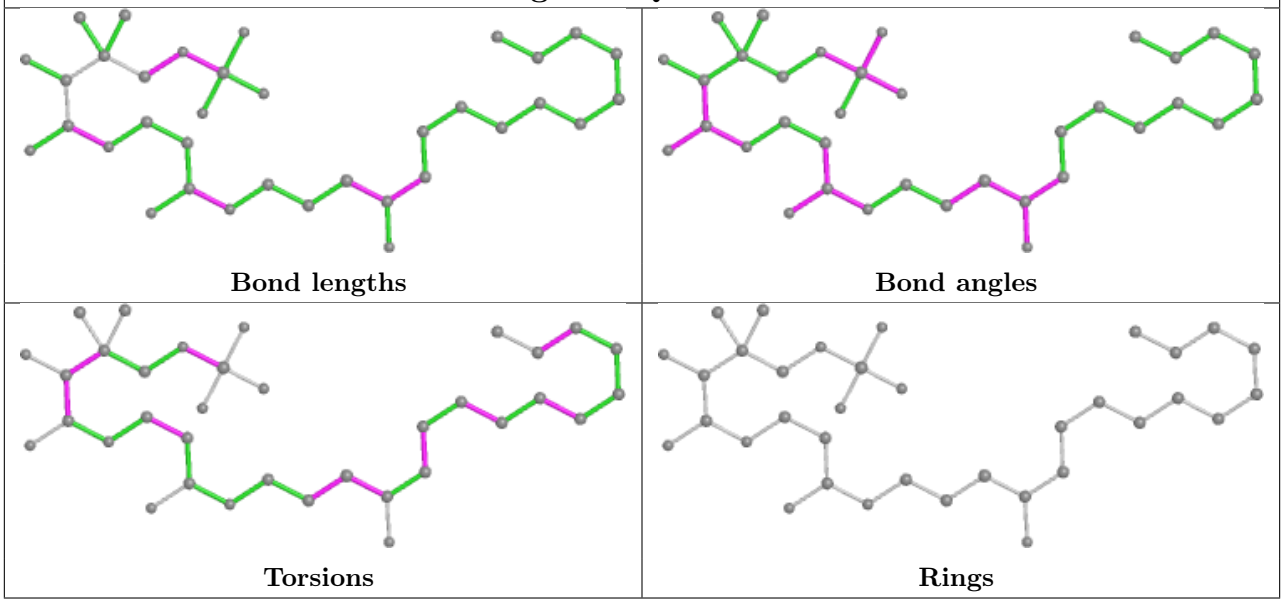


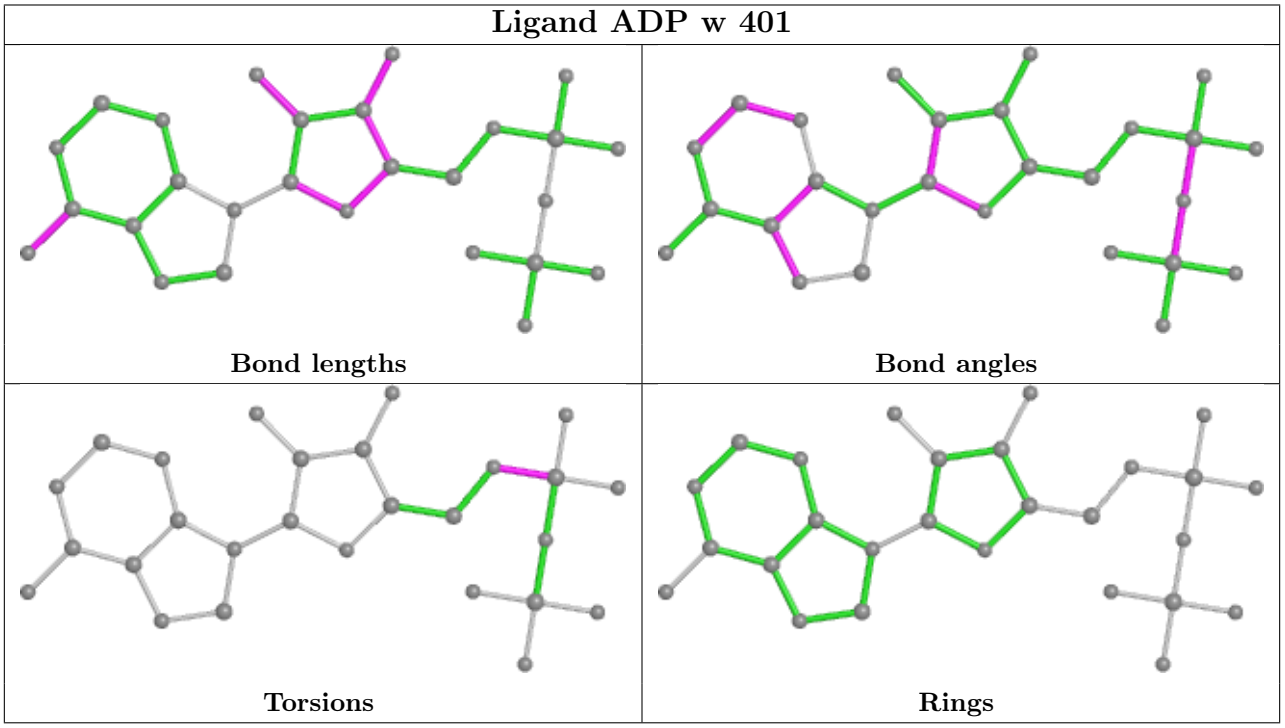
Ligand PLX m 201



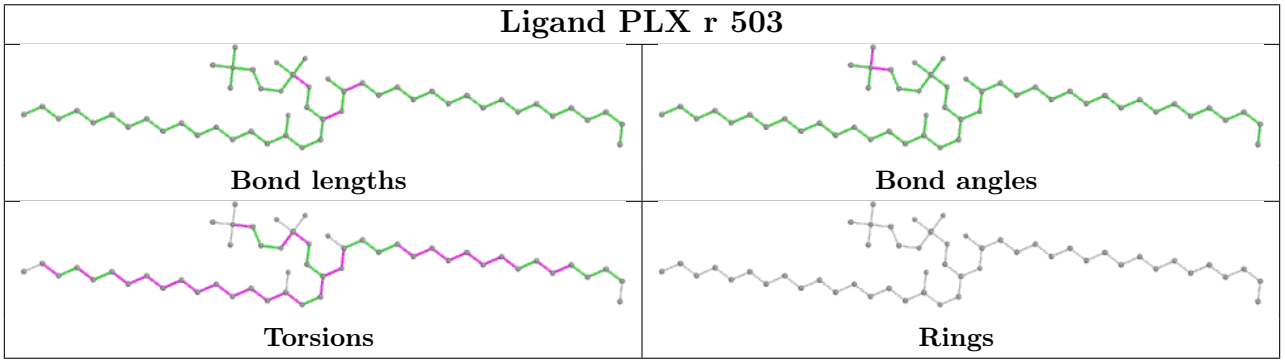
Ligand 8Q1 X 201



Ligand ADP w 401



Ligand PLX r 503



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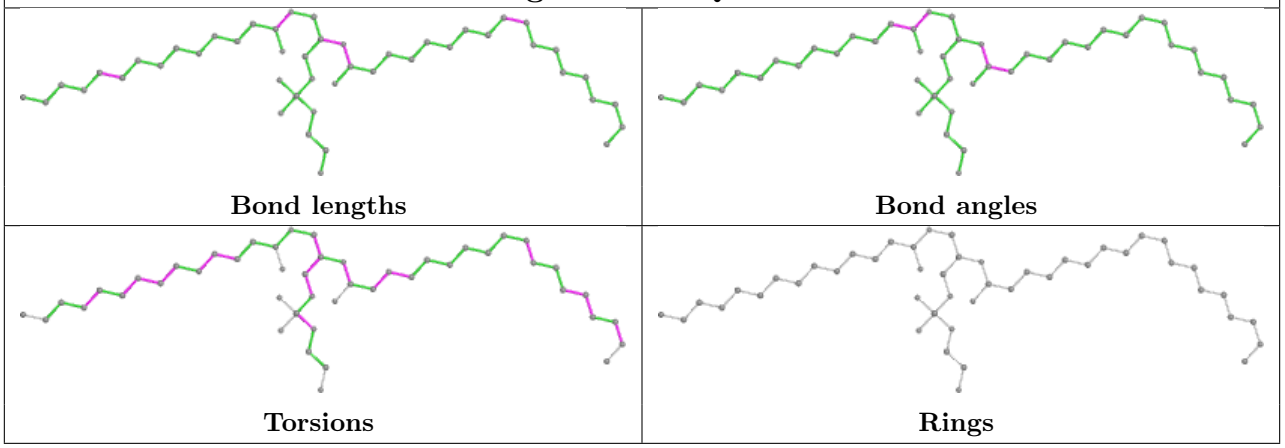
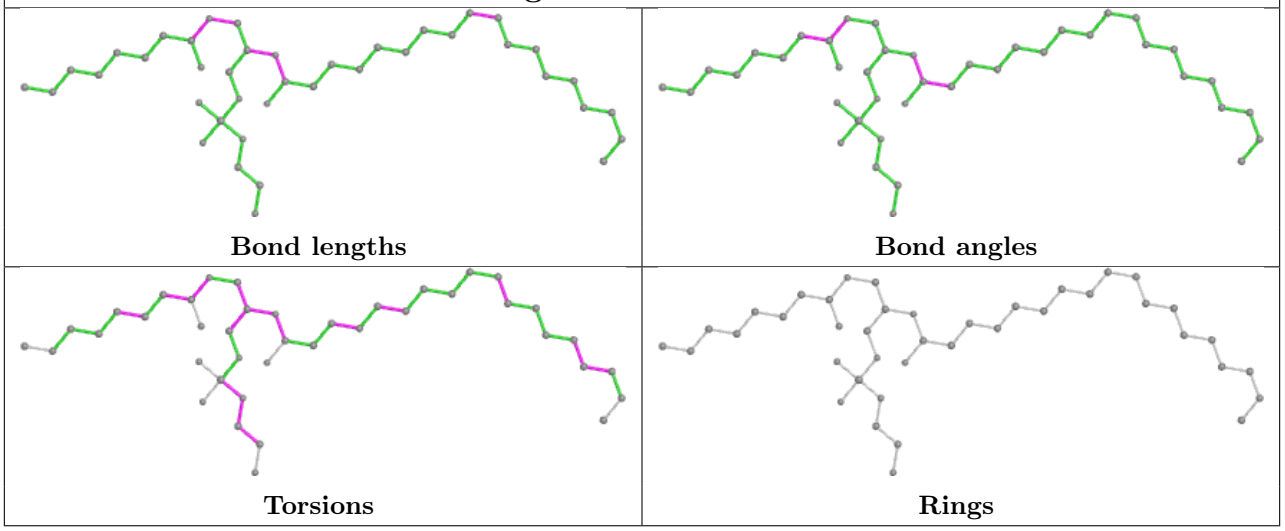
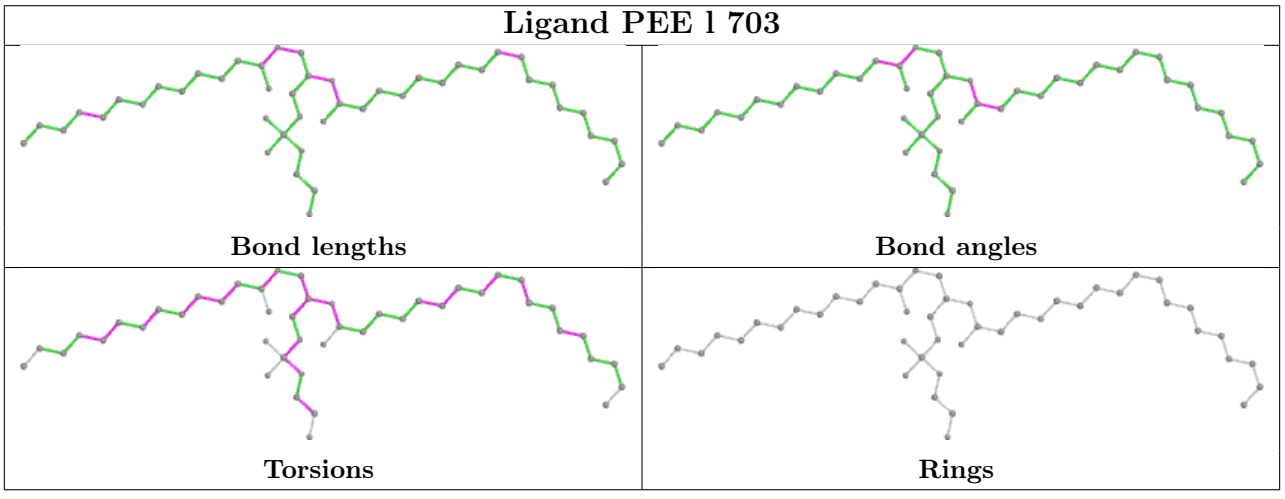


Ligand PEE m 202



Ligand PEE l 703



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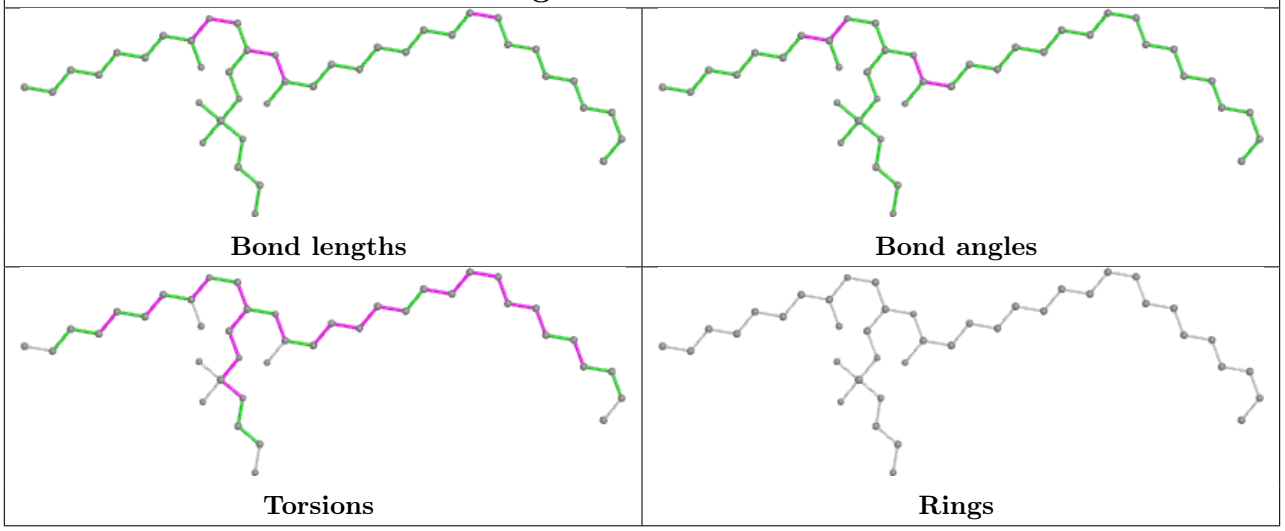
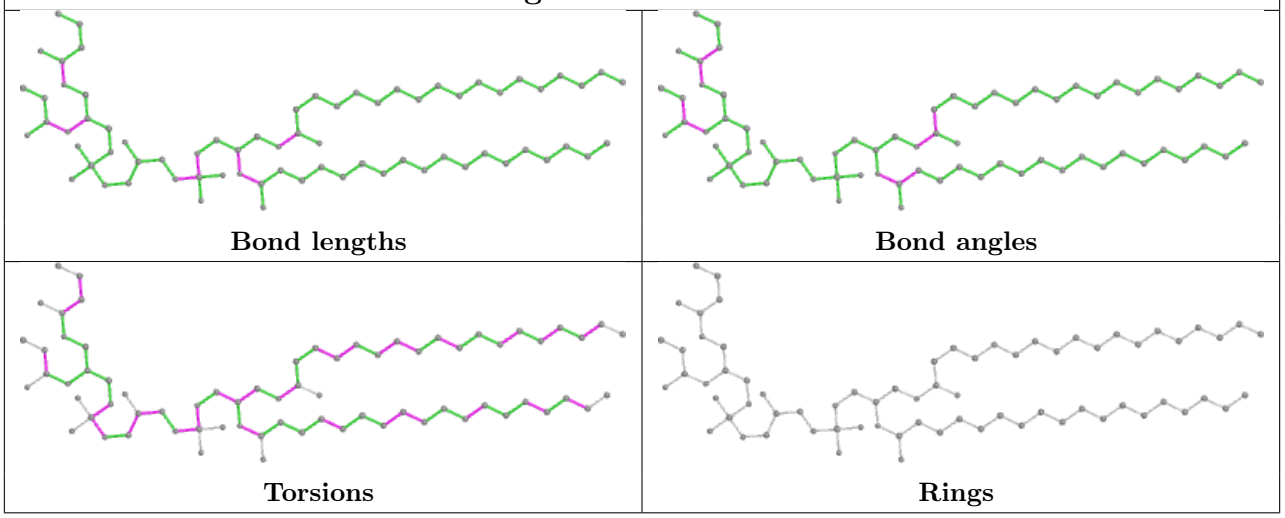


Ligand CDL V 201



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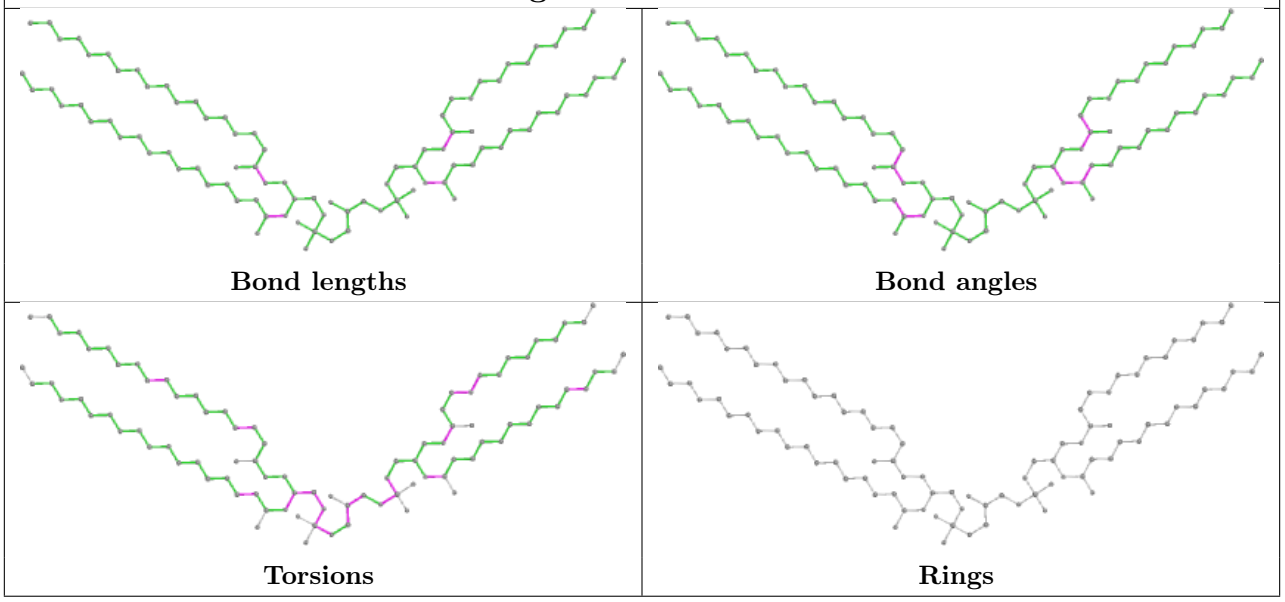
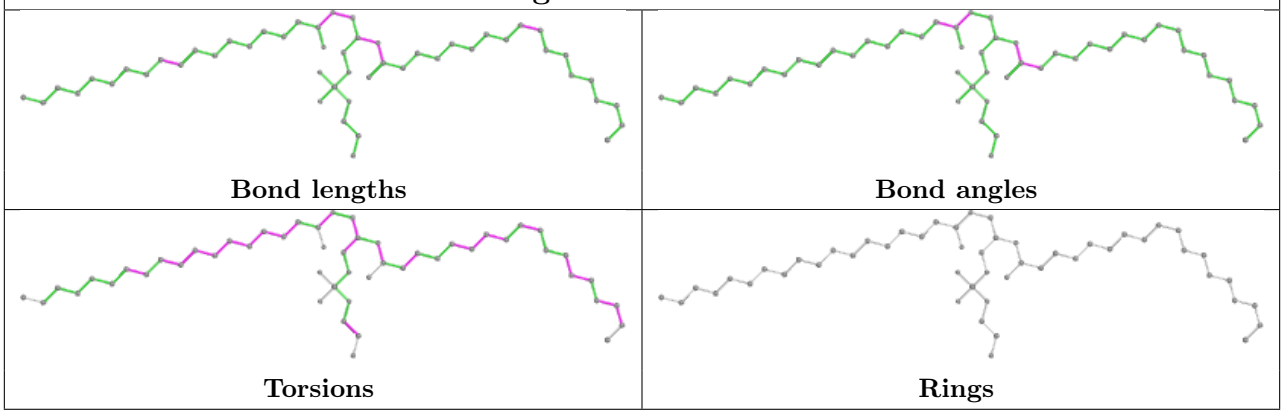
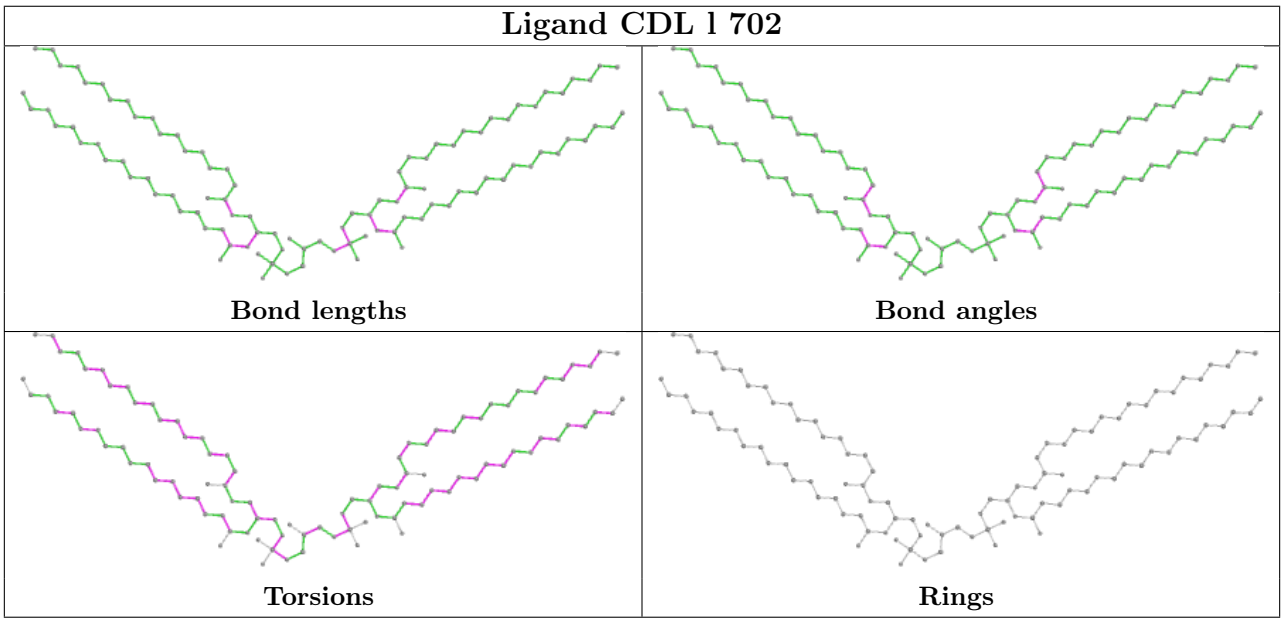


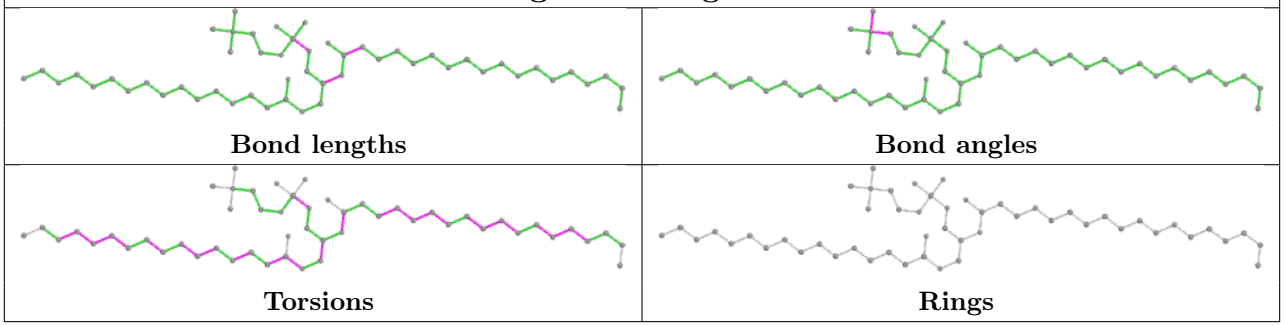
Ligand PEE s 401



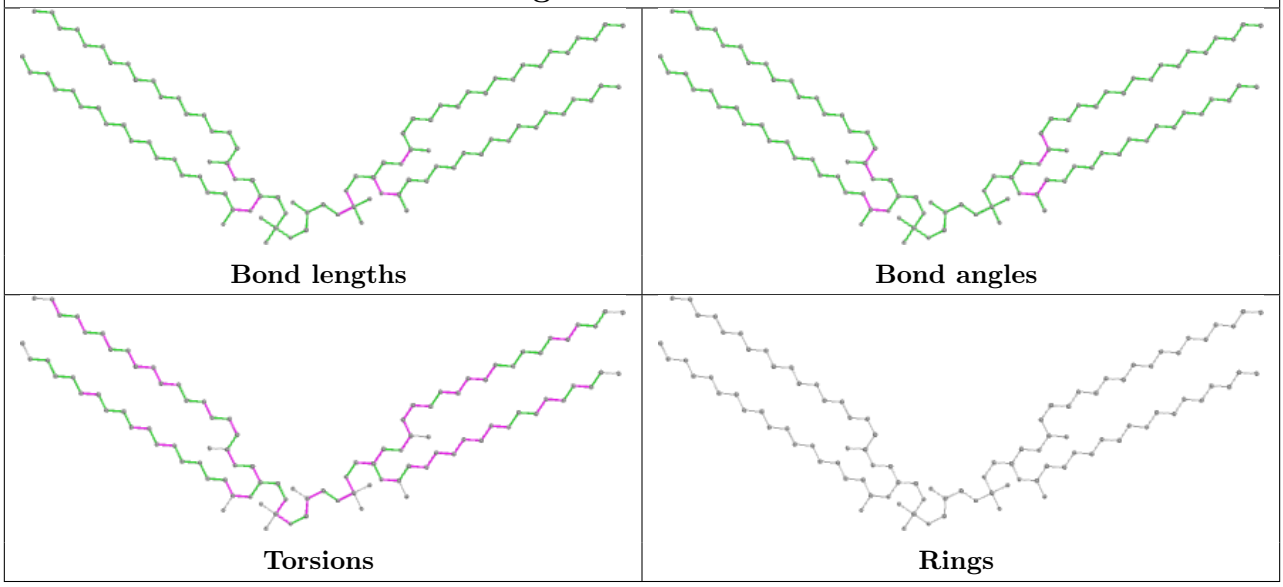
Ligand CDL l 702



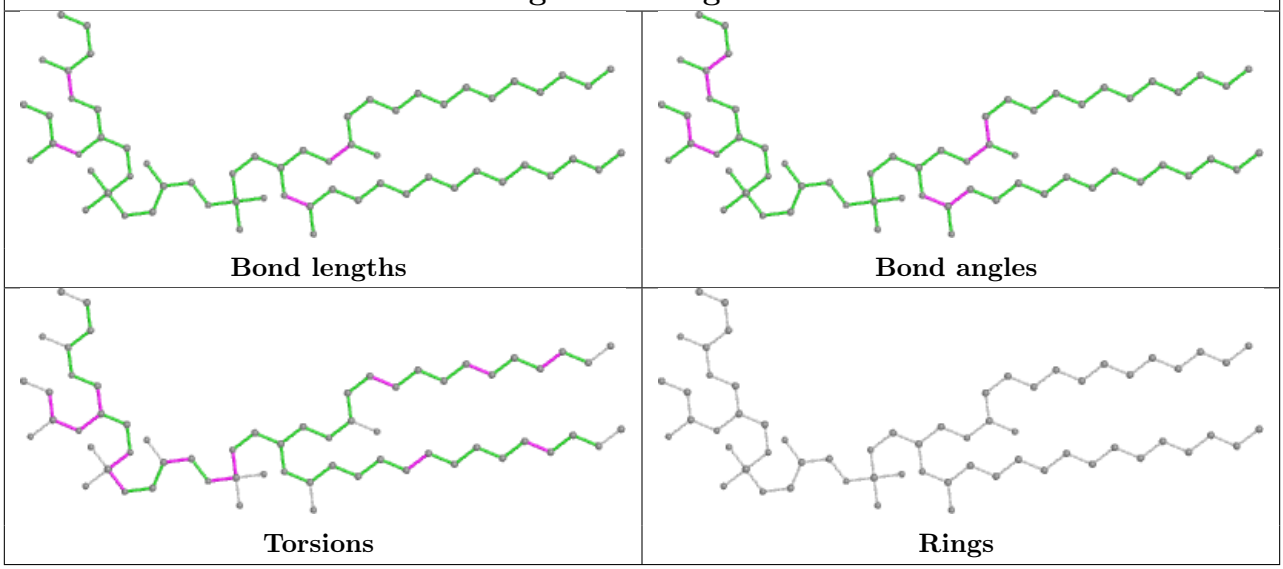
Ligand PLX g 201



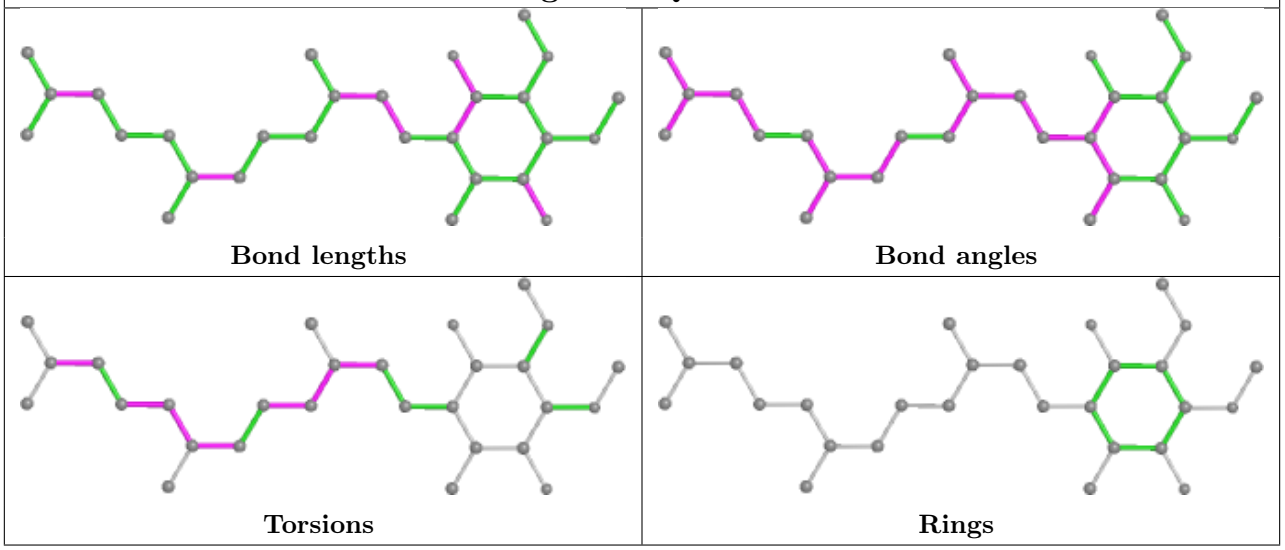
Ligand CDL l 701



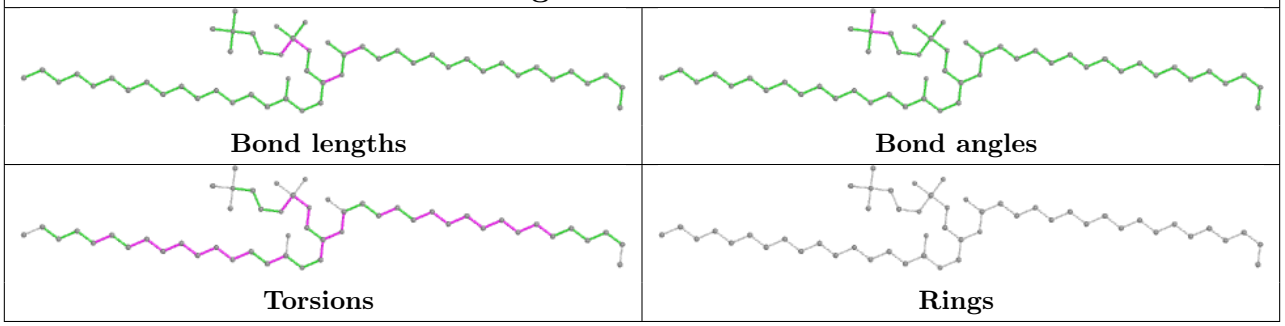
Ligand CDL g 202



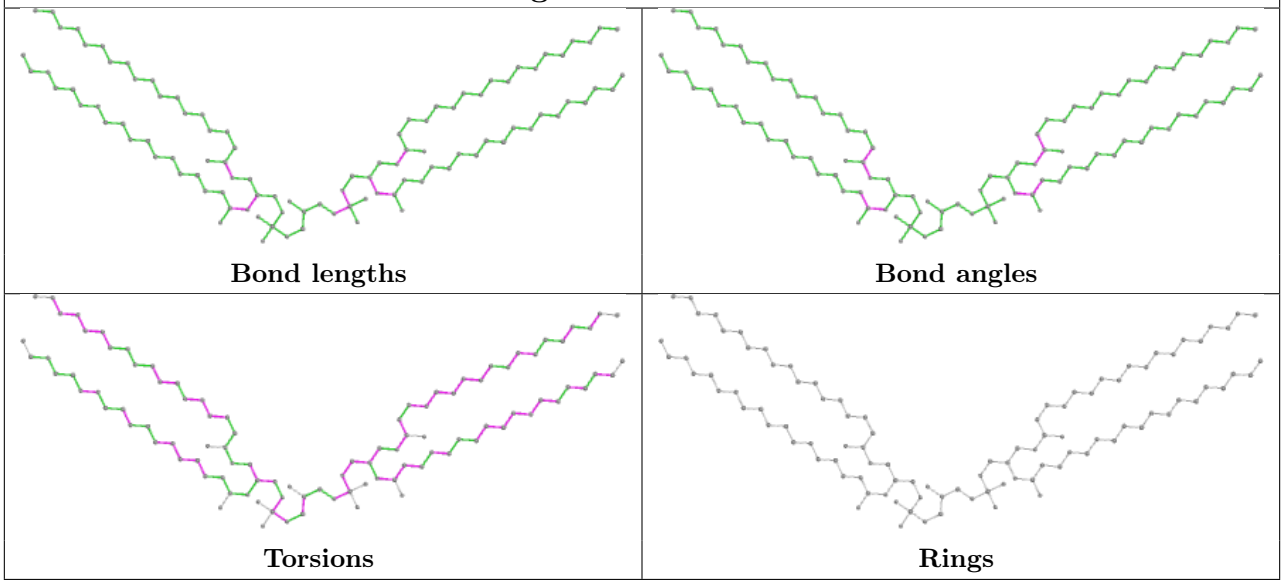
Ligand UQ s 402



Ligand PLX r 502



Ligand CDL r 504



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

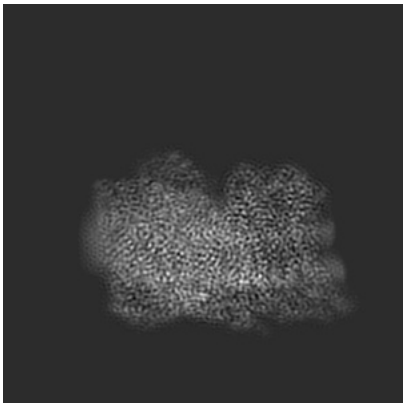
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-31884. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

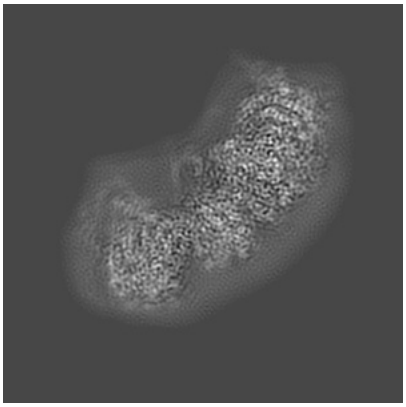
6.1 Orthogonal projections

6.1.1 Primary map



X

Y

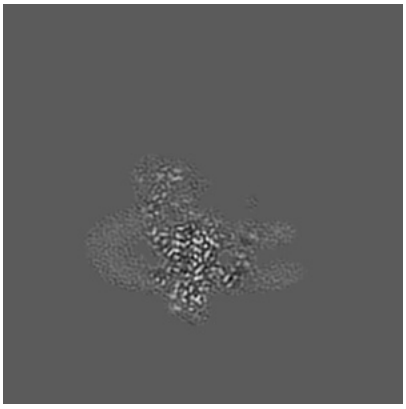


Z

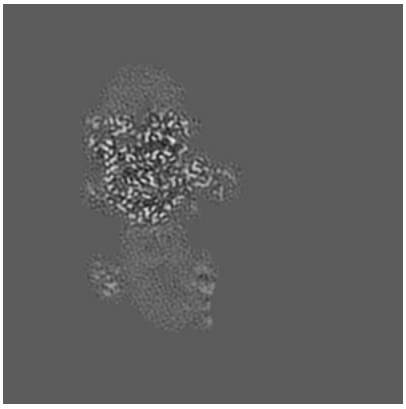
The images above show the map projected in three orthogonal directions.

6.2 Central slices

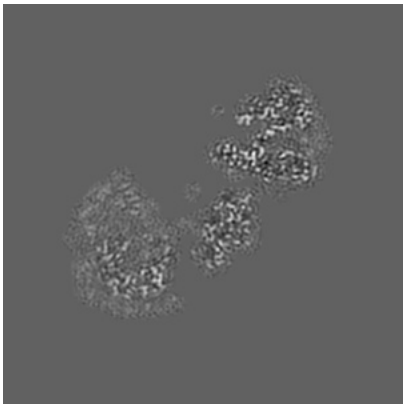
6.2.1 Primary map



X Index: 256



Y Index: 256



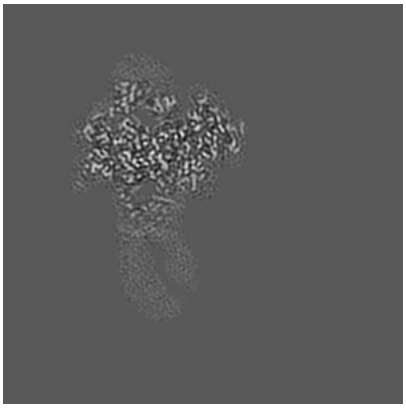
Z Index: 256

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

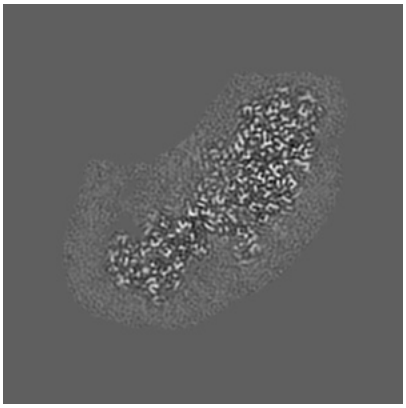
6.3 Largest variance slices (i)

6.3.1 Primary map

X Index: 331



Y Index: 306

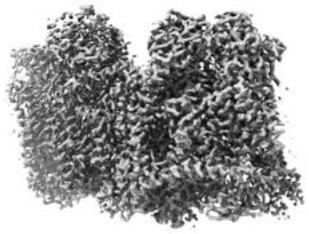


Z Index: 210

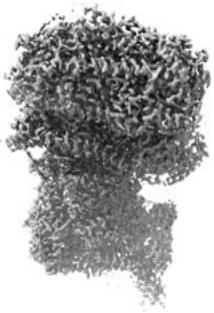
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

6.4.1 Primary map



X



Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.0123. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

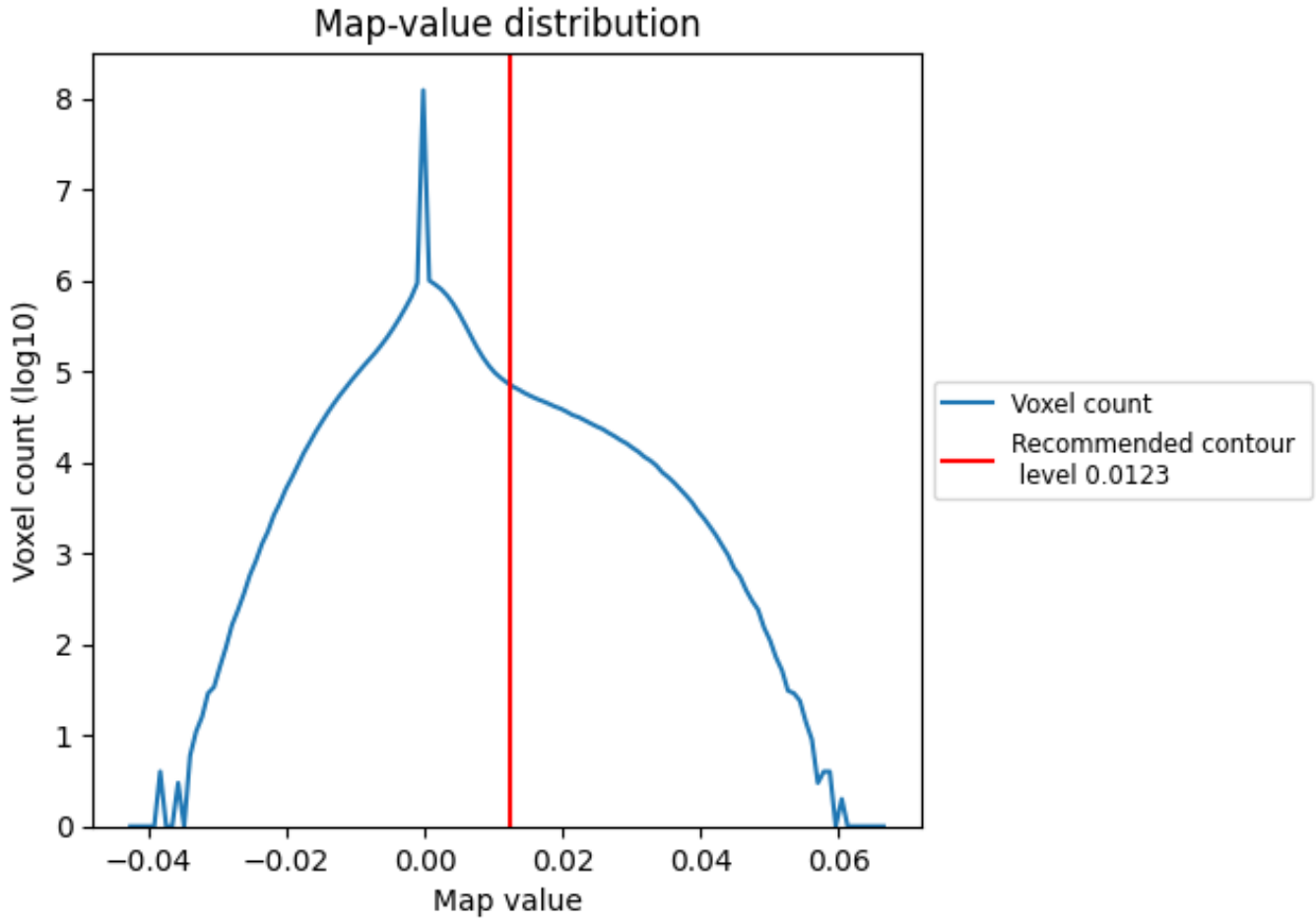
6.5 Mask visualisation (i)

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

7 Map analysis

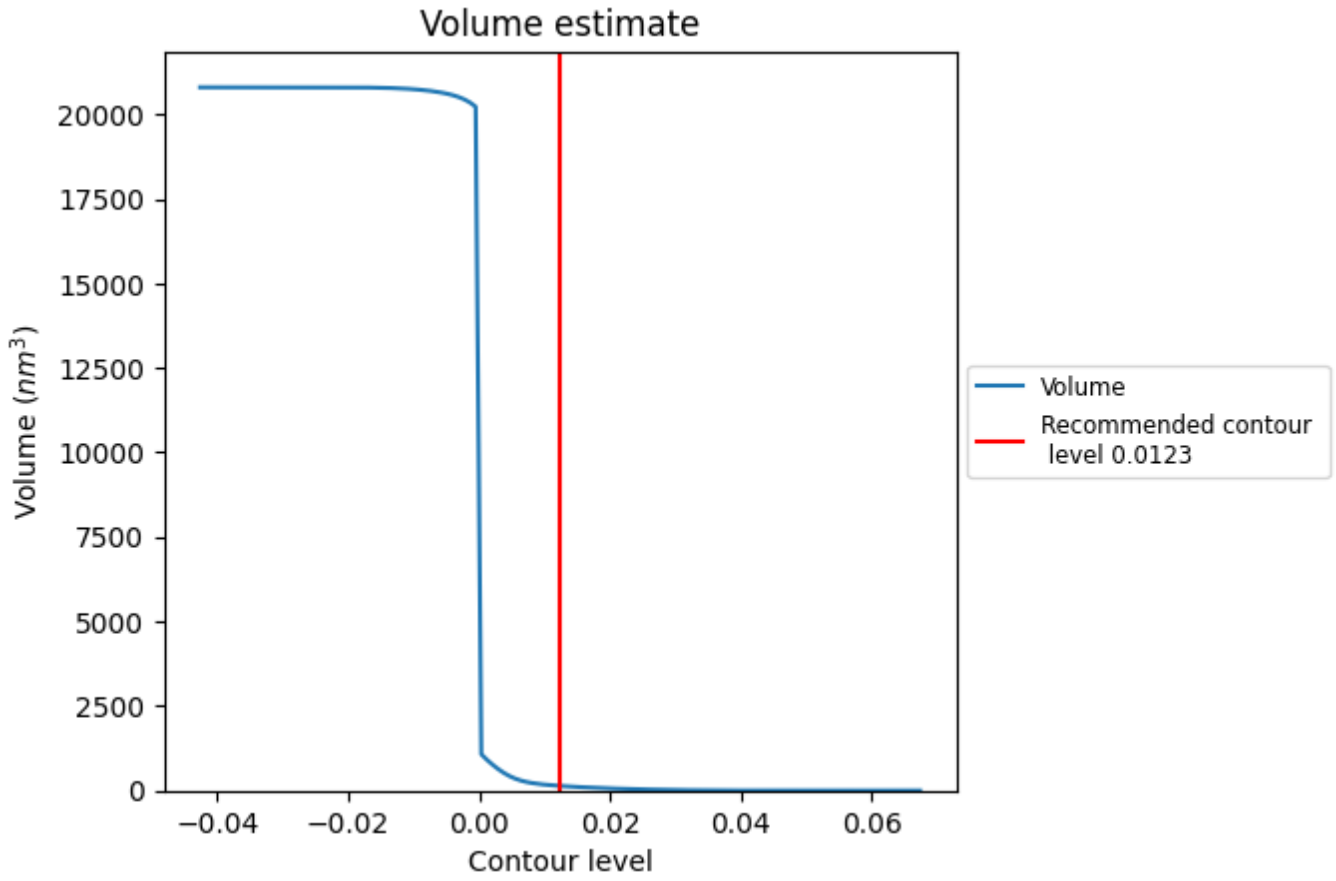
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

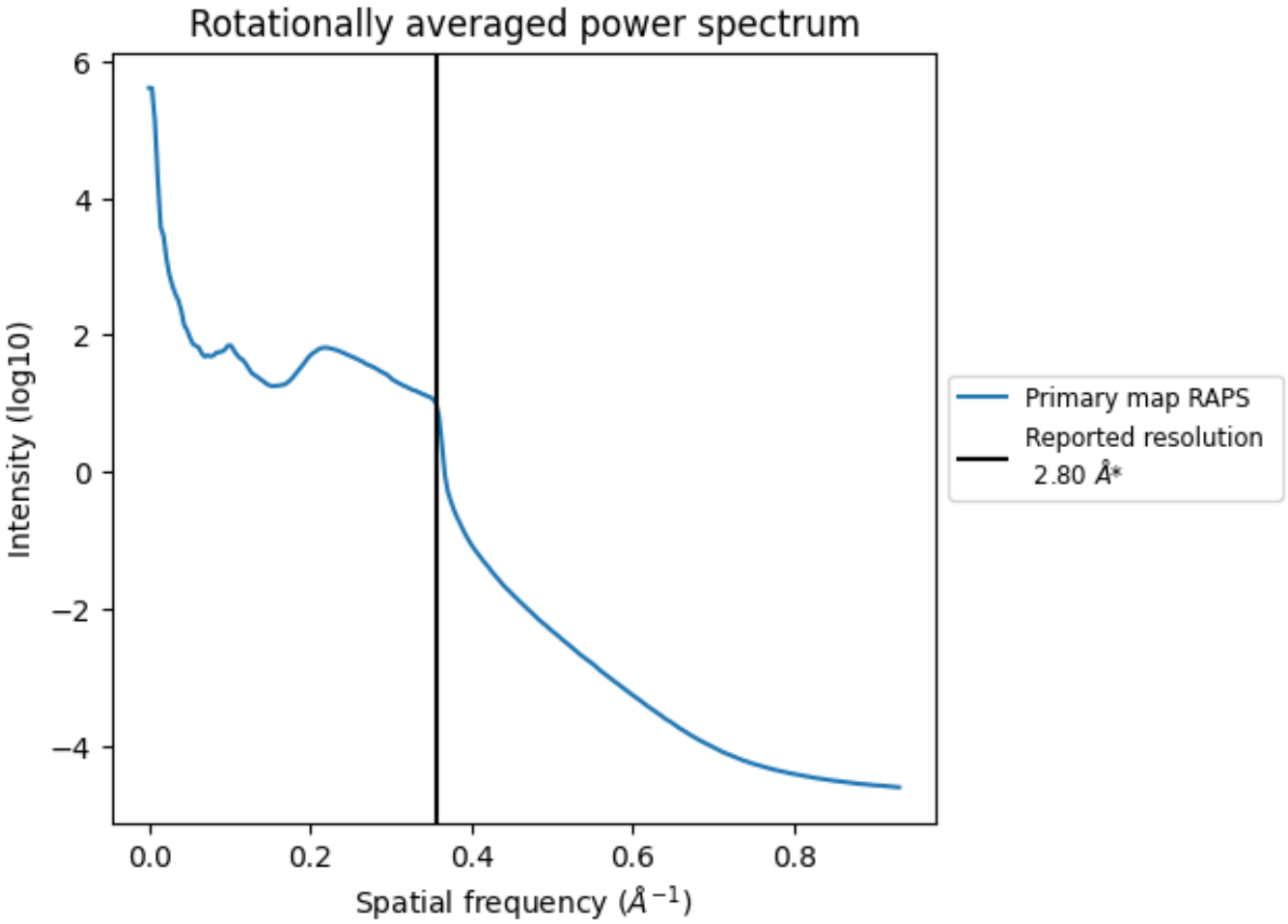
7.2 Volume estimate (i)



The volume at the recommended contour level is 138 nm^3; this corresponds to an approximate mass of 125 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 0.357 $Å^{-1}$

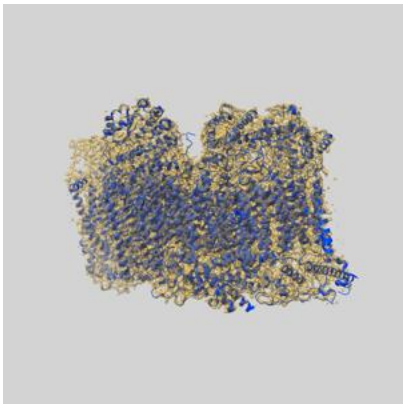
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

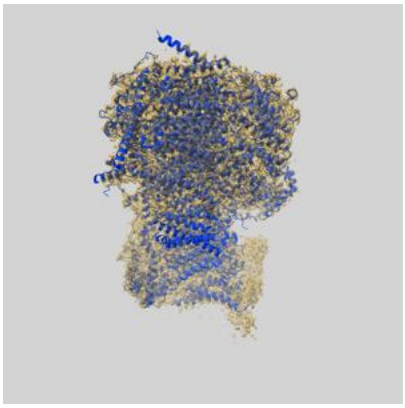
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-31884 and PDB model 7VBP. Per-residue inclusion information can be found in section 3 on page 15.

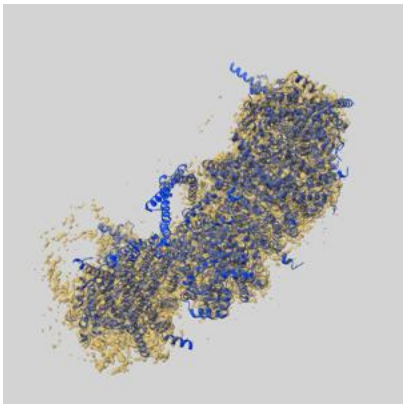
9.1 Map-model overlay



X



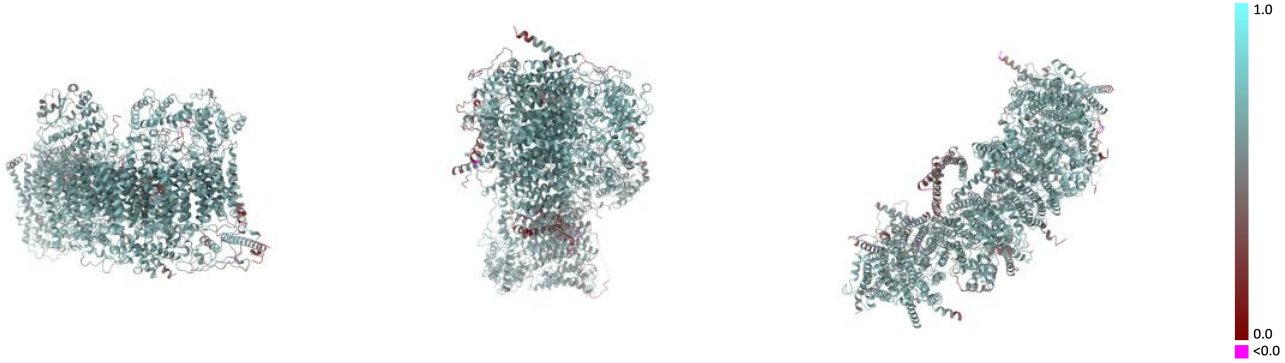
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0123 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.

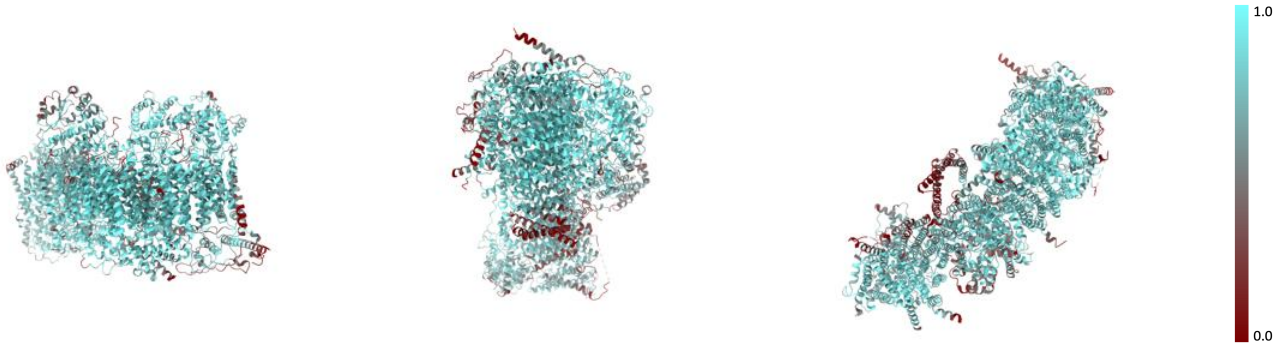
9.2 Q-score mapped to coordinate model



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.

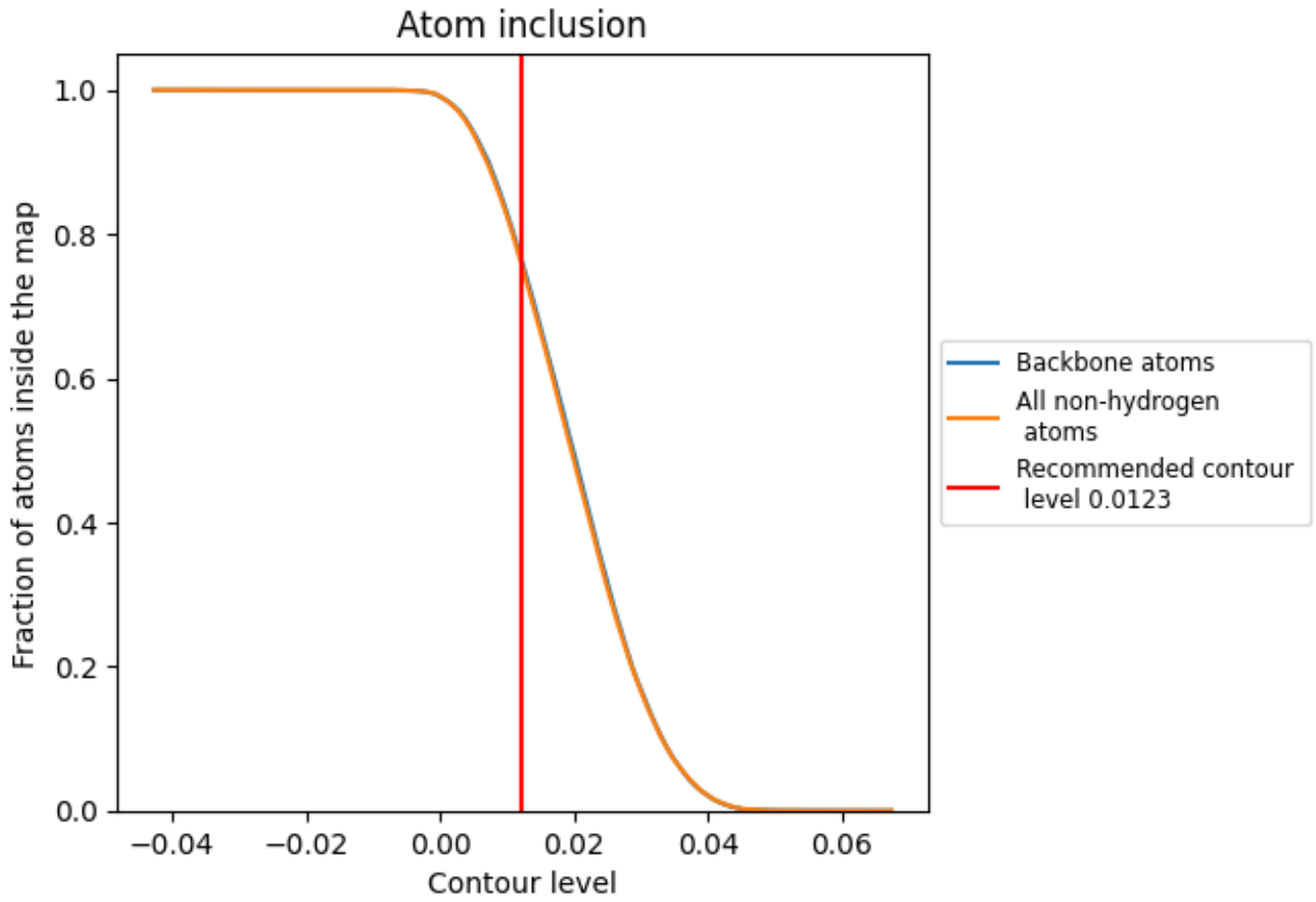
9.3 Atom inclusion mapped to coordinate model



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 (0.0123).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 75% 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 (0.0123) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7541	0.6030
Q	0.4182	0.5380
S	0.7740	0.6110
U	0.6985	0.5860
V	0.2780	0.4410
W	0.7976	0.6210
X	0.7663	0.6000
Y	0.6103	0.5510
Z	0.5745	0.5190
a	0.8118	0.6210
b	0.6469	0.5550
c	0.7912	0.6140
d	0.7604	0.6060
e	0.7422	0.5990
f	0.6707	0.5760
g	0.8209	0.6260
h	0.7979	0.6170
i	0.9050	0.6480
j	0.6616	0.5670
k	0.6482	0.5720
l	0.8197	0.6270
m	0.6272	0.5550
n	0.6875	0.5750
o	0.8037	0.6130
p	0.8409	0.6240
r	0.8955	0.6450
s	0.7981	0.6130
u	0.7467	0.6030
v	0.5824	0.5380
w	0.6663	0.5910