



Full wwPDB EM Validation Report ⓘ

Jun 30, 2021 – 04:23 am BST

PDB ID : 7ODR
EMDB ID : EMD-12845
Title : State A of the human mitoribosomal large subunit assembly intermediate
Authors : Lenarcic, T.; Jaskolowski, M.; Leibundgut, M.; Scaiola, A.; Schoenhut, T.;
Saurer, M.; Lee, R.G.; Rackham, O.; Filipovska, A.; Ban, N.
Deposited on : 2021-04-30
Resolution : 2.90 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

EMDB validation analysis : 0.0.0.dev84
Mogul : 1.8.5 (274361), 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)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.22

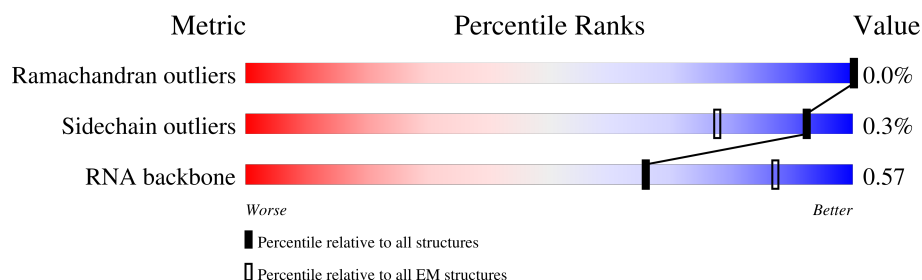
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
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	u	234	<div> <div>6%</div> <div>47%</div> <div>53%</div> </div>
2	v	70	<div> <div>74%</div> <div>99%</div> <div>.</div> </div>
3	w	156	<div> <div>50%</div> <div>51%</div> <div>49%</div> </div>
4	x	384	<div> <div>86%</div> <div>12%</div> </div>
5	y	381	<div> <div>64%</div> <div>36%</div> </div>
6	0	188	<div> <div>58%</div> <div>41%</div> </div>
7	1	65	<div> <div>85%</div> <div>15%</div> </div>
8	2	92	<div> <div>50%</div> <div>50%</div> </div>

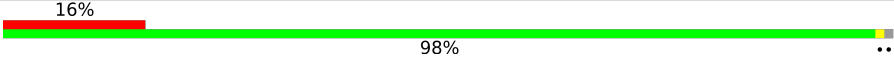
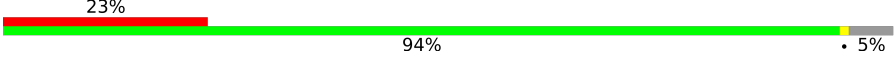

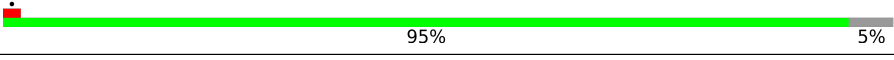
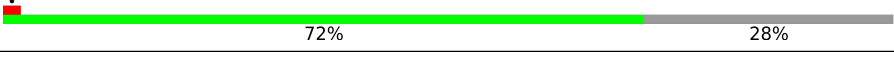
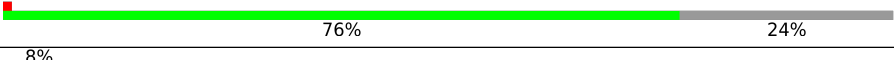

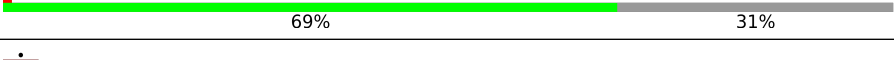



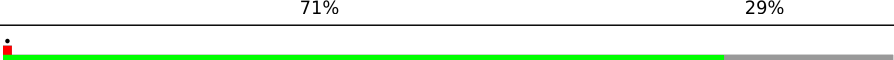

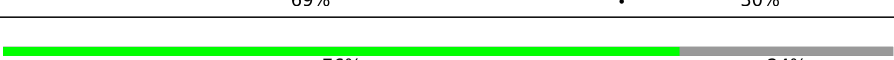
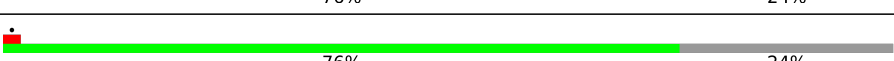
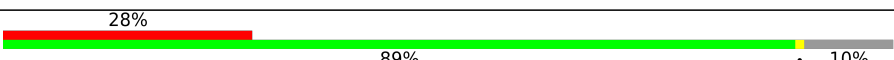
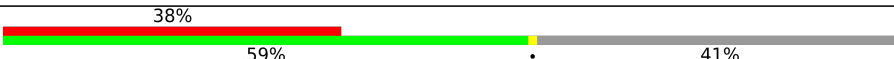
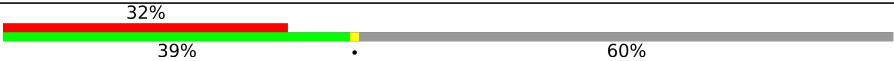
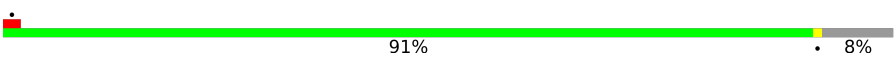


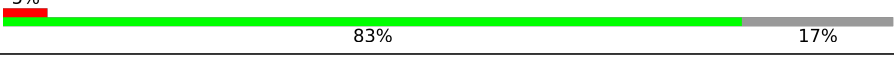
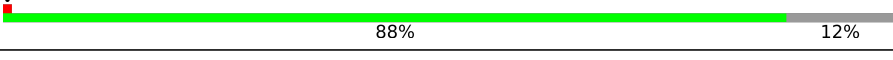

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Mol	Chain	Length	Quality of chain
9	3	188	
10	4	103	
11	5	423	
12	6	380	
13	7	338	
14	8	206	
15	9	137	
16	A	1590	
17	B	72	
18	D	305	
19	E	348	
20	F	311	
21	H	267	
22	I	261	
23	J	192	
24	K	178	
25	L	145	
26	M	296	
27	N	251	
28	O	175	
29	P	180	
30	Q	292	
31	R	149	
32	S	205	
33	T	206	

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Mol	Chain	Length	Quality of chain
34	U	153	
35	V	216	
36	W	148	
37	X	256	
38	Y	250	
39	Z	161	
40	a	142	
41	b	215	
42	c	332	
43	d	306	
44	e	279	
45	f	212	
46	g	166	
47	h	158	
48	i	128	
49	j	123	
50	k	112	
51	l	138	
52	m	128	
53	o	102	
54	p	206	
55	q	222	
56	r	196	
57	s	439	

2 Entry composition

There are 63 unique types of molecules in this entry. The entry contains 107464 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 Mitochondrial assembly of ribosomal large subunit protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	u	110	Total	C	N	O	S	0	0
			919	591	154	164	10		

- Molecule 2 is a protein called MIEF1 upstream open reading frame protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	v	69	Total	C	N	O		0	0
			588	372	116	100			

- Molecule 3 is a protein called Acyl carrier protein, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	w	79	Total	C	N	O	S	0	0
			638	410	95	128	5		

- Molecule 4 is a protein called 5-methylcytosine rRNA methyltransferase NSUN4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	x	336	Total	C	N	O	S	0	0
			2660	1694	465	484	17		

- Molecule 5 is a protein called Transcription termination factor 4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	y	244	Total	C	N	O	S	0	0
			1980	1264	342	362	12		

- Molecule 6 is a protein called 39S ribosomal protein L32, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	0	110	Total	C	N	O	S	0	0
			898	554	176	162	6		

- Molecule 7 is a protein called 39S ribosomal protein L33, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	1	55	Total	C	N	O	S	0	0
			455	290	87	76	2		

- Molecule 8 is a protein called 39S ribosomal protein L34, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	2	46	Total	C	N	O	S	0	0
			377	233	83	60	1		

- Molecule 9 is a protein called 39S ribosomal protein L35, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	3	95	Total	C	N	O	S	0	0
			832	539	162	128	3		

- Molecule 10 is a protein called 39S ribosomal protein L36, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	4	38	Total	C	N	O	S	0	0
			342	217	72	49	4		

- Molecule 11 is a protein called 39S ribosomal protein L37, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	5	394	Total	C	N	O	S	0	0
			3210	2073	560	566	11		

- Molecule 12 is a protein called 39S ribosomal protein L38, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	6	354	Total	C	N	O	S	0	0
			2948	1881	525	533	9		

- Molecule 13 is a protein called 39S ribosomal protein L39, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	7	294	Total	C	N	O	S	0	0
			2390	1529	405	438	18		

- Molecule 14 is a protein called 39S ribosomal protein L40, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	8	102	Total	C	N	O	S	0	0
			860	543	152	163	2		

- Molecule 15 is a protein called 39S ribosomal protein L41, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	9	124	Total	C	N	O	S	0	0
			997	644	170	181	2		

- Molecule 16 is a RNA chain called 16S mitochondrial rRNA, DNA (31-MER),16S mitochondrial rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	A	1448	Total	C	N	O	P	0	0
			30460	13658	5442	9912	1448		

- Molecule 17 is a RNA chain called mitochondrial tRNAVal.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	B	72	Total	C	N	O	P	0	0
			1522	683	269	498	72		

- Molecule 18 is a protein called 39S ribosomal protein L2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	D	240	Total	C	N	O	S	0	0
			1872	1165	378	320	9		

- Molecule 19 is a protein called 39S ribosomal protein L3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	E	305	Total	C	N	O	S	0	0
			2406	1545	418	432	11		

- Molecule 20 is a protein called 39S ribosomal protein L4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	F	252	Total	C	N	O	S	0	0
			2031	1305	370	350	6		

- Molecule 21 is a protein called 39S ribosomal protein L9, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	H	97	Total	C	N	O	0	0
			802	508	155	139		

- Molecule 22 is a protein called 39S ribosomal protein L10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	I	163	Total	C	N	O	S	0	0
			1324	854	240	220	10		

- Molecule 23 is a protein called 39S ribosomal protein L11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	J	175	Total	C	N	O	S	0	0
			1330	847	237	244	2		

- Molecule 24 is a protein called 39S ribosomal protein L13, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	K	177	Total	C	N	O	S	0	0
			1455	936	259	253	7		

- Molecule 25 is a protein called 39S ribosomal protein L14, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	L	115	Total	C	N	O	S	0	0
			890	559	171	155	5		

- Molecule 26 is a protein called 39S ribosomal protein L15, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	M	291	Total	C	N	O	S	0	0
			2327	1483	430	408	6		

- Molecule 27 is a protein called 39S ribosomal protein L16, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	N	212	Total	C	N	O	S	0	0
			1723	1107	310	297	9		

- Molecule 28 is a protein called 39S ribosomal protein L17, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	O	154	Total	C	N	O	S	0	0
			1259	792	241	219	7		

- Molecule 29 is a protein called 39S ribosomal protein L18, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	P	144	Total	C	N	O	S	0	0
			1173	733	224	211	5		

- Molecule 30 is a protein called 39S ribosomal protein L19, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Q	221	Total	C	N	O	S	0	0
			1843	1179	327	328	9		

- Molecule 31 is a protein called 39S ribosomal protein L20, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	R	140	Total	C	N	O	S	0	0
			1154	732	231	187	4		

- Molecule 32 is a protein called 39S ribosomal protein L21, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	S	161	Total	C	N	O	S	0	0
			1293	835	227	227	4		

- Molecule 33 is a protein called 39S ribosomal protein L22, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	T	166	Total	C	N	O	S	0	0
			1369	875	254	233	7		

- Molecule 34 is a protein called 39S ribosomal protein L23, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	U	152	Total	C	N	O	S	0	0
			1251	788	234	226	3		

- Molecule 35 is a protein called 39S ribosomal protein L24, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	V	205	Total	C	N	O	S	0	0
			1676	1068	298	302	8		

- Molecule 36 is a protein called 39S ribosomal protein L27, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	W	106	Total	C	N	O	S	0	0
			835	536	157	139	3		

- Molecule 37 is a protein called 39S ribosomal protein L28, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	X	244	Total	C	N	O	S	0	0
			2044	1322	352	365	5		

- Molecule 38 is a protein called 39S ribosomal protein L47, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Y	181	Total	C	N	O	S	0	0
			1556	995	298	259	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
39	Z	122	Total	C	N	O	S	0	0
			996	636	186	171	3		

- Molecule 40 is a protein called 39S ribosomal protein L42, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	a	100	Total	C	N	O	S	0	0
			840	529	152	154	5		

- Molecule 41 is a protein called 39S ribosomal protein L43, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	b	149	Total	C	N	O	S	0	0
			1189	739	230	217	3		

- Molecule 42 is a protein called 39S ribosomal protein L44, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	c	286	Total	C	N	O	S	0	0
			2299	1470	397	423	9		

- Molecule 43 is a protein called 39S ribosomal protein L45, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	d	259	Total	C	N	O	S	0	0
			2124	1357	369	384	14		

- Molecule 44 is a protein called 39S ribosomal protein L46, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	e	228	Total	C	N	O	S	0	0
			1848	1174	326	342	6		

- Molecule 45 is a protein called 39S ribosomal protein L48, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	f	150	Total	C	N	O	S	0	0
			1196	764	197	231	4		

- Molecule 46 is a protein called 39S ribosomal protein L49, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	g	134	Total	C	N	O	S	0	0
			1113	719	193	199	2		

- Molecule 47 is a protein called 39S ribosomal protein L50, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	h	110	Total	C	N	O	S	0	0
			895	568	156	168	3		

- Molecule 48 is a protein called 39S ribosomal protein L51, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	i	97	Total	C	N	O	S	0	0
			828	532	165	127	4		

- Molecule 49 is a protein called 39S ribosomal protein L52, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	j	94	Total	C	N	O	S	0	0
			745	463	144	136	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
50	k	101	Total	C	N	O	S	0	0
			774	479	148	142	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
51	l	82	Total	C	N	O	S	0	0
			688	437	120	128	3		

- Molecule 52 is a protein called 39S ribosomal protein L55, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	m	51	Total	C	N	O	S	0	0
			419	262	82	73	2		

- Molecule 53 is a protein called Ribosomal protein 63, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	o	94	Total	C	N	O	S	0	0
			798	501	165	129	3		

- Molecule 54 is a protein called Peptidyl-tRNA hydrolase ICT1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	p	147	Total	C	N	O	S	0	0
			1205	748	228	225	4		

- Molecule 55 is a protein called Growth arrest and DNA damage-inducible proteins-interacting protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	q	141	Total	C	N	O	S	0	0
			1177	732	229	211	5		

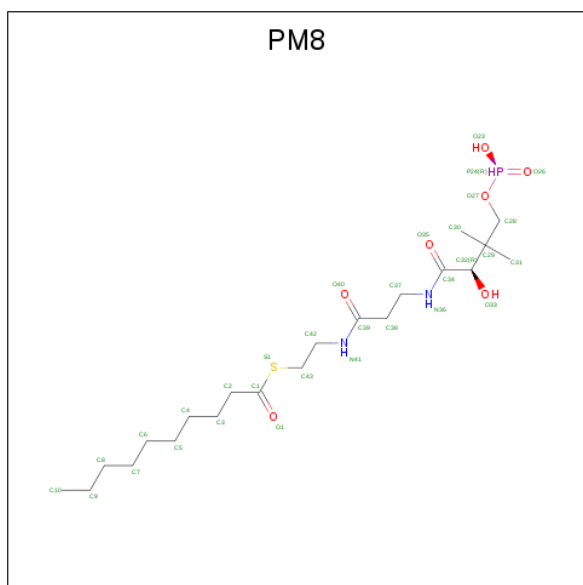
- Molecule 56 is a protein called 39S ribosomal protein S18a, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	r	162	Total	C	N	O	S	0	0
			1322	839	252	223	8		

- Molecule 57 is a protein called 39S ribosomal protein S30, mitochondrial.

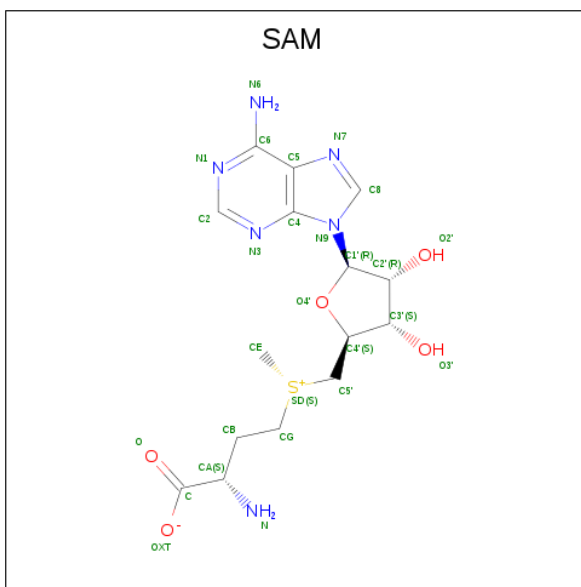
Mol	Chain	Residues	Atoms					AltConf	Trace
57	s	386	Total	C	N	O	S	0	0
			3155	2023	559	559	14		

- Molecule 58 is S-(2-{[N-(2-HYDROXY-4-{[HYDROXY(OXIDO)PHOSPHINO]OXY}-3,3-DIMETHYLBUTANOYL)-BETA-ALANYL]AMINO}ETHYL) DECANETHIOATE (three-letter code: PM8) (formula: C₂₁H₄₁N₂O₇PS).



Mol	Chain	Residues	Atoms						AltConf
58	w	1	Total	C	N	O	P	S	0
			32	21	2	7	1	1	

- Molecule 59 is S-ADENOSYLMETHIONINE (three-letter code: SAM) (formula: C₁₅H₂₂N₆O₅S).



Mol	Chain	Residues	Atoms					AltConf
59	x	1	Total	C	N	O	S	0
			27	15	6	5	1	

- Molecule 60 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
60	0	1	Total	Zn	0
			1	1	
60	4	1	Total	Zn	0
			1	1	

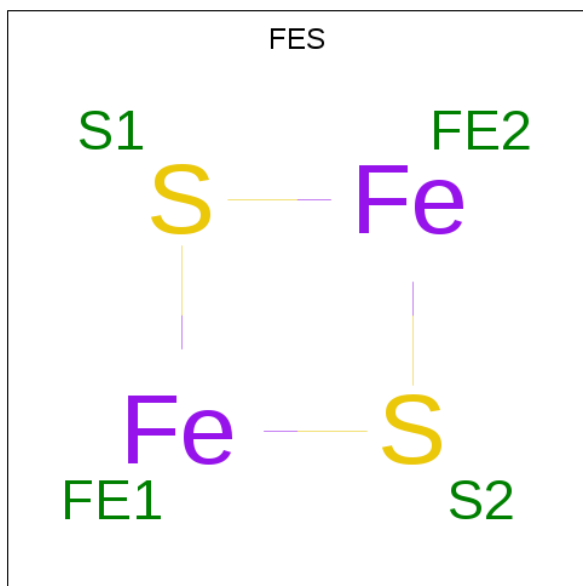
- Molecule 61 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
61	9	1	Total	Mg	0
			1	1	
61	A	92	Total	Mg	0
			92	92	
61	D	1	Total	Mg	0
			1	1	
61	M	1	Total	Mg	0
			1	1	
61	O	1	Total	Mg	0
			1	1	
61	g	1	Total	Mg	0
			1	1	

- Molecule 62 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
62	A	2	Total	K	0
			2	2	

- Molecule 63 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe₂S₂).



Mol	Chain	Residues	Atoms			AltConf
63	r	1	Total	Fe	S	0
			4	2	2	

- Molecule 10: 39S ribosomal protein L36, mitochondrial

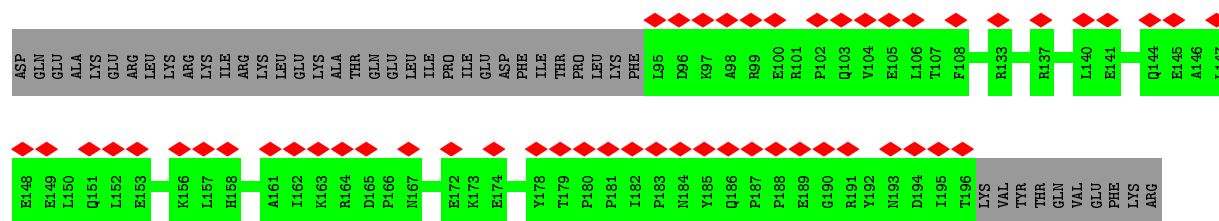
- Molecule 11: 39S ribosomal protein L37, mitochondrial

- Molecule 12: 39S ribosomal protein L38, mitochondrial

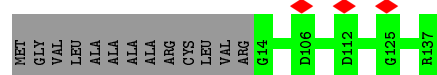
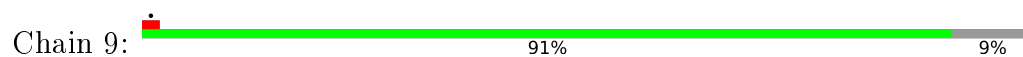
- Molecule 13: 39S ribosomal protein L39, mitochondrial

- Molecule 14: 39S ribosomal protein L40, mitochondrial

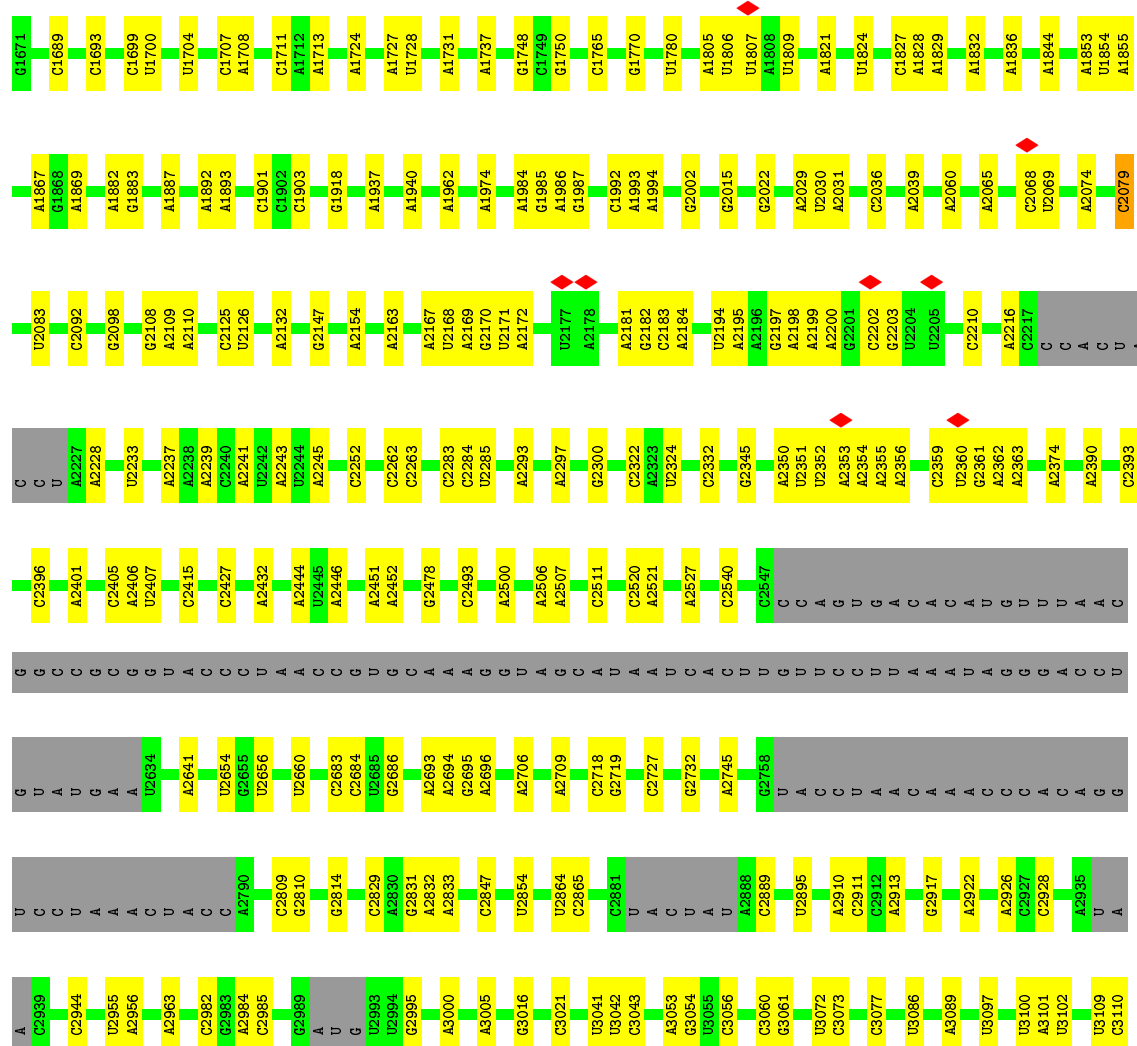
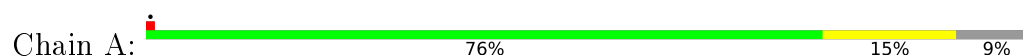
MET	THR	ALA	SER	VAL	LEU	ARG	SER	ILE	SER	LEU	ALA	LEU	ARG	PRO	THR	SER	GLY	LEU	LEU	GLY	THR	TRP	GLN	THR	GLN	LEU	ARG	GLU	THR	HIS	GLN	ARG	ALA	SER	LEU	LEU	SER	PHE	LEU	GLU	LEU	ILE	PRO	PRO	MET	ARG	SER	LYS	LYS	LYS	VAL	ASP	PRO	LYS	LYS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

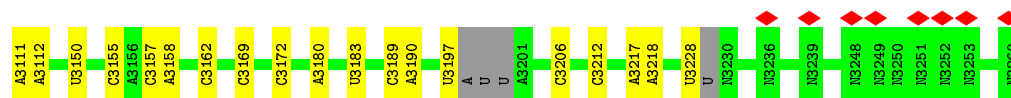


- Molecule 15: 39S ribosomal protein L41, mitochondrial

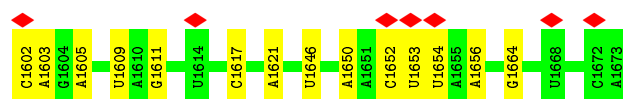
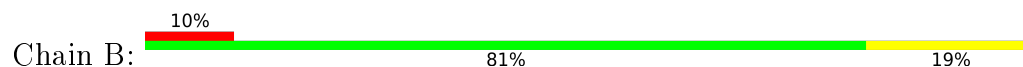


- Molecule 16: 16S mitochondrial rRNA, DNA (31-MER), 16S mitochondrial rRNA

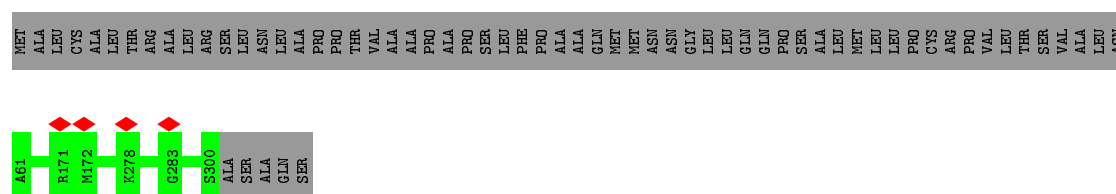
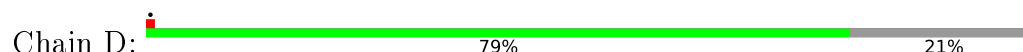




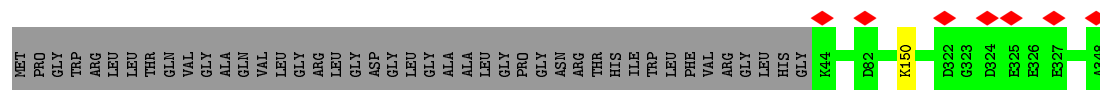
- Molecule 17: mitochondrial tRNAVal



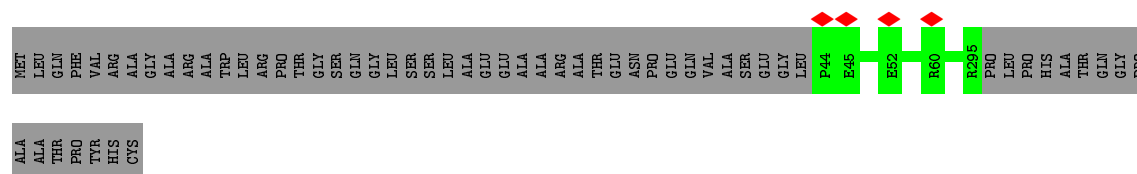
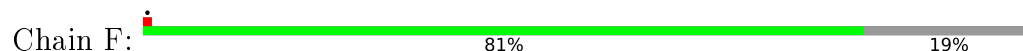
- Molecule 18: 39S ribosomal protein L2, mitochondrial



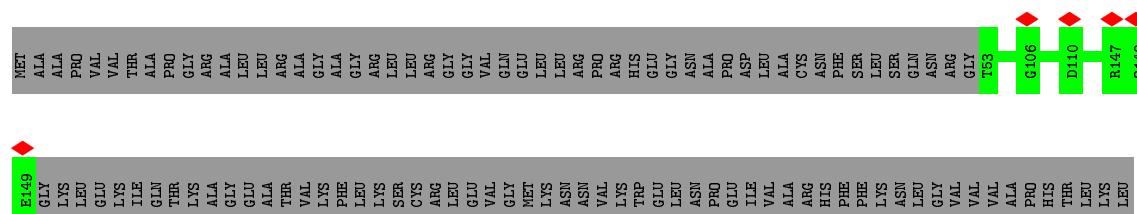
- Molecule 19: 39S ribosomal protein L3, mitochondrial



- Molecule 20: 39S ribosomal protein L4, mitochondrial

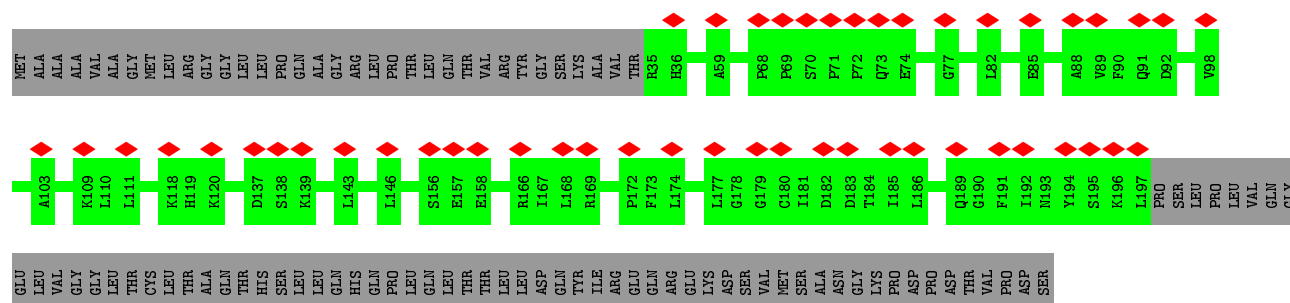


- Molecule 21: 39S ribosomal protein L9, mitochondrial

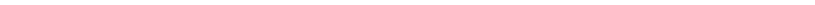


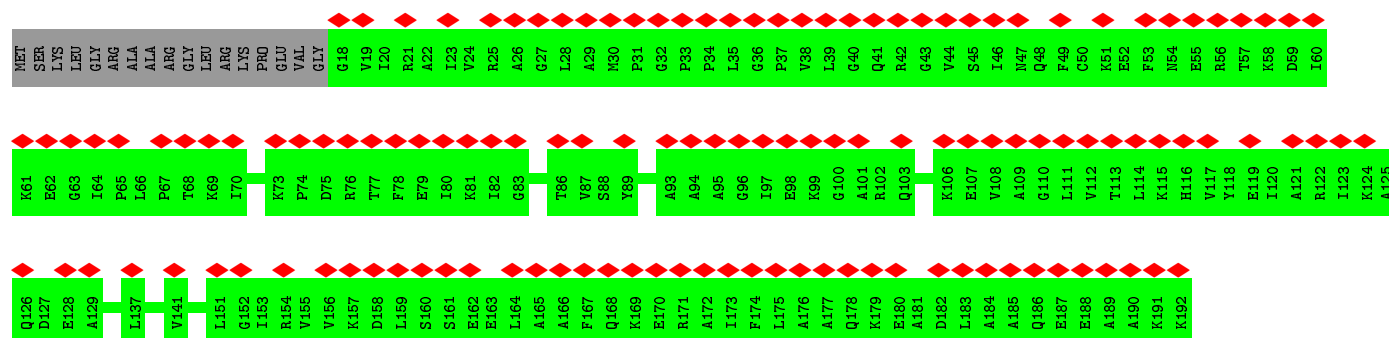
- Molecule 22: 39S ribosomal protein L10, mitochondrial

Chain I: 19% 62% 19%



- Molecule 23: 39S ribosomal protein L11, mitochondrial

Chain J:  68% 91% 9%



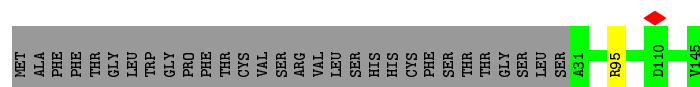
- Molecule 24: 39S ribosomal protein L13, mitochondrial

Chain K: 99%



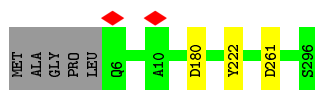
- Molecule 25: 39S ribosomal protein L14, mitochondrial

Chain L:

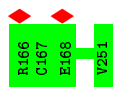
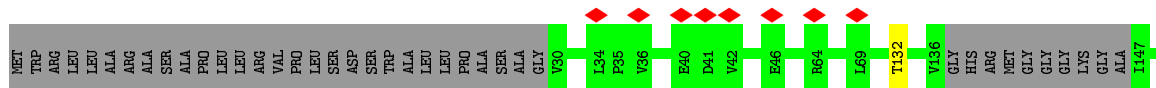
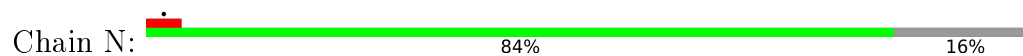


- Molecule 26: 39S ribosomal protein L15, mitochondrial

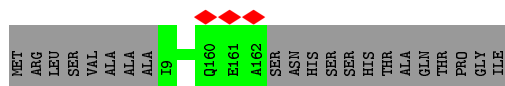
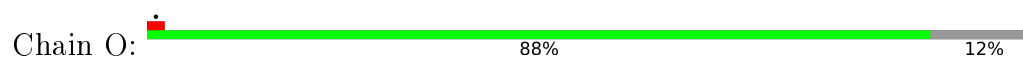
Chain M: 97%



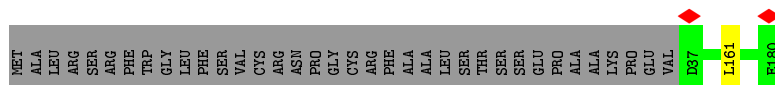
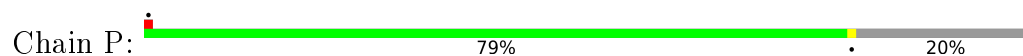
- Molecule 27: 39S ribosomal protein L16, mitochondrial



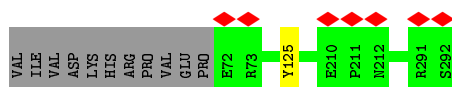
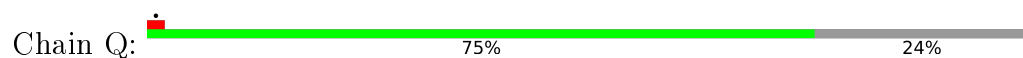
- Molecule 28: 39S ribosomal protein L17, mitochondrial



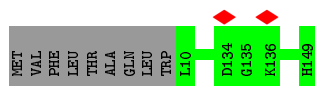
- Molecule 29: 39S ribosomal protein L18, mitochondrial




- Molecule 30: 39S ribosomal protein L19, mitochondrial



- Molecule 31: 39S ribosomal protein L20, mitochondrial




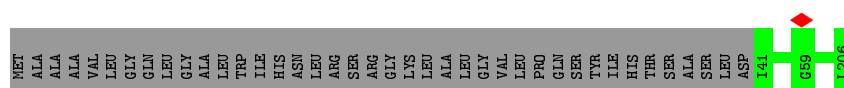
- Molecule 32: 39S ribosomal protein L21, mitochondrial

Chain S:  79% 21%



- Molecule 33: 39S ribosomal protein L22, mitochondrial

Chain T:  81% 19%



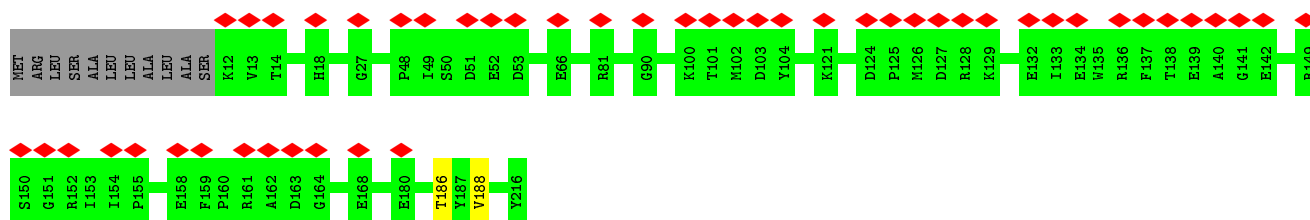
- Molecule 34: 39S ribosomal protein L23, mitochondrial

Chain U:  16% 98% ..




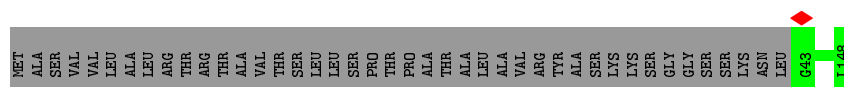
- Molecule 35: 39S ribosomal protein L24, mitochondrial

Chain V:  23% 94% • 5%



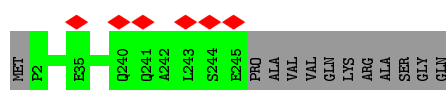
- Molecule 36: 39S ribosomal protein L27, mitochondrial

Chain W:  72% 28%



- Molecule 37: 39S ribosomal protein L28, mitochondrial

Chain X:  95% 5%




- Molecule 38: 39S ribosomal protein L47, mitochondrial

Chain Y:  72% 28%

MET ALA ALA ALA GLY LEU LEU LEU LEU CYS ARG ARG VAL SER SER SER SER LEU LYS SER SER ARG SER SER ILE THR PRO GLN VAL PRO ALA CYS THR GLY PHE LEU LEU LEU SER LEU LEU PRO LYS SER THR PRO ASN VAL THR SER PHE HIS GLN TYR ARG LEU LEU HIS THR THR LEU SER

ARG LYS G63 H240 L241 A242 E243 ALA GLN LYS SER SER LEU VAL

- Molecule 39: 39S ribosomal protein L30, mitochondrial

Chain Z:  76% 24%

MET ALA GLY ILE LEU ARG LEU VAL VAL GLN MET TRP PRO PRO GLY ARG LEU LEU GLN THR VAL THR LYS VAL GLN GLU SER LEU ILE CYS THR ASP VAL ASP TRP ILE ARG LYS HIS K35 E155 Q156 LYS ALA HIS GLU SER

- Molecule 40: 39S ribosomal protein L42, mitochondrial

Chain a:  8% 70% 30%

MET ALA VAL ALA ALA VAL LYS TRP VAL VAL MET SER LYS TRP ARG THR ILE ARG LEU LEU HIS THR PHE PRO VAL GLN ASN GLY ALA TYR CYS VAL ASP TRP HIS LYS T35 R77 P78 D79 PRO VAL HIS ASN ASN GLU THR H88 D89 T94 R95 L96 E97 E98 K99 V100 R142


- Molecule 41: 39S ribosomal protein L43, mitochondrial

Chain b:  69% 31%

MET T2 Q149 D150 PRO PRO PRO GLN ASP THR THR GLY ARG LEU SER SER VAL VAL ALA ALA PRO GLN ILE LEU LEU LEU PRO PRO GLY TRP PRO PRO PRO ASP ASP LEU LEU THR VAL ASP PRO ILE SER SER SER LEU THR SER ALA PRO PRO MET SER ALA VAL CYS SER LEU PRO ILE

VAL PRO ALA LEU THR THR VAL CYS SER SER ALA


- Molecule 42: 39S ribosomal protein L44, mitochondrial

Chain c:  86% 14%

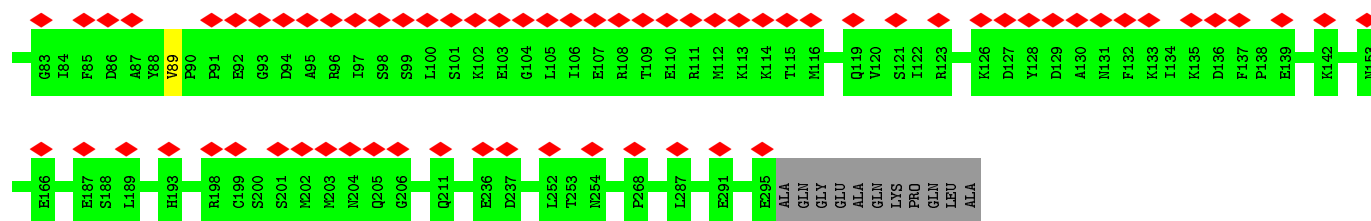
MET ALA SER GLY LEU VAL ARG LEU LEU GLN GLY HIS ARG ARG CYS LEU LEU ALA PRO VAL VAL PRO LYS LEU VAL PRO VAL VAL GLY V31 R52 E102 A103 K104 Q107 L108 G109 I110 GLU V115 L116 L117 N118 K318 P319 K320 GLU THR THR ARG ALA GLU

LYS SER ILE THR ALA SER

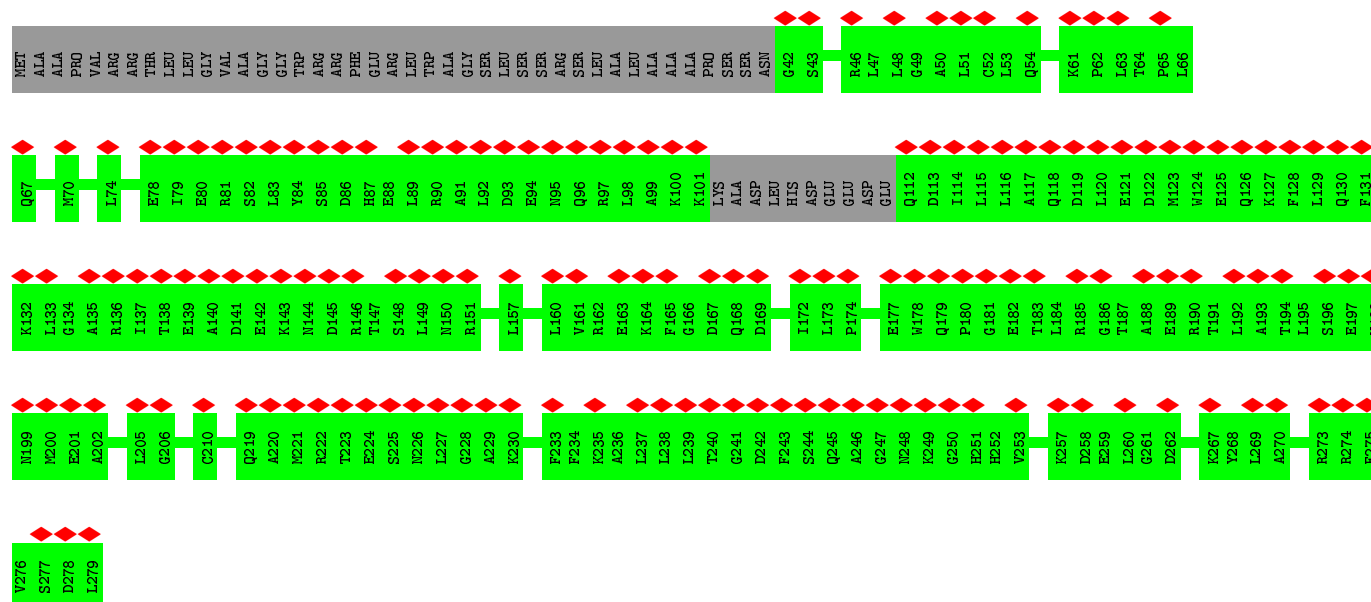
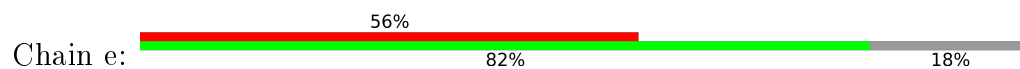
- Molecule 43: 39S ribosomal protein L45, mitochondrial

Chain d:  29% 84% 15%

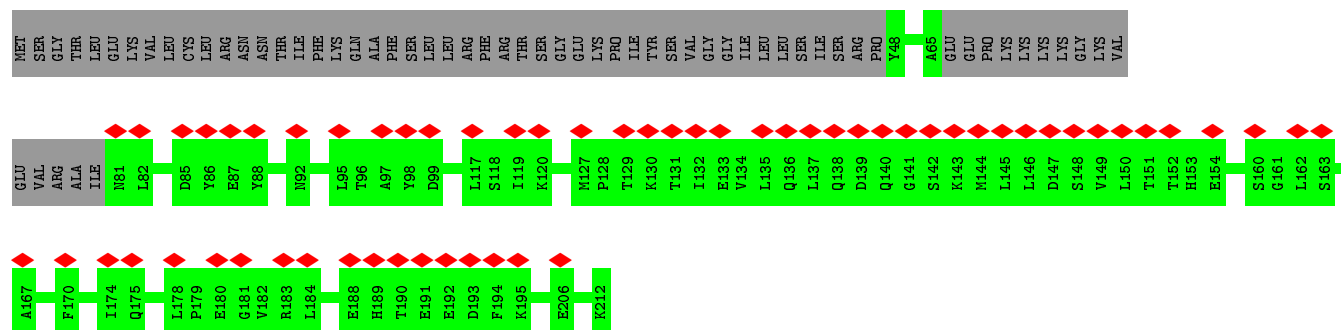
MET ALA ALA PRO PRO PRO GLN GLY PHE TRP PHE ARG GLN PRO PRO VAL VAL THR GLN SER SER ALA ALA ILE VAL PRO VAL ARG T37 K38 K39 R40 K54 E55 F56 M57 Q58 H59 A60 R61 K62 A63 G64 L65 V66 I67 P68 P69 E70 K71 S72



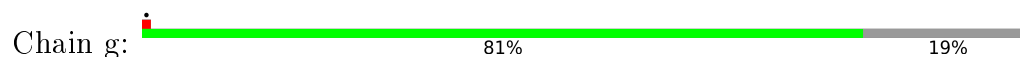
- Molecule 44: 39S ribosomal protein L46, mitochondrial

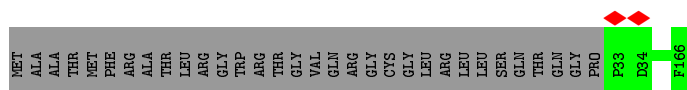


- Molecule 45: 39S ribosomal protein L48, mitochondrial

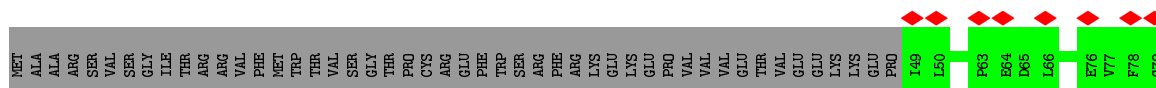


- Molecule 46: 39S ribosomal protein L49, mitochondrial

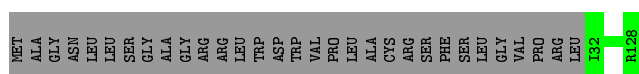
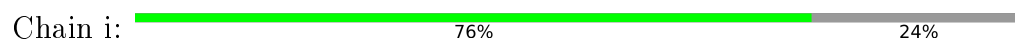




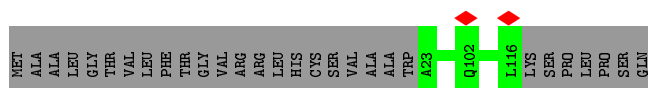
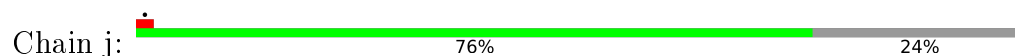
- Molecule 47: 39S ribosomal protein L50, mitochondrial



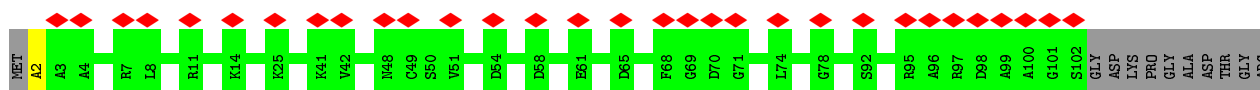
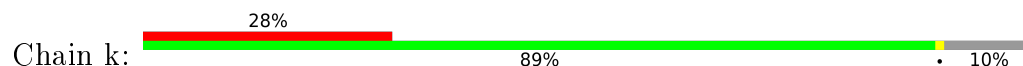
- Molecule 48: 39S ribosomal protein L51, mitochondrial



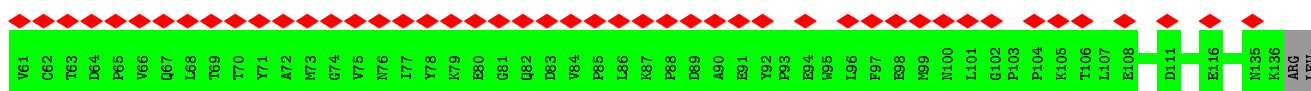
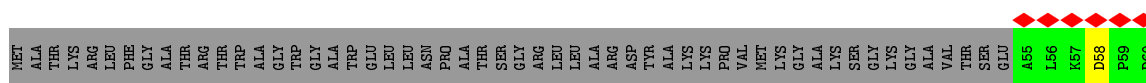
- Molecule 49: 39S ribosomal protein L52, mitochondrial



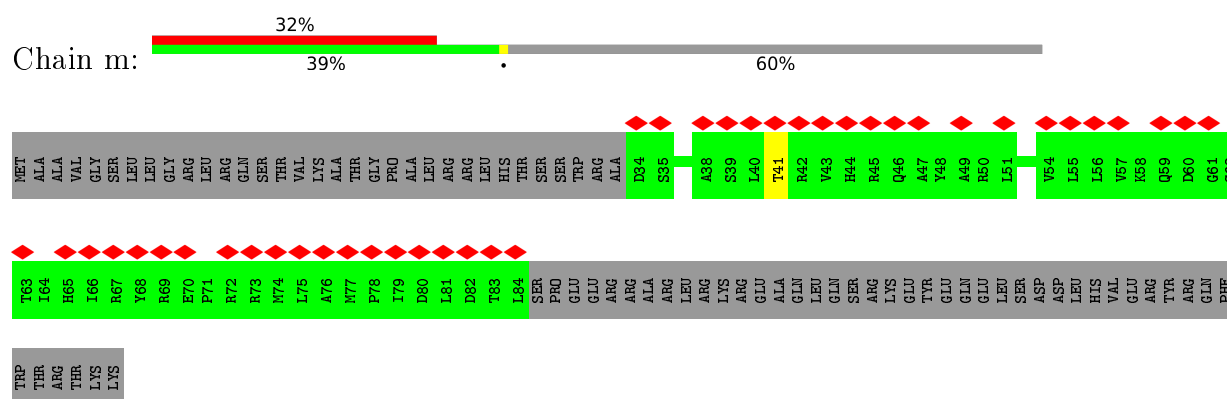
- Molecule 50: 39S ribosomal protein L53, mitochondrial



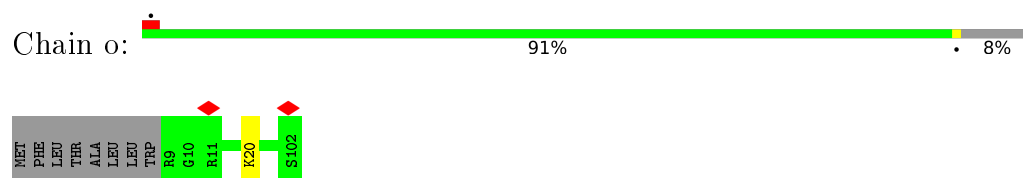
- Molecule 51: 39S ribosomal protein L54, mitochondrial



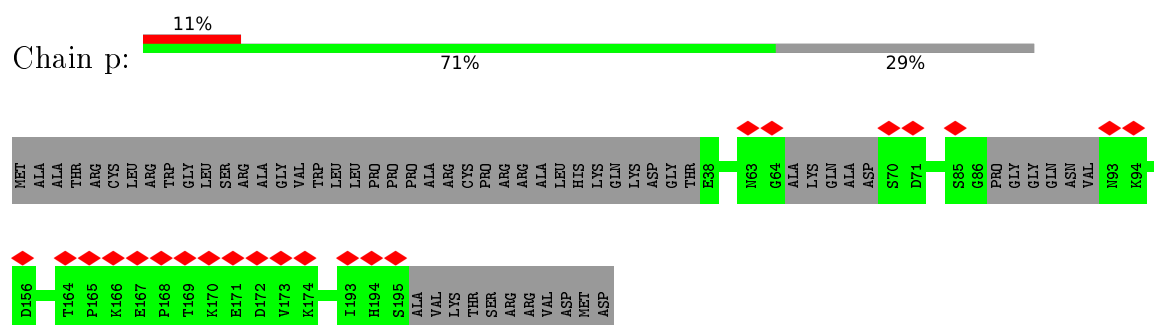
- Molecule 52: 39S ribosomal protein L55, mitochondrial



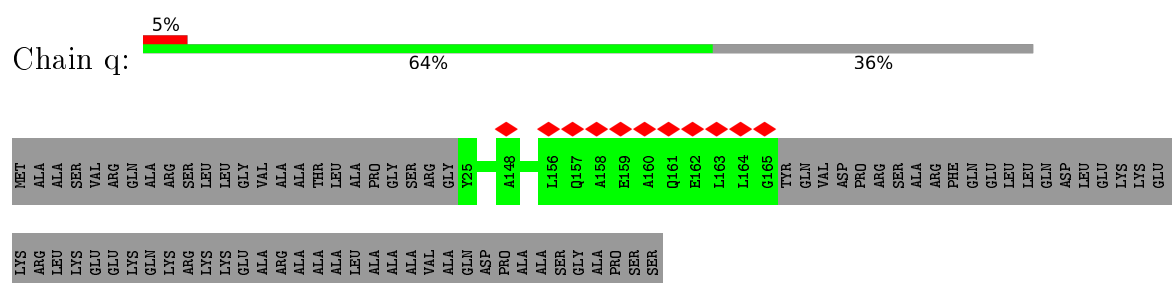
- Molecule 53: Ribosomal protein 63, mitochondrial



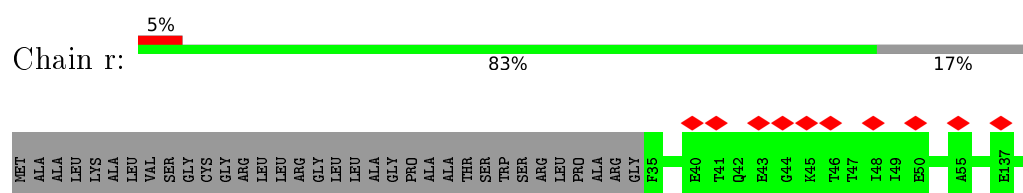
- Molecule 54: Peptidyl-tRNA hydrolase ICT1, mitochondrial



- Molecule 55: Growth arrest and DNA damage-inducible proteins-interacting protein 1



- Molecule 56: 39S ribosomal protein S18a, mitochondrial



- Molecule 57: 39S ribosomal protein S30, mitochondrial

LEU
LEU
GLU
ASN

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	123267	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.222	Depositor
Minimum map value	-1.532	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.118	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	474.87997, 474.87997, 474.87997	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: AYA, PM8, ZN, SAM, SAC, K, FES, THC, MG

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	u	0.23	0/941	0.45	0/1270
2	v	0.23	0/597	0.52	0/796
3	w	0.23	0/647	0.39	0/871
4	x	0.24	0/2721	0.46	0/3691
5	y	0.24	0/2011	0.43	0/2702
6	0	0.24	0/913	0.50	0/1224
7	1	0.23	0/460	0.53	0/610
8	2	0.23	0/383	0.53	0/507
9	3	0.24	0/853	0.50	0/1136
10	4	0.25	0/350	0.54	0/461
11	5	0.24	0/3305	0.46	0/4502
12	6	0.24	0/3043	0.48	0/4140
13	7	0.24	0/2447	0.44	0/3310
14	8	0.24	0/880	0.44	0/1188
15	9	0.26	0/1025	0.47	0/1379
16	A	0.20	0/33664	0.69	2/52392 (0.0%)
17	B	0.28	1/1700 (0.1%)	0.66	0/2641
18	D	0.24	0/1910	0.54	0/2569
19	E	0.24	0/2475	0.45	0/3355
20	F	0.24	0/2090	0.48	0/2842
21	H	0.24	0/816	0.51	0/1097
22	I	0.24	0/1354	0.47	0/1829
23	J	0.24	0/1348	0.45	0/1813
24	K	0.24	0/1490	0.46	0/2021
25	L	0.24	0/905	0.51	0/1218
26	M	0.25	0/2381	0.51	0/3212
27	N	0.24	0/1768	0.48	0/2383
28	O	0.24	0/1283	0.50	0/1727
29	P	0.23	0/1199	0.51	0/1623
30	Q	0.25	0/1884	0.49	0/2535
31	R	0.24	0/1175	0.50	0/1572
32	S	0.24	0/1320	0.50	0/1789

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	T	0.25	0/1403	0.47	0/1886
34	U	0.25	0/1274	0.51	0/1723
35	V	0.23	0/1721	0.49	0/2333
36	W	0.26	0/857	0.48	0/1155
37	X	0.24	0/2099	0.45	0/2837
38	Y	0.24	0/1593	0.47	0/2136
39	Z	0.24	0/1021	0.46	0/1378
40	a	0.24	0/866	0.48	0/1174
41	b	0.24	0/1203	0.52	0/1627
42	c	0.24	0/2347	0.44	0/3171
43	d	0.24	0/2181	0.46	0/2949
44	e	0.23	0/1885	0.45	0/2542
45	f	0.24	0/1216	0.41	0/1638
46	g	0.25	0/1151	0.48	0/1569
47	h	0.23	0/918	0.44	0/1249
48	i	0.24	0/850	0.50	0/1135
49	j	0.24	0/760	0.46	0/1023
50	k	0.23	0/777	0.49	0/1048
51	l	0.23	0/707	0.44	0/960
52	m	0.22	0/426	0.56	0/575
53	o	0.23	0/819	0.51	0/1097
54	p	0.23	0/1223	0.48	0/1641
55	q	0.23	0/1208	0.48	0/1633
56	r	0.24	0/1362	0.49	0/1846
57	s	0.25	0/3239	0.48	0/4400
All	All	0.23	1/112444 (0.0%)	0.56	2/159130 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	B	1602	C	OP3-P	-10.66	1.48	1.61

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	A	2079	C	C2-N1-C1'	5.52	124.88	118.80
16	A	2079	C	N1-C2-O2	5.18	122.00	118.90

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles

5.3.1 Protein backbone

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	u	108/234 (46%)	104 (96%)	4 (4%)	0	100	100
2	v	67/70 (96%)	67 (100%)	0	0	100	100
3	w	77/156 (49%)	73 (95%)	4 (5%)	0	100	100
4	x	332/384 (86%)	328 (99%)	4 (1%)	0	100	100
5	y	242/381 (64%)	240 (99%)	2 (1%)	0	100	100
6	0	108/188 (57%)	108 (100%)	0	0	100	100
7	1	53/65 (82%)	52 (98%)	1 (2%)	0	100	100
8	2	44/92 (48%)	42 (96%)	2 (4%)	0	100	100
9	3	93/188 (50%)	92 (99%)	1 (1%)	0	100	100
10	4	36/103 (35%)	36 (100%)	0	0	100	100
11	5	392/423 (93%)	389 (99%)	3 (1%)	0	100	100
12	6	352/380 (93%)	346 (98%)	6 (2%)	0	100	100
13	7	292/338 (86%)	287 (98%)	5 (2%)	0	100	100
14	8	100/206 (48%)	100 (100%)	0	0	100	100
15	9	122/137 (89%)	121 (99%)	1 (1%)	0	100	100
18	D	238/305 (78%)	234 (98%)	4 (2%)	0	100	100
19	E	303/348 (87%)	298 (98%)	4 (1%)	1 (0%)	41	71
20	F	250/311 (80%)	248 (99%)	2 (1%)	0	100	100
21	H	95/267 (36%)	94 (99%)	1 (1%)	0	100	100
22	I	161/261 (62%)	159 (99%)	2 (1%)	0	100	100
23	J	173/192 (90%)	172 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
24	K	175/178 (98%)	174 (99%)	1 (1%)	0	100	100
25	L	113/145 (78%)	113 (100%)	0	0	100	100
26	M	289/296 (98%)	287 (99%)	2 (1%)	0	100	100
27	N	208/251 (83%)	206 (99%)	2 (1%)	0	100	100
28	O	152/175 (87%)	150 (99%)	2 (1%)	0	100	100
29	P	142/180 (79%)	138 (97%)	4 (3%)	0	100	100
30	Q	219/292 (75%)	219 (100%)	0	0	100	100
31	R	138/149 (93%)	137 (99%)	1 (1%)	0	100	100
32	S	159/205 (78%)	159 (100%)	0	0	100	100
33	T	164/206 (80%)	164 (100%)	0	0	100	100
34	U	150/153 (98%)	148 (99%)	2 (1%)	0	100	100
35	V	203/216 (94%)	202 (100%)	1 (0%)	0	100	100
36	W	104/148 (70%)	102 (98%)	2 (2%)	0	100	100
37	X	242/256 (94%)	241 (100%)	1 (0%)	0	100	100
38	Y	179/250 (72%)	178 (99%)	1 (1%)	0	100	100
39	Z	120/161 (74%)	118 (98%)	2 (2%)	0	100	100
40	a	96/142 (68%)	95 (99%)	1 (1%)	0	100	100
41	b	147/215 (68%)	145 (99%)	2 (1%)	0	100	100
42	c	282/332 (85%)	280 (99%)	2 (1%)	0	100	100
43	d	257/306 (84%)	255 (99%)	2 (1%)	0	100	100
44	e	224/279 (80%)	219 (98%)	5 (2%)	0	100	100
45	f	146/212 (69%)	143 (98%)	3 (2%)	0	100	100
46	g	132/166 (80%)	131 (99%)	1 (1%)	0	100	100
47	h	108/158 (68%)	106 (98%)	2 (2%)	0	100	100
48	i	95/128 (74%)	95 (100%)	0	0	100	100
49	j	92/123 (75%)	92 (100%)	0	0	100	100
50	k	99/112 (88%)	97 (98%)	2 (2%)	0	100	100
51	l	80/138 (58%)	80 (100%)	0	0	100	100
52	m	49/128 (38%)	49 (100%)	0	0	100	100
53	o	92/102 (90%)	92 (100%)	0	0	100	100
54	p	141/206 (68%)	139 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
55	q	139/222 (63%)	139 (100%)	0	0	100	100
56	r	160/196 (82%)	158 (99%)	2 (1%)	0	100	100
57	s	382/439 (87%)	374 (98%)	8 (2%)	0	100	100
All	All	9116/11894 (77%)	9015 (99%)	100 (1%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
19	E	150	LYS

5.3.2 Protein sidechains ⓘ

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	u	104/200 (52%)	104 (100%)	0	100	100
2	v	59/60 (98%)	59 (100%)	0	100	100
3	w	73/136 (54%)	73 (100%)	0	100	100
4	x	291/328 (89%)	286 (98%)	5 (2%)	60	86
5	y	226/350 (65%)	226 (100%)	0	100	100
6	0	99/164 (60%)	98 (99%)	1 (1%)	76	92
7	1	52/60 (87%)	52 (100%)	0	100	100
8	2	40/72 (56%)	40 (100%)	0	100	100
9	3	88/166 (53%)	88 (100%)	0	100	100
10	4	37/89 (42%)	37 (100%)	0	100	100
11	5	353/368 (96%)	352 (100%)	1 (0%)	92	98
12	6	313/332 (94%)	311 (99%)	2 (1%)	86	96
13	7	270/303 (89%)	269 (100%)	1 (0%)	91	97
14	8	93/190 (49%)	93 (100%)	0	100	100
15	9	104/112 (93%)	104 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	D	194/245 (79%)	194 (100%)	0	100	100
19	E	260/290 (90%)	260 (100%)	0	100	100
20	F	219/262 (84%)	219 (100%)	0	100	100
21	H	88/228 (39%)	88 (100%)	0	100	100
22	I	151/232 (65%)	151 (100%)	0	100	100
23	J	138/150 (92%)	138 (100%)	0	100	100
24	K	154/155 (99%)	154 (100%)	0	100	100
25	L	98/124 (79%)	97 (99%)	1 (1%)	76	92
26	M	246/249 (99%)	243 (99%)	3 (1%)	71	91
27	N	185/211 (88%)	184 (100%)	1 (0%)	88	96
28	O	134/150 (89%)	134 (100%)	0	100	100
29	P	126/155 (81%)	125 (99%)	1 (1%)	81	94
30	Q	203/256 (79%)	202 (100%)	1 (0%)	88	96
31	R	118/126 (94%)	118 (100%)	0	100	100
32	S	146/180 (81%)	146 (100%)	0	100	100
33	T	146/176 (83%)	146 (100%)	0	100	100
34	U	134/135 (99%)	133 (99%)	1 (1%)	84	95
35	V	183/191 (96%)	181 (99%)	2 (1%)	73	92
36	W	86/119 (72%)	86 (100%)	0	100	100
37	X	220/229 (96%)	220 (100%)	0	100	100
38	Y	163/223 (73%)	163 (100%)	0	100	100
39	Z	113/147 (77%)	113 (100%)	0	100	100
40	a	96/133 (72%)	96 (100%)	0	100	100
41	b	130/185 (70%)	130 (100%)	0	100	100
42	c	251/288 (87%)	251 (100%)	0	100	100
43	d	237/274 (86%)	236 (100%)	1 (0%)	91	97
44	e	198/236 (84%)	198 (100%)	0	100	100
45	f	133/188 (71%)	133 (100%)	0	100	100
46	g	124/148 (84%)	124 (100%)	0	100	100
47	h	104/148 (70%)	103 (99%)	1 (1%)	76	92
48	i	86/110 (78%)	86 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
49	j	74/97 (76%)	74 (100%)	0	100	100
50	k	83/90 (92%)	83 (100%)	0	100	100
51	l	76/116 (66%)	75 (99%)	1 (1%)	69	90
52	m	46/113 (41%)	45 (98%)	1 (2%)	52	81
53	o	80/87 (92%)	79 (99%)	1 (1%)	69	90
54	p	135/181 (75%)	135 (100%)	0	100	100
55	q	119/178 (67%)	119 (100%)	0	100	100
56	r	147/169 (87%)	147 (100%)	0	100	100
57	s	340/381 (89%)	339 (100%)	1 (0%)	92	98
All	All	8166/10285 (79%)	8140 (100%)	26 (0%)	92	98

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	x	241	TRP
4	x	271	ASN
4	x	282	GLN
4	x	326	GLU
4	x	360	VAL
6	0	185	PHE
11	5	47	ASP
12	6	179	VAL
12	6	243	ASN
13	7	234	LYS
25	L	95	ARG
26	M	180	ASP
26	M	222	TYR
26	M	261	ASP
27	N	132	THR
29	P	161	LEU
30	Q	125	TYR
34	U	11	ARG
35	V	186	THR
35	V	188	VAL
43	d	89	VAL
47	h	103	HIS
51	l	58	ASP
52	m	41	THR
53	o	20	LYS

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Mol	Chain	Res	Type
57	s	97	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (62) such sidechains are listed below:

Mol	Chain	Res	Type
2	v	19	GLN
4	x	85	HIS
4	x	172	GLN
4	x	214	GLN
4	x	230	GLN
4	x	316	GLN
4	x	322	GLN
5	y	122	GLN
5	y	123	GLN
5	y	192	GLN
5	y	195	ASN
5	y	210	GLN
5	y	235	GLN
5	y	255	GLN
5	y	284	GLN
7	1	31	ASN
7	1	52	GLN
11	5	165	GLN
11	5	191	GLN
11	5	266	HIS
11	5	384	GLN
12	6	320	GLN
12	6	359	HIS
13	7	290	GLN
18	D	195	ASN
20	F	103	GLN
20	F	241	ASN
22	I	43	GLN
22	I	150	HIS
23	J	168	GLN
25	L	52	HIS
27	N	202	GLN
27	N	210	GLN
27	N	237	HIS
28	O	146	ASN
28	O	147	GLN
29	P	79	HIS

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Mol	Chain	Res	Type
29	P	142	ASN
31	R	27	HIS
31	R	77	GLN
32	S	118	ASN
34	U	27	GLN
38	Y	99	HIS
39	Z	64	HIS
40	a	46	ASN
41	b	129	GLN
43	d	167	HIS
43	d	235	GLN
44	e	67	GLN
44	e	75	GLN
44	e	212	HIS
44	e	219	GLN
46	g	155	GLN
51	l	82	GLN
52	m	65	HIS
53	o	94	HIS
56	r	96	HIS
56	r	130	ASN
57	s	239	ASN
57	s	240	GLN
57	s	343	GLN
57	s	358	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	A	1409/1590 (88%)	246 (17%)	1 (0%)
17	B	71/72 (98%)	13 (18%)	0
All	All	1480/1662 (89%)	259 (17%)	1 (0%)

All (259) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
16	A	1689	C
16	A	1693	C
16	A	1699	C
16	A	1700	U
16	A	1704	U

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Mol	Chain	Res	Type
16	A	1707	C
16	A	1708	A
16	A	1711	C
16	A	1713	A
16	A	1724	A
16	A	1727	A
16	A	1728	U
16	A	1731	A
16	A	1737	A
16	A	1748	G
16	A	1750	G
16	A	1765	C
16	A	1770	G
16	A	1780	U
16	A	1805	A
16	A	1806	U
16	A	1807	U
16	A	1809	U
16	A	1821	A
16	A	1824	U
16	A	1827	C
16	A	1828	A
16	A	1829	A
16	A	1832	A
16	A	1836	A
16	A	1844	A
16	A	1853	A
16	A	1854	U
16	A	1855	A
16	A	1867	A
16	A	1869	A
16	A	1882	A
16	A	1883	G
16	A	1887	A
16	A	1892	A
16	A	1893	A
16	A	1901	C
16	A	1903	C
16	A	1918	G
16	A	1937	A
16	A	1940	A
16	A	1962	A

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Mol	Chain	Res	Type
16	A	1974	A
16	A	1984	A
16	A	1985	G
16	A	1986	A
16	A	1987	G
16	A	1992	C
16	A	1993	A
16	A	1994	A
16	A	2002	G
16	A	2015	G
16	A	2022	G
16	A	2029	A
16	A	2030	U
16	A	2031	A
16	A	2036	C
16	A	2039	A
16	A	2060	A
16	A	2065	A
16	A	2068	C
16	A	2069	U
16	A	2074	A
16	A	2079	C
16	A	2083	U
16	A	2092	C
16	A	2098	G
16	A	2108	G
16	A	2109	A
16	A	2110	A
16	A	2125	C
16	A	2126	U
16	A	2132	A
16	A	2147	G
16	A	2154	A
16	A	2163	A
16	A	2167	A
16	A	2168	U
16	A	2169	A
16	A	2170	G
16	A	2171	U
16	A	2172	A
16	A	2181	A
16	A	2182	G

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Mol	Chain	Res	Type
16	A	2183	C
16	A	2184	A
16	A	2194	U
16	A	2195	A
16	A	2197	G
16	A	2198	A
16	A	2199	A
16	A	2200	A
16	A	2202	C
16	A	2203	G
16	A	2210	C
16	A	2216	A
16	A	2228	A
16	A	2233	U
16	A	2237	A
16	A	2239	A
16	A	2241	A
16	A	2243	A
16	A	2245	A
16	A	2252	C
16	A	2262	C
16	A	2263	C
16	A	2283	C
16	A	2284	C
16	A	2285	U
16	A	2293	A
16	A	2297	A
16	A	2300	G
16	A	2322	C
16	A	2324	U
16	A	2332	C
16	A	2345	G
16	A	2350	A
16	A	2351	U
16	A	2352	U
16	A	2353	A
16	A	2354	A
16	A	2355	A
16	A	2356	A
16	A	2359	C
16	A	2360	U
16	A	2361	G

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Mol	Chain	Res	Type
16	A	2362	A
16	A	2363	A
16	A	2374	A
16	A	2390	A
16	A	2393	C
16	A	2396	C
16	A	2401	A
16	A	2405	C
16	A	2406	A
16	A	2407	U
16	A	2415	C
16	A	2427	C
16	A	2432	A
16	A	2444	A
16	A	2446	A
16	A	2451	A
16	A	2452	A
16	A	2478	G
16	A	2493	C
16	A	2500	A
16	A	2506	A
16	A	2507	A
16	A	2511	C
16	A	2520	C
16	A	2521	A
16	A	2527	A
16	A	2540	C
16	A	2641	A
16	A	2654	U
16	A	2656	U
16	A	2660	U
16	A	2683	C
16	A	2684	C
16	A	2686	G
16	A	2693	A
16	A	2694	A
16	A	2695	G
16	A	2696	A
16	A	2706	A
16	A	2709	A
16	A	2718	C
16	A	2719	G

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Mol	Chain	Res	Type
16	A	2727	C
16	A	2732	G
16	A	2745	A
16	A	2809	C
16	A	2810	G
16	A	2814	G
16	A	2829	C
16	A	2831	G
16	A	2832	A
16	A	2833	A
16	A	2847	C
16	A	2854	U
16	A	2864	U
16	A	2865	C
16	A	2889	C
16	A	2895	U
16	A	2910	A
16	A	2911	C
16	A	2913	A
16	A	2917	G
16	A	2922	A
16	A	2926	A
16	A	2928	C
16	A	2944	C
16	A	2955	U
16	A	2956	A
16	A	2963	A
16	A	2982	C
16	A	2984	A
16	A	2985	C
16	A	2995	G
16	A	3000	A
16	A	3005	A
16	A	3016	G
16	A	3021	C
16	A	3041	U
16	A	3042	U
16	A	3043	C
16	A	3053	A
16	A	3054	G
16	A	3056	C
16	A	3060	C

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Mol	Chain	Res	Type
16	A	3061	G
16	A	3072	U
16	A	3073	C
16	A	3077	C
16	A	3086	U
16	A	3089	A
16	A	3097	U
16	A	3100	U
16	A	3101	A
16	A	3102	U
16	A	3109	U
16	A	3110	C
16	A	3111	A
16	A	3112	A
16	A	3150	U
16	A	3155	C
16	A	3157	C
16	A	3158	A
16	A	3162	C
16	A	3169	C
16	A	3172	C
16	A	3180	A
16	A	3183	U
16	A	3189	C
16	A	3190	A
16	A	3197	U
16	A	3206	C
16	A	3212	C
16	A	3217	A
16	A	3218	A
16	A	3228	U
17	B	1603	A
17	B	1605	A
17	B	1609	U
17	B	1611	G
17	B	1617	C
17	B	1621	A
17	B	1646	U
17	B	1650	A
17	B	1652	C
17	B	1653	U
17	B	1654	U

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Mol	Chain	Res	Type
17	B	1656	A
17	B	1664	G

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
16	A	2030	U

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

4 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
34	AYA	U	2	34	6,7,8	1.30	1 (16%)	5,8,10	1.22	1 (20%)
50	AYA	k	2	50	6,7,8	1.24	1 (16%)	5,8,10	1.32	1 (20%)
41	THC	b	2	41	8,9,10	1.06	1 (12%)	9,11,13	0.71	0
24	SAC	K	2	24	7,8,9	1.02	0	8,9,11	0.81	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
34	AYA	U	2	34	-	0/4/6/8	-
50	AYA	k	2	50	-	0/4/6/8	-
41	THC	b	2	41	-	0/8/10/12	-
24	SAC	K	2	24	-	2/7/8/10	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
34	U	2	AYA	CA-N	-2.57	1.43	1.46
50	k	2	AYA	CA-N	-2.27	1.44	1.46
41	b	2	THC	CA-N	-2.15	1.43	1.46

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	k	2	AYA	CB-CA-N	2.71	112.63	109.61
34	U	2	AYA	CB-CA-N	2.58	112.48	109.61

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
24	K	2	SAC	N-CA-CB-OG
24	K	2	SAC	C-CA-CB-OG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 104 ligands modelled in this entry, 101 are monoatomic - leaving 3 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	$\# Z > 2$
63	FES	r	201	56,22	0,4,4	0.00	-	-		
59	SAM	x	401	-	21,29,29	1.20	2 (9%)	18,42,42	1.59	2 (11%)
58	PM8	w	200	3	25,31,31	0.22	0	30,38,38	0.43	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
63	FES	r	201	56,22	-	-	0/1/1/1
59	SAM	x	401	-	-	4/8/33/33	0/3/3/3
58	PM8	w	200	3	-	14/36/38/38	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	x	401	SAM	C2-N3	4.01	1.38	1.32
59	x	401	SAM	C2-N1	2.46	1.38	1.33

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
59	x	401	SAM	N3-C2-N1	-5.45	120.16	128.68
59	x	401	SAM	C3'-C2'-C1'	2.79	105.18	100.98

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
58	w	200	PM8	O27-C28-C29-C32
58	w	200	PM8	C32-C34-N36-C37
58	w	200	PM8	O1-C1-S1-C43
58	w	200	PM8	C2-C1-S1-C43
59	x	401	SAM	N-CA-CB-CG
59	x	401	SAM	C-CA-CB-CG
59	x	401	SAM	CB-CG-SD-C5'
58	w	200	PM8	C38-C39-N41-C42
58	w	200	PM8	O35-C34-N36-C37
58	w	200	PM8	O40-C39-N41-C42
58	w	200	PM8	O27-C28-C29-C30
58	w	200	PM8	O27-C28-C29-C31
58	w	200	PM8	O33-C32-C34-O35
59	x	401	SAM	CB-CG-SD-CE
58	w	200	PM8	O33-C32-C34-N36
58	w	200	PM8	C42-C43-S1-C1
58	w	200	PM8	C31-C29-C32-C34

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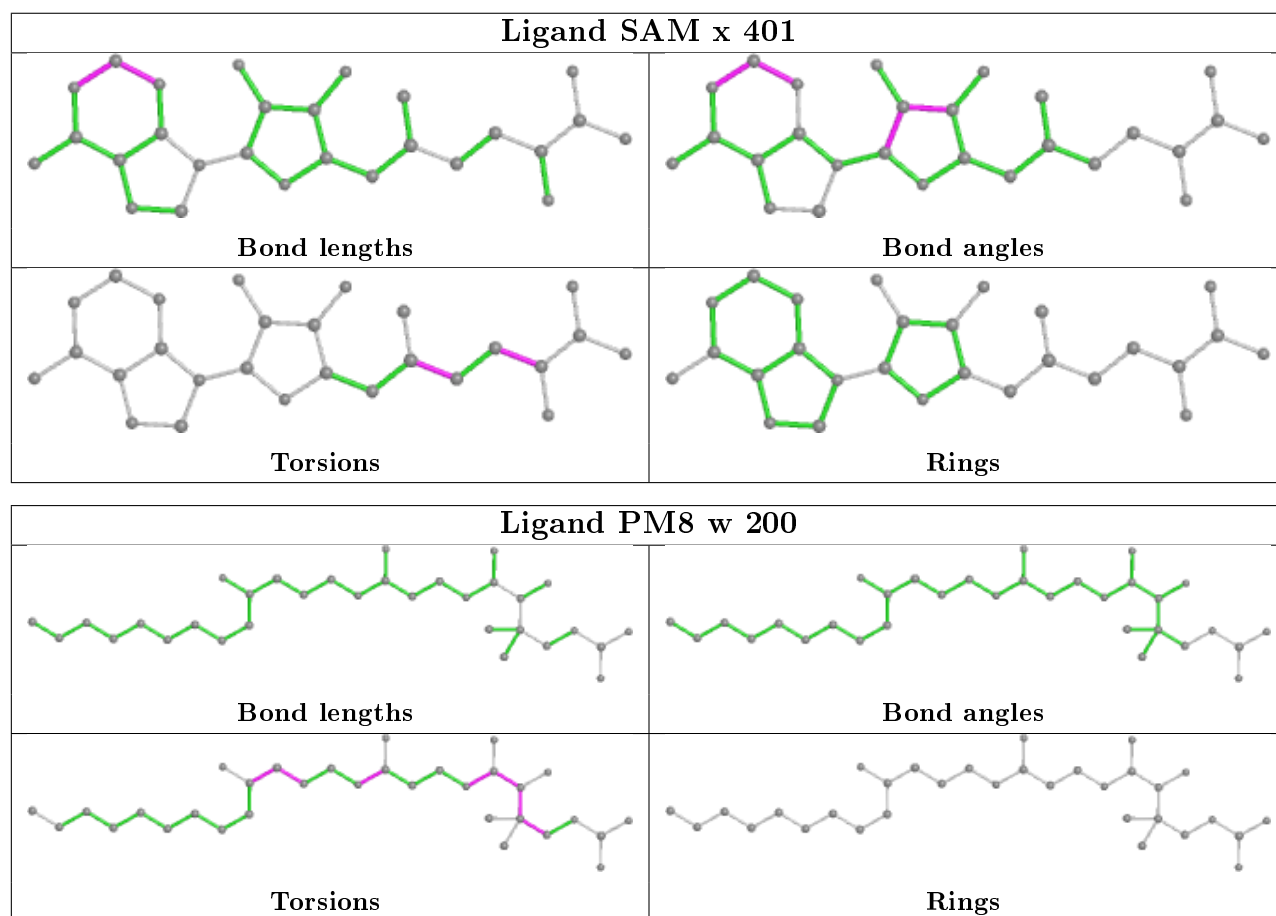
Continued from previous page...

Mol	Chain	Res	Type	Atoms
58	w	200	PM8	C28-C29-C32-C34

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
16	A	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	3251:N	O3'	3252:N	P	17.10
1	A	3236:N	O3'	3237:N	P	13.81

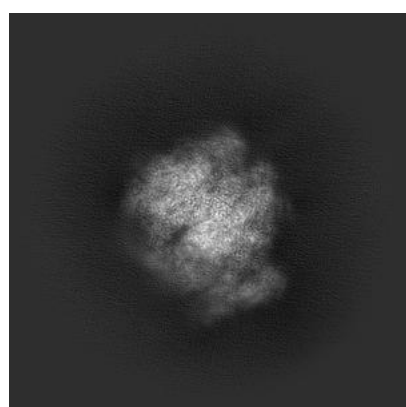
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-12845. These allow visual inspection of the internal detail of the map and identification of artifacts.

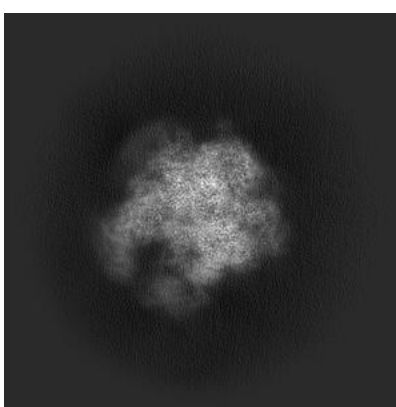
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

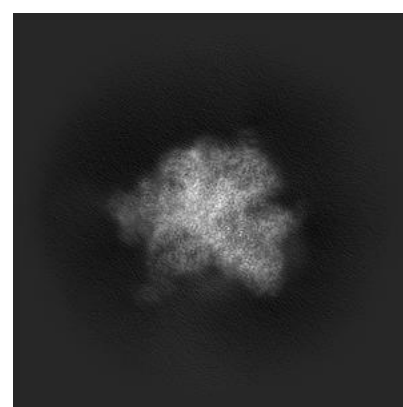
6.1.1 Primary map



X



Y

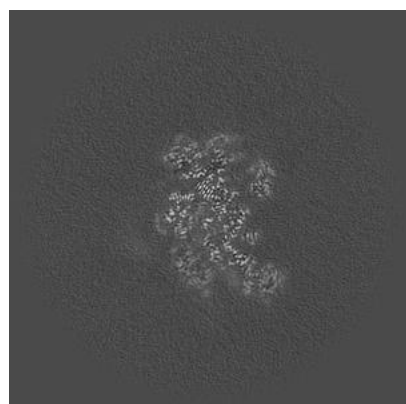


Z

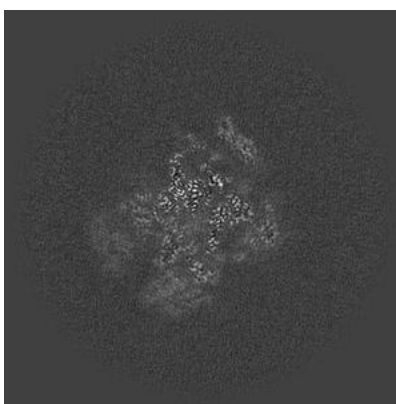
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

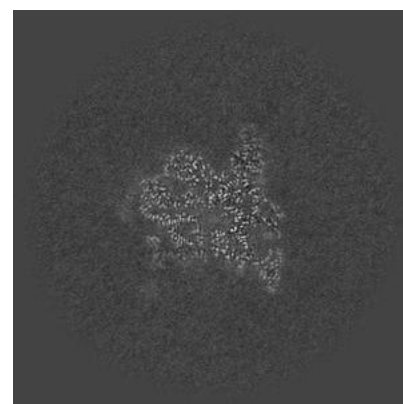
6.2.1 Primary map



X Index: 224



Y Index: 224

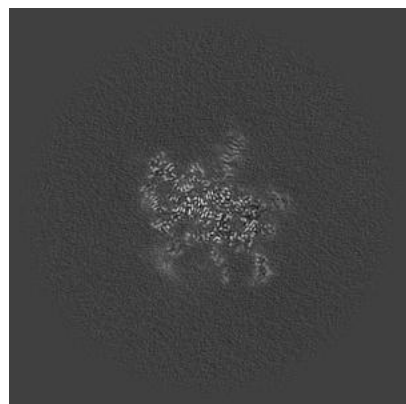


Z Index: 224

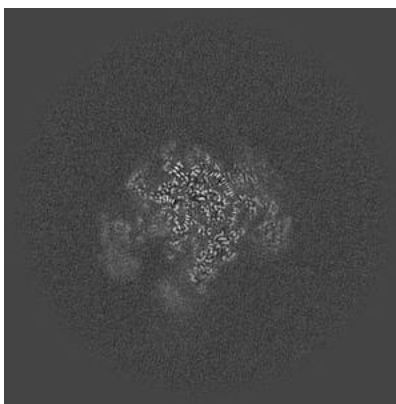
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

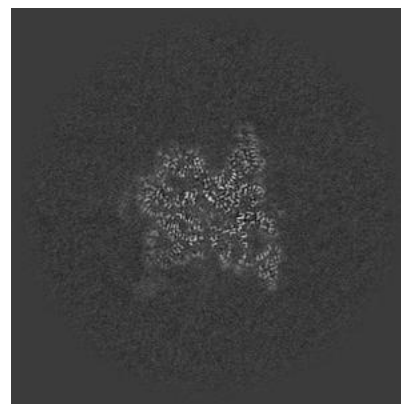
6.3.1 Primary map



X Index: 256



Y Index: 242



Z Index: 227

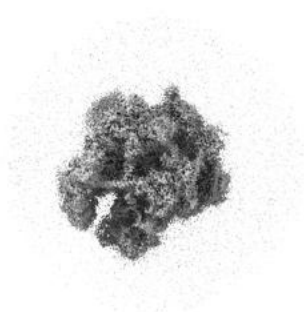
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

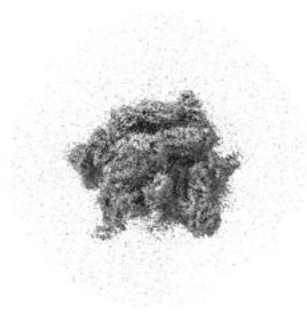
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

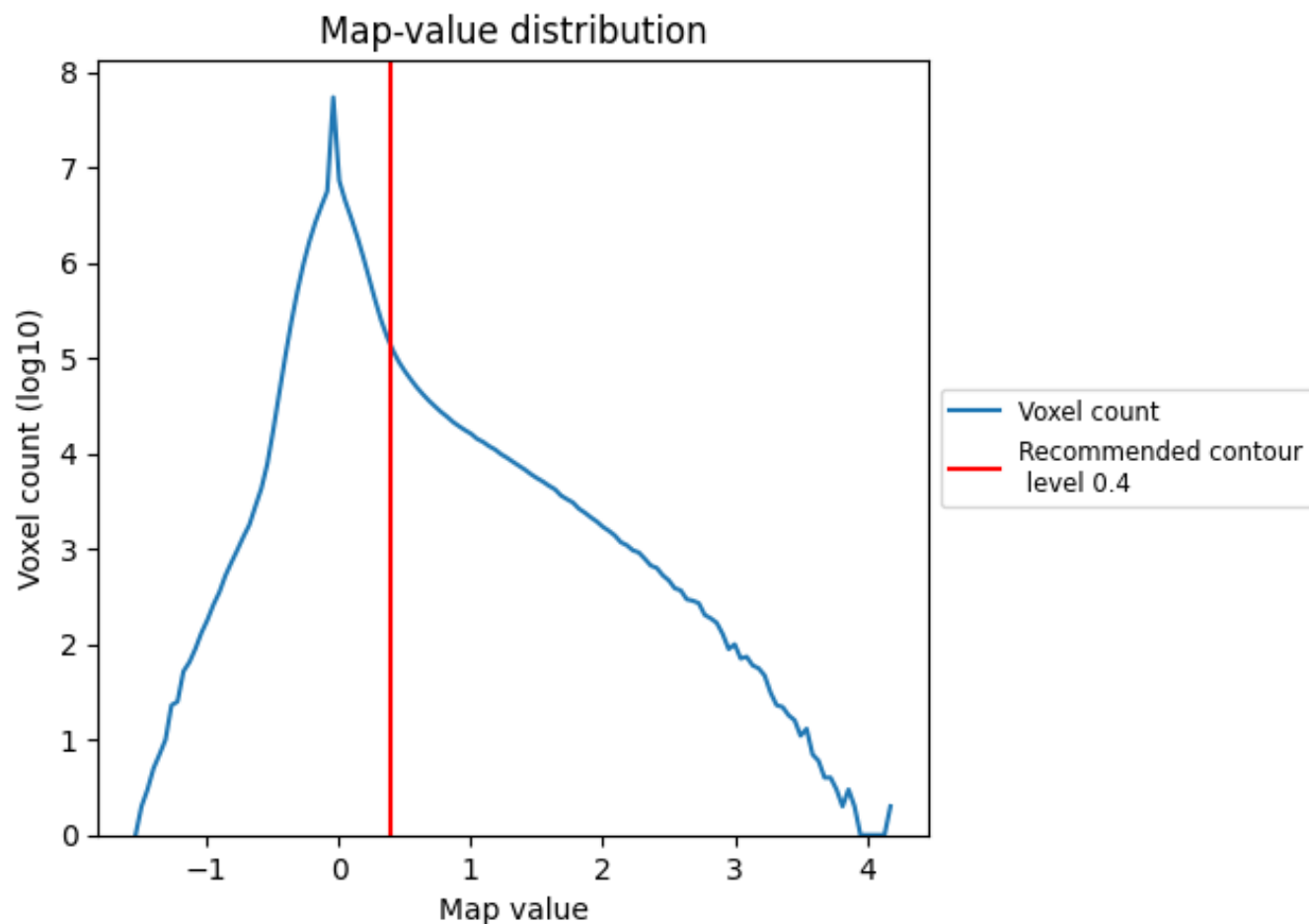
6.5 Mask visualisation

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

7 Map analysis [i](#)

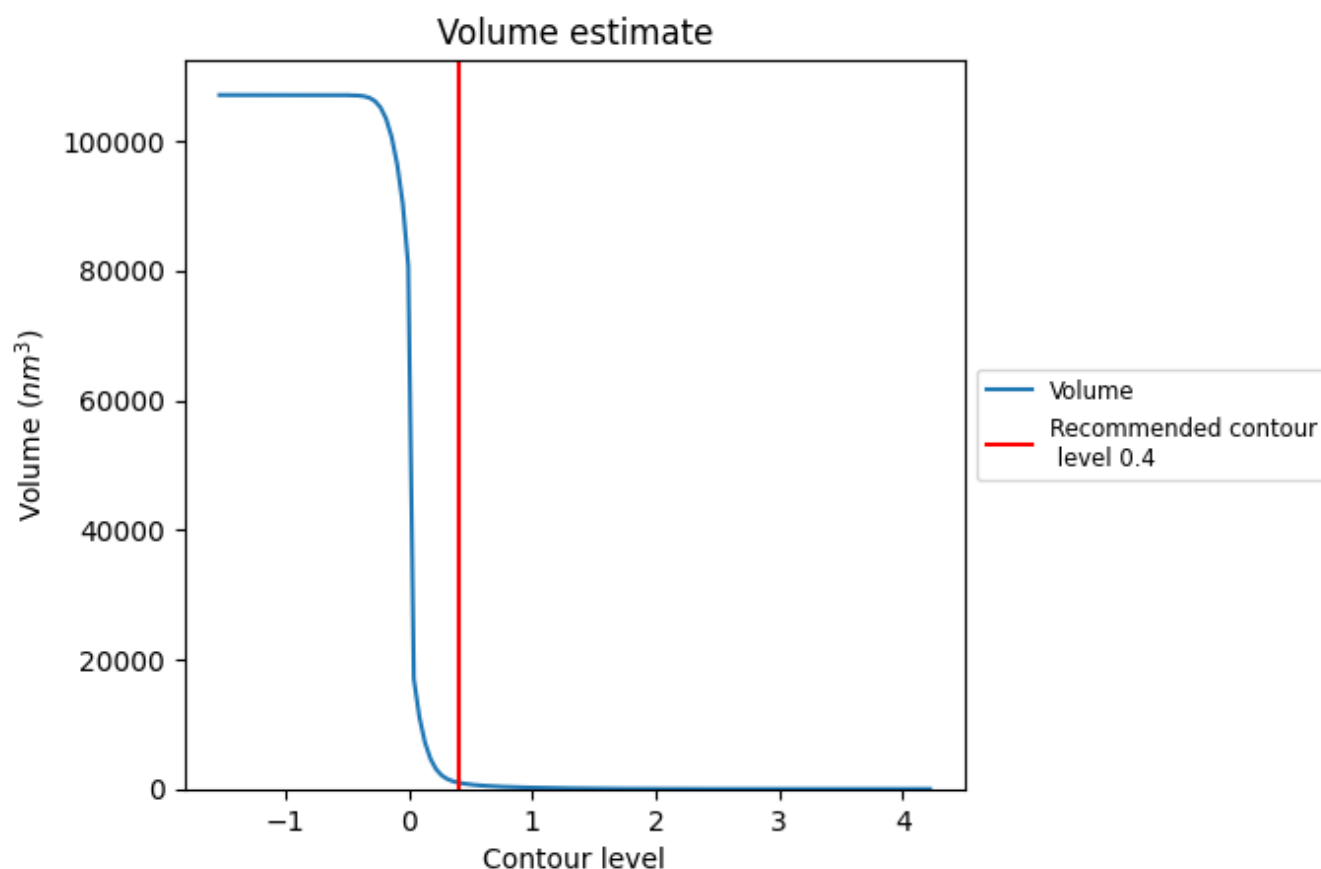
This section contains the results of statistical analysis of the map.

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.

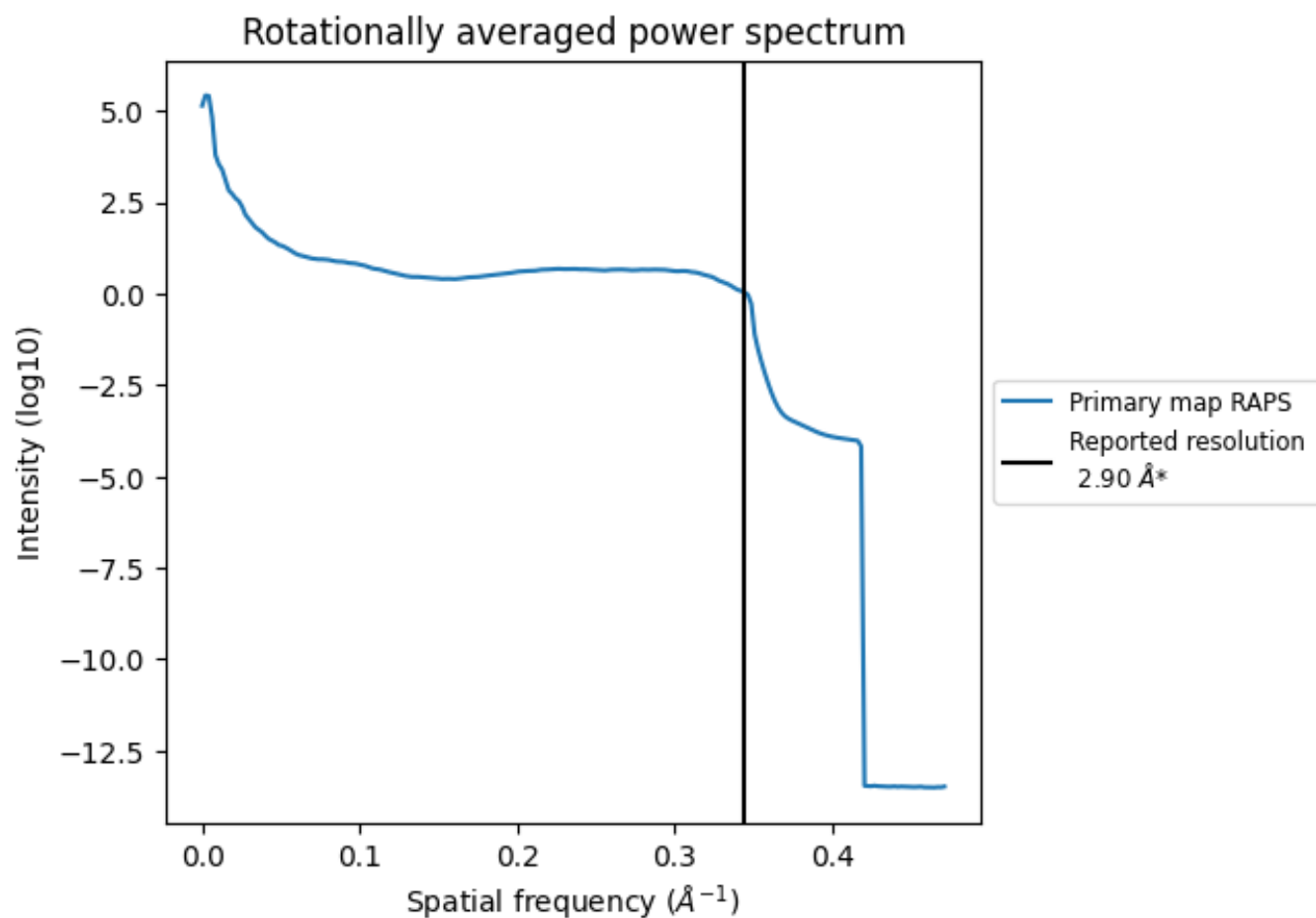
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 985 nm^3 ; this corresponds to an approximate mass of 890 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.345 Å⁻¹

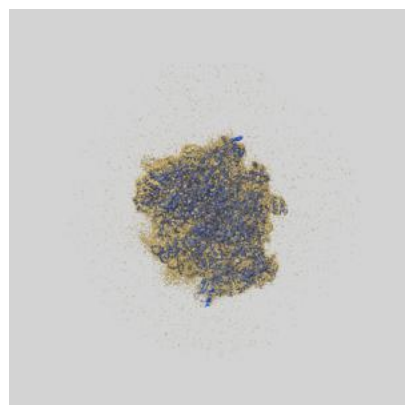
8 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

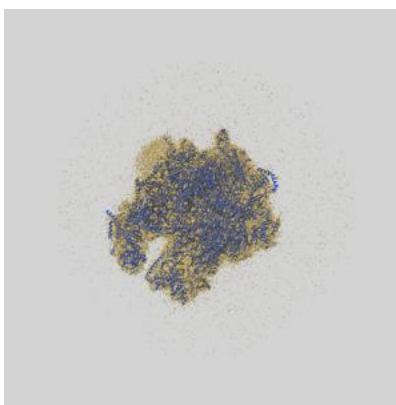
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-12845 and PDB model 7ODR. Per-residue inclusion information can be found in [section 3](#) on [page 16](#).

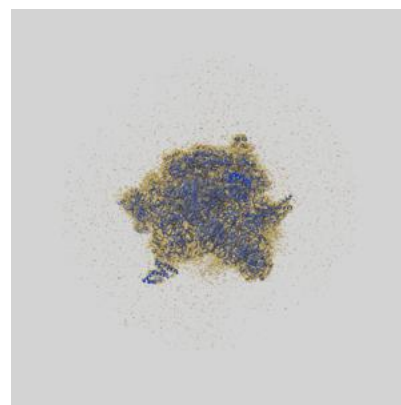
9.1 Map-model overlay [i](#)



X



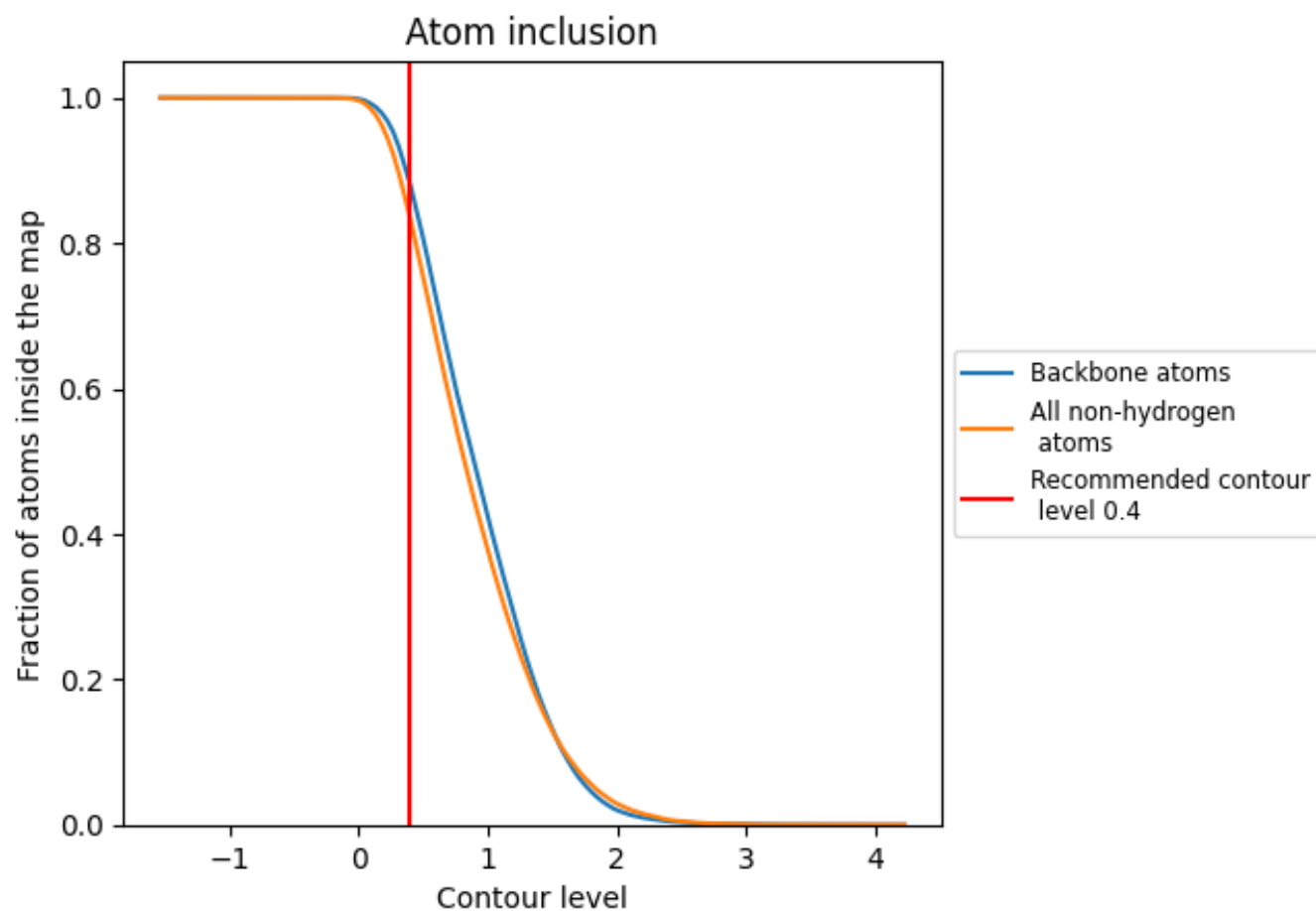
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.4 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 Atom inclusion [i](#)



At the recommended contour level, 88% of all backbone atoms, 83% of all non-hydrogen atoms, are inside the map.