Full wwPDB EM Validation Report ⓘ

Oct 19, 2022 – 05:03 am BST

PDB ID	:	8APF
EMDB ID	:	EMD-15568
Title	:	rotational state 2a of the Trypanosoma brucei mitochondrial ATP synthase dimer
Authors	:	Muehleip, A.; Gahura, O.; Zikova, A.; Amunts, A.
Deposited on	:	2022-08-09
Resolution	:	4.30 Å(reported)

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

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

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

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

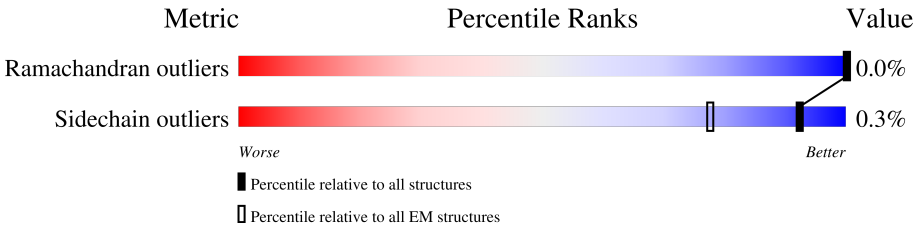
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 4.30 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	H1	182	28% 88% · 12%
2	I1	75	35% 87% 13%
3	J1	188	16% 88% 12%
3	K1	188	8% 88% 12%
3	L1	188	15% 87% · 12%
4	L	92	15% 71% 29%
4	l	92	30% 71% 29%
5	M	144	33% 90% 10%
5	m	144	15% 90% 10%

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Mol	Chain	Length	Quality of chain
6	M1	255	13% 91% 8%
7	O1	118	23% 66% 34%
7	P1	118	29% 66% 34%
7	Q1	118	29% 66% 34%
7	R1	118	12% 66% 34%
7	S1	118	8% 66% 34%
7	T1	118	8% 66% 34%
7	U1	118	16% 65% 34%
7	V1	118	19% 66% 34%
7	W1	118	21% 66% 34%
7	X1	118	21% 66% 34%
8	a	231	99%
9	c	114	75% 25%
10	d	370	10% 90% 10%
11	e	396	96%
12	f	145	92% 7%
13	g	269	44% 100%
14	h	157	22% 87% 13%
15	i	104	99%
16	j	169	99%
17	k	124	85% 15%
18	n	156	89% 11%
19	o	101	94% 5%
20	p	105	76% 24%
21	q	98	87% 13%

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Mol	Chain	Length	Quality of chain
22	r	62	100%
23	G1	305	27% 98%
24	A1	584	8% 89% 10%
24	B1	584	9% 90% 9%
24	C1	584	89% 10%
25	D1	519	8% 94% 6%
25	E1	519	11% 93% 6%
25	F1	519	13% 94% 6%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
29	Q7G	e	407	X	-	-	-
29	Q7G	n	201	X	-	-	-

2 Entry composition

There are 34 unique types of molecules in this entry. The entry contains 129563 atoms, of which 65460 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 ATP synthase, epsilon chain, putative.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	H1	161	Total	C	H	N	O	S	0	0
			2483	788	1232	211	248	4		

- Molecule 2 is a protein called ATP synthase subunit epsilon, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	I1	65	Total	C	H	N	O	S	0	0
			1046	332	513	97	102	2		

- Molecule 3 is a protein called ATP synthase subunit p18, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	J1	166	Total	C	H	N	O	S	0	0
			2591	822	1276	221	258	14		
3	K1	166	Total	C	H	N	O	S	0	0
			2591	822	1276	221	258	14		
3	L1	165	Total	C	H	N	O	S	0	0
			2581	819	1271	220	257	14		

- Molecule 4 is a protein called subunit-e.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	L	65	Total	C	H	N	O	S	0	0
			1082	340	545	104	92	1		
4	l	65	Total	C	H	N	O	S	0	0
			1082	340	545	104	92	1		

- Molecule 5 is a protein called subunit-g.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	M	129	Total	C	H	N	O	S	0	0
			2069	662	1042	177	186	2		

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Mol	Chain	Residues	Atoms						AltConf	Trace
5	m	129	Total	C	H	N	O	S	0	0
			2069	662	1042	177	186	2		

- Molecule 6 is a protein called OSCP.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	M1	234	Total	C	H	N	O	S	0	0
			3750	1212	1873	302	360	3		

- Molecule 7 is a protein called ATPase subunit 9, putative.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	O1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	P1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	Q1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	R1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	S1	78	Total	C	H	N	O	S	0	0
			1166	376	601	89	96	4		
7	T1	78	Total	C	H	N	O	S	0	0
			1166	376	601	89	96	4		
7	U1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	V1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	W1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		
7	X1	78	Total	C	H	N	O	S	0	0
			1165	376	600	89	96	4		

- Molecule 8 is a protein called ATP synthase subunit a.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	a	231	Total	C	H	N	O	S	0	0
			4076	1459	2044	261	284	28		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	23	TRP	-	insertion	UNP P24499
a	180	TRP	-	insertion	UNP P24499

- Molecule 9 is a protein called subunit-8.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	c	86	Total	C	H	N	O	S	0	0
			1460	494	715	116	130	5		

- Molecule 10 is a protein called subunit-d.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	d	332	Total	C	H	N	O	S	0	0
			5499	1710	2762	505	514	8		

- Molecule 11 is a protein called ATPTB1.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	e	383	Total	C	H	N	O	S	0	0
			6270	2060	3050	558	585	17		

- Molecule 12 is a protein called subunit-f.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	f	135	Total	C	H	N	O	S	0	0
			2256	744	1111	201	195	5		

- Molecule 13 is a protein called ATPTB3.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	g	268	Total	C	H	N	O	S	0	0
			3953	1211	2020	343	378	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
g	176	ALA	VAL	conflict	UNP A0A3L6KRX7

- Molecule 14 is a protein called ATPTB4.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	h	137	Total	C	H	N	O	S	0	0
			2158	680	1088	184	203	3		

- Molecule 15 is a protein called subunit-i/j.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	i	103	Total	C	H	N	O	S	0	0
			1740	574	857	152	151	6		

- Molecule 16 is a protein called ATPTB6.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	j	168	Total	C	H	N	O	S	0	0
			2835	919	1411	249	249	7		

- Molecule 17 is a protein called subunit-k.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	k	105	Total	C	H	N	O	S	0	0
			1749	577	876	149	141	6		

- Molecule 18 is a protein called ATPTB11.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	n	139	Total	C	H	N	O	S	0	0
			2210	730	1082	183	208	7		

- Molecule 19 is a protein called ATPTB12.

Mol	Chain	Residues	Atoms						AltConf	Trace
19	o	96	Total	C	H	N	O	S	0	0
			1556	506	767	140	140	3		

- Molecule 20 is a protein called subunit-b.

Mol	Chain	Residues	Atoms						AltConf	Trace
20	p	80	Total	C	H	N	O	S	0	0
			1335	448	651	108	125	3		

- Molecule 21 is a protein called ATPEG3.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	q	85	Total	C	H	N	O	0	0
			1486	499	720	142	125		

- Molecule 22 is a protein called ATPEG4.

Mol	Chain	Residues	Atoms						AltConf	Trace
22	r	62	Total	C	H	N	O	S	0	0
			1040	358	498	94	85	5		

- Molecule 23 is a protein called ATP synthase gamma subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
23	G1	300	Total	C	H	N	O	S	0	0
			4774	1507	2387	423	448	9		

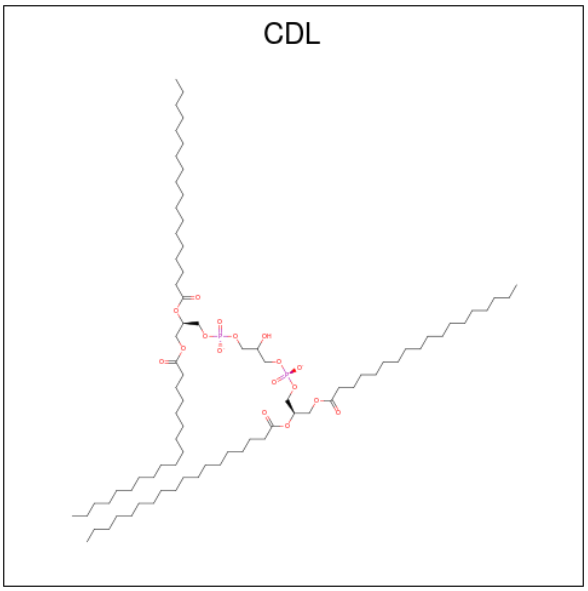
- Molecule 24 is a protein called ATP synthase subunit alpha, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
24	A1	523	Total	C	H	N	O	S	0	0
			8193	2587	4154	701	731	20		
24	B1	529	Total	C	H	N	O	S	0	0
			8260	2603	4187	709	741	20		
24	C1	524	Total	C	H	N	O	S	0	0
			8219	2594	4170	703	732	20		

- Molecule 25 is a protein called ATP synthase subunit beta, mitochondrial.

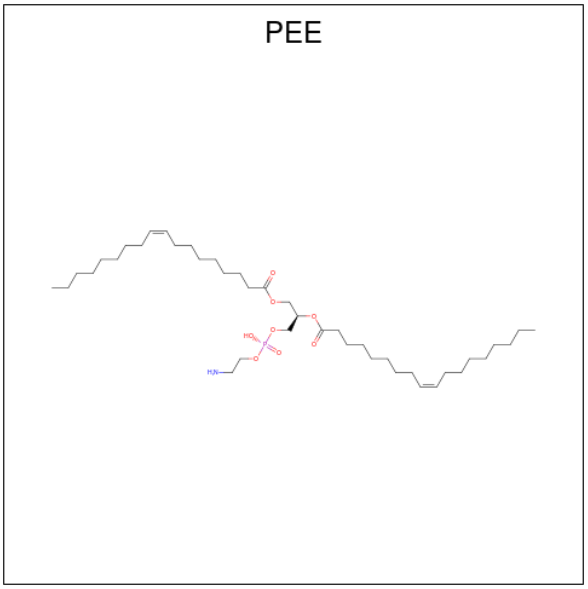
Mol	Chain	Residues	Atoms						AltConf	Trace
25	D1	488	Total	C	H	N	O	S	0	0
			7446	2334	3750	632	711	19		
25	E1	486	Total	C	H	N	O	S	0	0
			7414	2324	3732	630	709	19		
25	F1	488	Total	C	H	N	O	S	0	0
			7446	2334	3750	632	711	19		

- Molecule 26 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$) (labeled as "Ligand of Interest" by depositor).



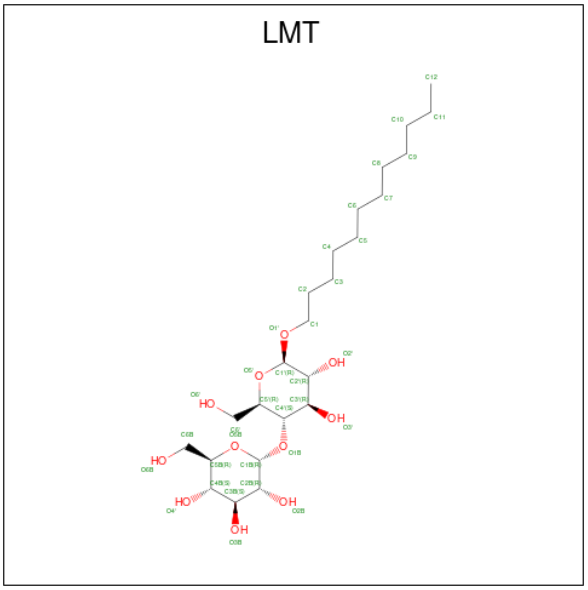
Mol	Chain	Residues	Atoms					AltConf
26	L	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	M	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	c	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	e	1	Total	C	H	O	P	0
			1280	405	780	85	10	
26	e	1	Total	C	H	O	P	0
			1280	405	780	85	10	
26	e	1	Total	C	H	O	P	0
			1280	405	780	85	10	
26	e	1	Total	C	H	O	P	0
			1280	405	780	85	10	
26	e	1	Total	C	H	O	P	0
			1280	405	780	85	10	
26	f	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	j	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	l	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	m	1	Total	C	H	O	P	0
			256	81	156	17	2	
26	q	1	Total	C	H	O	P	0
			512	162	312	34	4	
26	q	1	Total	C	H	O	P	0
			512	162	312	34	4	

- Molecule 27 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).



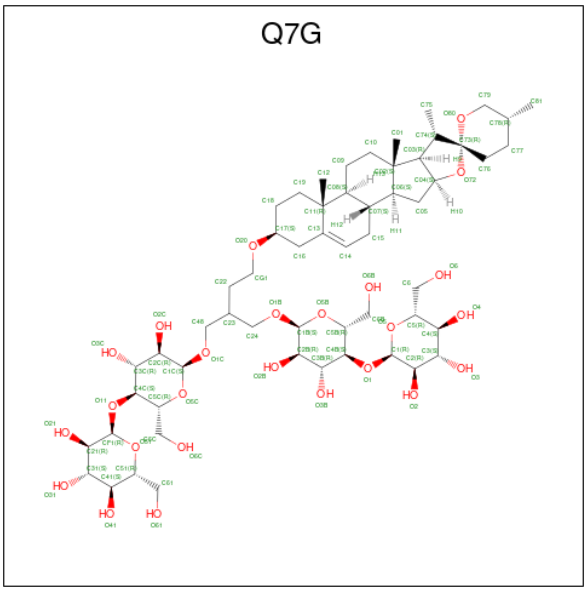
Mol	Chain	Residues	Atoms						AltConf
27	M	1	Total	C	H	N	O	P	0
			133	41	82	1	8	1	
27	f	1	Total	C	H	N	O	P	0
			133	41	82	1	8	1	
27	m	1	Total	C	H	N	O	P	0
			133	41	82	1	8	1	

- Molecule 28 is DODECYL-BETA-D-MALTOSIDE (three-letter code: LMT) (formula: $C_{24}H_{46}O_{11}$).



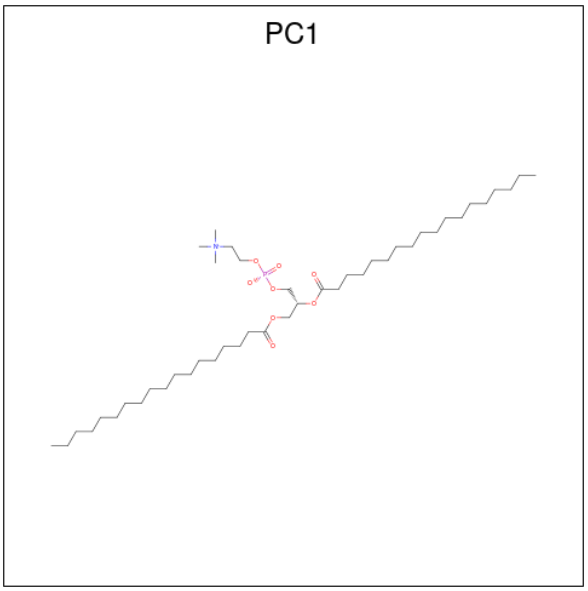
Mol	Chain	Residues	Atoms				AltConf
28	e	1	Total	C	H	O	0
			74	24	39	11	
28	j	1	Total	C	H	O	0
			74	24	39	11	

- Molecule 29 is 2-{[(4-O-alpha-D-glucopyranosyl-alpha-D-glucopyranosyl)oxy]methyl}-4-{[(3beta,9beta,14beta,17beta,25R)-spirost-5-en-3-yl]oxy}butyl 4-O-alpha-D-glucopyranosyl-alpha-D-glucopyranoside (three-letter code: Q7G) (formula: $C_{56}H_{92}O_{25}$).



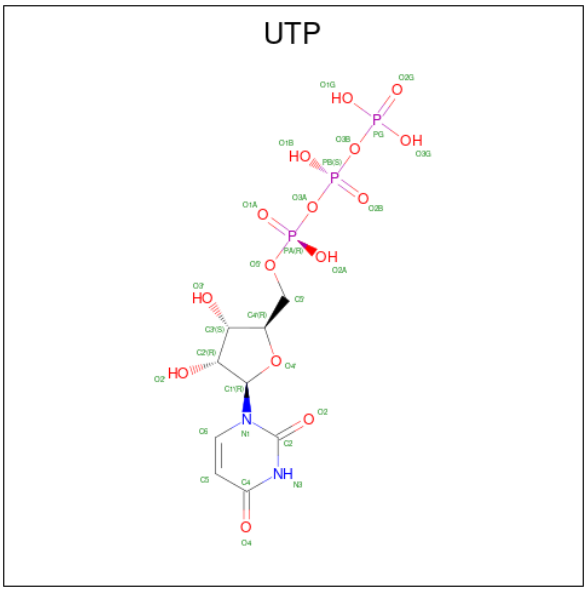
Mol	Chain	Residues	Atoms				AltConf
29	e	1	Total	C	H	O	0
			108	38	60	10	
29	n	1	Total	C	H	O	0
			129	44	70	15	

- Molecule 30 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (three-letter code: PC1) (formula: $C_{44}H_{88}NO_8P$) (labeled as "Ligand of Interest" by depositor).



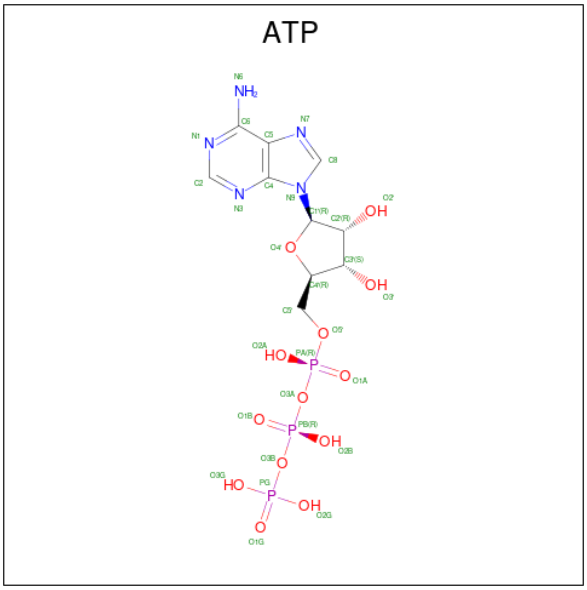
Mol	Chain	Residues	Atoms						AltConf
30	f	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
30	i	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
30	j	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	
30	p	1	Total	C	H	N	O	P	0
			142	44	88	1	8	1	

- Molecule 31 is URIDINE 5'-TRIPHOSPHATE (three-letter code: UTP) (formula: $C_9H_{15}N_2O_{15}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
31	G1	1	Total	C	H	N	O	P	0
			40	9	11	2	15	3	

- Molecule 32 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
32	A1	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
32	B1	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
32	C1	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
32	D1	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	

- Molecule 33 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
33	A1	1	Total	Mg	0
			1	1	
33	B1	1	Total	Mg	0
			1	1	
33	C1	1	Total	Mg	0
			1	1	
33	D1	1	Total	Mg	0
			1	1	

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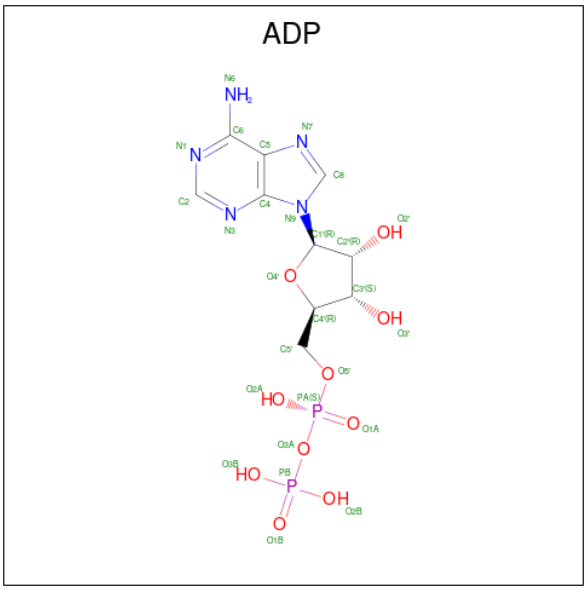
Mol	Chain	Residues	Atoms	AltConf
33	E1	1	Total Mg 1 1	0

- Molecule 34 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).



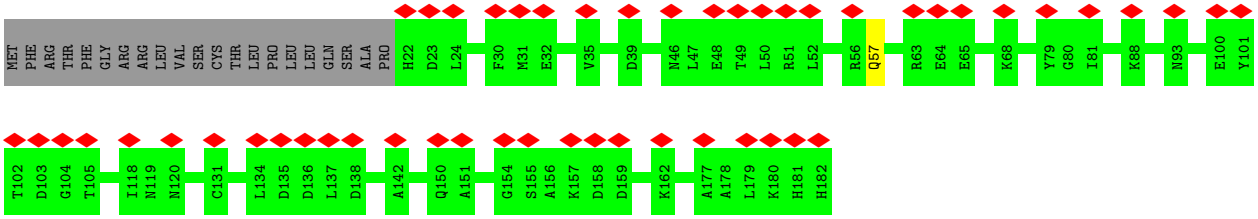
Mol	Chain	Residues	Atoms	AltConf
34	E1	1	Total C H N O P 39 10 12 5 10 2	0

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.

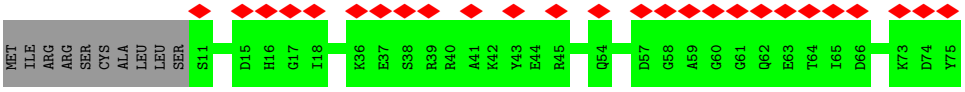
• Molecule 1: ATP synthase, epsilon chain, putative

Chain H1:



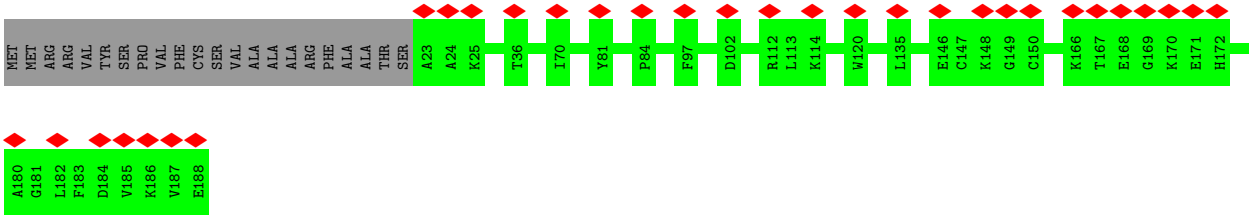
• Molecule 2: ATP synthase subunit epsilon, mitochondrial

Chain I1:



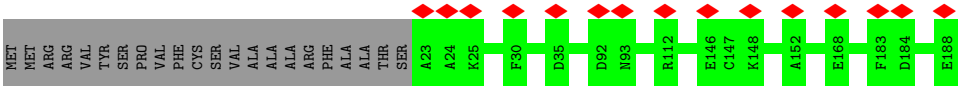
• Molecule 3: ATP synthase subunit p18, mitochondrial

Chain J1:



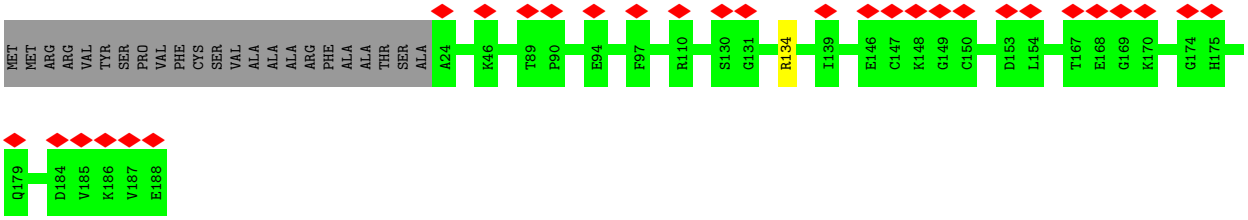
• Molecule 3: ATP synthase subunit p18, mitochondrial

Chain K1:



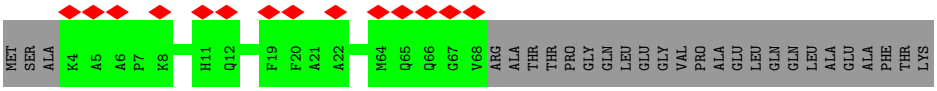
• Molecule 3: ATP synthase subunit p18, mitochondrial

Chain L1:



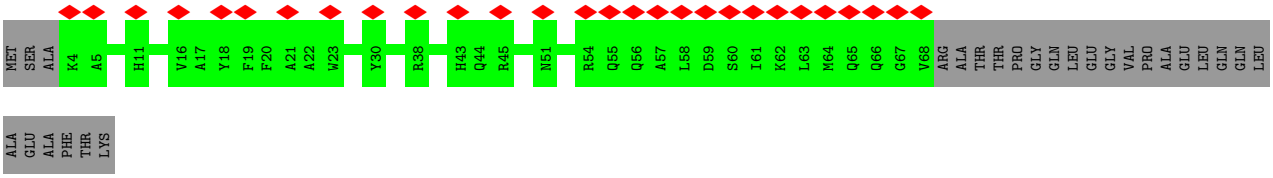
• Molecule 4: subunit-e

Chain L:



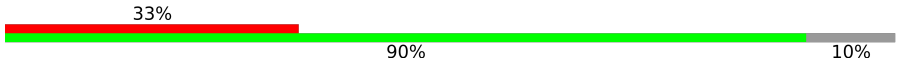
• Molecule 4: subunit-e

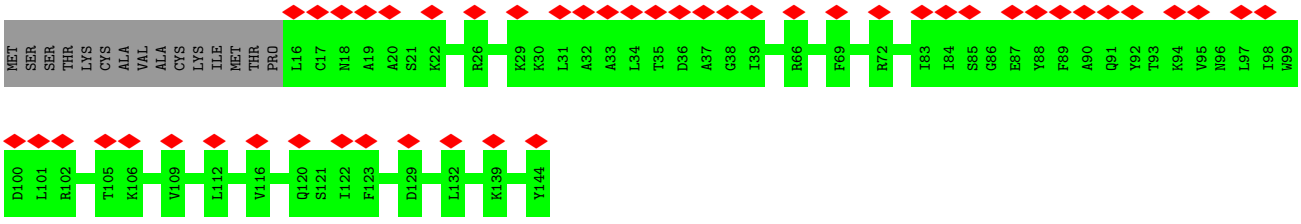
Chain l:



• Molecule 5: subunit-g

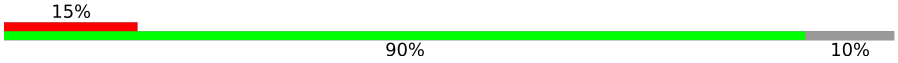
Chain M:

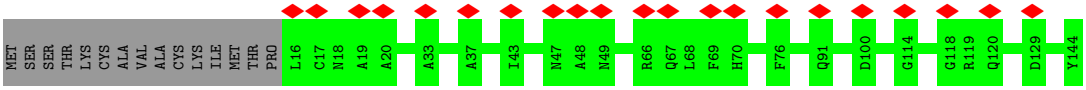




• Molecule 5: subunit-g

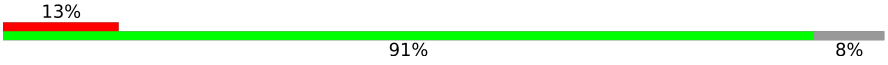
Chain m:

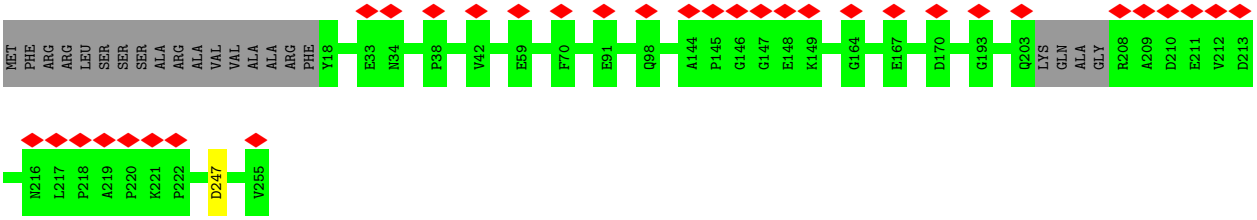




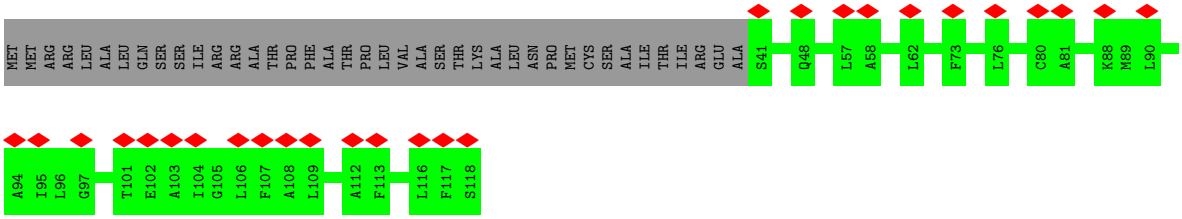
• Molecule 6: OSCP

Chain M1:

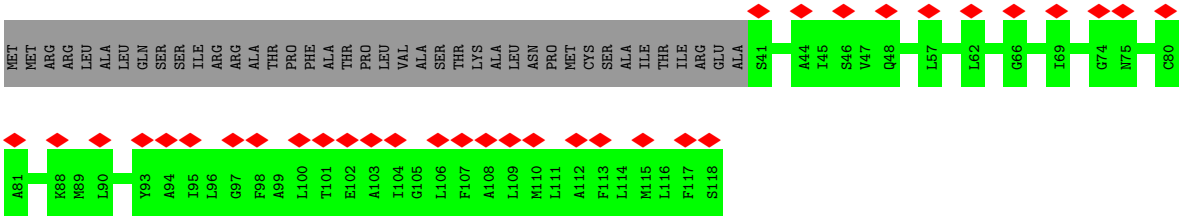




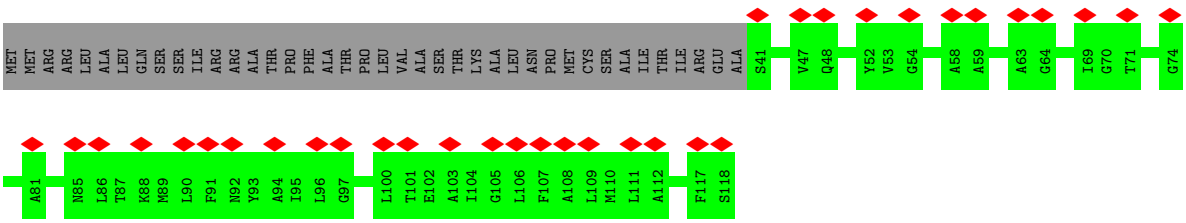
• Molecule 7: ATPase subunit 9, putative



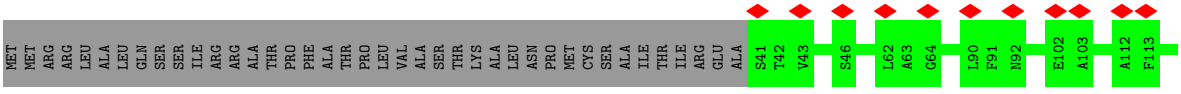
• Molecule 7: ATPase subunit 9, putative



• Molecule 7: ATPase subunit 9, putative

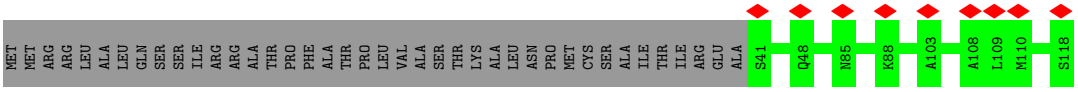


• Molecule 7: ATPase subunit 9, putative



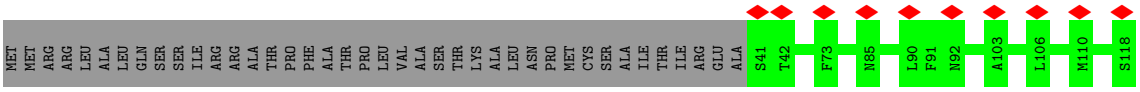
• Molecule 7: ATPase subunit 9, putative

Chain S1:



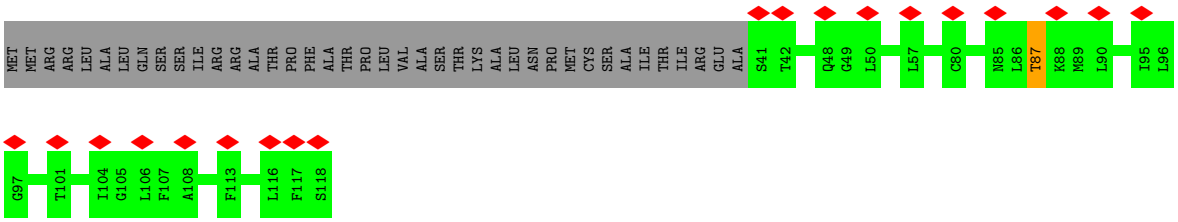
• Molecule 7: ATPase subunit 9, putative

Chain T1:



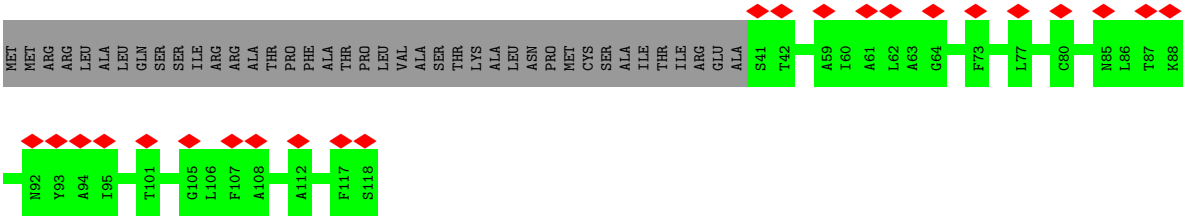
• Molecule 7: ATPase subunit 9, putative

Chain U1:



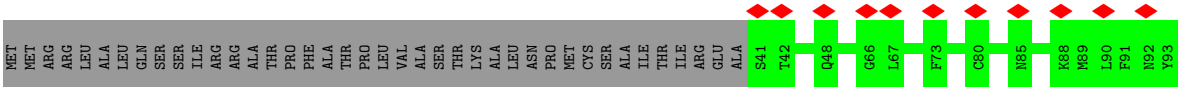
• Molecule 7: ATPase subunit 9, putative

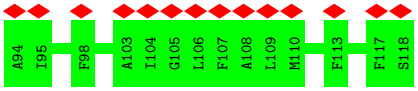
Chain V1:



• Molecule 7: ATPase subunit 9, putative

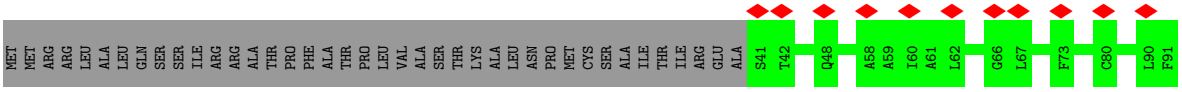
Chain W1:

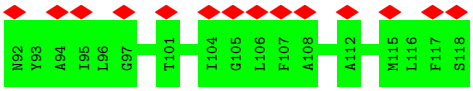




• Molecule 7: ATPase subunit 9, putative

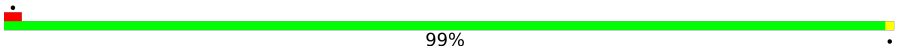
Chain X1:

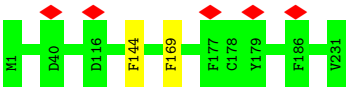




• Molecule 8: ATP synthase subunit a

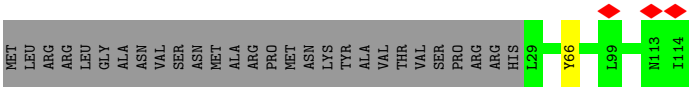
Chain a:





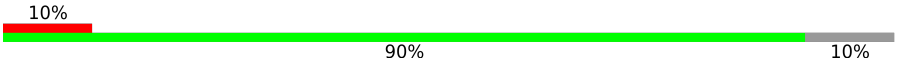
• Molecule 9: subunit-8

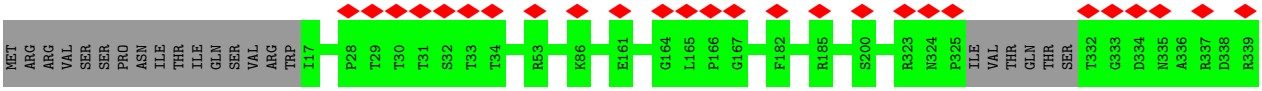
Chain c:

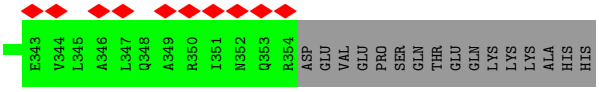


• Molecule 10: subunit-d

Chain d:

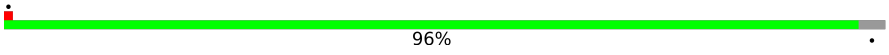


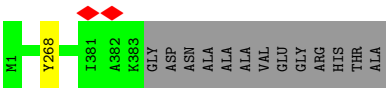




• Molecule 11: ATPTB1

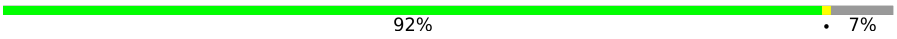
Chain e:

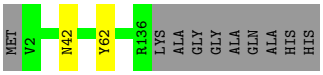




• Molecule 12: subunit-f

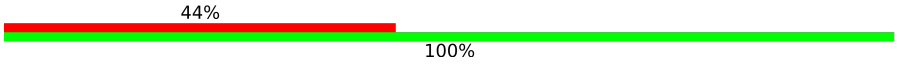
Chain f:

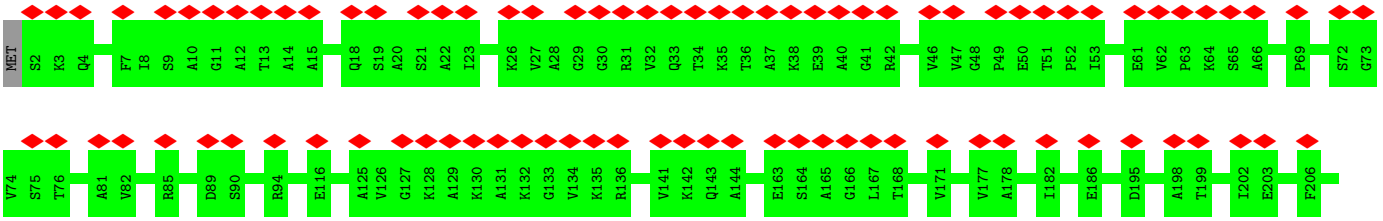




• Molecule 13: ATPTB3

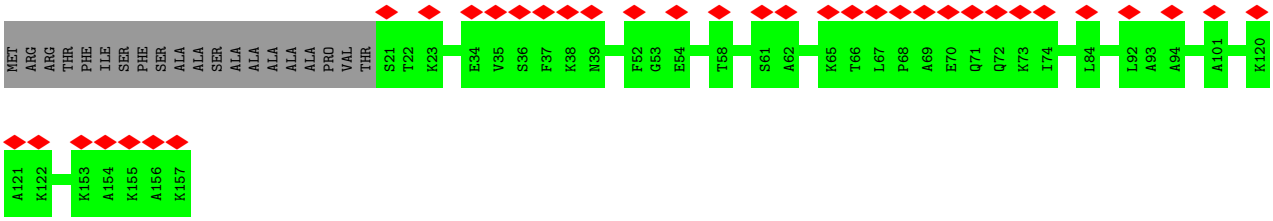
Chain g:





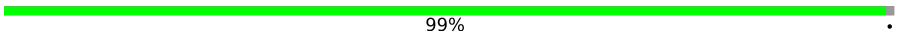
• Molecule 14: ATPTB4

Chain h:



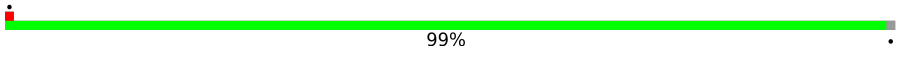
• Molecule 15: subunit-i/j

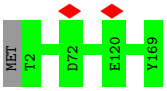
Chain i:



• Molecule 16: ATPTB6

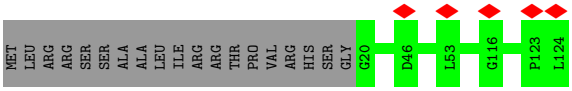
Chain j:





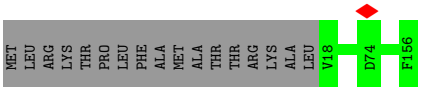
• Molecule 17: subunit-k

Chain k:



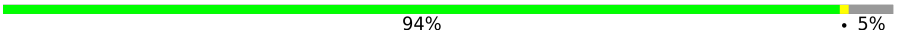
• Molecule 18: ATPTB11

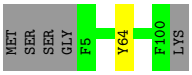
Chain n:



• Molecule 19: ATPTB12

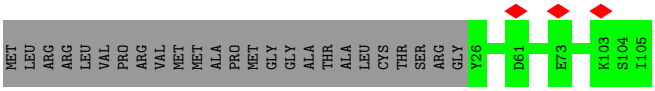
Chain o:





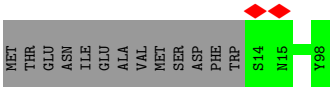
• Molecule 20: subunit-b

Chain p:



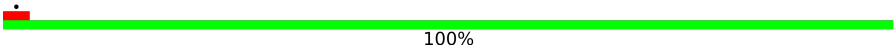
• Molecule 21: ATPEG3

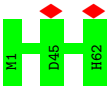
Chain q:



• Molecule 22: ATPEG4

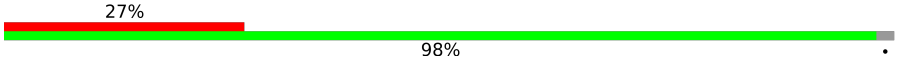
Chain r:

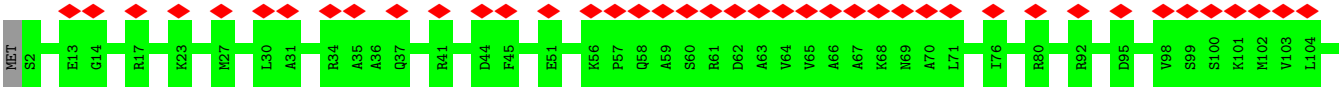


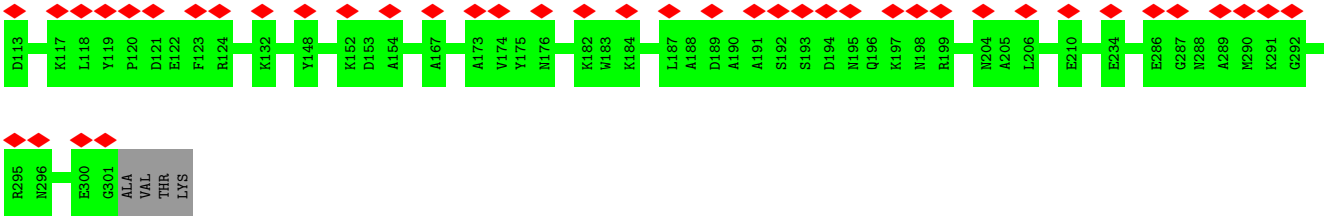


• Molecule 23: ATP synthase gamma subunit

Chain G1:

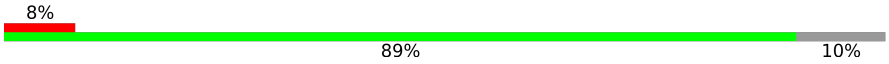


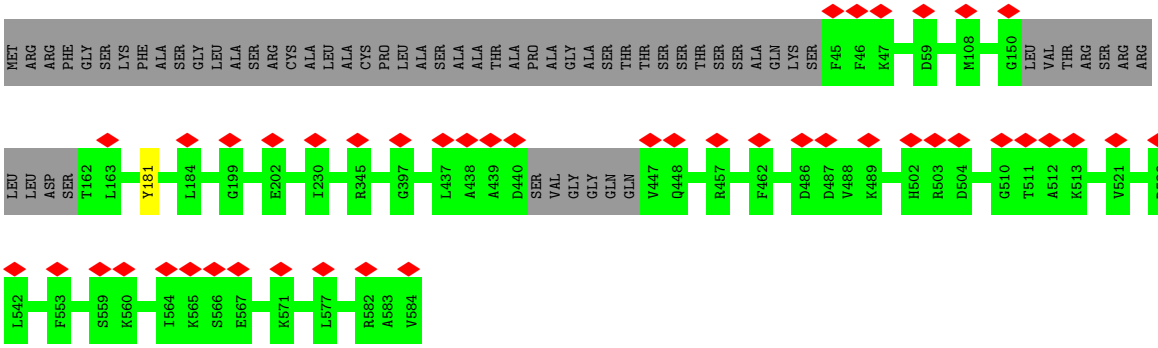




• Molecule 24: ATP synthase subunit alpha, mitochondrial

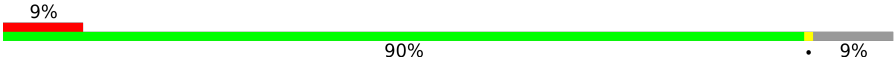
Chain A1:

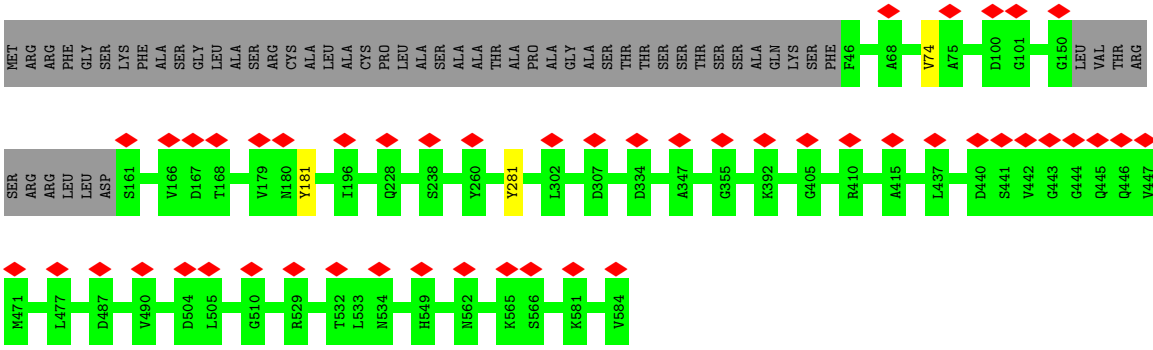




• Molecule 24: ATP synthase subunit alpha, mitochondrial

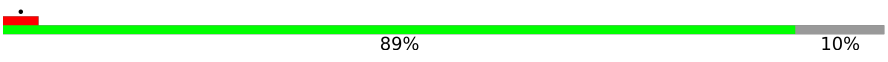
Chain B1:

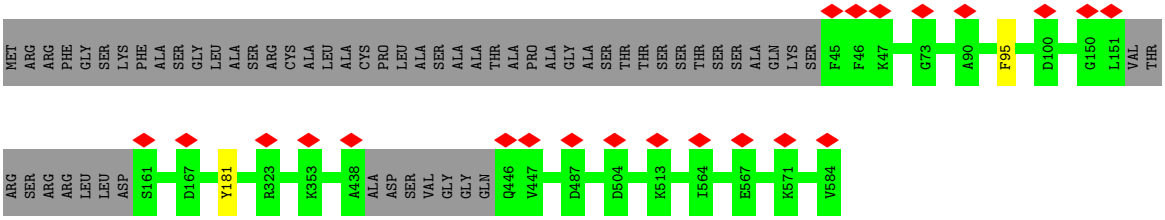




• Molecule 24: ATP synthase subunit alpha, mitochondrial

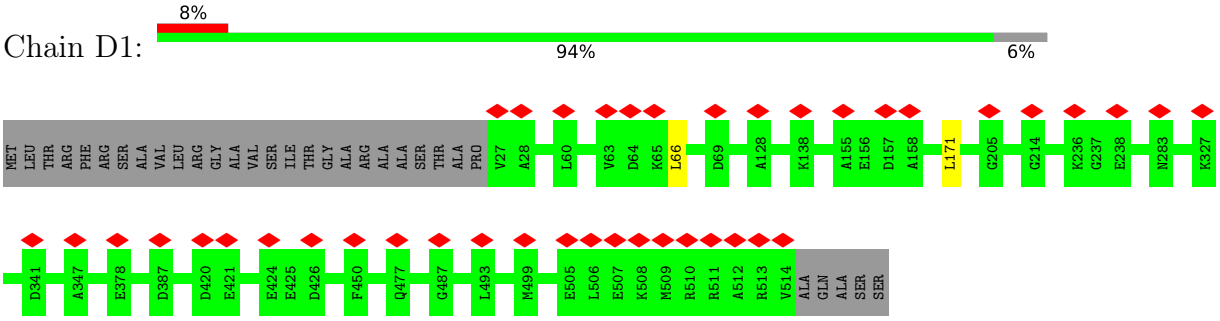
Chain C1:





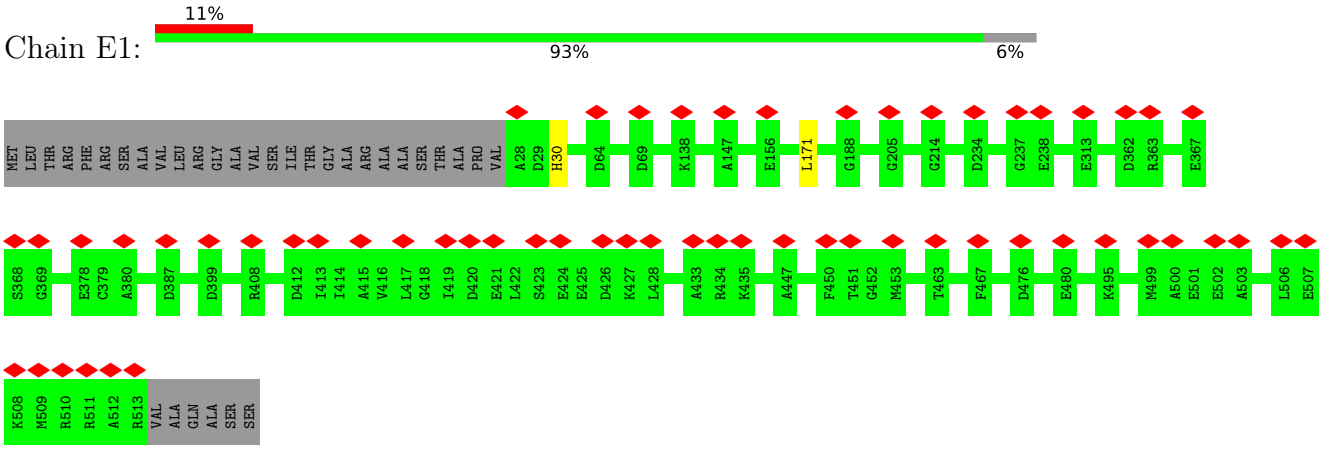
• Molecule 25: ATP synthase subunit beta, mitochondrial

Chain D1:



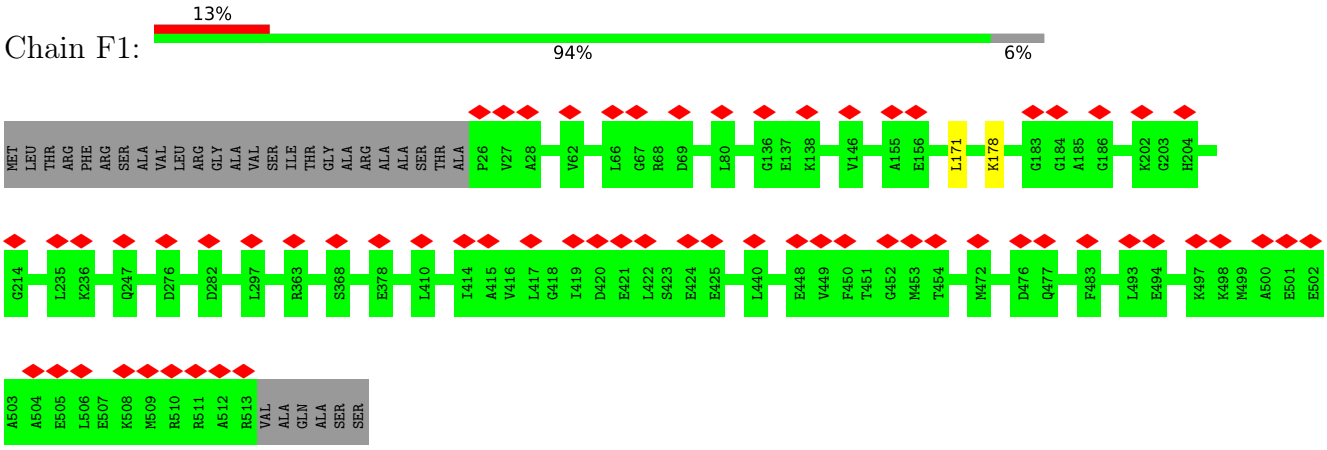
• Molecule 25: ATP synthase subunit beta, mitochondrial

Chain E1:



• Molecule 25: ATP synthase subunit beta, mitochondrial

Chain F1:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	12173	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 ($e^-/Å^2$)	33	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	3200	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.105	Depositor
Minimum map value	-0.063	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.012	Depositor
Map size (Å)	464.8, 464.8, 464.8	wwPDB
Map dimensions	560, 560, 560	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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: Q7G, PEE, ATP, AME, PC1, UTP, CDL, ADP, MG, LMT

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	H1	0.25	0/1274	0.44	0/1728
2	I1	0.23	0/547	0.48	0/738
3	J1	0.23	0/1342	0.39	0/1810
3	K1	0.23	0/1342	0.39	0/1810
3	L1	0.23	0/1337	0.39	0/1803
4	L	0.22	0/547	0.43	0/735
4	l	0.23	0/547	0.43	0/735
5	M	0.24	0/1049	0.41	0/1423
5	m	0.25	0/1049	0.42	0/1423
6	M1	0.25	0/1916	0.41	0/2591
7	O1	0.24	0/574	0.39	0/777
7	P1	0.24	0/574	0.38	0/777
7	Q1	0.24	0/574	0.39	0/777
7	R1	0.24	0/574	0.39	0/777
7	S1	0.24	0/574	0.39	0/777
7	T1	0.24	0/574	0.40	0/777
7	U1	0.25	0/574	0.39	0/777
7	V1	0.24	0/574	0.38	0/777
7	W1	0.25	0/574	0.39	0/777
7	X1	0.24	0/574	0.38	0/777
8	a	0.30	0/2111	0.40	0/2861
9	c	0.27	0/772	0.45	0/1054
10	d	0.23	0/2786	0.50	0/3760
11	e	0.25	0/3305	0.45	0/4482
12	f	0.26	0/1183	0.49	0/1601
13	g	0.24	0/1953	0.44	0/2650
14	h	0.24	0/1088	0.39	0/1466
15	i	0.25	0/913	0.46	0/1240
16	j	0.24	0/1462	0.48	0/1973
17	k	0.25	0/904	0.49	0/1228
18	n	0.26	0/1166	0.44	0/1581
19	o	0.24	0/814	0.38	0/1100

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
20	p	0.26	0/707	0.44	0/957
21	q	0.25	0/799	0.49	0/1091
22	r	0.26	0/567	0.45	0/767
23	G1	0.24	0/2427	0.47	0/3268
24	A1	0.24	0/4113	0.47	0/5569
24	B1	0.24	0/4147	0.47	0/5616
24	C1	0.25	0/4123	0.47	0/5582
25	D1	0.24	0/3752	0.46	0/5087
25	E1	0.24	0/3738	0.46	0/5067
25	F1	0.24	0/3753	0.46	0/5088
All	All	0.24	0/63273	0.45	0/85654

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H1	159/182 (87%)	156 (98%)	3 (2%)	0	100	100
2	I1	63/75 (84%)	61 (97%)	2 (3%)	0	100	100
3	J1	164/188 (87%)	161 (98%)	3 (2%)	0	100	100
3	K1	164/188 (87%)	163 (99%)	1 (1%)	0	100	100
3	L1	163/188 (87%)	162 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	L	63/92 (68%)	63 (100%)	0	0	100	100
4	l	63/92 (68%)	63 (100%)	0	0	100	100
5	M	127/144 (88%)	127 (100%)	0	0	100	100
5	m	127/144 (88%)	127 (100%)	0	0	100	100
6	M1	230/255 (90%)	226 (98%)	4 (2%)	0	100	100
7	O1	76/118 (64%)	75 (99%)	1 (1%)	0	100	100
7	P1	76/118 (64%)	76 (100%)	0	0	100	100
7	Q1	76/118 (64%)	76 (100%)	0	0	100	100
7	R1	76/118 (64%)	76 (100%)	0	0	100	100
7	S1	76/118 (64%)	76 (100%)	0	0	100	100
7	T1	76/118 (64%)	75 (99%)	1 (1%)	0	100	100
7	U1	76/118 (64%)	74 (97%)	1 (1%)	1 (1%)	12	48
7	V1	76/118 (64%)	76 (100%)	0	0	100	100
7	W1	76/118 (64%)	76 (100%)	0	0	100	100
7	X1	76/118 (64%)	75 (99%)	1 (1%)	0	100	100
8	a	229/231 (99%)	224 (98%)	5 (2%)	0	100	100
9	c	84/114 (74%)	83 (99%)	1 (1%)	0	100	100
10	d	328/370 (89%)	323 (98%)	5 (2%)	0	100	100
11	e	381/396 (96%)	377 (99%)	4 (1%)	0	100	100
12	f	133/145 (92%)	130 (98%)	3 (2%)	0	100	100
13	g	266/269 (99%)	264 (99%)	2 (1%)	0	100	100
14	h	135/157 (86%)	133 (98%)	2 (2%)	0	100	100
15	i	101/104 (97%)	100 (99%)	1 (1%)	0	100	100
16	j	166/169 (98%)	161 (97%)	5 (3%)	0	100	100
17	k	103/124 (83%)	99 (96%)	4 (4%)	0	100	100
18	n	137/156 (88%)	130 (95%)	7 (5%)	0	100	100
19	o	94/101 (93%)	93 (99%)	1 (1%)	0	100	100
20	p	78/105 (74%)	77 (99%)	1 (1%)	0	100	100
21	q	83/98 (85%)	81 (98%)	2 (2%)	0	100	100
22	r	60/62 (97%)	59 (98%)	1 (2%)	0	100	100
23	G1	298/305 (98%)	292 (98%)	6 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
24	A1	517/584 (88%)	509 (98%)	8 (2%)	0	100	100
24	B1	525/584 (90%)	515 (98%)	10 (2%)	0	100	100
24	C1	518/584 (89%)	507 (98%)	11 (2%)	0	100	100
25	D1	486/519 (94%)	476 (98%)	10 (2%)	0	100	100
25	E1	484/519 (93%)	474 (98%)	10 (2%)	0	100	100
25	F1	486/519 (94%)	473 (97%)	13 (3%)	0	100	100
All	All	7775/8943 (87%)	7644 (98%)	130 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
7	U1	87	THR

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	H1	137/156 (88%)	136 (99%)	1 (1%)	84	90
2	I1	58/67 (87%)	58 (100%)	0	100	100
3	J1	145/162 (90%)	145 (100%)	0	100	100
3	K1	145/162 (90%)	145 (100%)	0	100	100
3	L1	145/162 (90%)	144 (99%)	1 (1%)	84	90
4	L	55/75 (73%)	55 (100%)	0	100	100
4	l	55/75 (73%)	55 (100%)	0	100	100
5	M	111/124 (90%)	111 (100%)	0	100	100
5	m	111/124 (90%)	111 (100%)	0	100	100
6	M1	200/215 (93%)	199 (100%)	1 (0%)	88	93
7	O1	56/89 (63%)	56 (100%)	0	100	100
7	P1	56/89 (63%)	56 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	Q1	56/89 (63%)	56 (100%)	0	100	100
7	R1	56/89 (63%)	56 (100%)	0	100	100
7	S1	56/89 (63%)	56 (100%)	0	100	100
7	T1	56/89 (63%)	56 (100%)	0	100	100
7	U1	56/89 (63%)	55 (98%)	1 (2%)	59	77
7	V1	56/89 (63%)	56 (100%)	0	100	100
7	W1	56/89 (63%)	56 (100%)	0	100	100
7	X1	56/89 (63%)	56 (100%)	0	100	100
8	a	225/225 (100%)	223 (99%)	2 (1%)	78	88
9	c	80/104 (77%)	79 (99%)	1 (1%)	69	82
10	d	297/334 (89%)	297 (100%)	0	100	100
11	e	334/341 (98%)	333 (100%)	1 (0%)	92	95
12	f	119/124 (96%)	117 (98%)	2 (2%)	60	78
13	g	205/206 (100%)	205 (100%)	0	100	100
14	h	110/123 (89%)	110 (100%)	0	100	100
15	i	95/96 (99%)	95 (100%)	0	100	100
16	j	149/150 (99%)	149 (100%)	0	100	100
17	k	91/107 (85%)	91 (100%)	0	100	100
18	n	123/137 (90%)	123 (100%)	0	100	100
19	o	82/86 (95%)	81 (99%)	1 (1%)	71	84
20	p	75/94 (80%)	75 (100%)	0	100	100
21	q	80/92 (87%)	80 (100%)	0	100	100
22	r	56/56 (100%)	56 (100%)	0	100	100
23	G1	253/257 (98%)	253 (100%)	0	100	100
24	A1	434/479 (91%)	433 (100%)	1 (0%)	93	96
24	B1	438/479 (91%)	435 (99%)	3 (1%)	84	90
24	C1	436/479 (91%)	434 (100%)	2 (0%)	88	93
25	D1	399/420 (95%)	397 (100%)	2 (0%)	88	93
25	E1	397/420 (94%)	395 (100%)	2 (0%)	88	93
25	F1	399/420 (95%)	397 (100%)	2 (0%)	88	93
All	All	6599/7441 (89%)	6576 (100%)	23 (0%)	92	95

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H1	57	GLN
3	L1	134	ARG
6	M1	247	ASP
7	U1	87	THR
8	a	144	PHE
8	a	169	PHE
9	c	66	TYR
11	e	268	TYR
12	f	42	ASN
12	f	62	TYR
19	o	64	TYR
24	A1	181	TYR
24	B1	74	VAL
24	B1	181	TYR
24	B1	281	TYR
24	C1	95	PHE
24	C1	181	TYR
25	D1	66	LEU
25	D1	171	LEU
25	E1	30	HIS
25	E1	171	LEU
25	F1	171	LEU
25	F1	178	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
3	J1	82	GLN
3	J1	93	ASN
3	J1	172	HIS
3	K1	74	ASN
8	a	155	HIS
9	c	113	ASN
11	e	69	ASN
12	f	38	ASN
20	p	95	GLN
23	G1	136	HIS
23	G1	162	ASN
23	G1	233	ASN
24	A1	71	ASN
24	A1	522	GLN

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Mol	Chain	Res	Type
24	B1	339	HIS
24	B1	398	GLN
24	B1	463	ASN
25	D1	490	ASN
25	E1	30	HIS
25	F1	30	HIS
25	F1	411	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	AME	e	1	11	9,10,11	0.23	0	9,11,13	0.50	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
11	AME	e	1	11	-	3/9/10/12	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	e	1	AME	N-CA-CB-CG
11	e	1	AME	C-CA-N-CT1
11	e	1	AME	CB-CA-N-CT1

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 36 ligands modelled in this entry, 5 are monoatomic - leaving 31 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	$\#\|Z\| > 2$
28	LMT	e	406	-	36,36,36	0.10	0	47,47,47	0.15	0
26	CDL	j	201	-	99,99,99	0.29	0	105,111,111	0.25	0
26	CDL	e	403	-	99,99,99	0.29	0	105,111,111	0.26	0
26	CDL	q	101	-	99,99,99	0.30	0	105,111,111	0.25	0
30	PC1	j	202	-	53,53,53	0.29	0	59,61,61	0.26	0
26	CDL	c	201	-	99,99,99	0.29	0	105,111,111	0.26	0
30	PC1	i	201	-	53,53,53	0.29	0	59,61,61	0.27	0
26	CDL	m	202	-	99,99,99	0.29	0	105,111,111	0.25	0
29	Q7G	n	201	-	66,66,90	0.13	0	100,102,138	0.29	0
32	ATP	A1	601	33	26,33,33	0.62	0	31,52,52	0.59	1 (3%)
34	ADP	E1	601	33	24,29,29	0.70	0	29,45,45	0.80	1 (3%)
26	CDL	q	102	-	99,99,99	0.29	0	105,111,111	0.28	0
26	CDL	e	401	-	99,99,99	0.29	0	105,111,111	0.26	0
26	CDL	L	101	-	99,99,99	0.29	0	105,111,111	0.25	0
29	Q7G	e	407	-	54,54,90	0.13	0	82,84,138	0.31	0
26	CDL	e	405	-	99,99,99	0.29	0	105,111,111	0.25	0
26	CDL	f	201	-	99,99,99	0.29	0	105,111,111	0.27	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
31	UTP	G1	401	-	22,30,30	0.91	1 (4%)	27,47,47	0.83	1 (3%)
32	ATP	C1	601	33	26,33,33	0.61	0	31,52,52	0.64	1 (3%)
27	PEE	f	202	-	50,50,50	0.76	2 (4%)	53,55,55	0.47	0
26	CDL	e	404	-	99,99,99	0.29	0	105,111,111	0.26	0
27	PEE	m	201	-	50,50,50	0.76	2 (4%)	53,55,55	0.47	0
32	ATP	D1	601	33	26,33,33	0.62	0	31,52,52	0.61	1 (3%)
30	PC1	p	201	-	53,53,53	0.28	0	59,61,61	0.28	0
26	CDL	e	402	-	99,99,99	0.29	0	105,111,111	0.26	0
30	PC1	f	203	-	53,53,53	0.28	0	59,61,61	0.28	0
26	CDL	l	101	-	99,99,99	0.30	0	105,111,111	0.25	0
26	CDL	M	201	-	99,99,99	0.30	0	105,111,111	0.32	1 (0%)
32	ATP	B1	601	33	26,33,33	0.61	0	31,52,52	0.62	1 (3%)
28	LMT	j	203	-	36,36,36	0.12	0	47,47,47	0.17	0
27	PEE	M	202	-	50,50,50	0.75	2 (4%)	53,55,55	0.48	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
28	LMT	e	406	-	-	1/21/61/61	0/2/2/2
26	CDL	j	201	-	-	24/110/110/110	-
26	CDL	e	403	-	-	26/110/110/110	-
26	CDL	q	101	-	-	30/110/110/110	-
30	PC1	j	202	-	-	15/57/57/57	-
26	CDL	c	201	-	-	26/110/110/110	-
30	PC1	i	201	-	-	9/57/57/57	-
26	CDL	m	202	-	-	28/110/110/110	-
29	Q7G	n	201	-	2/2/24/34	6/20/148/200	0/8/8/10
32	ATP	A1	601	33	-	5/18/38/38	0/3/3/3
34	ADP	E1	601	33	-	1/12/32/32	0/3/3/3
26	CDL	q	102	-	-	27/110/110/110	-
26	CDL	e	401	-	-	26/110/110/110	-
26	CDL	L	101	-	-	18/110/110/110	-
29	Q7G	e	407	-	1/1/19/34	5/15/123/200	0/7/7/10
26	CDL	e	405	-	-	32/110/110/110	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
26	CDL	f	201	-	-	21/110/110/110	-
31	UTP	G1	401	-	-	1/20/38/38	0/2/2/2
32	ATP	C1	601	33	-	8/18/38/38	0/3/3/3
27	PEE	f	202	-	-	19/54/54/54	-
26	CDL	e	404	-	-	21/110/110/110	-
27	PEE	m	201	-	-	23/54/54/54	-
32	ATP	D1	601	33	-	3/18/38/38	0/3/3/3
30	PC1	p	201	-	-	10/57/57/57	-
26	CDL	e	402	-	-	23/110/110/110	-
30	PC1	f	203	-	-	12/57/57/57	-
26	CDL	l	101	-	-	20/110/110/110	-
26	CDL	M	201	-	-	27/110/110/110	-
32	ATP	B1	601	33	-	6/18/38/38	0/3/3/3
28	LMT	j	203	-	-	5/21/61/61	0/2/2/2
27	PEE	M	202	-	-	25/54/54/54	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
27	f	202	PEE	C39-C38	3.58	1.52	1.31
27	m	201	PEE	C18-C19	3.58	1.52	1.31
27	M	202	PEE	C18-C19	3.55	1.52	1.31
27	f	202	PEE	C18-C19	3.54	1.52	1.31
27	m	201	PEE	C39-C38	3.49	1.52	1.31
27	M	202	PEE	C39-C38	3.47	1.51	1.31
31	G1	401	UTP	C4-N3	3.11	1.38	1.33

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
31	G1	401	UTP	C5-C4-N3	-3.87	114.79	123.31
32	C1	601	ATP	C5-C6-N6	2.45	124.08	120.35
32	B1	601	ATP	C5-C6-N6	2.37	123.96	120.35
34	E1	601	ADP	C5-C6-N6	2.34	123.91	120.35
32	D1	601	ATP	C5-C6-N6	2.30	123.84	120.35
32	A1	601	ATP	C5-C6-N6	2.23	123.73	120.35
26	M	201	CDL	C27-C26-C25	2.11	129.44	113.42

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
29	e	407	Q7G	C1B
29	n	201	Q7G	C1B
29	n	201	Q7G	C1C

All (503) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
26	L	101	CDL	CA2-OA2-PA1-OA3
26	L	101	CDL	CA2-OA2-PA1-OA4
26	M	201	CDL	CA2-C1-CB2-OB2
26	M	201	CDL	CA3-OA5-PA1-OA3
26	M	201	CDL	OA6-CA4-CA6-OA8
26	M	201	CDL	CB2-OB2-PB2-OB4
26	M	201	CDL	C51-CB5-OB6-CB4
26	c	201	CDL	CB3-OB5-PB2-OB4
26	e	401	CDL	CA3-OA5-PA1-OA3
26	e	401	CDL	CB2-OB2-PB2-OB3
26	e	401	CDL	CB2-OB2-PB2-OB4
26	e	401	CDL	CB2-OB2-PB2-OB5
26	e	401	CDL	CB3-OB5-PB2-OB3
26	e	402	CDL	CA3-OA5-PA1-OA2
26	e	402	CDL	CA3-OA5-PA1-OA3
26	e	402	CDL	CA3-OA5-PA1-OA4
26	e	404	CDL	CA3-OA5-PA1-OA4
26	e	404	CDL	CB3-OB5-PB2-OB3
26	e	404	CDL	CB3-OB5-PB2-OB4
26	e	405	CDL	CA3-OA5-PA1-OA2
26	e	405	CDL	CA3-OA5-PA1-OA3
26	e	405	CDL	CA3-OA5-PA1-OA4
26	e	405	CDL	OB5-CB3-CB4-OB6
26	f	201	CDL	CA2-OA2-PA1-OA4
26	j	201	CDL	CA2-OA2-PA1-OA3
26	j	201	CDL	CA3-OA5-PA1-OA2
26	j	201	CDL	CA3-OA5-PA1-OA3
26	j	201	CDL	CA3-OA5-PA1-OA4
26	l	101	CDL	CA2-OA2-PA1-OA3
26	l	101	CDL	CA2-OA2-PA1-OA4
26	m	202	CDL	CA2-C1-CB2-OB2
26	m	202	CDL	CA3-OA5-PA1-OA3
26	m	202	CDL	OA6-CA4-CA6-OA8
26	m	202	CDL	CB2-OB2-PB2-OB4
26	m	202	CDL	C51-CB5-OB6-CB4
26	q	101	CDL	CA2-OA2-PA1-OA4

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Mol	Chain	Res	Type	Atoms
26	q	102	CDL	CA2-C1-CB2-OB2
26	q	102	CDL	OA5-CA3-CA4-OA6
26	q	102	CDL	CB3-OB5-PB2-OB2
26	q	102	CDL	CB3-OB5-PB2-OB3
27	M	202	PEE	C1-O3P-P-O2P
27	M	202	PEE	O4P-C4-C5-N
27	f	202	PEE	C4-O4P-P-O2P
27	f	202	PEE	C4-O4P-P-O1P
27	m	201	PEE	C1-O3P-P-O2P
27	m	201	PEE	O4P-C4-C5-N
28	e	406	LMT	C2-C1-O1'-C1'
28	j	203	LMT	C2'-C1'-O1'-C1
28	j	203	LMT	O5'-C1'-O1'-C1
28	j	203	LMT	C2-C1-O1'-C1'
29	e	407	Q7G	C2B-C1B-O1B-C24
29	e	407	Q7G	O5B-C1B-O1B-C24
29	e	407	Q7G	CG1-C22-C23-C48
29	n	201	Q7G	C2B-C1B-O1B-C24
29	n	201	Q7G	O5B-C1B-O1B-C24
30	f	203	PC1	C11-O13-P-O11
30	f	203	PC1	O13-C11-C12-N
30	i	201	PC1	C11-O13-P-O12
30	i	201	PC1	C11-O13-P-O14
30	i	201	PC1	C11-O13-P-O11
30	i	201	PC1	O13-C11-C12-N
30	j	202	PC1	C11-O13-P-O14
30	j	202	PC1	C1-O11-P-O12
30	j	202	PC1	C1-O11-P-O14
30	p	201	PC1	C11-O13-P-O12
32	A1	601	ATP	PB-O3B-PG-O2G
32	B1	601	ATP	PB-O3B-PG-O2G
32	C1	601	ATP	PB-O3B-PG-O2G
26	M	201	CDL	OB7-CB5-OB6-CB4
26	m	202	CDL	OB7-CB5-OB6-CB4
26	M	201	CDL	O1-C1-CB2-OB2
26	e	404	CDL	O1-C1-CA2-OA2
26	m	202	CDL	O1-C1-CB2-OB2
26	q	102	CDL	O1-C1-CB2-OB2
27	m	201	PEE	C31-C30-O3-C3
26	e	403	CDL	C11-CA5-OA6-CA4
26	e	402	CDL	C31-CA7-OA8-CA6
26	l	101	CDL	O1-C1-CA2-OA2

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Mol	Chain	Res	Type	Atoms
26	M	201	CDL	CA5-C11-C12-C13
26	m	202	CDL	CA5-C11-C12-C13
27	M	202	PEE	C31-C30-O3-C3
26	e	402	CDL	OA9-CA7-OA8-CA6
26	e	403	CDL	OA7-CA5-OA6-CA4
27	m	201	PEE	O5-C30-O3-C3
26	L	101	CDL	CA2-OA2-PA1-OA5
26	L	101	CDL	CA3-OA5-PA1-OA2
26	M	201	CDL	CA3-OA5-PA1-OA2
26	M	201	CDL	CB2-OB2-PB2-OB5
26	c	201	CDL	CB3-OB5-PB2-OB2
26	e	401	CDL	CB3-OB5-PB2-OB2
26	e	404	CDL	CA3-OA5-PA1-OA2
26	e	404	CDL	CB3-OB5-PB2-OB2
26	e	405	CDL	CB3-OB5-PB2-OB2
26	f	201	CDL	CA2-OA2-PA1-OA5
26	f	201	CDL	CB3-OB5-PB2-OB2
26	l	101	CDL	CA2-OA2-PA1-OA5
26	l	101	CDL	CA3-OA5-PA1-OA2
26	m	202	CDL	CA3-OA5-PA1-OA2
26	m	202	CDL	CB2-OB2-PB2-OB5
26	q	101	CDL	CB3-OB5-PB2-OB2
26	q	102	CDL	CB2-OB2-PB2-OB5
27	M	202	PEE	C1-O3P-P-O4P
27	M	202	PEE	C4-O4P-P-O3P
27	f	202	PEE	C4-O4P-P-O3P
27	m	201	PEE	C1-O3P-P-O4P
27	m	201	PEE	C4-O4P-P-O3P
30	j	202	PC1	C11-O13-P-O11
30	j	202	PC1	C1-O11-P-O13
30	p	201	PC1	C11-O13-P-O11
30	p	201	PC1	C1-O11-P-O13
27	M	202	PEE	O5-C30-O3-C3
26	e	403	CDL	C51-CB5-OB6-CB4
26	q	102	CDL	C11-CA5-OA6-CA4
26	q	101	CDL	C78-C79-C80-C81
26	j	201	CDL	C13-C14-C15-C16
26	e	403	CDL	OB7-CB5-OB6-CB4
26	q	102	CDL	OA7-CA5-OA6-CA4
26	q	101	CDL	C74-C75-C76-C77
26	e	403	CDL	O1-C1-CA2-OA2
26	e	404	CDL	O1-C1-CB2-OB2

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Mol	Chain	Res	Type	Atoms
26	q	102	CDL	CA5-C11-C12-C13
27	M	202	PEE	C31-C32-C33-C34
26	e	403	CDL	C71-C72-C73-C74
27	m	201	PEE	C17-C18-C19-C20
26	e	405	CDL	C11-CA5-OA6-CA4
26	q	101	CDL	C11-CA5-OA6-CA4
29	e	407	Q7G	CG1-C22-C23-C24
26	e	405	CDL	CA7-C31-C32-C33
26	c	201	CDL	O1-C1-CA2-OA2
26	f	201	CDL	O1-C1-CB2-OB2
26	q	101	CDL	O1-C1-CB2-OB2
26	c	201	CDL	C55-C56-C57-C58
26	q	101	CDL	CA2-C1-CB2-OB2
26	e	405	CDL	OA7-CA5-OA6-CA4
26	q	101	CDL	OA7-CA5-OA6-CA4
26	e	404	CDL	C17-C18-C19-C20
26	e	405	CDL	C57-C58-C59-C60
26	M	201	CDL	C12-C13-C14-C15
26	e	401	CDL	C77-C78-C79-C80
26	j	201	CDL	C81-C82-C83-C84
30	f	203	PC1	O22-C21-O21-C2
26	e	403	CDL	C14-C15-C16-C17
26	M	201	CDL	C73-C74-C75-C76
26	m	202	CDL	C73-C74-C75-C76
26	j	201	CDL	CA7-C31-C32-C33
26	m	202	CDL	C12-C13-C14-C15
26	q	101	CDL	C15-C16-C17-C18
27	f	202	PEE	C42-C43-C44-C45
26	L	101	CDL	C11-CA5-OA6-CA4
26	e	404	CDL	C11-CA5-OA6-CA4
26	q	101	CDL	C51-CB5-OB6-CB4
27	f	202	PEE	C11-C10-O2-C2
30	f	203	PC1	C22-C21-O21-C2
26	e	404	CDL	OA7-CA5-OA6-CA4
26	L	101	CDL	C31-CA7-OA8-CA6
27	m	201	PEE	C31-C32-C33-C34
26	c	201	CDL	C34-C35-C36-C37
26	j	201	CDL	C34-C35-C36-C37
28	j	203	LMT	O5B-C5B-C6B-O6B
27	M	202	PEE	C17-C18-C19-C20
29	n	201	Q7G	O5C-C5C-C6C-O6C
27	f	202	PEE	O4-C10-O2-C2

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Mol	Chain	Res	Type	Atoms
26	j	201	CDL	CA4-CA3-OA5-PA1
26	M	201	CDL	OA5-CA3-CA4-CA6
26	c	201	CDL	OA5-CA3-CA4-CA6
26	q	102	CDL	OA5-CA3-CA4-CA6
26	q	102	CDL	CB7-C71-C72-C73
26	e	403	CDL	C78-C79-C80-C81
26	e	402	CDL	C81-C82-C83-C84
26	e	402	CDL	C78-C79-C80-C81
26	e	404	CDL	CB2-C1-CA2-OA2
26	e	404	CDL	CA2-C1-CB2-OB2
26	j	201	CDL	C62-C63-C64-C65
26	l	101	CDL	C14-C15-C16-C17
26	e	403	CDL	C17-C18-C19-C20
26	M	201	CDL	CA3-CA4-CA6-OA8
26	c	201	CDL	CA3-CA4-CA6-OA8
26	e	403	CDL	CB3-CB4-CB6-OB8
26	q	101	CDL	CB3-CB4-CB6-OB8
27	M	202	PEE	C1-C2-C3-O3
27	m	201	PEE	C1-C2-C3-O3
30	p	201	PC1	C1-C2-C3-O31
26	e	401	CDL	C18-C19-C20-C21
26	m	202	CDL	C78-C79-C80-C81
26	e	401	CDL	C56-C57-C58-C59
26	e	402	CDL	C11-C12-C13-C14
26	M	201	CDL	C78-C79-C80-C81
26	c	201	CDL	C39-C40-C41-C42
26	l	101	CDL	C31-CA7-OA8-CA6
30	i	201	PC1	C32-C31-O31-C3
26	e	405	CDL	CA4-CA3-OA5-PA1
26	M	201	CDL	OA5-CA3-CA4-OA6
26	e	405	CDL	OA5-CA3-CA4-OA6
26	j	201	CDL	OB5-CB3-CB4-OB6
26	m	202	CDL	OA5-CA3-CA4-OA6
26	L	101	CDL	C14-C15-C16-C17
26	L	101	CDL	OA9-CA7-OA8-CA6
26	c	201	CDL	CA4-CA6-OA8-CA7
26	e	403	CDL	OB6-CB4-CB6-OB8
26	f	201	CDL	OB6-CB4-CB6-OB8
26	L	101	CDL	OA7-CA5-OA6-CA4
26	q	101	CDL	OB7-CB5-OB6-CB4
26	c	201	CDL	C51-C52-C53-C54
27	M	202	PEE	C22-C23-C24-C25

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Mol	Chain	Res	Type	Atoms
32	D1	601	ATP	PG-O3B-PB-O1B
26	f	201	CDL	C77-C78-C79-C80
27	m	201	PEE	C22-C23-C24-C25
26	c	201	CDL	CB2-C1-CA2-OA2
26	l	101	CDL	C11-CA5-OA6-CA4
26	e	405	CDL	OB5-CB3-CB4-CB6
26	e	405	CDL	C76-C77-C78-C79
26	j	201	CDL	O1-C1-CA2-OA2
30	p	201	PC1	C22-C21-O21-C2
26	c	201	CDL	CA4-CA3-OA5-PA1
26	q	102	CDL	C1-CB2-OB2-PB2
27	m	201	PEE	C2-C1-O3P-P
26	e	404	CDL	CB3-CB4-CB6-OB8
26	m	202	CDL	CA3-CA4-CA6-OA8
30	f	203	PC1	C1-C2-C3-O31
30	i	201	PC1	C2C-C2D-C2E-C2F
26	l	101	CDL	OA9-CA7-OA8-CA6
26	e	402	CDL	C75-C76-C77-C78
26	l	101	CDL	CB2-OB2-PB2-OB5
26	q	102	CDL	CA2-OA2-PA1-OA5
30	i	201	PC1	O32-C31-O31-C3
26	c	201	CDL	OA5-CA3-CA4-OA6
26	f	201	CDL	OA5-CA3-CA4-OA6
26	q	101	CDL	OA5-CA3-CA4-OA6
26	c	201	CDL	CA5-C11-C12-C13
26	L	101	CDL	OA6-CA4-CA6-OA8
26	e	404	CDL	OB6-CB4-CB6-OB8
26	l	101	CDL	OA6-CA4-CA6-OA8
27	f	202	PEE	O2-C2-C3-O3
30	p	201	PC1	O21-C2-C3-O31
26	m	202	CDL	C21-C22-C23-C24
29	n	201	Q7G	C24-C23-C48-O1C
26	l	101	CDL	OA7-CA5-OA6-CA4
26	q	101	CDL	C79-C80-C81-C82
26	L	101	CDL	CA4-CA3-OA5-PA1
26	e	402	CDL	CA4-CA3-OA5-PA1
26	f	201	CDL	CB4-CB3-OB5-PB2
26	l	101	CDL	CA4-CA3-OA5-PA1
27	M	202	PEE	C2-C1-O3P-P
26	e	405	CDL	C78-C79-C80-C81
26	e	402	CDL	C11-CA5-OA6-CA4
26	q	101	CDL	C72-C73-C74-C75

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Mol	Chain	Res	Type	Atoms
26	e	405	CDL	OA5-CA3-CA4-CA6
26	m	202	CDL	OA5-CA3-CA4-CA6
26	q	101	CDL	OA5-CA3-CA4-CA6
26	L	101	CDL	O1-C1-CA2-OA2
26	l	101	CDL	C31-C32-C33-C34
26	M	201	CDL	C21-C22-C23-C24
26	e	403	CDL	C62-C63-C64-C65
26	e	402	CDL	CA6-CA4-OA6-CA5
26	q	101	CDL	CB3-CB4-OB6-CB5
26	q	102	CDL	CB3-CB4-OB6-CB5
26	e	402	CDL	OA7-CA5-OA6-CA4
30	p	201	PC1	O22-C21-O21-C2
26	L	101	CDL	C31-C32-C33-C34
26	e	405	CDL	CB3-CB4-CB6-OB8
26	j	201	CDL	C1-CB2-OB2-PB2
26	q	101	CDL	CB4-CB3-OB5-PB2
27	f	202	PEE	C1-C2-C3-O3
26	j	201	CDL	CB2-C1-CA2-OA2
26	c	201	CDL	OA6-CA4-CA6-OA8
26	q	101	CDL	OB6-CB4-CB6-OB8
30	f	203	PC1	O21-C2-C3-O31
27	f	202	PEE	C31-C30-O3-C3
26	e	402	CDL	C74-C75-C76-C77
26	f	201	CDL	C12-C13-C14-C15
30	j	202	PC1	C3C-C3D-C3E-C3F
26	c	201	CDL	C83-C84-C85-C86
26	e	405	CDL	C40-C41-C42-C43
32	B1	601	ATP	PG-O3B-PB-O2B
32	C1	601	ATP	PA-O3A-PB-O2B
29	n	201	Q7G	C16-C17-O20-CG1
29	n	201	Q7G	C18-C17-O20-CG1
30	f	203	PC1	C32-C31-O31-C3
26	L	101	CDL	CB2-OB2-PB2-OB5
26	j	201	CDL	CA2-OA2-PA1-OA5
26	q	101	CDL	CA2-OA2-PA1-OA5
27	f	202	PEE	C1-O3P-P-O4P
30	j	202	PC1	C2-C1-O11-P
27	f	202	PEE	O5-C30-O3-C3
26	L	101	CDL	CA3-OA5-PA1-OA3
26	M	201	CDL	CA3-OA5-PA1-OA4
26	e	401	CDL	CB3-OB5-PB2-OB4
26	e	405	CDL	CB3-OB5-PB2-OB3

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Mol	Chain	Res	Type	Atoms
26	f	201	CDL	CB3-OB5-PB2-OB3
26	j	201	CDL	CA2-OA2-PA1-OA4
26	l	101	CDL	CA3-OA5-PA1-OA3
26	l	101	CDL	CA3-OA5-PA1-OA4
26	m	202	CDL	CA3-OA5-PA1-OA4
26	q	101	CDL	CB3-OB5-PB2-OB4
26	q	102	CDL	CB2-OB2-PB2-OB3
26	q	102	CDL	CB2-OB2-PB2-OB4
27	M	202	PEE	C4-O4P-P-O2P
27	M	202	PEE	C4-O4P-P-O1P
27	m	201	PEE	C4-O4P-P-O2P
27	m	201	PEE	C4-O4P-P-O1P
30	f	203	PC1	C11-O13-P-O12
30	j	202	PC1	C11-O13-P-O12
30	p	201	PC1	C1-O11-P-O12
30	p	201	PC1	C1-O11-P-O14
30	j	202	PC1	O11-C1-C2-C3
26	q	102	CDL	C77-C78-C79-C80
30	f	203	PC1	O32-C31-O31-C3
26	q	101	CDL	C76-C77-C78-C79
26	e	404	CDL	OA5-CA3-CA4-OA6
26	q	102	CDL	OB5-CB3-CB4-OB6
29	e	407	Q7G	C23-C24-O1B-C1B
30	j	202	PC1	O11-C1-C2-O21
26	M	201	CDL	C42-C43-C44-C45
27	M	202	PEE	C11-C10-O2-C2
30	j	202	PC1	O13-C11-C12-N
30	p	201	PC1	O13-C11-C12-N
26	e	405	CDL	OB6-CB4-CB6-OB8
27	M	202	PEE	O2-C2-C3-O3
27	m	201	PEE	O2-C2-C3-O3
26	e	402	CDL	C52-C51-CB5-OB6
26	j	201	CDL	C72-C73-C74-C75
26	q	101	CDL	C61-C62-C63-C64
26	j	201	CDL	C55-C56-C57-C58
32	D1	601	ATP	PB-O3B-PG-O1G
34	E1	601	ADP	PA-O3A-PB-O1B
26	e	404	CDL	CA6-CA4-OA6-CA5
26	j	201	CDL	OB5-CB3-CB4-CB6
26	l	101	CDL	CB2-C1-CA2-OA2
26	e	401	CDL	C13-C14-C15-C16
27	m	201	PEE	C36-C37-C38-C39

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Mol	Chain	Res	Type	Atoms
26	m	202	CDL	C33-C34-C35-C36
26	M	201	CDL	C33-C34-C35-C36
26	e	401	CDL	C81-C82-C83-C84
26	m	202	CDL	C42-C43-C44-C45
27	m	201	PEE	C23-C24-C25-C26
27	m	201	PEE	C41-C42-C43-C44
28	j	203	LMT	C2-C3-C4-C5
26	c	201	CDL	CA3-OA5-PA1-OA2
26	e	401	CDL	CA3-OA5-PA1-OA2
26	e	403	CDL	CB2-OB2-PB2-OB5
26	q	102	CDL	CA3-OA5-PA1-OA2
26	f	201	CDL	CB3-CB4-CB6-OB8
32	A1	601	ATP	PA-O3A-PB-O2B
32	B1	601	ATP	PA-O3A-PB-O2B
32	D1	601	ATP	PG-O3B-PB-O2B
26	e	404	CDL	C18-C19-C20-C21
30	f	203	PC1	C37-C38-C39-C3A
26	e	402	CDL	C1-CB2-OB2-PB2
27	M	202	PEE	O4-C10-O2-C2
26	l	101	CDL	C39-C40-C41-C42
26	m	202	CDL	C71-CB7-OB8-CB6
26	c	201	CDL	C35-C36-C37-C38
26	e	404	CDL	OA5-CA3-CA4-CA6
26	e	403	CDL	CB5-C51-C52-C53
26	f	201	CDL	C13-C14-C15-C16
27	M	202	PEE	C39-C40-C41-C42
26	L	101	CDL	C39-C40-C41-C42
26	f	201	CDL	C78-C79-C80-C81
26	e	405	CDL	C71-C72-C73-C74
27	f	202	PEE	C18-C19-C20-C21
26	e	405	CDL	C79-C80-C81-C82
26	c	201	CDL	C53-C54-C55-C56
30	i	201	PC1	C2A-C2B-C2C-C2D
26	e	403	CDL	CA3-CA4-CA6-OA8
30	f	203	PC1	O31-C31-C32-C33
26	e	405	CDL	C53-C54-C55-C56
27	f	202	PEE	C19-C20-C21-C22
26	j	201	CDL	CA3-CA4-OA6-CA5
26	c	201	CDL	C62-C63-C64-C65
27	M	202	PEE	C43-C44-C45-C46
26	f	201	CDL	OA7-CA5-OA6-CA4
26	e	404	CDL	C78-C79-C80-C81

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Mol	Chain	Res	Type	Atoms
27	f	202	PEE	C16-C17-C18-C19
26	m	202	CDL	OB9-CB7-OB8-CB6
26	c	201	CDL	C38-C39-C40-C41
26	e	401	CDL	C16-C17-C18-C19
26	e	402	CDL	C54-C55-C56-C57
26	e	401	CDL	CB4-CB3-OB5-PB2
26	e	403	CDL	C1-CA2-OA2-PA1
26	e	401	CDL	OB5-CB3-CB4-OB6
26	q	101	CDL	C71-CB7-OB8-CB6
26	e	401	CDL	OB5-CB3-CB4-CB6
26	e	403	CDL	C11-C12-C13-C14
26	e	403	CDL	OA6-CA4-CA6-OA8
27	M	202	PEE	C36-C37-C38-C39
26	M	201	CDL	C19-C20-C21-C22
26	M	201	CDL	C20-C21-C22-C23
26	q	101	CDL	OB9-CB7-OB8-CB6
26	e	402	CDL	C55-C56-C57-C58
27	M	202	PEE	C16-C17-C18-C19
27	m	201	PEE	C16-C17-C18-C19
26	L	101	CDL	C60-C61-C62-C63
26	c	201	CDL	C56-C57-C58-C59
26	q	102	CDL	OB5-CB3-CB4-CB6
27	f	202	PEE	O4P-C4-C5-N
26	e	405	CDL	C12-C11-CA5-OA6
26	c	201	CDL	C1-CB2-OB2-PB2
27	f	202	PEE	C36-C37-C38-C39
26	c	201	CDL	C42-C43-C44-C45
26	e	403	CDL	C32-C31-CA7-OA8
26	M	201	CDL	CB3-OB5-PB2-OB2
32	B1	601	ATP	PB-O3B-PG-O1G
32	C1	601	ATP	PB-O3B-PG-O1G
26	f	201	CDL	C12-C11-CA5-OA6
26	e	405	CDL	C56-C57-C58-C59
26	M	201	CDL	C12-C11-CA5-OA6
26	f	201	CDL	C72-C71-CB7-OB8
27	M	202	PEE	C38-C39-C40-C41
27	m	201	PEE	C38-C39-C40-C41
26	e	405	CDL	OB7-CB5-OB6-CB4
26	e	403	CDL	C52-C51-CB5-OB6
26	m	202	CDL	C12-C11-CA5-OA6
27	f	202	PEE	O2-C10-C11-C12
26	q	102	CDL	C73-C74-C75-C76

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Mol	Chain	Res	Type	Atoms
26	c	201	CDL	C40-C41-C42-C43
26	L	101	CDL	CA3-CA4-CA6-OA8
26	l	101	CDL	CA3-CA4-CA6-OA8
26	q	102	CDL	C71-C72-C73-C74
26	q	101	CDL	C12-C11-CA5-OA6
26	e	401	CDL	C11-C12-C13-C14
27	m	201	PEE	O2-C10-C11-C12
27	M	202	PEE	C23-C24-C25-C26
32	C1	601	ATP	PB-O3B-PG-O3G
26	e	402	CDL	OB5-CB3-CB4-CB6
26	e	403	CDL	OA5-CA3-CA4-CA6
26	e	401	CDL	C32-C31-CA7-OA8
27	M	202	PEE	O2-C10-C11-C12
30	j	202	PC1	O31-C31-C32-C33
26	e	405	CDL	OA6-CA4-CA6-OA8
27	M	202	PEE	C18-C19-C20-C21
27	m	201	PEE	C34-C35-C36-C37
26	j	201	CDL	C52-C51-CB5-OB6
30	j	202	PC1	O22-C21-O21-C2
26	e	405	CDL	C32-C31-CA7-OA8
32	A1	601	ATP	PG-O3B-PB-O2B
32	B1	601	ATP	PG-O3B-PB-O1B
32	C1	601	ATP	PG-O3B-PB-O1B
32	C1	601	ATP	PG-O3B-PB-O2B
32	C1	601	ATP	PA-O3A-PB-O1B
26	e	405	CDL	C51-CB5-OB6-CB4
26	f	201	CDL	C11-CA5-OA6-CA4
26	f	201	CDL	C37-C38-C39-C40
26	q	102	CDL	C79-C80-C81-C82
26	q	101	CDL	C38-C39-C40-C41
26	M	201	CDL	C12-C11-CA5-OA7
26	m	202	CDL	C12-C11-CA5-OA7
30	f	203	PC1	C2B-C2C-C2D-C2E
27	m	201	PEE	C18-C19-C20-C21
26	e	403	CDL	C12-C13-C14-C15
26	e	405	CDL	C74-C75-C76-C77
26	e	405	CDL	C12-C11-CA5-OA7
26	f	201	CDL	C12-C11-CA5-OA7
26	e	401	CDL	C43-C44-C45-C46
26	e	403	CDL	C32-C31-CA7-OA9
27	f	202	PEE	O4-C10-C11-C12
26	e	402	CDL	C32-C31-CA7-OA8

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Mol	Chain	Res	Type	Atoms
26	M	201	CDL	OA7-CA5-OA6-CA4
26	e	401	CDL	OB7-CB5-OB6-CB4
26	m	202	CDL	OA7-CA5-OA6-CA4
26	M	201	CDL	CB3-OB5-PB2-OB3
26	c	201	CDL	CB2-OB2-PB2-OB3
26	e	401	CDL	CA3-OA5-PA1-OA4
26	e	403	CDL	CB2-OB2-PB2-OB3
26	e	403	CDL	CB3-OB5-PB2-OB3
26	m	202	CDL	CB3-OB5-PB2-OB3
26	q	101	CDL	CA2-OA2-PA1-OA3
26	q	102	CDL	CA2-OA2-PA1-OA3
26	q	102	CDL	CA3-OA5-PA1-OA3
27	f	202	PEE	C1-O3P-P-O1P
32	A1	601	ATP	C5'-O5'-PA-O1A
32	B1	601	ATP	C5'-O5'-PA-O1A
32	C1	601	ATP	C5'-O5'-PA-O1A
31	G1	401	UTP	O4'-C4'-C5'-O5'
26	e	403	CDL	C52-C51-CB5-OB7
26	q	101	CDL	C12-C11-CA5-OA7
30	j	202	PC1	O32-C31-C32-C33
26	f	201	CDL	OA5-CA3-CA4-CA6
26	e	401	CDL	C32-C31-CA7-OA9
27	m	201	PEE	O4-C10-C11-C12
32	A1	601	ATP	PB-O3B-PG-O1G
26	e	405	CDL	C32-C31-CA7-OA9
26	m	202	CDL	C72-C71-CB7-OB8
26	l	101	CDL	C60-C61-C62-C63
26	j	201	CDL	CA6-CA4-OA6-CA5
30	j	202	PC1	C12-C11-O13-P
26	f	201	CDL	C72-C71-CB7-OB9
26	e	405	CDL	C11-C12-C13-C14
26	e	401	CDL	C52-C51-CB5-OB6
26	e	404	CDL	C32-C31-CA7-OA8
26	m	202	CDL	C19-C20-C21-C22
26	e	402	CDL	C32-C31-CA7-OA9
27	M	202	PEE	O4-C10-C11-C12
26	e	402	CDL	C53-C54-C55-C56
30	i	201	PC1	C3B-C3C-C3D-C3E
26	q	102	CDL	C72-C71-CB7-OB8
26	q	101	CDL	C73-C74-C75-C76
26	j	201	CDL	C52-C51-CB5-OB7
26	e	402	CDL	C72-C71-CB7-OB8

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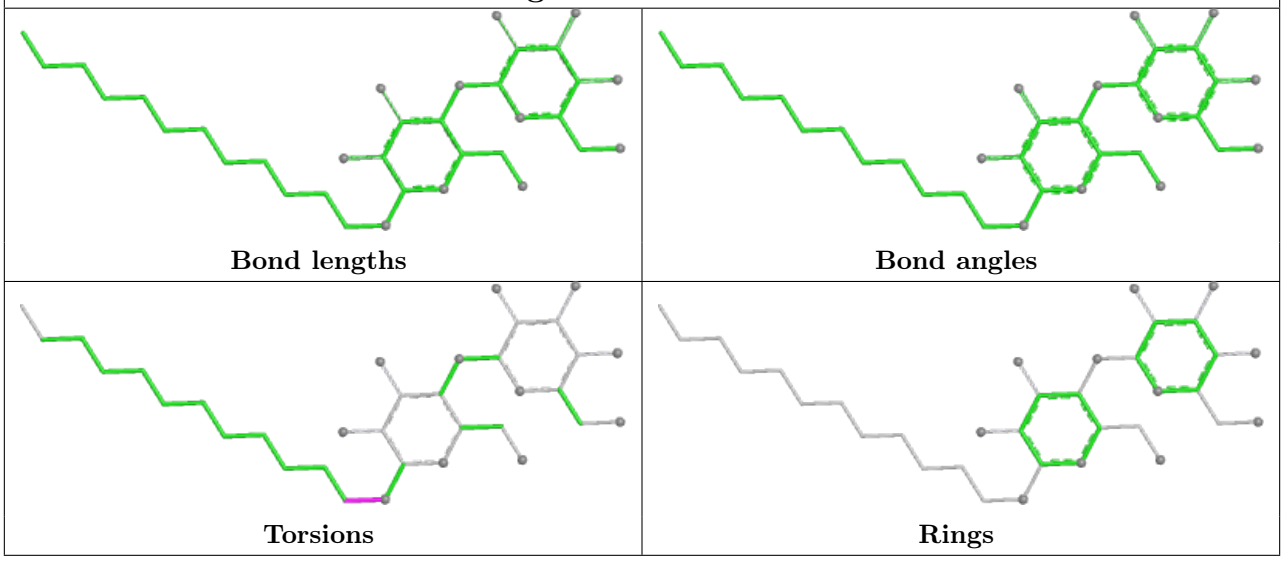
Mol	Chain	Res	Type	Atoms
26	e	401	CDL	C52-C51-CB5-OB7
26	e	404	CDL	C32-C31-CA7-OA9
26	e	401	CDL	C75-C76-C77-C78
26	j	201	CDL	C77-C78-C79-C80
26	q	102	CDL	C72-C71-CB7-OB9

There are no ring outliers.

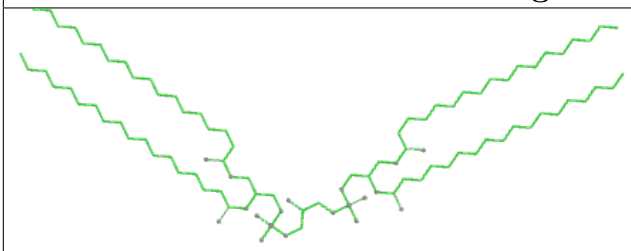
No monomer is involved in short contacts.

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.

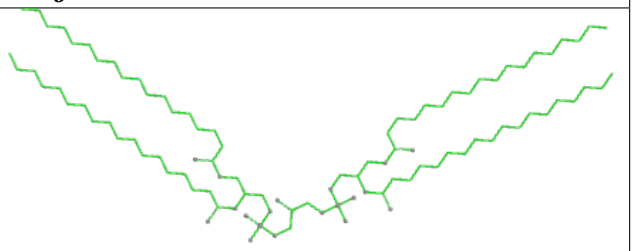
Ligand LMT e 406



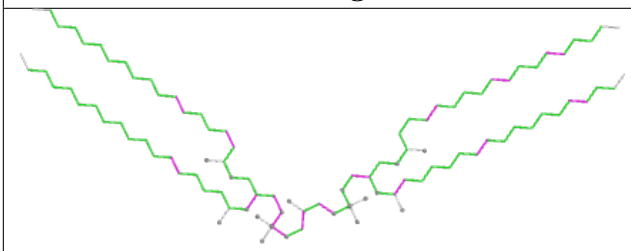
Ligand CDL j 201



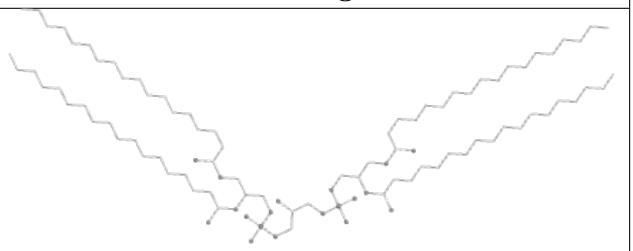
Bond lengths



Bond angles

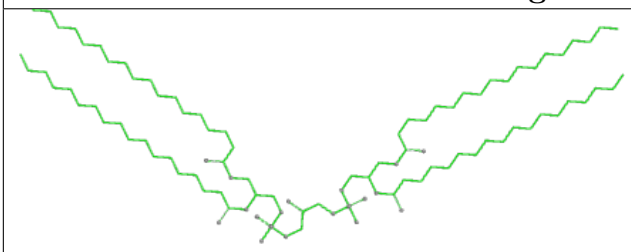


Torsions

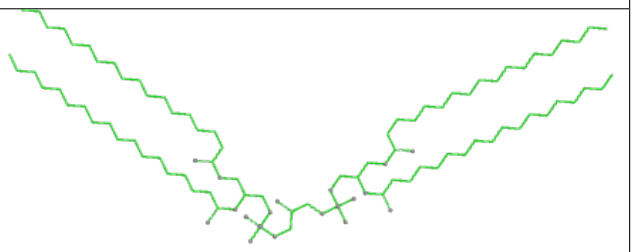


Rings

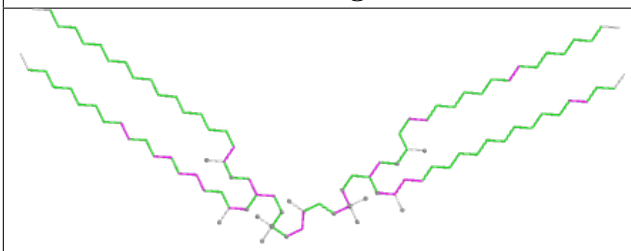
Ligand CDL e 403



Bond lengths



Bond angles



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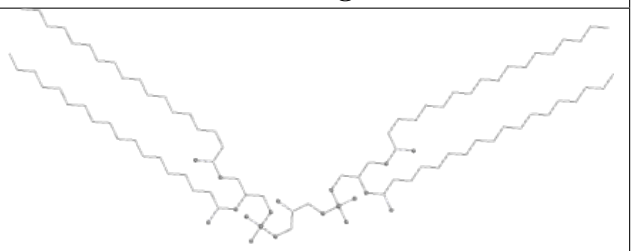
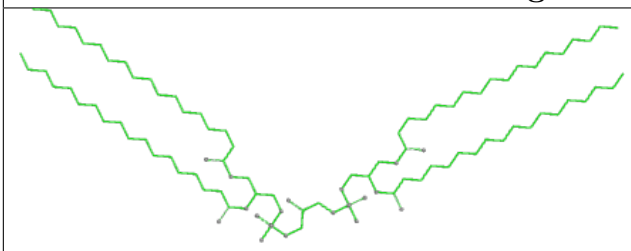
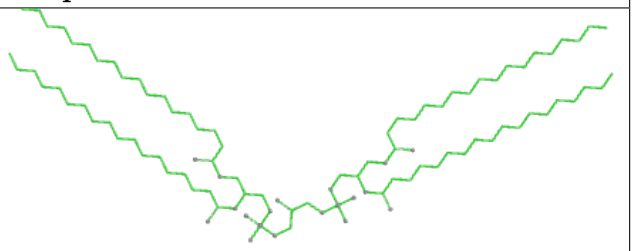
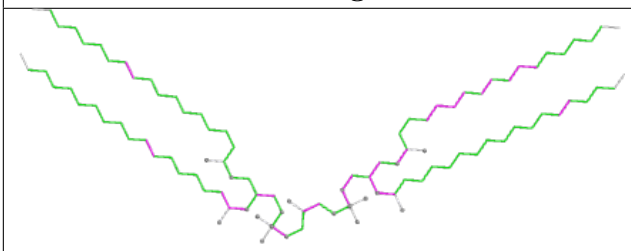


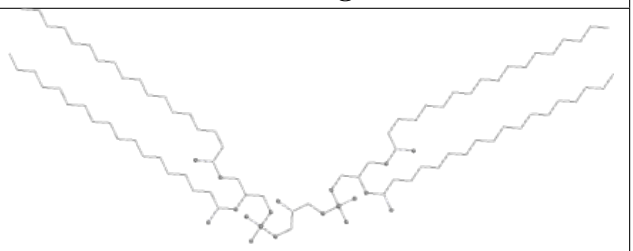
Rings

Ligand CDL q 101

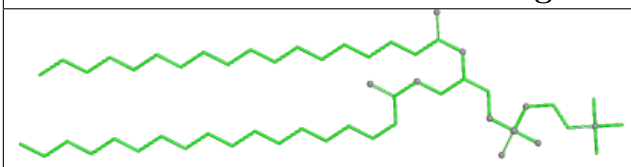

Bond lengths

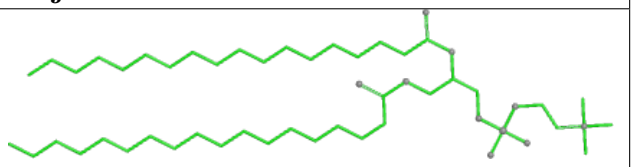

Bond angles

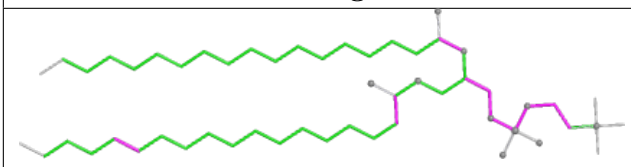

Torsions

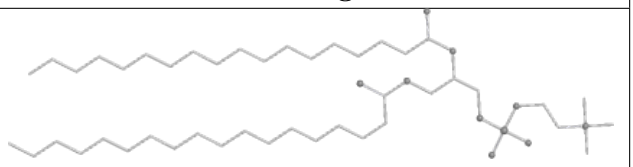

Rings

Ligand PC1 j 202

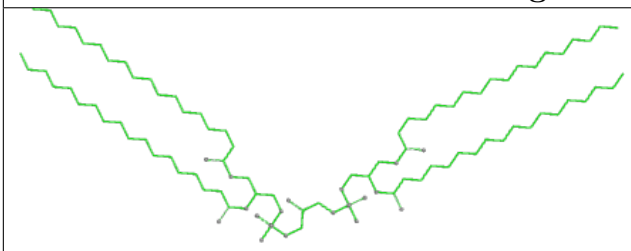

Bond lengths

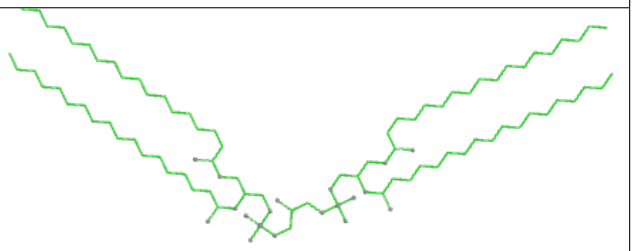

Bond angles

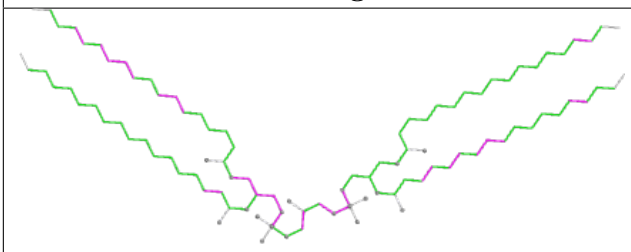

Torsions


Rings

Ligand CDL c 201


Bond lengths


Bond angles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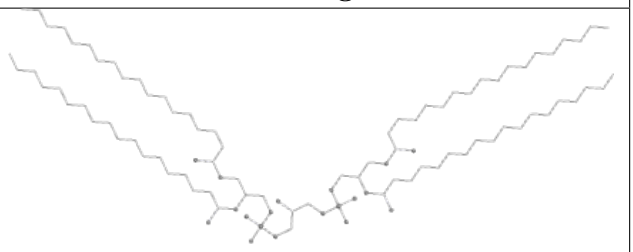
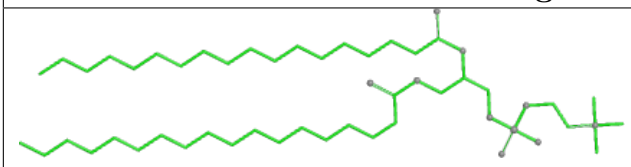
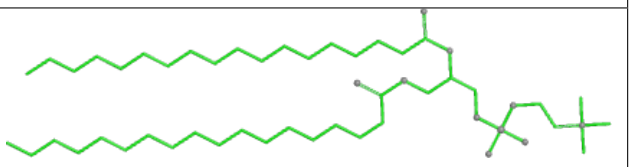

Rings

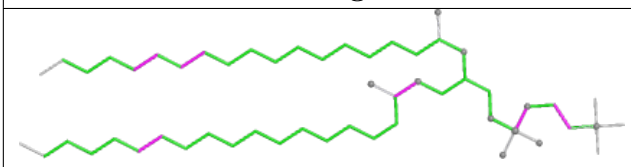
Ligand PC1 i 201



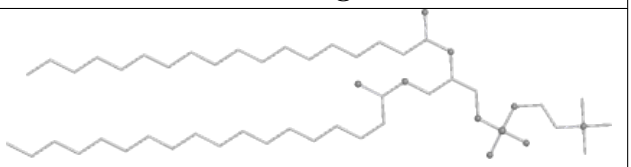
Bond lengths



Bond angles

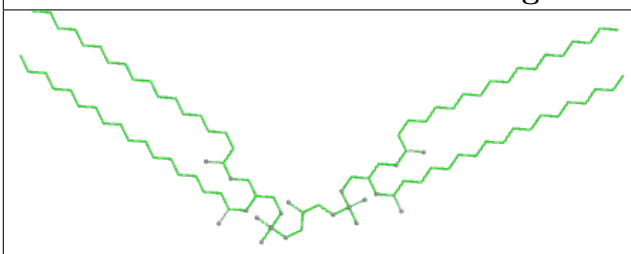


Torsions

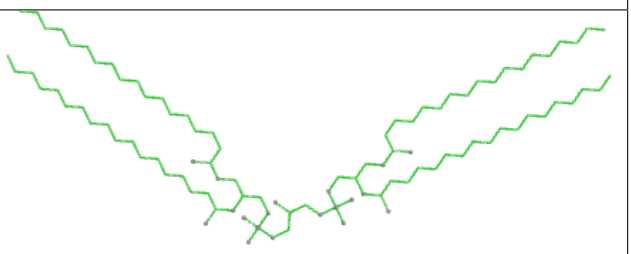


Rings

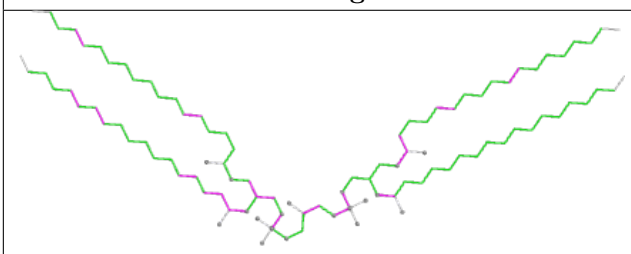
Ligand CDL m 202



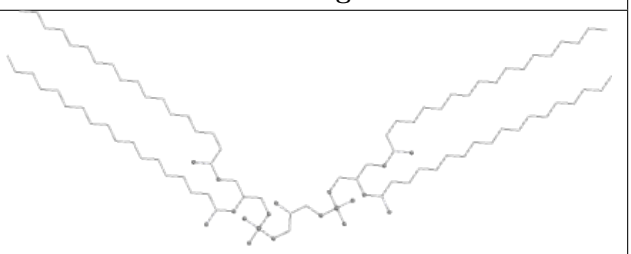
Bond lengths



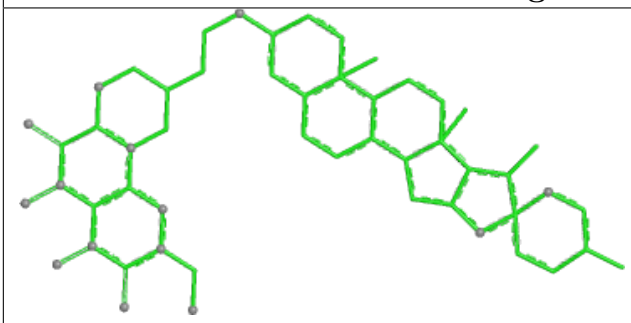
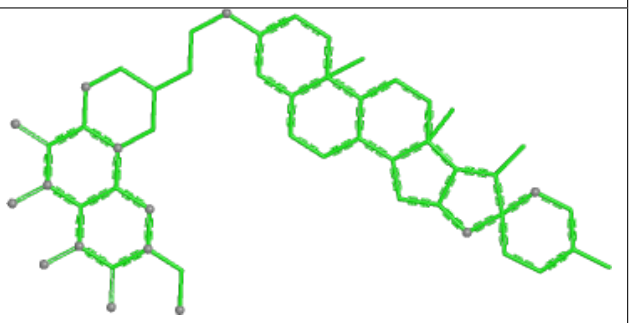
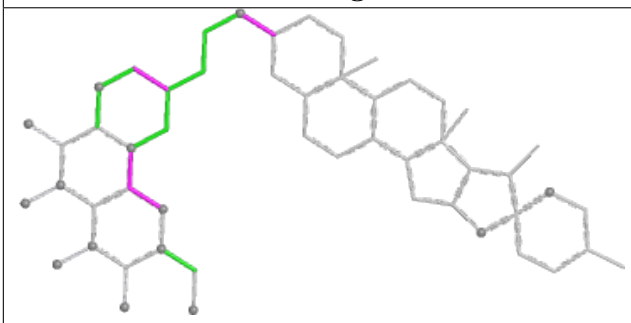
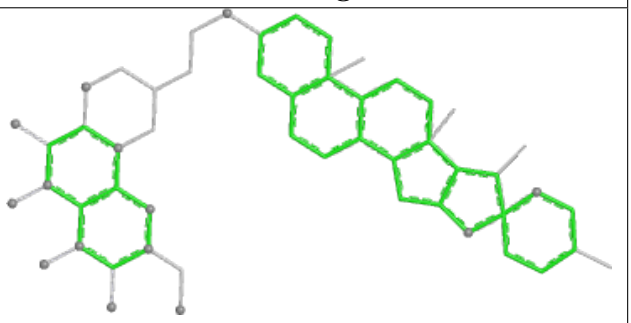
Bond angles

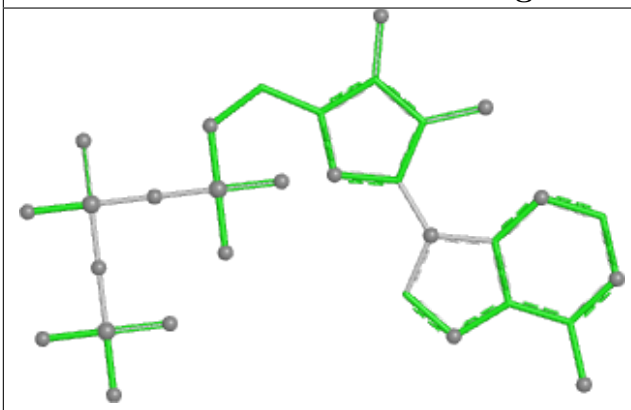
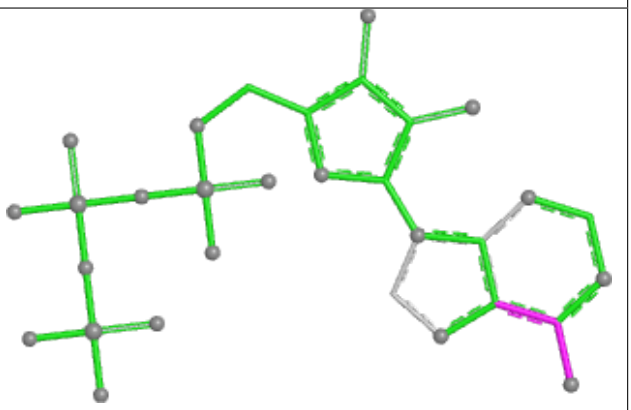
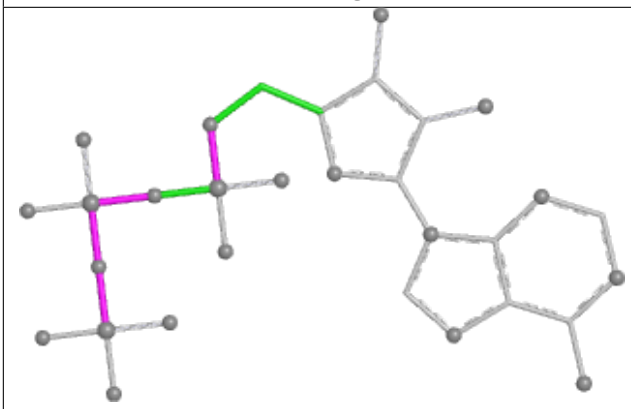
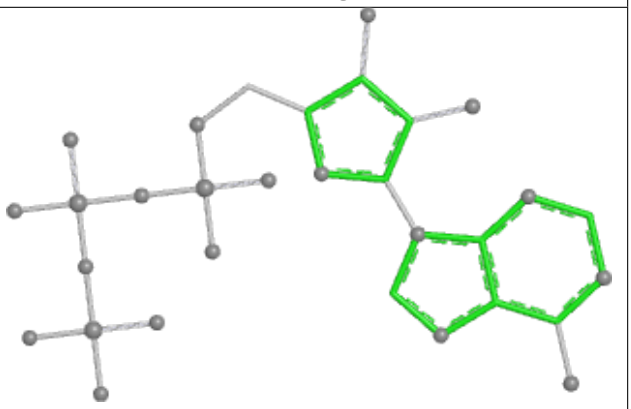


Torsions

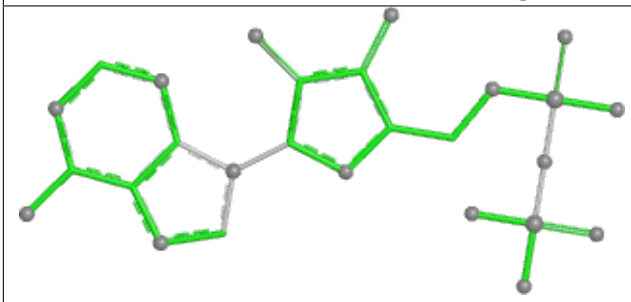


Rings

Ligand Q7G n 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ATP A1 601	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ADP E1 601



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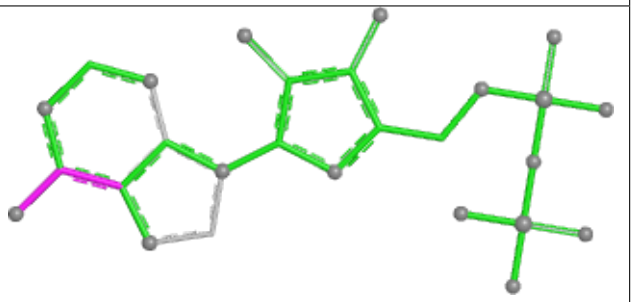

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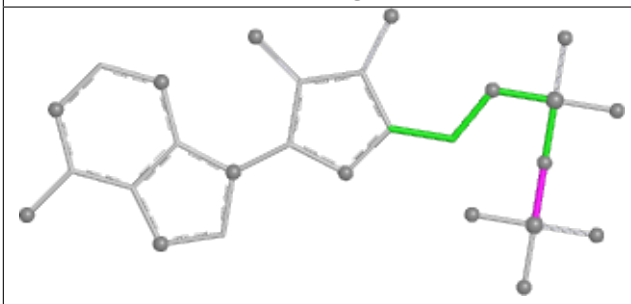

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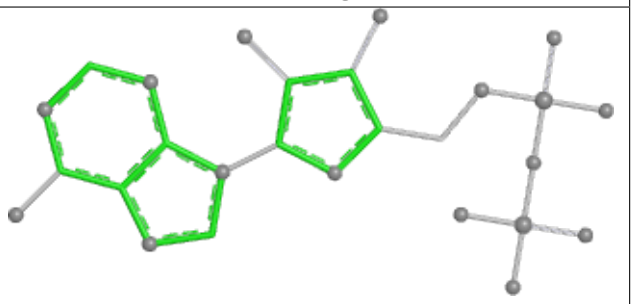
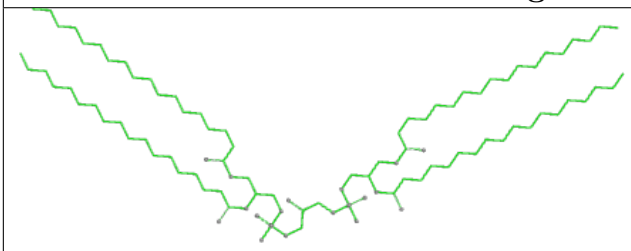


Rings

Ligand CDL q 102



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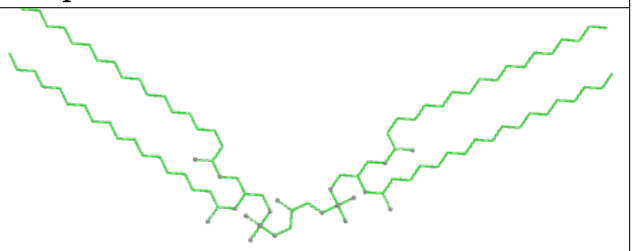

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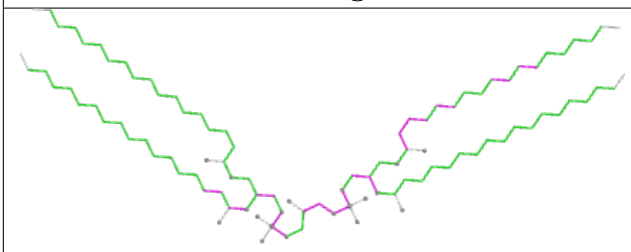

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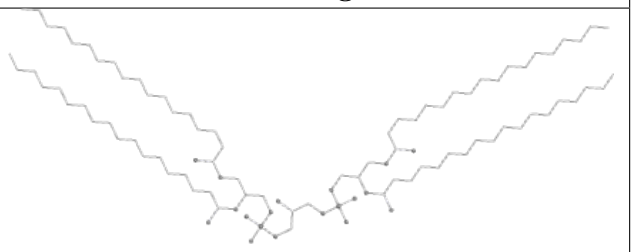
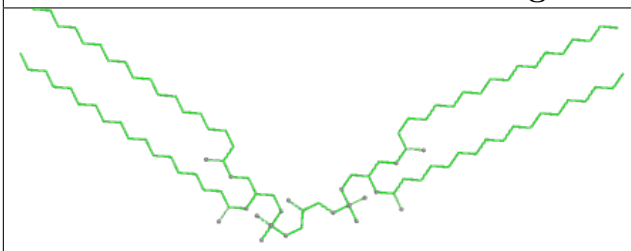


Rings

Ligand CDL e 401



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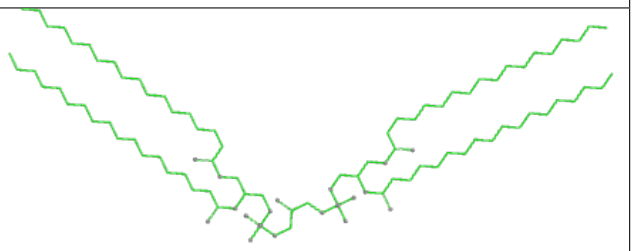

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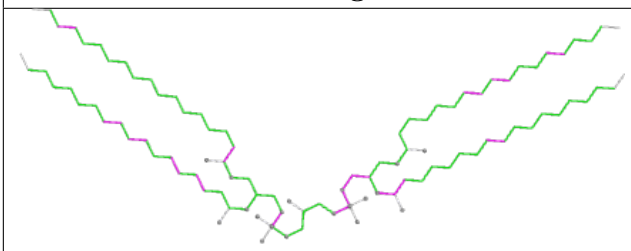

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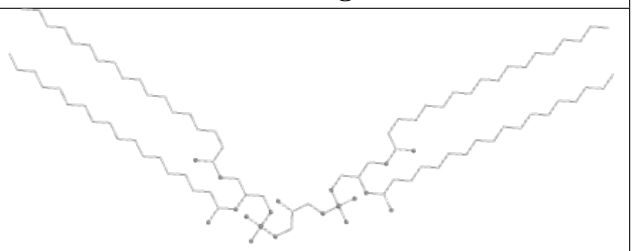
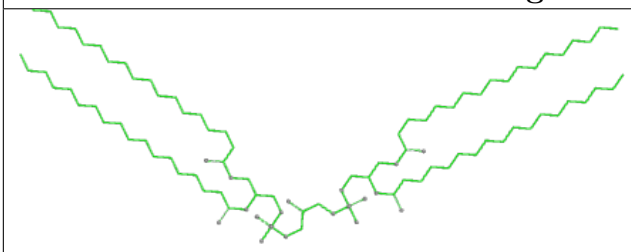


Rings

Ligand CDL L 101



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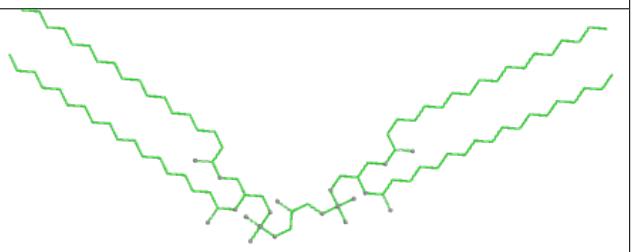

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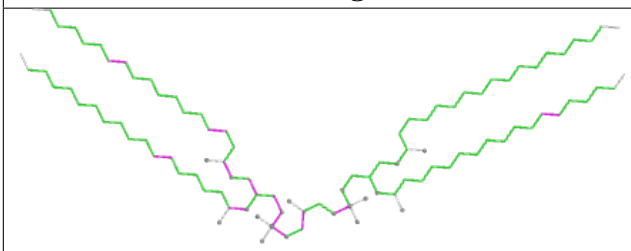

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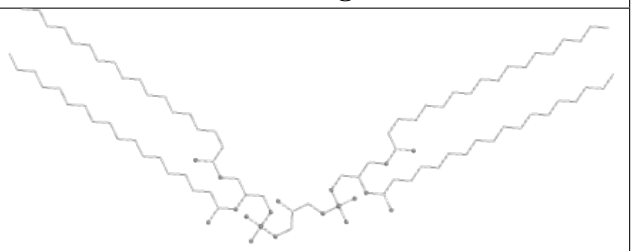
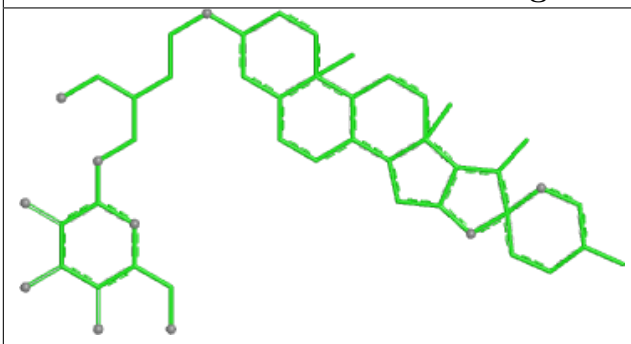


Rings

Ligand Q7G e 407



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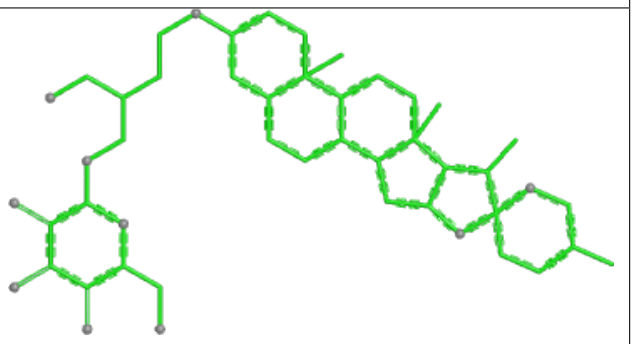

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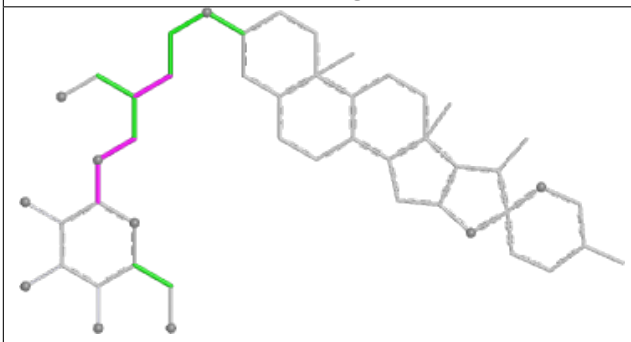

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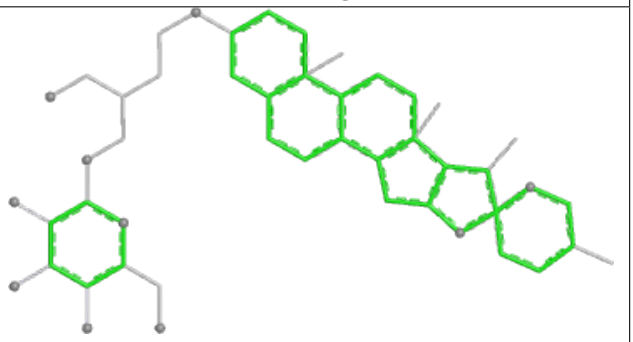
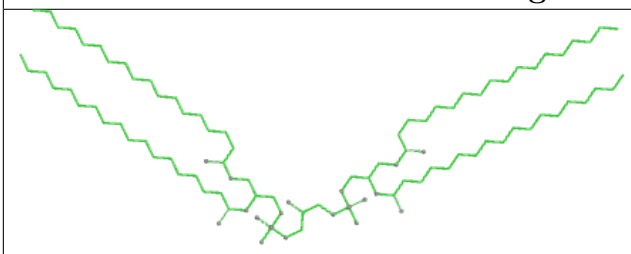


Rings

Ligand CDL e 405



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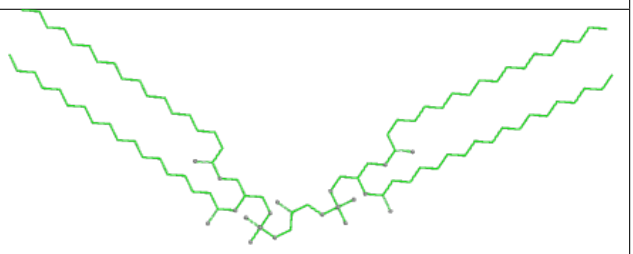

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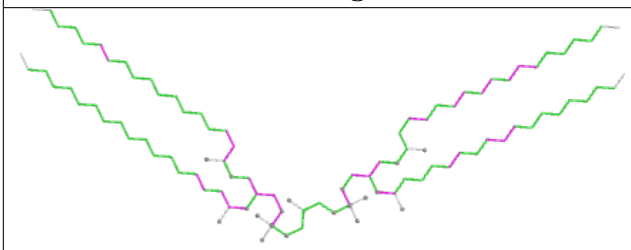

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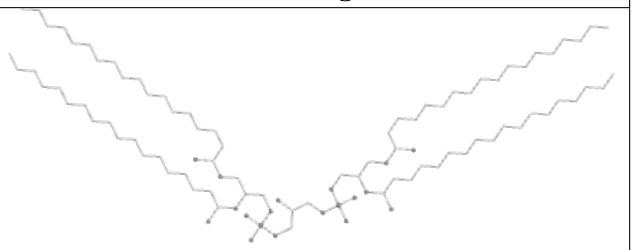
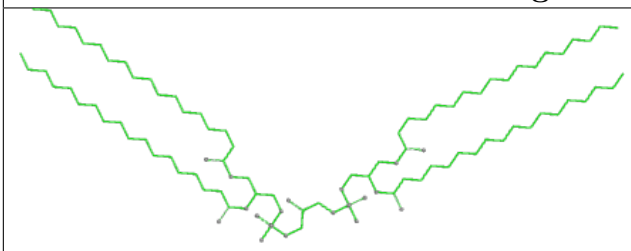


Rings

Ligand CDL f 201



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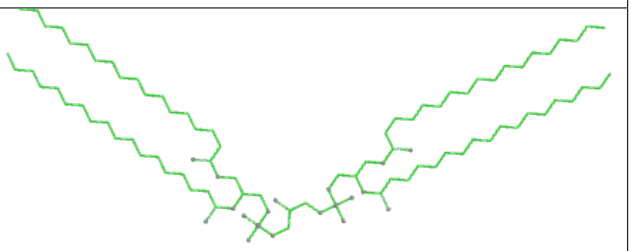

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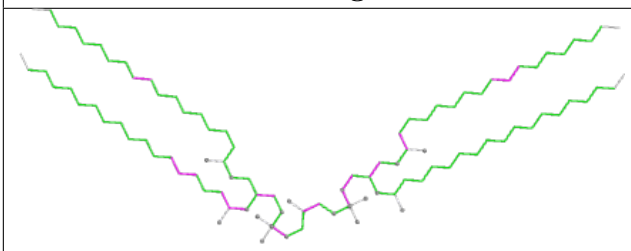

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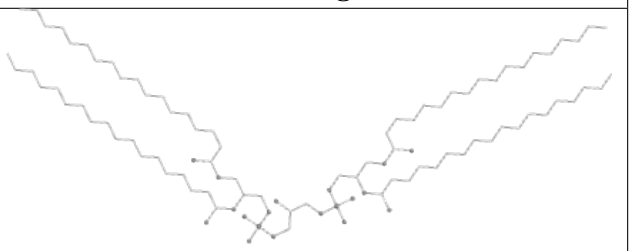
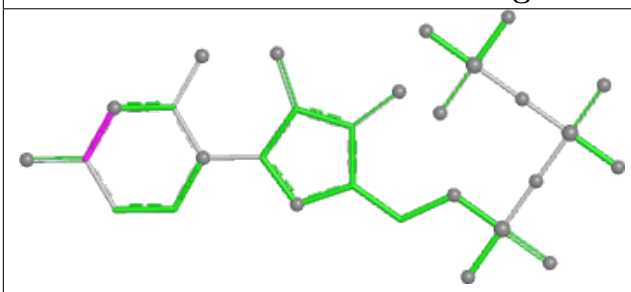


Rings

Ligand UTP G1 401



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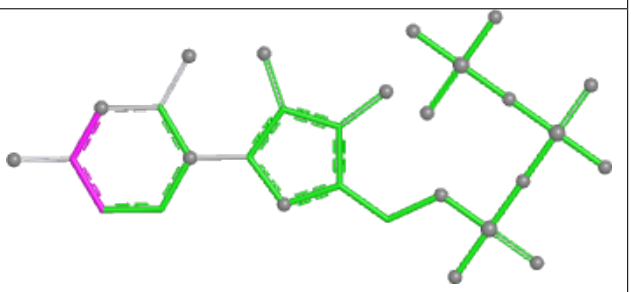
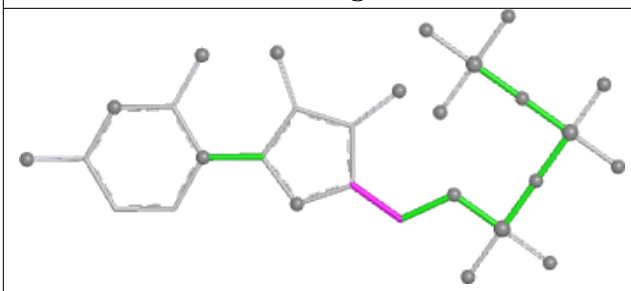


Bond angles



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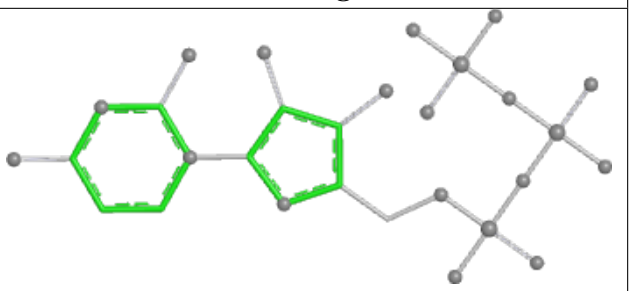
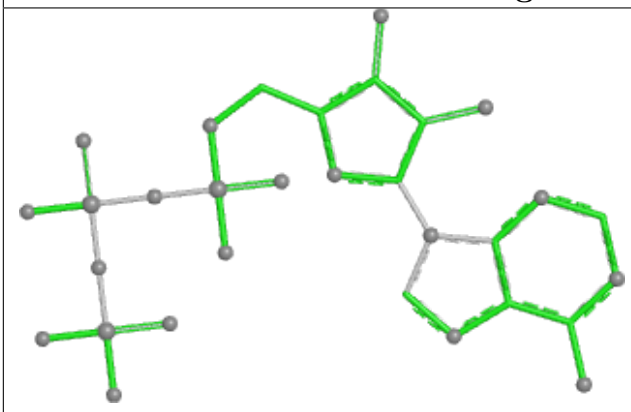
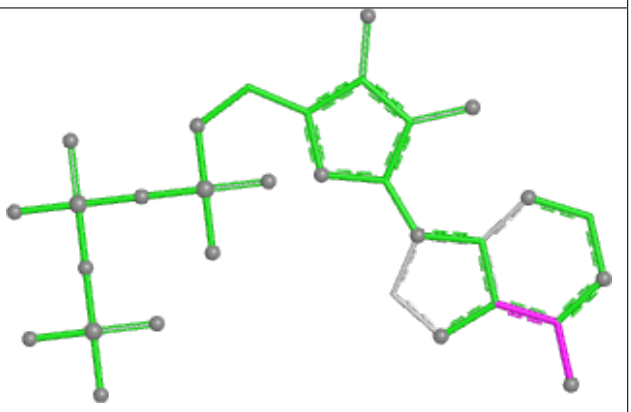
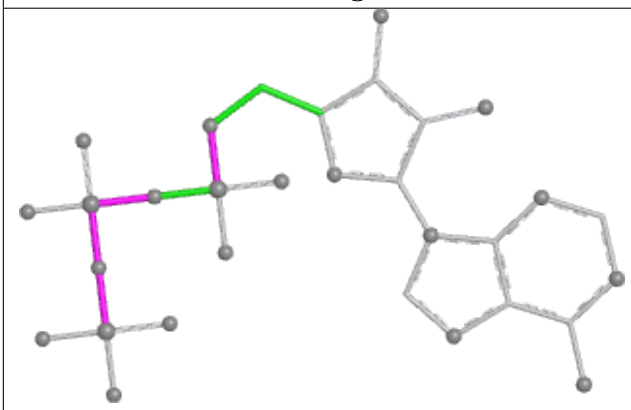
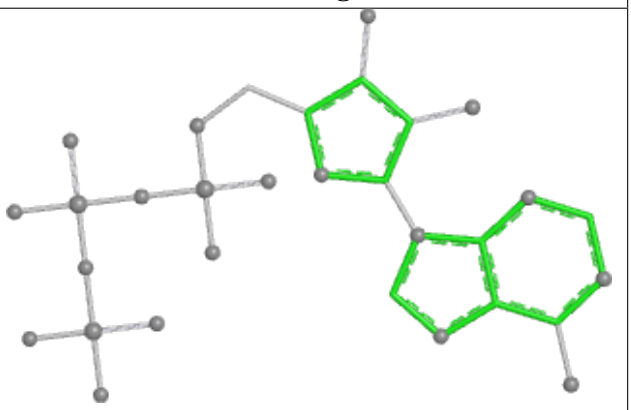


Rings

Ligand ATP C1 601	
 Bond lengths	 Bond angles
 Torsions	 Rings

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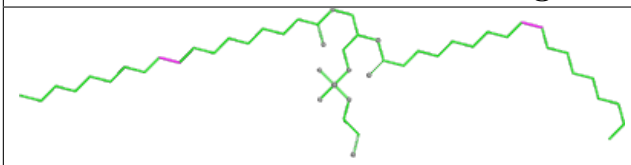
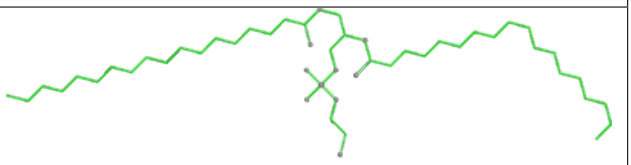
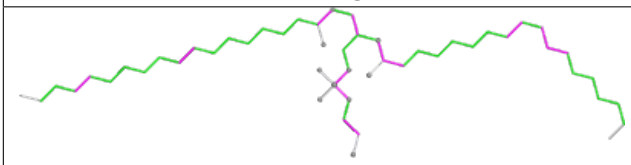
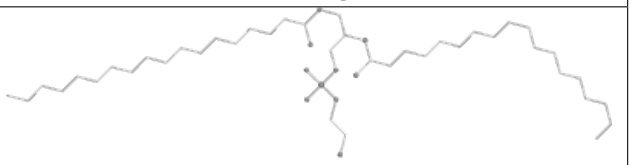
 Bond lengths	 Bond angles
 Torsions	 Rings

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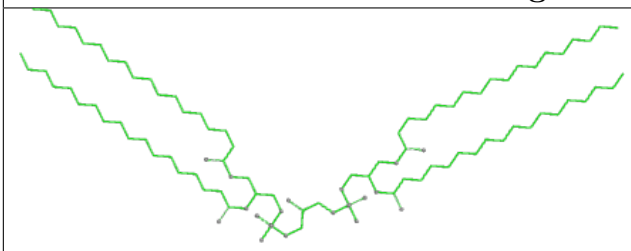
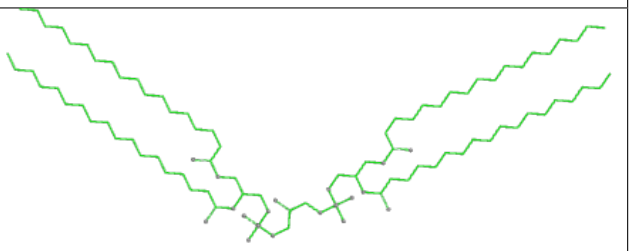
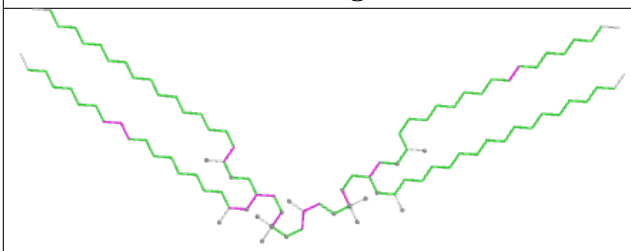
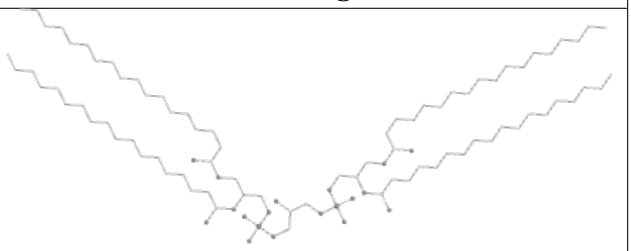
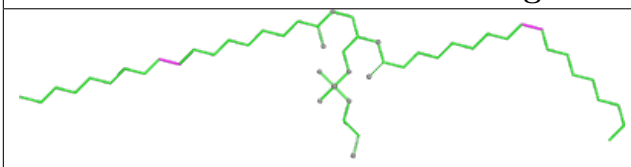
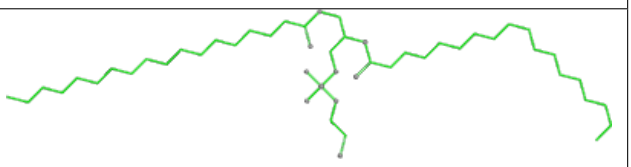
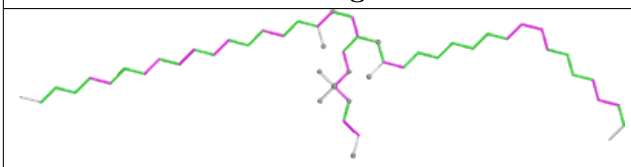
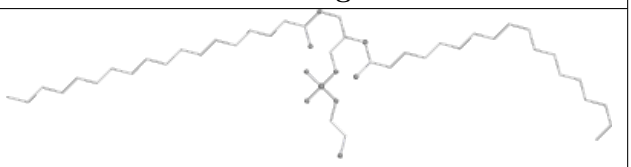
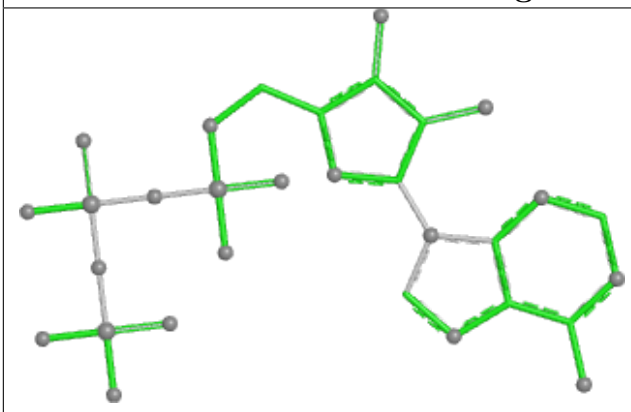
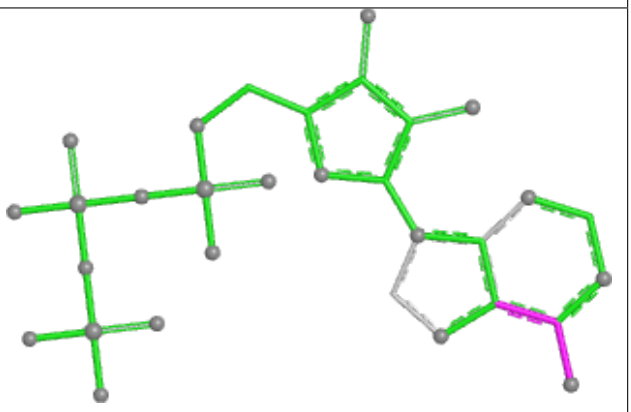
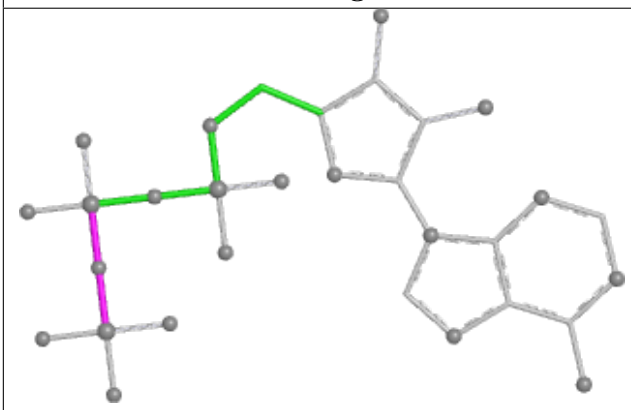
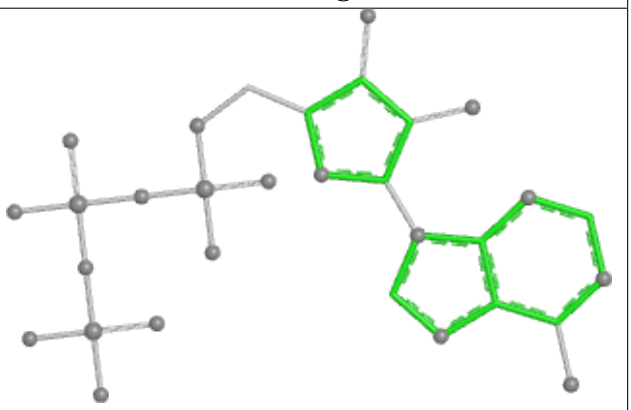
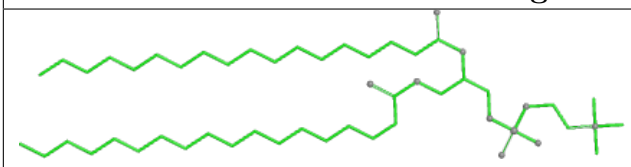
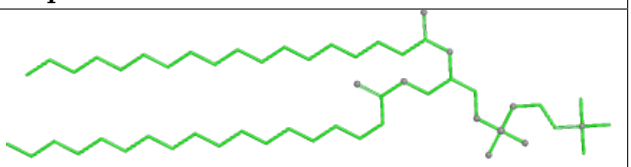
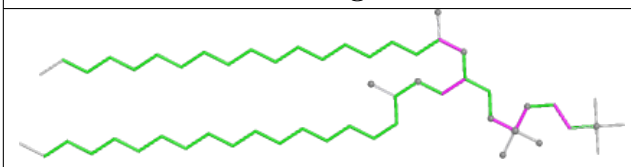
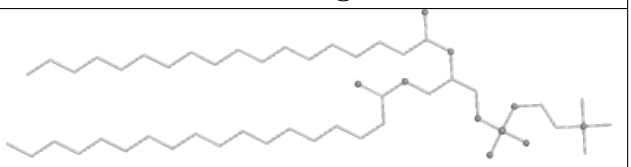
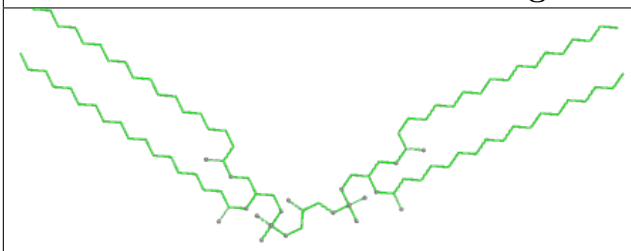
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PEE m 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

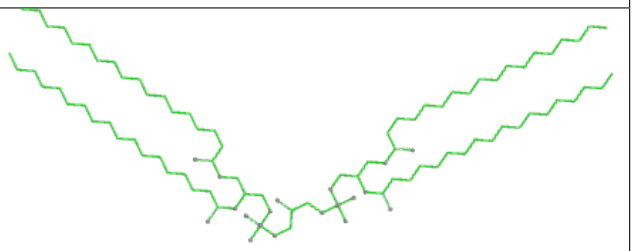
Ligand ATP D1 601	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand PC1 p 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

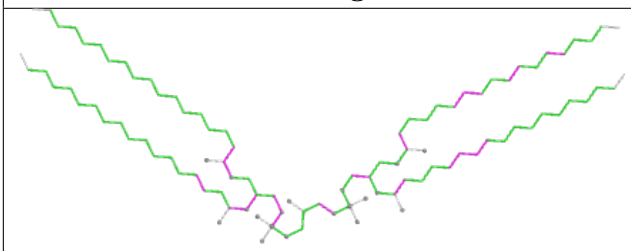
Ligand CDL e 402



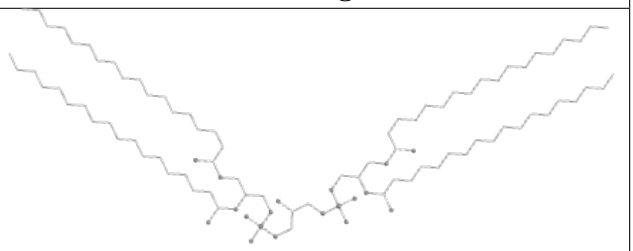
Bond lengths



Bond angles

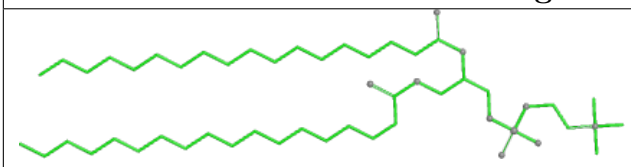


Torsions

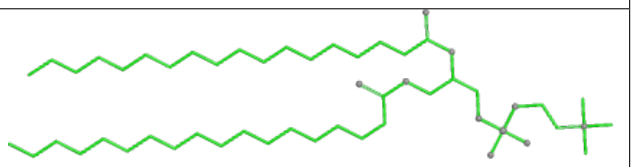


Rings

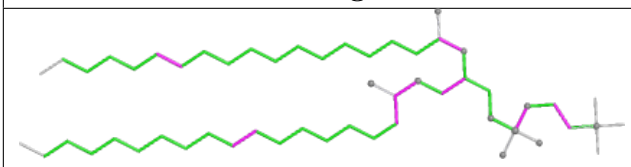
Ligand PC1 f 203



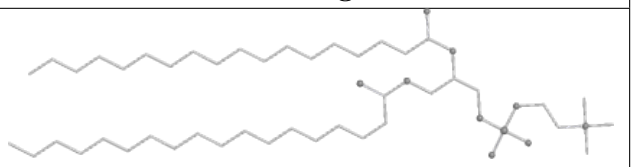
Bond lengths



Bond angles

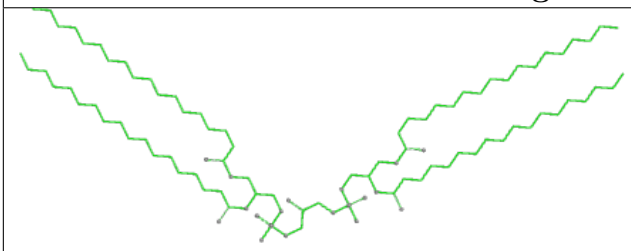


Torsions

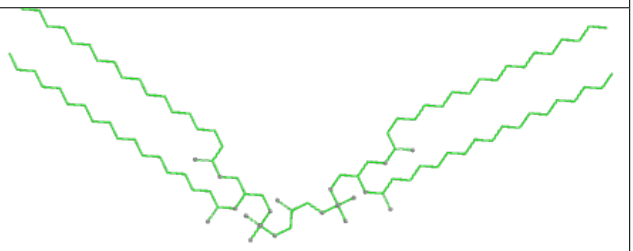


Rings

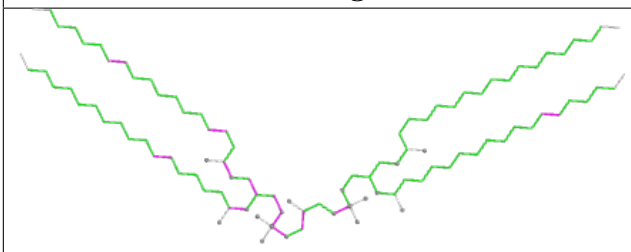
Ligand CDL l 101



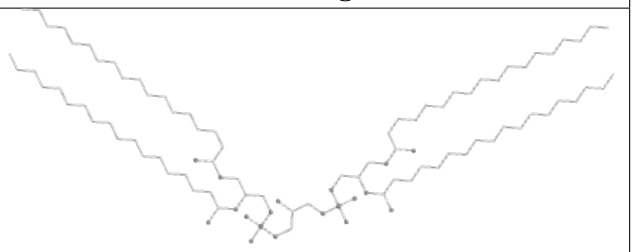
Bond lengths



Bond angles

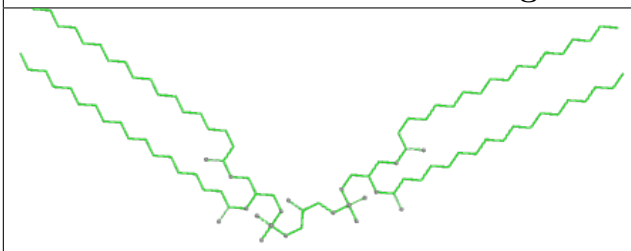


Torsions

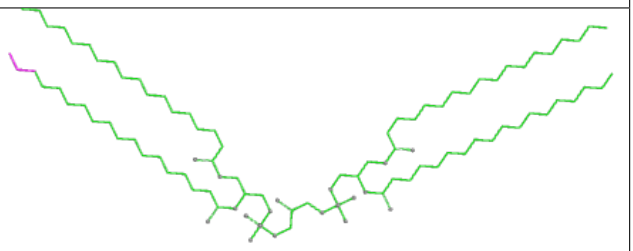


Rings

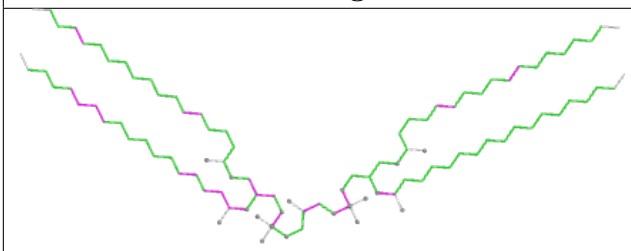
Ligand CDL M 201



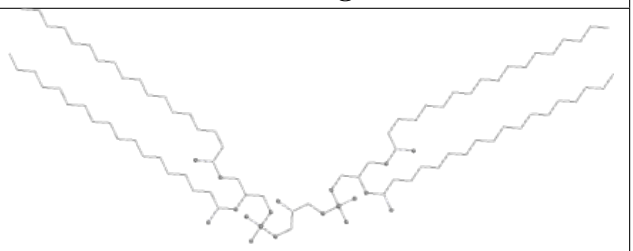
Bond lengths



Bond angles

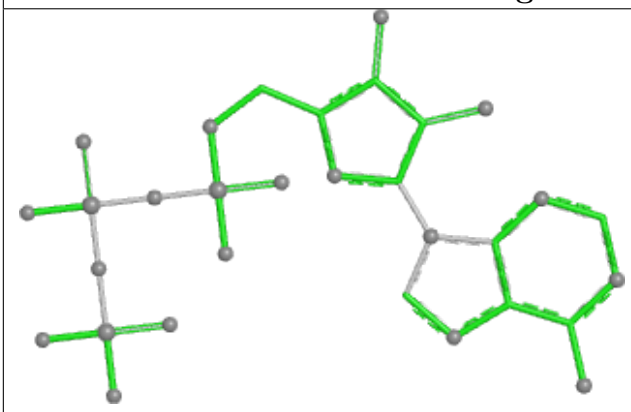


Torsions

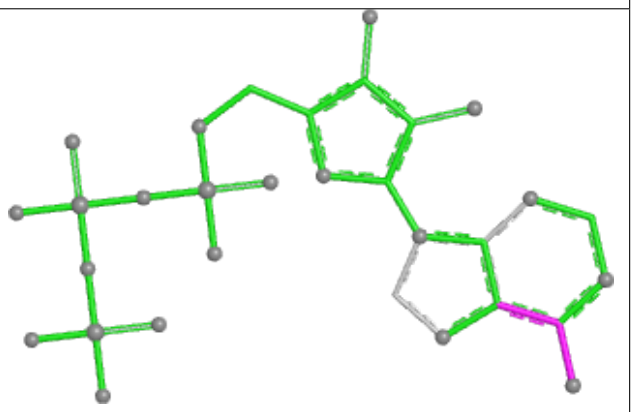


Rings

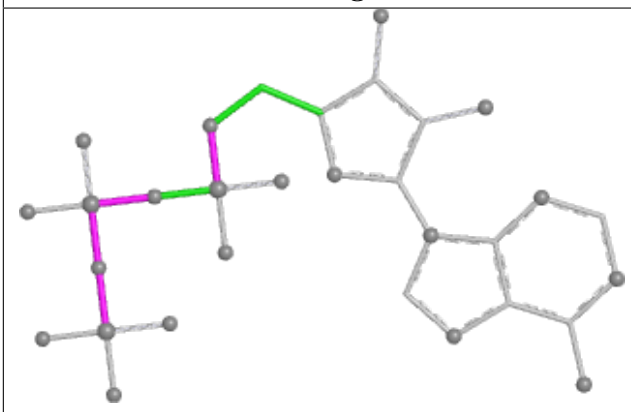
Ligand ATP B1 601



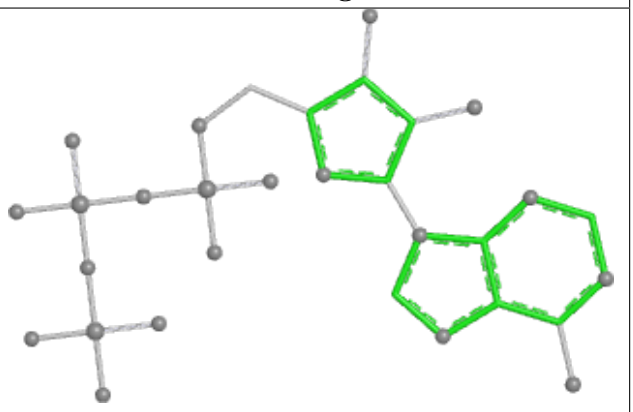
Bond lengths



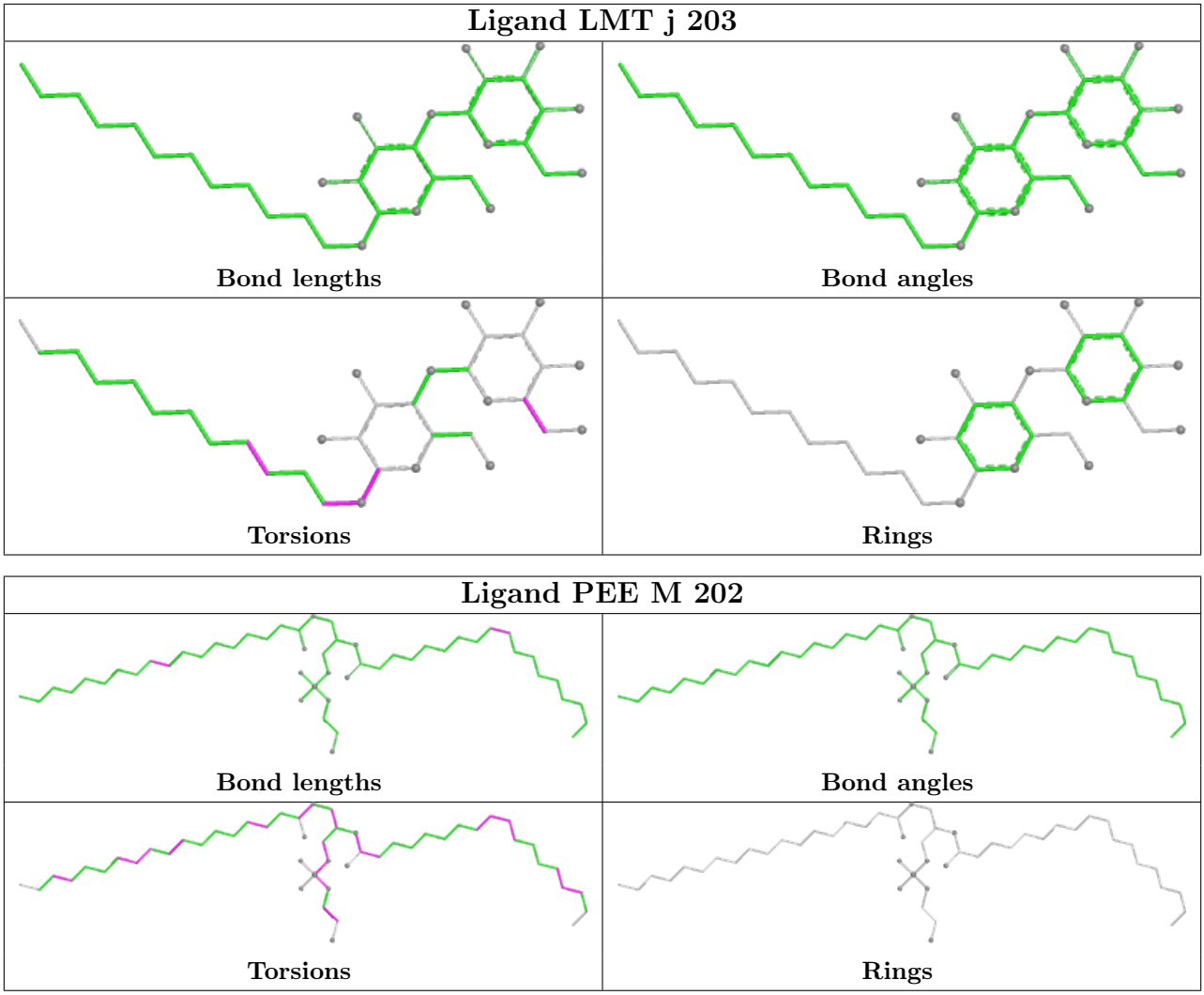
Bond angles



Torsions



Rings



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

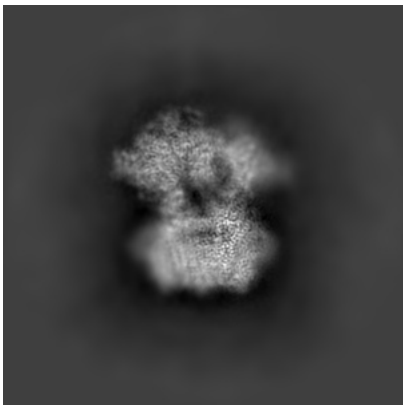
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-15568. These allow visual inspection of the internal detail of the map and identification of artifacts.

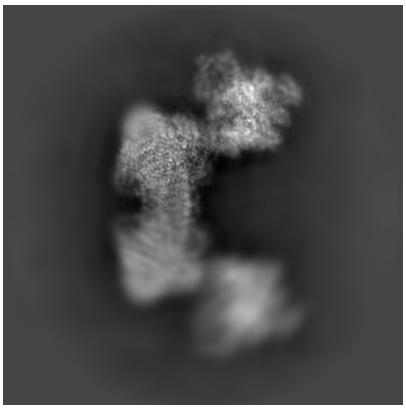
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

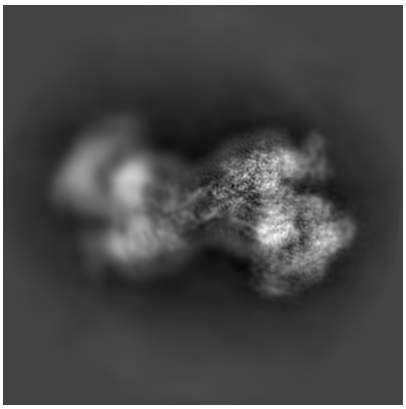
6.1.1 Primary map



X

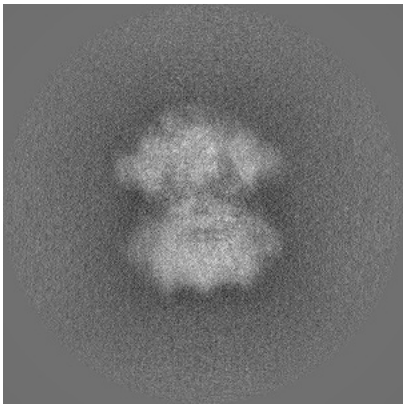


Y

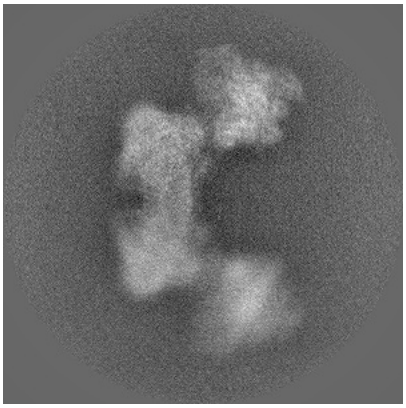


Z

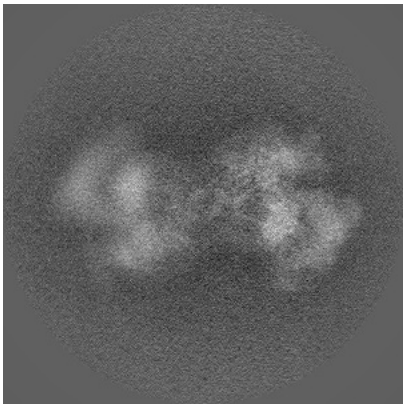
6.1.2 Raw map



X



Y

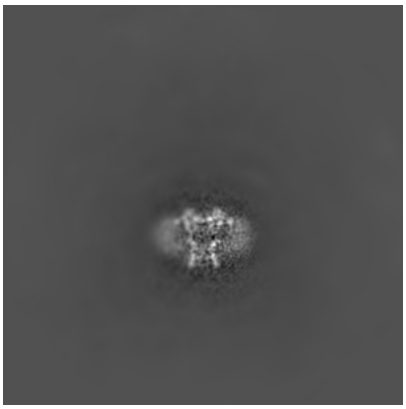


Z

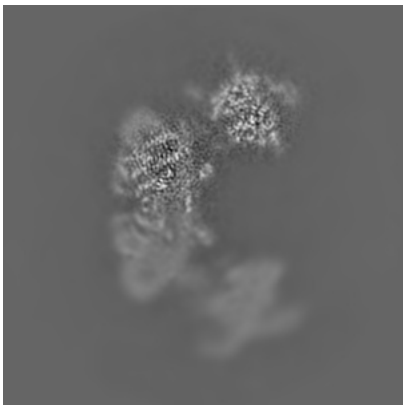
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

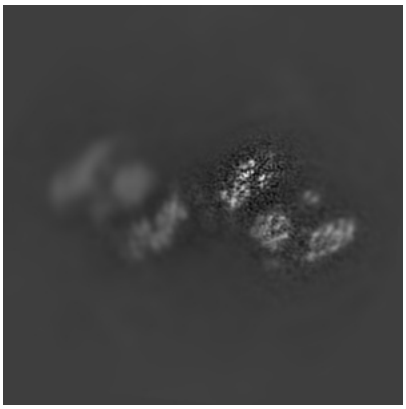
6.2.1 Primary map



X Index: 280

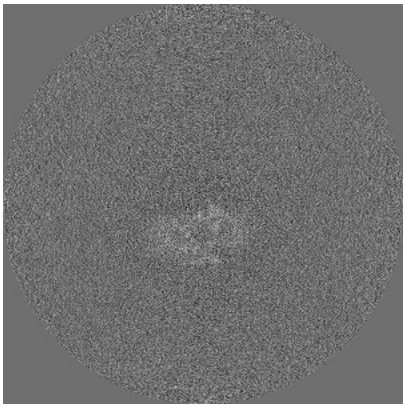


Y Index: 280

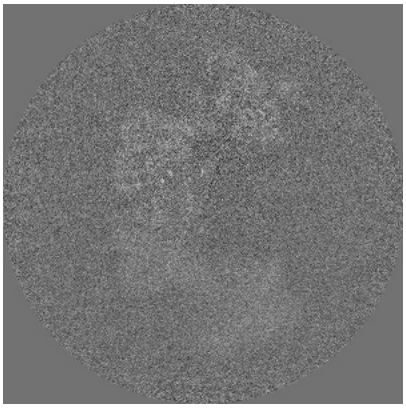


Z Index: 280

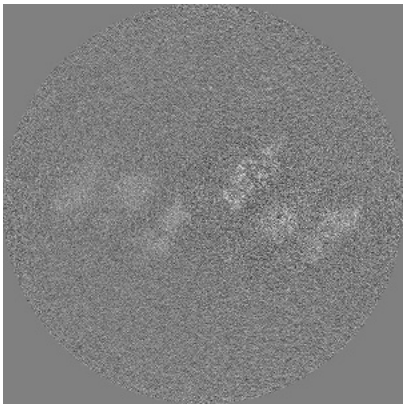
6.2.2 Raw map



X Index: 280



Y Index: 280

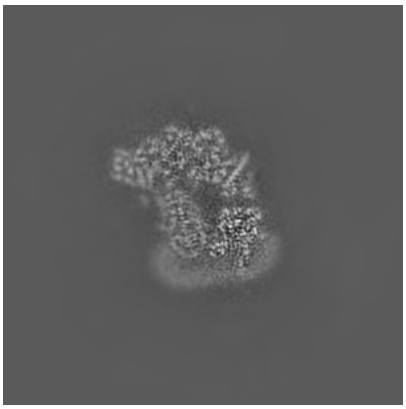


Z Index: 280

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

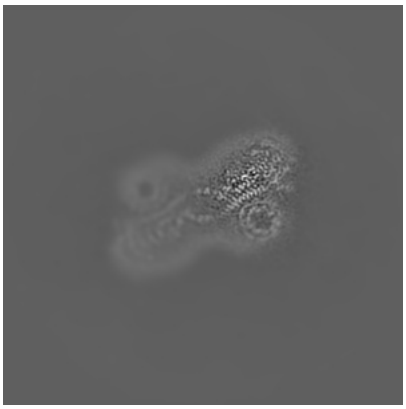
6.3 Largest variance slices (i)

6.3.1 Primary map



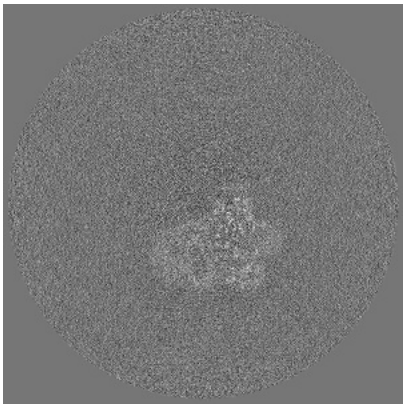
X Index: 378

Y Index: 319

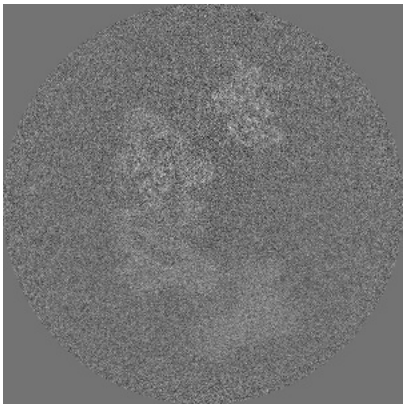


Z Index: 233

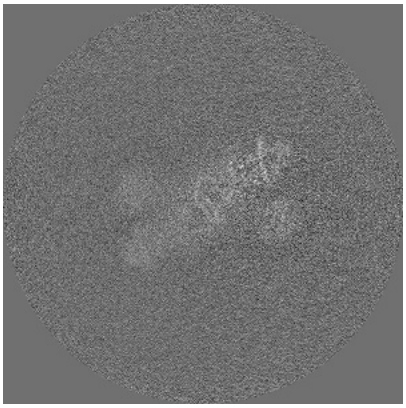
6.3.2 Raw map



X Index: 347



Y Index: 288



Z Index: 259

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

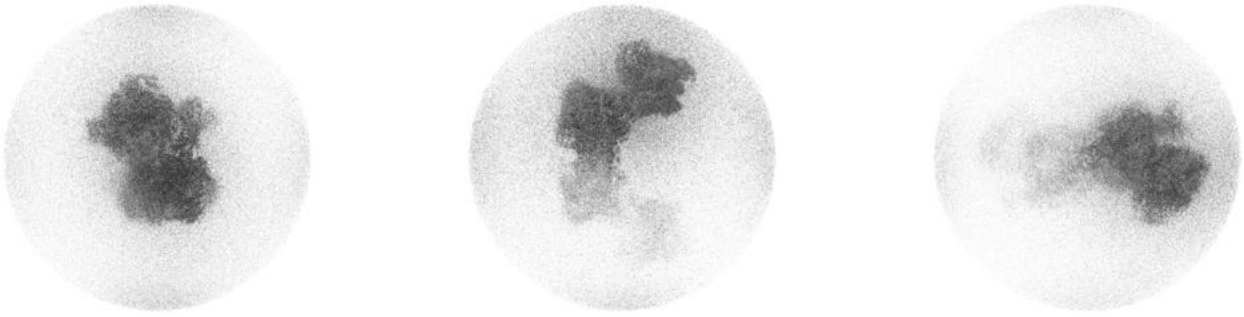
6.4 Orthogonal surface views (i)

6.4.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.012. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 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.

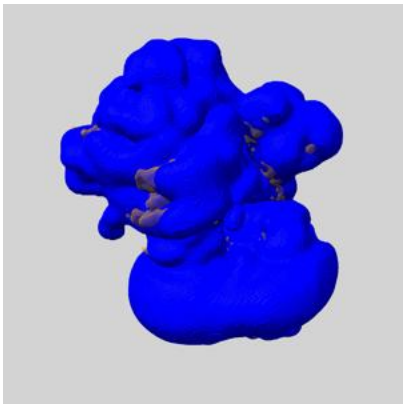
6.5 Mask visualisation (i)

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

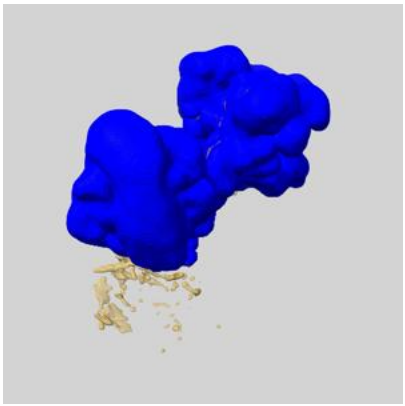
A mask typically either:

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

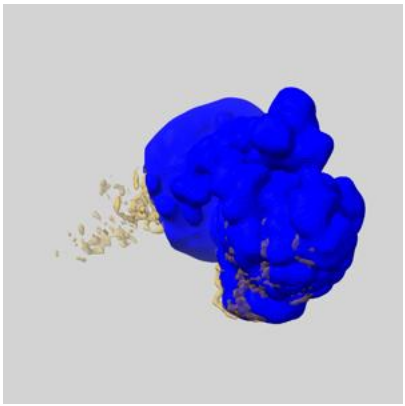
6.5.1 emd_15568_msk_1.map (i)



X



Y

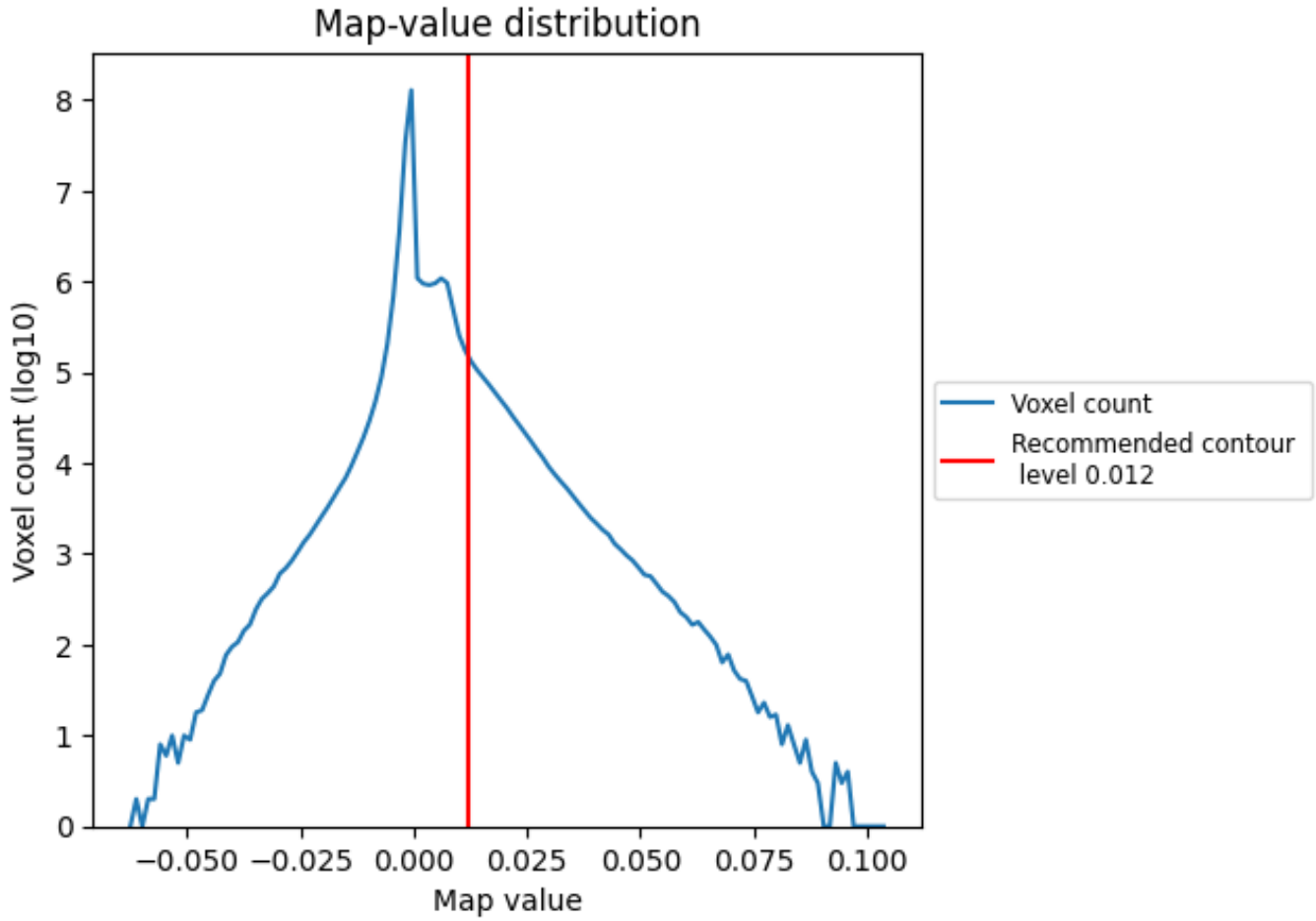


Z

7 Map analysis

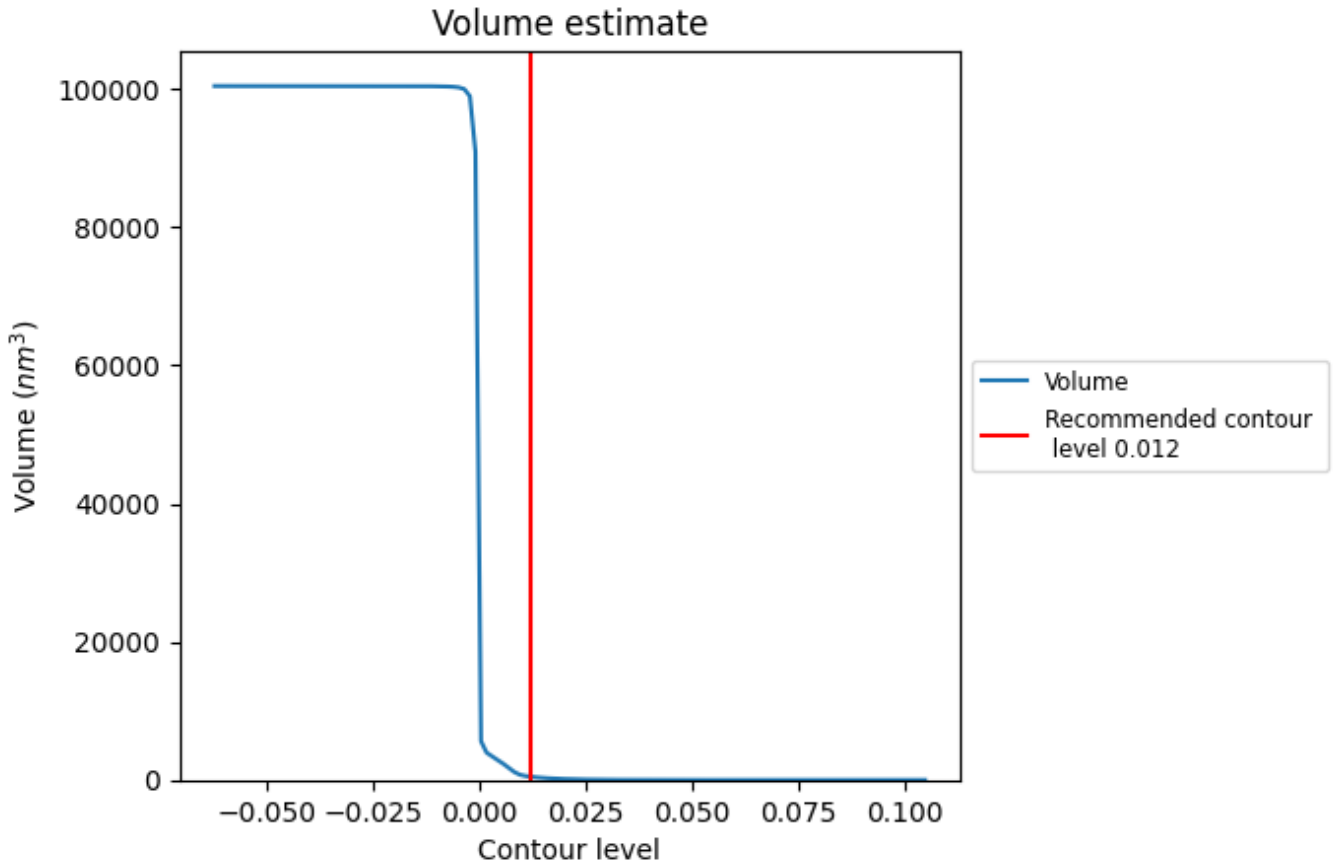
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

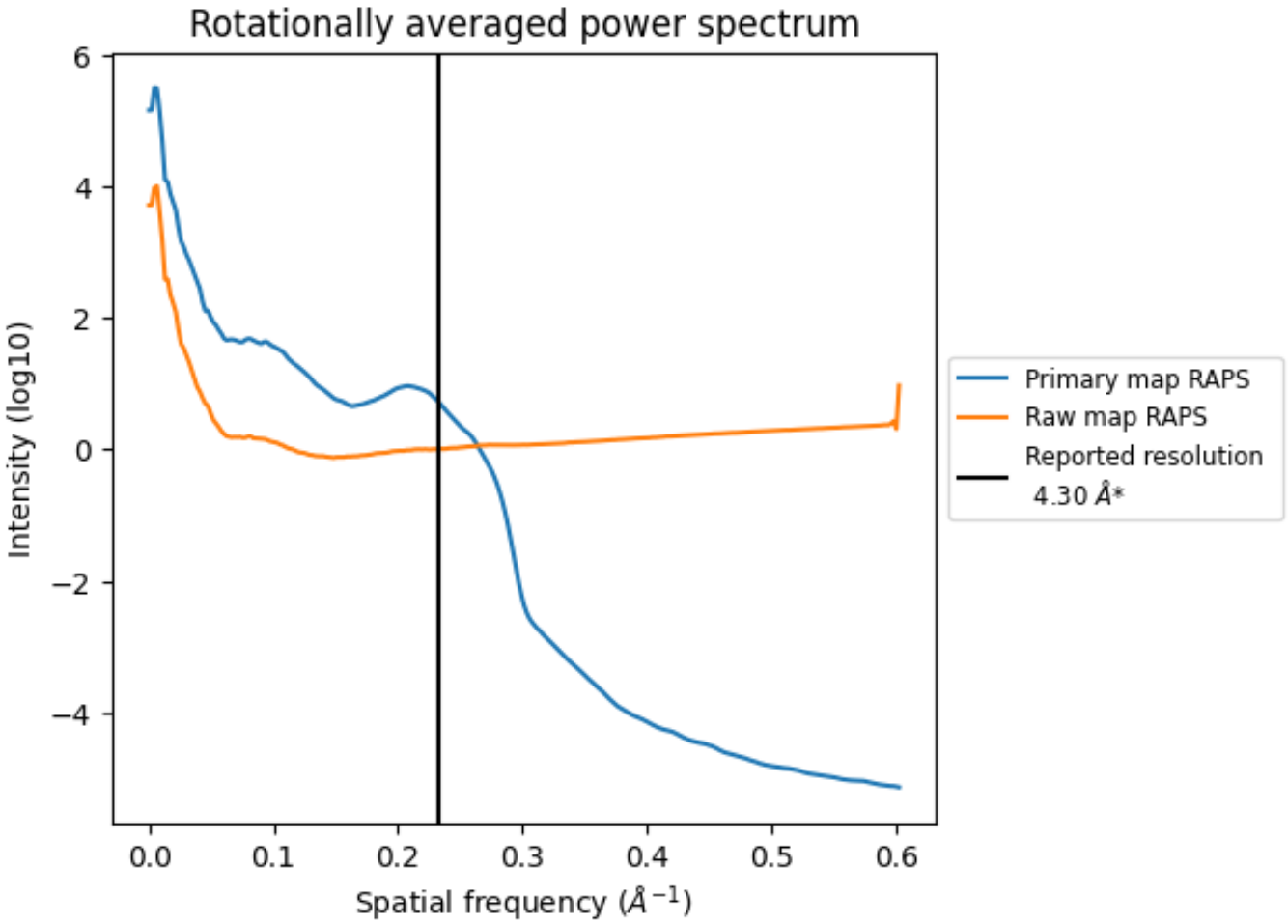
7.2 Volume estimate



The volume at the recommended contour level is 465 nm^3; this corresponds to an approximate mass of 420 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)

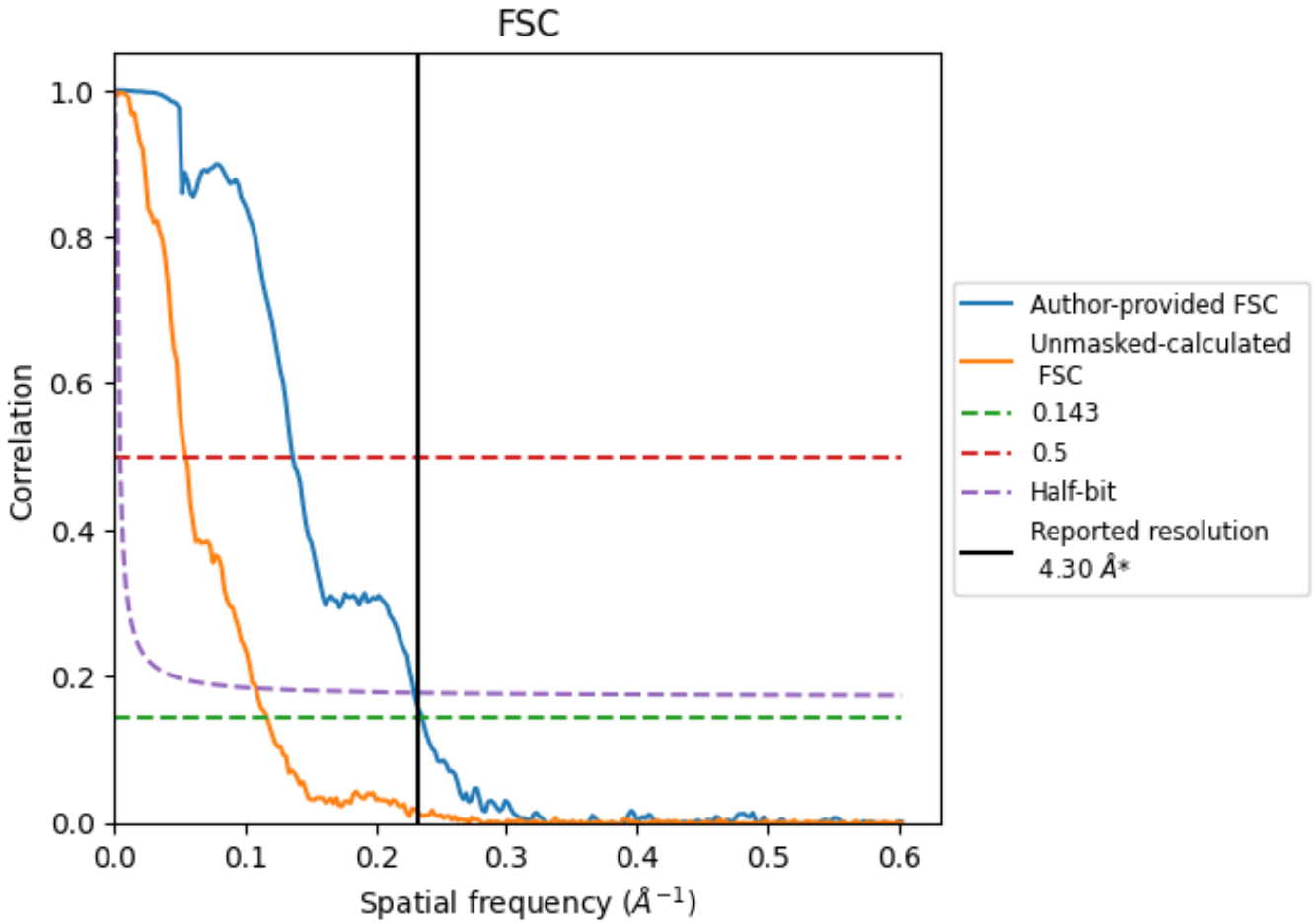


*Reported resolution corresponds to spatial frequency of 0.233 Å^{-1}

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 0.233 Å^{-1}

8.2 Resolution estimates (i)

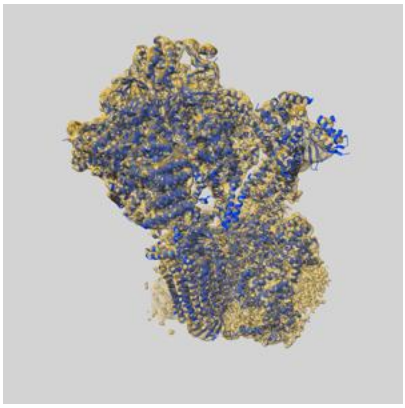
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.30	-	-
Author-provided FSC curve	4.25	7.33	4.36
Unmasked-calculated*	8.57	18.48	9.24

*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 8.57 differs from the reported value 4.3 by more than 10 %

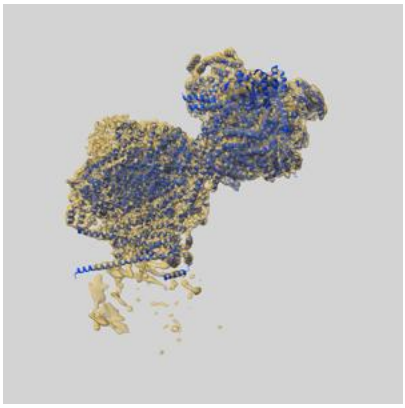
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-15568 and PDB model 8APF. Per-residue inclusion information can be found in section 3 on page 16.

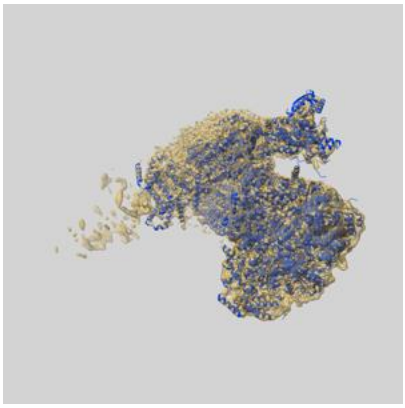
9.1 Map-model overlay



X



Y



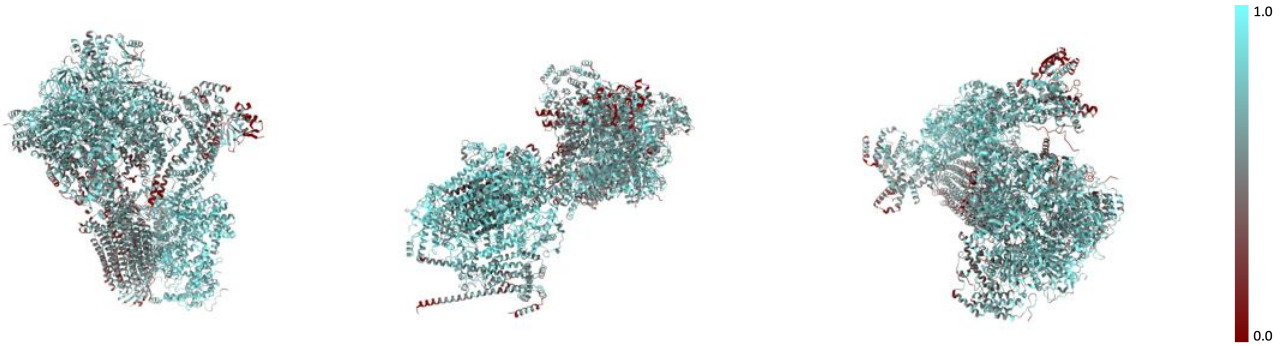
Z

The images above show the 3D surface view of the map at the recommended contour level 0.012 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

This section was not generated.

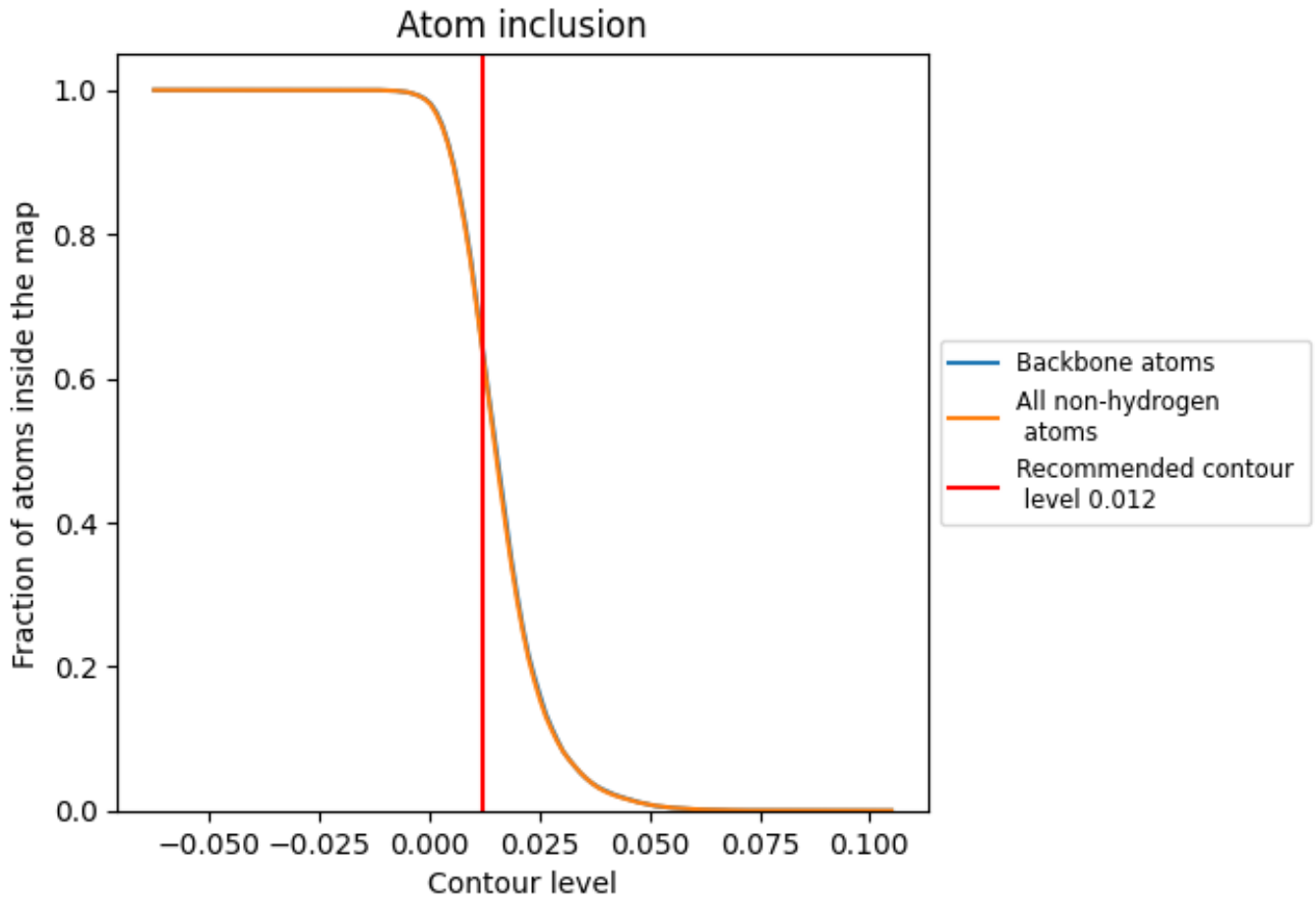
9.3 Atom inclusion mapped to coordinate model



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 (0.012).

9.4 Atom inclusion (i)



At the recommended contour level, 65% of all backbone atoms, 64% 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 (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	0.6410
A1	0.6597
B1	0.6626
C1	0.7208
D1	0.6689
E1	0.6618
F1	0.6361
G1	0.5512
H1	0.5040
I1	0.4845
J1	0.5820
K1	0.6451
L	0.4559
L1	0.5804
M	0.4149
M1	0.5824
O1	0.5098
P1	0.4528
Q1	0.4688
R1	0.5758
S1	0.6239
T1	0.6096
U1	0.5365
V1	0.5169
W1	0.4902
X1	0.5205
a	0.7968
c	0.7591
d	0.6781
e	0.7636
f	0.7735
g	0.4375
h	0.5426
i	0.8284
j	0.7505

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Chain	Atom inclusion
k	0.7530
l	0.3981
m	0.5281
n	0.8240
o	0.7817
p	0.7004
q	0.7503
r	0.7657