



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 5, 2023 – 03:39 PM EDT

PDB ID : 6OTR  
Title : Dimeric E.coli YoeB bound to Thermus thermophilus 70S post-cleavage (AAU)  
Authors : Pavelich, I.P.; Hoffer, E.D.; Maehigashi, T.; Dunham, C.M.  
Deposited on : 2019-05-03  
Resolution : 3.12 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

<https://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 : **FAILED**  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

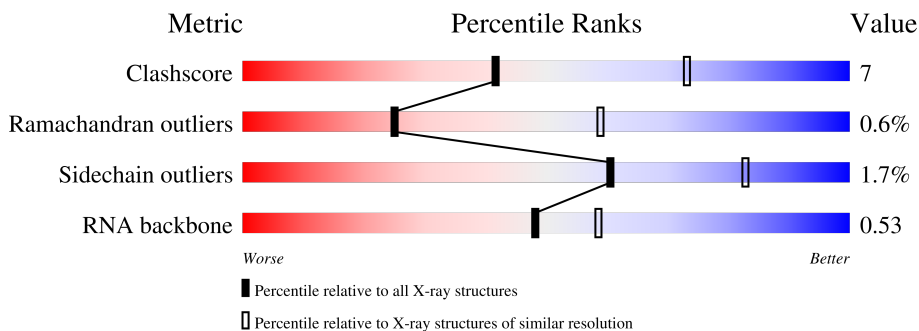
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.12 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1389 (3.14-3.10)
Ramachandran outliers	138981	1337 (3.14-3.10)
Sidechain outliers	138945	1337 (3.14-3.10)
RNA backbone	3102	1134 (3.44-2.80)











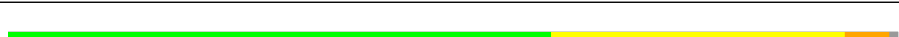


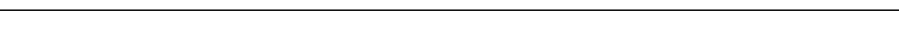
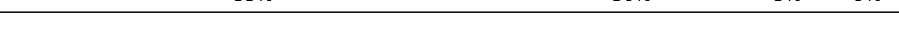
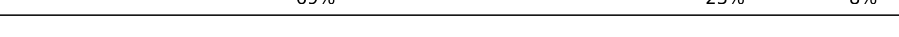



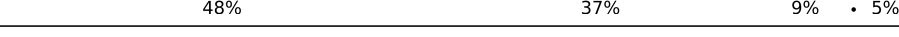





The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ .

Note EDS failed to run properly.

Mol	Chain	Length	Quality of chain
1	QA	1521	
1	XA	1521	
2	QB	256	
2	XB	256	
3	QC	239	
3	XC	239	













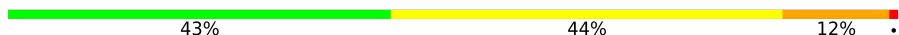


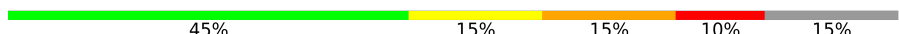
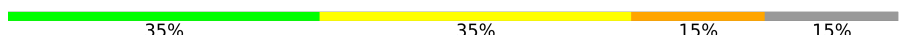








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Mol	Chain	Length	Quality of chain
4	QD	209	 77% 22%
4	XD	209	 73% 25%
5	QE	162	 68% 23% 7%
5	XE	162	 77% 17% 7%
6	QF	101	 87% 12%
6	XF	101	 79% 21%
7	QG	156	 70% 27% ...
7	XG	156	 74% 22% ..
8	QH	138	 68% 29% ..
8	XH	138	 80% 20%
9	QI	128	 61% 33% 5%
9	XI	128	 69% 27% ..
10	QJ	105	 47% 39% 9% 6%
10	XJ	105	 55% 30% 5% 9%
11	QK	129	 69% 23% 8%
11	XK	129	 71% 19% 10%
12	QL	132	 75% 18% 5%
12	XL	132	 65% 20% 6% 8%
13	QM	126	 48% 37% 9% 5%
13	XM	126	 60% 33% 6%
14	QN	61	 82% 13% ...
14	XN	61	 72% 26%
15	QO	89	 83% 16%
15	XO	89	 74% 19% ..
16	QP	88	 82% 14% 5%









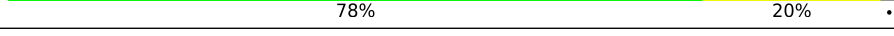

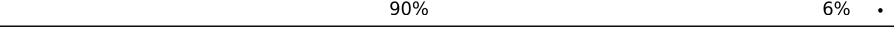
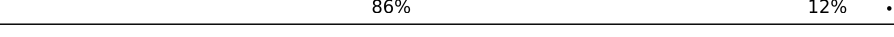

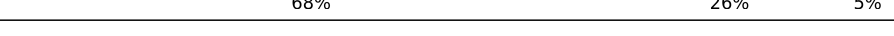


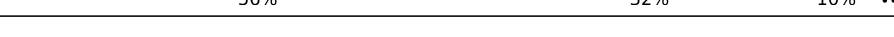

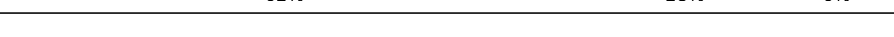






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Mol	Chain	Length	Quality of chain
16	XP	88	 75% 20% 5%
17	QQ	105	 78% 17% 5%
17	XQ	105	 73% 22% 5%
18	QR	88	 68% 10% 20%
18	XR	88	 60% 18% 20%
19	QS	93	 55% 30% 11%
19	XS	93	 70% 18% 11%
20	QT	106	 83% 9% 7%
20	XT	106	 56% 35% 7%
21	QU	27	 63% 30% 7%
21	XU	27	 74% 15% 7%
22	QV	77	 62% 34% 4%
22	QW	77	 43% 44% 12%
22	XV	77	 66% 27% 5%
22	XW	77	 45% 43% 9%
23	QX	20	 45% 15% 15% 10% 15%
23	XX	20	 35% 35% 15% 15%
24	QY	84	 73% 26% 1%
24	QZ	84	 43% 54% 3%
24	XY	84	 67% 32% 1%
24	XZ	84	 64% 30% 6%
25	R0	85	 66% 27% 5%
25	Y0	85	 74% 21% 5%
26	R1	98	 65% 32% 3%
26	Y1	98	 83% 16% 1%









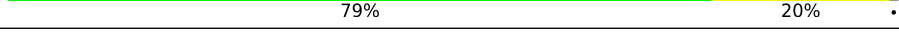

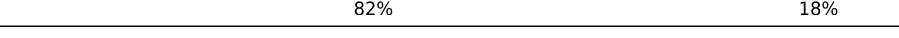
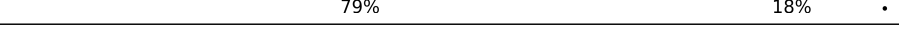

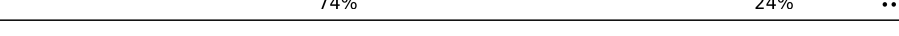


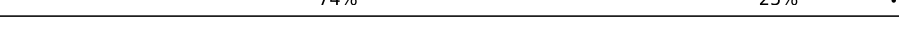

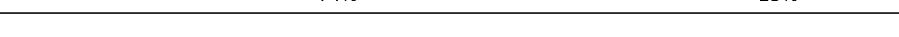






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Mol	Chain	Length	Quality of chain
27	R2	72	 76% 15% . .
27	Y2	72	 64% 25% 6% . .
28	R3	60	 70% 28% .
28	Y3	60	 82% 17% .
29	R4	71	 51% 34% 11% . .
29	Y4	71	 59% 30% 7% . .
30	R5	60	 75% 22% . .
30	Y5	60	 88% 8% . .
31	R6	54	 78% 20% .
31	Y6	54	 83% 15% .
32	R7	49	 90% 6% .
32	Y7	49	 86% 12% .
33	R8	65	 72% 25% . .
33	Y8	65	 68% 26% 5% .
34	R9	37	 51% 35% 11% .
34	Y9	37	 70% 30%
35	RA	2915	 56% 32% 10% . .
35	YA	2915	 57% 30% 10% . .
36	RB	124	 62% 28% 6% . .
36	YB	124	 65% 24% 8% . .
37	RD	276	 70% 26% . .
37	YD	276	 86% 13% .
38	RE	206	 68% 27% .
38	YE	206	 71% 26% . .
39	RF	210	 77% 19% . .








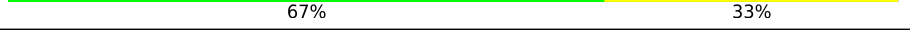
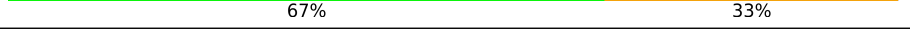
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Mol	Chain	Length	Quality of chain
39	YF	210	 76% 19% ..
40	RG	182	 56% 40% ..
40	YG	182	 66% 29% ..
41	RH	180	 51% 35% 9% ..
41	YH	180	 73% 20% ...
42	RI	148	 53% 36% 6% ..
42	YI	148	 68% 25% 5% ..
43	RN	140	 73% 24% ..
43	YN	140	 79% 20% .
44	RO	122	 79% 20% .
44	YO	122	 82% 18%
45	RP	150	 79% 18% ..
45	YP	150	 84% 14% .
46	RQ	141	 74% 24% ..
46	YQ	141	 80% 20%
47	RR	118	 83% 15% ..
47	YR	118	 74% 25% ..
48	RS	112	 66% 30% ..
48	YS	112	 74% 25% .
49	RT	146	 64% 26% 6% ..
49	YT	146	 61% 31% 6% .
50	RU	118	 89% 9% ..
50	YU	118	 72% 25% ...
51	RV	101	 73% 26% .
51	YV	101	 56% 41% .

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Mol	Chain	Length	Quality of chain
52	RW	113	 88% 12% .
52	YW	113	 89% 11%
53	RX	96	 79% 16% . .
53	YX	96	 88% 8% .
54	RY	110	 75% 21% . . .
54	YY	110	 78% 18% . .
55	RZ	206	 59% 25% . 11%
55	YZ	206	 55% 28% 5% 11%
56	ZA	3	 67% 33%
56	ZB	3	 67% 33%

## 2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 298517 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	QA	1510	Total 32452	C 14444	N 6009	O 10489	P 1510	0	0	0
1	XA	1507	Total 32389	C 14416	N 5999	O 10467	P 1507	0	0	0

- Molecule 2 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	QB	235	Total 1907	C 1217	N 342	O 343	S 5	0	0	0
2	XB	236	Total 1915	C 1223	N 343	O 344	S 5	0	0	0

- Molecule 3 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	QC	205	Total 1605	C 1011	N 313	O 280	S 1	0	0	0
3	XC	205	Total 1605	C 1011	N 313	O 280	S 1	0	0	0

- Molecule 4 is a protein called 30S ribosomal protein S4.

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

- Molecule 5 is a protein called 30S ribosomal protein S5.



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	QE	151	Total	C	N	O	S	0	0	0
			1155	729	218	204	4			
5	XE	151	Total	C	N	O	S	0	0	0
			1155	729	218	204	4			

- Molecule 6 is a protein called 30S ribosomal protein S6.

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

- Molecule 7 is a protein called 30S ribosomal protein S7.

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

- Molecule 8 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	QH	137	Total	C	N	O	S	0	0	0
			1108	700	214	192	2			
8	XH	137	Total	C	N	O	S	0	0	0
			1108	700	214	192	2			

- Molecule 9 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
9	QI	127	Total	C	N	O	0	0	0
			1010	639	197	174			
9	XI	126	Total	C	N	O	0	0	0
			998	633	193	172			

- Molecule 10 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	QJ	99	Total	C	N	O	S	0	0	0
			801	504	157	139	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	XJ	96	Total	C	N	O	S	0	0	0
			777	487	153	136	1			

- Molecule 11 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	QK	119	Total	C	N	O	S	0	0	0
			885	549	168	165	3			
11	XK	116	Total	C	N	O	S	0	0	0
			864	537	164	160	3			

- Molecule 12 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
12	QL	125	Total	C	N	O	S	0	0	0
			975	614	196	164	1			
12	XL	122	Total	C	N	O	S	0	0	0
			956	603	193	159	1			

- Molecule 13 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	QM	120	Total	C	N	O	S	0	0	0
			955	591	197	165	2			
13	XM	119	Total	C	N	O	S	0	0	0
			946	585	195	164	2			

- Molecule 14 is a protein called 30S ribosomal protein S14 type Z.

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

- Molecule 15 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
15	QO	88	Total	C	N	O	S	0	0	0
			734	459	147	126	2			
15	XO	87	Total	C	N	O	S	0	0	0
			729	457	146	124	2			

- Molecule 16 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
16	QP	84	Total	C	N	O	S	0	0	0
			705	446	140	118	1			
16	XP	84	Total	C	N	O	S	0	0	0
			705	446	140	118	1			

- Molecule 17 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
17	QQ	100	Total	C	N	O	S	0	0	0
			834	534	155	143	2			
17	XQ	100	Total	C	N	O	S	0	0	0
			834	534	155	143	2			

- Molecule 18 is a protein called 30S ribosomal protein S18.

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

- Molecule 19 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
19	QS	83	Total	C	N	O	S	0	0	0
			665	424	124	115	2			
19	XS	83	Total	C	N	O	S	0	0	0
			665	424	124	115	2			

- Molecule 20 is a protein called 30S ribosomal protein S20.

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

- Molecule 21 is a protein called 30S ribosomal protein Thx.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
21	QU	25	Total	C	N	O	0	0	0
			217	134	52	31			
21	XU	25	Total	C	N	O	0	0	0
			217	134	52	31			

- Molecule 22 is a RNA chain called tRNA-fMet.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
22	QV	77	Total	C	N	O	P	0	0	0
			1640	732	297	535	76			
22	QW	77	Total	C	N	O	P	0	0	0
			1640	732	297	535	76			
22	XV	77	Total	C	N	O	P	0	0	0
			1640	732	297	535	76			
22	XW	77	Total	C	N	O	P	0	0	0
			1640	732	297	535	76			

- Molecule 23 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	QX	17	Total	C	N	O	P	0	0	0
			370	167	77	110	16			
23	XX	17	Total	C	N	O	P	0	0	0
			370	167	77	110	16			

- Molecule 24 is a protein called Addiction module toxin, Txe/YoeB family.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
24	QY	84	Total	C	N	O	S	0	0	0
			723	464	126	131	2			
24	QZ	84	Total	C	N	O	S	0	0	0
			723	464	126	131	2			
24	XY	84	Total	C	N	O	S	0	0	0
			723	464	126	131	2			
24	XZ	84	Total	C	N	O	S	0	0	0
			723	464	126	131	2			

- Molecule 25 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
25	R0	81	Total	C	N	O	S	0	0	0
			643	398	137	107	1			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
25	Y0	82	Total	C	N	O	S	0	0	0
			648	401	138	108	1			

- Molecule 26 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	R1	97	Total	C	N	O	S	0	0	0
			763	481	150	131	1			
26	Y1	97	Total	C	N	O	S	0	0	0
			763	481	150	131	1			

- Molecule 27 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
27	R2	69	Total	C	N	O	S	0	0	0
			581	358	118	104	1			
27	Y2	69	Total	C	N	O	S	0	0	0
			581	358	118	104	1			

- Molecule 28 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
28	R3	59	Total	C	N	O	0	0	0
			469	298	90	81			
28	Y3	59	Total	C	N	O	0	0	0
			469	298	90	81			

- Molecule 29 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
29	R4	69	Total	C	N	O	S	0	0	0
			565	356	103	101	5			
29	Y4	69	Total	C	N	O	S	0	0	0
			565	356	103	101	5			

- Molecule 30 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
30	R5	59	Total	C	N	O	S	0	0	0
			459	288	90	76	5			
30	Y5	59	Total	C	N	O	S	0	0	0
			459	288	90	76	5			

- Molecule 31 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
31	R6	53	Total	C	N	O	S	0	0	0
			453	281	91	77	4			
31	Y6	53	Total	C	N	O	S	0	0	0
			453	281	91	77	4			

- Molecule 32 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
32	R7	47	Total	C	N	O	S	0	0	0
			409	251	102	54	2			
32	Y7	48	Total	C	N	O	S	0	0	0
			418	257	104	55	2			

- Molecule 33 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
33	R8	64	Total	C	N	O	S	0	0	0
			517	331	102	82	2			
33	Y8	64	Total	C	N	O	S	0	0	0
			517	331	102	82	2			

- Molecule 34 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
34	R9	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			
34	Y9	37	Total	C	N	O	S	0	0	0
			307	188	68	47	4			

- Molecule 35 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
35	RA	2891	Total	C	N	O	P	0	0	0
			62266	27713	11649	20014	2890			
35	YA	2878	Total	C	N	O	P	0	0	0
			61981	27587	11589	19928	2877			

- Molecule 36 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
36	RB	122	2617	1166	486	844	121	0	0	0
36	YB	122	2617	1166	486	844	121	0	0	0

- Molecule 37 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
37	RD	272	2115	1335	420	357	3	0	0	0
37	YD	274	2135	1347	426	359	3	0	0	0

- Molecule 38 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
38	RE	205	1568	991	300	271	6	0	0	0
38	YE	204	1563	988	299	270	6	0	0	0

- Molecule 39 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
39	RF	202	1585	1011	297	275	2	0	0	0
39	YF	202	1585	1011	297	275	2	0	0	0

- Molecule 40 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
40	RG	181	1474	942	268	260	4	0	0	0
40	YG	181	1474	942	268	260	4	0	0	0

- Molecule 41 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
41	RH	174	1336	848	251	236	1	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
41	YH	174	1336	848	251	236	1	0	0	0

- Molecule 42 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
42	RI	145	1131	723	200	207	1	0	0	0
42	YI	146	1136	726	201	208	1	0	0	0

- Molecule 43 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
43	RN	138	1104	712	206	182	4	0	0	0
43	YN	138	1104	712	206	182	4	0	0	0

- Molecule 44 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
44	RO	122	933	588	171	170	4	0	0	0
44	YO	122	933	588	171	170	4	0	0	0

- Molecule 45 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
45	RP	150	1145	712	232	198	3	0	0	0
45	YP	147	1122	698	229	192	3	0	0	0

- Molecule 46 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
46	RQ	139	1107	707	209	184	7	0	0	0
46	YQ	141	1122	715	212	188	7	0	0	0



- Molecule 47 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
47	RR	117	960	599	202	159	0	0	0
47	YR	117	960	599	202	159	0	0	0

- Molecule 48 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
48	RS	111	882	556	176	150	0	0	0
48	YS	111	882	556	176	150	0	0	0

- Molecule 49 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
49	RT	137	1141	710	234	196	1	0	0	0
49	YT	137	1141	710	234	196	1	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
50	RU	117	964	610	202	151	1	0	0	0
50	YU	117	964	610	202	151	1	0	0	0

- Molecule 51 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
51	RV	101	779	501	142	135	1	0	0	0
51	YV	101	779	501	142	135	1	0	0	0

- Molecule 52 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
52	RW	113	Total	C	N	O	S	0	0	0
			900	566	177	155	2			
52	YW	113	Total	C	N	O	S	0	0	0
			900	566	177	155	2			

- Molecule 53 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	RX	92	Total	C	N	O	S	0	0	0
			725	471	131	123				
53	YX	92	Total	C	N	O	S	0	0	0
			725	471	131	123				

- Molecule 54 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	RY	107	Total	C	N	O	S	0	0	0
			818	525	155	132	6			
54	YY	107	Total	C	N	O	S	0	0	0
			818	525	155	132	6			

- Molecule 55 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
55	RZ	183	Total	C	N	O	S	0	0	0
			1461	933	260	265	3			
55	YZ	183	Total	C	N	O	S	0	0	0
			1461	933	260	265	3			

- Molecule 56 is a RNA chain called CCPuro.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
56	ZA	3	Total	C	N	O	P	0	0	0
			74	40	13	19	2			
56	ZB	3	Total	C	N	O	P	0	0	0
			74	40	13	19	2			

- Molecule 57 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
57	QA	87	Total	Mg	0	0
			87	87		

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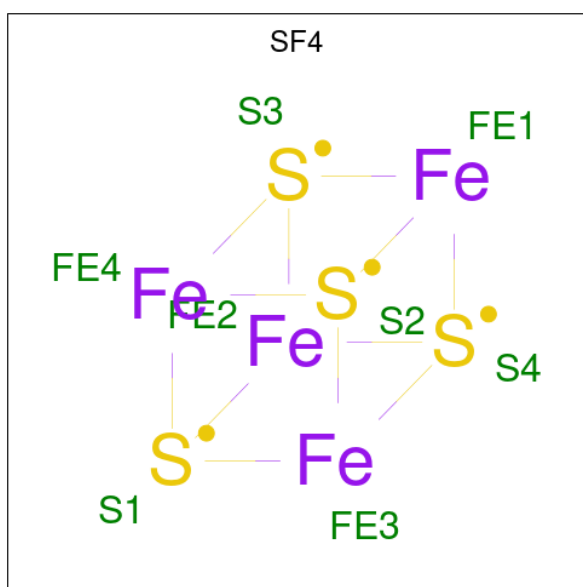
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
57	QE	1	Total 1	Mg 1	0	0
57	QV	3	Total 3	Mg 3	0	0
57	R0	2	Total 2	Mg 2	0	0
57	R5	1	Total 1	Mg 1	0	0
57	RA	305	Total 305	Mg 305	0	0
57	RB	3	Total 3	Mg 3	0	0
57	RD	1	Total 1	Mg 1	0	0
57	RE	2	Total 2	Mg 2	0	0
57	RN	1	Total 1	Mg 1	0	0
57	RO	1	Total 1	Mg 1	0	0
57	RP	1	Total 1	Mg 1	0	0
57	RQ	1	Total 1	Mg 1	0	0
57	RR	1	Total 1	Mg 1	0	0
57	XA	106	Total 106	Mg 106	0	0
57	XD	1	Total 1	Mg 1	0	0
57	XE	1	Total 1	Mg 1	0	0
57	XF	1	Total 1	Mg 1	0	0
57	XL	1	Total 1	Mg 1	0	0
57	XV	4	Total 4	Mg 4	0	0
57	Y5	1	Total 1	Mg 1	0	0
57	Y9	1	Total 1	Mg 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
57	YA	329	Total Mg 329 329	0	0
57	YB	6	Total Mg 6 6	0	0
57	YD	2	Total Mg 2 2	0	0
57	YE	4	Total Mg 4 4	0	0
57	YG	1	Total Mg 1 1	0	0
57	YO	1	Total Mg 1 1	0	0
57	YP	1	Total Mg 1 1	0	0
57	YQ	1	Total Mg 1 1	0	0
57	YR	1	Total Mg 1 1	0	0
57	YS	1	Total Mg 1 1	0	0
57	YV	1	Total Mg 1 1	0	0

- Molecule 58 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe<sub>4</sub>S<sub>4</sub>).

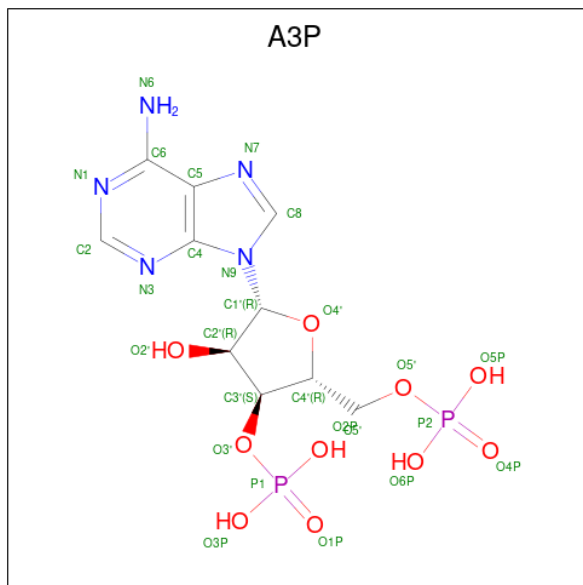


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
58	QD	1	Total	Fe	S	0	0
			8	4	4		
58	XD	1	Total	Fe	S	0	0
			8	4	4		

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
59	QN	1	Total	Zn	0	0
			1	1		
59	R6	1	Total	Zn	0	0
			1	1		
59	R9	1	Total	Zn	0	0
			1	1		
59	XN	1	Total	Zn	0	0
			1	1		
59	Y6	1	Total	Zn	0	0
			1	1		

- Molecule 60 is ADENOSINE-3'-5'-DIPHOSPHATE (three-letter code: A3P) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>10</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
60	QX	1	Total	C	N	O	P	0	0
			26	10	5	9	2		
60	XX	1	Total	C	N	O	P	0	0
			26	10	5	9	2		

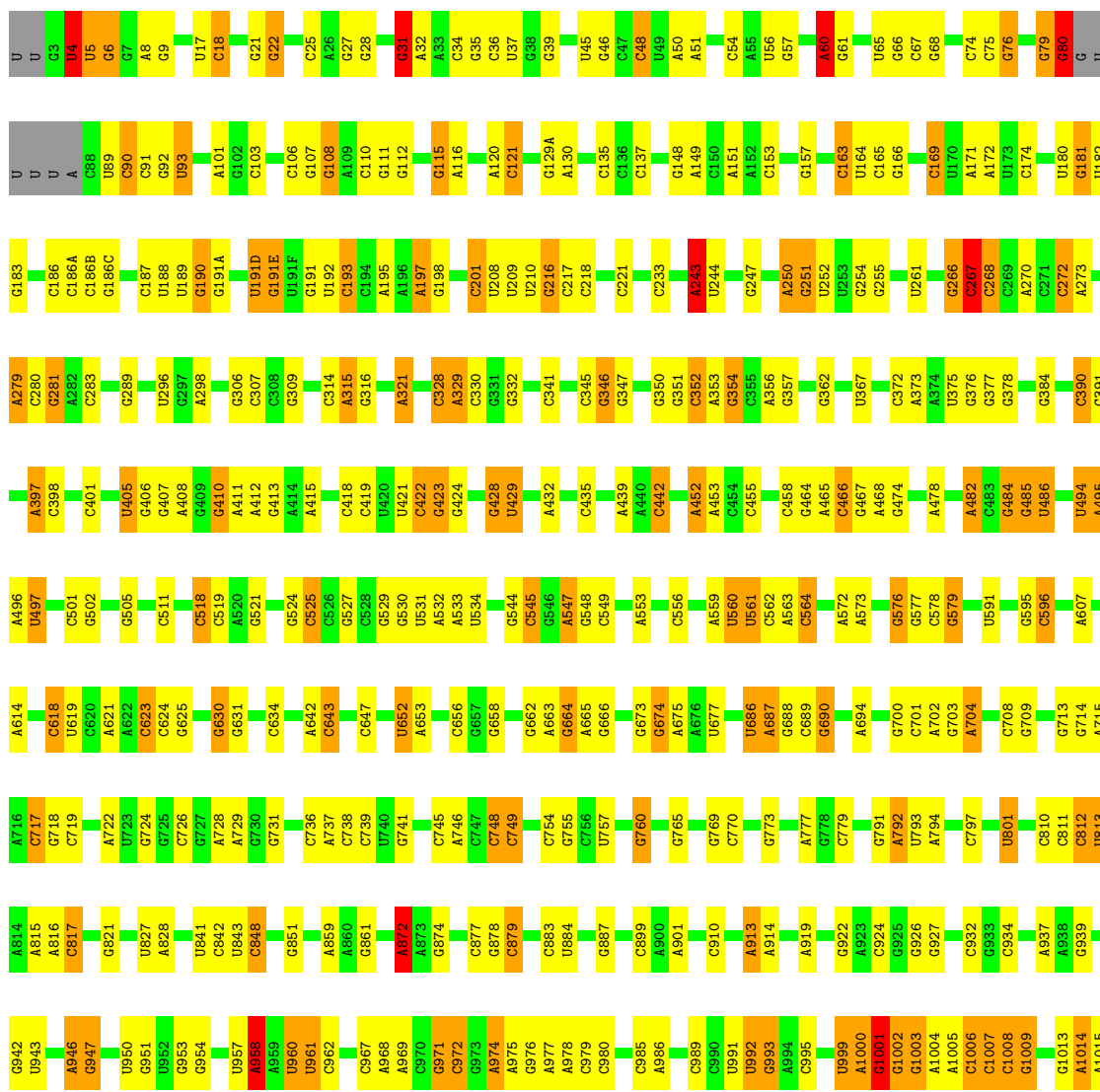
### 3 Residue-property plots [i](#)

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.

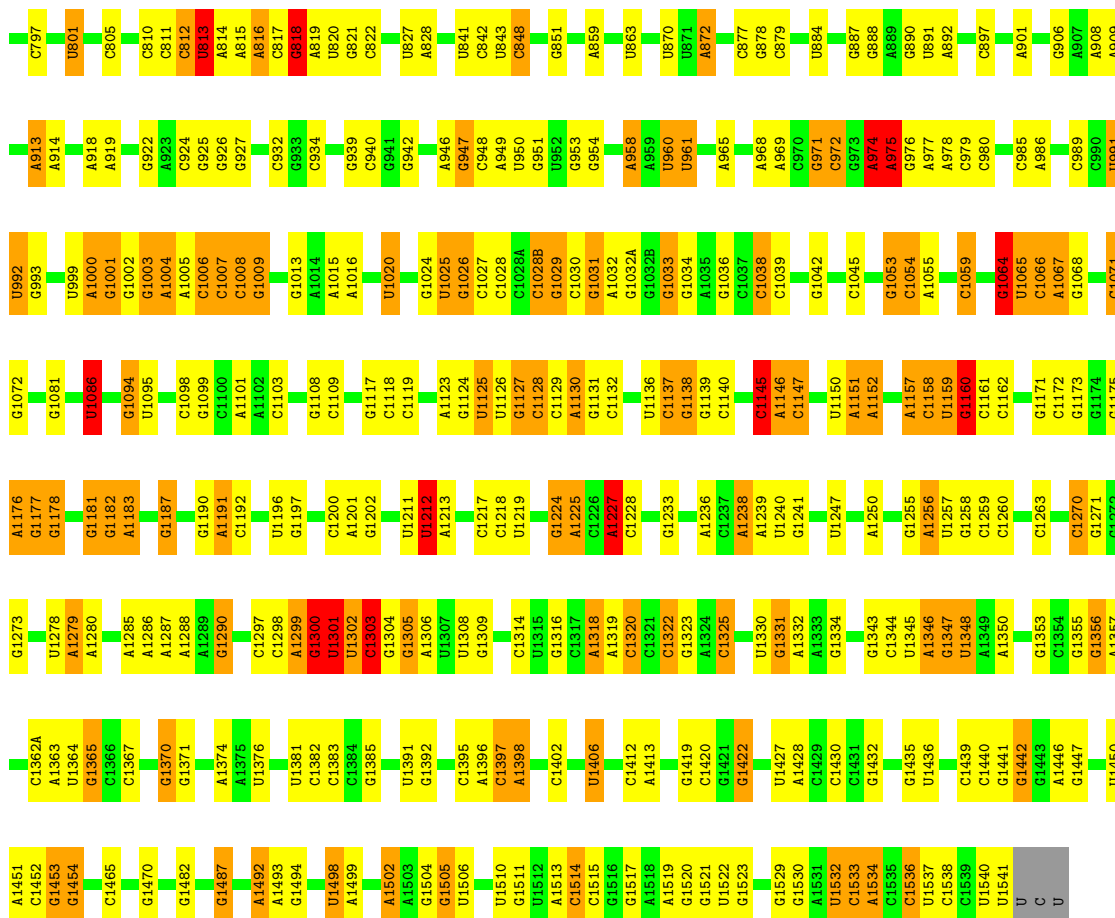
Note EDS failed to run properly.

- Molecule 1: 16S rRNA

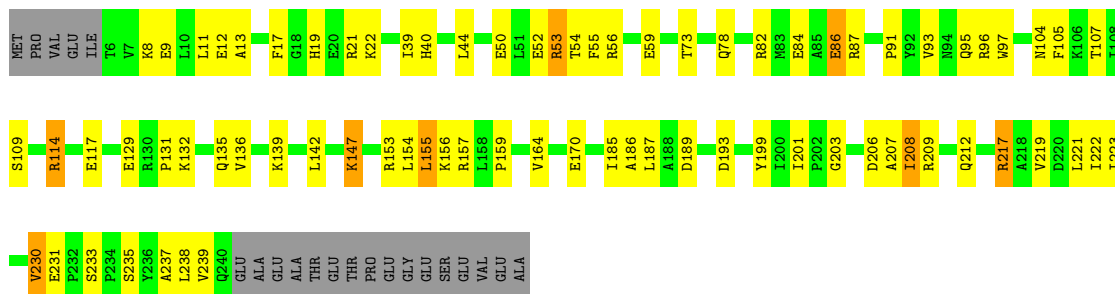
Chain QA:  57% 29% 11% ..



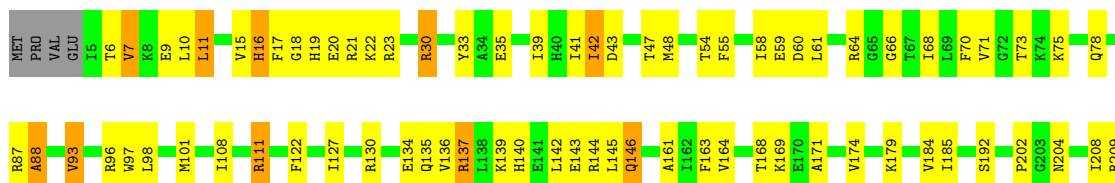




• Molecule 2: 30S ribosomal protein S2



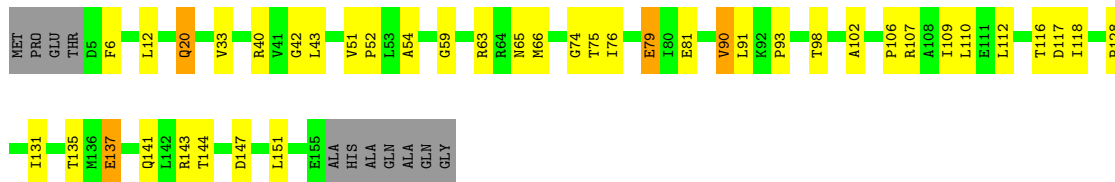
• Molecule 2: 30S ribosomal protein S2






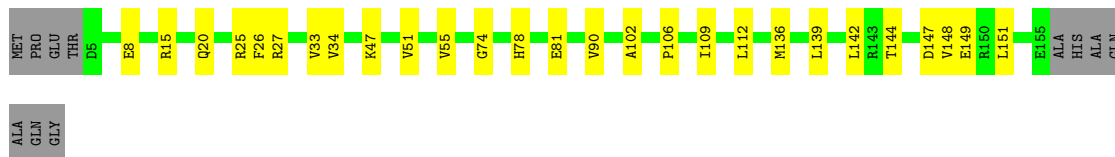


Chain QE:  68% 23% 7%




• Molecule 5: 30S ribosomal protein S5

Chain XE:  77% 17% 7%




• Molecule 6: 30S ribosomal protein S6

Chain QF:  87% 12%



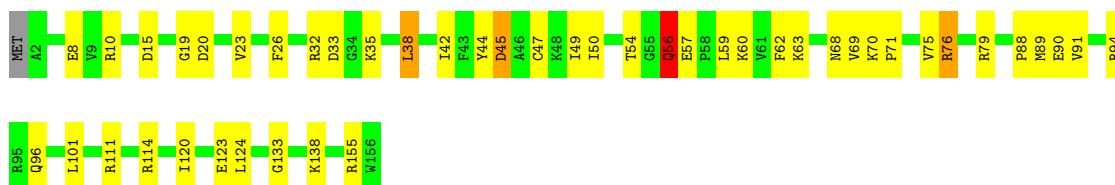
• Molecule 6: 30S ribosomal protein S6

Chain XF:  79% 21%




• Molecule 7: 30S ribosomal protein S7

Chain QG:  70% 27%



• Molecule 7: 30S ribosomal protein S7

Chain XG:  74% 22%





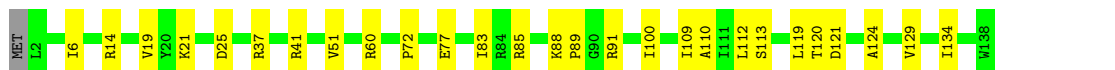
- Molecule 8: 30S ribosomal protein S8

Chain QH: 68% 29% ..



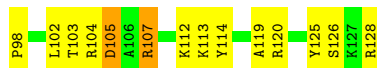
- Molecule 8: 30S ribosomal protein S8

Chain XH: 80% 20% .



- Molecule 9: 30S ribosomal protein S9

Chain QI: 61% 33% 5% .



- Molecule 9: 30S ribosomal protein S9

Chain XI: 69% 27% ..



- Molecule 10: 30S ribosomal protein S10

Chain QJ: 47% 39% 9% 6%



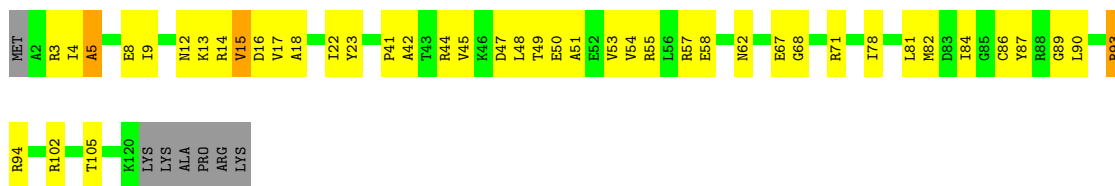


Chain QM:  48% 37% 9% 5%




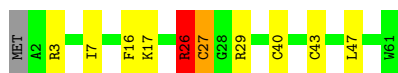
• Molecule 13: 30S ribosomal protein S13

Chain XM:  60% 33% 6%



• Molecule 14: 30S ribosomal protein S14 type Z

Chain QN:  82% 13% . . .




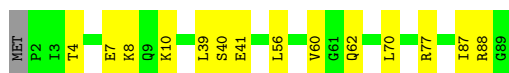
• Molecule 14: 30S ribosomal protein S14 type Z

Chain XN:  72% 26% .



• Molecule 15: 30S ribosomal protein S15

Chain QO:  83% 16% .




• Molecule 15: 30S ribosomal protein S15

Chain XO:  74% 19% . .

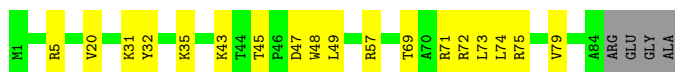
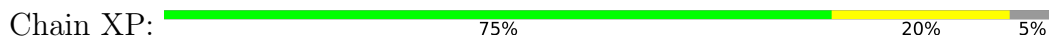


• Molecule 16: 30S ribosomal protein S16

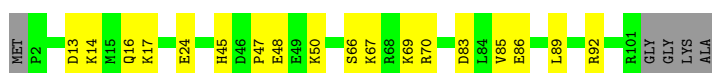
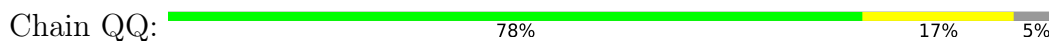
Chain QP:  82% 14% 5%



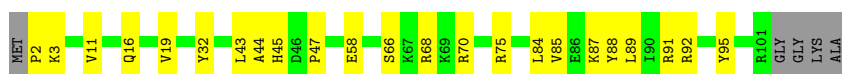
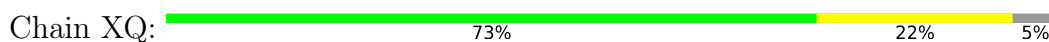
• Molecule 16: 30S ribosomal protein S16



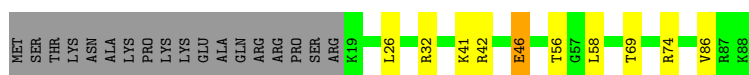
• Molecule 17: 30S ribosomal protein S17



• Molecule 17: 30S ribosomal protein S17



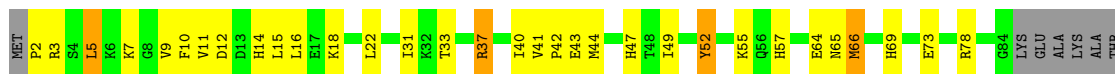
• Molecule 18: 30S ribosomal protein S18



• Molecule 18: 30S ribosomal protein S18

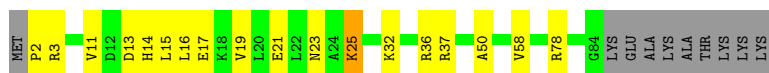


• Molecule 19: 30S ribosomal protein S19




• Molecule 19: 30S ribosomal protein S19

Chain XS:  70% 18% 11%



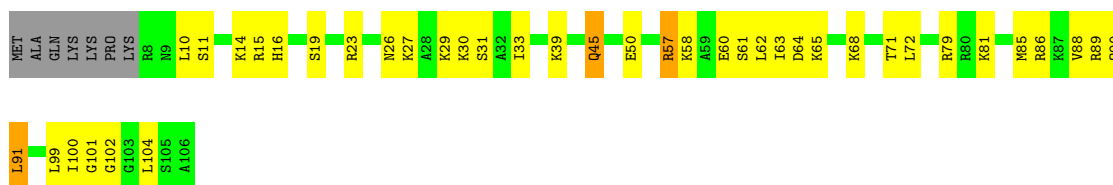
- Molecule 20: 30S ribosomal protein S20

Chain QT:  83% 9% 7%



- Molecule 20: 30S ribosomal protein S20

Chain XT:  56% 35% 7%




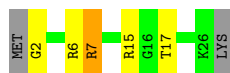
- Molecule 21: 30S ribosomal protein Thx

Chain QU:  63% 30% 7%



- Molecule 21: 30S ribosomal protein Thx

Chain XU:  74% 15% 7%



- Molecule 22: tRNA-fMet

Chain QV:  62% 34% 0%



- Molecule 22: tRNA-fMet

Chain QW:  43% 44% 12%



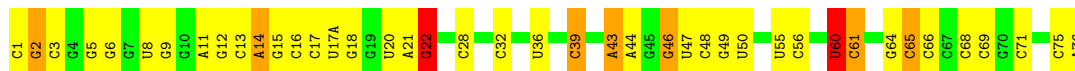
- Molecule 22: tRNA-fMet

Chain XV:  66% 27% 5%



- Molecule 22: tRNA-fMet

Chain XW:  45% 43% 9%




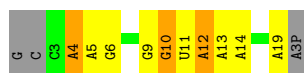
- Molecule 23: mRNA

Chain QX:  45% 15% 15% 10% 15%




- Molecule 23: mRNA

Chain XX:  35% 35% 15% 15%



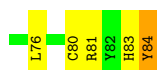
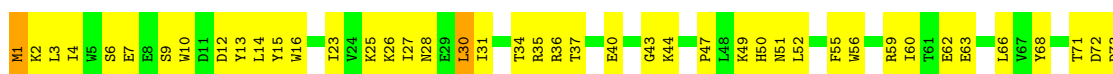
- Molecule 24: Addiction module toxin, Txe/YoeB family

Chain QY:  73% 26%



- Molecule 24: Addiction module toxin, Txe/YoeB family

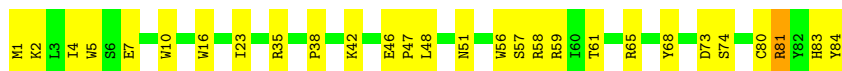
Chain QZ:  43% 54%



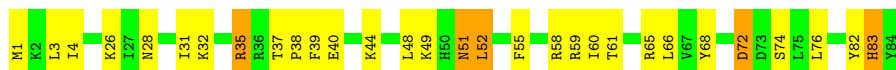
- Molecule 24: Addiction module toxin, Txe/YoeB family

Chain XY:  67% 32%

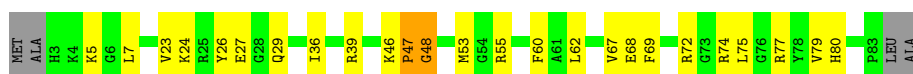




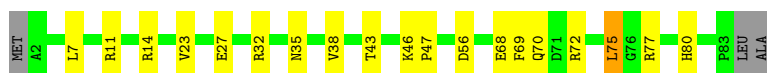
- Molecule 24: Addiction module toxin, Txe/YoeB family



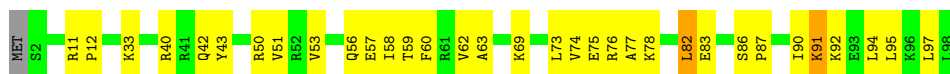
- Molecule 25: 50S ribosomal protein L27



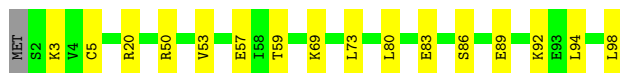
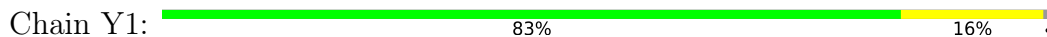
- Molecule 25: 50S ribosomal protein L27



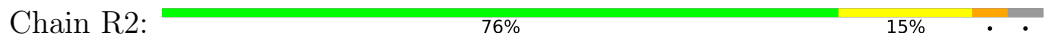
- Molecule 26: 50S ribosomal protein L28



- Molecule 26: 50S ribosomal protein L28



- Molecule 27: 50S ribosomal protein L29



- Molecule 27: 50S ribosomal protein L29

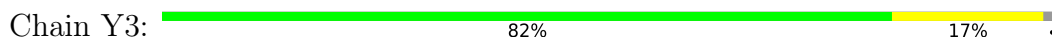




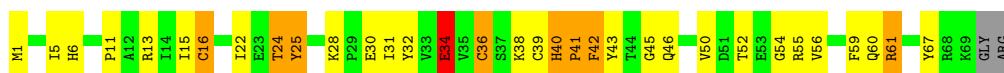
- Molecule 28: 50S ribosomal protein L30



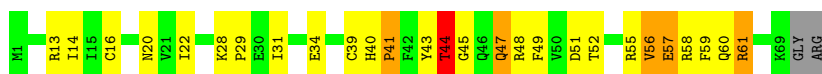
- Molecule 28: 50S ribosomal protein L30



- Molecule 29: 50S ribosomal protein L31



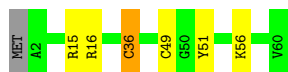
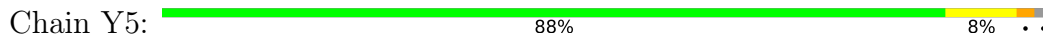
- Molecule 29: 50S ribosomal protein L31



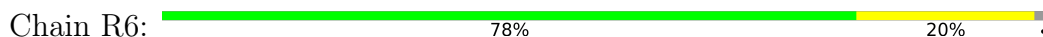
- Molecule 30: 50S ribosomal protein L32



- Molecule 30: 50S ribosomal protein L32

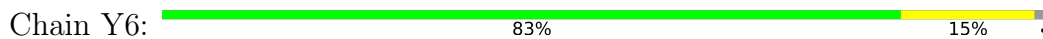


- Molecule 31: 50S ribosomal protein L33





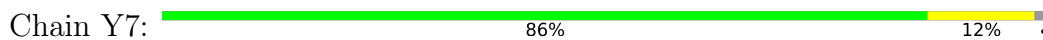
- Molecule 31: 50S ribosomal protein L33



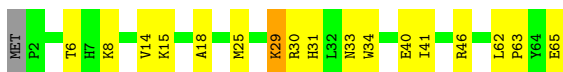
- Molecule 32: 50S ribosomal protein L34



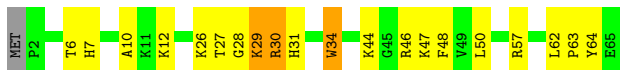
- Molecule 32: 50S ribosomal protein L34



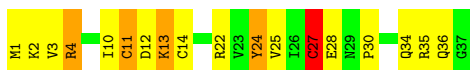
- Molecule 33: 50S ribosomal protein L35



- Molecule 33: 50S ribosomal protein L35



- Molecule 34: 50S ribosomal protein L36



- Molecule 34: 50S ribosomal protein L36

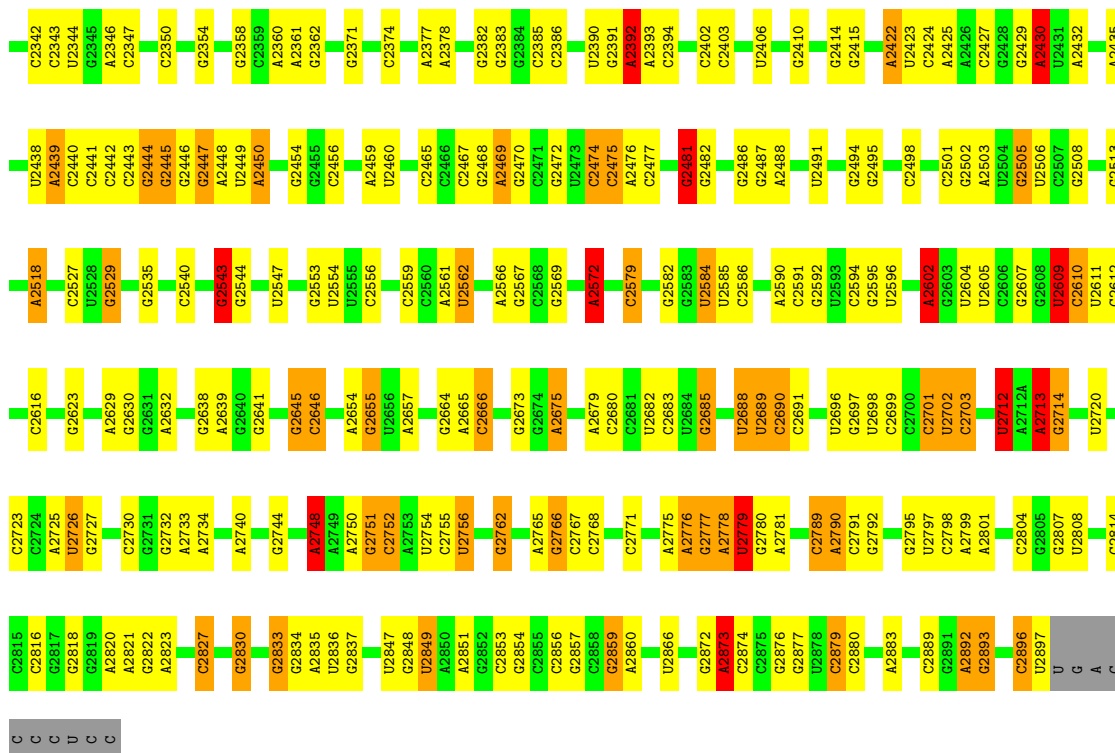




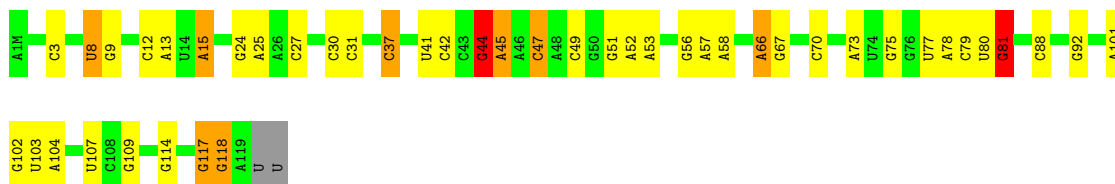
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A1174	A1272	C1346	G1444	A1529	A1616	G1731	G1835	G1948	G2046	U2132	U2233	G2325	C2423	A2497
U1176	U1273	G1345	A1444	C1533	C1617	A1732	C1836	G1949	G2052	G2133	G2238	C2326	C2424	C2498
A1177	A1275	G1346	C1445	C1533	G1618	G1733	C1837	G1950	G2055	A2135	G2239	A2327	A2425	C2499
C1178	A1278	U1352	C1446	U1535	A1631	C1734	G1838	G1951	C2055	G2141	G2242	A2328	A2426	C2501
C1179	G1279	A1353	A1446	A1536	A1631	C1735	G1839	U1955	G2056	G2141	U2243	G2329	C2427	G2502
C1180	G1280	A1354	A1449	A1537	A1632	G1743	G1846	U1956	G2056	U2144	U2244	G2334	G2428	A2503
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G1188	G1282	G1450	A1451	G1539	A1637	C1751	U1851	C1962	A2060	C2146	U2246	A2336	A2430	G2505
U1189	G1283	A1360	C1451	G1540	C1638	C1752	U1852	U1963	G2061	G2147	G2247	A2337	A2431	G2506
	U1284	A1361	U1454	G1541	U1639	C1754	A1854	U1964	G2062	G2148	G2250	C2342	A2432	G2508
	U1285	G1364	U1454	G1542	U1640	C1755	A1855	G1964	C2063	G2149	G2253	C2343	A2433	G2509
	A1286	A1365	G1455	A1543	A1641	A1755	G1857	U1965	C2063	U2150	G2253	G2344	A2434	C2512
	A1287	A1366	C1458	A1544	G1642	G1756	G1858	U1966	C2065	G2156	G2254	U2344	A2435	
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		C1370	G1461	C1550	C1648	G1764	G1869	A1972	G2080	C2161	C2261	C2347	C2441	G2527
	C1293	A1378	C1467	C1551	G1649	C1771	A1872	A1972	G2080	G2162	A2266	C2350	C2442	G2527
	U1294	A1379	A1471	C1552	A1652	G1772	G1878	G1979	U2086	C2163	G2266	C2351	C2443	U2528
	G1296	G1380	A1471	A1554	G1652	A1773	G1879	G1980	G2087	C2164	U2272	C2355	G2444	G2529
		U1394	C1474	A1559	A1654	C1774	C1880	G1981	G2088	G2165	A2273	C2356	G2445	G2535
	U1300	G1385	G1475	C1559	C1657	U1775	C1881	C1982	U2089	G2166	A2274	C2364	G2446	G2536
	A1301	C1386	G1475	C1560	C1688	G1776	C1882	G1989	G2090	U2167	C2275	C2365	A2448	U2537
	G1302	G1387	A1478	C1561	C1688	U1779	A1885	U1989	U2091	G2168	G2279	C2371	U2449	C2538
	G1303	G1388	G1479	G1562	G1667	A1780	G1888	G1992	U2092	A2169	C2279	C2372	A2450	C2539
	C1304	U1391	G1482	A1566	A1669	C1781	A1889	U1993	G2093	A2170	C2283	C2373	A2451	G2540
	C1306	C1306	G1483	A1567	A1670	U1786	A1890	G1994	C2095	U2172	C2284	C2374	G2454	A2542
	A1307	U1394	G1484	A1568	C1670	A1786	A1891	U1995	U2098	A2173	C2285	C2375	G2454	G2543
	A1308	A1395	G1485	A1569	G1674	C1790	G1899	C2006	U2099	C2178	A2286	A2376	U2457	G2544
	U1234	U1397	G1488	A1570	G1678	A1791	A1900	C2007	G2100	C2183	C2287	A2377	A2458	G2545
	G1236	U1397	A1489	A1571	G1678	G1792	A1901	U2011	C2103	G2184	C2291	C2380	G2459	G2546
		U1312	A1490	A1572	G1681	C1797	A1906	G2012	G2104	U2189	C2292	C2381	U2460	U2547
	U1313	U1313	C1493	C1574	C1686	C1800	G1906	C2012	C2104	G2190	C2293	C2382	U2461	G2550
	C1314	C1314	U1405	U1578	C1686	G1801	C1909	A2019	C2108	G2191	C2294	C2383	C2465	C2551
	C1315	U1406	U1406	U1578	C1686	A1802	C1909	A2020	C2111	G2192	C2295	C2384	G2468	U2552
	U1316	C1407	C1499	C1585	A1689	A1803	A1913	C2021	G2112	G2193	C2296	C2385	G2469	G2553
	C1318	U1415	C1502	A1586	U1693	C1804	C1914	U2022	U2113	G2196	A2298	C2391	G2470	U2554
	G1319	G1416	C1505	A1587	C1694	U1805	U1905	G2023	A2114	U2197	G2298	A2392	C2471	C2559
		G1417	C1506	A1588	G1695	G1816	C1920	C2026	G2115	G2198	G2304	A2393	G2472	
	C1326	G1418	A1507	C1598	G1696	G1817	C1924	G2027	G2116	A2198	A2305	C2394	G2473	A2566
	G1327	U1419	A1508	C1599	G1697	U1818	U1924	U2028	G2117	A2199	C2306	C2394	C2474	G2567
	G1328	U1420	C1509	C1600	G1698	A1819	A1927	G2029	U2118	G2205	C2307	U2401	C2475	C2568
	U1329	G1421	A1510	G1601	G1699	A1820	A1928	A2030	A2119	C2209	A2309	C2402	A2476	G2569
		U1427	U1514	U1602	A1700	U1820	A1929	A2031	G2120	G2210	A2310	C2403	C2477	G2570
	G1332	A1428	C1513	A1603	G1703	G1824	G1929	G2032	G2121	G2211	A2311	A2394	C2478	C2571
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	G1334	G1429	G1499	A1608	C1708	C1827	U1931	A2036	G2123	G2213	U2313	G2410	C2480	C2573
	U1338	C1430	U1523	A1609	G1725	G1828	U1934	G2036	G2124	G2215	C2314	A2411	G2484	G2574
	G1339	A1434	G1524	A1610	G1728	G1829	G1935	G2037	G2125	G2216	G2315	G2415	G2489	A2577
	U1340	G1526	G1526	C1611	G1728	C1830	G1936	G2038	A2126	A2225	C2318	C2416	G2490	G2582
	U1341	G1527	G1527	A1614	G1729	U1833	A1937	U2041	C2128	C2226	C2319	C2417	U2491	G2583
							A1938	A2042	U2130	C2229	A2320	U2130	U2491	U2584



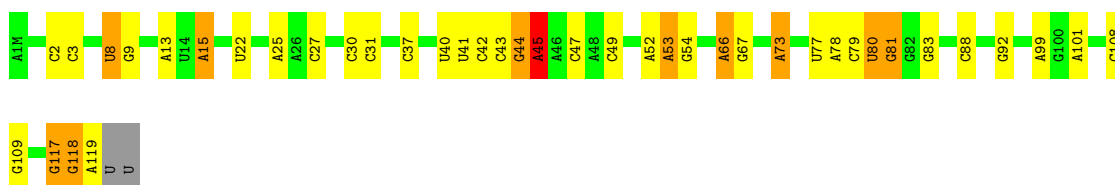




• Molecule 36: 5S rRNA



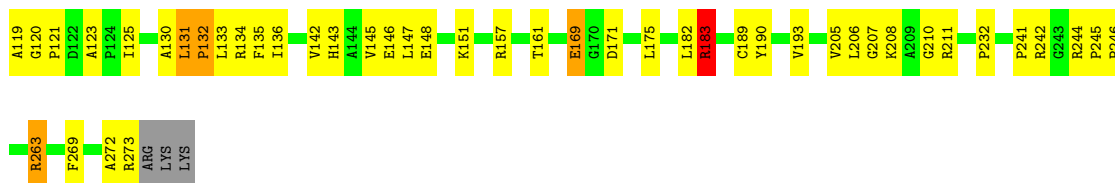
• Molecule 36: 5S rRNA



• Molecule 37: 50S ribosomal protein L2

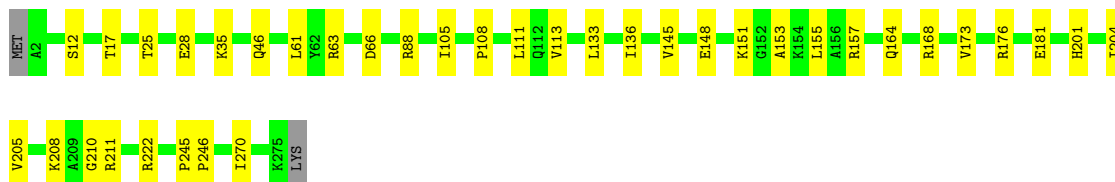






- Molecule 37: 50S ribosomal protein L2

Chain YD: 86% 13%



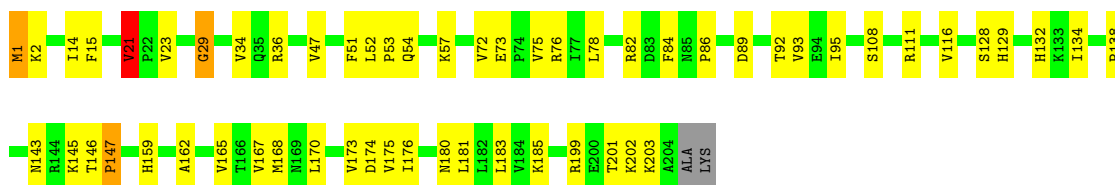
- Molecule 38: 50S ribosomal protein L3

Chain RE: 68% 27%



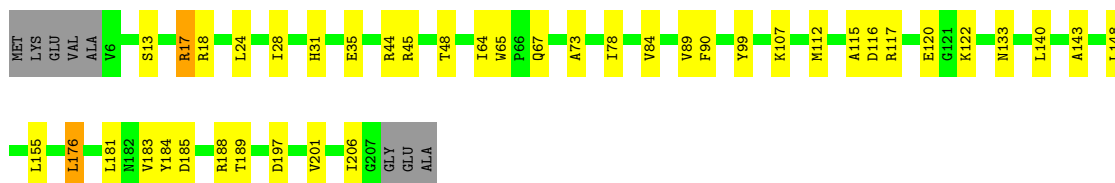
- Molecule 38: 50S ribosomal protein L3

Chain YE: 71% 26%



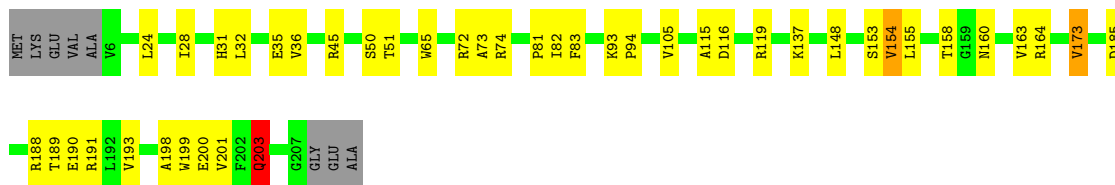
- Molecule 39: 50S ribosomal protein L4

Chain RF: 77% 19%

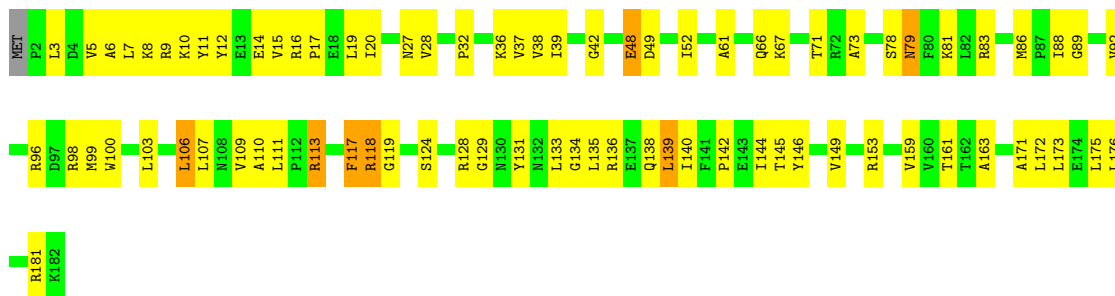


- Molecule 39: 50S ribosomal protein L4

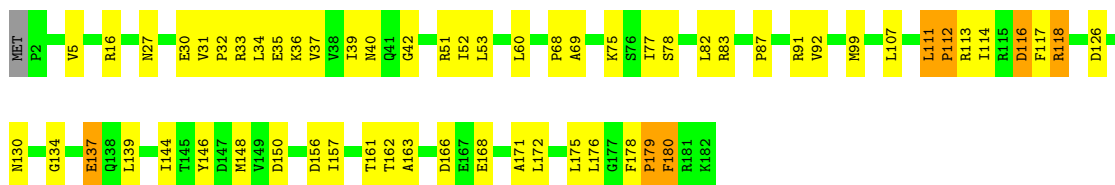
Chain YF: 76% 19%



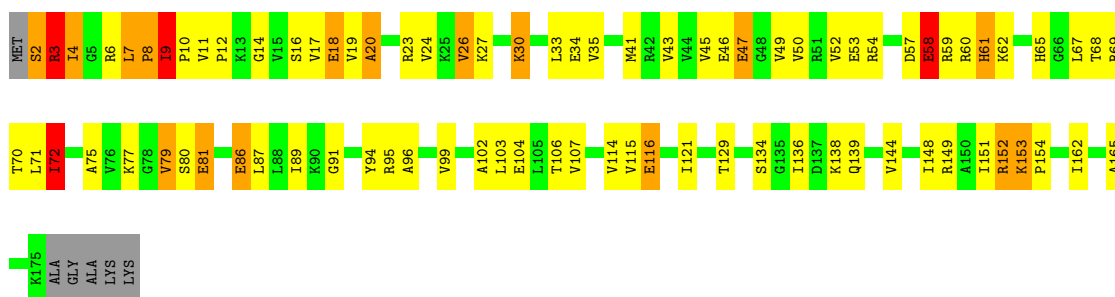
• Molecule 40: 50S ribosomal protein L5



• Molecule 40: 50S ribosomal protein L5



• Molecule 41: 50S ribosomal protein L6



• Molecule 41: 50S ribosomal protein L6





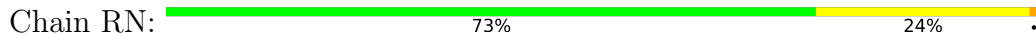
- Molecule 42: 50S ribosomal protein L9



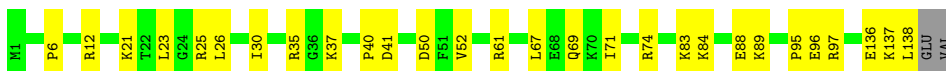
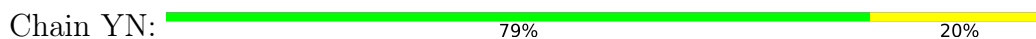
- Molecule 42: 50S ribosomal protein L9



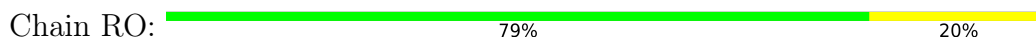
- Molecule 43: 50S ribosomal protein L13



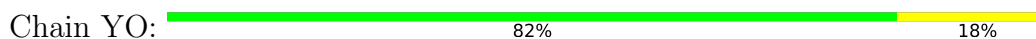
- Molecule 43: 50S ribosomal protein L13



- Molecule 44: 50S ribosomal protein L14

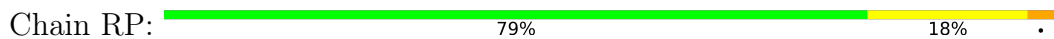


- Molecule 44: 50S ribosomal protein L14

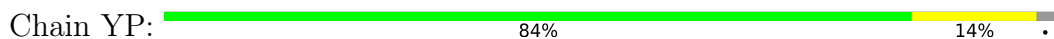




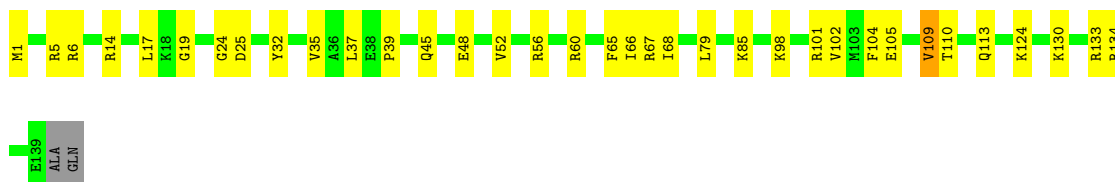
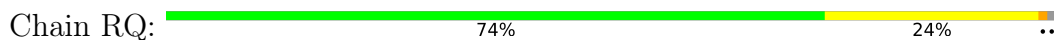
- Molecule 45: 50S ribosomal protein L15



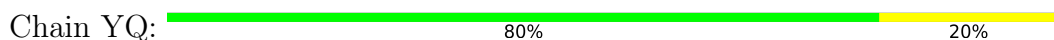
- Molecule 45: 50S ribosomal protein L15



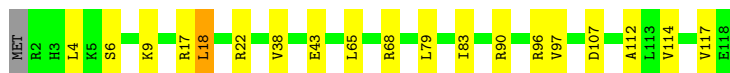
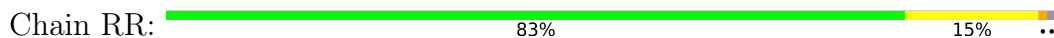
- Molecule 46: 50S ribosomal protein L16



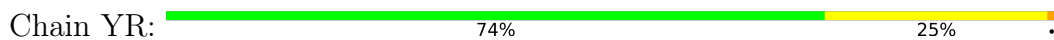
- Molecule 46: 50S ribosomal protein L16



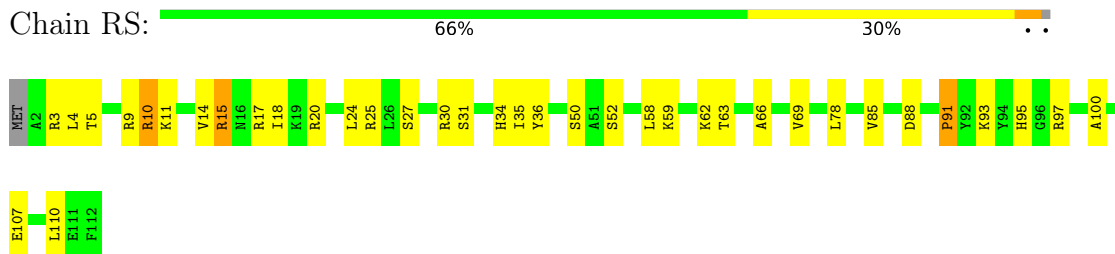
- Molecule 47: 50S ribosomal protein L17



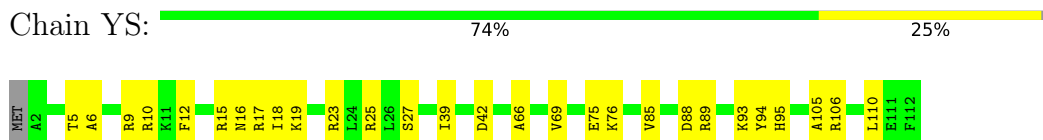
- Molecule 47: 50S ribosomal protein L17



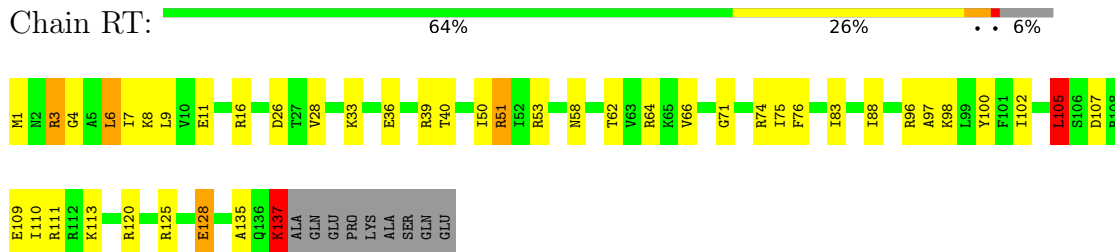
- Molecule 48: 50S ribosomal protein L18



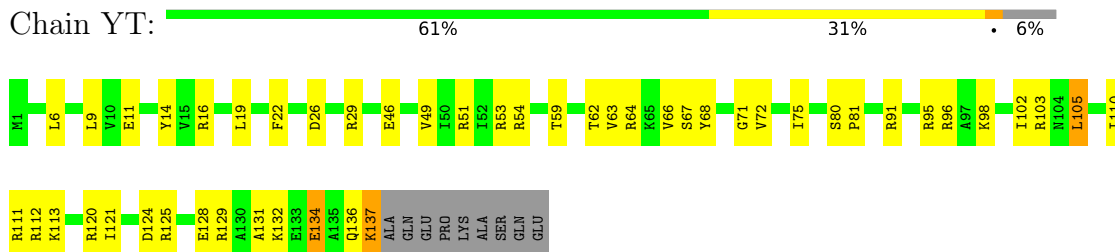
- Molecule 48: 50S ribosomal protein L18



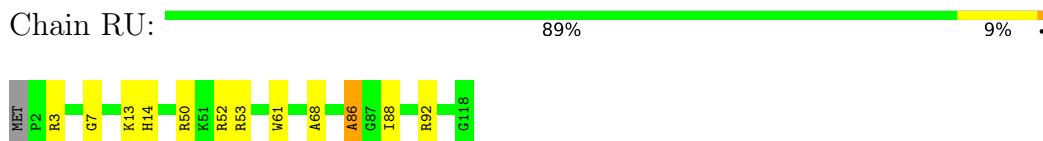
- Molecule 49: 50S ribosomal protein L19



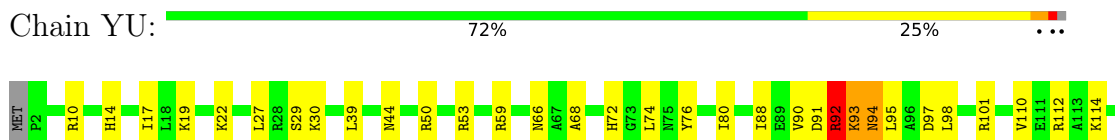
- Molecule 49: 50S ribosomal protein L19



- Molecule 50: 50S ribosomal protein L20



- Molecule 50: 50S ribosomal protein L20

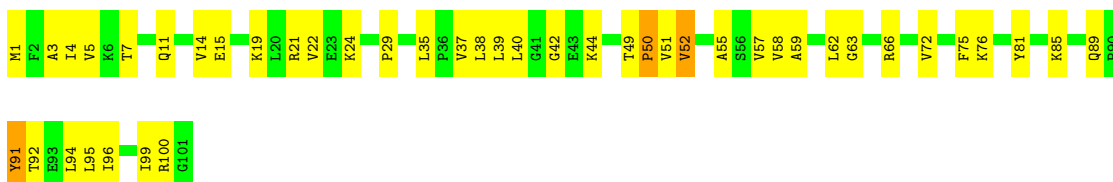


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- Molecule 51: 50S ribosomal protein L21

Chain RV:  73% 26%

- Molecule 51: 50S ribosomal protein L21

Chain YV:  56% 41%


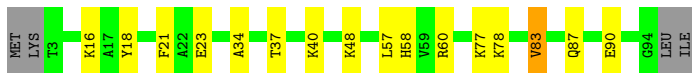
- Molecule 52: 50S ribosomal protein L22

Chain RW:  88% 12%


- Molecule 52: 50S ribosomal protein L22

Chain YW:  89% 11%

- Molecule 53: 50S ribosomal protein L23

Chain RX:  79% 16%

- Molecule 53: 50S ribosomal protein L23

Chain YX:  88% 8%

- Molecule 54: 50S ribosomal protein L24



## 4 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	213.36Å 451.70Å 607.63Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	146.15 – 3.12	Depositor
% Data completeness (in resolution range)	98.6 (146.15-3.12)	Depositor
$R_{merge}$	0.21	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.66 (at 3.13Å)	Xtrriage
Refinement program	PHENIX 1.15_3459	Depositor
R, $R_{free}$	0.232 , 0.257	Depositor
Wilson B-factor (Å <sup>2</sup> )	62.4	Xtrriage
Anisotropy	0.211	Xtrriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	298517	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	80.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.44% 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 i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, PPU, SF4, A3P, MG

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	QA	0.52	1/36324 (0.0%)	1.39	420/56690 (0.7%)
1	XA	0.52	1/36254 (0.0%)	1.39	416/56581 (0.7%)
2	QB	0.68	1/1942 (0.1%)	1.02	9/2619 (0.3%)
2	XB	0.75	4/1950 (0.2%)	1.01	10/2630 (0.4%)
3	QC	1.04	8/1629 (0.5%)	1.01	9/2195 (0.4%)
3	XC	0.60	1/1629 (0.1%)	0.87	6/2195 (0.3%)
4	QD	0.58	1/1733 (0.1%)	0.81	5/2318 (0.2%)
4	XD	0.62	1/1733 (0.1%)	0.84	4/2318 (0.2%)
5	QE	0.66	3/1171 (0.3%)	0.80	3/1576 (0.2%)
5	XE	0.51	0/1171	0.78	1/1576 (0.1%)
6	QF	0.52	0/856	0.73	1/1154 (0.1%)
6	XF	0.57	0/856	0.76	1/1154 (0.1%)
7	QG	0.62	1/1276 (0.1%)	0.93	4/1709 (0.2%)
7	XG	0.55	0/1276	0.88	6/1709 (0.4%)
8	QH	0.61	1/1128 (0.1%)	0.79	3/1517 (0.2%)
8	XH	0.55	0/1128	0.74	0/1517
9	QI	0.88	5/1029 (0.5%)	1.05	3/1379 (0.2%)
9	XI	0.73	2/1017 (0.2%)	1.01	6/1365 (0.4%)
10	QJ	0.82	0/814	1.24	11/1095 (1.0%)
10	XJ	0.82	5/790 (0.6%)	1.01	5/1063 (0.5%)
11	QK	0.83	4/900 (0.4%)	0.88	3/1213 (0.2%)
11	XK	0.51	1/879 (0.1%)	0.76	2/1187 (0.2%)
12	QL	0.59	1/991 (0.1%)	0.83	1/1327 (0.1%)
12	XL	0.65	1/972 (0.1%)	0.93	5/1301 (0.4%)
13	QM	1.62	19/965 (2.0%)	1.53	18/1292 (1.4%)
13	XM	0.55	0/956	0.93	2/1281 (0.2%)
14	QN	0.71	2/501 (0.4%)	0.95	1/664 (0.2%)
14	XN	0.65	0/501	0.93	1/664 (0.2%)
15	QO	0.58	0/745	0.78	1/992 (0.1%)
15	XO	0.71	1/740 (0.1%)	1.06	6/987 (0.6%)
16	QP	0.45	0/721	0.80	3/970 (0.3%)
16	XP	0.58	1/721 (0.1%)	0.74	0/970

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
17	QQ	0.48	0/847	0.75	0/1131
17	XQ	0.52	0/847	0.73	1/1131 (0.1%)
18	QR	0.62	1/579 (0.2%)	0.88	2/768 (0.3%)
18	XR	0.55	0/579	0.93	1/768 (0.1%)
19	QS	0.86	3/680 (0.4%)	1.02	1/915 (0.1%)
19	XS	0.54	0/680	0.91	1/915 (0.1%)
20	QT	0.58	1/765 (0.1%)	0.86	1/1007 (0.1%)
20	XT	0.80	3/765 (0.4%)	1.14	4/1007 (0.4%)
21	QU	0.61	0/221	0.89	0/288
21	XU	0.66	0/221	1.01	1/288 (0.3%)
22	QV	0.55	0/1832	1.43	23/2855 (0.8%)
22	QW	0.45	0/1832	1.41	26/2855 (0.9%)
22	XV	0.54	0/1832	1.36	10/2855 (0.4%)
22	XW	0.48	0/1832	1.38	24/2855 (0.8%)
23	QX	0.51	0/417	1.27	4/650 (0.6%)
23	XX	0.51	0/417	1.31	2/650 (0.3%)
24	QY	0.60	1/743 (0.1%)	0.86	1/1002 (0.1%)
24	QZ	0.64	0/743	1.02	2/1002 (0.2%)
24	XY	0.64	0/743	0.84	0/1002
24	XZ	0.36	0/743	0.57	0/1002
25	R0	0.51	0/652	0.82	1/867 (0.1%)
25	Y0	0.45	0/657	0.67	1/874 (0.1%)
26	R1	0.66	1/770 (0.1%)	1.01	4/1022 (0.4%)
26	Y1	0.60	0/770	0.84	1/1022 (0.1%)
27	R2	0.63	1/583 (0.2%)	0.84	3/771 (0.4%)
27	Y2	0.74	2/583 (0.3%)	1.09	4/771 (0.5%)
28	R3	0.56	0/474	0.78	1/635 (0.2%)
28	Y3	0.53	0/474	0.96	3/635 (0.5%)
29	R4	1.46	6/578 (1.0%)	1.20	7/776 (0.9%)
29	Y4	0.74	1/578 (0.2%)	1.19	5/776 (0.6%)
30	R5	0.59	2/473 (0.4%)	0.67	1/639 (0.2%)
30	Y5	0.67	1/473 (0.2%)	0.73	0/639
31	R6	0.62	0/460	0.67	0/613
31	Y6	0.96	1/460 (0.2%)	1.05	3/613 (0.5%)
32	R7	0.49	0/417	0.75	0/550
32	Y7	0.45	0/426	0.65	0/561
33	R8	0.63	1/525 (0.2%)	1.01	5/691 (0.7%)
33	Y8	0.92	3/525 (0.6%)	0.87	0/691
34	R9	0.95	3/310 (1.0%)	1.56	6/407 (1.5%)
34	Y9	0.47	0/310	0.75	0/407
35	RA	0.58	10/69739 (0.0%)	1.49	1148/108870 (1.1%)
35	YA	0.60	18/69419 (0.0%)	1.50	1151/108369 (1.1%)
36	RB	0.55	0/2928	1.50	43/4568 (0.9%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
36	YB	0.54	0/2928	1.49	44/4568 (1.0%)
37	RD	0.71	7/2165 (0.3%)	0.84	5/2919 (0.2%)
37	YD	0.56	2/2185 (0.1%)	0.73	0/2944
38	RE	0.66	5/1601 (0.3%)	0.88	3/2160 (0.1%)
38	YE	0.63	1/1596 (0.1%)	0.78	1/2153 (0.0%)
39	RF	0.60	1/1620 (0.1%)	0.80	6/2194 (0.3%)
39	YF	0.61	3/1620 (0.2%)	0.79	1/2194 (0.0%)
40	RG	0.75	5/1499 (0.3%)	1.05	6/2016 (0.3%)
40	YG	0.94	7/1499 (0.5%)	1.02	8/2016 (0.4%)
41	RH	1.16	10/1362 (0.7%)	1.23	17/1841 (0.9%)
41	YH	0.88	4/1362 (0.3%)	1.00	4/1841 (0.2%)
42	RI	1.21	14/1146 (1.2%)	1.13	8/1551 (0.5%)
42	YI	0.75	2/1151 (0.2%)	1.01	5/1558 (0.3%)
43	RN	0.59	0/1131	0.88	3/1525 (0.2%)
43	YN	0.57	0/1131	0.78	0/1525
44	RO	0.70	3/943 (0.3%)	0.88	4/1269 (0.3%)
44	YO	0.62	1/943 (0.1%)	0.80	1/1269 (0.1%)
45	RP	0.73	2/1162 (0.2%)	1.02	5/1544 (0.3%)
45	YP	0.53	0/1139	0.78	1/1514 (0.1%)
46	RQ	0.69	3/1128 (0.3%)	0.89	1/1508 (0.1%)
46	YQ	0.54	0/1143	0.78	1/1527 (0.1%)
47	RR	0.59	1/974 (0.1%)	0.76	0/1302
47	YR	0.53	0/974	0.81	1/1302 (0.1%)
48	RS	0.77	1/892 (0.1%)	1.10	7/1187 (0.6%)
48	YS	0.56	1/892 (0.1%)	0.86	2/1187 (0.2%)
49	RT	0.94	5/1155 (0.4%)	1.17	9/1542 (0.6%)
49	YT	0.71	3/1155 (0.3%)	0.89	1/1542 (0.1%)
50	RU	0.58	0/982	0.68	2/1306 (0.2%)
50	YU	0.66	2/982 (0.2%)	0.84	2/1306 (0.2%)
51	RV	0.63	0/790	0.83	1/1057 (0.1%)
51	YV	0.61	0/790	0.88	4/1057 (0.4%)
52	RW	0.55	1/911 (0.1%)	0.73	0/1220
52	YW	0.54	0/911	0.70	0/1220
53	RX	0.61	1/739 (0.1%)	0.70	1/993 (0.1%)
53	YX	0.59	0/739	0.70	1/993 (0.1%)
54	RY	0.71	3/831 (0.4%)	0.74	1/1108 (0.1%)
54	YY	0.61	1/831 (0.1%)	0.89	4/1108 (0.4%)
55	RZ	0.78	7/1493 (0.5%)	0.99	6/2026 (0.3%)
55	YZ	0.99	10/1493 (0.7%)	0.99	8/2026 (0.4%)
56	ZA	0.41	0/40	1.24	0/60
56	ZB	0.45	0/40	1.35	0/60
All	All	0.61	230/323268 (0.1%)	1.33	3631/483159 (0.8%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	QB	0	4
2	XB	0	2
3	QC	0	2
3	XC	0	1
4	XD	0	1
7	XG	0	1
10	QJ	0	1
10	XJ	0	2
12	XL	0	3
13	QM	0	2
14	QN	0	1
18	QR	0	1
18	XR	0	2
19	XS	0	1
27	Y2	0	3
28	R3	0	1
29	R4	0	1
29	Y4	0	3
34	R9	0	1
37	RD	0	1
38	RE	0	2
38	YE	0	1
40	YG	0	1
41	RH	0	3
41	YH	0	2
42	RI	0	3
42	YI	0	2
43	RN	0	1
45	RP	0	2
46	RQ	0	1
48	RS	0	1
49	RT	0	1
50	YU	0	1
55	RZ	0	1
All	All	0	56

The worst 5 of 230 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
29	R4	34	GLU	CB-CG	-22.72	1.08	1.52
13	QM	71	ARG	CZ-NH1	18.52	1.57	1.33
41	RH	18	GLU	CG-CD	-18.50	1.24	1.51
40	YG	112	PRO	N-CD	15.77	1.70	1.47
49	RT	3	ARG	CA-CB	15.24	1.87	1.53

The worst 5 of 3631 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
35	YA	1913	A	C5-C6-N6	-21.10	106.82	123.70
13	QM	90	LEU	CB-CG-CD2	-20.03	76.94	111.00
35	RA	309	G	O5'-P-OP1	-19.70	87.06	110.70
49	RT	3	ARG	CA-CB-CG	17.17	151.18	113.40
3	QC	38	ARG	NE-CZ-NH2	-15.93	112.34	120.30

There are no chirality outliers.

5 of 56 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	QB	114	ARG	Peptide
2	QB	131	PRO	Peptide
2	QB	153	ARG	Peptide
2	QB	217	ARG	Sidechain
3	QC	35	GLU	Sidechain

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

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	QA	32452	0	16383	225	0
1	XA	32389	0	16350	231	0
2	QB	1907	0	1958	58	0
2	XB	1915	0	1969	82	0
3	QC	1605	0	1668	46	0
3	XC	1605	0	1668	30	0
4	QD	1703	0	1766	30	0
4	XD	1703	0	1767	43	0
5	QE	1155	0	1213	28	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	XE	1155	0	1213	18	0
6	QF	843	0	857	7	0
6	XF	843	0	857	16	0
7	QG	1257	0	1296	42	0
7	XG	1257	0	1296	25	0
8	QH	1108	0	1165	31	0
8	XH	1108	0	1165	18	0
9	QI	1010	0	1037	49	0
9	XI	998	0	1024	29	0
10	QJ	801	0	849	72	0
10	XJ	777	0	816	29	0
11	QK	885	0	904	18	0
11	XK	864	0	881	14	0
12	QL	975	0	1062	24	0
12	XL	956	0	1046	32	0
13	QM	955	0	1021	78	0
13	XM	946	0	1007	43	0
14	QN	492	0	530	5	0
14	XN	492	0	529	16	0
15	QO	734	0	771	6	0
15	XO	729	0	768	16	0
16	QP	705	0	725	11	0
16	XP	705	0	725	12	0
17	QQ	834	0	904	12	0
17	XQ	834	0	904	16	0
18	QR	574	0	644	6	0
18	XR	574	0	644	7	0
19	QS	665	0	686	47	0
19	XS	665	0	686	18	0
20	QT	763	0	861	10	0
20	XT	763	0	861	30	0
21	QU	217	0	234	6	0
21	XU	217	0	234	7	0
22	QV	1640	0	837	2	0
22	QW	1640	0	837	19	0
22	XV	1640	0	837	7	0
22	XW	1640	0	837	8	0
23	QX	370	0	186	3	0
23	XX	370	0	186	5	0
24	QY	723	0	713	37	0
24	QZ	723	0	713	81	0
24	XY	723	0	713	21	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
24	XZ	723	0	713	55	0
25	R0	643	0	667	23	0
25	Y0	648	0	672	14	0
26	R1	763	0	848	23	0
26	Y1	763	0	848	10	0
27	R2	581	0	629	8	0
27	Y2	581	0	629	18	0
28	R3	469	0	518	8	0
28	Y3	469	0	518	6	0
29	R4	565	0	561	32	0
29	Y4	565	0	557	25	0
30	R5	459	0	480	8	0
30	Y5	459	0	480	3	0
31	R6	453	0	475	11	0
31	Y6	453	0	474	4	0
32	R7	409	0	454	5	0
32	Y7	418	0	467	5	0
33	R8	517	0	582	12	0
33	Y8	517	0	582	20	0
34	R9	307	0	336	15	0
34	Y9	307	0	336	7	0
35	RA	62266	0	31389	339	0
35	YA	61981	0	31240	292	0
36	RB	2617	0	1328	15	0
36	YB	2617	0	1328	6	0
37	RD	2115	0	2195	69	0
37	YD	2135	0	2221	25	0
38	RE	1568	0	1634	50	0
38	YE	1563	0	1629	41	0
39	RF	1585	0	1632	25	0
39	YF	1585	0	1631	35	0
40	RG	1474	0	1535	82	0
40	YG	1474	0	1535	44	0
41	RH	1336	0	1418	121	0
41	YH	1336	0	1418	29	0
42	RI	1131	0	1218	76	0
42	YI	1136	0	1223	44	0
43	RN	1104	0	1180	23	0
43	YN	1104	0	1180	21	0
44	RO	933	0	996	18	0
44	YO	933	0	996	21	0
45	RP	1145	0	1228	23	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
45	YP	1122	0	1206	15	0
46	RQ	1107	0	1166	26	0
46	YQ	1122	0	1179	21	0
47	RR	960	0	1021	15	0
47	YR	960	0	1020	19	0
48	RS	882	0	943	38	0
48	YS	882	0	943	17	0
49	RT	1141	0	1202	34	0
49	YT	1141	0	1202	37	0
50	RU	964	0	1022	10	0
50	YU	964	0	1022	37	0
51	RV	779	0	852	20	0
51	YV	779	0	852	50	0
52	RW	900	0	964	10	0
52	YW	900	0	964	17	0
53	RX	725	0	778	13	0
53	YX	725	0	778	7	0
54	RY	818	0	913	14	0
54	YY	818	0	913	12	0
55	RZ	1461	0	1493	44	0
55	YZ	1461	0	1493	58	0
56	ZA	74	0	51	0	0
56	ZB	74	0	51	1	0
57	QA	87	0	0	0	0
57	QE	1	0	0	0	0
57	QV	3	0	0	0	0
57	R0	2	0	0	0	0
57	R5	1	0	0	0	0
57	RA	305	0	0	0	0
57	RB	3	0	0	0	0
57	RD	1	0	0	0	0
57	RE	2	0	0	0	0
57	RN	1	0	0	0	0
57	RO	1	0	0	0	0
57	RP	1	0	0	0	0
57	RQ	1	0	0	0	0
57	RR	1	0	0	0	0
57	XA	106	0	0	0	0
57	XD	1	0	0	0	0
57	XE	1	0	0	0	0
57	XF	1	0	0	0	0
57	XL	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
57	XV	4	0	0	0	0
57	Y5	1	0	0	0	0
57	Y9	1	0	0	0	0
57	YA	329	0	0	0	0
57	YB	6	0	0	0	0
57	YD	2	0	0	0	0
57	YE	4	0	0	0	0
57	YG	1	0	0	0	0
57	YO	1	0	0	0	0
57	YP	1	0	0	0	0
57	YQ	1	0	0	0	0
57	YR	1	0	0	0	0
57	YS	1	0	0	0	0
57	YV	1	0	0	0	0
58	QD	8	0	0	0	0
58	XD	8	0	0	0	0
59	QN	1	0	0	0	0
59	R6	1	0	0	0	0
59	R9	1	0	0	0	0
59	XN	1	0	0	0	0
59	Y6	1	0	0	0	0
60	QX	26	0	11	5	0
60	XX	26	0	11	2	0
All	All	298517	0	202833	3434	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

The worst 5 of 3434 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)
5:QE:90:VAL:CB	5:QE:90:VAL:CG1	1.74	1.63
2:XB:137:ARG:CG	2:XB:137:ARG:CD	1.77	1.62
13:QM:67:GLU:CG	13:QM:67:GLU:CB	1.74	1.62
49:RT:3:ARG:CG	49:RT:3:ARG:CD	1.76	1.62
55:YZ:14:LYS:CA	55:YZ:14:LYS:CB	1.75	1.62

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	QB	233/256 (91%)	205 (88%)	27 (12%)	1 (0%)	34	68
2	XB	234/256 (91%)	204 (87%)	29 (12%)	1 (0%)	34	68
3	QC	203/239 (85%)	188 (93%)	15 (7%)	0	100	100
3	XC	203/239 (85%)	191 (94%)	12 (6%)	0	100	100
4	QD	206/209 (99%)	200 (97%)	6 (3%)	0	100	100
4	XD	206/209 (99%)	197 (96%)	8 (4%)	1 (0%)	29	63
5	QE	149/162 (92%)	143 (96%)	5 (3%)	1 (1%)	22	56
5	XE	149/162 (92%)	143 (96%)	5 (3%)	1 (1%)	22	56
6	QF	99/101 (98%)	98 (99%)	1 (1%)	0	100	100
6	XF	99/101 (98%)	99 (100%)	0	0	100	100
7	QG	153/156 (98%)	145 (95%)	7 (5%)	1 (1%)	22	56
7	XG	153/156 (98%)	148 (97%)	5 (3%)	0	100	100
8	QH	135/138 (98%)	130 (96%)	5 (4%)	0	100	100
8	XH	135/138 (98%)	130 (96%)	5 (4%)	0	100	100
9	QI	125/128 (98%)	108 (86%)	17 (14%)	0	100	100
9	XI	124/128 (97%)	111 (90%)	13 (10%)	0	100	100
10	QJ	97/105 (92%)	86 (89%)	10 (10%)	1 (1%)	15	48
10	XJ	94/105 (90%)	88 (94%)	6 (6%)	0	100	100
11	QK	117/129 (91%)	107 (92%)	10 (8%)	0	100	100
11	XK	114/129 (88%)	107 (94%)	7 (6%)	0	100	100
12	QL	123/132 (93%)	110 (89%)	12 (10%)	1 (1%)	19	53
12	XL	120/132 (91%)	108 (90%)	10 (8%)	2 (2%)	9	35
13	QM	118/126 (94%)	99 (84%)	17 (14%)	2 (2%)	9	35
13	XM	117/126 (93%)	100 (86%)	16 (14%)	1 (1%)	17	51
14	QN	58/61 (95%)	55 (95%)	2 (3%)	1 (2%)	9	35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
14	XN	58/61 (95%)	54 (93%)	4 (7%)	0	100	100
15	QO	86/89 (97%)	83 (96%)	3 (4%)	0	100	100
15	XO	85/89 (96%)	83 (98%)	2 (2%)	0	100	100
16	QP	82/88 (93%)	79 (96%)	3 (4%)	0	100	100
16	XP	82/88 (93%)	79 (96%)	3 (4%)	0	100	100
17	QQ	98/105 (93%)	93 (95%)	5 (5%)	0	100	100
17	XQ	98/105 (93%)	95 (97%)	3 (3%)	0	100	100
18	QR	68/88 (77%)	66 (97%)	2 (3%)	0	100	100
18	XR	68/88 (77%)	66 (97%)	2 (3%)	0	100	100
19	QS	81/93 (87%)	71 (88%)	10 (12%)	0	100	100
19	XS	81/93 (87%)	77 (95%)	3 (4%)	1 (1%)	13	43
20	QT	97/106 (92%)	92 (95%)	5 (5%)	0	100	100
20	XT	97/106 (92%)	89 (92%)	8 (8%)	0	100	100
21	QU	23/27 (85%)	23 (100%)	0	0	100	100
21	XU	23/27 (85%)	23 (100%)	0	0	100	100
24	QY	82/84 (98%)	71 (87%)	11 (13%)	0	100	100
24	QZ	82/84 (98%)	74 (90%)	7 (8%)	1 (1%)	13	43
24	XY	82/84 (98%)	76 (93%)	6 (7%)	0	100	100
24	XZ	82/84 (98%)	71 (87%)	10 (12%)	1 (1%)	13	43
25	R0	79/85 (93%)	71 (90%)	7 (9%)	1 (1%)	12	41
25	Y0	80/85 (94%)	77 (96%)	3 (4%)	0	100	100
26	R1	95/98 (97%)	84 (88%)	11 (12%)	0	100	100
26	Y1	95/98 (97%)	89 (94%)	5 (5%)	1 (1%)	14	45
27	R2	67/72 (93%)	60 (90%)	7 (10%)	0	100	100
27	Y2	67/72 (93%)	65 (97%)	2 (3%)	0	100	100
28	R3	57/60 (95%)	55 (96%)	2 (4%)	0	100	100
28	Y3	57/60 (95%)	55 (96%)	2 (4%)	0	100	100
29	R4	67/71 (94%)	46 (69%)	18 (27%)	3 (4%)	2	14
29	Y4	67/71 (94%)	49 (73%)	13 (19%)	5 (8%)	1	5
30	R5	57/60 (95%)	54 (95%)	3 (5%)	0	100	100
30	Y5	57/60 (95%)	55 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
31	R6	51/54 (94%)	50 (98%)	1 (2%)	0	100	100
31	Y6	51/54 (94%)	51 (100%)	0	0	100	100
32	R7	45/49 (92%)	45 (100%)	0	0	100	100
32	Y7	46/49 (94%)	46 (100%)	0	0	100	100
33	R8	62/65 (95%)	58 (94%)	2 (3%)	2 (3%)	4	21
33	Y8	62/65 (95%)	57 (92%)	3 (5%)	2 (3%)	4	21
34	R9	35/37 (95%)	33 (94%)	2 (6%)	0	100	100
34	Y9	35/37 (95%)	33 (94%)	2 (6%)	0	100	100
37	RD	270/276 (98%)	256 (95%)	14 (5%)	0	100	100
37	YD	272/276 (99%)	262 (96%)	10 (4%)	0	100	100
38	RE	203/206 (98%)	177 (87%)	22 (11%)	4 (2%)	7	30
38	YE	202/206 (98%)	191 (95%)	8 (4%)	3 (2%)	10	38
39	RF	200/210 (95%)	194 (97%)	6 (3%)	0	100	100
39	YF	200/210 (95%)	188 (94%)	12 (6%)	0	100	100
40	RG	179/182 (98%)	161 (90%)	16 (9%)	2 (1%)	14	45
40	YG	179/182 (98%)	153 (86%)	25 (14%)	1 (1%)	25	59
41	RH	172/180 (96%)	137 (80%)	30 (17%)	5 (3%)	4	23
41	YH	172/180 (96%)	160 (93%)	9 (5%)	3 (2%)	9	35
42	RI	143/148 (97%)	121 (85%)	17 (12%)	5 (4%)	3	19
42	YI	144/148 (97%)	126 (88%)	15 (10%)	3 (2%)	7	29
43	RN	136/140 (97%)	123 (90%)	11 (8%)	2 (2%)	10	38
43	YN	136/140 (97%)	125 (92%)	10 (7%)	1 (1%)	22	56
44	RO	120/122 (98%)	115 (96%)	5 (4%)	0	100	100
44	YO	120/122 (98%)	115 (96%)	5 (4%)	0	100	100
45	RP	148/150 (99%)	129 (87%)	15 (10%)	4 (3%)	5	24
45	YP	145/150 (97%)	138 (95%)	7 (5%)	0	100	100
46	RQ	137/141 (97%)	122 (89%)	14 (10%)	1 (1%)	22	56
46	YQ	139/141 (99%)	132 (95%)	6 (4%)	1 (1%)	22	56
47	RR	115/118 (98%)	105 (91%)	9 (8%)	1 (1%)	17	51
47	YR	115/118 (98%)	108 (94%)	7 (6%)	0	100	100
48	RS	109/112 (97%)	87 (80%)	21 (19%)	1 (1%)	17	51

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	YS	109/112 (97%)	94 (86%)	15 (14%)	0	100	100
49	RT	135/146 (92%)	120 (89%)	15 (11%)	0	100	100
49	YT	135/146 (92%)	122 (90%)	13 (10%)	0	100	100
50	RU	115/118 (98%)	113 (98%)	2 (2%)	0	100	100
50	YU	115/118 (98%)	111 (96%)	3 (3%)	1 (1%)	17	51
51	RV	99/101 (98%)	88 (89%)	10 (10%)	1 (1%)	15	48
51	YV	99/101 (98%)	96 (97%)	2 (2%)	1 (1%)	15	48
52	RW	111/113 (98%)	105 (95%)	6 (5%)	0	100	100
52	YW	111/113 (98%)	106 (96%)	5 (4%)	0	100	100
53	RX	90/96 (94%)	86 (96%)	4 (4%)	0	100	100
53	YX	90/96 (94%)	86 (96%)	4 (4%)	0	100	100
54	RY	105/110 (96%)	99 (94%)	6 (6%)	0	100	100
54	YY	105/110 (96%)	101 (96%)	4 (4%)	0	100	100
55	RZ	181/206 (88%)	168 (93%)	12 (7%)	1 (1%)	25	59
55	YZ	181/206 (88%)	176 (97%)	5 (3%)	0	100	100
All	All	11788/12464 (95%)	10894 (92%)	822 (7%)	72 (1%)	25	59

5 of 72 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
13	QM	15	VAL
29	R4	25	TYR
38	RE	18	ASP
42	RI	15	VAL
42	RI	133	HIS

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	QB	203/220 (92%)	203 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	XB	204/220 (93%)	197 (97%)	7 (3%)	37	68
3	QC	159/188 (85%)	154 (97%)	5 (3%)	40	69
3	XC	159/188 (85%)	157 (99%)	2 (1%)	69	86
4	QD	180/181 (99%)	178 (99%)	2 (1%)	73	88
4	XD	180/181 (99%)	177 (98%)	3 (2%)	60	83
5	QE	116/123 (94%)	115 (99%)	1 (1%)	78	91
5	XE	116/123 (94%)	115 (99%)	1 (1%)	78	91
6	QF	90/90 (100%)	88 (98%)	2 (2%)	52	77
6	XF	90/90 (100%)	89 (99%)	1 (1%)	73	88
7	QG	126/127 (99%)	123 (98%)	3 (2%)	49	75
7	XG	126/127 (99%)	124 (98%)	2 (2%)	62	84
8	QH	118/119 (99%)	115 (98%)	3 (2%)	47	75
8	XH	118/119 (99%)	117 (99%)	1 (1%)	81	92
9	QI	98/99 (99%)	95 (97%)	3 (3%)	40	69
9	XI	97/99 (98%)	95 (98%)	2 (2%)	53	78
10	QJ	89/92 (97%)	85 (96%)	4 (4%)	27	59
10	XJ	86/92 (94%)	84 (98%)	2 (2%)	50	76
11	QK	90/99 (91%)	89 (99%)	1 (1%)	73	88
11	XK	88/99 (89%)	86 (98%)	2 (2%)	50	76
12	QL	104/109 (95%)	104 (100%)	0	100	100
12	XL	103/109 (94%)	100 (97%)	3 (3%)	42	71
13	QM	96/101 (95%)	94 (98%)	2 (2%)	53	78
13	XM	95/101 (94%)	93 (98%)	2 (2%)	53	78
14	QN	49/50 (98%)	48 (98%)	1 (2%)	55	79
14	XN	49/50 (98%)	49 (100%)	0	100	100
15	QO	79/80 (99%)	76 (96%)	3 (4%)	33	65
15	XO	79/80 (99%)	77 (98%)	2 (2%)	47	75
16	QP	72/74 (97%)	72 (100%)	0	100	100
16	XP	72/74 (97%)	72 (100%)	0	100	100
17	QQ	95/97 (98%)	92 (97%)	3 (3%)	39	69
17	XQ	95/97 (98%)	94 (99%)	1 (1%)	73	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	QR	61/77 (79%)	61 (100%)	0	100	100
18	XR	61/77 (79%)	58 (95%)	3 (5%)	25	57
19	QS	72/80 (90%)	71 (99%)	1 (1%)	67	85
19	XS	72/80 (90%)	72 (100%)	0	100	100
20	QT	76/82 (93%)	76 (100%)	0	100	100
20	XT	76/82 (93%)	75 (99%)	1 (1%)	69	86
21	QU	20/22 (91%)	20 (100%)	0	100	100
21	XU	20/22 (91%)	19 (95%)	1 (5%)	24	56
24	QY	78/78 (100%)	78 (100%)	0	100	100
24	QZ	78/78 (100%)	75 (96%)	3 (4%)	33	65
24	XY	78/78 (100%)	76 (97%)	2 (3%)	46	74
24	XZ	78/78 (100%)	72 (92%)	6 (8%)	13	40
25	R0	65/67 (97%)	65 (100%)	0	100	100
25	Y0	65/67 (97%)	64 (98%)	1 (2%)	65	85
26	R1	82/83 (99%)	79 (96%)	3 (4%)	34	66
26	Y1	82/83 (99%)	81 (99%)	1 (1%)	71	87
27	R2	64/67 (96%)	63 (98%)	1 (2%)	62	84
27	Y2	64/67 (96%)	63 (98%)	1 (2%)	62	84
28	R3	51/52 (98%)	51 (100%)	0	100	100
28	Y3	51/52 (98%)	51 (100%)	0	100	100
29	R4	62/63 (98%)	59 (95%)	3 (5%)	25	57
29	Y4	62/63 (98%)	62 (100%)	0	100	100
30	R5	51/52 (98%)	49 (96%)	2 (4%)	32	64
30	Y5	51/52 (98%)	50 (98%)	1 (2%)	55	79
31	R6	51/52 (98%)	50 (98%)	1 (2%)	55	79
31	Y6	51/52 (98%)	50 (98%)	1 (2%)	55	79
32	R7	40/42 (95%)	40 (100%)	0	100	100
32	Y7	41/42 (98%)	41 (100%)	0	100	100
33	R8	54/55 (98%)	54 (100%)	0	100	100
33	Y8	54/55 (98%)	54 (100%)	0	100	100
34	R9	34/34 (100%)	32 (94%)	2 (6%)	19	50

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
34	Y9	34/34 (100%)	33 (97%)	1 (3%)	42	71
37	RD	214/218 (98%)	209 (98%)	5 (2%)	50	76
37	YD	216/218 (99%)	216 (100%)	0	100	100
38	RE	165/166 (99%)	162 (98%)	3 (2%)	59	82
38	YE	165/166 (99%)	160 (97%)	5 (3%)	41	70
39	RF	161/166 (97%)	159 (99%)	2 (1%)	71	87
39	YF	161/166 (97%)	160 (99%)	1 (1%)	86	93
40	RG	155/156 (99%)	152 (98%)	3 (2%)	57	80
40	YG	155/156 (99%)	153 (99%)	2 (1%)	69	86
41	RH	145/148 (98%)	142 (98%)	3 (2%)	53	78
41	YH	145/148 (98%)	142 (98%)	3 (2%)	53	78
42	RI	122/124 (98%)	118 (97%)	4 (3%)	38	68
42	YI	122/124 (98%)	118 (97%)	4 (3%)	38	68
43	RN	117/119 (98%)	116 (99%)	1 (1%)	78	91
43	YN	117/119 (98%)	116 (99%)	1 (1%)	78	91
44	RO	100/100 (100%)	99 (99%)	1 (1%)	76	89
44	YO	100/100 (100%)	100 (100%)	0	100	100
45	RP	116/116 (100%)	116 (100%)	0	100	100
45	YP	114/116 (98%)	112 (98%)	2 (2%)	59	82
46	RQ	110/111 (99%)	110 (100%)	0	100	100
46	YQ	111/111 (100%)	110 (99%)	1 (1%)	78	91
47	RR	100/101 (99%)	99 (99%)	1 (1%)	76	89
47	YR	100/101 (99%)	100 (100%)	0	100	100
48	RS	87/88 (99%)	86 (99%)	1 (1%)	73	88
48	YS	87/88 (99%)	87 (100%)	0	100	100
49	RT	120/127 (94%)	117 (98%)	3 (2%)	47	75
49	YT	120/127 (94%)	117 (98%)	3 (2%)	47	75
50	RU	93/94 (99%)	93 (100%)	0	100	100
50	YU	93/94 (99%)	90 (97%)	3 (3%)	39	69
51	RV	82/82 (100%)	79 (96%)	3 (4%)	34	66
51	YV	82/82 (100%)	82 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
52	RW	92/92 (100%)	91 (99%)	1 (1%)	73	88
52	YW	92/92 (100%)	91 (99%)	1 (1%)	73	88
53	RX	74/78 (95%)	73 (99%)	1 (1%)	67	85
53	YX	74/78 (95%)	74 (100%)	0	100	100
54	RY	88/91 (97%)	86 (98%)	2 (2%)	50	76
54	YY	88/91 (97%)	86 (98%)	2 (2%)	50	76
55	RZ	162/179 (90%)	158 (98%)	4 (2%)	47	75
55	YZ	162/179 (90%)	156 (96%)	6 (4%)	34	66
All	All	10007/10378 (96%)	9836 (98%)	171 (2%)	60	83

5 of 171 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
15	XO	13	GLN
40	YG	116	ASP
18	XR	68	LYS
24	XZ	83	HIS
42	YI	77	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
3	QC	108	ASN
10	QJ	76	ASN
37	RD	96	HIS
27	Y2	38	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	QA	1508/1521 (99%)	311 (20%)	52 (3%)
1	XA	1505/1521 (98%)	303 (20%)	50 (3%)
22	QV	77/77 (100%)	12 (15%)	4 (5%)
22	QW	76/77 (98%)	18 (23%)	1 (1%)
22	XV	76/77 (98%)	13 (17%)	3 (3%)
22	XW	76/77 (98%)	21 (27%)	1 (1%)
23	QX	16/20 (80%)	8 (50%)	2 (12%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
23	XX	16/20 (80%)	7 (43%)	1 (6%)
35	RA	2888/2915 (99%)	606 (20%)	49 (1%)
35	YA	2875/2915 (98%)	593 (20%)	46 (1%)
36	RB	121/124 (97%)	21 (17%)	1 (0%)
36	YB	121/124 (97%)	20 (16%)	1 (0%)
56	ZA	1/3 (33%)	0	0
56	ZB	1/3 (33%)	0	0
All	All	9357/9474 (98%)	1933 (20%)	211 (2%)

5 of 1933 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	QA	4	U
1	QA	5	U
1	QA	6	G
1	QA	9	G
1	QA	22	G

5 of 211 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	XA	243	A
1	XA	1054	C
35	YA	2335	A
1	XA	315	A
1	XA	717	C

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
56	PPU	ZA	3	35,56	32,40,41	0.91	2 (6%)	33,57,60	1.51	6 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
56	PPU	ZB	3	35,56	32,40,41	0.89	2 (6%)	33,57,60	1.44	5 (15%)

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
56	PPU	ZA	3	35,56	-	4/21/43/44	0/4/4/4
56	PPU	ZB	3	35,56	-	3/21/43/44	0/4/4/4

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
56	ZA	3	PPU	C5-C4	2.76	1.48	1.40
56	ZB	3	PPU	C5-C4	2.73	1.48	1.40
56	ZA	3	PPU	C6-N1	2.18	1.36	1.33
56	ZB	3	PPU	C6-N1	2.02	1.36	1.33

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
56	ZB	3	PPU	C4-C5-N7	-3.49	105.76	109.40
56	ZA	3	PPU	C4-C5-N7	-3.46	105.79	109.40
56	ZA	3	PPU	C3'-N3'-C	-3.34	118.18	123.21
56	ZA	3	PPU	N3-C2-N1	-3.25	123.60	128.68
56	ZB	3	PPU	N3-C2-N1	-3.24	123.61	128.68

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
56	ZB	3	PPU	CE1-CZ-OC-CM
56	ZB	3	PPU	CE2-CZ-OC-CM
56	ZA	3	PPU	CE2-CZ-OC-CM
56	ZA	3	PPU	CE1-CZ-OC-CM
56	ZA	3	PPU	C5-C6-N6-C9

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
56	ZB	3	PPU	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 883 ligands modelled in this entry, 879 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
58	SF4	XD	301	4	0,12,12	-	-	-		
58	SF4	QD	301	4	0,12,12	-	-	-		
60	A3P	XX	101	23	23,28,29	5.26	7 (30%)	23,42,45	1.59	4 (17%)
60	A3P	QX	101	23	23,28,29	5.17	7 (30%)	23,42,45	1.46	3 (13%)

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
58	SF4	XD	301	4	-	-	0/6/5/5
58	SF4	QD	301	4	-	-	0/6/5/5
60	A3P	XX	101	23	-	0/8/30/31	0/3/3/3
60	A3P	QX	101	23	-	2/8/30/31	0/3/3/3

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	XX	101	A3P	O4'-C1'	18.58	1.67	1.41
60	QX	101	A3P	O4'-C1'	18.11	1.66	1.41
60	XX	101	A3P	C2'-C1'	-13.95	1.32	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	QX	101	A3P	C2'-C1'	-13.75	1.32	1.53
60	QX	101	A3P	O4'-C4'	-6.31	1.30	1.45

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	XX	101	A3P	N3-C2-N1	-4.92	120.99	128.68
60	QX	101	A3P	N3-C2-N1	-4.77	121.22	128.68
60	XX	101	A3P	C3'-C2'-C1'	3.31	107.22	99.89
60	QX	101	A3P	C4-C5-N7	-3.24	106.02	109.40
60	XX	101	A3P	C4-C5-N7	-2.87	106.40	109.40

There are no chirality outliers.

All (2) torsion outliers are listed below:

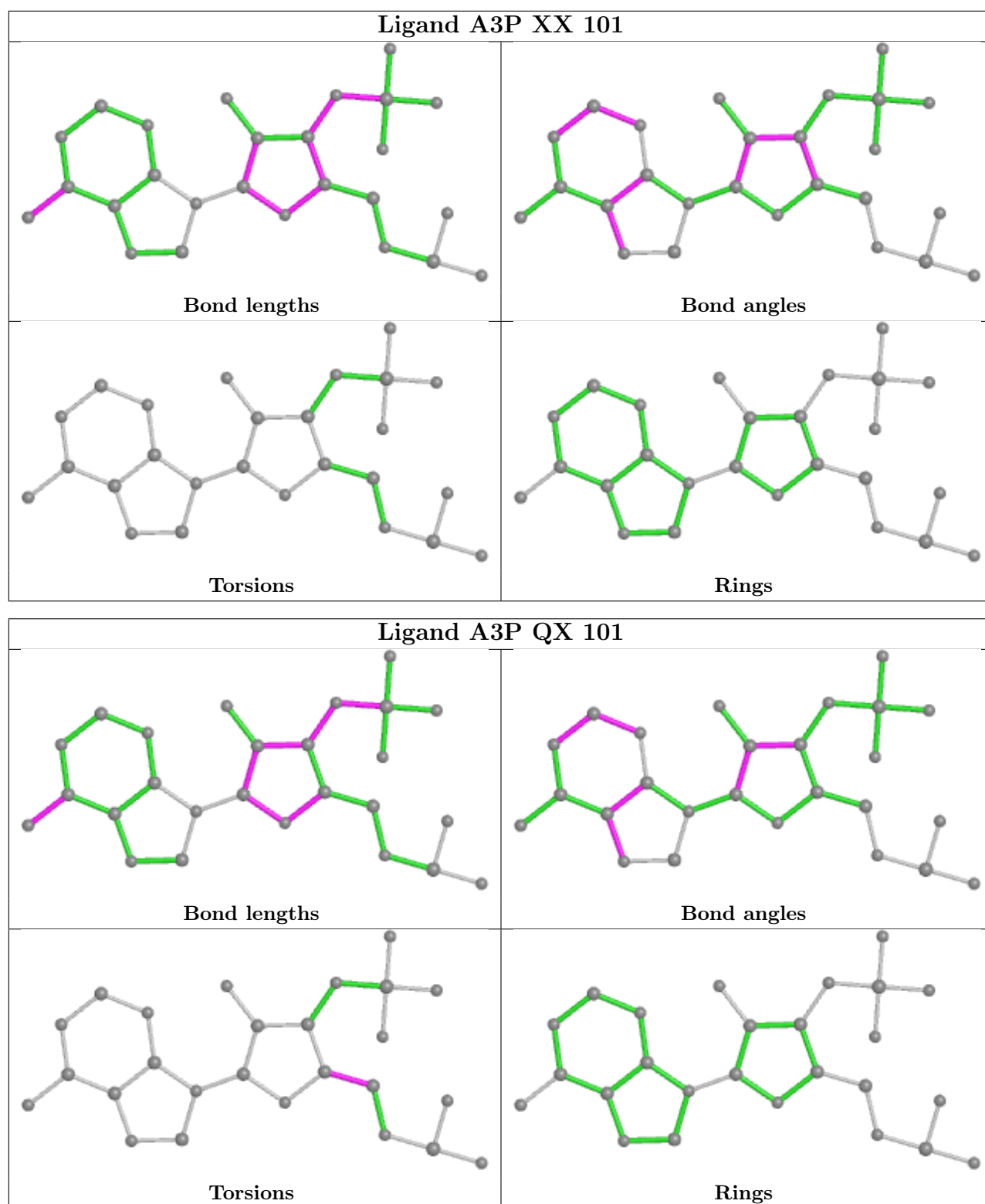
Mol	Chain	Res	Type	Atoms
60	QX	101	A3P	C3'-C4'-C5'-O5'
60	QX	101	A3P	O4'-C4'-C5'-O5'

There are no ring outliers.

2 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
60	XX	101	A3P	2	0
60	QX	101	A3P	5	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

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

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

EDS failed to run properly - this section is therefore empty.

### 6.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

### 6.4 Ligands

EDS failed to run properly - this section is therefore empty.

### 6.5 Other polymers

EDS failed to run properly - this section is therefore empty.