



Full wwPDB EM Validation Report ⓘ

Nov 9, 2024 – 11:03 am GMT

PDB ID : 9G8O
EMDB ID : EMD-51134
Title : human 40S ribosome bound by a SKI238-exosome complex
Authors : Koegel, A.; Keidel, A.; Loukeri, M.J.; Kuhn, C.C.; Langer, L.M.; Schaefer, I.B.; Conti, E.
Deposited on : 2024-07-23
Resolution : 3.40 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.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

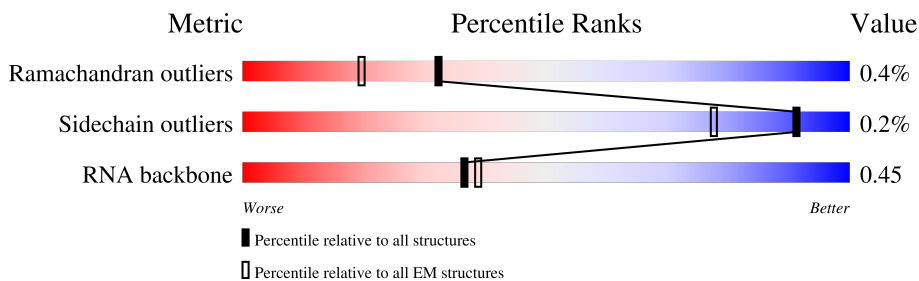
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	B	1568	
2	C	305	
2	D	305	
3	F	295	
4	J	199	
5	K	443	
6	L	280	
7	N	245	

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Mol	Chain	Length	Quality of chain
8	O	239	87% 87% 13%
9	A	1246	89% 89% 11%
10	E	274	24% 24% 76%
11	G	272	92% 92% 8%
12	H	279	85% 85% 15%
13	I	297	97% 97% .
14	X	250	28% 19% 30% . 51%
15	Ln	25	12% 96% .
16	M	1096	89% 89% 11%
17	S2	1869	. 67% 25% . 7%
18	SA	295	. 74% . 25%
19	SB	264	. 80% . 19%
20	SC	293	. 75% . 24%
21	SD	243	. 92% 8%
22	SE	263	. 98% .
23	SF	204	89% 11%
24	SG	249	12% 92% . 5%
25	SH	194	14% 96% . .
26	SI	208	7% 98% . .
27	SJ	194	. 93% . 5%
28	SK	165	9% 59% 41%
29	SL	158	12% 96% . .
30	SM	132	36% 79% 21%
31	SN	151	6% 97% . .
32	SO	151	5% 90% . 7%

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Mol	Chain	Length	Quality of chain
33	SP	145	11% 85% 15%
34	SQ	146	95% 5%
35	SR	135	96% ..
36	SS	152	13% 94% 6%
37	ST	145	99% .
38	SU	119	10% 87% 13%
39	SV	83	96% .
40	SW	130	99% .
41	SX	143	98% ..
42	SY	133	5% 96% ..
43	SZ	125	7% 58% 42%
44	Sa	115	8% 92% 7%
45	Sb	84	99% .
46	Sc	69	84% 14%
47	Sd	56	98% .
48	Se	59	14% 98% .
49	Sf	156	21% 41% 59%
50	Sg	317	9% 98% .

2 Entry composition

There are 50 unique types of molecules in this entry. The entry contains 125225 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Superkiller complex protein 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	B	934	7299	4637	1259	1359	44	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	GLY	-	expression tag	UNP Q6PGP7
B	-2	PRO	-	expression tag	UNP Q6PGP7
B	-1	ASP	-	expression tag	UNP Q6PGP7
B	0	SER	-	expression tag	UNP Q6PGP7

- Molecule 2 is a protein called WD repeat-containing protein 61.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	305	2373	1507	399	462	5	0	0
2	D	305	2373	1507	399	462	5	0	0

- Molecule 3 is a protein called Exosome complex component RRP42.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	F	286	2194	1373	374	432	15	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-3	GLY	-	expression tag	UNP Q15024
F	-2	PRO	-	expression tag	UNP Q15024
F	-1	ASP	-	expression tag	UNP Q15024
F	0	SER	-	expression tag	UNP Q15024

- Molecule 4 is a protein called Exosome complex component CSL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	J	184	1414	889	248	267	10	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J	-3	GLY	-	expression tag	UNP Q9Y3B2
J	-2	PRO	-	expression tag	UNP Q9Y3B2
J	-1	ASP	-	expression tag	UNP Q9Y3B2
J	0	SER	-	expression tag	UNP Q9Y3B2

- Molecule 5 is a protein called Exosome complex component RRP45.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	K	353	2764	1734	482	529	19	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	-3	GLY	-	expression tag	UNP Q06265
K	-2	PRO	-	expression tag	UNP Q06265
K	-1	ASP	-	expression tag	UNP Q06265
K	0	SER	-	expression tag	UNP Q06265

- Molecule 6 is a protein called Exosome complex component RRP43.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	L	265	2020	1272	337	397	14	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	-3	GLY	-	expression tag	UNP Q96B26
L	-2	PRO	-	expression tag	UNP Q96B26
L	-1	ASP	-	expression tag	UNP Q96B26
L	0	SER	-	expression tag	UNP Q96B26

- Molecule 7 is a protein called Exosome complex component RRP41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	N	241	1819	1123	343	344	9	0	0

- Molecule 8 is a protein called Exosome complex component RRP46.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	O	208	1566	979	278	297	12	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
O	-3	GLY	-	expression tag	UNP Q9NQT4
O	-2	PRO	-	expression tag	UNP Q9NQT4
O	-1	ASP	-	expression tag	UNP Q9NQT4
O	0	SER	-	expression tag	UNP Q9NQT4

- Molecule 9 is a protein called Helicase SKI2W.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	A	1112	8706	5519	1526	1613	48	0	0

- Molecule 10 is a protein called Isoform 2 of HBS1-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	E	66	525	340	89	95	1	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	365	GLY	-	expression tag	UNP Q9Y450
E	366	PRO	-	expression tag	UNP Q9Y450
E	367	ASP	-	expression tag	UNP Q9Y450
E	368	SER	-	expression tag	UNP Q9Y450
E	633	LEU	-	expression tag	UNP Q9Y450
E	634	GLU	-	expression tag	UNP Q9Y450
E	635	VAL	-	expression tag	UNP Q9Y450
E	636	LEU	-	expression tag	UNP Q9Y450
E	637	PHE	-	expression tag	UNP Q9Y450
E	638	GLN	-	expression tag	UNP Q9Y450

- Molecule 11 is a protein called Exosome complex component MTR3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	G	251	1852	1149	352	344	7	0	0

- Molecule 12 is a protein called Exosome complex component RRP40.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	H	237	1806	1136	329	329	12	0	0

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-3	GLY	-	expression tag	UNP Q9NQT5
H	-2	PRO	-	expression tag	UNP Q9NQT5
H	-1	ASP	-	expression tag	UNP Q9NQT5
H	0	SER	-	expression tag	UNP Q9NQT5
H	225	HIS	TYR	variant	UNP Q9NQT5

- Molecule 13 is a protein called Exosome complex component RRP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	I	289	2263	1424	405	419	15	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	-3	GLY	-	expression tag	UNP Q13868
I	-2	PRO	-	expression tag	UNP Q13868
I	-1	ASP	-	expression tag	UNP Q13868
I	0	SER	-	expression tag	UNP Q13868

- Molecule 14 is a RNA chain called CrPV-IRES RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
14	X	123	2514	1126	375	890	123	0	0

- Molecule 15 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	Ln	24	230	139	62	26	3	0	0

- Molecule 16 is a protein called DIS3-like exonuclease 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	M	975	7903	4986	1405	1471	41	0	0

There are 43 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	-41	MET	-	initiating methionine	UNP Q8TF46
M	-40	SER	-	expression tag	UNP Q8TF46
M	-39	ALA	-	expression tag	UNP Q8TF46
M	-38	TRP	-	expression tag	UNP Q8TF46
M	-37	SER	-	expression tag	UNP Q8TF46
M	-36	HIS	-	expression tag	UNP Q8TF46
M	-35	PRO	-	expression tag	UNP Q8TF46
M	-34	GLN	-	expression tag	UNP Q8TF46
M	-33	PHE	-	expression tag	UNP Q8TF46
M	-32	GLU	-	expression tag	UNP Q8TF46
M	-31	LYS	-	expression tag	UNP Q8TF46
M	-30	GLY	-	expression tag	UNP Q8TF46
M	-29	GLY	-	expression tag	UNP Q8TF46
M	-28	GLY	-	expression tag	UNP Q8TF46
M	-27	SER	-	expression tag	UNP Q8TF46
M	-26	GLY	-	expression tag	UNP Q8TF46
M	-25	GLY	-	expression tag	UNP Q8TF46
M	-24	GLY	-	expression tag	UNP Q8TF46
M	-23	SER	-	expression tag	UNP Q8TF46
M	-22	GLY	-	expression tag	UNP Q8TF46
M	-21	GLY	-	expression tag	UNP Q8TF46
M	-20	SER	-	expression tag	UNP Q8TF46
M	-19	ALA	-	expression tag	UNP Q8TF46
M	-18	TRP	-	expression tag	UNP Q8TF46
M	-17	SER	-	expression tag	UNP Q8TF46
M	-16	HIS	-	expression tag	UNP Q8TF46
M	-15	PRO	-	expression tag	UNP Q8TF46
M	-14	GLN	-	expression tag	UNP Q8TF46
M	-13	PHE	-	expression tag	UNP Q8TF46
M	-12	GLU	-	expression tag	UNP Q8TF46
M	-11	LYS	-	expression tag	UNP Q8TF46

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Chain	Residue	Modelled	Actual	Comment	Reference
M	-10	THR	-	expression tag	UNP Q8TF46
M	-9	ALA	-	expression tag	UNP Q8TF46
M	-8	GLY	-	expression tag	UNP Q8TF46
M	-7	LEU	-	expression tag	UNP Q8TF46
M	-6	GLU	-	expression tag	UNP Q8TF46
M	-5	VAL	-	expression tag	UNP Q8TF46
M	-4	LEU	-	expression tag	UNP Q8TF46
M	-3	PHE	-	expression tag	UNP Q8TF46
M	-2	GLN	-	expression tag	UNP Q8TF46
M	-1	GLY	-	expression tag	UNP Q8TF46
M	0	PRO	-	expression tag	UNP Q8TF46
M	486	ASN	ASP	conflict	UNP Q8TF46

- Molecule 17 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
17	S2	1739	36835	16429	6582	12086	1738	0	0

- Molecule 18 is a protein called 40S ribosomal protein SA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	SA	222	1747	1109	306	324	8	0	0

- Molecule 19 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	SB	214	1738	1103	310	311	14	0	0

- Molecule 20 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	SC	222	1725	1115	298	302	10	0	0

- Molecule 21 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	SD	224	1745	1112	314	312	7	0	0

- Molecule 22 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	SE	262	2076	1324	386	358	8	0	0

- Molecule 23 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	SF	182	1445	906	271	261	7	0	0

- Molecule 24 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	SG	237	1923	1200	387	329	7	0	0

- Molecule 25 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	SH	189	1521	969	280	271	1	0	0

- Molecule 26 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	SI	206	1686	1058	332	291	5	0	0

- Molecule 27 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	SJ	185	1525	969	306	248	2	0	0

- Molecule 28 is a protein called 40S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	SK	97	816	533	144	133	6	0	0

- Molecule 29 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	SL	153	1247	793	234	214	6	0	0

- Molecule 30 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	SM	104	793	496	139	152	6	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
SM	52	GLN	LEU	conflict	UNP P25398
SM	69	LEU	CYS	conflict	UNP P25398
SM	99	ASN	LYS	conflict	UNP P25398

- Molecule 31 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	SN	150	1208	773	229	205	1	0	0

- Molecule 32 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	SO	140	1049	642	204	197	6	0	0

- Molecule 33 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	SP	123	1005	638	188	172	7	0	0

- Molecule 34 is a protein called 40S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	SQ	139	1105	704	207	191	3	0	0

- Molecule 35 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	SR	131	1064	668	198	194	4	0	0

- Molecule 36 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	SS	143	1184	743	240	200	1	0	0

- Molecule 37 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	ST	143	1112	697	214	198	3	0	0

- Molecule 38 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	SU	104	821	514	155	148	4	0	0

- Molecule 39 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	SV	83	636	393	117	121	5	0	0

- Molecule 40 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	SW	129	1034	659	193	176	6	0	0

- Molecule 41 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	SX	141	1098	693	219	183	3	0	0

- Molecule 42 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	SY	131	Total	C	N	O	S	0	0
			1065	673	209	178	5		

- Molecule 43 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	SZ	72	Total	C	N	O	S	0	0
			570	366	104	99	1		

- Molecule 44 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Sa	107	Total	C	N	O	S	0	0
			847	528	176	138	5		

- Molecule 45 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Sb	83	Total	C	N	O	S	0	0
			651	408	121	115	7		

- Molecule 46 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Sc	59	Total	C	N	O	S	0	0
			464	281	93	88	2		

- Molecule 47 is a protein called 40S ribosomal protein S29.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	Sd	55	Total	C	N	O	S	0	0
			459	286	94	74	5		

- Molecule 48 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	Se	58	Total	C	N	O	S	0	0
			459	284	100	74	1		

- Molecule 49 is a protein called Ubiquitin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	Sf	64	522	329	99	87	7	0	0

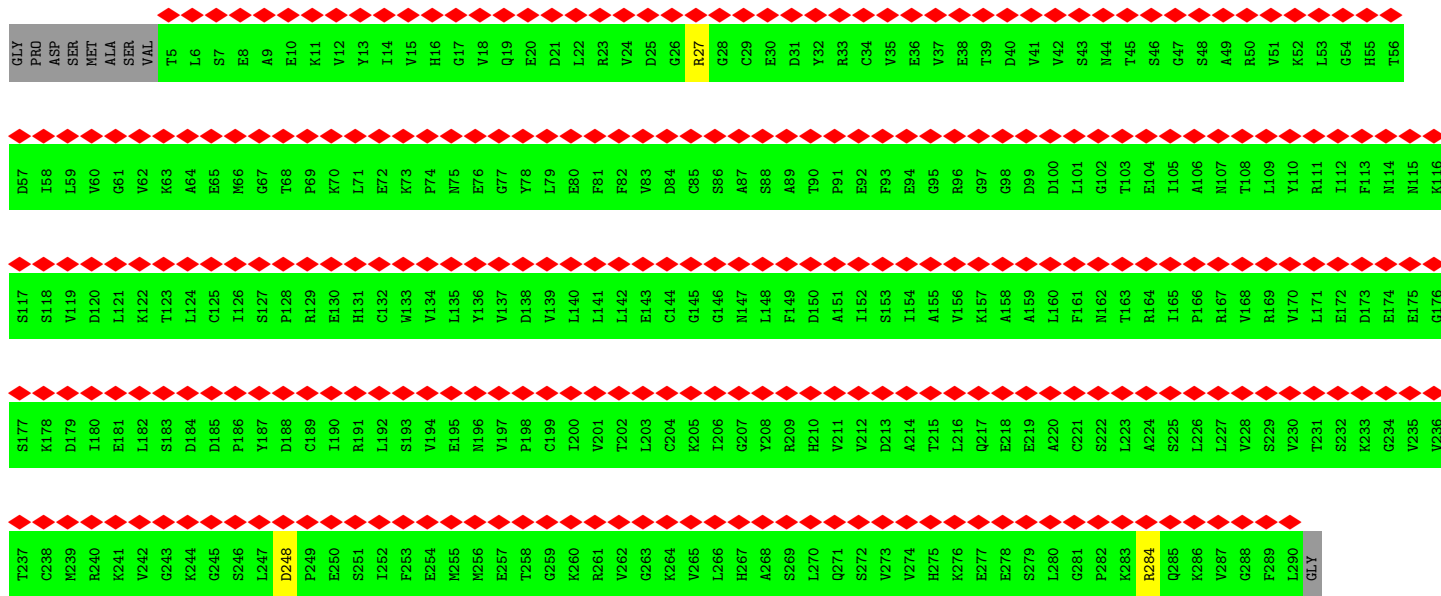
- Molecule 50 is a protein called Receptor of activated protein C kinase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	Sg	312	2429	1531	423	463	12	0	0

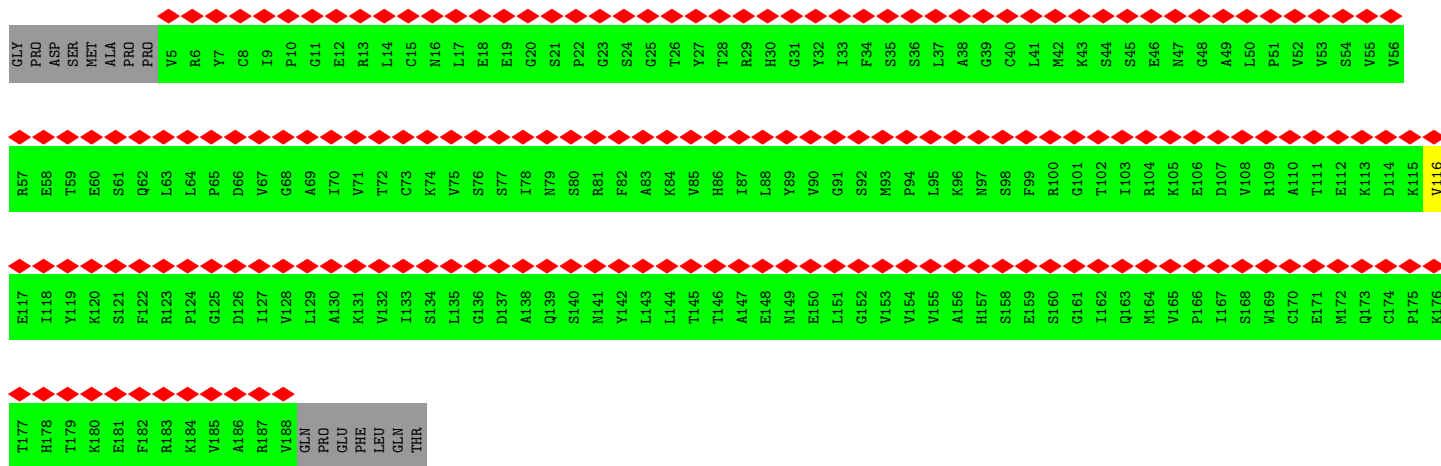
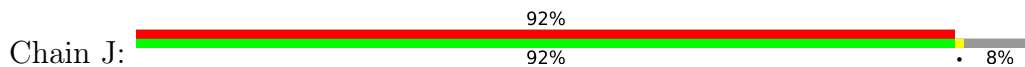
S1437	G1438	K1439	L1440	S1441	S1442	L1443	L1444	R1445	L1446	L1447	L1448	L1449	A1450	L1451	K1452	V1453	C1454	M1455	A1456	M1457	L1458	S1459	N1460	D1461	H1462	W1463	P1464	S1465	L1466	V1467	Q1468	E1469	V1470	T1471	T1472	E1473	A1474	L1475	K1476	L1477	C1478	F1479	C1480	P1481	C1482	Y1483	R1484	K1485	L1486	Q1487	Q1488	L1489	L1490	Q1491	F1492	K1493	R1494	K1495	M1496
F1317	E1318	N1319	Y1320	N1321	Q1322	S1323	L1324	E1325	K1326	W1327	S1328	L1329	S1330	Q1331	A1332	V1333	T1334	G1335	L1336	I1337	T1338	T1339	G1340	R1341	I1342	S1343	E1344	W1345	A1346	T1347	L1348	C1349	T1350	K1351	N1352	L1353	Q1354	S1355	N1356	P1357	L1358	Q1359	P1360	L1361	A1362	I1363	L1364	L1365	S1366	R1367	Q1368	V1369	Q1370	I1371	K1372	P1373	G1374	L1375	E1376
S1377	Q1378	K1379	P1380	L1381	P1382	D1383	A1384	V1385	L1386	E1387	E1388	L1389	Q1390	K1391	T1392	V1393	M1394	S1395	M1396	S1397	T1398	S1399	V1400	P1401	A1402	W1403	Q1404	W1405	L1406	A1407	H1408	V1409	Y1410	Q1411	S1412	Q1413	G1414	M1415	M1416	R1417	A1418	A1419	E1420	M1421	C1422	Y1423	R1424	K1425	S1426	L1427	Q1428	L1429	A1430	S1431	Q1432	K1433	G1434	S1435	W1436
K1257	T1258	I1259	Q1260	K1261	A1262	S1263	L1264	L1265	S1266	P1267	G1268	D1269	P1270	A1271	W1272	W1273	G1274	G1275	L1276	M1277	A1278	A1279	C1280	H1281	A1282	D1283	D1284	L1285	L1286	A1287	L1288	V1289	M1290	M1291	T1292	Q1293	Q1294	K1295	R1296	I1297	D1298	L1299	Y1300	L1301	A1302	L1303	L1304	S1305	A1306	V1307	S1308	A1309	S1310	I1311	K1312	D1313	E1314	K1315	F1316
S1197	L1198	L1199	S1200	R1201	V1202	V1203	A1204	Q1205	N1206	A1207	Q1208	R1209	N1210	A1211	K1212	G1213	G1214	V1215	V1216	A1217	G1218	N1219	V1220	A1221	H1222	I1223	L1224	D1225	L1226	S1227	H1228	G1229	K1230	K1231	A1232	L1233	L1234	Y1235	T1236	A1237	V1238	N1239	Q1240	L1241	A1242	M1243	G1244	A1245	S1246	S1247	A1248	E1249	D1250	E1251	N1252	M1253	T1254	A1255	L1256
D1137	A1138	T1139	L1140	S1141	K1142	A1143	A1144	L1145	N1146	E1147	L1148	R1149	K1150	H1151	I1152	K1153	H1154	K1155	D1156	S1157	N1158	Y1159	Q1160	R1161	C1162	L1163	L1164	T1165	S1166	A1167	I1168	Y1169	A1170	L1171	Q1172	G1173	L1174	S1175	V1176	A1177	V1178	Q1179	K1180	Q1181	I1182	S1183	K1184	A1185	V1186	H1187	S1188	M1189	P1190	G1191	D1192	P1193	L1194	L1195	W1196
A1077	L1078	S1079	I1080	V1081	E1082	S1083	E1084	Q1085	D1086	K1087	A1088	H1089	I1090	L1091	T1092	A1093	L1094	A1095	I1096	T1097	E1098	Y1099	K1100	L1101	G1102	K1103	T1104	D1105	V1106	A1107	K1108	T1109	L1110	L1111	F1112	L1113	C1114	S1115	L1116	L1117	K1118	E1119	P1120	T1121	T1122	E1123	S1124	A1125	Q1126	A1127	L1128	C1129	A1130	L1131	G1132	L1133	A1134	M1135	Q1136
D1017	T1018	Y1019	N1020	V1021	A1022	I1023	R1024	N1025	Y1026	G1027	R1028	L1029	L1030	C1031	S1032	V1033	G1034	E1035	Y1036	D1037	K1038	A1039	T1040	Q1041	A1042	F1043	K1044	S1045	N1046	P1047	L1048	E1049	N1050	L1051	D1052	D1053	I1054	I1055	K1056	F1057	A1058	L1059	A1060	L1061	A1062	Y1063	Q1064	G1065	A1066	I1067	L1068	E1069	L1070	Q1071	T1072	A1073	E1074	D1075	L1076
L957	Q958	M959	N960	A961	I962	P963	A964	A965	Q966	V967	I968	L969	N970	K971	Y972	V973	E974	R975	I976	Q977	R978	Y979	A980	P981	A982	F983	T984	M985	R986	G987	Y988	L989	N990	E991	H992	L993	Y994	L995	K996	K997	E998	A999	A1000	N1001	A1002	Y1003	Q1004	A1005	A1006	I1007	L1008	L1009	E1010	L951	Y952	Q953	Y954	D1015	Q1016
C897	W898	I899	G900	Q901	A902	L903	I904	A905	E906	A907	V908	G909	S910	Y911	D912	T913	M914	D915	L916	F917	R918	H919	T920	T921	E922	L923	N924	M925	R926	T927	E928	G929	A930	L931	G932	Y933	A934	Y935	W936	V937	C938	T939	T940	L941	E942	D943	K944	S945	M946	R947	E948	T949	E950	L951	Y952	Q953	Y954	N955	I956
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Y837	S838	G839	I840	G841	N842	Y843	A844	N845	Y846	Q847	H848	C849	F850	Y851	K852	S853	I854	Q855	S856	E857	Q858	I859	M860	A861	V862	A863	W864	T865	N866	L867	G868	V869	K870	S871	L872	T873	N874	E875	K876	L877	E878	Y879	A880	H881	E882	A883	F884	S885	M886	A887	Q888	S889	L890	D891	P892	S893	Y894	L895	M896
N777	T778	W779	C780	D781	L782	G783	I784	N785	Y786	Y787	R788	Q789	A790	Y791	H792	L793	A794	E795	T796	G797	S798	N799	M800	N801	V802	L803	K804	E805	N806	L807	E808	K809	S810	L811	H812	C813	L814	K815	K816	A817	V818	R819	L820	D821	S822	N823	N824	H825	Y826	Y827	W828	N829	A830	L831	G832	V833	Y834	A835	C836
W717	K718	L719	A720	D721	G722	A723	C724	T725	C726	L727	Y728	A729	V730	A731	S732	S733	K734	V735	N736	V737	H738	V739	L740	G741	V742	L743	L744	G745	Q746	K747	E748	G749	K750	Q751	V752	L753	K754	K755	N756	E757	L758	L759	H760	L761	G762	G763	R764	C765	Y766	G767	R768	A769	L770	K771	L772	M773	S774	T775	S776

◆◆◆◆◆
 Y301
 D302
 C303
 P304
 I305

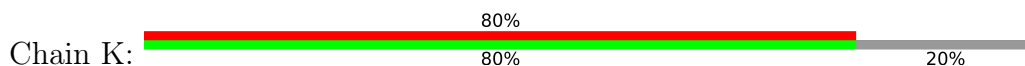
● Molecule 3: Exosome complex component RRP42



● Molecule 4: Exosome complex component CSL4

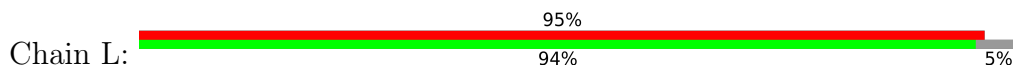


● Molecule 5: Exosome complex component RRP45



G57	Q68	V59	S60	C61	E62	L63	V64	S65	P66	K67	L68	N69	R70	A71	T72	E73	G74	I76	L76	F77	F78	N79	L80	E81	L82	S83	Q84	M85	A86	A87	P88	A89	F90	E91	P92	G93	R94	Q95	S96	D97	L98	L99	V100	K101	L102	N103	R104	L105	M106	E107	R108	C109	L110	R111	N112	K114	C115	I116		
D117	T118	E119	S120	L121	C122	V123	V124	A125	G126	E127	K128	V129	V130	Q131	I132	R133	V134	D135	L136	H137	L138	L139	M140	H141	D142	G143	M144	I145	I146	D147	A148	A149	S150	I151	A152	A153	I154	V155	A156	L157	C158	H159	F160	R161	P162	P163	D164	V165	S166	V167	Q168	G169	D170	E171	V172	T173	L174	Y175	T176	
P177	E178	E179	R180	D181	P182	V183	P184	L185	S186	I187	H188	H189	M190	P191	I192	C193	V194	S195	F196	K197	F198	F199	Q200	Q201	G202	T203	Y204	L205	L206	V207	D208	P209	N210	E211	R212	E213	E214	R215	V216	M217	D218	G219	L220	L221	V222	I223	A224	M225	N226	K227	H228	R229	E230	I231	V232	T233	I234	Q235	S236	
S237	G238	G239	I240	M241	L242	L243	K244	D245	Q246	V247	L248	R249	C250	S251	K252	A253	A254	G255	V256	K257	V258	A259	E260	I261	T262	E263	L264	I265	L266	K267	A268	L269	E270	M271	D272	Q273	Q274	V275	R276	K277	E278	G279	G280	K281	F282	G283	F284	A285	E286	S287	I288	A289	N290	Q291	R292	C293	I293	T294	A295	F296
K297	M298	E299	K300	A301	P302	I303	D304	T305	S306	D307	V308	E309	E310	K311	A312	E313	E314	I315	I316	A317	E318	A319	E320	P321	P322	S323	E324	V325	S326	S327	T328	F329	V330	L331	N332	G333	P334	G335	T336	A337	Q338	I339	G340	E341	G342	V343	E344	N345	S346	W347	G348	D349	L350	Q351	D352	S353	GLU	LYS	GLU	
ASP	ASP	GLU	GLY	GLY	GLY	ASP	GLN	ALA	SER	ALA	ILE	LYS	ILE	LEU	VAL	ASP	GLY	GLY	ILE	ARG	LYS	MET	LYS	ASP	THR	GLY	VAL	VAL	VAL	SER	ASP	ILE	ILE	GLY	SER	GLN	ASP	ALA	ALA	PRO	ILE	ILE	LEU	GLU	PRO	ASP	LYS	LYS	ASN	PRO	LYS	LYS	ILE	ARG	THR	GLN	THR			
SER	ALA	LYS	GLN	GLU	LYS	ALA	PRO	ALA	GLY	PHE	LYS	THR	VAL	E9	P10	L11	E12	Y13	Y14	R15	R16	F17	L18	K19	E20	M21	C22	R23	P24	D25	G26	R27	E28	L29	G30	E31	F32	R33	T34	T35	T36	V37	N38	I39	G40	S41	I42	S43	A44	A45	G47	S48	A49	V51	K52	L53	G54	N55	T56	

• Molecule 6: Exosome complex component RRP43



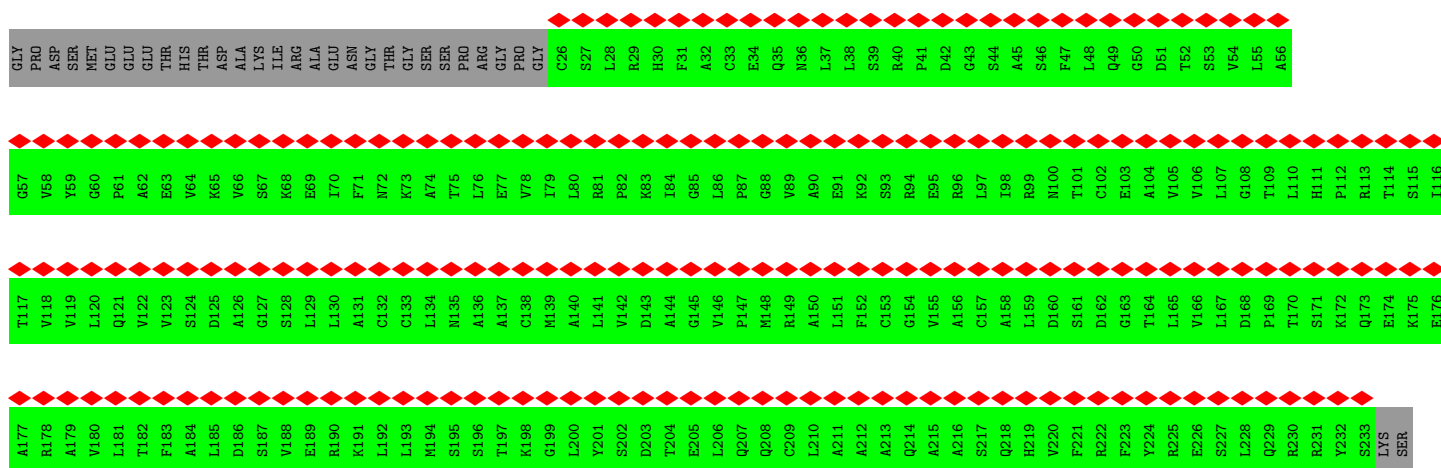
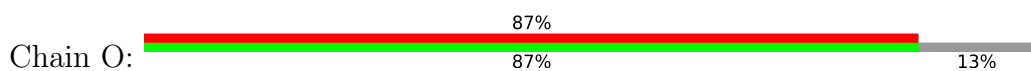
GLY	PRO	ASP	SER	MET	GLY	LYS	ALA	ALA	GLY	PHE	LYS	THR	VAL	E9	P10	L11	E12	Y13	Y14	R15	R16	F17	L18	K19	E20	M21	C22	R23	P24	D25	G26	R27	E28	L29	G30	E31	F32	R33	T34	T35	T36	V37	N38	I39	G40	S41	I42	S43	A44	A45	G47	S48	A49	V51	K52	L53	G54	N55	T56
T57	V58	I59	C60	G61	V62	K63	A64	E65	F66	A67	A68	P69	S70	T71	D72	A73	P74	D75	K76	G77	V78	V79	V80	P81	N82	N83	D84	L85	P86	P87	L88	C89	S90	S91	R92	F93	R94	S95	G96	P97	P98	G99	E100	E101	A102	Q103	V104	A105	S106	Q107	F108	I109	A110	D111	I112	I113	E114	N115	S116
Q117	I118	I119	Q120	K121	E122	D123	L124	C125	I126	S127	P128	G129	K130	L131	V132	M133	V134	L135	V136	C137	D138	L139	I140	C141	D142	D143	Y144	D145	G146	M147	L148	L149	D150	A151	C152	T153	F154	A155	L156	L157	A158	A159	L160	N161	V163	Q164	L165	P166	E167	V168	L169	T170	M171	E172	E173	T174	A175	L176	
A177	E178	V179	N180	L181	K182	K183	K184	S185	Y186	L187	N188	I189	R190	T191	H192	P193	V194	A195	T196	S197	F198	A199	V200	F201	D202	D203	T204	L205	L206	I207	V208	D209	P210	T211	G212	E213	E214	E215	H216	L217	A218	T219	G220	T221	L222	T223	I224	V225	M226	D227	E228	E229	G230	K231	L232	C233	C234	L235	H236
K237	P238	G239	G240	S241	G242	L243	T244	G245	A246	K247	L248	Q249	D250	C251	H252	S253	R254	A255	V256	T257	R258	H259	K260	E261	K263	K264	L265	M266	D267	E268	V269	I270	K271	S272	K273	LYS	PRO	LYS																					

• Molecule 7: Exosome complex component RRP41

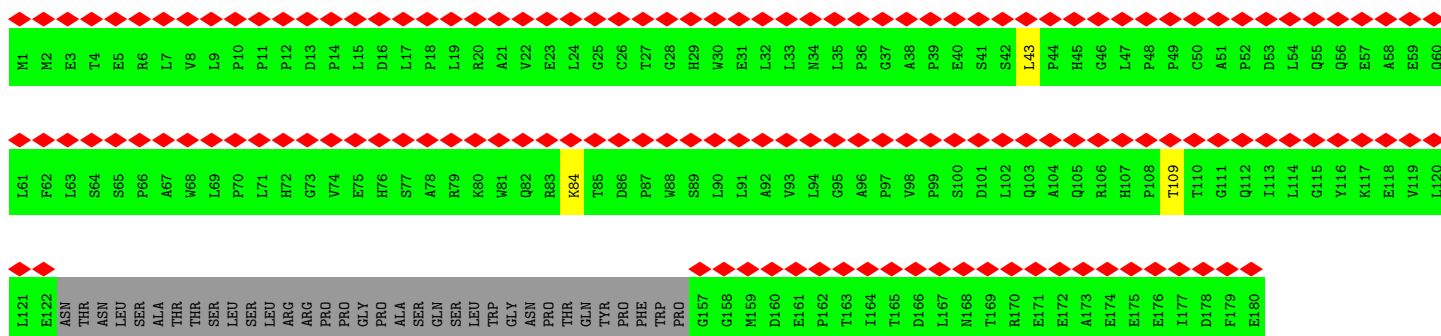
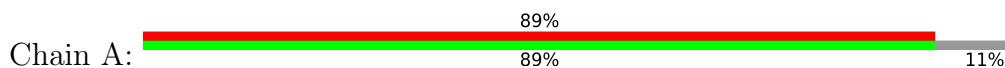




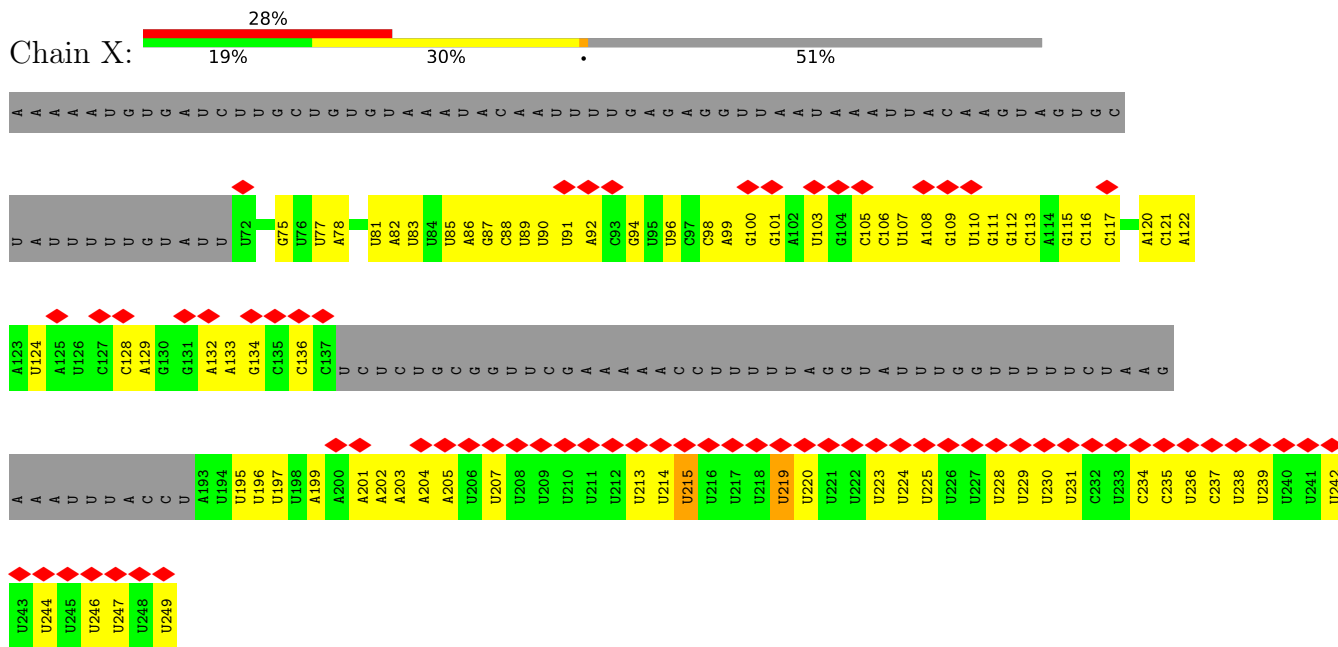
• Molecule 8: Exosome complex component RRP46



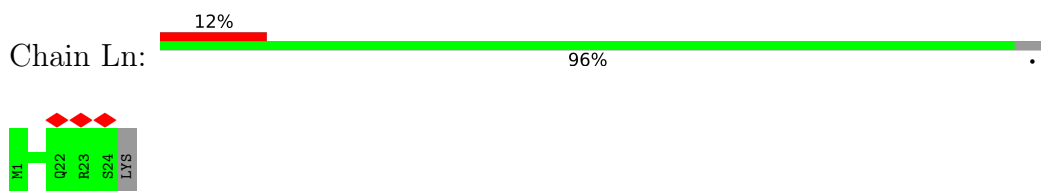
• Molecule 9: Helicase SKI2W



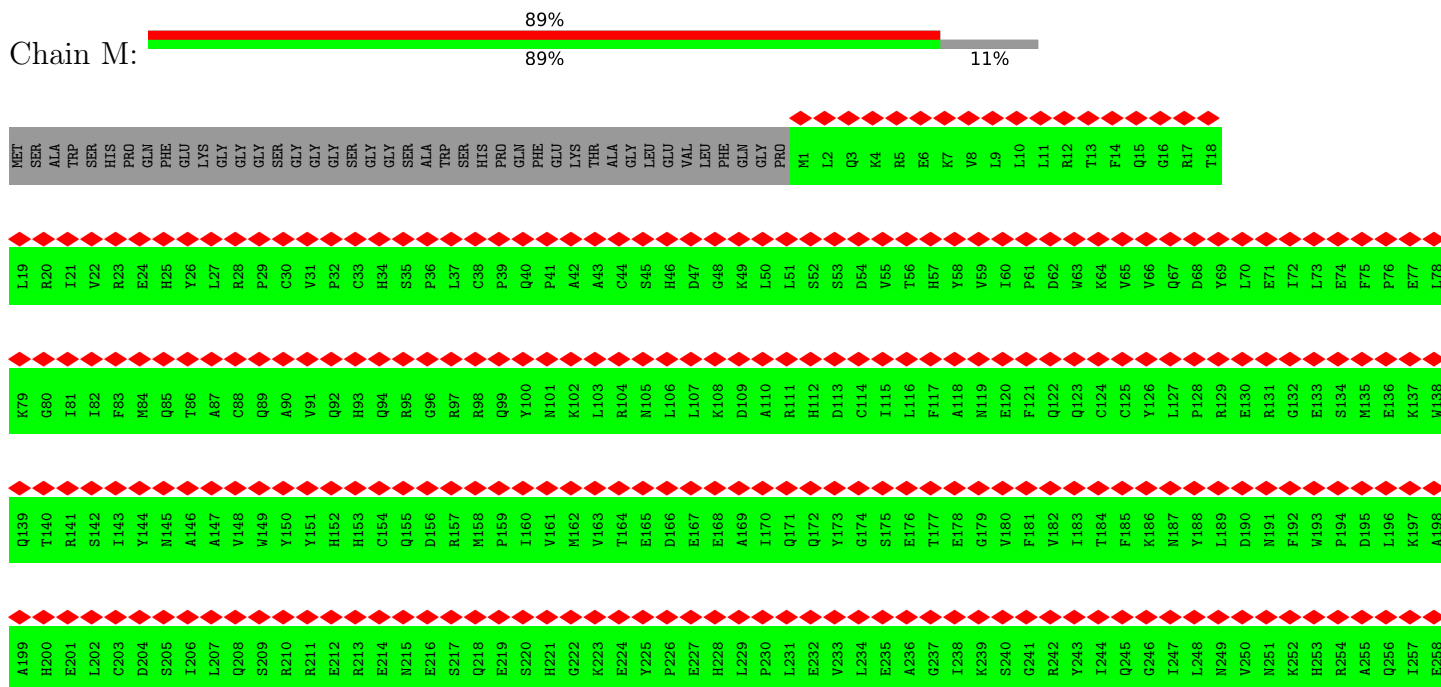
• Molecule 14: CrPV-IRES RNA



• Molecule 15: 60S ribosomal protein L41



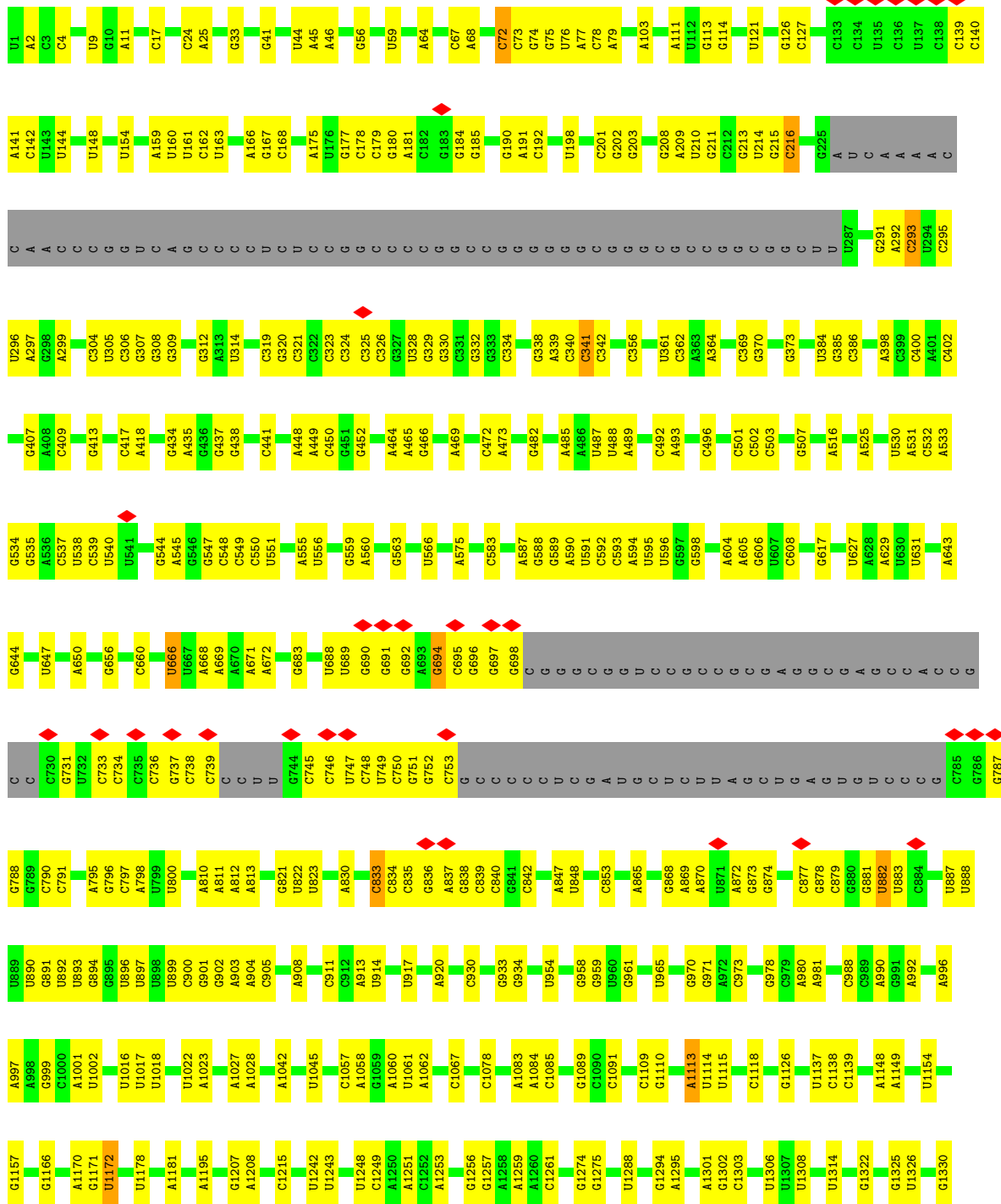
• Molecule 16: DIS3-like exonuclease 1



A259	F260	V261	R262	L263	GLN	GLY	ALA	SER	SER	LYS	ASP	ASP	LEU	VAL	SER	D276	I277	L278	I279	H280	G281	M282	K283	A284	R285	N286	R287	S288	I289	H290	G291	D292	V293	V294	V295	V296	E297	L298	L299	P300	K301	N302	E303	V304	K305	G306	R307	THR	VAL	ALA	LEU	CYS	GLU	ASN	ASP	ASP	ASP			
LYS	ALA	SER	GLY	SER	PRO	SER	E327	P328	M329	P330	T331	G332	R333	V334	V335	G336	I337	L338	Q339	K340	N341	W342	R343	D344	Y345	V346	V347	T348	F349	P350	S351	K352	E353	E354	V355	Q356	S357	Q358	G359	K360	N361	A362	Q363	K364	I365	L366	V367	T368	P369	W370	D371	Y372	R373	I374	P375	S376	I377	R378		
I379	S380	L381	Q382	A383	A384	E385	T386	L387	Q388	D389	F390	R391	V392	V393	V394	R395	I396	D397	S398	W399	E400	S401	T402	S403	V404	Y405	P406	N407	G408	H409	F410	V411	R412	V413	L414	G415	G416	R417	G418	D419	L420	E421	G422	E423	I424	A425	T426	L427	L428	V429	E430	N431	S432	I433	S434	V435	I436	P437	F438	
S439	E440	A441	Q442	M443	C444	E445	M446	D447	V448	N449	T450	P451	E452	S453	P454	W455	K456	V457	S458	P459	E460	E461	E462	Q463	K464	R465	K466	D467	L468	R469	K470	S471	H472	L473	V474	F475	S476	I477	D478	P479	K480	G481	C482	E483	D484	V485	N486	D487	L488	L489	S490	V491	R492	T493	L494	N495	N496	G497	N498	
L499	E500	L501	G502	V503	H504	I505	A506	D507	V508	T509	H510	F511	V512	A513	P514	N515	S516	Y517	I518	D519	I520	E521	A522	R523	T524	R525	A526	T527	T528	Y529	Y530	L531	A532	D533	R534	R535	Y536	D537	N538	L539	P540	S541	V542	L543	S544	A545	D546	L547	C548	S549	L550	G551	G552	G553	V554	D555	S556	Y557	A558	
V559	S560	I561	M562	W563	E564	L565	D566	K567	A568	S569	V570	E571	I572	K573	K574	V575	W576	Y577	G578	R579	T580	I581	I582	R583	S584	A585	Y586	K587	L588	F589	Y590	E591	A592	A593	Q594	E595	L596	L597	D598	G599	N600	L601	SER	VAL	VAL	ASP	ASP	ILE	PRO	GLU	PHE	LYS	ASP	LEU	D614	E615	K616	S617	R618	
Q619	A620	K621	L622	E623	E624	L625	V626	W627	A628	I629	G630	K631	L632	T633	D634	I635	A636	R637	H638	V639	R640	A641	K642	R643	D644	G645	C646	G647	A648	L649	E650	L651	G652	G653	V654	E655	V656	C657	V658	Q659	L660	D661	D662	K663	G664	K665	V666	H667	D668	L669	I670	P671	K672	Q673	P674	L675	E676	V677	H678	
E679	T680	V681	A682	E683	C684	M685	L686	L687	A688	N689	H690	M691	V692	A693	K694	K695	L696	W697	E698	S699	F700	P701	H702	Q703	A704	L705	L706	R707	Q708	H709	P710	P711	P712	H713	Q714	E715	E716	F717	S718	E719	L720	R721	E722	C723	A724	K725	A726	K727	G728	H729	F730	I731	D732	T733	R734	S735	N736	K737	T738	
L739	A740	D741	S742	L743	D744	M745	A746	D747	D748	P749	H750	D751	L752	L753	V754	M755	R756	L757	L758	R759	S760	M761	A762	T763	Q764	A765	M766	S767	M768	A769	L770	Y771	F772	S773	T774	G775	S776	C777	A778	E779	R780	E781	F782	H783	H784	Y785	G786	L787	L788	L789	D790	K791	Y792	T793	H794	F795	T796	S797	P798	
I799	R800	R801	Y802	S803	D804	I805	V806	W807	H808	R809	L810	L811	M812	A813	A814	I815	S816	R817	D818	R819	K820	M821	E822	L823	K824	G825	N826	L827	S828	R829	N830	K831	D832	L833	E834	E835	G836	L836	C837	R838	H839	T840	M841	N842	R843	N844	Q845	A846	A847	H848	H849	S850	K851	X852	Q853	S854	T855	E856	L857	F858
Q859	C860	M861	Y862	F863	K864	D865	K866	D867	P868	A869	T870	E871	E872	R873	C874	I875	S876	D877	G878	W879	I880	Y881	S882	L883	R884	T885	N886	L887	R888	L889	L890	F891	P893	R894	F895	G896	I897	K898	G899	A900	A901	Y902	L903	K904	X905	N906	D907	G908	L909	L910	K911	S912	Q913	N914	P915	D916	S917	C918		
S919	E920	M921	K922	P923	G924	S925	L926	Q927	R928	F929	Q930	M931	K932	I933	T934	S935	T936	T937	T938	D939	V940	E941	S942	Y943	T944	F945	H946	L947	F948	D949	H950	Y951	T952	Y953	R954	I955	S956	I957	Q958	A959	S960	R961	C962	H963	S964	D965	T966	P967	R968	L969	E970	I971	T972	S973	N974	K975	P976	Y977	K978	
I979	P980	N981	T982	E983	LEU	ILE	HIS	GLN	SER	PRO	LEU	LYS	SER	GLU	LEU	VAL	LYS	GLU	THR	LYS	SER	VAL	GLU	GLU	ALA	GLN	LEU	GLN	GLU	VAL	VAL	N1016	I1017	I1018	Q1019	E1020	E1021	Y1022	Q1023	E1024	Y1025	R1026	Q1027	T1028	K1029	R1030	R1031	S1032	D965	Y1034	T1035	L1036	L1037	E1038						

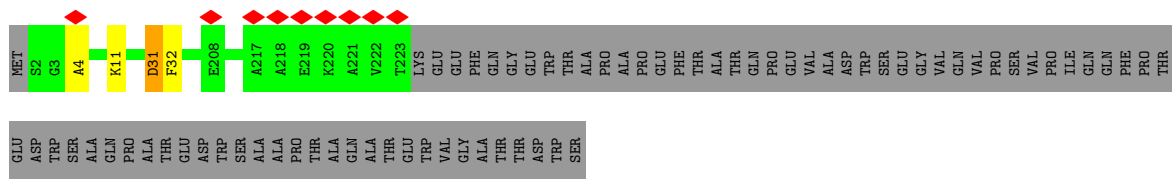
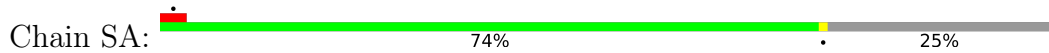
E1039	I1040	R1041	D1042	L1043	A1044	L1045	L1046	D1047	V1048	S1049	H1050	ASN	TYR	GLY	ILE
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● Molecule 17: 18S ribosomal RNA

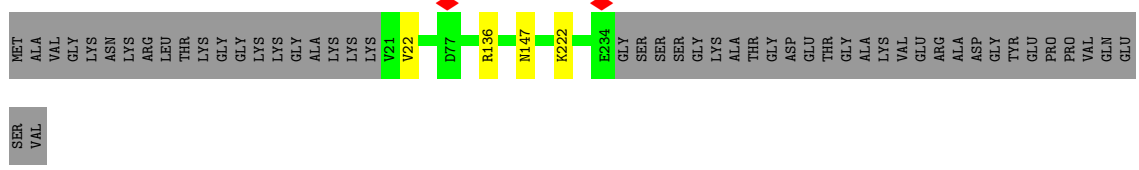
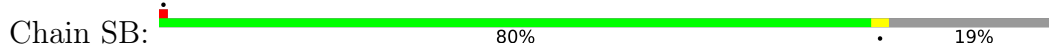




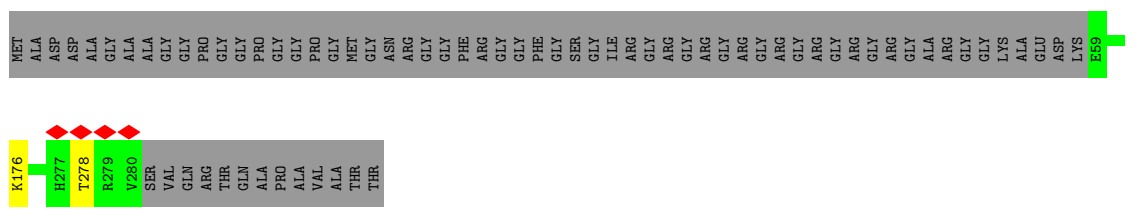
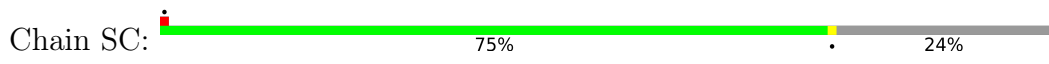
• Molecule 18: 40S ribosomal protein SA



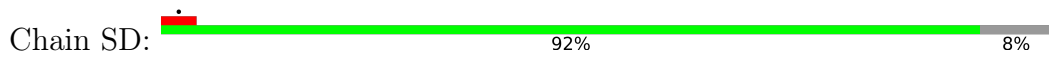
• Molecule 19: 40S ribosomal protein S3a

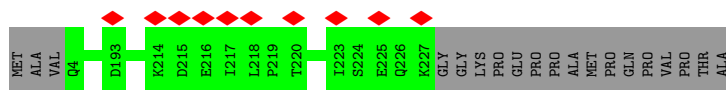


• Molecule 20: 40S ribosomal protein S2

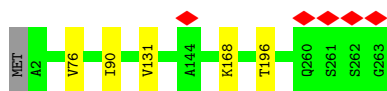


• Molecule 21: 40S ribosomal protein S3





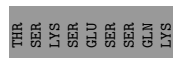
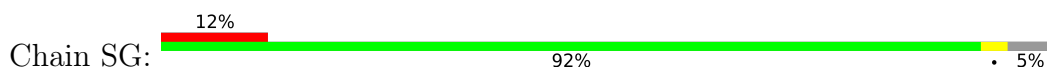
- Molecule 22: 40S ribosomal protein S4, X isoform



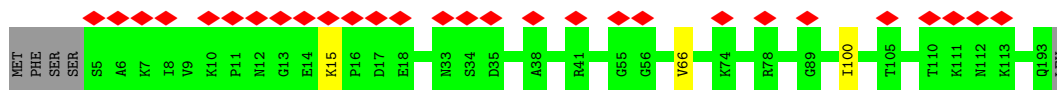
- Molecule 23: 40S ribosomal protein S5



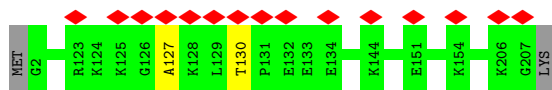
- Molecule 24: 40S ribosomal protein S6



- Molecule 25: 40S ribosomal protein S7

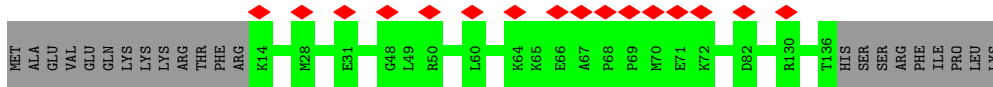
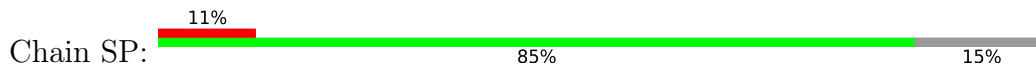


- Molecule 26: 40S ribosomal protein S8

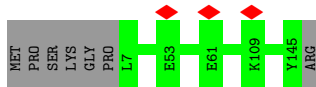


- Molecule 27: 40S ribosomal protein S9

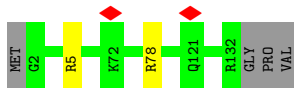




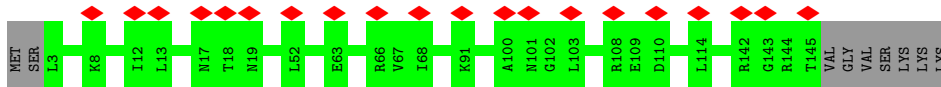
- Molecule 34: 40S ribosomal protein S16



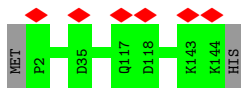
- Molecule 35: 40S ribosomal protein S17



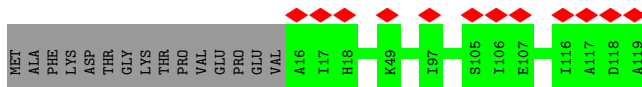
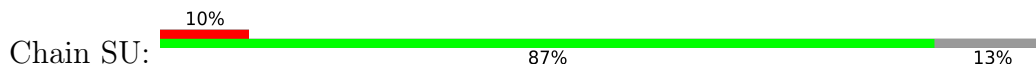
- Molecule 36: 40S ribosomal protein S18



- Molecule 37: 40S ribosomal protein S19



- Molecule 38: 40S ribosomal protein S20



- Molecule 39: 40S ribosomal protein S21



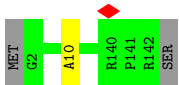
- Molecule 40: 40S ribosomal protein S15a

Chain SW:  99%



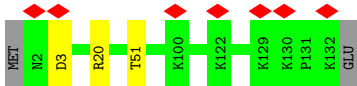
- Molecule 41: 40S ribosomal protein S23

Chain SX:  98%



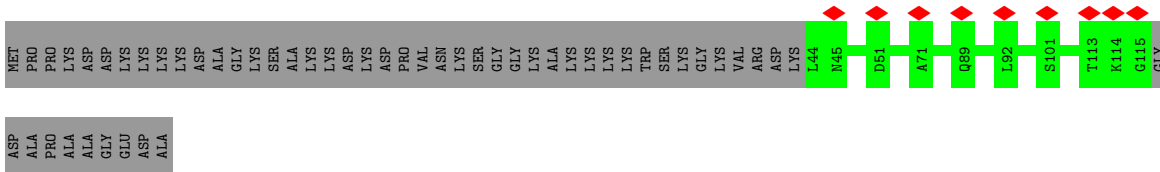
- Molecule 42: 40S ribosomal protein S24

Chain SY:  96%

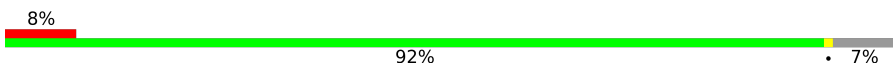


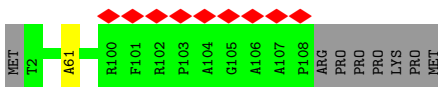
- Molecule 43: 40S ribosomal protein S25

Chain SZ:  58% 42%



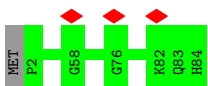
- Molecule 44: 40S ribosomal protein S26

Chain Sa:  92% 7%




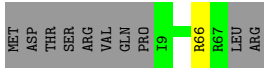
- Molecule 45: 40S ribosomal protein S27

Chain Sb:  99%



- Molecule 46: 40S ribosomal protein S28

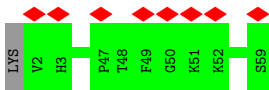
Chain Sc:  84% 14%



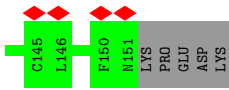
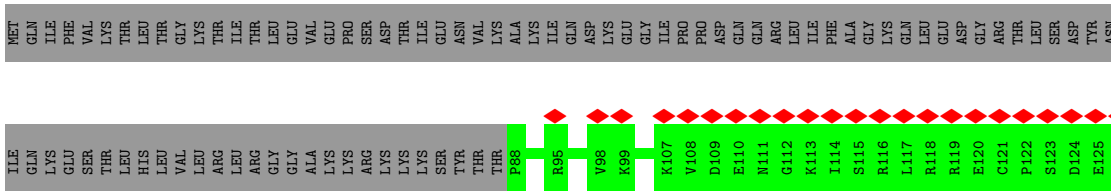
- Molecule 47: 40S ribosomal protein S29



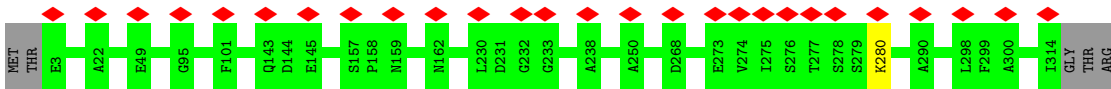
- Molecule 48: 40S ribosomal protein S30



- Molecule 49: Ubiquitin



- Molecule 50: Receptor of activated protein C kinase 1



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	53460	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	64.2	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.053	Depositor
Minimum map value	-0.013	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.01	Depositor
Map size (\AA)	708.19836, 708.19836, 708.19836	wwPDB
Map dimensions	832, 832, 832	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.8512, 0.8512, 0.8512	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	B	0.25	0/7429	0.48	0/10058
2	C	0.25	0/2432	0.54	0/3311
2	D	0.27	0/2432	0.54	0/3311
3	F	0.26	0/2225	0.52	0/3007
4	J	0.25	0/1438	0.54	0/1942
5	K	0.25	0/2807	0.52	0/3792
6	L	0.26	0/2053	0.52	0/2786
7	N	0.25	0/1843	0.56	0/2492
8	O	0.27	0/1586	0.55	0/2145
9	A	0.26	0/8881	0.54	1/12039 (0.0%)
10	E	0.25	0/535	0.52	0/722
11	G	0.25	0/1881	0.59	0/2551
12	H	0.25	0/1832	0.54	0/2467
13	I	0.25	0/2296	0.56	0/3092
14	X	0.35	0/2792	0.99	11/4331 (0.3%)
15	Ln	0.34	0/231	0.80	0/294
16	M	0.24	0/8072	0.50	0/10916
17	S2	0.61	0/41169	0.90	48/64139 (0.1%)
18	SA	0.38	0/1784	0.63	1/2424 (0.0%)
19	SB	0.36	0/1765	0.60	0/2362
20	SC	0.40	0/1762	0.61	0/2381
21	SD	0.33	0/1773	0.57	0/2387
22	SE	0.36	0/2118	0.65	0/2849
23	SF	0.34	0/1465	0.56	0/1969
24	SG	0.32	0/1946	0.65	1/2590 (0.0%)
25	SH	0.31	0/1544	0.58	0/2068
26	SI	0.36	0/1715	0.62	0/2287
27	SJ	0.39	0/1550	0.70	1/2069 (0.0%)
28	SK	0.32	0/840	0.53	0/1133
29	SL	0.40	0/1268	0.63	1/1696 (0.1%)
30	SM	0.28	0/799	0.50	0/1076
31	SN	0.36	0/1232	0.59	0/1656
32	SO	0.33	0/1062	0.67	0/1425
33	SP	0.32	0/1024	0.55	0/1369

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
34	SQ	0.35	0/1122	0.59	0/1503
35	SR	0.33	0/1078	0.59	0/1447
36	SS	0.29	0/1202	0.60	0/1610
37	ST	0.33	0/1131	0.53	0/1515
38	SU	0.31	0/831	0.57	0/1115
39	SV	0.34	0/643	0.60	0/860
40	SW	0.39	0/1051	0.64	0/1406
41	SX	0.37	0/1116	0.60	0/1490
42	SY	0.37	0/1083	0.63	0/1438
43	SZ	0.30	0/576	0.54	0/774
44	Sa	0.38	0/863	0.65	0/1159
45	Sb	0.33	0/665	0.59	0/891
46	Sc	0.31	0/465	0.64	0/621
47	Sd	0.34	0/470	0.56	0/623
48	Se	0.33	0/465	0.62	0/612
49	Sf	0.29	0/533	0.53	0/706
50	Sg	0.30	0/2486	0.54	0/3384
All	All	0.42	0/131361	0.71	64/186290 (0.0%)

There are no bond length outliers.

All (64) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	S2	1442	U	OP1-P-O3'	-11.25	80.45	105.20
17	S2	1442	U	OP2-P-O3'	-9.56	84.17	105.20
14	X	215	U	C2-N1-C1'	7.87	127.14	117.70
27	SJ	4	ALA	C-N-CA	7.75	141.07	121.70
17	S2	1646	C	N1-C2-O2	7.64	123.49	118.90
14	X	215	U	N1-C2-O2	7.35	127.94	122.80
17	S2	1109	C	O4'-C1'-N1	6.88	113.70	108.20
17	S2	666	U	C2-N1-C1'	6.88	125.95	117.70
17	S2	833	C	N1-C2-O2	6.82	122.99	118.90
17	S2	1443	C	OP1-P-OP2	6.80	129.81	119.60
17	S2	1646	C	N3-C2-O2	-6.79	117.15	121.90
18	SA	4	ALA	C-N-CA	6.73	138.53	121.70
17	S2	72	C	O5'-P-OP2	-6.60	99.76	105.70
14	X	215	U	N3-C2-O2	-6.54	117.62	122.20
17	S2	882	U	C2-N1-C1'	6.53	125.54	117.70
17	S2	1022	U	C2-N1-C1'	6.44	125.42	117.70
17	S2	1646	C	C2-N1-C1'	6.41	125.85	118.80
17	S2	882	U	N1-C2-O2	6.37	127.26	122.80
17	S2	293	C	C2-N1-C1'	6.36	125.80	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	S2	341	C	N1-C2-O2	6.21	122.63	118.90
17	S2	356	C	N1-C2-O2	6.18	122.61	118.90
14	X	219	U	C2-N1-C1'	6.17	125.11	117.70
17	S2	341	C	C2-N1-C1'	6.17	125.59	118.80
17	S2	1314	U	C2-N1-C1'	6.13	125.06	117.70
17	S2	293	C	N1-C2-O2	6.12	122.57	118.90
17	S2	872	A	O4'-C1'-N9	6.12	113.10	108.20
17	S2	1261	C	N1-C2-O2	6.11	122.56	118.90
17	S2	882	U	N3-C2-O2	-6.09	117.94	122.20
17	S2	356	C	C2-N1-C1'	6.05	125.46	118.80
17	S2	1172	U	C2-N1-C1'	5.93	124.82	117.70
17	S2	216	C	N3-C2-O2	-5.88	117.78	121.90
29	SL	33	LEU	CA-CB-CG	5.84	128.73	115.30
24	SG	147	LEU	CA-CB-CG	5.71	128.42	115.30
14	X	234	C	N1-C2-O2	5.70	122.32	118.90
17	S2	501	C	C2-N1-C1'	5.65	125.02	118.80
14	X	219	U	N1-C2-O2	5.56	126.69	122.80
17	S2	1057	C	C2-N1-C1'	5.55	124.90	118.80
17	S2	216	C	C2-N1-C1'	5.53	124.88	118.80
17	S2	216	C	N1-C2-O2	5.48	122.19	118.90
14	X	234	C	C2-N1-C1'	5.47	124.82	118.80
17	S2	647	U	C2-N1-C1'	5.47	124.27	117.70
17	S2	293	C	N3-C2-O2	-5.45	118.08	121.90
17	S2	1520	G	C4-N9-C1'	5.37	133.49	126.50
14	X	75	G	N1-C6-O6	-5.37	116.68	119.90
17	S2	1261	C	C2-N1-C1'	5.32	124.65	118.80
17	S2	694	G	O4'-C1'-N9	5.30	112.44	108.20
14	X	219	U	N3-C2-O2	-5.28	118.50	122.20
17	S2	342	C	C2-N1-C1'	5.27	124.59	118.80
14	X	215	U	C6-N1-C1'	-5.25	113.84	121.20
9	A	43	LEU	CA-CB-CG	5.20	127.25	115.30
17	S2	833	C	N3-C2-O2	-5.20	118.26	121.90
17	S2	1261	C	N3-C2-O2	-5.12	118.32	121.90
17	S2	1520	G	N3-C4-N9	5.10	129.06	126.00
17	S2	341	C	N3-C2-O2	-5.08	118.34	121.90
14	X	105	C	N1-C2-O2	5.08	121.95	118.90
17	S2	356	C	N3-C2-O2	-5.07	118.35	121.90
17	S2	1113	A	O4'-C1'-N9	5.06	112.25	108.20
17	S2	1520	G	C8-N9-C1'	-5.06	120.42	127.00
17	S2	1860	A	P-O3'-C3'	5.03	125.73	119.70
17	S2	1057	C	N1-C2-O2	5.02	121.91	118.90
17	S2	293	C	C6-N1-C2	-5.01	118.29	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	S2	833	C	C2-N1-C1'	5.01	124.31	118.80
17	S2	72	C	O5'-P-OP1	5.01	116.72	110.70
17	S2	216	C	C6-N1-C2	-5.01	118.30	120.30

There are no chirality outliers.

There are no planarity outliers.

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	B	932/1568 (59%)	874 (94%)	58 (6%)	0	100	100
2	C	303/305 (99%)	272 (90%)	31 (10%)	0	100	100
2	D	303/305 (99%)	259 (86%)	44 (14%)	0	100	100
3	F	284/295 (96%)	267 (94%)	16 (6%)	1 (0%)	30	60
4	J	182/199 (92%)	158 (87%)	23 (13%)	1 (0%)	25	54
5	K	351/443 (79%)	331 (94%)	20 (6%)	0	100	100
6	L	263/280 (94%)	247 (94%)	16 (6%)	0	100	100
7	N	239/245 (98%)	225 (94%)	14 (6%)	0	100	100
8	O	206/239 (86%)	199 (97%)	7 (3%)	0	100	100
9	A	1104/1246 (89%)	1023 (93%)	80 (7%)	1 (0%)	48	78
10	E	60/274 (22%)	51 (85%)	9 (15%)	0	100	100
11	G	247/272 (91%)	239 (97%)	8 (3%)	0	100	100
12	H	233/279 (84%)	213 (91%)	20 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	I	285/297 (96%)	261 (92%)	24 (8%)	0	100	100
15	Ln	22/25 (88%)	19 (86%)	3 (14%)	0	100	100
16	M	965/1096 (88%)	921 (95%)	44 (5%)	0	100	100
18	SA	220/295 (75%)	191 (87%)	26 (12%)	3 (1%)	9	31
19	SB	212/264 (80%)	181 (85%)	29 (14%)	2 (1%)	14	41
20	SC	220/293 (75%)	186 (84%)	32 (14%)	2 (1%)	14	41
21	SD	222/243 (91%)	216 (97%)	6 (3%)	0	100	100
22	SE	260/263 (99%)	219 (84%)	36 (14%)	5 (2%)	6	26
23	SF	178/204 (87%)	167 (94%)	11 (6%)	0	100	100
24	SG	235/249 (94%)	197 (84%)	31 (13%)	7 (3%)	3	19
25	SH	187/194 (96%)	154 (82%)	31 (17%)	2 (1%)	12	37
26	SI	204/208 (98%)	177 (87%)	25 (12%)	2 (1%)	13	39
27	SJ	183/194 (94%)	160 (87%)	20 (11%)	3 (2%)	8	29
28	SK	95/165 (58%)	87 (92%)	8 (8%)	0	100	100
29	SL	151/158 (96%)	127 (84%)	24 (16%)	0	100	100
30	SM	100/132 (76%)	90 (90%)	10 (10%)	0	100	100
31	SN	148/151 (98%)	142 (96%)	3 (2%)	3 (2%)	6	25
32	SO	138/151 (91%)	107 (78%)	27 (20%)	4 (3%)	3	19
33	SP	121/145 (83%)	115 (95%)	6 (5%)	0	100	100
34	SQ	137/146 (94%)	130 (95%)	7 (5%)	0	100	100
35	SR	129/135 (96%)	125 (97%)	4 (3%)	0	100	100
36	SS	141/152 (93%)	137 (97%)	4 (3%)	0	100	100
37	ST	141/145 (97%)	140 (99%)	1 (1%)	0	100	100
38	SU	102/119 (86%)	96 (94%)	6 (6%)	0	100	100
39	SV	81/83 (98%)	65 (80%)	14 (17%)	2 (2%)	4	22
40	SW	127/130 (98%)	115 (91%)	12 (9%)	0	100	100
41	SX	139/143 (97%)	126 (91%)	12 (9%)	1 (1%)	19	47
42	SY	129/133 (97%)	115 (89%)	12 (9%)	2 (2%)	8	29
43	SZ	70/125 (56%)	65 (93%)	5 (7%)	0	100	100
44	Sa	105/115 (91%)	81 (77%)	23 (22%)	1 (1%)	13	39
45	Sb	81/84 (96%)	66 (82%)	15 (18%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
46	Sc	57/69 (83%)	53 (93%)	4 (7%)	0	100	100
47	Sd	53/56 (95%)	52 (98%)	1 (2%)	0	100	100
48	Se	56/59 (95%)	43 (77%)	13 (23%)	0	100	100
49	Sf	62/156 (40%)	57 (92%)	5 (8%)	0	100	100
50	Sg	310/317 (98%)	288 (93%)	22 (7%)	0	100	100
All	All	10773/12844 (84%)	9829 (91%)	902 (8%)	42 (0%)	32	60

All (42) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
18	SA	32	PHE
19	SB	147	ASN
22	SE	76	VAL
24	SG	25	ARG
24	SG	122	PRO
25	SH	66	VAL
27	SJ	3	VAL
27	SJ	8	VAL
32	SO	68	GLU
39	SV	36	VAL
41	SX	10	ALA
19	SB	22	VAL
20	SC	278	THR
24	SG	12	CYS
26	SI	130	THR
39	SV	78	ILE
9	A	109	THR
18	SA	31	ASP
24	SG	212	LEU
31	SN	24	THR
32	SO	129	ILE
44	Sa	61	ALA
24	SG	20	ASP
24	SG	175	LYS
31	SN	3	ARG
32	SO	56	VAL
22	SE	131	VAL
22	SE	168	LYS
22	SE	196	THR
25	SH	100	ILE

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Mol	Chain	Res	Type
32	SO	140	THR
3	F	248	ASP
18	SA	11	LYS
24	SG	152	ASP
26	SI	127	ALA
27	SJ	138	ARG
42	SY	3	ASP
42	SY	51	THR
4	J	116	VAL
20	SC	176	LYS
31	SN	68	GLY
22	SE	90	ILE

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	B	780/1316 (59%)	778 (100%)	2 (0%)	91 95
2	C	260/260 (100%)	260 (100%)	0	100 100
2	D	260/260 (100%)	259 (100%)	1 (0%)	89 93
3	F	249/255 (98%)	247 (99%)	2 (1%)	79 87
4	J	160/173 (92%)	160 (100%)	0	100 100
5	K	307/384 (80%)	307 (100%)	0	100 100
6	L	227/238 (95%)	226 (100%)	1 (0%)	89 93
7	N	183/186 (98%)	183 (100%)	0	100 100
8	O	172/196 (88%)	172 (100%)	0	100 100
9	A	953/1062 (90%)	950 (100%)	3 (0%)	91 95
10	E	57/251 (23%)	57 (100%)	0	100 100
11	G	178/188 (95%)	178 (100%)	0	100 100
12	H	196/224 (88%)	196 (100%)	0	100 100
13	I	251/257 (98%)	250 (100%)	1 (0%)	89 93

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
15	Ln	23/24 (96%)	23 (100%)	0	100	100
16	M	873/973 (90%)	872 (100%)	1 (0%)	92	97
18	SA	184/243 (76%)	183 (100%)	1 (0%)	86	91
19	SB	195/231 (84%)	193 (99%)	2 (1%)	73	83
20	SC	188/225 (84%)	188 (100%)	0	100	100
21	SD	188/202 (93%)	188 (100%)	0	100	100
22	SE	224/225 (100%)	224 (100%)	0	100	100
23	SF	155/170 (91%)	155 (100%)	0	100	100
24	SG	207/218 (95%)	207 (100%)	0	100	100
25	SH	169/174 (97%)	168 (99%)	1 (1%)	84	90
26	SI	178/180 (99%)	178 (100%)	0	100	100
27	SJ	161/168 (96%)	161 (100%)	0	100	100
28	SK	88/136 (65%)	88 (100%)	0	100	100
29	SL	137/142 (96%)	137 (100%)	0	100	100
30	SM	86/108 (80%)	86 (100%)	0	100	100
31	SN	130/131 (99%)	130 (100%)	0	100	100
32	SO	110/119 (92%)	110 (100%)	0	100	100
33	SP	109/130 (84%)	109 (100%)	0	100	100
34	SQ	115/121 (95%)	115 (100%)	0	100	100
35	SR	119/122 (98%)	117 (98%)	2 (2%)	56	74
36	SS	124/132 (94%)	124 (100%)	0	100	100
37	ST	113/115 (98%)	113 (100%)	0	100	100
38	SU	94/107 (88%)	94 (100%)	0	100	100
39	SV	67/67 (100%)	66 (98%)	1 (2%)	60	76
40	SW	112/113 (99%)	112 (100%)	0	100	100
41	SX	113/115 (98%)	113 (100%)	0	100	100
42	SY	113/115 (98%)	112 (99%)	1 (1%)	75	86
43	SZ	63/103 (61%)	63 (100%)	0	100	100
44	Sa	90/98 (92%)	90 (100%)	0	100	100
45	Sb	75/76 (99%)	75 (100%)	0	100	100
46	Sc	52/62 (84%)	51 (98%)	1 (2%)	52	71

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
47	Sd	48/49 (98%)	48 (100%)	0	100	100
48	Se	47/48 (98%)	47 (100%)	0	100	100
49	Sf	57/140 (41%)	57 (100%)	0	100	100
50	Sg	271/275 (98%)	270 (100%)	1 (0%)	89	93
All	All	9311/10907 (85%)	9290 (100%)	21 (0%)	91	96

All (21) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	947	ARG
1	B	1118	LYS
2	D	29	LYS
3	F	27	ARG
3	F	284	ARG
6	L	33	ARG
9	A	84	LYS
9	A	905	LYS
9	A	1019	ARG
13	I	238	ARG
16	M	932	LYS
18	SA	31	ASP
19	SB	136	ARG
19	SB	222	LYS
25	SH	15	LYS
35	SR	5	ARG
35	SR	78	ARG
39	SV	35	ASN
42	SY	20	ARG
46	Sc	66	ARG
50	Sg	280	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	642	GLN
1	B	708	GLN
1	B	860	ASN
1	B	1179	GLN
1	B	1356	ASN
1	B	1413	GLN

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Mol	Chain	Res	Type
1	B	1432	GLN
2	C	57	GLN
2	C	237	ASN
8	O	49	GLN
16	M	139	GLN
16	M	619	GLN
16	M	784	HIS
16	M	1019	GLN
24	SG	186	GLN
27	SJ	111	GLN
30	SM	52	GLN
31	SN	90	HIS
35	SR	116	ASN
37	ST	126	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
14	X	121/250 (48%)	72 (59%)	3 (2%)
17	S2	1712/1869 (91%)	463 (27%)	19 (1%)
All	All	1833/2119 (86%)	535 (29%)	22 (1%)

All (535) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
14	X	77	U
14	X	78	A
14	X	81	U
14	X	82	A
14	X	83	U
14	X	85	U
14	X	86	A
14	X	87	G
14	X	88	C
14	X	89	U
14	X	90	U
14	X	91	U
14	X	92	A
14	X	94	G
14	X	96	U
14	X	98	C

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Mol	Chain	Res	Type
14	X	99	A
14	X	101	G
14	X	103	U
14	X	106	C
14	X	107	U
14	X	108	A
14	X	109	G
14	X	110	U
14	X	111	G
14	X	112	G
14	X	113	C
14	X	115	G
14	X	116	C
14	X	117	C
14	X	120	A
14	X	121	C
14	X	122	A
14	X	124	U
14	X	128	C
14	X	129	A
14	X	132	A
14	X	133	A
14	X	134	G
14	X	136	C
14	X	195	U
14	X	196	U
14	X	197	U
14	X	199	A
14	X	201	A
14	X	202	A
14	X	203	A
14	X	204	A
14	X	205	A
14	X	207	U
14	X	213	U
14	X	214	U
14	X	215	U
14	X	219	U
14	X	220	U
14	X	223	U
14	X	224	U
14	X	225	U

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Mol	Chain	Res	Type
14	X	228	U
14	X	229	U
14	X	230	U
14	X	231	U
14	X	235	C
14	X	236	U
14	X	237	C
14	X	238	U
14	X	239	U
14	X	242	U
14	X	244	U
14	X	246	U
14	X	247	U
14	X	249	U
17	S2	2	A
17	S2	4	C
17	S2	9	U
17	S2	11	A
17	S2	17	C
17	S2	25	A
17	S2	33	G
17	S2	41	G
17	S2	44	U
17	S2	45	A
17	S2	46	A
17	S2	56	G
17	S2	59	U
17	S2	64	A
17	S2	67	C
17	S2	68	A
17	S2	72	C
17	S2	73	C
17	S2	74	G
17	S2	75	G
17	S2	76	U
17	S2	77	A
17	S2	78	C
17	S2	79	A
17	S2	103	A
17	S2	111	A
17	S2	113	G
17	S2	114	G

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Mol	Chain	Res	Type
17	S2	121	U
17	S2	126	G
17	S2	127	C
17	S2	139	C
17	S2	140	C
17	S2	141	A
17	S2	142	C
17	S2	144	U
17	S2	148	U
17	S2	154	U
17	S2	159	A
17	S2	160	U
17	S2	161	U
17	S2	162	C
17	S2	163	U
17	S2	166	A
17	S2	167	G
17	S2	168	C
17	S2	175	A
17	S2	177	G
17	S2	179	C
17	S2	180	G
17	S2	181	A
17	S2	184	G
17	S2	185	G
17	S2	190	G
17	S2	191	A
17	S2	192	C
17	S2	198	U
17	S2	201	C
17	S2	202	G
17	S2	203	G
17	S2	208	G
17	S2	209	A
17	S2	210	U
17	S2	211	G
17	S2	213	G
17	S2	214	U
17	S2	215	G
17	S2	216	C
17	S2	291	G
17	S2	292	A

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Mol	Chain	Res	Type
17	S2	293	C
17	S2	295	C
17	S2	296	U
17	S2	297	A
17	S2	299	A
17	S2	304	C
17	S2	305	U
17	S2	306	C
17	S2	307	G
17	S2	308	G
17	S2	309	G
17	S2	312	G
17	S2	314	U
17	S2	319	C
17	S2	320	G
17	S2	321	C
17	S2	323	C
17	S2	324	C
17	S2	325	C
17	S2	326	C
17	S2	328	U
17	S2	329	G
17	S2	330	G
17	S2	332	G
17	S2	334	C
17	S2	338	G
17	S2	339	A
17	S2	340	C
17	S2	341	C
17	S2	361	U
17	S2	362	C
17	S2	364	A
17	S2	369	C
17	S2	370	G
17	S2	373	G
17	S2	384	U
17	S2	385	G
17	S2	386	C
17	S2	398	A
17	S2	400	C
17	S2	402	C
17	S2	407	G

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Mol	Chain	Res	Type
17	S2	409	C
17	S2	413	G
17	S2	417	C
17	S2	418	A
17	S2	434	G
17	S2	435	A
17	S2	437	G
17	S2	438	G
17	S2	441	C
17	S2	448	A
17	S2	449	A
17	S2	450	C
17	S2	452	G
17	S2	464	A
17	S2	465	A
17	S2	466	G
17	S2	469	A
17	S2	472	C
17	S2	473	A
17	S2	482	G
17	S2	485	A
17	S2	487	U
17	S2	488	U
17	S2	489	A
17	S2	492	C
17	S2	493	A
17	S2	496	C
17	S2	502	C
17	S2	503	C
17	S2	507	G
17	S2	516	A
17	S2	525	A
17	S2	530	U
17	S2	531	A
17	S2	532	C
17	S2	533	A
17	S2	534	G
17	S2	535	G
17	S2	537	C
17	S2	538	U
17	S2	539	C
17	S2	540	U

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Mol	Chain	Res	Type
17	S2	544	G
17	S2	545	A
17	S2	547	G
17	S2	548	C
17	S2	549	C
17	S2	550	C
17	S2	551	U
17	S2	555	A
17	S2	556	U
17	S2	559	G
17	S2	560	A
17	S2	563	G
17	S2	566	U
17	S2	575	A
17	S2	583	C
17	S2	587	A
17	S2	588	G
17	S2	589	G
17	S2	590	A
17	S2	591	U
17	S2	592	C
17	S2	593	C
17	S2	594	A
17	S2	595	U
17	S2	596	U
17	S2	598	G
17	S2	604	A
17	S2	605	A
17	S2	606	G
17	S2	608	C
17	S2	617	G
17	S2	627	U
17	S2	629	A
17	S2	631	U
17	S2	643	A
17	S2	644	G
17	S2	650	A
17	S2	656	G
17	S2	660	C
17	S2	666	U
17	S2	668	A
17	S2	669	A

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Mol	Chain	Res	Type
17	S2	671	A
17	S2	672	A
17	S2	683	G
17	S2	688	U
17	S2	689	U
17	S2	690	G
17	S2	691	G
17	S2	692	G
17	S2	694	G
17	S2	695	C
17	S2	696	G
17	S2	697	G
17	S2	698	G
17	S2	731	G
17	S2	733	C
17	S2	734	C
17	S2	736	C
17	S2	737	G
17	S2	738	C
17	S2	739	C
17	S2	745	C
17	S2	746	C
17	S2	747	U
17	S2	748	C
17	S2	749	U
17	S2	750	C
17	S2	751	G
17	S2	752	G
17	S2	753	C
17	S2	787	G
17	S2	788	G
17	S2	790	C
17	S2	791	C
17	S2	795	A
17	S2	796	G
17	S2	797	C
17	S2	798	A
17	S2	800	U
17	S2	810	A
17	S2	811	A
17	S2	812	A
17	S2	813	A

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Mol	Chain	Res	Type
17	S2	821	G
17	S2	822	U
17	S2	823	U
17	S2	830	A
17	S2	834	C
17	S2	835	C
17	S2	836	G
17	S2	837	A
17	S2	838	G
17	S2	839	C
17	S2	840	C
17	S2	842	C
17	S2	847	A
17	S2	848	U
17	S2	853	C
17	S2	865	A
17	S2	869	A
17	S2	870	A
17	S2	873	G
17	S2	874	G
17	S2	877	C
17	S2	878	G
17	S2	879	C
17	S2	881	G
17	S2	882	U
17	S2	883	U
17	S2	887	U
17	S2	888	U
17	S2	890	U
17	S2	891	G
17	S2	892	U
17	S2	893	U
17	S2	894	G
17	S2	896	U
17	S2	897	U
17	S2	899	U
17	S2	900	C
17	S2	901	G
17	S2	902	G
17	S2	903	A
17	S2	904	A
17	S2	905	C

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Mol	Chain	Res	Type
17	S2	908	A
17	S2	911	C
17	S2	913	A
17	S2	914	U
17	S2	917	U
17	S2	920	A
17	S2	930	C
17	S2	933	G
17	S2	934	G
17	S2	954	U
17	S2	958	G
17	S2	959	G
17	S2	961	G
17	S2	965	U
17	S2	970	G
17	S2	971	G
17	S2	973	C
17	S2	978	G
17	S2	981	A
17	S2	988	C
17	S2	990	A
17	S2	992	A
17	S2	996	A
17	S2	997	A
17	S2	999	G
17	S2	1001	A
17	S2	1002	U
17	S2	1017	U
17	S2	1018	U
17	S2	1023	A
17	S2	1027	A
17	S2	1028	A
17	S2	1042	A
17	S2	1045	U
17	S2	1058	A
17	S2	1060	A
17	S2	1062	A
17	S2	1067	C
17	S2	1078	C
17	S2	1083	A
17	S2	1084	A
17	S2	1085	C

Continued on next page...

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Mol	Chain	Res	Type
17	S2	1089	G
17	S2	1091	C
17	S2	1110	G
17	S2	1113	A
17	S2	1114	U
17	S2	1115	U
17	S2	1118	C
17	S2	1126	G
17	S2	1138	C
17	S2	1139	C
17	S2	1148	A
17	S2	1149	A
17	S2	1154	U
17	S2	1157	G
17	S2	1166	G
17	S2	1170	A
17	S2	1171	G
17	S2	1172	U
17	S2	1178	U
17	S2	1181	A
17	S2	1195	A
17	S2	1207	G
17	S2	1208	A
17	S2	1215	C
17	S2	1242	U
17	S2	1243	U
17	S2	1248	U
17	S2	1249	C
17	S2	1251	A
17	S2	1253	A
17	S2	1256	G
17	S2	1257	G
17	S2	1259	A
17	S2	1274	G
17	S2	1275	G
17	S2	1288	U
17	S2	1294	G
17	S2	1295	A
17	S2	1301	A
17	S2	1302	G
17	S2	1303	C
17	S2	1306	U

Continued on next page...

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Mol	Chain	Res	Type
17	S2	1308	U
17	S2	1322	G
17	S2	1325	G
17	S2	1326	U
17	S2	1330	G
17	S2	1342	U
17	S2	1371	U
17	S2	1378	A
17	S2	1397	U
17	S2	1406	G
17	S2	1418	C
17	S2	1435	C
17	S2	1436	C
17	S2	1438	A
17	S2	1439	A
17	S2	1447	G
17	S2	1454	A
17	S2	1461	G
17	S2	1462	U
17	S2	1463	U
17	S2	1476	A
17	S2	1489	A
17	S2	1490	G
17	S2	1493	C
17	S2	1497	G
17	S2	1498	A
17	S2	1507	G
17	S2	1508	A
17	S2	1521	C
17	S2	1533	A
17	S2	1540	G
17	S2	1553	C
17	S2	1579	A
17	S2	1580	A
17	S2	1588	A
17	S2	1601	A
17	S2	1621	U
17	S2	1623	A
17	S2	1637	A
17	S2	1639	G
17	S2	1654	G
17	S2	1661	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
17	S2	1665	G
17	S2	1671	G
17	S2	1680	G
17	S2	1693	G
17	S2	1695	A
17	S2	1699	A
17	S2	1714	U
17	S2	1715	A
17	S2	1719	A
17	S2	1721	U
17	S2	1722	G
17	S2	1726	G
17	S2	1730	U
17	S2	1739	C
17	S2	1742	C
17	S2	1744	G
17	S2	1745	A
17	S2	1748	G
17	S2	1750	C
17	S2	1751	C
17	S2	1752	C
17	S2	1754	G
17	S2	1755	C
17	S2	1757	G
17	S2	1758	G
17	S2	1773	C
17	S2	1777	G
17	S2	1781	A
17	S2	1783	C
17	S2	1784	G
17	S2	1786	U
17	S2	1787	G
17	S2	1788	A
17	S2	1789	G
17	S2	1805	G
17	S2	1812	U
17	S2	1813	A
17	S2	1814	G
17	S2	1823	A
17	S2	1824	A
17	S2	1825	A
17	S2	1826	G

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Mol	Chain	Res	Type
17	S2	1829	G
17	S2	1838	U
17	S2	1839	U
17	S2	1843	G
17	S2	1849	G
17	S2	1850	A
17	S2	1852	C
17	S2	1856	C
17	S2	1861	G
17	S2	1862	G
17	S2	1863	A
17	S2	1864	U
17	S2	1865	C
17	S2	1868	U
17	S2	1869	A

All (22) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
14	X	100	G
14	X	108	A
14	X	213	U
17	S2	24	C
17	S2	178	C
17	S2	213	G
17	S2	339	A
17	S2	417	C
17	S2	465	A
17	S2	604	A
17	S2	668	A
17	S2	688	U
17	S2	833	C
17	S2	868	G
17	S2	980	A
17	S2	1016	U
17	S2	1061	U
17	S2	1137	U
17	S2	1325	G
17	S2	1434	C
17	S2	1823	A
17	S2	1860	A

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

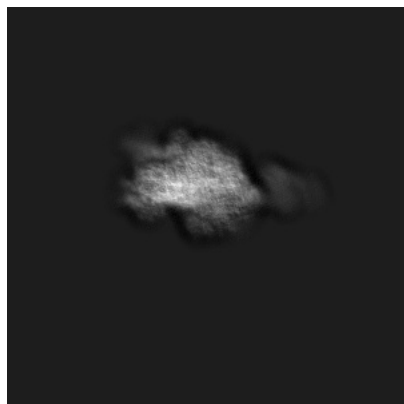
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51134. These allow visual inspection of the internal detail of the map and identification of artifacts.

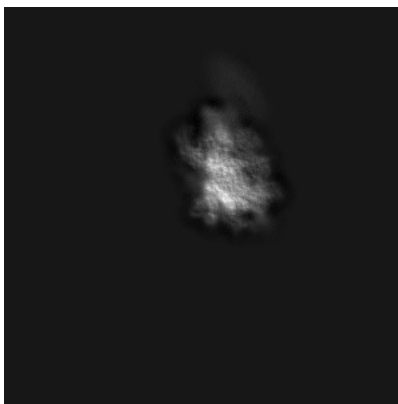
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

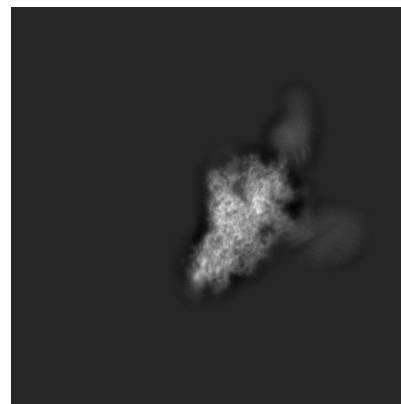
6.1.1 Primary map



X

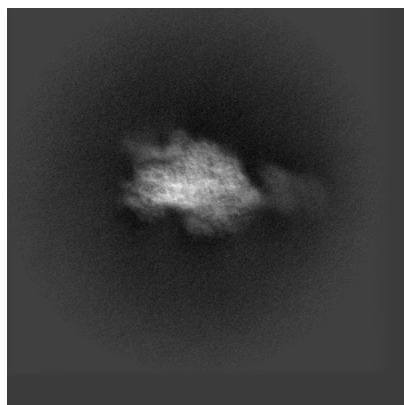


Y

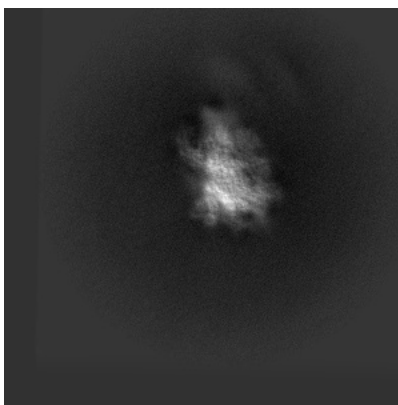


Z

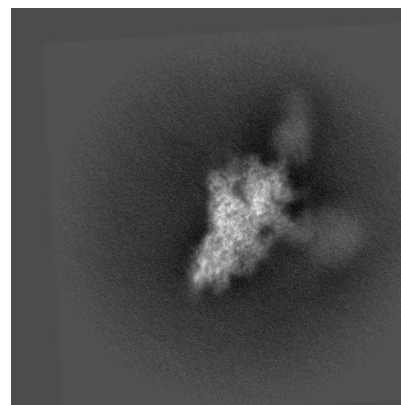
6.1.2 Raw map



X



Y

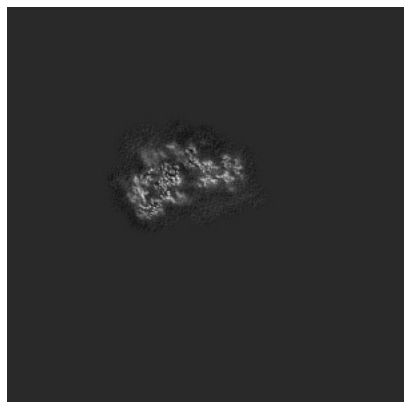


Z

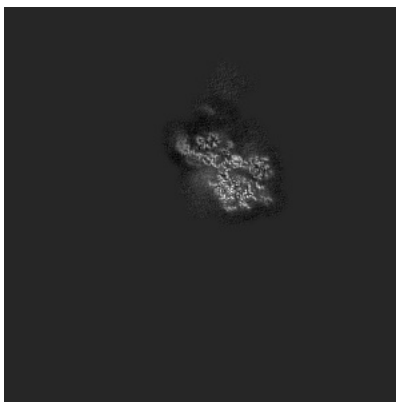
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

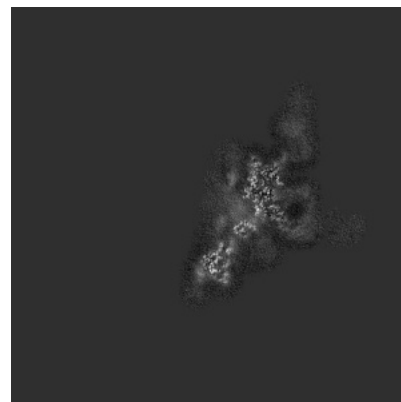
6.2.1 Primary map



X Index: 416

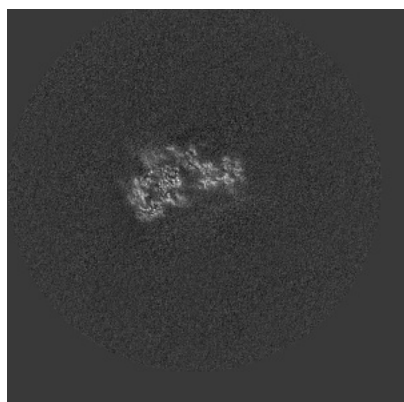


Y Index: 416

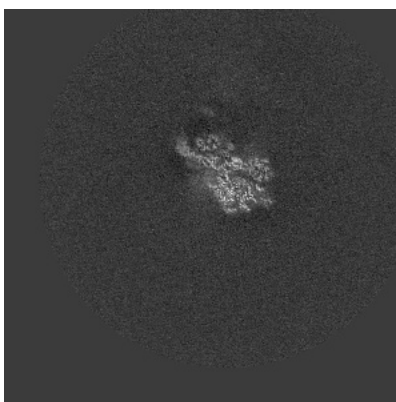


Z Index: 416

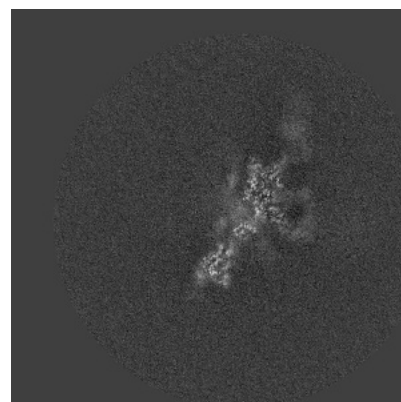
6.2.2 Raw map



X Index: 416



Y Index: 416

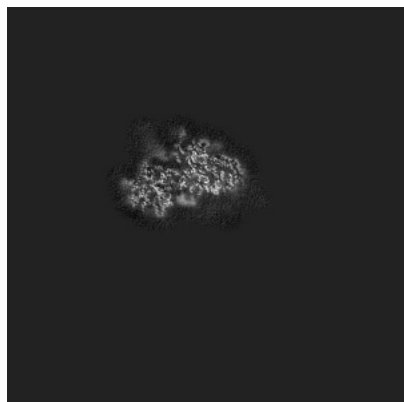


Z Index: 416

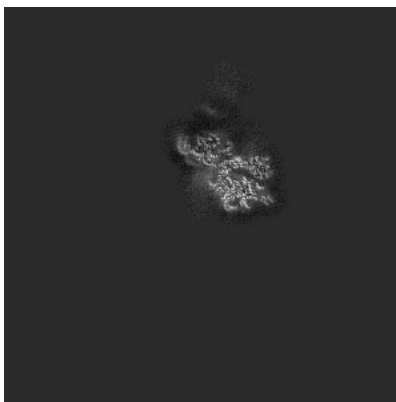
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

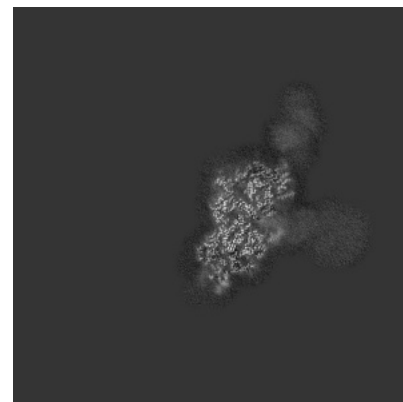
6.3.1 Primary map



X Index: 433

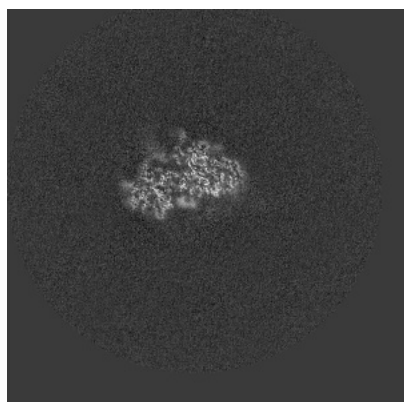


Y Index: 414

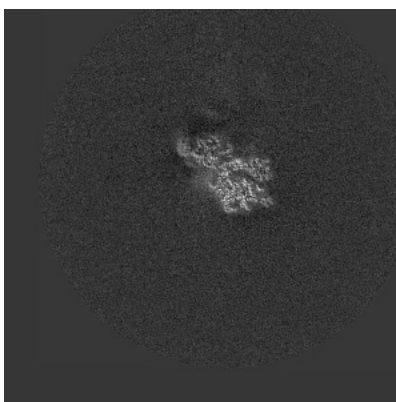


Z Index: 462

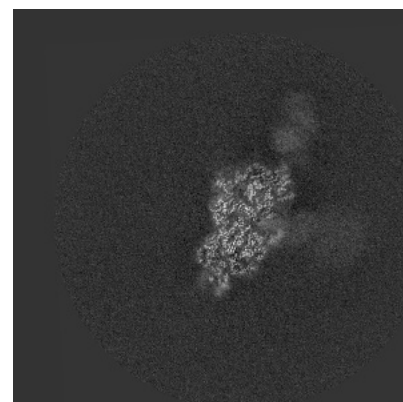
6.3.2 Raw map



X Index: 433



Y Index: 414

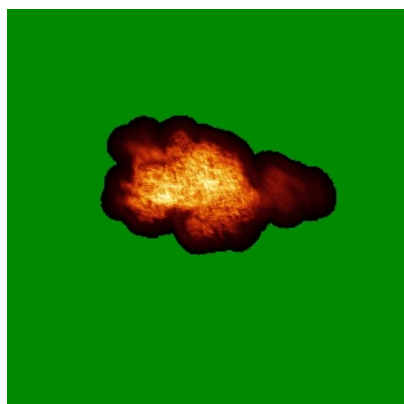


Z Index: 462

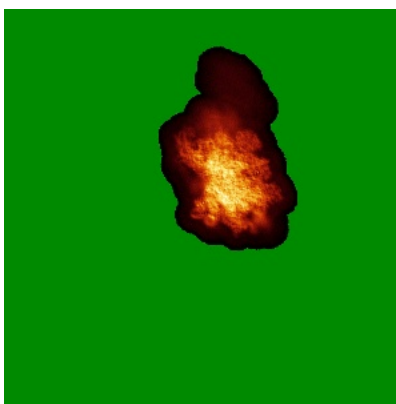
The images above show the largest variance slices of the map in three orthogonal directions.

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

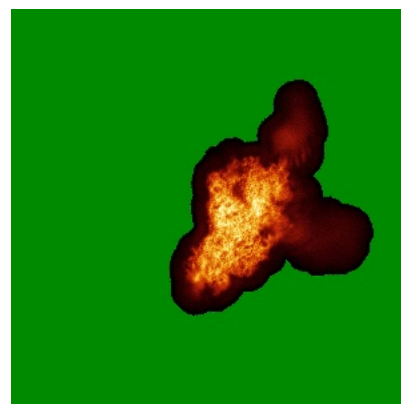
6.4.1 Primary map



X

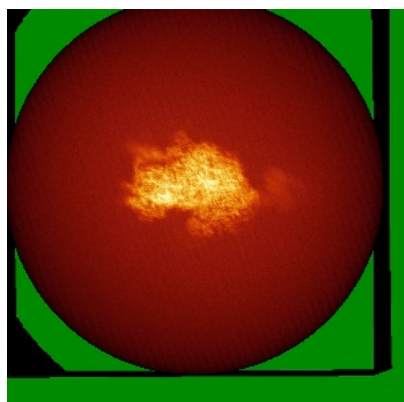


Y

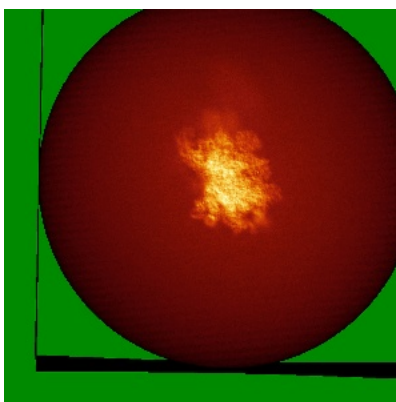


Z

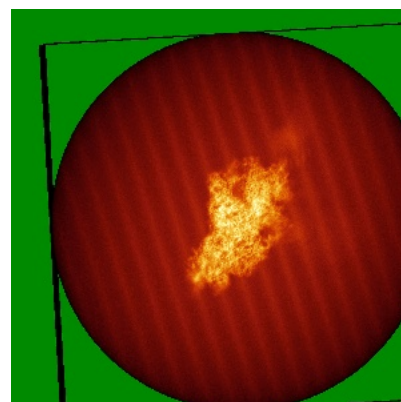
6.4.2 Raw map



X



Y

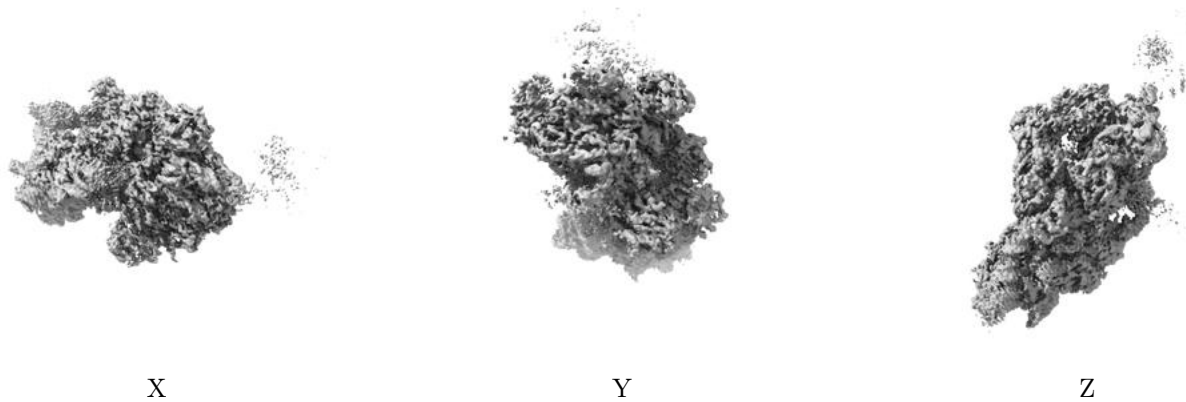


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

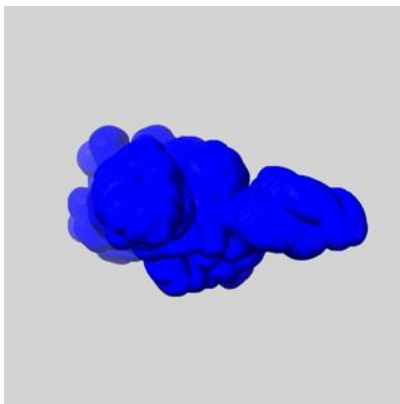
6.6 Mask visualisation [i](#)

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

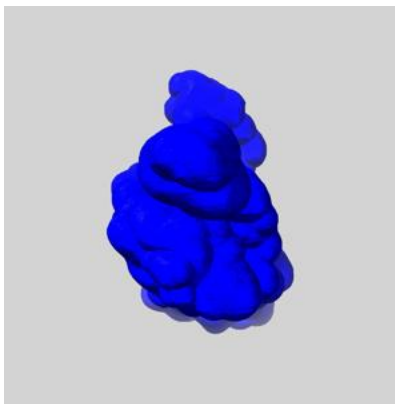
A mask typically either:

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

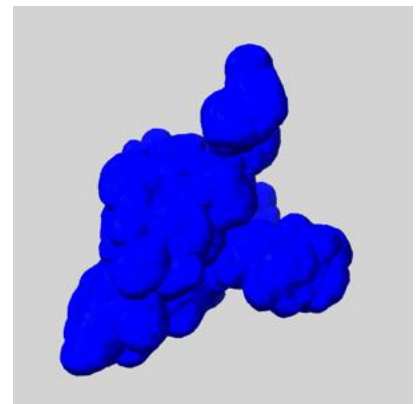
6.6.1 emd_51134_msk_1.map [i](#)



X



Y

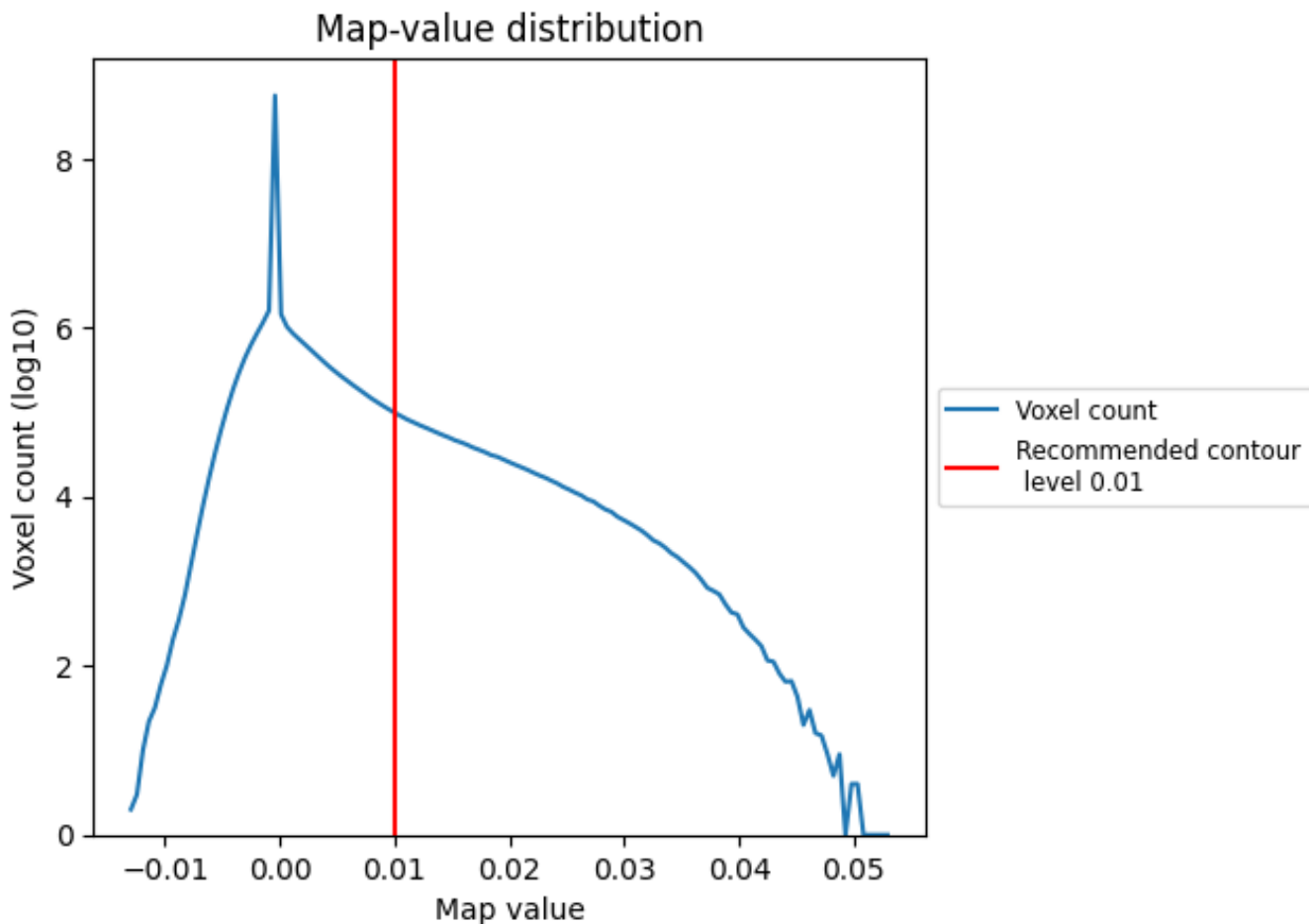


Z

7 Map analysis [i](#)

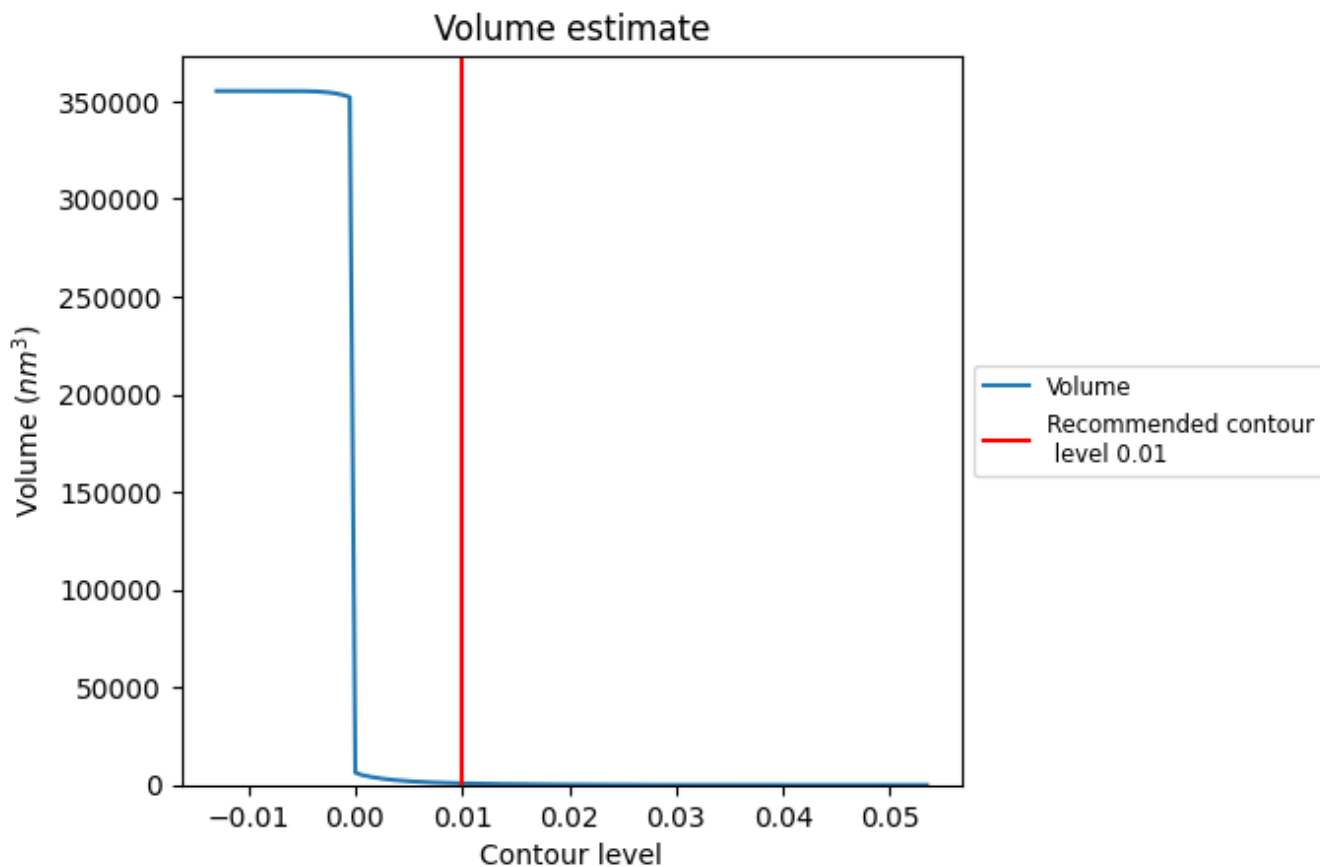
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

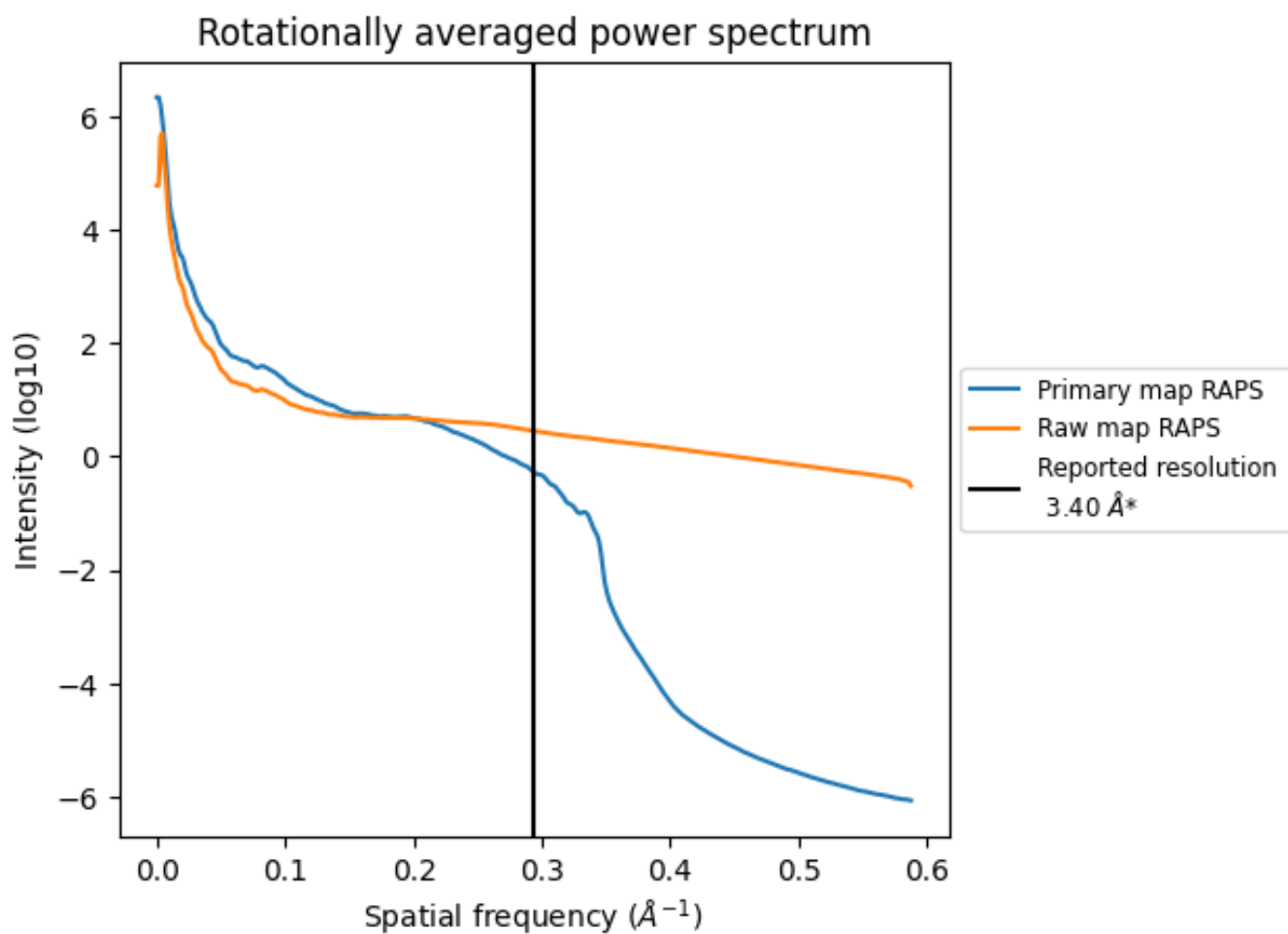
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 840 nm³; this corresponds to an approximate mass of 759 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](#)

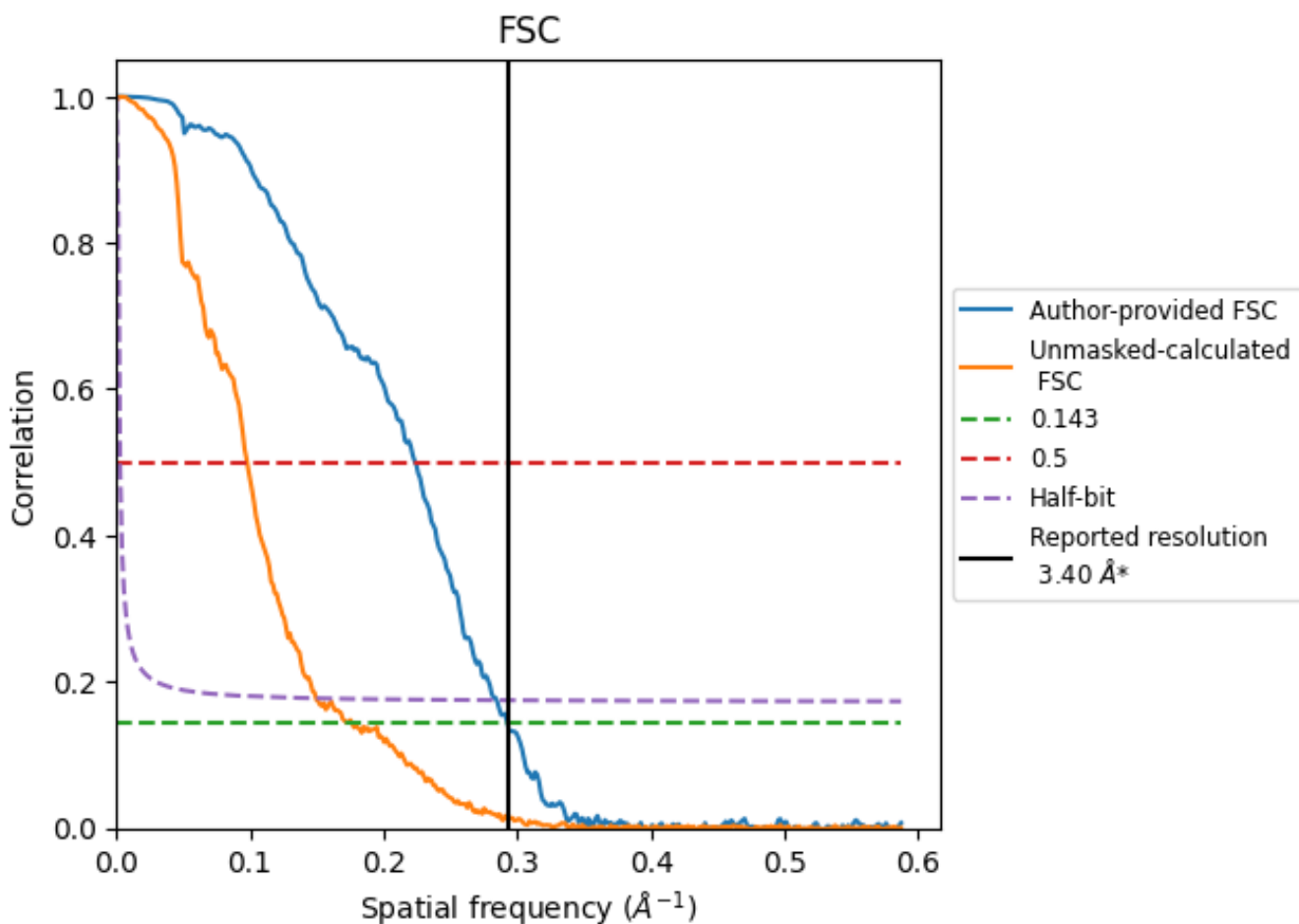


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

8.2 Resolution estimates [i](#)

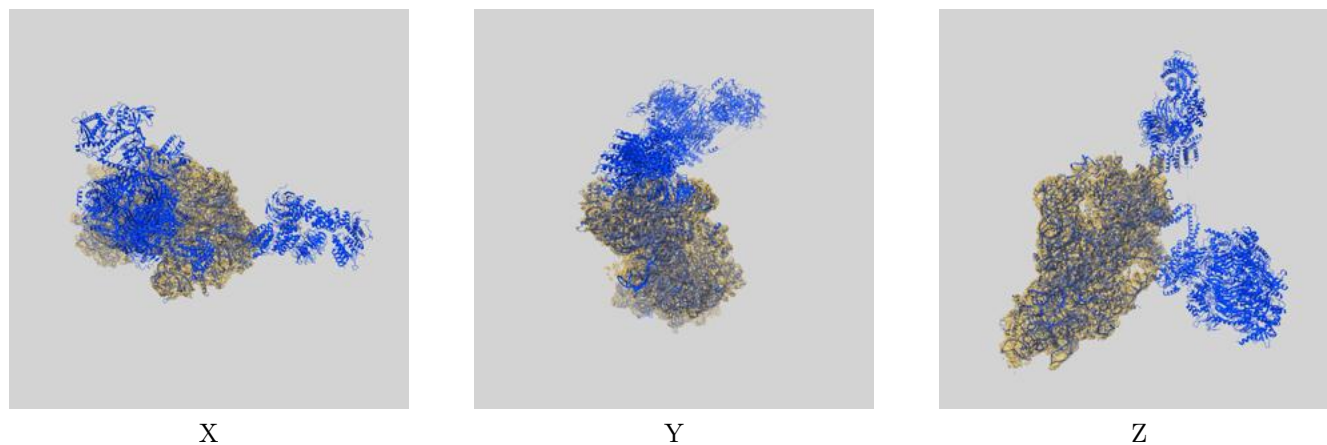
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.42	4.47	3.51
Unmasked-calculated*	5.67	10.22	6.69

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 5.67 differs from the reported value 3.4 by more than 10 %

9 Map-model fit [i](#)

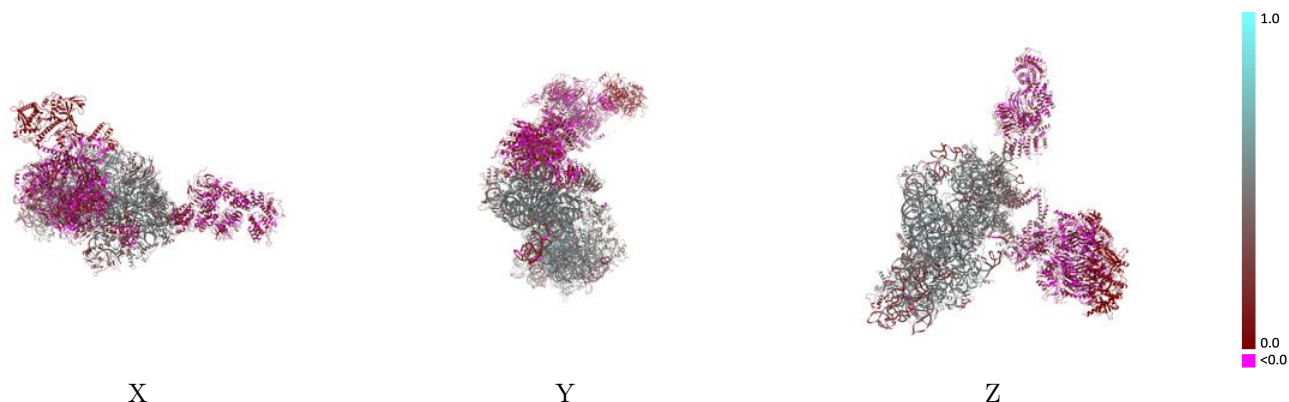
This section contains information regarding the fit between EMDB map EMD-51134 and PDB model 9G8O. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



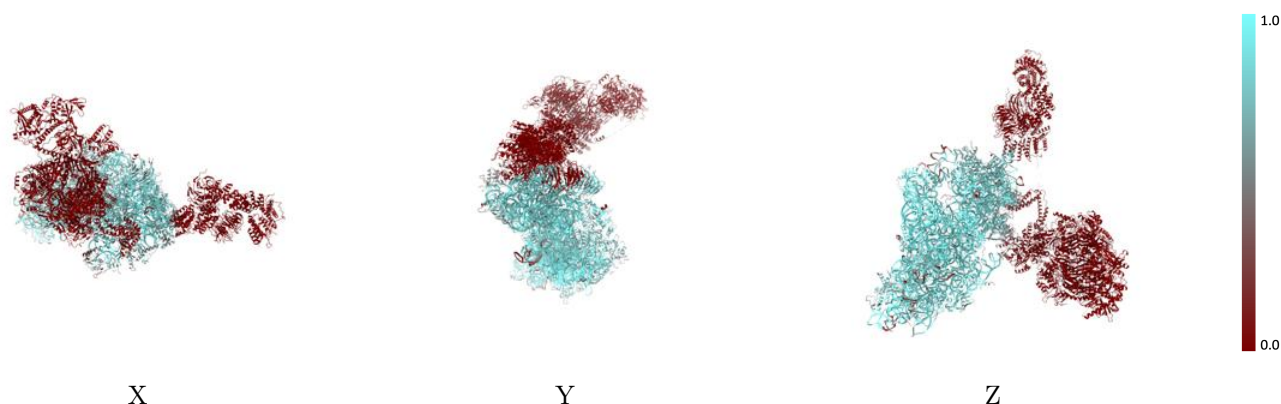
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



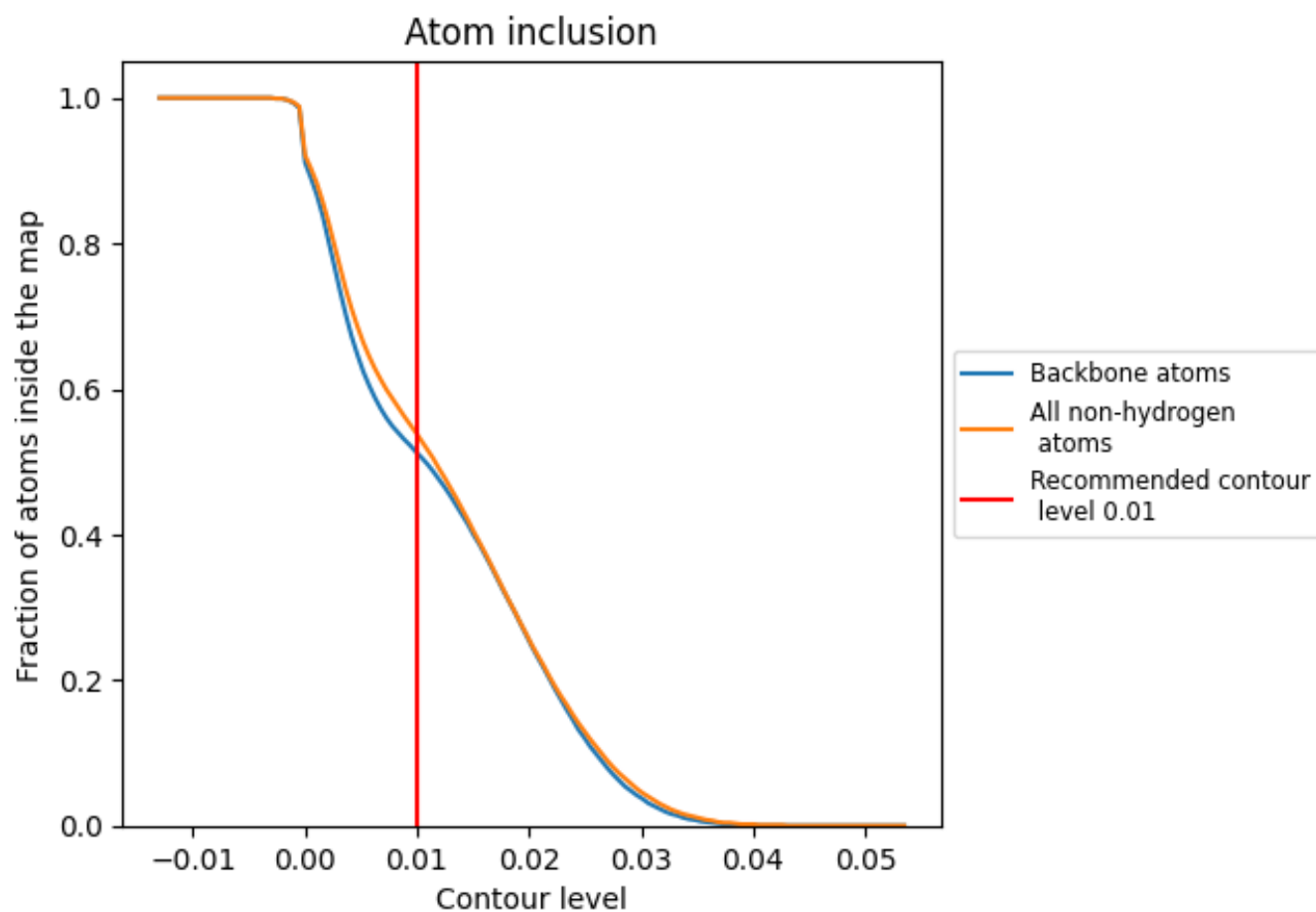
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 51% of all backbone atoms, 54% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5380	 0.3070
A	 0.0070	 0.1160
B	 0.0180	 0.1110
C	 0.0010	 0.0890
D	 0.0080	 0.1020
E	 0.0000	 0.0830
F	 0.0000	 0.0810
G	 0.0000	 0.0790
H	 0.0000	 0.0750
I	 0.0000	 0.0670
J	 0.0000	 0.0770
K	 0.0000	 0.0750
L	 0.0000	 0.0950
Ln	 0.8130	 0.4340
M	 0.0000	 0.0030
N	 0.0000	 0.0570
O	 0.0000	 0.0840
S2	 0.9450	 0.4670
SA	 0.8690	 0.4550
SB	 0.8860	 0.4580
SC	 0.9220	 0.4970
SD	 0.8130	 0.4480
SE	 0.8440	 0.4780
SF	 0.8180	 0.4700
SG	 0.7160	 0.3400
SH	 0.6920	 0.3960
SI	 0.8340	 0.4340
SJ	 0.9020	 0.4780
SK	 0.6710	 0.4530
SL	 0.7950	 0.4740
SM	 0.4430	 0.2760
SN	 0.8380	 0.4840
SO	 0.8680	 0.4560
SP	 0.6950	 0.4450
SQ	 0.8250	 0.4960



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Chain	Atom inclusion	Q-score
SR	 0.8330	 0.4370
SS	 0.6580	 0.4200
ST	 0.7530	 0.4680
SU	 0.7250	 0.4440
SV	 0.8760	 0.4750
SW	 0.9190	 0.5020
SX	 0.9520	 0.5080
SY	 0.8310	 0.4380
SZ	 0.6390	 0.4010
Sa	 0.8830	 0.4700
Sb	 0.8450	 0.4400
Sc	 0.8660	 0.4890
Sd	 0.9160	 0.5360
Se	 0.7610	 0.3800
Sf	 0.4040	 0.2960
Sg	 0.7540	 0.3860
X	 0.3770	 0.1040