Full wwPDB EM Validation Report ⓘ

Sep 26, 2022 – 10:31 pm BST

PDB ID	:	7P7L
EMDB ID	:	EMD-13239
Title	:	Complex I from E. coli, DDM/LMNG-purified, with NADH and FMN, Open state
Authors	:	Kravchuk, V.; Kampjut, D.; Sazanov, L.
Deposited on	:	2021-07-19
Resolution	:	3.00 Å(reported)
Based on initial models	:	4HEA, 3RKO

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

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

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

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

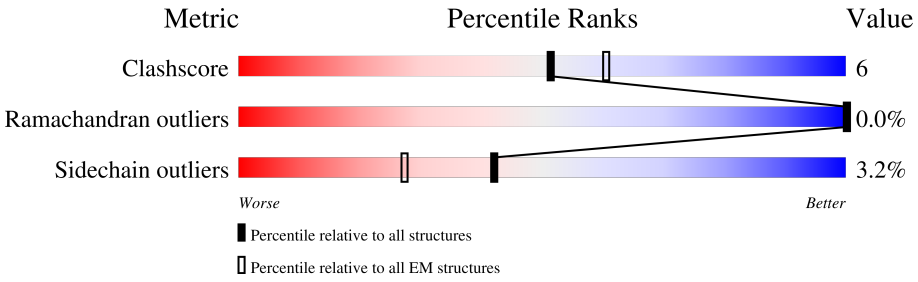
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.00 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)
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	27% 78% 22%
2	E	156	14% 83% 15%
3	G	905	84% 15%
4	C	600	80% 17%
5	B	220	69% 20% 10%
6	I	180	82% 17%
7	H	325	75% 20%
8	A	147	60% 8% 31%

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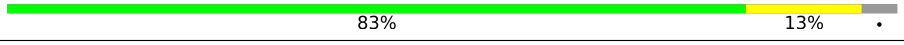
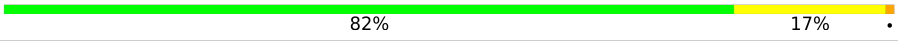
Mol	Chain	Length	Quality of chain
9	L	613	
10	M	504	
11	N	485	
12	K	100	
13	J	162	

2 Entry composition (i)

There are 20 unique types of molecules in this entry. The entry contains 37587 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	585	4705	3014	820	847	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	311	Total	C	N	O	S	0	0
			2444	1645	384	397	18		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	A	101	Total	C	N	O	S	0	0
			800	549	123	124	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
9	L	589	Total	C	N	O	S	0	0
			4498	2998	712	757	31		

- 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	480	Total	C	N	O	S	0	0
			3630	2424	573	613	20		

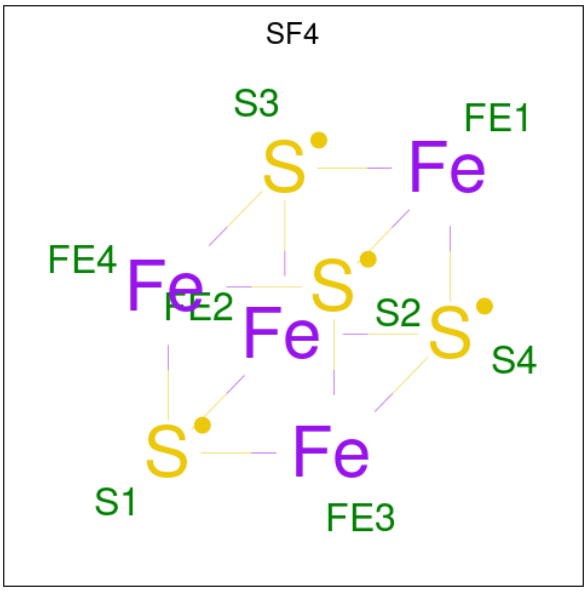
- Molecule 12 is a protein called NADH-quinone oxidoreductase subunit K.

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.

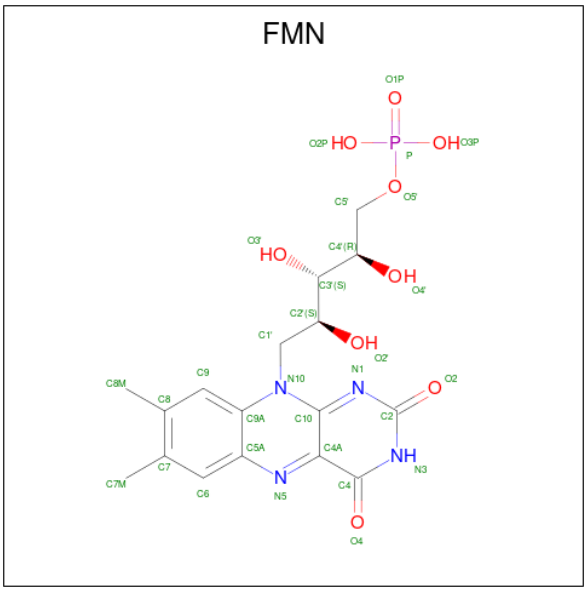
Mol	Chain	Residues	Atoms					AltConf	Trace
13	J	162	Total	C	N	O	S	0	0
			1214	818	188	201	7		

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



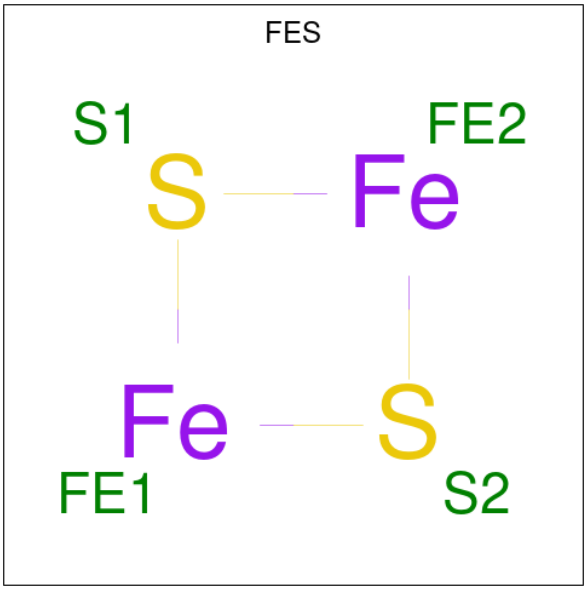
Mol	Chain	Residues	Atoms	AltConf
14	F	1	Total Fe S 8 4 4	0
14	G	1	Total Fe S 24 12 12	0
14	G	1	Total Fe S 24 12 12	0
14	G	1	Total Fe S 24 12 12	0
14	B	1	Total Fe S 8 4 4	0
14	I	1	Total Fe S 16 8 8	0
14	I	1	Total Fe S 16 8 8	0

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

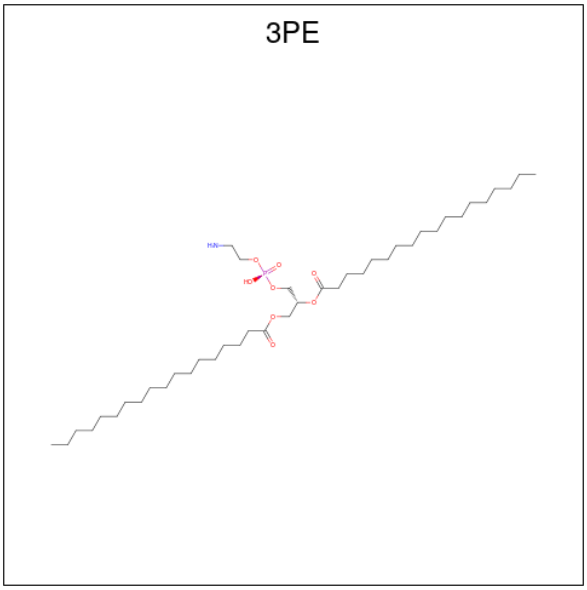


Mol	Chain	Residues	Atoms			AltConf
16	E	1	Total	Fe	S	0
			4	2	2	
16	G	1	Total	Fe	S	0
			4	2	2	

- Molecule 17 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 18 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (three-letter code: 3PE) (formula: $C_{41}H_{82}NO_8P$).



Mol	Chain	Residues	Atoms	AltConf
18	C	1	Total C N O P 51 41 1 8 1	0
18	I	1	Total C N O P 51 41 1 8 1	0
18	H	1	Total C N O P 141 111 3 24 3	0
18	H	1	Total C N O P 141 111 3 24 3	0
18	H	1	Total C N O P 141 111 3 24 3	0
18	A	1	Total C N O P 86 66 2 16 2	0
18	A	1	Total C N O P 86 66 2 16 2	0
18	L	1	Total C N O P 229 179 5 40 5	0
18	L	1	Total C N O P 229 179 5 40 5	0
18	L	1	Total C N O P 229 179 5 40 5	0

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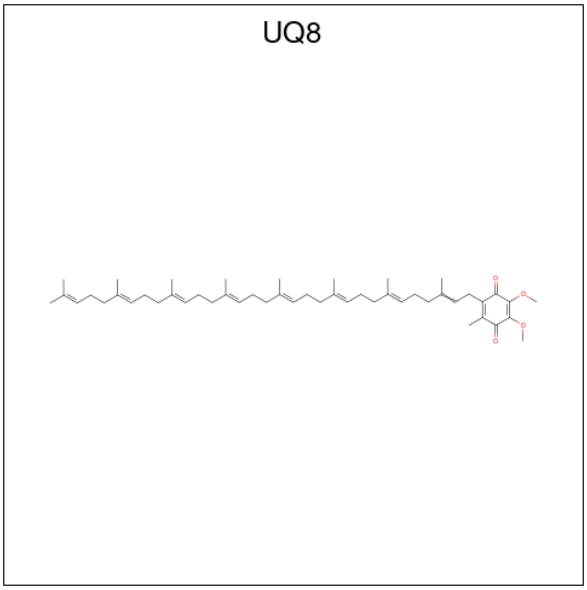
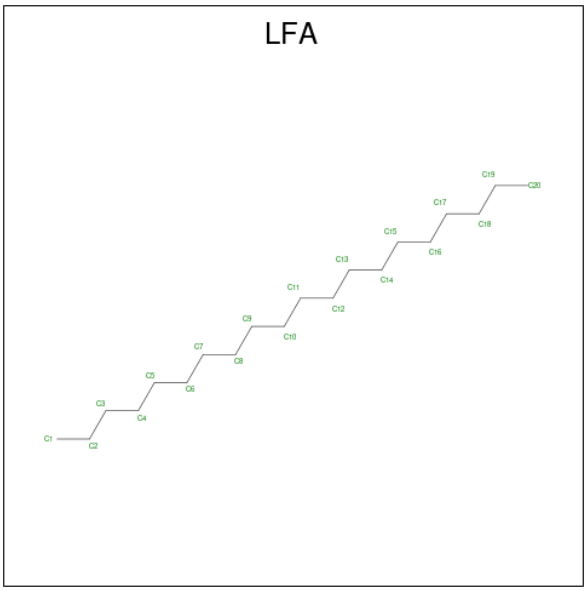
Mol	Chain	Residues	Atoms					AltConf
18	L	1	Total	C	N	O	P	0
			229	179	5	40	5	
18	L	1	Total	C	N	O	P	0
			229	179	5	40	5	
18	M	1	Total	C	N	O	P	0
			153	123	3	24	3	
18	M	1	Total	C	N	O	P	0
			153	123	3	24	3	
18	M	1	Total	C	N	O	P	0
			153	123	3	24	3	

- Molecule 19 is Ubiquinone-8 (three-letter code: UQ8) (formula: $C_{49}H_{74}O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
19	B	1	Total	C	O	0
			29	25	4	

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



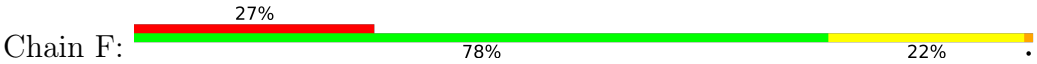
Mol	Chain	Residues	Atoms	AltConf
20	H	1	Total C 20 20	0
20	L	1	Total C 20 20	0
20	M	1	Total C 20 20	0
20	N	1	Total C 34 34	0
20	N	1	Total C 34 34	0

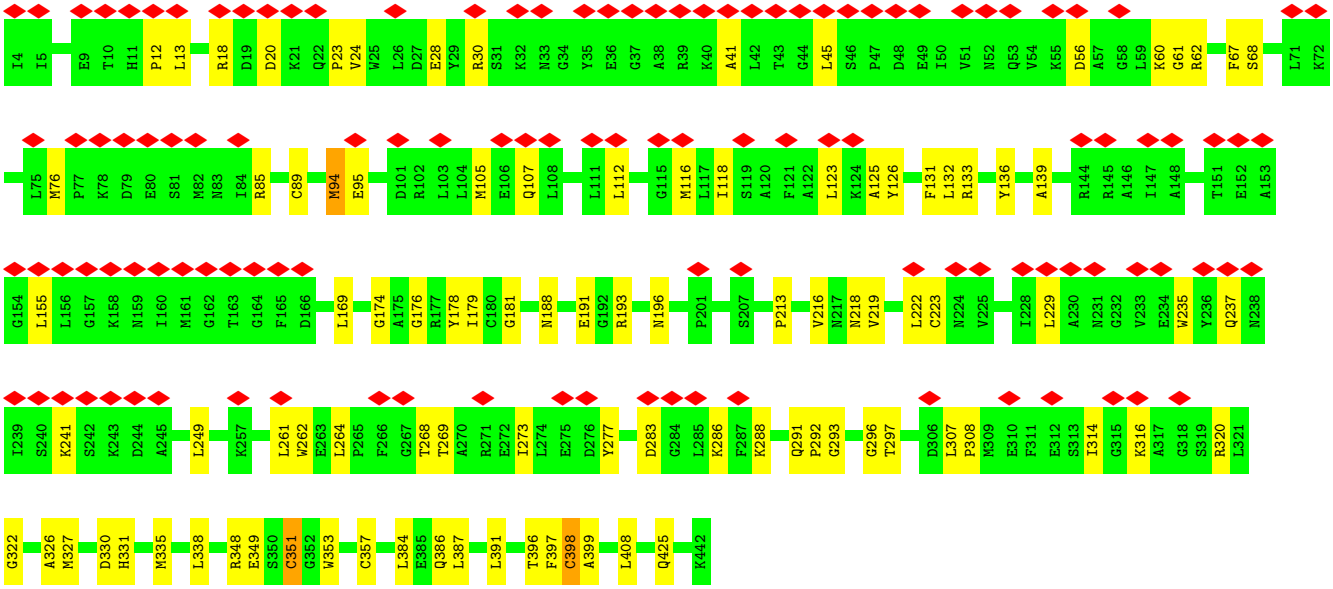
3 Residue-property plots (i)

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

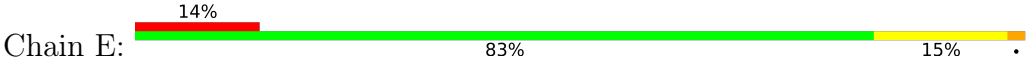
Chain F:

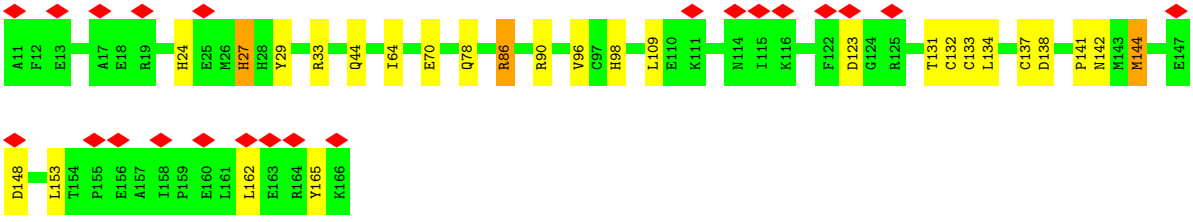




• Molecule 2: NADH dehydrogenase I subunit E

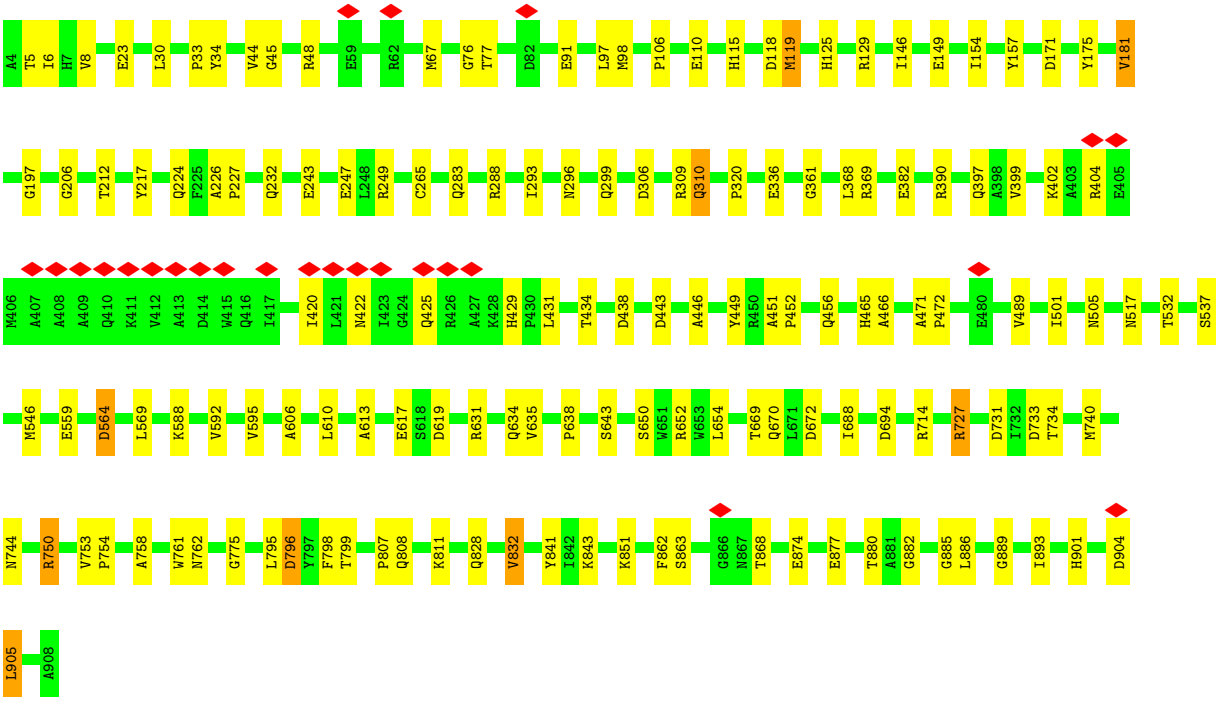
Chain E:





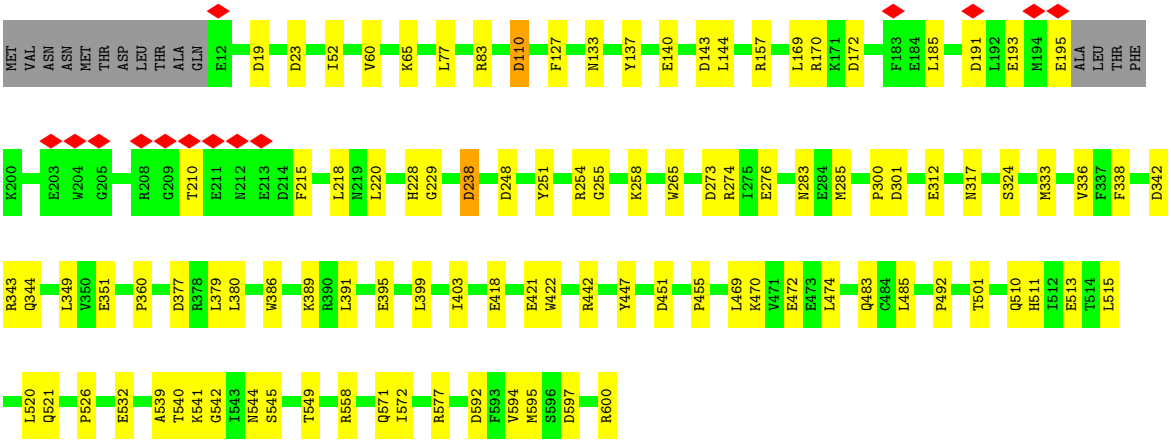
• Molecule 3: NADH-quinone oxidoreductase

Chain G:



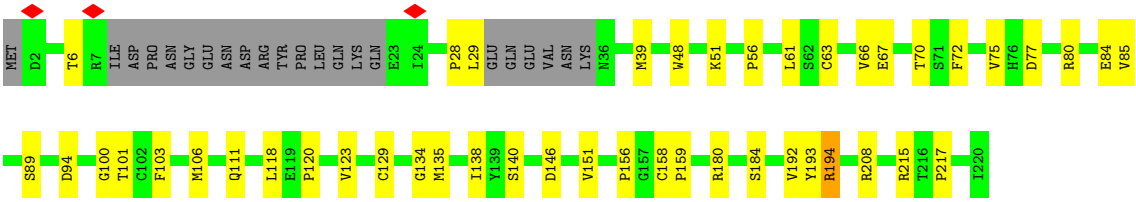
• Molecule 4: NADH-quinone oxidoreductase subunit C/D

Chain C:



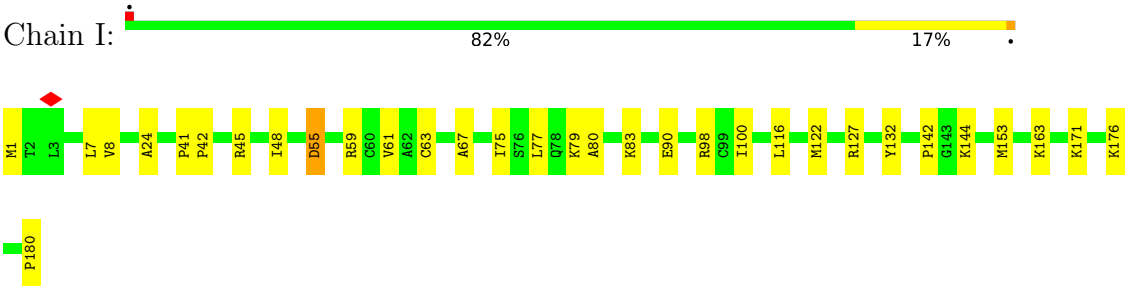
• Molecule 5: NADH-quinone oxidoreductase subunit B

Chain B:



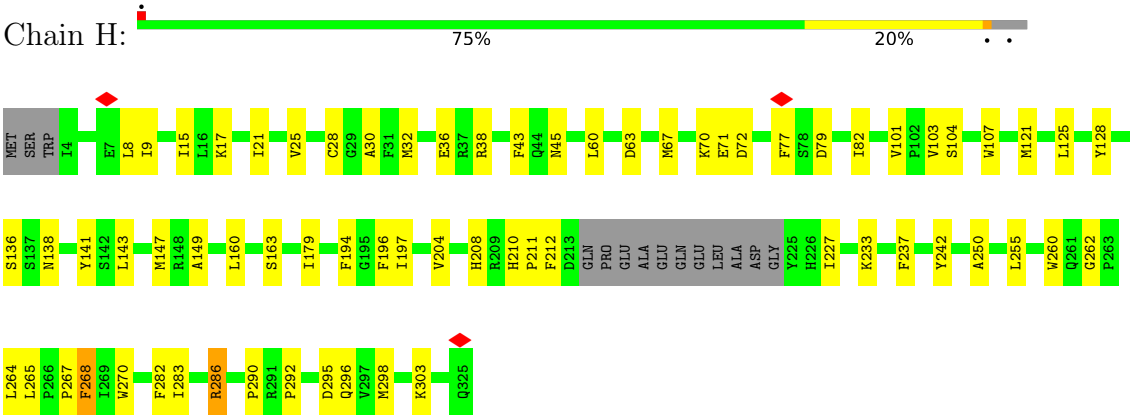
• Molecule 6: NADH-quinone oxidoreductase subunit I

Chain I:



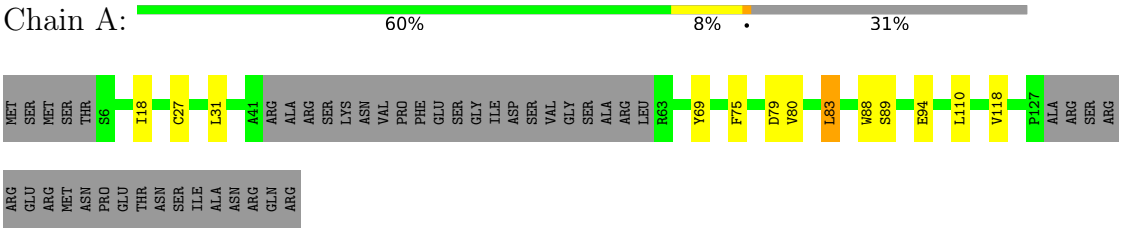
• Molecule 7: NADH-quinone oxidoreductase subunit H

Chain H:



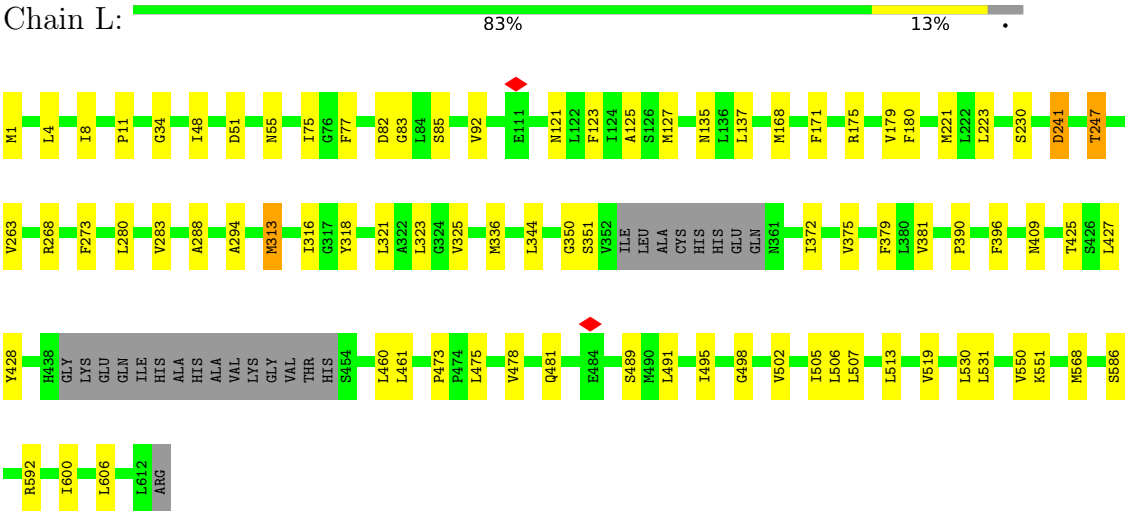
• Molecule 8: NADH-quinone oxidoreductase subunit A

Chain A:



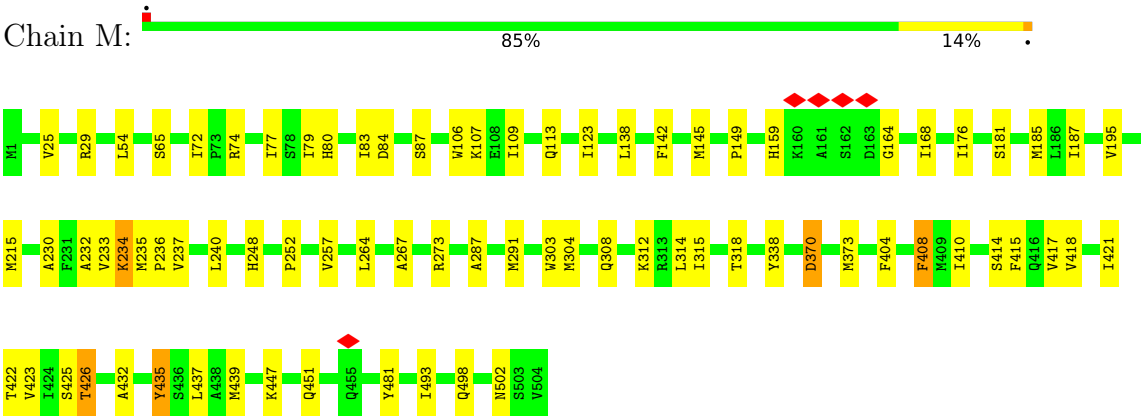
• Molecule 9: Proton-translocating NADH-quinone oxidoreductase, chain L

Chain L:



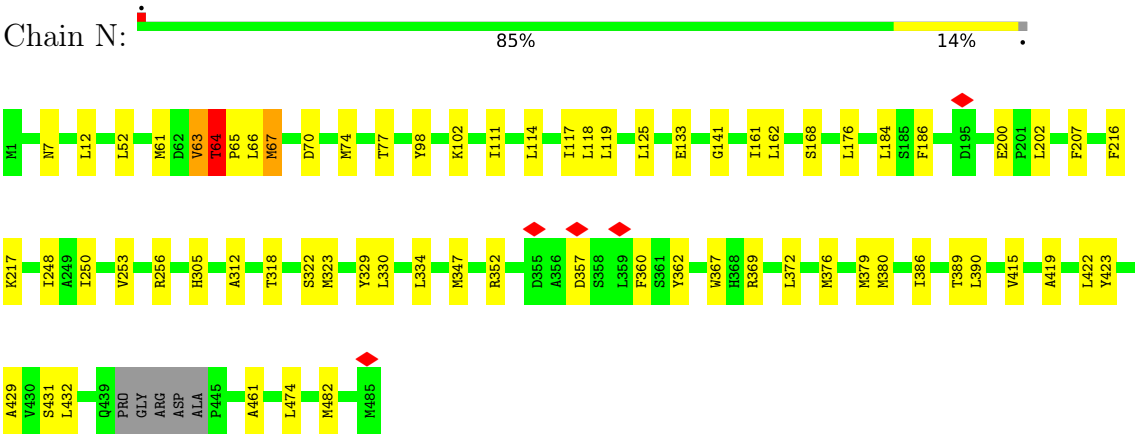
• Molecule 10: NADH dehydrogenase I subunit M

Chain M:



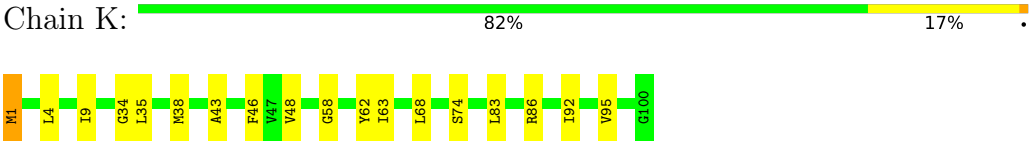
• Molecule 11: NADH-quinone oxidoreductase subunit N

Chain N:



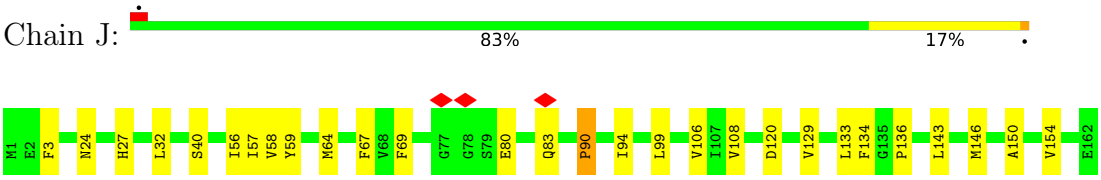
• Molecule 12: NADH-quinone oxidoreductase subunit K

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	36756	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	0.382	Depositor
Minimum map value	-0.047	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.017	Depositor
Recommended contour level	0.04	Depositor
Map size (Å)	155.81999, 209.87999, 240.61998	wwPDB
Map dimensions	227, 198, 147	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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, LFA, 3PE, FMN, SF4, CA, UQ8

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	0.26	0/3486	0.53	0/4713
2	E	0.27	0/1248	0.52	0/1691
3	G	0.31	0/7173	0.56	2/9726 (0.0%)
4	C	0.31	0/4834	0.55	2/6562 (0.0%)
5	B	0.30	0/1601	0.53	0/2168
6	I	0.31	0/1470	0.54	0/1985
7	H	0.33	0/2516	0.52	1/3422 (0.0%)
8	A	0.33	0/825	0.56	1/1123 (0.1%)
9	L	0.30	0/4612	0.54	2/6285 (0.0%)
10	M	0.32	0/4074	0.52	1/5546 (0.0%)
11	N	0.32	0/3719	0.54	1/5075 (0.0%)
12	K	0.32	0/769	0.56	0/1040
13	J	0.32	0/1240	0.54	1/1693 (0.1%)
All	All	0.31	0/37567	0.54	11/51029 (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
11	N	0	2

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	L	491	LEU	CA-CB-CG	8.07	133.87	115.30
4	C	248	ASP	CB-CG-OD1	7.44	125.00	118.30
10	M	109	ILE	CG1-CB-CG2	-6.32	97.49	111.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	G	904	ASP	CB-CG-OD2	6.19	123.87	118.30
8	A	83	LEU	CA-CB-CG	6.12	129.37	115.30
11	N	64	THR	N-CA-C	-5.87	95.15	111.00
4	C	220	LEU	CA-CB-CG	5.73	128.49	115.30
9	L	530	LEU	CA-CB-CG	5.43	127.78	115.30
13	J	90	PRO	CA-N-CD	-5.27	104.13	111.50
7	H	264	LEU	CA-CB-CG	5.10	127.03	115.30
3	G	310	GLN	CA-CB-CG	5.01	124.42	113.40

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
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	3375	58	0
2	E	1220	0	1189	17	0
3	G	7022	0	6824	82	0
4	C	4705	0	4608	58	0
5	B	1568	0	1553	33	0
6	I	1436	0	1415	25	0
7	H	2444	0	2500	44	0
8	A	800	0	810	10	0
9	L	4498	0	4645	42	0
10	M	3953	0	4053	42	0
11	N	3630	0	3794	40	0
12	K	760	0	817	15	0
13	J	1214	0	1285	21	0
14	B	8	0	0	0	0
14	F	8	0	0	1	0
14	G	24	0	0	2	0
14	I	16	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
15	F	31	0	19	3	0
16	E	4	0	0	1	0
16	G	4	0	0	0	0
17	G	1	0	0	0	0
18	A	86	0	126	2	0
18	C	51	0	82	4	0
18	H	141	0	219	3	0
18	I	51	0	82	4	0
18	L	229	0	352	8	0
18	M	153	0	246	2	0
19	B	29	0	33	3	0
20	H	20	0	42	3	0
20	L	20	0	42	0	0
20	M	20	0	42	1	0
20	N	34	0	69	1	0
All	All	37587	0	38222	437	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 6.

All (437) 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	1.72	0.90
9:L:223:LEU:HD13	9:L:283:VAL:HG22	1.76	0.67
11:N:217:LYS:HB3	11:N:250:ILE:HD13	1.76	0.67
9:L:11:PRO:HB2	9:L:125:ALA:HB2	1.78	0.66
3:G:828:GLN:NE2	3:G:889:GLY:O	2.28	0.65
3:G:45:GLY:O	3:G:48:ARG:NH2	2.30	0.65
11:N:248:ILE:HG12	11:N:330:LEU:HD22	1.78	0.65
7:H:21:ILE:HG12	20:H:601:LFA:H62	1.79	0.63
1:F:116:MET:HE1	1:F:169:LEU:HD22	1.80	0.63
3:G:750:ARG:HE	3:G:753:VAL:HG22	1.63	0.62
4:C:324:SER:HB2	4:C:336:VAL:HA	1.81	0.62
4:C:317:ASN:OD1	4:C:343:ARG:NH1	2.33	0.62
1:F:249:LEU:HB3	1:F:261:LEU:HD11	1.82	0.62
10:M:187:ILE:HD11	11:N:415:VAL:HG21	1.79	0.62
1:F:94:MET:SD	1:F:133:ARG:NH2	2.73	0.61
1:F:176:GLY:HA3	2:E:78:GLN:HG2	1.83	0.61
9:L:325:VAL:O	9:L:409:ASN:ND2	2.33	0.60
2:E:142:ASN:ND2	16:E:201:FES:S1	2.75	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:N:77:THR:HG23	11:N:117:ILE:HG12	1.82	0.60
1:F:85:ARG:HG2	1:F:213:PRO:HG2	1.84	0.59
3:G:434:THR:HG23	3:G:449:TYR:HB3	1.84	0.59
4:C:185:LEU:HD21	5:B:111:GLN:HG3	1.84	0.59
10:M:25:VAL:O	10:M:113:GLN:NE2	2.35	0.59
1:F:118:ILE:HG21	1:F:229:LEU:HD22	1.82	0.59
4:C:377:ASP:OD1	4:C:377:ASP:N	2.35	0.59
4:C:276:GLU:O	4:C:283:ASN:ND2	2.34	0.59
11:N:111:ILE:HG21	13:J:150:ALA:HB2	1.84	0.59
13:J:57:ILE:HG22	13:J:58:VAL:HG23	1.85	0.59
3:G:694:ASP:OD1	3:G:694:ASP:N	2.35	0.58
3:G:91:GLU:HG3	3:G:125:HIS:HB2	1.86	0.58
11:N:419:ALA:HA	11:N:422:LEU:HD12	1.84	0.58
2:E:141:PRO:HG2	2:E:153:LEU:HB2	1.86	0.58
9:L:85:SER:OG	9:L:268:ARG:NH2	2.37	0.58
11:N:65:PRO:HG2	13:J:136:PRO:HB3	1.86	0.58
7:H:104:SER:HB3	7:H:107:TRP:HB2	1.84	0.58
1:F:291:GLN:NE2	1:F:297:THR:O	2.37	0.58
1:F:288:LYS:HD3	1:F:331:HIS:HA	1.86	0.58
8:A:69:TYR:OH	12:K:74:SER:O	2.22	0.57
3:G:288:ARG:HH21	3:G:293:ILE:HD11	1.69	0.57
11:N:64:THR:HG22	11:N:66:LEU:H	1.68	0.57
18:C:701:3PE:H2G2	18:I:203:3PE:H2I3	1.86	0.57
8:A:94:GLU:N	8:A:94:GLU:OE2	2.36	0.57
4:C:541:LYS:NZ	4:C:592:ASP:OD1	2.37	0.57
9:L:606:LEU:HB3	13:J:106:VAL:HG11	1.86	0.57
3:G:796:ASP:OD1	3:G:796:ASP:N	2.37	0.57
4:C:395:GLU:HA	4:C:399:LEU:HB2	1.85	0.57
6:I:59:ARG:NH2	6:I:142:PRO:O	2.39	0.56
18:H:604:3PE:H2C1	18:H:604:3PE:H3E1	1.86	0.56
11:N:429:ALA:HA	11:N:432:LEU:HD12	1.86	0.56
7:H:121:MET:HG3	13:J:57:ILE:HG13	1.87	0.56
1:F:283:ASP:OD2	1:F:283:ASP:N	2.36	0.56
10:M:87:SER:OG	10:M:273:ARG:NH2	2.38	0.56
10:M:338:TYR:HB3	10:M:493:ILE:HD12	1.88	0.56
5:B:6:THR:HG21	5:B:194:ARG:HH21	1.69	0.56
11:N:63:VAL:O	11:N:67:MET:CB	2.51	0.56
10:M:176:ILE:HD11	11:N:423:TYR:HB2	1.88	0.56
4:C:238:ASP:OD1	4:C:238:ASP:N	2.40	0.55
3:G:6:ILE:HG22	3:G:77:THR:HB	1.87	0.55
1:F:136:TYR:HB3	1:F:139:ALA:HB3	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:K:9:ILE:HG12	13:J:108:VAL:HG22	1.89	0.55
1:F:179:ILE:HG12	1:F:351:CYS:HB3	1.88	0.55
10:M:414:SER:O	10:M:418:VAL:N	2.36	0.55
13:J:32:LEU:HD13	13:J:64:MET:HE1	1.88	0.55
5:B:135:MET:HB3	6:I:100:ILE:HG21	1.88	0.54
18:L:801:3PE:H262	18:L:801:3PE:H322	1.89	0.54
1:F:23:PRO:HA	1:F:107:GLN:HA	1.89	0.54
6:I:48:ILE:HG12	6:I:116:LEU:HG	1.90	0.54
9:L:51:ASP:OD1	9:L:55:ASN:ND2	2.41	0.54
3:G:369:ARG:NH2	3:G:775:GLY:O	2.41	0.54
7:H:36:GLU:HG3	7:H:283:ILE:HD12	1.89	0.54
3:G:807:PRO:HB3	3:G:882:GLY:HA3	1.89	0.54
10:M:181:SER:HB3	10:M:230:ALA:HA	1.89	0.54
11:N:176:LEU:HD22	11:N:202:LEU:HD11	1.89	0.54
3:G:404:ARG:HG2	3:G:420:ILE:HD13	1.90	0.54
9:L:592:ARG:HG3	12:K:92:ILE:HD11	1.88	0.54
2:E:24:HIS:HA	2:E:27:HIS:CE1	2.43	0.53
1:F:116:MET:HB2	1:F:222:LEU:HD13	1.91	0.53
4:C:110:ASP:OD2	4:C:442:ARG:NH1	2.41	0.53
4:C:210:THR:HA	4:C:215:PHE:HB2	1.90	0.53
8:A:75:PHE:O	8:A:79:ASP:HB2	2.08	0.53
2:E:138:ASP:OD1	2:E:138:ASP:N	2.39	0.53
9:L:273:PHE:HB3	9:L:280:LEU:HD13	1.91	0.53
1:F:397:PHE:HD1	3:G:48:ARG:HH22	1.56	0.52
4:C:510:GLN:O	4:C:511:HIS:ND1	2.42	0.52
8:A:83:LEU:HD23	13:J:58:VAL:HG21	1.90	0.52
3:G:613:ALA:HB1	3:G:617:GLU:HB2	1.90	0.52
9:L:82:ASP:N	9:L:82:ASP:OD1	2.43	0.52
5:B:77:ASP:HB3	5:B:80:ARG:HE	1.75	0.52
7:H:295:ASP:N	7:H:295:ASP:OD1	2.43	0.52
1:F:181:GLY:O	15:F:502:FMN:O2'	2.27	0.52
5:B:134:GLY:O	6:I:98:ARG:NH1	2.37	0.52
1:F:18:ARG:NH2	1:F:20:ASP:OD2	2.44	0.51
1:F:338:LEU:HD12	2:E:98:HIS:HD2	1.76	0.51
3:G:631:ARG:NH2	3:G:688:ILE:O	2.44	0.51
4:C:455:PRO:HB2	4:C:469:LEU:HD22	1.91	0.51
6:I:7:LEU:HD22	18:I:203:3PE:H381	1.91	0.51
18:A:202:3PE:H292	18:A:202:3PE:H382	1.91	0.51
10:M:123:ILE:HG13	10:M:149:PRO:HB2	1.91	0.51
3:G:296:ASN:OD1	3:G:299:GLN:NE2	2.33	0.51
3:G:569:LEU:HD11	3:G:650:SER:HB3	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:30:ALA:HB1	7:H:60:LEU:HD11	1.92	0.51
18:H:604:3PE:N	18:A:202:3PE:O14	2.40	0.51
1:F:330:ASP:N	1:F:330:ASP:OD1	2.44	0.51
9:L:550:VAL:HG13	18:L:803:3PE:H232	1.91	0.51
4:C:342:ASP:OD1	4:C:386:TRP:NE1	2.37	0.51
9:L:179:VAL:HG22	10:M:426:THR:HG22	1.92	0.51
12:K:34:GLY:O	12:K:38:MET:HG3	2.11	0.51
3:G:397:GLN:O	3:G:404:ARG:NH2	2.42	0.51
4:C:349:LEU:HD13	4:C:379:LEU:HB2	1.92	0.51
13:J:120:ASP:OD2	13:J:120:ASP:N	2.44	0.51
3:G:5:THR:O	3:G:76:GLY:N	2.43	0.51
5:B:94:ASP:HB3	7:H:70:LYS:HE3	1.92	0.51
9:L:344:LEU:HB2	9:L:460:LEU:HB3	1.93	0.51
3:G:110:GLU:HG3	3:G:206:GLY:HA2	1.93	0.50
5:B:215:ARG:HB2	6:I:42:PRO:HB3	1.93	0.50
7:H:260:TRP:HB2	7:H:267:PRO:HB3	1.92	0.50
13:J:90:PRO:HB3	13:J:94:ILE:HD11	1.93	0.50
4:C:143:ASP:OD1	4:C:157:ARG:NH1	2.43	0.50
11:N:312:ALA:O	11:N:322:SER:OG	2.30	0.50
3:G:97:LEU:HD22	3:G:154:ILE:HB	1.92	0.50
7:H:121:MET:HG2	13:J:56:ILE:HB	1.93	0.50
3:G:592:VAL:HB	3:G:606:ALA:HA	1.93	0.50
4:C:251:TYR:HD2	5:B:106:MET:HG2	1.75	0.50
1:F:56:ASP:O	1:F:237:GLN:NE2	2.44	0.50
1:F:133:ARG:NH2	2:E:133:CYS:O	2.45	0.50
3:G:438:ASP:OD1	3:G:438:ASP:N	2.45	0.50
3:G:118:ASP:OD1	3:G:762:ASN:ND2	2.45	0.50
11:N:352:ARG:NH2	11:N:357:ASP:O	2.45	0.50
2:E:70:GLU:OE2	6:I:176:LYS:NZ	2.44	0.50
9:L:168:MET:HG2	10:M:437:LEU:HD23	1.94	0.50
3:G:569:LEU:HD13	3:G:654:LEU:HD11	1.94	0.50
4:C:83:ARG:NH2	4:C:172:ASP:OD1	2.43	0.50
2:E:131:THR:OG1	2:E:132:CYS:N	2.45	0.49
3:G:212:THR:HG22	3:G:832:VAL:HG21	1.93	0.49
4:C:451:ASP:O	4:C:483:GLN:NE2	2.38	0.49
1:F:273:ILE:HA	1:F:277:TYR:HD2	1.77	0.49
3:G:382:GLU:OE2	3:G:505:ASN:ND2	2.44	0.49
11:N:386:ILE:O	11:N:389:THR:OG1	2.24	0.49
5:B:101:THR:HA	5:B:129:CYS:HB3	1.93	0.49
11:N:7:ASN:HB3	11:N:63:VAL:HG13	1.94	0.49
9:L:294:ALA:HB2	9:L:313:MET:HG2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:8:VAL:HG13	18:I:203:3PE:H31	1.94	0.49
10:M:236:PRO:HD3	10:M:264:LEU:HG	1.95	0.49
10:M:415:PHE:HB2	10:M:422:THR:HG21	1.95	0.49
12:K:43:ALA:HB1	12:K:62:TYR:HD1	1.77	0.49
3:G:48:ARG:HD3	3:G:67:MET:HE3	1.95	0.49
1:F:132:LEU:O	1:F:174:GLY:N	2.46	0.49
9:L:427:LEU:HD11	9:L:507:LEU:HD12	1.95	0.49
1:F:60:LYS:HA	1:F:68:SER:HA	1.95	0.49
9:L:247:THR:HG21	9:L:350:GLY:HA3	1.94	0.49
1:F:348:ARG:NH1	1:F:349:GLU:OE2	2.46	0.48
1:F:384:LEU:HD13	1:F:408:LEU:HD11	1.95	0.48
4:C:144:LEU:HB3	4:C:169:LEU:HB2	1.95	0.48
7:H:36:GLU:OE1	7:H:242:TYR:OH	2.20	0.48
7:H:125:LEU:HD13	18:H:604:3PE:H2G1	1.95	0.48
1:F:60:LYS:O	1:F:62:ARG:NH1	2.47	0.48
2:E:148:ASP:OD2	2:E:165:TYR:OH	2.30	0.48
3:G:731:ASP:OD2	3:G:734:THR:OG1	2.26	0.48
18:C:701:3PE:H32	7:H:296:GLN:HE21	1.77	0.48
9:L:263:VAL:HG13	9:L:323:LEU:HD11	1.94	0.48
11:N:376:MET:O	11:N:380:MET:HG2	2.14	0.48
4:C:380:LEU:HD23	4:C:485:LEU:HD13	1.94	0.48
5:B:66:VAL:O	5:B:70:THR:OG1	2.27	0.48
11:N:369:ARG:HD3	11:N:372:LEU:HD12	1.94	0.48
1:F:85:ARG:HB2	1:F:125:ALA:HA	1.95	0.48
18:L:803:3PE:H3D1	18:L:803:3PE:H2D2	1.96	0.48
11:N:248:ILE:HD11	11:N:334:LEU:HB2	1.96	0.48
3:G:863:SER:HB3	3:G:868:THR:HG22	1.95	0.48
4:C:191:ASP:O	4:C:195:GLU:HB2	2.14	0.48
4:C:360:PRO:O	6:I:45:ARG:NH1	2.39	0.48
4:C:229:GLY:HA3	4:C:595:MET:HB2	1.95	0.48
4:C:532:GLU:OE2	4:C:549:THR:OG1	2.30	0.48
9:L:519:VAL:HG13	18:L:804:3PE:H31	1.96	0.48
11:N:98:TYR:O	11:N:102:LYS:NZ	2.37	0.48
1:F:348:ARG:HH22	2:E:132:CYS:HA	1.78	0.48
7:H:72:ASP:OD1	7:H:233:LYS:NZ	2.46	0.48
2:E:134:LEU:HD12	2:E:142:ASN:HB2	1.95	0.48
3:G:125:HIS:CD2	4:C:513:GLU:HG2	2.49	0.48
5:B:61:LEU:HB3	5:B:100:GLY:HA3	1.95	0.48
5:B:85:VAL:HA	19:B:302:UQ8:H10	1.96	0.48
11:N:70:ASP:OD2	11:N:70:ASP:N	2.45	0.48
7:H:262:GLY:HA3	7:H:270:TRP:CD1	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:K:46:PHE:HD1	12:K:58:GLY:HA2	1.78	0.47
10:M:252:PRO:HG2	10:M:257:VAL:HG21	1.96	0.47
3:G:472:PRO:HG3	3:G:799:THR:HA	1.94	0.47
11:N:161:ILE:HG23	12:K:35:LEU:HD11	1.96	0.47
12:K:46:PHE:CD1	12:K:58:GLY:HA2	2.50	0.47
3:G:247:GLU:HG3	3:G:249:ARG:HE	1.79	0.47
3:G:744:ASN:OD1	3:G:750:ARG:NH2	2.47	0.47
3:G:841:TYR:HD2	3:G:874:GLU:HB2	1.78	0.47
10:M:248:HIS:O	10:M:312:LYS:NZ	2.38	0.47
3:G:670:GLN:NE2	3:G:672:ASP:OD2	2.48	0.47
3:G:808:GLN:HG3	3:G:811:LYS:HB2	1.95	0.47
4:C:77:LEU:HB3	4:C:137:TYR:HB3	1.97	0.47
9:L:4:LEU:HA	9:L:48:ILE:HD11	1.96	0.47
11:N:367:TRP:HH2	20:N:501:LFA:H41	1.80	0.47
13:J:80:GLU:N	13:J:83:GLN:OE1	2.47	0.47
11:N:114:LEU:HD23	13:J:146:MET:HG2	1.97	0.47
11:N:119:LEU:HD22	11:N:253:VAL:HG11	1.96	0.47
4:C:254:ARG:HG3	5:B:103:PHE:HE1	1.80	0.47
4:C:300:PRO:HG3	4:C:492:PRO:HG2	1.96	0.47
7:H:268:PHE:HD1	20:H:601:LFA:H131	1.80	0.47
4:C:312:GLU:OE2	4:C:447:TYR:OH	2.27	0.47
5:B:138:ILE:HG23	5:B:140:SER:H	1.80	0.47
11:N:52:LEU:HD22	11:N:74:MET:HG2	1.97	0.47
3:G:402:LYS:HB2	3:G:429:HIS:CG	2.50	0.46
3:G:843:LYS:HD3	3:G:874:GLU:HB3	1.97	0.46
13:J:64:MET:HA	13:J:67:PHE:HB2	1.97	0.46
1:F:30:ARG:HH21	1:F:155:LEU:HD21	1.80	0.46
7:H:303:LYS:HE3	8:A:118:VAL:HG13	1.98	0.46
1:F:61:GLY:N	1:F:67:PHE:O	2.48	0.46
2:E:86:ARG:NH1	2:E:123:ASP:O	2.47	0.46
11:N:347:MET:HB2	11:N:360:PHE:HE1	1.80	0.46
1:F:264:LEU:HD13	1:F:268:THR:HG21	1.98	0.46
9:L:600:ILE:HG13	13:J:99:LEU:HD21	1.98	0.46
1:F:76:MET:HG3	1:F:123:LEU:HD11	1.97	0.46
8:A:80:VAL:O	8:A:83:LEU:HG	2.15	0.46
18:L:806:3PE:H2F1	18:M:1202:3PE:H3D2	1.98	0.46
3:G:451:ALA:O	3:G:456:GLN:NE2	2.43	0.46
4:C:133:ASN:HB3	4:C:422:TRP:HA	1.98	0.46
9:L:498:GLY:O	9:L:502:VAL:HG23	2.16	0.46
1:F:112:LEU:HD13	1:F:219:VAL:HG13	1.97	0.46
1:F:269:THR:HA	1:F:308:PRO:HA	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:67:GLU:HG3	5:B:159:PRO:HB2	1.97	0.46
3:G:431:LEU:O	3:G:446:ALA:N	2.48	0.46
3:G:146:ILE:HD11	3:G:197:GLY:HA2	1.98	0.46
3:G:517:ASN:HD21	3:G:798:PHE:HB2	1.81	0.46
3:G:617:GLU:HG2	3:G:638:PRO:HG3	1.98	0.46
3:G:669:THR:OG1	3:G:670:GLN:N	2.49	0.45
3:G:33:PRO:HB3	3:G:119:MET:HG3	1.97	0.45
10:M:234:LYS:HB3	10:M:267:ALA:HB2	1.98	0.45
10:M:410:ILE:O	10:M:414:SER:OG	2.30	0.45
11:N:305:HIS:ND1	11:N:329:TYR:OH	2.38	0.45
13:J:129:VAL:O	13:J:133:LEU:HB2	2.16	0.45
3:G:226:ALA:HB3	3:G:635:VAL:HG22	1.98	0.45
10:M:314:LEU:O	10:M:318:THR:HG23	2.16	0.45
12:K:1:MET:SD	12:K:1:MET:N	2.82	0.45
1:F:353:TRP:HZ2	3:G:44:VAL:HB	1.81	0.45
4:C:140:GLU:OE2	4:C:600:ARG:NH1	2.49	0.45
9:L:83:GLY:H	9:L:478:VAL:HG21	1.81	0.45
4:C:539:ALA:HB2	4:C:544:ASN:HB2	1.97	0.45
7:H:103:VAL:HG21	20:H:601:LFA:H61	1.98	0.45
9:L:381:VAL:HG21	9:L:461:LEU:HD23	1.97	0.45
10:M:164:GLY:O	10:M:168:ILE:HG12	2.16	0.45
3:G:306:ASP:OD1	3:G:309:ARG:NH1	2.43	0.45
4:C:255:GLY:HA3	5:B:138:ILE:HG12	1.99	0.45
5:B:118:LEU:HB3	7:H:71:GLU:HB3	1.99	0.45
7:H:160:LEU:O	7:H:163:SER:OG	2.31	0.45
9:L:230:SER:HB3	9:L:316:ILE:HG21	1.97	0.45
1:F:291:GLN:O	1:F:326:ALA:HA	2.17	0.45
4:C:470:LYS:NZ	4:C:540:THR:O	2.50	0.45
1:F:95:GLU:OE2	1:F:296:GLY:N	2.49	0.45
10:M:315:ILE:O	10:M:318:THR:OG1	2.29	0.45
11:N:125:LEU:HD23	11:N:186:PHE:HE1	1.82	0.45
1:F:396:THR:OG1	1:F:398:CYS:O	2.34	0.45
2:E:90:ARG:HB2	2:E:144:MET:HB3	1.99	0.45
3:G:34:TYR:O	3:G:115:HIS:NE2	2.39	0.45
1:F:398:CYS:SG	1:F:399:ALA:N	2.89	0.44
11:N:118:LEU:HD22	13:J:143:LEU:HD13	1.97	0.44
3:G:320:PRO:HB2	3:G:537:SER:HB2	2.00	0.44
6:I:80:ALA:HB2	6:I:90:GLU:HB2	1.99	0.44
7:H:38:ARG:HD2	7:H:38:ARG:HA	1.86	0.44
7:H:82:ILE:HB	7:H:136:SER:HB2	1.99	0.44
10:M:79:ILE:HA	10:M:138:LEU:HD22	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:94:ASP:OD1	5:B:94:ASP:N	2.49	0.44
7:H:149:ALA:HB1	7:H:208:HIS:CE1	2.53	0.44
4:C:520:LEU:HD23	4:C:520:LEU:HA	1.82	0.44
5:B:156:PRO:HG2	6:I:122:MET:HB2	2.00	0.44
1:F:94:MET:HB3	1:F:178:TYR:HD1	1.82	0.44
3:G:886:LEU:HD22	3:G:893:ILE:HD13	2.00	0.44
2:E:33:ARG:HG3	2:E:64:ILE:HG21	1.99	0.44
5:B:217:PRO:HD3	6:I:144:LYS:HB3	2.00	0.44
10:M:142:PHE:HA	10:M:145:MET:HB2	2.00	0.44
1:F:191:GLU:OE1	1:F:193:ARG:NH2	2.45	0.44
7:H:21:ILE:O	7:H:25:VAL:HG12	2.18	0.44
7:H:77:PHE:O	7:H:138:ASN:ND2	2.51	0.44
1:F:13:LEU:HD11	1:F:223:CYS:HB3	1.99	0.43
6:I:55:ASP:OD1	6:I:55:ASP:N	2.51	0.43
7:H:211:PRO:HB2	7:H:292:PRO:HD3	1.99	0.43
4:C:265:TRP:HB2	4:C:526:PRO:HG2	2.01	0.43
7:H:265:LEU:HB2	7:H:270:TRP:CD1	2.52	0.43
10:M:65:SER:HB3	10:M:83:ILE:HG22	2.00	0.43
3:G:224:GLN:HB3	3:G:243:GLU:HG3	1.99	0.43
3:G:501:ILE:HG12	3:G:532:THR:HB	1.98	0.43
4:C:170:ARG:O	4:C:258:LYS:NZ	2.51	0.43
10:M:195:VAL:HG11	10:M:215:MET:HG2	1.98	0.43
3:G:232:GLN:HB2	14:G:1003:SF4:S3	2.58	0.43
10:M:29:ARG:NH1	10:M:106:TRP:O	2.51	0.43
10:M:417:VAL:HG12	10:M:418:VAL:HG13	2.00	0.43
1:F:41:ALA:HA	1:F:45:LEU:HB3	2.01	0.43
1:F:188:ASN:ND2	1:F:196:ASN:O	2.41	0.43
3:G:828:GLN:H	3:G:828:GLN:HG3	1.69	0.43
10:M:287:ALA:O	10:M:291:MET:HB2	2.19	0.43
1:F:397:PHE:HB3	14:F:501:SF4:S2	2.58	0.43
4:C:19:ASP:OD1	4:C:19:ASP:N	2.42	0.43
4:C:351:GLU:HB3	6:I:41:PRO:HG3	2.01	0.43
4:C:594:VAL:HG23	4:C:597:ASP:HB2	2.01	0.43
5:B:48:TRP:HA	5:B:51:LYS:HE2	1.99	0.43
9:L:135:ASN:N	9:L:135:ASN:OD1	2.50	0.43
10:M:421:ILE:O	10:M:425:SER:OG	2.29	0.43
3:G:443:ASP:OD1	3:G:443:ASP:N	2.51	0.43
3:G:727:ARG:HA	3:G:727:ARG:NH1	2.34	0.43
18:C:701:3PE:H361	18:C:701:3PE:H292	2.01	0.43
5:B:6:THR:HG23	5:B:192:VAL:HB	1.99	0.43
4:C:338:PHE:HE1	7:H:45:ASN:HB2	1.83	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:7:LEU:HB3	18:I:203:3PE:H361	2.01	0.43
6:I:83:LYS:H	6:I:83:LYS:HG2	1.56	0.43
9:L:241:ASP:N	9:L:241:ASP:OD1	2.51	0.43
10:M:498:GLN:O	10:M:502:ASN:HB2	2.18	0.43
1:F:24:VAL:HG13	1:F:28:GLU:HB3	2.01	0.43
1:F:307:LEU:HD12	1:F:314:ILE:HD13	2.00	0.43
4:C:418:GLU:HA	4:C:421:GLU:HG2	2.01	0.43
4:C:501:THR:HG23	4:C:521:GLN:HB3	2.01	0.43
4:C:344:GLN:HG2	5:B:75:VAL:HG21	2.01	0.42
8:A:31:LEU:HD23	8:A:31:LEU:HA	1.85	0.42
18:L:805:3PE:H3D1	18:L:805:3PE:H291	2.01	0.42
10:M:481:TYR:HD2	20:M:1201:LFA:H122	1.84	0.42
3:G:175:TYR:O	3:G:181:VAL:HA	2.19	0.42
3:G:559:GLU:O	3:G:588:LYS:NZ	2.35	0.42
4:C:389:LYS:HE2	4:C:389:LYS:HB2	1.85	0.42
4:C:391:LEU:HD23	4:C:391:LEU:HA	1.86	0.42
5:B:123:VAL:HB	5:B:151:VAL:HA	2.01	0.42
2:E:96:VAL:HG11	2:E:137:CYS:HB3	2.00	0.42
6:I:67:ALA:HA	6:I:75:ILE:HB	2.01	0.42
11:N:162:LEU:HB3	11:N:216:PHE:CE1	2.54	0.42
12:K:43:ALA:HB1	12:K:62:TYR:CD1	2.54	0.42
3:G:368:LEU:HD21	3:G:390:ARG:HG3	2.02	0.42
10:M:370:ASP:HB3	10:M:373:MET:HG2	2.00	0.42
7:H:101:VAL:HG11	7:H:250:ALA:HB1	2.02	0.42
9:L:34:GLY:HA2	9:L:121:ASN:HD21	1.84	0.42
9:L:551:LYS:HA	9:L:551:LYS:HD3	1.75	0.42
13:J:24:ASN:HB3	13:J:27:HIS:HB2	2.02	0.42
1:F:178:TYR:HB3	1:F:349:GLU:HB3	2.02	0.42
5:B:85:VAL:HG13	19:B:302:UQ8:H15A	2.00	0.42
7:H:210:HIS:HB3	7:H:286:ARG:HA	2.02	0.42
8:A:83:LEU:HD11	12:K:63:ILE:HG23	2.02	0.42
8:A:88:TRP:HB2	13:J:134:PHE:CE1	2.55	0.42
11:N:184:LEU:HD21	12:K:46:PHE:HZ	1.84	0.42
15:F:502:FMN:H9	15:F:502:FMN:H1'1	1.82	0.42
6:I:24:ALA:HB2	7:H:43:PHE:CD1	2.55	0.42
9:L:75:ILE:HG21	9:L:137:LEU:HD23	2.02	0.42
10:M:304:MET:O	10:M:308:GLN:HG2	2.20	0.42
4:C:52:ILE:HD12	4:C:60:VAL:HG21	2.01	0.42
10:M:72:ILE:HB	10:M:77:ILE:HB	2.01	0.42
11:N:133:GLU:HG3	12:K:68:LEU:HD22	2.02	0.42
1:F:286:LYS:HE3	1:F:286:LYS:HB3	1.93	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:109:LEU:HD23	2:E:162:LEU:HD11	2.01	0.42
9:L:137:LEU:HD12	9:L:137:LEU:HA	1.92	0.42
9:L:473:PRO:HB2	9:L:475:LEU:HG	2.02	0.42
10:M:423:VAL:HG21	18:M:1204:3PE:H231	2.01	0.42
11:N:360:PHE:CE2	11:N:362:TYR:HB3	2.54	0.42
3:G:98:MET:HG3	4:C:513:GLU:HG3	2.02	0.41
3:G:157:TYR:N	14:G:1002:SF4:S4	2.89	0.41
3:G:758:ALA:HB3	3:G:761:TRP:HB2	2.02	0.41
3:G:862:PHE:HB3	3:G:905:LEU:HD22	2.02	0.41
4:C:228:HIS:O	4:C:595:MET:N	2.49	0.41
4:C:422:TRP:CG	4:C:571:GLN:HG3	2.55	0.41
5:B:146:ASP:OD2	6:I:127:ARG:NH1	2.45	0.41
9:L:505:ILE:HG22	9:L:506:LEU:HD23	2.01	0.41
10:M:185:MET:HB2	10:M:230:ALA:HB2	2.02	0.41
11:N:323:MET:H	11:N:323:MET:HG3	1.66	0.41
1:F:12:PRO:HB3	1:F:235:TRP:HH2	1.85	0.41
3:G:361:GLY:HA2	3:G:795:LEU:HG	2.03	0.41
3:G:452:PRO:HD3	3:G:880:THR:HG21	2.00	0.41
4:C:549:THR:HB	4:C:558:ARG:HB3	2.01	0.41
18:C:701:3PE:H2I1	7:H:196:PHE:HZ	1.83	0.41
6:I:61:VAL:HG23	6:I:63:CYS:HB3	2.02	0.41
7:H:179:ILE:HG21	7:H:255:LEU:HD23	2.01	0.41
9:L:425:THR:HA	9:L:428:TYR:CE2	2.55	0.41
9:L:531:LEU:HD23	9:L:531:LEU:HA	1.91	0.41
11:N:379:MET:HE1	11:N:461:ALA:HA	2.02	0.41
1:F:41:ALA:HB2	1:F:229:LEU:HD21	2.02	0.41
4:C:572:ILE:HD13	4:C:572:ILE:HA	1.94	0.41
9:L:288:ALA:HB2	9:L:321:LEU:HD12	2.01	0.41
10:M:235:MET:HB3	10:M:237:VAL:HG23	2.01	0.41
3:G:217:TYR:HB3	6:I:79:LYS:HD2	2.01	0.41
4:C:403:ILE:HB	7:H:290:PRO:HG2	2.03	0.41
5:B:120:PRO:HD2	7:H:70:LYS:HD2	2.02	0.41
9:L:390:PRO:HA	9:L:396:PHE:CG	2.56	0.41
10:M:432:ALA:HA	10:M:435:TYR:CE2	2.55	0.41
1:F:348:ARG:HD2	6:I:180:PRO:HB2	2.02	0.41
3:G:564:ASP:OD1	3:G:564:ASP:N	2.36	0.41
4:C:218:LEU:HB3	7:H:141:TYR:HE1	1.86	0.41
4:C:391:LEU:HD11	4:C:474:LEU:HD22	2.03	0.41
7:H:28:CYS:O	7:H:32:MET:HB2	2.21	0.41
11:N:12:LEU:HD12	11:N:12:LEU:HA	1.88	0.41
12:K:4:LEU:HD12	12:K:48:VAL:HG12	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:K:83:LEU:HD11	12:K:95:VAL:HG21	2.02	0.41
1:F:179:ILE:HD12	1:F:179:ILE:HA	1.88	0.41
1:F:293:GLY:HA3	1:F:322:GLY:HA3	2.03	0.41
3:G:466:ALA:HB3	3:G:489:VAL:HG21	2.03	0.41
3:G:465:HIS:HA	3:G:471:ALA:HB3	2.03	0.41
7:H:17:LYS:HG2	7:H:107:TRP:CH2	2.56	0.41
9:L:372:ILE:HB	9:L:375:VAL:HB	2.01	0.41
3:G:8:VAL:HG11	3:G:30:LEU:HD13	2.02	0.41
7:H:143:LEU:O	7:H:147:MET:HG2	2.21	0.41
9:L:92:VAL:HG21	9:L:127:MET:HE2	2.03	0.41
1:F:218:ASN:N	15:F:502:FMN:O2P	2.54	0.41
3:G:399:VAL:HA	3:G:429:HIS:HB2	2.02	0.41
3:G:422:ASN:O	3:G:425:GLN:NE2	2.51	0.41
3:G:652:ARG:NH2	3:G:733:ASP:OD1	2.51	0.41
4:C:274:ARG:NH2	5:B:158:CYS:SG	2.88	0.41
5:B:28:PRO:HB2	5:B:29:LEU:HD12	2.02	0.41
5:B:180:ARG:HB2	5:B:193:TYR:HB2	2.03	0.41
6:I:83:LYS:HE2	6:I:83:LYS:HB3	1.94	0.41
7:H:128:TYR:OH	13:J:64:MET:HB2	2.20	0.41
9:L:180:PHE:O	9:L:221:MET:HB3	2.21	0.41
9:L:495:ILE:HD13	9:L:495:ILE:HA	1.95	0.41
10:M:232:ALA:HB1	10:M:237:VAL:HB	2.02	0.41
3:G:619:ASP:OD1	3:G:634:GLN:N	2.50	0.41
5:B:89:SER:OG	7:H:227:ILE:O	2.37	0.41
7:H:9:ILE:HD13	7:H:9:ILE:HA	1.97	0.41
1:F:297:THR:HG22	1:F:320:ARG:HB2	2.03	0.40
3:G:106:PRO:HD3	4:C:515:LEU:HD21	2.03	0.40
3:G:843:LYS:HB2	3:G:885:GLY:HA3	2.03	0.40
10:M:84:ASP:OD2	10:M:273:ARG:NH2	2.44	0.40
11:N:141:GLY:HA3	13:J:154:VAL:HG22	2.02	0.40
11:N:390:LEU:HD21	11:N:474:LEU:HD22	2.03	0.40
9:L:8:ILE:HG21	18:L:805:3PE:H3G2	2.02	0.40
10:M:233:VAL:HG22	10:M:240:LEU:HB3	2.03	0.40
3:G:149:GLU:OE2	6:I:163:LYS:NZ	2.54	0.40
7:H:15:ILE:HG23	8:A:18:ILE:HG21	2.04	0.40
18:L:805:3PE:H2E2	18:L:805:3PE:H3A2	2.03	0.40
10:M:404:PHE:O	10:M:408:PHE:HB2	2.21	0.40
10:M:447:LYS:HD2	10:M:447:LYS:HA	1.82	0.40
1:F:387:LEU:O	1:F:391:LEU:HB2	2.21	0.40
3:G:227:PRO:HD3	3:G:754:PRO:HB3	2.04	0.40
19:B:302:UQ8:H15A	19:B:302:UQ8:H17A	1.91	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:194:PHE:HA	7:H:197:ILE:HG12	2.03	0.40
9:L:171:PHE:HB3	10:M:437:LEU:HD21	2.03	0.40
1:F:291:GLN:HA	1:F:292:PRO:HD3	1.91	0.40
3:G:171:ASP:N	3:G:171:ASP:OD1	2.55	0.40
3:G:595:VAL:HG22	3:G:610:LEU:HD12	2.03	0.40
4:C:539:ALA:N	4:C:542:GLY:O	2.55	0.40
5:B:56:PRO:HG3	5:B:72:PHE:HZ	1.87	0.40
5:B:208:ARG:NH1	6:I:132:TYR:OH	2.54	0.40
7:H:204:VAL:HG12	7:H:212:PHE:HD2	1.87	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%)	423 (97%)	14 (3%)	0	100	100
2	E	154/156 (99%)	147 (96%)	7 (4%)	0	100	100
3	G	903/905 (100%)	883 (98%)	20 (2%)	0	100	100
4	C	581/600 (97%)	569 (98%)	12 (2%)	0	100	100
5	B	192/220 (87%)	186 (97%)	6 (3%)	0	100	100
6	I	178/180 (99%)	175 (98%)	3 (2%)	0	100	100
7	H	307/325 (94%)	298 (97%)	9 (3%)	0	100	100
8	A	97/147 (66%)	97 (100%)	0	0	100	100
9	L	583/613 (95%)	567 (97%)	16 (3%)	0	100	100
10	M	502/504 (100%)	492 (98%)	10 (2%)	0	100	100
11	N	476/485 (98%)	465 (98%)	10 (2%)	1 (0%)	47	82
12	K	98/100 (98%)	95 (97%)	3 (3%)	0	100	100
13	J	160/162 (99%)	155 (97%)	5 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	4668/4836 (96%)	4552 (98%)	115 (2%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	N	64	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%)	337 (96%)	16 (4%)	27 64
2	E	129/129 (100%)	124 (96%)	5 (4%)	32 69
3	G	732/732 (100%)	711 (97%)	21 (3%)	42 76
4	C	500/519 (96%)	487 (97%)	13 (3%)	46 78
5	B	171/192 (89%)	166 (97%)	5 (3%)	42 76
6	I	154/154 (100%)	149 (97%)	5 (3%)	39 74
7	H	257/269 (96%)	248 (96%)	9 (4%)	36 71
8	A	79/119 (66%)	76 (96%)	3 (4%)	33 69
9	L	467/486 (96%)	451 (97%)	16 (3%)	37 72
10	M	413/413 (100%)	400 (97%)	13 (3%)	40 75
11	N	380/385 (99%)	371 (98%)	9 (2%)	49 79
12	K	79/79 (100%)	77 (98%)	2 (2%)	47 79
13	J	125/128 (98%)	121 (97%)	4 (3%)	39 74
All	All	3839/3958 (97%)	3718 (97%)	121 (3%)	42 74

All (121) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	89	CYS
1	F	94	MET

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Mol	Chain	Res	Type
1	F	105	MET
1	F	126	TYR
1	F	131	PHE
1	F	216	VAL
1	F	241	LYS
1	F	262	TRP
1	F	316	LYS
1	F	327	MET
1	F	335	MET
1	F	351	CYS
1	F	357	CYS
1	F	386	GLN
1	F	398	CYS
1	F	425	GLN
2	E	27	HIS
2	E	29	TYR
2	E	44	GLN
2	E	86	ARG
2	E	144	MET
3	G	23	GLU
3	G	119	MET
3	G	129	ARG
3	G	181	VAL
3	G	265	CYS
3	G	283	GLN
3	G	310	GLN
3	G	336	GLU
3	G	546	MET
3	G	564	ASP
3	G	643	SER
3	G	714	ARG
3	G	727	ARG
3	G	740	MET
3	G	750	ARG
3	G	796	ASP
3	G	832	VAL
3	G	851	LYS
3	G	877	GLU
3	G	901	HIS
3	G	905	LEU
4	C	23	ASP
4	C	65	LYS

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Mol	Chain	Res	Type
4	C	110	ASP
4	C	127	PHE
4	C	193	GLU
4	C	238	ASP
4	C	273	ASP
4	C	285	MET
4	C	301	ASP
4	C	333	MET
4	C	472	GLU
4	C	545	SER
4	C	577	ARG
5	B	39	MET
5	B	63	CYS
5	B	84	GLU
5	B	184	SER
5	B	194	ARG
6	I	1	MET
6	I	55	ASP
6	I	77	LEU
6	I	153	MET
6	I	171	LYS
7	H	8	LEU
7	H	63	ASP
7	H	67	MET
7	H	79	ASP
7	H	237	PHE
7	H	268	PHE
7	H	282	PHE
7	H	286	ARG
7	H	298	MET
8	A	27	CYS
8	A	89	SER
8	A	110	LEU
9	L	1	MET
9	L	77	PHE
9	L	123	PHE
9	L	175	ARG
9	L	241	ASP
9	L	247	THR
9	L	313	MET
9	L	318	TYR
9	L	336	MET

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Mol	Chain	Res	Type
9	L	351	SER
9	L	379	PHE
9	L	481	GLN
9	L	489	SER
9	L	513	LEU
9	L	568	MET
9	L	586	SER
10	M	54	LEU
10	M	74	ARG
10	M	80	HIS
10	M	107	LYS
10	M	159	HIS
10	M	234	LYS
10	M	303	TRP
10	M	370	ASP
10	M	408	PHE
10	M	426	THR
10	M	435	TYR
10	M	439	MET
10	M	451	GLN
11	N	61	MET
11	N	67	MET
11	N	168	SER
11	N	200	GLU
11	N	207	PHE
11	N	256	ARG
11	N	318	THR
11	N	431	SER
11	N	482	MET
12	K	1	MET
12	K	86	ARG
13	J	3	PHE
13	J	40	SER
13	J	59	TYR
13	J	69	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
9	L	409	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 32 ligands modelled in this entry, 1 is monoatomic - leaving 31 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
19	UQ8	B	302	-	29,29,53	0.29	0	35,38,67	0.65	2 (5%)
20	LFA	H	601	-	19,19,19	0.18	0	18,18,18	0.19	0
15	FMN	F	502	-	33,33,33	1.07	2 (6%)	48,50,50	1.20	8 (16%)
18	3PE	C	701	-	50,50,50	0.29	0	53,55,55	0.32	0
20	LFA	L	802	-	19,19,19	0.15	0	18,18,18	0.14	0
16	FES	G	1004	3	0,4,4	-	-	-		
14	SF4	I	202	6	0,12,12	-	-	-		
18	3PE	A	202	-	50,50,50	0.30	0	53,55,55	0.28	0
18	3PE	M	1202	-	50,50,50	0.31	0	53,55,55	0.30	0
20	LFA	N	502	-	13,13,19	0.13	0	12,12,18	0.15	0
18	3PE	H	604	-	50,50,50	0.31	0	53,55,55	0.31	0
14	SF4	B	301	5	0,12,12	-	-	-		
14	SF4	G	1002	3	0,12,12	-	-	-		
18	3PE	M	1204	-	50,50,50	0.30	0	53,55,55	0.31	0
14	SF4	I	201	6	0,12,12	-	-	-		
14	SF4	G	1003	3	0,12,12	-	-	-		
18	3PE	L	804	-	24,24,50	0.42	0	27,29,55	0.39	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
18	3PE	M	1203	-	50,50,50	0.29	0	53,55,55	0.30	0
18	3PE	A	201	-	34,34,50	0.35	0	37,39,55	0.33	0
18	3PE	L	806	-	50,50,50	0.30	0	53,55,55	0.28	0
18	3PE	L	801	-	50,50,50	0.30	0	53,55,55	0.29	0
14	SF4	F	501	1	0,12,12	-	-	-		
18	3PE	I	203	-	50,50,50	0.30	0	53,55,55	0.28	0
18	3PE	H	603	-	50,50,50	0.30	0	53,55,55	0.32	0
20	LFA	M	1201	-	19,19,19	0.13	0	18,18,18	0.09	0
18	3PE	L	805	-	50,50,50	0.31	0	53,55,55	0.32	0
20	LFA	N	501	-	19,19,19	0.12	0	18,18,18	0.13	0
14	SF4	G	1001	3	0,12,12	-	-	-		
18	3PE	H	602	-	38,38,50	0.34	0	41,43,55	0.33	0
16	FES	E	201	2	0,4,4	-	-	-		
18	3PE	L	803	-	50,50,50	0.30	0	53,55,55	0.31	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
19	UQ8	B	302	-	-	6/23/47/75	0/1/1/1
20	LFA	H	601	-	-	3/17/17/17	-
15	FMN	F	502	-	-	10/18/18/18	0/3/3/3
20	LFA	L	802	-	-	0/17/17/17	-
18	3PE	C	701	-	-	8/54/54/54	-
16	FES	G	1004	3	-	-	0/1/1/1
16	FES	E	201	2	-	-	0/1/1/1
14	SF4	I	202	6	-	-	0/6/5/5
18	3PE	A	202	-	-	11/54/54/54	-
18	3PE	M	1202	-	-	7/54/54/54	-
20	LFA	N	502	-	-	0/11/11/17	-
18	3PE	H	604	-	-	9/54/54/54	-
14	SF4	B	301	5	-	-	0/6/5/5
14	SF4	G	1002	3	-	-	0/6/5/5
18	3PE	M	1204	-	-	14/54/54/54	-
14	SF4	I	201	6	-	-	0/6/5/5
14	SF4	G	1003	3	-	-	0/6/5/5
18	3PE	L	804	-	-	6/28/28/54	-
18	3PE	M	1203	-	-	13/54/54/54	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
18	3PE	A	201	-	-	10/38/38/54	-
18	3PE	L	806	-	-	12/54/54/54	-
18	3PE	L	801	-	-	8/54/54/54	-
18	3PE	H	603	-	-	5/54/54/54	-
18	3PE	I	203	-	-	7/54/54/54	-
20	LFA	M	1201	-	-	0/17/17/17	-
14	SF4	F	501	1	-	-	0/6/5/5
18	3PE	L	805	-	-	15/54/54/54	-
20	LFA	N	501	-	-	0/17/17/17	-
18	3PE	H	602	-	-	14/42/42/54	-
14	SF4	G	1001	3	-	-	0/6/5/5
18	3PE	L	803	-	-	14/54/54/54	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	F	502	FMN	C4A-N5	3.79	1.38	1.30
15	F	502	FMN	C10-N1	2.50	1.38	1.33

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
15	F	502	FMN	C4-N3-C2	-3.19	119.75	125.64
15	F	502	FMN	C4A-C4-N3	2.70	120.06	113.19
15	F	502	FMN	O4-C4-C4A	-2.50	119.97	126.60
15	F	502	FMN	C4A-C10-N10	2.40	119.99	116.48
19	B	302	UQ8	C8-C7-C6	2.38	118.45	112.05
15	F	502	FMN	C4A-C10-N1	-2.35	119.28	124.73
15	F	502	FMN	C10-C4A-N5	-2.19	120.20	124.86
19	B	302	UQ8	C7-C6-C5	-2.19	115.85	118.48
15	F	502	FMN	C9A-C5A-N5	-2.15	120.10	122.43
15	F	502	FMN	C5A-C9A-N10	2.02	120.04	117.95

There are no chirality outliers.

All (172) 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'

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Mol	Chain	Res	Type	Atoms
15	F	502	FMN	C1'-C2'-C3'-C4'
15	F	502	FMN	C5'-O5'-P-O1P
15	F	502	FMN	C5'-O5'-P-O3P
18	C	701	3PE	C11-O13-P-O11
18	C	701	3PE	C11-O13-P-O14
18	C	701	3PE	O13-C11-C12-N
18	H	602	3PE	C11-O13-P-O11
18	H	602	3PE	C11-O13-P-O12
18	H	602	3PE	C11-O13-P-O14
18	H	602	3PE	O13-C11-C12-N
18	H	603	3PE	O13-C11-C12-N
18	H	604	3PE	C1-O11-P-O14
18	H	604	3PE	C11-O13-P-O12
18	A	201	3PE	C1-O11-P-O14
18	A	201	3PE	C11-O13-P-O14
18	A	201	3PE	O13-C11-C12-N
18	A	202	3PE	C1-O11-P-O12
18	A	202	3PE	C1-O11-P-O13
18	A	202	3PE	C11-O13-P-O14
18	A	202	3PE	O13-C11-C12-N
18	L	801	3PE	O13-C11-C12-N
18	L	803	3PE	C1-O11-P-O12
18	L	803	3PE	C11-O13-P-O12
18	L	803	3PE	C11-O13-P-O14
18	L	804	3PE	C1-O11-P-O12
18	L	804	3PE	C1-O11-P-O14
18	L	804	3PE	C11-O13-P-O11
18	L	804	3PE	C11-O13-P-O12
18	L	804	3PE	C11-O13-P-O14
18	L	805	3PE	C1-O11-P-O14
18	L	805	3PE	C11-O13-P-O11
18	L	805	3PE	C11-O13-P-O12
18	L	805	3PE	C11-O13-P-O14
18	L	805	3PE	C2-C1-O11-P
18	L	805	3PE	O13-C11-C12-N
18	L	806	3PE	C11-O13-P-O12
18	L	806	3PE	C11-O13-P-O14
18	L	806	3PE	O13-C11-C12-N
18	L	806	3PE	O21-C2-C3-O31
18	M	1202	3PE	O13-C11-C12-N
18	M	1203	3PE	C1-O11-P-O12
18	M	1203	3PE	C11-O13-P-O12

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Mol	Chain	Res	Type	Atoms
18	M	1203	3PE	C11-O13-P-O14
18	M	1204	3PE	C1-O11-P-O14
18	M	1204	3PE	C11-O13-P-O11
18	M	1204	3PE	C11-O13-P-O12
18	M	1204	3PE	C11-O13-P-O14
18	M	1204	3PE	O13-C11-C12-N
19	B	302	UQ8	C14-C16-C17-C18
19	B	302	UQ8	C15-C14-C16-C17
19	B	302	UQ8	C13-C14-C16-C17
18	L	805	3PE	O21-C2-C3-O31
18	L	805	3PE	C31-C32-C33-C34
18	L	805	3PE	C3C-C3D-C3E-C3F
18	H	604	3PE	C1-O11-P-O13
18	H	604	3PE	C11-O13-P-O11
18	L	803	3PE	C1-O11-P-O13
18	L	803	3PE	C11-O13-P-O11
18	L	804	3PE	C1-O11-P-O13
18	L	806	3PE	C1-O11-P-O13
18	L	806	3PE	C11-O13-P-O11
18	M	1203	3PE	C11-O13-P-O11
18	M	1204	3PE	C1-O11-P-O13
18	M	1202	3PE	C3C-C3D-C3E-C3F
18	L	801	3PE	C2C-C2D-C2E-C2F
18	L	803	3PE	C3D-C3E-C3F-C3G
18	L	801	3PE	C37-C38-C39-C3A
20	H	601	LFA	C14-C15-C16-C17
18	L	806	3PE	C2-C1-O11-P
18	M	1204	3PE	C2D-C2E-C2F-C2G
18	M	1203	3PE	C3C-C3D-C3E-C3F
18	H	604	3PE	C21-C22-C23-C24
18	L	801	3PE	C3E-C3F-C3G-C3H
18	M	1202	3PE	C24-C25-C26-C27
18	H	603	3PE	C31-C32-C33-C34
15	F	502	FMN	O2'-C2'-C3'-C4'
18	I	203	3PE	C1-O11-P-O13
18	H	602	3PE	C1-O11-P-O13
18	A	202	3PE	C11-O13-P-O11
18	M	1203	3PE	C2-C1-O11-P
18	H	604	3PE	C34-C35-C36-C37
18	H	603	3PE	C32-C33-C34-C35
18	L	801	3PE	C23-C24-C25-C26
18	M	1203	3PE	C26-C27-C28-C29

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Mol	Chain	Res	Type	Atoms
15	F	502	FMN	C2'-C3'-C4'-C5'
18	L	805	3PE	C39-C3A-C3B-C3C
18	H	602	3PE	O11-C1-C2-C3
19	B	302	UQ8	C9-C11-C12-C13
18	M	1204	3PE	C31-C32-C33-C34
18	M	1204	3PE	O31-C31-C32-C33
18	L	806	3PE	C2A-C2B-C2C-C2D
18	L	805	3PE	C1-C2-C3-O31
18	L	806	3PE	C1-C2-C3-O31
18	A	201	3PE	C11-O13-P-O11
18	A	201	3PE	C31-C32-C33-C34
18	L	803	3PE	C3F-C3G-C3H-C3I
18	L	803	3PE	C3B-C3C-C3D-C3E
18	M	1204	3PE	C28-C29-C2A-C2B
18	I	203	3PE	C2-C1-O11-P
18	H	602	3PE	C2-C1-O11-P
18	A	202	3PE	O11-C1-C2-C3
15	F	502	FMN	O2'-C2'-C3'-O3'
15	F	502	FMN	C5'-O5'-P-O2P
20	H	601	LFA	C7-C8-C9-C10
18	H	603	3PE	C1-C2-C3-O31
18	A	202	3PE	C2-C1-O11-P
18	A	202	3PE	O11-C1-C2-O21
18	L	805	3PE	C34-C35-C36-C37
18	H	604	3PE	C33-C34-C35-C36
18	A	201	3PE	C2-C1-O11-P
18	I	203	3PE	C1-O11-P-O12
18	H	604	3PE	C1-O11-P-O12
18	A	202	3PE	C1-O11-P-O14
18	L	803	3PE	C1-O11-P-O14
18	L	806	3PE	C1-O11-P-O12
18	L	806	3PE	C1-O11-P-O14
18	M	1203	3PE	C1-O11-P-O14
18	M	1204	3PE	C1-O11-P-O12
18	H	602	3PE	O11-C1-C2-O21
18	L	803	3PE	C39-C3A-C3B-C3C
18	A	202	3PE	C23-C24-C25-C26
18	L	801	3PE	C33-C34-C35-C36
18	M	1204	3PE	C37-C38-C39-C3A
18	A	201	3PE	O31-C31-C32-C33
18	H	603	3PE	O21-C2-C3-O31
18	M	1202	3PE	C1-O11-P-O13

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Mol	Chain	Res	Type	Atoms
18	M	1202	3PE	C11-O13-P-O11
18	H	602	3PE	C29-C2A-C2B-C2C
19	B	302	UQ8	C5-C4-O4-C4M
18	M	1202	3PE	C2-C1-O11-P
20	H	601	LFA	C11-C10-C9-C8
18	M	1203	3PE	O13-C11-C12-N
18	A	202	3PE	O21-C21-C22-C23
18	C	701	3PE	C3D-C3E-C3F-C3G
18	L	801	3PE	C34-C35-C36-C37
18	A	201	3PE	C36-C37-C38-C39
18	M	1203	3PE	C1-O11-P-O13
18	H	604	3PE	C2F-C2G-C2H-C2I
18	M	1204	3PE	O32-C31-C32-C33
18	L	801	3PE	C25-C26-C27-C28
18	L	805	3PE	C3E-C3F-C3G-C3H
18	L	806	3PE	C2B-C2C-C2D-C2E
18	L	805	3PE	C3D-C3E-C3F-C3G
18	M	1203	3PE	C2F-C2G-C2H-C2I
18	M	1203	3PE	C28-C29-C2A-C2B
18	H	602	3PE	C25-C26-C27-C28
18	I	203	3PE	C2D-C2E-C2F-C2G
18	I	203	3PE	O21-C21-C22-C23
18	H	602	3PE	O21-C21-C22-C23
19	B	302	UQ8	C3-C4-O4-C4M
18	L	803	3PE	C3E-C3F-C3G-C3H
18	A	201	3PE	C1-O11-P-O13
18	I	203	3PE	C2A-C2B-C2C-C2D
18	L	803	3PE	O31-C31-C32-C33
18	H	602	3PE	C1-O11-P-O14
18	M	1202	3PE	C11-O13-P-O14
18	H	602	3PE	O22-C21-C22-C23
18	L	805	3PE	O21-C21-C22-C23
15	F	502	FMN	C1'-C2'-C3'-O3'
18	H	602	3PE	C2C-C2D-C2E-C2F
18	A	201	3PE	C32-C33-C34-C35
18	C	701	3PE	O21-C21-C22-C23
18	L	803	3PE	O32-C31-C32-C33
18	C	701	3PE	O31-C31-C32-C33
18	L	803	3PE	O21-C21-C22-C23
18	C	701	3PE	O32-C31-C32-C33
18	C	701	3PE	C25-C26-C27-C28
18	M	1203	3PE	O21-C21-C22-C23

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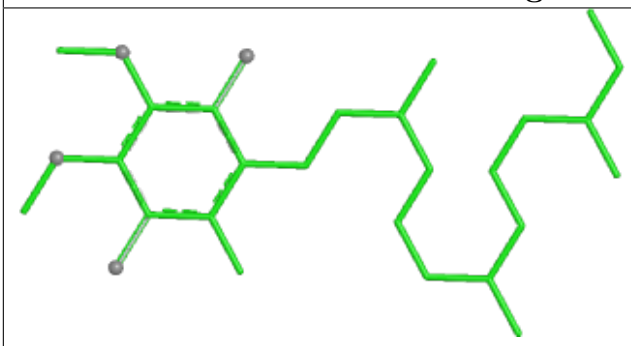
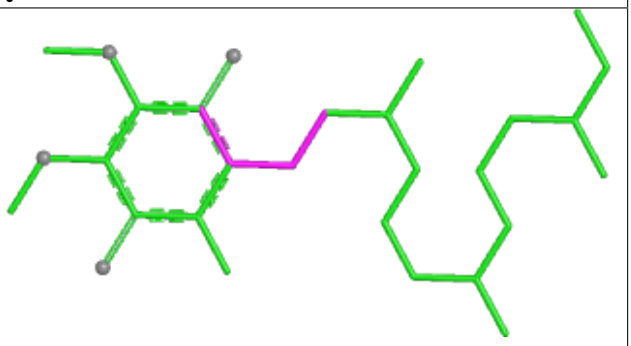
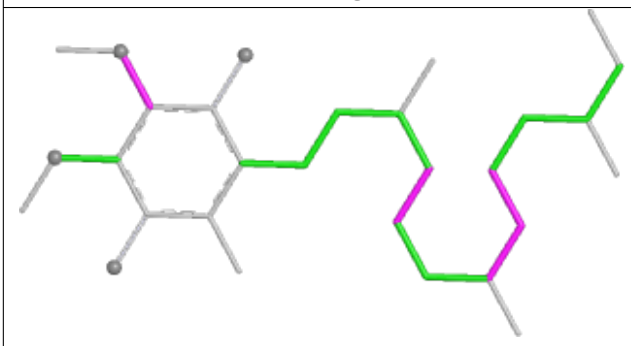
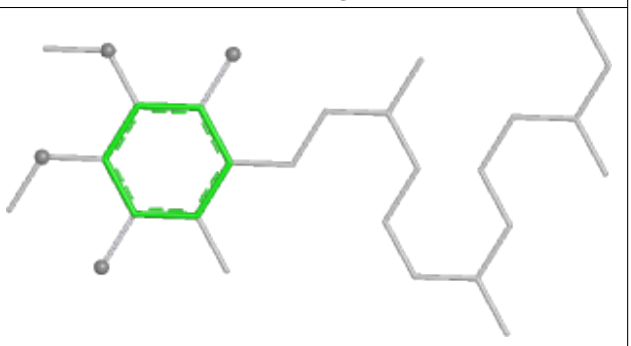
Mol	Chain	Res	Type	Atoms
18	M	1204	3PE	C26-C27-C28-C29
18	I	203	3PE	O22-C21-C22-C23

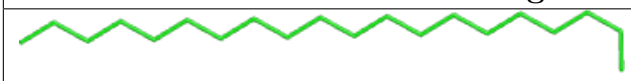
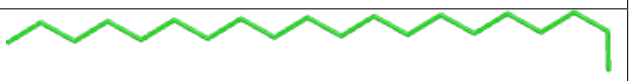
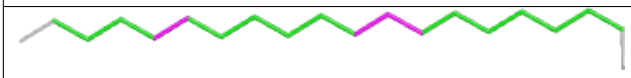
There are no ring outliers.

20 monomers are involved in 35 short contacts:

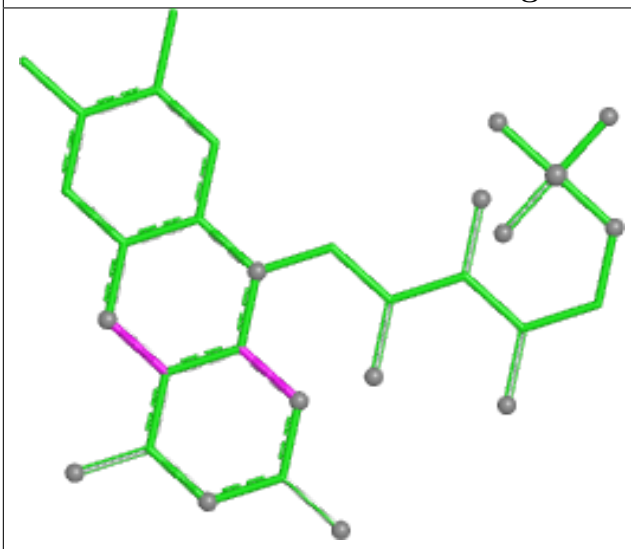
Mol	Chain	Res	Type	Clashes	Symm-Clashes
19	B	302	UQ8	3	0
20	H	601	LFA	3	0
15	F	502	FMN	3	0
18	C	701	3PE	4	0
18	A	202	3PE	2	0
18	M	1202	3PE	1	0
18	H	604	3PE	3	0
14	G	1002	SF4	1	0
18	M	1204	3PE	1	0
14	G	1003	SF4	1	0
18	L	804	3PE	1	0
18	L	806	3PE	1	0
18	L	801	3PE	1	0
14	F	501	SF4	1	0
18	I	203	3PE	4	0
20	M	1201	LFA	1	0
18	L	805	3PE	3	0
20	N	501	LFA	1	0
16	E	201	FES	1	0
18	L	803	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.

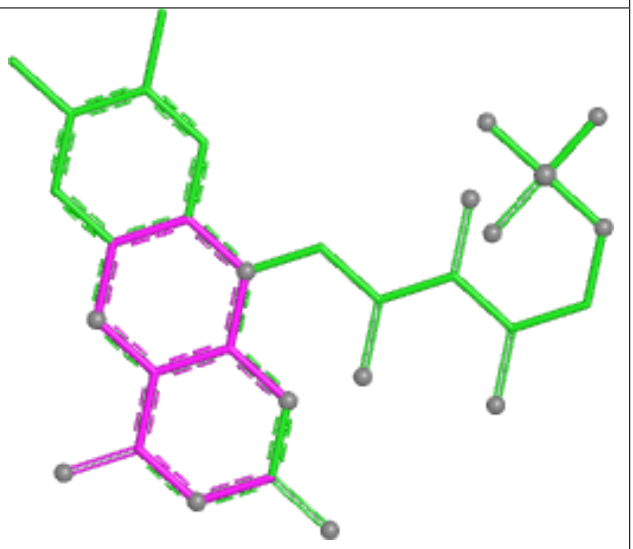
Ligand UQ8 B 302	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand LFA H 601	
 Bond lengths	 Bond angles
 Torsions	 Rings

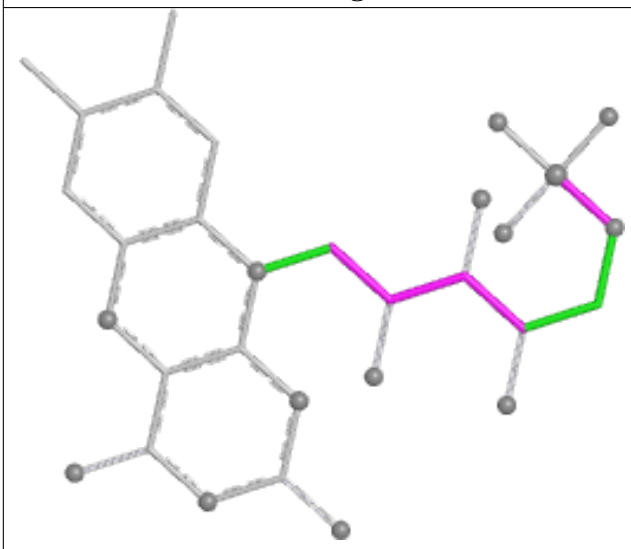
Ligand FMN F 502



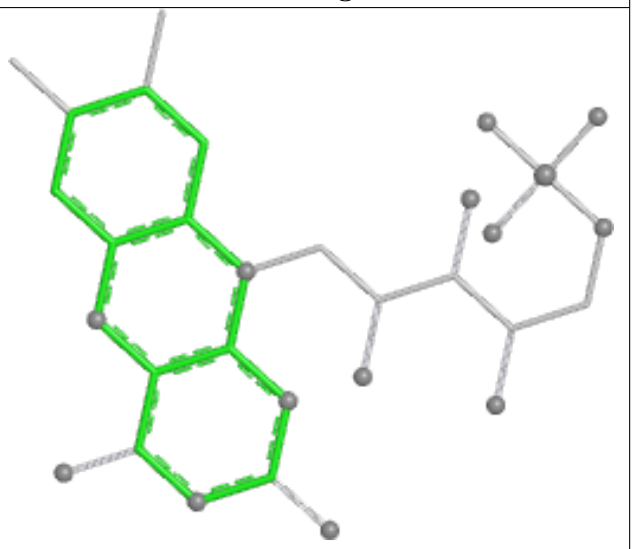
Bond lengths



Bond angles

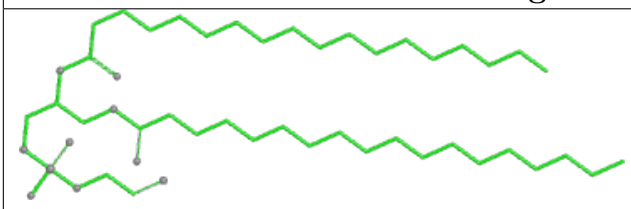


Torsions

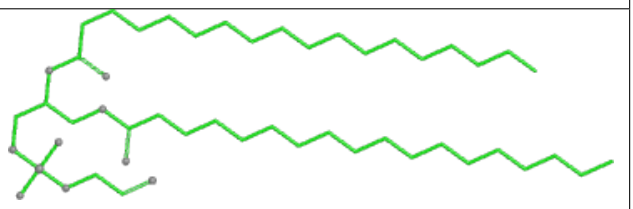


Rings

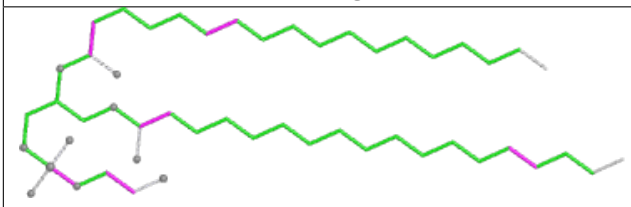
Ligand 3PE C 701



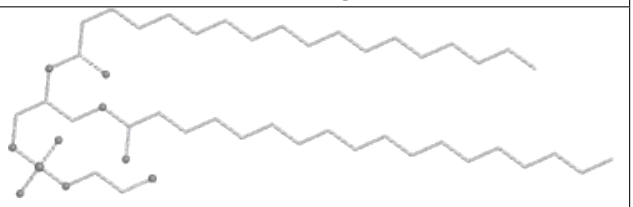
Bond lengths



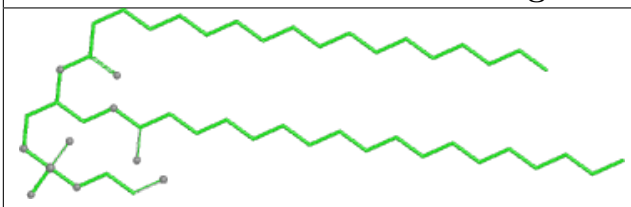
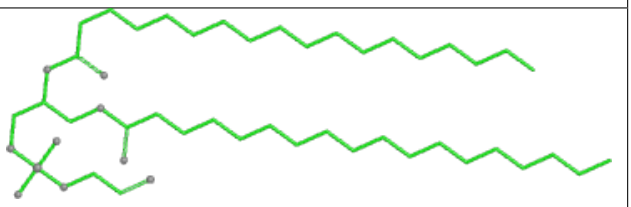
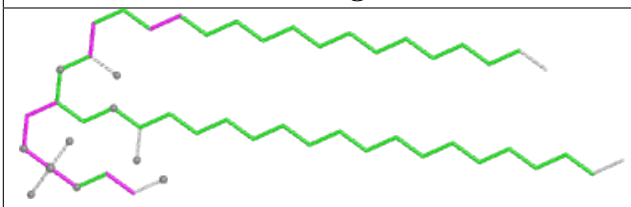
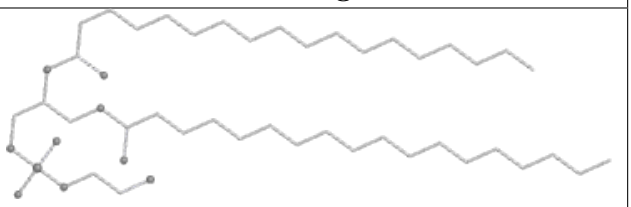
Bond angles

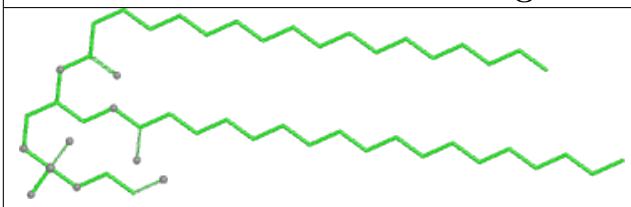
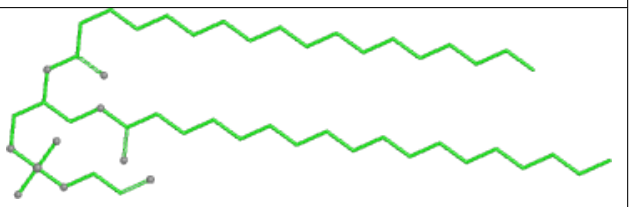
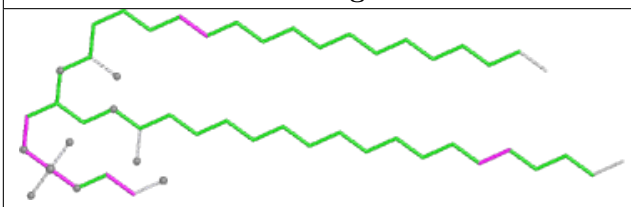
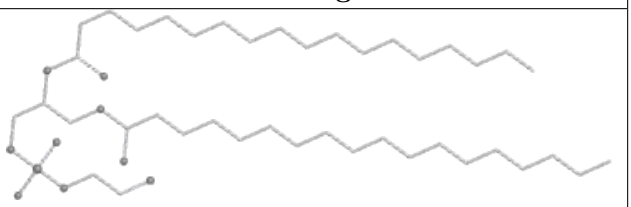


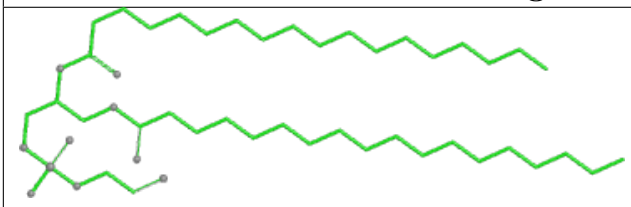
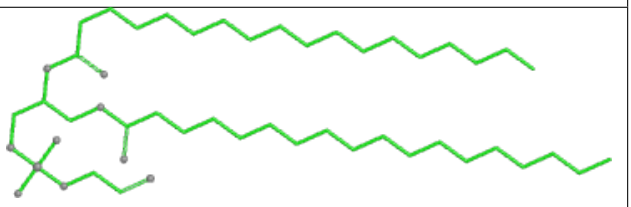
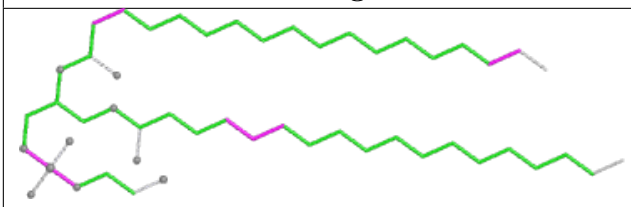
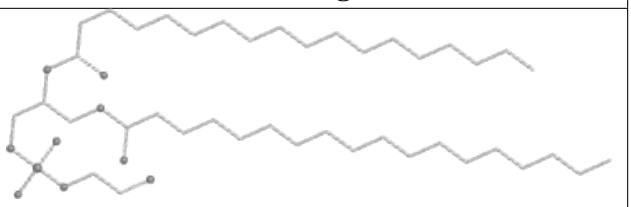
Torsions



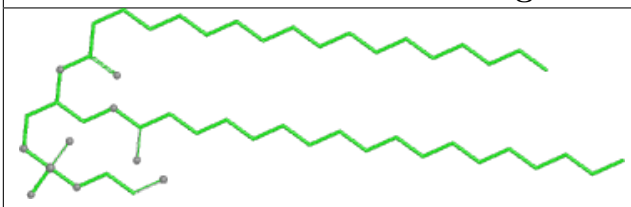
Rings

Ligand 3PE A 202	
 Bond lengths	 Bond angles
 Torsions	 Rings

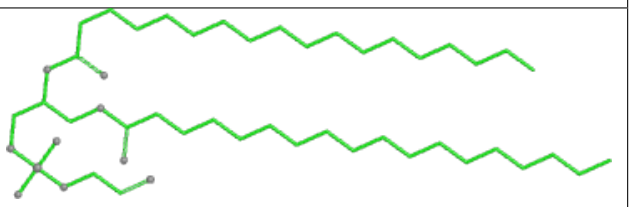
Ligand 3PE M 1202	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE H 604	
 Bond lengths	 Bond angles
 Torsions	 Rings

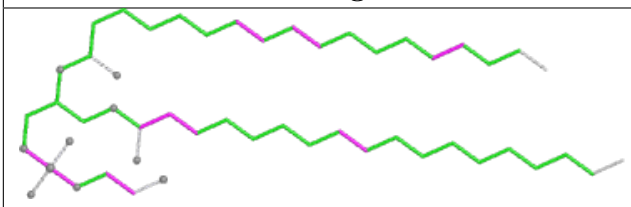
Ligand 3PE M 1204



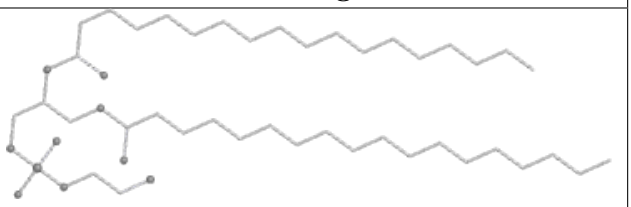
Bond lengths



Bond angles

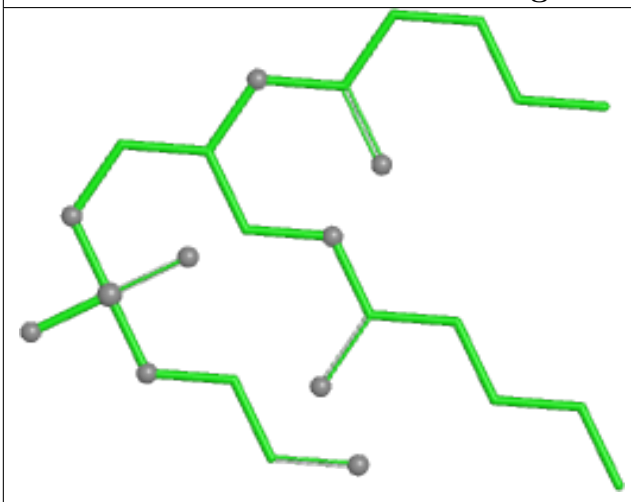


Torsions

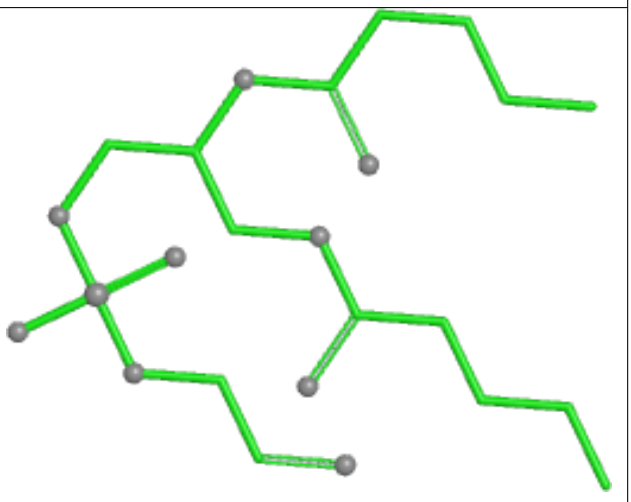


Rings

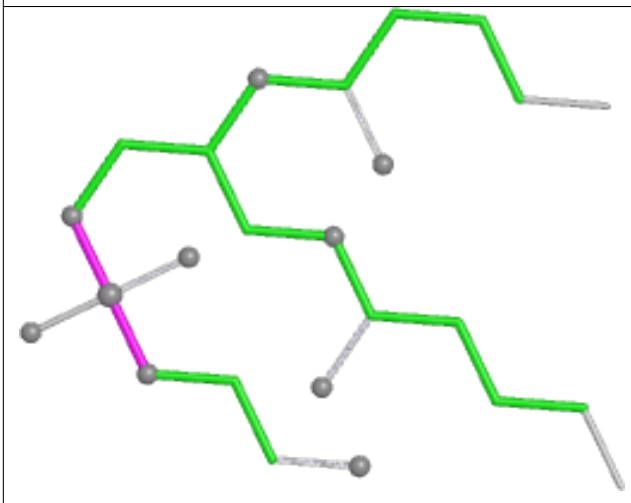
Ligand 3PE L 804



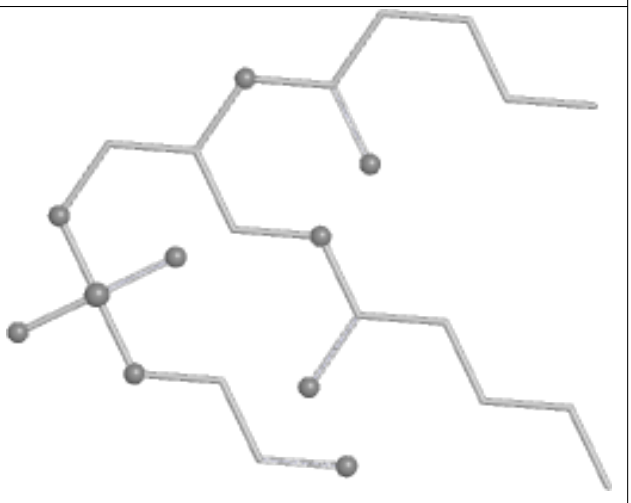
Bond lengths



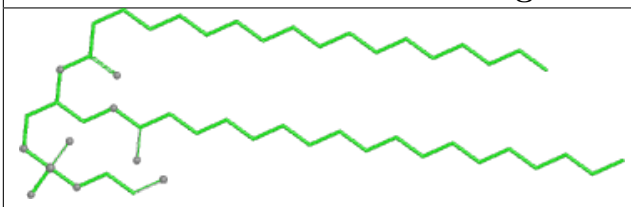
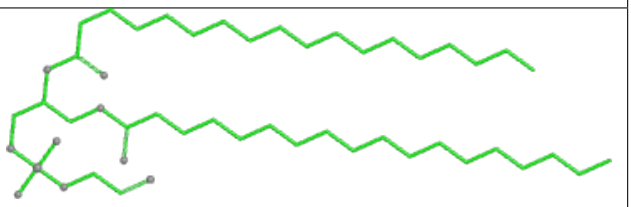
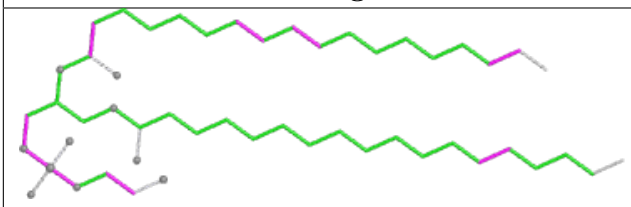
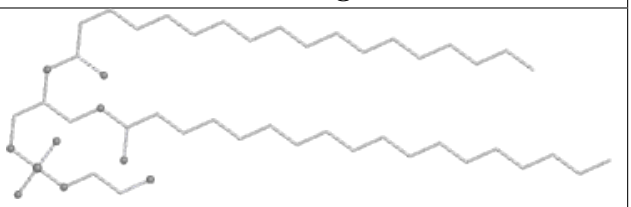
Bond angles

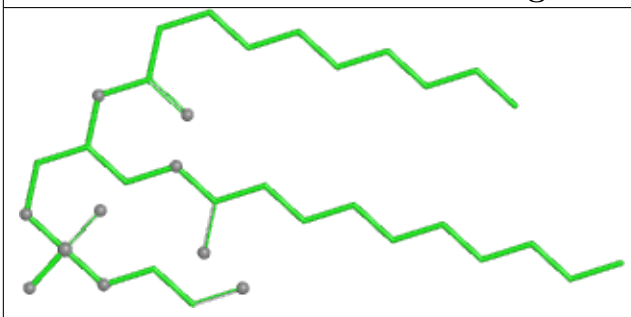
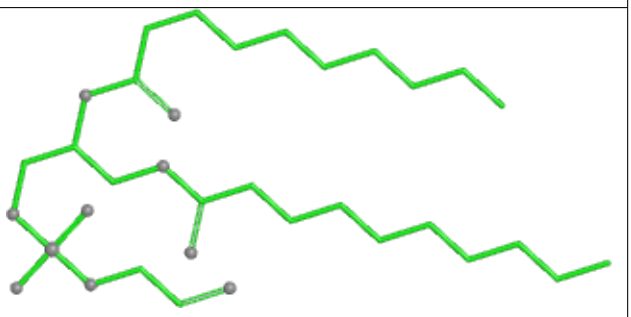
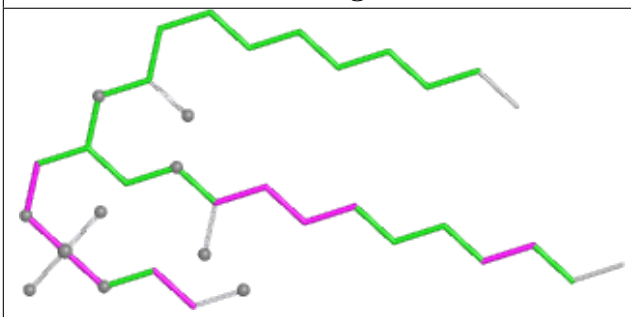
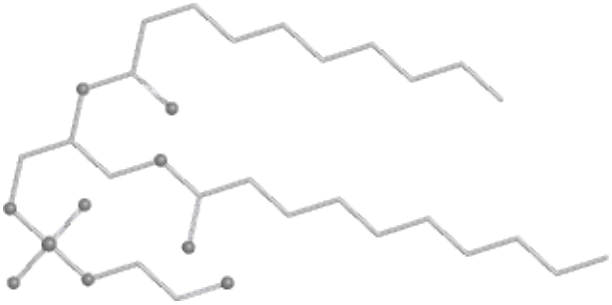


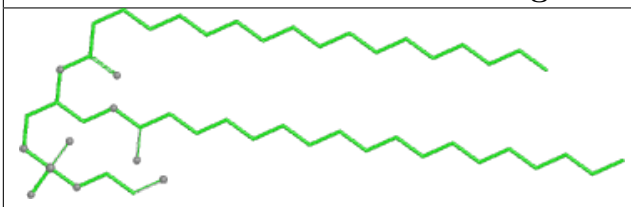
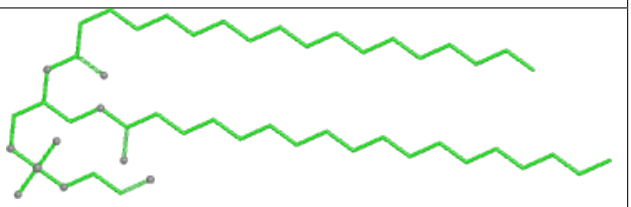
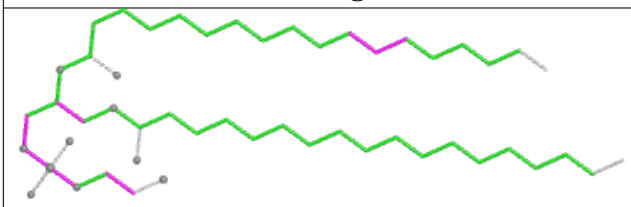
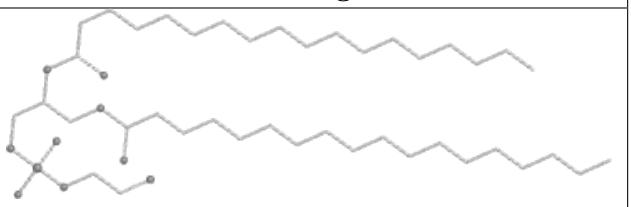
Torsions

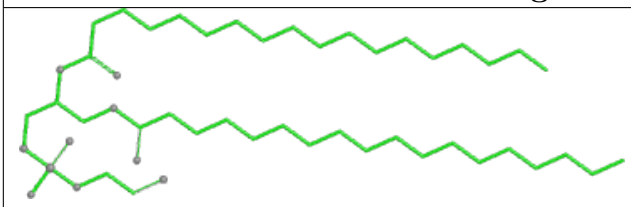
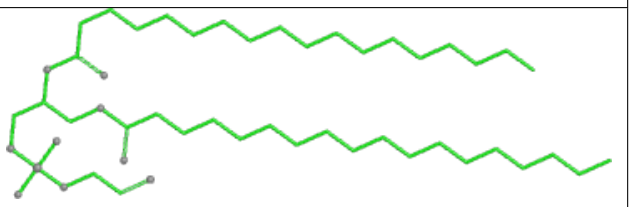
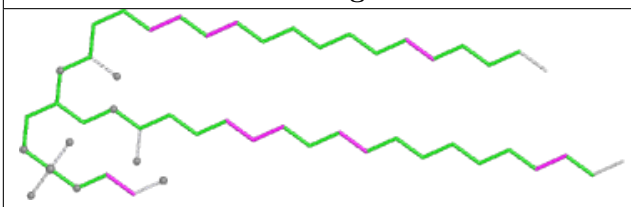
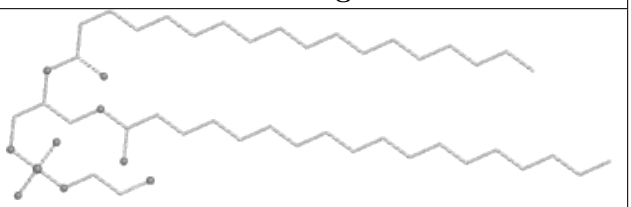


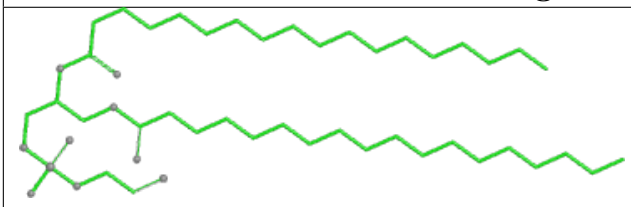
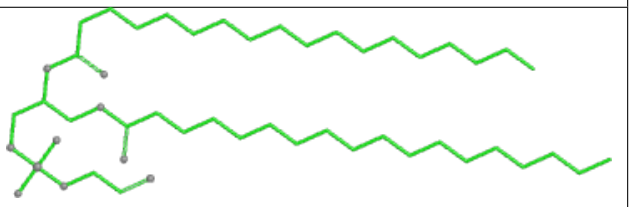
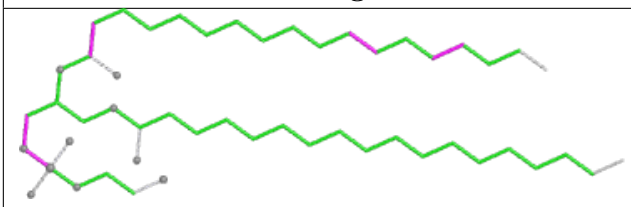
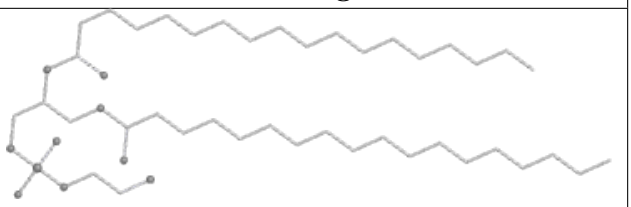
Rings

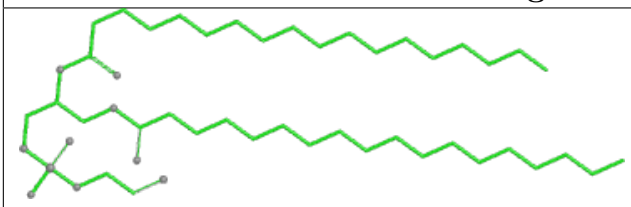
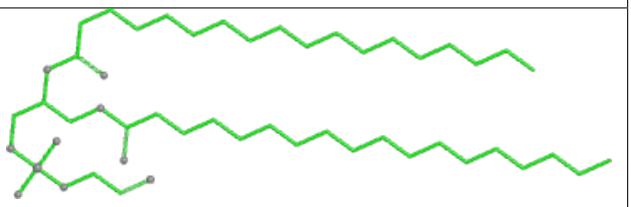
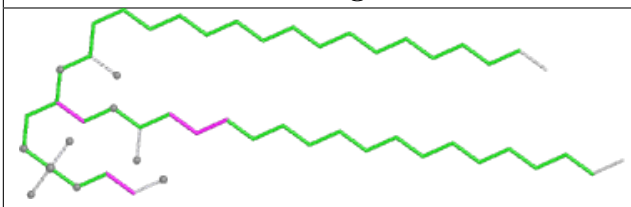
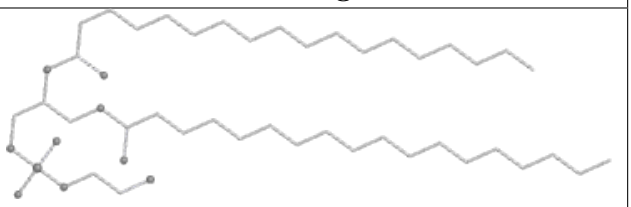
Ligand 3PE M 1203	
 Bond lengths	 Bond angles
 Torsions	 Rings

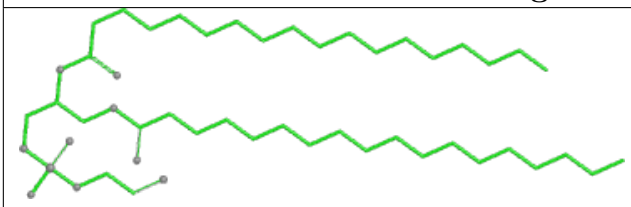
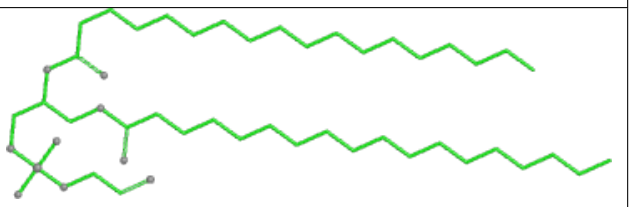
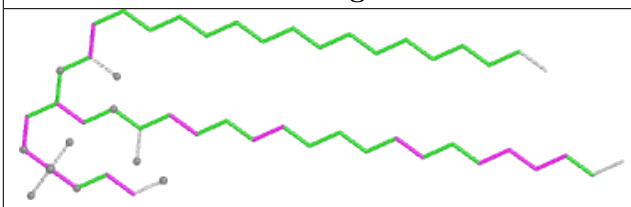
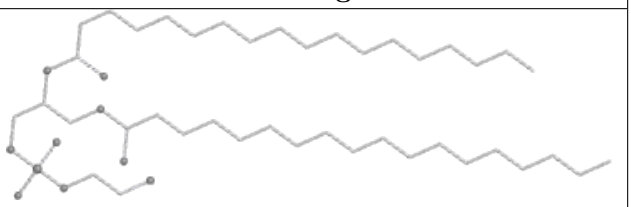
Ligand 3PE A 201	
 Bond lengths	 Bond angles
 Torsions	 Rings

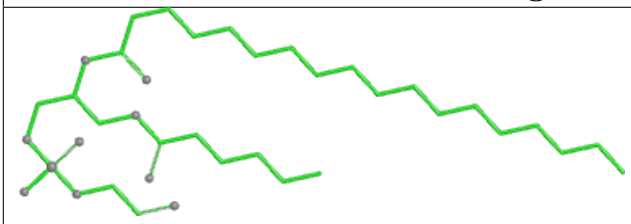
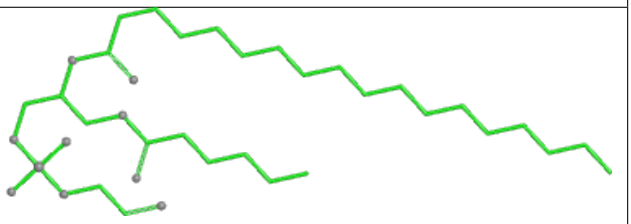
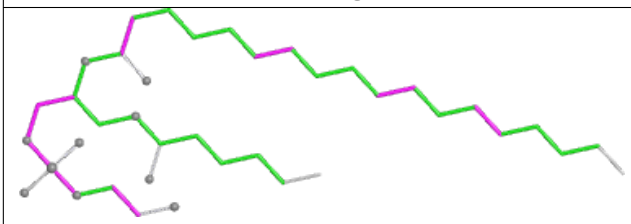
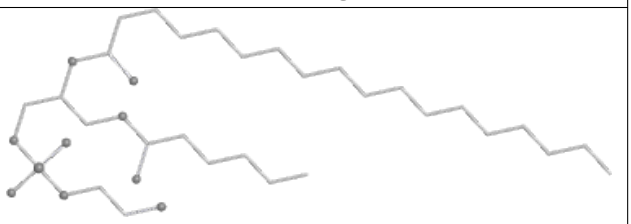
Ligand 3PE L 806	
 Bond lengths	 Bond angles
 Torsions	 Rings

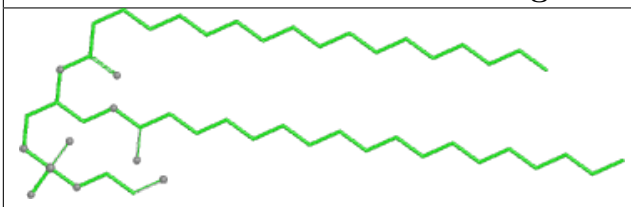
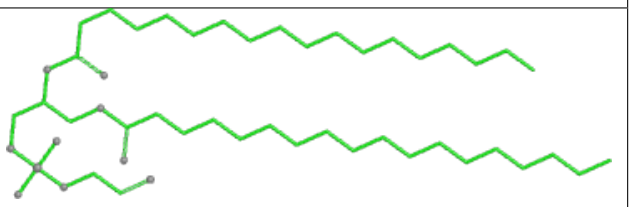
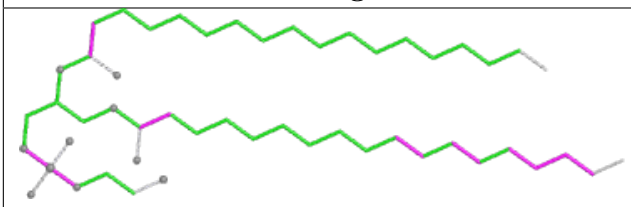
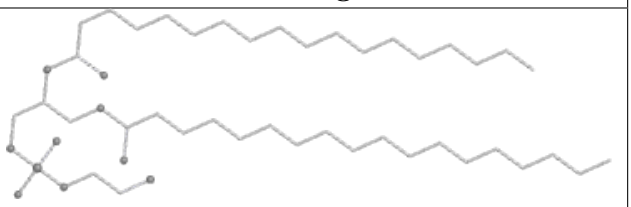
Ligand 3PE L 801	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE I 203	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE H 603	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE L 805	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE H 602	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand 3PE L 803	
 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.

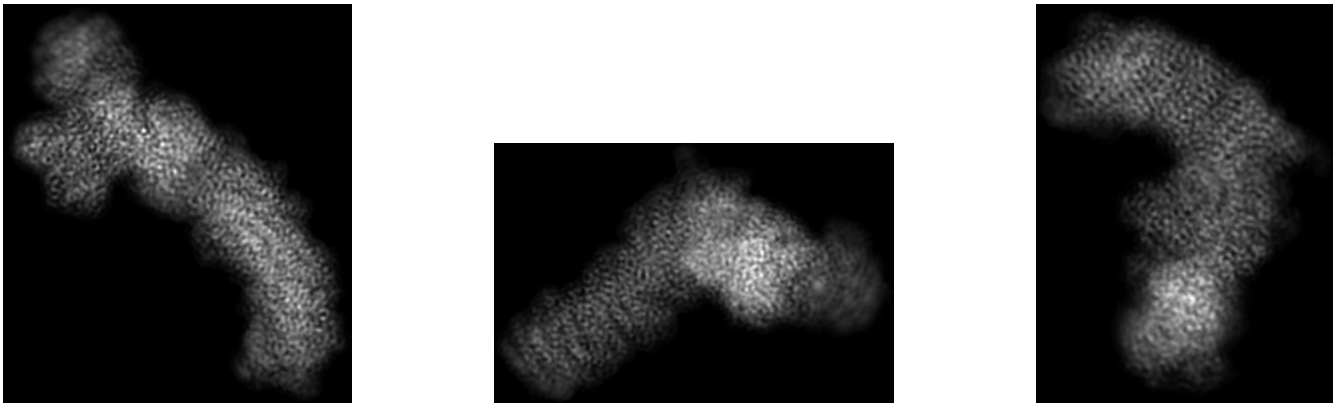
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-13239. 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

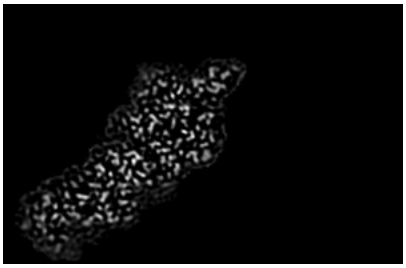
X Index: 73 Y Index: 99 Z Index: 113

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: 76



Y Index: 152

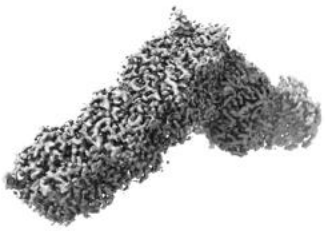
Z Index: 151

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 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

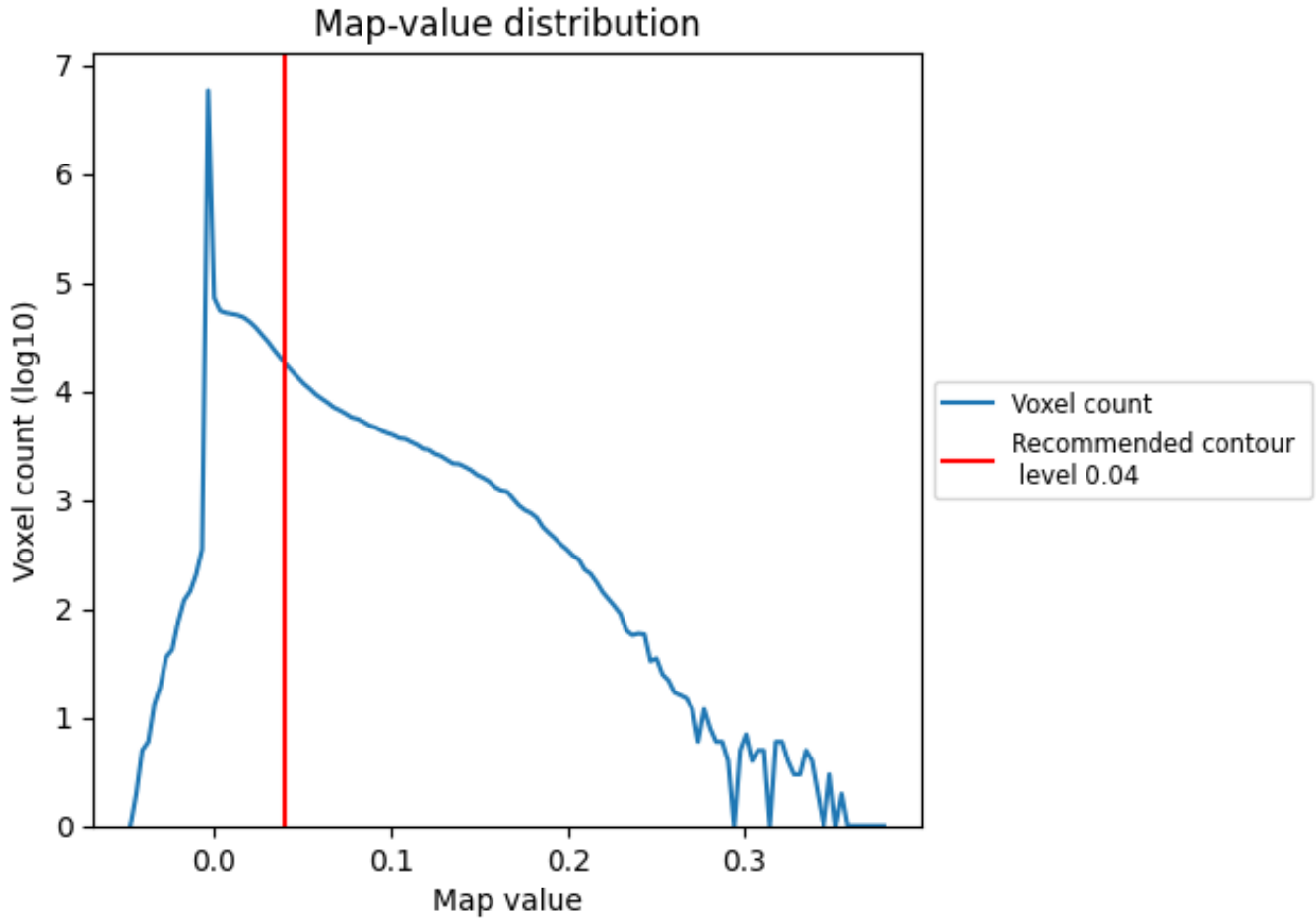
6.5 Mask visualisation (i)

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

7 Map analysis

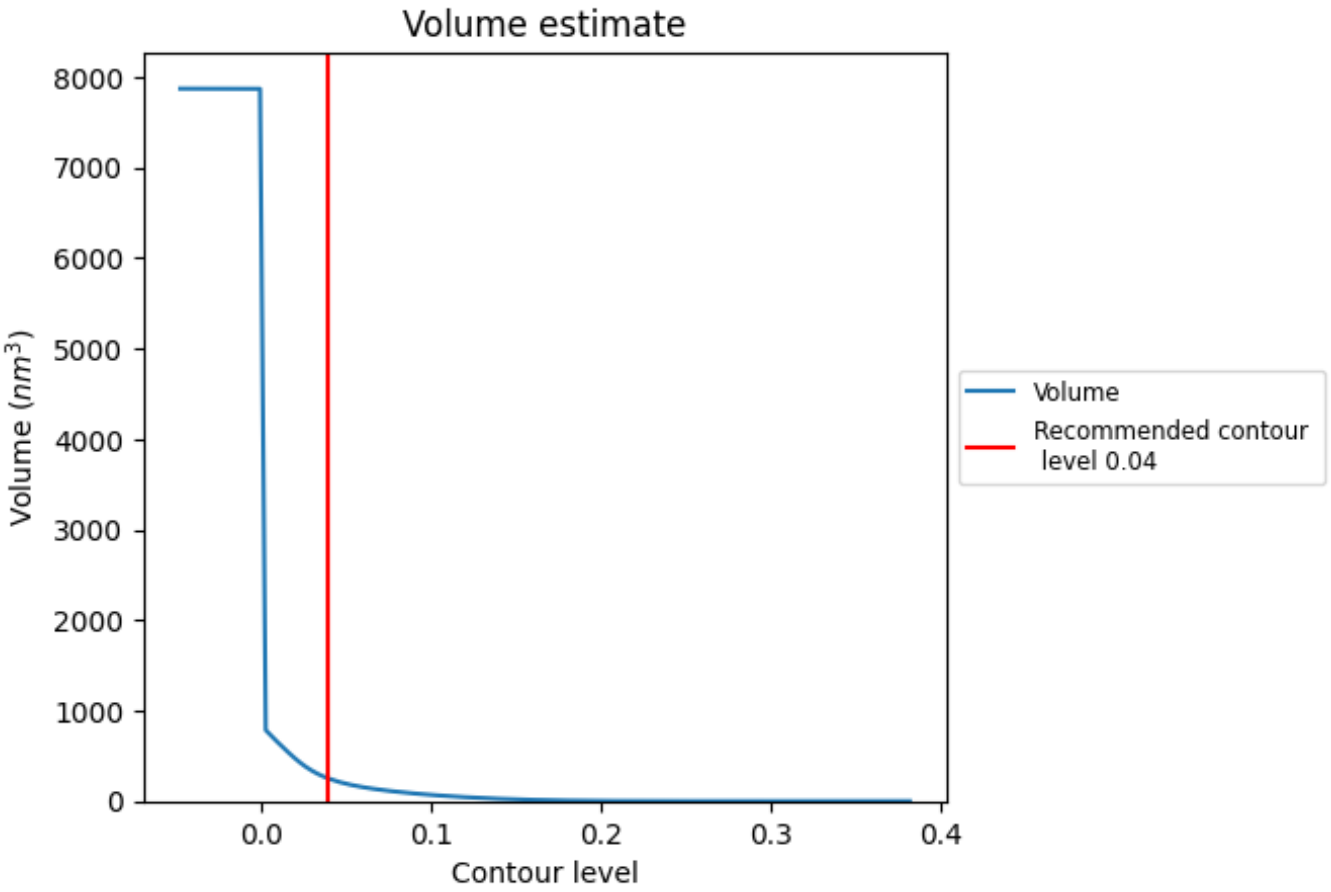
This section contains the results of statistical analysis of the map.

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 251 nm^3; this corresponds to an approximate mass of 227 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.

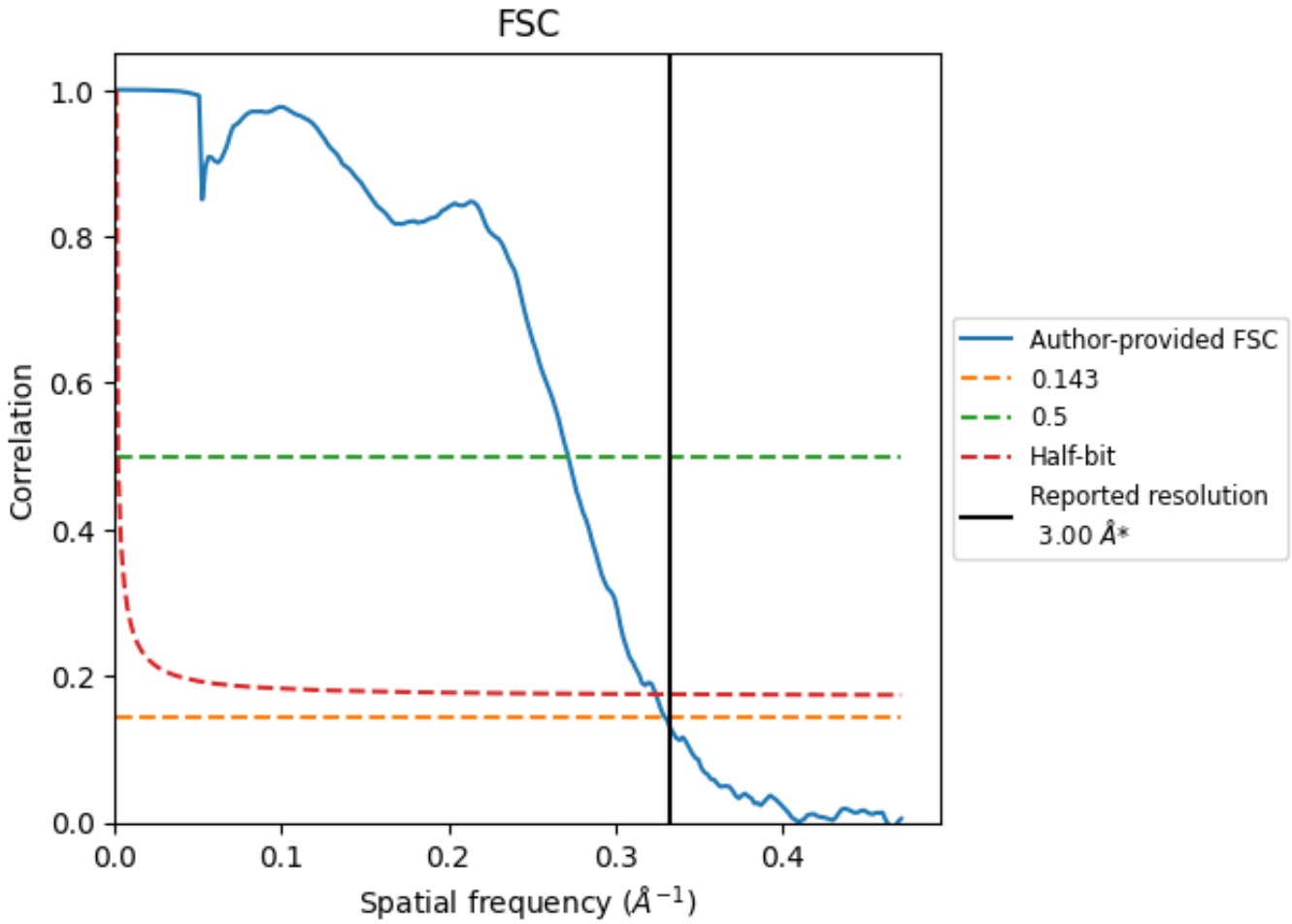
7.3 Rotationally averaged power spectrum

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 0.333 Å^{-1}

8.2 Resolution estimates (i)

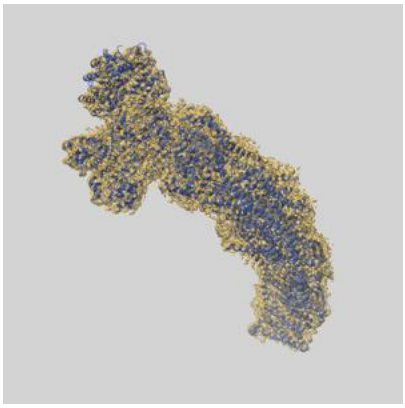
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	3.03	3.68	3.08
Unmasked-calculated*	-	-	-

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

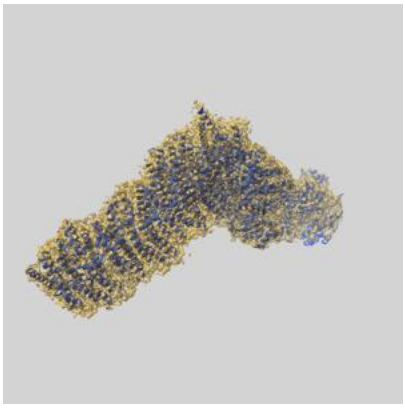
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-13239 and PDB model 7P7L. Per-residue inclusion information can be found in section 3 on page 11.

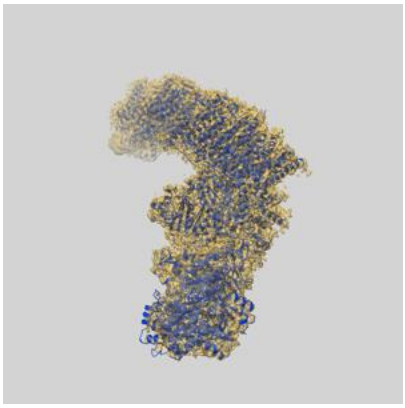
9.1 Map-model overlay



X



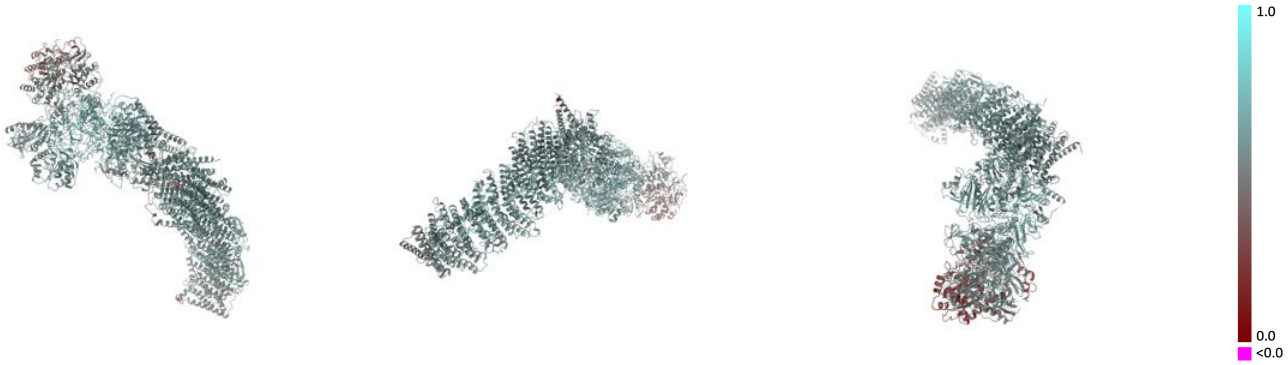
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04 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.

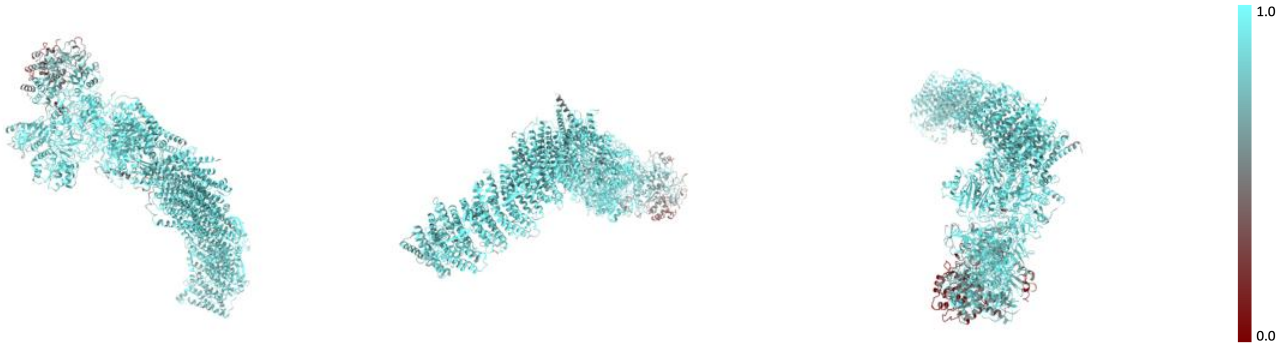
9.2 Q-score mapped to coordinate model (i)



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.

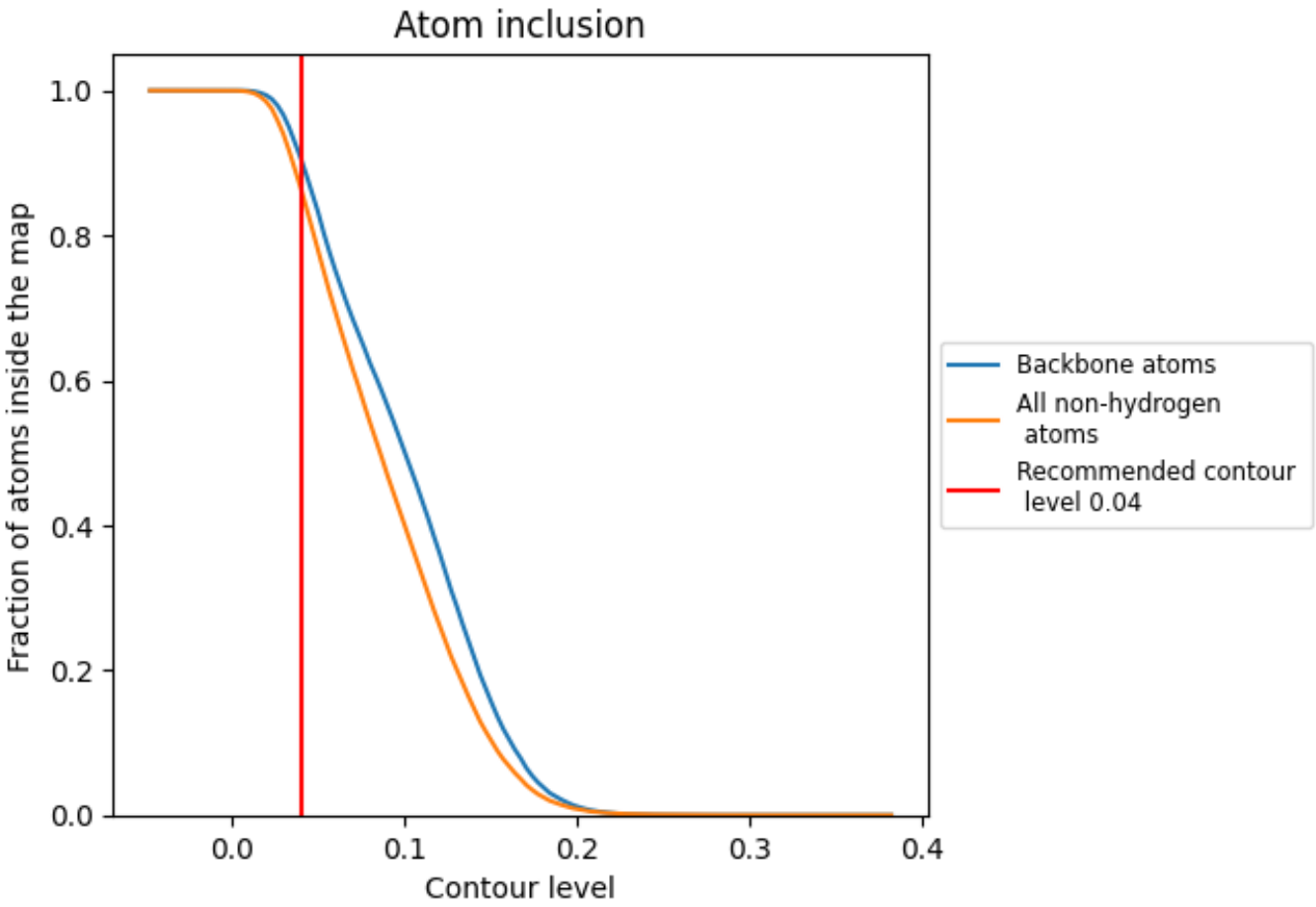
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.04).

9.4 Atom inclusion (i)



At the recommended contour level, 91% of all backbone atoms, 87% 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 (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8664	0.5640
A	0.8756	0.5580
B	0.9193	0.5980
C	0.9196	0.5990
E	0.6839	0.4770
F	0.5907	0.4080
G	0.9030	0.5960
H	0.8611	0.5530
I	0.9092	0.6130
J	0.8850	0.5690
K	0.9275	0.6010
L	0.8716	0.5500
M	0.9107	0.5870
N	0.9324	0.5950