W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

wwPDB EM Validation Summary Report (i)

Apr 16, 2024 – 03:28 am BST

PDB ID	:	7P2E
EMDB ID	:	EMD-13170
Title	:	Human mitochondrial ribosome small subunit in complex with IF3, GMPPMP and streptomycin
Authors	:	Itoh, Y.; Khawaja, A.; Singh, V.; Rorbach, J.; Amunts, A.
Deposited on	:	2021-07-05
Resolution	:	2.40 Å(reported)
Based on initial model	:	6RW4

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 (i) 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 (i)) were used in the production of this report:

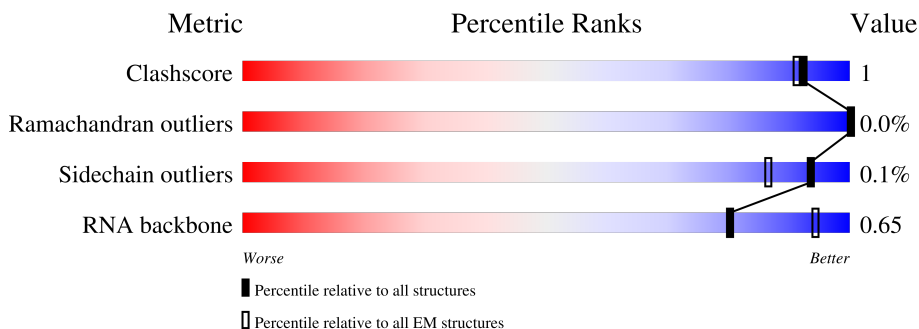|		
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

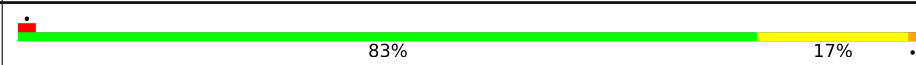The following experimental techniques were used to determine the structure:
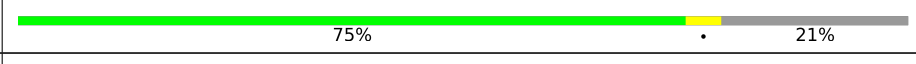*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.40 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.
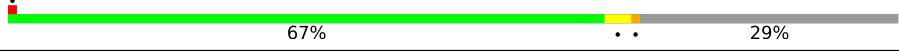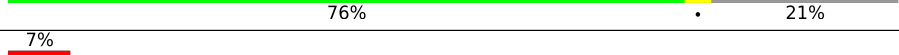
Metric	Percentile Ranks	Value
Clashscore		1
Ramachandran outliers		0.0%
Sidechain outliers		0.1%
RNA backbone		0.65

Worse   *Better*

▌ Percentile relative to all structures

▯ Percentile relative to all EM structures
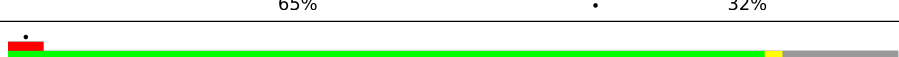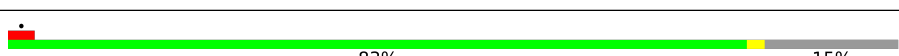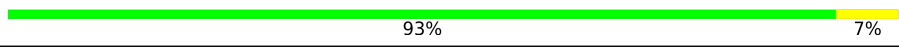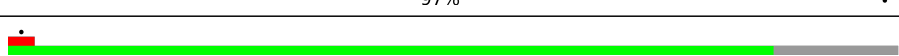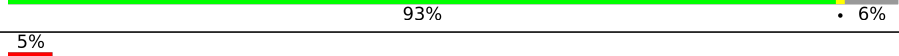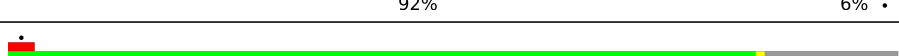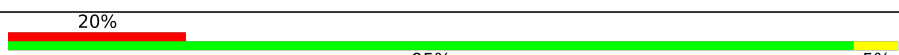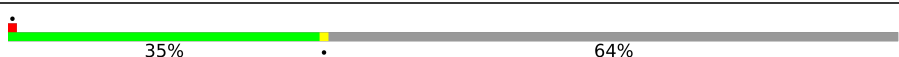
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	955	83% 17% ·
2	B	296	75% · 24%
3	C	167	75% · 21%
4	D	430	77% · 22%
5	E	125	98% ·
6	F	242	82% · 14%
7	G	396	6% 80% · 17%

Continued from previous page...

Mol	Chain	Length	Quality of chain
8	H	201	61% 8% 30%
9	I	194	67% 29%
10	J	138	78% 22%
11	K	128	76% 21%
12	L	257	7% 65% 32%
13	M	137	85% 13%
14	N	130	83% 15%
15	O	258	74% 25%
16	P	142	66% 32%
17	Q	86	93% 7%
18	R	360	79% 18%
19	S	190	6% 67% 29%
20	T	173	97%
21	U	205	86% 14%
22	V	414	5% 83% 13%
23	W	187	53% 47%
24	X	398	84% 12%
25	Y	395	5% 37% 62%
26	Z	106	5% 93% 6%
27	0	218	5% 92% 6%
28	1	323	84% 15%
29	2	117	20% 95% 5%
30	3	199	35% 64%
31	4	689	12% 80% 6% 14%
32	8	285	18% 66% 33%

2 Entry composition (i)

There are 42 unique types of molecules in this entry. The entry contains 131715 atoms, of which 59572 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 RNA chain called 12S mitochondrial rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	955	Total	C	H	N	O	P	9	0
			30884	9183	10412	3687	6638	964		

- Molecule 2 is a protein called 28S ribosomal protein S2, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	225	Total	C	H	N	O	S	2	0
			3670	1173	1832	331	323	11		

- Molecule 3 is a protein called 28S ribosomal protein S24, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	C	132	Total	C	H	N	O	S	0	0
			2172	699	1089	195	185	4		

- Molecule 4 is a protein called 28S ribosomal protein S5, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	D	337	Total	C	H	N	O	S	0	0
			5425	1683	2743	506	480	13		

- Molecule 5 is a protein called 28S ribosomal protein S6, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	E	122	Total	C	H	N	O	S	1	0
			1992	619	1012	180	177	4		

- Molecule 6 is a protein called 28S ribosomal protein S7, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	F	208	Total	C	H	N	O	S	0	0
			3495	1104	1770	312	298	11		

- Molecule 7 is a protein called 28S ribosomal protein S9, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	G	330	Total 5433	C 1726	H 2717	N 485	O 491	S 14	0	0

- Molecule 8 is a protein called 28S ribosomal protein S10, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	H	140	Total 2336	C 745	H 1184	N 194	O 210	S 3	0	0

- Molecule 9 is a protein called 28S ribosomal protein S11, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	I	137	Total 2081	C 642	H 1061	N 192	O 182	S 4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	184	5F0	ASN	conflict	UNP P82912

- Molecule 10 is a protein called 28S ribosomal protein S12, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	J	108	Total 1727	C 521	H 888	N 169	O 143	S 6	0	0

- Molecule 11 is a protein called 28S ribosomal protein S14, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	K	101	Total 1748	C 537	H 886	N 179	O 141	S 5	0	0

- Molecule 12 is a protein called 28S ribosomal protein S15, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	L	174	Total 2994	C 925	H 1541	N 270	O 251	S 7	0	0

- Molecule 13 is a protein called 28S ribosomal protein S16, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	M	119	Total	C	H	N	O	S	0	0
			1908	594	966	185	157	6		

- Molecule 14 is a protein called 28S ribosomal protein S17, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	N	110	Total	C	H	N	O	S	0	0
			1797	562	929	156	147	3		

- Molecule 15 is a protein called 28S ribosomal protein S18b, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
15	O	193	Total	C	H	N	O	S	0	0
			3149	1014	1557	294	277	7		

- Molecule 16 is a protein called 28S ribosomal protein S18c, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	P	97	Total	C	H	N	O	S	0	0
			1588	501	807	134	138	8		

- Molecule 17 is a protein called 28S ribosomal protein S21, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	Q	86	Total	C	H	N	O	S	1	0
			1521	465	769	153	126	8		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Q	50	ARG	CYS	variant	UNP P82921

- Molecule 18 is a protein called 28S ribosomal protein S22, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	R	295	Total	C	H	N	O	S	0	0
			4838	1533	2429	413	455	8		

- Molecule 19 is a protein called 28S ribosomal protein S23, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
19	S	135	Total 2255	C 724	H 1129	N 201	O 200	S 1	3	0

- Molecule 20 is a protein called 28S ribosomal protein S25, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
20	T	168	Total 2784	C 882	H 1405	N 242	O 244	S 11	1	0

- Molecule 21 is a protein called 28S ribosomal protein S26, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
21	U	176	Total 2988	C 916	H 1500	N 301	O 267	S 4	0	0

- Molecule 22 is a protein called 28S ribosomal protein S27, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
22	V	362	Total 5933	C 1904	H 2964	N 495	O 558	S 12	0	0

- Molecule 23 is a protein called 28S ribosomal protein S28, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
23	W	100	Total 1592	C 498	H 803	N 141	O 146	S 4	0	0

- Molecule 24 is a protein called 28S ribosomal protein S29, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
24	X	352	Total 5711	C 1827	H 2856	N 500	O 517	S 11	1	0

- Molecule 25 is a protein called 28S ribosomal protein S31, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
25	Y	149	Total 2461	C 806	H 1206	N 209	O 236	S 4	1	0

- Molecule 26 is a protein called 28S ribosomal protein S33, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
26	Z	100	Total	C	H	N	O	S	0	0
			1698	534	859	153	148	4		

- Molecule 27 is a protein called 28S ribosomal protein S34, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
27	0	215	Total	C	H	N	O	S	0	0
			3584	1130	1797	339	313	5		

- Molecule 28 is a protein called 28S ribosomal protein S35, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
28	1	276	Total	C	H	N	O	S	0	0
			4507	1419	2269	381	427	11		

- Molecule 29 is a protein called Coiled-coil-helix-coiled-coil-helix domain-containing protein 1.

Mol	Chain	Residues	Atoms						AltConf	Trace
29	2	117	Total	C	H	N	O	S	0	0
			1904	579	969	182	166	8		

- Molecule 30 is a protein called Aurora kinase A-interacting protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
30	3	71	Total	C	H	N	O	S	0	0
			1331	403	702	135	90	1		

- Molecule 31 is a protein called Pentatricopeptide repeat domain-containing protein 3, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
31	4	592	Total	C	H	N	O	S	0	0
			9593	3070	4798	812	885	28		

- Molecule 32 is a protein called Translation initiation factor IF-3, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
32	8	191	Total	C	H	N	O	S	0	0
			3131	953	1588	289	293	8		

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
8	68	ILE	THR	variant	UNP Q9H2K0
8	243	LEU	PHE	variant	UNP Q9H2K0
8	279	GLY	-	expression tag	UNP Q9H2K0
8	280	LEU	-	expression tag	UNP Q9H2K0
8	281	GLU	-	expression tag	UNP Q9H2K0
8	282	VAL	-	expression tag	UNP Q9H2K0
8	283	LEU	-	expression tag	UNP Q9H2K0
8	284	PHE	-	expression tag	UNP Q9H2K0
8	285	GLN	-	expression tag	UNP Q9H2K0

- Molecule 33 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).

NAD
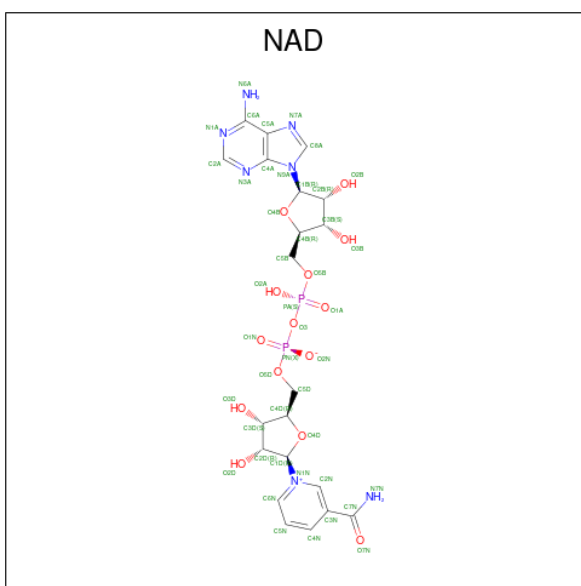
Mol	Chain	Residues	Atoms						AltConf
33	A	1	Total	C	H	N	O	P	0
			70	21	26	7	14	2	

- Molecule 34 is SPERMINE (three-letter code: SPM) (formula: $C_{10}H_{26}N_4$) (labeled as "Ligand of Interest" by depositor).

SPM
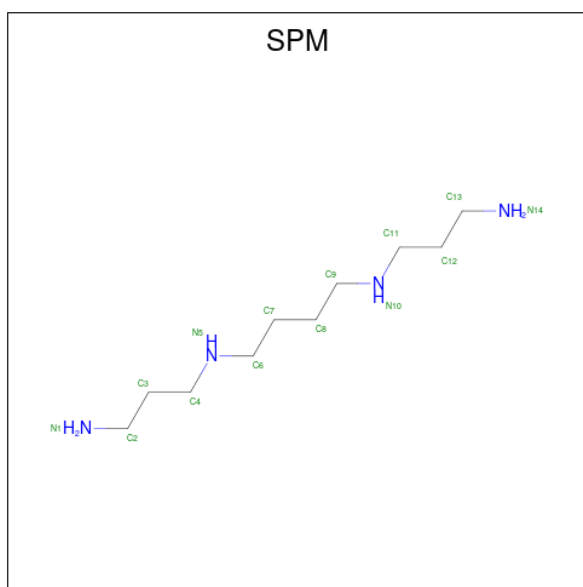
Mol	Chain	Residues	Atoms				AltConf
			Total	C	H	N	
34	A	1	44	10	30	4	0

- Molecule 35 is [(2 {S},3 {S},4 {S},5 {R},6 {S})-2-[(2 {R},3 {R},4 {R},5 {S})-2-[(1 {R},2 {S},3 {R},4 {R},5 {S},6 {R})-2,4-bis[[azaniumylidene(azanyl)methyl]amino]-3,5,6-tris(oxidanyl)cyclohexyl]oxy-4-[bis(oxidanyl)methyl]-5-methyl-4-oxidanyl-oxolan-3-yl]oxy-6-(hydroxymethyl)-4,5-bis(oxidanyl)oxan-3-yl]-methyl-azanium (three-letter code: 5I0) (formula: $C_{21}H_{44}N_7O_{13}$) (labeled as "Ligand of Interest" by depositor).

5I0
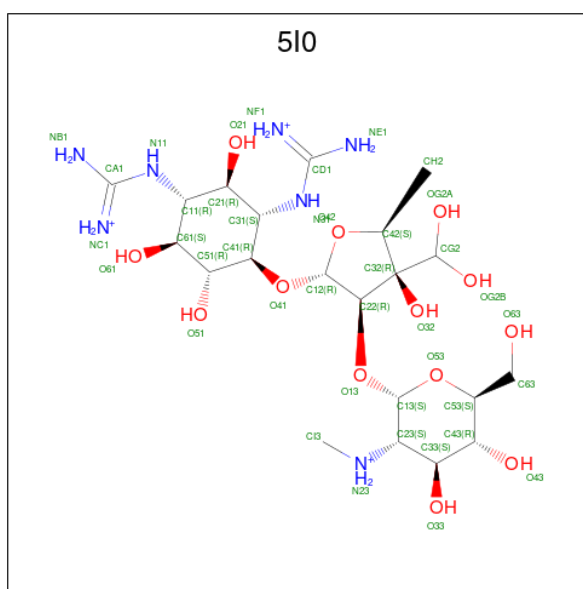
Mol	Chain	Residues	Atoms					AltConf
			Total	C	H	N	O	
35	A	1	106	27	54	7	18	1

- Molecule 36 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
36	A	21	Total 21	K 21	0

- Molecule 37 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
37	A	59	Total 59	Mg 59	0
37	B	1	Total 1	Mg 1	0
37	X	1	Total 1	Mg 1	0
37	3	1	Total 1	Mg 1	0

- Molecule 38 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
38	O	1	Total 1	Zn 1	0

- Molecule 39 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2) (labeled as "Ligand of Interest" by depositor).
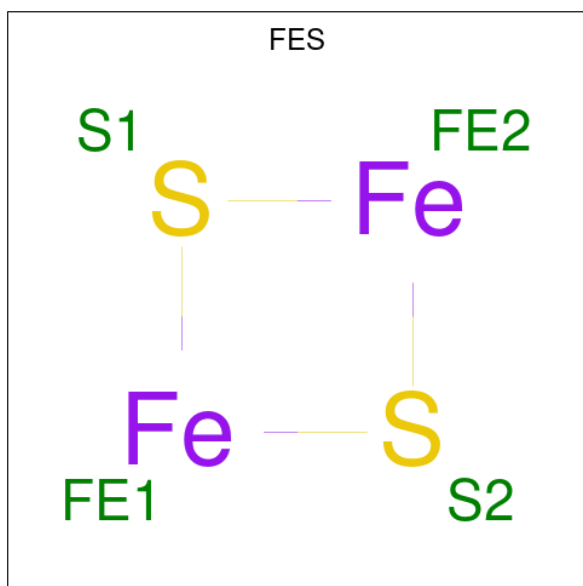
Mol	Chain	Residues	Atoms			AltConf
39	P	1	Total	Fe	S	0
			4	2	2	
39	T	1	Total	Fe	S	0
			4	2	2	

- Molecule 40 is **ADENOSINE-5'-TRIPHOSPHATE** (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).

ATP
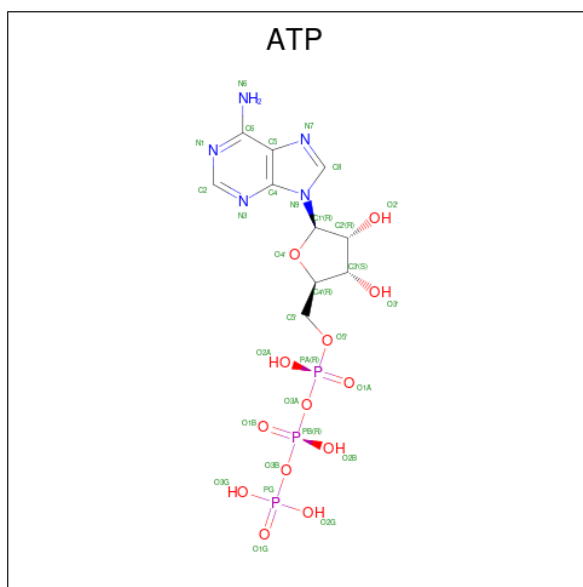
Mol	Chain	Residues	Atoms						AltConf
40	X	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	

- Molecule 41 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).
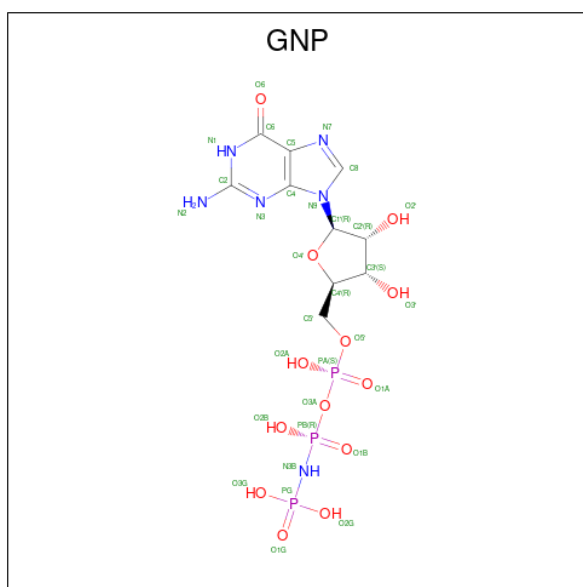
Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
41	X	1	45	10	13	6	13	3	0

- Molecule 42 is water.

Mol	Chain	Residues	Atoms		AltConf
42	A	1857	Total 1857	O 1857	0
42	B	100	Total 100	O 100	0
42	C	65	Total 65	O 65	0
42	D	76	Total 76	O 76	0
42	E	6	Total 6	O 6	0
42	F	41	Total 41	O 41	0
42	G	99	Total 99	O 99	0
42	H	75	Total 75	O 75	0
42	I	22	Total 22	O 22	0
42	J	22	Total 22	O 22	0
42	K	60	Total 60	O 60	0

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Mol	Chain	Residues	Atoms		AltConf
42	L	28	Total	O	0
			28	28	
42	M	33	Total	O	0
			33	33	
42	N	24	Total	O	0
			24	24	
42	O	42	Total	O	0
			42	42	
42	P	20	Total	O	0
			20	20	
42	Q	53	Total	O	0
			53	53	
42	R	49	Total	O	0
			49	49	
42	S	25	Total	O	0
			25	25	
42	T	29	Total	O	0
			29	29	
42	U	15	Total	O	0
			15	15	
42	V	5	Total	O	0
			5	5	
42	W	27	Total	O	0
			27	27	
42	X	89	Total	O	0
			89	89	
42	Y	19	Total	O	0
			19	19	
42	Z	35	Total	O	0
			35	35	
42	0	38	Total	O	0
			38	38	
42	1	53	Total	O	0
			53	53	
42	2	26	Total	O	0
			26	26	
42	3	25	Total	O	0
			25	25	
42	4	25	Total	O	0
			25	25	
42	8	2	Total	O	0
			2	2	

3 Residue-property plots ⓘ

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

- Molecule 1: 12S mitochondrial rRNA
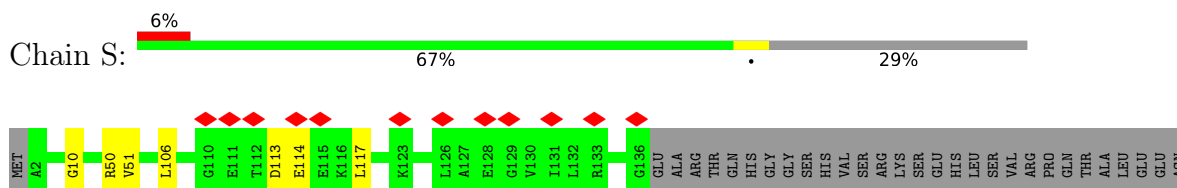
Chain A:
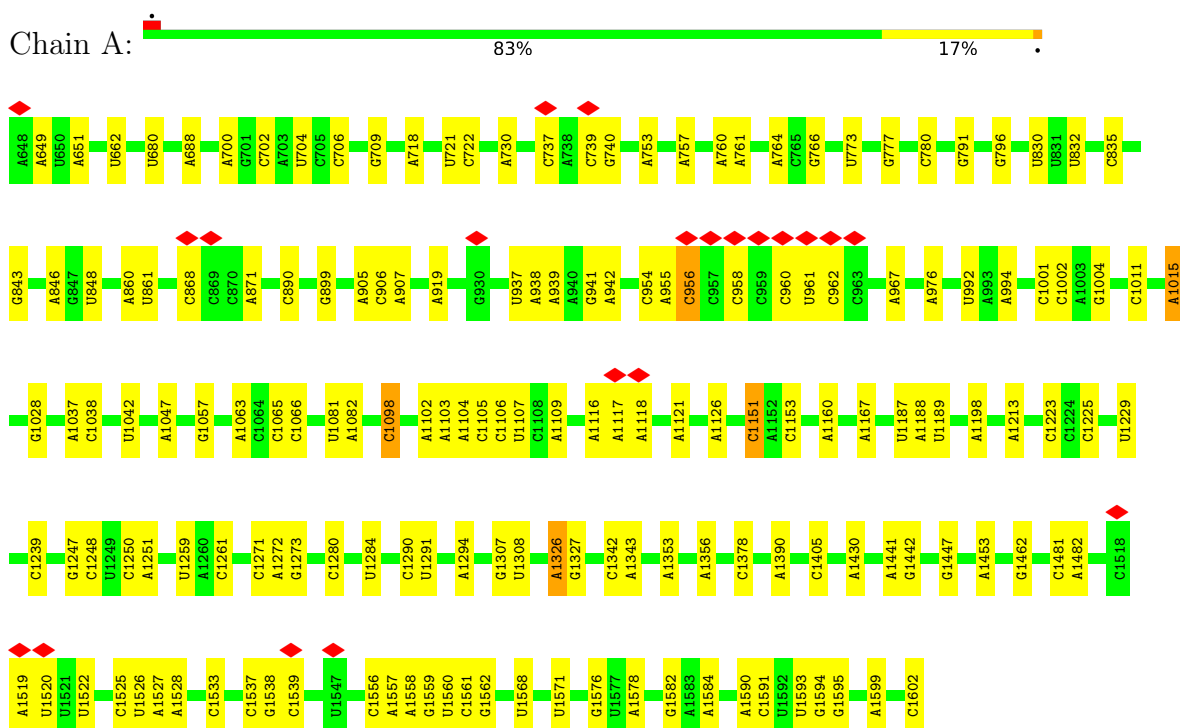
- Molecule 2: 28S ribosomal protein S2, mitochondrial

Chain B:
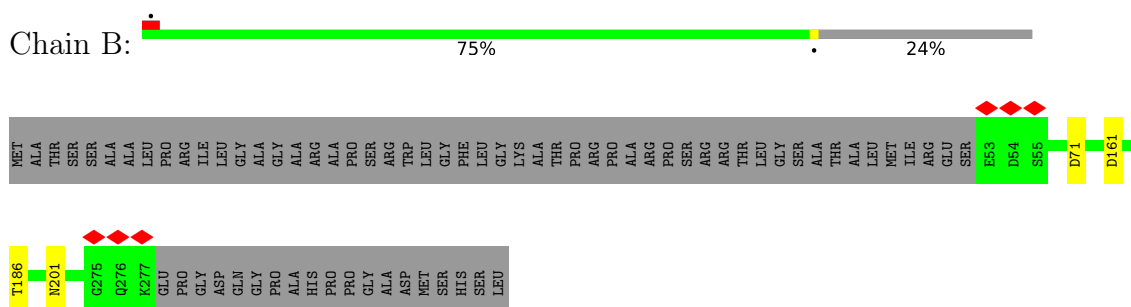
- Molecule 3: 28S ribosomal protein S24, mitochondrial
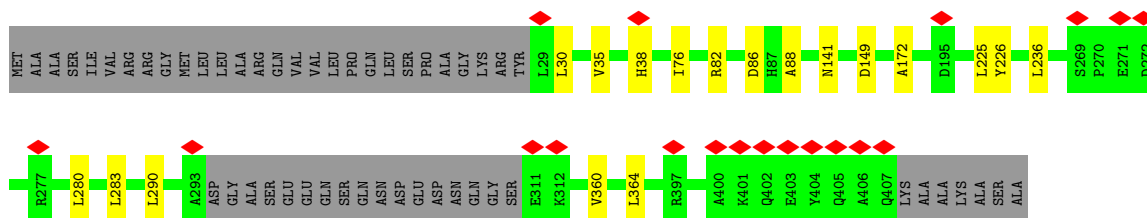
Chain C:
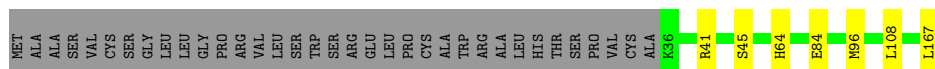
• Molecule 4: 28S ribosomal protein S5, mitochondrial

Chain D: 77%   22%
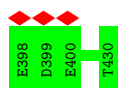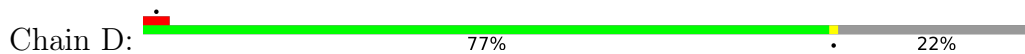
• Molecule 5: 28S ribosomal protein S6, mitochondrial

Chain E: 98%

• Molecule 6: 28S ribosomal protein S7, mitochondrial

Chain F: 82%   14%
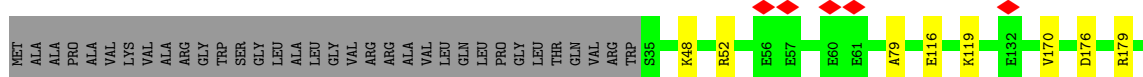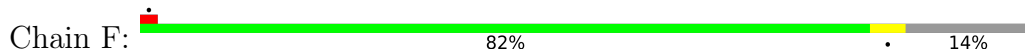
• Molecule 7: 28S ribosomal protein S9, mitochondrial

Chain G: 6%   80%   17%
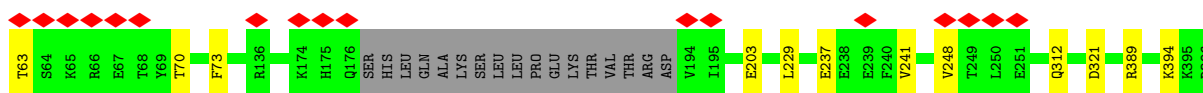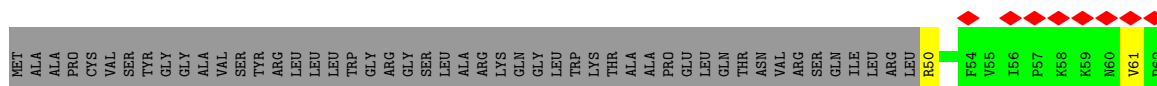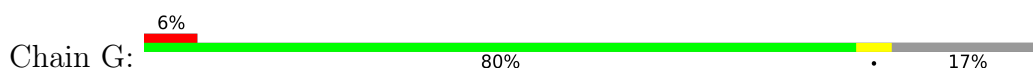
• Molecule 8: 28S ribosomal protein S10, mitochondrial

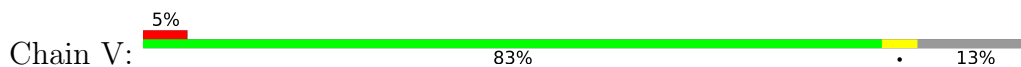Chain H: 61%   8%   30%
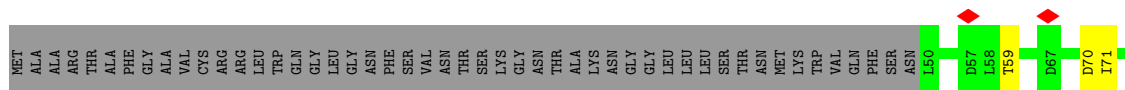
• Molecule 9: 28S ribosomal protein S11, mitochondrial

Chain I:
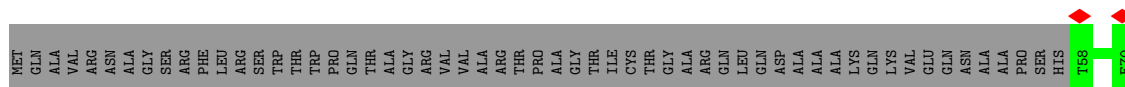
• Molecule 10: 28S ribosomal protein S12, mitochondrial

Chain J:
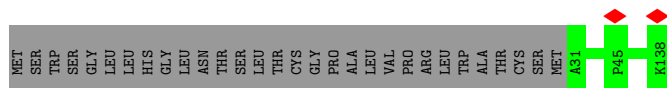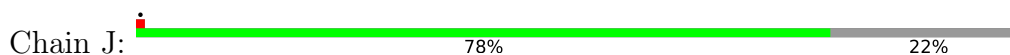
• Molecule 11: 28S ribosomal protein S14, mitochondrial

Chain K:
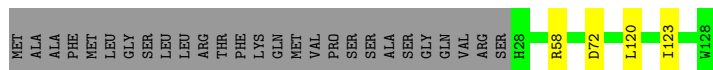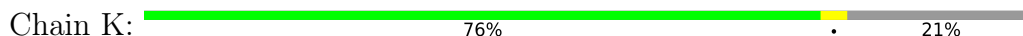
• Molecule 12: 28S ribosomal protein S15, mitochondrial

Chain L:
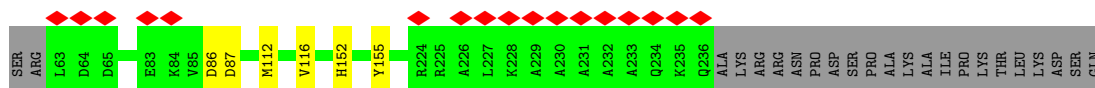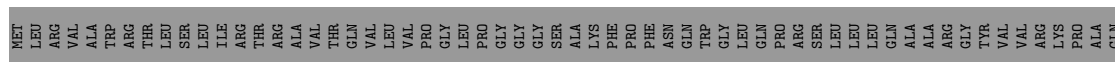
• Molecule 13: 28S ribosomal protein S16, mitochondrial

Chain M:
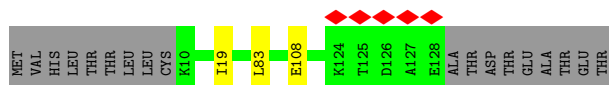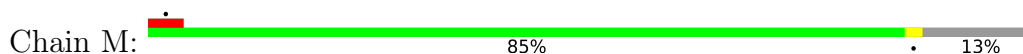
• Molecule 14: 28S ribosomal protein S17, mitochondrial

Chain N: 83%   15%

MET SER VAL **V4 R5** C58 L81 **S112 E113** THR THR GLN LEU SER ASN LEU GLU LEU LEU ASN ILE SER SER ALA GLN
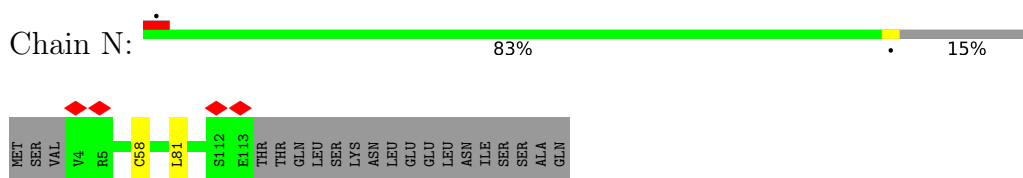
• Molecule 15: 28S ribosomal protein S18b, mitochondrial

Chain O: 74%   25%

MET ALA ALA SER VAL LEU ASN THR VAL LEU LEU ARG ARG LEU PRO MET LEU SER LEU PHE ARG GLY SER HIS ARG VAL GLN VAL VAL PRO LEU GLN THR LEU CYS THR LYS ALA PRO SER GLU GLU ASP SER LEU SER SER VAL **P47 I48** D53 **E54** K57 S185 **M238 P239** PRO ARG

THR PRO ALA GLU ALA SER SER THR GLY GLN THR GLY PRO GLN SER ALA LEU
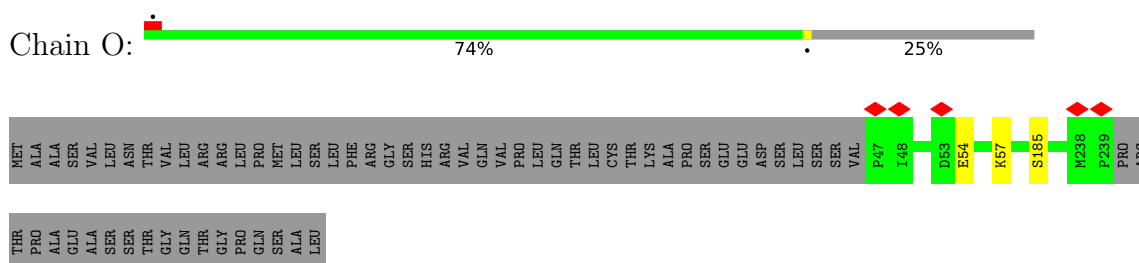
• Molecule 16: 28S ribosomal protein S18c, mitochondrial

Chain P: 66%   32%

MET ALA ALA VAL VAL ALA VAL CYS GLY GLY LEU GLY ARG LYS LYS LEU THR HIS LEU VAL THR ALA ALA VAL SER LEU THR HIS PRO GLY THR HIS THR VAL LEU TRP ARG ARG GLY CYS SER GLN GLN VAL SER **S46** D49 **R141 E142**
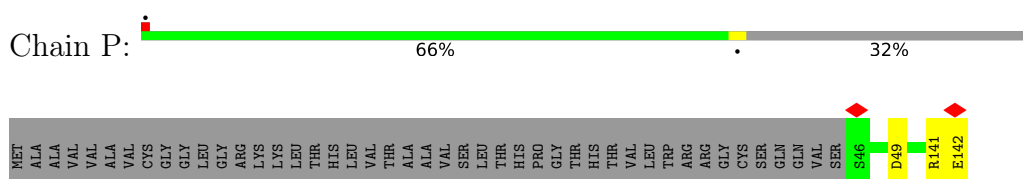
• Molecule 17: 28S ribosomal protein S21, mitochondrial

Chain Q: 93%   7%

A2 E20 I39 R50 I72 G86 **C87**
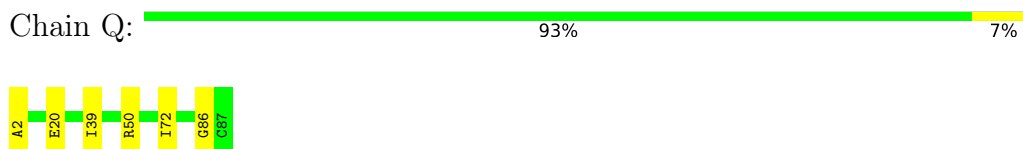
• Molecule 18: 28S ribosomal protein S22, mitochondrial

Chain R: 79%   18%

MET ALA PRO LEU GLY THR THR THR VAL LEU LEU TRP SER SER LEU LEU ARG SER SER PRO GLY VAL GLU ARG VAL CYS PHE ARG ALA ARG ILE GLN PRO TRP HIS GLY LEU LEU LEU GLN PRO LEU PRO CYS SER PHE GLU MET GLY LEU LEU PRO ARG ARG ARG PHE SER SER GLU ALA ALA GLU SER

GLY SER PRO **E64 T65 K66** F70 Q76 S162 R170 K183 E187 Y219 R256 L262 T265 V276 L307 **D310 D319 E323 S354 R355 H356 S357 A358** ALA SER
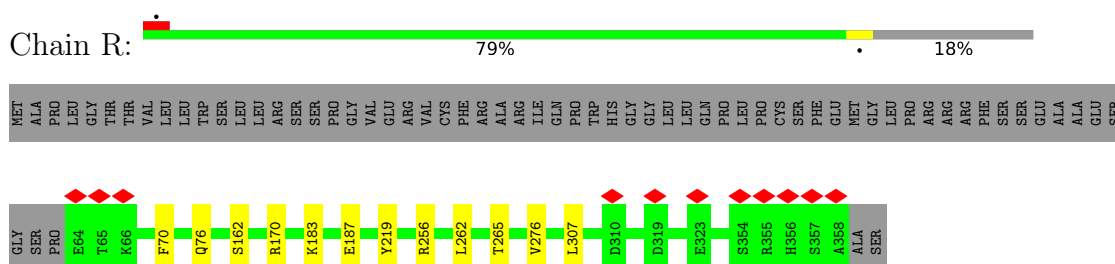
• Molecule 19: 28S ribosomal protein S23, mitochondrial

6%

Chain S: 67%   29%

MET **A2** G10 R50 V51 L106 **G110 E111 T112 D113 E114 E115 K116 L117** K123 **L126 A127 E128 G129 V130 I131 L132 R133** G136 GLU ALA ARG THR GLN HIS GLY GLY SER HIS VAL SER ARG LYS SER GLU HIS LEU LEU SER VAL ARG PRO GLN THR ALA LEU GLU GLU ASN

GLU THR GLN LYS GLU VAL PRO GLN ASP GLN HIS LEU GLU ALA PRO ASP GLN SER LYS GLY LEU LEU PRO PRO

• Molecule 20: 28S ribosomal protein S25, mitochondrial

Chain T: 97%

MET P2 A165 A166 L167 K168 A169 ASP ALA GLN ASP

• Molecule 21: 28S ribosomal protein S26, mitochondrial

Chain U: 86% 14%

MET LEU ARG ALA LEU SER ARG LEU GLY ALA GLY THR PRO CYS ARG PRO ARG ALA PRO LEU VAL LEU PRO ALA ARG GLY R27 R86 E138 Q139 A140 R141 K142 Q201 R202 ARG ASP SER
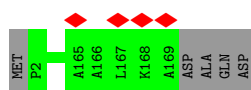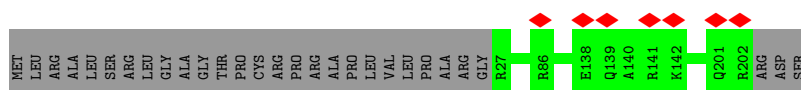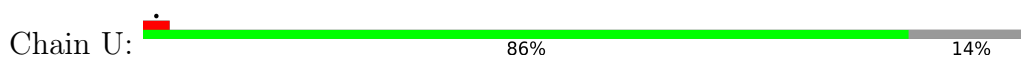
• Molecule 22: 28S ribosomal protein S27, mitochondrial

Chain V: 5% 83% 13%

MET ALA ALA SER ILE VAL ARG ARG GLY MET LEU LEU ALA ARG GLN VAL VAL LEU PRO GLN LEU SER PRO ALA GLY LYS ARG TYR L29 L30 V35 H38 I76 R82 D86 H87 A88 N141 D149 A172 D195 L225 Y226 L236 S269 P270 E271 D272

R277 L280 L283 L290 A293 ASP GLY ALA SER GLU GLU GLN GLN SER GLN ASN ASP GLU ASP ASN GLN GLY SER E311 K312 V360 L364 R397 A400 K401 Q402 E403 Y404 Q405 A406 Q407 LYS ALA ALA LYS ALA SER ALA

• Molecule 23: 28S ribosomal protein S28, mitochondrial

Chain W: 53% 47%

MET ALA ALA LEU CYS ARG ALA THR ARG ALA ALA VAL ALA ALA GLU SER HIS PHE LEU ARG ALA VAL PHE LEU PHE PHE ARG PRO PHE ARG GLY VAL GLY THR GLU GLY SER GLY SER GLU SER GLY SER SER ASN ALA LYS GLU PRO LYS THR ARG ALA ALA GLY GLY PHE ALA SER ALA LEU GLU ARG HIS SER

GLU LEU LEU GLN LYS VAL GLU PRO LEU GLN LYS GLY SER GLY SER PRO LYS N76 S82 E174 S175 LYS ASP SER ARG SER LYS GLU GLU HIS HIS LEU GLU LYS
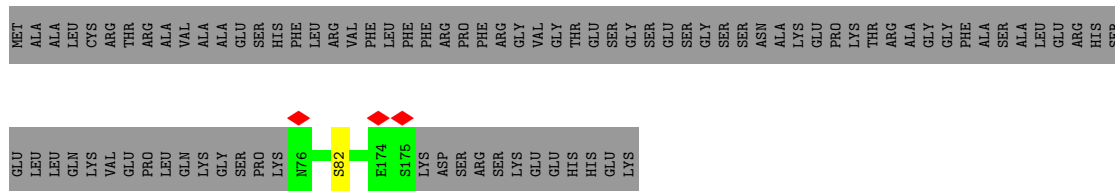
• Molecule 24: 28S ribosomal protein S29, mitochondrial

Chain X: 84% 12%

MET MET LEU LYS GLY ILE THR ARG LEU ILE SER ARG ILE HIS LYS LEU ASP PRO GLY ARG PHE LEU HIS MET GLY THR GLN ALA ARG GLN SER ILE ALA ALA HIS LEU ASP ASN GLN VAL PRO VAL GLU SER PRO ARG A47 I48 H81 L108 V141 L151 I152 L153 E206

K212 R213 L244 L247 K248 R249 R276 E277 E286 V307 E327 L380 H394 L398

• Molecule 25: 28S ribosomal protein S31, mitochondrial

Chain Y:

• Molecule 26: 28S ribosomal protein S33, mitochondrial

Chain Z:

• Molecule 27: 28S ribosomal protein S34, mitochondrial

Chain 0:

• Molecule 28: 28S ribosomal protein S35, mitochondrial

Chain 1:

• Molecule 29: Coiled-coil-helix-coiled-coil-helix domain-containing protein 1

Chain 2:

• Molecule 30: Aurora kinase A-interacting protein

Chain 3:

• Molecule 31: Pentatricopeptide repeat domain-containing protein 3, mitochondrial

Chain 4:

• Molecule 32: Translation initiation factor IF-3, mitochondrial

Chain 8:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	885199	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 $(e^-/\text{Å}^2)$	30	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	2.563	Depositor
Minimum map value	-1.110	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.036	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	398.4, 398.4, 398.4	wwPDB
Map dimensions	720, 720, 720	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.55333334, 0.55333334, 0.55333334	Depositor

5　Model quality　ⓘ

5.1　Standard geometry　ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 5MU, GNP, FES, K, 5F0, AYA, 5I0, ATP, B8T, MG, NAD, SPM, 5MC, MA6, 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	A	0.25	0/22774	0.68	0/35454
2	B	0.25	0/1887	0.50	0/2552
3	C	0.25	0/1113	0.48	0/1505
4	D	0.24	0/2733	0.50	0/3659
5	E	0.24	0/1000	0.51	0/1349
6	F	0.24	0/1767	0.46	0/2373
7	G	0.24	0/2775	0.48	0/3720
8	H	0.24	0/1178	0.46	0/1598
9	I	0.24	0/1030	0.50	0/1386
10	J	0.25	0/855	0.56	0/1148
11	K	0.22	0/880	0.58	0/1182
12	L	0.23	0/1477	0.47	0/1974
13	M	0.24	0/963	0.53	0/1295
14	N	0.24	0/886	0.50	0/1199
15	O	0.24	0/1648	0.48	0/2243
16	P	0.25	0/798	0.45	0/1070
17	Q	0.24	0/759	0.57	0/1008
18	R	0.24	0/2456	0.45	0/3317
19	S	0.26	0/1153	0.50	0/1553
20	T	0.24	0/1413	0.47	0/1897
21	U	0.23	0/1510	0.53	0/2025
22	V	0.23	0/3030	0.40	0/4093
23	W	0.25	0/801	0.51	0/1079
24	X	0.24	0/2930	0.44	0/3965
25	Y	0.24	0/1289	0.40	0/1737
26	Z	0.24	0/857	0.47	0/1141
27	0	0.24	0/1834	0.54	0/2484
28	1	0.24	0/2285	0.44	0/3090
29	2	0.23	0/941	0.52	0/1257
30	3	0.23	0/640	0.56	0/844
31	4	0.24	0/4904	0.42	0/6636
32	8	0.23	0/1560	0.47	0/2089

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
All	All	0.24	0/72126	0.56	0/101922

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
9	I	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	I	184	5F0	Mainchain

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	20472	10412	10396	52	0
2	B	1838	1832	1835	4	0
3	C	1083	1089	1088	5	0
4	D	2682	2743	2741	2	0
5	E	980	1012	1013	0	0
6	F	1725	1770	1769	7	0
7	G	2716	2717	2714	11	0
8	H	1152	1184	1183	14	0
9	I	1020	1061	1053	5	0
10	J	839	888	887	0	0
11	K	862	886	885	2	0
12	L	1453	1541	1540	4	0
13	M	942	966	965	2	0
14	N	868	929	928	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
15	O	1592	1557	1557	2	0
16	P	781	807	806	2	0
17	Q	752	769	771	6	0
18	R	2409	2429	2428	7	0
19	S	1126	1129	1126	5	0
20	T	1379	1405	1406	0	0
21	U	1488	1500	1499	0	0
22	V	2969	2964	2961	9	0
23	W	789	803	802	1	0
24	X	2855	2856	2856	11	0
25	Y	1255	1206	1204	2	0
26	Z	839	859	858	1	0
27	0	1787	1797	1796	9	0
28	1	2238	2269	2269	5	0
29	2	935	969	971	5	0
30	3	629	702	702	1	0
31	4	4795	4798	4796	24	0
32	8	1543	1588	1587	2	0
33	A	44	26	26	0	0
34	A	14	30	26	0	0
35	A	52	54	0	0	0
36	A	21	0	0	0	0
37	3	1	0	0	0	0
37	A	59	0	0	0	0
37	B	1	0	0	0	0
37	X	1	0	0	0	0
38	O	1	0	0	0	0
39	P	4	0	0	0	0
39	T	4	0	0	0	0
40	X	31	12	12	0	0
41	X	32	13	13	0	0
42	0	38	0	0	0	0
42	1	53	0	0	0	0
42	2	26	0	0	0	0
42	3	25	0	0	0	0
42	4	25	0	0	0	0
42	8	2	0	0	0	0
42	A	1857	0	0	20	0
42	B	100	0	0	3	0
42	C	65	0	0	1	0
42	D	76	0	0	0	0
42	E	6	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
42	F	41	0	0	1	0
42	G	99	0	0	1	0
42	H	75	0	0	0	0
42	I	22	0	0	0	0
42	J	22	0	0	0	0
42	K	60	0	0	0	0
42	L	28	0	0	0	0
42	M	33	0	0	1	0
42	N	24	0	0	0	0
42	O	42	0	0	0	0
42	P	20	0	0	0	0
42	Q	53	0	0	1	0
42	R	49	0	0	0	0
42	S	25	0	0	1	0
42	T	29	0	0	0	0
42	U	15	0	0	0	0
42	V	5	0	0	0	0
42	W	27	0	0	0	0
42	X	89	0	0	1	0
42	Y	19	0	0	0	0
42	Z	35	0	0	0	0
All	All	72143	59572	59469	172	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 1.

The worst 5 of 172 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)
1:A:1593:U:O4	17:Q:50[B]:ARG:NH2	2.16	0.79
1:A:1353:A:N1	42:A:1805:HOH:O	2.19	0.76
19:S:10:GLY:O	42:S:201:HOH:O	2.05	0.75
24:X:327:GLU:OE1	42:X:601:HOH:O	2.08	0.70
6:F:116:GLU:OE1	42:F:301:HOH:O	2.10	0.68

There are no symmetry-related clashes.

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	
2	B	225/296 (76%)	221 (98%)	4 (2%)	0	100	100
3	C	130/167 (78%)	127 (98%)	3 (2%)	0	100	100
4	D	333/430 (77%)	321 (96%)	12 (4%)	0	100	100
5	E	121/125 (97%)	120 (99%)	1 (1%)	0	100	100
6	F	206/242 (85%)	203 (98%)	3 (2%)	0	100	100
7	G	326/396 (82%)	315 (97%)	11 (3%)	0	100	100
8	H	138/201 (69%)	134 (97%)	3 (2%)	1 (1%)	22	32
9	I	134/194 (69%)	130 (97%)	4 (3%)	0	100	100
10	J	106/138 (77%)	103 (97%)	3 (3%)	0	100	100
11	K	99/128 (77%)	99 (100%)	0	0	100	100
12	L	172/257 (67%)	169 (98%)	3 (2%)	0	100	100
13	M	117/137 (85%)	117 (100%)	0	0	100	100
14	N	108/130 (83%)	106 (98%)	2 (2%)	0	100	100
15	O	191/258 (74%)	188 (98%)	3 (2%)	0	100	100
16	P	95/142 (67%)	93 (98%)	2 (2%)	0	100	100
17	Q	85/86 (99%)	84 (99%)	1 (1%)	0	100	100
18	R	293/360 (81%)	284 (97%)	9 (3%)	0	100	100
19	S	135/190 (71%)	131 (97%)	4 (3%)	0	100	100
20	T	167/173 (96%)	164 (98%)	3 (2%)	0	100	100
21	U	174/205 (85%)	174 (100%)	0	0	100	100
22	V	358/414 (86%)	349 (98%)	9 (2%)	0	100	100
23	W	98/187 (52%)	96 (98%)	2 (2%)	0	100	100
24	X	351/398 (88%)	345 (98%)	6 (2%)	0	100	100
25	Y	148/395 (38%)	145 (98%)	2 (1%)	1 (1%)	22	32
26	Z	98/106 (92%)	97 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	0	213/218 (98%)	211 (99%)	2 (1%)	0	100	100
28	1	274/323 (85%)	269 (98%)	5 (2%)	0	100	100
29	2	115/117 (98%)	114 (99%)	1 (1%)	0	100	100
30	3	69/199 (35%)	68 (99%)	1 (1%)	0	100	100
31	4	588/689 (85%)	578 (98%)	10 (2%)	0	100	100
32	8	189/285 (66%)	184 (97%)	5 (3%)	0	100	100
All	All	5856/7586 (77%)	5739 (98%)	115 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	H	126	ILE
25	Y	323	ASP

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	
2	B	200/249 (80%)	200 (100%)	0	100	100
3	C	115/143 (80%)	115 (100%)	0	100	100
4	D	281/357 (79%)	281 (100%)	0	100	100
5	E	105/107 (98%)	105 (100%)	0	100	100
6	F	185/209 (88%)	185 (100%)	0	100	100
7	G	288/342 (84%)	287 (100%)	1 (0%)	92	97
8	H	130/180 (72%)	130 (100%)	0	100	100
9	I	104/146 (71%)	104 (100%)	0	100	100
10	J	93/118 (79%)	93 (100%)	0	100	100
11	K	91/113 (80%)	91 (100%)	0	100	100
12	L	158/226 (70%)	158 (100%)	0	100	100
13	M	97/113 (86%)	97 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	N	96/115 (84%)	96 (100%)	0	100	100
15	O	174/230 (76%)	174 (100%)	0	100	100
16	P	88/123 (72%)	88 (100%)	0	100	100
17	Q	79/78 (101%)	79 (100%)	0	100	100
18	R	264/318 (83%)	264 (100%)	0	100	100
19	S	117/164 (71%)	117 (100%)	0	100	100
20	T	154/157 (98%)	154 (100%)	0	100	100
21	U	152/174 (87%)	152 (100%)	0	100	100
22	V	325/364 (89%)	323 (99%)	2 (1%)	86	94
23	W	87/158 (55%)	87 (100%)	0	100	100
24	X	312/351 (89%)	310 (99%)	2 (1%)	86	94
25	Y	138/357 (39%)	138 (100%)	0	100	100
26	Z	90/95 (95%)	90 (100%)	0	100	100
27	0	188/190 (99%)	188 (100%)	0	100	100
28	1	254/291 (87%)	254 (100%)	0	100	100
29	2	100/100 (100%)	100 (100%)	0	100	100
30	3	65/166 (39%)	65 (100%)	0	100	100
31	4	529/609 (87%)	528 (100%)	1 (0%)	93	97
32	8	172/253 (68%)	172 (100%)	0	100	100
All	All	5231/6596 (79%)	5225 (100%)	6 (0%)	93	98

5 of 6 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
24	X	81	HIS
24	X	394	HIS
31	4	486	TYR
22	V	38	HIS
7	G	389	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 8 such sidechains are listed below:

Mol	Chain	Res	Type
32	8	118	GLN

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Mol	Chain	Res	Type
31	4	295	ASN
31	4	257	HIS
29	2	109	GLN
31	4	285	ASN

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	942/955 (98%)	104 (11%)	0

5 of 104 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	649	A
1	A	651	A
1	A	680	U
1	A	688	A
1	A	704	U

There are no RNA pucker outliers to report.

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

8 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	$\#|Z| > 2$
1	MA6	A	1583	1	18,26,27	0.75	0	19,38,41	0.60	0
1	MA6	A	1584	1	18,26,27	0.76	0	19,38,41	0.59	0
29	AYA	2	2	29	6,7,8	0.80	0	5,8,10	0.51	0
1	5MC	A	1488	1	18,22,23	0.31	0	26,32,35	0.43	0
9	5F0	I	184	9	8,8,9	0.58	0	7,9,11	1.09	1 (14%)
1	5MU	A	1076	1	19,22,23	0.30	0	28,32,35	0.33	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	B8T	A	1486	1	19,22,23	0.32	0	26,31,34	0.33	0
17	AYA	Q	2	17	6,7,8	0.75	0	5,8,10	0.49	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
1	MA6	A	1583	1	-	0/7/29/30	0/3/3/3
1	MA6	A	1584	1	-	2/7/29/30	0/3/3/3
29	AYA	2	2	29	-	0/4/6/8	-
1	5MC	A	1488	1	-	0/7/25/26	0/2/2/2
9	5F0	I	184	9	-	0/9/9/10	-
1	5MU	A	1076	1	-	0/7/25/26	0/2/2/2
1	B8T	A	1486	1	-	0/7/27/28	0/2/2/2
17	AYA	Q	2	17	-	0/4/6/8	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	I	184	5F0	O-C-CB	-2.39	118.46	125.43

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1584	MA6	C5-C6-N6-C9
1	A	1584	MA6	C4'-C5'-O5'-P

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1584	MA6	1	0
17	Q	2	AYA	1	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 92 ligands modelled in this entry, 84 are monoatomic - leaving 8 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	$\#\|Z\| > 2$
39	FES	T	201	13,20	0,4,4	-	-	-		
40	ATP	X	501	37	26,33,33	0.76	0	31,52,52	0.65	0
41	GNP	X	502	-	29,34,34	1.22	4 (13%)	33,54,54	1.99	5 (15%)
33	NAD	A	1701	37	42,48,48	0.57	0	50,73,73	0.56	1 (2%)
34	SPM	A	1702	-	13,13,13	0.28	0	12,12,12	0.96	0
35	5I0	A	1703[A]	-	41,43,43	0.49	1 (2%)	54,65,65	0.94	4 (7%)
35	5I0	A	1703[B]	-	41,43,43	0.54	1 (2%)	54,65,65	0.93	4 (7%)
39	FES	P	201	5,16	0,4,4	-	-	-		

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
39	FES	T	201	13,20	-	-	0/1/1/1
40	ATP	X	501	37	-	0/18/38/38	0/3/3/3
41	GNP	X	502	-	-	1/14/38/38	0/3/3/3
33	NAD	A	1701	37	-	5/26/62/62	0/5/5/5
34	SPM	A	1702	-	-	0/11/11/11	-
35	5I0	A	1703[A]	-	-	1/24/90/90	0/3/3/3
35	5I0	A	1703[B]	-	-	0/24/90/90	0/3/3/3
39	FES	P	201	5,16	-	-	0/1/1/1

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
41	X	502	GNP	PB-O2B	-3.18	1.48	1.56
41	X	502	GNP	PG-O1G	3.18	1.51	1.46
35	A	1703[B]	5I0	C23-N23	2.49	1.51	1.47
35	A	1703[A]	5I0	C23-N23	2.15	1.51	1.47
41	X	502	GNP	PG-O2G	-2.13	1.51	1.56

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
41	X	502	GNP	C5-C6-N1	-7.42	113.28	123.43
41	X	502	GNP	C2-N1-C6	5.87	125.26	115.93
35	A	1703[A]	5I0	C12-O42-C42	-3.26	103.25	108.38
35	A	1703[B]	5I0	C12-O42-C42	-3.26	103.25	108.38
35	A	1703[A]	5I0	C43-C33-C23	-3.14	105.74	110.34

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
41	X	502	GNP	PB-N3B-PG-O1G
33	A	1701	NAD	C2N-C3N-C7N-O7N
33	A	1701	NAD	C2N-C3N-C7N-N7N
33	A	1701	NAD	C4N-C3N-C7N-O7N
33	A	1701	NAD	C4N-C3N-C7N-N7N

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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand FES T 201

Bond lengths

Bond angles

Torsions

Rings

Ligand ATP X 501

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP X 502

Bond lengths

Bond angles

Torsions

Rings

Ligand NAD A 1701

Bond lengths

Bond angles

Torsions

Rings

Ligand SPM A 1702

Bond lengths

Bond angles

Torsions

Rings

Ligand 5I0 A 1703 (A)

Bond lengths

Bond angles

Torsions

Rings

Ligand 5I0 A 1703 (B)

Bond lengths

Bond angles

Torsions

Rings

Ligand FES P 201

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6   Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-13170. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1   Orthogonal projections ⓘ
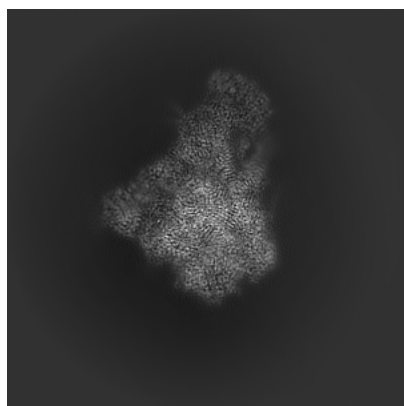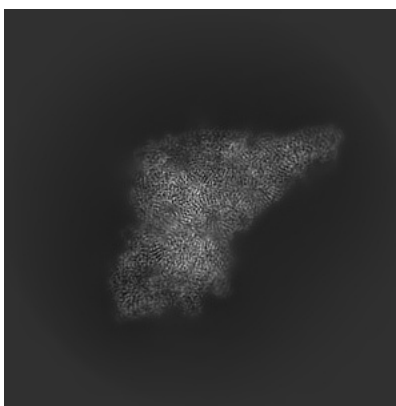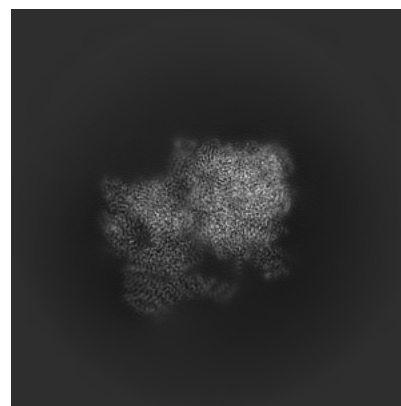
6.1.1   Primary map

X   Y   Z

6.1.2   Raw map

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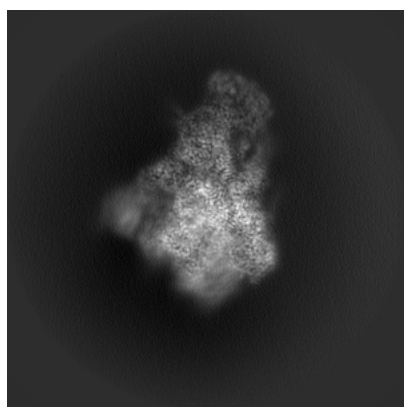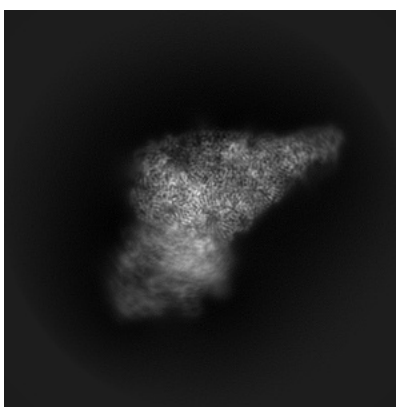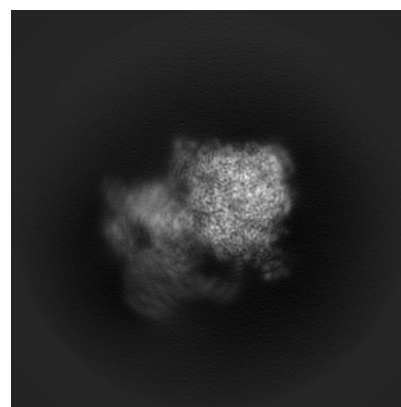
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
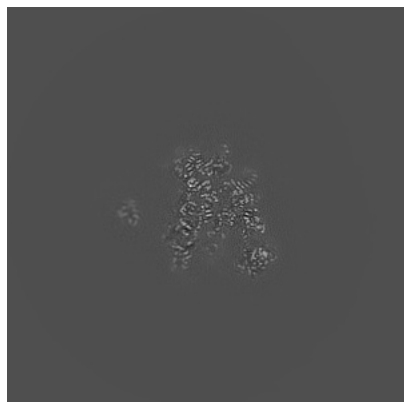
6.2.1 Primary map
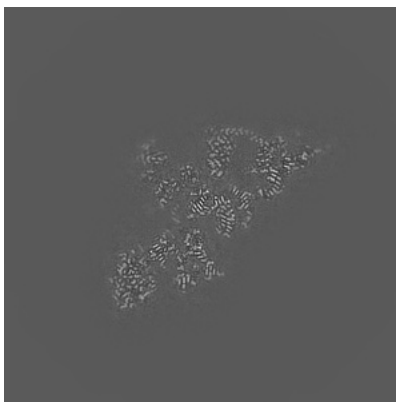
| X Index: 360 | Y Index: 360 | Z Index: 360 |
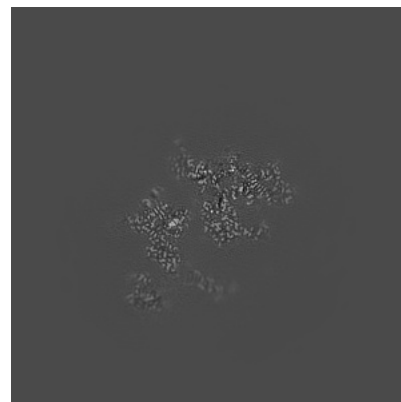
6.2.2 Raw map
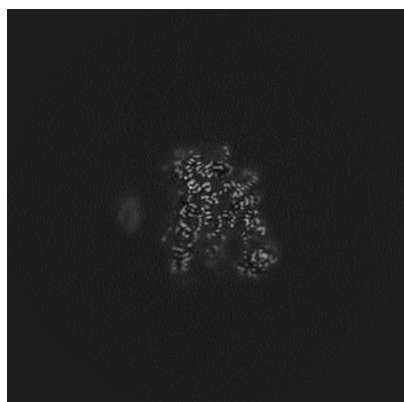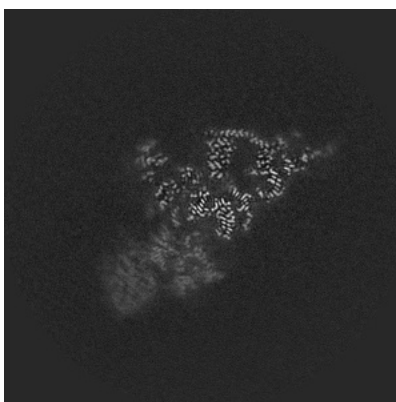
| X Index: 240 | Y Index: 240 | Z Index: 240 |
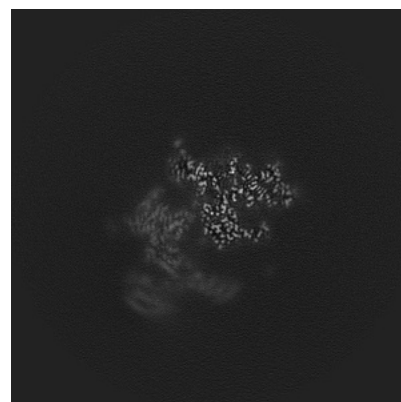
The images above show central slices of the map in three orthogonal directions.

6.3   Largest variance slices ⓘ

6.3.1   Primary map
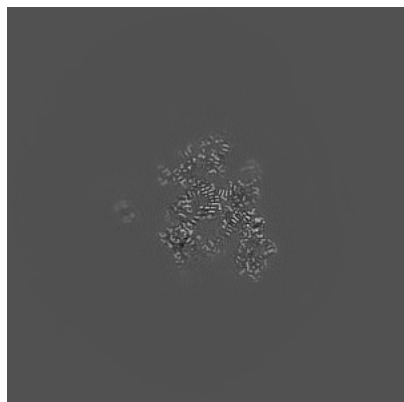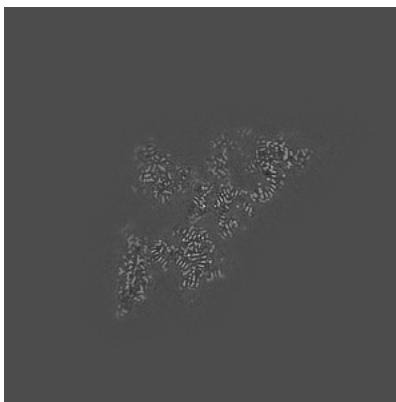
| X Index: 372 | Y Index: 352 | Z Index: 341 |
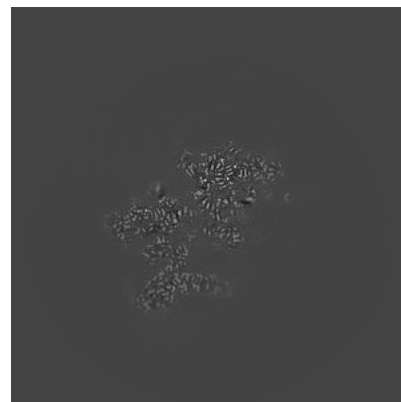
6.3.2   Raw map
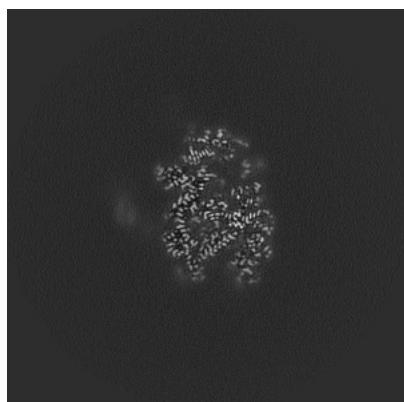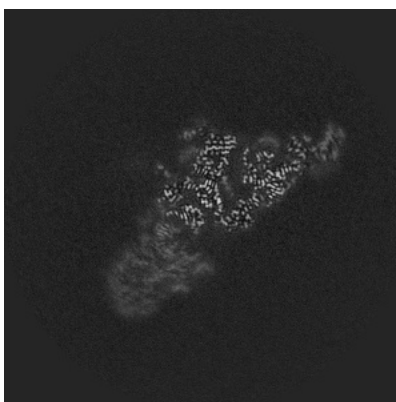
| X Index: 259 | Y Index: 255 | Z Index: 233 |
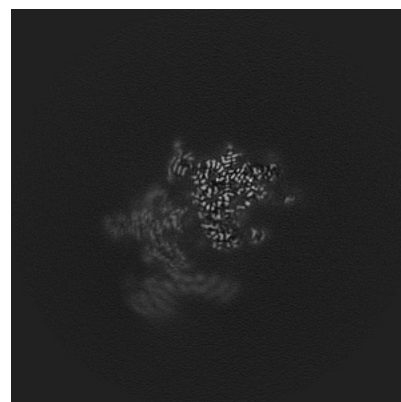
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
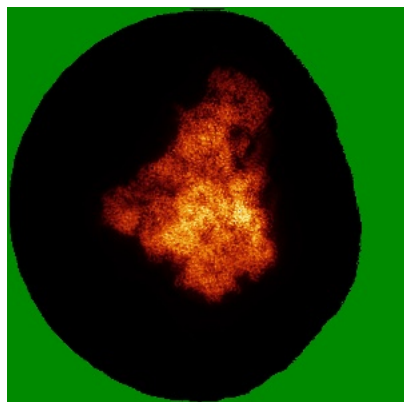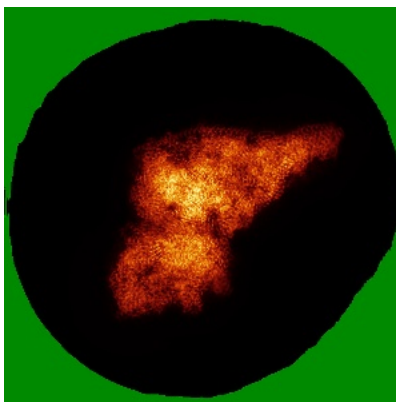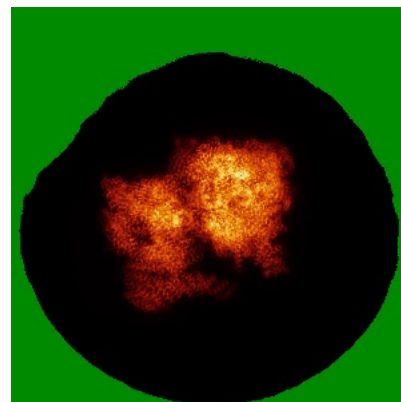
X   Y   Z

6.4.2 Raw map

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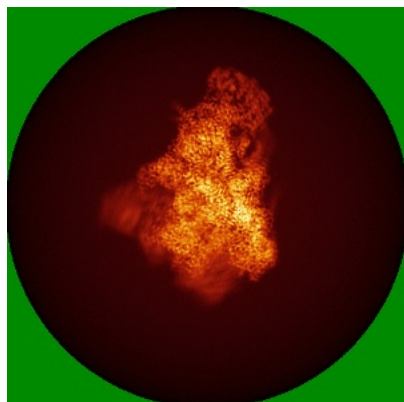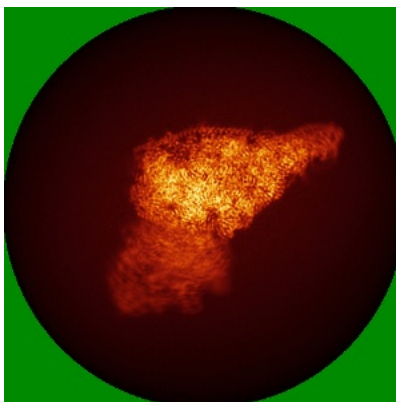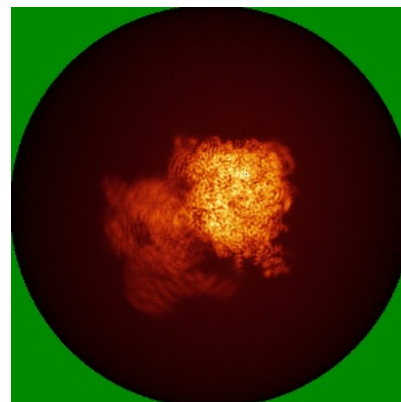
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5　Orthogonal surface views　(i)

6.5.1　Primary map

X　　　　　　　　　　　Y　　　　　　　　　　　Z
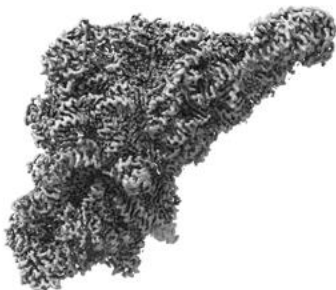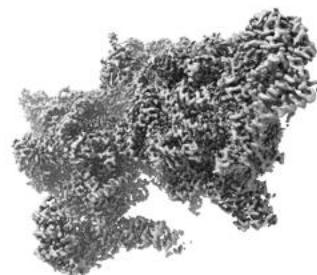
The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2　Raw map

X　　　　　　　　　　　Y　　　　　　　　　　　Z

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

6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

A mask typically either:

- Encompasses the whole structure

- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_13170_msk_1.map (i)
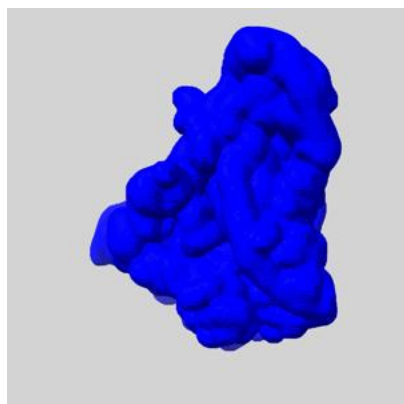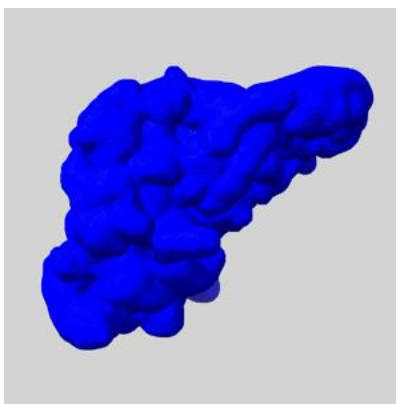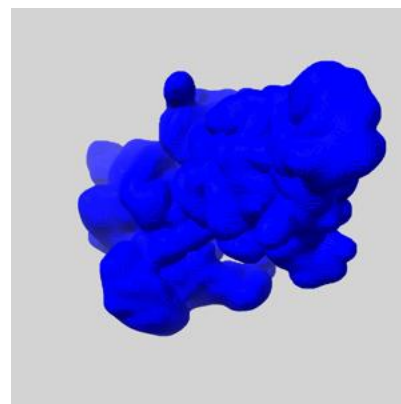
| X | Y | Z |

7   Map analysis (i)

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

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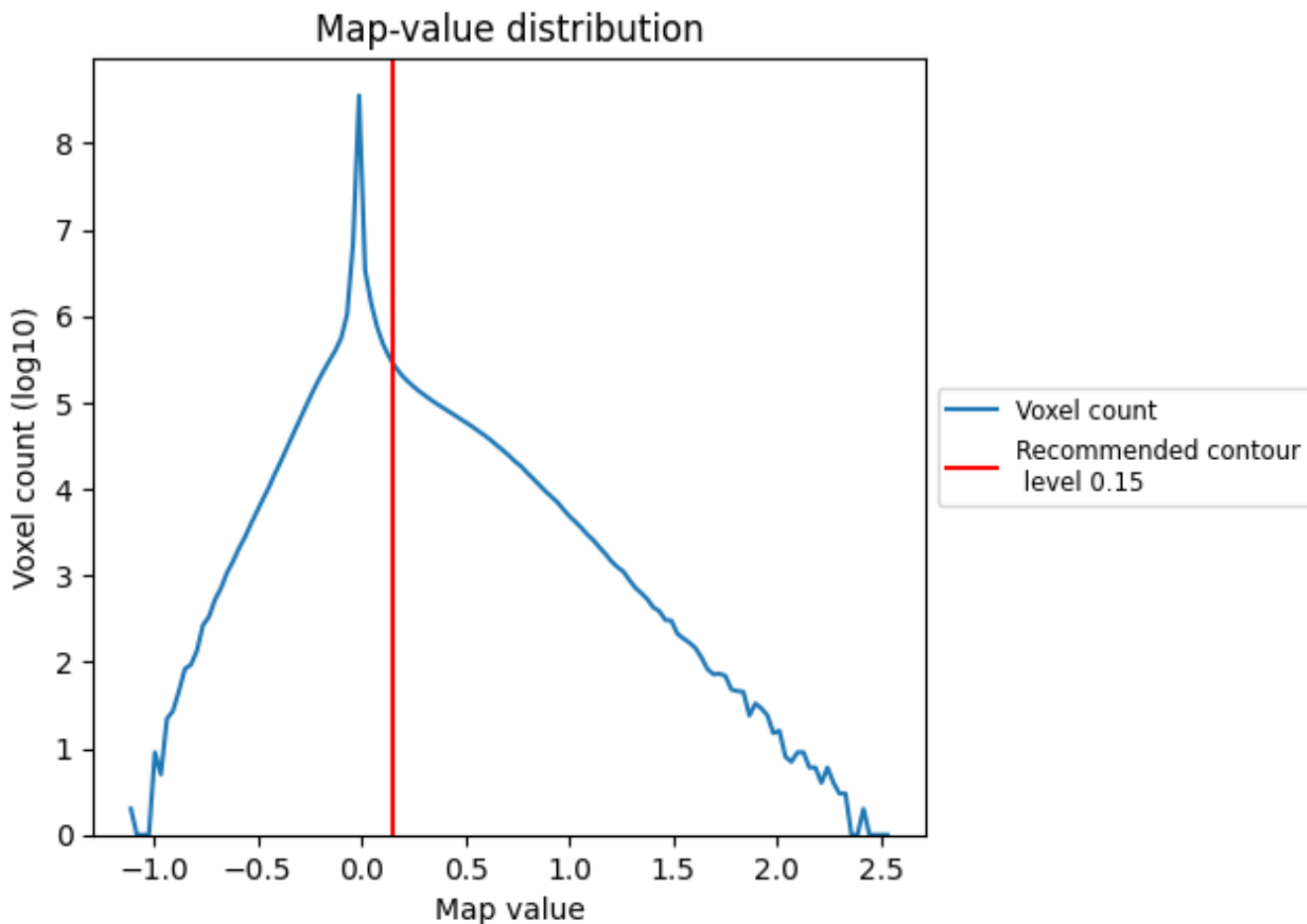
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
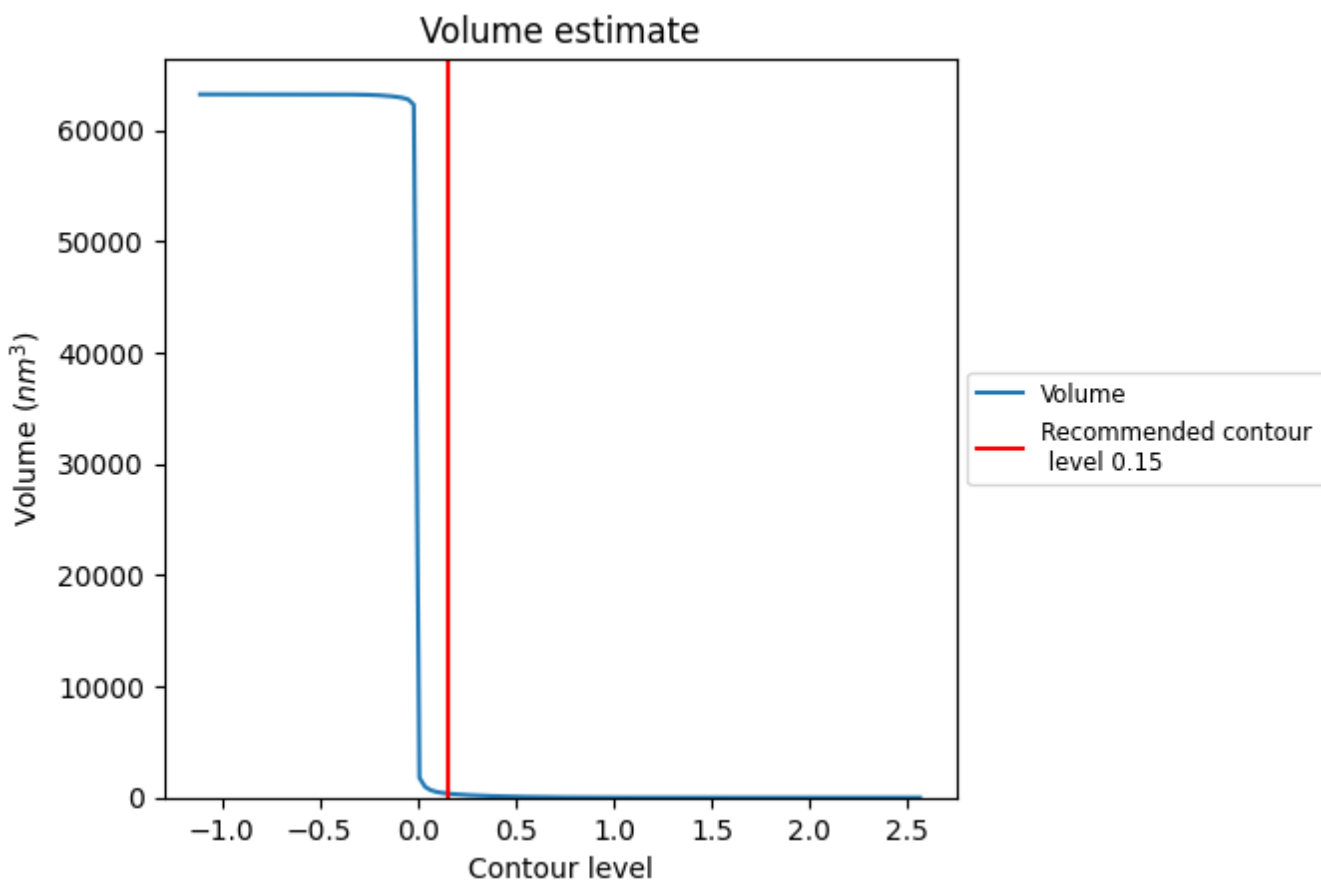
The volume at the recommended contour level is 366 nm^3; this corresponds to an approximate mass of 330 kDa.

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 ⓘ
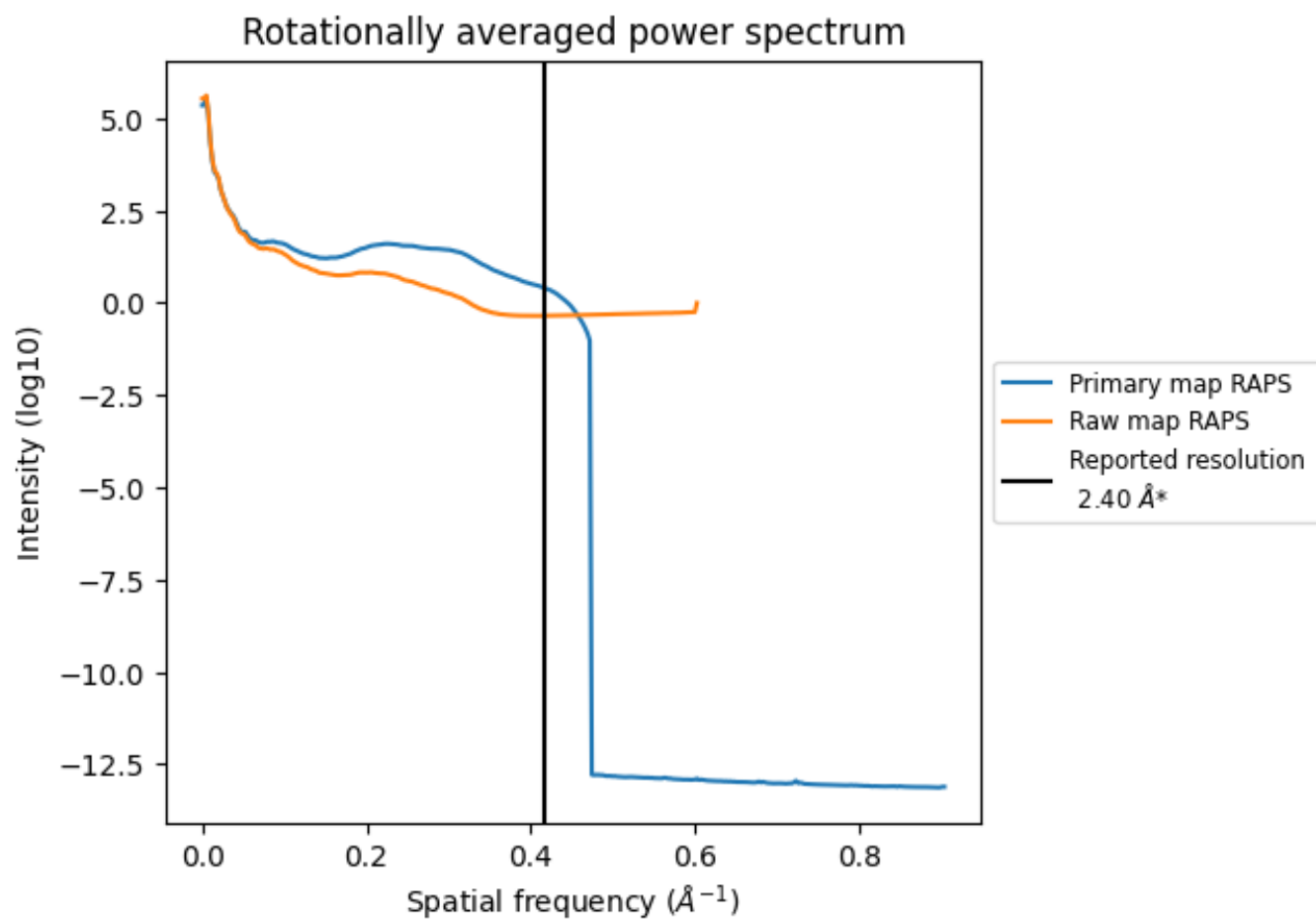
*Reported resolution corresponds to spatial frequency of 0.417 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

8.1 FSC ⓘ
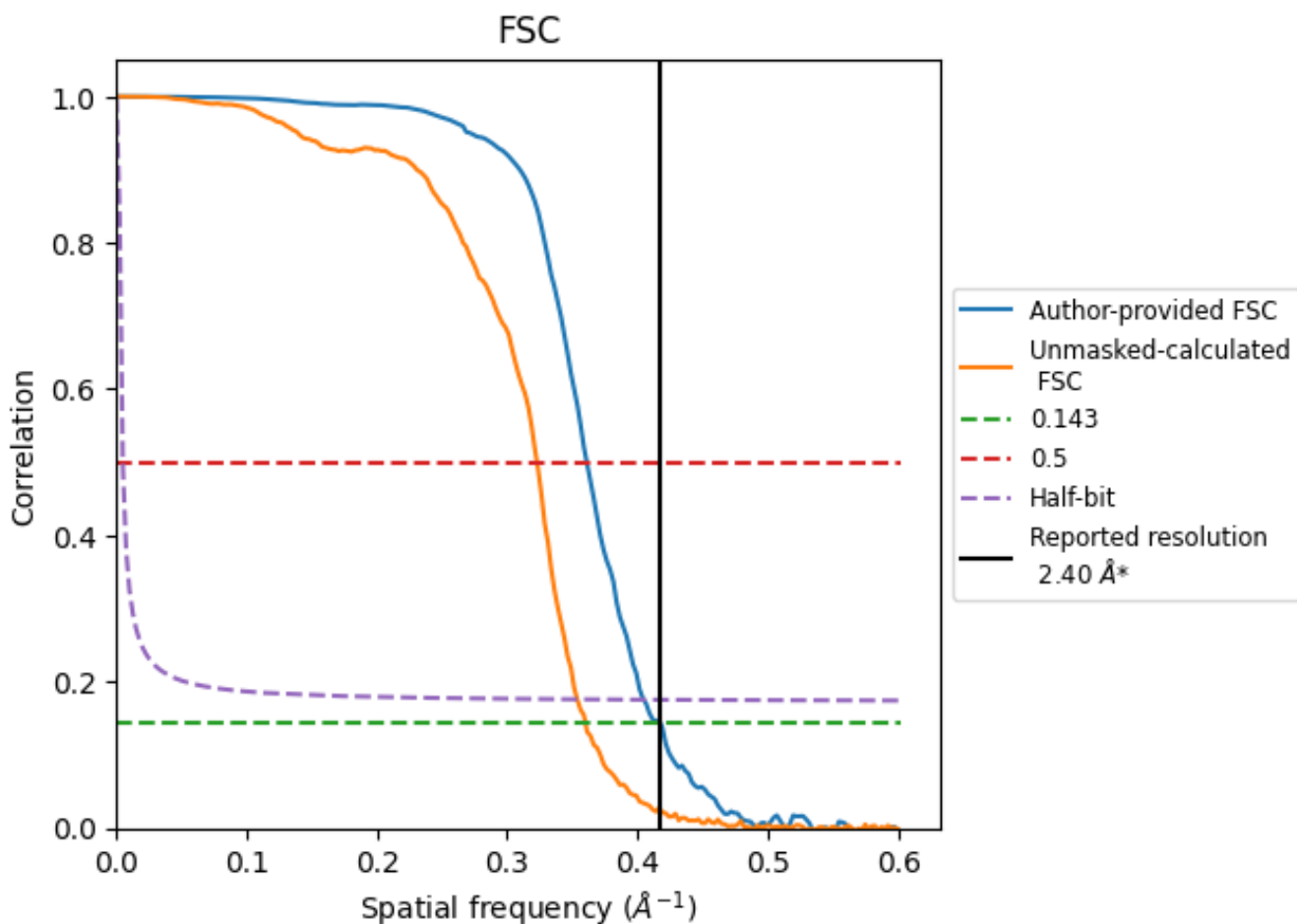
*Reported resolution corresponds to spatial frequency of 0.417 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.40	-	-
Author-provided FSC curve	2.39	2.77	2.47
Unmasked-calculated*	2.78	3.10	2.83

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 2.78 differs from the reported value 2.4 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-13170 and PDB model 7P2E. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay ⓘ

X   Y   Z
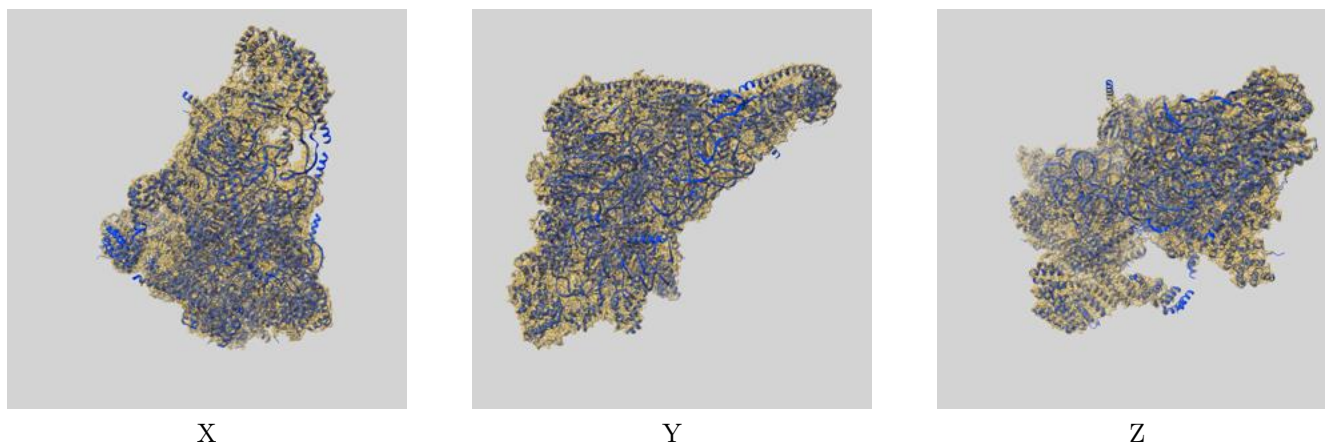
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

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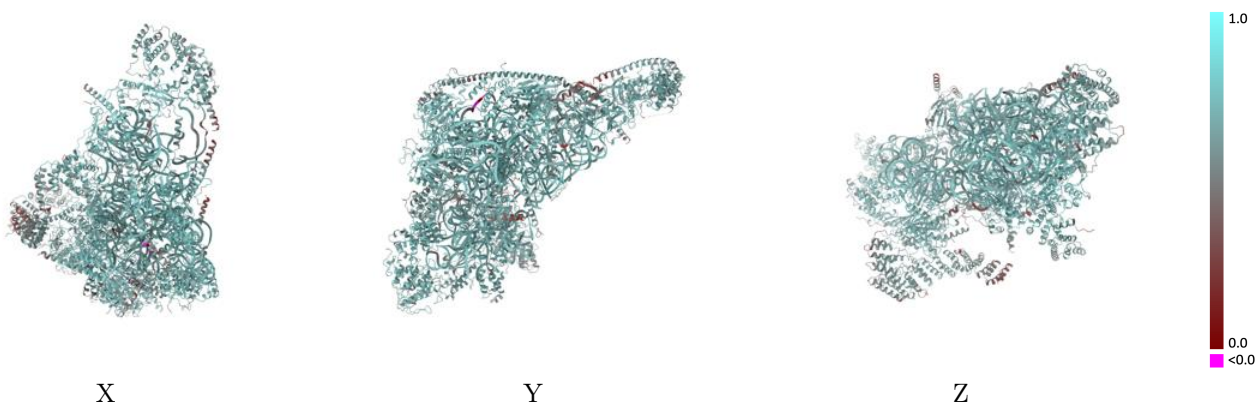
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3   Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
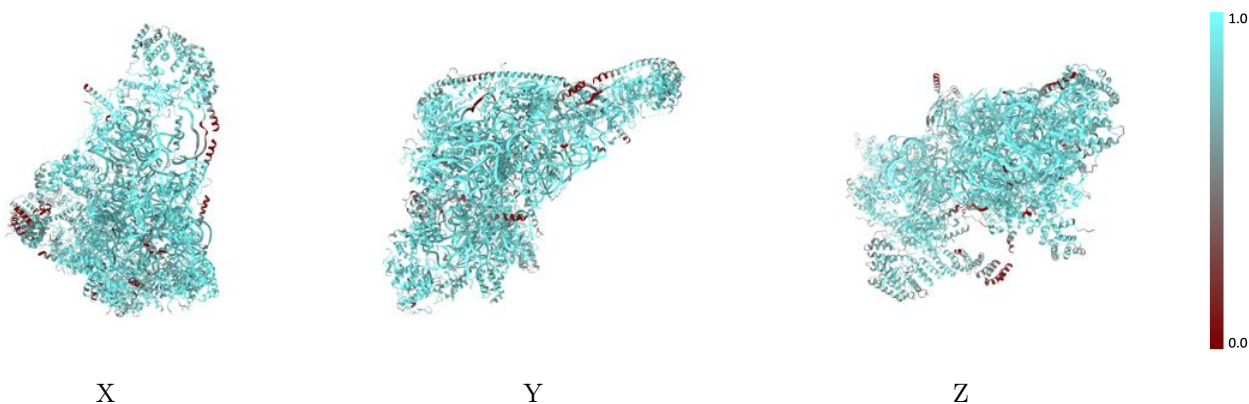
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.15).

9.4   Atom inclusion ⓘ
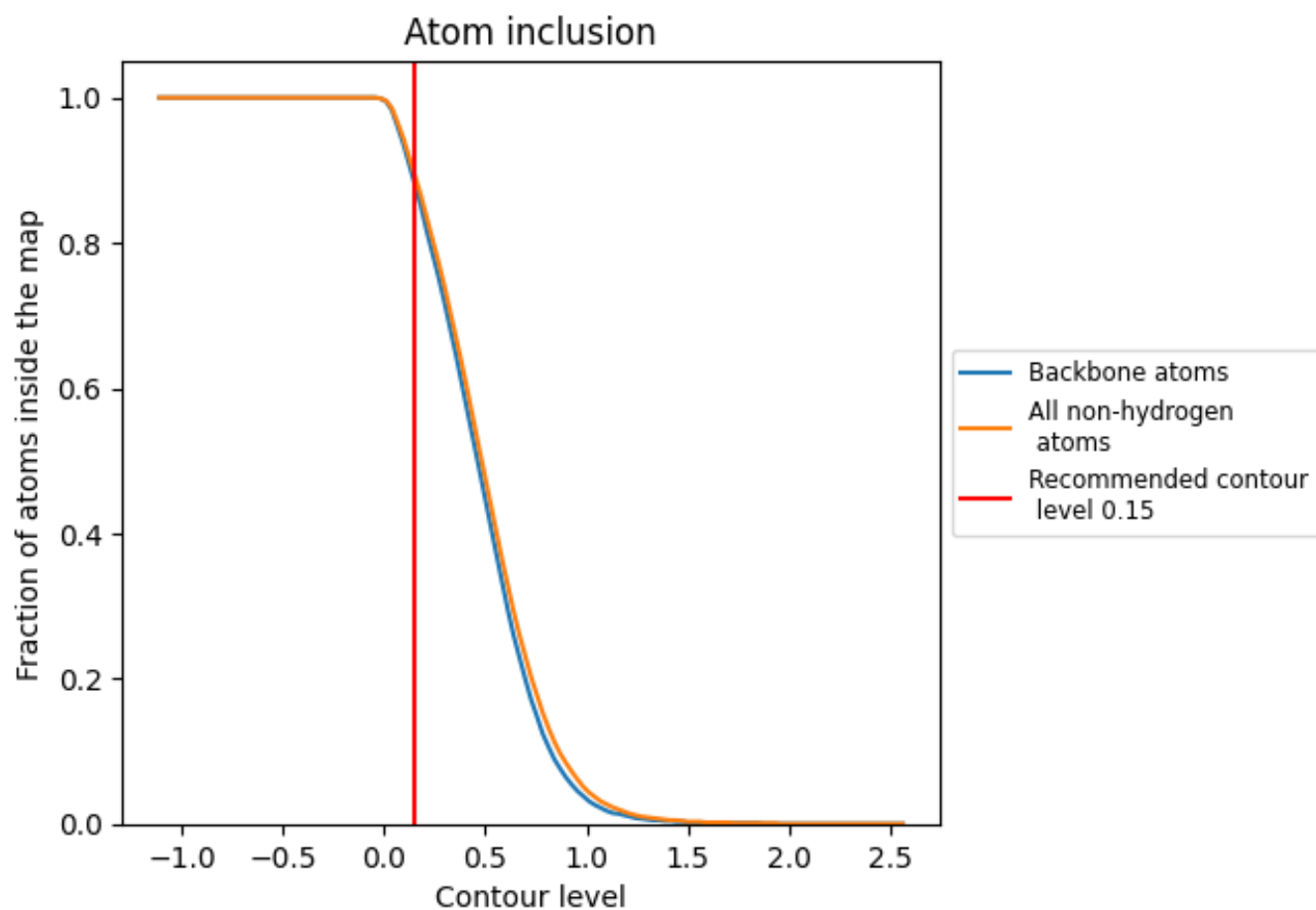
At the recommended contour level, 88% of all backbone atoms, 90% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8950	0.6670
0	0.8960	0.6700
1	0.8660	0.6570
2	0.7190	0.6000
3	0.9250	0.6960
4	0.7320	0.5660
8	0.6180	0.5640
A	0.9600	0.6930
B	0.9350	0.7130
C	0.9640	0.7340
D	0.8890	0.6730
E	0.9000	0.6700
F	0.8860	0.6580
G	0.8460	0.6510
H	0.8930	0.6910
I	0.9370	0.6910
J	0.9140	0.6850
K	0.9690	0.7360
L	0.8540	0.6580
M	0.9230	0.7080
N	0.9460	0.7120
O	0.9160	0.6850
P	0.9210	0.6970
Q	0.9750	0.7290
R	0.8730	0.6530
S	0.8430	0.6430
T	0.9040	0.6930
U	0.8180	0.6340
V	0.8030	0.6150
W	0.9250	0.6920
X	0.9240	0.6770
Y	0.7830	0.6140
Z	0.8830	0.6810

1.0

0.0

<0.0