



wwPDB EM Validation Summary Report ⓘ

Apr 15, 2026 – 02:43 AM UTC

PDB ID : 9QSA / pdb_00009qsa
EMDB ID : EMD-53333
Title : Mouse Ribosome rotated-1 PRE state
Authors : Santo, P.E.; Astier, A.; Plisson-Chastang, C.
Deposited on : 2025-04-04
Resolution : 3.40 Å(reported)

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

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

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.dev132
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

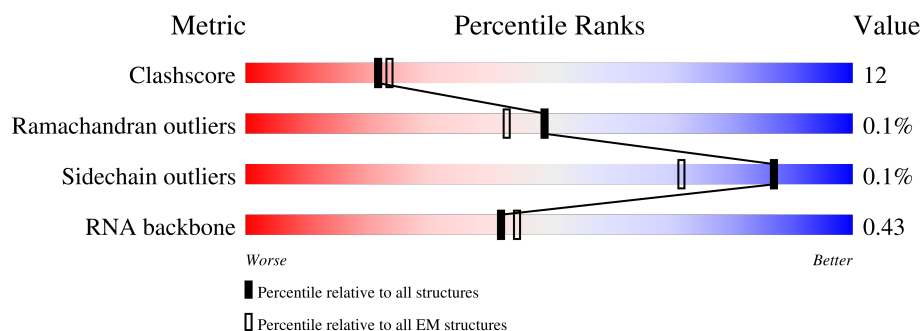
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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)
Clashscore	229148	23984
Ramachandran outliers	224038	23583
Sidechain outliers	223484	23102
RNA backbone	8273	3508

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	A1	270	<div> <div>44%</div> <div>63%</div> <div>20%</div> <div>18%</div> </div>
2	A2	3615	<div> <div>25%</div> <div>39%</div> <div>48%</div> <div>9%</div> <div>.</div> </div>
3	A3	152	<div> <div>32%</div> <div>59%</div> <div>32%</div> <div>.</div> <div>9%</div> </div>
4	B1	266	<div> <div>42%</div> <div>66%</div> <div>15%</div> <div>18%</div> </div>
5	B2	121	<div> <div>.</div> <div>53%</div> <div>41%</div> <div>.</div> <div>.</div> </div>
6	B3	145	<div> <div>43%</div> <div>64%</div> <div>32%</div> <div>.</div> </div>
7	Bz	76	<div> <div>38%</div> <div>11%</div> <div>34%</div> <div>42%</div> <div>13%</div> </div>

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Mol	Chain	Length	Quality of chain
8	Bx	10	
9	By	22	
10	C1	192	
11	C2	156	
12	C3	119	
13	D1	214	
14	D2	257	
15	D3	83	
16	E1	178	
17	E2	403	
18	E3	143	
19	F1	211	
20	F2	419	
21	F3	115	
22	G1	217	
23	G2	297	
24	G3	69	
25	H1	204	
26	H2	296	
27	H3	56	
28	I2	203	
29	I3	317	
30	J2	184	
31	J3	293	
32	K2	188	

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Mol	Chain	Length	Quality of chain
33	K3	249	
34	L2	196	
35	L3	194	
36	M2	176	
37	M3	132	
38	N2	160	
39	N3	151	
40	O2	128	
41	O3	151	
42	P2	140	
43	P3	130	
44	Q2	157	
45	Q3	133	
46	R2	156	
47	R3	125	
48	S2	145	
49	S3	84	
50	T2	136	
51	T3	133	
52	U2	148	
53	V2	160	
54	W2	115	
55	X2	125	
56	Y2	135	
57	Z2	110	

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Mol	Chain	Length	Quality of chain
58	a2	117	
59	b2	123	
60	c2	105	
61	d2	97	
62	e2	70	
63	f2	51	
64	g2	128	
65	h2	25	
66	i2	106	
67	j2	92	
68	k2	137	
69	m2	1635	
70	n2	73	
71	o2	295	
72	p2	264	
73	q2	243	
74	r2	257	
75	s2	204	
76	t2	194	
77	u2	208	
78	v2	165	
79	w2	158	
80	x2	145	
81	y2	146	
82	z2	135	

2 Entry composition

There are 85 unique types of molecules in this entry. The entry contains 206246 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 Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A1	222	Total	C	N	O	S	0	0
			1843	1185	353	297	8		

- Molecule 2 is a RNA chain called 28S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A2	3511	Total	C	N	O	P	0	0
			75321	33579	13742	24490	3510		

- Molecule 3 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A3	139	Total	C	N	O	S	0	0
			1154	725	233	195	1		

- Molecule 4 is a protein called Large ribosomal subunit protein eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	B1	217	Total	C	N	O	S	1	0
			1764	1127	340	293	4		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
5	B2	119	Total	C	N	O	P	0	0
			2538	1132	454	834	118		

- Molecule 6 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	B3	140	Total	C	N	O	S	0	0
			1091	686	210	192	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B3	88	MET	ARG	conflict	UNP Q9CZX8

- Molecule 7 is a RNA chain called transfer RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	Bz	66	Total	C	N	O	P	0	0
			1412	629	255	462	66		

- Molecule 8 is a RNA chain called messenger RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	Bx	10	Total	C	N	O	P	0	0
			200	90	20	80	10		

- Molecule 9 is a protein called Nascent protein chain.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	By	22	Total	C	N	O	0	0
			110	66	22	22		

- Molecule 10 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	C1	190	Total	C	N	O	S	0	0
			1519	956	284	273	6		

- Molecule 11 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	C2	156	Total	C	N	O	P	0	0
			3315	1481	585	1094	155		

- Molecule 12 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	C3	84	Total	C	N	O	S	0	0
			679	428	130	117	4		

- Molecule 13 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	D1	204	Total	C	N	O	S	0	0
			1656	1052	319	272	13		

- Molecule 14 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	D2	245	Total	C	N	O	S	0	0
			1876	1177	383	310	6		

- Molecule 15 is a protein called Small ribosomal subunit protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	D3	83	Total	C	N	O	S	0	0
			589	369	111	104	5		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D3	25	GLY	ALA	conflict	UNP Q9CQR2
D3	41	LYS	ARG	conflict	UNP Q9CQR2
D3	42	VAL	THR	conflict	UNP Q9CQR2
D3	54	ALA	GLY	conflict	UNP Q9CQR2

- Molecule 16 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	E1	174	Total	C	N	O	S	0	0
			1397	880	260	251	6		

- Molecule 17 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	E2	395	Total	C	N	O	S	0	0
			3189	2030	601	544	14		

- Molecule 18 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	E3	139	Total	C	N	O	S	0	0
			1080	682	214	181	3		

- Molecule 19 is a protein called Large ribosomal subunit protein eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	F1	203	Total	C	N	O	S	0	0
			1643	1029	339	271	4		

- Molecule 20 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	F2	352	Total	C	N	O	S	0	0
			2823	1776	566	466	15		

- Molecule 21 is a protein called Small ribosomal subunit protein eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	F3	97	Total	C	N	O	S	0	0
			774	481	160	128	5		

- Molecule 22 is a protein called Large ribosomal subunit protein eL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	G1	139	Total	C	N	O	S	0	0
			1143	732	221	183	7		

- Molecule 23 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	G2	293	Total	C	N	O	S	0	0
			2389	1509	441	425	14		

- Molecule 24 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	G3	56	Total	C	N	O	S	0	0
			435	267	85	81	2		

- Molecule 25 is a protein called Large ribosomal subunit protein eL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	H1	203	Total	C	N	O	S	0	0
			1701	1072	359	266	4		

- Molecule 26 is a protein called Large ribosomal subunit protein eL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	H2	218	Total	C	N	O	S	0	0
			1766	1130	337	295	4		

- Molecule 27 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	H3	51	Total	C	N	O	S	0	0
			427	269	87	66	5		

- Molecule 28 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	I2	198	Total	C	N	O	S	0	0
			1618	1043	316	253	6		

- Molecule 29 is a protein called Small ribosomal subunit protein RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	I3	234	Total	C	N	O	S	0	0
			1800	1135	318	337	10		

- Molecule 30 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	J2	153	Total	C	N	O	S	0	0
			1242	777	241	215	9		

- Molecule 31 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	J3	217	Total	C	N	O	S	0	0
			1590	1039	276	266	9		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J3	61	MET	ILE	conflict	UNP P25444

- Molecule 32 is a protein called Large ribosomal subunit protein eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	K2	186	Total	C	N	O	S	0	0
			1511	946	313	248	4		

- Molecule 33 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	K3	211	Total	C	N	O	S	0	0
			1708	1073	342	286	7		

- Molecule 34 is a protein called Large ribosomal subunit protein eL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	L2	169	Total	C	N	O	S	0	0
			1408	873	304	222	9		

- Molecule 35 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	L3	179	Total	C	N	O	S	0	0
			1495	953	299	241	2		

- Molecule 36 is a protein called Large ribosomal subunit protein eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	M2	175	Total	C	N	O	S	0	0
			1450	924	283	233	10		

- Molecule 37 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	M3	84	Total	C	N	O	S	0	0
			525	332	97	91	5		

- Molecule 38 is a protein called Large ribosomal subunit protein eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	N2	159	Total	C	N	O	S	0	0
			1299	824	252	217	6		

- Molecule 39 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	N3	149	Total	C	N	O	S	0	0
			1202	770	228	203	1		

- Molecule 40 is a protein called Large ribosomal subunit protein eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	O2	101	Total	C	N	O	S	0	0
			825	529	144	150	2		

- Molecule 41 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	O3	135	Total	C	N	O	S	0	0
			1003	615	198	184	6		

- Molecule 42 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	P2	129	Total	C	N	O	S	0	0
			969	613	182	169	5		

- Molecule 43 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	P3	129	Total	C	N	O	S	0	0
			1027	655	192	174	6		

- Molecule 44 is a protein called Large ribosomal subunit protein eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Q2	62	Total	C	N	O	S	0	0
			519	332	101	83	3		

- Molecule 45 is a protein called Small ribosomal subunit protein eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Q3	121	Total	C	N	O	S	0	0
			981	620	192	164	5		

- Molecule 46 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	R2	118	Total	C	N	O	S	0	0
			967	618	181	167	1		

- Molecule 47 is a protein called Small ribosomal subunit protein eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	R3	73	Total	C	N	O	S	0	0
			585	374	108	102	1		

- Molecule 48 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	S2	134	Total	C	N	O	S	0	0
			1115	700	226	186	3		

- Molecule 49 is a protein called Small ribosomal subunit protein eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	S3	79	Total	C	N	O	S	0	0
			618	386	115	110	7		

- Molecule 50 is a protein called Large ribosomal subunit protein eL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	T2	135	Total	C	N	O	S	0	0
			1107	714	208	182	3		

- Molecule 51 is a protein called Ubiquitin-like FUBI-ribosomal protein eS30 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	T3	40	Total	C	N	O	S	0	0
			319	194	73	51	1		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
T3	55	PRO	ASN	conflict	UNP P62862
T3	56	ASN	VAL	conflict	UNP P62862
T3	57	ALA	VAL	conflict	UNP P62862

- Molecule 52 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	U2	147	Total	C	N	O	S	0	0
			1164	736	239	185	4		

- Molecule 53 is a protein called Large ribosomal subunit protein eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	V2	117	Total	C	N	O	S	0	0
			945	596	198	146	5		

- Molecule 54 is a protein called Large ribosomal subunit protein eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	W2	94	Total	C	N	O	S	0	0
			732	465	130	131	6		

- Molecule 55 is a protein called Large ribosomal subunit protein eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	X2	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 56 is a protein called Large ribosomal subunit protein eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	Y2	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 57 is a protein called Large ribosomal subunit protein eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	Z2	109	Total	C	N	O	S	0	0
			876	555	174	143	4		

- Molecule 58 is a protein called Large ribosomal subunit protein eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	a2	107	Total	C	N	O	S	0	0
			854	535	176	137	6		

- Molecule 59 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	b2	120	Total	C	N	O	S	0	0
			1001	634	201	165	1		

- Molecule 60 is a protein called Large ribosomal subunit protein eL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	c2	102	Total	C	N	O	S	0	0
			832	521	177	129	5		

- Molecule 61 is a protein called Large ribosomal subunit protein eL37.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	d2	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 62 is a protein called Large ribosomal subunit protein eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	e2	69	Total	C	N	O	S	0	0
			568	365	103	99	1		

- Molecule 63 is a protein called Large ribosomal subunit protein eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	f2	50	Total	C	N	O	S	0	0
			444	281	98	64	1		

- Molecule 64 is a protein called Ubiquitin-ribosomal protein eL40 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	g2	50	Total	C	N	O	S	0	0
			412	255	87	64	6		

- Molecule 65 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	h2	24	Total	C	N	O	S	0	0
			230	139	62	26	3		

- Molecule 66 is a protein called Large ribosomal subunit protein eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	i2	103	Total	C	N	O	S	0	0
			842	528	172	136	6		

- Molecule 67 is a protein called Large ribosomal subunit protein eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	j2	89	Total	C	N	O	S	0	0
			694	436	133	118	7		

- Molecule 68 is a protein called Large ribosomal subunit protein eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	k2	125	Total	C	N	O	S	0	0
			1001	621	207	168	5		

- Molecule 69 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	m2	1616	Total	C	N	O	P	0	0
			34547	15439	6209	11283	1616		

- Molecule 70 is a RNA chain called transfer RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	n2	73	Total	C	N	O	P	0	0
			1562	698	291	501	72		

- Molecule 71 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	o2	215	Total	C	N	O	S	0	0
			1704	1083	298	315	8		

- Molecule 72 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	p2	212	Total	C	N	O	S	0	0
			1722	1093	308	307	14		

- Molecule 73 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	q2	202	Total	C	N	O	S	0	0
			1572	1006	283	276	7		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
q2	195	THR	SER	conflict	UNP P62908

- Molecule 74 is a protein called Small ribosomal subunit protein eS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	r2	257	Total	C	N	O	S	0	0
			2031	1298	381	344	8		

There are 19 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
r2	46	VAL	ILE	conflict	UNP P62702
r2	78	VAL	THR	conflict	UNP P62702
r2	80	VAL	ILE	conflict	UNP P62702
r2	93	GLU	ASP	conflict	UNP P62702
r2	98	HIS	ASN	conflict	UNP P62702
r2	102	VAL	ILE	conflict	UNP P62702
r2	116	VAL	PRO	conflict	UNP P62702
r2	130	THR	PHE	conflict	UNP P62702
r2	133	VAL	THR	conflict	UNP P62702
r2	153	VAL	LEU	conflict	UNP P62702
r2	160	VAL	ILE	conflict	UNP P62702
r2	165	GLY	GLU	conflict	UNP P62702
r2	170	ILE	THR	conflict	UNP P62702
r2	171	ASN	ASP	conflict	UNP P62702
r2	184	ILE	THR	conflict	UNP P62702
r2	192	VAL	ILE	conflict	UNP P62702
r2	230	ASN	LYS	conflict	UNP P62702
r2	248	VAL	ILE	conflict	UNP P62702
r2	258	THR	ALA	conflict	UNP P62702

- Molecule 75 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	s2	185	Total	C	N	O	S	0	0
			1468	919	277	265	7		

- Molecule 76 is a protein called Small ribosomal subunit protein eS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	t2	174	Total	C	N	O	S	0	0
			1322	857	246	218	1		

- Molecule 77 is a protein called Small ribosomal subunit protein eS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	u2	175	Total	C	N	O	S	0	0
			1359	853	267	234	5		

- Molecule 78 is a protein called Small ribosomal subunit protein eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	v2	83	Total	C	N	O	S	0	0
			705	462	122	115	6		

- Molecule 79 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	w2	138	Total	C	N	O	S	0	0
			1134	722	214	192	6		

- Molecule 80 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	x2	120	Total	C	N	O	S	0	0
			999	635	188	169	7		

- Molecule 81 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	y2	130	Total	C	N	O	S	0	0
			1028	655	194	176	3		

- Molecule 82 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	z2	125	Total	C	N	O	S	0	0
			1011	634	187	186	4		

- Molecule 83 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of

Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
83	A2	83	Total 83	Mg 83	0
83	E3	1	Total 1	Mg 1	0
83	J2	1	Total 1	Mg 1	0
83	m2	31	Total 31	Mg 31	0
83	q2	1	Total 1	Mg 1	0

- Molecule 84 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
84	F3	1	Total 1	Zn 1	0
84	H3	1	Total 1	Zn 1	0
84	d2	1	Total 1	Zn 1	0
84	g2	1	Total 1	Zn 1	0
84	i2	1	Total 1	Zn 1	0
84	j2	1	Total 1	Zn 1	0

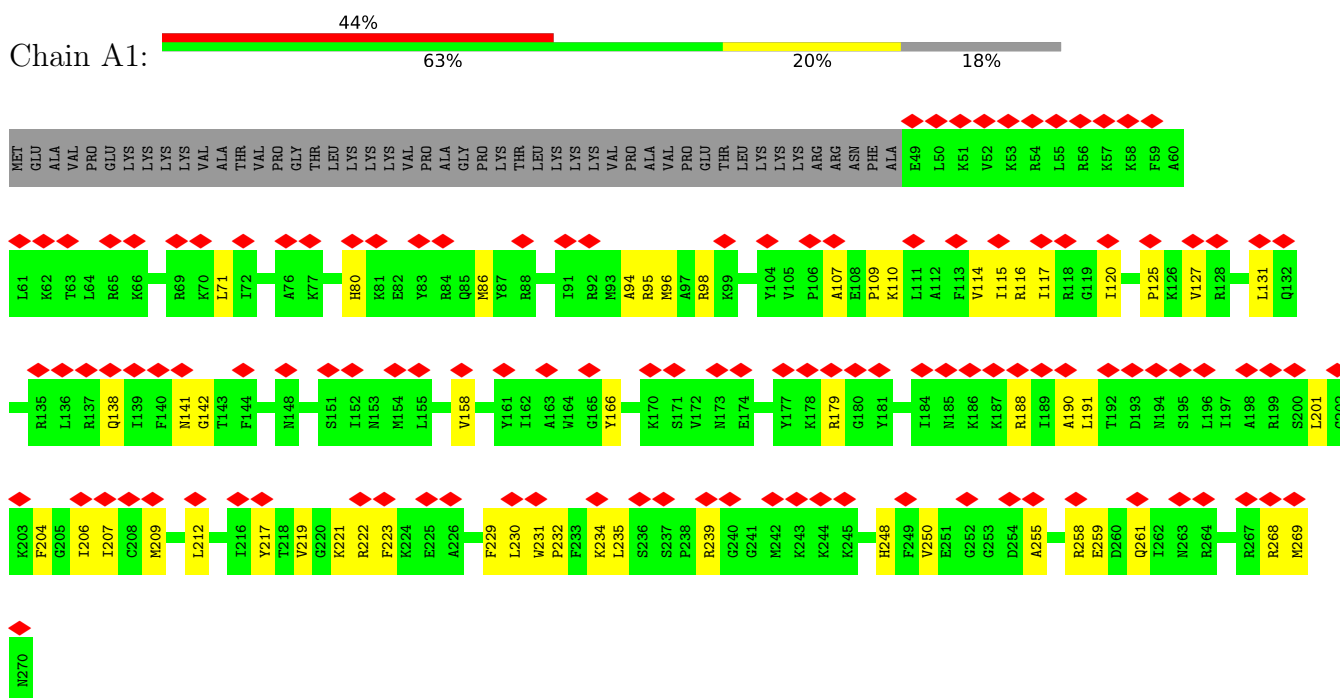
- Molecule 85 is water.

Mol	Chain	Residues	Atoms		AltConf
85	B1	1	Total 1	O 1	0

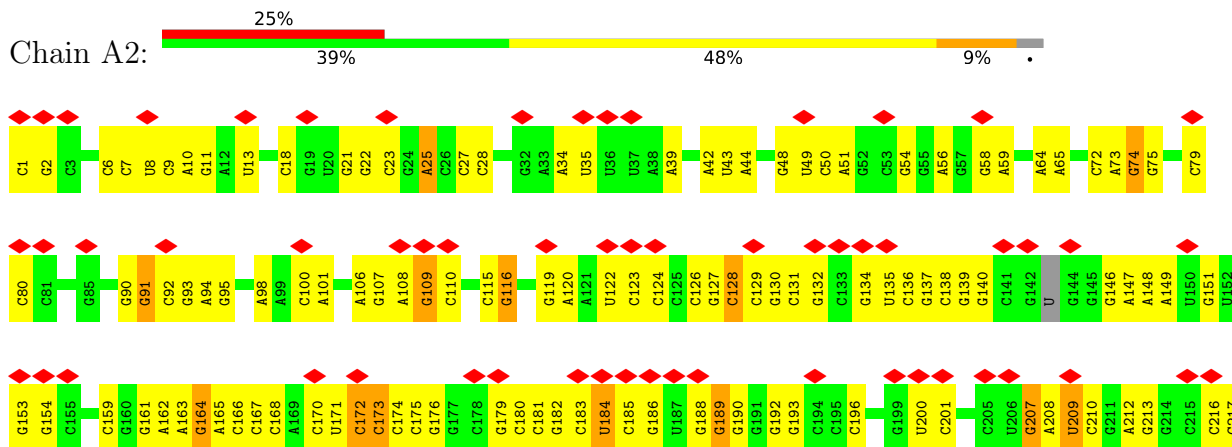
3 Residue-property plots

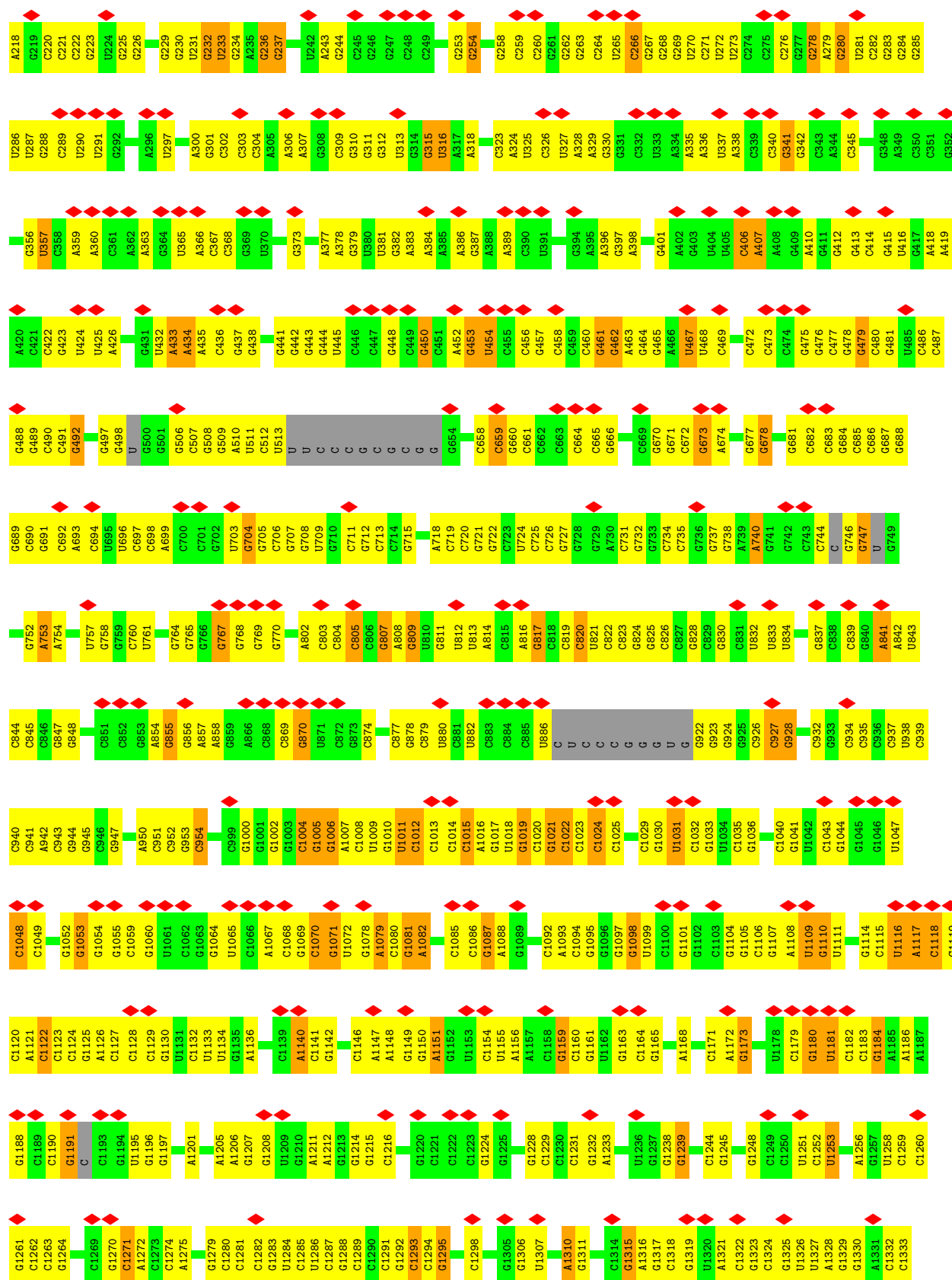
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: Large ribosomal subunit protein uL30



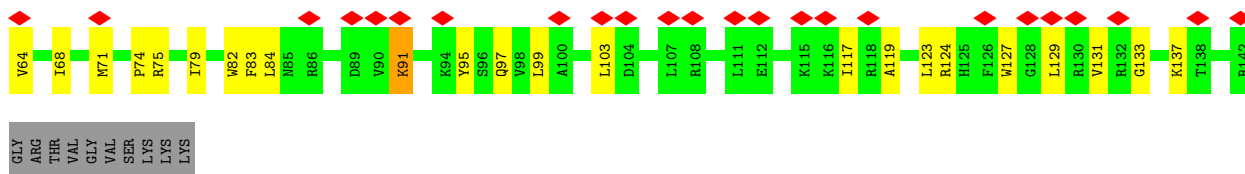
- Molecule 2: 28S ribosomal RNA



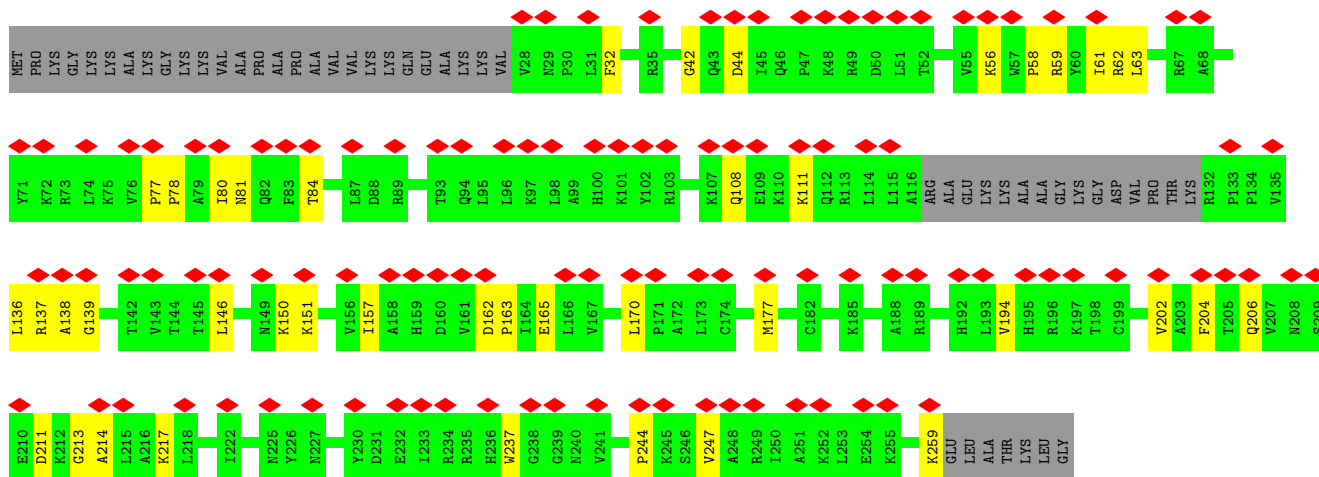
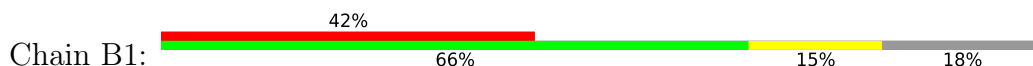


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G2273	U2274	C2275	G2276	G2277	G2278	U2279	U2280	A2284	U2285	C2288	C2289	G2290	A2291	C2292	U2293	C2294	C2295	G2296	G2297	A2298	C2299	U2300	G2301	C2302	C2303	G2304	G2305	U2309	G2310	G2311	G2312	C2313	G	C	C	C	C	A	G	C	G2324	U2325	C2326	C2327	A2328	C2329	U2330	U2331	U2392	C2395	A2396	A2397	C2398	C2399	G2400	C2401	G2404	G2405
U2209	G2210	G2211	G2212	C2213	G2214	A2215	G2216	U2217	G2218	C2219	C2220	G2221	U2222	G2223	C2224	A2225	G2226	G2229	G2230	G2231	A2232	C2233	G2234	G2235	C2236	C2237	G2238	A2239	U2240	G2241	C2242	G2243	C2244	U2245	C2246	C2247	G2248	G2251	C2254	U2255	C2256	G2257	G2258	C2259	G2260	G2261	A2262	U2263	C2264	A2267	A2268	G2269	G2270	G2271	A2272			
A2136	A2137	C2138	U2139	U2140	U2141	G2142	A2143	A2150	A2151	C2152	U2153	G2154	C2155	A2156	G2157	G2160	G2161	C2162	U2163	U2164	C2165	C2166	A2167	U2168	G2169	U2170	U2171	A2172	G2176	C2177	A2178	C2179	U2180	A2183	A2184	C2185	A2186	U2187	C2188	U2191	C2192	C2196	G2197	C2198	U2199	C2200	G2203	A2204	G2205	C2206	G2207	A2208						
U2059	U2060	C2061	A2062	G2063	G2064	C2065	C2066	U2067	A2068	G2069	G2070	G2077	G2081	C2082	C2083	U2084	G2085	C2086	A2087	C2088	G2091	C2092	C2093	C2094	G2098	U2099	G2100	C2101	A2102	C2103	A2104	U2105	C2106	U2107	U2108	G2109	G2116	U2117	A2118	A2122	A2123	U2124	A2125	U2126	C2127	C2128	A2129	A2130	C2132	G2133	A2134	C2135						
A1907	C1908	G1909	G1910	G1911	A1912	G1913	G1914	C1914	G2004	U2005	C2006	G2007	G2008	G2009	C2010	C2011	C2012	C2013	G2014	C2015	G2016	G2017	C2020	C2021	U2022	A2023	G2024	G2025	C2026	C2027	G2028	C2029	G2030	A2031	C2032	G2033	A2034	G2035	G2038	G2039	A2040	G2041	G2042	G2043	C2044	C2047	U2048	G2049	C2050	G2051	G2052	U2053	C2054	A2055	G2056	C2057	C2058	
C1833	U1834	A1835	G1836	C1837	U1840	G1841	A1845	U1846	G1847	A1848	A1849	U1850	G1851	G1852	U1856	G1857	C1858	G1862	U1863	C1864	A1871	U1872	A1873	C1874	C1875	U1876	G1878	C1879	C1880	G1881	U1882	C1883	G1884	C1885	C1886	C1889	A1890	G1891	U1892	C1893	G1894	A1895	A1896	A1897	C1898	G1899	G1900	A1901	A1902	C1903	G1904	G1905	G1906					
C1717	G1718	A1719	U1720	G1721	C1722	G1723	U1724	G1727	C1728	A1731	U1732	C1733	A1734	G1735	A1736	C1737	C1738	C1739	G1740	A1741	G	A1743	A1744	A1745	A1746	G1747	G1750	U1751	U1752	G1753	G1754	U1761	A1762	G1763	A1764	C1765	A1766	G1767	C1768	A1769	G1770	G1771	A1772	C1820	C1821	U1822	G1823	C1824	C1825	A1828	U1829	C1830	A1831	A1832				
G1644	A1645	G1646	U1647	G1648	C1649	C1650	U1651	A1652	G1653	U1654	G1655	G1656	G1657	C1658	U1665	G1668	A1669	A1670	G1671	C1672	A1673	G1674	A1675	A1676	C1677	U1678	G1679	G1680	C1681	G1682	C1683	U1684	G1685	C1686	G1687	G1688	G1689	A1690	A1693	G1697	A1698	A1699	C1700	G1701	C1702	C1703	G1704	U1708	A1709	A1710	G1714	C1715	C1716					
U1558	U1559	G1560	G1561	G1562	G1563	U1575	U1576	A1577	A1578	C1579	C1580	U1584	C1585	A1589	A1590	A1596	G1599	A1604	G1605	A1606	A1607	G1608	C1609	C1610	G1613	C1614	U1615	C1616	G1617	C1618	U1619	G1620	C1621	C1622	G1623	U1624	G1625	G1626	A1627	G1628	C1629	G1630	G1631	G1632	G1633	C1634	G1635	U1636	G1637	G1638	A1639							
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C1334	G1335	A1336	A1337	A1338	G1343	U1344	A1347	C1348	U1349	A1350	U1351	G1352	C1353	U1354	U1355	G1358	C1359	A1360	G1361	G1362	G1363	A1366	C1369	C1370	A1373	G1374	G1375	A1376	A1377	A1378	C1379	U1380	C1381	U1382	G1383	G1384	G1387	A1388	G1389	G1390	U1391	C1392	C1393	G1394	U1395	A1396	G1397	U1401	C1402	C1403	U1404							

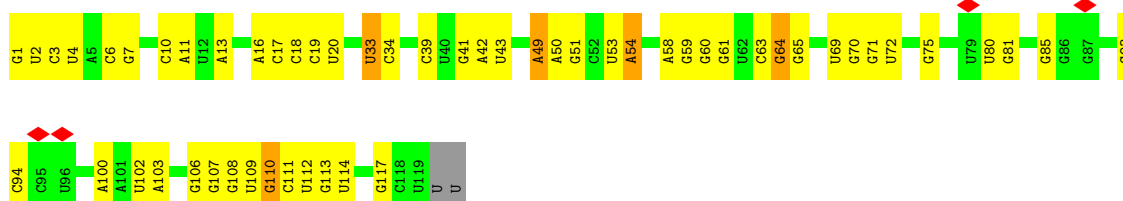




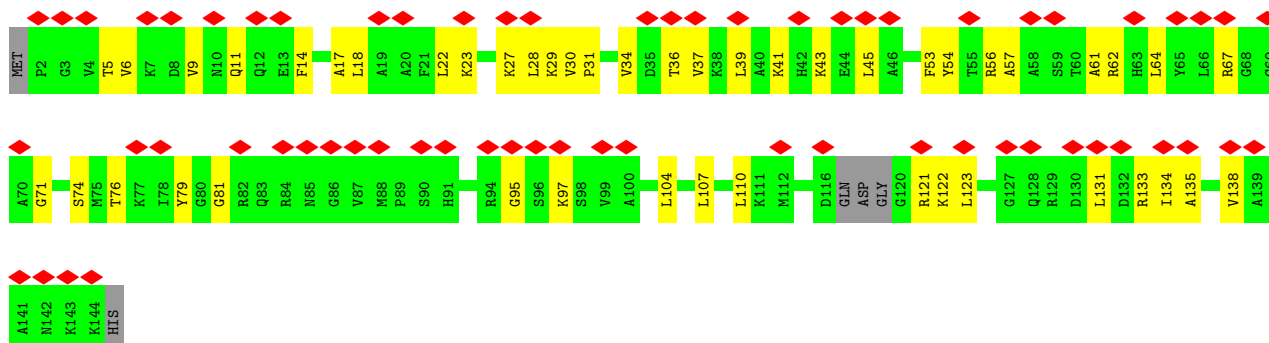
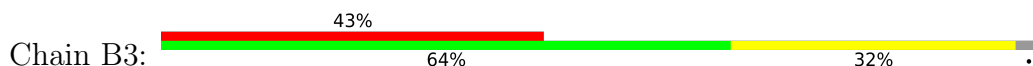
• Molecule 4: Large ribosomal subunit protein eL8



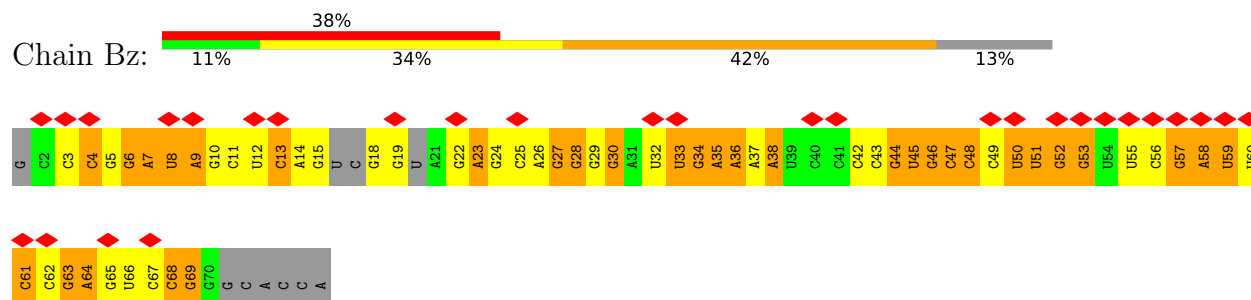
• Molecule 5: 5S ribosomal RNA



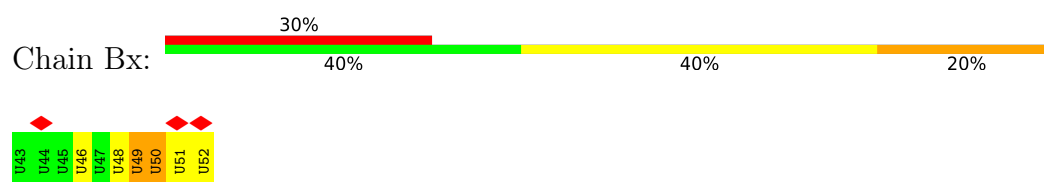
• Molecule 6: Small ribosomal subunit protein eS19



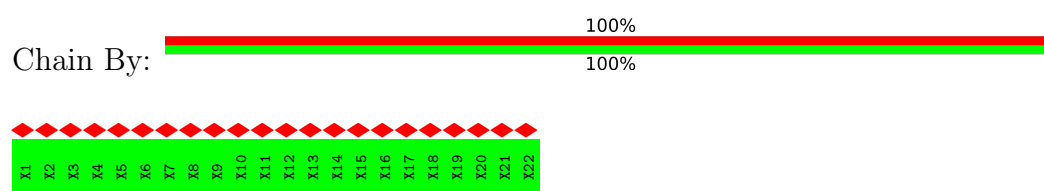
- Molecule 7: transfer RNA



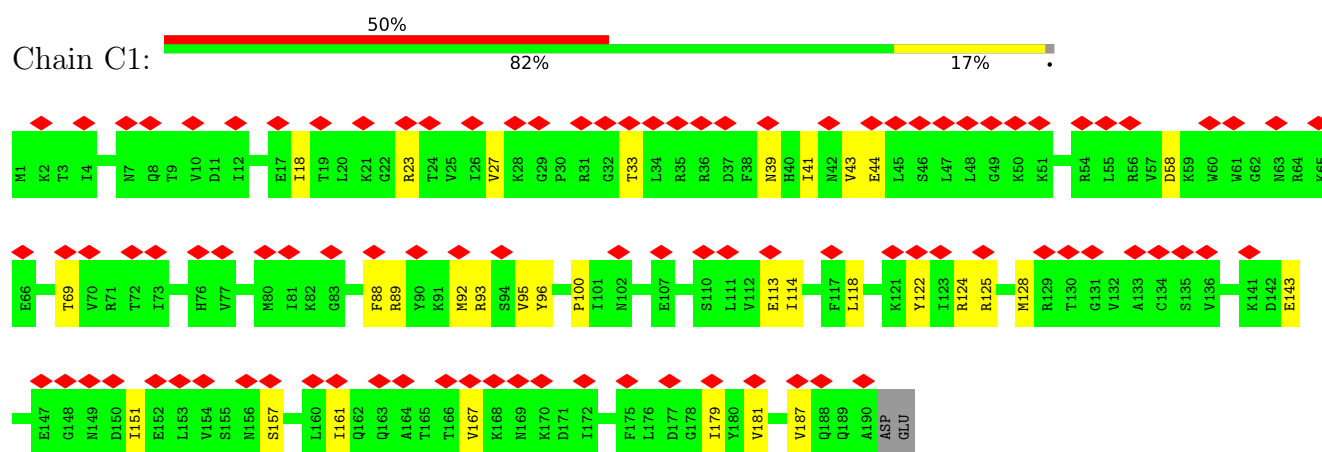
- Molecule 8: messenger RNA



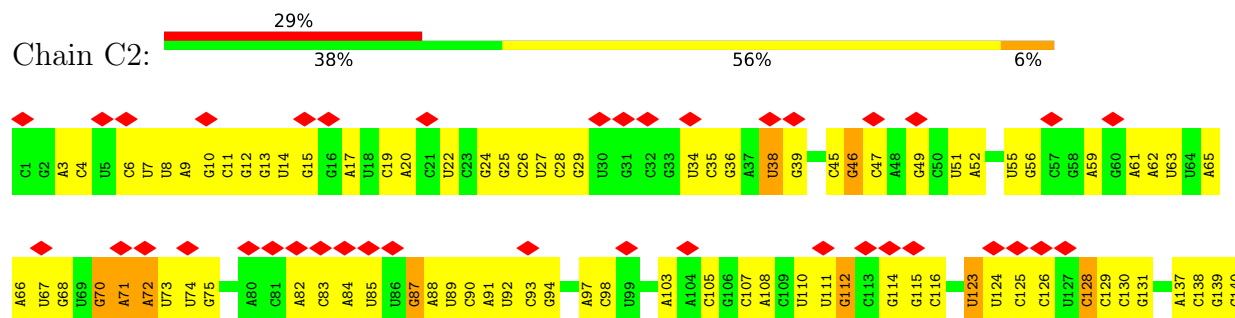
- Molecule 9: Nascent protein chain

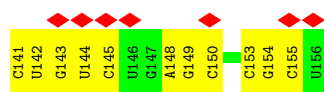


- Molecule 10: Large ribosomal subunit protein uL6

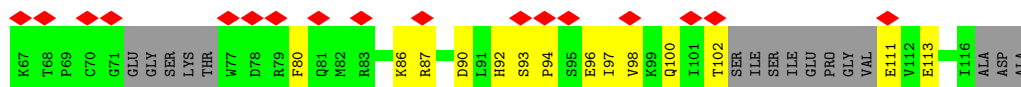


- Molecule 11: 5.8S ribosomal RNA

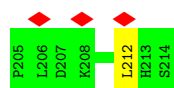
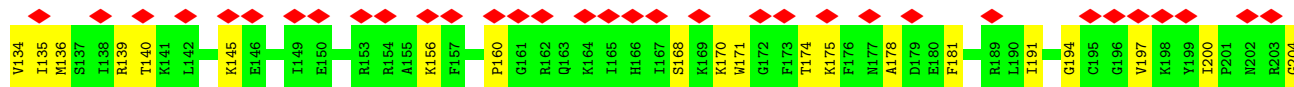
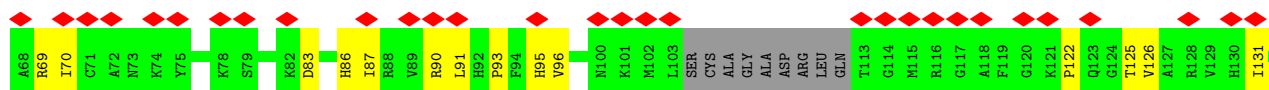
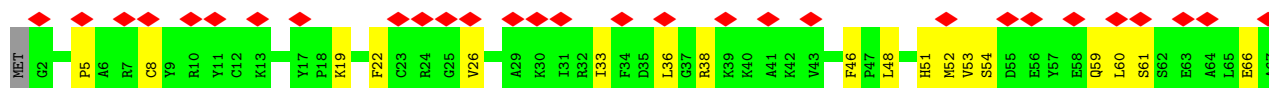
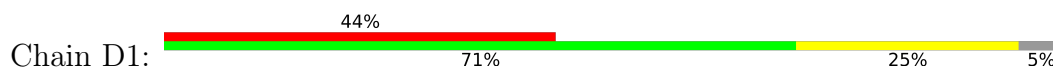




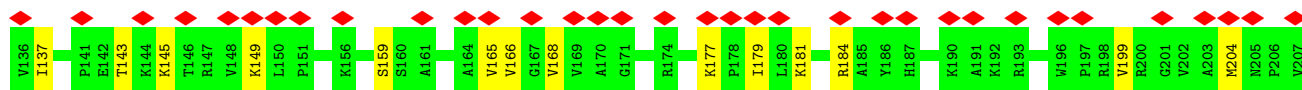
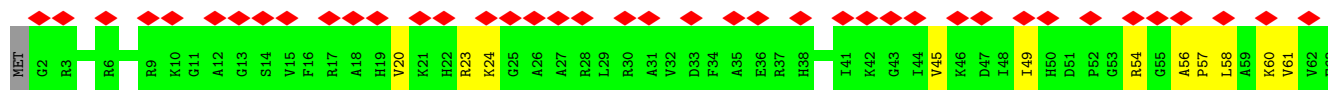
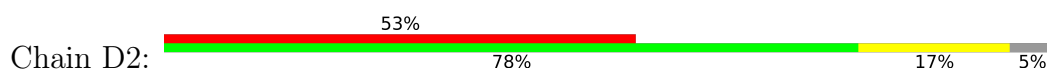
• Molecule 12: Small ribosomal subunit protein uS10

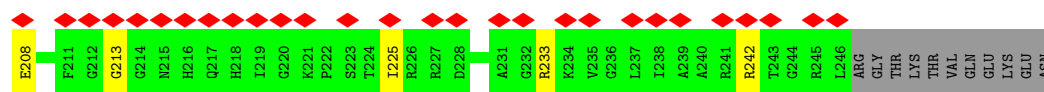


• Molecule 13: Large ribosomal subunit protein uL16

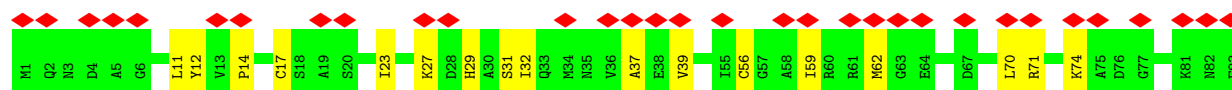
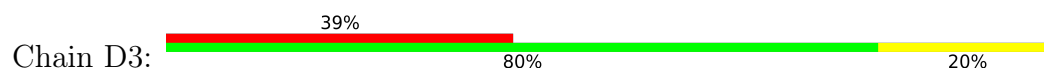


• Molecule 14: Large ribosomal subunit protein uL2

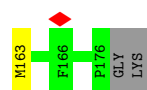
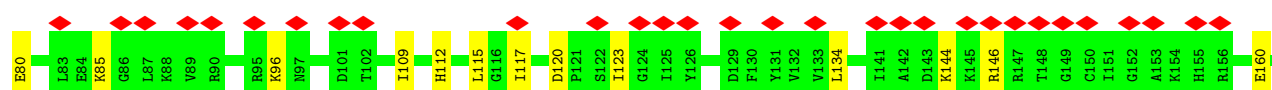
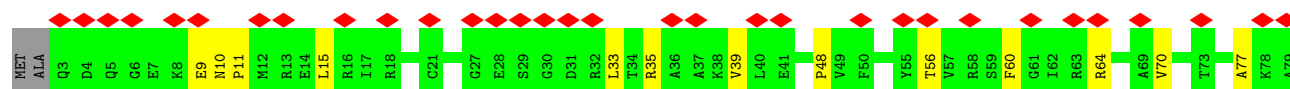
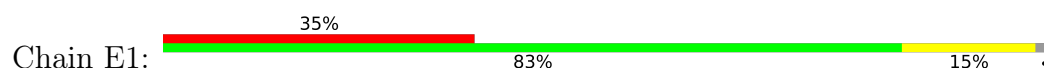




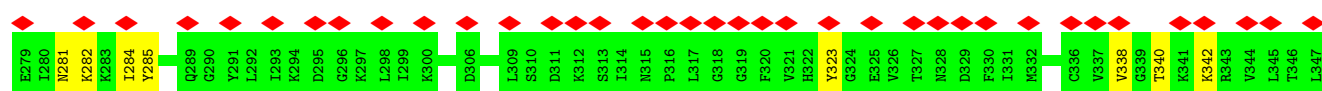
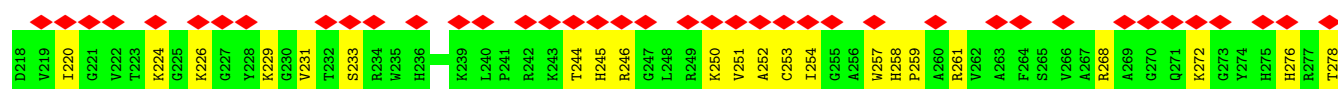
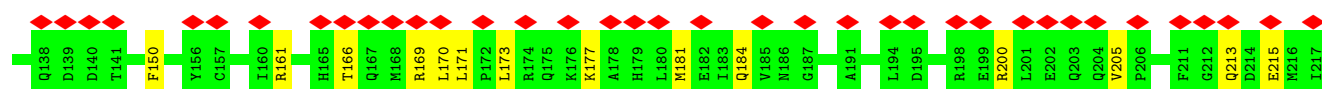
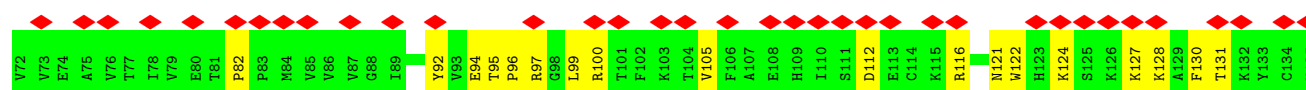
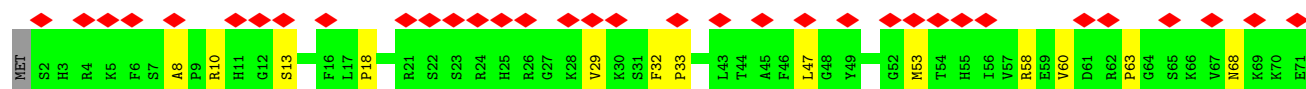
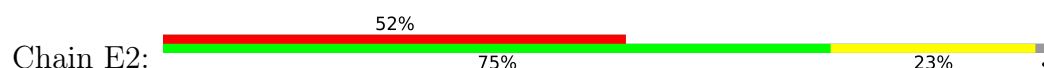
- Molecule 15: Small ribosomal subunit protein eS21

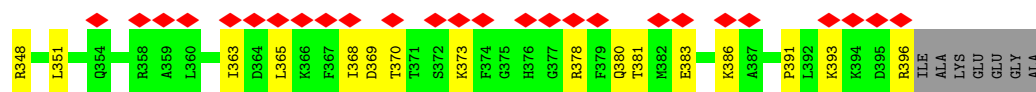


- Molecule 16: Large ribosomal subunit protein uL5

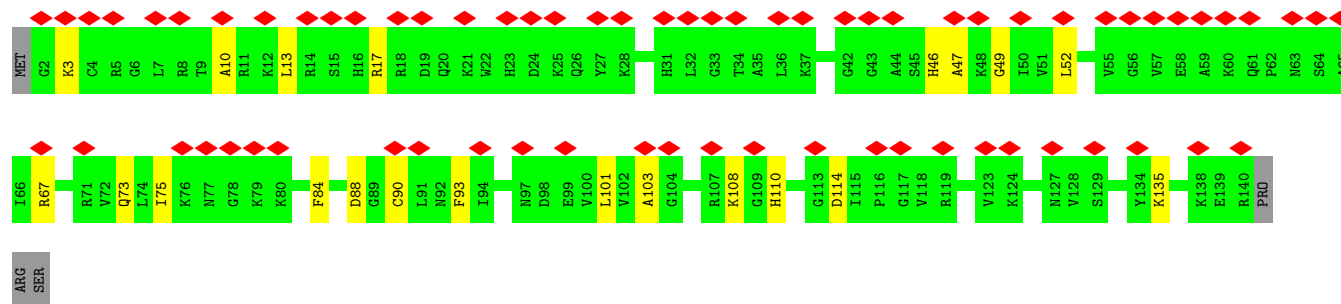
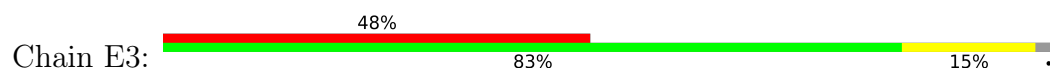


- Molecule 17: Large ribosomal subunit protein uL3

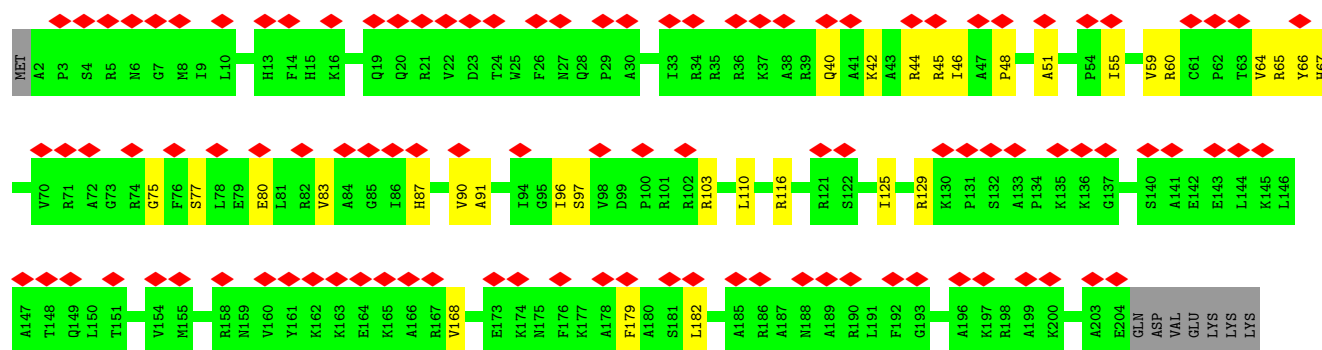
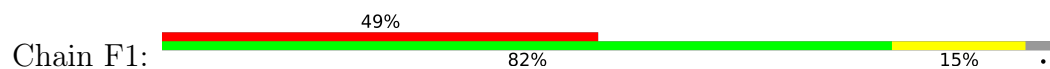




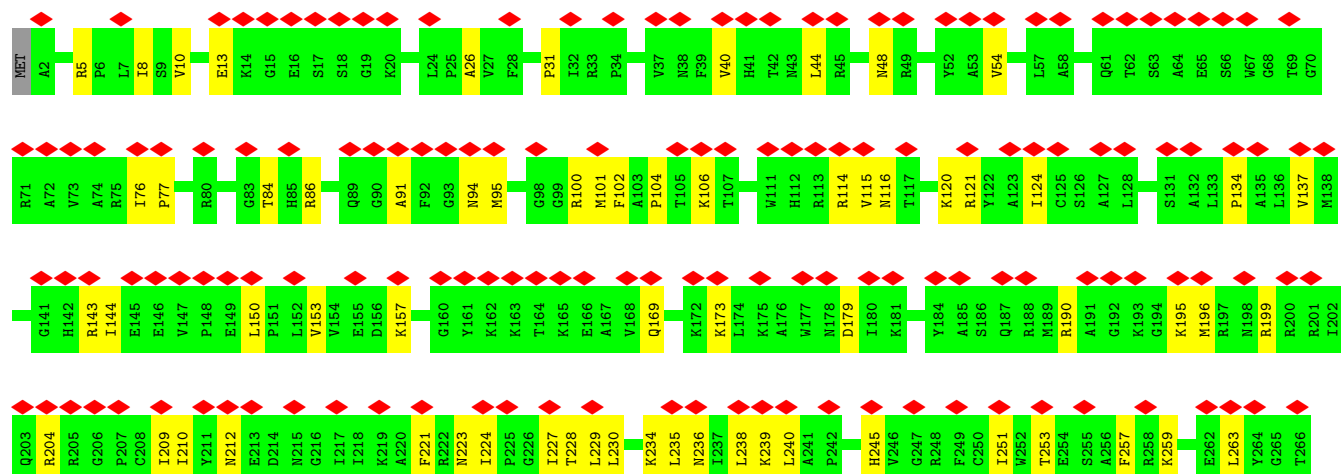
• Molecule 18: Small ribosomal subunit protein uS12

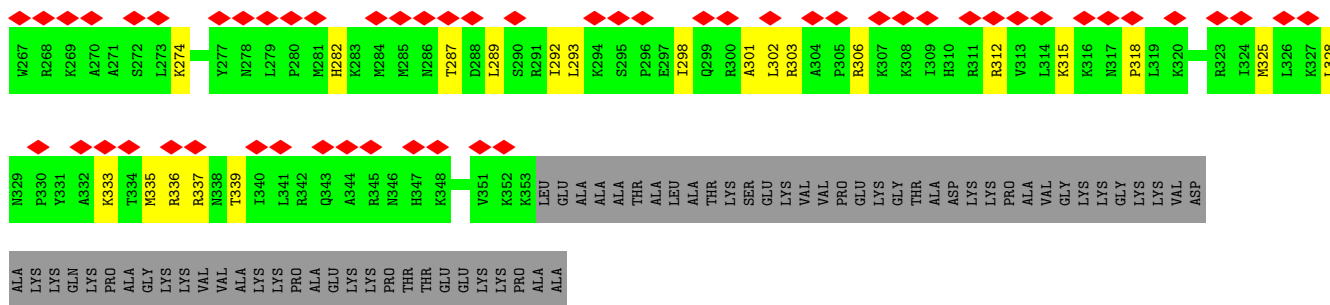


• Molecule 19: Large ribosomal subunit protein eL13

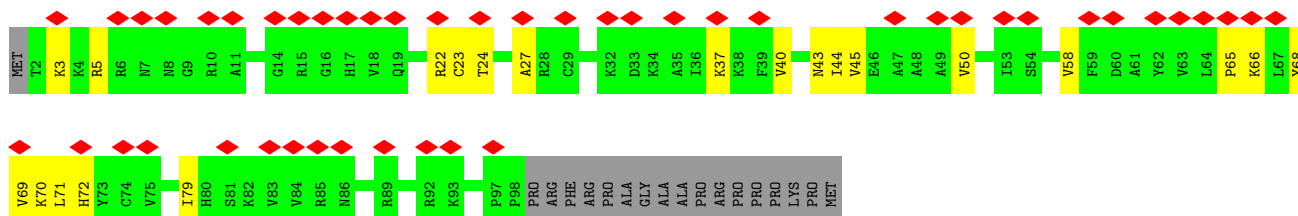
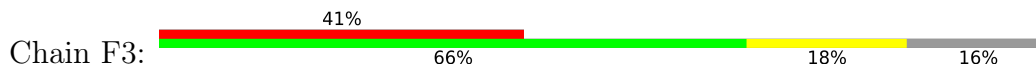


• Molecule 20: Large ribosomal subunit protein uL4

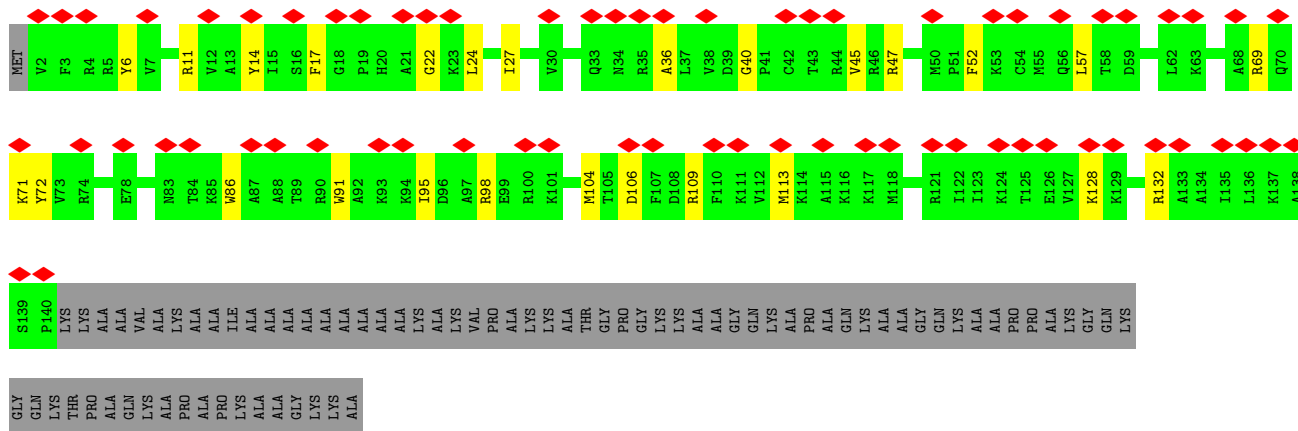




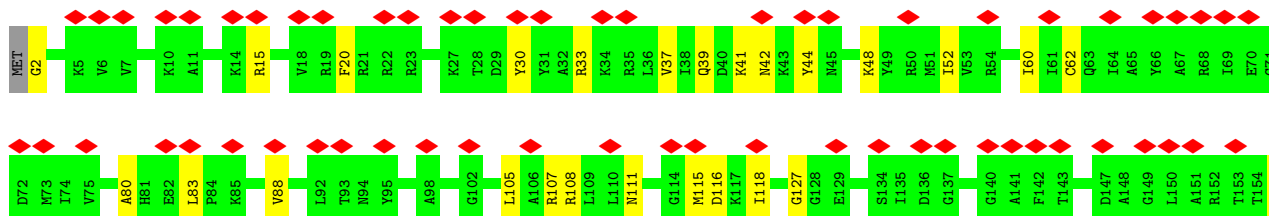
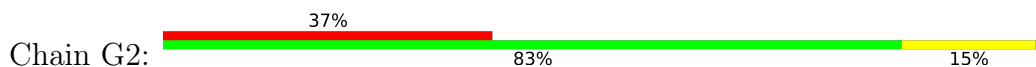
- Molecule 21: Small ribosomal subunit protein eS26

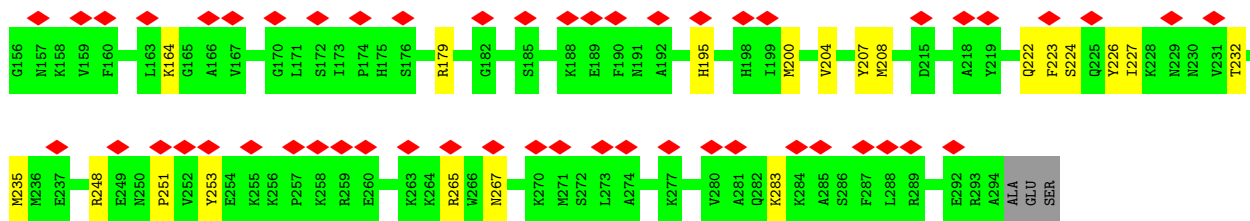


- Molecule 22: Large ribosomal subunit protein eL14



- Molecule 23: Large ribosomal subunit protein uL18

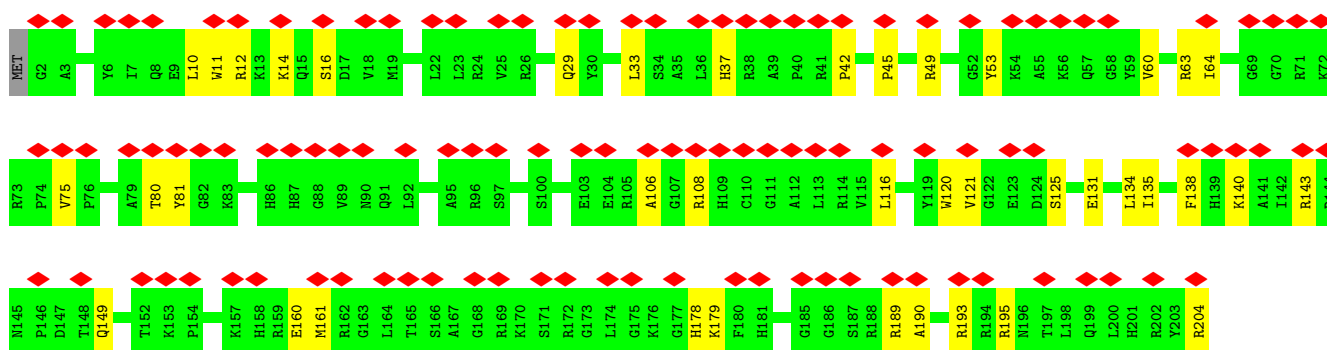
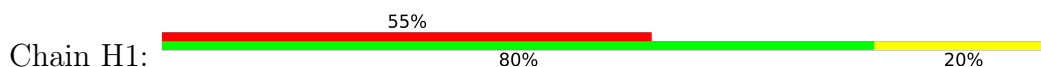




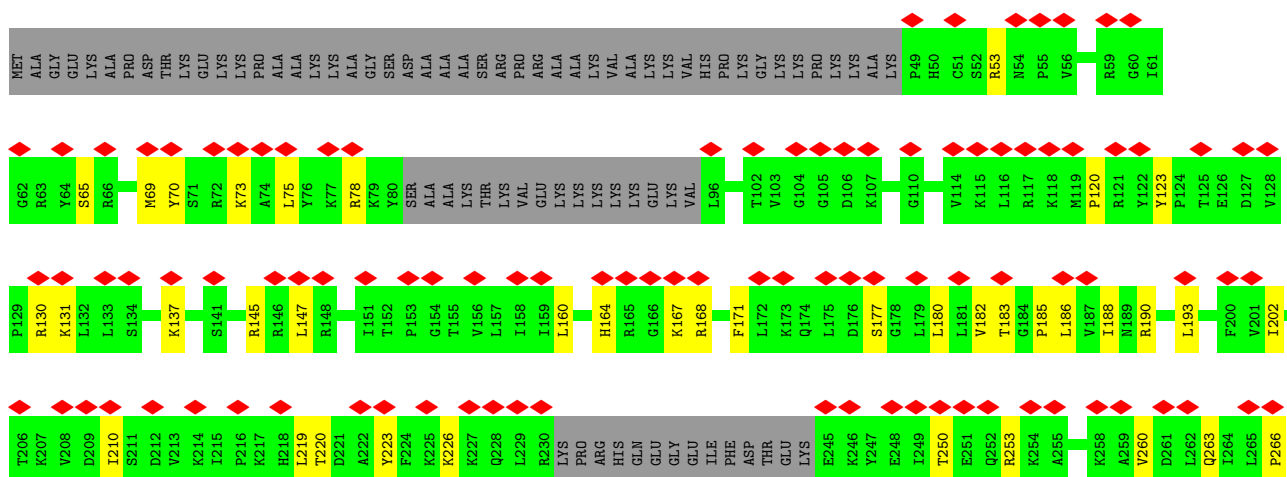
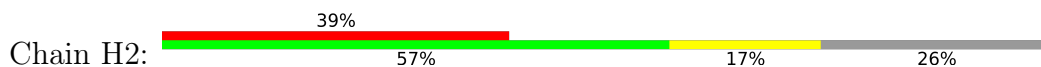
• Molecule 24: Small ribosomal subunit protein eS28

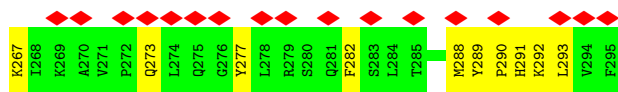


• Molecule 25: Large ribosomal subunit protein eL15



• Molecule 26: Large ribosomal subunit protein eL6

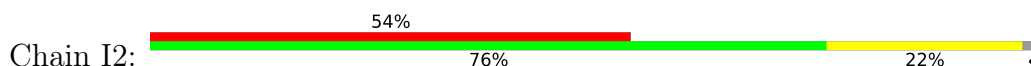




- Molecule 27: Small ribosomal subunit protein uS14



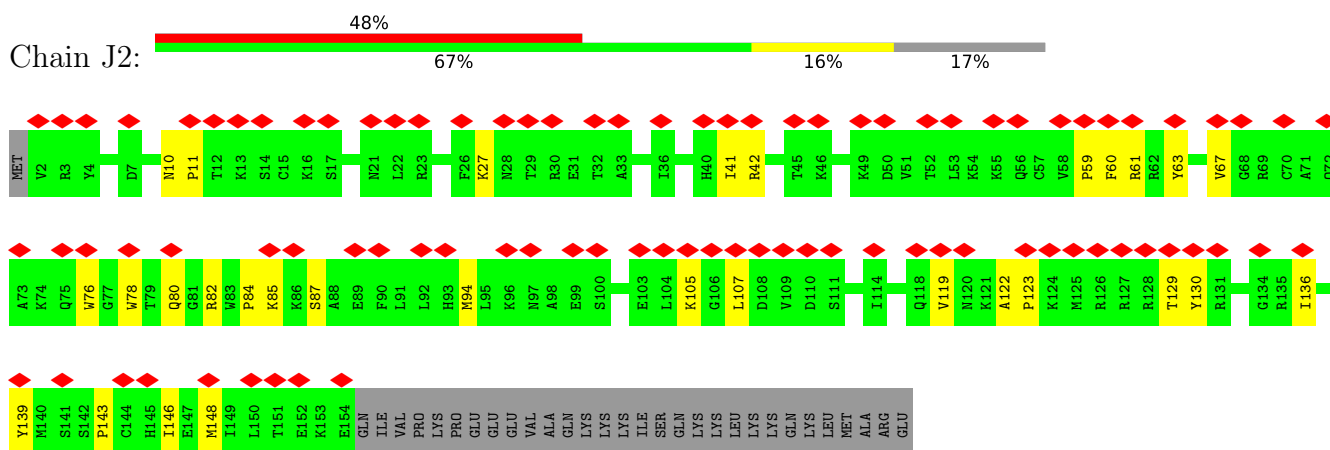
- Molecule 28: Large ribosomal subunit protein uL13



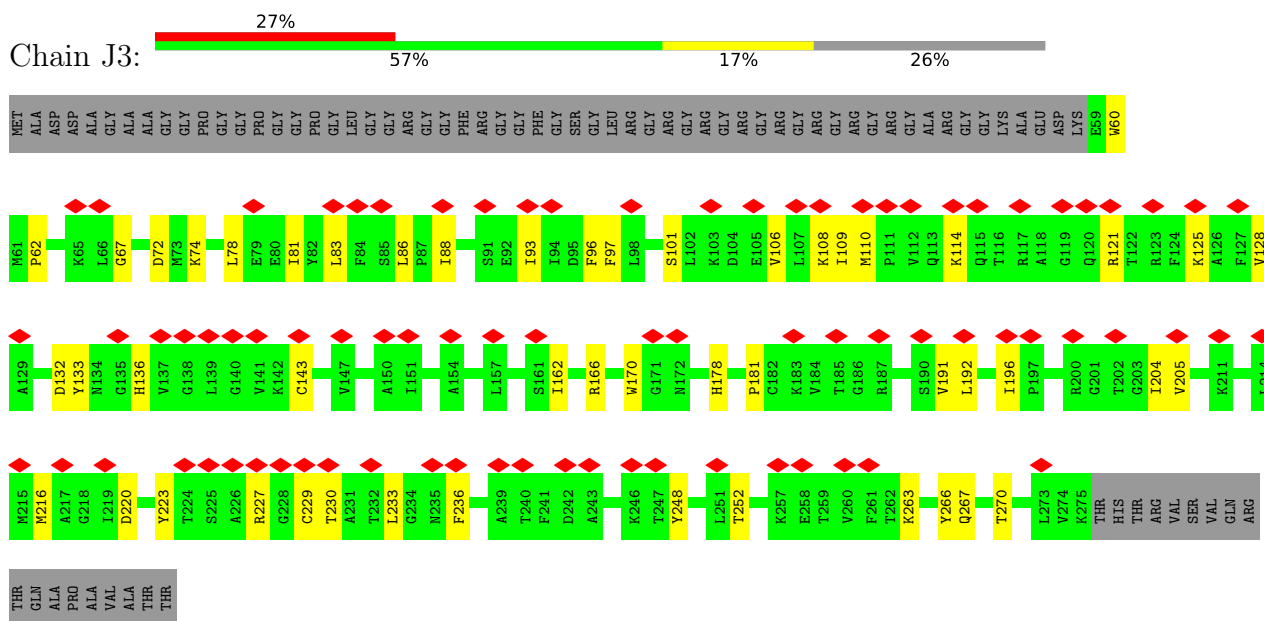
- Molecule 29: Small ribosomal subunit protein RACK1



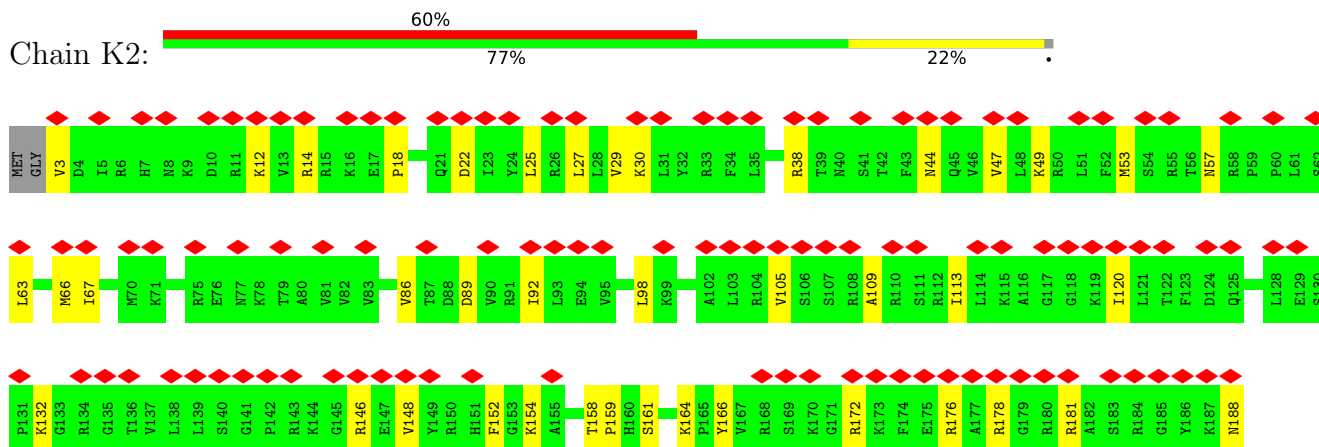
- Molecule 30: Large ribosomal subunit protein uL22



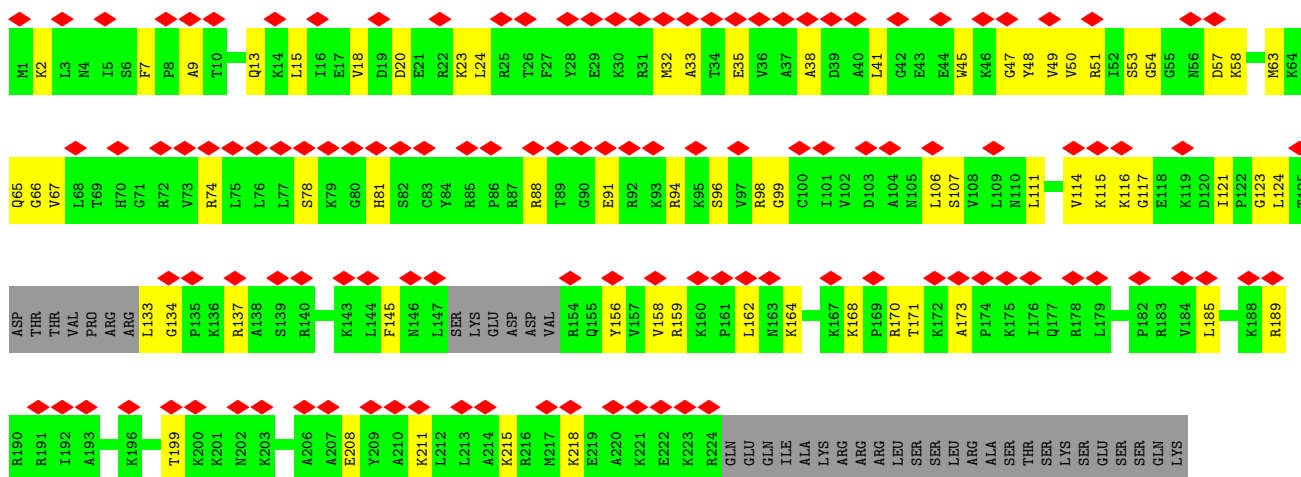
• Molecule 31: Small ribosomal subunit protein uS5

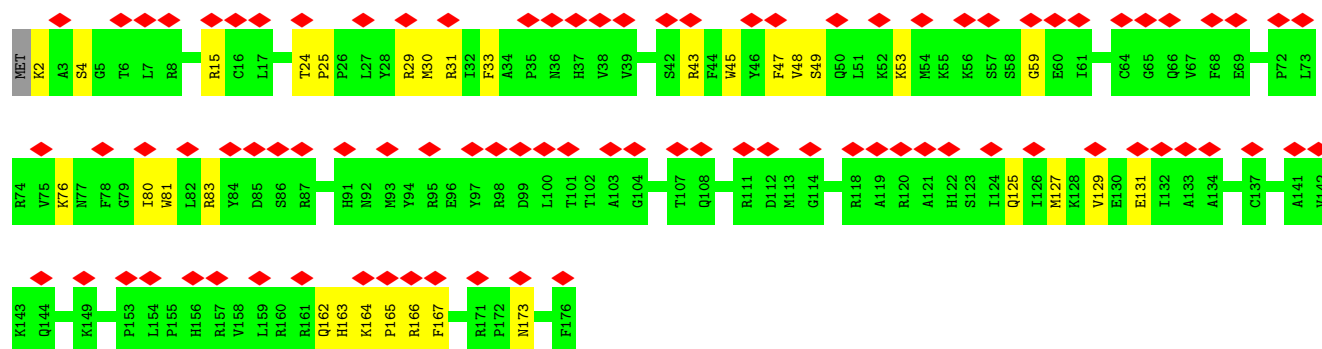


• Molecule 32: Large ribosomal subunit protein eL18

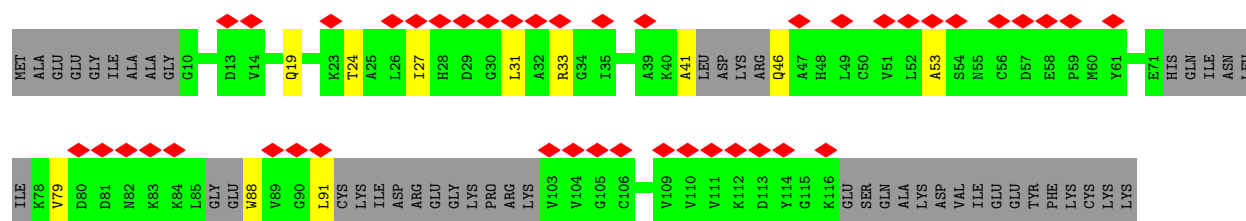


• Molecule 33: Small ribosomal subunit protein eS6

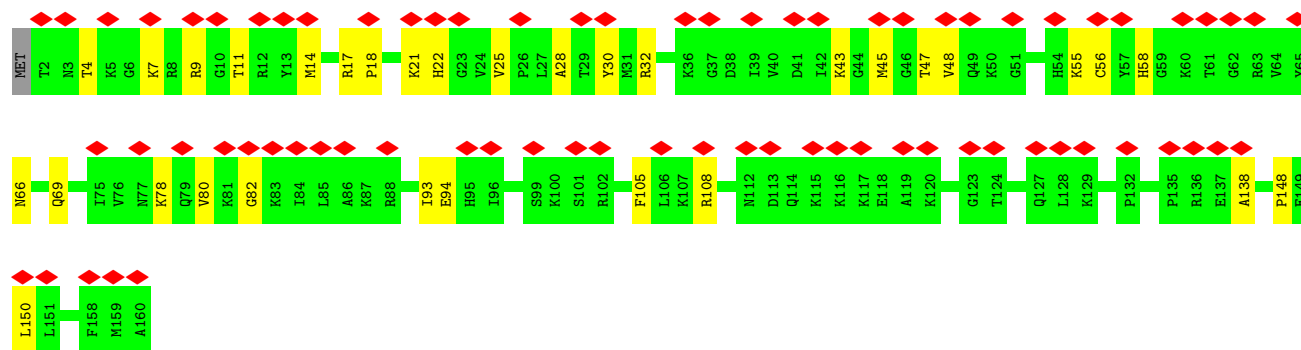
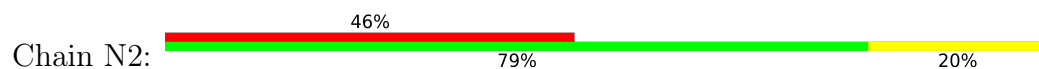




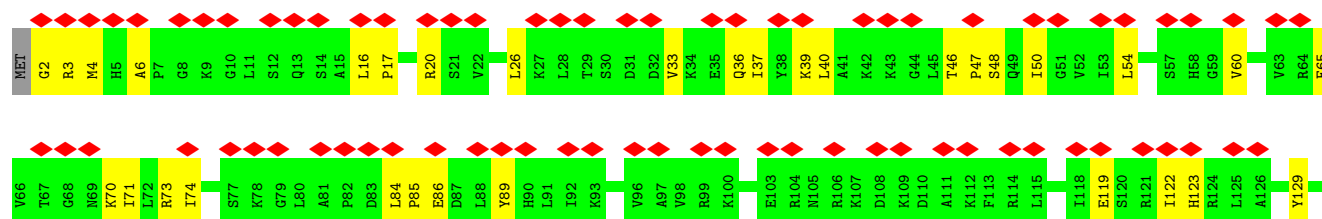
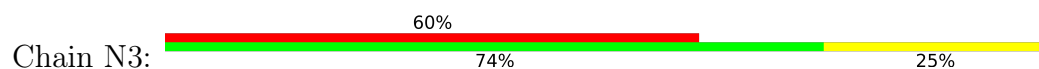
- Molecule 37: Small ribosomal subunit protein eS12



- Molecule 38: Large ribosomal subunit protein eL21

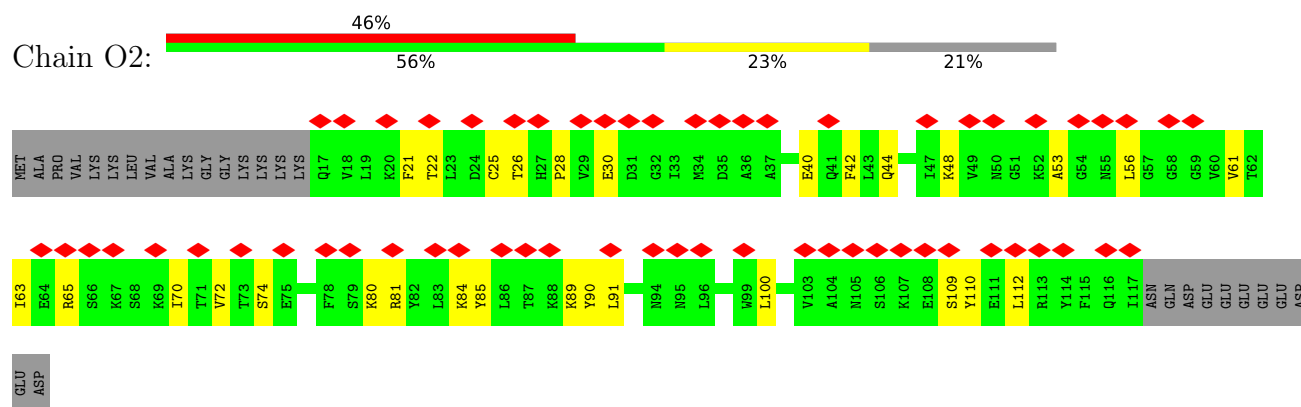


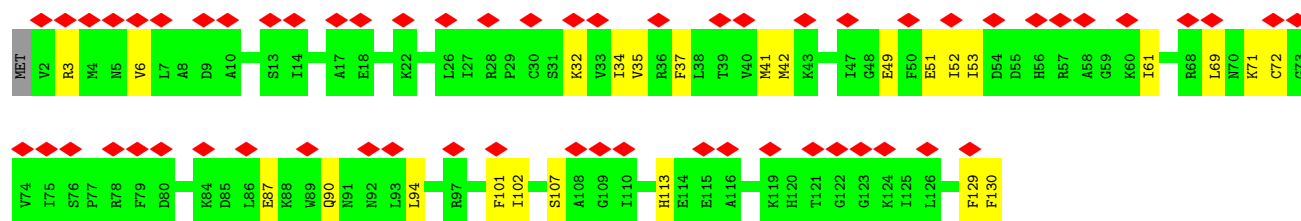
- Molecule 39: Small ribosomal subunit protein uS15



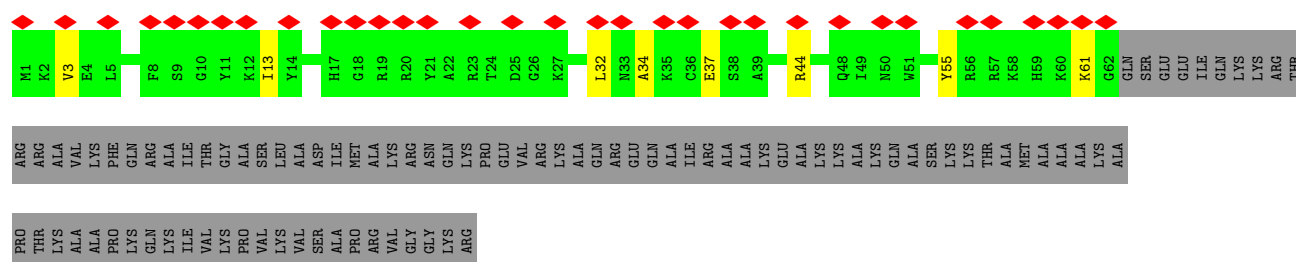
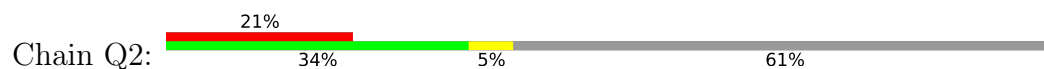


- Molecule 40: Large ribosomal subunit protein eL22

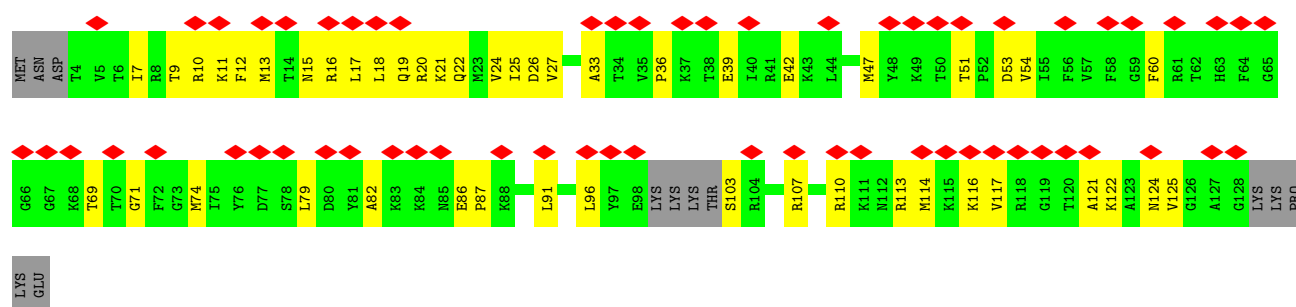




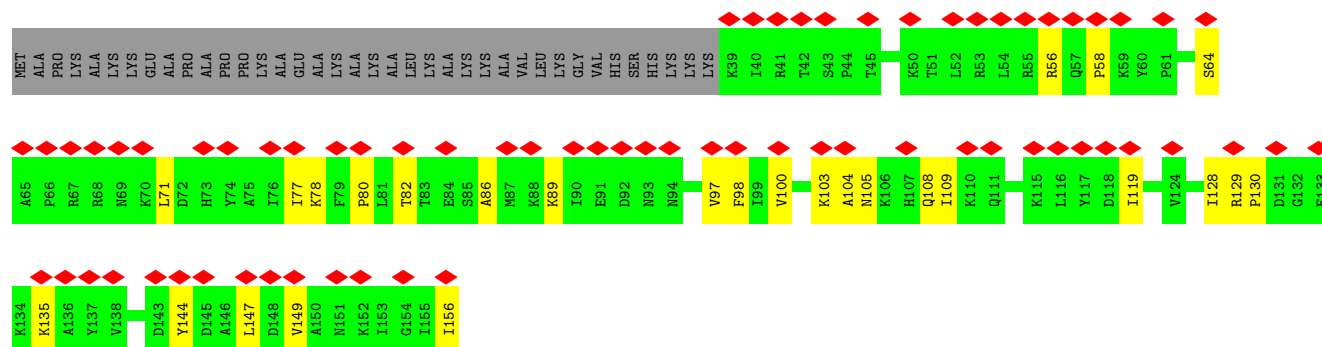
- Molecule 44: Large ribosomal subunit protein eL24



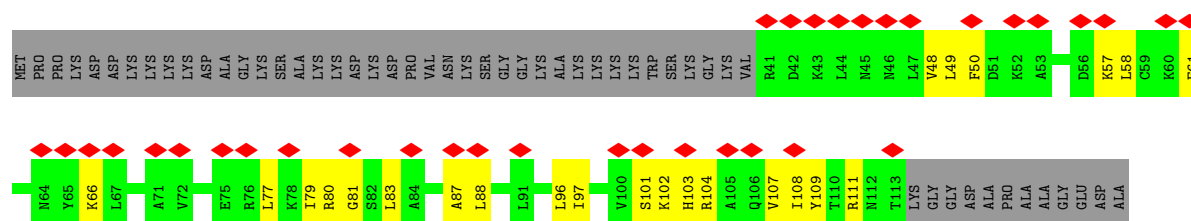
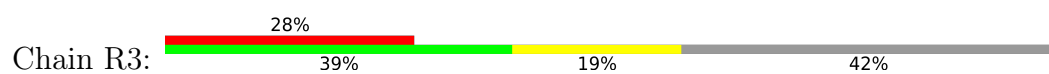
- Molecule 45: Small ribosomal subunit protein eS24



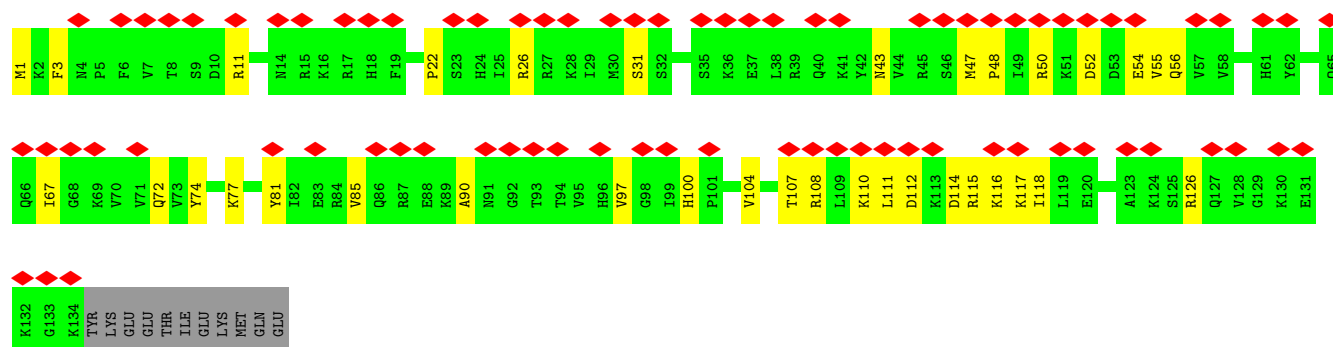
- Molecule 46: Large ribosomal subunit protein uL23



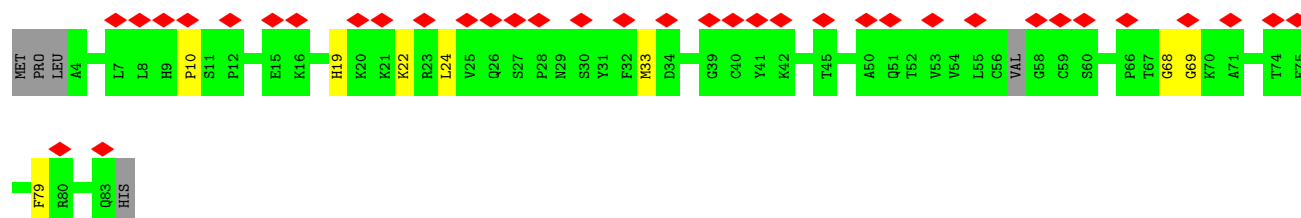
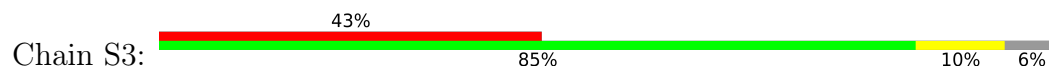
- Molecule 47: Small ribosomal subunit protein eS25



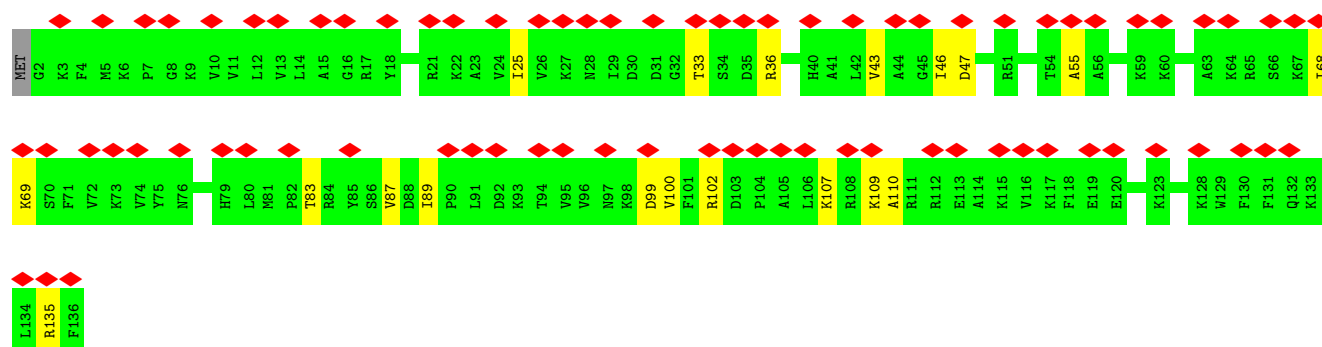
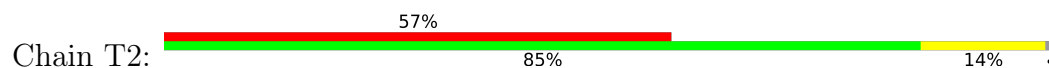
- Molecule 48: Large ribosomal subunit protein uL24



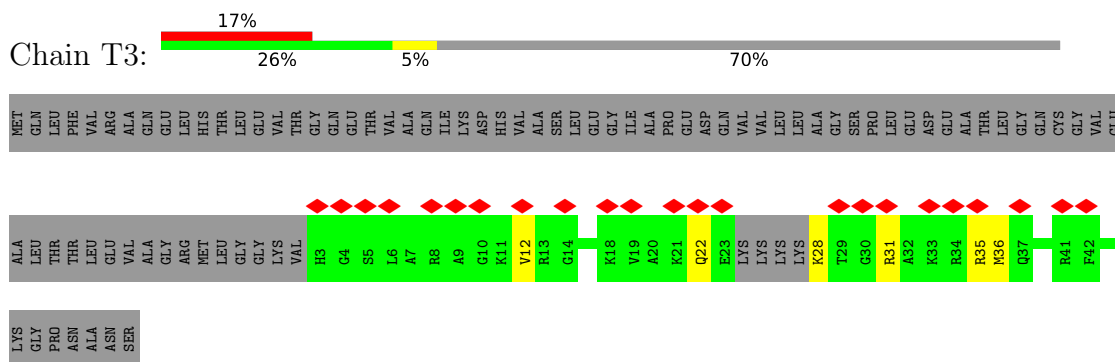
- Molecule 49: Small ribosomal subunit protein eS27



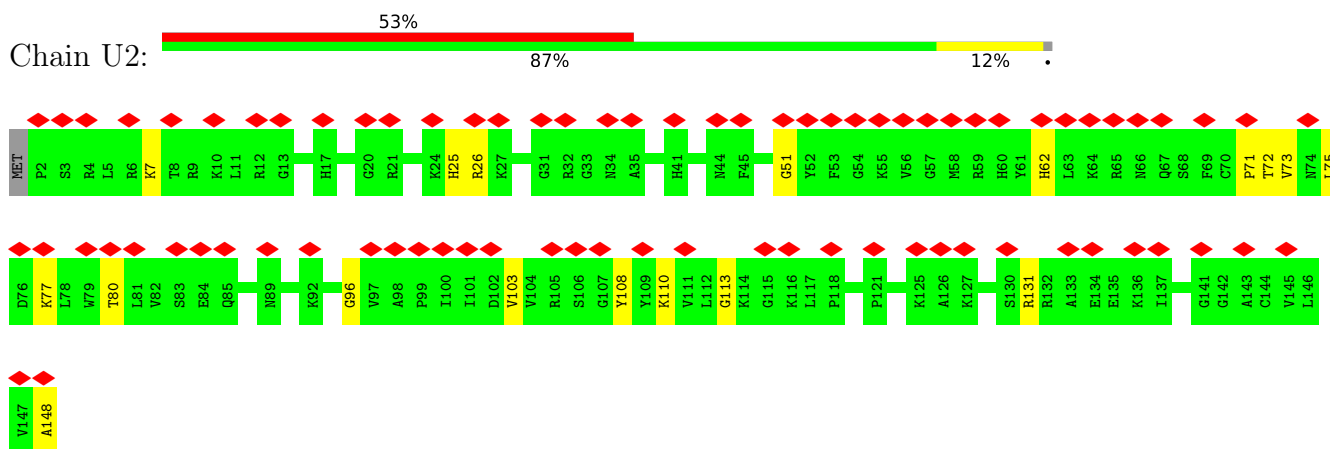
- Molecule 50: Large ribosomal subunit protein eL27



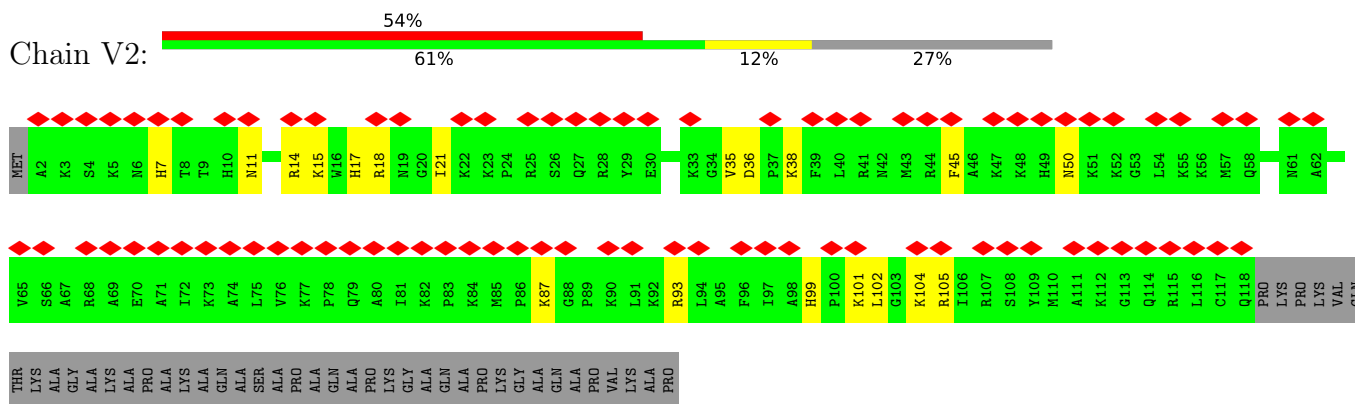
- Molecule 51: Ubiquitin-like FUBI-ribosomal protein eS30 fusion protein



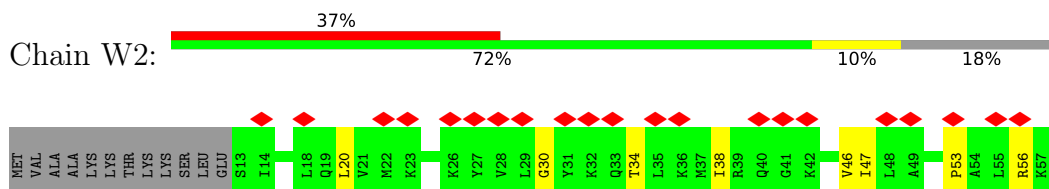
- Molecule 52: Large ribosomal subunit protein uL15

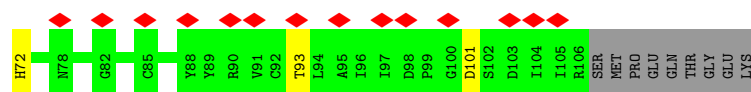


- Molecule 53: Large ribosomal subunit protein eL29

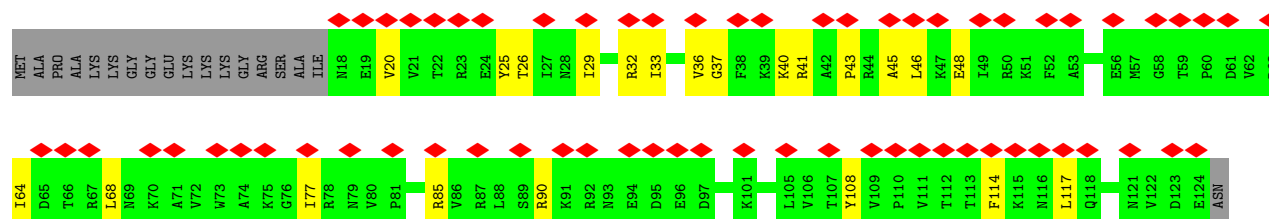


- Molecule 54: Large ribosomal subunit protein eL30

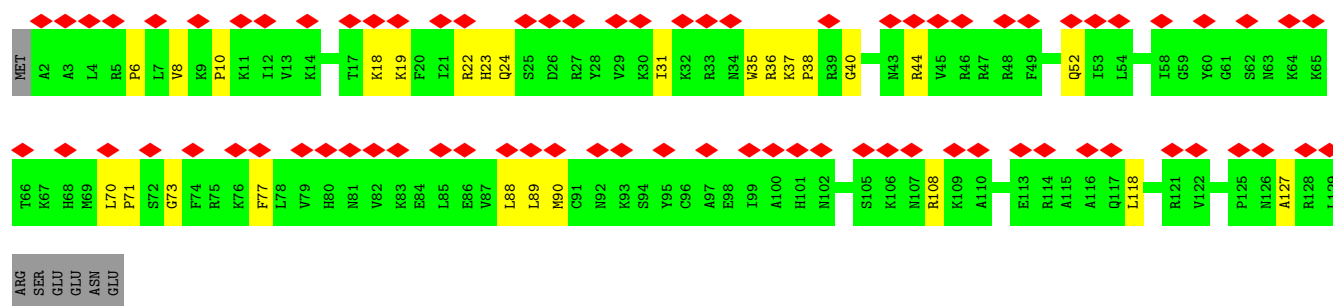
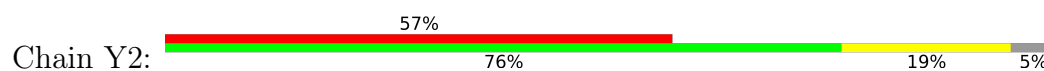




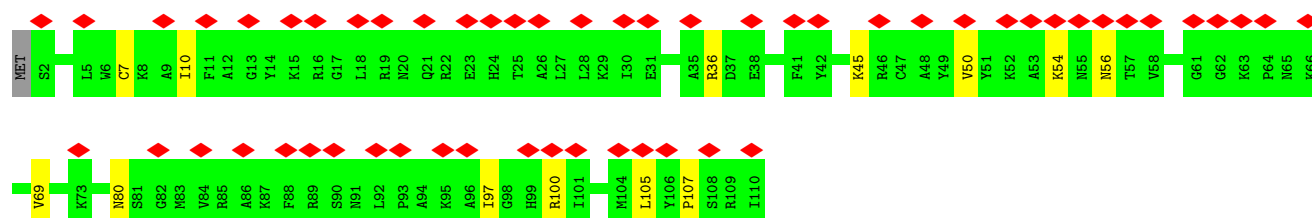
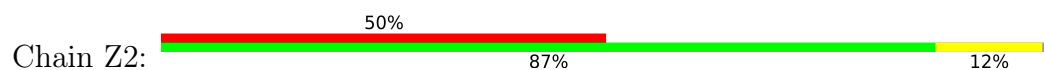
- Molecule 55: Large ribosomal subunit protein eL31



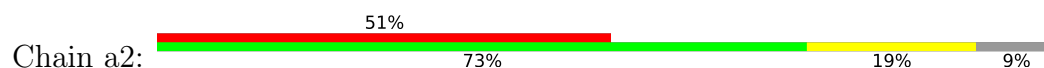
- Molecule 56: Large ribosomal subunit protein eL32



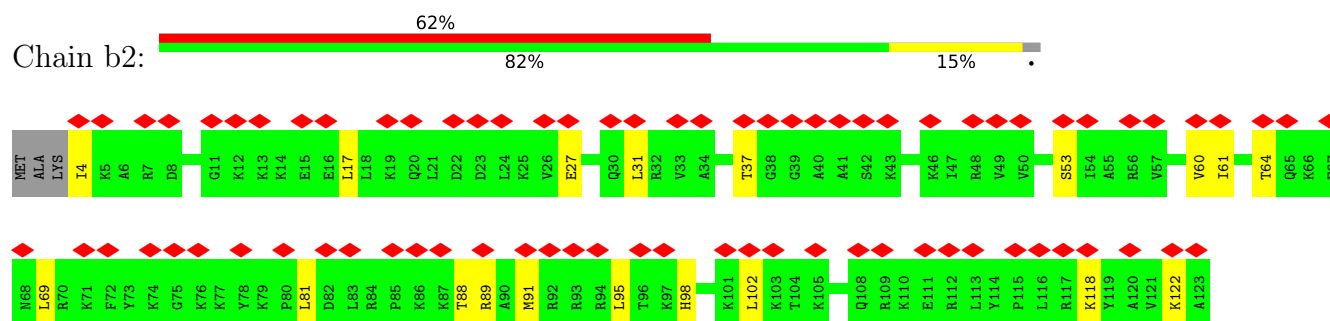
- Molecule 57: Large ribosomal subunit protein eL33



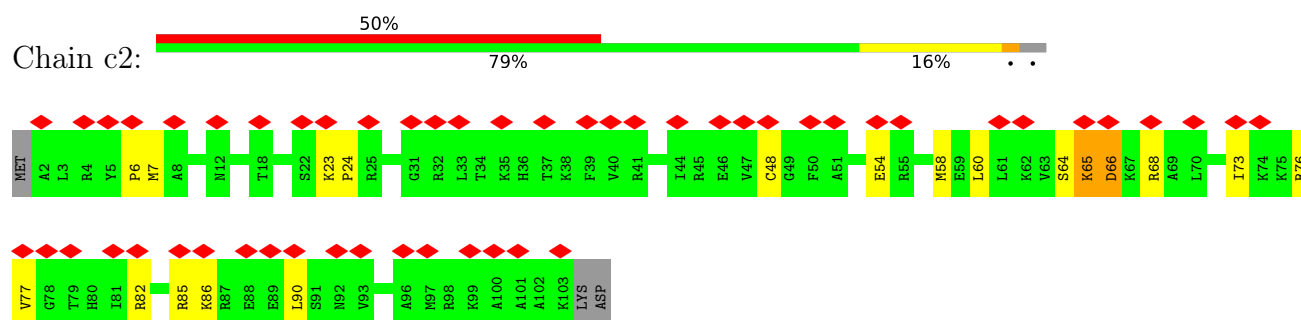
- Molecule 58: Large ribosomal subunit protein eL34



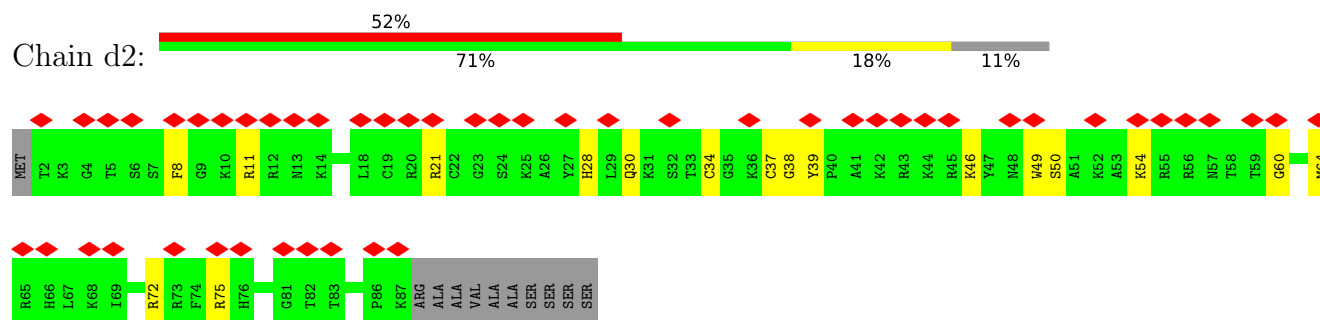
- Molecule 59: Large ribosomal subunit protein uL29



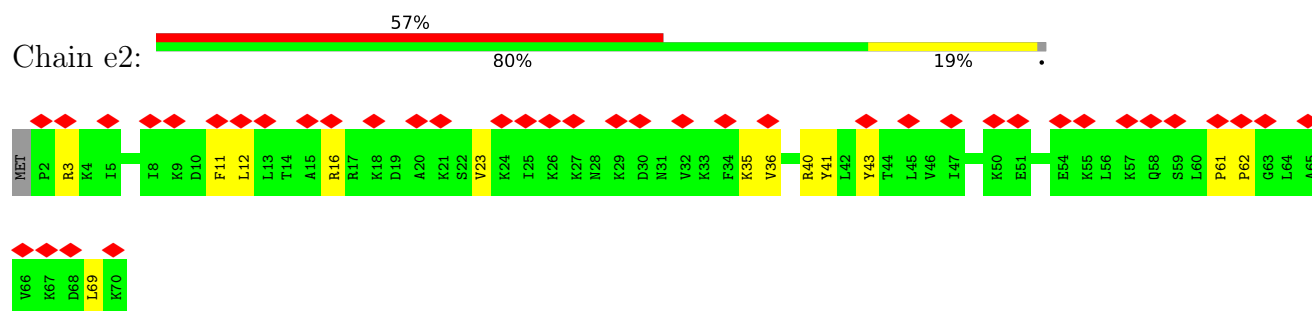
- Molecule 60: Large ribosomal subunit protein eL36



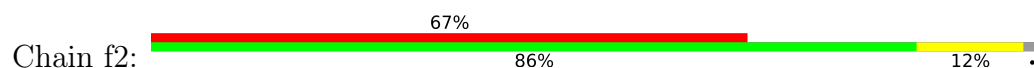
- Molecule 61: Large ribosomal subunit protein eL37

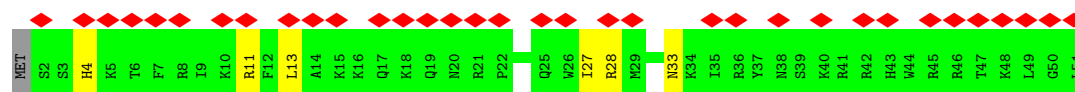


- Molecule 62: Large ribosomal subunit protein eL38

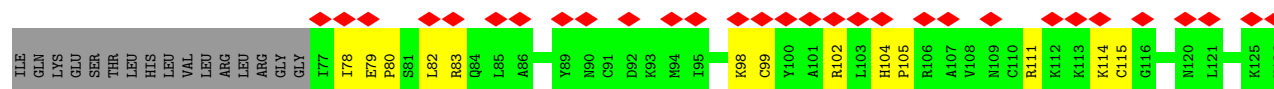
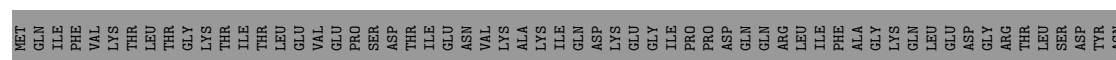


- Molecule 63: Large ribosomal subunit protein eL39

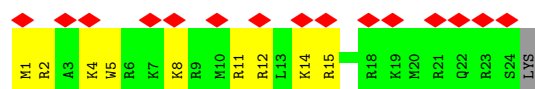




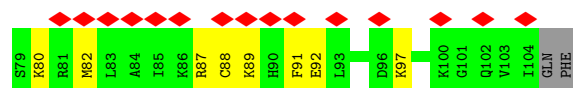
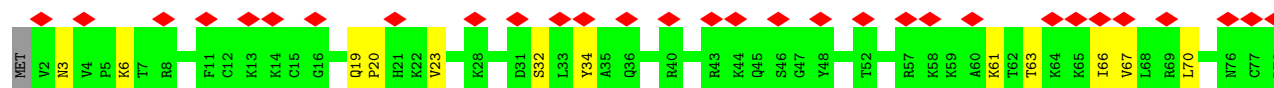
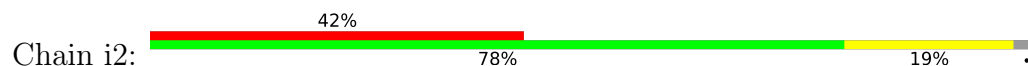
- Molecule 64: Ubiquitin-ribosomal protein eL40 fusion protein



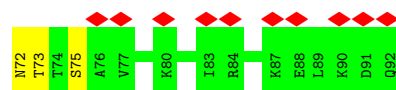
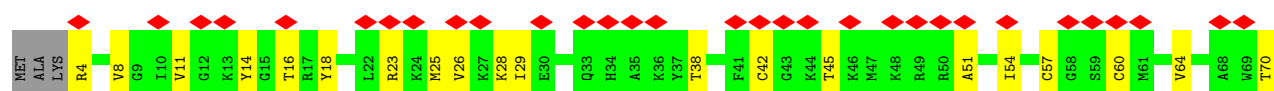
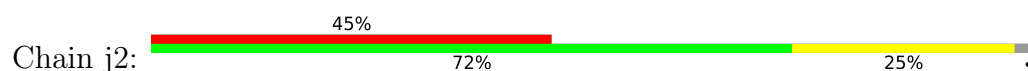
- Molecule 65: 60S ribosomal protein L41



- Molecule 66: Large ribosomal subunit protein eL42

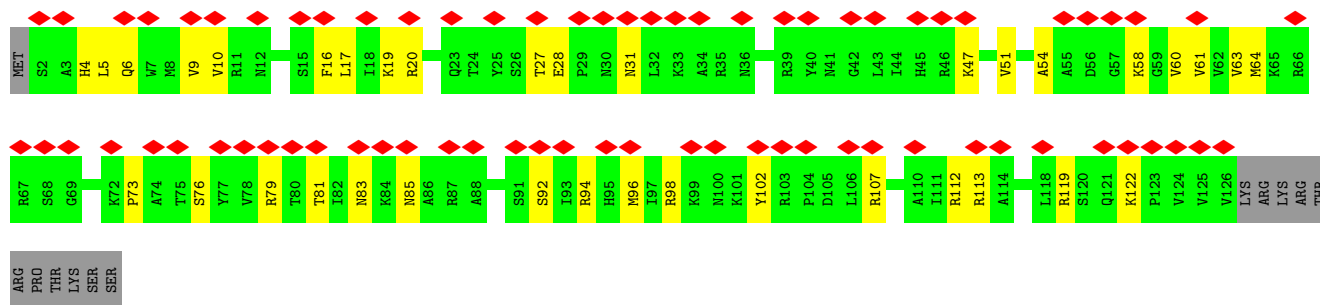


- Molecule 67: Large ribosomal subunit protein eL43

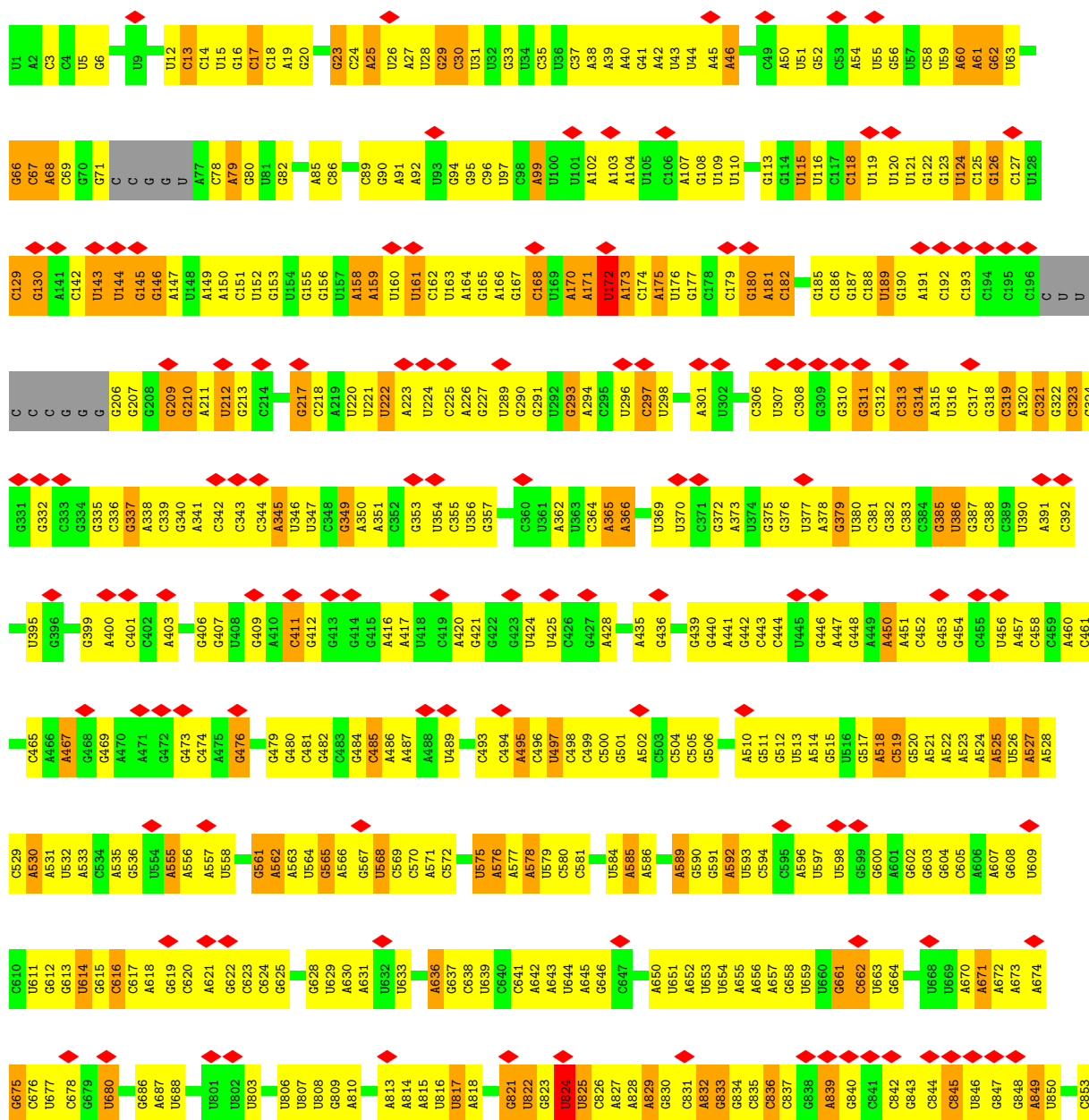


- Molecule 68: Large ribosomal subunit protein eL28

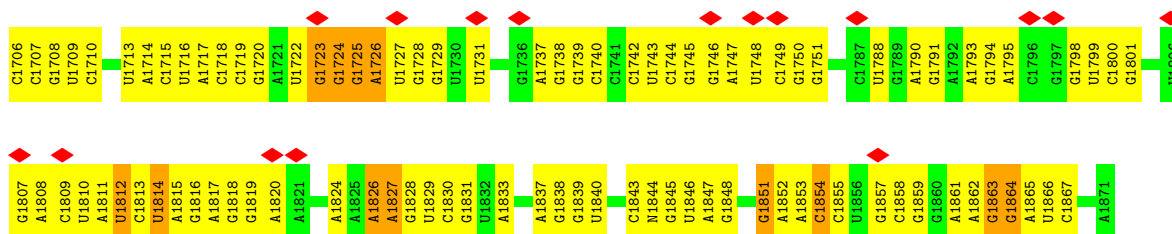




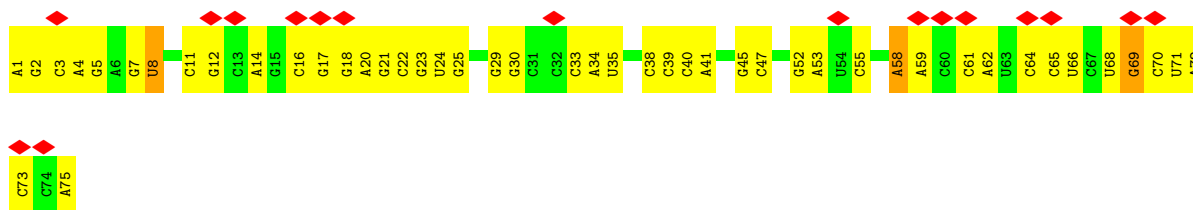
• Molecule 69: 18S ribosomal RNA



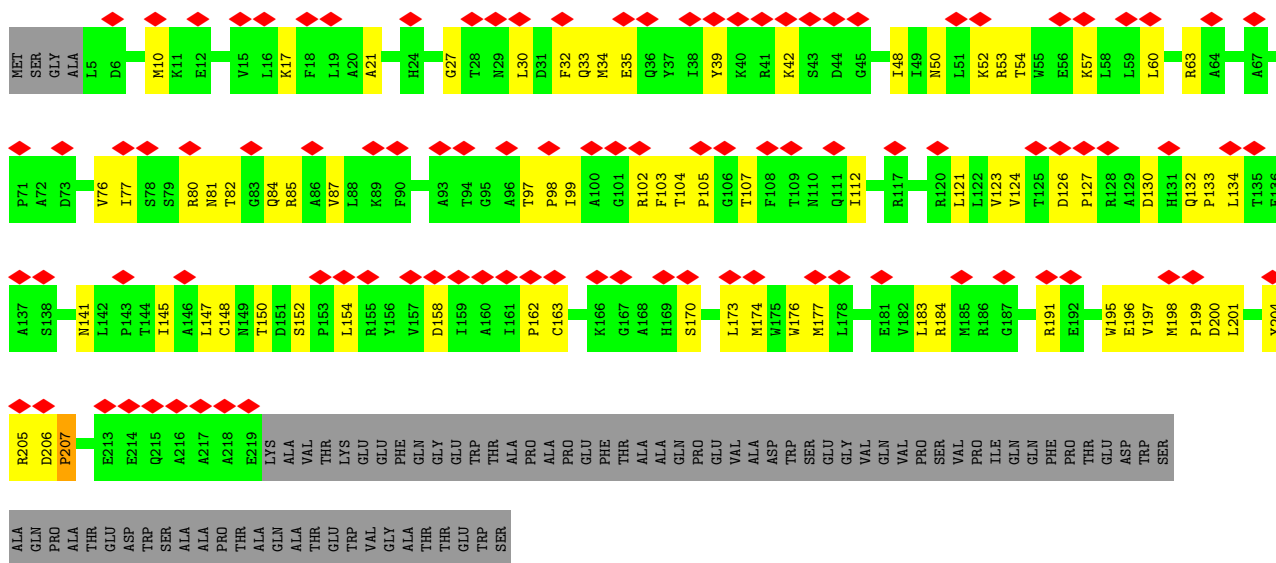
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U1447	A1448	G1449	A1450	G1451	A1454	C1455	A1456	U1459	G1460	G1461	U1464	U1465	G1468	C1469	C1470	A1471	C1472	C1473	C1474	G1475	A1476	C1477	A1478	U1479	U1480	G1481	A1482	U1487	A1488	A1489	C1490	A1491	G1492	G1493	U1496	G1497	U1498	G1499	A1500	U1501	G1502	C1503	C1504	C1505	U1506	U1507	A1508	G1509	A1510	U1511	U1512	U1513	U1514	U1515	U1516	U1517	U1518	U1519	U1520	U1521	U1522	U1523	U1524	U1525	U1526	U1527	U1528	U1529	U1530	U1531	U1532	U1533	U1534	U1535	U1536	U1537	U1538	U1539	U1540	U1541	U1542	U1543	U1544	U1545	U1546	U1547	U1548	U1549	U1550	U1551	U1552	U1553	U1554	U1555	U1556	U1557	U1558	U1559	U1560	U1561	U1562	U1563	U1564	U1565	U1566	U1567	U1568	U1569	U1570	U1571	U1572	U1573	U1574	U1575	U1576	U1577	U1578	U1579	U1580																																																																																																																													
G1322	G1323	G1326	G1329	U1330	U1331	U1332	C1333	A1334	U1335	G1336	G1337	C1338	C1339	G1340	U1341	U1342	C1343	U1344	U1345	A1346	G1347	G1350	G1351	U1352	G1353	G1354	A1355	G1356	C1357	G1358	A1359	U1360	U1361	U1362	G1363	U1364	C1365	U1366	G1367	G1368	U1369	U1370	A1371	A1372	U1373	U1374	C1375	C1376	G1377	A1378	U1379	A1380	C1381	G1382	G1383	A1384	U1385	U1386	U1387	U1388	U1389	U1390	U1391	U1392	U1393	U1394	U1395	U1396	U1397	U1398	U1399	U1400	U1401	U1402	U1403	U1404	U1405	U1406	U1407	U1408	U1409	U1410	U1411	U1412	U1413	U1414	U1415	U1416	U1417	U1418	U1419	U1420	U1421	U1422	U1423	U1424	U1425	U1426	U1427	U1428	U1429	U1430	U1431	U1432	U1433	U1434	U1435	U1436	U1437	U1438	U1439	U1440	U1441	U1442	U1443	U1444	U1445	U1446																																																																																																																														
G1258	G1259	A1260	A1261	A1262	C1263	U1264	U1265	C1266	A1267	G1268	C1269	U1270	G1271	G1272	G1273	C1274	C1275	U1276	G1277	C1278	G1279	C1280	C1281	G1282	G1283	A1284	C1285	G1286	G1287	G1288	A1289	U1290	U1291	C1294	A1295	G1300	A1301	U1302	A1303	G1304	C1305	U1306	C1307	U1308	U1309	U1310	C1311	U1312	C1313	G1314	A1315	U1316	U1317	C1318	C1319	G1320	U1321	U1322	U1323	U1324	U1325	U1326	U1327	U1328	U1329	U1330	U1331	U1332	U1333	U1334	U1335	U1336	U1337	U1338	U1339	U1340	U1341	U1342	U1343	U1344	U1345	U1346	U1347	U1348	U1349	U1350	U1351	U1352	U1353	U1354	U1355	U1356	U1357	U1358	U1359	U1360	U1361	U1362	U1363	U1364	U1365	U1366	U1367	U1368	U1369	U1370	U1371	U1372	U1373	U1374	U1375	U1376	U1377	U1378	U1379	U1380	U1381	U1382	U1383	U1384	U1385	U1386	U1387	U1388	U1389	U1390	U1391	U1392	U1393	U1394	U1395	U1396	U1397	U1398	U1399	U1400	U1401	U1402	U1403	U1404	U1405	U1406	U1407	U1408	U1409	U1410	U1411	U1412	U1413	U1414	U1415	U1416	U1417	U1418	U1419	U1420	U1421	U1422	U1423	U1424	U1425	U1426	U1427	U1428	U1429	U1430	U1431	U1432	U1433	U1434	U1435	U1436	U1437	U1438	U1439	U1440	U1441	U1442	U1443	U1444	U1445	U1446																																																														
U1188	G1189	A1190	A1191	A1192	C1193	A1197	A1198	G1199	G1200	A1201	U1202	U1203	U1204	G1205	C1206	A1207	G1208	G1209	C1217	C1218	A1219	C1220	C1221	A1222	G1223	G1224	A1225	G1226	G1229	G1230	G1231	C1232	C1233	U1234	G1235	C1236	G1237	G1238	C1239	A1242	A1243	U1244	U1245	U1246	G1247	A1248	C1249	B8N1250	C1251	A1252	A1253	C1254	A1255	C1256	G1257	U1258	U1259	U1260	U1261	U1262	U1263	U1264	U1265	U1266	U1267	U1268	U1269	U1270	U1271	U1272	U1273	U1274	U1275	U1276	U1277	U1278	U1279	U1280	U1281	U1282	U1283	U1284	U1285	U1286	U1287	U1288	U1289	U1290	U1291	U1292	U1293	U1294	U1295	U1296	U1297	U1298	U1299	U1300	U1301	U1302	U1303	U1304	U1305	U1306	U1307	U1308	U1309	U1310	U1311	U1312	U1313	U1314	U1315	U1316	U1317	U1318	U1319	U1320	U1321	U1322	U1323	U1324	U1325	U1326	U1327	U1328	U1329	U1330	U1331	U1332	U1333	U1334	U1335	U1336	U1337	U1338	U1339	U1340	U1341	U1342	U1343	U1344	U1345	U1346	U1347	U1348	U1349	U1350	U1351	U1352	U1353	U1354	U1355	U1356	U1357	U1358	U1359	U1360	U1361	U1362	U1363	U1364	U1365	U1366	U1367	U1368	U1369	U1370	U1371	U1372	U1373	U1374	U1375	U1376	U1377	U1378	U1379	U1380	U1381	U1382	U1383	U1384	U1385	U1386	U1387	U1388	U1389	U1390	U1391	U1392	U1393	U1394	U1395	U1396	U1397	U1398	U1399	U1400	U1401	U1402	U1403	U1404	U1405	U1406	U1407	U1408	U1409	U1410	U1411	U1412	U1413	U1414	U1415	U1416	U1417	U1418	U1419	U1420	U1421	U1422	U1423	U1424	U1425	U1426	U1427	U1428	U1429	U1430	U1431	U1432	U1433	U1434	U1435	U1436	U1437	U1438	U1439	U1440	U1441	U1442	U1443	U1444	U1445	U1446
U1117	C1118	C1119	U1120	A1121	U1122	G1123	A1124	C1125	C1126	C1130	G1131	G1132	G1133	C1134	A1135	G1136	C1137	U1138	U1139	C1140	G1143	G1144	A1145	A1146	A1147	C1148	C1149	A1150	A1151	C1155	U1156	U1157	G1161	U1162	U1163	C1164	C1165	G1166	G1167	G1170	G1171	A1172	A1175	U1176	U1180	G1181	C1182	A1183	A1184	A1185	G1186	C1187																																																																																																																																																																																																
A1044	G1045	U1046	U1047	U1048	C1049	A1052	G1053	A1054	U1058	A1059	A1060	G1061	A1062	U1063	A1064	C1065	C1066	G1067	U1068	G1069	G1076	C1077	G1078	A1082	U1083	A1084	A1085	A1086	C1087	G1088	U1089	U1090	G1091	C1092	C1093	G1094	A1095	C1096	U1097	G1098	A1099	A1100	G1101	A1102	U1103	G1104	C1105	G1106	G1107	C1111	A1115	U1116																																																																																																																																																																																																
C981	A982	C983	G987	G988	A989	C990	A991	A992	G993	A994	G995	C996	G997	A998	A999	A1000	G1001	C1002	A1003	U1004	U1005	U1006	G1007	C1008	C1009	A1010	A1011	G1012	A1013	A1014	U1015	G1016	U1017	U1018	U1019	U1020	C1021	A1022	A1025	A1026	U1027	C1028	A1029	A1030	G1031	A1032	A1033	A1036	A1037	A1038	G1039	U1040	C1041	G1042	G1043																																																																																																																																																																																													
G917	A918	U919	U920	A921	A922	G923	A924	G925	G926	G927	A928	C929	G930	G931	C932	C933	G934	G935	G936	G937	G938	C939	A940	U941	U942	C943	G944	U945	A946	U947	U948	G949	C950	G951	C952	C953	G954	C955	U956	A957	G960	C961	A965	A966	U967	U968	C969	U970	U971	G972	G973	C976	G977	C978	C979	G980																																																																																																																																																																																												
G854	G857	C858	U859	A860	G861	G862	A863	U864	U865	A866	A867	U868	G869	G870	A871	A872	U873	A874	G875	G876	A877	C878	C879	G880	C881	G882	U885	C886	U887	A888	U889	U890	U891	U892	G893	U894	U895	G896	C897	U898	U899	U900	U901	G902	G903	A906	C907	U908	G909	A910	G912	C913	C914	A915	U916																																																																																																																																																																																													



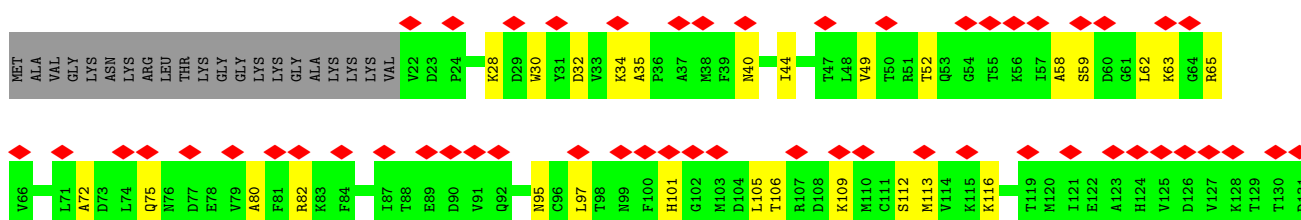
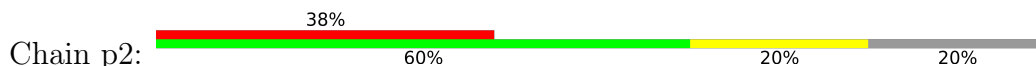
• Molecule 70: transfer RNA



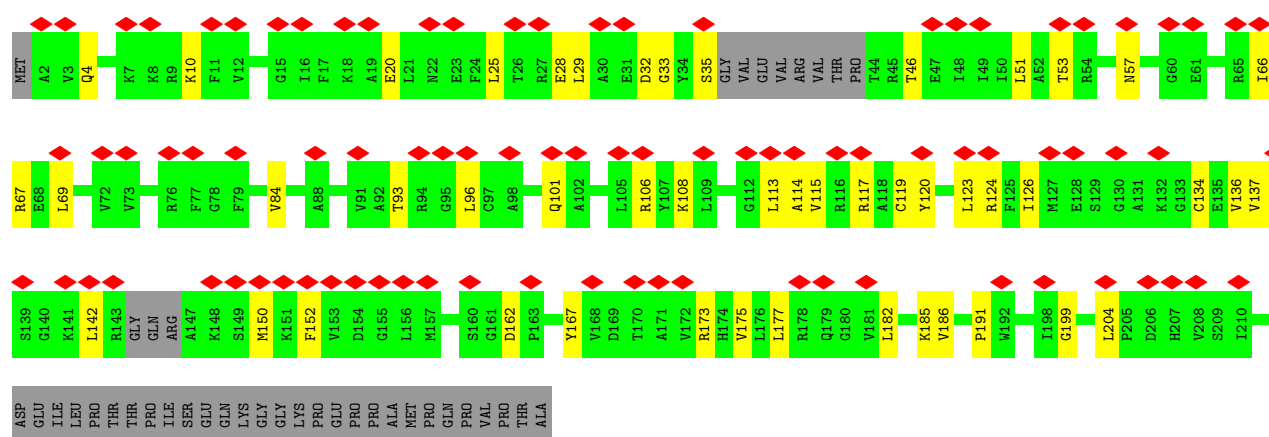
• Molecule 71: Small ribosomal subunit protein uS2



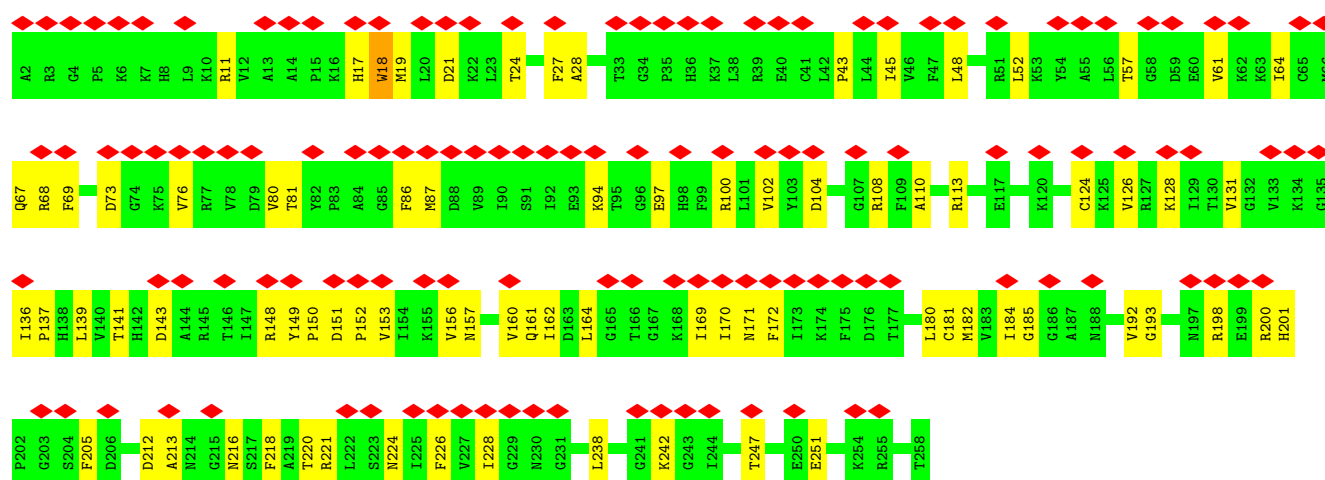
• Molecule 72: 40S ribosomal protein S3a



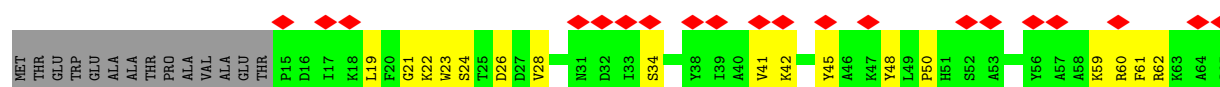
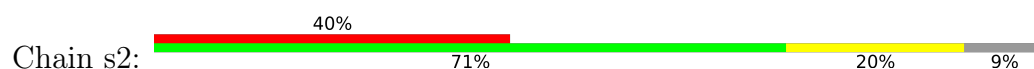
- Molecule 73: Small ribosomal subunit protein uS3



- Molecule 74: Small ribosomal subunit protein eS4

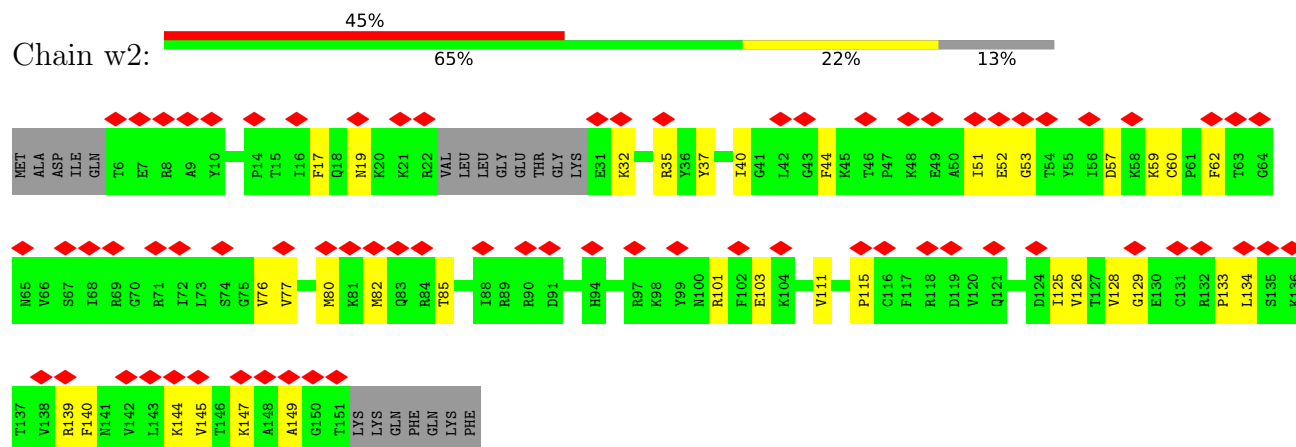


- Molecule 75: Small ribosomal subunit protein uS7

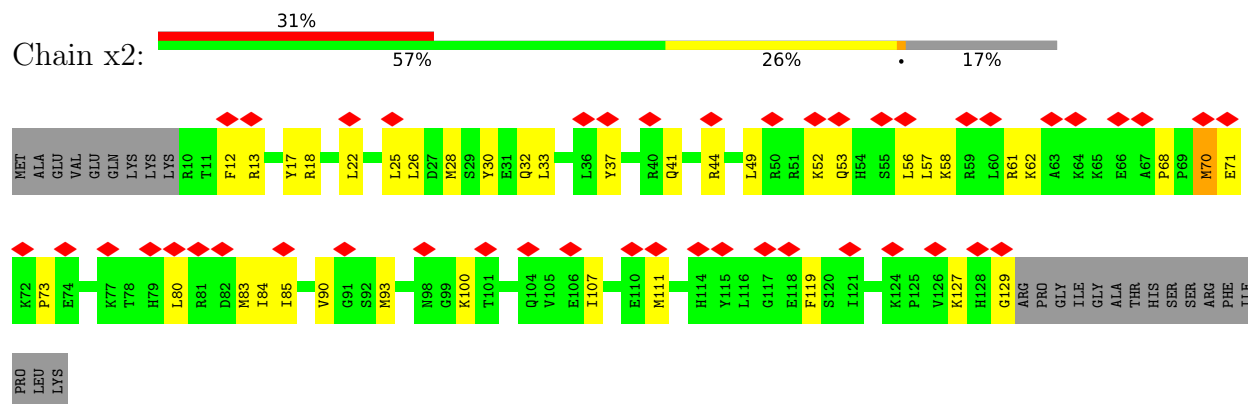


LYS
LYS
LYS
ALA
ASP
GLU
GLU
GLY
ALA
ALA
GLY
SER
SER
THR
GLU
PHE
GLN
ARG
GLY
GLY
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GLY
ANG
GLY
ARG
GLY
GLY
GLN
PRO
PRO
GLN

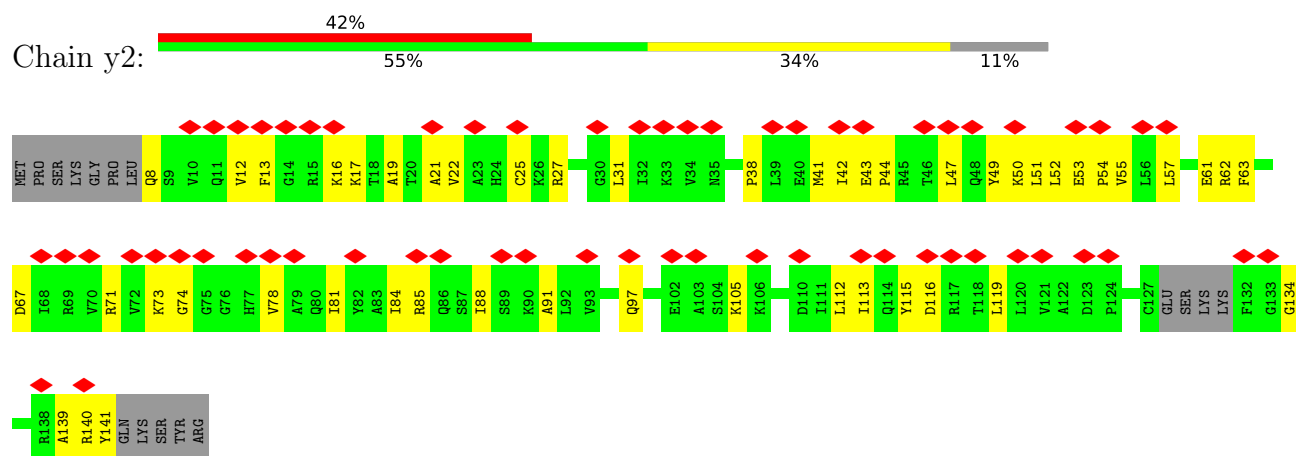
• Molecule 79: Small ribosomal subunit protein uS17



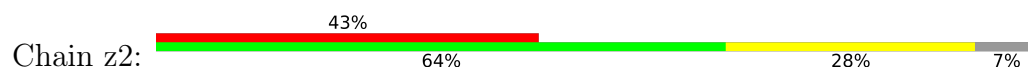
• Molecule 80: Small ribosomal subunit protein uS19

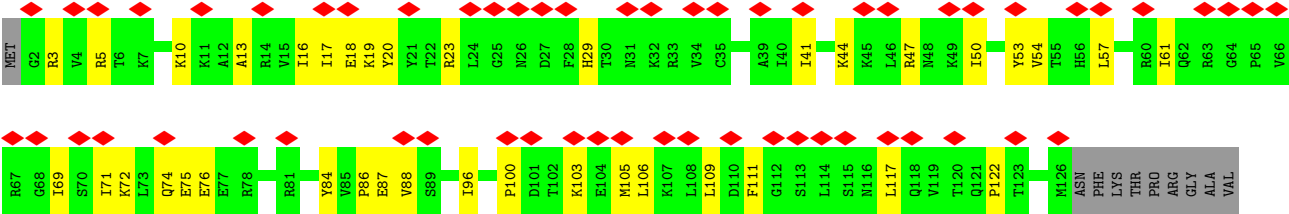


• Molecule 81: Small ribosomal subunit protein uS9



• Molecule 82: Small ribosomal subunit protein eS17





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	44947	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2900	Depositor
Magnification	100000	Depositor
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	1.822	Depositor
Minimum map value	-0.047	Depositor
Average map value	0.011	Depositor
Map value standard deviation	0.067	Depositor
Recommended contour level	0.0287	Depositor
Map size (Å)	331.28, 331.28, 331.28	wwPDB
Map dimensions	328, 328, 328	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.01, 1.01, 1.01	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, ZN, PSU, OMG, A2M, 2MG, UR3, OMC, B8T, 1MA, 4AC, OMU, 5MC, B8N

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	A1	0.21	0/1877	0.34	0/2502
2	A2	0.30	0/82417	0.32	0/128525
3	A3	0.19	0/1172	0.40	0/1570
4	B1	0.21	0/1799	0.37	0/2424
5	B2	0.29	0/2836	0.29	0/4421
6	B3	0.17	0/1109	0.39	0/1484
7	Bz	0.15	0/1576	0.35	0/2451
8	Bx	0.22	0/219	0.35	0/336
10	C1	0.21	0/1537	0.34	0/2065
11	C2	0.30	0/3675	0.32	0/5725
12	C3	0.17	0/685	0.31	0/916
13	D1	0.22	0/1694	0.37	0/2261
14	D2	0.24	0/1914	0.34	0/2567
15	D3	0.22	0/596	0.40	0/800
16	E1	0.19	0/1420	0.39	0/1899
17	E2	0.26	0/3256	0.41	0/4357
18	E3	0.16	0/1097	0.36	0/1464
19	F1	0.21	0/1674	0.35	0/2241
20	F2	0.23	0/2877	0.37	0/3860
21	F3	0.21	0/786	0.38	0/1053
22	G1	0.22	0/1165	0.33	0/1558
23	G2	0.19	0/2435	0.33	0/3260
24	G3	0.16	0/436	0.37	0/582
25	H1	0.20	0/1746	0.36	0/2338
26	H2	0.20	0/1799	0.35	0/2413
27	H3	0.17	0/437	0.36	0/580
28	I2	0.23	0/1648	0.39	0/2203
29	I3	0.14	0/1827	0.39	0/2467
30	J2	0.24	0/1268	0.41	0/1700
31	J3	0.24	0/1626	0.51	2/2211 (0.1%)
32	K2	0.21	0/1535	0.34	0/2048
33	K3	0.16	0/1728	0.39	0/2295

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
34	L2	0.20	0/1424	0.35	0/1884
35	L3	0.21	0/1520	0.42	0/2030
36	M2	0.23	0/1490	0.41	0/2000
37	M3	0.12	0/527	0.35	0/718
38	N2	0.20	0/1327	0.31	0/1771
39	N3	0.21	0/1226	0.41	0/1649
40	O2	0.17	0/839	0.33	0/1126
41	O3	0.19	0/1016	0.37	0/1363
42	P2	0.20	0/983	0.37	0/1319
43	P3	0.22	0/1044	0.42	0/1398
44	Q2	0.19	0/532	0.33	0/708
45	Q3	0.17	0/997	0.47	0/1325
46	R2	0.21	0/984	0.37	0/1323
47	R3	0.16	0/591	0.35	0/794
48	S2	0.20	0/1132	0.34	0/1504
49	S3	0.18	0/629	0.33	0/841
50	T2	0.20	0/1130	0.33	0/1507
51	T3	0.18	0/321	0.34	0/420
52	U2	0.21	0/1193	0.35	0/1593
53	V2	0.19	0/963	0.33	0/1275
54	W2	0.22	0/742	0.33	0/996
55	X2	0.22	0/903	0.35	0/1216
56	Y2	0.20	0/1071	0.36	0/1429
57	Z2	0.22	0/895	0.34	0/1198
58	a2	0.19	0/864	0.36	0/1152
59	b2	0.20	0/1009	0.36	0/1332
60	c2	0.34	0/843	0.43	0/1115
61	d2	0.21	0/720	0.38	0/952
62	e2	0.16	0/574	0.32	0/760
63	f2	0.22	0/454	0.29	0/599
64	g2	0.18	0/418	0.35	0/554
65	h2	0.17	0/231	0.36	0/294
66	i2	0.19	0/855	0.35	0/1128
67	j2	0.24	0/704	0.37	0/935
68	k2	0.23	0/1016	0.36	0/1363
69	m2	0.27	0/37837	0.33	0/58960
70	n2	0.19	0/1746	0.26	0/2717
71	o2	0.21	0/1741	0.46	0/2366
72	p2	0.20	0/1749	0.40	0/2340
73	q2	0.20	0/1595	0.38	0/2141
74	r2	0.19	0/2072	0.44	0/2793
75	s2	0.19	0/1489	0.40	1/1999 (0.1%)
76	t2	0.18	0/1341	0.42	0/1803

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
77	u2	0.18	0/1382	0.35	0/1859
78	v2	0.21	0/725	0.50	0/974
79	w2	0.19	0/1154	0.38	0/1543
80	x2	0.27	0/1018	0.45	0/1359
81	y2	0.17	0/1043	0.40	0/1398
82	z2	0.18	0/1023	0.42	0/1373
All	All	0.26	0/218948	0.34	3/321772 (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
71	o2	0	1
74	r2	0	1
All	All	0	2

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
31	J3	263	LYS	CA-C-N	8.93	133.17	120.49
31	J3	263	LYS	C-N-CA	8.93	133.17	120.49
75	s2	106	GLU	CB-CA-C	-5.53	110.19	116.54

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
71	o2	207	PRO	Peptide
74	r2	18	TRP	Peptide

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A1	1843	0	1975	44	0
2	A2	75321	0	38138	1476	0
3	A3	1154	0	1210	41	0
4	B1	1764	0	1892	29	0
5	B2	2538	0	1286	40	0
6	B3	1091	0	1130	39	0
7	Bz	1412	0	716	48	0
8	Bx	200	0	101	4	0
9	By	110	0	30	0	0
10	C1	1519	0	1603	22	0
11	C2	3315	0	1685	68	0
12	C3	679	0	744	17	0
13	D1	1656	0	1706	37	0
14	D2	1876	0	1970	31	0
15	D3	589	0	566	15	0
16	E1	1397	0	1425	17	0
17	E2	3189	0	3331	65	0
18	E3	1080	0	1147	16	0
19	F1	1643	0	1750	24	0
20	F2	2823	0	2996	72	0
21	F3	774	0	821	17	0
22	G1	1143	0	1219	23	0
23	G2	2389	0	2420	36	0
24	G3	435	0	461	10	0
25	H1	1701	0	1749	31	0
26	H2	1766	0	1902	40	0
27	H3	427	0	426	17	0
28	I2	1618	0	1775	30	0
29	I3	1800	0	1770	53	0
30	J2	1242	0	1274	21	0
31	J3	1590	0	1606	38	0
32	K2	1511	0	1636	30	0
33	K3	1708	0	1864	50	0
34	L2	1408	0	1550	32	0
35	L3	1495	0	1615	59	0
36	M2	1450	0	1488	24	0
37	M3	525	0	439	9	0
38	N2	1299	0	1368	24	0
39	N3	1202	0	1289	28	0
40	O2	825	0	850	18	0
41	O3	1003	0	1028	23	0
42	P2	969	0	1031	20	0
43	P3	1027	0	1067	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	Q2	519	0	533	5	0
45	Q3	981	0	1039	37	0
46	R2	967	0	1040	19	0
47	R3	585	0	640	20	0
48	S2	1115	0	1205	25	0
49	S3	618	0	634	6	0
50	T2	1107	0	1182	12	0
51	T3	319	0	338	7	0
52	U2	1164	0	1213	15	0
53	V2	945	0	1037	20	0
54	W2	732	0	769	6	0
55	X2	888	0	930	15	0
56	Y2	1053	0	1147	23	0
57	Z2	876	0	912	10	0
58	a2	854	0	945	16	0
59	b2	1001	0	1138	13	0
60	c2	832	0	917	15	0
61	d2	705	0	737	12	0
62	e2	568	0	635	11	0
63	f2	444	0	483	5	0
64	g2	412	0	443	11	0
65	h2	230	0	276	11	0
66	i2	842	0	912	16	0
67	j2	694	0	738	17	0
68	k2	1001	0	1066	26	0
69	m2	34547	0	17448	962	0
70	n2	1562	0	797	35	0
71	o2	1704	0	1702	59	0
72	p2	1722	0	1794	39	0
73	q2	1572	0	1661	34	0
74	r2	2031	0	2138	60	0
75	s2	1468	0	1519	28	0
76	t2	1322	0	1365	43	0
77	u2	1359	0	1341	20	0
78	v2	705	0	722	28	0
79	w2	1134	0	1197	23	0
80	x2	999	0	1046	26	0
81	y2	1028	0	1088	42	0
82	z2	1011	0	1063	36	0
83	A2	83	0	0	0	0
83	E3	1	0	0	0	0
83	J2	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
83	m2	31	0	0	0	0
83	q2	1	0	0	0	0
84	F3	1	0	0	0	0
84	H3	1	0	0	0	0
84	d2	1	0	0	0	0
84	g2	1	0	0	0	0
84	i2	1	0	0	0	0
84	j2	1	0	0	0	0
85	B1	1	0	0	0	0
All	All	206246	0	151839	4133	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 12.

The worst 5 of 4133 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A2:3348:A:H62	2:A2:3479:G:H21	1.08	1.00
2:A2:2600:A:H61	2:A2:3499:C:H42	1.04	0.99
2:A2:3348:A:H62	2:A2:3479:G:N2	1.60	0.97
69:m2:153:G:H1	69:m2:165:G:H22	1.06	0.97
8:Bx:48:U:H3	70:n2:33:C:N4	1.62	0.96

There are no symmetry-related clashes.

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	A1	220/270 (82%)	214 (97%)	6 (3%)	0	100	100
3	A3	137/152 (90%)	123 (90%)	13 (10%)	1 (1%)	18	47

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	B1	214/266 (80%)	208 (97%)	6 (3%)	0	100	100
6	B3	136/145 (94%)	129 (95%)	6 (4%)	1 (1%)	18	47
10	C1	188/192 (98%)	182 (97%)	6 (3%)	0	100	100
12	C3	78/119 (66%)	76 (97%)	2 (3%)	0	100	100
13	D1	200/214 (94%)	192 (96%)	8 (4%)	0	100	100
14	D2	243/257 (95%)	224 (92%)	19 (8%)	0	100	100
15	D3	81/83 (98%)	76 (94%)	5 (6%)	0	100	100
16	E1	172/178 (97%)	166 (96%)	6 (4%)	0	100	100
17	E2	393/403 (98%)	375 (95%)	18 (5%)	0	100	100
18	E3	137/143 (96%)	124 (90%)	13 (10%)	0	100	100
19	F1	201/211 (95%)	192 (96%)	9 (4%)	0	100	100
20	F2	350/419 (84%)	339 (97%)	11 (3%)	0	100	100
21	F3	95/115 (83%)	92 (97%)	3 (3%)	0	100	100
22	G1	137/217 (63%)	133 (97%)	4 (3%)	0	100	100
23	G2	291/297 (98%)	282 (97%)	9 (3%)	0	100	100
24	G3	52/69 (75%)	52 (100%)	0	0	100	100
25	H1	201/204 (98%)	193 (96%)	8 (4%)	0	100	100
26	H2	212/296 (72%)	205 (97%)	7 (3%)	0	100	100
27	H3	49/56 (88%)	43 (88%)	6 (12%)	0	100	100
28	I2	196/203 (97%)	192 (98%)	4 (2%)	0	100	100
29	I3	208/317 (66%)	190 (91%)	17 (8%)	1 (0%)	24	54
30	J2	151/184 (82%)	143 (95%)	8 (5%)	0	100	100
31	J3	215/293 (73%)	201 (94%)	14 (6%)	0	100	100
32	K2	184/188 (98%)	177 (96%)	7 (4%)	0	100	100
33	K3	205/249 (82%)	195 (95%)	10 (5%)	0	100	100
34	L2	167/196 (85%)	165 (99%)	2 (1%)	0	100	100
35	L3	177/194 (91%)	159 (90%)	18 (10%)	0	100	100
36	M2	173/176 (98%)	163 (94%)	10 (6%)	0	100	100
37	M3	74/132 (56%)	67 (90%)	7 (10%)	0	100	100
38	N2	157/160 (98%)	152 (97%)	5 (3%)	0	100	100
39	N3	147/151 (97%)	133 (90%)	14 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
40	O2	99/128 (77%)	95 (96%)	4 (4%)	0	100	100
41	O3	133/151 (88%)	124 (93%)	9 (7%)	0	100	100
42	P2	127/140 (91%)	121 (95%)	6 (5%)	0	100	100
43	P3	127/130 (98%)	116 (91%)	11 (9%)	0	100	100
44	Q2	60/157 (38%)	57 (95%)	3 (5%)	0	100	100
45	Q3	117/133 (88%)	108 (92%)	9 (8%)	0	100	100
46	R2	116/156 (74%)	112 (97%)	4 (3%)	0	100	100
47	R3	71/125 (57%)	67 (94%)	4 (6%)	0	100	100
48	S2	132/145 (91%)	130 (98%)	2 (2%)	0	100	100
49	S3	75/84 (89%)	69 (92%)	6 (8%)	0	100	100
50	T2	133/136 (98%)	130 (98%)	3 (2%)	0	100	100
51	T3	34/133 (26%)	32 (94%)	1 (3%)	1 (3%)	3	19
52	U2	145/148 (98%)	139 (96%)	6 (4%)	0	100	100
53	V2	115/160 (72%)	110 (96%)	5 (4%)	0	100	100
54	W2	92/115 (80%)	89 (97%)	3 (3%)	0	100	100
55	X2	105/125 (84%)	103 (98%)	2 (2%)	0	100	100
56	Y2	126/135 (93%)	124 (98%)	2 (2%)	0	100	100
57	Z2	107/110 (97%)	102 (95%)	5 (5%)	0	100	100
58	a2	105/117 (90%)	101 (96%)	4 (4%)	0	100	100
59	b2	118/123 (96%)	117 (99%)	1 (1%)	0	100	100
60	c2	100/105 (95%)	95 (95%)	4 (4%)	1 (1%)	12	40
61	d2	84/97 (87%)	78 (93%)	6 (7%)	0	100	100
62	e2	67/70 (96%)	67 (100%)	0	0	100	100
63	f2	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
64	g2	48/128 (38%)	45 (94%)	3 (6%)	0	100	100
65	h2	22/25 (88%)	21 (96%)	1 (4%)	0	100	100
66	i2	101/106 (95%)	98 (97%)	3 (3%)	0	100	100
67	j2	87/92 (95%)	77 (88%)	10 (12%)	0	100	100
68	k2	123/137 (90%)	116 (94%)	7 (6%)	0	100	100
71	o2	213/295 (72%)	196 (92%)	17 (8%)	0	100	100
72	p2	210/264 (80%)	192 (91%)	18 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
73	q2	196/243 (81%)	191 (97%)	5 (3%)	0	100	100
74	r2	255/257 (99%)	237 (93%)	18 (7%)	0	100	100
75	s2	181/204 (89%)	171 (94%)	10 (6%)	0	100	100
76	t2	166/194 (86%)	156 (94%)	10 (6%)	0	100	100
77	u2	169/208 (81%)	162 (96%)	7 (4%)	0	100	100
78	v2	81/165 (49%)	64 (79%)	16 (20%)	1 (1%)	10	35
79	w2	134/158 (85%)	124 (92%)	10 (8%)	0	100	100
80	x2	118/145 (81%)	111 (94%)	7 (6%)	0	100	100
81	y2	126/146 (86%)	117 (93%)	9 (7%)	0	100	100
82	z2	123/135 (91%)	112 (91%)	11 (9%)	0	100	100
All	All	10630/12625 (84%)	10079 (95%)	545 (5%)	6 (0%)	49	78

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	A3	91	LYS
29	I3	52	TYR
60	c2	66	ASP
51	T3	22	GLN
78	v2	53	LYS

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A1	193/234 (82%)	193 (100%)	0	100	100
3	A3	121/132 (92%)	121 (100%)	0	100	100
4	B1	189/223 (85%)	187 (99%)	2 (1%)	65	74
6	B3	111/115 (96%)	111 (100%)	0	100	100
10	C1	169/171 (99%)	169 (100%)	0	100	100
12	C3	79/107 (74%)	79 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
13	D1	174/181 (96%)	174 (100%)	0	100	100
14	D2	188/199 (94%)	188 (100%)	0	100	100
15	D3	53/67 (79%)	53 (100%)	0	100	100
16	E1	147/149 (99%)	147 (100%)	0	100	100
17	E2	343/348 (99%)	342 (100%)	1 (0%)	86	84
18	E3	111/115 (96%)	111 (100%)	0	100	100
19	F1	170/178 (96%)	170 (100%)	0	100	100
20	F2	298/348 (86%)	298 (100%)	0	100	100
21	F3	84/98 (86%)	84 (100%)	0	100	100
22	G1	118/157 (75%)	118 (100%)	0	100	100
23	G2	246/249 (99%)	246 (100%)	0	100	100
24	G3	49/62 (79%)	49 (100%)	0	100	100
25	H1	171/172 (99%)	171 (100%)	0	100	100
26	H2	196/256 (77%)	196 (100%)	0	100	100
27	H3	45/49 (92%)	45 (100%)	0	100	100
28	I2	170/173 (98%)	170 (100%)	0	100	100
29	I3	197/275 (72%)	197 (100%)	0	100	100
30	J2	134/163 (82%)	134 (100%)	0	100	100
31	J3	155/224 (69%)	155 (100%)	0	100	100
32	K2	164/165 (99%)	164 (100%)	0	100	100
33	K3	182/218 (84%)	182 (100%)	0	100	100
34	L2	149/175 (85%)	149 (100%)	0	100	100
35	L3	160/168 (95%)	160 (100%)	0	100	100
36	M2	155/156 (99%)	155 (100%)	0	100	100
37	M3	35/108 (32%)	35 (100%)	0	100	100
38	N2	139/140 (99%)	139 (100%)	0	100	100
39	N3	130/131 (99%)	130 (100%)	0	100	100
40	O2	91/114 (80%)	91 (100%)	0	100	100
41	O3	103/119 (87%)	103 (100%)	0	100	100
42	P2	100/107 (94%)	100 (100%)	0	100	100
43	P3	110/113 (97%)	110 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
44	Q2	54/126 (43%)	54 (100%)	0	100	100
45	Q3	103/115 (90%)	103 (100%)	0	100	100
46	R2	106/133 (80%)	106 (100%)	0	100	100
47	R3	65/103 (63%)	65 (100%)	0	100	100
48	S2	124/135 (92%)	124 (100%)	0	100	100
49	S3	71/76 (93%)	71 (100%)	0	100	100
50	T2	117/118 (99%)	117 (100%)	0	100	100
51	T3	31/105 (30%)	31 (100%)	0	100	100
52	U2	120/121 (99%)	120 (100%)	0	100	100
53	V2	98/124 (79%)	98 (100%)	0	100	100
54	W2	79/97 (81%)	79 (100%)	0	100	100
55	X2	98/110 (89%)	98 (100%)	0	100	100
56	Y2	114/121 (94%)	114 (100%)	0	100	100
57	Z2	88/89 (99%)	88 (100%)	0	100	100
58	a2	93/100 (93%)	93 (100%)	0	100	100
59	b2	108/110 (98%)	108 (100%)	0	100	100
60	c2	86/89 (97%)	83 (96%)	3 (4%)	32	56
61	d2	73/80 (91%)	73 (100%)	0	100	100
62	e2	64/65 (98%)	64 (100%)	0	100	100
63	f2	47/48 (98%)	47 (100%)	0	100	100
64	g2	46/116 (40%)	46 (100%)	0	100	100
65	h2	23/24 (96%)	23 (100%)	0	100	100
66	i2	91/94 (97%)	91 (100%)	0	100	100
67	j2	73/75 (97%)	73 (100%)	0	100	100
68	k2	109/121 (90%)	109 (100%)	0	100	100
71	o2	180/242 (74%)	180 (100%)	0	100	100
72	p2	193/229 (84%)	193 (100%)	0	100	100
73	q2	167/202 (83%)	167 (100%)	0	100	100
74	r2	220/220 (100%)	220 (100%)	0	100	100
75	s2	157/170 (92%)	157 (100%)	0	100	100
76	t2	132/174 (76%)	132 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
77	u2	133/180 (74%)	133 (100%)	0	100	100
78	v2	75/136 (55%)	75 (100%)	0	100	100
79	w2	125/142 (88%)	125 (100%)	0	100	100
80	x2	109/130 (84%)	108 (99%)	1 (1%)	70	76
81	y2	106/121 (88%)	106 (100%)	0	100	100
82	z2	113/121 (93%)	113 (100%)	0	100	100
All	All	9220/10721 (86%)	9213 (100%)	7 (0%)	87	89

5 of 7 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
60	c2	64	SER
60	c2	65	LYS
80	x2	70	MET
60	c2	66	ASP
17	E2	261	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 76 such sidechains are listed below:

Mol	Chain	Res	Type
56	Y2	34	ASN
76	t2	168	HIS
56	Y2	107	ASN
71	o2	132	GLN
82	z2	74	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	C2	155/156 (99%)	32 (20%)	0
2	A2	3482/3615 (96%)	734 (21%)	13 (0%)
5	B2	118/121 (97%)	12 (10%)	0
69	m2	1606/1635 (98%)	423 (26%)	0
7	Bz	63/76 (82%)	45 (71%)	0
70	n2	70/73 (95%)	9 (12%)	0
8	Bx	9/10 (90%)	4 (44%)	0
All	All	5503/5686 (96%)	1259 (22%)	13 (0%)

5 of 1259 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	A2	13	U
2	A2	21	G
2	A2	25	A
2	A2	39	A
2	A2	42	A

5 of 13 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	A2	2463	U
2	A2	3253	G
2	A2	4582	U
2	A2	4351	U
2	A2	4381	A

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

107 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
69	UR3	m2	1832	69	19,22,23	0.27	0	26,32,35	0.33	0
2	A2M	A2	3380	2	22,25,26	0.14	0	30,36,39	0.35	0
69	4AC	m2	1844	69	21,24,25	0.27	0	28,34,37	0.28	0
2	OMC	A2	3543	2	19,22,23	0.30	0	25,31,34	0.38	0
2	OMC	A2	2120	2	19,22,23	0.28	0	25,31,34	0.38	0
2	OMC	A2	2559	2	19,22,23	0.31	0	25,31,34	0.37	0
2	A2M	A2	2570	2	22,25,26	0.09	0	30,36,39	0.25	0
2	PSU	A2	1395	2	18,21,22	0.64	1 (5%)	21,30,33	0.54	0
2	PSU	A2	2263	2	18,21,22	0.55	0	21,30,33	0.58	0
2	PSU	A2	1496	2	18,21,22	0.59	1 (5%)	21,30,33	0.58	0
2	OMU	A2	3958	2	19,22,23	0.27	0	25,31,34	0.51	0
69	OMU	m2	430	69	19,22,23	0.28	0	25,31,34	0.53	0
69	A2M	m2	578	69	22,25,26	0.11	0	30,36,39	0.25	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
69	PSU	m2	1245	69	18,21,22	0.46	0	21,30,33	0.60	0
69	A2M	m2	670	69,83	22,25,26	0.14	0	30,36,39	0.40	0
69	B8T	m2	1339	69	19,22,23	0.32	0	25,31,34	0.40	0
2	OMC	A2	4188	2	19,22,23	0.31	0	25,31,34	0.42	0
2	OMC	A2	1154	2	19,22,23	0.28	0	25,31,34	0.41	0
2	A2M	A2	2156	2	22,25,26	0.29	0	30,36,39	0.52	0
2	OMG	A2	4044	2	23,26,27	0.28	0	32,38,41	0.36	0
2	OMG	A2	2179	2	23,26,27	0.31	0	32,38,41	0.36	0
69	A2M	m2	99	69,83	22,25,26	0.10	0	30,36,39	0.21	0
69	OMG	m2	511	69,83	23,26,27	0.25	0	32,38,41	0.36	0
2	OMG	A2	3400	2	23,26,27	0.32	0	32,38,41	0.35	0
69	PSU	m2	1083	69	18,21,22	0.47	0	21,30,33	0.58	0
69	OMG	m2	438	69	23,26,27	0.30	0	32,38,41	0.35	0
2	A2M	A2	4175	2,83	22,25,26	0.13	0	30,36,39	0.44	1 (3%)
2	PSU	A2	3371	2	18,21,22	0.52	0	21,30,33	0.55	0
2	OMC	A2	3497	2	19,22,23	0.26	0	25,31,34	0.35	0
69	OMG	m2	869	69	23,26,27	0.30	0	32,38,41	0.32	0
2	PSU	A2	4055	2	18,21,22	0.56	0	21,30,33	0.63	1 (4%)
2	OMU	A2	2592	2	19,22,23	0.29	0	25,31,34	0.54	0
2	PSU	A2	4183	2	18,21,22	0.50	0	21,30,33	0.41	0
2	A2M	A2	398	2	22,25,26	0.12	0	30,36,39	0.31	0
69	OMG	m2	646	69	23,26,27	0.29	0	32,38,41	0.33	0
2	A2M	A2	4223	2	22,25,26	0.14	0	30,36,39	0.30	0
69	OMC	m2	519	69	19,22,23	0.23	0	25,31,34	0.36	0
2	OMG	A2	3448	2	23,26,27	0.36	0	32,38,41	0.31	0
2	A2M	A2	3441	2	22,25,26	0.20	0	30,36,39	0.47	0
69	OMG	m2	685	69	23,26,27	0.37	0	32,38,41	0.40	0
2	OMC	A2	2106	2	19,22,23	0.29	0	25,31,34	0.35	0
2	OMC	A2	2616	2	19,22,23	0.27	0	25,31,34	0.37	0
2	2MG	A2	1330	2	23,26,27	0.28	0	33,38,41	0.37	0
69	OMC	m2	1705	69	19,22,23	0.27	0	25,31,34	0.33	0
69	OMU	m2	121	69	19,22,23	0.25	0	25,31,34	0.37	0
69	OMG	m2	1330	69	23,26,27	0.27	0	32,38,41	0.41	0
2	OMU	A2	3581	2	19,22,23	0.28	0	25,31,34	0.36	0
2	1MA	A2	4067	2	21,25,26	0.29	0	30,37,40	0.42	0
2	A2M	A2	4270	2	22,25,26	0.12	0	30,36,39	0.34	0
2	OMG	A2	2119	2,83	23,26,27	0.34	0	32,38,41	0.37	0
2	OMG	A2	4289	2	23,26,27	0.31	0	32,38,41	0.39	0
69	OMU	m2	172	69	19,22,23	0.20	0	25,31,34	0.52	1 (4%)
69	A2M	m2	1680	69	22,25,26	0.14	0	30,36,39	0.27	0
2	PSU	A2	4102	2,83	18,21,22	0.53	0	21,30,33	0.38	0
2	A2M	A2	1337	2	22,25,26	0.17	0	30,36,39	0.39	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	A2M	A2	3486	2	22,25,26	0.13	0	30,36,39	0.49	0
2	A2M	A2	2542	2	22,25,26	0.21	0	30,36,39	0.35	0
2	OMU	A2	4272	2	19,22,23	0.32	0	25,31,34	0.61	0
11	OMG	C2	75	11	23,26,27	0.30	0	32,38,41	0.33	0
2	A2M	A2	1140	2	22,25,26	0.12	0	30,36,39	0.32	0
69	B8N	m2	1250	69	25,29,30	0.57	0	28,42,45	0.58	0
2	A2M	A2	1673	2	22,25,26	0.12	0	30,36,39	0.42	0
2	PSU	A2	4094	2	18,21,22	0.59	1 (5%)	21,30,33	0.67	1 (4%)
2	PSU	A2	4152	2	18,21,22	0.49	0	21,30,33	0.61	0
2	OMG	A2	1130	2	23,26,27	0.38	0	32,38,41	0.39	0
69	OMC	m2	355	69	19,22,23	0.32	0	25,31,34	0.33	0
2	A2M	A2	2118	2,83	22,25,26	0.14	0	30,36,39	0.28	0
69	PSU	m2	824	69	18,21,22	0.45	0	21,30,33	0.60	1 (4%)
69	A2M	m2	27	69	22,25,26	0.13	0	30,36,39	0.28	0
69	OMU	m2	116	69	19,22,23	0.23	0	25,31,34	0.41	0
2	A2M	A2	3481	2	22,25,26	0.14	0	30,36,39	0.27	0
2	OMG	A2	1438	2	23,26,27	0.22	0	32,38,41	0.37	0
2	A2M	A2	3374	2	22,25,26	0.13	0	30,36,39	0.33	0
2	OMG	A2	1335	2	23,26,27	0.34	0	32,38,41	0.41	0
2	OMG	A2	4146	2	23,26,27	0.32	0	32,38,41	0.35	0
2	A2M	A2	1137	2	22,25,26	0.20	0	30,36,39	0.30	0
2	OMG	A2	4022	2	23,26,27	0.36	0	32,38,41	0.34	0
69	A2M	m2	1033	69	22,25,26	0.12	0	30,36,39	0.25	0
2	PSU	A2	3945	2	18,21,22	0.54	0	21,30,33	0.57	0
2	OMG	A2	3848	2	23,26,27	0.29	0	32,38,41	0.33	0
2	5MC	A2	3438	2,83	19,22,23	0.40	0	26,32,35	0.40	0
2	OMC	A2	1683	2,83	19,22,23	0.28	0	25,31,34	0.53	0
69	OMC	m2	174	69	19,22,23	0.28	0	25,31,34	0.52	0
2	OMG	A2	4275	2	23,26,27	0.35	0	32,38,41	0.31	0
2	OMG	A2	4151	2	23,26,27	0.33	0	32,38,41	0.43	0
69	A2M	m2	486	69	22,25,26	0.09	0	30,36,39	0.26	0
2	OMC	A2	4108	2	19,22,23	0.28	0	25,31,34	0.38	0
69	OMG	m2	603	69	23,26,27	0.34	0	32,38,41	0.34	0
2	OMG	A2	3880	2	23,26,27	0.28	0	32,38,41	0.48	0
2	OMC	A2	3357	2	19,22,23	0.31	0	25,31,34	0.47	0
2	5MC	A2	4099	2	19,22,23	0.39	0	26,32,35	0.52	0
2	OMC	A2	2579	2	19,22,23	0.25	0	25,31,34	0.34	0
2	A2M	A2	1347	2,83	22,25,26	0.19	0	30,36,39	0.61	1 (3%)
2	PSU	A2	3385	2	18,21,22	0.55	0	21,30,33	0.55	0
2	PSU	A2	4280	2	18,21,22	0.56	0	21,30,33	0.61	1 (4%)
69	PSU	m2	825	69	18,21,22	0.57	1 (5%)	21,30,33	0.55	0
2	OMC	A2	3525	2	19,22,23	0.27	0	25,31,34	0.42	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	OMC	A2	3464	2	19,22,23	0.31	0	25,31,34	0.36	0
69	PSU	m2	614	69	18,21,22	0.60	1 (5%)	21,30,33	0.54	0
2	PSU	A2	1490	2	18,21,22	0.59	0	21,30,33	0.38	0
2	OMC	A2	2177	2,83	19,22,23	0.27	0	25,31,34	0.39	0
69	A2M	m2	514	69	22,25,26	0.14	0	30,36,39	0.33	0
2	PSU	A2	4288	2	18,21,22	0.46	0	21,30,33	0.62	0
2	OMU	A2	3474	2	19,22,23	0.26	0	25,31,34	0.43	0
2	OMG	A2	3555	2,83	23,26,27	0.32	0	32,38,41	0.39	0
2	OMU	A2	4150	2	19,22,23	0.29	0	25,31,34	0.47	0
2	OMG	A2	3283	2	23,26,27	0.35	0	32,38,41	0.45	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
69	UR3	m2	1832	69	-	0/7/25/26	0/2/2/2
2	A2M	A2	3380	2	-	3/9/27/28	0/3/3/3
69	4AC	m2	1844	69	-	0/11/29/30	0/2/2/2
2	OMC	A2	3543	2	-	1/9/27/28	0/2/2/2
2	OMC	A2	2120	2	-	0/9/27/28	0/2/2/2
2	OMC	A2	2559	2	-	0/9/27/28	0/2/2/2
2	A2M	A2	2570	2	-	0/9/27/28	0/3/3/3
2	PSU	A2	1395	2	-	0/7/25/26	0/2/2/2
2	PSU	A2	2263	2	-	0/7/25/26	0/2/2/2
2	PSU	A2	1496	2	-	2/7/25/26	0/2/2/2
2	OMU	A2	3958	2	-	0/9/27/28	0/2/2/2
69	OMU	m2	430	69	-	4/9/27/28	0/2/2/2
69	A2M	m2	578	69	-	3/9/27/28	0/3/3/3
69	PSU	m2	1245	69	-	2/7/25/26	0/2/2/2
69	A2M	m2	670	69,83	-	2/9/27/28	0/3/3/3
69	B8T	m2	1339	69	-	3/7/27/28	0/2/2/2
2	OMC	A2	4188	2	-	0/9/27/28	0/2/2/2
2	OMC	A2	1154	2	-	0/9/27/28	0/2/2/2
2	A2M	A2	2156	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	4044	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	2179	2	-	0/9/27/28	0/3/3/3
69	A2M	m2	99	69,83	-	2/9/27/28	0/3/3/3
69	OMG	m2	511	69,83	-	1/9/27/28	0/3/3/3
2	OMG	A2	3400	2	-	0/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
69	PSU	m2	1083	69	-	0/7/25/26	0/2/2/2
69	OMG	m2	438	69	-	0/9/27/28	0/3/3/3
2	A2M	A2	4175	2,83	-	1/9/27/28	0/3/3/3
2	PSU	A2	3371	2	-	0/7/25/26	0/2/2/2
2	OMC	A2	3497	2	-	0/9/27/28	0/2/2/2
69	OMG	m2	869	69	-	1/9/27/28	0/3/3/3
2	PSU	A2	4055	2	-	0/7/25/26	0/2/2/2
2	OMU	A2	2592	2	-	0/9/27/28	0/2/2/2
2	PSU	A2	4183	2	-	2/7/25/26	0/2/2/2
2	A2M	A2	398	2	-	1/9/27/28	0/3/3/3
69	OMG	m2	646	69	-	3/9/27/28	0/3/3/3
2	A2M	A2	4223	2	-	0/9/27/28	0/3/3/3
69	OMC	m2	519	69	-	2/9/27/28	0/2/2/2
2	OMG	A2	3448	2	-	0/9/27/28	0/3/3/3
2	A2M	A2	3441	2	-	4/9/27/28	0/3/3/3
69	OMG	m2	685	69	-	2/9/27/28	0/3/3/3
2	OMC	A2	2106	2	-	1/9/27/28	0/2/2/2
2	OMC	A2	2616	2	-	0/9/27/28	0/2/2/2
2	2MG	A2	1330	2	-	0/9/27/28	0/3/3/3
69	OMC	m2	1705	69	-	0/9/27/28	0/2/2/2
69	OMU	m2	121	69	-	1/9/27/28	0/2/2/2
69	OMG	m2	1330	69	-	2/9/27/28	0/3/3/3
2	OMU	A2	3581	2	-	0/9/27/28	0/2/2/2
2	1MA	A2	4067	2	-	2/7/25/26	0/3/3/3
2	A2M	A2	4270	2	-	1/9/27/28	0/3/3/3
2	OMG	A2	2119	2,83	-	1/9/27/28	0/3/3/3
2	OMG	A2	4289	2	-	3/9/27/28	0/3/3/3
69	OMU	m2	172	69	-	2/9/27/28	0/2/2/2
69	A2M	m2	1680	69	-	0/9/27/28	0/3/3/3
2	PSU	A2	4102	2,83	-	2/7/25/26	0/2/2/2
2	A2M	A2	1337	2	-	3/9/27/28	0/3/3/3
2	A2M	A2	3486	2	-	0/9/27/28	0/3/3/3
2	A2M	A2	2542	2	-	2/9/27/28	0/3/3/3
2	OMU	A2	4272	2	-	4/9/27/28	0/2/2/2
11	OMG	C2	75	11	-	2/9/27/28	0/3/3/3
2	A2M	A2	1140	2	-	4/9/27/28	0/3/3/3
69	B8N	m2	1250	69	-	4/16/34/35	0/2/2/2
2	A2M	A2	1673	2	-	0/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PSU	A2	4094	2	-	0/7/25/26	0/2/2/2
2	PSU	A2	4152	2	-	1/7/25/26	0/2/2/2
2	OMG	A2	1130	2	-	1/9/27/28	0/3/3/3
69	OMC	m2	355	69	-	0/9/27/28	0/2/2/2
2	A2M	A2	2118	2,83	-	0/9/27/28	0/3/3/3
69	PSU	m2	824	69	-	0/7/25/26	0/2/2/2
69	A2M	m2	27	69	-	0/9/27/28	0/3/3/3
69	OMU	m2	116	69	-	0/9/27/28	0/2/2/2
2	A2M	A2	3481	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	1438	2	-	2/9/27/28	0/3/3/3
2	A2M	A2	3374	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	1335	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	4146	2	-	0/9/27/28	0/3/3/3
2	A2M	A2	1137	2	-	2/9/27/28	0/3/3/3
2	OMG	A2	4022	2	-	0/9/27/28	0/3/3/3
69	A2M	m2	1033	69	-	0/9/27/28	0/3/3/3
2	PSU	A2	3945	2	-	1/7/25/26	0/2/2/2
2	OMG	A2	3848	2	-	0/9/27/28	0/3/3/3
2	5MC	A2	3438	2,83	-	0/7/25/26	0/2/2/2
2	OMC	A2	1683	2,83	-	0/9/27/28	0/2/2/2
69	OMC	m2	174	69	-	2/9/27/28	0/2/2/2
2	OMG	A2	4275	2	-	0/9/27/28	0/3/3/3
2	OMG	A2	4151	2	-	2/9/27/28	0/3/3/3
69	A2M	m2	486	69	-	0/9/27/28	0/3/3/3
2	OMC	A2	4108	2	-	2/9/27/28	0/2/2/2
69	OMG	m2	603	69	-	0/9/27/28	0/3/3/3
2	OMG	A2	3880	2	-	0/9/27/28	0/3/3/3
2	OMC	A2	3357	2	-	4/9/27/28	0/2/2/2
2	5MC	A2	4099	2	-	4/7/25/26	0/2/2/2
2	OMC	A2	2579	2	-	0/9/27/28	0/2/2/2
2	A2M	A2	1347	2,83	-	3/9/27/28	0/3/3/3
2	PSU	A2	3385	2	-	1/7/25/26	0/2/2/2
2	PSU	A2	4280	2	-	0/7/25/26	0/2/2/2
69	PSU	m2	825	69	-	0/7/25/26	0/2/2/2
2	OMC	A2	3525	2	-	0/9/27/28	0/2/2/2
2	OMC	A2	3464	2	-	0/9/27/28	0/2/2/2
69	PSU	m2	614	69	-	0/7/25/26	0/2/2/2
2	PSU	A2	1490	2	-	3/7/25/26	0/2/2/2
2	OMC	A2	2177	2,83	-	1/9/27/28	0/2/2/2
69	A2M	m2	514	69	-	1/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PSU	A2	4288	2	-	2/7/25/26	0/2/2/2
2	OMU	A2	3474	2	-	2/9/27/28	0/2/2/2
2	OMG	A2	3555	2,83	-	0/9/27/28	0/3/3/3
2	OMU	A2	4150	2	-	0/9/27/28	0/2/2/2
2	OMG	A2	3283	2	-	0/9/27/28	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A2	4094	PSU	O4'-C1'	-2.17	1.40	1.43
2	A2	1395	PSU	O4'-C1'	-2.09	1.40	1.43
69	m2	614	PSU	O4'-C1'	-2.09	1.41	1.43
69	m2	825	PSU	O4'-C1'	-2.06	1.41	1.43
2	A2	1496	PSU	O4'-C1'	-2.01	1.41	1.43

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A2	1347	A2M	C3'-C2'-C1'	-2.23	98.53	102.81
2	A2	4055	PSU	O4'-C1'-C2'	2.20	108.20	105.15
2	A2	4094	PSU	O4'-C1'-C2'	2.16	108.14	105.15
69	m2	172	OMU	O2'-C2'-C1'	2.12	113.02	108.99
2	A2	4280	PSU	O4'-C1'-C2'	2.11	108.07	105.15

There are no chirality outliers.

5 of 107 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	C2	75	OMG	O4'-C4'-C5'-O5'
2	A2	398	A2M	C1'-C2'-O2'-CM'
2	A2	1130	OMG	C1'-C2'-O2'-CM2
2	A2	1140	A2M	O4'-C4'-C5'-O5'
2	A2	1140	A2M	C3'-C4'-C5'-O5'

There are no ring outliers.

62 monomers are involved in 114 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A2	3380	A2M	1	0
69	m2	1844	4AC	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A2	2559	OMC	2	0
2	A2	1496	PSU	2	0
2	A2	3958	OMU	1	0
69	m2	578	A2M	2	0
69	m2	1245	PSU	1	0
2	A2	4188	OMC	4	0
2	A2	1154	OMC	2	0
2	A2	4044	OMG	2	0
2	A2	2179	OMG	1	0
69	m2	99	A2M	2	0
69	m2	511	OMG	7	0
2	A2	4175	A2M	1	0
69	m2	869	OMG	3	0
2	A2	4183	PSU	1	0
2	A2	398	A2M	2	0
69	m2	646	OMG	1	0
2	A2	4223	A2M	1	0
69	m2	519	OMC	1	0
2	A2	3448	OMG	2	0
2	A2	3441	A2M	1	0
2	A2	2106	OMC	1	0
2	A2	2616	OMC	1	0
2	A2	1330	2MG	1	0
69	m2	1705	OMC	2	0
69	m2	121	OMU	3	0
69	m2	1330	OMG	2	0
2	A2	3581	OMU	3	0
2	A2	4289	OMG	1	0
69	m2	172	OMU	1	0
69	m2	1680	A2M	2	0
2	A2	4102	PSU	1	0
2	A2	1337	A2M	1	0
2	A2	4272	OMU	3	0
2	A2	1140	A2M	2	0
69	m2	1250	B8N	1	0
2	A2	1673	A2M	2	0
2	A2	1130	OMG	3	0
69	m2	355	OMC	4	0
2	A2	2118	A2M	3	0
69	m2	824	PSU	2	0
69	m2	27	A2M	2	0
69	m2	116	OMU	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A2	3481	A2M	1	0
2	A2	3374	A2M	1	0
2	A2	4146	OMG	1	0
69	m2	1033	A2M	1	0
69	m2	174	OMC	1	0
2	A2	4275	OMG	1	0
2	A2	4151	OMG	1	0
69	m2	486	A2M	3	0
69	m2	603	OMG	2	0
2	A2	4099	5MC	2	0
2	A2	2579	OMC	1	0
2	A2	1347	A2M	1	0
69	m2	825	PSU	1	0
2	A2	3464	OMC	1	0
69	m2	614	PSU	2	0
2	A2	2177	OMC	3	0
69	m2	514	A2M	6	0
2	A2	3555	OMG	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 123 ligands modelled in this entry, 123 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	A2	15
69	m2	6
70	n2	2
51	T3	1

The worst 5 of 24 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A2	1512:U	O3'	1521:A	P	25.77
1	m2	130:G	O3'	141:A	P	25.00
1	m2	690:U	O3'	801:U	P	19.11
1	A2	4437:C	O3'	4493:G	P	17.43
1	A2	770:G	O3'	799:C	P	16.64

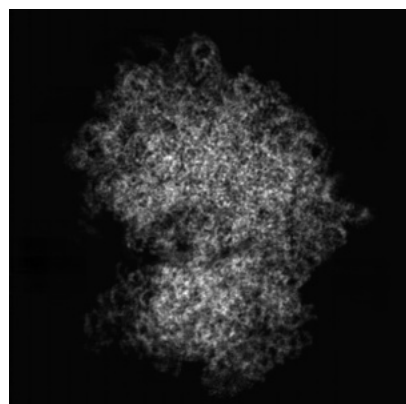
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-53333. These allow visual inspection of the internal detail of the map and identification of artifacts.

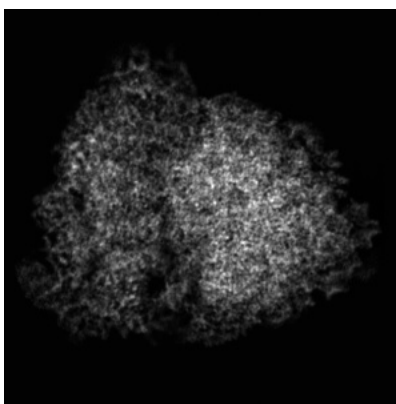
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

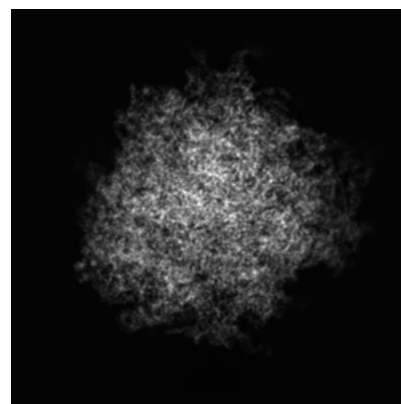
6.1.1 Primary map



X

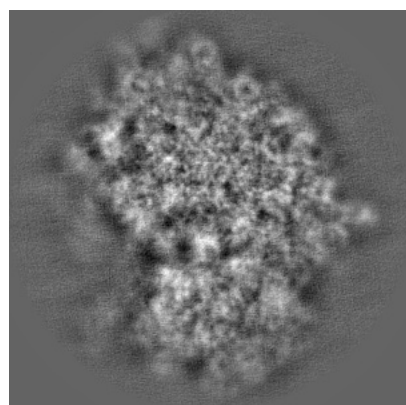


Y

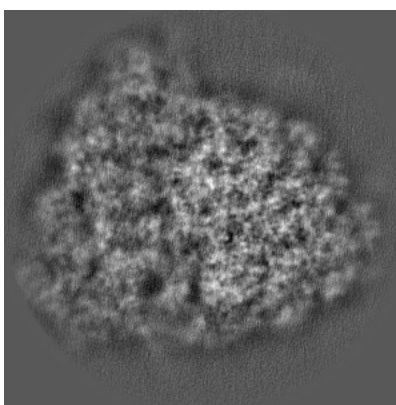


Z

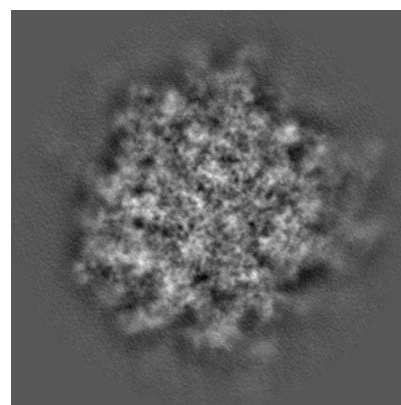
6.1.2 Raw map



X



Y

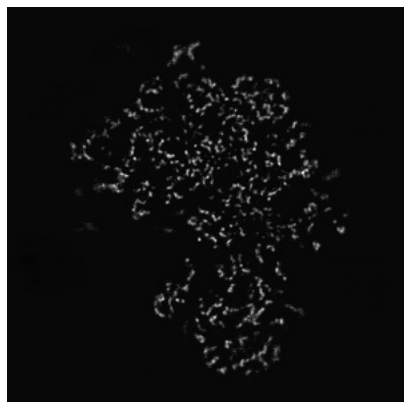


Z

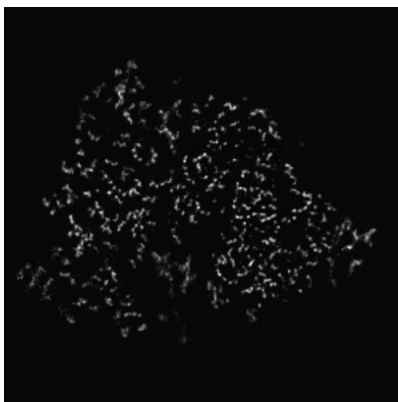
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

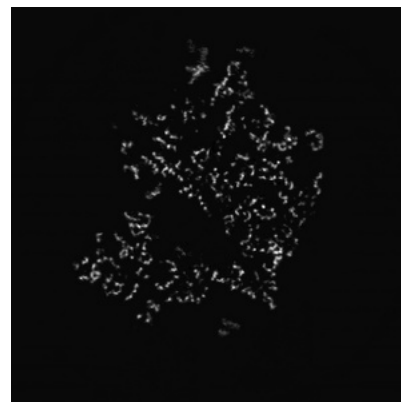
6.2.1 Primary map



X Index: 164

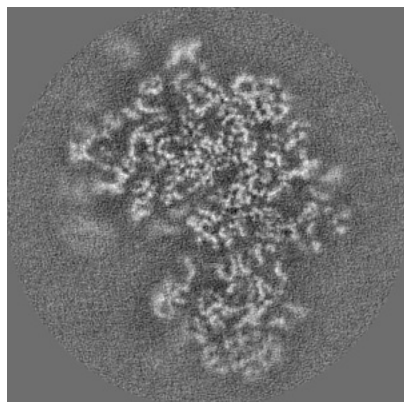


Y Index: 164

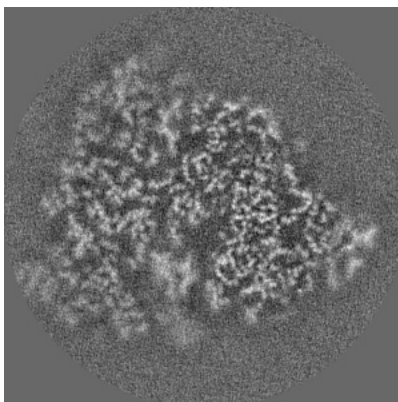


Z Index: 164

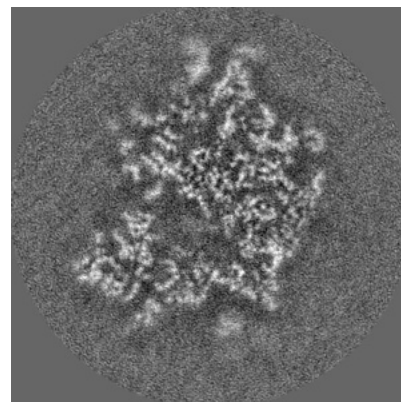
6.2.2 Raw map



X Index: 164



Y Index: 164

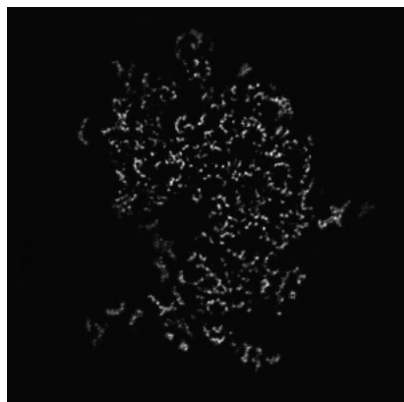


Z Index: 164

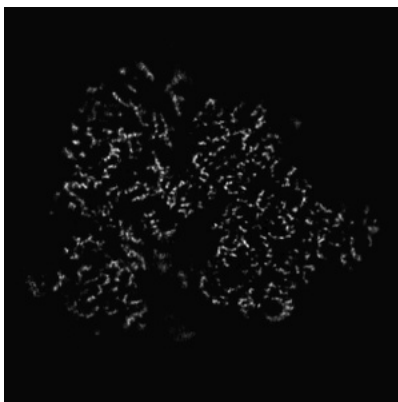
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

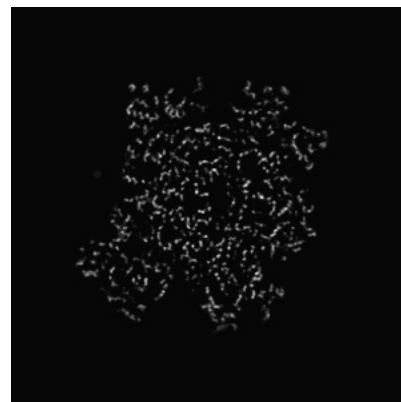
6.3.1 Primary map



X Index: 147

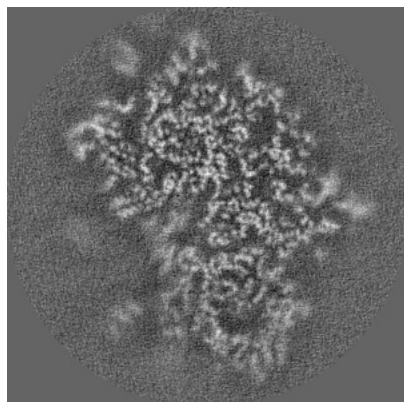


Y Index: 158

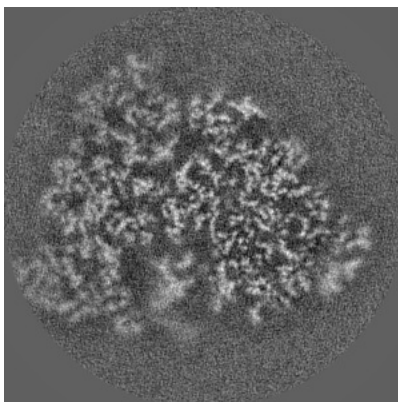


Z Index: 180

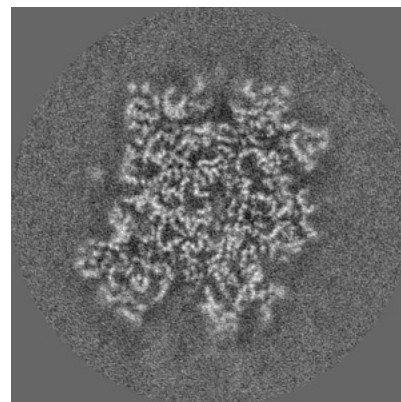
6.3.2 Raw map



X Index: 155



Y Index: 169

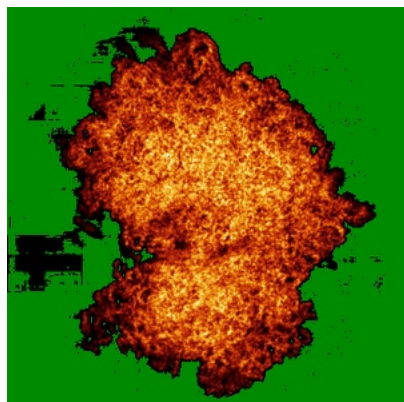


Z Index: 180

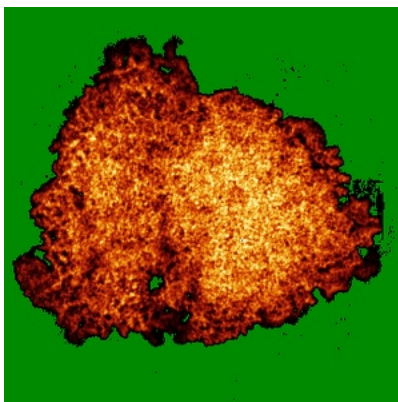
The images above show the largest variance slices of the map in three orthogonal directions.

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

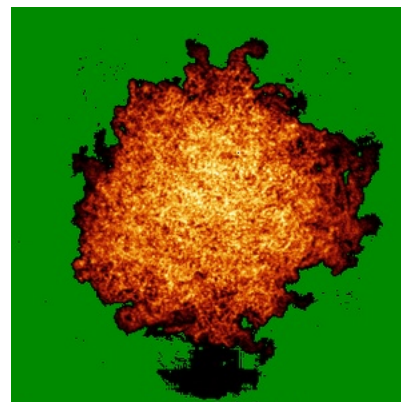
6.4.1 Primary map



X

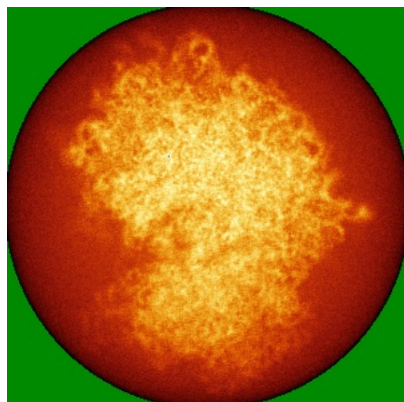


Y

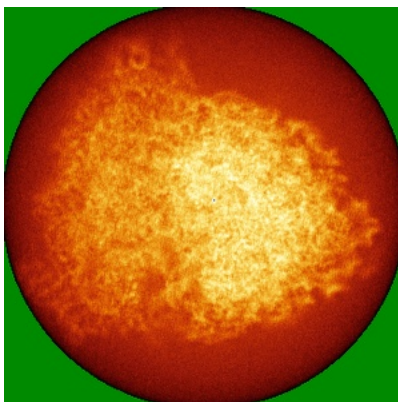


Z

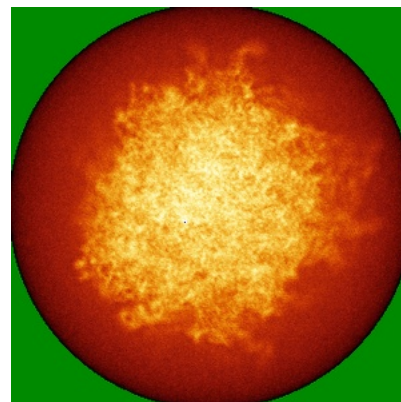
6.4.2 Raw map



X



Y

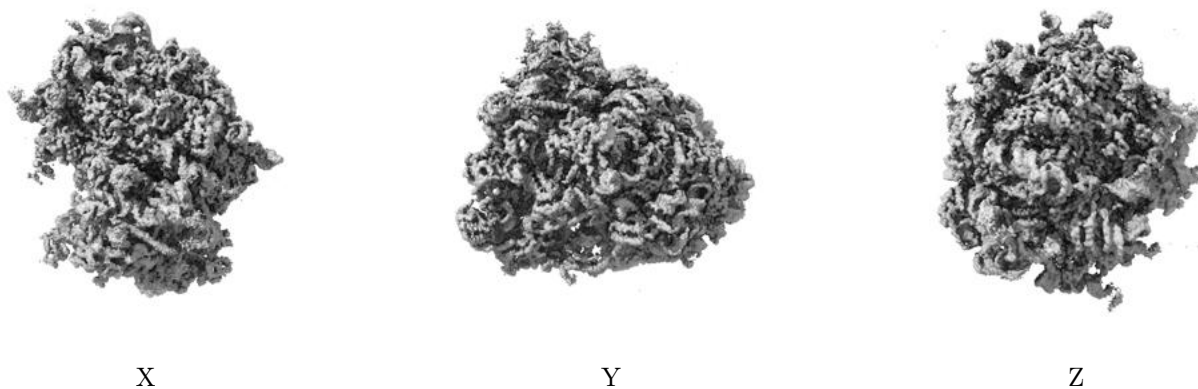


Z

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.

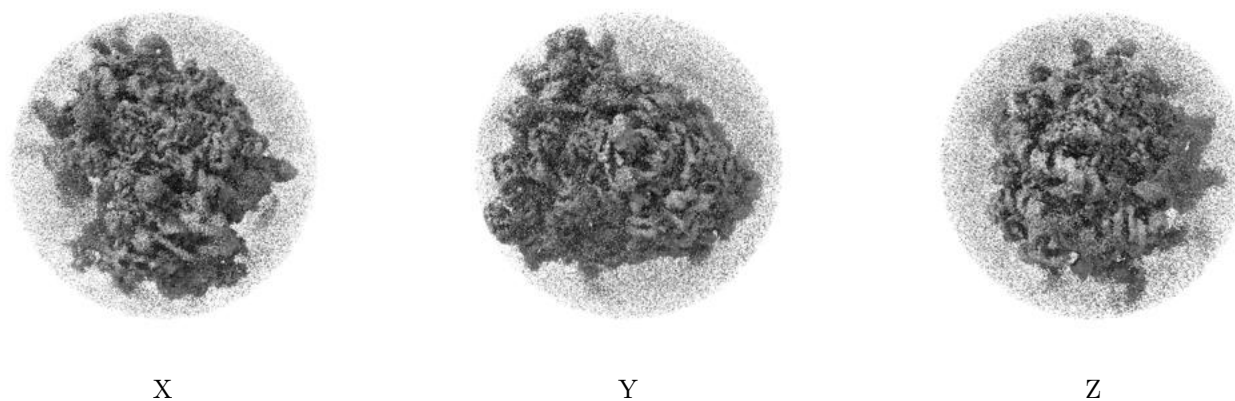
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0287. 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.

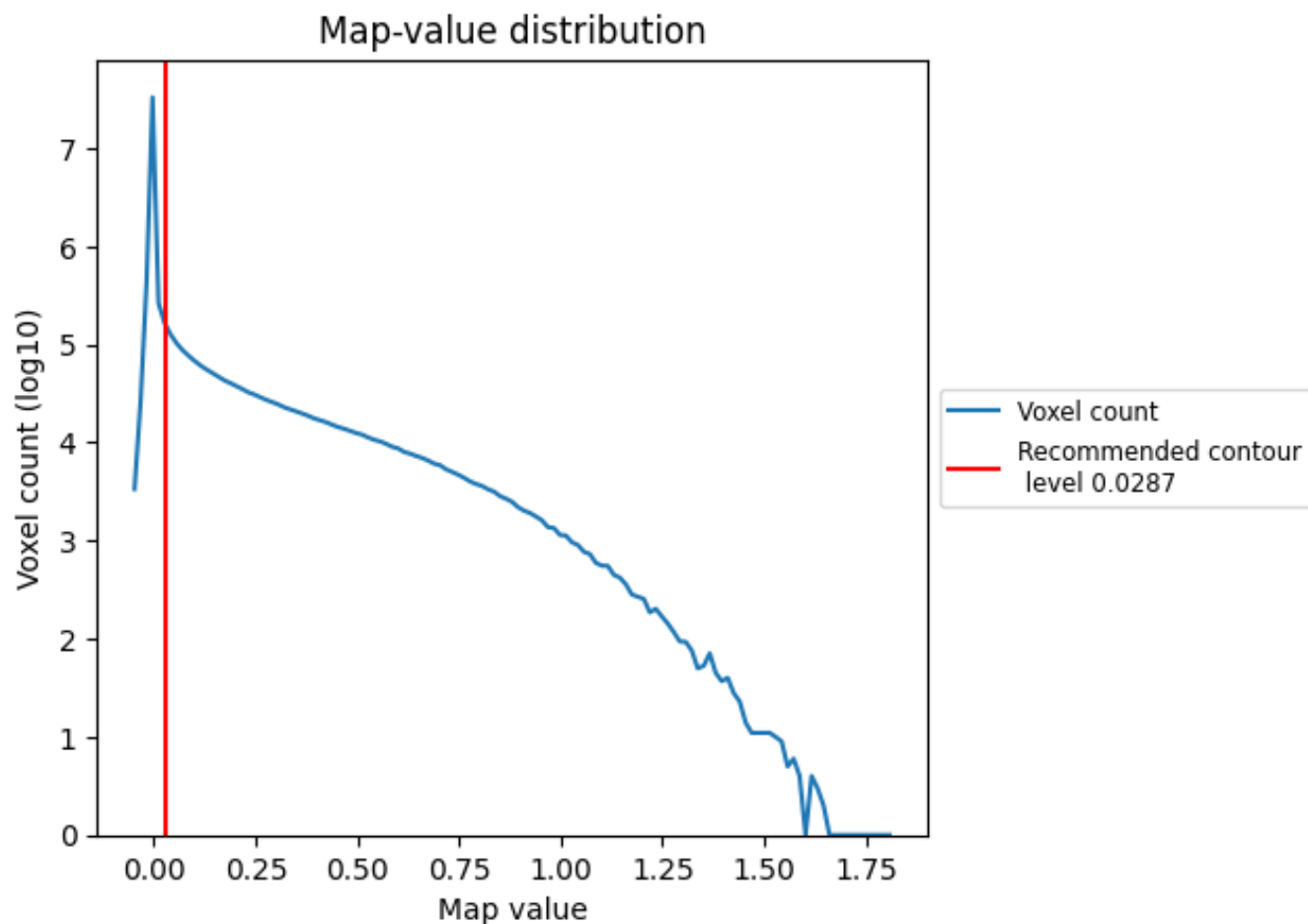
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

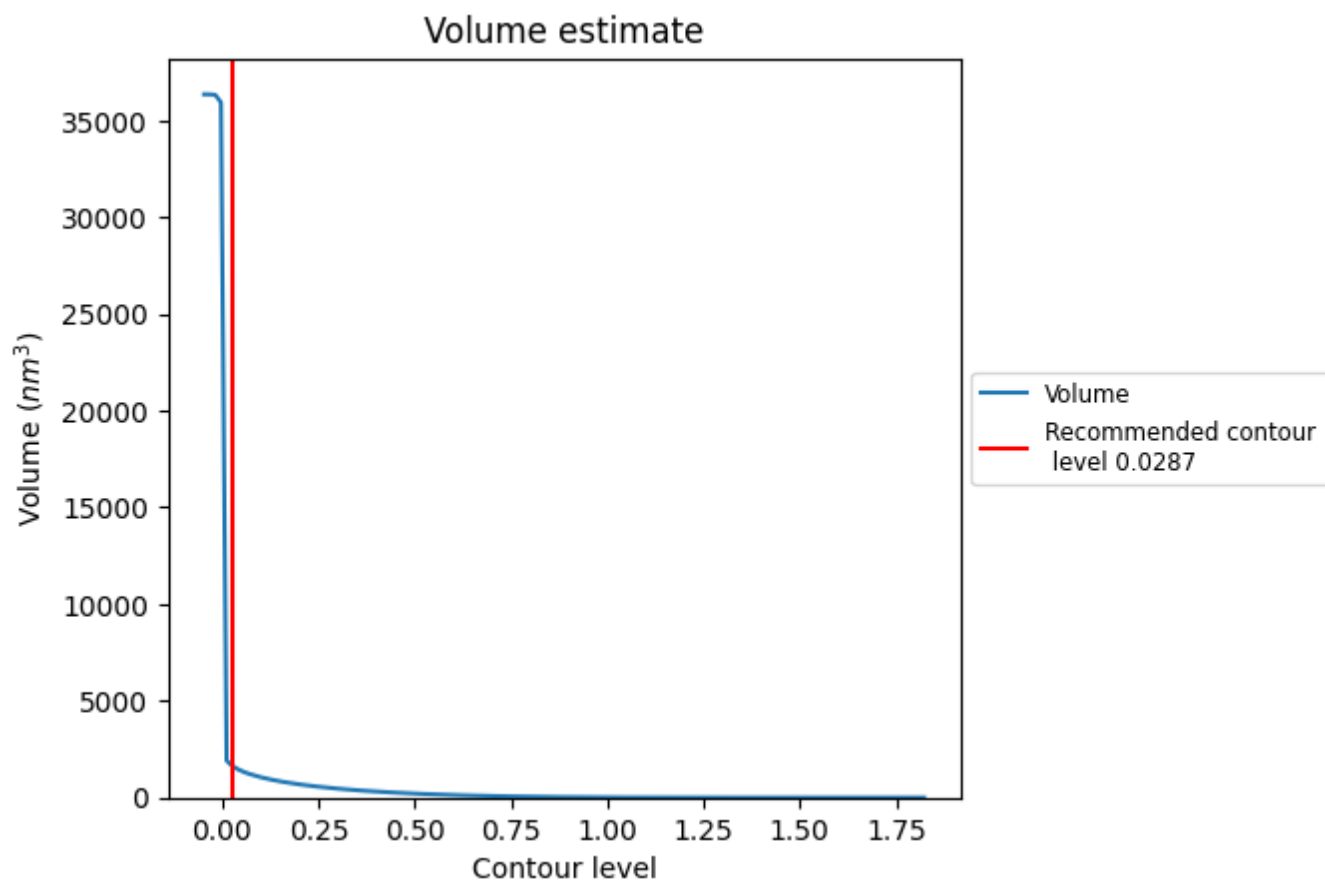
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

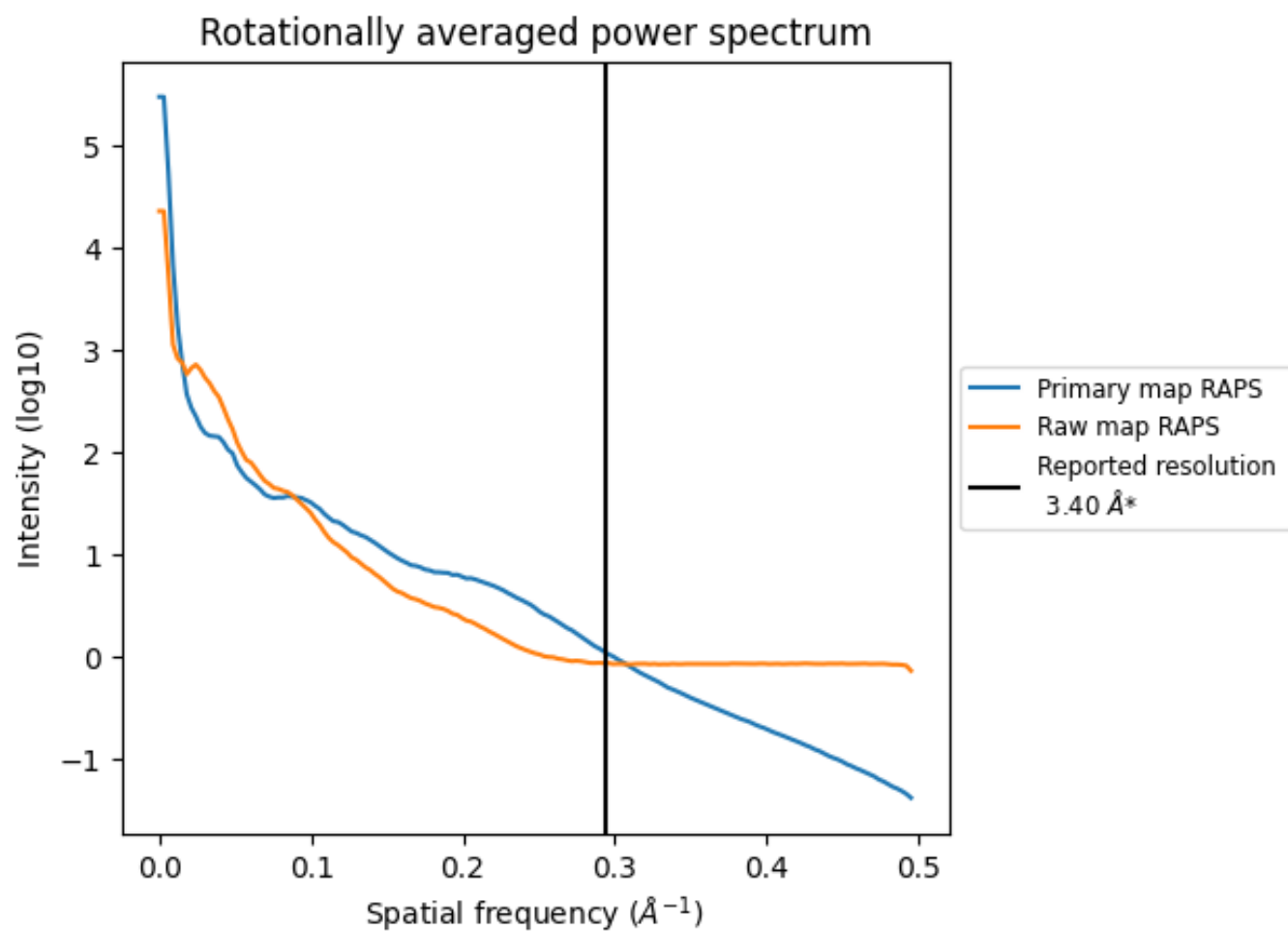
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1603 nm^3 ; this corresponds to an approximate mass of 1448 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

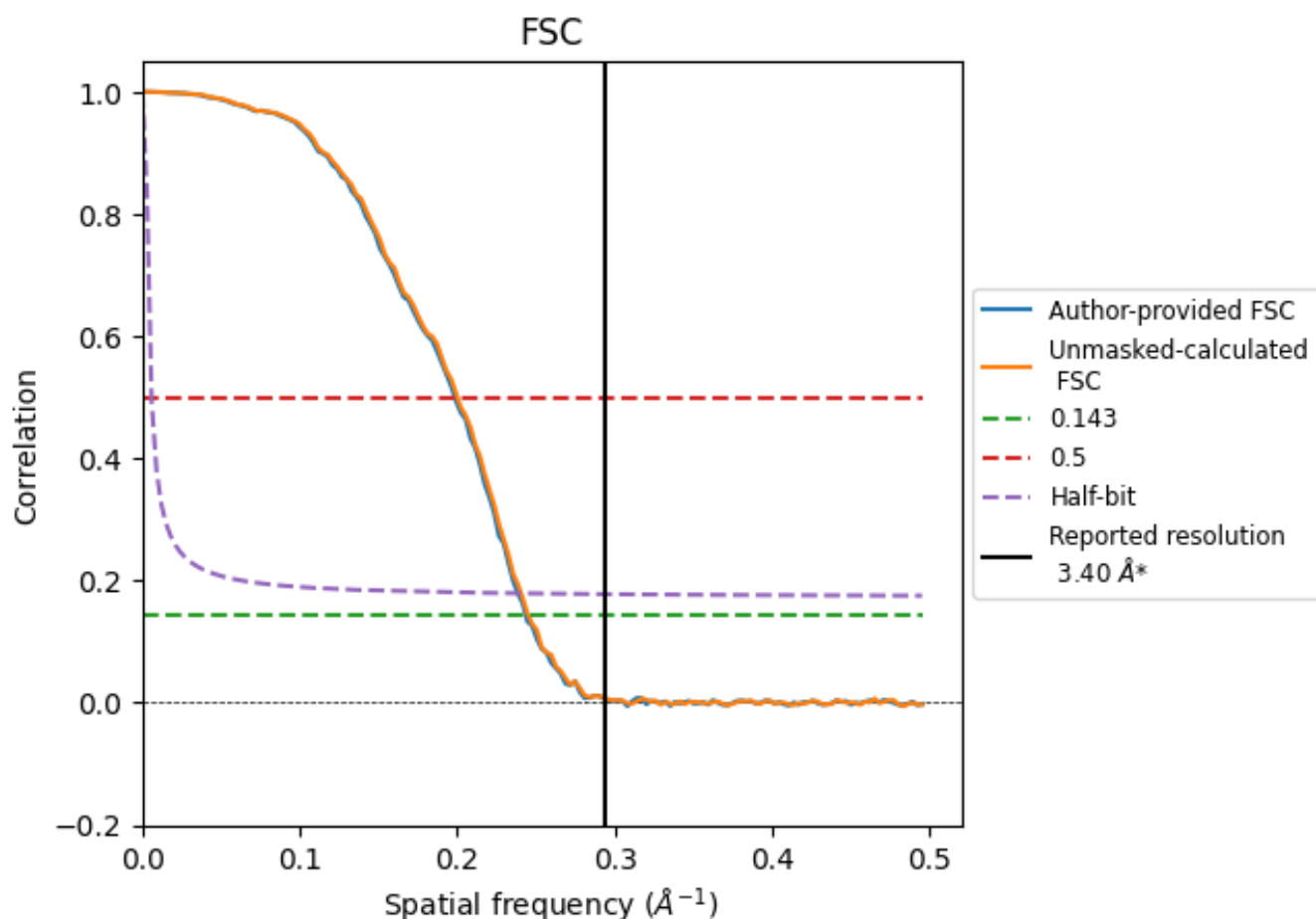


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

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 \AA^{-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	4.11	5.04	4.19
Unmasked-calculated*	4.08	5.00	4.16

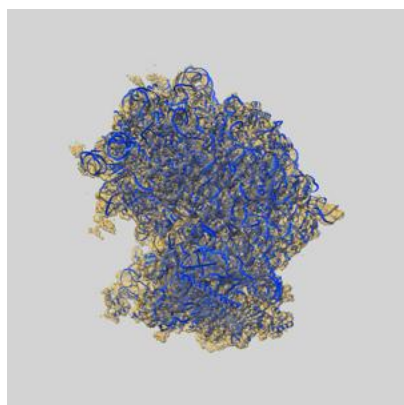
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from author-provided FSC intersecting FSC 0.143 CUT-OFF 4.11 differs from the reported value 3.4 by more than 10 %

The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.08 differs from the reported value 3.4 by more than 10 %

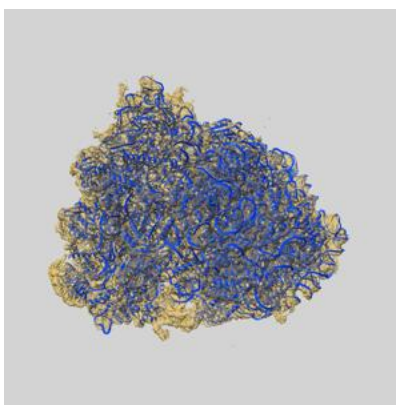
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-53333 and PDB model 9QSA. Per-residue inclusion information can be found in section 3 on page 20.

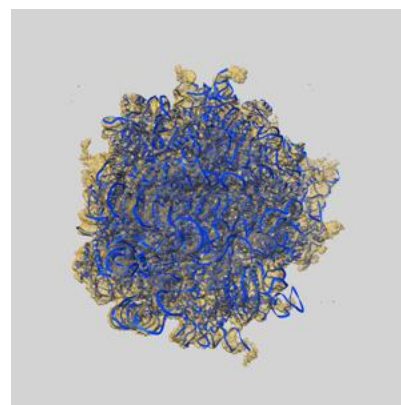
9.1 Map-model overlay [i](#)



X



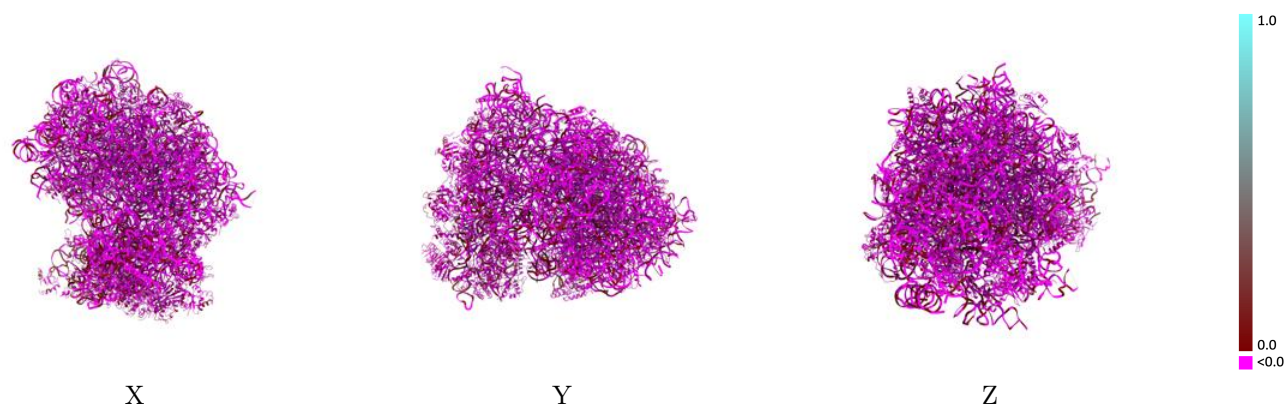
Y



Z

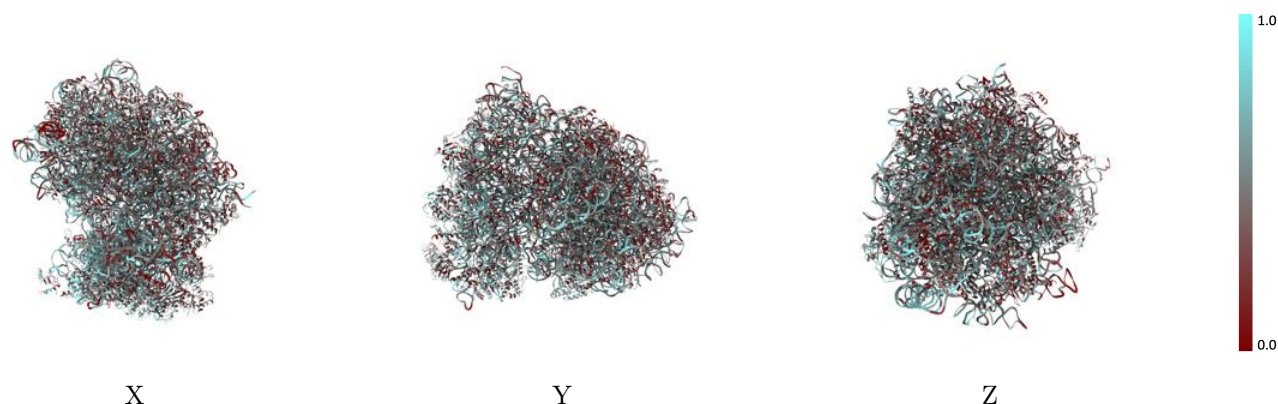
The images above show the 3D surface view of the map at the recommended contour level 0.0287 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



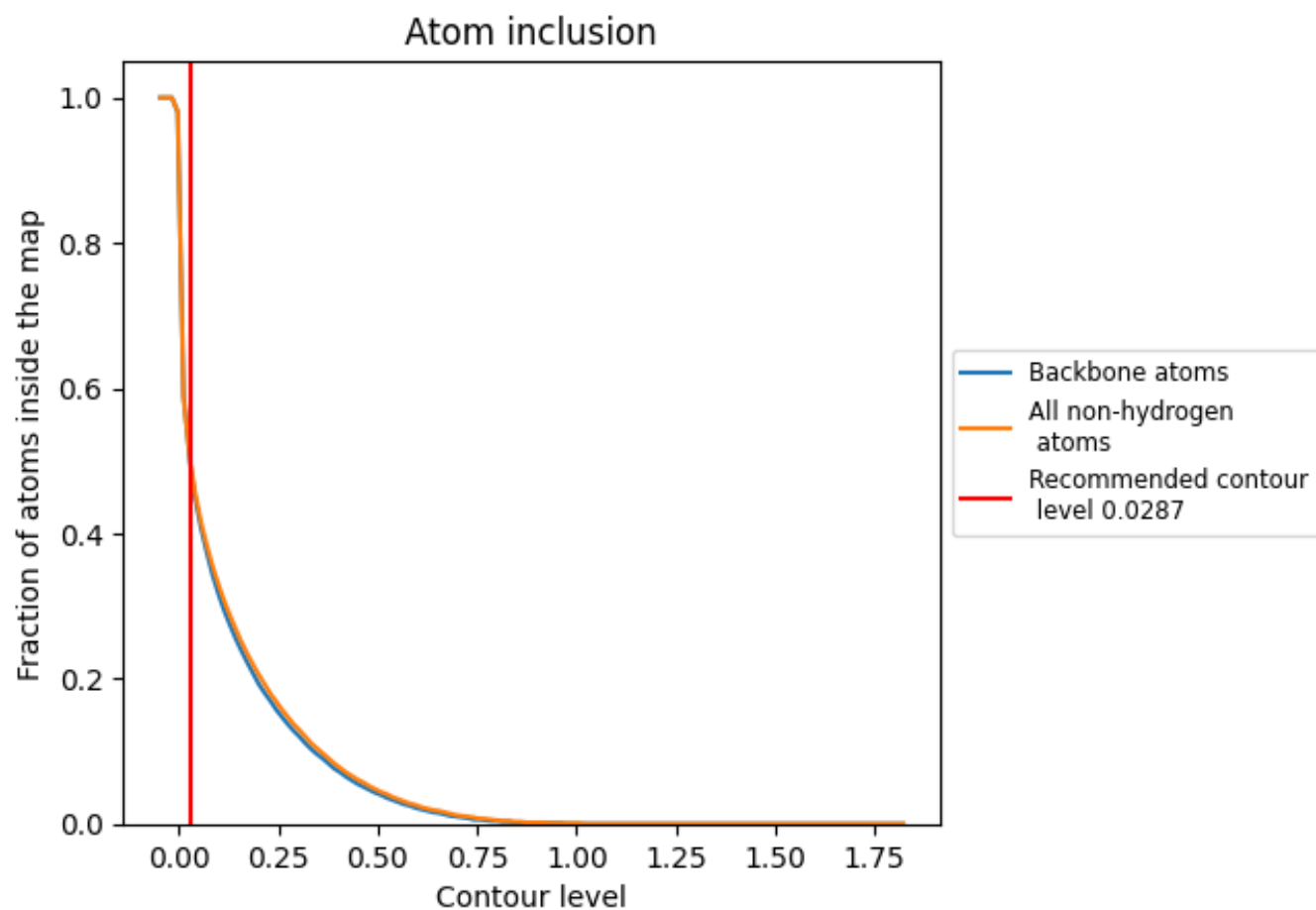
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0287).







































































9.4 Atom inclusion ⓘ



At the recommended contour level, 49% of all backbone atoms, 50% 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 (0.0287) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4970	 -0.0680
A1	 0.3980	 -0.1190
A2	 0.5350	 -0.0760
A3	 0.5460	 -0.0150
B1	 0.4300	 -0.0830
B2	 0.6580	 -0.0210
B3	 0.4530	 -0.0410
Bx	 0.5300	 -0.0110
By	 0.0000	 -0.0280
Bz	 0.4140	 -0.0260
C1	 0.4310	 -0.0960
C2	 0.5070	 -0.0850
C3	 0.4700	 -0.0140
D1	 0.4530	 -0.0840
D2	 0.3860	 -0.1210
D3	 0.5370	 -0.0460
E1	 0.5230	 -0.0440
E2	 0.4050	 -0.1050
E3	 0.4570	 -0.0600
F1	 0.4130	 -0.0840
F2	 0.3670	 -0.1040
F3	 0.4360	 -0.0710
G1	 0.4360	 -0.0850
G2	 0.5010	 -0.0510
G3	 0.4940	 -0.0310
H1	 0.3970	 -0.1050
H2	 0.4020	 -0.0970
H3	 0.4710	 -0.0430
I2	 0.4020	 -0.1000
I3	 0.4320	 -0.0540
J2	 0.3780	 -0.1200
J3	 0.5240	 -0.0570
K2	 0.3710	 -0.1030
K3	 0.3870	 -0.0770
L2	 0.3990	 -0.0910















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Chain	Atom inclusion	Q-score
L3	0.4470	-0.0370
M2	0.4450	-0.1140
M3	0.4290	0.0010
N2	0.4430	-0.0860
N3	0.3720	-0.0870
O2	0.3690	-0.0730
O3	0.4340	-0.0720
P2	0.4090	-0.1160
P3	0.4540	-0.0990
Q2	0.4020	-0.1040
Q3	0.4210	-0.0550
R2	0.3360	-0.1030
R3	0.4540	-0.0340
S2	0.3510	-0.0940
S3	0.4650	-0.0610
T2	0.3980	-0.0880
T3	0.4010	-0.0550
U2	0.3960	-0.1160
V2	0.2830	-0.0910
W2	0.4630	-0.0950
X2	0.3560	-0.1050
Y2	0.3500	-0.1120
Z2	0.3970	-0.1190
a2	0.3720	-0.1020
b2	0.3460	-0.0990
c2	0.4180	-0.0850
d2	0.3610	-0.1260
e2	0.3380	-0.1000
f2	0.3310	-0.1190
g2	0.3940	-0.1060
h2	0.3680	-0.0690
i2	0.4090	-0.1020
j2	0.4670	-0.0780
k2	0.3770	-0.1240
m2	0.6010	-0.0290
n2	0.5810	-0.0160
o2	0.4740	-0.0680
p2	0.4450	-0.0760
q2	0.4600	-0.0340
r2	0.4210	-0.0640
s2	0.4810	-0.0400
t2	0.4450	-0.0520

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Chain	Atom inclusion	Q-score
u2	 0.4160	 -0.0880
v2	 0.5040	 -0.0100
w2	 0.3830	 -0.0830
x2	 0.5290	 -0.0180
y2	 0.4300	 -0.0370
z2	 0.4650	 -0.0440