wwPDB EM Validation Summary Report (i)

Dec 17, 2022 – 12:32 pm GMT

PDB ID	:	6YLH
EMDB ID	:	EMD-10839
Title	:	Rix1-Rea1 pre-60S particle - full composite structure
Authors	:	Kater, L.; Beckmann, R.
Deposited on	:	2020-04-07
Resolution	:	3.10 Å(reported)
Based on initial models	:	3JCT, 6N8J, 6OR5, 6HYD, 6QTA, 6HYP

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 (i) 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 (i)) were used in the production of this report:

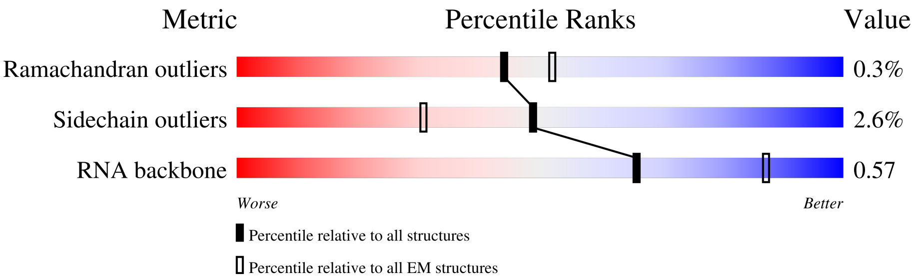
EMDB validation analysis	:	0.0.1.dev43
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	1	3396	8% / 71% 18% • 11%
2	2	158	• / 80% 17% •
3	3	121	7% / 80% 17% •
4	4	593	63% / 81% • • 14%
5	5	120	50% / 61% • • 35%
6	A	254	• / 94% • •
7	B	387	10% / 96% •
8	C	362	8% / 98% •

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Mol	Chain	Length	Quality of chain
9	D	297	69% 79% • 18%
10	E	176	18% 85% • 11%
11	F	244	5% 86% • 11%
12	G	256	16% 85% • 11%
13	H	191	8% 96% • •
14	I	166	37% 71% 7% 22%
15	J	174	37% 93% • • •
16	K	334	19% 74% • 23%
17	L	199	14% 88% • • 9%
18	M	138	12% 94% • •
19	N	204	5% 97% •
20	O	199	• 97% • •
21	P	184	7% 92% • 7%
22	Q	186	11% 76% • 23%
23	R	189	7% 79% • 20%
24	S	172	18% 95% • • •
25	T	160	61% 71% 6% • 22%
26	U	121	12% 80% • 17%
27	V	137	14% 82% 12% • • •
28	W	236	22% 96% • •
29	X	142	20% 98% • •
30	Y	127	6% 95% • • •
31	Z	136	10% 96% • •
32	a	149	8% 60% • 38%
33	b	647	35% 88% 6% • 5%

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Mol	Chain	Length	Quality of chain
34	c	175	35% 61% • 38%
35	d	113	12% 91% • 7%
36	e	130	7% 96% • •
37	f	107	6% 97% • •
38	g	121	• 86% • 12%
39	h	120	5% 98% ••
40	i	100	7% 93% • •
41	j	88	• 93% • 5%
42	k	78	32% 95% • •
43	l	51	• 92% • •
44	m	486	17% 86% • 10%
45	n	105	13% 91% • 8%
46	o	217	77% 78% • 18%
47	p	92	7% 93% • • •
48	q	165	38% 72% 5% 24%
49	r	261	6% 84% • 14%
50	s	520	8% 10% • 89%
51	t	767	13% 55% • 44%
52	u	199	15% 69% 5% • 26%
53	x	515	19% 87% • 11%
54	y	245	17% 87% 12% •
55	z	106	33% 68% 5% 27%
56	v	4910	• 74% 26%
57	0	555	18% 72% • 25%
57	w	555	27% 70% • 28%

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Mol	Chain	Length	Quality of chain
58	6	763	19% 69% • 29%
58	7	763	21% 71% • 28%

2 Entry composition (i)

There are 61 unique types of molecules in this entry. The entry contains 180897 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 RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	3039	65028	29041	11740	21208	3039	0	0

- Molecule 2 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	154	3273	1464	576	1079	154	0	0

- Molecule 3 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	3	117	2494	1114	446	817	117	0	0

- Molecule 4 is a protein called Probable metalloprotease ARX1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	4	509	3945	2503	673	754	15	0	0

- Molecule 5 is a protein called rRNA-processing protein CGR1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	5	78	681	419	140	119	3	0	0

- Molecule 6 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	A	245	1863	1162	376	324	1	0	0

- Molecule 7 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	B	386	3081	1956	584	533	8	0	0

- Molecule 8 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	C	361	2749	1730	522	494	3	0	0

- Molecule 9 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	D	243	1969	1250	344	373	2	0	0

- Molecule 10 is a protein called 60S ribosomal protein L6-A.

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

- Molecule 11 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	216	1744	1127	317	299	1	0	0

- Molecule 12 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	G	228	1784	1142	320	319	3	0	0

- Molecule 13 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	H	187	1486	944	270	268	4	0	0

- Molecule 14 is a protein called Bud site selection protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	I	130	Total 1051	C 657	N 194	O 197	S 3	0	0

- Molecule 15 is a protein called 60S ribosomal protein L11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	J	168	Total 1344	C 841	N 251	O 248	S 4	0	0

- Molecule 16 is a protein called Pre-rRNA-processing protein IPI1.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	K	258	Total 2089	C 1346	N 367	O 368	S 8	0	0

- Molecule 17 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	L	181	Total 1456	C 907	N 301	O 248	0	0

- Molecule 18 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	M	134	Total 1040	C 666	N 196	O 176	S 2	0	0

- Molecule 19 is a protein called 60S ribosomal protein L15-A.

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

- Molecule 20 is a protein called 60S ribosomal protein L16-A.

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

- Molecule 21 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	P	171	Total 1360	C 845	N 272	O 243	0	0

- Molecule 22 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Q	144	Total 1110	C 704	N 213	O 192	S 1	0	0

- Molecule 23 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	R	151	Total 1219	C 757	N 258	O 204	0	0

- Molecule 24 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	S	171	Total 1437	C 925	N 266	O 243	S 3	0	0

- Molecule 25 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	T	124	Total 983	C 619	N 188	O 173	S 3	0	0

- Molecule 26 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	U	101	Total 800	C 518	N 131	O 151	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
27	V	134	Total 993	C 623	N 187	O 176	S 7	0	0

- Molecule 28 is a protein called Ribosome assembly factor MRT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	W	233	Total 1877	C 1189	N 322	O 361	S 5	0	0

- Molecule 29 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	X	140	Total 1092	C 699	N 195	O 196	S 2	0	0

- Molecule 30 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	Y	125	Total 984	C 620	N 191	O 173	0	0

- Molecule 31 is a protein called 60S ribosomal protein L27-A.

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

- Molecule 32 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	a	93	Total 735	C 479	N 130	O 125	S 1	0	0

- Molecule 33 is a protein called Nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	b	613	Total 4953	C 3110	N 892	O 926	S 25	0	0

- Molecule 34 is a protein called Ribosome biogenesis protein ALB1.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	c	109	Total 872	C 543	N 171	O 158	0	0

- Molecule 35 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	d	105	Total 856	C 544	N 163	O 148	S 1	0	0

- Molecule 36 is a protein called 60S ribosomal protein L32.

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

- Molecule 37 is a protein called 60S ribosomal protein L33-A.

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

- Molecule 38 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	g	107	Total 846	C 525	N 173	O 144	S 4	0	0

- Molecule 39 is a protein called 60S ribosomal protein L35-A.

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

- Molecule 40 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	i	96	Total 743	C 465	N 148	O 128	S 2	0	0

- Molecule 41 is a protein called 60S ribosomal protein L37-A.

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

- Molecule 42 is a protein called 60S ribosomal protein L38.

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

- Molecule 43 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	l	49	Total 428	C 266	N 96	O 64	S 2	0	0

- Molecule 44 is a protein called Nucleolar GTP-binding protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	m	439	Total 3546	C 2249	N 647	O 641	S 9	0	0

- Molecule 45 is a protein called 60S ribosomal protein L30.

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

- Molecule 46 is a protein called 60S ribosomal protein L1-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	o	177	Total 877	C 523	N 177	O 177	0	0

- Molecule 47 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	p	89	Total 680	C 421	N 136	O 117	S 6	0	0

- Molecule 48 is a protein called 60S ribosomal protein L12-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	q	126	Total 961	C 606	N 171	O 182	S 2	0	0

- Molecule 49 is a protein called Ribosome biogenesis protein NSA2.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	r	225	Total 1818	C 1152	N 345	O 314	S 7	0	0

- Molecule 50 is a protein called Nuclear GTP-binding protein NUG1.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	s	56	Total 463	C 291	N 94	O 77	S 1	0	0

- Molecule 51 is a protein called Protein SDA1.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	t	431	Total 3395	C 2156	N 587	O 629	S 23	0	0

- Molecule 52 is a protein called Ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	u	148	Total 1247	C 783	N 250	O 205	S 9	0	0

- Molecule 53 is a protein called Ribosome assembly protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	x	459	Total 3385	C 2110	N 620	O 635	S 20	0	0

- Molecule 54 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	y	243	Total 1841	C 1141	N 318	O 376	S 6	0	0

- Molecule 55 is a protein called UPF0642 protein YBL028C.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	z	77	Total 643	C 403	N 130	O 109	S 1	0	0

- Molecule 56 is a protein called Midasin.

Mol	Chain	Residues	Atoms				AltConf	Trace
56	v	3629	Total 18010	C 10752	N 3629	O 3629	0	0

- Molecule 57 is a protein called Pre-rRNA-processing protein IPI3.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	w	399	Total 3139	C 2004	N 520	O 601	S 14	0	0
57	0	415	Total 3260	C 2077	N 548	O 621	S 14	0	0

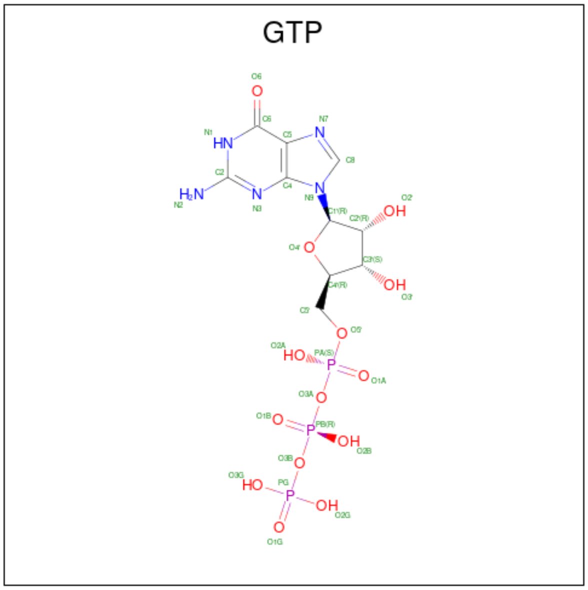
- Molecule 58 is a protein called Pre-rRNA-processing protein RIX1.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	6	545	Total 4352	C 2847	N 711	O 777	S 17	0	0
58	7	547	Total 4380	C 2862	N 720	O 782	S 16	0	0

- Molecule 59 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
59	I	1	Total 1	Zn 1	0
59	j	1	Total 1	Zn 1	0
59	p	1	Total 1	Zn 1	0
59	u	1	Total 1	Zn 1	0

- Molecule 60 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
60	b	1	32	10	5	14	3	0
60	m	1	32	10	5	14	3	0

- Molecule 61 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

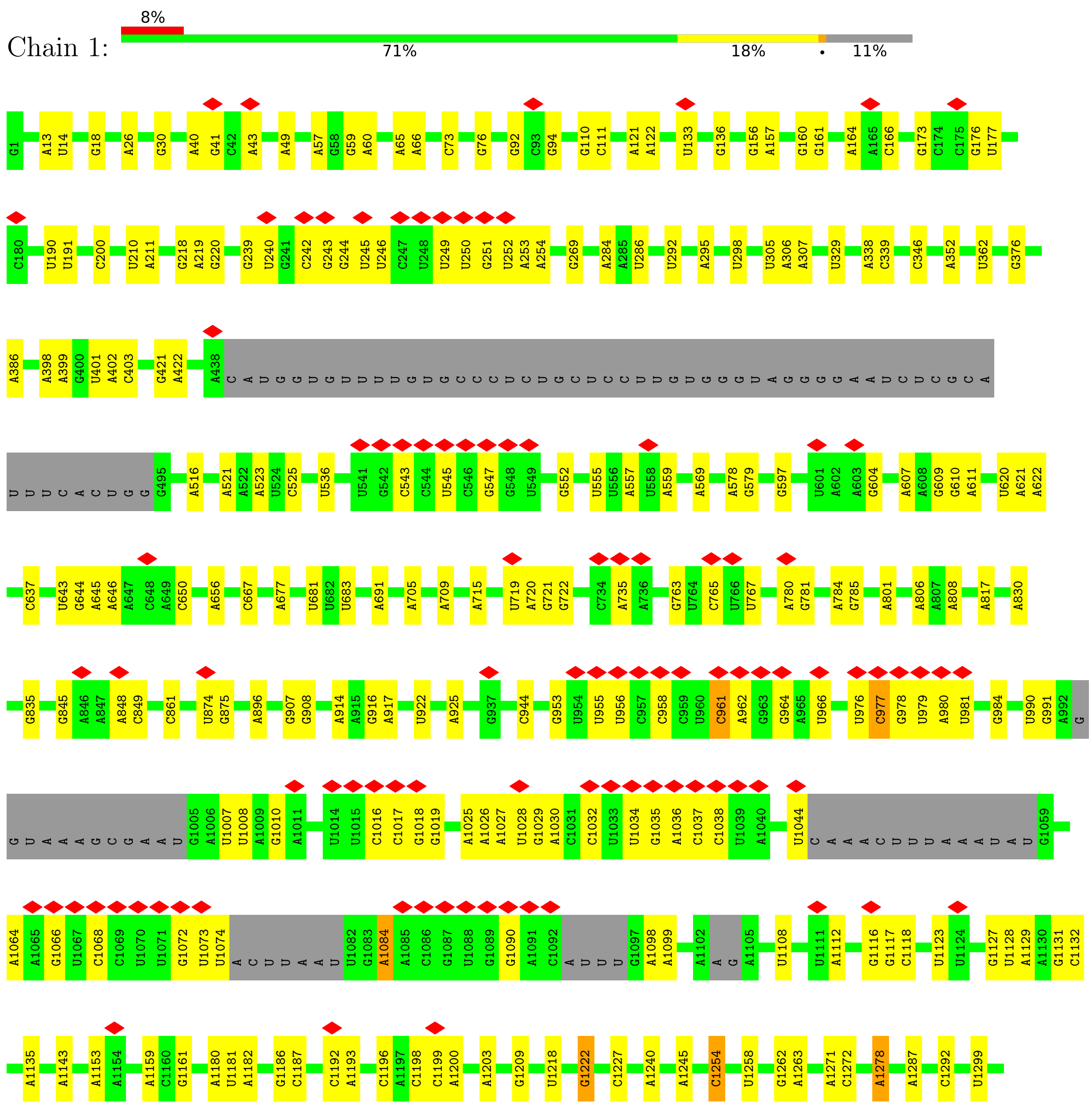
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
61	b	1	1	1	0
61	m	1	1	1	0

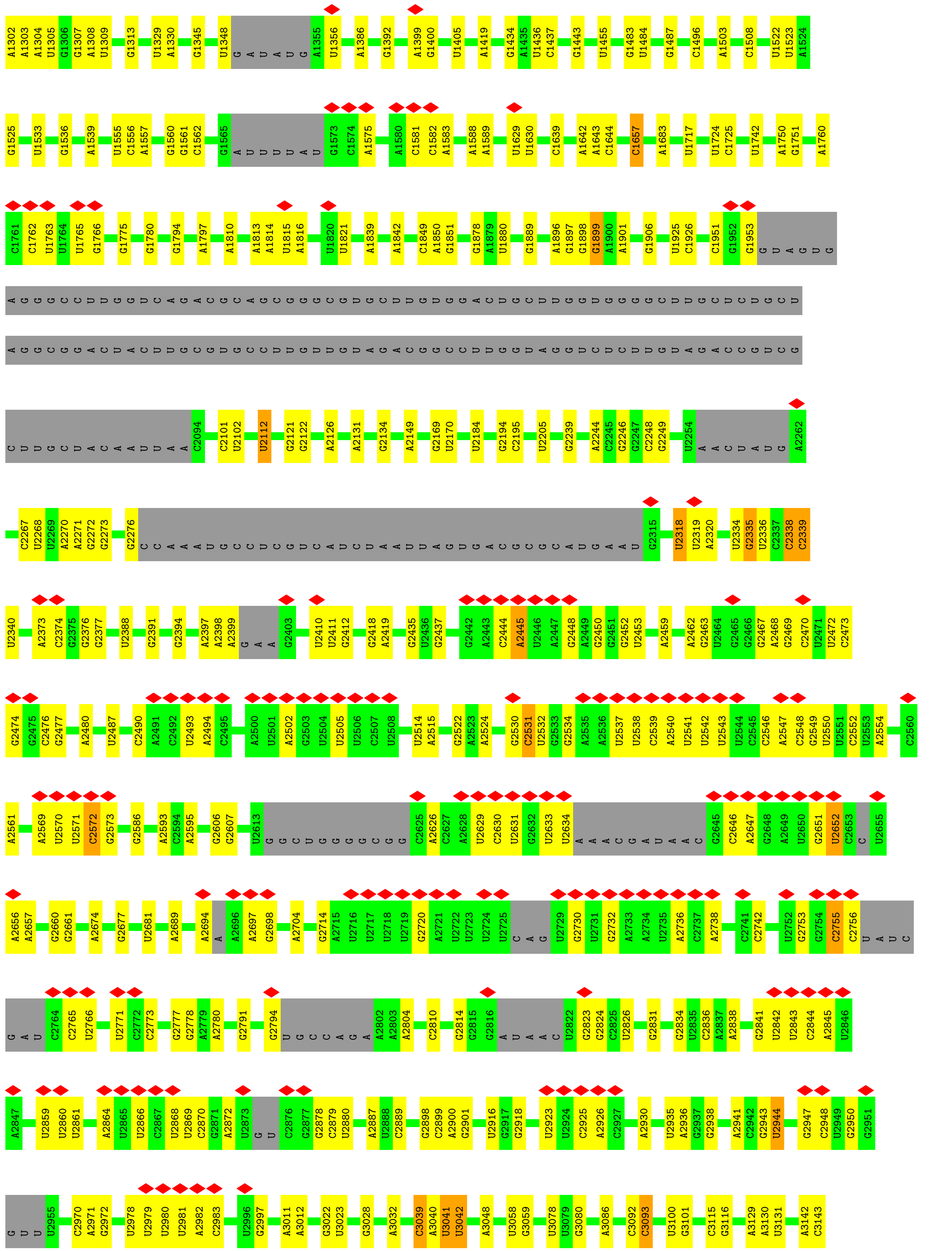
3 Residue-property plots ⓘ

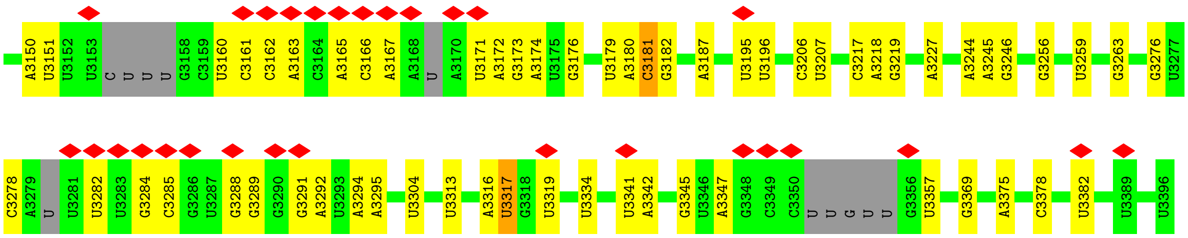
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 25S rRNA

Chain 1:

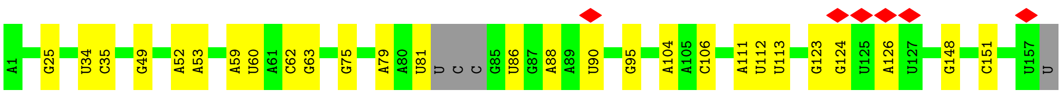






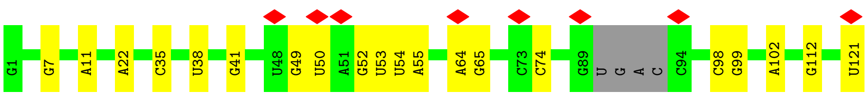
- Molecule 2: 5.8S rRNA

Chain 2:



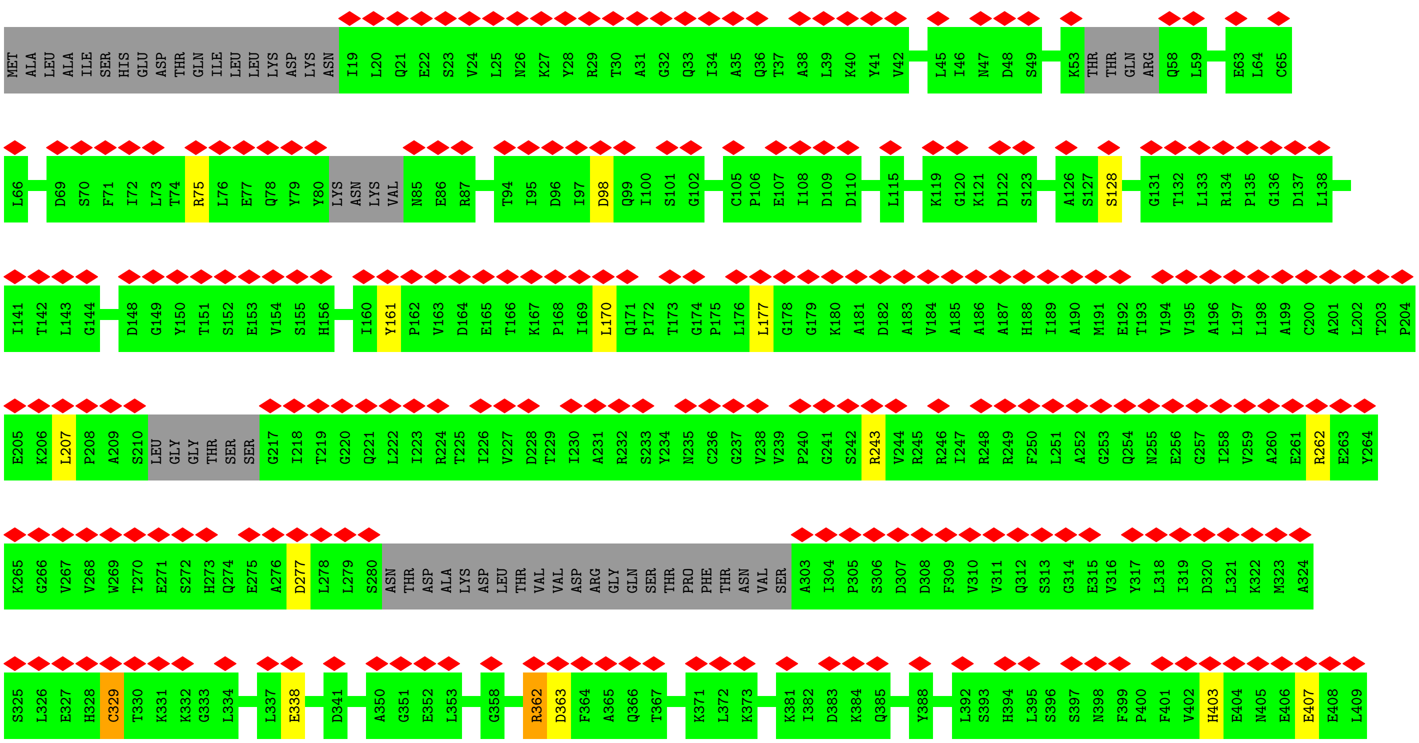
- Molecule 3: 5S rRNA

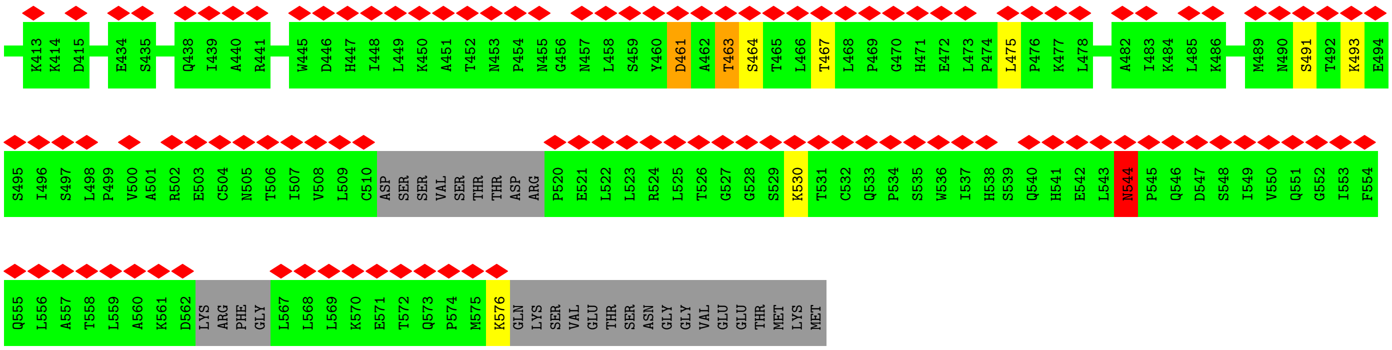
Chain 3:



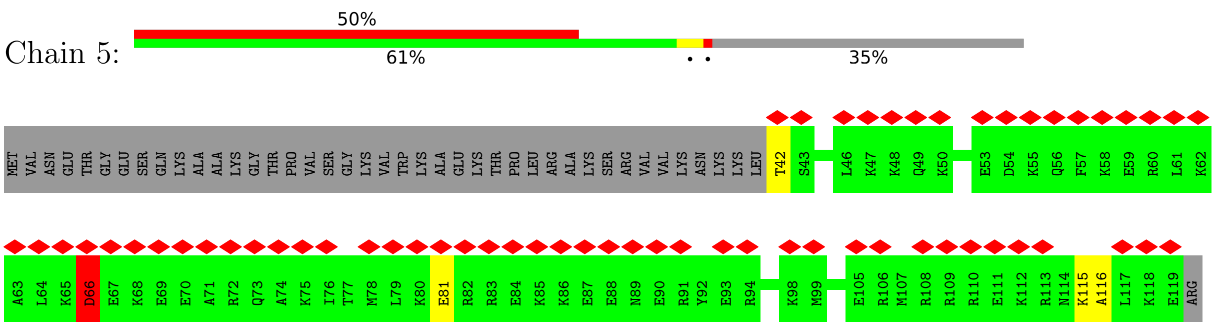
- Molecule 4: Probable metalloprotease ARX1

Chain 4:

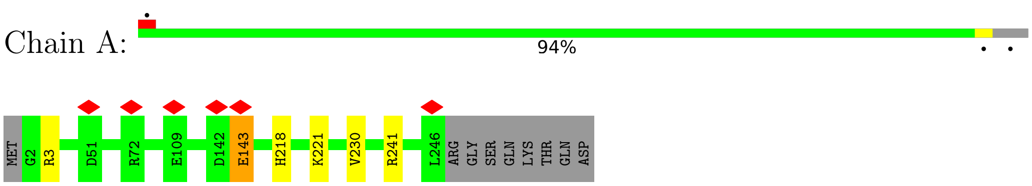




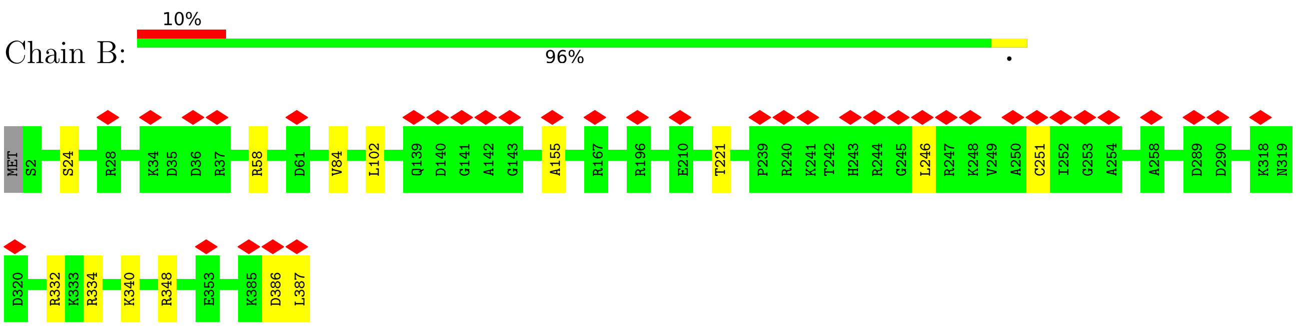
• Molecule 5: rRNA-processing protein CGR1



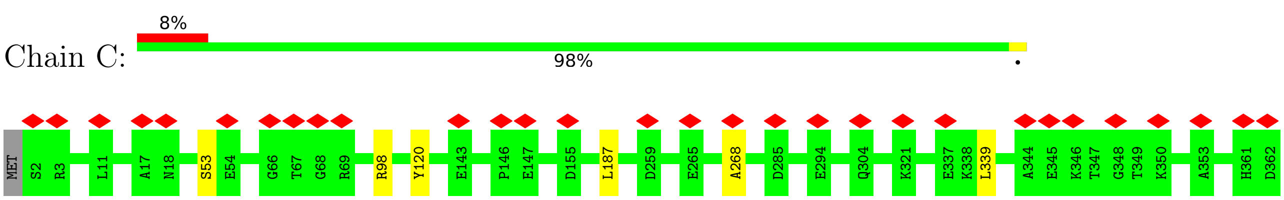
• Molecule 6: 60S ribosomal protein L2-A



• Molecule 7: 60S ribosomal protein L3

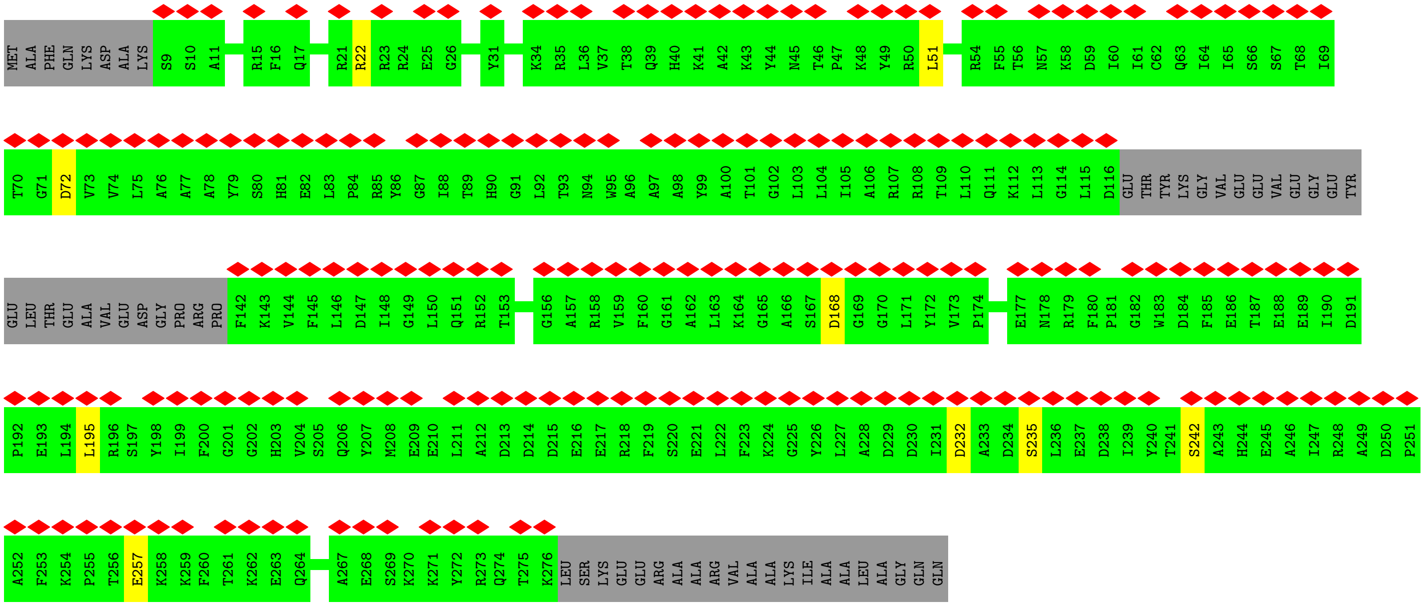


• Molecule 8: 60S ribosomal protein L4-A



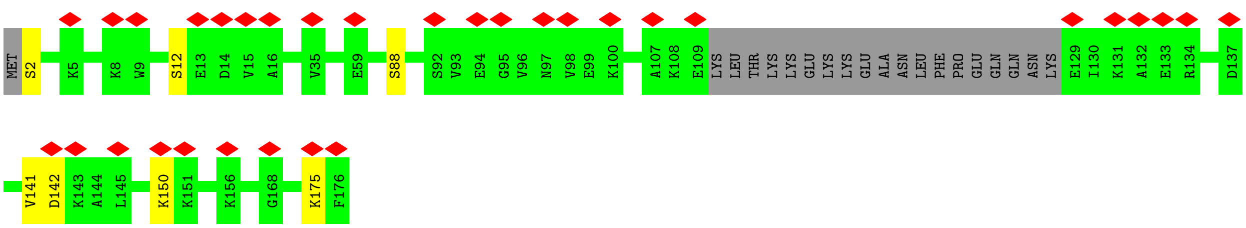
• Molecule 9: 60S ribosomal protein L5

Chain D:



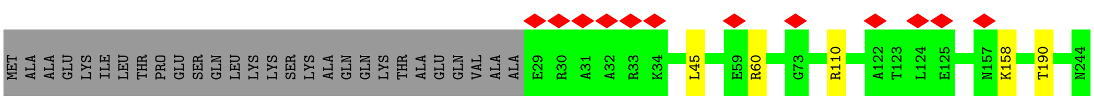
• Molecule 10: 60S ribosomal protein L6-A

Chain E:



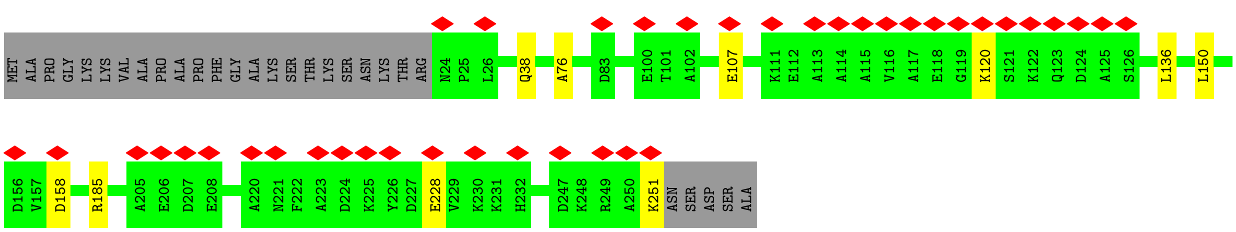
• Molecule 11: 60S ribosomal protein L7-A

Chain F:

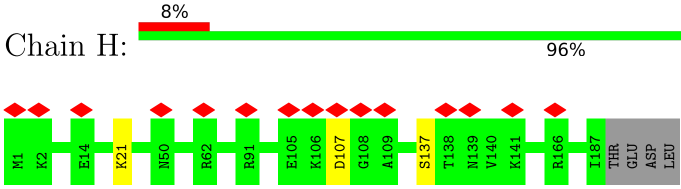


• Molecule 12: 60S ribosomal protein L8-A

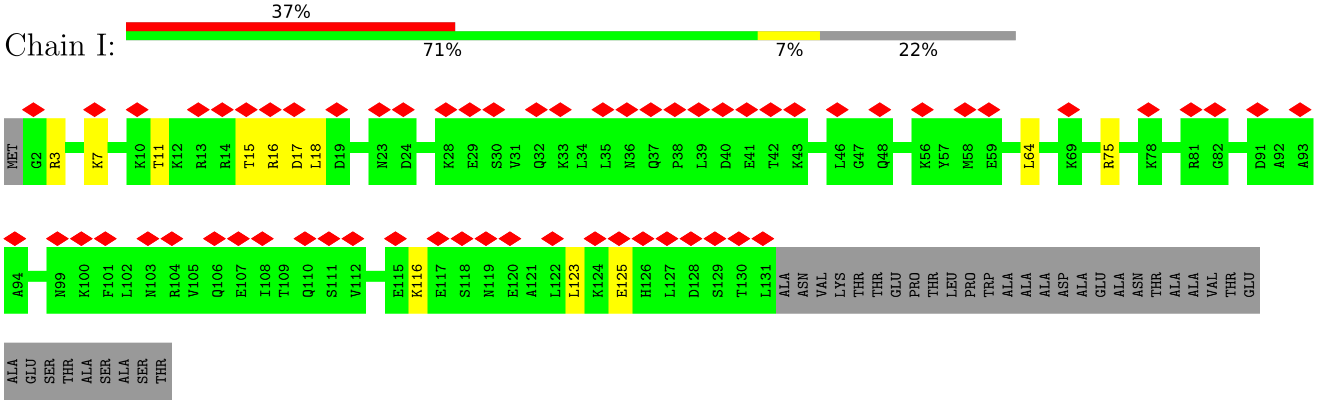
Chain G:



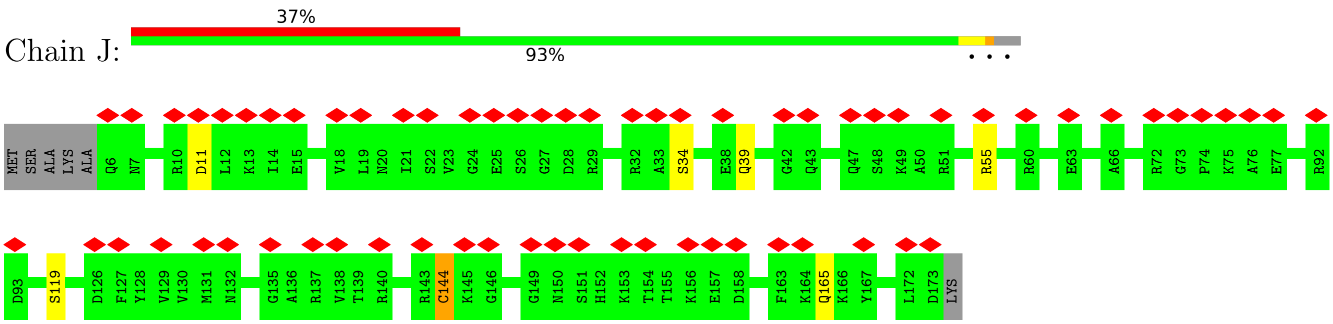
- Molecule 13: 60S ribosomal protein L9-A



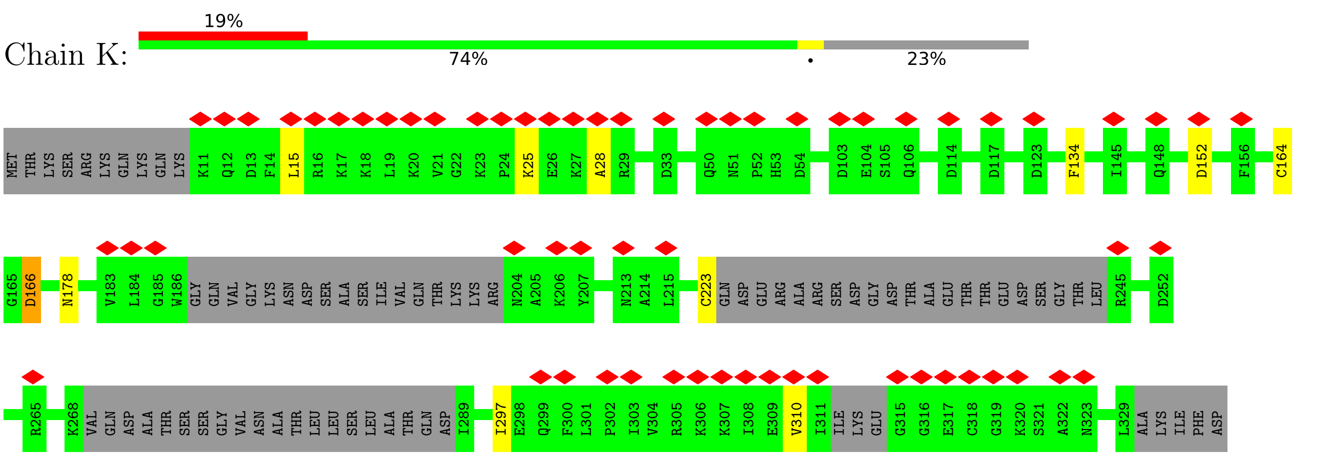
- Molecule 14: Bud site selection protein 20



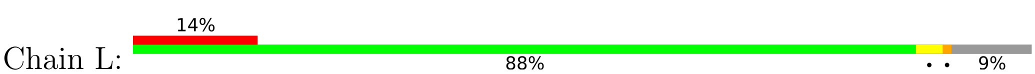
- Molecule 15: 60S ribosomal protein L11-A

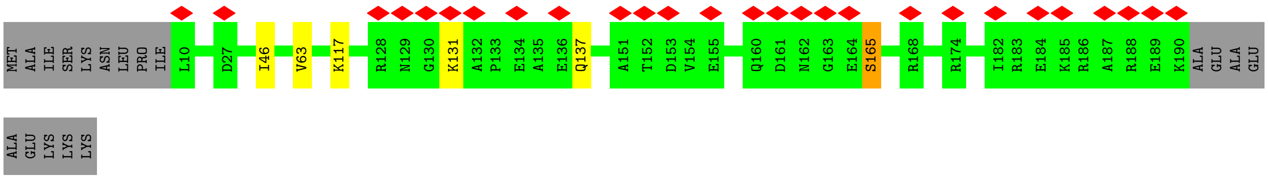


- Molecule 16: Pre-rRNA-processing protein IPI1



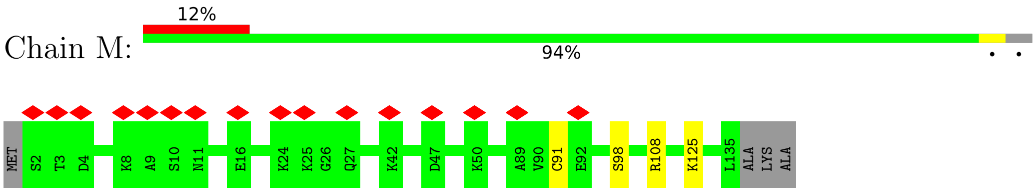
- Molecule 17: 60S ribosomal protein L13-A





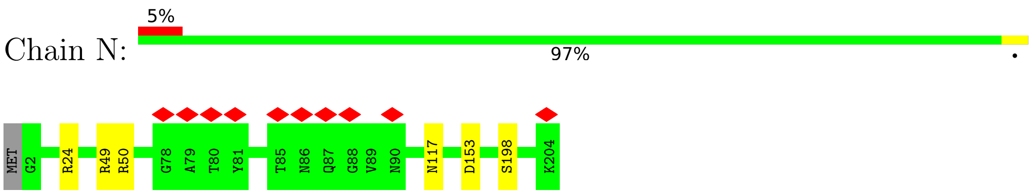
- Molecule 18: 60S ribosomal protein L14-A

Chain M:



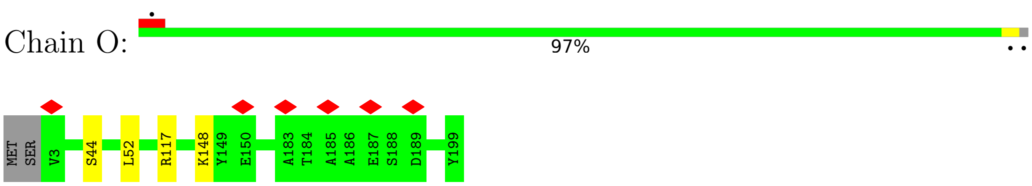
- Molecule 19: 60S ribosomal protein L15-A

Chain N:



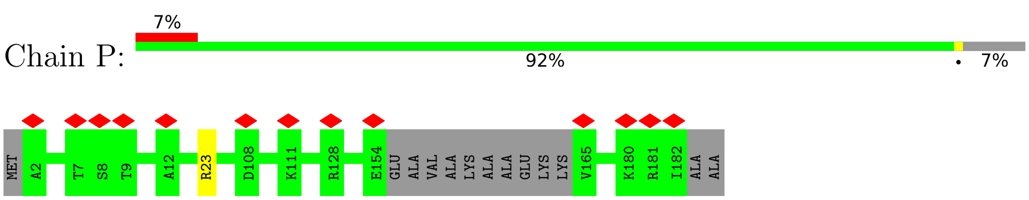
- Molecule 20: 60S ribosomal protein L16-A

Chain O:



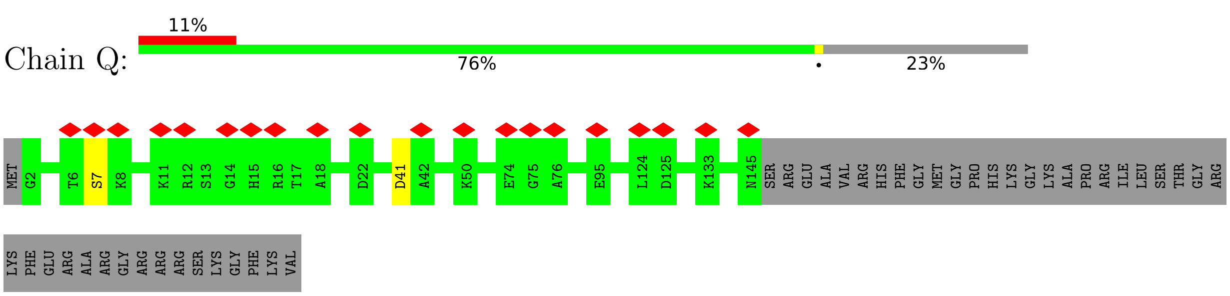
- Molecule 21: 60S ribosomal protein L17-A

Chain P:



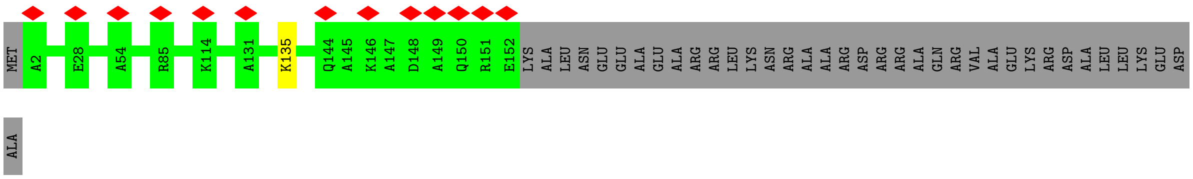
- Molecule 22: 60S ribosomal protein L18-A

Chain Q:

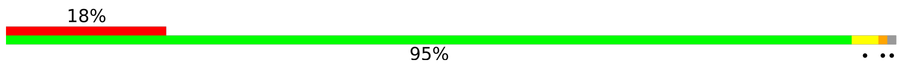


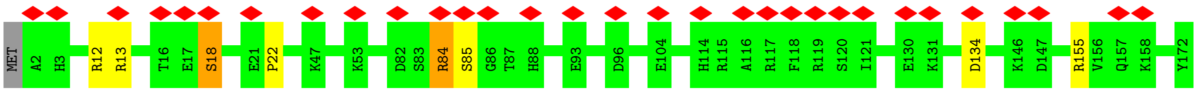
- Molecule 23: 60S ribosomal protein L19-A

Chain R:



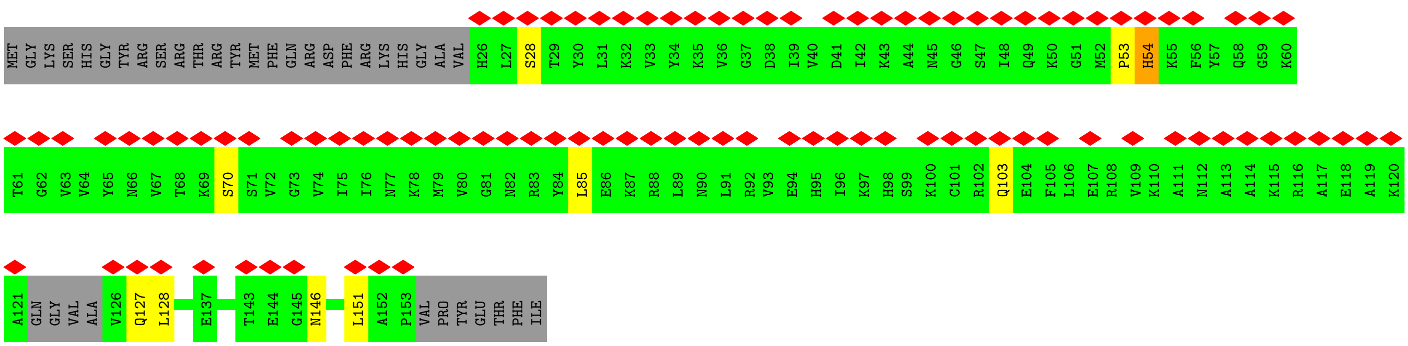
• Molecule 24: 60S ribosomal protein L20-A

Chain S:




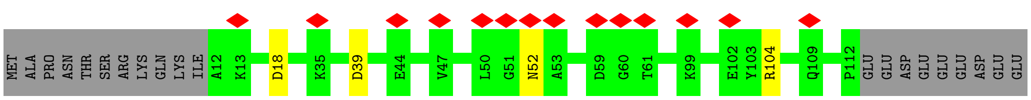
• Molecule 25: 60S ribosomal protein L21-A

Chain T:

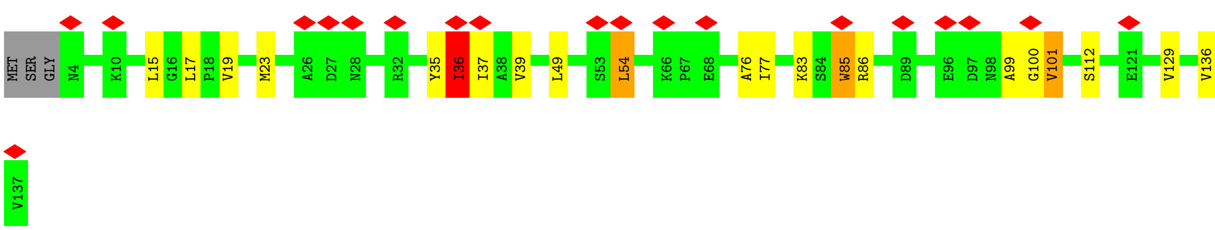
• Molecule 26: 60S ribosomal protein L22-A

Chain U:

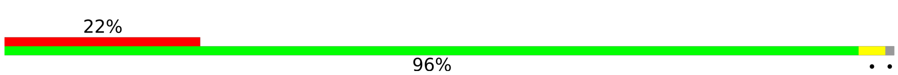



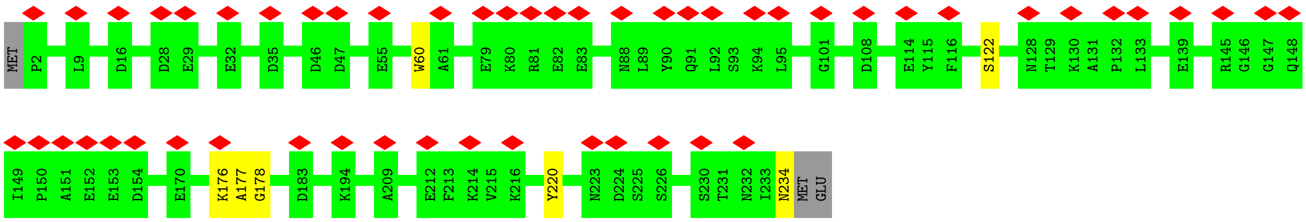
• Molecule 27: 60S ribosomal protein L23-A

Chain V:

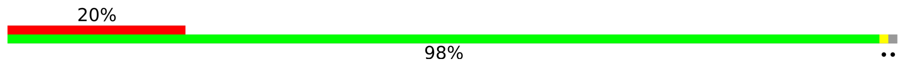
• Molecule 28: Ribosome assembly factor MRT4

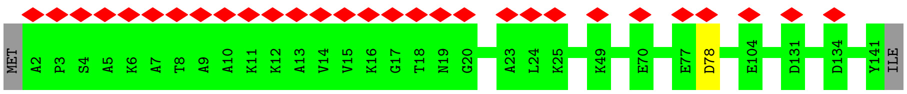
Chain W:




• Molecule 29: 60S ribosomal protein L25

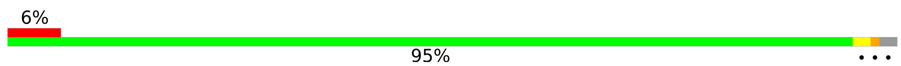
Chain X:

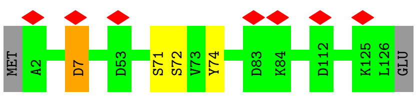




• Molecule 30: 60S ribosomal protein L26-A

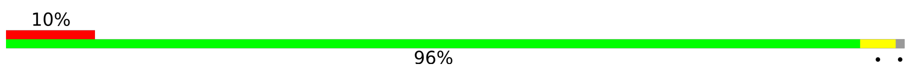
Chain Y:

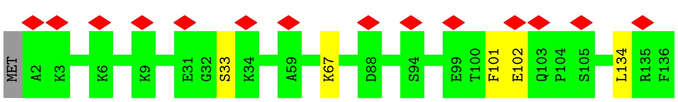




• Molecule 31: 60S ribosomal protein L27-A

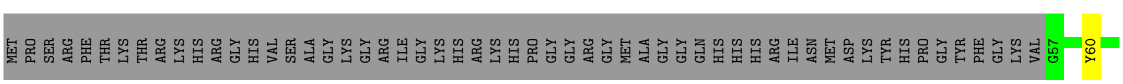
Chain Z:

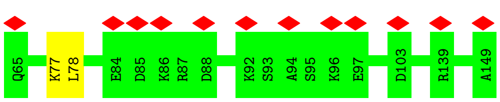




• Molecule 32: 60S ribosomal protein L28

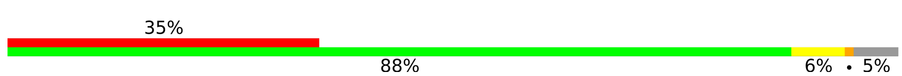
Chain a:

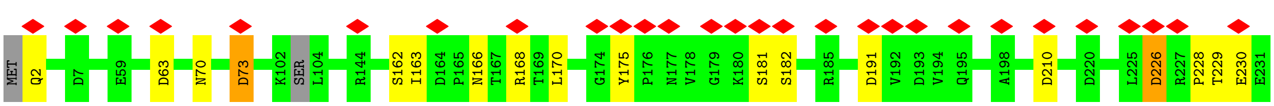


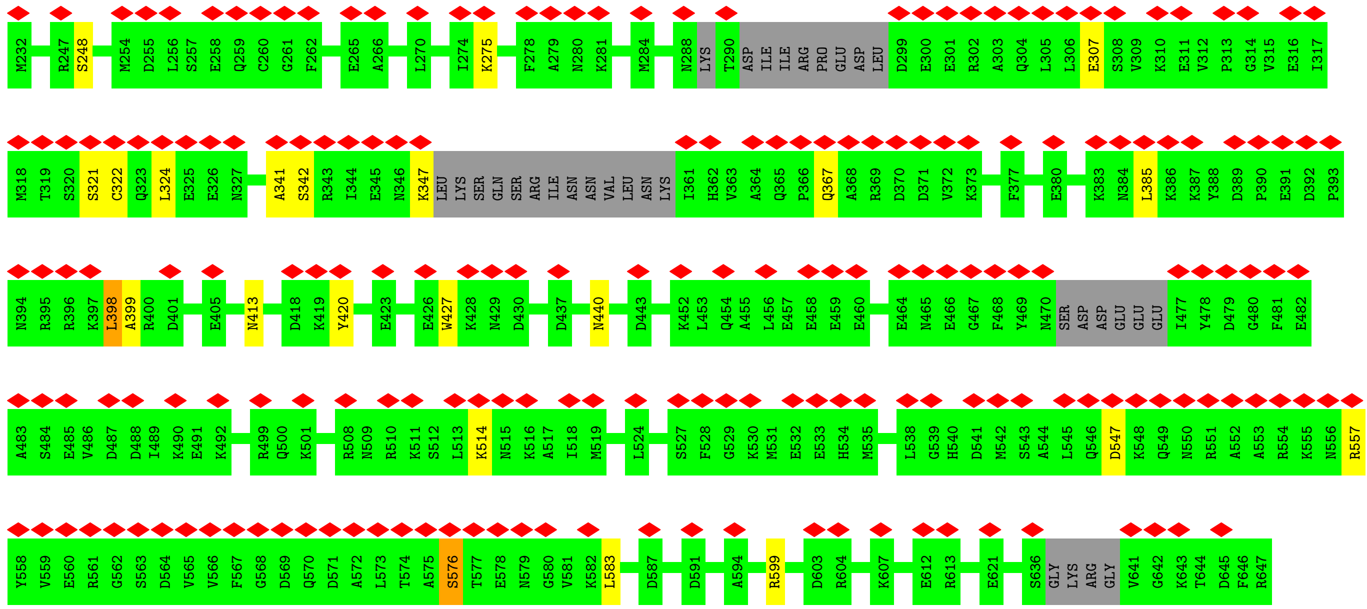


• Molecule 33: Nucleolar GTP-binding protein 1

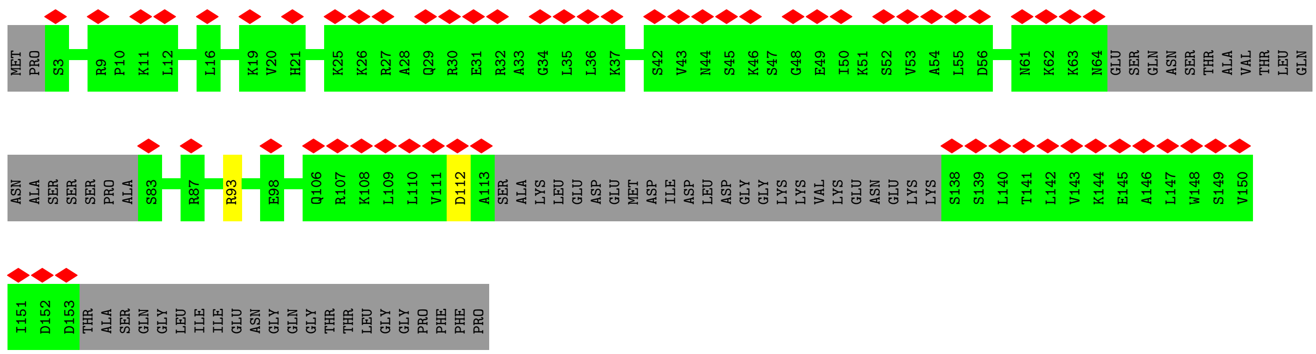
Chain b:



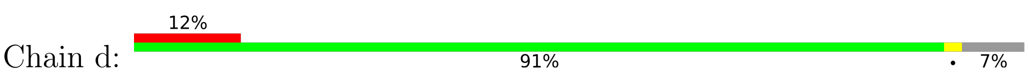


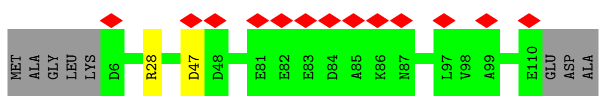


- Molecule 34: Ribosome biogenesis protein ALB1

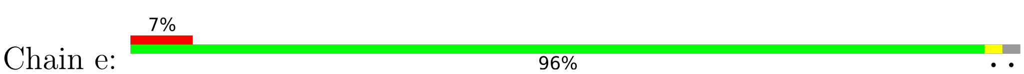


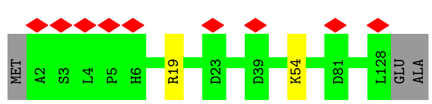
- Molecule 35: 60S ribosomal protein L31-A





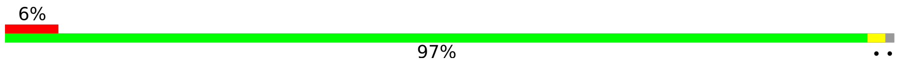
- Molecule 36: 60S ribosomal protein L32

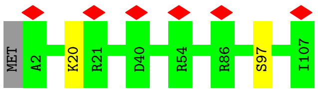




- Molecule 37: 60S ribosomal protein L33-A

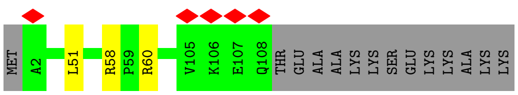
Chain f:





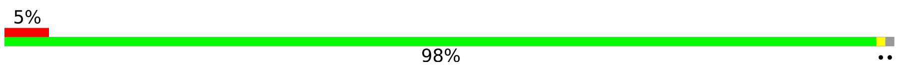
• Molecule 38: 60S ribosomal protein L34-A

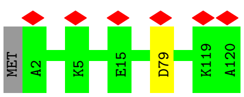
Chain g:



• Molecule 39: 60S ribosomal protein L35-A

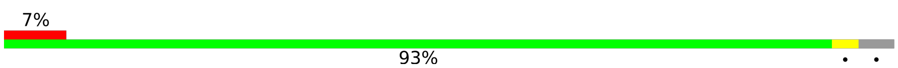
Chain h:

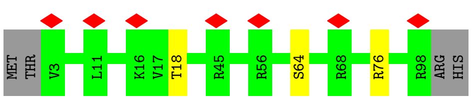




• Molecule 40: 60S ribosomal protein L36-A

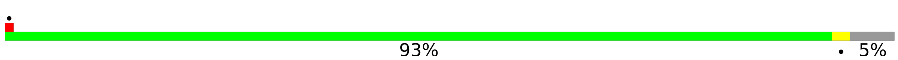
Chain i:

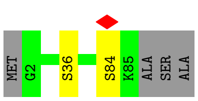




• Molecule 41: 60S ribosomal protein L37-A

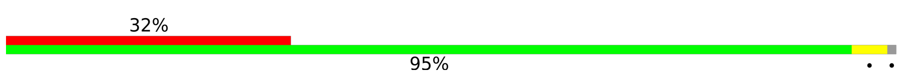
Chain j:

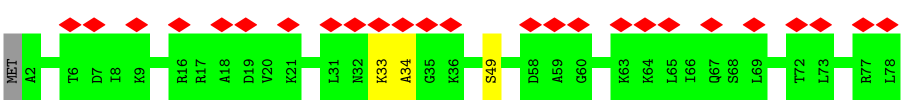




• Molecule 42: 60S ribosomal protein L38

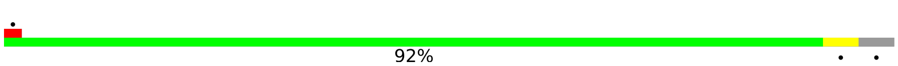
Chain k:

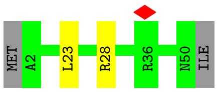




• Molecule 43: 60S ribosomal protein L39

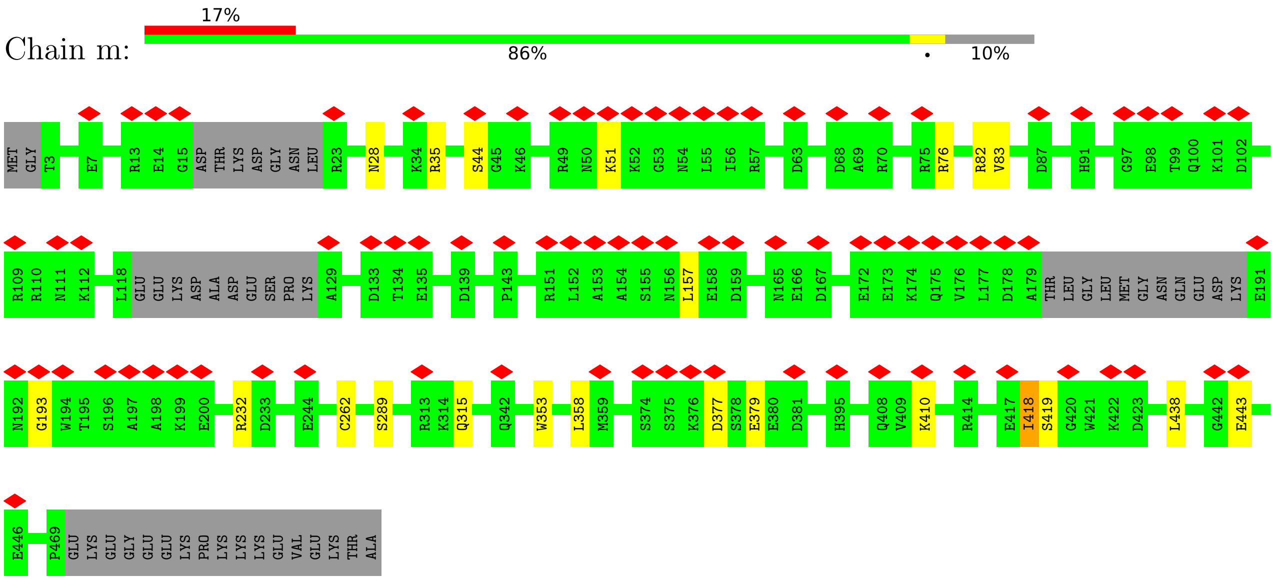
Chain l:





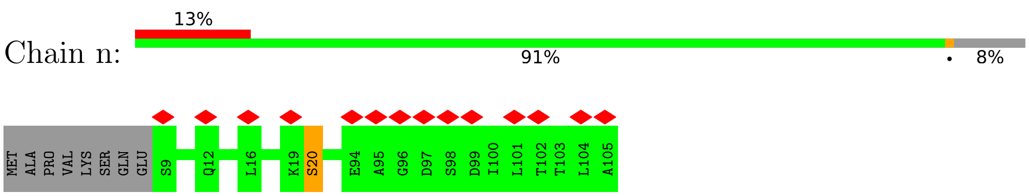
• Molecule 44: Nucleolar GTP-binding protein 2

Chain m:



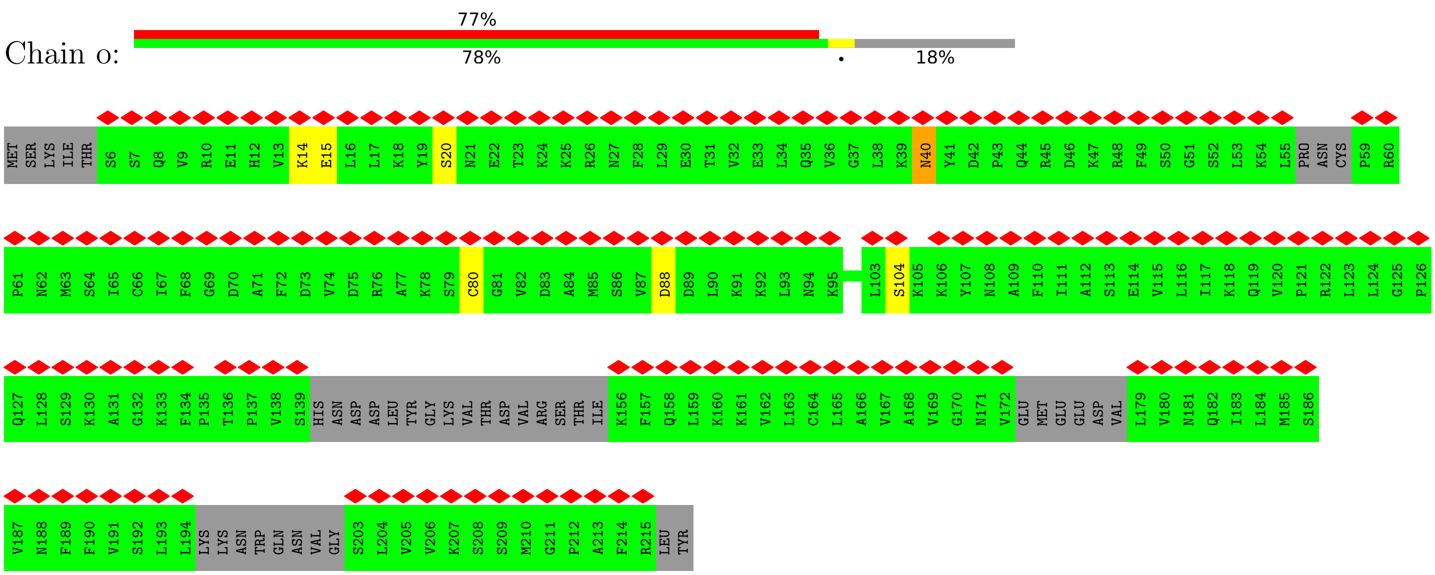
• Molecule 45: 60S ribosomal protein L30

Chain n:



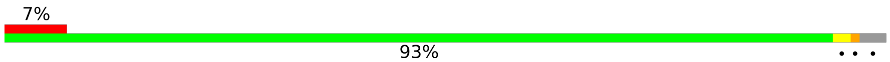
• Molecule 46: 60S ribosomal protein L1-A

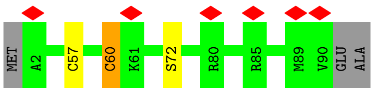
Chain o:



• Molecule 47: 60S ribosomal protein L43-A

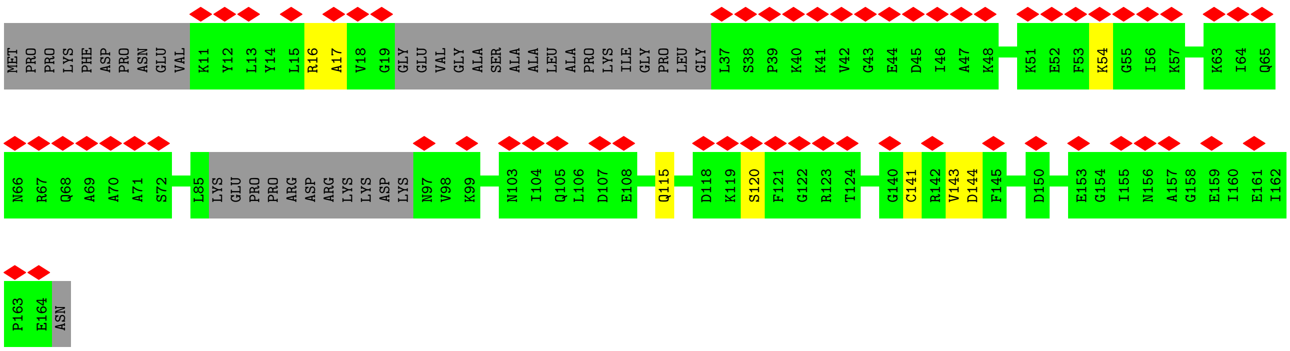
Chain p:





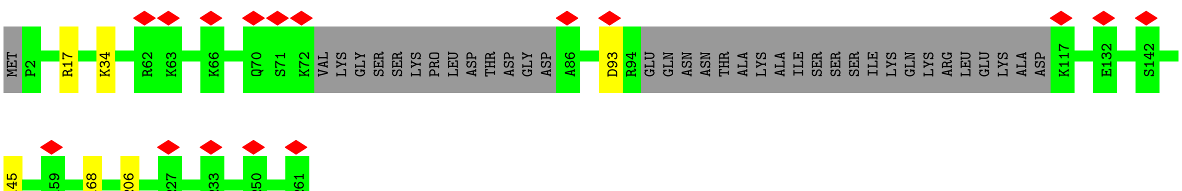
• Molecule 48: 60S ribosomal protein L12-A

Chain q:



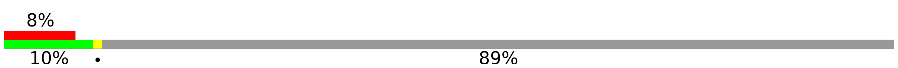
• Molecule 49: Ribosome biogenesis protein NSA2

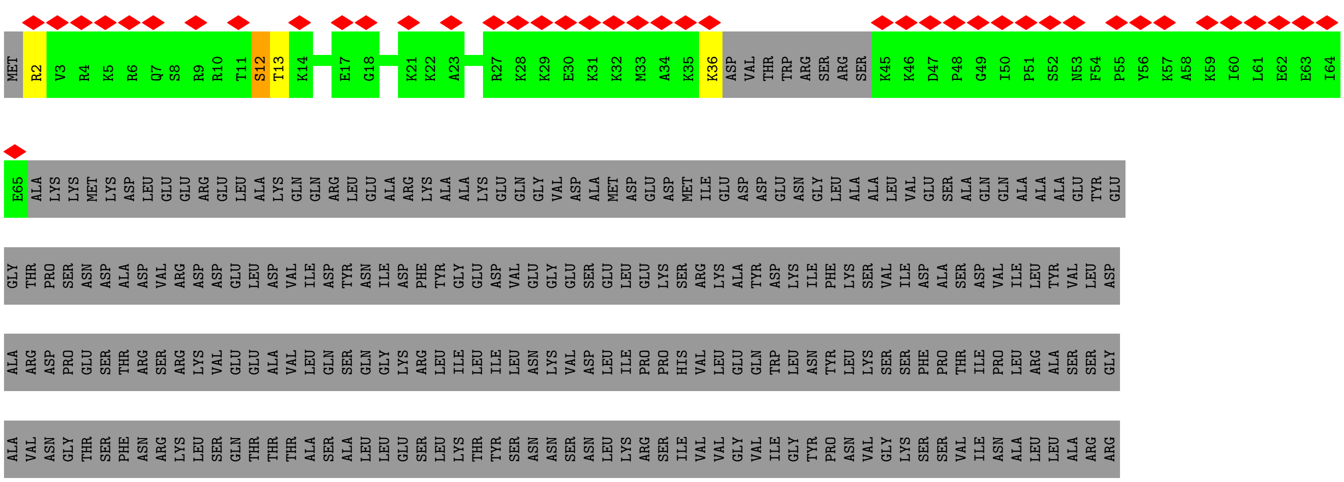
Chain r:



• Molecule 50: Nuclear GTP-binding protein NUG1

Chain s:





GLY GLY GLN SER LYS ALA CYS PRO VAL GLY ASN GLU ALA GLY VAL THR THR SER LEU ARG GLU ILE LYS ILE ASP ASN LYS LEU LYS ILE LEU ASP SER PRO GLY ILE CYS PHE PRO SER GLU ASN LYS LYS ARG SER LYS VAL GLU HIS GLU ALA GLU LEU ALA LEU LEU ASN ALA LEU

PRO ALA LYS HIS ILE VAL ASP PRO TYR PRO ALA VAL LEU MET LEU VAL LYS ARG LEU ALA LYS SER ASP GLU MET THR GLU SER PHE LYS LYS LEU TYR GLU ILE PRO PRO ILE PRO ALA ASN ASP ALA ASP THR PHE THR LYS HIS PHE LEU ILE HIS VAL ALA ARG LYS ARG GLY ARG

LEU GLY LYS GLY GLY ILE PRO ASN LEU ALA SER ALA GLY LEU SER VAL LEU ASN ASP TRP ARG ASP GLY LYS ILE LEU GLY TRP VAL LEU PRO ASN THR SER ALA ALA ALA SER GLN GLN ASP LYS GLN ASN LEU SER THR ILE ASN THR GLY THR LYS GLN ALA PRO ILE ALA ALA ASN

GLU SER THR ILE VAL SER GLU TRP SER LYS GLU PHE ASP LEU ASP GLY LEU PHE SER SER LEU ASP LYS ALA ILE ASP ALA SER LYS ASP GLN ASP THR MET MET GLU

- Molecule 51: Protein SDA1

Chain t: 13% 55% • 44%

MET GLY ARG ARG SER R6 M9 L17 R23 D24 E31 L48 ASN GLY LEU ALA GLY GLY ASP SER ALA ALA ALA THR ASN GLY LEU ASP VAL G66 S70 E126 M137 L138 R139 D142 N194 S217 K224 R227 E228 R231 R232 D236

M257 M261 D265 ALA ASP ARG GLU ARG GLU GLU ASN PHE GLU GLU ASN SER GLU ASP GLU ASP GLY PHE ASP LEU ASP ALA LEU ARG HIS LYS MET GLN VAL ASN LYS LYS THR GLY ARG ARG GLY LYS LYS LEU GLU ASN ALA ILE LYS THR VAL LYS LYS LYS LYS LYS ASN GLY

PRO GLY ALA PRO GLN GLY TYR L328 N329 F330 S331 H334 L335 F342 A343 E344 F347 G353 K354 T355 K356 N357 K358 F359 D360 M361 E362 R373 T377 H378 K379 L380 I381 V382 L383 L390 L393 K396 Q397 R398 D399 R402 I403 M404 Q409 D413 L414

E418 V419 I420 N421 R425 D429 E430 D434 G435 N438 E439 A443 G444 I445 R449 E450 R454 L457 A458 I459 D460 E461 D466 E469 Y470 K471 G472 S473 K474 A475 K476 M480 K483 L488 D491 E495 M496 L497 K498 K499 K500 D501 K504

M508 E509 V510 Q511 E512 A513 K514 K515 GLY GLY LYS ASP SER LYS ARG PRO GLN PHE GLY ALA ASP ASN SER VAL GLN GLY ILE ALA GLY ILE GLU LEU LEU ALA LYS TRP LYS LYS GLU HIS GLY GLU GLU SER GLU ASN GLU ASP ALA ASP ALA ASN TRP GLU VAL ASP VAL ASP SER GLU

GLU ASP ASP VAL ASP GLY GLU TRP VAL THR MET ASP SER ASP LYS GLU TYR ASP VAL ASP MET GLU ASP SER ASP GLU LYS ASP ASN ALA LYS GLY LYS GLU SER ASP SER ASP LEU GLU LEU SER ASP ASP ASP GLU LYS GLU VAL LYS ASP GLU GLN GLU ASP ALA ASP ILE

ASP PRO GLU ALA ALA PHE ARG GLU ILE ALA SER THR ARG ILE LEU THR PRO ALA ASP PHE ALA LYS LEU GLN GLU LEU ARG ASN GLU GLU SER VAL ALA LYS ILE MET GLY ILE HIS LYS GLN ASP LYS ARG GLU GLU LEU VAL ASP ALA SER THR LEU THR GLY PRO ILE LYS TYR LYS

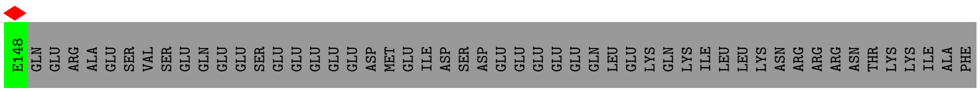
GLN SER ARG GLU GLU ARG LEU GLN LYS VAL LEU GLU GLY ARG GLU GLY ARG ASP LYS PHE GLY SER ARG ARG GLY LYS ARG ASP ASN MET ARG SER THR THR ASN ARG GLU LYS GLU ARG ARG LYS ASN PHE VAL MET SER ILE HIS LYS ARG SER VAL ARG GLY LYS GLN LYS MET SER

LEU ARG ASP LYS GLN LYS VAL LEU ARG ALA HIS ILE THR LYS GLN LYS LYS LYS GLY TYR

- Molecule 52: Ribosome biogenesis protein RLP24

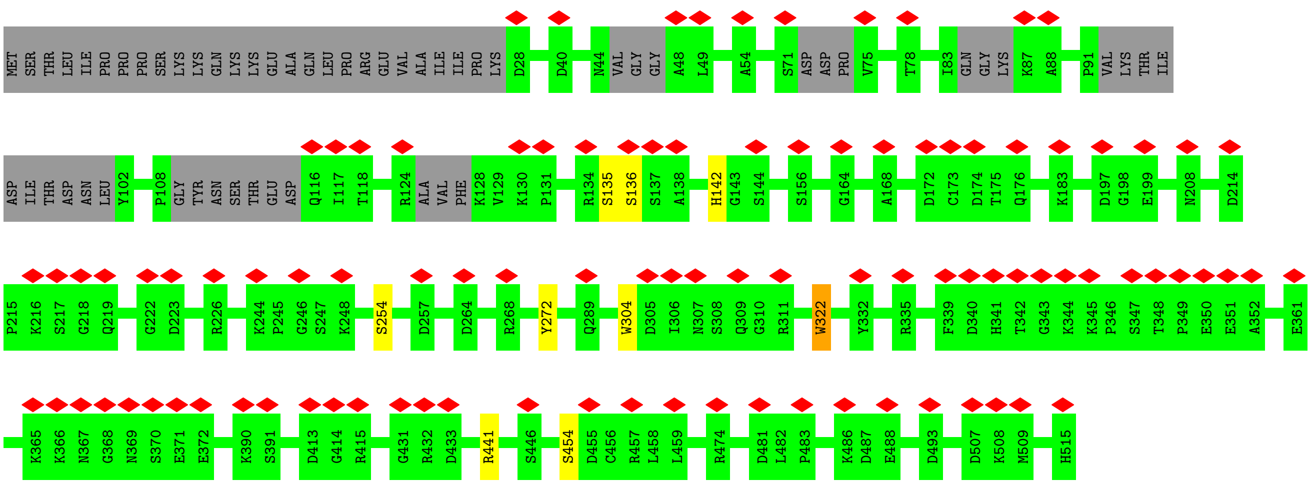
Chain u: 15% 69% 5% • 26%

M1 F8 S11 I19 R23 N24 D25 R43 R44 N45 E62 L63 A64 L69 T70 F71 R74 V77 E84 E97 E104 R113 D119 R122 D123 K124 K125 L126 V127 E128 S129 N130 R135 E138 V139 E140 I141 A142 R143 K144 L145 A146 K147



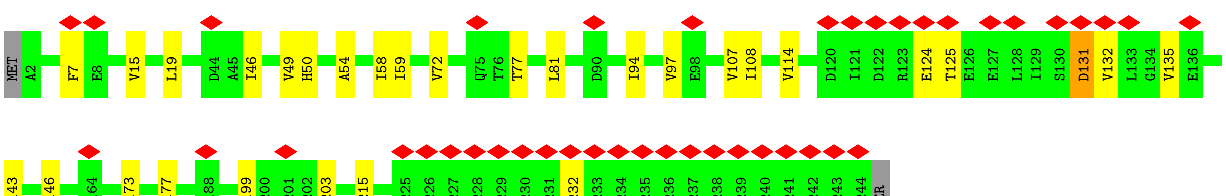
- Molecule 53: Ribosome assembly protein 4

Chain x:

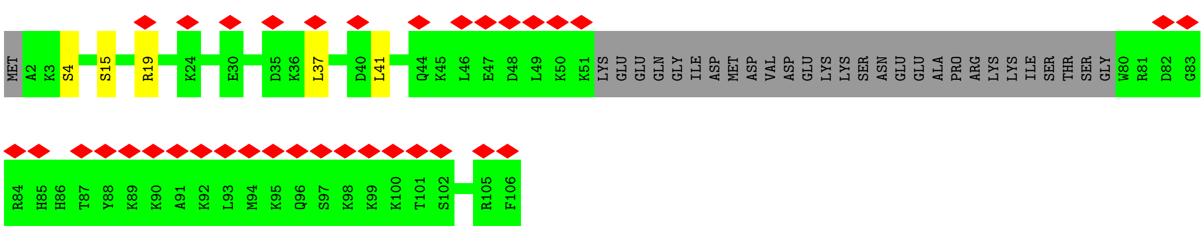
- Molecule 54: Eukaryotic translation initiation factor 6

Chain y:

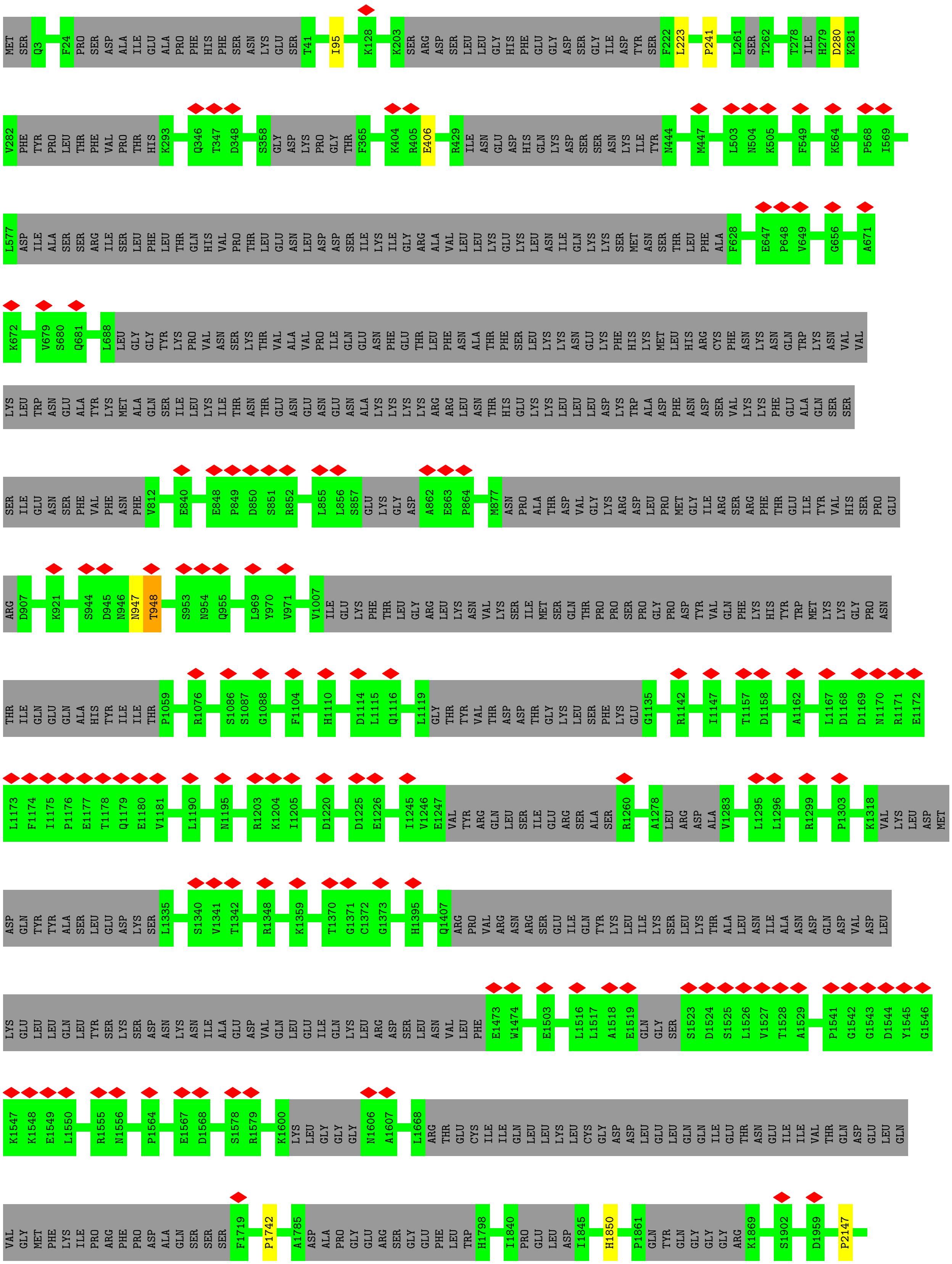
- Molecule 55: UPF0642 protein YBL028C

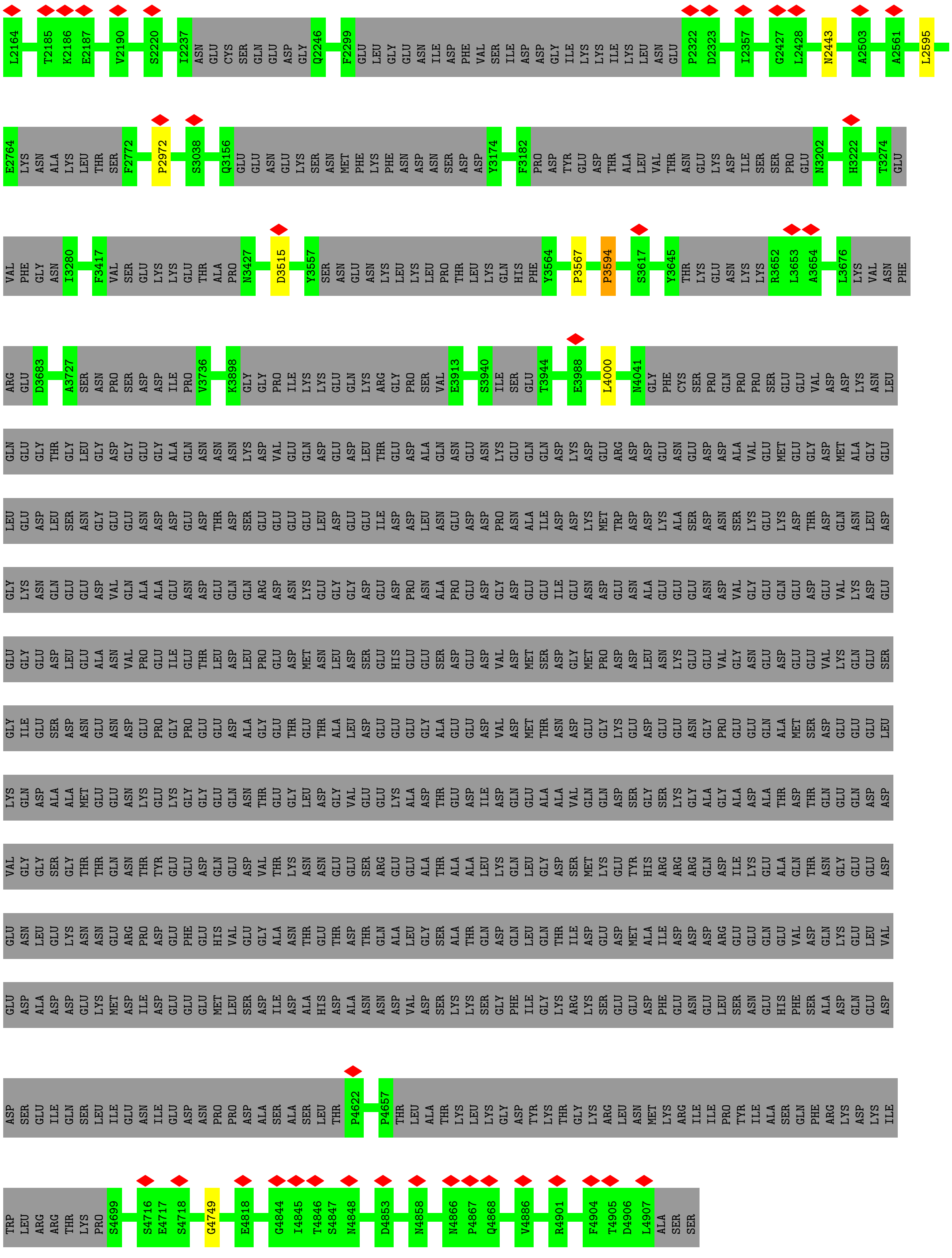
Chain z:

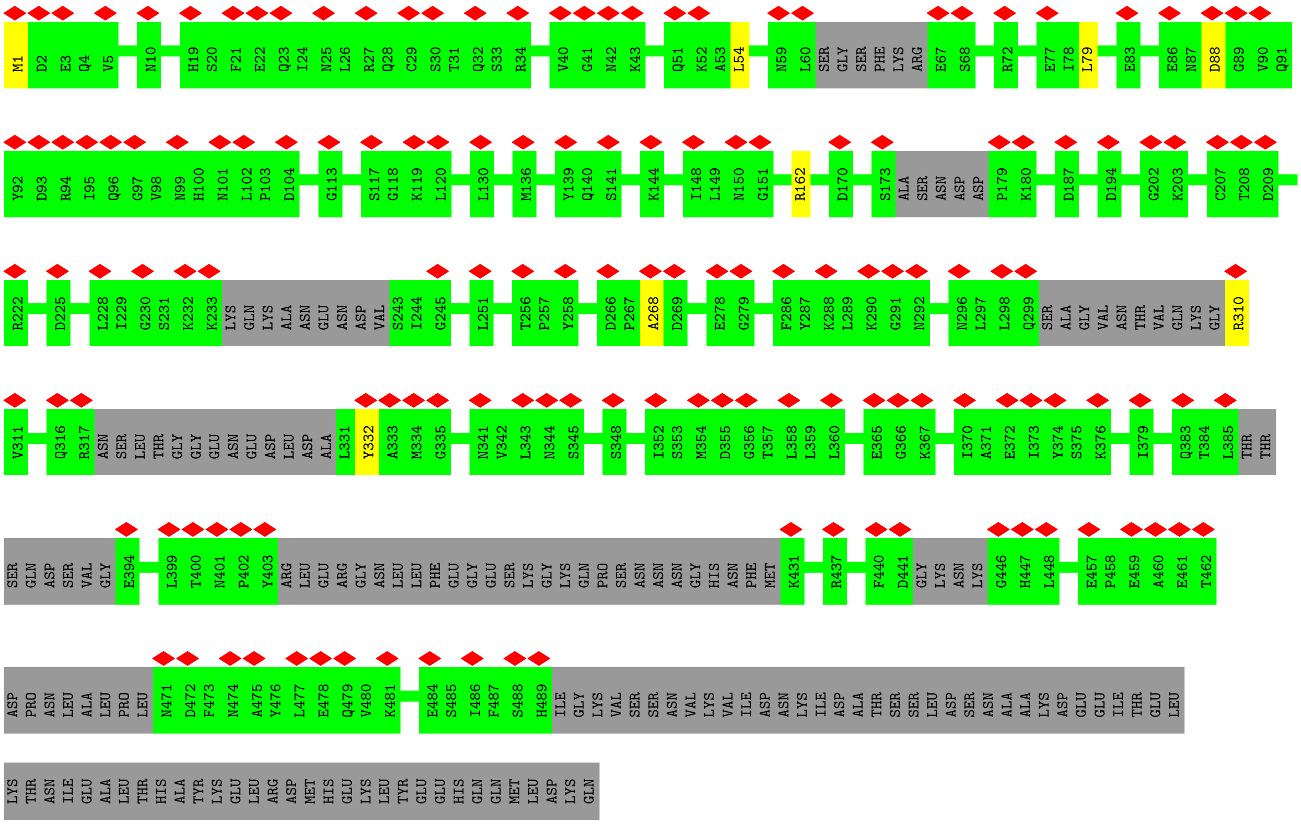
- Molecule 56: Midasin

Chain v:



MET SER Q3 F24 PRO SER ASP ALA ILE GLU ALA PRO PHE HIS PHE SER ASN LYS GLU SER T41 I95 K128 K203 SER ARG ASP SER LEU LEU GLY HIS PHE GLU GLY ASP SER GLY ILE ASP TYR SER F222 L223 P241 L261 SER T262 T278 ILE H279 D280 K281
V282 PHE TYR PRO LEU THR PHE VAL PRO THR HIS K293 Q346 T347 D348 S358 GLY ASP LYS PRO GLY THR F365 K404 R405 E406 R429 ILE ASN GLU ASP HIS GLN LYS ASP SER SER ASN LYS ILE TYR N444 M447 L503 N504 K505 F549 K564 P568 I569
L577 ASP ILE ALA SER SER ARG ILE SER LEU PHE LEU THR GLN HIS VAL PRO THR LEU GLU ASN LEU ASP ASP SER ILE LYS ILE GLY ARG ALA VAL LEU LEU LYS GLU LYS LEU ASN ILE GLN LYS LYS SER MET ASN SER THR LEU PHE ALA F628 E647 P648 V649 G656 A671
K672 V679 S680 Q681 L688 LEU GLY GLY TYR LYS PRO VAL ASN SER LYS THR VAL ALA VAL PRO ILE GLN GLU ASN PHE GLU THR LEU PHE ASN ALA THR PHE SER LEU LYS LYS ASN GLU LYS PHE HIS LYS MET LEU HIS ARG CYS PHE ASN LYS ASN GLN TRP LYS ASN VAL VAL
LYS LEU TRP ASN GLU ALA TYR LYS MET ALA GLN SER ILE LEU LYS ILE THR ASN THR GLU ASN GLU ASN GLU ASN ALA LYS LYS LYS ARG ARG LEU ASN THR HIS GLU LYS LYS LEU LEU LEU ASP LYS TRP ALA ASP PHE ASN ASP SER VAL LYS LYS PHE GLU ALA GLN SER SER
SER ILE GLU ASN SER PHE VAL PHE ASN PHE V812 E840 E848 P849 D850 S851 R852 L855 L856 S857 GLU LYS GLY ASP A862 E863 P864 M877 ASN PRO ALA THR ASP VAL GLY LYS ARG ASP LEU PRO MET GLY ILE ARG SER ARG PHE THR GLU ILE TYR VAL HIS SER PRO GLU
ARG D907 K921 S944 D945 N946 N947 T948 S953 N954 Q955 L969 Y970 V971 V1007 ILE GLU LYS PHE THR LEU GLY ARG LEU LYS ASN VAL LYS SER ILE MET SER GLN THR PRO PRO SER PRO GLY PRO ASP TYR VAL GLN PHE LYS HIS TYR TRP MET LYS LYS GLY PRO ASN
THR ILE GLN GLU GLN ALA HIS TYR ILE ILE THR P1059 R1076 S1086 S1087 G1088 F1104 H1110 D1114 L1115 Q1116 L1119 GLY THR TYR VAL THR ASP ASP THR GLY LYS LEU SER PHE LYS GLU G1135 R1142 I1147 T1157 D1158 A1162 L1167 D1168 D1169 N1170 R1171 E1172
L1173 F1174 I1175 P1176 E1177 T1178 Q1179 E1180 V1181 L1190 N1195 R1203 K1204 I1205 D1220 D1225 E1226 I1245 V1246 E1247 VAL TYR ARG GLN LEU SER ILE GLU ARG SER ALA SER R1260 A1278 LEU ARG ASP ALA V1283 L1295 L1296 R1299 P1303 K1318 VAL LYS LEU ASP MET
ASP GLN TYR TYR ALA SER LEU GLU ASP LYS SER L1335 S1340 V1341 T1342 R1348 K1359 T1370 G1371 C1372 G1373 H1395 Q1407 ARG PRO VAL ARG ASN ARG SER GLU ILE GLN TYR LYS LEU ILE LYS SER LEU LYS THR ALA LEU ASN ILE ALA ASN ASP GLN ASP VAL ASP LEU
LYS GLU LEU LEU GLN LEU TYR SER LYS SER ASP ASN LYS ASN ILE ALA GLU ASP VAL GLN LEU GLU ILE GLN LYS LEU ARG ASP SER LEU ASN VAL LEU PHE E1473 W1474 E1503 L1516 L1517 A1518 E1519 GLN GLY SER S1523 D1524 S1525 L1526 V1527 T1528 A1529 P1541 G1542 G1543 D1544 Y1545 G1546
K1547 K1548 E1549 L1550 R1555 N1556 P1564 E1567 D1568 S1578 R1579 K1600 LYS LEU GLY GLY GLY N1606 A1607 L1668 ARG THR GLU CYS ILE ILE GLN LEU LEU LYS LEU CYS GLY ASP ASP LEU GLU LEU GLN GLN ILE GLU THR ASN GLU ILE ILE VAL THR GLN ASP GLU LEU GLN
VAL GLY MET PHE LYS ILE PRO ARG PHE PRO ASP ALA GLN SER SER SER F1719 P1742 A1785 ASP ALA PRO GLY GLU ARG SER GLY GLU PHE LEU TRP H1798 I1840 PRO GLU LEU ASP I1845 H1850 P1861 GLN TYR GLN GLY GLY ARG K1869 S1902 D1959 P2147

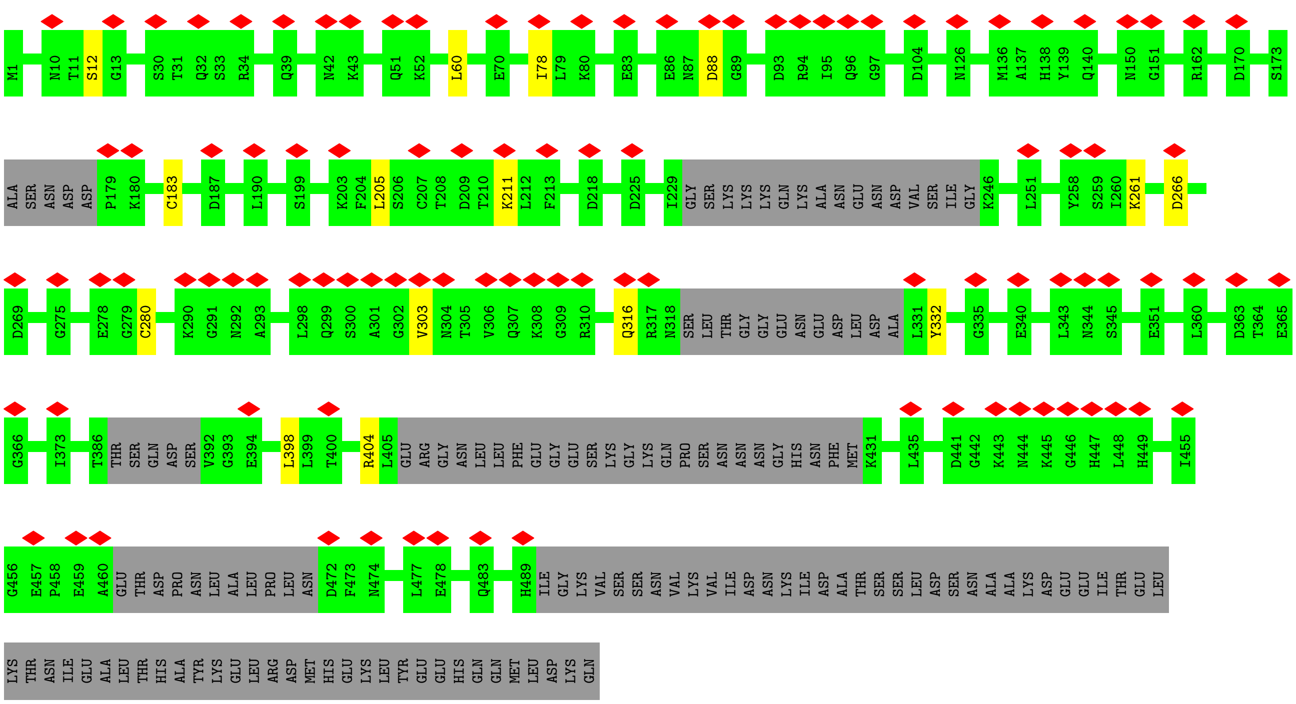


• Molecule 57: Pre-rRNA-processing protein IPI3

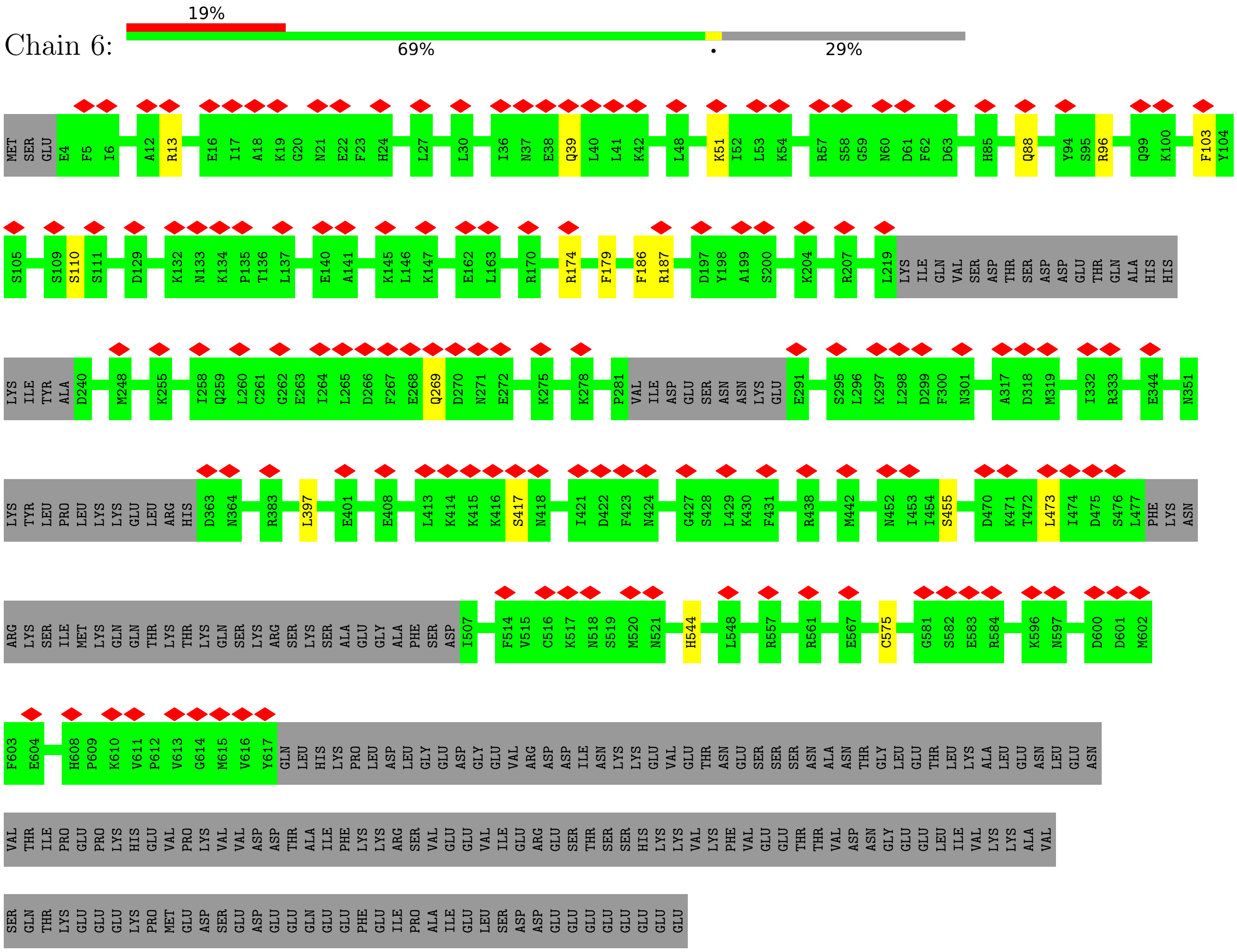


• Molecule 57: Pre-rRNA-processing protein IPI3

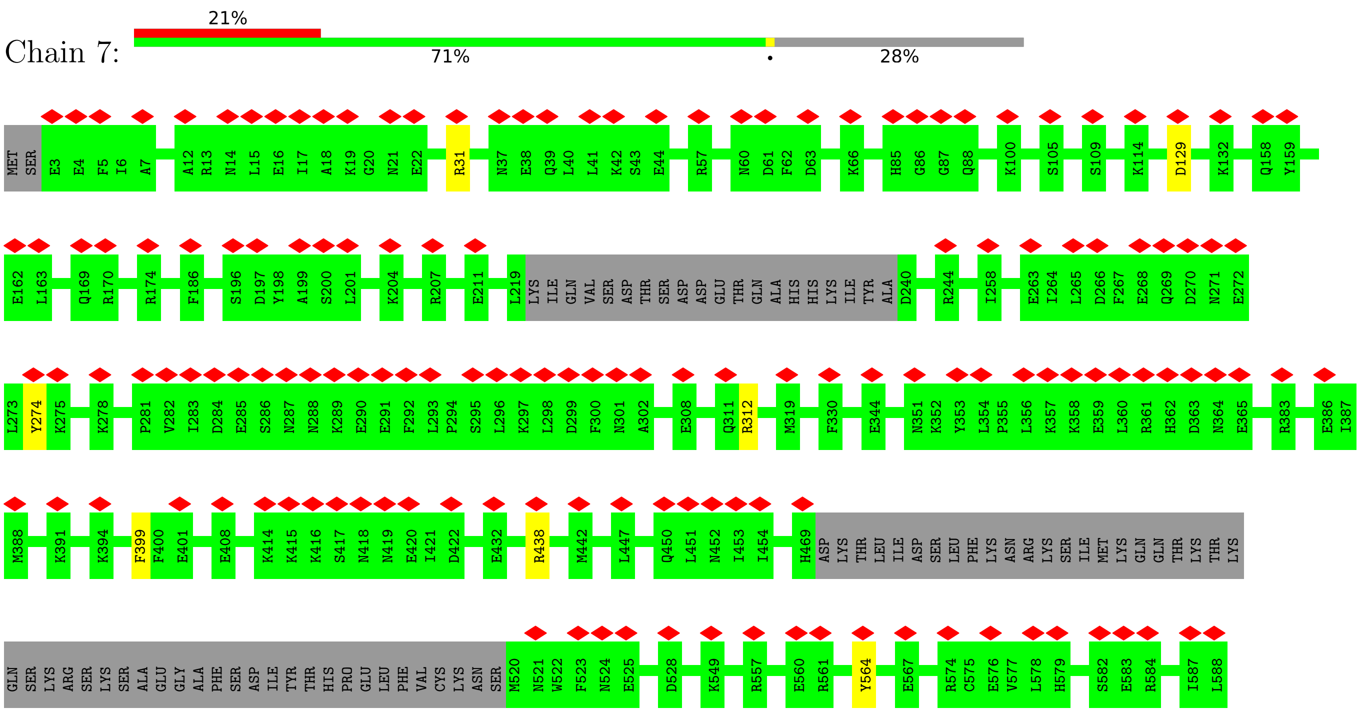
Chain 0:

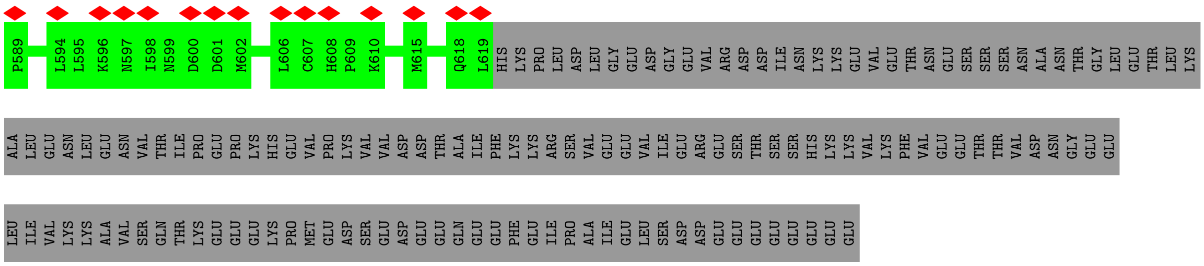


• Molecule 58: Pre-rRNA-processing protein RIX1



- Molecule 58: Pre-rRNA-processing protein RIX1




P589 L594 L595 K596 N597 I598 N599 D600 D601 M602 L606 C607 H608 P609 K610 M615 Q618 L619 HIS LYS PRO LEU ASP LEU GLY GLU ASP GLY GLU VAL ARG ASP ASP ILE ASN LYS LYS GLU VAL GLU THR ASN GLU SER SER SER ASN ALA ASN THR GLY LEU GLU THR LEU LYS
ALA LEU GLU ASN LEU GLU ASN VAL THR ILE PRO GLU PRO LYS HIS GLU VAL PRO LYS VAL VAL ASP ASP THR ALA ILE PHE LYS LYS ARG SER VAL GLU GLU VAL ILE GLU ARG GLU SER THR SER SER HIS LYS LYS VAL LYS PHE VAL GLU GLU THR THR VAL ASP ASN GLY GLU GLU
LEU ILE VAL LYS LYS ALA VAL SER GLN THR LYS GLU GLU GLU LYS PRO MET GLU ASP SER GLU ASP GLU GLU GLN GLU GLU PHE GLU ILE PRO ALA ILE GLU LEU SER ASP ASP GLU GLU GLU GLU GLU GLU GLU GLU

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	114398	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	75	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.138	Depositor
Minimum map value	-0.036	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.025	Depositor
Map size (Å)	635.4, 635.4, 635.4	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.059, 1.059, 1.059	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: MG, ZN, GTP

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	1	0.37	5/72767 (0.0%)	0.91	87/113396 (0.1%)
2	2	0.36	0/3657	0.85	0/5692
3	3	0.27	0/2787	0.83	2/4339 (0.0%)
4	4	0.28	0/4015	0.63	3/5447 (0.1%)
5	5	0.31	0/685	0.69	1/895 (0.1%)
6	A	0.31	0/1897	0.65	1/2550 (0.0%)
7	B	0.31	0/3152	0.67	2/4239 (0.0%)
8	C	0.29	0/2801	0.58	0/3792
9	D	0.28	0/2013	0.62	0/2715
10	E	0.30	0/1260	0.63	1/1694 (0.1%)
11	F	0.31	0/1781	0.60	0/2396
12	G	0.31	0/1816	0.58	0/2450
13	H	0.29	0/1507	0.56	0/2029
14	I	0.28	0/1067	0.61	1/1433 (0.1%)
15	J	0.27	0/1365	0.66	1/1831 (0.1%)
16	K	0.29	0/2125	0.60	1/2862 (0.0%)
17	L	0.31	0/1480	0.69	2/1986 (0.1%)
18	M	0.28	0/1055	0.58	0/1421
19	N	0.32	0/1757	0.67	0/2354
20	O	0.31	0/1585	0.60	0/2128
21	P	0.32	0/1382	0.64	0/1856
22	Q	0.29	0/1127	0.63	0/1521
23	R	0.29	0/1236	0.66	0/1650
24	S	0.31	0/1473	0.63	1/1980 (0.1%)
25	T	0.29	0/997	0.67	1/1336 (0.1%)
26	U	0.30	0/817	0.52	0/1109
27	V	0.40	0/1008	1.18	18/1356 (1.3%)
28	W	0.28	0/1910	0.57	0/2575
29	X	0.29	0/1108	0.55	0/1492
30	Y	0.28	0/995	0.59	0/1329
31	Z	0.31	0/1118	0.61	0/1497
32	a	0.29	0/751	0.55	0/1013

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	b	0.29	0/5032	0.68	9/6756 (0.1%)
34	c	0.28	0/879	0.64	1/1171 (0.1%)
35	d	0.29	0/870	0.64	0/1168
36	e	0.28	0/1041	0.60	0/1394
37	f	0.31	0/868	0.58	0/1168
38	g	0.31	0/856	0.67	0/1144
39	h	0.30	0/978	0.56	0/1301
40	i	0.28	0/749	0.65	0/995
41	j	0.31	0/680	0.68	0/901
42	k	0.30	0/618	0.61	0/826
43	l	0.29	0/435	0.63	0/577
44	m	0.30	0/3617	0.63	1/4870 (0.0%)
45	n	0.28	0/751	0.63	2/1008 (0.2%)
46	o	0.24	0/872	0.70	2/1208 (0.2%)
47	p	0.31	0/687	0.65	0/915
48	q	0.27	0/969	0.59	0/1301
49	r	0.31	0/1850	0.62	0/2472
50	s	0.27	0/467	0.69	2/609 (0.3%)
51	t	0.27	0/3447	0.54	0/4643
52	u	0.31	0/1269	0.72	3/1687 (0.2%)
53	x	0.27	0/3457	0.60	2/4691 (0.0%)
54	y	0.34	0/1864	1.11	27/2538 (1.1%)
55	z	0.26	0/650	0.60	0/854
56	v	0.27	0/17970	0.50	2/25013 (0.0%)
57	0	0.44	0/3312	0.71	4/4487 (0.1%)
57	w	0.41	0/3187	0.70	2/4316 (0.0%)
58	6	0.41	0/4443	0.67	4/6029 (0.1%)
58	7	0.40	0/4472	0.65	2/6067 (0.0%)
All	All	0.33	5/190784 (0.0%)	0.76	185/274472 (0.1%)

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
4	4	0	4
5	5	0	3
6	A	0	4
7	B	0	3
9	D	0	3
10	E	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
11	F	0	2
12	G	0	2
13	H	0	1
14	I	0	1
15	J	0	3
16	K	0	3
17	L	0	1
18	M	0	1
24	S	0	4
25	T	0	4
27	V	0	7
28	W	0	1
30	Y	0	1
31	Z	0	2
33	b	0	11
34	c	0	1
40	i	0	1
42	k	0	2
44	m	0	1
45	n	0	1
46	o	0	6
47	p	0	1
48	q	0	2
49	r	0	1
52	u	0	1
54	y	0	5
56	v	0	14
57	0	0	1
57	w	0	1
58	6	0	2
All	All	0	102

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	3093	C	C4-C5	10.73	1.51	1.43
1	1	3093	C	N1-C2	9.40	1.49	1.40
1	1	3093	C	N3-C4	9.07	1.40	1.33
1	1	3093	C	C2-N3	8.52	1.42	1.35
1	1	2318	U	C1'-N1	5.87	1.57	1.48

The worst 5 of 185 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	3048	A	O4'-C1'-N9	12.94	118.55	108.20
1	1	3093	C	C5-C6-N1	10.67	126.34	121.00
1	1	2335	G	O4'-C1'-N9	10.03	116.22	108.20
1	1	3093	C	C6-N1-C2	-9.96	116.31	120.30
1	1	2531	C	C2-N1-C1'	9.73	129.51	118.80

There are no chirality outliers.

5 of 102 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	4	329	CYS	Mainchain
4	4	362	ARG	Peptide
4	4	461	ASP	Mainchain
4	4	463	THR	Peptide
5	5	42	THR	Mainchain

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	
4	4	495/593 (84%)	456 (92%)	34 (7%)	5 (1%)	15	49
5	5	76/120 (63%)	71 (93%)	5 (7%)	0	100	100
6	A	243/254 (96%)	227 (93%)	16 (7%)	0	100	100
7	B	384/387 (99%)	342 (89%)	41 (11%)	1 (0%)	41	73
8	C	359/362 (99%)	336 (94%)	21 (6%)	2 (1%)	25	59
9	D	239/297 (80%)	218 (91%)	21 (9%)	0	100	100
10	E	152/176 (86%)	148 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	F	214/244 (88%)	195 (91%)	19 (9%)	0	100	100
12	G	226/256 (88%)	209 (92%)	17 (8%)	0	100	100
13	H	185/191 (97%)	172 (93%)	13 (7%)	0	100	100
14	I	128/166 (77%)	113 (88%)	13 (10%)	2 (2%)	9	37
15	J	166/174 (95%)	145 (87%)	20 (12%)	1 (1%)	25	59
16	K	248/334 (74%)	231 (93%)	15 (6%)	2 (1%)	19	54
17	L	179/199 (90%)	165 (92%)	12 (7%)	2 (1%)	14	46
18	M	132/138 (96%)	126 (96%)	6 (4%)	0	100	100
19	N	201/204 (98%)	187 (93%)	14 (7%)	0	100	100
20	O	195/199 (98%)	194 (100%)	1 (0%)	0	100	100
21	P	167/184 (91%)	155 (93%)	12 (7%)	0	100	100
22	Q	142/186 (76%)	131 (92%)	11 (8%)	0	100	100
23	R	149/189 (79%)	142 (95%)	7 (5%)	0	100	100
24	S	169/172 (98%)	156 (92%)	10 (6%)	3 (2%)	8	34
25	T	120/160 (75%)	115 (96%)	5 (4%)	0	100	100
26	U	99/121 (82%)	95 (96%)	4 (4%)	0	100	100
27	V	132/137 (96%)	120 (91%)	10 (8%)	2 (2%)	10	39
28	W	231/236 (98%)	225 (97%)	4 (2%)	2 (1%)	17	52
29	X	138/142 (97%)	130 (94%)	8 (6%)	0	100	100
30	Y	123/127 (97%)	119 (97%)	4 (3%)	0	100	100
31	Z	133/136 (98%)	118 (89%)	15 (11%)	0	100	100
32	a	91/149 (61%)	84 (92%)	5 (6%)	2 (2%)	6	29
33	b	600/647 (93%)	538 (90%)	58 (10%)	4 (1%)	22	57
34	c	103/175 (59%)	99 (96%)	4 (4%)	0	100	100
35	d	103/113 (91%)	100 (97%)	3 (3%)	0	100	100
36	e	125/130 (96%)	122 (98%)	3 (2%)	0	100	100
37	f	104/107 (97%)	103 (99%)	1 (1%)	0	100	100
38	g	105/121 (87%)	104 (99%)	1 (1%)	0	100	100
39	h	117/120 (98%)	113 (97%)	4 (3%)	0	100	100
40	i	94/100 (94%)	85 (90%)	8 (8%)	1 (1%)	14	46
41	j	82/88 (93%)	80 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
42	k	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
43	l	47/51 (92%)	44 (94%)	3 (6%)	0	100	100
44	m	431/486 (89%)	390 (90%)	38 (9%)	3 (1%)	22	57
45	n	95/105 (90%)	92 (97%)	3 (3%)	0	100	100
46	o	167/217 (77%)	145 (87%)	22 (13%)	0	100	100
47	p	87/92 (95%)	84 (97%)	2 (2%)	1 (1%)	14	46
48	q	120/165 (73%)	101 (84%)	16 (13%)	3 (2%)	5	27
49	r	219/261 (84%)	197 (90%)	20 (9%)	2 (1%)	17	52
50	s	52/520 (10%)	47 (90%)	3 (6%)	2 (4%)	3	19
51	t	425/767 (55%)	399 (94%)	26 (6%)	0	100	100
52	u	146/199 (73%)	139 (95%)	7 (5%)	0	100	100
53	x	445/515 (86%)	417 (94%)	28 (6%)	0	100	100
54	y	241/245 (98%)	220 (91%)	20 (8%)	1 (0%)	34	69
55	z	73/106 (69%)	67 (92%)	6 (8%)	0	100	100
56	v	3549/4910 (72%)	3232 (91%)	313 (9%)	4 (0%)	51	83
57	0	401/555 (72%)	393 (98%)	8 (2%)	0	100	100
57	w	379/555 (68%)	375 (99%)	4 (1%)	0	100	100
58	6	535/763 (70%)	527 (98%)	8 (2%)	0	100	100
58	7	541/763 (71%)	533 (98%)	8 (2%)	0	100	100
All	All	14977/19187 (78%)	13942 (93%)	990 (7%)	45 (0%)	44	73

5 of 45 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	C	339	LEU
28	W	177	ALA
33	b	398	LEU
33	b	399	ALA
56	v	241	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	4	445/520 (86%)	425 (96%)	20 (4%)	27	60
5	5	70/106 (66%)	67 (96%)	3 (4%)	29	62
6	A	188/196 (96%)	185 (98%)	3 (2%)	62	84
7	B	322/323 (100%)	314 (98%)	8 (2%)	47	75
8	C	288/289 (100%)	284 (99%)	4 (1%)	67	86
9	D	205/245 (84%)	199 (97%)	6 (3%)	42	72
10	E	134/153 (88%)	129 (96%)	5 (4%)	34	66
11	F	183/205 (89%)	180 (98%)	3 (2%)	62	84
12	G	187/208 (90%)	179 (96%)	8 (4%)	29	62
13	H	167/171 (98%)	165 (99%)	2 (1%)	71	88
14	I	116/141 (82%)	108 (93%)	8 (7%)	15	45
15	J	146/150 (97%)	143 (98%)	3 (2%)	53	79
16	K	238/302 (79%)	232 (98%)	6 (2%)	47	75
17	L	145/159 (91%)	142 (98%)	3 (2%)	53	79
18	M	107/109 (98%)	104 (97%)	3 (3%)	43	73
19	N	175/176 (99%)	169 (97%)	6 (3%)	37	69
20	O	160/162 (99%)	156 (98%)	4 (2%)	47	75
21	P	139/146 (95%)	138 (99%)	1 (1%)	84	93
22	Q	118/151 (78%)	116 (98%)	2 (2%)	60	83
23	R	125/154 (81%)	124 (99%)	1 (1%)	81	92
24	S	155/156 (99%)	153 (99%)	2 (1%)	69	87
25	T	107/137 (78%)	100 (94%)	7 (6%)	17	47
26	U	88/107 (82%)	84 (96%)	4 (4%)	27	60
27	V	103/105 (98%)	99 (96%)	4 (4%)	32	65
28	W	210/213 (99%)	206 (98%)	4 (2%)	57	81
29	X	116/118 (98%)	115 (99%)	1 (1%)	78	91
30	Y	108/110 (98%)	104 (96%)	4 (4%)	34	66
31	Z	115/116 (99%)	112 (97%)	3 (3%)	46	74
32	a	76/119 (64%)	75 (99%)	1 (1%)	69	87
33	b	541/573 (94%)	519 (96%)	22 (4%)	30	64

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
34	c	99/153 (65%)	99 (100%)	0	100	100
35	d	92/97 (95%)	90 (98%)	2 (2%)	52	78
36	e	109/111 (98%)	107 (98%)	2 (2%)	59	82
37	f	90/91 (99%)	88 (98%)	2 (2%)	52	78
38	g	92/103 (89%)	89 (97%)	3 (3%)	38	69
39	h	104/105 (99%)	103 (99%)	1 (1%)	76	90
40	i	78/82 (95%)	77 (99%)	1 (1%)	69	87
41	j	69/71 (97%)	67 (97%)	2 (3%)	42	72
42	k	68/69 (99%)	67 (98%)	1 (2%)	65	85
43	l	44/46 (96%)	42 (96%)	2 (4%)	27	60
44	m	388/428 (91%)	370 (95%)	18 (5%)	27	59
45	n	81/88 (92%)	81 (100%)	0	100	100
47	p	70/72 (97%)	68 (97%)	2 (3%)	42	72
48	q	105/136 (77%)	102 (97%)	3 (3%)	42	72
49	r	198/229 (86%)	195 (98%)	3 (2%)	65	85
50	s	50/445 (11%)	48 (96%)	2 (4%)	31	65
51	t	379/665 (57%)	372 (98%)	7 (2%)	59	82
52	u	131/180 (73%)	124 (95%)	7 (5%)	22	54
53	x	338/451 (75%)	330 (98%)	8 (2%)	49	76
54	y	209/211 (99%)	208 (100%)	1 (0%)	88	94
55	z	69/95 (73%)	64 (93%)	5 (7%)	14	44
57	0	375/497 (76%)	364 (97%)	11 (3%)	42	72
57	w	362/497 (73%)	357 (99%)	5 (1%)	67	86
58	6	503/707 (71%)	491 (98%)	12 (2%)	49	76
58	7	505/707 (71%)	500 (99%)	5 (1%)	76	90
All	All	9885/12156 (81%)	9629 (97%)	256 (3%)	49	74

5 of 256 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
57	0	183	CYS
57	0	398	LEU
22	Q	41	ASP

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Mol	Chain	Res	Type
20	O	148	LYS
58	6	179	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 45 such sidechains are listed below:

Mol	Chain	Res	Type
34	c	61	ASN
52	u	110	ASN
34	c	64	ASN
43	l	20	ASN
53	x	424	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	3010/3396 (88%)	598 (19%)	26 (0%)
2	2	152/158 (96%)	27 (17%)	1 (0%)
3	3	115/121 (95%)	19 (16%)	1 (0%)
All	All	3277/3675 (89%)	644 (19%)	28 (0%)

5 of 644 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	13	A
1	1	14	U
1	1	18	G
1	1	26	A
1	1	30	G

5 of 28 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	2318	U
3	3	52	G
1	1	2444	C
1	1	3042	U
1	1	2339	C

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 8 ligands modelled in this entry, 6 are monoatomic - leaving 2 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	$\#\|Z\| > 2$
60	GTP	b	701	33,61	26,34,34	1.14	2 (7%)	32,54,54	1.70	7 (21%)
60	GTP	m	501	61	26,34,34	1.14	1 (3%)	32,54,54	1.59	7 (21%)

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
60	GTP	b	701	33,61	-	2/18/38/38	0/3/3/3
60	GTP	m	501	61	-	6/18/38/38	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	b	701	GTP	C5-C6	-4.09	1.39	1.47
60	m	501	GTP	C5-C6	-4.06	1.39	1.47
60	b	701	GTP	C2-N3	2.28	1.38	1.33

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
60	b	701	GTP	PA-O3A-PB	-4.29	118.11	132.83
60	m	501	GTP	PA-O3A-PB	-3.93	119.34	132.83
60	m	501	GTP	PB-O3B-PG	-3.63	120.36	132.83
60	b	701	GTP	PB-O3B-PG	-3.53	120.70	132.83
60	b	701	GTP	C5-C6-N1	3.37	119.91	113.95

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

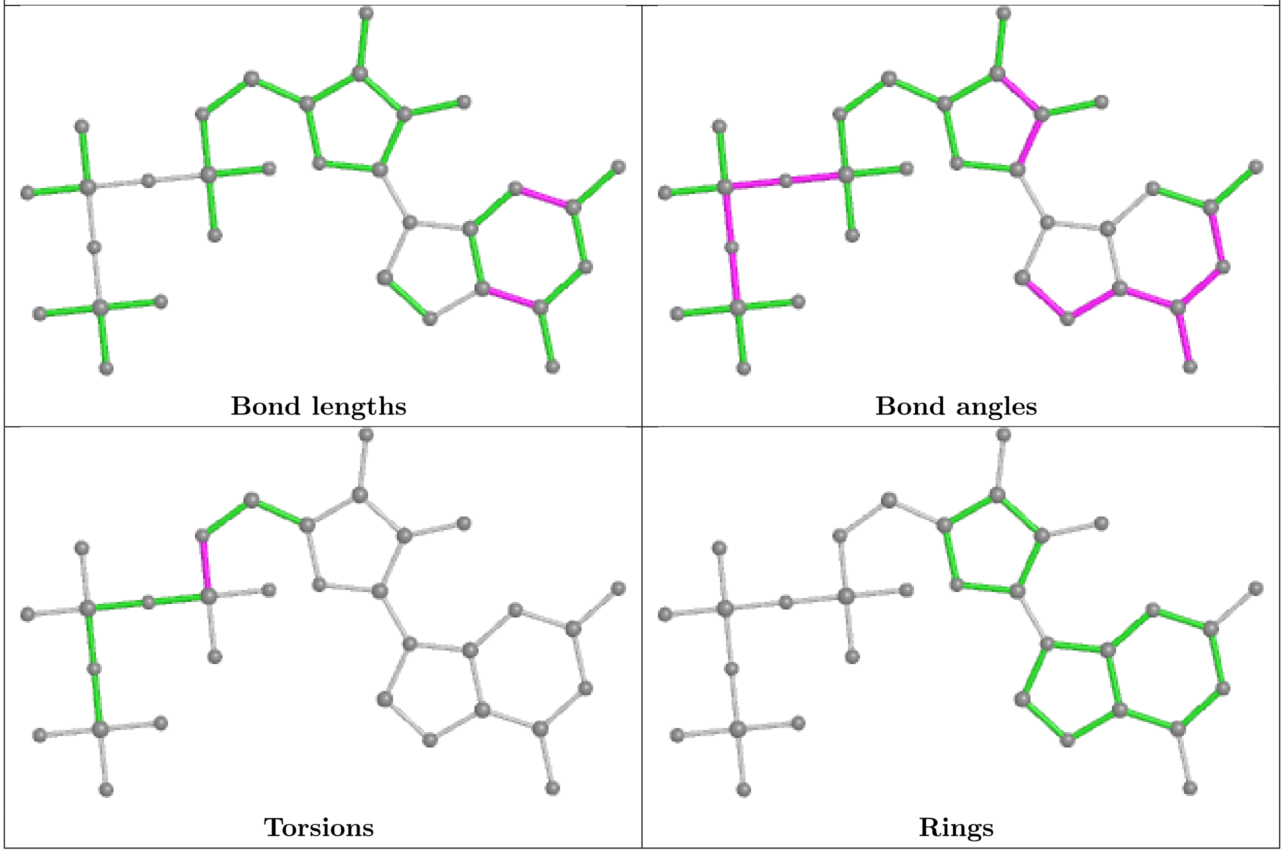
Mol	Chain	Res	Type	Atoms
60	b	701	GTP	C5'-O5'-PA-O1A
60	m	501	GTP	C5'-O5'-PA-O3A
60	m	501	GTP	C5'-O5'-PA-O2A
60	m	501	GTP	O4'-C4'-C5'-O5'
60	m	501	GTP	C4'-C5'-O5'-PA

There are no ring outliers.

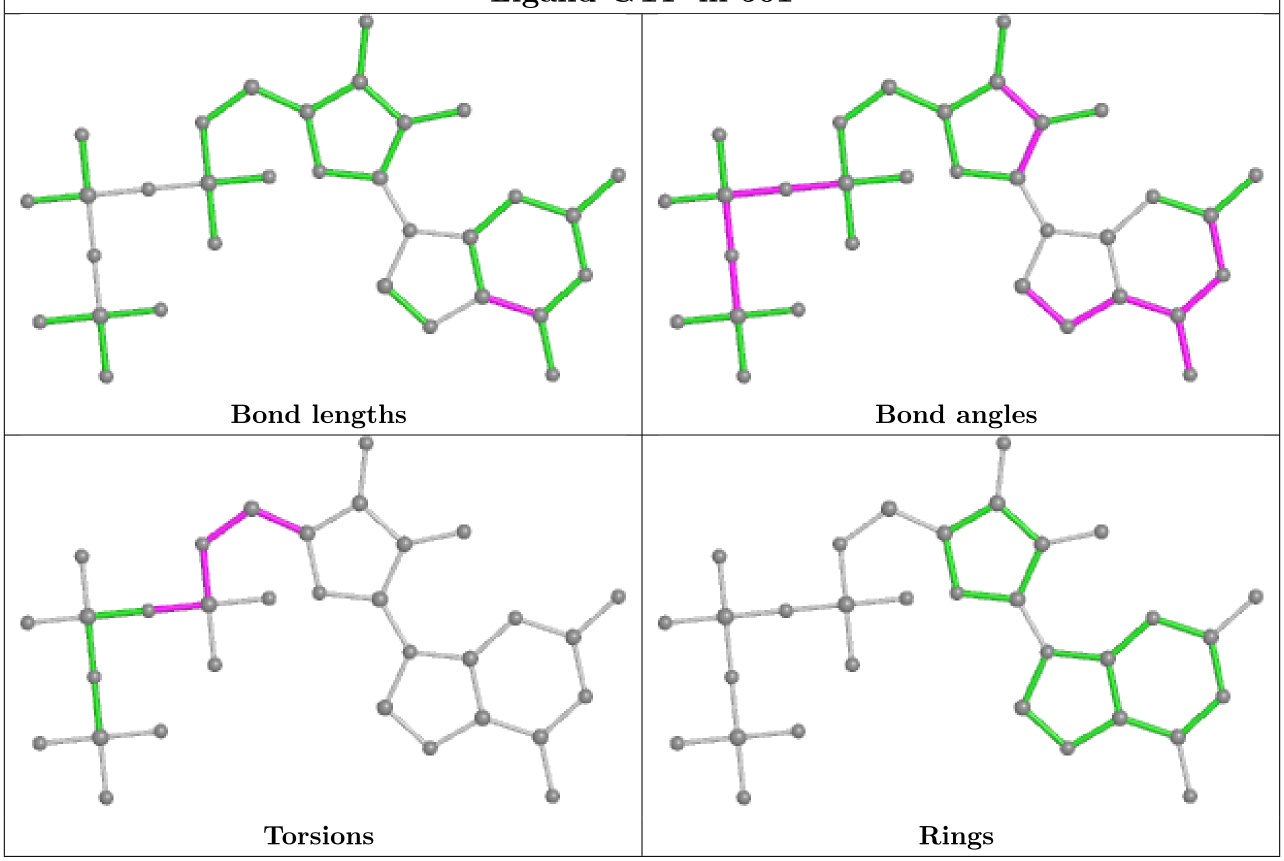
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GTP b 701



Ligand GTP m 501



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
56	v	3
1	1	3

The worst 5 of 6 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	v	3595:LEU	C	3599:ARG	N	4.97
1	1	3167:A	O3'	3168:A	P	4.92
1	v	3575:LEU	C	3579:VAL	N	3.43
1	v	3587:MET	C	3591:ARG	N	3.23
1	1	1012:G	O3'	1013:G	P	3.13

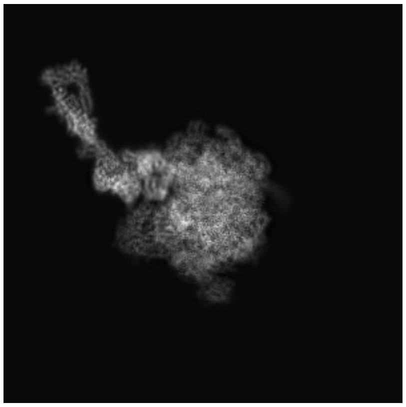
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-10839. These allow visual inspection of the internal detail of the map and identification of artifacts.

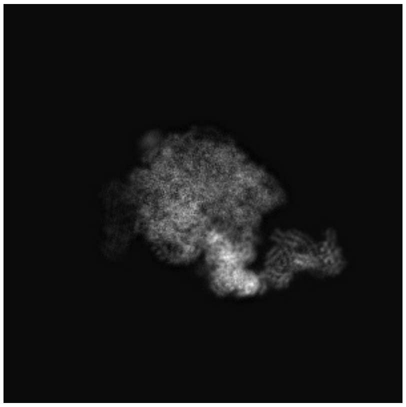
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

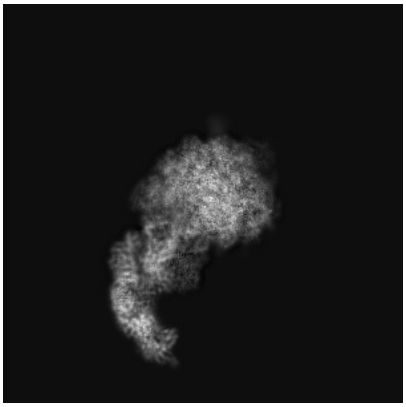
6.1.1 Primary map



X



Y



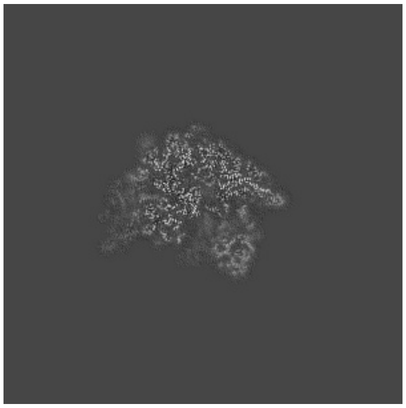
Z

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

6.2 Central slices (i)

6.2.1 Primary map

X Index: 300



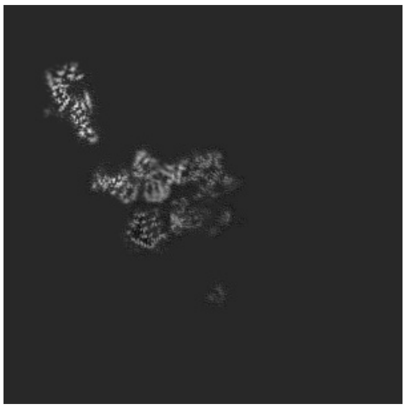
Y Index: 300

Z Index: 300

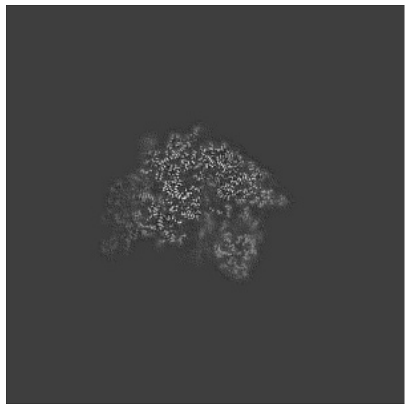
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

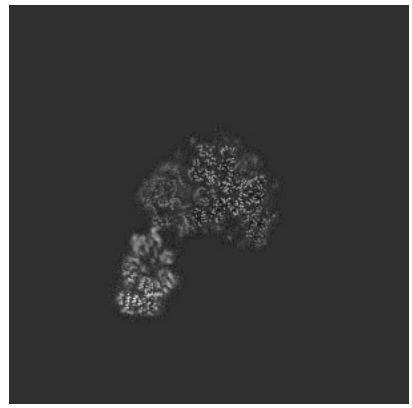
6.3.1 Primary map



X Index: 219



Y Index: 303



Z Index: 336

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

6.4 Orthogonal surface views

6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

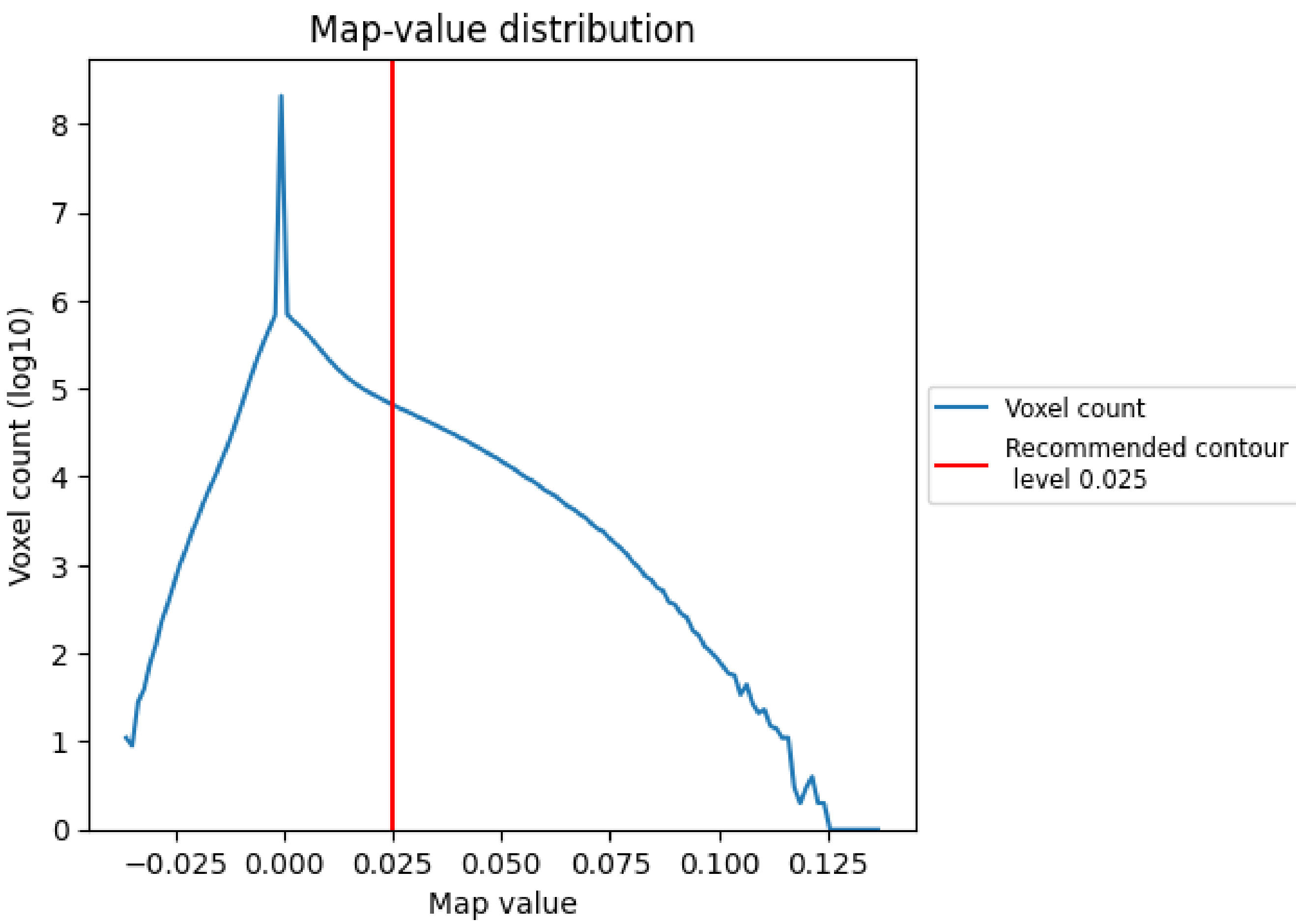
6.5 Mask visualisation (i)

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

7 Map analysis (i)

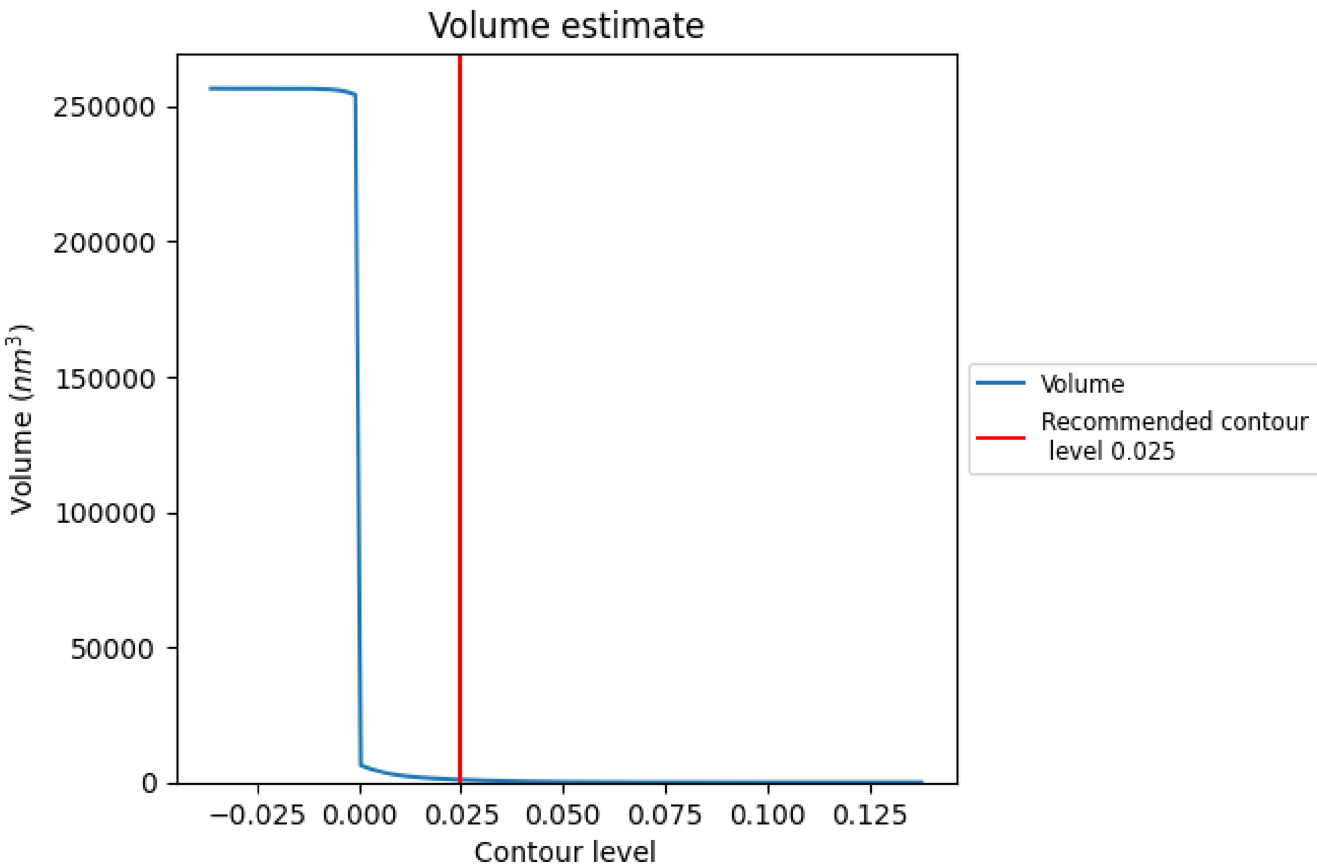
This section contains the results of statistical analysis of the map.

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.

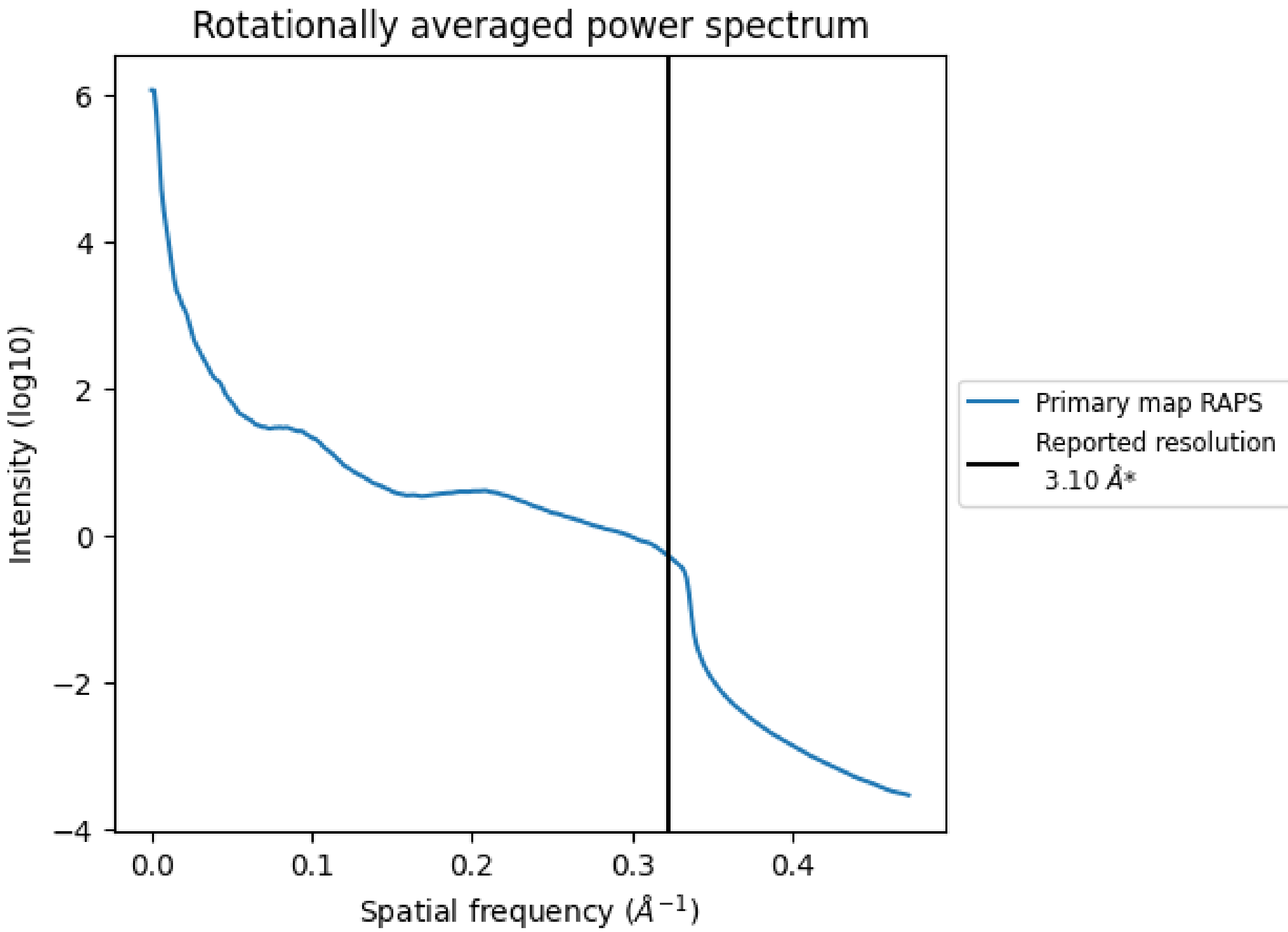
7.2 Volume estimate (i)



The volume at the recommended contour level is 970 nm^3; this corresponds to an approximate mass of 876 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

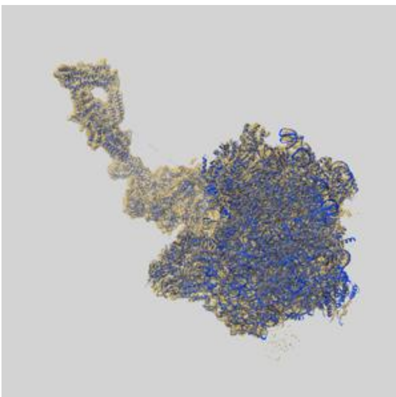
8 Fourier-Shell correlation ⓘ

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

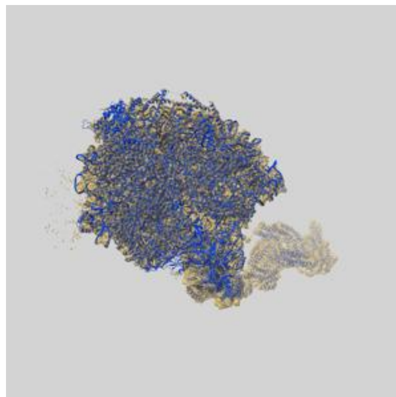
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-10839 and PDB model 6YLH. Per-residue inclusion information can be found in section 3 on page 16.

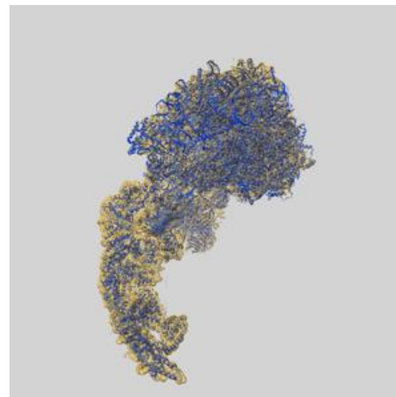
9.1 Map-model overlay (i)



X



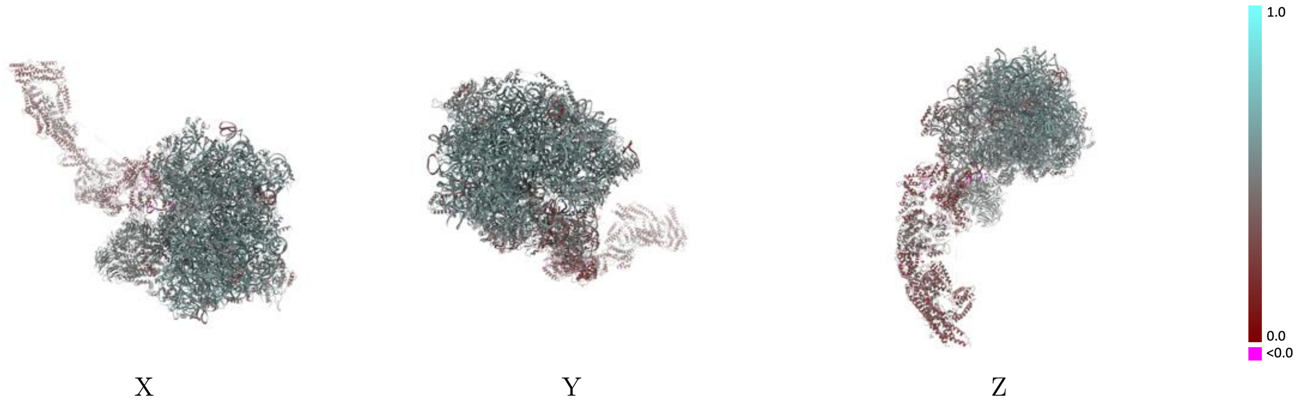
Y



Z

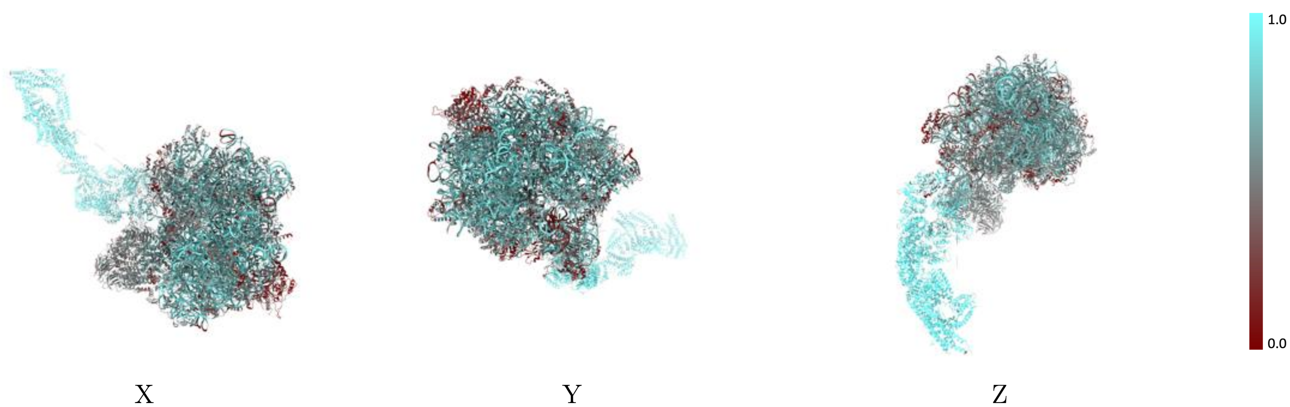
The images above show the 3D surface view of the map at the recommended contour level 0.025 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)



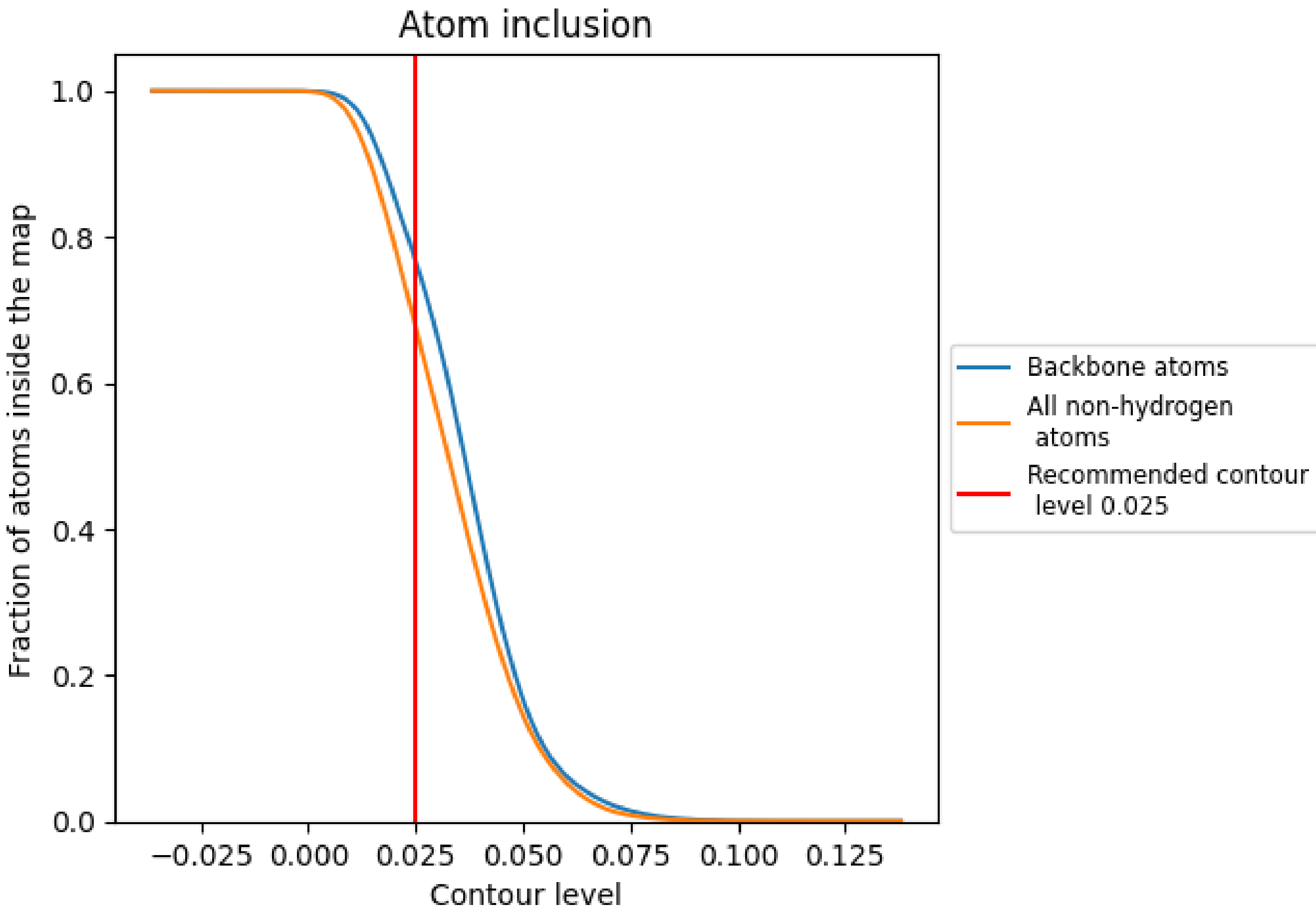
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.025).

9.4 Atom inclusion (i)



At the recommended contour level, 77% of all backbone atoms, 68% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6771	0.5120
0	0.5163	0.4940
1	0.7867	0.5480
2	0.8579	0.5820
3	0.6800	0.4900
4	0.2697	0.4950
5	0.3130	0.4510
6	0.4987	0.4750
7	0.4885	0.4760
A	0.7319	0.5940
B	0.6646	0.5690
C	0.6464	0.5630
D	0.2142	0.4160
E	0.5639	0.5370
F	0.6510	0.5490
G	0.5845	0.5290
H	0.6262	0.5570
I	0.4294	0.5260
J	0.4954	0.4410
K	0.5603	0.4690
L	0.6300	0.5460
M	0.6002	0.5500
N	0.7282	0.5850
O	0.6876	0.5710
P	0.6819	0.5740
Q	0.6137	0.5490
R	0.6598	0.5570
S	0.5717	0.5370
T	0.2313	0.4690
U	0.5573	0.5320
V	0.6037	0.5070
W	0.5158	0.5000
X	0.5850	0.5660
Y	0.6447	0.5640
Z	0.6321	0.5360

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Chain	Atom inclusion	Q-score
a	0.6444	0.5570
b	0.4752	0.5120
c	0.3455	0.5350
d	0.6373	0.5660
e	0.6449	0.5770
f	0.7077	0.5950
g	0.6756	0.5700
h	0.6554	0.5610
i	0.5981	0.5390
j	0.7641	0.5940
k	0.5042	0.5280
l	0.7224	0.5970
m	0.5998	0.5450
n	0.5896	0.5340
o	0.0798	0.3960
p	0.6692	0.5750
q	0.3759	0.4680
r	0.6473	0.5650
s	0.2711	0.5010
t	0.5635	0.4930
u	0.5938	0.5420
v	0.9182	0.3230
w	0.4490	0.4900
x	0.5705	0.4990
y	0.5484	0.5020
z	0.4432	0.5340