



wwPDB EM Validation Summary Report ⓘ

Apr 18, 2024 – 02:09 pm BST

PDB ID : 7OI6
EMDB ID : EMD-12919
Title : Cryo-EM structure of late human 39S mitoribosome assembly intermediates, state 1
Authors : Cheng, J.; Berninghausen, O.; Beckmann, R.
Deposited on : 2021-05-11
Resolution : 5.70 Å(reported)

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.dev92
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 : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

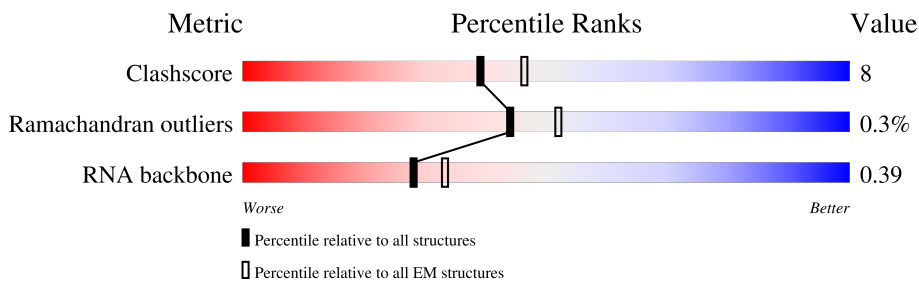
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 5.70 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
RNA backbone	4643	859

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 $\leq 5\%$. 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	D	305	
2	E	348	
3	F	311	
4	H	267	
5	K	178	
6	L	145	
7	M	296	
8	N	251	

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Mol	Chain	Length	Quality of chain
9	O	175	 84% 13%
10	Q	292	 69% 26% 5%
11	R	149	 91% 6%
12	S	205	 69% 24% 7%
13	T	206	 71% 23% 6%
14	U	153	 84% 9% 7%
15	V	216	 84% 11% 5%
16	X	256	 90% 5% 5%
17	Y	250	 69% 30%
18	Z	161	 72% 25%
19	0	188	 56% 43%
20	2	92	 45% 53%
21	5	423	 84% 9% 8%
22	7	338	 81% 15%
23	9	137	 82% 15%
24	a	142	 57% 42%
25	b	215	 69% 31%
26	c	332	 83% 17%
27	d	306	 69% 31%
28	g	166	 78% 22%
29	h	158	 63% 37%
30	i	128	 76% 24%
31	j	123	 69% 31%
32	o	102	 77% 23%
33	p	206	 49% 48%

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Mol	Chain	Length	Quality of chain
34	q	222	45% 55%
35	r	196	74% 26%
36	s	439	84% 16%
37	u	234	47% 53%
38	v	70	99%
39	w	156	6% 51% 49%
40	A	1559	26% 37% 13% 23%
41	x	540	69% 31%
42	y	387	67% 84% 14%
43	l	420	10% 61% 39%
43	z	420	8% 60% 40%
44	B	69	28% 45% 9% 19%
45	P	180	69% 5% 26%
46	W	148	56% 9% 34%
47	6	380	82% 14%
48	I	261	30% 58% 39%
49	J	192	51% 71% 27%
50	k	112	34% 71% 25%
51	l	138	17% 83%

2 Entry composition [i](#)

There are 54 unique types of molecules in this entry. The entry contains 69386 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 39S ribosomal protein L2, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	D	220	1076	636	220	220	0	0

- Molecule 2 is a protein called 39S ribosomal protein L3, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	E	285	1399	829	285	285	0	0

- Molecule 3 is a protein called 39S ribosomal protein L4, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	F	250	1233	733	250	250	0	0

- Molecule 4 is a protein called 39S ribosomal protein L9, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	H	95	469	279	95	95	0	0

- Molecule 5 is a protein called 39S ribosomal protein L13, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	K	177	876	522	177	177	0	0

- Molecule 6 is a protein called 39S ribosomal protein L14, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	L	115	565	335	115	115	0	0

- Molecule 7 is a protein called 39S ribosomal protein L15, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
7	M	257	1266	752	257	257	0	0

- Molecule 8 is a protein called 39S ribosomal protein L16, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
8	N	205	1006	596	205	205	0	0

- Molecule 9 is a protein called 39S ribosomal protein L17, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
9	O	152	749	445	152	152	0	0

- Molecule 10 is a protein called 39S ribosomal protein L19, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
10	Q	217	1075	641	217	217	0	0

- Molecule 11 is a protein called 39S ribosomal protein L20, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
11	R	140	693	413	140	140	0	0

- Molecule 12 is a protein called 39S ribosomal protein L21, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
12	S	156	772	460	156	156	0	0

- Molecule 13 is a protein called 39S ribosomal protein L22, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
13	T	159	788	470	159	159	0	0

- Molecule 14 is a protein called 39S ribosomal protein L23, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
14	U	139	Total	C	N	O	0	0
			686	408	139	139		

- Molecule 15 is a protein called 39S ribosomal protein L24, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
15	V	192	Total	C	N	O	0	0
			946	562	192	192		

- Molecule 16 is a protein called 39S ribosomal protein L28, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
16	X	243	Total	C	N	O	0	0
			1202	716	243	243		

- Molecule 17 is a protein called 39S ribosomal protein L47, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
17	Y	176	Total	C	N	O	0	0
			874	522	176	176		

- Molecule 18 is a protein called 39S ribosomal protein L30, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
18	Z	120	Total	C	N	O	0	0
			595	355	120	120		

- Molecule 19 is a protein called 39S ribosomal protein L32, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
19	0	108	Total	C	N	O	0	0
			534	318	108	108		

- Molecule 20 is a protein called 39S ribosomal protein L34, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
20	2	43	Total	C	N	O	0	0
			211	125	43	43		

- Molecule 21 is a protein called 39S ribosomal protein L37, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
21	5	387	1916	1142	387	387	0	0

- Molecule 22 is a protein called 39S ribosomal protein L39, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
22	7	287	1426	852	287	287	0	0

- Molecule 23 is a protein called 39S ribosomal protein L41, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
23	9	117	575	341	117	117	0	0

- Molecule 24 is a protein called 39S ribosomal protein L42, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
24	a	82	407	243	82	82	0	0

- Molecule 25 is a protein called 39S ribosomal protein L43, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
25	b	148	730	434	148	148	0	0

- Molecule 26 is a protein called 39S ribosomal protein L44, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
26	c	275	1360	810	275	275	0	0

- Molecule 27 is a protein called 39S ribosomal protein L45, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
27	d	211	1048	626	211	211	0	0

- Molecule 28 is a protein called 39S ribosomal protein L49, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
28	g	129	638	380	129	129	0	0

- Molecule 29 is a protein called 39S ribosomal protein L50, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
29	h	100	499	299	100	100	0	0

- Molecule 30 is a protein called 39S ribosomal protein L51, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	i	97	476	282	97	97	0	0

- Molecule 31 is a protein called 39S ribosomal protein L52, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	j	85	417	247	85	85	0	0

- Molecule 32 is a protein called Ribosomal protein 63, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	o	79	394	236	79	79	0	0

- Molecule 33 is a protein called Peptidyl-tRNA hydrolase ICT1, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
33	p	107	533	319	107	107	0	0

- Molecule 34 is a protein called Growth arrest and DNA damage-inducible proteins-interacting protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
34	q	99	490	292	99	99	0	0

- Molecule 35 is a protein called 39S ribosomal protein S18a, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
35	r	146	721	429	146	146	0	0

- Molecule 36 is a protein called 39S ribosomal protein S30, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
36	s	370	1838	1098	370	370	0	0

- Molecule 37 is a protein called Mitochondrial assembly of ribosomal large subunit protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
37	u	111	552	330	111	111	0	0

- Molecule 38 is a protein called MIEF1 upstream open reading frame protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
38	v	69	341	203	69	69	0	0

- Molecule 39 is a protein called Acyl carrier protein, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
39	w	79	392	234	79	79	0	0

- Molecule 40 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
40	A	1208	25636	11507	4620	8301	1208	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1437	U	UNK	conflict	GB 1025814679

- Molecule 41 is a protein called Probable ATP-dependent RNA helicase DDX28.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
41	x	374	1843	1095	374	374	0	0

- Molecule 42 is a protein called GTP-binding protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
42	y	331	1621	959	331	331	0	0

- Molecule 43 is a protein called rRNA methyltransferase 3, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
43	z	253	1242	736	253	253	0	0
43	1	257	1262	748	257	257	0	0

- Molecule 44 is a RNA chain called mitochondrial Val tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
44	B	56	1191	534	214	387	56	0	0

- Molecule 45 is a protein called 39S ribosomal protein L18, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
45	P	133	659	393	133	133	0	0

- Molecule 46 is a protein called 39S ribosomal protein L27, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
46	W	98	481	285	98	98	0	0

- Molecule 47 is a protein called 39S ribosomal protein L38, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
47	6	325	1611	961	325	325	0	0

- Molecule 48 is a protein called 39S ribosomal protein L10, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
48	I	158	785	469	158	158	0	0

- Molecule 49 is a protein called 39S ribosomal protein L11, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
49	J	140	686	406	140	140	0	0

- Molecule 50 is a protein called 39S ribosomal protein L53, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
50	k	84	416	248	84	84	0	0

- Molecule 51 is a protein called 39S ribosomal protein L54, mitochondrial.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
51	l	23	115	69	23	23	0	0

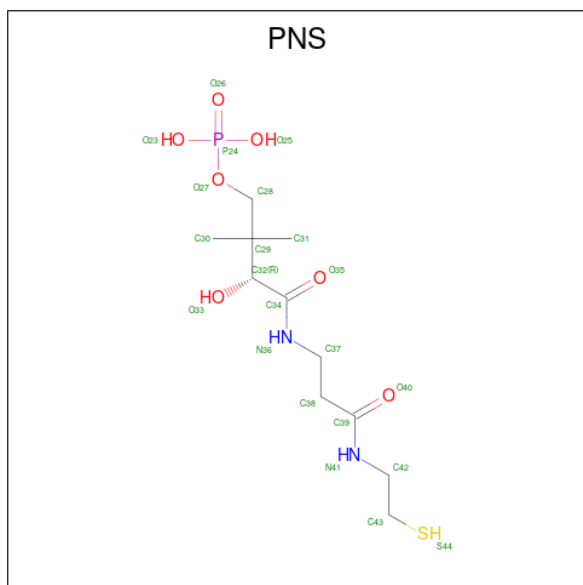
- Molecule 52 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
52	F	1	Total	Mg	0
			1	1	
52	g	1	Total	Mg	0
			1	1	
52	A	44	Total	Mg	0
			44	44	
52	x	1	Total	Mg	0
			1	1	
52	W	1	Total	Mg	0
			1	1	

- Molecule 53 is ZINC ION (three-letter code: ZN) (formula: Zn).

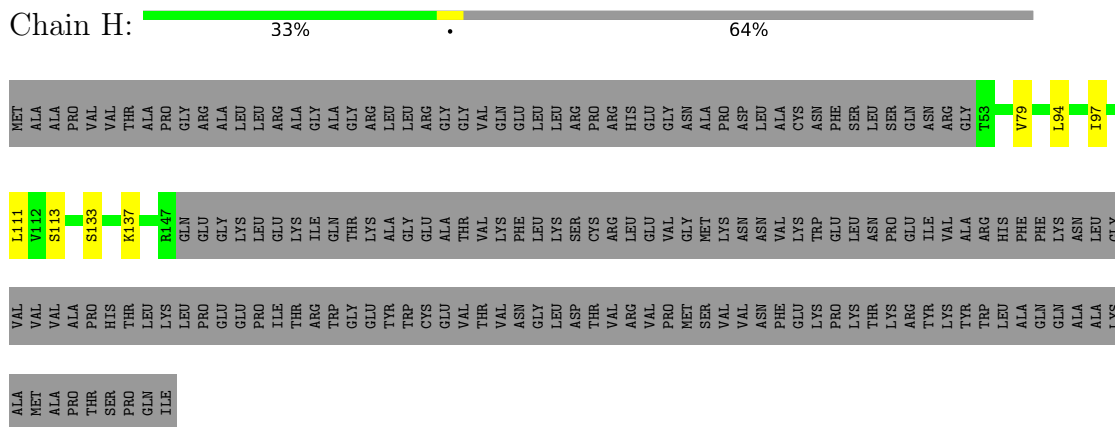
Mol	Chain	Residues	Atoms		AltConf
53	0	1	Total	Zn	0
			1	1	

- Molecule 54 is 4'-PHOSPHOPANTETHEINE (three-letter code: PNS) (formula: C₁₁H₂₃N₂O₇PS).

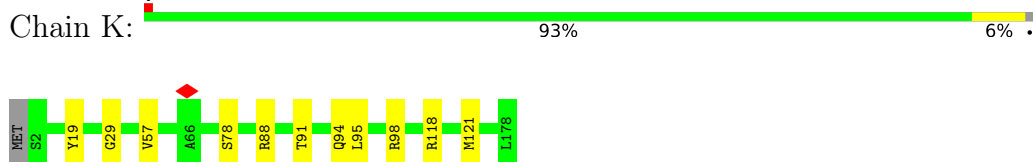


Mol	Chain	Residues	Atoms					AltConf	
			Total	C	N	O	P		S
54	v	1	21	11	2	6	1	1	0

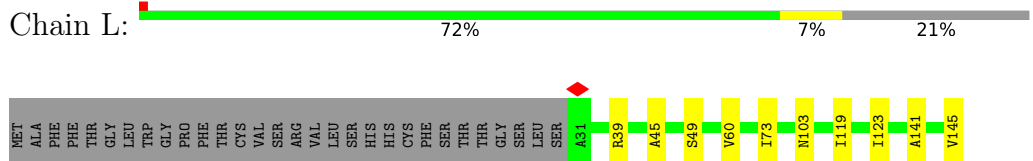
• Molecule 4: 39S ribosomal protein L9, mitochondrial



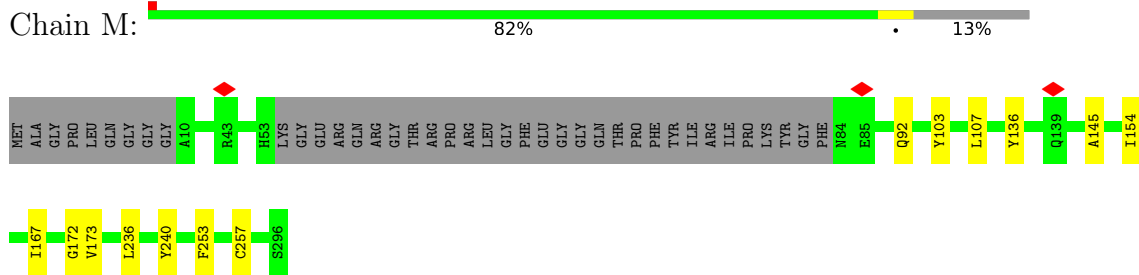
• Molecule 5: 39S ribosomal protein L13, mitochondrial



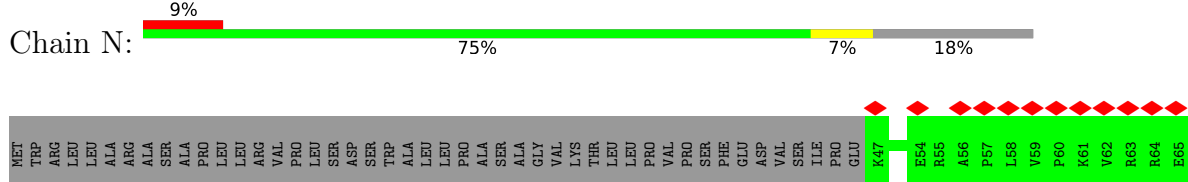
• Molecule 6: 39S ribosomal protein L14, mitochondrial

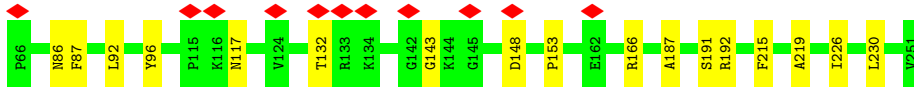


• Molecule 7: 39S ribosomal protein L15, mitochondrial



• Molecule 8: 39S ribosomal protein L16, mitochondrial





- Molecule 9: 39S ribosomal protein L17, mitochondrial

Chain O: 84% 13%



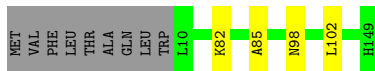
- Molecule 10: 39S ribosomal protein L19, mitochondrial

Chain Q: 69% 5% 26%



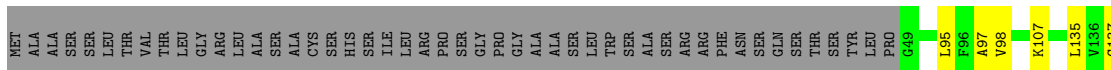
- Molecule 11: 39S ribosomal protein L20, mitochondrial

Chain R: 91% 6%



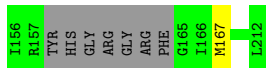
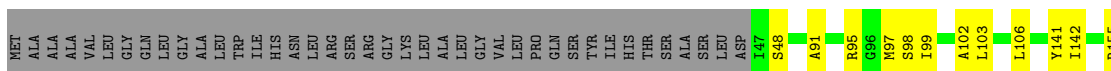
- Molecule 12: 39S ribosomal protein L21, mitochondrial

Chain S: 69% 7% 24%

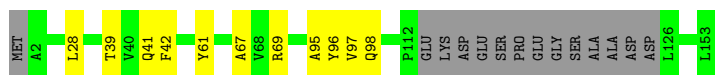
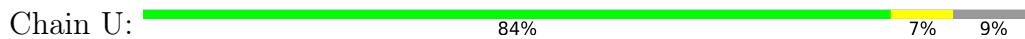


- Molecule 13: 39S ribosomal protein L22, mitochondrial

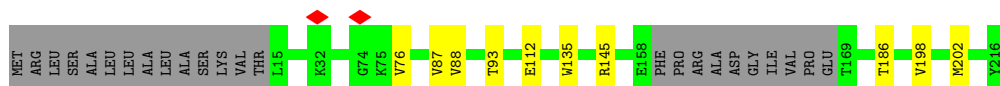
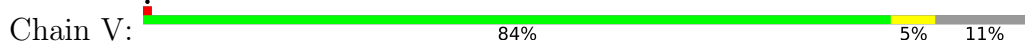
Chain T: 71% 6% 23%



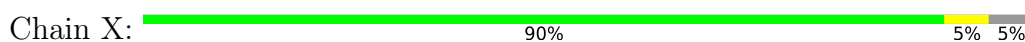
- Molecule 14: 39S ribosomal protein L23, mitochondrial



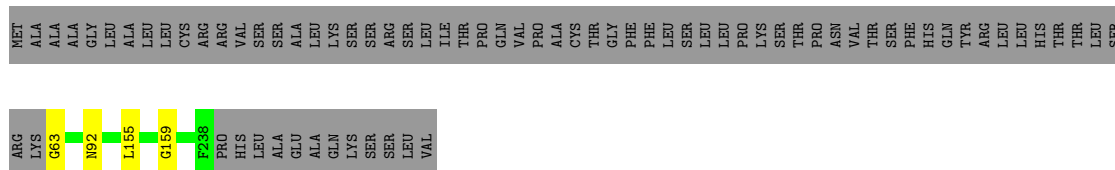
• Molecule 15: 39S ribosomal protein L24, mitochondrial



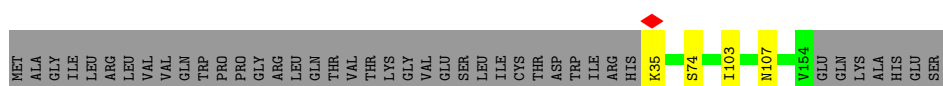
• Molecule 16: 39S ribosomal protein L28, mitochondrial



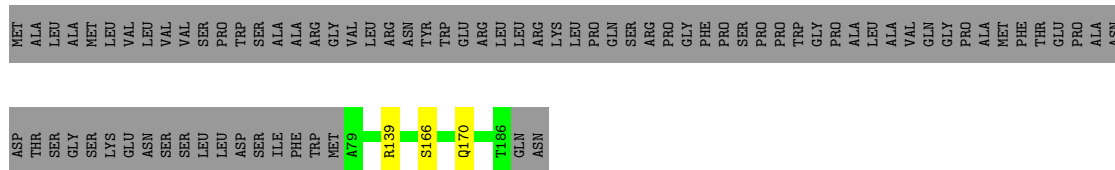
• Molecule 17: 39S ribosomal protein L47, mitochondrial



• Molecule 18: 39S ribosomal protein L30, mitochondrial

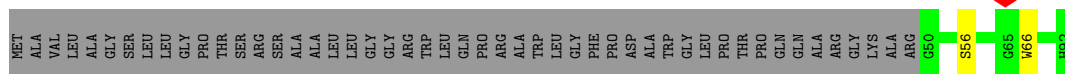


• Molecule 19: 39S ribosomal protein L32, mitochondrial

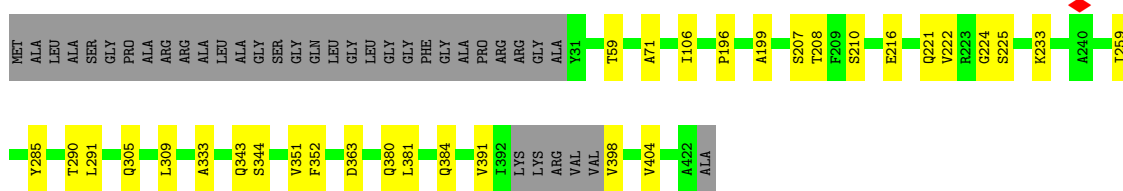
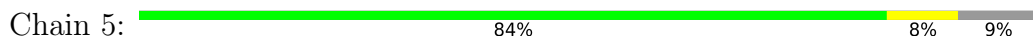


• Molecule 20: 39S ribosomal protein L34, mitochondrial

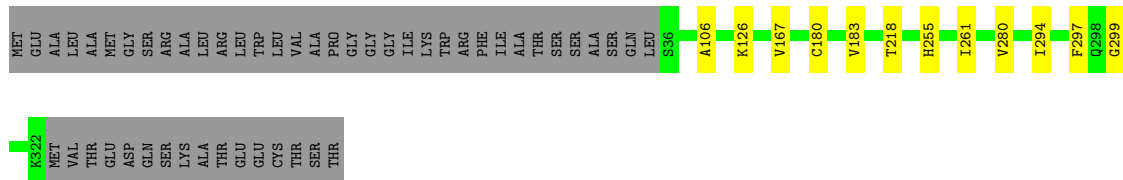
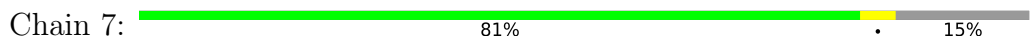




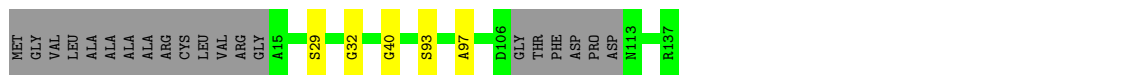
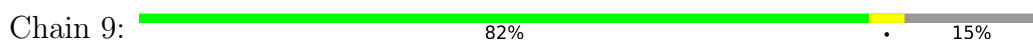
• Molecule 21: 39S ribosomal protein L37, mitochondrial



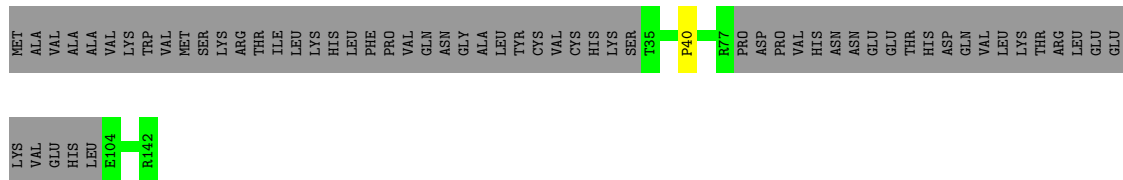
• Molecule 22: 39S ribosomal protein L39, mitochondrial



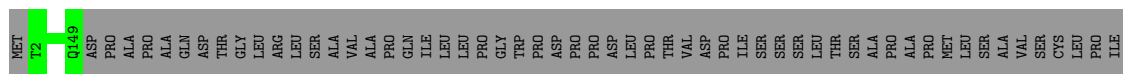
• Molecule 23: 39S ribosomal protein L41, mitochondrial



• Molecule 24: 39S ribosomal protein L42, mitochondrial




• Molecule 25: 39S ribosomal protein L43, mitochondrial



VAL
PRO
ALA
LEU
THR
THR
VAL
VAL
CYS
SER
SER
ALA

- Molecule 26: 39S ribosomal protein L44, mitochondrial

Chain c:  83% 17%

MET
ALA
SER
GLY
LEU
VAL
ARG
LEU
LEU
GLN
GLN
GLY
HIS
ARG
CYS
LEU
LEU
ALA
PRO
VAL
ALA
PRO
LYS
LEU
VAL
PRO
VAL
VAL
GLY
V81
Q107
LEU
GLY
ILE
GLU
LYS
GLU
ALA
VAL
LEU
LEU
ASN
L119
Y316
SER
LYS
PRO
LYS
THR
THR
ARG
ALA
GLU
LYS
SER
ILE

THR
ALA
SER


- Molecule 27: 39S ribosomal protein L45, mitochondrial

Chain d:  69% 31%

MET
ALA
PRO
ILE
PRO
GLN
GLY
PHE
SER
CYS
LEU
SER
PHE
LEU
GLY
TRP
PHE
ARG
GLN
VAL
VAL
THR
GLN
ALA
ALA
ILE
VAL
PRO
ARG
THR
LYS
LYS
ARG
PHE
THR
PRO
PRO
ILE
TYR
GLN
PRO
LYS
F50
H59
AGO
R61
K62
L65
P91
GLU

GLY
ASP
ALA
THR
ILE
SER
SER
LEU
SER
LYS
GLU
GLY
ILE
GLU
ARG
THR
GLN
TRP
MET
LYS
THR
MET
MET
ASN
GLN
N207
L252
THR
ASN
P255
E294
GLU
ALA
GLN
GLY
ALA
GLN
LYS
PRO
LEU
ALA

- Molecule 28: 39S ribosomal protein L49, mitochondrial

Chain g:  78% 22%

MET
ALA
THR
MET
PHE
ARG
ALA
THR
LEU
ARG
GLY
TRP
ARG
THR
GLY
VAL
GLN
ARG
GLY
CYS
LEU
LEU
LEU
SER
GLN
THR
THR
GLN
GLY
PRO
PRO
ASP
TYR
PRO
ARG
F38
F166

- Molecule 29: 39S ribosomal protein L50, mitochondrial

Chain h:  63% 37%

MET
ALA
ARG
SER
SER
GLY
ILE
THR
ARG
VAL
PHE
MET
TRP
TRP
VAL
VAL
SER
GLY
THR
PRO
CYS
ARG
PHE
PHE
LYS
GLU
GLU
VAL
VAL
VAL
THR
VAL
GLU
LYS
LYS
GLU
PRO
PRO
ILE
LEU
VAL
CYS
PRO
PRO
LEU
LEU
R56
F78
GLY
SER

SER
L62
Y158

- Molecule 30: 39S ribosomal protein L51, mitochondrial

Chain i:  76% 24%

MET
ALA
GLY
ASN
LEU
LEU
SER
GLY
ALA
GLY
ARG
ARG
TRP
ASP
VAL
VAL
PRO
LEU
ALA
CYS
ARG
SER
PHE
SER
LEU
VAL
VAL
I32
O61
G125
R128

- Molecule 31: 39S ribosomal protein L52, mitochondrial

MET	ALA	ALA	ALA	ALA	ARG	CYS	TRP	ARG	PRO	PRO	LEU	LEU	LEU	ARG	GLY	PRO	PRO	VAL	V41	P119	PRO	PRO	PRO	PRO	ALA	ALA	GLU	GLU	PRO	PRO	PRO	GLU	PRO	PRO	PRO	PRO	ALA
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

LEU	ASP	LEU	A140	K430	GLU	GLU	LYS	SER	SER	GLN	LEU	LEU	GLY	PRO	GLU	ASN
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- Molecule 37: Mitochondrial assembly of ribosomal large subunit protein 1

Chain u:  47% 53%

MET	GLY	PRO	GLY	GLY	GLY	VAL	ARG	VAL	ALA	ARG	LEU	LEU	ALA	ALA	PRO	LEU	GLY	LEU	LEU	LEU	LEU	VAL	VAL	GLY	ALA	ALA	PHE	GLU	CYS	ARG	ALA	ALA	GLN	GLN	PRO	ARG	LEU	PRO	VAL	VAL	GLY	ALA	ALA	PHE	ASP	ASP	ASP	THR	THR	ASN	PHE	VAL	VAL	THR	ARG	GLY
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

LEU	HIS	SER	GLU	PRO	GLY	LEU	GLU	GLU	ARG	ALA	ALA	GLY	THR	VAL	ASN	GLY	ARG	GLY	ARG	PRO	VAL	GLU	SER	SER	SER	ASP	VAL	ALA	ALA	ASP	HIS	THR	VAL	VAL	GLY	PRO	PRO	K91	D201	GLN	LEU	LEU	LEU	LEU	GLN	ILE	ALA	ALA	PRO	PRO	GLU	THR	THR	VAL	PRO	PRO	GLU	ASP	PHE	ASP	ILE	LEU	LEU	GLY	ILE	GLU	ILE	ASP	THR	SER	SER	VAL	THR	THR	PRO
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VAL	GLU	LEU	LYS	CYS	GLU
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- Molecule 38: MIEF1 upstream open reading frame protein

Chain v:  99%

MET	A2	I70
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- Molecule 39: Acyl carrier protein, mitochondrial

Chain w:  6% 51% 49%

MET	ALA	SER	ARG	VAL	ARG	LEU	SER	ALA	TYR	VAL	ASP	ARG	PRO	LEU	PRO	LEU	ALA	ALA	PHE	ALA	ALA	ALA	PRO	PRO	LEU	PRO	VAL	VAL	ARG	VAL	VAL	VAL	ARG	MET	LEU	LEU	VAL	VAL	ALA	ALA	ALA	LEU	LEU	SER	CYS	VAL	GLY	VAL	THR	THR	GLN	THR	ARG	LEU	ARG	LEU	GLY	GLY	GLY	THR	THR	GLN	GLN	PRO	ALA	LEU	VAL	VAL	ALA	GLN	VAL	PRO	GLY	ARG
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VAL	THR	GLN	LEU	CYS	ARG	GLN	TYR	PRO	L74	E77	I93	D94	P95	E96	M105	L108	G109	A135	E136	K152	ASP	TYR	VAL	GLU
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- Molecule 40: 16S rRNA

Chain A:  26% 37% 13% 23%

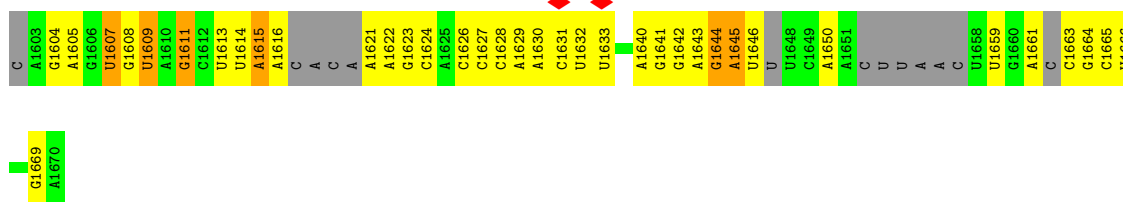
G1	C2	U3	A4	A5	A6	C7	C8	U9	C10	A10	A11	G12	G13	C14	C15	C19	C20	C21	A22	C23	U24	C28	A	U30	U31	A32	C33	U34	A35	C36	C37	A38	G	A	C	A42	A43	C44	C45	U46	U47	A48	C49	C50	C51	A52	A53	A54	C55	C56	A57	U58	U59	U60	A61	A62	C
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A	A	A67	U68	A69	A70	A71	G72	C73	U74	A75	U76	A77	G78	C79	C80	A81	U82	A83	C84	A85	A86	G90	A	A	C	A	C	U	G97	G98	C99	G100	C101	U164	A165	A166	C167	U104	A105	G106	A107	U108	U109	U110	A111	G112	C113	U114	U117	U118	C119	U180	G117	C118	A119	A	A120	U	G121	A	U	G123	A124	U125	G188	A126
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G197	A128	U129	G130	A133	A134	A135	U	U	U	A	A141	C142	C143	A144	A148	U149	A150	A151	U152	A153	U154	A155	G156	C157	A158	A159	G160	G161	A162	C163	U164	A165	A166	C167	C168	C169	C170	U171	U172	U173	A174	C175	C176	U177	U178	C179	U180	G181	C	A	U	A	A186	U187	G188
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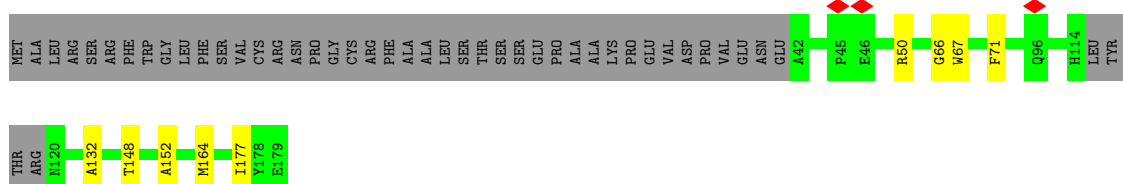
U192	G318	G386	A454	A522	U683	U646	C723	C855	A	U	A1041	G
A193	G387	C387	C455	U623	C584	G647	A792	C856	A	U	G1042	U
A194	A258	C322	U456	U524	C585	A648	A793	A857	A	C980	C1043	C
C195	A259	C388	A457	A525	U586	A649	A724	A858	A	U	A1044	C
A197	A	A323	A458	G526	C587	A650	C726	U862	G	U984	U1045	U
G198	C	U196	G459	A527	A588	A651	C727	A863	G	U985	G1046	A
A199	C	A390	A460	A528	C589	C652	A728	A	U	U986	A1047	A
A200	U	A391	A395	A529	A590	A653	A729	A799	A	C987	C1048	A
A201	A	C327	A461	A530	A591	A654	C730	A798	A	U988	G1049	A
U202	A	U392	A462	G531	C592	U655	A731	A801	A	C989	A	U
A203	A	A330	A463	C532	C593	A656	A802	A802	A	U990	G	U
A204	A	C331	A465	U533	A594	U657	C732	A803	A	U991	A	C
C205	A	G332	C466	U534	A595	C658	U734	A	C	A992	A1053	C
U206	G	A333	C467	U535	U596	C659	A735	C	U	C993	G1054	A
U207	G	C336	U468	C536	U597	C662	A736	C	C	U994	A1055	A
U208	C	U207	U469	A537	G598	C663	U737	C	G	U995	A	U
G209	C	G337	A470	A538	G599	G669	A738	C	C	U996	U1059	A
C210	A	G338	U471	G539	A600	C670	C744	C	C	U997	U1060	A
A211	C	G339	A472	C540	C601	C671	U741	A	A	A998	U1061	A
G212	C	U340	G473	U541	C602	U672	A742	A	A	A999	G1065	G
A212	C	G341	A476	A546	A603	G673	C743	A	A	C1000	U1069	U
G213	C	U342	G477	C547	A604	G674	C744	A	C	U1001	A1070	U
G214	C	A343	G478	C548	U605	G675	C745	U	U	A1002	U1071	U
A215	C	U344	A479	C549	C606	U676	U746	A	A	G1003	A1072	U
G216	C	G345	G479	U542	C607	G677	A747	U	U	U1004	U1073	U
A217	U	C346	U480	C543	C608	U678	A748	A	A	G1005	U1074	A
G218	U	U347	A481	C544	A609	U681	C749	A	C	U1006	A1075	A
C219	A	A348	A482	C545	C	U	U750	C	C	U1007	U1076	A
C220	G	G349	A483	C546	C	A	G751	C	C	A1008	U1077	A
A221	U	U350	A484	C547	C	A	U752	C	C	U1009	U1078	U
A222	U	U351	A485	C548	C	A	C753	C	C	U1010	U1079	A
A223	C	G352	A486	C549	C	A	C754	C	C	G1011	A1080	U
G224	C	C	U487	C550	C	A	U755	C	C	A1012	U1081	U
C225	A	C355	U488	C551	C	A	C756	C	C	U1013	G1082	G
U226	A	G358	U489	C552	C	A	C757	C	C	C1014	A1083	G
A227	A	U359	A490	C553	C	A	C758	U	U	U1015	U1084	C
A228	A	A360	C496	C554	C	A	U759	U	U	G1016	A1085	C
G229	U	U360	A497	C555	C	A	C760	C	C	C1017	U1086	C
A230	A	A361	U498	C556	C	A	C761	A	A	U1018	A	A
C231	G	G	U499	C557	C	A	A	C	C	G1019	A	A
C232	G	U366	A500	C558	C	A	C	C	C	U1020	A	A
C233	G	U367	A501	C559	C	A	C	C	C	G1021	A	A
A237	G	A369	A502	C560	C	A	C	C	C	U1022	A	A
A238	A	U370	A503	C561	C	A	C	C	C	A	A	A
A239	A	G370	G503	C562	C	A	C	C	C	G	A	A
C240	U	U371	U504	C563	C	A	C	C	C	U	G	G
C241	U	G372	A510	C564	C	A	C	C	C	A	C	C
A242	A	U373	G511	C565	C	A	C	C	C	C	A	A
G243	A	C373	G512	C566	C	A	C	C	C	C	A	A
A244	A	A374	G513	C567	C	A	C	C	C	C	A	A
A247	A	A375	G514	C568	C	A	C	C	C	C	A	A
G248	C	U377	G515	C569	C	A	C	C	C	C	A	A
C249	C	U378	G516	C570	C	A	C	C	C	C	A	A
G312	U	U379	G517	C571	C	A	C	C	C	C	A	A
U313	U	A380	G518	C572	C	A	C	C	C	C	A	A
A314	U	U381	G519	C573	C	A	C	C	C	C	A	A
G315	U	A382	G520	C574	C	A	C	C	C	C	A	A
C252	U	U383	G521	C575	C	A	C	C	C	C	A	A
C253	U	U384	G522	C576	C	A	C	C	C	C	A	A
A256	U	U385	G523	C577	C	A	C	C	C	C	A	A

Chain B: 



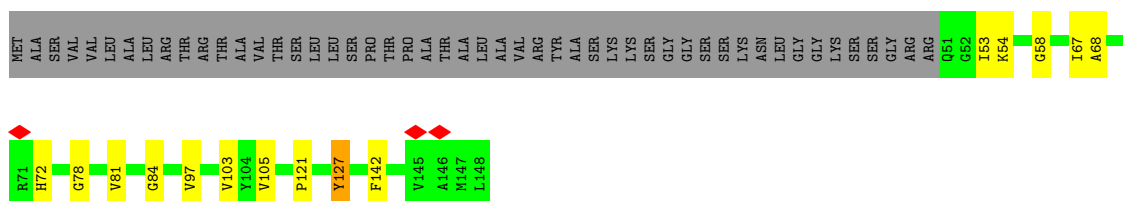
- Molecule 45: 39S ribosomal protein L18, mitochondrial

Chain P: 




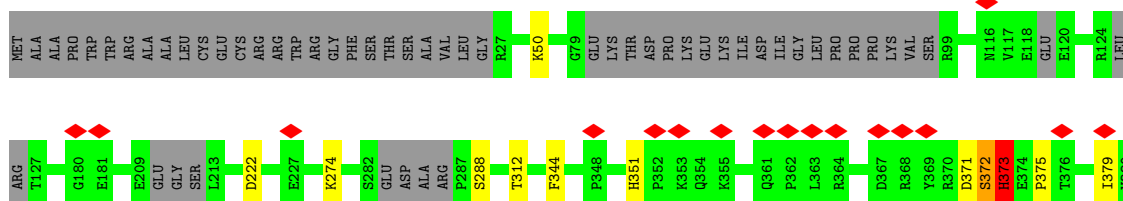
- Molecule 46: 39S ribosomal protein L27, mitochondrial

Chain W: 



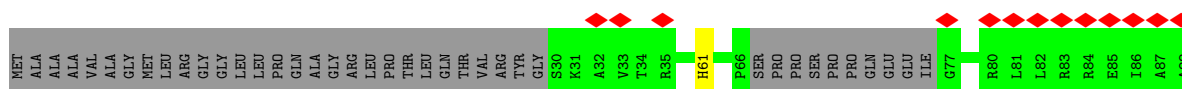
- Molecule 47: 39S ribosomal protein L38, mitochondrial

Chain 6: 



- Molecule 48: 39S ribosomal protein L10, mitochondrial

Chain I: 



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	18134	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	28	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.478	Depositor
Minimum map value	-0.383	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.02	Depositor
Map size (\AA)	390.24, 390.24, 390.24	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.084, 1.084, 1.084	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: MG, PNS, ZN

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	D	0.26	0/1074	0.47	0/1486
2	E	0.31	0/1397	0.49	0/1937
3	F	0.33	0/1232	0.50	0/1713
4	H	0.26	0/468	0.46	0/650
5	K	0.34	0/875	0.50	0/1218
6	L	0.27	0/564	0.48	0/782
7	M	0.31	0/1264	0.48	0/1755
8	N	0.26	0/1005	0.45	0/1394
9	O	0.29	0/748	0.45	0/1039
10	Q	0.28	0/1074	0.45	0/1496
11	R	0.34	0/692	0.49	0/963
12	S	0.32	0/771	0.53	0/1073
13	T	0.33	0/786	0.51	0/1093
14	U	0.32	0/684	0.49	0/949
15	V	0.29	0/944	0.47	0/1310
16	X	0.28	0/1201	0.42	0/1672
17	Y	0.31	0/873	0.41	0/1217
18	Z	0.32	0/594	0.49	0/827
19	0	0.32	0/533	0.46	0/741
20	2	0.35	0/210	0.50	0/290
21	5	0.27	0/1914	0.46	0/2665
22	7	0.28	0/1425	0.45	0/1988
23	9	0.30	0/573	0.49	0/793
24	a	0.33	0/405	0.55	0/562
25	b	0.38	0/729	0.52	0/1013
26	c	0.30	0/1358	0.43	0/1889
27	d	0.27	0/1044	0.48	0/1451
28	g	0.33	0/637	0.48	0/886
29	h	0.27	0/497	0.41	0/692
30	i	0.34	0/475	0.52	0/658
31	j	0.30	0/416	0.41	0/576
32	o	0.28	0/393	0.40	0/548

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	p	0.97	4/530 (0.8%)	1.02	7/736 (1.0%)
34	q	0.30	0/489	0.39	0/680
35	r	0.29	0/718	0.45	0/995
36	s	0.29	0/1836	0.46	0/2560
37	u	0.26	0/551	0.42	0/768
38	v	0.23	0/340	0.36	0/472
39	w	0.22	0/391	0.43	0/544
40	A	0.76	11/28659 (0.0%)	1.29	306/44547 (0.7%)
41	x	0.26	0/1841	0.43	0/2558
42	y	0.30	0/1620	0.51	0/2246
43	l	0.25	0/1259	0.42	0/1744
43	z	0.25	0/1238	0.43	0/1713
44	B	0.32	0/1328	1.08	5/2056 (0.2%)
45	P	0.25	0/657	0.45	0/913
46	W	0.25	0/480	0.45	0/665
47	6	0.34	1/1605 (0.1%)	0.66	7/2229 (0.3%)
48	I	0.25	0/783	0.41	0/1090
49	J	0.25	0/685	0.41	0/949
50	k	0.23	0/415	0.44	0/577
51	l	0.21	0/114	0.26	0/158
All	All	0.54	16/72394 (0.0%)	0.92	325/105526 (0.3%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	F	0	1
24	a	0	1
33	p	0	2
42	y	0	3
47	6	0	3
All	All	0	10

The worst 5 of 16 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
40	A	1281	A	N9-C4	11.65	1.44	1.37
33	p	145	ARG	C-N	11.26	1.59	1.34
40	A	1281	A	N7-C5	-10.98	1.32	1.39
33	p	146	ASN	N-CA	10.48	1.67	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
40	A	1306	G	P-O5'	7.89	1.67	1.59

The worst 5 of 325 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
40	A	340	U	C5-C4-O4	20.32	138.09	125.90
40	A	340	U	N3-C4-O4	-18.56	106.41	119.40
40	A	1281	A	C4-C5-C6	16.63	125.32	117.00
40	A	1281	A	N3-C4-N9	13.60	138.28	127.40
40	A	1305	G	O4'-C1'-N9	13.39	118.92	108.20

There are no chirality outliers.

5 of 10 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	F	151	VAL	Peptide
24	a	40	PRO	Peptide
33	p	145	ARG	Peptide
33	p	148	ALA	Peptide
42	y	127	LEU	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	D	1076	0	502	19	0
2	E	1399	0	611	19	0
3	F	1233	0	543	8	0
4	H	469	0	199	4	0
5	K	876	0	386	6	0
6	L	565	0	252	5	0
7	M	1266	0	559	7	0
8	N	1006	0	456	10	0
9	O	749	0	329	3	0
10	Q	1075	0	453	8	0
11	R	693	0	328	2	0
12	S	772	0	330	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
13	T	788	0	344	7	0
14	U	686	0	292	6	0
15	V	946	0	398	6	0
16	X	1202	0	513	8	0
17	Y	874	0	383	3	0
18	Z	595	0	245	3	0
19	0	534	0	228	2	0
20	2	211	0	90	2	0
21	5	1916	0	819	16	0
22	7	1426	0	610	7	0
23	9	575	0	257	3	0
24	a	407	0	158	0	0
25	b	730	0	320	0	0
26	c	1360	0	604	0	0
27	d	1048	0	442	0	0
28	g	638	0	257	0	0
29	h	499	0	204	0	0
30	i	476	0	203	0	0
31	j	417	0	198	0	0
32	o	394	0	185	0	0
33	p	533	0	234	0	0
34	q	490	0	219	0	0
35	r	721	0	294	0	0
36	s	1838	0	825	0	0
37	u	552	0	229	0	0
38	v	341	0	158	0	0
39	w	392	0	166	0	0
40	A	25636	0	13040	386	0
41	x	1843	0	825	0	0
42	y	1621	0	735	0	0
43	1	1262	0	579	1	0
43	z	1242	0	571	0	0
44	B	1191	0	607	19	0
45	P	659	0	300	6	0
46	W	481	0	221	10	0
47	6	1611	0	701	5	0
48	I	785	0	332	3	0
49	J	686	0	323	2	0
50	k	416	0	187	0	0
51	l	115	0	45	0	0
52	A	44	0	0	0	0
52	F	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
52	W	1	0	0	0	0
52	g	1	0	0	0	0
52	x	1	0	0	0	0
53	0	1	0	0	0	0
54	v	21	0	21	0	0
All	All	69386	0	32310	566	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 8.

The worst 5 of 566 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)
40:A:1446:C:N4	40:A:1470:A:H61	1.50	1.08
40:A:1446:C:H42	40:A:1470:A:N6	1.51	1.07
2:E:106:MET:HA	2:E:119:VAL:O	1.57	1.04
40:A:238:A:H62	40:A:342:A:N6	1.55	1.04
40:A:130:G:N2	40:A:135:A:H62	1.55	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	D	216/305 (71%)	204 (94%)	12 (6%)	0	100	100
2	E	281/348 (81%)	249 (89%)	32 (11%)	0	100	100
3	F	248/311 (80%)	221 (89%)	27 (11%)	0	100	100
4	H	93/267 (35%)	84 (90%)	9 (10%)	0	100	100
5	K	175/178 (98%)	154 (88%)	21 (12%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	L	113/145 (78%)	107 (95%)	6 (5%)	0	100	100
7	M	253/296 (86%)	226 (89%)	27 (11%)	0	100	100
8	N	203/251 (81%)	195 (96%)	8 (4%)	0	100	100
9	O	150/175 (86%)	138 (92%)	12 (8%)	0	100	100
10	Q	215/292 (74%)	196 (91%)	19 (9%)	0	100	100
11	R	138/149 (93%)	126 (91%)	12 (9%)	0	100	100
12	S	154/205 (75%)	141 (92%)	13 (8%)	0	100	100
13	T	155/206 (75%)	143 (92%)	12 (8%)	0	100	100
14	U	135/153 (88%)	123 (91%)	12 (9%)	0	100	100
15	V	188/216 (87%)	176 (94%)	12 (6%)	0	100	100
16	X	241/256 (94%)	227 (94%)	14 (6%)	0	100	100
17	Y	174/250 (70%)	161 (92%)	13 (8%)	0	100	100
18	Z	118/161 (73%)	107 (91%)	11 (9%)	0	100	100
19	0	106/188 (56%)	100 (94%)	6 (6%)	0	100	100
20	2	41/92 (45%)	36 (88%)	5 (12%)	0	100	100
21	5	383/423 (90%)	361 (94%)	21 (6%)	1 (0%)	41	76
22	7	285/338 (84%)	252 (88%)	33 (12%)	0	100	100
23	9	113/137 (82%)	99 (88%)	14 (12%)	0	100	100
24	a	78/142 (55%)	67 (86%)	11 (14%)	0	100	100
25	b	146/215 (68%)	127 (87%)	19 (13%)	0	100	100
26	c	271/332 (82%)	256 (94%)	15 (6%)	0	100	100
27	d	203/306 (66%)	189 (93%)	14 (7%)	0	100	100
28	g	127/166 (76%)	120 (94%)	7 (6%)	0	100	100
29	h	96/158 (61%)	92 (96%)	4 (4%)	0	100	100
30	i	95/128 (74%)	83 (87%)	12 (13%)	0	100	100
31	j	83/123 (68%)	78 (94%)	5 (6%)	0	100	100
32	o	77/102 (76%)	71 (92%)	6 (8%)	0	100	100
33	p	101/206 (49%)	93 (92%)	7 (7%)	1 (1%)	15	54
34	q	97/222 (44%)	93 (96%)	4 (4%)	0	100	100
35	r	140/196 (71%)	129 (92%)	11 (8%)	0	100	100
36	s	366/439 (83%)	341 (93%)	25 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	u	109/234 (47%)	100 (92%)	9 (8%)	0	100	100
38	v	67/70 (96%)	64 (96%)	3 (4%)	0	100	100
39	w	77/156 (49%)	73 (95%)	4 (5%)	0	100	100
41	x	370/540 (68%)	351 (95%)	16 (4%)	3 (1%)	19	60
42	y	329/387 (85%)	276 (84%)	49 (15%)	4 (1%)	13	49
43	1	251/420 (60%)	239 (95%)	12 (5%)	0	100	100
43	z	245/420 (58%)	233 (95%)	12 (5%)	0	100	100
45	P	129/180 (72%)	124 (96%)	4 (3%)	1 (1%)	19	60
46	W	96/148 (65%)	92 (96%)	2 (2%)	2 (2%)	7	36
47	6	313/380 (82%)	286 (91%)	23 (7%)	4 (1%)	12	48
48	I	154/261 (59%)	145 (94%)	8 (5%)	1 (1%)	25	65
49	J	138/192 (72%)	129 (94%)	8 (6%)	1 (1%)	22	62
50	k	82/112 (73%)	73 (89%)	5 (6%)	4 (5%)	2	20
51	l	21/138 (15%)	21 (100%)	0	0	100	100
All	All	8439/11715 (72%)	7771 (92%)	646 (8%)	22 (0%)	44	76

5 of 22 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
41	x	201	ILE
41	x	347	PRO
42	y	75	SER
47	6	373	HIS
50	k	62	PRO

5.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
40	A	1183/1559 (75%)	457 (38%)	20 (1%)
44	B	51/69 (73%)	18 (35%)	1 (1%)
All	All	1234/1628 (75%)	475 (38%)	21 (1%)

5 of 475 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
40	A	2	C
40	A	5	A
40	A	6	A
40	A	8	C
40	A	9	U

5 of 21 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
40	A	1235	A
40	A	1443	A
44	B	1607	U
40	A	1489	A
40	A	1371	U

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 50 ligands modelled in this entry, 49 are monoatomic - leaving 1 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
54	PNS	v	101	-	13,20,21	2.37	4 (30%)	18,26,29	1.14	1 (5%)

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
54	PNS	v	101	-	-	5/24/26/27	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
54	v	101	PNS	C34-N36	5.40	1.45	1.33
54	v	101	PNS	C39-N41	5.35	1.45	1.33
54	v	101	PNS	O40-C39	-2.19	1.18	1.23
54	v	101	PNS	O35-C34	-2.14	1.19	1.23

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
54	v	101	PNS	C38-C37-N36	-2.93	105.98	111.90

There are no chirality outliers.

All (5) torsion outliers are listed below:

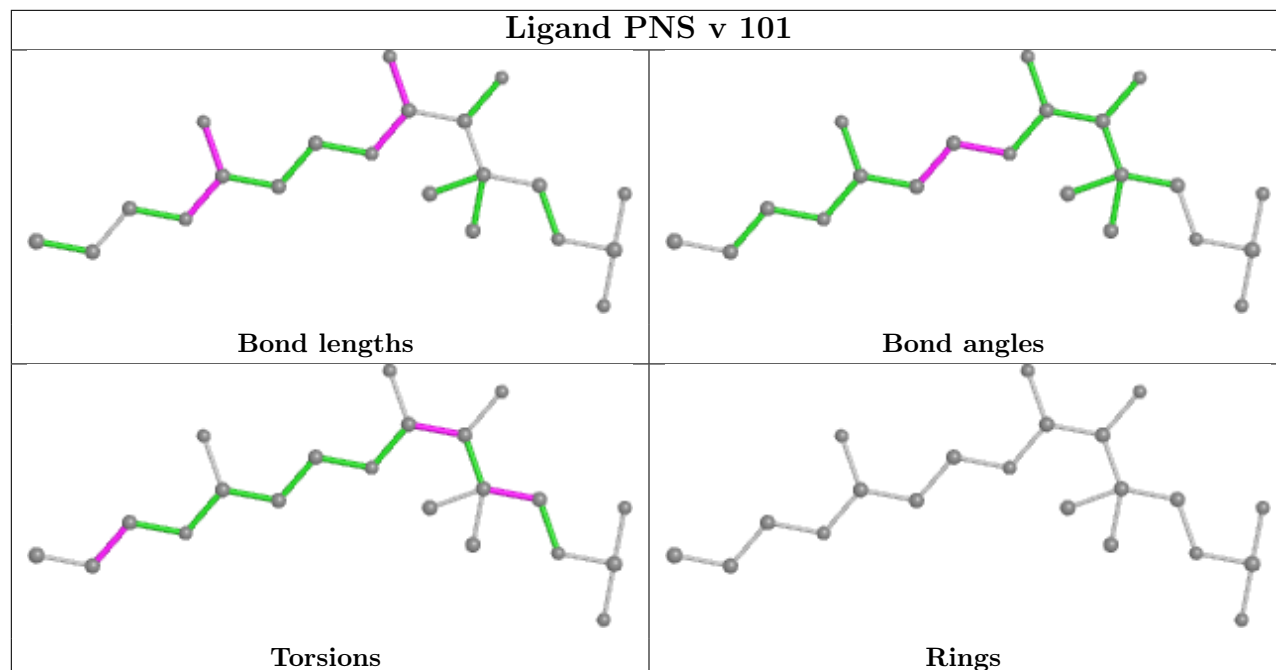
Mol	Chain	Res	Type	Atoms
54	v	101	PNS	O33-C32-C34-N36
54	v	101	PNS	O33-C32-C34-O35
54	v	101	PNS	C29-C32-C34-O35
54	v	101	PNS	N41-C42-C43-S44
54	v	101	PNS	O27-C28-C29-C30

There are no ring outliers.

No monomer is involved in short contacts.

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



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
40	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	1182:C	O3'	1183:A	P	11.06

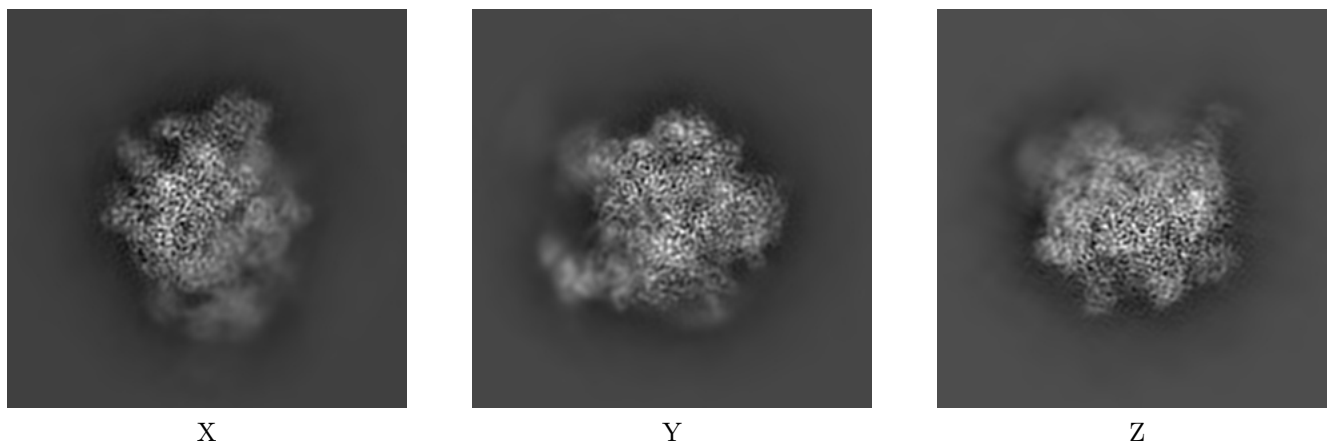
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12919. 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 [i](#)

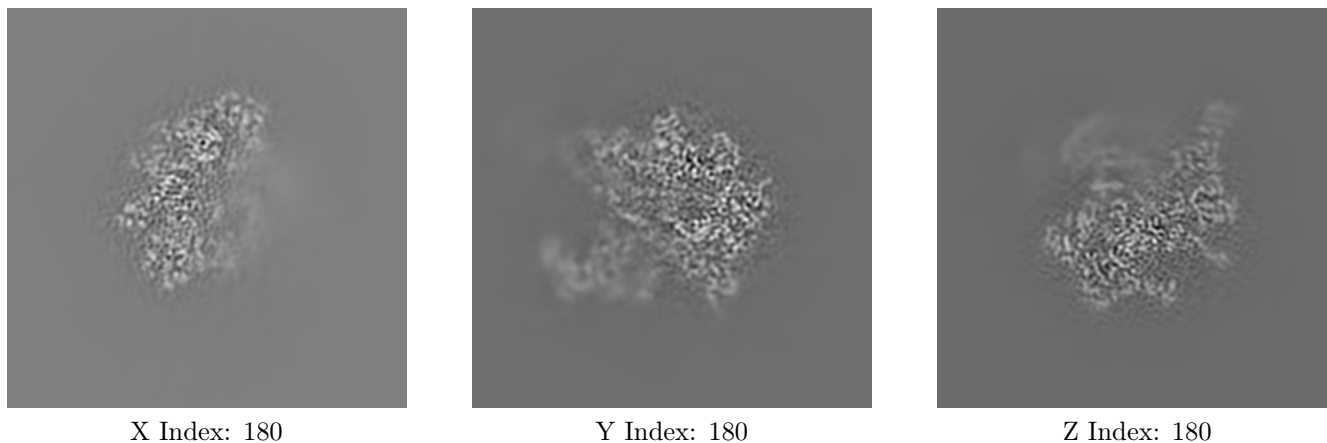
6.1.1 Primary map



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

6.2 Central slices [i](#)

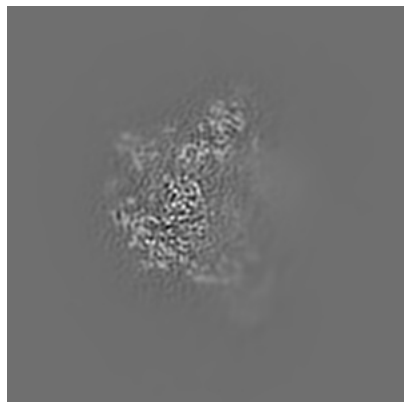
6.2.1 Primary map



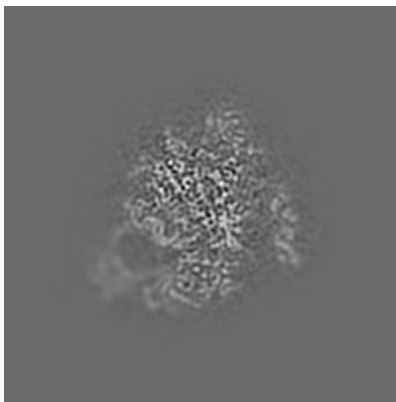
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

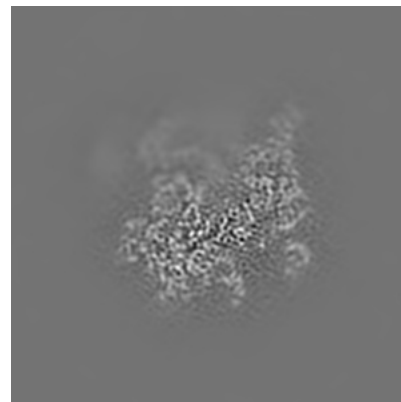
6.3.1 Primary map



X Index: 196



Y Index: 145

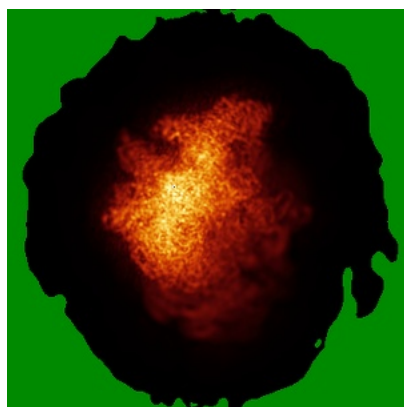


Z Index: 186

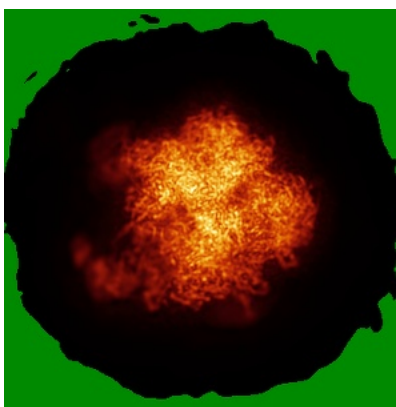
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

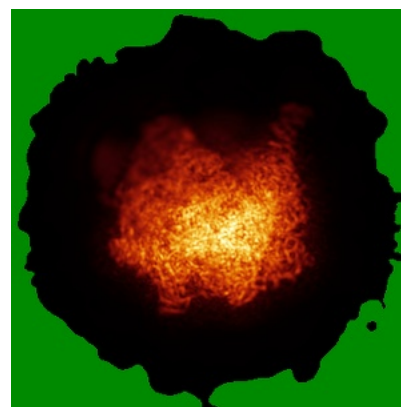
6.4.1 Primary map



X



Y



Z

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



The images above show the 3D surface view of the map at the recommended contour level 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

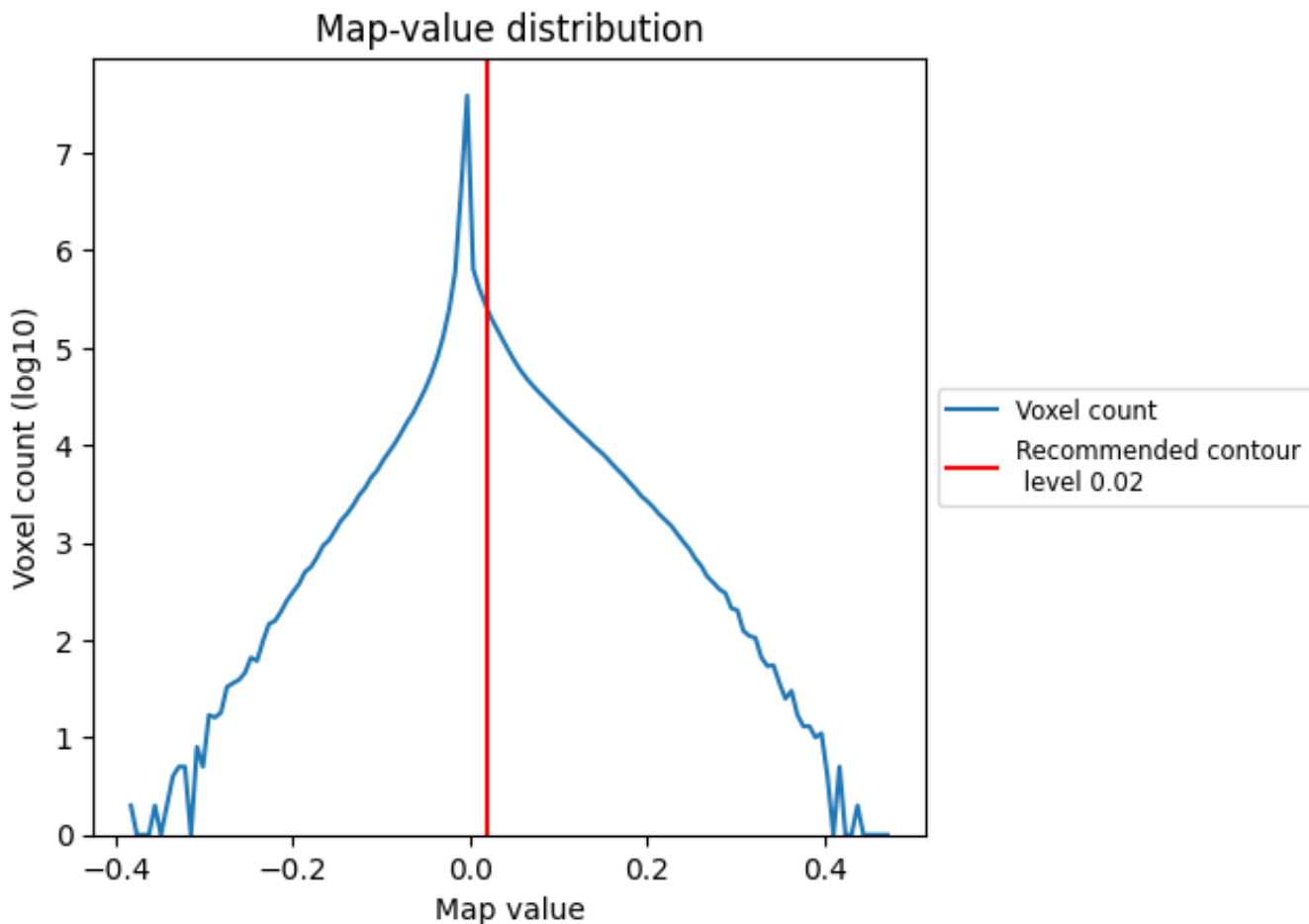
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

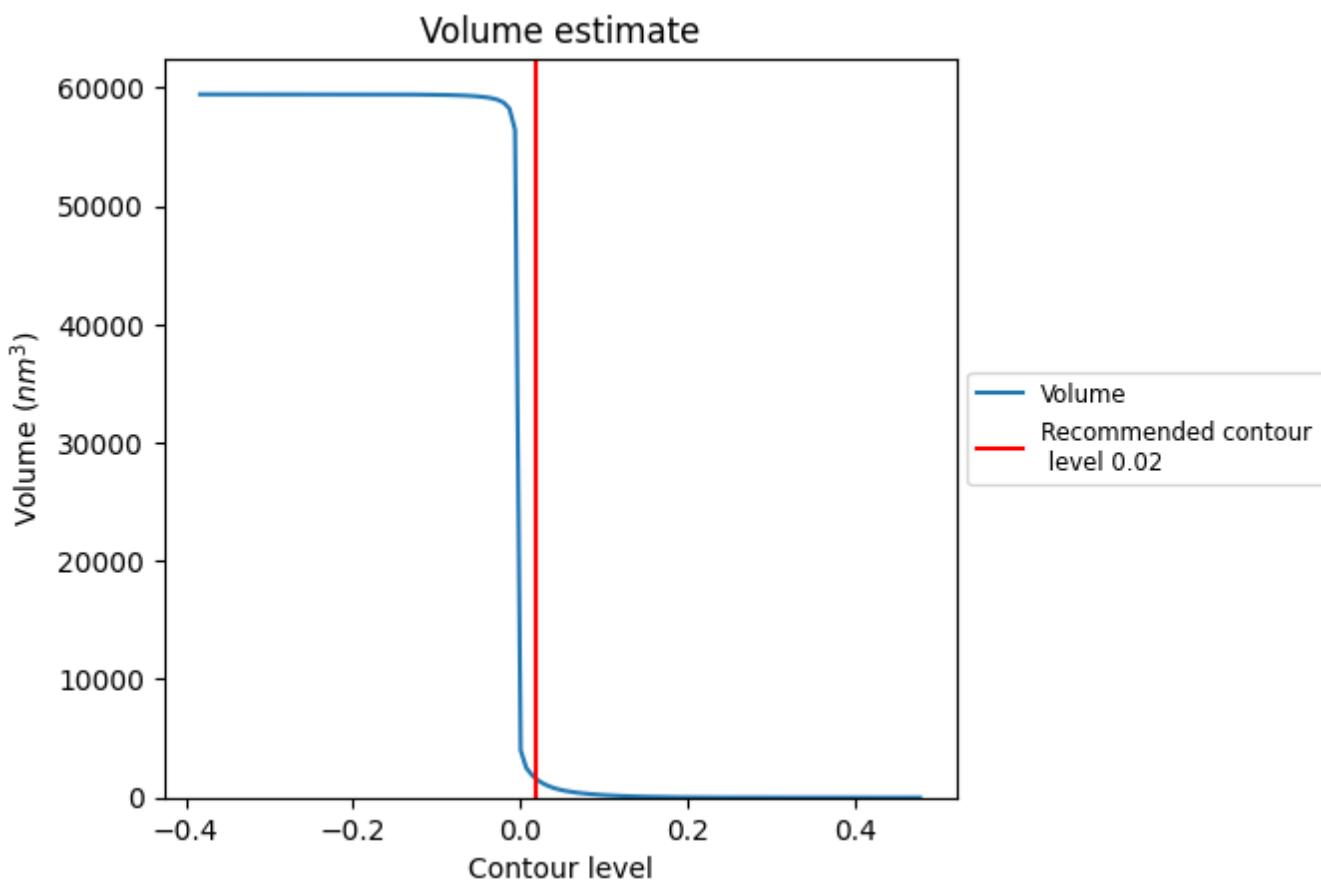
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

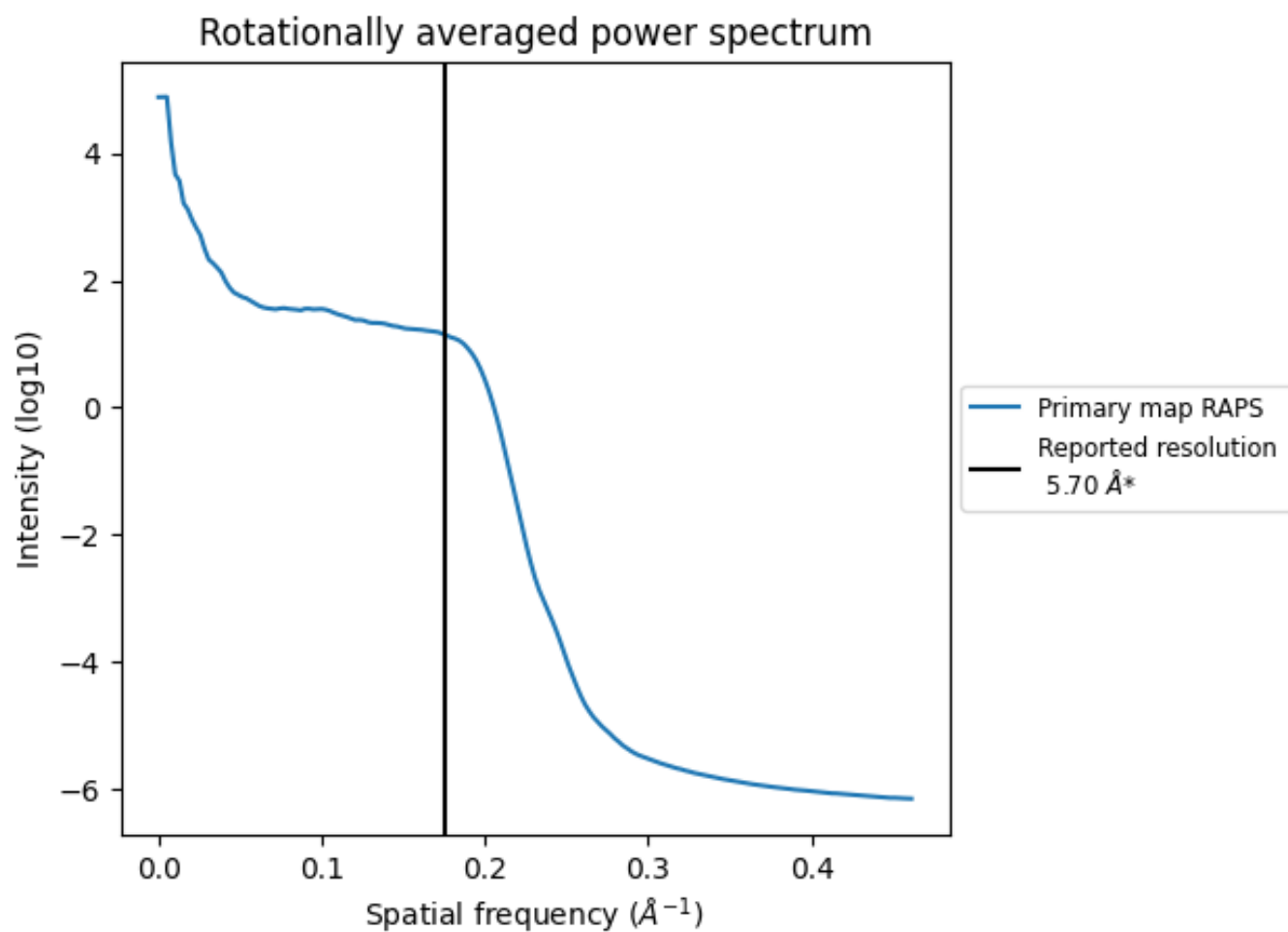
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1540 nm³; this corresponds to an approximate mass of 1391 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

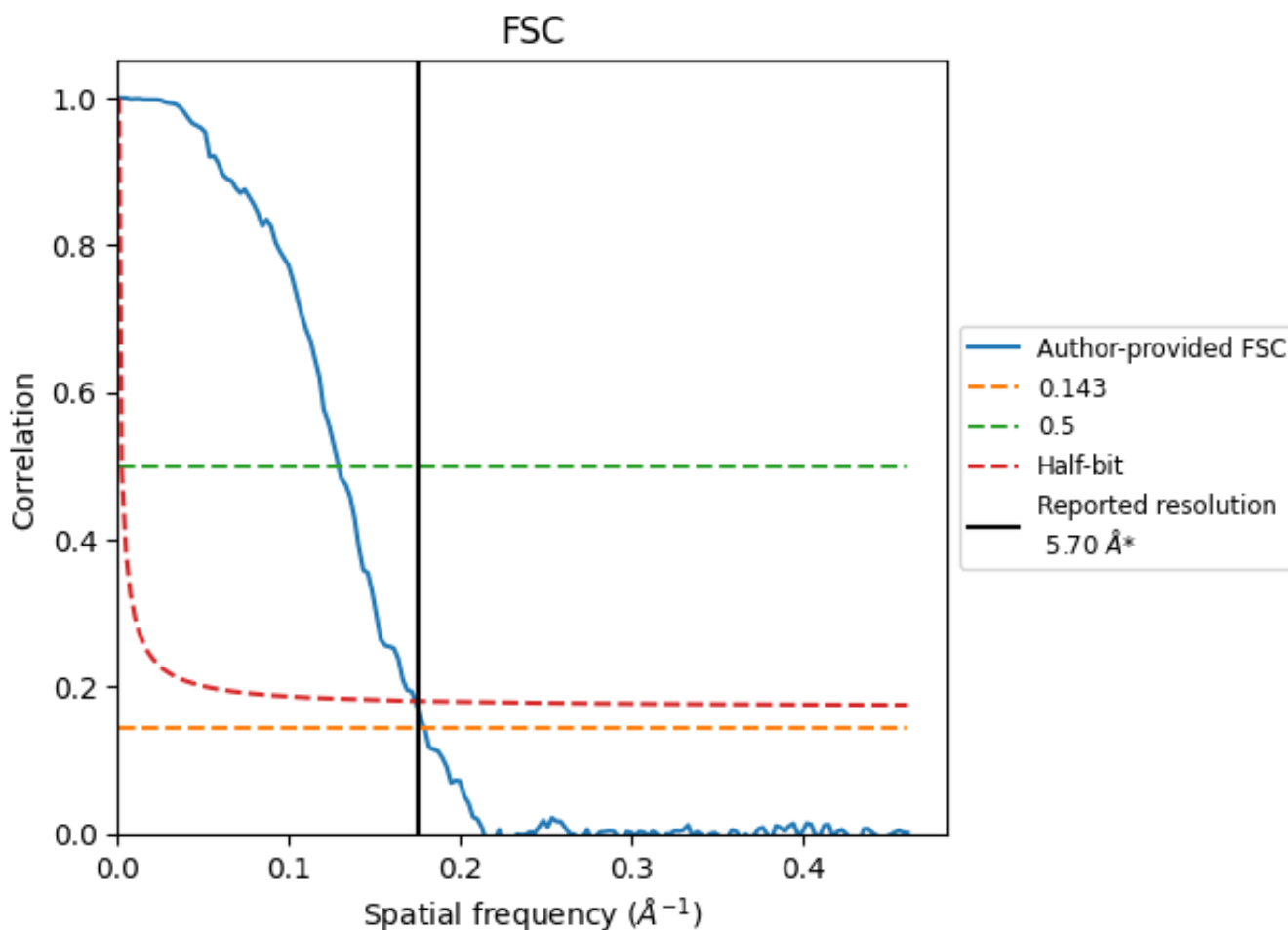


*Reported resolution corresponds to spatial frequency of 0.175 Å⁻¹

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.175 Å⁻¹

8.2 Resolution estimates [i](#)

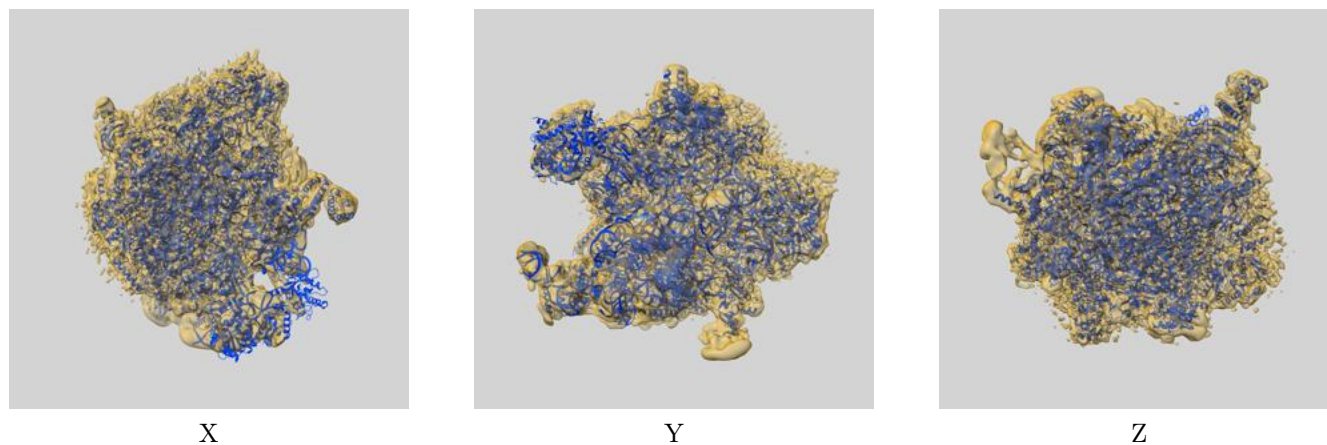
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	5.70	-	-
Author-provided FSC curve	5.58	7.75	5.75
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

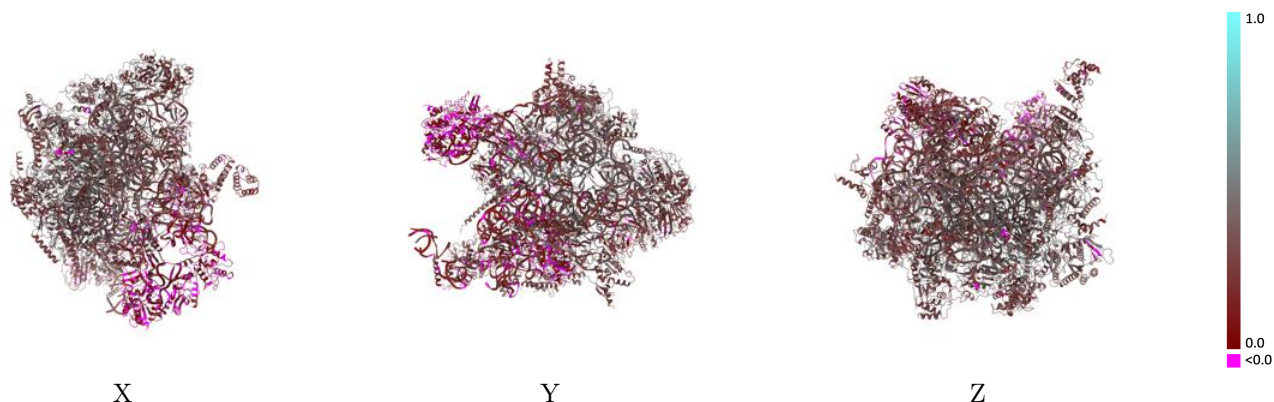
This section contains information regarding the fit between EMDB map EMD-12919 and PDB model 7OI6. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



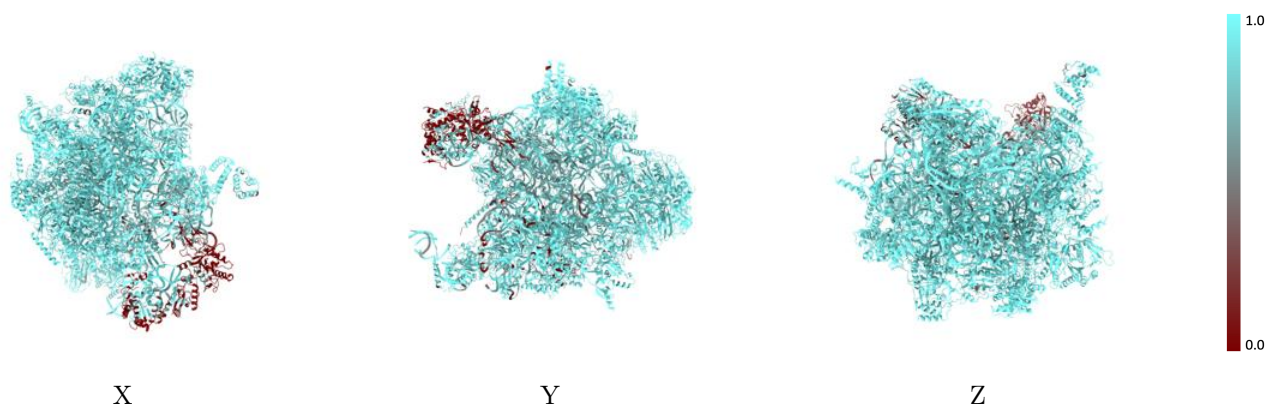
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [\(i\)](#)



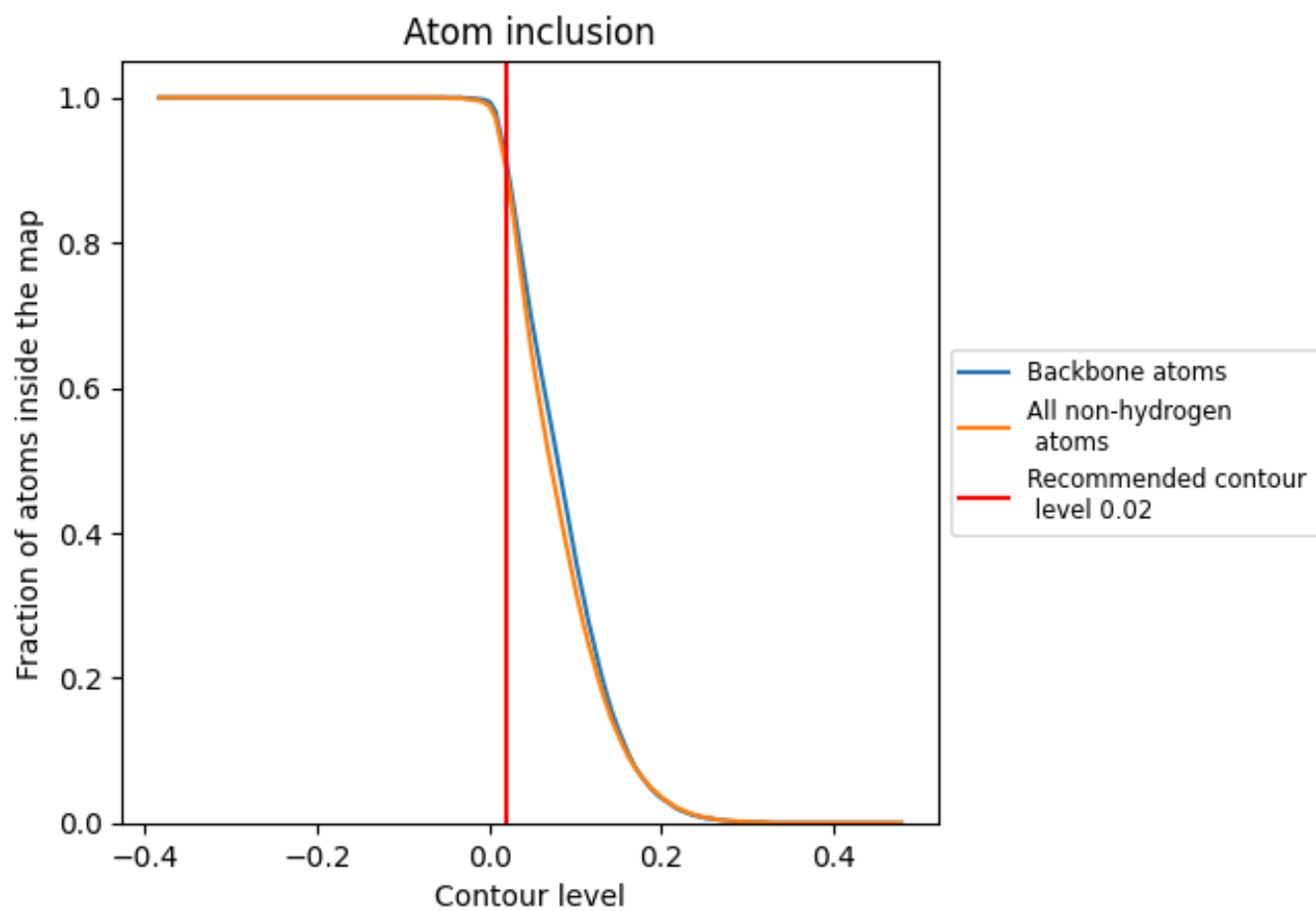
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 [\(i\)](#)



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 (0.02).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 90% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9020	 0.2800
0	 0.9870	 0.3990
1	 0.8380	 0.1160
2	 0.9530	 0.3520
5	 0.9740	 0.3200
6	 0.9210	 0.1630
7	 0.9880	 0.3370
9	 0.9910	 0.3940
A	 0.9000	 0.2670
B	 0.8790	 0.1270
D	 0.8450	 0.2270
E	 0.9850	 0.3670
F	 0.9690	 0.3770
H	 0.9890	 0.3240
I	 0.5060	 0.1080
J	 0.2830	 0.0330
K	 0.9750	 0.3880
L	 0.9660	 0.3470
M	 0.9720	 0.3580
N	 0.8610	 0.2230
O	 0.9850	 0.3580
P	 0.9510	 0.1980
Q	 0.9830	 0.3550
R	 0.9640	 0.3470
S	 0.9740	 0.3830
T	 0.9730	 0.4000
U	 0.9750	 0.4030
V	 0.9730	 0.3530
W	 0.9400	 0.2100
X	 0.9930	 0.3360
Y	 0.9790	 0.3430
Z	 0.9770	 0.3820
a	 0.9850	 0.4090
b	 0.9820	 0.4060
c	 0.9850	 0.3380



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Chain	Atom inclusion	Q-score
d	 0.9610	 0.3390
g	 0.9840	 0.3690
h	 0.9960	 0.3500
i	 0.9620	 0.3810
j	 0.9520	 0.3340
k	 0.5620	 0.0720
l	 0.9220	 0.1080
o	 0.9800	 0.3540
p	 0.9720	 0.2790
q	 0.9920	 0.3330
r	 0.9500	 0.3200
s	 0.9790	 0.3600
u	 0.9730	 0.2860
v	 0.9530	 0.2500
w	 0.8470	 0.2180
x	 0.9210	 0.2530
y	 0.2260	 0.0440
z	 0.8390	 0.1530