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

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

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

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

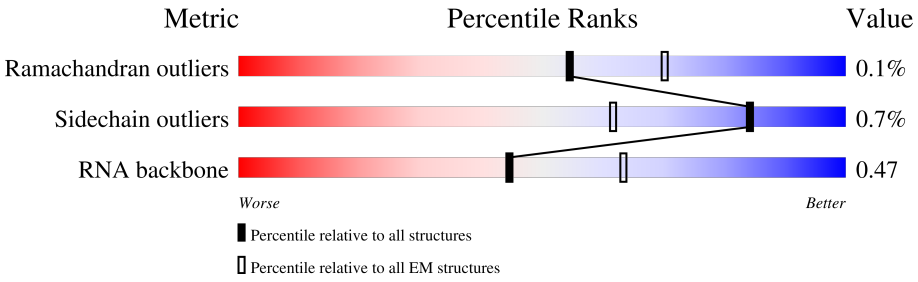
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

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 >=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	257	96% ·
2	C	413	87% 12%
3	D	297	99% ·
4	E	291	79% · 20%
5	F	247	91% 9%
6	G	319	· 73% 27%
7	H	192	· 99% ·
8	I	214	96% ·

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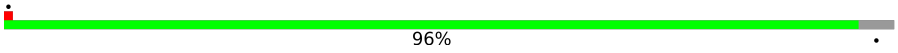
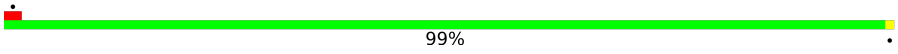
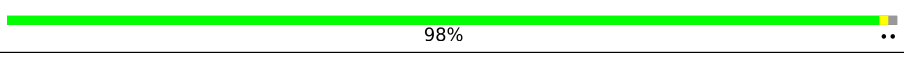
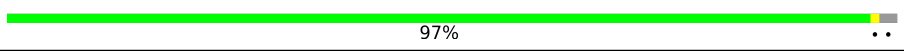
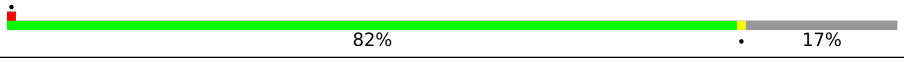
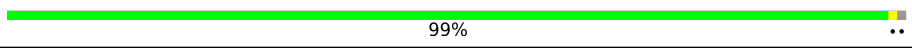
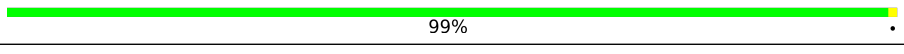
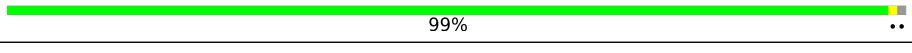
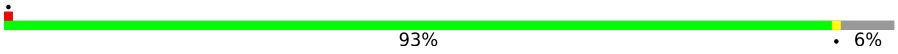
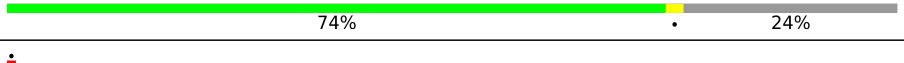
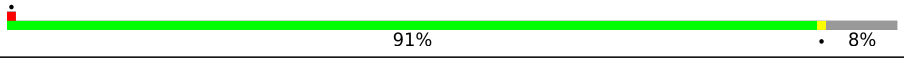
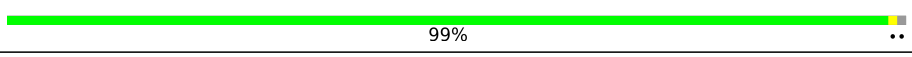
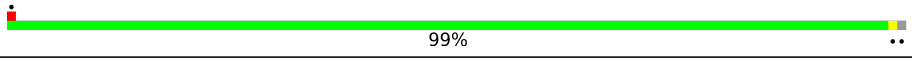
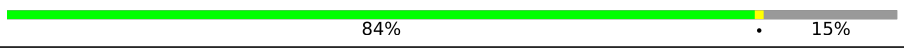
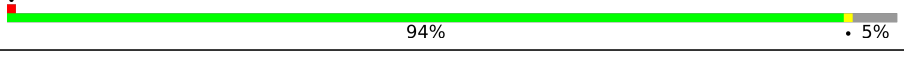
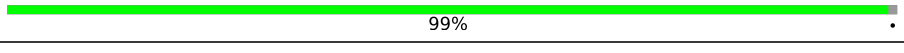
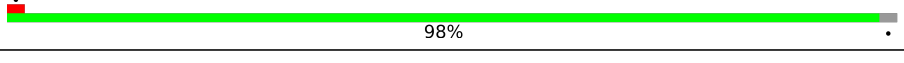
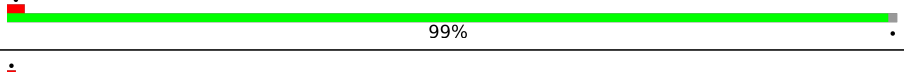
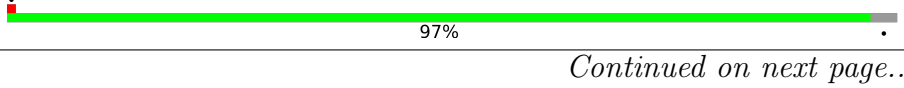
Mol	Chain	Length	Quality of chain
9	J	178	
10	L	211	
11	M	218	
12	N	204	
13	O	203	
14	P	184	
15	Q	188	
16	R	196	
17	S	176	
18	T	160	
19	U	128	
20	V	140	
21	W	157	
22	X	156	
23	Y	145	
24	Z	136	
25	a	148	
26	b	226	
27	c	115	
28	d	125	
29	e	135	
30	f	110	
31	g	116	
32	h	123	
33	i	105	

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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

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
6	G	233	Total	C	H	N	O	S	0	0
			3906	1199	2027	361	315	4		

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
7	H	190	Total	C	H	N	O	S	0	0
			3113	954	1597	284	272	6		

- Molecule 8 is a protein called uL16.

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

- Molecule 9 is a protein called uL5.

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

- Molecule 10 is a protein called eL13.

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

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
11	M	138	Total	C	H	N	O	S	0	0
			2348	727	1211	221	182	7		

- Molecule 12 is a protein called eL15.

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

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
13	O	199	Total	C	H	N	O	S	0	0
			3408	1051	1778	319	255	5		

- Molecule 14 is a protein called uL22.

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

- Molecule 15 is a protein called eL18.

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

- Molecule 16 is a protein called eL19.

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

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
17	S	176	Total	C	H	N	O	S	0	0
			2970	930	1508	285	236	11		

- Molecule 18 is a protein called eL21.

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

- Molecule 19 is a protein called eL22.

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

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
20	V	131	Total	C	H	N	O	S	0	0
			2018	618	1039	184	172	5		

- Molecule 21 is a protein called eL24.

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

- Molecule 22 is a protein called eL23.

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

- Molecule 23 is a protein called uL24.

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

- Molecule 24 is a protein called eL27.

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

- Molecule 25 is a protein called uL15.

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

- Molecule 26 is a protein called eL29.

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

- Molecule 27 is a protein called eL30.

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

- Molecule 28 is a protein called eL31.

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

- Molecule 29 is a protein called eL32.

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

- Molecule 30 is a protein called eL33.

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

- Molecule 31 is a protein called eL34.

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

- Molecule 32 is a protein called eL35.

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

- Molecule 33 is a protein called eL36.

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

- Molecule 34 is a protein called eL37.

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

- Molecule 35 is a protein called eL38.

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

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
36	l	50	Total	C	H	N	O	S	0	0
			927	286	480	96	64	1		

- Molecule 37 is a protein called eL40.

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

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
38	n	25	Total	C	H	N	O	S	0	0
			528	145	289	64	27	3		

- Molecule 39 is a protein called eL42.

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

- Molecule 40 is a protein called eL43.

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

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

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

- Molecule 42 is a protein called eL28.

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

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

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

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
44	v	156	Total	C	H	N	O	P	0	0
			4997	1480	1683	585	1094	155		

- Molecule 45 is a protein called uL3.

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

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
46	B	70	Total	C	H	N	O	S	0	0
			1054	349	528	84	87	6		

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

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

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

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

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

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

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

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

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

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

- Molecule 52 is a protein called Nicalin.

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

- Molecule 53 is a protein called Transmembrane protein 147.

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

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

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

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

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

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

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

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Continued from previous page...

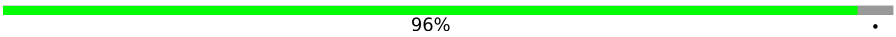
Mol	Chain	Residues	Atoms	AltConf
58	o	1	Total Zn 1 1	0
58	p	1	Total Zn 1 1	0

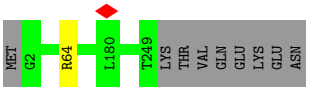
3 Residue-property plots (i)

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

- Molecule 1: uL2

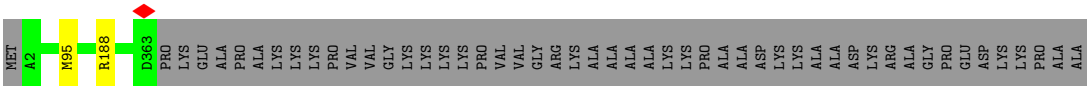
Chain A:





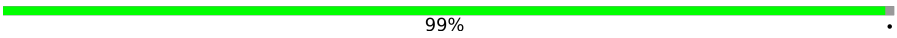
- Molecule 2: uL4

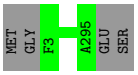
Chain C:



- Molecule 3: uL18

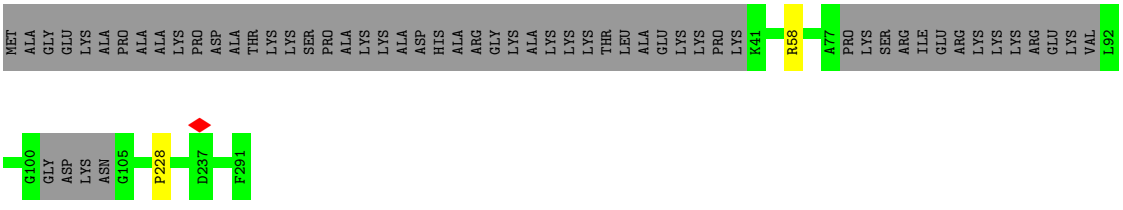
Chain D:





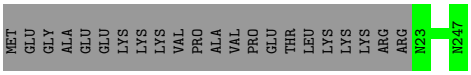
- Molecule 4: eL6

Chain E:



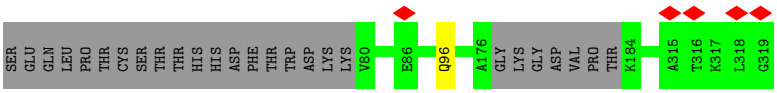
- Molecule 5: uL30

Chain F:



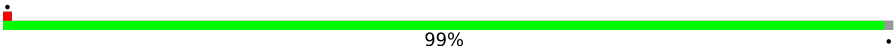
• Molecule 6: eL8

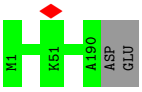
Chain G:



• Molecule 7: uL6

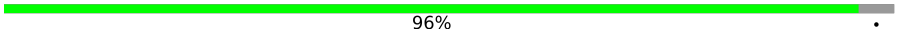
Chain H:

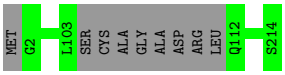




• Molecule 8: uL16

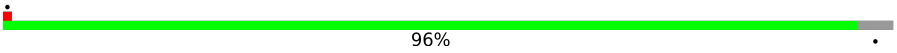
Chain I:

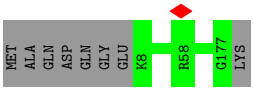




• Molecule 9: uL5

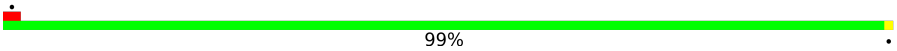
Chain J:

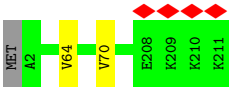




• Molecule 10: eL13

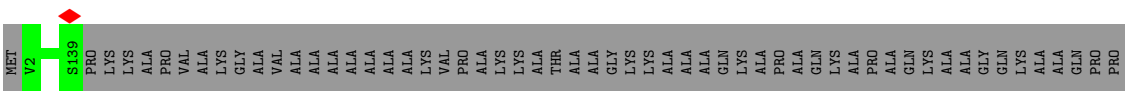
Chain L:





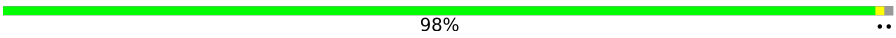
• Molecule 11: eL14

Chain M:



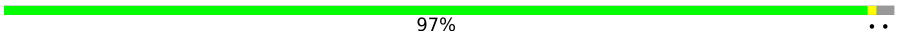
• Molecule 12: eL15

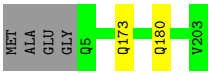
Chain N:



• Molecule 13: uL13

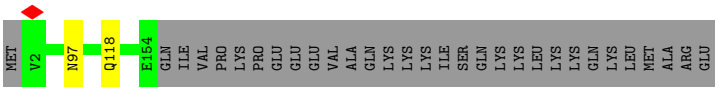
Chain O:





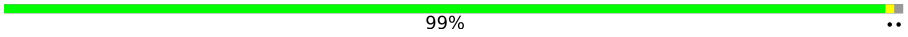
• Molecule 14: uL22

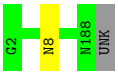
Chain P:



• Molecule 15: eL18

Chain Q:



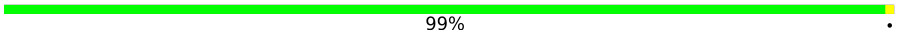


• Molecule 16: eL19

Chain R:

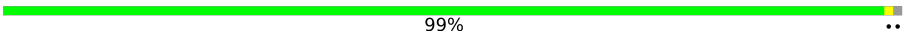
• Molecule 17: eL20

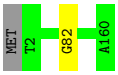
Chain S:



• Molecule 18: eL21

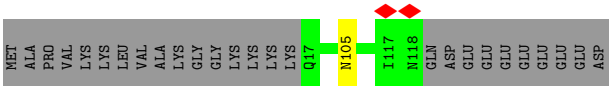
Chain T:





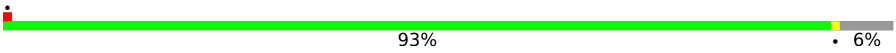
• Molecule 19: eL22

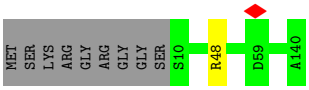
Chain U:



• Molecule 20: uL14

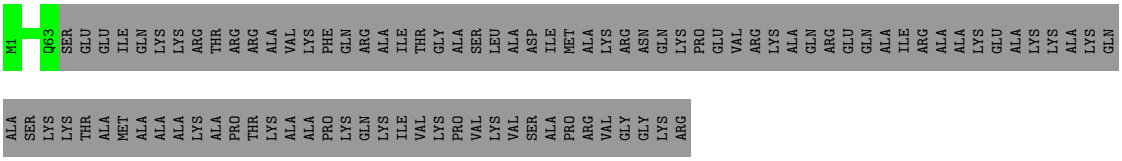
Chain V:





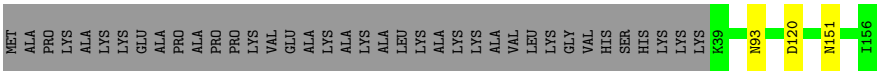
• Molecule 21: eL24

Chain W:



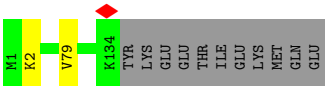
• Molecule 22: eL23

Chain X:



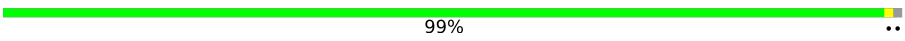
• Molecule 23: uL24

Chain Y:



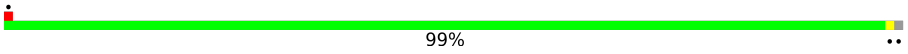
• Molecule 24: eL27

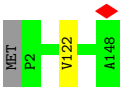
Chain Z:



• Molecule 25: uL15

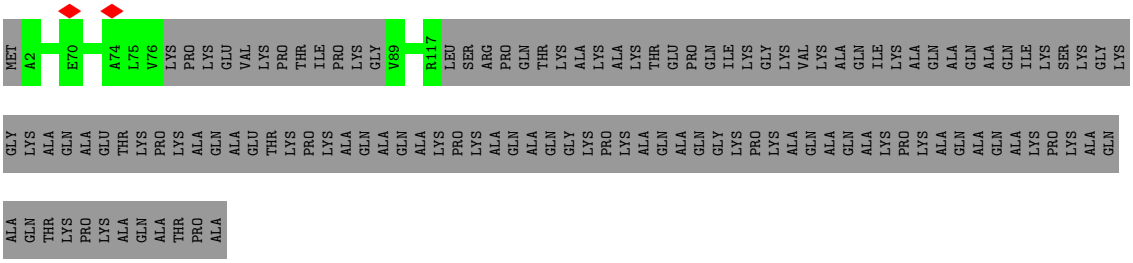
Chain a:





• Molecule 26: eL29

Chain b:

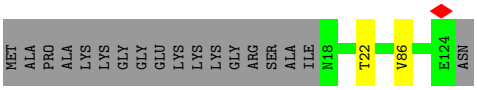


• Molecule 27: eL30

Chain c:

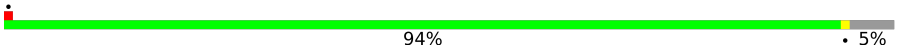
• Molecule 28: eL31

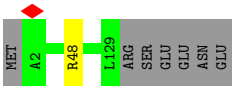
Chain d:



• Molecule 29: eL32

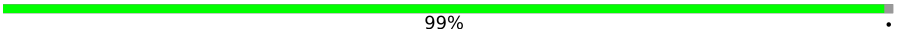
Chain e:





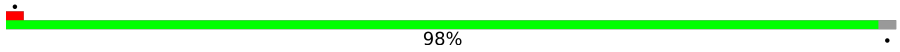
• Molecule 30: eL33

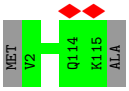
Chain f:



• Molecule 31: eL34

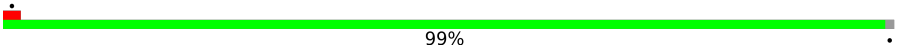
Chain g:





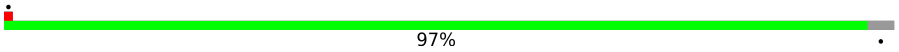
• Molecule 32: eL35

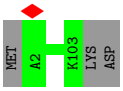
Chain h:



• Molecule 33: eL36

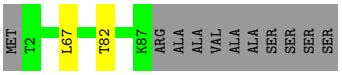
Chain i:





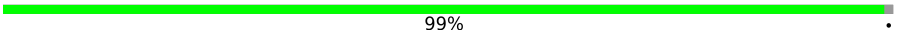
• Molecule 34: eL37

Chain j:



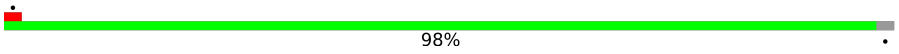
• Molecule 35: eL38

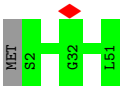
Chain k:



• Molecule 36: eL39

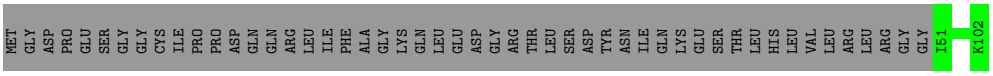
Chain l:





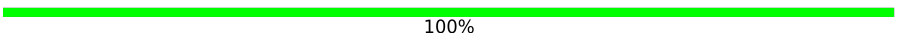
• Molecule 37: eL40

Chain m:



• Molecule 38: eL41

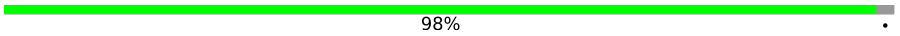
Chain n:



There are no outlier residues recorded for this chain.

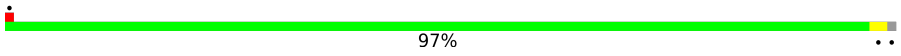
• Molecule 39: eL42

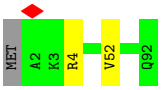
Chain o:



• Molecule 40: eL43

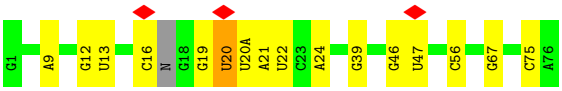
Chain p:





• Molecule 41: P-site tRNA

Chain q:

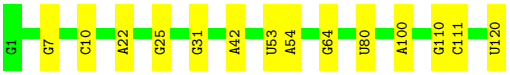


• Molecule 42: eL28

Chain r:

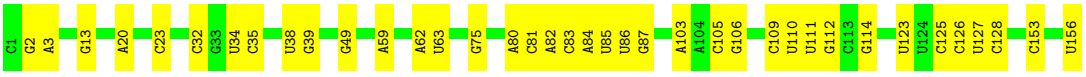
• Molecule 43: 5S ribosomal RNA

Chain u:



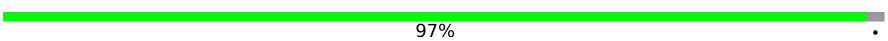
• Molecule 44: 5.8S ribosomal RNA

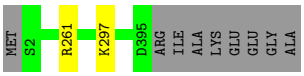
Chain v:



• Molecule 45: uL3

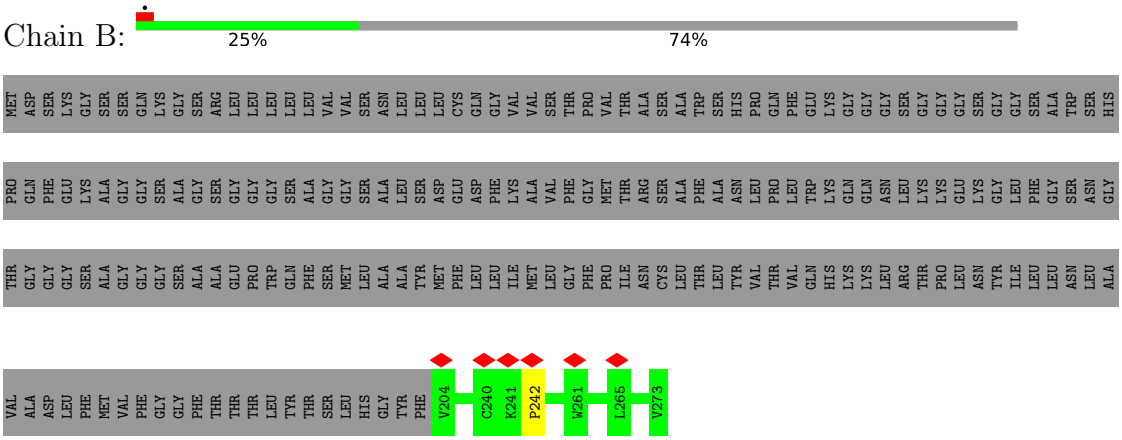
Chain w:





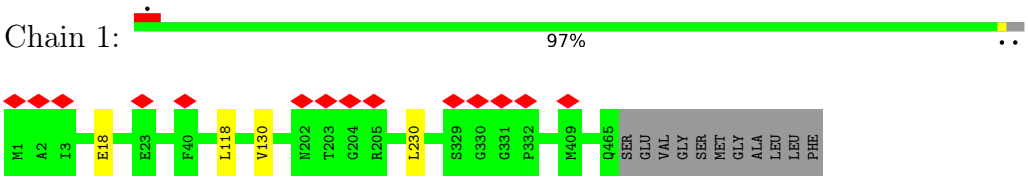
• Molecule 46: Nascent chain

Chain B:



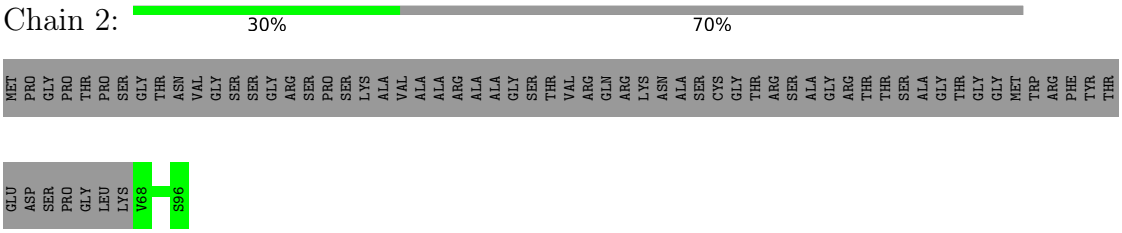
• Molecule 47: Protein transport protein Sec61 subunit alpha isoform 1

Chain 1:



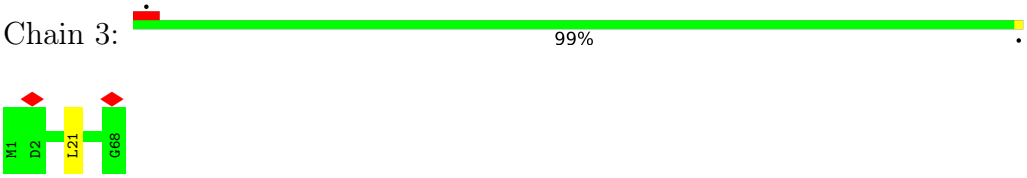
• Molecule 48: Protein transport protein Sec61 subunit beta

Chain 2:



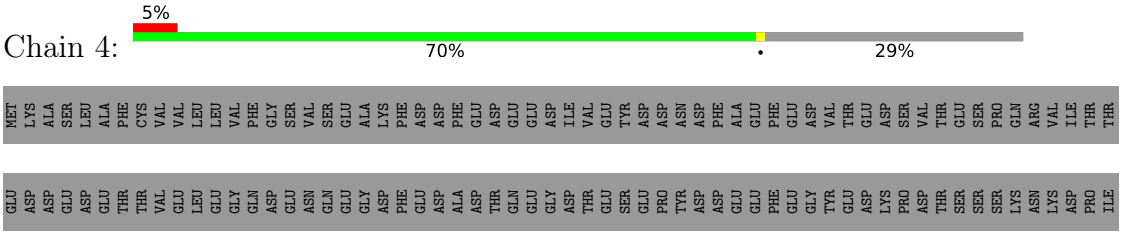
• Molecule 49: Protein transport protein Sec61 gamma

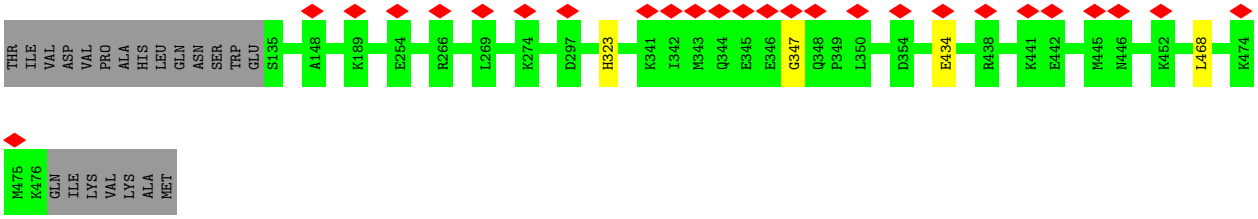
Chain 3:



• Molecule 50: Coiled-coil domain containing 47

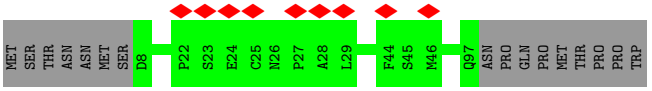
Chain 4:





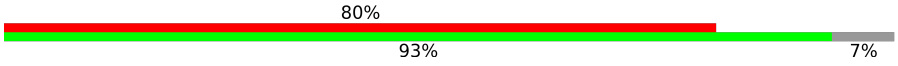
• Molecule 51: PAT complex subunit Asterix

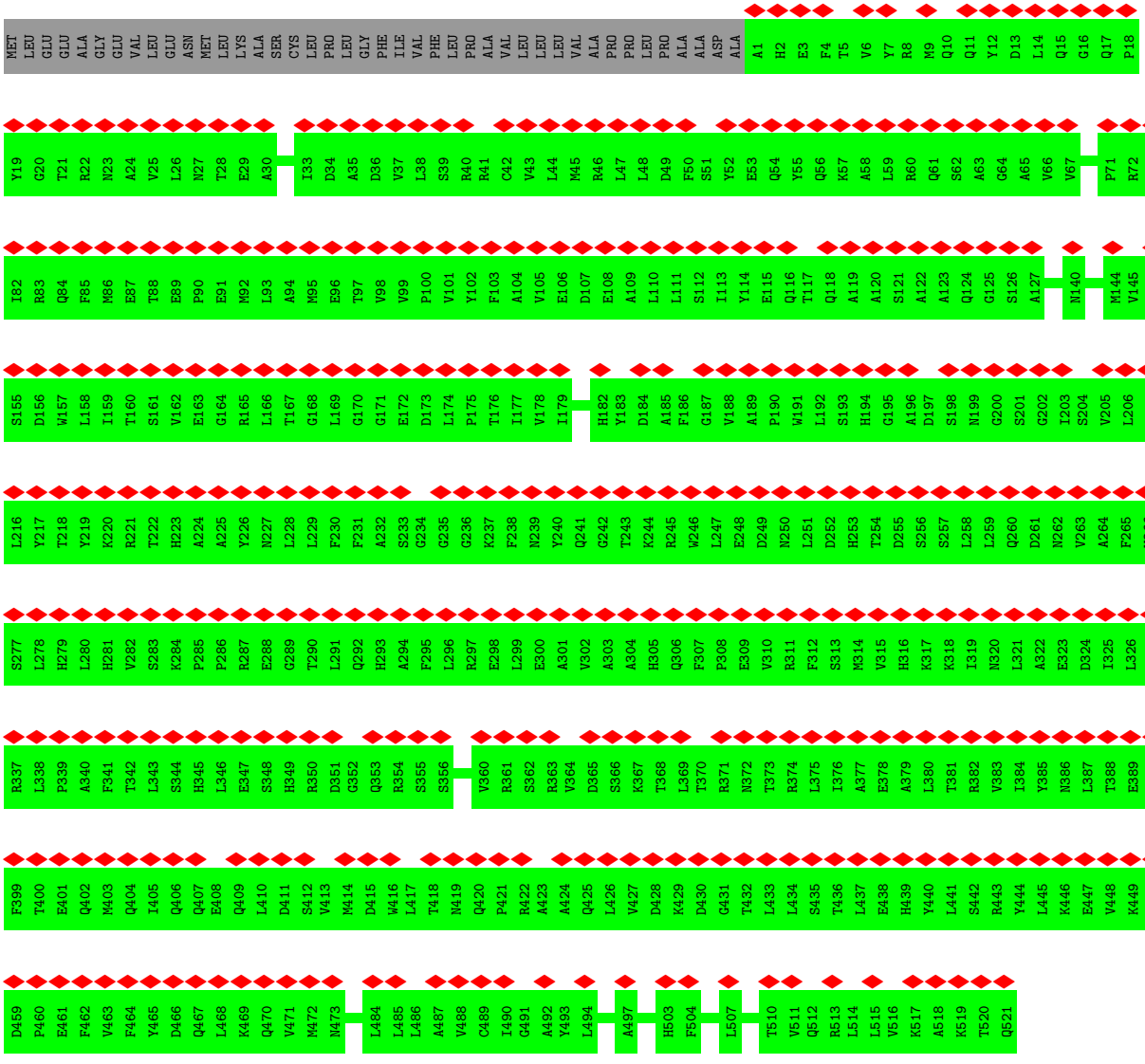
Chain 5:



• Molecule 52: Nicalin

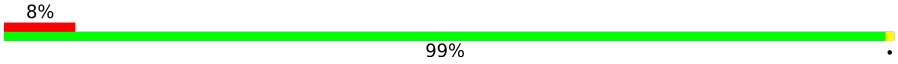
Chain 7:

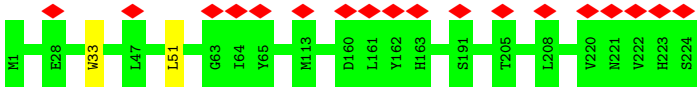




• Molecule 53: Transmembrane protein 147

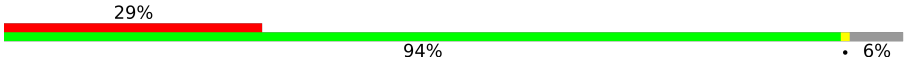
Chain 6:

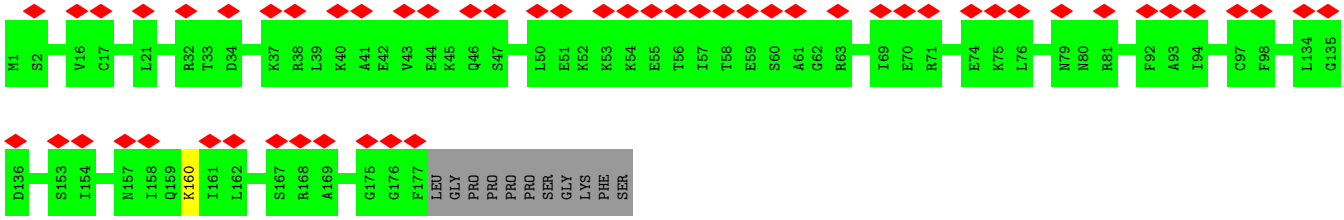




• Molecule 54: Calcium load-activated calcium channel

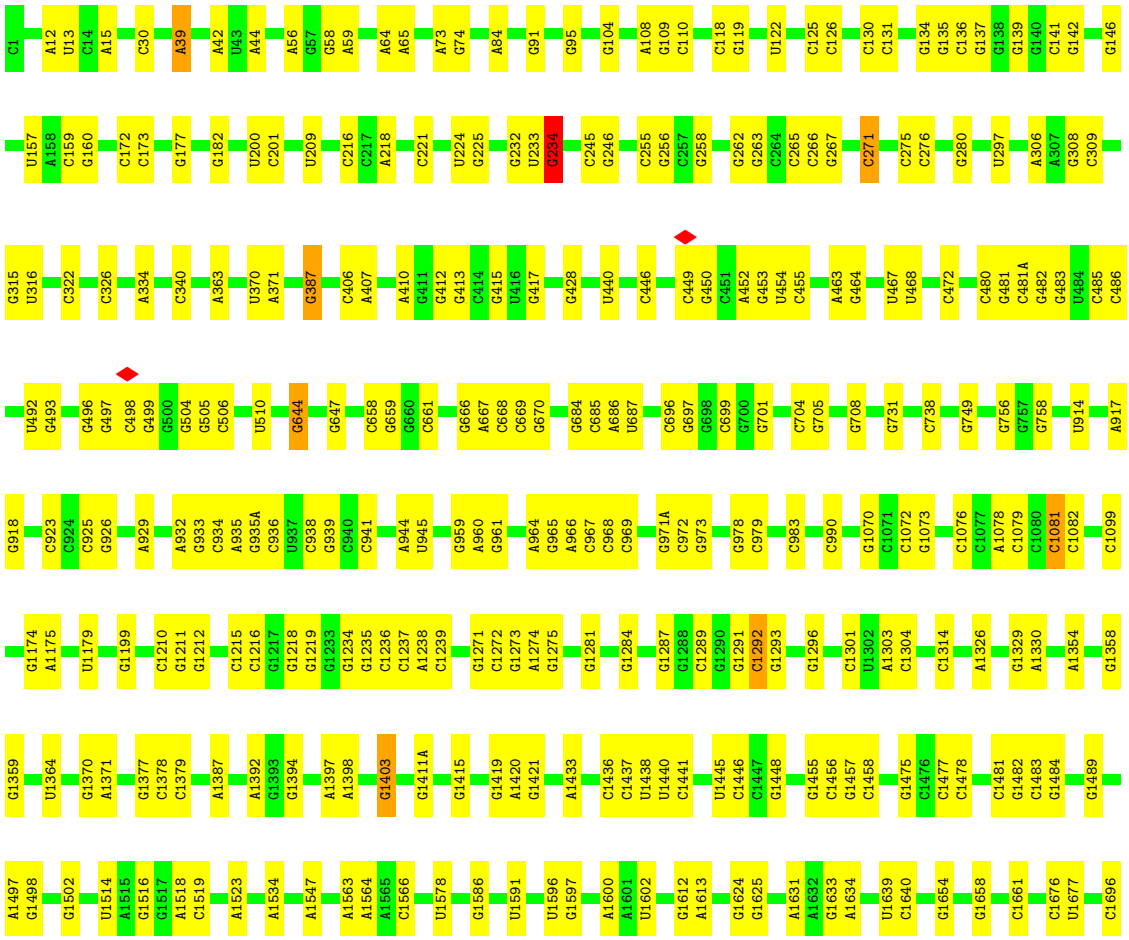
Chain 8:

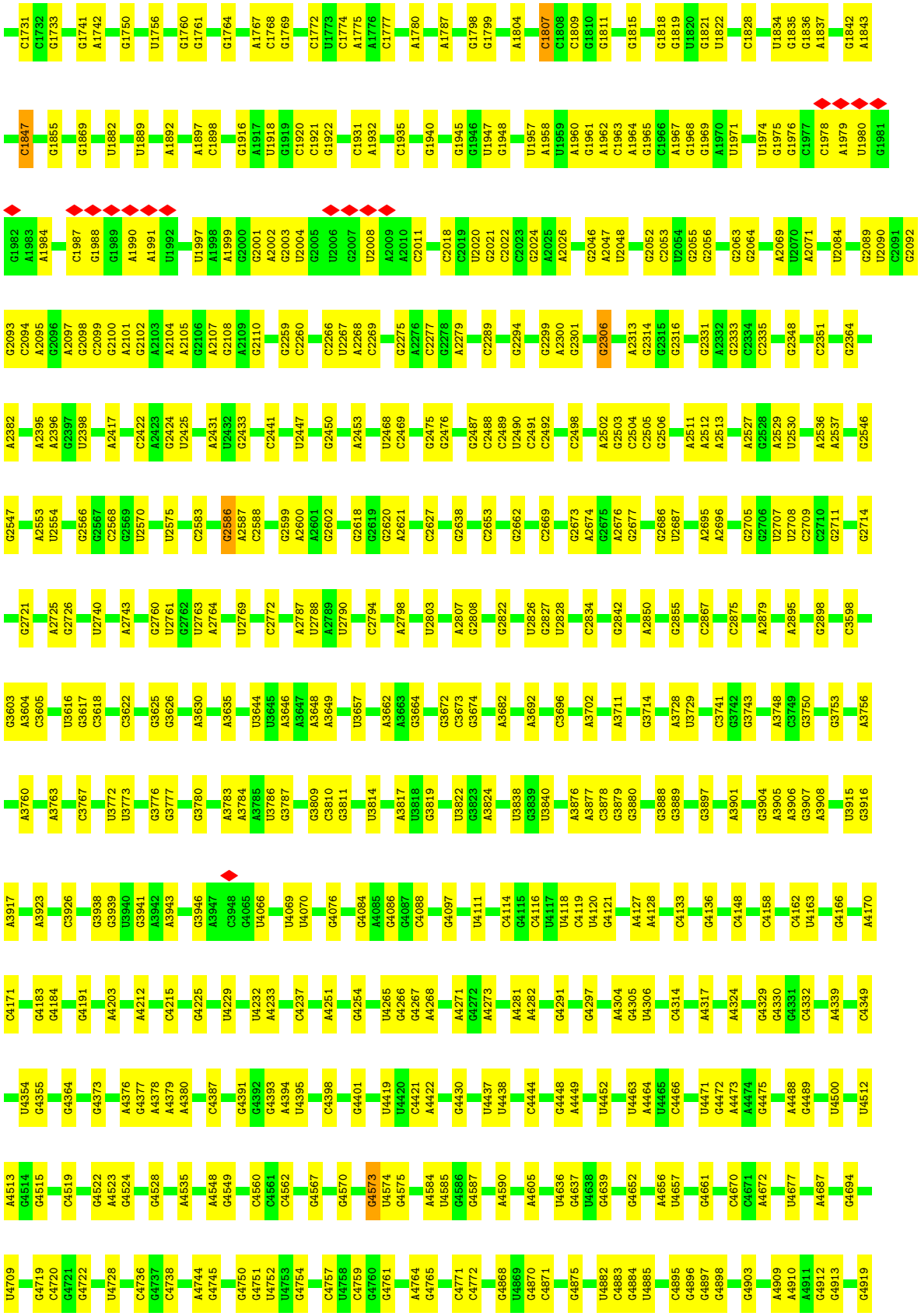




• Molecule 55: 28S ribosomal RNA

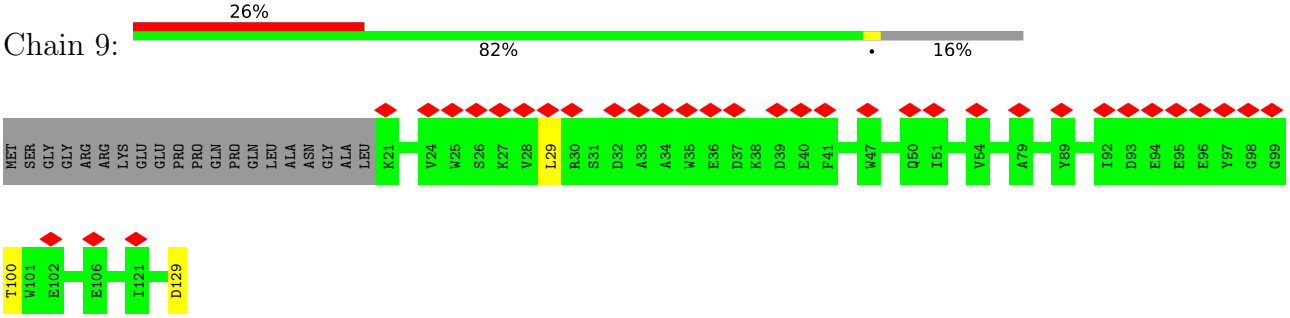
Chain K:




C1731 C1732 G1733 G1741 A1742 G1750 U1756 G1760 G1761 G1764 A1767 C1768 G1769 C1772 U1773 C1774 A1775 A1776 C1777 A1780 A1787 G1798 G1799 A1804 C1807 C1808 C1809 G1810 G1811 G1815 G1818 G1819 U1820 G1821 U1822 C1828 U1834 G1835 G1836 A1837 G1842 A1843
C1847 G1855 G1869 U1882 U1889 A1892 A1897 C1898 G1916 A1917 U1918 G1919 C1920 C1921 G1922 C1931 A1932 C1935 G1940 G1945 G1946 U1947 G1948 U1957 A1958 U1959 A1960 G1961 A1962 C1963 A1964 G1965 C1966 A1967 G1968 G1969 A1970 U1971 U1974 G1975 G1976 C1977 C1978 A1979 U1980 G1981
G1982 A1983 A1984 C1987 G1988 G1989 A1990 A1991 U1992 U1997 A1998 A1999 G2000 G2001 A2002 G2003 U2004 G2005 U2006 G2007 U2008 A2009 A2010 C2011 C2018 C2019 U2020 G2021 C2022 C2023 G2024 A2025 A2026 G2046 A2047 U2048 G2052 C2053 U2054 G2055 G2056 G2063 G2064 A2069 U2070 A2071 U2084 G2089 U2090 C2091 G2092
G2093 C2094 A2095 G2096 A2097 G2098 C2099 G2100 A2101 G2102 A2103 A2104 A2105 G2106 A2107 G2108 A2109 G2110 G2259 C2260 C2266 U2267 A2268 C2269 G2275 A2276 C2277 G2278 A2279 C2289 G2294 G2299 A2300 G2301 G2306 A2313 G2314 G2315 G2316 G2331 A2332 G2333 C2334 C2335 G2348 C2351 G2364
A2382 A2395 A2396 G2397 U2398 A2417 C2422 A2423 G2424 U2425 A2431 U2432 G2433 C2441 U2447 G2450 A2453 U2468 C2469 G2475 G2476 G2487 C2488 C2489 U2490 C2491 C2492 C2498 A2502 G2503 C2504 C2505 G2506 A2511 A2512 A2513 A2527 G2528 A2529 U2530 A2536 A2537 G2546
G2547 A2553 U2554 C2566 G2567 C2568 G2569 U2570 U2575 C2583 G2586 A2587 C2588 G2599 A2600 A2601 G2602 G2618 G2619 G2620 A2621 C2627 G2638 C2653 G2662 C2669 G2673 A2674 G2675 A2676 G2677 G2686 U2687 A2695 A2696 G2705 G2706 U2707 U2708 C2709 C2710 G2711 G2714
G2721 A2725 G2726 U2740 A2743 G2760 U2761 G2762 U2763 A2764 U2769 C2772 C2794 A2787 U2788 A2789 U2790 A2798 U2803 A2807 G2808 G2822 U2826 G2827 U2828 C2834 G2842 A2850 G2855 C2867 C2875 A2879 A2895 G2898 C3598
G3603 A3604 C3605 U3616 G3617 C3618 C3622 G3625 G3626 A3630 A3635 U3644 U3645 A3646 A3647 A3648 A3649 U3657 A3662 A3663 G3664 G3672 C3673 G3674 A3682 A3692 C3696 A3702 A3711 G3714 A3728 U3729 C3741 G3742 G3743 A3748 C3749 G3750 G3753 A3756
A3760 A3763 C3767 U3772 U3773 G3776 G3777 G3780 A3783 A3784 A3785 U3786 G3787 G3809 C3810 G3811 U3814 A3817 U3818 G3819 U3822 G3823 A3824 U3838 G3839 U3840 A3876 A3877 C3878 G3879 G3880 G3888 G3889 G3897 A3901 G3904 A3905 A3906 G3907 A3908 U3915 G3916
A3917 A3923 C3926 G3938 G3939 U3940 G3941 A3942 A3943 G3946 A3947 C3948 G4065 U4066 U4069 U4070 G4076 G4084 A4085 G4086 G4087 C4088 G4097 U4111 C4114 G4115 C4116 U4117 U4118 C4119 U4120 G4121 A4127 A4128 C4133 G4136 C4148 C4158 C4162 U4163 G4166 A4170
C4171 G4183 G4184 G4191 A4203 A4212 C4215 G4225 U4229 U4232 A4233 C4237 A4251 G4264 U4265 G4266 G4267 A4268 A4271 G4272 A4273 A4281 A4282 G4291 G4297 A4304 G4305 U4306 C4314 A4317 A4324 G4329 G4330 G4331 C4332 A4339 C4349
U4354 G4355 G4364 G4373 A4376 G4377 A4378 A4379 A4380 C4387 G4391 G4392 G4393 A4394 U4395 C4398 G4401 U4419 U4420 C4421 A4422 G4430 U4437 U4438 C4444 G4448 A4449 U4452 U4463 A4464 U4465 C4466 U4471 G4472 A4473 A4474 G4475 A4488 G4489 U4500 U4512
A4513 G4514 G4515 C4519 G4522 A4523 G4524 G4528 A4535 A4548 G4549 C4560 C4561 C4562 G4567 G4570 G4573 U4574 G4575 A4584 U4585 G4586 G4587 A4590 A4605 U4636 G4637 U4638 G4639 G4652 A4656 U4657 G4661 C4670 C4671 A4672 U4677 A4687 G4694
U4709 G4719 C4720 G4721 G4722 U4728 C4736 G4737 G4738 A4744 G4745 G4750 G4751 U4752 U4753 G4754 C4757 U4758 C4759 G4760 G4761 A4764 G4765 C4771 C4772 G4868 U4869 G4870 C4871 G4875 U4882 C4883 G4884 U4885 C4895 G4896 G4897 G4898 G4903 A4909 A4910 A4911 G4912 G4913 G4919

• Molecule 56: Obligate partner of TMCO1 insertase

Chain 9:



4 Experimental information (i)

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 ($e^-/Å^2$)	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 (Å)	552.08, 552.08, 552.08	wwPDB
Map dimensions	412, 412, 412	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality

5.1 Standard geometry

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.

All (46) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
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(^{o})	Ideal(^{o})
55	K	139	G	N3-C4-N9	-6.82	121.91	126.00
41	q	20	U	O5'-P-OP2	-6.75	99.63	105.70
55	K	271	C	C6-N1-C1'	-6.75	112.71	120.80
55	K	234	G	C8-N9-C1'	-6.71	118.28	127.00
55	K	4148	C	C2-N1-C1'	6.69	126.16	118.80
55	K	1081	C	N3-C2-O2	-6.68	117.22	121.90
55	K	234	G	N3-C4-N9	-6.35	122.19	126.00
55	K	387	G	O4'-C1'-N9	6.13	113.11	108.20
55	K	1219	G	C5-C6-O6	6.02	132.21	128.60
55	K	472	C	C6-N1-C2	-5.96	117.92	120.30
55	K	130	C	N3-C2-O2	-5.95	117.74	121.90
55	K	1807	C	C2-N1-C1'	5.88	125.27	118.80
55	K	4114	C	N3-C2-O2	-5.86	117.80	121.90
55	K	2898	G	C8-N9-C1'	-5.78	119.48	127.00
55	K	3741	C	N3-C2-O2	-5.73	117.89	121.90
55	K	1271	G	O4'-C1'-N9	5.71	112.77	108.20
55	K	130	C	N1-C2-N3	5.71	123.20	119.20
55	K	130	C	C6-N1-C2	-5.67	118.03	120.30
55	K	3941	G	C8-N9-C1'	-5.64	119.67	127.00
55	K	2898	G	C4-N9-C1'	5.59	133.76	126.50
55	K	4573	G	O4'-C1'-N9	5.57	112.66	108.20
55	K	978	G	O4'-C1'-N9	5.57	112.65	108.20
55	K	4148	C	C6-N1-C1'	-5.56	114.13	120.80
55	K	1292	C	C2-N1-C1'	5.53	124.88	118.80
55	K	39	A	O4'-C1'-N9	5.47	112.58	108.20
55	K	1777	C	C2-N1-C1'	5.46	124.80	118.80
55	K	1218	G	N3-C4-N9	5.45	129.27	126.00
55	K	3941	G	C4-N9-C1'	5.38	133.49	126.50
55	K	1847	C	C2-N1-C1'	5.36	124.70	118.80
55	K	255	C	N1-C2-O2	-5.36	115.68	118.90
55	K	644	G	C4-N9-C1'	5.33	133.42	126.50
55	K	2306	G	O4'-C1'-N9	5.20	112.36	108.20
55	K	1639	U	C2-N1-C1'	5.18	123.92	117.70
55	K	234	G	N9-C4-C5	5.16	107.46	105.40
55	K	4898	G	N3-C4-N9	-5.13	122.92	126.00
55	K	4463	U	O4'-C1'-N1	5.12	112.30	108.20
55	K	2586	G	O4'-C1'-N9	-5.07	104.14	108.20
55	K	1967	A	O4'-C1'-N9	-5.06	104.16	108.20
55	K	139	G	C5-C6-O6	5.04	131.62	128.60
55	K	1967	A	N9-C4-C5	-5.03	103.79	105.80
55	K	130	C	C5-C4-N4	5.02	123.72	120.20
55	K	1403	G	C4-N9-C1'	5.02	133.03	126.50

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
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

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
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
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

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
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

All (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
4	E	228	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
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

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
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
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

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
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

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	64	ARG
2	C	95	MET
2	C	188	ARG
4	E	58	ARG
6	G	96	GLN
10	L	70	VAL
12	N	26	ARG
12	N	80	THR
13	O	173	GLN
13	O	180	GLN
14	P	97	ASN
14	P	118	GLN
15	Q	8	ASN
16	R	71	ARG
17	S	67	VAL
17	S	90	THR
19	U	105	ASN
20	V	48	ARG
22	X	93	ASN
22	X	120	ASP
22	X	151	ASN
23	Y	2	LYS

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Mol	Chain	Res	Type
23	Y	79	VAL
24	Z	11	VAL
25	a	122	VAL
27	c	17	ARG
28	d	22	THR
28	d	86	VAL
29	e	48	ARG
34	j	67	LEU
34	j	82	THR
40	p	4	ARG
40	p	52	VAL
45	w	261	ARG
45	w	297	LYS
47	1	18	GLU
47	1	118	LEU
47	1	130	VAL
47	1	230	LEU
49	3	21	LEU
50	4	323	HIS
50	4	434	GLU
50	4	468	LEU
53	6	33	TRP
53	6	51	LEU
54	8	160	LYS
56	9	29	LEU
56	9	100	THR
56	9	129	ASP

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%)

All (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
41	q	20	U
41	q	20(A)	U
41	q	21	A
41	q	22	U
41	q	24	A
41	q	39	G
41	q	46	G
41	q	47	U
41	q	56	C
41	q	67	G
41	q	75	C
43	u	7	G
43	u	10	C
43	u	22	A
43	u	25	G
43	u	31	G
43	u	42	A
43	u	53	U
43	u	54	A
43	u	64	G
43	u	80	U
43	u	100	A
43	u	110	G
43	u	111	C
43	u	120	U
44	v	2	G
44	v	3	A
44	v	13	G
44	v	20	A

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Mol	Chain	Res	Type
44	v	23	C
44	v	32	C
44	v	34	U
44	v	35	C
44	v	38	U
44	v	49	G
44	v	59	A
44	v	62	A
44	v	63	U
44	v	75	G
44	v	80	A
44	v	81	C
44	v	82	A
44	v	83	C
44	v	84	A
44	v	85	U
44	v	86	U
44	v	87	G
44	v	103	A
44	v	105	C
44	v	106	G
44	v	109	C
44	v	110	U
44	v	111	U
44	v	112	G
44	v	114	G
44	v	123	U
44	v	125	C
44	v	126	C
44	v	127	U
44	v	128	C
44	v	153	C
44	v	156	U
55	K	12	A
55	K	13	U
55	K	15	A
55	K	30	C
55	K	39	A
55	K	42	A
55	K	44	A
55	K	56	A
55	K	58	G

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Mol	Chain	Res	Type
55	K	59	A
55	K	64	A
55	K	65	A
55	K	73	A
55	K	74	G
55	K	84	A
55	K	91	G
55	K	95	G
55	K	104	G
55	K	108	A
55	K	109	G
55	K	110	C
55	K	118	C
55	K	119	G
55	K	122	U
55	K	126	C
55	K	131	C
55	K	134	G
55	K	135	G
55	K	136	C
55	K	137	G
55	K	141	C
55	K	142	G
55	K	146	G
55	K	157	U
55	K	159	C
55	K	160	G
55	K	172	C
55	K	173	C
55	K	177	G
55	K	182	G
55	K	200	U
55	K	201	C
55	K	209	U
55	K	216	C
55	K	218	A
55	K	221	C
55	K	224	U
55	K	225	G
55	K	232	G
55	K	233	U
55	K	234	G

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Mol	Chain	Res	Type
55	K	246	G
55	K	256	G
55	K	258	G
55	K	262	G
55	K	263	G
55	K	265	C
55	K	266	C
55	K	267	G
55	K	271	C
55	K	276	C
55	K	280	G
55	K	297	U
55	K	306	A
55	K	308	G
55	K	309	C
55	K	315	G
55	K	316	U
55	K	322	C
55	K	326	C
55	K	334	A
55	K	340	C
55	K	363	A
55	K	370	U
55	K	371	A
55	K	387	G
55	K	407	A
55	K	410	A
55	K	412	G
55	K	413	G
55	K	415	G
55	K	417	G
55	K	428	G
55	K	440	U
55	K	446	C
55	K	449	C
55	K	450	G
55	K	452	A
55	K	453	G
55	K	454	U
55	K	455	C
55	K	463	A
55	K	464	G

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Mol	Chain	Res	Type
55	K	467	U
55	K	468	U
55	K	481	G
55	K	481(A)	C
55	K	482	G
55	K	483	G
55	K	485	C
55	K	486	C
55	K	492	U
55	K	493	G
55	K	496	G
55	K	497	G
55	K	498	C
55	K	499	G
55	K	505	G
55	K	506	C
55	K	510	U
55	K	644	G
55	K	647	G
55	K	658	C
55	K	659	G
55	K	661	C
55	K	666	G
55	K	667	A
55	K	668	C
55	K	669	C
55	K	670	G
55	K	685	C
55	K	686	A
55	K	687	U
55	K	696	C
55	K	697	G
55	K	699	C
55	K	701	G
55	K	704	C
55	K	705	G
55	K	708	G
55	K	731	G
55	K	738	C
55	K	749	G
55	K	756	G
55	K	758	G

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Mol	Chain	Res	Type
55	K	914	U
55	K	917	A
55	K	918	G
55	K	923	C
55	K	925	C
55	K	926	G
55	K	929	A
55	K	932	A
55	K	933	G
55	K	934	C
55	K	935	A
55	K	935(A)	G
55	K	936	C
55	K	938	C
55	K	939	G
55	K	941	C
55	K	944	A
55	K	945	U
55	K	959	G
55	K	960	A
55	K	961	G
55	K	964	A
55	K	965	G
55	K	966	A
55	K	967	C
55	K	968	C
55	K	969	C
55	K	971(A)	G
55	K	972	C
55	K	973	G
55	K	979	C
55	K	983	C
55	K	990	C
55	K	1070	G
55	K	1072	C
55	K	1073	G
55	K	1076	C
55	K	1078	A
55	K	1079	C
55	K	1081	C
55	K	1082	C
55	K	1099	C

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Mol	Chain	Res	Type
55	K	1175	A
55	K	1179	U
55	K	1199	G
55	K	1210	C
55	K	1211	G
55	K	1212	G
55	K	1215	C
55	K	1216	C
55	K	1234	G
55	K	1235	G
55	K	1236	C
55	K	1237	C
55	K	1238	A
55	K	1239	C
55	K	1272	C
55	K	1273	G
55	K	1274	A
55	K	1275	G
55	K	1281	G
55	K	1284	G
55	K	1287	G
55	K	1289	C
55	K	1291	G
55	K	1292	C
55	K	1293	G
55	K	1296	G
55	K	1301	C
55	K	1303	A
55	K	1304	C
55	K	1314	C
55	K	1326	A
55	K	1330	A
55	K	1354	A
55	K	1358	G
55	K	1359	G
55	K	1364	U
55	K	1370	G
55	K	1371	A
55	K	1377	G
55	K	1378	C
55	K	1379	C
55	K	1387	A

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Mol	Chain	Res	Type
55	K	1392	A
55	K	1394	G
55	K	1397	A
55	K	1398	A
55	K	1403	G
55	K	1411(A)	G
55	K	1415	G
55	K	1419	G
55	K	1420	A
55	K	1421	G
55	K	1433	A
55	K	1436	C
55	K	1437	C
55	K	1438	U
55	K	1440	U
55	K	1441	C
55	K	1445	U
55	K	1446	C
55	K	1448	G
55	K	1456	C
55	K	1457	G
55	K	1458	C
55	K	1475	G
55	K	1478	C
55	K	1481	C
55	K	1482	G
55	K	1483	C
55	K	1484	G
55	K	1489	G
55	K	1497	A
55	K	1498	G
55	K	1502	G
55	K	1514	U
55	K	1516	G
55	K	1518	A
55	K	1519	C
55	K	1523	A
55	K	1534	A
55	K	1547	A
55	K	1563	A
55	K	1564	A
55	K	1566	C

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Mol	Chain	Res	Type
55	K	1578	U
55	K	1586	G
55	K	1591	U
55	K	1596	U
55	K	1597	G
55	K	1600	A
55	K	1602	U
55	K	1612	G
55	K	1613	A
55	K	1624	G
55	K	1625	G
55	K	1631	A
55	K	1633	G
55	K	1634	A
55	K	1640	C
55	K	1654	G
55	K	1658	G
55	K	1661	C
55	K	1676	C
55	K	1677	U
55	K	1696	C
55	K	1731	C
55	K	1733	G
55	K	1741	G
55	K	1742	A
55	K	1750	G
55	K	1756	U
55	K	1760	G
55	K	1761	G
55	K	1764	G
55	K	1767	A
55	K	1768	C
55	K	1769	G
55	K	1772	C
55	K	1774	C
55	K	1775	A
55	K	1780	A
55	K	1787	A
55	K	1798	G
55	K	1799	G
55	K	1804	A
55	K	1807	C

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Mol	Chain	Res	Type
55	K	1809	C
55	K	1811	G
55	K	1815	G
55	K	1818	G
55	K	1819	G
55	K	1821	G
55	K	1822	U
55	K	1828	C
55	K	1834	U
55	K	1835	G
55	K	1836	G
55	K	1837	A
55	K	1842	G
55	K	1843	A
55	K	1847	C
55	K	1855	G
55	K	1869	G
55	K	1882	U
55	K	1889	U
55	K	1892	A
55	K	1897	A
55	K	1898	C
55	K	1916	G
55	K	1918	U
55	K	1920	C
55	K	1921	C
55	K	1922	G
55	K	1931	C
55	K	1932	A
55	K	1935	C
55	K	1940	G
55	K	1945	G
55	K	1947	U
55	K	1948	G
55	K	1957	U
55	K	1958	A
55	K	1960	A
55	K	1961	G
55	K	1962	A
55	K	1963	C
55	K	1964	A
55	K	1965	G

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Mol	Chain	Res	Type
55	K	1968	G
55	K	1969	G
55	K	1971	U
55	K	1974	U
55	K	1975	G
55	K	1976	G
55	K	1978	C
55	K	1979	A
55	K	1980	U
55	K	1984	A
55	K	1987	C
55	K	1988	G
55	K	1990	A
55	K	1991	A
55	K	1997	U
55	K	1999	A
55	K	2001	G
55	K	2002	A
55	K	2003	G
55	K	2004	U
55	K	2008	U
55	K	2011	C
55	K	2018	C
55	K	2020	U
55	K	2021	G
55	K	2022	C
55	K	2024	G
55	K	2026	A
55	K	2046	G
55	K	2047	A
55	K	2048	U
55	K	2052	G
55	K	2053	C
55	K	2055	G
55	K	2056	G
55	K	2063	G
55	K	2064	G
55	K	2069	A
55	K	2071	A
55	K	2084	U
55	K	2090	U
55	K	2092	G

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Mol	Chain	Res	Type
55	K	2093	G
55	K	2094	C
55	K	2095	A
55	K	2097	A
55	K	2098	G
55	K	2099	C
55	K	2100	G
55	K	2101	A
55	K	2102	G
55	K	2104	A
55	K	2105	A
55	K	2107	A
55	K	2108	G
55	K	2110	G
55	K	2259	G
55	K	2260	C
55	K	2267	U
55	K	2268	A
55	K	2269	C
55	K	2275	G
55	K	2277	C
55	K	2279	A
55	K	2289	C
55	K	2294	G
55	K	2299	G
55	K	2300	A
55	K	2301	G
55	K	2306	G
55	K	2313	A
55	K	2314	G
55	K	2316	G
55	K	2331	G
55	K	2333	G
55	K	2335	C
55	K	2348	G
55	K	2351	C
55	K	2364	G
55	K	2382	A
55	K	2395	A
55	K	2396	A
55	K	2398	U
55	K	2417	A

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Mol	Chain	Res	Type
55	K	2422	C
55	K	2424	G
55	K	2425	U
55	K	2431	A
55	K	2433	G
55	K	2441	C
55	K	2447	U
55	K	2450	G
55	K	2453	A
55	K	2469	C
55	K	2475	G
55	K	2476	G
55	K	2487	G
55	K	2488	C
55	K	2489	C
55	K	2490	U
55	K	2491	C
55	K	2492	C
55	K	2498	C
55	K	2503	G
55	K	2504	C
55	K	2505	C
55	K	2506	G
55	K	2511	A
55	K	2512	A
55	K	2513	A
55	K	2527	A
55	K	2529	A
55	K	2530	U
55	K	2536	A
55	K	2537	A
55	K	2546	G
55	K	2547	G
55	K	2553	A
55	K	2554	U
55	K	2566	G
55	K	2568	C
55	K	2570	U
55	K	2575	U
55	K	2583	C
55	K	2586	G
55	K	2587	A

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Mol	Chain	Res	Type
55	K	2588	C
55	K	2599	G
55	K	2600	A
55	K	2602	G
55	K	2618	G
55	K	2620	G
55	K	2621	A
55	K	2627	C
55	K	2638	G
55	K	2653	C
55	K	2662	G
55	K	2669	C
55	K	2673	G
55	K	2674	A
55	K	2676	A
55	K	2677	G
55	K	2686	G
55	K	2687	U
55	K	2695	A
55	K	2696	A
55	K	2705	G
55	K	2707	U
55	K	2708	U
55	K	2709	C
55	K	2711	G
55	K	2714	G
55	K	2721	G
55	K	2725	A
55	K	2726	G
55	K	2740	U
55	K	2743	A
55	K	2760	G
55	K	2761	U
55	K	2763	U
55	K	2764	A
55	K	2769	U
55	K	2772	C
55	K	2787	A
55	K	2788	U
55	K	2790	U
55	K	2794	C
55	K	2798	A

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Mol	Chain	Res	Type
55	K	2803	U
55	K	2807	A
55	K	2808	G
55	K	2822	G
55	K	2826	U
55	K	2827	G
55	K	2828	U
55	K	2834	C
55	K	2842	G
55	K	2850	A
55	K	2855	G
55	K	2867	C
55	K	2875	C
55	K	2879	A
55	K	2895	A
55	K	3598	C
55	K	3603	G
55	K	3604	A
55	K	3605	C
55	K	3616	U
55	K	3617	G
55	K	3618	C
55	K	3622	C
55	K	3625	G
55	K	3626	G
55	K	3630	A
55	K	3635	A
55	K	3644	U
55	K	3646	A
55	K	3648	A
55	K	3649	A
55	K	3657	U
55	K	3662	A
55	K	3664	G
55	K	3672	G
55	K	3673	C
55	K	3674	G
55	K	3682	A
55	K	3692	A
55	K	3696	C
55	K	3702	A
55	K	3711	A

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Mol	Chain	Res	Type
55	K	3714	G
55	K	3728	A
55	K	3729	U
55	K	3743	G
55	K	3748	A
55	K	3750	G
55	K	3753	G
55	K	3756	A
55	K	3760	A
55	K	3763	A
55	K	3767	C
55	K	3772	U
55	K	3773	U
55	K	3776	G
55	K	3777	G
55	K	3780	G
55	K	3783	A
55	K	3784	A
55	K	3786	U
55	K	3787	G
55	K	3809	G
55	K	3810	C
55	K	3811	G
55	K	3814	U
55	K	3817	A
55	K	3819	G
55	K	3822	U
55	K	3824	A
55	K	3838	U
55	K	3840	U
55	K	3876	A
55	K	3877	A
55	K	3878	C
55	K	3879	G
55	K	3880	G
55	K	3889	G
55	K	3897	G
55	K	3901	A
55	K	3905	A
55	K	3906	A
55	K	3907	G
55	K	3908	A

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Mol	Chain	Res	Type
55	K	3915	U
55	K	3916	G
55	K	3917	A
55	K	3923	A
55	K	3926	C
55	K	3938	G
55	K	3939	G
55	K	3943	A
55	K	3946	G
55	K	4066	U
55	K	4069	U
55	K	4070	U
55	K	4076	G
55	K	4084	G
55	K	4086	G
55	K	4088	C
55	K	4097	G
55	K	4111	U
55	K	4116	C
55	K	4118	U
55	K	4119	C
55	K	4120	U
55	K	4121	G
55	K	4127	A
55	K	4128	A
55	K	4133	C
55	K	4136	G
55	K	4158	C
55	K	4162	C
55	K	4163	U
55	K	4166	G
55	K	4170	A
55	K	4171	C
55	K	4183	G
55	K	4184	G
55	K	4191	G
55	K	4203	A
55	K	4212	A
55	K	4215	C
55	K	4225	G
55	K	4229	U
55	K	4233	A

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Mol	Chain	Res	Type
55	K	4237	C
55	K	4251	A
55	K	4254	G
55	K	4265	U
55	K	4266	G
55	K	4267	G
55	K	4268	A
55	K	4271	A
55	K	4273	A
55	K	4281	A
55	K	4282	A
55	K	4291	G
55	K	4297	G
55	K	4304	A
55	K	4305	G
55	K	4306	U
55	K	4314	C
55	K	4317	A
55	K	4324	A
55	K	4329	G
55	K	4330	G
55	K	4332	C
55	K	4339	A
55	K	4349	C
55	K	4354	U
55	K	4355	G
55	K	4364	G
55	K	4373	G
55	K	4376	A
55	K	4377	G
55	K	4378	A
55	K	4379	A
55	K	4380	A
55	K	4387	C
55	K	4391	G
55	K	4393	G
55	K	4394	A
55	K	4395	U
55	K	4398	C
55	K	4401	G
55	K	4419	U
55	K	4421	C

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Mol	Chain	Res	Type
55	K	4422	A
55	K	4430	G
55	K	4437	U
55	K	4438	U
55	K	4444	C
55	K	4448	G
55	K	4449	A
55	K	4452	U
55	K	4464	A
55	K	4466	C
55	K	4471	U
55	K	4472	G
55	K	4473	A
55	K	4475	G
55	K	4488	A
55	K	4489	G
55	K	4500	U
55	K	4512	U
55	K	4513	A
55	K	4515	G
55	K	4519	C
55	K	4522	G
55	K	4523	A
55	K	4524	G
55	K	4528	G
55	K	4535	A
55	K	4548	A
55	K	4549	G
55	K	4560	C
55	K	4562	C
55	K	4567	G
55	K	4570	G
55	K	4573	G
55	K	4574	U
55	K	4575	G
55	K	4584	A
55	K	4585	U
55	K	4587	G
55	K	4590	A
55	K	4605	A
55	K	4636	U
55	K	4637	G

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Mol	Chain	Res	Type
55	K	4639	G
55	K	4652	G
55	K	4656	A
55	K	4657	U
55	K	4661	G
55	K	4670	C
55	K	4672	A
55	K	4677	U
55	K	4687	A
55	K	4694	G
55	K	4709	U
55	K	4719	G
55	K	4720	C
55	K	4722	G
55	K	4728	U
55	K	4736	C
55	K	4738	C
55	K	4744	A
55	K	4745	G
55	K	4750	G
55	K	4751	G
55	K	4752	U
55	K	4754	G
55	K	4757	C
55	K	4759	C
55	K	4761	G
55	K	4764	A
55	K	4765	G
55	K	4771	C
55	K	4772	C
55	K	4868	G
55	K	4870	G
55	K	4871	C
55	K	4875	G
55	K	4882	U
55	K	4883	C
55	K	4885	U
55	K	4895	C
55	K	4896	G
55	K	4897	G
55	K	4903	G
55	K	4909	A

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Mol	Chain	Res	Type
55	K	4910	A
55	K	4912	G
55	K	4913	G
55	K	4919	G
55	K	4921	C
55	K	4922	C
55	K	4924	C
55	K	4925	U
55	K	4926	C
55	K	4927	G
55	K	4928	C
55	K	4931	G
55	K	4935	C
55	K	4937	C
55	K	4940	C
55	K	4943	A
55	K	4944	C
55	K	4948	C
55	K	4949	G
55	K	4950	U
55	K	4951	G
55	K	4955	A
55	K	4956	A
55	K	4957	C
55	K	4958	C
55	K	4960	G
55	K	4963	G
55	K	4965	U
55	K	4966	A
55	K	4967	A
55	K	4976	U
55	K	4977	A
55	K	4985	U
55	K	4988	U
55	K	4989	U
55	K	4990	C
55	K	4991	U
55	K	4993	G
55	K	5006	U
55	K	5014	A
55	K	5016	A
55	K	5017	G

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Mol	Chain	Res	Type
55	K	5022	U
55	K	5040	U
55	K	5041	G
55	K	5047	C
55	K	5050	C
55	K	5052	C
55	K	5053	U
55	K	5054	C
55	K	5056	A
55	K	5061	A
55	K	5062	G

All (58) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
55	K	12	A
55	K	125	C
55	K	134	G
55	K	245	C
55	K	265	C
55	K	275	C
55	K	406	C
55	K	449	C
55	K	480	C
55	K	485	C
55	K	498	C
55	K	504	G
55	K	684	G
55	K	685	C
55	K	696	C
55	K	704	C
55	K	935(A)	G
55	K	959	G
55	K	971(A)	G
55	K	1072	C
55	K	1174	G
55	K	1211	G
55	K	1236	C
55	K	1238	A
55	K	1329	G
55	K	1370	G
55	K	1440	U

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Mol	Chain	Res	Type
55	K	1445	U
55	K	1455	G
55	K	1477	C
55	K	1482	G
55	K	1633	G
55	K	1818	G
55	K	2046	G
55	K	2089	G
55	K	2266	C
55	K	2468	U
55	K	2488	C
55	K	2502	A
55	K	2546	G
55	K	2695	A
55	K	3603	G
55	K	3625	G
55	K	3876	A
55	K	3888	G
55	K	3904	G
55	K	4119	C
55	K	4170	A
55	K	4232	U
55	K	4354	U
55	K	4378	A
55	K	4448	G
55	K	4719	G
55	K	4884	G
55	K	4921	C
55	K	4925	U
55	K	4947	U
55	K	4989	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

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

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
55	K	24

All 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
1	K	990:C	O3'	1064:G	P	17.16
1	K	1696:C	O3'	1720:C	P	16.09
1	K	5022:U	O3'	5028:G	P	15.96
1	K	1406(C):G	O3'	1411:C	P	15.95
1	K	4777:C	O3'	4859:C	P	15.76
1	K	523:C	O3'	638:G	P	15.48
1	K	4101:C	O3'	4107:G	P	14.86
1	K	760:G	O3'	904:C	P	13.85
1	K	182:G	O3'	189:G	P	13.34
1	K	1364:U	O3'	1368:A	P	13.08
1	K	2901:G	O3'	3597:G	P	12.38

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	K	4729:A	O3'	4735:G	P	8.92
1	K	1180:C	O3'	1183:C	P	7.98
1	K	1100:U	O3'	1168:G	P	7.89
1	K	512:U	O3'	515:C	P	6.58
1	K	500:G	O3'	504:G	P	5.58
1	K	4740:G	O3'	4743:G	P	4.82
1	K	1239:C	O3'	1244:G	P	4.45
1	K	4899:G	O3'	4902:C	P	3.43

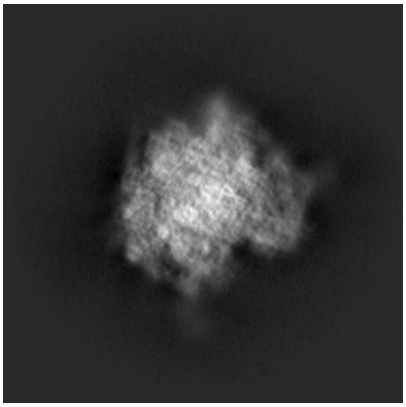
6 Map visualisation

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.

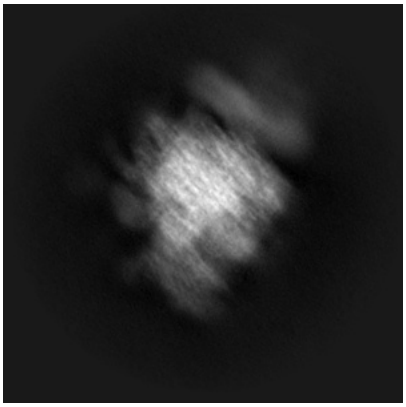
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

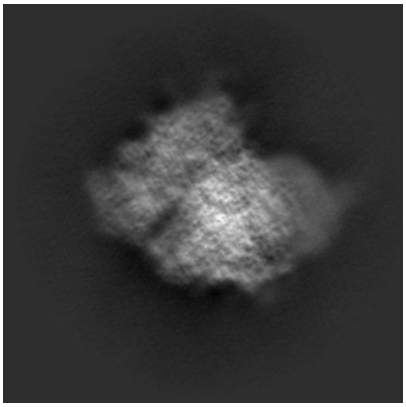
6.1.1 Primary map



X



Y

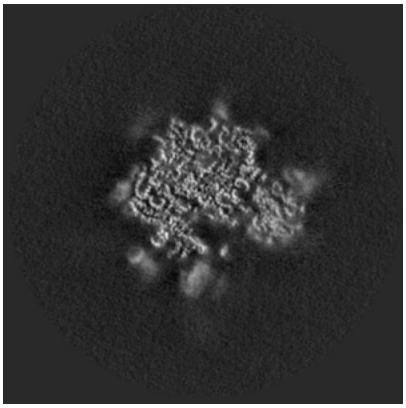


Z

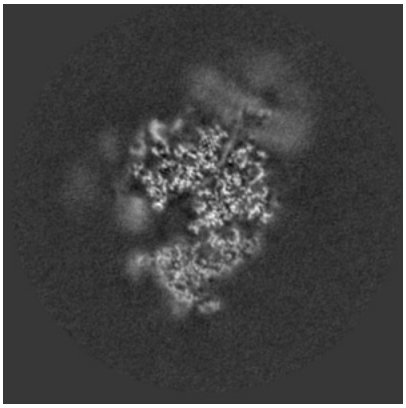
The images above show the map projected in three orthogonal directions.

6.2 Central slices

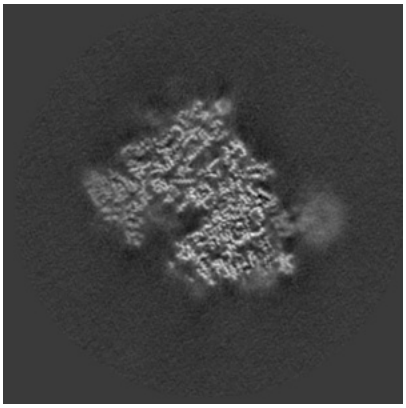
6.2.1 Primary map



X Index: 206



Y Index: 206

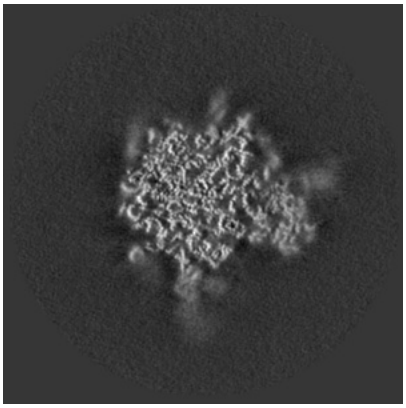


Z Index: 206

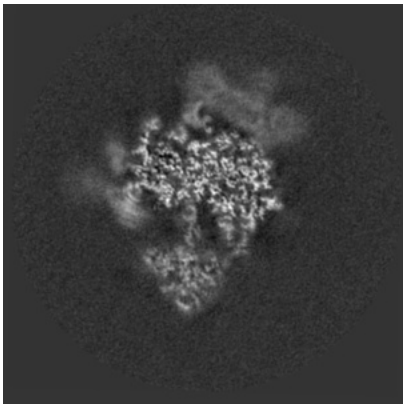
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

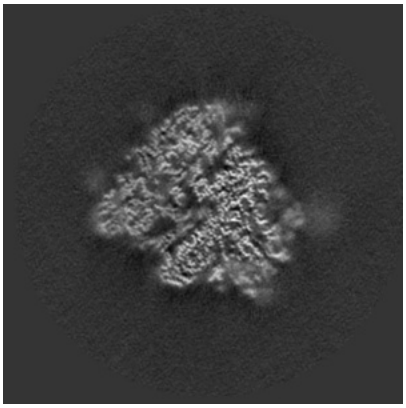
6.3.1 Primary map



X Index: 218



Y Index: 194

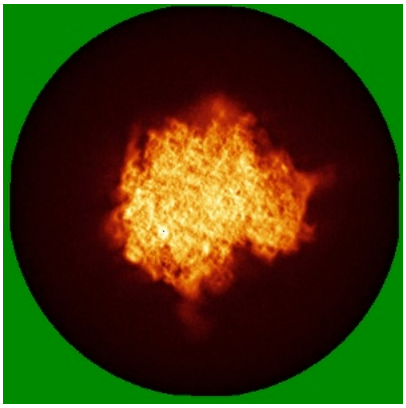


Z Index: 192

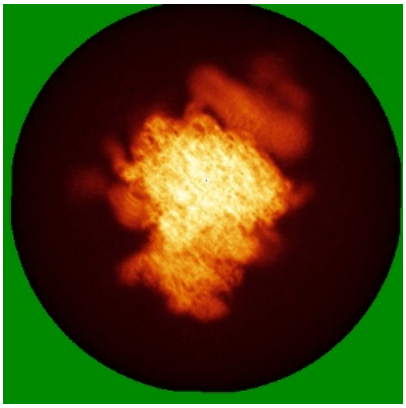
The images above show the largest variance slices of the map in three orthogonal directions.

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

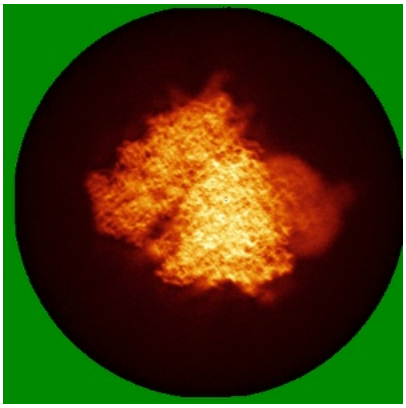
6.4.1 Primary map



X



Y

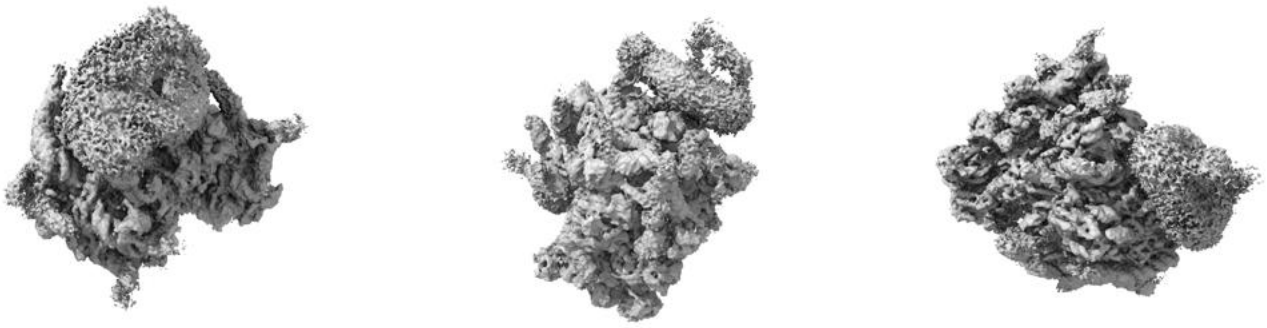


Z

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.

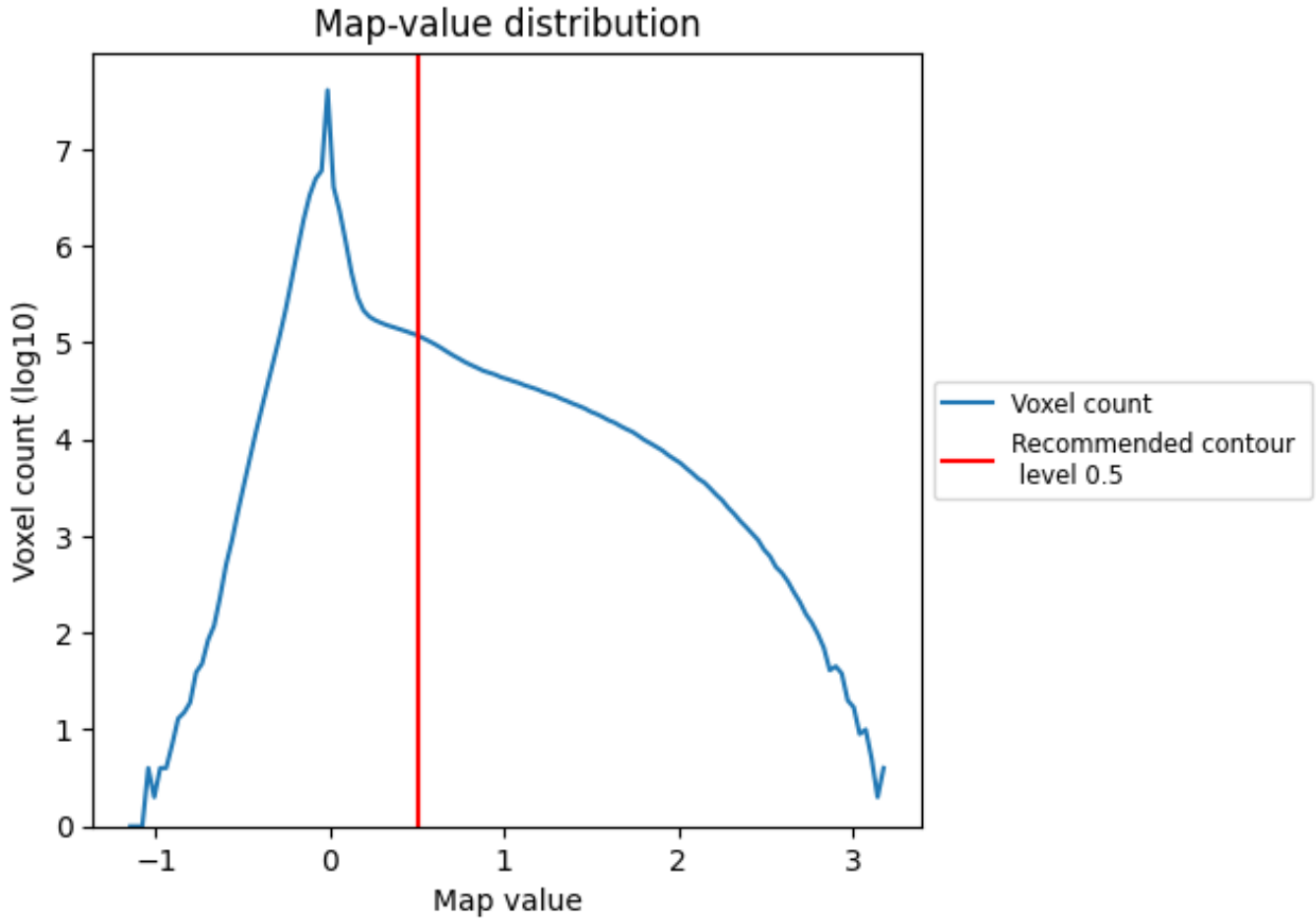
6.6 Mask visualisation (i)

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

7 Map analysis

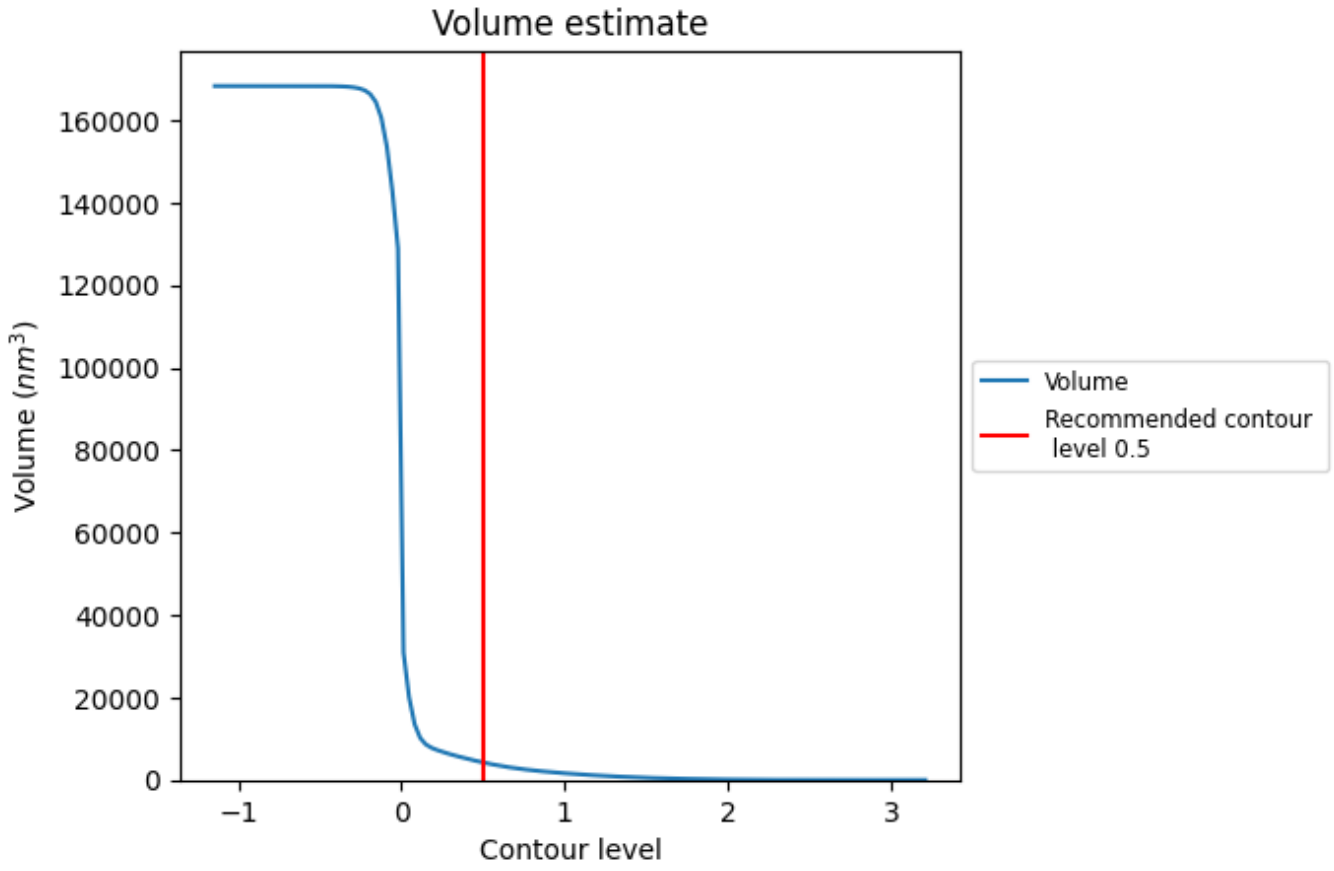
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

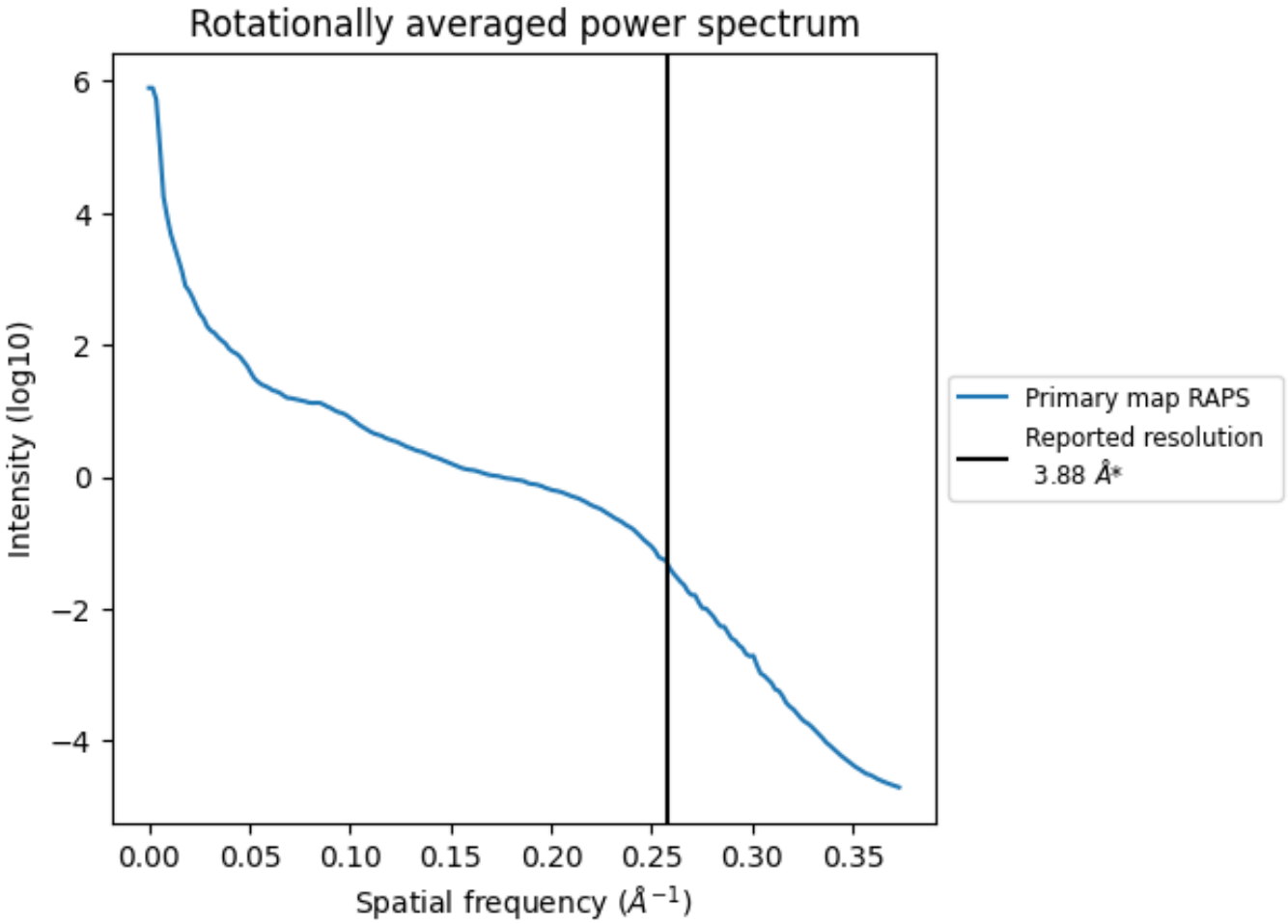
7.2 Volume estimate (i)



The volume at the recommended contour level is 4244 nm^3; 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^{-1}

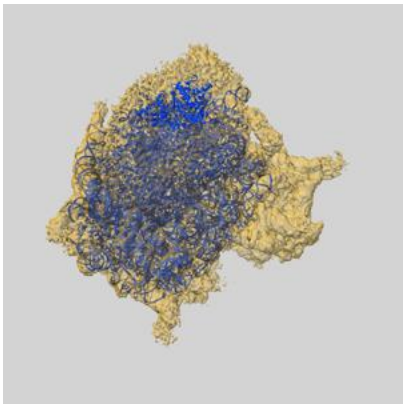
8 Fourier-Shell correlation

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

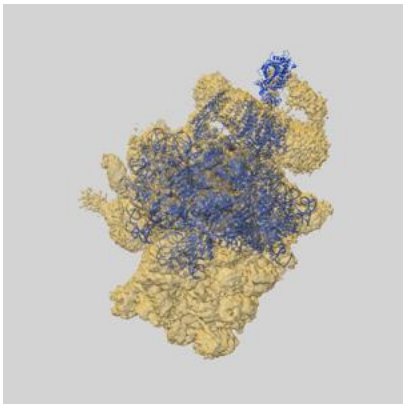
9 Map-model fit

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.

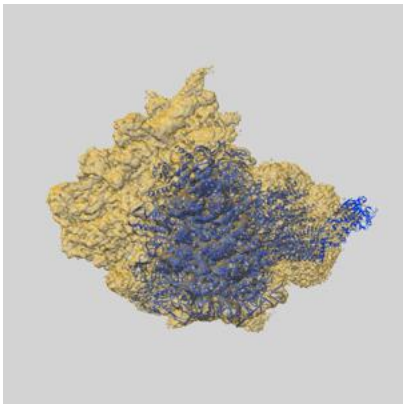
9.1 Map-model overlay



X



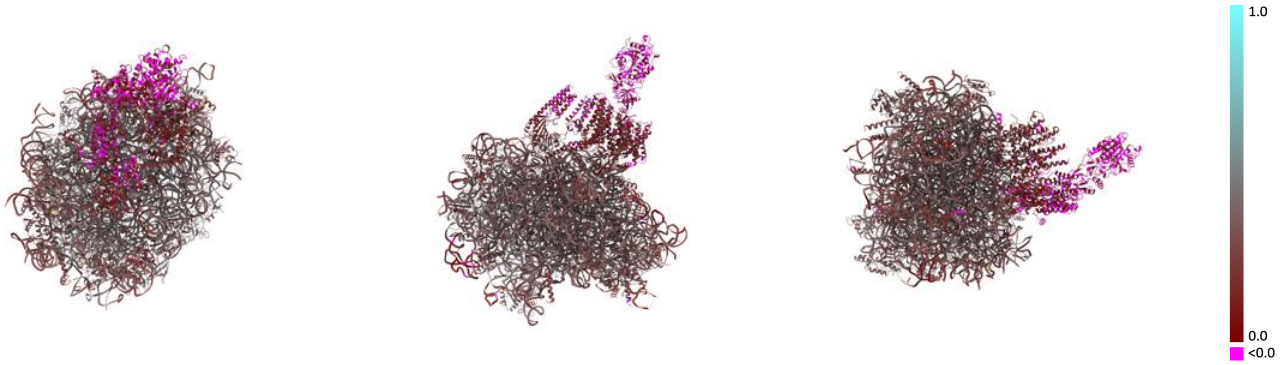
Y



Z

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.

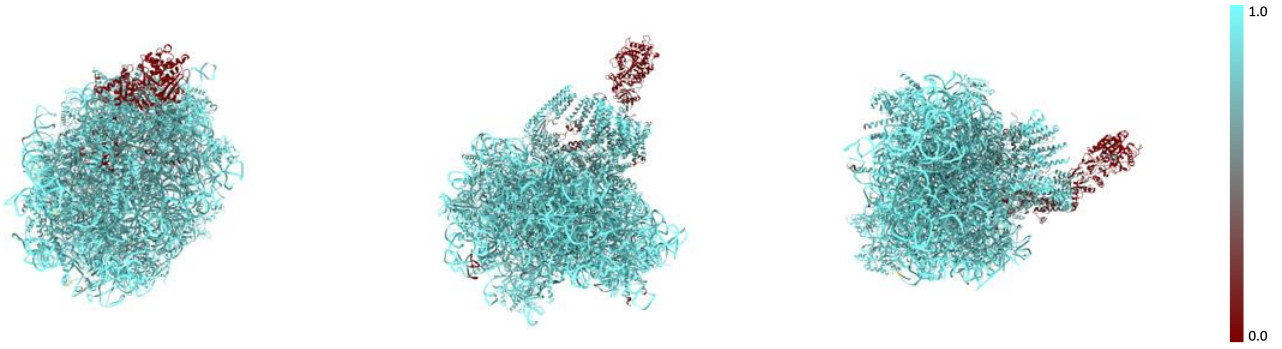
9.2 Q-score mapped to coordinate model (i)



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.

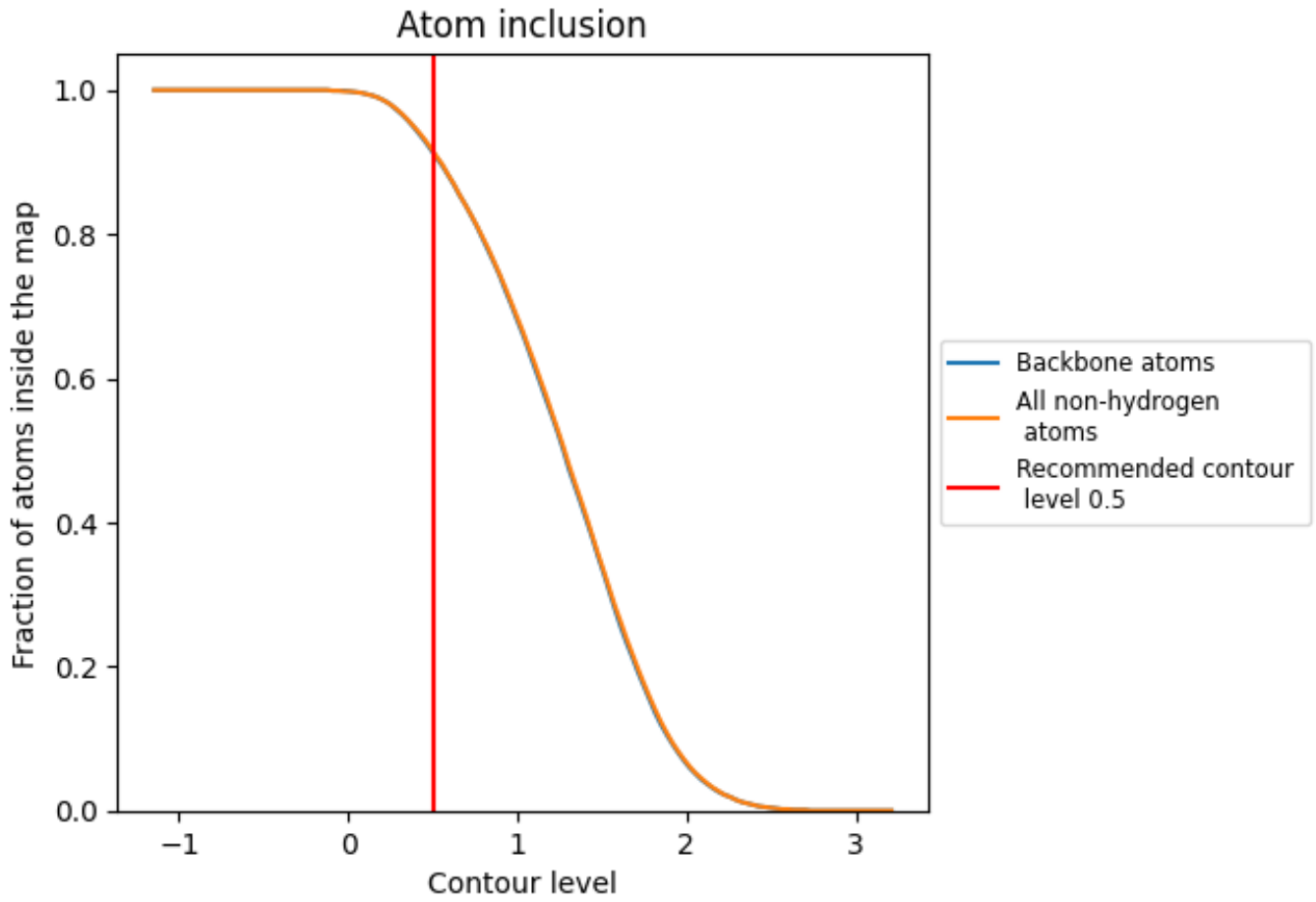
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.5).

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