Full wwPDB EM Validation Report ⓘ

Oct 26, 2026 – 03:10 PM EDT

PDB ID	:	9OCS / pdb_00009ocs
EMDB ID	:	EMD-70330
Title	:	High-resolution cryo-EM structure of the CIII2CIV1 respiratory supercomplex from Bacillus subtilis (composite)
Authors	:	Zheng, W.; Gu, M.; Zong, Y.; Zhu, J.; Zhang, K.
Deposited on	:	2025-04-25
Resolution	:	2.00 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:

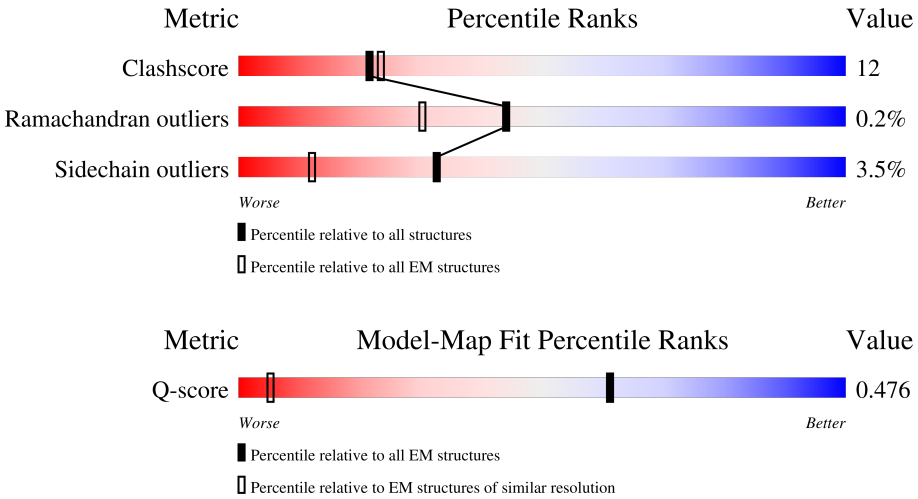
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.2
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

1 Overall quality at a glance

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

The reported resolution of this entry is 2.00 Å.

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



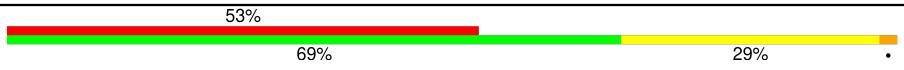
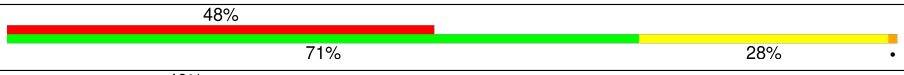
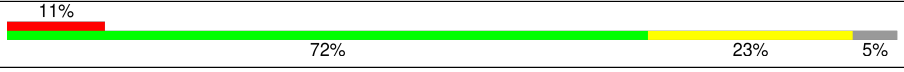
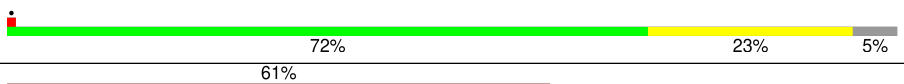
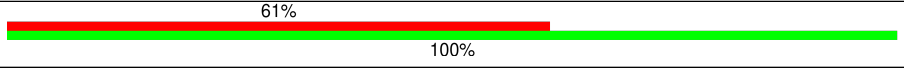
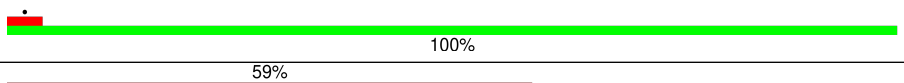
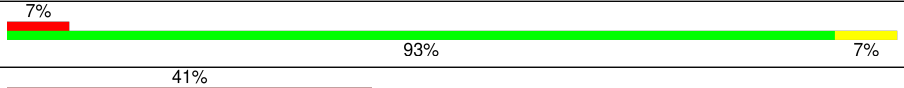
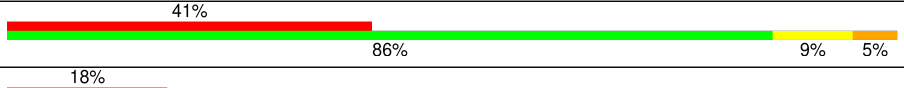
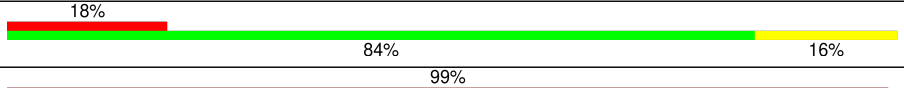
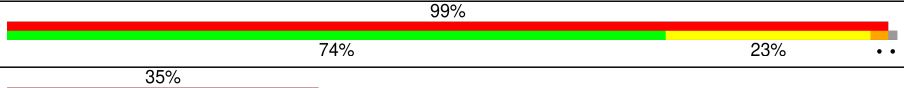
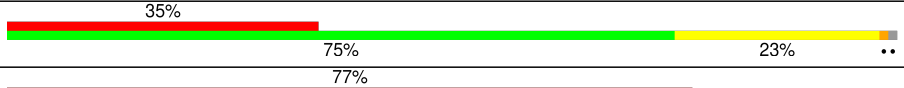
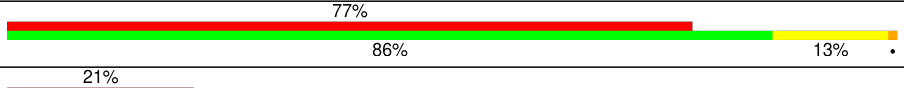
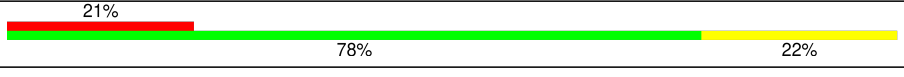
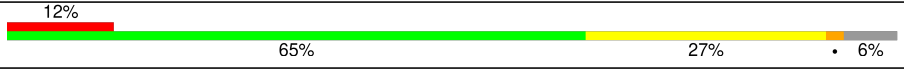
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	1659 (1.50 - 2.50)

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

Mol	Chain	Length	Quality of chain
1	A	167	74% 67% 29% • •
1	a	167	68% 63% 30% • 5%
2	B	224	7% 66% 33% •
2	b	224	5% 67% 31% •

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Mol	Chain	Length	Quality of chain
3	C	255	
3	c	255	
4	D	57	
4	d	57	
5	E	81	
5	e	81	
6	F	23	
6	f	23	
7	G	29	
7	g	29	
8	H	44	
8	h	44	
9	I	120	
9	i	120	
10	J	120	
11	K	110	
12	L	207	
13	M	622	
14	N	356	

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
15	FES	A	201	-	-	X	-
16	HEC	B	301	X	-	-	-
16	HEC	C	302	X	-	-	-
16	HEC	J	201	X	-	-	-
16	HEC	N	401	X	-	-	-

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
16	HEC	b	301	X	-	-	-
16	HEC	c	302	X	-	-	-
22	HAS	M	701	X	-	-	-
22	HAS	M	702	X	-	-	-
26	CUA	N	402	-	-	X	-

2 Entry composition (i)

There are 26 unique types of molecules in this entry. The entry contains 27762 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Menaquinol:cytochrome c reductase iron-sulfur subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	163	Total	C	N	O	S	0	0
			1290	825	216	239	10		
1	a	158	Total	C	N	O	S	0	0
			1255	804	208	234	9		

- Molecule 2 is a protein called Menaquinol:cytochrome c reductase cytochrome b subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	224	Total	C	N	O	S	0	0
			1804	1207	292	293	12		
2	b	224	Total	C	N	O	S	0	0
			1804	1207	292	293	12		

- Molecule 3 is a protein called Menaquinol:cytochrome c reductase cytochrome c subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	255	Total	C	N	O	S	0	0
			1986	1293	325	357	11		
3	c	255	Total	C	N	O	S	0	0
			1985	1292	325	357	11		

- Molecule 4 is a protein called YqgW.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	56	Total	C	N	O	S	0	0
			433	297	68	66	2		
4	d	56	Total	C	N	O	S	0	0
			433	297	68	66	2		

- Molecule 5 is a protein called YqgY.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	77	Total	C	N	O	S	0	0
			645	447	91	101	6		
5	e	77	Total	C	N	O	S	0	0
			645	447	91	101	6		

- Molecule 6 is a protein called QcrF.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	F	23	Total	C	N	O	0	0
			114	69	23	22		
6	f	23	Total	C	N	O	0	0
			114	69	23	22		

- Molecule 7 is a protein called QcrG.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	29	Total	C	N	O	S	0	0
			221	147	32	39	3		
7	g	29	Total	C	N	O	S	0	0
			221	147	32	39	3		

- Molecule 8 is a protein called YqzM.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	44	Total	C	N	O	S	0	0
			342	223	55	62	2		
8	h	44	Total	C	N	O	S	0	0
			342	223	55	62	2		

- Molecule 9 is a protein called YlbA.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	119	Total	C	N	O	S	0	0
			941	603	153	181	4		
9	i	119	Total	C	N	O	S	0	0
			941	603	153	181	4		

- Molecule 10 is a protein called Cytochrome c-550.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	120	Total	C	N	O	S	0	0
			895	567	147	176	5		

- Molecule 11 is a protein called Cytochrome c oxidase subunit 4B.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	110	Total	C	N	O	S	0	0
			894	604	141	144	5		

- Molecule 12 is a protein called Cytochrome c oxidase subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	207	Total	C	N	O	S	0	0
			1647	1104	251	282	10		

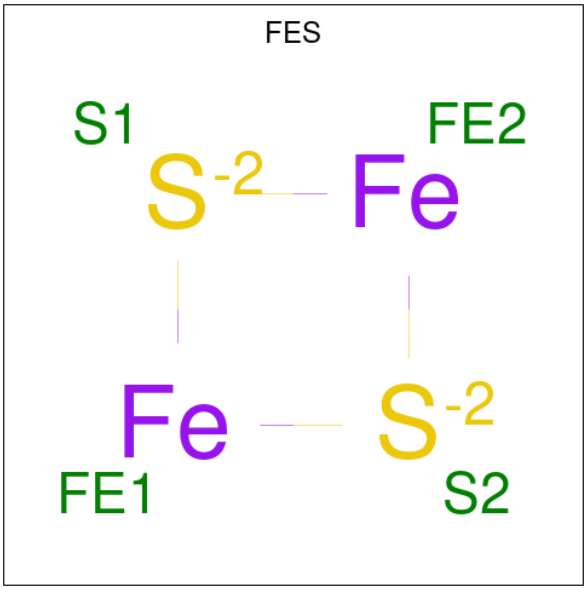
- Molecule 13 is a protein called Cytochrome c oxidase subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	603	Total	C	N	O	S	0	0
			4748	3206	745	771	26		

- Molecule 14 is a protein called Cytochrome c oxidase subunit 2.

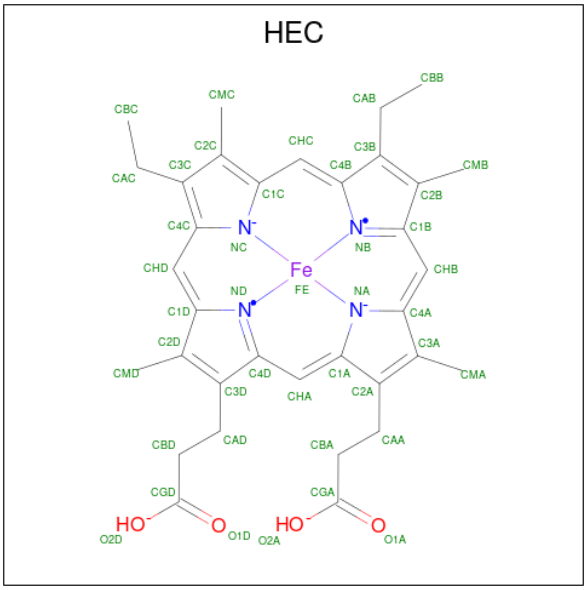
Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	335	Total	C	N	O	S	0	0
			2649	1704	437	496	12		

- Molecule 15 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).



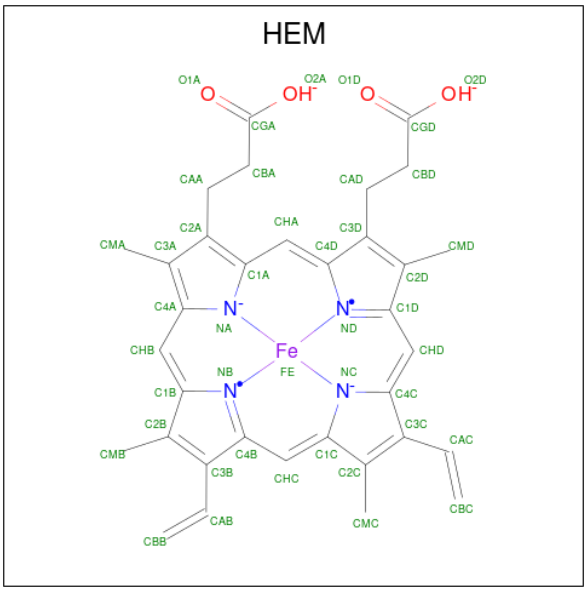
Mol	Chain	Residues	Atoms	AltConf
15	A	1	Total Fe S 4 2 2	0
15	a	1	Total Fe S 4 2 2	0

- Molecule 16 is HEME C (CCD ID: HEC) (formula: $C_{34}H_{36}FeN_4O_4$).



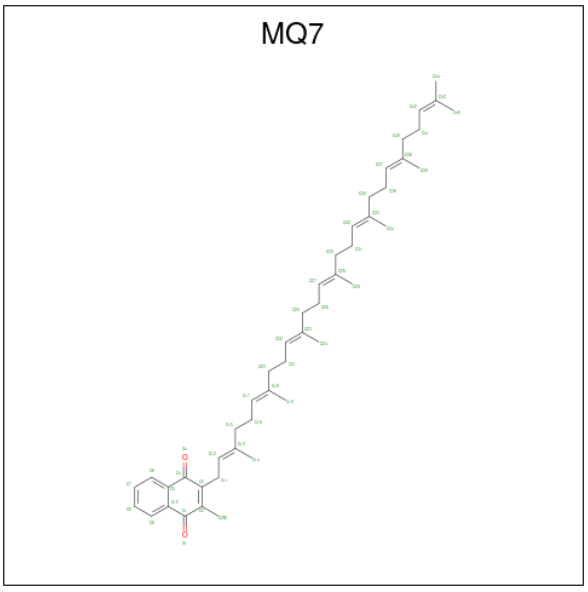
Mol	Chain	Residues	Atoms	AltConf
16	B	1	Total C Fe N O 43 34 1 4 4	0
16	C	1	Total C Fe N O 43 34 1 4 4	0
16	J	1	Total C Fe N O 43 34 1 4 4	0
16	N	1	Total C Fe N O 43 34 1 4 4	0
16	b	1	Total C Fe N O 43 34 1 4 4	0
16	c	1	Total C Fe N O 43 34 1 4 4	0

- Molecule 17 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



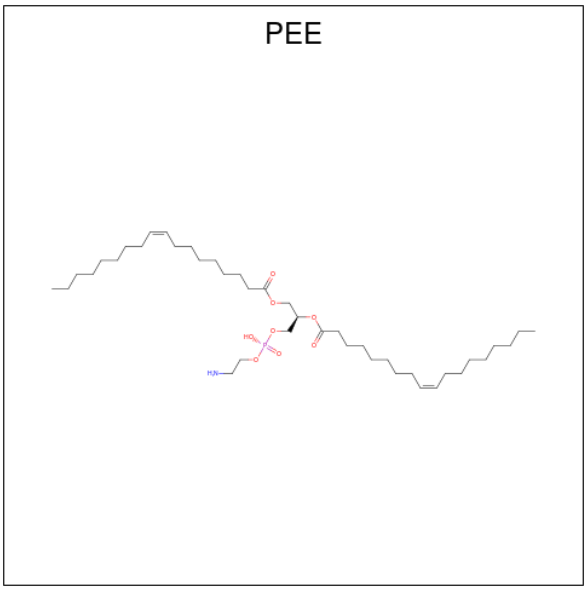
Mol	Chain	Residues	Atoms					AltConf
17	B	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
17	B	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
17	b	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
17	b	1	Total	C	Fe	N	O	0
			43	34	1	4	4	

- Molecule 18 is MENAQUINONE-7 (CCD ID: MQ7) (formula: $C_{46}H_{64}O_2$).



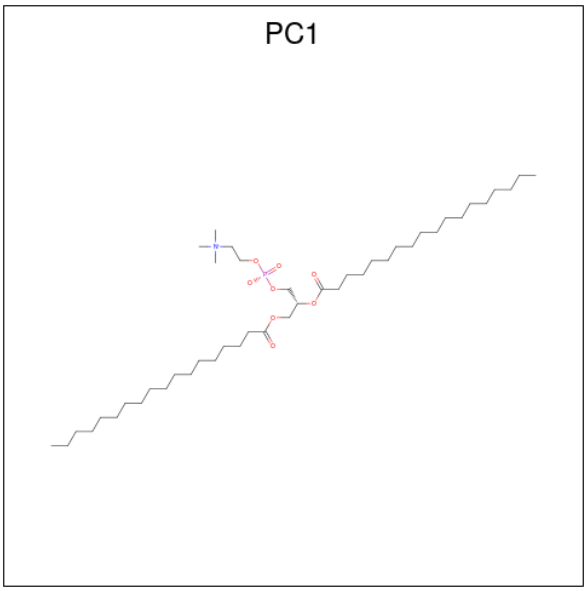
Mol	Chain	Residues	Atoms			AltConf
18	B	1	Total	C	O	0
			48	46	2	
18	C	1	Total	C	O	0
			48	46	2	
18	b	1	Total	C	O	0
			48	46	2	
18	c	1	Total	C	O	0
			48	46	2	

- Molecule 19 is 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (CCD ID: PEE) (formula: $C_{41}H_{78}NO_8P$).



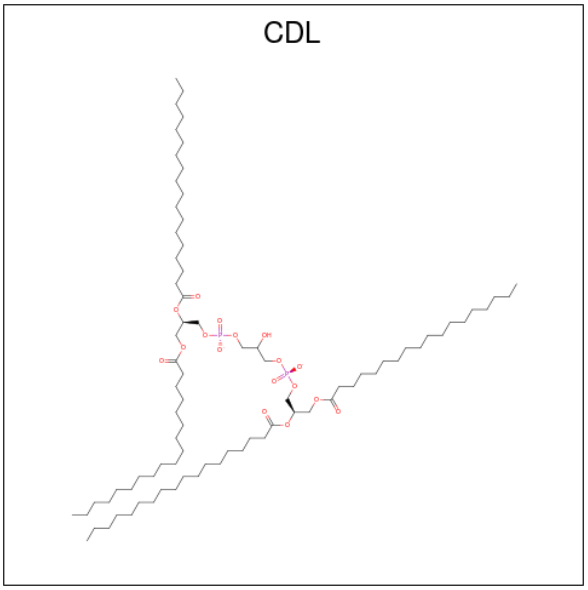
Mol	Chain	Residues	Atoms					AltConf
19	C	1	Total	C	N	O	P	0
			42	32	1	8	1	
19	J	1	Total	C	N	O	P	0
			40	30	1	8	1	
19	L	1	Total	C	N	O	P	0
			51	41	1	8	1	
19	c	1	Total	C	N	O	P	0
			42	32	1	8	1	

- Molecule 20 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: PC1) (formula: $C_{44}H_{88}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
20	C	1	Total	C	N	O	P	0
			48	38	1	8	1	
20	c	1	Total	C	N	O	P	0
			43	33	1	8	1	

- Molecule 21 is CARDIOLIPIN (CCD ID: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



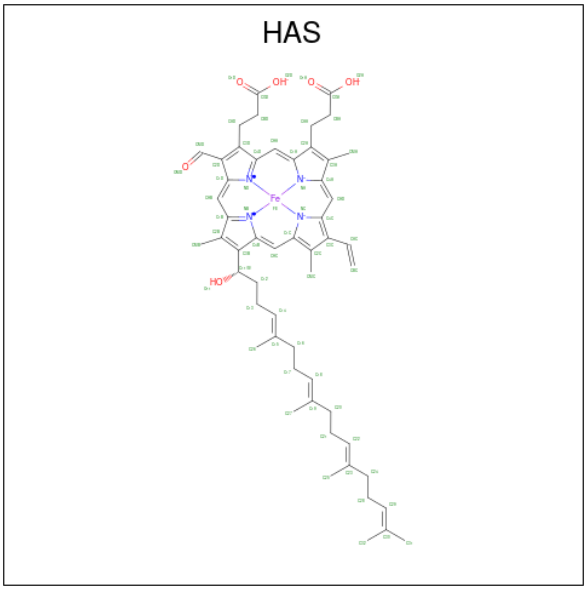
Mol	Chain	Residues	Atoms				AltConf
21	J	1	Total	C	O	P	0
			100	81	17	2	
21	K	1	Total	C	O	P	0
			100	81	17	2	

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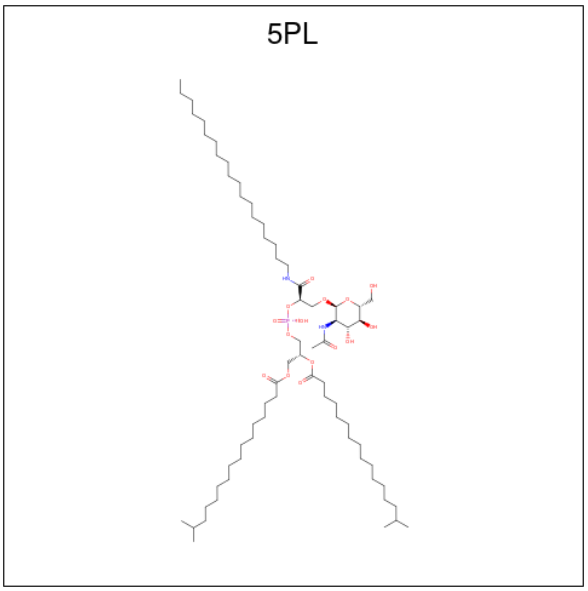
Mol	Chain	Residues	Atoms				AltConf
21	L	1	Total	C	O	P	0
			98	79	17	2	

- Molecule 22 is HEME-AS (CCD ID: HAS) (formula: $C_{54}H_{64}FeN_4O_6$).



Mol	Chain	Residues	Atoms					AltConf
22	M	1	Total	C	Fe	N	O	0
			65	54	1	4	6	
22	M	1	Total	C	Fe	N	O	0
			65	54	1	4	6	

- Molecule 23 is (1R,4S,6R)-6-({[2-(ACETYLAMINO)-2-DEOXY-ALPHA-D-GLUCOPYRANOSYL]OXY}METHYL)-4-HYDROXY-1-{[(15-METHYLHEXADECANOYL)OXY]METHYL}-4-OXIDO-7-OXO-3,5-DIOXA-8-AZA-4-PHOSPHAHEPTACOS-1-YL 15-METHYLHEXADECANOATE (CCD ID: 5PL) (formula: $C_{67}H_{129}N_2O_{15}P$).



Mol	Chain	Residues	Atoms					AltConf
23	M	1	Total	C	N	O	P	0
			85	67	2	15	1	

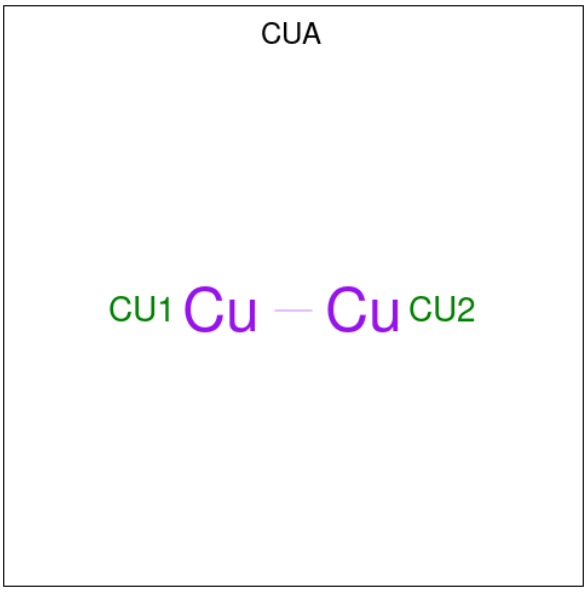
- Molecule 24 is COPPER (II) ION (CCD ID: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		AltConf
24	M	1	Total	Cu	0
			1	1	

- Molecule 25 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
25	M	1	Total	Mg	0
			1	1	

- Molecule 26 is DINUCLEAR COPPER ION (CCD ID: CUA) (formula: Cu_2).



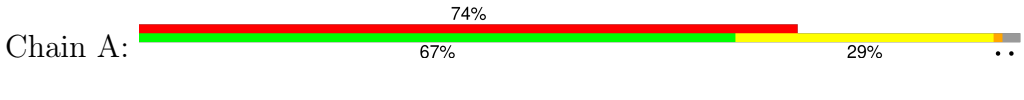
Mol	Chain	Residues	Atoms		AltConf
			Total	Cu	
26	N	1	2	2	0

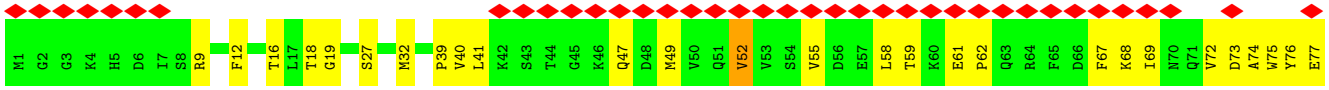
3 Residue-property plots (i)

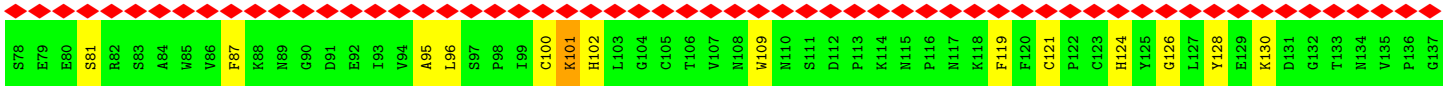
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.

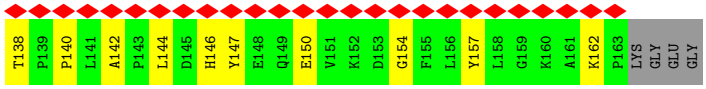
• Molecule 1: Menaquinol:cytochrome c reductase iron-sulfur subunit

Chain A:





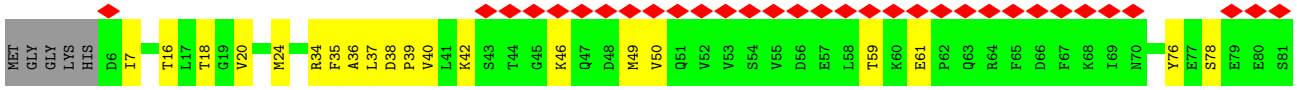


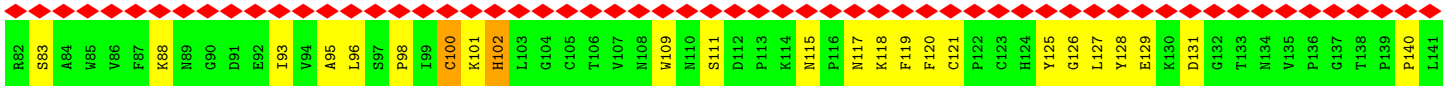


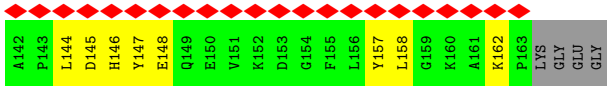
• Molecule 1: Menaquinol:cytochrome c reductase iron-sulfur subunit

Chain a:





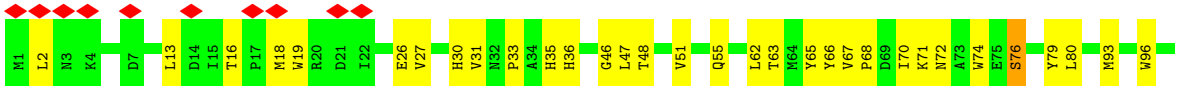


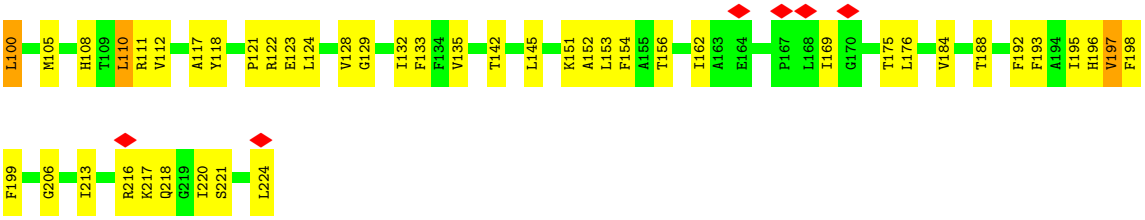


• Molecule 2: Menaquinol:cytochrome c reductase cytochrome b subunit

Chain B:



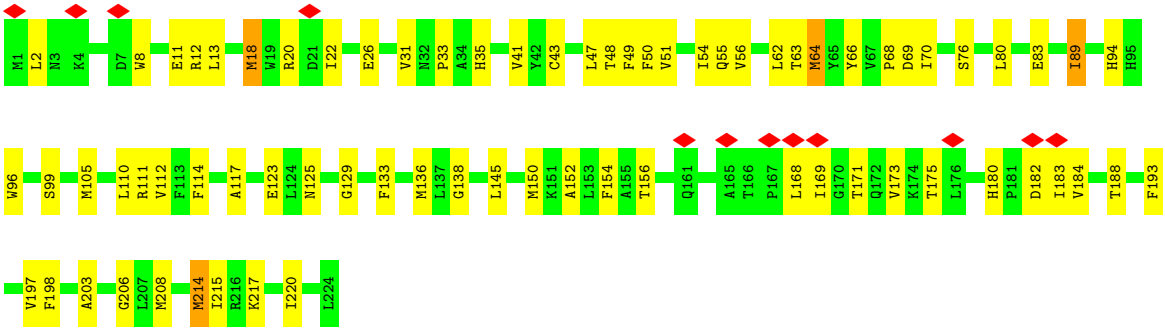




• Molecule 2: Menaquinol:cytochrome c reductase cytochrome b subunit

Chain b:

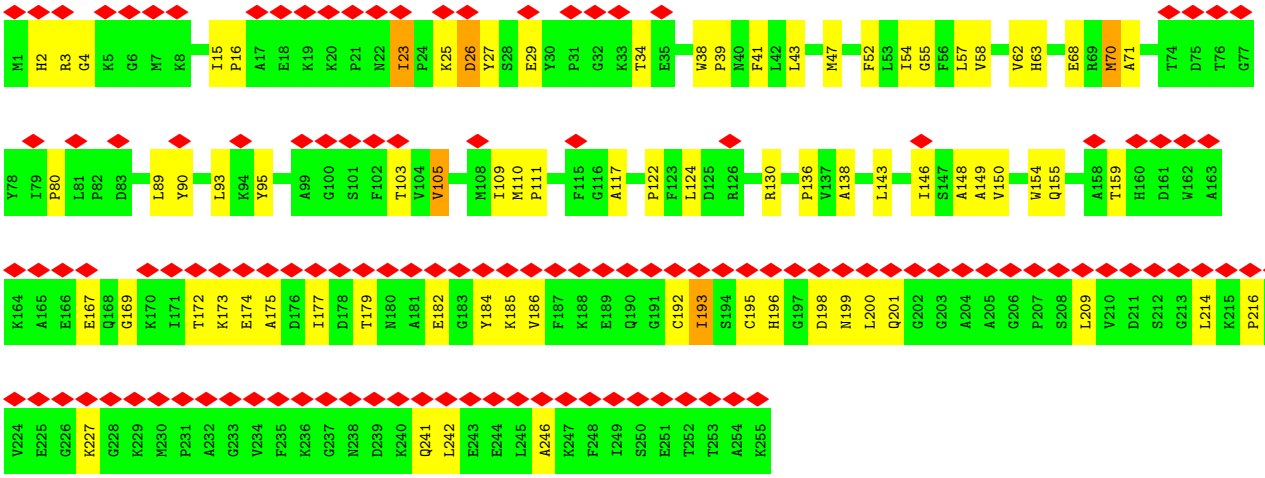




• Molecule 3: Menaquinol:cytochrome c reductase cytochrome c subunit

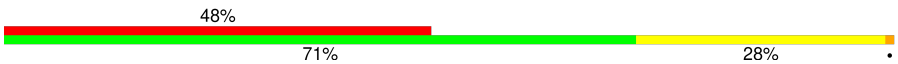
Chain C:

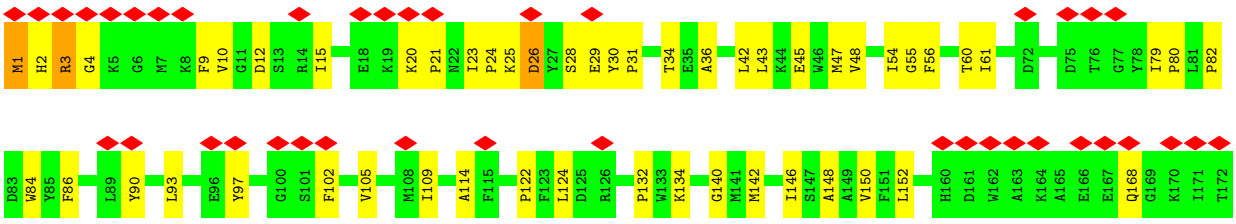


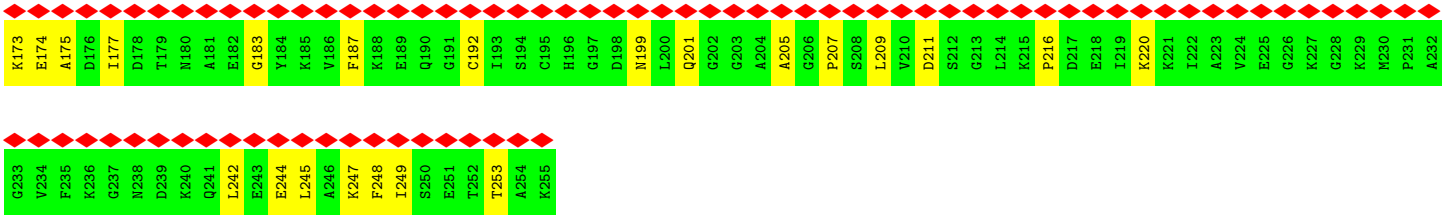


• Molecule 3: Menaquinol:cytochrome c reductase cytochrome c subunit

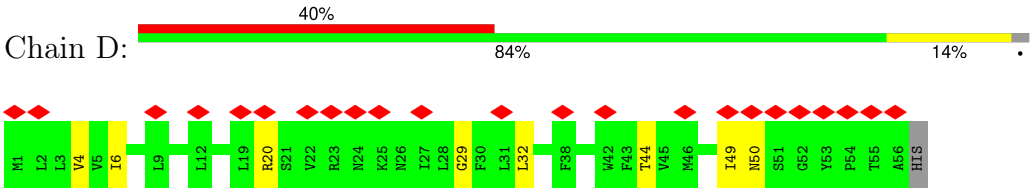
Chain c:



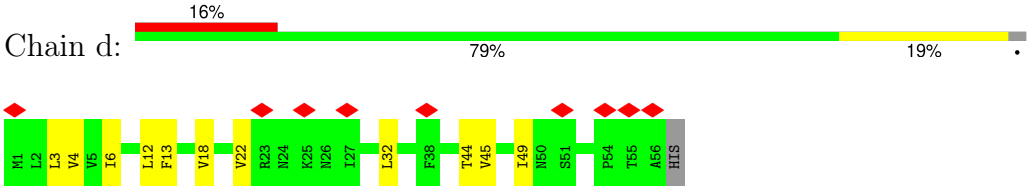




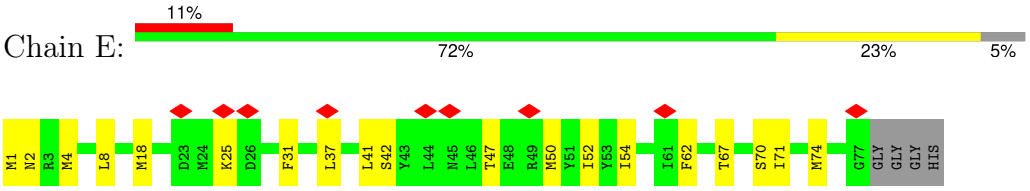
• Molecule 4: YqgW



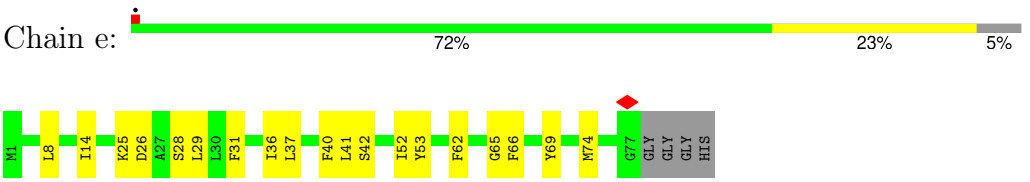
• Molecule 4: YqgW



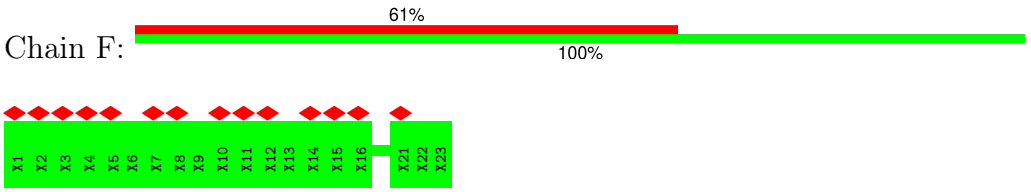
• Molecule 5: YqgY



• Molecule 5: YqgY



• Molecule 6: QcrF



• Molecule 6: QcrF

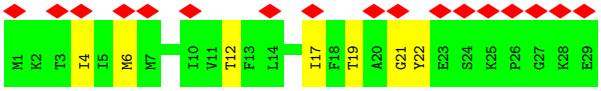




• Molecule 7: QcrG

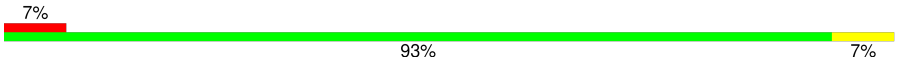
Chain G:

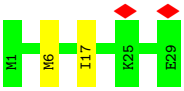




• Molecule 7: QcrG

Chain g:

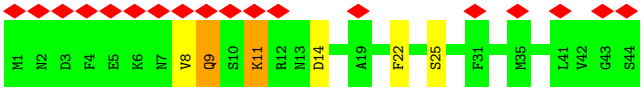




• Molecule 8: YqzM

Chain H:

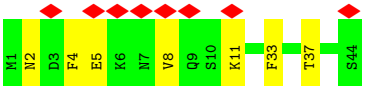




• Molecule 8: YqzM

Chain h:

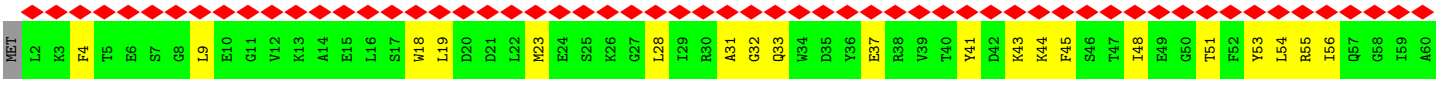


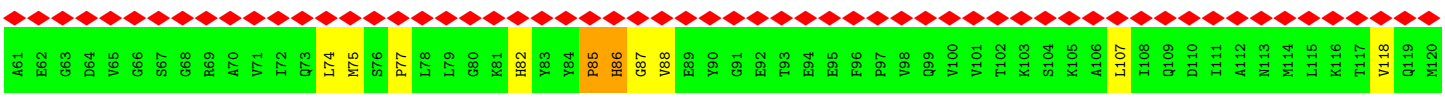


• Molecule 9: YlbA

Chain I:



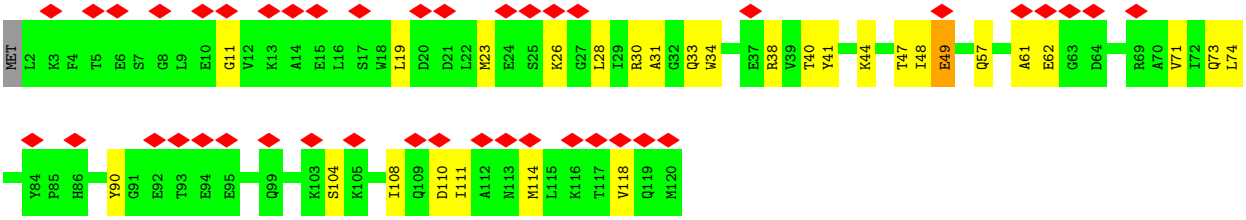




• Molecule 9: YlbA

Chain i:

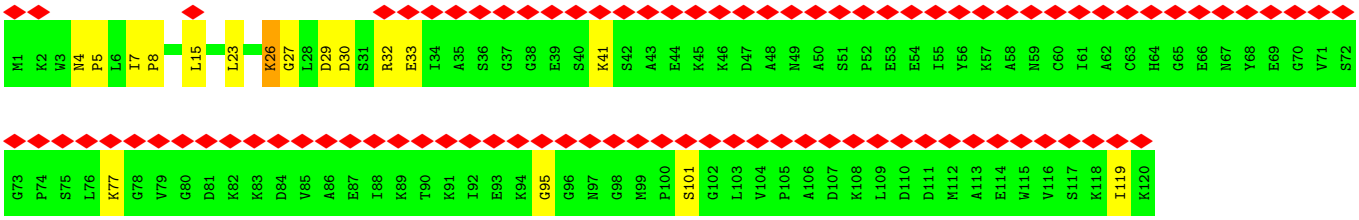




• Molecule 10: Cytochrome c-550

Chain J:

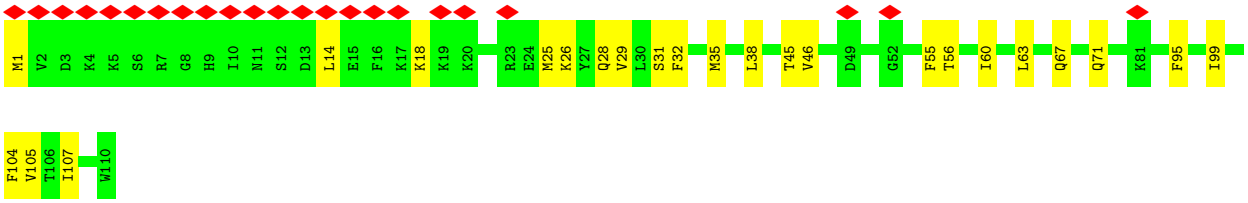




• Molecule 11: Cytochrome c oxidase subunit 4B

Chain K:

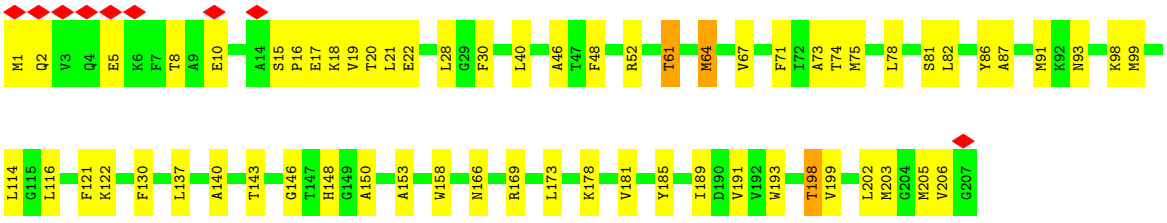




• Molecule 12: Cytochrome c oxidase subunit 3

Chain L:

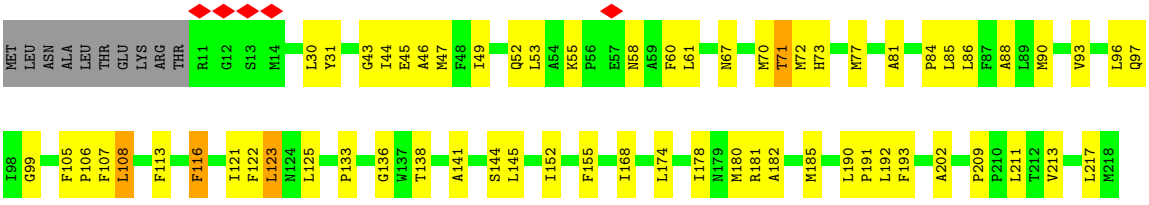


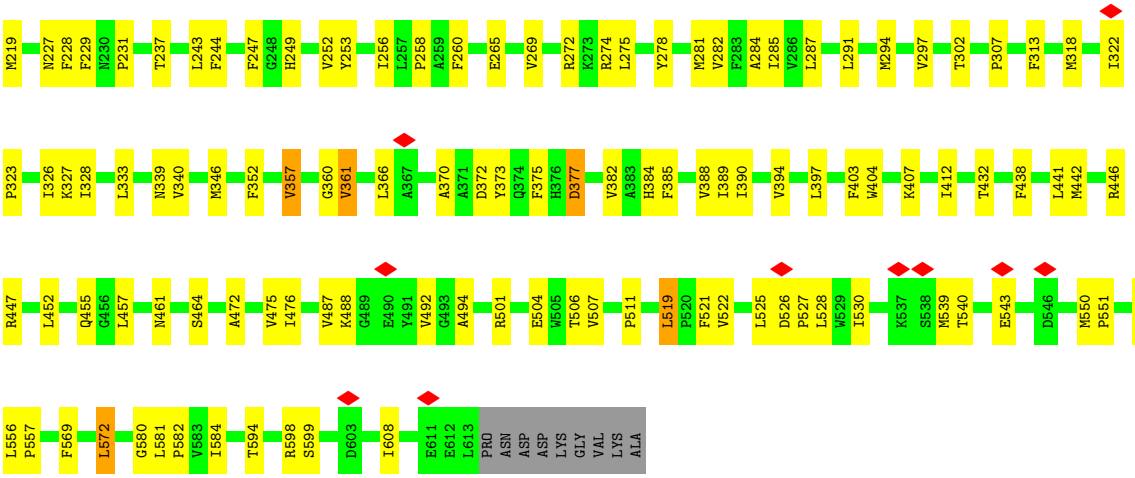


• Molecule 13: Cytochrome c oxidase subunit 1

Chain M:



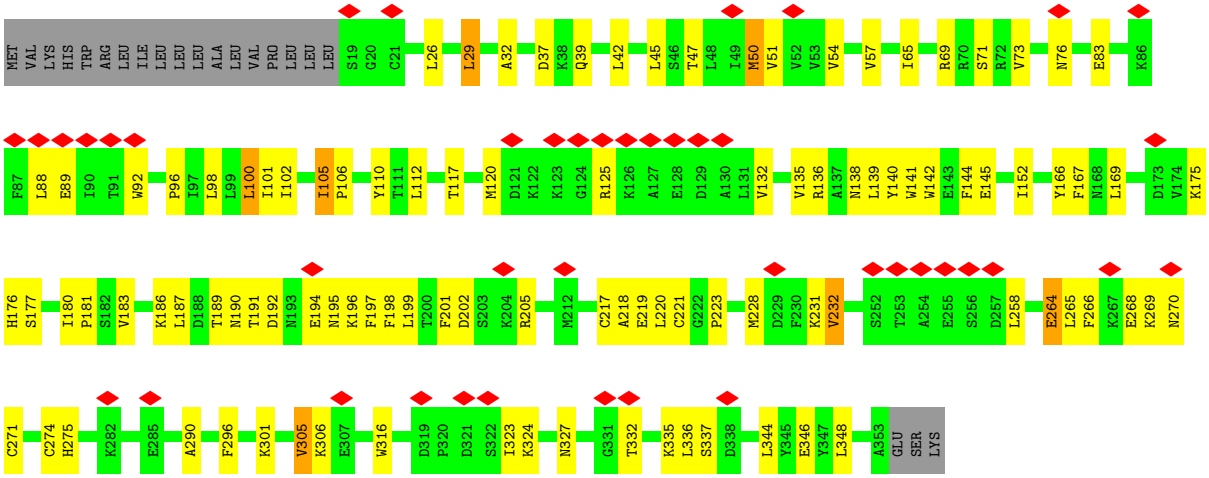




• Molecule 14: Cytochrome c oxidase subunit 2

Chain N:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	70713	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.825	Depositor
Minimum map value	-0.430	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.027	Depositor
Recommended contour level	0.25	Depositor
Map size (Å)	297.0, 297.0, 297.0	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.825, 0.825, 0.825	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: FES, 5PL, PC1, CUA, HAS, MQ7, CU, HEM, MG, HEC, CDL, PEE

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.17	0/1326	0.39	0/1796
1	a	0.16	0/1290	0.37	0/1750
2	B	0.20	0/1863	0.37	0/2533
2	b	0.20	0/1863	0.34	0/2533
3	C	0.15	0/2040	0.34	0/2759
3	c	0.20	0/2039	0.43	2/2757 (0.1%)
4	D	0.13	0/444	0.27	0/605
4	d	0.13	0/444	0.26	0/605
5	E	0.13	0/667	0.22	0/900
5	e	0.17	0/667	0.27	0/900
7	G	0.12	0/224	0.35	0/299
7	g	0.14	0/224	0.26	0/299
8	H	0.17	0/349	0.40	0/468
8	h	0.15	0/349	0.27	0/468
9	I	0.14	0/959	0.42	1/1291 (0.1%)
9	i	0.13	0/959	0.29	0/1291
10	J	0.18	0/910	0.48	2/1221 (0.2%)
11	K	0.16	0/920	0.31	0/1243
12	L	0.18	0/1698	0.29	0/2304
13	M	0.19	0/4912	0.35	0/6695
14	N	0.24	0/2706	0.42	0/3660
All	All	0.18	0/26853	0.36	5/36377 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	J	26	LYS	CB-CG-CD	8.85	131.65	111.30
3	c	1	MET	CB-CA-C	6.91	123.22	110.10
10	J	26	LYS	CG-CD-CE	-6.83	95.59	111.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	c	1	MET	CB-CG-SD	6.54	132.32	112.70
9	I	86	HIS	N-CA-C	5.88	117.84	107.61

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1290	0	1254	38	0
1	a	1255	0	1216	39	0
2	B	1804	0	1813	73	0
2	b	1804	0	1813	60	0
3	C	1986	0	1999	64	0
3	c	1985	0	1993	83	0
4	D	433	0	463	6	0
4	d	433	0	463	5	0
5	E	645	0	642	12	0
5	e	645	0	642	16	0
6	F	114	0	25	0	0
6	f	114	0	26	0	0
7	G	221	0	241	3	0
7	g	221	0	241	2	0
8	H	342	0	334	7	0
8	h	342	0	334	7	0
9	I	941	0	938	30	0
9	i	941	0	938	18	0
10	J	895	0	909	15	0
11	K	894	0	923	26	0
12	L	1647	0	1645	51	0
13	M	4748	0	4773	124	0
14	N	2649	0	2680	77	0
15	A	4	0	0	2	0
15	a	4	0	0	1	0
16	B	43	0	30	6	0
16	C	43	0	32	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
16	J	43	0	32	0	0
16	N	43	0	32	3	0
16	b	43	0	31	6	0
16	c	43	0	30	3	0
17	B	86	0	60	11	0
17	b	86	0	60	3	0
18	B	48	0	64	6	0
18	C	48	0	64	4	0
18	b	48	0	64	1	0
18	c	48	0	64	8	0
19	C	42	0	54	4	0
19	J	40	0	53	0	0
19	L	51	0	78	5	0
19	c	42	0	52	2	0
20	C	48	0	73	3	0
20	c	43	0	60	2	0
21	J	100	0	154	13	0
21	K	100	0	156	3	0
21	L	98	0	149	8	0
22	M	130	0	124	14	0
23	M	85	0	128	10	0
24	M	1	0	0	0	0
25	M	1	0	0	0	0
26	N	2	0	0	3	0
All	All	27762	0	27949	651	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

All (651) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:N:221:CYS:SG	26:N:402:CUA:CU1	1.21	1.27
14:N:217:CYS:SG	26:N:402:CUA:CU2	1.34	1.17
18:B:304:MQ7:H7	3:c:1:MET:N	1.73	1.02
18:B:304:MQ7:H7	3:c:1:MET:H1	1.21	0.97
2:B:31:VAL:HG11	16:B:301:HEC:HAB	1.50	0.93
9:I:86:HIS:HB3	3:c:3:ARG:H	1.38	0.89
14:N:105:ILE:HG13	14:N:106:PRO:HD3	1.55	0.89
10:J:26:LYS:HG3	21:J:202:CDL:H721	1.55	0.87
21:J:202:CDL:HA61	12:L:203:MET:HE1	1.58	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:c:105:VAL:HA	3:c:109:ILE:HB	1.61	0.82
13:M:361:VAL:HG13	14:N:50:MET:HG2	1.60	0.82
13:M:527:PRO:HB2	13:M:539:MET:HE1	1.65	0.79
9:I:28:LEU:HB3	9:I:41:TYR:HB3	1.67	0.76
2:b:89:ILE:HG13	5:e:74:MET:HE1	1.67	0.76
9:I:45:PHE:HZ	9:I:54:LEU:HD23	1.51	0.76
2:b:180:HIS:HD2	2:b:182:ASP:H	1.32	0.76
2:B:176:LEU:HD21	1:a:37:LEU:HD23	1.68	0.75
1:A:32:MET:HE3	2:B:93:MET:HE1	1.69	0.74
22:M:702:HAS:H252	14:N:96:PRO:HB3	1.71	0.73
13:M:67:ASN:O	13:M:71:THR:HG23	1.88	0.73
14:N:169:LEU:HB3	14:N:189:THR:HG22	1.69	0.72
1:A:138:THR:HG22	1:A:140:PRO:HD2	1.72	0.72
12:L:21:LEU:HD21	13:M:180:MET:HE1	1.71	0.72
3:C:105:VAL:HA	3:C:109:ILE:HB	1.72	0.71
13:M:284:ALA:HB2	13:M:326:ILE:HD11	1.71	0.71
1:A:150:GLU:HB3	1:A:157:TYR:HB2	1.72	0.70
11:K:29:VAL:HG21	19:L:301:PEE:H7	1.73	0.70
14:N:217:CYS:HG	26:N:402:CUA:CU2	0.37	0.70
1:A:124:HIS:HE1	15:A:201:FES:S2	2.08	0.69
3:c:24:PRO:HD2	8:h:11:LYS:HA	1.74	0.69
2:B:154:PHE:HB3	3:C:80:PRO:HB3	1.75	0.69
9:I:23:MET:HB3	9:I:28:LEU:HB2	1.75	0.69
12:L:122:LYS:HG2	21:L:302:CDL:H322	1.74	0.69
2:b:145:LEU:HA	2:b:152:ALA:HB1	1.73	0.69
2:B:184:VAL:HG13	2:B:188:THR:HG21	1.74	0.68
2:B:124:LEU:HD21	18:B:304:MQ7:H312	1.75	0.68
3:C:222:ILE:HG12	3:C:227:LYS:HD3	1.76	0.68
3:C:136:PRO:HD2	4:D:20:ARG:HH22	1.59	0.68
2:B:193:PHE:O	2:B:197:VAL:HB	1.94	0.67
17:B:303:HEM:HBB2	17:B:303:HEM:HHC	1.76	0.67
3:C:222:ILE:HG23	3:C:227:LYS:HB2	1.77	0.67
16:B:301:HEC:HMC3	3:C:41:PHE:HZ	1.58	0.67
9:I:86:HIS:HB3	3:c:3:ARG:N	2.10	0.66
14:N:270:ASN:HD21	16:N:401:HEC:HBB1	1.61	0.66
10:J:29:ASP:HA	10:J:32:ARG:HD2	1.78	0.66
1:A:73:ASP:HB2	2:b:183:ILE:HG21	1.76	0.66
11:K:95:PHE:HZ	13:M:294:MET:HE1	1.60	0.66
3:c:25:LYS:HG3	3:c:26:ASP:OD2	1.96	0.66
3:c:183:GLY:HA2	3:c:244:GLU:O	1.96	0.65
14:N:120:MET:HE2	14:N:166:TYR:HB3	1.77	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:a:20:VAL:O	1:a:24:MET:HG3	1.96	0.65
13:M:144:SER:HB3	13:M:152:ILE:HG21	1.79	0.65
10:J:95:GLY:HA3	10:J:101:SER:HA	1.79	0.65
12:L:2:GLN:HG2	12:L:5:GLU:HA	1.77	0.65
11:K:31:SER:O	11:K:35:MET:HG3	1.97	0.65
2:B:145:LEU:HA	2:B:152:ALA:HB1	1.79	0.64
2:B:71:LYS:HE3	1:a:76:TYR:HE1	1.62	0.64
3:c:124:LEU:HB3	19:c:303:PEE:H8	1.79	0.64
5:e:25:LYS:HA	5:e:28:SER:HB3	1.78	0.64
3:C:124:LEU:HD12	4:D:29:GLY:HA2	1.79	0.64
14:N:142:TRP:NE1	14:N:228:MET:HG2	2.13	0.64
1:a:101:LYS:HE3	1:a:145:ASP:H	1.62	0.64
3:C:174:GLU:HA	3:C:201:GLN:HE21	1.63	0.64
10:J:26:LYS:CG	21:J:202:CDL:H721	2.28	0.64
14:N:187:LEU:HD13	14:N:195:ASN:HB3	1.79	0.64
21:K:201:CDL:H601	21:K:201:CDL:H362	1.80	0.64
3:c:183:GLY:HA3	3:c:248:PHE:HB2	1.80	0.64
13:M:168:ILE:HG12	23:M:703:5PL:HAE2	1.80	0.63
2:b:105:MET:HE3	2:b:133:PHE:CD1	2.32	0.63
1:a:49:MET:HE2	1:a:157:TYR:HB3	1.79	0.63
1:A:39:PRO:HB2	2:b:175:THR:HG22	1.80	0.63
1:a:118:LYS:HG2	1:a:129:GLU:HA	1.81	0.63
2:b:184:VAL:HG13	2:b:188:THR:HG21	1.80	0.63
3:c:93:LEU:HD12	18:c:301:MQ7:H7	1.81	0.63
3:c:174:GLU:HA	3:c:201:GLN:HE21	1.65	0.62
9:i:26:LYS:HD2	9:i:111:ILE:HG13	1.81	0.62
1:A:72:VAL:HG13	1:A:77:GLU:HG3	1.80	0.62
2:b:220:ILE:HD12	16:b:301:HEC:HAD1	1.81	0.62
14:N:271:CYS:SG	16:N:401:HEC:HMC3	2.40	0.62
13:M:49:ILE:HD11	13:M:70:MET:HA	1.82	0.62
2:b:138:GLY:HA3	18:c:301:MQ7:H243	1.80	0.62
11:K:60:ILE:HG22	12:L:198:THR:HG23	1.80	0.62
14:N:47:THR:O	14:N:51:VAL:HG13	2.00	0.62
3:c:26:ASP:HB2	3:c:28:SER:H	1.65	0.62
10:J:27:GLY:HA2	10:J:30:ASP:HB2	1.81	0.62
2:b:203:ALA:HB1	18:c:301:MQ7:H32	1.81	0.62
13:M:231:PRO:HB3	14:N:192:ASP:HB3	1.82	0.61
13:M:274:ARG:HD2	14:N:83:GLU:HA	1.82	0.61
2:B:135:VAL:HG23	18:C:301:MQ7:H301	1.81	0.61
13:M:377:ASP:HA	13:M:446:ARG:HD3	1.81	0.61
20:c:304:PC1:H221	7:g:6:MET:HG2	1.80	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:13:LEU:HD21	2:b:214:MET:HG2	1.82	0.61
9:I:4:PHE:HB2	9:I:77:PRO:HG2	1.82	0.61
14:N:142:TRP:HE1	14:N:228:MET:HG2	1.65	0.61
2:B:206:GLY:HA3	18:C:301:MQ7:H42	1.82	0.61
9:I:86:HIS:HA	3:c:1:MET:HE2	1.81	0.61
1:A:49:MET:HE2	1:A:157:TYR:HB3	1.82	0.60
2:B:121:PRO:HG3	3:c:10:VAL:CG1	2.31	0.60
9:I:56:ILE:HG22	9:I:77:PRO:HB3	1.81	0.60
14:N:231:LYS:HE3	14:N:301:LYS:HE3	1.81	0.60
2:b:123:GLU:HG2	3:c:122:PRO:HB3	1.83	0.60
1:A:52:VAL:HB	1:A:67:PHE:HB3	1.82	0.60
18:B:304:MQ7:H7	3:c:1:MET:H2	1.64	0.60
10:J:26:LYS:NZ	21:J:202:CDL:HB62	2.17	0.60
2:b:33:PRO:HG3	16:b:301:HEC:HBC1	1.84	0.60
2:b:154:PHE:HB3	3:c:80:PRO:HB3	1.83	0.60
1:A:12:PHE:O	1:A:16:THR:HG23	2.02	0.60
21:K:201:CDL:H182	21:K:201:CDL:H572	1.82	0.60
13:M:97:GLN:HB3	13:M:191:PRO:HG2	1.83	0.60
13:M:357:VAL:HG22	22:M:702:HAS:H18	1.82	0.59
13:M:432:THR:HA	13:M:464:SER:HA	1.84	0.59
2:b:62:LEU:HD22	2:b:80:LEU:HD11	1.84	0.59
13:M:522:VAL:HG13	13:M:527:PRO:HG3	1.85	0.59
1:A:95:ALA:HB1	1:A:147:TYR:HD2	1.67	0.58
13:M:501:ARG:HB3	13:M:526:ASP:HB3	1.84	0.58
9:i:40:THR:HG23	9:i:57:GLN:HG2	1.85	0.58
1:a:59:THR:HG23	1:a:61:GLU:H	1.68	0.58
2:B:121:PRO:HG3	3:c:10:VAL:HG13	1.86	0.58
3:C:90:TYR:CD1	18:C:301:MQ7:H8	2.38	0.58
13:M:307:PRO:HB2	14:N:112:LEU:HD23	1.85	0.58
23:M:703:5PL:HBD1	23:M:703:5PL:HAZ1	1.85	0.58
2:b:48:THR:HG21	2:b:105:MET:HB2	1.86	0.58
1:A:16:THR:HG21	5:E:52:ILE:HG21	1.85	0.58
3:C:124:LEU:HB3	19:C:303:PEE:H1	1.86	0.58
3:c:23:ILE:HG23	8:h:11:LYS:HB3	1.86	0.58
13:M:412:ILE:HD12	13:M:492:VAL:HG11	1.86	0.57
1:A:74:ALA:HB1	2:B:79:TYR:CZ	2.39	0.57
2:B:221:SER:HB3	3:C:130:ARG:HH12	1.69	0.57
3:C:222:ILE:HG21	16:C:302:HEC:HMA3	1.86	0.57
13:M:340:VAL:HG13	13:M:346:MET:HE2	1.86	0.57
1:a:95:ALA:H	1:a:146:HIS:CE1	2.22	0.57
4:d:4:VAL:HG13	4:d:44:THR:HG23	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:118:TYR:HB2	3:C:122:PRO:HG3	1.86	0.57
13:M:99:GLY:HA3	13:M:182:ALA:HB2	1.86	0.57
9:i:28:LEU:HB3	9:i:41:TYR:HB3	1.86	0.57
1:A:96:LEU:H	1:A:146:HIS:HB3	1.70	0.57
3:C:150:VAL:HG22	20:C:304:PC1:H272	1.86	0.57
9:I:51:THR:HG23	9:I:82:HIS:HB3	1.86	0.57
1:a:148:GLU:HB3	1:a:162:LYS:HZ1	1.70	0.57
18:b:304:MQ7:H22	18:b:304:MQ7:H17	1.87	0.57
12:L:17:GLU:HG2	12:L:18:LYS:HG3	1.86	0.57
11:K:95:PHE:CZ	13:M:294:MET:HE1	2.39	0.56
13:M:373:TYR:HB2	14:N:39:GLN:HE21	1.70	0.56
3:C:43:LEU:O	3:C:47:MET:HG3	2.05	0.56
3:C:138:ALA:HB2	19:C:303:PEE:H7	1.87	0.56
14:N:117:THR:HB	14:N:120:MET:HE3	1.86	0.56
1:a:96:LEU:HD21	1:a:119:PHE:HE2	1.69	0.56
13:M:556:LEU:HD22	13:M:594:THR:HG23	1.87	0.56
9:i:11:GLY:HA2	9:i:73:GLN:HE21	1.69	0.56
2:B:198:PHE:HE2	2:b:63:THR:HG21	1.71	0.56
1:a:16:THR:HG21	5:e:52:ILE:HG12	1.87	0.56
1:A:100:CYS:SG	1:A:102:HIS:HB3	2.46	0.56
11:K:14:LEU:O	11:K:18:LYS:HG2	2.05	0.56
13:M:297:VAL:HB	13:M:313:PHE:CG	2.41	0.55
13:M:390:ILE:HA	13:M:394:VAL:HB	1.89	0.55
14:N:167:PHE:HE2	14:N:199:LEU:HB2	1.71	0.55
2:B:220:ILE:HG12	16:B:301:HEC:HBB2	1.87	0.55
1:A:55:VAL:HA	1:A:58:LEU:HD22	1.88	0.55
12:L:64:MET:HE1	12:L:130:PHE:HB2	1.87	0.55
14:N:183:VAL:HG12	14:N:199:LEU:HD22	1.89	0.55
9:I:85:PRO:HD2	3:c:4:GLY:HA3	1.88	0.55
3:c:43:LEU:O	3:c:47:MET:HG3	2.06	0.55
3:C:177:ILE:HB	3:C:199:ASN:HB3	1.88	0.55
13:M:438:PHE:O	13:M:442:MET:HG3	2.06	0.55
22:M:701:HAS:HBC1	22:M:701:HAS:HMC3	1.88	0.55
2:b:56:VAL:HG22	17:b:302:HEM:HAB	1.87	0.55
2:B:68:PRO:HD2	2:b:68:PRO:HD2	1.89	0.55
3:C:143:LEU:HA	3:C:146:ILE:HD12	1.88	0.55
2:B:217:LYS:HE3	18:B:304:MQ7:H212	1.87	0.55
12:L:22:GLU:HG3	23:M:703:5PL:H61C	1.89	0.55
14:N:324:LYS:HB2	14:N:327:ASN:HD22	1.71	0.55
19:L:301:PEE:H68	5:e:40:PHE:HZ	1.72	0.54
2:B:35:HIS:HE1	9:I:31:ALA:HB1	1.73	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:119:PHE:HE2	1:A:130:LYS:HA	1.71	0.54
13:M:44:ILE:HG12	22:M:701:HAS:H22	1.89	0.54
13:M:256:ILE:HB	22:M:702:HAS:HBC1	1.88	0.54
2:B:110:LEU:HB3	7:G:17:ILE:HD13	1.89	0.54
2:B:108:HIS:HD2	17:B:303:HEM:NC	2.06	0.54
2:B:133:PHE:HB2	17:B:303:HEM:HBB1	1.88	0.54
14:N:176:HIS:ND1	14:N:228:MET:HE1	2.22	0.54
1:A:40:VAL:HG23	1:A:41:LEU:HG	1.89	0.54
17:B:302:HEM:HHC	17:B:302:HEM:HBB2	1.87	0.54
13:M:86:LEU:HD22	13:M:258:PRO:HB2	1.89	0.54
14:N:217:CYS:CB	14:N:228:MET:HE3	2.38	0.54
2:b:99:SER:HB3	3:c:84:TRP:HE1	1.73	0.54
13:M:389:ILE:HG13	22:M:702:HAS:HAC	1.89	0.54
13:M:506:THR:HG22	13:M:528:LEU:HD13	1.90	0.54
3:c:220:LYS:HG2	3:c:242:LEU:HG	1.90	0.54
2:B:65:TYR:HB2	2:B:80:LEU:HD12	1.89	0.54
13:M:272:ARG:HH12	14:N:76:ASN:HA	1.74	0.54
13:M:599:SER:HB2	23:M:703:5PL:HBA2	1.89	0.54
14:N:219:GLU:O	14:N:220:LEU:C	2.50	0.54
13:M:121:ILE:O	13:M:125:LEU:HB2	2.09	0.53
1:a:128:TYR:CZ	1:a:140:PRO:HB3	2.44	0.53
2:B:48:THR:HG22	17:B:303:HEM:HBC2	1.89	0.53
11:K:45:THR:HG22	11:K:56:THR:HG23	1.89	0.53
12:L:40:LEU:HB2	13:M:209:PRO:HB3	1.90	0.53
14:N:190:ASN:HD22	14:N:195:ASN:HD21	1.56	0.53
13:M:181:ARG:HD3	13:M:190:LEU:HD21	1.90	0.53
13:M:441:LEU:HD13	14:N:29:LEU:HD11	1.88	0.53
3:c:173:LYS:HG3	3:c:175:ALA:H	1.73	0.53
3:c:207:PRO:HD3	16:c:302:HEC:HBA2	1.91	0.53
14:N:120:MET:HE1	14:N:196:LYS:HB3	1.90	0.53
2:b:49:PHE:HD1	2:b:208:MET:HE1	1.73	0.53
3:c:47:MET:HE3	5:e:8:LEU:HD11	1.90	0.53
3:c:26:ASP:CG	3:c:29:GLU:HG3	2.33	0.53
5:E:70:SER:HA	5:E:74:MET:HE2	1.90	0.53
14:N:101:ILE:O	14:N:105:ILE:HG12	2.09	0.53
14:N:125:ARG:HH22	14:N:132:VAL:HG23	1.73	0.53
3:c:97:TYR:CE2	3:c:105:VAL:HG21	2.44	0.53
13:M:107:PHE:CE2	13:M:557:PRO:HD3	2.43	0.53
14:N:266:PHE:O	14:N:271:CYS:HB2	2.09	0.52
13:M:52:GLN:HA	13:M:58:ASN:HD22	1.75	0.52
9:I:86:HIS:O	3:c:3:ARG:HA	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:L:146:GLY:HA3	21:L:302:CDL:H191	1.90	0.52
14:N:217:CYS:HB2	14:N:228:MET:HE3	1.91	0.52
2:b:110:LEU:HD21	3:c:146:ILE:HD11	1.92	0.52
2:b:66:TYR:HA	2:b:76:SER:OG	2.08	0.52
5:E:18:MET:HE1	7:G:6:MET:HE1	1.92	0.52
21:L:302:CDL:H511	21:L:302:CDL:H761	1.92	0.52
9:i:19:LEU:HD21	9:i:74:LEU:HD21	1.92	0.52
3:C:216:PRO:HA	3:C:246:ALA:HB1	1.91	0.52
21:J:202:CDL:H471	12:L:191:VAL:HG11	1.91	0.52
14:N:98:LEU:O	14:N:102:ILE:HG23	2.10	0.52
3:C:68:GLU:HG2	3:C:169:GLY:HA3	1.91	0.52
14:N:180:ILE:HD13	14:N:232:VAL:HG11	1.91	0.52
3:c:29:GLU:HG2	8:h:5:GLU:CD	2.35	0.52
5:E:47:THR:HG23	5:E:50:MET:H	1.75	0.52
3:C:220:LYS:HG2	3:C:242:LEU:HG	1.91	0.51
3:c:90:TYR:CD1	18:c:301:MQ7:H8	2.45	0.51
11:K:67:GLN:O	11:K:71:GLN:HG3	2.11	0.51
13:M:281:MET:SD	13:M:327:LYS:HE3	2.50	0.51
11:K:38:LEU:HD22	11:K:63:LEU:HD22	1.92	0.51
13:M:452:LEU:HD11	14:N:305:VAL:HG12	1.93	0.51
13:M:105:PHE:HB2	13:M:108:LEU:HB2	1.91	0.51
9:i:30:ARG:HG2	9:i:34:TRP:CD1	2.46	0.51
3:C:195:CYS:SG	16:C:302:HEC:HHC	2.51	0.51
12:L:67:VAL:HG22	12:L:205:MET:HE3	1.92	0.51
1:A:62:PRO:HA	1:A:87:PHE:HB3	1.93	0.51
1:a:35:PHE:HZ	2:b:80:LEU:HG	1.76	0.51
3:c:152:LEU:HD21	4:d:3:LEU:HD22	1.93	0.51
13:M:366:LEU:HD22	22:M:702:HAS:HBD2	1.93	0.51
14:N:135:VAL:HG22	14:N:144:PHE:HD1	1.76	0.51
14:N:275:HIS:CE1	14:N:290:ALA:HB1	2.46	0.51
13:M:52:GLN:NE2	13:M:61:LEU:H	2.08	0.51
13:M:249:HIS:O	13:M:252:VAL:HG22	2.10	0.51
2:B:74:TRP:HB3	3:C:70:MET:HG3	1.93	0.50
14:N:270:ASN:ND2	14:N:332:THR:HB	2.25	0.50
1:A:128:TYR:HD2	1:A:144:LEU:HD22	1.76	0.50
3:C:117:ALA:HB1	19:C:303:PEE:H50	1.93	0.50
9:I:33:GLN:NE2	9:I:55:ARG:HH21	2.08	0.50
13:M:46:ALA:HB2	13:M:73:HIS:CE1	2.46	0.50
3:c:26:ASP:OD2	3:c:29:GLU:HG3	2.10	0.50
2:B:175:THR:HB	1:a:40:VAL:HG22	1.94	0.50
2:b:55:GLN:HE22	2:b:94:HIS:HA	1.77	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:c:21:PRO:HB2	3:c:23:ILE:HG13	1.92	0.50
14:N:183:VAL:HG21	14:N:201:PHE:CD2	2.47	0.50
12:L:20:THR:HG23	12:L:173:LEU:HD13	1.93	0.50
13:M:71:THR:CG2	13:M:136:GLY:H	2.25	0.50
2:b:112:VAL:HG13	2:b:117:ALA:HB3	1.94	0.50
3:c:205:ALA:O	16:c:302:HEC:HHB	2.12	0.50
5:E:41:LEU:HD13	5:E:54:ILE:HD13	1.92	0.50
14:N:32:ALA:HB1	14:N:205:ARG:HB3	1.93	0.50
9:i:110:ASP:O	9:i:114:MET:HG2	2.12	0.50
9:I:54:LEU:HD21	9:I:107:LEU:HD23	1.93	0.50
2:B:67:VAL:HG21	2:b:69:ASP:HB2	1.94	0.50
12:L:8:THR:HG23	12:L:10:GLU:H	1.77	0.50
13:M:86:LEU:O	13:M:90:MET:HG3	2.11	0.50
13:M:318:MET:HB3	14:N:100:LEU:HD12	1.93	0.50
1:a:76:TYR:HE2	1:a:78:SER:HB2	1.77	0.50
11:K:45:THR:HA	5:e:29:LEU:HD13	1.92	0.49
8:h:8:VAL:HA	8:h:11:LYS:HE2	1.93	0.49
13:M:30:LEU:HB3	13:M:113:PHE:CZ	2.47	0.49
13:M:475:VAL:HG21	22:M:701:HAS:H263	1.94	0.49
14:N:140:TYR:HB3	14:N:324:LYS:HE2	1.94	0.49
14:N:26:LEU:O	14:N:181:PRO:HB2	2.12	0.49
3:c:55:GLY:HA2	5:e:31:PHE:CZ	2.47	0.49
3:c:82:PRO:HB3	18:c:301:MQ7:O1	2.13	0.49
1:A:73:ASP:OD1	1:A:73:ASP:O	2.31	0.49
13:M:52:GLN:HE21	13:M:60:PHE:HB3	1.77	0.49
1:a:96:LEU:HD21	1:a:119:PHE:CE2	2.48	0.49
4:d:45:VAL:O	4:d:49:ILE:HG12	2.13	0.49
1:A:101:LYS:HE3	1:A:144:LEU:HA	1.93	0.49
2:B:47:LEU:O	2:B:51:VAL:HG23	2.12	0.49
4:D:4:VAL:HG23	4:D:44:THR:HG23	1.93	0.49
2:b:50:PHE:HB2	16:b:301:HEC:HBB3	1.94	0.49
10:J:29:ASP:CB	21:J:202:CDL:HB61	2.42	0.49
23:M:703:5PL:OCM	23:M:703:5PL:HBI1	2.13	0.49
2:B:72:ASN:O	2:B:76:SER:HB3	2.13	0.49
2:B:111:ARG:HH22	17:B:303:HEM:HBA2	1.78	0.49
21:J:202:CDL:H791	21:J:202:CDL:H642	1.94	0.49
12:L:166:ASN:HD21	12:L:169:ARG:HH21	1.60	0.49
13:M:45:GLU:HB3	13:M:73:HIS:HB2	1.93	0.49
1:a:96:LEU:HD13	1:a:144:LEU:HD22	1.95	0.49
3:c:211:ASP:HA	3:c:253:THR:HG22	1.95	0.49
12:L:64:MET:HE1	12:L:130:PHE:CG	2.48	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:N:42:LEU:HG	14:N:110:TYR:HD2	1.78	0.49
10:J:77:LYS:HG2	10:J:119:ILE:HG22	1.94	0.49
13:M:370:ALA:O	14:N:39:GLN:HG2	2.13	0.48
5:e:37:LEU:O	5:e:41:LEU:HB2	2.13	0.48
2:B:110:LEU:HD11	3:C:146:ILE:HD11	1.95	0.48
12:L:114:LEU:HD21	12:L:153:ALA:HB2	1.95	0.48
2:B:27:VAL:HG11	3:C:41:PHE:CE1	2.48	0.48
21:J:202:CDL:H552	21:J:202:CDL:H512	1.96	0.48
9:I:19:LEU:O	9:I:23:MET:HG2	2.13	0.48
14:N:141:TRP:CD1	16:N:401:HEC:HAA1	2.48	0.48
14:N:258:LEU:HD23	14:N:346:GLU:HG3	1.96	0.48
2:b:47:LEU:O	2:b:51:VAL:HG23	2.13	0.48
9:i:104:SER:O	9:i:108:ILE:HG12	2.14	0.48
13:M:77:MET:HA	13:M:81:ALA:HB3	1.95	0.48
14:N:265:LEU:O	14:N:269:LYS:HB2	2.13	0.48
3:C:54:ILE:HG12	5:E:62:PHE:CD2	2.49	0.48
13:M:31:TYR:HB3	13:M:88:ALA:HB2	1.96	0.48
13:M:382:VAL:HA	13:M:385:PHE:CE2	2.48	0.48
2:b:169:ILE:HG12	2:b:173:VAL:HG23	1.96	0.48
2:B:162:ILE:HD11	3:C:93:LEU:HD11	1.96	0.48
13:M:253:TYR:HA	13:M:256:ILE:HG22	1.94	0.48
2:b:35:HIS:HE1	9:i:31:ALA:HB1	1.78	0.48
11:K:18:LYS:HD2	12:L:93:ASN:ND2	2.28	0.48
1:a:100:CYS:SG	1:a:102:HIS:HB3	2.54	0.48
2:B:27:VAL:HG21	3:C:41:PHE:CD2	2.49	0.47
2:B:105:MET:HE3	2:B:133:PHE:CD1	2.49	0.47
2:B:142:THR:OG1	2:B:196:HIS:HB2	2.13	0.47
13:M:133:PRO:HG3	13:M:155:PHE:HB2	1.96	0.47
3:C:155:GLN:O	3:C:159:THR:HG22	2.13	0.47
1:a:46:LYS:HA	1:a:46:LYS:HD3	1.74	0.47
9:I:18:TRP:NE1	9:I:118:VAL:HG21	2.29	0.47
14:N:323:ILE:HG22	14:N:324:LYS:HG3	1.97	0.47
3:C:214:LEU:HD11	16:C:302:HEC:HAA1	1.95	0.47
7:G:19:THR:HG22	7:G:21:GLY:H	1.79	0.47
13:M:361:VAL:HG21	14:N:54:VAL:HG23	1.96	0.47
14:N:274:CYS:SG	14:N:290:ALA:HB2	2.55	0.47
3:c:20:LYS:H	3:c:20:LYS:HD2	1.79	0.47
2:B:145:LEU:HB2	2:B:156:THR:OG1	2.14	0.47
13:M:43:GLY:O	13:M:47:MET:HG2	2.15	0.47
2:b:20:ARG:NH2	3:c:24:PRO:HA	2.30	0.47
3:c:30:TYR:CE2	3:c:36:ALA:HB2	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:101:LYS:HG3	1:A:142:ALA:HB3	1.97	0.47
1:a:34:ARG:HG3	8:h:33:PHE:HE1	1.78	0.47
11:K:35:MET:SD	11:K:71:GLN:HG2	2.54	0.47
1:a:34:ARG:HH12	1:a:38:ASP:HA	1.80	0.47
2:b:110:LEU:HD23	3:c:142:MET:HE3	1.96	0.47
2:b:145:LEU:HD13	2:b:156:THR:HG21	1.96	0.47
2:B:26:GLU:HB3	3:c:1:MET:HE3	1.96	0.47
2:B:123:GLU:HG2	3:C:122:PRO:HB3	1.97	0.47
12:L:143:THR:HA	21:L:302:CDL:H212	1.97	0.47
14:N:270:ASN:HD21	14:N:332:THR:HB	1.79	0.47
2:b:105:MET:HE3	2:b:133:PHE:HD1	1.78	0.47
3:C:173:LYS:HG3	3:C:175:ALA:H	1.80	0.47
13:M:521:PHE:HB3	13:M:540:THR:HB	1.97	0.47
13:M:580:GLY:O	13:M:584:ILE:HG13	2.15	0.47
2:b:41:VAL:HG11	7:g:17:ILE:HA	1.97	0.47
2:b:54:ILE:HG21	3:c:56:PHE:HE2	1.79	0.47
16:b:301:HEC:CMC	3:c:48:VAL:HB	2.45	0.47
1:a:144:LEU:HD12	1:a:144:LEU:H	1.80	0.47
3:c:86:PHE:CE1	18:c:301:MQ7:H152	2.50	0.47
13:M:519:LEU:HB2	13:M:543:GLU:HG2	1.96	0.46
12:L:30:PHE:CZ	12:L:185:TYR:HB2	2.50	0.46
13:M:193:PHE:HB2	13:M:265:GLU:HG3	1.96	0.46
13:M:487:VAL:HG12	13:M:488:LYS:HD2	1.96	0.46
14:N:296:PHE:HD2	14:N:348:LEU:HB3	1.79	0.46
1:a:88:LYS:HD2	1:a:88:LYS:HA	1.61	0.46
1:A:27:SER:OG	3:C:57:LEU:HD11	2.14	0.46
11:K:56:THR:O	11:K:60:ILE:HG12	2.15	0.46
12:L:87:ALA:O	12:L:99:MET:HG3	2.15	0.46
13:M:217:LEU:HD22	13:M:228:PHE:CE2	2.50	0.46
10:J:41:LYS:HA	10:J:41:LYS:HD3	1.79	0.46
12:L:74:THR:HA	12:L:193:TRP:HE1	1.80	0.46
12:L:86:TYR:CD2	19:L:301:PEE:H15	2.49	0.46
3:c:150:VAL:HA	20:c:304:PC1:H271	1.97	0.46
1:A:40:VAL:HG12	2:b:175:THR:HB	1.97	0.46
17:B:303:HEM:HBB2	17:B:303:HEM:CHC	2.44	0.46
3:C:55:GLY:HA2	5:E:31:PHE:CZ	2.51	0.46
3:C:179:THR:HA	3:C:184:TYR:CD2	2.50	0.46
13:M:96:LEU:HD11	13:M:511:PRO:HG2	1.98	0.46
14:N:69:ARG:HH11	14:N:71:SER:HB2	1.81	0.46
14:N:88:LEU:HB3	14:N:92:TRP:CZ3	2.51	0.46
14:N:186:LYS:HB3	14:N:186:LYS:HE3	1.74	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:213:ILE:HA	2:B:216:ARG:HE	1.79	0.46
12:L:61:THR:HG23	12:L:137:LEU:HD21	1.96	0.46
2:b:31:VAL:HG11	2:b:220:ILE:HG21	1.97	0.46
9:I:86:HIS:HB2	3:c:1:MET:C	2.41	0.46
13:M:122:PHE:HZ	13:M:572:LEU:HD22	1.81	0.46
2:B:195:ILE:HA	2:B:199:PHE:HD2	1.81	0.46
12:L:71:PHE:CZ	12:L:75:MET:HE2	2.51	0.46
13:M:93:VAL:HG12	13:M:97:GLN:HG3	1.97	0.46
13:M:269:VAL:HG21	13:M:403:PHE:HZ	1.81	0.46
14:N:306:LYS:HB3	14:N:306:LYS:HE2	1.79	0.46
14:N:316:TRP:HA	14:N:323:ILE:HD13	1.97	0.46
3:c:54:ILE:HG12	5:e:62:PHE:CE2	2.51	0.46
9:i:61:ALA:HB3	9:i:71:VAL:HG23	1.98	0.46
9:I:87:GLY:HA3	3:c:3:ARG:HH21	1.81	0.45
10:J:5:PRO:HD2	1:a:7:ILE:HB	1.97	0.45
1:a:39:PRO:HA	1:a:42:LYS:HD2	1.98	0.45
19:C:303:PEE:H17	19:C:303:PEE:H51	1.98	0.45
1:a:83:SER:HB3	1:a:98:PRO:HG2	1.99	0.45
1:a:147:TYR:HB2	1:a:158:LEU:HD22	1.97	0.45
2:b:18:MET:O	2:b:22:ILE:HG23	2.16	0.45
2:B:19:TRP:HZ2	8:H:14:ASP:HB3	1.81	0.45
3:C:193:ILE:HG23	3:C:198:ASP:HA	1.99	0.45
2:B:62:LEU:HD22	2:B:80:LEU:HD11	1.97	0.45
13:M:287:LEU:HG	13:M:291:LEU:HD12	1.97	0.45
3:C:29:GLU:HG3	9:I:88:VAL:HB	1.97	0.45
9:I:87:GLY:HA3	3:c:3:ARG:NH2	2.31	0.45
12:L:150:ALA:HA	21:L:302:CDL:H432	1.98	0.45
3:c:97:TYR:CE1	3:c:102:PHE:HB2	2.52	0.45
13:M:53:LEU:O	13:M:461:ASN:HB3	2.16	0.45
13:M:472:ALA:HA	22:M:701:HAS:H161	1.98	0.45
2:B:55:GLN:HG2	17:B:302:HEM:C2C	2.52	0.45
3:C:110:MET:HB2	3:C:111:PRO:HD3	1.98	0.45
3:C:124:LEU:HD11	4:D:32:LEU:HD12	1.99	0.45
12:L:202:LEU:O	12:L:206:VAL:HG13	2.16	0.45
14:N:183:VAL:HG21	14:N:201:PHE:CE2	2.52	0.45
8:H:9:GLN:HE21	8:H:9:GLN:HB3	1.55	0.45
21:L:302:CDL:HA62	21:L:302:CDL:H311	1.48	0.45
13:M:297:VAL:HB	13:M:313:PHE:CD1	2.52	0.45
14:N:69:ARG:NH1	14:N:71:SER:HB2	2.32	0.45
3:c:142:MET:O	3:c:146:ILE:HG12	2.16	0.45
1:A:59:THR:HG23	1:A:61:GLU:H	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:112:VAL:HA	2:B:117:ALA:HB3	1.98	0.45
12:L:16:PRO:HG2	12:L:91:MET:HE3	1.99	0.45
13:M:385:PHE:O	13:M:389:ILE:HB	2.17	0.45
2:b:43:CYS:HB3	16:b:301:HEC:HMC2	1.99	0.45
3:c:177:ILE:HB	3:c:199:ASN:HB3	1.98	0.45
2:B:108:HIS:HD2	17:B:303:HEM:C1C	2.35	0.45
12:L:158:TRP:CH2	12:L:181:VAL:HG12	2.52	0.45
13:M:302:THR:HG22	13:M:373:TYR:HA	1.99	0.45
13:M:455:GLN:O	13:M:457:LEU:HG	2.17	0.45
11:K:35:MET:HE3	12:L:78:LEU:HD11	1.98	0.44
2:b:217:LYS:HB3	2:b:217:LYS:HE3	1.70	0.44
3:C:149:ALA:HB1	20:C:304:PC1:H2B1	1.98	0.44
12:L:148:HIS:NE2	12:L:193:TRP:HB2	2.32	0.44
9:i:48:ILE:HD13	9:i:48:ILE:HA	1.85	0.44
2:B:66:TYR:HA	2:B:76:SER:OG	2.17	0.44
2:B:192:PHE:O	2:B:196:HIS:HB3	2.18	0.44
21:J:202:CDL:H352	12:L:199:VAL:HG21	1.98	0.44
13:M:84:PRO:HG3	13:M:116:PHE:CE1	2.52	0.44
2:B:128:VAL:O	2:B:132:ILE:HG13	2.17	0.44
13:M:360:GLY:HA3	22:M:702:HAS:C14	2.48	0.44
13:M:476:ILE:HD11	22:M:701:HAS:H202	1.99	0.44
1:a:126:GLY:HA3	15:a:201:FES:S1	2.58	0.44
2:B:111:ARG:O	2:B:112:VAL:HB	2.18	0.44
11:K:95:PHE:HD1	21:K:201:CDL:H412	1.82	0.44
3:C:105:VAL:O	3:C:110:MET:HG3	2.18	0.44
9:I:48:ILE:HD12	9:I:48:ILE:HA	1.87	0.44
14:N:202:ASP:HB3	14:N:205:ARG:HB2	2.00	0.44
3:c:42:LEU:HA	3:c:45:GLU:HG3	1.99	0.44
2:B:63:THR:HG21	2:b:198:PHE:HE2	1.82	0.44
2:B:70:ILE:HD11	1:a:76:TYR:CG	2.53	0.44
11:K:55:PHE:HA	5:e:69:TYR:OH	2.17	0.44
12:L:148:HIS:HE1	12:L:189:ILE:O	2.00	0.44
1:A:121:CYS:HB3	1:A:126:GLY:H	1.81	0.44
2:B:18:MET:H	2:B:18:MET:HG2	1.57	0.44
2:B:46:GLY:HA3	16:B:301:HEC:C1D	2.47	0.44
3:c:148:ALA:HB2	4:d:6:ILE:HG21	1.99	0.44
3:c:245:LEU:O	3:c:249:ILE:HG13	2.17	0.44
10:J:26:LYS:HE2	21:J:202:CDL:H721	1.41	0.44
10:J:29:ASP:HB2	21:J:202:CDL:HB61	2.00	0.44
2:b:125:ASN:HD21	2:b:215:ILE:HG13	1.83	0.44
11:K:26:LYS:HE3	11:K:26:LYS:HB3	1.70	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:180:MET:HA	13:M:180:MET:HE2	2.00	0.43
2:b:136:MET:HE2	2:b:136:MET:HB2	1.81	0.43
11:K:1:MET:C	11:K:1:MET:HE3	2.44	0.43
13:M:47:MET:HE3	13:M:47:MET:HA	2.00	0.43
14:N:145:GLU:HG3	14:N:152:ILE:HB	2.00	0.43
5:e:14:ILE:HD13	5:e:14:ILE:HA	1.85	0.43
9:I:85:PRO:HB2	3:c:2:HIS:C	2.44	0.43
12:L:15:SER:O	12:L:19:VAL:HG23	2.18	0.43
14:N:175:LYS:HG3	14:N:190:ASN:HA	2.00	0.43
2:b:8:TRP:O	2:b:12:ARG:HD3	2.18	0.43
2:b:26:GLU:OE2	3:c:34:THR:HG21	2.17	0.43
1:A:9:ARG:HH22	9:I:32:GLY:HA2	1.83	0.43
5:E:2:ASN:O	5:E:42:SER:HB2	2.18	0.43
13:M:211:LEU:HB2	13:M:247:PHE:CG	2.54	0.43
13:M:550:MET:SD	13:M:608:ILE:HD11	2.59	0.43
1:a:24:MET:HG3	1:a:24:MET:H	1.68	0.43
2:b:55:GLN:NE2	2:b:94:HIS:HA	2.33	0.43
16:B:301:HEC:HMC3	3:C:41:PHE:CZ	2.45	0.43
12:L:173:LEU:HD23	12:L:173:LEU:HA	1.78	0.43
13:M:357:VAL:HG21	14:N:57:VAL:HG11	1.99	0.43
1:a:120:PHE:CE1	1:a:125:TYR:HA	2.53	0.43
3:c:26:ASP:CG	3:c:29:GLU:H	2.25	0.43
1:A:47:GLN:HG3	1:A:69:ILE:HD12	2.01	0.43
2:B:129:GLY:HA3	17:B:303:HEM:C2B	2.54	0.43
2:B:151:LYS:HG2	3:C:68:GLU:OE2	2.19	0.43
12:L:73:ALA:HB2	12:L:116:LEU:HD23	2.01	0.43
13:M:260:PHE:HB3	13:M:327:LYS:NZ	2.33	0.43
13:M:447:ARG:HB3	14:N:220:LEU:HD13	1.99	0.43
1:a:115:ASN:HB3	1:a:118:LYS:HD2	2.00	0.43
3:c:29:GLU:O	3:c:31:PRO:HD3	2.17	0.43
9:i:30:ARG:O	9:i:33:GLN:HG2	2.18	0.43
2:B:218:GLN:HB3	3:c:15:ILE:HD11	2.01	0.43
8:H:8:VAL:HG13	8:H:11:LYS:HG3	1.99	0.43
12:L:150:ALA:HB1	23:M:703:5PL:H71C	2.00	0.43
21:J:202:CDL:HA32	12:L:203:MET:HE3	2.00	0.43
13:M:213:VAL:O	13:M:217:LEU:HG	2.18	0.43
2:b:11:GLU:OE2	3:c:10:VAL:HG21	2.19	0.43
13:M:407:LYS:HA	13:M:407:LYS:HD3	1.66	0.43
3:c:174:GLU:HB3	3:c:199:ASN:HD22	1.84	0.43
3:c:187:PHE:O	3:c:192:CYS:HB2	2.18	0.43
2:B:128:VAL:HG22	18:B:304:MQ7:H361	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:148:ALA:HB2	4:D:6:ILE:HG21	2.00	0.43
3:C:200:LEU:HB3	3:C:209:LEU:HB2	2.01	0.43
13:M:55:LYS:HE3	13:M:58:ASN:OD1	2.19	0.43
13:M:229:PHE:HB3	13:M:237:THR:HG22	2.00	0.43
2:b:96:TRP:HB2	3:c:56:PHE:HE1	1.83	0.43
3:C:26:ASP:O	3:C:27:TYR:HB2	2.18	0.42
13:M:219:MET:HE3	13:M:219:MET:HB3	1.86	0.42
13:M:278:TYR:CZ	13:M:525:LEU:HD21	2.54	0.42
1:a:120:PHE:HA	1:a:127:LEU:HA	2.00	0.42
18:c:301:MQ7:H412	18:c:301:MQ7:H391	1.54	0.42
3:C:2:HIS:O	3:C:4:GLY:N	2.52	0.42
13:M:85:LEU:HB3	13:M:397:LEU:HD22	2.01	0.42
1:a:109:TRP:CH2	1:a:117:ASN:HA	2.54	0.42
2:b:114:PHE:O	3:c:132:PRO:HG3	2.20	0.42
13:M:106:PRO:HG2	13:M:551:PRO:HG3	2.01	0.42
13:M:555:ILE:O	13:M:555:ILE:HG13	2.19	0.42
3:c:79:ILE:H	3:c:168:GLN:NE2	2.17	0.42
12:L:64:MET:HE1	12:L:130:PHE:CB	2.50	0.42
2:b:111:ARG:HH22	17:b:303:HEM:HBD1	1.83	0.42
1:A:124:HIS:HB2	15:A:201:FES:S1	2.59	0.42
5:E:25:LYS:HD2	5:E:25:LYS:HA	1.60	0.42
11:K:104:PHE:HZ	13:M:243:LEU:HG	1.84	0.42
22:M:701:HAS:H212	22:M:701:HAS:H18	1.60	0.42
13:M:384:HIS:O	13:M:388:VAL:HG22	2.19	0.42
14:N:344:LEU:O	14:N:348:LEU:HG	2.20	0.42
2:b:129:GLY:HA3	17:b:303:HEM:C3C	2.53	0.42
3:c:209:LEU:HD21	16:c:302:HEC:HMD2	2.02	0.42
9:i:49:GLU:H	9:i:49:GLU:HG2	1.57	0.42
1:A:109:TRP:HB2	1:A:119:PHE:CE1	2.55	0.42
2:B:35:HIS:CE1	9:I:31:ALA:HB1	2.53	0.42
3:C:154:TRP:HZ2	20:C:304:PC1:H142	1.84	0.42
3:c:9:PHE:HD1	3:c:15:ILE:O	2.03	0.42
2:B:2:LEU:HD12	2:B:2:LEU:HA	1.83	0.42
3:C:58:VAL:O	3:C:62:VAL:HG22	2.20	0.42
8:H:11:LYS:HG3	8:H:11:LYS:H	1.61	0.42
11:K:25:MET:HE3	11:K:29:VAL:HG23	2.01	0.42
12:L:114:LEU:HD12	12:L:114:LEU:HA	1.83	0.42
5:E:67:THR:O	5:E:71:ILE:HB	2.20	0.42
19:L:301:PEE:H81	5:e:36:ILE:HD11	2.02	0.42
13:M:141:ALA:O	13:M:145:LEU:HG	2.20	0.42
13:M:294:MET:HE2	13:M:294:MET:HB3	1.97	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:372:ASP:HA	13:M:375:PHE:HB2	2.02	0.42
13:M:581:LEU:HB3	13:M:582:PRO:HD3	2.01	0.42
22:M:702:HAS:H273	22:M:702:HAS:C15	2.50	0.42
23:M:703:5PL:HCB	23:M:703:5PL:HAW1	1.85	0.42
14:N:177:SER:HB3	14:N:218:ALA:H	1.85	0.42
9:I:9:LEU:HD23	9:I:9:LEU:HA	1.88	0.42
9:I:44:LYS:HA	9:I:53:TYR:CD1	2.55	0.42
3:c:244:GLU:HA	3:c:247:LYS:HG2	2.00	0.42
2:B:62:LEU:HD13	17:B:302:HEM:HBA1	2.01	0.41
10:J:8:PRO:HG2	5:e:53:TYR:CZ	2.55	0.41
12:L:30:PHE:CG	12:L:181:VAL:HG13	2.55	0.41
12:L:82:LEU:HD23	19:L:301:PEE:H22	2.02	0.41
13:M:282:VAL:O	13:M:285:ILE:HG12	2.20	0.41
13:M:322:ILE:O	13:M:326:ILE:HG23	2.20	0.41
2:b:26:GLU:HG2	3:c:30:TYR:HD1	1.85	0.41
1:A:162:LYS:HE3	1:A:162:LYS:HB3	1.92	0.41
2:B:153:LEU:HD22	3:C:71:ALA:HB1	2.02	0.41
3:C:173:LYS:HA	3:C:173:LYS:HD2	1.92	0.41
13:M:275:LEU:HD21	13:M:281:MET:HE3	2.02	0.41
11:K:32:PHE:CD2	12:L:82:LEU:HD22	2.54	0.41
13:M:174:LEU:HD11	13:M:202:ALA:HA	2.02	0.41
13:M:185:MET:HB2	13:M:522:VAL:HG21	2.01	0.41
14:N:136:ARG:CZ	14:N:138:ASN:HD21	2.33	0.41
8:h:2:ASN:HB2	9:i:90:TYR:CE1	2.55	0.41
2:B:33:PRO:HG3	16:B:301:HEC:HBC3	2.02	0.41
18:C:301:MQ7:H161	18:C:301:MQ7:H201	1.92	0.41
12:L:52:ARG:HA	12:L:137:LEU:HD13	2.01	0.41
13:M:72:MET:HE1	13:M:123:LEU:HD22	2.02	0.41
13:M:455:GLN:H	13:M:455:GLN:HG2	1.59	0.41
9:i:44:LYS:HB3	9:i:44:LYS:HE3	1.86	0.41
1:A:55:VAL:HG22	1:A:154:GLY:O	2.21	0.41
2:B:13:LEU:HD11	2:b:214:MET:HG2	2.02	0.41
13:M:598:ARG:HH22	23:M:703:5PL:HAR2	1.85	0.41
3:c:61:ILE:HD11	5:e:66:PHE:HD1	1.86	0.41
3:C:25:LYS:HG3	3:C:26:ASP:H	1.84	0.41
4:D:49:ILE:HG13	4:D:50:ASN:OD1	2.21	0.41
9:I:45:PHE:CZ	9:I:54:LEU:HD23	2.41	0.41
11:K:46:VAL:HG11	12:L:205:MET:HE2	2.02	0.41
13:M:211:LEU:HD13	13:M:247:PHE:CE2	2.56	0.41
3:c:54:ILE:HG12	5:e:62:PHE:CD2	2.56	0.41
1:A:18:THR:HB	8:H:22:PHE:HB2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:19:GLY:HA2	8:H:25:SER:OG	2.21	0.41
2:B:169:ILE:O	2:B:169:ILE:HG13	2.21	0.41
9:I:43:LYS:HG3	9:I:44:LYS:N	2.34	0.41
12:L:28:LEU:HD21	13:M:178:ILE:HB	2.03	0.41
13:M:67:ASN:HD21	14:N:223:PRO:HA	1.85	0.41
13:M:339:ASN:OD1	14:N:73:VAL:HB	2.19	0.41
14:N:120:MET:HA	14:N:125:ARG:NH2	2.36	0.41
3:c:216:PRO:O	3:c:220:LYS:HG3	2.21	0.41
1:A:95:ALA:HB1	1:A:147:TYR:CD2	2.53	0.41
10:J:23:LEU:HA	10:J:26:LYS:HB2	2.01	0.41
12:L:98:LYS:H	12:L:98:LYS:HG2	1.76	0.41
13:M:370:ALA:O	13:M:373:TYR:HB2	2.21	0.41
2:b:193:PHE:O	2:b:197:VAL:HG12	2.20	0.41
3:c:134:LYS:HE3	3:c:134:LYS:HB3	1.72	0.41
2:B:112:VAL:HG13	2:B:117:ALA:HB3	2.03	0.41
3:C:54:ILE:HG23	5:E:62:PHE:CE1	2.56	0.41
9:I:19:LEU:HD21	9:I:74:LEU:HD11	2.03	0.41
11:K:25:MET:O	11:K:29:VAL:HG23	2.21	0.41
11:K:104:PHE:CZ	13:M:243:LEU:HG	2.55	0.41
12:L:48:PHE:HA	12:L:140:ALA:HB1	2.03	0.41
12:L:121:PHE:HD2	21:L:302:CDL:H361	1.86	0.41
13:M:138:THR:HA	13:M:244:PHE:CZ	2.56	0.41
14:N:98:LEU:O	14:N:101:ILE:HG22	2.21	0.41
14:N:264:GLU:O	14:N:268:GLU:HG3	2.21	0.41
14:N:336:LEU:HD22	14:N:344:LEU:HD11	2.03	0.41
1:a:49:MET:HE3	1:a:50:VAL:H	1.86	0.41
1:a:129:GLU:HG2	1:a:131:ASP:H	1.86	0.41
16:b:301:HEC:CMC	3:c:45:GLU:HA	2.51	0.41
3:c:56:PHE:O	3:c:60:THR:HG23	2.21	0.41
5:e:65:GLY:O	5:e:69:TYR:HD2	2.03	0.41
9:i:23:MET:HB3	9:i:28:LEU:HB2	2.01	0.41
9:i:30:ARG:HH11	9:i:34:TRP:CG	2.39	0.41
2:B:96:TRP:HZ2	3:C:63:HIS:CD2	2.39	0.41
3:C:47:MET:HE3	5:E:8:LEU:HD11	2.03	0.41
21:J:202:CDL:H722	21:J:202:CDL:H131	2.01	0.41
13:M:253:TYR:HA	13:M:253:TYR:HD1	1.75	0.41
1:a:42:LYS:HB2	1:a:42:LYS:HE3	1.85	0.41
8:h:4:PHE:CD1	9:i:38:ARG:HD3	2.56	0.41
2:B:30:HIS:HA	2:B:36:HIS:HD2	1.86	0.40
2:B:224:LEU:HD23	2:B:224:LEU:HA	1.80	0.40
13:M:93:VAL:HG21	13:M:404:TRP:CD2	2.55	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:a:36:ALA:HB2	2:b:64:MET:HE1	2.03	0.40
1:a:88:LYS:HD3	1:a:93:ILE:HD12	2.02	0.40
3:c:173:LYS:HD2	3:c:173:LYS:HA	1.88	0.40
3:C:15:ILE:HA	3:C:16:PRO:HD3	1.96	0.40
12:L:178:LYS:HE3	23:M:703:5PL:HAX2	2.02	0.40
2:b:49:PHE:CD1	2:b:208:MET:HE1	2.55	0.40
2:b:206:GLY:HA3	18:c:301:MQ7:H401	2.03	0.40
3:c:114:ALA:HB2	19:c:303:PEE:H32	2.02	0.40
1:A:68:LYS:HG2	1:A:81:SER:HA	2.03	0.40
1:A:76:TYR:CD2	2:b:70:ILE:HD11	2.57	0.40
2:B:100:LEU:HD12	3:C:52:PHE:HZ	1.86	0.40
3:C:186:VAL:HG11	3:C:241:GLN:HB3	2.02	0.40
11:K:95:PHE:CZ	11:K:99:ILE:HD11	2.57	0.40
13:M:360:GLY:HA3	22:M:702:HAS:C15	2.51	0.40
13:M:504:GLU:O	13:M:507:VAL:HG22	2.21	0.40
14:N:89:GLU:HA	14:N:92:TRP:CE2	2.57	0.40
3:c:140:GLY:HA3	4:d:13:PHE:CE2	2.55	0.40
3:C:192:CYS:SG	3:C:196:HIS:HB2	2.61	0.40
11:K:104:PHE:CB	12:L:46:ALA:HB1	2.52	0.40
21:L:302:CDL:H611	21:L:302:CDL:H222	2.03	0.40
13:M:323:PRO:O	13:M:326:ILE:HG12	2.21	0.40
3:C:23:ILE:HG22	8:H:11:LYS:HB3	2.03	0.40
3:C:27:TYR:O	9:I:33:GLN:HA	2.21	0.40
3:C:38:TRP:HA	3:C:39:PRO:HA	1.91	0.40
3:C:182:GLU:HA	3:C:185:LYS:HD2	2.04	0.40
10:J:4:ASN:OD1	10:J:7:ILE:HG12	2.21	0.40
23:M:703:5PL:HBV2	23:M:703:5PL:OCL	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	161/167 (96%)	147 (91%)	14 (9%)	0	100	100
1	a	156/167 (93%)	142 (91%)	14 (9%)	0	100	100
2	B	222/224 (99%)	209 (94%)	12 (5%)	1 (0%)	24	21
2	b	222/224 (99%)	219 (99%)	2 (1%)	1 (0%)	24	21
3	C	253/255 (99%)	238 (94%)	14 (6%)	1 (0%)	30	27
3	c	253/255 (99%)	241 (95%)	10 (4%)	2 (1%)	16	11
4	D	54/57 (95%)	52 (96%)	2 (4%)	0	100	100
4	d	54/57 (95%)	53 (98%)	1 (2%)	0	100	100
5	E	75/81 (93%)	75 (100%)	0	0	100	100
5	e	75/81 (93%)	74 (99%)	1 (1%)	0	100	100
7	G	27/29 (93%)	20 (74%)	6 (22%)	1 (4%)	2	1
7	g	27/29 (93%)	27 (100%)	0	0	100	100
8	H	42/44 (96%)	39 (93%)	3 (7%)	0	100	100
8	h	42/44 (96%)	39 (93%)	3 (7%)	0	100	100
9	I	117/120 (98%)	113 (97%)	3 (3%)	1 (1%)	14	9
9	i	117/120 (98%)	115 (98%)	2 (2%)	0	100	100
10	J	118/120 (98%)	110 (93%)	8 (7%)	0	100	100
11	K	108/110 (98%)	104 (96%)	4 (4%)	0	100	100
12	L	205/207 (99%)	202 (98%)	3 (2%)	0	100	100
13	M	601/622 (97%)	582 (97%)	18 (3%)	1 (0%)	43	42
14	N	333/356 (94%)	314 (94%)	19 (6%)	0	100	100
All	All	3262/3369 (97%)	3115 (96%)	139 (4%)	8 (0%)	44	42

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	3	ARG
2	B	16	THR
3	c	3	ARG
3	c	26	ASP
7	G	22	TYR
13	M	494	ALA
9	I	85	PRO
2	b	168	LEU

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	142/144 (99%)	139 (98%)	3 (2%)	47 52
1	a	139/144 (96%)	134 (96%)	5 (4%)	31 31
2	B	188/188 (100%)	183 (97%)	5 (3%)	39 42
2	b	188/188 (100%)	179 (95%)	9 (5%)	23 21
3	C	205/205 (100%)	194 (95%)	11 (5%)	20 17
3	c	205/205 (100%)	204 (100%)	1 (0%)	81 87
4	D	45/46 (98%)	45 (100%)	0	100 100
4	d	45/46 (98%)	41 (91%)	4 (9%)	9 6
5	E	66/67 (98%)	63 (96%)	3 (4%)	24 23
5	e	66/67 (98%)	64 (97%)	2 (3%)	36 38
7	G	25/25 (100%)	23 (92%)	2 (8%)	11 8
7	g	25/25 (100%)	25 (100%)	0	100 100
8	H	37/37 (100%)	35 (95%)	2 (5%)	20 17
8	h	37/37 (100%)	36 (97%)	1 (3%)	39 42
9	I	100/101 (99%)	98 (98%)	2 (2%)	48 54
9	i	100/101 (99%)	96 (96%)	4 (4%)	28 27
10	J	96/96 (100%)	94 (98%)	2 (2%)	47 52
11	K	94/94 (100%)	91 (97%)	3 (3%)	34 35
12	L	173/173 (100%)	168 (97%)	5 (3%)	37 40
13	M	490/506 (97%)	474 (97%)	16 (3%)	33 34
14	N	291/311 (94%)	274 (94%)	17 (6%)	18 15
All	All	2757/2806 (98%)	2660 (96%)	97 (4%)	32 32

All (97) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	VAL

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Mol	Chain	Res	Type
1	A	75	TRP
1	A	101	LYS
2	B	76	SER
2	B	100	LEU
2	B	110	LEU
2	B	122	ARG
2	B	197	VAL
3	C	23	ILE
3	C	26	ASP
3	C	34	THR
3	C	70	MET
3	C	89	LEU
3	C	95	TYR
3	C	103	THR
3	C	105	VAL
3	C	167	GLU
3	C	172	THR
3	C	193	ILE
5	E	1	MET
5	E	4	MET
5	E	37	LEU
7	G	4	ILE
7	G	12	THR
8	H	9	GLN
8	H	11	LYS
9	I	37	GLU
9	I	75	MET
10	J	15	LEU
10	J	33	GLU
11	K	28	GLN
11	K	105	VAL
11	K	107	ILE
12	L	1	MET
12	L	61	THR
12	L	64	MET
12	L	81	SER
12	L	198	THR
13	M	71	THR
13	M	108	LEU
13	M	116	PHE
13	M	123	LEU
13	M	192	LEU

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Mol	Chain	Res	Type
13	M	227	ASN
13	M	328	ILE
13	M	333	LEU
13	M	352	PHE
13	M	357	VAL
13	M	361	VAL
13	M	377	ASP
13	M	519	LEU
13	M	530	ILE
13	M	569	PHE
13	M	572	LEU
14	N	29	LEU
14	N	37	ASP
14	N	45	LEU
14	N	50	MET
14	N	65	ILE
14	N	100	LEU
14	N	105	ILE
14	N	139	LEU
14	N	191	THR
14	N	194	GLU
14	N	197	PHE
14	N	198	PHE
14	N	232	VAL
14	N	264	GLU
14	N	305	VAL
14	N	335	LYS
14	N	337	SER
1	a	18	THR
1	a	100	CYS
1	a	102	HIS
1	a	111	SER
1	a	121	CYS
2	b	2	LEU
2	b	13	LEU
2	b	18	MET
2	b	64	MET
2	b	83	GLU
2	b	89	ILE
2	b	150	MET
2	b	171	THR
2	b	214	MET

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Mol	Chain	Res	Type
3	c	12	ASP
4	d	12	LEU
4	d	18	VAL
4	d	22	VAL
4	d	32	LEU
5	e	26	ASP
5	e	42	SER
8	h	37	THR
9	i	47	THR
9	i	49	GLU
9	i	62	GLU
9	i	118	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (43) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	11	GLN
1	A	146	HIS
2	B	35	HIS
2	B	82	ASN
2	B	88	GLN
2	B	172	GLN
5	E	34	GLN
8	H	9	GLN
8	H	40	HIS
9	I	33	GLN
10	J	64	HIS
11	K	83	HIS
12	L	2	GLN
12	L	4	GLN
12	L	93	ASN
12	L	148	HIS
12	L	166	ASN
12	L	172	ASN
13	M	52	GLN
13	M	64	GLN
13	M	67	ASN
13	M	160	GLN
13	M	536	HIS
13	M	604	HIS
14	N	39	GLN
14	N	138	ASN

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Mol	Chain	Res	Type
14	N	195	ASN
14	N	261	GLN
14	N	270	ASN
14	N	327	ASN
1	a	47	GLN
2	b	25	HIS
2	b	35	HIS
2	b	72	ASN
2	b	81	GLN
2	b	180	HIS
3	c	190	GLN
3	c	199	ASN
4	d	24	ASN
4	d	26	ASN
4	d	50	ASN
9	i	73	GLN
9	i	82	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 31 ligands modelled in this entry, 2 are monoatomic - leaving 29 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	$\#\|Z\|>2$
19	PEE	J	203	-	39,39,50	0.33	0	42,44,55	0.43	0
18	MQ7	b	304	-	49,49,49	0.39	0	61,63,63	0.67	1 (1%)
17	HEM	b	303	2	50,50,50	1.59	9 (18%)	67,82,82	1.58	12 (17%)
19	PEE	c	303	-	41,41,50	0.33	0	44,46,55	0.40	0
21	CDL	K	201	-	99,99,99	0.28	0	105,111,111	0.38	0
16	HEC	C	302	-	50,50,50	3.09	31 (62%)	68,82,82	2.26	28 (41%)
22	HAS	M	702	13	72,72,72	2.39	26 (36%)	87,109,109	2.43	32 (36%)
16	HEC	J	201	-	50,50,50	3.10	30 (60%)	68,82,82	2.25	28 (41%)
18	MQ7	C	301	-	49,49,49	0.42	0	61,63,63	0.68	2 (3%)
15	FES	a	201	1	0,4,4	-	-	-		
18	MQ7	B	304	-	49,49,49	0.38	0	61,63,63	0.55	1 (1%)
22	HAS	M	701	13	72,72,72	2.41	27 (37%)	87,109,109	2.30	32 (36%)
17	HEM	B	302	2	50,50,50	1.59	9 (18%)	67,82,82	1.68	13 (19%)
17	HEM	b	302	2	50,50,50	1.58	9 (18%)	67,82,82	1.66	14 (20%)
20	PC1	C	304	-	47,47,53	0.30	0	53,55,61	0.33	0
19	PEE	C	303	-	41,41,50	0.33	0	44,46,55	0.43	0
21	CDL	L	302	-	97,97,99	0.28	0	103,109,111	0.44	0
21	CDL	J	202	-	99,99,99	0.30	0	105,111,111	0.52	1 (0%)
20	PC1	c	304	-	42,42,53	0.55	0	48,50,61	0.51	1 (2%)
16	HEC	c	302	3	50,50,50	3.82	31 (62%)	68,82,82	9.13	31 (45%)
15	FES	A	201	1	0,4,4	-	-	-		
19	PEE	L	301	-	50,50,50	0.31	0	53,55,55	0.41	0
16	HEC	b	301	2	50,50,50	2.83	25 (50%)	68,82,82	2.49	27 (39%)
23	5PL	M	703	-	84,85,85	0.25	0	95,101,101	0.53	1 (1%)
16	HEC	N	401	14	50,50,50	2.90	27 (54%)	68,82,82	2.38	28 (41%)
18	MQ7	c	301	-	49,49,49	0.39	0	61,63,63	0.49	1 (1%)
17	HEM	B	303	2	50,50,50	1.60	10 (20%)	67,82,82	1.55	11 (16%)
16	HEC	B	301	2	50,50,50	2.95	28 (56%)	68,82,82	2.43	22 (32%)
26	CUA	N	402	-	0,1,1	-	-	-		

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
19	PEE	J	203	-	-	7/43/43/54	-
18	MQ7	b	304	-	-	8/41/61/61	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	HEM	b	303	2	-	6/14/54/54	-
19	PEE	c	303	-	-	8/45/45/54	-
21	CDL	K	201	-	-	15/110/110/110	-
16	HEC	C	302	-	1/1/3/7	5/14/54/54	-
22	HAS	M	702	13	1/1/8/18	15/42/82/82	-
16	HEC	J	201	-	1/1/3/7	10/14/54/54	-
18	MQ7	C	301	-	-	10/41/61/61	0/2/2/2
18	MQ7	B	304	-	-	11/41/61/61	0/2/2/2
15	FES	a	201	1	-	-	0/1/1/1
22	HAS	M	701	13	1/1/8/18	14/42/82/82	-
17	HEM	B	302	2	-	7/14/54/54	-
17	HEM	b	302	2	-	9/14/54/54	-
20	PC1	C	304	-	-	11/51/51/57	-
19	PEE	C	303	-	-	5/45/45/54	-
21	CDL	L	302	-	-	25/108/108/110	-
21	CDL	J	202	-	-	18/110/110/110	-
20	PC1	c	304	-	-	14/46/46/57	-
16	HEC	c	302	3	1/1/3/7	10/14/54/54	-
15	FES	A	201	1	-	-	0/1/1/1
19	PEE	L	301	-	-	7/54/54/54	-
16	HEC	b	301	2	1/1/3/7	5/14/54/54	-
23	5PL	M	703	-	-	17/87/107/107	0/1/1/1
16	HEC	N	401	14	1/1/3/7	7/14/54/54	-
18	MQ7	c	301	-	-	9/41/61/61	0/2/2/2
17	HEM	B	303	2	-	8/14/54/54	-
16	HEC	B	301	2	1/1/3/7	11/14/54/54	-

All (262) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	c	302	HEC	CAC-C3C	10.00	1.76	1.51
16	c	302	HEC	CMC-C2C	9.43	1.70	1.50
22	M	701	HAS	C3B-C2B	5.75	1.47	1.34
16	J	201	HEC	C3B-C2B	5.72	1.49	1.36
16	C	302	HEC	C3B-C2B	5.70	1.49	1.36
16	c	302	HEC	C2A-C3A	5.63	1.48	1.36
16	c	302	HEC	C3B-C2B	5.61	1.48	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	C	302	HEC	CHB-C4A	5.53	1.49	1.38
16	J	201	HEC	C3D-C2D	5.53	1.48	1.36
16	J	201	HEC	C2A-C3A	5.52	1.48	1.36
16	C	302	HEC	C2A-C3A	5.51	1.48	1.36
16	J	201	HEC	CHB-C4A	5.48	1.49	1.38
22	M	702	HAS	C3B-C2B	5.47	1.47	1.34
16	C	302	HEC	C3D-C2D	5.45	1.48	1.36
16	c	302	HEC	C3D-C2D	5.45	1.48	1.36
16	c	302	HEC	CHA-C1A	5.44	1.49	1.38
16	c	302	HEC	CHB-C4A	5.42	1.49	1.38
16	J	201	HEC	CHA-C1A	5.42	1.49	1.38
16	c	302	HEC	CHD-C1D	5.39	1.49	1.38
16	N	401	HEC	C3B-C2B	5.38	1.48	1.36
16	C	302	HEC	CHA-C1A	5.37	1.48	1.38
16	B	301	HEC	C3B-C2B	5.31	1.48	1.36
17	B	302	HEM	FE-NB	5.31	2.11	1.94
16	J	201	HEC	CHC-C4B	5.30	1.49	1.38
16	J	201	HEC	CHD-C1D	5.29	1.49	1.38
16	B	301	HEC	C2A-C3A	5.27	1.48	1.36
17	b	302	HEM	FE-NB	5.27	2.11	1.94
16	C	302	HEC	CHC-C4B	5.26	1.49	1.38
16	C	302	HEC	CHD-C1D	5.25	1.49	1.38
22	M	702	HAS	FE-NB	5.21	2.10	1.94
22	M	702	HAS	C2A-C3A	5.17	1.47	1.36
16	c	302	HEC	CHC-C4B	5.16	1.48	1.38
17	B	303	HEM	FE-NB	5.15	2.10	1.94
16	B	301	HEC	C3D-C2D	5.13	1.47	1.36
16	b	301	HEC	FE-NB	5.11	2.10	1.94
22	M	702	HAS	FE-ND	5.10	2.10	1.94
17	b	303	HEM	FE-NB	5.10	2.10	1.94
16	B	301	HEC	CHC-C4B	5.09	1.48	1.38
16	c	302	HEC	C4C-C3C	5.06	1.54	1.44
16	b	301	HEC	C2A-C3A	5.05	1.47	1.36
22	M	701	HAS	FE-ND	5.02	2.10	1.94
16	B	301	HEC	FE-ND	5.02	2.10	1.94
16	N	401	HEC	C3D-C2D	5.01	1.47	1.36
22	M	701	HAS	CHA-C1A	5.00	1.48	1.38
22	M	701	HAS	C2A-C3A	4.99	1.47	1.36
16	N	401	HEC	CHB-C4A	4.99	1.48	1.38
16	b	301	HEC	CHB-C4A	4.98	1.48	1.38
16	b	301	HEC	FE-ND	4.97	2.10	1.94
22	M	701	HAS	CHD-C4A	4.96	1.48	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	B	301	HEC	FE-NB	4.96	2.10	1.94
16	N	401	HEC	CHA-C1A	4.95	1.48	1.38
22	M	701	HAS	FE-NB	4.95	2.10	1.94
16	b	301	HEC	C3B-C2B	4.93	1.47	1.36
16	N	401	HEC	C2A-C3A	4.92	1.47	1.36
16	c	302	HEC	C3C-C2C	-4.92	1.26	1.38
16	c	302	HEC	CHD-C4C	4.90	1.50	1.39
16	N	401	HEC	FE-ND	4.86	2.09	1.94
16	B	301	HEC	CHA-C1A	4.86	1.47	1.38
22	M	701	HAS	CHC-C4B	4.84	1.48	1.38
16	b	301	HEC	C3D-C2D	4.83	1.47	1.36
16	B	301	HEC	CHB-C4A	4.83	1.47	1.38
16	N	401	HEC	FE-NB	4.83	2.09	1.94
16	b	301	HEC	CHA-C1A	4.81	1.47	1.38
22	M	702	HAS	CHD-C4A	4.76	1.47	1.38
16	N	401	HEC	CHD-C1D	4.70	1.47	1.38
16	N	401	HEC	CHC-C4B	4.70	1.47	1.38
22	M	702	HAS	CHA-C1A	4.67	1.47	1.38
22	M	702	HAS	FE-NA	4.67	2.10	1.95
16	B	301	HEC	FE-NC	4.66	2.10	1.95
16	B	301	HEC	FE-NA	4.63	2.10	1.95
22	M	702	HAS	FE-NC	4.61	2.10	1.95
22	M	702	HAS	CHC-C4B	4.61	1.47	1.38
16	J	201	HEC	FE-ND	4.60	2.09	1.94
16	c	302	HEC	FE-NB	4.57	2.09	1.94
16	C	302	HEC	FE-ND	4.57	2.09	1.94
16	b	301	HEC	CHD-C1D	4.56	1.47	1.38
16	C	302	HEC	FE-NB	4.56	2.08	1.94
16	b	301	HEC	FE-NA	4.55	2.10	1.95
16	B	301	HEC	CHD-C1D	4.55	1.47	1.38
16	J	201	HEC	FE-NB	4.55	2.08	1.94
22	M	702	HAS	CHB-C1D	4.54	1.47	1.38
16	c	302	HEC	FE-ND	4.51	2.08	1.94
16	b	301	HEC	FE-NC	4.51	2.10	1.95
22	M	701	HAS	FE-NC	4.51	2.10	1.95
22	M	701	HAS	FE-NA	4.45	2.09	1.95
16	c	302	HEC	CHA-C4D	4.42	1.49	1.39
16	c	302	HEC	C1C-NC	-4.41	1.31	1.39
16	N	401	HEC	FE-NC	4.36	2.09	1.95
16	J	201	HEC	CHB-C1B	4.36	1.49	1.39
16	J	201	HEC	CHD-C4C	4.36	1.49	1.39
16	C	302	HEC	CHA-C4D	4.33	1.49	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	J	201	HEC	CHA-C4D	4.32	1.49	1.39
16	C	302	HEC	CHD-C4C	4.31	1.49	1.39
16	N	401	HEC	FE-NA	4.29	2.09	1.95
16	J	201	HEC	CHC-C1C	4.28	1.49	1.39
16	c	302	HEC	CHC-C1C	4.27	1.49	1.39
16	C	302	HEC	CHB-C1B	4.26	1.48	1.39
16	C	302	HEC	CHC-C1C	4.24	1.48	1.39
16	c	302	HEC	FE-NA	4.24	2.09	1.95
22	M	701	HAS	CHB-C1D	4.22	1.46	1.38
17	b	303	HEM	FE-NC	4.21	2.09	1.95
16	C	302	HEC	FE-NC	4.20	2.09	1.95
16	B	301	HEC	CHC-C1C	4.20	1.48	1.39
22	M	702	HAS	C2D-C3D	4.20	1.46	1.37
16	c	302	HEC	CHB-C1B	4.19	1.48	1.39
17	b	302	HEM	FE-NC	4.19	2.09	1.95
16	c	302	HEC	FE-NC	4.17	2.08	1.95
16	J	201	HEC	FE-NC	4.15	2.08	1.95
16	J	201	HEC	FE-NA	4.14	2.08	1.95
16	C	302	HEC	FE-NA	4.13	2.08	1.95
22	M	701	HAS	C2D-C3D	4.08	1.46	1.37
16	b	301	HEC	CHC-C4B	4.07	1.46	1.38
16	N	401	HEC	CHA-C4D	4.07	1.48	1.39
17	B	302	HEM	FE-NC	4.05	2.08	1.95
16	N	401	HEC	CHD-C4C	3.97	1.48	1.39
17	B	303	HEM	FE-NC	3.95	2.08	1.95
22	M	701	HAS	CHC-C1C	3.93	1.48	1.39
16	B	301	HEC	CHB-C1B	3.93	1.48	1.39
22	M	701	HAS	CHA-C4D	3.92	1.48	1.39
16	J	201	HEC	C3C-C2C	3.92	1.49	1.38
16	c	302	HEC	C4C-NC	-3.91	1.32	1.39
16	b	301	HEC	CHB-C1B	3.89	1.48	1.39
16	B	301	HEC	CHA-C4D	3.86	1.48	1.39
16	C	302	HEC	C3C-C2C	3.86	1.49	1.38
22	M	701	HAS	CHD-C4C	3.80	1.47	1.39
16	B	301	HEC	CHD-C4C	3.78	1.47	1.39
16	b	301	HEC	CHA-C4D	3.78	1.47	1.39
22	M	702	HAS	CHC-C1C	3.78	1.47	1.39
16	N	401	HEC	CHB-C1B	3.76	1.47	1.39
22	M	702	HAS	CHD-C4C	3.75	1.47	1.39
22	M	702	HAS	CHB-C1B	3.73	1.47	1.39
16	N	401	HEC	CHC-C1C	3.71	1.47	1.39
16	b	301	HEC	CHD-C4C	3.61	1.47	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	B	303	HEM	C4D-ND	-3.60	1.34	1.40
22	M	702	HAS	CHA-C4D	3.55	1.47	1.39
17	b	303	HEM	C1B-NB	-3.53	1.34	1.40
22	M	701	HAS	CHB-C1B	3.47	1.47	1.39
16	B	301	HEC	C3C-C2C	3.43	1.47	1.38
17	B	303	HEM	C1B-NB	-3.38	1.34	1.40
17	B	302	HEM	C1B-NB	-3.36	1.34	1.40
16	b	301	HEC	C3C-C2C	3.35	1.47	1.38
16	c	302	HEC	C1C-C2C	3.35	1.51	1.43
16	N	401	HEC	C3C-C2C	3.34	1.47	1.38
17	B	302	HEM	C4D-ND	-3.33	1.34	1.40
17	b	302	HEM	C4D-ND	-3.30	1.34	1.40
16	b	301	HEC	CHC-C1C	3.30	1.46	1.39
17	b	303	HEM	C4D-ND	-3.28	1.34	1.40
17	b	302	HEM	C1B-NB	-3.27	1.34	1.40
16	N	401	HEC	C4B-NB	-3.23	1.34	1.40
16	b	301	HEC	C4B-NB	-3.21	1.34	1.40
16	C	302	HEC	C4B-NB	-3.18	1.34	1.40
16	J	201	HEC	C4B-NB	-3.16	1.34	1.40
16	J	201	HEC	C1D-ND	-3.12	1.34	1.40
16	c	302	HEC	C1D-ND	-3.12	1.34	1.40
22	M	701	HAS	C1D-ND	-3.11	1.34	1.40
16	c	302	HEC	C4B-NB	-3.09	1.34	1.40
16	C	302	HEC	C1D-ND	-3.06	1.34	1.40
16	N	401	HEC	C1D-ND	-3.04	1.35	1.40
16	B	301	HEC	C1C-C2C	3.00	1.50	1.43
16	B	301	HEC	C1D-ND	-2.95	1.35	1.40
22	M	701	HAS	C4B-NB	-2.92	1.35	1.40
22	M	701	HAS	C4D-C3D	2.87	1.49	1.45
22	M	702	HAS	C1D-ND	-2.86	1.35	1.40
16	C	302	HEC	C1C-C2C	2.76	1.49	1.43
16	B	301	HEC	C4B-NB	-2.76	1.35	1.40
16	J	201	HEC	C1C-C2C	2.75	1.49	1.43
16	b	301	HEC	C1D-ND	-2.73	1.35	1.40
17	B	303	HEM	FE-ND	-2.71	1.86	1.94
22	M	701	HAS	C4B-C3B	2.70	1.49	1.44
16	b	301	HEC	C1B-C2B	2.67	1.49	1.44
17	b	303	HEM	C1C-C2C	-2.67	1.40	1.45
22	M	702	HAS	C4B-NB	-2.65	1.35	1.40
16	J	201	HEC	C1A-NA	-2.65	1.34	1.39
16	N	401	HEC	C1A-NA	-2.62	1.34	1.39
16	c	302	HEC	C4D-C3D	2.61	1.49	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
22	M	701	HAS	C1C-C2C	2.60	1.49	1.43
16	J	201	HEC	C4D-C3D	2.60	1.49	1.45
22	M	702	HAS	C4B-C3B	2.59	1.49	1.44
17	b	303	HEM	FE-ND	-2.59	1.86	1.94
16	C	302	HEC	C1A-NA	-2.56	1.34	1.39
17	B	303	HEM	C1C-C2C	-2.56	1.40	1.45
16	C	302	HEC	C4D-C3D	2.55	1.49	1.45
16	J	201	HEC	C4A-NA	-2.54	1.34	1.39
16	J	201	HEC	C4C-NC	-2.54	1.34	1.39
16	C	302	HEC	C4C-NC	-2.53	1.34	1.39
16	c	302	HEC	C1B-C2B	2.53	1.49	1.44
16	N	401	HEC	C1C-NC	-2.53	1.34	1.39
16	c	302	HEC	C4A-NA	-2.53	1.34	1.39
16	C	302	HEC	C4A-NA	-2.52	1.34	1.39
16	J	201	HEC	C1B-C2B	2.52	1.49	1.44
16	b	301	HEC	C1C-NC	-2.51	1.34	1.39
22	M	702	HAS	C1C-C2C	2.51	1.49	1.43
16	c	302	HEC	C1A-C2A	2.51	1.49	1.45
22	M	702	HAS	C1A-NA	-2.49	1.34	1.39
16	C	302	HEC	C1B-C2B	2.45	1.49	1.44
17	B	302	HEM	FE-ND	-2.44	1.87	1.94
16	N	401	HEC	C4C-C3C	2.44	1.49	1.44
17	b	302	HEM	FE-ND	-2.44	1.87	1.94
16	N	401	HEC	C4A-NA	-2.43	1.35	1.39
22	M	701	HAS	C11-C3B	-2.43	1.48	1.51
22	M	701	HAS	C4C-NC	-2.42	1.35	1.39
16	c	302	HEC	C1A-NA	-2.42	1.35	1.39
22	M	701	HAS	C4A-NA	-2.41	1.35	1.39
22	M	702	HAS	C4D-C3D	2.40	1.49	1.45
16	b	301	HEC	C1A-NA	-2.38	1.35	1.39
17	B	302	HEM	C1C-C2C	-2.38	1.40	1.45
16	c	302	HEC	C1D-C2D	2.37	1.49	1.44
17	b	302	HEM	C1C-C2C	-2.36	1.40	1.45
16	B	301	HEC	C4D-C3D	2.35	1.49	1.45
16	B	301	HEC	C4A-NA	-2.35	1.35	1.39
16	N	401	HEC	C1B-C2B	2.34	1.49	1.44
16	B	301	HEC	C4C-NC	-2.34	1.35	1.39
16	C	302	HEC	C4B-C3B	2.34	1.49	1.45
22	M	701	HAS	C1A-NA	-2.32	1.35	1.39
16	C	302	HEC	C1D-C2D	2.32	1.49	1.44
16	B	301	HEC	C1A-NA	-2.32	1.35	1.39
16	B	301	HEC	C1B-C2B	2.31	1.49	1.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	b	301	HEC	C4A-NA	-2.31	1.35	1.39
16	N	401	HEC	C4D-C3D	2.31	1.49	1.45
16	C	302	HEC	C1C-NC	-2.30	1.35	1.39
22	M	702	HAS	C4C-NC	-2.29	1.35	1.39
16	B	301	HEC	C4B-C3B	2.27	1.48	1.45
16	N	401	HEC	C4C-NC	-2.27	1.35	1.39
16	J	201	HEC	C1D-C2D	2.27	1.49	1.44
16	J	201	HEC	C1C-NC	-2.26	1.35	1.39
16	J	201	HEC	C4B-C3B	2.24	1.48	1.45
17	b	303	HEM	C1D-ND	-2.23	1.34	1.38
16	b	301	HEC	C4C-NC	-2.23	1.35	1.39
16	C	302	HEC	C1A-C2A	2.23	1.49	1.45
22	M	702	HAS	C11-C3B	-2.22	1.48	1.51
17	B	303	HEM	C1D-ND	-2.22	1.34	1.38
17	b	302	HEM	C3C-C4C	-2.22	1.42	1.46
22	M	702	HAS	C4A-NA	-2.20	1.35	1.39
17	B	302	HEM	C3C-C4C	-2.19	1.42	1.46
17	b	303	HEM	C4B-NB	-2.17	1.34	1.38
16	B	301	HEC	C1A-C2A	2.15	1.49	1.45
16	J	201	HEC	C1A-C2A	2.14	1.49	1.45
22	M	701	HAS	C1A-C2A	2.14	1.49	1.45
22	M	701	HAS	C1C-NC	-2.13	1.35	1.39
17	B	302	HEM	C3B-C4B	2.13	1.49	1.44
16	c	302	HEC	C4B-C3B	2.13	1.48	1.45
22	M	702	HAS	C1B-C2B	2.13	1.48	1.44
16	C	302	HEC	C4C-C3C	2.12	1.48	1.44
16	C	302	HEC	C4A-C3A	2.12	1.49	1.45
22	M	701	HAS	C1B-NB	-2.11	1.34	1.38
17	b	302	HEM	C1D-ND	-2.11	1.34	1.38
16	J	201	HEC	C4C-C3C	2.10	1.48	1.44
17	B	303	HEM	C3B-C4B	2.07	1.48	1.44
16	b	301	HEC	C4D-C3D	2.07	1.48	1.45
16	b	301	HEC	C1A-C2A	2.05	1.48	1.45
16	C	302	HEC	C4D-ND	-2.05	1.34	1.38
16	B	301	HEC	C1D-C2D	2.04	1.48	1.44
17	B	303	HEM	C3C-C4C	-2.04	1.42	1.46
17	B	303	HEM	C4B-NB	-2.04	1.34	1.38
17	b	302	HEM	C4B-NB	-2.03	1.34	1.38
22	M	702	HAS	C1C-NC	-2.03	1.35	1.39
16	N	401	HEC	C1C-C2C	2.03	1.47	1.43
16	N	401	HEC	C4D-ND	-2.03	1.34	1.38
17	b	303	HEM	C3C-C4C	-2.02	1.42	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	J	201	HEC	C4D-ND	-2.02	1.34	1.38
16	B	301	HEC	C4A-C3A	2.02	1.49	1.45
17	B	302	HEM	C1D-ND	-2.01	1.34	1.38

All (286) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	c	302	HEC	CAC-C3C-C2C	-52.59	43.69	126.89
16	c	302	HEC	CMC-C2C-C3C	-46.69	26.59	125.62
16	c	302	HEC	CAC-C3C-C4C	13.73	143.79	124.91
16	c	302	HEC	CBC-CAC-C3C	12.33	145.86	112.42
22	M	702	HAS	C2D-C3D-C4D	-8.03	100.62	106.43
22	M	701	HAS	C2D-C3D-C4D	-7.40	101.07	106.43
16	c	302	HEC	CMC-C2C-C1C	6.45	135.25	125.42
16	c	302	HEC	C3C-C4C-NC	6.30	117.14	110.15
22	M	702	HAS	C3D-C4D-ND	5.98	116.13	110.35
16	N	401	HEC	C1B-C2B-C3B	-5.96	100.71	106.98
16	B	301	HEC	C1B-C2B-C3B	-5.93	100.74	106.98
16	b	301	HEC	C1B-C2B-C3B	-5.83	100.84	106.98
22	M	702	HAS	C2A-C1A-NA	5.81	115.93	110.32
16	c	302	HEC	C1B-C2B-C3B	-5.61	101.08	106.98
16	C	302	HEC	C1B-C2B-C3B	-5.60	101.09	106.98
16	J	201	HEC	C1B-C2B-C3B	-5.53	101.17	106.98
16	B	301	HEC	C2A-C1A-NA	5.33	115.46	110.32
22	M	702	HAS	C3C-C2C-C1C	-5.25	100.99	107.17
16	B	301	HEC	C2B-C1B-NB	5.24	115.97	109.90
22	M	701	HAS	C2B-C1B-NB	5.22	115.94	109.90
17	b	302	HEM	CHC-C4B-NB	5.17	129.99	124.42
16	b	301	HEC	C2A-C1A-NA	5.15	115.30	110.32
16	b	301	HEC	C2B-C1B-NB	5.06	115.75	109.90
16	N	401	HEC	C2B-C1B-NB	5.02	115.71	109.90
22	M	702	HAS	C3C-C4C-NC	4.99	114.00	109.80
16	C	302	HEC	C1C-C2C-C3C	-4.98	101.11	106.82
22	M	701	HAS	C3C-C2C-C1C	-4.95	101.33	107.17
16	B	301	HEC	C2D-C1D-ND	4.95	115.53	109.84
16	b	301	HEC	C3D-C4D-ND	4.94	115.13	110.35
16	J	201	HEC	C1C-C2C-C3C	-4.94	101.16	106.82
22	M	702	HAS	C3B-C4B-NB	4.88	115.45	109.84
16	B	301	HEC	C3D-C4D-ND	4.85	115.04	110.35
22	M	701	HAS	C3D-C4D-ND	4.85	115.04	110.35
16	b	301	HEC	C1C-C2C-C3C	-4.83	101.28	106.82
22	M	702	HAS	C2B-C1B-NB	4.80	115.45	109.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	b	301	HEC	C2D-C1D-ND	4.79	115.35	109.84
16	B	301	HEC	CBB-CAB-C3B	4.72	125.22	112.42
16	B	301	HEC	CBC-CAC-C3C	4.71	125.19	112.42
16	B	301	HEC	C1C-C2C-C3C	-4.71	101.42	106.82
17	b	303	HEM	CHC-C4B-NB	4.69	129.47	124.42
16	N	401	HEC	C1C-C2C-C3C	-4.62	101.53	106.82
22	M	701	HAS	C3C-C4C-NC	4.62	113.69	109.80
17	B	302	HEM	CHD-C1D-ND	4.56	129.33	124.42
16	J	201	HEC	CBC-CAC-C3C	4.55	124.74	112.42
16	c	302	HEC	CBB-CAB-C3B	4.54	124.72	112.42
16	C	302	HEC	CBC-CAC-C3C	4.53	124.71	112.42
22	M	701	HAS	C2A-C1A-NA	4.53	114.69	110.32
16	C	302	HEC	CBB-CAB-C3B	4.52	124.68	112.42
16	J	201	HEC	CBB-CAB-C3B	4.51	124.65	112.42
17	B	302	HEM	CHC-C4B-NB	4.50	129.26	124.42
22	M	701	HAS	CAD-C3D-C4D	4.49	132.52	124.70
16	N	401	HEC	CBC-CAC-C3C	4.49	124.58	112.42
16	N	401	HEC	C2D-C1D-ND	4.43	114.94	109.84
22	M	701	HAS	C3B-C4B-NB	4.42	114.92	109.84
16	b	301	HEC	C3B-C4B-NB	4.41	115.01	110.17
16	c	302	HEC	C4C-C3C-C2C	-4.37	100.10	106.87
16	b	301	HEC	CBB-CAB-C3B	4.34	124.18	112.42
16	c	302	HEC	C2B-C1B-NB	4.29	114.87	109.90
16	N	401	HEC	CBB-CAB-C3B	4.29	124.05	112.42
16	N	401	HEC	C3D-C4D-ND	4.26	114.47	110.35
16	b	301	HEC	C1D-C2D-C3D	-4.25	102.52	106.98
16	B	301	HEC	C1D-C2D-C3D	-4.24	102.52	106.98
17	b	302	HEM	CHD-C1D-ND	4.23	128.97	124.42
16	C	302	HEC	C2B-C1B-NB	4.22	114.78	109.90
16	N	401	HEC	C2A-C1A-NA	4.17	114.34	110.32
16	N	401	HEC	C1D-C2D-C3D	-4.07	102.70	106.98
16	b	301	HEC	C2C-C1C-NC	4.04	116.62	110.14
16	J	201	HEC	C2B-C1B-NB	4.04	114.57	109.90
16	N	401	HEC	CAC-C3C-C4C	3.97	130.38	124.91
17	B	303	HEM	C1B-NB-C4B	3.95	109.89	105.21
16	b	301	HEC	CMC-C2C-C3C	3.92	133.93	125.62
16	b	301	HEC	CBC-CAC-C3C	3.88	122.95	112.42
22	M	701	HAS	CAD-CBD-CGD	-3.87	103.40	113.67
16	c	302	HEC	C2A-C1A-NA	3.87	114.06	110.32
17	b	303	HEM	CHD-C1D-ND	3.82	128.54	124.42
16	C	302	HEC	C2A-C1A-NA	3.78	113.97	110.32
22	M	702	HAS	C27-C19-C20	3.77	121.77	115.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	B	302	HEM	CHA-C4D-ND	3.76	129.01	124.37
17	b	302	HEM	CHA-C4D-ND	3.74	128.99	124.37
16	C	302	HEC	C1D-C2D-C3D	-3.73	103.06	106.98
16	J	201	HEC	C2A-C1A-NA	3.69	113.88	110.32
22	M	702	HAS	C2C-C1C-NC	3.68	116.05	110.14
22	M	702	HAS	C17-C18-C19	-3.67	119.22	127.62
16	B	301	HEC	C3C-C4C-NC	3.66	114.22	110.15
16	J	201	HEC	CHA-C4D-ND	-3.66	120.48	124.42
16	J	201	HEC	C1D-C2D-C3D	-3.65	103.14	106.98
22	M	701	HAS	C1B-C2B-C3B	-3.65	102.58	106.80
16	J	201	HEC	C3D-C4D-ND	3.64	113.87	110.35
16	c	302	HEC	C4C-NC-C1C	-3.63	99.90	105.82
16	c	302	HEC	C1D-C2D-C3D	-3.61	103.18	106.98
17	B	302	HEM	CHB-C1B-NB	3.59	128.80	124.37
16	N	401	HEC	C2C-C1C-NC	3.54	115.82	110.14
16	C	302	HEC	C3D-C4D-ND	3.53	113.76	110.35
16	C	302	HEC	CHB-C1B-NB	-3.51	120.65	124.42
17	b	302	HEM	CHB-C1B-NB	3.50	128.69	124.37
16	c	302	HEC	CHD-C4C-NC	-3.50	117.52	123.86
16	b	301	HEC	C3C-C4C-NC	3.49	114.03	110.15
16	J	201	HEC	C2D-C1D-ND	3.48	113.84	109.84
18	C	301	MQ7	C11-C3-C2	-3.48	118.92	124.89
16	C	302	HEC	CHA-C4D-ND	-3.48	120.68	124.42
17	B	303	HEM	CHD-C1D-ND	3.47	128.16	124.42
16	J	201	HEC	CHB-C1B-NB	-3.45	120.70	124.42
16	c	302	HEC	CHB-C1B-NB	-3.42	120.74	124.42
16	C	302	HEC	C2D-C1D-ND	3.42	113.77	109.84
16	b	301	HEC	C1A-C2A-C3A	-3.42	102.61	107.11
16	B	301	HEC	C1A-C2A-C3A	-3.40	102.63	107.11
17	b	303	HEM	C1B-NB-C4B	3.39	109.22	105.21
16	C	302	HEC	CHB-C4A-NA	-3.38	120.77	124.45
16	c	302	HEC	C3D-C4D-ND	3.37	113.60	110.35
17	b	303	HEM	CHB-C1B-NB	3.36	128.53	124.37
16	J	201	HEC	CHB-C4A-NA	-3.35	120.81	124.45
16	c	302	HEC	C1A-C2A-C3A	-3.33	102.72	107.11
17	b	303	HEM	CHA-C4D-ND	3.33	128.48	124.37
22	M	702	HAS	C1A-C2A-C3A	-3.32	102.73	107.11
16	c	302	HEC	C2D-C1D-ND	3.31	113.65	109.84
16	C	302	HEC	CHA-C1A-NA	-3.31	120.85	124.45
18	b	304	MQ7	C11-C3-C2	-3.30	119.23	124.89
17	B	303	HEM	CHA-C4D-ND	3.28	128.42	124.37
22	M	702	HAS	C1B-C2B-C3B	-3.27	103.01	106.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
22	M	702	HAS	C3A-C4A-NA	3.27	115.68	109.64
17	B	303	HEM	CHC-C4B-NB	3.25	127.92	124.42
22	M	701	HAS	C2C-C1C-NC	3.22	115.31	110.14
17	B	302	HEM	C1B-NB-C4B	3.22	109.02	105.21
22	M	701	HAS	C1A-C2A-C3A	-3.22	102.87	107.11
16	J	201	HEC	CHA-C1A-NA	-3.20	120.97	124.45
22	M	702	HAS	C21-C22-C23	-3.20	120.29	127.62
22	M	702	HAS	C4A-C3A-C2A	-3.20	102.23	106.97
16	C	302	HEC	C1A-C2A-C3A	-3.19	102.90	107.11
16	N	401	HEC	C3B-C4B-NB	3.17	113.64	110.17
16	N	401	HEC	CHB-C1B-NB	-3.17	121.02	124.42
17	B	303	HEM	CHB-C1B-NB	3.15	128.27	124.37
22	M	701	HAS	C26-C15-C16	3.14	120.68	115.23
17	b	302	HEM	C1B-NB-C4B	3.13	108.91	105.21
17	B	303	HEM	C3B-C4B-NB	-3.13	107.22	109.47
16	B	301	HEC	C3A-C4A-NA	3.11	115.38	109.64
23	M	703	5PL	OCK-CBU-CBV	3.11	118.20	111.48
16	B	301	HEC	C2C-C1C-NC	3.10	115.11	110.14
16	J	201	HEC	C1A-C2A-C3A	-3.09	103.04	107.11
22	M	701	HAS	C12-C11-C3B	-3.08	107.31	112.12
17	B	302	HEM	C3B-C4B-NB	-3.06	107.27	109.47
22	M	702	HAS	CAD-C3D-C4D	3.05	130.02	124.70
16	N	401	HEC	C4A-C3A-C2A	-3.04	102.46	106.97
16	B	301	HEC	C4A-C3A-C2A	-3.01	102.51	106.97
16	N	401	HEC	CMC-C2C-C3C	3.00	131.99	125.62
22	M	701	HAS	OMD-CMD-C2D	-2.98	118.89	125.62
22	M	702	HAS	C26-C15-C16	2.97	120.39	115.23
16	c	302	HEC	CHA-C1A-NA	-2.96	121.22	124.45
22	M	702	HAS	C4B-C3B-C2B	-2.96	102.46	107.44
16	b	301	HEC	C3A-C4A-NA	2.95	115.10	109.64
16	C	302	HEC	CMC-C2C-C3C	2.92	131.81	125.62
22	M	701	HAS	C4B-C3B-C2B	-2.89	102.58	107.44
16	c	302	HEC	CHA-C4D-ND	-2.89	121.32	124.42
16	J	201	HEC	CMC-C2C-C3C	2.89	131.75	125.62
16	C	302	HEC	C2C-C1C-NC	2.88	114.75	110.14
22	M	701	HAS	CHA-C4D-ND	-2.88	121.33	124.42
22	M	701	HAS	C25-C23-C24	2.87	120.21	115.23
22	M	701	HAS	C3A-C4A-NA	2.86	114.92	109.64
22	M	702	HAS	CAA-CBA-CGA	-2.85	106.10	113.67
22	M	702	HAS	OMD-CMD-C2D	-2.85	119.18	125.62
22	M	701	HAS	C27-C19-C20	2.85	120.17	115.23
16	c	302	HEC	CHB-C4A-NA	-2.84	121.36	124.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	b	302	HEM	CHD-C4C-NC	2.82	127.52	124.45
16	J	201	HEC	CHD-C1D-ND	-2.81	120.89	124.37
16	J	201	HEC	C2C-C1C-NC	2.79	114.62	110.14
16	J	201	HEC	C4D-C3D-C2D	-2.79	102.83	106.89
16	b	301	HEC	CHC-C1C-C2C	-2.79	119.33	127.43
16	B	301	HEC	C4D-C3D-C2D	-2.78	102.84	106.89
16	b	301	HEC	C4A-C3A-C2A	-2.78	102.85	106.97
22	M	702	HAS	C25-C23-C24	2.78	120.05	115.23
17	B	302	HEM	CHD-C1D-C2D	-2.77	120.65	125.03
16	N	401	HEC	C1A-C2A-C3A	-2.76	103.48	107.11
22	M	701	HAS	C4A-C3A-C2A	-2.76	102.88	106.97
16	B	301	HEC	C3B-C4B-NB	2.75	113.18	110.17
16	J	201	HEC	C4A-C3A-C2A	-2.72	102.94	106.97
16	N	401	HEC	C3A-C4A-NA	2.71	114.65	109.64
16	C	302	HEC	CHC-C4B-NB	-2.69	121.04	124.37
22	M	702	HAS	C13-C14-C15	-2.66	121.53	127.62
22	M	702	HAS	CHA-C1A-C2A	-2.66	120.66	124.86
16	C	302	HEC	CHD-C1D-ND	-2.66	121.08	124.37
16	C	302	HEC	C4D-C3D-C2D	-2.66	103.03	106.89
16	c	302	HEC	C4D-C3D-C2D	-2.66	103.03	106.89
16	N	401	HEC	C4D-C3D-C2D	-2.65	103.03	106.89
16	c	302	HEC	C4A-C3A-C2A	-2.64	103.06	106.97
17	B	302	HEM	CHD-C4C-NC	2.64	127.33	124.45
16	b	301	HEC	C4D-C3D-C2D	-2.62	103.07	106.89
22	M	701	HAS	C13-C14-C15	-2.61	121.66	127.62
16	N	401	HEC	CHB-C4A-NA	-2.60	121.62	124.45
17	b	302	HEM	CHD-C1D-C2D	-2.60	120.92	125.03
16	C	302	HEC	C4A-C3A-C2A	-2.60	103.12	106.97
16	J	201	HEC	CAD-C3D-C4D	2.59	129.22	124.70
17	B	303	HEM	C1A-CHA-C4D	-2.59	120.17	126.25
16	c	302	HEC	CAD-C3D-C4D	2.56	129.15	124.70
17	B	303	HEM	C1C-CHC-C4B	-2.55	120.60	126.02
16	c	302	HEC	C2C-C1C-NC	2.53	114.20	110.14
22	M	702	HAS	CMB-C2B-C1B	2.53	128.99	125.03
18	C	301	MQ7	C11-C3-C4	2.52	121.23	118.58
17	b	303	HEM	C3B-C4B-NB	-2.52	107.66	109.47
22	M	701	HAS	C21-C22-C23	-2.50	121.90	127.62
16	B	301	HEC	CHB-C4A-NA	-2.47	121.76	124.45
21	J	202	CDL	OB6-CB5-C51	2.45	116.79	111.48
18	B	304	MQ7	C11-C3-C2	-2.45	120.69	124.89
22	M	701	HAS	CAA-CBA-CGA	-2.44	107.19	113.67
16	c	302	HEC	C3A-C4A-NA	2.44	114.14	109.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	c	302	HEC	C3B-C4B-NB	2.43	112.84	110.17
16	b	301	HEC	CAB-C3B-C2B	2.43	132.01	127.56
17	b	302	HEM	CHA-C4D-C3D	-2.42	120.76	125.23
16	N	401	HEC	CAD-C3D-C4D	2.42	128.92	124.70
17	b	302	HEM	C3B-C4B-NB	-2.42	107.73	109.47
16	J	201	HEC	CHC-C4B-NB	-2.42	121.38	124.37
16	B	301	HEC	CAA-CBA-CGA	-2.41	107.27	113.67
22	M	702	HAS	CHA-C4D-C3D	-2.41	121.26	124.77
16	C	302	HEC	CAC-C3C-C2C	2.41	130.70	126.89
22	M	701	HAS	CHB-C1B-C2B	-2.40	121.23	125.03
16	J	201	HEC	CAC-C3C-C2C	2.40	130.69	126.89
16	N	401	HEC	CMA-C3A-C4A	2.39	128.94	124.73
17	B	302	HEM	C1A-CHA-C4D	-2.39	120.63	126.25
16	B	301	HEC	CAC-C3C-C2C	2.38	130.66	126.89
16	c	302	HEC	CHD-C1D-ND	-2.38	121.42	124.37
17	b	303	HEM	C4C-CHD-C1D	-2.38	120.97	126.02
17	B	303	HEM	C4D-ND-C1D	2.38	108.02	105.21
20	c	304	PC1	O12-P-O14	2.37	123.48	112.44
16	b	301	HEC	CHB-C1B-NB	-2.35	121.89	124.42
18	c	301	MQ7	C11-C3-C2	-2.34	120.87	124.89
16	N	401	HEC	CBA-CAA-C2A	-2.34	106.06	112.53
16	N	401	HEC	C3C-C4C-NC	2.33	112.74	110.15
17	b	303	HEM	C1A-CHA-C4D	-2.31	120.81	126.25
16	B	301	HEC	CMC-C2C-C1C	2.31	128.94	125.42
17	B	302	HEM	CHA-C4D-C3D	-2.29	121.01	125.23
16	b	301	HEC	CMB-C2B-C1B	2.29	128.61	125.03
16	C	302	HEC	CAD-C3D-C4D	2.28	128.67	124.70
22	M	701	HAS	CHC-C4B-NB	-2.27	121.56	124.37
16	N	401	HEC	CMD-C2D-C1D	2.27	128.58	125.03
22	M	702	HAS	C32-C30-C31	2.26	119.80	114.59
22	M	701	HAS	C32-C30-C31	2.25	119.78	114.59
16	N	401	HEC	CHD-C1D-ND	-2.25	121.58	124.37
17	b	302	HEM	C1A-CHA-C4D	-2.25	120.95	126.25
17	b	302	HEM	CHA-C1A-NA	2.25	127.94	123.86
16	C	302	HEC	CMA-C3A-C4A	2.25	128.68	124.73
17	b	303	HEM	C4A-CHB-C1B	-2.24	120.97	126.25
16	c	302	HEC	CMD-C2D-C1D	2.24	128.53	125.03
16	b	301	HEC	CHC-C4B-C3B	-2.23	121.11	125.23
17	B	303	HEM	C4C-CHD-C1D	-2.22	121.30	126.02
16	J	201	HEC	C3A-C4A-NA	2.22	113.74	109.64
16	J	201	HEC	CMD-C2D-C1D	2.22	128.50	125.03
22	M	702	HAS	CHC-C1C-C2C	-2.21	121.00	127.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	C	302	HEC	C3C-C4C-NC	2.21	112.61	110.15
22	M	701	HAS	C17-C18-C19	-2.21	122.56	127.62
16	N	401	HEC	CHA-C4D-ND	-2.20	122.05	124.42
17	b	303	HEM	C4D-ND-C1D	2.19	107.80	105.21
16	B	301	HEC	CMB-C2B-C3B	2.18	132.04	126.15
16	N	401	HEC	CHC-C1C-C2C	-2.18	121.10	127.43
16	J	201	HEC	CMA-C3A-C4A	2.17	128.54	124.73
16	C	302	HEC	CMD-C2D-C1D	2.17	128.42	125.03
16	B	301	HEC	CHB-C1B-NB	-2.16	122.10	124.42
17	b	303	HEM	CHD-C1D-C2D	-2.16	121.62	125.03
16	C	302	HEC	CMB-C2B-C3B	2.16	131.98	126.15
16	J	201	HEC	C3C-C4C-NC	2.15	112.54	110.15
22	M	701	HAS	C4C-C3C-C2C	-2.15	104.63	107.30
17	B	302	HEM	CHA-C1A-NA	2.15	127.75	123.86
22	M	702	HAS	CHB-C1B-C2B	-2.14	121.65	125.03
16	b	301	HEC	CAC-C3C-C2C	2.14	130.27	126.89
16	C	302	HEC	C3A-C4A-NA	2.13	113.58	109.64
16	J	201	HEC	C3B-C4B-NB	2.13	112.51	110.17
17	b	302	HEM	C4C-CHD-C1D	-2.12	121.50	126.02
22	M	702	HAS	C27-C19-C18	-2.12	118.19	123.63
16	C	302	HEC	C3B-C4B-NB	2.12	112.49	110.17
22	M	702	HAS	CAD-CBD-CGD	-2.11	108.07	113.67
17	B	302	HEM	CHB-C1B-C2B	-2.11	120.96	126.95
22	M	701	HAS	C1D-C2D-C3D	-2.10	105.35	107.28
16	b	301	HEC	CMD-C2D-C1D	2.10	128.31	125.03
17	b	302	HEM	CBD-CAD-C3D	-2.08	106.79	112.53
16	N	401	HEC	CMB-C2B-C3B	2.07	131.76	126.15
22	M	701	HAS	CMA-C3A-C4A	2.07	128.37	124.73
17	B	302	HEM	CBD-CAD-C3D	-2.07	106.82	112.53
16	b	301	HEC	CHD-C1D-C2D	-2.06	121.08	126.95
16	J	201	HEC	CMB-C2B-C3B	2.06	131.72	126.15
17	b	302	HEM	CHB-C1B-C2B	-2.06	121.10	126.95
16	c	302	HEC	CHC-C1C-NC	-2.06	120.13	123.86
16	c	302	HEC	CMB-C2B-C3B	2.06	131.71	126.15
16	b	301	HEC	CHA-C4D-C3D	-2.05	121.78	124.77
22	M	702	HAS	CMC-C2C-C3C	2.05	131.36	126.55
22	M	701	HAS	CAA-C2A-C1A	2.04	129.01	124.85
16	b	301	HEC	CAD-C3D-C4D	2.04	128.25	124.70
22	M	702	HAS	C4C-C3C-C2C	-2.03	104.78	107.30
17	B	303	HEM	C4A-CHB-C1B	-2.03	121.47	126.25
17	b	303	HEM	CBD-CAD-C3D	-2.01	106.98	112.53

All (8) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
16	B	301	HEC	NA
16	C	302	HEC	NA
16	J	201	HEC	NA
16	N	401	HEC	NA
16	b	301	HEC	NA
16	c	302	HEC	NA
22	M	701	HAS	NA
22	M	702	HAS	NA

All (272) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
17	B	302	HEM	C2C-C3C-CAC-CBC
17	b	302	HEM	C2C-C3C-CAC-CBC
17	b	302	HEM	C4C-C3C-CAC-CBC
18	C	301	MQ7	C12-C11-C3-C2
18	C	301	MQ7	C12-C11-C3-C4
18	b	304	MQ7	C12-C11-C3-C4
19	J	203	PEE	O5-C30-O3-C3
19	J	203	PEE	C31-C30-O3-C3
20	C	304	PC1	C11-O13-P-O14
20	C	304	PC1	C1-O11-P-O13
20	C	304	PC1	O13-C11-C12-N
20	C	304	PC1	O22-C21-O21-C2
21	J	202	CDL	CB3-OB5-PB2-OB3
21	J	202	CDL	CB4-CB3-OB5-PB2
21	J	202	CDL	OB7-CB5-OB6-CB4
21	J	202	CDL	C51-CB5-OB6-CB4
21	J	202	CDL	OB9-CB7-OB8-CB6
21	J	202	CDL	C71-CB7-OB8-CB6
21	K	201	CDL	CA3-OA5-PA1-OA2
21	K	201	CDL	OA9-CA7-OA8-CA6
21	K	201	CDL	C31-CA7-OA8-CA6
21	L	302	CDL	C1-CA2-OA2-PA1
21	L	302	CDL	OA9-CA7-OA8-CA6
21	L	302	CDL	C31-CA7-OA8-CA6
21	L	302	CDL	C1-CB2-OB2-PB2
21	L	302	CDL	CB3-OB5-PB2-OB2
21	L	302	CDL	OB9-CB7-OB8-CB6
21	L	302	CDL	C71-CB7-OB8-CB6
22	M	701	HAS	C1D-C2D-CMD-OMD
22	M	701	HAS	C3D-C2D-CMD-OMD
22	M	702	HAS	C1A-C2A-CAA-CBA

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Mol	Chain	Res	Type	Atoms
22	M	702	HAS	C1D-C2D-CMD-OMD
22	M	702	HAS	C3D-C2D-CMD-OMD
23	M	703	5PL	CAW-OCJ-PCR-OCM
23	M	703	5PL	OCG-CAN-CAP-OCH
23	M	703	5PL	OCG-CAN-CAP-NCB
23	M	703	5PL	CBV-CBU-OCK-CBH
23	M	703	5PL	OCN-CBU-OCK-CBH
23	M	703	5PL	C1-C2-N2-CAQ
16	N	401	HEC	C2C-C3C-CAC-CBC
16	C	302	HEC	C4B-C3B-CAB-CBB
16	J	201	HEC	C4B-C3B-CAB-CBB
16	N	401	HEC	C4B-C3B-CAB-CBB
16	c	302	HEC	C4B-C3B-CAB-CBB
16	B	301	HEC	C4C-C3C-CAC-CBC
16	C	302	HEC	C4C-C3C-CAC-CBC
16	J	201	HEC	C4C-C3C-CAC-CBC
16	N	401	HEC	C4C-C3C-CAC-CBC
16	b	301	HEC	C4C-C3C-CAC-CBC
16	c	302	HEC	C4C-C3C-CAC-CBC
16	B	301	HEC	C4B-C3B-CAB-CBB
16	b	301	HEC	C4B-C3B-CAB-CBB
16	B	301	HEC	C2B-C3B-CAB-CBB
16	C	302	HEC	C2B-C3B-CAB-CBB
16	J	201	HEC	C2B-C3B-CAB-CBB
16	N	401	HEC	C2B-C3B-CAB-CBB
16	b	301	HEC	C2B-C3B-CAB-CBB
16	c	302	HEC	C2B-C3B-CAB-CBB
16	B	301	HEC	C2C-C3C-CAC-CBC
16	C	302	HEC	C2C-C3C-CAC-CBC
16	J	201	HEC	C2C-C3C-CAC-CBC
16	b	301	HEC	C2C-C3C-CAC-CBC
16	c	302	HEC	C2C-C3C-CAC-CBC
20	C	304	PC1	C22-C21-O21-C2
22	M	702	HAS	C3A-C2A-CAA-CBA
20	c	304	PC1	C22-C21-O21-C2
18	B	304	MQ7	C19-C18-C20-C21
18	b	304	MQ7	C24-C23-C25-C26
18	b	304	MQ7	C39-C38-C40-C41
18	c	301	MQ7	C34-C33-C35-C36
18	c	301	MQ7	C39-C38-C40-C41
22	M	701	HAS	C26-C15-C16-C17
18	B	304	MQ7	C17-C18-C20-C21

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Mol	Chain	Res	Type	Atoms
18	b	304	MQ7	C22-C23-C25-C26
18	b	304	MQ7	C37-C38-C40-C41
18	c	301	MQ7	C32-C33-C35-C36
18	c	301	MQ7	C37-C38-C40-C41
22	M	701	HAS	C14-C15-C16-C17
18	B	304	MQ7	C13-C15-C16-C17
18	C	301	MQ7	C33-C35-C36-C37
18	c	301	MQ7	C28-C30-C31-C32
18	c	301	MQ7	C38-C40-C41-C42
22	M	702	HAS	C15-C16-C17-C18
22	M	702	HAS	C23-C24-C28-C29
21	K	201	CDL	C1-CA2-OA2-PA1
16	B	301	HEC	C3D-CAD-CBD-CGD
20	c	304	PC1	C32-C31-O31-C3
18	C	301	MQ7	C39-C38-C40-C41
18	C	301	MQ7	C37-C38-C40-C41
20	c	304	PC1	O22-C21-O21-C2
18	C	301	MQ7	C23-C25-C26-C27
20	c	304	PC1	O32-C31-O31-C3
16	c	302	HEC	C2A-CAA-CBA-CGA
17	B	302	HEM	C2A-CAA-CBA-CGA
17	B	303	HEM	C2A-CAA-CBA-CGA
17	b	302	HEM	C2A-CAA-CBA-CGA
21	K	201	CDL	CA4-CA3-OA5-PA1
16	J	201	HEC	C2A-CAA-CBA-CGA
23	M	703	5PL	CAM-CAN-OCG-PCR
19	C	303	PEE	C10-C11-C12-C13
22	M	701	HAS	C2D-C3D-CAD-CBD
20	c	304	PC1	C33-C34-C35-C36
22	M	701	HAS	C23-C24-C28-C29
20	C	304	PC1	C2B-C2C-C2D-C2E
21	L	302	CDL	CA5-C11-C12-C13
19	J	203	PEE	C31-C32-C33-C34
22	M	701	HAS	C4D-C3D-CAD-CBD
21	J	202	CDL	C17-C18-C19-C20
23	M	703	5PL	CAN-CAM-O1-C1
17	B	302	HEM	C4C-C3C-CAC-CBC
23	M	703	5PL	CBU-CBV-CBW-CBX
21	L	302	CDL	OB6-CB4-CB6-OB8
23	M	703	5PL	CBH-CAW-OCJ-PCR
16	B	301	HEC	C1A-C2A-CAA-CBA
16	c	302	HEC	C1A-C2A-CAA-CBA

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Mol	Chain	Res	Type	Atoms
19	c	303	PEE	C33-C34-C35-C36
21	J	202	CDL	C14-C15-C16-C17
21	J	202	CDL	C39-C40-C41-C42
21	L	302	CDL	CB3-CB4-CB6-OB8
16	c	302	HEC	C3A-C2A-CAA-CBA
22	M	702	HAS	C3B-C11-C12-C13
21	L	302	CDL	C71-C72-C73-C74
21	K	201	CDL	C52-C51-CB5-OB6
21	K	201	CDL	C12-C13-C14-C15
21	L	302	CDL	OB5-CB3-CB4-CB6
23	M	703	5PL	OCJ-CAW-CBH-CBI
19	c	303	PEE	C18-C19-C20-C21
16	B	301	HEC	C3A-C2A-CAA-CBA
20	c	304	PC1	C26-C27-C28-C29
23	M	703	5PL	OCJ-CAW-CBH-OCK
21	J	202	CDL	C19-C20-C21-C22
23	M	703	5PL	CAM-CAN-CAP-OCH
17	B	303	HEM	C3D-CAD-CBD-CGD
19	L	301	PEE	O2-C2-C3-O3
21	L	302	CDL	C54-C55-C56-C57
23	M	703	5PL	CBV-CBW-CBX-CBY
21	J	202	CDL	C52-C53-C54-C55
18	b	304	MQ7	C12-C11-C3-C2
20	c	304	PC1	C31-C32-C33-C34
17	B	303	HEM	C2C-C3C-CAC-CBC
17	b	302	HEM	C2B-C3B-CAB-CBB
17	b	303	HEM	C2B-C3B-CAB-CBB
17	b	303	HEM	C2C-C3C-CAC-CBC
23	M	703	5PL	C19-C18-CBJ-CAV
19	L	301	PEE	C36-C37-C38-C39
19	C	303	PEE	O3P-C1-C2-O2
20	C	304	PC1	O11-C1-C2-O21
18	c	301	MQ7	C13-C15-C16-C17
17	B	303	HEM	C4B-C3B-CAB-CBB
19	c	303	PEE	C32-C33-C34-C35
20	c	304	PC1	C28-C29-C2A-C2B
18	C	301	MQ7	C24-C23-C25-C26
19	J	203	PEE	C5-C4-O4P-P
19	L	301	PEE	C5-C4-O4P-P
20	c	304	PC1	O13-C11-C12-N
21	L	302	CDL	C17-C18-C19-C20
19	J	203	PEE	C18-C19-C20-C21

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Mol	Chain	Res	Type	Atoms
21	J	202	CDL	C75-C76-C77-C78
20	c	304	PC1	C24-C25-C26-C27
21	L	302	CDL	C78-C79-C80-C81
19	L	301	PEE	C1-C2-C3-O3
19	L	301	PEE	C4-O4P-P-O1P
19	c	303	PEE	C1-O3P-P-O1P
20	C	304	PC1	C1-O11-P-O14
21	J	202	CDL	CA2-OA2-PA1-OA3
21	L	302	CDL	CA3-OA5-PA1-OA3
21	L	302	CDL	CB3-OB5-PB2-OB3
18	C	301	MQ7	C14-C13-C15-C16
18	C	301	MQ7	C22-C23-C25-C26
21	J	202	CDL	C82-C83-C84-C85
23	M	703	5PL	C3-C2-N2-CAQ
22	M	702	HAS	O11-C11-C12-C13
18	B	304	MQ7	C35-C36-C37-C38
19	c	303	PEE	O2-C2-C3-O3
21	L	302	CDL	CB5-C51-C52-C53
21	J	202	CDL	C1-CB2-OB2-PB2
16	N	401	HEC	C2A-CAA-CBA-CGA
18	B	304	MQ7	C34-C33-C35-C36
18	b	304	MQ7	C19-C18-C20-C21
18	C	301	MQ7	C12-C13-C15-C16
19	C	303	PEE	C18-C19-C20-C21
19	C	303	PEE	C16-C17-C18-C19
19	L	301	PEE	C18-C19-C20-C21
17	b	303	HEM	C4C-C3C-CAC-CBC
19	c	303	PEE	C16-C17-C18-C19
19	J	203	PEE	C32-C33-C34-C35
21	L	302	CDL	C51-C52-C53-C54
22	M	702	HAS	C26-C15-C16-C17
16	B	301	HEC	CAD-CBD-CGD-O2D
19	c	303	PEE	C10-C11-C12-C13
21	J	202	CDL	CA6-CA4-OA6-CA5
18	B	304	MQ7	C32-C33-C35-C36
16	B	301	HEC	CAD-CBD-CGD-O1D
17	b	302	HEM	CAD-CBD-CGD-O1D
22	M	702	HAS	CAD-CBD-CGD-O2D
21	K	201	CDL	CB5-C51-C52-C53
16	J	201	HEC	CAD-CBD-CGD-O1D
17	b	302	HEM	CAA-CBA-CGA-O1A
22	M	701	HAS	CAD-CBD-CGD-O1D

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Mol	Chain	Res	Type	Atoms
22	M	702	HAS	C14-C15-C16-C17
16	J	201	HEC	CAD-CBD-CGD-O2D
17	B	302	HEM	CAA-CBA-CGA-O1A
17	B	302	HEM	CAD-CBD-CGD-O2D
18	B	304	MQ7	C14-C13-C15-C16
18	B	304	MQ7	C29-C28-C30-C31
18	b	304	MQ7	C17-C18-C20-C21
20	c	304	PC1	C22-C23-C24-C25
17	B	302	HEM	CAD-CBD-CGD-O1D
17	b	302	HEM	CAD-CBD-CGD-O2D
22	M	702	HAS	CAD-CBD-CGD-O1D
18	B	304	MQ7	C25-C26-C27-C28
16	N	401	HEC	CAD-CBD-CGD-O2D
17	b	302	HEM	CAA-CBA-CGA-O2A
22	M	701	HAS	CAD-CBD-CGD-O2D
16	c	302	HEC	C3D-CAD-CBD-CGD
22	M	702	HAS	CAA-CBA-CGA-O2A
17	B	302	HEM	CAA-CBA-CGA-O2A
21	K	201	CDL	C52-C51-CB5-OB7
16	J	201	HEC	C4D-C3D-CAD-CBD
21	K	201	CDL	C11-C12-C13-C14
17	B	303	HEM	CAD-CBD-CGD-O1D
22	M	701	HAS	CAA-CBA-CGA-O1A
20	C	304	PC1	O11-C1-C2-C3
21	K	201	CDL	CB7-C71-C72-C73
16	N	401	HEC	CAD-CBD-CGD-O1D
18	B	304	MQ7	C27-C28-C30-C31
18	c	301	MQ7	C40-C41-C42-C43
17	B	303	HEM	CAD-CBD-CGD-O2D
22	M	701	HAS	CAA-CBA-CGA-O2A
22	M	702	HAS	CAA-CBA-CGA-O1A
22	M	701	HAS	C19-C20-C21-C22
17	B	303	HEM	C4C-C3C-CAC-CBC
17	b	302	HEM	C4B-C3B-CAB-CBB
17	b	303	HEM	C4B-C3B-CAB-CBB
16	J	201	HEC	CAA-CBA-CGA-O2A
16	c	302	HEC	CAD-CBD-CGD-O1D
16	c	302	HEC	CAD-CBD-CGD-O2D
16	B	301	HEC	CAA-CBA-CGA-O2A
21	K	201	CDL	C78-C79-C80-C81
21	L	302	CDL	C12-C11-CA5-OA6
20	C	304	PC1	C2C-C2D-C2E-C2F

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Mol	Chain	Res	Type	Atoms
20	c	304	PC1	C35-C36-C37-C38
16	J	201	HEC	CAA-CBA-CGA-O1A
21	L	302	CDL	C52-C51-CB5-OB6
21	K	201	CDL	OB6-CB4-CB6-OB8
21	L	302	CDL	CA7-C31-C32-C33
20	c	304	PC1	O21-C21-C22-C23
18	B	304	MQ7	C30-C31-C32-C33
23	M	703	5PL	CBA-CBB-CBC-CBD
19	J	203	PEE	C1-C2-O2-C10
20	C	304	PC1	C1-C2-O21-C21
16	B	301	HEC	CAA-CBA-CGA-O1A
20	c	304	PC1	C25-C26-C27-C28
18	c	301	MQ7	C20-C21-C22-C23
19	C	303	PEE	C31-C32-C33-C34
17	b	303	HEM	CAA-CBA-CGA-O2A
21	J	202	CDL	OA5-CA3-CA4-OA6
16	C	302	HEC	CAA-CBA-CGA-O2A
21	K	201	CDL	C42-C43-C44-C45
21	L	302	CDL	C12-C11-CA5-OA7
21	J	202	CDL	C44-C45-C46-C47
19	c	303	PEE	C1-C2-C3-O3
17	B	303	HEM	CAA-CBA-CGA-O2A
21	L	302	CDL	C18-C19-C20-C21
22	M	701	HAS	C24-C28-C29-C30
22	M	701	HAS	C18-C19-C20-C21
21	L	302	CDL	C52-C51-CB5-OB7
21	K	201	CDL	C84-C85-C86-C87
16	b	301	HEC	C3D-CAD-CBD-CGD
22	M	702	HAS	C24-C28-C29-C30
17	b	303	HEM	CAA-CBA-CGA-O1A
19	L	301	PEE	O3-C30-C31-C32

There are no ring outliers.

27 monomers are involved in 124 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	b	304	MQ7	1	0
17	b	303	HEM	2	0
19	c	303	PEE	2	0
21	K	201	CDL	3	0
16	C	302	HEC	3	0
22	M	702	HAS	8	0

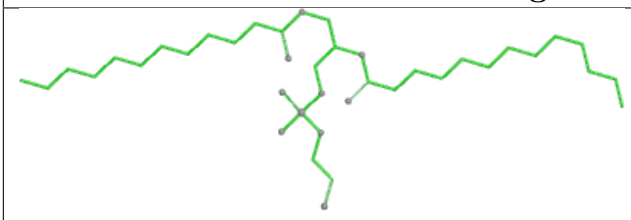
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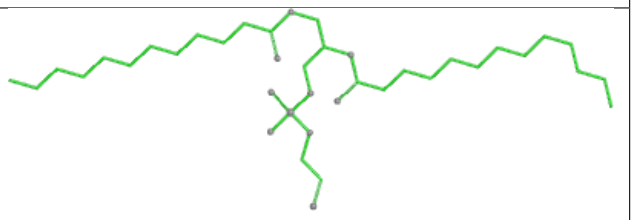
Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	C	301	MQ7	4	0
15	a	201	FES	1	0
18	B	304	MQ7	6	0
22	M	701	HAS	6	0
17	B	302	HEM	3	0
17	b	302	HEM	1	0
20	C	304	PC1	3	0
19	C	303	PEE	4	0
21	L	302	CDL	8	0
21	J	202	CDL	13	0
20	c	304	PC1	2	0
16	c	302	HEC	3	0
15	A	201	FES	2	0
19	L	301	PEE	5	0
16	b	301	HEC	6	0
23	M	703	5PL	10	0
16	N	401	HEC	3	0
18	c	301	MQ7	8	0
17	B	303	HEM	8	0
16	B	301	HEC	6	0
26	N	402	CUA	3	0

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

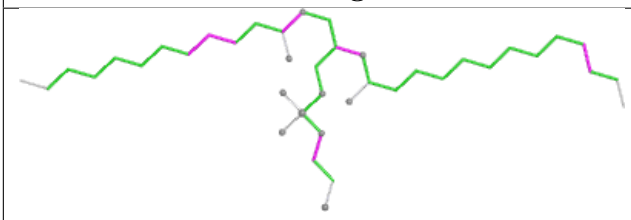
Ligand PEE J 203



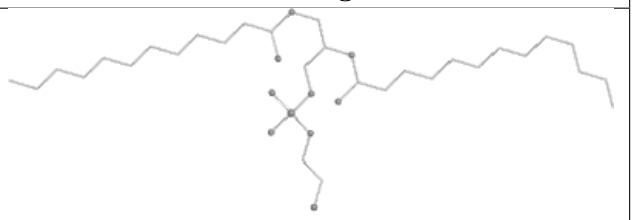
Bond lengths



Bond angles

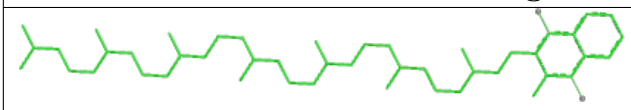


Torsions

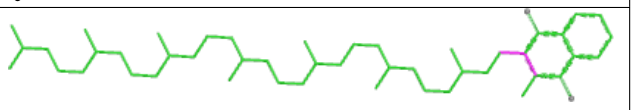


Rings

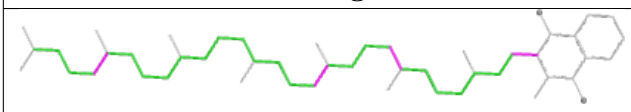
Ligand MQ7 b 304



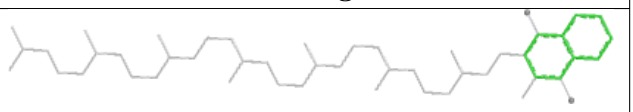
Bond lengths



Bond angles

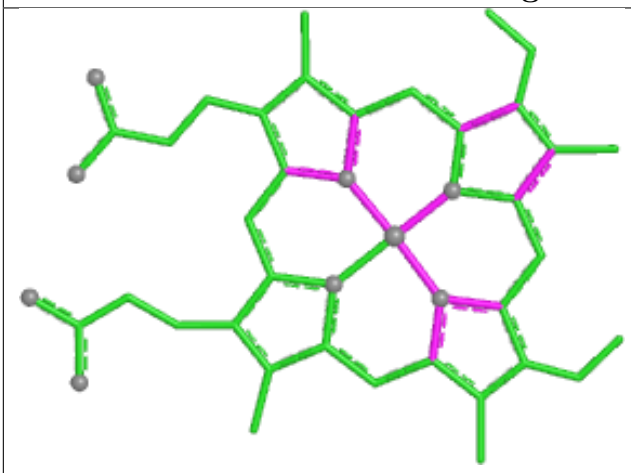


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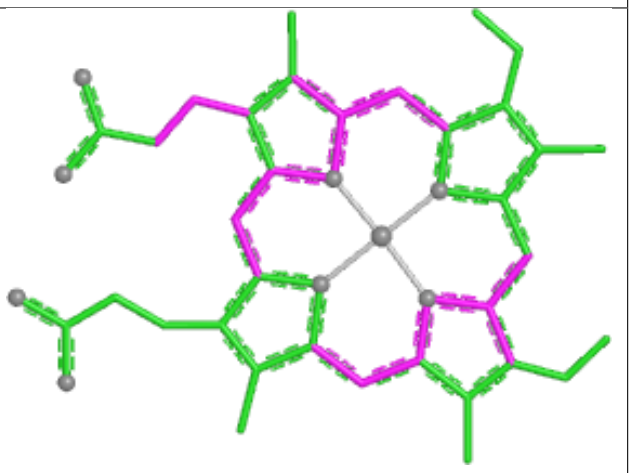


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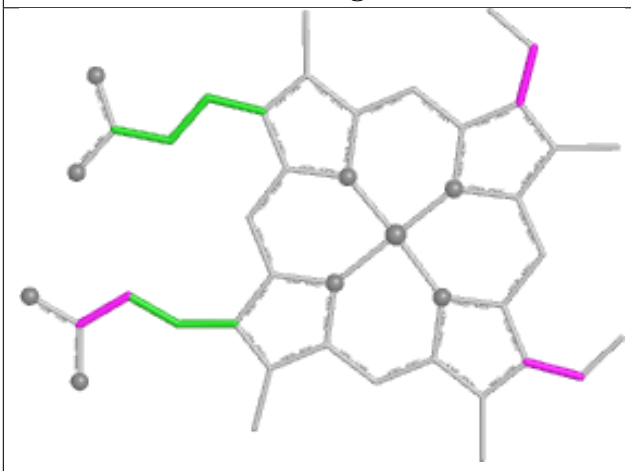
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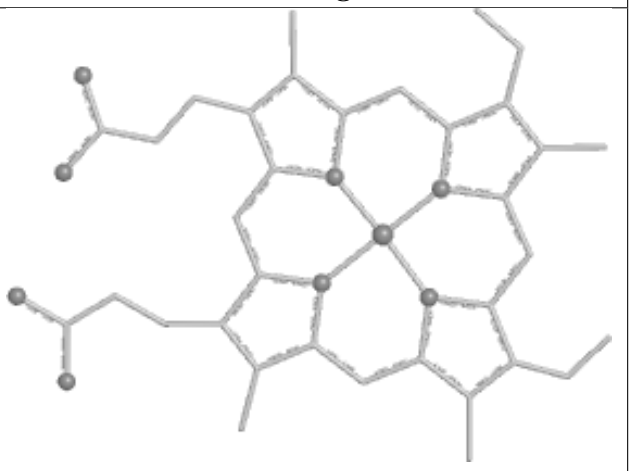
Bond lengths



Bond angles

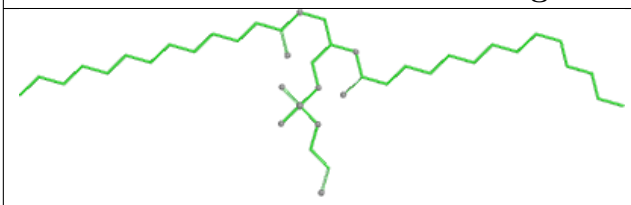


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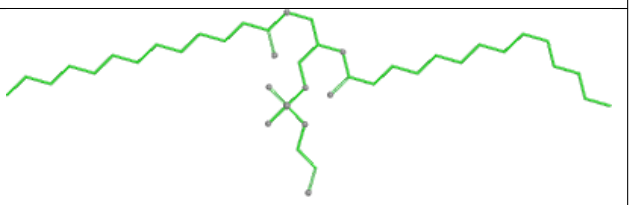


Rings

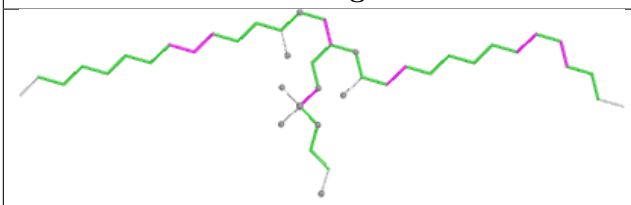
Ligand PEE c 303



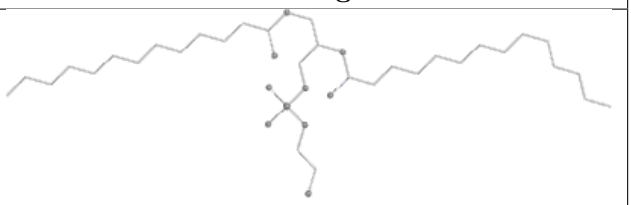
Bond lengths



Bond angles

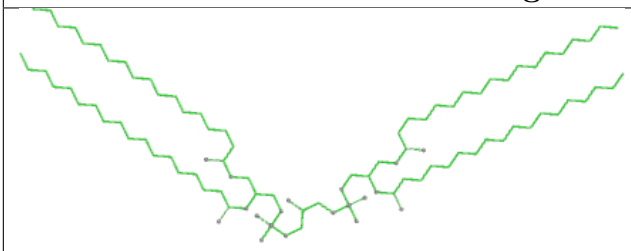


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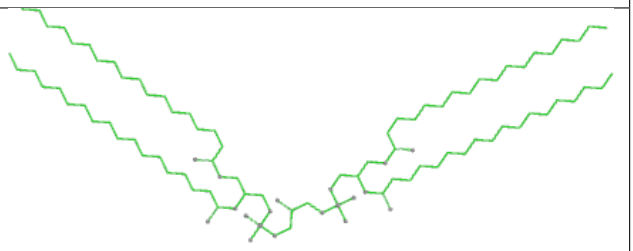


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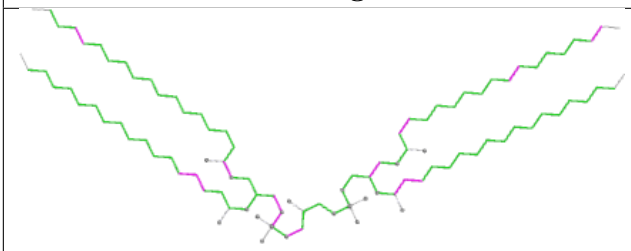
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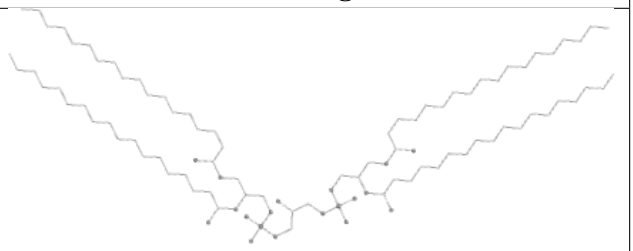
Bond lengths



Bond angles

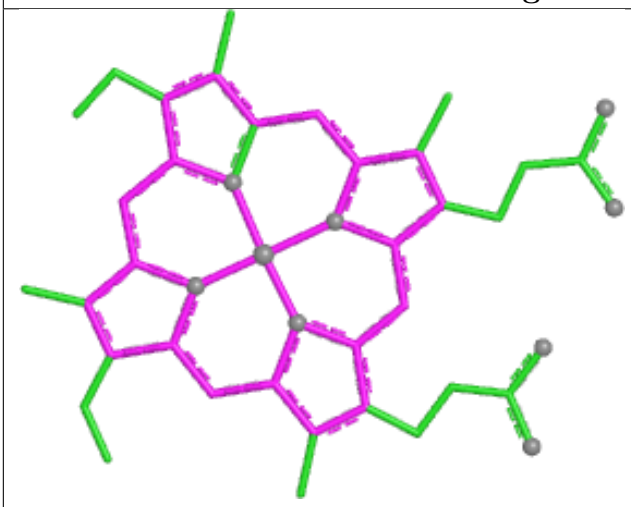


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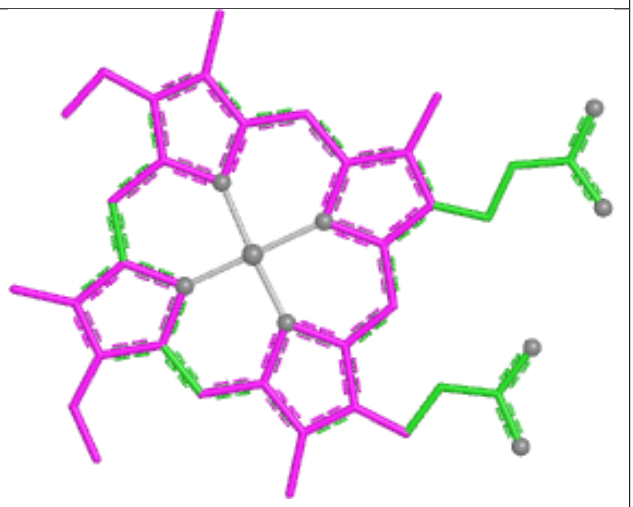


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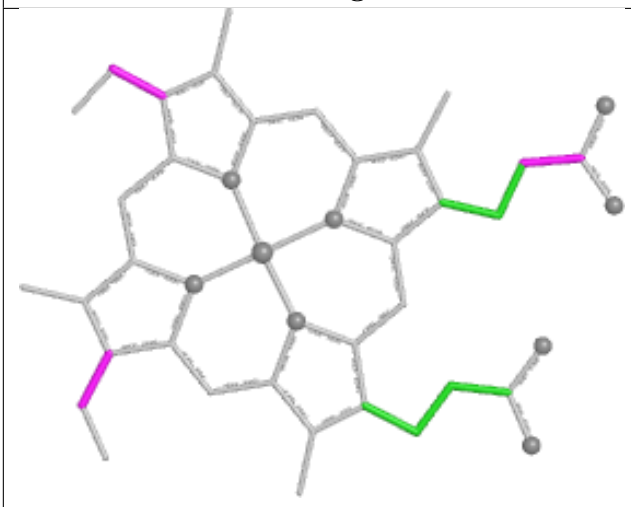
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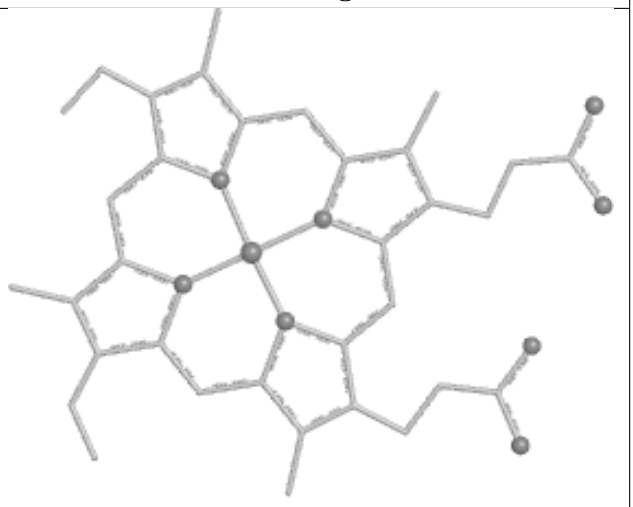
Bond lengths



Bond angles

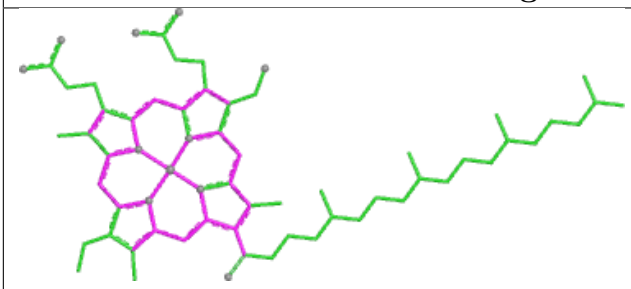


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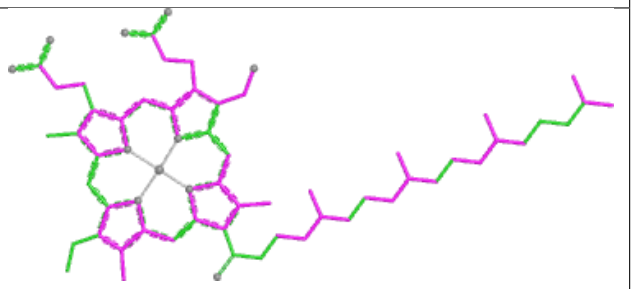


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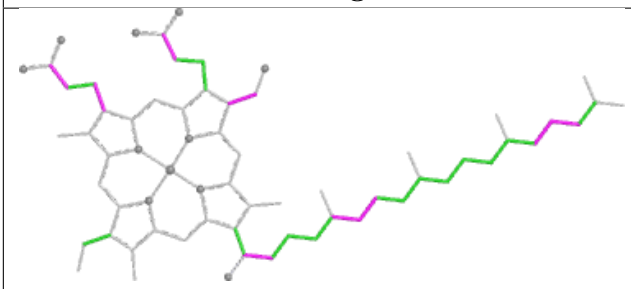
Ligand HAS M 702



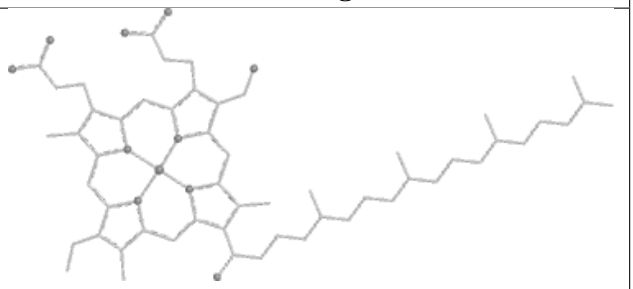
Bond lengths



Bond angles

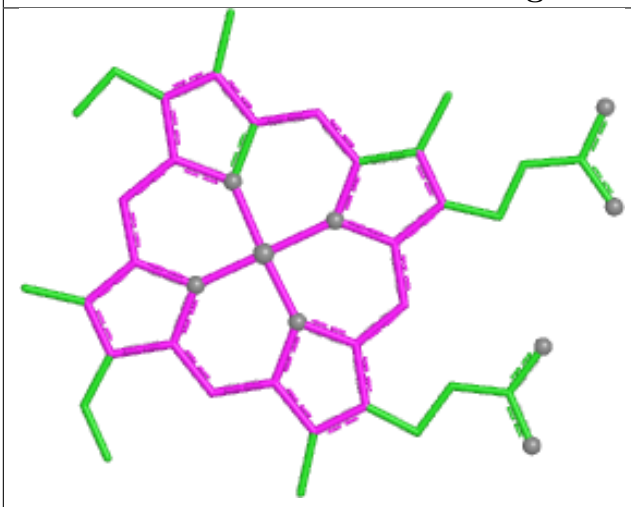


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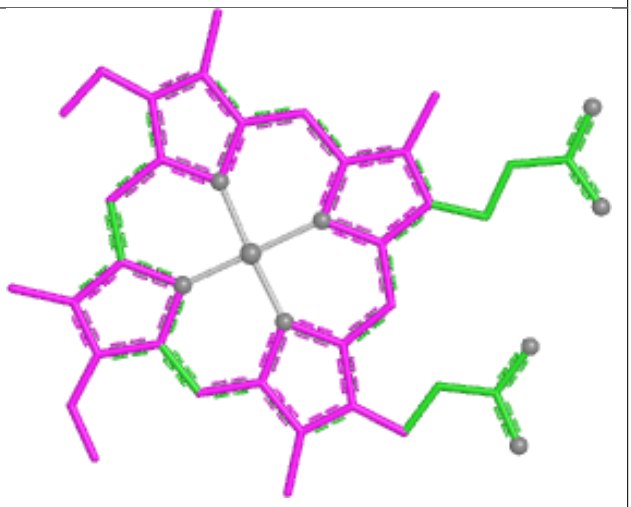


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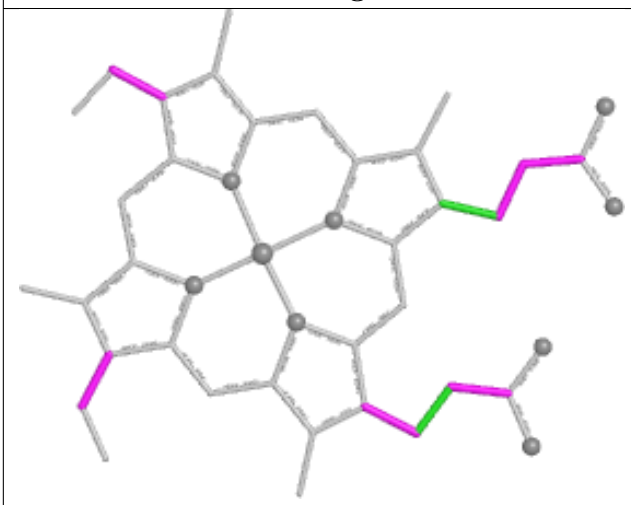
Ligand HEC J 201



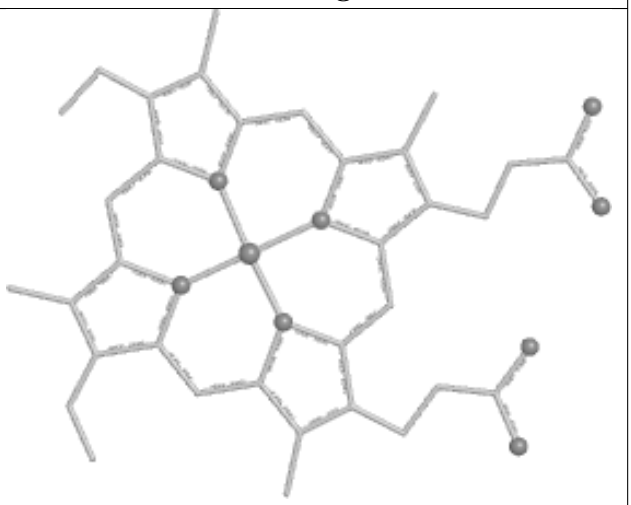
Bond lengths



Bond angles



Torsions



Rings

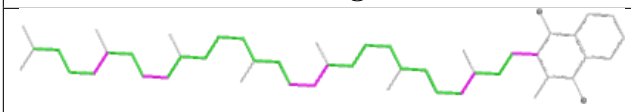
Ligand MQ7 C 301



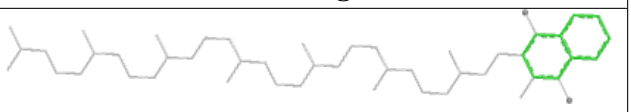
Bond lengths



Bond angles



Torsions



Rings

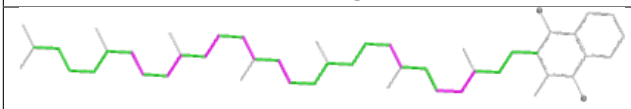
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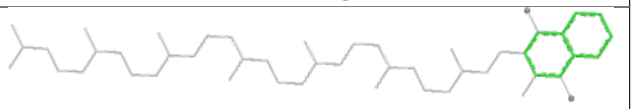
Bond lengths



Bond angles

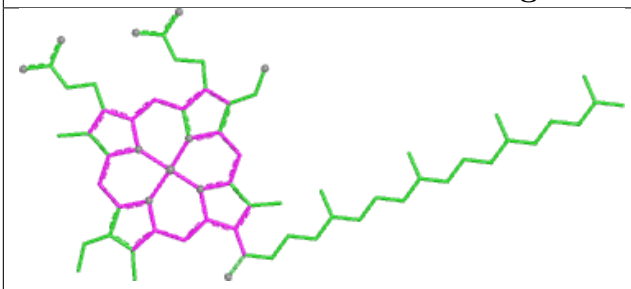


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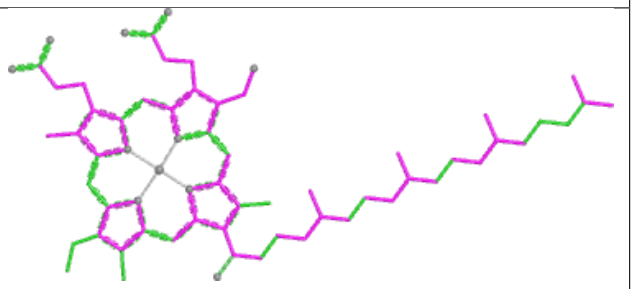


Rings

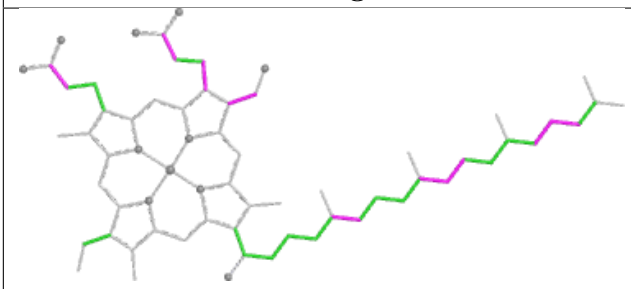
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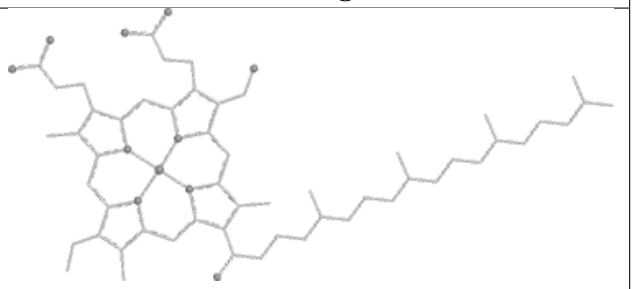
Bond lengths



Bond angles

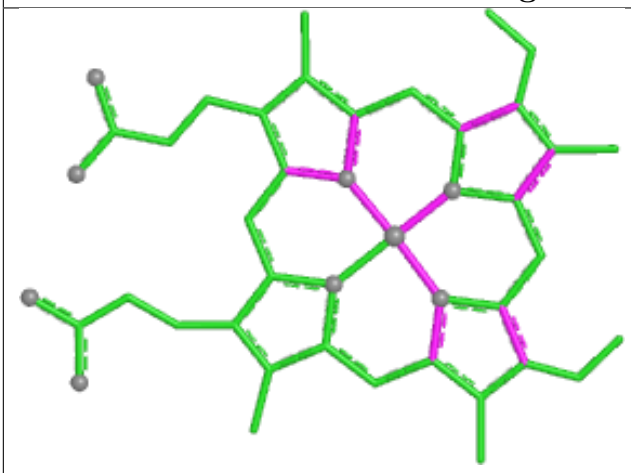


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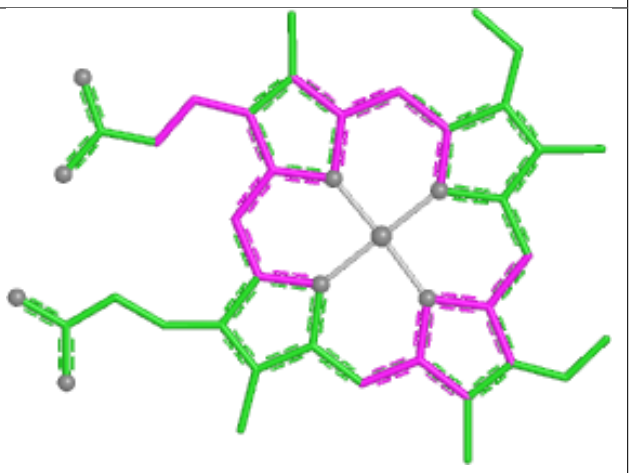


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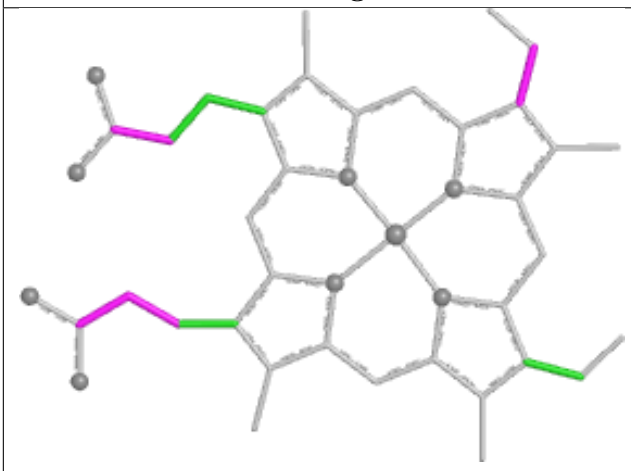
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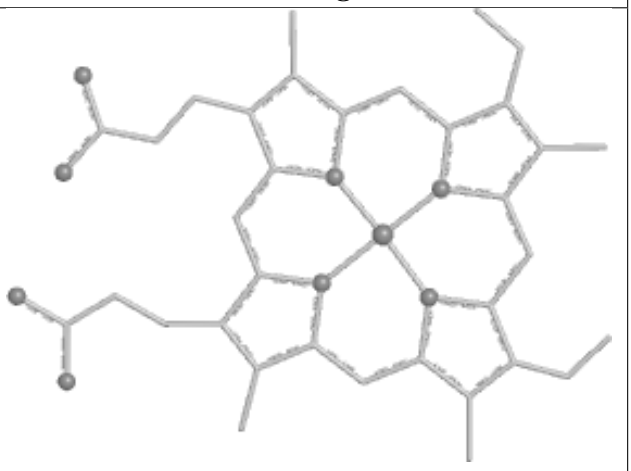
Bond lengths



Bond angles

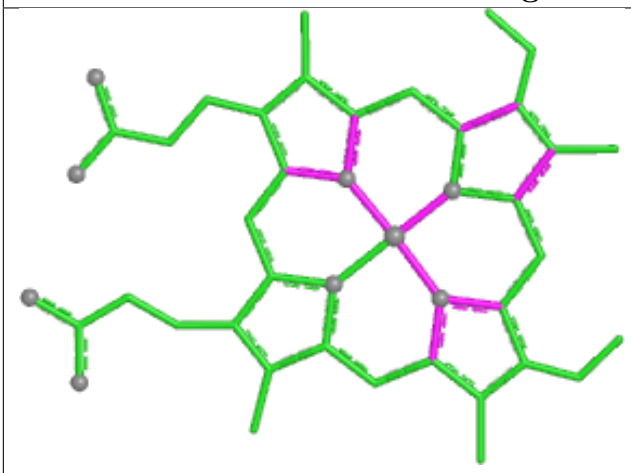


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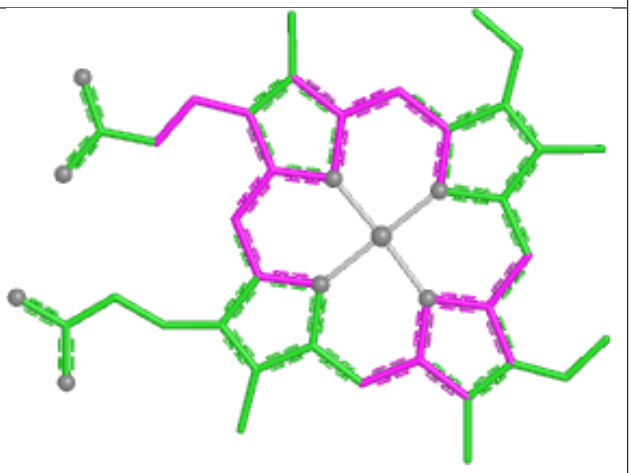


Rings

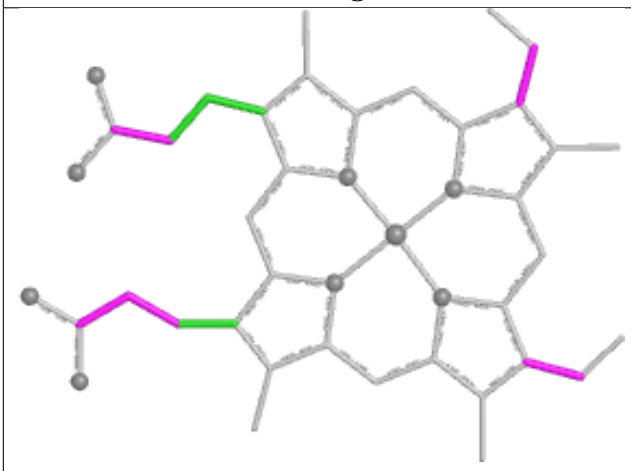
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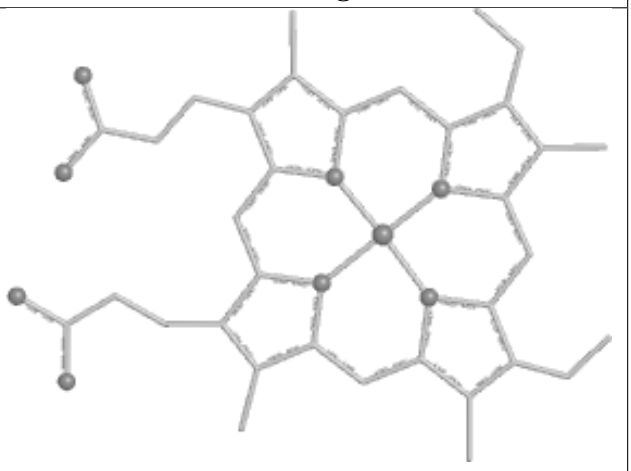
Bond lengths



Bond angles

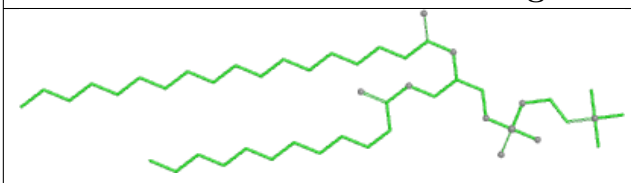


Torsions

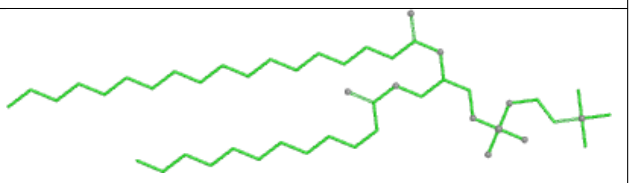


Rings

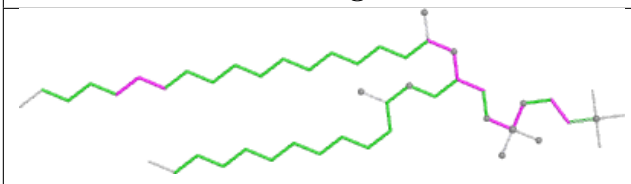
Ligand PC1 C 304



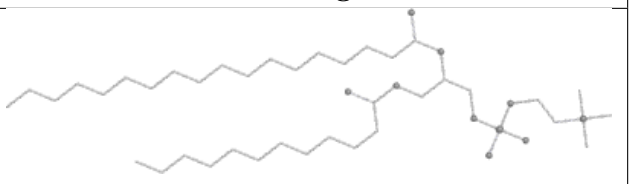
Bond lengths



Bond angles

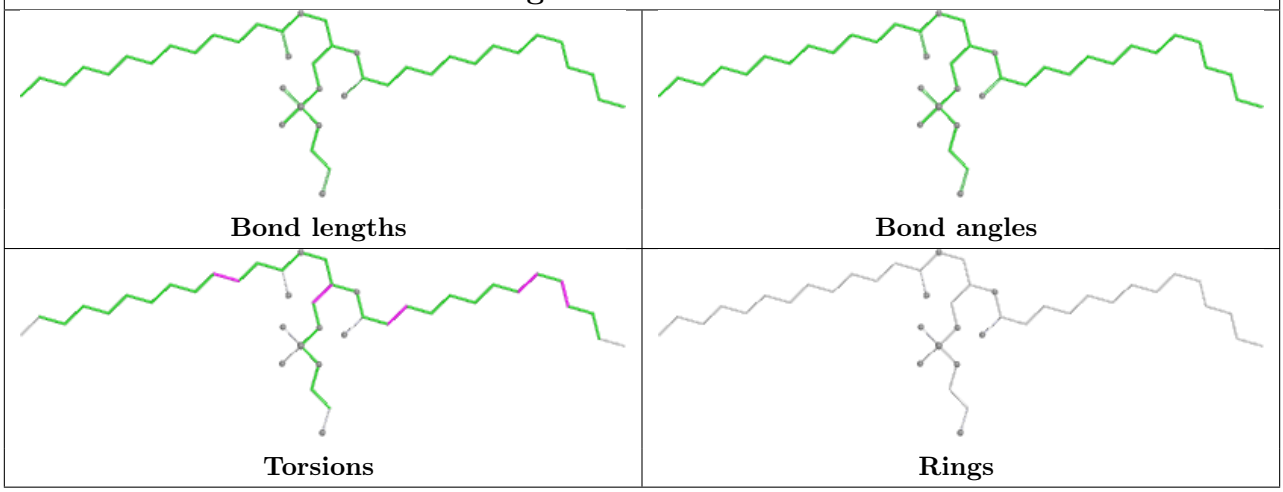


Torsions

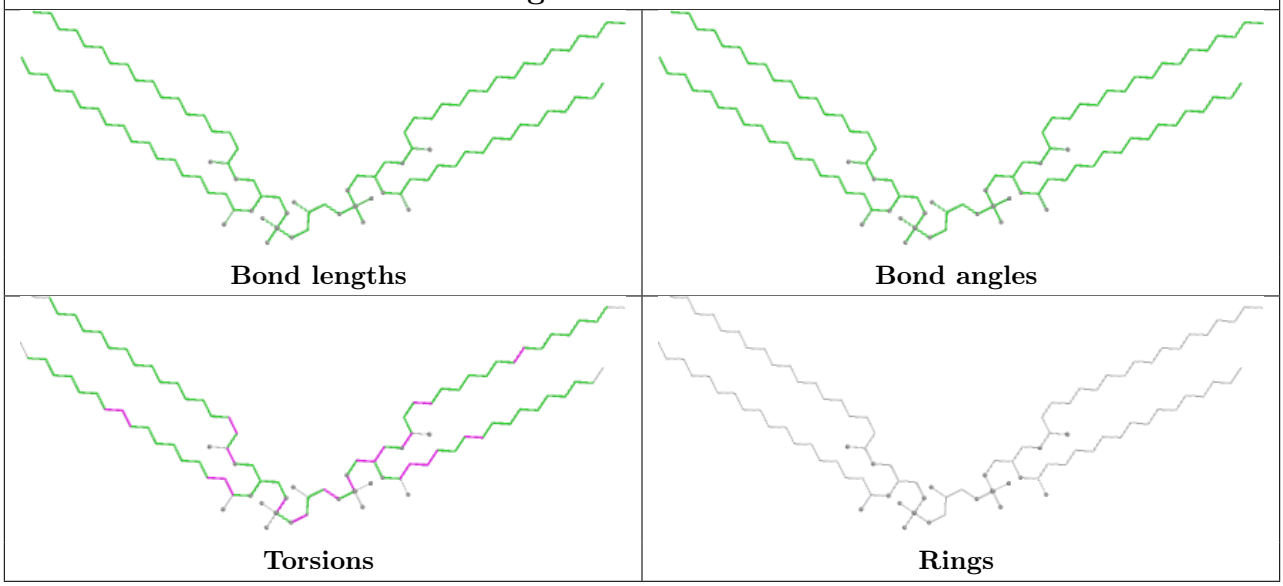


Rings

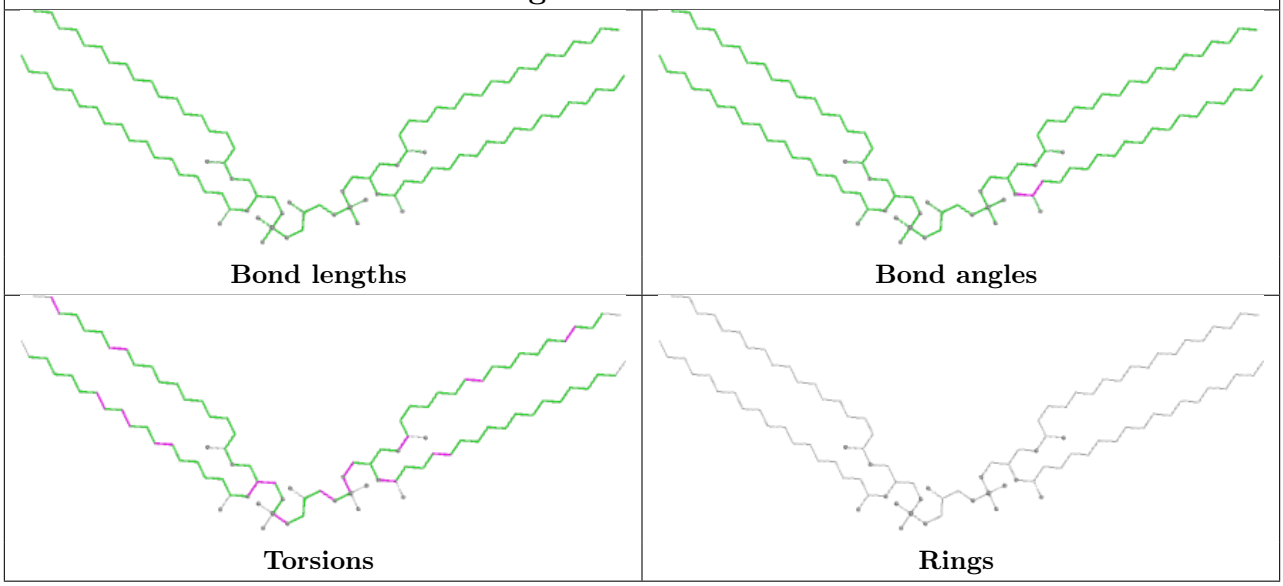
Ligand PEE C 303



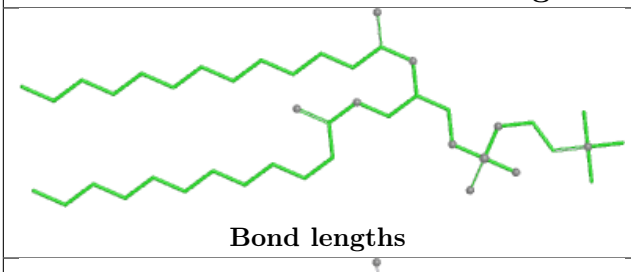
Ligand CDL L 302



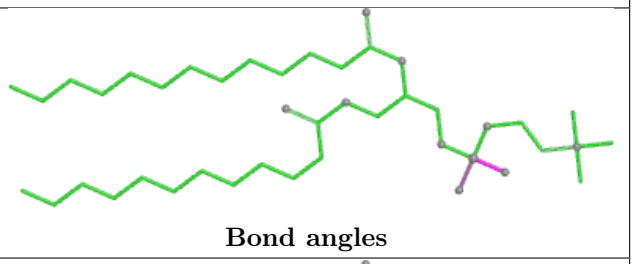
Ligand CDL J 202



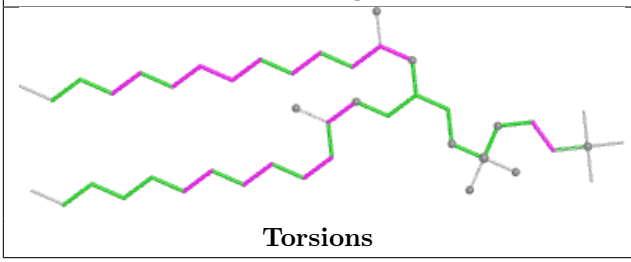
Ligand PC1 c 304



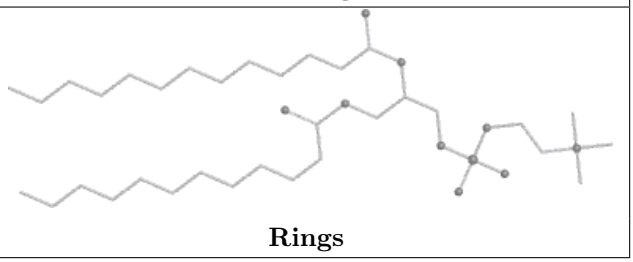
Bond lengths



Bond angles

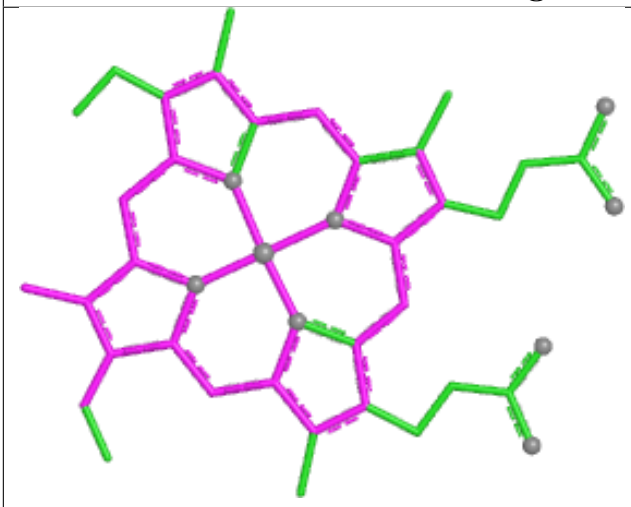


Torsions

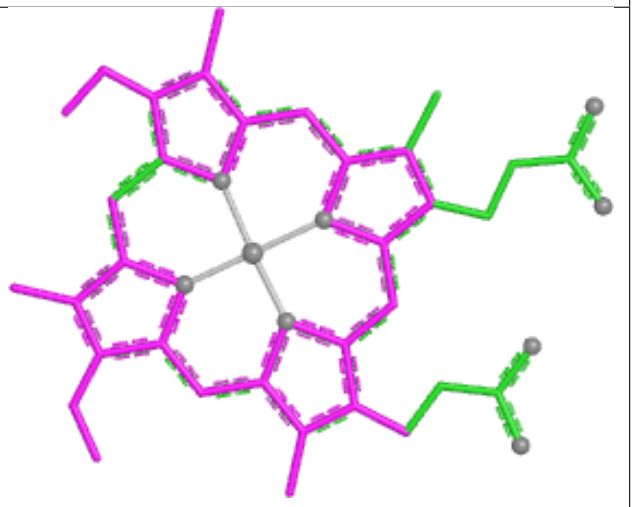


Rings

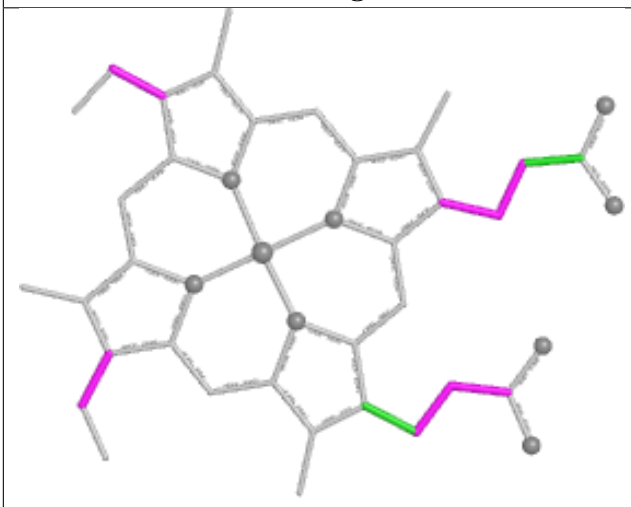
Ligand HEC c 302



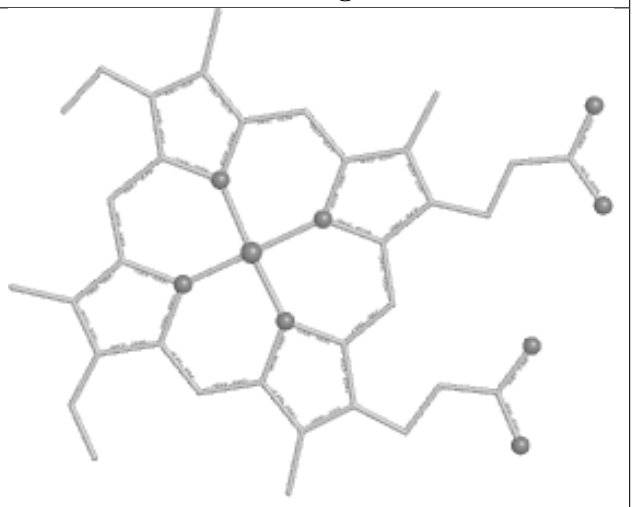
Bond lengths



Bond angles

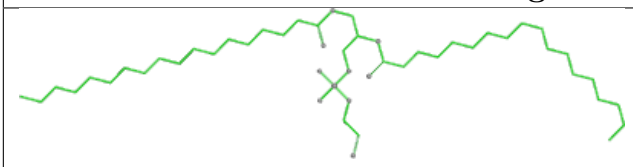


Torsions

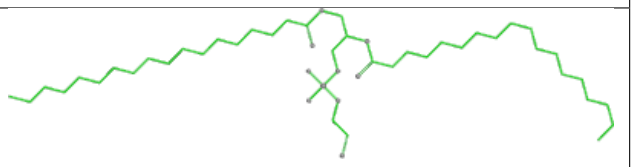


Rings

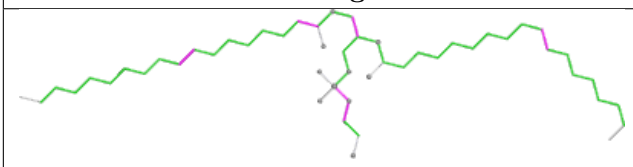
Ligand PEE L 301



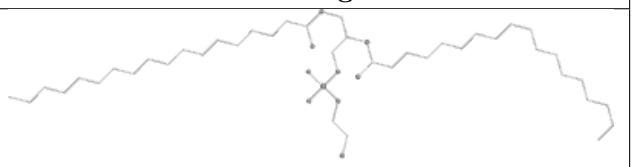
Bond lengths



Bond angles

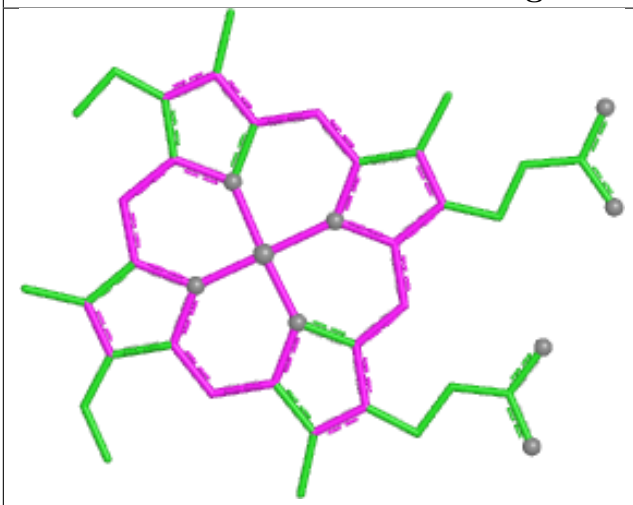


Torsions

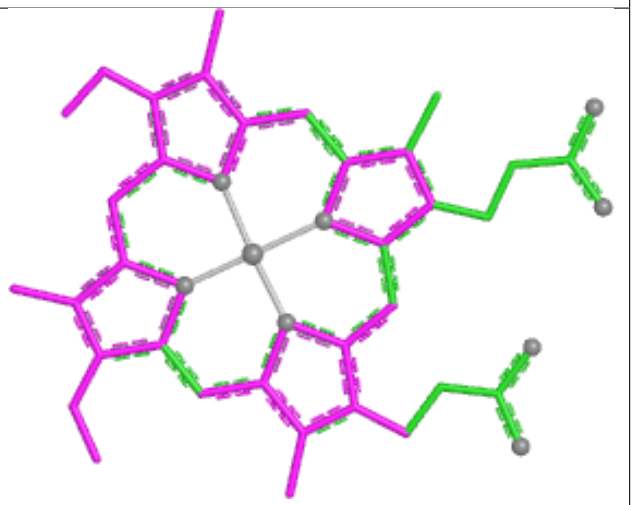


Rings

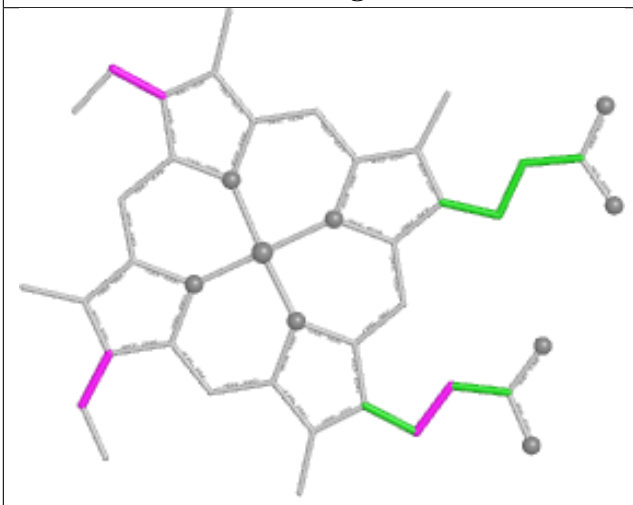
Ligand HEC b 301



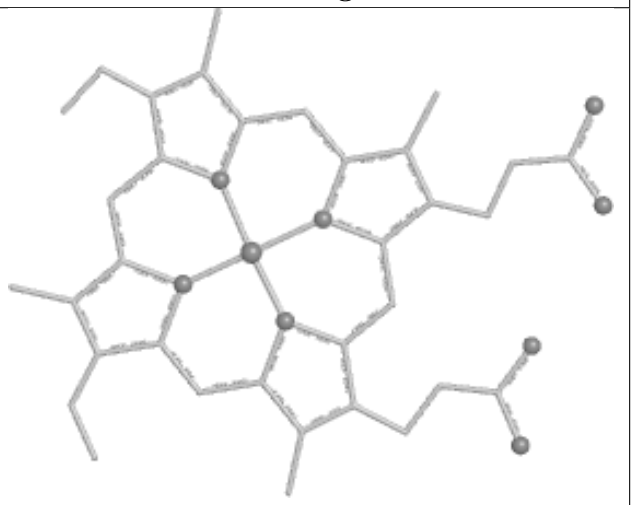
Bond lengths



Bond angles

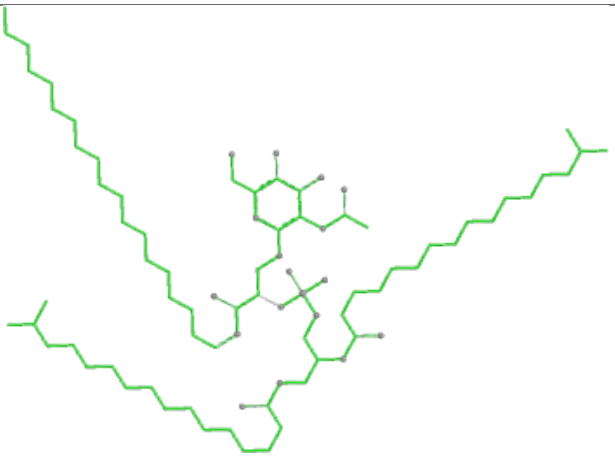


Torsions

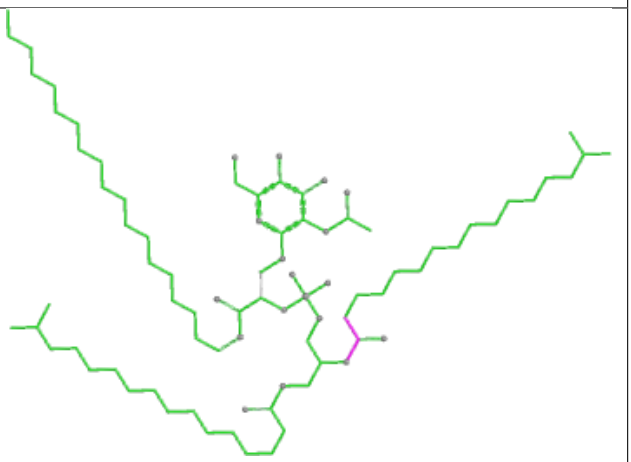


Rings

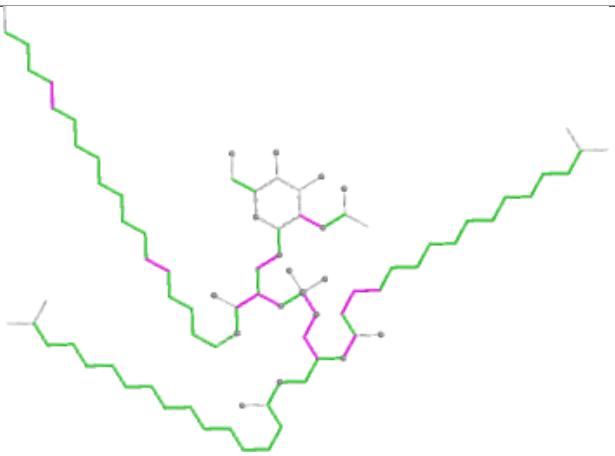
Ligand 5PL M 703



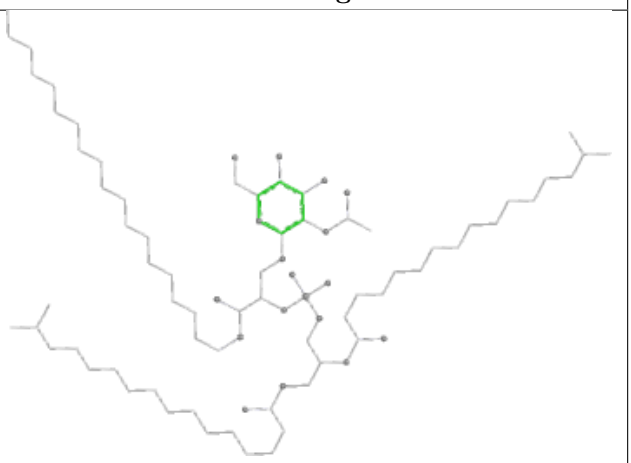
Bond lengths



Bond angles

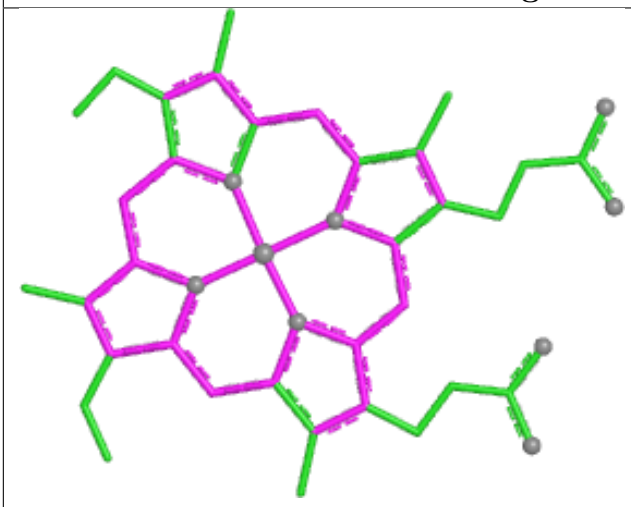


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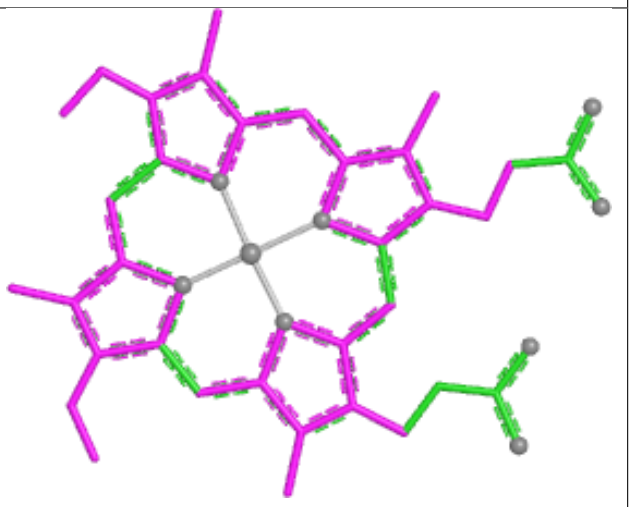


Rings

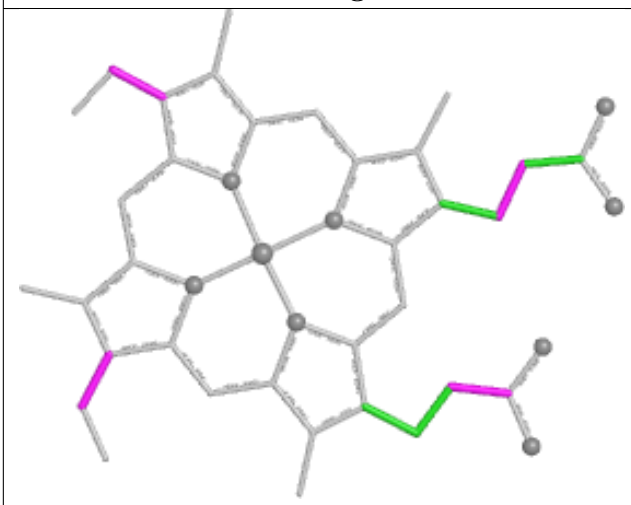
Ligand HEC N 401



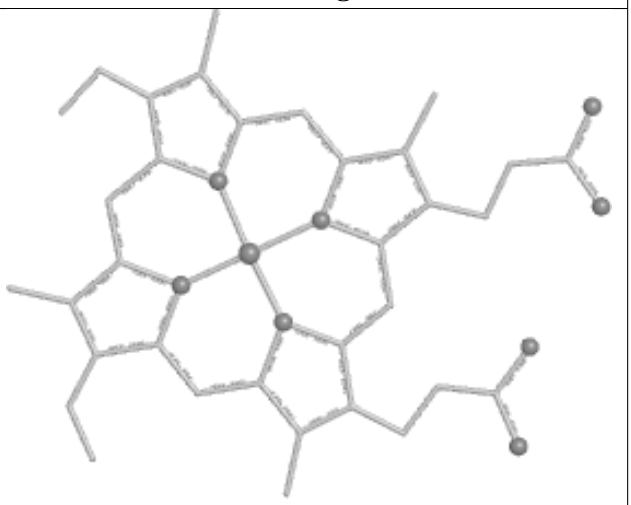
Bond lengths



Bond angles



Torsions



Rings

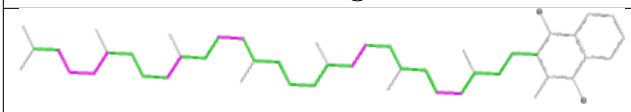
Ligand MQ7 c 301



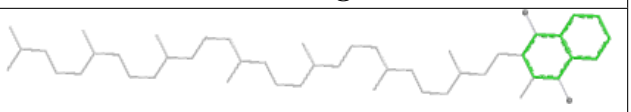
Bond lengths



Bond angles

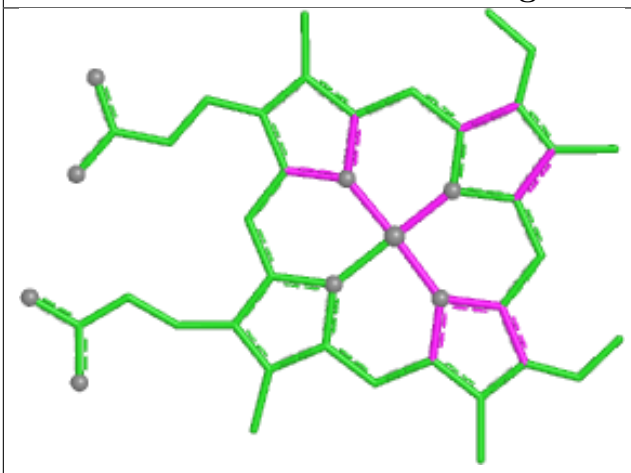


Torsions

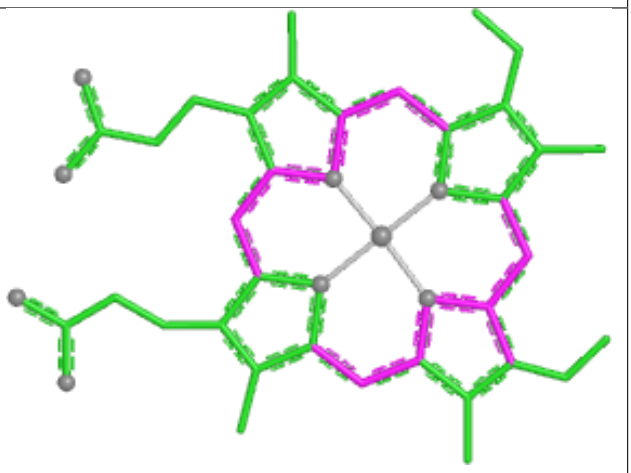


Rings

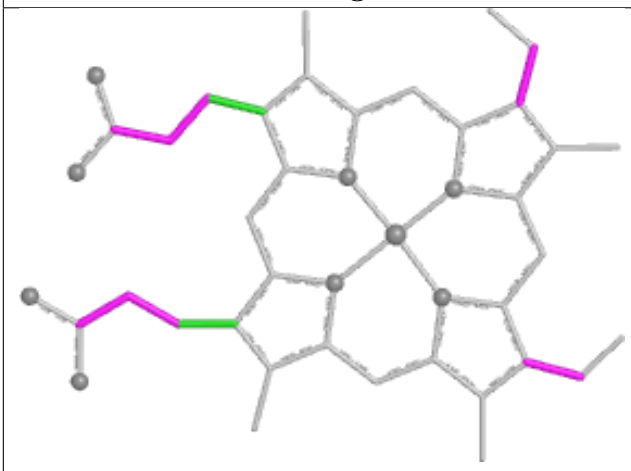
Ligand HEM B 303



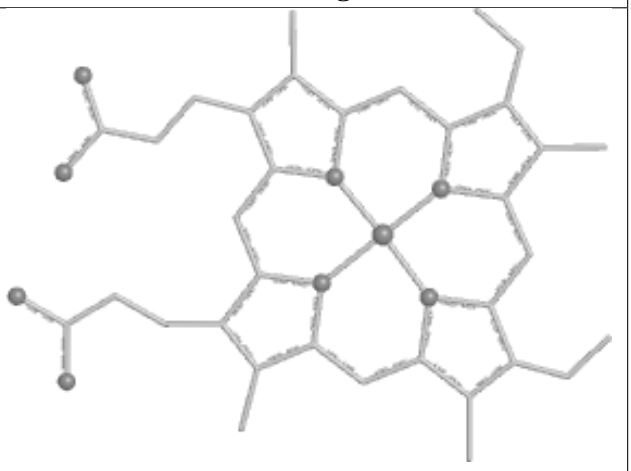
Bond lengths



Bond angles

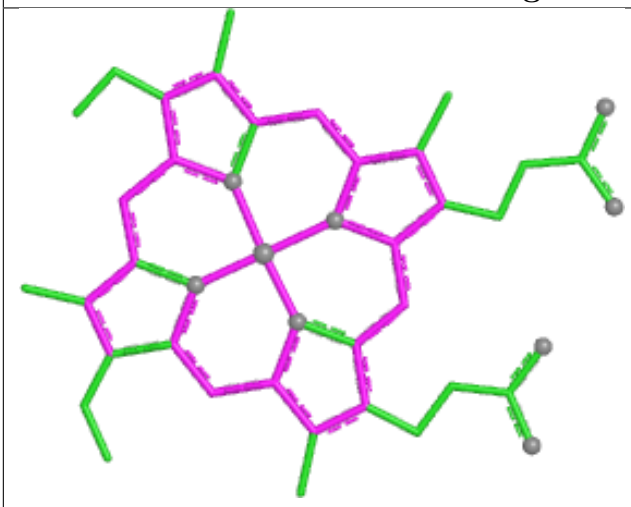


Torsions

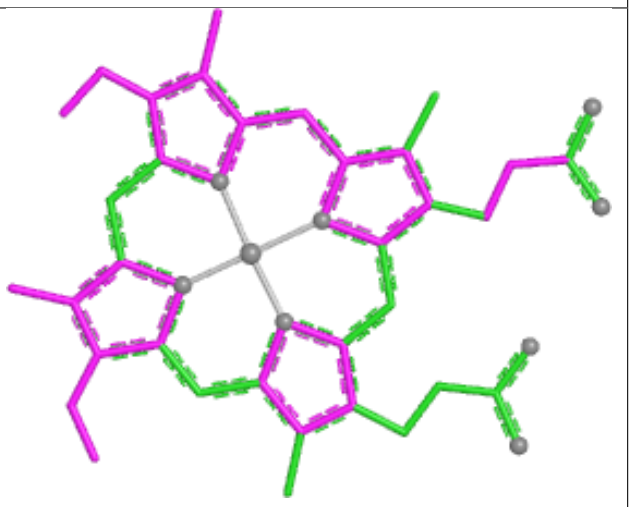


Rings

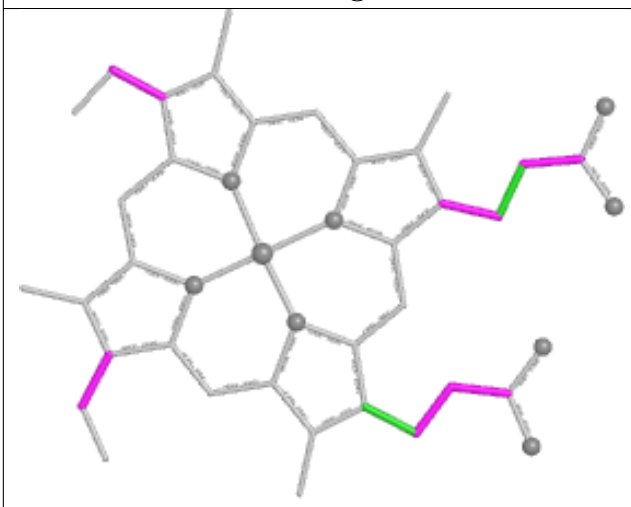
Ligand HEC B 301



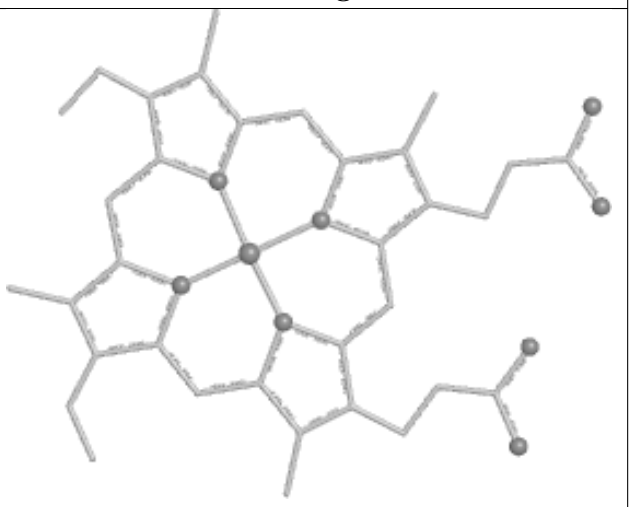
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

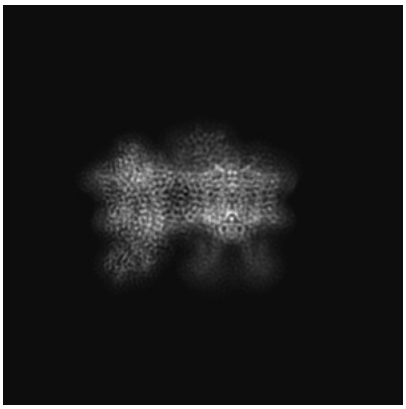
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-70330. These allow visual inspection of the internal detail of the map and identification of artifacts.

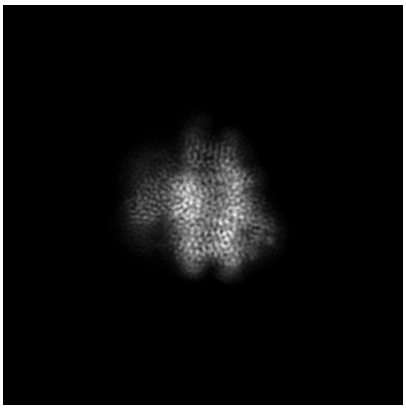
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

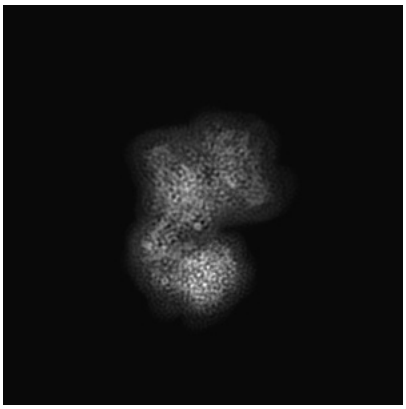
6.1.1 Primary map



X

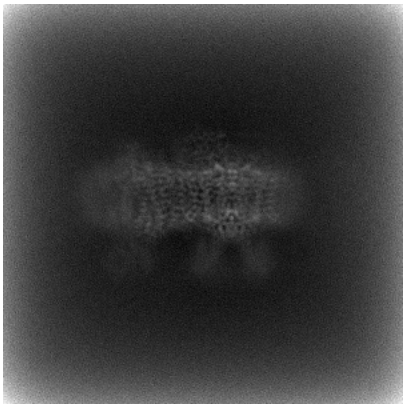


Y

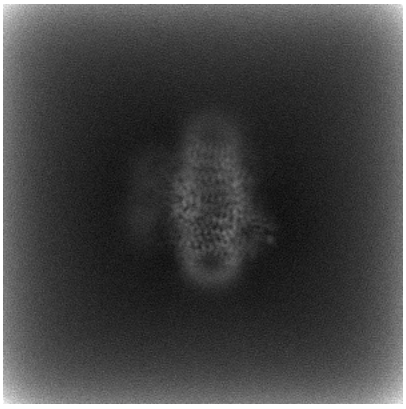


Z

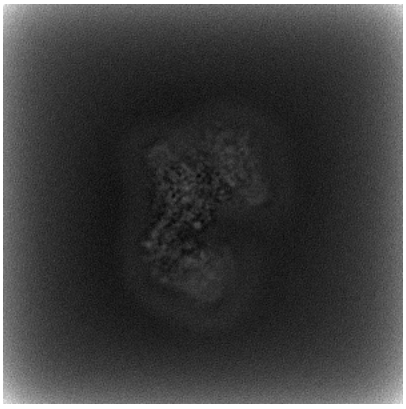
6.1.2 Raw map



X



Y



Z

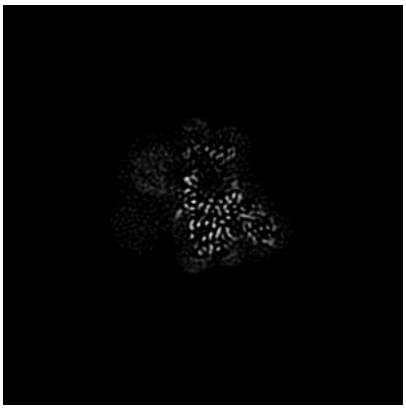
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

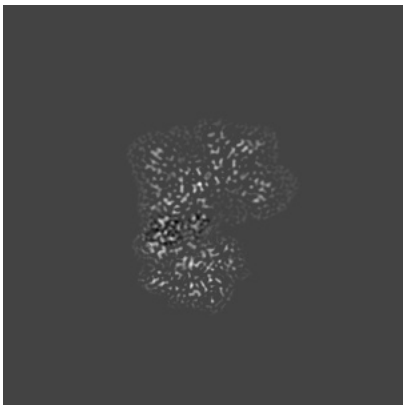
6.2.1 Primary map



X Index: 180

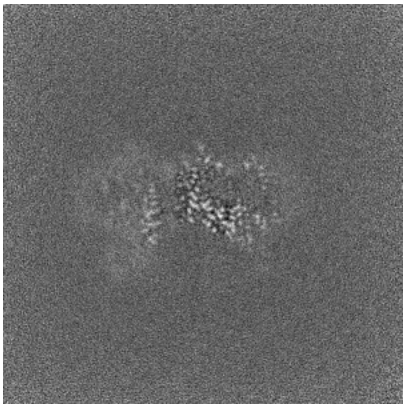


Y Index: 180

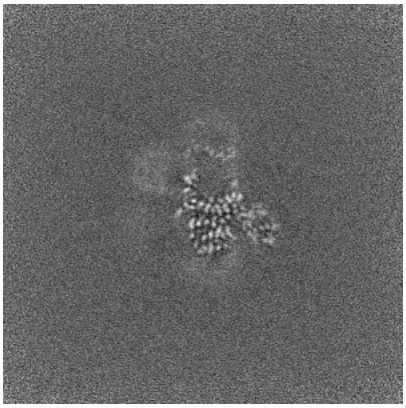


Z Index: 180

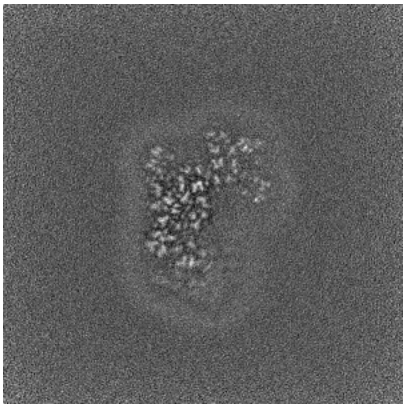
6.2.2 Raw map



X Index: 180



Y Index: 180

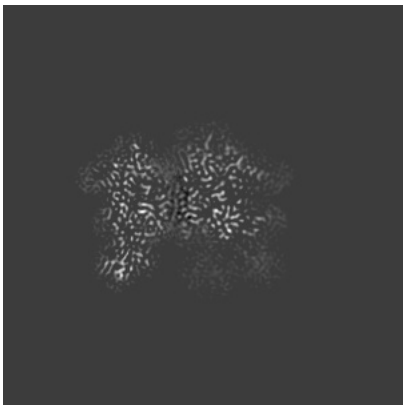


Z Index: 180

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: 169

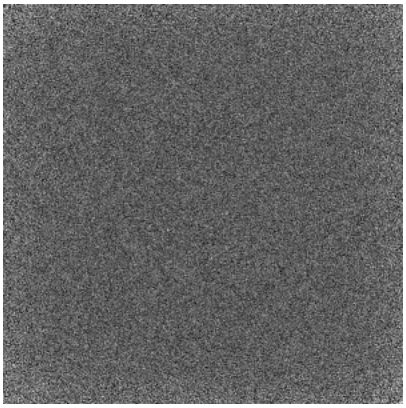


Y Index: 127

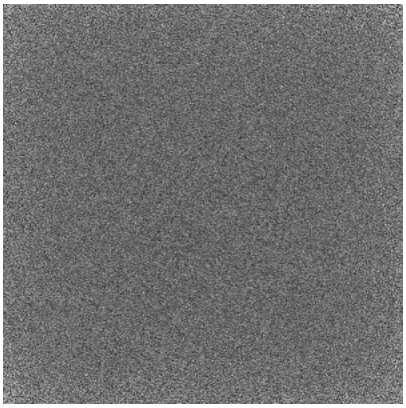


Z Index: 170

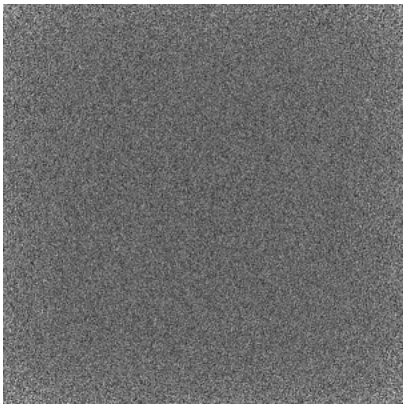
6.3.2 Raw map



X Index: 0



Y Index: 0

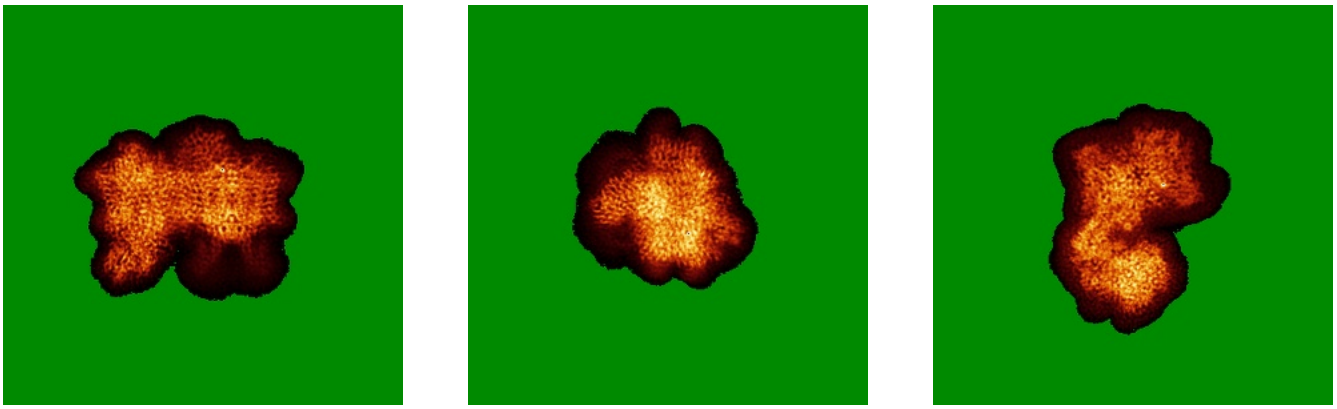


Z Index: 0

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

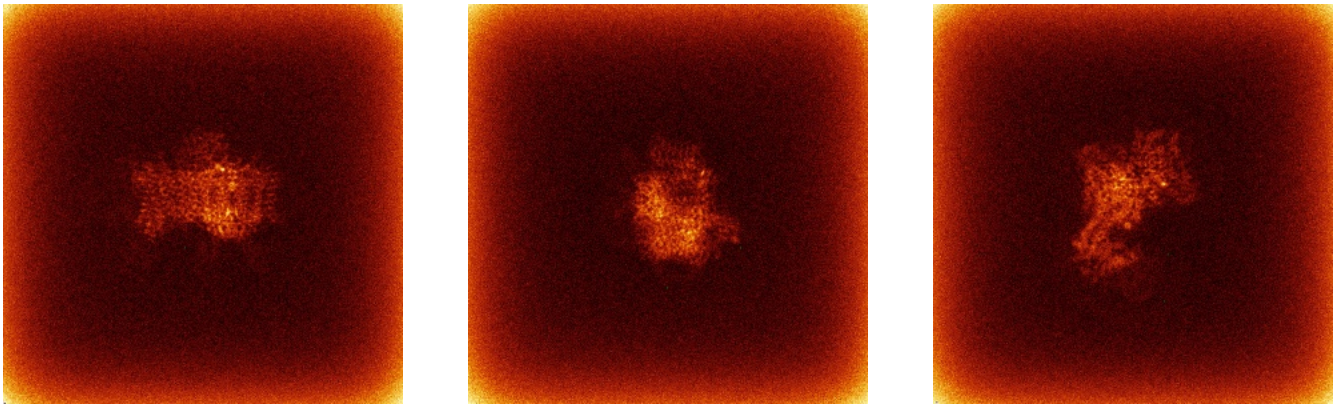
6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



X Y Z

6.4.2 Raw map

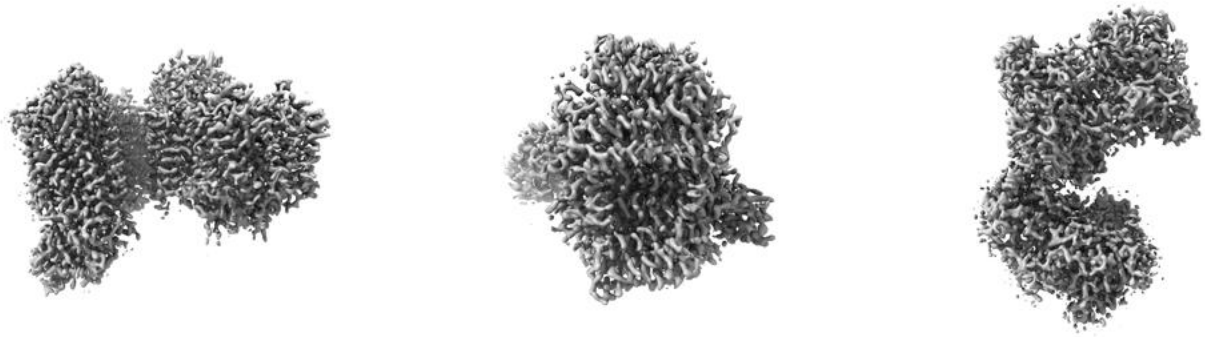


X Y Z

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

6.5 Orthogonal surface views (i)

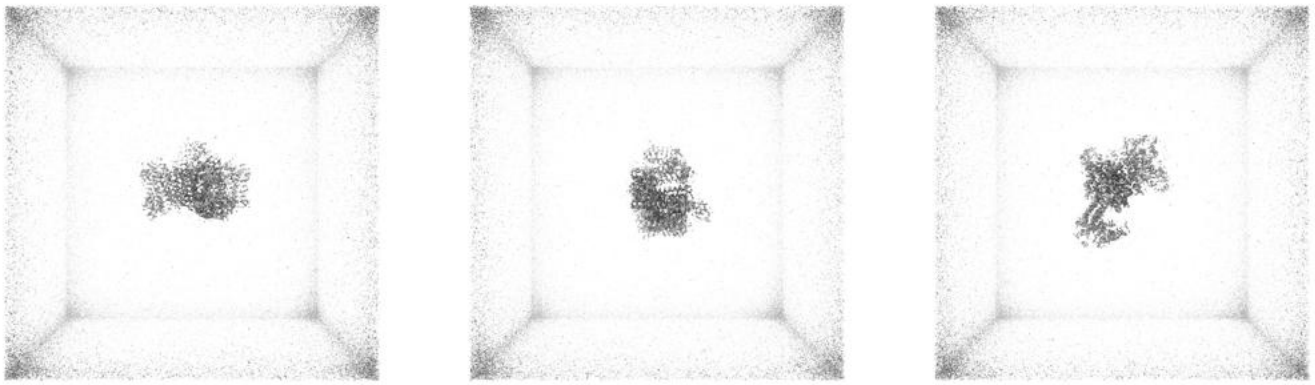
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.25. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

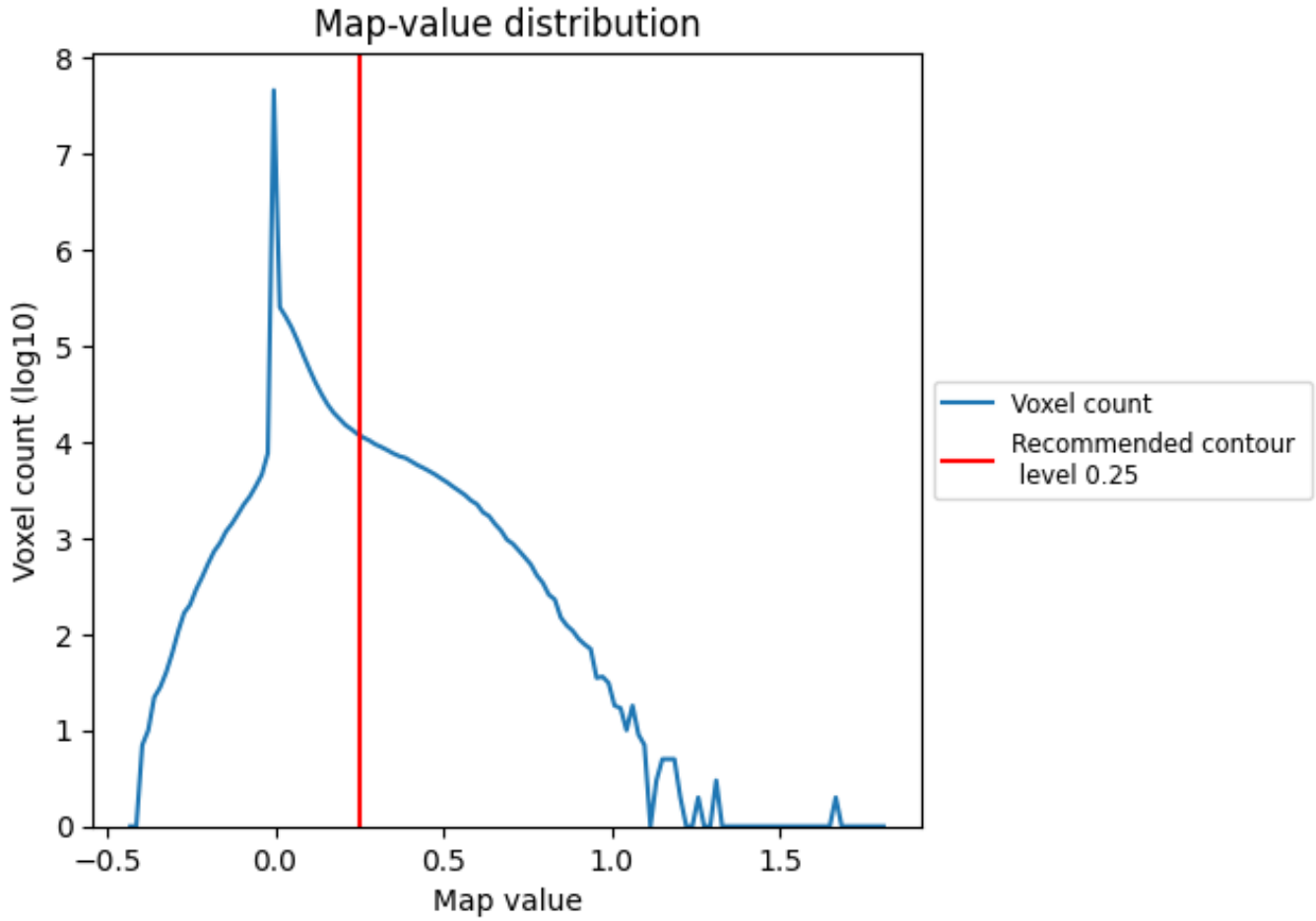
6.6 Mask visualisation (i)

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

7 Map analysis

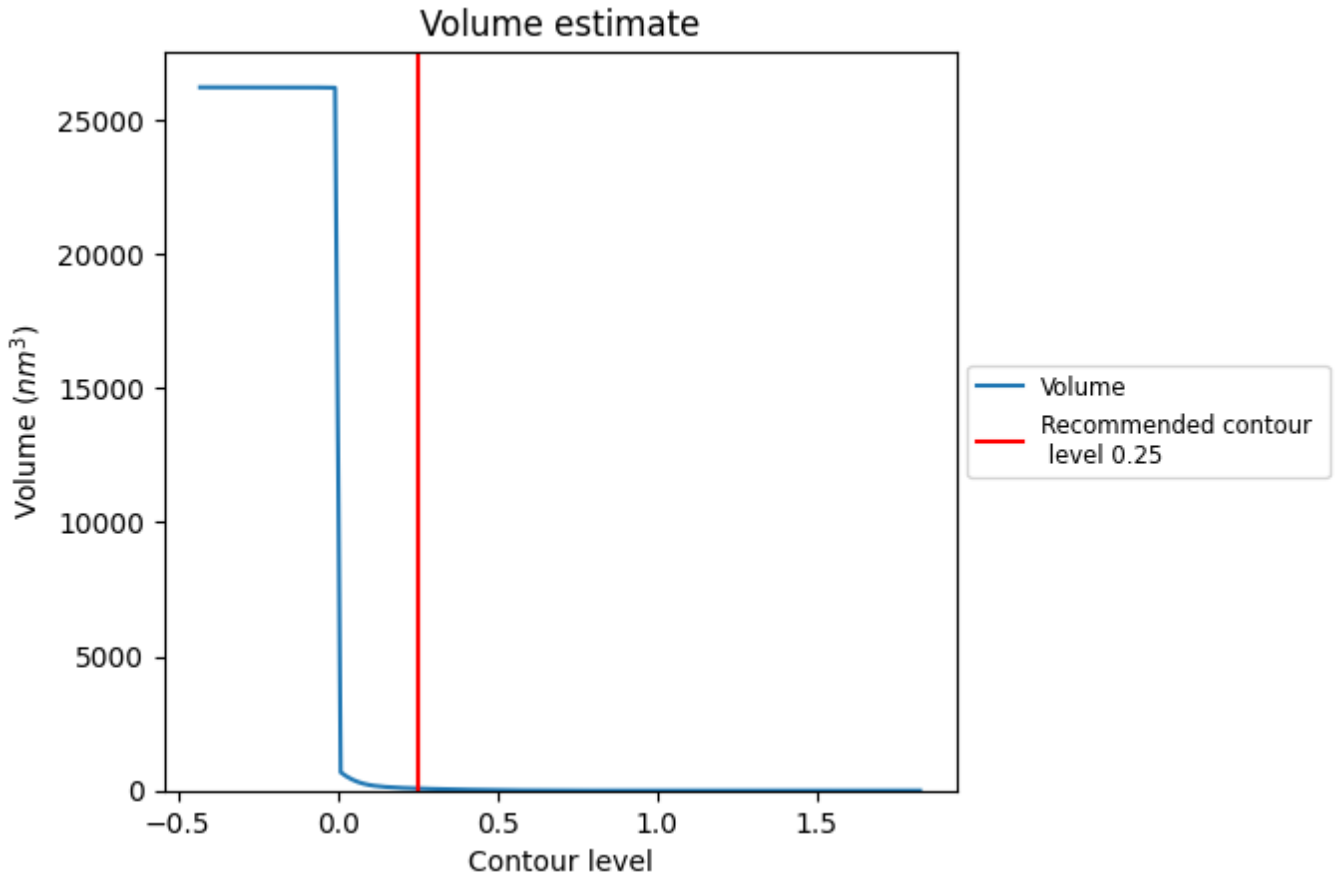
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

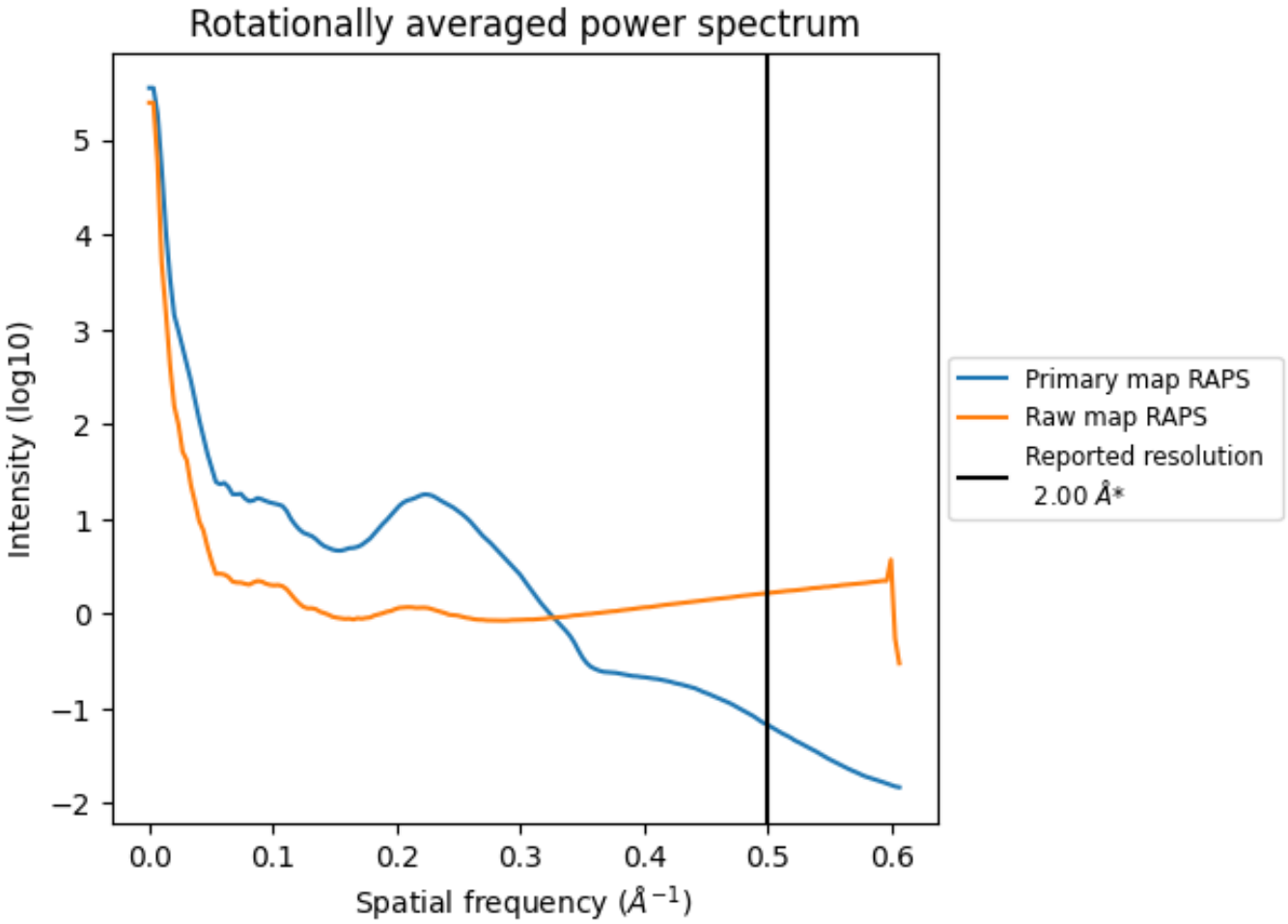
7.2 Volume estimate (i)



The volume at the recommended contour level is 78 nm^3; this corresponds to an approximate mass of 70 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)

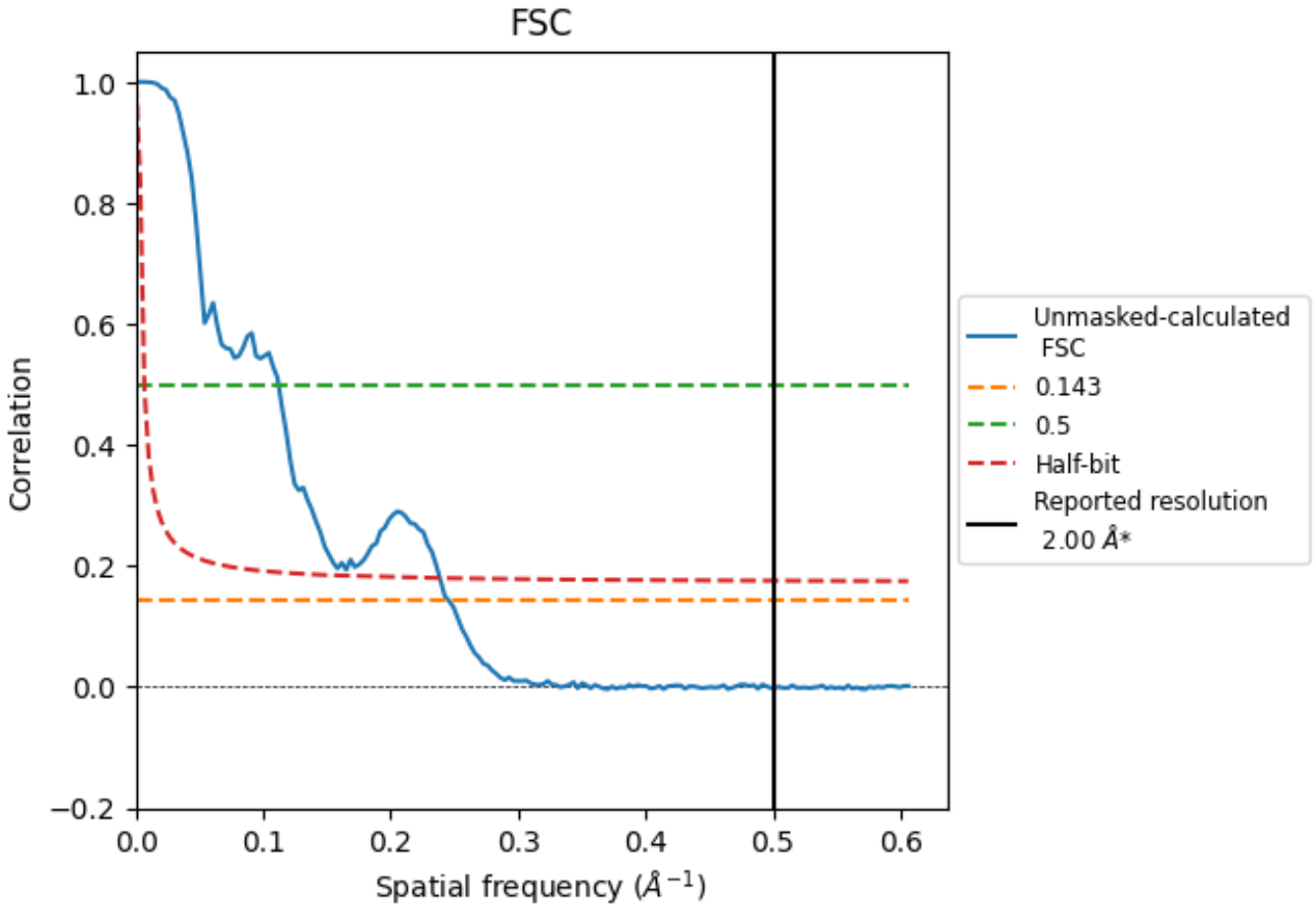


*Reported resolution corresponds to spatial frequency of 0.500 Å^{-1}

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 0.500 Å^{-1}

8.2 Resolution estimates (i)

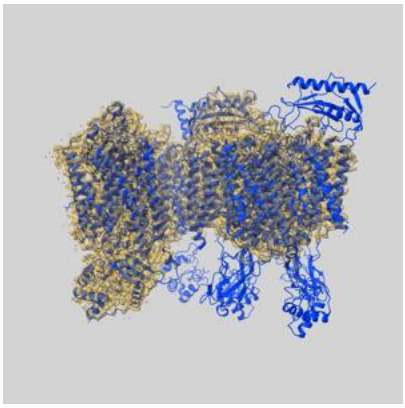
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.07	8.94	4.19

*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 4.07 differs from the reported value 2.0 by more than 10 %

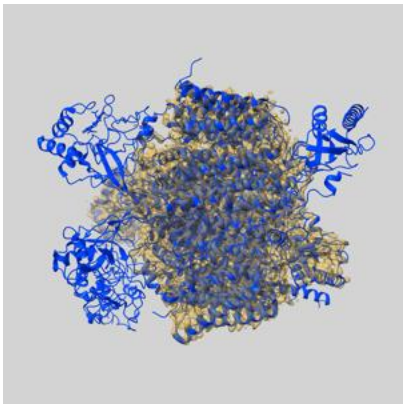
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-70330 and PDB model 9OCS. Per-residue inclusion information can be found in section 3 on page 15.

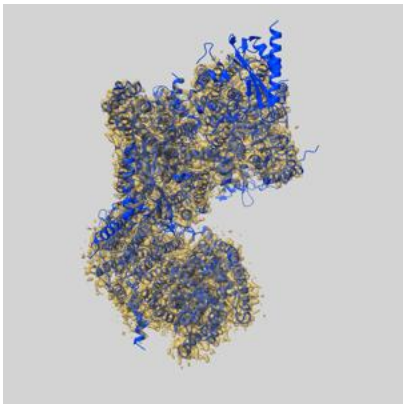
9.1 Map-model overlay



X



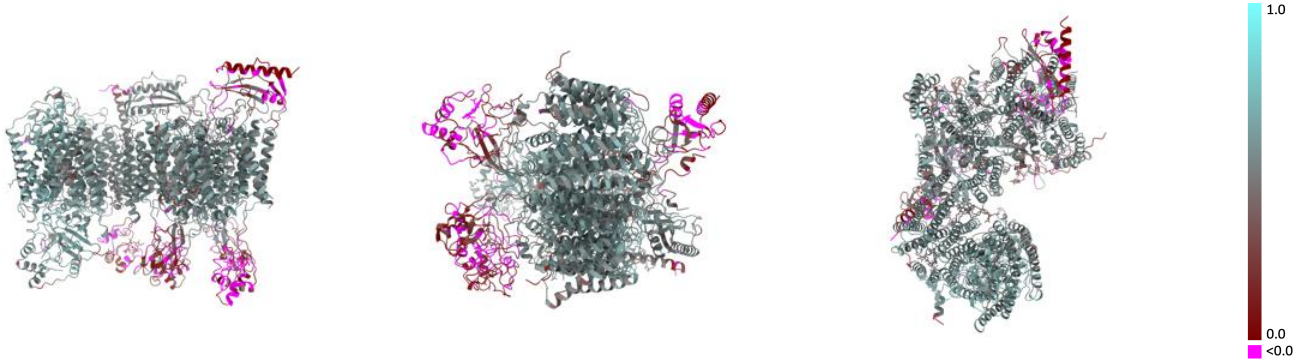
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.25 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

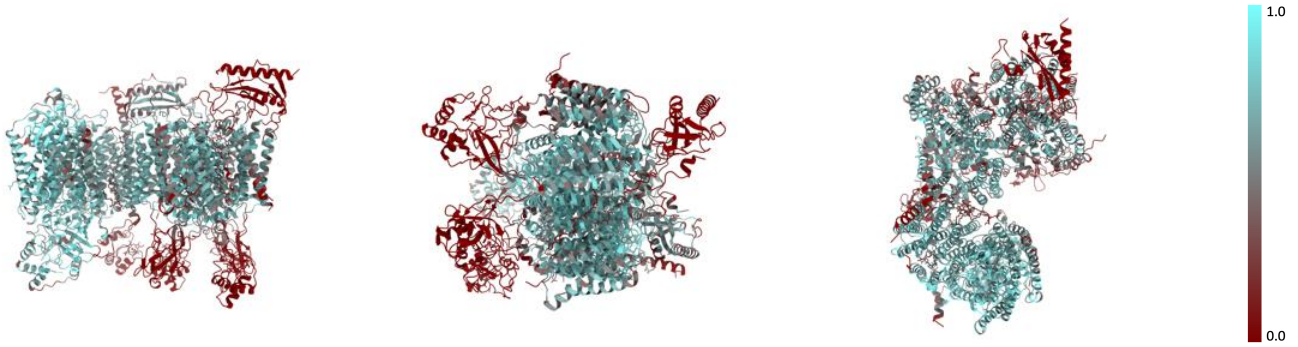
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

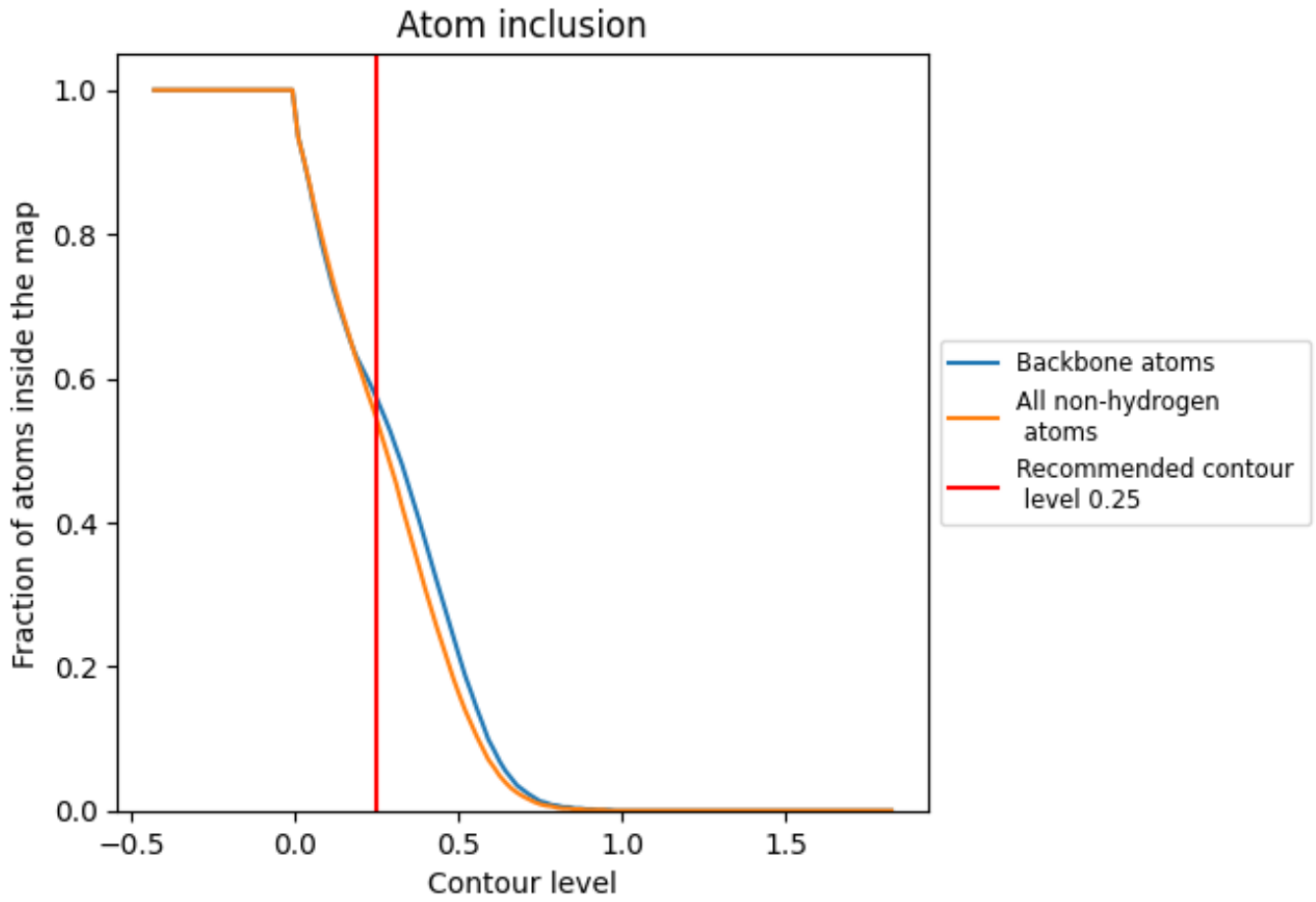
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.25).

9.4 Atom inclusion (i)



At the recommended contour level, 57% of all backbone atoms, 54% 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 (0.25) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5440	0.4760
A	0.1750	0.2860
B	0.6830	0.5590
C	0.3470	0.3710
D	0.4180	0.4790
E	0.6470	0.5590
F	0.3680	0.5290
G	0.3450	0.4690
H	0.3970	0.4270
I	0.0000	0.1250
J	0.1820	0.1890
K	0.6100	0.5110
L	0.7160	0.5550
M	0.7630	0.5950
N	0.6760	0.5630
a	0.2060	0.3290
b	0.7250	0.5610
c	0.3960	0.3750
d	0.5630	0.5110
e	0.8100	0.5770
f	0.7720	0.5440
g	0.6640	0.5330
h	0.6320	0.5100
i	0.4800	0.5120

