



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 9, 2023 – 07:49 PM EDT

PDB ID : 6BOH  
Title : Antibiotic blasticidin S and E. coli release factor 1 (containing deletion 302-304) bound to the 70S ribosome  
Authors : Svidritskiy, E.; Korostelev, A.A.  
Deposited on : 2017-11-20  
Resolution : 3.40 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 : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.35.1  
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) : 2.35.1

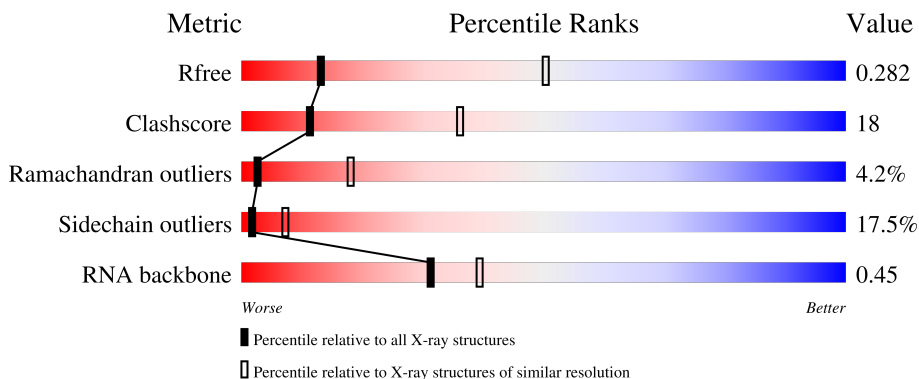
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.40 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.



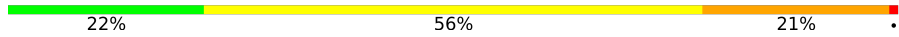
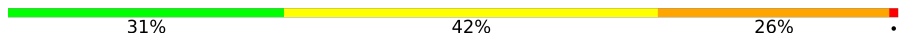
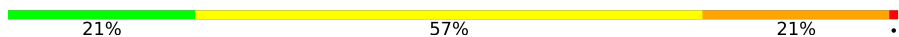



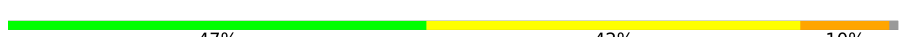

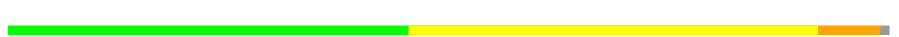

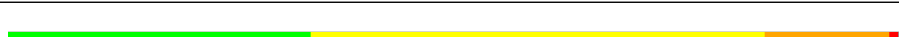
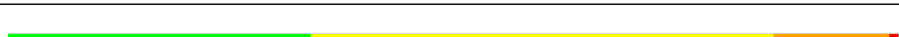

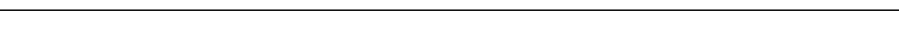
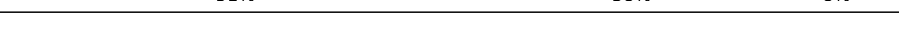
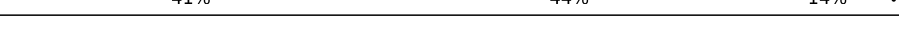



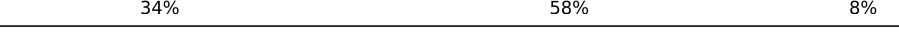





Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RNA backbone	3102	1006 (3.84-2.96)

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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	A	1507	
1	FB	1507	
2	B	2880	
2	GB	2880	
3	C	120	
3	HB	120	

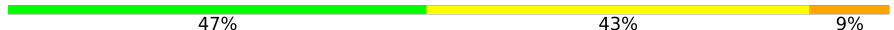


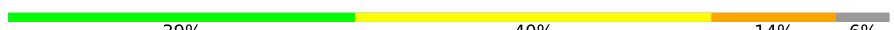
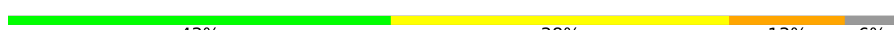
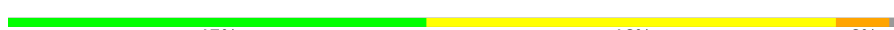




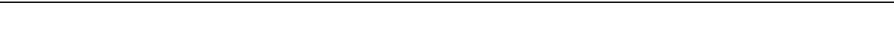

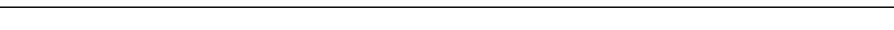
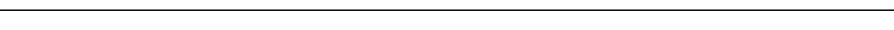










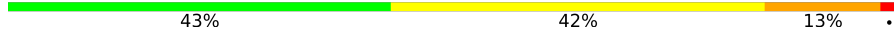
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Mol	Chain	Length	Quality of chain
4	D	77	 22% 56% 21% .
4	IA	77	 31% 42% 26% .
4	IB	77	 21% 57% 21% .
4	NC	77	 32% 47% 21%
5	E	275	 49% 43% 7%
5	JB	275	 51% 41% 7%
6	F	206	 47% 42% 10% .
6	KB	206	 49% 41% 9% .
7	G	205	 45% 46% 7% .
7	LB	205	 46% 45% 7% .
8	H	182	 34% 51% 14% ..
8	MB	182	 34% 52% 13% ..
9	I	180	 52% 37% 7% ..
9	NB	180	 51% 38% 8% ..
10	J	148	 41% 44% 14% ..
10	OB	148	 42% 45% 11% .
11	K	140	 49% 41% 9%
11	PB	140	 54% 37% 9%
12	L	122	 34% 58% 8%
12	QB	122	 34% 57% 9%
13	M	150	 53% 36% 9% .
13	RB	150	 54% 33% 11% .
14	N	141	 51% 40% 9%
14	SB	141	 56% 35% 8% .
15	O	118	 49% 42% 9%




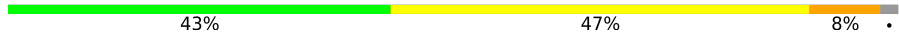





















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Mol	Chain	Length	Quality of chain
15	TB	118	 47% 43% 9%
16	P	112	 47% 39% 12%
16	UB	112	 47% 39% 12%
17	Q	146	 39% 40% 14% 6%
17	VB	146	 43% 38% 13% 6%
18	R	118	 47% 46% 6%
18	WB	118	 48% 46% 5%
19	S	101	 55% 37% 8%
19	XB	101	 56% 37% 7%
20	T	113	 51% 39% 9%
20	YB	113	 53% 38% 8%
21	U	96	 50% 43% 6%
21	ZB	96	 58% 32% 8%
22	AC	110	 46% 36% 15%
22	V	110	 50% 33% 15%
23	BC	206	 44% 38% 10% 8%
23	W	206	 41% 40% 10% 8%
24	CC	85	 51% 41% 7%
24	X	85	 51% 39% 9%
25	DC	98	 44% 41% 14%
25	Y	98	 52% 35% 12%
26	EC	72	 53% 33% 11%
26	Z	72	 51% 35% 11%
27	AA	60	 43% 42% 13%
27	FC	60	 47% 40% 12%

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Mol	Chain	Length	Quality of chain
28	BA	71	 41% 42% 14% .
28	GC	71	 42% 44% 11% .
29	CA	60	 40% 48% 10% .
29	HC	60	 43% 47% 8% .
30	DA	54	 57% 31% 9% .
30	IC	54	 61% 30% 7% .
31	EA	49	 53% 35% 10% .
31	JC	49	 53% 35% 10% .
32	FA	65	 57% 37% 5% .
32	KC	65	 58% 35% 5% .
33	GA	37	 65% 27% 8%
33	LC	37	 68% 24% 8%
34	HA	27	 11% 19% 11% 59%
34	MC	27	 11% 19% 11% 59%
35	JA	365	 16% 12% . 70%
35	KA	365	 6% 6% . 85%
35	OC	365	 15% 12% . 70%
35	PC	365	 6% 6% . 85%
36	LA	256	 38% 40% 12% . 9%
36	QC	256	 39% 39% 12% . 9%
37	MA	239	 39% 38% 9% 14%
37	RC	239	 41% 37% 8% . 14%
38	NA	209	 48% 42% 10%
38	SC	209	 50% 39% 11%
39	OA	162	 41% 43% 9% 7%

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Mol	Chain	Length	Quality of chain			
39	TC	162	39%	45%	9%	7%
40	PA	101	51%	44%	5%	
40	UC	101	47%	49%	5%	
41	QA	156	47%	44%	6%	..
41	VC	156	47%	44%	6%	..
42	RA	138	44%	47%	8%	.
42	WC	138	45%	46%	9%	
43	SA	128	43%	46%	9%	..
43	XC	128	42%	46%	10%	..
44	TA	105	42%	41%	10%	7%
44	YC	105	43%	40%	10%	7%
45	UA	129	49%	35%	6%	10%
45	ZC	129	47%	39%	5%	10%
46	AD	132	43%	36%	13%	8%
46	VA	132	42%	37%	13%	8%
47	BD	126	39%	44%	10%	7%
47	WA	126	37%	46%	10%	7%
48	CD	61	39%	54%	5%	.
48	XA	61	39%	54%	5%	.
49	DD	89	36%	51%	12%	.
49	YA	89	38%	48%	12%	.
50	ED	88	49%	38%	8%	6%
50	ZA	88	51%	38%	6%	6%
51	AB	105	43%	41%	10%	6%
51	FD	105	45%	39%	10%	6%

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Mol	Chain	Length	Quality of chain
52	BB	88	
52	GD	88	
53	CB	93	
53	HD	93	
54	DB	106	
54	ID	106	
55	EB	27	
55	JD	27	

## 2 Entry composition [i](#)

There are 58 unique types of molecules in this entry. The entry contains 298186 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	A	1507	Total	C	N	O	P	0	0	0
			32394	14424	5998	10465	1507			
1	FB	1507	Total	C	N	O	P	0	0	0
			32394	14424	5998	10465	1507			

- Molecule 2 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	B	2880	Total	C	N	O	P	0	0	0
			62031	27612	11589	19950	2880			
2	GB	2880	Total	C	N	O	P	0	0	0
			62031	27612	11589	19950	2880			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	154A	C	UNK	conflict	GB 46197919
GB	154A	C	UNK	conflict	GB 46197919

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	C	120	Total	C	N	O	P	0	0	0
			2576	1146	476	834	120			
3	HB	120	Total	C	N	O	P	0	0	0
			2576	1146	476	834	120			

- Molecule 4 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	P	S			
4	D	77	Total	C	N	O	P	S	0	0	0
			1642	734	297	534	76	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
4	IA	77	Total	C	N	O	P	S	0	0	0
			1642	734	297	534	76	1			
4	IB	77	Total	C	N	O	P	S	0	0	0
			1642	734	297	534	76	1			
4	NC	77	Total	C	N	O	P	S	0	0	0
			1642	734	297	534	76	1			

- Molecule 5 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	275	Total	C	N	O	S	0	0	0
			2145	1353	428	361	3			
5	JB	275	Total	C	N	O	S	0	0	0
			2145	1353	428	361	3			

- Molecule 6 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	204	Total	C	N	O	S	0	0	0
			1563	988	299	270	6			
6	KB	204	Total	C	N	O	S	0	0	0
			1563	988	299	270	6			

- Molecule 7 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	G	202	Total	C	N	O	S	0	0	0
			1586	1011	297	275	3			
7	LB	202	Total	C	N	O	S	0	0	0
			1586	1011	297	275	3			

- Molecule 8 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	181	Total	C	N	O	S	0	0	0
			1471	940	267	260	4			
8	MB	181	Total	C	N	O	S	0	0	0
			1471	940	267	260	4			

- Molecule 9 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	I	174	Total	C	N	O	S	0	0	0
			1330	845	248	236	1			
9	NB	174	Total	C	N	O	S	0	0	0
			1330	845	248	236	1			

- Molecule 10 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	J	146	Total	C	N	O	S	0	0	0
			1137	727	201	208	1			
10	OB	146	Total	C	N	O	S	0	0	0
			1137	727	201	208	1			

- Molecule 11 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	K	140	Total	C	N	O	S	0	0	0
			1121	722	208	187	4			
11	PB	140	Total	C	N	O	S	0	0	0
			1121	722	208	187	4			

- Molecule 12 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
12	L	122	Total	C	N	O	S	0	0	0
			932	587	171	170	4			
12	QB	122	Total	C	N	O	S	0	0	0
			932	587	171	170	4			

- Molecule 13 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	M	150	Total	C	N	O	S	0	0	0
			1145	712	232	198	3			
13	RB	150	Total	C	N	O	S	0	0	0
			1145	712	232	198	3			

- Molecule 14 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
14	N	141	Total	C	N	O	S	0	0	0
			1121	715	212	187	7			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
14	SB	141	1121	715	212	187	7	0	0	0

- Molecule 15 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
15	O	118	968	604	203	160	1	0	0	0
15	TB	118	968	604	203	160	1	0	0	0

- Molecule 16 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
16	P	110	877	553	175	149		0	0	0
16	UB	110	877	553	175	149		0	0	0

- Molecule 17 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
17	Q	137	1143	713	234	195	1	0	0	0
17	VB	137	1143	713	234	195	1	0	0	0

- Molecule 18 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
18	R	117	964	610	202	151	1	0	0	0
18	WB	117	964	610	202	151	1	0	0	0

- Molecule 19 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
19	S	101	779	501	142	135	1	0	0	0
19	XB	101	779	501	142	135	1	0	0	0

- Molecule 20 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
20	T	112	Total	C	N	O	S	0	0	0
			890	560	175	153	2			
20	YB	112	Total	C	N	O	S	0	0	0
			890	560	175	153	2			

- Molecule 21 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
21	U	95	Total	C	N	O	S	0	0	0
			750	488	135	126	1			
21	ZB	95	Total	C	N	O	S	0	0	0
			750	488	135	126	1			

- Molecule 22 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
22	V	107	Total	C	N	O	S	0	0	0
			814	523	154	131	6			
22	AC	107	Total	C	N	O	S	0	0	0
			814	523	154	131	6			

- Molecule 23 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	W	189	Total	C	N	O	S	0	0	0
			1495	953	266	273	3			
23	BC	189	Total	C	N	O	S	0	0	0
			1495	953	266	273	3			

- Molecule 24 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
24	X	84	Total	C	N	O	S	0	0	0
			662	410	140	111	1			
24	CC	84	Total	C	N	O	S	0	0	0
			662	410	140	111	1			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
X	11	ARG	LYS	conflict	UNP Q72HR3

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Chain	Residue	Modelled	Actual	Comment	Reference
CC	11	ARG	LYS	conflict	UNP Q72HR3

- Molecule 25 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
25	Y	97	Total	C	N	O	S	0	0	0
			761	478	151	131	1			
25	DC	97	Total	C	N	O	S	0	0	0
			761	478	151	131	1			

- Molecule 26 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	Z	70	Total	C	N	O	S	0	0	0
			592	368	119	103	2			
26	EC	70	Total	C	N	O	S	0	0	0
			592	368	119	103	2			

- Molecule 27 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
27	AA	60	Total	C	N	O	S	0	0	0
			477	303	91	82	1			
27	FC	60	Total	C	N	O	S	0	0	0
			477	303	91	82	1			

- Molecule 28 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
28	BA	69	Total	C	N	O	S	0	0	0
			552	349	99	99	5			
28	GC	69	Total	C	N	O	S	0	0	0
			552	349	99	99	5			

- Molecule 29 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
29	CA	59	Total	C	N	O	S	0	0	0
			460	290	90	75	5			
29	HC	59	Total	C	N	O	S	0	0	0
			460	290	90	75	5			

- Molecule 30 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
30	DA	53	Total	C	N	O	S	0	0	0
			453	281	91	77	4			
30	IC	53	Total	C	N	O	S	0	0	0
			453	281	91	77	4			

- Molecule 31 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
31	EA	48	Total	C	N	O	S	0	0	0
			418	257	104	55	2			
31	JC	48	Total	C	N	O	S	0	0	0
			418	257	104	55	2			

- Molecule 32 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
32	FA	64	Total	C	N	O	S	0	0	0
			517	331	102	82	2			
32	KC	64	Total	C	N	O	S	0	0	0
			517	331	102	82	2			

- Molecule 33 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
33	GA	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			
33	LC	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			

- Molecule 34 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
34	HA	11	Total	C	N	O	P	0	0	0
			220	98	44	67	11			
34	MC	11	Total	C	N	O	P	0	0	0
			220	98	44	67	11			

- Molecule 35 is a protein called Peptide chain release factor 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
35	JA	110	850	525	157	164	4	0	0	0
35	KA	55	455	281	83	89	2	0	0	0
35	OC	110	850	525	157	164	4	0	0	0
35	PC	55	455	281	83	89	2	0	0	0

There are 44 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
JA	?	-	ASP	deletion	UNP B7MKB3
JA	?	-	ARG	deletion	UNP B7MKB3
JA	?	-	SER	deletion	UNP B7MKB3
JA	358	LEU	-	expression tag	UNP B7MKB3
JA	359	GLU	-	expression tag	UNP B7MKB3
JA	360	HIS	-	expression tag	UNP B7MKB3
JA	361	HIS	-	expression tag	UNP B7MKB3
JA	362	HIS	-	expression tag	UNP B7MKB3
JA	363	HIS	-	expression tag	UNP B7MKB3
JA	364	HIS	-	expression tag	UNP B7MKB3
JA	365	HIS	-	expression tag	UNP B7MKB3
KA	?	-	ASP	deletion	UNP B7MKB3
KA	?	-	ARG	deletion	UNP B7MKB3
KA	?	-	SER	deletion	UNP B7MKB3
KA	361	LEU	-	expression tag	UNP B7MKB3
KA	362	GLU	-	expression tag	UNP B7MKB3
KA	363	HIS	-	expression tag	UNP B7MKB3
KA	364	HIS	-	expression tag	UNP B7MKB3
KA	365	HIS	-	expression tag	UNP B7MKB3
KA	366	HIS	-	expression tag	UNP B7MKB3
KA	367	HIS	-	expression tag	UNP B7MKB3
KA	368	HIS	-	expression tag	UNP B7MKB3
OC	?	-	ASP	deletion	UNP B7MKB3
OC	?	-	ARG	deletion	UNP B7MKB3
OC	?	-	SER	deletion	UNP B7MKB3
OC	358	LEU	-	expression tag	UNP B7MKB3
OC	359	GLU	-	expression tag	UNP B7MKB3
OC	360	HIS	-	expression tag	UNP B7MKB3
OC	361	HIS	-	expression tag	UNP B7MKB3
OC	362	HIS	-	expression tag	UNP B7MKB3
OC	363	HIS	-	expression tag	UNP B7MKB3

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Chain	Residue	Modelled	Actual	Comment	Reference
OC	364	HIS	-	expression tag	UNP B7MKB3
OC	365	HIS	-	expression tag	UNP B7MKB3
PC	?	-	ASP	deletion	UNP B7MKB3
PC	?	-	ARG	deletion	UNP B7MKB3
PC	?	-	SER	deletion	UNP B7MKB3
PC	361	LEU	-	expression tag	UNP B7MKB3
PC	362	GLU	-	expression tag	UNP B7MKB3
PC	363	HIS	-	expression tag	UNP B7MKB3
PC	364	HIS	-	expression tag	UNP B7MKB3
PC	365	HIS	-	expression tag	UNP B7MKB3
PC	366	HIS	-	expression tag	UNP B7MKB3
PC	367	HIS	-	expression tag	UNP B7MKB3
PC	368	HIS	-	expression tag	UNP B7MKB3

- Molecule 36 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
36	LA	234	Total 1900	C 1213	N 341	O 341	S 5	0	0	0
36	QC	234	Total 1900	C 1213	N 341	O 341	S 5	0	0	0

- Molecule 37 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
37	MA	206	Total 1612	C 1016	N 314	O 281	S 1	0	0	0
37	RC	206	Total 1612	C 1016	N 314	O 281	S 1	0	0	0

- Molecule 38 is a protein called 50S ribosomal protein S4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
38	NA	208	Total 1703	C 1066	N 339	O 291	S 7	0	0	0
38	SC	208	Total 1703	C 1066	N 339	O 291	S 7	0	0	0

- Molecule 39 is a protein called 30S ribosomal protein S5.



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
39	OA	151	Total	C	N	O	S	0	0	0
			1155	729	218	204	4			
39	TC	151	Total	C	N	O	S	0	0	0
			1155	729	218	204	4			

- Molecule 40 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
40	PA	101	Total	C	N	O	S	0	0	0
			843	531	155	154	3			
40	UC	101	Total	C	N	O	S	0	0	0
			843	531	155	154	3			

- Molecule 41 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
41	QA	155	Total	C	N	O	S	0	0	0
			1257	781	252	218	6			
41	VC	155	Total	C	N	O	S	0	0	0
			1257	781	252	218	6			

- Molecule 42 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
42	RA	138	Total	C	N	O	S	0	0	0
			1116	705	215	193	3			
42	WC	138	Total	C	N	O	S	0	0	0
			1116	705	215	193	3			

- Molecule 43 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
43	SA	127	Total	C	N	O	0	0	0
			1011	639	198	174			
43	XC	127	Total	C	N	O	0	0	0
			1011	639	198	174			

- Molecule 44 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
44	TA	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			
44	YC	98	794	499	156	138	1	0	0	0

- Molecule 45 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
45	UA	116	864	537	164	160	3	0	0	0
45	ZC	116	864	537	164	160	3	0	0	0

- Molecule 46 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
46	VA	122	958	604	193	159	2	0	0	0
46	AD	122	958	604	193	159	2	0	0	0

- Molecule 47 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
47	WA	117	933	577	192	162	2	0	0	0
47	BD	117	933	577	192	162	2	0	0	0

- Molecule 48 is a protein called 30S ribosomal protein S14 type Z.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
48	XA	60	492	312	104	72	4	0	0	0
48	CD	60	492	312	104	72	4	0	0	0

- Molecule 49 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
49	YA	88	734	459	147	126	2	0	0	0
49	DD	88	734	459	147	126	2	0	0	0

- Molecule 50 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
50	ZA	83	Total	C	N	O	S	0	0	0
			700	443	139	117	1			
50	ED	83	Total	C	N	O	S	0	0	0
			700	443	139	117	1			

- Molecule 51 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
51	AB	99	Total	C	N	O	S	0	0	0
			823	528	152	141	2			
51	FD	99	Total	C	N	O	S	0	0	0
			823	528	152	141	2			

- Molecule 52 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
52	BB	70	Total	C	N	O	0	0	0
			574	367	112	95			
52	GD	70	Total	C	N	O	0	0	0
			574	367	112	95			

- Molecule 53 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	CB	83	Total	C	N	O	S	0	0	0
			665	424	124	115	2			
53	HD	83	Total	C	N	O	S	0	0	0
			665	424	124	115	2			

- Molecule 54 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	DB	99	Total	C	N	O	S	0	0	0
			762	469	162	129	2			
54	ID	99	Total	C	N	O	S	0	0	0
			762	469	162	129	2			

- Molecule 55 is a protein called 30S ribosomal protein Thx.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
55	EB	24	Total	C	N	O	0	0	0
			208	128	50	30			
55	JD	24	Total	C	N	O	0	0	0
			208	128	50	30			

- Molecule 56 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
56	A	183	Total	Mg	0	0
			183	183		
56	B	433	Total	Mg	0	0
			433	433		
56	C	22	Total	Mg	0	0
			22	22		
56	D	5	Total	Mg	0	0
			5	5		
56	E	6	Total	Mg	0	0
			6	6		
56	F	4	Total	Mg	0	0
			4	4		
56	G	2	Total	Mg	0	0
			2	2		
56	H	2	Total	Mg	0	0
			2	2		
56	J	1	Total	Mg	0	0
			1	1		
56	K	4	Total	Mg	0	0
			4	4		
56	L	3	Total	Mg	0	0
			3	3		
56	M	3	Total	Mg	0	0
			3	3		
56	O	2	Total	Mg	0	0
			2	2		
56	Q	1	Total	Mg	0	0
			1	1		
56	R	1	Total	Mg	0	0
			1	1		
56	S	1	Total	Mg	0	0
			1	1		
56	T	2	Total	Mg	0	0
			2	2		
56	U	1	Total	Mg	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
56	V	2	Total 2	Mg 2	0	0
56	Y	3	Total 3	Mg 3	0	0
56	Z	1	Total 1	Mg 1	0	0
56	AA	1	Total 1	Mg 1	0	0
56	CA	1	Total 1	Mg 1	0	0
56	EA	1	Total 1	Mg 1	0	0
56	FA	1	Total 1	Mg 1	0	0
56	HA	3	Total 3	Mg 3	0	0
56	IA	9	Total 9	Mg 9	0	0
56	JA	1	Total 1	Mg 1	0	0
56	LA	1	Total 1	Mg 1	0	0
56	MA	6	Total 6	Mg 6	0	0
56	NA	2	Total 2	Mg 2	0	0
56	OA	4	Total 4	Mg 4	0	0
56	PA	3	Total 3	Mg 3	0	0
56	QA	1	Total 1	Mg 1	0	0
56	SA	1	Total 1	Mg 1	0	0
56	UA	1	Total 1	Mg 1	0	0
56	VA	2	Total 2	Mg 2	0	0
56	YA	3	Total 3	Mg 3	0	0
56	AB	2	Total 2	Mg 2	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
56	BB	1	Total 1	Mg 1	0	0
56	CB	1	Total 1	Mg 1	0	0
56	FB	194	Total 194	Mg 194	0	0
56	GB	402	Total 402	Mg 402	0	0
56	HB	20	Total 20	Mg 20	0	0
56	IB	2	Total 2	Mg 2	0	0
56	JB	5	Total 5	Mg 5	0	0
56	KB	2	Total 2	Mg 2	0	0
56	LB	4	Total 4	Mg 4	0	0
56	NB	1	Total 1	Mg 1	0	0
56	OB	1	Total 1	Mg 1	0	0
56	PB	2	Total 2	Mg 2	0	0
56	QB	2	Total 2	Mg 2	0	0
56	RB	3	Total 3	Mg 3	0	0
56	SB	2	Total 2	Mg 2	0	0
56	TB	1	Total 1	Mg 1	0	0
56	UB	4	Total 4	Mg 4	0	0
56	VB	3	Total 3	Mg 3	0	0
56	XB	2	Total 2	Mg 2	0	0
56	ZB	2	Total 2	Mg 2	0	0
56	AC	1	Total 1	Mg 1	0	0

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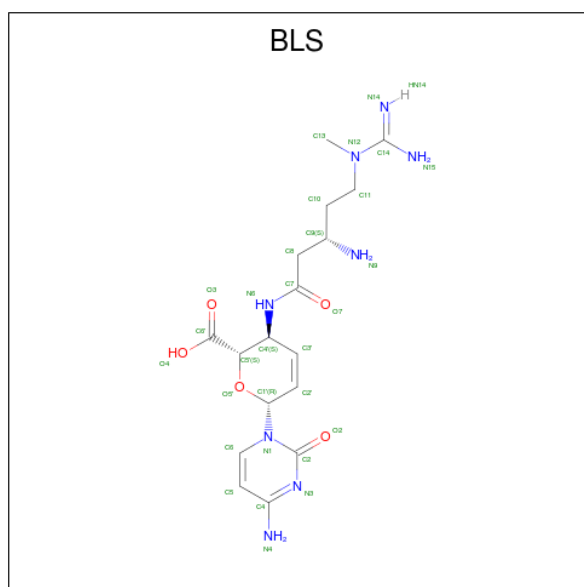
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
56	BC	1	Total Mg 1 1	0	0
56	CC	1	Total Mg 1 1	0	0
56	DC	1	Total Mg 1 1	0	0
56	GC	1	Total Mg 1 1	0	0
56	IC	1	Total Mg 1 1	0	0
56	JC	1	Total Mg 1 1	0	0
56	KC	1	Total Mg 1 1	0	0
56	MC	3	Total Mg 3 3	0	0
56	NC	10	Total Mg 10 10	0	0
56	OC	1	Total Mg 1 1	0	0
56	PC	1	Total Mg 1 1	0	0
56	QC	3	Total Mg 3 3	0	0
56	RC	2	Total Mg 2 2	0	0
56	SC	4	Total Mg 4 4	0	0
56	TC	3	Total Mg 3 3	0	0
56	UC	3	Total Mg 3 3	0	0
56	VC	1	Total Mg 1 1	0	0
56	WC	1	Total Mg 1 1	0	0
56	ZC	1	Total Mg 1 1	0	0
56	AD	4	Total Mg 4 4	0	0
56	BD	1	Total Mg 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
56	DD	1	Total Mg 1 1	0	0
56	ED	1	Total Mg 1 1	0	0
56	HD	1	Total Mg 1 1	0	0

- Molecule 57 is BLASTICIDIN S (three-letter code: BLS) (formula: C<sub>17</sub>H<sub>26</sub>N<sub>8</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
57	B	1	Total C N O 30 17 8 5	0	0
57	GB	1	Total C N O 30 17 8 5	0	0

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

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
58	V	1	Total Zn 1 1	0	0
58	BA	1	Total Zn 1 1	0	0
58	CA	1	Total Zn 1 1	0	0
58	DA	1	Total Zn 1 1	0	0

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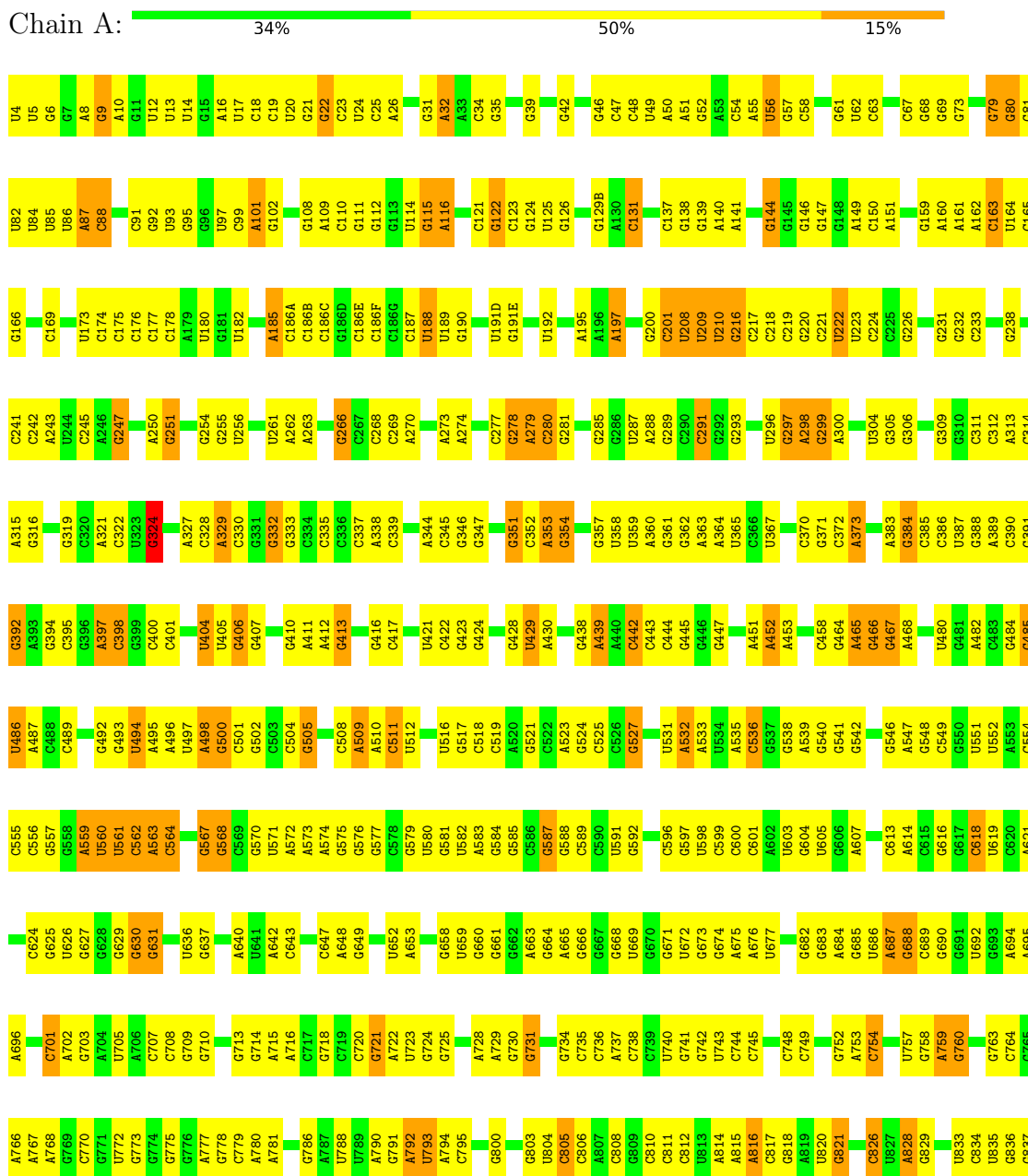
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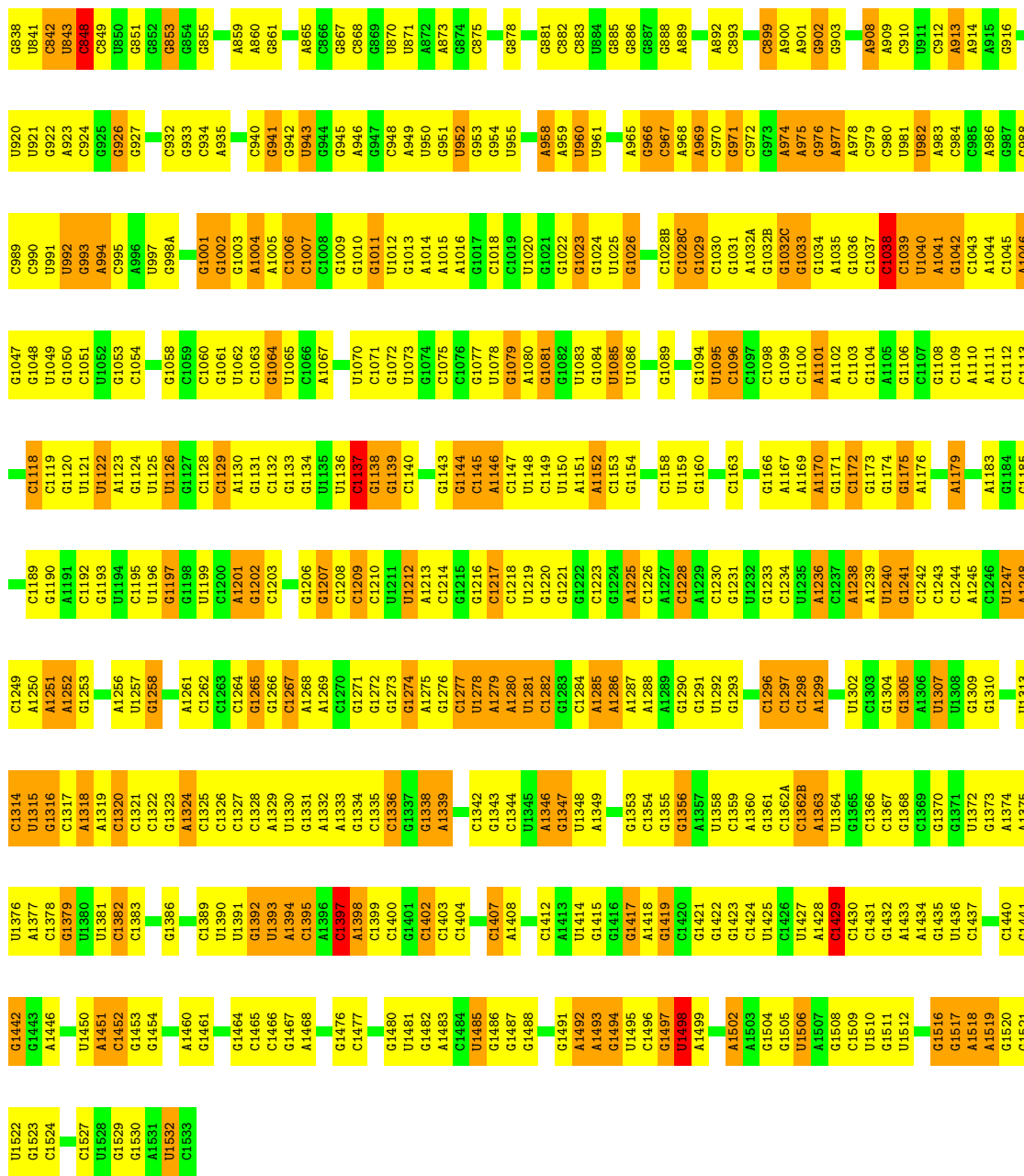
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
58	GA	1	Total 1	Zn 1	0	0
58	AC	1	Total 1	Zn 1	0	0
58	GC	1	Total 1	Zn 1	0	0
58	HC	1	Total 1	Zn 1	0	0
58	IC	1	Total 1	Zn 1	0	0
58	LC	1	Total 1	Zn 1	0	0

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

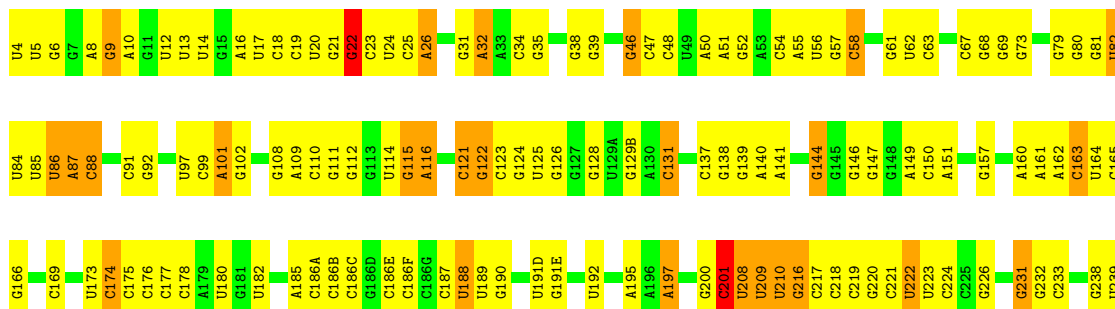
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: 16S ribosomal RNA





● Molecule 1: 16S ribosomal RNA



G1265	G1266	G1267	A1268	A1269	G1270	G1271	G1272	G1273	G1274	A1275	G1276	G1277	G1278	A1279	A1280	A1281	G1282	G1283	A1284	A1285	A1286	A1287	A1288	A1289	G1290	G1291	A1292	G1293	A1296	G1297	G1298	A1299	G1302	G1303	G1304	G1305	A1306	A1307	G1308	G1309	G1310	U1313	G1314	G1315	G1316	G1317	A1318	A1319	G1320	G1321	G1322	G1323	A1324	G1326	G1327																																																									
C1202	C1203	G1206	G1207	C1208	C1209	C1210	U1211	A1212	A1213	C1214	G1215	G1216	C1217	C1218	U1219	G1220	G1221	G1222	G1223	G1224	A1225	G1226	A1227	C1228	A1229	C1230	G1231	U1232	G1233	C1234	U1235	A1236	C1237	A1238	A1239	U1240	G1241	C1242	A1245	U1247	A1248	C1249	A1250	A1251	A1252	G1253	A1256	U1257	G1258	C1259	G1260	A1261	C1262	C1263	C1264																																																									
C1132	G1133	G1134	U1135	U1136	C1137	G1138	G1139	C1140	G1143	A1144	C1145	A1146	C1147	U1148	C1149	U1150	A1151	A1152	C1153	G1154	C1158	U1159	G1160	C1163	G1166	A1167	A1169	U1170	G1171	C1172	G1173	G1174	G1175	A1176	G1177	A1178	A1179	A1183	G1184	G1185	C1188	C1189	G1190	A1191	C1192	A1193	U1194	C1195	U1196	G1197	G1198	U1199	C1200	A1201																																																										
U1062	C1063	G1064	U1065	C1066	A1067	G1068	U1069	G1070	U1071	C1072	U1073	G1077	U1078	U1079	A1080	G1081	G1084	U1085	U1086	G1089	G1094	U1095	C1096	C1097	C1098	U1099	C1100	G1101	C1102	C1103	G1104	A1105	G1106	C1107	C1108	C1109	A1110	A1111	C1112	C1113	C1118	C1119	G1120	U1121	U1122	A1123	G1124	U1125	U1126	U1127	G1128	A1129	A1130	G1131																																																										
G1002	G1003	A1004	A1005	G941	G942	C1007	C1008	G1009	G1010	U1011	U1012	G1013	A1014	A1015	A1016	U1020	G1021	G1022	G1023	U1024	U1025	G1026	C1028B	C1028C	U1029	C1030	G1031	A1032A	C1032B	U1032C	G1033	A1034	A1035	G1036	G1037	C1038	C1039	U1040	A1041	U981	U982	A983	C984	C985	A986	G987	G988	U989	U990	U991	U992	U993	A994	A995	A996	U997	G998A	G1001																																																						
A935	C940	A858	A859	A860	A861	G867	U870	U871	U872	A873	A874	C875	G876	C877	G878	G881	C882	U883	U884	G885	G886	G887	G888	A889	C810	A892	C893	A814	A815	A816	A817	G818	A819	U820	G821	C826	U827	A828	U833	C834	U835	C836	C837	G838	U841	C842	C843	C844	C845	C846	C847	C848	C849	U850	G851	U852	U853	C854	C855	C856																																																				
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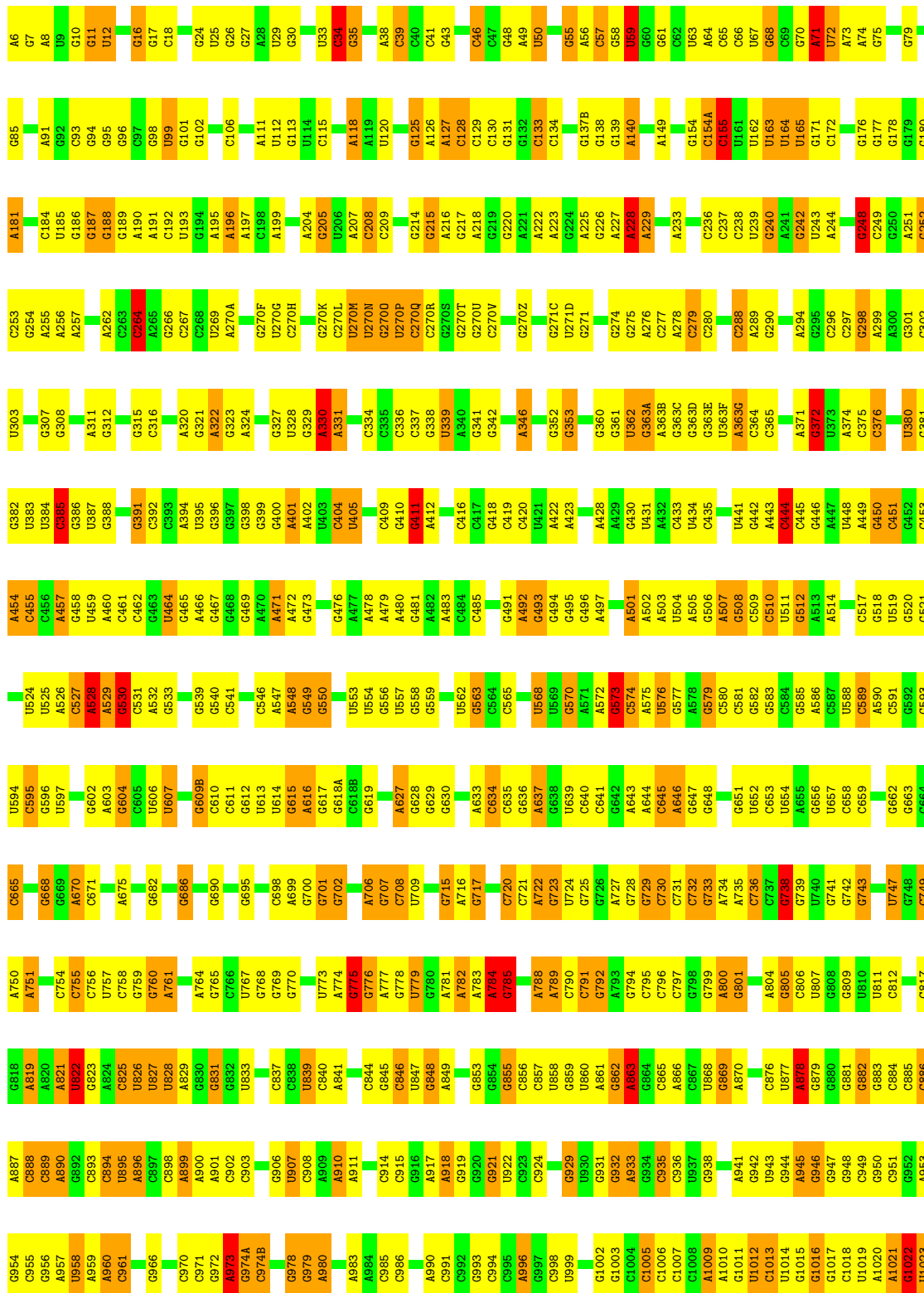


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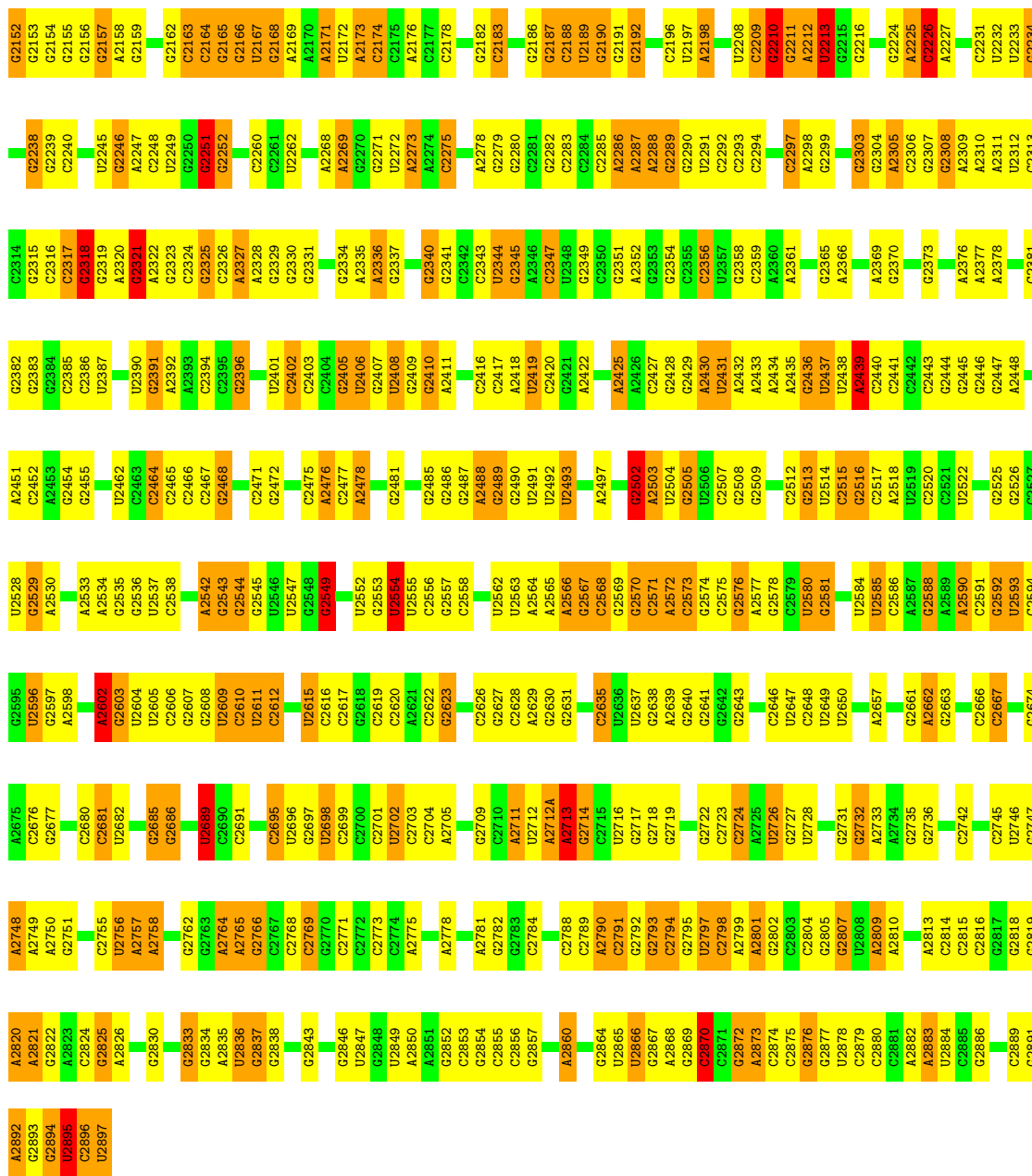
• Molecule 2: 23S ribosomal RNA

Chain GB:  37% 43% 18%

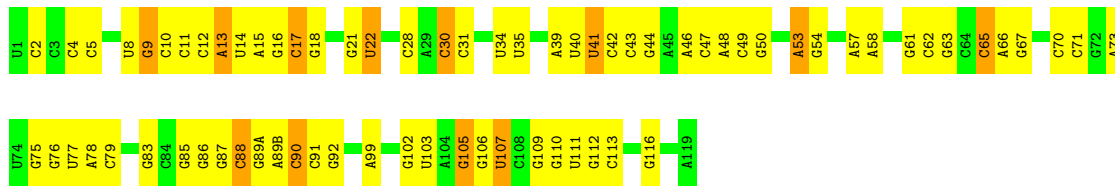




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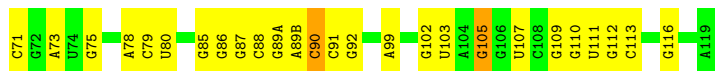
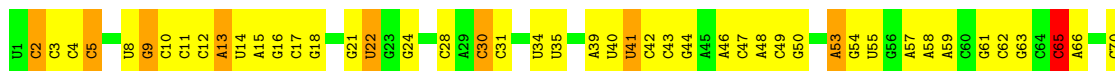


• Molecule 3: 5S ribosomal RNA

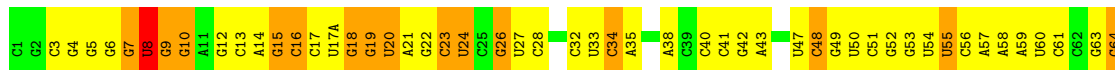


• Molecule 3: 5S ribosomal RNA

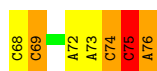
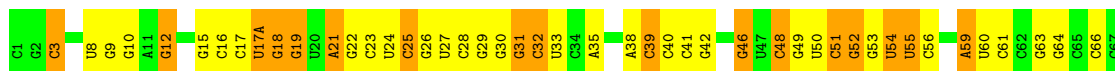




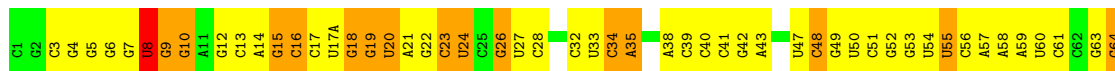
• Molecule 4: tRNA



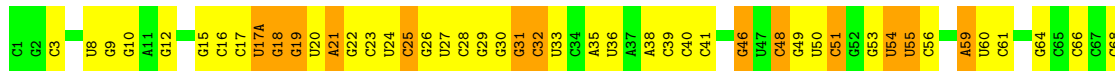
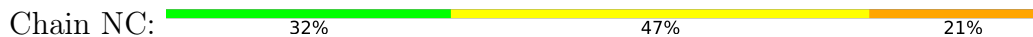
• Molecule 4: tRNA



• Molecule 4: tRNA

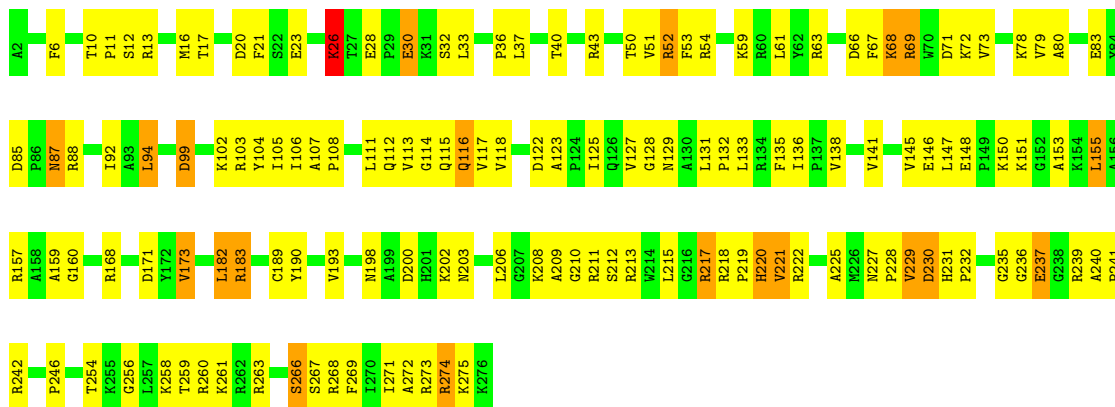


• Molecule 4: tRNA

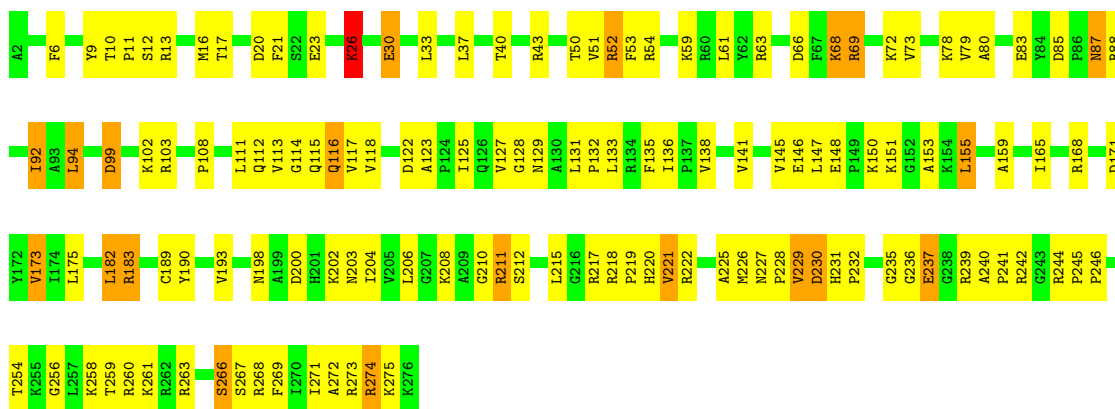


• Molecule 5: 50S ribosomal protein L2

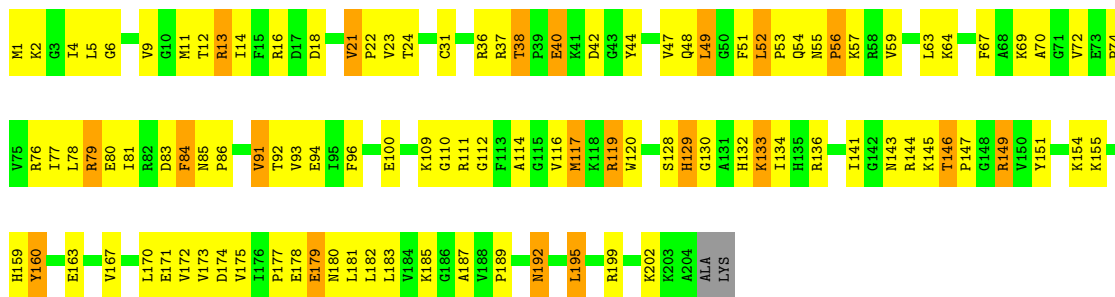




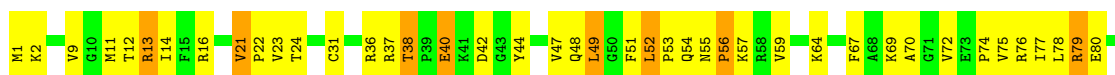
• Molecule 5: 50S ribosomal protein L2

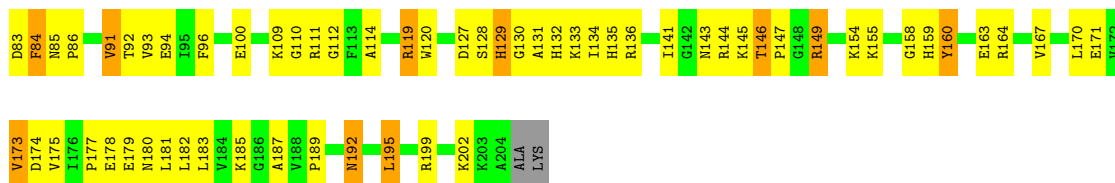


• Molecule 6: 50S ribosomal protein L3

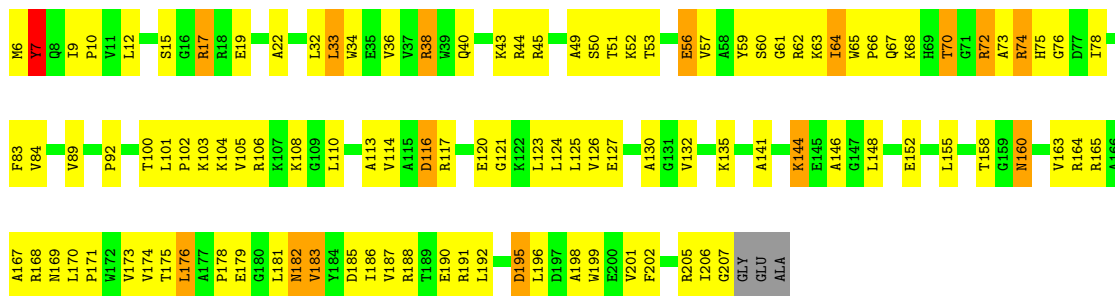


• Molecule 6: 50S ribosomal protein L3

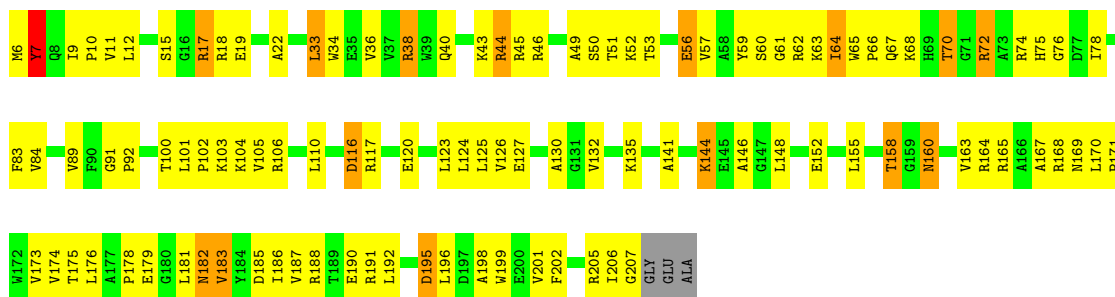




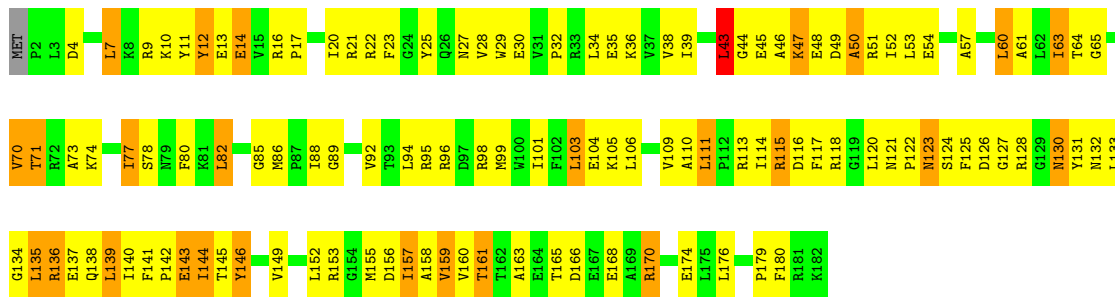
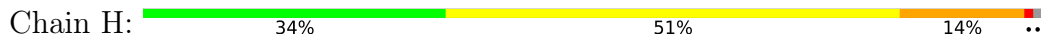
• Molecule 7: 50S ribosomal protein L4



• Molecule 7: 50S ribosomal protein L4

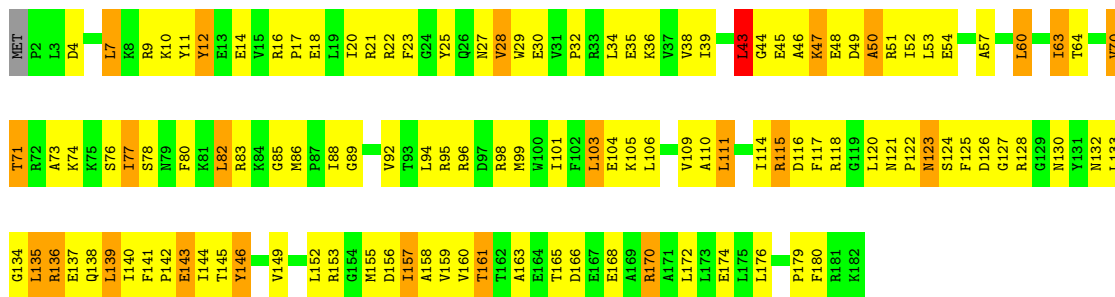


• Molecule 8: 50S ribosomal protein L5



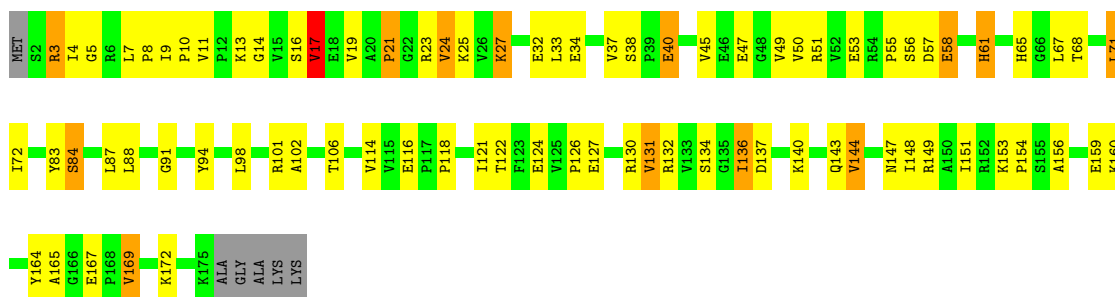
• Molecule 8: 50S ribosomal protein L5





• Molecule 9: 50S ribosomal protein L6

Chain I: 52% 37% 7% ..



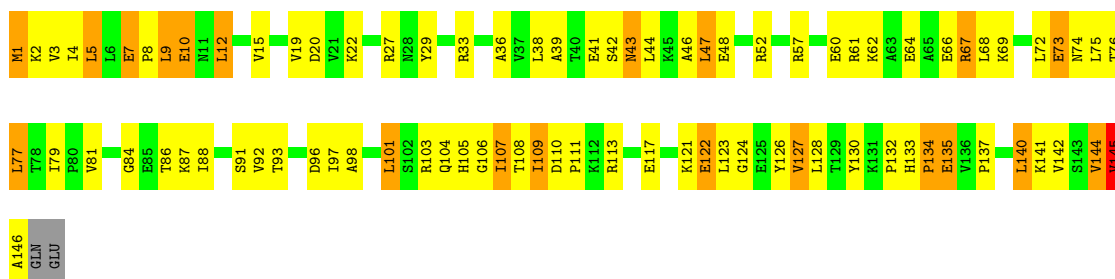
• Molecule 9: 50S ribosomal protein L6

Chain NB: 51% 38% 8% ..



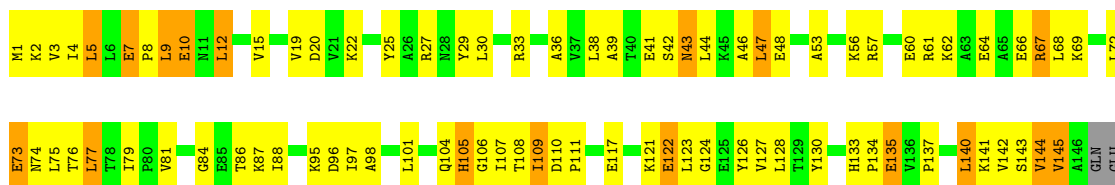
• Molecule 10: 50S ribosomal protein L9

Chain J: 41% 44% 14% ..



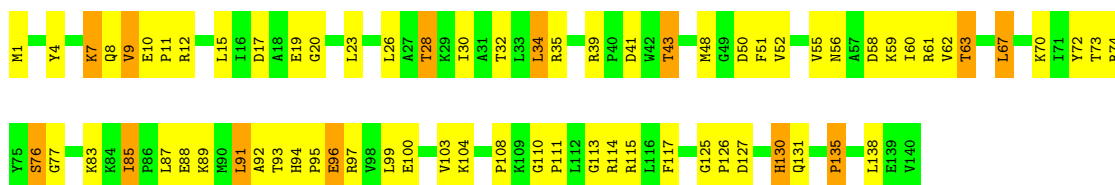
• Molecule 10: 50S ribosomal protein L9

Chain OB: 42% 45% 11%



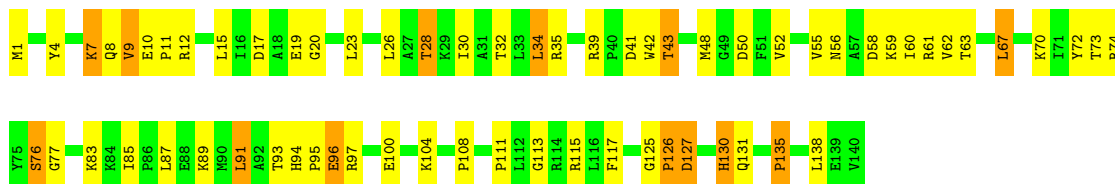
- Molecule 11: 50S ribosomal protein L13

Chain K: 49% 41% 9%



- Molecule 11: 50S ribosomal protein L13

Chain PB: 54% 37% 9%



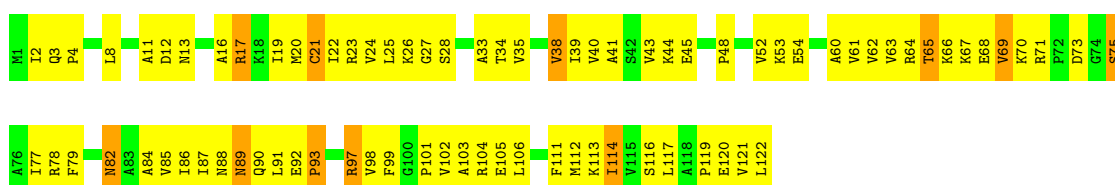
- Molecule 12: 50S ribosomal protein L14

Chain L: 34% 58% 8%



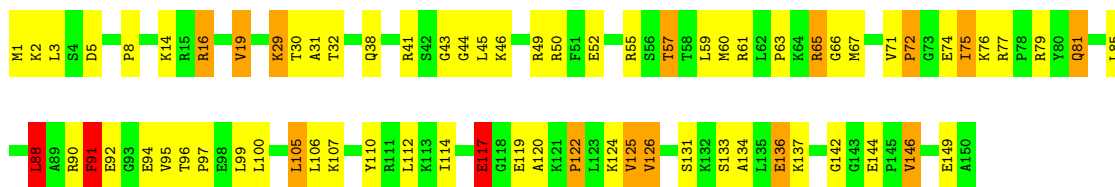
- Molecule 12: 50S ribosomal protein L14

Chain QB: 34% 57% 9%



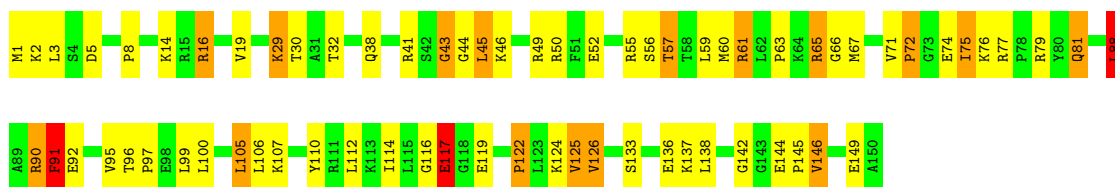
- Molecule 13: 50S ribosomal protein L15

Chain M:  53% 36% 9%



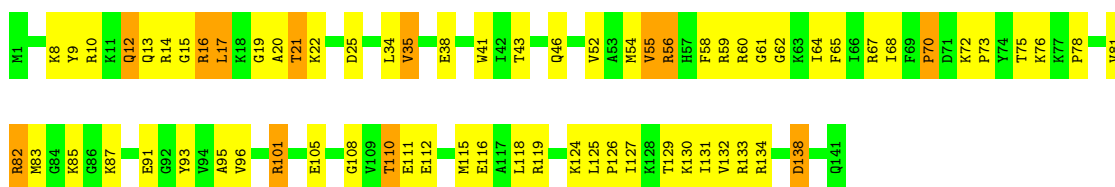
- Molecule 13: 50S ribosomal protein L15

Chain RB:  54% 33% 11%



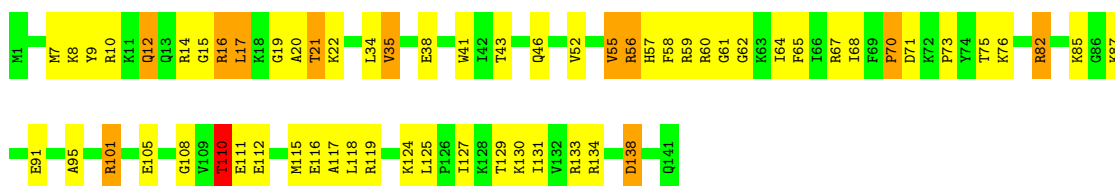
- Molecule 14: 50S ribosomal protein L16

Chain N:  51% 40% 9%



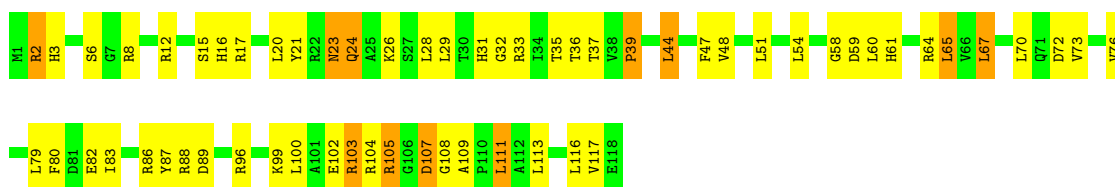
- Molecule 14: 50S ribosomal protein L16

Chain SB:  56% 35% 8%



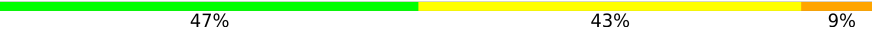
- Molecule 15: 50S ribosomal protein L17

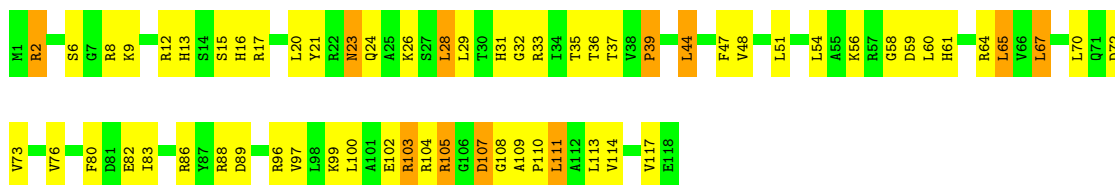
Chain O:  49% 42% 9%



- Molecule 15: 50S ribosomal protein L17

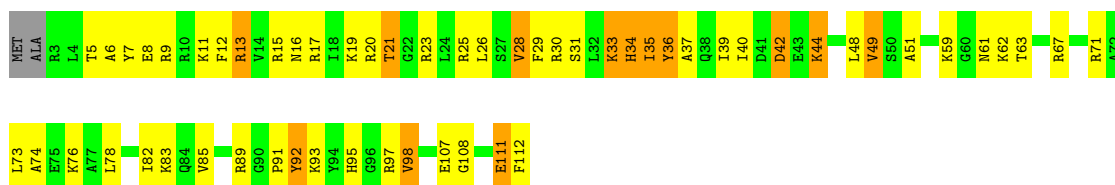


Chain TB:  47% 43% 9%



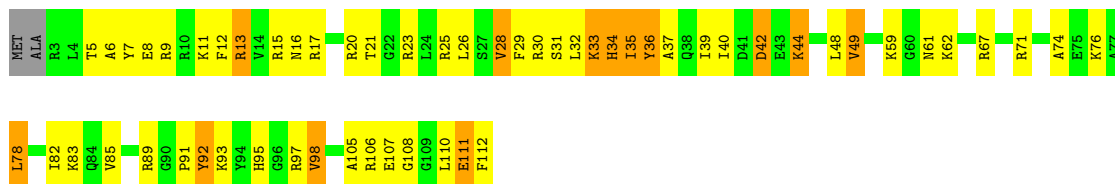
- Molecule 16: 50S ribosomal protein L18

Chain P:  47% 39% 12%



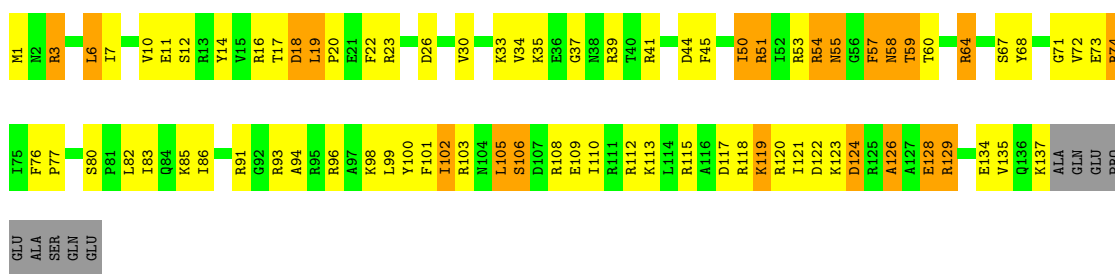
- Molecule 16: 50S ribosomal protein L18

Chain UB:  47% 39% 12%



- Molecule 17: 50S ribosomal protein L19

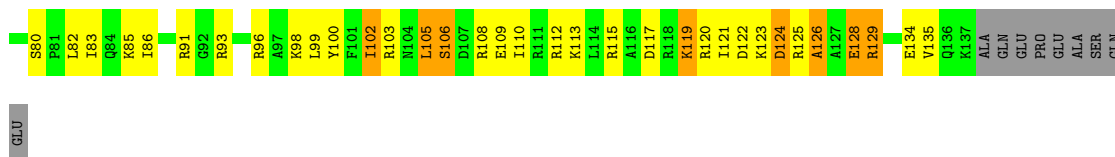
Chain Q:  39% 40% 14% 6%



- Molecule 17: 50S ribosomal protein L19

Chain VB:  43% 38% 13% 6%

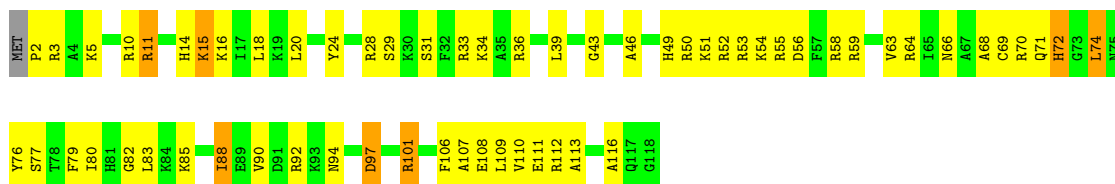




GLU

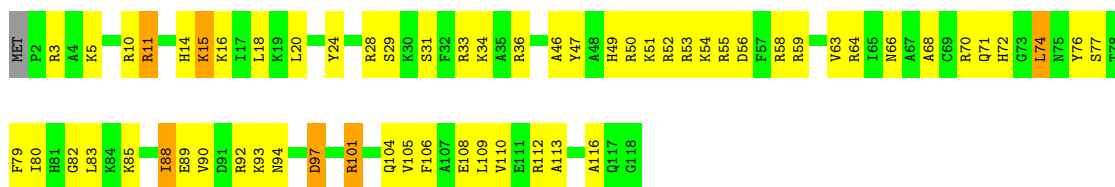
- Molecule 18: 50S ribosomal protein L20

Chain R: 47% 46% 6%



- Molecule 18: 50S ribosomal protein L20

Chain WB: 48% 46% 5%



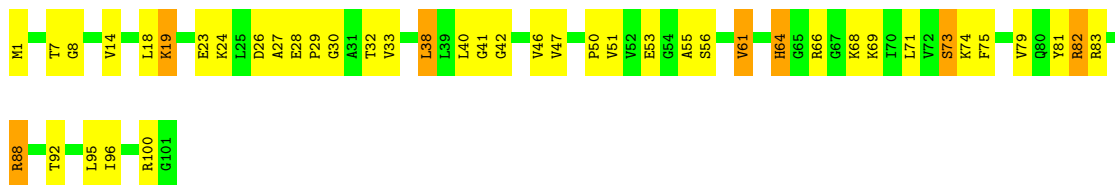
- Molecule 19: 50S ribosomal protein L21

Chain S: 55% 37% 8%



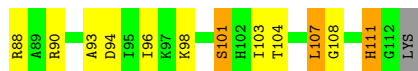
- Molecule 19: 50S ribosomal protein L21

Chain XB: 56% 37% 7%

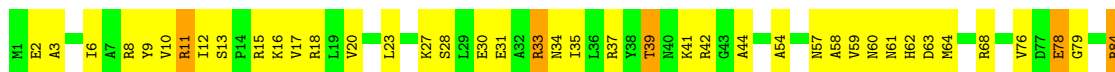


- Molecule 20: 50S ribosomal protein L22

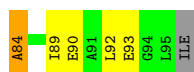
Chain T: 51% 39% 9%



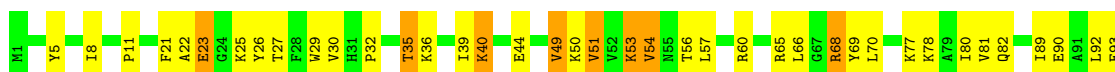
- Molecule 20: 50S ribosomal protein L22



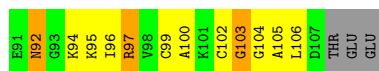
- Molecule 21: 50S ribosomal protein L23



- Molecule 21: 50S ribosomal protein L23

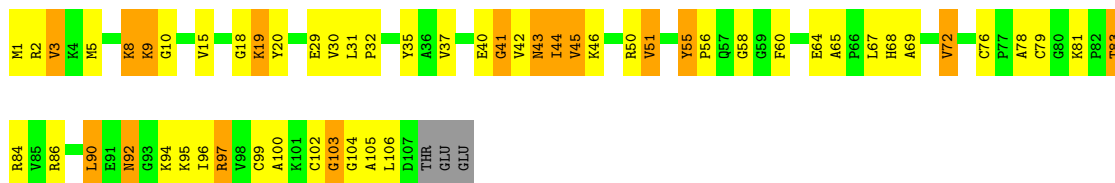


- Molecule 22: 50S ribosomal protein L24



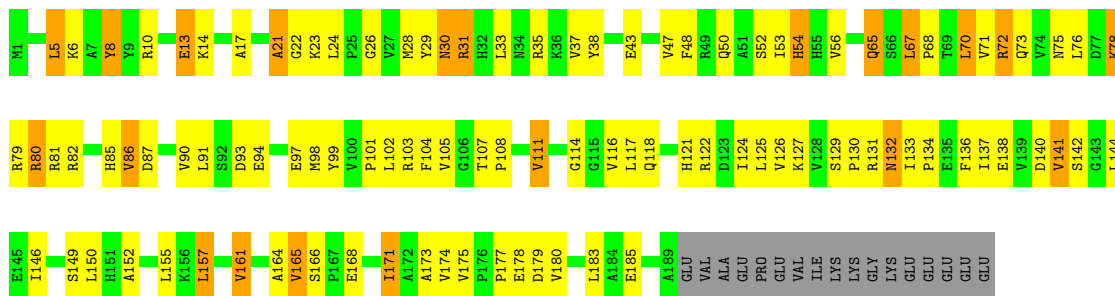
- Molecule 22: 50S ribosomal protein L24





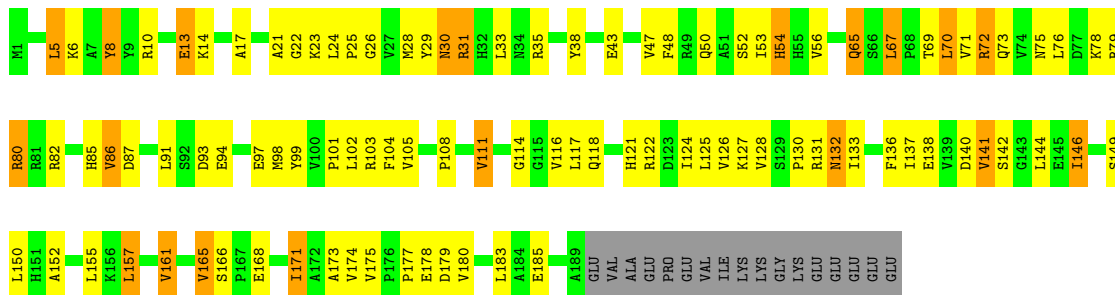
- Molecule 23: 50S ribosomal protein L25

Chain W: 41% 40% 10% 8%



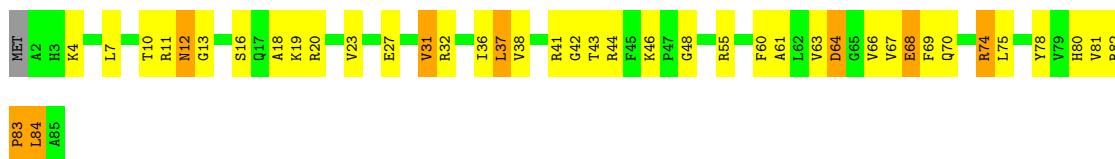
- Molecule 23: 50S ribosomal protein L25

Chain BC: 44% 38% 10% 8%



- Molecule 24: 50S ribosomal protein L27

Chain X: 51% 39% 9%



- Molecule 24: 50S ribosomal protein L27

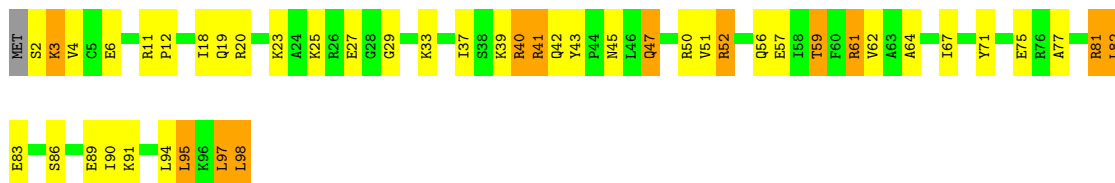
Chain CC: 51% 41% 7%



A85

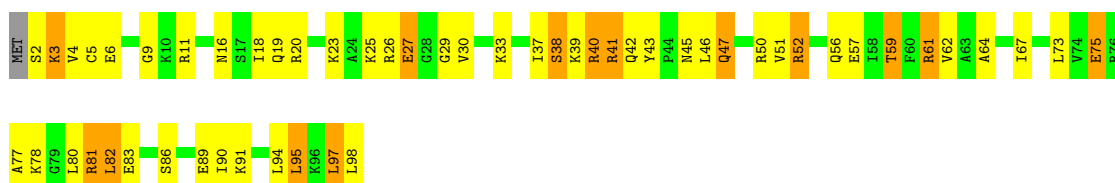
- Molecule 25: 50S ribosomal protein L28

Chain Y: 52% 35% 12%



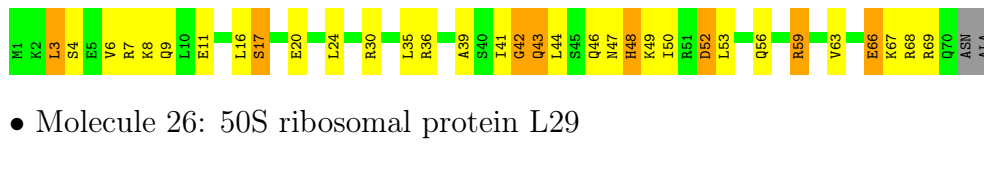
- Molecule 25: 50S ribosomal protein L28

Chain DC: 44% 41% 14%



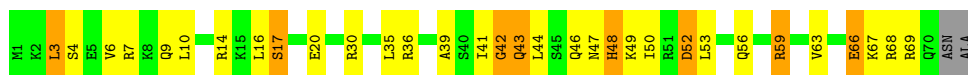
- Molecule 26: 50S ribosomal protein L29

Chain Z: 51% 35% 11%



- Molecule 26: 50S ribosomal protein L29

Chain EC: 53% 33% 11%



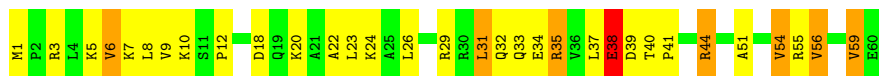
- Molecule 27: 50S ribosomal protein L30

Chain AA: 43% 42% 13%



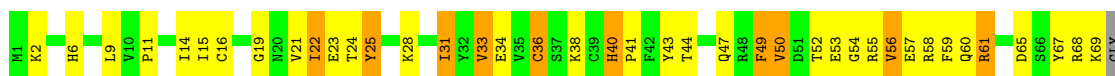
- Molecule 27: 50S ribosomal protein L30

Chain FC: 47% 40% 12%



- Molecule 28: 50S ribosomal protein L31

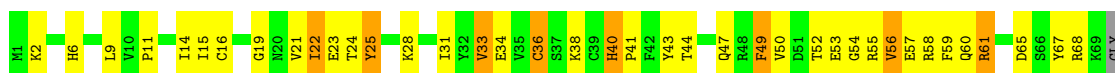
Chain BA:  41% 42% 14%



ARG

- Molecule 28: 50S ribosomal protein L31

Chain GC:  42% 44% 11%



ARG

- Molecule 29: 50S ribosomal protein L32

Chain CA:  40% 48% 10%



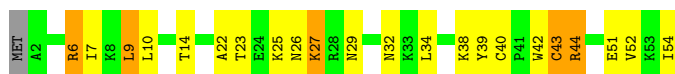
- Molecule 29: 50S ribosomal protein L32

Chain HC:  43% 47% 8%



- Molecule 30: 50S ribosomal protein L33

Chain DA:  57% 31% 9%



- Molecule 30: 50S ribosomal protein L33

Chain IC:  61% 30% 7%



- Molecule 31: 50S ribosomal protein L34

Chain EA:  53% 35% 10%



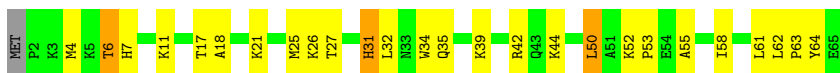
- Molecule 31: 50S ribosomal protein L34



- Molecule 32: 50S ribosomal protein L35



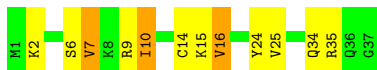
- Molecule 32: 50S ribosomal protein L35



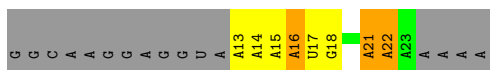
- Molecule 33: 50S ribosomal protein L36



- Molecule 33: 50S ribosomal protein L36



- Molecule 34: mRNA



- Molecule 34: mRNA

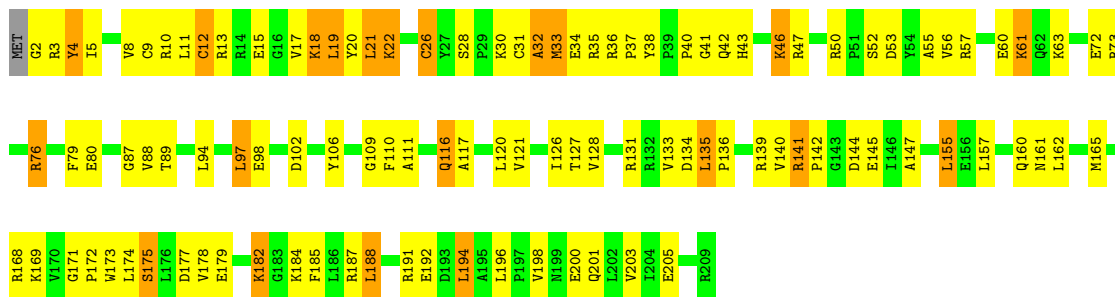








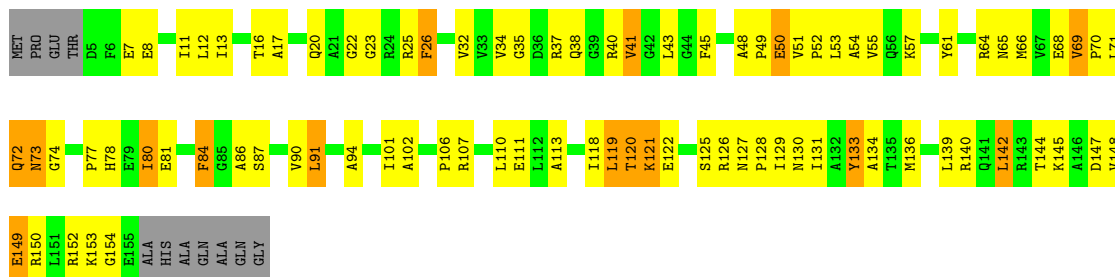




- Molecule 38: 50S ribosomal protein S4



- Molecule 39: 30S ribosomal protein S5

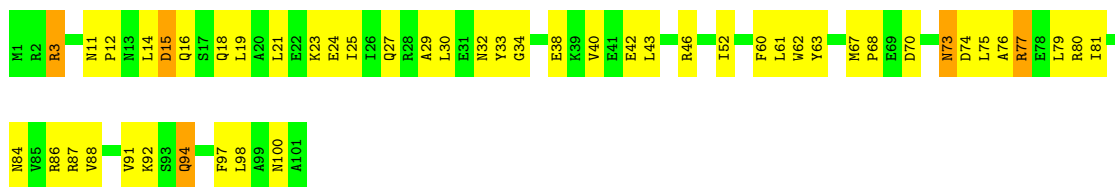


- Molecule 39: 30S ribosomal protein S5



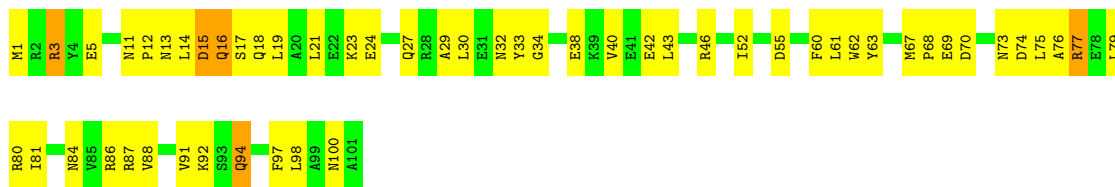
- Molecule 40: 30S ribosomal protein S6

Chain PA:  51% 44% 5%



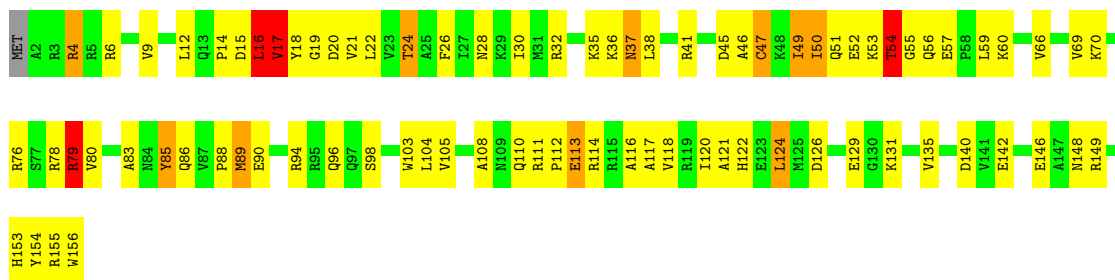
• Molecule 40: 30S ribosomal protein S6

Chain UC:  47% 49% 5%



• Molecule 41: 30S ribosomal protein S7

Chain QA:  47% 44% 6%



• Molecule 41: 30S ribosomal protein S7

Chain VC:  47% 44% 6%



• Molecule 42: 30S ribosomal protein S8

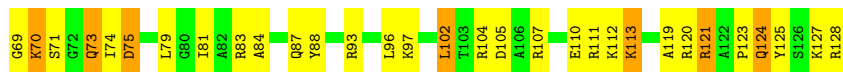
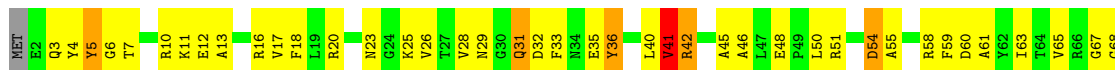
Chain RA:  44% 47% 8%



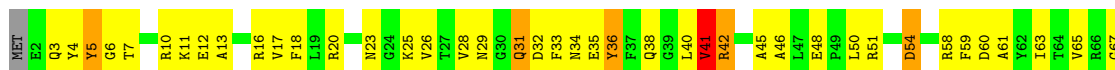
• Molecule 42: 30S ribosomal protein S8



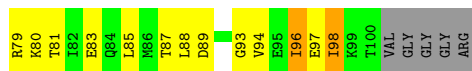
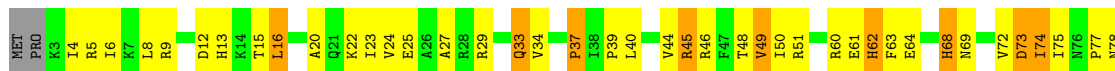
• Molecule 43: 30S ribosomal protein S9



• Molecule 43: 30S ribosomal protein S9

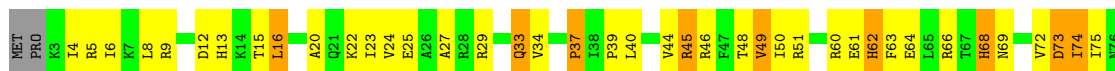


• Molecule 44: 30S ribosomal protein S10

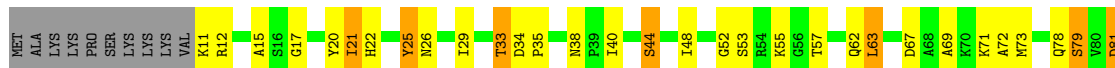


• Molecule 44: 30S ribosomal protein S10





- Molecule 45: 30S ribosomal protein S11



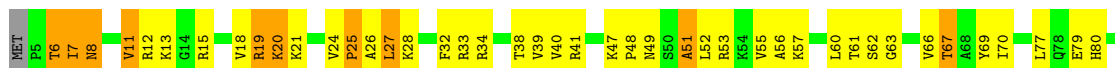
- Molecule 45: 30S ribosomal protein S11



- Molecule 46: 30S ribosomal protein S12

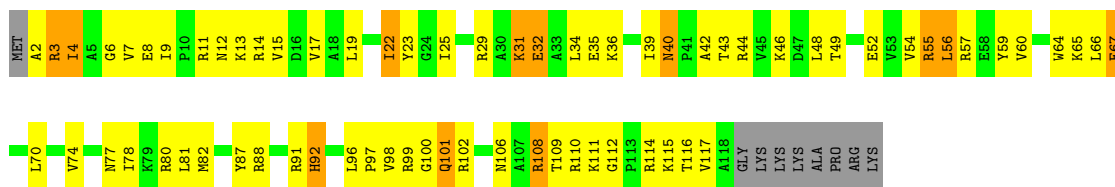


- Molecule 46: 30S ribosomal protein S12



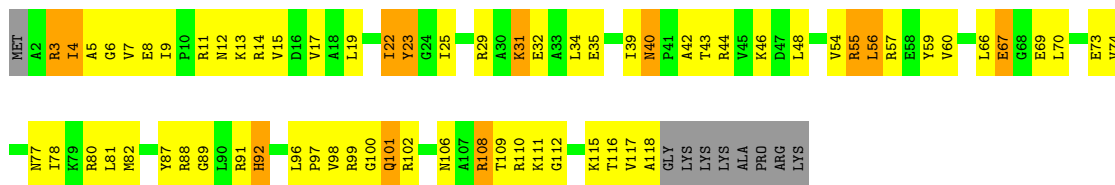
- Molecule 47: 30S ribosomal protein S13

Chain WA: 37% 46% 10% 7%



• Molecule 47: 30S ribosomal protein S13

Chain BD: 39% 44% 10% 7%



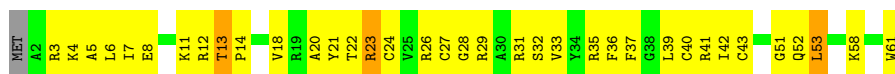
• Molecule 48: 30S ribosomal protein S14 type Z

Chain XA: 39% 54% 5%



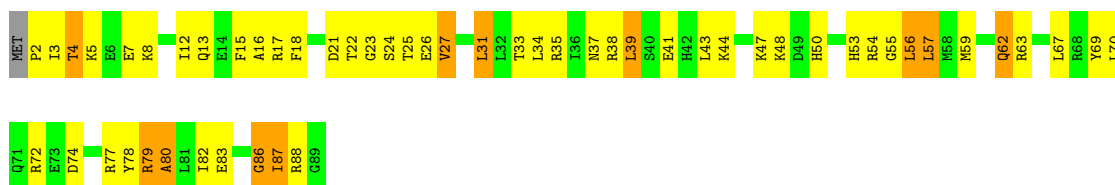
• Molecule 48: 30S ribosomal protein S14 type Z

Chain CD: 39% 54% 5%



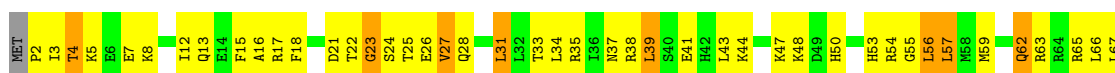
• Molecule 49: 30S ribosomal protein S15

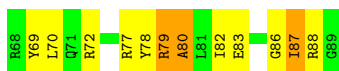
Chain YA: 38% 48% 12%



• Molecule 49: 30S ribosomal protein S15

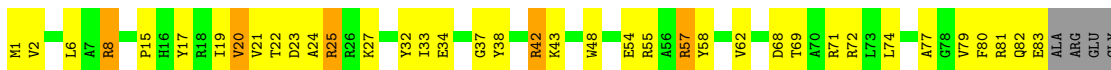
Chain DD: 36% 51% 12%





- Molecule 50: 30S ribosomal protein S16

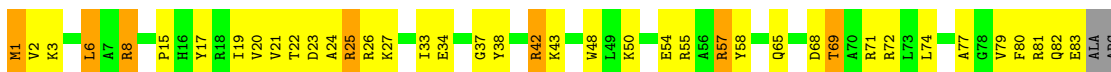
Chain ZA: 51% 38% 6% 6%



ALA

- Molecule 50: 30S ribosomal protein S16

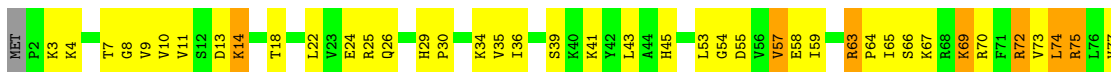
Chain ED: 49% 38% 8% 6%



GLU  
GLY  
ALA

- Molecule 51: 30S ribosomal protein S17

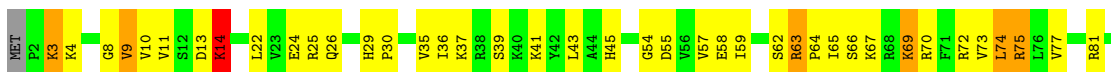
Chain AB: 43% 41% 10% 6%



R81  
L84  
K87  
I90  
R91  
R92  
Q93  
Q96  
Y95  
S97  
S99  
K100  
ARG  
GLY  
LYS  
ALA

- Molecule 51: 30S ribosomal protein S17

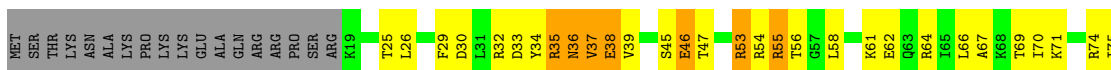
Chain FD: 45% 39% 10% 6%



L84  
K87  
I90  
R91  
R92  
Q93  
Y95  
S97  
S99  
K100  
ARG  
GLY  
LYS  
ALA

- Molecule 52: 30S ribosomal protein S18

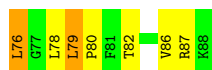
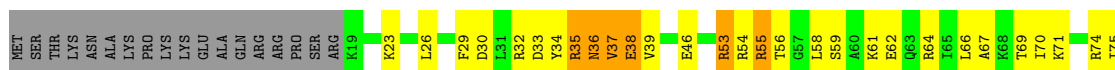
Chain BB: 38% 33% 9% 20%



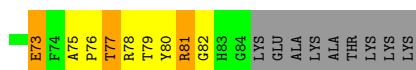




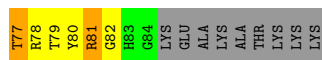
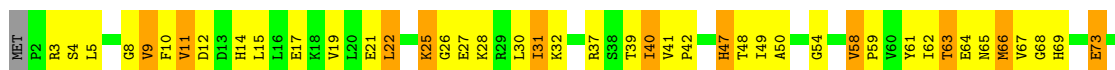
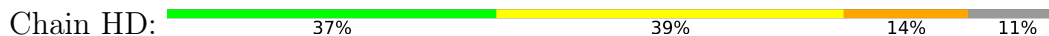
- Molecule 52: 30S ribosomal protein S18



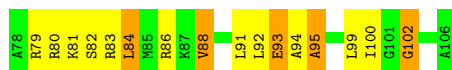
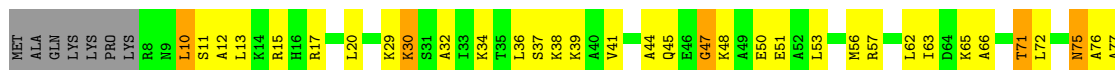
- Molecule 53: 30S ribosomal protein S19



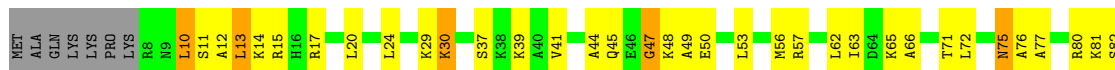
- Molecule 53: 30S ribosomal protein S19



- Molecule 54: 30S ribosomal protein S20

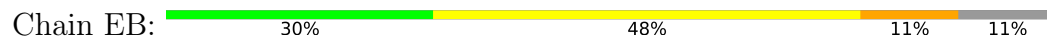


- Molecule 54: 30S ribosomal protein S20

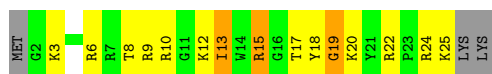
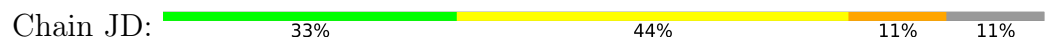




- Molecule 55: 30S ribosomal protein Thx



- Molecule 55: 30S ribosomal protein Thx



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	209.86Å 450.69Å 615.88Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.40 69.13 – 3.40	Depositor EDS
% Data completeness (in resolution range)	99.9 (50.00-3.40) 100.0 (69.13-3.40)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.22 (at 3.41Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	(Not available) , (Not available) 0.243 , 0.282	Depositor DCC
$R_{free}$ test set	7928 reflections (1.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	120.8	Xtrriage
Anisotropy	0.263	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.26 , 82.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.37$ , $\langle L^2 \rangle = 0.20$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	298186	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	137.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.58% 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: 4SU, ZN, 4OC, 2MU, 7MG, 2MA, BLS, M2G, OMG, UR3, 5MU, MG, 0TD, PSU, 2MG, MA6, 5MC

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	A	0.60	1/35961 (0.0%)	1.09	67/56125 (0.1%)
1	FB	0.59	1/35961 (0.0%)	1.09	73/56125 (0.1%)
2	B	0.94	58/69214 (0.1%)	1.41	808/108048 (0.7%)
2	GB	0.83	32/69214 (0.0%)	1.33	620/108048 (0.6%)
3	C	0.56	0/2881	1.05	3/4494 (0.1%)
3	HB	0.51	0/2881	1.02	2/4494 (0.0%)
4	D	0.40	0/1744	0.90	0/2719
4	IA	0.60	0/1744	1.06	4/2719 (0.1%)
4	IB	0.37	0/1744	0.90	0/2719
4	NC	0.50	0/1744	1.00	0/2719
5	E	0.80	4/2195 (0.2%)	0.80	1/2955 (0.0%)
5	JB	0.63	2/2195 (0.1%)	0.73	1/2955 (0.0%)
6	F	0.52	0/1596	0.69	1/2153 (0.0%)
6	KB	0.57	0/1596	0.70	1/2153 (0.0%)
7	G	0.61	0/1621	0.69	0/2194
7	LB	0.51	0/1621	0.65	0/2194
8	H	0.36	0/1496	0.57	0/2013
8	MB	0.33	0/1496	0.57	0/2013
9	I	0.43	0/1356	0.59	0/1834
9	NB	0.34	0/1356	0.55	0/1834
10	J	0.46	0/1152	0.62	0/1559
10	OB	0.42	0/1152	0.61	0/1559
11	K	0.49	0/1148	0.62	0/1547
11	PB	0.44	0/1148	0.59	0/1547
12	L	0.59	0/942	0.66	0/1268
12	QB	0.65	0/942	0.68	0/1268
13	M	0.54	0/1162	0.69	0/1544
13	RB	0.47	0/1162	0.65	0/1544
14	N	0.51	0/1142	0.62	0/1525
14	SB	0.49	0/1142	0.60	0/1525
15	O	0.51	0/982	0.63	0/1312

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
15	TB	0.53	0/982	0.64	0/1312
16	P	0.42	0/887	0.56	0/1180
16	UB	0.40	0/887	0.56	0/1180
17	Q	0.48	0/1157	0.57	0/1544
17	VB	0.54	0/1157	0.59	0/1544
18	R	0.55	0/982	0.60	0/1306
18	WB	0.49	0/982	0.60	0/1306
19	S	0.49	0/790	0.65	0/1057
19	XB	0.44	0/790	0.61	0/1057
20	T	0.65	0/901	0.69	0/1209
20	YB	0.60	0/901	0.68	0/1209
21	U	0.71	0/764	0.68	0/1025
21	ZB	0.60	0/764	0.61	0/1025
22	AC	0.50	0/827	0.61	0/1103
22	V	0.58	0/827	0.64	0/1103
23	BC	0.40	0/1527	0.58	0/2073
23	W	0.44	0/1527	0.60	0/2073
24	CC	0.50	0/671	0.62	0/892
24	X	0.52	0/671	0.63	0/892
25	DC	0.57	0/768	0.69	0/1021
25	Y	0.63	0/768	0.68	0/1021
26	EC	0.50	0/594	0.64	0/785
26	Z	0.61	0/594	0.71	0/785
27	AA	0.50	0/482	0.63	0/646
27	FC	0.44	0/482	0.59	0/646
28	BA	0.39	0/565	0.53	0/761
28	GC	0.35	0/565	0.52	0/761
29	CA	0.54	0/474	0.66	0/640
29	HC	0.54	0/474	0.64	0/640
30	DA	0.34	0/460	0.51	0/613
30	IC	0.33	0/460	0.51	0/613
31	EA	0.77	0/426	0.76	0/561
31	JC	0.65	0/426	0.72	0/561
32	FA	0.60	0/525	0.64	0/691
32	KC	0.53	0/525	0.62	0/691
33	GA	0.41	0/310	0.58	0/407
33	LC	0.45	0/310	0.60	0/407
34	HA	0.72	0/247	0.92	0/382
34	MC	0.72	0/247	0.91	0/382
35	JA	0.37	0/867	0.51	0/1165
35	KA	0.39	0/461	0.56	0/622
35	OC	0.34	0/867	0.51	0/1165
35	PC	0.36	0/461	0.56	0/622

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
36	LA	0.39	0/1935	0.57	0/2609
36	QC	0.35	0/1935	0.55	0/2609
37	MA	0.37	0/1636	0.54	0/2205
37	RC	0.36	0/1636	0.54	0/2205
38	NA	0.47	1/1733 (0.1%)	0.59	1/2318 (0.0%)
38	SC	0.53	1/1733 (0.1%)	0.62	1/2318 (0.0%)
39	OA	0.45	0/1171	0.62	0/1576
39	TC	0.44	0/1171	0.61	0/1576
40	PA	0.51	0/856	0.62	0/1154
40	UC	0.43	0/856	0.60	0/1154
41	QA	0.36	0/1276	0.51	0/1709
41	VC	0.34	0/1276	0.50	0/1709
42	RA	0.37	0/1136	0.57	0/1527
42	WC	0.38	0/1136	0.56	0/1527
43	SA	0.34	0/1029	0.54	0/1378
43	XC	0.32	0/1029	0.53	1/1378 (0.1%)
44	TA	0.36	0/807	0.56	0/1085
44	YC	0.34	0/807	0.57	0/1085
45	UA	0.48	0/879	0.64	0/1187
45	ZC	0.41	0/879	0.59	0/1187
46	AD	0.52	0/963	0.62	0/1287
46	VA	0.50	0/963	0.61	0/1287
47	BD	0.33	0/943	0.51	0/1265
47	WA	0.36	0/943	0.52	0/1265
48	CD	0.35	0/501	0.48	0/664
48	XA	0.37	0/501	0.52	0/664
49	DD	0.42	0/745	0.55	0/992
49	YA	0.49	0/745	0.58	0/992
50	ED	0.40	0/716	0.59	0/963
50	ZA	0.34	0/716	0.56	0/963
51	AB	0.47	0/836	0.57	0/1117
51	FD	0.48	0/836	0.58	0/1117
52	BB	0.46	0/579	0.54	0/768
52	GD	0.41	0/579	0.52	0/768
53	CB	0.32	0/680	0.50	0/915
53	HD	0.30	0/680	0.51	0/915
54	DB	0.36	0/764	0.53	0/1006
54	ID	0.40	0/764	0.54	0/1006
55	EB	0.31	0/212	0.48	0/277
55	JD	0.31	0/212	0.46	0/277
All	All	0.71	100/320836 (0.0%)	1.12	1584/479388 (0.3%)

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
21	U	0	1

The worst 5 of 100 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	237	GLU	CG-CD	10.38	1.67	1.51
5	E	237	GLU	CB-CG	8.22	1.67	1.52
38	SC	12	CYS	CB-SG	8.17	1.96	1.82
38	NA	12	CYS	CB-SG	7.71	1.95	1.82
2	GB	1780	A	N9-C4	-7.60	1.33	1.37

The worst 5 of 1584 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	298	G	N1-C6-O6	16.25	129.65	119.90
2	B	2593	U	N3-C4-C5	-15.20	105.48	114.60
2	B	2593	U	C6-N1-C2	-14.08	112.55	121.00
2	GB	2593	U	N3-C4-C5	-13.88	106.27	114.60
2	B	2032	G	C4-C5-N7	13.65	116.26	110.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
21	U	84	ALA	Peptide

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

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	32394	0	16367	824	0
1	FB	32394	0	16367	817	0
2	B	62031	0	31273	1297	0
2	GB	62031	0	31275	1270	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	2576	0	1305	62	0
3	HB	2576	0	1305	63	0
4	D	1642	0	841	47	0
4	IA	1642	0	841	44	0
4	IB	1642	0	841	46	0
4	NC	1642	0	841	41	0
5	E	2145	0	2234	111	0
5	JB	2145	0	2234	105	0
6	F	1563	0	1629	90	0
6	KB	1563	0	1629	88	0
7	G	1586	0	1632	110	0
7	LB	1586	0	1632	105	0
8	H	1471	0	1526	90	0
8	MB	1471	0	1526	86	1
9	I	1330	0	1407	63	0
9	NB	1330	0	1407	58	0
10	J	1137	0	1225	56	0
10	OB	1137	0	1225	55	0
11	K	1121	0	1195	57	0
11	PB	1121	0	1195	54	0
12	L	932	0	994	75	0
12	QB	932	0	994	72	0
13	M	1145	0	1228	56	0
13	RB	1145	0	1228	47	0
14	N	1121	0	1179	64	0
14	SB	1121	0	1179	59	0
15	O	968	0	1033	33	0
15	TB	968	0	1033	38	0
16	P	877	0	938	48	0
16	UB	877	0	938	48	0
17	Q	1143	0	1211	81	0
17	VB	1143	0	1211	67	0
18	R	964	0	1022	61	0
18	WB	964	0	1022	55	0
19	S	779	0	852	28	0
19	XB	779	0	852	25	0
20	T	890	0	951	37	0
20	YB	890	0	951	40	0
21	U	750	0	814	40	0
21	ZB	750	0	814	37	0
22	AC	814	0	907	40	0
22	V	814	0	907	40	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
23	BC	1495	0	1521	80	0
23	W	1495	0	1521	90	0
24	CC	662	0	688	40	0
24	X	662	0	688	38	0
25	DC	761	0	837	52	0
25	Y	761	0	837	46	0
26	EC	592	0	654	32	0
26	Z	592	0	654	33	0
27	AA	477	0	529	27	0
27	FC	477	0	529	25	0
28	BA	552	0	537	31	0
28	GC	552	0	537	30	0
29	CA	460	0	481	32	0
29	HC	460	0	482	30	0
30	DA	453	0	477	15	0
30	IC	453	0	477	13	0
31	EA	418	0	467	24	0
31	JC	418	0	467	30	0
32	FA	517	0	582	31	0
32	KC	517	0	582	28	0
33	GA	307	0	337	11	0
33	LC	307	0	337	9	0
34	HA	220	0	108	10	0
34	MC	220	0	108	10	0
35	JA	850	0	816	38	0
35	KA	455	0	444	24	0
35	OC	850	0	816	38	0
35	PC	455	0	444	26	0
36	LA	1900	0	1951	101	0
36	QC	1900	0	1951	96	0
37	MA	1612	0	1677	91	0
37	RC	1612	0	1677	80	0
38	NA	1703	0	1767	94	0
38	SC	1703	0	1767	91	0
39	OA	1155	0	1213	64	0
39	TC	1155	0	1213	75	0
40	PA	843	0	857	35	0
40	UC	843	0	857	37	0
41	QA	1257	0	1296	62	0
41	VC	1257	0	1296	61	0
42	RA	1116	0	1177	61	0
42	WC	1116	0	1177	61	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
43	SA	1011	0	1043	61	0
43	XC	1011	0	1043	59	0
44	TA	794	0	840	37	0
44	YC	794	0	840	38	0
45	UA	864	0	881	39	0
45	ZC	864	0	881	45	0
46	AD	958	0	1047	54	0
46	VA	958	0	1047	55	0
47	BD	933	0	992	62	0
47	WA	933	0	992	64	0
48	CD	492	0	533	37	0
48	XA	492	0	533	39	0
49	DD	734	0	771	41	0
49	YA	734	0	771	37	0
50	ED	700	0	720	33	0
50	ZA	700	0	720	28	0
51	AB	823	0	893	40	0
51	FD	823	0	893	40	0
52	BB	574	0	644	32	0
52	GD	574	0	644	31	0
53	CB	665	0	686	43	0
53	HD	665	0	686	43	0
54	DB	762	0	859	43	0
54	ID	762	0	859	41	0
55	EB	208	0	221	16	0
55	JD	208	0	221	16	0
56	A	183	0	0	0	0
56	AA	1	0	0	0	0
56	AB	2	0	0	0	0
56	AC	1	0	0	0	0
56	AD	4	0	0	0	0
56	B	433	0	0	0	0
56	BB	1	0	0	0	0
56	BC	1	0	0	0	0
56	BD	1	0	0	0	0
56	C	22	0	0	0	0
56	CA	1	0	0	0	0
56	CB	1	0	0	0	0
56	CC	1	0	0	0	0
56	D	5	0	0	0	0
56	DC	1	0	0	0	0
56	DD	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	E	6	0	0	0	0
56	EA	1	0	0	0	0
56	ED	1	0	0	0	0
56	F	4	0	0	0	0
56	FA	1	0	0	0	0
56	FB	194	0	0	0	0
56	G	2	0	0	0	0
56	GB	402	0	0	0	0
56	GC	1	0	0	0	0
56	H	2	0	0	0	0
56	HA	3	0	0	0	0
56	HB	20	0	0	0	0
56	HD	1	0	0	0	0
56	IA	9	0	0	0	0
56	IB	2	0	0	0	0
56	IC	1	0	0	0	0
56	J	1	0	0	0	0
56	JA	1	0	0	0	0
56	JB	5	0	0	0	0
56	JC	1	0	0	0	0
56	K	4	0	0	0	0
56	KB	2	0	0	0	0
56	KC	1	0	0	0	0
56	L	3	0	0	0	0
56	LA	1	0	0	0	0
56	LB	4	0	0	0	0
56	M	3	0	0	0	0
56	MA	6	0	0	0	0
56	MC	3	0	0	0	0
56	NA	2	0	0	0	0
56	NB	1	0	0	0	0
56	NC	10	0	0	0	0
56	O	2	0	0	0	0
56	OA	4	0	0	0	0
56	OB	1	0	0	0	0
56	OC	1	0	0	0	0
56	PA	3	0	0	0	0
56	PB	2	0	0	0	0
56	PC	1	0	0	0	0
56	Q	1	0	0	0	0
56	QA	1	0	0	0	0
56	QB	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	QC	3	0	0	0	0
56	R	1	0	0	0	0
56	RB	3	0	0	0	0
56	RC	2	0	0	0	0
56	S	1	0	0	0	0
56	SA	1	0	0	0	0
56	SB	2	0	0	0	0
56	SC	4	0	0	0	0
56	T	2	0	0	0	0
56	TB	1	0	0	0	0
56	TC	3	0	0	0	0
56	U	1	0	0	0	0
56	UA	1	0	0	0	0
56	UB	4	0	0	0	0
56	UC	3	0	0	0	0
56	V	2	0	0	0	0
56	VA	2	0	0	0	0
56	VB	3	0	0	0	0
56	VC	1	0	0	0	0
56	WC	1	0	0	0	0
56	XB	2	0	0	0	0
56	Y	3	0	0	0	0
56	YA	3	0	0	0	0
56	Z	1	0	0	0	0
56	ZB	2	0	0	0	0
56	ZC	1	0	0	0	0
57	B	30	0	24	4	0
57	GB	30	0	24	7	0
58	AC	1	0	0	0	0
58	BA	1	0	0	0	0
58	CA	1	0	0	0	0
58	DA	1	0	0	0	0
58	GA	1	0	0	0	0
58	GC	1	0	0	0	0
58	HC	1	0	0	0	0
58	IC	1	0	0	0	0
58	LC	1	0	0	0	0
58	V	1	0	0	0	0
All	All	298186	0	202351	8489	1

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 18.

The worst 5 of 8489 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:SC:18:LYS:NZ	38:SC:26:CYS:SG	2.02	1.33
38:SC:18:LYS:NZ	38:SC:31:CYS:SG	2.07	1.27
38:NA:18:LYS:NZ	38:NA:26:CYS:SG	2.09	1.26
3:C:90:C:OP2	14:N:16:ARG:NH1	1.77	1.18
1:FB:9:G:OP2	39:TC:121:LYS:NZ	1.76	1.16

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:GB:1412:A:O2'	8:MB:9:ARG:NH1[1_655]	1.99	0.21

## 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	
5	E	273/275 (99%)	243 (89%)	24 (9%)	6 (2%)	6	29
5	JB	273/275 (99%)	245 (90%)	22 (8%)	6 (2%)	6	29
6	F	202/206 (98%)	166 (82%)	28 (14%)	8 (4%)	3	18
6	KB	202/206 (98%)	167 (83%)	29 (14%)	6 (3%)	4	23
7	G	200/205 (98%)	173 (86%)	24 (12%)	3 (2%)	10	36
7	LB	200/205 (98%)	172 (86%)	25 (12%)	3 (2%)	10	36
8	H	179/182 (98%)	134 (75%)	37 (21%)	8 (4%)	2	16
8	MB	179/182 (98%)	134 (75%)	37 (21%)	8 (4%)	2	16
9	I	172/180 (96%)	134 (78%)	32 (19%)	6 (4%)	3	21
9	NB	172/180 (96%)	134 (78%)	32 (19%)	6 (4%)	3	21
10	J	144/148 (97%)	111 (77%)	23 (16%)	10 (7%)	1	8

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	OB	144/148 (97%)	111 (77%)	24 (17%)	9 (6%)	1	9
11	K	138/140 (99%)	115 (83%)	17 (12%)	6 (4%)	2	17
11	PB	138/140 (99%)	118 (86%)	15 (11%)	5 (4%)	3	21
12	L	120/122 (98%)	110 (92%)	9 (8%)	1 (1%)	19	51
12	QB	120/122 (98%)	108 (90%)	9 (8%)	3 (2%)	5	26
13	M	148/150 (99%)	126 (85%)	12 (8%)	10 (7%)	1	8
13	RB	148/150 (99%)	124 (84%)	14 (10%)	10 (7%)	1	8
14	N	139/141 (99%)	120 (86%)	17 (12%)	2 (1%)	11	37
14	SB	139/141 (99%)	121 (87%)	15 (11%)	3 (2%)	6	29
15	O	116/118 (98%)	99 (85%)	12 (10%)	5 (4%)	2	17
15	TB	116/118 (98%)	97 (84%)	13 (11%)	6 (5%)	2	13
16	P	108/112 (96%)	82 (76%)	23 (21%)	3 (3%)	5	24
16	UB	108/112 (96%)	83 (77%)	22 (20%)	3 (3%)	5	24
17	Q	135/146 (92%)	118 (87%)	13 (10%)	4 (3%)	4	23
17	VB	135/146 (92%)	117 (87%)	15 (11%)	3 (2%)	6	29
18	R	115/118 (98%)	106 (92%)	9 (8%)	0	100	100
18	WB	115/118 (98%)	106 (92%)	8 (7%)	1 (1%)	17	49
19	S	99/101 (98%)	85 (86%)	10 (10%)	4 (4%)	3	18
19	XB	99/101 (98%)	84 (85%)	12 (12%)	3 (3%)	4	23
20	T	110/113 (97%)	97 (88%)	11 (10%)	2 (2%)	8	32
20	YB	110/113 (97%)	98 (89%)	12 (11%)	0	100	100
21	U	93/96 (97%)	83 (89%)	8 (9%)	2 (2%)	6	29
21	ZB	93/96 (97%)	85 (91%)	6 (6%)	2 (2%)	6	29
22	AC	105/110 (96%)	83 (79%)	16 (15%)	6 (6%)	1	12
22	V	105/110 (96%)	83 (79%)	14 (13%)	8 (8%)	1	6
23	BC	187/206 (91%)	137 (73%)	43 (23%)	7 (4%)	3	20
23	W	187/206 (91%)	139 (74%)	41 (22%)	7 (4%)	3	20
24	CC	82/85 (96%)	70 (85%)	8 (10%)	4 (5%)	2	14
24	X	82/85 (96%)	71 (87%)	8 (10%)	3 (4%)	3	20
25	DC	95/98 (97%)	87 (92%)	7 (7%)	1 (1%)	14	44
25	Y	95/98 (97%)	86 (90%)	8 (8%)	1 (1%)	14	44

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	EC	68/72 (94%)	61 (90%)	4 (6%)	3 (4%)	2	16
26	Z	68/72 (94%)	59 (87%)	6 (9%)	3 (4%)	2	16
27	AA	58/60 (97%)	44 (76%)	12 (21%)	2 (3%)	3	21
27	FC	58/60 (97%)	45 (78%)	11 (19%)	2 (3%)	3	21
28	BA	67/71 (94%)	43 (64%)	16 (24%)	8 (12%)	0	3
28	GC	67/71 (94%)	44 (66%)	15 (22%)	8 (12%)	0	3
29	CA	57/60 (95%)	50 (88%)	6 (10%)	1 (2%)	8	32
29	HC	57/60 (95%)	49 (86%)	8 (14%)	0	100	100
30	DA	51/54 (94%)	42 (82%)	8 (16%)	1 (2%)	7	30
30	IC	51/54 (94%)	42 (82%)	8 (16%)	1 (2%)	7	30
31	EA	46/49 (94%)	41 (89%)	5 (11%)	0	100	100
31	JC	46/49 (94%)	38 (83%)	8 (17%)	0	100	100
32	FA	62/65 (95%)	53 (86%)	9 (14%)	0	100	100
32	KC	62/65 (95%)	53 (86%)	9 (14%)	0	100	100
33	GA	35/37 (95%)	24 (69%)	8 (23%)	3 (9%)	1	5
33	LC	35/37 (95%)	24 (69%)	8 (23%)	3 (9%)	1	5
35	JA	108/365 (30%)	84 (78%)	18 (17%)	6 (6%)	2	12
35	KA	53/365 (14%)	31 (58%)	13 (24%)	9 (17%)	0	0
35	OC	108/365 (30%)	83 (77%)	19 (18%)	6 (6%)	2	12
35	PC	53/365 (14%)	31 (58%)	14 (26%)	8 (15%)	0	0
36	LA	232/256 (91%)	176 (76%)	40 (17%)	16 (7%)	1	8
36	QC	232/256 (91%)	174 (75%)	41 (18%)	17 (7%)	1	7
37	MA	204/239 (85%)	166 (81%)	28 (14%)	10 (5%)	2	14
37	RC	204/239 (85%)	167 (82%)	25 (12%)	12 (6%)	1	11
38	NA	206/209 (99%)	162 (79%)	35 (17%)	9 (4%)	2	16
38	SC	206/209 (99%)	158 (77%)	39 (19%)	9 (4%)	2	16
39	OA	149/162 (92%)	126 (85%)	19 (13%)	4 (3%)	5	26
39	TC	149/162 (92%)	124 (83%)	20 (13%)	5 (3%)	3	21
40	PA	99/101 (98%)	81 (82%)	14 (14%)	4 (4%)	3	18
40	UC	99/101 (98%)	82 (83%)	13 (13%)	4 (4%)	3	18
41	QA	153/156 (98%)	121 (79%)	24 (16%)	8 (5%)	2	13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
41	VC	153/156 (98%)	121 (79%)	24 (16%)	8 (5%)	2	13
42	RA	136/138 (99%)	106 (78%)	25 (18%)	5 (4%)	3	20
42	WC	136/138 (99%)	106 (78%)	25 (18%)	5 (4%)	3	20
43	SA	125/128 (98%)	91 (73%)	28 (22%)	6 (5%)	2	15
43	XC	125/128 (98%)	93 (74%)	25 (20%)	7 (6%)	2	12
44	TA	96/105 (91%)	72 (75%)	15 (16%)	9 (9%)	0	4
44	YC	96/105 (91%)	75 (78%)	12 (12%)	9 (9%)	0	4
45	UA	114/129 (88%)	87 (76%)	23 (20%)	4 (4%)	3	21
45	ZC	114/129 (88%)	87 (76%)	24 (21%)	3 (3%)	5	26
46	AD	119/132 (90%)	91 (76%)	20 (17%)	8 (7%)	1	8
46	VA	119/132 (90%)	89 (75%)	22 (18%)	8 (7%)	1	8
47	BD	115/126 (91%)	90 (78%)	18 (16%)	7 (6%)	1	10
47	WA	115/126 (91%)	91 (79%)	18 (16%)	6 (5%)	2	13
48	CD	58/61 (95%)	45 (78%)	12 (21%)	1 (2%)	9	34
48	XA	58/61 (95%)	44 (76%)	13 (22%)	1 (2%)	9	34
49	DD	86/89 (97%)	67 (78%)	16 (19%)	3 (4%)	3	21
49	YA	86/89 (97%)	68 (79%)	14 (16%)	4 (5%)	2	15
50	ED	81/88 (92%)	72 (89%)	8 (10%)	1 (1%)	13	41
50	ZA	81/88 (92%)	71 (88%)	9 (11%)	1 (1%)	13	41
51	AB	97/105 (92%)	78 (80%)	15 (16%)	4 (4%)	3	18
51	FD	97/105 (92%)	81 (84%)	11 (11%)	5 (5%)	2	13
52	BB	68/88 (77%)	63 (93%)	4 (6%)	1 (2%)	10	36
52	GD	68/88 (77%)	61 (90%)	5 (7%)	2 (3%)	4	24
53	CB	81/93 (87%)	58 (72%)	16 (20%)	7 (9%)	1	5
53	HD	81/93 (87%)	58 (72%)	17 (21%)	6 (7%)	1	7
54	DB	97/106 (92%)	79 (81%)	11 (11%)	7 (7%)	1	7
54	ID	97/106 (92%)	79 (81%)	12 (12%)	6 (6%)	1	10
55	EB	22/27 (82%)	18 (82%)	2 (9%)	2 (9%)	1	4
55	JD	22/27 (82%)	18 (82%)	2 (9%)	2 (9%)	1	4
All	All	11806/13576 (87%)	9599 (81%)	1713 (14%)	494 (4%)	3	18

5 of 494 Ramachandran outliers are listed below:



Mol	Chain	Res	Type
5	E	122	ASP
7	G	130	ALA
8	H	12	TYR
8	H	43	LEU
8	H	47	LYS

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
5	E	217/217 (100%)	177 (82%)	40 (18%)	1 5
5	JB	217/217 (100%)	176 (81%)	41 (19%)	1 4
6	F	165/166 (99%)	139 (84%)	26 (16%)	2 10
6	KB	165/166 (99%)	139 (84%)	26 (16%)	2 10
7	G	161/162 (99%)	136 (84%)	25 (16%)	2 11
7	LB	161/162 (99%)	134 (83%)	27 (17%)	2 8
8	H	154/156 (99%)	121 (79%)	33 (21%)	1 3
8	MB	154/156 (99%)	121 (79%)	33 (21%)	1 3
9	I	144/148 (97%)	123 (85%)	21 (15%)	3 12
9	NB	144/148 (97%)	122 (85%)	22 (15%)	2 11
10	J	122/124 (98%)	95 (78%)	27 (22%)	1 2
10	OB	122/124 (98%)	94 (77%)	28 (23%)	1 2
11	K	119/119 (100%)	99 (83%)	20 (17%)	2 8
11	PB	119/119 (100%)	98 (82%)	21 (18%)	2 6
12	L	100/100 (100%)	88 (88%)	12 (12%)	5 19
12	QB	100/100 (100%)	87 (87%)	13 (13%)	4 16
13	M	116/116 (100%)	86 (74%)	30 (26%)	0 2
13	RB	116/116 (100%)	86 (74%)	30 (26%)	0 2
14	N	111/111 (100%)	94 (85%)	17 (15%)	2 11
14	SB	111/111 (100%)	94 (85%)	17 (15%)	2 11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
15	O	101/101 (100%)	83 (82%)	18 (18%)	2	6
15	TB	101/101 (100%)	84 (83%)	17 (17%)	2	8
16	P	87/88 (99%)	72 (83%)	15 (17%)	2	8
16	UB	87/88 (99%)	73 (84%)	14 (16%)	2	10
17	Q	121/128 (94%)	97 (80%)	24 (20%)	1	4
17	VB	121/128 (94%)	96 (79%)	25 (21%)	1	3
18	R	93/94 (99%)	82 (88%)	11 (12%)	5	19
18	WB	93/94 (99%)	82 (88%)	11 (12%)	5	19
19	S	82/82 (100%)	64 (78%)	18 (22%)	1	3
19	XB	82/82 (100%)	64 (78%)	18 (22%)	1	3
20	T	91/92 (99%)	78 (86%)	13 (14%)	3	13
20	YB	91/92 (99%)	79 (87%)	12 (13%)	4	15
21	U	77/78 (99%)	70 (91%)	7 (9%)	9	32
21	ZB	77/78 (99%)	68 (88%)	9 (12%)	5	20
22	AC	87/91 (96%)	71 (82%)	16 (18%)	1	5
22	V	87/91 (96%)	71 (82%)	16 (18%)	1	5
23	BC	163/179 (91%)	133 (82%)	30 (18%)	1	5
23	W	163/179 (91%)	133 (82%)	30 (18%)	1	5
24	CC	66/67 (98%)	54 (82%)	12 (18%)	1	6
24	X	66/67 (98%)	53 (80%)	13 (20%)	1	4
25	DC	81/83 (98%)	64 (79%)	17 (21%)	1	3
25	Y	81/83 (98%)	67 (83%)	14 (17%)	2	7
26	EC	66/67 (98%)	60 (91%)	6 (9%)	9	32
26	Z	66/67 (98%)	59 (89%)	7 (11%)	6	24
27	AA	52/52 (100%)	38 (73%)	14 (27%)	0	1
27	FC	52/52 (100%)	37 (71%)	15 (29%)	0	1
28	BA	59/63 (94%)	44 (75%)	15 (25%)	0	2
28	GC	59/63 (94%)	44 (75%)	15 (25%)	0	2
29	CA	51/52 (98%)	43 (84%)	8 (16%)	2	10
29	HC	51/52 (98%)	43 (84%)	8 (16%)	2	10
30	DA	51/52 (98%)	41 (80%)	10 (20%)	1	4

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
30	IC	51/52 (98%)	41 (80%)	10 (20%)	1	4
31	EA	41/42 (98%)	33 (80%)	8 (20%)	1	4
31	JC	41/42 (98%)	33 (80%)	8 (20%)	1	4
32	FA	54/55 (98%)	50 (93%)	4 (7%)	13	42
32	KC	54/55 (98%)	49 (91%)	5 (9%)	9	31
33	GA	34/34 (100%)	33 (97%)	1 (3%)	42	69
33	LC	34/34 (100%)	33 (97%)	1 (3%)	42	69
35	JA	85/305 (28%)	68 (80%)	17 (20%)	1	3
35	KA	50/305 (16%)	38 (76%)	12 (24%)	0	2
35	OC	85/305 (28%)	68 (80%)	17 (20%)	1	3
35	PC	50/305 (16%)	38 (76%)	12 (24%)	0	2
36	LA	202/220 (92%)	156 (77%)	46 (23%)	1	2
36	QC	202/220 (92%)	154 (76%)	48 (24%)	0	2
37	MA	160/188 (85%)	137 (86%)	23 (14%)	3	13
37	RC	160/188 (85%)	138 (86%)	22 (14%)	3	14
38	NA	180/181 (99%)	155 (86%)	25 (14%)	3	13
38	SC	180/181 (99%)	155 (86%)	25 (14%)	3	13
39	OA	116/123 (94%)	93 (80%)	23 (20%)	1	4
39	TC	116/123 (94%)	94 (81%)	22 (19%)	1	4
40	PA	90/90 (100%)	79 (88%)	11 (12%)	5	18
40	UC	90/90 (100%)	78 (87%)	12 (13%)	4	15
41	QA	126/127 (99%)	105 (83%)	21 (17%)	2	8
41	VC	126/127 (99%)	105 (83%)	21 (17%)	2	8
42	RA	119/119 (100%)	105 (88%)	14 (12%)	5	19
42	WC	119/119 (100%)	106 (89%)	13 (11%)	6	23
43	SA	98/99 (99%)	79 (81%)	19 (19%)	1	4
43	XC	98/99 (99%)	79 (81%)	19 (19%)	1	4
44	TA	88/92 (96%)	72 (82%)	16 (18%)	1	6
44	YC	88/92 (96%)	71 (81%)	17 (19%)	1	4
45	UA	88/99 (89%)	77 (88%)	11 (12%)	4	17
45	ZC	88/99 (89%)	77 (88%)	11 (12%)	4	17

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
46	AD	102/108 (94%)	84 (82%)	18 (18%)	2	6
46	VA	102/108 (94%)	84 (82%)	18 (18%)	2	6
47	BD	94/101 (93%)	74 (79%)	20 (21%)	1	3
47	WA	94/101 (93%)	74 (79%)	20 (21%)	1	3
48	CD	49/50 (98%)	42 (86%)	7 (14%)	3	13
48	XA	49/50 (98%)	42 (86%)	7 (14%)	3	13
49	DD	79/80 (99%)	62 (78%)	17 (22%)	1	3
49	YA	79/80 (99%)	62 (78%)	17 (22%)	1	3
50	ED	72/74 (97%)	60 (83%)	12 (17%)	2	8
50	ZA	72/74 (97%)	61 (85%)	11 (15%)	2	11
51	AB	94/97 (97%)	77 (82%)	17 (18%)	1	6
51	FD	94/97 (97%)	76 (81%)	18 (19%)	1	4
52	BB	61/77 (79%)	49 (80%)	12 (20%)	1	4
52	GD	61/77 (79%)	50 (82%)	11 (18%)	1	6
53	CB	72/80 (90%)	57 (79%)	15 (21%)	1	3
53	HD	72/80 (90%)	58 (81%)	14 (19%)	1	4
54	DB	76/82 (93%)	66 (87%)	10 (13%)	4	15
54	ID	76/82 (93%)	66 (87%)	10 (13%)	4	15
55	EB	19/22 (86%)	15 (79%)	4 (21%)	1	3
55	JD	19/22 (86%)	15 (79%)	4 (21%)	1	3
All	All	9972/11276 (88%)	8229 (82%)	1743 (18%)	2	7

5 of 1743 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	KB	160	TYR
16	UB	42	ASP
44	YC	96	ILE
7	LB	158	THR
6	KB	154	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 26 such sidechains are listed below:

Mol	Chain	Res	Type
12	QB	82	ASN
15	TB	24	GLN
45	ZC	22	HIS
12	QB	90	GLN
16	UB	16	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1502/1507 (99%)	347 (23%)	12 (0%)
1	FB	1502/1507 (99%)	343 (22%)	12 (0%)
2	B	2876/2880 (99%)	658 (22%)	22 (0%)
2	GB	2876/2880 (99%)	658 (22%)	22 (0%)
3	C	119/120 (99%)	19 (15%)	0
3	HB	119/120 (99%)	20 (16%)	0
34	HA	9/27 (33%)	3 (33%)	0
34	MC	9/27 (33%)	3 (33%)	0
4	D	76/77 (98%)	27 (35%)	0
4	IA	76/77 (98%)	20 (26%)	0
4	IB	76/77 (98%)	26 (34%)	0
4	NC	76/77 (98%)	19 (25%)	0
All	All	9316/9376 (99%)	2143 (23%)	68 (0%)

5 of 2143 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	13	U
1	A	22	G
1	A	26	A
1	A	31	G

5 of 68 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	GB	1558	A
2	GB	1939	5MU
2	GB	2439	A
2	B	1608	A
2	B	1558	A

## 5.4 Non-standard residues in protein, DNA, RNA chains

64 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
1	7MG	A	527	1	22,26,27	3.22	7 (31%)	29,39,42	2.05	8 (27%)
46	0TD	VA	92	46	7,9,10	1.79	1 (14%)	6,11,13	3.11	4 (66%)
2	PSU	GB	1911	2	18,21,22	1.54	3 (16%)	22,30,33	2.02	7 (31%)
2	5MU	B	1939	2	19,22,23	2.05	4 (21%)	28,32,35	2.58	8 (28%)
2	5MU	GB	1915	2	19,22,23	1.99	3 (15%)	28,32,35	2.16	8 (28%)
4	5MC	IB	32	4	18,22,23	1.61	3 (16%)	26,32,35	1.11	2 (7%)
2	2MU	B	2552	2	19,22,24	2.68	5 (26%)	26,31,36	2.18	7 (26%)
2	PSU	B	1911	2	18,21,22	1.32	1 (5%)	22,30,33	1.97	7 (31%)
1	2MG	FB	1207	1	18,26,27	2.34	4 (22%)	16,38,41	1.32	3 (18%)
1	5MC	A	1404	1	18,22,23	1.77	4 (22%)	26,32,35	1.24	5 (19%)
1	UR3	A	1498	1	19,22,23	1.77	1 (5%)	26,32,35	1.17	1 (3%)
2	PSU	B	1917	2	18,21,22	1.71	2 (11%)	22,30,33	1.68	4 (18%)
1	5MC	FB	967	1	18,22,23	1.59	4 (22%)	26,32,35	1.39	5 (19%)
4	4SU	IA	8	4	18,21,22	4.79	7 (38%)	26,30,33	5.73	10 (38%)
2	2MA	B	2503	2	17,25,26	1.34	2 (11%)	17,37,40	1.09	2 (11%)
4	5MU	IA	54	4	19,22,23	2.05	3 (15%)	28,32,35	2.02	6 (21%)
2	5MC	GB	1942	2	18,22,23	1.62	3 (16%)	26,32,35	1.58	3 (11%)
1	7MG	FB	527	1	22,26,27	3.36	7 (31%)	29,39,42	2.14	8 (27%)
1	PSU	FB	516	1	18,21,22	1.73	3 (16%)	22,30,33	1.31	3 (13%)
1	5MC	A	1400	1	18,22,23	1.58	3 (16%)	26,32,35	1.35	4 (15%)
4	5MC	NC	32	4	18,22,23	1.67	3 (16%)	26,32,35	1.08	2 (7%)
2	OMG	GB	2251	2	18,26,27	2.25	5 (27%)	19,38,41	1.60	6 (31%)
1	2MG	A	1207	1	18,26,27	2.40	4 (22%)	16,38,41	1.34	3 (18%)
4	PSU	IB	55	4	18,21,22	1.61	2 (11%)	22,30,33	1.62	4 (18%)
4	PSU	D	55	4	18,21,22	1.64	2 (11%)	22,30,33	1.64	4 (18%)
4	5MU	D	54	4	19,22,23	2.07	3 (15%)	28,32,35	2.09	7 (25%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	5MC	A	967	1	18,22,23	1.66	4 (22%)	26,32,35	1.42	4 (15%)
1	PSU	A	516	1	18,21,22	1.57	3 (16%)	22,30,33	1.34	2 (9%)
1	MA6	FB	1519	1	19,26,27	1.77	3 (15%)	18,38,41	1.42	2 (11%)
2	OMG	B	2251	2	18,26,27	2.21	3 (16%)	19,38,41	1.64	6 (31%)
4	PSU	IA	55	4	18,21,22	1.59	2 (11%)	22,30,33	1.74	4 (18%)
1	5MC	FB	1407	1	18,22,23	1.74	3 (16%)	26,32,35	1.11	3 (11%)
1	UR3	FB	1498	1	19,22,23	1.78	1 (5%)	26,32,35	1.26	2 (7%)
1	M2G	FB	966	1	20,27,28	2.49	5 (25%)	22,40,43	1.25	4 (18%)
1	4OC	A	1402	1	20,23,24	1.08	2 (10%)	26,32,35	1.21	2 (7%)
1	5MC	FB	1400	1	18,22,23	1.57	4 (22%)	26,32,35	1.17	2 (7%)
2	4OC	B	1920	2,56	19,22,24	1.17	1 (5%)	26,31,35	1.51	2 (7%)
2	4OC	GB	1920	2	19,22,24	1.10	1 (5%)	26,31,35	1.42	1 (3%)
46	0TD	AD	92	46	7,9,10	1.75	1 (14%)	6,11,13	3.07	4 (66%)
1	5MC	A	1407	1	18,22,23	1.72	3 (16%)	26,32,35	1.18	3 (11%)
1	5MC	FB	1404	1	18,22,23	1.53	3 (16%)	26,32,35	1.13	2 (7%)
2	5MU	B	1915	2	19,22,23	2.00	3 (15%)	28,32,35	2.27	9 (32%)
1	4OC	FB	1402	1	20,23,24	1.03	2 (10%)	26,32,35	1.29	2 (7%)
1	MA6	FB	1518	1	19,26,27	1.56	3 (15%)	18,38,41	1.47	2 (11%)
2	5MU	GB	1939	2	19,22,23	2.22	4 (21%)	28,32,35	2.40	8 (28%)
2	2MU	GB	2552	2	19,22,24	2.52	5 (26%)	26,31,36	2.18	7 (26%)
2	5MC	GB	1962	2	18,22,23	1.71	4 (22%)	26,32,35	1.38	2 (7%)
1	MA6	A	1519	1	19,26,27	1.43	3 (15%)	18,38,41	1.37	1 (5%)
2	PSU	GB	2605	2	18,21,22	1.68	3 (16%)	22,30,33	2.17	6 (27%)
4	5MC	IA	32	4	18,22,23	1.68	3 (16%)	26,32,35	0.98	2 (7%)
4	4SU	NC	8	4	18,21,22	4.52	7 (38%)	26,30,33	6.05	10 (38%)
4	5MU	NC	54	4	19,22,23	2.07	3 (15%)	28,32,35	2.00	7 (25%)
4	PSU	NC	55	4	18,21,22	1.66	2 (11%)	22,30,33	1.69	4 (18%)
1	M2G	A	966	1	20,27,28	2.51	3 (15%)	22,40,43	1.33	4 (18%)
4	5MU	IB	54	4	19,22,23	2.04	3 (15%)	28,32,35	2.09	7 (25%)
4	4SU	IB	8	4	18,21,22	4.45	7 (38%)	26,30,33	5.76	11 (42%)
4	5MC	D	32	4	18,22,23	1.64	3 (16%)	26,32,35	1.11	2 (7%)
1	MA6	A	1518	1	19,26,27	1.66	3 (15%)	18,38,41	1.40	3 (16%)
4	4SU	D	8	4	18,21,22	4.58	7 (38%)	26,30,33	5.78	10 (38%)
2	5MC	B	1942	2	18,22,23	1.68	3 (16%)	26,32,35	1.42	3 (11%)
2	PSU	GB	1917	2	18,21,22	1.75	2 (11%)	22,30,33	1.70	4 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	5MC	B	1962	2	18,22,23	1.79	4 (22%)	26,32,35	1.46	3 (11%)
2	PSU	B	2605	2	18,21,22	1.48	2 (11%)	22,30,33	1.98	5 (22%)
2	2MA	GB	2503	2	17,25,26	1.34	2 (11%)	17,37,40	1.09	2 (11%)

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
1	7MG	A	527	1	-	2/7/37/38	0/3/3/3
46	0TD	VA	92	46	-	4/7/12/14	-
2	PSU	GB	1911	2	-	0/7/25/26	0/2/2/2
2	5MU	B	1939	2	-	1/7/25/26	0/2/2/2
2	5MU	GB	1915	2	-	0/7/25/26	0/2/2/2
4	5MC	IB	32	4	-	0/7/25/26	0/2/2/2
2	2MU	B	2552	2	-	1/9/27/28	0/2/2/2
2	PSU	B	1911	2	-	0/7/25/26	0/2/2/2
1	2MG	FB	1207	1	-	0/5/27/28	0/3/3/3
1	5MC	A	1404	1	-	0/7/25/26	0/2/2/2
1	UR3	A	1498	1	-	2/7/25/26	0/2/2/2
2	PSU	B	1917	2	-	0/7/25/26	0/2/2/2
1	5MC	FB	967	1	-	0/7/25/26	0/2/2/2
4	4SU	IA	8	4	-	2/7/25/26	0/2/2/2
2	2MA	B	2503	2	-	2/3/25/26	0/3/3/3
4	5MU	IA	54	4	-	0/7/25/26	0/2/2/2
2	5MC	GB	1942	2	-	0/7/25/26	0/2/2/2
1	7MG	FB	527	1	-	2/7/37/38	0/3/3/3
1	PSU	FB	516	1	-	0/7/25/26	0/2/2/2
1	5MC	A	1400	1	-	0/7/25/26	0/2/2/2
4	5MC	NC	32	4	-	0/7/25/26	0/2/2/2
2	OMG	GB	2251	2	-	3/5/27/28	0/3/3/3
1	2MG	A	1207	1	-	0/5/27/28	0/3/3/3
4	PSU	IB	55	4	-	1/7/25/26	0/2/2/2
4	PSU	D	55	4	-	1/7/25/26	0/2/2/2
4	5MU	D	54	4	-	0/7/25/26	0/2/2/2
1	5MC	A	967	1	-	0/7/25/26	0/2/2/2
1	PSU	A	516	1	-	0/7/25/26	0/2/2/2
1	MA6	FB	1519	1	-	4/7/29/30	0/3/3/3
2	OMG	B	2251	2	-	3/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PSU	IA	55	4	-	2/7/25/26	0/2/2/2
1	5MC	FB	1407	1	-	0/7/25/26	0/2/2/2
1	UR3	FB	1498	1	-	2/7/25/26	0/2/2/2
1	M2G	FB	966	1	-	0/7/29/30	0/3/3/3
1	4OC	A	1402	1	-	1/9/29/30	0/2/2/2
1	5MC	FB	1400	1	-	0/7/25/26	0/2/2/2
2	4OC	B	1920	2,56	-	1/9/27/30	0/2/2/2
2	4OC	GB	1920	2	-	1/9/27/30	0/2/2/2
46	0TD	AD	92	46	-	2/7/12/14	-
1	5MC	A	1407	1	-	0/7/25/26	0/2/2/2
1	5MC	FB	1404	1	-	0/7/25/26	0/2/2/2
2	5MU	B	1915	2	-	0/7/25/26	0/2/2/2
1	4OC	FB	1402	1	-	2/9/29/30	0/2/2/2
1	MA6	FB	1518	1	-	3/7/29/30	0/3/3/3
2	5MU	GB	1939	2	-	0/7/25/26	0/2/2/2
2	2MU	GB	2552	2	-	1/9/27/28	0/2/2/2
2	5MC	GB	1962	2	-	2/7/25/26	0/2/2/2
1	MA6	A	1519	1	-	4/7/29/30	0/3/3/3
2	PSU	GB	2605	2	-	0/7/25/26	0/2/2/2
4	5MC	IA	32	4	-	0/7/25/26	0/2/2/2
4	4SU	NC	8	4	-	2/7/25/26	0/2/2/2
4	5MU	NC	54	4	-	0/7/25/26	0/2/2/2
4	PSU	NC	55	4	-	1/7/25/26	0/2/2/2
1	M2G	A	966	1	-	0/7/29/30	0/3/3/3
4	5MU	IB	54	4	-	0/7/25/26	0/2/2/2
4	4SU	IB	8	4	-	1/7/25/26	0/2/2/2
4	5MC	D	32	4	-	0/7/25/26	0/2/2/2
1	MA6	A	1518	1	-	3/7/29/30	0/3/3/3
4	4SU	D	8	4	-	1/7/25/26	0/2/2/2
2	5MC	B	1942	2	-	0/7/25/26	0/2/2/2
2	PSU	GB	1917	2	-	1/7/25/26	0/2/2/2
2	5MC	B	1962	2	-	2/7/25/26	0/2/2/2
2	PSU	B	2605	2	-	0/7/25/26	0/2/2/2
2	2MA	GB	2503	2	-	2/3/25/26	0/3/3/3

The worst 5 of 209 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	IA	8	4SU	C4-N3	12.96	1.51	1.37
4	D	8	4SU	C4-N3	12.04	1.50	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	NC	8	4SU	C4-N3	11.76	1.50	1.37
4	IA	8	4SU	O2-C2	11.39	1.43	1.23
4	D	8	4SU	O2-C2	11.38	1.43	1.23

The worst 5 of 288 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	IB	8	4SU	S4-C4-N3	-16.20	104.25	120.21
4	NC	8	4SU	C4-N3-C2	-14.89	112.88	127.34
4	IA	8	4SU	C4-N3-C2	-14.28	113.47	127.34
4	D	8	4SU	C4-N3-C2	-13.64	114.09	127.34
4	D	8	4SU	S4-C4-N3	-13.13	107.28	120.21

There are no chirality outliers.

5 of 62 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1402	4OC	C1'-C2'-O2'-CM2
1	A	1498	UR3	O4'-C4'-C5'-O5'
1	A	1498	UR3	C3'-C4'-C5'-O5'
1	A	1518	MA6	C5-C6-N6-C9
1	A	1518	MA6	C5-C6-N6-C10

There are no ring outliers.

43 monomers are involved in 78 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	527	7MG	1	0
46	VA	92	0TD	1	0
2	B	1939	5MU	1	0
2	GB	1915	5MU	1	0
2	B	2552	2MU	1	0
1	FB	1207	2MG	3	0
1	A	1498	UR3	2	0
1	FB	967	5MC	4	0
2	B	2503	2MA	3	0
4	IA	54	5MU	4	0
2	GB	1942	5MC	1	0
1	FB	527	7MG	1	0
4	NC	32	5MC	2	0
2	GB	2251	OMG	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	1207	2MG	3	0
1	A	967	5MC	4	0
1	FB	1519	MA6	1	0
2	B	2251	OMG	3	0
4	IA	55	PSU	1	0
1	FB	1407	5MC	1	0
1	FB	1498	UR3	3	0
1	FB	966	M2G	1	0
1	A	1402	4OC	1	0
2	B	1920	4OC	4	0
2	GB	1920	4OC	1	0
46	AD	92	0TD	1	0
1	A	1407	5MC	1	0
2	B	1915	5MU	1	0
1	FB	1402	4OC	2	0
1	FB	1518	MA6	1	0
2	GB	1939	5MU	2	0
2	GB	1962	5MC	1	0
1	A	1519	MA6	1	0
4	IA	32	5MC	3	0
4	NC	54	5MU	4	0
4	NC	55	PSU	1	0
1	A	966	M2G	2	0
4	IB	8	4SU	2	0
1	A	1518	MA6	1	0
4	D	8	4SU	3	0
2	GB	1917	PSU	2	0
2	B	1962	5MC	1	0
2	GB	2503	2MA	3	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 1440 ligands modelled in this entry, 1438 are monoatomic - leaving 2 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
57	BLS	B	9001	-	28,31,31	3.12	10 (35%)	28,43,43	2.77	11 (39%)
57	BLS	GB	9001	-	28,31,31	3.12	10 (35%)	28,43,43	2.35	9 (32%)

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
57	BLS	B	9001	-	-	7/21/38/38	0/2/2/2
57	BLS	GB	9001	-	-	7/21/38/38	0/2/2/2

The worst 5 of 20 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
57	B	9001	BLS	C14-N12	8.87	1.54	1.35
57	GB	9001	BLS	C14-N12	8.44	1.53	1.35
57	GB	9001	BLS	C7-N6	7.66	1.50	1.34
57	B	9001	BLS	C7-N6	6.79	1.48	1.34
57	B	9001	BLS	C11-N12	5.07	1.57	1.47

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
57	B	9001	BLS	C1'-C2'-C3'	-8.94	110.80	122.52
57	GB	9001	BLS	C1'-C2'-C3'	-7.21	113.08	122.52
57	B	9001	BLS	C10-C11-N12	5.48	120.97	112.15
57	GB	9001	BLS	C10-C11-N12	5.44	120.91	112.15
57	B	9001	BLS	C4-N3-C2	3.95	120.34	116.34

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
57	B	9001	BLS	C11-C10-C9-C8
57	B	9001	BLS	C11-C10-C9-N9
57	B	9001	BLS	C10-C11-N12-C13

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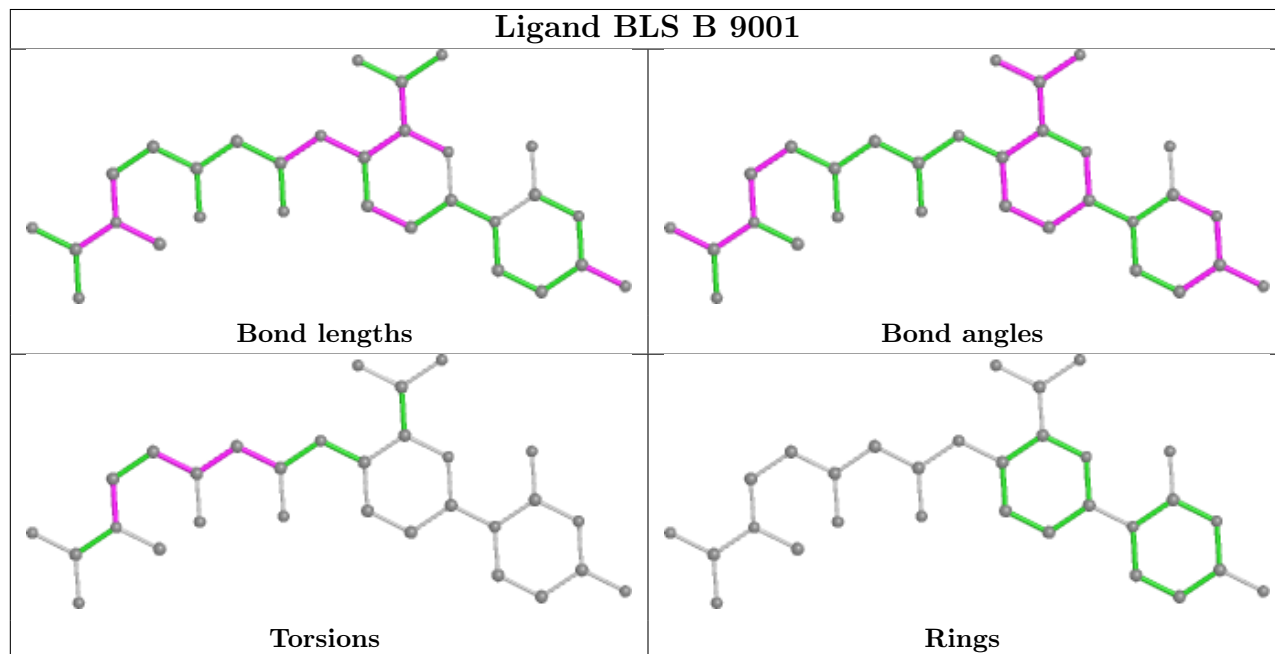
Mol	Chain	Res	Type	Atoms
57	B	9001	BLS	C10-C11-N12-C14
57	GB	9001	BLS	C11-C10-C9-C8

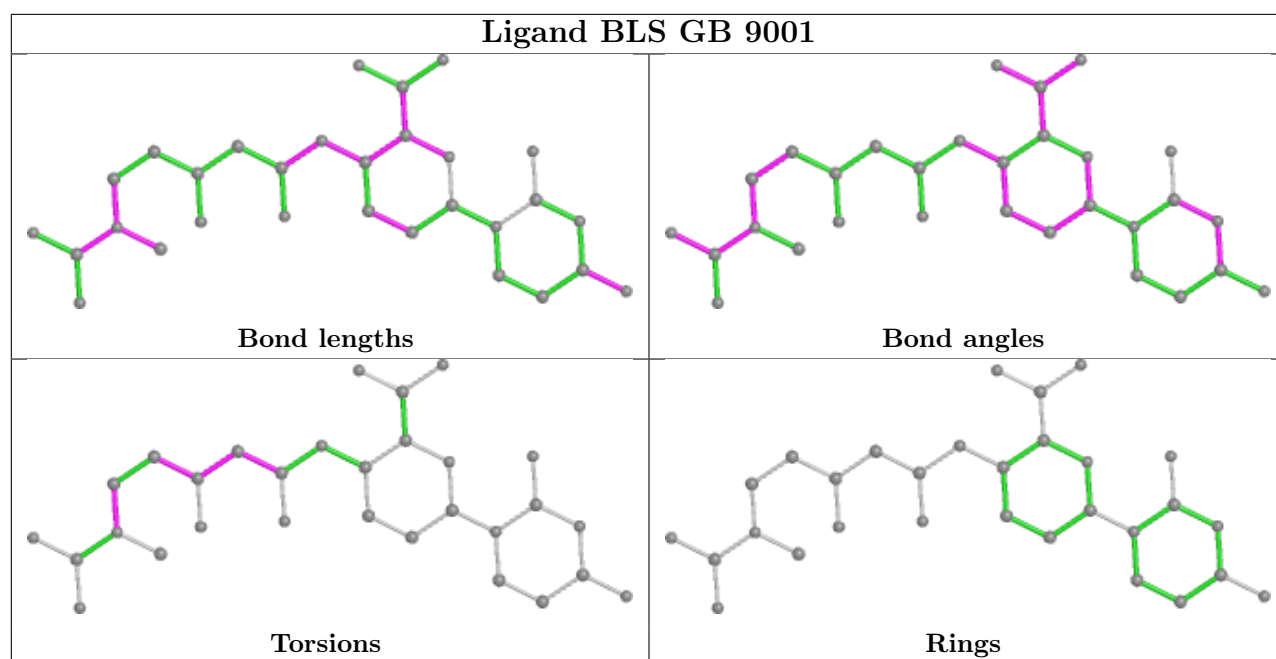
There are no ring outliers.

2 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
57	B	9001	BLS	4	0
57	GB	9001	BLS	7	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](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

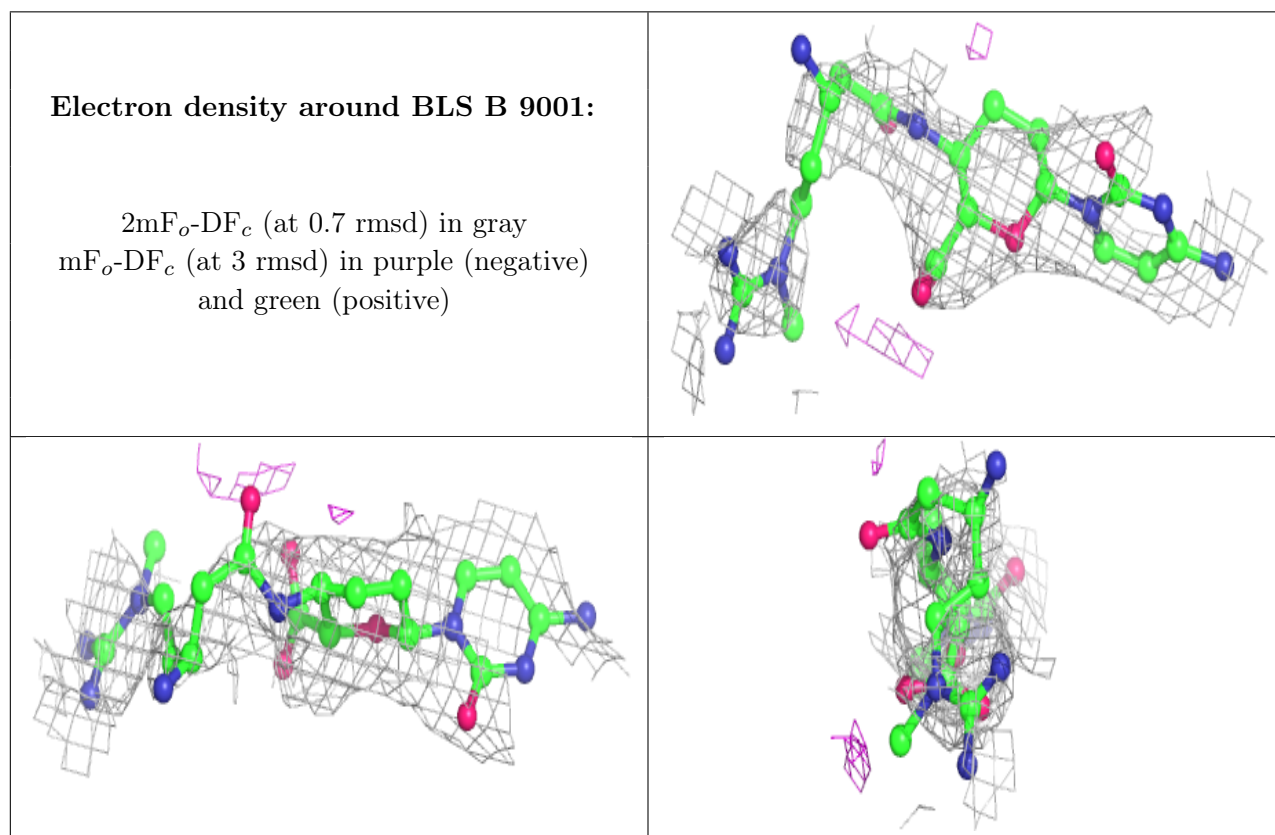
### 6.3 Carbohydrates [i](#)

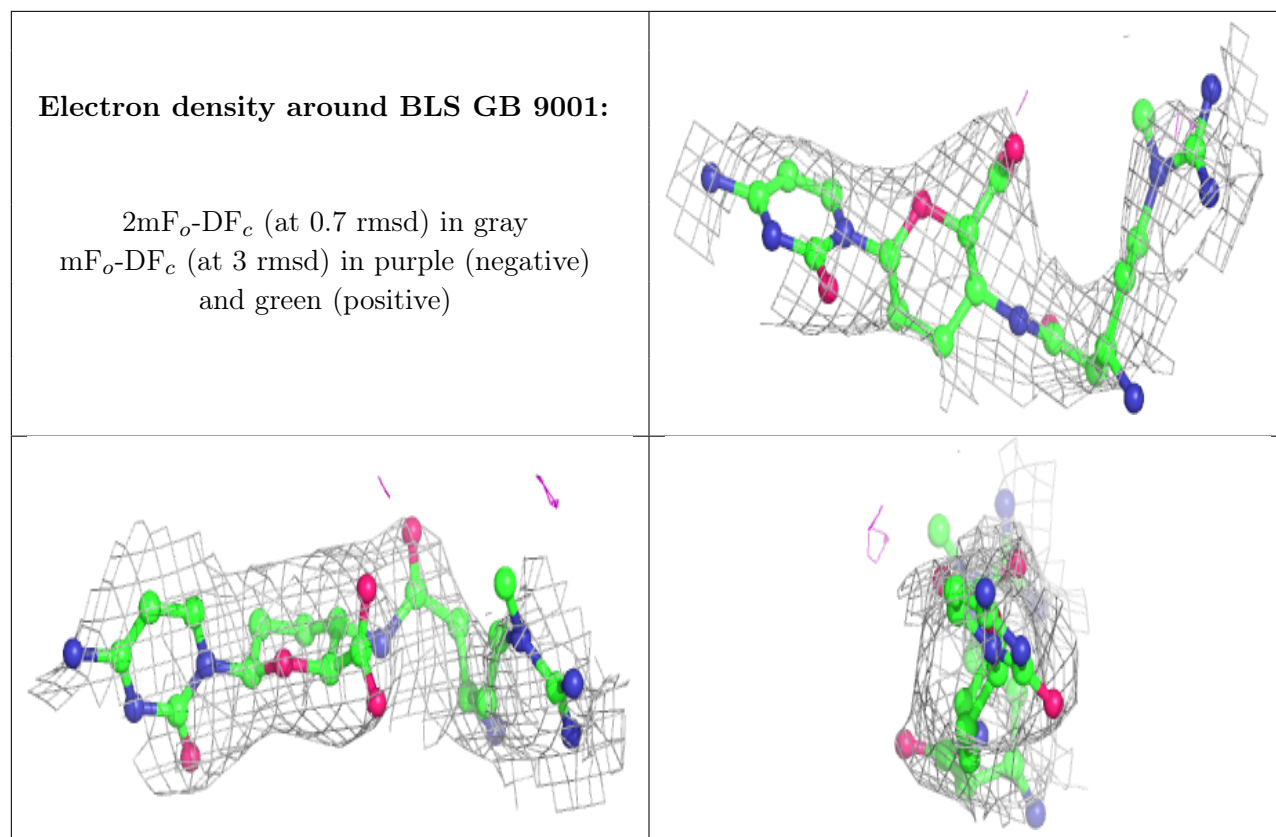
Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.4 Ligands [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

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





## 6.5 Other polymers [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.