



## wwPDB EM Validation Summary Report ⓘ

Jun 1, 2024 – 03:54 PM EDT

PDB ID : 7TUT  
EMDB ID : EMD-26133  
Title : Structure of the rabbit 80S ribosome stalled on a 4-TMD Rhodopsin intermediate in complex with the multipass translocon  
Authors : Kim, M.K.; Lewis, A.J.O.; Keenan, R.J.; Hegde, R.S.  
Deposited on : 2022-02-03  
Resolution : 3.88 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

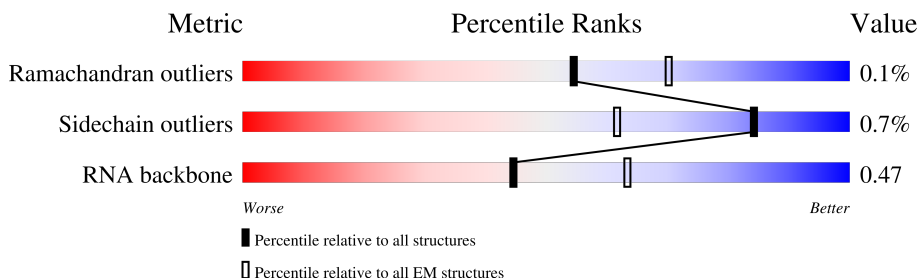
EMDB validation analysis : 0.0.1.dev92  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.88 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.



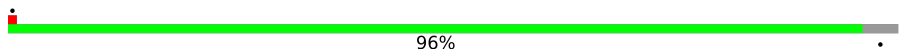
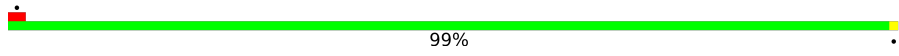

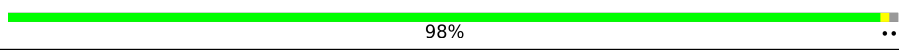
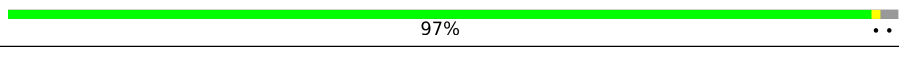

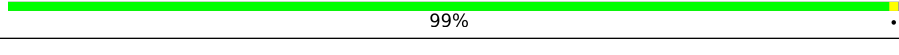

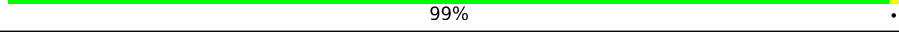
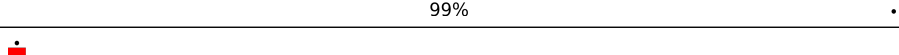
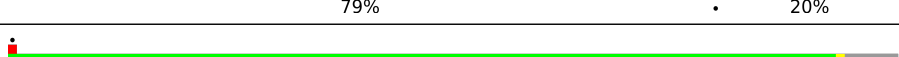
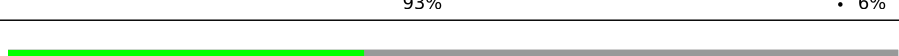

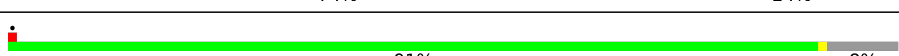
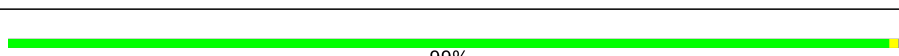
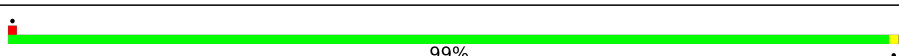
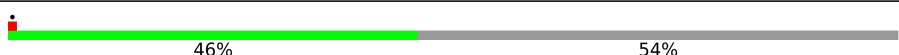


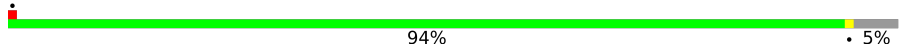
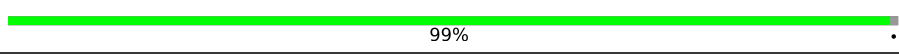
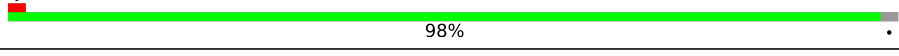
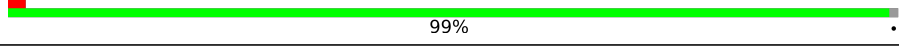
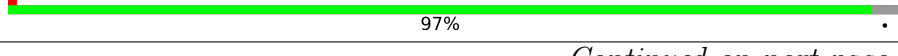

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\geq 3$ , 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	A	257	
2	C	413	
3	D	297	
4	E	291	
5	F	247	
6	G	319	
7	H	192	
8	I	214	


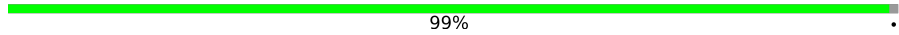
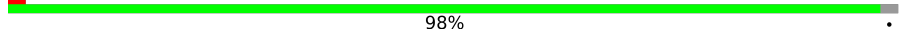
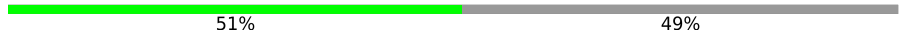
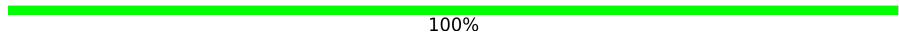
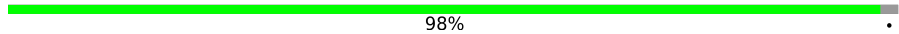
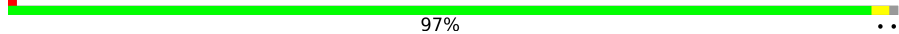




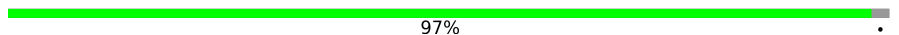

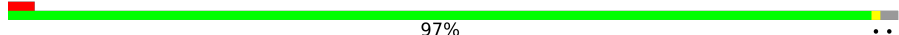

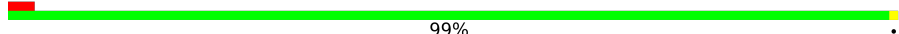



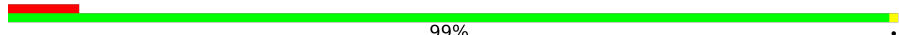
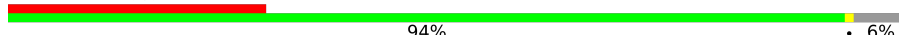


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Mol	Chain	Length	Quality of chain
9	J	178	 96%
10	L	211	 99%
11	M	218	 63% 37%
12	N	204	 98%
13	O	203	 97%
14	P	184	 82% 17%
15	Q	188	 99%
16	R	196	 79% 21%
17	S	176	 99%
18	T	160	 99%
19	U	128	 79% 20%
20	V	140	 93% 6%
21	W	157	 40% 60%
22	X	156	 74% 24%
23	Y	145	 91% 8%
24	Z	136	 99%
25	a	148	 99%
26	b	226	 46% 54%
27	c	115	 84% 15%
28	d	125	 84% 14%
29	e	135	 94% 5%
30	f	110	 99%
31	g	116	 98%
32	h	123	 99%
33	i	105	 97%

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Mol	Chain	Length	Quality of chain
34	j	97	 87% 11%
35	k	70	 99%
36	l	51	 98%
37	m	102	 51% 49%
38	n	25	 100%
39	o	106	 98%
40	p	92	 97%
41	q	77	 78% 19%
42	r	137	 91% 9%
43	u	120	 88% 12%
44	v	156	 76% 24%
45	w	403	 97%
46	B	273	 25% 74%
47	1	476	 97%
48	2	96	 30% 70%
49	3	68	 99%
50	4	483	 5% 70% 29%
51	5	106	 8% 85% 15%
52	7	563	 80% 93% 7%
53	6	224	 8% 99%
54	8	188	 29% 94% 6%
55	K	3543	 76% 24%
56	9	129	 26% 82% 16%

## 2 Entry composition [i](#)

There are 58 unique types of molecules in this entry. The entry contains 267107 atoms, of which 114508 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 uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	A	248	3891	1189	1993	389	314	6	0	0

- Molecule 2 is a protein called uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	C	362	5936	1812	3053	577	480	14	0	0

- Molecule 3 is a protein called uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
3	D	293	4815	1512	2424	438	427	14	0	0

- Molecule 4 is a protein called eL6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
4	E	233	3908	1206	2031	357	311	3	0	0

- Molecule 5 is a protein called uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
5	F	225	3870	1205	1995	358	303	9	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	61	ARG	GLY	conflict	UNP G1TUB1
F	93	ARG	GLY	conflict	UNP G1TUB1
F	131	MET	VAL	conflict	UNP G1TUB1

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Chain	Residue	Modelled	Actual	Comment	Reference
F	153	ILE	VAL	conflict	UNP G1TUB1

- Molecule 6 is a protein called eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
6	G	233	3906	1199	2027	361	315	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	244	GLY	CYS	conflict	UNP G1STW0

- Molecule 7 is a protein called uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
7	H	190	3113	954	1597	284	272	6	0	0

- Molecule 8 is a protein called uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
8	I	205	3376	1056	1712	321	274	13	0	0

- Molecule 9 is a protein called uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
9	J	170	2761	861	1399	254	241	6	0	0

- Molecule 10 is a protein called eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
10	L	210	3522	1065	1820	354	279	4	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	46	ILE	-	insertion	UNP G1TPV0

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Chain	Residue	Modelled	Actual	Comment	Reference
L	47	ALA	-	insertion	UNP G1TPV0
L	48	PRO	-	insertion	UNP G1TPV0
L	49	ARG	-	insertion	UNP G1TPV0
L	50	PRO	-	insertion	UNP G1TPV0
L	51	ALA	-	insertion	UNP G1TPV0
L	52	ALA	-	insertion	UNP G1TPV0
L	53	GLY	-	insertion	UNP G1TPV0
L	54	PRO	-	insertion	UNP G1TPV0

- Molecule 11 is a protein called eL14.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
11	M	138	2348	727	1211	221	182	7	0	0

- Molecule 12 is a protein called eL15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
12	N	202	3441	1069	1745	358	265	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
N	2	GLY	ALA	conflict	UNP G1T0C1

- Molecule 13 is a protein called uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
13	O	199	3408	1051	1778	319	255	5	0	0

- Molecule 14 is a protein called uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
14	P	153	2516	777	1274	241	215	9	0	0

- Molecule 15 is a protein called eL18.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
15	Q	187	3148	946	1634	315	249	4	0	0

- Molecule 16 is a protein called eL19.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
16	R	155	2728	808	1434	278	199	9	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	38	ARG	CYS	conflict	UNP G1TJR3
R	64	ARG	GLN	conflict	UNP G1TJR3
R	94	THR	LYS	conflict	UNP G1TJR3

- Molecule 17 is a protein called eL20.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
17	S	176	2970	930	1508	285	236	11	0	0

- Molecule 18 is a protein called eL21.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
18	T	159	2665	823	1367	252	217	6	0	0

- Molecule 19 is a protein called eL22.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
19	U	102	1690	534	856	146	152	2	0	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
U	18	LEU	VAL	conflict	UNP G1TSG1
U	32	GLY	ARG	conflict	UNP G1TSG1
U	36	ALA	GLU	conflict	UNP G1TSG1
U	39	PHE	SER	conflict	UNP G1TSG1
U	54	GLY	ARG	conflict	UNP G1TSG1

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Chain	Residue	Modelled	Actual	Comment	Reference
U	60	VAL	ALA	conflict	UNP G1TSG1
U	62	SER	THR	conflict	UNP G1TSG1
U	63	LEU	ILE	conflict	UNP G1TSG1
U	97	ARG	HIS	conflict	UNP G1TSG1
U	106	THR	SER	conflict	UNP G1TSG1
U	126	GLU	ASP	conflict	UNP G1TSG1

- Molecule 20 is a protein called uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O	S		
20	V	131	2018	618	1039	184	172	5	0	0

- Molecule 21 is a protein called eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O	S		
21	W	63	1069	337	541	103	85	3	0	0

- Molecule 22 is a protein called eL23.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O	S		
22	X	118	2007	618	1040	181	167	1	0	0

- Molecule 23 is a protein called uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O	S		
23	Y	134	2320	700	1205	226	186	3	0	0

- Molecule 24 is a protein called eL27.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O	S		
24	Z	135	2289	714	1182	208	182	3	0	0

- Molecule 25 is a protein called uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
25	a	147	2371	734	1209	239	185	4	0	0

- Molecule 26 is a protein called eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
26	b	104	1768	527	920	189	129	3	0	0

- Molecule 27 is a protein called eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
27	c	98	1555	481	794	134	140	6	0	0

- Molecule 28 is a protein called eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
28	d	107	1818	560	930	171	155	2	0	0

- Molecule 29 is a protein called eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
29	e	128	2200	667	1147	216	165	5	0	0

- Molecule 30 is a protein called eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
30	f	109	1788	555	912	174	143	4	0	0

- Molecule 31 is a protein called eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
31	g	114	1904	566	998	187	147	6	0	0

- Molecule 32 is a protein called eL35.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
32	h	122	2145	637	1136	203	168	1	0	0

- Molecule 33 is a protein called eL36.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
33	i	102	1746	520	916	176	129	5	0	0

- Molecule 34 is a protein called eL37.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
34	j	86	1443	434	738	155	111	5	0	0

- Molecule 35 is a protein called eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
35	k	69	1206	366	637	103	99	1	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k	24	LYS	ASN	conflict	UNP G1U001

- Molecule 36 is a protein called eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
36	l	50	927	286	480	96	64	1	0	0

- Molecule 37 is a protein called eL40.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
37	m	52	895	266	466	90	67	6	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
m	1	MET	-	initiating methionine	UNP A0A2K5PSA0

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Chain	Residue	Modelled	Actual	Comment	Reference
m	2	GLY	-	expression tag	UNP A0A2K5PSA0
m	3	ASP	-	expression tag	UNP A0A2K5PSA0
m	4	PRO	-	expression tag	UNP A0A2K5PSA0
m	5	GLU	-	expression tag	UNP A0A2K5PSA0
m	6	SER	-	expression tag	UNP A0A2K5PSA0
m	7	GLY	-	expression tag	UNP A0A2K5PSA0
m	8	GLY	-	expression tag	UNP A0A2K5PSA0
m	9	CYS	-	expression tag	UNP A0A2K5PSA0

- Molecule 38 is a protein called eL41.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
38	n	25	528	145	289	64	27	3	0	0

- Molecule 39 is a protein called eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
39	o	104	1773	533	922	174	138	6	0	0

- Molecule 40 is a protein called eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
40	p	91	1465	445	757	136	120	7	0	0

- Molecule 41 is a RNA chain called P-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
41	q	76	2439	723	823	291	527	75	0	0

- Molecule 42 is a protein called eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
42	r	124	2045	616	1051	205	167	6	0	0

- Molecule 43 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
43	u	120	3854	1141	1296	456	842	119	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
u	2	U	N	conflict	GB X06789.1
u	36	C	N	conflict	GB X06789.1
u	102	U	N	conflict	GB X06789.1
u	112	U	N	conflict	GB X06789.1
u	114	U	N	conflict	GB X06789.1
u	119	U	C	conflict	GB X06789.1
u	120	U	N	conflict	GB X06789.1

- Molecule 44 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
44	v	156	4997	1480	1683	585	1094	155	0	0

- Molecule 45 is a protein called uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
45	w	394	6482	2020	3310	597	542	13	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
w	1	MET	-	insertion	UNP G1TL06

- Molecule 46 is a protein called Nascent chain.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
46	B	70	1054	349	528	84	87	6	0	0

- Molecule 47 is a protein called Protein transport protein Sec61 subunit alpha isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
47	1	465	7320	2360	3722	580	634	24	0	0

- Molecule 48 is a protein called Protein transport protein Sec61 subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
48	2	29	475	157	245	36	35	2	0	0

- Molecule 49 is a protein called Protein transport protein Sec61 gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
49	3	68	1120	355	577	94	89	5	0	0

- Molecule 50 is a protein called Coiled-coil domain containing 47.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
50	4	342	5595	1738	2817	495	522	23	0	0

- Molecule 51 is a protein called PAT complex subunit Asterix.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
51	5	90	1421	456	710	115	128	12	0	0

- Molecule 52 is a protein called Nicalin.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
52	7	521	8260	2625	4121	726	771	17	0	0

- Molecule 53 is a protein called Transmembrane protein 147.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
53	6	224	3575	1190	1792	277	300	16	0	0

- Molecule 54 is a protein called Calcium load-activated calcium channel.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
54	8	177	2884	900	1478	242	252	12	0	0

- Molecule 55 is a RNA chain called 28S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
55	K	3543	114330	33833	38358	13910	24686	3543	0	0

- Molecule 56 is a protein called Obligate partner of TMCO1 insertase.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
56	9	109	1784	610	881	134	156	3	0	0

- Molecule 57 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
57	C	1	Total 1	Mg 1	0
57	D	1	Total 1	Mg 1	0
57	I	2	Total 2	Mg 2	0
57	J	1	Total 1	Mg 1	0
57	P	1	Total 1	Mg 1	0
57	V	1	Total 1	Mg 1	0
57	a	1	Total 1	Mg 1	0
57	u	4	Total 4	Mg 4	0
57	v	6	Total 6	Mg 6	0
57	K	202	Total 202	Mg 202	0

- Molecule 58 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
58	g	1	Total 1	Zn 1	0
58	j	1	Total 1	Zn 1	0
58	m	1	Total 1	Zn 1	0

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
58	o	1	Total 1	Zn 1	0
58	p	1	Total 1	Zn 1	0

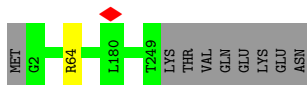


### 3 Residue-property plots [i](#)

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

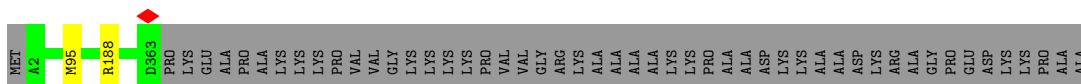
- Molecule 1: uL2

Chain A:  96%



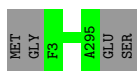
- Molecule 2: uL4

Chain C:  87%  12%


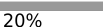


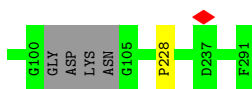
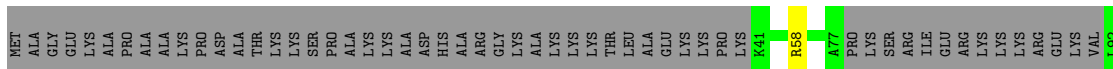
- Molecule 3: uL18

Chain D:  99%





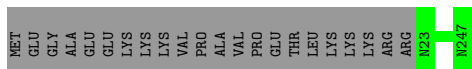
- Molecule 4: eL6

Chain E:  79%  20%

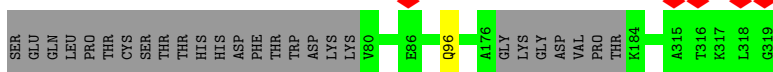
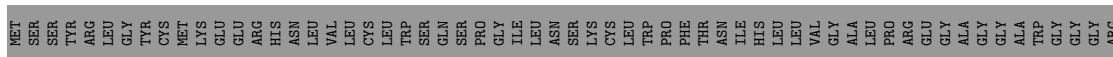


- Molecule 5: uL30

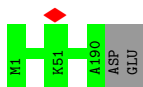
Chain F:  91%  9%



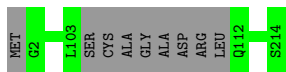
• Molecule 6: eL8



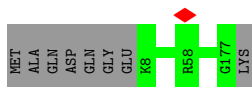
• Molecule 7: uL6



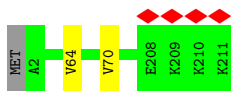
• Molecule 8: uL16



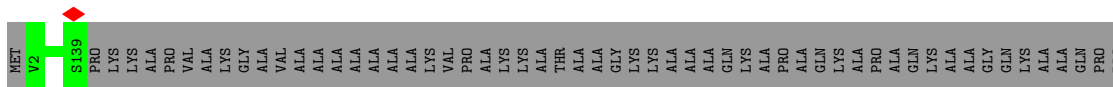
• Molecule 9: uL5



• Molecule 10: eL13



• Molecule 11: eL14



LYS  
ALA  
GLN  
LYS  
GLY  
GLN  
LYS  
PRO  
PRO  
ALA  
GLN  
LYS  
ALA  
PRO  
ALA  
LYS  
LYS  
SER  
GLY  
LYS  
LYS  
ALA

• Molecule 12: eL15



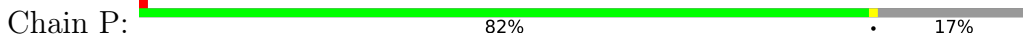
MET  
GLY  
G2  
R26  
P76  
T80  
R204

• Molecule 13: uL13



MET  
ALA  
GLU  
GLY  
Q5  
Q173  
Q180  
V203

• Molecule 14: uL22



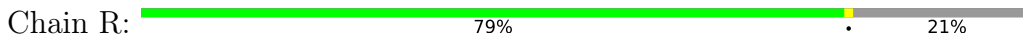
MET  
V2  
N97  
Q118  
E154  
GLN  
ILE  
VAL  
PRO  
LYS  
PRO  
GLU  
GLU  
VAL  
ALA  
GLN  
LYS  
LYS  
ILE  
SER  
GLN  
LYS  
LYS  
LEU  
LYS  
GLN  
LYS  
LEU  
MET  
ALA  
ARG  
GLU

• Molecule 15: eL18



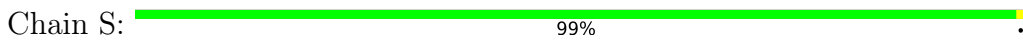
G2  
M8  
N188  
UNK

• Molecule 16: eL19



MET  
G2  
R71  
A156  
ASP  
GLN  
ALA  
GLU  
ALA  
ARG  
ARG  
SER  
LYS  
THR  
LYS  
GLU  
ALA  
ARG  
LYS  
ARG  
ARG  
GLU  
GLU  
ARG  
LEU  
GLN  
ALA  
LYS  
GLU  
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SER  
LYS  
GLU  
GLU  
THR  
LYS  
LYS

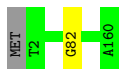
• Molecule 17: eL20



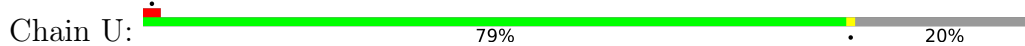
M1  
V67  
T90  
F176

• Molecule 18: eL21

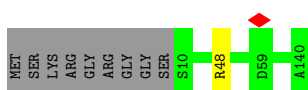




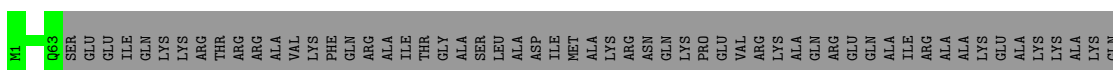
• Molecule 19: eL22



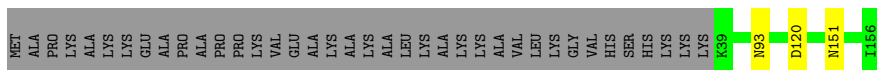
• Molecule 20: uL14



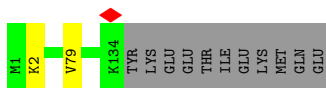
• Molecule 21: eL24



• Molecule 22: eL23



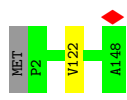
• Molecule 23: uL24



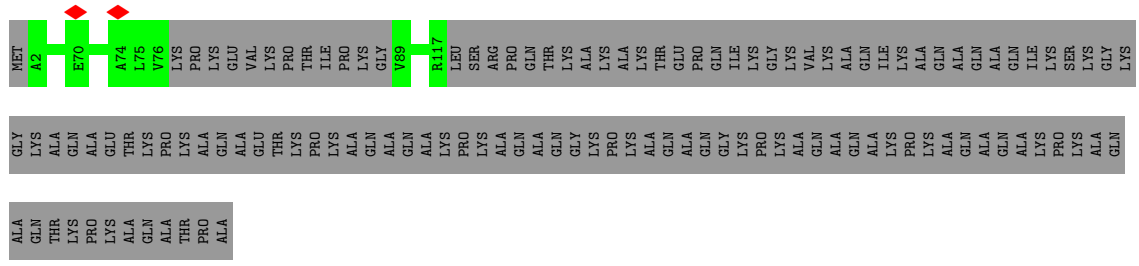
• Molecule 24: eL27



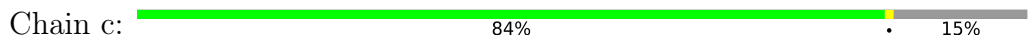
• Molecule 25: uL15



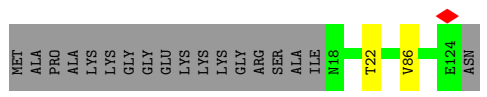
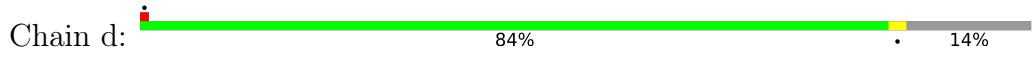
• Molecule 26: eL29



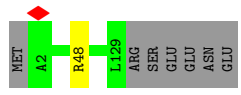
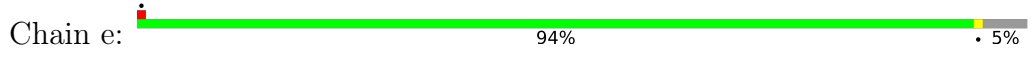
• Molecule 27: eL30



• Molecule 28: eL31



• Molecule 29: eL32

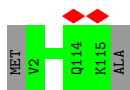


• Molecule 30: eL33

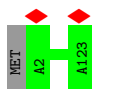


• Molecule 31: eL34

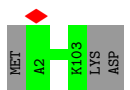




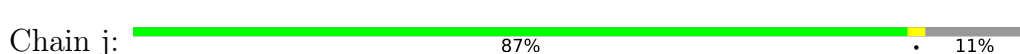
• Molecule 32: eL35



• Molecule 33: eL36



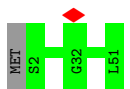
• Molecule 34: eL37



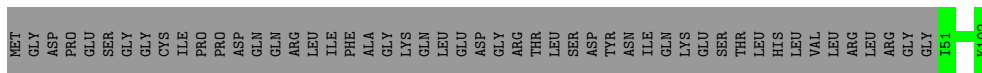
• Molecule 35: eL38



• Molecule 36: eL39



• Molecule 37: eL40



• Molecule 38: eL41



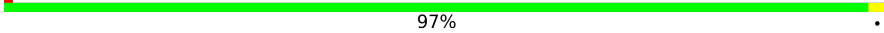
There are no outlier residues recorded for this chain.

- Molecule 39: eL42

Chain o:  98%




- Molecule 40: eL43

Chain p:  97%



- Molecule 41: P-site tRNA

Chain q:  78% 19%




- Molecule 42: eL28

Chain r:  91% 9%




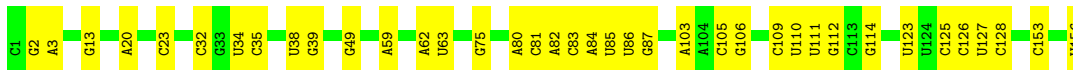
- Molecule 43: 5S ribosomal RNA

Chain u:  88% 12%



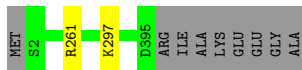
- Molecule 44: 5.8S ribosomal RNA

Chain v:  76% 24%



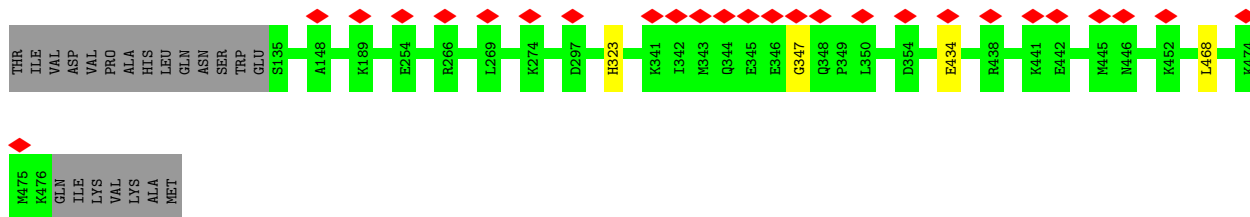
- Molecule 45: uL3

Chain w:  97%

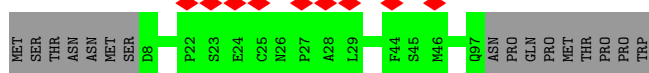
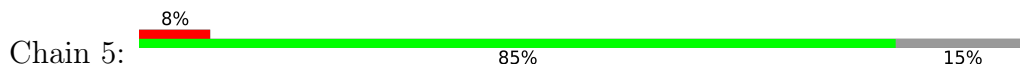




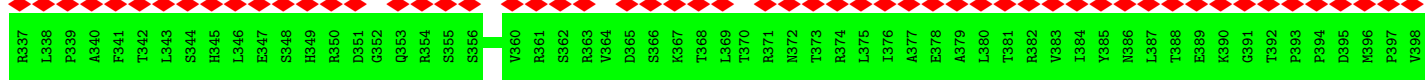
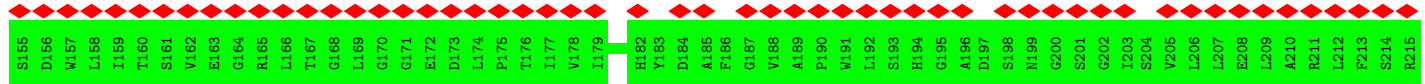
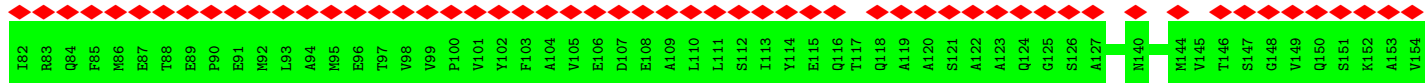
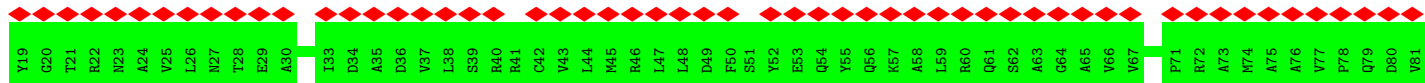
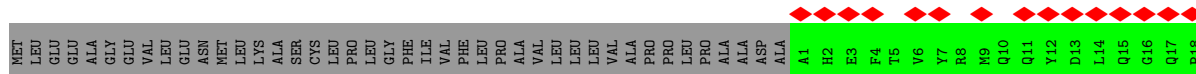
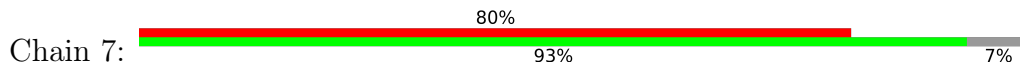




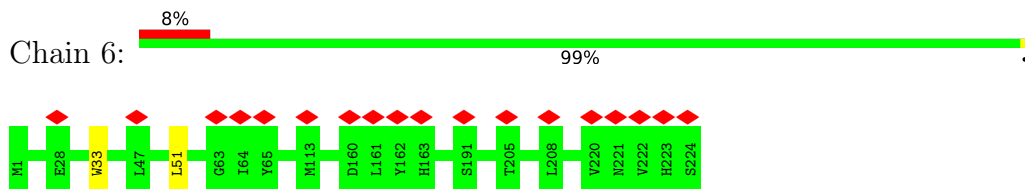
• Molecule 51: PAT complex subunit Asterix



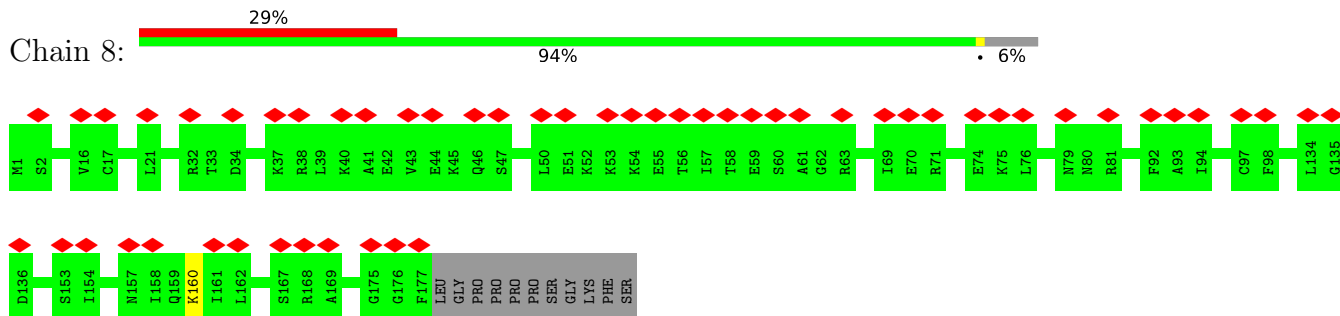
• Molecule 52: Nicalin



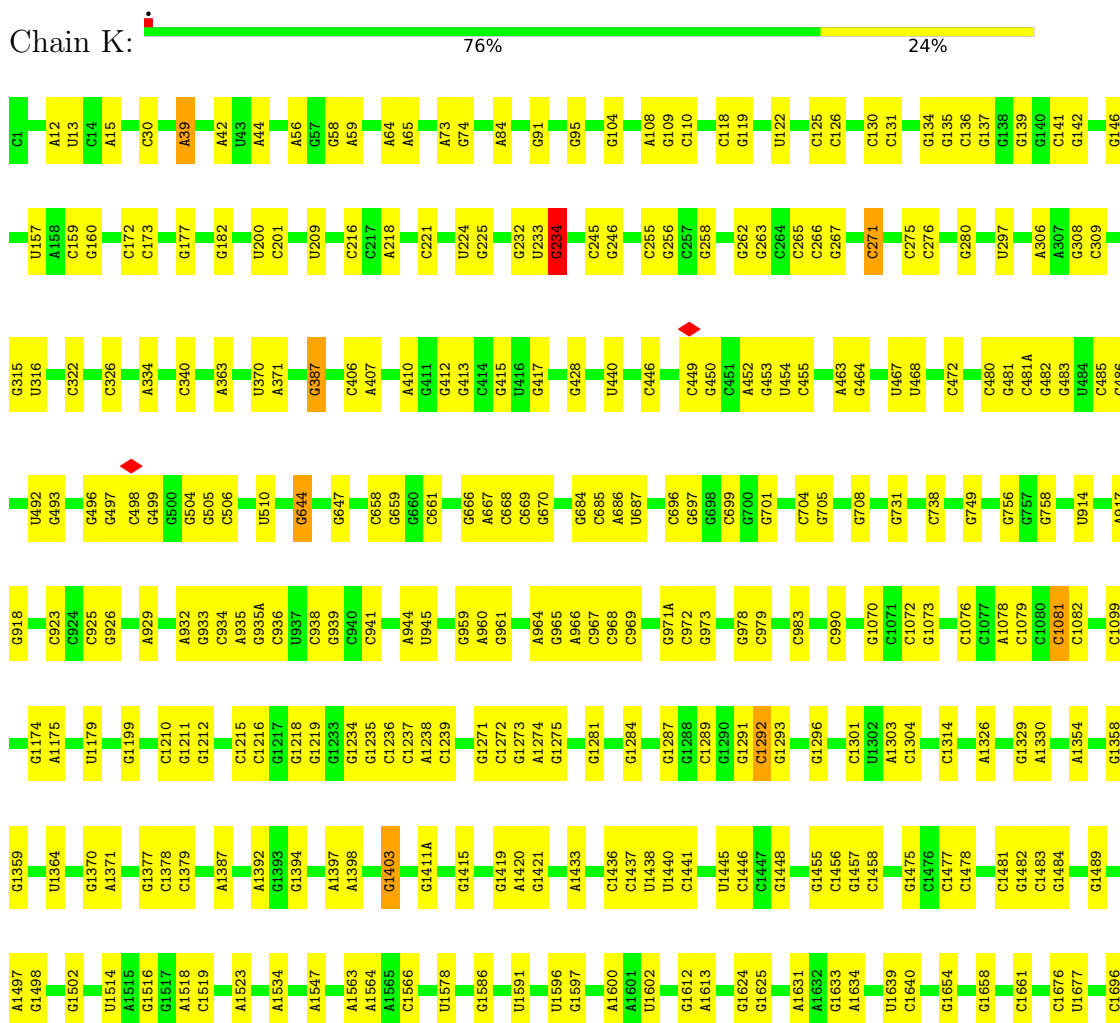
• Molecule 53: Transmembrane protein 147



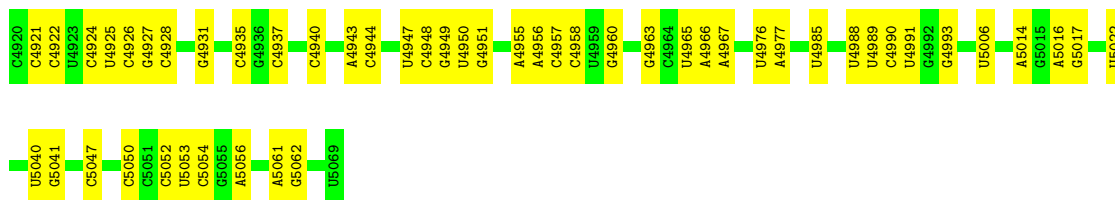
• Molecule 54: Calcium load-activated calcium channel



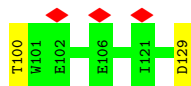
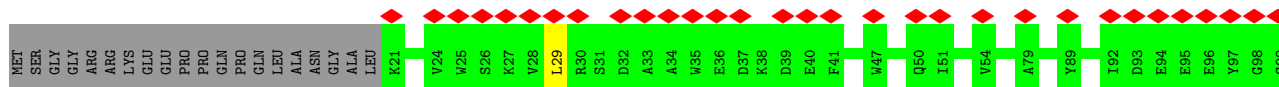
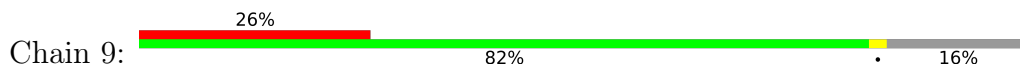
• Molecule 55: 28S ribosomal RNA



G4709	U4728	G4736	G4737	G4738	G4744	G4745	A4513	G4514	G4354	G4355	C4171	A3917	G3760	G3603	G2721	G2547	A2382	G2093	G1982	A1983	A1984	G1857	G1855	C1847	C1731	G1732	C1733	G1741	G1742	G1750	U1756	G1760	G1761	G1764	G1916	A1767	C1768	G1769	U1918	G1919	C1920	C1772	U1773	C1774	A1775	A1776	C1777	A1780	G1945	G1798	G1946	U1947	G1948	A1804	U1957	A1958	C1808	U1959	A1960	G1961	A1962	G1963	A1964	G1965	G1818	G1819	U1820	G1821	U1822	A1970	U1971	C1828	U1974	U1834	G1975	C1976	G1835	G1836	A1837	G1842	A1843	G1981	C1987	G1988	U1882	U1889	A1892	A1897	C1898	G1916	A1917	G1918	U1919	A2002	G2003	U2004	G2005	U2006	G2007	U2008	A2009	A2010	C2011	C2018	C2019	U2020	G2021	C2022	G2023	G2024	A2025	A2026	G2300	A2300	G2306	G2307	A2046	U2048	G2052	C2053	U2054	G2055	G2056	G2063	G2064	A2069	U2070	A2071	U2084	G2089	U2090	C2091	G2092	G2098	A2095	G2096	A2097	G2098	G2099	G2100	A2101	G2102	A2104	A2105	G2106	A2107	G2108	A2109	G2110	A2117	A2122	G2123	G2124	U2125	C2186	A2191	G2192	G2193	G2194	A2267	C2268	G2269	A2270	G2275	A2276	G2277	G2278	A2279	C2289	G2294	G2299	A2300	G2301	G2306	A2313	G2314	G2315	G2316	G2331	A2332	G2333	G2335	G2348	C2351	G2384	A2382	A2395	G2396	G2397	U2398	A2417	C2422	G2423	G2424	U2425	A2431	G2432	G2433	C2441	U2447	G2450	A2453	U2468	C2469	G2475	G2476	G2487	C2488	U2490	C2491	C2492	C2498	A2502	G2503	C2504	C2505	G2506	A2511	A2512	A2513	A2527	G2528	U2529	U2530	A2556	A2537	G2546	A2553	U2554	G2556	G2567	C2568	U2570	U2575	C2583	G2586	A2587	C2588	G2589	A2600	G2602	G2618	G2619	A2620	A2621	C2627	G2638	C2653	G2662	C2669	G2673	A2674	G2675	A2676	G2677	G2686	U2687	A2695	A2696	G2705	G2706	U2707	U2708	C2709	G2710	G2711	G2714	G2721	A2725	G2726	U2740	A2743	G2760	U2761	G2762	U2763	A2764	U2769	C2772	A2787	U2788	A2789	U2790	C2794	A3662	A3663	G3664	G3672	C3673	G3674	A3682	A3692	C3696	U3822	G3823	A3824	U3838	G3839	U3840	A3876	A3877	C3878	C3879	G3880	G3888	C3889	G3897	A3901	G3904	A3905	A3906	G3907	A3908	U3915	G3916	A3756	A3917	A3923	C3926	G3938	G3939	U3940	A3941	A3942	A3943	G3946	A3947	C3948	A4065	U4066	U4069	U4070	G4076	G4084	A4085	A4086	G4087	C4088	G4097	U4111	C4114	G4115	U4117	C4118	A4119	U4120	G4121	A4127	U4128	C4133	G4136	C4148	C4158	G4329	C4330	G4331	C4332	A4339	C4349	U4354	G4355	G4364	G4373	A4376	G4377	A4378	A4379	A4380	C4387	G4391	A4392	G4393	A4394	U4395	C4398	G4401	U4419	U4420	C4421	A4422	G4430	U4437	U4438	C4444	G4448	A4449	U4452	U4463	A4464	U4466	U4471	G4472	A4473	G4474	G4475	A4488	G4489	U4500	U4512	G4513	G4514	G4515	C4519	G4522	A4523	G4524	C4528	G4535	A4548	U4549	G4549	C4560	U4561	C4562	U4567	C4570	G4573	U4574	G4575	A4584	U4585	G4586	U4587	A4590	A4605	U4636	U4637	U4638	C4639	G4652	A4656	U4657	G4661	C4670	G4671	A4672	C4677	U4677	A4688	A4687	C4694	G4719	G4720	G4721	G4722	U4728	G4736	G4737	G4738	G4744	G4745	G4750	G4751	U4752	U4753	G4754	G4757	U4758	G4759	G4760	G4761	G4765	G4766	G4771	C4772	G4868	U4869	G4870	C4871	G4875	U4882	C4883	G4884	U4885	C4895	G4896	G4897	G4898	G4903	A4909	A4910	A4911	G4912	G4913	G4919
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● Molecule 56: Obligate partner of TMCO1 insertase



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	136812	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	54	Depositor
Minimum defocus (nm)	1900	Depositor
Maximum defocus (nm)	2700	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	3.210	Depositor
Minimum map value	-1.145	Depositor
Average map value	0.019	Depositor
Map value standard deviation	0.183	Depositor
Recommended contour level	0.5	Depositor
Map size ( $\text{\AA}$ )	552.08, 552.08, 552.08	wwPDB
Map dimensions	412, 412, 412	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.34, 1.34, 1.34	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 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	A	0.25	0/1936	0.57	0/2596
2	C	0.25	0/2937	0.57	0/3946
3	D	0.26	0/2437	0.53	0/3264
4	E	0.26	0/1914	0.55	0/2566
5	F	0.25	0/1911	0.53	0/2549
6	G	0.25	0/1910	0.55	0/2569
7	H	0.25	0/1535	0.55	0/2063
8	I	0.25	0/1702	0.55	0/2272
9	J	0.26	0/1385	0.55	0/1852
10	L	0.25	0/1733	0.60	0/2316
11	M	0.26	0/1158	0.56	0/1547
12	N	0.25	0/1741	0.60	0/2331
13	O	0.26	0/1662	0.55	0/2222
14	P	0.27	0/1268	0.55	0/1700
15	Q	0.25	0/1538	0.61	0/2054
16	R	0.24	0/1310	0.60	0/1734
17	S	0.26	0/1501	0.58	0/2012
18	T	0.25	0/1326	0.53	0/1770
19	U	0.26	0/848	0.51	0/1138
20	V	0.26	0/993	0.53	0/1332
21	W	0.26	0/541	0.53	0/720
22	X	0.26	0/984	0.54	0/1323
23	Y	0.25	0/1132	0.57	0/1504
24	Z	0.26	0/1130	0.54	0/1507
25	a	0.25	0/1191	0.55	0/1590
26	b	0.24	0/861	0.56	0/1138
27	c	0.26	0/771	0.49	0/1034
28	d	0.25	0/903	0.58	0/1216
29	e	0.24	0/1071	0.56	0/1429
30	f	0.27	0/895	0.58	0/1198
31	g	0.25	0/916	0.60	0/1220
32	h	0.25	0/1017	0.55	0/1344

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	i	0.25	0/841	0.58	0/1112
34	j	0.24	0/720	0.61	0/952
35	k	0.25	0/575	0.54	0/761
36	l	0.24	0/459	0.65	0/608
37	m	0.24	0/435	0.55	0/575
38	n	0.26	0/240	0.73	0/305
39	o	0.26	0/864	0.55	0/1140
40	p	0.25	0/718	0.54	0/953
41	q	0.24	0/1805	0.86	1/2809 (0.0%)
42	r	0.25	0/1010	0.59	0/1354
43	u	0.25	0/2858	0.80	0/4455
44	v	0.26	0/3701	0.82	1/5766 (0.0%)
45	w	0.25	0/3240	0.51	0/4339
46	B	0.28	0/541	0.59	0/738
47	1	0.26	0/3677	0.47	0/4986
48	2	0.25	0/237	0.39	0/321
49	3	0.27	0/553	0.46	0/738
50	4	0.25	0/2819	0.49	0/3772
51	5	0.25	0/730	0.42	0/988
52	7	0.24	0/4224	0.47	0/5728
53	6	0.25	0/1835	0.41	0/2495
54	8	0.25	0/1426	0.46	0/1908
55	K	0.29	0/84979	0.87	44/132532 (0.0%)
56	9	0.24	0/932	0.43	0/1268
All	All	0.27	0/163576	0.76	46/239659 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
55	K	0	1

There are no bond length outliers.

The worst 5 of 46 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
55	K	234	G	C8-N9-C4	-10.19	102.32	106.40
44	v	39	G	O4'-C1'-N9	8.19	114.75	108.20
55	K	271	C	C2-N1-C1'	7.38	126.92	118.80
55	K	1219	G	N3-C4-N9	-7.09	121.75	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
55	K	139	G	N3-C4-N9	-6.82	121.91	126.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
55	K	234	G	Sidechain

## 5.2 Too-close contacts [i](#)

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

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	246/257 (96%)	220 (89%)	26 (11%)	0	100	100
2	C	360/413 (87%)	336 (93%)	24 (7%)	0	100	100
3	D	291/297 (98%)	270 (93%)	21 (7%)	0	100	100
4	E	227/291 (78%)	218 (96%)	8 (4%)	1 (0%)	34	71
5	F	223/247 (90%)	208 (93%)	15 (7%)	0	100	100
6	G	229/319 (72%)	214 (93%)	15 (7%)	0	100	100
7	H	188/192 (98%)	176 (94%)	12 (6%)	0	100	100
8	I	201/214 (94%)	182 (90%)	19 (10%)	0	100	100
9	J	168/178 (94%)	158 (94%)	10 (6%)	0	100	100
10	L	208/211 (99%)	194 (93%)	13 (6%)	1 (0%)	29	67
11	M	136/218 (62%)	126 (93%)	10 (7%)	0	100	100
12	N	200/204 (98%)	185 (92%)	14 (7%)	1 (0%)	29	67

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	O	197/203 (97%)	187 (95%)	10 (5%)	0	100	100
14	P	151/184 (82%)	143 (95%)	8 (5%)	0	100	100
15	Q	185/188 (98%)	171 (92%)	14 (8%)	0	100	100
16	R	153/196 (78%)	144 (94%)	9 (6%)	0	100	100
17	S	174/176 (99%)	160 (92%)	14 (8%)	0	100	100
18	T	157/160 (98%)	139 (88%)	17 (11%)	1 (1%)	25	63
19	U	100/128 (78%)	90 (90%)	10 (10%)	0	100	100
20	V	129/140 (92%)	121 (94%)	8 (6%)	0	100	100
21	W	61/157 (39%)	55 (90%)	6 (10%)	0	100	100
22	X	116/156 (74%)	106 (91%)	10 (9%)	0	100	100
23	Y	132/145 (91%)	125 (95%)	7 (5%)	0	100	100
24	Z	133/136 (98%)	122 (92%)	11 (8%)	0	100	100
25	a	145/148 (98%)	132 (91%)	13 (9%)	0	100	100
26	b	100/226 (44%)	95 (95%)	5 (5%)	0	100	100
27	c	96/115 (84%)	92 (96%)	4 (4%)	0	100	100
28	d	105/125 (84%)	94 (90%)	11 (10%)	0	100	100
29	e	126/135 (93%)	118 (94%)	8 (6%)	0	100	100
30	f	107/110 (97%)	101 (94%)	6 (6%)	0	100	100
31	g	112/116 (97%)	106 (95%)	6 (5%)	0	100	100
32	h	120/123 (98%)	117 (98%)	3 (2%)	0	100	100
33	i	100/105 (95%)	95 (95%)	5 (5%)	0	100	100
34	j	84/97 (87%)	81 (96%)	3 (4%)	0	100	100
35	k	67/70 (96%)	63 (94%)	4 (6%)	0	100	100
36	l	48/51 (94%)	39 (81%)	9 (19%)	0	100	100
37	m	50/102 (49%)	47 (94%)	3 (6%)	0	100	100
38	n	23/25 (92%)	23 (100%)	0	0	100	100
39	o	102/106 (96%)	93 (91%)	9 (9%)	0	100	100
40	p	89/92 (97%)	81 (91%)	8 (9%)	0	100	100
42	r	122/137 (89%)	112 (92%)	10 (8%)	0	100	100
45	w	392/403 (97%)	361 (92%)	31 (8%)	0	100	100
46	B	68/273 (25%)	56 (82%)	11 (16%)	1 (2%)	10	45

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
47	1	463/476 (97%)	460 (99%)	3 (1%)	0	100	100
48	2	27/96 (28%)	27 (100%)	0	0	100	100
49	3	66/68 (97%)	66 (100%)	0	0	100	100
50	4	340/483 (70%)	336 (99%)	3 (1%)	1 (0%)	41	75
51	5	88/106 (83%)	87 (99%)	1 (1%)	0	100	100
52	7	519/563 (92%)	512 (99%)	7 (1%)	0	100	100
53	6	222/224 (99%)	222 (100%)	0	0	100	100
54	8	175/188 (93%)	174 (99%)	1 (1%)	0	100	100
56	9	107/129 (83%)	101 (94%)	6 (6%)	0	100	100
All	All	8428/9902 (85%)	7941 (94%)	481 (6%)	6 (0%)	54	84

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	N	76	PRO
10	L	64	VAL
50	4	347	GLY
18	T	82	GLY
46	B	242	PRO

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	190/199 (96%)	189 (100%)	1 (0%)	88	93
2	C	302/337 (90%)	300 (99%)	2 (1%)	84	90
3	D	247/250 (99%)	247 (100%)	0	100	100
4	E	206/251 (82%)	205 (100%)	1 (0%)	88	93
5	F	196/215 (91%)	196 (100%)	0	100	100
6	G	200/272 (74%)	199 (100%)	1 (0%)	88	93
7	H	169/171 (99%)	169 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	I	175/181 (97%)	175 (100%)	0	100	100
9	J	143/149 (96%)	143 (100%)	0	100	100
10	L	175/176 (99%)	174 (99%)	1 (1%)	86	91
11	M	117/161 (73%)	117 (100%)	0	100	100
12	N	171/172 (99%)	169 (99%)	2 (1%)	71	83
13	O	171/173 (99%)	169 (99%)	2 (1%)	71	83
14	P	134/163 (82%)	132 (98%)	2 (2%)	65	80
15	Q	164/164 (100%)	163 (99%)	1 (1%)	86	91
16	R	138/175 (79%)	137 (99%)	1 (1%)	84	90
17	S	157/157 (100%)	155 (99%)	2 (1%)	69	81
18	T	139/140 (99%)	139 (100%)	0	100	100
19	U	92/114 (81%)	91 (99%)	1 (1%)	73	84
20	V	101/107 (94%)	100 (99%)	1 (1%)	76	86
21	W	55/126 (44%)	55 (100%)	0	100	100
22	X	106/134 (79%)	103 (97%)	3 (3%)	43	66
23	Y	124/135 (92%)	122 (98%)	2 (2%)	62	79
24	Z	117/118 (99%)	116 (99%)	1 (1%)	78	87
25	a	119/120 (99%)	118 (99%)	1 (1%)	81	89
26	b	84/172 (49%)	84 (100%)	0	100	100
27	c	84/98 (86%)	83 (99%)	1 (1%)	71	83
28	d	98/110 (89%)	96 (98%)	2 (2%)	55	74
29	e	114/121 (94%)	113 (99%)	1 (1%)	78	87
30	f	88/89 (99%)	88 (100%)	0	100	100
31	g	98/99 (99%)	98 (100%)	0	100	100
32	h	108/110 (98%)	108 (100%)	0	100	100
33	i	86/89 (97%)	86 (100%)	0	100	100
34	j	73/80 (91%)	71 (97%)	2 (3%)	44	67
35	k	64/65 (98%)	64 (100%)	0	100	100
36	l	47/48 (98%)	47 (100%)	0	100	100
37	m	48/90 (53%)	48 (100%)	0	100	100
38	n	24/24 (100%)	24 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
39	o	92/94 (98%)	92 (100%)	0	100	100
40	p	74/75 (99%)	72 (97%)	2 (3%)	44	67
42	r	108/121 (89%)	108 (100%)	0	100	100
45	w	342/348 (98%)	340 (99%)	2 (1%)	86	91
46	B	54/207 (26%)	54 (100%)	0	100	100
47	1	390/398 (98%)	386 (99%)	4 (1%)	76	86
48	2	26/74 (35%)	26 (100%)	0	100	100
49	3	59/59 (100%)	58 (98%)	1 (2%)	60	78
50	4	306/435 (70%)	303 (99%)	3 (1%)	76	86
51	5	83/99 (84%)	83 (100%)	0	100	100
52	7	443/476 (93%)	443 (100%)	0	100	100
53	6	187/187 (100%)	185 (99%)	2 (1%)	73	84
54	8	155/164 (94%)	154 (99%)	1 (1%)	86	91
56	9	93/108 (86%)	90 (97%)	3 (3%)	39	63
All	All	7336/8400 (87%)	7287 (99%)	49 (1%)	84	90

5 of 49 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
29	e	48	ARG
47	1	18	GLU
34	j	67	LEU
40	p	52	VAL
47	1	130	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
7	H	76	HIS
16	R	58	HIS
45	w	322	HIS
47	1	294	GLN
52	7	452	HIS

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
41	q	74/77 (96%)	16 (21%)	0
43	u	119/120 (99%)	14 (11%)	0
44	v	155/156 (99%)	37 (23%)	0
55	K	3519/3543 (99%)	818 (23%)	58 (1%)
All	All	3867/3896 (99%)	885 (22%)	58 (1%)

5 of 885 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
41	q	9	A
41	q	12	G
41	q	13	U
41	q	16	C
41	q	19	G

5 of 58 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
55	K	1455	G
55	K	4925	U
55	K	2266	C
55	K	4921	C
55	K	4354	U

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 225 ligands modelled in this entry, 225 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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
55	K	24

The worst 5 of 24 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	K	2113:G	O3'	2258:C	P	40.45
1	K	1252:C	O3'	1271:G	P	37.04
1	K	1219:G	O3'	1233:G	P	18.73
1	K	3948:C	O3'	4065:G	P	18.66
1	K	4138:C	O3'	4146:G	P	17.71

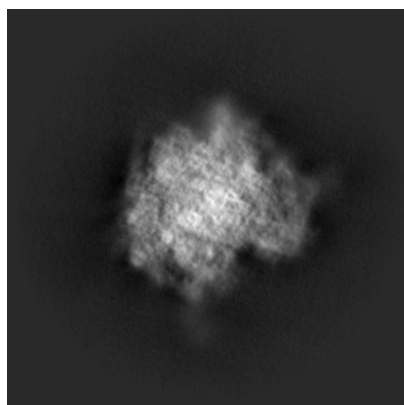
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-26133. These allow visual inspection of the internal detail of the map and identification of artifacts.

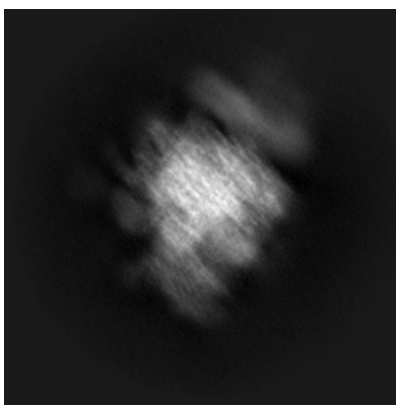
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

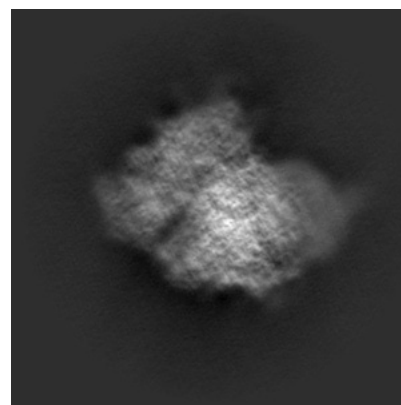
#### 6.1.1 Primary map



X



Y

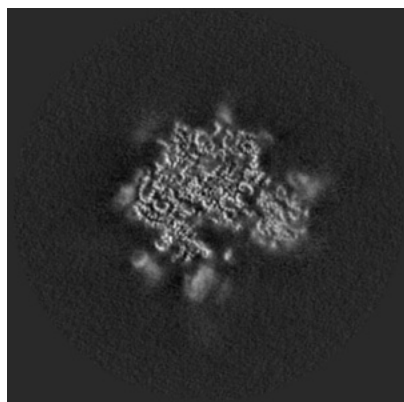


Z

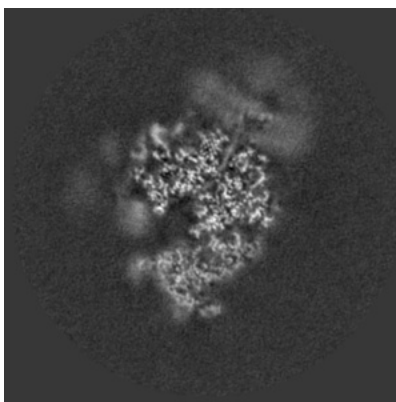
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

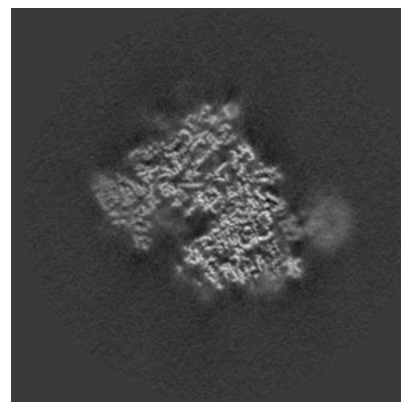
#### 6.2.1 Primary map



X Index: 206



Y Index: 206

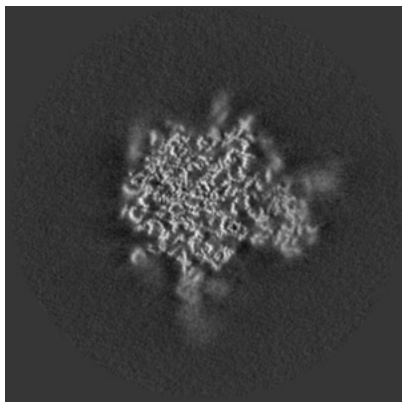


Z Index: 206

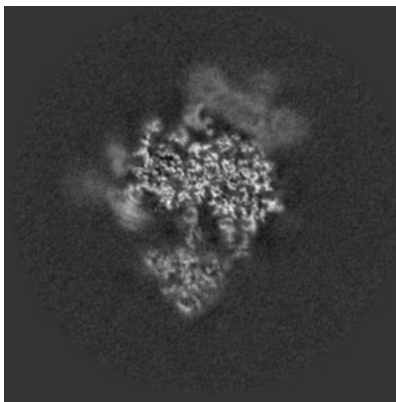
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

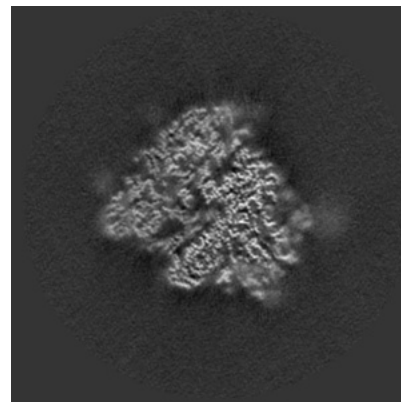
### 6.3.1 Primary map



X Index: 218



Y Index: 194

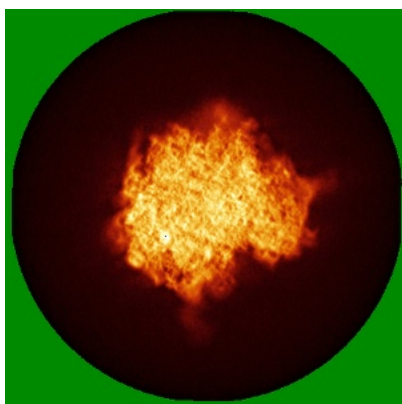


Z Index: 192

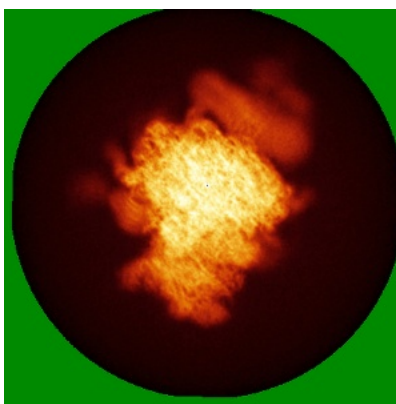
The images above show the largest variance slices of the map in three orthogonal directions.

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

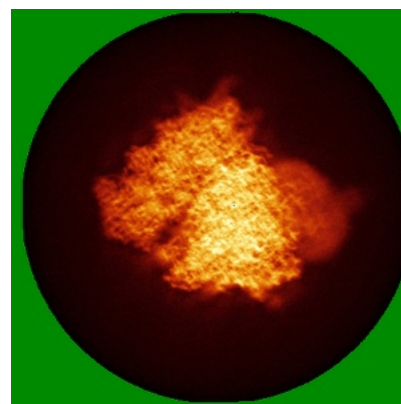
### 6.4.1 Primary map



X



Y



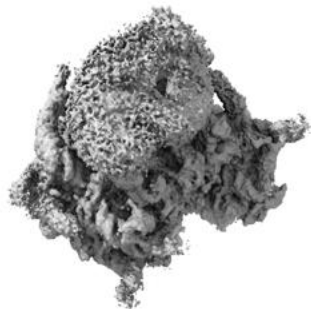
Z

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



## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

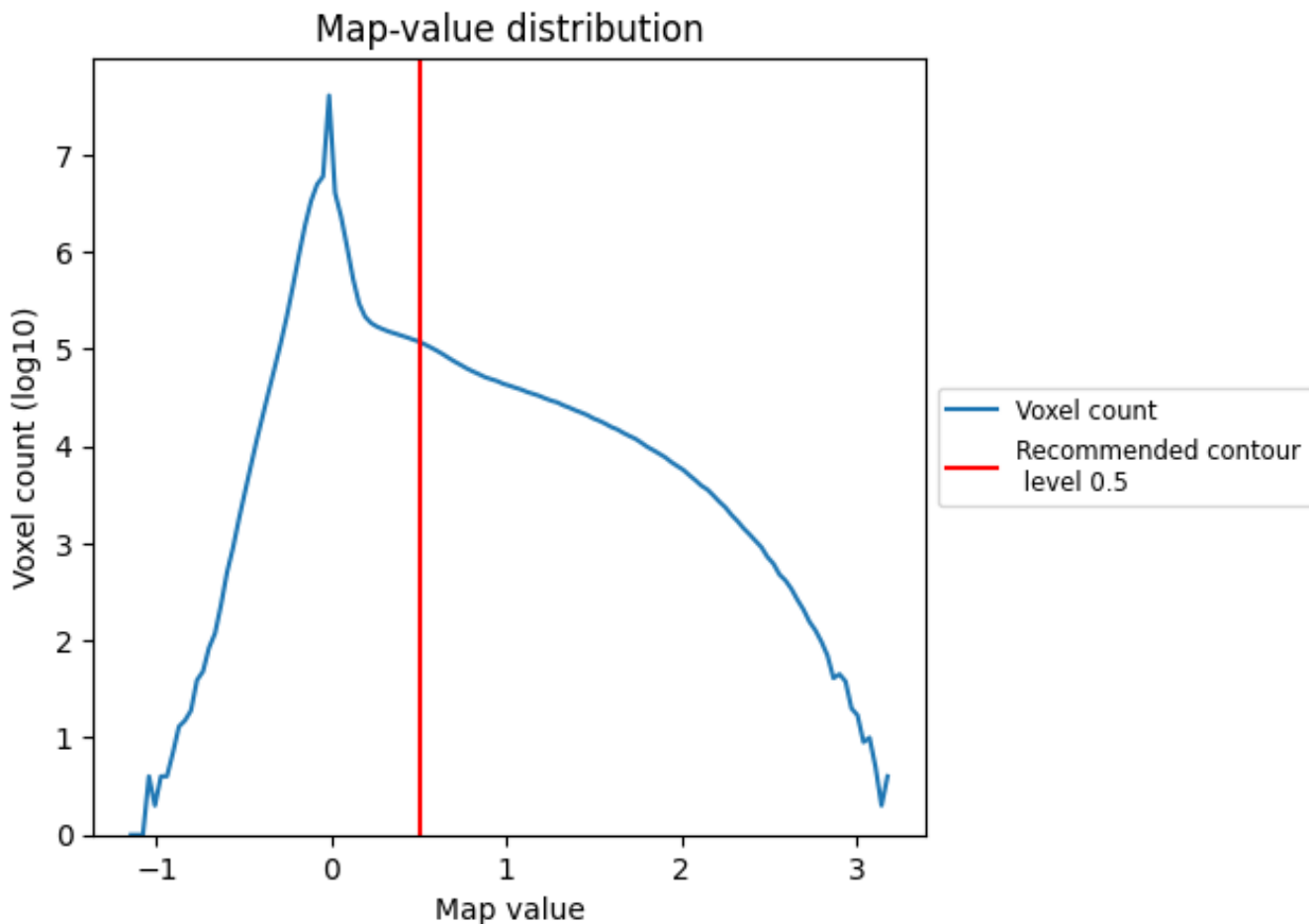
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

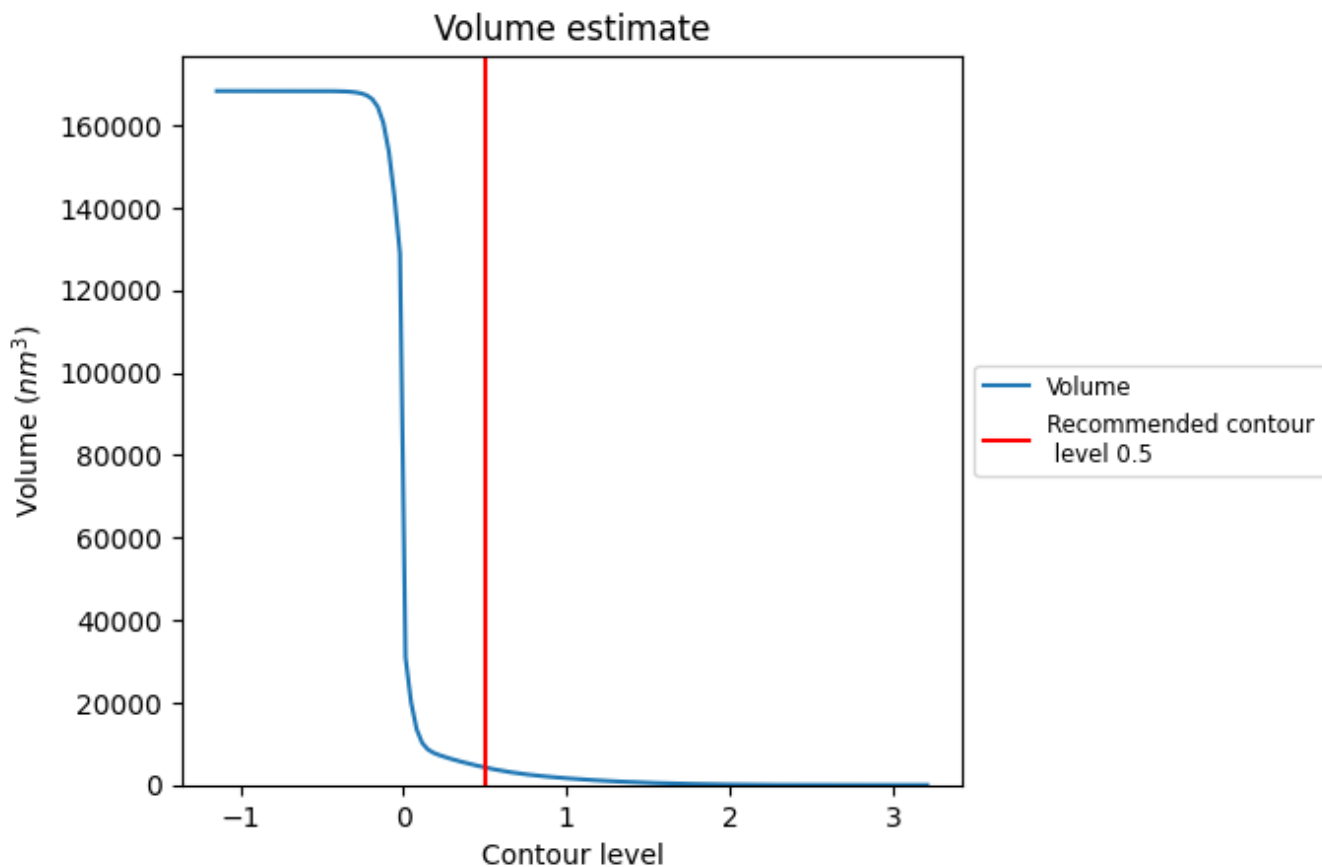
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

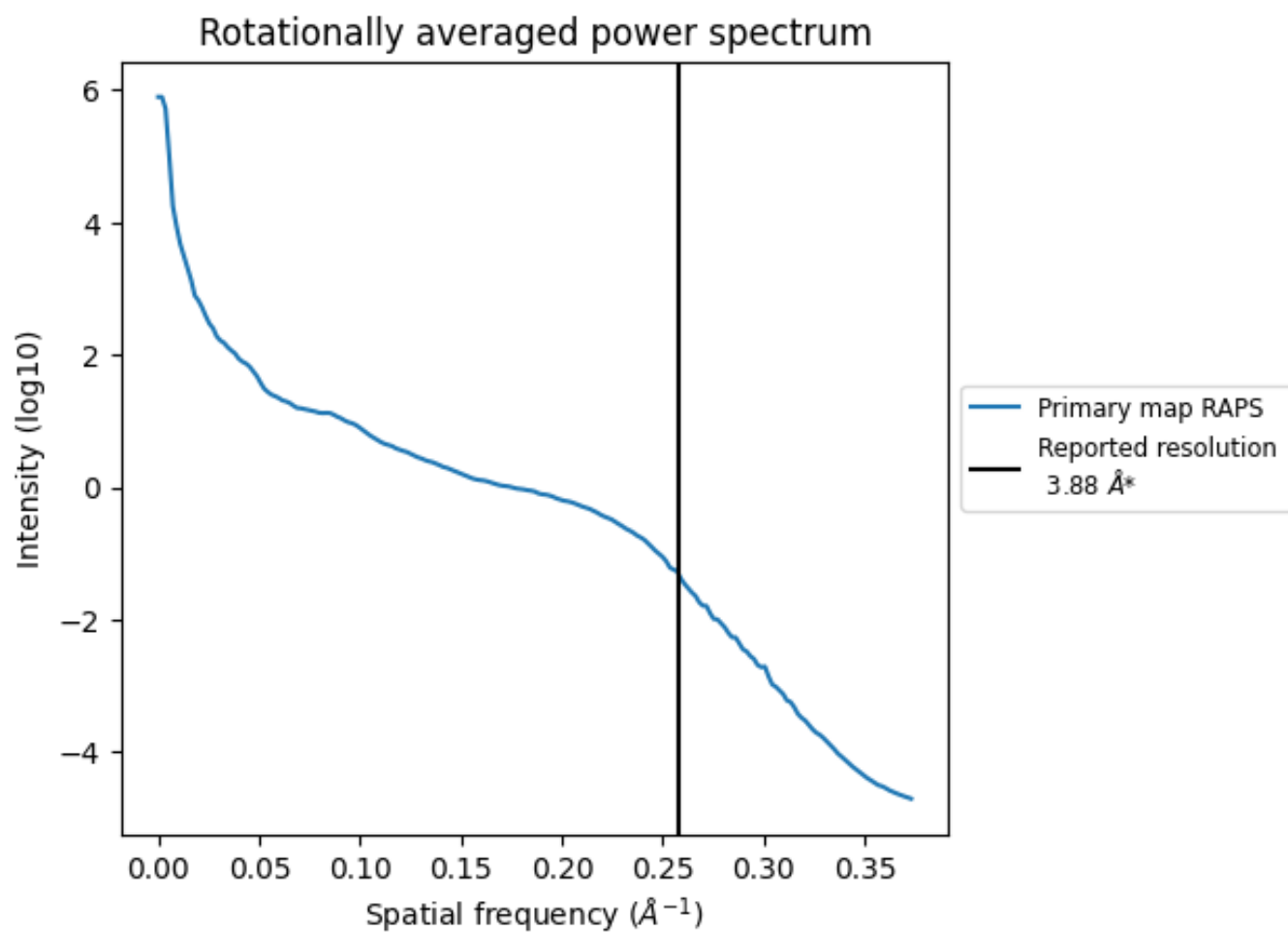
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 4244 nm<sup>3</sup>; this corresponds to an approximate mass of 3834 kDa.

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

### 7.3 Rotationally averaged power spectrum [i](#)



\*Reported resolution corresponds to spatial frequency of 0.258 Å<sup>-1</sup>

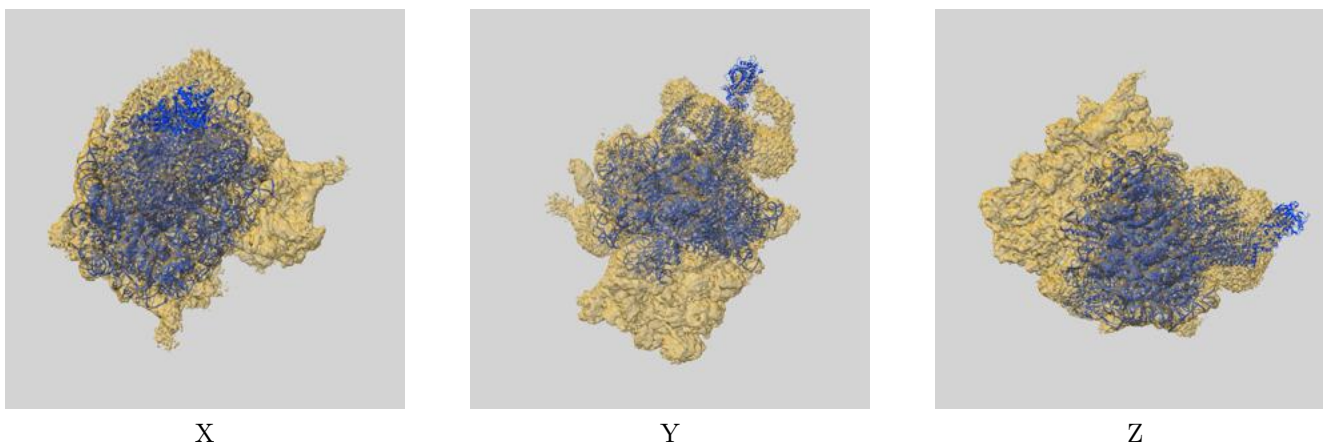
## 8 Fourier-Shell correlation

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

## 9 Map-model fit [i](#)

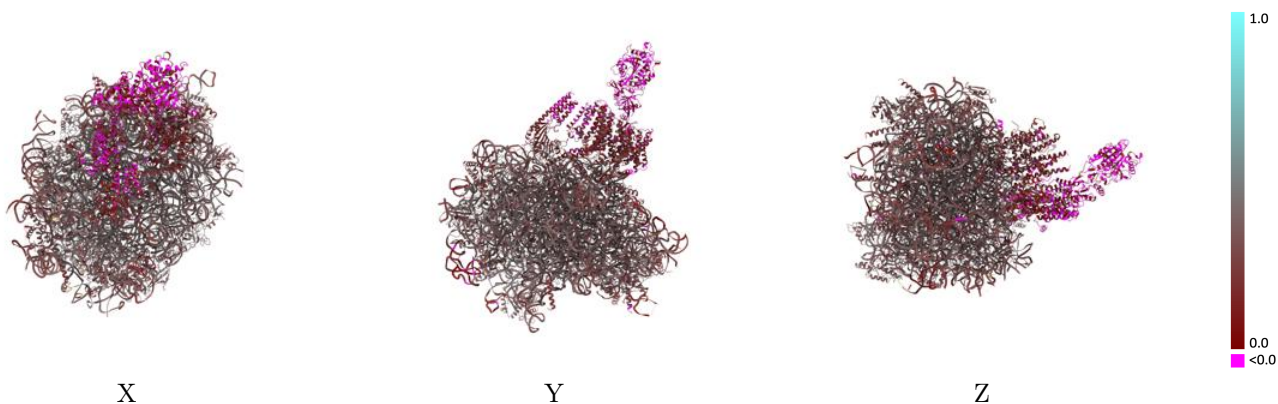
This section contains information regarding the fit between EMDB map EMD-26133 and PDB model 7TUT. Per-residue inclusion information can be found in section 3 on page 17.

### 9.1 Map-model overlay [i](#)



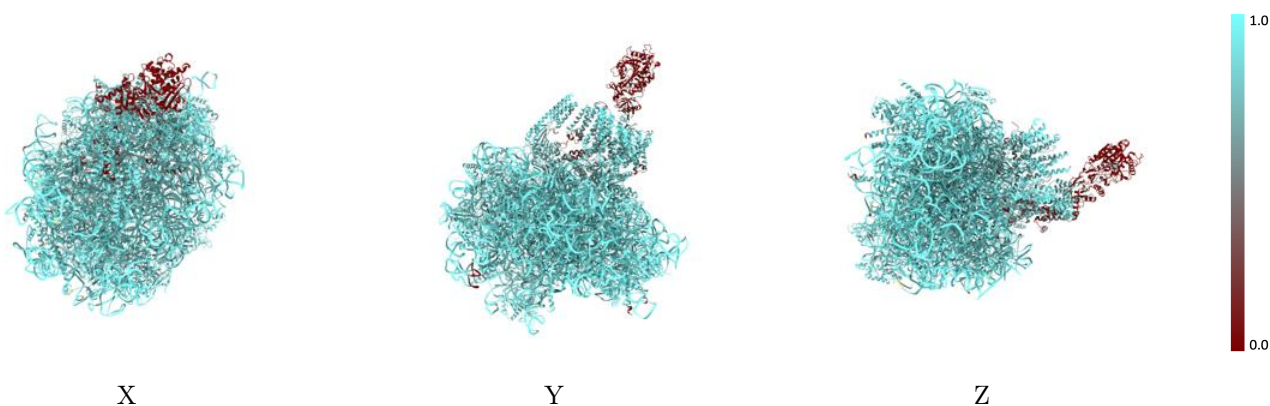
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



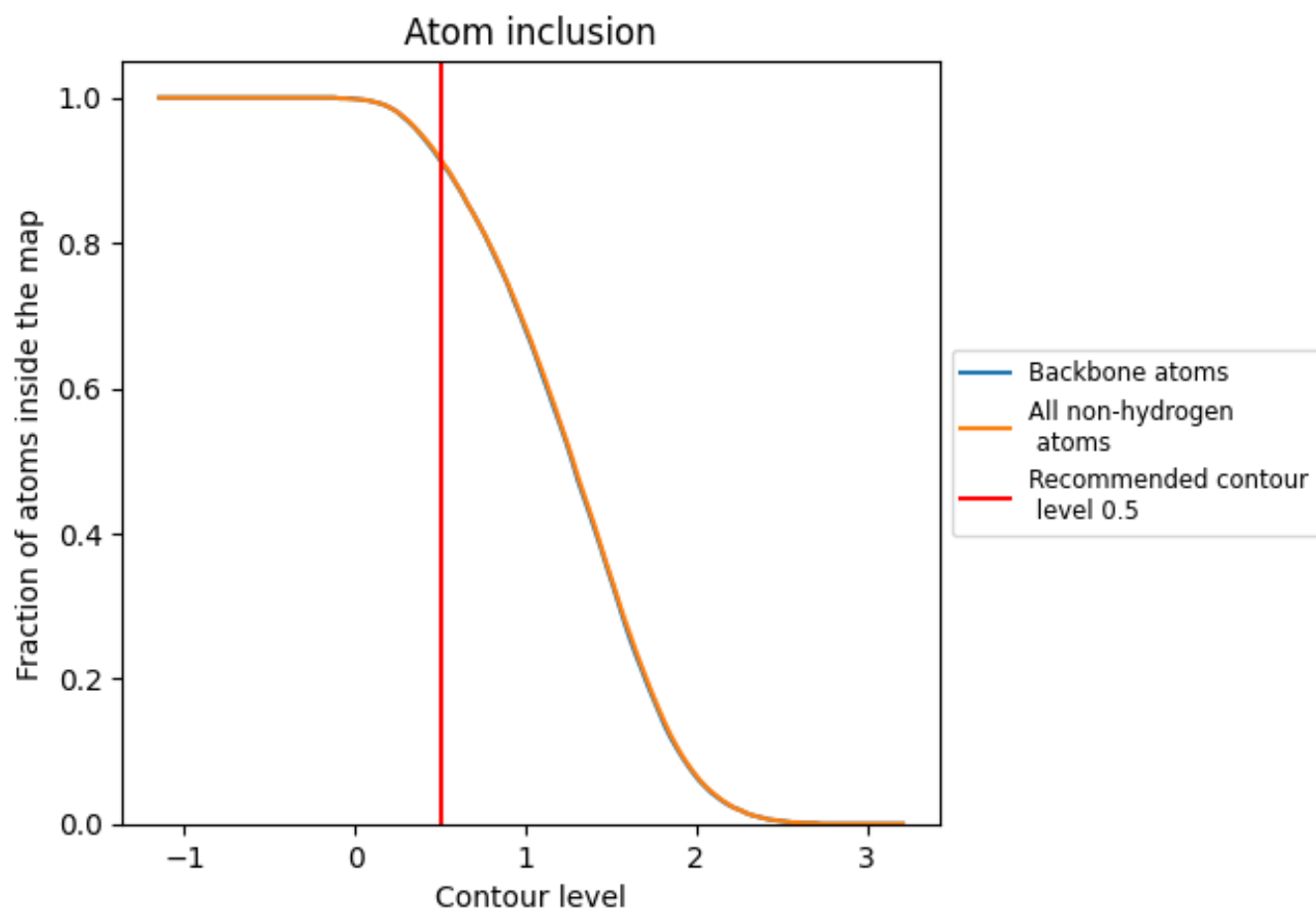
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.5).

## 9.4 Atom inclusion [i](#)









































































At the recommended contour level, 91% of all backbone atoms, 92% 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 (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9160	 0.3250
1	 0.8120	 0.2120
2	 0.8580	 0.1580
3	 0.7680	 0.1660
4	 0.7570	 0.1820
5	 0.8210	 0.0900
6	 0.8010	 0.1400
7	 0.1390	 0.0200
8	 0.6010	 0.1030
9	 0.6230	 0.0320
A	 0.9220	 0.3700
B	 0.7840	 0.2490
C	 0.9200	 0.3570
D	 0.9380	 0.3220
E	 0.9190	 0.3340
F	 0.9060	 0.3420
G	 0.8760	 0.3020
H	 0.8950	 0.3520
I	 0.9120	 0.3640
J	 0.9140	 0.3220
K	 0.9880	 0.3510
L	 0.8960	 0.3290
M	 0.9090	 0.3450
N	 0.9160	 0.3470
O	 0.8920	 0.3470
P	 0.8860	 0.3480
Q	 0.9390	 0.3670
R	 0.8840	 0.3280
S	 0.9230	 0.3740
T	 0.8960	 0.3620
U	 0.8580	 0.3010
V	 0.9110	 0.3820
W	 0.9080	 0.3630
X	 0.8900	 0.3420
Y	 0.8530	 0.3400



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Chain	Atom inclusion	Q-score
Z	 0.9150	 0.3380
a	 0.9340	 0.3580
b	 0.8740	 0.2900
c	 0.9340	 0.3320
d	 0.9280	 0.3540
e	 0.8980	 0.3730
f	 0.9130	 0.3800
g	 0.8880	 0.3390
h	 0.8730	 0.3120
i	 0.9080	 0.3200
j	 0.9350	 0.3480
k	 0.8560	 0.3050
l	 0.8950	 0.3240
m	 0.9280	 0.3500
n	 0.8490	 0.2300
o	 0.9250	 0.3640
p	 0.8910	 0.3330
q	 0.8890	 0.3160
r	 0.9310	 0.3650
u	 0.9950	 0.3740
v	 0.9860	 0.3500
w	 0.9170	 0.3710