wwPDB EM Validation Summary Report

Sep 8, 2026 – 11:20 pm BST

PDB ID	:	7NYU / pdb_00007nyu
EMDB ID	:	EMD-12654
Title	:	Respiratory complex I from Escherichia coli - conformation 2
Authors	:	Kolata, P.; Efremov, R.G.
Deposited on	:	2021-03-23
Resolution	:	3.80 Å(reported)
Based on initial models	:	4HEA, 3RKO

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

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

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

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

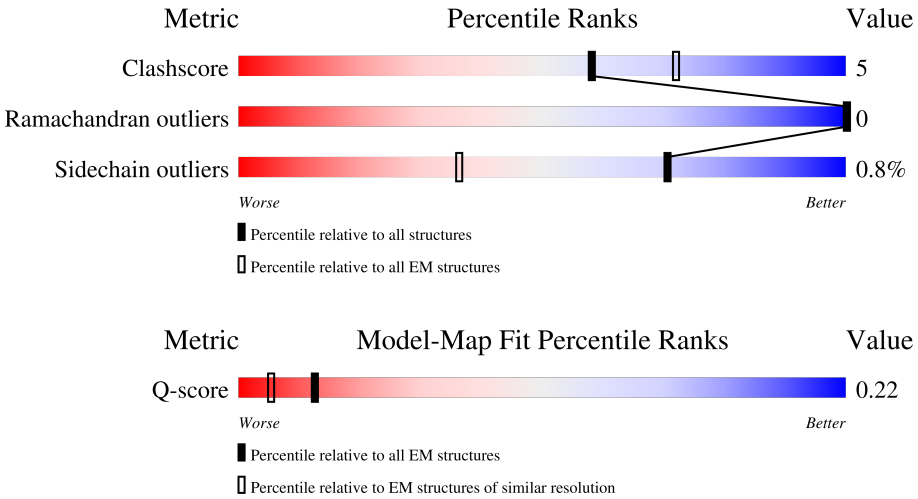
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

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 3.80 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	10198 (3.30 - 4.30)

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

Mol	Chain	Length	Quality of chain
1	A	147	25% 42% 20% 37%
2	B	220	7% 68% • 28%
3	D	596	6% 94% 5% •
4	E	166	90% • 6%

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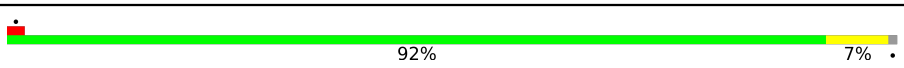
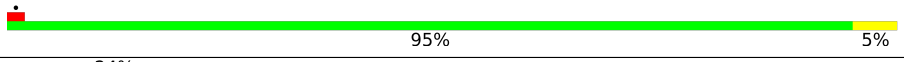
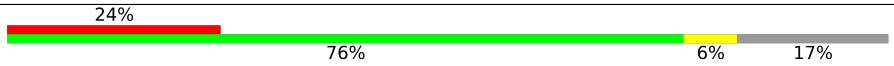
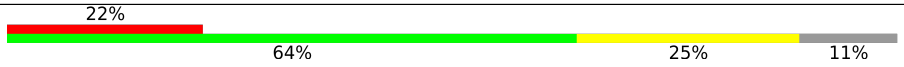
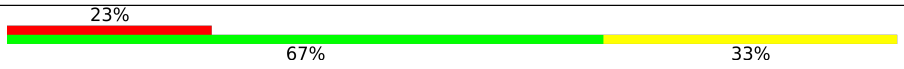
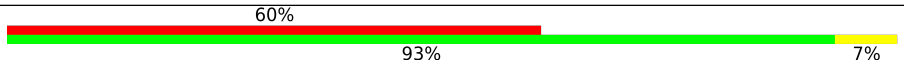
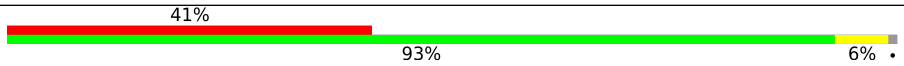
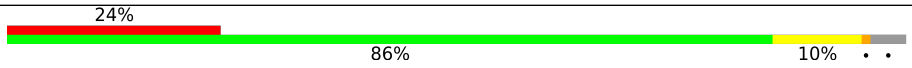
Mol	Chain	Length	Quality of chain
5	F	445	
6	G	908	
7	H	325	
8	I	180	
9	J	184	
10	K	100	
11	L	613	
12	M	509	
13	N	485	

2 Entry composition (i)

There are 17 unique types of molecules in this entry. The entry contains 35228 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 A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	92	668	448	108	111	1	0	0

- Molecule 2 is a protein called NADH-quinone oxidoreductase subunit B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	159	1222	769	218	222	13	0	0

- Molecule 3 is a protein called NADH-quinone oxidoreductase subunit C/D.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	588	4725	3027	825	852	21	0	0

- Molecule 4 is a protein called NADH-quinone oxidoreductase subunit E.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	441	3424	2171	599	633	21	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	G	907	7044	4402	1272	1332	38	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	270	Total	C	N	O	S	0	0
			1985	1317	317	337	14		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	158	Total	C	N	O	S	0	0
			1220	771	205	232	12		

- Molecule 9 is a protein called NADH-quinone oxidoreductase subunit J.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	164	Total	C	N	O	S	0	0
			1242	833	193	209	7		

- Molecule 10 is a protein called NADH-quinone oxidoreductase subunit K.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L	612	Total	C	N	O	S	0	0
			4126	2671	698	733	24		

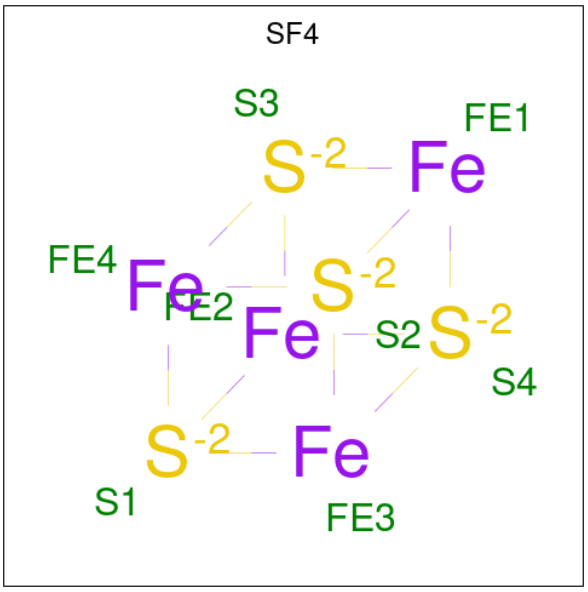
- Molecule 12 is a protein called NADH-quinone oxidoreductase subunit M.

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

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

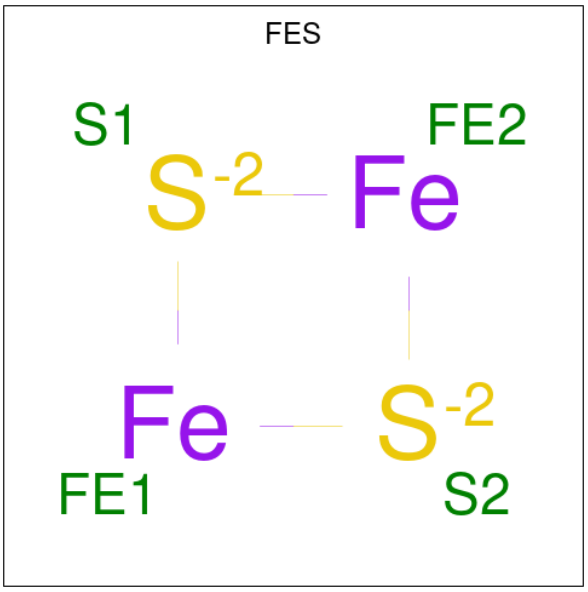
Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	467	Total	C	N	O	S	0	0
			3543	2370	559	596	18		

- Molecule 14 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4).



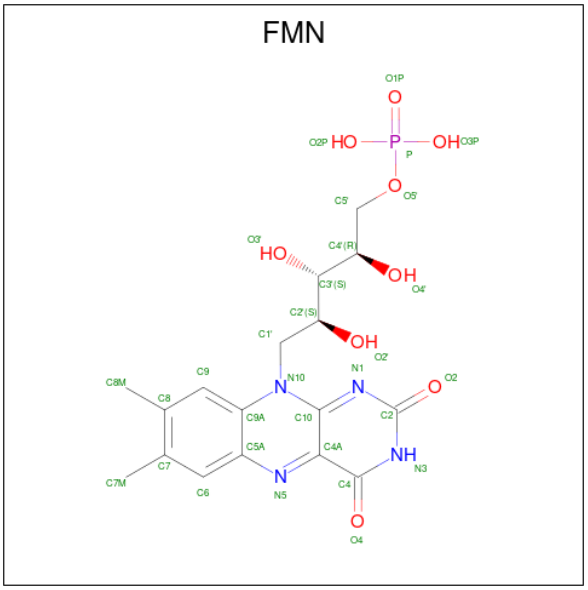
Mol	Chain	Residues	Atoms	AltConf
14	B	1	Total Fe S 8 4 4	0
14	F	1	Total Fe S 8 4 4	0
14	G	1	Total Fe S 8 4 4	0
14	G	1	Total Fe S 8 4 4	0
14	G	1	Total Fe S 8 4 4	0
14	I	1	Total Fe S 8 4 4	0
14	I	1	Total Fe S 8 4 4	0

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



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

- Molecule 16 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



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

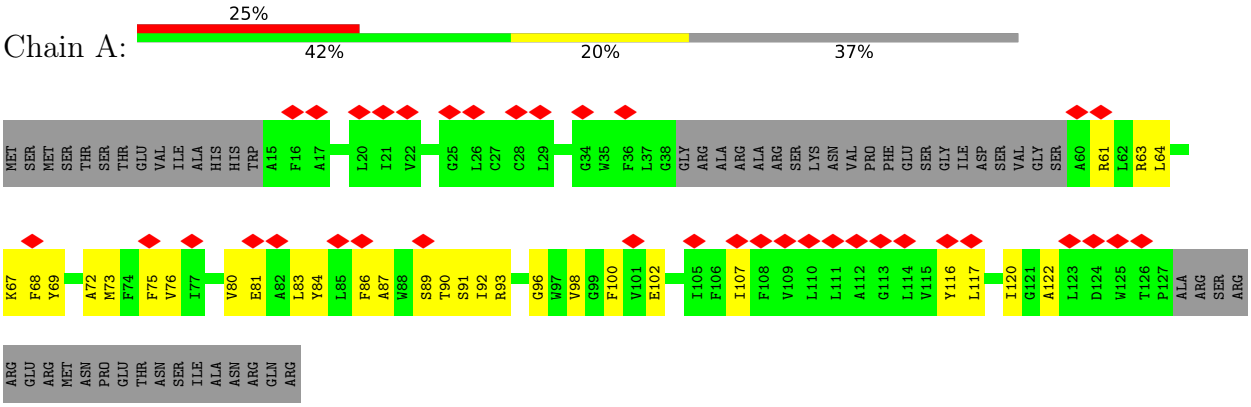
- Molecule 17 is CALCIUM ION (CCD ID: CA) (formula: Ca).

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

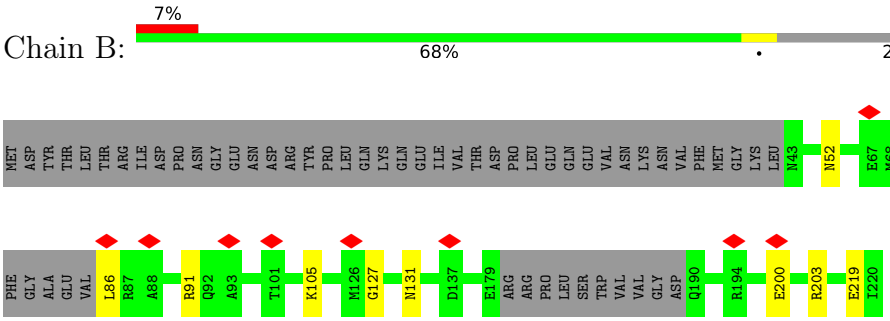
3 Residue-property plots (i)

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.

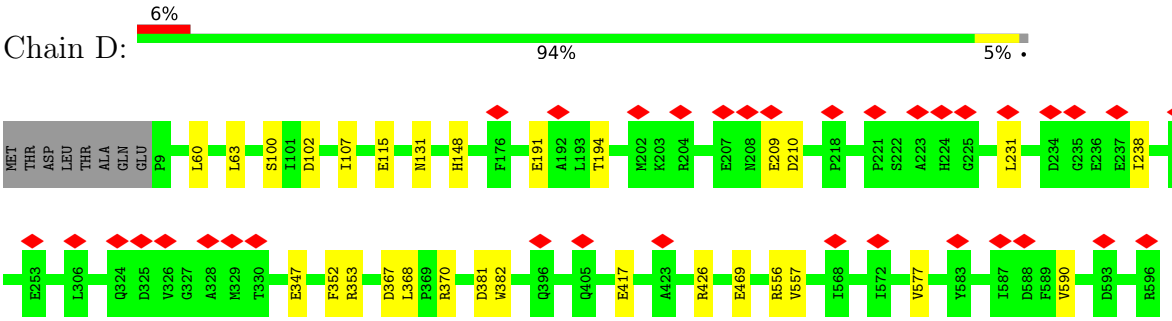
• Molecule 1: NADH-quinone oxidoreductase subunit A



• Molecule 2: NADH-quinone oxidoreductase subunit B

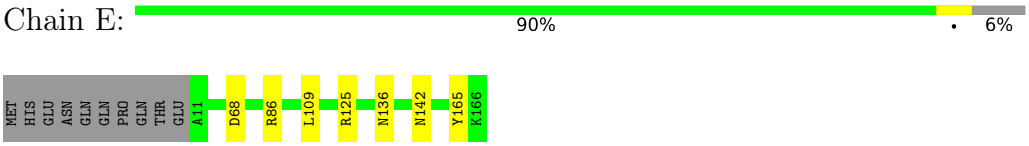


• Molecule 3: NADH-quinone oxidoreductase subunit C/D



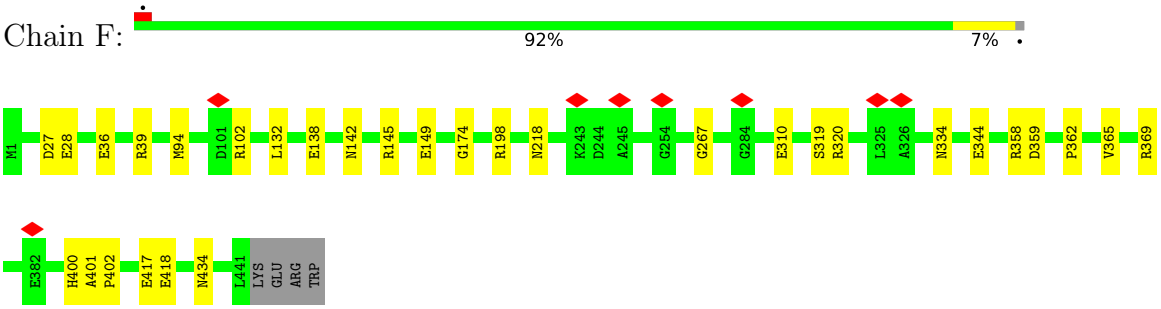
• Molecule 4: NADH-quinone oxidoreductase subunit E

Chain E:



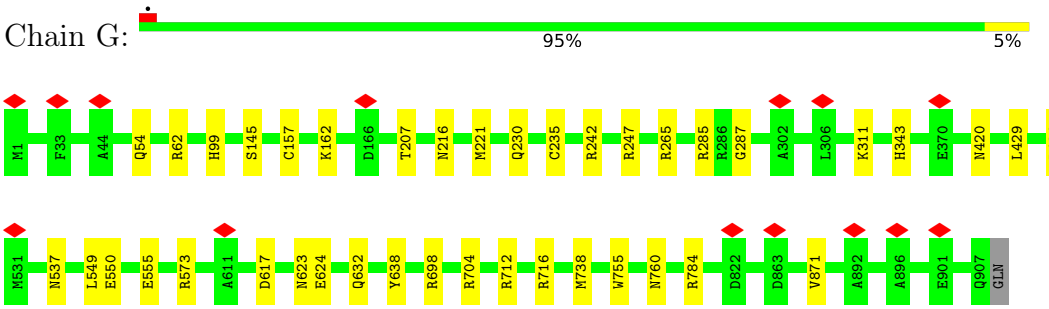
• Molecule 5: NADH-quinone oxidoreductase subunit F

Chain F:



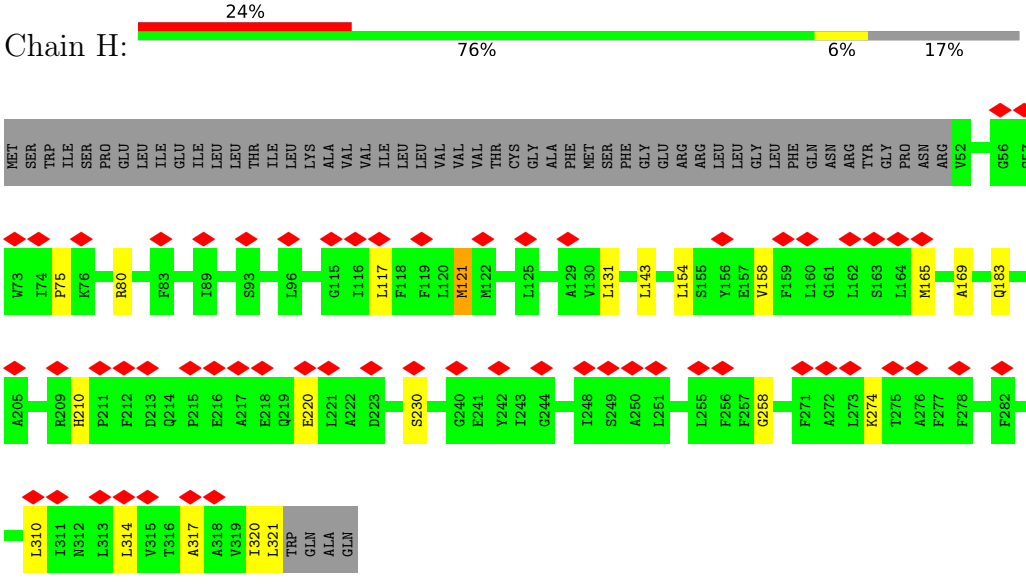
• Molecule 6: NADH-quinone oxidoreductase subunit G

Chain G:



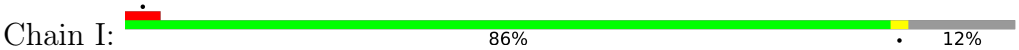
• Molecule 7: NADH-quinone oxidoreductase subunit H

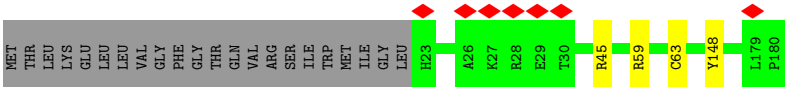
Chain H:



• Molecule 8: NADH-quinone oxidoreductase subunit I

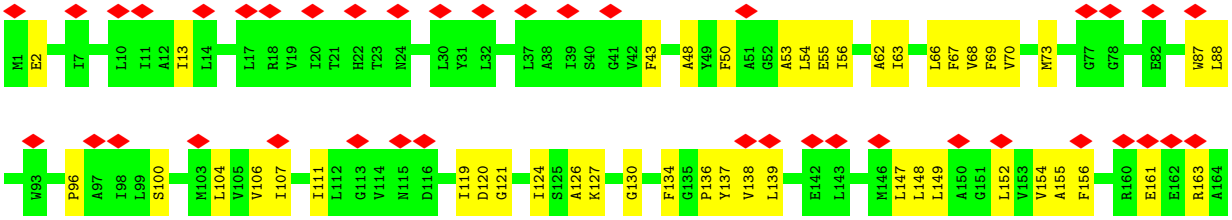
Chain I:





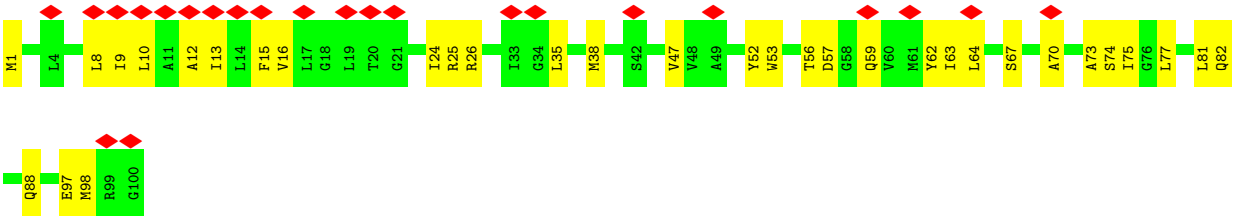
• Molecule 9: NADH-quinone oxidoreductase subunit J



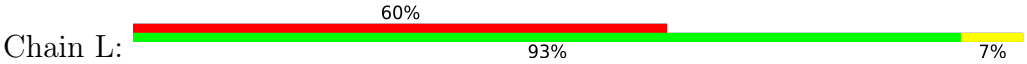


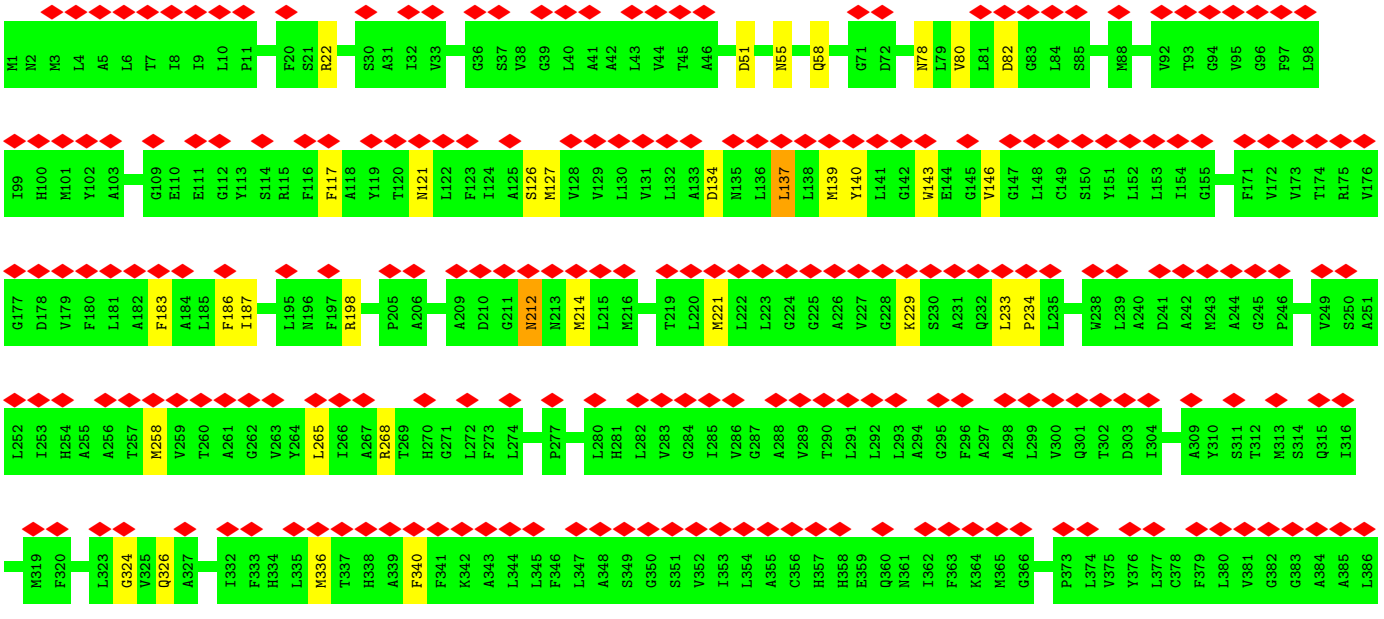
• Molecule 10: NADH-quinone oxidoreductase subunit K

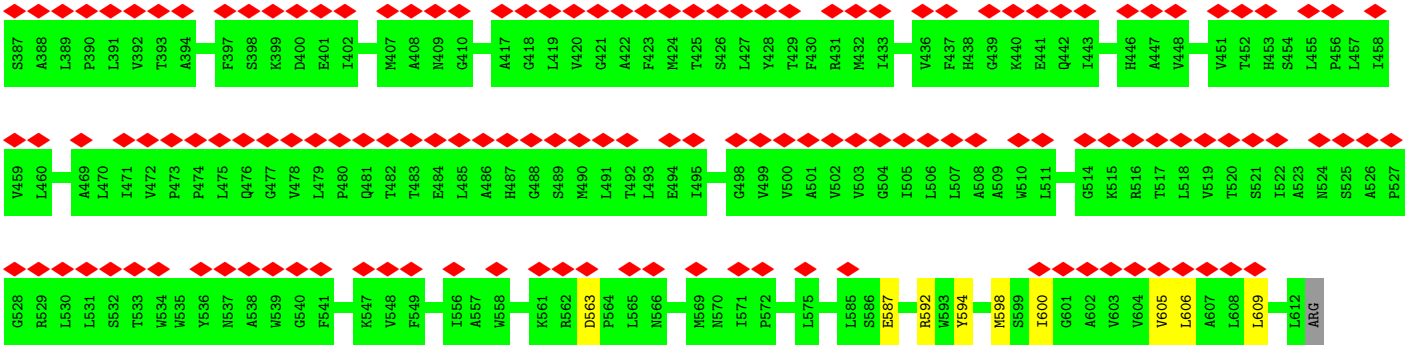




• Molecule 11: NADH-quinone oxidoreductase subunit L

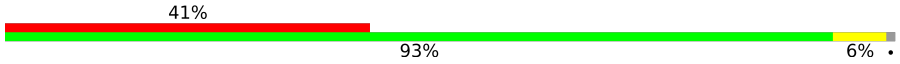


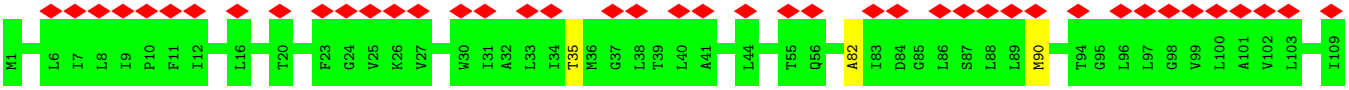


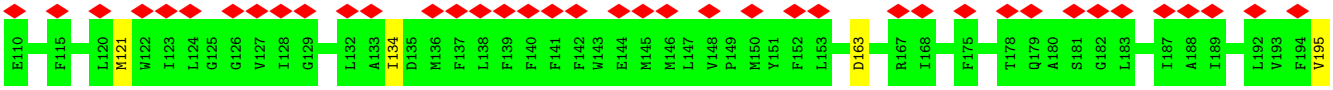


• Molecule 12: NADH-quinone oxidoreductase subunit M

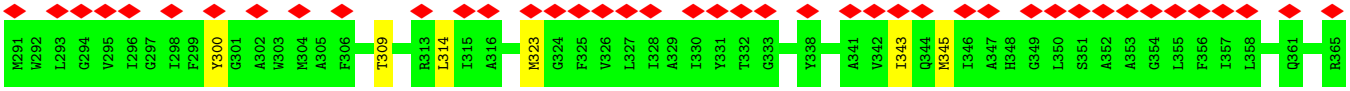
Chain M:



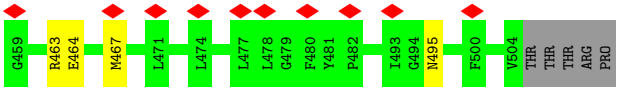








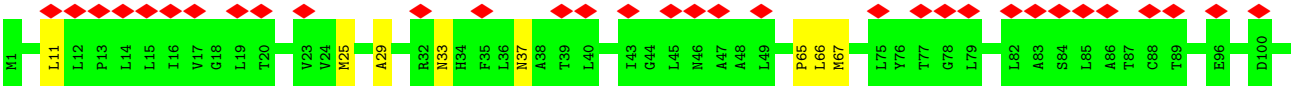




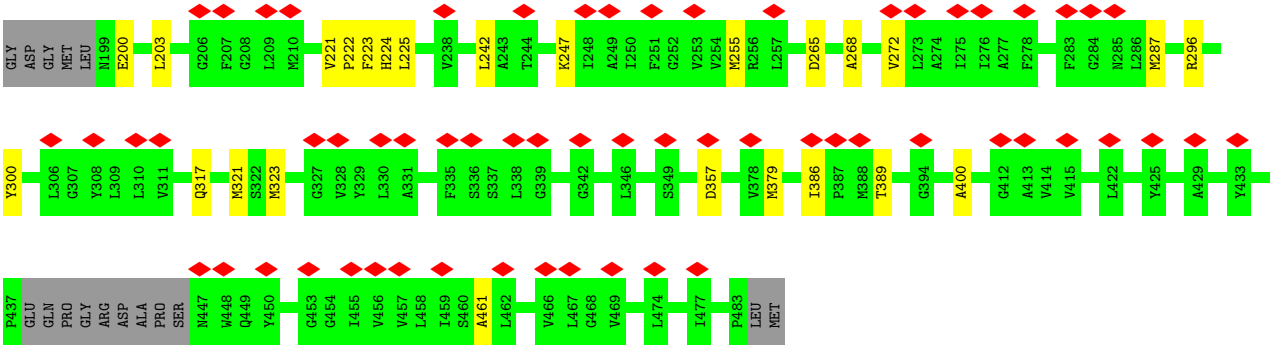
• Molecule 13: NADH-quinone oxidoreductase subunit N

Chain N:








GLY ASP GLY MET LEU N199 E200 L203 G206 F207 G208 L209 M210 V221 P222 F223 H224 L225 V238 L242 A243 T244 K247 I248 A249 I250 F251 G252 V253 V254 M255 R256 L257 D265 A268 V272 L273 A274 I275 I276 A277 F278 F283 G284 N285 L286 M287 R296
Y300 L306 G307 Y308 L309 L310 V311 Q317 M321 S322 M323 G327 V328 Y329 L330 A331 F335 S336 S337 L338 G339 G342 L346 S349 D357 V378 M379 I386 P387 M388 T389 G394 A400 G412 A413 V414 V415 L422 Y425 A429 Y433
P437 GLU GLN PRO GLY ARG ASP ALA PRO SER N447 W448 Q449 Y450 G453 G454 I455 V456 V457 L458 I459 S460 A461 L462 V466 L467 G468 V469 L474 I477 P483 LEU MET

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21620	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	64.7	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	60000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	150.751	Depositor
Minimum map value	-36.167	Depositor
Average map value	0.001	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	2	Depositor
Map size (Å)	385.5, 385.5, 385.5	wwPDB
Map dimensions	250, 250, 250	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.542, 1.542, 1.542	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SF4, CSX, FMN, FES, CA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.18	0/684	0.40	0/932
2	B	0.21	0/1238	0.48	0/1674
3	D	0.19	0/4856	0.46	0/6593
4	E	0.20	0/1240	0.49	0/1680
5	F	0.19	0/3495	0.45	0/4723
6	G	0.18	0/7195	0.43	0/9755
7	H	0.19	0/2037	0.45	0/2780
8	I	0.18	0/1248	0.42	0/1691
9	J	0.19	0/1268	0.42	0/1729
10	K	0.20	0/769	0.43	0/1040
11	L	0.26	0/4205	0.51	0/5754
12	M	0.28	0/4074	0.52	0/5546
13	N	0.29	0/3630	0.52	0/4954
All	All	0.22	0/35939	0.47	0/48851

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	668	0	623	105	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	1222	0	1182	9	0
3	D	4725	0	4619	21	0
4	E	1220	0	1187	3	0
5	F	3424	0	3391	17	0
6	G	7044	0	6849	23	0
7	H	1985	0	1921	39	0
8	I	1220	0	1155	3	0
9	J	1242	0	1315	126	0
10	K	760	0	817	66	0
11	L	4126	0	3691	43	0
12	M	3953	0	4053	22	0
13	N	3543	0	3709	70	0
14	B	8	0	0	0	0
14	F	8	0	0	1	0
14	G	24	0	0	3	0
14	I	16	0	0	1	0
15	E	4	0	0	0	0
15	G	4	0	0	0	0
16	F	31	0	19	1	0
17	G	1	0	0	0	0
All	All	35228	0	34531	327	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 5.

The worst 5 of 327 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:L:22:ARG:NH1	12:M:378:TRP:HE1	1.46	1.11
9:J:136:PRO:HB3	13:N:65:PRO:HD2	1.16	1.10
11:L:587:GLU:OE2	13:N:287:MET:HE1	1.52	1.09
9:J:149:LEU:HD11	13:N:25:MET:HE1	1.40	1.03
1:A:100:PHE:CD1	7:H:317:ALA:HB1	1.94	1.02

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	88/147 (60%)	84 (96%)	4 (4%)	0	100	100
2	B	152/220 (69%)	143 (94%)	9 (6%)	0	100	100
3	D	586/596 (98%)	567 (97%)	19 (3%)	0	100	100
4	E	153/166 (92%)	150 (98%)	3 (2%)	0	100	100
5	F	438/445 (98%)	431 (98%)	7 (2%)	0	100	100
6	G	905/908 (100%)	888 (98%)	17 (2%)	0	100	100
7	H	268/325 (82%)	253 (94%)	15 (6%)	0	100	100
8	I	156/180 (87%)	154 (99%)	2 (1%)	0	100	100
9	J	162/184 (88%)	155 (96%)	7 (4%)	0	100	100
10	K	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
11	L	610/613 (100%)	576 (94%)	34 (6%)	0	100	100
12	M	502/509 (99%)	485 (97%)	17 (3%)	0	100	100
13	N	461/485 (95%)	447 (97%)	14 (3%)	0	100	100
All	All	4579/4878 (94%)	4429 (97%)	150 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	55/119 (46%)	55 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	126/191 (66%)	125 (99%)	1 (1%)	73	76
3	D	500/515 (97%)	495 (99%)	5 (1%)	68	74
4	E	128/138 (93%)	126 (98%)	2 (2%)	55	68
5	F	354/358 (99%)	352 (99%)	2 (1%)	78	79
6	G	735/736 (100%)	730 (99%)	5 (1%)	76	77
7	H	190/269 (71%)	186 (98%)	4 (2%)	47	64
8	I	126/154 (82%)	126 (100%)	0	100	100
9	J	129/146 (88%)	129 (100%)	0	100	100
10	K	79/79 (100%)	79 (100%)	0	100	100
11	L	322/486 (66%)	317 (98%)	5 (2%)	55	68
12	M	413/418 (99%)	412 (100%)	1 (0%)	87	87
13	N	371/385 (96%)	367 (99%)	4 (1%)	65	73
All	All	3528/3994 (88%)	3499 (99%)	29 (1%)	70	76

5 of 29 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	G	871	VAL
13	N	174	MET
7	H	183	GLN
12	M	495	ASN
7	H	143	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 30 such sidechains are listed below:

Mol	Chain	Res	Type
5	F	439	ASN
12	M	455	GLN
6	G	467	ASN
13	N	404	GLN
11	L	281	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

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

3 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	CSX	E	132	4	3,6,7	0.91	0	1,6,8	0.95	0
2	CSX	B	102	2	3,6,7	0.94	0	1,6,8	0.54	0
5	CSX	F	215	5	3,6,7	0.64	0	1,6,8	0.38	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
4	CSX	E	132	4	-	1/1/5/7	-
2	CSX	B	102	2	-	0/1/5/7	-
5	CSX	F	215	5	-	1/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	132	CSX	N-CA-CB-SG
5	F	215	CSX	N-CA-CB-SG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 11 ligands modelled in this entry, 1 is monoatomic - leaving 10 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	I	202	8	0,12,12	-	-	-		
14	SF4	B	301	2	0,12,12	-	-	-		
14	SF4	I	201	8	0,12,12	-	-	-		
14	SF4	F	502	5	0,12,12	-	-	-		
14	SF4	G	1002	6	0,12,12	-	-	-		
15	FES	G	1001	6	0,4,4	-	-	-		
16	FMN	F	501	-	33,33,33	1.05	2 (6%)	48,50,50	1.34	7 (14%)
15	FES	E	201	4	0,4,4	-	-	-		
14	SF4	G	1004	6	0,12,12	-	-	-		
14	SF4	G	1003	6	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	I	202	8	-	-	0/6/5/5
14	SF4	B	301	2	-	-	0/6/5/5
14	SF4	I	201	8	-	-	0/6/5/5
14	SF4	F	502	5	-	-	0/6/5/5
14	SF4	G	1002	6	-	-	0/6/5/5
15	FES	G	1001	6	-	-	0/1/1/1
16	FMN	F	501	-	-	1/18/18/18	0/3/3/3
15	FES	E	201	4	-	-	0/1/1/1
14	SF4	G	1004	6	-	-	0/6/5/5
14	SF4	G	1003	6	-	-	0/6/5/5

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	F	501	FMN	C4A-N5	3.46	1.37	1.30
16	F	501	FMN	C10-N1	2.38	1.38	1.33

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	F	501	FMN	C4-N3-C2	-3.35	119.45	125.64
16	F	501	FMN	C4A-C10-N10	2.99	120.85	116.48
16	F	501	FMN	C4A-C4-N3	2.66	119.95	113.19
16	F	501	FMN	C4A-C10-N1	-2.60	118.69	124.73
16	F	501	FMN	O4-C4-C4A	-2.46	120.08	126.60

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
16	F	501	FMN	C4'-C5'-O5'-P

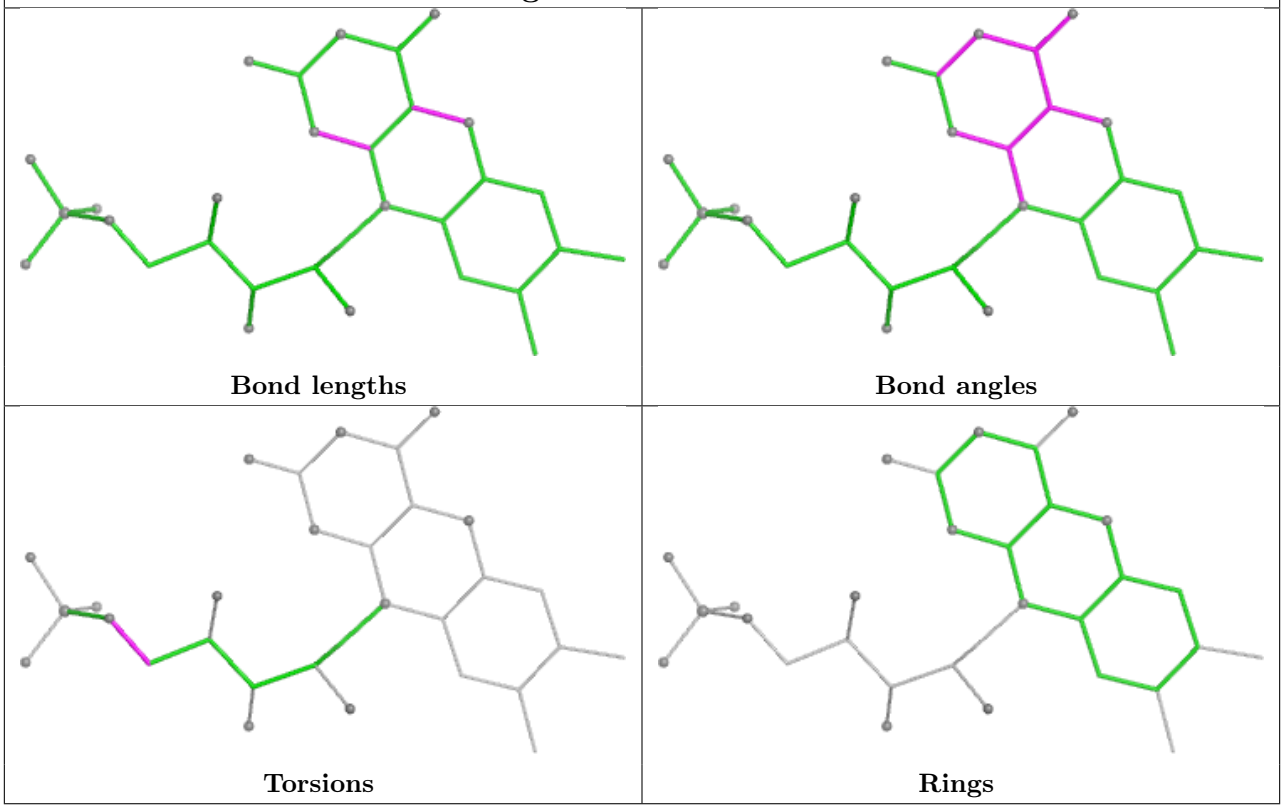
There are no ring outliers.

6 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
14	I	201	SF4	1	0
14	F	502	SF4	1	0
14	G	1002	SF4	1	0
16	F	501	FMN	1	0
14	G	1004	SF4	1	0
14	G	1003	SF4	1	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 FMN F 501



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

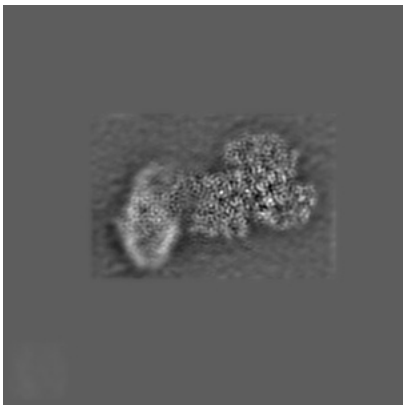
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-12654. These allow visual inspection of the internal detail of the map and identification of artifacts.

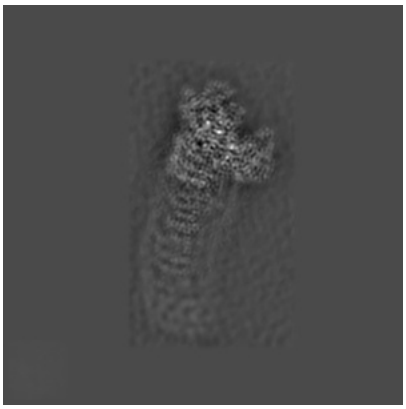
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

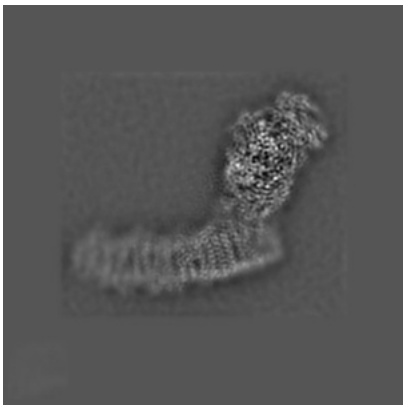
6.1.1 Primary map



X

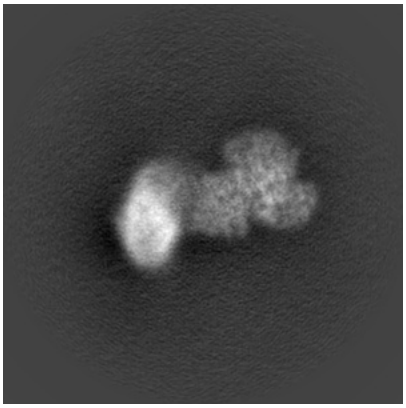


Y

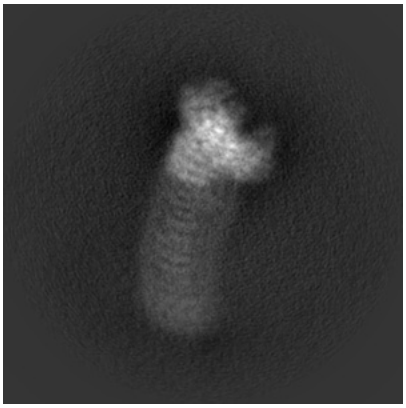


Z

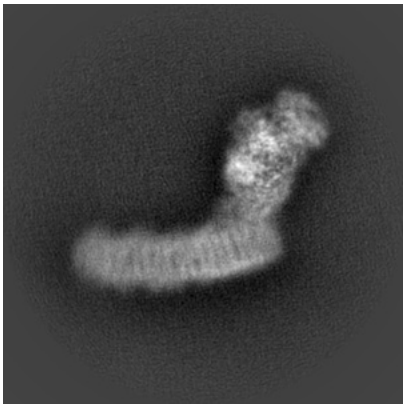
6.1.2 Raw map



X



Y

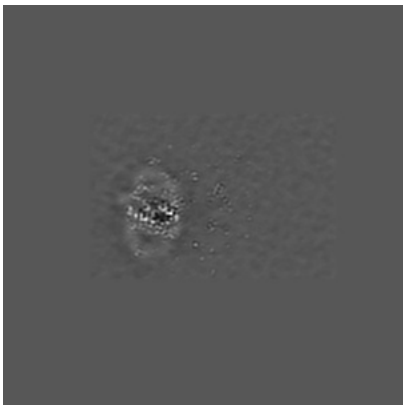


Z

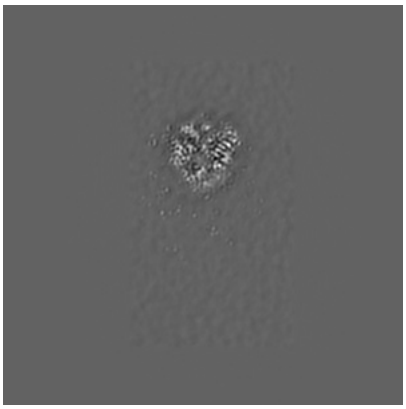
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

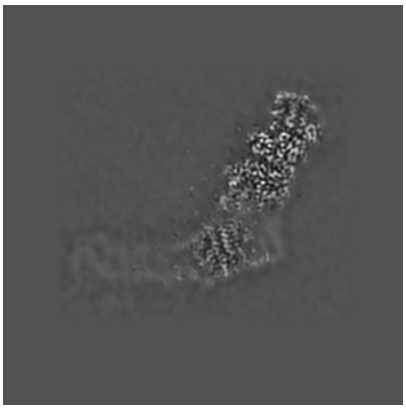
6.2.1 Primary map



X Index: 125

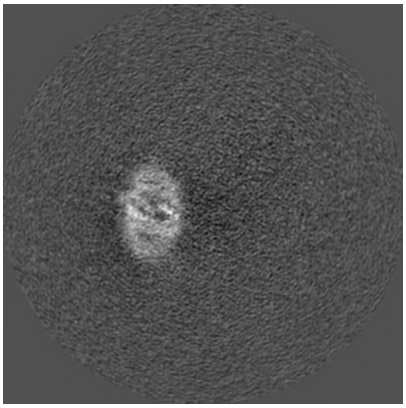


Y Index: 125

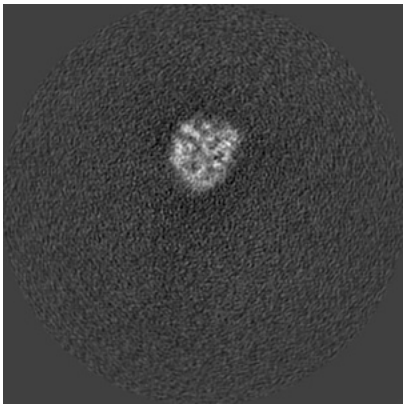


Z Index: 125

6.2.2 Raw map



X Index: 125



Y Index: 125



Z Index: 125

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

6.3 Largest variance slices (i)

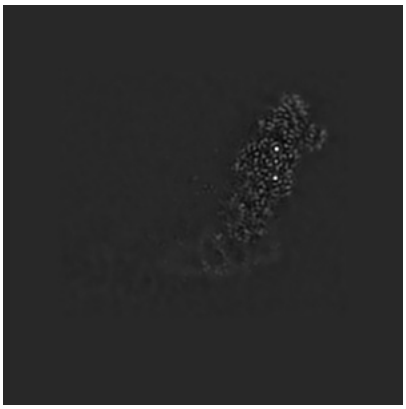
6.3.1 Primary map



X Index: 170

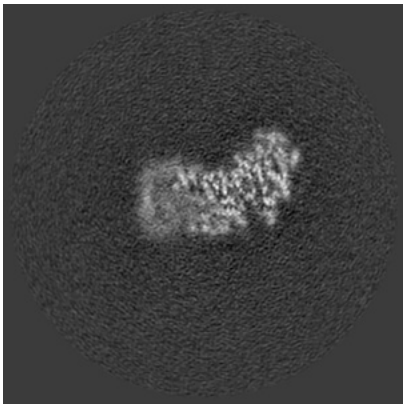


Y Index: 160

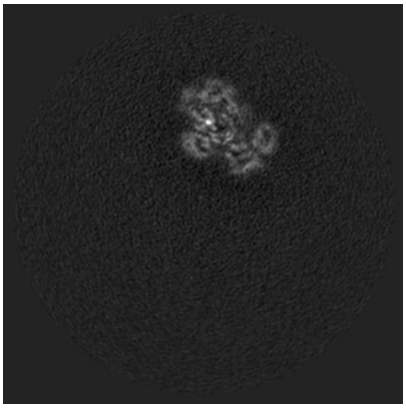


Z Index: 135

6.3.2 Raw map



X Index: 161



Y Index: 166

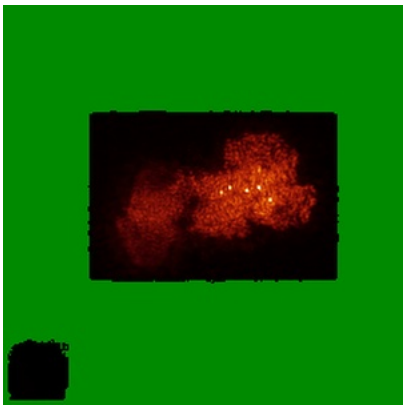


Z Index: 127

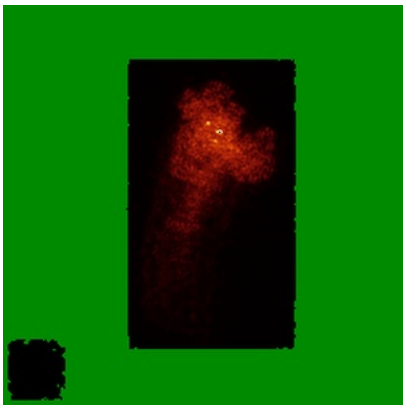
The images above show the largest variance slices of the map in three orthogonal directions.

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

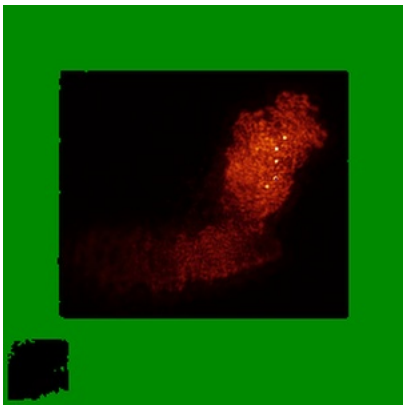
6.4.1 Primary map



X

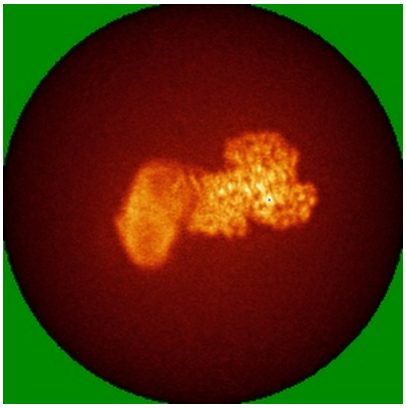


Y



Z

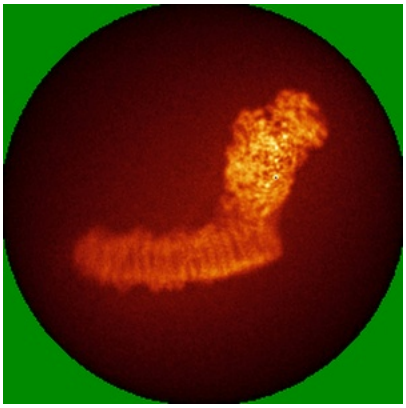
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 2.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

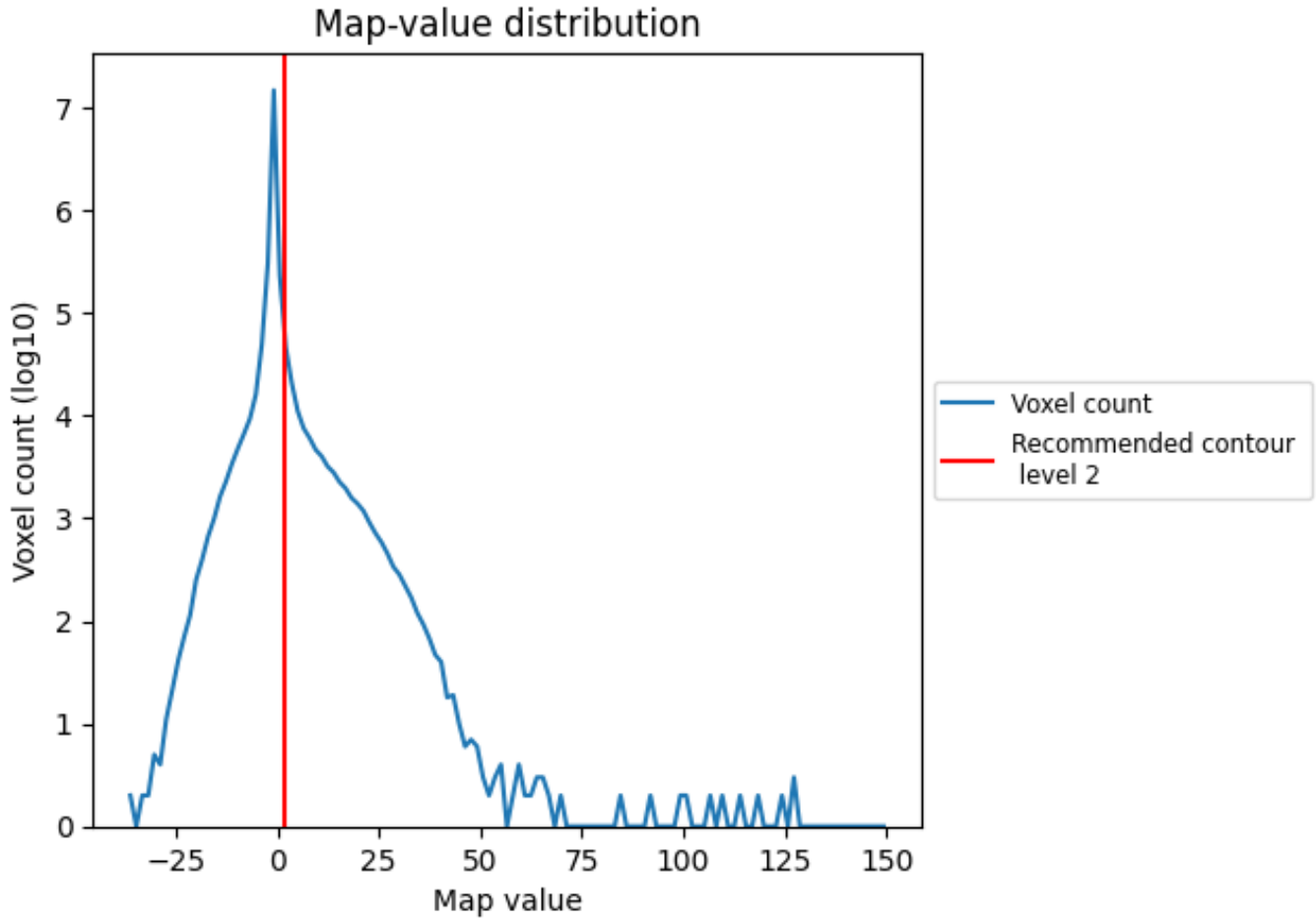
6.6 Mask visualisation (i)

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

7 Map analysis

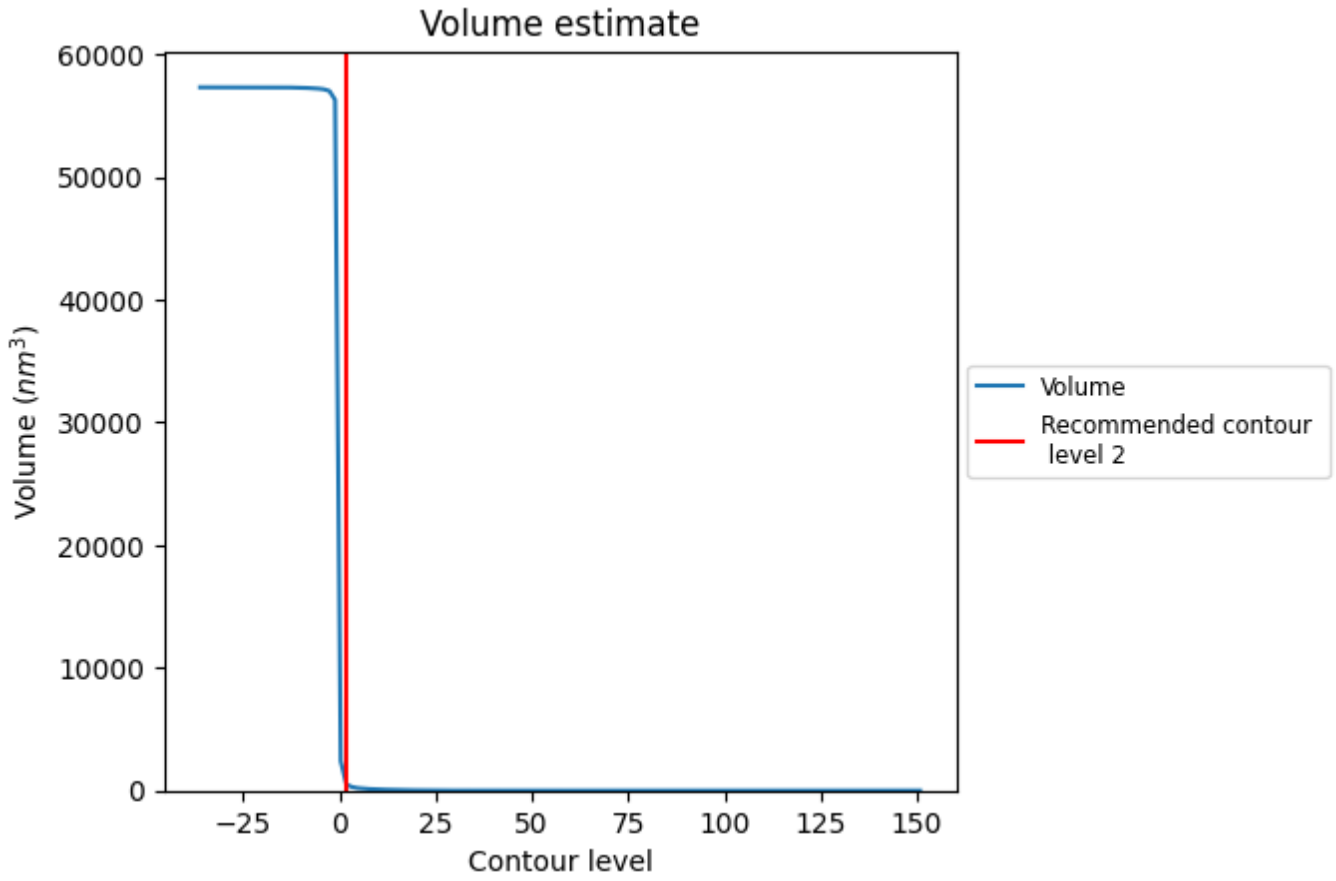
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

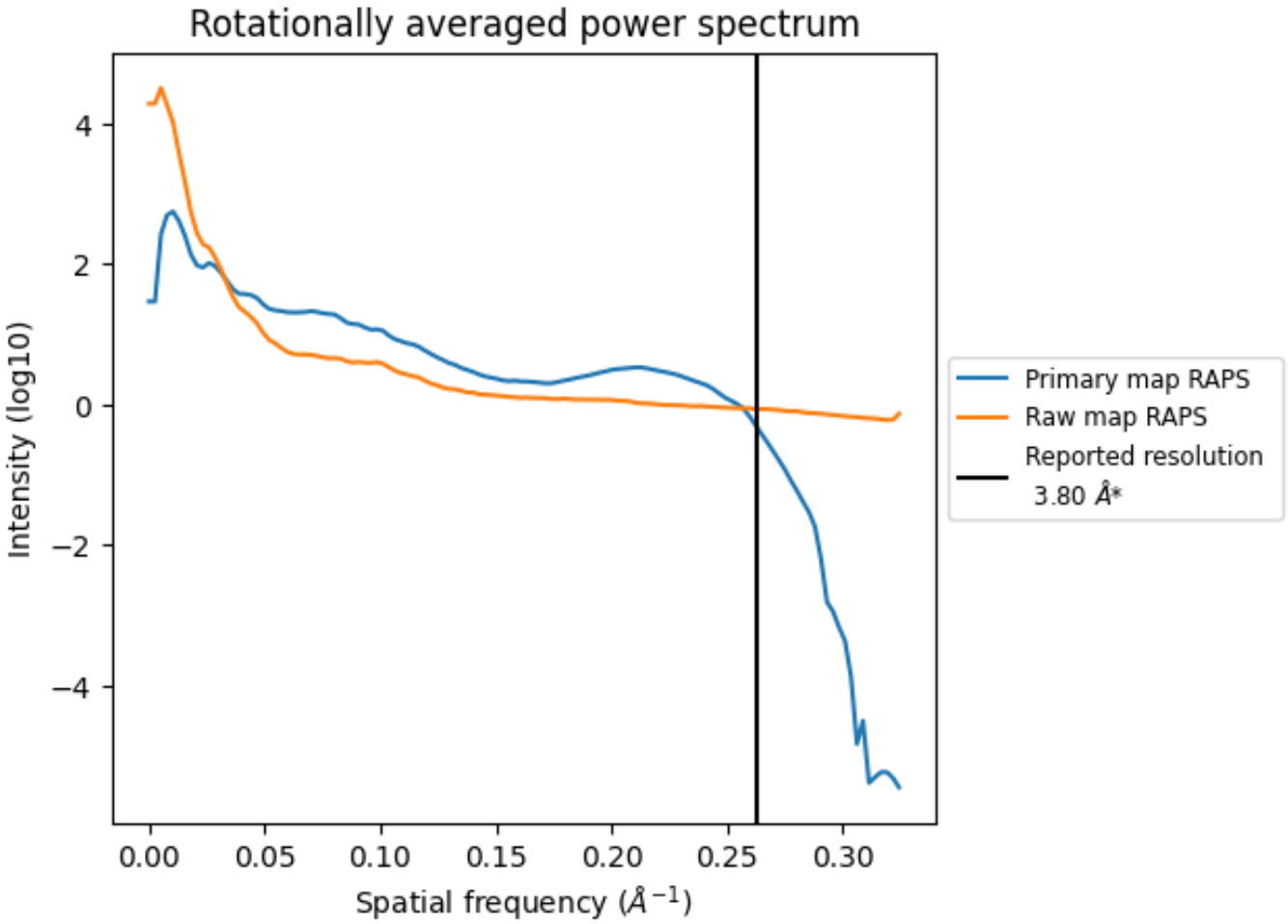
7.2 Volume estimate (i)



The volume at the recommended contour level is 464 nm^3; this corresponds to an approximate mass of 419 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

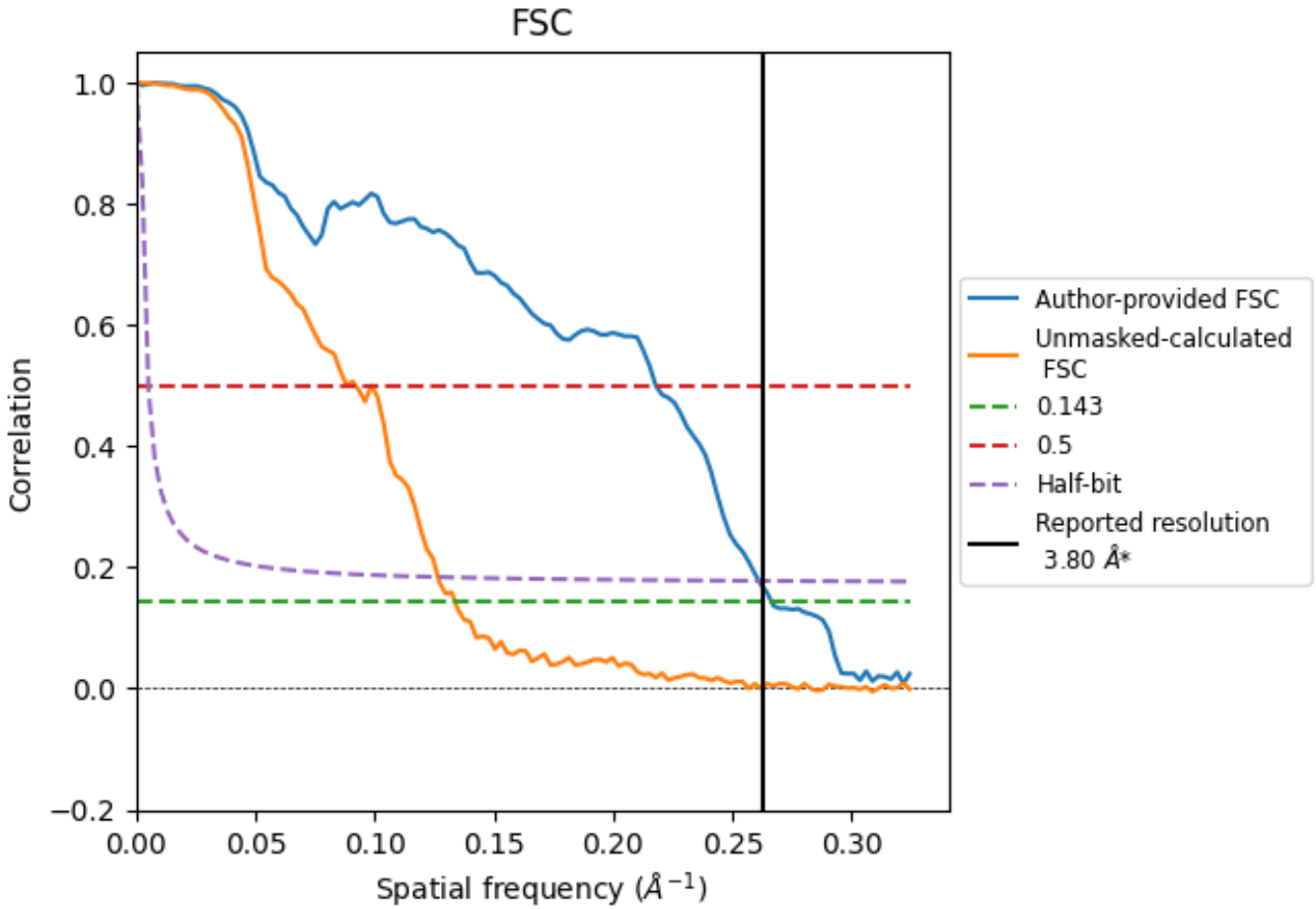


*Reported resolution corresponds to spatial frequency of 0.263 Å^{-1}

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.263 Å^{-1}

8.2 Resolution estimates (i)

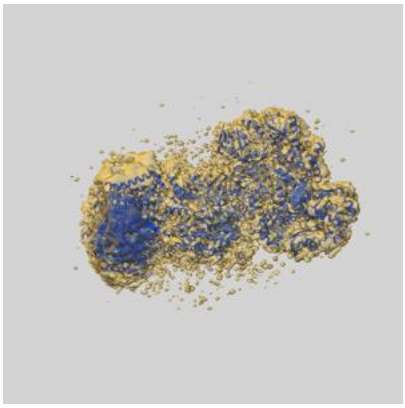
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.75	4.59	3.83
Unmasked-calculated*	7.48	10.88	7.90

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.48 differs from the reported value 3.8 by more than 10 %

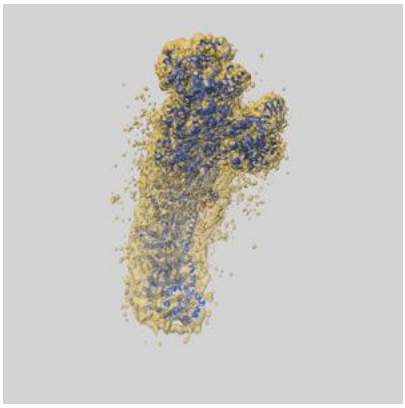
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-12654 and PDB model 7NYU. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay



X



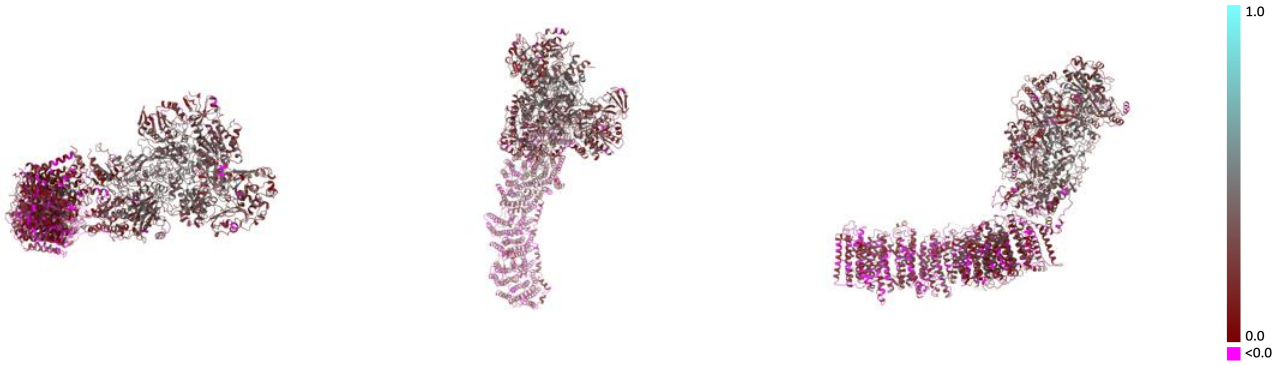
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 2.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

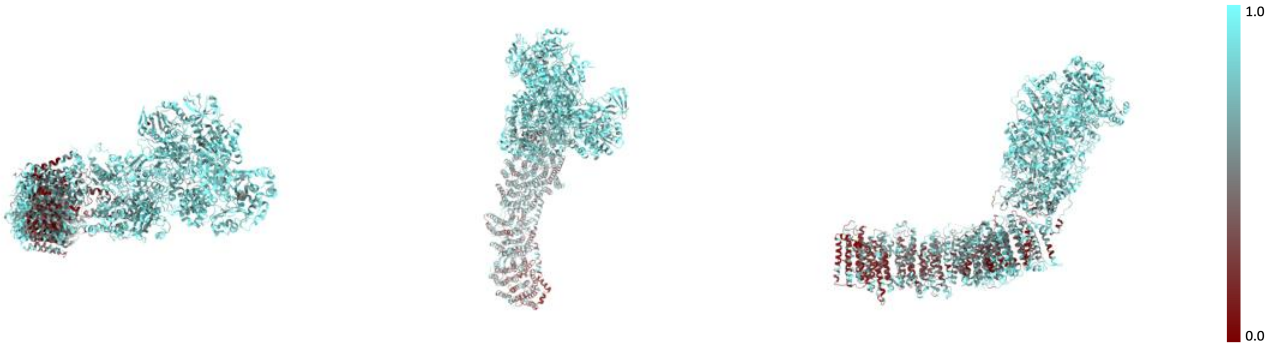
9.2 Q-score mapped to coordinate model



X Y Z

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

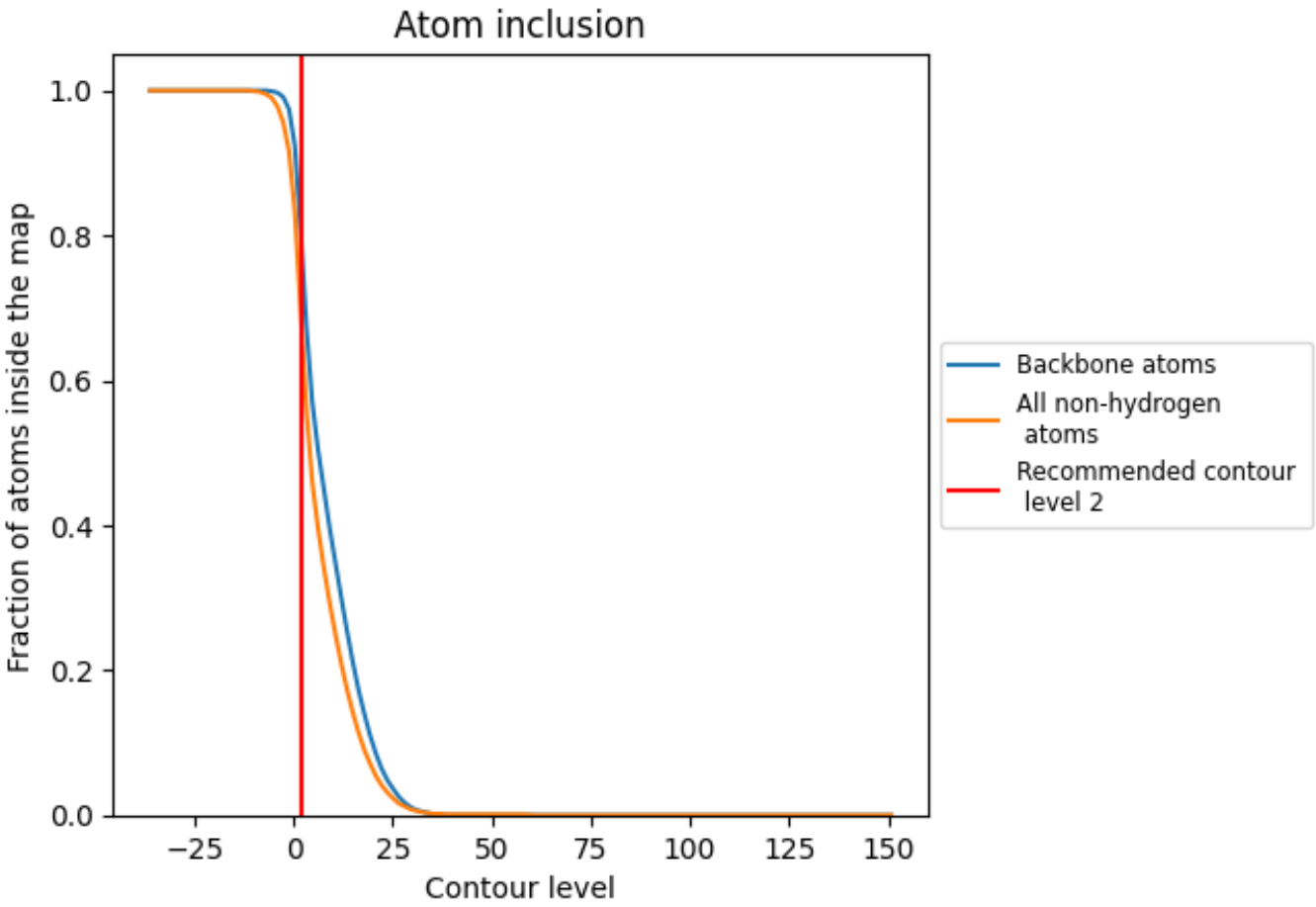
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (2).

9.4 Atom inclusion (i)



At the recommended contour level, 79% of all backbone atoms, 68% 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 (2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6770	0.2200
A	0.5030	0.1000
B	0.7590	0.2800
D	0.7720	0.2830
E	0.8550	0.3170
F	0.8350	0.3180
G	0.8350	0.3380
H	0.5720	0.1310
I	0.8320	0.3650
J	0.6180	0.1500
K	0.6090	0.1830
L	0.3760	0.0760
M	0.5110	0.0760
N	0.6100	0.1310

