



wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 5, 2023 – 01:54 PM EST

PDB ID : 5J30
Title : Thermus thermophilus 70S termination complex containing E. coli RF1
Authors : Hoffer, E.D.; Dunham, C.M.
Deposited on : 2016-03-30
Resolution : 3.20 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

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>.

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**
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) : 2.36

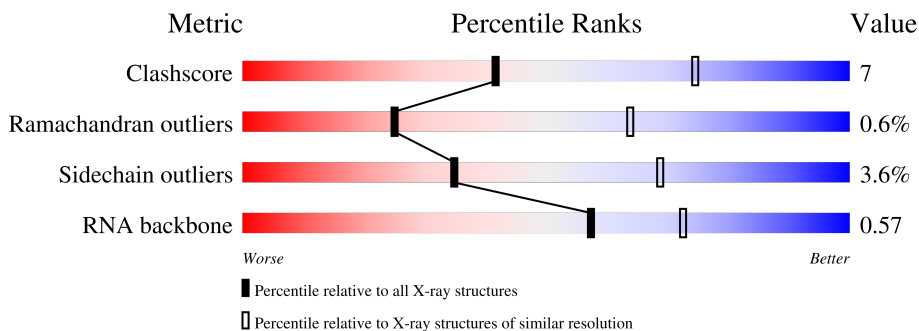
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RNA backbone	3102	1010 (3.50-2.90)


























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 ≥ 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	RA	2915	
1	YA	2915	
2	RB	122	
2	YB	122	
3	RD	276	
3	YD	276	

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Mol	Chain	Length	Quality of chain
4	RE	206	 81% 16% ..
4	YE	206	 78% 19% ..
5	RF	210	 75% 20% ..
5	YF	210	 71% 20% 5% .
6	RG	182	 74% 23% ..
6	YG	182	 63% 32% ..
7	RH	180	 79% 17% ..
7	YH	180	 66% 26% . .
8	RI	148	 78% 20% ..
8	YI	148	 78% 17% ..
9	RN	140	 81% 16% .
9	YN	140	 81% 17% .
10	RO	122	 89% 11%
10	YO	122	 86% 14%
11	RP	150	 79% 19% ..
11	YP	150	 77% 21% ..
12	RQ	141	 79% 20% .
12	YQ	141	 79% 18% .
13	RR	118	 81% 17% .
13	YR	118	 81% 19%
14	RS	112	 85% 12% ..
14	YS	112	 78% 20% ..
15	RT	146	 68% 21% . 10%
15	YT	146	 75% 14% . 10%
16	RU	118	 83% 14% ..

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Mol	Chain	Length	Quality of chain
16	YU	118	84% 14% ..
17	RV	101	89% 10% .
17	YV	101	75% 22% .
18	RW	113	82% 13% ..
18	YW	113	89% 8% ..
19	RX	96	79% 20% .
19	YX	96	78% 21% .
20	RY	110	77% 18% ..
20	YY	110	72% 24% ..
21	RZ	206	76% 15% . 8%
21	YZ	206	73% 17% . 8%
22	R0	85	76% 12% . 9%
22	Y0	85	72% 19% 9%
23	R1	98	84% 13% ..
23	Y1	98	74% 20% ..
24	R2	72	88% 8% ..
24	Y2	72	81% 15% ..
25	R3	60	92% 7% .
25	Y3	60	77% 18% ..
26	R4	71	56% 37% . ..
26	Y4	71	55% 37% 6% .
27	R5	60	75% 22% ..
27	Y5	60	85% 12% ..
28	R6	54	76% 20% ..
28	Y6	54	87% 11% .

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Mol	Chain	Length	Quality of chain
29	R7	49	76% 22% .
29	Y7	49	78% 20% .
30	R8	65	69% 28% ..
30	Y8	65	78% 18% ..
31	R9	37	81% 19%
31	Y9	37	70% 30%
32	QA	1521	63% 29% 6% ..
32	XA	1521	62% 30% 6% ..
33	QB	256	59% 29% . 10%
33	XB	256	57% 30% . 10%
34	QC	239	72% 14% 14%
34	XC	239	66% 20% 14%
35	QD	209	75% 23% .
35	XD	209	76% 22% .
36	QE	162	65% 26% 9%
36	XE	162	69% 23% 9%
37	QF	101	80% 19% .
37	XF	101	83% 16% .
38	QG	156	80% 19% ..
38	XG	156	81% 18% ..
39	QH	138	76% 22% ..
39	XH	138	82% 16% ..
40	QI	128	72% 25% ..
40	XI	128	57% 40% ..
41	QJ	105	61% 30% . 8%




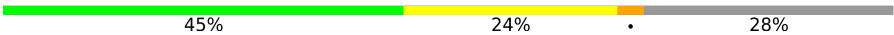
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Mol	Chain	Length	Quality of chain
41	XJ	105	55% 34% 9%
42	QK	129	68% 19% 12%
42	XK	129	74% 15% 12%
43	QL	132	79% 13% 8%
43	XL	132	75% 16% 8%
44	QM	126	62% 29% 8%
44	XM	126	63% 26% 10%
45	QN	61	66% 26% 7%
45	XN	61	74% 23% 3%
46	QO	89	67% 30% 3%
46	XO	89	82% 15% 3%
47	QP	88	77% 15% 7%
47	XP	88	65% 27% 7%
48	QQ	105	78% 16% 6%
48	XQ	105	86% 9% 6%
49	QR	88	64% 14% 23%
49	XR	88	57% 19% 23%
50	QS	93	69% 19% 11%
50	XS	93	63% 26% 11%
51	QT	106	67% 23% 9%
51	XT	106	73% 18% 8%
52	QU	27	74% 11% 15%
52	XU	27	52% 30% 15%
53	QV	77	56% 29% 16%
53	XV	77	62% 29% 9%

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Mol	Chain	Length	Quality of chain
54	QX	25	
54	XX	25	
55	QY	360	
55	XY	360	

2 Entry composition [i](#)

There are 58 unique types of molecules in this entry. The entry contains 294739 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 23S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	RA	2867	Total	C	N	O	P	0	0	0
			61758	27491	11552	19850	2865			
1	YA	2867	Total	C	N	O	P	0	0	0
			61758	27491	11552	19850	2865			

- Molecule 2 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	RB	120	Total	C	N	O	P	0	0	0
			2572	1145	476	832	119			
2	YB	120	Total	C	N	O	P	0	0	0
			2573	1146	476	832	119			

- Molecule 3 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	RD	275	Total	C	N	O	S	0	0	0
			2131	1346	422	360	3			
3	YD	275	Total	C	N	O	S	0	0	0
			2136	1349	423	361	3			

- Molecule 4 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	RE	204	Total	C	N	O	S	0	0	0
			1559	985	298	270	6			
4	YE	204	Total	C	N	O	S	0	0	0
			1559	985	298	270	6			

- Molecule 5 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	RF	203	Total	C	N	O	S	0	0	1
			1584	1009	298	275	2			
5	YF	203	Total	C	N	O	S	0	0	1
			1580	1007	297	274	2			

- Molecule 6 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	RG	181	Total	C	N	O	S	0	0	0
			1426	916	253	253	4			
6	YG	181	Total	C	N	O	S	0	0	0
			1424	912	259	249	4			

- Molecule 7 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	RH	174	Total	C	N	O	S	0	0	0
			1330	845	248	236	1			
7	YH	173	Total	C	N	O	S	0	0	0
			1324	842	247	234	1			

- Molecule 8 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	RI	147	Total	C	N	O	S	0	0	0
			1094	699	191	203	1			
8	YI	146	Total	C	N	O	S	0	0	0
			1076	687	186	202	1			

- Molecule 9 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	RN	140	Total	C	N	O	S	0	0	0
			1121	722	208	187	4			
9	YN	140	Total	C	N	O	S	0	0	0
			1117	719	207	187	4			

- Molecule 10 is a protein called 50S ribosomal protein L14.

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

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

- Molecule 11 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
11	RP	149	1135	706	230	196	3	0	0	0
11	YP	149	1135	706	230	196	3	0	0	0

- Molecule 12 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
12	RQ	141	1122	715	212	188	7	0	0	0
12	YQ	141	1122	715	212	188	7	0	0	0

- Molecule 13 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
13	RR	118	968	604	203	160	1	0	0	0
13	YR	118	968	604	203	160	1	0	0	0

- Molecule 14 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
14	RS	110	877	553	175	149	0	0	0
14	YS	110	870	549	173	148	0	0	0

- Molecule 15 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
15	RT	131	1091	680	225	185	1	0	0	0
15	YT	131	1083	675	224	183	1	0	0	0

- Molecule 16 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
16	RU	116	Total	C	N	O	S	0	0	0
			959	608	201	149	1			
16	YU	116	Total	C	N	O	S	0	0	0
			959	608	201	149	1			

- Molecule 17 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
17	RV	101	Total	C	N	O	S	0	0	0
			775	498	141	135	1			
17	YV	101	Total	C	N	O	S	0	0	0
			771	495	140	135	1			

- Molecule 18 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
18	RW	112	Total	C	N	O	S	0	0	0
			886	557	174	153	2			
18	YW	112	Total	C	N	O	S	0	0	0
			886	557	174	153	2			

- Molecule 19 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
19	RX	95	Total	C	N	O	S	0	0	0
			750	488	135	126	1			
19	YX	95	Total	C	N	O	S	0	0	0
			750	488	135	126	1			

- Molecule 20 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
20	RY	107	Total	C	N	O	S	0	0	0
			810	520	153	131	6			
20	YY	107	Total	C	N	O	S	0	0	0
			810	519	153	132	6			

- Molecule 21 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
21	RZ	189	Total	C	N	O	S	0	0	0
			1485	946	265	272	2			
21	YZ	189	Total	C	N	O	S	0	0	0
			1469	938	259	270	2			

- Molecule 22 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
22	R0	77	Total	C	N	O	S	0	0	0
			608	375	129	103	1			
22	Y0	77	Total	C	N	O	S	0	0	0
			608	375	129	103	1			

- Molecule 23 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
23	R1	97	Total	C	N	O	S	0	0	0
			754	475	148	130	1			
23	Y1	97	Total	C	N	O	S	0	0	0
			759	478	149	131	1			

- Molecule 24 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
24	R2	70	Total	C	N	O	S	0	0	0
			588	365	118	103	2			
24	Y2	70	Total	C	N	O	S	0	0	0
			592	368	119	103	2			

- Molecule 25 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
25	R3	59	Total	C	N	O	0	0	0
			469	298	90	81			
25	Y3	59	Total	C	N	O	0	0	0
			464	296	90	78			

- Molecule 26 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	R4	69	Total	C	N	O	S	0	0	0
			546	346	96	99	5			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
26	Y4	69	Total	C	N	O	S	0	0	0
			536	342	98	91	5			

- Molecule 27 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
27	R5	59	Total	C	N	O	S	0	0	0
			459	288	90	76	5			
27	Y5	59	Total	C	N	O	S	0	0	0
			455	285	89	76	5			

- Molecule 28 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
28	R6	53	Total	C	N	O	S	0	0	0
			453	281	91	77	4			
28	Y6	53	Total	C	N	O	S	0	0	0
			449	279	91	75	4			

- Molecule 29 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
29	R7	48	Total	C	N	O	S	0	0	0
			418	257	104	55	2			
29	Y7	48	Total	C	N	O	S	0	0	0
			418	257	104	55	2			

- Molecule 30 is a protein called 50S ribosomal protein L35.

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

- Molecule 31 is a protein called 50S ribosomal protein L36.

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

- Molecule 32 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
32	QA	1500	Total	C	N	O	P	0	0	0
			32246	14358	5975	10413	1500			
32	XA	1504	Total	C	N	O	P	0	0	0
			32331	14396	5990	10441	1504			

- Molecule 33 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
33	QB	231	Total	C	N	O	S	0	0	0
			1842	1175	330	332	5			
33	XB	231	Total	C	N	O	S	0	0	0
			1825	1167	326	327	5			

- Molecule 34 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
34	QC	206	Total	C	N	O	S	0	0	0
			1558	979	305	273	1			
34	XC	206	Total	C	N	O	S	0	0	0
			1542	968	300	273	1			

- Molecule 35 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
35	QD	208	Total	C	N	O	S	0	0	0
			1665	1043	329	286	7			
35	XD	208	Total	C	N	O	S	0	0	0
			1668	1047	330	284	7			

- Molecule 36 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
36	QE	148	Total	C	N	O	S	0	0	0
			1133	716	214	199	4			
36	XE	148	Total	C	N	O	S	0	0	0
			1133	716	214	199	4			

- Molecule 37 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
37	QF	100	Total	C	N	O	S	0	0	0
			814	516	144	151	3			
37	XF	100	Total	C	N	O	S	0	0	0
			816	516	146	151	3			

- Molecule 38 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
38	QG	155	Total	C	N	O	S	0	0	0
			1235	769	244	216	6			
38	XG	155	Total	C	N	O	S	0	0	0
			1229	766	241	216	6			

- Molecule 39 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
39	QH	137	Total	C	N	O	S	0	0	0
			1098	694	210	192	2			
39	XH	137	Total	C	N	O	S	0	0	0
			1088	689	206	191	2			

- Molecule 40 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
40	QI	127	Total	C	N	O	0	0	0
			986	625	193	168			
40	XI	126	Total	C	N	O	0	0	0
			966	613	186	167			

- Molecule 41 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
41	QJ	97	Total	C	N	O	0	0	0
			719	446	142	131			
41	XJ	96	Total	C	N	O	0	0	0
			710	442	137	131			

- Molecule 42 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
42	QK	114	Total	C	N	O	S	0	0	0
			834	520	156	155	3			

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
42	XK	114	833	519	156	155	3	0	0	0

- Molecule 43 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
43	QL	122	932	586	185	159	2	0	0	0
43	XL	122	932	586	185	159	2	0	0	0

- Molecule 44 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
44	QM	116	914	564	189	159	2	0	0	0
44	XM	114	895	550	186	157	2	0	0	0

- Molecule 45 is a protein called 30S ribosomal protein S14 type Z.

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

- Molecule 46 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
46	QO	88	728	456	144	126	2	0	0	0
46	XO	88	728	456	144	126	2	0	0	0

- Molecule 47 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
47	QP	82	681	433	134	113	1	0	0	0
47	XP	82	677	430	133	113	1	0	0	0

- Molecule 48 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
48	QQ	99	Total	C	N	O	S	0	0	0
			823	528	151	142	2			
48	XQ	99	Total	C	N	O	S	0	0	0
			823	528	151	142	2			

- Molecule 49 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
49	QR	68	Total	C	N	O	0	0	0
			555	355	108	92			
49	XR	68	Total	C	N	O	0	0	0
			555	355	108	92			

- Molecule 50 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
50	QS	83	Total	C	N	O	S	0	0	0
			648	415	120	111	2			
50	XS	83	Total	C	N	O	S	0	0	0
			645	410	118	115	2			

- Molecule 51 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
51	QT	96	Total	C	N	O	S	0	0	0
			732	449	157	124	2			
51	XT	98	Total	C	N	O	S	0	0	0
			733	451	154	126	2			

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
52	QU	23	Total	C	N	O	0	0	0
			199	122	48	29			
52	XU	23	Total	C	N	O	0	0	0
			199	122	48	29			

- Molecule 53 is a RNA chain called P-site tRNA fMet.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	QV	77	Total	C	N	O	P	0	0	0
			1644	732	297	538	77			
53	XV	77	Total	C	N	O	P	0	0	0
			1644	732	297	538	77			

- Molecule 54 is a RNA chain called messenger RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	QX	10	Total	C	N	O	P	0	0	0
			215	97	42	66	10			
54	XX	9	Total	C	N	O	P	0	0	0
			193	87	37	60	9			

- Molecule 55 is a protein called Peptide chain release factor 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
55	QY	258	Total	C	N	O	S	0	0	0
			2014	1235	382	389	8			
55	XY	259	Total	C	N	O	S	0	0	0
			2023	1240	384	391	8			

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
56	RA	1039	Total	Mg	0	0
			1039	1039		
56	RB	27	Total	Mg	0	0
			27	27		
56	RD	15	Total	Mg	0	0
			15	15		
56	RE	8	Total	Mg	0	0
			8	8		
56	RF	12	Total	Mg	0	0
			12	12		
56	RG	4	Total	Mg	0	0
			4	4		
56	RH	1	Total	Mg	0	0
			1	1		
56	RN	2	Total	Mg	0	0
			2	2		
56	RO	1	Total	Mg	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
56	RP	1	Total Mg 1 1	0	0
56	RQ	6	Total Mg 6 6	0	0
56	RR	3	Total Mg 3 3	0	0
56	RT	2	Total Mg 2 2	0	0
56	RU	2	Total Mg 2 2	0	0
56	RV	4	Total Mg 4 4	0	0
56	RW	2	Total Mg 2 2	0	0
56	RX	1	Total Mg 1 1	0	0
56	RY	1	Total Mg 1 1	0	0
56	RZ	1	Total Mg 1 1	0	0
56	R0	4	Total Mg 4 4	0	0
56	R1	4	Total Mg 4 4	0	0
56	R3	2	Total Mg 2 2	0	0
56	R5	3	Total Mg 3 3	0	0
56	R7	2	Total Mg 2 2	0	0
56	R8	1	Total Mg 1 1	0	0
56	QA	256	Total Mg 256 256	0	0
56	QB	1	Total Mg 1 1	0	0
56	QD	3	Total Mg 3 3	0	0
56	QE	2	Total Mg 2 2	0	0
56	QF	1	Total Mg 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
56	QG	2	Total Mg 2 2	0	0
56	QH	1	Total Mg 1 1	0	0
56	QI	1	Total Mg 1 1	0	0
56	QL	2	Total Mg 2 2	0	0
56	QM	1	Total Mg 1 1	0	0
56	QN	2	Total Mg 2 2	0	0
56	QO	1	Total Mg 1 1	0	0
56	QQ	1	Total Mg 1 1	0	0
56	QR	1	Total Mg 1 1	0	0
56	QT	2	Total Mg 2 2	0	0
56	QV	6	Total Mg 6 6	0	0
56	YA	744	Total Mg 744 744	0	0
56	YB	18	Total Mg 18 18	0	0
56	YD	9	Total Mg 9 9	0	0
56	YE	5	Total Mg 5 5	0	0
56	YF	3	Total Mg 3 3	0	0
56	YG	2	Total Mg 2 2	0	0
56	YI	1	Total Mg 1 1	0	0
56	YN	1	Total Mg 1 1	0	0
56	YO	2	Total Mg 2 2	0	0
56	YP	1	Total Mg 1 1	0	0

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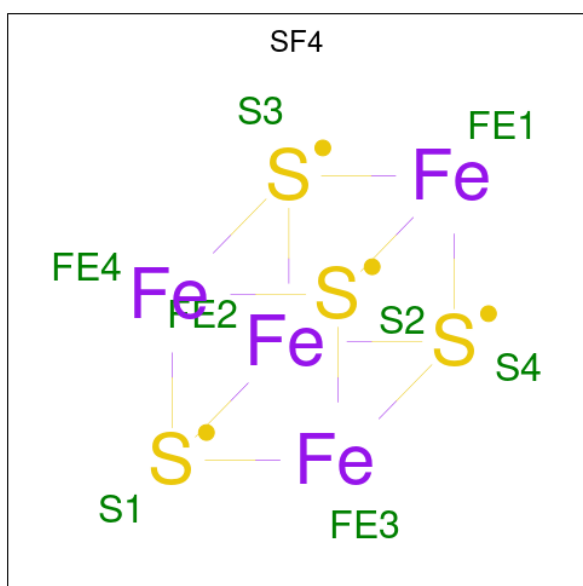
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
56	YQ	2	Total Mg 2 2	0	0
56	YR	1	Total Mg 1 1	0	0
56	YT	4	Total Mg 4 4	0	0
56	YV	1	Total Mg 1 1	0	0
56	YW	2	Total Mg 2 2	0	0
56	YX	1	Total Mg 1 1	0	0
56	Y0	1	Total Mg 1 1	0	0
56	Y1	1	Total Mg 1 1	0	0
56	Y5	1	Total Mg 1 1	0	0
56	Y7	2	Total Mg 2 2	0	0
56	Y8	2	Total Mg 2 2	0	0
56	XA	183	Total Mg 183 183	0	0
56	XE	1	Total Mg 1 1	0	0
56	XF	2	Total Mg 2 2	0	0
56	XJ	1	Total Mg 1 1	0	0
56	XK	1	Total Mg 1 1	0	0
56	XL	1	Total Mg 1 1	0	0
56	XR	1	Total Mg 1 1	0	0
56	XT	1	Total Mg 1 1	0	0
56	XV	4	Total Mg 4 4	0	0
56	XX	1	Total Mg 1 1	0	0

- Molecule 57 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
57	RY	1	Total Zn 1 1	0	0
57	R4	1	Total Zn 1 1	0	0
57	R5	1	Total Zn 1 1	0	0
57	R6	1	Total Zn 1 1	0	0
57	R9	1	Total Zn 1 1	0	0
57	QN	1	Total Zn 1 1	0	0
57	YY	1	Total Zn 1 1	0	0
57	Y4	1	Total Zn 1 1	0	0
57	Y5	1	Total Zn 1 1	0	0
57	Y6	1	Total Zn 1 1	0	0
57	Y9	1	Total Zn 1 1	0	0
57	XN	1	Total Zn 1 1	0	0

- Molecule 58 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄).



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

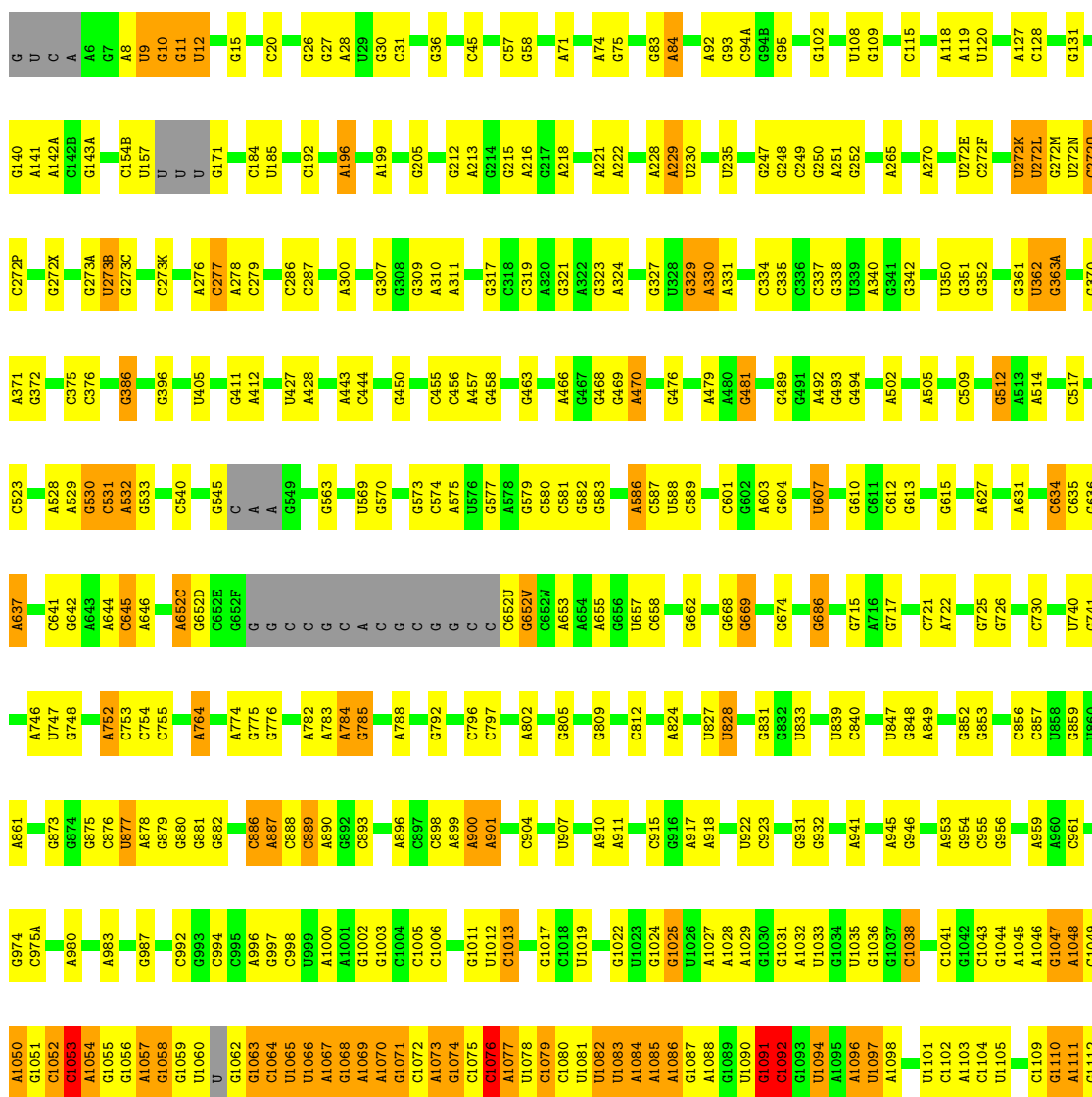
3 Residue-property plots [i](#)

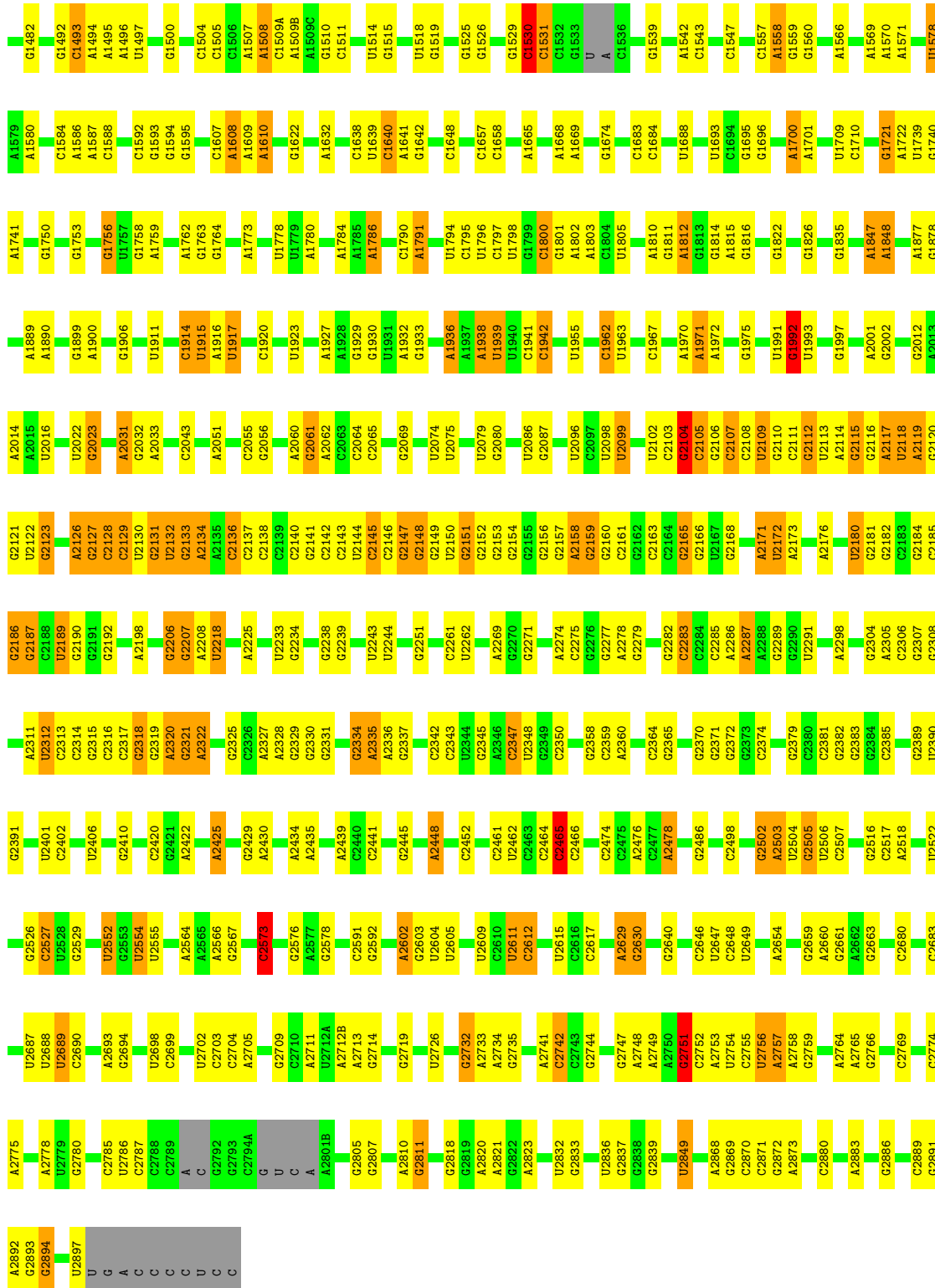
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded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

Note EDS failed to run properly.

- Molecule 1: 23S rRNA

Chain RA: 





• Molecule 2: 5S rRNA

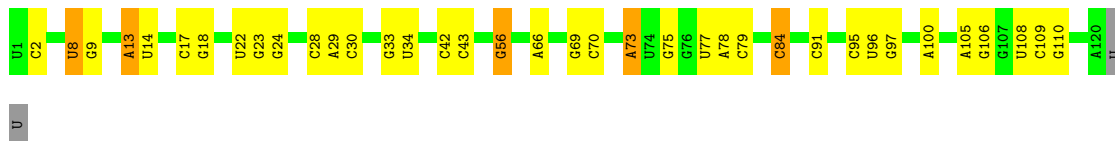
Chain RB:





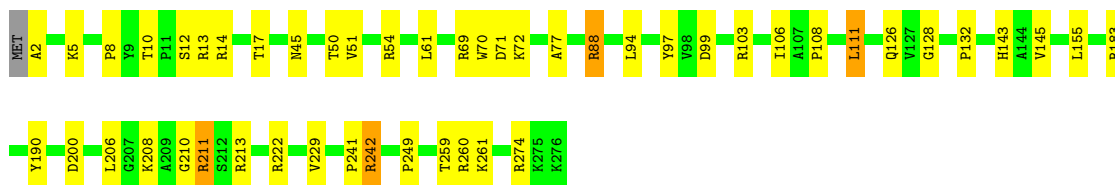
- Molecule 2: 5S rRNA

Chain YB: 68% 26%



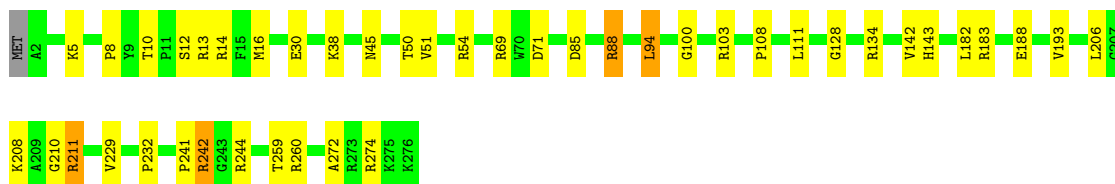
- Molecule 3: 50S ribosomal protein L2

Chain RD: 82% 16%



- Molecule 3: 50S ribosomal protein L2

Chain YD: 84% 14%



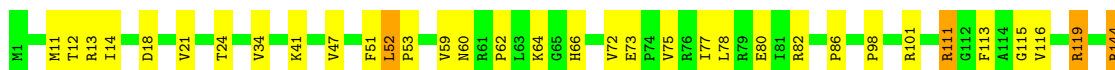
- Molecule 4: 50S ribosomal protein L3

Chain RE: 81% 16%



- Molecule 4: 50S ribosomal protein L3

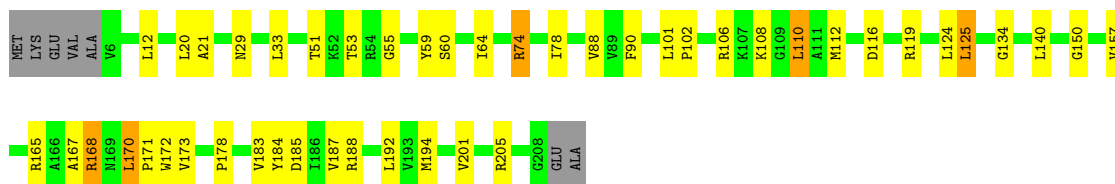
Chain YE: 78% 19%





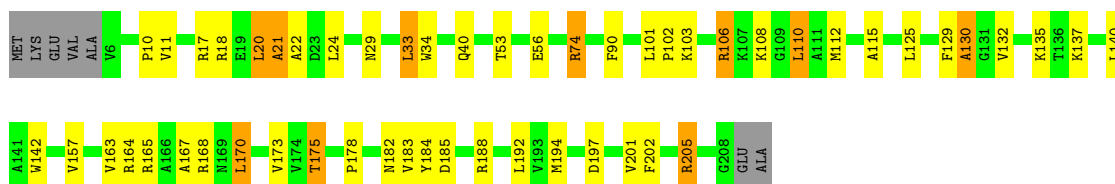
- Molecule 5: 50S ribosomal protein L4

Chain RF: 75% 20%



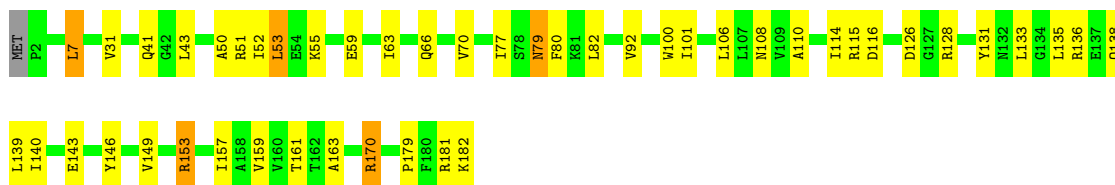
- Molecule 5: 50S ribosomal protein L4

Chain YF: 71% 20% 5%



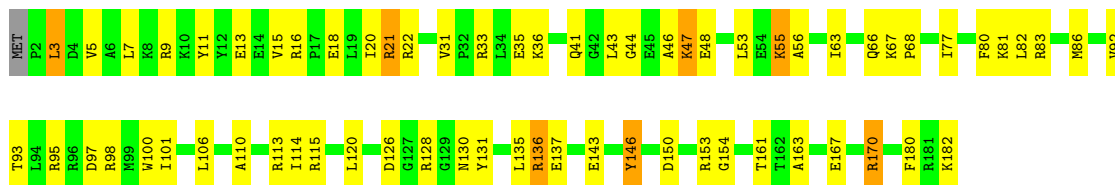
- Molecule 6: 50S ribosomal protein L5

Chain RG: 74% 23%



- Molecule 6: 50S ribosomal protein L5

Chain YG: 63% 32%



- Molecule 7: 50S ribosomal protein L6

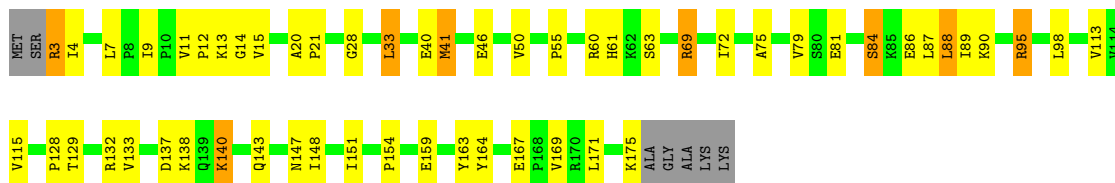
Chain RH: 79% 17%



GLY
ALA
LYS
LYS

- Molecule 7: 50S ribosomal protein L6

Chain YH: 66% 26%



- Molecule 8: 50S ribosomal protein L9

Chain RI: 78% 20%



- Molecule 8: 50S ribosomal protein L9

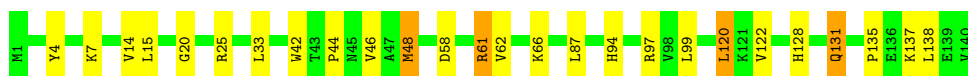
Chain YI: 78% 17%



GLN
GLU

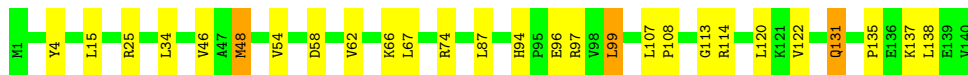
- Molecule 9: 50S ribosomal protein L13

Chain RN: 81% 16%



- Molecule 9: 50S ribosomal protein L13

Chain YN: 81% 17%




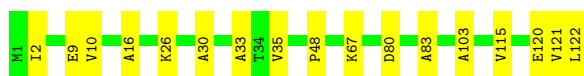
- Molecule 10: 50S ribosomal protein L14

Chain RO: 89% 11%




- Molecule 10: 50S ribosomal protein L14

Chain YO:  86% 14%




- Molecule 11: 50S ribosomal protein L15

Chain RP:  79% 19% ..




- Molecule 11: 50S ribosomal protein L15

Chain YP:  77% 21% ..




- Molecule 12: 50S ribosomal protein L16

Chain RQ:  79% 20% .




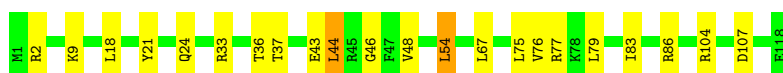
- Molecule 12: 50S ribosomal protein L16

Chain YQ:  79% 18% .




- Molecule 13: 50S ribosomal protein L17

Chain RR:  81% 17% .




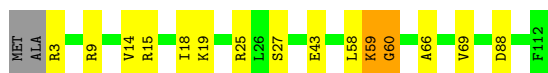
- Molecule 13: 50S ribosomal protein L17

Chain YR:  81% 19%




- Molecule 14: 50S ribosomal protein L18

Chain RS:  85% 12% ..



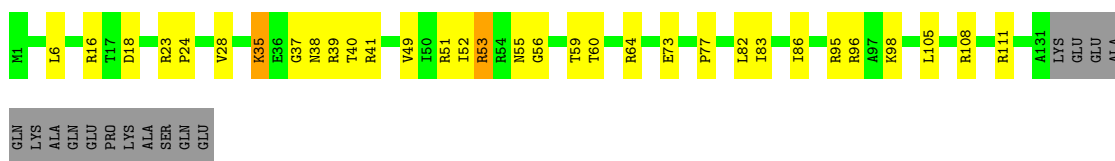
- Molecule 14: 50S ribosomal protein L18

Chain YS:  78% 20% ..




- Molecule 15: 50S ribosomal protein L19

Chain RT:  68% 21% • 10%




- Molecule 15: 50S ribosomal protein L19

Chain YT:  75% 14% • 10%




- Molecule 16: 50S ribosomal protein L20

Chain RU:  83% 14% ..




- Molecule 16: 50S ribosomal protein L20

Chain YU:  84% 14% ..

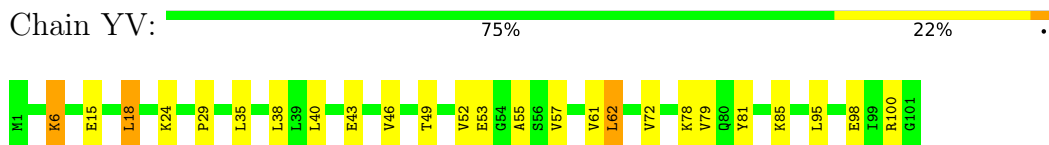


- Molecule 17: 50S ribosomal protein L21

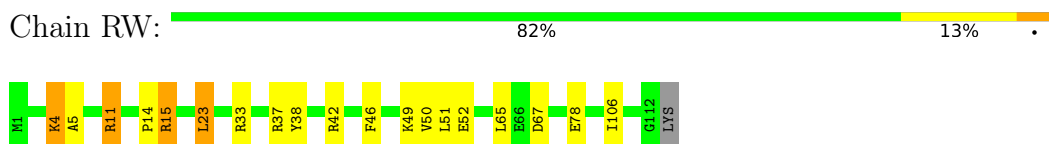
Chain RV:  89% 10% •



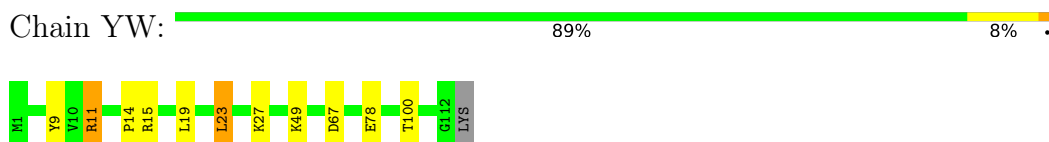
- Molecule 17: 50S ribosomal protein L21



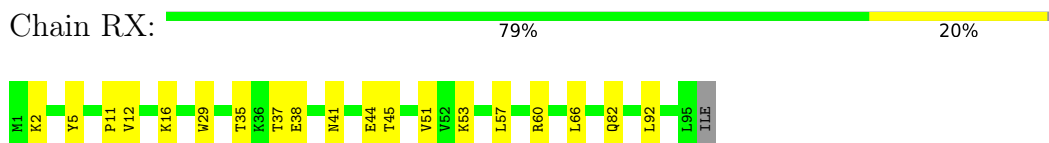
- Molecule 18: 50S ribosomal protein L22



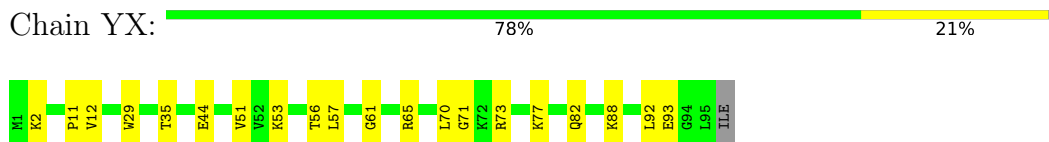
- Molecule 18: 50S ribosomal protein L22



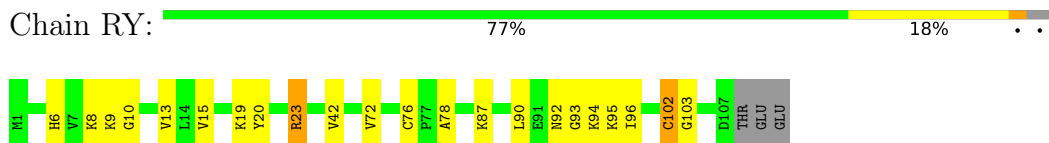
- Molecule 19: 50S ribosomal protein L23



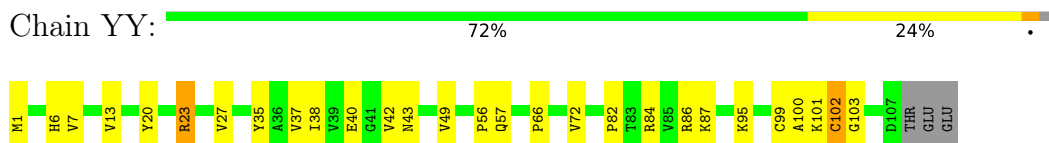
- Molecule 19: 50S ribosomal protein L23



- Molecule 20: 50S ribosomal protein L24



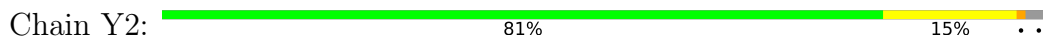
- Molecule 20: 50S ribosomal protein L24



- Molecule 21: 50S ribosomal protein L25



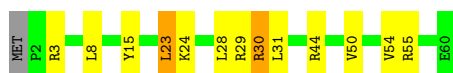
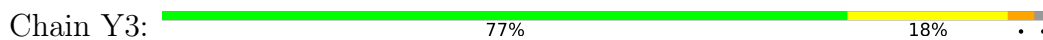
- Molecule 24: 50S ribosomal protein L29



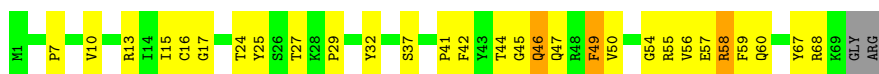
- Molecule 25: 50S ribosomal protein L30



- Molecule 25: 50S ribosomal protein L30



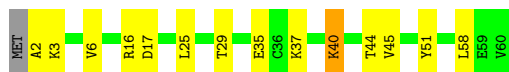
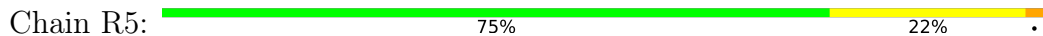
- Molecule 26: 50S ribosomal protein L31



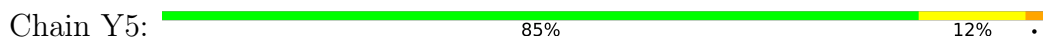
- Molecule 26: 50S ribosomal protein L31



- Molecule 27: 50S ribosomal protein L32

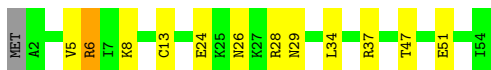
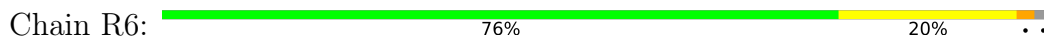


- Molecule 27: 50S ribosomal protein L32

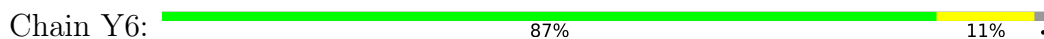




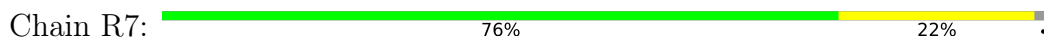
- Molecule 28: 50S ribosomal protein L33



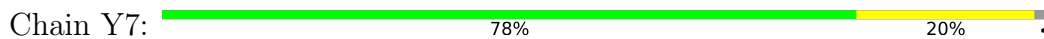
- Molecule 28: 50S ribosomal protein L33



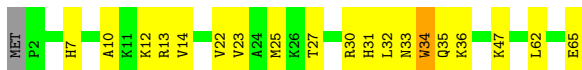
- Molecule 29: 50S ribosomal protein L34



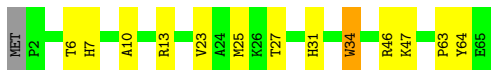
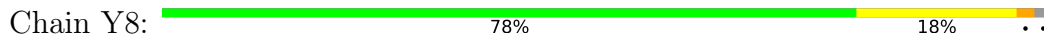
- Molecule 29: 50S ribosomal protein L34



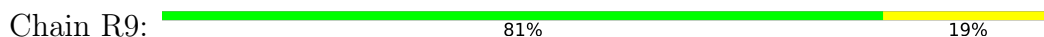
- Molecule 30: 50S ribosomal protein L35



- Molecule 30: 50S ribosomal protein L35

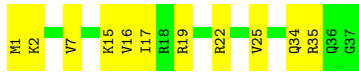


- Molecule 31: 50S ribosomal protein L36

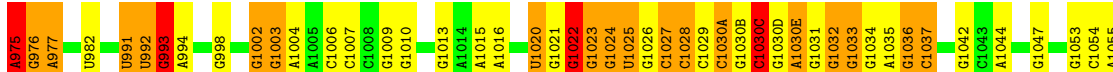
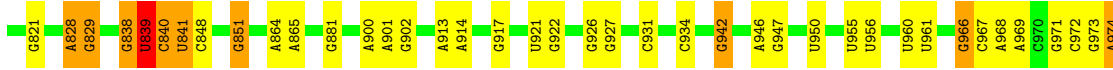
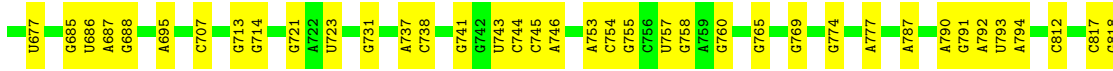
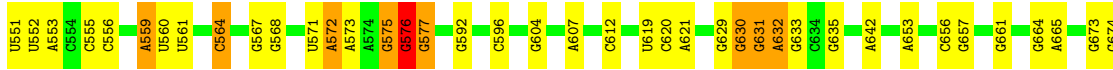
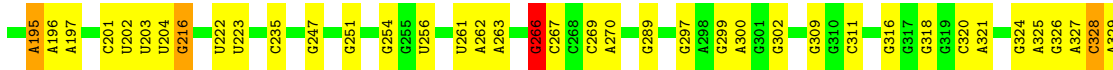
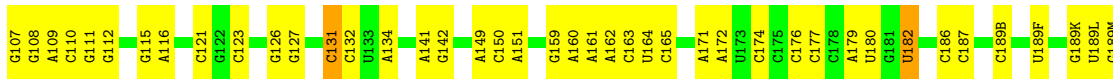
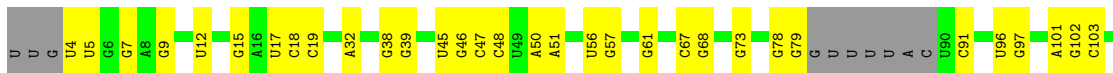


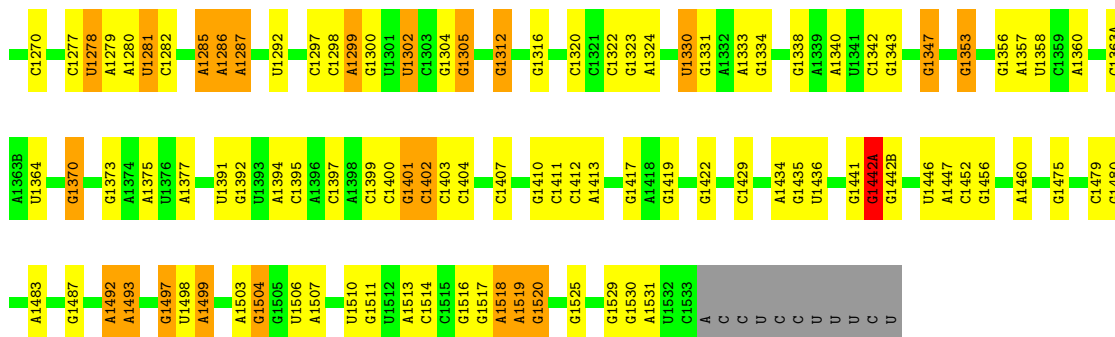


- Molecule 31: 50S ribosomal protein L36

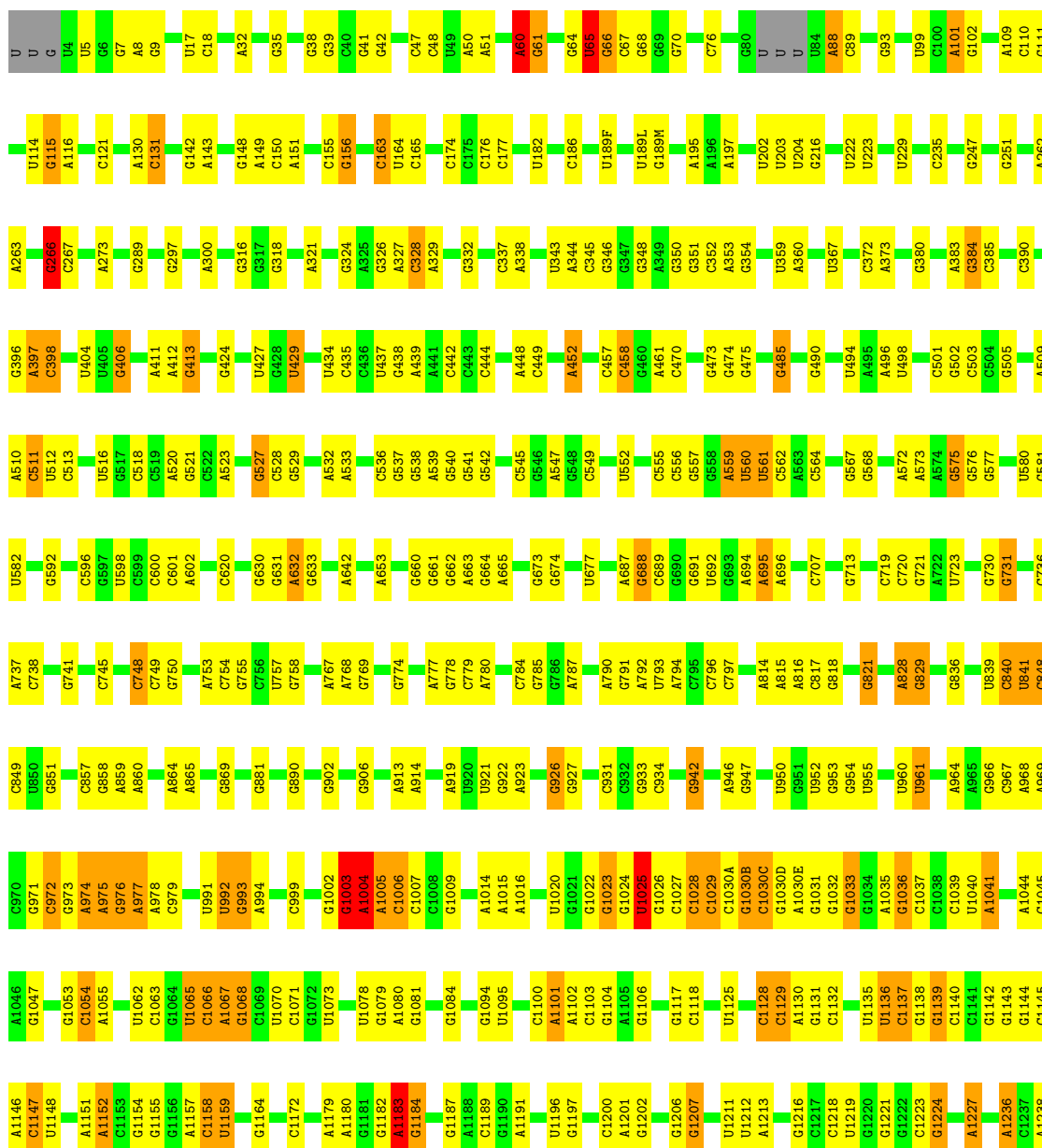


- Molecule 32: 16S rRNA

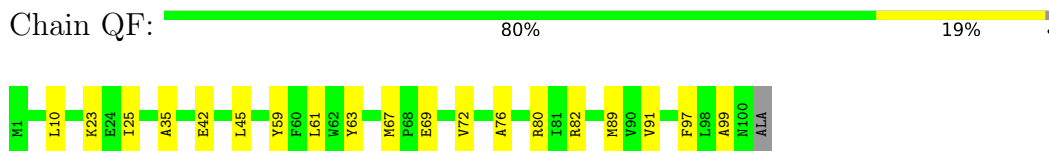




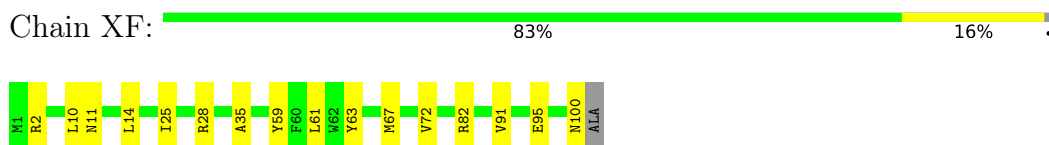
• Molecule 32: 16S rRNA



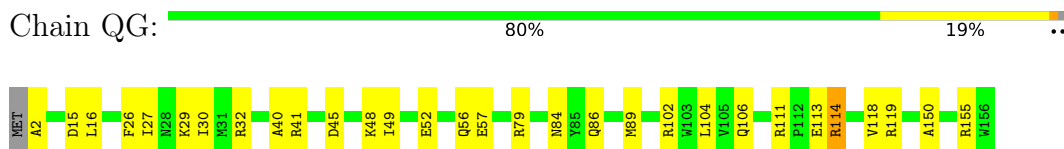
- Molecule 37: 30S ribosomal protein S6



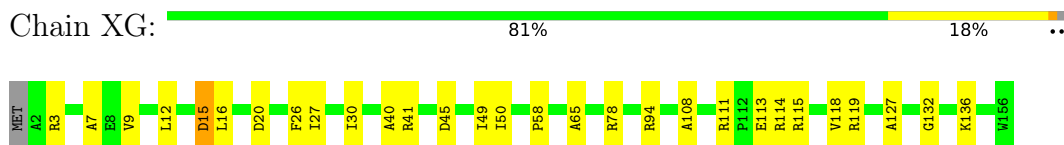
- Molecule 37: 30S ribosomal protein S6



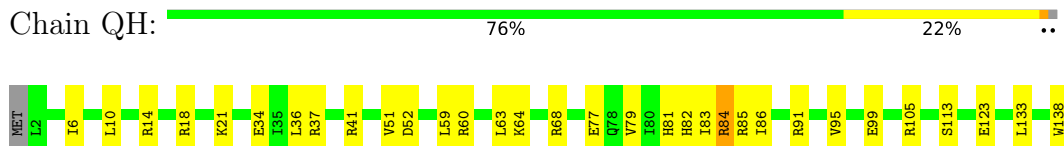
- Molecule 38: 30S ribosomal protein S7



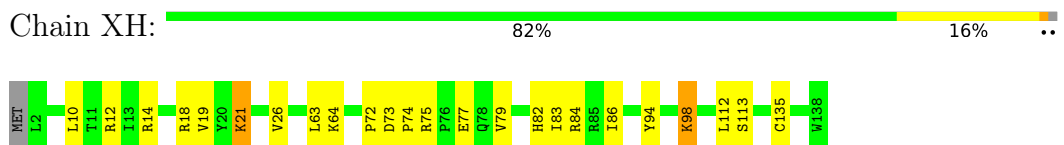
- Molecule 38: 30S ribosomal protein S7



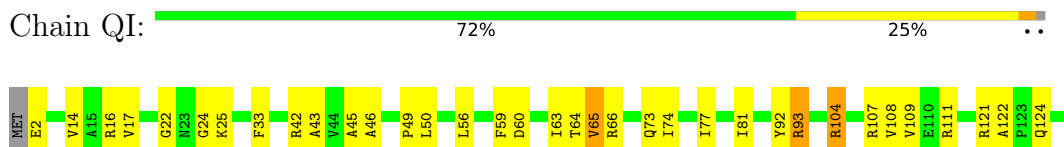
- Molecule 39: 30S ribosomal protein S8



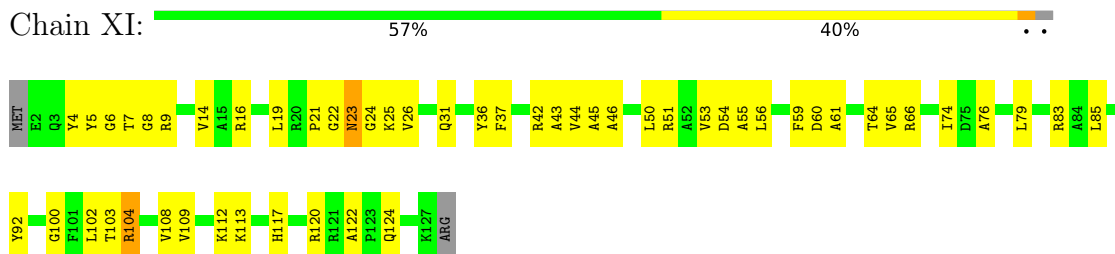
- Molecule 39: 30S ribosomal protein S8



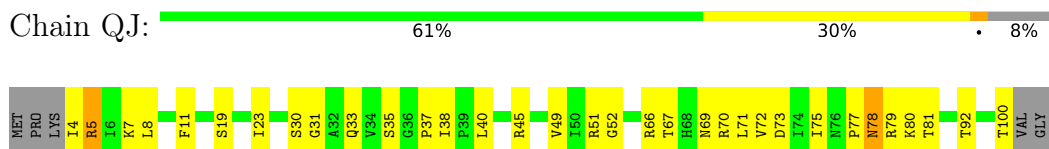
- Molecule 40: 30S ribosomal protein S9



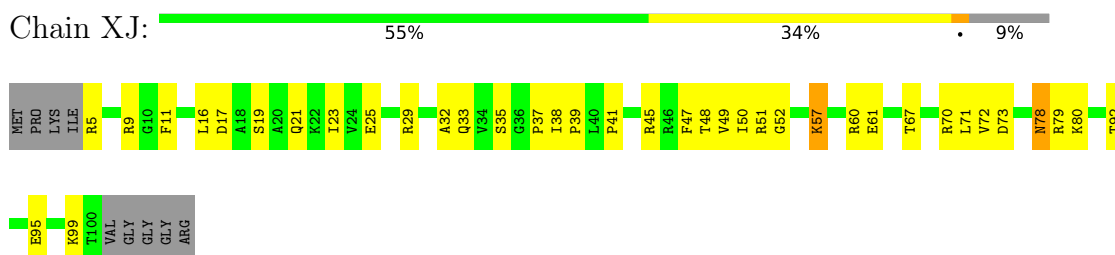
- Molecule 40: 30S ribosomal protein S9



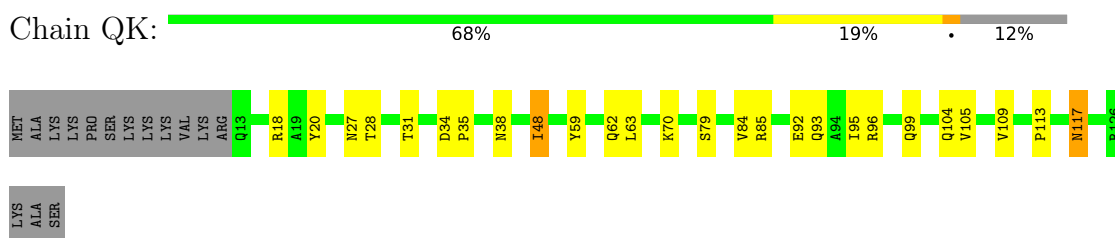
- Molecule 41: 30S ribosomal protein S10



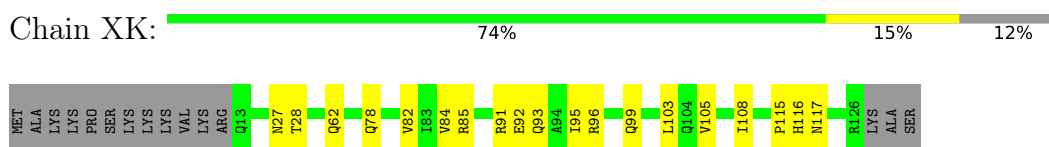
- Molecule 41: 30S ribosomal protein S10



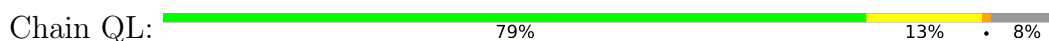
- Molecule 42: 30S ribosomal protein S11



- Molecule 42: 30S ribosomal protein S11



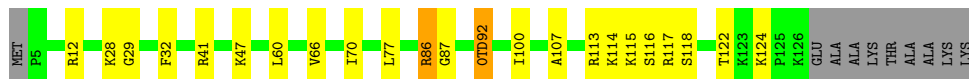
- Molecule 43: 30S ribosomal protein S12





- Molecule 43: 30S ribosomal protein S12

Chain XL: 75% 16% 8%



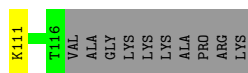
- Molecule 44: 30S ribosomal protein S13

Chain QM: 62% 29% 8%



- Molecule 44: 30S ribosomal protein S13

Chain XM: 63% 26% 10%



- Molecule 45: 30S ribosomal protein S14 type Z

Chain QN: 66% 26% 7%



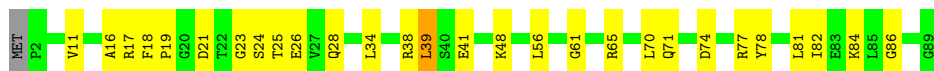
- Molecule 45: 30S ribosomal protein S14 type Z

Chain XN: 74% 23% 2%

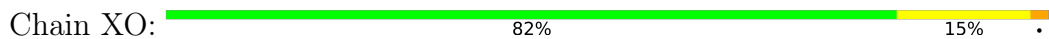


- Molecule 46: 30S ribosomal protein S15

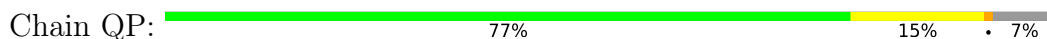
Chain QO: 67% 30% 2%



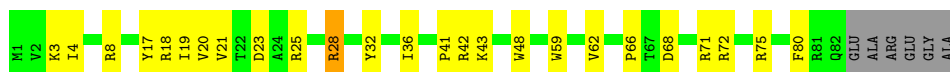
- Molecule 46: 30S ribosomal protein S15



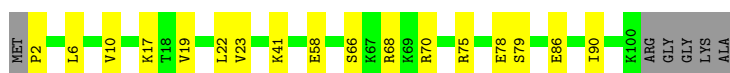
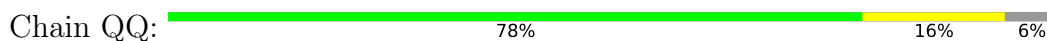
- Molecule 47: 30S ribosomal protein S16



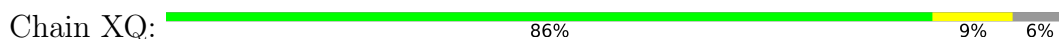
- Molecule 47: 30S ribosomal protein S16



- Molecule 48: 30S ribosomal protein S17



- Molecule 48: 30S ribosomal protein S17



- Molecule 49: 30S ribosomal protein S18

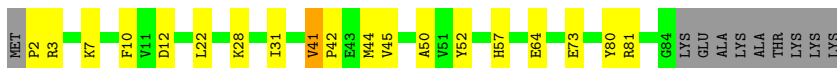


- Molecule 49: 30S ribosomal protein S18

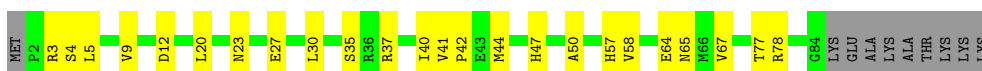




- Molecule 50: 30S ribosomal protein S19



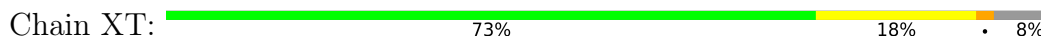
- Molecule 50: 30S ribosomal protein S19



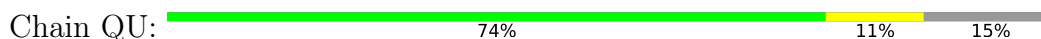
- Molecule 51: 30S ribosomal protein S20



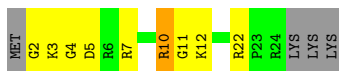
- Molecule 51: 30S ribosomal protein S20



- Molecule 52: 30S ribosomal protein Thx



- Molecule 52: 30S ribosomal protein Thx



- Molecule 53: P-site tRNA fMet



ASP	R137	V237	I344
ILE	Y138	N238	I345
GLU	T239	T240	Q352
THR	R145	D241	LEU
ALA	E153	S242	ALA
GLN	K160	A243	ALA
MET	E161	R261	LEU
MET	I162	S262	SER
LEU	I163	Q263	GLU
ASP	A164	H264	GLN
PRO	K165	K265	GLU
GLU	I166	N266	GLU
MET	S167	K267	
ARG	G170	L274	
GLU	G170	R286	
MET	ALA	R294	
ALA	GLN	D302	
GLN	ASP	R183	
ASP	GLU	R184	
GLU	LEU	V184	
LEU	LEU	Q185	
LEU	LEU	R186	
LEU	LEU	R187	
LEU	LEU	V187	
LEU	LEU	P188	
LEU	LEU	Q193	
LEU	LEU	G194	
LEU	LEU	R195	
LEU	LEU	I196	
LEU	LEU	H197	
LEU	LEU	T198	
LEU	LEU	S199	
LEU	LEU	A200	
LEU	LEU	E208	
LEU	LEU	L209	
LEU	LEU	P210	
LEU	LEU	D211	
LEU	LEU	A212	
LEU	LEU	E213	
LEU	LEU	L214	
LEU	LEU	P215	
LEU	LEU	D216	
LEU	LEU	I217	
LEU	LEU	L222	
LEU	LEU	R223	
LEU	LEU	L224	
LEU	LEU	D225	
LEU	LEU	T226	
LEU	LEU	F227	
LEU	LEU	R228	
LEU	LEU	S229	
LEU	LEU	G233	
LEU	LEU	R133	
LEU	LEU	M134	
LEU	LEU	Q94	
LEU	LEU	L101	
LEU	LEU	P102	
LEU	LEU	K103	
LEU	LEU	D104	
LEU	LEU	P105	
LEU	LEU	D106	
LEU	LEU	D107	
LEU	LEU	E108	
LEU	LEU	R109	
LEU	LEU	E114	
LEU	LEU	V115	
LEU	LEU	R116	
LEU	LEU	T119	
LEU	LEU	G120	
LEU	LEU	G121	
LEU	LEU	D122	
LEU	LEU	E123	
LEU	LEU	G129	
LEU	LEU	R133	
LEU	LEU	M134	

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, α , β , γ	210.03Å 449.71Å 620.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.81 – 3.20	Depositor
% Data completeness (in resolution range)	99.9 (49.81-3.20)	Depositor
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.39 (at 3.19Å)	Xtrriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.214 , 0.244	Depositor
Wilson B-factor (Å ²)	93.8	Xtrriage
Anisotropy	0.251	Xtrriage
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	294739	wwPDB-VP
Average B, all atoms (Å ²)	117.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.59% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 7MG, 2MU, 4OC, 5MU, ZN, 2MG, 0TD, MEQ, MA6, PSU, MG, OMG, SF4, 5MC, UR3, 2MA, M2G

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	RA	0.26	0/68901	0.85	52/107544 (0.0%)
1	YA	0.30	4/68901 (0.0%)	0.87	72/107544 (0.1%)
2	RB	0.25	0/2876	0.83	0/4486
2	YB	0.27	0/2878	0.84	0/4490
3	RD	0.30	0/2181	0.54	0/2940
3	YD	0.30	0/2186	0.56	0/2944
4	RE	0.29	0/1592	0.53	0/2149
4	YE	0.31	0/1592	0.57	1/2149 (0.0%)
5	RF	0.28	0/1619	0.52	0/2193
5	YF	0.30	0/1615	0.53	0/2188
6	RG	0.28	0/1451	0.53	0/1961
6	YG	0.29	0/1449	0.52	0/1957
7	RH	0.28	0/1356	0.50	0/1834
7	YH	0.29	0/1350	0.56	2/1826 (0.1%)
8	RI	0.27	0/1109	0.54	0/1512
8	YI	0.27	0/1091	0.55	1/1490 (0.1%)
9	RN	0.28	0/1148	0.51	0/1547
9	YN	0.28	0/1144	0.50	0/1543
10	RO	0.29	0/943	0.55	0/1269
10	YO	0.29	0/943	0.55	0/1269
11	RP	0.28	0/1152	0.56	0/1533
11	YP	0.28	0/1152	0.56	0/1533
12	RQ	0.30	0/1143	0.52	0/1527
12	YQ	0.29	0/1143	0.51	0/1527
13	RR	0.27	0/982	0.54	0/1312
13	YR	0.27	0/982	0.53	0/1312
14	RS	0.27	0/887	0.52	0/1180
14	YS	0.29	0/880	0.52	0/1172
15	RT	0.29	0/1105	0.58	0/1477
15	YT	0.28	0/1097	0.55	0/1468
16	RU	0.29	0/977	0.45	0/1301

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
16	YU	0.30	0/977	0.46	0/1301
17	RV	0.28	0/786	0.52	0/1053
17	YV	0.32	0/782	0.57	0/1049
18	RW	0.27	0/897	0.48	0/1205
18	YW	0.28	0/897	0.50	0/1205
19	RX	0.30	0/764	0.53	0/1025
19	YX	0.30	0/764	0.53	0/1025
20	RY	0.29	0/823	0.55	0/1099
20	YY	0.33	0/823	0.55	0/1100
21	RZ	0.31	0/1517	0.53	0/2062
21	YZ	0.28	0/1501	0.52	0/2043
22	R0	0.28	0/616	0.53	0/821
22	Y0	0.27	0/616	0.55	0/821
23	R1	0.27	0/761	0.53	0/1013
23	Y1	0.28	0/766	0.56	0/1018
24	R2	0.29	0/590	0.51	0/781
24	Y2	0.26	0/594	0.46	0/785
25	R3	0.28	0/474	0.51	0/635
25	Y3	0.29	0/469	0.54	0/630
26	R4	0.32	0/559	0.66	0/754
26	Y4	0.37	0/549	0.63	0/741
27	R5	0.33	0/473	0.54	0/639
27	Y5	0.32	0/469	0.54	0/635
28	R6	0.28	0/460	0.53	0/613
28	Y6	0.23	0/456	0.46	0/608
29	R7	0.26	0/426	0.49	0/561
29	Y7	0.26	0/426	0.45	0/561
30	R8	0.29	0/525	0.52	0/691
30	Y8	0.28	0/525	0.51	0/691
31	R9	0.23	0/310	0.47	0/407
31	Y9	0.26	0/310	0.51	0/407
32	QA	0.26	0/35795	0.86	38/55864 (0.1%)
32	XA	0.26	0/35890	0.85	30/56012 (0.1%)
33	QB	0.28	0/1876	0.54	0/2533
33	XB	0.30	0/1860	0.57	0/2518
34	QC	0.27	0/1582	0.52	0/2137
34	XC	0.28	0/1566	0.52	0/2119
35	QD	0.28	0/1695	0.50	0/2274
35	XD	0.27	0/1698	0.47	0/2277
36	QE	0.30	0/1149	0.52	0/1548
36	XE	0.28	0/1149	0.51	0/1548
37	QF	0.26	0/827	0.51	0/1120
37	XF	0.26	0/829	0.52	0/1123

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
38	QG	0.27	0/1254	0.43	0/1683
38	XG	0.27	0/1248	0.45	0/1676
39	QH	0.27	0/1118	0.50	0/1506
39	XH	0.28	0/1108	0.51	0/1494
40	QI	0.28	0/1005	0.53	0/1351
40	XI	0.28	0/985	0.52	0/1329
41	QJ	0.26	0/732	0.51	0/993
41	XJ	0.26	0/723	0.51	0/984
42	QK	0.26	0/849	0.48	0/1150
42	XK	0.26	0/848	0.53	0/1149
43	QL	0.28	0/937	0.54	0/1260
43	XL	0.29	0/937	0.59	0/1260
44	QM	0.26	0/924	0.52	0/1242
44	XM	0.26	0/905	0.50	0/1217
45	QN	0.28	0/501	0.44	0/664
45	XN	0.29	0/501	0.46	0/664
46	QO	0.26	0/739	0.48	0/985
46	XO	0.26	0/739	0.49	0/985
47	QP	0.28	0/697	0.51	0/939
47	XP	0.28	0/693	0.50	0/935
48	QQ	0.26	0/836	0.50	0/1117
48	XQ	0.26	0/836	0.50	0/1117
49	QR	0.26	0/560	0.51	0/746
49	XR	0.26	0/560	0.51	0/746
50	QS	0.27	0/663	0.57	0/895
50	XS	0.27	0/660	0.55	0/893
51	QT	0.27	0/734	0.48	0/969
51	XT	0.27	0/736	0.42	0/976
52	QU	0.25	0/203	0.52	0/266
52	XU	0.30	0/203	0.52	0/266
53	QV	0.33	1/1836 (0.1%)	0.82	0/2859
53	XV	0.34	1/1836 (0.1%)	0.82	0/2859
54	QX	0.33	0/241	0.95	0/373
54	XX	0.27	0/216	0.89	0/334
55	QY	0.31	0/2035	0.51	0/2742
55	XY	0.29	0/2044	0.51	0/2754
All	All	0.28	6/316288 (0.0%)	0.78	196/472607 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
14	RS	0	1
26	R4	0	1
33	QB	0	1
43	XL	0	1
All	All	0	4

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	XV	1	C	OP3-P	-10.46	1.48	1.61
53	QV	1	C	OP3-P	-10.44	1.48	1.61
1	YA	2751	G	N1-C2	-8.70	1.30	1.37
1	YA	2751	G	C2-N3	-6.96	1.27	1.32
1	YA	1029	A	N3-C4	-5.78	1.31	1.34

The worst 5 of 196 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	YA	1029	A	N1-C2-N3	12.53	135.56	129.30
32	QA	576	G	OP1-P-O3'	-11.19	80.59	105.20
1	RA	2602	A	OP2-P-O3'	-11.18	80.60	105.20
32	QA	576	G	OP2-P-O3'	-10.40	82.31	105.20
1	RA	1050	A	N1-C2-N3	10.32	134.46	129.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
33	QB	231	GLU	Peptide
26	R4	67	TYR	Peptide
14	RS	58	LEU	Peptide
43	XL	86	ARG	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.

Continued on next page...

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	RA	61758	0	31145	564	0
1	YA	61758	0	31148	595	1
2	RB	2572	0	1305	8	0
2	YB	2573	0	1306	23	0
3	RD	2131	0	2207	42	0
3	YD	2136	0	2218	37	0
4	RE	1559	0	1618	27	0
4	YE	1559	0	1618	30	0
5	RF	1584	0	1625	31	0
5	YF	1580	0	1619	42	0
6	RG	1426	0	1445	34	0
6	YG	1424	0	1441	45	0
7	RH	1330	0	1407	24	0
7	YH	1324	0	1402	36	0
8	RI	1094	0	1127	23	0
8	YI	1076	0	1094	21	0
9	RN	1121	0	1195	14	0
9	YN	1117	0	1184	21	0
10	RO	933	0	996	9	0
10	YO	933	0	996	10	0
11	RP	1135	0	1212	25	0
11	YP	1135	0	1212	32	0
12	RQ	1122	0	1179	22	0
12	YQ	1122	0	1179	20	0
13	RR	968	0	1033	15	0
13	YR	968	0	1033	11	0
14	RS	877	0	938	9	0
14	YS	870	0	923	14	0
15	RT	1091	0	1151	21	0
15	YT	1083	0	1136	19	0
16	RU	959	0	1019	12	0
16	YU	959	0	1019	13	0
17	RV	775	0	841	7	0
17	YV	771	0	830	15	0
18	RW	886	0	940	13	0
18	YW	886	0	940	8	0
19	RX	750	0	814	17	0
19	YX	750	0	814	12	0
20	RY	810	0	892	14	0
20	YY	810	0	888	18	0
21	RZ	1485	0	1493	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
21	YZ	1469	0	1467	26	0
22	R0	608	0	622	10	0
22	Y0	608	0	622	14	0
23	R1	754	0	823	10	0
23	Y1	759	0	837	20	0
24	R2	588	0	643	5	1
24	Y2	592	0	654	7	0
25	R3	469	0	518	4	0
25	Y3	464	0	514	7	0
26	R4	546	0	522	26	0
26	Y4	536	0	514	28	0
27	R5	459	0	476	11	0
27	Y5	455	0	465	7	0
28	R6	453	0	473	14	0
28	Y6	449	0	469	4	0
29	R7	418	0	467	13	0
29	Y7	418	0	467	8	0
30	R8	517	0	582	21	0
30	Y8	517	0	582	17	0
31	R9	307	0	335	9	0
31	Y9	307	0	335	15	0
32	QA	32246	0	16294	310	0
32	XA	32331	0	16338	344	0
33	QB	1842	0	1862	55	0
33	XB	1825	0	1828	57	0
34	QC	1558	0	1557	30	0
34	XC	1542	0	1517	38	0
35	QD	1665	0	1688	42	0
35	XD	1668	0	1704	39	0
36	QE	1133	0	1191	31	0
36	XE	1133	0	1191	24	0
37	QF	814	0	808	14	0
37	XF	816	0	808	11	0
38	QG	1235	0	1249	20	0
38	XG	1229	0	1238	16	0
39	QH	1098	0	1143	26	0
39	XH	1088	0	1126	14	0
40	QI	986	0	990	28	0
40	XI	966	0	953	37	0
41	QJ	719	0	672	22	0
41	XJ	710	0	661	30	0
42	QK	834	0	838	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
42	XK	833	0	836	12	0
43	QL	932	0	980	14	0
43	XL	932	0	981	20	0
44	QM	914	0	954	30	0
44	XM	895	0	920	24	0
45	QN	492	0	529	19	0
45	XN	492	0	529	19	0
46	QO	728	0	760	17	0
46	XO	728	0	760	9	0
47	QP	681	0	697	11	0
47	XP	677	0	686	19	0
48	QQ	823	0	891	12	0
48	XQ	823	0	891	7	0
49	QR	555	0	618	11	0
49	XR	555	0	618	14	0
50	QS	648	0	658	16	0
50	XS	645	0	635	27	0
51	QT	732	0	809	16	0
51	XT	733	0	795	15	0
52	QU	199	0	208	2	0
52	XU	199	0	208	7	0
53	QV	1644	0	835	23	0
53	XV	1644	0	836	15	0
54	QX	215	0	109	1	0
54	XX	193	0	97	5	0
55	QY	2014	0	1981	60	0
55	XY	2023	0	1988	78	0
56	QA	256	0	0	0	0
56	QB	1	0	0	0	0
56	QD	3	0	0	0	0
56	QE	2	0	0	0	0
56	QF	1	0	0	0	0
56	QG	2	0	0	0	0
56	QH	1	0	0	0	0
56	QI	1	0	0	0	0
56	QL	2	0	0	0	0
56	QM	1	0	0	0	0
56	QN	2	0	0	0	0
56	QO	1	0	0	0	0
56	QQ	1	0	0	0	0
56	QR	1	0	0	0	0
56	QT	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	QV	6	0	0	0	0
56	R0	4	0	0	0	0
56	R1	4	0	0	0	0
56	R3	2	0	0	0	0
56	R5	3	0	0	0	0
56	R7	2	0	0	0	0
56	R8	1	0	0	0	0
56	RA	1039	0	0	0	0
56	RB	27	0	0	0	0
56	RD	15	0	0	0	0
56	RE	8	0	0	0	0
56	RF	12	0	0	0	0
56	RG	4	0	0	0	0
56	RH	1	0	0	0	0
56	RN	2	0	0	0	0
56	RO	1	0	0	0	0
56	RP	1	0	0	0	0
56	RQ	6	0	0	0	0
56	RR	3	0	0	0	0
56	RT	2	0	0	0	0
56	RU	2	0	0	0	0
56	RV	4	0	0	0	0
56	RW	2	0	0	0	0
56	RX	1	0	0	0	0
56	RY	1	0	0	0	0
56	RZ	1	0	0	0	0
56	XA	183	0	0	0	0
56	XE	1	0	0	0	0
56	XF	2	0	0	0	0
56	XJ	1	0	0	0	0
56	XK	1	0	0	0	0
56	XL	1	0	0	0	0
56	XR	1	0	0	0	0
56	XT	1	0	0	0	0
56	XV	4	0	0	0	0
56	XX	1	0	0	0	0
56	Y0	1	0	0	0	0
56	Y1	1	0	0	0	0
56	Y5	1	0	0	0	0
56	Y7	2	0	0	0	0
56	Y8	2	0	0	0	0
56	YA	744	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	YB	18	0	0	0	0
56	YD	9	0	0	0	0
56	YE	5	0	0	0	0
56	YF	3	0	0	0	0
56	YG	2	0	0	0	0
56	YI	1	0	0	0	0
56	YN	1	0	0	0	0
56	YO	2	0	0	0	0
56	YP	1	0	0	0	0
56	YQ	2	0	0	0	0
56	YR	1	0	0	0	0
56	YT	4	0	0	0	0
56	YV	1	0	0	0	0
56	YW	2	0	0	0	0
56	YX	1	0	0	0	0
57	QN	1	0	0	0	0
57	R4	1	0	0	0	0
57	R5	1	0	0	0	0
57	R6	1	0	0	0	0
57	R9	1	0	0	0	0
57	RY	1	0	0	0	0
57	XN	1	0	0	0	0
57	Y4	1	0	0	0	0
57	Y5	1	0	0	0	0
57	Y6	1	0	0	0	0
57	Y9	1	0	0	0	0
57	YY	1	0	0	0	0
58	QD	8	0	0	0	0
58	XD	8	0	0	0	0
All	All	294739	0	198434	3343	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 7.

The worst 5 of 3343 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)
1:YA:2552:2MU:C4	1:YA:2552:2MU:C5	1.80	1.59
1:RA:2552:2MU:C5	1:RA:2552:2MU:C4	1.80	1.58
32:XA:1003:G:H2'	32:XA:1004:A:H4'	1.32	1.08
1:YA:1029:A:N6	1:YA:1125:G:O2'	1.87	1.06

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:Y4:59:PHE:HA	26:Y4:61:ARG:N	1.76	1.00

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)
24:R2:46:GLN:OE1	1:YA:277:C:O2'[3_555]	2.14	0.06

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	
3	RD	273/276 (99%)	261 (96%)	12 (4%)	0	100	100
3	YD	273/276 (99%)	262 (96%)	11 (4%)	0	100	100
4	RE	202/206 (98%)	195 (96%)	6 (3%)	1 (0%)	29	67
4	YE	202/206 (98%)	195 (96%)	7 (4%)	0	100	100
5	RF	201/210 (96%)	197 (98%)	4 (2%)	0	100	100
5	YF	201/210 (96%)	196 (98%)	3 (2%)	2 (1%)	15	54
6	RG	179/182 (98%)	166 (93%)	12 (7%)	1 (1%)	25	64
6	YG	179/182 (98%)	170 (95%)	8 (4%)	1 (1%)	25	64
7	RH	172/180 (96%)	167 (97%)	5 (3%)	0	100	100
7	YH	171/180 (95%)	164 (96%)	7 (4%)	0	100	100
8	RI	145/148 (98%)	135 (93%)	10 (7%)	0	100	100
8	YI	144/148 (97%)	137 (95%)	7 (5%)	0	100	100
9	RN	138/140 (99%)	136 (99%)	2 (1%)	0	100	100
9	YN	138/140 (99%)	136 (99%)	2 (1%)	0	100	100
10	RO	120/122 (98%)	114 (95%)	6 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	YO	120/122 (98%)	114 (95%)	6 (5%)	0	100	100
11	RP	147/150 (98%)	142 (97%)	4 (3%)	1 (1%)	22	61
11	YP	147/150 (98%)	142 (97%)	4 (3%)	1 (1%)	22	61
12	RQ	139/141 (99%)	136 (98%)	3 (2%)	0	100	100
12	YQ	139/141 (99%)	136 (98%)	3 (2%)	0	100	100
13	RR	116/118 (98%)	114 (98%)	2 (2%)	0	100	100
13	YR	116/118 (98%)	114 (98%)	2 (2%)	0	100	100
14	RS	108/112 (96%)	104 (96%)	3 (3%)	1 (1%)	17	56
14	YS	108/112 (96%)	105 (97%)	3 (3%)	0	100	100
15	RT	129/146 (88%)	124 (96%)	5 (4%)	0	100	100
15	YT	129/146 (88%)	125 (97%)	4 (3%)	0	100	100
16	RU	114/118 (97%)	113 (99%)	1 (1%)	0	100	100
16	YU	114/118 (97%)	114 (100%)	0	0	100	100
17	RV	99/101 (98%)	96 (97%)	2 (2%)	1 (1%)	15	54
17	YV	99/101 (98%)	96 (97%)	2 (2%)	1 (1%)	15	54
18	RW	110/113 (97%)	109 (99%)	1 (1%)	0	100	100
18	YW	110/113 (97%)	109 (99%)	1 (1%)	0	100	100
19	RX	93/96 (97%)	92 (99%)	1 (1%)	0	100	100
19	YX	93/96 (97%)	92 (99%)	1 (1%)	0	100	100
20	RY	105/110 (96%)	99 (94%)	6 (6%)	0	100	100
20	YY	105/110 (96%)	102 (97%)	3 (3%)	0	100	100
21	RZ	187/206 (91%)	182 (97%)	5 (3%)	0	100	100
21	YZ	187/206 (91%)	181 (97%)	6 (3%)	0	100	100
22	R0	75/85 (88%)	73 (97%)	2 (3%)	0	100	100
22	Y0	75/85 (88%)	73 (97%)	2 (3%)	0	100	100
23	R1	95/98 (97%)	94 (99%)	0	1 (1%)	14	51
23	Y1	95/98 (97%)	93 (98%)	1 (1%)	1 (1%)	14	51
24	R2	68/72 (94%)	67 (98%)	1 (2%)	0	100	100
24	Y2	68/72 (94%)	67 (98%)	1 (2%)	0	100	100
25	R3	57/60 (95%)	55 (96%)	2 (4%)	0	100	100
25	Y3	57/60 (95%)	55 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	R4	67/71 (94%)	56 (84%)	7 (10%)	4 (6%)	1	12
26	Y4	67/71 (94%)	55 (82%)	9 (13%)	3 (4%)	2	18
27	R5	57/60 (95%)	55 (96%)	2 (4%)	0	100	100
27	Y5	57/60 (95%)	56 (98%)	1 (2%)	0	100	100
28	R6	51/54 (94%)	49 (96%)	2 (4%)	0	100	100
28	Y6	51/54 (94%)	49 (96%)	2 (4%)	0	100	100
29	R7	46/49 (94%)	46 (100%)	0	0	100	100
29	Y7	46/49 (94%)	46 (100%)	0	0	100	100
30	R8	62/65 (95%)	62 (100%)	0	0	100	100
30	Y8	62/65 (95%)	62 (100%)	0	0	100	100
31	R9	35/37 (95%)	35 (100%)	0	0	100	100
31	Y9	35/37 (95%)	35 (100%)	0	0	100	100
33	QB	229/256 (90%)	201 (88%)	24 (10%)	4 (2%)	9	42
33	XB	229/256 (90%)	205 (90%)	19 (8%)	5 (2%)	6	35
34	QC	204/239 (85%)	190 (93%)	14 (7%)	0	100	100
34	XC	204/239 (85%)	189 (93%)	15 (7%)	0	100	100
35	QD	206/209 (99%)	197 (96%)	9 (4%)	0	100	100
35	XD	206/209 (99%)	199 (97%)	7 (3%)	0	100	100
36	QE	146/162 (90%)	144 (99%)	2 (1%)	0	100	100
36	XE	146/162 (90%)	144 (99%)	2 (1%)	0	100	100
37	QF	98/101 (97%)	96 (98%)	2 (2%)	0	100	100
37	XF	98/101 (97%)	96 (98%)	2 (2%)	0	100	100
38	QG	153/156 (98%)	151 (99%)	2 (1%)	0	100	100
38	XG	153/156 (98%)	149 (97%)	3 (2%)	1 (1%)	22	61
39	QH	135/138 (98%)	132 (98%)	3 (2%)	0	100	100
39	XH	135/138 (98%)	132 (98%)	3 (2%)	0	100	100
40	QI	125/128 (98%)	116 (93%)	9 (7%)	0	100	100
40	XI	124/128 (97%)	113 (91%)	9 (7%)	2 (2%)	9	43
41	QJ	95/105 (90%)	83 (87%)	8 (8%)	4 (4%)	3	20
41	XJ	94/105 (90%)	84 (89%)	8 (8%)	2 (2%)	7	37
42	QK	112/129 (87%)	105 (94%)	6 (5%)	1 (1%)	17	56

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
42	XK	112/129 (87%)	106 (95%)	6 (5%)	0	100	100
43	QL	119/132 (90%)	117 (98%)	2 (2%)	0	100	100
43	XL	119/132 (90%)	116 (98%)	3 (2%)	0	100	100
44	QM	114/126 (90%)	105 (92%)	7 (6%)	2 (2%)	8	41
44	XM	112/126 (89%)	105 (94%)	6 (5%)	1 (1%)	17	56
45	QN	58/61 (95%)	56 (97%)	2 (3%)	0	100	100
45	XN	58/61 (95%)	56 (97%)	2 (3%)	0	100	100
46	QO	86/89 (97%)	83 (96%)	3 (4%)	0	100	100
46	XO	86/89 (97%)	82 (95%)	4 (5%)	0	100	100
47	QP	80/88 (91%)	77 (96%)	3 (4%)	0	100	100
47	XP	80/88 (91%)	77 (96%)	3 (4%)	0	100	100
48	QQ	97/105 (92%)	94 (97%)	2 (2%)	1 (1%)	15	54
48	XQ	97/105 (92%)	95 (98%)	2 (2%)	0	100	100
49	QR	66/88 (75%)	66 (100%)	0	0	100	100
49	XR	66/88 (75%)	65 (98%)	1 (2%)	0	100	100
50	QS	81/93 (87%)	78 (96%)	2 (2%)	1 (1%)	13	49
50	XS	81/93 (87%)	77 (95%)	4 (5%)	0	100	100
51	QT	94/106 (89%)	88 (94%)	5 (5%)	1 (1%)	14	51
51	XT	96/106 (91%)	89 (93%)	5 (5%)	2 (2%)	7	37
52	QU	21/27 (78%)	19 (90%)	2 (10%)	0	100	100
52	XU	21/27 (78%)	18 (86%)	2 (10%)	1 (5%)	2	17
55	QY	255/360 (71%)	224 (88%)	17 (7%)	14 (6%)	2	14
55	XY	256/360 (71%)	222 (87%)	25 (10%)	9 (4%)	3	24
All	All	11925/12848 (93%)	11396 (96%)	459 (4%)	70 (1%)	25	64

5 of 70 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
26	R4	49	PHE
33	QB	16	HIS
33	QB	22	LYS
51	QT	95	ALA
55	QY	215	PRO

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	
3	RD	214/218 (98%)	206 (96%)	8 (4%)	34	68
3	YD	215/218 (99%)	210 (98%)	5 (2%)	50	78
4	RE	164/166 (99%)	157 (96%)	7 (4%)	29	64
4	YE	164/166 (99%)	156 (95%)	8 (5%)	25	61
5	RF	160/166 (96%)	151 (94%)	9 (6%)	21	57
5	YF	159/166 (96%)	149 (94%)	10 (6%)	18	52
6	RG	144/156 (92%)	136 (94%)	8 (6%)	21	57
6	YG	142/156 (91%)	131 (92%)	11 (8%)	13	44
7	RH	144/148 (97%)	141 (98%)	3 (2%)	53	79
7	YH	143/148 (97%)	133 (93%)	10 (7%)	15	48
8	RI	111/124 (90%)	102 (92%)	9 (8%)	11	42
8	YI	108/124 (87%)	101 (94%)	7 (6%)	17	51
9	RN	119/119 (100%)	111 (93%)	8 (7%)	16	50
9	YN	118/119 (99%)	114 (97%)	4 (3%)	37	70
10	RO	100/100 (100%)	100 (100%)	0	100	100
10	YO	100/100 (100%)	100 (100%)	0	100	100
11	RP	115/116 (99%)	113 (98%)	2 (2%)	60	83
11	YP	115/116 (99%)	113 (98%)	2 (2%)	60	83
12	RQ	111/111 (100%)	108 (97%)	3 (3%)	44	75
12	YQ	111/111 (100%)	105 (95%)	6 (5%)	22	58
13	RR	101/101 (100%)	95 (94%)	6 (6%)	19	54
13	YR	101/101 (100%)	95 (94%)	6 (6%)	19	54
14	RS	87/88 (99%)	85 (98%)	2 (2%)	50	78
14	YS	85/88 (97%)	83 (98%)	2 (2%)	49	77
15	RT	115/127 (91%)	111 (96%)	4 (4%)	36	69
15	YT	113/127 (89%)	110 (97%)	3 (3%)	44	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	RU	93/94 (99%)	89 (96%)	4 (4%)	29	64
16	YU	93/94 (99%)	90 (97%)	3 (3%)	39	71
17	RV	81/82 (99%)	77 (95%)	4 (5%)	25	61
17	YV	80/82 (98%)	76 (95%)	4 (5%)	24	60
18	RW	90/92 (98%)	84 (93%)	6 (7%)	16	50
18	YW	90/92 (98%)	87 (97%)	3 (3%)	38	71
19	RX	77/78 (99%)	76 (99%)	1 (1%)	69	87
19	YX	77/78 (99%)	77 (100%)	0	100	100
20	RY	86/91 (94%)	84 (98%)	2 (2%)	50	78
20	YY	86/91 (94%)	83 (96%)	3 (4%)	36	69
21	RZ	159/179 (89%)	153 (96%)	6 (4%)	33	67
21	YZ	156/179 (87%)	150 (96%)	6 (4%)	33	67
22	R0	61/67 (91%)	59 (97%)	2 (3%)	38	71
22	Y0	61/67 (91%)	60 (98%)	1 (2%)	62	84
23	R1	79/83 (95%)	77 (98%)	2 (2%)	47	77
23	Y1	81/83 (98%)	77 (95%)	4 (5%)	25	61
24	R2	65/67 (97%)	63 (97%)	2 (3%)	40	72
24	Y2	66/67 (98%)	64 (97%)	2 (3%)	41	73
25	R3	51/52 (98%)	51 (100%)	0	100	100
25	Y3	50/52 (96%)	44 (88%)	6 (12%)	5	22
26	R4	58/63 (92%)	56 (97%)	2 (3%)	37	70
26	Y4	54/63 (86%)	46 (85%)	8 (15%)	3	14
27	R5	51/52 (98%)	49 (96%)	2 (4%)	32	67
27	Y5	50/52 (96%)	48 (96%)	2 (4%)	31	66
28	R6	51/52 (98%)	49 (96%)	2 (4%)	32	67
28	Y6	50/52 (96%)	50 (100%)	0	100	100
29	R7	41/42 (98%)	41 (100%)	0	100	100
29	Y7	41/42 (98%)	41 (100%)	0	100	100
30	R8	54/55 (98%)	51 (94%)	3 (6%)	21	57
30	Y8	54/55 (98%)	52 (96%)	2 (4%)	34	68
31	R9	34/34 (100%)	34 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
31	Y9	34/34 (100%)	34 (100%)	0	100	100
33	QB	191/220 (87%)	180 (94%)	11 (6%)	20	55
33	XB	187/220 (85%)	173 (92%)	14 (8%)	13	45
34	QC	144/188 (77%)	142 (99%)	2 (1%)	67	86
34	XC	140/188 (74%)	137 (98%)	3 (2%)	53	79
35	QD	171/181 (94%)	166 (97%)	5 (3%)	42	74
35	XD	172/181 (95%)	169 (98%)	3 (2%)	60	83
36	QE	114/123 (93%)	113 (99%)	1 (1%)	78	91
36	XE	114/123 (93%)	113 (99%)	1 (1%)	78	91
37	QF	85/90 (94%)	85 (100%)	0	100	100
37	XF	85/90 (94%)	84 (99%)	1 (1%)	71	88
38	QG	120/127 (94%)	114 (95%)	6 (5%)	24	60
38	XG	119/127 (94%)	115 (97%)	4 (3%)	37	70
39	QH	116/119 (98%)	113 (97%)	3 (3%)	46	76
39	XH	114/119 (96%)	110 (96%)	4 (4%)	36	69
40	QI	91/99 (92%)	83 (91%)	8 (9%)	10	36
40	XI	88/99 (89%)	83 (94%)	5 (6%)	20	56
41	QJ	68/92 (74%)	66 (97%)	2 (3%)	42	74
41	XJ	68/92 (74%)	67 (98%)	1 (2%)	65	85
42	QK	83/99 (84%)	81 (98%)	2 (2%)	49	77
42	XK	83/99 (84%)	83 (100%)	0	100	100
43	QL	96/108 (89%)	95 (99%)	1 (1%)	76	90
43	XL	96/108 (89%)	95 (99%)	1 (1%)	76	90
44	QM	90/101 (89%)	87 (97%)	3 (3%)	38	71
44	XM	87/101 (86%)	86 (99%)	1 (1%)	73	88
45	QN	49/50 (98%)	44 (90%)	5 (10%)	7	29
45	XN	49/50 (98%)	48 (98%)	1 (2%)	55	80
46	QO	78/80 (98%)	74 (95%)	4 (5%)	24	60
46	XO	78/80 (98%)	75 (96%)	3 (4%)	33	67
47	QP	69/74 (93%)	68 (99%)	1 (1%)	67	86
47	XP	68/74 (92%)	66 (97%)	2 (3%)	42	74

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
48	QQ	94/97 (97%)	94 (100%)	0	100	100
48	XQ	94/97 (97%)	94 (100%)	0	100	100
49	QR	59/77 (77%)	59 (100%)	0	100	100
49	XR	59/77 (77%)	58 (98%)	1 (2%)	60	83
50	QS	68/80 (85%)	66 (97%)	2 (3%)	42	74
50	XS	67/80 (84%)	67 (100%)	0	100	100
51	QT	71/82 (87%)	68 (96%)	3 (4%)	30	65
51	XT	70/82 (85%)	69 (99%)	1 (1%)	67	86
52	QU	18/22 (82%)	18 (100%)	0	100	100
52	XU	18/22 (82%)	17 (94%)	1 (6%)	21	57
55	QY	210/299 (70%)	200 (95%)	10 (5%)	25	61
55	XY	211/299 (71%)	198 (94%)	13 (6%)	18	53
All	All	9765/10662 (92%)	9411 (96%)	354 (4%)	35	69

5 of 354 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
11	YP	70	GLN
26	Y4	61	ARG
12	YQ	109	VAL
20	YY	6	HIS
33	XB	158	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
34	XC	6	HIS
40	XI	124	GLN
50	XS	23	ASN
31	R9	20	HIS
11	RP	9	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	RA	2855/2915 (97%)	442 (15%)	27 (0%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	YA	2855/2915 (97%)	439 (15%)	25 (0%)
2	RB	119/122 (97%)	9 (7%)	0
2	YB	119/122 (97%)	10 (8%)	0
32	QA	1494/1521 (98%)	229 (15%)	16 (1%)
32	XA	1498/1521 (98%)	227 (15%)	19 (1%)
53	QV	76/77 (98%)	15 (19%)	0
53	XV	76/77 (98%)	15 (19%)	1 (1%)
54	QX	9/25 (36%)	2 (22%)	0
54	XX	8/25 (32%)	3 (37%)	0
All	All	9109/9320 (97%)	1391 (15%)	88 (0%)

5 of 1391 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	RA	10	G
1	RA	11	G
1	RA	12	U
1	RA	15	G
1	RA	45	C

5 of 88 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	YA	1076	C
32	XA	266	G
1	YA	1420	U
1	YA	2321	G
32	XA	748	C

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

50 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	PSU	RA	1917	1	18,21,22	4.30	7 (38%)	22,30,33	1.76	4 (18%)
32	5MC	QA	1400	32	18,22,23	3.67	7 (38%)	26,32,35	1.00	1 (3%)
32	MA6	QA	1518	32	19,26,27	1.14	2 (10%)	18,38,41	3.50	2 (11%)
1	PSU	YA	1917	1	18,21,22	4.26	7 (38%)	22,30,33	1.86	4 (18%)
32	PSU	QA	516	56,32	18,21,22	4.33	7 (38%)	22,30,33	1.84	5 (22%)
32	PSU	XA	516	32	18,21,22	4.27	7 (38%)	22,30,33	1.95	6 (27%)
32	5MC	XA	1400	32	18,22,23	3.62	7 (38%)	26,32,35	1.03	2 (7%)
55	MEQ	XY	235	55	8,9,10	0.90	0	5,10,12	0.80	0
1	OMG	YA	2251	56,53,1	18,26,27	2.52	7 (38%)	19,38,41	1.57	6 (31%)
1	2MA	RA	2503	56,1	17,25,26	2.72	5 (29%)	17,37,40	1.40	3 (17%)
32	2MG	XA	1207	32	18,26,27	2.53	6 (33%)	16,38,41	1.61	4 (25%)
32	2MG	QA	1207	56,32	18,26,27	2.56	6 (33%)	16,38,41	1.81	5 (31%)
32	MA6	QA	1519	32	19,26,27	1.13	2 (10%)	18,38,41	3.55	2 (11%)
32	4OC	QA	1402	32	20,23,24	3.26	7 (35%)	26,32,35	0.98	2 (7%)
1	2MA	YA	2503	56,1	17,25,26	2.78	5 (29%)	17,37,40	1.42	3 (17%)
1	5MU	YA	1915	56,1	19,22,23	5.21	6 (31%)	28,32,35	4.11	11 (39%)
1	4OC	YA	1920	1	19,22,24	3.11	7 (36%)	26,31,35	0.94	1 (3%)
1	5MC	YA	1942	1	18,22,23	3.67	7 (38%)	26,32,35	1.12	2 (7%)
43	0TD	XL	92	43	7,9,10	1.25	0	6,11,13	2.31	3 (50%)
32	5MC	XA	1404	32	18,22,23	3.65	7 (38%)	26,32,35	0.97	1 (3%)
32	7MG	XA	527	56,32	22,26,27	4.70	10 (45%)	29,39,42	2.07	10 (34%)
1	PSU	YA	2605	1	18,21,22	4.25	7 (38%)	22,30,33	1.97	5 (22%)
1	OMG	RA	2251	56,53,1	18,26,27	2.55	7 (38%)	19,38,41	1.63	6 (31%)
55	MEQ	QY	235	55	8,9,10	0.93	0	5,10,12	1.08	1 (20%)
1	5MU	RA	1915	1	19,22,23	5.21	6 (31%)	28,32,35	4.10	13 (46%)
1	2MU	YA	2552	56,1	19,22,24	6.56	14 (73%)	26,31,36	2.60	6 (23%)
32	5MC	XA	967	32	18,22,23	3.69	7 (38%)	26,32,35	0.94	1 (3%)
32	5MC	QA	967	32	18,22,23	3.69	7 (38%)	26,32,35	0.93	1 (3%)
1	4OC	RA	1920	1	19,22,24	3.13	7 (36%)	26,31,35	0.91	0
1	PSU	RA	1911	1	18,21,22	4.29	7 (38%)	22,30,33	1.72	4 (18%)
1	5MC	RA	1942	56,1	18,22,23	3.65	7 (38%)	26,32,35	1.07	2 (7%)
1	2MU	RA	2552	56,1	19,22,24	6.53	14 (73%)	26,31,36	2.64	7 (26%)
32	MA6	XA	1518	32	19,26,27	1.06	2 (10%)	18,38,41	3.59	2 (11%)
1	5MU	YA	1939	56,1	19,22,23	4.97	7 (36%)	28,32,35	4.14	9 (32%)
32	UR3	XA	1498	56,32	19,22,23	3.20	7 (36%)	26,32,35	1.35	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	PSU	RA	2605	1	18,21,22	4.31	7 (38%)	22,30,33	2.03	5 (22%)
32	MA6	XA	1519	32	19,26,27	1.12	2 (10%)	18,38,41	3.54	2 (11%)
43	0TD	QL	92	43	7,9,10	1.13	0	6,11,13	3.18	5 (83%)
32	M2G	XA	966	32	20,27,28	3.89	6 (30%)	22,40,43	1.69	6 (27%)
32	4OC	XA	1402	32	20,23,24	3.08	8 (40%)	26,32,35	1.26	1 (3%)
1	PSU	YA	1911	1	18,21,22	4.23	7 (38%)	22,30,33	1.88	5 (22%)
1	5MC	YA	1962	56,1	18,22,23	3.65	7 (38%)	26,32,35	1.07	2 (7%)
32	5MC	QA	1404	32	18,22,23	3.71	7 (38%)	26,32,35	0.97	1 (3%)
32	5MC	QA	1407	32	18,22,23	3.66	7 (38%)	26,32,35	1.01	1 (3%)
1	5MC	RA	1962	56,1	18,22,23	3.63	7 (38%)	26,32,35	1.04	1 (3%)
32	5MC	XA	1407	32	18,22,23	3.66	7 (38%)	26,32,35	0.92	1 (3%)
32	M2G	QA	966	32	20,27,28	4.02	7 (35%)	22,40,43	1.52	5 (22%)
1	5MU	RA	1939	1	19,22,23	4.97	7 (36%)	28,32,35	4.01	10 (35%)
32	7MG	QA	527	56,32	22,26,27	4.68	10 (45%)	29,39,42	2.09	9 (31%)
32	UR3	QA	1498	32	19,22,23	3.21	7 (36%)	26,32,35	1.34	1 (3%)

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	PSU	RA	1917	1	-	0/7/25/26	0/2/2/2
32	5MC	QA	1400	32	-	2/7/25/26	0/2/2/2
32	MA6	QA	1518	32	-	0/7/29/30	0/3/3/3
1	PSU	YA	1917	1	-	0/7/25/26	0/2/2/2
32	PSU	QA	516	56,32	-	0/7/25/26	0/2/2/2
32	PSU	XA	516	32	-	0/7/25/26	0/2/2/2
32	5MC	XA	1400	32	-	2/7/25/26	0/2/2/2
55	MEQ	XY	235	55	-	4/8/9/11	-
1	OMG	YA	2251	56,53,1	-	0/5/27/28	0/3/3/3
1	2MA	RA	2503	56,1	-	1/3/25/26	0/3/3/3
32	2MG	XA	1207	32	-	0/5/27/28	0/3/3/3
32	2MG	QA	1207	56,32	-	0/5/27/28	0/3/3/3
32	MA6	QA	1519	32	-	2/7/29/30	0/3/3/3
32	4OC	QA	1402	32	-	2/9/29/30	0/2/2/2
1	2MA	YA	2503	56,1	-	1/3/25/26	0/3/3/3
1	5MU	YA	1915	56,1	-	4/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	4OC	YA	1920	1	-	1/9/27/30	0/2/2/2
1	5MC	YA	1942	1	-	0/7/25/26	0/2/2/2
43	0TD	XL	92	43	-	3/7/12/14	-
32	5MC	XA	1404	32	-	0/7/25/26	0/2/2/2
32	7MG	XA	527	56,32	-	2/7/37/38	0/3/3/3
1	PSU	YA	2605	1	-	0/7/25/26	0/2/2/2
1	OMG	RA	2251	56,53,1	-	0/5/27/28	0/3/3/3
55	MEQ	QY	235	55	-	2/8/9/11	-
1	5MU	RA	1915	1	-	4/7/25/26	0/2/2/2
1	2MU	YA	2552	56,1	-	0/9/27/28	0/2/2/2
32	5MC	XA	967	32	-	0/7/25/26	0/2/2/2
32	5MC	QA	967	32	-	0/7/25/26	0/2/2/2
1	4OC	RA	1920	1	-	0/9/27/30	0/2/2/2
1	PSU	RA	1911	1	-	0/7/25/26	0/2/2/2
1	5MC	RA	1942	56,1	-	0/7/25/26	0/2/2/2
1	2MU	RA	2552	56,1	-	0/9/27/28	0/2/2/2
32	MA6	XA	1518	32	-	0/7/29/30	0/3/3/3
1	5MU	YA	1939	56,1	-	0/7/25/26	0/2/2/2
32	UR3	XA	1498	56,32	-	0/7/25/26	0/2/2/2
1	PSU	RA	2605	1	-	0/7/25/26	0/2/2/2
32	MA6	XA	1519	32	-	2/7/29/30	0/3/3/3
43	0TD	QL	92	43	-	1/7/12/14	-
32	M2G	XA	966	32	-	0/7/29/30	0/3/3/3
32	4OC	XA	1402	32	-	2/9/29/30	0/2/2/2
1	PSU	YA	1911	1	-	0/7/25/26	0/2/2/2
1	5MC	YA	1962	56,1	-	0/7/25/26	0/2/2/2
32	5MC	QA	1404	32	-	0/7/25/26	0/2/2/2
32	5MC	QA	1407	32	-	0/7/25/26	0/2/2/2
1	5MC	RA	1962	56,1	-	0/7/25/26	0/2/2/2
32	5MC	XA	1407	32	-	0/7/25/26	0/2/2/2
32	M2G	QA	966	32	-	0/7/29/30	0/3/3/3
1	5MU	RA	1939	1	-	0/7/25/26	0/2/2/2
32	7MG	QA	527	56,32	-	2/7/37/38	0/3/3/3
32	UR3	QA	1498	32	-	0/7/25/26	0/2/2/2

The worst 5 of 314 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	YA	2552	2MU	C5-C4	16.69	1.80	1.43
1	RA	2552	2MU	C5-C4	16.60	1.80	1.43
32	QA	966	M2G	C2-N3	13.70	1.47	1.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
32	XA	966	M2G	C2-N3	13.13	1.46	1.30
32	XA	527	7MG	C8-N9	13.11	1.53	1.46

The worst 5 of 190 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
32	QA	1519	MA6	N1-C6-N6	-14.19	102.12	117.06
32	XA	1518	MA6	N1-C6-N6	-14.17	102.14	117.06
1	YA	1915	5MU	C5-C4-N3	14.15	127.39	115.31
1	YA	1939	5MU	C5-C4-N3	13.92	127.19	115.31
32	XA	1519	MA6	N1-C6-N6	-13.85	102.48	117.06

There are no chirality outliers.

5 of 37 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	RA	1915	5MU	O4'-C1'-N1-C2
1	RA	1915	5MU	O4'-C1'-N1-C6
1	RA	1915	5MU	O4'-C4'-C5'-O5'
32	QA	527	7MG	C3'-C4'-C5'-O5'
32	QA	1402	4OC	O4'-C4'-C5'-O5'

There are no ring outliers.

21 monomers are involved in 33 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	RA	1917	PSU	1	0
32	QA	1518	MA6	1	0
1	YA	1917	PSU	1	0
1	RA	2503	2MA	2	0
32	XA	1207	2MG	1	0
32	QA	1519	MA6	3	0
32	QA	1402	4OC	2	0
1	YA	2503	2MA	2	0
1	YA	1942	5MC	1	0
43	XL	92	0TD	1	0
1	YA	2552	2MU	4	0
1	RA	1942	5MC	1	0
1	RA	2552	2MU	4	0
32	XA	1518	MA6	2	0
1	YA	1939	5MU	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
32	XA	1519	MA6	1	0
32	XA	1402	4OC	3	0
1	YA	1962	5MC	1	0
1	RA	1962	5MC	1	0
32	QA	966	M2G	1	0
1	RA	1939	5MU	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 2445 ligands modelled in this entry, 2443 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
58	SF4	XD	301	-	0,12,12	-	-	-		
58	SF4	QD	302	35	0,12,12	-	-	-		

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	-	-	-	0/6/5/5
58	SF4	QD	302	35	-	-	0/6/5/5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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

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

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

6.3 Carbohydrates [i](#)

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

6.4 Ligands [i](#)

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

6.5 Other polymers [i](#)

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