



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 3, 2024 – 09:24 am GMT

PDB ID : 4V5P  
Title : The crystal structure of EF-Tu and A9C-tRNA-Trp bound to a near- cognate codon on the 70S ribosome  
Authors : Schmeing, T.M.; Voorhees, R.M.; Ramakrishnan, V.  
Deposited on : 2010-12-07  
Resolution : 3.10 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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 : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

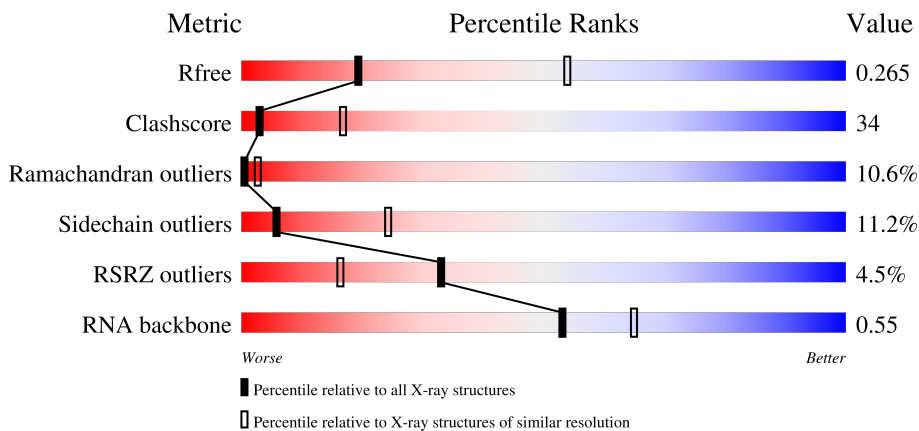
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.10 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1094 (3.10-3.10)
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)
RSRZ outliers	127900	1067 (3.10-3.10)
RNA backbone	3102	1116 (3.40-2.80)

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 of 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	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 36%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 49%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 12%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-top: 5px;">2% 36% 49% 12% ..</p>
1	CA	1522	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 35%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 51%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 12%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-top: 5px;">2% 35% 51% 12% ..</p>
2	AB	256	<div style="display: flex; align-items: center;"> <div style="width: 1%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 30%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 49%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 12%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 9%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-top: 5px;">% 30% 49% 12% . 9%</p>
2	CB	256	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 28%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 52%; height: 10px; background-color: yellow; margin-right: 2px;"></div> <div style="width: 11%; height: 10px; background-color: orange; margin-right: 2px;"></div> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 9%; height: 10px; background-color: grey; margin-right: 2px;"></div> </div> <p style="margin-top: 5px;">2% 28% 52% 11% . 9%</p>

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Mol	Chain	Length	Quality of chain
3	AC	239	
3	CC	239	
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	135	
12	CL	135	
13	AM	126	
13	CM	126	
14	AN	61	
14	CN	61	
15	AO	89	

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Mol	Chain	Length	Quality of chain
15	CO	89	53% 39% 6% ..
16	AP	88	32% 53% 9% 6%
16	CP	88	3% 31% 55% 9% 6%
17	AQ	105	43% 46% 6% 6%
17	CQ	105	42% 48% 5% 6%
18	AR	88	40% 34% 6% 20%
18	CR	88	2% 36% 38% 6% 20%
19	AS	93	6% 23% 45% 16% 16%
19	CS	93	6% 24% 44% 16% 16%
20	AT	106	5% 33% 50% 10% 7%
20	CT	106	4% 32% 50% 11% 7%
21	AU	27	4% 52% 30% 7% 11%
21	CU	27	11% 48% 33% 7% 11%
22	AV	76	42% 36% 22%
22	AW	76	14% 32% 55% 12% .
22	CV	76	39% 38% 22%
22	CW	76	18% 29% 58% 12% .
23	AX	27	11% 19% 33% 11% 37%
23	CX	27	19% 15% 41% 7% 37%
24	AY	77	26% 21% 48% 22% 9%
24	CY	77	38% 18% 53% 19% 9%
25	AZ	405	13% 34% 52% 10% 5%
25	CZ	405	14% 33% 51% 10% 5%
26	B0	85	8% 44% 49% 5% ..
26	D0	85	8% 41% 51% 6% ..

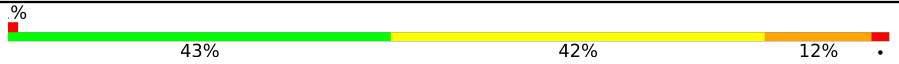

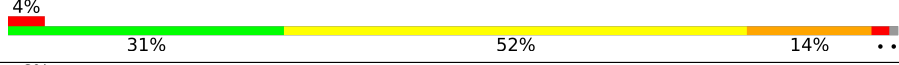
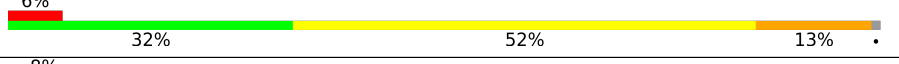
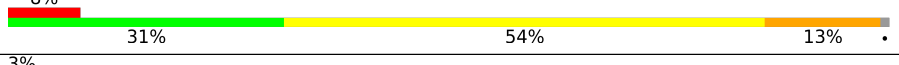
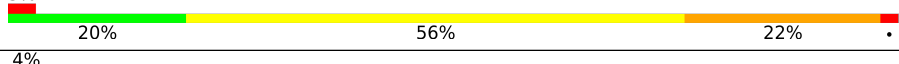
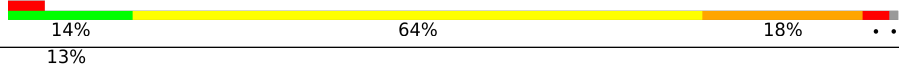
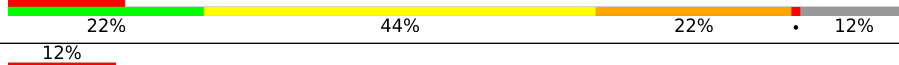
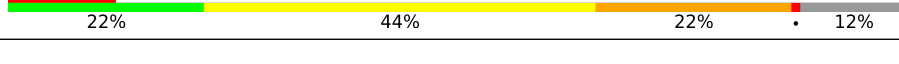


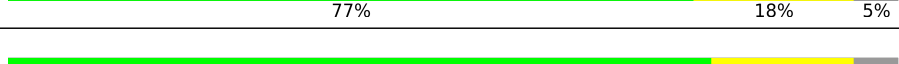
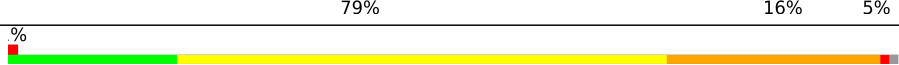
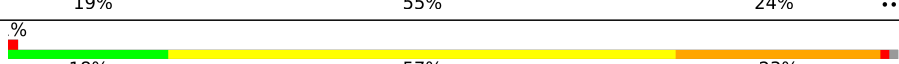
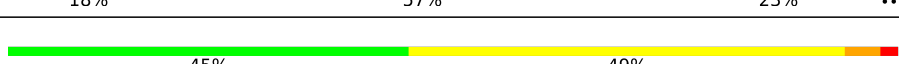
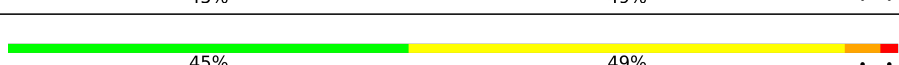
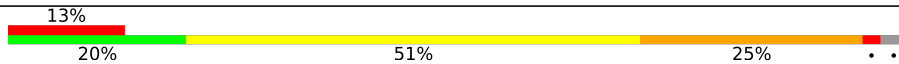
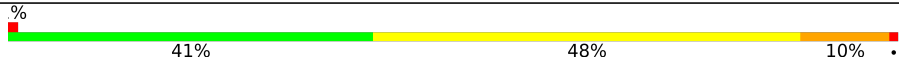
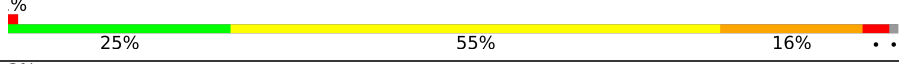
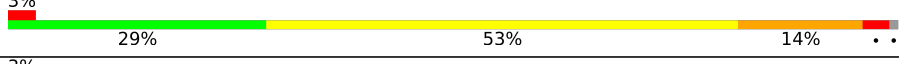

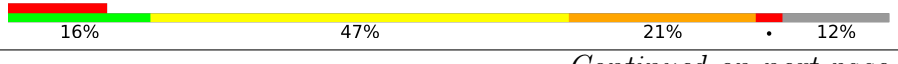

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Mol	Chain	Length	Quality of chain
27	B1	98	% 33% 48% 11% 5%
27	D1	98	5% 39% 45% 10% 5%
28	B2	72	26% 6% 71% 21% ..
28	D2	72	6% 26% 56% 14% ..
29	B3	60	2% 33% 50% 13% ..
29	D3	60	5% 33% 50% 13% ..
30	B4	71	7% 11% 39% 10% 38%
30	D4	71	4% 13% 38% 10% 38%
31	B5	60	5% 35% 43% 15% 5%
31	D5	60	7% 33% 45% 15% 5%
32	B6	54	11% 6% 44% 31% 11% 7%
32	D6	54	11% 6% 44% 33% 9% 7%
33	B7	49	2% 51% 39% 8% .
33	D7	49	51% 37% 10% .
34	B8	65	5% 18% 63% 12% . .
34	D8	65	6% 17% 65% 12% . .
35	B9	37	3% 38% 43% 19%
35	D9	37	5% 38% 46% 16%
36	BA	2915	4% 34% 52% 13% .
36	DA	2915	4% 33% 52% 13% .
37	BB	122	33% 45% 16% . .
37	DB	122	29% 49% 16% . .
38	BC	229	6% 48% 45% 7%
38	DC	229	13% 48% 44% 7%
39	BD	276	% 46% 41% 11% .

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Mol	Chain	Length	Quality of chain
39	DD	276	
40	BE	206	
40	DE	206	
41	BF	210	
41	DF	210	
42	BG	182	
42	DG	182	
43	BH	180	
43	DH	180	
44	BJ	173	
44	DJ	173	
45	BK	147	
45	DK	147	
46	BN	140	
46	DN	140	
47	BO	122	
47	DO	122	
48	BP	150	
48	DP	150	
49	BQ	141	
49	DQ	141	
50	BR	118	
50	DR	118	
51	BS	112	
51	DS	112	

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Mol	Chain	Length	Quality of chain
52	BT	146	
52	DT	146	
53	BU	118	
53	DU	118	
54	BV	101	
54	DV	101	
55	BW	113	
55	DW	113	
56	BX	96	
56	DX	96	
57	BY	110	
57	DY	110	
58	BZ	206	
58	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
24	H2U	AY	16	-	-	-	X
24	H2U	AY	17	-	-	-	X
24	H2U	AY	20	-	-	-	X
24	PSU	AY	55	X	-	-	-
24	H2U	CY	16	-	-	-	X
24	H2U	CY	17	-	-	-	X
24	H2U	CY	20	-	-	-	X
24	7MG	CY	46	-	-	-	X
24	PSU	CY	55	X	-	-	X

## 2 Entry composition

There are 61 unique types of molecules in this entry. The entry contains 307322 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 RRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	AA	1510	Total 32451	C 14445	N 6010	O 10487	P 1509	0	0	0
1	CA	1510	Total 32451	C 14445	N 6010	O 10487	P 1509	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	234	Total 1900	C 1213	N 341	O 341	S 5	0	0	0
2	CB	234	Total 1900	C 1213	N 341	O 341	S 5	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	AC	206	Total 1612	C 1016	N 314	O 281	S 1	0	0	0
3	CC	206	Total 1612	C 1016	N 314	O 281	S 1	0	0	0

- 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	150	Total	C	N	O	S	0	0	0
			1146	724	217	201	4			
5	CE	150	Total	C	N	O	S	0	0	0
			1146	724	217	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	98	Total	C	N	O	S	0	0	0
			794	499	156	138	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
10	CJ	98	794	499	156	138	1	0	0	0

- 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	124	970	611	195	163	1	0	0	0
12	CL	124	970	611	195	163	1	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AL	1	MET	-	expression tag	UNP Q5SHN3
AL	2	VAL	-	expression tag	UNP Q5SHN3
AL	3	ALA	-	expression tag	UNP Q5SHN3
AL	4	LEU	-	expression tag	UNP Q5SHN3
CL	1	MET	-	expression tag	UNP Q5SHN3
CL	2	VAL	-	expression tag	UNP Q5SHN3
CL	3	ALA	-	expression tag	UNP Q5SHN3
CL	4	LEU	-	expression tag	UNP Q5SHN3

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
13	AM	124	987	611	205	169	2	0	0	0
13	CM	124	987	611	205	169	2	0	0	0

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

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

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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
16	AP	83	Total	C	N	O	S	0	0	0
			700	443	139	117	1			
16	CP	83	Total	C	N	O	S	0	0	0
			700	443	139	117	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
17	AQ	99	Total	C	N	O	S	0	0	0
			823	528	151	142	2			
17	CQ	99	Total	C	N	O	S	0	0	0
			823	528	151	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	78	Total	C	N	O	S	0	0	0
			629	403	114	110	2			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
19	CS	78	Total	C	N	O	S	0	0	0
			629	403	114	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	24	Total	C	N	O	0	0	0
			208	128	50	30			
21	CU	24	Total	C	N	O	0	0	0
			208	128	50	30			

- Molecule 22 is a RNA chain called E-SITE TRNA PHE OR P-SITE TRNA PHE.

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

- Molecule 23 is a RNA chain called MRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	AX	17	Total	C	N	O	P	0	0	0
			361	164	68	113	16			
23	CX	17	Total	C	N	O	P	0	0	0
			361	164	68	113	16			

- Molecule 24 is a RNA chain called A-SITE TRNA A9C TRP-TRNA TRP.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
24	AY	77	Total	C	N	O	P	S	0	0	0
			1643	741	287	537	76	2			
24	CY	77	Total	C	N	O	P	S	0	0	0
			1643	741	287	537	76	2			

- Molecule 25 is a protein called ELONGATION FACTOR TU.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
25	AZ	385	Total	C	N	O	S	0	0	0
			2983	1886	522	563	12			
25	CZ	385	Total	C	N	O	S	0	0	0
			2983	1886	522	563	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AZ	6	ILE	VAL	conflict	UNP Q5SHN6
AZ	264	LYS	ARG	conflict	UNP Q5SHN6
CZ	6	ILE	VAL	conflict	UNP Q5SHN6
CZ	264	LYS	ARG	conflict	UNP Q5SHN6

- 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			
26	D0	84	Total	C	N	O	S	0	0	0
			662	410	140	111	1			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
27	B1	93	Total	C	N	O	S	0	0	0
			731	460	145	125	1			
27	D1	93	Total	C	N	O	S	0	0	0
			731	460	145	125	1			

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

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

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
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	59	467	298	90	78	1	0	0	0
29	D3	59	467	298	90	78	1	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
30	B4	44	340	218	57	61	4	0	0	0
30	D4	44	340	218	57	61	4	0	0	0

- 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
			Total	C	N	O	S			
32	B6	50	433	270	88	71	4	0	0	0
32	D6	50	433	270	88	71	4	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
33	B7	48	418	257	104	55	2	0	0	0
33	D7	48	418	257	104	55	2	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
34	B8	63	Total 507	C 326	N 101	O 78	S 2	0	0	0
34	D8	63	Total 507	C 326	N 101	O 78	S 2	0	0	0

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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
36	BA	2901	Total 62477	C 27807	N 11683	O 20087	P 2900	0	0	0
36	DA	2901	Total 62477	C 27807	N 11683	O 20087	P 2900	0	0	0

- 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	Total 2551	C 1136	N 471	O 826	P 118	0	0	0
37	DB	119	Total 2551	C 1136	N 471	O 826	P 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	Total 1742	C 1101	N 319	O 319	S 3	0	0	0
38	DC	228	Total 1742	C 1101	N 319	O 319	S 3	0	0	0

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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
40	BE	204	Total	C	N	O	S	0	0	0
			1563	988	299	270	6			
40	DE	204	Total	C	N	O	S	0	0	0
			1563	988	299	270	6			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
41	BF	207	Total	C	N	O	S	0	0	0
			1623	1035	303	282	3			
41	DF	207	Total	C	N	O	S	0	0	0
			1623	1035	303	282	3			

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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
43	BH	159	Total	C	N	O	S	0	0	0
			1222	773	228	220	1			
43	DH	159	Total	C	N	O	S	0	0	0
			1222	773	228	220	1			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
44	BJ	130	Total	C	N	O	0	0	0
			651	391	130	130			

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
44	DJ	130	651	391	130	130	0	0	0

- Molecule 45 is a protein called 50S RIBOSOMAL PROTEIN L11.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
45	BK	140	700	420	140	140	0	0	0
45	DK	140	700	420	140	140	0	0	0

- Molecule 46 is a protein called 50S RIBOSOMAL PROTEIN L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
46	BN	138	1104	712	206	182	4	0	0	0
46	DN	138	1104	712	206	182	4	0	0	0

- Molecule 47 is a protein called 50S RIBOSOMAL PROTEIN L14.

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

- Molecule 48 is a protein called 50S RIBOSOMAL PROTEIN L15.

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

- Molecule 49 is a protein called 50S RIBOSOMAL PROTEIN L16.

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

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

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

- Molecule 51 is a protein called 50S RIBOSOMAL PROTEIN L18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
51	BS	98	Total	C	N	O	0	0	0
			770	486	154	130			
51	DS	98	Total	C	N	O	0	0	0
			770	486	154	130			

- Molecule 52 is a protein called 50S RIBOSOMAL PROTEIN L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
52	BT	137	Total	C	N	O	S	0	0	0
			1141	710	234	196	1			
52	DT	137	Total	C	N	O	S	0	0	0
			1141	710	234	196	1			

- Molecule 53 is a protein called 50S RIBOSOMAL PROTEIN L20.

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

- Molecule 54 is a protein called 50S RIBOSOMAL PROTEIN L21.

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

- Molecule 55 is a protein called 50S RIBOSOMAL PROTEIN L22.

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

- Molecule 56 is a protein called 50S RIBOSOMAL PROTEIN L23.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
56	BX	92	Total	C	N	O	S	0	0	0
			725	471	131	123				
56	DX	92	Total	C	N	O	S	0	0	0
			725	471	131	123				

- Molecule 57 is a protein called 50S RIBOSOMAL PROTEIN L24.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
57	BY	100	Total	C	N	O	S	0	0	0
			775	500	148	123	4			
57	DY	100	Total	C	N	O	S	0	0	0
			775	500	148	123	4			

- Molecule 58 is a protein called 50S RIBOSOMAL PROTEIN L25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
58	BZ	176	Total	C	N	O	S	0	0	0
			1403	897	252	252	2			
58	DZ	176	Total	C	N	O	S	0	0	0
			1403	897	252	252	2			

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

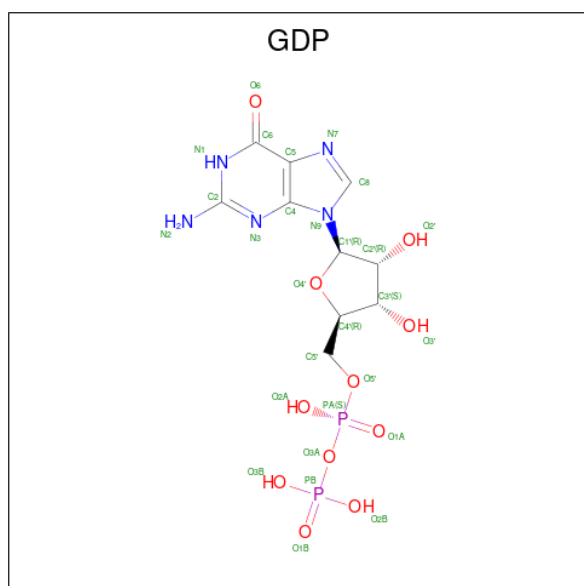
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
59	AD	1	Total	Zn	0	0
			1	1		
59	AN	1	Total	Zn	0	0
			1	1		
59	B4	1	Total	Zn	0	0
			1	1		
59	B9	1	Total	Zn	0	0
			1	1		
59	CD	1	Total	Zn	0	0
			1	1		

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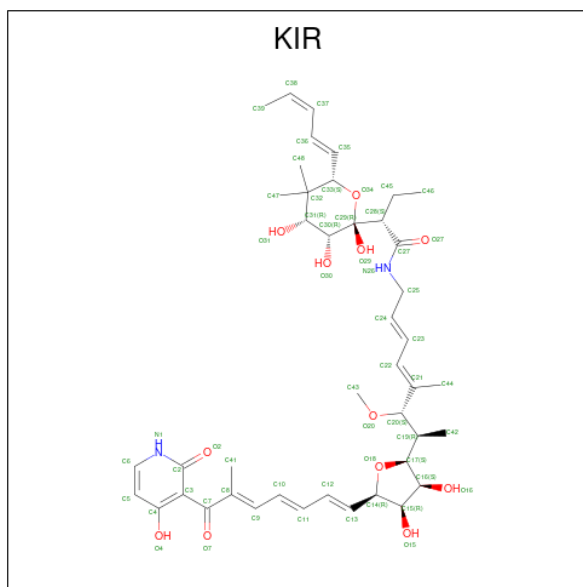
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
59	CN	1	Total	Zn	0	0
			1	1		
59	D4	1	Total	Zn	0	0
			1	1		
59	D9	1	Total	Zn	0	0
			1	1		

- 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	
60	AZ	1	Total	C	N	O	P	0	0
			28	10	5	11	2		
60	CZ	1	Total	C	N	O	P	0	0
			28	10	5	11	2		

- Molecule 61 is KIRROMYCIN (three-letter code: KIR) (formula:  $C_{43}H_{60}N_2O_{12}$ ).

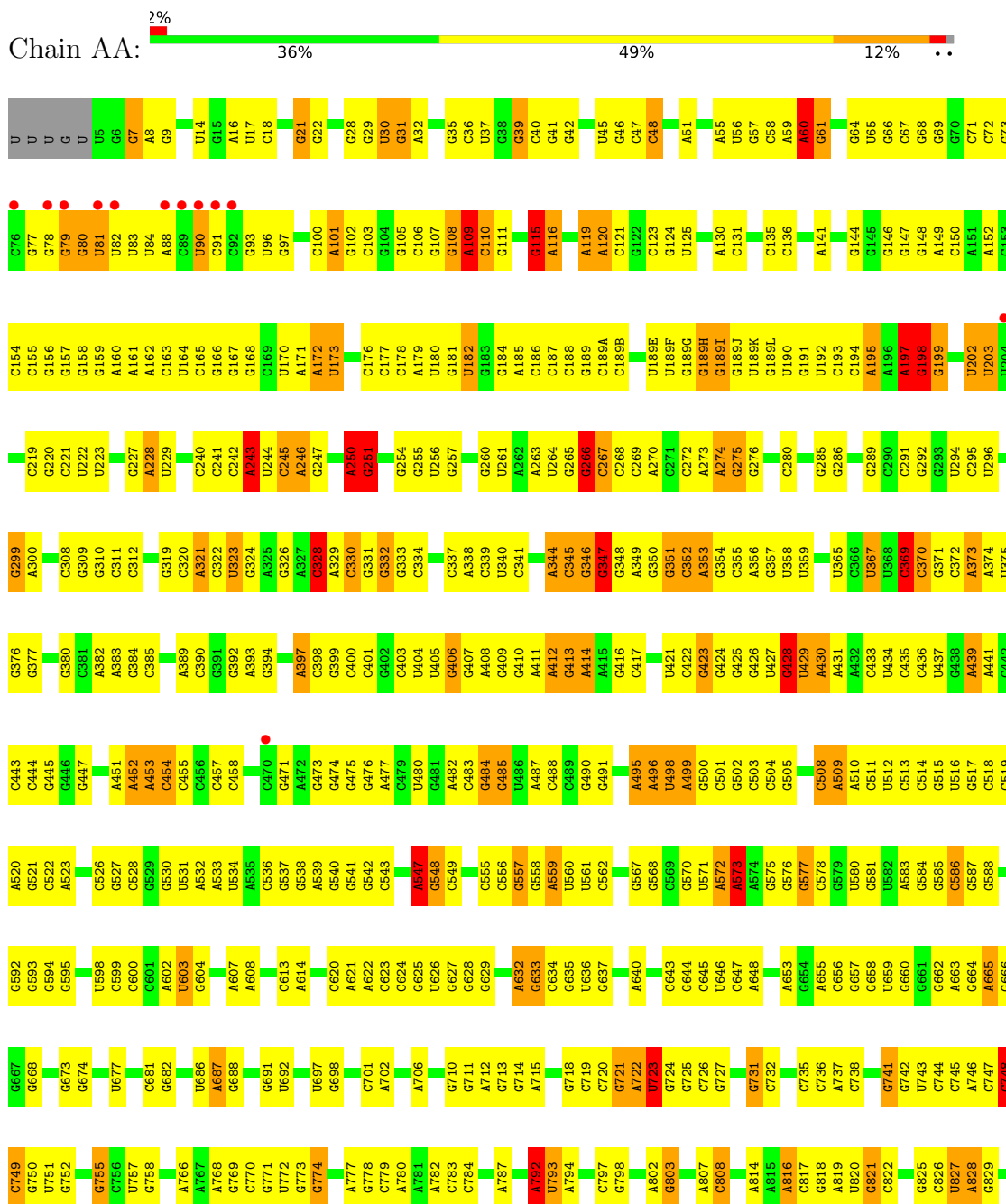


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
61	AZ	1	57	43	2	12	0	0
61	CZ	1	57	43	2	12	0	0

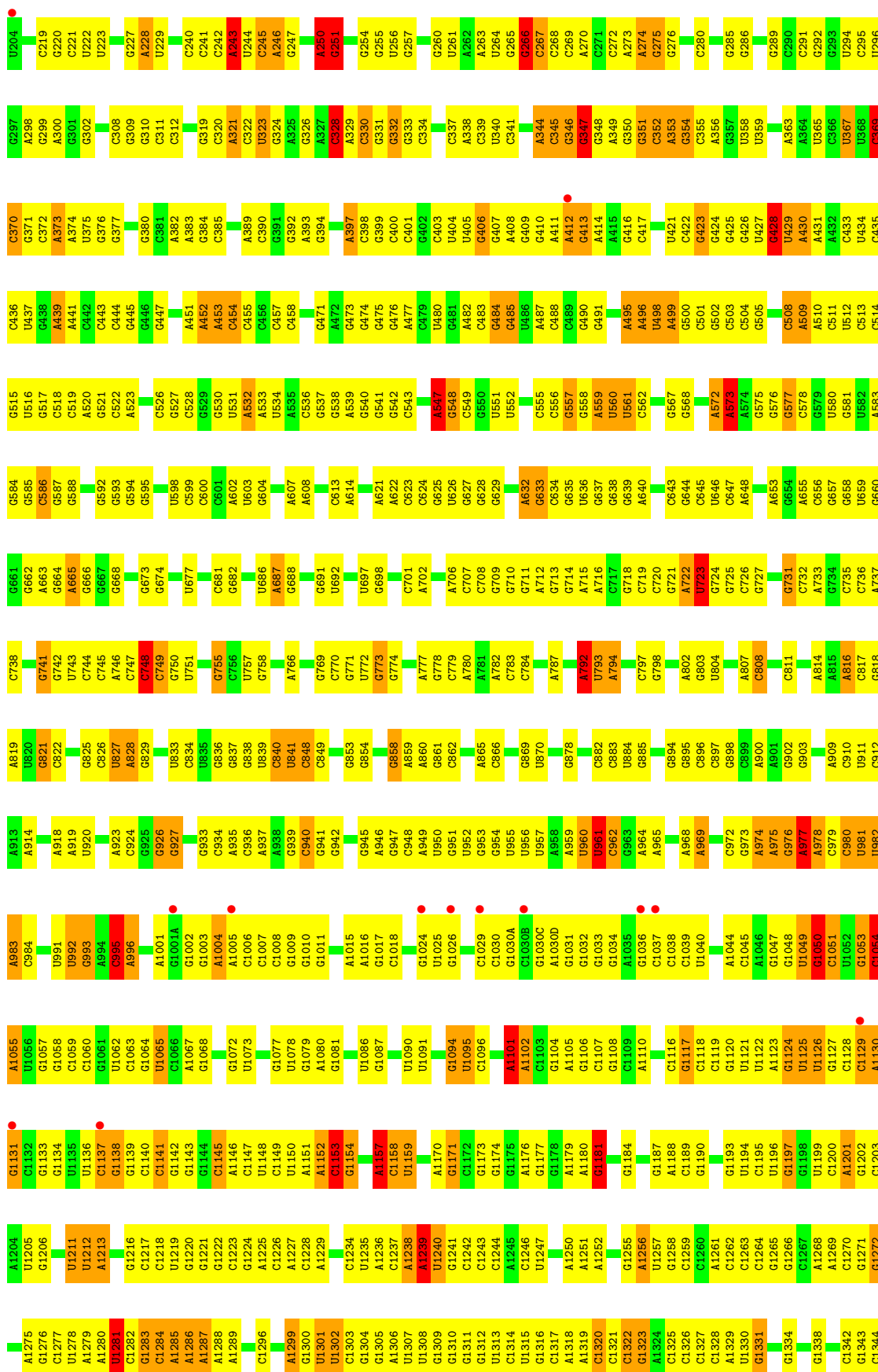
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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.

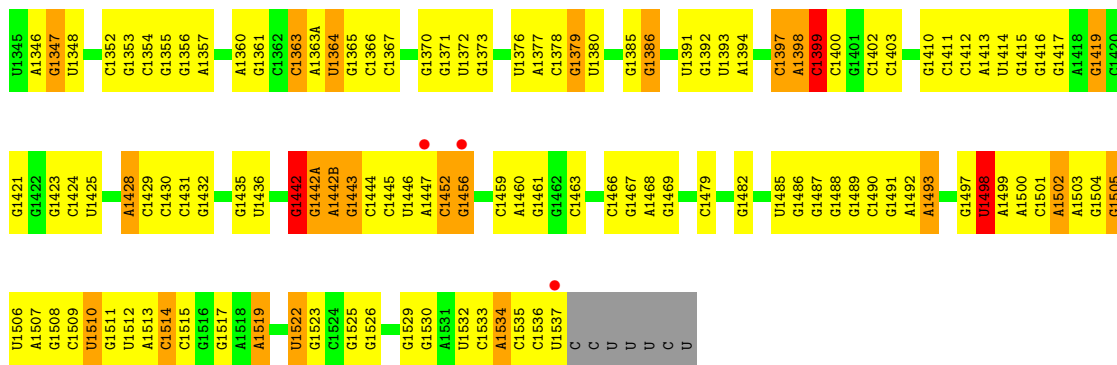
- Molecule 1: 16S RRNA



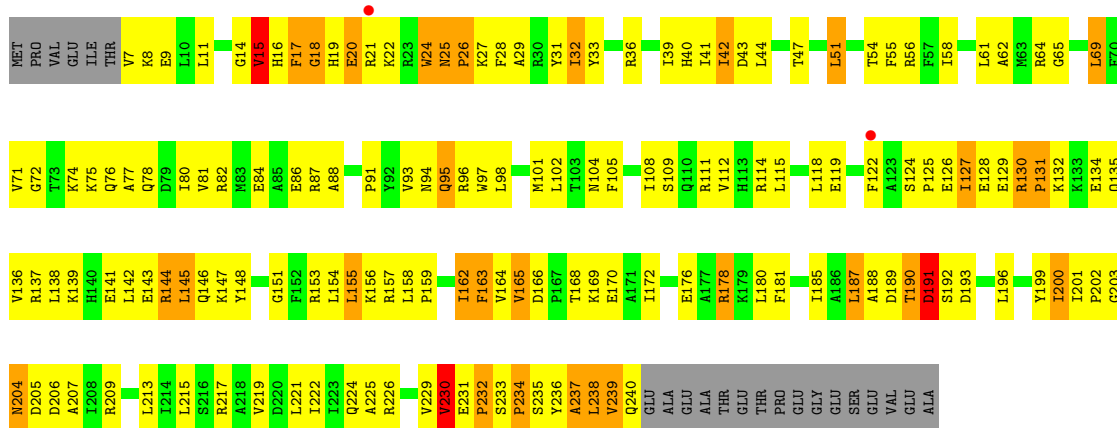




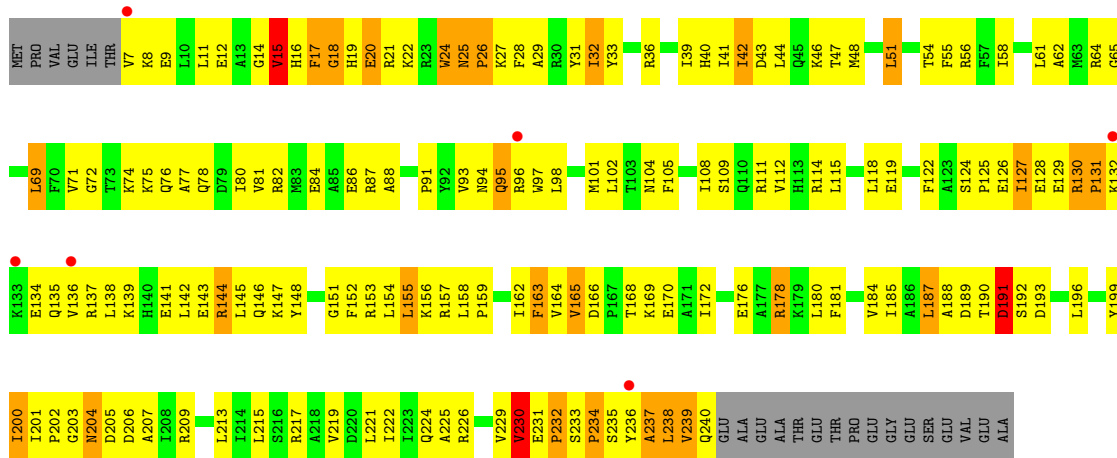




• Molecule 2: 30S RIBOSOMAL PROTEIN S2



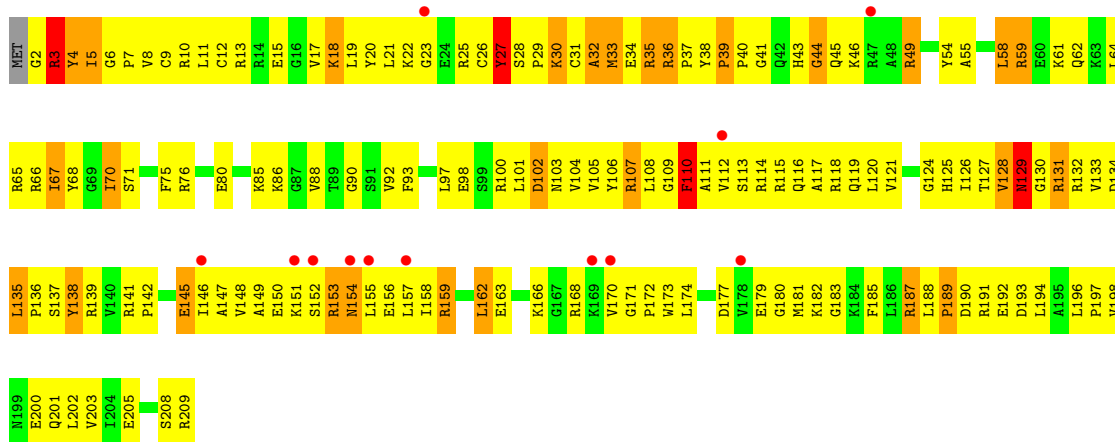
• Molecule 2: 30S RIBOSOMAL PROTEIN S2



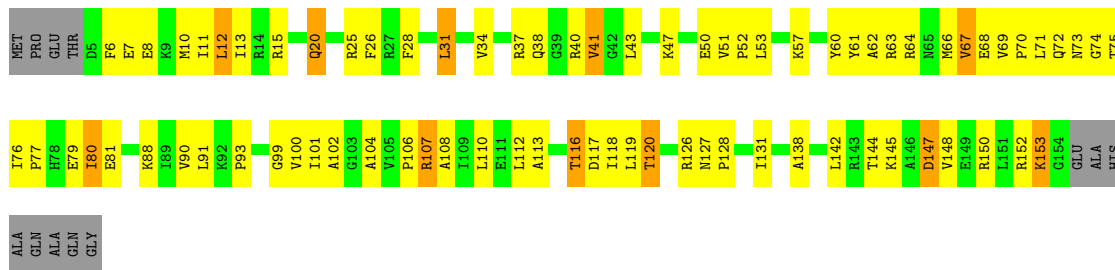
• Molecule 3: 30S RIBOSOMAL PROTEIN S3



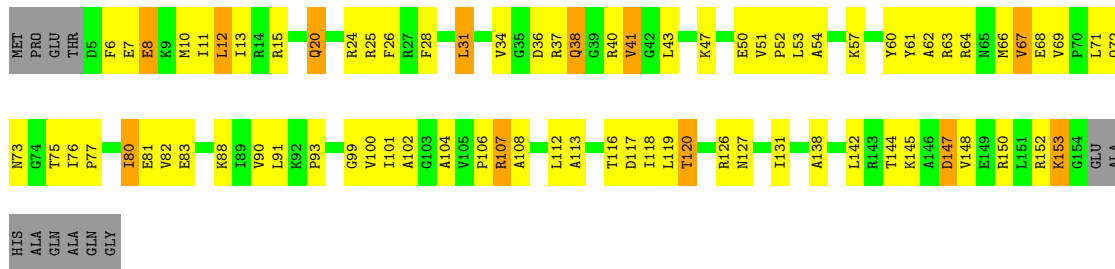




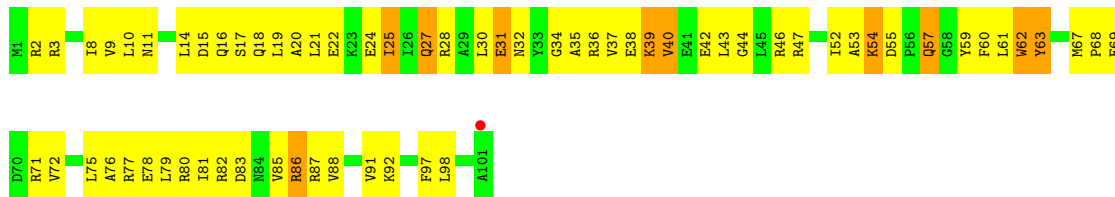
• Molecule 5: 30S RIBOSOMAL PROTEIN S5



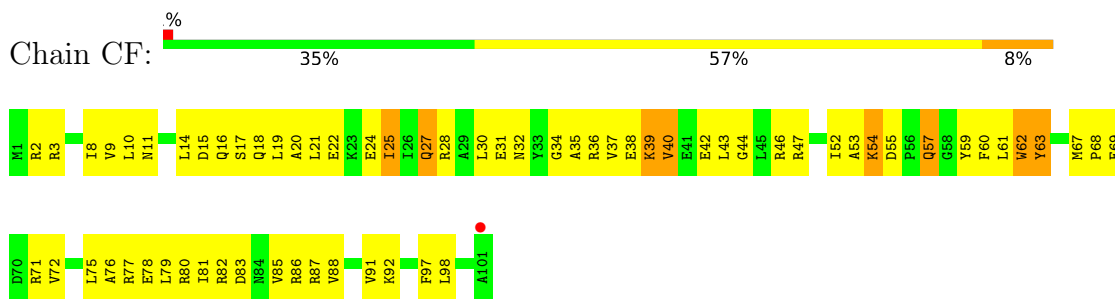
• Molecule 5: 30S RIBOSOMAL PROTEIN S5



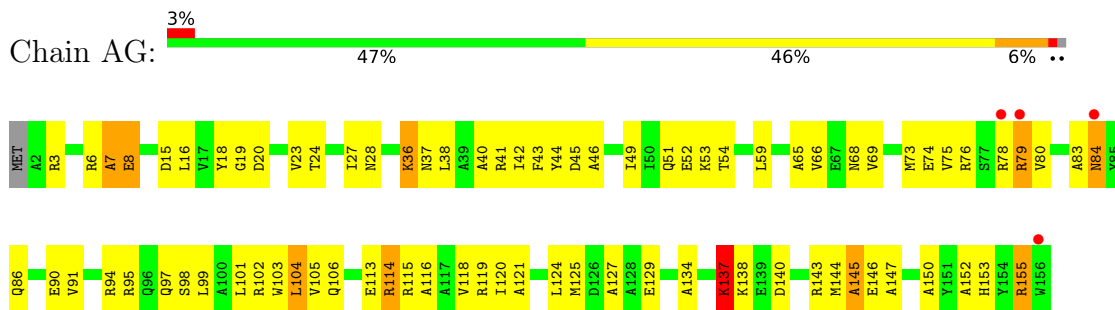
• Molecule 6: 30S RIBOSOMAL PROTEIN S6



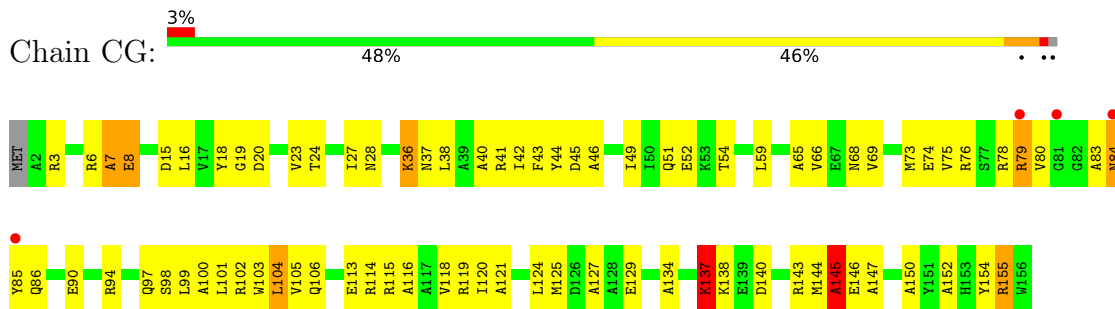
• Molecule 6: 30S RIBOSOMAL PROTEIN S6



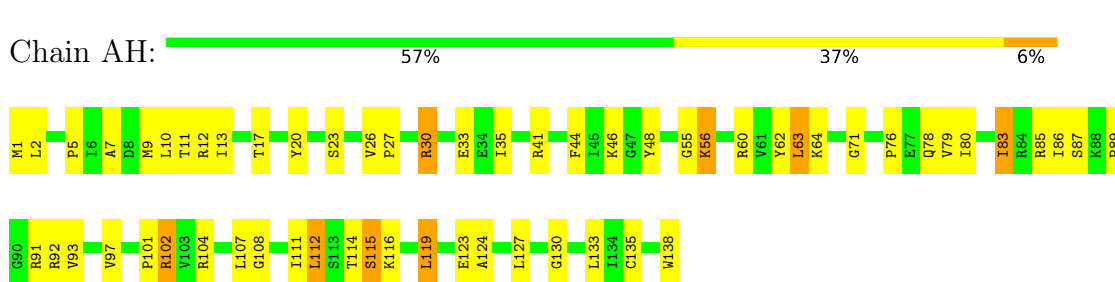
• Molecule 7: 30S RIBOSOMAL PROTEIN S7



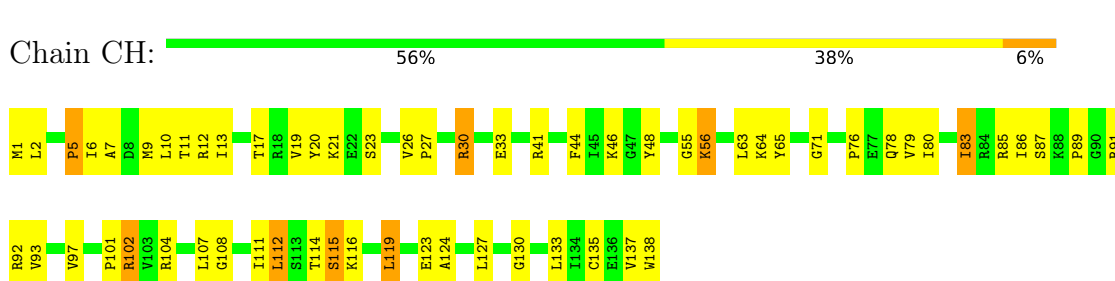
• Molecule 7: 30S RIBOSOMAL PROTEIN S7



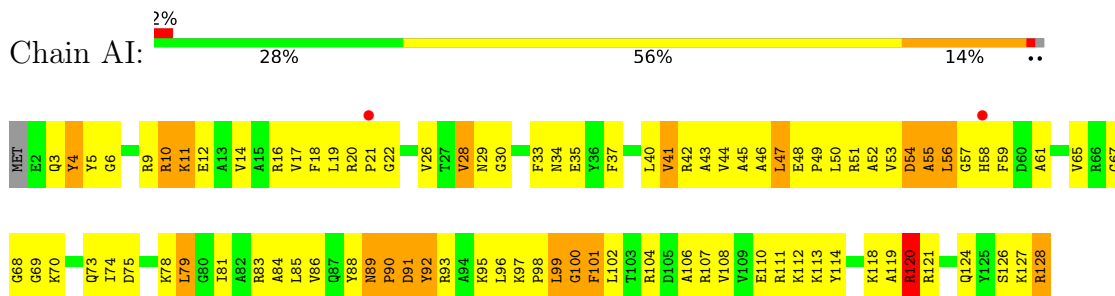
• Molecule 8: 30S RIBOSOMAL PROTEIN S8



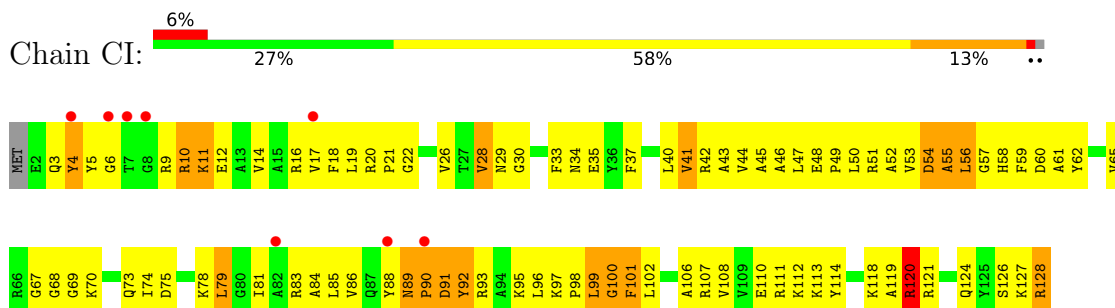
• Molecule 8: 30S RIBOSOMAL PROTEIN S8



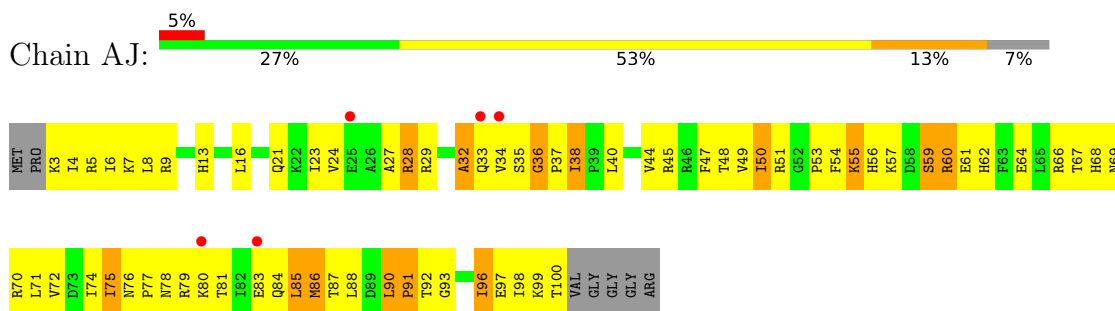
- Molecule 9: 30S RIBOSOMAL PROTEIN S9



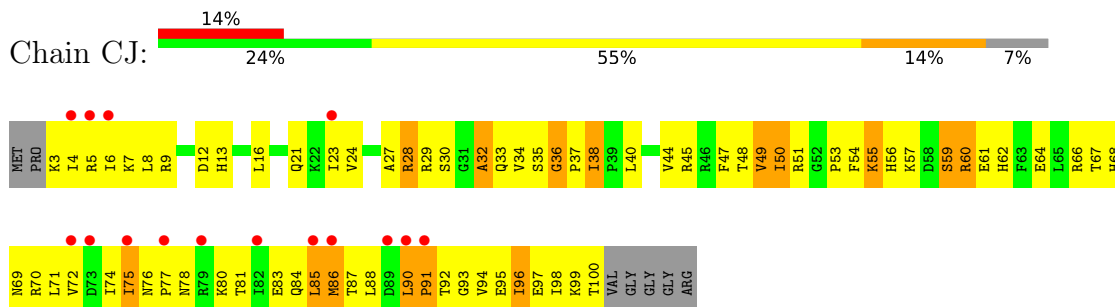
- Molecule 9: 30S RIBOSOMAL PROTEIN S9



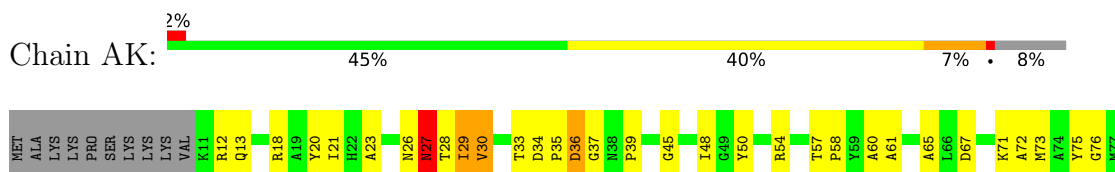
- Molecule 10: 30S RIBOSOMAL PROTEIN S10



- Molecule 10: 30S RIBOSOMAL PROTEIN S10

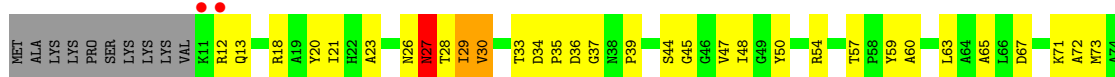


- Molecule 11: 30S RIBOSOMAL PROTEIN S11

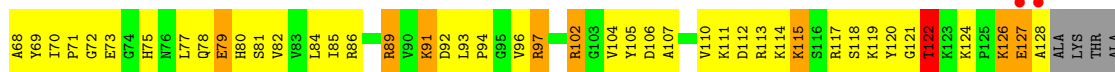




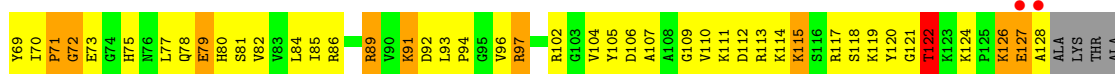
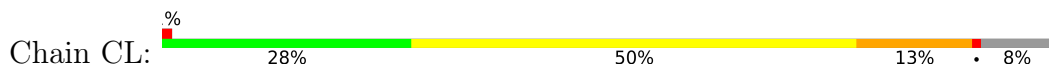
• Molecule 11: 30S RIBOSOMAL PROTEIN S11



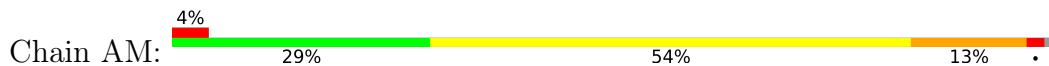
• Molecule 12: 30S RIBOSOMAL PROTEIN S12



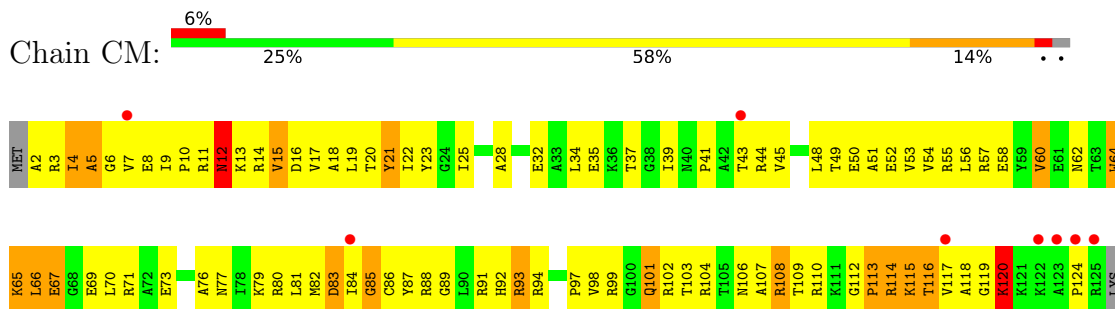
• Molecule 12: 30S RIBOSOMAL PROTEIN S12



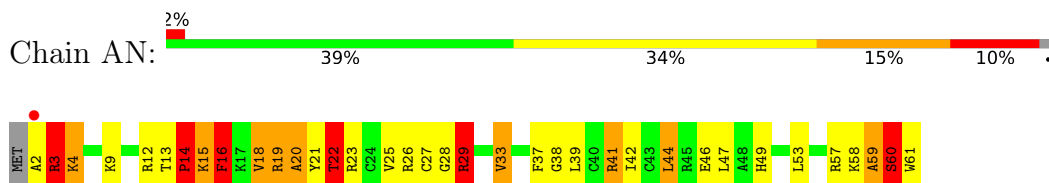
• Molecule 13: 30S RIBOSOMAL PROTEIN S13



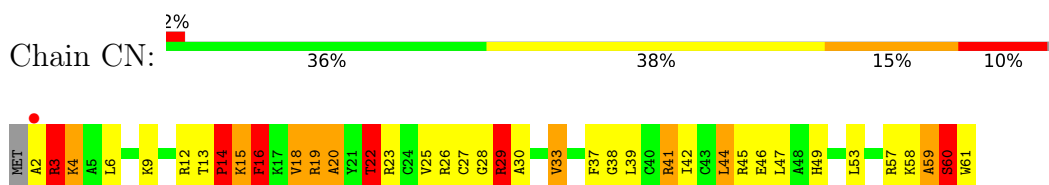
- Molecule 13: 30S RIBOSOMAL PROTEIN S13



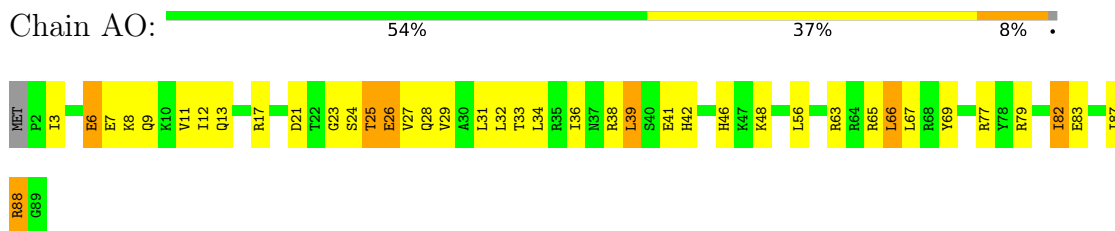
- Molecule 14: 30S RIBOSOMAL PROTEIN S14



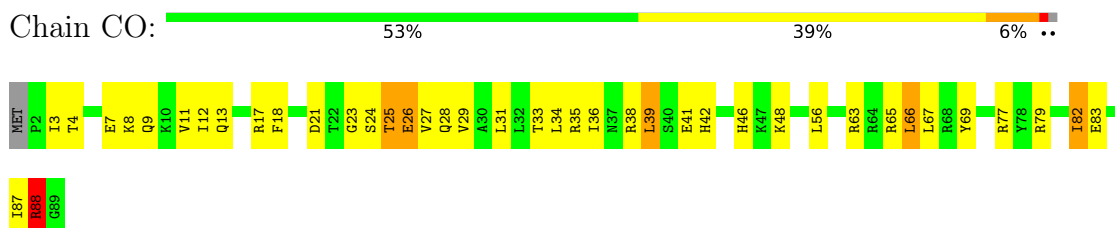
- Molecule 14: 30S RIBOSOMAL PROTEIN S14



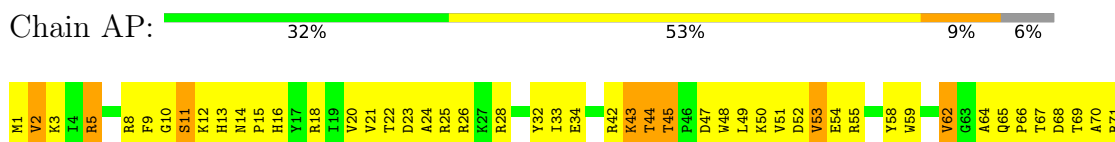
- Molecule 15: 30S RIBOSOMAL PROTEIN S15

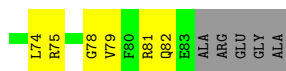


- Molecule 15: 30S RIBOSOMAL PROTEIN S15

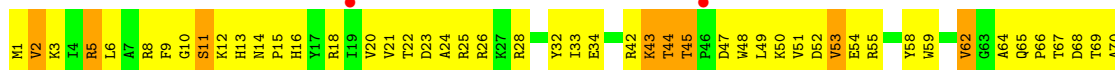


- Molecule 16: 30S RIBOSOMAL PROTEIN S16

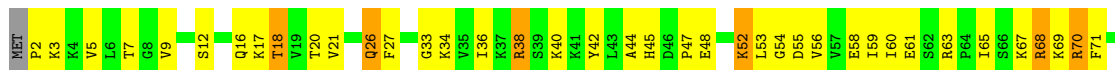




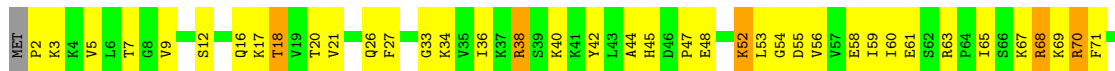
- Molecule 16: 30S RIBOSOMAL PROTEIN S16



- Molecule 17: 30S RIBOSOMAL PROTEIN S17



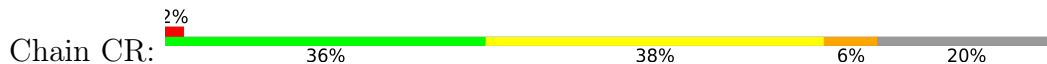
- Molecule 17: 30S RIBOSOMAL PROTEIN S17



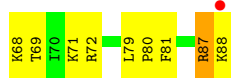
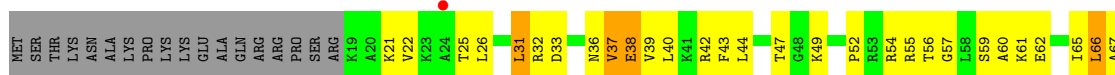
- Molecule 18: 30S RIBOSOMAL PROTEIN S18



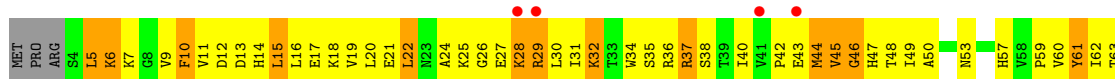
- Molecule 18: 30S RIBOSOMAL PROTEIN S18



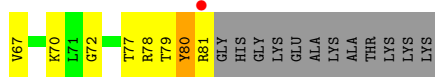
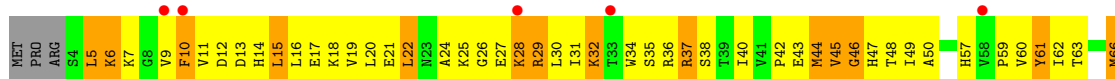




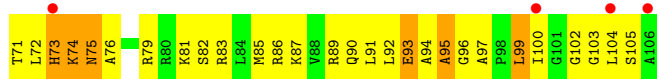
• Molecule 19: 30S RIBOSOMAL PROTEIN S19



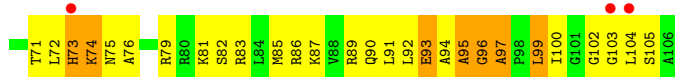
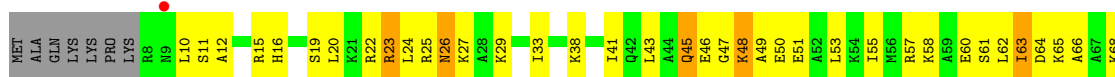
• Molecule 19: 30S RIBOSOMAL PROTEIN S19



• Molecule 20: 30S RIBOSOMAL PROTEIN S20



• Molecule 20: 30S RIBOSOMAL PROTEIN S20



- Molecule 21: 30S RIBOSOMAL PROTEIN THX



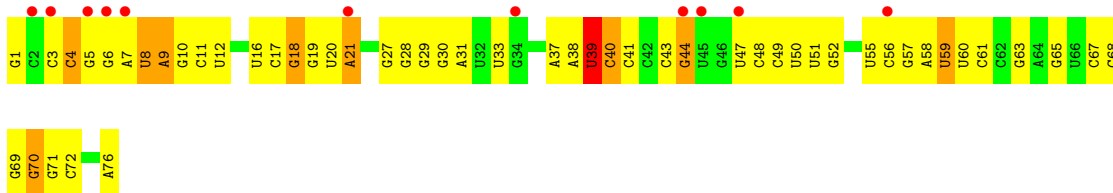
- Molecule 21: 30S RIBOSOMAL PROTEIN THX



- Molecule 22: E-SITE TRNA PHE OR P-SITE TRNA PHE



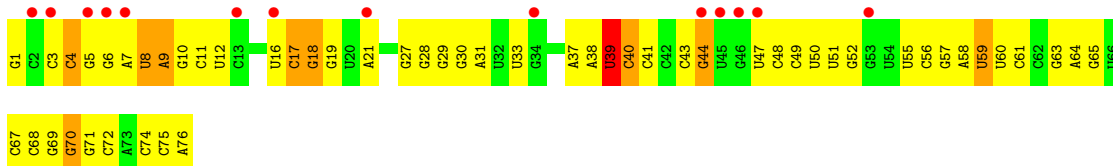
- Molecule 22: E-SITE TRNA PHE OR P-SITE TRNA PHE



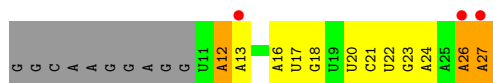
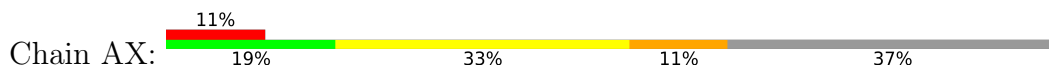
- Molecule 22: E-SITE TRNA PHE OR P-SITE TRNA PHE



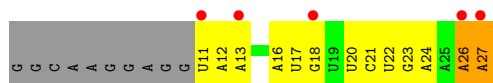
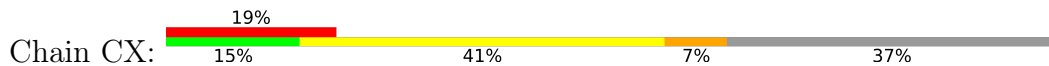
- Molecule 22: E-SITE TRNA PHE OR P-SITE TRNA PHE



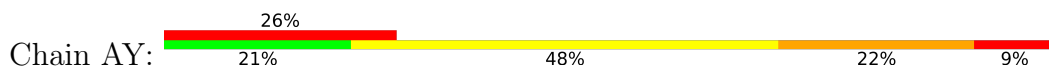
- Molecule 23: MRNA



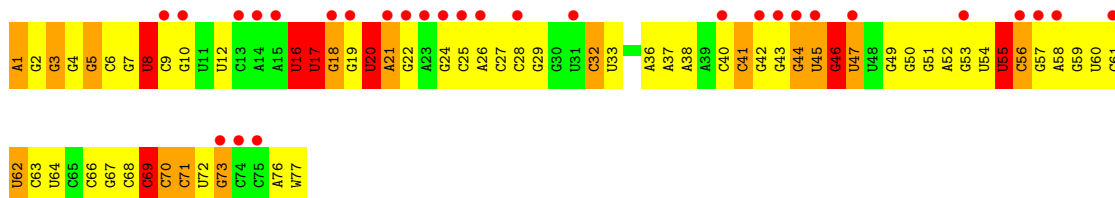
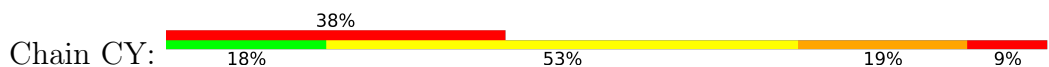
• Molecule 23: MRNA



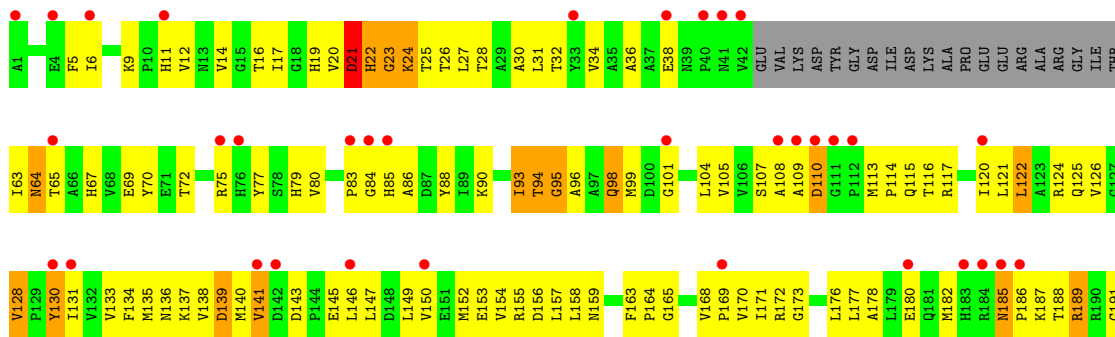
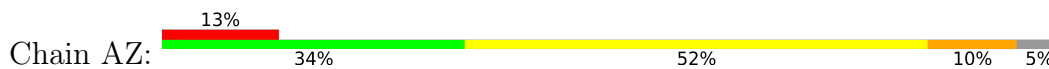
• Molecule 24: A-SITE TRNA A9C TRP-TRNA TRP

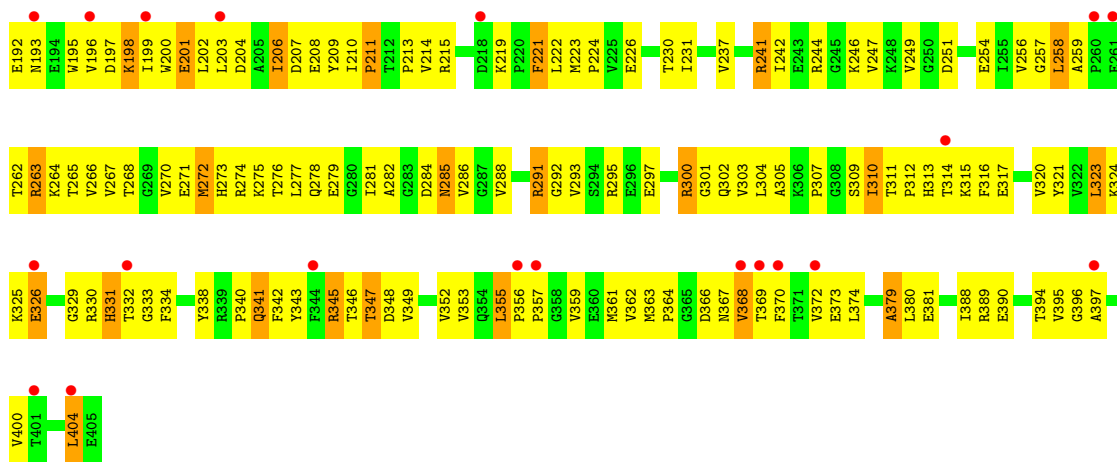


• Molecule 24: A-SITE TRNA A9C TRP-TRNA TRP

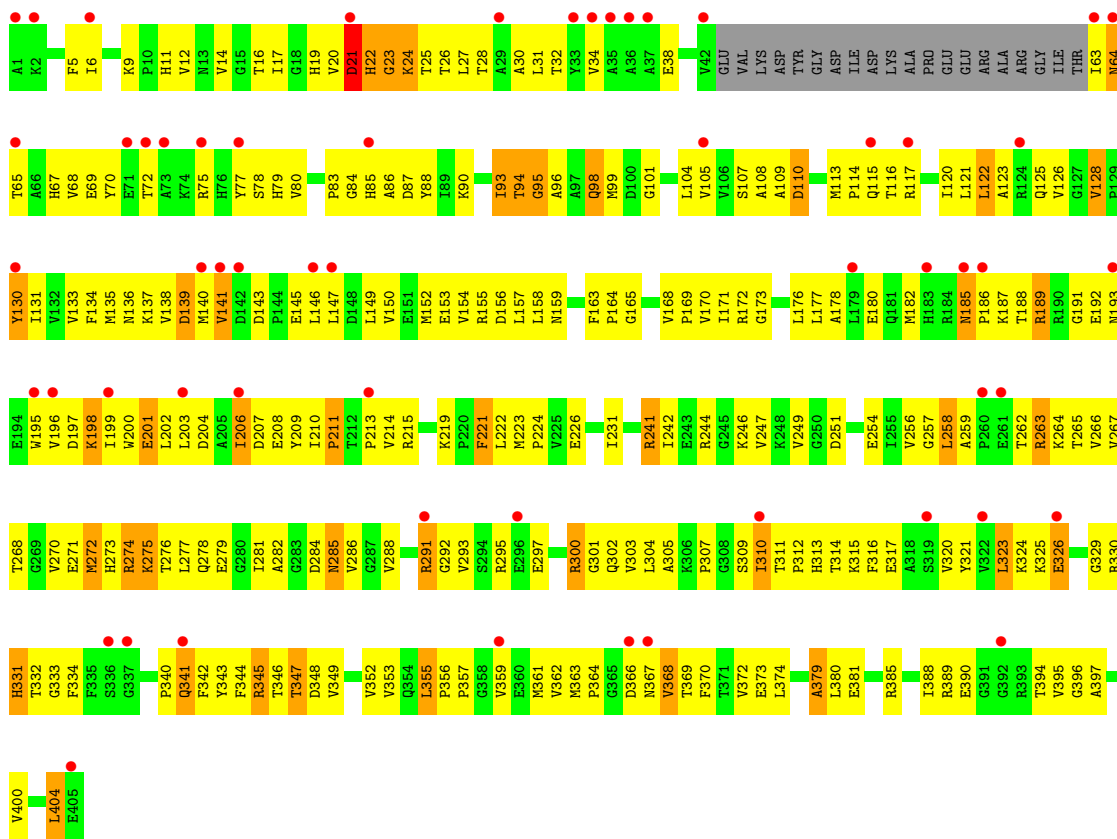


• Molecule 25: ELONGATION FACTOR TU





● Molecule 25: ELONGATION FACTOR TU

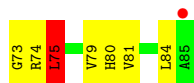
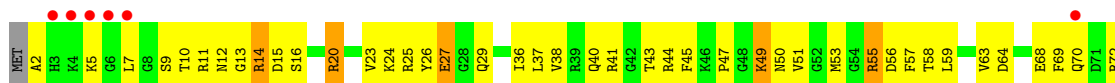


● Molecule 26: 50S RIBOSOMAL PROTEIN L27

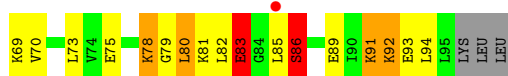
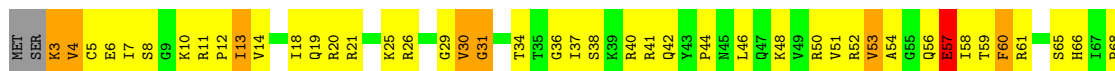




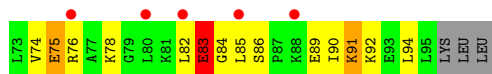
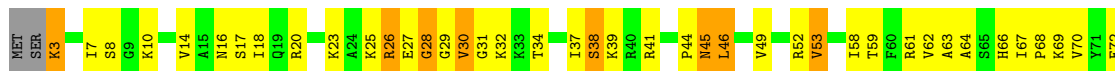
- Molecule 26: 50S RIBOSOMAL PROTEIN L27



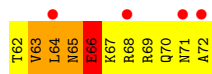
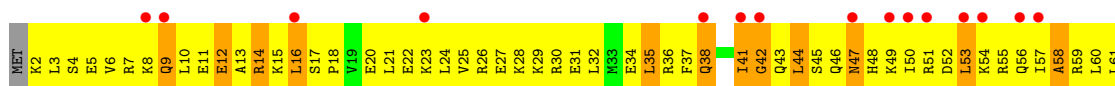
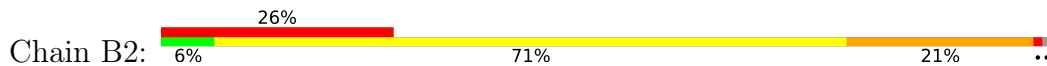
- Molecule 27: 50S RIBOSOMAL PROTEIN L28



- Molecule 27: 50S RIBOSOMAL PROTEIN L28

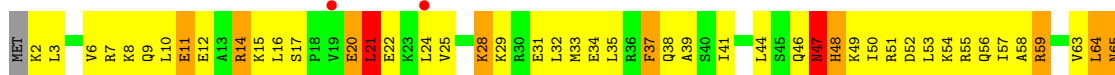


- Molecule 28: 50S RIBOSOMAL PROTEIN L29



- Molecule 28: 50S RIBOSOMAL PROTEIN L29





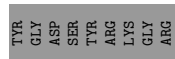
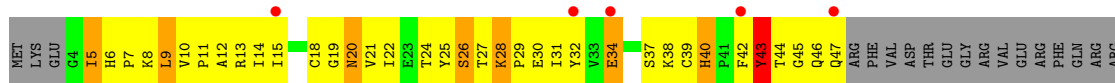
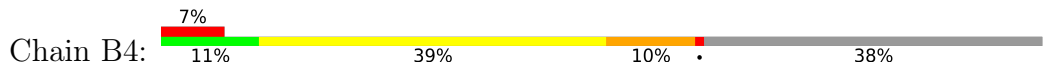
• Molecule 29: 50S RIBOSOMAL PROTEIN L30



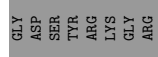
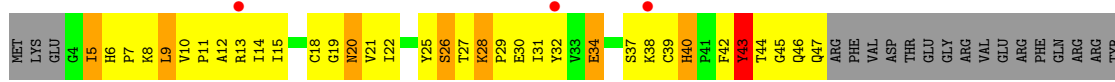
• Molecule 29: 50S RIBOSOMAL PROTEIN L30



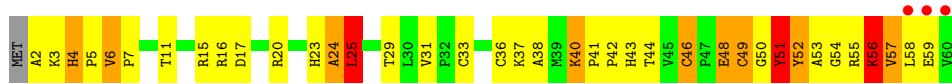
• Molecule 30: 50S RIBOSOMAL PROTEIN L31



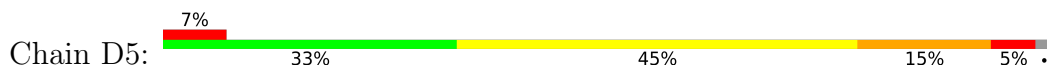
• Molecule 30: 50S RIBOSOMAL PROTEIN L31



• Molecule 31: 50S RIBOSOMAL PROTEIN L32



• Molecule 31: 50S RIBOSOMAL PROTEIN L32



- Molecule 32: 50S RIBOSOMAL PROTEIN L33



- Molecule 32: 50S RIBOSOMAL PROTEIN L33



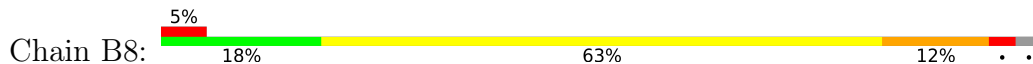
- Molecule 33: 50S RIBOSOMAL PROTEIN L34



- Molecule 33: 50S RIBOSOMAL PROTEIN L34

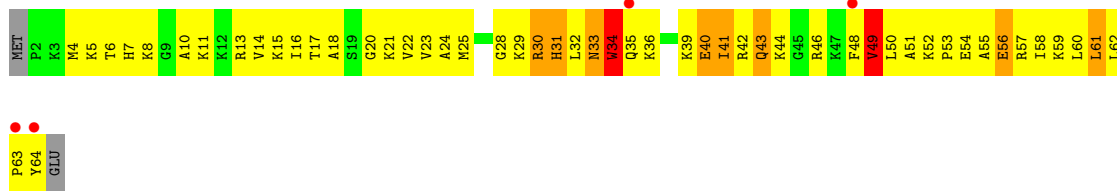


- Molecule 34: 50S RIBOSOMAL PROTEIN L35



- Molecule 34: 50S RIBOSOMAL PROTEIN L35

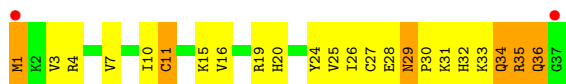




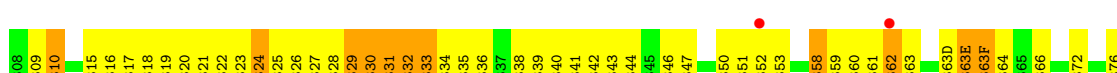
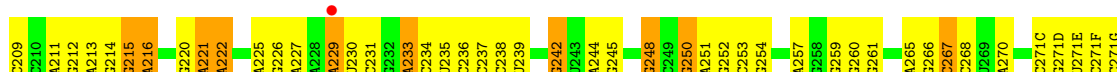
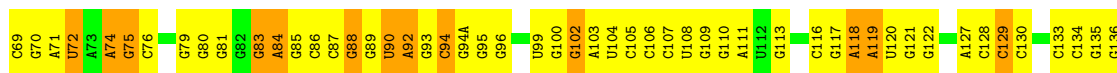
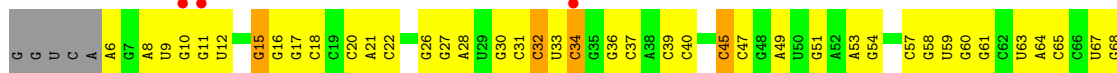
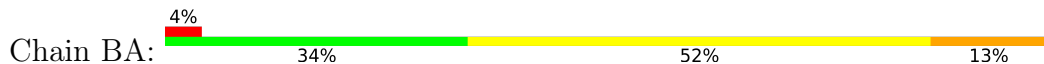
• Molecule 35: 50S RIBOSOMAL PROTEIN L36



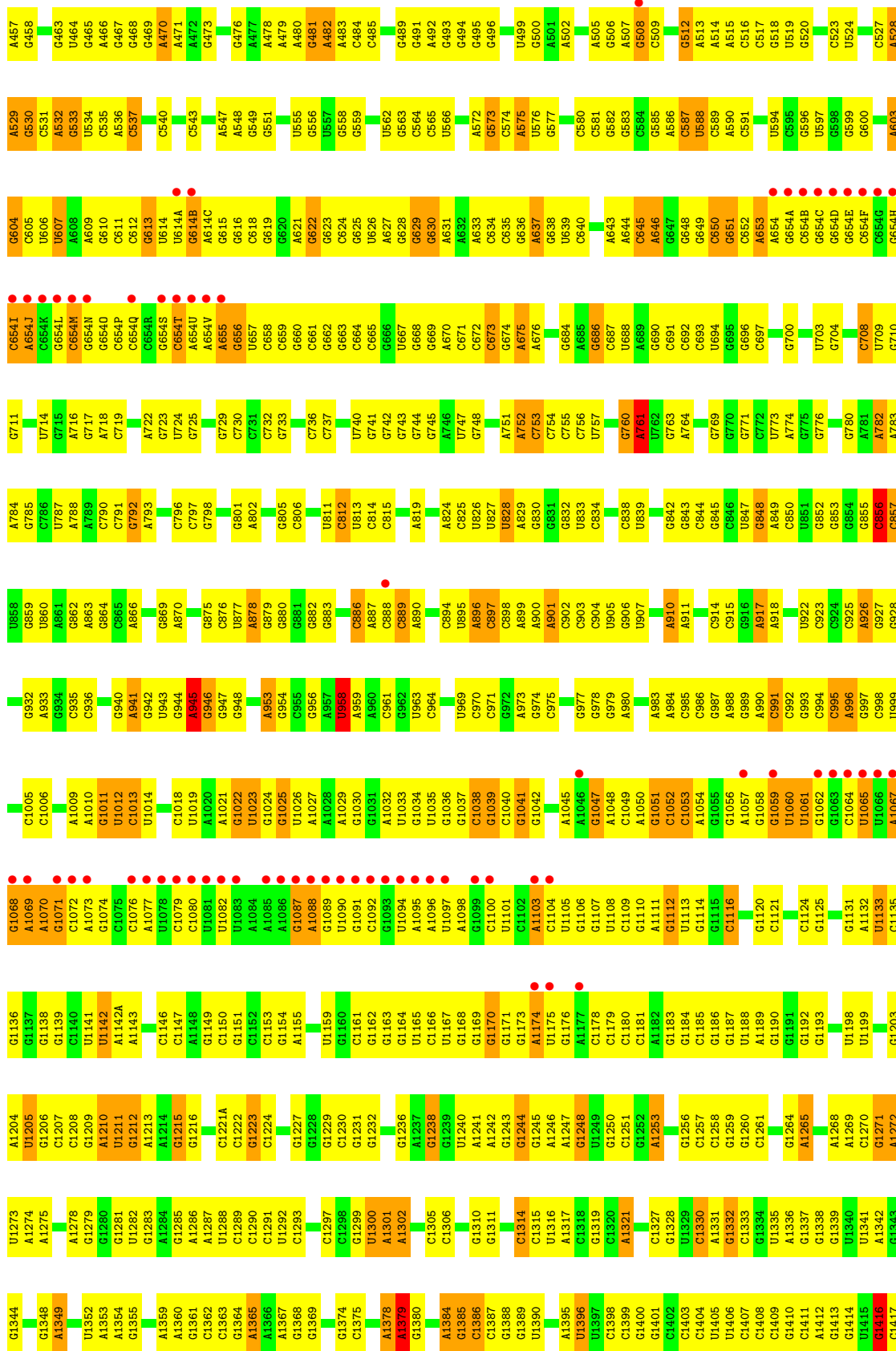
• Molecule 35: 50S RIBOSOMAL PROTEIN L36



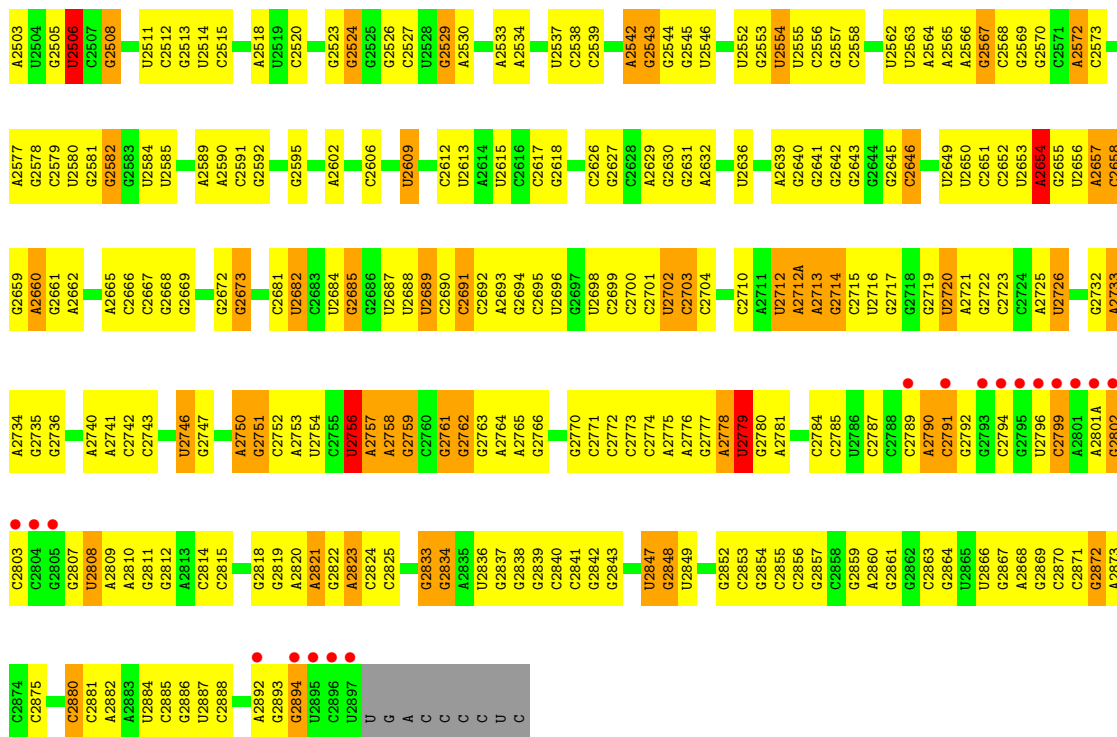
• Molecule 36: 23S RIBOSOMAL RNA



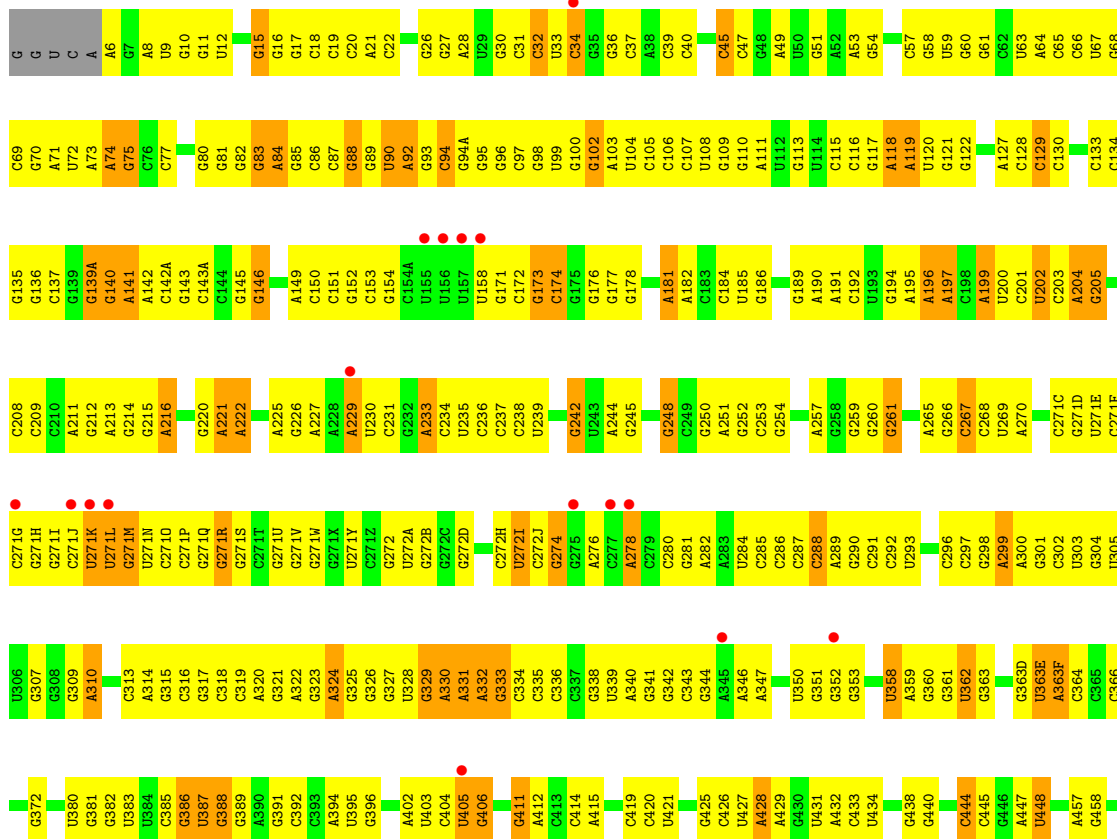




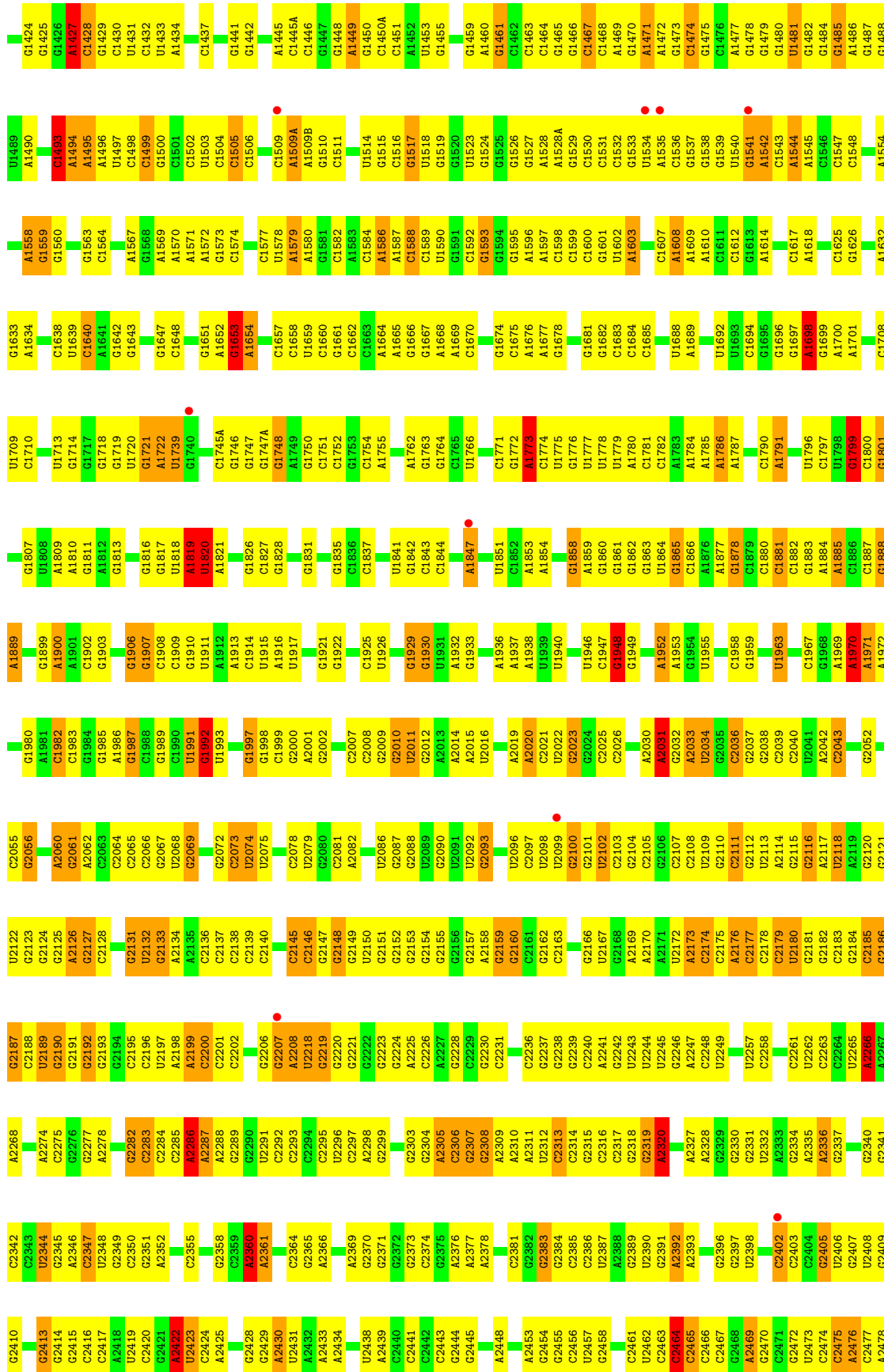




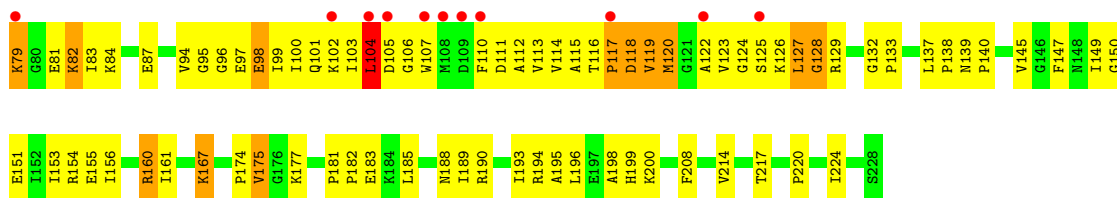
• Molecule 36: 23S RIBOSOMAL RNA



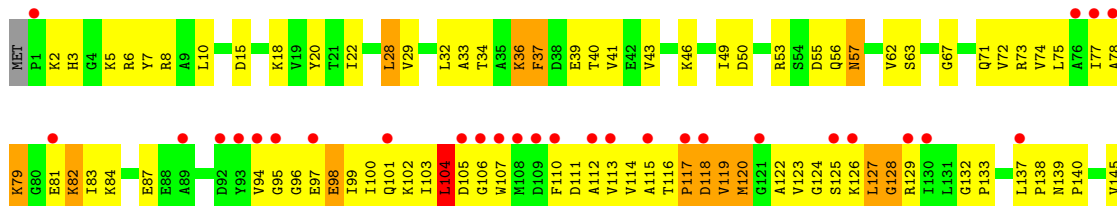
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A1278	G1279	G1280	G1281	U1282	G1283	A1284	A1285	A1286	U1288	C1289	C1290	C1291	G1292	C1293	C1297	G1298	U1300	A1301	A1302	G1303	C1304	U1240	A1241	A1242	G1243	G1244	G1245	A1246	A1247	G1248	U1249	G1250	C1251	G1252	A1253	G1256	C1257	C1258	G1259	G1260	C1261	C1333	U1263	G1264	A1265	A1268	A1269	C1270	G1271	A1272	U1273	A1274	A1275					
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U787	A788	C789	G790	C791	G792	A793	C796	A870	C876	A877	A878	C879	G880	G881	G882	C883	C884	C885	U810	U811	C812	C813	C814	C815	C816	A819	A824	C825	U826	U827	U828	A829	G830	G831	C903	C904	U905	G906	U907	A910	A911	C914	C915	G916	A917	G918	A918	U922	C923	G924	C925	G926	C927	C857	U858	U860		
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G710	G711	U714	G715	G716	G717	A722	G723	U724	G728	C730	C732	G733	C736	C737	G738	G739	U740	C741	G742	G743	G744	U745	A751	A752	C753	C754	C755	C756	G760	A761	A764	G769	G770	G771	C772	U773	A774	G775	G776	G777	G780	A781	A782	A783	A784	G785	C786											
A603	G604	C605	U606	A607	G608	G609	G610	C611	G612	C613	U614	U614A	G614B	A614C	G615	G616	C618	G619	G620	G621	G622	G623	C624	G625	U626	A627	G628	G629	C630	A631	A632	A633	C634	C635	A636	A637	G638	U639	C640	A643	A644	C645	A646	G647	G648	C649	C650	G651	C652	A653	A654	G654A	C654B	C654C	G654D	G654E	C654F	C654G
A532	G533	U534	A535	G536	C537	C540	C543	A547	U548	G549	G551	U555	C556	U557	C558	G559	U562	C563	C564	C565	U566	U569	C570	A571	A572	G573	C574	A575	U576	G577	C580	C581	G582	C583	C584	G585	A586	C587	U588	C589	A590	U591	G592	G593	U594	C595	G596	U597	G598	G599	G600							
G463	U464	G465	A466	G467	G468	G469	A470	A471	A472	G473	G476	A477	A478	A479	A480	G481	A482	A483	C484	C485	G489	C563	G491	A492	A493	G494	G495	C496	U499	G500	A501	A502	A505	G506	A507	G508	C509	G512	C584	A513	A514	A515	C516	C517	G518	U519	G520	C523	U524	C527	A528	A529	G530	C531				



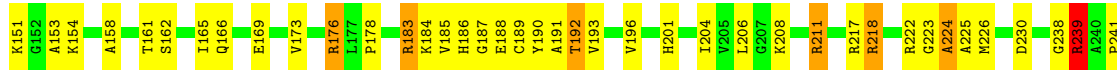
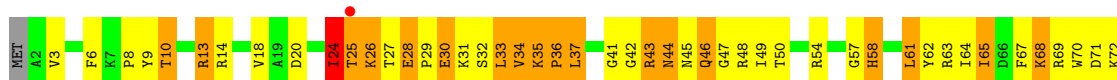




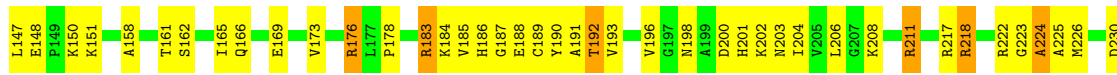
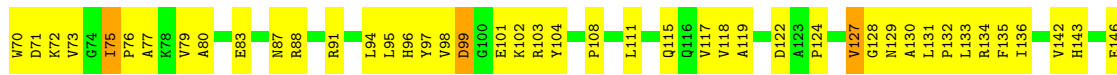
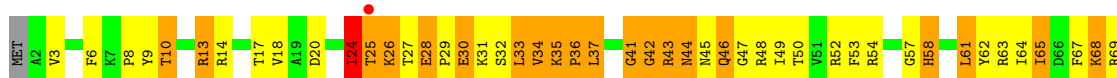
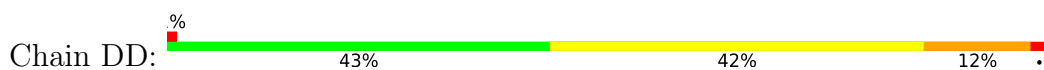
● Molecule 38: 50S RIBOSOMAL PROTEIN L1



● Molecule 39: 50S RIBOSOMAL PROTEIN L2

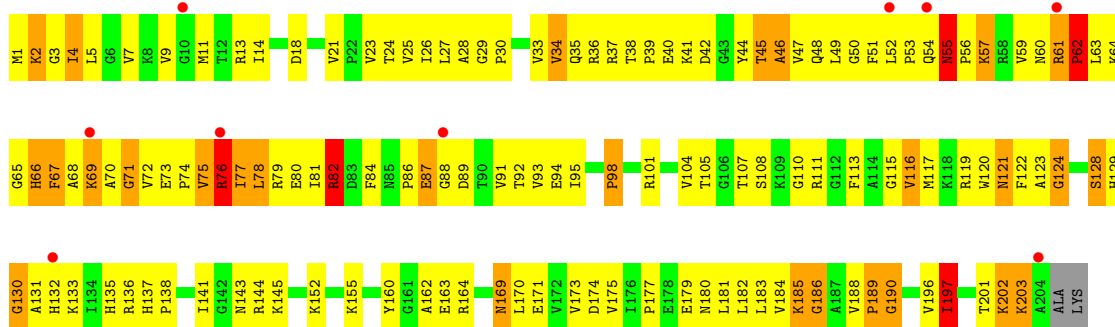


● Molecule 39: 50S RIBOSOMAL PROTEIN L2

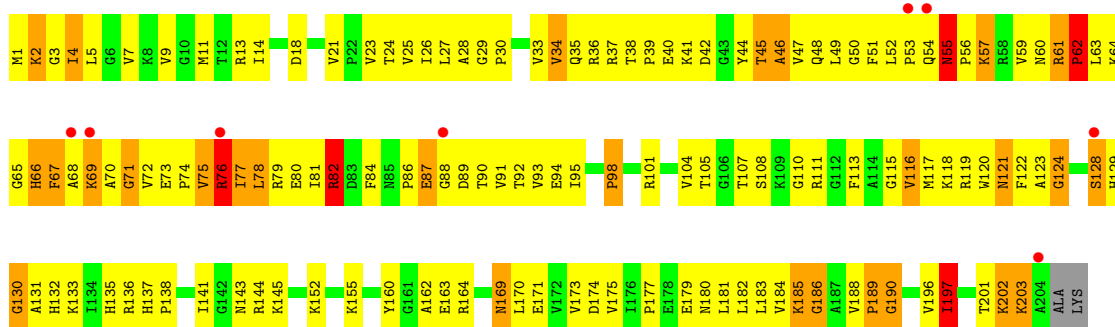




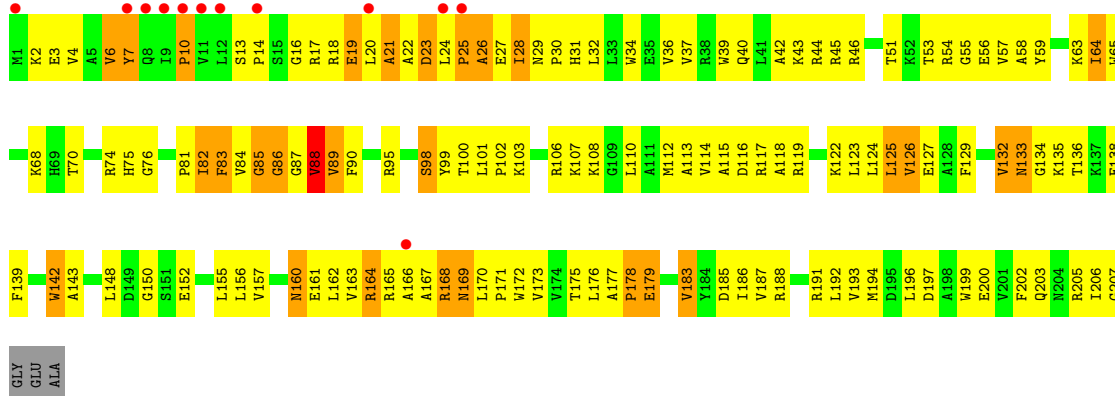
• Molecule 40: 50S RIBOSOMAL PROTEIN L3



• Molecule 40: 50S RIBOSOMAL PROTEIN L3

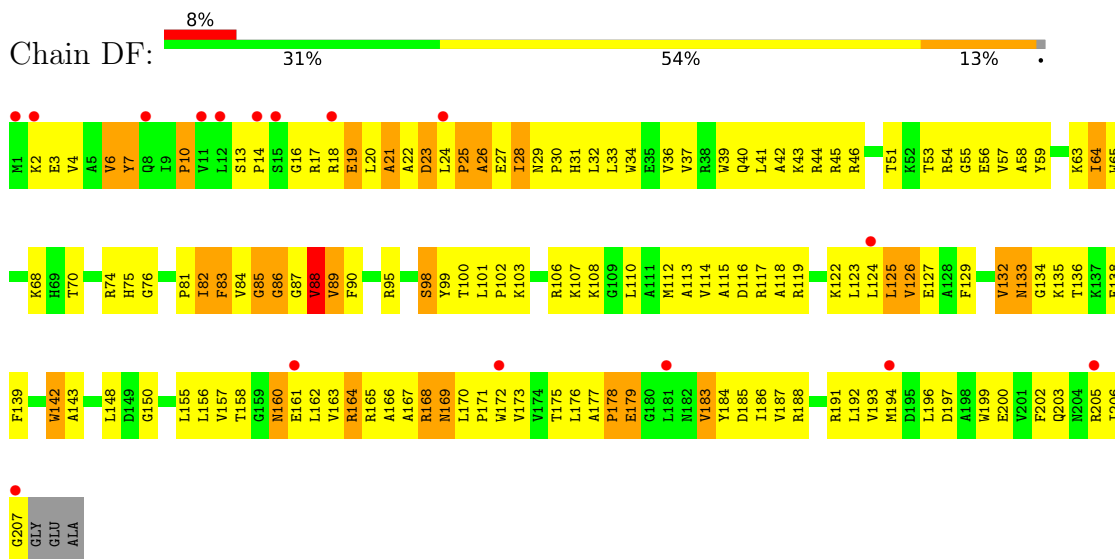


• Molecule 41: 50S RIBOSOMAL PROTEIN L4

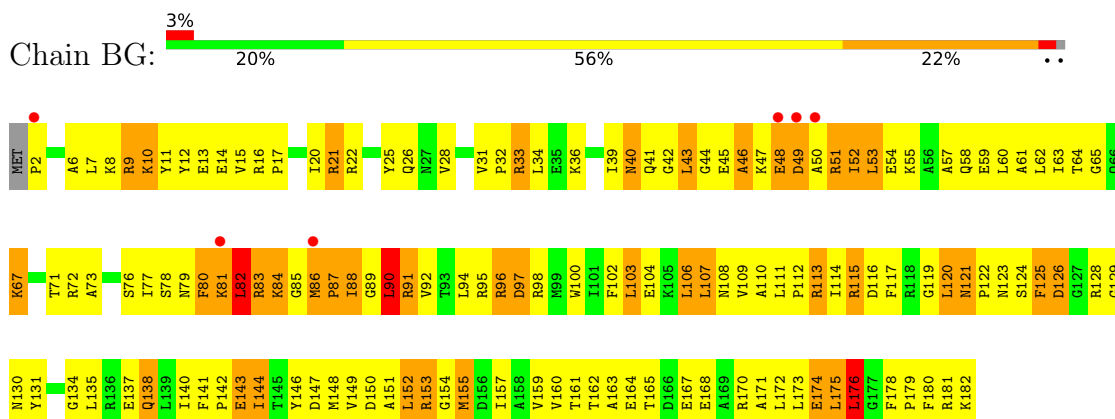


• Molecule 41: 50S RIBOSOMAL PROTEIN L4

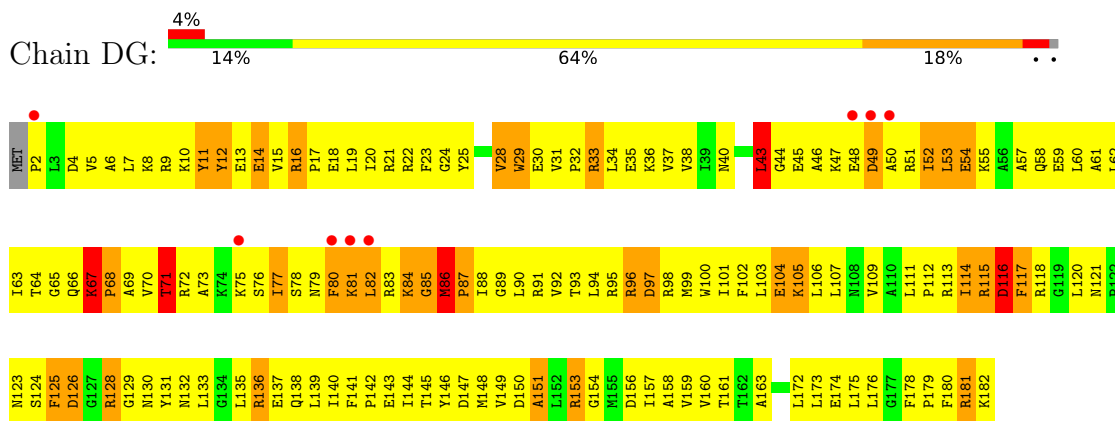




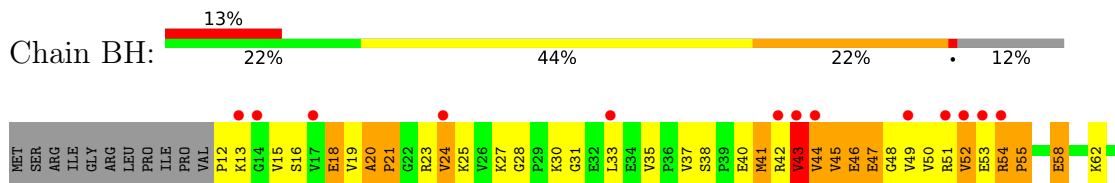
- Molecule 42: 50S RIBOSOMAL PROTEIN L5

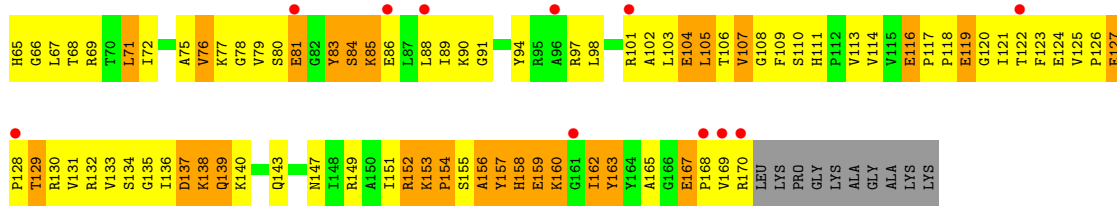


- Molecule 42: 50S RIBOSOMAL PROTEIN L5

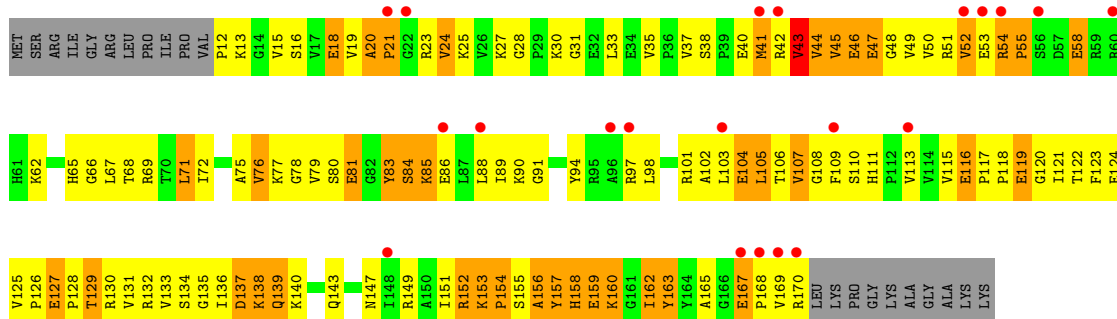
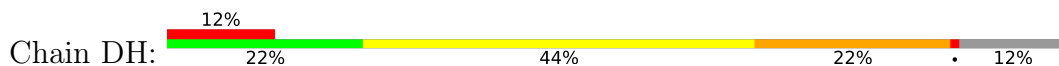


- Molecule 43: 50S RIBOSOMAL PROTEIN L6

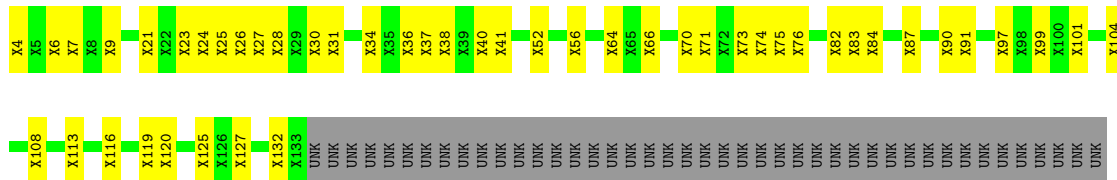




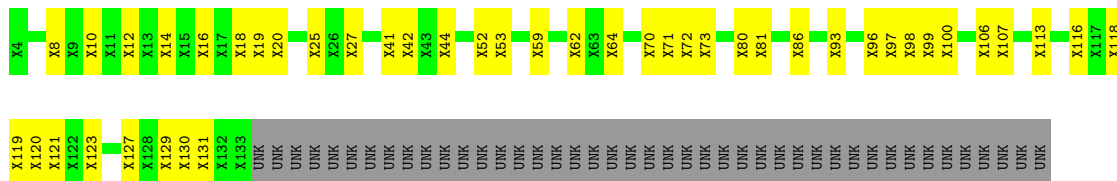
• Molecule 43: 50S RIBOSOMAL PROTEIN L6



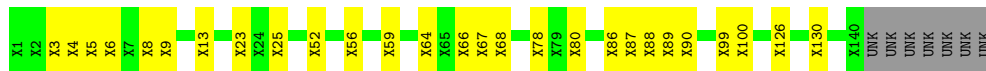
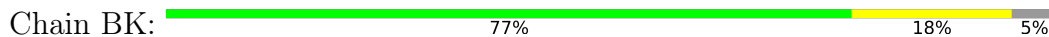
• Molecule 44: 50S RIBOSOMAL PROTEIN L10




• Molecule 44: 50S RIBOSOMAL PROTEIN L10



• Molecule 45: 50S RIBOSOMAL PROTEIN L11



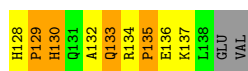
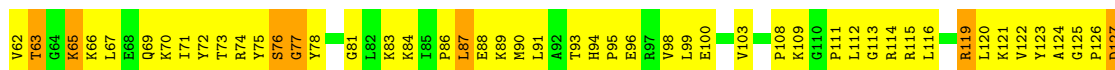
• Molecule 45: 50S RIBOSOMAL PROTEIN L11

Chain DK:  79% 16% 5%



- Molecule 46: 50S RIBOSOMAL PROTEIN L13

Chain BN:  19% 55% 24% ..



- Molecule 46: 50S RIBOSOMAL PROTEIN L13

Chain DN:  18% 57% 23% ..



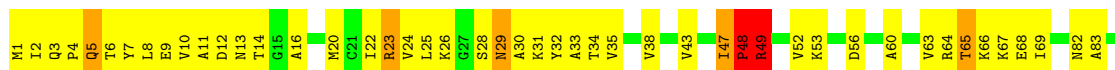
- Molecule 47: 50S RIBOSOMAL PROTEIN L14

Chain BO:  45% 49% ..



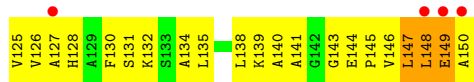
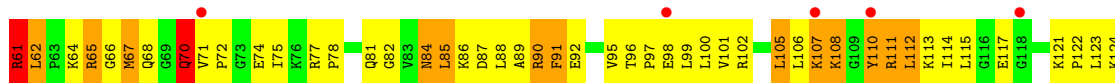
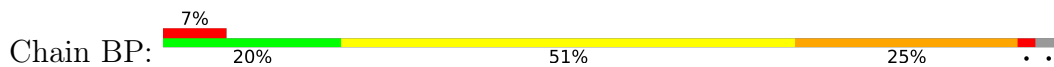
- Molecule 47: 50S RIBOSOMAL PROTEIN L14

Chain DO:  45% 49% ..

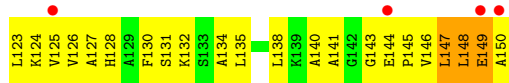
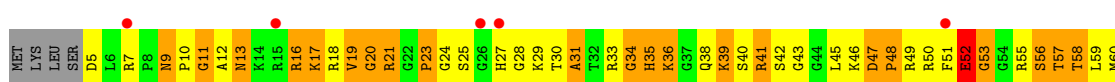
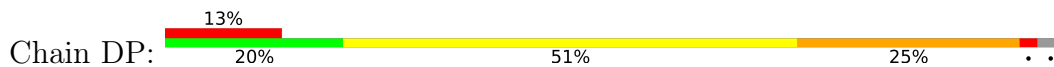




• Molecule 48: 50S RIBOSOMAL PROTEIN L15



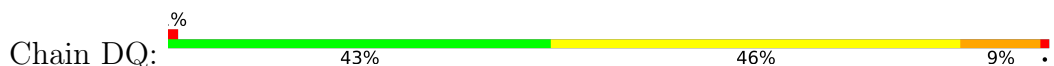
• Molecule 48: 50S RIBOSOMAL PROTEIN L15



• Molecule 49: 50S RIBOSOMAL PROTEIN L16

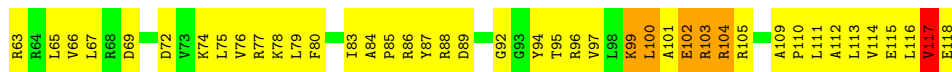


• Molecule 49: 50S RIBOSOMAL PROTEIN L16





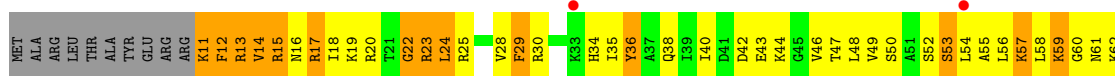
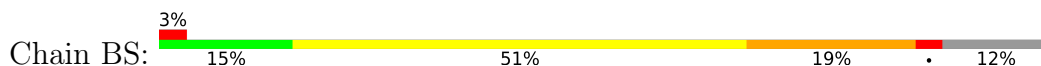
• Molecule 50: 50S RIBOSOMAL PROTEIN L17



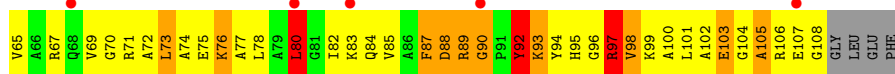
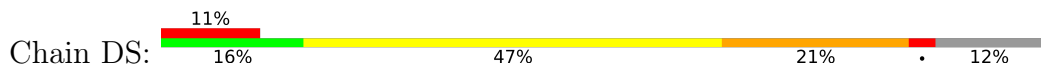
• Molecule 50: 50S RIBOSOMAL PROTEIN L17



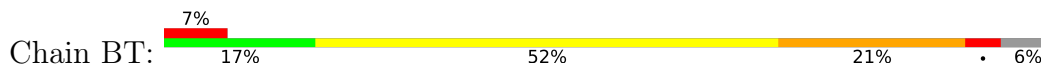
• Molecule 51: 50S RIBOSOMAL PROTEIN L18

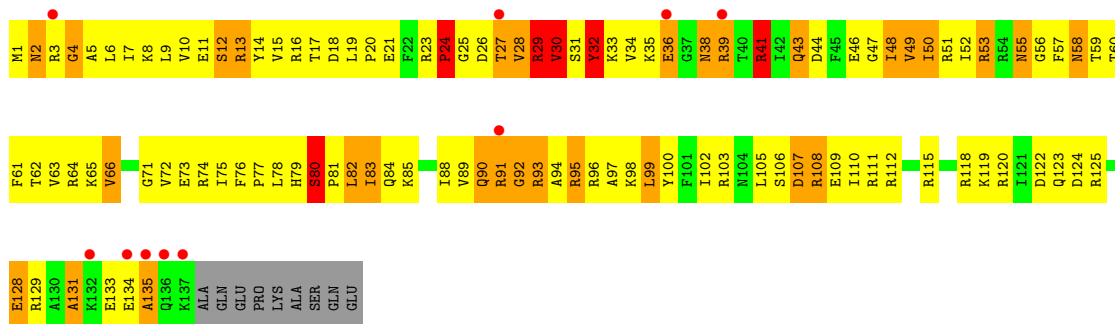


• Molecule 51: 50S RIBOSOMAL PROTEIN L18

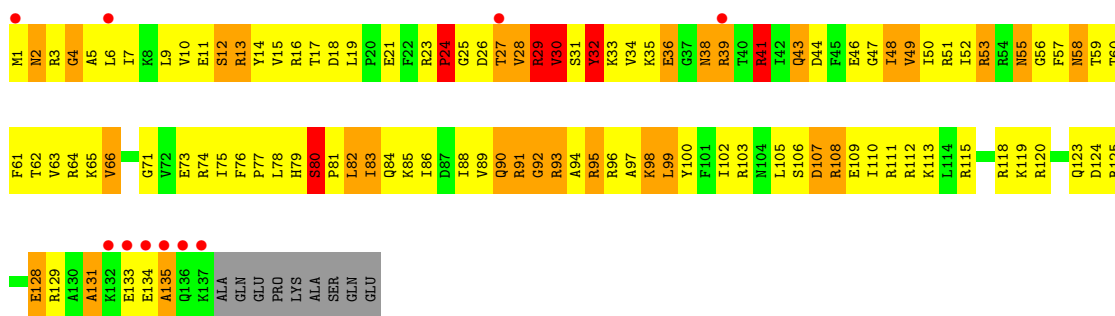
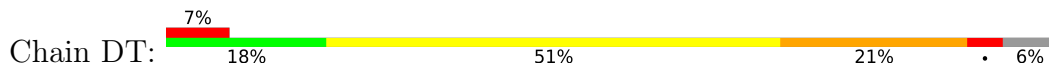


• Molecule 52: 50S RIBOSOMAL PROTEIN L19

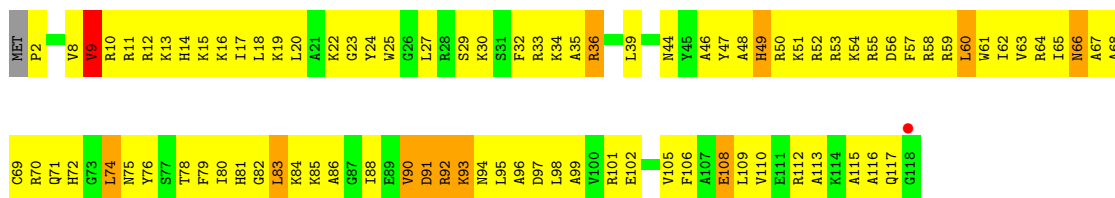




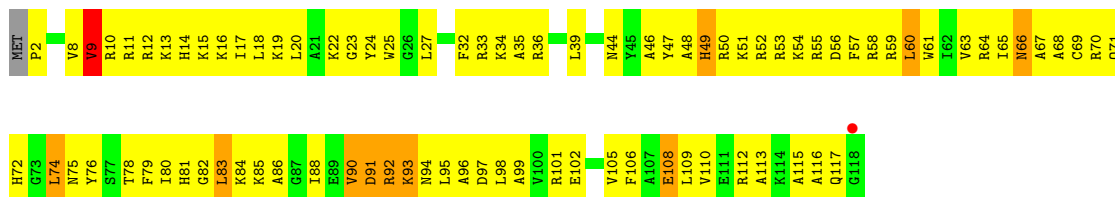
• Molecule 52: 50S RIBOSOMAL PROTEIN L19



• Molecule 53: 50S RIBOSOMAL PROTEIN L20

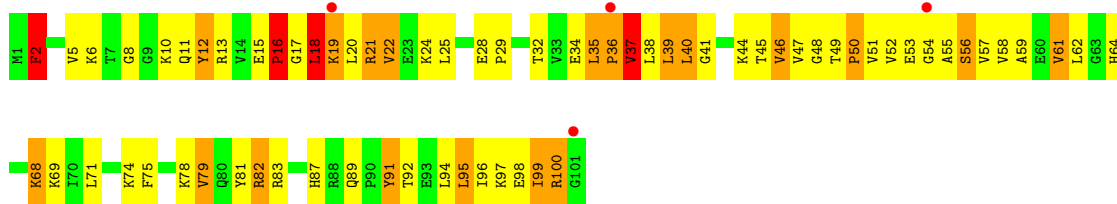


• Molecule 54: 50S RIBOSOMAL PROTEIN L21

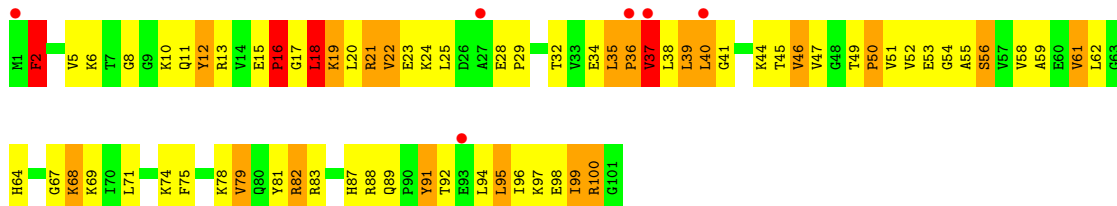


• Molecule 55: 50S RIBOSOMAL PROTEIN L22

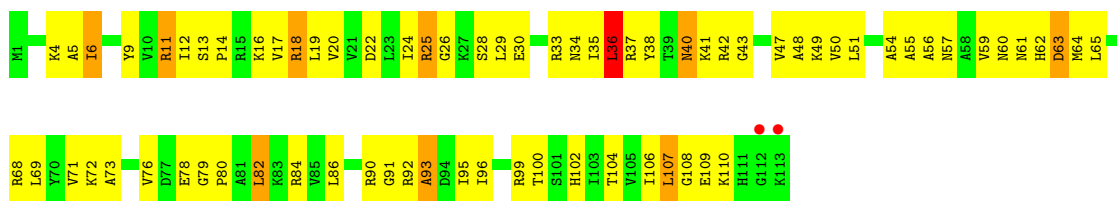




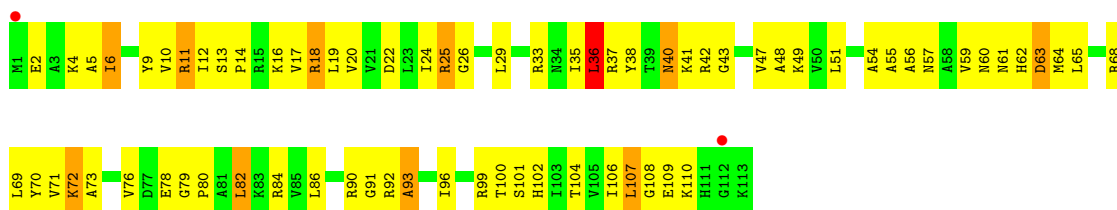
• Molecule 54: 50S RIBOSOMAL PROTEIN L21



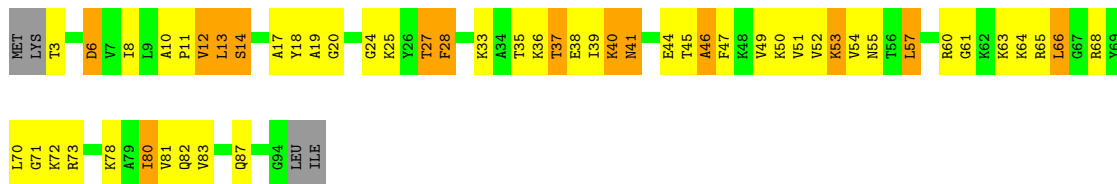
• Molecule 55: 50S RIBOSOMAL PROTEIN L22



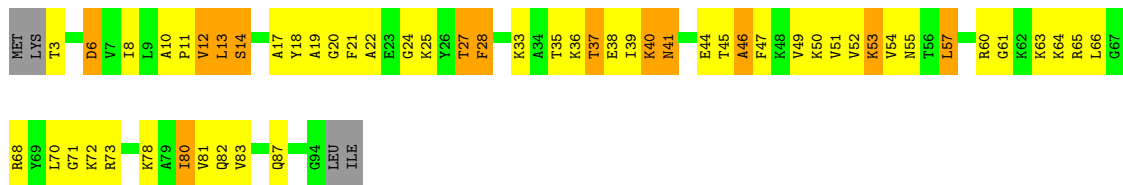
• Molecule 55: 50S RIBOSOMAL PROTEIN L22



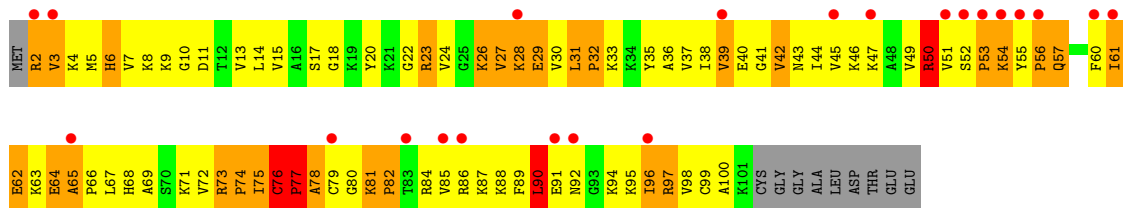
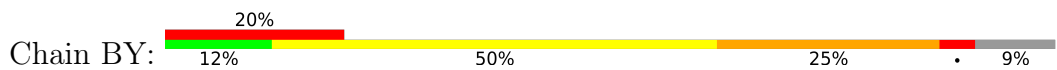
• Molecule 56: 50S RIBOSOMAL PROTEIN L23



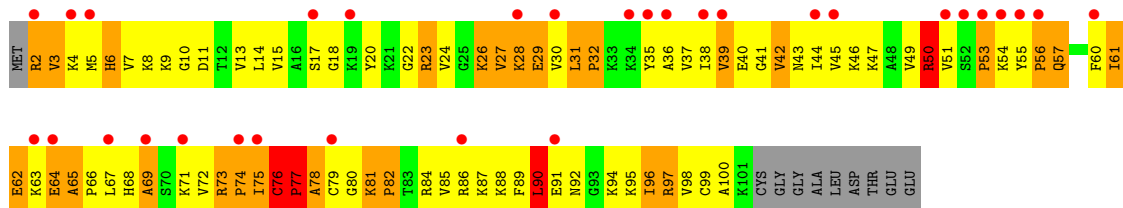
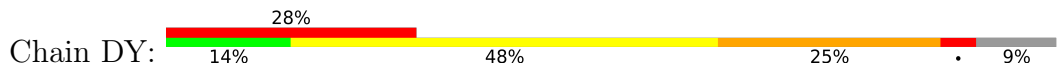
• Molecule 56: 50S RIBOSOMAL PROTEIN L23



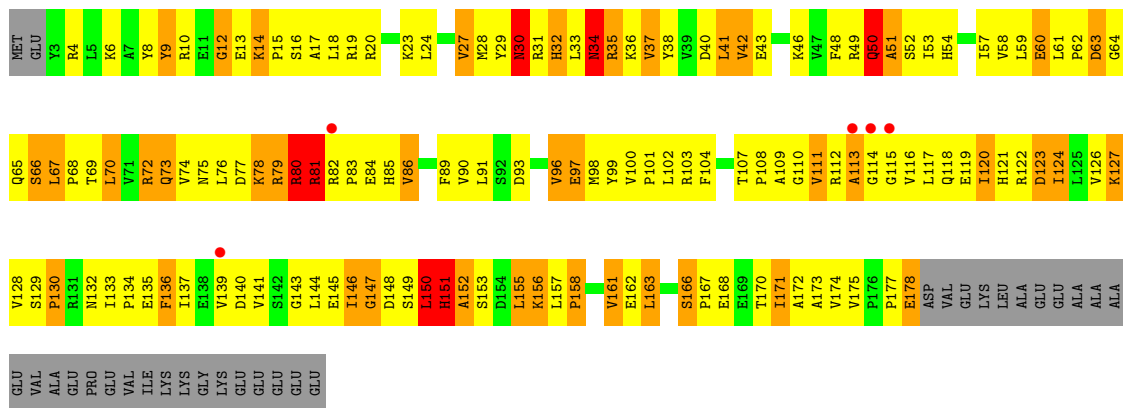
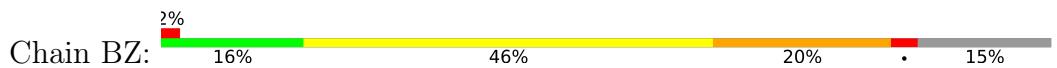
• Molecule 57: 50S RIBOSOMAL PROTEIN L24



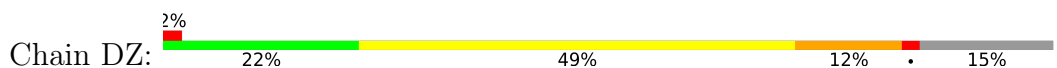
• Molecule 57: 50S RIBOSOMAL PROTEIN L24



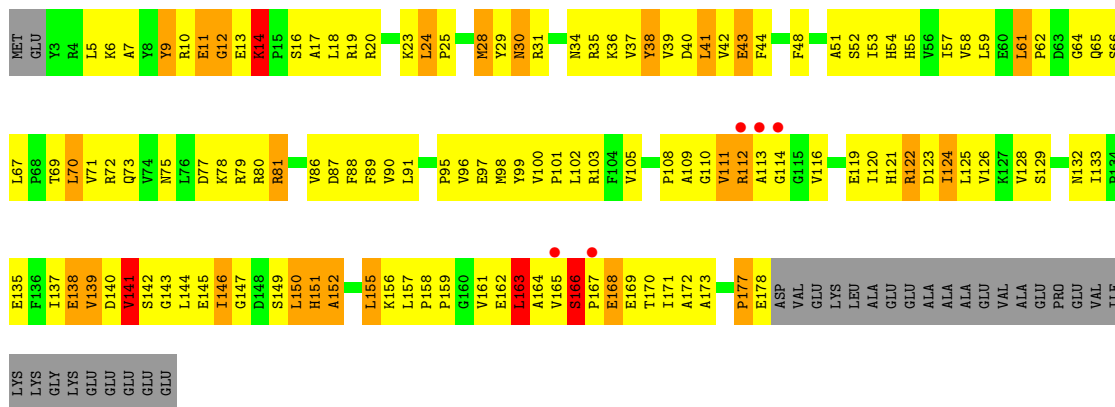
• Molecule 58: 50S RIBOSOMAL PROTEIN L25



• Molecule 58: 50S RIBOSOMAL PROTEIN L25







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	289.90Å 268.50Å 403.60Å 90.00° 91.62° 90.00°	Depositor
Resolution (Å)	50.00 – 3.10 49.92 – 2.93	Depositor EDS
% Data completeness (in resolution range)	98.0 (50.00-3.10) 90.5 (49.92-2.93)	Depositor EDS
$R_{merge}$	0.02	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.38 (at 2.91Å)	Xtrriage
Refinement program	CNS 1.2	Depositor
R, $R_{free}$	0.243 , 0.267 0.241 , 0.265	Depositor DCC
$R_{free}$ test set	59600 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	59.1	Xtrriage
Anisotropy	0.077	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 71.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.018 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	307322	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	77.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.42% 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: 7MG, 4SU, MIA, H2U, KIR, ZN, 5MU, OMC, PSU, GDP

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	0.57	4/36325 (0.0%)	0.75	46/56695 (0.1%)
1	CA	0.52	2/36325 (0.0%)	0.74	36/56695 (0.1%)
2	AB	0.44	0/1935	0.68	0/2609
2	CB	0.43	0/1935	0.69	0/2609
3	AC	0.49	0/1636	0.73	1/2205 (0.0%)
3	CC	0.45	0/1636	0.72	1/2205 (0.0%)
4	AD	0.39	0/1733	0.63	0/2318
4	CD	0.39	0/1733	0.63	0/2318
5	AE	0.54	0/1162	0.77	0/1564
5	CE	0.52	0/1162	0.76	0/1564
6	AF	0.39	0/856	0.65	0/1154
6	CF	0.39	0/856	0.66	0/1154
7	AG	0.45	0/1276	0.63	0/1709
7	CG	0.42	0/1276	0.63	1/1709 (0.1%)
8	AH	0.49	0/1136	0.73	0/1527
8	CH	0.45	0/1136	0.73	0/1527
9	AI	0.44	0/1029	0.68	0/1379
9	CI	0.42	0/1029	0.68	0/1379
10	AJ	0.41	0/807	0.68	0/1085
10	CJ	0.39	0/807	0.67	0/1085
11	AK	0.50	0/900	0.70	0/1213
11	CK	0.47	0/900	0.70	0/1213
12	AL	0.42	0/986	0.72	0/1320
12	CL	0.41	0/986	0.71	0/1320
13	AM	0.41	0/998	0.71	1/1336 (0.1%)
13	CM	0.38	0/998	0.71	1/1336 (0.1%)
14	AN	0.46	0/501	0.78	0/664
14	CN	0.45	0/501	0.79	0/664
15	AO	0.42	0/745	0.64	0/992
15	CO	0.43	0/745	0.64	0/992
16	AP	0.36	0/716	0.64	0/963
16	CP	0.35	0/716	0.64	0/963

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
17	AQ	0.45	0/836	0.67	0/1117
17	CQ	0.44	0/836	0.67	0/1117
18	AR	0.45	0/579	0.66	0/768
18	CR	0.46	0/579	0.67	0/768
19	AS	0.44	0/642	0.69	0/865
19	CS	0.41	0/642	0.69	0/865
20	AT	0.35	0/765	0.65	0/1007
20	CT	0.34	0/765	0.65	0/1007
21	AU	0.45	0/212	0.67	0/277
21	CU	0.50	0/212	0.66	0/277
22	AV	0.55	0/1809	0.73	1/2819 (0.0%)
22	AW	0.36	0/1809	0.73	2/2819 (0.1%)
22	CV	0.53	0/1809	0.73	1/2819 (0.0%)
22	CW	0.36	0/1809	0.73	2/2819 (0.1%)
23	AX	0.50	0/405	0.71	0/629
23	CX	0.49	0/405	0.70	0/629
24	AY	0.43	1/1616 (0.1%)	0.70	1/2511 (0.0%)
24	CY	0.45	1/1616 (0.1%)	0.70	1/2511 (0.0%)
25	AZ	0.31	0/3041	0.56	0/4127
25	CZ	0.32	0/3041	0.57	0/4127
26	B0	0.39	0/671	0.69	0/892
26	D0	0.41	0/671	0.70	0/892
27	B1	0.47	0/738	0.73	0/981
27	D1	0.40	0/738	0.68	0/981
28	B2	0.35	0/600	0.66	0/793
28	D2	0.33	0/600	0.64	1/793 (0.1%)
29	B3	0.37	0/472	0.61	0/634
29	D3	0.35	0/472	0.61	0/634
30	B4	0.38	0/349	0.65	0/474
30	D4	0.37	0/349	0.65	0/474
31	B5	0.38	0/473	0.72	0/639
31	D5	0.38	0/473	0.71	0/639
32	B6	0.60	0/440	0.82	0/586
32	D6	0.54	0/440	0.80	0/586
33	B7	0.42	0/426	0.68	0/561
33	D7	0.42	0/426	0.69	0/561
34	B8	0.56	0/515	0.87	1/679 (0.1%)
34	D8	0.53	0/515	0.87	1/679 (0.1%)
35	B9	0.42	0/310	0.65	0/407
35	D9	0.41	0/310	0.65	0/407
36	BA	0.51	3/69976 (0.0%)	0.72	33/109244 (0.0%)
36	DA	0.49	2/69976 (0.0%)	0.72	32/109244 (0.0%)
37	BB	0.43	0/2853	0.75	2/4451 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
37	DB	0.46	0/2853	0.75	2/4451 (0.0%)
38	BC	0.39	1/1774 (0.1%)	0.60	0/2391
38	DC	0.40	2/1774 (0.1%)	0.60	0/2391
39	BD	0.51	0/2195	0.81	1/2955 (0.0%)
39	DD	0.50	0/2195	0.80	1/2955 (0.0%)
40	BE	0.43	0/1596	0.75	0/2153
40	DE	0.43	0/1596	0.74	0/2153
41	BF	0.36	0/1658	0.65	0/2244
41	DF	0.37	0/1658	0.65	0/2244
42	BG	0.40	0/1499	0.74	1/2016 (0.0%)
42	DG	0.38	0/1499	0.68	0/2016
43	BH	0.32	0/1245	0.66	0/1682
43	DH	0.32	0/1245	0.66	0/1682
46	BN	0.37	0/1131	0.70	0/1525
46	DN	0.37	0/1131	0.69	0/1525
47	BO	0.47	0/943	0.68	0/1269
47	DO	0.46	0/943	0.67	0/1269
48	BP	0.43	0/1131	0.91	2/1504 (0.1%)
48	DP	0.42	0/1131	0.91	2/1504 (0.1%)
49	BQ	0.50	0/1143	0.71	0/1527
49	DQ	0.49	0/1143	0.72	0/1527
50	BR	0.38	0/974	0.71	1/1302 (0.1%)
50	DR	0.38	0/974	0.70	1/1302 (0.1%)
51	BS	0.36	0/778	0.76	0/1036
51	DS	0.37	0/778	0.75	0/1036
52	BT	0.43	0/1155	0.76	2/1542 (0.1%)
52	DT	0.41	0/1155	0.76	2/1542 (0.1%)
53	BU	0.41	0/975	0.68	0/1297
53	DU	0.43	0/975	0.68	0/1297
54	BV	0.37	0/790	0.68	0/1057
54	DV	0.39	0/790	0.68	0/1057
55	BW	0.35	0/907	0.67	0/1216
55	DW	0.36	0/907	0.67	0/1216
56	BX	0.40	0/739	0.65	0/993
56	DX	0.40	0/739	0.65	0/993
57	BY	0.36	0/788	0.73	1/1051 (0.1%)
57	DY	0.36	0/788	0.73	1/1051 (0.1%)
58	BZ	0.46	0/1435	0.81	1/1949 (0.1%)
58	DZ	0.44	0/1435	0.74	0/1949
All	All	0.49	16/330268 (0.0%)	0.72	183/493444 (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	5	49
1	CA	4	49
22	AW	1	1
22	CW	1	1
24	AY	2	0
24	CY	2	0
36	BA	2	66
36	DA	2	67
37	BB	0	6
37	DB	0	6
All	All	19	245

The worst 5 of 16 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
36	BA	761	A	C5-C6	-10.36	1.31	1.41
36	DA	761	A	C5-C6	-10.14	1.31	1.41
36	BA	2506	U	N1-C2	8.65	1.46	1.38
36	DA	2506	U	N1-C2	8.34	1.46	1.38
1	AA	858	G	C5-C6	-7.88	1.34	1.42

The worst 5 of 183 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
39	BD	244	ARG	C-N-CD	-11.04	96.32	120.60
39	DD	244	ARG	C-N-CD	-10.91	96.59	120.60
1	CA	1498	U	C2'-C3'-O3'	10.87	133.42	109.50
1	AA	1498	U	C2'-C3'-O3'	10.68	132.99	109.50
1	AA	508	C	C2'-C3'-O3'	9.74	130.93	109.50

5 of 19 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	AA	508	C	C3'
1	AA	1239	A	C3'
1	AA	1498	U	C3'
1	AA	1504	G	C3'
1	AA	1531	A	C3'

5 of 245 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AA	108	G	Sidechain
1	AA	14	U	Sidechain
1	AA	189(G)	G	Sidechain
1	AA	189(H)	G	Sidechain
1	AA	21	G	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	32451	0	16382	1017	0
1	CA	32451	0	16382	1043	0
2	AB	1900	0	1951	209	0
2	CB	1900	0	1951	211	0
3	AC	1612	0	1677	148	0
3	CC	1612	0	1677	155	0
4	AD	1703	0	1764	221	0
4	CD	1703	0	1763	226	0
5	AE	1146	0	1207	78	0
5	CE	1146	0	1207	89	0
6	AF	843	0	857	78	0
6	CF	843	0	857	77	0
7	AG	1257	0	1296	94	0
7	CG	1257	0	1296	89	0
8	AH	1116	0	1177	50	0
8	CH	1116	0	1177	52	0
9	AI	1010	0	1037	143	0
9	CI	1010	0	1037	142	0
10	AJ	794	0	840	113	0
10	CJ	794	0	840	118	0
11	AK	885	0	904	59	0
11	CK	885	0	904	61	0
12	AL	970	0	1057	112	0
12	CL	970	0	1057	111	0
13	AM	987	0	1059	136	0
13	CM	987	0	1059	139	0
14	AN	492	0	529	58	0
14	CN	492	0	529	61	0
15	AO	734	0	771	42	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
15	CO	734	0	771	43	0
16	AP	700	0	720	72	0
16	CP	700	0	720	73	0
17	AQ	823	0	891	56	0
17	CQ	823	0	891	58	0
18	AR	574	0	644	35	0
18	CR	574	0	644	39	0
19	AS	629	0	652	77	0
19	CS	629	0	652	79	0
20	AT	763	0	861	78	0
20	CT	763	0	861	79	0
21	AU	208	0	221	12	0
21	CU	208	0	221	13	0
22	AV	1619	0	822	60	0
22	AW	1619	0	822	65	0
22	CV	1619	0	822	63	0
22	CW	1619	0	822	69	0
23	AX	361	0	184	7	0
23	CX	361	0	184	11	0
24	AY	1643	0	853	76	0
24	CY	1643	0	853	75	0
25	AZ	2983	0	2999	284	0
25	CZ	2983	0	2999	287	0
26	B0	662	0	688	63	0
26	D0	662	0	688	65	0
27	B1	731	0	808	69	0
27	D1	731	0	808	69	0
28	B2	598	0	653	158	0
28	D2	598	0	653	67	0
29	B3	467	0	523	49	0
29	D3	467	0	523	47	0
30	B4	340	0	336	51	0
30	D4	340	0	336	53	0
31	B5	459	0	480	62	0
31	D5	459	0	480	65	0
32	B6	433	0	461	135	0
32	D6	433	0	461	133	0
33	B7	418	0	467	29	0
33	D7	418	0	467	28	0
34	B8	507	0	576	124	0
34	D8	507	0	576	123	0
35	B9	307	0	336	39	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
35	D9	307	0	335	42	0
36	BA	62477	0	31497	2140	0
36	DA	62477	0	31497	2211	0
37	BB	2551	0	1295	85	0
37	DB	2551	0	1295	97	0
38	BC	1742	0	1800	141	0
38	DC	1742	0	1800	132	0
39	BD	2145	0	2234	221	0
39	DD	2145	0	2234	234	0
40	BE	1563	0	1629	225	0
40	DE	1563	0	1629	222	0
41	BF	1623	0	1677	193	0
41	DF	1623	0	1677	197	0
42	BG	1474	0	1535	247	0
42	DG	1474	0	1535	232	0
43	BH	1222	0	1282	178	0
43	DH	1222	0	1282	184	0
44	BJ	651	0	164	27	0
44	DJ	651	0	164	31	0
45	BK	700	0	173	18	0
45	DK	700	0	173	15	0
46	BN	1104	0	1180	176	0
46	DN	1104	0	1180	171	0
47	BO	933	0	996	77	0
47	DO	933	0	996	78	0
48	BP	1114	0	1187	263	0
48	DP	1114	0	1187	265	0
49	BQ	1122	0	1179	112	0
49	DQ	1122	0	1179	106	0
50	BR	960	0	1021	133	0
50	DR	960	0	1021	128	0
51	BS	770	0	832	152	0
51	DS	770	0	832	150	0
52	BT	1141	0	1202	229	0
52	DT	1141	0	1202	223	0
53	BU	958	0	1015	132	0
53	DU	958	0	1015	130	0
54	BV	779	0	852	117	0
54	DV	779	0	852	120	0
55	BW	896	0	953	87	0
55	DW	896	0	953	86	0
56	BX	725	0	778	82	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	DX	725	0	778	84	0
57	BY	775	0	870	162	0
57	DY	775	0	870	156	0
58	BZ	1403	0	1432	216	0
58	DZ	1403	0	1432	200	0
59	AD	1	0	0	0	0
59	AN	1	0	0	0	0
59	B4	1	0	0	0	0
59	B9	1	0	0	0	0
59	CD	1	0	0	0	0
59	CN	1	0	0	0	0
59	D4	1	0	0	0	0
59	D9	1	0	0	0	0
60	AZ	28	0	12	2	0
60	CZ	28	0	12	6	0
61	AZ	57	0	58	3	0
61	CZ	57	0	59	2	0
All	All	307322	0	208715	17679	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 34.

The worst 5 of 17679 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:DC:123:VAL:CG2	38:DC:127:LEU:HD23	1.33	1.53
38:BC:123:VAL:CG2	38:BC:127:LEU:HD23	1.33	1.51
38:DC:123:VAL:HG23	38:DC:127:LEU:CD2	1.50	1.42
38:BC:123:VAL:HG23	38:BC:127:LEU:CD2	1.50	1.41
36:DA:1899:G:N2	36:DA:1902:C:H41	1.34	1.24

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	232/256 (91%)	175 (75%)	39 (17%)	18 (8%)	1	5
2	CB	232/256 (91%)	173 (75%)	41 (18%)	18 (8%)	1	5
3	AC	204/239 (85%)	161 (79%)	23 (11%)	20 (10%)	0	3
3	CC	204/239 (85%)	159 (78%)	28 (14%)	17 (8%)	1	5
4	AD	206/209 (99%)	134 (65%)	46 (22%)	26 (13%)	0	1
4	CD	206/209 (99%)	133 (65%)	48 (23%)	25 (12%)	0	1
5	AE	148/162 (91%)	138 (93%)	5 (3%)	5 (3%)	3	21
5	CE	148/162 (91%)	138 (93%)	6 (4%)	4 (3%)	5	25
6	AF	99/101 (98%)	80 (81%)	12 (12%)	7 (7%)	1	6
6	CF	99/101 (98%)	81 (82%)	11 (11%)	7 (7%)	1	6
7	AG	153/156 (98%)	123 (80%)	22 (14%)	8 (5%)	2	12
7	CG	153/156 (98%)	123 (80%)	22 (14%)	8 (5%)	2	12
8	AH	136/138 (99%)	125 (92%)	10 (7%)	1 (1%)	22	57
8	CH	136/138 (99%)	125 (92%)	10 (7%)	1 (1%)	22	57
9	AI	125/128 (98%)	85 (68%)	23 (18%)	17 (14%)	0	1
9	CI	125/128 (98%)	84 (67%)	24 (19%)	17 (14%)	0	1
10	AJ	96/105 (91%)	75 (78%)	12 (12%)	9 (9%)	0	3
10	CJ	96/105 (91%)	75 (78%)	12 (12%)	9 (9%)	0	3
11	AK	117/129 (91%)	100 (86%)	10 (8%)	7 (6%)	1	9
11	CK	117/129 (91%)	101 (86%)	9 (8%)	7 (6%)	1	9
12	AL	122/135 (90%)	94 (77%)	15 (12%)	13 (11%)	0	2
12	CL	122/135 (90%)	91 (75%)	18 (15%)	13 (11%)	0	2
13	AM	122/126 (97%)	82 (67%)	26 (21%)	14 (12%)	0	2
13	CM	122/126 (97%)	84 (69%)	24 (20%)	14 (12%)	0	2
14	AN	58/61 (95%)	41 (71%)	6 (10%)	11 (19%)	0	0
14	CN	58/61 (95%)	40 (69%)	7 (12%)	11 (19%)	0	0
15	AO	86/89 (97%)	79 (92%)	7 (8%)	0	100	100
15	CO	86/89 (97%)	79 (92%)	6 (7%)	1 (1%)	13	44
16	AP	81/88 (92%)	52 (64%)	22 (27%)	7 (9%)	1	4
16	CP	81/88 (92%)	52 (64%)	22 (27%)	7 (9%)	1	4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	AQ	97/105 (92%)	86 (89%)	9 (9%)	2 (2%)	7	30
17	CQ	97/105 (92%)	86 (89%)	9 (9%)	2 (2%)	7	30
18	AR	68/88 (77%)	56 (82%)	11 (16%)	1 (2%)	10	39
18	CR	68/88 (77%)	57 (84%)	10 (15%)	1 (2%)	10	39
19	AS	76/93 (82%)	50 (66%)	16 (21%)	10 (13%)	0	1
19	CS	76/93 (82%)	50 (66%)	16 (21%)	10 (13%)	0	1
20	AT	97/106 (92%)	64 (66%)	24 (25%)	9 (9%)	0	3
20	CT	97/106 (92%)	62 (64%)	26 (27%)	9 (9%)	0	3
21	AU	22/27 (82%)	18 (82%)	3 (14%)	1 (4%)	2	15
21	CU	22/27 (82%)	18 (82%)	3 (14%)	1 (4%)	2	15
25	AZ	381/405 (94%)	269 (71%)	82 (22%)	30 (8%)	1	5
25	CZ	381/405 (94%)	268 (70%)	83 (22%)	30 (8%)	1	5
26	B0	82/85 (96%)	69 (84%)	10 (12%)	3 (4%)	3	19
26	D0	82/85 (96%)	69 (84%)	10 (12%)	3 (4%)	3	19
27	B1	91/98 (93%)	70 (77%)	10 (11%)	11 (12%)	0	1
27	D1	91/98 (93%)	71 (78%)	14 (15%)	6 (7%)	1	7
28	B2	69/72 (96%)	40 (58%)	15 (22%)	14 (20%)	0	0
28	D2	69/72 (96%)	44 (64%)	18 (26%)	7 (10%)	0	3
29	B3	57/60 (95%)	47 (82%)	5 (9%)	5 (9%)	1	4
29	D3	57/60 (95%)	47 (82%)	5 (9%)	5 (9%)	1	4
30	B4	42/71 (59%)	20 (48%)	17 (40%)	5 (12%)	0	1
30	D4	42/71 (59%)	20 (48%)	17 (40%)	5 (12%)	0	1
31	B5	57/60 (95%)	39 (68%)	8 (14%)	10 (18%)	0	0
31	D5	57/60 (95%)	39 (68%)	8 (14%)	10 (18%)	0	0
32	B6	48/54 (89%)	24 (50%)	8 (17%)	16 (33%)	0	0
32	D6	48/54 (89%)	24 (50%)	8 (17%)	16 (33%)	0	0
33	B7	46/49 (94%)	42 (91%)	3 (6%)	1 (2%)	6	29
33	D7	46/49 (94%)	42 (91%)	3 (6%)	1 (2%)	6	29
34	B8	61/65 (94%)	34 (56%)	21 (34%)	6 (10%)	0	3
34	D8	61/65 (94%)	34 (56%)	21 (34%)	6 (10%)	0	3
35	B9	35/37 (95%)	25 (71%)	6 (17%)	4 (11%)	0	2

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
35	D9	35/37 (95%)	24 (69%)	8 (23%)	3 (9%)	1	4
38	BC	226/229 (99%)	170 (75%)	45 (20%)	11 (5%)	2	14
38	DC	226/229 (99%)	171 (76%)	43 (19%)	12 (5%)	2	12
39	BD	273/276 (99%)	219 (80%)	31 (11%)	23 (8%)	1	5
39	DD	273/276 (99%)	217 (80%)	31 (11%)	25 (9%)	1	4
40	BE	202/206 (98%)	134 (66%)	39 (19%)	29 (14%)	0	1
40	DE	202/206 (98%)	134 (66%)	39 (19%)	29 (14%)	0	1
41	BF	205/210 (98%)	148 (72%)	35 (17%)	22 (11%)	0	2
41	DF	205/210 (98%)	149 (73%)	34 (17%)	22 (11%)	0	2
42	BG	179/182 (98%)	118 (66%)	33 (18%)	28 (16%)	0	0
42	DG	179/182 (98%)	119 (66%)	31 (17%)	29 (16%)	0	0
43	BH	157/180 (87%)	93 (59%)	34 (22%)	30 (19%)	0	0
43	DH	157/180 (87%)	94 (60%)	33 (21%)	30 (19%)	0	0
46	BN	136/140 (97%)	93 (68%)	20 (15%)	23 (17%)	0	0
46	DN	136/140 (97%)	93 (68%)	20 (15%)	23 (17%)	0	0
47	BO	120/122 (98%)	106 (88%)	8 (7%)	6 (5%)	2	13
47	DO	120/122 (98%)	106 (88%)	8 (7%)	6 (5%)	2	13
48	BP	144/150 (96%)	78 (54%)	36 (25%)	30 (21%)	0	0
48	DP	144/150 (96%)	77 (54%)	37 (26%)	30 (21%)	0	0
49	BQ	139/141 (99%)	114 (82%)	20 (14%)	5 (4%)	3	20
49	DQ	139/141 (99%)	114 (82%)	20 (14%)	5 (4%)	3	20
50	BR	115/118 (98%)	83 (72%)	16 (14%)	16 (14%)	0	1
50	DR	115/118 (98%)	83 (72%)	17 (15%)	15 (13%)	0	1
51	BS	96/112 (86%)	50 (52%)	24 (25%)	22 (23%)	0	0
51	DS	96/112 (86%)	49 (51%)	23 (24%)	24 (25%)	0	0
52	BT	135/146 (92%)	82 (61%)	30 (22%)	23 (17%)	0	0
52	DT	135/146 (92%)	82 (61%)	30 (22%)	23 (17%)	0	0
53	BU	115/118 (98%)	83 (72%)	25 (22%)	7 (6%)	1	9
53	DU	115/118 (98%)	83 (72%)	25 (22%)	7 (6%)	1	9
54	BV	99/101 (98%)	61 (62%)	23 (23%)	15 (15%)	0	0
54	DV	99/101 (98%)	62 (63%)	22 (22%)	15 (15%)	0	0

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
55	BW	111/113 (98%)	87 (78%)	12 (11%)	12 (11%)	0	2
55	DW	111/113 (98%)	85 (77%)	14 (13%)	12 (11%)	0	2
56	BX	90/96 (94%)	64 (71%)	20 (22%)	6 (7%)	1	7
56	DX	90/96 (94%)	65 (72%)	19 (21%)	6 (7%)	1	7
57	BY	98/110 (89%)	41 (42%)	31 (32%)	26 (26%)	0	0
57	DY	98/110 (89%)	43 (44%)	29 (30%)	26 (26%)	0	0
58	BZ	174/206 (84%)	109 (63%)	27 (16%)	38 (22%)	0	0
58	DZ	174/206 (84%)	109 (63%)	47 (27%)	18 (10%)	0	3
All	All	12256/13106 (94%)	8858 (72%)	2104 (17%)	1294 (11%)	0	3

5 of 1294 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	AB	15	VAL
2	AB	18	GLY
2	AB	190	THR
2	AB	191	ASP
2	AB	230	VAL

### 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%)	178 (88%)	24 (12%)	5	20
2	CB	202/220 (92%)	180 (89%)	22 (11%)	6	25
3	AC	160/188 (85%)	143 (89%)	17 (11%)	6	26
3	CC	160/188 (85%)	144 (90%)	16 (10%)	7	28
4	AD	180/181 (99%)	157 (87%)	23 (13%)	4	18
4	CD	180/181 (99%)	157 (87%)	23 (13%)	4	18
5	AE	115/123 (94%)	104 (90%)	11 (10%)	8	31
5	CE	115/123 (94%)	105 (91%)	10 (9%)	10	36

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	AF	90/90 (100%)	81 (90%)	9 (10%)	7	28
6	CF	90/90 (100%)	82 (91%)	8 (9%)	9	34
7	AG	126/127 (99%)	116 (92%)	10 (8%)	12	40
7	CG	126/127 (99%)	116 (92%)	10 (8%)	12	40
8	AH	119/119 (100%)	109 (92%)	10 (8%)	11	38
8	CH	119/119 (100%)	109 (92%)	10 (8%)	11	38
9	AI	98/99 (99%)	89 (91%)	9 (9%)	9	33
9	CI	98/99 (99%)	89 (91%)	9 (9%)	9	33
10	AJ	88/92 (96%)	80 (91%)	8 (9%)	9	33
10	CJ	88/92 (96%)	80 (91%)	8 (9%)	9	33
11	AK	90/99 (91%)	81 (90%)	9 (10%)	7	28
11	CK	90/99 (91%)	82 (91%)	8 (9%)	9	34
12	AL	104/111 (94%)	95 (91%)	9 (9%)	10	36
12	CL	104/111 (94%)	97 (93%)	7 (7%)	16	46
13	AM	99/101 (98%)	86 (87%)	13 (13%)	4	17
13	CM	99/101 (98%)	86 (87%)	13 (13%)	4	17
14	AN	49/50 (98%)	39 (80%)	10 (20%)	1	5
14	CN	49/50 (98%)	39 (80%)	10 (20%)	1	5
15	AO	79/80 (99%)	70 (89%)	9 (11%)	5	23
15	CO	79/80 (99%)	71 (90%)	8 (10%)	7	28
16	AP	72/74 (97%)	66 (92%)	6 (8%)	11	38
16	CP	72/74 (97%)	66 (92%)	6 (8%)	11	38
17	AQ	94/97 (97%)	87 (93%)	7 (7%)	13	42
17	CQ	94/97 (97%)	87 (93%)	7 (7%)	13	42
18	AR	61/77 (79%)	54 (88%)	7 (12%)	5	22
18	CR	61/77 (79%)	54 (88%)	7 (12%)	5	22
19	AS	69/80 (86%)	56 (81%)	13 (19%)	1	6
19	CS	69/80 (86%)	56 (81%)	13 (19%)	1	6
20	AT	76/82 (93%)	71 (93%)	5 (7%)	16	47
20	CT	76/82 (93%)	71 (93%)	5 (7%)	16	47
21	AU	19/22 (86%)	18 (95%)	1 (5%)	22	54

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
21	CU	19/22 (86%)	18 (95%)	1 (5%)	22	54
25	AZ	322/338 (95%)	299 (93%)	23 (7%)	14	44
25	CZ	322/338 (95%)	299 (93%)	23 (7%)	14	44
26	B0	66/67 (98%)	58 (88%)	8 (12%)	5	20
26	D0	66/67 (98%)	56 (85%)	10 (15%)	3	12
27	B1	78/83 (94%)	67 (86%)	11 (14%)	3	15
27	D1	78/83 (94%)	71 (91%)	7 (9%)	9	34
28	B2	66/67 (98%)	61 (92%)	5 (8%)	13	41
28	D2	66/67 (98%)	60 (91%)	6 (9%)	9	33
29	B3	51/52 (98%)	44 (86%)	7 (14%)	3	16
29	D3	51/52 (98%)	44 (86%)	7 (14%)	3	16
30	B4	39/63 (62%)	32 (82%)	7 (18%)	2	8
30	D4	39/63 (62%)	32 (82%)	7 (18%)	2	8
31	B5	51/52 (98%)	43 (84%)	8 (16%)	2	11
31	D5	51/52 (98%)	43 (84%)	8 (16%)	2	11
32	B6	49/52 (94%)	36 (74%)	13 (26%)	0	1
32	D6	49/52 (94%)	37 (76%)	12 (24%)	0	2
33	B7	41/42 (98%)	35 (85%)	6 (15%)	3	13
33	D7	41/42 (98%)	35 (85%)	6 (15%)	3	13
34	B8	53/55 (96%)	45 (85%)	8 (15%)	3	12
34	D8	53/55 (96%)	45 (85%)	8 (15%)	3	12
35	B9	34/34 (100%)	31 (91%)	3 (9%)	10	36
35	D9	34/34 (100%)	31 (91%)	3 (9%)	10	36
38	BC	180/181 (99%)	170 (94%)	10 (6%)	21	52
38	DC	180/181 (99%)	171 (95%)	9 (5%)	24	57
39	BD	217/218 (100%)	187 (86%)	30 (14%)	3	16
39	DD	217/218 (100%)	186 (86%)	31 (14%)	3	14
40	BE	165/166 (99%)	148 (90%)	17 (10%)	7	27
40	DE	165/166 (99%)	148 (90%)	17 (10%)	7	27
41	BF	165/166 (99%)	150 (91%)	15 (9%)	9	33
41	DF	165/166 (99%)	150 (91%)	15 (9%)	9	33

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
42	BG	155/156 (99%)	132 (85%)	23 (15%)	3	13
42	DG	155/156 (99%)	138 (89%)	17 (11%)	6	25
43	BH	132/148 (89%)	116 (88%)	16 (12%)	5	20
43	DH	132/148 (89%)	116 (88%)	16 (12%)	5	20
46	BN	117/119 (98%)	102 (87%)	15 (13%)	4	18
46	DN	117/119 (98%)	102 (87%)	15 (13%)	4	18
47	BO	100/100 (100%)	95 (95%)	5 (5%)	24	57
47	DO	100/100 (100%)	95 (95%)	5 (5%)	24	57
48	BP	112/116 (97%)	97 (87%)	15 (13%)	4	16
48	DP	112/116 (97%)	97 (87%)	15 (13%)	4	16
49	BQ	111/111 (100%)	96 (86%)	15 (14%)	4	16
49	DQ	111/111 (100%)	97 (87%)	14 (13%)	4	18
50	BR	100/101 (99%)	89 (89%)	11 (11%)	6	25
50	DR	100/101 (99%)	90 (90%)	10 (10%)	7	28
51	BS	77/88 (88%)	68 (88%)	9 (12%)	5	22
51	DS	77/88 (88%)	68 (88%)	9 (12%)	5	22
52	BT	120/127 (94%)	97 (81%)	23 (19%)	1	6
52	DT	120/127 (94%)	98 (82%)	22 (18%)	1	7
53	BU	92/94 (98%)	83 (90%)	9 (10%)	8	29
53	DU	92/94 (98%)	84 (91%)	8 (9%)	10	36
54	BV	82/82 (100%)	66 (80%)	16 (20%)	1	6
54	DV	82/82 (100%)	66 (80%)	16 (20%)	1	6
55	BW	91/92 (99%)	86 (94%)	5 (6%)	21	53
55	DW	91/92 (99%)	86 (94%)	5 (6%)	21	53
56	BX	74/78 (95%)	64 (86%)	10 (14%)	4	16
56	DX	74/78 (95%)	64 (86%)	10 (14%)	4	16
57	BY	84/91 (92%)	70 (83%)	14 (17%)	2	9
57	DY	84/91 (92%)	70 (83%)	14 (17%)	2	9
58	BZ	155/179 (87%)	126 (81%)	29 (19%)	1	7
58	DZ	155/179 (87%)	135 (87%)	20 (13%)	4	18
All	All	10338/10860 (95%)	9176 (89%)	1162 (11%)	6	24

5 of 1162 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
39	DD	217	ARG
58	DZ	28	MET
41	DF	28	ILE
39	DD	211	ARG
49	DQ	56	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 301 such sidechains are listed below:

Mol	Chain	Res	Type
31	D5	43	HIS
52	DT	90	GLN
39	DD	96	HIS
43	DH	147	ASN
58	DZ	132	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	1509/1522 (99%)	240 (15%)	49 (3%)
1	CA	1509/1522 (99%)	234 (15%)	47 (3%)
22	AV	75/76 (98%)	19 (25%)	2 (2%)
22	AW	75/76 (98%)	17 (22%)	0
22	CV	75/76 (98%)	19 (25%)	1 (1%)
22	CW	75/76 (98%)	17 (22%)	0
23	AX	16/27 (59%)	6 (37%)	0
23	CX	16/27 (59%)	6 (37%)	0
24	AY	74/77 (96%)	25 (33%)	5 (6%)
24	CY	74/77 (96%)	25 (33%)	5 (6%)
36	BA	2900/2915 (99%)	510 (17%)	46 (1%)
36	DA	2900/2915 (99%)	508 (17%)	46 (1%)
37	BB	118/122 (96%)	25 (21%)	2 (1%)
37	DB	118/122 (96%)	25 (21%)	2 (1%)
All	All	9534/9630 (99%)	1676 (17%)	205 (2%)

5 of 1676 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	7	G
1	AA	9	G
1	AA	31	G

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Mol	Chain	Res	Type
1	AA	32	A
1	AA	39	G

5 of 205 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	CA	266	G
1	CA	1211	U
36	DA	2481	G
1	CA	351	G
1	CA	748	C

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

18 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
24	MIA	AY	37	24	24,31,32	1.19	2 (8%)	26,44,47	1.71	4 (15%)
24	4SU	AY	8	24	18,21,22	0.53	0	26,30,33	0.84	2 (7%)
24	4SU	CY	8	24	18,21,22	0.56	0	26,30,33	0.82	2 (7%)
24	H2U	CY	17	24	18,21,22	0.86	0	21,30,33	2.02	6 (28%)
24	PSU	AY	55	24	18,21,22	1.00	1 (5%)	22,30,33	1.62	3 (13%)
24	H2U	AY	17	24	18,21,22	0.86	0	21,30,33	2.01	5 (23%)
24	7MG	AY	46	24	22,26,27	2.91	2 (9%)	29,39,42	1.55	2 (6%)
24	OMC	CY	32	24	19,22,23	0.35	0	26,31,34	0.68	1 (3%)
24	OMC	AY	32	24	19,22,23	0.34	0	26,31,34	0.69	1 (3%)
24	5MU	AY	54	24	19,22,23	0.33	0	28,32,35	0.41	0
24	5MU	CY	54	24	19,22,23	0.31	0	28,32,35	0.41	0
24	H2U	AY	20	24	18,21,22	0.87	0	21,30,33	1.92	4 (19%)
24	MIA	CY	37	24	24,31,32	1.02	1 (4%)	26,44,47	1.71	4 (15%)
24	H2U	CY	16	24	18,21,22	0.94	0	21,30,33	1.79	4 (19%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
24	PSU	CY	55	24	18,21,22	1.00	2 (11%)	22,30,33	1.60	3 (13%)
24	H2U	AY	16	24	18,21,22	0.89	0	21,30,33	1.79	4 (19%)
24	H2U	CY	20	24	18,21,22	0.85	0	21,30,33	1.92	4 (19%)
24	7MG	CY	46	24	22,26,27	2.91	2 (9%)	29,39,42	1.56	2 (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
24	MIA	AY	37	24	-	2/11/33/34	0/3/3/3
24	4SU	AY	8	24	-	1/7/25/26	0/2/2/2
24	4SU	CY	8	24	-	1/7/25/26	0/2/2/2
24	H2U	CY	17	24	-	3/7/38/39	0/2/2/2
24	PSU	AY	55	24	1/1/5/5	3/7/25/26	0/2/2/2
24	H2U	AY	17	24	-	3/7/38/39	0/2/2/2
24	7MG	AY	46	24	-	2/7/37/38	0/3/3/3
24	OMC	CY	32	24	-	0/9/27/28	0/2/2/2
24	OMC	AY	32	24	-	0/9/27/28	0/2/2/2
24	PSU	CY	55	24	1/1/5/5	3/7/25/26	0/2/2/2
24	5MU	AY	54	24	-	0/7/25/26	0/2/2/2
24	H2U	AY	20	24	-	1/7/38/39	0/2/2/2
24	MIA	CY	37	24	-	2/11/33/34	0/3/3/3
24	H2U	CY	16	24	-	0/7/38/39	0/2/2/2
24	5MU	CY	54	24	-	0/7/25/26	0/2/2/2
24	H2U	AY	16	24	-	0/7/38/39	0/2/2/2
24	H2U	CY	20	24	-	1/7/38/39	0/2/2/2
24	7MG	CY	46	24	-	2/7/37/38	0/3/3/3

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
24	CY	46	7MG	C8-N9	-13.14	1.38	1.46
24	AY	46	7MG	C8-N9	-13.12	1.38	1.46
24	AY	37	MIA	C2-S10	3.49	1.78	1.75
24	AY	46	7MG	C5-N7	3.40	1.39	1.35
24	CY	46	7MG	C5-N7	3.34	1.39	1.35

The worst 5 of 51 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
24	CY	46	7MG	N9-C8-N7	6.62	112.85	103.38
24	AY	46	7MG	N9-C8-N7	6.59	112.81	103.38
24	CY	37	MIA	C11-S10-C2	5.58	106.44	102.27
24	AY	37	MIA	C11-S10-C2	5.50	106.38	102.27
24	CY	20	H2U	C4-N3-C2	-5.18	121.49	125.79

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
24	AY	55	PSU	C3'
24	CY	55	PSU	C3'

5 of 24 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
24	AY	17	H2U	C4'-C5'-O5'-P
24	AY	37	MIA	C5-C6-N6-C12
24	AY	55	PSU	C2'-C1'-C5-C4
24	CY	17	H2U	C4'-C5'-O5'-P
24	CY	37	MIA	C5-C6-N6-C12

There are no ring outliers.

17 monomers are involved in 32 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
24	AY	37	MIA	1	0
24	AY	8	4SU	1	0
24	CY	8	4SU	1	0
24	CY	17	H2U	5	0
24	AY	55	PSU	3	0
24	AY	17	H2U	5	0
24	AY	46	7MG	4	0
24	CY	32	OMC	1	0
24	AY	32	OMC	1	0
24	AY	54	5MU	1	0
24	CY	54	5MU	1	0
24	AY	20	H2U	2	0
24	CY	16	H2U	3	0
24	CY	55	PSU	2	0
24	AY	16	H2U	3	0
24	CY	20	H2U	2	0
24	CY	46	7MG	4	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 8 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
60	GDP	CZ	501	-	24,30,30	1.29	2 (8%)	30,47,47	1.59	5 (16%)
61	KIR	AZ	502	-	56,59,59	3.48	23 (41%)	62,84,84	1.68	13 (20%)
60	GDP	AZ	501	-	24,30,30	1.29	2 (8%)	30,47,47	1.48	6 (20%)
61	KIR	CZ	502	-	56,59,59	3.45	23 (41%)	62,84,84	1.67	13 (20%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
60	GDP	CZ	501	-	-	0/12/32/32	0/3/3/3
61	KIR	AZ	502	-	-	4/54/98/98	0/3/3/3
60	GDP	AZ	501	-	-	0/12/32/32	0/3/3/3
61	KIR	CZ	502	-	-	3/54/98/98	0/3/3/3

The worst 5 of 50 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
61	AZ	502	KIR	O18-C17	-14.83	1.22	1.44
61	CZ	502	KIR	O18-C17	-14.56	1.22	1.44
61	AZ	502	KIR	O30-C30	-12.56	1.17	1.42
61	CZ	502	KIR	O30-C30	-12.50	1.17	1.42
61	AZ	502	KIR	C22-C21	5.64	1.39	1.33

The worst 5 of 37 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
61	AZ	502	KIR	O29-C29-O34	-4.75	102.25	110.21
61	CZ	502	KIR	O29-C29-O34	-4.61	102.48	110.21
61	AZ	502	KIR	C48-C32-C47	-4.46	101.36	107.72
61	CZ	502	KIR	C11-C10-C9	-4.46	114.34	123.47
61	AZ	502	KIR	C11-C10-C9	-4.45	114.37	123.47

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

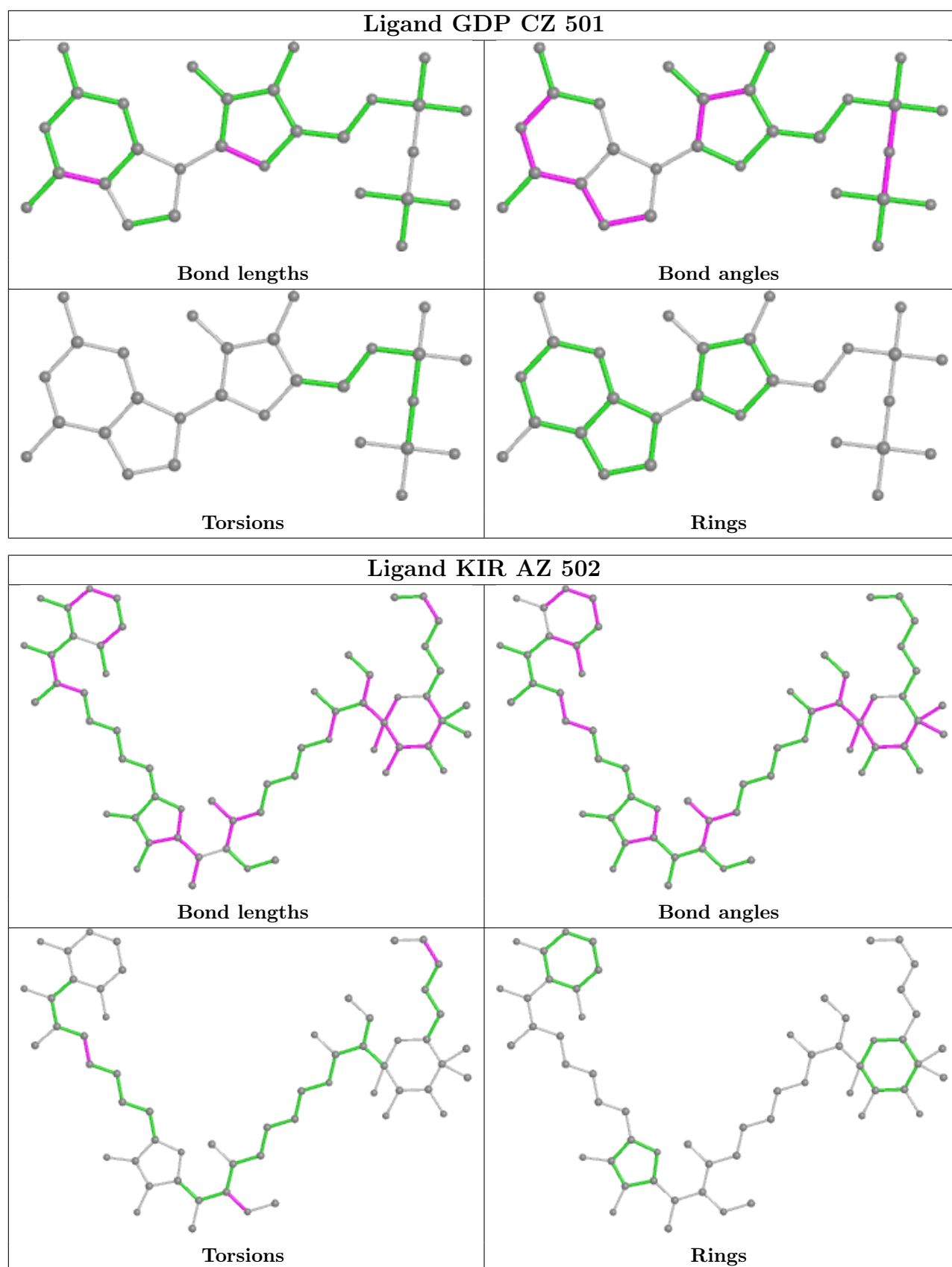
Mol	Chain	Res	Type	Atoms
61	AZ	502	KIR	C11-C10-C9-C8
61	CZ	502	KIR	C11-C10-C9-C8
61	AZ	502	KIR	C36-C37-C38-C39
61	CZ	502	KIR	C36-C37-C38-C39
61	AZ	502	KIR	C19-C20-O20-C43

There are no ring outliers.

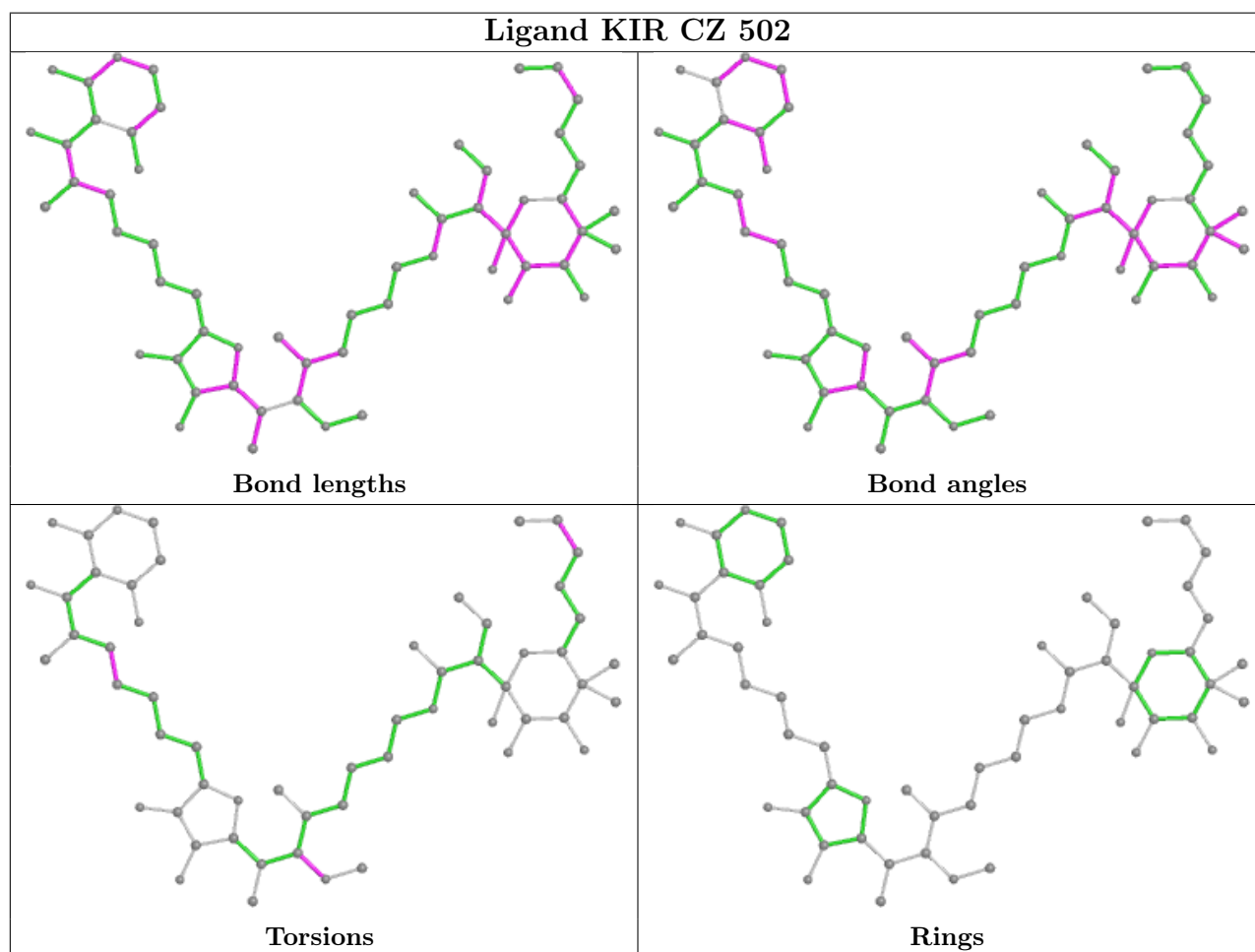
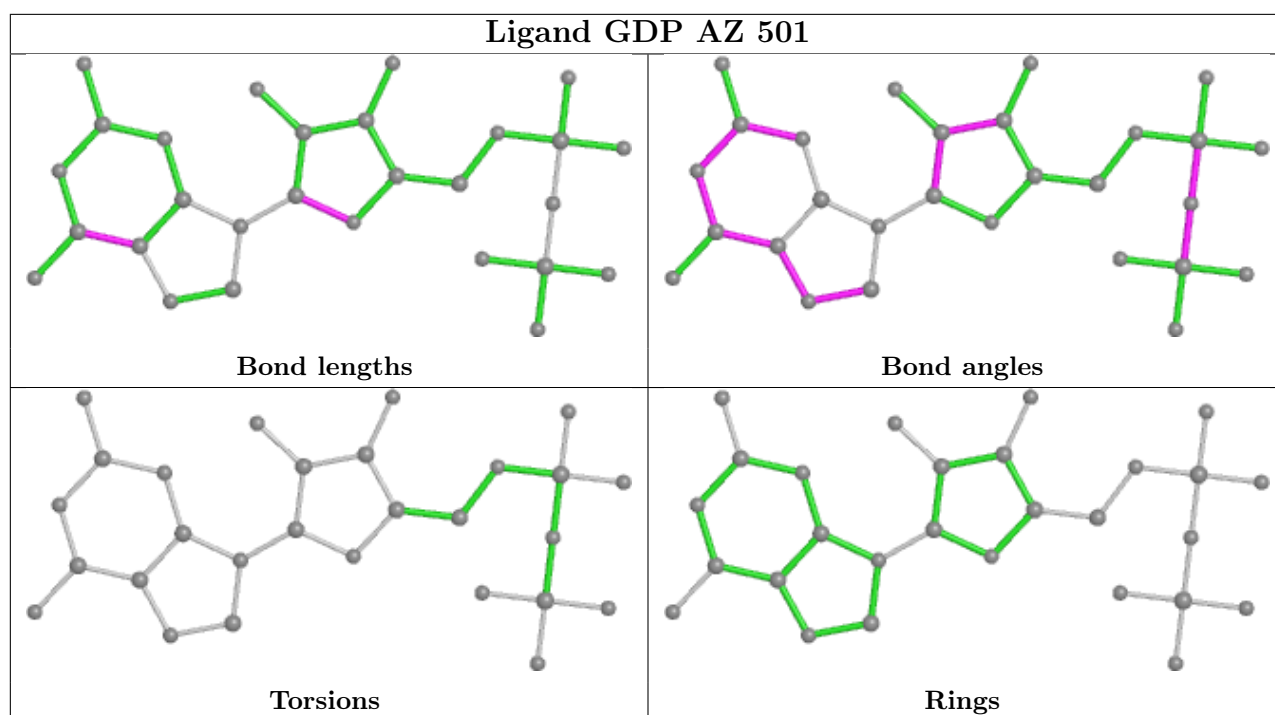
4 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
60	CZ	501	GDP	6	0
61	AZ	502	KIR	3	0
60	AZ	501	GDP	2	0
61	CZ	502	KIR	2	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](#)

There are no chain breaks in this entry.

## 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	1510/1522 (99%)	0.02	32 (2%) 63 43	17, 54, 143, 200	0
1	CA	1510/1522 (99%)	-0.17	26 (1%) 70 49	26, 58, 145, 200	0
2	AB	234/256 (91%)	-0.14	2 (0%) 84 69	34, 64, 130, 141	0
2	CB	234/256 (91%)	-0.12	6 (2%) 56 33	36, 65, 130, 142	0
3	AC	206/239 (86%)	-0.30	0 100 100	27, 48, 81, 86	0
3	CC	206/239 (86%)	-0.41	0 100 100	32, 52, 82, 88	0
4	AD	208/209 (99%)	0.29	8 (3%) 40 20	55, 89, 119, 122	0
4	CD	208/209 (99%)	0.22	12 (5%) 23 10	55, 90, 119, 122	0
5	AE	150/162 (92%)	-0.43	0 100 100	23, 41, 62, 84	0
5	CE	150/162 (92%)	-0.43	0 100 100	30, 44, 64, 86	0
6	AF	101/101 (100%)	-0.25	1 (0%) 82 67	48, 72, 88, 94	0
6	CF	101/101 (100%)	0.04	1 (0%) 82 67	52, 74, 90, 95	0
7	AG	155/156 (99%)	-0.13	4 (2%) 56 33	40, 64, 100, 115	0
7	CG	155/156 (99%)	-0.10	4 (2%) 56 33	45, 67, 101, 115	0
8	AH	138/138 (100%)	-0.41	0 100 100	30, 44, 61, 71	0
8	CH	138/138 (100%)	-0.50	0 100 100	31, 47, 62, 72	0
9	AI	127/128 (99%)	0.26	2 (1%) 72 51	33, 73, 113, 120	0
9	CI	127/128 (99%)	0.34	8 (6%) 20 8	40, 77, 114, 120	0
10	AJ	98/105 (93%)	0.47	5 (5%) 28 13	41, 80, 133, 136	0
10	CJ	98/105 (93%)	0.72	15 (15%) 2 1	44, 84, 134, 137	0
11	AK	119/129 (92%)	-0.13	3 (2%) 57 34	28, 49, 80, 104	0
11	CK	119/129 (92%)	-0.17	3 (2%) 57 34	32, 53, 82, 104	0
12	AL	124/135 (91%)	-0.01	2 (1%) 72 51	28, 66, 87, 125	0
12	CL	124/135 (91%)	0.10	2 (1%) 72 51	30, 67, 88, 124	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
13	AM	124/126 (98%)	0.09	5 (4%) 38 19	50, 73, 100, 137	0
13	CM	124/126 (98%)	0.17	8 (6%) 18 8	53, 76, 101, 137	0
14	AN	60/61 (98%)	-0.04	1 (1%) 70 49	33, 48, 76, 79	0
14	CN	60/61 (98%)	-0.19	1 (1%) 70 49	39, 53, 76, 80	0
15	AO	88/89 (98%)	-0.35	0 100 100	36, 51, 73, 81	0
15	CO	88/89 (98%)	-0.22	0 100 100	37, 53, 73, 81	0
16	AP	83/88 (94%)	0.28	0 100 100	62, 78, 99, 125	0
16	CP	83/88 (94%)	0.34	3 (3%) 42 22	62, 80, 100, 124	0
17	AQ	99/105 (94%)	-0.20	0 100 100	33, 55, 72, 83	0
17	CQ	99/105 (94%)	-0.17	0 100 100	39, 56, 73, 83	0
18	AR	70/88 (79%)	-0.25	1 (1%) 75 56	37, 55, 87, 99	0
18	CR	70/88 (79%)	-0.15	2 (2%) 51 28	43, 59, 88, 99	0
19	AS	78/93 (83%)	0.38	6 (7%) 13 5	61, 81, 116, 125	0
19	CS	78/93 (83%)	0.53	6 (7%) 13 5	63, 83, 117, 125	0
20	AT	99/106 (93%)	0.20	5 (5%) 28 13	49, 77, 112, 115	0
20	CT	99/106 (93%)	0.30	4 (4%) 38 19	52, 78, 113, 115	0
21	AU	24/27 (88%)	0.31	1 (4%) 36 18	43, 55, 76, 93	0
21	CU	24/27 (88%)	0.56	3 (12%) 3 1	46, 59, 78, 92	0
22	AV	76/76 (100%)	-0.13	0 100 100	34, 64, 95, 113	0
22	AW	76/76 (100%)	0.89	11 (14%) 2 1	60, 165, 193, 200	0
22	CV	76/76 (100%)	-0.21	0 100 100	38, 66, 97, 114	0
22	CW	76/76 (100%)	1.03	14 (18%) 1 0	63, 166, 193, 200	0
23	AX	17/27 (62%)	0.76	3 (17%) 1 0	27, 87, 137, 139	0
23	CX	17/27 (62%)	0.83	5 (29%) 0 0	32, 88, 137, 140	0
24	AY	68/77 (88%)	1.50	20 (29%) 0 0	70, 145, 175, 178	0
24	CY	68/77 (88%)	1.77	29 (42%) 0 0	72, 146, 174, 178	0
25	AZ	385/405 (95%)	0.86	54 (14%) 2 1	84, 129, 155, 177	0
25	CZ	385/405 (95%)	0.97	57 (14%) 2 1	85, 129, 155, 177	0
26	B0	84/85 (98%)	0.28	7 (8%) 11 4	47, 64, 95, 108	0
26	D0	84/85 (98%)	0.38	7 (8%) 11 4	50, 66, 95, 108	0
27	B1	93/98 (94%)	0.03	1 (1%) 80 64	38, 55, 114, 120	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
27	D1	93/98 (94%)	0.31	5 (5%) 25 12	54, 71, 121, 129	0
28	B2	71/72 (98%)	1.35	19 (26%) 0 0	108, 136, 147, 149	0
28	D2	71/72 (98%)	0.55	4 (5%) 24 11	88, 107, 126, 142	0
29	B3	59/60 (98%)	0.23	1 (1%) 70 49	50, 71, 91, 116	0
29	D3	59/60 (98%)	0.53	3 (5%) 28 13	51, 72, 91, 116	0
30	B4	44/71 (61%)	0.98	5 (11%) 5 2	109, 148, 172, 176	0
30	D4	44/71 (61%)	0.53	3 (6%) 17 7	110, 148, 172, 176	0
31	B5	59/60 (98%)	0.10	3 (5%) 28 13	45, 71, 131, 148	0
31	D5	59/60 (98%)	0.19	4 (6%) 17 7	46, 73, 130, 148	0
32	B6	50/54 (92%)	1.03	6 (12%) 4 2	50, 80, 106, 112	0
32	D6	50/54 (92%)	0.92	6 (12%) 4 2	54, 82, 106, 114	0
33	B7	48/49 (97%)	0.07	1 (2%) 63 43	45, 53, 90, 110	0
33	D7	48/49 (97%)	-0.05	0 100 100	47, 54, 89, 110	0
34	B8	63/65 (96%)	0.29	3 (4%) 30 14	49, 63, 79, 101	0
34	D8	63/65 (96%)	0.29	4 (6%) 20 8	51, 65, 80, 101	0
35	B9	37/37 (100%)	0.37	1 (2%) 54 31	62, 75, 96, 98	0
35	D9	37/37 (100%)	0.61	2 (5%) 25 12	61, 77, 96, 98	0
36	BA	2901/2915 (99%)	0.12	116 (3%) 38 19	21, 65, 173, 200	0
36	DA	2901/2915 (99%)	0.05	107 (3%) 41 21	26, 67, 173, 200	0
37	BB	119/122 (97%)	-0.16	0 100 100	52, 81, 104, 123	0
37	DB	119/122 (97%)	-0.27	0 100 100	55, 82, 104, 123	0
38	BC	228/229 (99%)	0.21	13 (5%) 23 11	47, 78, 152, 166	0
38	DC	228/229 (99%)	0.63	29 (12%) 3 1	51, 80, 152, 167	0
39	BD	275/276 (99%)	-0.27	3 (1%) 80 64	27, 44, 71, 96	0
39	DD	275/276 (99%)	-0.30	2 (0%) 87 75	29, 46, 71, 96	0
40	BE	204/206 (99%)	0.14	9 (4%) 34 17	40, 65, 114, 124	0
40	DE	204/206 (99%)	0.11	8 (3%) 39 20	41, 65, 114, 124	0
41	BF	207/210 (98%)	0.30	12 (5%) 23 10	45, 96, 152, 159	0
41	DF	207/210 (98%)	0.40	16 (7%) 13 5	45, 97, 152, 159	0
42	BG	181/182 (99%)	-0.09	6 (3%) 46 24	50, 73, 111, 132	0
42	DG	181/182 (99%)	0.21	8 (4%) 34 17	78, 100, 124, 135	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
43	BH	159/180 (88%)	1.03	24 (15%) 2 1	84, 119, 144, 150	0
43	DH	159/180 (88%)	0.94	21 (13%) 3 1	83, 119, 144, 151	0
44	BJ	0/173	-	-	-	-
44	DJ	0/173	-	-	-	-
45	BK	0/147	-	-	-	-
45	DK	0/147	-	-	-	-
46	BN	138/140 (98%)	0.03	1 (0%) 87 75	51, 74, 118, 123	0
46	DN	138/140 (98%)	0.04	1 (0%) 87 75	51, 75, 118, 123	0
47	BO	122/122 (100%)	-0.32	0 100 100	35, 49, 62, 66	0
47	DO	122/122 (100%)	-0.40	0 100 100	35, 50, 62, 65	0
48	BP	146/150 (97%)	0.73	11 (7%) 14 5	47, 92, 118, 139	0
48	DP	146/150 (97%)	0.83	19 (13%) 3 1	49, 95, 118, 138	0
49	BQ	141/141 (100%)	-0.08	2 (1%) 75 56	35, 54, 75, 117	0
49	DQ	141/141 (100%)	-0.09	2 (1%) 75 56	39, 54, 76, 117	0
50	BR	117/118 (99%)	0.14	1 (0%) 84 69	51, 70, 88, 93	0
50	DR	117/118 (99%)	0.12	4 (3%) 45 24	52, 71, 89, 93	0
51	BS	98/112 (87%)	0.37	3 (3%) 49 26	69, 89, 114, 118	0
51	DS	98/112 (87%)	0.72	12 (12%) 4 1	71, 90, 114, 117	0
52	BT	137/146 (93%)	0.20	10 (7%) 15 6	50, 71, 133, 164	0
52	DT	137/146 (93%)	0.17	10 (7%) 15 6	51, 72, 134, 164	0
53	BU	117/118 (99%)	-0.00	1 (0%) 84 69	51, 68, 90, 112	0
53	DU	117/118 (99%)	-0.07	1 (0%) 84 69	52, 69, 89, 112	0
54	BV	101/101 (100%)	0.35	4 (3%) 38 19	52, 98, 113, 116	0
54	DV	101/101 (100%)	0.41	6 (5%) 22 10	52, 98, 113, 116	0
55	BW	113/113 (100%)	0.05	2 (1%) 68 47	56, 71, 102, 133	0
55	DW	113/113 (100%)	0.19	2 (1%) 68 47	56, 72, 103, 134	0
56	BX	92/96 (95%)	0.28	0 100 100	64, 83, 101, 111	0
56	DX	92/96 (95%)	0.23	0 100 100	65, 84, 102, 112	0
57	BY	100/110 (90%)	1.35	22 (22%) 0 0	93, 114, 151, 160	0
57	DY	100/110 (90%)	1.50	31 (31%) 0 0	93, 114, 151, 160	0
58	BZ	176/206 (85%)	0.06	5 (2%) 53 30	44, 71, 117, 123	0
58	DZ	176/206 (85%)	0.17	5 (2%) 53 30	56, 78, 111, 119	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
All	All	21994/23376 (94%)	0.14	989 (4%) 33 16	17, 69, 146, 200	0

The worst 5 of 989 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
36	BA	2802	G	12.0
49	DQ	141	GLN	10.9
58	DZ	113	ALA	10.7
36	DA	2802	G	10.3
42	DG	2	PRO	9.6

## 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
24	7MG	CY	46	24/25	0.50	0.47	170,172,175,176	0
24	H2U	CY	16	20/21	0.53	0.58	170,173,173,174	0
24	H2U	AY	16	20/21	0.54	0.60	169,173,173,174	0
24	H2U	CY	20	20/21	0.59	0.44	178,179,179,180	0
24	7MG	AY	46	24/25	0.59	0.38	170,172,175,176	0
24	4SU	AY	8	20/21	0.63	0.34	145,147,149,149	0
24	H2U	CY	17	20/21	0.65	0.52	170,173,175,176	0
24	H2U	AY	17	20/21	0.67	0.62	170,174,175,176	0
24	PSU	CY	55	20/21	0.70	0.43	154,160,160,160	0
24	H2U	AY	20	20/21	0.71	0.52	178,179,179,179	0
24	4SU	CY	8	20/21	0.74	0.34	146,147,148,149	0
24	PSU	AY	55	20/21	0.74	0.39	154,159,160,161	0
24	5MU	AY	54	21/22	0.78	0.32	145,149,150,153	0
24	5MU	CY	54	21/22	0.80	0.39	144,149,151,153	0
24	OMC	CY	32	21/22	0.82	0.50	107,112,121,122	0
24	MIA	AY	37	29/30	0.90	0.32	71,88,103,104	0
24	OMC	AY	32	21/22	0.90	0.31	107,112,120,121	0
24	MIA	CY	37	29/30	0.93	0.25	74,88,101,102	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides 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
60	GDP	AZ	501	28/28	0.78	0.31	130,136,140,141	0
61	KIR	CZ	502	57/57	0.84	0.35	118,120,121,123	0
61	KIR	AZ	502	57/57	0.85	0.31	117,119,121,122	0
60	GDP	CZ	501	28/28	0.86	0.17	129,136,140,140	0
59	ZN	D4	101	1/1	0.94	0.10	115,115,115,115	0
59	ZN	B4	101	1/1	0.97	0.17	90,90,90,90	0
59	ZN	D9	101	1/1	0.97	0.11	81,81,81,81	0
59	ZN	AD	301	1/1	0.99	0.25	59,59,59,59	0
59	ZN	B9	101	1/1	0.99	0.11	82,82,82,82	0
59	ZN	CN	101	1/1	0.99	0.17	60,60,60,60	0
59	ZN	CD	301	1/1	1.00	0.26	72,72,72,72	0
59	ZN	AN	101	1/1	1.00	0.16	34,34,34,34	0

### 6.5 Other polymers [i](#)

There are no such residues in this entry.