Full wwPDB EM Validation Report ⓘ

Oct 1, 2022 – 10:26 am BST

PDB ID	:	7P64
EMDB ID	:	EMD-13217
Title	:	Complex I from E. coli, DDM/LMNG-purified, under Turnover at pH 6, Open state
Authors	:	Kravchuk, V.; Kampjut, D.; Sazanov, L.
Deposited on	:	2021-07-15
Resolution	:	2.50 Å(reported)
Based on initial models	:	3RKO, 4HEA

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

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

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

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

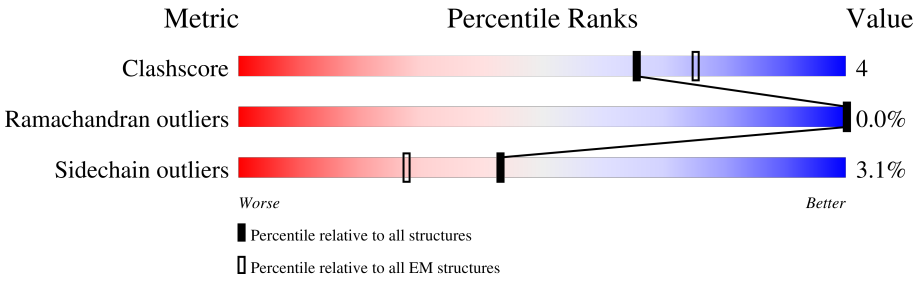
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance

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

The reported resolution of this entry is 2.50 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)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	F	439	88% 11%
2	E	156	89% 11%
3	G	905	88% 12%
4	C	600	87% 10%
5	B	220	80% 10% 10%
6	I	180	89% 11%
7	H	325	82% 14%
8	A	147	61% 8% 31%

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Mol	Chain	Length	Quality of chain
9	L	613	
10	M	504	
11	N	485	
12	K	100	
13	J	162	

2 Entry composition

There are 22 unique types of molecules in this entry. The entry contains 38981 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called NADH-quinone oxidoreductase subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	F	439	3407	2162	596	629	20	0	0

- Molecule 2 is a protein called NADH dehydrogenase I subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	E	156	1220	768	215	229	8	0	0

- Molecule 3 is a protein called NADH-quinone oxidoreductase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	G	905	7022	4388	1269	1328	37	0	0

- Molecule 4 is a protein called NADH-quinone oxidoreductase subunit C/D.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	588	4741	3039	824	854	24	0	0

- Molecule 5 is a protein called NADH-quinone oxidoreductase subunit B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	B	198	1568	994	272	286	16	0	0

- Molecule 6 is a protein called NADH-quinone oxidoreductase subunit I.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	I	180	1436	915	242	264	15	0	0

- Molecule 7 is a protein called NADH-quinone oxidoreductase subunit H.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	314	Total	C	N	O	S	0	0
			2474	1665	389	402	18		

- Molecule 8 is a protein called NADH-quinone oxidoreductase subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	A	102	Total	C	N	O	S	0	0
			808	555	124	125	4		

- Molecule 9 is a protein called Proton-translocating NADH-quinone oxidoreductase, chain L.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	L	606	Total	C	N	O	S	0	0
			4637	3083	741	781	32		

- Molecule 10 is a protein called NADH dehydrogenase I subunit M.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	M	504	Total	C	N	O	S	0	0
			3953	2661	617	646	29		

- Molecule 11 is a protein called NADH-quinone oxidoreductase subunit N.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	N	478	Total	C	N	O	S	0	0
			3620	2418	571	611	20		

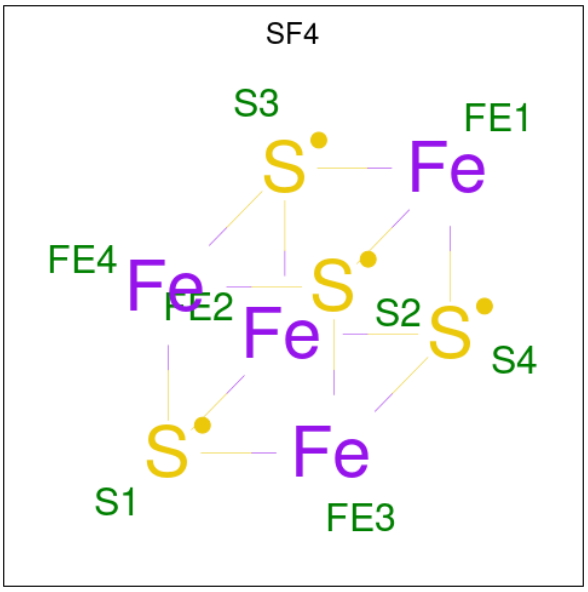
- Molecule 12 is a protein called NADH-quinone oxidoreductase subunit K.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	K	100	Total	C	N	O	S	0	0
			760	494	132	129	5		

- Molecule 13 is a protein called NADH-quinone oxidoreductase subunit J.

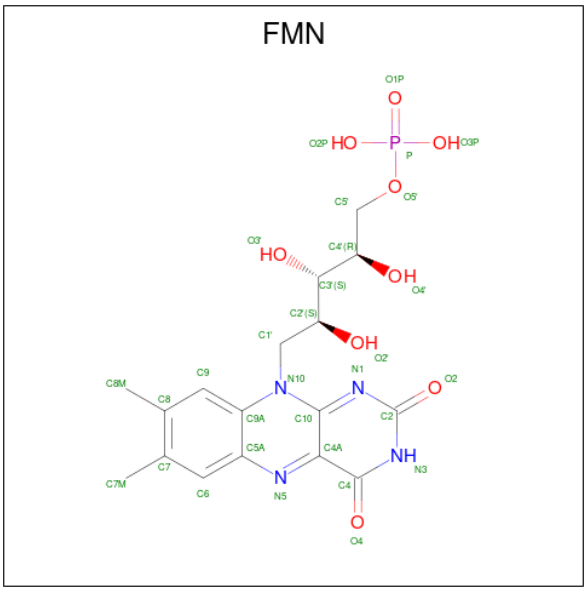
Mol	Chain	Residues	Atoms					AltConf	Trace
13	J	162	Total	C	N	O	S	0	0
			1226	824	188	207	7		

- Molecule 14 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



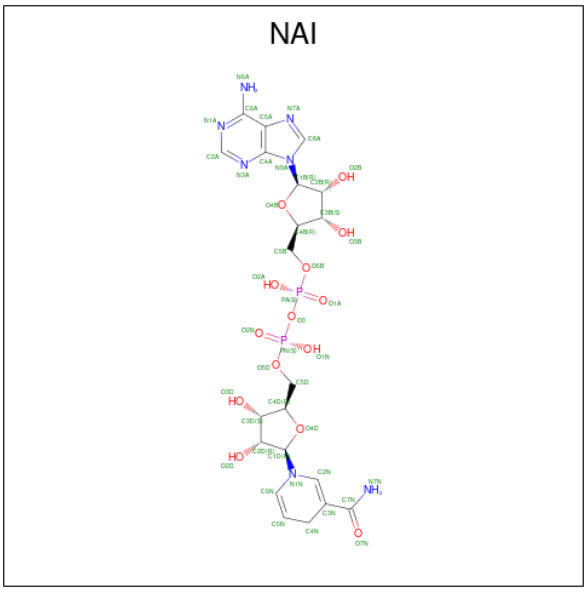
Mol	Chain	Residues	Atoms	AltConf
14	F	1	Total Fe S 8 4 4	0
14	G	1	Total Fe S 24 12 12	0
14	G	1	Total Fe S 24 12 12	0
14	G	1	Total Fe S 24 12 12	0
14	B	1	Total Fe S 8 4 4	0
14	I	1	Total Fe S 16 8 8	0
14	I	1	Total Fe S 16 8 8	0

- Molecule 15 is FLAVIN MONONUCLEOTIDE (three-letter code: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



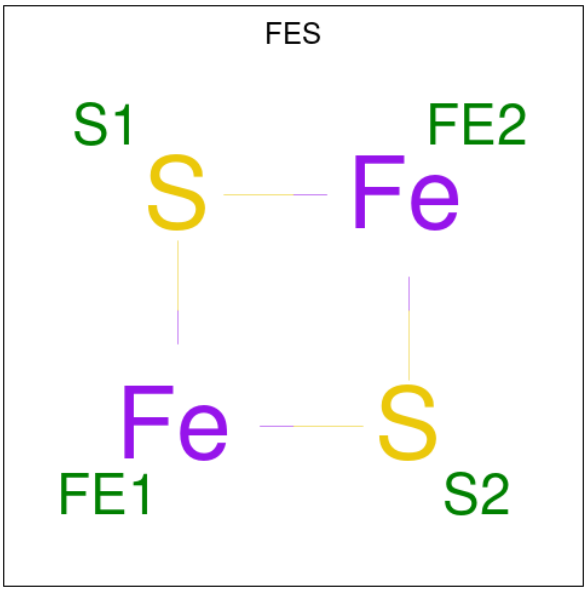
Mol	Chain	Residues	Atoms					AltConf
15	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 16 is 1,4-DIHYDRONICOTINAMIDE ADENINE DINUCLEOTIDE (three-letter code: NAI) (formula: $C_{21}H_{29}N_7O_{14}P_2$).



Mol	Chain	Residues	Atoms					AltConf
16	F	1	Total	C	N	O	P	0
			44	21	7	14	2	

- Molecule 17 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).

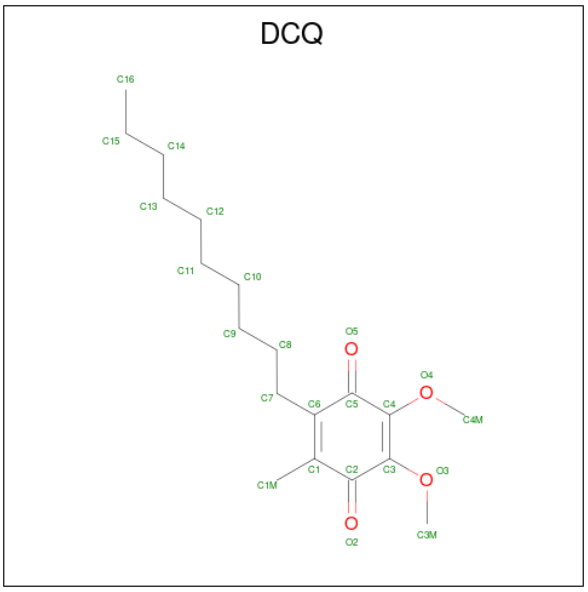


Mol	Chain	Residues	Atoms	AltConf
17	E	1	Total Fe S 4 2 2	0
17	G	1	Total Fe S 4 2 2	0

- Molecule 18 is CALCIUM ION (three-letter code: CA) (formula: Ca).

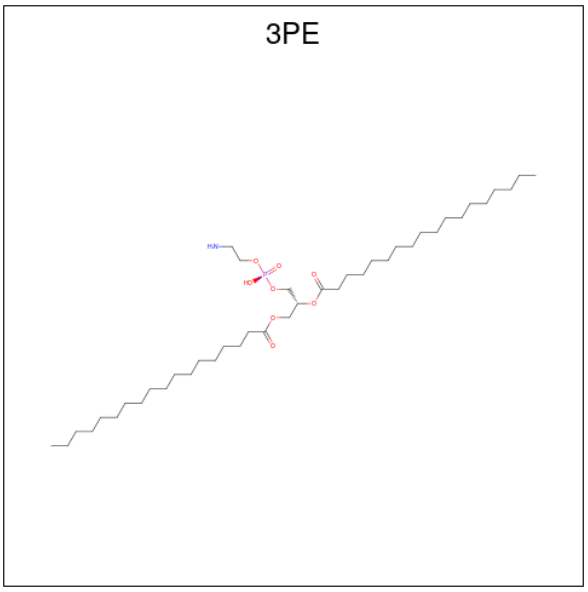
Mol	Chain	Residues	Atoms	AltConf
18	G	1	Total Ca 1 1	0

- Molecule 19 is 2-decyl-5,6-dimethoxy-3-methylcyclohexa-2,5-diene-1,4-dione (three-letter code: DCQ) (formula: $C_{19}H_{30}O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
19	B	1	Total	C	O	0
			23	19	4	

- Molecule 20 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
20	I	1	Total	C	N	O	P	0
			79	61	2	14	2	
20	I	1	Total	C	N	O	P	0
			79	61	2	14	2	

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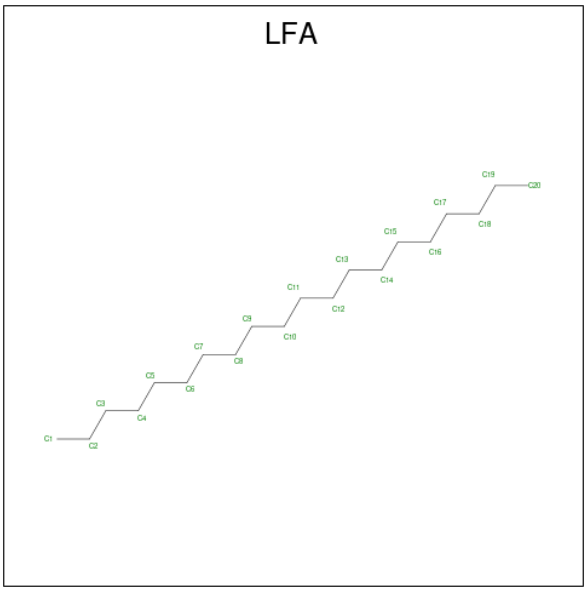
Mol	Chain	Residues	Atoms	AltConf
20	H	1	Total C N O P 183 143 4 32 4	0
20	H	1	Total C N O P 183 143 4 32 4	0
20	H	1	Total C N O P 183 143 4 32 4	0
20	H	1	Total C N O P 183 143 4 32 4	0
20	A	1	Total C N O P 42 32 1 8 1	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	L	1	Total C N O P 306 246 6 48 6	0
20	M	1	Total C N O P 153 123 3 24 3	0
20	M	1	Total C N O P 153 123 3 24 3	0
20	M	1	Total C N O P 153 123 3 24 3	0
20	N	1	Total C N O P 51 41 1 8 1	0
20	J	1	Total C N O P 51 41 1 8 1	0

- Molecule 21 is EICOSANE (three-letter code: LFA) (formula: $C_{20}H_{42}$).



Mol	Chain	Residues	Atoms	AltConf
21	H	1	Total C 20 20	0
21	L	1	Total C 20 20	0
21	M	1	Total C 20 20	0
21	N	1	Total C 34 34	0
21	N	1	Total C 34 34	0

- Molecule 22 is water.

Mol	Chain	Residues	Atoms	AltConf
22	F	34	Total O 34 34	0
22	E	12	Total O 12 12	0
22	G	308	Total O 308 308	0
22	C	162	Total O 162 162	0
22	B	57	Total O 57 57	0
22	I	83	Total O 83 83	0
22	H	47	Total O 47 47	0

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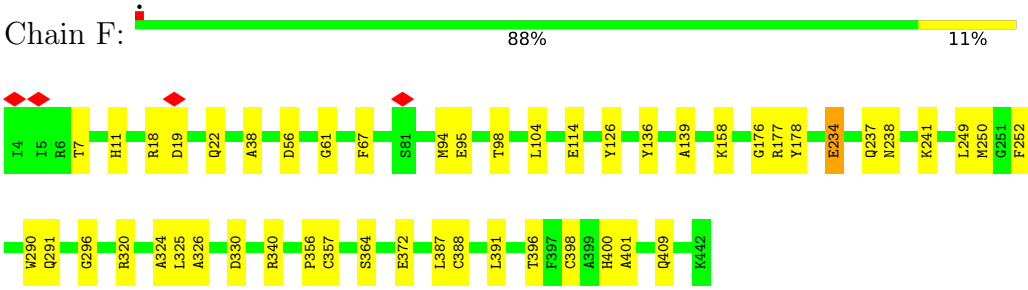
Mol	Chain	Residues	Atoms	AltConf
22	A	17	Total O 17 17	0
22	L	62	Total O 62 62	0
22	M	90	Total O 90 90	0
22	N	73	Total O 73 73	0
22	K	22	Total O 22 22	0
22	J	20	Total O 20 20	0

3 Residue-property plots (i)

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

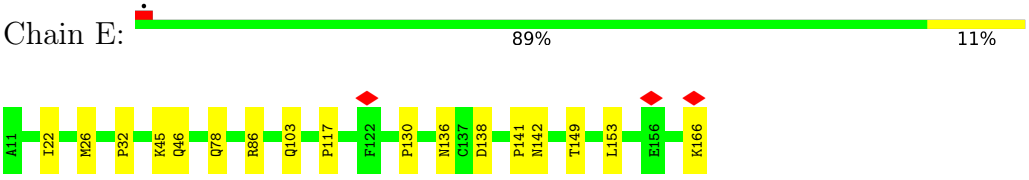
• Molecule 1: NADH-quinone oxidoreductase subunit F

Chain F:



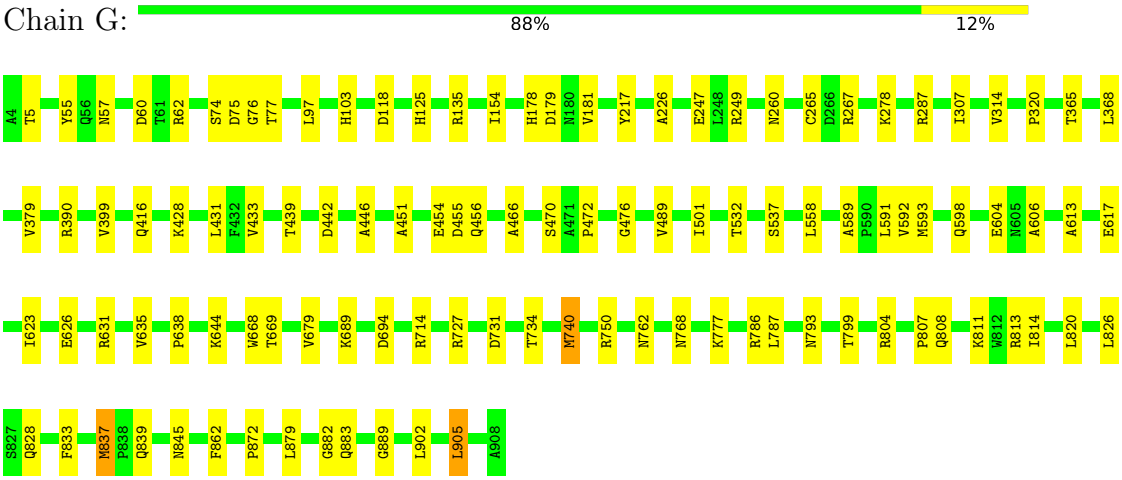
• Molecule 2: NADH dehydrogenase I subunit E

Chain E:



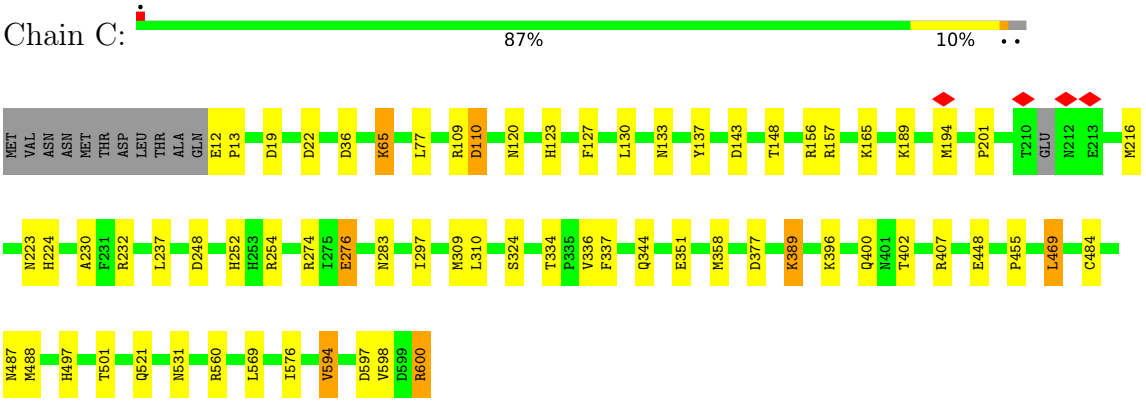
• Molecule 3: NADH-quinone oxidoreductase

Chain G:



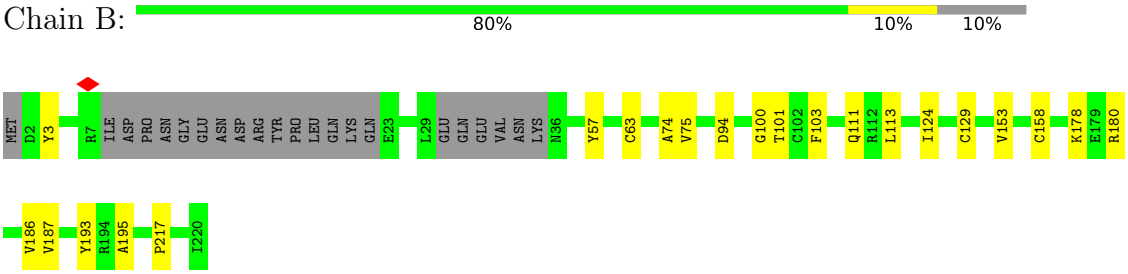
• Molecule 4: NADH-quinone oxidoreductase subunit C/D

Chain C:



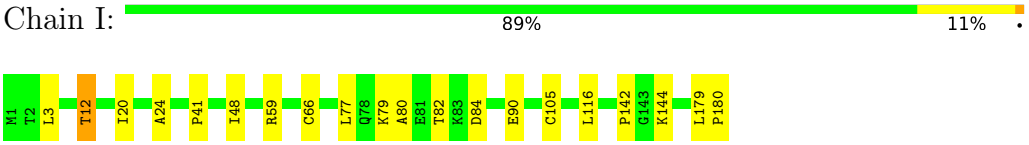
• Molecule 5: NADH-quinone oxidoreductase subunit B

Chain B:



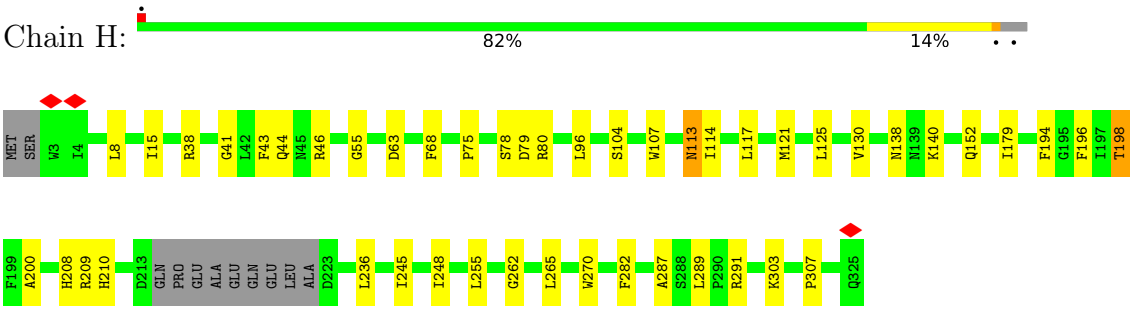
• Molecule 6: NADH-quinone oxidoreductase subunit I

Chain I:



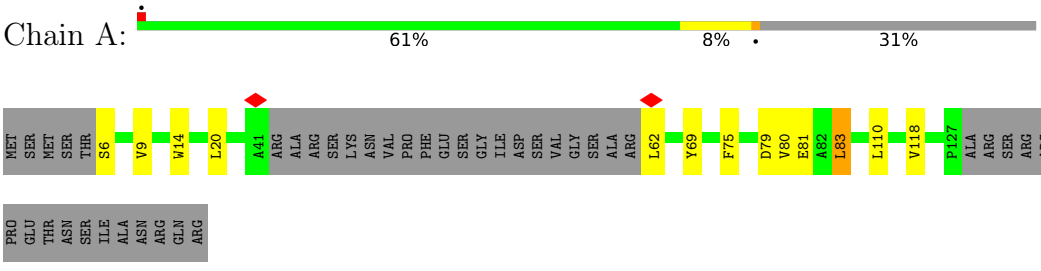
• Molecule 7: NADH-quinone oxidoreductase subunit H

Chain H:



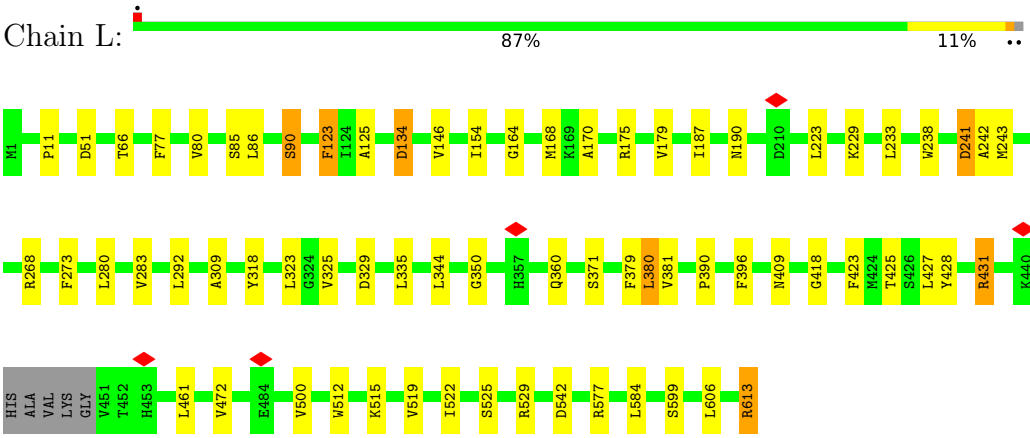
• Molecule 8: NADH-quinone oxidoreductase subunit A

Chain A:



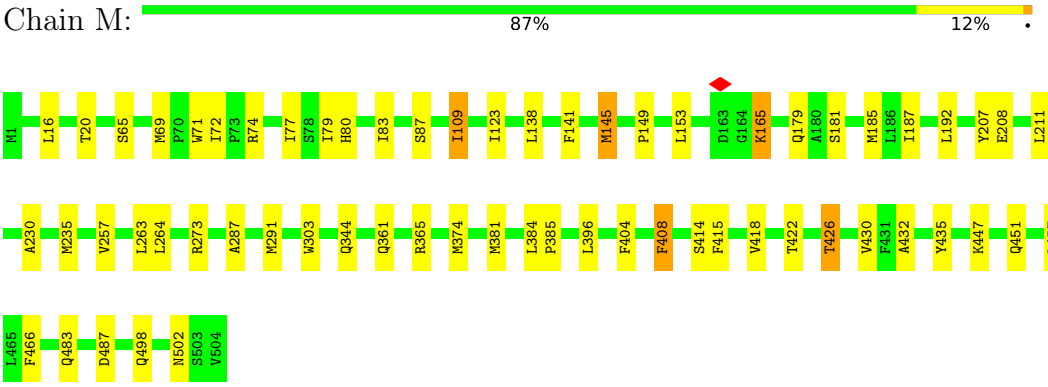
• Molecule 9: Proton-translocating NADH-quinone oxidoreductase, chain L

Chain L:



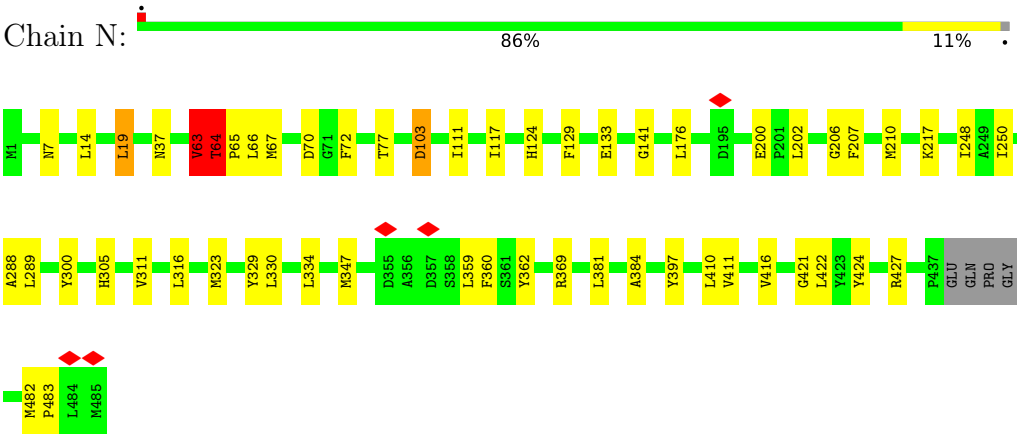
• Molecule 10: NADH dehydrogenase I subunit M

Chain M:



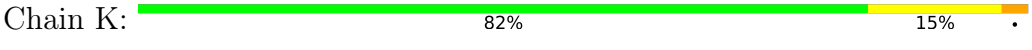
• Molecule 11: NADH-quinone oxidoreductase subunit N

Chain N:



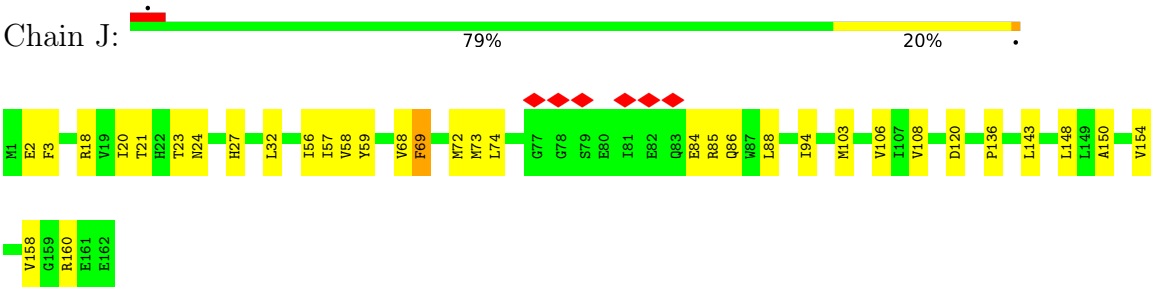
• Molecule 12: NADH-quinone oxidoreductase subunit K

Chain K:



• Molecule 13: NADH-quinone oxidoreductase subunit J

Chain J:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	97923	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	78	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.590	Depositor
Minimum map value	-0.088	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.022	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	157.5, 210.5, 240.0	wwPDB
Map dimensions	480, 421, 315	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.5, 0.5, 0.5	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CA, 3PE, FES, LFA, FMN, NAI, DCQ, SF4

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	F	0.28	0/3486	0.51	0/4713
2	E	0.29	0/1248	0.51	0/1691
3	G	0.31	0/7173	0.55	1/9726 (0.0%)
4	C	0.31	0/4871	0.57	2/6610 (0.0%)
5	B	0.31	0/1601	0.54	0/2168
6	I	0.32	0/1470	0.57	1/1985 (0.1%)
7	H	0.32	0/2548	0.52	1/3465 (0.0%)
8	A	0.30	0/833	0.52	1/1134 (0.1%)
9	L	0.29	0/4755	0.50	2/6479 (0.0%)
10	M	0.31	0/4074	0.52	2/5546 (0.0%)
11	N	0.31	0/3709	0.52	2/5061 (0.0%)
12	K	0.29	0/769	0.51	0/1040
13	J	0.30	0/1252	0.49	0/1708
All	All	0.31	0/37789	0.53	12/51326 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	G	0	2
11	N	0	2
All	All	0	4

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	201	PRO	CA-N-CD	-11.64	95.20	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	H	8	LEU	CA-CB-CG	6.22	129.60	115.30
8	A	83	LEU	CA-CB-CG	6.21	129.59	115.30
4	C	201	PRO	N-CD-CG	-5.89	94.36	103.20
10	M	263	LEU	CA-CB-CG	5.71	128.44	115.30
11	N	64	THR	N-CA-C	-5.59	95.89	111.00
3	G	905	LEU	CA-CB-CG	5.51	127.98	115.30
9	L	134	ASP	CB-CG-OD2	5.48	123.23	118.30
9	L	51	ASP	CB-CG-OD2	5.39	123.15	118.30
11	N	63	VAL	C-N-CA	5.18	134.65	121.70
10	M	109	ILE	CG1-CB-CG2	-5.17	100.02	111.40
6	I	3	LEU	CA-CB-CG	5.08	126.99	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	G	260	ASN	Peptide
3	G	668	TRP	Peptide
11	N	63	VAL	Peptide
11	N	64	THR	Peptide

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	F	3407	0	3374	24	0
2	E	1220	0	1187	8	0
3	G	7022	0	6824	58	0
4	C	4741	0	4652	38	0
5	B	1568	0	1553	13	0
6	I	1436	0	1415	13	0
7	H	2474	0	2528	32	0
8	A	808	0	821	12	0
9	L	4637	0	4783	45	0
10	M	3953	0	4053	33	0
11	N	3620	0	3790	34	0
12	K	760	0	817	12	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
13	J	1226	0	1297	24	0
14	B	8	0	0	1	0
14	F	8	0	0	0	0
14	G	24	0	0	0	0
14	I	16	0	0	0	0
15	F	31	0	19	0	0
16	F	44	0	27	1	0
17	E	4	0	0	0	0
17	G	4	0	0	0	0
18	G	1	0	0	0	0
19	B	23	0	30	1	0
20	A	42	0	61	2	0
20	H	183	0	280	9	0
20	I	79	0	119	2	0
20	J	51	0	82	3	0
20	L	306	0	492	11	0
20	M	153	0	246	4	0
20	N	51	0	82	1	0
21	H	20	0	42	0	0
21	L	20	0	42	0	0
21	M	20	0	42	0	0
21	N	34	0	69	1	0
22	A	17	0	0	0	0
22	B	57	0	0	0	0
22	C	162	0	0	1	0
22	E	12	0	0	0	0
22	F	34	0	0	0	0
22	G	308	0	0	7	0
22	H	47	0	0	1	0
22	I	83	0	0	0	0
22	J	20	0	0	0	0
22	K	22	0	0	0	0
22	L	62	0	0	3	0
22	M	90	0	0	1	0
22	N	73	0	0	0	0
All	All	38981	0	38727	315	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 4.

All (315) 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)
11:N:63:VAL:O	11:N:67:MET:HB2	1.70	0.91
4:C:560:ARG:HH12	4:C:600:ARG:HH21	1.37	0.72
11:N:64:THR:HB	11:N:66:LEU:H	1.53	0.71
11:N:217:LYS:HB3	11:N:250:ILE:HD13	1.73	0.70
10:M:181:SER:HB2	10:M:230:ALA:HA	1.75	0.67
9:L:223:LEU:HD13	9:L:283:VAL:HG22	1.75	0.66
11:N:65:PRO:HG2	13:J:136:PRO:HB3	1.77	0.66
1:F:95:GLU:HB2	16:F:503:NAI:H42N	1.80	0.64
20:L:704:3PE:H331	20:L:704:3PE:H231	1.80	0.64
3:G:845:ASN:ND2	3:G:879:LEU:O	2.32	0.63
4:C:309:MET:HE2	4:C:484:CYS:HB3	1.80	0.63
9:L:233:LEU:HD21	20:L:707:3PE:H3F2	1.80	0.63
4:C:389:LYS:H	4:C:389:LYS:HE2	1.63	0.62
1:F:249:LEU:HB3	1:F:261:LEU:HD11	1.82	0.62
4:C:344:GLN:HG2	5:B:75:VAL:HG21	1.83	0.61
3:G:768:ASN:ND2	22:G:1108:HOH:O	2.34	0.60
11:N:289:LEU:O	11:N:427:ARG:NH1	2.34	0.60
3:G:714:ARG:NH2	22:G:1113:HOH:O	2.35	0.59
7:H:75:PRO:HB2	7:H:78:SER:HB3	1.85	0.59
4:C:254:ARG:HG3	5:B:103:PHE:HE1	1.68	0.59
4:C:402:THR:H	6:I:12:THR:HG21	1.67	0.59
9:L:187:ILE:HD11	20:M:703:3PE:H341	1.84	0.59
3:G:777:LYS:NZ	22:G:1120:HOH:O	2.37	0.58
9:L:519:VAL:HG13	20:L:705:3PE:H31	1.86	0.58
11:N:111:ILE:HG21	13:J:150:ALA:HB2	1.86	0.58
20:L:701:3PE:H2A2	11:N:416:VAL:HG13	1.86	0.57
7:H:104:SER:HB3	7:H:107:TRP:HB2	1.86	0.57
3:G:862:PHE:HB3	3:G:905:LEU:HD23	1.86	0.57
8:A:83:LEU:HD23	13:J:58:VAL:HG21	1.87	0.57
20:H:405:3PE:H341	20:J:201:3PE:H321	1.85	0.57
3:G:118:ASP:OD1	3:G:762:ASN:ND2	2.38	0.56
11:N:248:ILE:HG12	11:N:330:LEU:HD22	1.87	0.56
9:L:292:LEU:HB3	20:L:707:3PE:H2H1	1.87	0.56
12:K:9:ILE:HG12	13:J:108:VAL:HG22	1.87	0.56
3:G:828:GLN:NE2	3:G:889:GLY:O	2.39	0.56
7:H:179:ILE:HG21	7:H:255:LEU:HD23	1.87	0.56
9:L:66:THR:H	20:L:706:3PE:H112	1.69	0.56
3:G:476:GLY:O	3:G:804:ARG:NH2	2.39	0.56
3:G:808:GLN:HG3	3:G:811:LYS:HB2	1.88	0.56
7:H:291:ARG:NH1	22:H:508:HOH:O	2.39	0.55
3:G:617:GLU:HG2	3:G:638:PRO:HG3	1.88	0.55
1:F:136:TYR:HB3	1:F:139:ALA:HB3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:K:80:LEU:HD21	13:J:74:LEU:HD11	1.89	0.55
5:B:186:VAL:HG23	5:B:187:VAL:HG23	1.89	0.55
1:F:56:ASP:O	1:F:237:GLN:NE2	2.38	0.54
9:L:11:PRO:HB2	9:L:125:ALA:HB2	1.90	0.54
7:H:79:ASP:OD2	13:J:27:HIS:NE2	2.38	0.54
6:I:59:ARG:NH2	6:I:142:PRO:O	2.40	0.54
4:C:65:LYS:NZ	4:C:130:LEU:O	2.40	0.54
6:I:24:ALA:HB2	7:H:43:PHE:HD1	1.73	0.54
11:N:37:ASN:ND2	11:N:103:ASP:OD2	2.38	0.54
11:N:305:HIS:ND1	11:N:329:TYR:OH	2.36	0.54
9:L:85:SER:OG	9:L:268:ARG:NH2	2.41	0.53
9:L:329:ASP:OD1	9:L:329:ASP:N	2.36	0.53
1:F:340:ARG:NE	1:F:372:GLU:OE1	2.42	0.53
3:G:883:GLN:NE2	22:G:1131:HOH:O	2.41	0.53
10:M:414:SER:O	10:M:418:VAL:N	2.36	0.53
13:J:68:VAL:O	13:J:72:MET:HG2	2.08	0.53
1:F:391:LEU:HD23	1:F:401:ALA:HB1	1.91	0.53
4:C:77:LEU:HB3	4:C:137:TYR:HB3	1.90	0.53
12:K:82:GLN:NE2	13:J:158:VAL:O	2.42	0.53
10:M:415:PHE:HB2	10:M:422:THR:HG21	1.91	0.53
9:L:318:TYR:OH	9:L:418:GLY:O	2.25	0.53
3:G:125:HIS:ND1	22:G:1104:HOH:O	2.33	0.53
2:E:86:ARG:NH2	2:E:166:LYS:O	2.42	0.52
12:K:85:ARG:NH1	13:J:160:ARG:O	2.42	0.52
3:G:626:GLU:OE1	3:G:786:ARG:NH1	2.42	0.52
3:G:368:LEU:HD21	3:G:390:ARG:HB3	1.91	0.52
9:L:268:ARG:NH1	22:L:811:HOH:O	2.41	0.52
12:K:16:VAL:O	12:K:20:THR:OG1	2.28	0.52
4:C:110:ASP:OD1	4:C:110:ASP:N	2.41	0.52
9:L:179:VAL:HG22	10:M:426:THR:HG22	1.91	0.52
20:H:405:3PE:H3B1	20:J:201:3PE:H3B2	1.91	0.52
9:L:243:MET:HG3	9:L:309:ALA:HB2	1.92	0.52
5:B:180:ARG:HB2	5:B:193:TYR:HB2	1.91	0.52
11:N:176:LEU:HD22	11:N:202:LEU:HD11	1.92	0.52
5:B:101:THR:HA	5:B:129:CYS:HB3	1.90	0.52
10:M:344:GLN:NE2	22:M:817:HOH:O	2.39	0.51
4:C:189:LYS:HD2	5:B:111:GLN:HG2	1.90	0.51
4:C:230:ALA:O	4:C:252:HIS:NE2	2.40	0.51
11:N:369:ARG:HH22	11:N:450:TYR:HE2	1.57	0.51
1:F:234:GLU:O	1:F:238:ASN:ND2	2.44	0.51
1:F:357:CYS:HB2	1:F:401:ALA:HB2	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:133:ASN:OD1	4:C:133:ASN:N	2.40	0.51
1:F:98:THR:HA	1:F:325:LEU:HD12	1.93	0.51
3:G:454:GLU:OE1	3:G:813:ARG:NH1	2.38	0.51
3:G:74:SER:O	3:G:77:THR:OG1	2.29	0.50
20:H:405:3PE:H2C1	20:H:405:3PE:H3E1	1.92	0.50
7:H:209:ARG:HD3	7:H:245:ILE:HD11	1.92	0.50
20:L:704:3PE:H2E1	20:M:703:3PE:H2A1	1.93	0.50
4:C:276:GLU:O	4:C:283:ASN:ND2	2.33	0.50
7:H:38:ARG:NH1	7:H:55:GLY:O	2.44	0.50
10:M:208:GLU:HA	10:M:211:LEU:HD12	1.93	0.50
11:N:421:GLY:HA2	11:N:424:TYR:CE2	2.46	0.50
1:F:176:GLY:HA3	2:E:78:GLN:HG2	1.93	0.50
7:H:140:LYS:HD3	8:A:62:LEU:HB2	1.94	0.49
10:M:71:TRP:HB2	10:M:79:ILE:HG13	1.94	0.49
4:C:274:ARG:NH2	5:B:158:CYS:SG	2.83	0.49
4:C:396:LYS:NZ	4:C:400:GLN:OE1	2.45	0.49
9:L:247:THR:HG21	9:L:350:GLY:HA3	1.92	0.49
4:C:224:HIS:HB2	4:C:230:ALA:HA	1.93	0.49
4:C:600:ARG:NH2	22:C:726:HOH:O	2.45	0.49
8:A:69:TYR:OH	12:K:74:SER:O	2.30	0.49
10:M:153:LEU:HD13	10:M:257:VAL:HG22	1.94	0.49
10:M:187:ILE:HD12	11:N:411:VAL:HG13	1.95	0.49
10:M:87:SER:OG	10:M:273:ARG:NH2	2.44	0.49
10:M:463:ARG:NH1	10:M:464:GLU:OE1	2.46	0.49
12:K:33:ILE:HG23	13:J:32:LEU:HD22	1.95	0.49
3:G:694:ASP:N	3:G:694:ASP:OD1	2.44	0.49
3:G:807:PRO:HB3	3:G:882:GLY:HA3	1.93	0.49
6:I:80:ALA:HB2	6:I:90:GLU:HB2	1.95	0.48
10:M:381:MET:HB2	10:M:385:PRO:HD3	1.95	0.48
4:C:324:SER:HB2	4:C:336:VAL:HA	1.95	0.48
7:H:113:ASN:N	7:H:113:ASN:OD1	2.46	0.48
9:L:606:LEU:HB3	13:J:106:VAL:HG11	1.96	0.48
3:G:399:VAL:HG13	3:G:428:LYS:HB2	1.96	0.48
3:G:5:THR:O	3:G:76:GLY:N	2.46	0.48
4:C:455:PRO:HB2	4:C:469:LEU:HD22	1.96	0.48
4:C:232:ARG:HB2	4:C:248:ASP:HB3	1.96	0.47
7:H:41:GLY:HA2	7:H:46:ARG:HG3	1.95	0.47
3:G:793:ASN:OD1	3:G:793:ASN:N	2.47	0.47
4:C:594:VAL:HG23	4:C:597:ASP:HB2	1.94	0.47
8:A:80:VAL:O	8:A:83:LEU:HG	2.14	0.47
9:L:170:ALA:HA	9:L:238:TRP:HB2	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:L:577:ARG:NH1	20:L:701:3PE:O22	2.42	0.47
11:N:311:VAL:HG22	11:N:410:LEU:HD13	1.97	0.47
9:L:154:ILE:HD13	9:L:242:ALA:HB1	1.97	0.47
3:G:451:ALA:O	3:G:456:GLN:NE2	2.47	0.47
12:K:1:MET:SD	12:K:1:MET:N	2.87	0.47
4:C:143:ASP:OD1	4:C:157:ARG:NH1	2.45	0.47
3:G:365:THR:O	3:G:786:ARG:NH2	2.46	0.47
3:G:679:VAL:HG11	3:G:689:LYS:HB2	1.97	0.47
20:I:203:3PE:H2I3	20:H:401:3PE:H2G2	1.96	0.47
10:M:65:SER:HB3	10:M:83:ILE:HG22	1.97	0.47
13:J:84:GLU:OE1	13:J:86:GLN:NE2	2.48	0.47
1:F:38:ALA:HB2	1:F:114:GLU:HG3	1.97	0.47
3:G:592:VAL:HB	3:G:606:ALA:HA	1.96	0.47
7:H:303:LYS:HE3	8:A:118:VAL:HG13	1.96	0.47
11:N:77:THR:HG23	11:N:117:ILE:HG12	1.95	0.47
4:C:569:LEU:HD12	4:C:598:VAL:HG11	1.97	0.47
9:L:80:VAL:HB	9:L:134:ASP:HB3	1.97	0.47
20:H:405:3PE:H382	8:A:20:LEU:HD12	1.96	0.46
11:N:129:PHE:O	11:N:133:GLU:HG2	2.15	0.46
11:N:66:LEU:HA	11:N:124:HIS:HB2	1.96	0.46
10:M:432:ALA:HA	10:M:435:TYR:CE2	2.49	0.46
10:M:498:GLN:O	10:M:502:ASN:HB2	2.15	0.46
3:G:55:TYR:HB3	3:G:60:ASP:HB3	1.96	0.46
4:C:216:MET:HG3	4:C:237:LEU:HB2	1.98	0.46
11:N:14:LEU:HD21	13:J:143:LEU:HD11	1.97	0.46
3:G:598:GLN:HG3	3:G:826:LEU:HD22	1.98	0.46
7:H:121:MET:HG3	13:J:57:ILE:HG13	1.97	0.46
7:H:307:PRO:HB2	20:A:201:3PE:H2D2	1.98	0.46
3:G:613:ALA:HB1	3:G:617:GLU:HB2	1.97	0.46
3:G:466:ALA:HB3	3:G:489:VAL:HG21	1.98	0.45
9:L:179:VAL:HG21	10:M:430:VAL:HG23	1.98	0.45
9:L:263:VAL:HG13	9:L:323:LEU:HD11	1.97	0.45
9:L:273:PHE:HB3	9:L:280:LEU:HD13	1.98	0.45
11:N:70:ASP:N	11:N:70:ASP:OD1	2.47	0.45
9:L:371:SER:OG	9:L:441:GLU:OE2	2.25	0.45
10:M:404:PHE:O	10:M:408:PHE:HB2	2.16	0.45
3:G:267:ARG:HB2	3:G:820:LEU:HG	1.97	0.45
3:G:278:LYS:HA	3:G:278:LYS:HD3	1.71	0.45
9:L:381:VAL:HG21	9:L:461:LEU:HG	1.98	0.45
1:F:61:GLY:N	1:F:67:PHE:O	2.49	0.45
9:L:164:GLY:O	9:L:168:MET:HG3	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:296:GLY:O	1:F:320:ARG:NH2	2.48	0.45
10:M:483:GLN:NE2	10:M:487:ASP:OD1	2.44	0.45
3:G:740:MET:SD	22:G:1107:HOH:O	2.62	0.45
10:M:141:PHE:O	10:M:145:MET:HB2	2.17	0.45
1:F:178:TYR:HE2	1:F:400:HIS:HD2	1.64	0.45
2:E:136:ASN:O	2:E:142:ASN:ND2	2.43	0.45
3:G:178:HIS:HD1	3:G:179:ASP:H	1.64	0.45
3:G:839:GLN:NE2	3:G:872:PRO:HG3	2.32	0.45
8:A:118:VAL:HG11	20:A:201:3PE:H221	1.99	0.45
9:L:190:ASN:ND2	22:L:816:HOH:O	2.47	0.45
10:M:79:ILE:HA	10:M:138:LEU:HD22	1.98	0.45
10:M:287:ALA:O	10:M:291:MET:HG3	2.15	0.45
11:N:288:ALA:HB2	11:N:300:TYR:HB2	1.98	0.45
4:C:334:THR:HG21	6:I:20:ILE:HD12	1.99	0.45
7:H:114:ILE:HB	7:H:117:LEU:HB2	1.98	0.45
10:M:381:MET:HG2	10:M:457:LEU:HD12	1.99	0.45
4:C:123:HIS:HA	4:C:148:THR:O	2.17	0.44
10:M:109:ILE:HD12	10:M:109:ILE:HG23	1.80	0.44
10:M:361:GLN:O	10:M:365:ARG:HG2	2.17	0.44
3:G:247:GLU:HG3	3:G:249:ARG:HE	1.82	0.44
4:C:501:THR:HG23	4:C:521:GLN:HB3	2.00	0.44
6:I:82:THR:OG1	6:I:84:ASP:OD2	2.25	0.44
7:H:200:ALA:HB1	20:H:401:3PE:H3C2	1.99	0.44
10:M:185:MET:HB2	10:M:230:ALA:HB2	2.00	0.44
1:F:330:ASP:OD1	1:F:330:ASP:N	2.41	0.44
1:F:364:SER:HB3	1:F:387:LEU:HD13	1.99	0.44
13:J:57:ILE:HG22	13:J:58:VAL:HG23	2.00	0.44
3:G:226:ALA:HB3	3:G:635:VAL:HG22	2.00	0.44
3:G:501:ILE:HG12	3:G:532:THR:HB	1.99	0.44
10:M:72:ILE:HB	10:M:77:ILE:HB	1.99	0.44
11:N:7:ASN:HB3	11:N:63:VAL:HG13	1.98	0.44
19:B:302:DCQ:H1M	19:B:302:DCQ:H7	1.83	0.44
11:N:384:ALA:HB1	11:N:422:LEU:HD23	1.99	0.44
3:G:97:LEU:HD22	3:G:154:ILE:HB	2.00	0.44
3:G:731:ASP:OD2	3:G:734:THR:OG1	2.30	0.44
9:L:175:ARG:NH2	10:M:396:LEU:O	2.51	0.44
9:L:613:ARG:NH2	22:L:820:HOH:O	2.49	0.44
2:E:141:PRO:HG2	2:E:153:LEU:HB2	1.99	0.44
20:L:701:3PE:H2F1	20:M:701:3PE:H3B1	2.00	0.44
3:G:320:PRO:HB2	3:G:537:SER:HB2	2.00	0.44
7:H:130:VAL:HG21	7:H:208:HIS:CE1	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:L:241:ASP:OD2	9:L:241:ASP:N	2.51	0.44
2:E:22:ILE:O	2:E:26:MET:HG3	2.17	0.43
1:F:287:PHE:HZ	1:F:290:TRP:HB3	1.82	0.43
3:G:808:GLN:H	3:G:808:GLN:HG2	1.64	0.43
1:F:356:PRO:HB2	1:F:396:THR:HG22	2.01	0.43
3:G:307:ILE:HG22	3:G:591:LEU:HD22	2.00	0.43
4:C:334:THR:OG1	7:H:287:ALA:O	2.24	0.43
4:C:297:ILE:HG12	4:C:497:HIS:CG	2.53	0.43
9:L:431:ARG:HG3	9:L:512:TRP:CE2	2.54	0.43
20:I:203:3PE:H2F2	20:H:401:3PE:H2E1	1.99	0.43
8:A:81:GLU:HG2	13:J:148:LEU:HD13	2.00	0.43
10:M:123:ILE:HG13	10:M:149:PRO:HB2	1.99	0.43
13:J:20:ILE:HG13	13:J:21:THR:HG23	2.00	0.43
11:N:347:MET:HB2	11:N:360:PHE:HE1	1.83	0.43
3:G:439:THR:OG1	3:G:442:ASP:OD1	2.35	0.43
11:N:259:LEU:HB2	11:N:316:LEU:HD21	2.01	0.43
2:E:117:PRO:HB3	2:E:130:PRO:HD3	2.01	0.43
7:H:38:ARG:HA	7:H:38:ARG:HD2	1.81	0.43
9:L:599:SER:HB3	12:K:19:LEU:HD21	2.00	0.43
11:N:330:LEU:HD23	11:N:330:LEU:HA	1.89	0.43
3:G:103:HIS:ND1	22:G:1105:HOH:O	2.34	0.43
4:C:407:ARG:NH1	7:H:291:ARG:O	2.51	0.43
5:B:217:PRO:HG3	6:I:144:LYS:HD2	2.01	0.43
7:H:15:ILE:HD11	8:A:14:TRP:HB3	2.00	0.43
11:N:206:GLY:O	11:N:210:MET:HG3	2.19	0.43
1:F:291:GLN:O	1:F:326:ALA:HA	2.19	0.43
3:G:431:LEU:O	3:G:446:ALA:N	2.52	0.43
5:B:100:GLY:HA2	14:B:301:SF4:S4	2.59	0.43
7:H:265:LEU:HB2	7:H:270:TRP:CD1	2.54	0.43
20:L:702:3PE:H2I3	20:L:706:3PE:H391	2.00	0.43
9:L:325:VAL:O	9:L:409:ASN:ND2	2.52	0.42
10:M:192:LEU:HB2	10:M:223:LEU:HD13	2.01	0.42
1:F:18:ARG:HE	1:F:22:GLN:HB2	1.84	0.42
4:C:120:ASN:OD1	4:C:120:ASN:N	2.52	0.42
4:C:351:GLU:HB3	6:I:41:PRO:HG3	2.01	0.42
10:M:165:LYS:HD3	10:M:165:LYS:HA	1.66	0.42
6:I:24:ALA:HB2	7:H:43:PHE:CD1	2.53	0.42
6:I:48:ILE:HG12	6:I:116:LEU:HG	2.02	0.42
11:N:72:PHE:HB2	11:N:483:PRO:HB3	2.01	0.42
1:F:104:LEU:HD12	1:F:104:LEU:HA	1.90	0.42
7:H:96:LEU:HD13	8:A:20:LEU:HD22	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:262:GLY:HA3	7:H:270:TRP:CD1	2.55	0.42
1:F:283:ASP:OD1	1:F:283:ASP:N	2.50	0.42
2:E:26:MET:HE3	2:E:32:PRO:HB3	2.00	0.42
9:L:423:PHE:HB2	9:L:500:VAL:HG13	2.00	0.42
9:L:390:PRO:HA	9:L:396:PHE:CG	2.55	0.42
7:H:210:HIS:NE2	7:H:289:LEU:O	2.43	0.42
9:L:243:MET:HE2	9:L:243:MET:HB3	1.82	0.42
10:M:179:GLN:HG2	11:N:422:LEU:HD11	2.00	0.42
11:N:19:LEU:HD11	20:N:503:3PE:H3F1	2.01	0.42
12:K:43:ALA:HB1	12:K:62:TYR:HD1	1.84	0.42
1:F:177:ARG:HA	1:F:177:ARG:HD3	1.79	0.42
8:A:6:SER:HB3	8:A:9:VAL:HG22	2.02	0.42
5:B:124:ILE:HG12	5:B:153:VAL:HB	2.00	0.42
9:L:522:ILE:O	9:L:525:SER:OG	2.34	0.42
4:C:12:GLU:HA	4:C:13:PRO:HD3	1.89	0.42
13:J:69:PHE:O	13:J:73:MET:HG3	2.20	0.42
4:C:576:ILE:HD12	4:C:576:ILE:HA	1.91	0.41
11:N:141:GLY:HA3	13:J:154:VAL:HG22	2.02	0.41
1:F:250:MET:HG2	1:F:324:ALA:HB1	2.03	0.41
3:G:379:VAL:HB	3:G:433:VAL:HG12	2.01	0.41
3:G:451:ALA:HB1	3:G:455:ASP:HB2	2.02	0.41
11:N:381:LEU:HD12	21:N:501:LFA:H181	2.00	0.41
13:J:18:ARG:HD2	13:J:18:ARG:HA	1.73	0.41
3:G:623:ILE:HD12	3:G:787:LEU:HD11	2.02	0.41
7:H:194:PHE:O	7:H:198:THR:OG1	2.31	0.41
9:L:260:THR:HB	9:L:335:LEU:HD11	2.01	0.41
3:G:287:ARG:NH2	3:G:604:GLU:O	2.53	0.41
4:C:310:LEU:HD23	4:C:310:LEU:HA	1.91	0.41
4:C:337:PHE:HB3	5:B:74:ALA:HB2	2.02	0.41
4:C:334:THR:HG23	7:H:44:GLN:HG2	2.02	0.41
13:J:94:ILE:HD12	13:J:94:ILE:HA	1.92	0.41
3:G:428:LYS:HE3	3:G:428:LYS:HB3	1.82	0.41
3:G:472:PRO:HG3	3:G:799:THR:HA	2.01	0.41
9:L:380:LEU:HD23	9:L:380:LEU:HA	1.91	0.41
3:G:833:PHE:O	3:G:837:MET:N	2.48	0.41
20:H:405:3PE:H261	20:J:201:3PE:H271	2.01	0.41
9:L:123:PHE:HE1	9:L:146:VAL:HG13	1.85	0.41
5:B:57:TYR:HE2	5:B:113:LEU:HD13	1.86	0.41
8:A:75:PHE:O	8:A:79:ASP:HB2	2.21	0.41
9:L:584:LEU:HD23	9:L:584:LEU:HA	1.94	0.41
11:N:248:ILE:HD11	11:N:334:LEU:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:G:390:ARG:HD2	3:G:390:ARG:HA	1.79	0.41
3:G:644:LYS:HB3	3:G:644:LYS:HE3	1.64	0.41
4:C:165:LYS:HA	4:C:165:LYS:HD3	1.84	0.41
10:M:16:LEU:O	10:M:20:THR:OG1	2.29	0.41
3:G:5:THR:H	3:G:75:ASP:HA	1.85	0.40
6:I:179:LEU:HA	6:I:180:PRO:HD3	1.91	0.40
9:L:86:LEU:O	9:L:90:SER:OG	2.32	0.40
9:L:425:THR:HA	9:L:428:TYR:CE2	2.56	0.40
12:K:93:ASP:O	12:K:96:SER:OG	2.31	0.40
13:J:85:ARG:HB3	13:J:88:LEU:HD12	2.03	0.40
2:E:138:ASP:N	2:E:138:ASP:OD1	2.52	0.40
3:G:558:LEU:HD22	3:G:589:ALA:HB2	2.03	0.40
7:H:125:LEU:HD13	20:H:405:3PE:H2G1	2.04	0.40
9:L:344:LEU:HD21	9:L:381:VAL:HG23	2.03	0.40
7:H:236:LEU:HD23	7:H:236:LEU:HA	1.95	0.40
7:H:248:ILE:HD13	7:H:248:ILE:HA	1.94	0.40
9:L:229:LYS:HA	9:L:229:LYS:HD3	1.85	0.40
9:L:427:LEU:HD21	20:L:705:3PE:H361	2.04	0.40
13:J:24:ASN:HB3	13:J:27:HIS:HB2	2.03	0.40
3:G:217:TYR:HB3	6:I:79:LYS:HD2	2.02	0.40
6:I:66:CYS:HB2	6:I:105:CYS:HB2	2.03	0.40
12:K:92:ILE:HD12	12:K:92:ILE:HA	1.92	0.40
3:G:814:ILE:HD11	3:G:902:LEU:HD13	2.03	0.40
5:B:3:TYR:CD1	5:B:195:ALA:HA	2.56	0.40
7:H:121:MET:HG2	13:J:56:ILE:HB	2.04	0.40
10:M:217:SER:O	20:M:701:3PE:N	2.40	0.40
11:N:217:LYS:HA	11:N:217:LYS:HD3	1.83	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	F	437/439 (100%)	428 (98%)	9 (2%)	0	100	100
2	E	154/156 (99%)	150 (97%)	4 (3%)	0	100	100
3	G	903/905 (100%)	880 (98%)	22 (2%)	1 (0%)	51	73
4	C	584/600 (97%)	571 (98%)	13 (2%)	0	100	100
5	B	192/220 (87%)	183 (95%)	9 (5%)	0	100	100
6	I	178/180 (99%)	174 (98%)	4 (2%)	0	100	100
7	H	310/325 (95%)	301 (97%)	9 (3%)	0	100	100
8	A	98/147 (67%)	98 (100%)	0	0	100	100
9	L	602/613 (98%)	591 (98%)	11 (2%)	0	100	100
10	M	502/504 (100%)	491 (98%)	11 (2%)	0	100	100
11	N	474/485 (98%)	464 (98%)	9 (2%)	1 (0%)	47	68
12	K	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
13	J	160/162 (99%)	160 (100%)	0	0	100	100
All	All	4692/4836 (97%)	4587 (98%)	103 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	N	64	THR
3	G	669	THR

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	353/353 (100%)	340 (96%)	13 (4%)	34	60
2	E	129/129 (100%)	125 (97%)	4 (3%)	40	67
3	G	732/732 (100%)	718 (98%)	14 (2%)	57	80
4	C	505/519 (97%)	484 (96%)	21 (4%)	30	54
5	B	171/192 (89%)	168 (98%)	3 (2%)	59	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
6	I	154/154 (100%)	152 (99%)	2 (1%)	69 87
7	H	260/269 (97%)	251 (96%)	9 (4%)	36 62
8	A	80/119 (67%)	79 (99%)	1 (1%)	69 87
9	L	482/486 (99%)	469 (97%)	13 (3%)	44 71
10	M	413/413 (100%)	397 (96%)	16 (4%)	32 57
11	N	380/385 (99%)	369 (97%)	11 (3%)	42 69
12	K	79/79 (100%)	73 (92%)	6 (8%)	13 25
13	J	128/128 (100%)	121 (94%)	7 (6%)	21 41
All	All	3866/3958 (98%)	3746 (97%)	120 (3%)	43 67

All (120) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	7	THR
1	F	11	HIS
1	F	19	ASP
1	F	94	MET
1	F	126	TYR
1	F	158	LYS
1	F	234	GLU
1	F	241	LYS
1	F	252	PHE
1	F	283	ASP
1	F	388	CYS
1	F	398	CYS
1	F	409	GLN
2	E	45	LYS
2	E	46	GLN
2	E	103	GLN
2	E	149	THR
3	G	57	ASN
3	G	62	ARG
3	G	135	ARG
3	G	181	VAL
3	G	265	CYS
3	G	314	VAL
3	G	416	GLN
3	G	470	SER
3	G	593	MET

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Mol	Chain	Res	Type
3	G	631	ARG
3	G	727	ARG
3	G	740	MET
3	G	750	ARG
3	G	837	MET
4	C	19	ASP
4	C	22	ASP
4	C	36	ASP
4	C	65	LYS
4	C	109	ARG
4	C	110	ASP
4	C	127	PHE
4	C	156	ARG
4	C	194	MET
4	C	223	ASN
4	C	276	GLU
4	C	358	MET
4	C	377	ASP
4	C	389	LYS
4	C	448	GLU
4	C	469	LEU
4	C	487	ASN
4	C	488	MET
4	C	531	ASN
4	C	594	VAL
4	C	600	ARG
5	B	63	CYS
5	B	94	ASP
5	B	178	LYS
6	I	12	THR
6	I	77	LEU
7	H	63	ASP
7	H	68	PHE
7	H	80	ARG
7	H	113	ASN
7	H	138	ASN
7	H	152	GLN
7	H	196	PHE
7	H	198	THR
7	H	282	PHE
8	A	110	LEU
9	L	77	PHE

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Mol	Chain	Res	Type
9	L	90	SER
9	L	123	PHE
9	L	241	ASP
9	L	360	GLN
9	L	379	PHE
9	L	380	LEU
9	L	431	ARG
9	L	472	VAL
9	L	515	LYS
9	L	529	ARG
9	L	542	ASP
9	L	613	ARG
10	M	69	MET
10	M	74	ARG
10	M	80	HIS
10	M	145	MET
10	M	165	LYS
10	M	207	TYR
10	M	235	MET
10	M	264	LEU
10	M	303	TRP
10	M	374	MET
10	M	384	LEU
10	M	408	PHE
10	M	426	THR
10	M	447	LYS
10	M	451	GLN
10	M	466	PHE
11	N	19	LEU
11	N	103	ASP
11	N	200	GLU
11	N	207	PHE
11	N	255	MET
11	N	256	ARG
11	N	323	MET
11	N	359	LEU
11	N	362	TYR
11	N	397	TYR
11	N	482	MET
12	K	1	MET
12	K	20	THR
12	K	27	ASN

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Mol	Chain	Res	Type
12	K	46	PHE
12	K	96	SER
12	K	99	ARG
13	J	2	GLU
13	J	3	PHE
13	J	23	THR
13	J	59	TYR
13	J	69	PHE
13	J	103	MET
13	J	120	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 36 ligands modelled in this entry, 1 is monoatomic - leaving 35 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	$\#\|Z\| > 2$
14	SF4	G	1001	3	0,12,12	-	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
14	SF4	B	301	5	0,12,12	-	-	-		
21	LFA	N	501	-	19,19,19	0.14	0	18,18,18	0.17	0
20	3PE	H	403	-	29,29,50	0.39	0	32,34,55	0.37	0
20	3PE	M	703	-	50,50,50	0.30	0	53,55,55	0.30	0
21	LFA	L	703	-	19,19,19	0.14	0	18,18,18	0.16	0
19	DCQ	B	302	-	23,23,23	0.25	0	26,29,29	0.39	0
17	FES	E	201	2	0,4,4	-	-	-		
20	3PE	I	203	-	50,50,50	0.30	0	53,55,55	0.29	0
20	3PE	L	704	-	50,50,50	0.30	0	53,55,55	0.30	0
20	3PE	L	706	-	50,50,50	0.30	0	53,55,55	0.31	0
21	LFA	M	704	-	19,19,19	0.14	0	18,18,18	0.11	0
17	FES	G	1004	3	0,4,4	-	-	-		
20	3PE	H	404	-	50,50,50	0.30	0	53,55,55	0.35	0
20	3PE	H	405	-	50,50,50	0.31	0	53,55,55	0.30	0
21	LFA	N	502	-	13,13,19	0.14	0	12,12,18	0.12	0
20	3PE	N	503	-	50,50,50	0.30	0	53,55,55	0.30	0
14	SF4	I	201	6	0,12,12	-	-	-		
20	3PE	L	701	-	50,50,50	0.30	0	53,55,55	0.29	0
20	3PE	A	201	-	41,41,50	0.33	0	44,46,55	0.29	0
20	3PE	M	701	-	50,50,50	0.31	0	53,55,55	0.30	0
15	FMN	F	502	-	33,33,33	1.05	2 (6%)	48,50,50	1.28	6 (12%)
21	LFA	H	402	-	19,19,19	0.14	0	18,18,18	0.11	0
20	3PE	H	401	-	50,50,50	0.29	0	53,55,55	0.29	0
20	3PE	M	702	-	50,50,50	0.29	0	53,55,55	0.29	0
20	3PE	L	705	-	50,50,50	0.31	0	53,55,55	0.32	0
20	3PE	L	702	-	50,50,50	0.30	0	53,55,55	0.28	0
20	3PE	J	201	-	50,50,50	0.30	0	53,55,55	0.28	0
20	3PE	I	204	-	27,27,50	0.38	0	29,30,55	0.34	0
14	SF4	I	202	6	0,12,12	-	-	-		
16	NAI	F	503	-	42,48,48	0.50	0	47,73,73	0.57	1 (2%)
20	3PE	L	707	-	50,50,50	0.32	0	53,55,55	0.57	1 (1%)
14	SF4	G	1003	3	0,12,12	-	-	-		
14	SF4	G	1002	3	0,12,12	-	-	-		
14	SF4	F	501	1	0,12,12	-	-	-		

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
14	SF4	G	1001	3	-	-	0/6/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
21	LFA	N	501	-	-	1/17/17/17	-
14	SF4	B	301	5	-	-	0/6/5/5
20	3PE	H	403	-	-	10/33/33/54	-
20	3PE	M	703	-	-	12/54/54/54	-
21	LFA	L	703	-	-	0/17/17/17	-
19	DCQ	B	302	-	-	1/14/38/38	0/1/1/1
17	FES	E	201	2	-	-	0/1/1/1
20	3PE	L	706	-	-	16/54/54/54	-
20	3PE	I	203	-	-	8/54/54/54	-
20	3PE	L	704	-	-	13/54/54/54	-
21	LFA	M	704	-	-	0/17/17/17	-
17	FES	G	1004	3	-	-	0/1/1/1
20	3PE	H	404	-	-	9/54/54/54	-
20	3PE	H	405	-	-	8/54/54/54	-
21	LFA	N	502	-	-	0/11/11/17	-
20	3PE	N	503	-	-	13/54/54/54	-
14	SF4	I	201	6	-	-	0/6/5/5
20	3PE	L	701	-	-	15/54/54/54	-
20	3PE	A	201	-	-	14/45/45/54	-
20	3PE	M	701	-	-	10/54/54/54	-
15	FMN	F	502	-	-	5/18/18/18	0/3/3/3
21	LFA	H	402	-	-	1/17/17/17	-
20	3PE	H	401	-	-	13/54/54/54	-
20	3PE	M	702	-	-	12/54/54/54	-
20	3PE	L	705	-	-	9/54/54/54	-
20	3PE	L	702	-	-	14/54/54/54	-
20	3PE	J	201	-	-	14/54/54/54	-
20	3PE	I	204	-	-	4/28/28/54	-
14	SF4	I	202	6	-	-	0/6/5/5
16	NAI	F	503	-	-	5/25/72/72	0/5/5/5
20	3PE	L	707	-	-	9/54/54/54	-
14	SF4	G	1003	3	-	-	0/6/5/5
14	SF4	G	1002	3	-	-	0/6/5/5
14	SF4	F	501	1	-	-	0/6/5/5

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	F	502	FMN	C4A-N5	3.65	1.37	1.30
15	F	502	FMN	C10-N1	2.21	1.37	1.33

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
15	F	502	FMN	C4-N3-C2	-3.33	119.49	125.64
15	F	502	FMN	C4A-C10-N10	2.96	120.81	116.48
15	F	502	FMN	C4A-C4-N3	2.75	120.17	113.19
15	F	502	FMN	O4-C4-C4A	-2.45	120.09	126.60
15	F	502	FMN	C10-C4A-N5	-2.42	119.73	124.86
15	F	502	FMN	C4A-C10-N1	-2.34	119.29	124.73
20	L	707	3PE	C2-O21-C21	2.33	123.52	117.79
16	F	503	NAI	C5A-C6A-N6A	2.30	123.85	120.35

There are no chirality outliers.

All (216) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
15	F	502	FMN	N10-C1'-C2'-O2'
15	F	502	FMN	N10-C1'-C2'-C3'
15	F	502	FMN	C5'-O5'-P-O2P
15	F	502	FMN	C5'-O5'-P-O3P
20	I	203	3PE	O13-C11-C12-N
20	I	204	3PE	C11-O13-P-O12
20	H	401	3PE	C11-O13-P-O12
20	H	401	3PE	C11-O13-P-O14
20	H	403	3PE	C11-O13-P-O11
20	H	403	3PE	C11-O13-P-O14
20	H	404	3PE	C11-O13-P-O11
20	H	404	3PE	C11-O13-P-O12
20	H	404	3PE	C11-O13-P-O14
20	H	404	3PE	O13-C11-C12-N
20	H	405	3PE	C1-O11-P-O12
20	H	405	3PE	C1-O11-P-O13
20	H	405	3PE	C1-O11-P-O14
20	A	201	3PE	C1-O11-P-O14
20	L	701	3PE	C1-O11-P-O14
20	L	701	3PE	O13-C11-C12-N
20	L	702	3PE	C1-O11-P-O14
20	L	702	3PE	C11-O13-P-O12
20	L	704	3PE	C1-O11-P-O14

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Mol	Chain	Res	Type	Atoms
20	L	704	3PE	C11-O13-P-O11
20	L	704	3PE	C11-O13-P-O12
20	L	704	3PE	C11-O13-P-O14
20	L	704	3PE	O13-C11-C12-N
20	L	705	3PE	C1-O11-P-O12
20	L	705	3PE	C1-O11-P-O14
20	L	705	3PE	C11-O13-P-O11
20	L	705	3PE	C11-O13-P-O12
20	L	705	3PE	C11-O13-P-O14
20	L	706	3PE	C1-O11-P-O14
20	L	706	3PE	C2-C1-O11-P
20	L	706	3PE	O21-C2-C3-O31
20	L	707	3PE	C1-O11-P-O14
20	L	707	3PE	C11-O13-P-O14
20	L	707	3PE	O13-C11-C12-N
20	M	701	3PE	C11-O13-P-O11
20	M	701	3PE	C11-O13-P-O14
20	M	701	3PE	O13-C11-C12-N
20	M	702	3PE	C11-O13-P-O11
20	M	702	3PE	C11-O13-P-O12
20	M	702	3PE	C11-O13-P-O14
20	M	703	3PE	C1-O11-P-O12
20	M	703	3PE	C11-O13-P-O12
20	M	703	3PE	C11-O13-P-O14
20	M	703	3PE	O13-C11-C12-N
20	N	503	3PE	C1-O11-P-O12
20	N	503	3PE	C1-O11-P-O14
20	J	201	3PE	C1-O11-P-O12
20	J	201	3PE	C1-O11-P-O14
20	J	201	3PE	O13-C11-C12-N
20	L	706	3PE	C31-C32-C33-C34
20	I	204	3PE	C11-O13-P-O11
20	H	401	3PE	C11-O13-P-O11
20	L	701	3PE	C1-O11-P-O13
20	L	701	3PE	C11-O13-P-O11
20	L	702	3PE	C1-O11-P-O13
20	L	705	3PE	C1-O11-P-O13
20	L	706	3PE	C11-O13-P-O11
20	M	701	3PE	C1-O11-P-O13
20	M	703	3PE	C1-O11-P-O13
20	M	703	3PE	C11-O13-P-O11
20	N	503	3PE	C1-O11-P-O13

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Mol	Chain	Res	Type	Atoms
20	J	201	3PE	C1-O11-P-O13
20	L	702	3PE	C23-C24-C25-C26
20	L	707	3PE	C37-C38-C39-C3A
20	L	705	3PE	C35-C36-C37-C38
20	M	702	3PE	C3E-C3F-C3G-C3H
20	L	702	3PE	C37-C38-C39-C3A
20	L	702	3PE	C2C-C2D-C2E-C2F
20	L	707	3PE	C24-C25-C26-C27
20	L	704	3PE	C3E-C3F-C3G-C3H
20	H	401	3PE	O13-C11-C12-N
20	H	403	3PE	O13-C11-C12-N
20	A	201	3PE	O13-C11-C12-N
21	H	402	LFA	C14-C15-C16-C17
20	L	701	3PE	C3B-C3C-C3D-C3E
20	L	701	3PE	C2B-C2C-C2D-C2E
20	M	701	3PE	C24-C25-C26-C27
20	M	702	3PE	C26-C27-C28-C29
20	L	702	3PE	C3E-C3F-C3G-C3H
20	I	203	3PE	C1-O11-P-O13
20	L	702	3PE	C11-O13-P-O11
20	L	704	3PE	C1-O11-P-O13
15	F	502	FMN	C5'-O5'-P-O1P
20	M	702	3PE	C2-C1-O11-P
20	L	701	3PE	O21-C2-C3-O31
20	H	401	3PE	C3D-C3E-C3F-C3G
20	H	405	3PE	C3B-C3C-C3D-C3E
20	M	703	3PE	C2D-C2E-C2F-C2G
20	L	706	3PE	C34-C35-C36-C37
20	M	703	3PE	C28-C29-C2A-C2B
20	J	201	3PE	O11-C1-C2-C3
20	L	706	3PE	C39-C3A-C3B-C3C
20	J	201	3PE	C21-C22-C23-C24
20	N	503	3PE	C2-C1-O11-P
20	J	201	3PE	C2-C1-O11-P
20	N	503	3PE	C2A-C2B-C2C-C2D
20	L	701	3PE	C1-C2-C3-O31
20	L	707	3PE	C11-O13-P-O11
20	I	203	3PE	C2-C1-O11-P
20	L	701	3PE	C2-C1-O11-P
20	M	701	3PE	C2-C1-O11-P
20	A	201	3PE	C28-C29-C2A-C2B
16	F	503	NAI	PN-O3-PA-O5B

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Mol	Chain	Res	Type	Atoms
20	H	403	3PE	O11-C1-C2-C3
20	J	201	3PE	C23-C24-C25-C26
20	J	201	3PE	O21-C21-C22-C23
20	H	401	3PE	C3C-C3D-C3E-C3F
20	L	702	3PE	C34-C35-C36-C37
20	H	403	3PE	C2-C1-O11-P
20	H	404	3PE	C1-C2-C3-O31
20	L	706	3PE	C1-C2-C3-O31
20	J	201	3PE	O11-C1-C2-O21
20	L	706	3PE	C3C-C3D-C3E-C3F
20	M	703	3PE	C26-C27-C28-C29
20	H	404	3PE	O21-C2-C3-O31
20	L	704	3PE	O21-C2-C3-O31
16	F	503	NAI	C5B-O5B-PA-O3
20	H	401	3PE	C3F-C3G-C3H-C3I
19	B	302	DCQ	C11-C12-C13-C14
20	I	203	3PE	C1-O11-P-O12
20	I	204	3PE	C11-O13-P-O14
20	L	701	3PE	C1-O11-P-O12
20	L	701	3PE	C11-O13-P-O14
20	L	702	3PE	C1-O11-P-O12
20	L	702	3PE	C11-O13-P-O14
20	L	706	3PE	C11-O13-P-O14
20	M	701	3PE	C1-O11-P-O14
20	M	702	3PE	C2F-C2G-C2H-C2I
20	L	701	3PE	C24-C25-C26-C27
20	H	404	3PE	C12-C11-O13-P
20	M	702	3PE	C2E-C2F-C2G-C2H
20	L	706	3PE	C3E-C3F-C3G-C3H
20	H	403	3PE	O11-C1-C2-O21
20	A	201	3PE	O11-C1-C2-O21
20	H	405	3PE	C3C-C3D-C3E-C3F
20	A	201	3PE	C27-C28-C29-C2A
20	L	701	3PE	C28-C29-C2A-C2B
20	I	203	3PE	C32-C33-C34-C35
20	L	702	3PE	C25-C26-C27-C28
20	M	703	3PE	C37-C38-C39-C3A
20	H	404	3PE	C32-C33-C34-C35
20	I	203	3PE	C2D-C2E-C2F-C2G
20	H	405	3PE	C11-O13-P-O11
20	A	201	3PE	C1-O11-P-O13
20	L	706	3PE	C1-O11-P-O13

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Mol	Chain	Res	Type	Atoms
20	N	503	3PE	C11-O13-P-O11
20	J	201	3PE	C11-O13-P-O11
20	M	701	3PE	C35-C36-C37-C38
16	F	503	NAI	O4D-C1D-N1N-C2N
20	L	706	3PE	C37-C38-C39-C3A
20	H	405	3PE	C21-C22-C23-C24
20	L	701	3PE	C31-C32-C33-C34
20	H	404	3PE	C2-C1-O11-P
20	H	401	3PE	C1-C2-C3-O31
20	L	707	3PE	C1-C2-O21-C21
20	L	707	3PE	C1-O11-P-O13
20	A	201	3PE	O11-C1-C2-C3
20	I	203	3PE	C2A-C2B-C2C-C2D
20	H	405	3PE	C23-C24-C25-C26
20	H	401	3PE	O21-C2-C3-O31
16	F	503	NAI	C2D-C1D-N1N-C2N
20	M	703	3PE	O31-C31-C32-C33
20	L	706	3PE	O13-C11-C12-N
20	N	503	3PE	O13-C11-C12-N
20	L	707	3PE	C23-C24-C25-C26
20	A	201	3PE	C2-C1-O11-P
20	H	401	3PE	O31-C31-C32-C33
20	M	703	3PE	C2C-C2D-C2E-C2F
20	N	503	3PE	C2B-C2C-C2D-C2E
20	L	704	3PE	O21-C21-C22-C23
20	L	705	3PE	O31-C31-C32-C33
20	M	702	3PE	O31-C31-C32-C33
20	N	503	3PE	O21-C21-C22-C23
20	A	201	3PE	C2C-C2D-C2E-C2F
20	H	401	3PE	C29-C2A-C2B-C2C
20	N	503	3PE	O31-C31-C32-C33
20	H	403	3PE	C25-C26-C27-C28
20	L	702	3PE	O21-C2-C3-O31
20	L	702	3PE	C31-C32-C33-C34
20	M	702	3PE	C29-C2A-C2B-C2C
20	A	201	3PE	O21-C21-C22-C23
20	J	201	3PE	O22-C21-C22-C23
21	N	501	LFA	C11-C10-C9-C8
20	L	704	3PE	O22-C21-C22-C23
20	M	702	3PE	O32-C31-C32-C33
20	H	401	3PE	O32-C31-C32-C33
20	N	503	3PE	O32-C31-C32-C33

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Mol	Chain	Res	Type	Atoms
20	L	704	3PE	C1-C2-C3-O31
20	H	401	3PE	C25-C26-C27-C28
20	A	201	3PE	O22-C21-C22-C23
20	L	705	3PE	O32-C31-C32-C33
16	F	503	NAI	C5B-O5B-PA-O2A
20	L	704	3PE	C1-O11-P-O12
20	L	706	3PE	C1-O11-P-O12
20	M	702	3PE	C1-O11-P-O14
20	N	503	3PE	C11-O13-P-O14
20	J	201	3PE	C11-O13-P-O14
20	N	503	3PE	O22-C21-C22-C23
20	H	403	3PE	O21-C21-C22-C23
20	L	701	3PE	C23-C24-C25-C26
20	L	706	3PE	C3D-C3E-C3F-C3G
20	I	203	3PE	C12-C11-O13-P
20	H	403	3PE	C12-C11-O13-P
20	M	701	3PE	C12-C11-O13-P
20	I	204	3PE	O31-C31-C32-C33
20	J	201	3PE	C24-C25-C26-C27
20	A	201	3PE	O31-C31-C32-C33
20	M	701	3PE	C2F-C2G-C2H-C2I
20	A	201	3PE	O32-C31-C32-C33
20	A	201	3PE	C26-C27-C28-C29
20	H	403	3PE	O22-C21-C22-C23
20	L	704	3PE	O31-C31-C32-C33

There are no ring outliers.

18 monomers are involved in 29 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
14	B	301	SF4	1	0
21	N	501	LFA	1	0
20	M	703	3PE	2	0
19	B	302	DCQ	1	0
20	I	203	3PE	2	0
20	L	704	3PE	2	0
20	L	706	3PE	2	0
20	H	405	3PE	6	0
20	N	503	3PE	1	0
20	L	701	3PE	3	0
20	A	201	3PE	2	0
20	M	701	3PE	2	0

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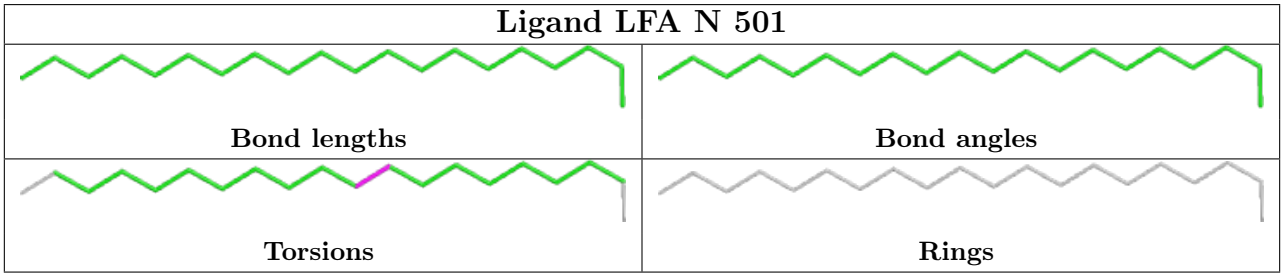
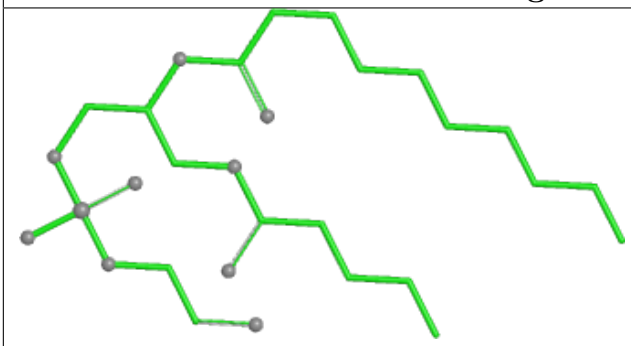
Mol	Chain	Res	Type	Clashes	Symm-Clashes
20	H	401	3PE	3	0
20	L	705	3PE	2	0
20	L	702	3PE	1	0
20	J	201	3PE	3	0
16	F	503	NAI	1	0
20	L	707	3PE	2	0

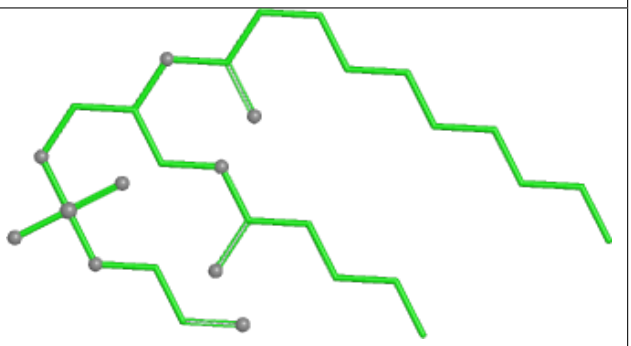
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



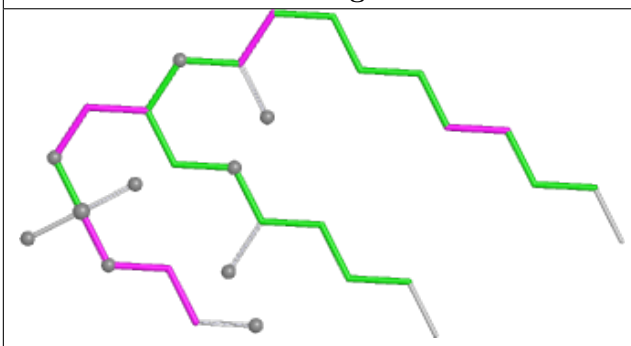
Ligand 3PE H 403



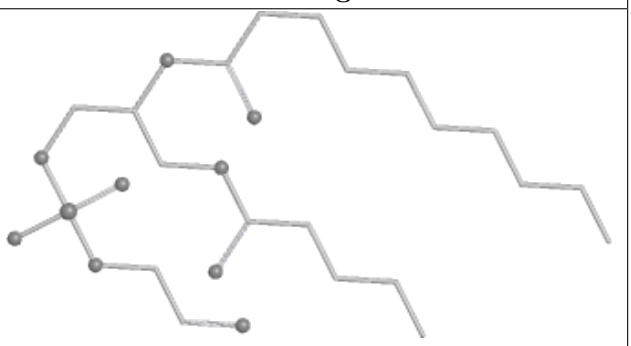
Bond lengths



Bond angles

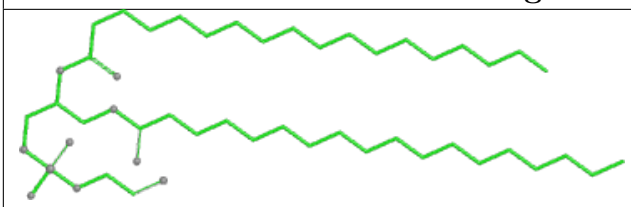


Torsions

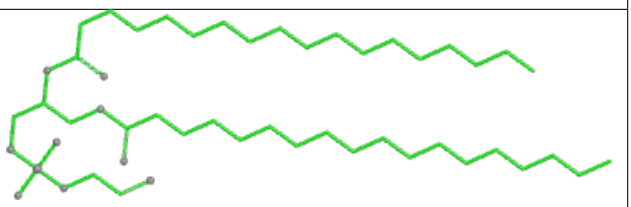


Rings

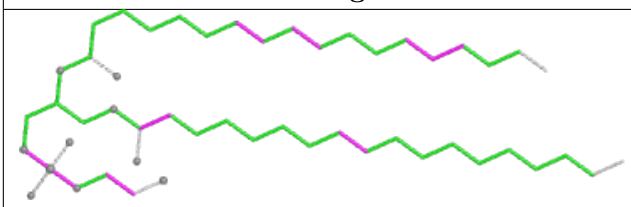
Ligand 3PE M 703



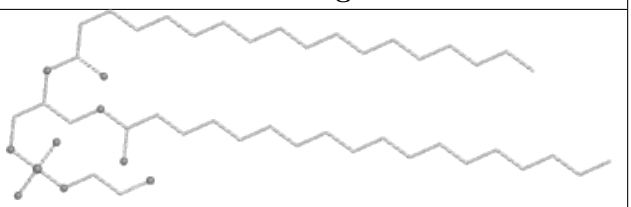
Bond lengths



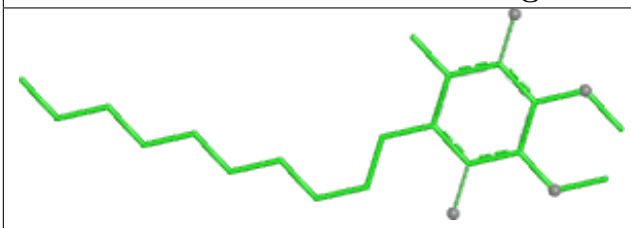
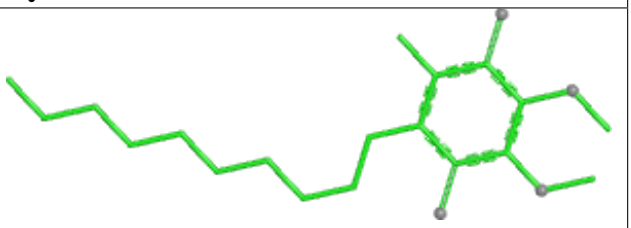
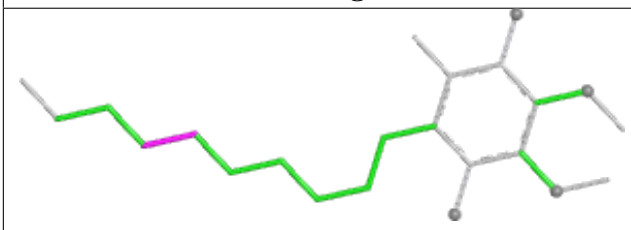
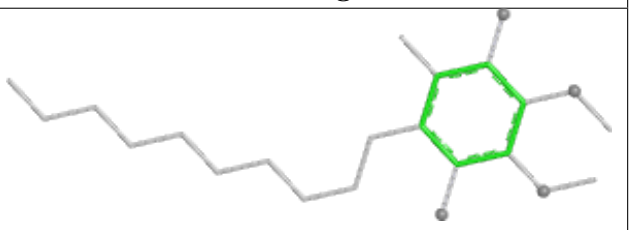
Bond angles

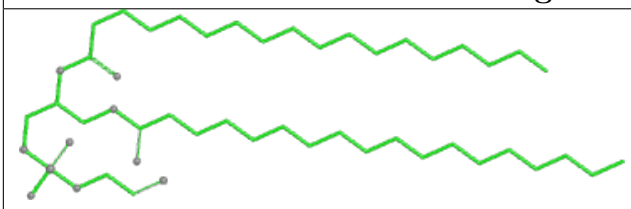
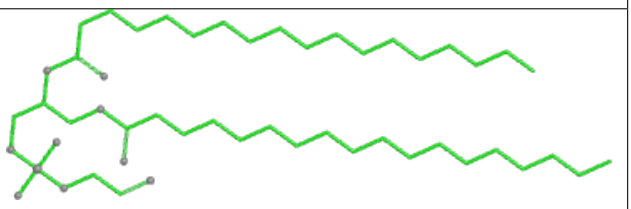
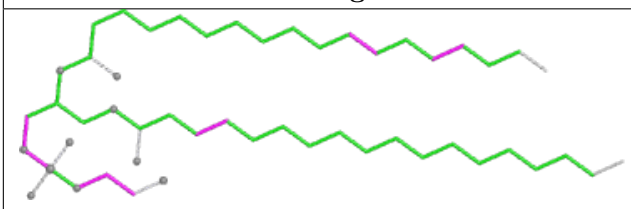
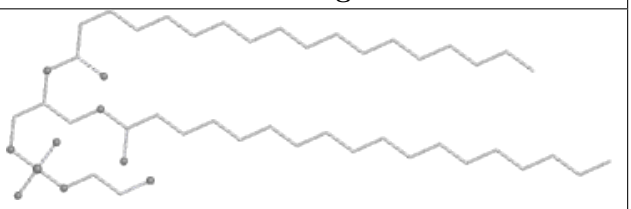


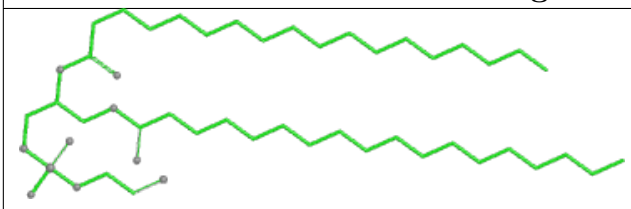
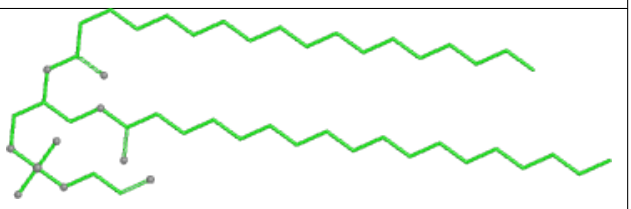
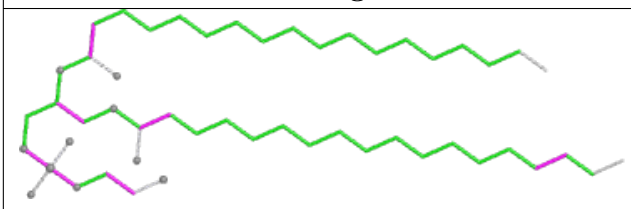
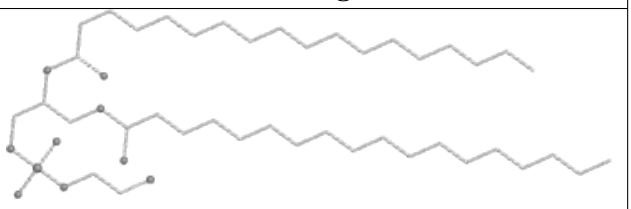
Torsions



Rings

Ligand DCQ B 302	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE I 203	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE L 704	
 Bond lengths	 Bond angles
 Torsions	 Rings

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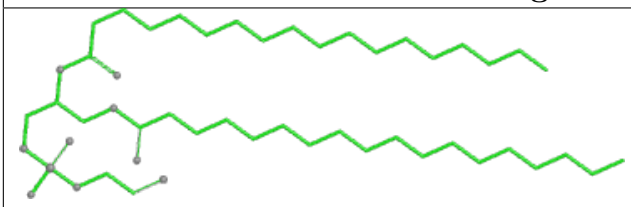
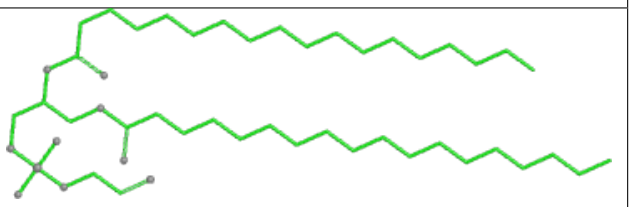
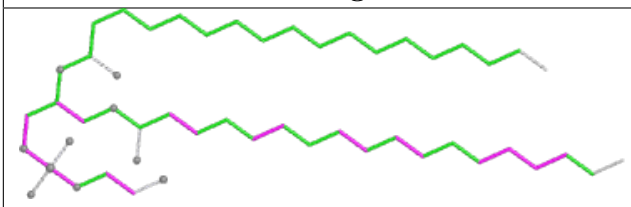
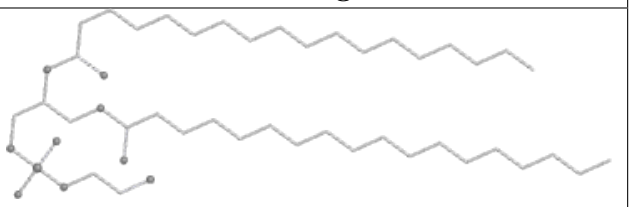
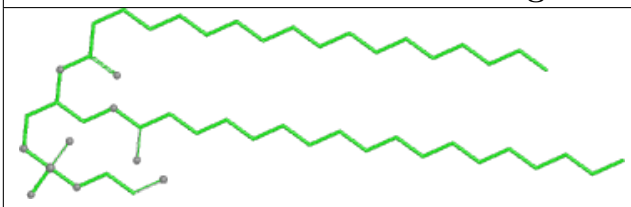
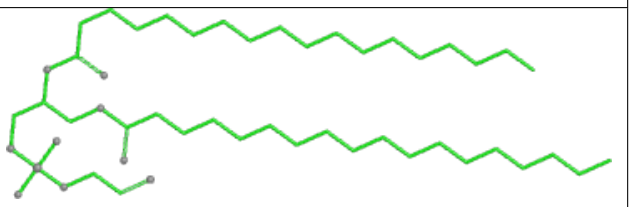
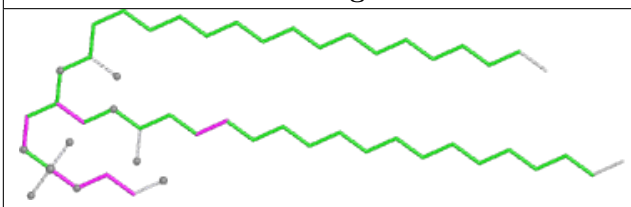
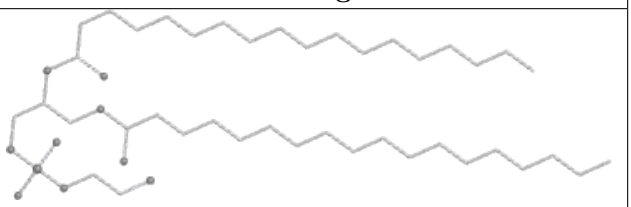
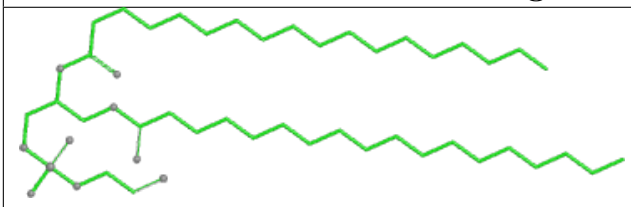
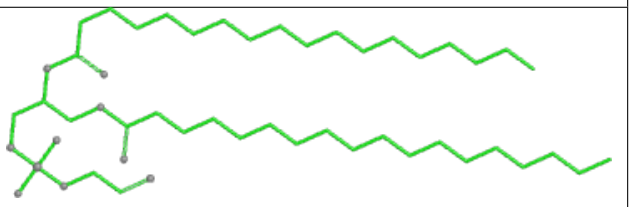
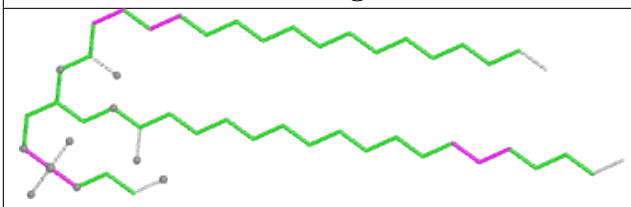
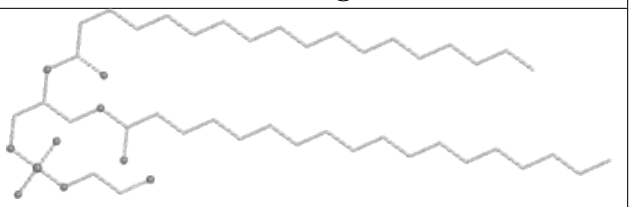
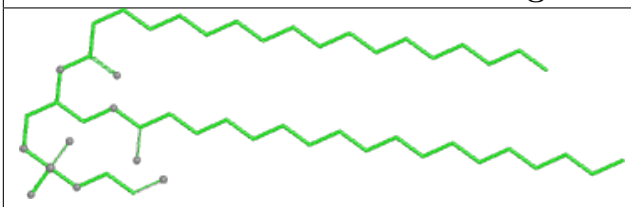
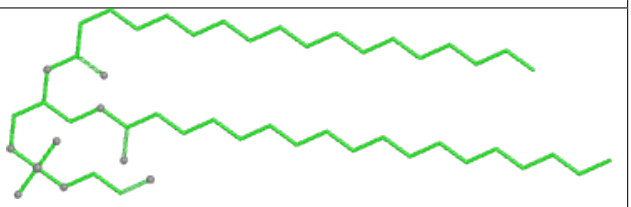
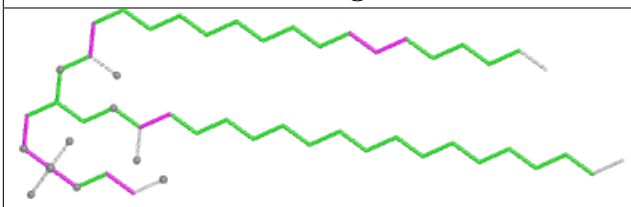
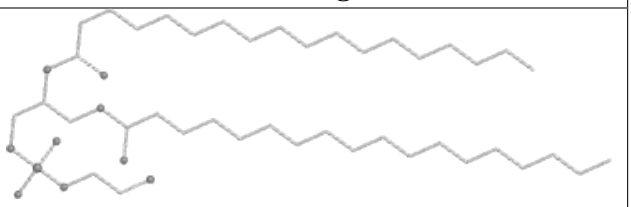
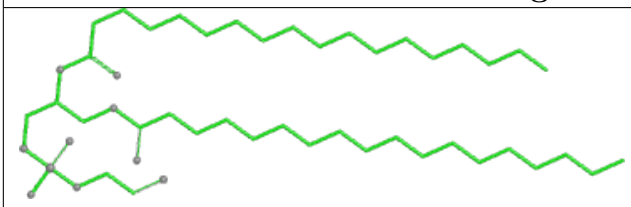
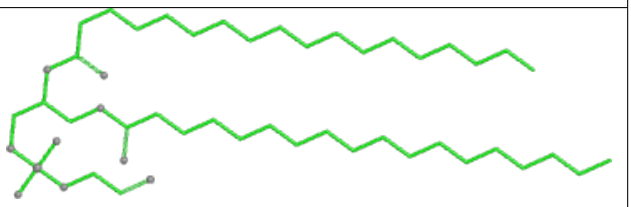
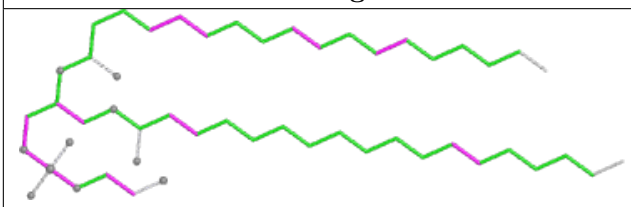
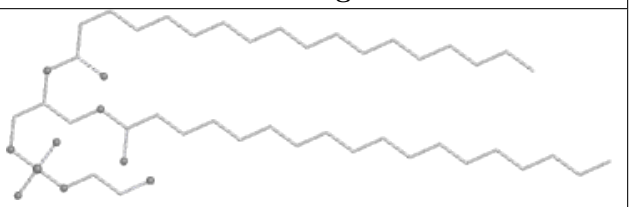
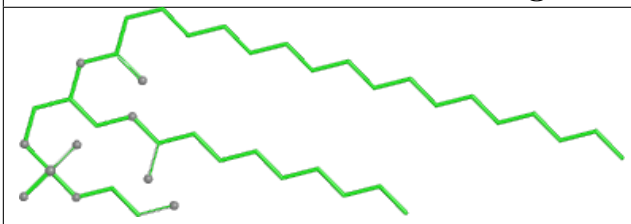
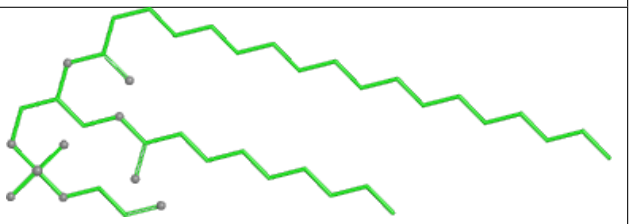
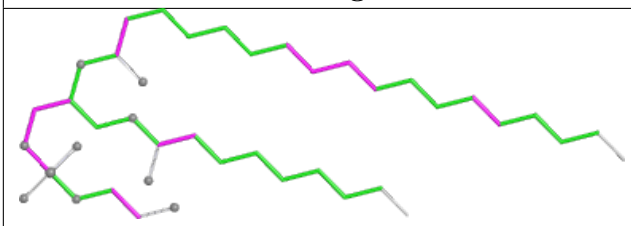
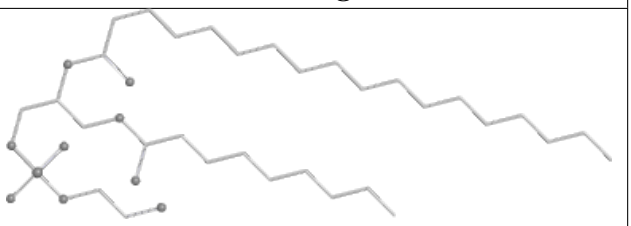
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE H 404	
 Bond lengths	 Bond angles
 Torsions	 Rings

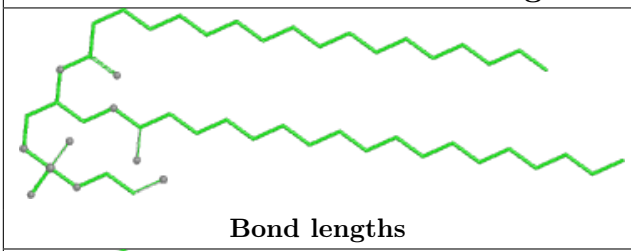
Ligand 3PE H 405	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE N 503	
 Bond lengths	 Bond angles
 Torsions	 Rings

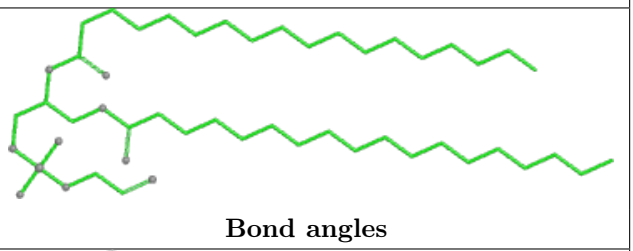
Ligand 3PE L 701	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE A 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

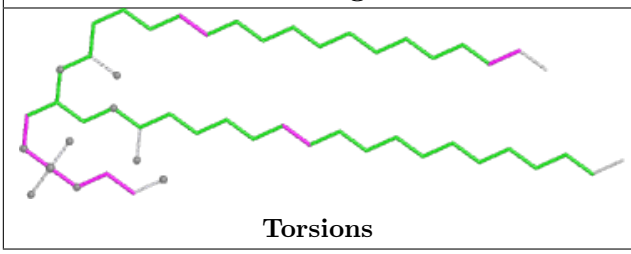
Ligand 3PE M 701



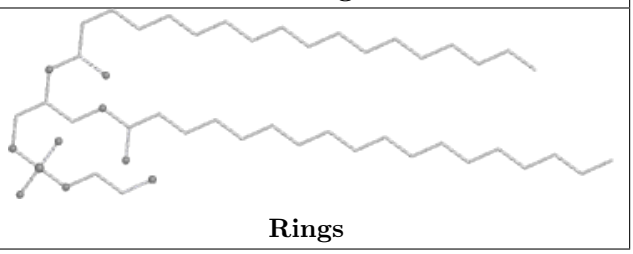
Bond lengths



Bond angles

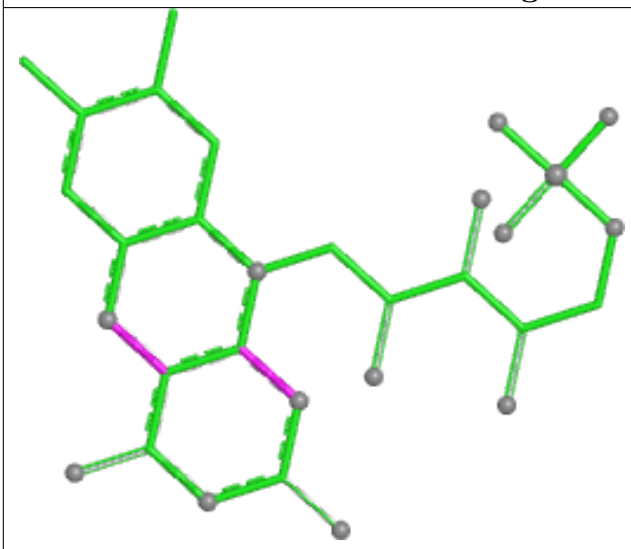


Torsions

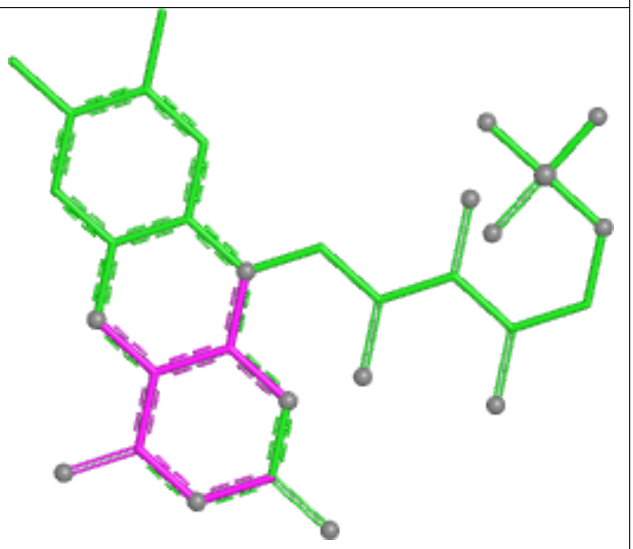


Rings

Ligand FMN F 502



Bond lengths



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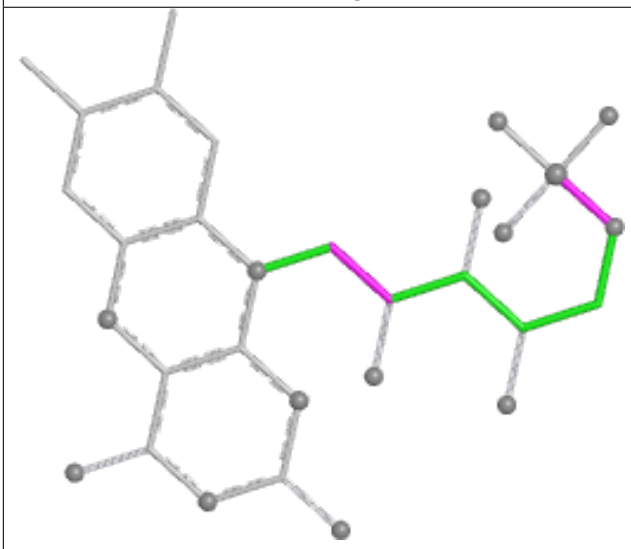

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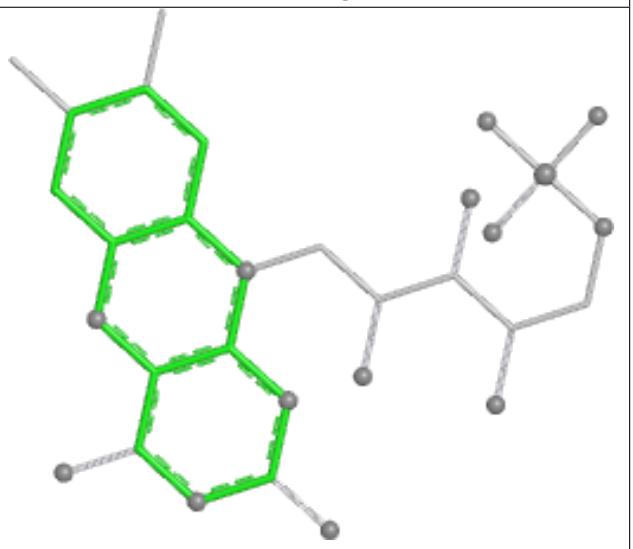
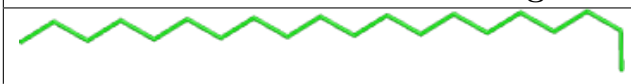
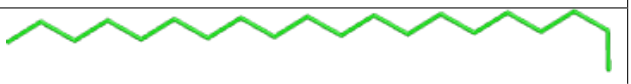
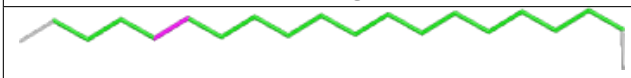
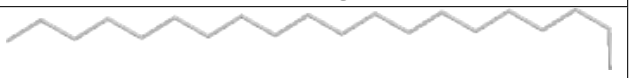
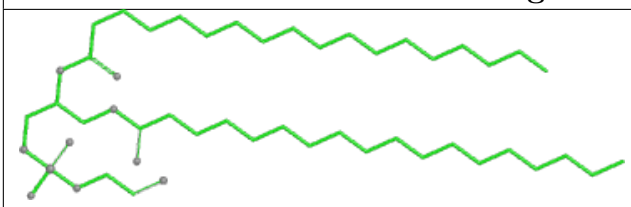
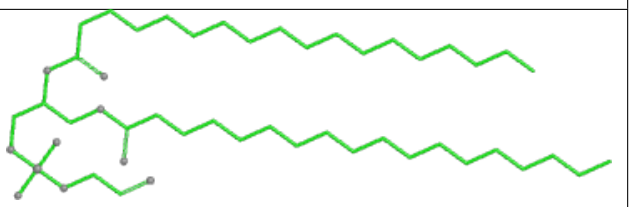
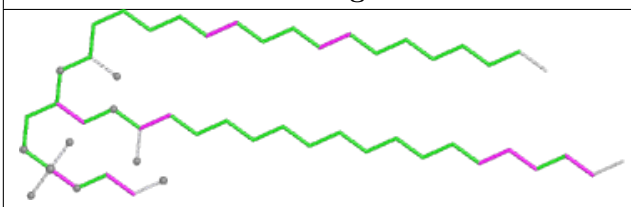
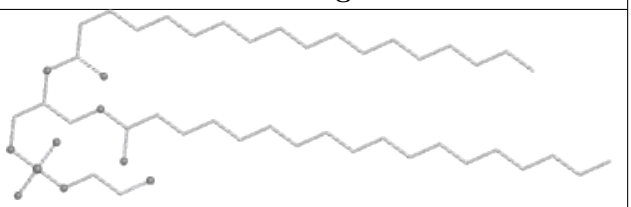
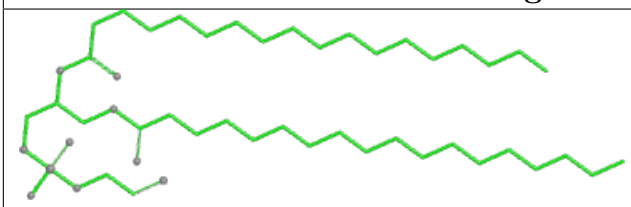
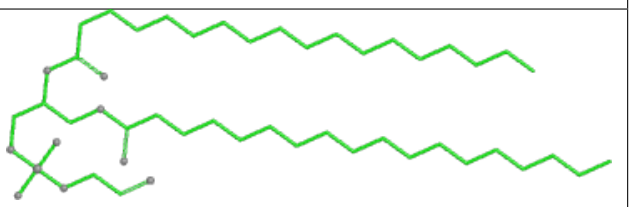
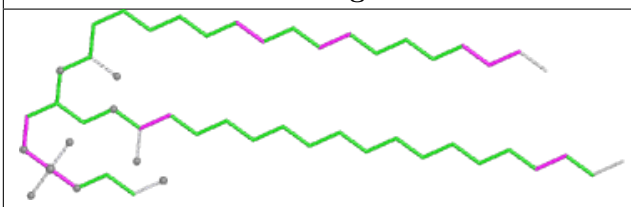
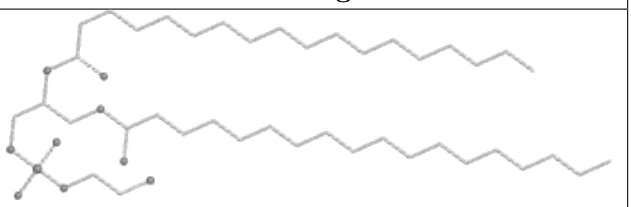


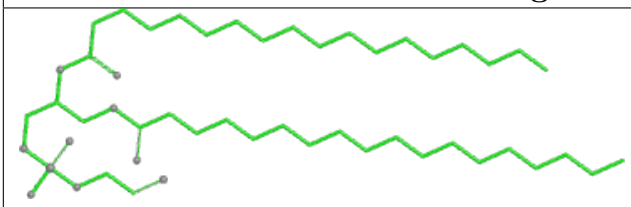
Rings

Ligand LFA H 402	
 Bond lengths	 Bond angles
 Torsions	 Rings

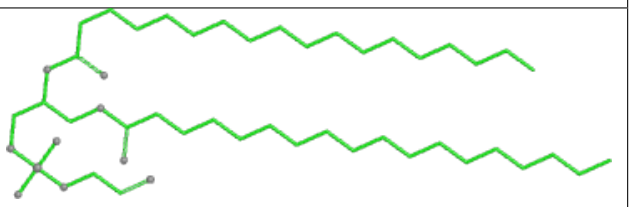
Ligand 3PE H 401	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE M 702	
 Bond lengths	 Bond angles
 Torsions	 Rings

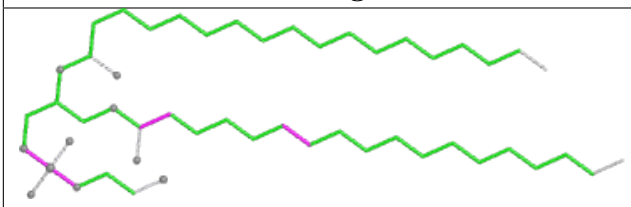
Ligand 3PE L 705



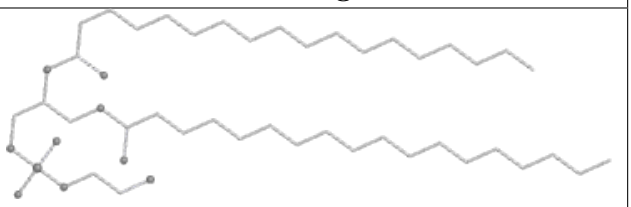
Bond lengths



Bond angles

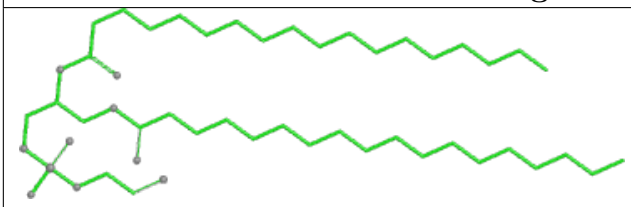


Torsions

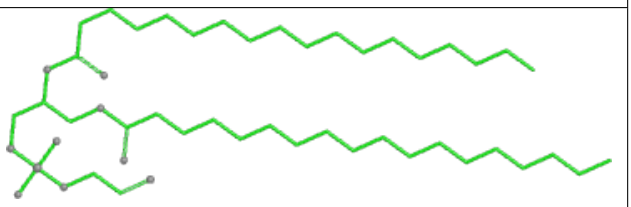


Rings

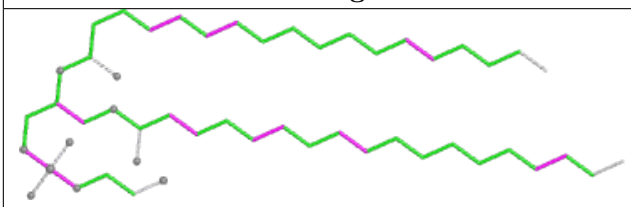
Ligand 3PE L 702



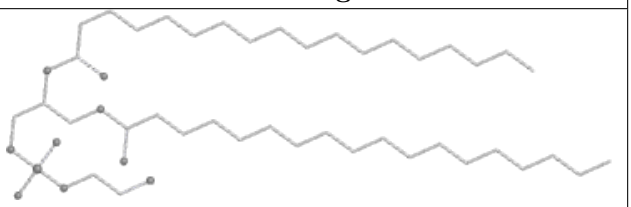
Bond lengths



Bond angles

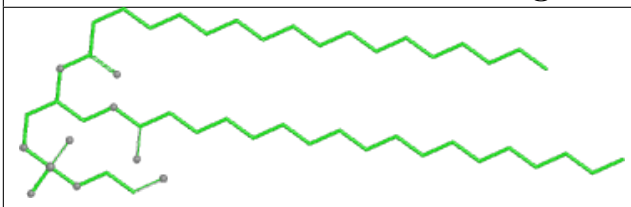


Torsions

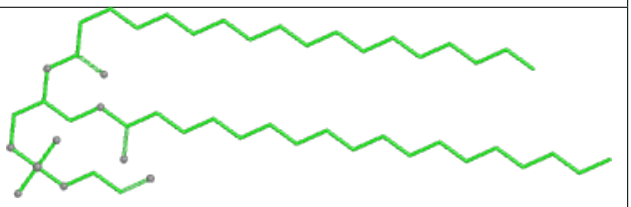


Rings

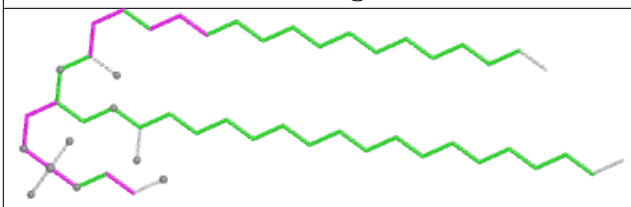
Ligand 3PE J 201



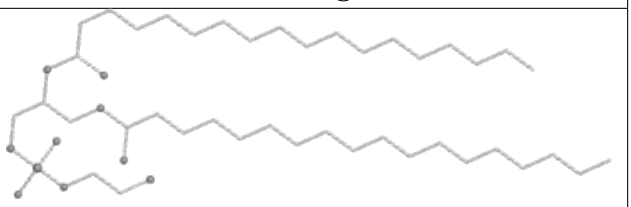
Bond lengths



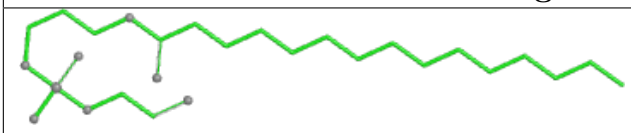
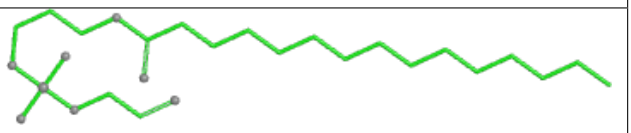
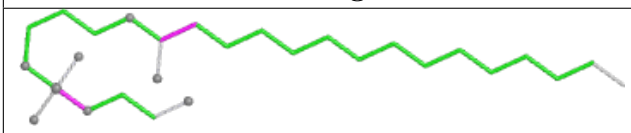
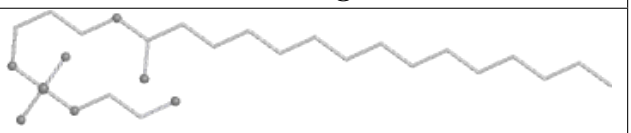
Bond angles

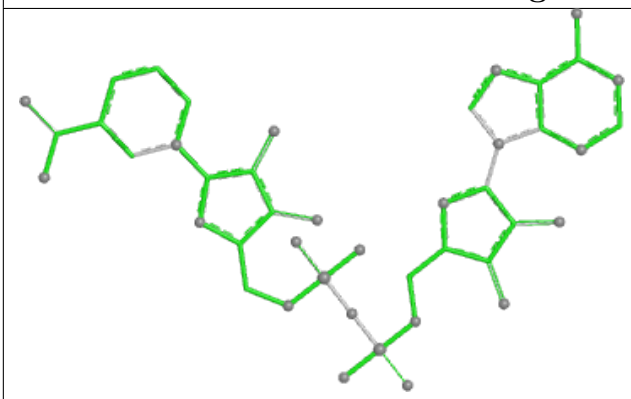
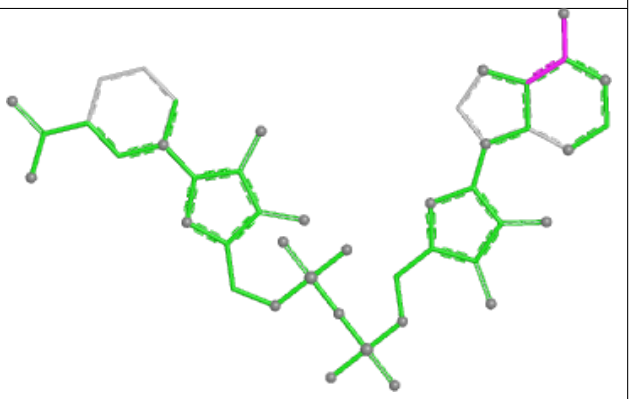
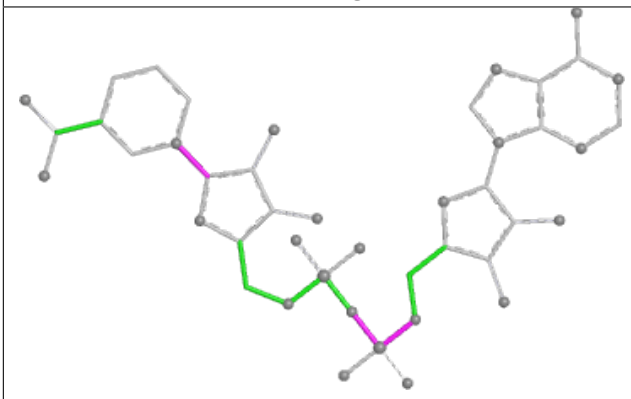
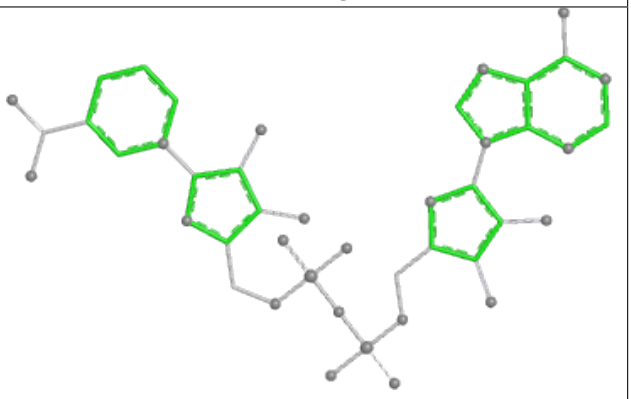


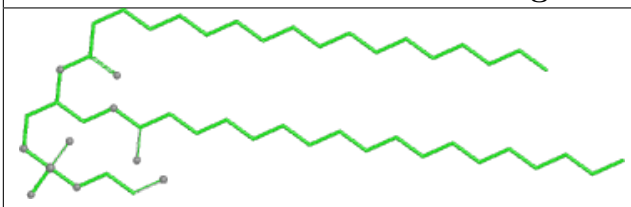
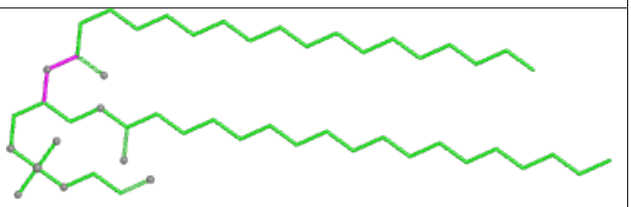
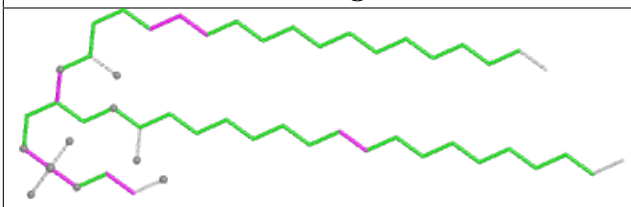
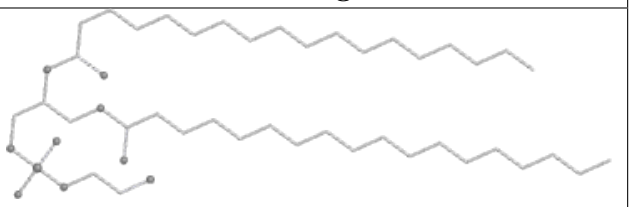
Torsions



Rings

Ligand 3PE I 204	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand NAI F 503	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE L 707	
 Bond lengths	 Bond angles
 Torsions	 Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

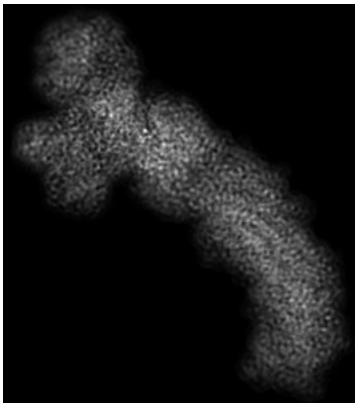
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-13217. These allow visual inspection of the internal detail of the map and identification of artifacts.

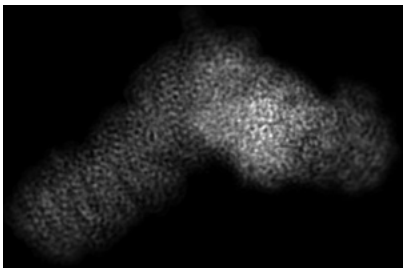
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

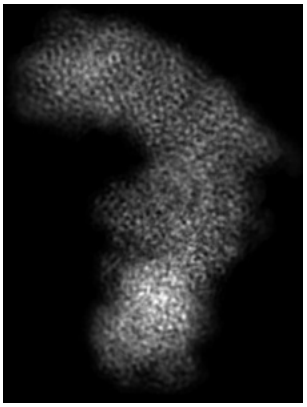
6.1.1 Primary map



X



Y



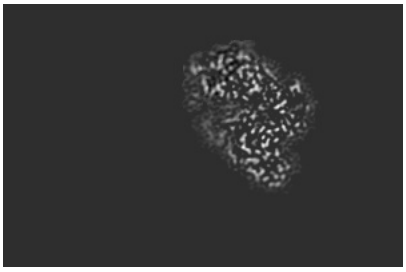
Z

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

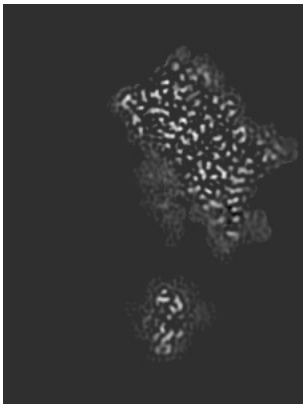
6.2 Central slices

6.2.1 Primary map

X Index: 157



Y Index: 210



Z Index: 240

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: 168

Y Index: 129

Z Index: 320

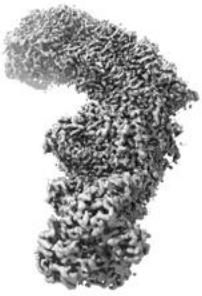
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

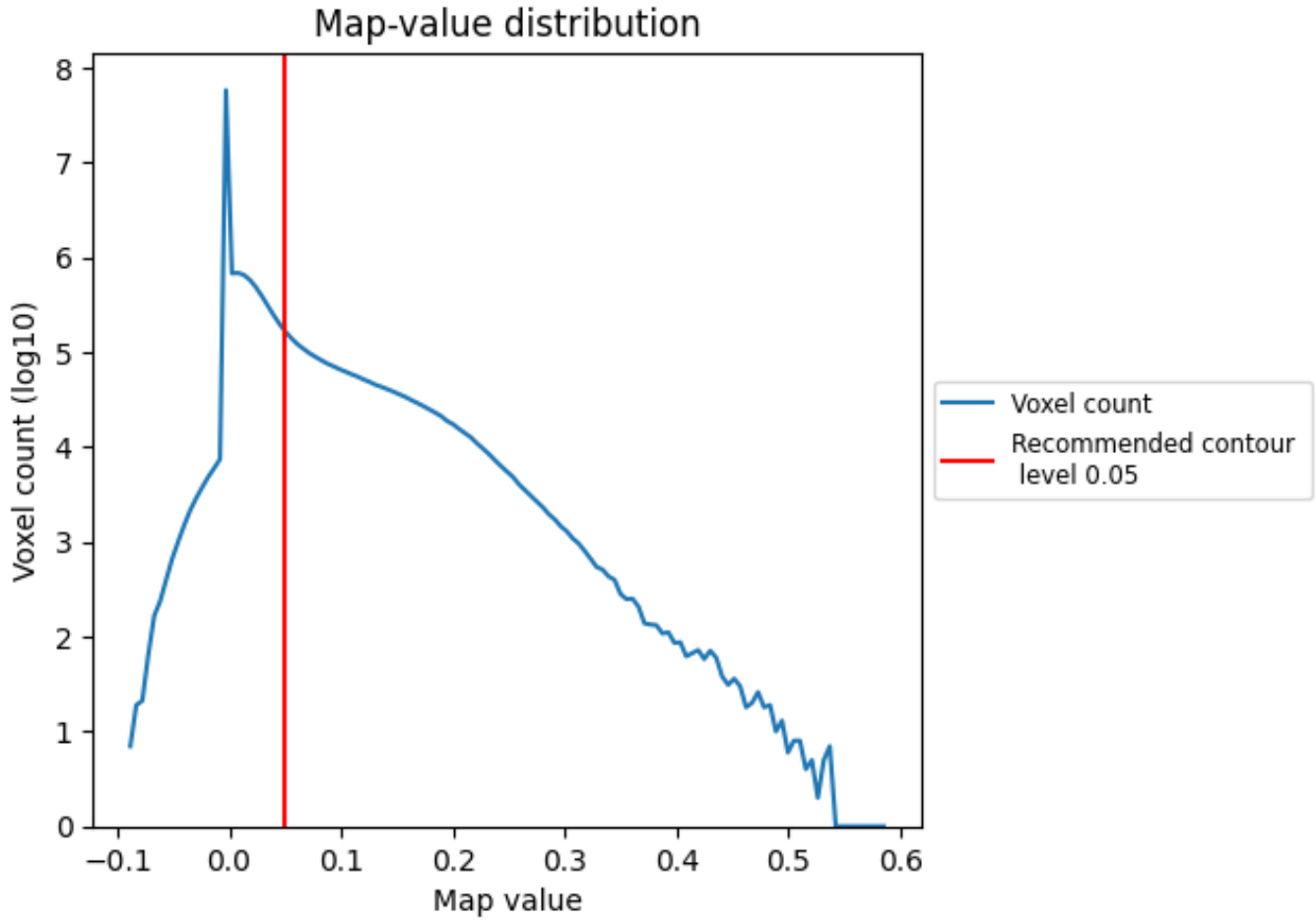
6.5 Mask visualisation (i)

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

7 Map analysis

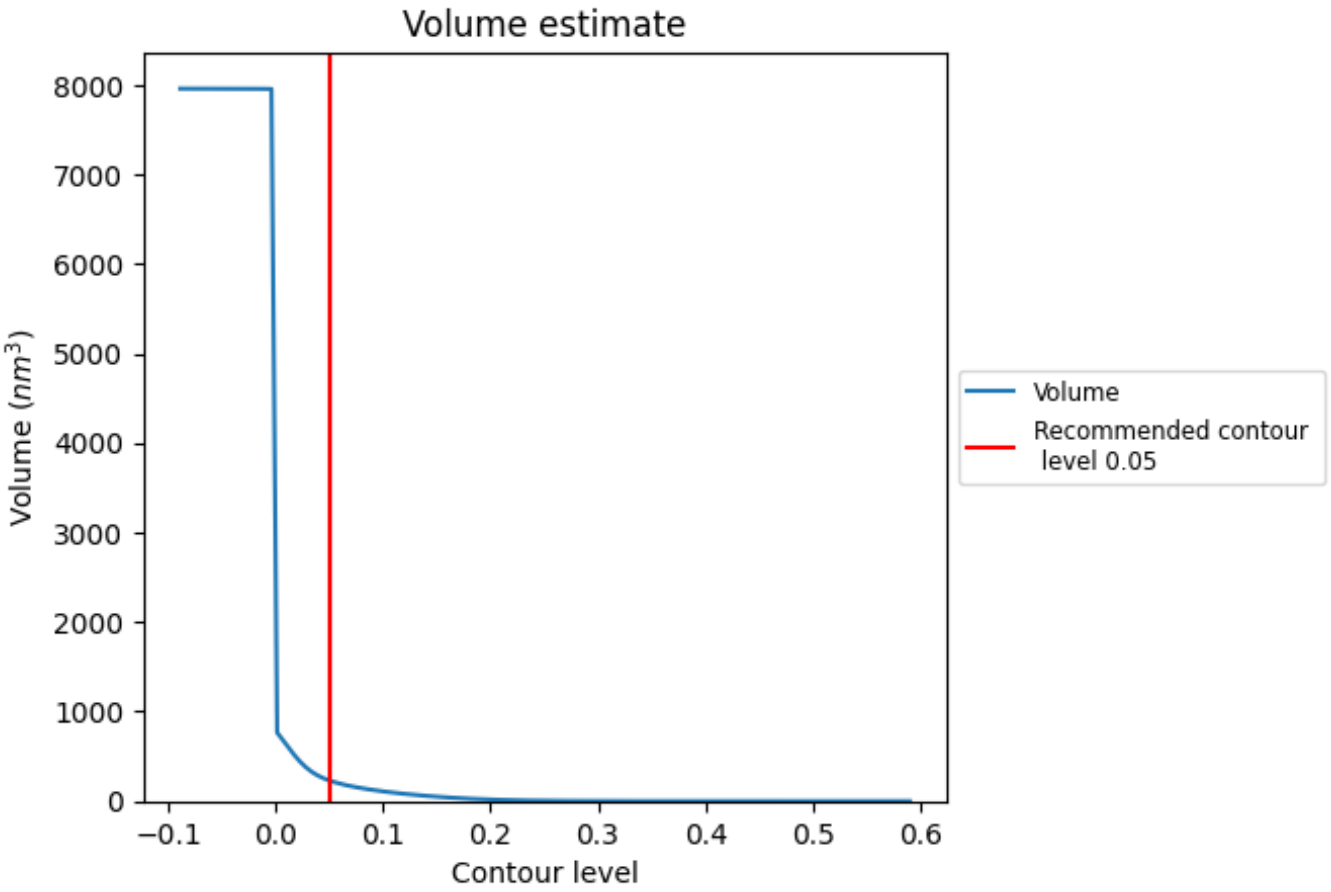
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

7.2 Volume estimate



The volume at the recommended contour level is 232 nm^3; this corresponds to an approximate mass of 210 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.

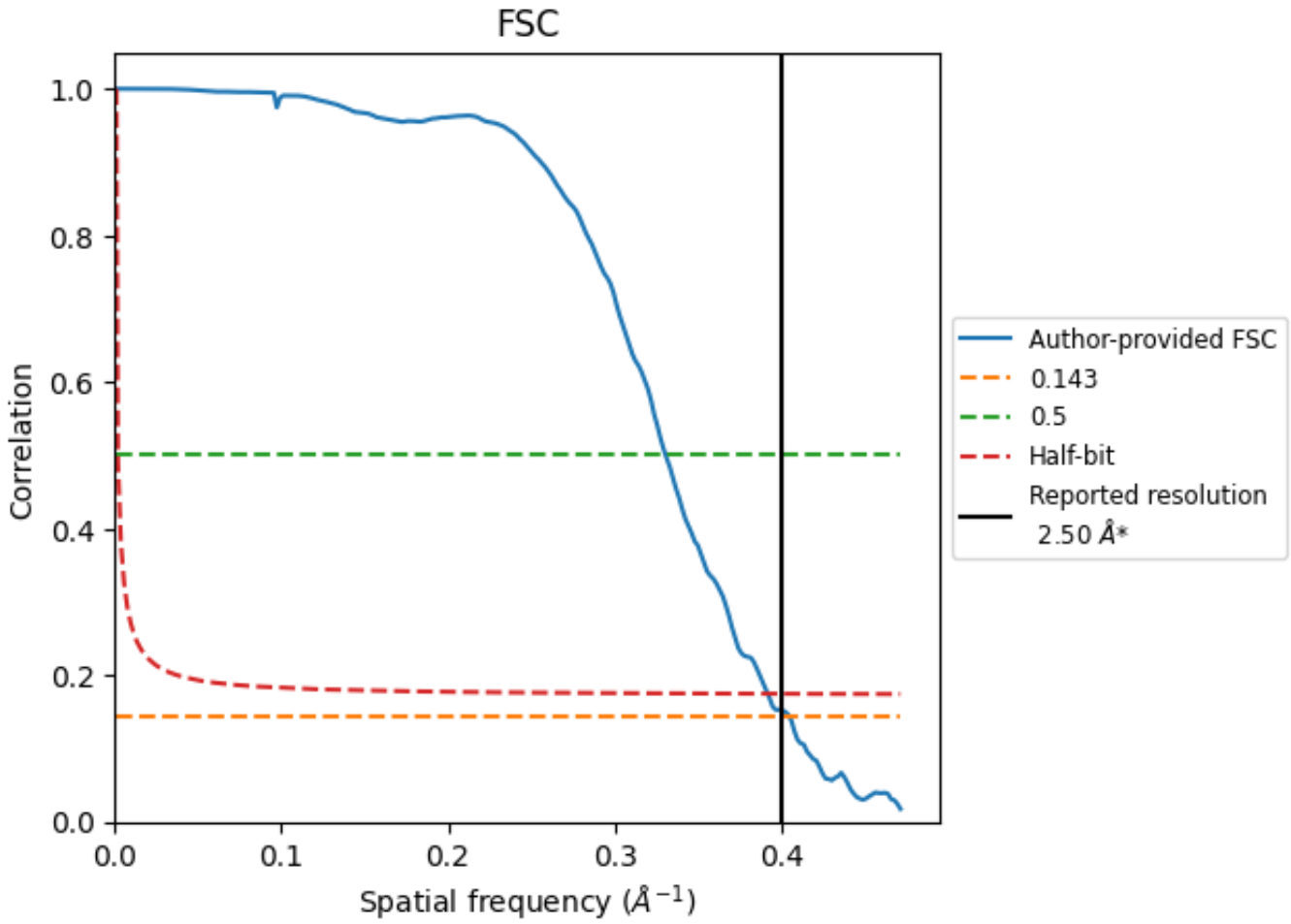
7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum is only generated for cubic maps.

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 0.400 Å^{-1}

8.2 Resolution estimates (i)

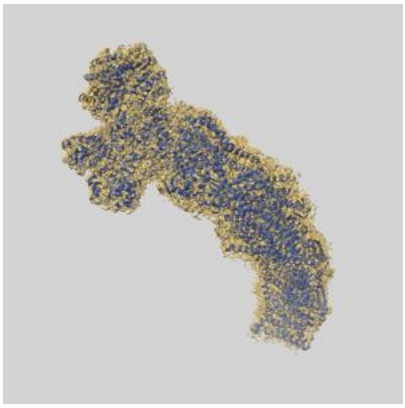
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.50	-	-
Author-provided FSC curve	2.47	3.02	2.55
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

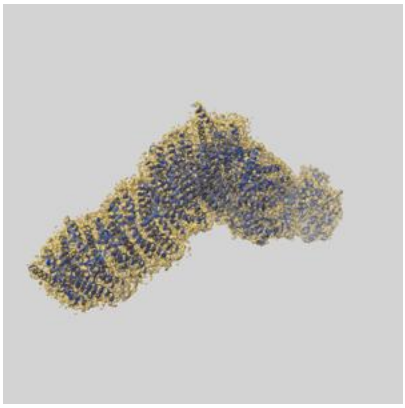
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-13217 and PDB model 7P64. Per-residue inclusion information can be found in section 3 on page 13.

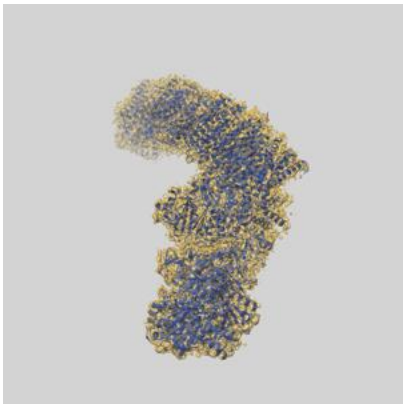
9.1 Map-model overlay



X



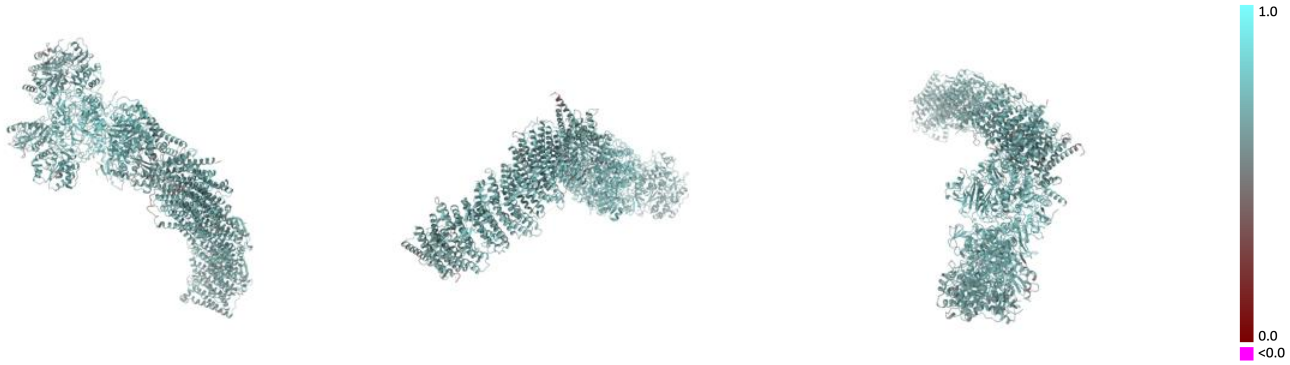
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05 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.

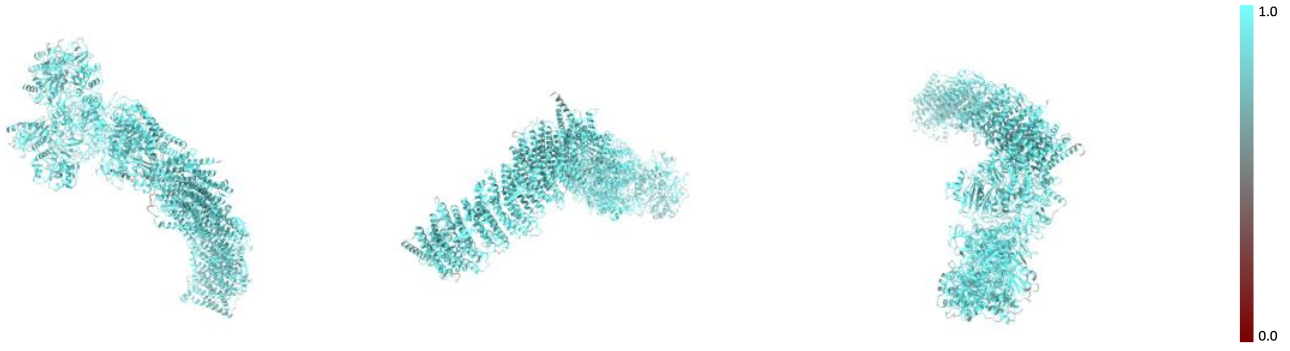
9.2 Q-score mapped to coordinate model (i)



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.

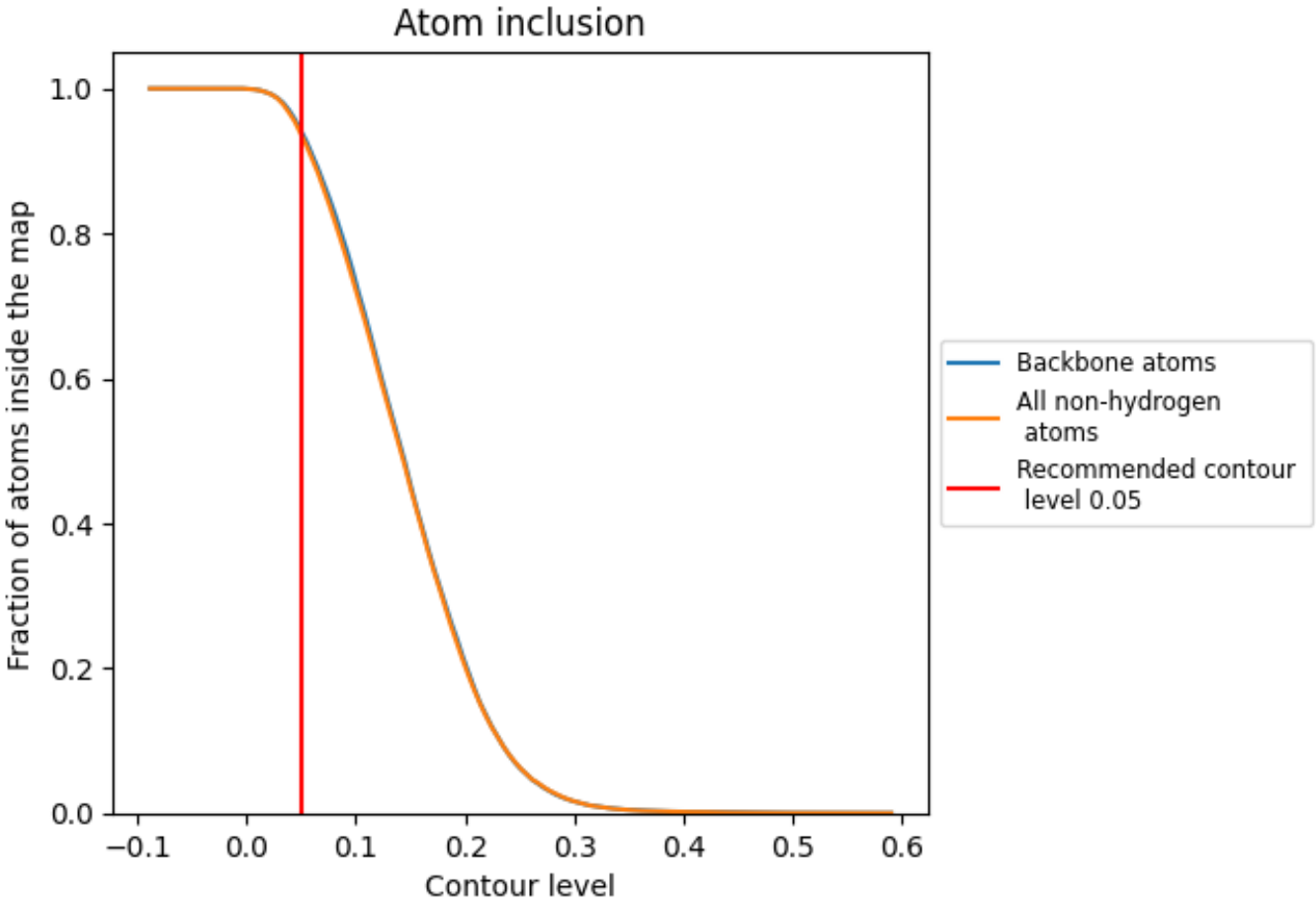
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.05).

9.4 Atom inclusion (i)



At the recommended contour level, 94% of all backbone atoms, 94% 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 (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9360	0.6660
A	0.9256	0.6410
B	0.9479	0.6920
C	0.9539	0.6970
E	0.9093	0.6350
F	0.9084	0.6330
G	0.9611	0.6980
H	0.9210	0.6300
I	0.9350	0.7000
J	0.9167	0.6460
K	0.9799	0.6950
L	0.9023	0.6240
M	0.9483	0.6590
N	0.9542	0.6740