



wwPDB EM Validation Summary Report ⓘ

Mar 9, 2026 – 04:08 PM UTC

PDB ID : 8EWC / pdb_00008ewc
EMDB ID : EMD-28643
Title : Hypopseudouridylated yeast 80S bound with Taura syndrome virus (TSV) internal ribosome entry site (IRES), Structure II
Authors : Zhao, Y.; Rai, J.; Li, H.
Deposited on : 2022-10-22
Resolution : 2.45 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:

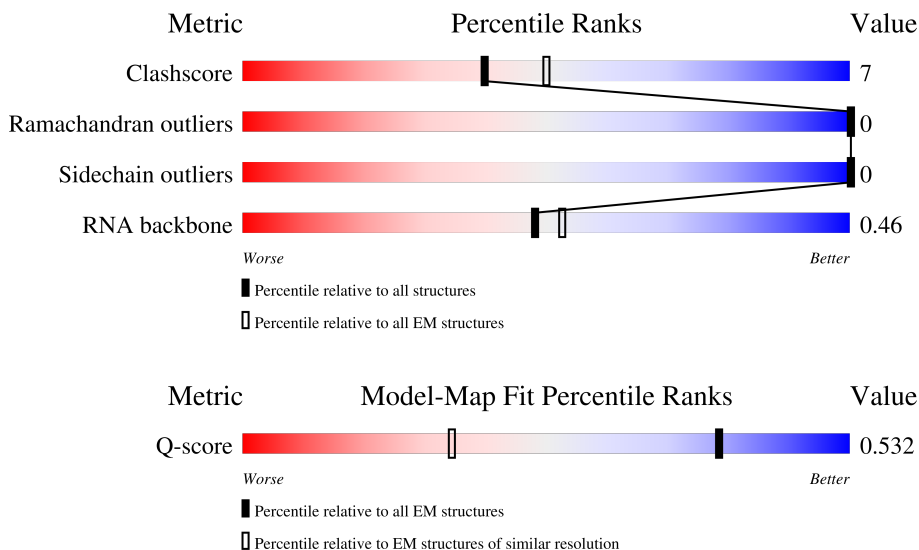
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
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 i

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

The reported resolution of this entry is 2.45 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.















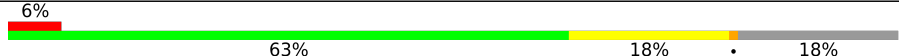
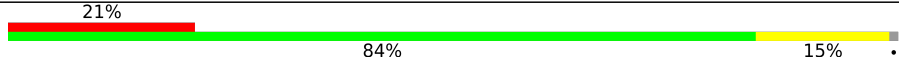
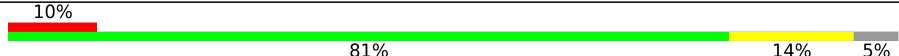

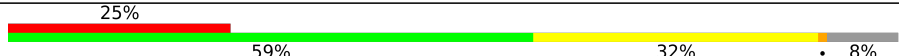
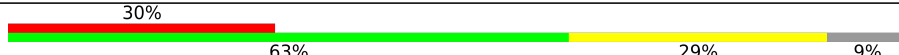
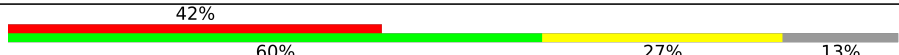
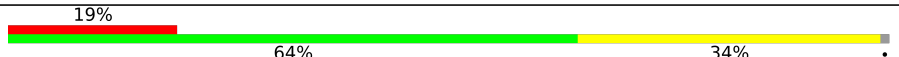
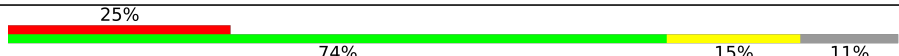



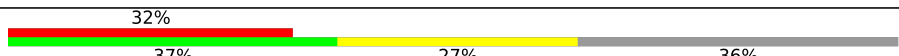
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	5931 (1.96 - 2.95)

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	BA	252	
2	BB	255	
3	BC	254	

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Mol	Chain	Length	Quality of chain
4	BE	261	
5	BG	236	
6	BH	190	
7	BI	200	
8	BJ	197	
9	BL	156	
10	BN	151	
11	BO	137	
12	BV	87	
13	BW	130	
14	BX	145	
15	BY	135	
16	Ba	119	
17	Bb	82	
18	Be	63	
19	BD	240	
20	BF	225	
21	BK	105	
22	BP	142	
23	BQ	143	
24	BR	136	
25	BS	146	
26	BT	144	
27	BU	121	
28	BZ	108	

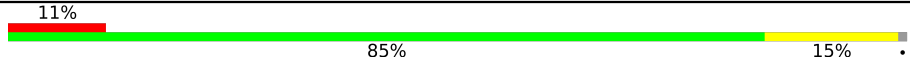







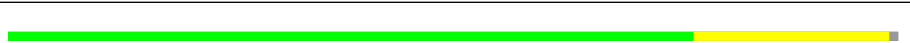

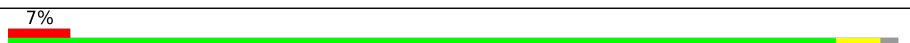


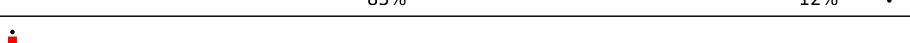
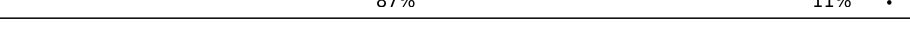
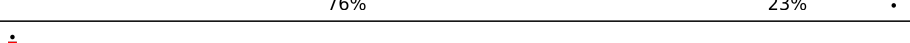
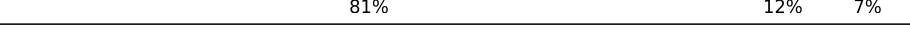
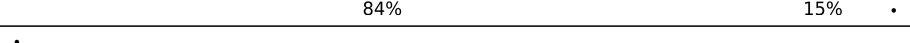
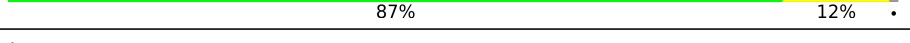






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Mol	Chain	Length	Quality of chain
29	Bc	67	
30	Bd	56	
31	Bg	319	
32	Bf	152	
33	BM	143	
34	B5	1798	
35	AA	254	
36	AB	387	
37	AC	362	
38	A1	3360	
39	A3	121	
40	A4	158	
41	AD	297	
42	AE	176	
43	AF	244	
44	AG	256	
45	AH	191	
46	AI	221	
47	AJ	174	
48	AL	199	
49	AM	138	
50	AN	204	
51	AO	199	
52	AP	184	
53	AQ	186	


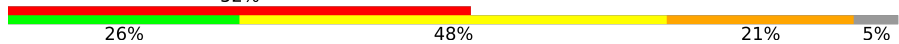
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Mol	Chain	Length	Quality of chain
54	AR	189	
55	AS	178	
56	AT	160	
57	AU	121	
58	AV	137	
59	AW	155	
60	AX	142	
61	AY	127	
62	AZ	136	
63	Aa	149	
64	Ab	59	
65	Ac	105	
66	Ad	113	
67	Ae	130	
68	Af	107	
69	Ag	121	
70	Ah	120	
71	Ai	100	
72	Aj	88	
73	Ak	78	
74	Al	51	
75	Am	128	
76	An	25	
77	Ao	106	
78	Ap	92	

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Mol	Chain	Length	Quality of chain
79	E	217	 <p>82%</p> <p>68%</p> <p>32%</p>
80	EC	202	 <p>52%</p> <p>26%</p> <p>48%</p> <p>21%</p> <p>5%</p>

2 Entry composition

There are 82 unique types of molecules in this entry. The entry contains 206055 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 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	BA	206	1612	1034	285	291	2	0	0

- Molecule 2 is a protein called RPS1A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	BB	214	1709	1084	310	311	4	0	0

- Molecule 3 is a protein called RPS2 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	BC	217	1635	1047	289	297	2	0	0

- Molecule 4 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	BE	260	2068	1316	389	360	3	0	0

- Molecule 5 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	BG	226	1820	1142	350	325	3	0	0

- Molecule 6 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	BH	184	1481	951	265	265	0	0

- Molecule 7 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	BI	188	1489	925	298	264	2	0	0

- Molecule 8 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	BJ	185	1494	943	289	261	1	0	0

- Molecule 9 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	BL	155	1244	798	235	208	3	0	0

- Molecule 10 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	BN	150	1192	759	224	207	2	0	0

- Molecule 11 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	BO	127	941	578	186	174	3	0	0

- Molecule 12 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	BV	87	684	420	125	137	2	0	0

- Molecule 13 is a protein called RPS22A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	BW	129	1021	650	188	180	3	0	0

- Molecule 14 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	BX	144	1121	708	220	191	2	0	0

- Molecule 15 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	BY	134	1073	676	208	189		0	0

- Molecule 16 is a protein called RPS26B isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	Ba	97	769	475	160	129	5	0	0

- Molecule 17 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Bb	81	610	382	110	113	5	0	0

- Molecule 18 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	Be	60	475	299	98	77	1	0	0

- Molecule 19 is a protein called RPS3 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	BD	223	1734	1101	313	314	6	0	0

- Molecule 20 is a protein called Rps5p.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	BF	206	1609	1007	300	299	3	0	0

- Molecule 21 is a protein called 40S ribosomal protein S10-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	BK	96	Total	C	N	O	S	0	0
			817	529	133	153	2		

- Molecule 22 is a protein called RPS15 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	BP	124	Total	C	N	O	S	0	0
			991	631	187	166	7		

- Molecule 23 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	BQ	141	Total	C	N	O	0	0
			1105	708	203	194		

- Molecule 24 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	BR	121	Total	C	N	O	S	0	0
			975	611	183	179	2		

- Molecule 25 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	BS	145	Total	C	N	O	S	0	0
			1192	743	237	210	2		

- Molecule 26 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	BT	141	Total	C	N	O	S	0	0
			1095	685	206	202	2		

- Molecule 27 is a protein called RPS20 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	BU	107	Total	C	N	O	S	0	0
			855	539	156	159	1		

- Molecule 28 is a protein called RPS25A isoform 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	BZ	69	Total	C	N	O	0	0
			558	357	103	98		

- Molecule 29 is a protein called RPS28A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Bc	63	Total	C	N	O	S	0	0
			497	306	99	91	1		

- Molecule 30 is a protein called RPS29A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Bd	53	Total	C	N	O	S	0	0
			443	275	92	72	4		

- Molecule 31 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	Bg	312	Total	C	N	O	S	0	0
			2401	1522	410	461	8		

- Molecule 32 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	Bf	75	Total	C	N	O	S	0	0
			605	386	116	99	4		

- Molecule 33 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	BM	124	Total	C	N	O	S	0	0
			935	587	165	181	2		

- Molecule 34 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	B5	1782	Total	C	N	O	P	1	0
			38004	17005	6718	12499	1782		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B5	1280	4AC	C	conflict	GB 1329886537
B5	1773	4AC	C	conflict	GB 1329886537

- Molecule 35 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	AA	247	1878	1170	381	326	1	0	0

- Molecule 36 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	AB	386	3080	1955	584	533	8	0	0

- Molecule 37 is a protein called RPL4A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	AC	361	2748	1729	522	494	3	0	0

- Molecule 38 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
38	A1	3198	68445	30596	12331	22320	3198	0	0

- Molecule 39 is a RNA chain called 5s rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
39	A3	121	2579	1152	461	845	121	0	0

- Molecule 40 is a RNA chain called 5.8 S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
40	A4	158	3353	1500	586	1109	158	0	0

- Molecule 41 is a protein called RPL5 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	AD	292	Total	C	N	O	S	0	0
			2341	1478	408	453	2		

- Molecule 42 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	AE	156	Total	C	N	O	S	0	0
			1239	800	222	216	1		

- Molecule 43 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	AF	222	Total	C	N	O	S	0	0
			1784	1151	324	308	1		

- Molecule 44 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	AG	230	Total	C	N	O	S	0	0
			1798	1149	323	323	3		

- Molecule 45 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	AH	190	Total	C	N	O	S	0	0
			1510	957	273	276	4		

- Molecule 46 is a protein called RPL10 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	AI	205	Total	C	N	O	S	0	0
			1672	1063	316	288	5		

- Molecule 47 is a protein called RPL11A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	AJ	169	Total	C	N	O	S	0	0
			1353	847	253	249	4		

- Molecule 48 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
48	AL	193	Total	C	N	O	0	0
			1543	962	315	266		

- Molecule 49 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	AM	136	Total	C	N	O	S	0	0
			1053	675	199	177	2		

- Molecule 50 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	AN	203	Total	C	N	O	S	0	0
			1720	1077	361	281	1		

- Molecule 51 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	AO	197	Total	C	N	O	S	197	0
			1555	1003	289	262	1		

- Molecule 52 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
52	AP	175	Total	C	N	O	0	0
			1388	862	277	249		

- Molecule 53 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	AQ	185	Total	C	N	O	S	0	0
			1441	908	290	241	2		

- Molecule 54 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
54	AR	188	Total	C	N	O	0	0
			1521	935	326	260		

- Molecule 55 is a protein called 60S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	AS	172	1445	930	267	244	4	0	0

- Molecule 56 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	AT	159	1276	805	246	221	4	0	0

- Molecule 57 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
57	AU	100	796	516	131	149	0	0

- Molecule 58 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	AV	136	1003	628	189	179	7	0	0

- Molecule 59 is a protein called RPL24A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	AW	63	521	336	102	82	1	0	0

- Molecule 60 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	AX	121	968	623	170	173	2	0	0

- Molecule 61 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
61	AY	126	993	625	192	176	0	0

- Molecule 62 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
62	AZ	135	1092	710	202	180	0	0

- Molecule 63 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	Aa	148	1173	749	231	190	3	0	0

- Molecule 64 is a protein called RPL29 isoform 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
64	Ab	58	462	289	100	73	0	0

- Molecule 65 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	Ac	97	743	479	124	139	1	0	0

- Molecule 66 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	Ad	109	890	565	168	156	1	0	0

- Molecule 67 is a protein called RPL32 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	Ae	127	1020	647	205	167	1	0	0

- Molecule 68 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	Af	106	850	540	165	144	1	0	0

- Molecule 69 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	Ag	112	Total	C	N	O	S	0	0
			880	545	179	152	4		

- Molecule 70 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	Ah	119	Total	C	N	O	S	0	0
			969	615	186	167	1		

- Molecule 71 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	Ai	99	Total	C	N	O	S	0	0
			771	481	156	132	2		

- Molecule 72 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	Aj	87	Total	C	N	O	S	0	0
			681	414	148	114	5		

- Molecule 73 is a protein called RPL38 isoform 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
73	Ak	77	Total	C	N	O	0	0
			612	391	115	106		

- Molecule 74 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	Al	50	Total	C	N	O	S	0	0
			436	272	97	65	2		

- Molecule 75 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	Am	52	Total	C	N	O	S	0	0
			417	259	86	67	5		

- Molecule 76 is a protein called 60S ribosomal protein L41-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	An	25	Total	C	N	O	S	0	0
			233	142	63	27	1		

- Molecule 77 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	Ao	102	Total	C	N	O	S	0	0
			819	514	166	134	5		

- Molecule 78 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	Ap	91	Total	C	N	O	S	0	0
			694	429	138	121	6		

- Molecule 79 is a protein called RPL1A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	E	217	Total	C	N	O	S	0	0
			1718	1097	299	312	10		

- Molecule 80 is a RNA chain called internal ribosome entry site (IRES).

Mol	Chain	Residues	Atoms					AltConf	Trace
80	EC	192	Total	C	N	O	P	0	0
			4090	1828	729	1341	192		

- Molecule 81 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
81	BN	1	Total	Mg	0
			1	1	
81	Ba	1	Total	Mg	0
			1	1	
81	B5	55	Total	Mg	0
			55	55	
81	AB	2	Total	Mg	0
			2	2	
81	A1	174	Total	Mg	0
			174	174	
81	A3	2	Total	Mg	0
			2	2	

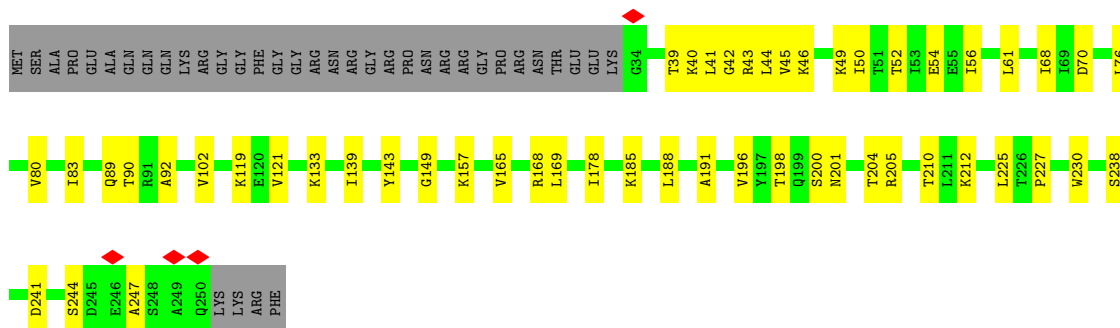
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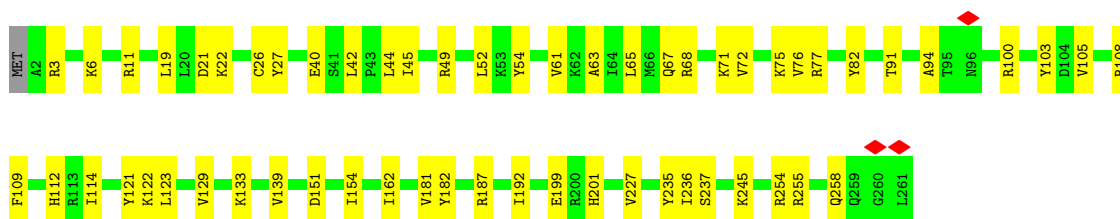
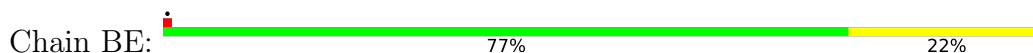
Mol	Chain	Residues	Atoms		AltConf
81	A4	4	Total 4	Mg 4	0
81	AI	1	Total 1	Mg 1	0
81	AL	1	Total 1	Mg 1	0
81	AP	1	Total 1	Mg 1	0
81	AR	1	Total 1	Mg 1	0
81	Ae	1	Total 1	Mg 1	0
81	Af	1	Total 1	Mg 1	0
81	Aj	2	Total 2	Mg 2	0

- Molecule 82 is ZINC ION (CCD ID: ZN) (formula: Zn).

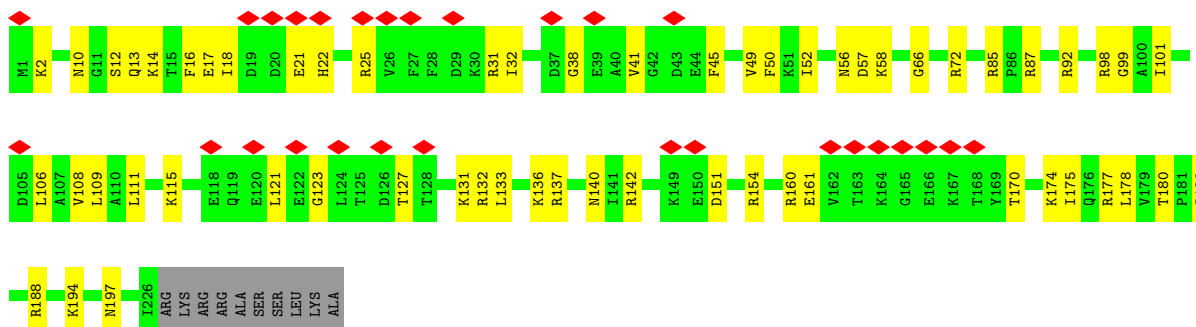
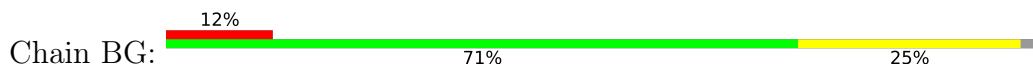
Mol	Chain	Residues	Atoms		AltConf
82	Ao	1	Total 1	Zn 1	0



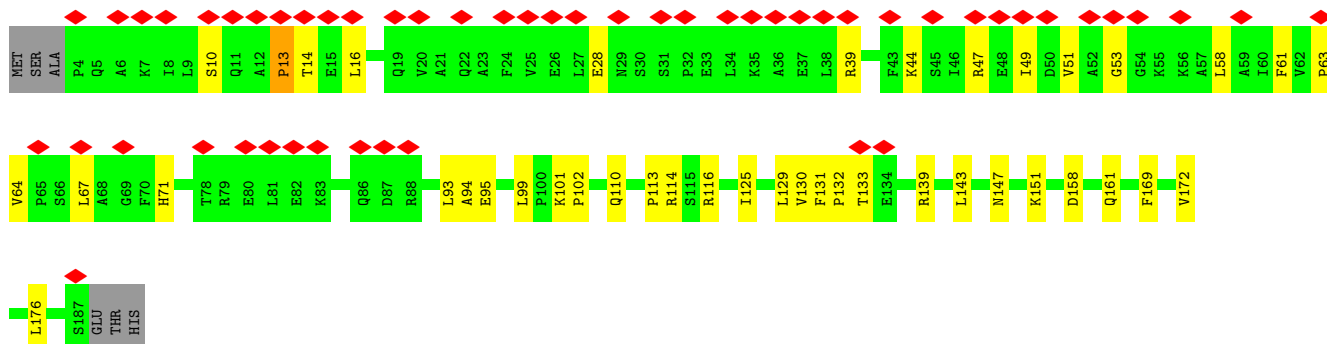
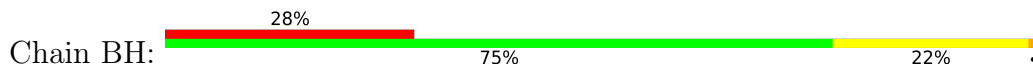
• Molecule 4: 40S ribosomal protein S4-A



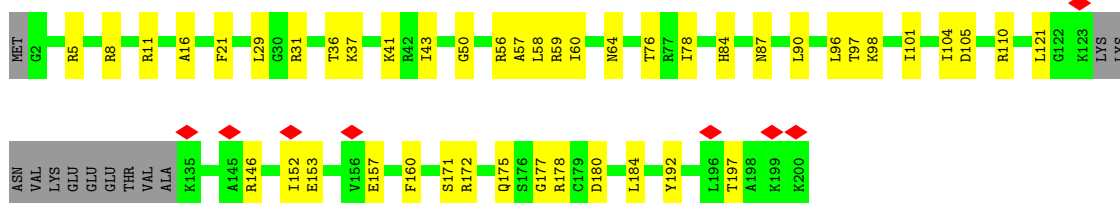
• Molecule 5: 40S ribosomal protein S6-A



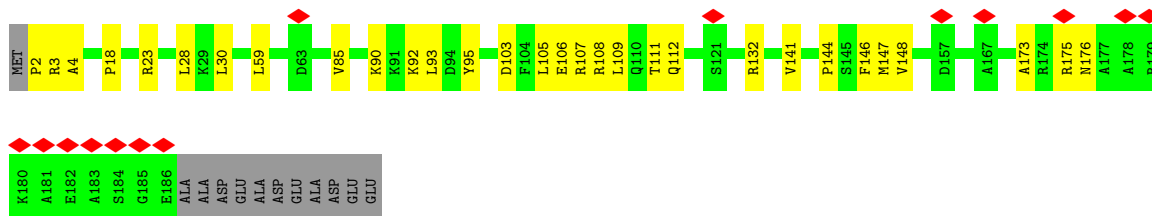
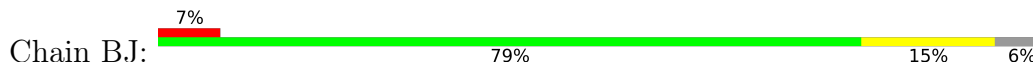
• Molecule 6: 40S ribosomal protein S7-A



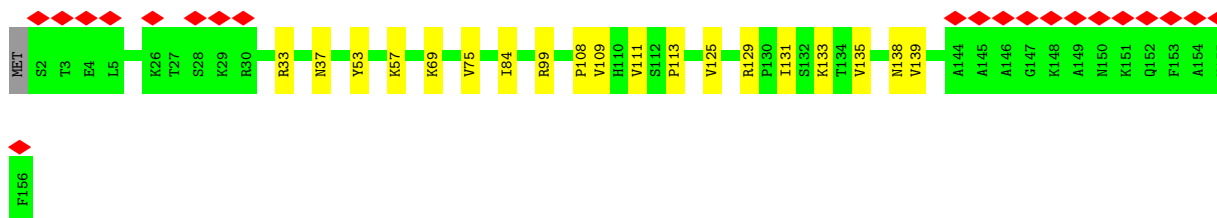
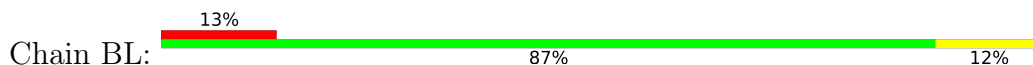
• Molecule 7: 40S ribosomal protein S8-A



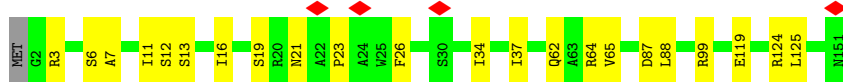
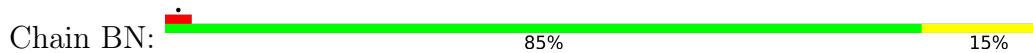
• Molecule 8: 40S ribosomal protein S9-A



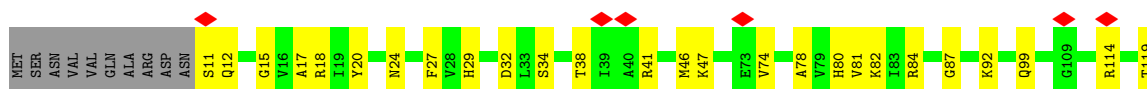
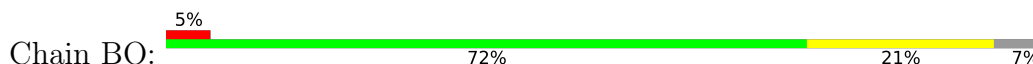
• Molecule 9: 40S ribosomal protein S11-A

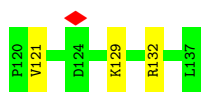


• Molecule 10: 40S ribosomal protein S13

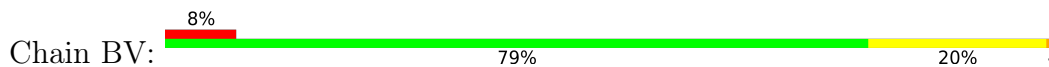


• Molecule 11: 40S ribosomal protein S14-A

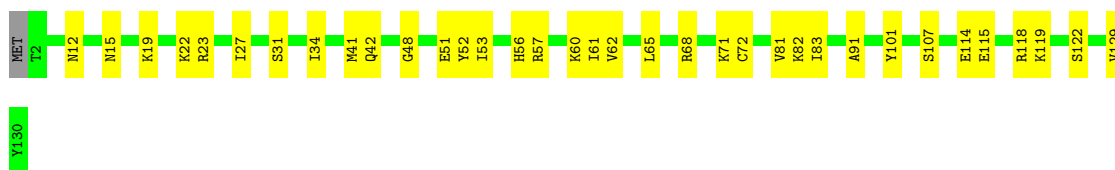




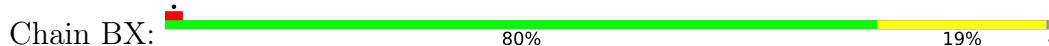
• Molecule 12: 40S ribosomal protein S21-A



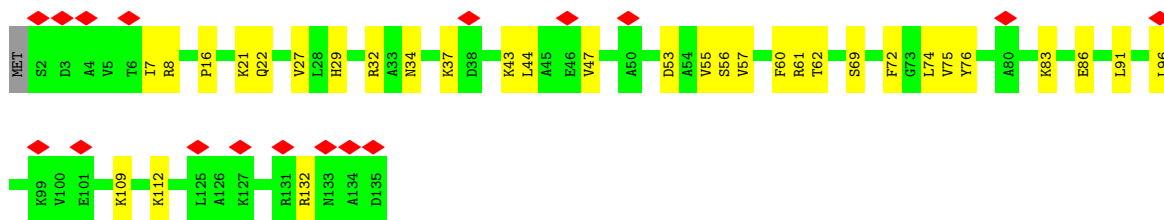
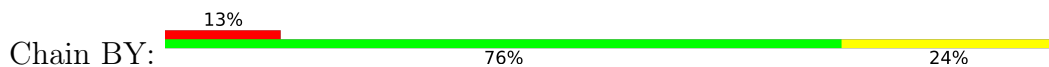
• Molecule 13: RPS22A isoform 1



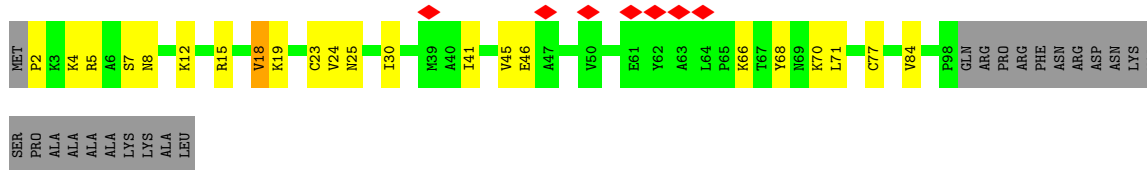
• Molecule 14: 40S ribosomal protein S23-A



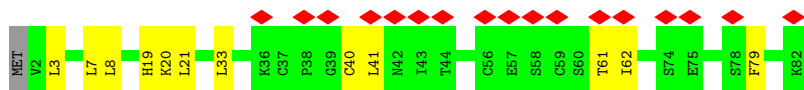
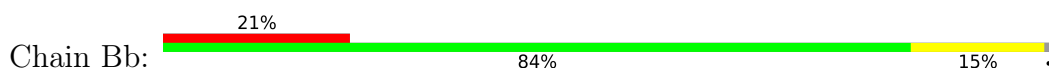
• Molecule 15: 40S ribosomal protein S24-A



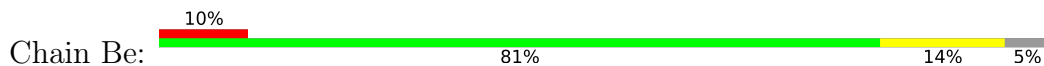
• Molecule 16: RPS26B isoform 1



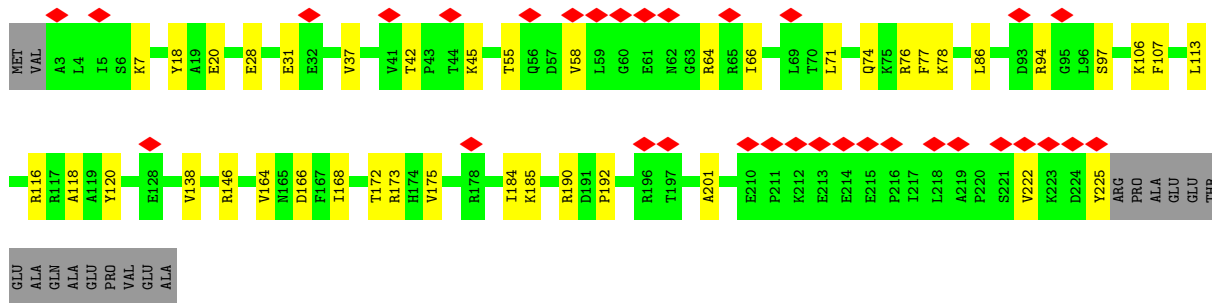
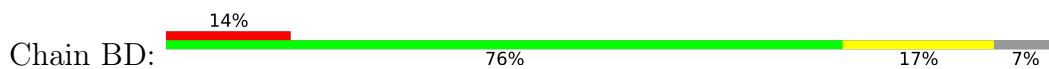
• Molecule 17: 40S ribosomal protein S27-A



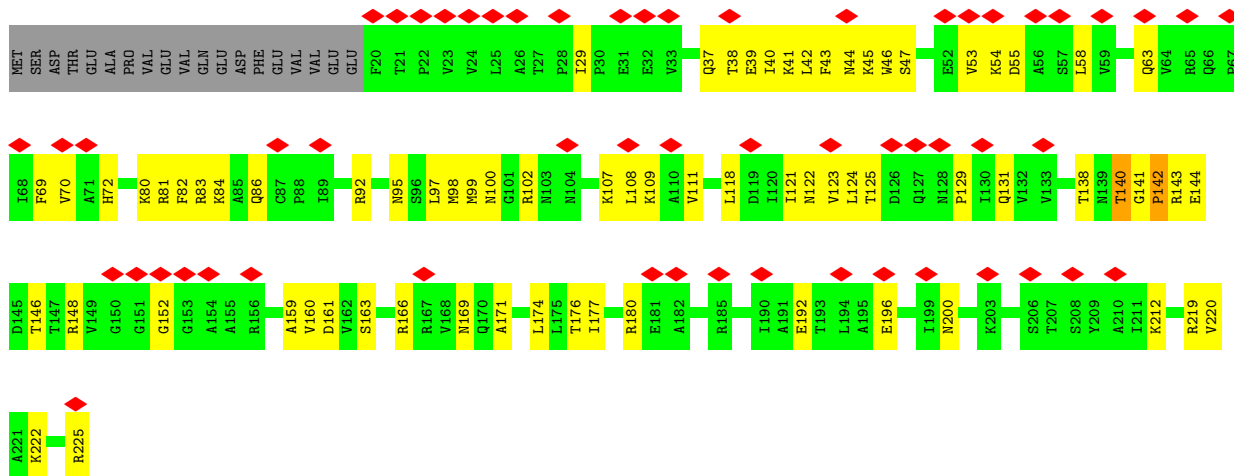
• Molecule 18: 40S ribosomal protein S30-A



• Molecule 19: RPS3 isoform 1

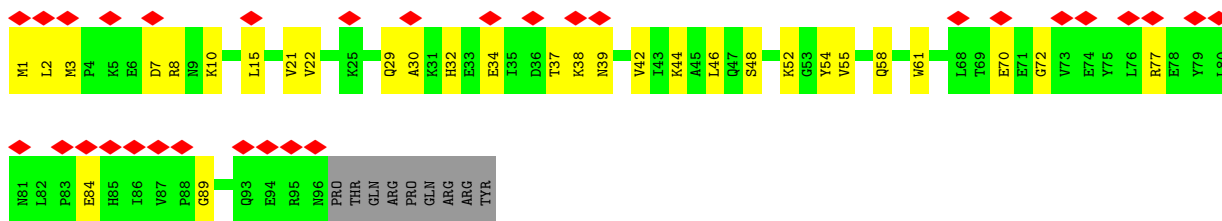


• Molecule 20: Rps5p

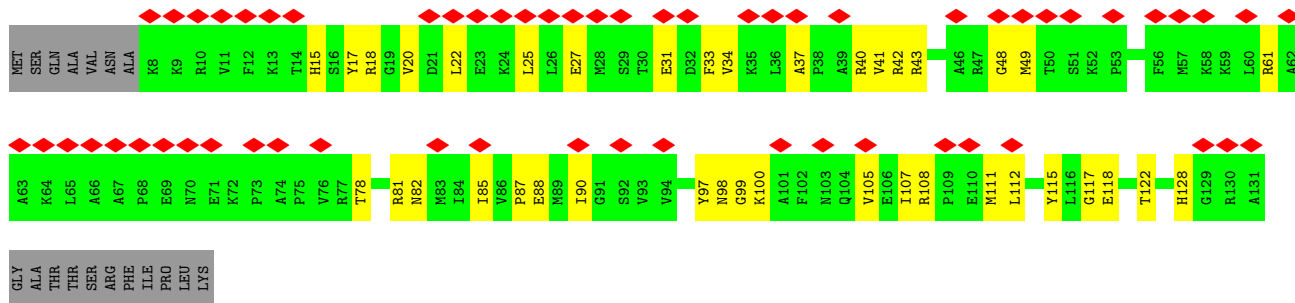
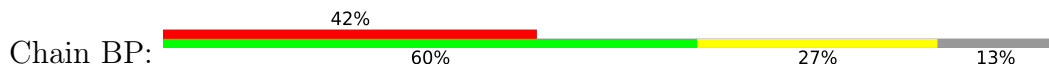


• Molecule 21: 40S ribosomal protein S10-A

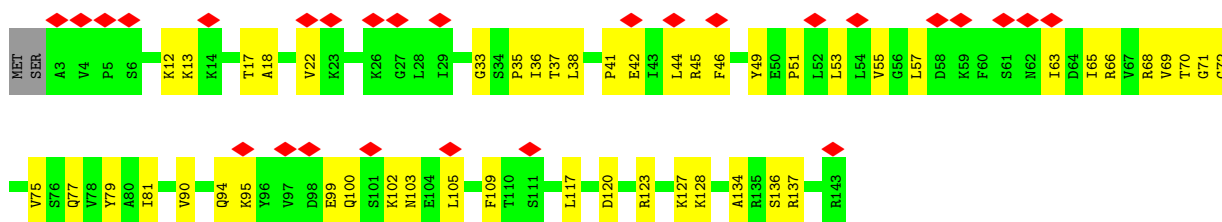




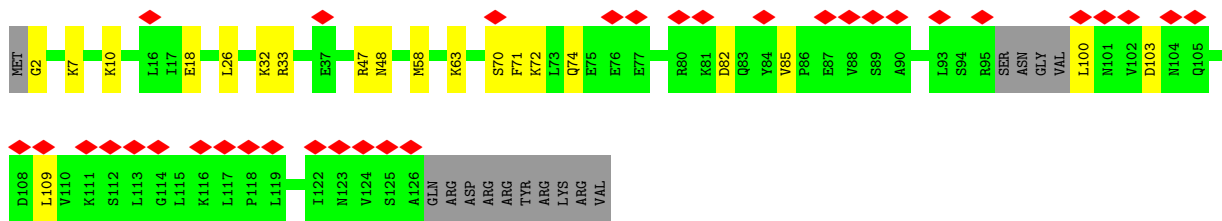
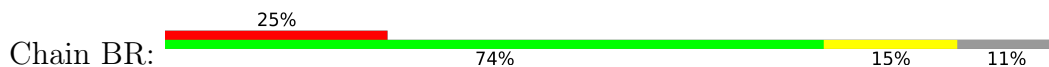
• Molecule 22: RPS15 isoform 1



• Molecule 23: 40S ribosomal protein S16-A

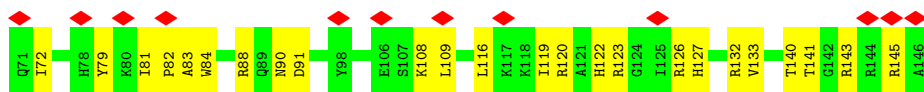


• Molecule 24: 40S ribosomal protein S17-A

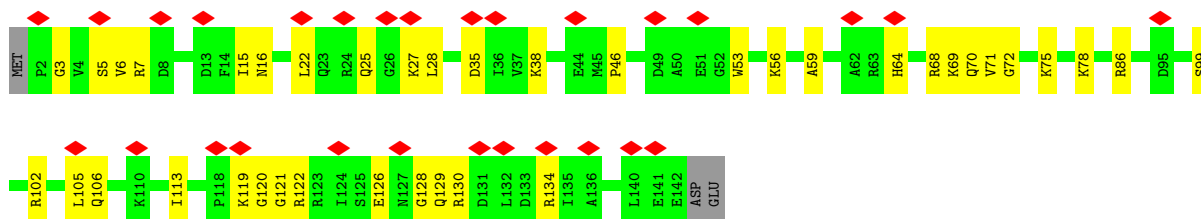
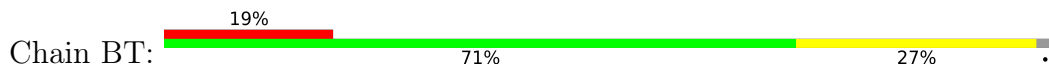


• Molecule 25: 40S ribosomal protein S18-A

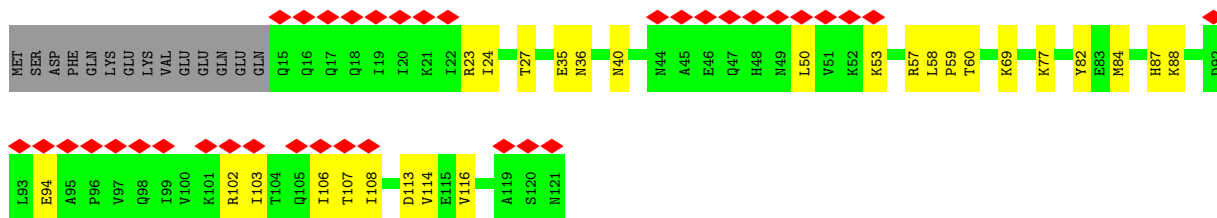




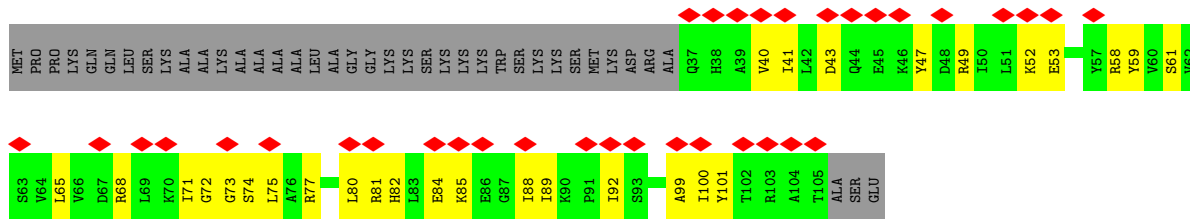
• Molecule 26: 40S ribosomal protein S19-A



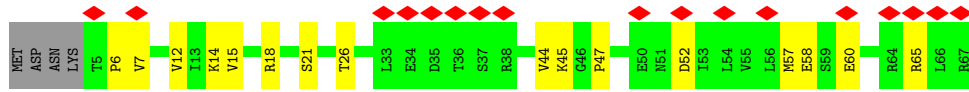
• Molecule 27: RPS20 isoform 1



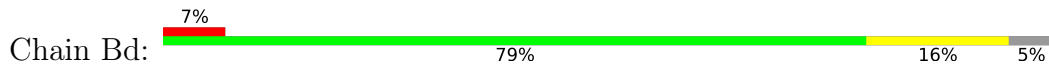
• Molecule 28: RPS25A isoform 1



• Molecule 29: RPS28A isoform 1

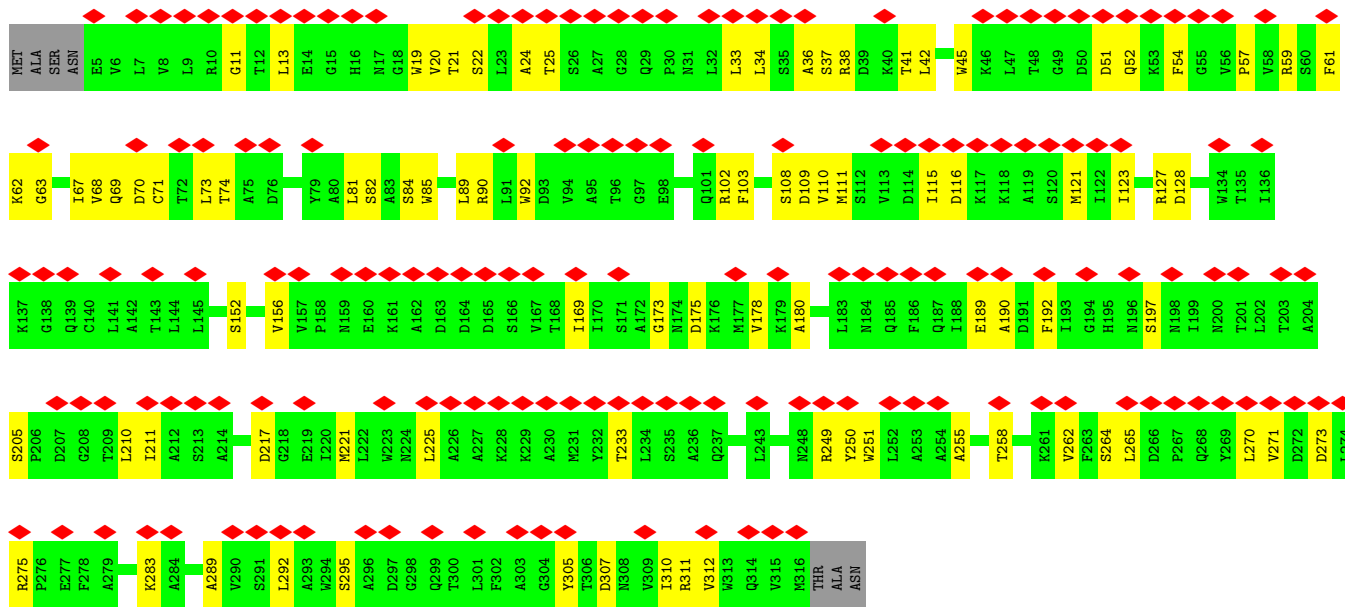
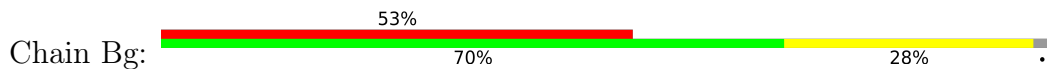


• Molecule 30: RPS29A isoform 1

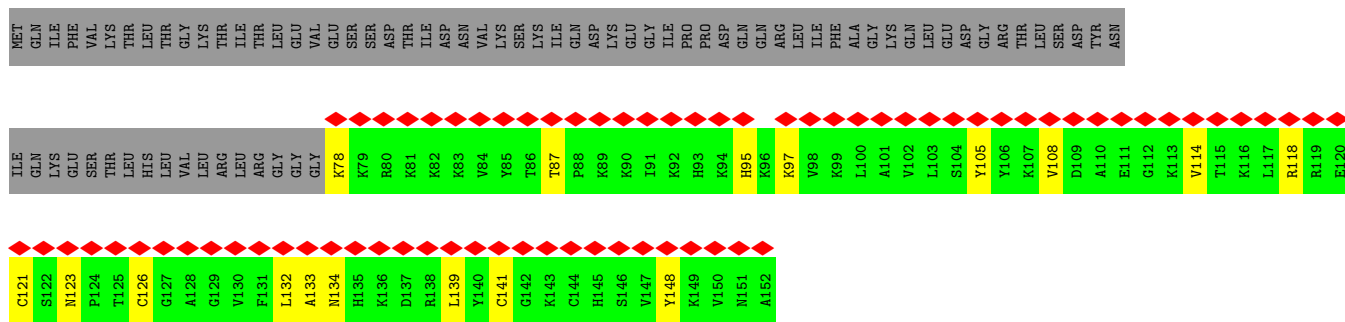
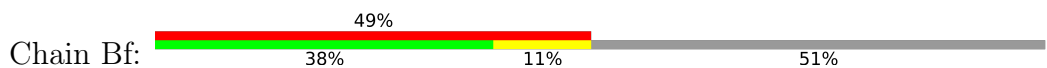




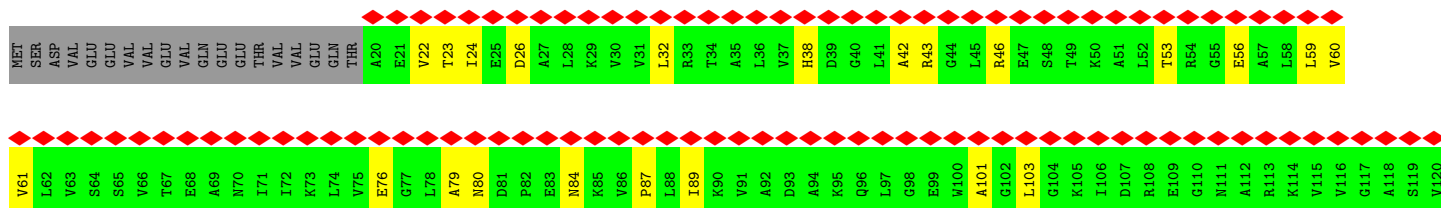
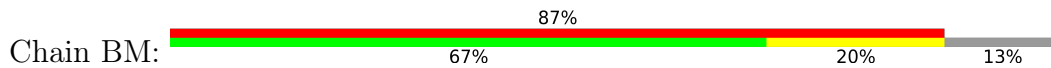
• Molecule 31: Guanine nucleotide-binding protein subunit beta-like protein

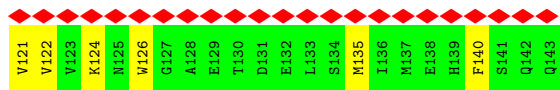


• Molecule 32: Ubiquitin-40S ribosomal protein S31

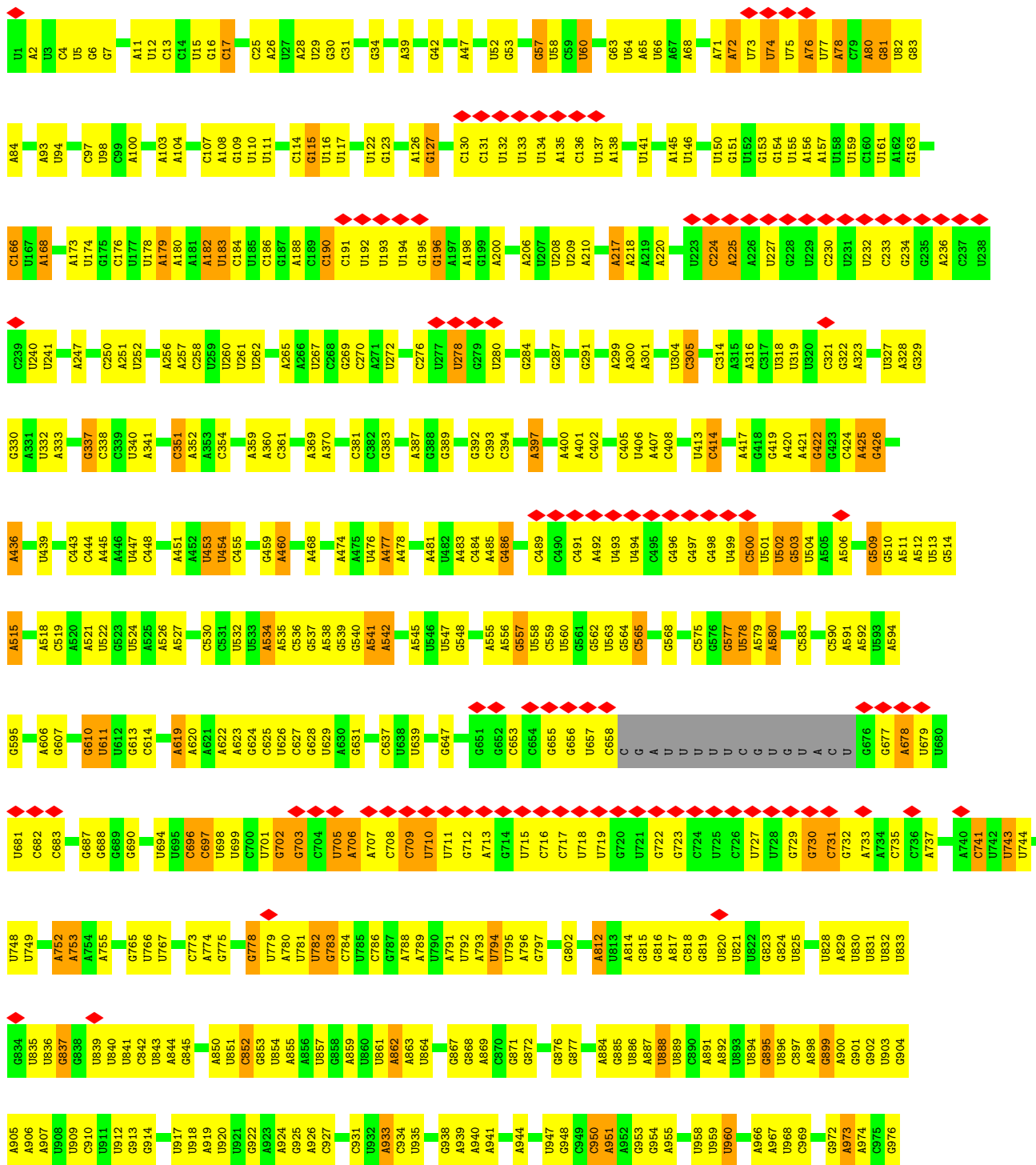


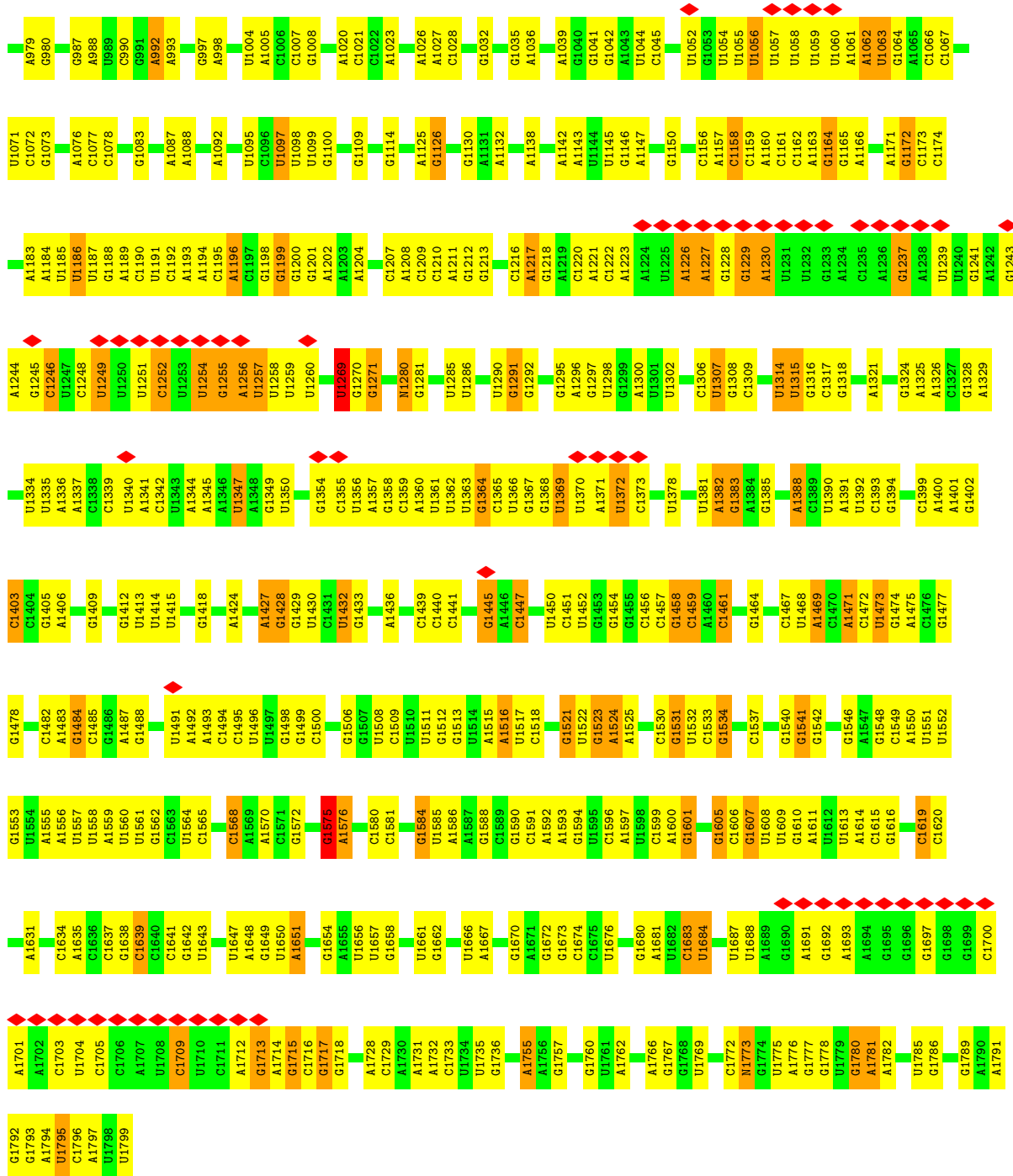
• Molecule 33: 40S ribosomal protein S12



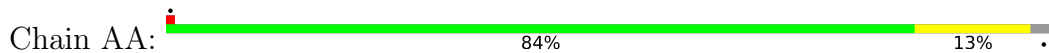


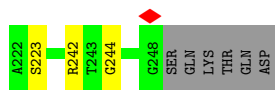
• Molecule 34: 18S rRNA



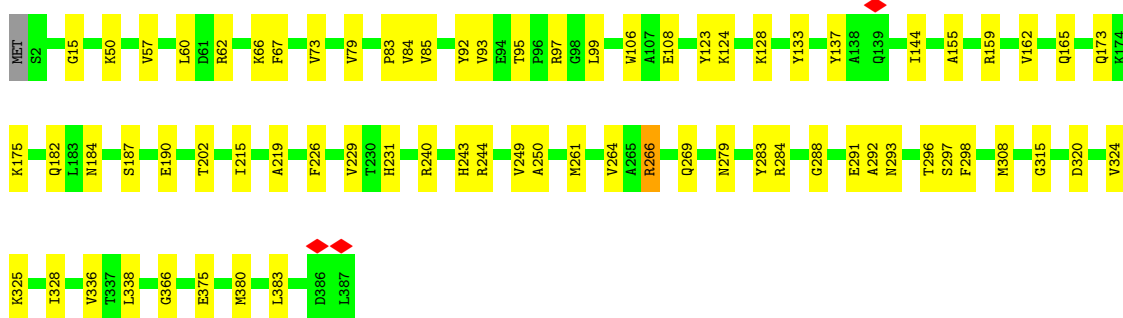
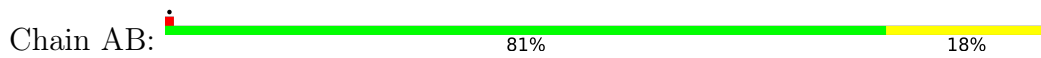


• Molecule 35: 60S ribosomal protein L2-A

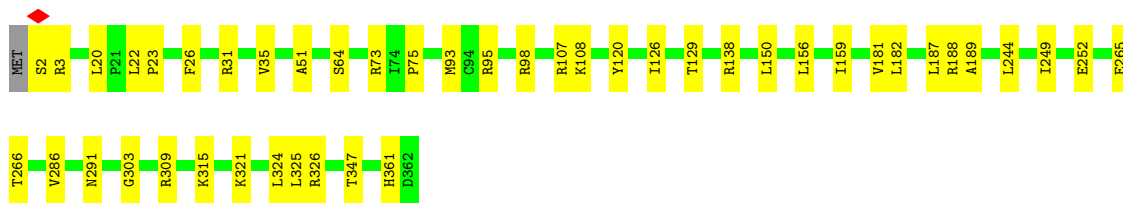




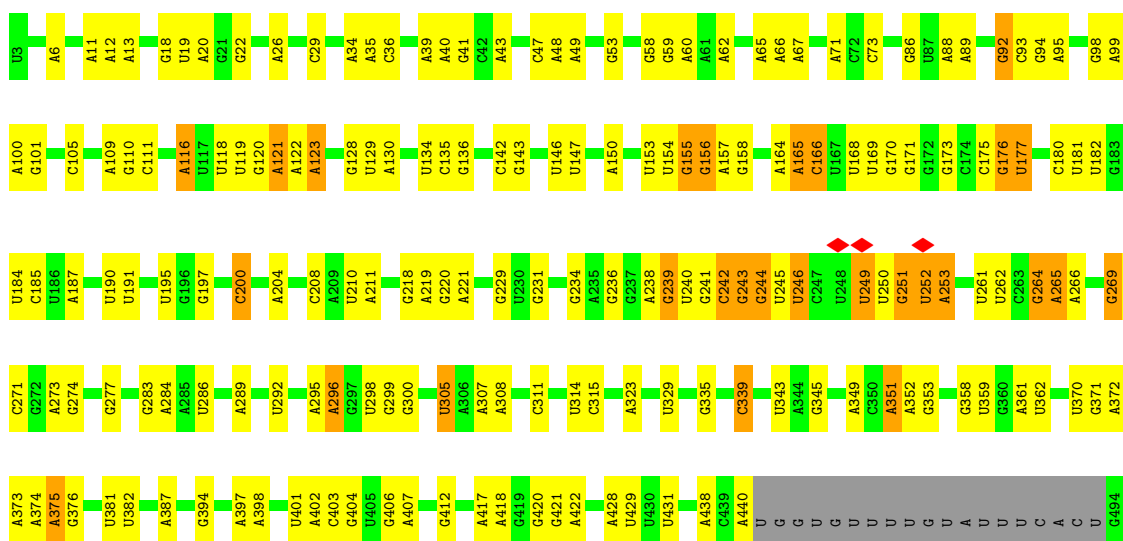
• Molecule 36: 60S ribosomal protein L3

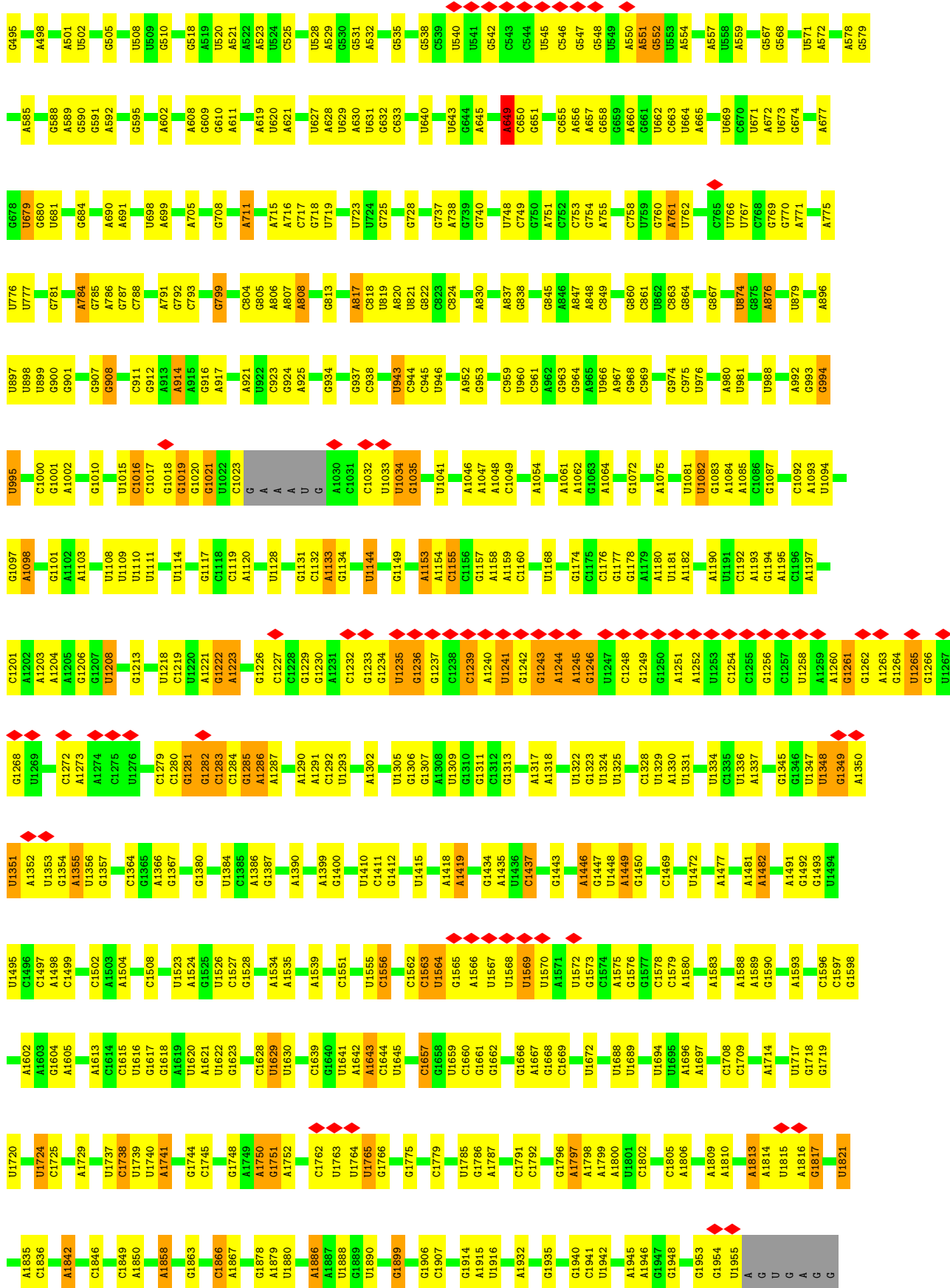


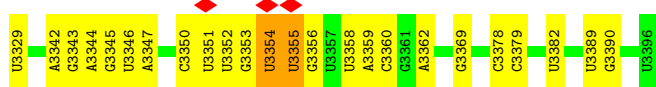
• Molecule 37: RPL4A isoform 1



• Molecule 38: 25S rRNA



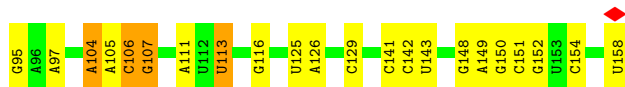




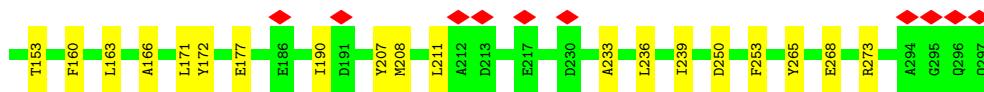
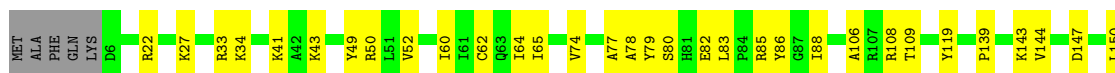
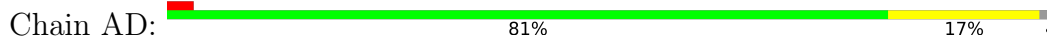
• Molecule 39: 5s rRNA



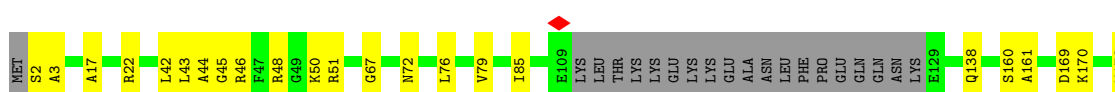
• Molecule 40: 5.8 S rRNA



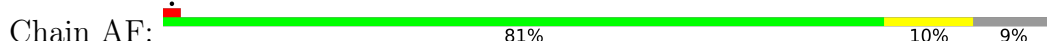
• Molecule 41: RPL5 isoform 1

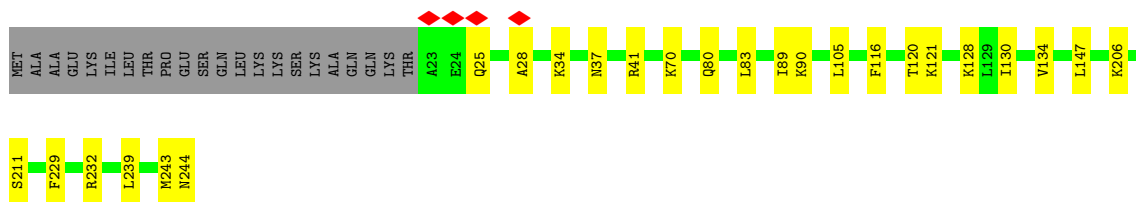


• Molecule 42: 60S ribosomal protein L6-A

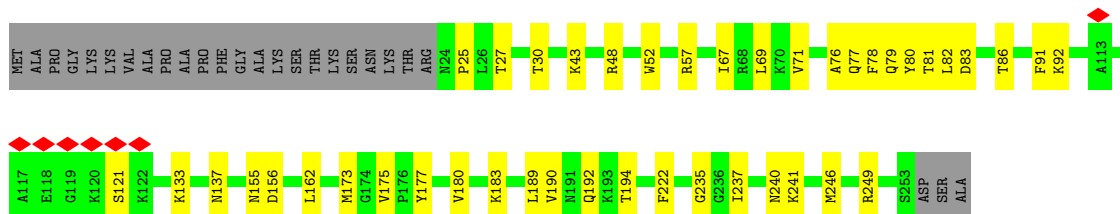
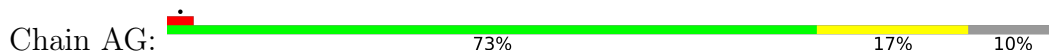


• Molecule 43: 60S ribosomal protein L7-A

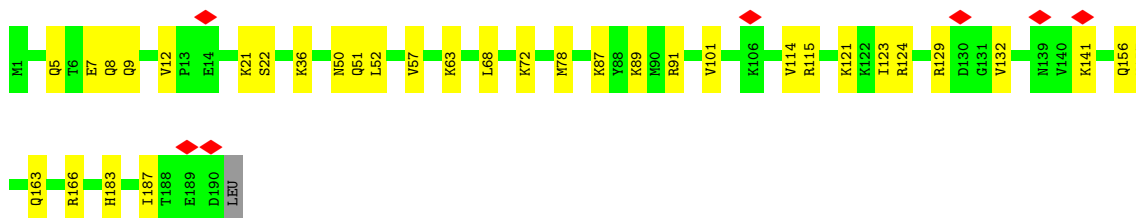
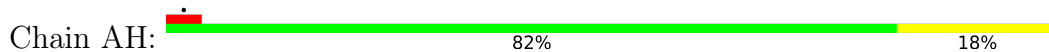




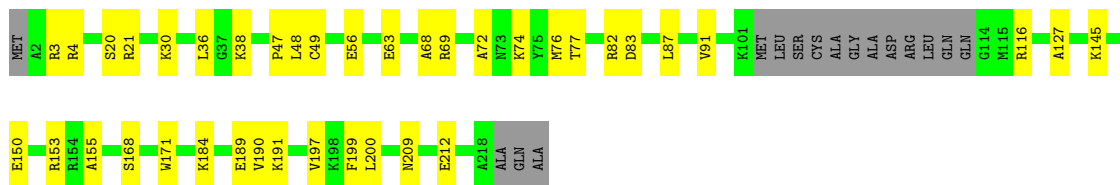
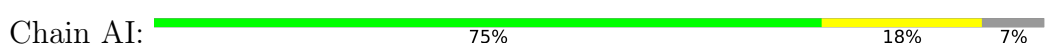
• Molecule 44: 60S ribosomal protein L8-A



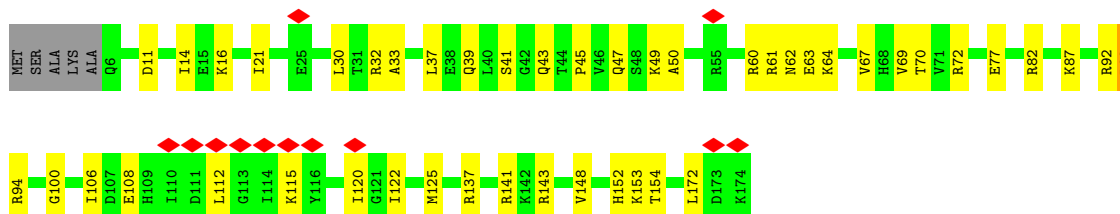
• Molecule 45: 60S ribosomal protein L9-A



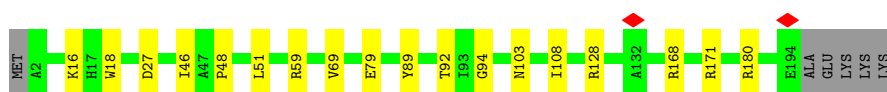
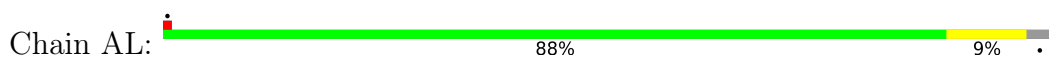
• Molecule 46: RPL10 isoform 1



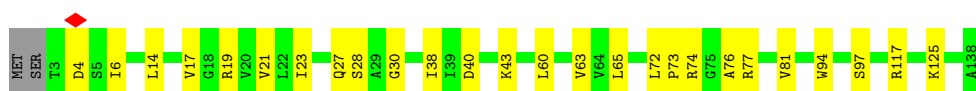
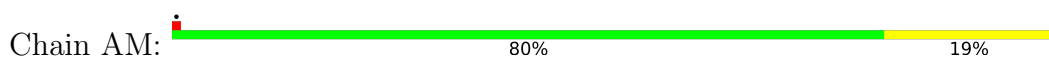
• Molecule 47: RPL11A isoform 1



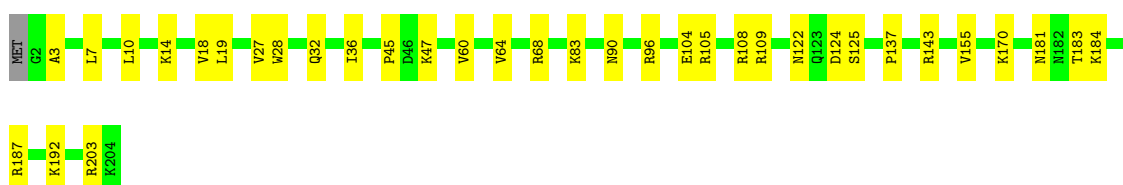
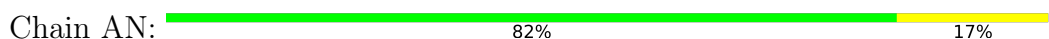
• Molecule 48: 60S ribosomal protein L13-A



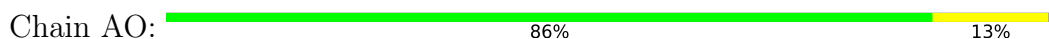
• Molecule 49: 60S ribosomal protein L14-A



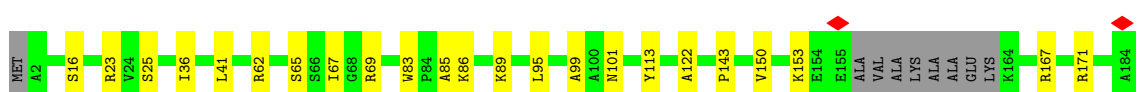
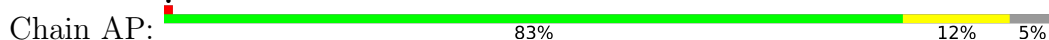
• Molecule 50: 60S ribosomal protein L15-A



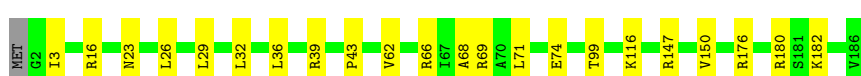
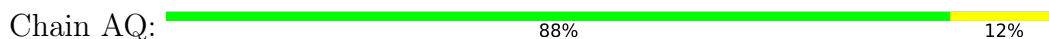
• Molecule 51: 60S ribosomal protein L16-A



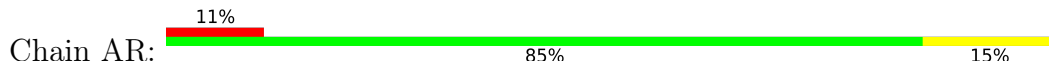
• Molecule 52: 60S ribosomal protein L17-A

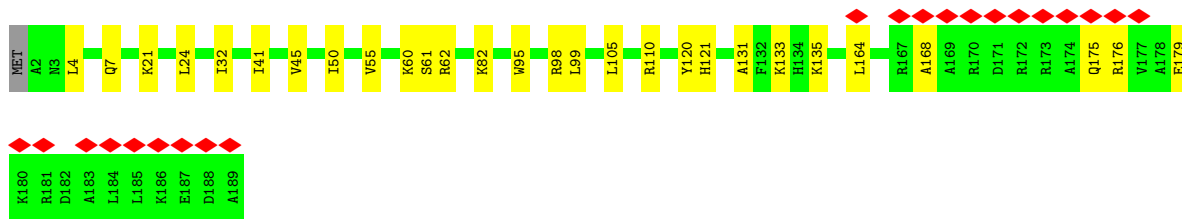


• Molecule 53: 60S ribosomal protein L18-A

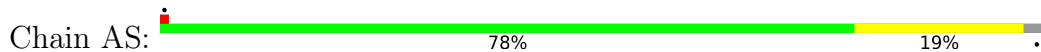


• Molecule 54: 60S ribosomal protein L19-A

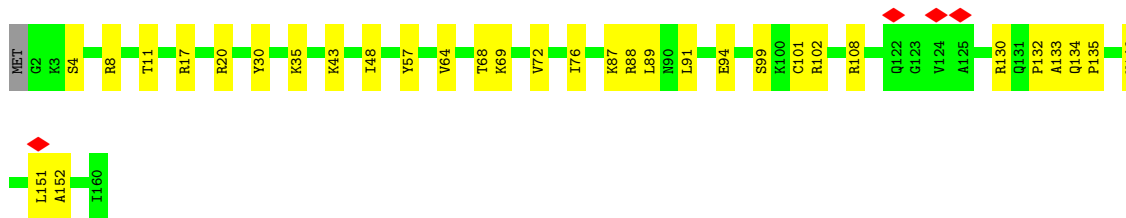
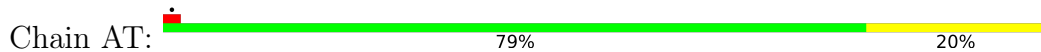




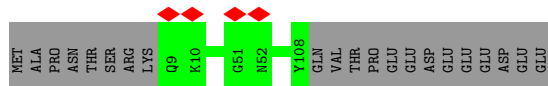
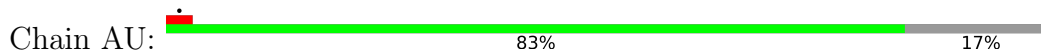
• Molecule 55: 60S ribosomal protein L20



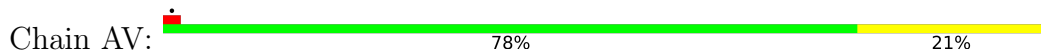
• Molecule 56: 60S ribosomal protein L21-A



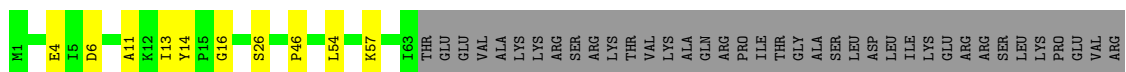
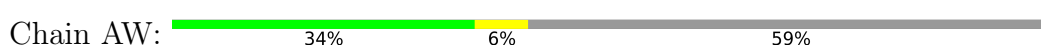
• Molecule 57: 60S ribosomal protein L22-A



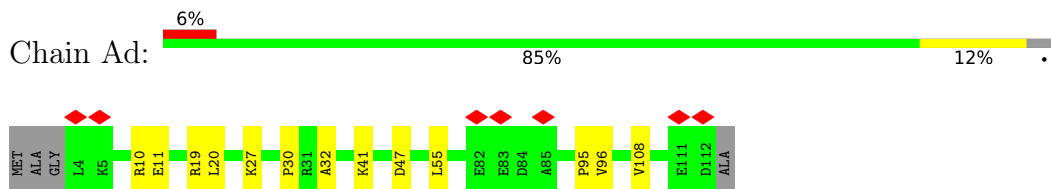
• Molecule 58: 60S ribosomal protein L23-A



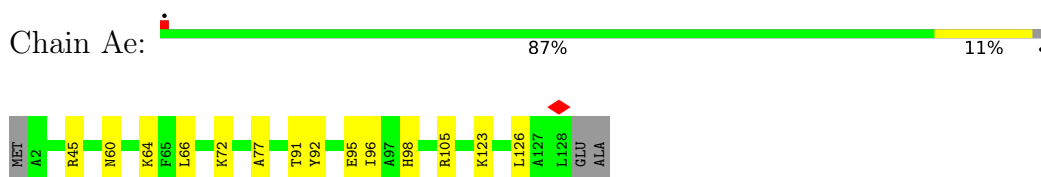
• Molecule 59: RPL24A isoform 1



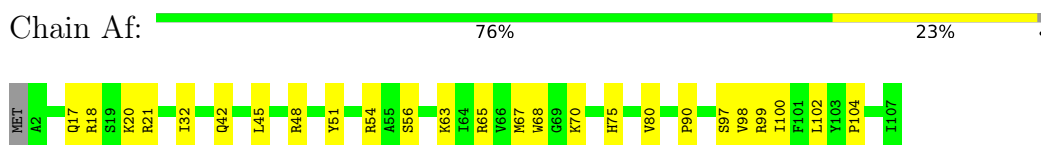
- Molecule 66: 60S ribosomal protein L31-A



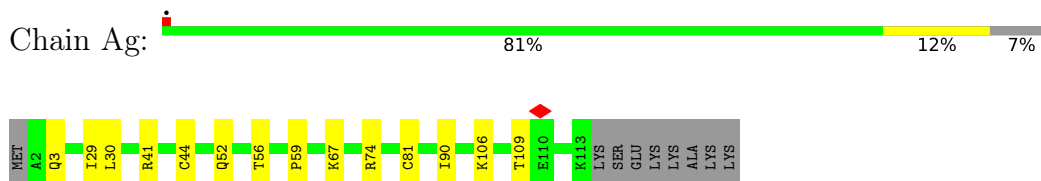
- Molecule 67: RPL32 isoform 1



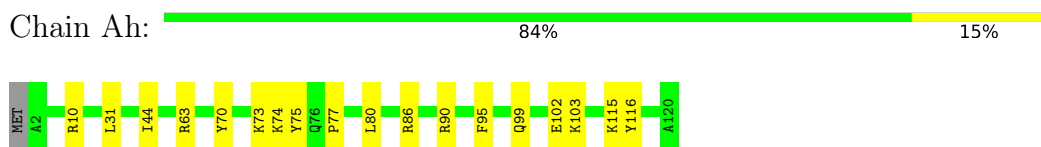
- Molecule 68: 60S ribosomal protein L33-A



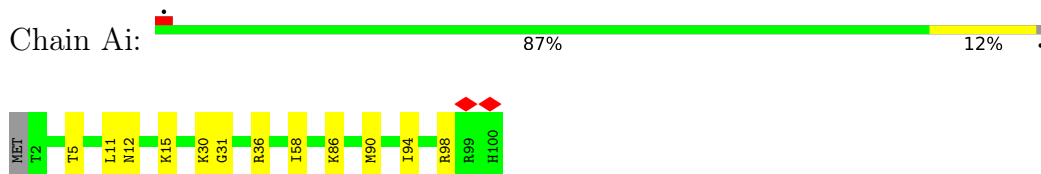
- Molecule 69: 60S ribosomal protein L34-A



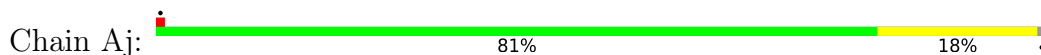
- Molecule 70: 60S ribosomal protein L35-A



- Molecule 71: 60S ribosomal protein L36-A

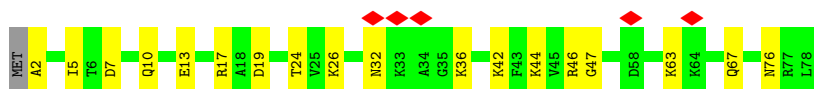
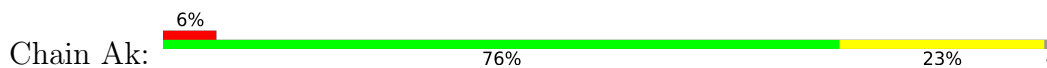


- Molecule 72: 60S ribosomal protein L37-A

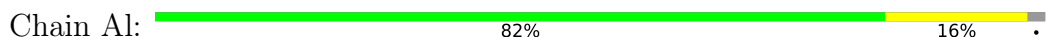




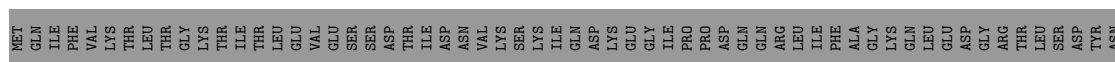
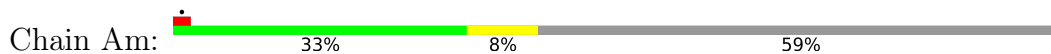
• Molecule 73: RPL38 isoform 1



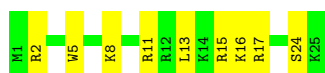
• Molecule 74: 60S ribosomal protein L39



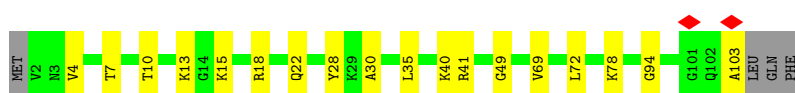
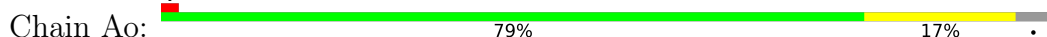
• Molecule 75: Ubiquitin-60S ribosomal protein L40



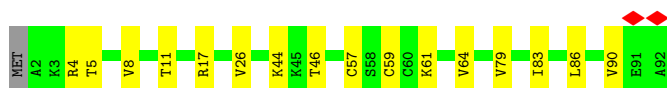
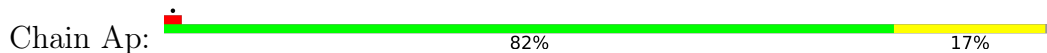
• Molecule 76: 60S ribosomal protein L41-A



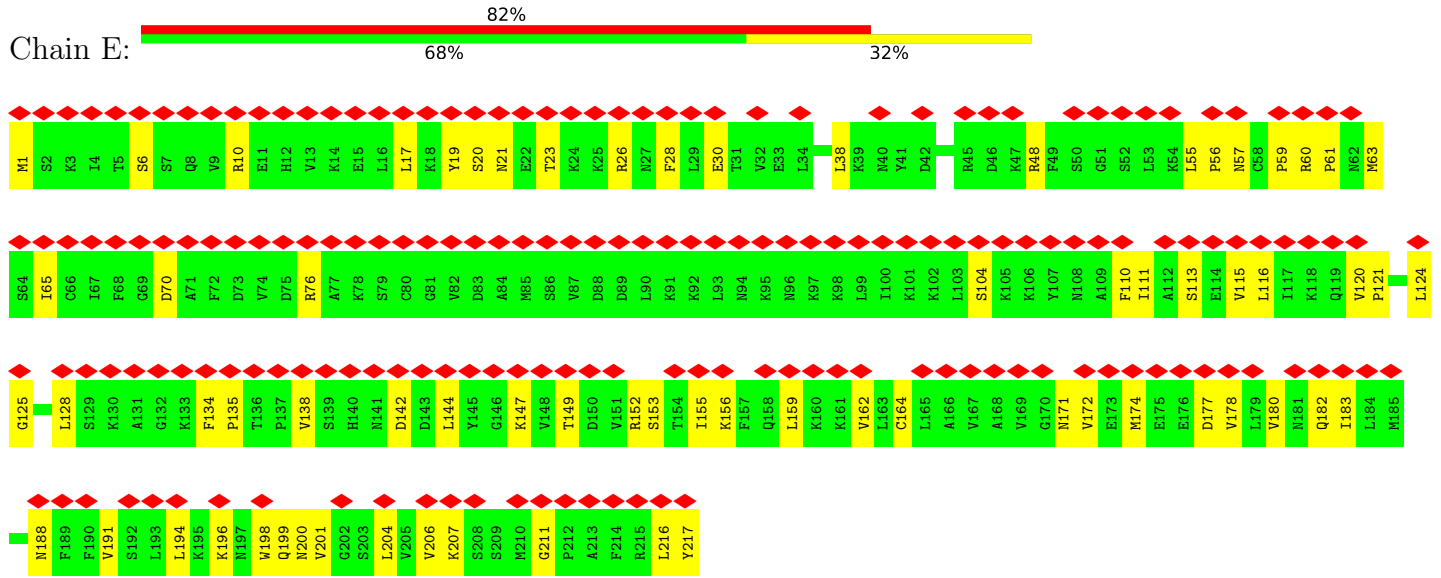
• Molecule 77: 60S ribosomal protein L42-A



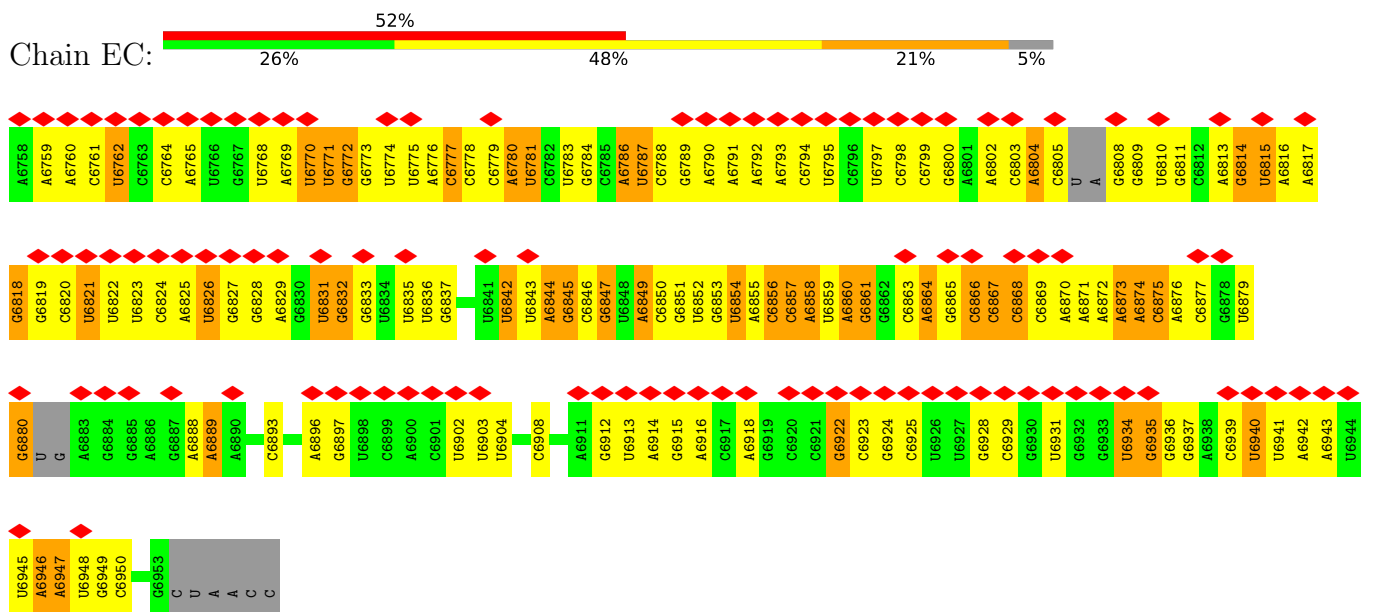
• Molecule 78: 60S ribosomal protein L43-A



• Molecule 79: RPL1A isoform 1



• Molecule 80: internal ribosome entry site (IRES)



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	94694	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	6.788	Depositor
Minimum map value	-2.847	Depositor
Average map value	0.021	Depositor
Map value standard deviation	0.244	Depositor
Recommended contour level	0.6	Depositor
Map size (Å)	423.99997, 423.99997, 423.99997	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 1MA, OMC, 5MC, UR3, OMU, MA6, A2M, MG, HIC, 4AC, G7M, XSX, OMG

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	BA	0.16	0/1653	0.43	0/2261
2	BB	0.20	0/1735	0.58	4/2335 (0.2%)
3	BC	0.17	0/1665	0.40	0/2263
4	BE	0.14	0/2109	0.40	0/2839
5	BG	0.14	0/1844	0.39	0/2464
6	BH	0.21	0/1506	0.51	2/2028 (0.1%)
7	BI	0.16	0/1514	0.46	0/2021
8	BJ	0.14	0/1519	0.41	0/2035
9	BL	0.14	0/1272	0.37	0/1712
10	BN	0.14	0/1215	0.39	0/1638
11	BO	0.17	0/952	0.47	0/1279
12	BV	0.19	0/693	0.52	1/935 (0.1%)
13	BW	0.15	0/1038	0.40	0/1395
14	BX	0.16	0/1139	0.47	0/1518
15	BY	0.15	0/1087	0.43	0/1449
16	Ba	0.19	0/782	0.61	2/1047 (0.2%)
17	Bb	0.15	0/620	0.44	0/838
18	Be	0.12	0/483	0.40	0/643
19	BD	0.15	0/1759	0.43	0/2368
20	BF	0.36	2/1629 (0.1%)	1.00	8/2202 (0.4%)
21	BK	0.18	0/837	0.56	2/1131 (0.2%)
22	BP	0.16	0/1012	0.46	0/1356
23	BQ	0.20	0/1125	0.49	0/1510
24	BR	0.18	0/984	0.43	0/1318
25	BS	0.14	0/1211	0.42	0/1628
26	BT	0.15	0/1113	0.42	0/1494
27	BU	0.18	0/865	0.45	0/1169
28	BZ	0.17	0/566	0.47	0/761
29	Bc	0.42	1/499 (0.2%)	0.74	3/670 (0.4%)
30	Bd	0.13	0/453	0.38	0/602
31	Bg	0.16	0/2454	0.45	0/3340
32	Bf	0.23	0/616	0.59	0/817

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	BM	0.19	0/943	0.48	0/1274
34	B5	0.16	2/41880 (0.0%)	0.33	0/65248
35	AA	0.17	0/1912	0.39	0/2569
36	AB	0.17	0/3138	0.41	0/4217
37	AC	0.16	0/2800	0.40	0/3790
38	A1	0.18	2/75561 (0.0%)	0.36	0/117806
39	A3	0.14	0/2883	0.31	0/4491
40	A4	0.16	0/3746	0.33	0/5832
41	AD	0.15	0/2390	0.41	0/3225
42	AE	0.15	0/1260	0.40	0/1694
43	AF	0.17	0/1821	0.41	0/2451
44	AG	0.18	0/1830	0.46	0/2469
45	AH	0.17	0/1531	0.44	0/2062
46	AI	0.15	0/1708	0.36	0/2290
47	AJ	0.19	0/1374	0.52	2/1842 (0.1%)
48	AL	0.15	0/1568	0.40	0/2106
49	AM	0.14	0/1068	0.37	0/1438
50	AN	0.16	0/1757	0.40	0/2354
51	AO	0.14	0/1585	0.36	0/2128
52	AP	0.16	0/1410	0.38	0/1893
53	AQ	0.13	0/1465	0.36	0/1965
54	AR	0.14	0/1538	0.34	0/2050
55	AS	0.20	0/1481	0.46	0/1990
56	AT	0.17	0/1300	0.38	0/1743
57	AU	0.15	0/812	0.43	0/1099
58	AV	0.16	0/1018	0.39	0/1369
59	AW	0.15	0/533	0.37	0/707
60	AX	0.16	0/983	0.37	0/1325
61	AY	0.18	0/1004	0.37	0/1341
62	AZ	0.16	0/1118	0.43	0/1497
63	Aa	0.16	0/1204	0.44	0/1612
64	Ab	0.15	0/473	0.36	0/629
65	Ac	0.12	0/751	0.34	0/1008
66	Ad	0.14	0/904	0.35	0/1213
67	Ae	0.15	0/1041	0.39	0/1394
68	Af	0.16	0/868	0.35	0/1168
69	Ag	0.19	0/890	0.43	0/1189
70	Ah	0.14	0/978	0.37	0/1301
71	Ai	0.18	0/778	0.42	0/1034
72	Aj	0.17	0/696	0.44	0/923
73	Ak	0.14	0/618	0.42	0/826
74	Al	0.14	0/443	0.36	0/588
75	Am	0.14	0/423	0.37	0/562

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	An	0.17	0/234	0.39	0/300
77	Ao	0.15	0/831	0.40	0/1097
78	Ap	0.17	0/701	0.46	0/934
79	E	0.20	0/1745	0.49	0/2342
80	EC	0.18	0/4571	0.42	0/7114
All	All	0.17	7/219515 (0.0%)	0.39	24/322565 (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
1	BA	0	1
2	BB	0	2
15	BY	0	1
36	AB	0	1
41	AD	0	1
42	AE	0	1
43	AF	0	1
44	AG	0	3
54	AR	0	1
63	Aa	0	1
All	All	0	13

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
20	BF	142	PRO	CG-CD	-8.27	1.22	1.50
29	Bc	6	PRO	CG-CD	-7.85	1.24	1.50
34	B5	1575	G7M	O3'-P	6.58	1.62	1.56
38	A1	2256	A2M	O3'-P	6.25	1.62	1.56
20	BF	142	PRO	CB-CG	-5.27	1.23	1.49

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
20	BF	142	PRO	N-CD-CG	-23.91	67.34	103.20
20	BF	142	PRO	CB-CG-CD	23.07	179.93	106.10
20	BF	142	PRO	CA-CB-CG	-19.83	66.83	104.50
29	Bc	6	PRO	N-CD-CG	-11.88	85.39	103.20
29	Bc	6	PRO	CA-N-CD	-7.20	101.92	112.00

There are no chirality outliers.

5 of 13 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
36	AB	266	ARG	Sidechain
1	BA	94	GLY	Peptide
2	BB	177	GLN	Peptide
2	BB	178	GLY	Peptide
15	BY	34	ASN	Peptide

5.2 Too-close contacts [i](#)

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	BA	1612	0	1623	51	0
2	BB	1709	0	1784	52	0
3	BC	1635	0	1723	38	0
4	BE	2068	0	2154	44	0
5	BG	1820	0	1918	46	0
6	BH	1481	0	1572	30	0
7	BI	1489	0	1525	33	0
8	BJ	1494	0	1573	21	0
9	BL	1244	0	1314	13	0
10	BN	1192	0	1255	16	0
11	BO	941	0	979	24	0
12	BV	684	0	672	16	0
13	BW	1021	0	1060	27	0
14	BX	1121	0	1196	20	0
15	BY	1073	0	1132	21	0
16	Ba	769	0	818	17	0
17	Bb	610	0	633	10	0
18	Be	475	0	525	8	0
19	BD	1734	0	1817	29	0
20	BF	1609	0	1675	61	0
21	BK	817	0	804	21	0
22	BP	991	0	1035	33	0
23	BQ	1105	0	1166	39	0
24	BR	975	0	1039	19	0
25	BS	1192	0	1222	37	0
26	BT	1095	0	1114	30	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
27	BU	855	0	917	22	0
28	BZ	558	0	598	27	0
29	Bc	497	0	535	11	0
30	Bd	443	0	436	11	0
31	Bg	2401	0	2356	61	0
32	Bf	605	0	654	17	0
33	BM	935	0	975	20	0
34	B5	38004	0	19140	573	0
35	AA	1878	0	1946	28	0
36	AB	3080	0	3158	57	0
37	AC	2748	0	2859	34	0
38	A1	68445	0	34457	654	0
39	A3	2579	0	1304	32	0
40	A4	3353	0	1695	37	0
41	AD	2341	0	2290	35	0
42	AE	1239	0	1326	18	0
43	AF	1784	0	1862	18	0
44	AG	1798	0	1894	28	0
45	AH	1510	0	1576	22	0
46	AI	1672	0	1711	23	0
47	AJ	1353	0	1383	30	0
48	AL	1543	0	1608	14	0
49	AM	1053	0	1149	18	0
50	AN	1720	0	1779	26	0
51	AO	1555	0	1659	18	0
52	AP	1388	0	1423	18	0
53	AQ	1441	0	1543	17	0
54	AR	1521	0	1617	19	0
55	AS	1445	0	1487	28	0
56	AT	1276	0	1323	27	0
57	AU	796	0	812	0	0
58	AV	1003	0	1048	17	0
59	AW	521	0	551	7	0
60	AX	968	0	1036	5	0
61	AY	993	0	1081	17	0
62	AZ	1092	0	1155	19	0
63	Aa	1173	0	1215	29	0
64	Ab	462	0	491	5	0
65	Ac	743	0	797	11	0
66	Ad	890	0	938	7	0
67	Ae	1020	0	1089	11	0
68	Af	850	0	880	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
69	Ag	880	0	945	12	0
70	Ah	969	0	1078	13	0
71	Ai	771	0	849	9	0
72	Aj	681	0	687	13	0
73	Ak	612	0	682	13	0
74	Al	436	0	475	6	0
75	Am	417	0	459	9	0
76	An	233	0	284	9	0
77	Ao	819	0	886	15	0
78	Ap	694	0	738	13	0
79	E	1718	0	1811	51	0
80	EC	4090	0	2068	55	0
81	A1	174	0	0	0	0
81	A3	2	0	0	0	0
81	A4	4	0	0	0	0
81	AB	2	0	0	0	0
81	AI	1	0	0	0	0
81	AL	1	0	0	0	0
81	AP	1	0	0	0	0
81	AR	1	0	0	0	0
81	Ae	1	0	0	0	0
81	Af	1	0	0	0	0
81	Aj	2	0	0	0	0
81	B5	55	0	0	0	0
81	BN	1	0	0	0	0
81	Ba	1	0	0	0	0
82	Ao	1	0	0	0	0
All	All	206055	0	152043	2472	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 7.

The worst 5 of 2472 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)
38:A1:1222:G:N2	38:A1:1286:A:H62	1.51	1.09
38:A1:1222:G:H21	38:A1:1286:A:N6	1.60	0.99
38:A1:2138:A:HO2'	72:Aj:2:GLY:N	1.66	0.92
34:B5:1687:U:H3	34:B5:1715:G:H1	1.12	0.91
34:B5:1213:G:H1	34:B5:1450:U:H3	1.18	0.87

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	BA	204/252 (81%)	185 (91%)	19 (9%)	0	100	100
2	BB	212/255 (83%)	183 (86%)	29 (14%)	0	100	100
3	BC	215/254 (85%)	207 (96%)	8 (4%)	0	100	100
4	BE	258/261 (99%)	238 (92%)	20 (8%)	0	100	100
5	BG	224/236 (95%)	211 (94%)	13 (6%)	0	100	100
6	BH	182/190 (96%)	171 (94%)	11 (6%)	0	100	100
7	BI	184/200 (92%)	167 (91%)	17 (9%)	0	100	100
8	BJ	183/197 (93%)	170 (93%)	13 (7%)	0	100	100
9	BL	153/156 (98%)	139 (91%)	14 (9%)	0	100	100
10	BN	148/151 (98%)	139 (94%)	9 (6%)	0	100	100
11	BO	125/137 (91%)	112 (90%)	13 (10%)	0	100	100
12	BV	85/87 (98%)	71 (84%)	14 (16%)	0	100	100
13	BW	127/130 (98%)	123 (97%)	4 (3%)	0	100	100
14	BX	142/145 (98%)	128 (90%)	14 (10%)	0	100	100
15	BY	132/135 (98%)	123 (93%)	9 (7%)	0	100	100
16	Ba	95/119 (80%)	80 (84%)	15 (16%)	0	100	100
17	Bb	79/82 (96%)	70 (89%)	9 (11%)	0	100	100
18	Be	58/63 (92%)	52 (90%)	6 (10%)	0	100	100
19	BD	221/240 (92%)	209 (95%)	12 (5%)	0	100	100
20	BF	204/225 (91%)	186 (91%)	18 (9%)	0	100	100
21	BK	94/105 (90%)	82 (87%)	12 (13%)	0	100	100
22	BP	122/142 (86%)	109 (89%)	13 (11%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	BQ	139/143 (97%)	136 (98%)	3 (2%)	0	100	100
24	BR	117/136 (86%)	112 (96%)	5 (4%)	0	100	100
25	BS	143/146 (98%)	130 (91%)	13 (9%)	0	100	100
26	BT	139/144 (96%)	125 (90%)	14 (10%)	0	100	100
27	BU	105/121 (87%)	100 (95%)	5 (5%)	0	100	100
28	BZ	67/108 (62%)	64 (96%)	3 (4%)	0	100	100
29	Bc	61/67 (91%)	54 (88%)	7 (12%)	0	100	100
30	Bd	51/56 (91%)	50 (98%)	1 (2%)	0	100	100
31	Bg	310/319 (97%)	276 (89%)	34 (11%)	0	100	100
32	Bf	73/152 (48%)	67 (92%)	6 (8%)	0	100	100
33	BM	122/143 (85%)	107 (88%)	15 (12%)	0	100	100
35	AA	245/254 (96%)	232 (95%)	13 (5%)	0	100	100
36	AB	383/387 (99%)	361 (94%)	22 (6%)	0	100	100
37	AC	359/362 (99%)	340 (95%)	19 (5%)	0	100	100
41	AD	290/297 (98%)	273 (94%)	17 (6%)	0	100	100
42	AE	152/176 (86%)	142 (93%)	10 (7%)	0	100	100
43	AF	220/244 (90%)	211 (96%)	9 (4%)	0	100	100
44	AG	228/256 (89%)	211 (92%)	17 (8%)	0	100	100
45	AH	188/191 (98%)	173 (92%)	15 (8%)	0	100	100
46	AI	201/221 (91%)	188 (94%)	13 (6%)	0	100	100
47	AJ	167/174 (96%)	152 (91%)	15 (9%)	0	100	100
48	AL	191/199 (96%)	175 (92%)	16 (8%)	0	100	100
49	AM	134/138 (97%)	129 (96%)	5 (4%)	0	100	100
50	AN	201/204 (98%)	189 (94%)	12 (6%)	0	100	100
51	AO	195/199 (98%)	192 (98%)	3 (2%)	0	100	100
52	AP	171/184 (93%)	167 (98%)	4 (2%)	0	100	100
53	AQ	183/186 (98%)	177 (97%)	6 (3%)	0	100	100
54	AR	186/189 (98%)	179 (96%)	7 (4%)	0	100	100
55	AS	170/178 (96%)	162 (95%)	8 (5%)	0	100	100
56	AT	157/160 (98%)	147 (94%)	10 (6%)	0	100	100
57	AU	98/121 (81%)	93 (95%)	5 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
58	AV	134/137 (98%)	132 (98%)	2 (2%)	0	100	100
59	AW	61/155 (39%)	61 (100%)	0	0	100	100
60	AX	119/142 (84%)	113 (95%)	6 (5%)	0	100	100
61	AY	124/127 (98%)	122 (98%)	2 (2%)	0	100	100
62	AZ	133/136 (98%)	126 (95%)	7 (5%)	0	100	100
63	Aa	146/149 (98%)	132 (90%)	14 (10%)	0	100	100
64	Ab	56/59 (95%)	50 (89%)	6 (11%)	0	100	100
65	Ac	95/105 (90%)	94 (99%)	1 (1%)	0	100	100
66	Ad	107/113 (95%)	103 (96%)	4 (4%)	0	100	100
67	Ae	125/130 (96%)	120 (96%)	5 (4%)	0	100	100
68	Af	104/107 (97%)	98 (94%)	6 (6%)	0	100	100
69	Ag	110/121 (91%)	107 (97%)	3 (3%)	0	100	100
70	Ah	117/120 (98%)	113 (97%)	4 (3%)	0	100	100
71	Ai	97/100 (97%)	91 (94%)	6 (6%)	0	100	100
72	Aj	85/88 (97%)	81 (95%)	4 (5%)	0	100	100
73	Ak	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
74	Al	48/51 (94%)	47 (98%)	1 (2%)	0	100	100
75	Am	50/128 (39%)	48 (96%)	2 (4%)	0	100	100
76	An	23/25 (92%)	22 (96%)	1 (4%)	0	100	100
77	Ao	100/106 (94%)	91 (91%)	9 (9%)	0	100	100
78	Ap	89/92 (97%)	84 (94%)	5 (6%)	0	100	100
79	E	215/217 (99%)	204 (95%)	11 (5%)	0	100	100
All	All	11106/12103 (92%)	10380 (94%)	726 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	BA	173/210 (82%)	173 (100%)	0	100	100
2	BB	191/224 (85%)	191 (100%)	0	100	100
3	BC	176/205 (86%)	176 (100%)	0	100	100
4	BE	221/222 (100%)	221 (100%)	0	100	100
5	BG	193/201 (96%)	193 (100%)	0	100	100
6	BH	165/170 (97%)	165 (100%)	0	100	100
7	BI	150/161 (93%)	150 (100%)	0	100	100
8	BJ	158/166 (95%)	158 (100%)	0	100	100
9	BL	136/137 (99%)	136 (100%)	0	100	100
10	BN	127/128 (99%)	127 (100%)	0	100	100
11	BO	96/105 (91%)	96 (100%)	0	100	100
12	BV	74/74 (100%)	74 (100%)	0	100	100
13	BW	110/111 (99%)	110 (100%)	0	100	100
14	BX	119/120 (99%)	119 (100%)	0	100	100
15	BY	112/113 (99%)	112 (100%)	0	100	100
16	Ba	83/100 (83%)	83 (100%)	0	100	100
17	Bb	70/71 (99%)	70 (100%)	0	100	100
18	Be	51/54 (94%)	51 (100%)	0	100	100
19	BD	182/195 (93%)	182 (100%)	0	100	100
20	BF	173/191 (91%)	173 (100%)	0	100	100
21	BK	89/98 (91%)	89 (100%)	0	100	100
22	BP	104/118 (88%)	104 (100%)	0	100	100
23	BQ	117/119 (98%)	117 (100%)	0	100	100
24	BR	110/124 (89%)	110 (100%)	0	100	100
25	BS	128/129 (99%)	128 (100%)	0	100	100
26	BT	113/116 (97%)	113 (100%)	0	100	100
27	BU	100/114 (88%)	100 (100%)	0	100	100
28	BZ	61/89 (68%)	61 (100%)	0	100	100
29	Bc	56/60 (93%)	56 (100%)	0	100	100
30	Bd	47/49 (96%)	47 (100%)	0	100	100
31	Bg	256/262 (98%)	256 (100%)	0	100	100
32	Bf	66/135 (49%)	66 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	BM	100/119 (84%)	100 (100%)	0	100	100
35	AA	189/196 (96%)	189 (100%)	0	100	100
36	AB	320/322 (99%)	320 (100%)	0	100	100
37	AC	288/289 (100%)	288 (100%)	0	100	100
41	AD	241/245 (98%)	241 (100%)	0	100	100
42	AE	134/153 (88%)	134 (100%)	0	100	100
43	AF	186/205 (91%)	186 (100%)	0	100	100
44	AG	189/208 (91%)	189 (100%)	0	100	100
45	AH	170/171 (99%)	170 (100%)	0	100	100
46	AI	176/187 (94%)	176 (100%)	0	100	100
47	AJ	147/150 (98%)	147 (100%)	0	100	100
48	AL	154/159 (97%)	154 (100%)	0	100	100
49	AM	107/109 (98%)	107 (100%)	0	100	100
50	AN	175/176 (99%)	175 (100%)	0	100	100
51	AO	160/162 (99%)	160 (100%)	0	100	100
52	AP	141/146 (97%)	141 (100%)	0	100	100
53	AQ	150/151 (99%)	150 (100%)	0	100	100
54	AR	153/154 (99%)	153 (100%)	0	100	100
55	AS	156/162 (96%)	156 (100%)	0	100	100
56	AT	136/137 (99%)	136 (100%)	0	100	100
57	AU	87/107 (81%)	87 (100%)	0	100	100
58	AV	104/105 (99%)	104 (100%)	0	100	100
59	AW	55/129 (43%)	55 (100%)	0	100	100
60	AX	105/118 (89%)	105 (100%)	0	100	100
61	AY	109/110 (99%)	109 (100%)	0	100	100
62	AZ	115/116 (99%)	115 (100%)	0	100	100
63	Aa	118/119 (99%)	118 (100%)	0	100	100
64	Ab	46/47 (98%)	46 (100%)	0	100	100
65	Ac	81/88 (92%)	81 (100%)	0	100	100
66	Ad	96/97 (99%)	96 (100%)	0	100	100
67	Ae	109/111 (98%)	109 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
68	Af	90/91 (99%)	90 (100%)	0	100	100
69	Ag	95/103 (92%)	95 (100%)	0	100	100
70	Ah	104/105 (99%)	104 (100%)	0	100	100
71	Ai	81/82 (99%)	81 (100%)	0	100	100
72	Aj	70/71 (99%)	70 (100%)	0	100	100
73	Ak	68/69 (99%)	68 (100%)	0	100	100
74	Al	45/46 (98%)	45 (100%)	0	100	100
75	Am	47/116 (40%)	47 (100%)	0	100	100
76	An	23/23 (100%)	23 (100%)	0	100	100
77	Ao	87/91 (96%)	87 (100%)	0	100	100
78	Ap	71/72 (99%)	71 (100%)	0	100	100
79	E	198/198 (100%)	198 (100%)	0	100	100
All	All	9483/10186 (93%)	9483 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 117 such sidechains are listed below:

Mol	Chain	Res	Type
31	Bg	196	ASN
73	Ak	10	GLN
44	AG	95	ASN
72	Aj	57	HIS
61	AY	4	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
34	B5	1780/1798 (98%)	445 (25%)	13 (0%)
38	A1	3194/3360 (95%)	634 (19%)	29 (0%)
39	A3	120/121 (99%)	13 (10%)	1 (0%)
40	A4	157/158 (99%)	30 (19%)	0
80	EC	189/202 (93%)	102 (53%)	10 (5%)
All	All	5440/5639 (96%)	1224 (22%)	53 (0%)

5 of 1224 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
34	B5	2	A
34	B5	4	C
34	B5	17	C
34	B5	25	C
34	B5	26	A

5 of 53 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
38	A1	1292	C
38	A1	2501	U
80	EC	6858	A
38	A1	1354	G
38	A1	2241	U

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

67 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
34	OMG	B5	1271	34	23,26,27	1.18	3 (13%)	32,38,41	1.92	6 (18%)
38	OMG	A1	2619	38	23,26,27	1.18	3 (13%)	32,38,41	1.97	6 (18%)
34	A2M	B5	796	34	22,25,26	1.51	4 (18%)	30,36,39	2.17	9 (30%)
34	OMG	B5	1126	34	23,26,27	1.17	3 (13%)	32,38,41	2.00	6 (18%)
34	4AC	B5	1280	34	21,24,25	1.07	1 (4%)	28,34,37	1.10	2 (7%)
38	OMG	A1	867	81,38	23,26,27	1.19	3 (13%)	32,38,41	1.97	6 (18%)
38	A2M	A1	2280	38	22,25,26	1.49	4 (18%)	30,36,39	2.08	9 (30%)
34	A2M	B5	541	34	22,25,26	1.54	4 (18%)	30,36,39	2.28	7 (23%)
38	A2M	A1	2256	38	22,25,26	1.55	4 (18%)	30,36,39	2.25	11 (36%)
34	A2M	B5	420	34	22,25,26	1.49	4 (18%)	30,36,39	2.12	10 (33%)
38	OMU	A1	2347	38	19,22,23	1.27	4 (21%)	25,31,34	1.78	5 (20%)
34	A2M	B5	619	81,34	22,25,26	1.50	5 (22%)	30,36,39	2.00	9 (30%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
34	XSX	B5	1191	34	24,28,29	1.38	5 (20%)	30,40,43	4.69	7 (23%)
38	OMU	A1	2421	38	19,22,23	1.25	4 (21%)	25,31,34	1.78	5 (20%)
34	OMU	B5	1269	34	19,22,23	1.28	4 (21%)	25,31,34	1.82	5 (20%)
34	A2M	B5	28	34	22,25,26	1.51	4 (18%)	30,36,39	2.06	8 (26%)
38	A2M	A1	649	38	22,25,26	1.50	4 (18%)	30,36,39	2.03	8 (26%)
38	OMC	A1	2948	38	19,22,23	0.80	0	25,31,34	0.95	2 (8%)
38	A2M	A1	2220	38	22,25,26	1.53	5 (22%)	30,36,39	1.99	9 (30%)
34	OMG	B5	1428	81,34	23,26,27	1.19	3 (13%)	32,38,41	1.98	6 (18%)
34	A2M	B5	100	81,34	22,25,26	1.51	4 (18%)	30,36,39	2.03	7 (23%)
38	OMG	A1	2793	38	23,26,27	1.18	3 (13%)	32,38,41	1.98	6 (18%)
34	OMC	B5	1639	34	19,22,23	0.78	0	25,31,34	0.80	1 (4%)
38	A2M	A1	1449	81,38	22,25,26	1.49	4 (18%)	30,36,39	2.05	8 (26%)
38	OMC	A1	2197	38	19,22,23	0.77	0	25,31,34	0.84	0
38	OMU	A1	898	38	19,22,23	1.24	3 (15%)	25,31,34	1.74	4 (16%)
38	OMG	A1	2791	38	23,26,27	1.18	3 (13%)	32,38,41	1.99	6 (18%)
36	HIC	AB	243	36	10,11,12	1.49	1 (10%)	9,14,16	1.35	2 (22%)
38	5MC	A1	2870	38	19,22,23	1.59	3 (15%)	26,32,35	1.31	3 (11%)
38	OMG	A1	2922	38	23,26,27	1.20	3 (13%)	32,38,41	2.03	6 (18%)
38	OMU	A1	2729	38	19,22,23	1.26	4 (21%)	25,31,34	1.73	5 (20%)
38	A2M	A1	817	81,38	22,25,26	1.51	5 (22%)	30,36,39	2.07	9 (30%)
34	OMG	B5	562	34	23,26,27	1.18	3 (13%)	32,38,41	1.96	6 (18%)
38	OMU	A1	2724	38	19,22,23	1.21	3 (15%)	25,31,34	1.77	5 (20%)
38	A2M	A1	2946	81,38	22,25,26	1.50	5 (22%)	30,36,39	2.17	9 (30%)
38	OMG	A1	908	81,38	23,26,27	1.21	3 (13%)	32,38,41	2.03	6 (18%)
38	OMU	A1	1888	38	19,22,23	1.28	3 (15%)	25,31,34	1.88	4 (16%)
38	A2M	A1	2281	38	22,25,26	1.40	5 (22%)	30,36,39	2.40	11 (36%)
38	A2M	A1	876	38	22,25,26	1.49	4 (18%)	30,36,39	2.00	8 (26%)
38	1MA	A1	645	81,38	21,25,26	1.34	4 (19%)	30,37,40	1.70	6 (20%)
38	OMU	A1	2417	38	19,22,23	1.22	3 (15%)	25,31,34	1.75	5 (20%)
38	OMC	A1	650	38	19,22,23	0.78	0	25,31,34	0.76	0
34	4AC	B5	1773	34	21,24,25	0.96	1 (4%)	28,34,37	1.96	5 (17%)
34	A2M	B5	974	34	22,25,26	1.49	4 (18%)	30,36,39	2.04	8 (26%)
34	MA6	B5	1781	34	23,26,27	1.53	5 (21%)	33,38,41	2.08	10 (30%)
38	A2M	A1	807	38	22,25,26	1.51	4 (18%)	30,36,39	2.05	8 (26%)
38	OMC	A1	663	38	19,22,23	0.80	0	25,31,34	0.84	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
38	OMG	A1	805	38	23,26,27	1.19	3 (13%)	32,38,41	2.01	6 (18%)
38	OMG	A1	2288	38	23,26,27	1.19	3 (13%)	32,38,41	2.00	6 (18%)
34	A2M	B5	436	34	22,25,26	1.50	4 (18%)	30,36,39	2.13	8 (26%)
38	OMU	A1	2921	38	19,22,23	1.22	3 (15%)	25,31,34	1.81	5 (20%)
34	OMU	B5	578	34	19,22,23	1.20	2 (10%)	25,31,34	1.82	5 (20%)
34	OMC	B5	414	34	19,22,23	0.81	0	25,31,34	0.85	1 (4%)
38	5MC	A1	2278	81,38	19,22,23	1.57	3 (15%)	26,32,35	1.23	3 (11%)
34	G7M	B5	1575	34	23,26,27	2.54	6 (26%)	34,39,42	3.10	14 (41%)
34	MA6	B5	1782	34	23,26,27	1.52	5 (21%)	33,38,41	2.10	10 (30%)
38	A2M	A1	1133	38	22,25,26	1.48	4 (18%)	30,36,39	2.23	9 (30%)
38	OMC	A1	2337	38	19,22,23	0.78	0	25,31,34	0.77	0
38	UR3	A1	2634	38	19,22,23	1.00	1 (5%)	26,32,35	1.76	2 (7%)
38	OMC	A1	1437	81,38	19,22,23	0.81	0	25,31,34	1.14	2 (8%)
38	OMG	A1	2815	38	23,26,27	1.17	3 (13%)	32,38,41	1.97	5 (15%)
38	OMG	A1	1450	38	23,26,27	1.19	3 (13%)	32,38,41	1.98	6 (18%)
38	1MA	A1	2142	81,38	21,25,26	1.33	4 (19%)	30,37,40	1.70	3 (10%)
34	OMC	B5	1007	34	19,22,23	0.81	0	25,31,34	0.95	1 (4%)
38	OMC	A1	2959	38	19,22,23	0.80	0	25,31,34	0.85	1 (4%)
34	OMG	B5	1572	34	23,26,27	1.18	3 (13%)	32,38,41	1.97	6 (18%)
38	A2M	A1	2640	38	22,25,26	1.51	4 (18%)	30,36,39	2.07	8 (26%)

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
34	OMG	B5	1271	34	-	1/9/27/28	0/3/3/3
38	OMG	A1	2619	38	-	1/9/27/28	0/3/3/3
34	A2M	B5	796	34	-	0/9/27/28	0/3/3/3
34	OMG	B5	1126	34	-	1/9/27/28	0/3/3/3
34	4AC	B5	1280	34	-	4/11/29/30	0/2/2/2
38	OMG	A1	867	81,38	-	0/9/27/28	0/3/3/3
38	A2M	A1	2280	38	-	1/9/27/28	0/3/3/3
34	A2M	B5	541	34	-	4/9/27/28	0/3/3/3
38	A2M	A1	2256	38	-	2/9/27/28	0/3/3/3
34	A2M	B5	420	34	-	1/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
38	OMU	A1	2347	38	-	2/9/27/28	0/2/2/2
34	A2M	B5	619	81,34	-	2/9/27/28	0/3/3/3
34	XSX	B5	1191	34	-	6/16/34/35	0/2/2/2
38	OMU	A1	2421	38	-	1/9/27/28	0/2/2/2
34	OMU	B5	1269	34	-	3/9/27/28	0/2/2/2
34	A2M	B5	28	34	-	1/9/27/28	0/3/3/3
38	A2M	A1	649	38	-	1/9/27/28	0/3/3/3
38	OMC	A1	2948	38	-	0/9/27/28	0/2/2/2
38	A2M	A1	2220	38	-	1/9/27/28	0/3/3/3
34	OMG	B5	1428	81,34	-	3/9/27/28	0/3/3/3
34	A2M	B5	100	81,34	-	0/9/27/28	0/3/3/3
38	OMG	A1	2793	38	-	1/9/27/28	0/3/3/3
34	OMC	B5	1639	34	-	1/9/27/28	0/2/2/2
38	A2M	A1	1449	81,38	-	0/9/27/28	0/3/3/3
38	OMC	A1	2197	38	-	6/9/27/28	0/2/2/2
38	OMU	A1	898	38	-	0/9/27/28	0/2/2/2
38	OMG	A1	2791	38	-	0/9/27/28	0/3/3/3
36	HIC	AB	243	36	-	0/5/6/8	0/1/1/1
38	5MC	A1	2870	38	-	4/7/25/26	0/2/2/2
38	OMG	A1	2922	38	-	0/9/27/28	0/3/3/3
38	OMU	A1	2729	38	-	2/9/27/28	0/2/2/2
38	A2M	A1	817	81,38	-	1/9/27/28	0/3/3/3
34	OMG	B5	562	34	-	1/9/27/28	0/3/3/3
38	OMU	A1	2724	38	-	0/9/27/28	0/2/2/2
38	A2M	A1	2946	81,38	-	0/9/27/28	0/3/3/3
38	OMG	A1	908	81,38	-	0/9/27/28	0/3/3/3
38	OMU	A1	1888	38	-	0/9/27/28	0/2/2/2
38	A2M	A1	2281	38	-	0/9/27/28	0/3/3/3
38	A2M	A1	876	38	-	0/9/27/28	0/3/3/3
38	1MA	A1	645	81,38	-	2/7/25/26	0/3/3/3
38	OMU	A1	2417	38	-	1/9/27/28	0/2/2/2
38	OMC	A1	650	38	-	0/9/27/28	0/2/2/2
34	4AC	B5	1773	34	-	4/11/29/30	0/2/2/2
34	A2M	B5	974	34	-	0/9/27/28	0/3/3/3
34	MA6	B5	1781	34	-	1/11/29/30	0/3/3/3
38	A2M	A1	807	38	-	0/9/27/28	0/3/3/3
38	OMC	A1	663	38	-	0/9/27/28	0/2/2/2
38	OMG	A1	805	38	-	0/9/27/28	0/3/3/3
38	OMG	A1	2288	38	-	0/9/27/28	0/3/3/3
34	A2M	B5	436	34	-	0/9/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
38	OMU	A1	2921	38	-	0/9/27/28	0/2/2/2
34	OMU	B5	578	34	-	0/9/27/28	0/2/2/2
34	OMC	B5	414	34	-	1/9/27/28	0/2/2/2
38	5MC	A1	2278	81,38	-	1/7/25/26	0/2/2/2
34	G7M	B5	1575	34	-	0/7/25/26	0/3/3/3
34	MA6	B5	1782	34	-	3/11/29/30	0/3/3/3
38	A2M	A1	1133	38	-	0/9/27/28	0/3/3/3
38	OMC	A1	2337	38	-	0/9/27/28	0/2/2/2
38	UR3	A1	2634	38	-	0/7/25/26	0/2/2/2
38	OMC	A1	1437	81,38	-	4/9/27/28	0/2/2/2
38	OMG	A1	2815	38	-	0/9/27/28	0/3/3/3
38	OMG	A1	1450	38	-	0/9/27/28	0/3/3/3
38	1MA	A1	2142	81,38	-	0/7/25/26	0/3/3/3
34	OMC	B5	1007	34	-	0/9/27/28	0/2/2/2
38	OMC	A1	2959	38	-	0/9/27/28	0/2/2/2
34	OMG	B5	1572	34	-	0/9/27/28	0/3/3/3
38	A2M	A1	2640	38	-	1/9/27/28	0/3/3/3

The worst 5 of 202 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
34	B5	1575	G7M	C8-N7	7.70	1.46	1.33
38	A1	2278	5MC	C5-C4	5.55	1.48	1.44
38	A1	2870	5MC	C5-C4	5.43	1.48	1.44
34	B5	541	A2M	C5-C4	4.94	1.47	1.39
34	B5	1575	G7M	C5-N7	-4.79	1.33	1.39

The worst 5 of 385 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
34	B5	1191	XSX	C3-C1-N3	24.10	154.29	112.16
34	B5	1575	G7M	CN7-N7-C8	-7.90	112.83	124.79
34	B5	541	A2M	C5-C4-N3	-7.13	116.90	126.72
34	B5	1773	4AC	N4-C4-N3	7.09	125.38	113.87
38	A1	2634	UR3	C4-N3-C2	-7.07	118.89	124.58

There are no chirality outliers.

5 of 69 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
34	B5	28	A2M	C1'-C2'-O2'-CM'

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Mol	Chain	Res	Type	Atoms
34	B5	541	A2M	C2'-C1'-N9-C8
34	B5	541	A2M	C2'-C1'-N9-C4
34	B5	562	OMG	C1'-C2'-O2'-CM2
34	B5	1191	XSX	C3-C1-N3-C2

There are no ring outliers.

26 monomers are involved in 34 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
34	B5	1271	OMG	1	0
34	B5	1126	OMG	2	0
34	B5	1280	4AC	3	0
38	A1	2256	A2M	1	0
38	A1	2347	OMU	1	0
34	B5	1269	OMU	1	0
38	A1	649	A2M	1	0
38	A1	2948	OMC	2	0
38	A1	2220	A2M	2	0
34	B5	1639	OMC	1	0
38	A1	1449	A2M	1	0
38	A1	2197	OMC	2	0
38	A1	2922	OMG	1	0
38	A1	2724	OMU	1	0
38	A1	2946	A2M	1	0
38	A1	2281	A2M	1	0
38	A1	876	A2M	1	0
38	A1	650	OMC	1	0
34	B5	1773	4AC	2	0
34	B5	1781	MA6	1	0
38	A1	663	OMC	1	0
34	B5	436	A2M	1	0
34	B5	414	OMC	1	0
34	B5	1575	G7M	2	0
38	A1	1133	A2M	1	0
38	A1	2640	A2M	1	0

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 248 ligands modelled in this entry, 248 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

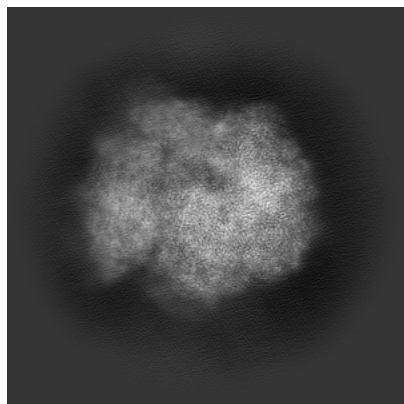
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-28643. These allow visual inspection of the internal detail of the map and identification of artifacts.

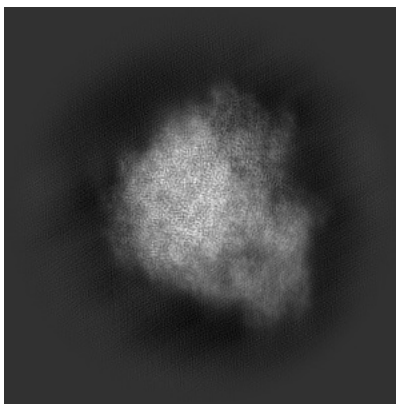
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

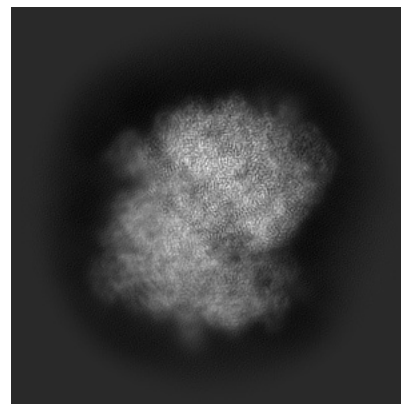
6.1.1 Primary map



X

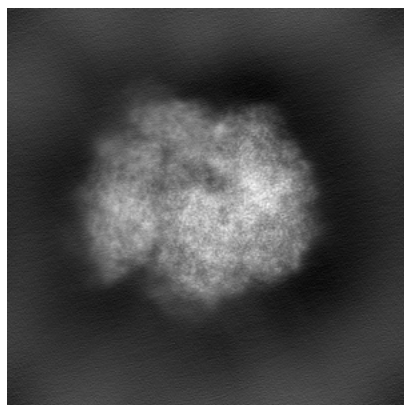


Y

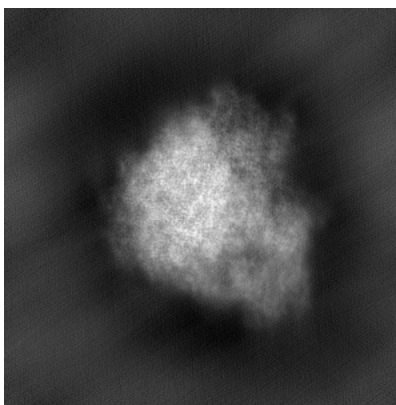


Z

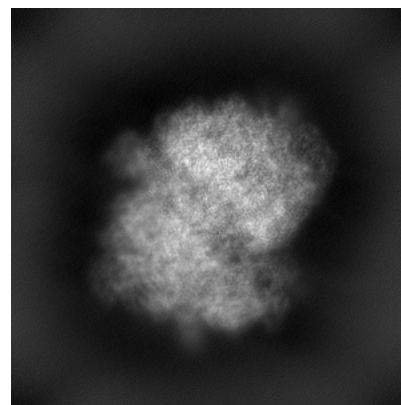
6.1.2 Raw map



X



Y

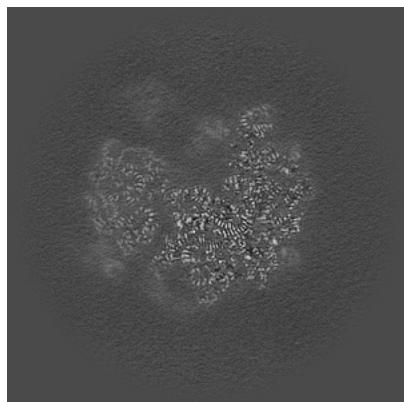


Z

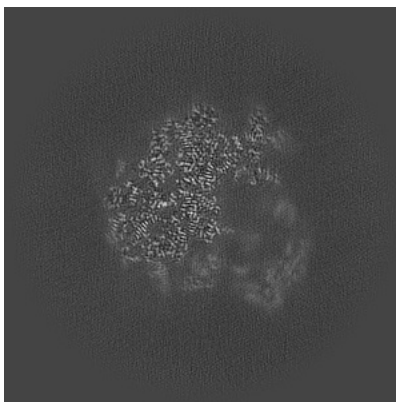
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

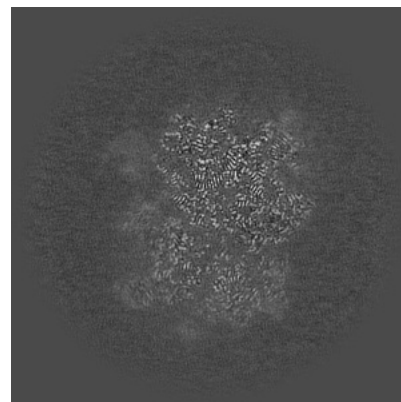
6.2.1 Primary map



X Index: 200

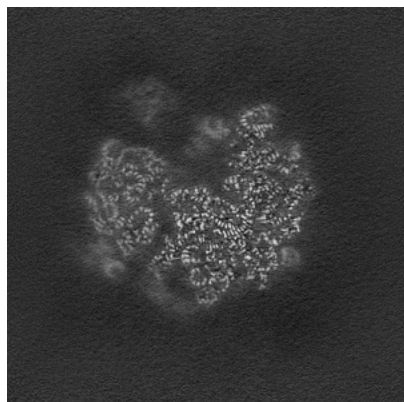


Y Index: 200

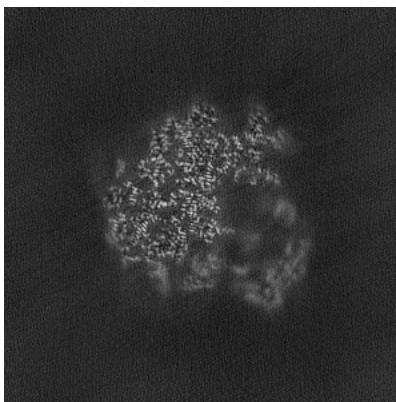


Z Index: 200

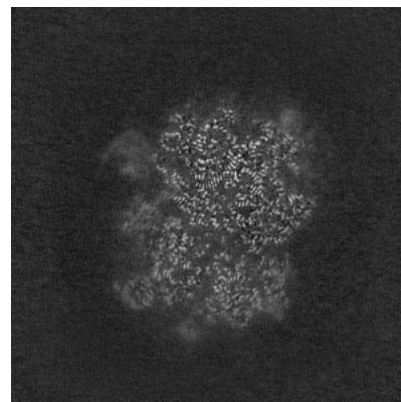
6.2.2 Raw map



X Index: 200



Y Index: 200

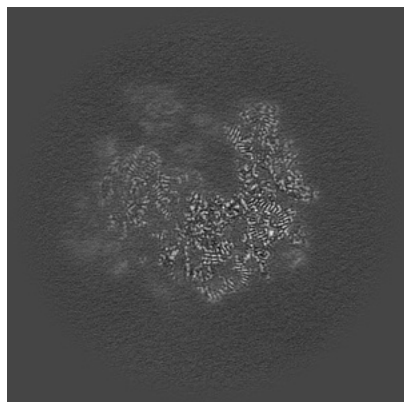


Z Index: 200

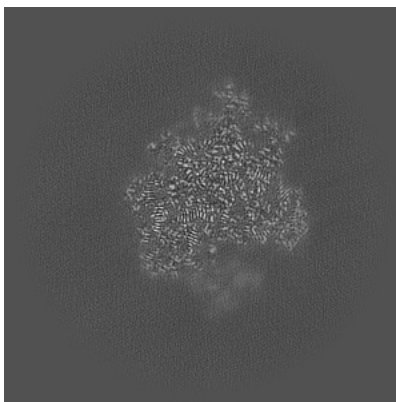
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

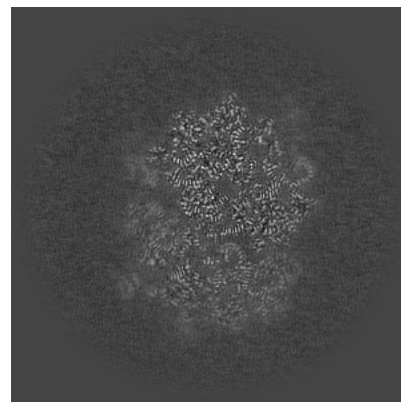
6.3.1 Primary map



X Index: 188

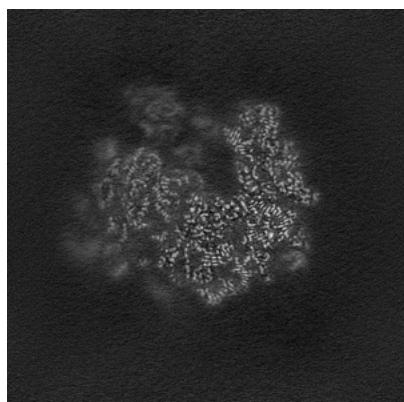


Y Index: 245

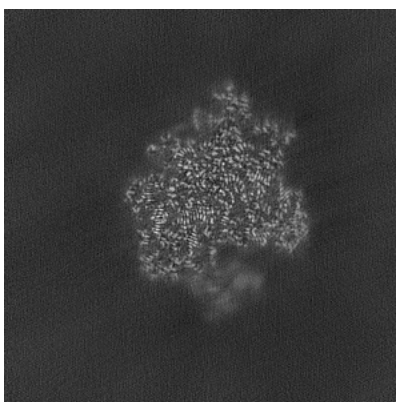


Z Index: 191

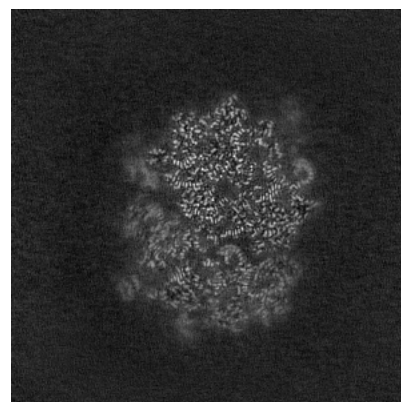
6.3.2 Raw map



X Index: 188



Y Index: 245

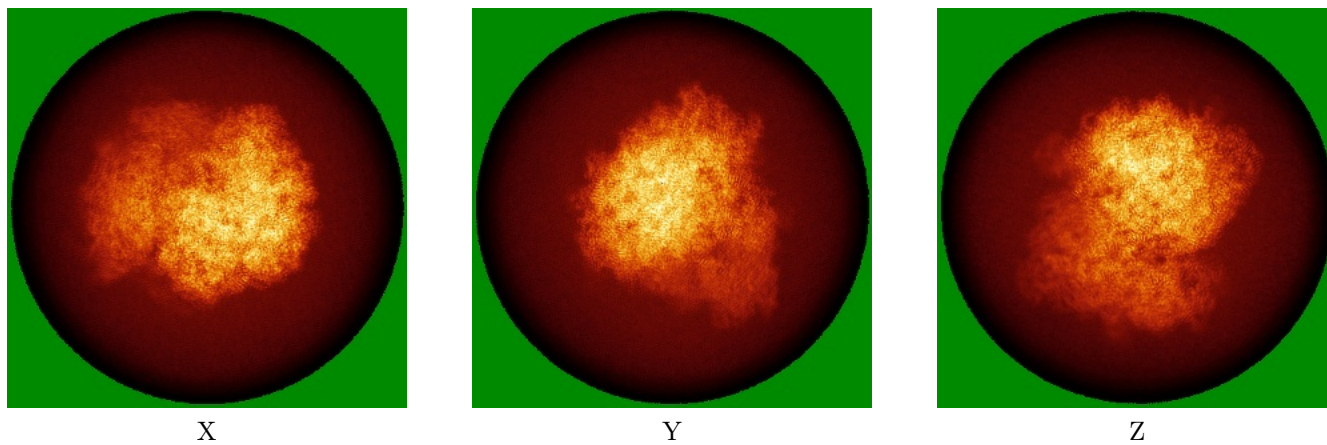


Z Index: 191

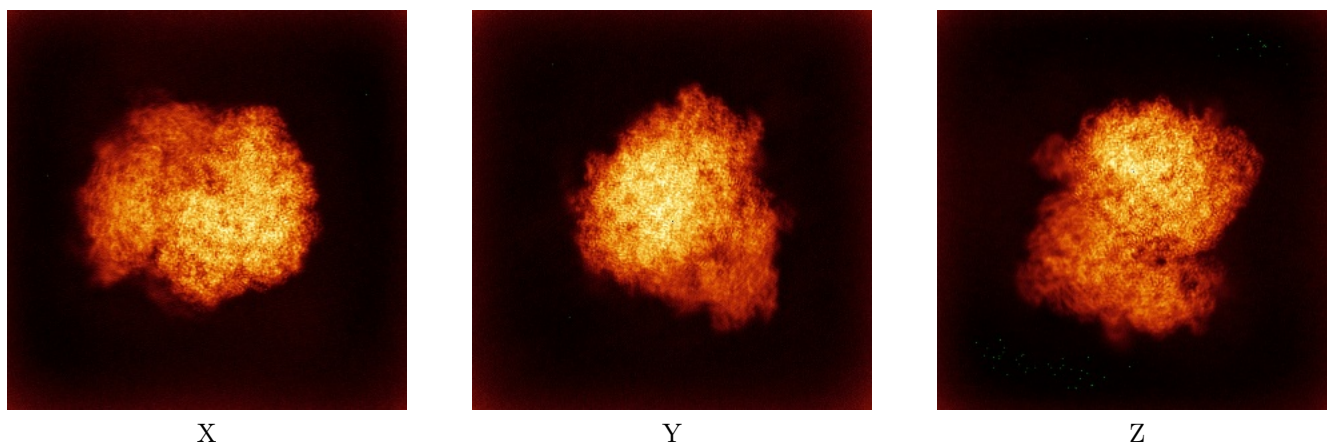
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



6.4.2 Raw map



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](#)

This section was not generated.

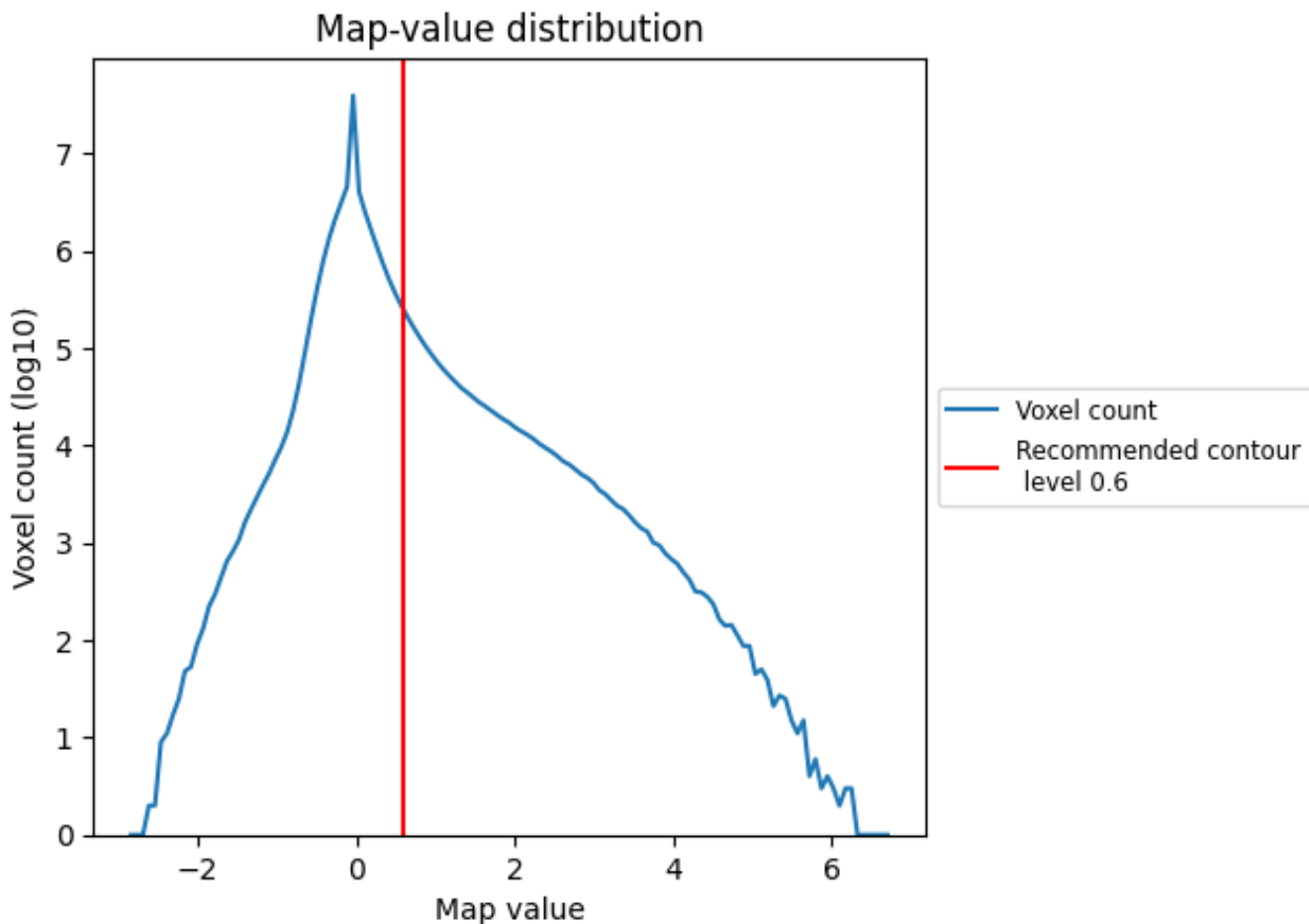
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

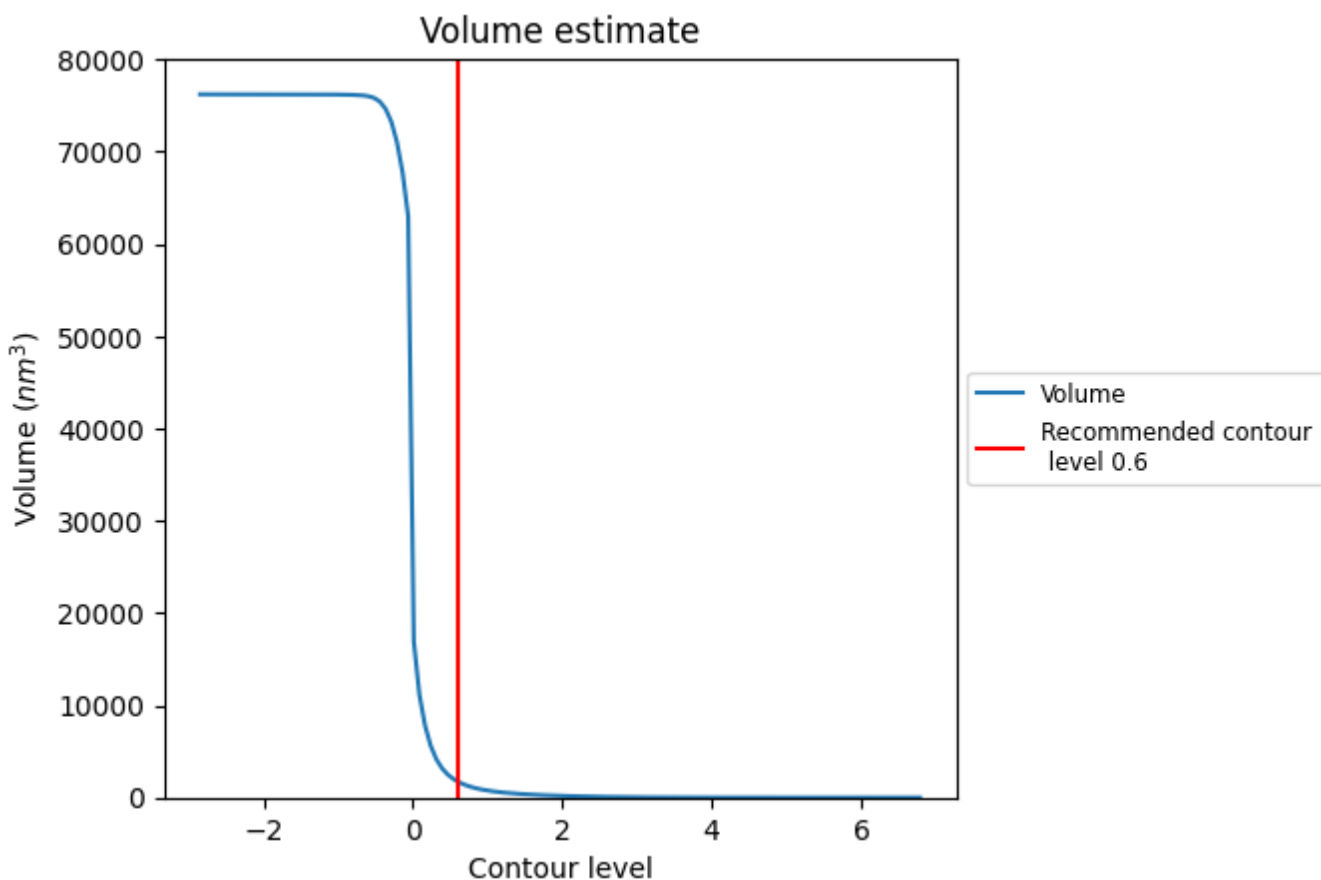
This section contains the results of statistical analysis of the map.

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.

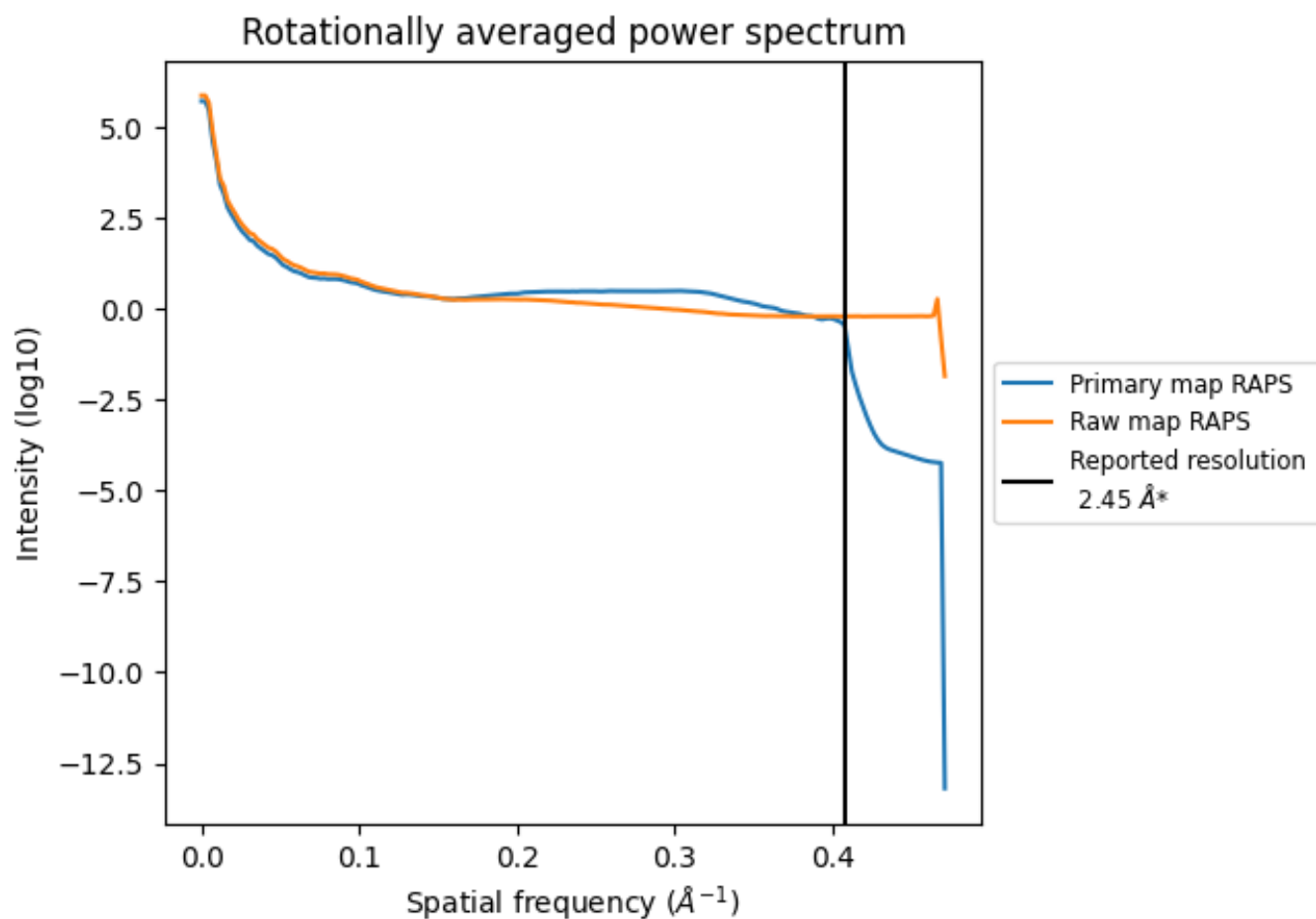
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1747 nm³; this corresponds to an approximate mass of 1578 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)

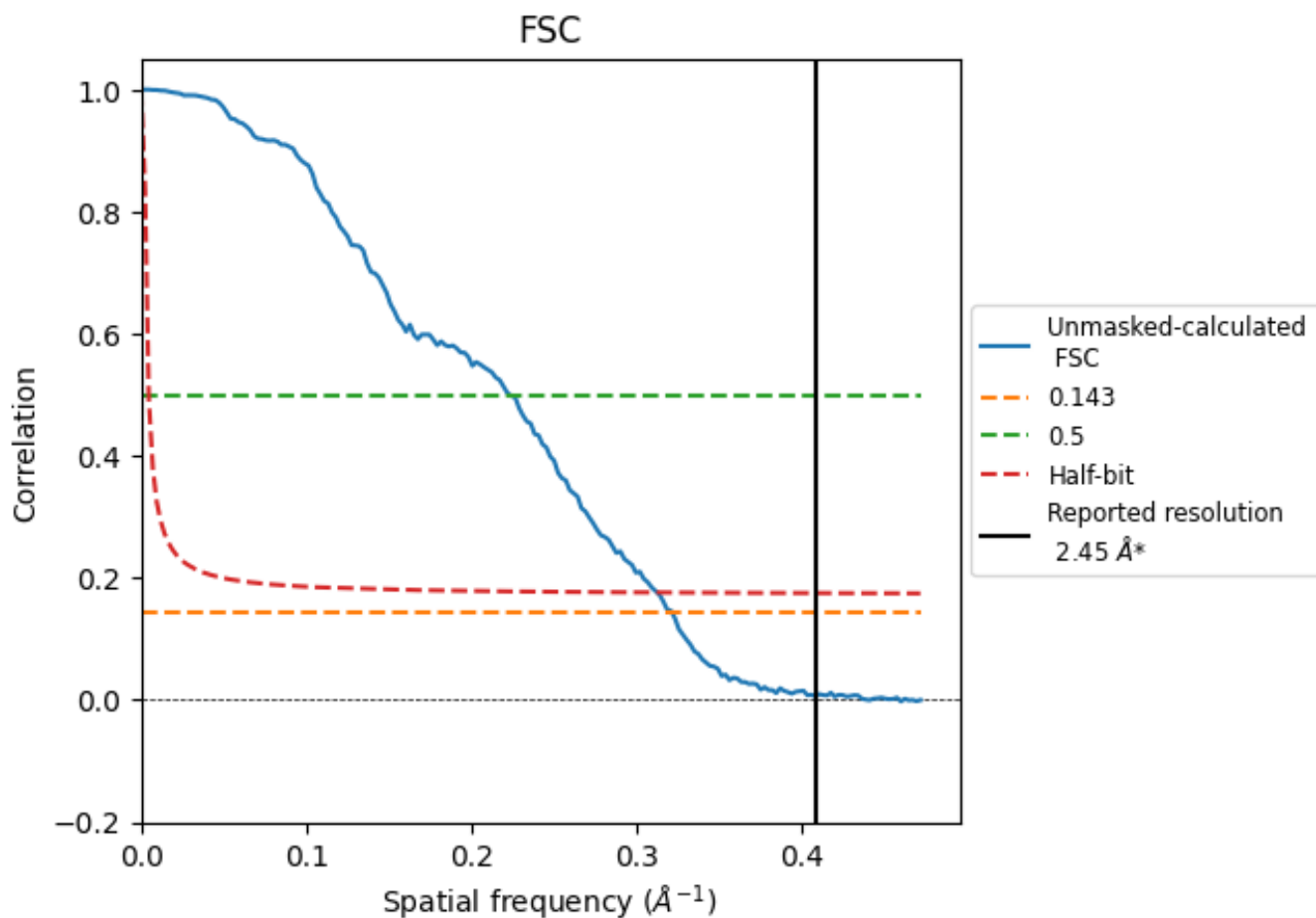


*Reported resolution corresponds to spatial frequency of 0.408 Å⁻¹

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 0.408 Å⁻¹

8.2 Resolution estimates [i](#)

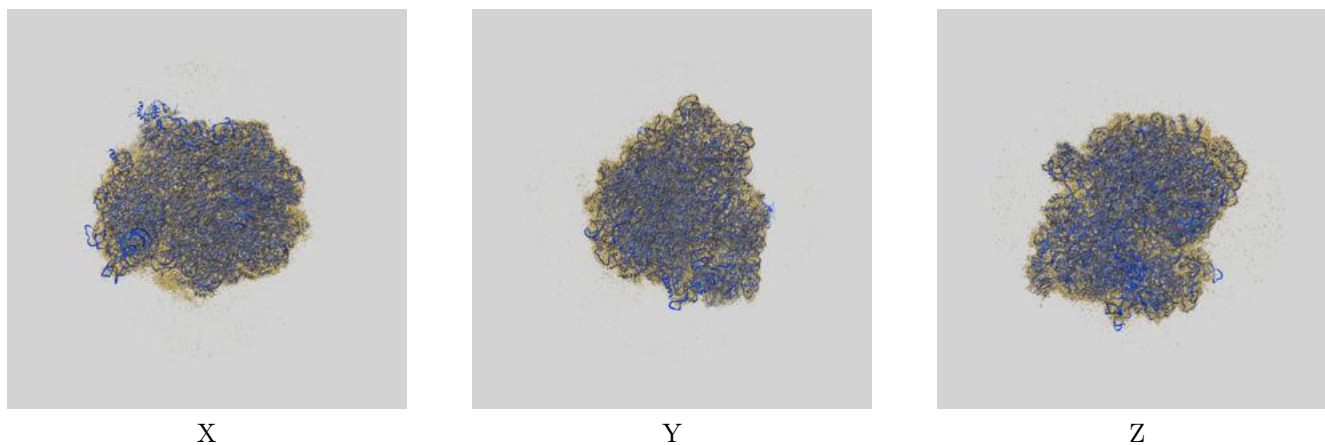
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.45	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.11	4.48	3.20

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.11 differs from the reported value 2.45 by more than 10 %

9 Map-model fit [i](#)

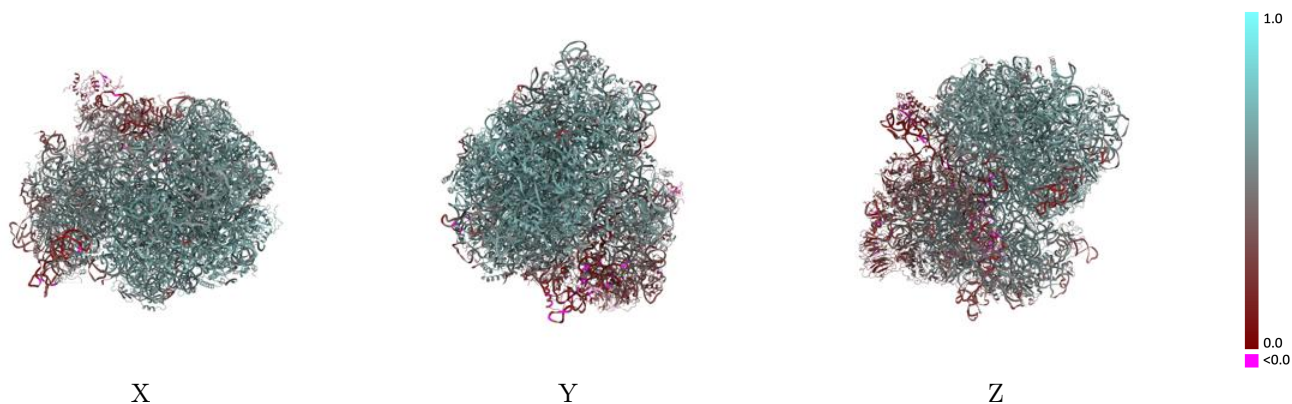
This section contains information regarding the fit between EMDB map EMD-28643 and PDB model 8EWC. Per-residue inclusion information can be found in section [3](#) on page [20](#).

9.1 Map-model overlay [i](#)



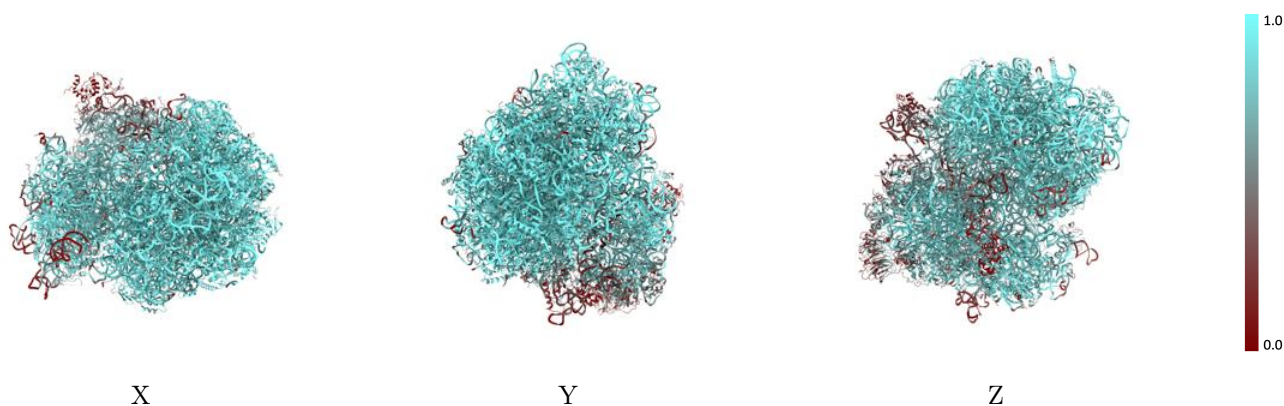
The images above show the 3D surface view of the map at the recommended contour level 0.6 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



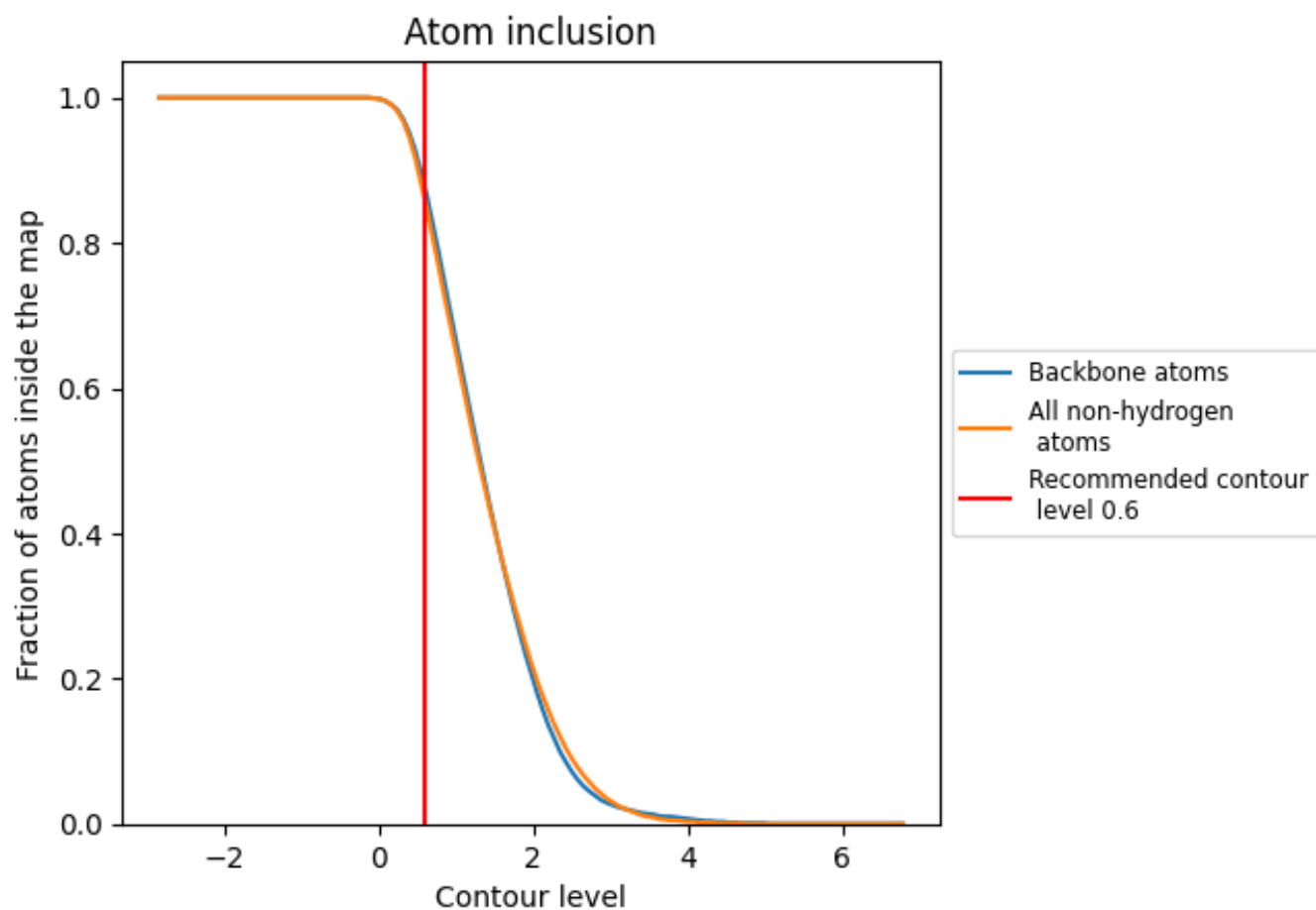
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.6).

9.4 Atom inclusion [i](#)



At the recommended contour level, 87% of all backbone atoms, 86% 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 (0.6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8560	0.5320
A1	0.9440	0.5950
A3	0.9810	0.5940
A4	0.9770	0.6300
AA	0.9850	0.6470
AB	0.9580	0.6110
AC	0.9590	0.6350
AD	0.8660	0.5590
AE	0.8750	0.5550
AF	0.9450	0.6200
AG	0.8930	0.5640
AH	0.8800	0.5640
AI	0.9390	0.6070
AJ	0.7980	0.4840
AL	0.9420	0.6180
AM	0.9220	0.5810
AN	0.9870	0.6520
AO	0.9620	0.6120
AP	0.9660	0.6320
AQ	0.9790	0.6520
AR	0.8470	0.5650
AS	0.9390	0.6030
AT	0.9300	0.6050
AU	0.8400	0.5560
AV	0.9450	0.6300
AW	0.9620	0.6230
AX	0.9410	0.6210
AY	0.9310	0.6140
AZ	0.9180	0.5850
Aa	0.9630	0.6390
Ab	0.9070	0.5760
Ac	0.9330	0.5970
Ad	0.8990	0.5950
Ae	0.9600	0.6380
Af	0.9760	0.6270











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Chain	Atom inclusion	Q-score
Ag	0.9450	0.6160
Ah	0.9390	0.6130
Ai	0.9260	0.5790
Aj	0.9820	0.6630
Ak	0.8010	0.5490
Al	0.9690	0.6440
Am	0.9010	0.5930
An	0.9430	0.5910
Ao	0.9380	0.6110
Ap	0.9490	0.6250
B5	0.8480	0.4770
BA	0.7360	0.4440
BB	0.6710	0.4100
BC	0.8860	0.5330
BD	0.6830	0.4160
BE	0.9020	0.5360
BF	0.5660	0.3430
BG	0.7130	0.4590
BH	0.5720	0.4180
BI	0.8610	0.5520
BJ	0.8110	0.5010
BK	0.5160	0.3440
BL	0.8290	0.5430
BM	0.0350	0.1880
BN	0.8560	0.5260
BO	0.7650	0.4370
BP	0.4320	0.3160
BQ	0.6350	0.3480
BR	0.6340	0.3830
BS	0.5320	0.3280
BT	0.6020	0.3420
BU	0.5440	0.3580
BV	0.8040	0.4770
BW	0.9170	0.5690
BX	0.9110	0.5720
BY	0.7540	0.4800
BZ	0.4430	0.2850
Ba	0.8040	0.4850
Bb	0.7070	0.4540
Bc	0.5790	0.3590
Bd	0.8110	0.4610
Be	0.7910	0.4810

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Chain	Atom inclusion	Q-score
Bf	 0.0540	 0.1130
Bg	 0.3850	 0.2590
E	 0.2180	 0.2120
EC	 0.3940	 0.1630