



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 15, 2020 – 09:22 pm BST

PDB ID : 4V8U  
Title : Crystal Structure of 70S Ribosome with Both Cognate tRNAs in the E and P Sites Representing an Authentic Elongation Complex.  
Authors : Gao, Y.G.; Feng, S.; Chen, Y.  
Deposited on : 2012-08-28  
Resolution : 3.70 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

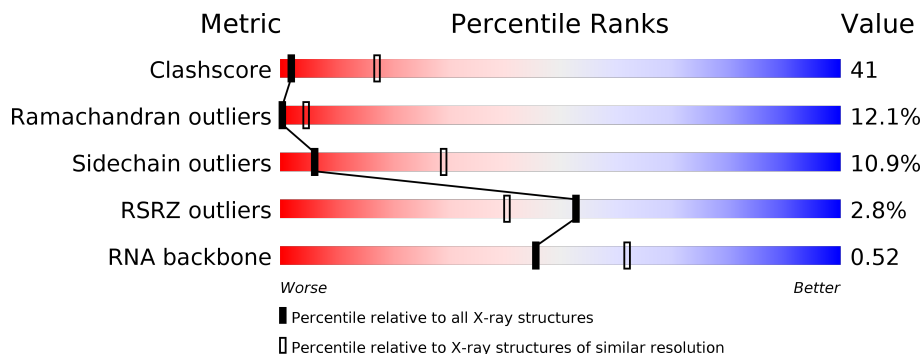
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.70 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.






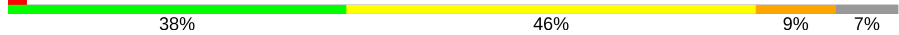
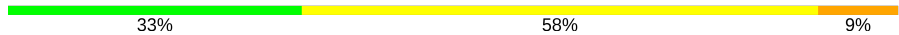
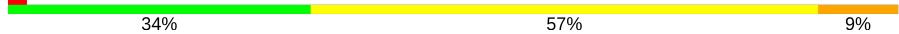
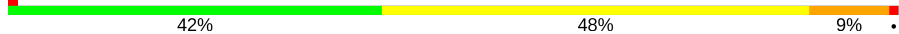
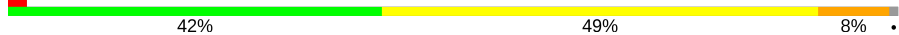
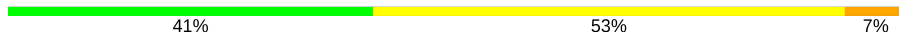
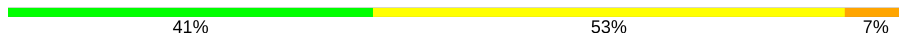
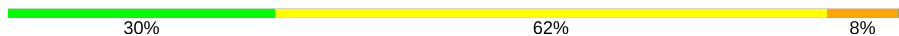
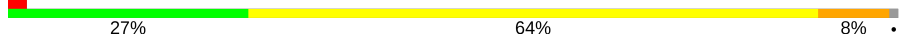
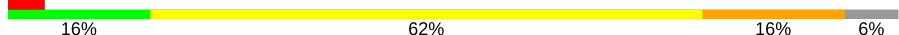
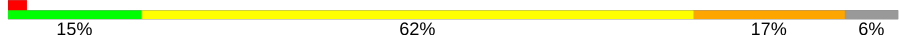



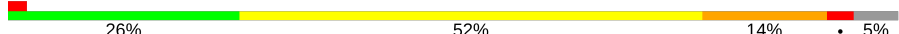
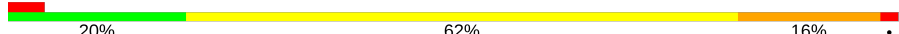
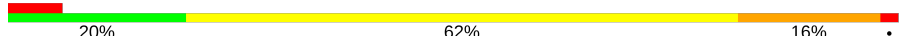





Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1027 (3.86-3.54)
Ramachandran outliers	138981	1069 (3.88-3.52)
Sidechain outliers	138945	1065 (3.88-3.52)
RSRZ outliers	127900	1578 (3.90-3.50)
RNA backbone	3102	1027 (4.40-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	AA	1522	
1	CA	1522	
2	AB	256	
2	CB	256	
3	AC	239	
3	CC	239	

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Mol	Chain	Length	Quality of chain
4	AD	209	
4	CD	209	
5	AE	162	
5	CE	162	
6	AF	101	
6	CF	101	
7	AG	156	
7	CG	156	
8	AH	138	
8	CH	138	
9	AI	128	
9	CI	128	
10	AJ	105	
10	CJ	105	
11	AK	129	
11	CK	129	
12	AL	132	
12	CL	132	
13	AM	126	
13	CM	126	
14	AN	61	
14	CN	61	
15	AO	89	
15	CO	89	
16	AP	88	

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Mol	Chain	Length	Quality of chain
16	CP	88	
17	AQ	105	
17	CQ	105	
18	AR	88	
18	CR	88	
19	AS	93	
19	CS	93	
20	AT	106	
20	CT	106	
21	AU	27	
21	CU	27	
22	AV	76	
22	CV	76	
23	AW	77	
23	CW	77	
24	AX	25	
24	CX	25	
25	AY	691	
25	CY	691	
26	B0	85	
26	D0	85	
27	B1	98	
27	D1	98	
28	B2	72	
28	D2	72	

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Mol	Chain	Length	Quality of chain
29	B3	60	
29	D3	60	
30	B4	71	
30	D4	71	
31	B5	60	
31	D5	60	
32	B6	54	
32	D6	54	
33	B7	49	
33	D7	49	
34	B8	65	
34	D8	65	
35	B9	37	
35	D9	37	
36	BA	2915	
36	DA	2915	
37	BB	122	
37	DB	122	
38	BC	229	
38	DC	229	
39	BD	276	
39	DD	276	
40	BE	206	
40	DE	206	
41	BF	210	

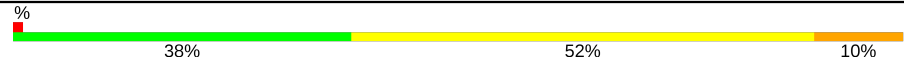

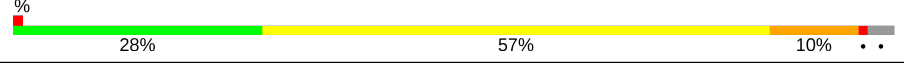
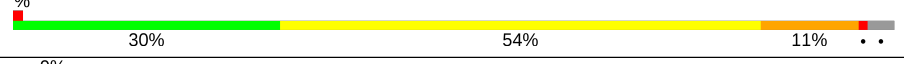
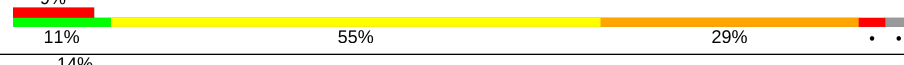
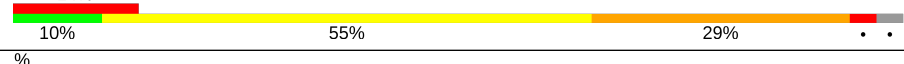
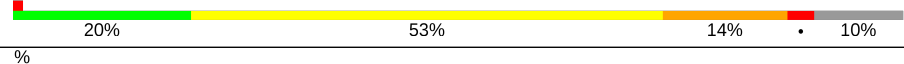
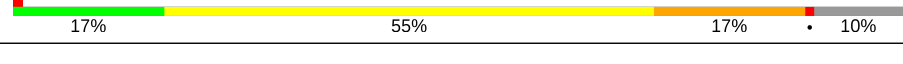
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Mol	Chain	Length	Quality of chain
41	DF	210	5% 25% 60% 13% 7%
42	BG	182	2% 18% 60% 19%
42	DG	182	3% 15% 63% 20%
43	BH	180	5% 24% 47% 20% 7%
43	DH	180	3% 23% 49% 19% 7%
44	BJ	173	72% 26%
44	DJ	173	70% 28%
45	BN	140	24% 53% 21%
45	DN	140	2% 22% 54% 21%
46	BO	122	34% 57% 8%
46	DO	122	39% 52% 8%
47	BP	150	15% 57% 23%
47	DP	150	5% 15% 57% 23%
48	BQ	141	40% 48% 11%
48	DQ	141	41% 48% 10%
49	BR	118	18% 69% 11%
49	DR	118	19% 65% 14%
50	BS	112	14% 53% 21% 12%
50	DS	112	3% 15% 53% 20% 12%
51	BT	146	3% 17% 49% 25% 5%
51	DT	146	3% 12% 53% 25% 5%
52	BU	118	27% 61% 11%
52	DU	118	25% 61% 13%
53	BV	101	2% 26% 56% 15%
53	DV	101	4% 25% 57% 16%

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Mol	Chain	Length	Quality of chain
54	BW	113	
54	DW	113	
55	BX	96	
55	DX	96	
56	BY	110	
56	DY	110	
57	BZ	206	
57	DZ	206	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
59	FUA	AY	701	-	-	-	X
59	FUA	CY	701	-	-	X	X
60	GDP	AY	702	-	-	X	-
60	GDP	CY	702	-	-	X	-

## 2 Entry composition

There are 61 unique types of molecules in this entry. The entry contains 307606 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 16S RIBOSOMAL RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	AA	1504	Total 32329	C 14390	N 5992	O 10444	P 1503	0	0	0
1	CA	1504	Total 32329	C 14390	N 5992	O 10444	P 1503	0	0	0

- Molecule 2 is a protein called 30S RIBOSOMAL PROTEIN S2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	AB	235	Total 1901	C 1213	N 342	O 341	S 5	0	0	1
2	CB	235	Total 1901	C 1213	N 342	O 341	S 5	0	0	1

- Molecule 3 is a protein called 30S RIBOSOMAL PROTEIN S3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	AC	207	Total 1613	C 1016	N 315	O 281	S 1	0	0	1
3	CC	207	Total 1613	C 1016	N 315	O 281	S 1	0	0	1

- Molecule 4 is a protein called 30S RIBOSOMAL PROTEIN S4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	AD	208	Total 1703	C 1066	N 339	O 291	S 7	0	0	0
4	CD	208	Total 1703	C 1066	N 339	O 291	S 7	0	0	0

- Molecule 5 is a protein called 30S RIBOSOMAL PROTEIN S5.



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	AE	151	Total	C	N	O	S	0	0	1
			1147	724	218	201	4			
5	CE	151	Total	C	N	O	S	0	0	1
			1147	724	218	201	4			

- Molecule 6 is a protein called 30S RIBOSOMAL PROTEIN S6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	AF	101	Total	C	N	O	S	0	0	0
			843	531	155	154	3			
6	CF	101	Total	C	N	O	S	0	0	0
			843	531	155	154	3			

- Molecule 7 is a protein called 30S RIBOSOMAL PROTEIN S7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	AG	155	Total	C	N	O	S	0	0	0
			1257	781	252	218	6			
7	CG	155	Total	C	N	O	S	0	0	0
			1257	781	252	218	6			

- Molecule 8 is a protein called 30S RIBOSOMAL PROTEIN S8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	AH	138	Total	C	N	O	S	0	0	0
			1116	705	215	193	3			
8	CH	138	Total	C	N	O	S	0	0	0
			1116	705	215	193	3			

- Molecule 9 is a protein called 30S RIBOSOMAL PROTEIN S9.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
9	AI	127	Total	C	N	O	0	0	0
			1010	639	197	174			
9	CI	127	Total	C	N	O	0	0	0
			1010	639	197	174			

- Molecule 10 is a protein called 30S RIBOSOMAL PROTEIN S10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	AJ	99	Total	C	N	O	S	0	0	1
			795	499	157	138	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
10	CJ	99	795	499	157	138	1	0	0	1

- Molecule 11 is a protein called 30S RIBOSOMAL PROTEIN S11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
11	AK	119	885	549	168	165	3	0	0	0
11	CK	119	885	549	168	165	3	0	0	0

- Molecule 12 is a protein called 30S RIBOSOMAL PROTEIN S12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
12	AL	125	971	611	196	163	1	0	0	1
12	CL	125	971	611	196	163	1	0	0	1

- Molecule 13 is a protein called 30S RIBOSOMAL PROTEIN S13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
13	AM	125	988	611	206	169	2	0	0	1
13	CM	125	988	611	206	169	2	0	0	1

- Molecule 14 is a protein called 30S RIBOSOMAL PROTEIN S14 TYPE Z.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
14	AN	60	492	312	104	72	4	0	0	0
14	CN	60	492	312	104	72	4	0	0	0

- Molecule 15 is a protein called 30S RIBOSOMAL PROTEIN S15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
15	AO	88	734	459	147	126	2	0	0	0
15	CO	88	734	459	147	126	2	0	0	0

- Molecule 16 is a protein called 30S RIBOSOMAL PROTEIN S16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
16	AP	84	Total	C	N	O	S	0	0	1
			701	443	140	117	1			
16	CP	84	Total	C	N	O	S	0	0	1
			701	443	140	117	1			

- Molecule 17 is a protein called 30S RIBOSOMAL PROTEIN S17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
17	AQ	100	Total	C	N	O	S	0	0	1
			824	528	152	142	2			
17	CQ	100	Total	C	N	O	S	0	0	1
			824	528	152	142	2			

- Molecule 18 is a protein called 30S RIBOSOMAL PROTEIN S18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
18	AR	70	Total	C	N	O	0	0	0
			574	367	112	95			
18	CR	70	Total	C	N	O	0	0	0
			574	367	112	95			

- Molecule 19 is a protein called 30S RIBOSOMAL PROTEIN S19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
19	AS	79	Total	C	N	O	S	0	0	1
			630	403	115	110	2			
19	CS	79	Total	C	N	O	S	0	0	1
			630	403	115	110	2			

- Molecule 20 is a protein called 30S RIBOSOMAL PROTEIN S20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
20	AT	99	Total	C	N	O	S	0	0	0
			763	470	162	129	2			
20	CT	99	Total	C	N	O	S	0	0	0
			763	470	162	129	2			

- Molecule 21 is a protein called 30S RIBOSOMAL PROTEIN THX.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
21	AU	25	Total	C	N	O	0	0	1
			209	128	51	30			
21	CU	25	Total	C	N	O	0	0	1
			209	128	51	30			

- Molecule 22 is a RNA chain called MRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
22	AV	76	Total	C	N	O	P	0	0	0
			1619	723	290	531	75			
22	CV	76	Total	C	N	O	P	0	0	0
			1619	723	290	531	75			

- Molecule 23 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	AW	77	Total	C	N	O	P	0	0	0
			1641	733	297	535	76			
23	CW	77	Total	C	N	O	P	0	0	0
			1641	733	297	535	76			

- Molecule 24 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
24	AX	12	Total	C	N	O	P	0	0	0
			257	116	49	80	12			
24	CX	12	Total	C	N	O	P	0	0	0
			257	116	49	80	12			

- Molecule 25 is a protein called ELONGATION FACTOR G.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
25	AY	667	Total	C	N	O	S	0	0	1
			5215	3316	893	988	18			
25	CY	667	Total	C	N	O	S	0	0	1
			5215	3316	893	988	18			

- Molecule 26 is a protein called 50S RIBOSOMAL PROTEIN L27.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	B0	84	Total	C	N	O	S	0	0	0
			662	410	140	111	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
26	D0	84	662	410	140	111	1	0	0	0

- Molecule 27 is a protein called 50S RIBOSOMAL PROTEIN L28.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
27	B1	94	732	460	146	125	1	0	0	1
27	D1	94	732	460	146	125	1	0	0	1

- Molecule 28 is a protein called 50S RIBOSOMAL PROTEIN L29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
28	B2	71	598	370	121	106	1	0	0	0
28	D2	71	598	370	121	106	1	0	0	0

- Molecule 29 is a protein called 50S RIBOSOMAL PROTEIN L30.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
29	B3	60	468	298	91	78	1	0	0	1
29	D3	60	468	298	91	78	1	0	0	1

- Molecule 30 is a protein called 50S RIBOSOMAL PROTEIN L31.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
30	B4	58	451	285	78	83	5	0	0	1
30	D4	58	451	285	78	83	5	0	0	1

- Molecule 31 is a protein called 50S RIBOSOMAL PROTEIN L32.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
31	B5	59	459	288	90	76	5	0	0	0
31	D5	59	459	288	90	76	5	0	0	0

- Molecule 32 is a protein called 50S RIBOSOMAL PROTEIN L33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
32	B6	50	Total	C	N	O	S	0	0	0
			433	270	88	71	4			
32	D6	50	Total	C	N	O	S	0	0	0
			433	270	88	71	4			

- Molecule 33 is a protein called 50S RIBOSOMAL PROTEIN L34.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
33	B7	49	Total	C	N	O	S	0	0	1
			419	257	105	55	2			
33	D7	49	Total	C	N	O	S	0	0	1
			419	257	105	55	2			

- Molecule 34 is a protein called 50S RIBOSOMAL PROTEIN L35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
34	B8	64	Total	C	N	O	S	0	0	1
			508	326	102	78	2			
34	D8	64	Total	C	N	O	S	0	0	1
			508	326	102	78	2			

- Molecule 35 is a protein called 50S RIBOSOMAL PROTEIN L36.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
35	B9	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			
35	D9	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			

- Molecule 36 is a RNA chain called 23S RIBOSOMAL RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
36	BA	2901	Total	C	N	O	P	0	0	0
			62474	27806	11681	20087	2900			
36	DA	2901	Total	C	N	O	P	0	0	0
			62474	27806	11681	20087	2900			

- Molecule 37 is a RNA chain called 5S RIBOSOMAL RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
37	BB	119	2551	1136	471	826	118	0	0	0
37	DB	119	2551	1136	471	826	118	0	0	0

- Molecule 38 is a protein called 50S RIBOSOMAL PROTEIN L1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
38	BC	228	1742	1101	319	319	3	0	0	0
38	DC	228	1742	1101	319	319	3	0	0	0

- Molecule 39 is a protein called 50S RIBOSOMAL PROTEIN L2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
39	BD	275	2145	1353	428	361	3	0	0	0
39	DD	275	2145	1353	428	361	3	0	0	0

- Molecule 40 is a protein called 50S RIBOSOMAL PROTEIN L3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
40	BE	205	1564	988	300	270	6	0	0	1
40	DE	205	1564	988	300	270	6	0	0	1

- Molecule 41 is a protein called 50S RIBOSOMAL PROTEIN L4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
41	BF	208	1624	1035	304	282	3	0	0	1
41	DF	208	1624	1035	304	282	3	0	0	1

- Molecule 42 is a protein called 50S RIBOSOMAL PROTEIN L5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
42	BG	181	1474	942	268	260	4	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
42	DG	181	1474	942	268	260	4	0	0	0

- Molecule 43 is a protein called 50S RIBOSOMAL PROTEIN L6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
43	BH	167	1269	803	238	227	1	0	0	1
43	DH	167	1269	803	238	227	1	0	0	1

- Molecule 44 is a protein called 50S RIBOSOMAL PROTEIN L10.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace	
			Total	C	N	O				
44	BJ	170	851	510	170	171		0	0	0
44	DJ	170	851	510	170	171		0	0	0

- Molecule 45 is a protein called 50S RIBOSOMAL PROTEIN L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
45	BN	139	1105	712	207	182	4	0	0	1
45	DN	139	1105	712	207	182	4	0	0	1

- Molecule 46 is a protein called 50S RIBOSOMAL PROTEIN L14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
46	BO	122	933	588	171	170	4	0	0	0
46	DO	122	933	588	171	170	4	0	0	0

- Molecule 47 is a protein called 50S RIBOSOMAL PROTEIN L15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
47	BP	146	1114	692	227	193	2	0	0	0
47	DP	146	1114	692	227	193	2	0	0	0



- Molecule 48 is a protein called 50S RIBOSOMAL PROTEIN L16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
48	BQ	141	Total 1122	C 715	N 212	O 188	S 7	0	0	0
48	DQ	141	Total 1122	C 715	N 212	O 188	S 7	0	0	0

- Molecule 49 is a protein called 50S RIBOSOMAL PROTEIN L17.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
49	BR	117	Total 960	C 599	N 202	O 159	0	0	0
49	DR	117	Total 960	C 599	N 202	O 159	0	0	0

- Molecule 50 is a protein called 50S RIBOSOMAL PROTEIN L18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
50	BS	99	Total 771	C 486	N 155	O 130	0	0	1
50	DS	99	Total 771	C 486	N 155	O 130	0	0	1

- Molecule 51 is a protein called 50S RIBOSOMAL PROTEIN L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
51	BT	138	Total 1142	C 710	N 235	O 196	S 1	0	0	1
51	DT	138	Total 1142	C 710	N 235	O 196	S 1	0	0	1

- Molecule 52 is a protein called 50S RIBOSOMAL PROTEIN L20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
52	BU	117	Total 958	C 604	N 202	O 151	S 1	0	0	0
52	DU	117	Total 958	C 604	N 202	O 151	S 1	0	0	0

- Molecule 53 is a protein called 50S RIBOSOMAL PROTEIN L21.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	BV	101	Total	C	N	O	S	0	0	0
			779	501	142	135	1			
53	DV	101	Total	C	N	O	S	0	0	0
			779	501	142	135	1			

- Molecule 54 is a protein called 50S RIBOSOMAL PROTEIN L22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	BW	113	Total	C	N	O	S	0	0	0
			896	563	176	155	2			
54	DW	113	Total	C	N	O	S	0	0	0
			896	563	176	155	2			

- Molecule 55 is a protein called 50S RIBOSOMAL PROTEIN L23.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
55	BX	93	Total	C	N	O	0	0	1
			726	471	132	123			
55	DX	93	Total	C	N	O	0	0	1
			726	471	132	123			

- Molecule 56 is a protein called 50S RIBOSOMAL PROTEIN L24.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
56	BY	107	Total	C	N	O	S	0	0	1
			811	520	155	131	5			
56	DY	107	Total	C	N	O	S	0	0	1
			811	520	155	131	5			

- Molecule 57 is a protein called 50S RIBOSOMAL PROTEIN L25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
57	BZ	185	Total	C	N	O	S	0	0	1
			1468	936	262	268	2			
57	DZ	185	Total	C	N	O	S	0	0	1
			1468	936	262	268	2			

- Molecule 58 is ZINC ION (three-letter code: ZN) (formula: Zn).

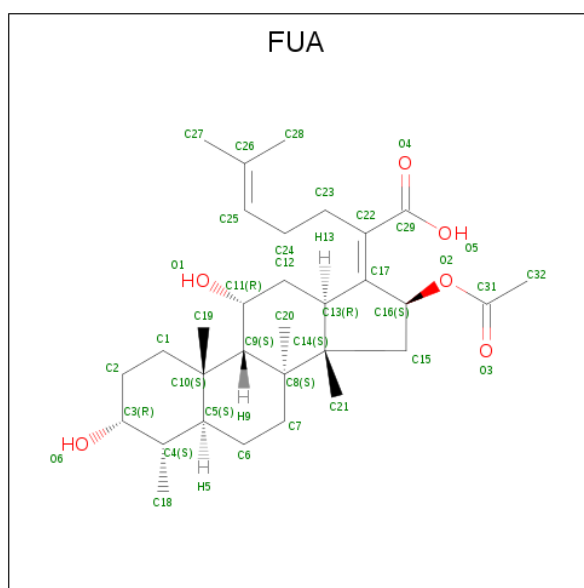
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
58	B4	1	Total	Zn	0	0
			1	1		

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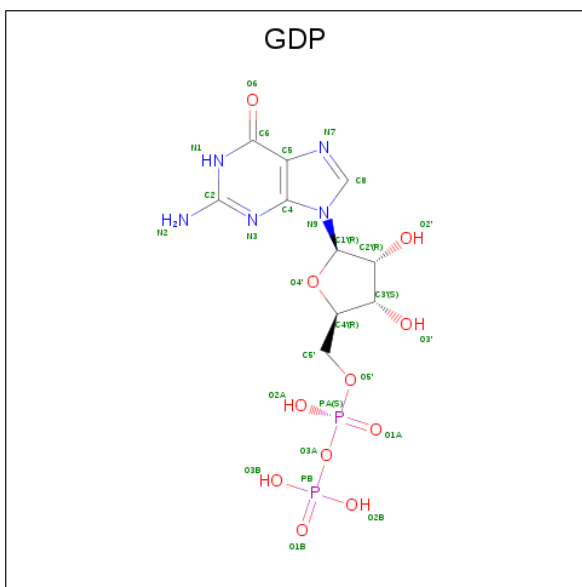
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
58	CN	1	Total Zn 1 1	0	0
58	AN	1	Total Zn 1 1	0	0
58	B9	1	Total Zn 1 1	0	0
58	D9	1	Total Zn 1 1	0	0
58	D4	1	Total Zn 1 1	0	0
58	CD	1	Total Zn 1 1	0	0
58	AD	1	Total Zn 1 1	0	0

- Molecule 59 is FUSIDIC ACID (three-letter code: FUA) (formula:  $C_{31}H_{48}O_6$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
59	AY	1	Total C O 37 31 6	0	0
59	CY	1	Total C O 37 31 6	0	0

- Molecule 60 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula:  $C_{10}H_{15}N_5O_{11}P_2$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
60	AY	1	28	10	5	11	2	0	0
60	CY	1	28	10	5	11	2	0	0

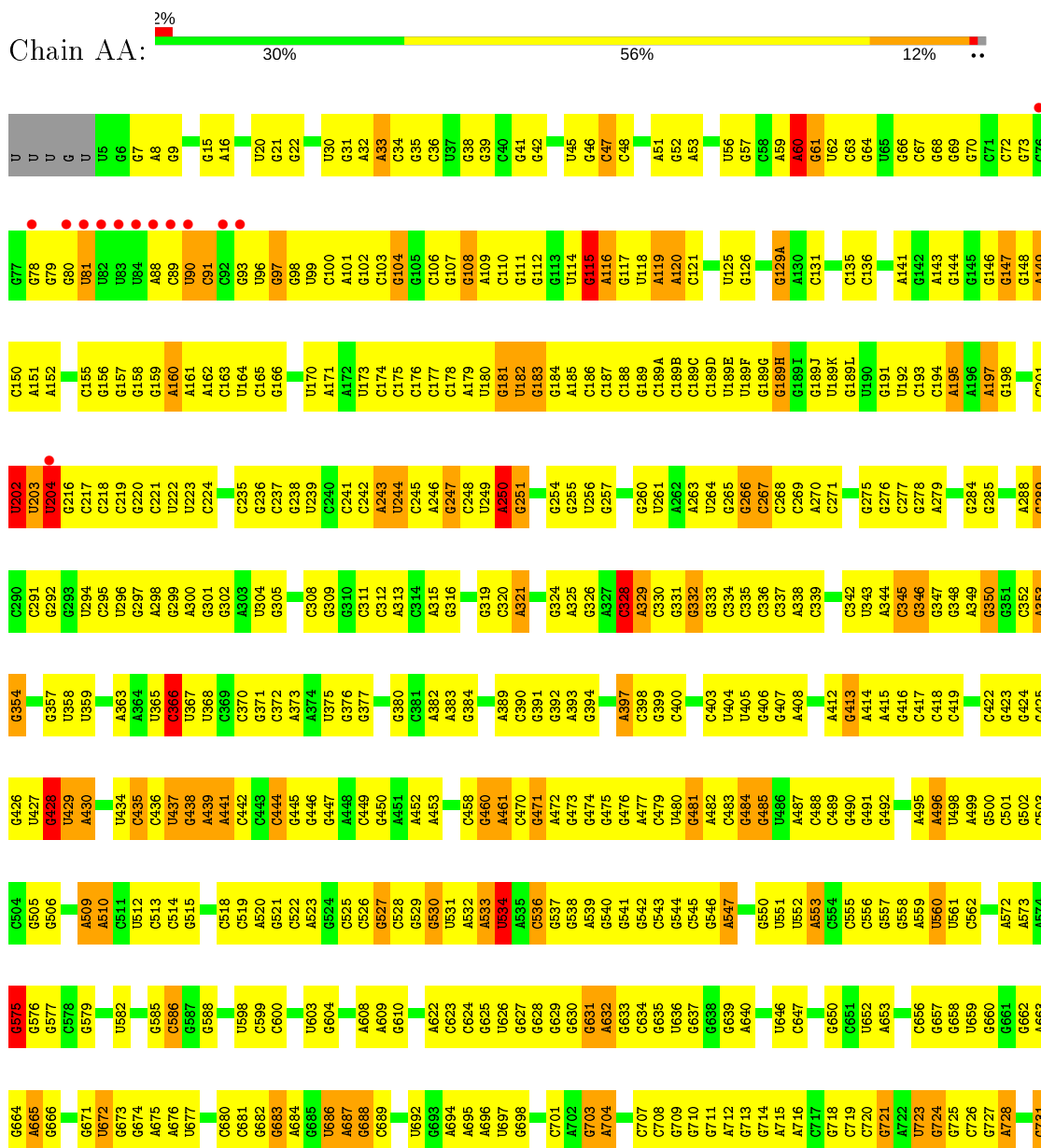
- Molecule 61 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

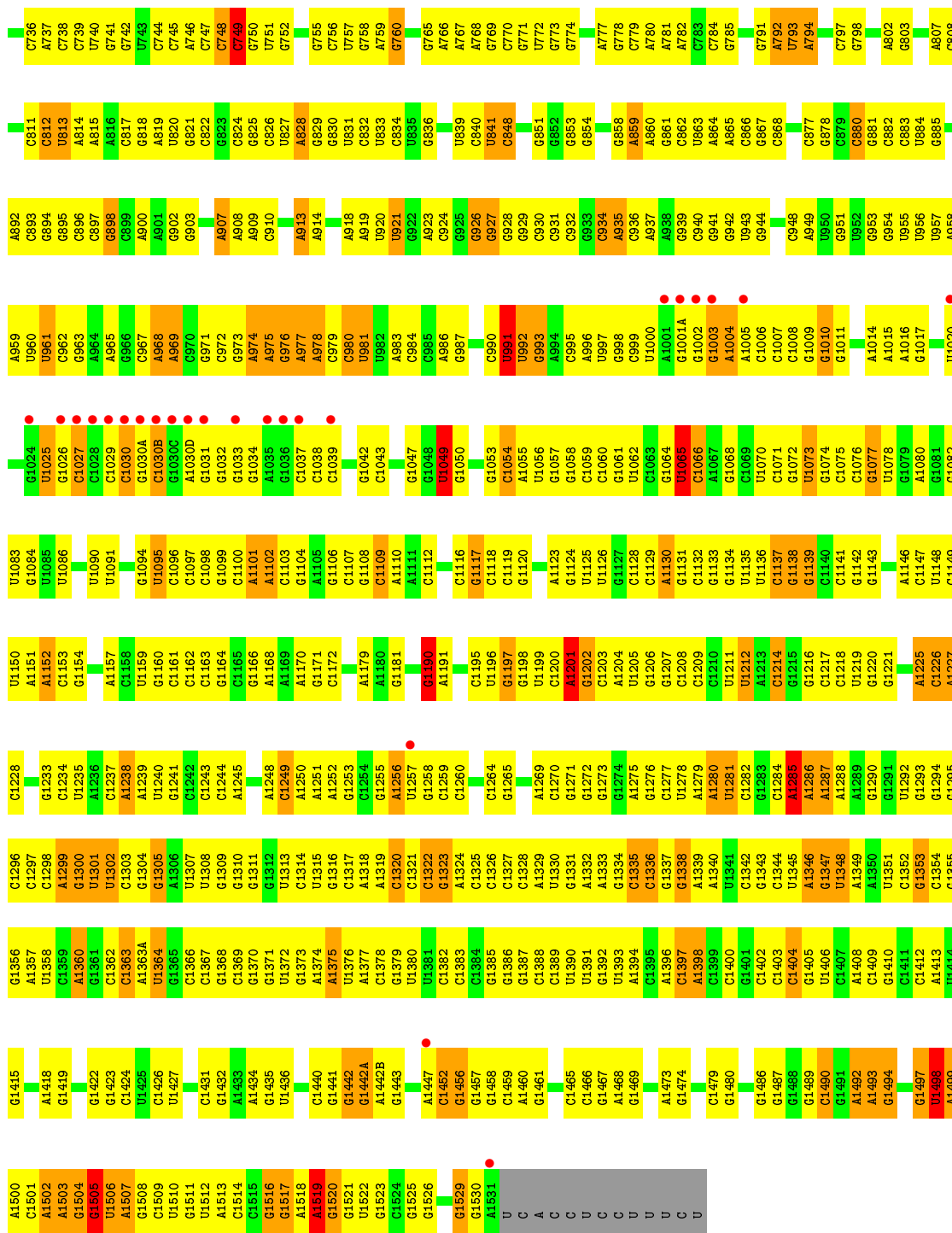
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
61	AY	1	1	1	0	0
61	CY	1	1	1	0	0

### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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 electron 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 dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). 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: 16S RIBOSOMAL RNA

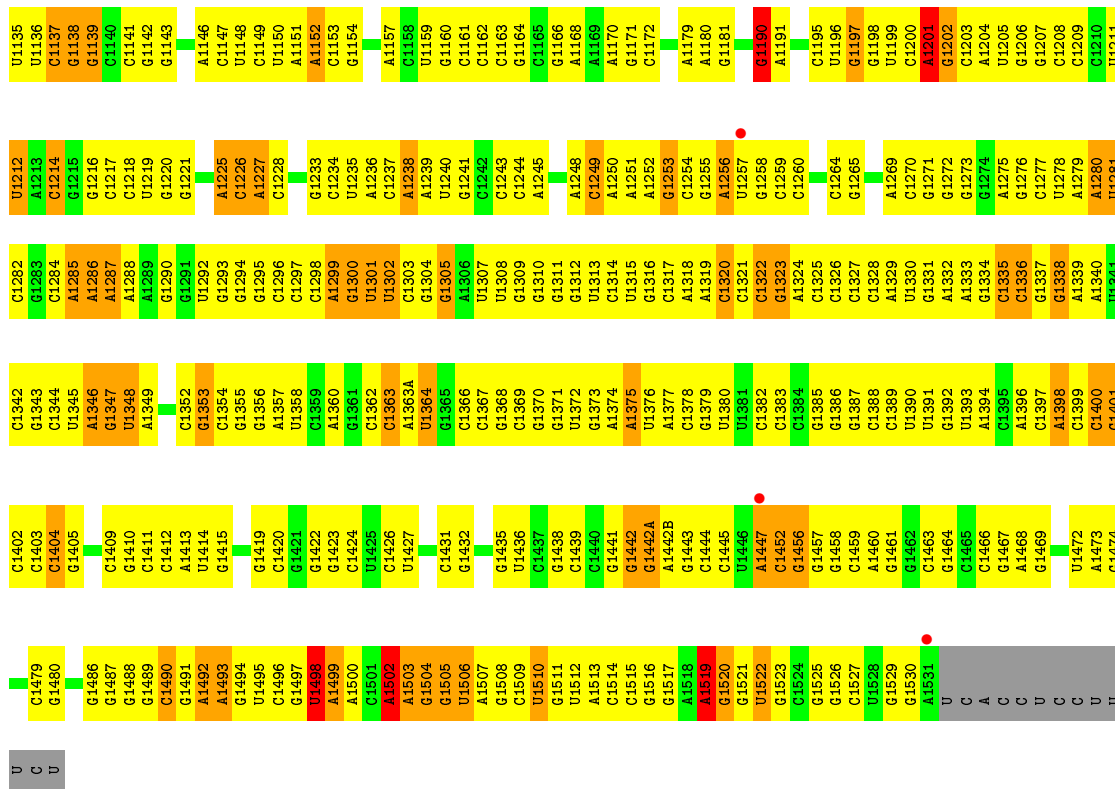




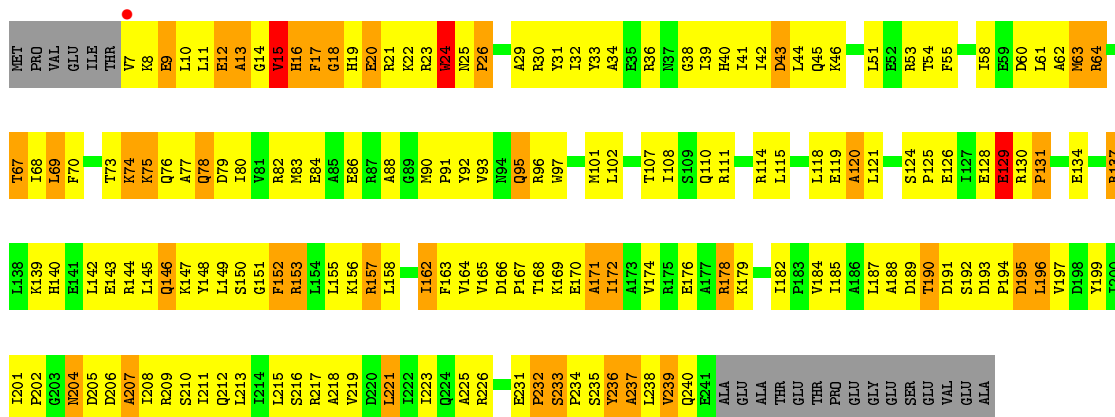
• Molecule 1: 16S RIBOSOMAL RNA



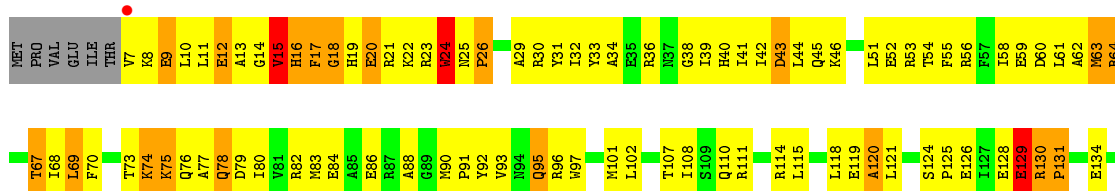
G1069	U1070	G1071	G1072	G1073	G1074	G1075	G1076	G1077	G1078	G1079	A1080	G1081	G1082	U1083	G1084	U1085	U1086	U1087	U1089	U1091	G1094	U1095	U1096	G1097	G1098	G1099	G1100	A1101	A1102	G1103	G1104	G1105	G1106	G1107	G1108	G1109	A1110	A1111	G1112	G1116	G1117	G1118	G1119	G1120	A1123	G1124	U1125	U1126	G1127	G1128	G1129	G1130	G1131	G1132	G1133	G1134																																																																			
G942	U943	G944	G1007	G1008	G1009	G1010	G1011	U950	G951	G952	G953	G954	U955	U956	U957	U958	U959	U960	U961	U962	U963	G964	G965	G966	G967	U968	U969	U970	U971	U972	U973	U974	U975	U976	U977	U978	U979	U980	U981	U982	U983	U984	U985	U986	U987	U988	U989	U990	U991	U992	U993	U994	U995	U996	U997	U998	U999	U1000	U1001	U1001A	U1002	U1003																																																													
A865	C866	G867	C868	C877	G878	C879	C880	A802	G803	C802	C803	U804	U807	C808	C811	C812	U813	A814	C815	G816	C817	G818	C819	A900	U901	G902	G903	G821	A907	U908	A909	C910	U913	A914	U918	A919	U920	U921	U922	A923	C924	G925	G926	G927	U928	U929	U930	U931	C932	G933	C934	G935	G936	A935	C936	U937	A938	U939	C940	U941	U942	U943	U944	U945	U946	U947	U948	U949	U950	U951	U952	U953	U954	U955	U956	U957	U958	U959	U960	U961	U962	U963	U964	U965	U966	U967	U968	U969	U970	U971	U972	U973	U974	U975	U976	U977	U978	U979	U980	U981	U982	U983	U984	U985	U986	U987	U988	U989	U990	U991	U992	U993	U994	U995	U996	U997	U998	U999	U1000	U1001	U1001A	U1002	U1003
G717	G718	C719	C720	A721	A722	U723	G724	U725	G726	G727	A728	G731	C736	A737	C738	C739	U740	G741	G742	U743	C744	A745	U746	C747	C748	C749	G750	U751	G752	G755	C756	U757	G758	A759	G760	G765	A766	U767	G768	U769	C770	G771	U772	G773	G774	A777	G778	C779	A780	A781	A782	G783	C784	U785																																																																					
G650	C651	A652	U653	A654	A655	C656	C657	C658	U659	A660	G661	G662	A663	G664	A665	G666	G671	U672	G673	G674	A675	A676	U677	C680	C681	C682	G683	A684	G685	U686	A687	U688	G689	U692	G693	A694	U695	U696	U697	U698	U699	C700	C701	A702	A703	A704	C707	C708	G709	G710	G711	A712	G713	G714	A715	A716																																																																			
U561	C562	U571	A572	A573	U574	C575	G576	C577	U578	U579	U582	A583	U584	C585	C586	U587	U588	U591	U592	A593	A594	U595	C596	C597	U598	C599	C600	G601	A602	U603	U604	A608	A609	U610	U611	A622	C623	C624	U625	U626	U627	U628	G629	U630	U631	A632	C634	U635	U636	U637	U638	U639	U640	U641	U642	U643	U644	U645	U646	U647	U648	U649	U650																																																												
A496	U498	A499	G500	G501	G502	G503	U504	U505	U506	U509	C511	U512	C513	C514	C515	C516	U517	U518	C519	A520	C521	C522	A523	U524	U525	U526	U527	U528	U529	U530	U531	U532	U533	U534	A535	U536	U537	U538	U539	U540	U541	U542	U543	U544	U545	U546	U547	U552	U553	U554	U555	U556	U557	U558	U559	U560																																																																			
G416	C417	C418	C419	C422	C423	C424	C425	C426	C427	U428	A429	A430	U434	C435	C436	C437	U438	A439	U441	A442	C443	C444	C445	U446	U447	U448	C449	C450	U451	U452	U453	U454	U455	C456	C457	U458	U459	U460	U461	U462	U463	U464	U465	U466	U467	U468	U469	U470	U471	U472	U473	U474	U475	U476	U477	U478	U479	U480	U481	U482	U483	U484	U485	U486	U487	U488	U489	U490	U491	U492	U493	U494	U495	U496	U497	U498	U499	U500																																													
A288	C289	C290	C291	G292	C293	U294	C295	U296	C297	A298	C299	U300	G301	C302	C303	C308	G309	G310	C311	C312	C313	C314	A315	G316	C317	C318	C319	C320	A321	G322	U323	U324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C342	U343	A344	C345	G346	G347	G348	A349	G350	G351	A353																																																																		
G354	G357	U358	U359	G361	U362	A363	A364	U365	C366	U367	U368	C369	C370	C371	C372	A373	A374	U375	C376	C377	C378	C379	G380	C381	A382	A383	A384	C385	C386	U387	C388	A389	C390	G391	C392	A393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	U404	U405	C406	C407	C408	A409	A410	A411	A412	A413	A414	A415																																																																	
G146	G147	G148	A149	G150	G151	A152	C155	G156	G157	U81	U82	U83	U84	A160	A161	A162	C163	C164	C165	G166	U170	G171	U172	C173	C174	C175	C176	G104	C177	C178	G105	C106	G107	G181	U182	C183	G184	A185	G112	C186	C187	C188	G189	C189A	C189B	C189C	C189D	U189E	U189F	U189G	G189H	G189I	G189J	U189K	U189L	U190	G191	G192	C193	C194	A195	G144	G145																																																												



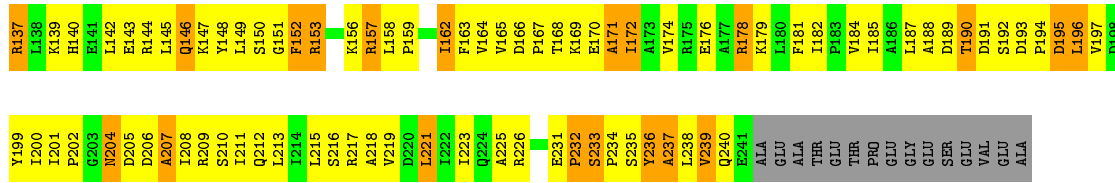
• Molecule 2: 30S RIBOSOMAL PROTEIN S2



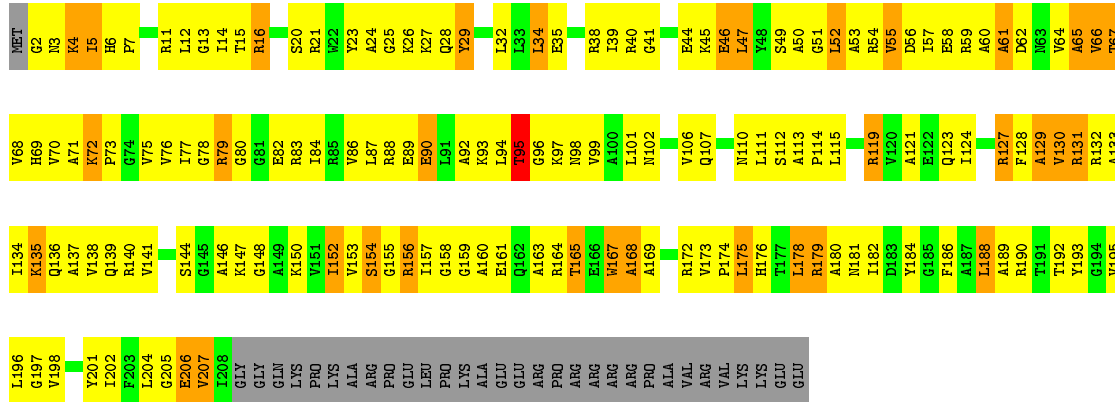
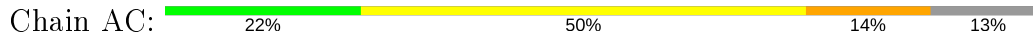
• Molecule 2: 30S RIBOSOMAL PROTEIN S2



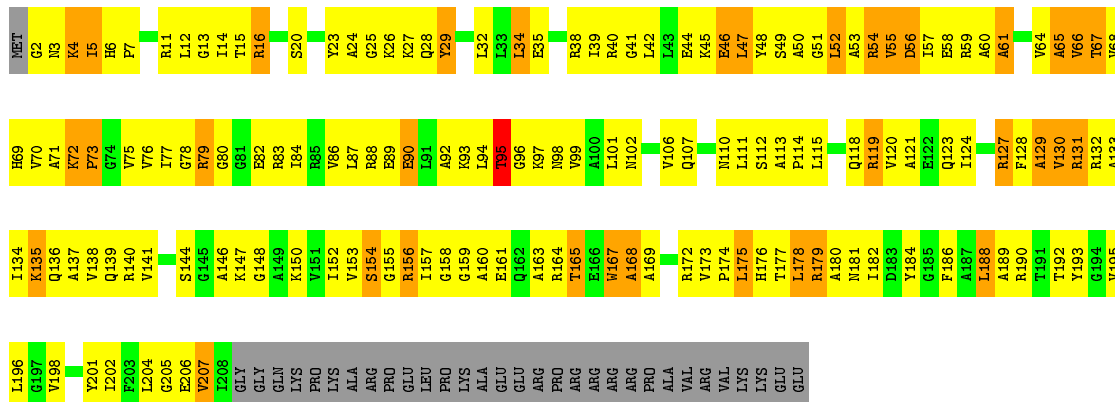




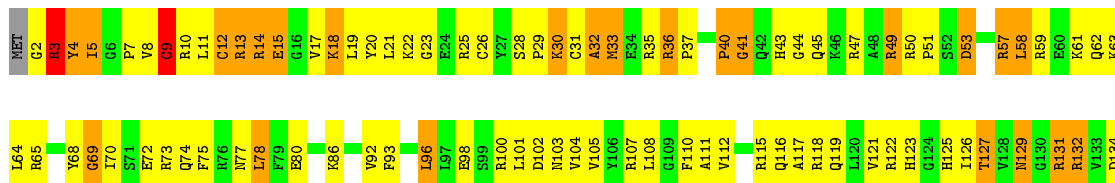
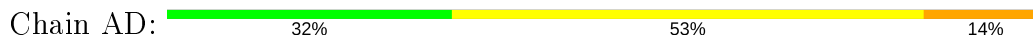
• Molecule 3: 30S RIBOSOMAL PROTEIN S3

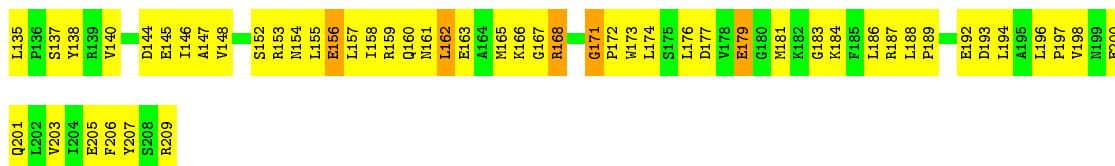


• Molecule 3: 30S RIBOSOMAL PROTEIN S3

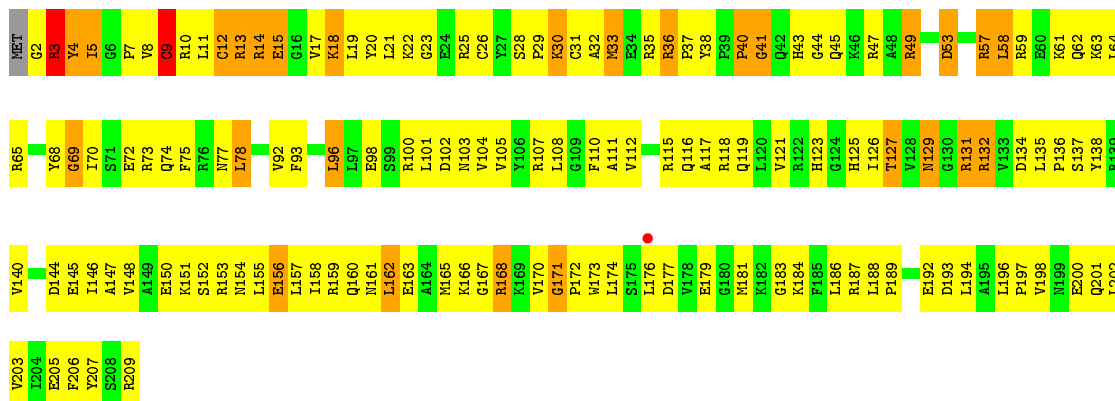
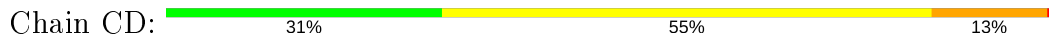


• Molecule 4: 30S RIBOSOMAL PROTEIN S4

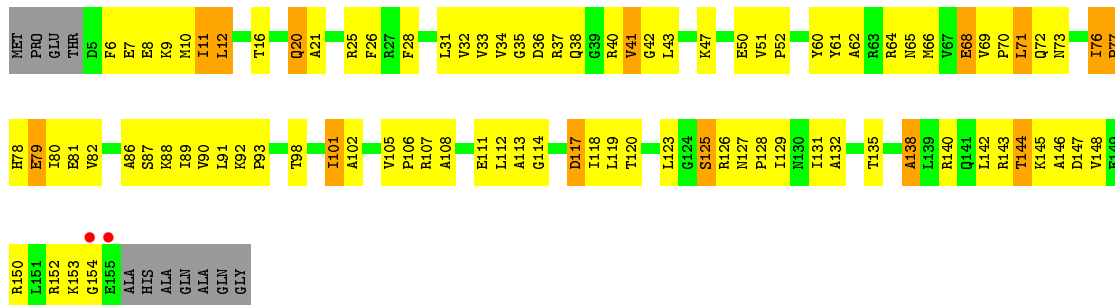




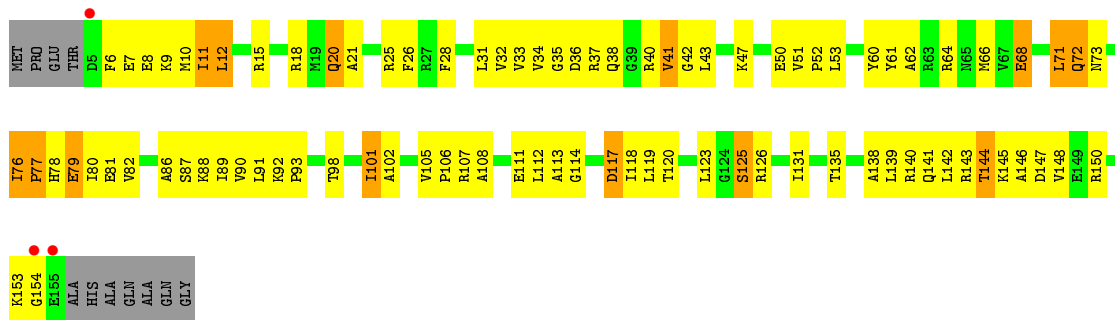
• Molecule 4: 30S RIBOSOMAL PROTEIN S4



• Molecule 5: 30S RIBOSOMAL PROTEIN S5

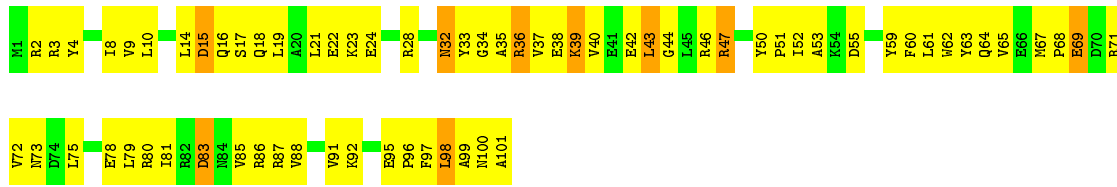


• Molecule 5: 30S RIBOSOMAL PROTEIN S5



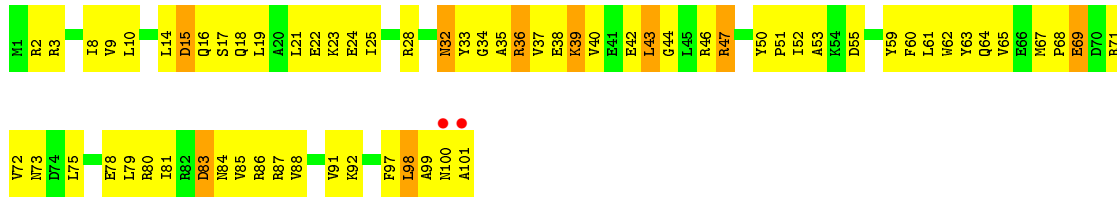
• Molecule 6: 30S RIBOSOMAL PROTEIN S6

Chain AF: 33% 58% 9%



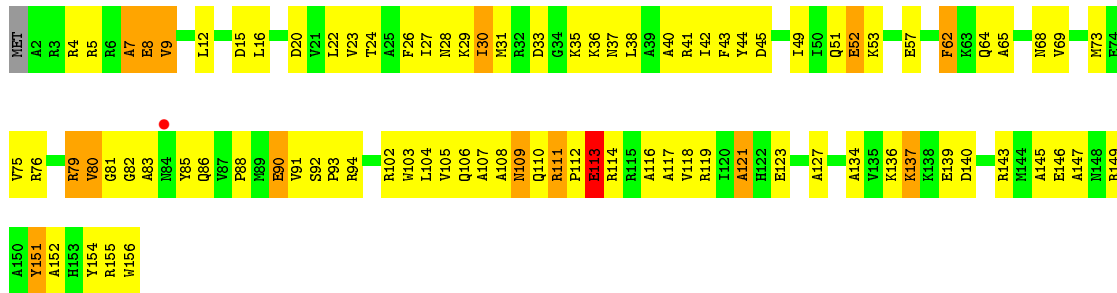
• Molecule 6: 30S RIBOSOMAL PROTEIN S6

Chain CF: 2% 34% 57% 9%



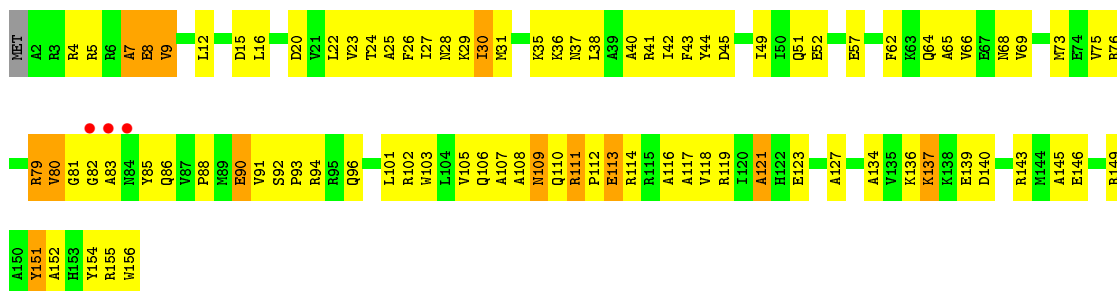
• Molecule 7: 30S RIBOSOMAL PROTEIN S7

Chain AG: % 42% 48% 9% ..



• Molecule 7: 30S RIBOSOMAL PROTEIN S7

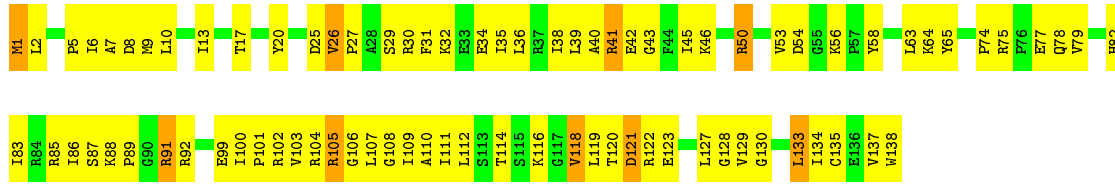
Chain CG: 2% 42% 49% 8%



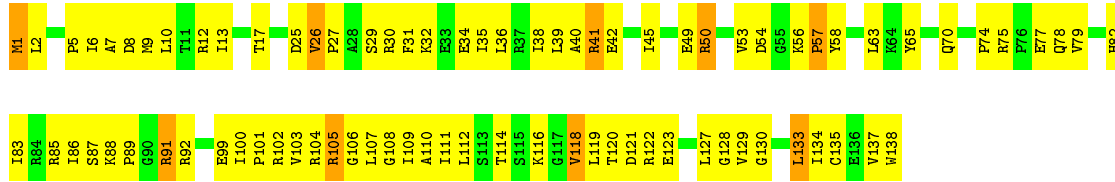
• Molecule 8: 30S RIBOSOMAL PROTEIN S8

Chain AH: 41% 53% 7%

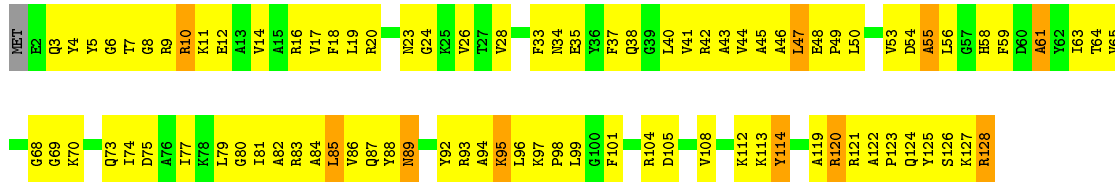




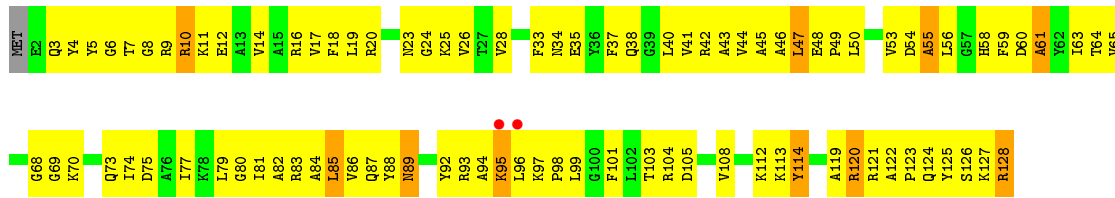
• Molecule 8: 30S RIBOSOMAL PROTEIN S8



• Molecule 9: 30S RIBOSOMAL PROTEIN S9



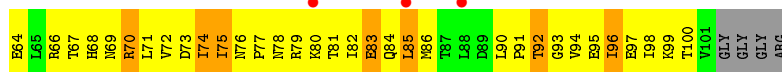
• Molecule 9: 30S RIBOSOMAL PROTEIN S9

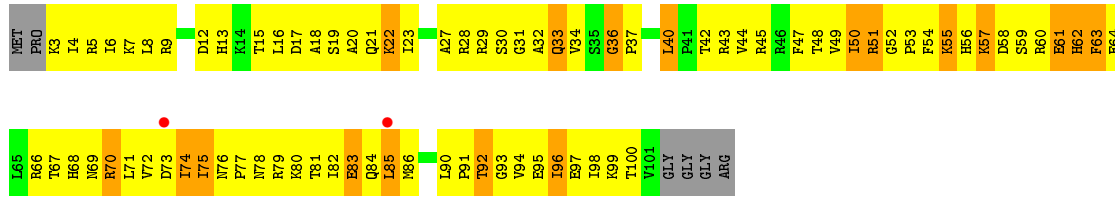


• Molecule 10: 30S RIBOSOMAL PROTEIN S10

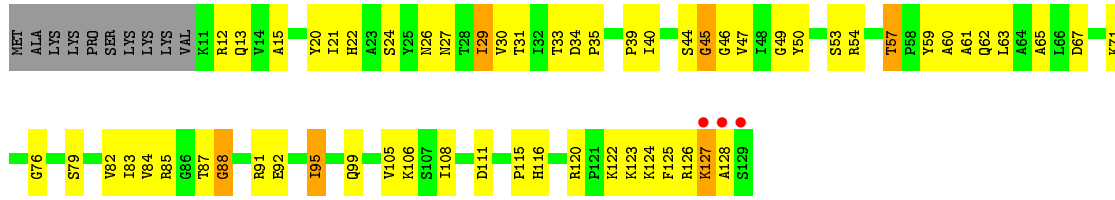


• Molecule 10: 30S RIBOSOMAL PROTEIN S10

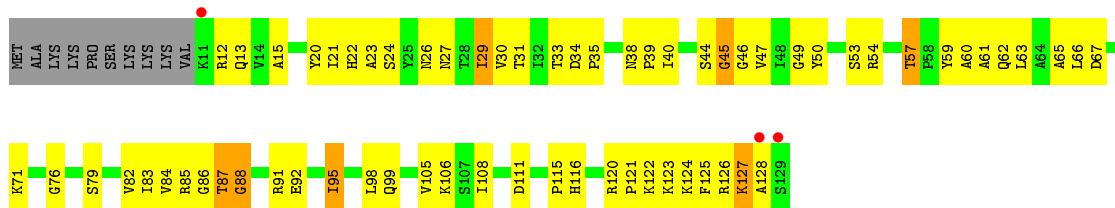




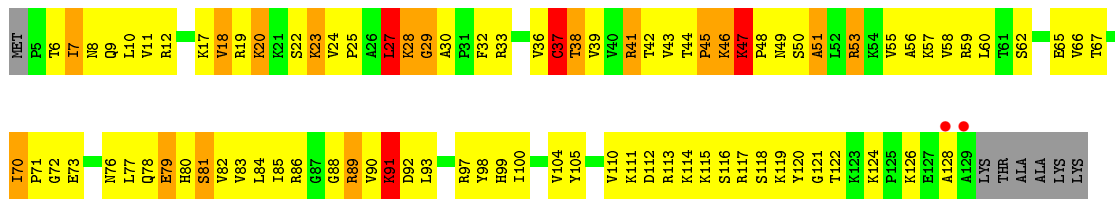
• Molecule 11: 30S RIBOSOMAL PROTEIN S11



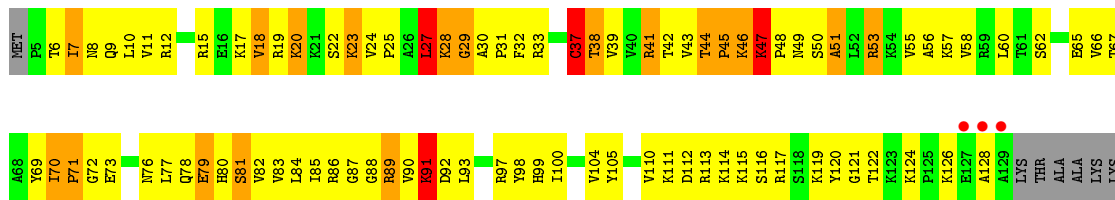
• Molecule 11: 30S RIBOSOMAL PROTEIN S11



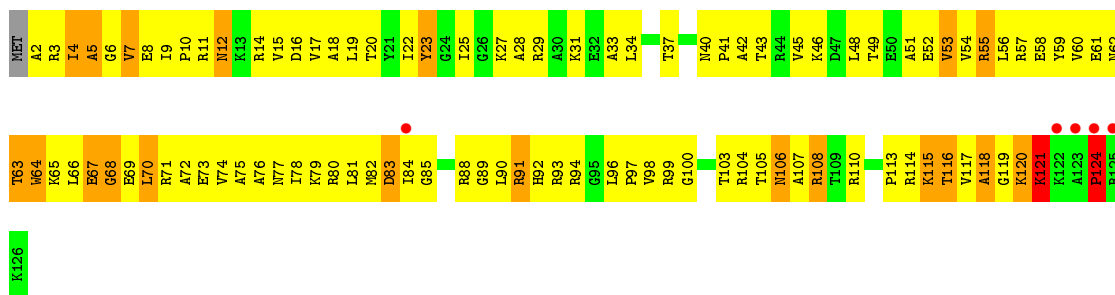
• Molecule 12: 30S RIBOSOMAL PROTEIN S12



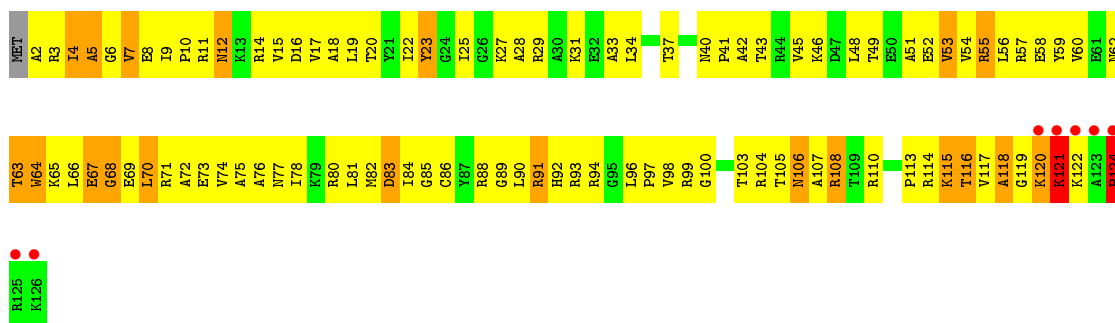
• Molecule 12: 30S RIBOSOMAL PROTEIN S12



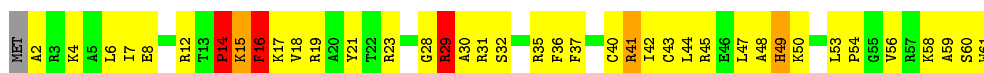
• Molecule 13: 30S RIBOSOMAL PROTEIN S13



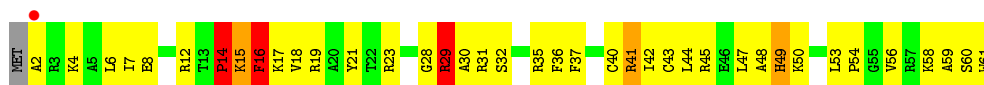
• Molecule 13: 30S RIBOSOMAL PROTEIN S13



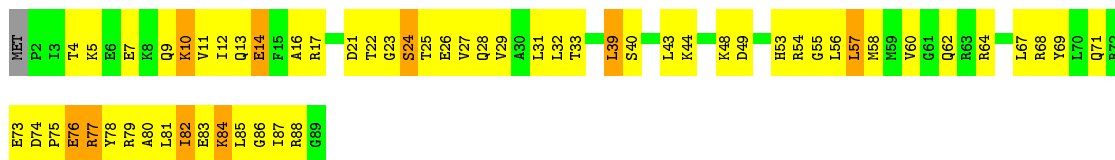
• Molecule 14: 30S RIBOSOMAL PROTEIN S14 TYPE Z



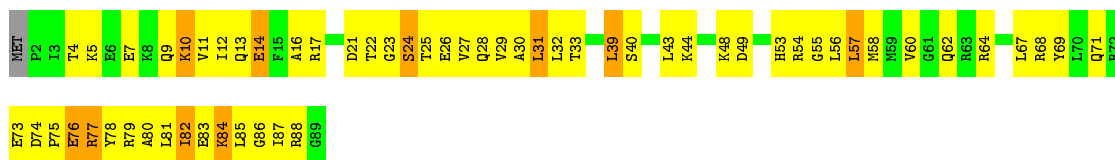
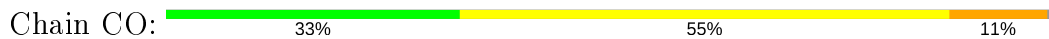
• Molecule 14: 30S RIBOSOMAL PROTEIN S14 TYPE Z



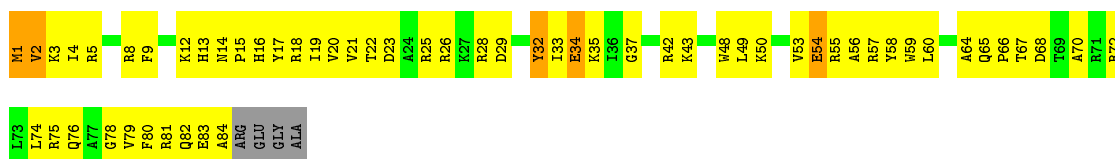
• Molecule 15: 30S RIBOSOMAL PROTEIN S15



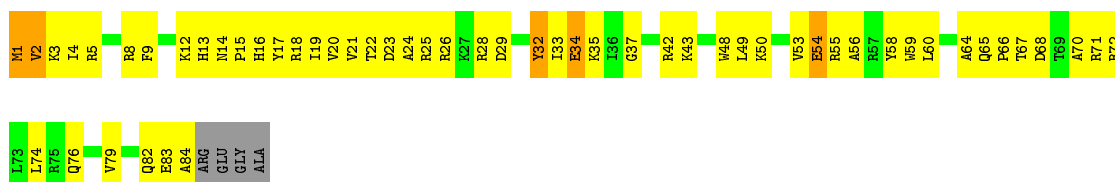
• Molecule 15: 30S RIBOSOMAL PROTEIN S15



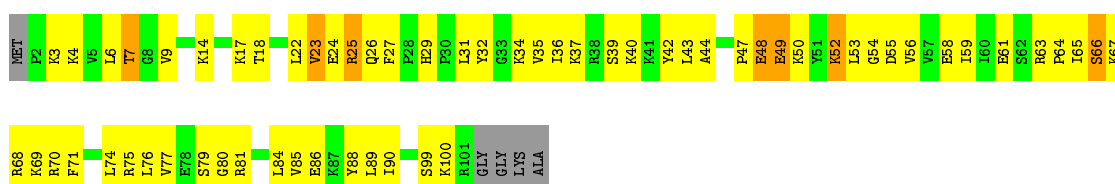
• Molecule 16: 30S RIBOSOMAL PROTEIN S16



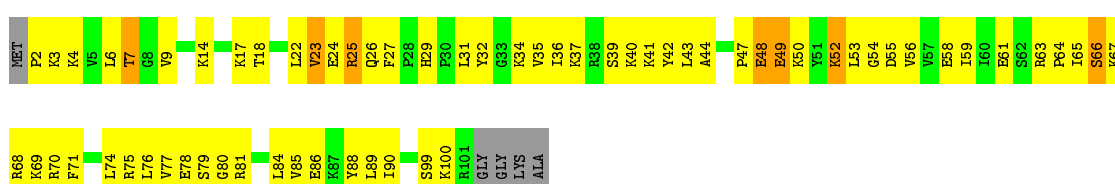
• Molecule 16: 30S RIBOSOMAL PROTEIN S16



• Molecule 17: 30S RIBOSOMAL PROTEIN S17

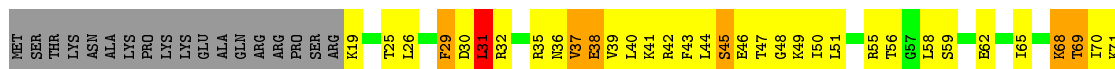


• Molecule 17: 30S RIBOSOMAL PROTEIN S17

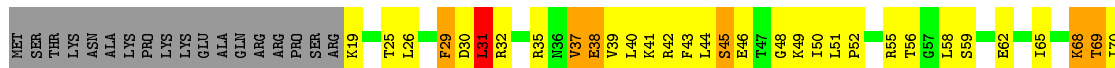


• Molecule 18: 30S RIBOSOMAL PROTEIN S18

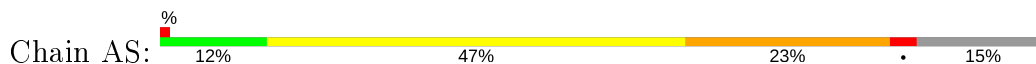




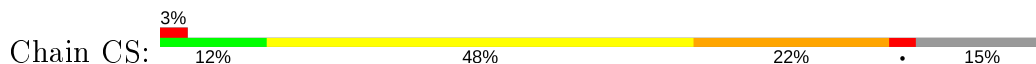
- Molecule 18: 30S RIBOSOMAL PROTEIN S18



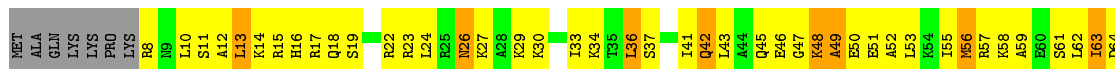
- Molecule 19: 30S RIBOSOMAL PROTEIN S19



- Molecule 19: 30S RIBOSOMAL PROTEIN S19



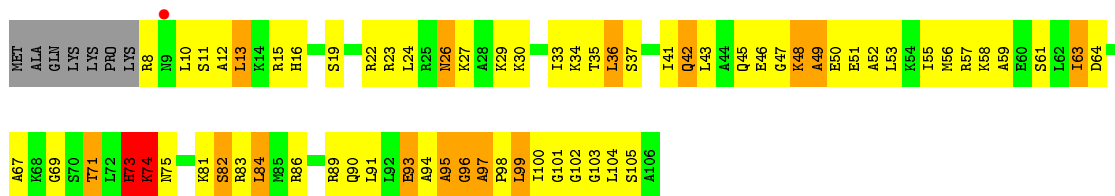
- Molecule 20: 30S RIBOSOMAL PROTEIN S20



- Molecule 20: 30S RIBOSOMAL PROTEIN S20







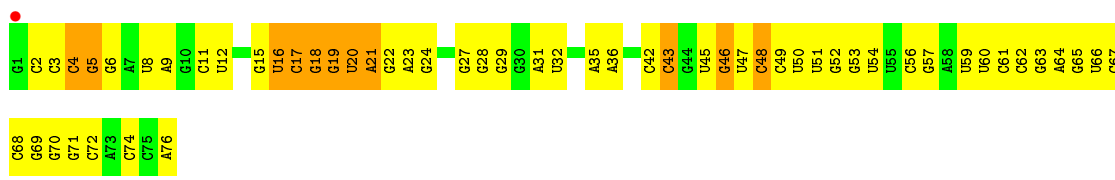
• Molecule 21: 30S RIBOSOMAL PROTEIN THX



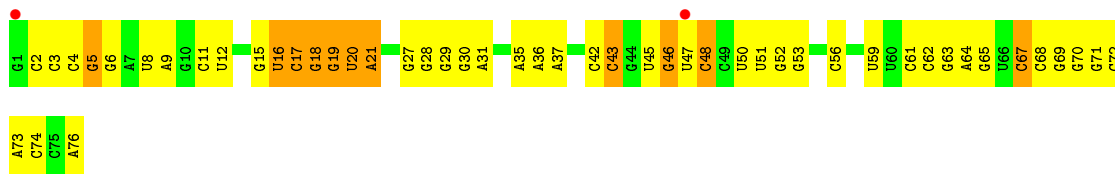
• Molecule 21: 30S RIBOSOMAL PROTEIN THX



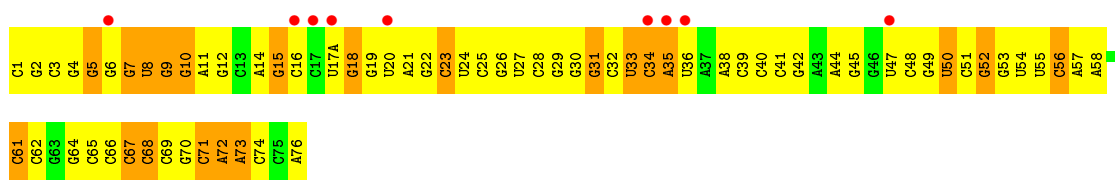
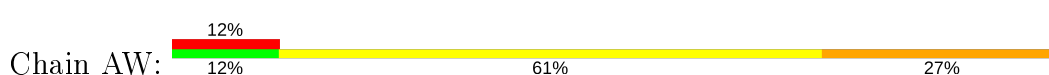
• Molecule 22: MRNA



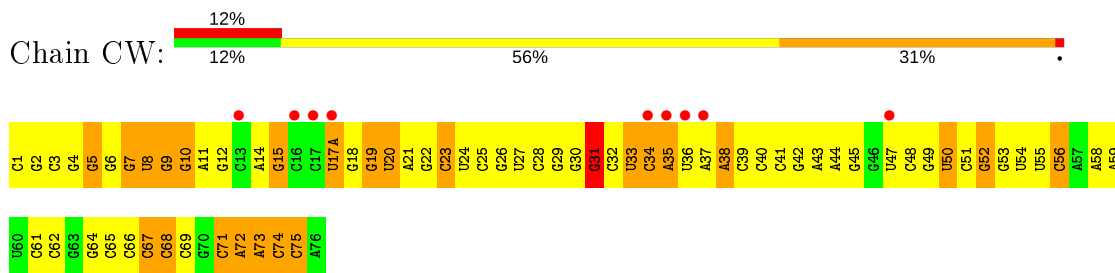
• Molecule 22: MRNA



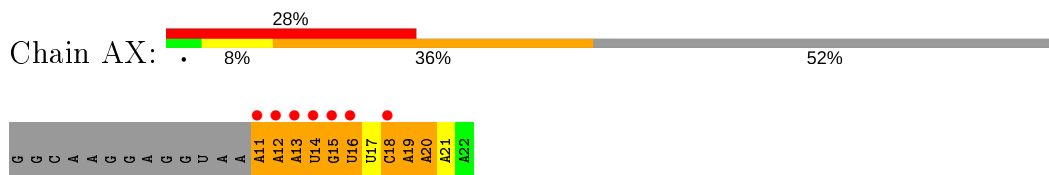
• Molecule 23: RNA



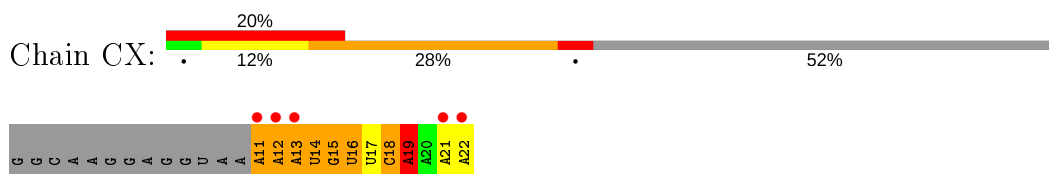
• Molecule 23: RNA



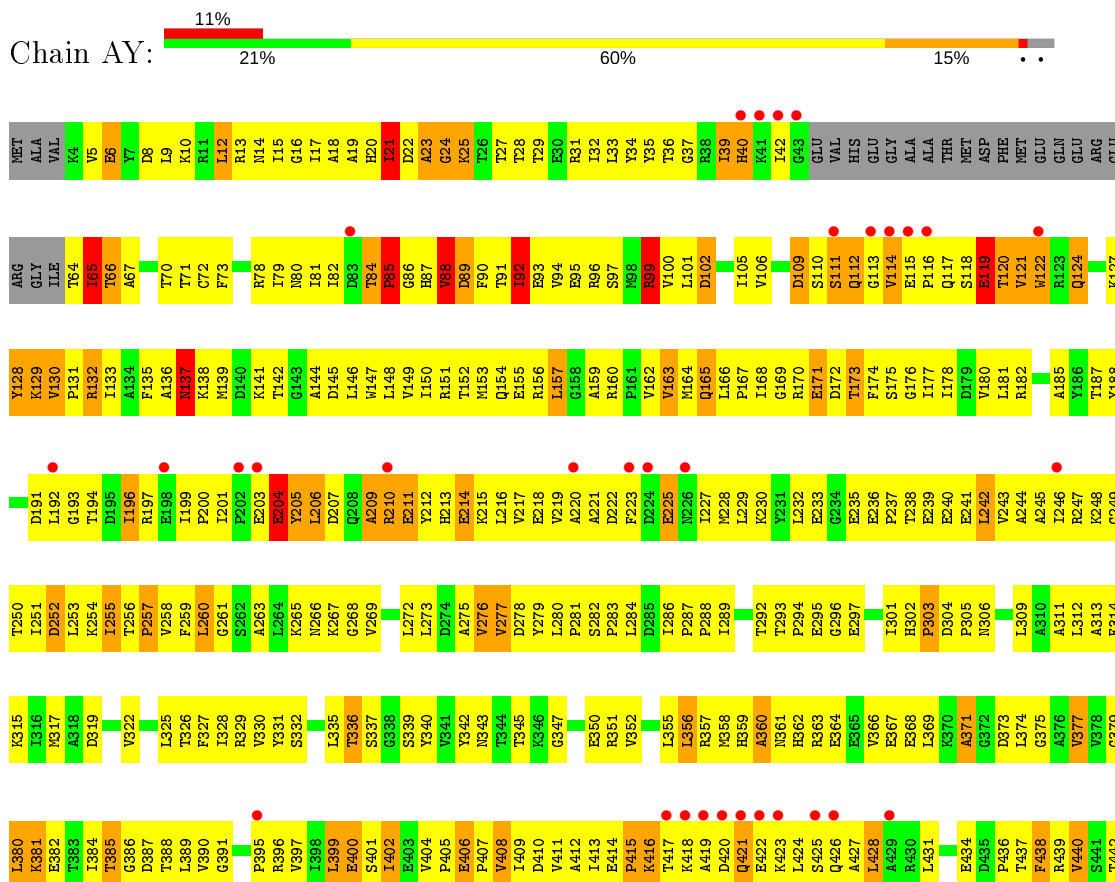
• Molecule 24: RNA

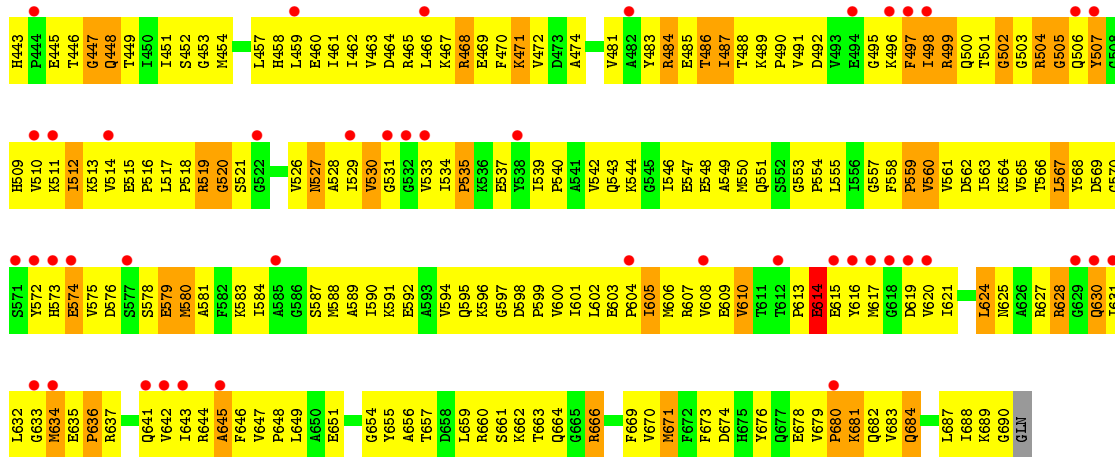


• Molecule 24: RNA



• Molecule 25: ELONGATION FACTOR G

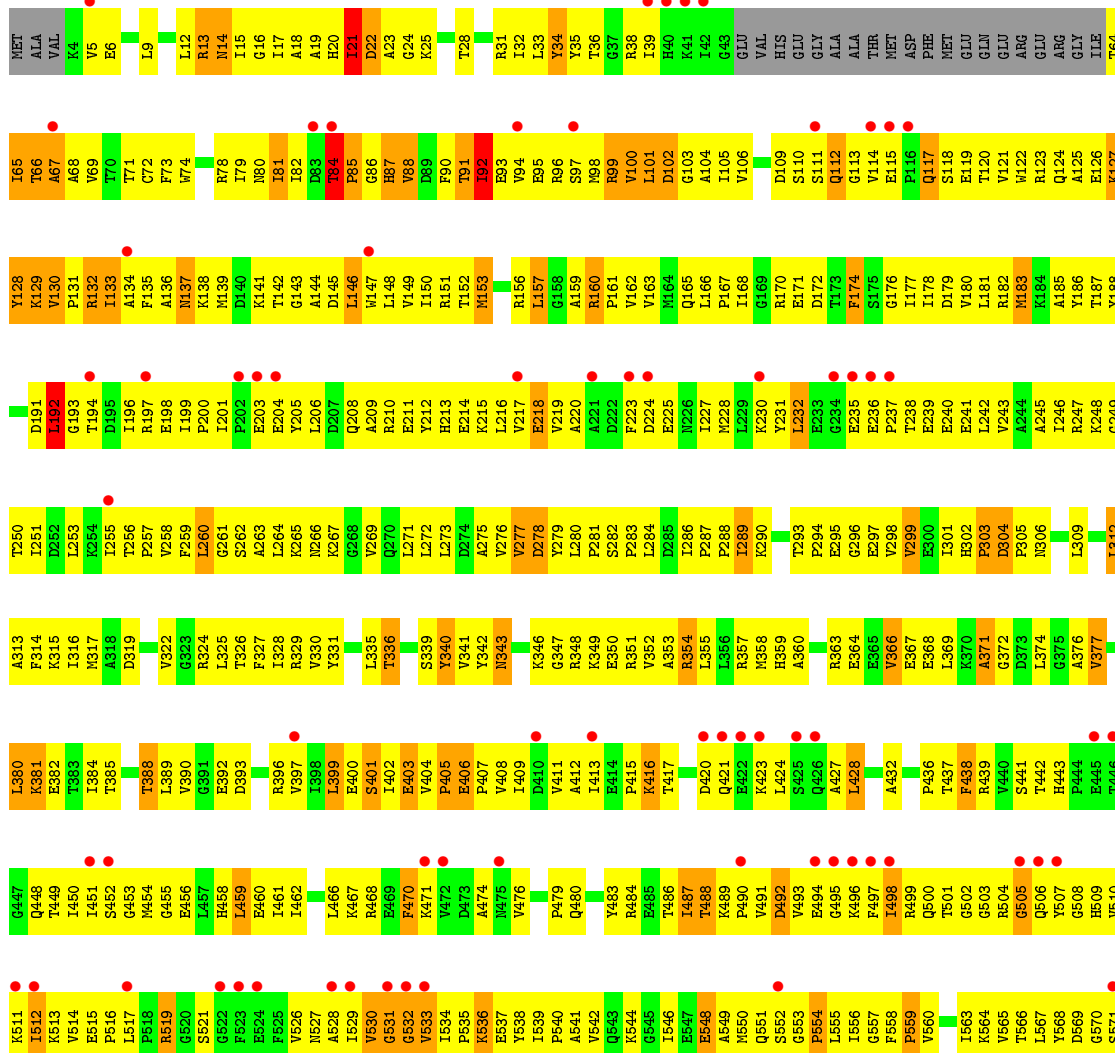
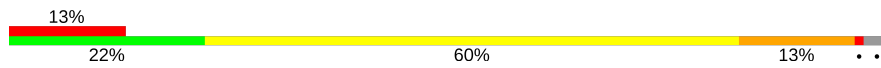


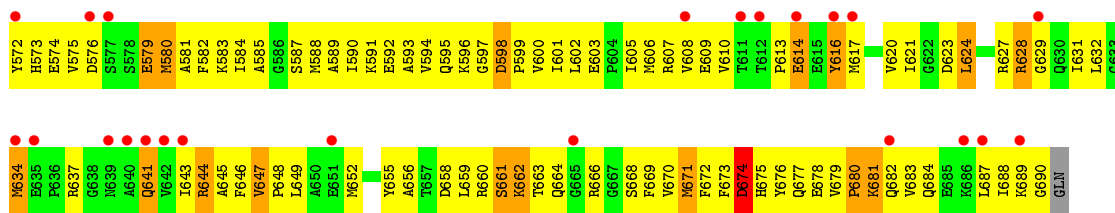


● Molecule 25: ELONGATION FACTOR G

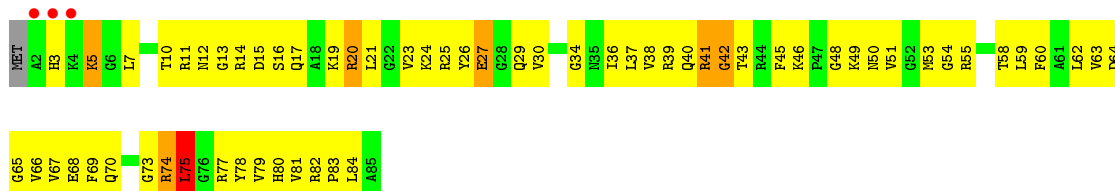


Chain CY:

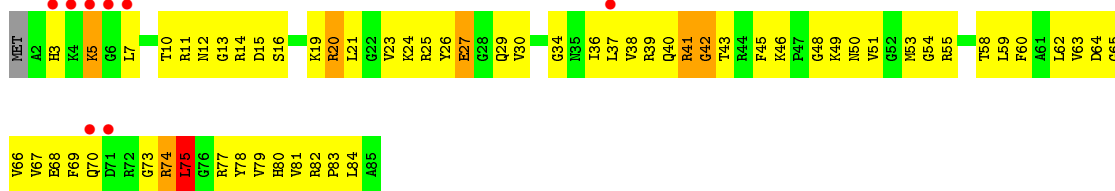




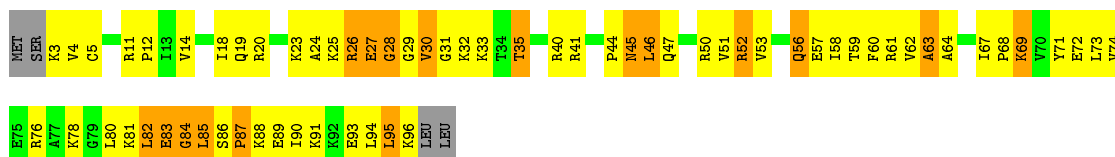
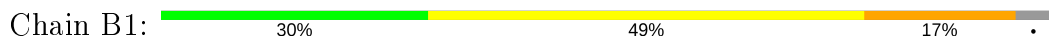
• Molecule 26: 50S RIBOSOMAL PROTEIN L27



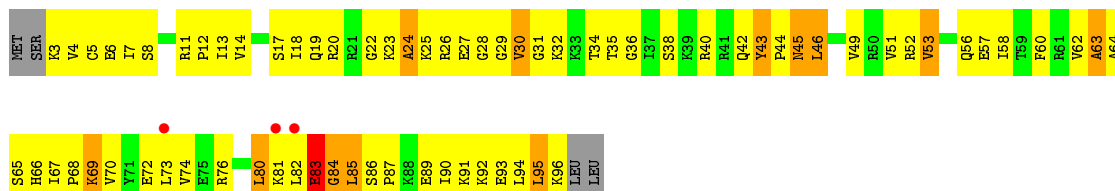
• Molecule 26: 50S RIBOSOMAL PROTEIN L27



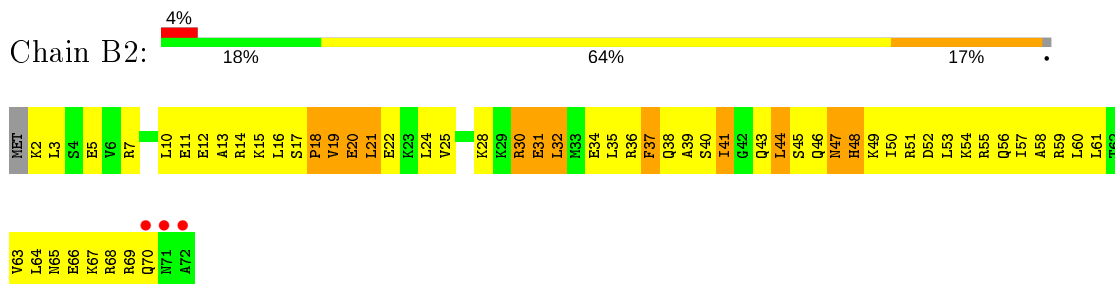
• Molecule 27: 50S RIBOSOMAL PROTEIN L28



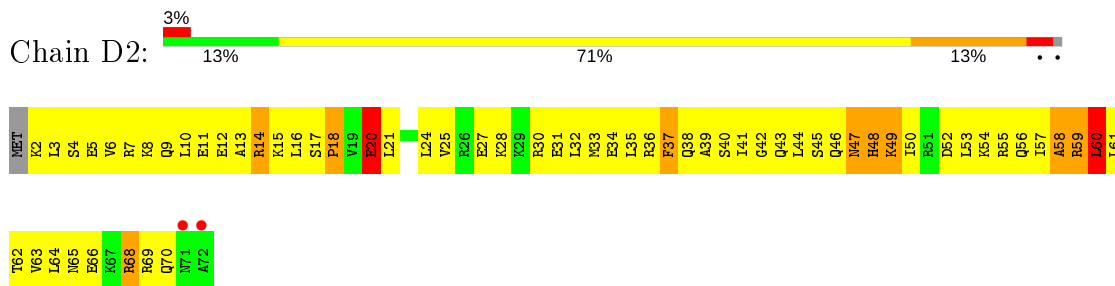
• Molecule 27: 50S RIBOSOMAL PROTEIN L28



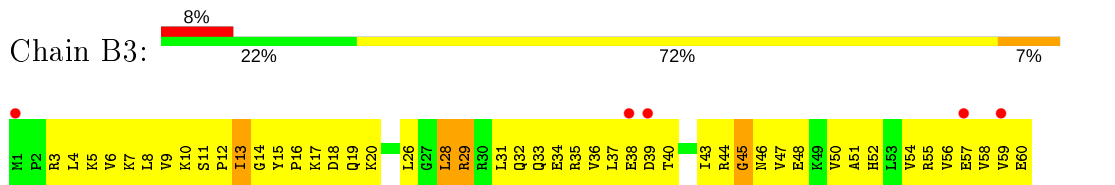
• Molecule 28: 50S RIBOSOMAL PROTEIN L29



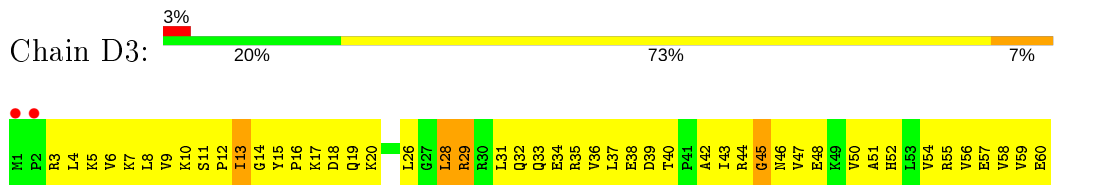
• Molecule 28: 50S RIBOSOMAL PROTEIN L29



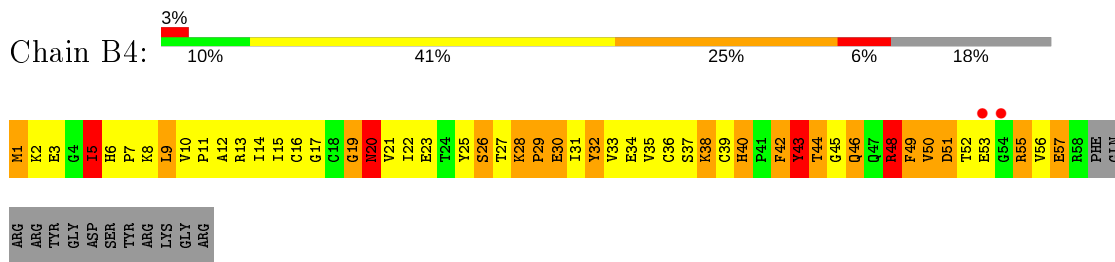
• Molecule 29: 50S RIBOSOMAL PROTEIN L30



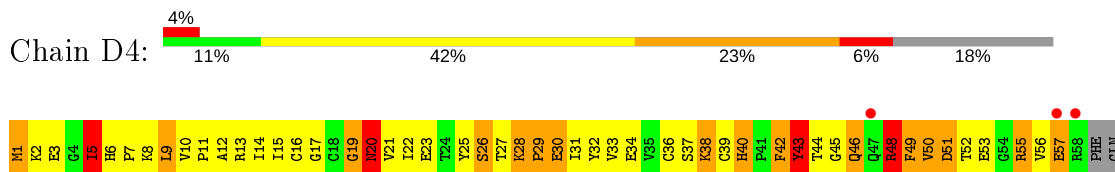
• Molecule 29: 50S RIBOSOMAL PROTEIN L30



• Molecule 30: 50S RIBOSOMAL PROTEIN L31



• Molecule 30: 50S RIBOSOMAL PROTEIN L31

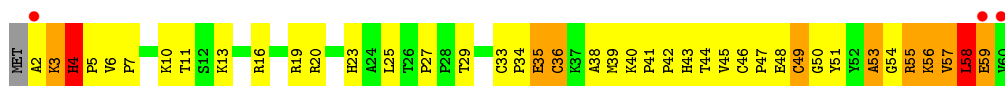


ARG  
ARG  
TYR  
GLY  
ASP  
SER  
TYR  
ARG  
LYS  
GLY  
ARG

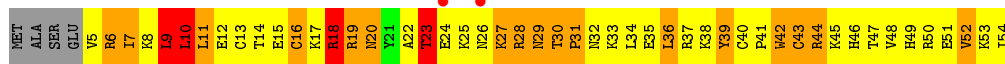
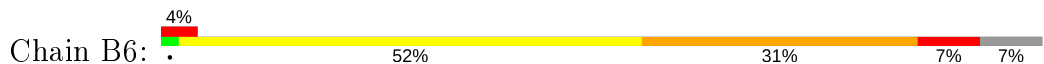
• Molecule 31: 50S RIBOSOMAL PROTEIN L32



• Molecule 31: 50S RIBOSOMAL PROTEIN L32



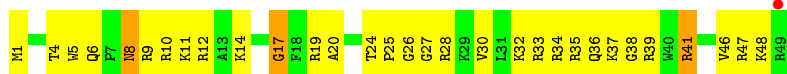
• Molecule 32: 50S RIBOSOMAL PROTEIN L33



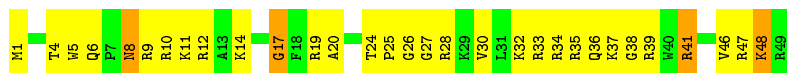
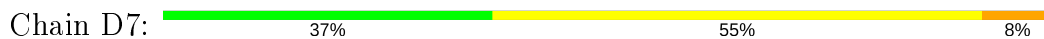
• Molecule 32: 50S RIBOSOMAL PROTEIN L33



• Molecule 33: 50S RIBOSOMAL PROTEIN L34

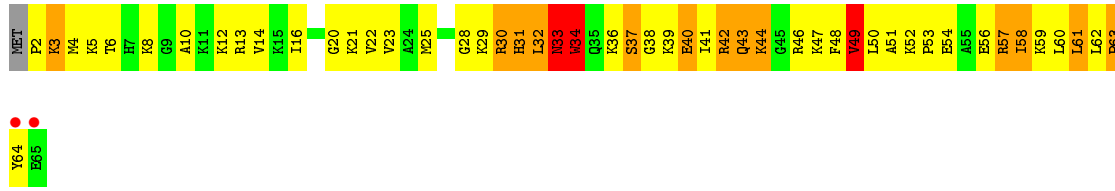


• Molecule 33: 50S RIBOSOMAL PROTEIN L34

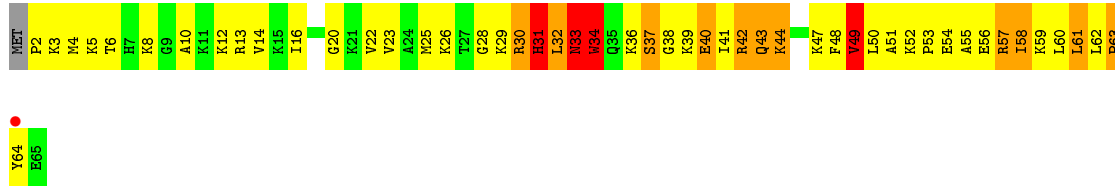


• Molecule 34: 50S RIBOSOMAL PROTEIN L35

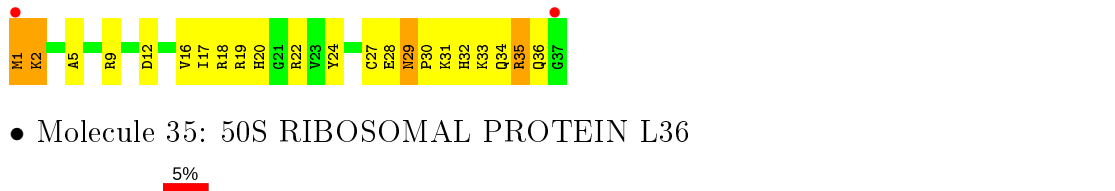




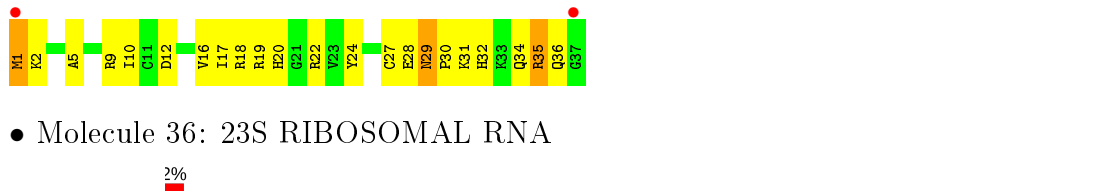
• Molecule 34: 50S RIBOSOMAL PROTEIN L35



• Molecule 35: 50S RIBOSOMAL PROTEIN L36

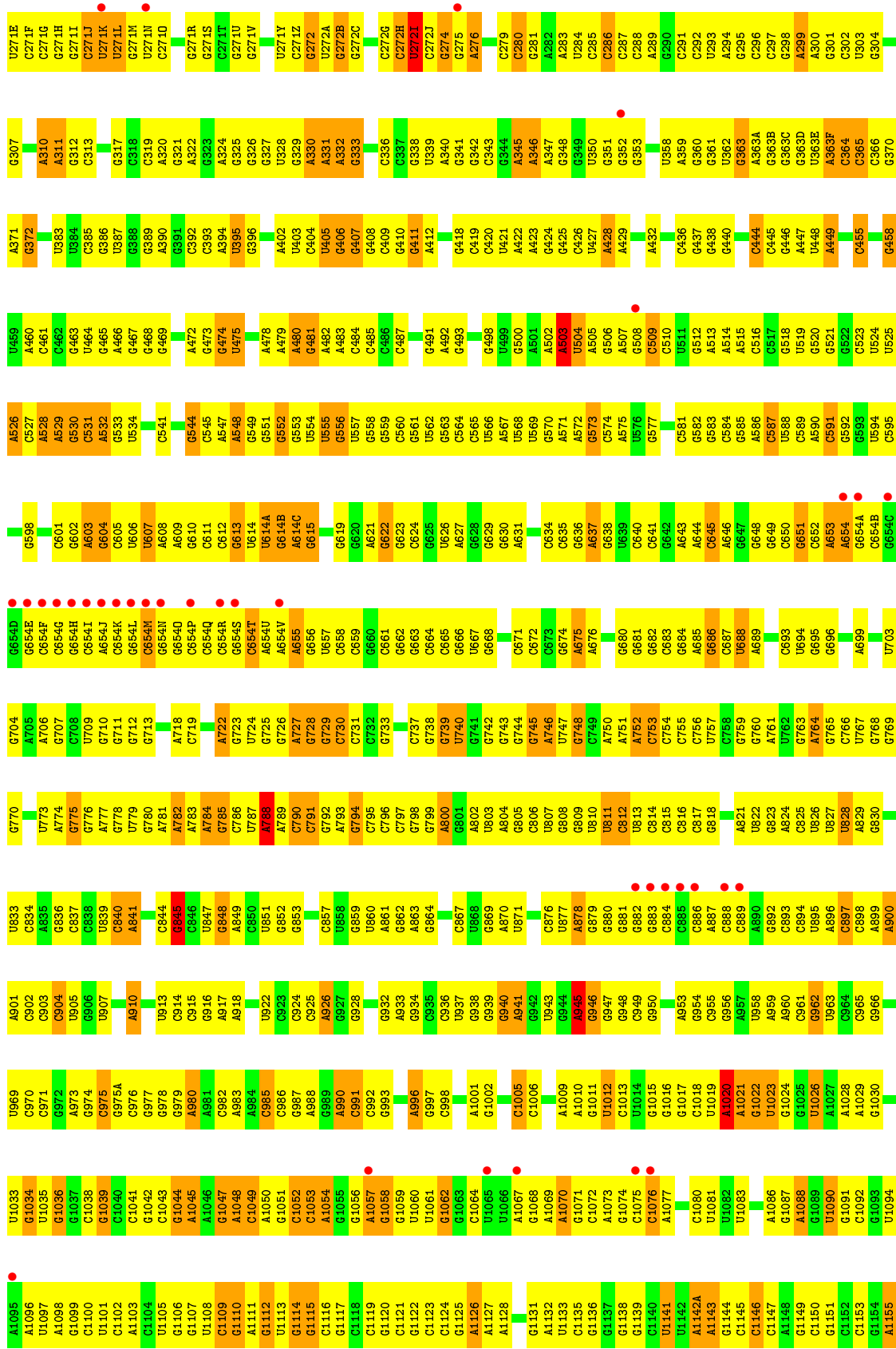


• Molecule 35: 50S RIBOSOMAL PROTEIN L36



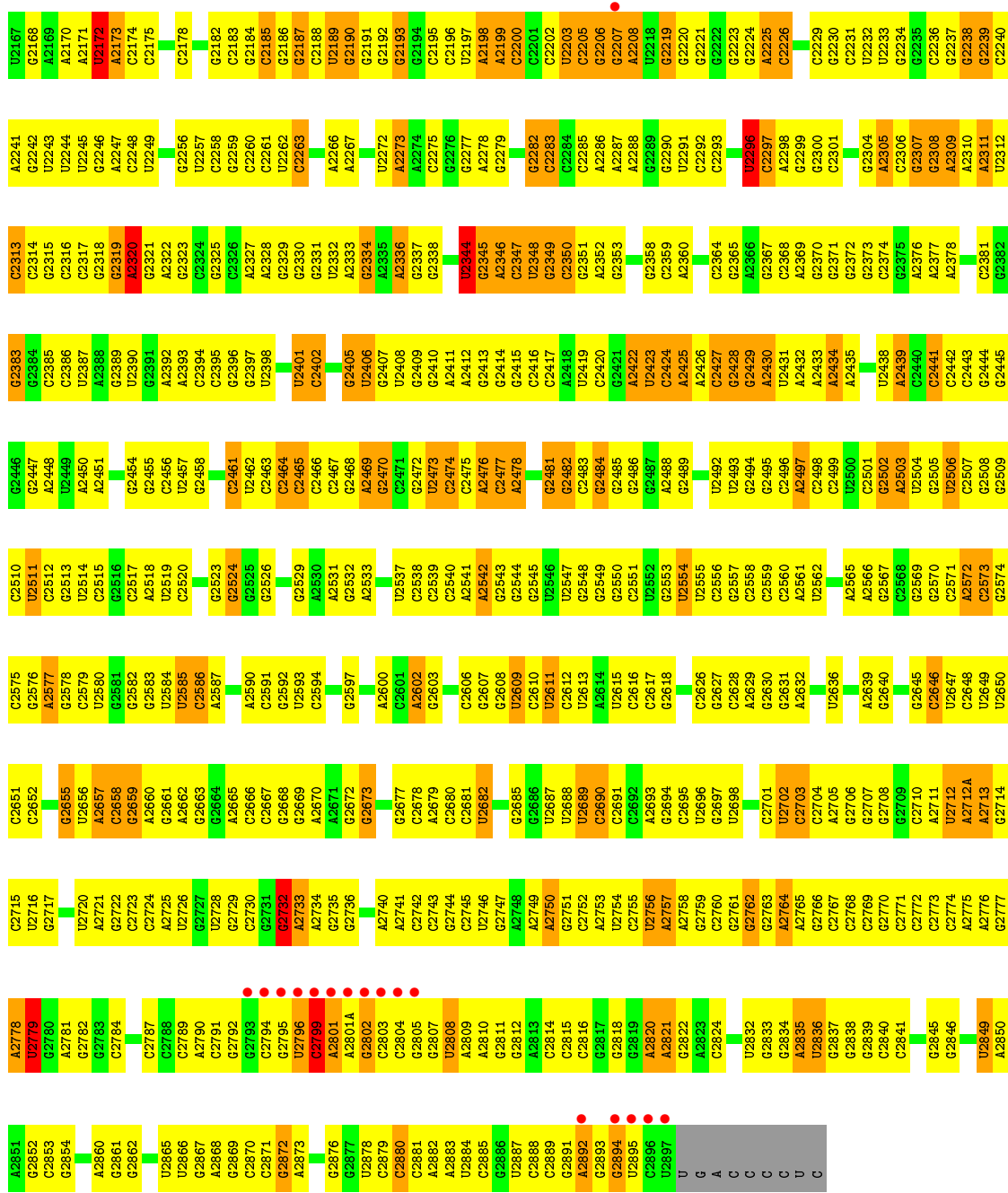
• Molecule 36: 23S RIBOSOMAL RNA



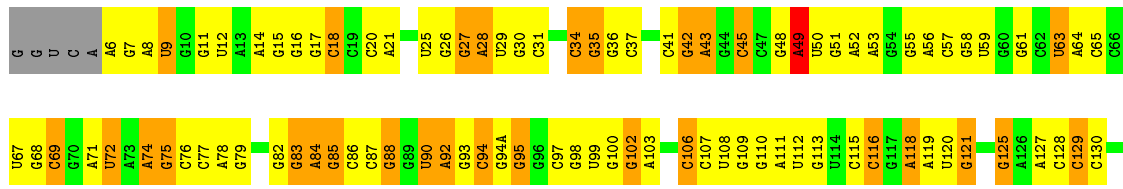




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G1878	U1985	G2029	A2030	G2031	G2032	A2033	U2034	G2035	G2036	G2037	G2038	G2039	C2040	U2041	A2042	C2043	G2044	G2046	G2049	C2050	G1985	A2051	G2052	G2053	G1989	A2054	C2055	G2056	A2057	A2060	G2061	A2062	C2065	U2068	G2069	G2070	A2071	G2072	C2073	G2147	G2148	G2149	G2151	G2152	G2080	C2081	A2082	G2083	C2084	G2090	U2091	U2092	G2093	C2097	U2098	G2165	G2100																						
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G1714	G1717	G1718	G1719	U1720	G1721	U1722	U1723	U1724	U1725	U1726	U1727	U1728	U1729	U1730	U1731	U1732	U1733	U1734	U1735	U1736	U1737	U1738	U1739	U1740	U1741	U1742	U1743	U1744	U1745	U1746	U1747	U1748	U1749	U1750	U1751	U1752	U1753	U1754	U1755	U1756	U1757	U1758	U1759	U1760	U1761	U1762	U1763	U1764	U1765	U1766	U1767	U1768	U1769	U1770	U1771	U1772	U1773	U1774	U1775	U1776	U1777	U1778	U1779	U1780	U1781	U1782	U1783	U1784	U1785	U1786	U1787	U1788	U1789	U1790	U1791	U1794	U1795	U1796	U1797
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• Molecule 36: 23S RIBOSOMAL RNA

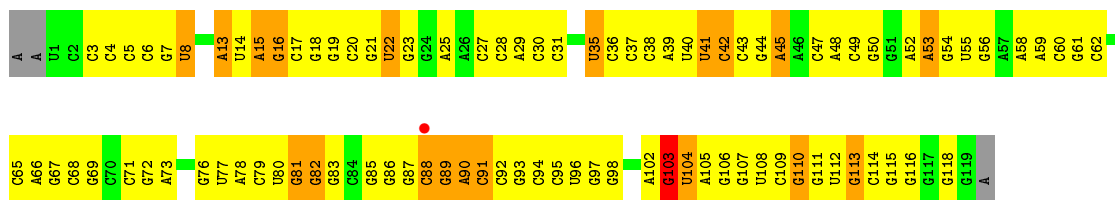




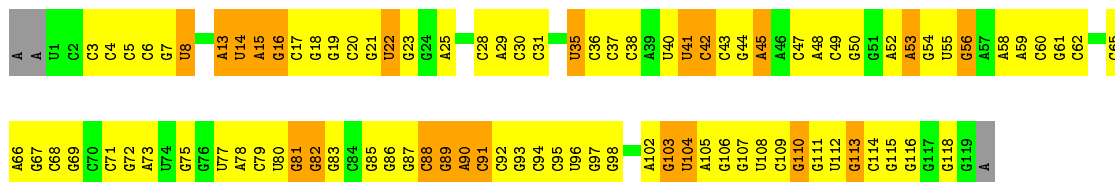
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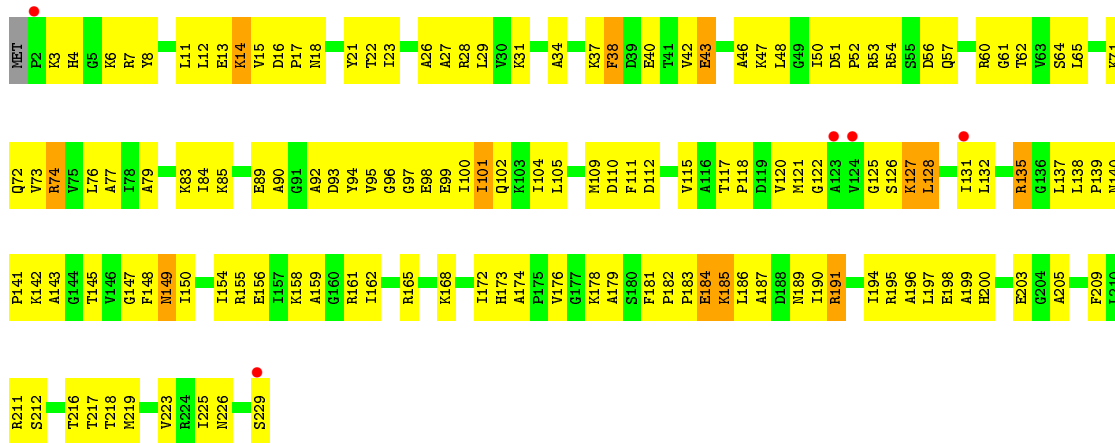
● Molecule 37: 5S RIBOSOMAL RNA



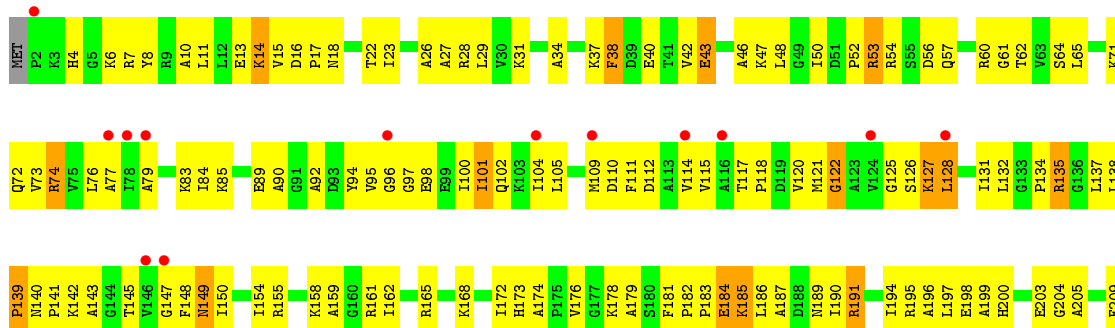
- Molecule 37: 5S RIBOSOMAL RNA

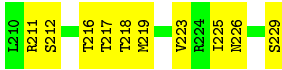


- Molecule 38: 50S RIBOSOMAL PROTEIN L1



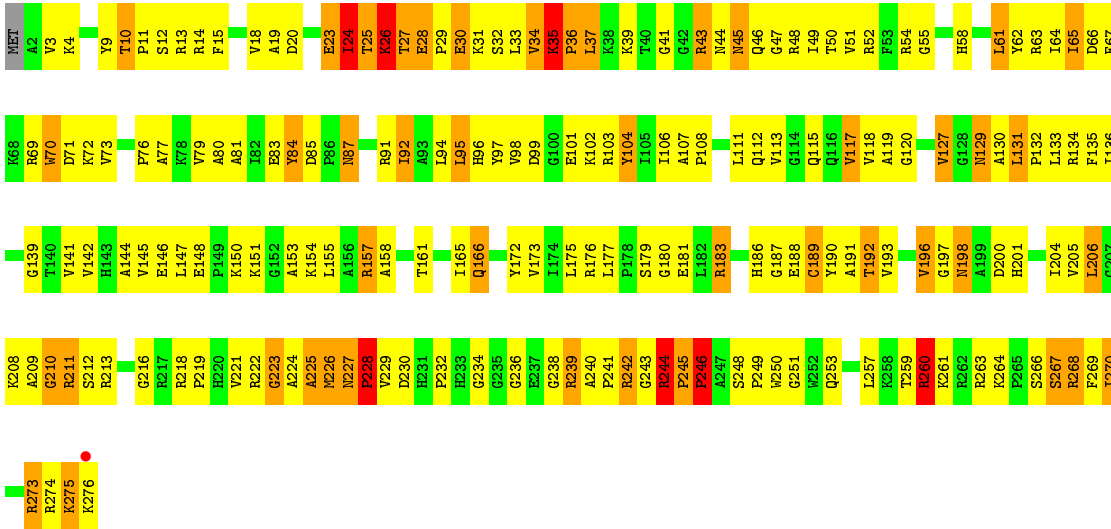
- Molecule 38: 50S RIBOSOMAL PROTEIN L1





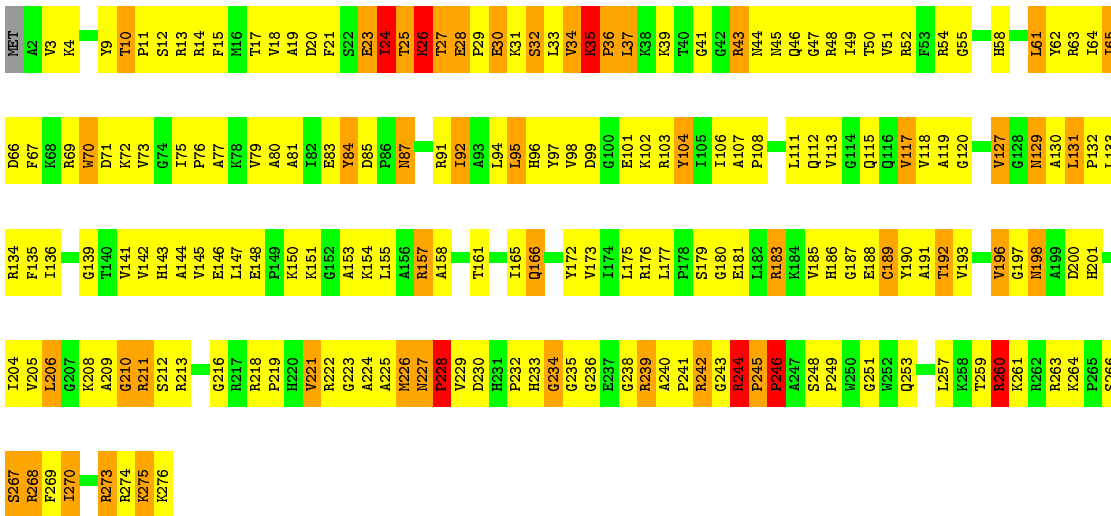
- Molecule 39: 50S RIBOSOMAL PROTEIN L2

Chain BD: 31% 50% 16%



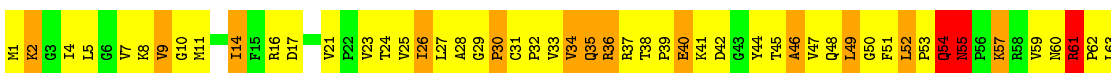
- Molecule 39: 50S RIBOSOMAL PROTEIN L2

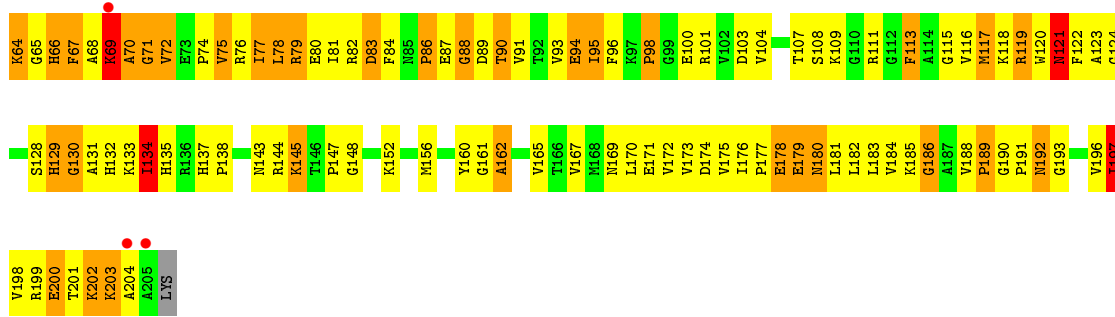
Chain DD: 29% 52% 16%



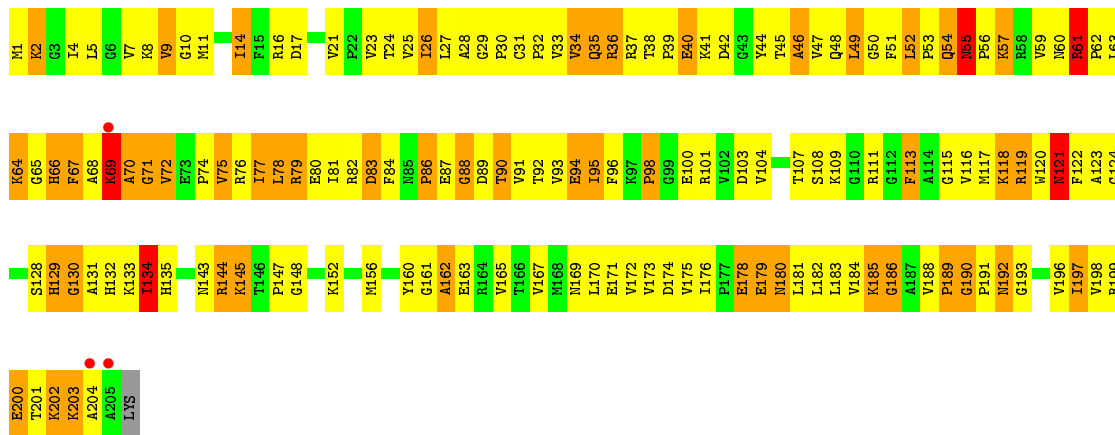
- Molecule 40: 50S RIBOSOMAL PROTEIN L3

Chain BE: 24% 50% 22%

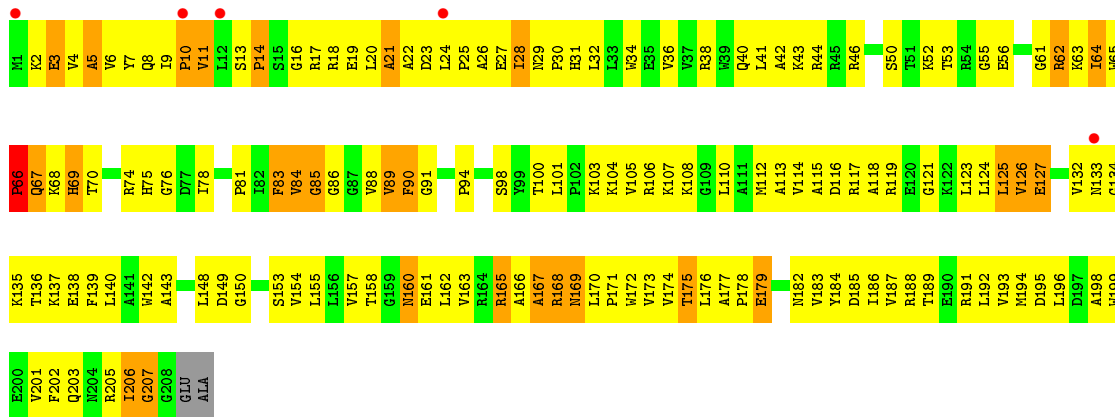




• Molecule 40: 50S RIBOSOMAL PROTEIN L3



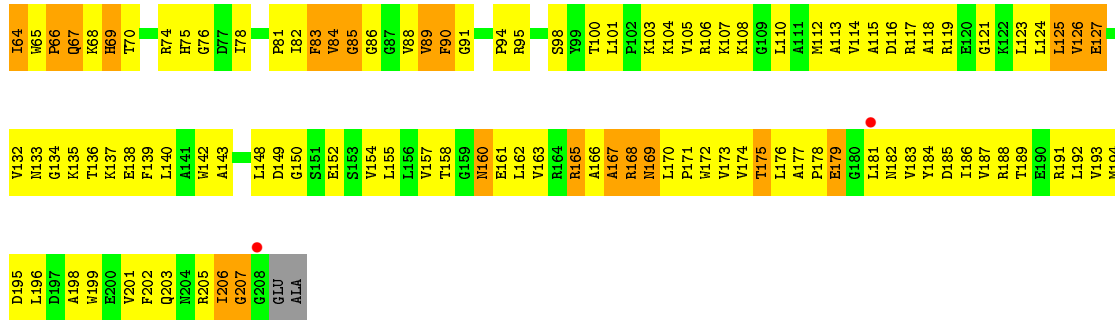
• Molecule 41: 50S RIBOSOMAL PROTEIN L4



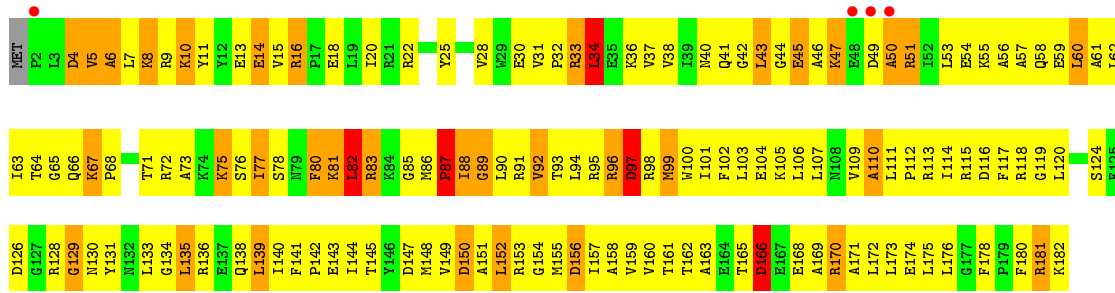
• Molecule 41: 50S RIBOSOMAL PROTEIN L4



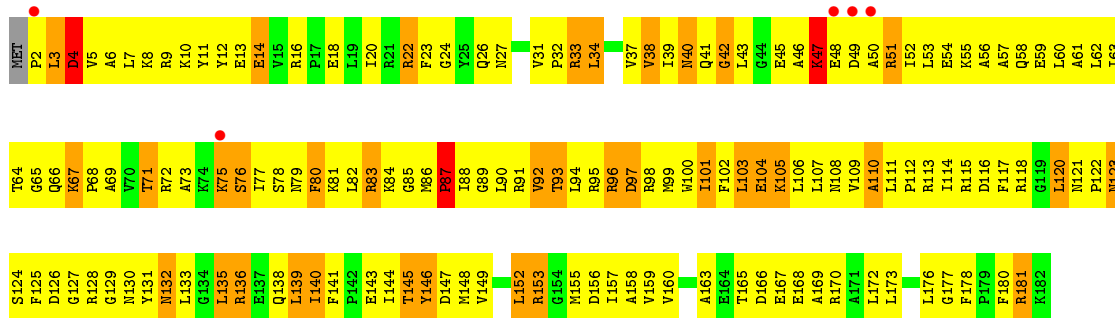




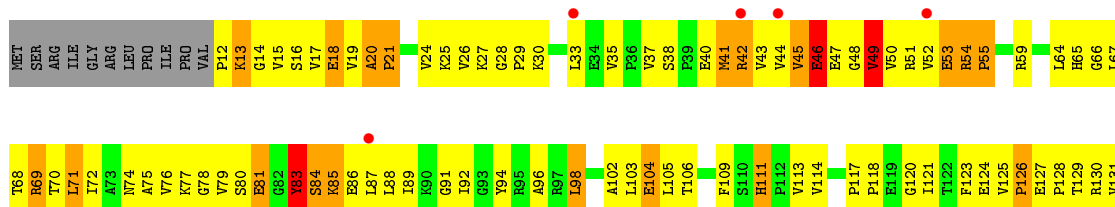
• Molecule 42: 50S RIBOSOMAL PROTEIN L5

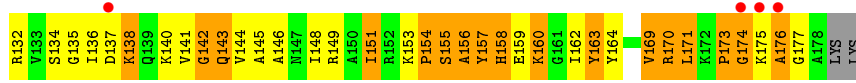


• Molecule 42: 50S RIBOSOMAL PROTEIN L5

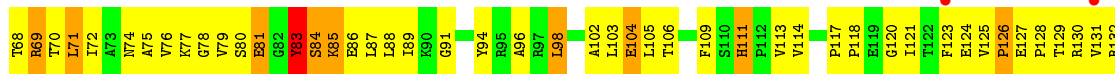


• Molecule 43: 50S RIBOSOMAL PROTEIN L6

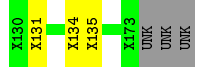




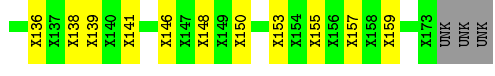
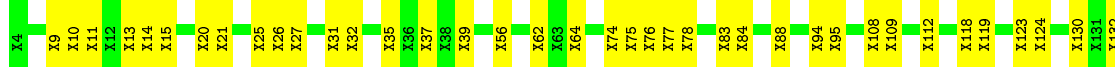
• Molecule 43: 50S RIBOSOMAL PROTEIN L6



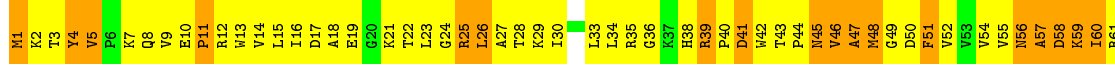
• Molecule 44: 50S RIBOSOMAL PROTEIN L10



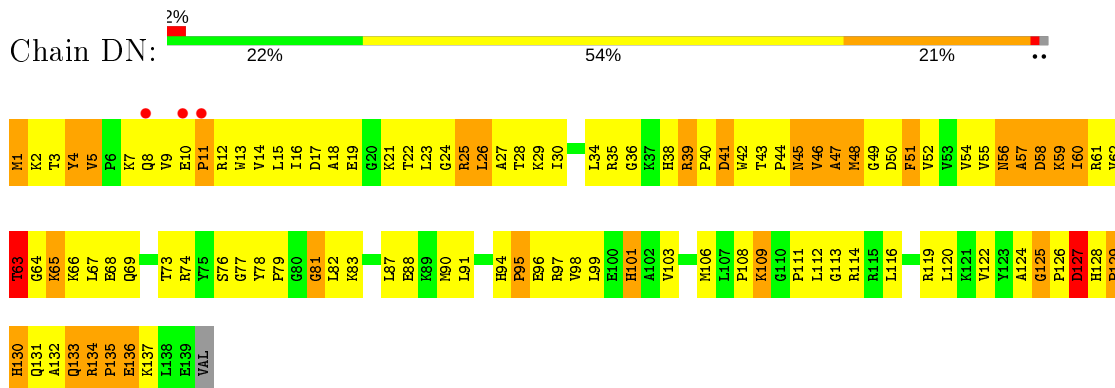
• Molecule 44: 50S RIBOSOMAL PROTEIN L10



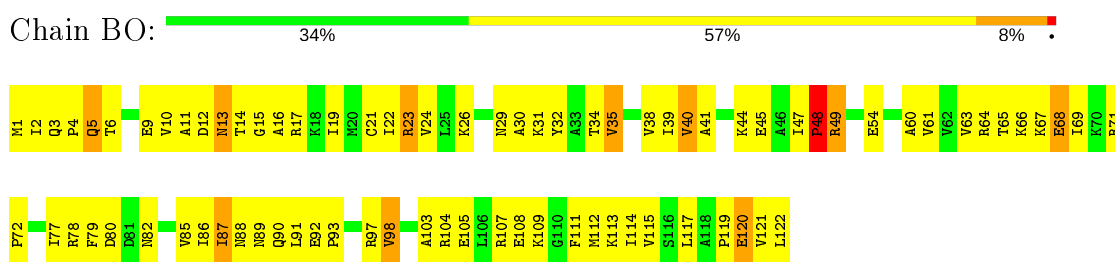
• Molecule 45: 50S RIBOSOMAL PROTEIN L13



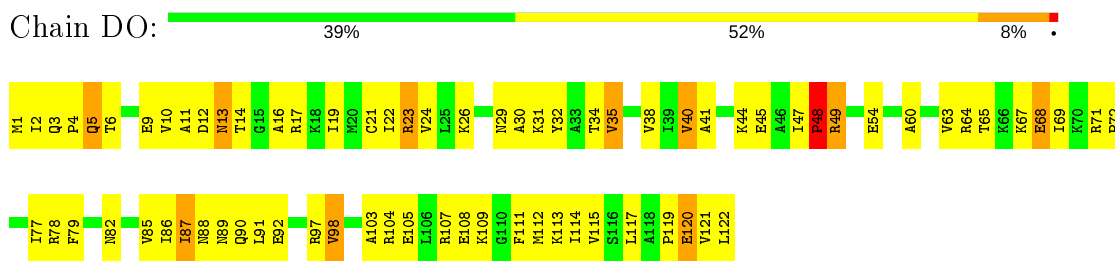
• Molecule 45: 50S RIBOSOMAL PROTEIN L13



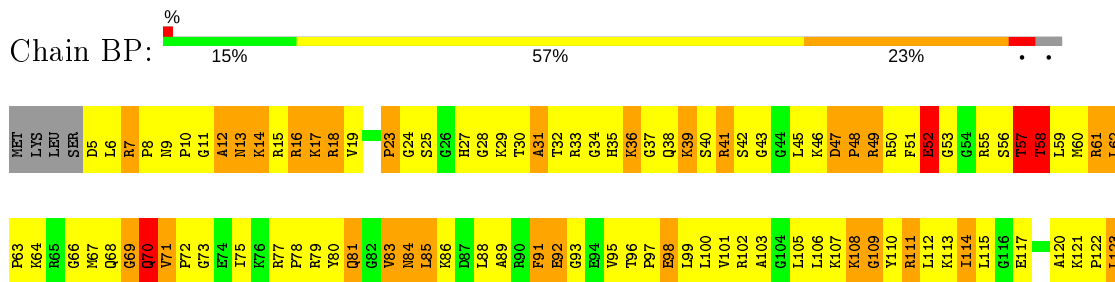
• Molecule 46: 50S RIBOSOMAL PROTEIN L14



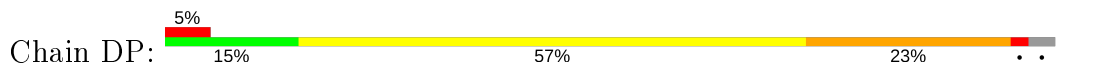
• Molecule 46: 50S RIBOSOMAL PROTEIN L14

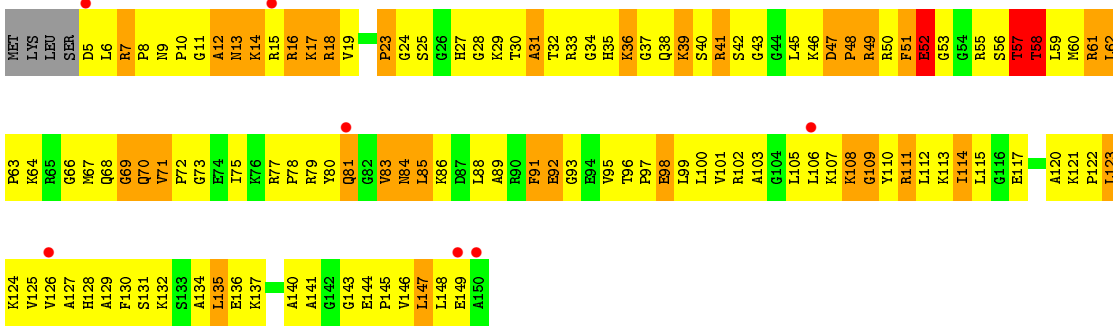


• Molecule 47: 50S RIBOSOMAL PROTEIN L15

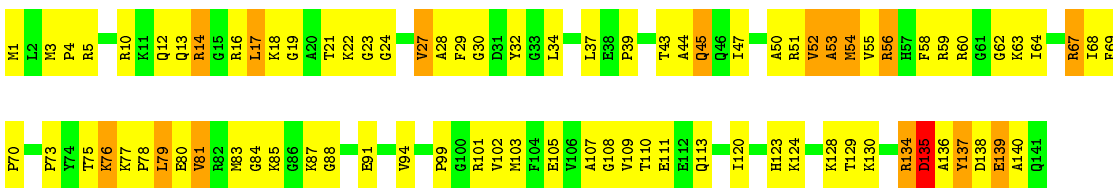


• Molecule 47: 50S RIBOSOMAL PROTEIN L15

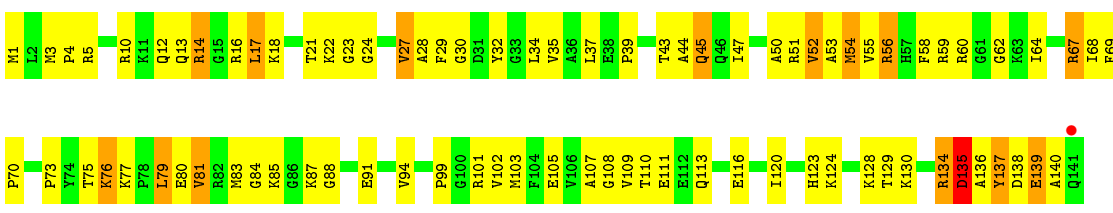




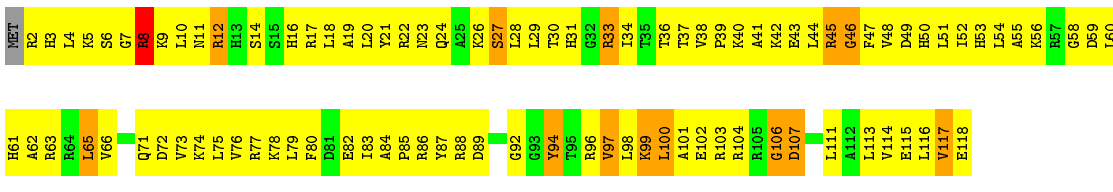
• Molecule 48: 50S RIBOSOMAL PROTEIN L16



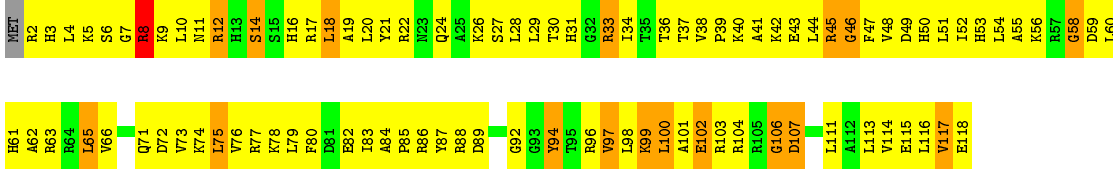
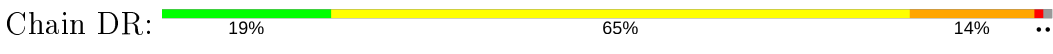
• Molecule 48: 50S RIBOSOMAL PROTEIN L16



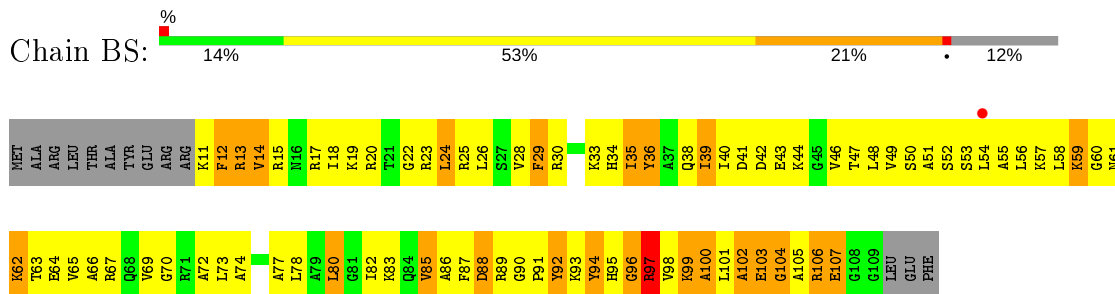
• Molecule 49: 50S RIBOSOMAL PROTEIN L17



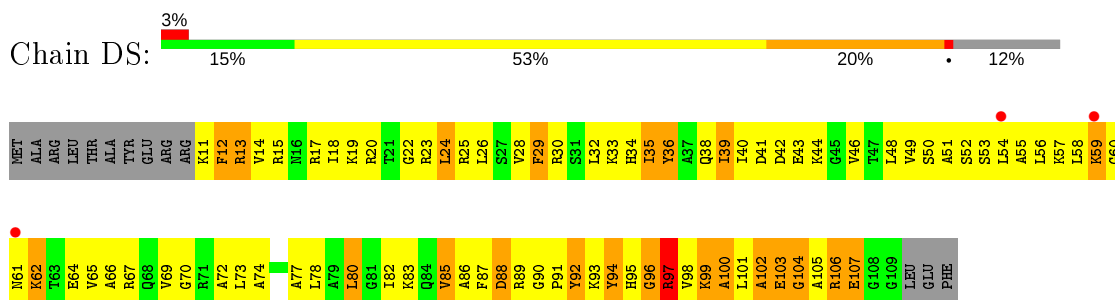
• Molecule 49: 50S RIBOSOMAL PROTEIN L17



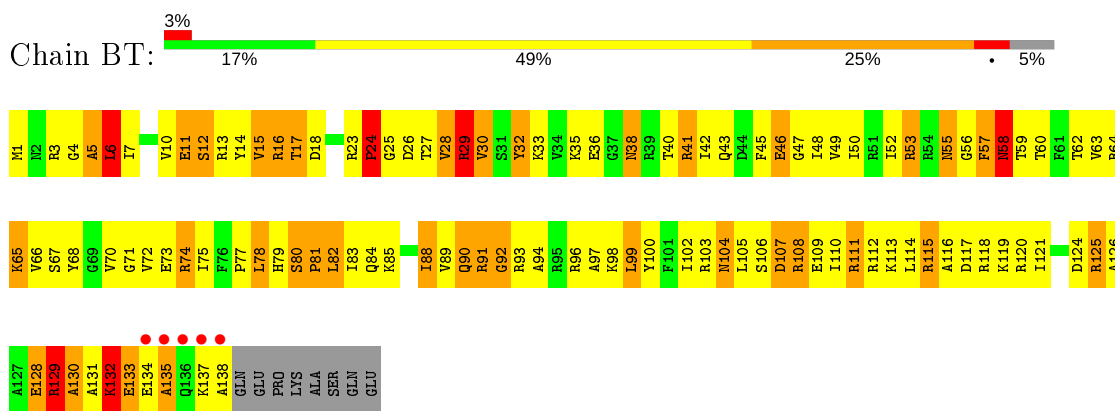
- Molecule 50: 50S RIBOSOMAL PROTEIN L18



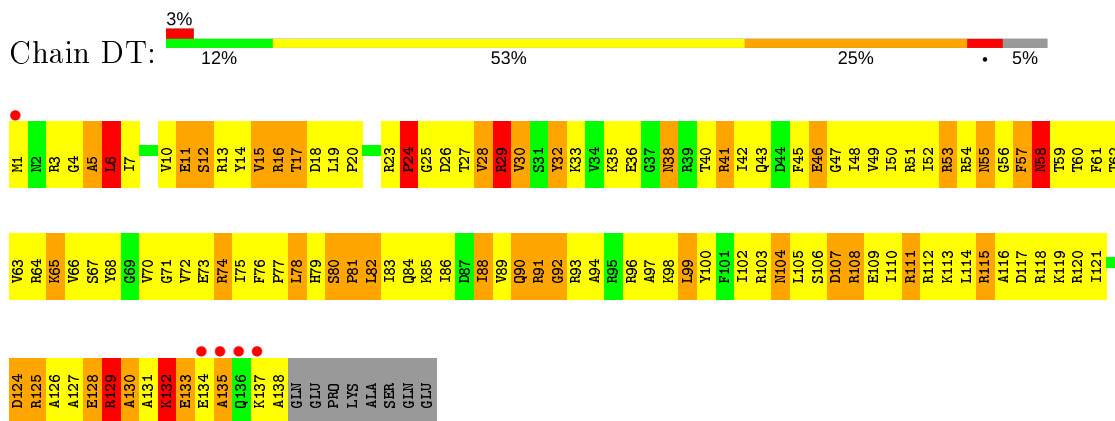
- Molecule 50: 50S RIBOSOMAL PROTEIN L18



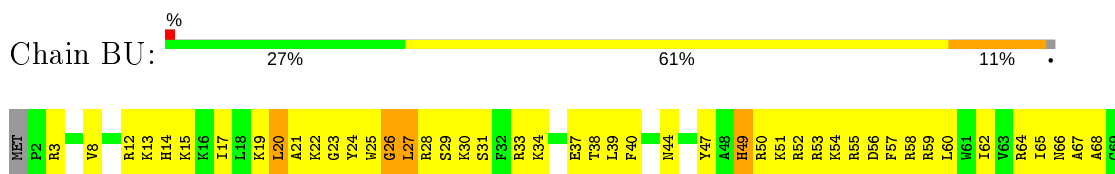
- Molecule 51: 50S RIBOSOMAL PROTEIN L19



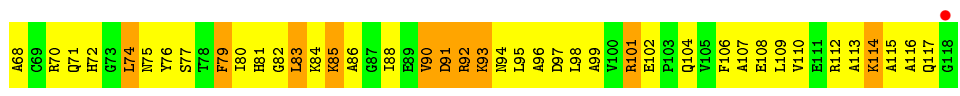
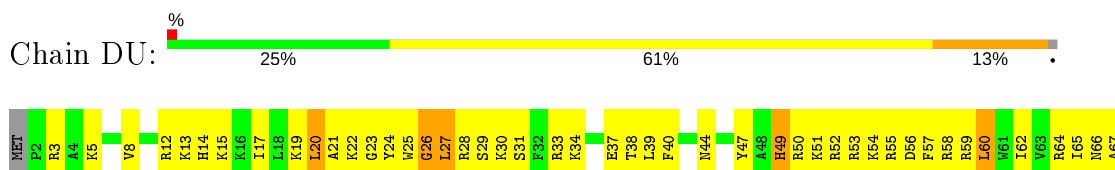
- Molecule 51: 50S RIBOSOMAL PROTEIN L19



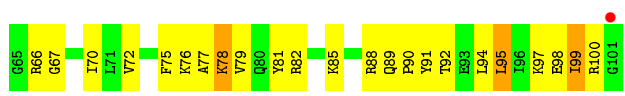
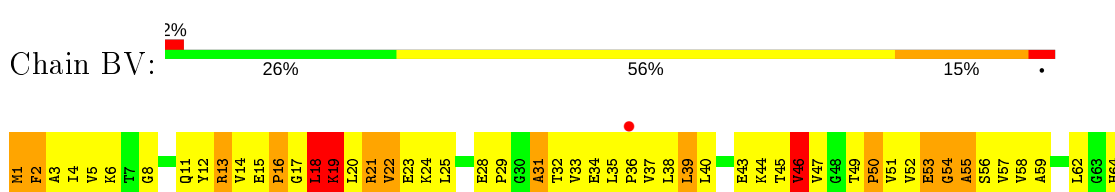
- Molecule 52: 50S RIBOSOMAL PROTEIN L20



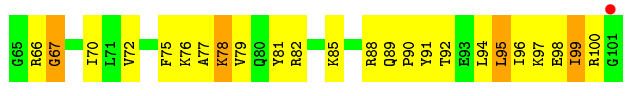
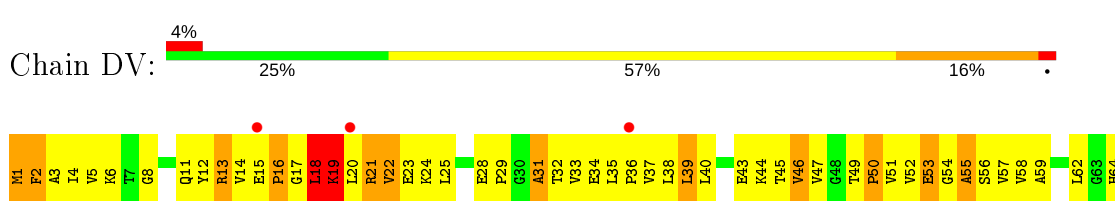
• Molecule 52: 50S RIBOSOMAL PROTEIN L20



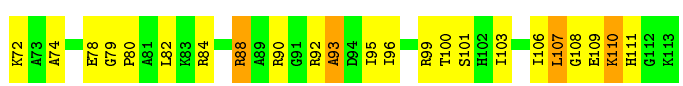
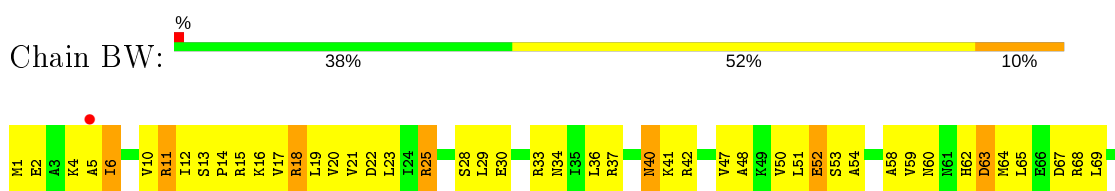
• Molecule 53: 50S RIBOSOMAL PROTEIN L21



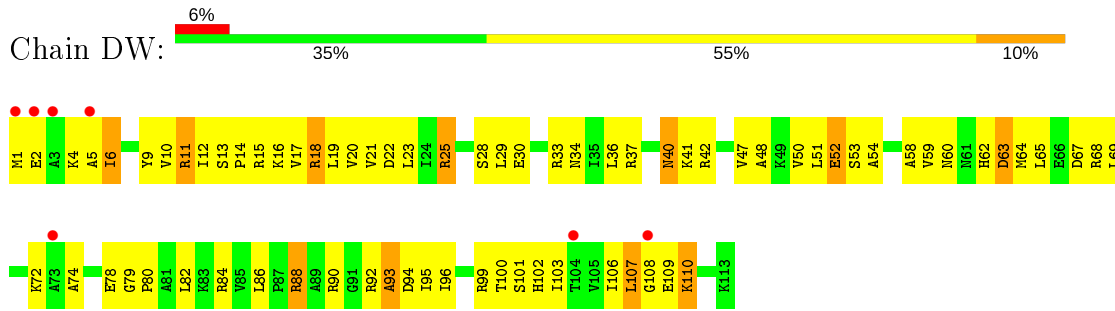
• Molecule 53: 50S RIBOSOMAL PROTEIN L21



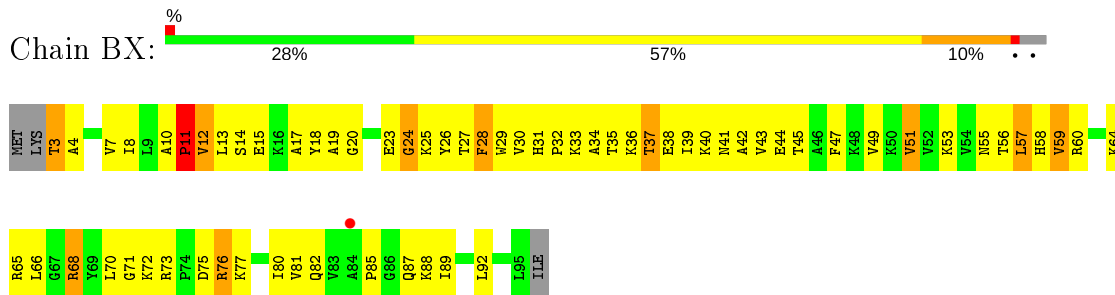
• Molecule 54: 50S RIBOSOMAL PROTEIN L22



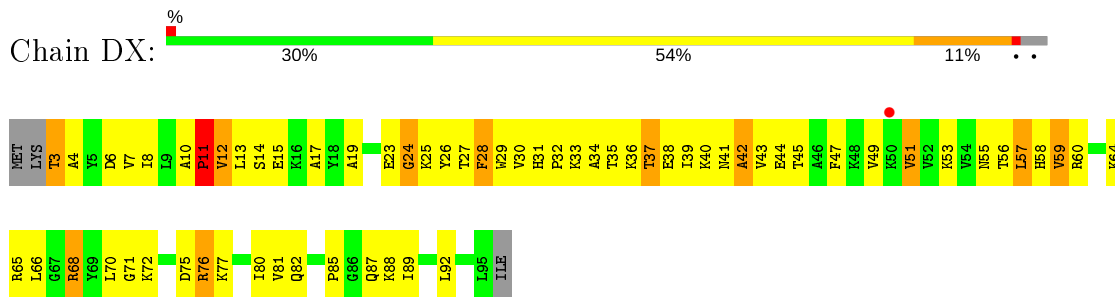
• Molecule 54: 50S RIBOSOMAL PROTEIN L22



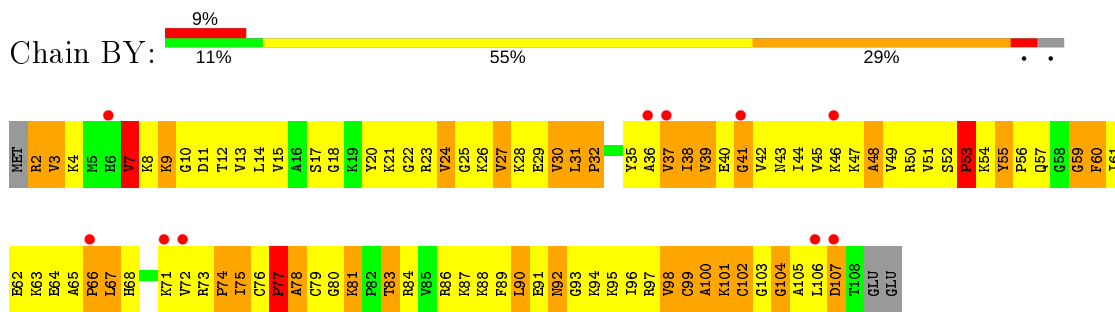
• Molecule 55: 50S RIBOSOMAL PROTEIN L23



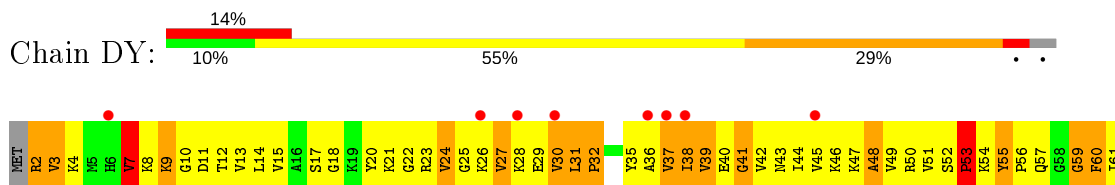
• Molecule 55: 50S RIBOSOMAL PROTEIN L23

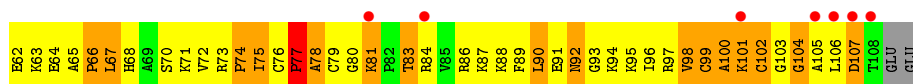


• Molecule 56: 50S RIBOSOMAL PROTEIN L24

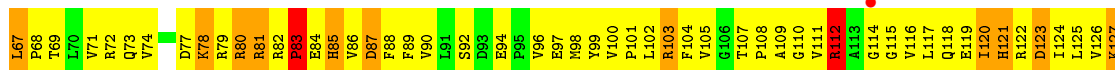


• Molecule 56: 50S RIBOSOMAL PROTEIN L24



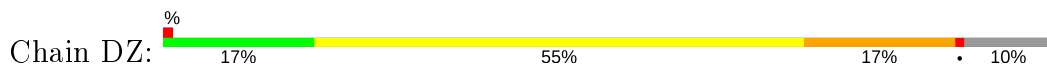


● Molecule 57: 50S RIBOSOMAL PROTEIN L25



PRO  
GLU  
VAL  
ILE  
LVS  
LYS  
GLY  
LVS  
GLU  
GLU  
GLU  
GLU  
GLU

● Molecule 57: 50S RIBOSOMAL PROTEIN L25



GLU  
VAL  
ALA  
GLU  
PRO  
GLU  
VAL  
ILE  
LVS  
LYS  
GLY  
LVS  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU  
GLU



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	291.36Å 269.43Å 401.95Å 90.00° 91.78° 90.00°	Depositor
Resolution (Å)	49.75 – 3.70 49.75 – 3.40	Depositor EDS
% Data completeness (in resolution range)	99.9 (49.75-3.70) 99.8 (49.75-3.40)	Depositor EDS
$R_{merge}$	0.20	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.47 (at 3.40Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, $R_{free}$	0.214 , 0.249 0.215 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	84.2	Xtriage
Anisotropy	0.051	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 96.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.41$ , $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	0.048 for h,-k,-l	Xtriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	307606	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	102.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.34% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GDP, 5MU, ZN, MG, FUA

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	AA	0.54	0/36190	0.74	23/56486 (0.0%)
1	CA	0.51	0/36190	0.74	16/56486 (0.0%)
2	AB	0.44	0/1936	0.67	0/2611
2	CB	0.41	0/1936	0.68	0/2611
3	AC	0.48	0/1637	0.64	0/2207
3	CC	0.43	0/1637	0.64	0/2207
4	AD	0.39	0/1733	0.65	0/2318
4	CD	0.39	0/1733	0.65	0/2318
5	AE	0.49	0/1163	0.68	0/1566
5	CE	0.50	0/1163	0.68	0/1566
6	AF	0.40	0/856	0.63	0/1154
6	CF	0.38	0/856	0.64	0/1154
7	AG	0.40	0/1276	0.60	0/1709
7	CG	0.38	0/1276	0.61	0/1709
8	AH	0.45	0/1136	0.71	0/1527
8	CH	0.43	0/1136	0.70	0/1527
9	AI	0.42	0/1027	0.67	0/1373
9	CI	0.40	0/1027	0.66	0/1373
10	AJ	0.45	0/808	0.69	0/1087
10	CJ	0.42	0/808	0.69	0/1087
11	AK	0.45	0/900	0.70	0/1213
11	CK	0.41	0/900	0.69	0/1213
12	AL	0.47	0/987	0.71	0/1322
12	CL	0.45	0/987	0.70	0/1322
13	AM	0.39	0/999	0.67	0/1338
13	CM	0.38	0/999	0.67	0/1338
14	AN	0.47	0/501	0.67	0/664
14	CN	0.45	0/501	0.67	0/664
15	AO	0.40	0/745	0.62	0/992
15	CO	0.39	0/745	0.62	0/992
16	AP	0.39	0/717	0.63	0/965
16	CP	0.40	0/717	0.62	0/965

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
17	AQ	0.47	0/837	0.66	0/1119
17	CQ	0.44	0/837	0.66	0/1119
18	AR	0.45	0/579	0.67	0/768
18	CR	0.46	0/579	0.68	0/768
19	AS	0.43	0/643	0.68	1/867 (0.1%)
19	CS	0.41	0/643	0.68	1/867 (0.1%)
20	AT	0.38	0/765	0.64	0/1007
20	CT	0.36	0/765	0.65	0/1007
21	AU	0.47	0/213	0.61	0/279
21	CU	0.46	0/213	0.62	0/279
22	AV	0.52	0/1809	0.70	0/2819
22	CV	0.46	0/1809	0.69	0/2819
23	AW	0.36	0/1810	0.70	0/2821
23	CW	0.95	2/1810 (0.1%)	0.68	0/2821
24	AX	0.38	0/288	0.72	0/446
24	CX	0.69	1/288 (0.3%)	0.85	1/446 (0.2%)
25	AY	0.47	0/5313	0.69	0/7195
25	CY	0.45	0/5313	0.68	0/7195
26	B0	0.40	0/671	0.66	0/892
26	D0	0.40	0/671	0.66	0/892
27	B1	0.42	0/739	0.71	0/983
27	D1	0.41	0/739	0.67	0/983
28	B2	0.32	0/600	0.64	0/793
28	D2	0.33	0/600	0.61	0/793
29	B3	0.40	0/473	0.59	0/636
29	D3	0.40	0/473	0.60	0/636
30	B4	0.47	0/461	0.83	1/623 (0.2%)
30	D4	0.48	0/461	0.83	1/623 (0.2%)
31	B5	0.37	0/473	0.69	0/639
31	D5	0.39	0/473	0.69	0/639
32	B6	0.62	0/440	0.94	2/586 (0.3%)
32	D6	0.56	0/440	0.93	2/586 (0.3%)
33	B7	0.43	0/427	0.68	0/563
33	D7	0.44	0/427	0.67	0/563
34	B8	0.54	0/516	0.83	0/681
34	D8	0.51	0/516	0.82	0/681
35	B9	0.42	0/310	0.65	0/407
35	D9	0.43	0/310	0.66	0/407
36	BA	0.50	3/69972 (0.0%)	0.74	35/109237 (0.0%)
36	DA	0.49	3/69972 (0.0%)	0.73	36/109237 (0.0%)
37	BB	0.41	0/2853	0.72	1/4451 (0.0%)
37	DB	0.41	0/2853	0.72	1/4451 (0.0%)
38	BC	0.55	1/1774 (0.1%)	0.61	0/2391

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
38	DC	0.41	0/1774	0.60	0/2391
39	BD	0.47	0/2195	0.77	1/2955 (0.0%)
39	DD	0.46	0/2195	0.76	1/2955 (0.0%)
40	BE	0.44	0/1597	0.70	0/2155
40	DE	0.44	0/1597	0.70	0/2155
41	BF	0.37	0/1659	0.62	0/2246
41	DF	0.36	0/1659	0.62	0/2246
42	BG	0.41	0/1498	0.74	1/2013 (0.0%)
42	DG	0.38	0/1498	0.69	0/2013
43	BH	0.36	0/1293	0.67	0/1746
43	DH	0.36	0/1293	0.67	0/1746
45	BN	0.35	0/1132	0.68	0/1527
45	DN	0.35	0/1132	0.68	0/1527
46	BO	0.44	0/943	0.66	0/1269
46	DO	0.44	0/943	0.66	0/1269
47	BP	0.41	0/1131	0.87	3/1504 (0.2%)
47	DP	0.40	0/1131	0.87	3/1504 (0.2%)
48	BQ	0.43	0/1143	0.63	0/1527
48	DQ	0.43	0/1143	0.63	0/1527
49	BR	0.37	0/974	0.66	0/1302
49	DR	0.36	0/974	0.66	0/1302
50	BS	0.39	0/779	0.68	0/1038
50	DS	0.37	0/779	0.67	0/1038
51	BT	0.45	0/1156	0.77	1/1544 (0.1%)
51	DT	0.45	0/1156	0.77	1/1544 (0.1%)
52	BU	0.39	0/975	0.64	0/1297
52	DU	0.40	0/975	0.64	0/1297
53	BV	0.36	0/790	0.67	0/1057
53	DV	0.35	0/790	0.68	0/1057
54	BW	0.36	0/907	0.62	0/1216
54	DW	0.35	0/907	0.62	0/1216
55	BX	0.40	0/740	0.65	0/995
55	DX	0.41	0/740	0.64	0/995
56	BY	0.39	0/824	0.62	0/1100
56	DY	0.39	0/824	0.62	0/1100
57	BZ	0.44	0/1500	0.67	0/2037
57	DZ	0.41	0/1500	0.70	0/2037
All	All	0.48	10/331626 (0.0%)	0.72	132/494526 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	AA	1	26
1	CA	1	21
22	AV	0	1
36	BA	2	39
36	DA	2	37
All	All	6	124

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
23	CW	38	A	O3'-P	37.35	2.06	1.61
38	BC	54	ARG	C-N	-15.66	0.98	1.34
24	CX	19	A	O3'-P	-9.03	1.50	1.61
36	BA	272(I)	U	N1-C2	7.87	1.45	1.38
36	DA	272(I)	U	N1-C2	7.37	1.45	1.38

The worst 5 of 132 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
36	BA	1992	G	C2'-C3'-O3'	10.46	132.51	109.50
36	DA	1992	G	C2'-C3'-O3'	10.39	132.37	109.50
1	AA	1498	U	C2'-C3'-O3'	9.73	130.91	109.50
1	CA	1498	U	C2'-C3'-O3'	9.60	130.62	109.50
36	BA	1799	G	C2'-C3'-O3'	9.35	130.07	109.50

5 of 6 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	AA	1498	U	C3'
36	BA	1799	G	C3'
36	BA	1992	G	C3'
1	CA	1498	U	C3'
36	DA	1799	G	C3'

5 of 124 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AA	108	G	Sidechain
1	AA	118	U	Sidechain
1	AA	202	U	Sidechain
1	AA	250	A	Sidechain
1	AA	436	C	Sidechain

## 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	AA	32329	0	16318	1169	0
1	CA	32329	0	16318	1210	0
2	AB	1901	0	1951	223	0
2	CB	1901	0	1951	225	0
3	AC	1613	0	1677	185	0
3	CC	1613	0	1677	191	0
4	AD	1703	0	1763	171	0
4	CD	1703	0	1763	178	0
5	AE	1147	0	1207	115	0
5	CE	1147	0	1207	112	0
6	AF	843	0	857	76	0
6	CF	843	0	857	79	0
7	AG	1257	0	1296	89	0
7	CG	1257	0	1296	93	0
8	AH	1116	0	1177	89	0
8	CH	1116	0	1177	88	0
9	AI	1010	0	1035	139	0
9	CI	1010	0	1035	137	0
10	AJ	795	0	840	154	0
10	CJ	795	0	840	159	0
11	AK	885	0	904	56	0
11	CK	885	0	904	63	0
12	AL	971	0	1057	142	0
12	CL	971	0	1057	145	0
13	AM	988	0	1059	156	0
13	CM	988	0	1059	154	0
14	AN	492	0	529	64	0
14	CN	492	0	529	63	0
15	AO	734	0	771	69	0
15	CO	734	0	771	73	0
16	AP	701	0	720	66	0
16	CP	701	0	720	67	0
17	AQ	824	0	891	57	0
17	CQ	824	0	891	65	0
18	AR	574	0	644	79	0
18	CR	574	0	644	79	0
19	AS	630	0	652	106	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	CS	630	0	652	108	0
20	AT	763	0	861	97	0
20	CT	763	0	861	94	0
21	AU	209	0	221	18	0
21	CU	209	0	221	17	0
22	AV	1619	0	822	60	0
22	CV	1619	0	822	58	0
23	AW	1641	0	839	126	0
23	CW	1641	0	840	115	0
24	AX	257	0	130	45	0
24	CX	257	0	130	51	0
25	AY	5215	0	5288	857	0
25	CY	5215	0	5287	809	0
26	B0	662	0	688	98	0
26	D0	662	0	688	99	0
27	B1	732	0	808	126	0
27	D1	732	0	808	112	0
28	B2	598	0	653	84	0
28	D2	598	0	653	113	0
29	B3	468	0	523	59	0
29	D3	468	0	523	64	0
30	B4	451	0	449	93	0
30	D4	451	0	449	88	0
31	B5	459	0	480	101	0
31	D5	459	0	480	99	0
32	B6	433	0	461	150	0
32	D6	433	0	461	149	0
33	B7	419	0	467	38	0
33	D7	419	0	467	36	0
34	B8	508	0	576	96	0
34	D8	508	0	576	101	0
35	B9	307	0	335	30	0
35	D9	307	0	335	27	0
36	BA	62474	0	31497	2601	0
36	DA	62474	0	31497	2636	0
37	BB	2551	0	1295	132	0
37	DB	2551	0	1295	139	0
38	BC	1742	0	1797	158	0
38	DC	1742	0	1798	160	0
39	BD	2145	0	2234	304	0
39	DD	2145	0	2234	315	0
40	BE	1564	0	1629	249	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
40	DE	1564	0	1629	244	0
41	BF	1624	0	1677	237	0
41	DF	1624	0	1677	232	0
42	BG	1474	0	1534	241	0
42	DG	1474	0	1534	261	0
43	BH	1269	0	1337	178	0
43	DH	1269	0	1337	176	0
44	BJ	851	0	194	31	0
44	DJ	851	0	195	32	0
45	BN	1105	0	1180	183	0
45	DN	1105	0	1180	184	0
46	BO	933	0	996	109	0
46	DO	933	0	996	102	0
47	BP	1114	0	1187	296	0
47	DP	1114	0	1187	297	0
48	BQ	1122	0	1179	134	0
48	DQ	1122	0	1179	123	0
49	BR	960	0	1021	150	0
49	DR	960	0	1021	152	0
50	BS	771	0	832	153	0
50	DS	771	0	832	146	0
51	BT	1142	0	1202	242	0
51	DT	1142	0	1202	241	0
52	BU	958	0	1015	133	0
52	DU	958	0	1015	139	0
53	BV	779	0	852	140	0
53	DV	779	0	852	140	0
54	BW	896	0	953	100	0
54	DW	896	0	953	99	0
55	BX	726	0	778	79	0
55	DX	726	0	778	83	0
56	BY	811	0	901	175	0
56	DY	811	0	901	179	0
57	BZ	1468	0	1492	200	0
57	DZ	1468	0	1492	219	0
58	AD	1	0	0	0	0
58	AN	1	0	0	0	0
58	B4	1	0	0	0	0
58	B9	1	0	0	0	0
58	CD	1	0	0	0	0
58	CN	1	0	0	0	0
58	D4	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
58	D9	1	0	0	0	0
59	AY	37	0	47	15	0
59	CY	37	0	47	26	0
60	AY	28	0	12	13	0
60	CY	28	0	12	10	0
61	AY	1	0	0	0	0
61	CY	1	0	0	0	0
All	All	307606	0	211582	21259	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 41.

The worst 5 of 21259 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:BC:121:MET:CE	38:BC:121:MET:SD	2.02	1.48
1:CA:1503:A:N1	24:CX:11:A:C2	1.82	1.47
23:CW:34:C:C3'	23:CW:35:A:H5''	1.42	1.47
38:DC:121:MET:CE	38:DC:121:MET:SD	2.02	1.46
38:DC:109:MET:CE	38:DC:109:MET:SD	2.03	1.44

There are no symmetry-related clashes.

## 5.3 Torsion angles [\(i\)](#)

### 5.3.1 Protein backbone [\(i\)](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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
2	AB	233/256 (91%)	148 (64%)	52 (22%)	33 (14%)	0 3
2	CB	233/256 (91%)	148 (64%)	52 (22%)	33 (14%)	0 3
3	AC	205/239 (86%)	146 (71%)	32 (16%)	27 (13%)	0 4
3	CC	205/239 (86%)	148 (72%)	31 (15%)	26 (13%)	0 4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	AD	206/209 (99%)	138 (67%)	47 (23%)	21 (10%)	0	7
4	CD	206/209 (99%)	138 (67%)	49 (24%)	19 (9%)	1	9
5	AE	149/162 (92%)	117 (78%)	26 (17%)	6 (4%)	3	26
5	CE	149/162 (92%)	118 (79%)	26 (17%)	5 (3%)	3	30
6	AF	99/101 (98%)	69 (70%)	26 (26%)	4 (4%)	3	26
6	CF	99/101 (98%)	69 (70%)	26 (26%)	4 (4%)	3	26
7	AG	153/156 (98%)	112 (73%)	27 (18%)	14 (9%)	1	9
7	CG	153/156 (98%)	112 (73%)	29 (19%)	12 (8%)	1	12
8	AH	136/138 (99%)	106 (78%)	26 (19%)	4 (3%)	4	32
8	CH	136/138 (99%)	105 (77%)	27 (20%)	4 (3%)	4	32
9	AI	121/128 (94%)	85 (70%)	27 (22%)	9 (7%)	1	13
9	CI	121/128 (94%)	87 (72%)	25 (21%)	9 (7%)	1	13
10	AJ	97/105 (92%)	67 (69%)	19 (20%)	11 (11%)	0	5
10	CJ	97/105 (92%)	68 (70%)	18 (19%)	11 (11%)	0	5
11	AK	117/129 (91%)	85 (73%)	23 (20%)	9 (8%)	1	13
11	CK	117/129 (91%)	85 (73%)	23 (20%)	9 (8%)	1	13
12	AL	123/132 (93%)	84 (68%)	19 (15%)	20 (16%)	0	3
12	CL	123/132 (93%)	84 (68%)	19 (15%)	20 (16%)	0	3
13	AM	123/126 (98%)	75 (61%)	30 (24%)	18 (15%)	0	3
13	CM	123/126 (98%)	75 (61%)	30 (24%)	18 (15%)	0	3
14	AN	58/61 (95%)	43 (74%)	10 (17%)	5 (9%)	1	10
14	CN	58/61 (95%)	42 (72%)	11 (19%)	5 (9%)	1	10
15	AO	86/89 (97%)	55 (64%)	24 (28%)	7 (8%)	1	11
15	CO	86/89 (97%)	54 (63%)	25 (29%)	7 (8%)	1	11
16	AP	82/88 (93%)	62 (76%)	15 (18%)	5 (6%)	1	18
16	CP	82/88 (93%)	63 (77%)	14 (17%)	5 (6%)	1	18
17	AQ	98/105 (93%)	80 (82%)	15 (15%)	3 (3%)	4	32
17	CQ	98/105 (93%)	80 (82%)	15 (15%)	3 (3%)	4	32
18	AR	68/88 (77%)	47 (69%)	13 (19%)	8 (12%)	0	5
18	CR	68/88 (77%)	48 (71%)	12 (18%)	8 (12%)	0	5
19	AS	77/93 (83%)	42 (54%)	17 (22%)	18 (23%)	0	0

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	CS	77/93 (83%)	40 (52%)	19 (25%)	18 (23%)	0	0
20	AT	97/106 (92%)	57 (59%)	28 (29%)	12 (12%)	0	4
20	CT	97/106 (92%)	57 (59%)	27 (28%)	13 (13%)	0	4
21	AU	23/27 (85%)	13 (56%)	7 (30%)	3 (13%)	0	4
21	CU	23/27 (85%)	13 (56%)	7 (30%)	3 (13%)	0	4
25	AY	663/691 (96%)	458 (69%)	126 (19%)	79 (12%)	0	5
25	CY	663/691 (96%)	482 (73%)	125 (19%)	56 (8%)	1	10
26	B0	82/85 (96%)	63 (77%)	15 (18%)	4 (5%)	2	22
26	D0	82/85 (96%)	63 (77%)	15 (18%)	4 (5%)	2	22
27	B1	92/98 (94%)	74 (80%)	8 (9%)	10 (11%)	0	6
27	D1	92/98 (94%)	71 (77%)	12 (13%)	9 (10%)	0	8
28	B2	69/72 (96%)	40 (58%)	21 (30%)	8 (12%)	0	5
28	D2	69/72 (96%)	34 (49%)	26 (38%)	9 (13%)	0	4
29	B3	58/60 (97%)	35 (60%)	19 (33%)	4 (7%)	1	15
29	D3	58/60 (97%)	35 (60%)	19 (33%)	4 (7%)	1	15
30	B4	56/71 (79%)	27 (48%)	14 (25%)	15 (27%)	0	0
30	D4	56/71 (79%)	27 (48%)	14 (25%)	15 (27%)	0	0
31	B5	57/60 (95%)	37 (65%)	10 (18%)	10 (18%)	0	2
31	D5	57/60 (95%)	37 (65%)	10 (18%)	10 (18%)	0	2
32	B6	48/54 (89%)	21 (44%)	13 (27%)	14 (29%)	0	0
32	D6	48/54 (89%)	21 (44%)	13 (27%)	14 (29%)	0	0
33	B7	47/49 (96%)	38 (81%)	8 (17%)	1 (2%)	7	38
33	D7	47/49 (96%)	38 (81%)	8 (17%)	1 (2%)	7	38
34	B8	62/65 (95%)	30 (48%)	18 (29%)	14 (23%)	0	0
34	D8	62/65 (95%)	30 (48%)	18 (29%)	14 (23%)	0	0
35	B9	35/37 (95%)	25 (71%)	6 (17%)	4 (11%)	0	5
35	D9	35/37 (95%)	25 (71%)	6 (17%)	4 (11%)	0	5
38	BC	226/229 (99%)	175 (77%)	42 (19%)	9 (4%)	3	26
38	DC	226/229 (99%)	176 (78%)	40 (18%)	10 (4%)	2	24
39	BD	273/276 (99%)	184 (67%)	54 (20%)	35 (13%)	0	4
39	DD	273/276 (99%)	185 (68%)	53 (19%)	35 (13%)	0	4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
40	BE	203/206 (98%)	123 (61%)	39 (19%)	41 (20%)	0	1
40	DE	203/206 (98%)	122 (60%)	39 (19%)	42 (21%)	0	1
41	BF	206/210 (98%)	138 (67%)	45 (22%)	23 (11%)	0	5
41	DF	206/210 (98%)	138 (67%)	44 (21%)	24 (12%)	0	5
42	BG	177/182 (97%)	116 (66%)	39 (22%)	22 (12%)	0	4
42	DG	177/182 (97%)	112 (63%)	44 (25%)	21 (12%)	0	5
43	BH	165/180 (92%)	89 (54%)	40 (24%)	36 (22%)	0	1
43	DH	165/180 (92%)	90 (54%)	40 (24%)	35 (21%)	0	1
45	BN	137/140 (98%)	87 (64%)	26 (19%)	24 (18%)	0	2
45	DN	137/140 (98%)	88 (64%)	25 (18%)	24 (18%)	0	2
46	BO	120/122 (98%)	97 (81%)	13 (11%)	10 (8%)	1	10
46	DO	120/122 (98%)	97 (81%)	13 (11%)	10 (8%)	1	10
47	BP	144/150 (96%)	79 (55%)	38 (26%)	27 (19%)	0	1
47	DP	144/150 (96%)	79 (55%)	39 (27%)	26 (18%)	0	1
48	BQ	139/141 (99%)	106 (76%)	25 (18%)	8 (6%)	1	19
48	DQ	139/141 (99%)	107 (77%)	25 (18%)	7 (5%)	2	22
49	BR	115/118 (98%)	81 (70%)	23 (20%)	11 (10%)	0	8
49	DR	115/118 (98%)	81 (70%)	22 (19%)	12 (10%)	0	7
50	BS	97/112 (87%)	42 (43%)	32 (33%)	23 (24%)	0	0
50	DS	97/112 (87%)	41 (42%)	34 (35%)	22 (23%)	0	0
51	BT	136/146 (93%)	77 (57%)	32 (24%)	27 (20%)	0	1
51	DT	136/146 (93%)	78 (57%)	31 (23%)	27 (20%)	0	1
52	BU	115/118 (98%)	78 (68%)	30 (26%)	7 (6%)	1	18
52	DU	115/118 (98%)	76 (66%)	31 (27%)	8 (7%)	1	15
53	BV	99/101 (98%)	69 (70%)	17 (17%)	13 (13%)	0	4
53	DV	99/101 (98%)	68 (69%)	18 (18%)	13 (13%)	0	4
54	BW	111/113 (98%)	78 (70%)	23 (21%)	10 (9%)	1	9
54	DW	111/113 (98%)	76 (68%)	25 (22%)	10 (9%)	1	9
55	BX	91/96 (95%)	55 (60%)	27 (30%)	9 (10%)	0	8
55	DX	91/96 (95%)	55 (60%)	26 (29%)	10 (11%)	0	6
56	BY	105/110 (96%)	44 (42%)	32 (30%)	29 (28%)	0	0

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
56	DY	105/110 (96%)	44 (42%)	32 (30%)	29 (28%)	0	0
57	BZ	183/206 (89%)	116 (63%)	39 (21%)	28 (15%)	0	3
57	DZ	183/206 (89%)	118 (64%)	34 (19%)	31 (17%)	0	2
All	All	12924/13672 (94%)	8641 (67%)	2723 (21%)	1560 (12%)	0	4

5 of 1560 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	AB	12	GLU
2	AB	13	ALA
2	AB	15	VAL
2	AB	74	LYS
2	AB	75	LYS

### 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 X-ray entries followed by that with respect to entries of similar resolution.

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	
2	AB	202/220 (92%)	184 (91%)	18 (9%)	9	37
2	CB	202/220 (92%)	183 (91%)	19 (9%)	8	35
3	AC	160/188 (85%)	139 (87%)	21 (13%)	4	22
3	CC	160/188 (85%)	139 (87%)	21 (13%)	4	22
4	AD	180/181 (99%)	160 (89%)	20 (11%)	6	28
4	CD	180/181 (99%)	160 (89%)	20 (11%)	6	28
5	AE	115/123 (94%)	104 (90%)	11 (10%)	8	34
5	CE	115/123 (94%)	104 (90%)	11 (10%)	8	34
6	AF	90/90 (100%)	83 (92%)	7 (8%)	12	42
6	CF	90/90 (100%)	83 (92%)	7 (8%)	12	42
7	AG	126/127 (99%)	117 (93%)	9 (7%)	14	45
7	CG	126/127 (99%)	118 (94%)	8 (6%)	18	49
8	AH	119/119 (100%)	110 (92%)	9 (8%)	13	43

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	CH	119/119 (100%)	110 (92%)	9 (8%)	13	43
9	AI	98/99 (99%)	91 (93%)	7 (7%)	14	45
9	CI	98/99 (99%)	91 (93%)	7 (7%)	14	45
10	AJ	88/92 (96%)	77 (88%)	11 (12%)	4	23
10	CJ	88/92 (96%)	76 (86%)	12 (14%)	3	21
11	AK	90/99 (91%)	87 (97%)	3 (3%)	38	64
11	CK	90/99 (91%)	87 (97%)	3 (3%)	38	64
12	AL	104/109 (95%)	93 (89%)	11 (11%)	6	30
12	CL	104/109 (95%)	93 (89%)	11 (11%)	6	30
13	AM	99/101 (98%)	90 (91%)	9 (9%)	9	36
13	CM	99/101 (98%)	90 (91%)	9 (9%)	9	36
14	AN	49/50 (98%)	44 (90%)	5 (10%)	7	31
14	CN	49/50 (98%)	44 (90%)	5 (10%)	7	31
15	AO	79/80 (99%)	73 (92%)	6 (8%)	13	43
15	CO	79/80 (99%)	73 (92%)	6 (8%)	13	43
16	AP	72/74 (97%)	68 (94%)	4 (6%)	21	53
16	CP	72/74 (97%)	68 (94%)	4 (6%)	21	53
17	AQ	94/97 (97%)	89 (95%)	5 (5%)	22	54
17	CQ	94/97 (97%)	88 (94%)	6 (6%)	17	48
18	AR	61/77 (79%)	58 (95%)	3 (5%)	25	56
18	CR	61/77 (79%)	58 (95%)	3 (5%)	25	56
19	AS	69/80 (86%)	60 (87%)	9 (13%)	4	22
19	CS	69/80 (86%)	60 (87%)	9 (13%)	4	22
20	AT	76/82 (93%)	66 (87%)	10 (13%)	4	22
20	CT	76/82 (93%)	67 (88%)	9 (12%)	5	26
21	AU	19/22 (86%)	18 (95%)	1 (5%)	22	54
21	CU	19/22 (86%)	18 (95%)	1 (5%)	22	54
25	AY	563/582 (97%)	495 (88%)	68 (12%)	5	24
25	CY	563/582 (97%)	498 (88%)	65 (12%)	5	27
26	B0	66/67 (98%)	59 (89%)	7 (11%)	6	30
26	D0	66/67 (98%)	59 (89%)	7 (11%)	6	30

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
27	B1	78/83 (94%)	68 (87%)	10 (13%)	4	23
27	D1	78/83 (94%)	72 (92%)	6 (8%)	13	43
28	B2	66/67 (98%)	60 (91%)	6 (9%)	9	36
28	D2	66/67 (98%)	61 (92%)	5 (8%)	13	43
29	B3	51/52 (98%)	48 (94%)	3 (6%)	19	51
29	D3	51/52 (98%)	48 (94%)	3 (6%)	19	51
30	B4	51/63 (81%)	39 (76%)	12 (24%)	1	5
30	D4	51/63 (81%)	39 (76%)	12 (24%)	1	5
31	B5	51/52 (98%)	47 (92%)	4 (8%)	12	42
31	D5	51/52 (98%)	47 (92%)	4 (8%)	12	42
32	B6	49/52 (94%)	39 (80%)	10 (20%)	1	8
32	D6	49/52 (94%)	39 (80%)	10 (20%)	1	8
33	B7	41/42 (98%)	36 (88%)	5 (12%)	5	24
33	D7	41/42 (98%)	36 (88%)	5 (12%)	5	24
34	B8	53/55 (96%)	45 (85%)	8 (15%)	3	17
34	D8	53/55 (96%)	44 (83%)	9 (17%)	2	13
35	B9	34/34 (100%)	32 (94%)	2 (6%)	19	51
35	D9	34/34 (100%)	32 (94%)	2 (6%)	19	51
38	BC	180/181 (99%)	169 (94%)	11 (6%)	18	50
38	DC	180/181 (99%)	168 (93%)	12 (7%)	16	47
39	BD	217/218 (100%)	182 (84%)	35 (16%)	2	15
39	DD	217/218 (100%)	182 (84%)	35 (16%)	2	15
40	BE	165/166 (99%)	140 (85%)	25 (15%)	3	17
40	DE	165/166 (99%)	140 (85%)	25 (15%)	3	17
41	BF	165/166 (99%)	154 (93%)	11 (7%)	16	47
41	DF	165/166 (99%)	154 (93%)	11 (7%)	16	47
42	BG	155/156 (99%)	127 (82%)	28 (18%)	1	11
42	DG	155/156 (99%)	126 (81%)	29 (19%)	1	10
43	BH	136/148 (92%)	125 (92%)	11 (8%)	11	41
43	DH	136/148 (92%)	125 (92%)	11 (8%)	11	41
45	BN	117/119 (98%)	103 (88%)	14 (12%)	5	25

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
45	DN	117/119 (98%)	103 (88%)	14 (12%)	5	25
46	BO	100/100 (100%)	94 (94%)	6 (6%)	19	50
46	DO	100/100 (100%)	94 (94%)	6 (6%)	19	50
47	BP	112/116 (97%)	93 (83%)	19 (17%)	2	13
47	DP	112/116 (97%)	92 (82%)	20 (18%)	2	11
48	BQ	111/111 (100%)	101 (91%)	10 (9%)	9	37
48	DQ	111/111 (100%)	101 (91%)	10 (9%)	9	37
49	BR	100/101 (99%)	89 (89%)	11 (11%)	6	29
49	DR	100/101 (99%)	87 (87%)	13 (13%)	4	22
50	BS	77/88 (88%)	69 (90%)	8 (10%)	7	30
50	DS	77/88 (88%)	69 (90%)	8 (10%)	7	30
51	BT	120/127 (94%)	96 (80%)	24 (20%)	1	8
51	DT	120/127 (94%)	96 (80%)	24 (20%)	1	8
52	BU	92/94 (98%)	82 (89%)	10 (11%)	6	29
52	DU	92/94 (98%)	81 (88%)	11 (12%)	5	25
53	BV	82/82 (100%)	72 (88%)	10 (12%)	5	24
53	DV	82/82 (100%)	73 (89%)	9 (11%)	6	29
54	BW	91/92 (99%)	86 (94%)	5 (6%)	21	53
54	DW	91/92 (99%)	86 (94%)	5 (6%)	21	53
55	BX	74/78 (95%)	65 (88%)	9 (12%)	5	24
55	DX	74/78 (95%)	65 (88%)	9 (12%)	5	24
56	BY	87/91 (96%)	76 (87%)	11 (13%)	4	23
56	DY	87/91 (96%)	76 (87%)	11 (13%)	4	23
57	BZ	162/179 (90%)	137 (85%)	25 (15%)	2	17
57	DZ	162/179 (90%)	145 (90%)	17 (10%)	7	30
All	All	10872/11344 (96%)	9687 (89%)	1185 (11%)	6	29

5 of 1185 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
52	BU	108	GLU
5	CE	79	GLU
50	DS	67	ARG

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Mol	Chain	Res	Type
54	BW	107	LEU
2	CB	36	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 349 such sidechains are listed below:

Mol	Chain	Res	Type
53	BV	11	GLN
7	CG	13	GLN
48	DQ	45	GLN
55	BX	82	GLN
3	CC	110	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	1503/1522 (98%)	254 (16%)	36 (2%)
1	CA	1503/1522 (98%)	252 (16%)	34 (2%)
22	AV	75/76 (98%)	13 (17%)	1 (1%)
22	CV	75/76 (98%)	15 (20%)	1 (1%)
23	AW	76/77 (98%)	27 (35%)	1 (1%)
23	CW	76/77 (98%)	27 (35%)	1 (1%)
24	AX	12/25 (48%)	8 (66%)	2 (16%)
24	CX	12/25 (48%)	7 (58%)	2 (16%)
36	BA	2900/2915 (99%)	588 (20%)	61 (2%)
36	DA	2900/2915 (99%)	585 (20%)	63 (2%)
37	BB	118/122 (96%)	25 (21%)	0
37	DB	118/122 (96%)	25 (21%)	0
All	All	9368/9474 (98%)	1826 (19%)	202 (2%)

5 of 1826 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	7	G
1	AA	9	G
1	AA	31	G
1	AA	32	A
1	AA	33	A

5 of 202 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
36	BA	2345	G
1	CA	429	U
36	DA	2198	A
36	BA	2481	G
1	CA	60	A

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

2 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
23	5MU	AW	54	23	15,22,23	1.13	2 (13%)	16,32,35	3.72	1 (6%)
23	5MU	CW	54	23	15,22,23	1.12	2 (13%)	16,32,35	3.72	1 (6%)

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
23	5MU	AW	54	23	-	0/5/25/26	0/2/2/2
23	5MU	CW	54	23	-	0/5/25/26	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
23	CW	54	5MU	C4-N3	3.21	1.38	1.33
23	AW	54	5MU	C4-N3	3.17	1.38	1.33
23	CW	54	5MU	C6-C5	-2.14	1.34	1.40
23	AW	54	5MU	C6-C5	-2.04	1.34	1.40

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	AW	54	5MU	C4-N3-C2	14.52	127.40	115.14
23	CW	54	5MU	C4-N3-C2	14.50	127.39	115.14

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
23	AW	54	5MU	2	0
23	CW	54	5MU	2	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 10 are monoatomic - leaving 4 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
59	FUA	AY	701	-	36,40,40	1.76	6 (16%)	46,64,64	1.51	5 (10%)
60	GDP	CY	702	61	24,30,30	1.45	4 (16%)	31,47,47	1.99	9 (29%)
59	FUA	CY	701	-	36,40,40	1.78	6 (16%)	46,64,64	1.45	9 (19%)
60	GDP	AY	702	61	24,30,30	1.37	3 (12%)	31,47,47	2.02	7 (22%)

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
59	FUA	AY	701	-	-	6/11/92/92	0/4/4/4
60	GDP	CY	702	61	-	0/12/32/32	0/3/3/3
59	FUA	CY	701	-	-	6/11/92/92	0/4/4/4
60	GDP	AY	702	61	-	2/12/32/32	0/3/3/3

The worst 5 of 19 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	CY	701	FUA	C23-C22	-6.73	1.39	1.51
59	AY	701	FUA	C23-C22	-6.55	1.39	1.51
60	CY	702	GDP	C6-N1	4.55	1.41	1.33
60	AY	702	GDP	C6-N1	4.32	1.40	1.33
59	AY	701	FUA	C23-C24	-4.27	1.39	1.53

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	AY	702	GDP	C2-N3-C4	5.34	121.45	115.36
60	AY	702	GDP	N3-C2-N1	-5.06	120.47	127.22
60	CY	702	GDP	N3-C2-N1	-5.04	120.50	127.22
60	AY	702	GDP	C5-C6-N1	-4.56	117.20	123.43
59	AY	701	FUA	C13-C12-C11	-4.33	105.84	111.90

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

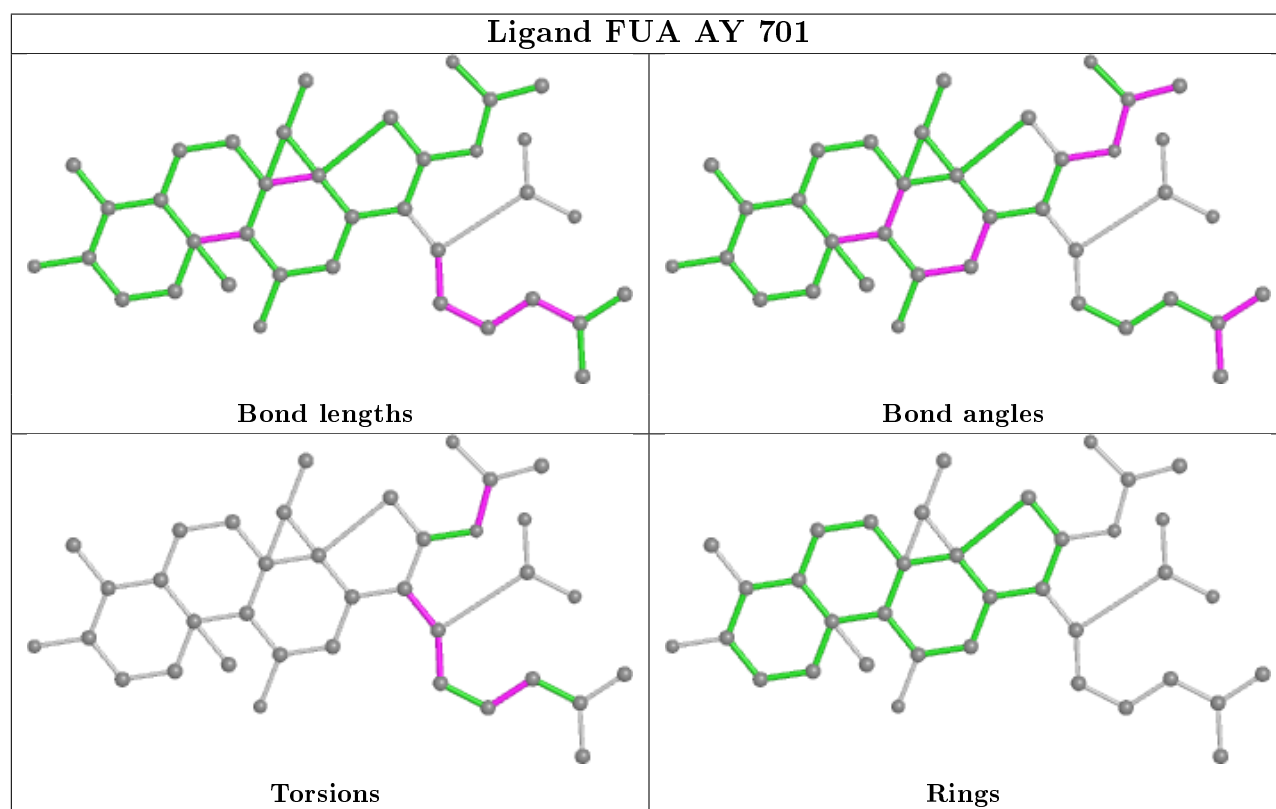
Mol	Chain	Res	Type	Atoms
59	AY	701	FUA	C13-C17-C22-C29
59	AY	701	FUA	C17-C22-C23-C24
59	AY	701	FUA	C29-C22-C23-C24
59	CY	701	FUA	C13-C17-C22-C29
59	CY	701	FUA	C17-C22-C23-C24

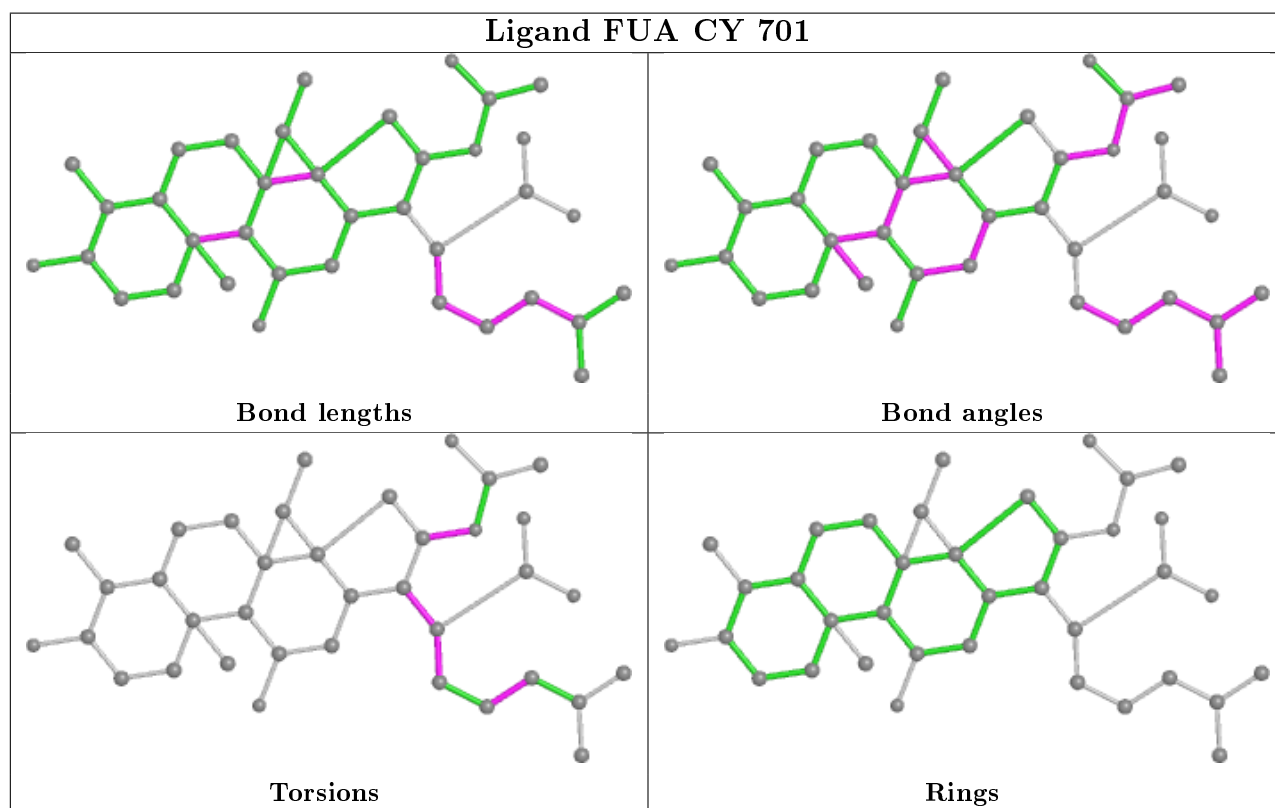
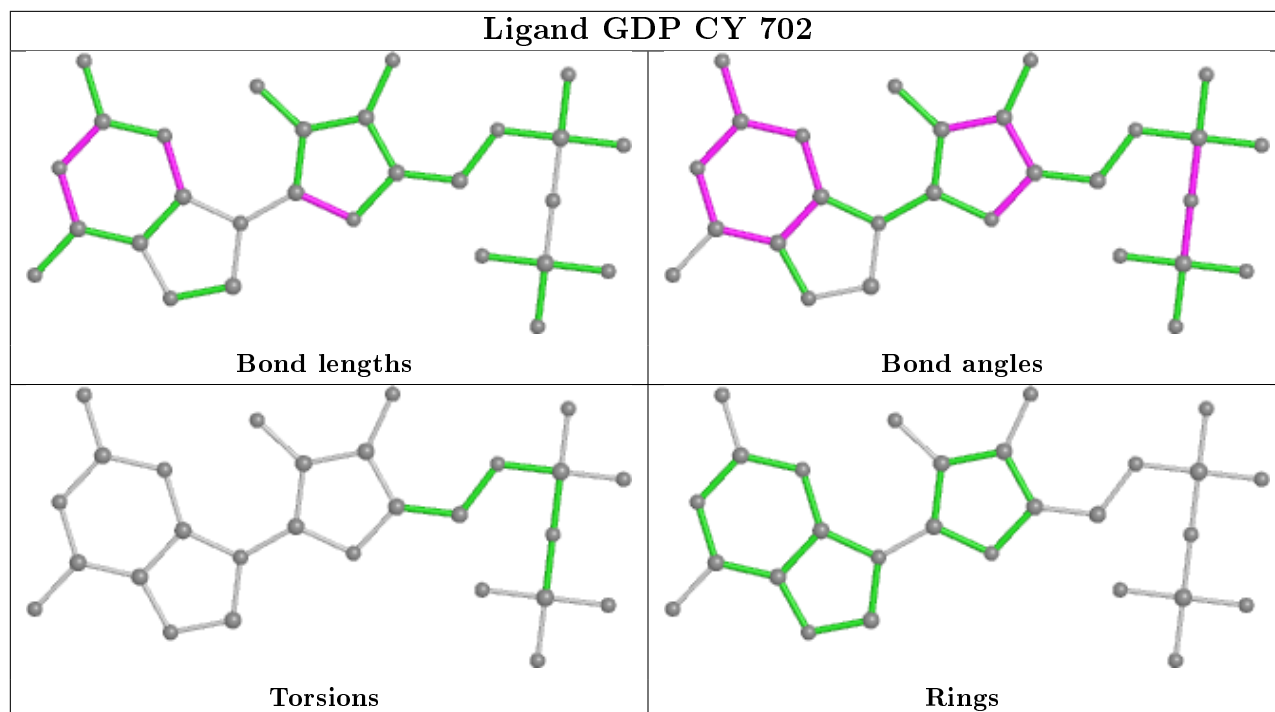
There are no ring outliers.

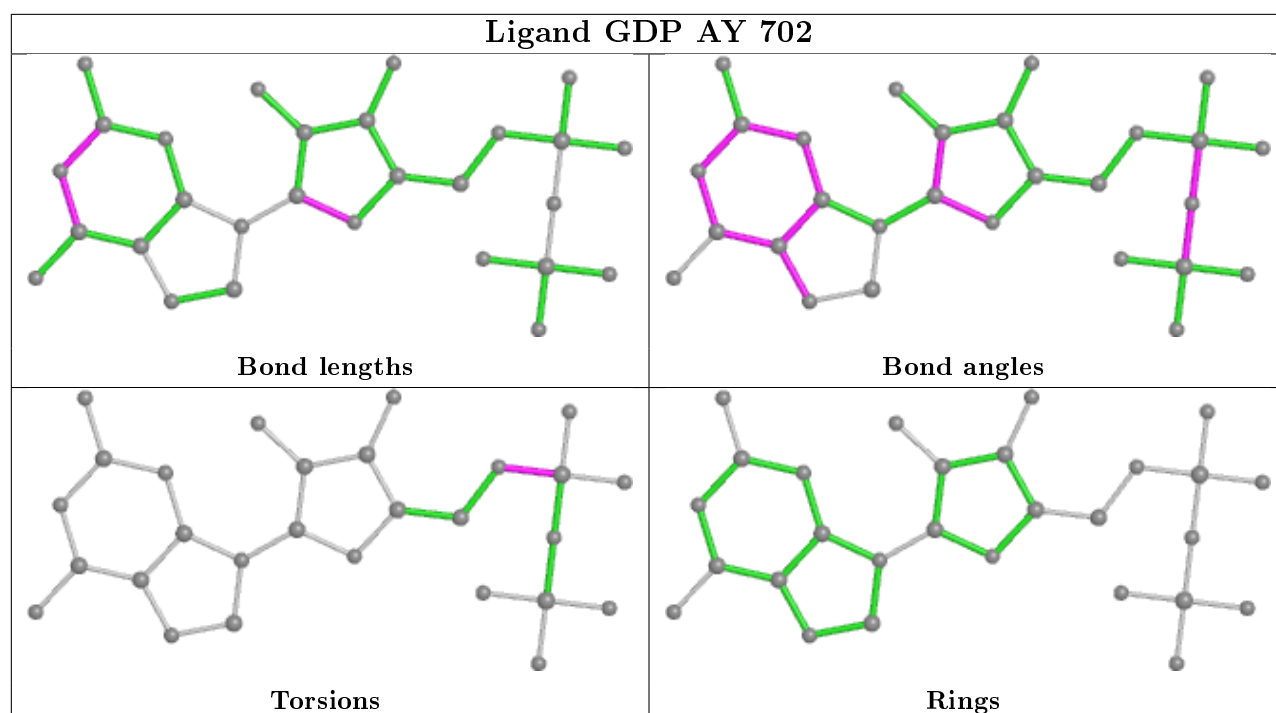
4 monomers are involved in 64 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
59	AY	701	FUA	15	0
60	CY	702	GDP	10	0
59	CY	701	FUA	26	0
60	AY	702	GDP	13	0

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 than 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.







## 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
9	AI	2
9	CI	2
42	DG	1
42	BG	1
23	CW	1
38	BC	1

The worst 5 of 8 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	BG	112:PRO	C	113:ARG	N	3.28
1	DG	112:PRO	C	113:ARG	N	3.21
1	CI	53:VAL	C	54:ASP	N	3.01
1	AI	53:VAL	C	54:ASP	N	3.00
1	CI	104:ARG	C	105:ASP	N	2.58

## 6 Fit of model and data i

### 6.1 Protein, DNA and RNA chains i

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	AA	1504/1522 (98%)	-0.05	38 (2%) 57 45	34, 72, 165, 200	0
1	CA	1504/1522 (98%)	-0.05	30 (1%) 65 53	43, 89, 174, 200	0
2	AB	235/256 (91%)	-0.46	1 (0%) 92 88	40, 82, 172, 191	0
2	CB	235/256 (91%)	-0.29	1 (0%) 92 88	53, 102, 164, 194	0
3	AC	207/239 (86%)	-0.60	0 100 100	23, 69, 122, 174	0
3	CC	207/239 (86%)	-0.49	0 100 100	45, 93, 143, 190	0
4	AD	208/209 (99%)	-0.30	0 100 100	46, 95, 144, 166	0
4	CD	208/209 (99%)	-0.23	1 (0%) 91 85	48, 107, 157, 188	0
5	AE	151/162 (93%)	-0.48	2 (1%) 77 67	27, 62, 107, 187	0
5	CE	151/162 (93%)	-0.34	3 (1%) 65 53	45, 76, 117, 200	0
6	AF	101/101 (100%)	-0.49	0 100 100	44, 85, 125, 174	0
6	CF	101/101 (100%)	-0.08	2 (1%) 65 53	72, 115, 152, 183	0
7	AG	155/156 (99%)	-0.45	1 (0%) 89 83	36, 80, 126, 182	0
7	CG	155/156 (99%)	-0.26	3 (1%) 66 55	63, 108, 150, 193	0
8	AH	138/138 (100%)	-0.57	0 100 100	35, 65, 111, 136	0
8	CH	138/138 (100%)	-0.46	0 100 100	45, 79, 117, 147	0
9	AI	127/128 (99%)	-0.23	0 100 100	41, 79, 135, 157	0
9	CI	127/128 (99%)	-0.05	2 (1%) 72 61	68, 111, 151, 175	0
10	AJ	99/105 (94%)	-0.03	4 (4%) 38 28	33, 87, 180, 193	0
10	CJ	99/105 (94%)	0.18	2 (2%) 65 53	60, 127, 179, 190	0
11	AK	119/129 (92%)	-0.29	3 (2%) 57 45	27, 62, 109, 171	0
11	CK	119/129 (92%)	-0.10	3 (2%) 57 45	48, 89, 126, 181	0
12	AL	125/132 (94%)	-0.34	2 (1%) 72 61	37, 76, 118, 180	0
12	CL	125/132 (94%)	-0.12	3 (2%) 59 47	42, 82, 124, 200	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
13	AM	125/126 (99%)	0.00	5 (4%) 38 28	52, 98, 165, 200	0
13	CM	125/126 (99%)	0.16	7 (5%) 24 17	63, 126, 171, 200	0
14	AN	60/61 (98%)	-0.41	0 100 100	35, 62, 103, 131	0
14	CN	60/61 (98%)	-0.22	1 (1%) 70 59	58, 91, 127, 146	0
15	AO	88/89 (98%)	-0.49	0 100 100	27, 71, 116, 144	0
15	CO	88/89 (98%)	-0.32	0 100 100	31, 82, 119, 141	0
16	AP	84/88 (95%)	-0.16	0 100 100	36, 85, 130, 160	0
16	CP	84/88 (95%)	-0.02	0 100 100	58, 95, 126, 166	0
17	AQ	100/105 (95%)	-0.33	0 100 100	40, 78, 112, 139	0
17	CQ	100/105 (95%)	-0.21	0 100 100	60, 84, 120, 147	0
18	AR	70/88 (79%)	-0.38	1 (1%) 75 64	38, 72, 119, 167	0
18	CR	70/88 (79%)	-0.28	1 (1%) 75 64	60, 95, 142, 167	0
19	AS	79/93 (84%)	-0.15	1 (1%) 77 67	63, 95, 174, 182	0
19	CS	79/93 (84%)	0.23	3 (3%) 40 30	74, 117, 181, 199	0
20	AT	99/106 (93%)	0.04	1 (1%) 82 73	55, 95, 147, 176	0
20	CT	99/106 (93%)	0.00	1 (1%) 82 73	72, 103, 153, 173	0
21	AU	25/27 (92%)	0.17	2 (8%) 12 9	33, 84, 132, 167	0
21	CU	25/27 (92%)	0.60	2 (8%) 12 9	77, 115, 145, 164	0
22	AV	76/76 (100%)	-0.05	1 (1%) 77 67	51, 94, 154, 200	0
22	CV	76/76 (100%)	-0.04	2 (2%) 56 43	67, 107, 165, 200	0
23	AW	76/77 (98%)	0.74	9 (11%) 4 4	97, 182, 200, 200	0
23	CW	76/77 (98%)	0.84	9 (11%) 4 4	97, 190, 200, 200	0
24	AX	12/25 (48%)	2.65	7 (58%) 0 0	52, 114, 167, 193	0
24	CX	12/25 (48%)	2.19	5 (41%) 0 0	52, 114, 172, 193	0
25	AY	667/691 (96%)	0.55	76 (11%) 5 4	71, 142, 179, 200	0
25	CY	667/691 (96%)	0.67	92 (13%) 2 3	84, 151, 186, 200	0
26	B0	84/85 (98%)	0.19	3 (3%) 42 32	61, 87, 134, 191	0
26	D0	84/85 (98%)	0.70	8 (9%) 8 6	78, 109, 144, 172	0
27	B1	94/98 (95%)	-0.12	0 100 100	50, 88, 142, 151	0
27	D1	94/98 (95%)	0.11	3 (3%) 47 35	59, 99, 153, 181	0
28	B2	71/72 (98%)	0.03	3 (4%) 36 27	79, 127, 176, 194	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
28	D2	71/72 (98%)	0.25	2 (2%) 53 40	82, 134, 172, 186	0
29	B3	60/60 (100%)	0.53	5 (8%) 11 9	55, 95, 148, 180	0
29	D3	60/60 (100%)	0.46	2 (3%) 46 35	61, 105, 145, 174	0
30	B4	58/71 (81%)	0.23	2 (3%) 45 34	90, 141, 200, 200	0
30	D4	58/71 (81%)	0.25	3 (5%) 27 20	106, 166, 200, 200	0
31	B5	59/60 (98%)	-0.03	3 (5%) 28 21	46, 96, 175, 192	0
31	D5	59/60 (98%)	0.08	3 (5%) 28 21	50, 104, 167, 200	0
32	B6	50/54 (92%)	0.39	2 (4%) 38 28	55, 97, 142, 173	0
32	D6	50/54 (92%)	0.50	3 (6%) 21 15	71, 111, 153, 178	0
33	B7	49/49 (100%)	0.05	1 (2%) 65 53	51, 79, 117, 200	0
33	D7	49/49 (100%)	0.01	0 100 100	64, 91, 127, 166	0
34	B8	64/65 (98%)	-0.13	2 (3%) 49 36	51, 81, 124, 148	0
34	D8	64/65 (98%)	0.04	1 (1%) 72 61	67, 104, 137, 168	0
35	B9	37/37 (100%)	0.06	2 (5%) 25 19	66, 89, 127, 141	0
35	D9	37/37 (100%)	0.24	2 (5%) 25 19	65, 91, 151, 187	0
36	BA	2901/2915 (99%)	0.02	64 (2%) 62 50	36, 88, 184, 200	0
36	DA	2901/2915 (99%)	0.02	63 (2%) 62 50	42, 102, 186, 200	0
37	BB	119/122 (97%)	-0.28	1 (0%) 86 78	68, 101, 129, 160	0
37	DB	119/122 (97%)	-0.20	0 100 100	83, 126, 154, 189	0
38	BC	228/229 (99%)	-0.12	5 (2%) 62 50	44, 101, 163, 195	0
38	DC	228/229 (99%)	0.23	13 (5%) 23 16	66, 125, 187, 199	0
39	BD	275/276 (99%)	-0.42	1 (0%) 92 88	31, 64, 106, 155	0
39	DD	275/276 (99%)	-0.39	0 100 100	40, 74, 115, 163	0
40	BE	205/206 (99%)	-0.15	3 (1%) 73 63	37, 88, 146, 184	0
40	DE	205/206 (99%)	-0.08	3 (1%) 73 63	50, 97, 157, 200	0
41	BF	208/210 (99%)	-0.08	5 (2%) 59 47	53, 111, 183, 200	0
41	DF	208/210 (99%)	0.12	10 (4%) 30 22	58, 131, 186, 200	0
42	BG	181/182 (99%)	-0.31	4 (2%) 62 50	51, 99, 144, 194	0
42	DG	181/182 (99%)	-0.07	5 (2%) 53 40	67, 122, 168, 192	0
43	BH	167/180 (92%)	0.46	9 (5%) 25 19	87, 131, 174, 185	0
43	DH	167/180 (92%)	0.34	5 (2%) 50 37	76, 133, 175, 185	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
44	BJ	0/173	-	-	-	-
44	DJ	0/173	-	-	-	-
45	BN	139/140 (99%)	-0.22	0 100 100	60, 99, 148, 177	0
45	DN	139/140 (99%)	-0.10	3 (2%) 62 50	64, 108, 162, 176	0
46	BO	122/122 (100%)	-0.29	0 100 100	34, 72, 107, 128	0
46	DO	122/122 (100%)	-0.29	0 100 100	40, 79, 108, 156	0
47	BP	146/150 (97%)	0.15	1 (0%) 87 81	48, 104, 158, 195	0
47	DP	146/150 (97%)	0.52	7 (4%) 30 22	52, 127, 173, 195	0
48	BQ	141/141 (100%)	-0.34	0 100 100	39, 77, 122, 173	0
48	DQ	141/141 (100%)	-0.29	1 (0%) 87 81	52, 86, 127, 185	0
49	BR	117/118 (99%)	-0.19	0 100 100	36, 89, 128, 177	0
49	DR	117/118 (99%)	-0.07	0 100 100	46, 95, 135, 181	0
50	BS	99/112 (88%)	-0.15	1 (1%) 82 73	53, 109, 156, 191	0
50	DS	99/112 (88%)	0.34	3 (3%) 50 37	51, 121, 164, 192	0
51	BT	138/146 (94%)	-0.23	5 (3%) 42 32	53, 95, 168, 200	0
51	DT	138/146 (94%)	-0.22	5 (3%) 42 32	56, 103, 172, 200	0
52	BU	117/118 (99%)	-0.32	1 (0%) 84 76	55, 91, 138, 200	0
52	DU	117/118 (99%)	-0.22	1 (0%) 84 76	66, 104, 147, 191	0
53	BV	101/101 (100%)	-0.01	2 (1%) 65 53	43, 112, 158, 177	0
53	DV	101/101 (100%)	0.32	4 (3%) 38 28	64, 126, 171, 193	0
54	BW	113/113 (100%)	-0.04	1 (0%) 84 76	56, 95, 150, 195	0
54	DW	113/113 (100%)	0.28	7 (6%) 20 14	73, 106, 158, 194	0
55	BX	93/96 (96%)	-0.09	1 (1%) 80 71	61, 101, 133, 176	0
55	DX	93/96 (96%)	-0.05	1 (1%) 80 71	63, 111, 141, 154	0
56	BY	107/110 (97%)	0.67	10 (9%) 8 6	93, 138, 178, 187	0
56	DY	107/110 (97%)	1.12	15 (14%) 2 3	87, 147, 182, 200	0
57	BZ	185/206 (89%)	-0.04	2 (1%) 80 71	50, 108, 163, 190	0
57	DZ	185/206 (89%)	0.08	2 (1%) 80 71	54, 122, 170, 199	0
All	All	22516/23492 (95%)	-0.01	641 (2%) 53 40	23, 98, 175, 200	0

The worst 5 of 641 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
36	DA	654(E)	G	13.8
1	AA	89	C	13.0
23	CW	17	C	12.3
36	DA	654(D)	G	12.0
36	BA	654(D)	G	11.6

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
23	5MU	AW	54	21/22	0.58	0.27	200,200,200,200	0
23	5MU	CW	54	21/22	0.79	0.15	200,200,200,200	0

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

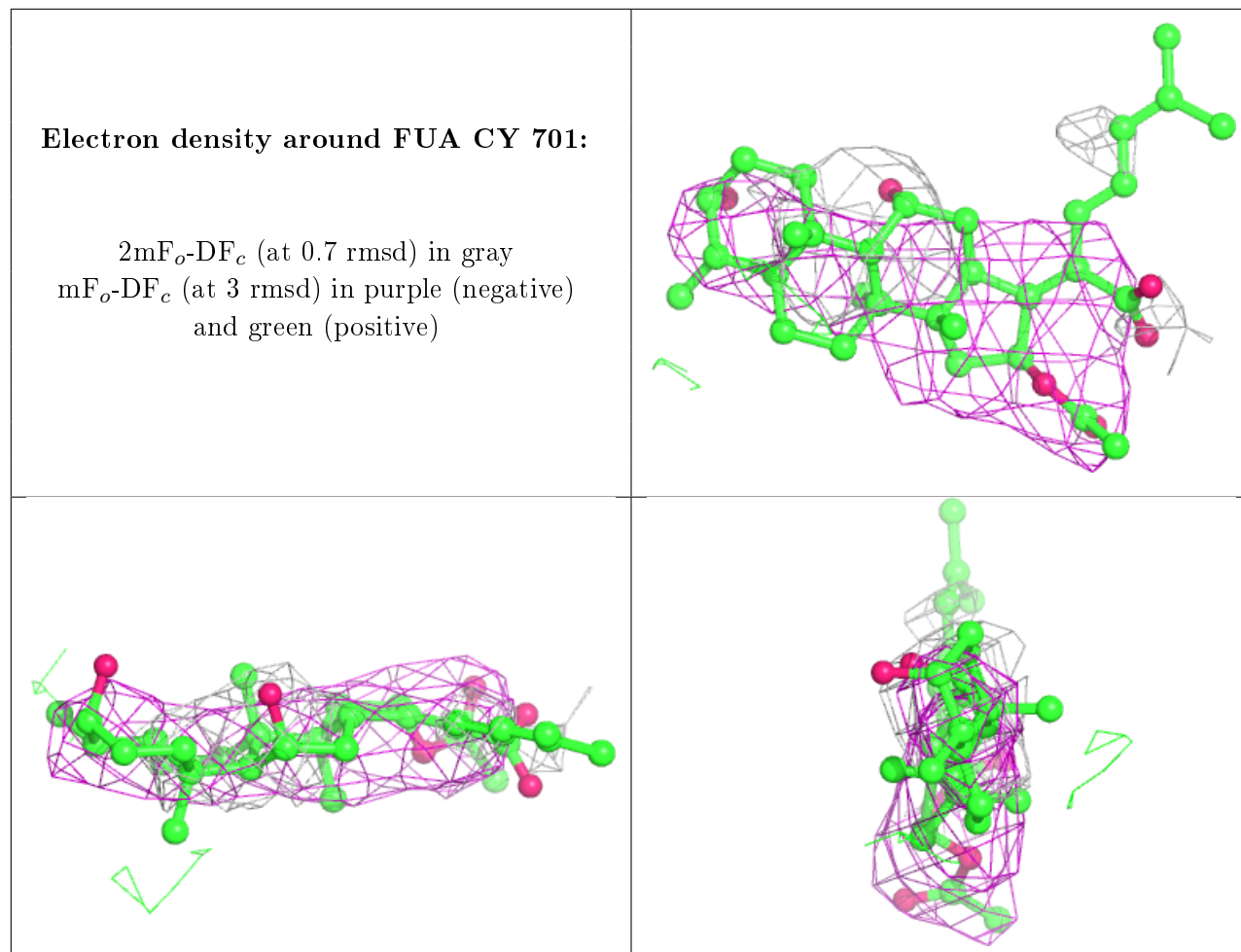
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
58	ZN	D4	1000	1/1	0.34	0.14	200,200,200,200	0
59	FUA	CY	701	37/37	0.62	0.64	102,104,107,109	0
59	FUA	AY	701	37/37	0.68	0.65	98,102,110,111	0
61	MG	CY	703	1/1	0.87	0.22	46,46,46,46	0
60	GDP	AY	702	28/28	0.88	0.23	93,97,99,99	0
60	GDP	CY	702	28/28	0.92	0.16	96,102,109,110	0
58	ZN	B4	101	1/1	0.92	0.08	172,172,172,172	0
58	ZN	D9	1000	1/1	0.96	0.09	123,123,123,123	0
58	ZN	AN	101	1/1	0.97	0.24	84,84,84,84	0
61	MG	AY	703	1/1	0.97	0.31	55,55,55,55	0
58	ZN	AD	301	1/1	0.98	0.30	78,78,78,78	0
58	ZN	CD	301	1/1	0.99	0.23	69,69,69,69	0

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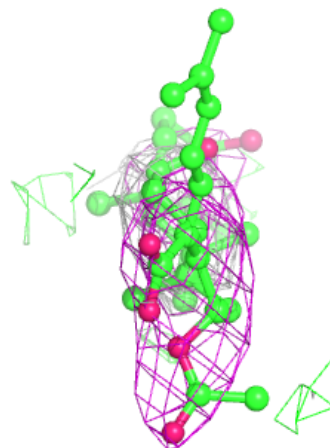
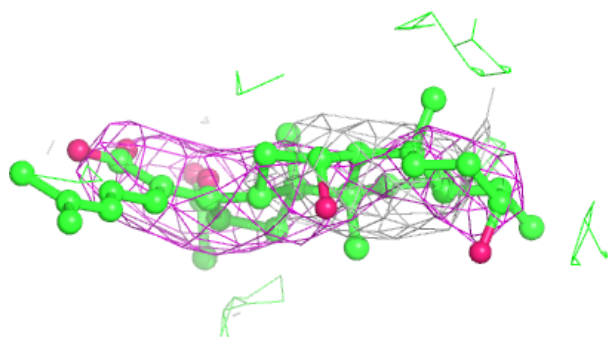
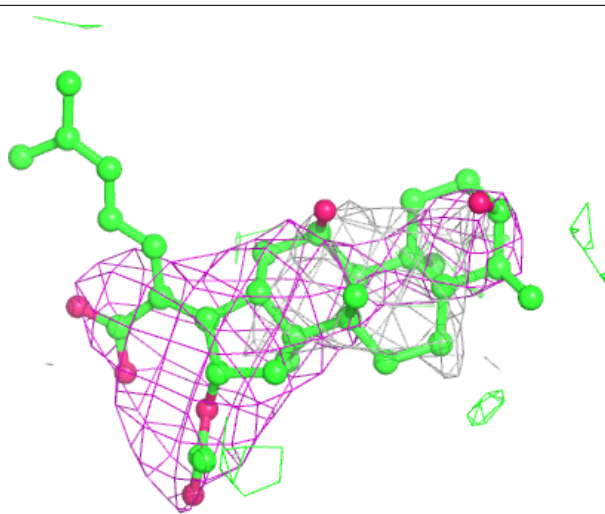
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
58	ZN	B9	101	1/1	0.99	0.10	93,93,93,93	0
58	ZN	CN	101	1/1	0.99	0.14	86,86,86,86	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



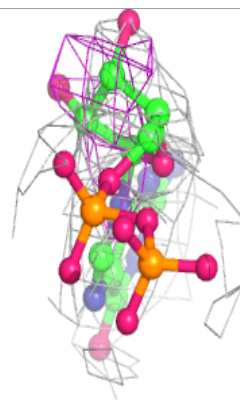
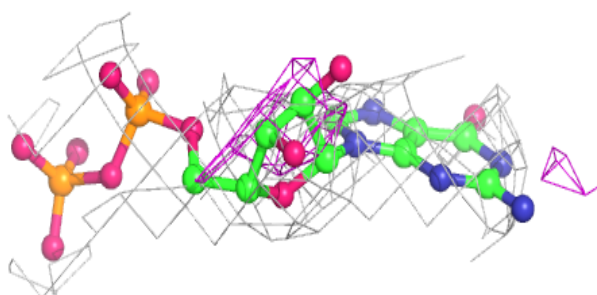
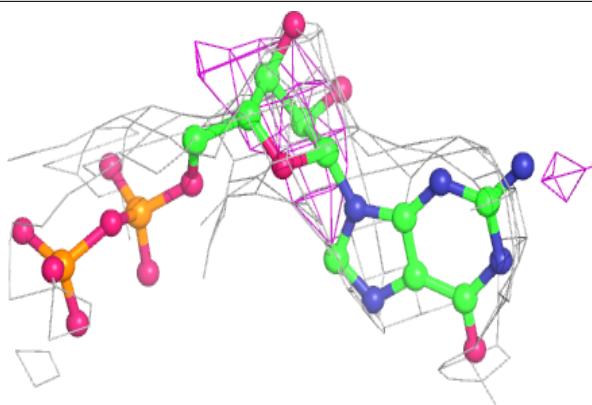
**Electron density around FUA AY 701:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

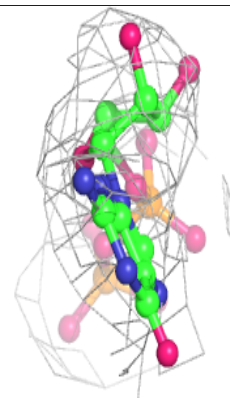
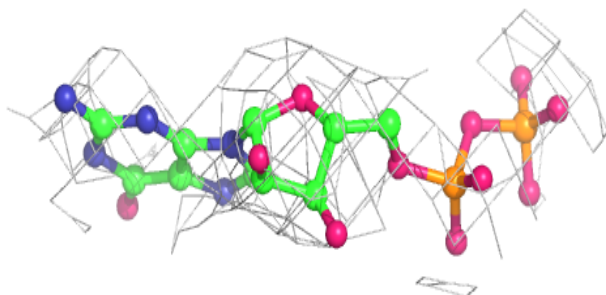
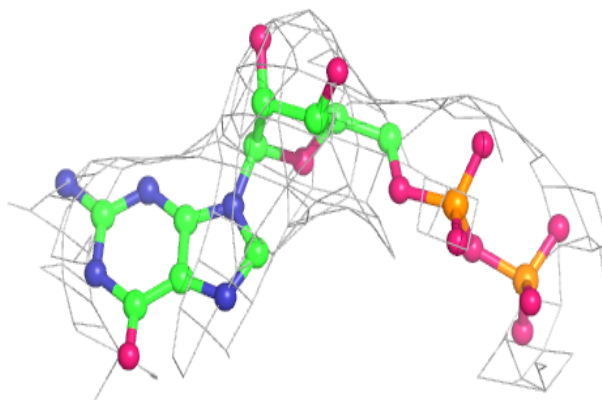


**Electron density around GDP AY 702:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around GDP CY 702:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



## 6.5 Other polymers

There are no such residues in this entry.