



wwPDB EM Validation Summary Report ⓘ

Apr 17, 2024 – 05:52 pm BST

PDB ID : 8CGN
EMDB ID : EMD-16648
Title : Non-rotated 80S *S. cerevisiae* ribosome with ligands
Authors : Milicevic, N.; Jenner, L.; Myasnikov, A.; Yusupov, M.; Yusupova, G.
Deposited on : 2023-02-06
Resolution : 2.28 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.dev92
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

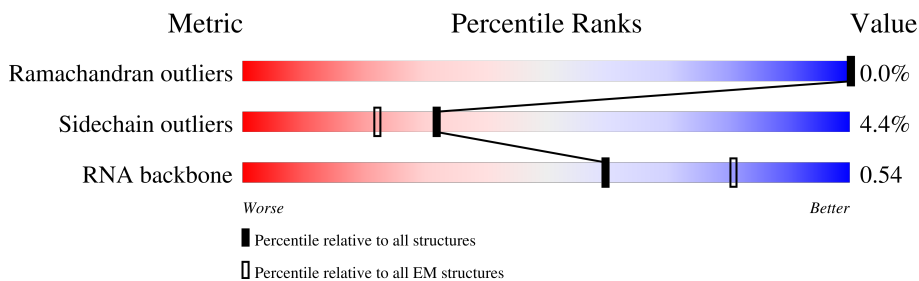
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.28 Å.

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




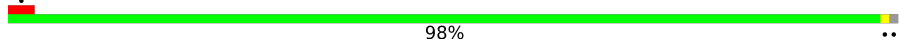


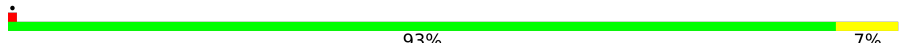



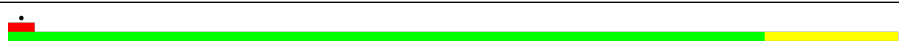




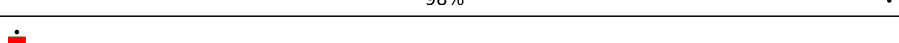
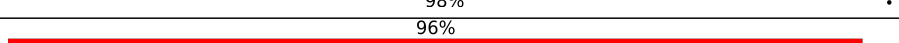
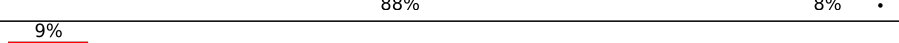
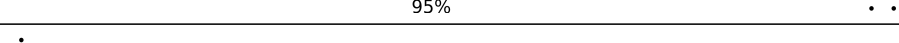
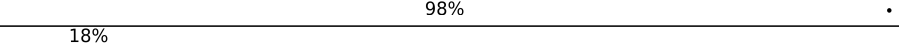
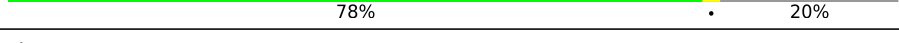
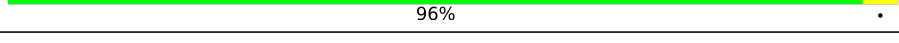
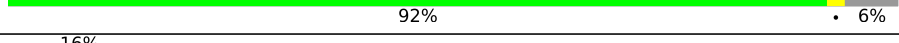
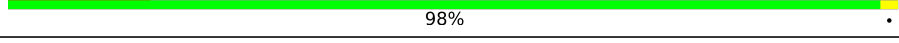



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	0	135	28% (red), 95% (green), 5% (yellow), 1% (grey)
2	1	108	46% (red), 63% (green), 35% (grey)
3	2	119	7% (red), 79% (green), 18% (grey)
4	3	82	26% (red), 94% (green), 5% (yellow), 1% (grey)
5	4	67	33% (red), 82% (green), 12% (yellow), 6% (grey)
6	5	56	80% (green), 7% (yellow), 12% (grey)
7	6	63	27% (red), 79% (green), 5% (yellow), 16% (grey)
8	7	319	74% (red), 94% (green), 6% (yellow)

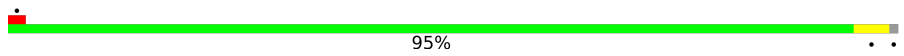

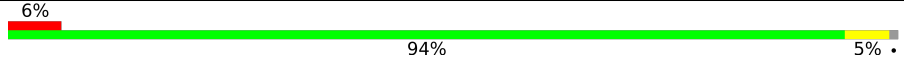
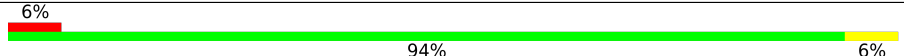
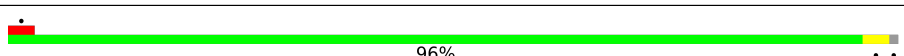
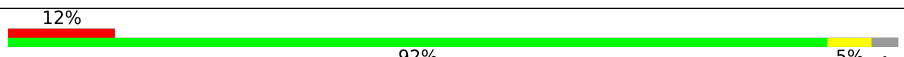
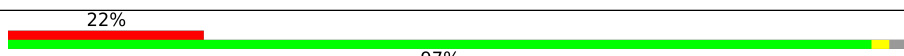
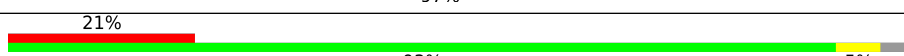
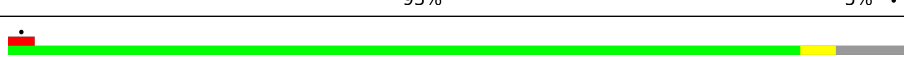

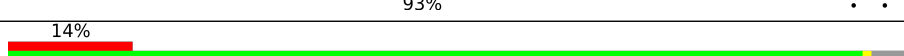
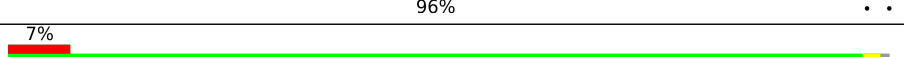
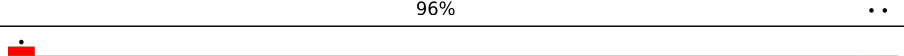
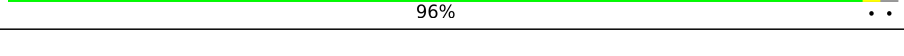
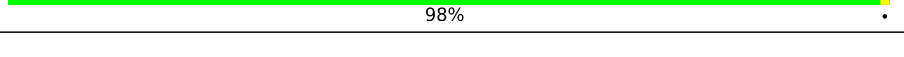
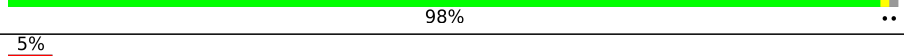

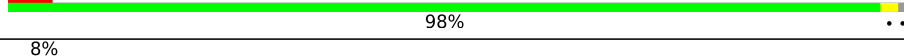
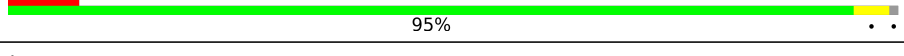
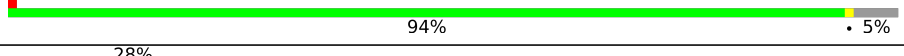
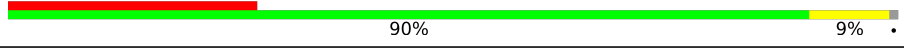
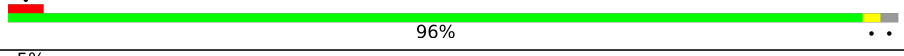


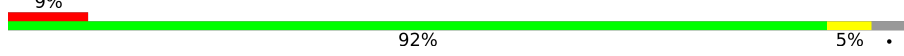
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Mol	Chain	Length	Quality of chain
9	8	152	
10	A	199	
11	AA	3396	
12	B	338	
13	BB	121	
14	Bb	77	
14	Cc	77	
15	C	186	
16	CC	158	
17	D	189	
18	DD	312	
19	Dd	39	
20	E	172	
21	EE	254	
22	Ee	165	
23	F	160	
24	FF	387	
25	G	121	
26	GG	362	
27	H	137	
28	HH	297	
29	I	155	
30	II	176	
31	J	142	
32	JJ	244	

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Mol	Chain	Length	Quality of chain
33	K	127	 95%
34	KK	256	 13% 89% 9%
35	L	136	 6% 94% 5%
36	LL	191	 6% 94% 6%
37	M	149	 96%
38	MM	221	 12% 92% 5%
39	N	59	 22% 97%
40	NN	174	 21% 93% 5%
41	O	105	 89% 8%
42	OO	199	 11% 93%
43	P	113	 14% 96%
44	PP	138	 7% 96%
45	Q	130	 96%
46	QQ	204	 98%
47	R	107	 98%
48	S	121	 5% 87% 10%
49	T	120	 5% 98%
50	U	100	 8% 95%
51	V	88	 94% 5%
52	W	78	 28% 90% 9%
53	X	51	 96%
54	Y	128	 5% 41% 59%
55	Z	25	 88% 12%
56	a	106	 9% 92% 5%
57	b	92	 5% 95%

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Mol	Chain	Length	Quality of chain
58	c	1800	9% 73% 16% 10%
59	d	252	11% 79% 18%
60	e	255	13% 79% 17%
61	f	254	82% 15%
62	g	240	24% 78% 8% 15%
63	h	261	11% 96% ..
64	i	225	23% 83% 5% 12%
65	j	236	44% 91% 6%
66	k	190	37% 93% ..
67	l	200	10% 89% 8%
68	m	197	15% 89% 5% 6%
69	n	105	27% 60% 38%
70	o	156	9% 87% 9%
71	p	151	9% 98% ..
72	q	137	7% 90% .. 7%
73	r	142	26% 61% 36%
74	s	143	16% 91% 5%
75	t	136	35% 82% 7% 11%
76	u	146	38% 90% 9% ..
77	v	144	26% 96% ..
78	w	121	33% 76% 7% 17%
79	x	87	11% 93% 7%
80	y	130	96% ..
81	z	145	9% 93% 6%

2 Entry composition [i](#)

There are 87 unique types of molecules in this entry. The entry contains 201528 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 S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	0	134	1073	676	208	189	0	0

- Molecule 2 is a protein called 40S ribosomal protein S25-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	1	70	563	360	104	99	0	0

- Molecule 3 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	97	769	475	160	129	5	0	0

- Molecule 4 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	81	610	382	110	113	5	0	0

- Molecule 5 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	63	497	306	99	91	1	0	0

- Molecule 6 is a protein called HLJ1_G0030400.mRNA.1.CDS.1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	5	49	404	249	86	65	4	0	0

- Molecule 7 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	6	53	427	269	88	69	1	0	0

- Molecule 8 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	7	318	2436	1541	418	469	8	0	0

- Molecule 9 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	8	36	276	173	54	45	4	0	0

- Molecule 10 is a protein called 60S ribosomal protein L16-A.

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

- Molecule 11 is a RNA chain called 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
11	AA	3197	68429	30589	12334	22309	3197	0	0

- Molecule 12 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	B	154	1222	761	237	224	0	0

- Molecule 13 is a RNA chain called 5S ribosomal RNA.

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

- Molecule 14 is a RNA chain called Transfer RNA fMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
14	Bb	77	1644	732	298	537	77	0	0
14	Cc	77	1644	732	298	537	77	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Bb	18	C	U	conflict	GB 170517292
Cc	18	C	U	conflict	GB 170517292

- Molecule 15 is a protein called 60S ribosomal protein L18-A.

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

- Molecule 16 is a RNA chain called 5.8S ribosomal RNA.

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

- Molecule 17 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
17	D	176	1423	875	308	240	0	0

- Molecule 18 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	DD	197	1531	980	266	281	4	0	0

- Molecule 19 is a RNA chain called Messenger RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
19	Dd	6	131	59	27	39	6	0	0

- Molecule 20 is a protein called 60S ribosomal protein L20-A.

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

- Molecule 21 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	EE	252	Total	C	N	O	S	0	0
			1914	1191	388	334	1		

- Molecule 22 is a protein called 60S ribosomal protein L12-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Ee	158	Total	C	N	O	S	0	0
			1196	750	216	228	2		

- Molecule 23 is a protein called 60S ribosomal protein L21-A.

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

- Molecule 24 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	FF	386	Total	C	N	O	S	0	0
			3075	1950	584	533	8		

- Molecule 25 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	G	97	Total	C	N	O	0	0
			770	499	126	145		

- Molecule 26 is a protein called 60S ribosomal protein L4-A.

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

- Molecule 27 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	H	129	Total	C	N	O	S	0	0
			963	607	180	169	7		

- Molecule 28 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	HH	296	Total	C	N	O	S	0	0
			2375	1501	414	458	2		

- Molecule 29 is a protein called 60S ribosomal protein L24-A.

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

- Molecule 30 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	II	155	Total	C	N	O	S	0	0
			1230	795	221	213	1		

- Molecule 31 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	J	120	Total	C	N	O	S	0	0
			959	617	168	172	2		

- Molecule 32 is a protein called 60S ribosomal protein L7-A.

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

- Molecule 33 is a protein called 60S ribosomal protein L26-A.

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

- Molecule 34 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	KK	233	1804	1151	323	327	3	0	0

- Molecule 35 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	L	135	1092	710	202	180		0	0

- Molecule 36 is a protein called RPL9A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	LL	191	1518	963	274	277	4	0	0

- Molecule 37 is a protein called 60S ribosomal protein L28.

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

- Molecule 38 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	MM	215	1743	1102	331	303	7	0	0

- Molecule 39 is a protein called 60S ribosomal protein L29.

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

- Molecule 40 is a protein called 60S ribosomal protein L11-A.

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

- Molecule 41 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	O	97	Total	C	N	O	S	0	0
			742	479	124	138	1		

- Molecule 42 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	OO	193	Total	C	N	O	S	0	0
			1543	962	315	266			

- Molecule 43 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	P	109	Total	C	N	O	S	0	0
			883	559	167	156	1		

- Molecule 44 is a protein called 60S ribosomal protein L14-A.

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

- Molecule 45 is a protein called 60S ribosomal protein L32.

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

- Molecule 46 is a protein called 60S ribosomal protein L15-A.

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

- Molecule 47 is a protein called 60S ribosomal protein L33-A.

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

- Molecule 48 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	S	109	Total	C	N	O	S	0	0
			861	533	175	149	4		

- Molecule 49 is a protein called 60S ribosomal protein L35-A.

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

- Molecule 50 is a protein called 60S ribosomal protein L36-A.

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

- Molecule 51 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	V	84	Total	C	N	O	S	0	0
			665	405	145	110	5		

- Molecule 52 is a protein called 60S ribosomal protein L38.

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

- Molecule 53 is a protein called 60S ribosomal protein L39.

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

- Molecule 54 is a protein called Ubiquitin-60S ribosomal protein L40.

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

- Molecule 55 is a protein called 60S ribosomal protein L41.

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

- Molecule 56 is a protein called 60S ribosomal protein L42-A.

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

- Molecule 57 is a protein called 60S ribosomal protein L43-A.

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

- Molecule 58 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	c	1624	Total	C	N	O	P	0	0
			34663	15513	6155	11371	1624		

- Molecule 59 is a protein called 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	d	206	Total	C	N	O	S	0	0
			1583	1017	281	283	2		

- Molecule 60 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	e	212	Total	C	N	O	S	0	0
			1689	1073	303	309	4		

- Molecule 61 is a protein called 40S ribosomal protein S2.

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

- Molecule 62 is a protein called RPS3 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	g	205	Total	C	N	O	S	0	0
			1593	1008	293	286	6		

- Molecule 63 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	h	258	Total	C	N	O	S	0	0
			2056	1308	387	358	3		

- Molecule 64 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	i	199	Total	C	N	O	S	0	0
			1572	987	290	292	3		

- Molecule 65 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	j	223	Total	C	N	O	S	0	0
			1798	1128	347	320	3		

- Molecule 66 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
66	k	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 67 is a protein called 40S ribosomal protein S8-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	l	184	Total	C	N	O	S	0	0
			1457	906	291	258	2		

- Molecule 68 is a protein called 40S ribosomal protein S9-A.

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

- Molecule 69 is a protein called 40S ribosomal protein S10-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
69	n	65	Total	C	N	O	0	0
			556	361	90	105		

- Molecule 70 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	o	142	Total	C	N	O	S	0	0
			1146	735	217	191	3		

- Molecule 71 is a protein called 40S ribosomal protein S13.

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

- Molecule 72 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	q	127	Total	C	N	O	S	0	0
			891	545	182	163	1		

- Molecule 73 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	r	91	Total	C	N	O	S	0	0
			732	469	138	120	5		

- Molecule 74 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
74	s	137	Total	C	N	O	0	0
			1080	692	199	189		

- Molecule 75 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	t	121	Total	C	N	O	S	0	0
			961	599	182	178	2		

- Molecule 76 is a protein called 40S ribosomal protein S18-A.

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

- Molecule 77 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	v	143	Total	C	N	O	S	0	0
			1112	694	208	208	2		

- Molecule 78 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	w	100	Total	C	N	O	S	0	0
			800	509	144	146	1		

- Molecule 79 is a protein called 40S ribosomal protein S21-A.

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

- Molecule 80 is a protein called 40S ribosomal protein S22-A.

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

- Molecule 81 is a protein called 40S ribosomal protein S23-A.

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

- Molecule 82 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
82	2	1	Total	Zn	0
			1	1	
82	5	1	Total	Zn	0
			1	1	
82	8	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
82	S	1	Total 1	Zn 1	0
82	V	1	Total 1	Zn 1	0
82	Y	1	Total 1	Zn 1	0
82	a	1	Total 1	Zn 1	0
82	b	1	Total 1	Zn 1	0

- Molecule 83 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
83	AA	199	Total 199	Mg 199	0
83	B	1	Total 1	Mg 1	0
83	BB	5	Total 5	Mg 5	0
83	Bb	2	Total 2	Mg 2	0
83	CC	3	Total 3	Mg 3	0
83	FF	1	Total 1	Mg 1	0
83	H	1	Total 1	Mg 1	0
83	MM	1	Total 1	Mg 1	0
83	QQ	1	Total 1	Mg 1	0
83	c	49	Total 49	Mg 49	0

- Molecule 84 is POTASSIUM ION (three-letter code: K) (formula: K).

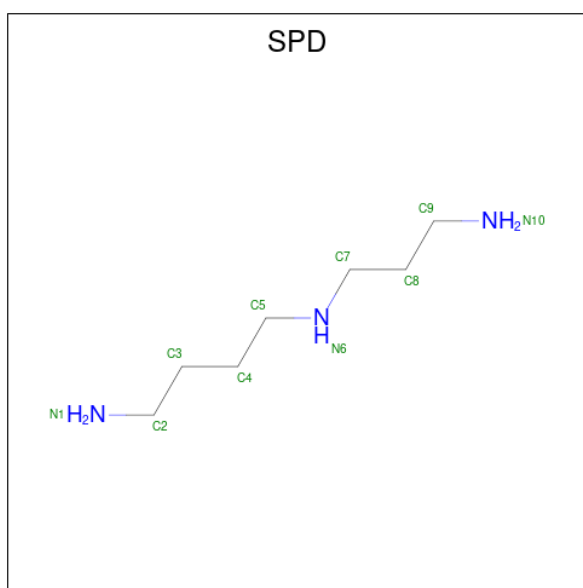
Mol	Chain	Residues	Atoms		AltConf
84	AA	13	Total 13	K 13	0
84	EE	1	Total 1	K 1	0

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Mol	Chain	Residues	Atoms	AltConf
84	MM	1	Total K 1 1	0
84	Q	1	Total K 1 1	0
84	S	1	Total K 1 1	0
84	c	1	Total K 1 1	0
84	q	1	Total K 1 1	0

- Molecule 85 is SPERMIDINE (three-letter code: SPD) (formula: $C_7H_{19}N_3$).



Mol	Chain	Residues	Atoms	AltConf
85	AA	1	Total C N 10 7 3	0
85	AA	1	Total C N 10 7 3	0
85	AA	1	Total C N 10 7 3	0
85	c	1	Total C N 10 7 3	0

- Molecule 86 is METHIONINE (three-letter code: MET) (formula: $C_5H_{11}NO_2S$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	S	
86	Bb	1	8	5	1	1	1	0

- Molecule 87 is water.

Mol	Chain	Residues	Atoms		AltConf
87	2	1	Total	O	0
			1	1	
87	A	2	Total	O	0
			2	2	
87	AA	774	Total	O	0
			774	774	
87	B	4	Total	O	0
			4	4	
87	BB	13	Total	O	0
			13	13	
87	Bb	5	Total	O	0
			5	5	
87	CC	13	Total	O	0
			13	13	
87	Cc	1	Total	O	0
			1	1	
87	D	1	Total	O	0
			1	1	
87	Dd	3	Total	O	0
			3	3	
87	EE	11	Total	O	0
			11	11	

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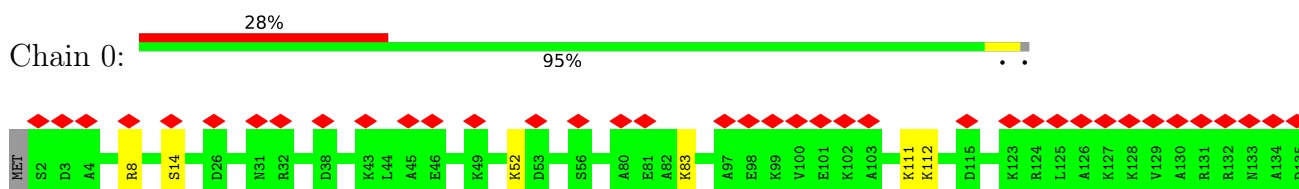
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Mol	Chain	Residues	Atoms		AltConf
87	F	2	Total 2	O 2	0
87	FF	4	Total 4	O 4	0
87	GG	3	Total 3	O 3	0
87	H	3	Total 3	O 3	0
87	HH	1	Total 1	O 1	0
87	J	1	Total 1	O 1	0
87	JJ	1	Total 1	O 1	0
87	M	2	Total 2	O 2	0
87	MM	1	Total 1	O 1	0
87	N	1	Total 1	O 1	0
87	P	1	Total 1	O 1	0
87	Q	4	Total 4	O 4	0
87	QQ	7	Total 7	O 7	0
87	V	4	Total 4	O 4	0
87	a	1	Total 1	O 1	0
87	c	122	Total 122	O 122	0
87	e	1	Total 1	O 1	0
87	h	2	Total 2	O 2	0
87	o	2	Total 2	O 2	0
87	p	1	Total 1	O 1	0

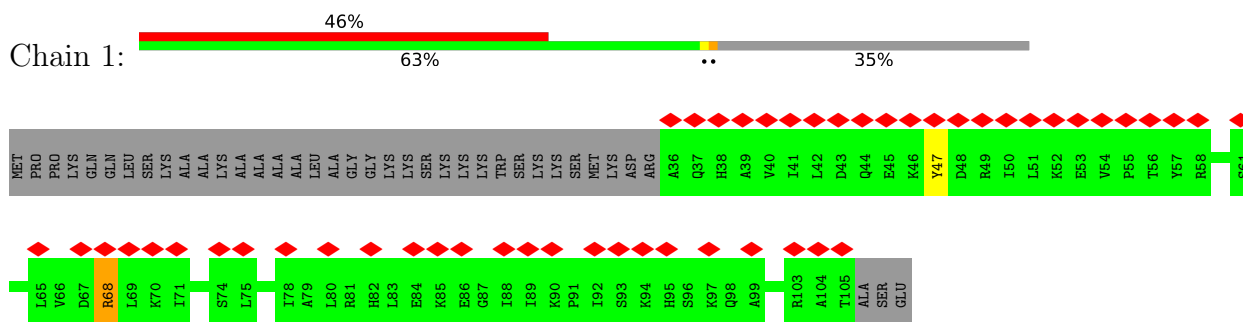
3 Residue-property plots [i](#)

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

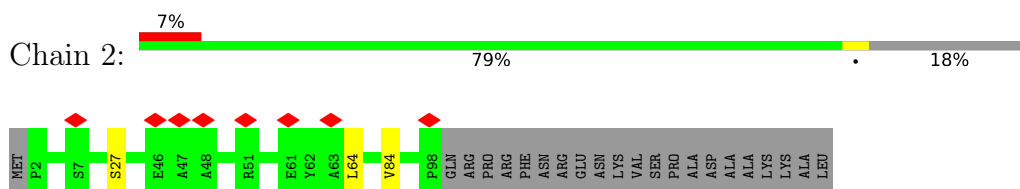
- Molecule 1: 40S ribosomal protein S24-A



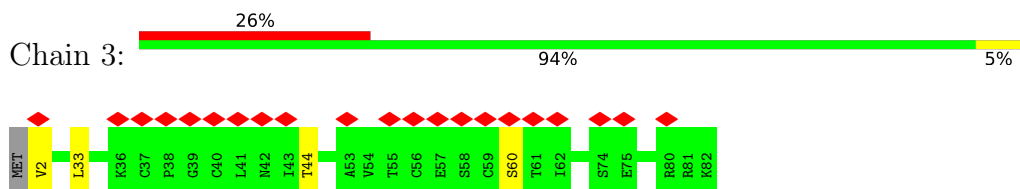
- Molecule 2: 40S ribosomal protein S25-A



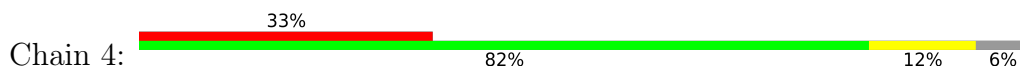
- Molecule 3: 40S ribosomal protein S26

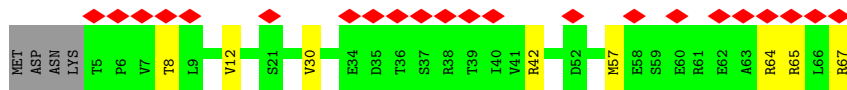


- Molecule 4: 40S ribosomal protein S27-A

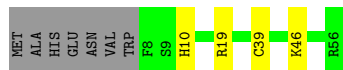
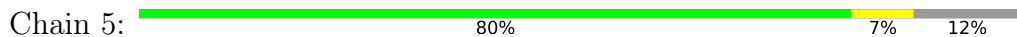


- Molecule 5: 40S ribosomal protein S28-A

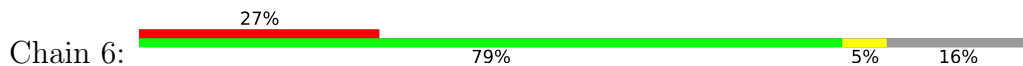




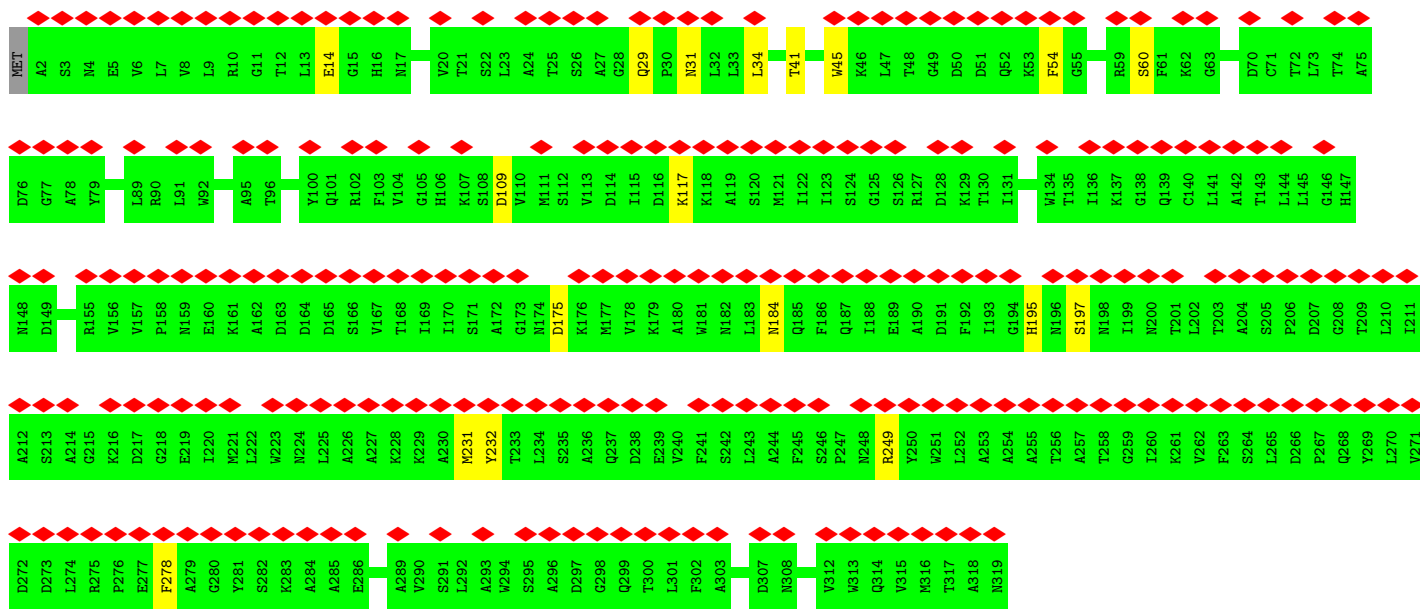
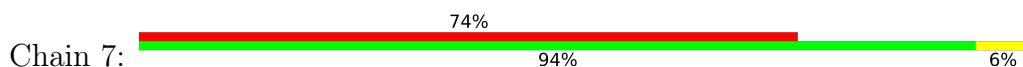
• Molecule 6: HLJ1_G0030400.mRNA.1.CDS.1



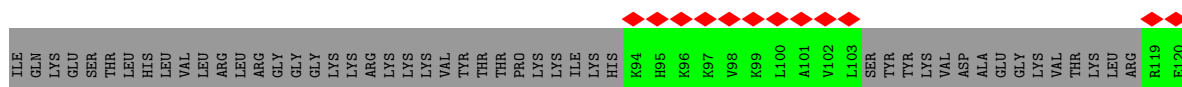
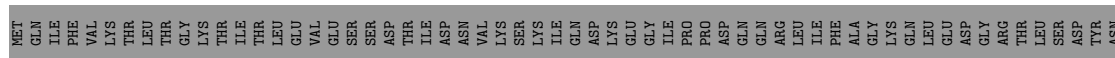
• Molecule 7: 40S ribosomal protein S30-A

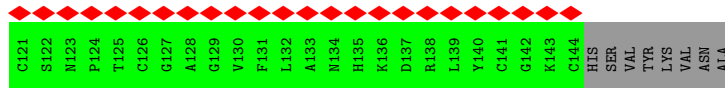


• Molecule 8: Guanine nucleotide-binding protein subunit beta-like protein

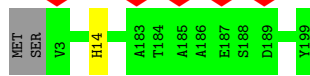


• Molecule 9: Ubiquitin-40S ribosomal protein S31

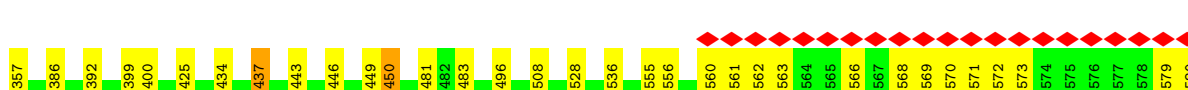
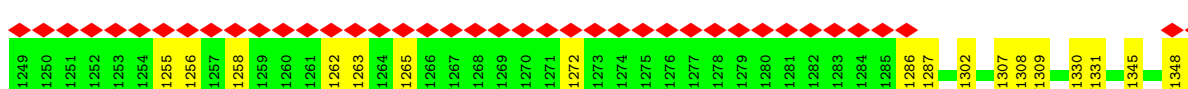
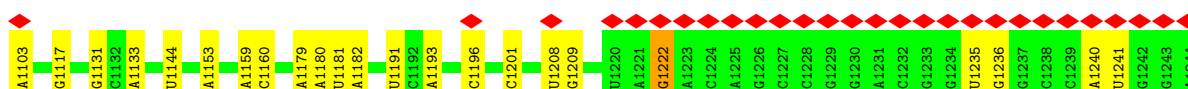
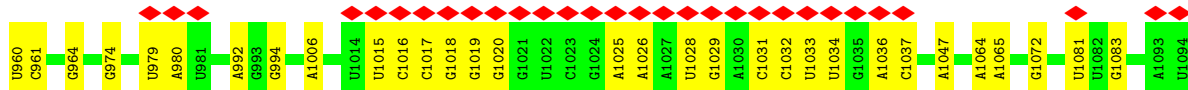
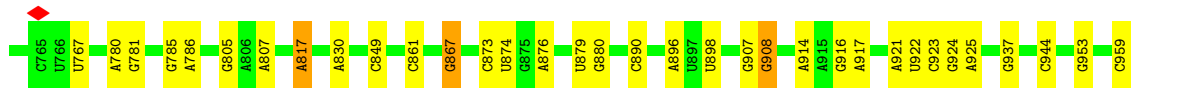
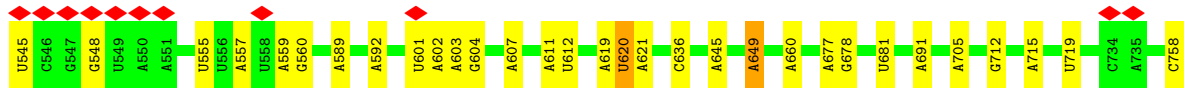
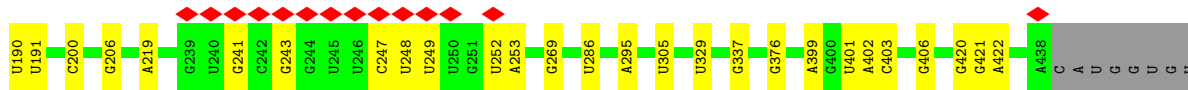
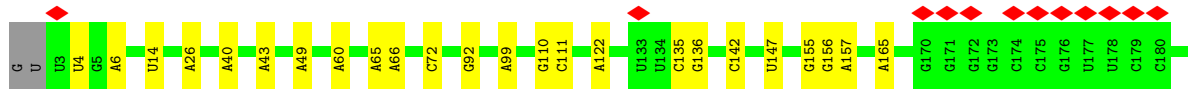
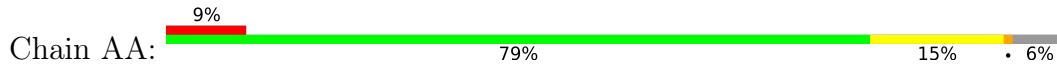




• Molecule 10: 60S ribosomal protein L16-A



• Molecule 11: 25S ribosomal RNA



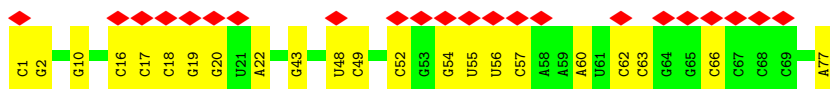
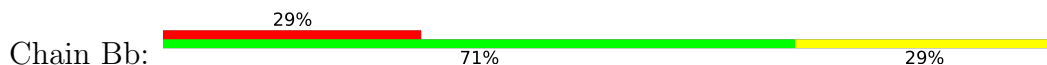
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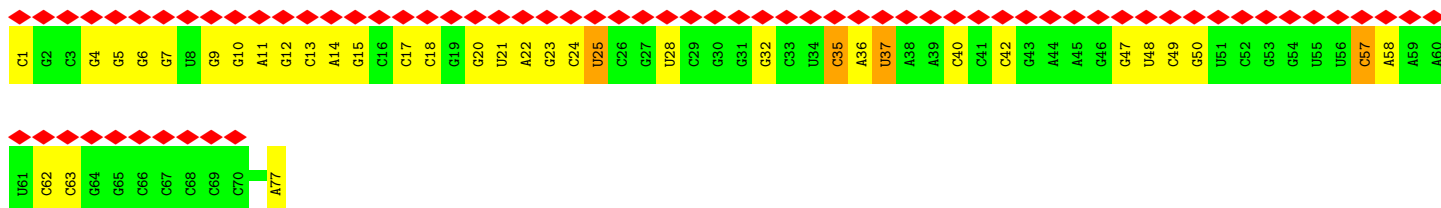
• Molecule 13: 5S ribosomal RNA



• Molecule 14: Transfer RNA fMet



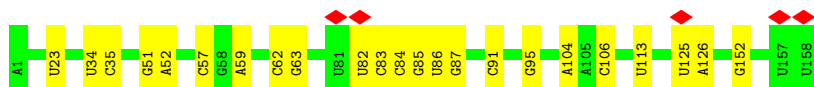
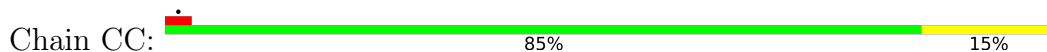
• Molecule 14: Transfer RNA fMet



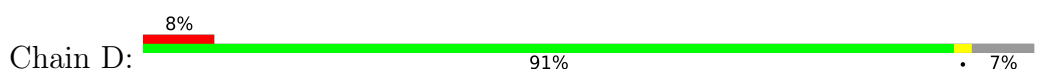
• Molecule 15: 60S ribosomal protein L18-A

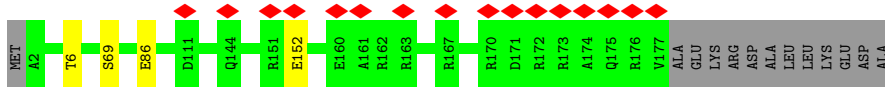


• Molecule 16: 5.8S ribosomal RNA

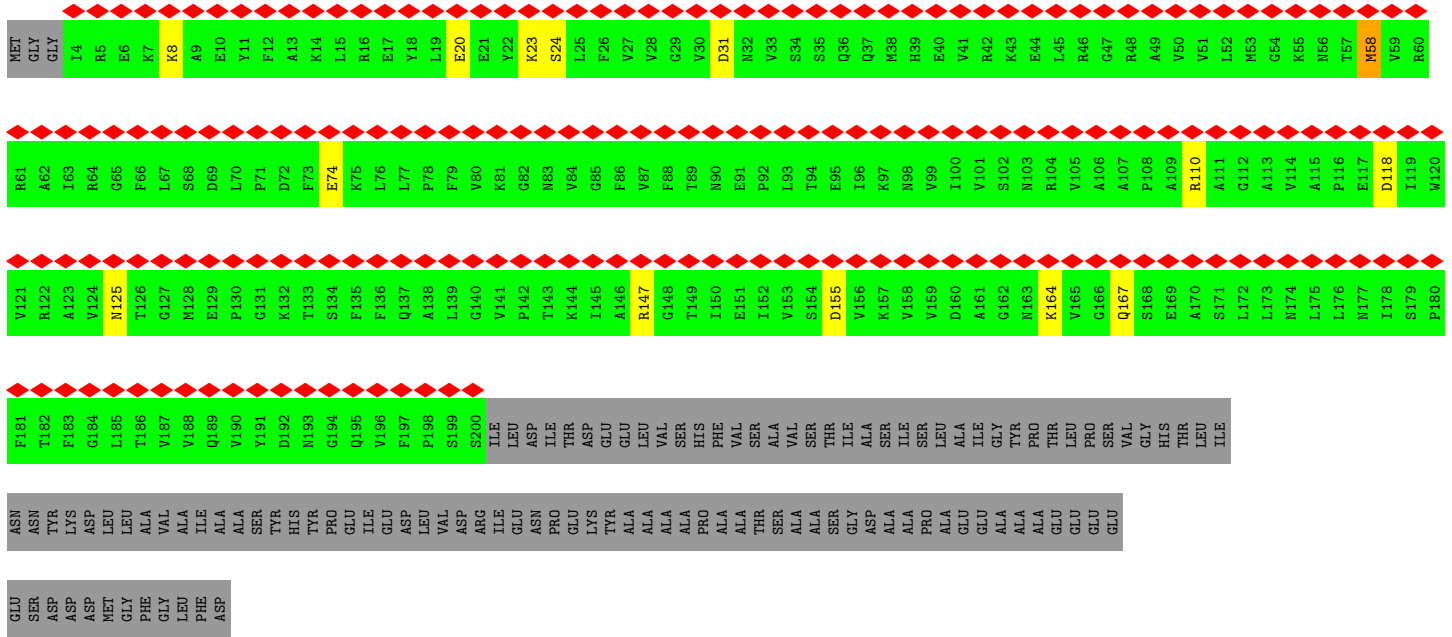


• Molecule 17: 60S ribosomal protein L19-A

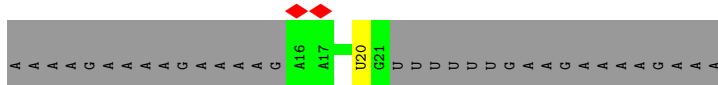




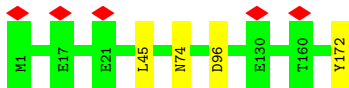
- Molecule 18: 60S acidic ribosomal protein P0



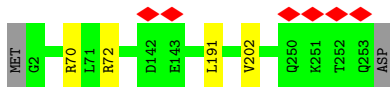
- Molecule 19: Messenger RNA



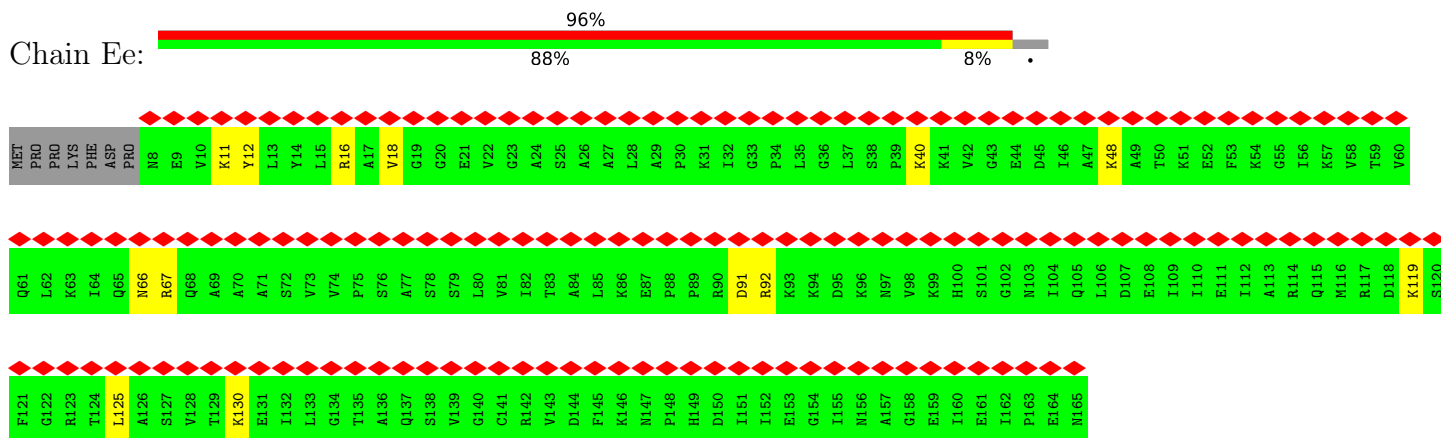
- Molecule 20: 60S ribosomal protein L20-A



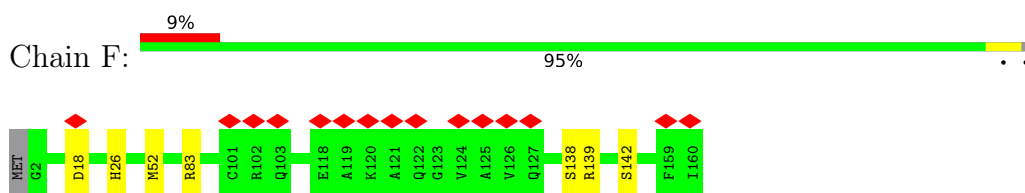
- Molecule 21: 60S ribosomal protein L2-A



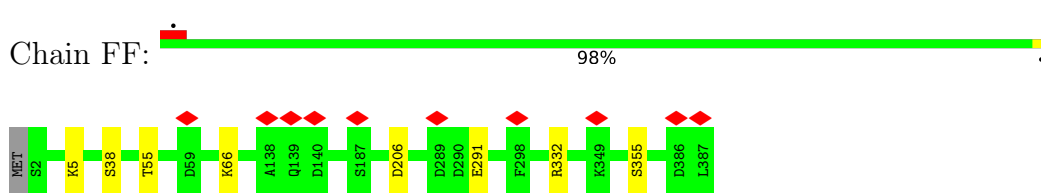
- Molecule 22: 60S ribosomal protein L12-A



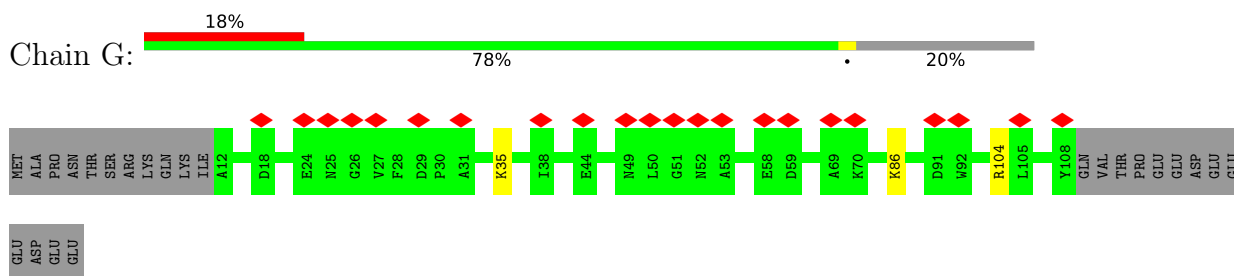
• Molecule 23: 60S ribosomal protein L21-A



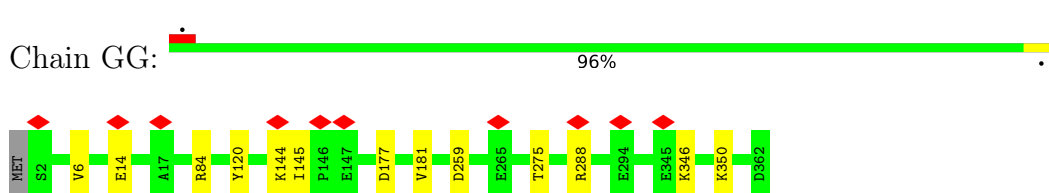
• Molecule 24: 60S ribosomal protein L3



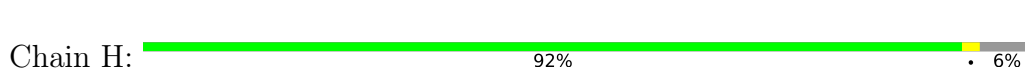
• Molecule 25: 60S ribosomal protein L22-A

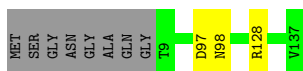


• Molecule 26: 60S ribosomal protein L4-A

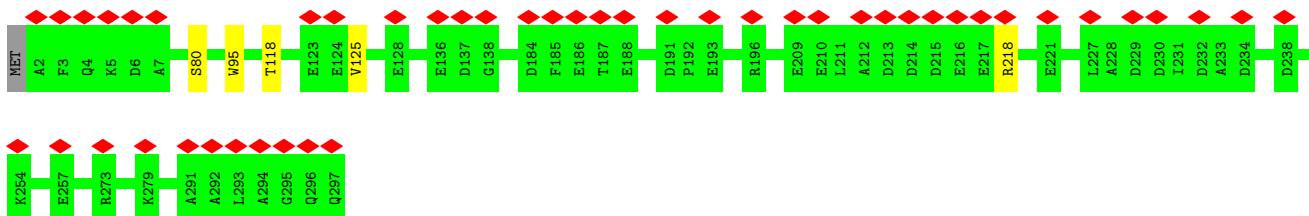


• Molecule 27: 60S ribosomal protein L23-A

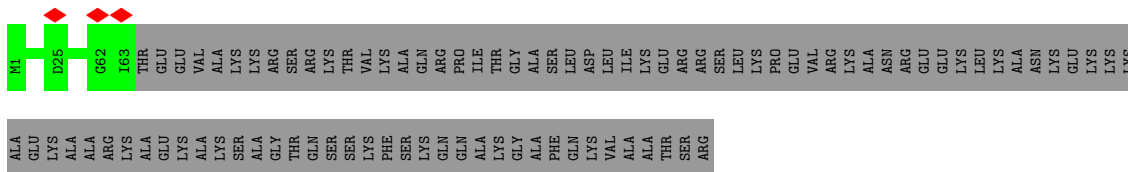




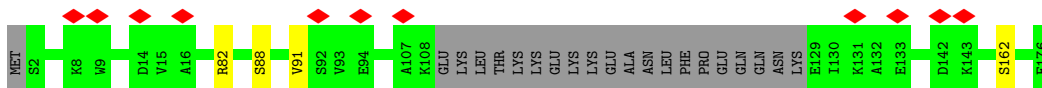
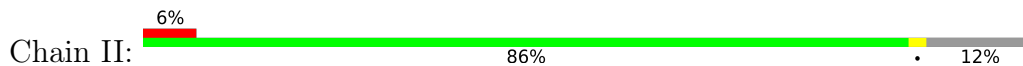
- Molecule 28: 60S ribosomal protein L5



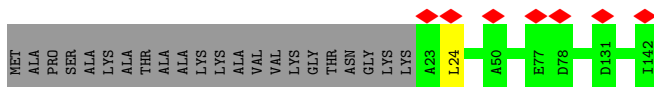
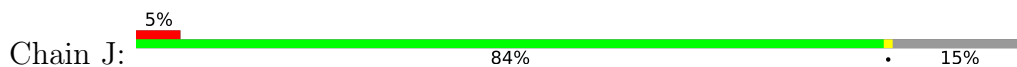
- Molecule 29: 60S ribosomal protein L24-A



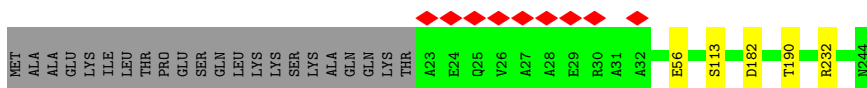
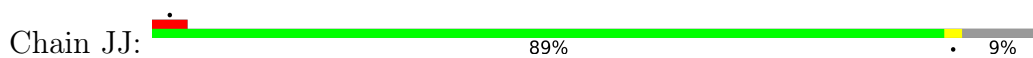
- Molecule 30: 60S ribosomal protein L6-A



- Molecule 31: 60S ribosomal protein L25



- Molecule 32: 60S ribosomal protein L7-A

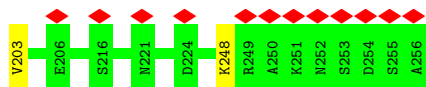
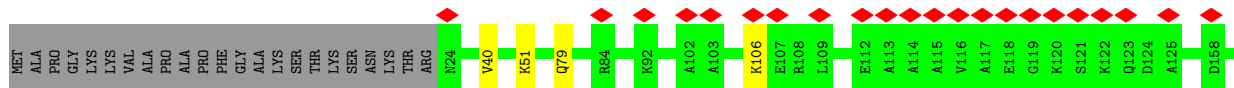
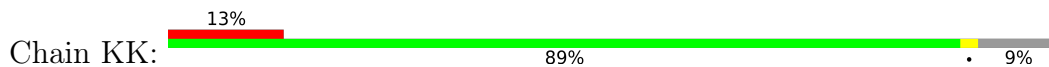


- Molecule 33: 60S ribosomal protein L26-A

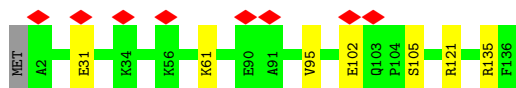
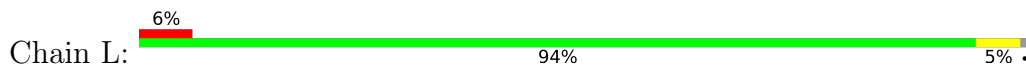




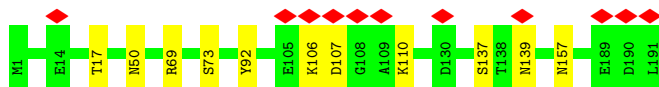
• Molecule 34: 60S ribosomal protein L8-A



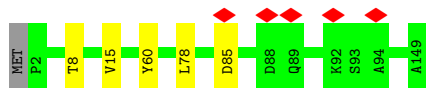
• Molecule 35: 60S ribosomal protein L27-A



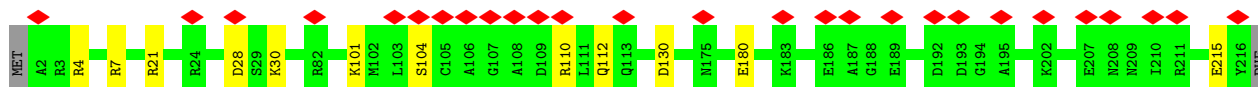
• Molecule 36: RPL9A isoform 1



• Molecule 37: 60S ribosomal protein L28

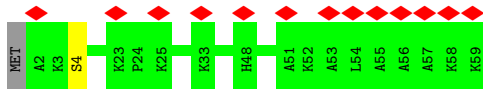


• Molecule 38: 60S ribosomal protein L10

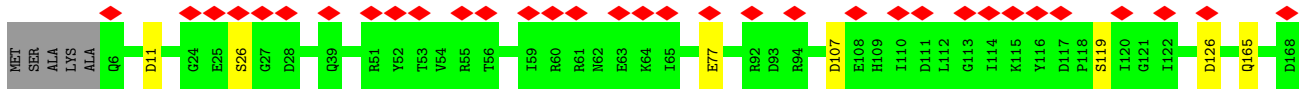


• Molecule 39: 60S ribosomal protein L29

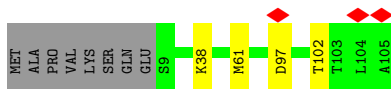
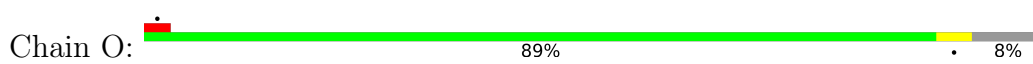




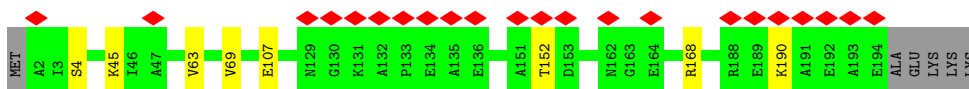
- Molecule 40: 60S ribosomal protein L11-A



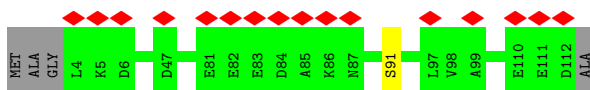
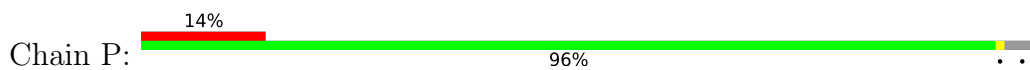
- Molecule 41: 60S ribosomal protein L30



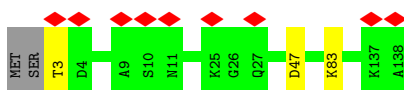
- Molecule 42: 60S ribosomal protein L13-A



- Molecule 43: 60S ribosomal protein L31-A



- Molecule 44: 60S ribosomal protein L14-A

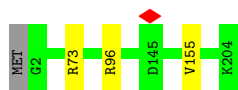


- Molecule 45: 60S ribosomal protein L32





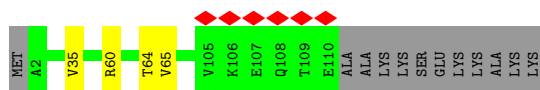
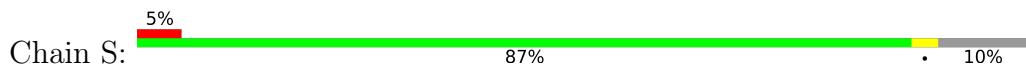
- Molecule 46: 60S ribosomal protein L15-A



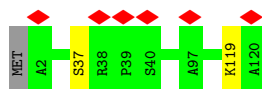
- Molecule 47: 60S ribosomal protein L33-A



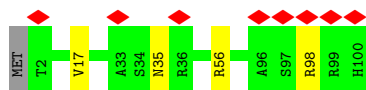
- Molecule 48: 60S ribosomal protein L34-A



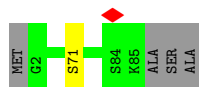
- Molecule 49: 60S ribosomal protein L35-A



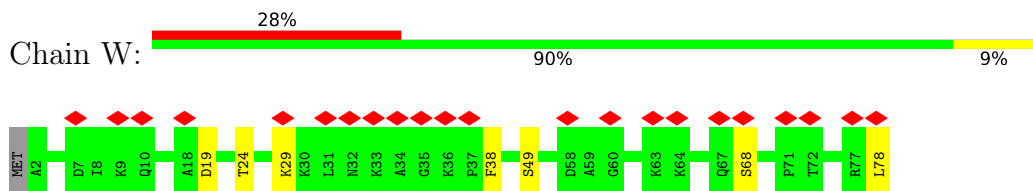
- Molecule 50: 60S ribosomal protein L36-A



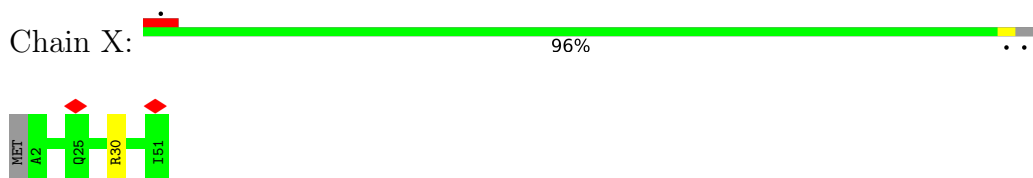
- Molecule 51: 60S ribosomal protein L37-A



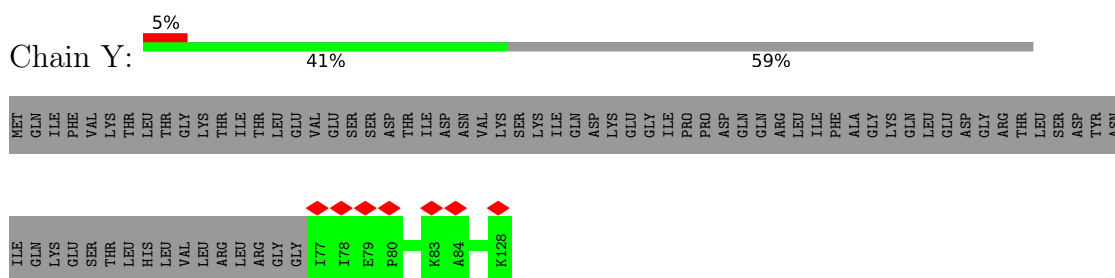
- Molecule 52: 60S ribosomal protein L38



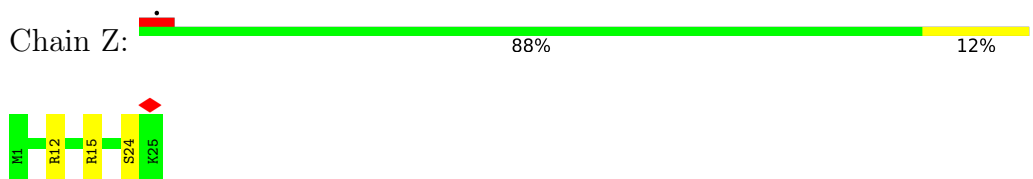
• Molecule 53: 60S ribosomal protein L39



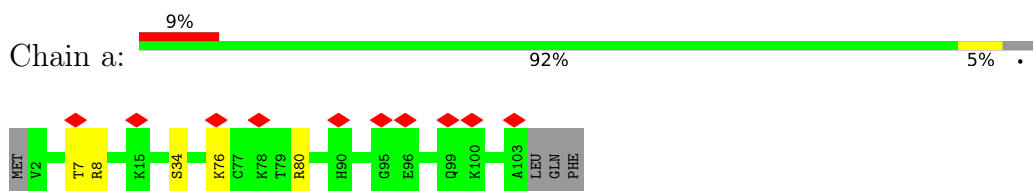
• Molecule 54: Ubiquitin-60S ribosomal protein L40



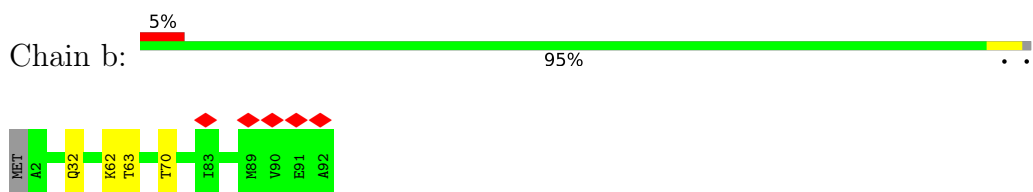
• Molecule 55: 60S ribosomal protein L41



• Molecule 56: 60S ribosomal protein L42-A

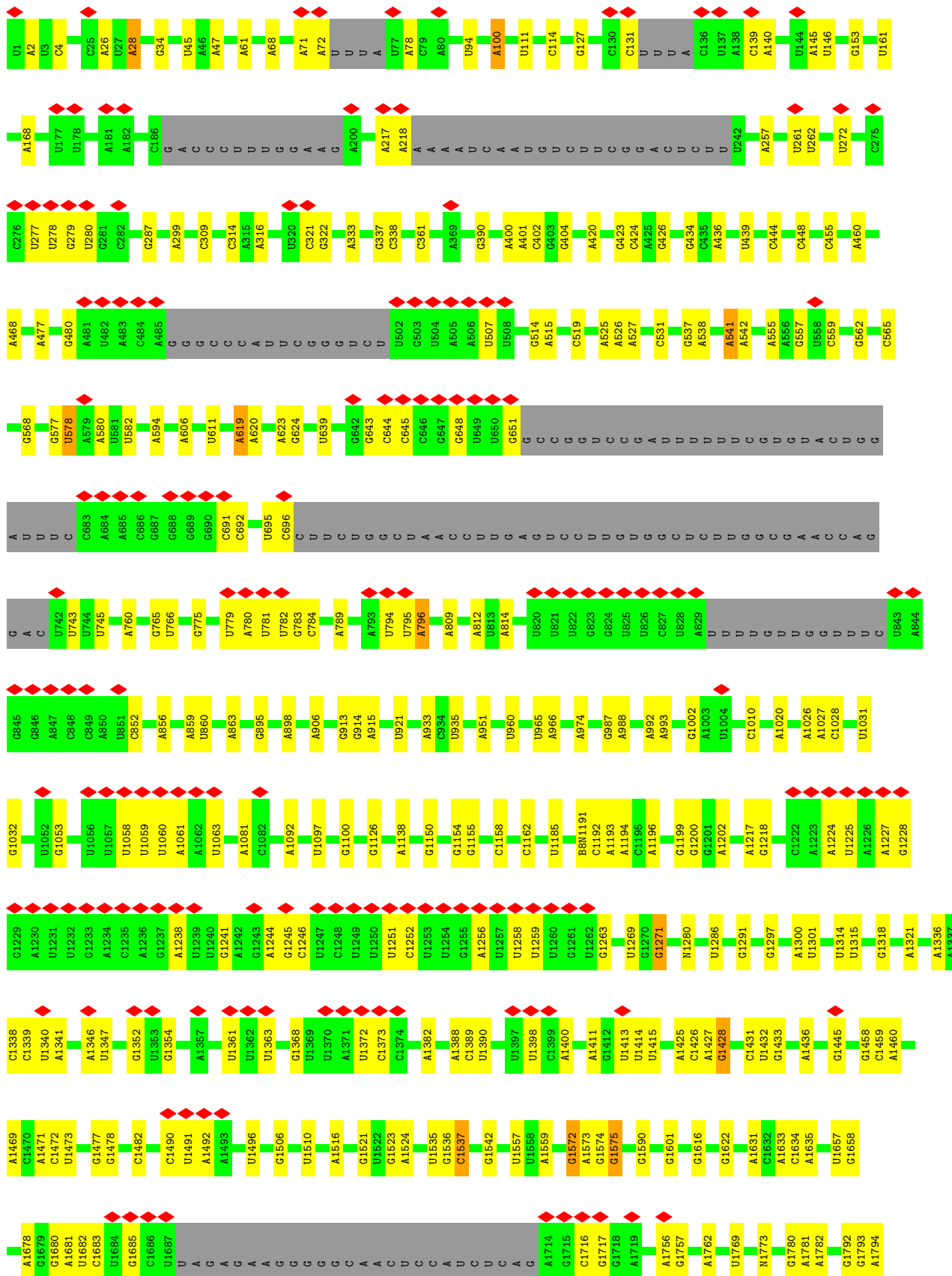


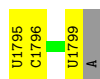
• Molecule 57: 60S ribosomal protein L43-A



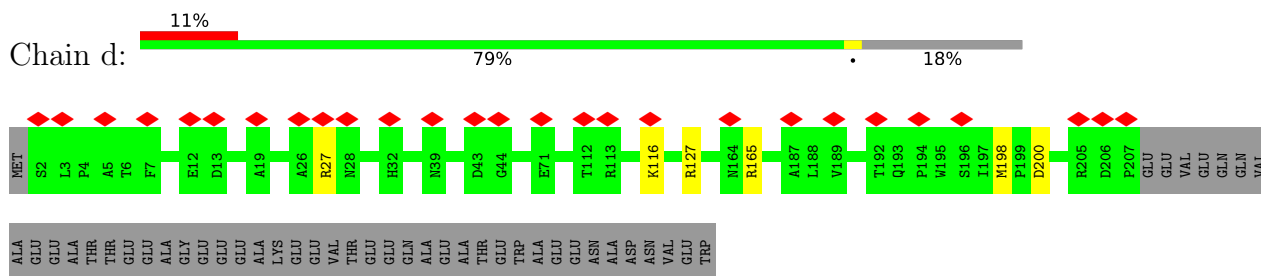
• Molecule 58: 18S ribosomal RNA



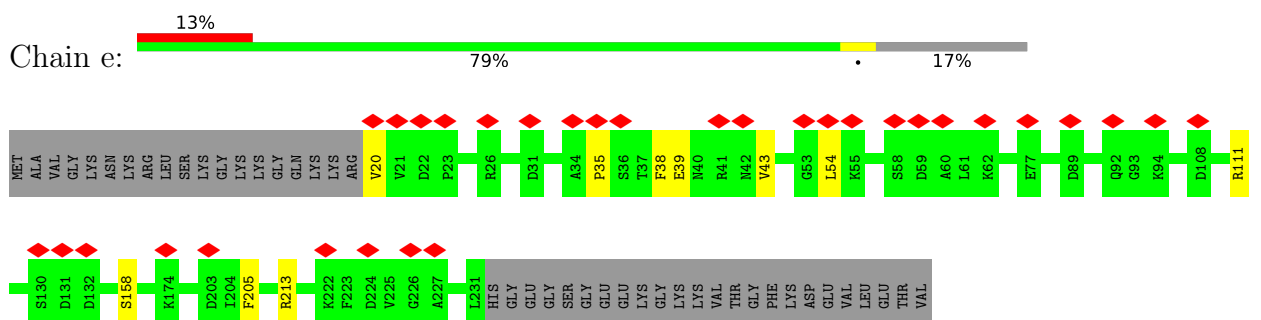




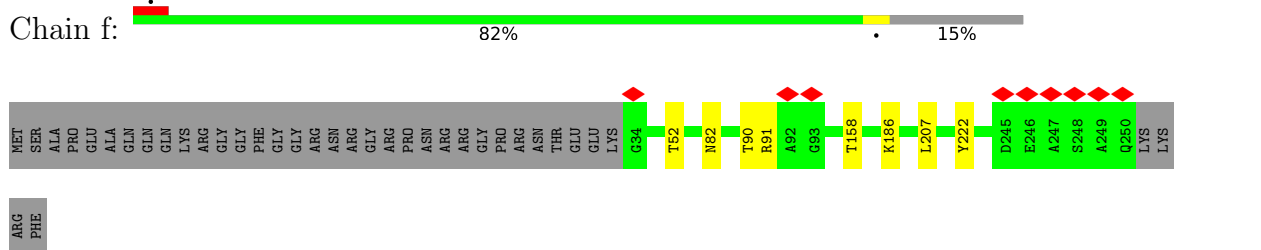
• Molecule 59: 40S ribosomal protein S0-A



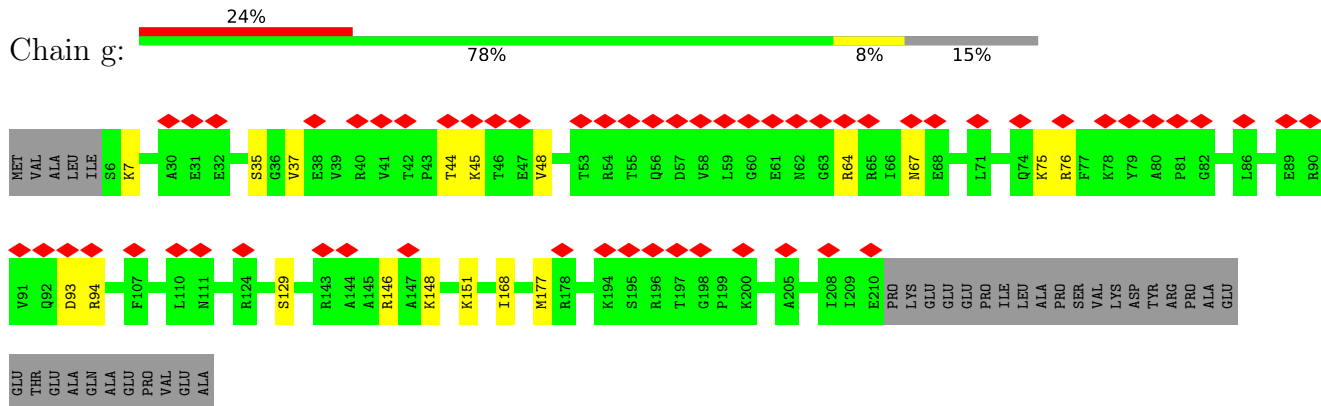
• Molecule 60: 40S ribosomal protein S1-A



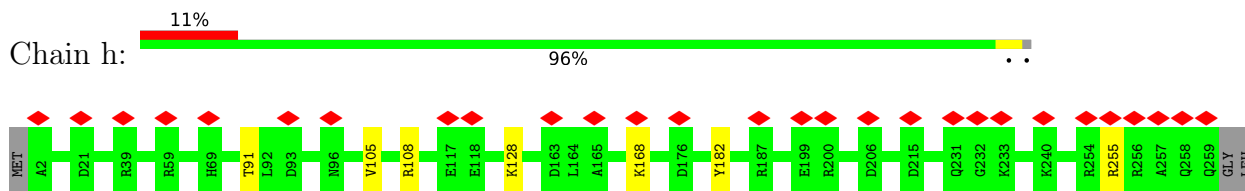
• Molecule 61: 40S ribosomal protein S2



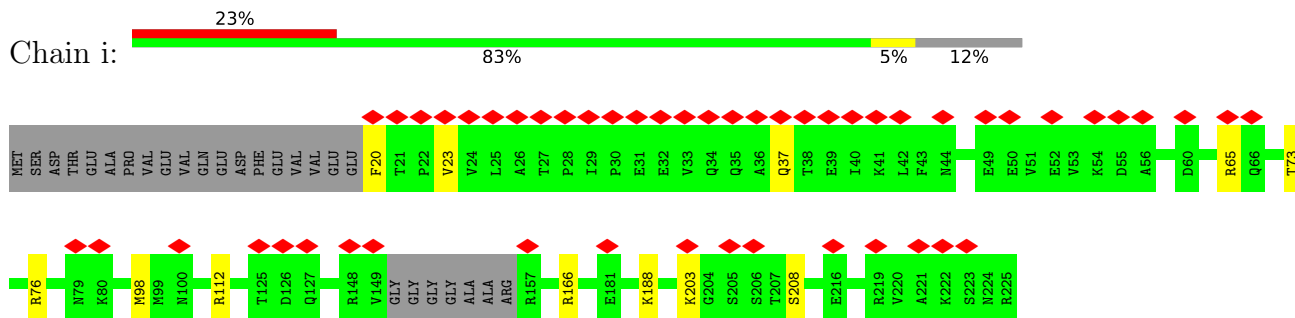
• Molecule 62: RPS3 isoform 1



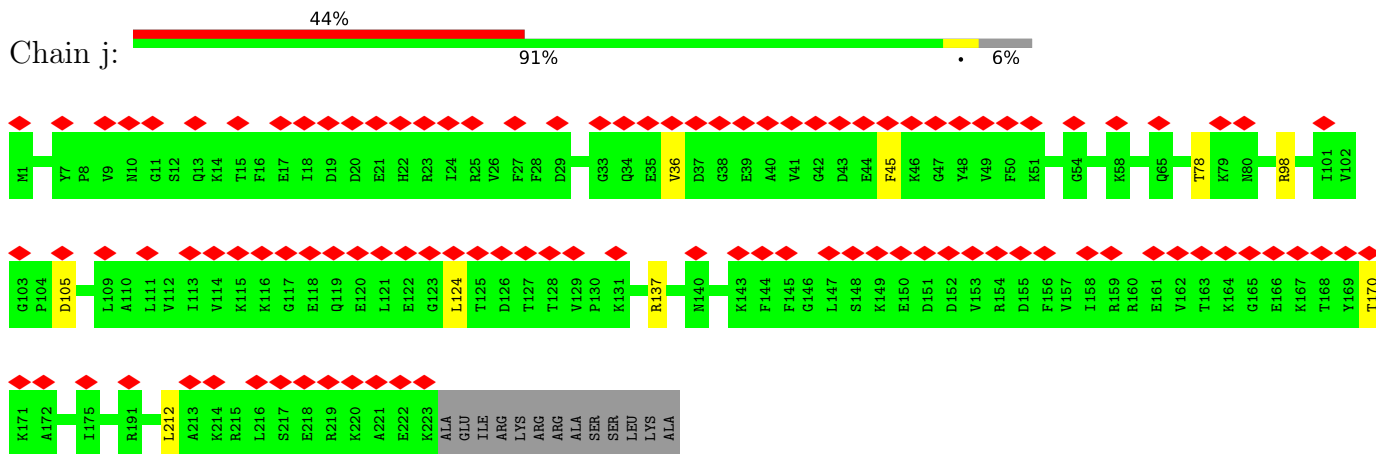
• Molecule 63: 40S ribosomal protein S4-A



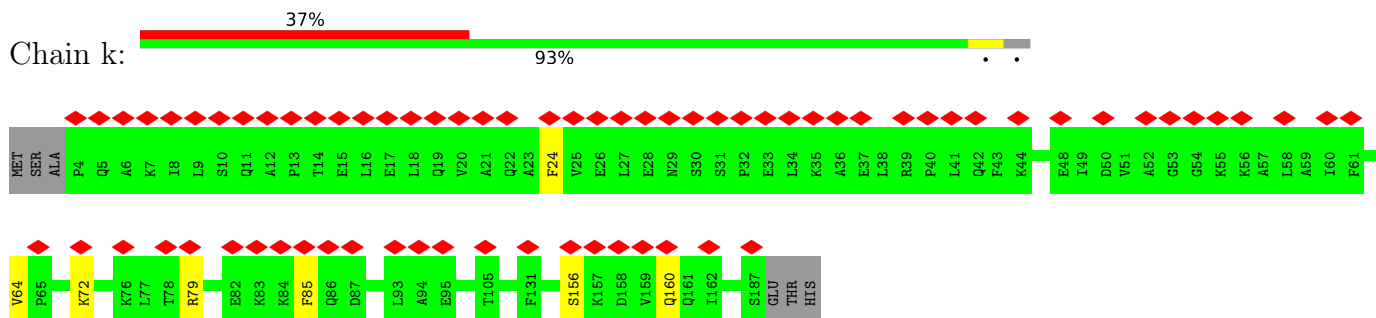
• Molecule 64: 40S ribosomal protein S5



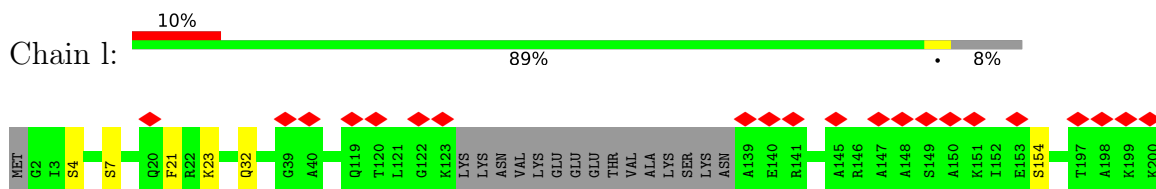
• Molecule 65: 40S ribosomal protein S6-A



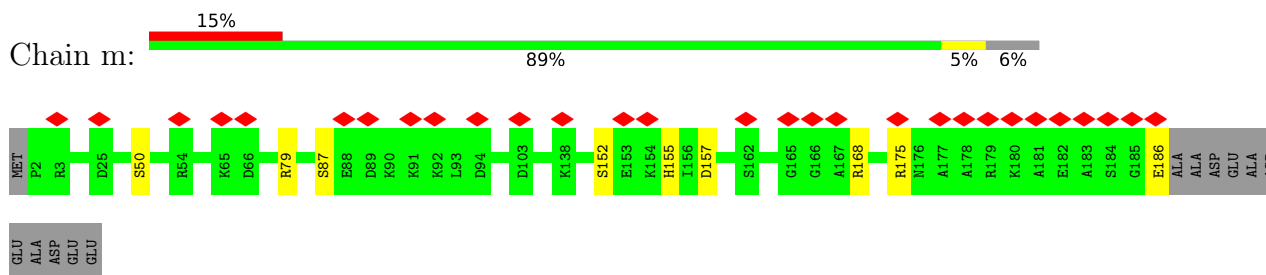
• Molecule 66: 40S ribosomal protein S7-A



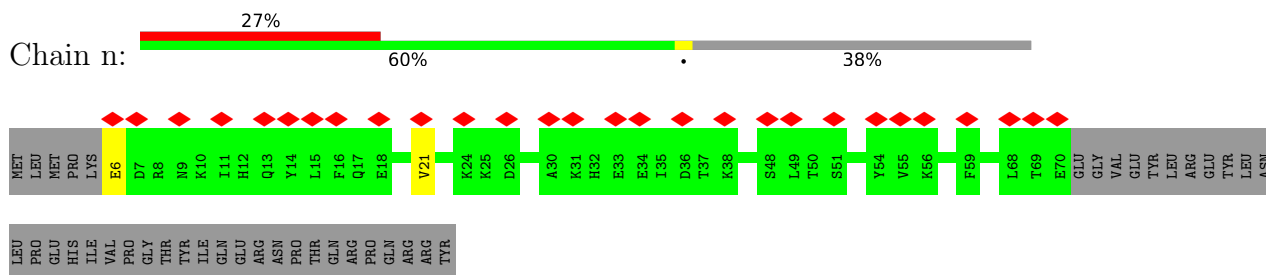
• Molecule 67: 40S ribosomal protein S8-B



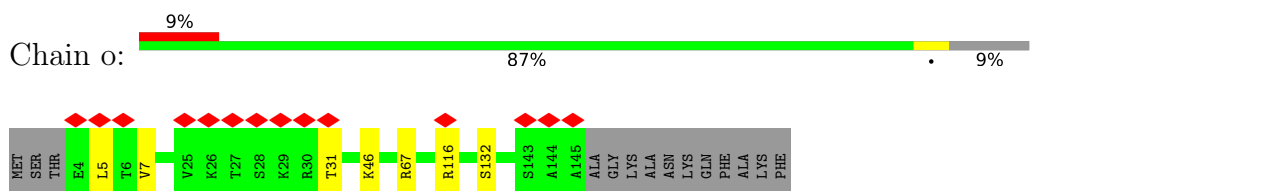
• Molecule 68: 40S ribosomal protein S9-A



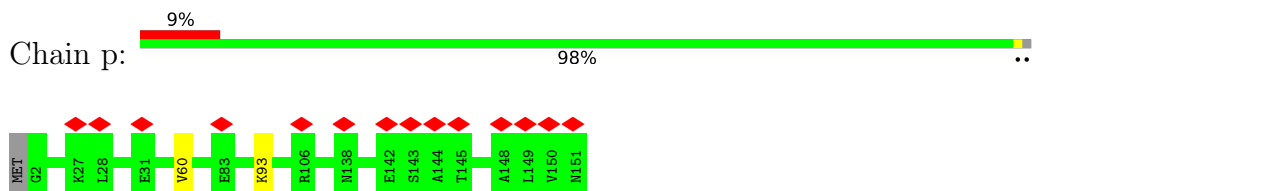
• Molecule 69: 40S ribosomal protein S10-A



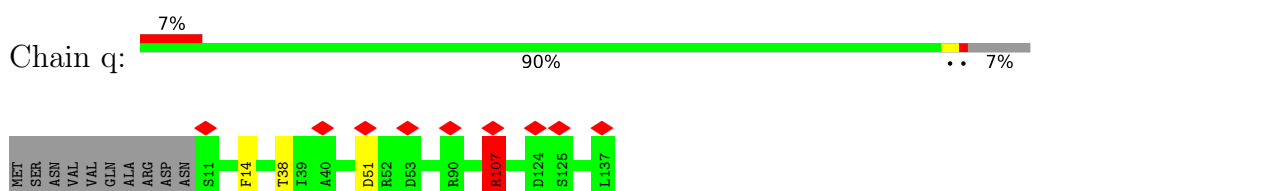
• Molecule 70: 40S ribosomal protein S11-A



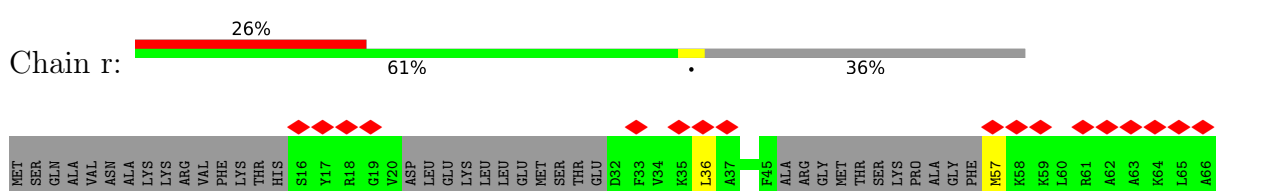
• Molecule 71: 40S ribosomal protein S13

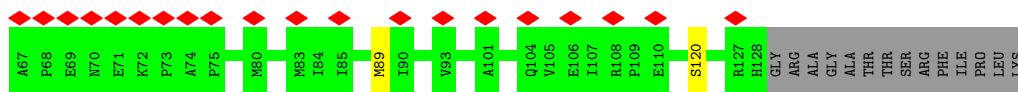


• Molecule 72: 40S ribosomal protein S14-A

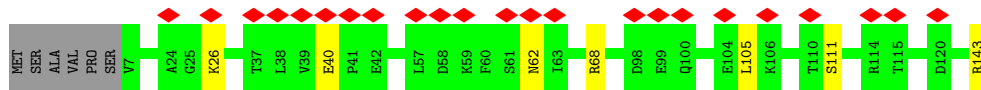
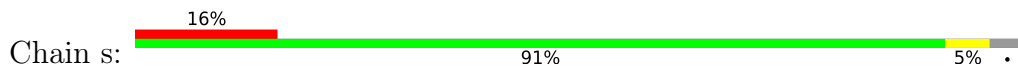


• Molecule 73: 40S ribosomal protein S15

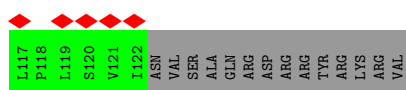
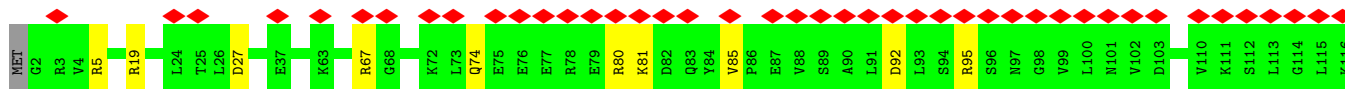
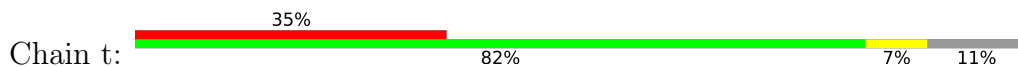




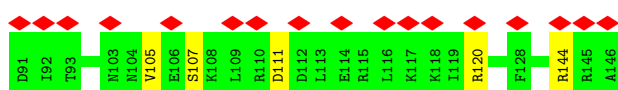
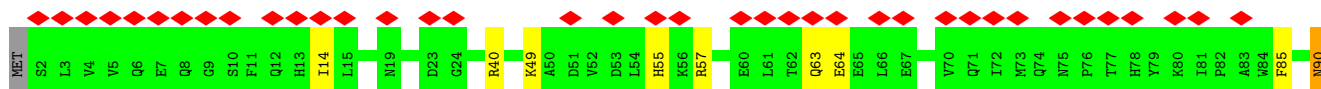
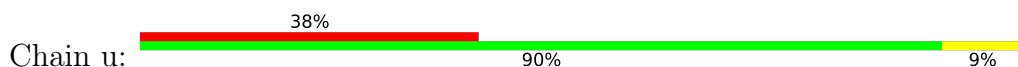
• Molecule 74: 40S ribosomal protein S16-A



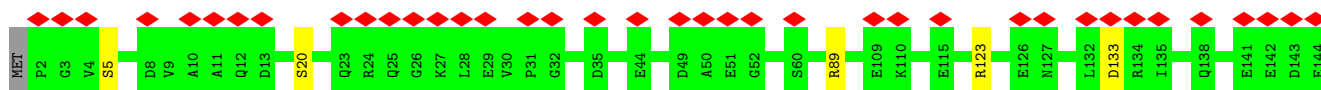
• Molecule 75: 40S ribosomal protein S17-A



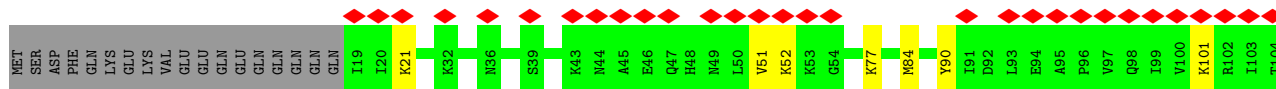
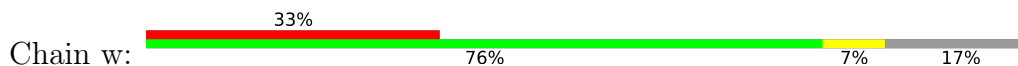
• Molecule 76: 40S ribosomal protein S18-A



• Molecule 77: 40S ribosomal protein S19-A

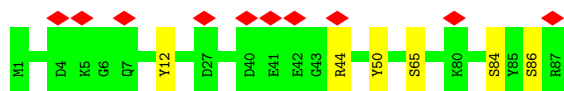
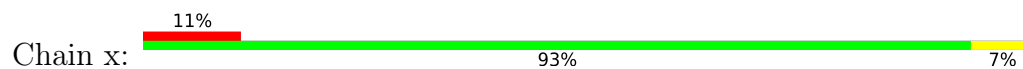


• Molecule 78: 40S ribosomal protein S20





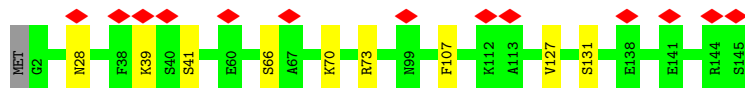
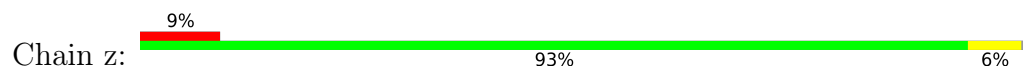
- Molecule 79: 40S ribosomal protein S21-A



- Molecule 80: 40S ribosomal protein S22-A



- Molecule 81: 40S ribosomal protein S23-A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21458	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 ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	1000	Depositor
Magnification	270000	Depositor
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	1.688	Depositor
Minimum map value	-0.693	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.055	Depositor
Recommended contour level	0.249	Depositor
Map size (Å)	540.0, 540.0, 540.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.9, 0.9, 0.9	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: SPD, K, UR3, ZN, OMG, 1MA, OMU, MA6, B8N, A2M, 5MC, G7M, MG, OMC, 4AC

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	0	0.26	0/1087	0.54	0/1449
2	1	0.29	0/571	0.64	1/768 (0.1%)
3	2	0.24	0/782	0.56	0/1047
4	3	0.24	0/620	0.54	0/838
5	4	0.26	0/499	0.65	0/670
6	5	0.25	0/412	0.57	0/544
7	6	0.25	0/433	0.62	0/575
8	7	0.26	0/2489	0.58	1/3389 (0.0%)
9	8	0.23	0/279	0.51	0/369
10	A	0.26	0/1585	0.51	0/2128
11	AA	0.23	0/75545	0.80	24/117782 (0.0%)
12	B	0.25	0/1245	0.52	0/1676
13	BB	0.20	0/2883	0.76	0/4491
14	Bb	0.32	1/1836 (0.1%)	0.78	0/2859
14	Cc	0.52	5/1836 (0.3%)	0.86	1/2859 (0.0%)
15	C	0.25	0/1465	0.54	0/1965
16	CC	0.22	0/3746	0.78	0/5832
17	D	0.24	0/1440	0.55	0/1921
18	DD	0.27	0/1558	0.59	1/2107 (0.0%)
19	Dd	0.29	0/147	0.84	0/227
20	E	0.26	0/1481	0.55	0/1990
21	EE	0.25	0/1948	0.56	0/2617
22	Ee	0.28	0/1210	0.57	1/1627 (0.1%)
23	F	0.26	0/1300	0.52	0/1743
24	FF	0.25	0/3146	0.54	0/4228
25	G	0.26	0/786	0.50	0/1065
26	GG	0.24	0/2800	0.51	0/3790
27	H	0.26	0/978	0.53	0/1316
28	HH	0.25	0/2425	0.50	0/3271
29	I	0.26	0/533	0.52	0/707
30	II	0.26	0/1251	0.50	0/1682
31	J	0.25	0/974	0.50	0/1314

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	JJ	0.26	0/1821	0.49	0/2451
33	K	0.25	0/1004	0.53	0/1341
34	KK	0.25	0/1836	0.48	0/2481
35	L	0.26	0/1118	0.49	0/1497
36	LL	0.26	0/1539	0.52	0/2073
37	M	0.25	0/1204	0.53	0/1612
38	MM	0.25	0/1779	0.53	0/2386
39	N	0.25	0/473	0.48	0/629
40	NN	0.25	0/1374	0.57	0/1842
41	O	0.25	0/750	0.45	0/1008
42	OO	0.26	0/1568	0.57	0/2106
43	P	0.24	0/897	0.54	0/1205
44	PP	0.24	0/1068	0.49	0/1438
45	Q	0.24	0/1041	0.51	0/1394
46	QQ	0.25	0/1757	0.58	0/2354
47	R	0.27	0/868	0.54	0/1168
48	S	0.24	0/871	0.55	0/1164
49	T	0.24	0/978	0.51	0/1301
50	U	0.24	0/778	0.55	0/1034
51	V	0.26	0/680	0.59	0/901
52	W	0.26	0/618	0.57	0/826
53	X	0.24	0/443	0.62	0/588
54	Y	0.24	0/423	0.53	0/562
55	Z	0.24	0/234	0.71	0/300
56	a	0.26	0/831	0.56	0/1097
57	b	0.25	0/701	0.58	0/934
58	c	0.22	0/38143	0.81	18/59408 (0.0%)
59	d	0.25	0/1623	0.52	0/2222
60	e	0.25	0/1714	0.54	0/2308
61	f	0.25	0/1665	0.52	0/2263
62	g	0.27	0/1614	0.58	0/2169
63	h	0.25	0/2097	0.53	0/2823
64	i	0.24	0/1591	0.54	0/2151
65	j	0.25	0/1822	0.56	0/2434
66	k	0.25	0/1506	0.55	0/2028
67	l	0.28	0/1482	0.56	0/1980
68	m	0.25	0/1519	0.54	0/2035
69	n	0.26	0/569	0.54	0/767
70	o	0.25	0/1172	0.54	0/1580
71	p	0.25	0/1215	0.52	0/1638
72	q	0.26	0/901	0.64	1/1217 (0.1%)
73	r	0.27	0/747	0.59	0/1002
74	s	0.29	0/1099	0.61	1/1473 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
75	t	0.24	0/971	0.58	0/1303
76	u	0.25	0/1211	0.61	0/1628
77	v	0.26	0/1130	0.52	0/1517
78	w	0.25	0/810	0.55	0/1095
79	x	0.25	0/693	0.58	0/935
80	y	0.26	0/1038	0.53	0/1395
81	z	0.25	0/1139	0.54	0/1518
All	All	0.24	6/213415 (0.0%)	0.72	49/313427 (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
2	1	0	1
18	DD	0	1
32	JJ	0	1
35	L	0	1
56	a	0	1
60	e	0	2
64	i	0	1
66	k	0	1
72	q	0	1
74	s	0	1
76	u	0	1
All	All	0	12

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	Bb	1	C	OP3-P	-10.59	1.48	1.61
14	Cc	1	C	OP3-P	-10.42	1.48	1.61
14	Cc	37	U	C1'-N1	5.99	1.57	1.48
14	Cc	25	U	C1'-N1	5.78	1.57	1.48
14	Cc	24	C	C1'-N1	5.53	1.57	1.48

The worst 5 of 49 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
58	c	94	U	C2-N3-C4	14.44	135.66	127.00
58	c	1537	C	C2-N1-C1'	8.46	128.11	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
58	c	1537	C	N1-C2-O2	8.12	123.77	118.90
11	AA	3278	C	N1-C2-O2	7.33	123.30	118.90
58	c	94	U	N3-C4-C5	7.32	118.99	114.60

There are no chirality outliers.

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	1	68	ARG	Sidechain
18	DD	20	GLU	Peptide
32	JJ	232	ARG	Peptide
35	L	102	GLU	Peptide
56	a	7	THR	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	132/135 (98%)	127 (96%)	5 (4%)	0	100	100
2	1	68/108 (63%)	62 (91%)	6 (9%)	0	100	100
3	2	95/119 (80%)	89 (94%)	6 (6%)	0	100	100
4	3	79/82 (96%)	74 (94%)	5 (6%)	0	100	100
5	4	61/67 (91%)	60 (98%)	1 (2%)	0	100	100
6	5	47/56 (84%)	47 (100%)	0	0	100	100
7	6	51/63 (81%)	49 (96%)	2 (4%)	0	100	100
8	7	316/319 (99%)	297 (94%)	19 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	8	32/152 (21%)	25 (78%)	7 (22%)	0	100	100
10	A	195/199 (98%)	193 (99%)	2 (1%)	0	100	100
12	B	152/338 (45%)	150 (99%)	2 (1%)	0	100	100
15	C	183/186 (98%)	182 (100%)	1 (0%)	0	100	100
17	D	174/189 (92%)	170 (98%)	4 (2%)	0	100	100
18	DD	195/312 (62%)	189 (97%)	6 (3%)	0	100	100
20	E	170/172 (99%)	163 (96%)	7 (4%)	0	100	100
21	EE	250/254 (98%)	247 (99%)	3 (1%)	0	100	100
22	Ee	156/165 (94%)	150 (96%)	6 (4%)	0	100	100
23	F	157/160 (98%)	154 (98%)	3 (2%)	0	100	100
24	FF	384/387 (99%)	373 (97%)	11 (3%)	0	100	100
25	G	95/121 (78%)	92 (97%)	3 (3%)	0	100	100
26	GG	359/362 (99%)	345 (96%)	14 (4%)	0	100	100
27	H	127/137 (93%)	126 (99%)	1 (1%)	0	100	100
28	HH	294/297 (99%)	288 (98%)	6 (2%)	0	100	100
29	I	61/155 (39%)	61 (100%)	0	0	100	100
30	II	151/176 (86%)	148 (98%)	3 (2%)	0	100	100
31	J	118/142 (83%)	115 (98%)	3 (2%)	0	100	100
32	JJ	220/244 (90%)	217 (99%)	3 (1%)	0	100	100
33	K	124/127 (98%)	123 (99%)	1 (1%)	0	100	100
34	KK	231/256 (90%)	227 (98%)	4 (2%)	0	100	100
35	L	133/136 (98%)	128 (96%)	5 (4%)	0	100	100
36	LL	189/191 (99%)	181 (96%)	8 (4%)	0	100	100
37	M	146/149 (98%)	141 (97%)	4 (3%)	1 (1%)	22	25
38	MM	213/221 (96%)	208 (98%)	5 (2%)	0	100	100
39	N	56/59 (95%)	54 (96%)	2 (4%)	0	100	100
40	NN	167/174 (96%)	161 (96%)	6 (4%)	0	100	100
41	O	95/105 (90%)	95 (100%)	0	0	100	100
42	OO	191/199 (96%)	178 (93%)	12 (6%)	1 (0%)	29	34
43	P	107/113 (95%)	103 (96%)	4 (4%)	0	100	100
44	PP	134/138 (97%)	133 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
45	Q	125/130 (96%)	125 (100%)	0	0	100	100
46	QQ	201/204 (98%)	194 (96%)	7 (4%)	0	100	100
47	R	104/107 (97%)	103 (99%)	1 (1%)	0	100	100
48	S	107/121 (88%)	107 (100%)	0	0	100	100
49	T	117/120 (98%)	115 (98%)	2 (2%)	0	100	100
50	U	97/100 (97%)	90 (93%)	7 (7%)	0	100	100
51	V	82/88 (93%)	81 (99%)	1 (1%)	0	100	100
52	W	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
53	X	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
54	Y	50/128 (39%)	50 (100%)	0	0	100	100
55	Z	23/25 (92%)	23 (100%)	0	0	100	100
56	a	100/106 (94%)	96 (96%)	4 (4%)	0	100	100
57	b	89/92 (97%)	89 (100%)	0	0	100	100
59	d	204/252 (81%)	194 (95%)	10 (5%)	0	100	100
60	e	210/255 (82%)	195 (93%)	15 (7%)	0	100	100
61	f	215/254 (85%)	203 (94%)	12 (6%)	0	100	100
62	g	203/240 (85%)	196 (97%)	7 (3%)	0	100	100
63	h	256/261 (98%)	248 (97%)	8 (3%)	0	100	100
64	i	195/225 (87%)	186 (95%)	9 (5%)	0	100	100
65	j	221/236 (94%)	215 (97%)	6 (3%)	0	100	100
66	k	182/190 (96%)	175 (96%)	7 (4%)	0	100	100
67	l	180/200 (90%)	164 (91%)	16 (9%)	0	100	100
68	m	183/197 (93%)	178 (97%)	5 (3%)	0	100	100
69	n	63/105 (60%)	58 (92%)	5 (8%)	0	100	100
70	o	140/156 (90%)	132 (94%)	8 (6%)	0	100	100
71	p	148/151 (98%)	145 (98%)	3 (2%)	0	100	100
72	q	125/137 (91%)	118 (94%)	7 (6%)	0	100	100
73	r	85/142 (60%)	82 (96%)	3 (4%)	0	100	100
74	s	135/143 (94%)	125 (93%)	10 (7%)	0	100	100
75	t	119/136 (88%)	111 (93%)	8 (7%)	0	100	100
76	u	143/146 (98%)	132 (92%)	11 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
77	v	141/144 (98%)	137 (97%)	4 (3%)	0	100	100
78	w	98/121 (81%)	98 (100%)	0	0	100	100
79	x	85/87 (98%)	78 (92%)	7 (8%)	0	100	100
80	y	127/130 (98%)	125 (98%)	2 (2%)	0	100	100
81	z	142/145 (98%)	129 (91%)	13 (9%)	0	100	100
All	All	10926/12368 (88%)	10539 (96%)	385 (4%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
42	OO	63	VAL
37	M	78	LEU

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	0	112/113 (99%)	106 (95%)	6 (5%)	22	28
2	1	61/89 (68%)	60 (98%)	1 (2%)	62	76
3	2	83/101 (82%)	80 (96%)	3 (4%)	35	47
4	3	70/71 (99%)	66 (94%)	4 (6%)	20	26
5	4	56/60 (93%)	48 (86%)	8 (14%)	3	3
6	5	43/49 (88%)	39 (91%)	4 (9%)	9	9
7	6	46/54 (85%)	43 (94%)	3 (6%)	17	21
8	7	259/262 (99%)	242 (93%)	17 (7%)	16	20
9	8	30/135 (22%)	30 (100%)	0	100	100
10	A	160/162 (99%)	159 (99%)	1 (1%)	86	93
12	B	125/271 (46%)	121 (97%)	4 (3%)	39	52
15	C	150/151 (99%)	148 (99%)	2 (1%)	69	80
17	D	143/154 (93%)	139 (97%)	4 (3%)	43	57

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	DD	167/254 (66%)	154 (92%)	13 (8%)	12	14
20	E	156/156 (100%)	152 (97%)	4 (3%)	46	60
21	EE	193/196 (98%)	189 (98%)	4 (2%)	53	68
22	Ee	129/136 (95%)	117 (91%)	12 (9%)	9	9
23	F	136/137 (99%)	129 (95%)	7 (5%)	24	31
24	FF	320/323 (99%)	312 (98%)	8 (2%)	47	62
25	G	84/107 (78%)	81 (96%)	3 (4%)	35	47
26	GG	288/289 (100%)	275 (96%)	13 (4%)	27	36
27	H	101/105 (96%)	98 (97%)	3 (3%)	41	54
28	HH	244/245 (100%)	239 (98%)	5 (2%)	55	70
29	I	55/129 (43%)	55 (100%)	0	100	100
30	II	133/153 (87%)	129 (97%)	4 (3%)	41	54
31	J	104/118 (88%)	103 (99%)	1 (1%)	76	86
32	JJ	186/205 (91%)	182 (98%)	4 (2%)	52	66
33	K	109/110 (99%)	104 (95%)	5 (5%)	27	35
34	KK	187/208 (90%)	181 (97%)	6 (3%)	39	52
35	L	115/116 (99%)	109 (95%)	6 (5%)	23	30
36	LL	171/171 (100%)	160 (94%)	11 (6%)	17	21
37	M	118/119 (99%)	114 (97%)	4 (3%)	37	49
38	MM	184/187 (98%)	172 (94%)	12 (6%)	17	21
39	N	46/47 (98%)	45 (98%)	1 (2%)	52	66
40	NN	147/150 (98%)	139 (95%)	8 (5%)	22	28
41	O	81/88 (92%)	77 (95%)	4 (5%)	25	33
42	OO	154/159 (97%)	147 (96%)	7 (4%)	27	36
43	P	94/97 (97%)	93 (99%)	1 (1%)	73	84
44	PP	107/109 (98%)	104 (97%)	3 (3%)	43	57
45	Q	109/111 (98%)	107 (98%)	2 (2%)	59	72
46	QQ	175/176 (99%)	172 (98%)	3 (2%)	60	74
47	R	90/91 (99%)	89 (99%)	1 (1%)	73	84
48	S	94/103 (91%)	90 (96%)	4 (4%)	29	38
49	T	104/105 (99%)	102 (98%)	2 (2%)	57	71

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
50	U	81/82 (99%)	77 (95%)	4 (5%)	25	33
51	V	69/71 (97%)	68 (99%)	1 (1%)	67	79
52	W	68/69 (99%)	61 (90%)	7 (10%)	7	7
53	X	45/46 (98%)	44 (98%)	1 (2%)	52	66
54	Y	47/116 (40%)	47 (100%)	0	100	100
55	Z	23/23 (100%)	20 (87%)	3 (13%)	4	4
56	a	87/91 (96%)	83 (95%)	4 (5%)	27	35
57	b	71/72 (99%)	67 (94%)	4 (6%)	21	27
59	d	165/210 (79%)	159 (96%)	6 (4%)	35	47
60	e	189/224 (84%)	181 (96%)	8 (4%)	30	39
61	f	176/205 (86%)	168 (96%)	8 (4%)	27	36
62	g	166/195 (85%)	148 (89%)	18 (11%)	6	6
63	h	220/222 (99%)	213 (97%)	7 (3%)	39	52
64	i	172/191 (90%)	161 (94%)	11 (6%)	17	21
65	j	191/201 (95%)	182 (95%)	9 (5%)	26	34
66	k	165/170 (97%)	159 (96%)	6 (4%)	35	47
67	l	146/161 (91%)	140 (96%)	6 (4%)	30	41
68	m	158/166 (95%)	149 (94%)	9 (6%)	20	26
69	n	60/98 (61%)	58 (97%)	2 (3%)	38	51
70	o	127/137 (93%)	120 (94%)	7 (6%)	21	27
71	p	127/128 (99%)	125 (98%)	2 (2%)	62	76
72	q	81/105 (77%)	77 (95%)	4 (5%)	25	33
73	r	77/118 (65%)	73 (95%)	4 (5%)	23	30
74	s	114/119 (96%)	109 (96%)	5 (4%)	28	37
75	t	105/124 (85%)	95 (90%)	10 (10%)	8	9
76	u	128/129 (99%)	114 (89%)	14 (11%)	6	6
77	v	115/116 (99%)	110 (96%)	5 (4%)	29	38
78	w	94/114 (82%)	86 (92%)	8 (8%)	10	12
79	x	74/74 (100%)	68 (92%)	6 (8%)	11	13
80	y	110/111 (99%)	106 (96%)	4 (4%)	35	47
81	z	119/120 (99%)	110 (92%)	9 (8%)	13	15

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	9289/10380 (90%)	8879 (96%)	410 (4%)	32 37

5 of 410 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
55	Z	12	ARG
63	h	168	LYS
80	y	107	SER
57	b	32	GLN
61	f	158	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 20 such sidechains are listed below:

Mol	Chain	Res	Type
60	e	49	ASN
75	t	31	ASN
78	w	47	GLN
78	w	44	ASN
22	Ee	156	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	AA	3193/3396 (94%)	478 (14%)	16 (0%)
13	BB	120/121 (99%)	8 (6%)	1 (0%)
14	Bb	76/77 (98%)	21 (27%)	0
14	Cc	76/77 (98%)	34 (44%)	0
16	CC	157/158 (99%)	22 (14%)	1 (0%)
19	Dd	5/39 (12%)	1 (20%)	0
58	c	1609/1800 (89%)	286 (17%)	0
All	All	5236/5668 (92%)	850 (16%)	18 (0%)

5 of 850 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	AA	4	U
11	AA	6	A
11	AA	14	U
11	AA	26	A
11	AA	40	A

5 of 18 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
11	AA	3121	U
16	CC	57	C
13	BB	72	A
11	AA	2458	A
11	AA	2971	A

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

66 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
11	A2M	AA	2280	11	18,25,26	3.59	8 (44%)	18,36,39	3.38	3 (16%)
11	A2M	AA	1449	11,83	18,25,26	3.59	8 (44%)	18,36,39	3.38	4 (22%)
11	5MC	AA	2870	11,84	18,22,23	0.66	0	26,32,35	0.61	0
58	OMG	c	1428	58	18,26,27	1.12	2 (11%)	19,38,41	0.89	2 (10%)
11	A2M	AA	1133	11,83	18,25,26	3.59	8 (44%)	18,36,39	3.40	3 (16%)
11	OMU	AA	1888	11	19,22,23	3.07	8 (42%)	26,31,34	1.75	5 (19%)
58	A2M	c	796	58	18,25,26	3.60	8 (44%)	18,36,39	3.36	4 (22%)
11	A2M	AA	2220	11	18,25,26	3.57	8 (44%)	18,36,39	3.36	3 (16%)
11	OMG	AA	2922	11	18,26,27	1.16	2 (11%)	19,38,41	0.92	1 (5%)
58	B8N	c	1191	58	24,29,30	3.07	7 (29%)	29,42,45	1.72	5 (17%)
11	OMU	AA	2421	11	19,22,23	3.07	8 (42%)	26,31,34	1.70	4 (15%)
11	OMG	AA	2619	11,14	18,26,27	1.13	2 (11%)	19,38,41	0.83	1 (5%)
58	A2M	c	28	58	18,25,26	3.61	9 (50%)	18,36,39	3.38	4 (22%)
11	OMG	AA	2815	11	18,26,27	1.10	2 (11%)	19,38,41	0.84	1 (5%)
58	G7M	c	1575	58,14	20,26,27	2.43	7 (35%)	17,39,42	1.17	1 (5%)
58	A2M	c	974	58	18,25,26	3.57	8 (44%)	18,36,39	3.38	3 (16%)
11	OMC	AA	2197	11,84	19,22,23	0.51	0	26,31,34	0.60	0
11	5MC	AA	2278	11,83	18,22,23	0.54	0	26,32,35	0.60	0
58	A2M	c	541	58	18,25,26	3.57	8 (44%)	18,36,39	3.37	4 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	OMC	AA	650	11	19,22,23	0.52	0	26,31,34	0.69	0
11	OMC	AA	2959	11,83	19,22,23	0.53	0	26,31,34	0.68	0
58	MA6	c	1781	58	18,26,27	1.03	2 (11%)	19,38,41	3.37	2 (10%)
11	A2M	AA	2256	11,58	18,25,26	3.59	8 (44%)	18,36,39	3.43	4 (22%)
11	1MA	AA	645	11,83	16,25,26	0.92	2 (12%)	18,37,40	1.08	2 (11%)
58	OMC	c	1007	58	19,22,23	0.52	0	26,31,34	0.67	0
11	A2M	AA	2281	11	18,25,26	3.63	8 (44%)	18,36,39	3.42	4 (22%)
11	OMU	AA	2724	11	19,22,23	3.07	8 (42%)	26,31,34	1.68	5 (19%)
58	OMU	c	1269	58	19,22,23	3.08	8 (42%)	26,31,34	1.73	5 (19%)
58	4AC	c	1280	58	21,24,25	3.54	10 (47%)	29,34,37	1.60	5 (17%)
11	A2M	AA	817	11,83	18,25,26	3.56	8 (44%)	18,36,39	3.44	3 (16%)
11	UR3	AA	2634	11	19,22,23	2.91	6 (31%)	26,32,35	1.31	2 (7%)
58	A2M	c	100	83,58	18,25,26	3.58	8 (44%)	18,36,39	3.36	4 (22%)
58	OMC	c	414	58	19,22,23	0.51	0	26,31,34	0.70	0
11	OMG	AA	867	11,84	18,26,27	1.12	2 (11%)	19,38,41	0.89	1 (5%)
58	OMG	c	1126	58	18,26,27	1.13	2 (11%)	19,38,41	0.87	1 (5%)
11	A2M	AA	807	11	18,25,26	3.59	8 (44%)	18,36,39	3.40	4 (22%)
58	OMU	c	578	58	19,22,23	3.08	8 (42%)	26,31,34	1.66	5 (19%)
11	A2M	AA	876	11	18,25,26	3.59	8 (44%)	18,36,39	3.38	4 (22%)
11	OMU	AA	2347	11	19,22,23	3.08	8 (42%)	26,31,34	1.69	5 (19%)
11	OMC	AA	2337	11	19,22,23	0.51	0	26,31,34	0.67	0
11	OMG	AA	2791	11	18,26,27	1.13	2 (11%)	19,38,41	0.84	1 (5%)
11	A2M	AA	2946	11,83	18,25,26	3.58	8 (44%)	18,36,39	3.34	3 (16%)
11	OMC	AA	1437	11,83	19,22,23	0.53	0	26,31,34	0.80	1 (3%)
11	OMU	AA	2729	11	19,22,23	3.05	8 (42%)	26,31,34	1.68	5 (19%)
11	1MA	AA	2142	11,83	16,25,26	0.94	2 (12%)	18,37,40	1.07	2 (11%)
58	A2M	c	619	83,58	18,25,26	3.60	7 (38%)	18,36,39	3.43	3 (16%)
58	OMC	c	1639	83,58	19,22,23	0.53	0	26,31,34	0.63	0
11	A2M	AA	2640	11	18,25,26	3.58	8 (44%)	18,36,39	3.34	4 (22%)
11	OMU	AA	2417	11	19,22,23	3.05	8 (42%)	26,31,34	1.68	5 (19%)
11	OMG	AA	908	11	18,26,27	1.13	2 (11%)	19,38,41	0.84	1 (5%)
58	OMG	c	562	58	18,26,27	1.10	2 (11%)	19,38,41	0.84	1 (5%)
11	A2M	AA	649	11	18,25,26	3.58	8 (44%)	18,36,39	3.36	4 (22%)
11	OMG	AA	2793	11	18,26,27	1.13	2 (11%)	19,38,41	0.85	1 (5%)
58	OMG	c	1572	58	18,26,27	1.12	2 (11%)	19,38,41	0.88	1 (5%)
58	OMG	c	1271	58	18,26,27	1.10	2 (11%)	19,38,41	0.88	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
58	A2M	c	436	58	18,25,26	3.61	8 (44%)	18,36,39	3.38	4 (22%)
11	OMC	AA	2948	11	19,22,23	0.53	0	26,31,34	0.85	1 (3%)
11	OMC	AA	663	11	19,22,23	0.53	0	26,31,34	0.77	0
58	4AC	c	1773	58	21,24,25	3.54	10 (47%)	29,34,37	1.58	5 (17%)
11	OMU	AA	898	11	19,22,23	3.07	8 (42%)	26,31,34	1.68	5 (19%)
58	A2M	c	420	58	18,25,26	3.58	8 (44%)	18,36,39	3.34	3 (16%)
11	OMU	AA	2921	11,83	19,22,23	3.07	8 (42%)	26,31,34	1.70	5 (19%)
11	OMG	AA	2288	11	18,26,27	1.10	2 (11%)	19,38,41	0.81	1 (5%)
11	OMG	AA	1450	11	18,26,27	1.10	2 (11%)	19,38,41	0.80	1 (5%)
11	OMG	AA	805	11	18,26,27	1.10	2 (11%)	19,38,41	0.88	1 (5%)
58	MA6	c	1782	58	18,26,27	1.02	2 (11%)	19,38,41	3.49	2 (10%)

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
11	A2M	AA	2280	11	-	2/5/27/28	0/3/3/3
11	A2M	AA	1449	11,83	-	0/5/27/28	0/3/3/3
11	5MC	AA	2870	11,84	-	4/7/25/26	0/2/2/2
58	OMG	c	1428	58	-	2/5/27/28	0/3/3/3
11	A2M	AA	1133	11,83	-	0/5/27/28	0/3/3/3
11	OMU	AA	1888	11	-	0/9/27/28	0/2/2/2
58	A2M	c	796	58	-	2/5/27/28	0/3/3/3
11	A2M	AA	2220	11	-	1/5/27/28	0/3/3/3
11	OMG	AA	2922	11	-	2/5/27/28	0/3/3/3
58	B8N	c	1191	58	-	4/16/34/35	0/2/2/2
11	OMU	AA	2421	11	-	1/9/27/28	0/2/2/2
11	OMG	AA	2619	11,14	-	1/5/27/28	0/3/3/3
58	A2M	c	28	58	-	2/5/27/28	0/3/3/3
11	OMG	AA	2815	11	-	0/5/27/28	0/3/3/3
58	G7M	c	1575	58,14	-	3/3/25/26	0/3/3/3
58	A2M	c	974	58	-	0/5/27/28	0/3/3/3
11	OMC	AA	2197	11,84	-	4/9/27/28	0/2/2/2
11	5MC	AA	2278	11,83	-	0/7/25/26	0/2/2/2
58	A2M	c	541	58	-	1/5/27/28	0/3/3/3
11	OMC	AA	650	11	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	OMC	AA	2959	11,83	-	0/9/27/28	0/2/2/2
58	MA6	c	1781	58	-	0/7/29/30	0/3/3/3
11	A2M	AA	2256	11,58	-	1/5/27/28	0/3/3/3
11	1MA	AA	645	11,83	-	0/3/25/26	0/3/3/3
58	OMC	c	1007	58	-	0/9/27/28	0/2/2/2
11	A2M	AA	2281	11	-	1/5/27/28	0/3/3/3
11	OMU	AA	2724	11	-	1/9/27/28	0/2/2/2
58	OMU	c	1269	58	-	2/9/27/28	0/2/2/2
58	4AC	c	1280	58	-	2/11/29/30	0/2/2/2
11	A2M	AA	817	11,83	-	2/5/27/28	0/3/3/3
11	UR3	AA	2634	11	-	0/7/25/26	0/2/2/2
58	A2M	c	100	83,58	-	2/5/27/28	0/3/3/3
58	OMC	c	414	58	-	1/9/27/28	0/2/2/2
11	OMG	AA	867	11,84	-	2/5/27/28	0/3/3/3
58	OMG	c	1126	58	-	0/5/27/28	0/3/3/3
11	A2M	AA	807	11	-	2/5/27/28	0/3/3/3
58	OMU	c	578	58	-	1/9/27/28	0/2/2/2
11	A2M	AA	876	11	-	0/5/27/28	0/3/3/3
11	OMU	AA	2347	11	-	0/9/27/28	0/2/2/2
11	OMC	AA	2337	11	-	0/9/27/28	0/2/2/2
11	OMG	AA	2791	11	-	0/5/27/28	0/3/3/3
11	A2M	AA	2946	11,83	-	1/5/27/28	0/3/3/3
11	OMC	AA	1437	11,83	-	2/9/27/28	0/2/2/2
11	OMU	AA	2729	11	-	0/9/27/28	0/2/2/2
11	1MA	AA	2142	11,83	-	0/3/25/26	0/3/3/3
58	A2M	c	619	83,58	-	3/5/27/28	0/3/3/3
58	OMC	c	1639	83,58	-	0/9/27/28	0/2/2/2
11	A2M	AA	2640	11	-	1/5/27/28	0/3/3/3
11	OMU	AA	2417	11	-	1/9/27/28	0/2/2/2
11	OMG	AA	908	11	-	3/5/27/28	0/3/3/3
58	OMG	c	562	58	-	0/5/27/28	0/3/3/3
11	A2M	AA	649	11	-	2/5/27/28	0/3/3/3
11	OMG	AA	2793	11	-	0/5/27/28	0/3/3/3
58	OMG	c	1572	58	-	2/5/27/28	0/3/3/3
58	OMG	c	1271	58	-	4/5/27/28	0/3/3/3
58	A2M	c	436	58	-	0/5/27/28	0/3/3/3
11	OMC	AA	2948	11	-	0/9/27/28	0/2/2/2
11	OMC	AA	663	11	-	1/9/27/28	0/2/2/2
58	4AC	c	1773	58	-	2/11/29/30	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	OMU	AA	898	11	-	0/9/27/28	0/2/2/2
58	A2M	c	420	58	-	1/5/27/28	0/3/3/3
11	OMU	AA	2921	11,83	-	0/9/27/28	0/2/2/2
11	OMG	AA	2288	11	-	0/5/27/28	0/3/3/3
11	OMG	AA	1450	11	-	2/5/27/28	0/3/3/3
11	OMG	AA	805	11	-	0/5/27/28	0/3/3/3
58	MA6	c	1782	58	-	1/7/29/30	0/3/3/3

The worst 5 of 318 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
58	c	28	A2M	C3'-C4'	-8.97	1.30	1.53
11	AA	807	A2M	C3'-C4'	-8.90	1.30	1.53
58	c	541	A2M	C3'-C4'	-8.83	1.30	1.53
11	AA	2220	A2M	C3'-C4'	-8.80	1.30	1.53
11	AA	1133	A2M	C3'-C4'	-8.79	1.30	1.53

The worst 5 of 165 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
58	c	1782	MA6	N1-C6-N6	-13.91	102.42	117.06
58	c	1781	MA6	N1-C6-N6	-13.44	102.91	117.06
11	AA	817	A2M	C5-C6-N6	10.80	136.76	120.35
11	AA	807	A2M	C5-C6-N6	10.77	136.72	120.35
11	AA	1133	A2M	C5-C6-N6	10.73	136.66	120.35

There are no chirality outliers.

5 of 72 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	AA	649	A2M	C1'-C2'-O2'-CM?
11	AA	663	OMC	C1'-C2'-O2'-CM2
11	AA	867	OMG	C3'-C4'-C5'-O5'
11	AA	908	OMG	O4'-C4'-C5'-O5'
11	AA	1437	OMC	C1'-C2'-O2'-CM2

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 295 ligands modelled in this entry, 290 are monoatomic - leaving 5 for Mogul analysis.

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
85	SPD	c	1951	-	9,9,9	0.32	0	8,8,8	0.83	0
85	SPD	AA	3610	-	9,9,9	0.32	0	8,8,8	0.83	0
86	MET	Bb	103	14	6,7,8	0.46	0	2,7,9	0.15	0
85	SPD	AA	3608	-	9,9,9	0.34	0	8,8,8	0.79	0
85	SPD	AA	3611	-	9,9,9	0.33	0	8,8,8	0.92	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
85	SPD	c	1951	-	-	1/7/7/7	-
85	SPD	AA	3610	-	-	0/7/7/7	-
86	MET	Bb	103	14	-	2/5/6/8	-
85	SPD	AA	3608	-	-	5/7/7/7	-
85	SPD	AA	3611	-	-	0/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
86	Bb	103	MET	C-CA-CB-CG

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Mol	Chain	Res	Type	Atoms
85	AA	3608	SPD	C3-C4-C5-N6
85	AA	3608	SPD	C4-C5-N6-C7
86	Bb	103	MET	CB-CG-SD-CE
85	AA	3608	SPD	C2-C3-C4-C5

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.

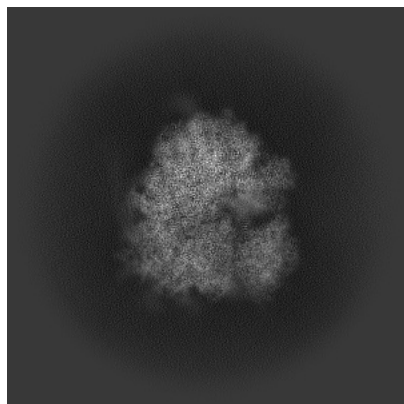
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-16648. These allow visual inspection of the internal detail of the map and identification of artifacts.

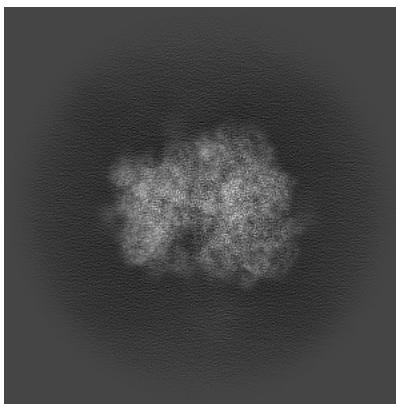
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

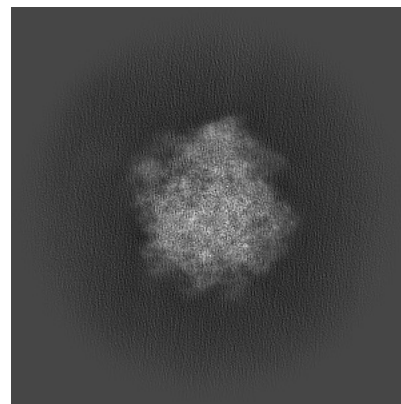
6.1.1 Primary map



X

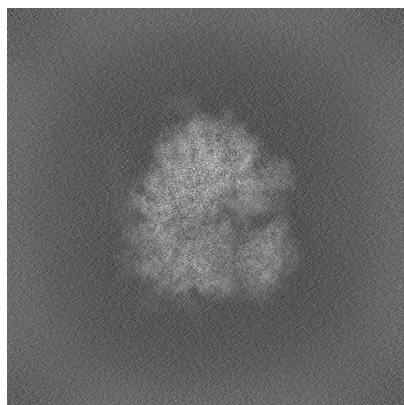


Y

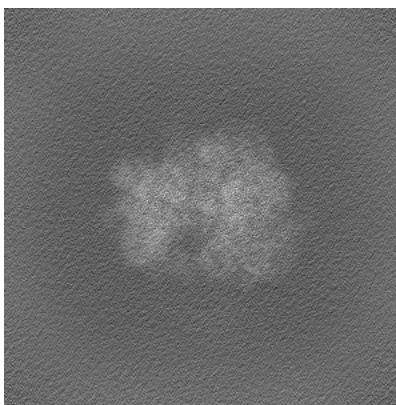


Z

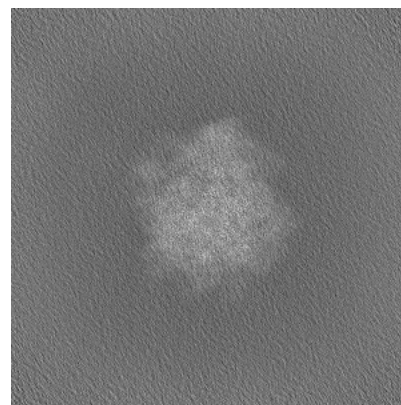
6.1.2 Raw map



X



Y

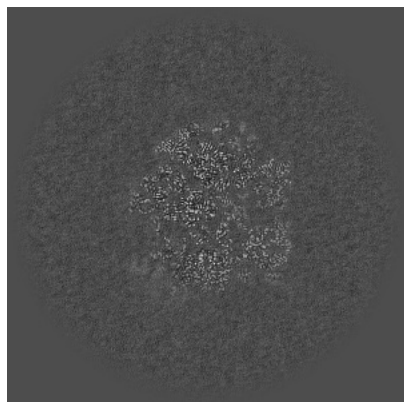


Z

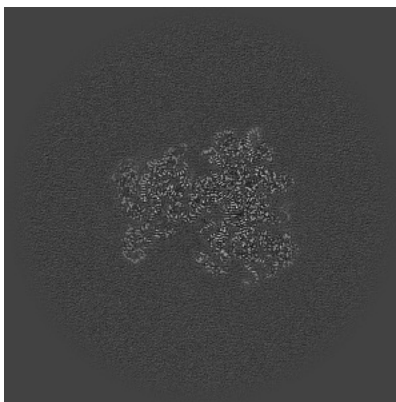
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

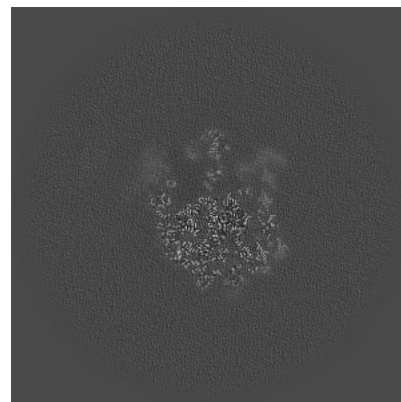
6.2.1 Primary map



X Index: 300

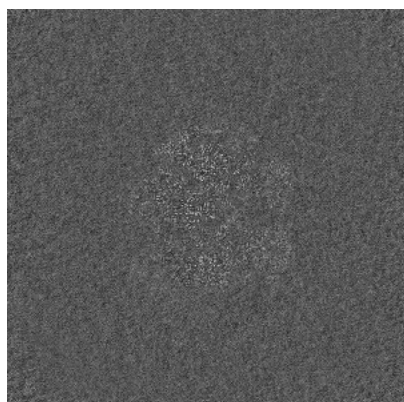


Y Index: 300

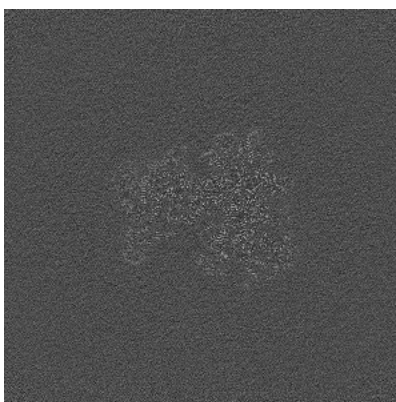


Z Index: 300

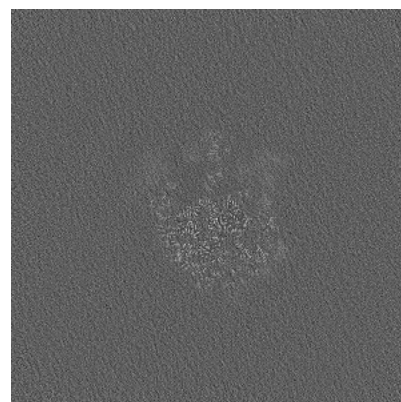
6.2.2 Raw map



X Index: 300



Y Index: 300

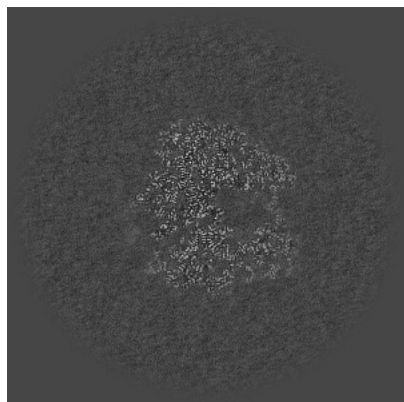


Z Index: 300

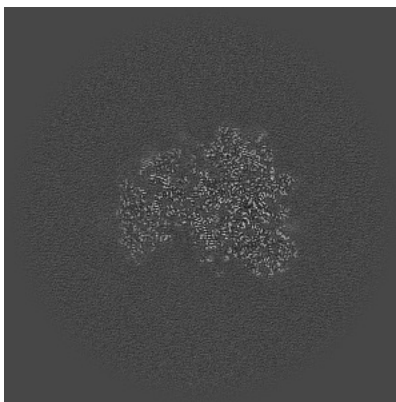
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

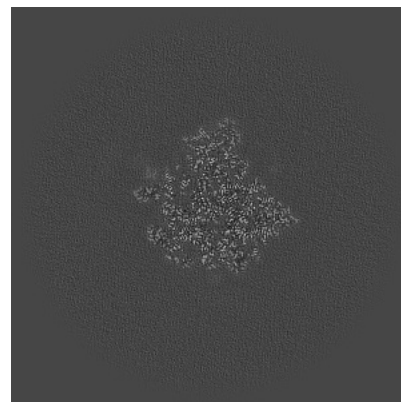
6.3.1 Primary map



X Index: 324

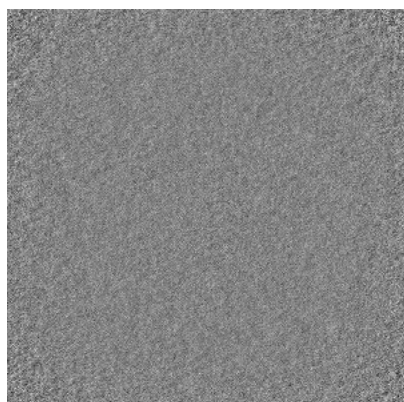


Y Index: 291

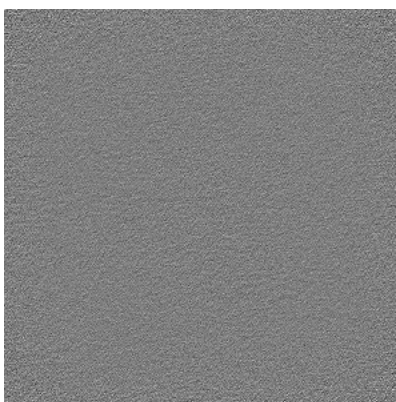


Z Index: 345

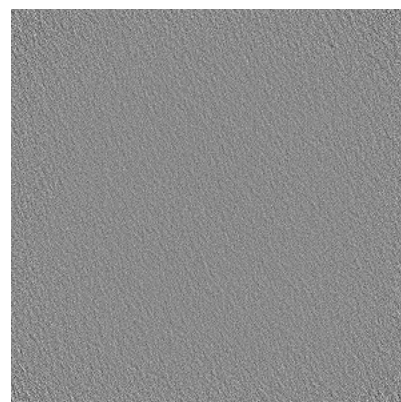
6.3.2 Raw map



X Index: 0



Y Index: 0

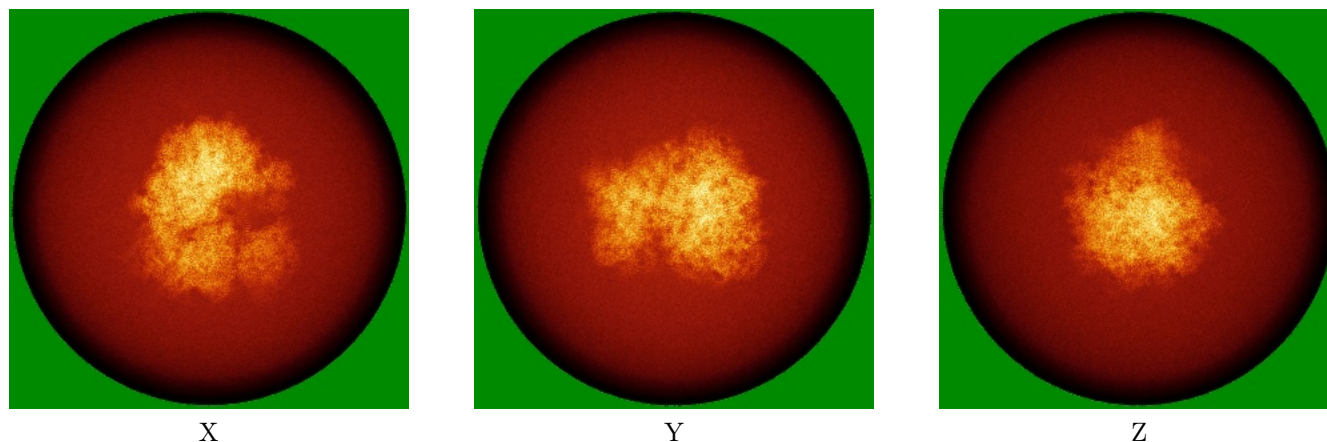


Z Index: 0

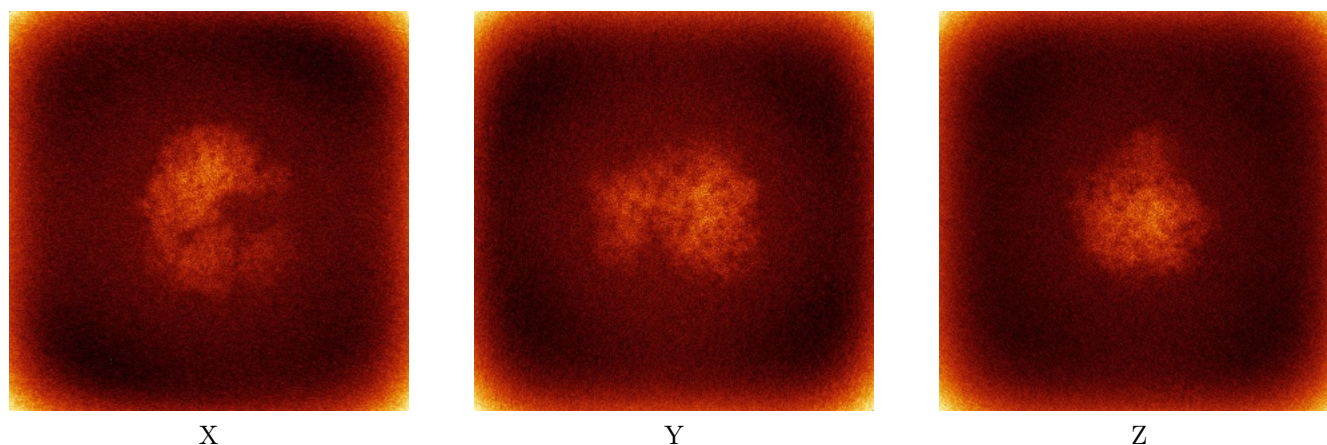
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



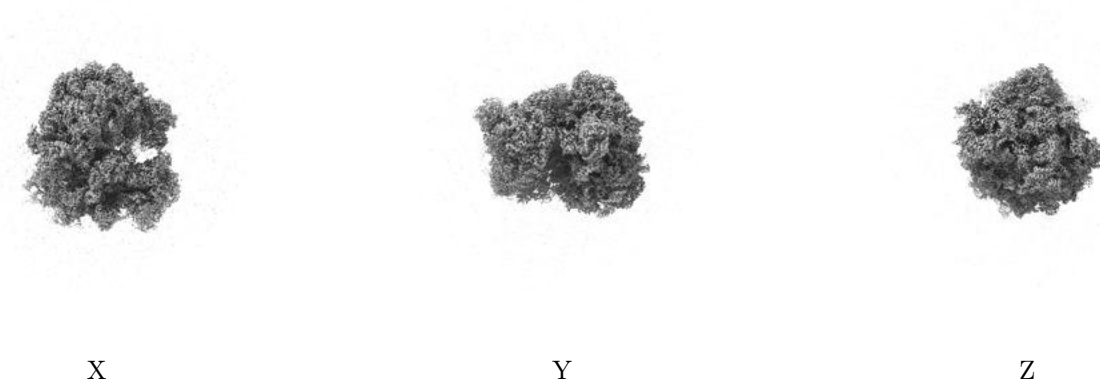
6.4.2 Raw map



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.

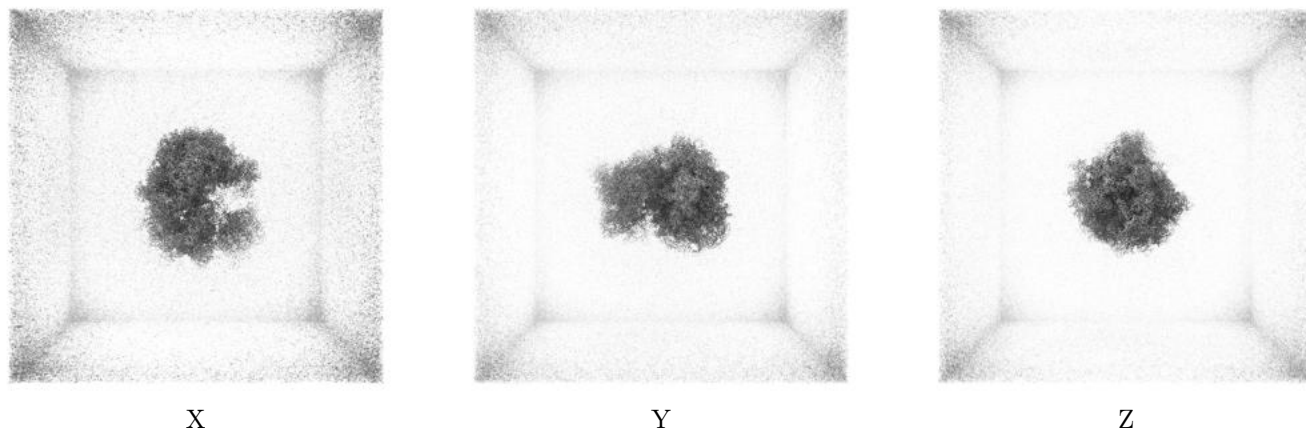
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.249. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

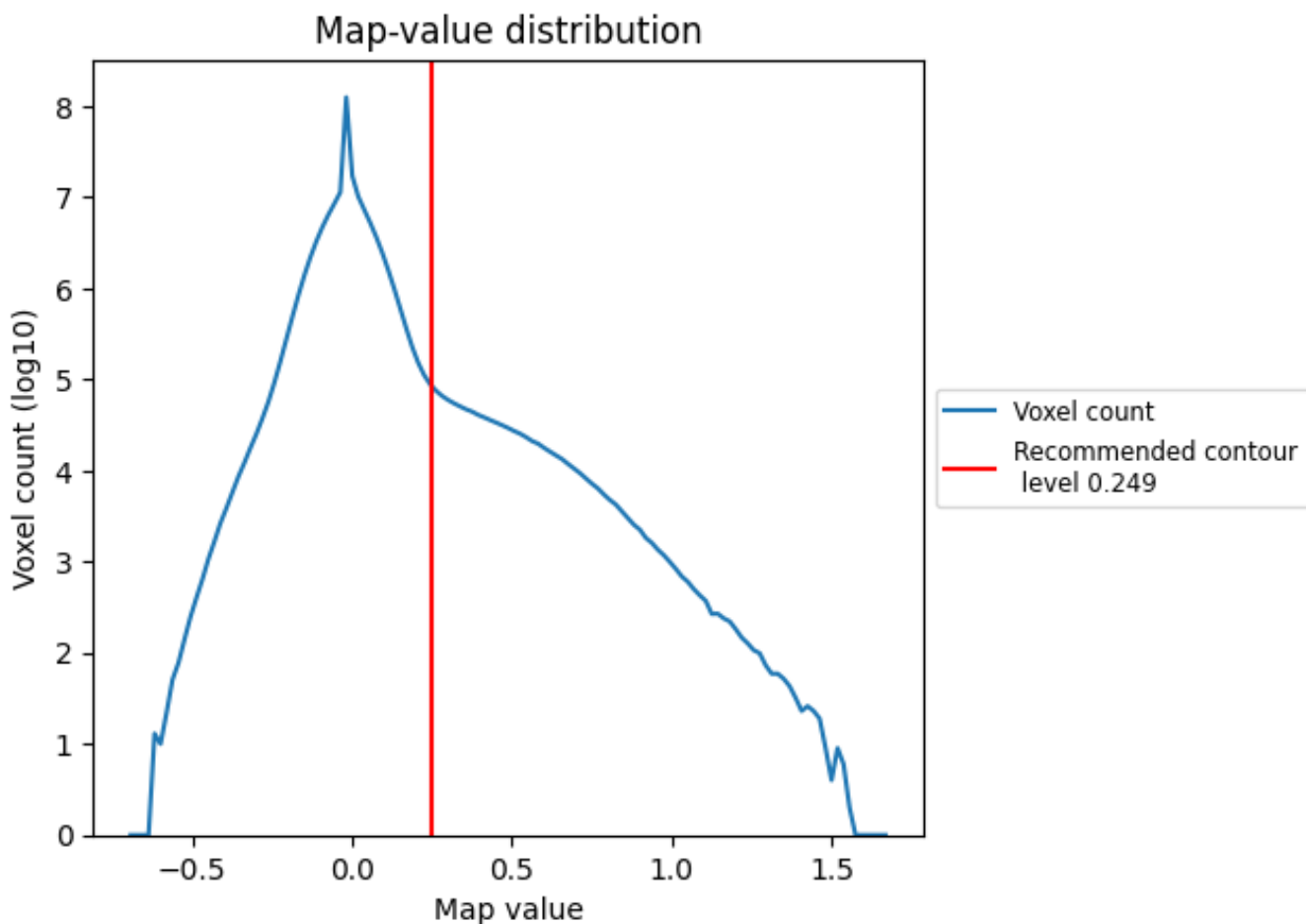
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

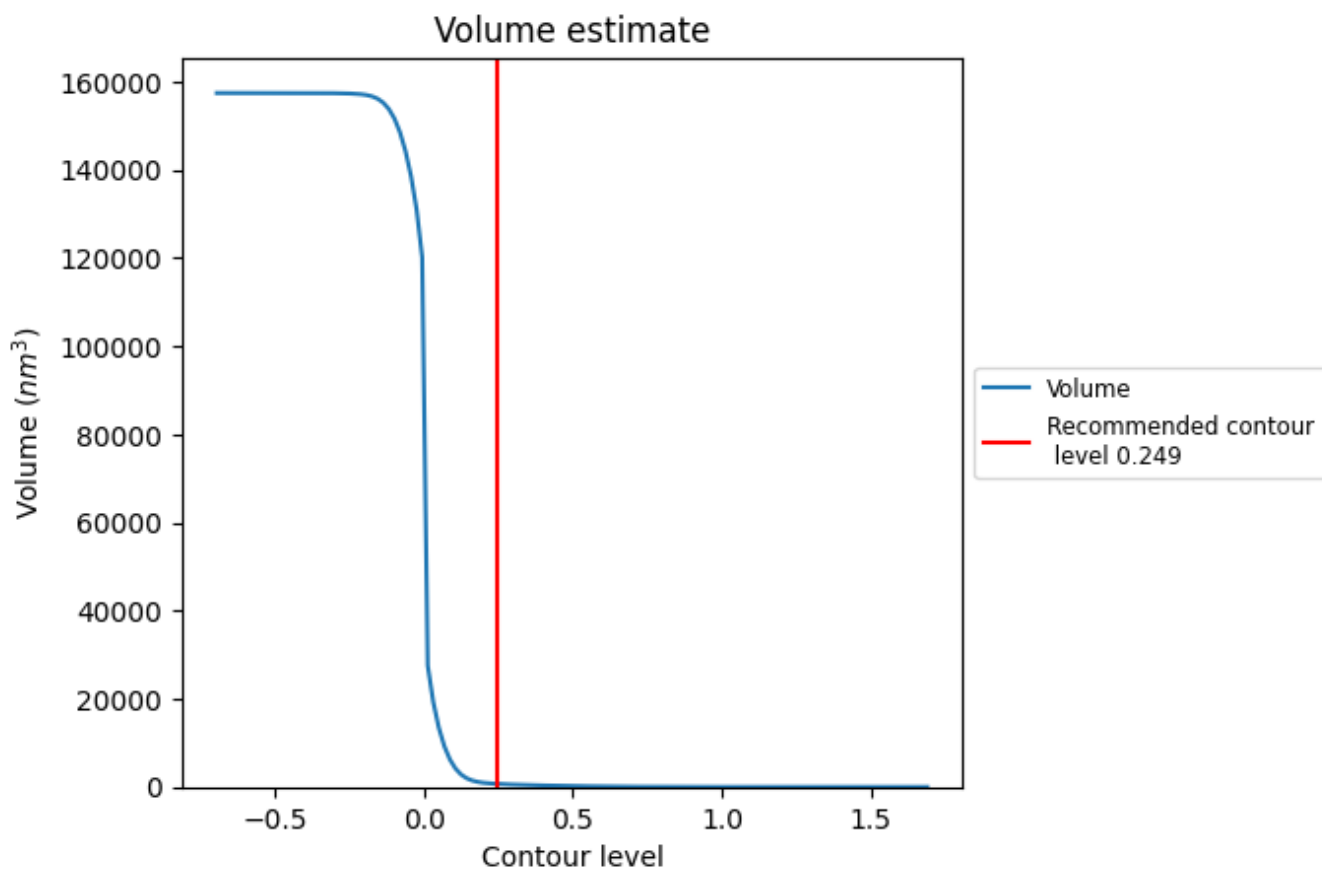
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

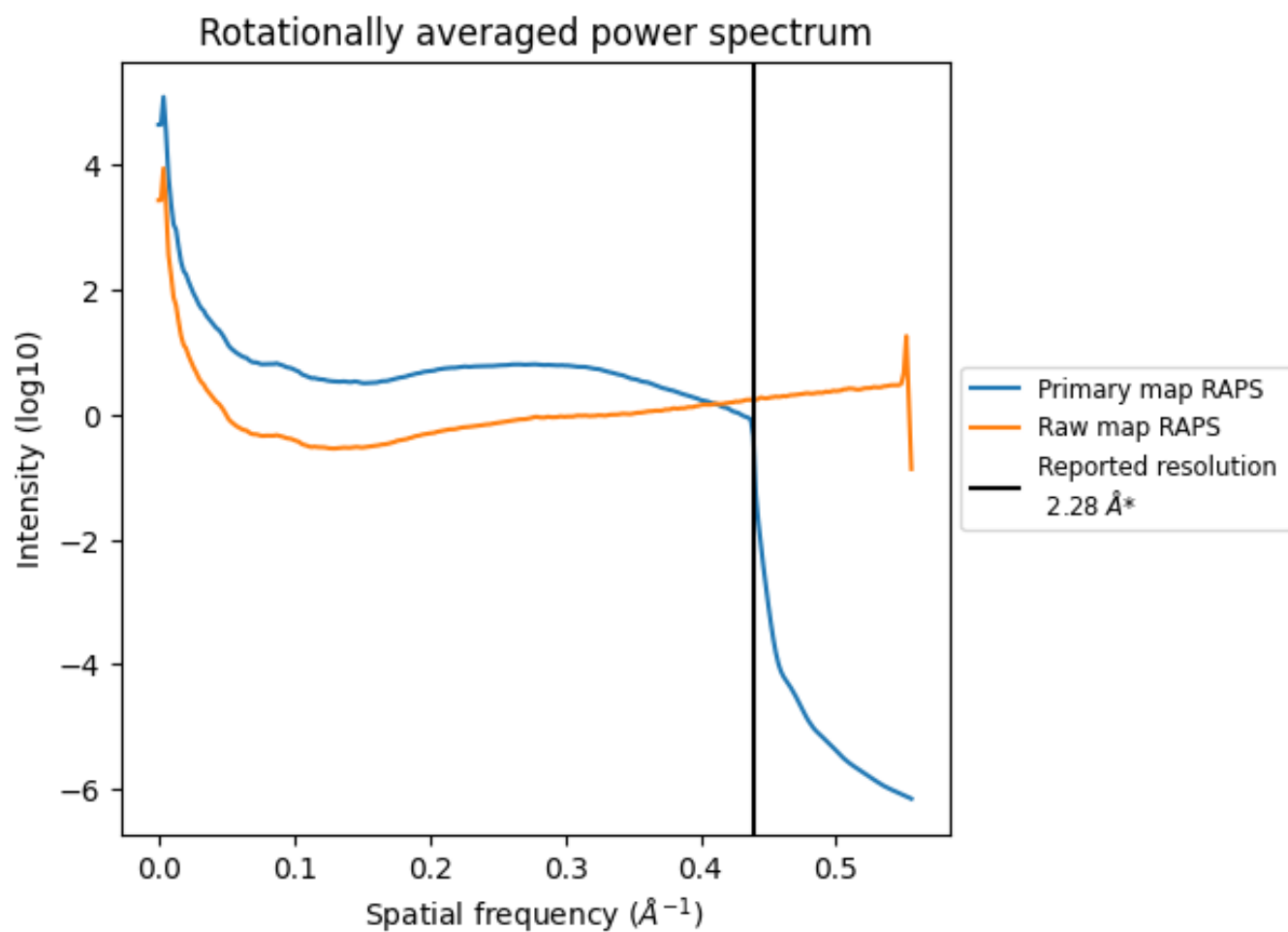
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 688 nm^3 ; this corresponds to an approximate mass of 621 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

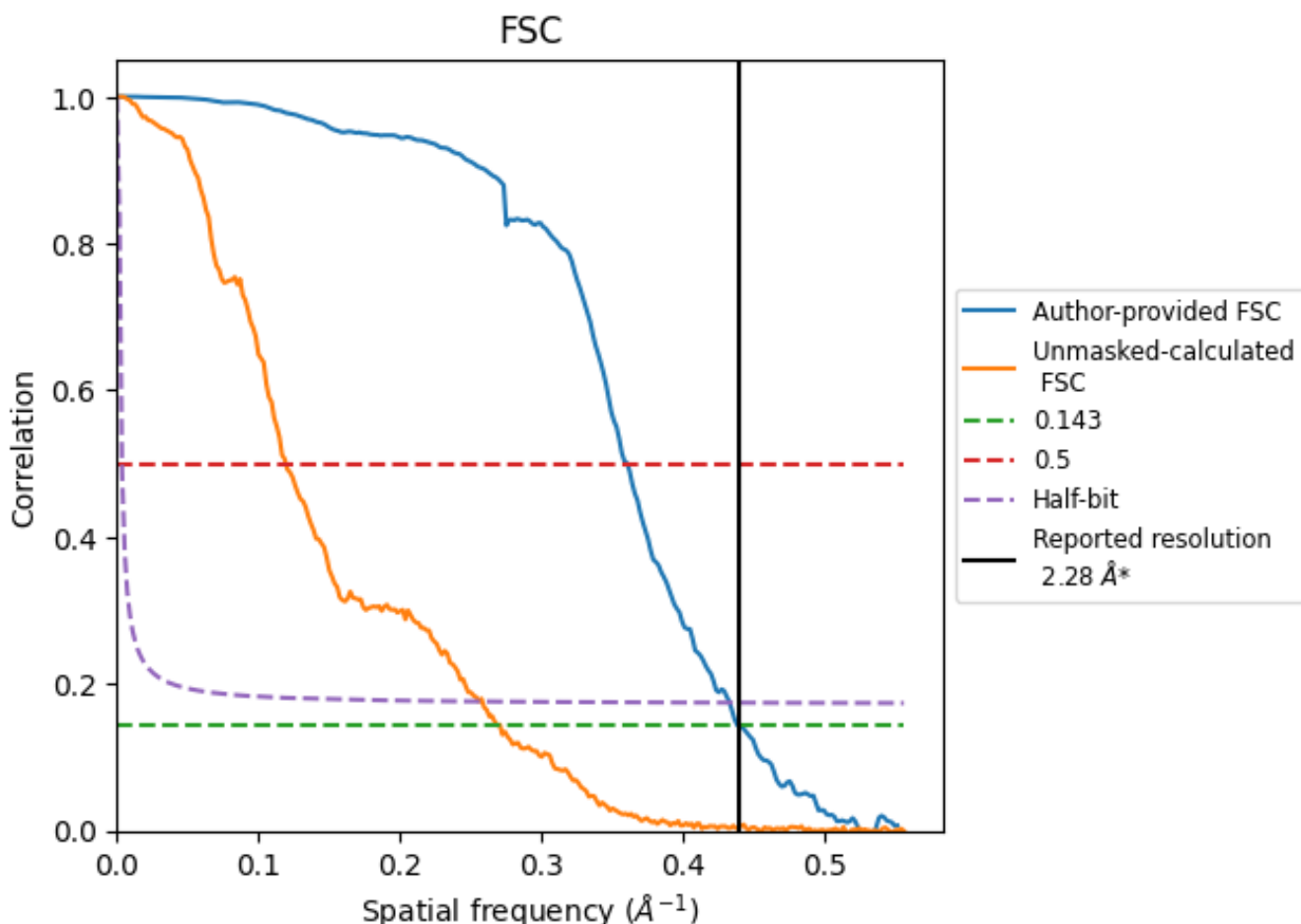


*Reported resolution corresponds to spatial frequency of 0.439 Å⁻¹

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 0.439 Å⁻¹

8.2 Resolution estimates [i](#)

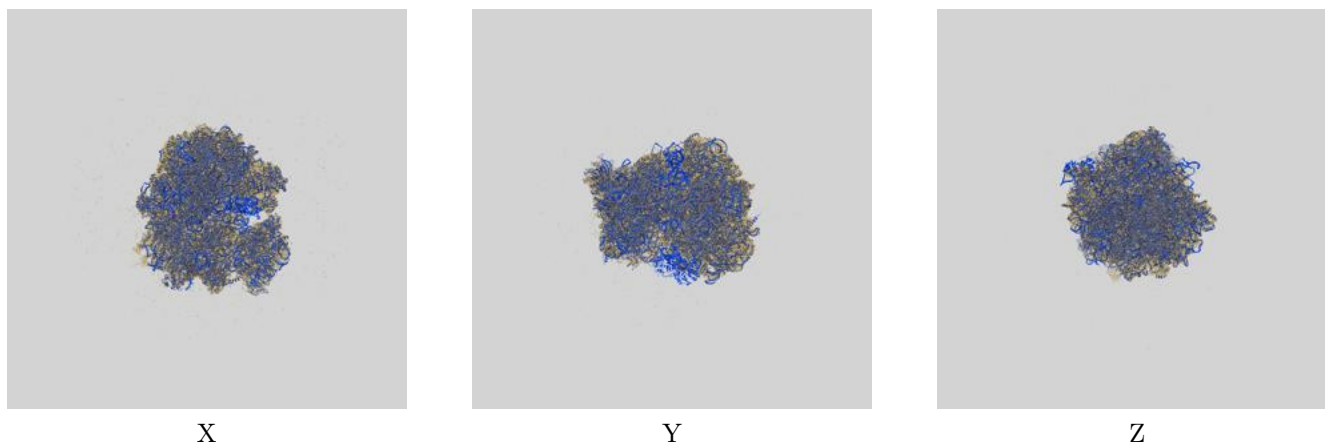
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.28	-	-
Author-provided FSC curve	2.28	2.78	2.31
Unmasked-calculated*	3.70	8.38	3.88

*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 3.70 differs from the reported value 2.28 by more than 10 %

9 Map-model fit [i](#)

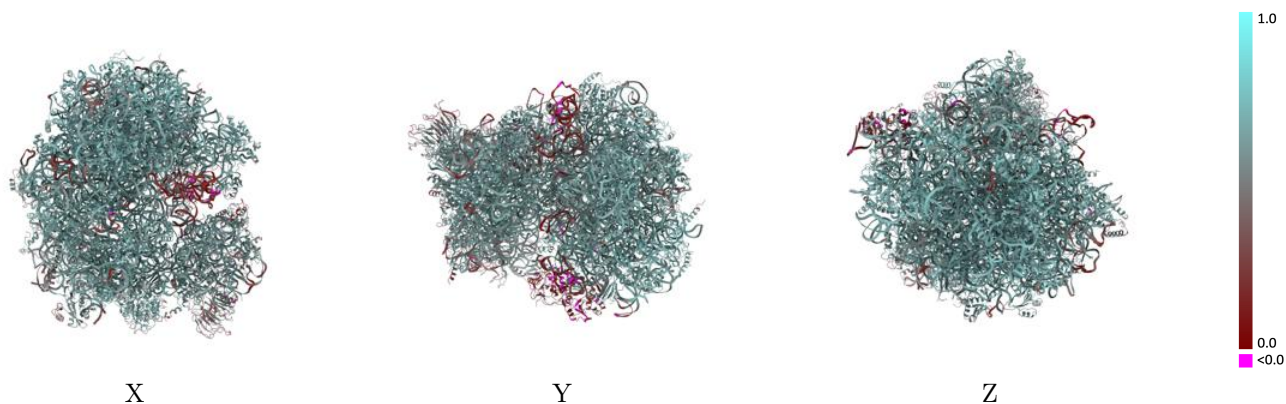
This section contains information regarding the fit between EMDB map EMD-16648 and PDB model 8CGN. Per-residue inclusion information can be found in section [3](#) on page [22](#).

9.1 Map-model overlay [i](#)



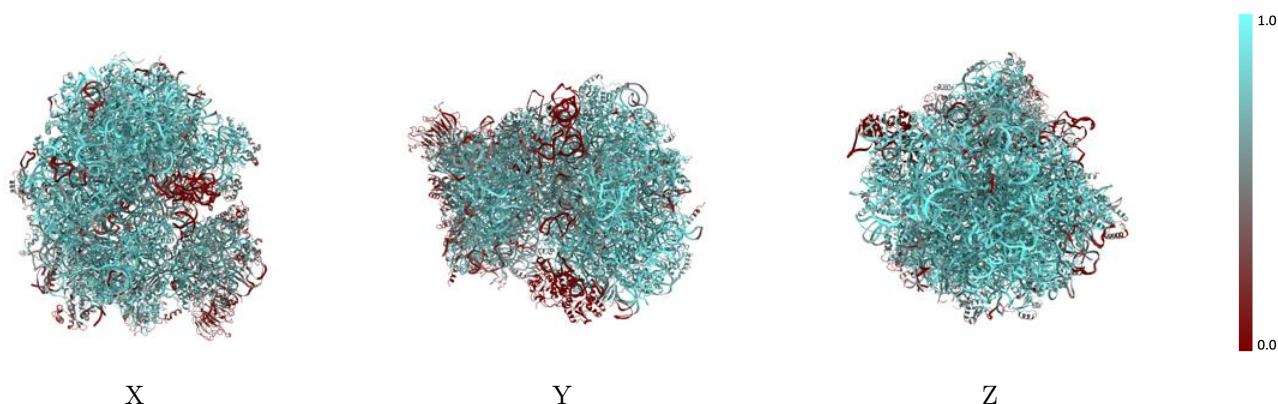
The images above show the 3D surface view of the map at the recommended contour level 0.249 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



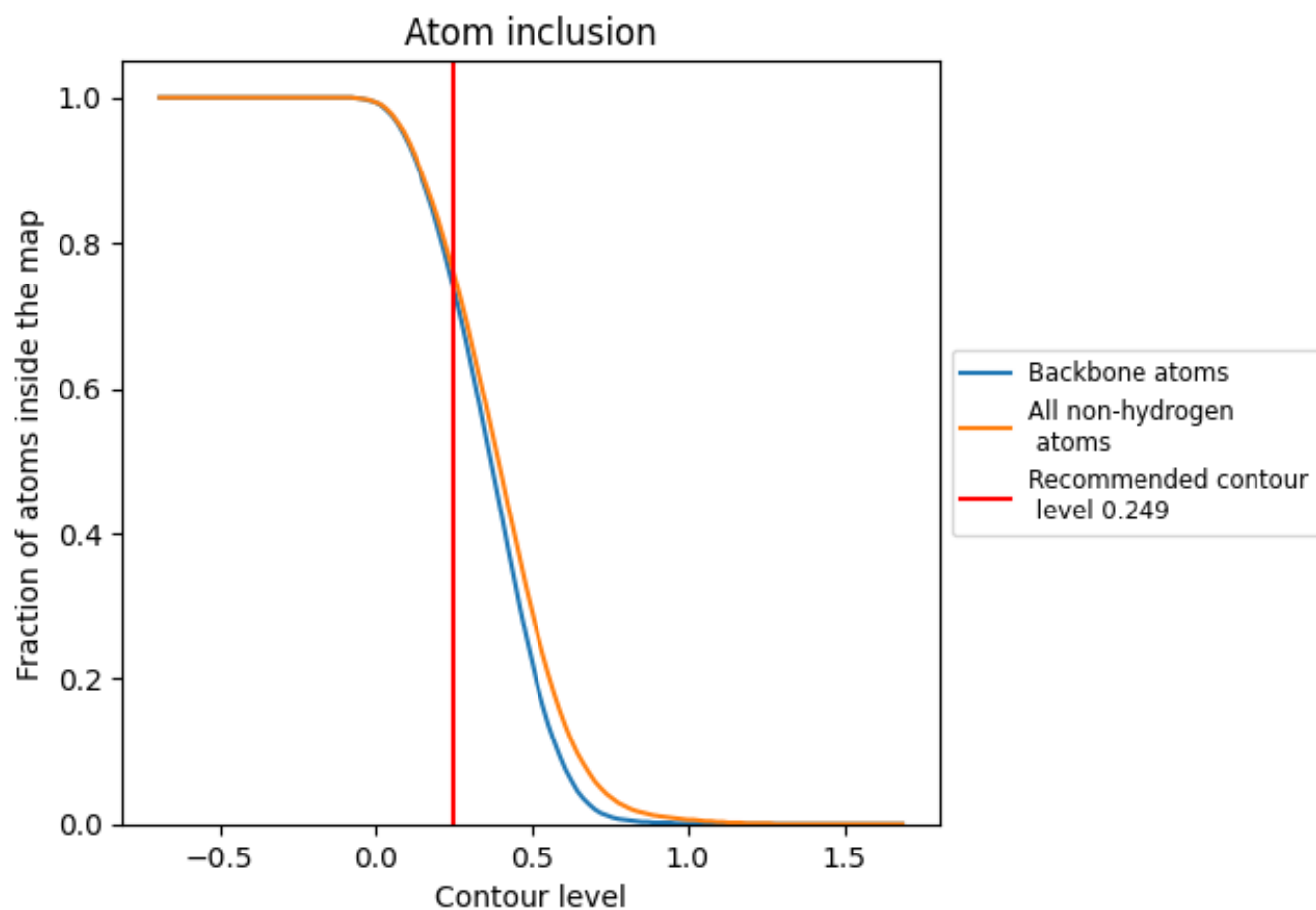
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.249).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 74% of all backbone atoms, 76% 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 (0.249) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7600	 0.6110
0	 0.5440	 0.5690
1	 0.2650	 0.3850
2	 0.7770	 0.6370
3	 0.6310	 0.5740
4	 0.4950	 0.5660
5	 0.8110	 0.6460
6	 0.5280	 0.5300
7	 0.2620	 0.4430
8	 0.0590	 0.3080
A	 0.8640	 0.6720
AA	 0.8420	 0.6230
B	 0.8950	 0.6880
BB	 0.9060	 0.6450
Bb	 0.5910	 0.5460
C	 0.8840	 0.6810
CC	 0.9120	 0.6520
Cc	 0.0990	 0.2980
D	 0.7890	 0.6410
DD	 0.0030	 0.2590
Dd	 0.6490	 0.6000
E	 0.8560	 0.6710
EE	 0.8810	 0.6860
Ee	 0.0010	 0.1550
F	 0.8070	 0.6540
FF	 0.8590	 0.6710
G	 0.6090	 0.5880
GG	 0.8620	 0.6730
H	 0.8610	 0.6820
HH	 0.6790	 0.6110
I	 0.8240	 0.6780
II	 0.7560	 0.6480
J	 0.7950	 0.6540
JJ	 0.8590	 0.6760
K	 0.8280	 0.6650















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Chain	Atom inclusion	Q-score
KK	0.6990	0.6240
L	0.7560	0.6330
LL	0.7260	0.6390
M	0.8790	0.6770
MM	0.7610	0.6600
N	0.7060	0.6130
NN	0.6070	0.5840
O	0.8030	0.6630
OO	0.7870	0.6420
P	0.7400	0.6310
PP	0.7940	0.6580
Q	0.8760	0.6840
QQ	0.9240	0.6900
R	0.9260	0.6940
S	0.8390	0.6620
T	0.7930	0.6450
U	0.7170	0.6220
V	0.9190	0.6880
W	0.5930	0.5890
X	0.8510	0.6550
Y	0.7050	0.6560
Z	0.8020	0.6610
a	0.7780	0.6600
b	0.7970	0.6610
c	0.7890	0.6040
d	0.6830	0.6020
e	0.6800	0.6180
f	0.7750	0.6430
g	0.5330	0.5740
h	0.6870	0.6210
i	0.5580	0.5640
j	0.4070	0.5200
k	0.4750	0.5400
l	0.7320	0.6200
m	0.6670	0.6040
n	0.4470	0.5270
o	0.7660	0.6360
p	0.7610	0.6480
q	0.7790	0.6330
r	0.4530	0.5400
s	0.6280	0.5760
t	0.4940	0.5290

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Chain	Atom inclusion	Q-score
u	 0.5030	 0.5370
v	 0.5720	 0.5600
w	 0.4590	 0.5460
x	 0.7210	 0.6210
y	 0.8580	 0.6750
z	 0.7050	 0.6310