



Full wwPDB EM Validation Report ⓘ

Dec 18, 2022 – 07:54 am GMT

PDB ID : 7A5K
EMDB ID : EMD-11646
Title : Structure of the human mitoribosome in the post translocation state bound to mtEF-G1
Authors : Desai, N.; Yang, H.; Chandrasekaran, V.; Kazi, R.; Minczuk, M.; Ramakrishnan, V.
Deposited on : 2020-08-21
Resolution : 3.70 Å(reported)

This is a Full wwPDB EM Validation 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/EMValidationReportHelp>

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:

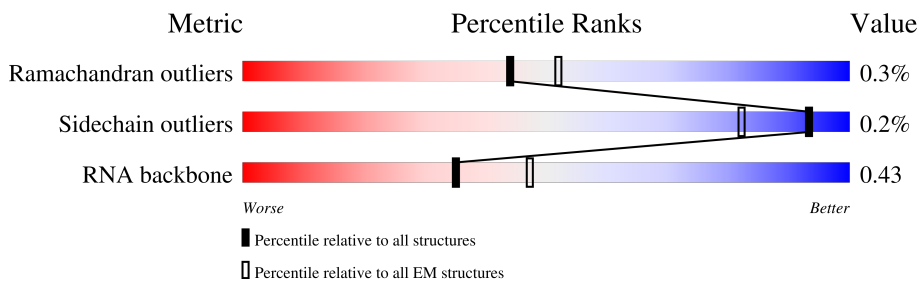
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	r1	751	
2	Y2	29	
3	8	1559	
3	A3	1559	
4	B3	73	
5	D3	305	
6	E3	348	
7	F3	311	

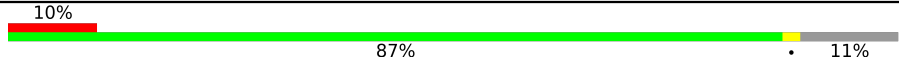

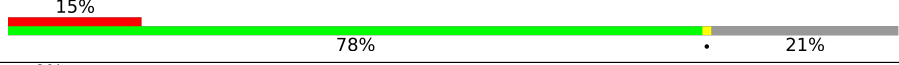

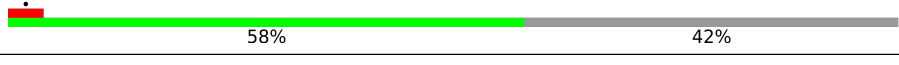
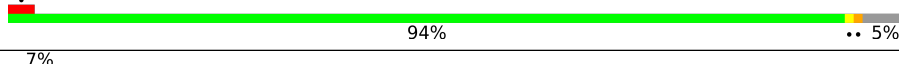
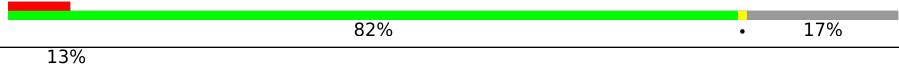
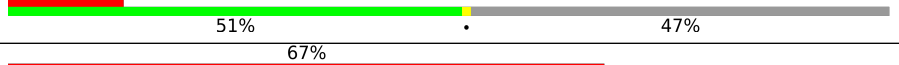
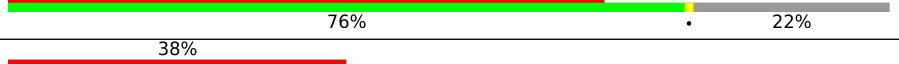


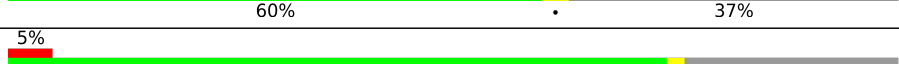
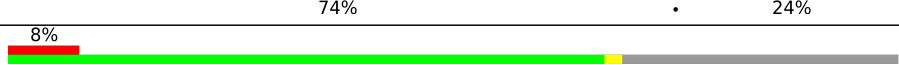
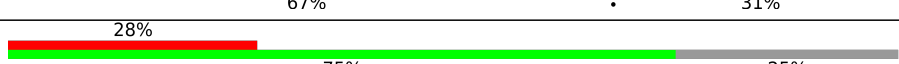
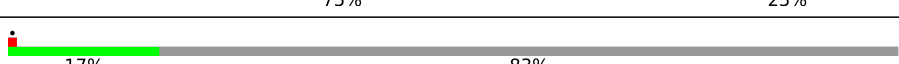

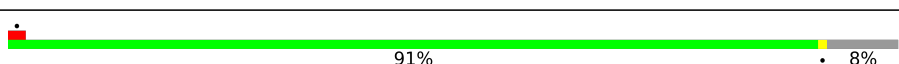
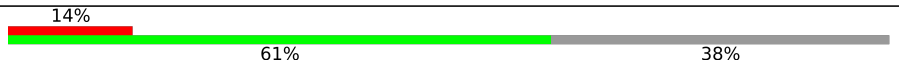
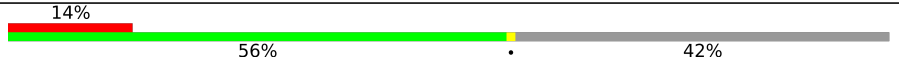


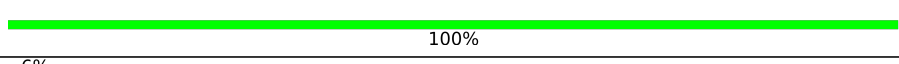
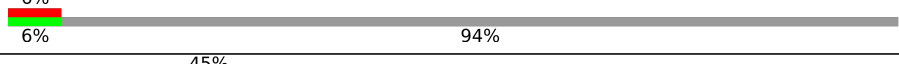


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Mol	Chain	Length	Quality of chain
8	D	267	
8	H3	267	
9	I3	261	
10	J3	192	
11	K3	178	
12	L3	145	
13	M3	296	
14	N3	251	
15	O3	175	
16	P3	179	
17	Q3	292	
18	R3	149	
19	S3	205	
20	T3	212	
21	U3	153	
22	V3	216	
23	W3	148	
24	X3	256	
25	Y3	250	
26	Z3	161	
27	03	188	
28	13	65	
29	23	92	
30	33	188	
31	43	103	

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Mol	Chain	Length	Quality of chain
32	53	423	
33	63	380	
34	73	338	
35	93	137	
36	a3	142	
37	b3	155	
38	c3	332	
39	d3	306	
40	e3	279	
41	f3	194	
42	g3	166	
43	h3	158	
44	i3	128	
45	j3	123	
46	k3	112	
47	l3	138	
48	m3	128	
49	o3	102	
50	p3	206	
51	q3	222	
52	r3	196	
53	s3	439	
54	u3	2	
55	A5	435	
56	B6	296	

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Mol	Chain	Length	Quality of chain
57	C6	167	78% 79% 21%
58	D6	430	43% 73% 25%
59	E6	125	78% 97% ..
60	F6	242	83% 81% .. 17%
61	G6	396	70% 76% 23%
62	H6	201	59% 60% 39%
63	I6	194	50% 69% 30%
64	J6	138	14% 77% 22%
65	K6	128	77% 78% 21%
66	L6	257	37% 63% 36%
67	M6	137	53% 82% 15%
68	N6	130	38% 79% 18%
69	O6	258	51% 68% 28%
70	P6	142	48% 65% 32%
71	Q6	87	56% 99% .
72	R6	360	56% 65% 33%
73	S6	190	52% 65% 34%
74	T6	173	54% 92% . 6%
75	U6	205	66% 83% 16%
76	V6	414	70% 78% 21%
77	W6	187	43% 51% 48%
78	X6	398	79% 78% 21%
79	Y6	395	27% 27% 73%
80	Z6	106	81% 82% 18%
81	a6	218	70% 88% 8%

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Mol	Chain	Length	Quality of chain
82	b6	323	<p>78% 77% 21%</p>
83	c6	118	<p>73% 95%</p>
84	d6	199	<p>9% 35% 65%</p>
85	e6	689	<p>60% 59% 40%</p>
86	A6	954	<p>28% 65% 29%</p>
87	24	73	<p>95% 41% 53% 5%</p>
87	FE	73	<p>73% 41% 53% 5%</p>
88	A	206	<p>62% 74% 21%</p>
89	n	286	<p>73% 75% 24%</p>
90	B	28	<p>71% 100%</p>

2 Entry composition i

There are 95 unique types of molecules in this entry. The entry contains 171122 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 protein called Elongation factor G, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	r1	696	5452	3435	940	1044	33	0	0

- Molecule 2 is a protein called nascent chain.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	Y2	29	145	87	29	29	0	0

- Molecule 3 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	A3	1503	31913	14319	5761	10330	1503	0	0
3	8	8	175	79	37	51	8	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A3	3107	U	UNK	conflict	GB 1025814679
8	663	U	UNK	conflict	GB 1025814679

- Molecule 4 is a RNA chain called mt-tRNAVal.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	B3	56	1191	534	214	387	56	0	0

- Molecule 5 is a protein called 39S ribosomal protein L2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	D3	236	Total	C	N	O	S	0	0
			1842	1145	373	315	9		

- Molecule 6 is a protein called 39S ribosomal protein L3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	E3	300	Total	C	N	O	S	0	0
			2365	1523	410	422	10		

- Molecule 7 is a protein called 39S ribosomal protein L4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	F3	250	Total	C	N	O	S	0	0
			2013	1294	365	348	6		

- Molecule 8 is a protein called 39S ribosomal protein L9, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H3	95	Total	C	N	O		0	0
			784	498	152	134			
8	D	80	Total	C	N	O	S	0	0
			648	421	111	112	4		

- Molecule 9 is a protein called 39S ribosomal protein L10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I3	158	Total	C	N	O	S	0	0
			1283	828	235	210	10		

- Molecule 10 is a protein called 39S ribosomal protein L11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J3	140	Total	C	N	O	S	0	0
			1061	680	192	187	2		

- Molecule 11 is a protein called 39S ribosomal protein L13, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K3	177	Total	C	N	O	S	0	0
			1451	934	259	251	7		

- Molecule 12 is a protein called 39S ribosomal protein L14, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L3	115	Total	C	N	O	S	0	0
			889	559	171	154	5		

- Molecule 13 is a protein called 39S ribosomal protein L15, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M3	287	Total	C	N	O	S	0	0
			2305	1472	425	402	6		

- Molecule 14 is a protein called 39S ribosomal protein L16, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N3	205	Total	C	N	O	S	0	0
			1654	1056	308	280	10		

- Molecule 15 is a protein called 39S ribosomal protein L17, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O3	152	Total	C	N	O	S	0	0
			1245	784	239	215	7		

- Molecule 16 is a protein called Mitochondrial ribosomal protein L18, isoform CRA_b.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P3	133	Total	C	N	O	S	0	0
			1080	677	209	189	5		

- Molecule 17 is a protein called 39S ribosomal protein L19, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q3	219	Total	C	N	O	S	0	0
			1822	1168	322	323	9		

- Molecule 18 is a protein called 39S ribosomal protein L20, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R3	140	Total	C	N	O	S	0	0
			1153	732	231	186	4		

- Molecule 19 is a protein called 39S ribosomal protein L21, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	S3	156	1251	806	222	219	4	0	0

- Molecule 20 is a protein called 39S ribosomal protein L22, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	T3	166	1368	875	254	232	7	0	0

- Molecule 21 is a protein called 39S ribosomal protein L23, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	U3	111	922	591	176	153	2	0	0

- Molecule 22 is a protein called 39S ribosomal protein L24, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	V3	189	1551	987	278	278	8	0	0

- Molecule 23 is a protein called 39S ribosomal protein L27, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	W3	111	871	558	164	146	3	0	0

- Molecule 24 is a protein called 39S ribosomal protein L28, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	X3	243	2027	1310	350	362	5	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
X3	148	ALA	THR	conflict	UNP Q13084
X3	149	SER	PRO	conflict	UNP Q13084
X3	150	GLY	LYS	conflict	UNP Q13084

- Molecule 25 is a protein called 39S ribosomal protein L47, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	Y3	176	1517	970	291	252	4	0	0

- Molecule 26 is a protein called 39S ribosomal protein L30, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Z3	120	978	626	183	166	3	0	0

- Molecule 27 is a protein called 39S ribosomal protein L32, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	03	108	880	545	172	157	6	0	0

- Molecule 28 is a protein called 39S ribosomal protein L33, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	13	52	433	278	83	70	2	0	0

- Molecule 29 is a protein called 39S ribosomal protein L34, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	23	46	376	233	83	59	1	0	0

- Molecule 30 is a protein called 39S ribosomal protein L35, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	33	95	831	539	162	127	3	0	0

- Molecule 31 is a protein called 39S ribosomal protein L36, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	43	36	322	203	70	46	3	0	0

- Molecule 32 is a protein called 39S ribosomal protein L37, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	53	376	3064	1987	529	538	10	0	0

- Molecule 33 is a protein called 39S ribosomal protein L38, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	63	325	2636	1692	465	470	9	0	0

- Molecule 34 is a protein called 39S ribosomal protein L39, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	73	266	2158	1383	371	388	16	0	0

- Molecule 35 is a protein called 39S ribosomal protein L41, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	93	109	873	565	152	154	2	0	0

- Molecule 36 is a protein called 39S ribosomal protein L42, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	a3	82	686	434	124	123	5	0	0

- Molecule 37 is a protein called 39S ribosomal protein L43, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	b3	148	1178	733	229	213	3	0	0

- Molecule 38 is a protein called 39S ribosomal protein L44, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	c3	275	2217	1415	383	410	9	0	0

- Molecule 39 is a protein called 39S ribosomal protein L45, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	d3	162	1347	870	234	235	8	0	0

- Molecule 40 is a protein called 39S ribosomal protein L46, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	e3	217	1762	1124	310	323	5	0	0

- Molecule 41 is a protein called 39S ribosomal protein L48, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	f3	131	1039	663	169	203	4	0	0

- Molecule 42 is a protein called 39S ribosomal protein L49, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	g3	129	1067	690	185	190	2	0	0

- Molecule 43 is a protein called 39S ribosomal protein L50, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	h3	100	827	524	146	155	2	0	0

- Molecule 44 is a protein called 39S ribosomal protein L51, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	i3	97	827	532	165	126	4	0	0

- Molecule 45 is a protein called cDNA FLJ76418, highly similar to Homo sapiens mitochondrial ribosomal protein L52 (MRPL52), transcript variant 1, mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	j3	85	684	423	133	126	2	0	0

- Molecule 46 is a protein called 39S ribosomal protein L53, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	k3	84	655	407	122	121	5	0	0

- Molecule 47 is a protein called 39S ribosomal protein L54, mitochondrial.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
47	l3	23	221	137	52	32	0	0

- Molecule 48 is a protein called 39S ribosomal protein L55, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	m3	45	372	232	76	62	2	0	0

- Molecule 49 is a protein called Ribosomal protein 63, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	o3	94	797	501	165	128	3	0	0

- Molecule 50 is a protein called Peptidyl-tRNA hydrolase ICT1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	p3	127	1058	661	201	192	4	0	0

- Molecule 51 is a protein called Growth arrest and DNA damage-inducible proteins-interacting protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	q3	128	1076	671	208	192	5	0	0

- Molecule 52 is a protein called 39S ribosomal protein S18a, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	r3	146	1203	764	232	199	8	0	0

- Molecule 53 is a protein called 39S ribosomal protein S30, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	s3	370	3036	1946	542	534	14	0	0

- Molecule 54 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
54	u3	2	42	19	8	13	2	0	0

- Molecule 55 is a protein called Mitochondrial inner membrane protein OXA1L.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
55	A5	28	136	80	28	28	0	0

- Molecule 56 is a protein called 28S ribosomal protein S2, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	B6	217	1768	1131	321	306	10	0	0

- Molecule 57 is a protein called 28S ribosomal protein S24, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	C6	132	1082	699	195	184	4	0	0

- Molecule 58 is a protein called 28S ribosomal protein S5, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	D6	322	2557	1611	476	457	13	0	0

- Molecule 59 is a protein called 28S ribosomal protein S6, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	E6	122	972	614	177	177	4	0	0

- Molecule 60 is a protein called 28S ribosomal protein S7, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	F6	201	1668	1069	305	283	11	0	0

- Molecule 61 is a protein called 28S ribosomal protein S9, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	G6	305	2516	1599	448	455	14	0	0

- Molecule 62 is a protein called 28S ribosomal protein S10, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	H6	122	999	643	168	185	3	0	0

- Molecule 63 is a protein called 28S ribosomal protein S11, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	I6	136	1011	637	192	178	4	0	0

- Molecule 64 is a protein called 28S ribosomal protein S12, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	J6	108	838	521	169	142	6	0	0

- Molecule 65 is a protein called 28S ribosomal protein S14, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	K6	101	861	537	179	140	5	0	0

- Molecule 66 is a protein called 28S ribosomal protein S15, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	L6	164	1382	883	257	235	7	0	0

- Molecule 67 is a protein called 28S ribosomal protein S16, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	M6	116	920	582	182	150	6	0	0

- Molecule 68 is a protein called 28S ribosomal protein S17, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	N6	107	846	549	153	141	3	0	0

- Molecule 69 is a protein called 28S ribosomal protein S18b, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	O6	185	1528	970	285	267	6	0	0

- Molecule 70 is a protein called 28S ribosomal protein S18c, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	P6	96	774	498	133	135	8	0	0

- Molecule 71 is a protein called 28S ribosomal protein S21, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	Q6	86	740	458	150	124	8	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Q6	50	ARG	CYS	conflict	UNP P82921

- Molecule 72 is a protein called 28S ribosomal protein S22, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
72	R6	242	2008	1285	343	372	8	0	0

- Molecule 73 is a protein called 28S ribosomal protein S23, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	S6	126	Total	C	N	O	S	0	0
			1042	673	183	185	1		

- Molecule 74 is a protein called 28S ribosomal protein S25, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	T6	162	Total	C	N	O	S	0	0
			1330	850	231	238	11		

- Molecule 75 is a protein called 28S ribosomal protein S26, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	U6	173	Total	C	N	O	S	0	0
			1461	900	294	263	4		

- Molecule 76 is a protein called 28S ribosomal protein S27, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	V6	328	Total	C	N	O	S	0	0
			2702	1737	452	502	11		

- Molecule 77 is a protein called 28S ribosomal protein S28, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	W6	97	Total	C	N	O	S	0	0
			766	486	137	139	4		

- Molecule 78 is a protein called 28S ribosomal protein S29, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	X6	316	Total	C	N	O	S	0	0
			2531	1625	440	455	11		

- Molecule 79 is a protein called 28S ribosomal protein S31, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Y6	108	Total	C	N	O	S	0	0
			914	593	150	169	2		

- Molecule 80 is a protein called 28S ribosomal protein S33, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
80	Z6	87	740	473	133	130	4	0	0

- Molecule 81 is a protein called 28S ribosomal protein S34, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
81	a6	201	1684	1065	322	292	5	0	0

- Molecule 82 is a protein called 28S ribosomal protein S35, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
82	b6	256	2076	1321	350	395	10	0	0

- Molecule 83 is a protein called Coiled-coil-helix-coiled-coil-helix domain-containing protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
83	c6	116	925	574	181	162	8	0	0

- Molecule 84 is a protein called Aurora kinase A-interacting protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
84	d6	69	610	393	130	86	1	0	0

- Molecule 85 is a protein called Pentatricopeptide repeat domain-containing protein 3, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
85	e6	414	2838	1805	490	529	14	0	0

- Molecule 86 is a RNA chain called 12S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
86	A6	928	19716	8840	3560	6388	928	0	0

- Molecule 87 is a RNA chain called mt-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
87	24	73	Total 1547	C 696	N 280	O 499	P 72	0	0
87	FE	73	Total 1547	C 696	N 280	O 499	P 72	0	0

- Molecule 88 is a protein called 39S ribosomal protein L40, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
88	A	162	Total 1375	C 876	N 247	O 249	S 3	0	0

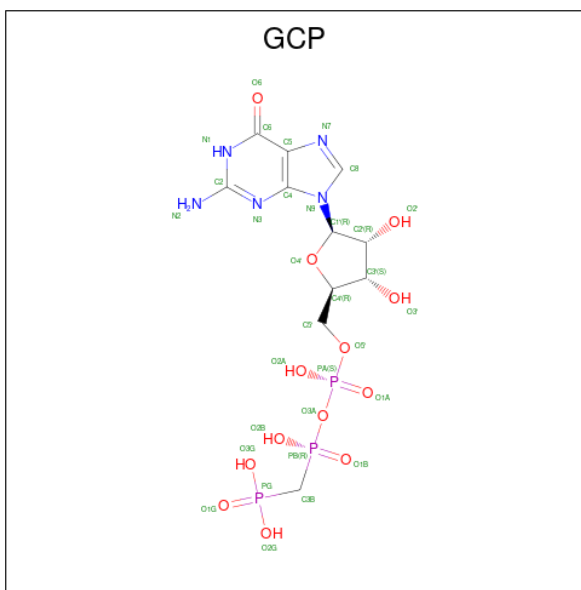
- Molecule 89 is a protein called 39S ribosomal protein L1, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
89	n	218	Total 1744	C 1121	N 294	O 324	S 5	0	0

- Molecule 90 is a protein called Unknown protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
90	B	28	Total 140	C 84	N 28	O 28	0	0

- Molecule 91 is PHOSPHOMETHYLPHOSPHONIC ACID GUANYLATE ESTER (three-letter code: GCP) (formula: $C_{11}H_{18}N_5O_{13}P_3$).

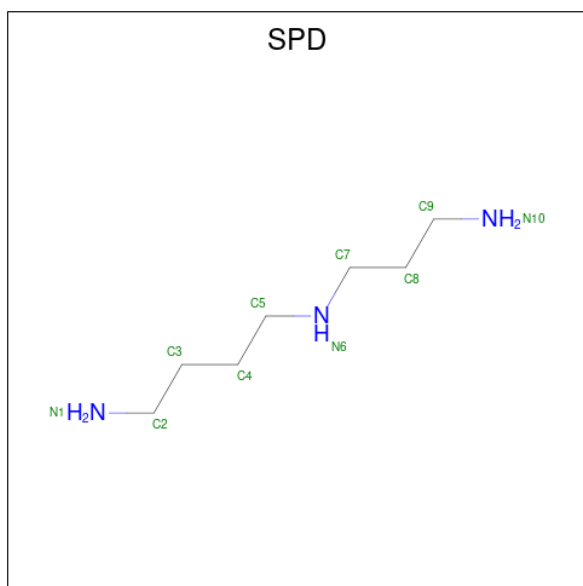


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
91	r1	1	32	11	5	13	3	0

- Molecule 92 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
92	r1	1	1	1	0
92	A3	95	95	95	0
92	D3	1	1	1	0
92	E3	1	1	1	0
92	M3	1	1	1	0
92	g3	1	1	1	0
92	A6	28	28	28	0

- Molecule 93 is SPERMIDINE (three-letter code: SPD) (formula: C₇H₁₉N₃).

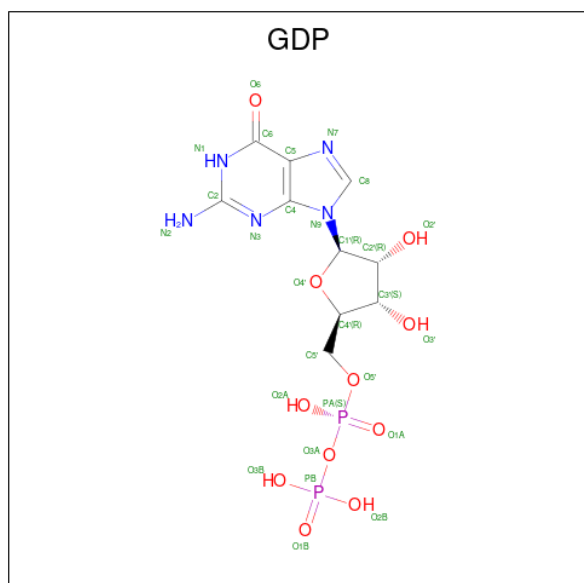


Mol	Chain	Residues	Atoms			AltConf
			Total	C	N	
93	A3	1	10	7	3	0

- Molecule 94 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
94	03	1	1	1	0
94	43	1	1	1	0
94	r3	1	1	1	0
94	B6	1	1	1	0
94	O6	1	1	1	0
94	P6	1	1	1	0
94	T6	1	1	1	0

- Molecule 95 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).

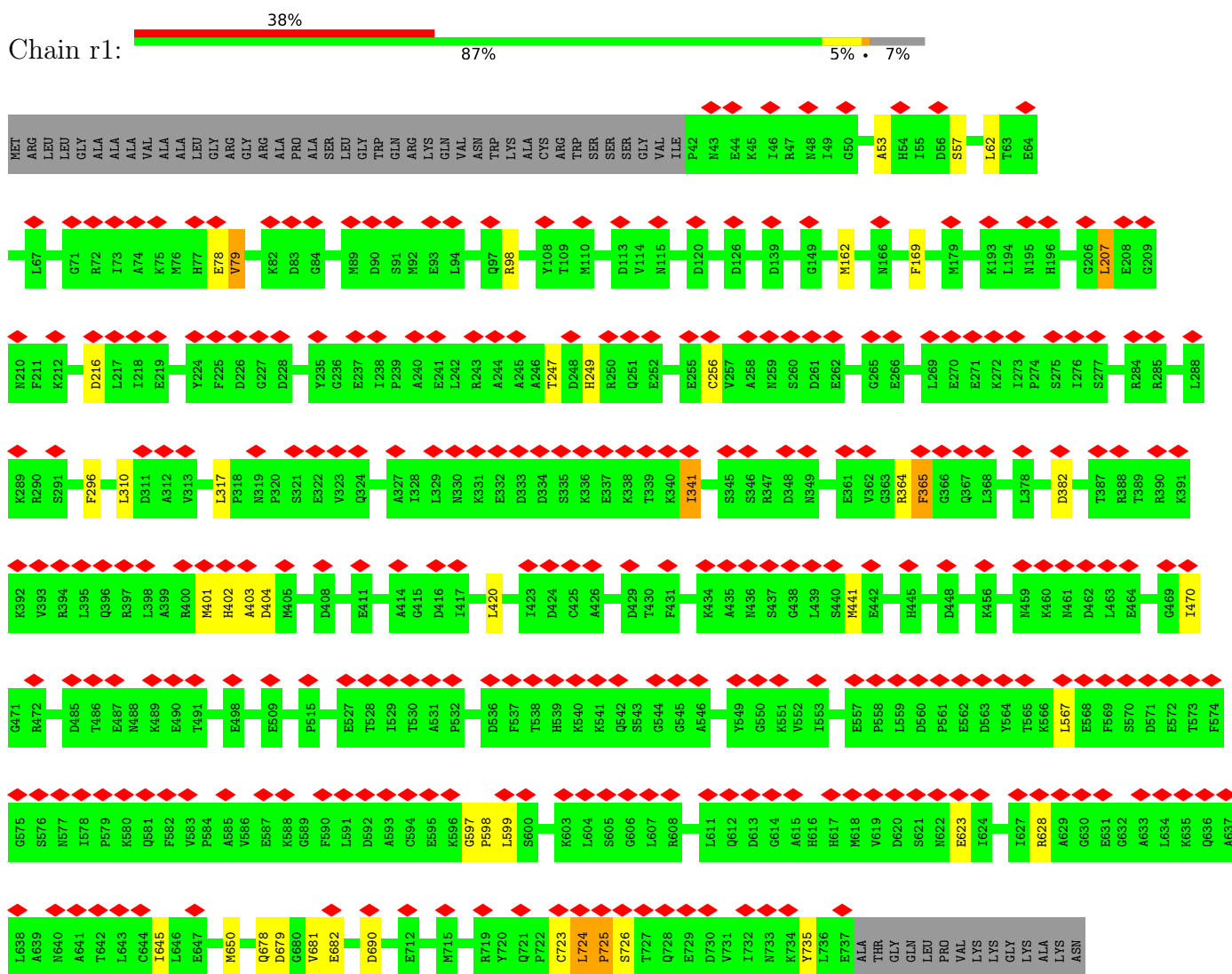


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
95	X6	1	28	10	5	11	2	0

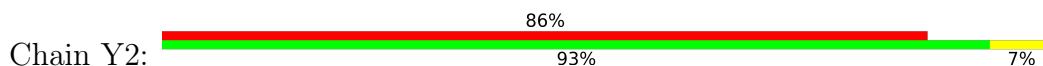
3 Residue-property plots i

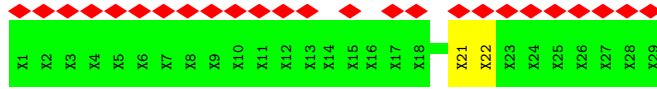
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Elongation factor G, mitochondrial

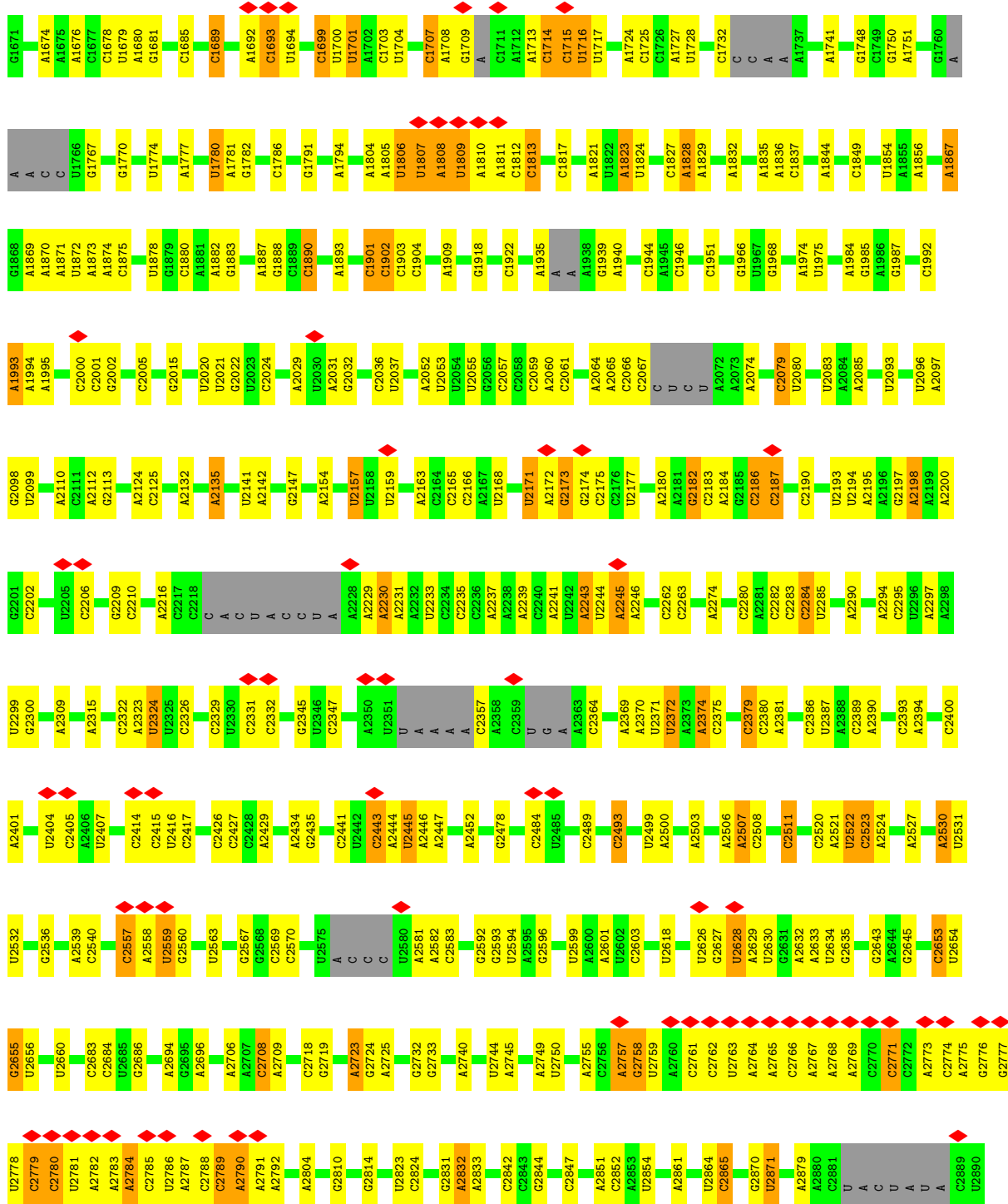


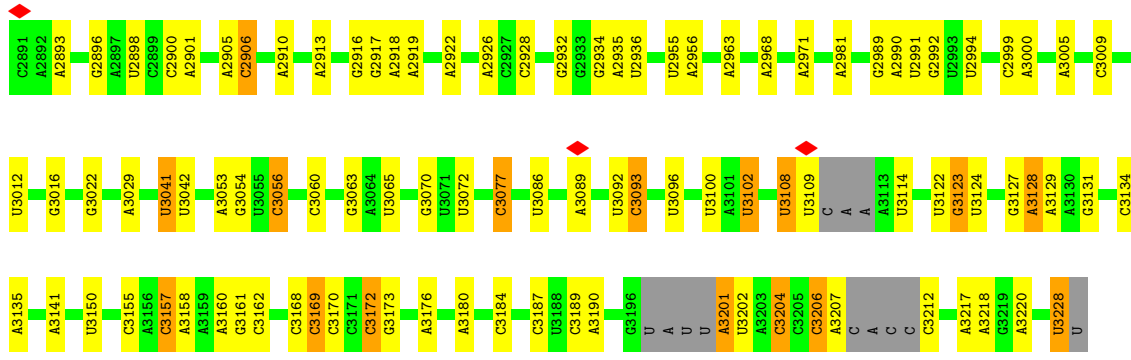
- Molecule 2: nascent chain





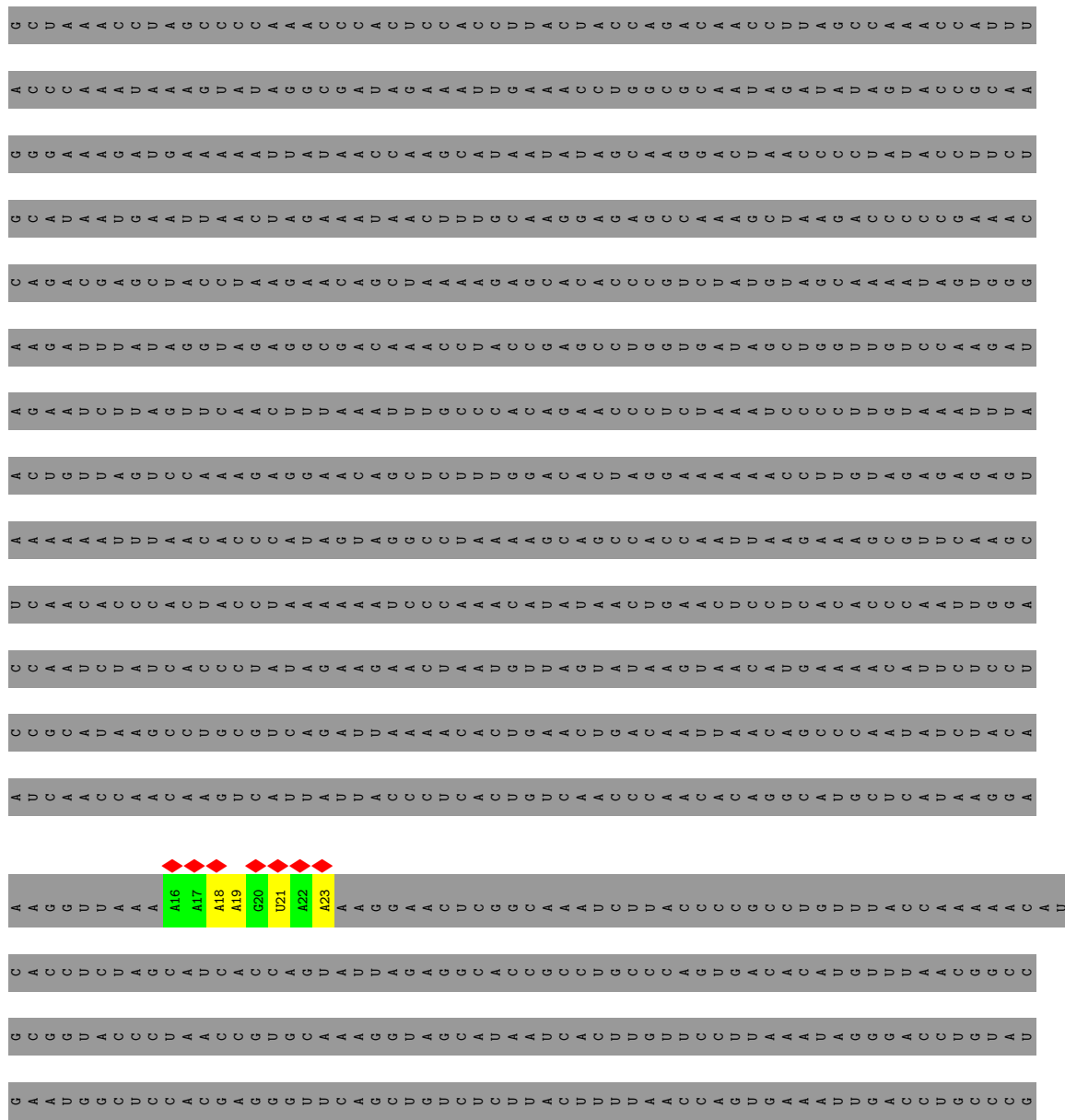
• Molecule 3: 16S rRNA

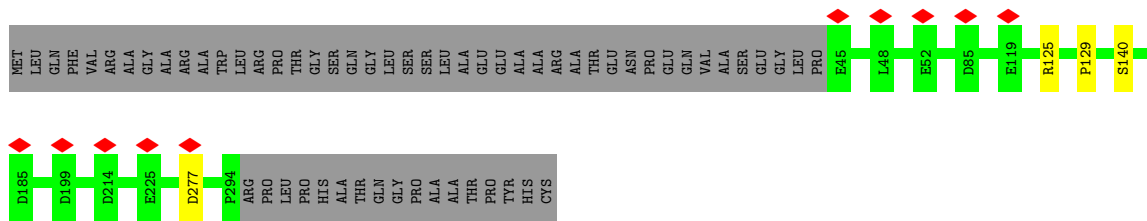




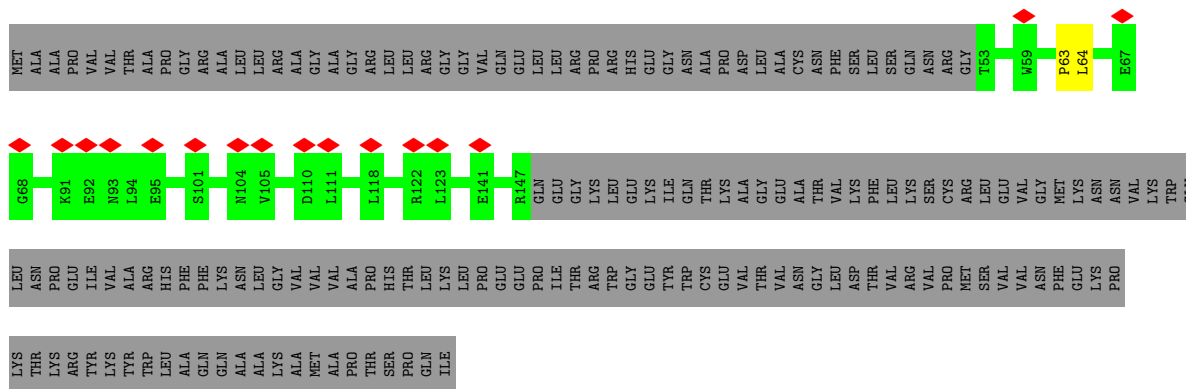
• Molecule 3: 16S rRNA

Chain 8: 99%

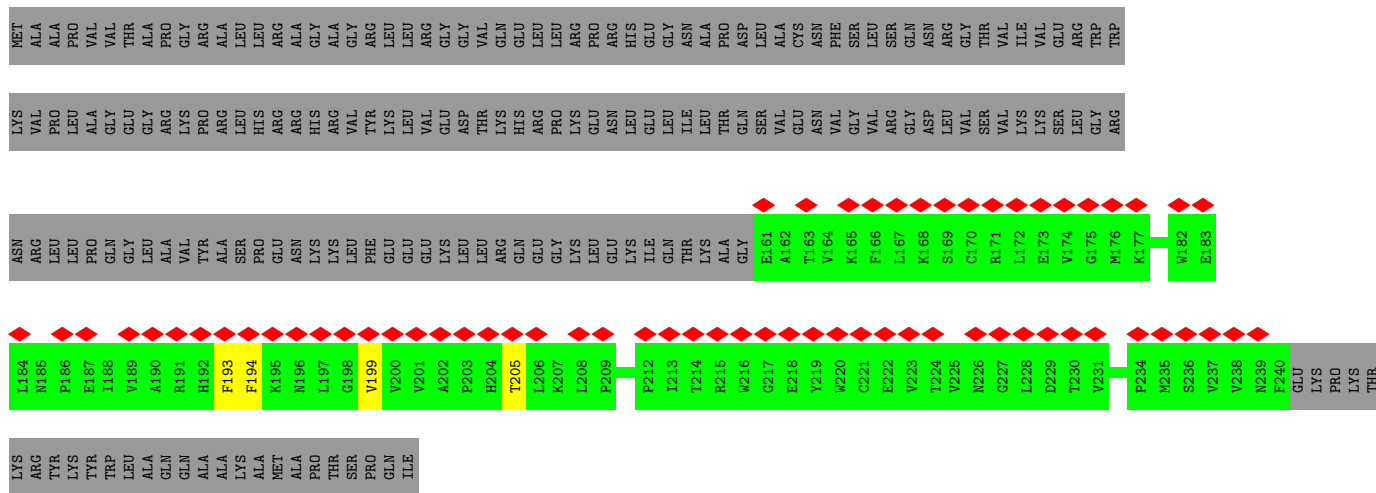




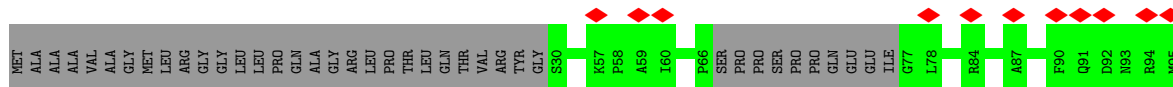
• Molecule 8: 39S ribosomal protein L9, mitochondrial

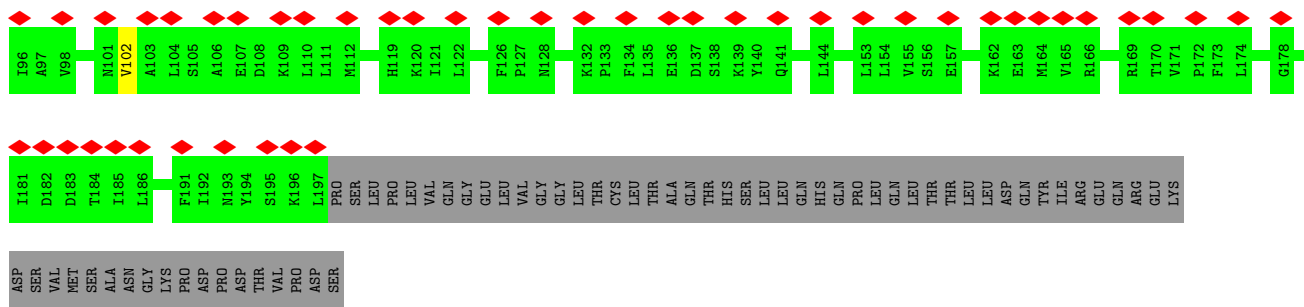


• Molecule 8: 39S ribosomal protein L9, mitochondrial

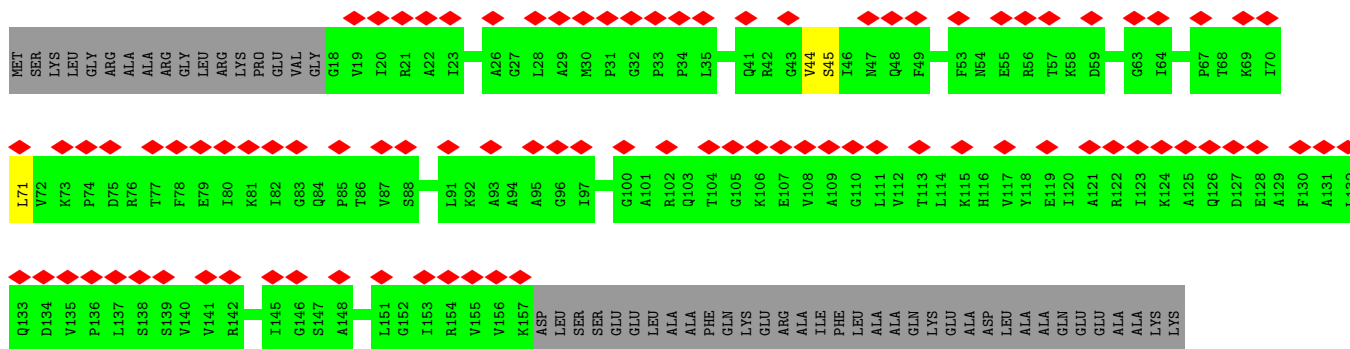
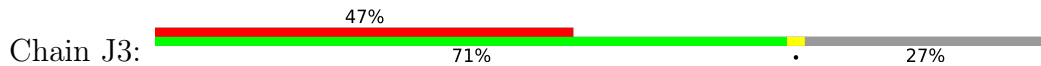


• Molecule 9: 39S ribosomal protein L10, mitochondrial

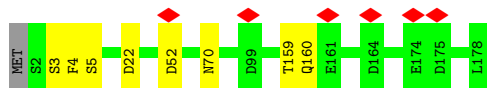




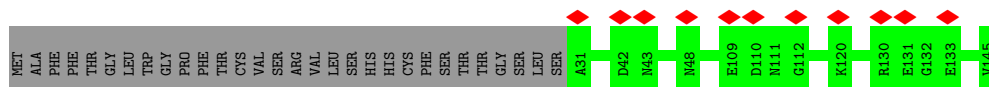
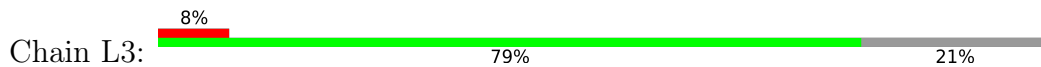
• Molecule 10: 39S ribosomal protein L11, mitochondrial



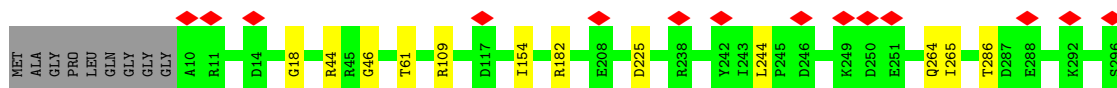
• Molecule 11: 39S ribosomal protein L13, mitochondrial



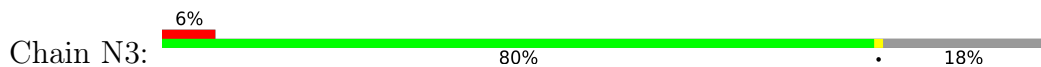
• Molecule 12: 39S ribosomal protein L14, mitochondrial

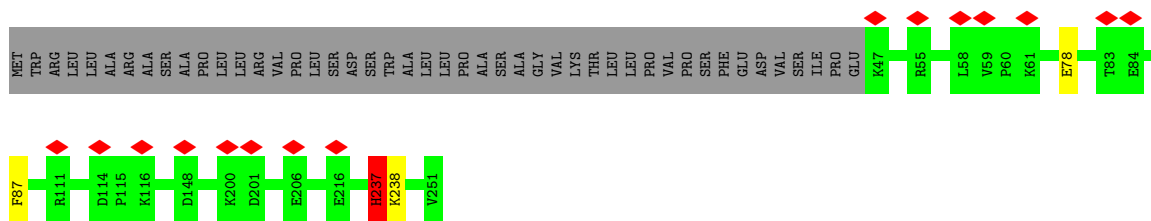


• Molecule 13: 39S ribosomal protein L15, mitochondrial

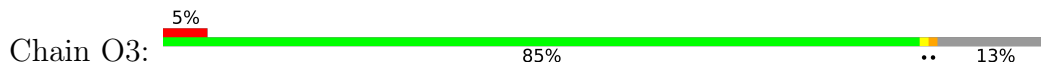


• Molecule 14: 39S ribosomal protein L16, mitochondrial

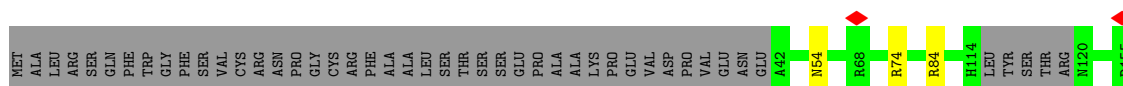
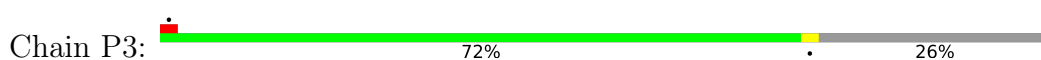




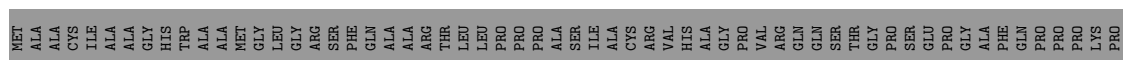
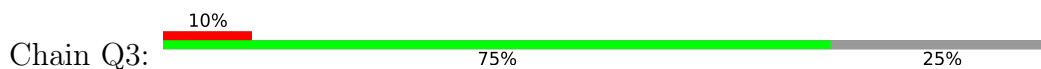
- Molecule 15: 39S ribosomal protein L17, mitochondrial



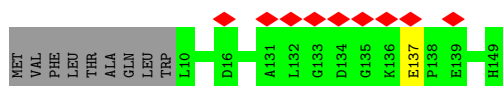
- Molecule 16: Mitochondrial ribosomal protein L18, isoform CRA_b



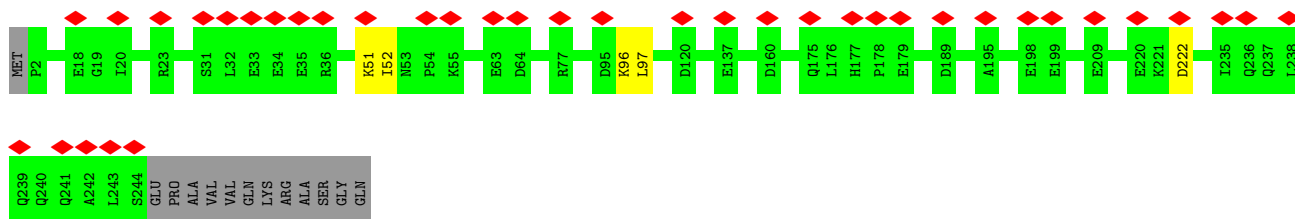
- Molecule 17: 39S ribosomal protein L19, mitochondrial



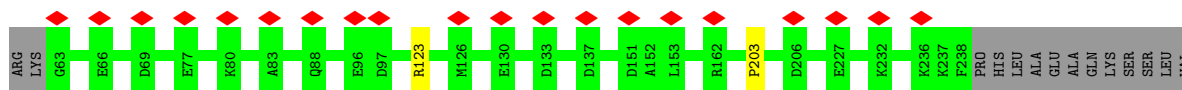
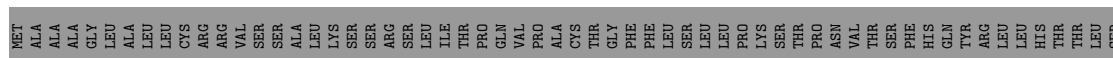
- Molecule 18: 39S ribosomal protein L20, mitochondrial



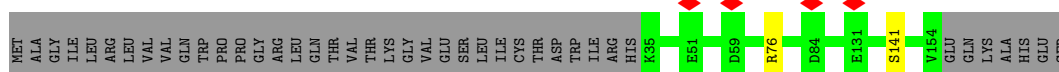
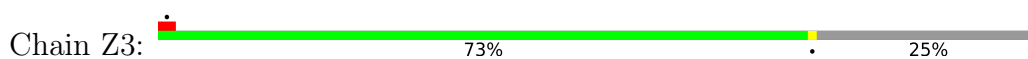
- Molecule 19: 39S ribosomal protein L21, mitochondrial



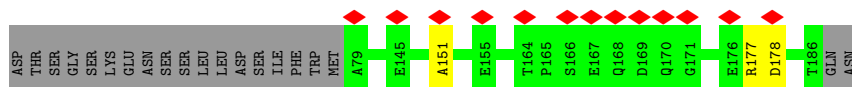
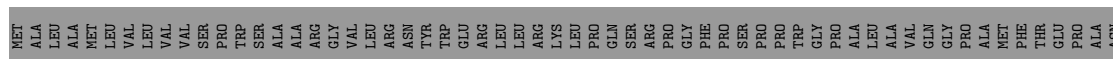
- Molecule 25: 39S ribosomal protein L47, mitochondrial



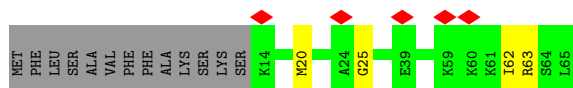
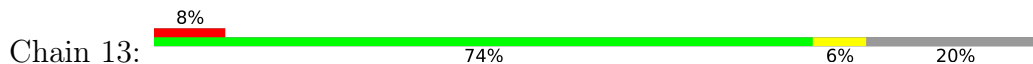
- Molecule 26: 39S ribosomal protein L30, mitochondrial



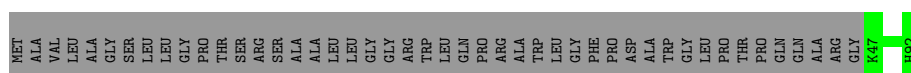
- Molecule 27: 39S ribosomal protein L32, mitochondrial



- Molecule 28: 39S ribosomal protein L33, mitochondrial

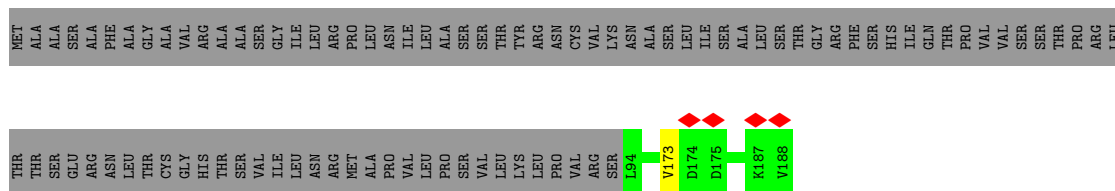


- Molecule 29: 39S ribosomal protein L34, mitochondrial



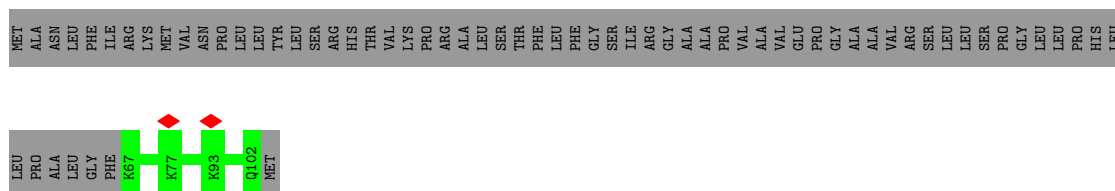
- Molecule 30: 39S ribosomal protein L35, mitochondrial

Chain 33:  50% 49%




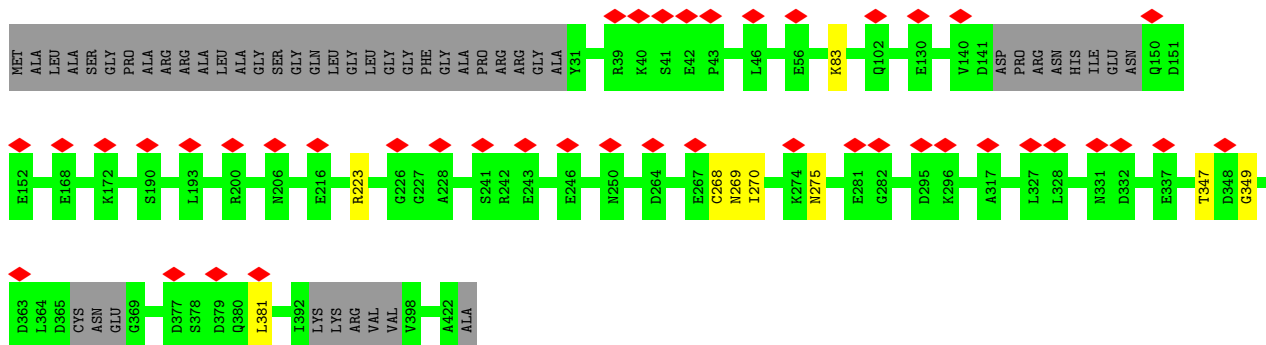
- Molecule 31: 39S ribosomal protein L36, mitochondrial

Chain 43:  35% 65%




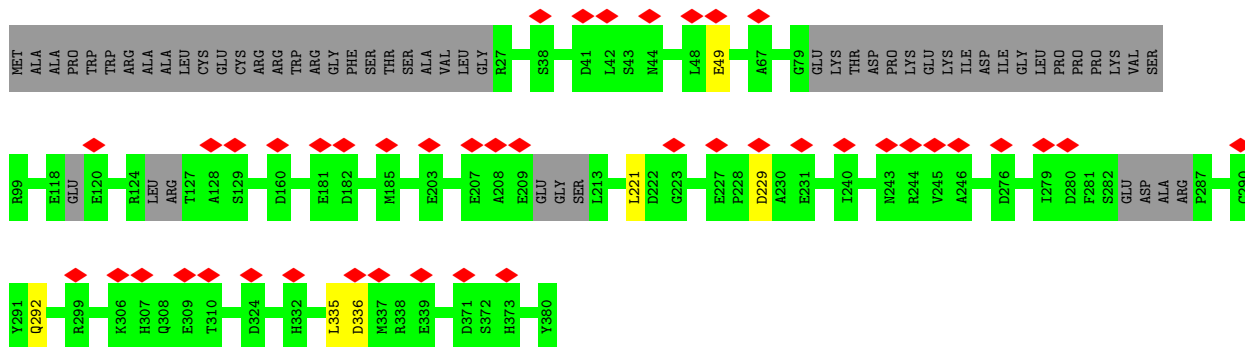
- Molecule 32: 39S ribosomal protein L37, mitochondrial

Chain 53:  10% 87% 11%

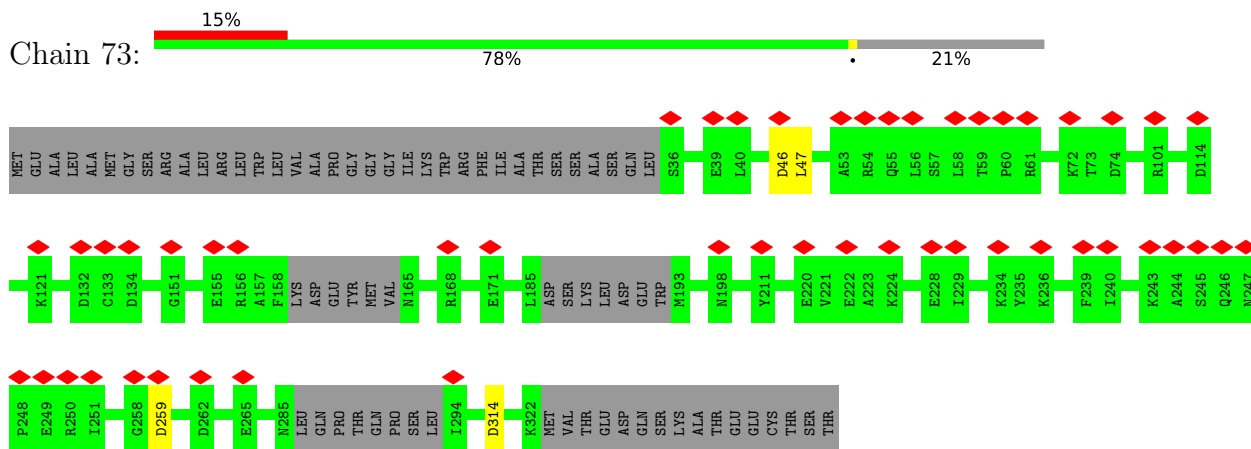


- Molecule 33: 39S ribosomal protein L38, mitochondrial

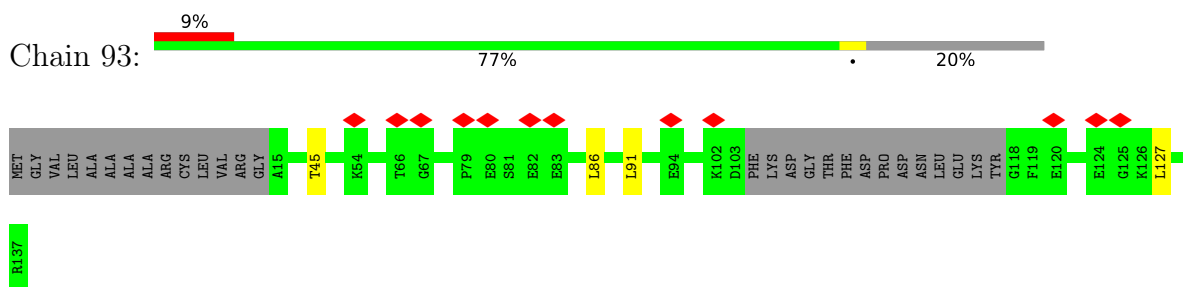
Chain 63:  11% 84% 14%



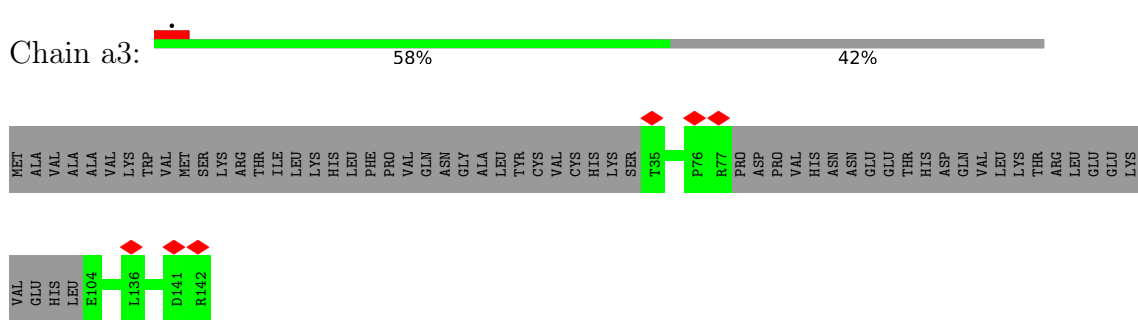
- Molecule 34: 39S ribosomal protein L39, mitochondrial



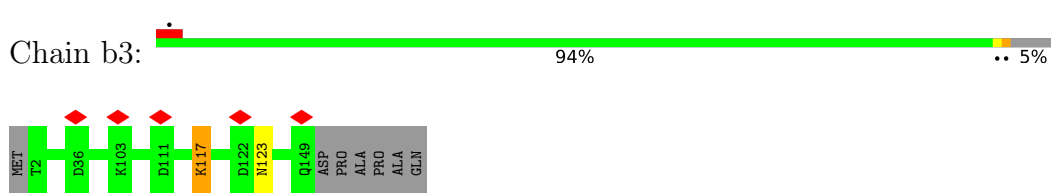
• Molecule 35: 39S ribosomal protein L41, mitochondrial



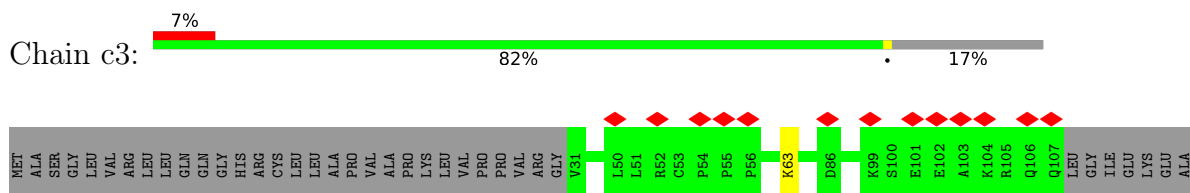
• Molecule 36: 39S ribosomal protein L42, mitochondrial

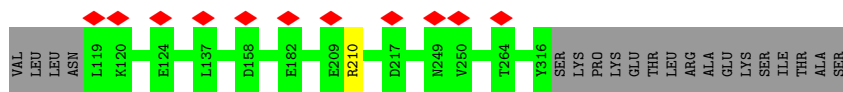


• Molecule 37: 39S ribosomal protein L43, mitochondrial

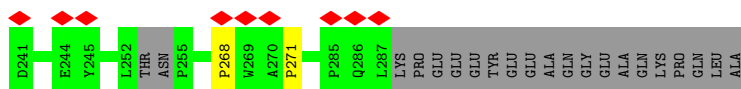
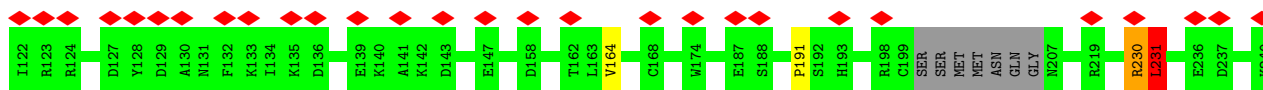
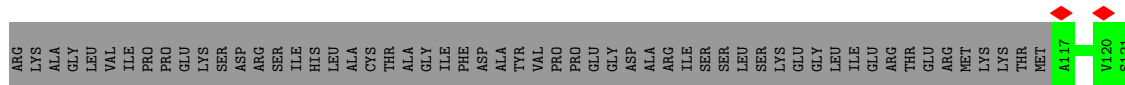
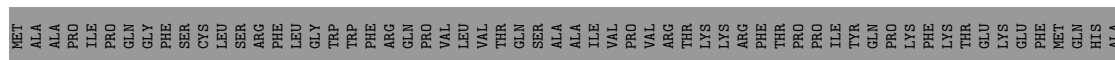


• Molecule 38: 39S ribosomal protein L44, mitochondrial

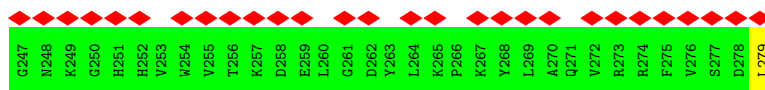
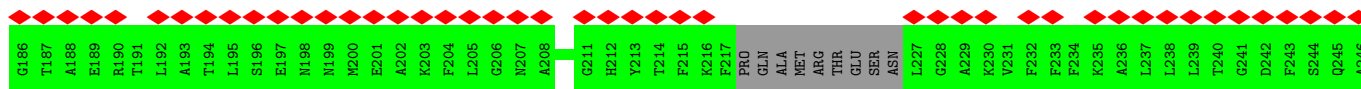
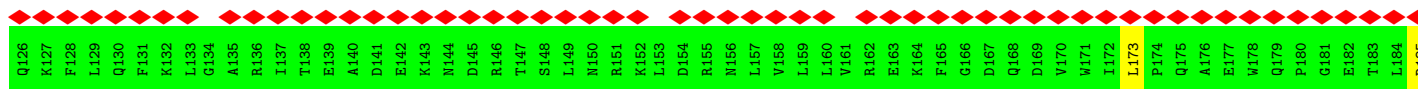
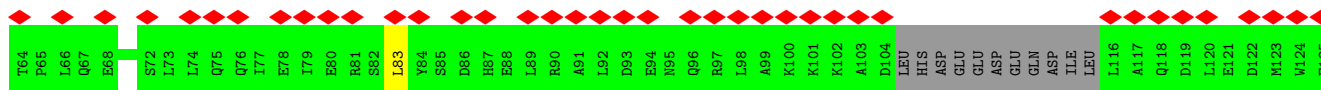
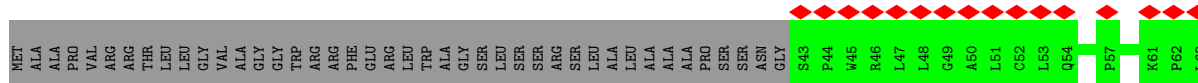
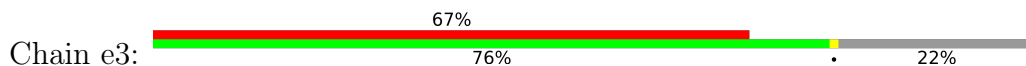




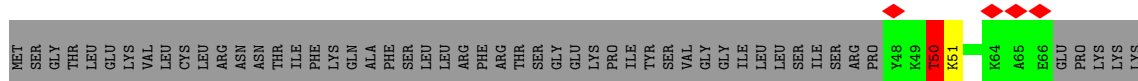
• Molecule 39: 39S ribosomal protein L45, mitochondrial

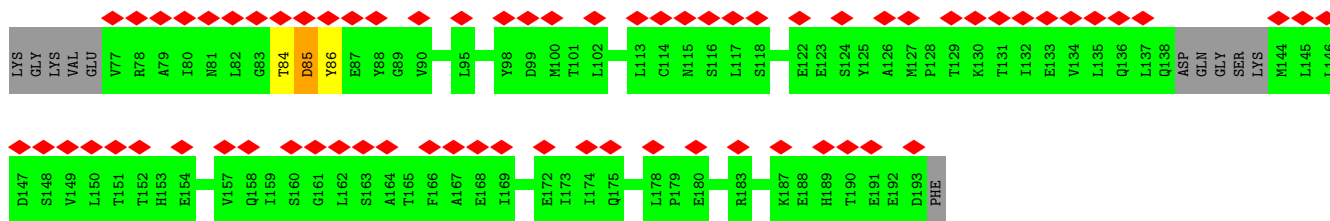


• Molecule 40: 39S ribosomal protein L46, mitochondrial

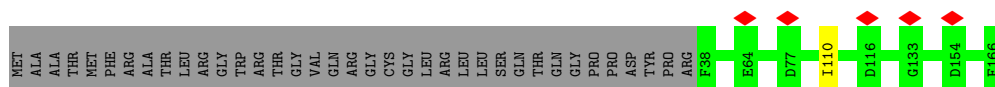
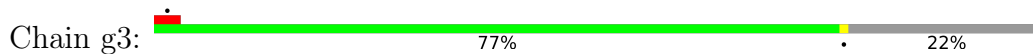


• Molecule 41: 39S ribosomal protein L48, mitochondrial

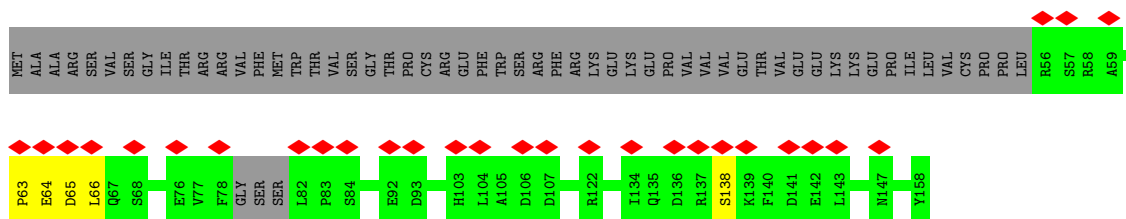




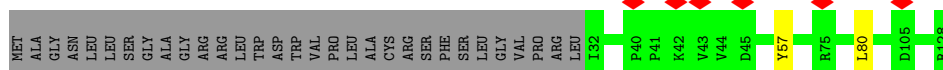
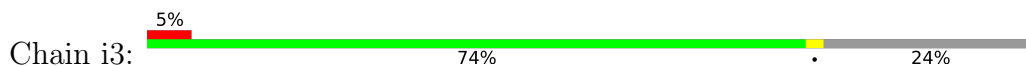
- Molecule 42: 39S ribosomal protein L49, mitochondrial



- Molecule 43: 39S ribosomal protein L50, mitochondrial



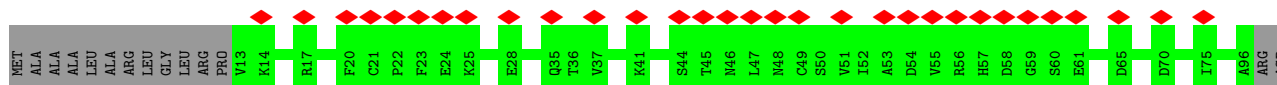
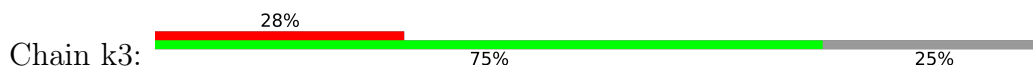
- Molecule 44: 39S ribosomal protein L51, mitochondrial



- Molecule 45: cDNA FLJ76418, highly similar to Homo sapiens mitochondrial ribosomal protein L52 (MRPL52), transcript variant 1, mRNA



- Molecule 46: 39S ribosomal protein L53, mitochondrial



ALA
ALA
GLY
SER
GLY
GLY
ASP
LYS
PRO
GLY
ALA
ALA
ASP
THR
GLY
ARG

- Molecule 47: 39S ribosomal protein L54, mitochondrial



MET
ALA
THR
LYS
ARG
LEU
PHE
GLY
ALA
THR
ARG
THR
TRP
ALA
GLY
TRP
TRP
GLY
LEU
LEU
ASN
PRO
ALA
THR
SER
GLY
ARG
LEU
LEU
ALA
ARG
ASP
TYR
LEU
ALA
LYS
LYS
PRO
VAL
MET
LYS
GLY
ALA
LYS
SER
LYS
GLY
LEU
GLY
ALA
VAL
THR
SER
GLU
GLU
ALA
LYS
ASP
PRO
ASP
ARG
LEU
LEU
VAL
THR
ASP
PRO
GLU
SER
GLU
LEU
LEU
K114
K115
K136
ARG
LEU
ASP

VAL
CYS
THR
ASP
PRO
VAL
GLN
LEU
THR
THR
TYR
ALA
MET
GLY
VAL
ASN
ILE
LYS
THR
GLY
GLY
ASN
GLN
VAL
PRO
LEU
LYS
PRO
ASP
ALA
TYR
GLY
PRO
GLU
TRP
LEU
PHE
GLU
MET
ASN
GLY
PRO
PRO
LYS
THR
SER
GLU
LEU
LEU
ASP
PRO
GLU
K114
K115
K136
ARG
LEU

- Molecule 48: 39S ribosomal protein L55, mitochondrial



MET
ALA
VAL
GLY
SER
LEU
LEU
GLY
ARG
LEU
ARG
GLN
SER
THR
VAL
ASP
LEU
THR
ALA
LYS
THR
GLY
PRO
GLU
ALA
LEU
ARG
ARG
LEU
HIS
SER
SER
LYS
ARG
ARG
GLU
ALA
D34
S35
S39
L40
H44
R45
Q46
A47
Y48
A49
R50
L51
L56
V57
K58
Q59
D60
G61
S62
T63
I64
H65
I66
R67

LYS

- Molecule 49: Ribosomal protein 63, mitochondrial



MET
PHE
THR
LEU
ALA
LEU
LEU
TRP
R9
E42
D90
S102

- Molecule 50: Peptidyl-tRNA hydrolase ICT1, mitochondrial



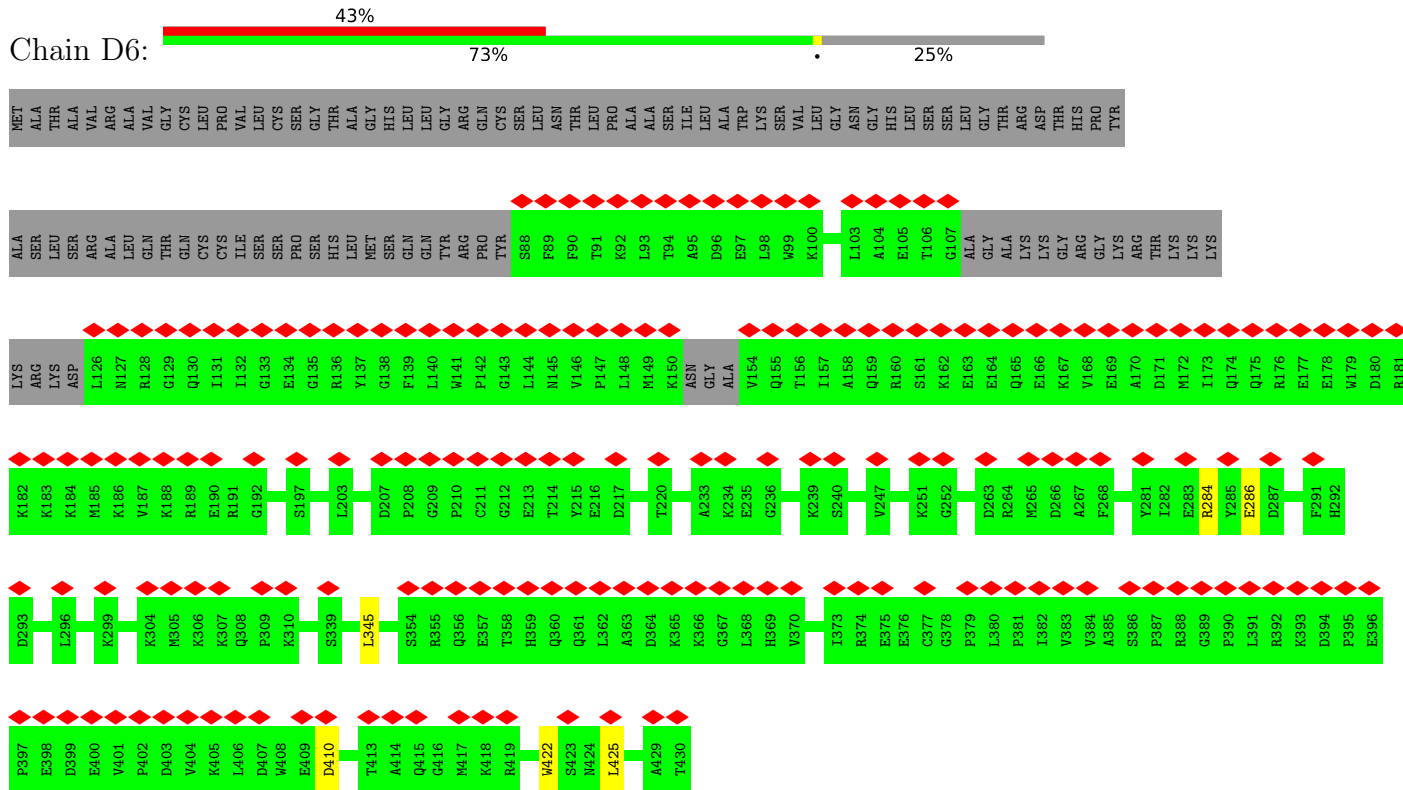
MET
ALA
ALA
THR
ARG
CYS
LEU
ARG
TRP
GLY
LEU
SER
ARG
ALA
VAL
VAL
LEU
LEU
PRO
PRO
ALA
ALA
CYS
PRO
ARG
ARG
ALA
LEU
HIS
LYS
GLN
LYS
ASP
GLY
THR
E38
D46
Q53
G54
S55
D56
R60
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ASP
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D70
R82

ARG
ARG
VAL
ASP
MET
ASP

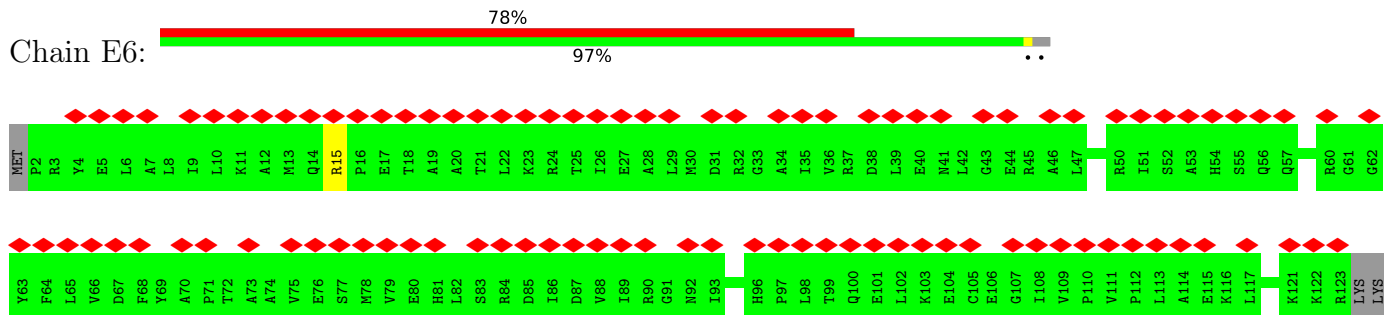
- Molecule 51: Growth arrest and DNA damage-inducible proteins-interacting protein 1



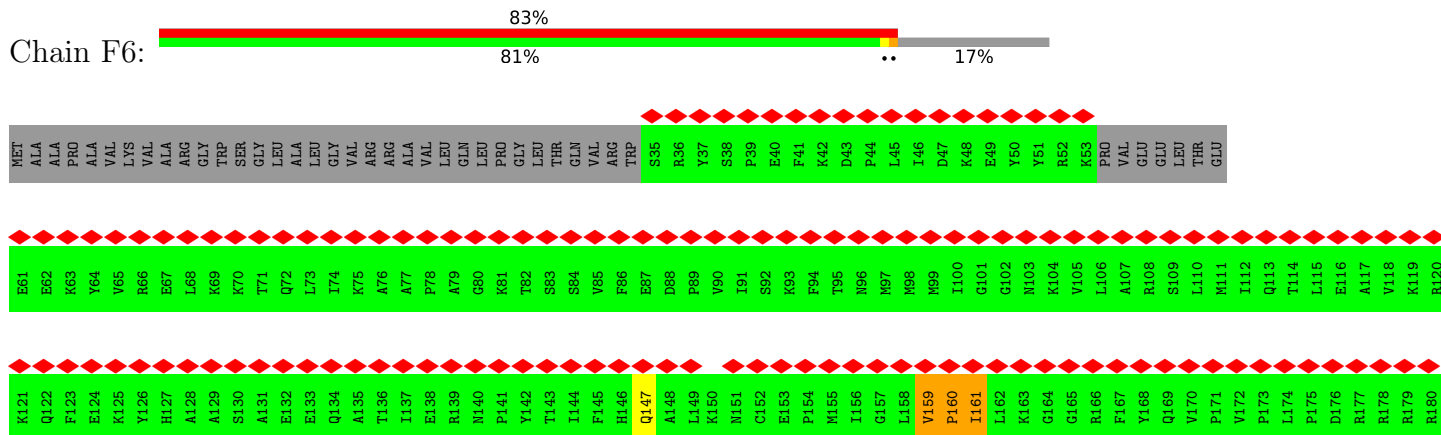
• Molecule 58: 28S ribosomal protein S5, mitochondrial

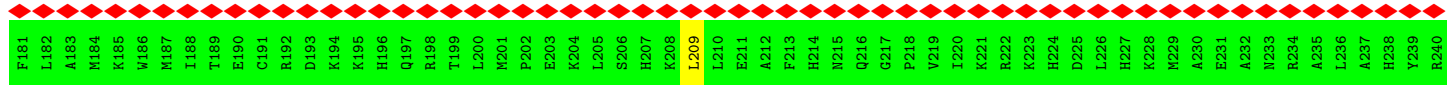


• Molecule 59: 28S ribosomal protein S6, mitochondrial

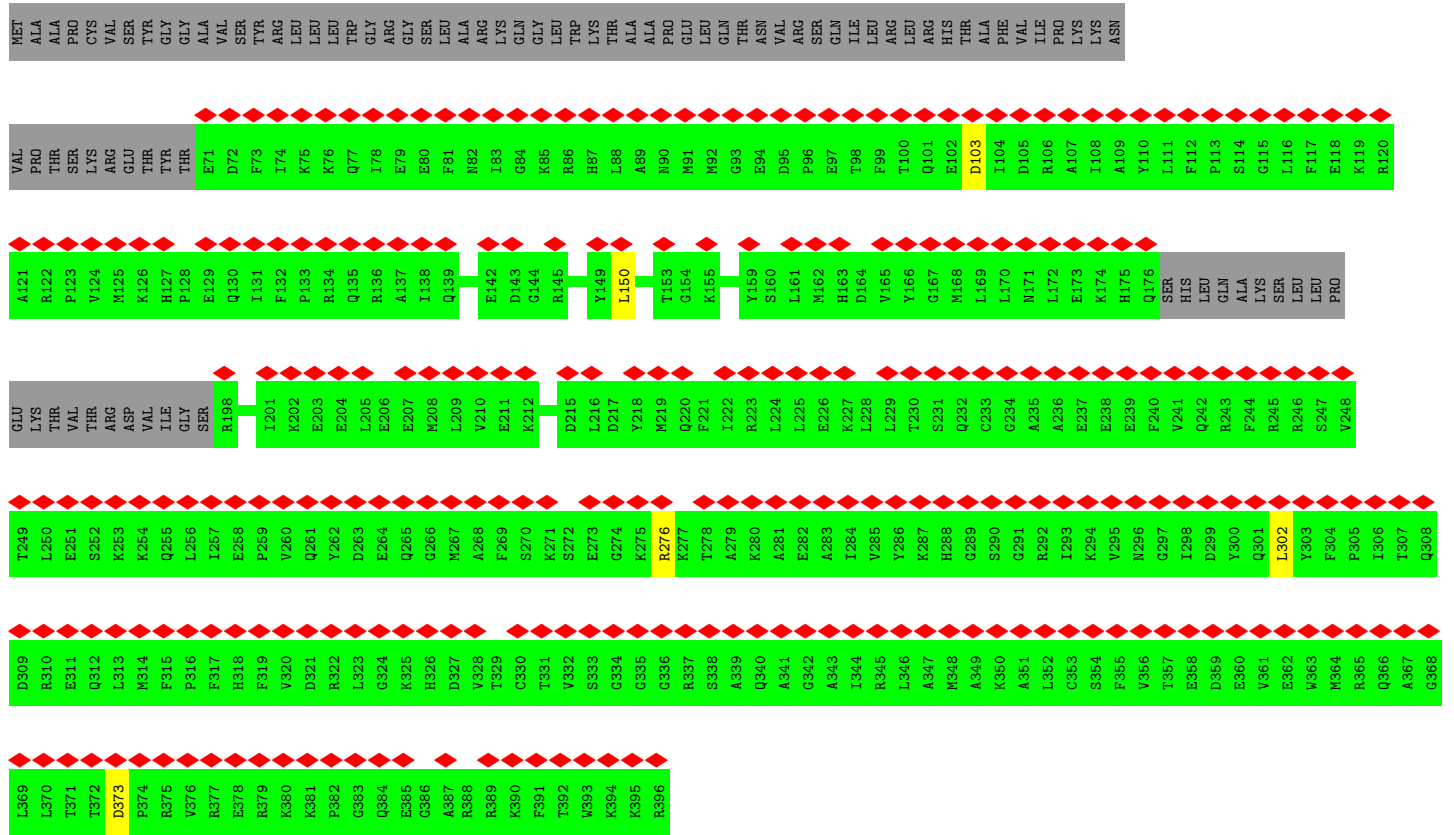
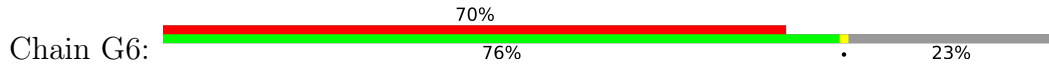


• Molecule 60: 28S ribosomal protein S7, mitochondrial

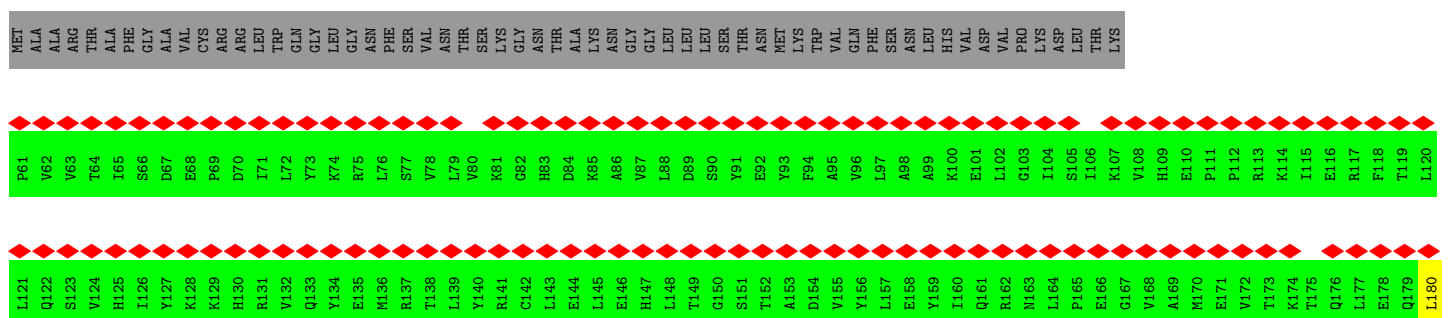


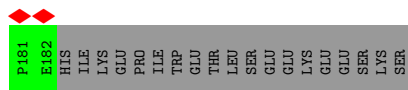


• Molecule 61: 28S ribosomal protein S9, mitochondrial

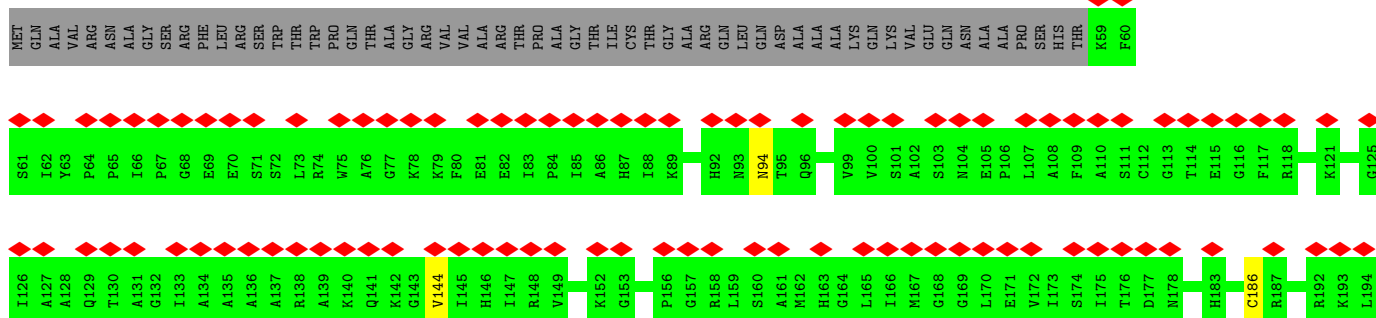


• Molecule 62: 28S ribosomal protein S10, mitochondrial

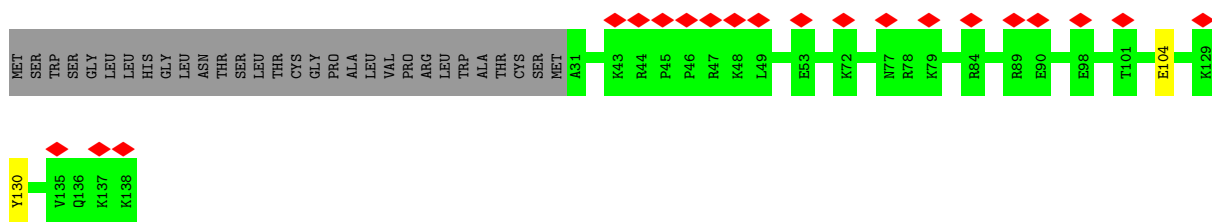
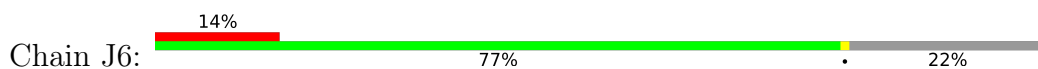




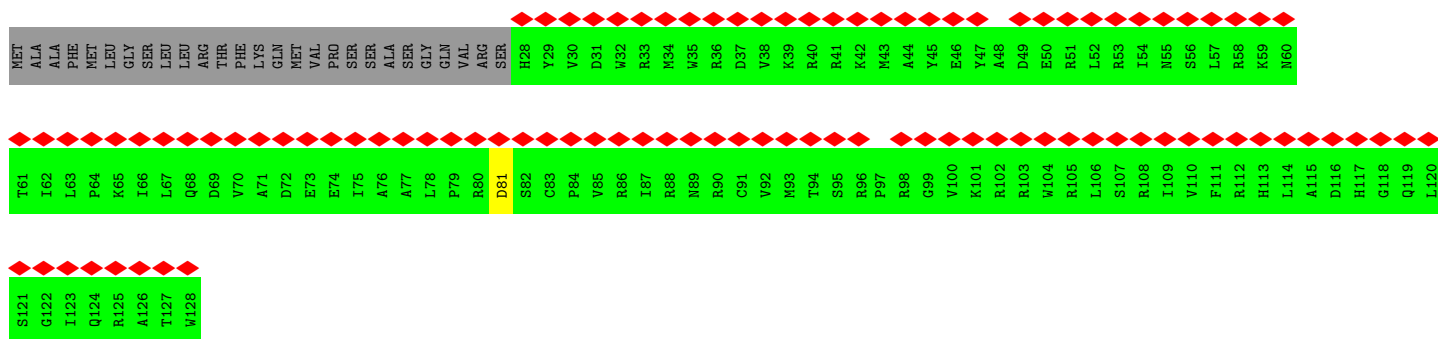
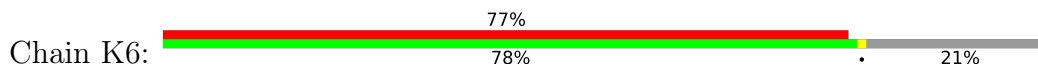
• Molecule 63: 28S ribosomal protein S11, mitochondrial



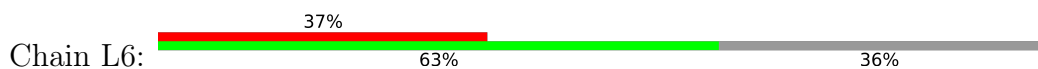
• Molecule 64: 28S ribosomal protein S12, mitochondrial

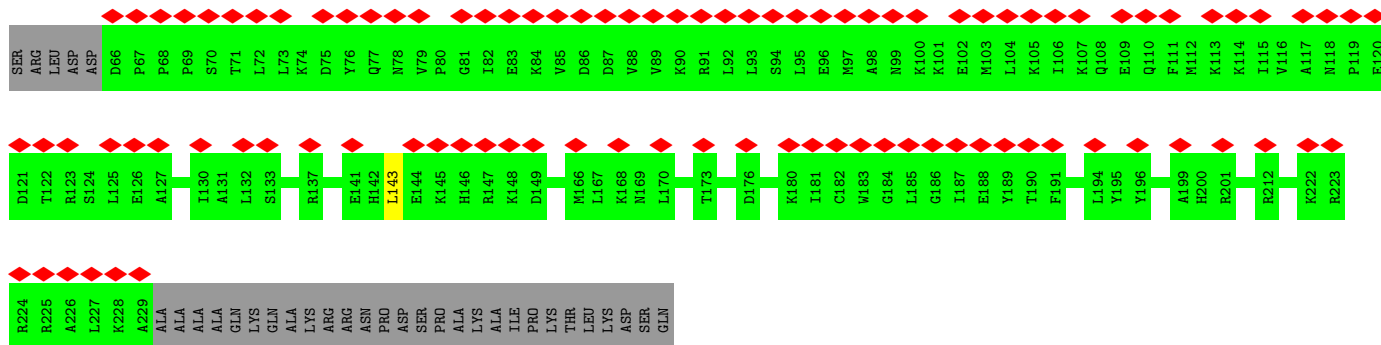


• Molecule 65: 28S ribosomal protein S14, mitochondrial

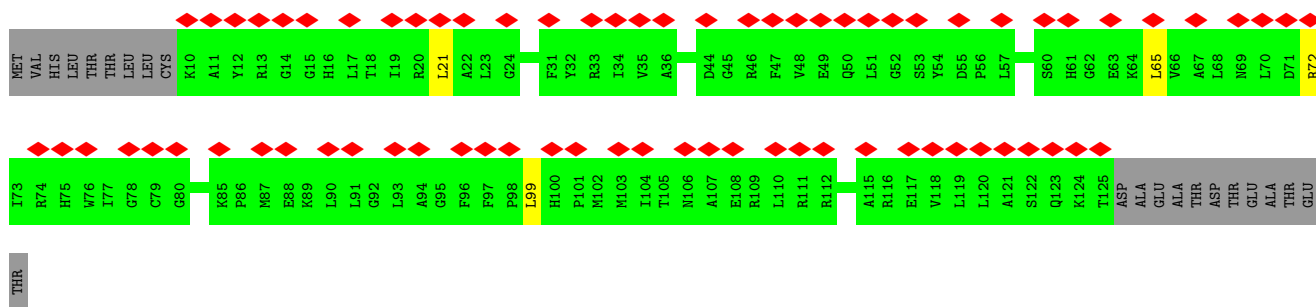
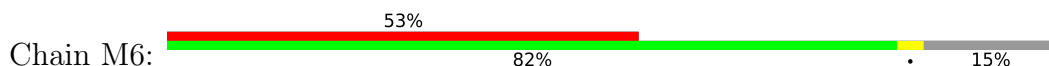


• Molecule 66: 28S ribosomal protein S15, mitochondrial

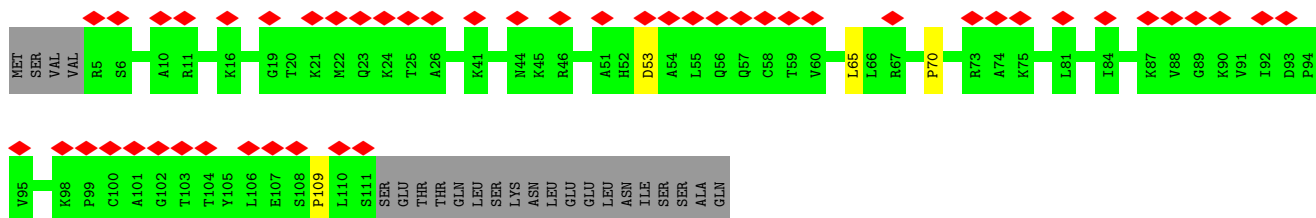
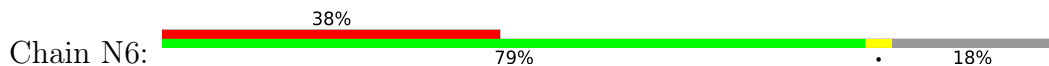




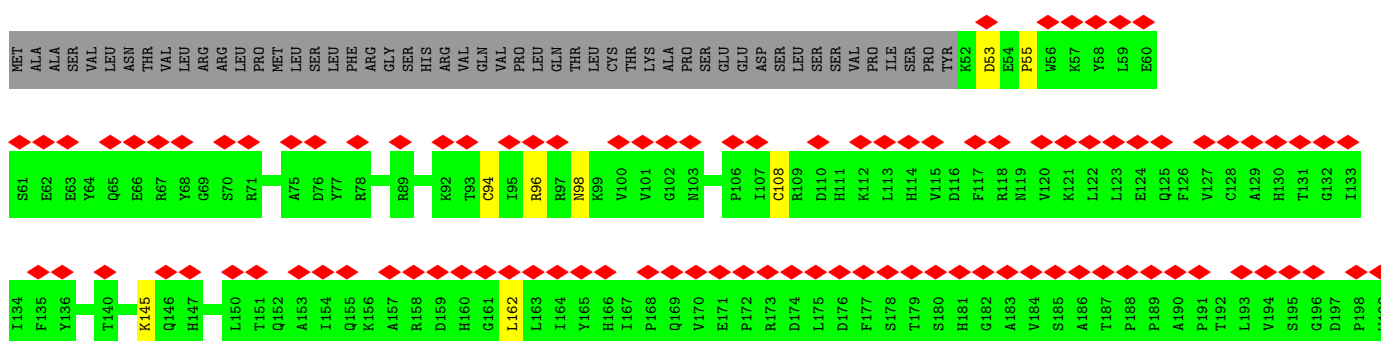
• Molecule 67: 28S ribosomal protein S16, mitochondrial

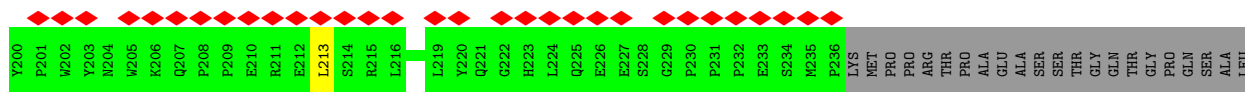


• Molecule 68: 28S ribosomal protein S17, mitochondrial

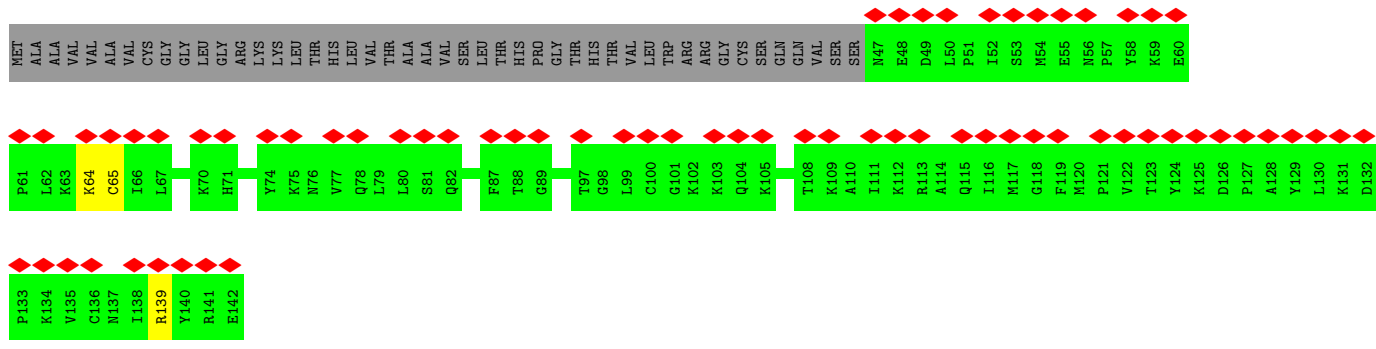


• Molecule 69: 28S ribosomal protein S18b, mitochondrial

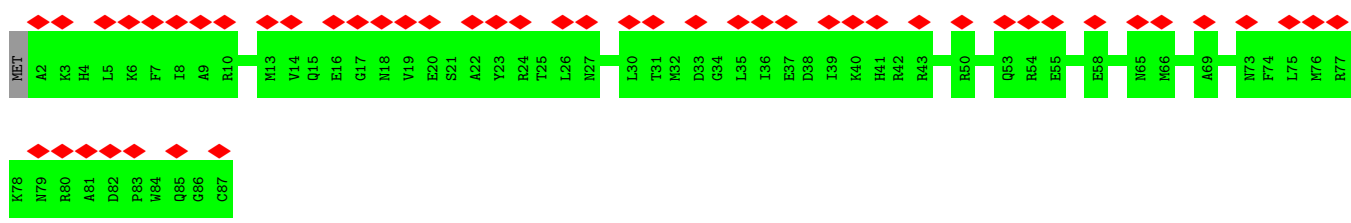




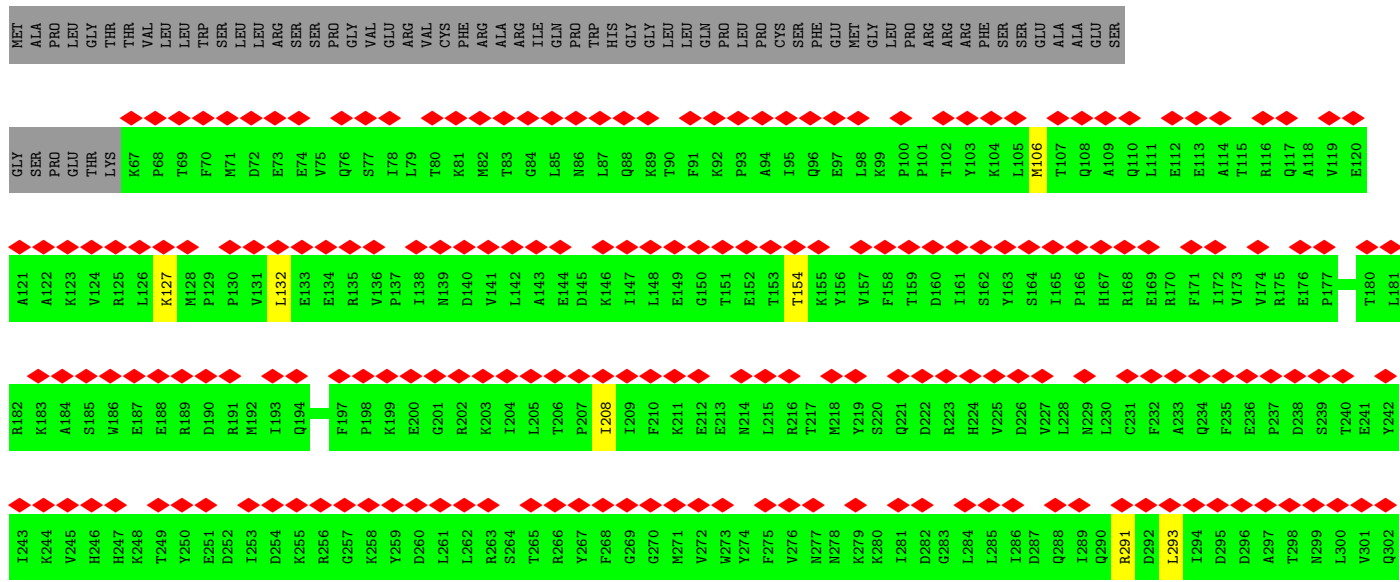
• Molecule 70: 28S ribosomal protein S18c, mitochondrial

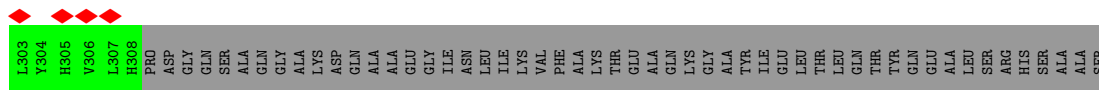


• Molecule 71: 28S ribosomal protein S21, mitochondrial

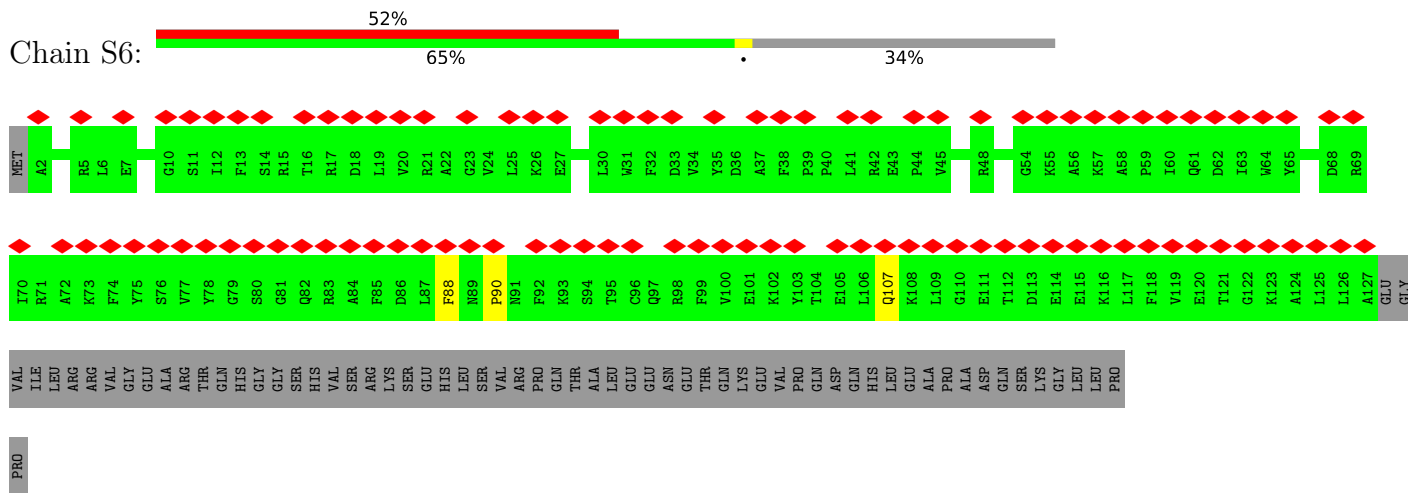


• Molecule 72: 28S ribosomal protein S22, mitochondrial

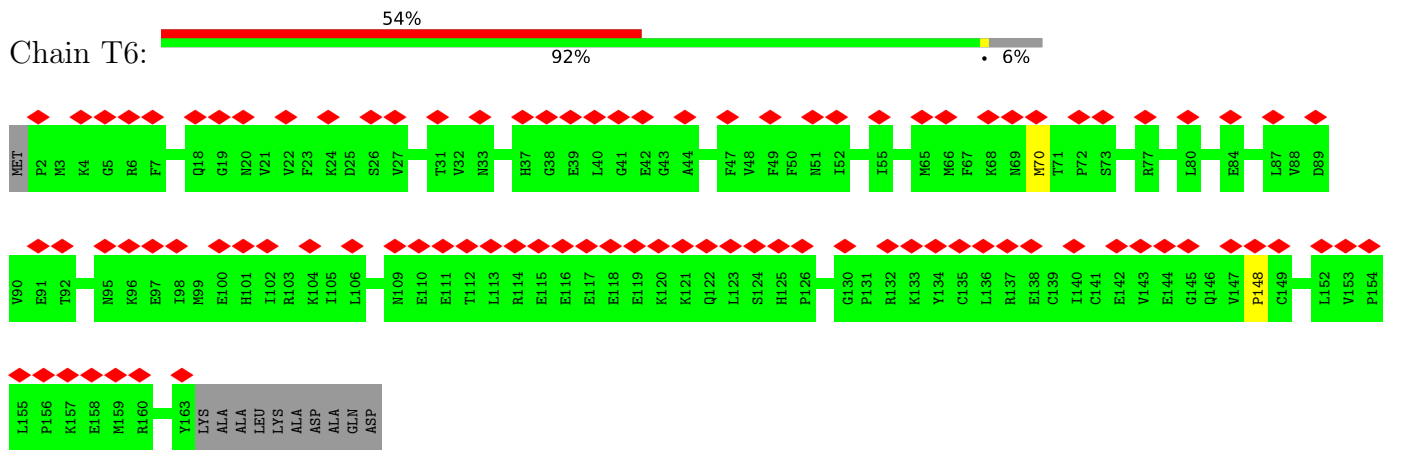




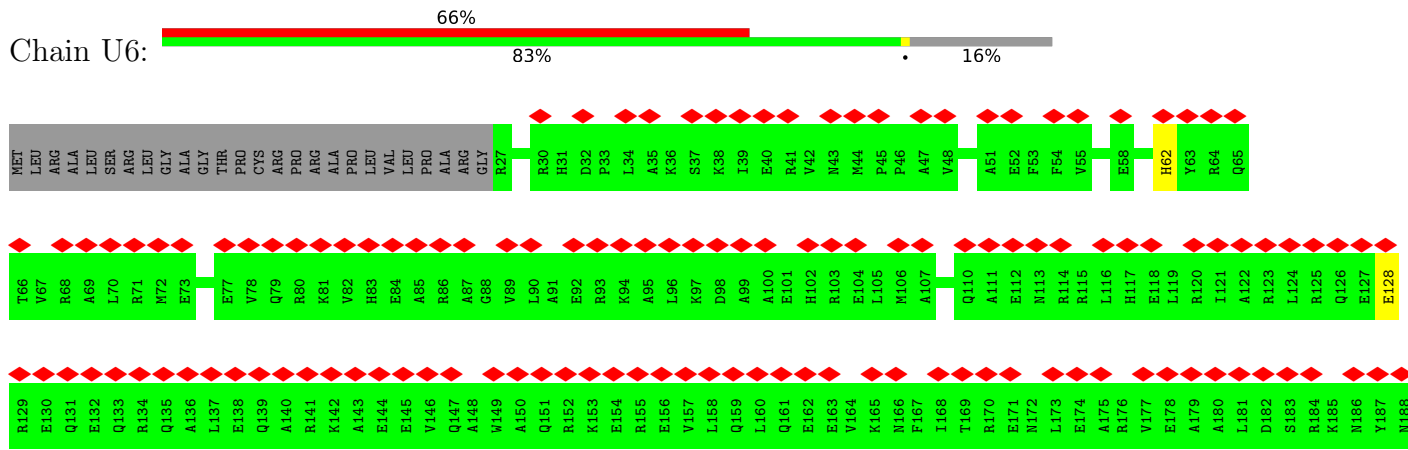
• Molecule 73: 28S ribosomal protein S23, mitochondrial

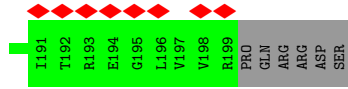


• Molecule 74: 28S ribosomal protein S25, mitochondrial

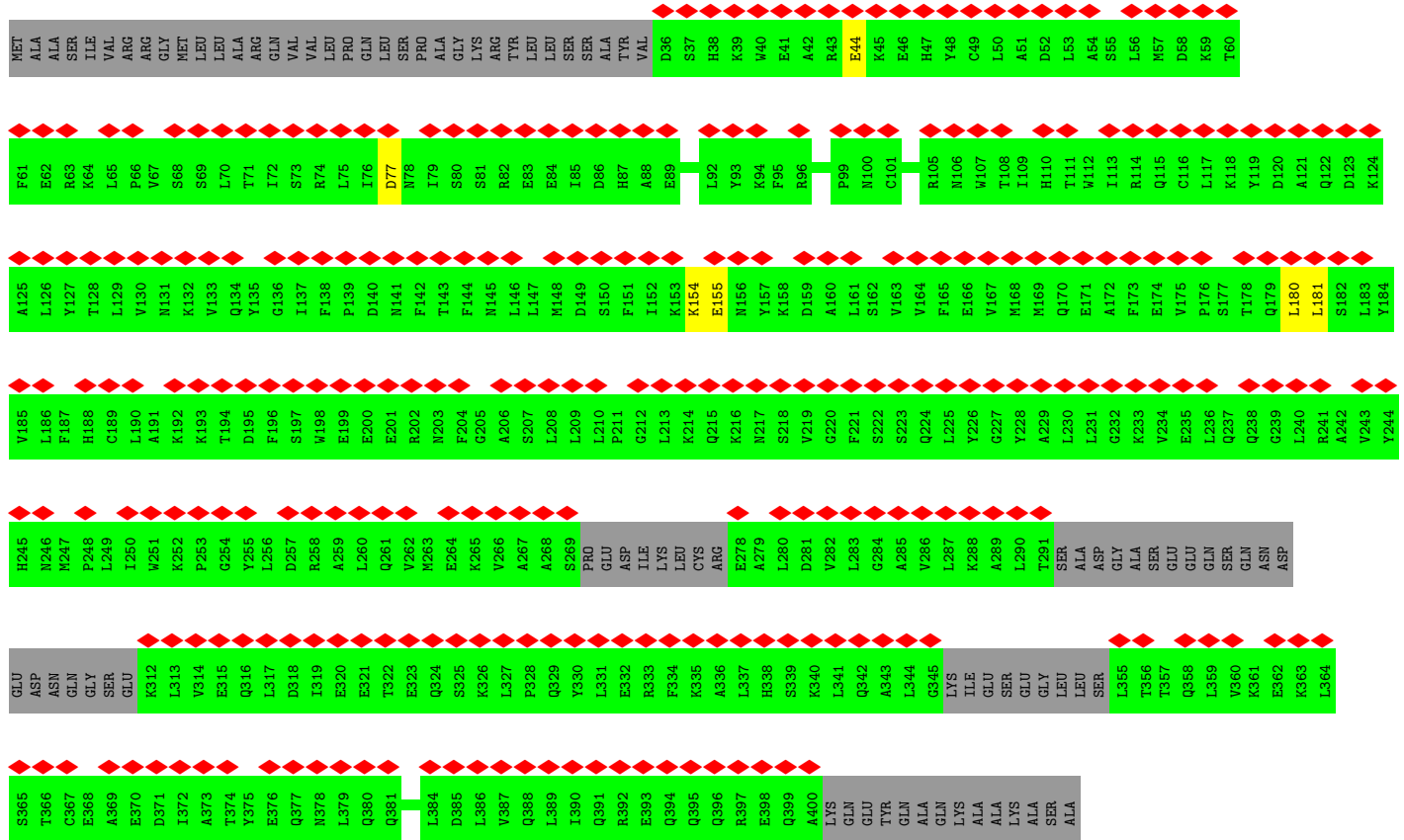
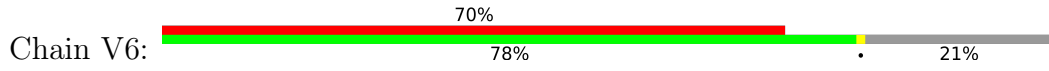


• Molecule 75: 28S ribosomal protein S26, mitochondrial

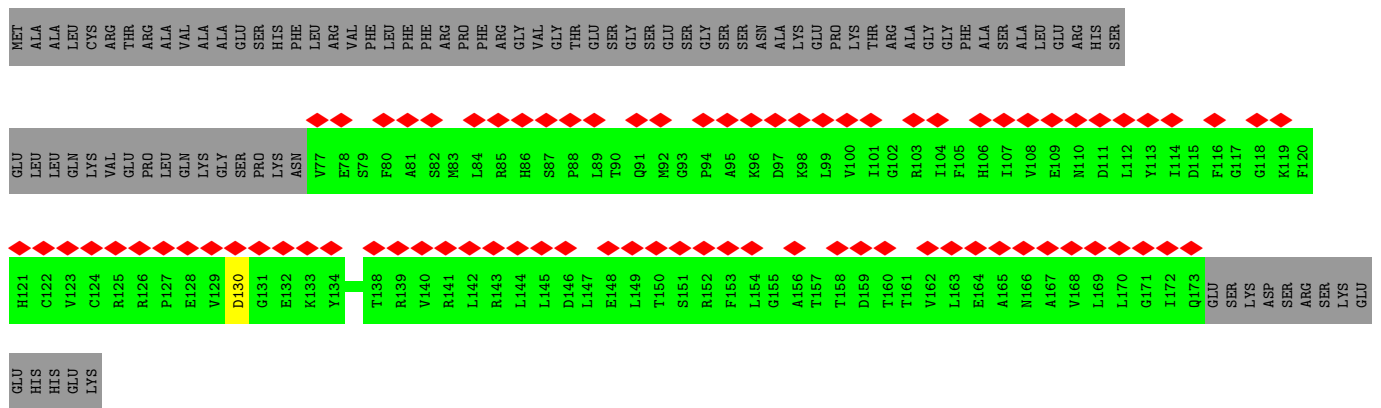




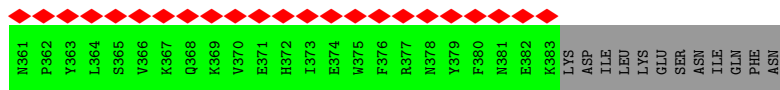
• Molecule 76: 28S ribosomal protein S27, mitochondrial



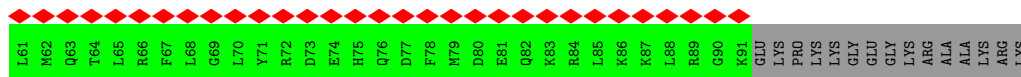
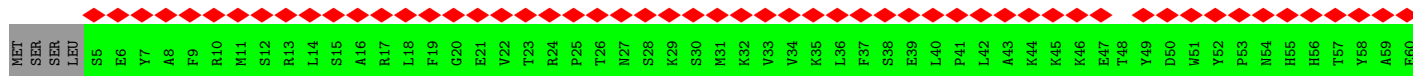
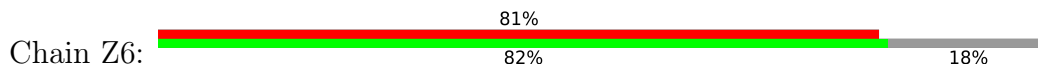
• Molecule 77: 28S ribosomal protein S28, mitochondrial



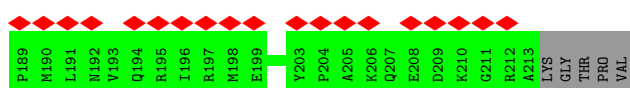
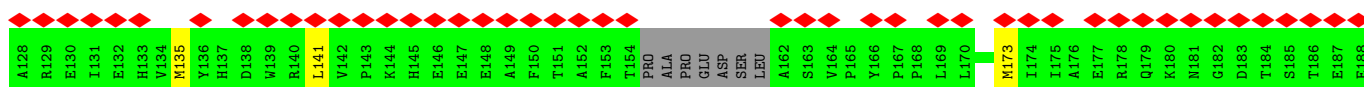
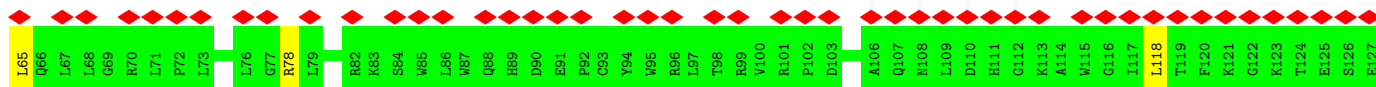
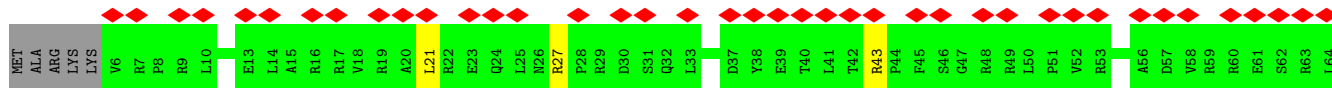
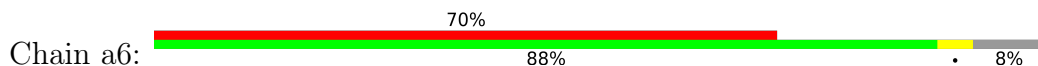
• Molecule 78: 28S ribosomal protein S29, mitochondrial



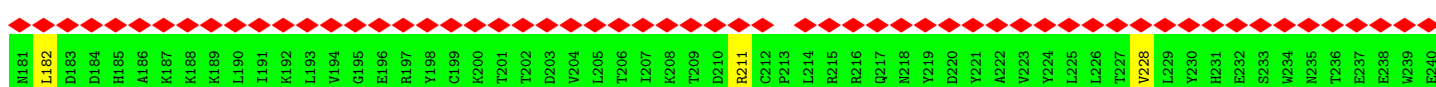
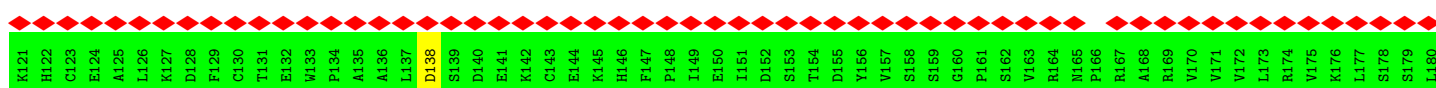
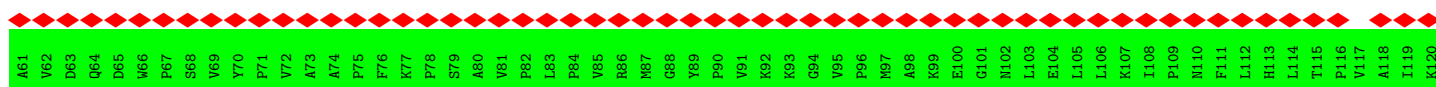
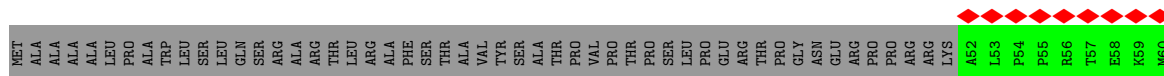
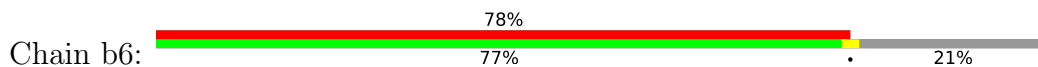
• Molecule 80: 28S ribosomal protein S33, mitochondrial

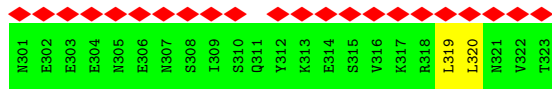
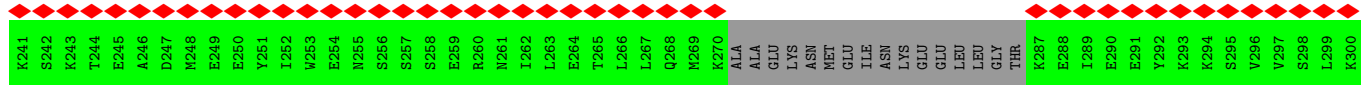


• Molecule 81: 28S ribosomal protein S34, mitochondrial

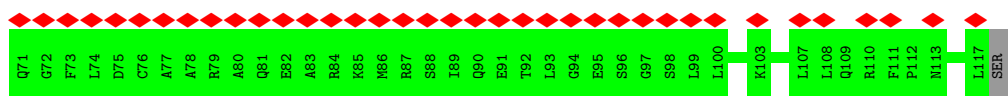
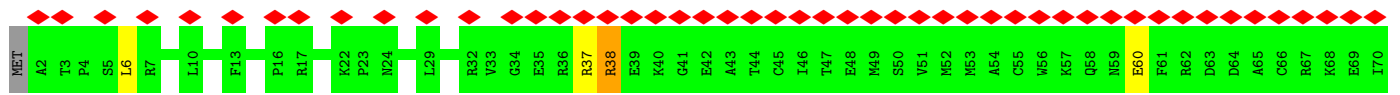
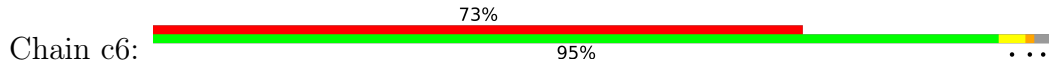


• Molecule 82: 28S ribosomal protein S35, mitochondrial

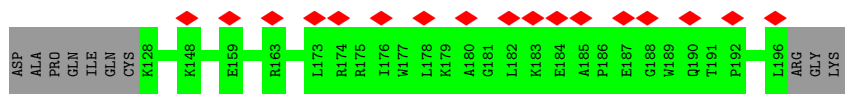
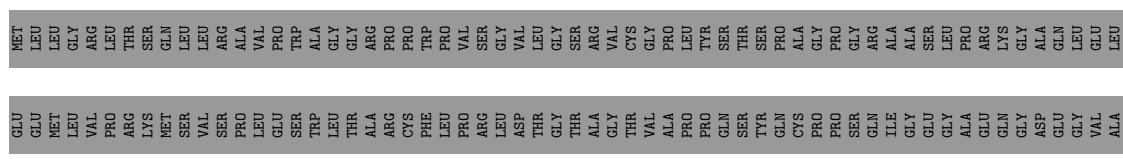




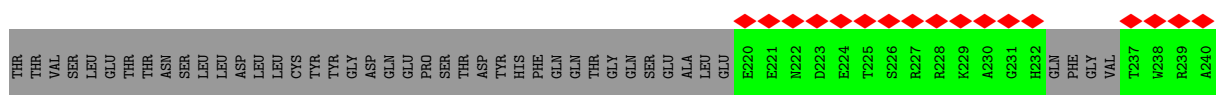
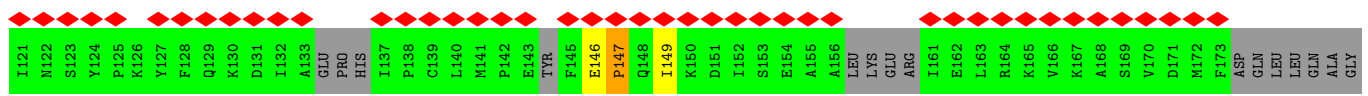
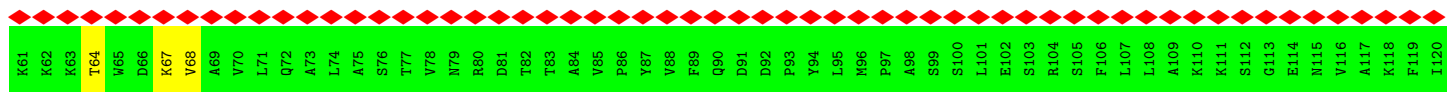
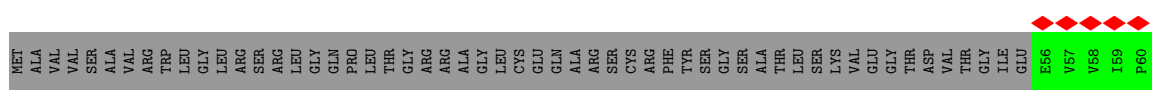
• Molecule 83: Coiled-coil-helix-coiled-coil-helix domain-containing protein 1



• Molecule 84: Aurora kinase A-interacting protein



• Molecule 85: Pentatricopeptide repeat domain-containing protein 3, mitochondrial

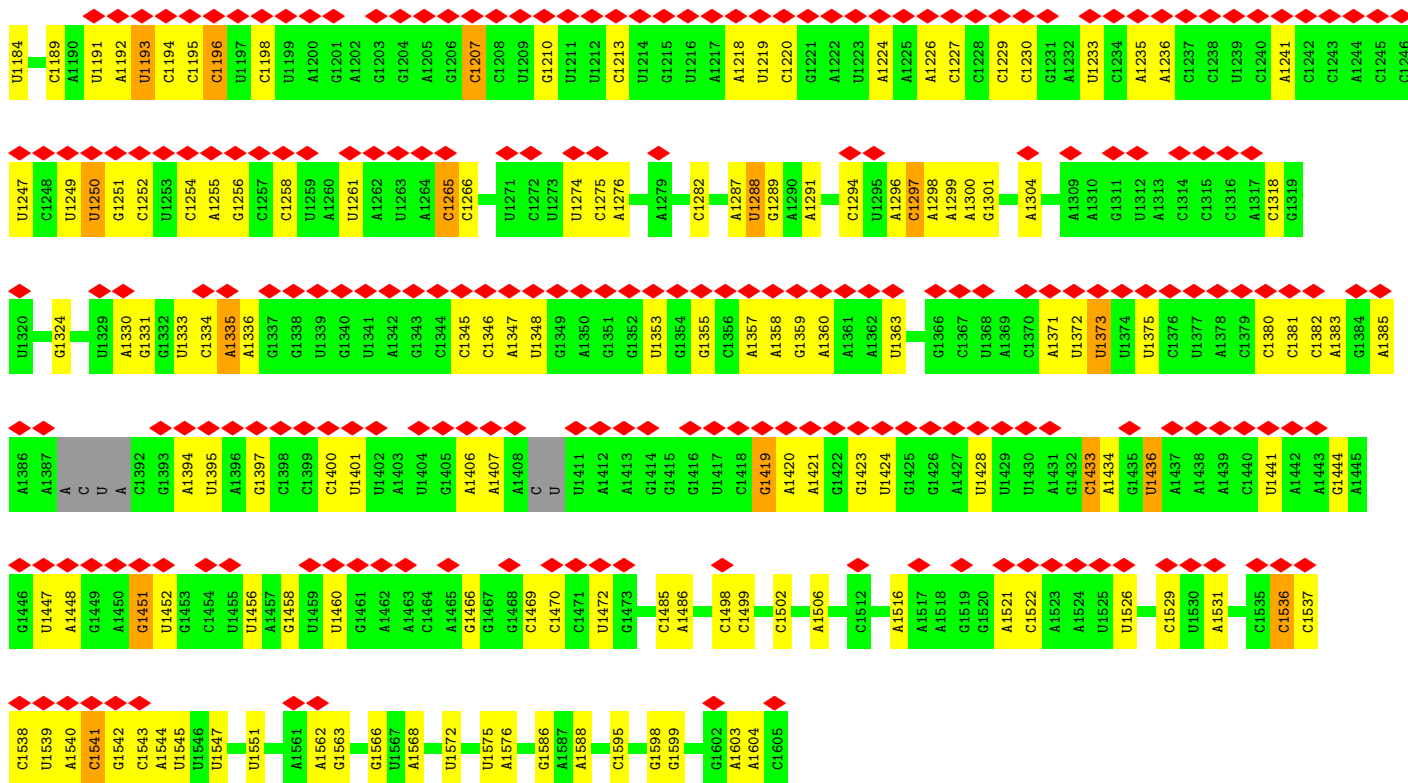


K241	N242	N243	A244	E245	R246	I247	F248	S249	L250	MET	PRO	GLU	LYS	N255	E256	H257	S258	Y259	C260	T261	M262	L263	R264	C265	M266	V267	K268	H269	ARG	ALA	Y272	E273	Q274	A275	L276	N277	L278	Y279	T280	E281	L282	L283	N284	N285	ARG	LEU	HIS	ALA	D290	V291	Y292	T293	F294	N295	A296	L297	I298	E299	A300			
THR	VAL	CYS	ALA	ILE	ASN	GLU	LYS	PHE	E311	K312	W313	S314	K315	I316	L317	E318	L319	L320	R321	H322	M323	V324	A325	Q326	LYS	VAL	LEU	PRO	N331	L332	Q333	T334	F335	N336	T337	I338	L339	K340	C341	L342	R343	R344	F345	HIS	VAL	PHE	ALA	ARG	SER	PRO	A353	L354	Q355	Q356	F357	R358	E359	M360				
K361	A362	ILE	GLY	ILE	GLU	PRO	S368	L369	A370	A371	Y372	H373	H374	I375	I376	R377	L378	F379	D380	GLN	PRO	GLY	ASP	PRO	L386	K387	R388	S389	S390	F391	I392	I393	D395	Y394	D395	F456	Y457	Y458	S459	K460	LEU	MET	GLY	THR	LYS	ARG	PHE	SER	PRO	VAL	LYS	ASP	PRO	ASP	ASP	K414	F415	F416	Q417	S418	A419	M420
S421	I422	C423	S424	S425	L426	ARG	ASP	LEU	E430	L431	A432	Y433	Q434	V435	H436	G437	L438	L439	K440	T441	GLY	ASN	ASP	TRP	LYS	PHE	ILE	GLY	P450	D451	Q452	H453	R454	M455	F456	Y457	Y458	S459	K460	F461	F462	D463	L464	I465	C466	M468	GLU	GLN	I471	D472	V473	T474	L475	K476	W477	Y478	E479	D480				
L481	I482	P483	S484	ALA	TRP	PHE	PRO	HIS	S490	Q491	T492	M493	I494	H495	L496	L497	Q498	A499	L500	D501	V502	A503	ASN	ARG	L506	E507	V508	I509	P510	K511	I512	W513	K514	D515	S516	K517	E518	T519	GLY	HIS	THR	PHE	ARG	S525	D526	L527	R528	E529	E530	E531	I531	L532	M533	L534	M535	A536	E537	ASP	LYS	HIS		
PRO	PRO	GLU	L544	Q545	V546	A547	F548	A549	D550	C551	A552	D554	I555	K556	S557	A558	Y559	E560	S561	GLN	PRO	PRO	ILE	ARG	GLN	THR	ALA	ASP	TRP	PRO	T574	S575	L576	M577	C578	I579	A580	I581	L582	F583	L584	R585	A586	GLY	ARG	THR	Q590	E591	A592	W593	K594	M595	L596	G597	L598	F599	R600					
K601	H602	ASN	LYS	ILE	PRO	ARG	SER	GLU	L610	L611	N612	E613	L614	M615	D616	S617	A618	K619	V620	S621	ASN	SER	PRO	S625	Q626	A627	L628	E629	V630	V631	E632	L633	A634	S635	A636	F637	S638	L639	PRO	ILE	CYS	GLU	GLY	LEU	THR	GLN	ARG	VAL	MET	SER	ASP	PHE	ALA	ILE	ASN	GLN	GLU	GLN	LYS			
GLU	ALA	LEU	SER	ASN	LEU	THR	ALA	LEU	THR	SER	ASP	SER	THR	SER	SER	ASP	ASP	ASP	ASP	SER	GLY	GLY	PRO	S625	Q626	A627	L628	E629	V630	V631	E632	L633	A634	S635	A636	F637	S638	L639	PRO	ILE	CYS	GLU	GLY	LEU	THR	GLN	ARG	VAL	MET	SER	ASP	PHE	ALA	ILE	ASN	GLN	GLU	GLN	LYS			

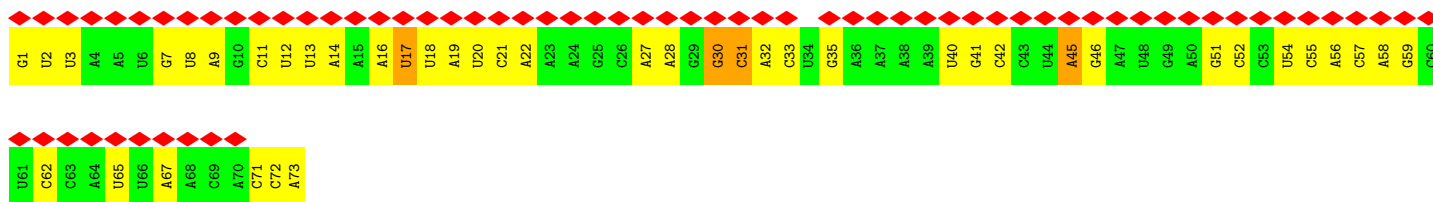
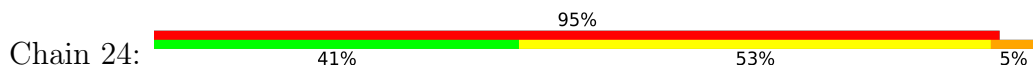
• Molecule 86: 12S rRNA



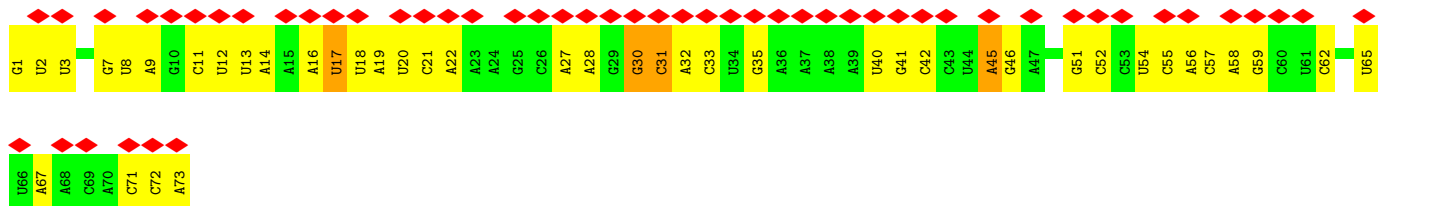
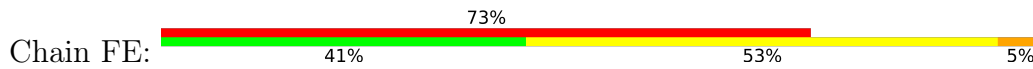
A	A653	A654	A655	U675	U678	U682	C683	U684	U685	A686	A692	U693	U694	A695	C698	G701	C702	A707	U708	C709	C710	C711	C712	G713	U714	U715	C716	C717	G721	A722	U724	U725	C726	A727	C738	A	C	C	A	C	G744	A749	A757	A761	A765			
A	A768	C769	G770	C774	A775	A776	U777	A786	A787	C791	U792	G795	C796	C797	U798	A799	G800	C801	C806	C809	C810	A811	C812	G813	A816	A817	A818	C819	A820	G821	A831	U834	U835	U836	C839	A840	A848	A849	A850	C851	U852	U853	C857	U858	A859	U865		
U	U868	A869	A870	C871	C872	C873	C874	C884	A885	A886	U887	U888	U889	C894	C901	G902	C903	U907	C908	A909	C921	A922	A923	G924	U925	C926	G931	A932	A933	G	C935	C936	G937	G938	A942	A943	A946	G947	U951	U952	U953	A954	U957	C958	A959	C	C	C
C	C969	A970	A971	C977	U978	A981	A982	U984	C985	A986	C987	C988	U989	G990	A991	G992	U996	A997	A998	C1003	U1004	C1005	C1006	A1007	G1011	A1012	C1013	A1014	C1015	A1018	A1019	A1023	C1024	U1025	U1026	G1032	U1033	G1034	G1035	C1036	U1037	U1038	A1043	U1044	A1045			
U1046	A1050	A1051	C1052	A1053	C1056	C1068	C1069	C1070	U1065	A1086	U1093	C1102	A1107	A1108	C1109	C1110	A1113	U1119	A	A	A	U	C1124	A1125	C1126	C1127	A1128	A1129	A1130	U1133	A1141	G1142	A1146	C1147	U1148	C1155	A1156	C1157	A1158	A1170	A1171	C1181	G1182	G1183				



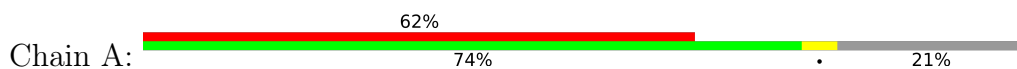
• Molecule 87: mt-tRNA

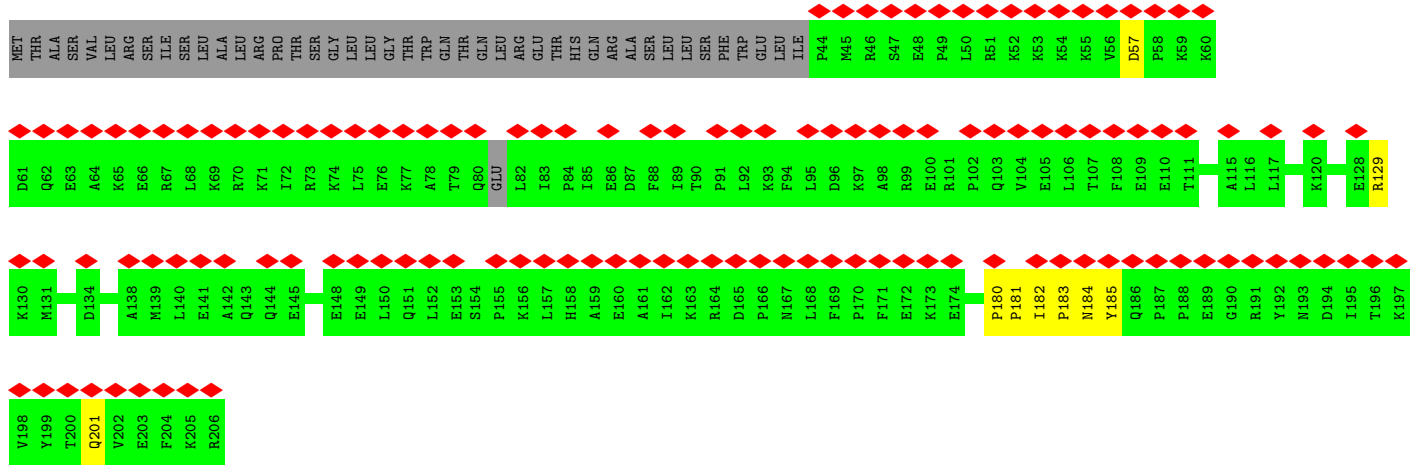


• Molecule 87: mt-tRNA

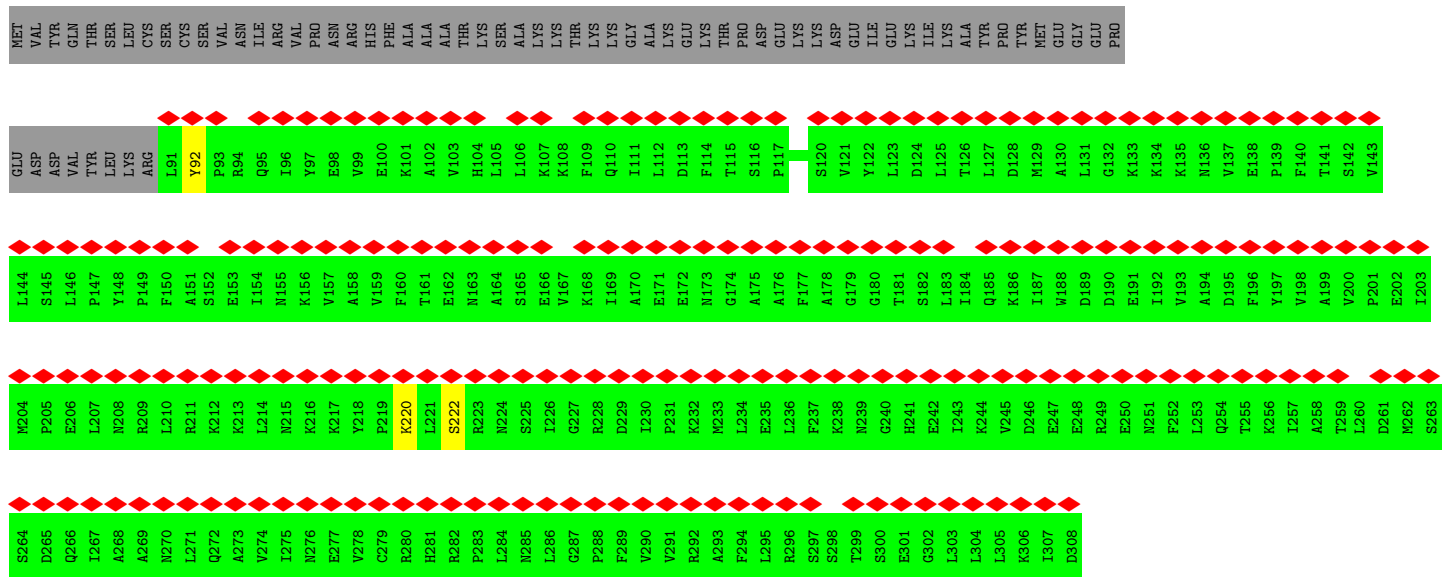
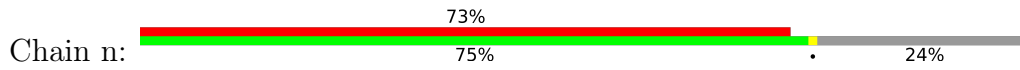


• Molecule 88: 39S ribosomal protein L40, mitochondrial

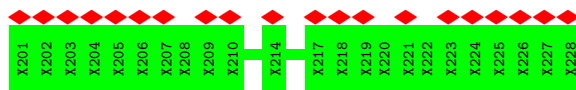




• Molecule 89: 39S ribosomal protein L1, mitochondrial



• Molecule 90: Unknown protein



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	19767	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.294	Depositor
Minimum map value	-0.153	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	532.48, 532.48, 532.48	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	Depositor

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, GCP, GDP, MG, SPD

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	r1	0.47	0/5552	0.93	15/7490 (0.2%)
3	8	0.52	0/197	1.06	0/305
3	A3	1.06	7/35697 (0.0%)	1.18	306/55544 (0.6%)
4	B3	0.57	0/1328	1.02	6/2056 (0.3%)
5	D3	0.46	0/1879	0.69	2/2527 (0.1%)
6	E3	0.54	0/2433	0.68	3/3299 (0.1%)
7	F3	0.55	0/2071	0.75	1/2817 (0.0%)
8	D	4.69	3/665 (0.5%)	1.19	7/905 (0.8%)
8	H3	0.44	0/798	0.73	1/1073 (0.1%)
9	I3	0.41	0/1308	0.71	0/1761
10	J3	0.39	0/1077	0.74	1/1452 (0.1%)
11	K3	0.55	0/1495	0.70	2/2029 (0.1%)
12	L3	0.47	0/904	0.71	0/1218
13	M3	0.55	1/2359 (0.0%)	0.73	4/3185 (0.1%)
14	N3	0.55	0/1697	0.73	2/2281 (0.1%)
15	O3	0.56	1/1269 (0.1%)	0.77	1/1708 (0.1%)
16	P3	0.54	0/1103	0.77	2/1491 (0.1%)
17	Q3	0.49	0/1863	0.70	0/2509
18	R3	0.60	0/1174	0.66	0/1572
19	S3	0.55	0/1276	0.72	3/1729 (0.2%)
20	T3	0.56	0/1402	0.64	1/1886 (0.1%)
21	U3	0.60	0/946	0.71	0/1283
22	V3	0.47	0/1590	0.75	2/2151 (0.1%)
23	W3	0.64	0/893	0.71	1/1204 (0.1%)
24	X3	0.46	0/2081	0.78	3/2812 (0.1%)
25	Y3	0.53	1/1552 (0.1%)	0.64	0/2079
26	Z3	0.51	0/1003	0.69	1/1354 (0.1%)
27	03	0.47	0/895	0.65	0/1201
28	13	0.47	0/438	0.87	1/583 (0.2%)
29	23	0.53	0/382	0.64	0/507
30	33	0.60	0/852	0.69	1/1136 (0.1%)
31	43	0.58	0/329	0.61	0/435

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	53	0.46	0/3154	0.67	1/4295 (0.0%)
33	63	0.49	0/2722	0.72	3/3709 (0.1%)
34	73	0.45	0/2207	0.74	4/2978 (0.1%)
35	93	0.48	0/896	0.74	3/1205 (0.2%)
36	a3	0.51	0/709	0.65	0/963
37	b3	0.51	0/1202	0.67	1/1626 (0.1%)
38	c3	0.48	0/2264	0.68	1/3059 (0.0%)
39	d3	0.45	0/1385	0.81	2/1877 (0.1%)
40	e3	0.35	0/1797	0.76	3/2422 (0.1%)
41	f3	0.43	0/1055	0.83	1/1427 (0.1%)
42	g3	0.58	0/1102	0.69	0/1503
43	h3	0.41	0/847	0.71	2/1150 (0.2%)
44	i3	0.58	0/849	0.76	1/1135 (0.1%)
45	j3	0.48	0/698	0.62	1/940 (0.1%)
46	k3	0.35	0/665	0.74	0/897
47	l3	0.45	0/226	0.63	0/299
48	m3	0.36	0/379	0.73	0/510
49	o3	0.58	0/818	0.62	0/1097
50	p3	0.37	0/1071	0.59	0/1433
51	q3	0.42	0/1107	0.62	0/1498
52	r3	0.56	0/1238	0.70	0/1676
53	s3	0.51	1/3114 (0.0%)	0.74	3/4225 (0.1%)
54	u3	1.03	0/46	0.98	0/69
55	A5	0.28	0/135	0.72	1/185 (0.5%)
56	B6	0.39	0/1811	0.76	2/2451 (0.1%)
57	C6	0.36	0/1112	0.63	0/1505
58	D6	0.40	0/2607	0.74	2/3498 (0.1%)
59	E6	0.39	0/989	0.74	0/1335
60	F6	0.41	1/1708 (0.1%)	0.68	2/2291 (0.1%)
61	G6	0.38	0/2570	0.72	4/3443 (0.1%)
62	H6	0.34	0/1019	0.71	1/1379 (0.1%)
63	I6	0.35	0/1031	0.65	1/1390 (0.1%)
64	J6	0.56	1/854 (0.1%)	0.77	0/1148
65	K6	0.36	0/879	0.66	1/1182 (0.1%)
66	L6	0.35	0/1406	0.69	1/1878 (0.1%)
67	M6	0.41	0/941	1.00	5/1265 (0.4%)
68	N6	0.54	1/864 (0.1%)	0.85	5/1169 (0.4%)
69	O6	0.43	1/1580 (0.1%)	0.76	4/2150 (0.2%)
70	P6	0.39	0/791	0.76	0/1062
71	Q6	0.43	0/752	0.74	0/1001
72	R6	0.36	0/2050	0.75	2/2770 (0.1%)
73	S6	0.62	1/1069 (0.1%)	0.98	5/1441 (0.3%)
74	T6	0.42	0/1361	0.74	0/1829

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
75	U6	0.36	0/1482	0.62	0/1987
76	V6	0.36	0/2758	0.71	4/3724 (0.1%)
77	W6	0.35	0/778	0.78	1/1048 (0.1%)
78	X6	0.34	0/2596	0.70	2/3519 (0.1%)
79	Y6	0.34	0/943	0.65	1/1274 (0.1%)
80	Z6	0.31	0/757	0.63	0/1011
81	a6	0.40	0/1727	0.82	7/2338 (0.3%)
82	b6	0.33	0/2121	0.74	4/2873 (0.1%)
83	c6	0.34	0/939	0.69	1/1256 (0.1%)
84	d6	0.42	0/621	0.72	0/820
85	e6	0.29	0/2859	0.58	3/3864 (0.1%)
86	A6	0.67	0/22053	1.10	125/34324 (0.4%)
87	24	1.16	6/1731 (0.3%)	1.31	21/2693 (0.8%)
87	FE	1.16	6/1731 (0.3%)	1.31	20/2693 (0.7%)
88	A	0.35	0/1403	0.73	3/1880 (0.2%)
89	n	4.89	7/1776 (0.4%)	0.75	3/2397 (0.1%)
All	All	0.87	38/179863 (0.0%)	0.92	623/255648 (0.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	r1	0	23
2	Y2	0	2
5	D3	0	1
6	E3	0	5
7	F3	0	2
8	D	0	2
8	H3	0	1
9	I3	0	1
10	J3	0	2
11	K3	0	2
13	M3	0	4
14	N3	0	2
15	O3	0	1
17	Q3	0	1
18	R3	0	1
20	T3	0	1
22	V3	0	2
24	X3	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
26	Z3	0	1
27	03	0	2
28	13	0	2
32	53	0	4
33	63	0	2
35	93	0	1
38	c3	0	1
39	d3	0	5
41	f3	0	4
42	g3	0	1
43	h3	0	2
44	i3	0	1
45	j3	0	1
49	o3	0	1
51	q3	0	1
53	s3	0	2
56	B6	0	1
58	D6	0	4
60	F6	0	4
61	G6	0	1
63	I6	0	2
64	J6	0	1
68	N6	0	1
69	O6	0	3
70	P6	0	3
72	R6	0	3
73	S6	0	1
75	U6	0	2
76	V6	0	2
81	a6	0	1
82	b6	0	1
83	c6	0	1
85	e6	0	2
88	A	0	6
89	n	0	1
All	All	0	125

All (38) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
89	n	220	LYS	CE-NZ	125.36	4.62	1.49
8	D	194	PHE	CB-CG	119.68	3.54	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
89	n	92	TYR	CD1-CE1	88.52	2.72	1.39
89	n	92	TYR	CD2-CE2	84.32	2.65	1.39
89	n	92	TYR	CE2-CZ	59.95	2.16	1.38
89	n	92	TYR	CE1-CZ	59.69	2.16	1.38
89	n	92	TYR	CG-CD2	47.04	2.00	1.39
89	n	92	TYR	CG-CD1	46.67	1.99	1.39
87	FE	17	U	C2-N3	24.50	1.54	1.37
87	24	17	U	C2-N3	24.48	1.54	1.37
87	FE	17	U	N3-C4	18.45	1.55	1.38
87	24	17	U	N3-C4	18.40	1.55	1.38
87	FE	17	U	N1-C2	17.73	1.54	1.38
87	24	17	U	N1-C2	17.65	1.54	1.38
87	24	17	U	N1-C6	16.81	1.53	1.38
87	FE	17	U	N1-C6	16.75	1.53	1.38
73	S6	90	PRO	CG-CD	-14.78	1.01	1.50
87	24	17	U	C4-C5	14.01	1.56	1.43
87	FE	17	U	C4-C5	14.00	1.56	1.43
87	24	17	U	C5-C6	12.54	1.45	1.34
87	FE	17	U	C5-C6	12.46	1.45	1.34
8	D	194	PHE	CG-CD2	11.07	1.55	1.38
8	D	194	PHE	CG-CD1	10.64	1.54	1.38
68	N6	70	PRO	CG-CD	-9.57	1.19	1.50
60	F6	159	VAL	C-N	9.02	1.51	1.34
3	A3	1828	A	N9-C4	-8.57	1.32	1.37
25	Y3	123	ARG	C-N	-6.42	1.19	1.34
13	M3	61	THR	C-N	-6.34	1.19	1.34
3	A3	1867	A	N9-C4	-6.33	1.34	1.37
53	s3	66	TRP	CB-CG	-5.96	1.39	1.50
3	A3	2755	A	N9-C4	-5.80	1.34	1.37
3	A3	2503	A	N9-C4	-5.51	1.34	1.37
64	J6	104	GLU	CA-C	5.32	1.66	1.52
3	A3	2052	A	N9-C4	-5.31	1.34	1.37
69	O6	94	CYS	CB-SG	-5.13	1.73	1.81
15	O3	104	TYR	CD1-CE1	-5.06	1.31	1.39
3	A3	2723	A	N9-C4	-5.05	1.34	1.37
3	A3	2198	A	N7-C5	-5.00	1.36	1.39

All (623) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	2790	A	OP1-P-OP2	-28.97	76.15	119.60
3	A3	2790	A	O5'-P-OP2	-28.55	76.44	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
73	S6	90	PRO	N-CD-CG	-18.72	75.12	103.20
3	A3	2790	A	O5'-P-OP1	15.95	129.84	110.70
87	24	30	G	C8-N9-C4	-15.63	100.15	106.40
87	FE	30	G	C8-N9-C4	-15.60	100.16	106.40
53	s3	427	ASN	C-N-CA	15.18	159.64	121.70
8	D	194	PHE	CD1-CG-CD2	-14.92	98.91	118.30
8	D	194	PHE	CB-CG-CD2	14.40	130.88	120.80
3	A3	2789	C	OP2-P-O3'	14.28	136.62	105.20
24	X3	97	LEU	CA-CB-CG	13.61	146.61	115.30
8	D	194	PHE	CB-CG-CD1	13.38	130.17	120.80
3	A3	1732	C	N1-C2-O2	12.90	126.64	118.90
87	24	30	G	N7-C8-N9	12.78	119.49	113.10
87	FE	30	G	N7-C8-N9	12.78	119.49	113.10
3	A3	2789	C	OP1-P-O3'	-12.53	77.63	105.20
1	r1	645	ILE	CG1-CB-CG2	-11.86	85.31	111.40
3	A3	1699	C	N1-C2-O2	11.83	126.00	118.90
86	A6	1373	U	N1-C2-O2	11.82	131.08	122.80
24	X3	97	LEU	CB-CG-CD2	11.57	130.67	111.00
3	A3	1732	C	C2-N1-C1'	11.44	131.38	118.80
86	A6	1373	U	C2-N1-C1'	11.29	131.24	117.70
86	A6	1373	U	N3-C2-O2	-11.24	114.33	122.20
73	S6	90	PRO	CA-CB-CG	-11.01	83.08	104.00
3	A3	1732	C	N3-C2-O2	-10.92	114.25	121.90
87	FE	31	C	O4'-C1'-N1	10.81	116.85	108.20
87	24	31	C	O4'-C1'-N1	10.77	116.82	108.20
3	A3	2780	C	N1-C2-O2	10.62	125.27	118.90
68	N6	70	PRO	N-CD-CG	-10.43	87.56	103.20
3	A3	3204	C	N1-C2-O2	10.26	125.06	118.90
3	A3	1699	C	N3-C2-O2	-10.01	114.89	121.90
67	M6	21	LEU	CB-CG-CD2	9.99	127.99	111.00
3	A3	2653	C	C6-N1-C2	-9.93	116.33	120.30
3	A3	1714	C	N1-C2-O2	9.54	124.62	118.90
3	A3	1902	C	C2-N1-C1'	9.54	129.29	118.80
3	A3	2079	C	N1-C2-O2	9.53	124.62	118.90
3	A3	1902	C	N1-C2-O2	9.44	124.56	118.90
3	A3	2079	C	N3-C2-O2	-9.39	115.33	121.90
3	A3	2066	C	N1-C2-O2	9.32	124.49	118.90
3	A3	3204	C	C2-N1-C1'	9.32	129.05	118.80
3	A3	2493	C	N1-C2-O2	9.26	124.46	118.90
3	A3	1699	C	C2-N1-C1'	9.26	128.98	118.80
3	A3	1837	C	C2-N1-C1'	9.25	128.97	118.80
3	A3	2522	U	C2-N1-C1'	9.22	128.77	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	3212	C	C2-N1-C1'	9.21	128.93	118.80
68	N6	70	PRO	CA-N-CD	-9.17	98.66	111.50
3	A3	3134	C	N1-C2-O2	9.12	124.37	118.90
67	M6	21	LEU	CA-CB-CG	9.08	136.18	115.30
3	A3	1837	C	N1-C2-O2	9.03	124.31	118.90
3	A3	1901	C	N1-C2-O2	8.98	124.29	118.90
3	A3	1732	C	C6-N1-C2	-8.93	116.73	120.30
3	A3	2080	U	N3-C2-O2	-8.91	115.96	122.20
3	A3	2779	C	P-O3'-C3'	8.90	130.39	119.70
3	A3	3212	C	N1-C2-O2	8.90	124.24	118.90
3	A3	2493	C	C2-N1-C1'	8.90	128.59	118.80
3	A3	2066	C	N3-C2-O2	-8.87	115.69	121.90
3	A3	2080	U	N1-C2-O2	8.82	128.97	122.80
3	A3	2066	C	C2-N1-C1'	8.81	128.50	118.80
3	A3	3134	C	N3-C2-O2	-8.74	115.78	121.90
3	A3	3204	C	N3-C2-O2	-8.67	115.83	121.90
3	A3	3157	C	N1-C2-O2	8.64	124.09	118.90
86	A6	809	C	C2-N1-C1'	8.59	128.25	118.80
3	A3	2780	C	C2-N1-C1'	8.58	128.24	118.80
86	A6	809	C	N1-C2-O2	8.47	123.98	118.90
3	A3	2079	C	C2-N1-C1'	8.40	128.04	118.80
87	FE	17	U	C6-N1-C2	8.37	126.02	121.00
34	73	314	ASP	CB-CG-OD1	8.35	125.81	118.30
87	24	17	U	C6-N1-C2	8.33	126.00	121.00
72	R6	293	LEU	CA-CB-CG	8.27	134.33	115.30
86	A6	769	C	C2-N1-C1'	8.26	127.89	118.80
3	A3	2235	C	C2-N1-C1'	8.23	127.86	118.80
86	A6	936	C	N3-C2-O2	-8.21	116.15	121.90
3	A3	1901	C	C2-N1-C1'	8.20	127.82	118.80
34	73	259	ASP	CB-CG-OD1	8.19	125.67	118.30
3	A3	1993	A	C2-N3-C4	8.16	114.68	110.60
3	A3	3157	C	C2-N1-C1'	8.14	127.76	118.80
3	A3	2493	C	N3-C2-O2	-8.14	116.20	121.90
3	A3	1902	C	N3-C2-O2	-8.07	116.25	121.90
34	73	47	LEU	CA-CB-CG	8.06	133.83	115.30
3	A3	2171	U	C2-N1-C1'	8.04	127.35	117.70
86	A6	715	U	C2-N1-C1'	7.99	127.28	117.70
86	A6	710	C	C2-N1-C1'	7.91	127.50	118.80
3	A3	2096	U	C2-N1-C1'	7.90	127.18	117.70
3	A3	2780	C	N3-C2-O2	-7.89	116.37	121.90
86	A6	1193	U	C2-N1-C1'	7.87	127.14	117.70
3	A3	2171	U	N3-C2-O2	-7.87	116.69	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
87	FE	17	U	N1-C2-N3	-7.86	110.19	114.90
87	24	17	U	N1-C2-N3	-7.83	110.20	114.90
86	A6	1070	C	C6-N1-C2	-7.81	117.18	120.30
81	a6	141	LEU	CA-CB-CG	7.79	133.22	115.30
3	A3	2080	U	C2-N1-C1'	7.78	127.03	117.70
61	G6	373	ASP	CB-CG-OD2	7.78	125.30	118.30
3	A3	2372	U	N3-C2-O2	-7.74	116.78	122.20
3	A3	2372	U	N1-C2-O2	7.72	128.20	122.80
86	A6	936	C	N1-C2-O2	7.72	123.53	118.90
3	A3	2898	U	C2-N1-C1'	7.71	126.95	117.70
3	A3	1714	C	N3-C2-O2	-7.71	116.50	121.90
3	A3	1699	C	C6-N1-C2	-7.69	117.22	120.30
86	A6	809	C	N3-C2-O2	-7.68	116.53	121.90
3	A3	2235	C	N1-C2-O2	7.67	123.50	118.90
53	s3	228	ASP	CB-CG-OD1	7.65	125.18	118.30
8	D	194	PHE	CG-CD2-CE2	7.62	129.18	120.80
3	A3	2061	C	N1-C2-O2	7.59	123.46	118.90
3	A3	1837	C	N3-C2-O2	-7.58	116.59	121.90
86	A6	769	C	N1-C2-O2	7.54	123.42	118.90
3	A3	1732	C	C6-N1-C1'	-7.52	111.78	120.80
3	A3	2157	U	C5-C6-N1	7.48	126.44	122.70
3	A3	2757	A	P-O3'-C3'	7.48	128.67	119.70
3	A3	2372	U	C2-N1-C1'	7.47	126.66	117.70
3	A3	3157	C	N3-C2-O2	-7.47	116.67	121.90
66	L6	143	LEU	CA-CB-CG	7.47	132.47	115.30
3	A3	3157	C	O4'-C1'-N1	7.46	114.17	108.20
11	K3	22	ASP	CB-CG-OD1	7.46	125.01	118.30
3	A3	2230	A	O5'-P-OP1	7.44	119.63	110.70
86	A6	1373	U	C6-N1-C1'	-7.44	110.78	121.20
3	A3	1813	C	N1-C2-O2	7.43	123.36	118.90
3	A3	1813	C	N3-C2-O2	-7.42	116.70	121.90
86	A6	1193	U	N1-C2-O2	7.40	127.98	122.80
3	A3	1813	C	C2-N1-C1'	7.39	126.92	118.80
86	A6	1541	C	N1-C2-O2	7.38	123.33	118.90
56	B6	251	ARG	NE-CZ-NH1	7.35	123.98	120.30
3	A3	2443	C	N1-C2-O2	7.29	123.28	118.90
89	n	92	TYR	CB-CG-CD2	-7.29	116.62	121.00
86	A6	1541	C	C6-N1-C2	-7.28	117.39	120.30
8	D	194	PHE	CG-CD1-CE1	7.28	128.81	120.80
3	A3	2484	C	N1-C2-O2	7.28	123.27	118.90
3	A3	3169	C	N1-C2-O2	7.27	123.26	118.90
86	A6	714	U	C2-N1-C1'	7.27	126.42	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	K3	52	ASP	CB-CG-OD1	7.27	124.84	118.30
3	A3	2171	U	N1-C2-O2	7.26	127.88	122.80
73	S6	90	PRO	CB-CG-CD	7.25	134.80	106.50
3	A3	2522	U	N1-C2-O2	7.25	127.88	122.80
3	A3	2557	C	N1-C2-O2	7.17	123.20	118.90
3	A3	2235	C	N3-C2-O2	-7.17	116.88	121.90
3	A3	3134	C	C6-N1-C2	-7.17	117.43	120.30
73	S6	88	PHE	C-N-CA	7.14	139.56	121.70
3	A3	3009	C	C2-N1-C1'	7.11	126.62	118.80
87	24	30	G	N3-C4-C5	-7.10	125.05	128.60
86	A6	715	U	N1-C2-O2	7.09	127.76	122.80
86	A6	710	C	N1-C2-O2	7.09	123.15	118.90
87	FE	30	G	N3-C4-C5	-7.08	125.06	128.60
82	b6	182	LEU	CA-CB-CG	7.06	131.53	115.30
83	c6	6	LEU	CA-CB-CG	7.02	131.45	115.30
3	A3	2522	U	C6-N1-C1'	-7.02	111.38	121.20
3	A3	1707	C	N1-C2-O2	6.98	123.09	118.90
3	A3	3228	U	C2-N1-C1'	6.97	126.07	117.70
3	A3	2182	G	P-O3'-C3'	6.97	128.06	119.70
3	A3	1716	U	N3-C2-O2	-6.96	117.33	122.20
3	A3	3201	A	P-O3'-C3'	6.95	128.04	119.70
76	V6	77	ASP	CB-CG-OD1	6.94	124.54	118.30
86	A6	769	C	N3-C2-O2	-6.94	117.04	121.90
61	G6	150	LEU	CA-CB-CG	6.92	131.21	115.30
3	A3	3170	C	C2-N1-C1'	6.91	126.41	118.80
3	A3	3170	C	N1-C2-O2	6.91	123.05	118.90
3	A3	1701	U	C2-N1-C1'	6.90	125.97	117.70
3	A3	1806	U	P-O3'-C3'	6.89	127.97	119.70
3	A3	2061	C	C2-N1-C1'	6.88	126.36	118.80
22	V3	102	MET	CA-CB-CG	6.86	124.97	113.30
3	A3	2484	C	C2-N1-C1'	6.85	126.34	118.80
86	A6	710	C	C6-N1-C1'	-6.85	112.58	120.80
3	A3	3134	C	C2-N1-C1'	6.83	126.31	118.80
3	A3	1901	C	N3-C2-O2	-6.80	117.14	121.90
3	A3	1809	U	N1-C2-O2	6.77	127.54	122.80
81	a6	65	LEU	CA-CB-CG	6.75	130.82	115.30
69	O6	108	CYS	CA-CB-SG	6.74	126.13	114.00
3	A3	3009	C	N3-C2-O2	-6.73	117.19	121.90
3	A3	3204	C	C6-N1-C1'	-6.73	112.73	120.80
3	A3	1902	C	C6-N1-C1'	-6.71	112.75	120.80
33	63	229	ASP	CB-CG-OD1	6.70	124.33	118.30
3	A3	2771	C	N1-C2-O2	6.70	122.92	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	1837	C	C6-N1-C1'	-6.69	112.77	120.80
4	B3	1649	C	N1-C2-O2	6.68	122.91	118.90
3	A3	2324	U	N1-C2-O2	6.68	127.47	122.80
86	A6	1155	C	N1-C2-O2	6.67	122.90	118.90
3	A3	3212	C	N3-C2-O2	-6.66	117.24	121.90
3	A3	2061	C	N3-C2-O2	-6.64	117.25	121.90
86	A6	1499	C	C6-N1-C2	-6.64	117.64	120.30
86	A6	936	C	C2-N1-C1'	6.63	126.09	118.80
3	A3	2096	U	N1-C2-O2	6.62	127.43	122.80
3	A3	2493	C	C6-N1-C1'	-6.61	112.87	120.80
1	r1	382	ASP	CB-CG-OD1	6.60	124.24	118.30
3	A3	1828	A	C2-N3-C4	-6.60	107.30	110.60
89	n	92	TYR	CD1-CG-CD2	6.60	125.16	117.90
67	M6	99	LEU	CA-CB-CG	6.59	130.47	115.30
3	A3	2898	U	N3-C2-O2	-6.59	117.59	122.20
3	A3	1701	U	N1-C2-O2	6.59	127.41	122.80
86	A6	1193	U	OP1-P-O3'	6.58	119.67	105.20
86	A6	936	C	C6-N1-C2	-6.58	117.67	120.30
40	e3	279	LEU	CA-CB-CG	6.57	130.42	115.30
3	A3	1807	U	P-O3'-C3'	6.55	127.56	119.70
3	A3	2079	C	C6-N1-C2	-6.55	117.68	120.30
86	A6	857	C	C6-N1-C2	-6.55	117.68	120.30
3	A3	2780	C	C6-N1-C2	-6.54	117.68	120.30
86	A6	1025	U	P-O3'-C3'	6.54	127.55	119.70
3	A3	1693	C	C2-N1-C1'	6.51	125.97	118.80
38	c3	210	ARG	NE-CZ-NH1	6.51	123.55	120.30
87	24	33	C	N1-C2-O2	6.50	122.80	118.90
1	r1	650	MET	CA-CB-CG	6.49	124.34	113.30
3	A3	2871	U	C5-C6-N1	6.49	125.95	122.70
3	A3	3212	C	C6-N1-C1'	-6.49	113.02	120.80
86	A6	1335	A	P-O3'-C3'	6.47	127.47	119.70
87	FE	33	C	N1-C2-O2	6.46	122.78	118.90
3	A3	2295	C	N3-C2-O2	-6.45	117.39	121.90
86	A6	1541	C	N3-C2-O2	-6.44	117.39	121.90
3	A3	1693	C	N1-C2-O2	6.40	122.74	118.90
81	a6	173	MET	CB-CG-SD	6.39	131.57	112.40
86	A6	712	C	C6-N1-C2	-6.39	117.75	120.30
3	A3	3009	C	N1-C2-O2	6.38	122.73	118.90
3	A3	2530	A	P-O3'-C3'	6.38	127.35	119.70
7	F3	277	ASP	CB-CG-OD1	6.38	124.04	118.30
86	A6	1127	C	N1-C2-O2	6.37	122.72	118.90
86	A6	1250	U	OP2-P-O3'	6.37	119.22	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	1689	C	N1-C2-O2	6.36	122.71	118.90
3	A3	2759	U	N1-C2-O2	6.34	127.24	122.80
5	D3	172	MET	CG-SD-CE	6.33	110.33	100.20
3	A3	1875	C	O5'-P-OP1	-6.32	100.01	105.70
13	M3	225	ASP	CB-CG-OD2	6.32	123.99	118.30
3	A3	1835	A	O4'-C1'-N9	6.32	113.26	108.20
86	A6	857	C	C5-C6-N1	6.30	124.15	121.00
6	E3	310	LEU	CA-CB-CG	6.29	129.78	115.30
87	24	11	C	N1-C2-O2	6.29	122.67	118.90
3	A3	2064	A	N1-C6-N6	-6.29	114.83	118.60
32	53	381	LEU	CA-CB-CG	6.29	129.76	115.30
3	A3	1901	C	C6-N1-C1'	-6.28	113.27	120.80
67	M6	72	ARG	NE-CZ-NH1	6.26	123.43	120.30
8	D	199	VAL	CG1-CB-CG2	-6.26	100.88	110.90
3	A3	2206	C	C6-N1-C2	-6.25	117.80	120.30
88	A	129	ARG	NE-CZ-NH2	6.25	123.42	120.30
3	A3	1714	C	C2-N1-C1'	6.25	125.67	118.80
3	A3	2523	C	C2-N1-C1'	6.24	125.66	118.80
55	A5	28	PRO	N-CA-CB	6.24	110.78	103.30
3	A3	3228	U	N1-C2-O2	6.23	127.16	122.80
86	A6	715	U	N3-C2-O2	-6.23	117.84	122.20
3	A3	2417	C	N1-C2-O2	6.22	122.63	118.90
86	A6	1288	U	N3-C2-O2	-6.22	117.85	122.20
87	FE	11	C	N1-C2-O2	6.21	122.63	118.90
3	A3	3173	G	C2-N3-C4	-6.18	108.81	111.90
26	Z3	76	ARG	NE-CZ-NH1	6.16	123.38	120.30
1	r1	420	LEU	CB-CG-CD1	-6.16	100.54	111.00
3	A3	3169	C	C2-N1-C1'	6.15	125.56	118.80
86	A6	1193	U	P-O3'-C3'	6.14	127.06	119.70
3	A3	2175	C	C6-N1-C2	-6.13	117.85	120.30
3	A3	3157	C	C6-N1-C1'	-6.13	113.44	120.80
3	A3	3128	A	C8-N9-C4	6.13	108.25	105.80
3	A3	2784	A	P-O3'-C3'	6.12	127.05	119.70
85	e6	496	LEU	CA-CB-CG	6.12	129.37	115.30
3	A3	3077	C	C6-N1-C2	-6.11	117.86	120.30
86	A6	1297	C	N1-C2-O2	6.11	122.56	118.90
15	O3	74	ARG	NE-CZ-NH1	6.10	123.35	120.30
3	A3	2324	U	N3-C2-O2	-6.10	117.93	122.20
3	A3	2066	C	C6-N1-C2	-6.10	117.86	120.30
3	A3	2758	G	O5'-P-OP1	-6.10	100.21	105.70
3	A3	2780	C	C5-C6-N1	6.09	124.04	121.00
3	A3	1984	A	C4-C5-N7	6.08	113.74	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	1701	U	N3-C2-O2	-6.08	117.94	122.20
3	A3	2759	U	N3-C2-O2	-6.08	117.95	122.20
86	A6	1353	U	C5-C6-N1	6.07	125.74	122.70
3	A3	2852	C	N1-C2-O2	6.06	122.54	118.90
86	A6	1070	C	C5-C6-N1	6.06	124.03	121.00
86	A6	1433	C	P-O3'-C3'	6.05	126.96	119.70
3	A3	2559	U	P-O3'-C3'	6.04	126.95	119.70
87	FE	42	C	C6-N1-C2	-6.04	117.89	120.30
19	S3	144	LEU	CA-CB-CG	6.04	129.19	115.30
39	d3	230	ARG	C-N-CA	6.04	136.79	121.70
87	FE	33	C	C2-N1-C1'	6.04	125.44	118.80
1	r1	216	ASP	CB-CG-OD1	6.03	123.73	118.30
87	24	33	C	C2-N1-C1'	6.03	125.43	118.80
3	A3	2569	C	N1-C2-O2	6.03	122.52	118.90
3	A3	1715	C	N1-C2-O2	6.02	122.51	118.90
3	A3	1732	C	C5-C6-N1	6.01	124.00	121.00
53	s3	161	ARG	NE-CZ-NH1	6.01	123.31	120.30
60	F6	209	LEU	CA-CB-CG	6.01	129.12	115.30
86	A6	721	G	P-O3'-C3'	6.01	126.91	119.70
3	A3	2386	C	N1-C2-O2	6.01	122.50	118.90
3	A3	1689	C	C2-N1-C1'	6.00	125.41	118.80
3	A3	2067	C	C6-N1-C2	-6.00	117.90	120.30
3	A3	2523	C	N1-C2-O2	6.00	122.50	118.90
3	A3	2999	C	C6-N1-C2	-6.00	117.90	120.30
86	A6	1181	C	C6-N1-C2	-5.99	117.90	120.30
87	24	42	C	C6-N1-C2	-5.99	117.90	120.30
86	A6	797	C	C2-N1-C1'	5.99	125.39	118.80
86	A6	1156	A	C4-N9-C1'	5.98	137.06	126.30
1	r1	310	LEU	CB-CG-CD2	-5.98	100.84	111.00
3	A3	2066	C	C6-N1-C1'	-5.96	113.64	120.80
86	A6	1170	A	P-O3'-C3'	5.96	126.86	119.70
58	D6	410	ASP	CB-CG-OD1	5.96	123.67	118.30
3	A3	1716	U	N1-C2-O2	5.95	126.96	122.80
23	W3	105	VAL	CG1-CB-CG2	-5.95	101.38	110.90
81	a6	43	ARG	NE-CZ-NH1	-5.93	117.33	120.30
86	A6	1541	C	P-O3'-C3'	5.93	126.82	119.70
3	A3	2243	A	P-O3'-C3'	5.93	126.81	119.70
3	A3	1993	A	C8-N9-C4	-5.93	103.43	105.80
3	A3	2898	U	N1-C2-O2	5.92	126.95	122.80
3	A3	1809	U	N3-C2-O2	-5.92	118.06	122.20
86	A6	1419	G	P-O3'-C3'	5.92	126.81	119.70
14	N3	237	HIS	C-N-CA	5.92	136.50	121.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	1806	U	OP2-P-O3'	5.92	118.22	105.20
1	r1	690	ASP	CB-CG-OD1	5.91	123.62	118.30
86	A6	809	C	C6-N1-C1'	-5.91	113.71	120.80
3	A3	2441	C	C6-N1-C2	-5.91	117.94	120.30
3	A3	1902	C	C6-N1-C2	-5.90	117.94	120.30
3	A3	2557	C	C2-N1-C1'	5.89	125.28	118.80
86	A6	1155	C	N3-C2-O2	-5.89	117.78	121.90
3	A3	2209	G	OP1-P-O3'	5.89	118.16	105.20
82	b6	319	LEU	CA-CB-CG	5.88	128.82	115.30
3	A3	1699	C	C6-N1-C1'	-5.87	113.75	120.80
86	A6	678	U	N3-C2-O2	-5.87	118.09	122.20
8	H3	64	LEU	CA-CB-CG	5.86	128.79	115.30
86	A6	1093	U	N3-C2-O2	-5.86	118.10	122.20
3	A3	2245	A	P-O3'-C3'	5.85	126.72	119.70
3	A3	2499	U	C2-N1-C1'	5.84	124.71	117.70
86	A6	951	U	N1-C2-O2	5.84	126.89	122.80
86	A6	769	C	C6-N1-C1'	-5.83	113.80	120.80
3	A3	3169	C	N3-C2-O2	-5.83	117.82	121.90
3	A3	2174	G	N3-C4-N9	5.83	129.50	126.00
4	B3	1649	C	N3-C2-O2	-5.83	117.82	121.90
68	N6	65	LEU	CA-CB-CG	5.82	128.69	115.30
13	M3	46	GLY	C-N-CA	5.82	136.25	121.70
3	A3	1809	U	P-O3'-C3'	5.82	126.68	119.70
3	A3	1725	C	N1-C2-O2	5.81	122.39	118.90
3	A3	2096	U	N3-C2-O2	-5.81	118.13	122.20
86	A6	711	C	N1-C2-O2	5.81	122.39	118.90
3	A3	1951	C	C6-N1-C2	-5.81	117.98	120.30
34	73	46	ASP	CB-CG-OD2	5.79	123.52	118.30
3	A3	1993	A	N3-C4-C5	-5.79	122.75	126.80
3	A3	3206	C	C2-N1-C1'	5.79	125.17	118.80
86	A6	926	C	C5-C6-N1	5.79	123.89	121.00
60	F6	160	PRO	N-CA-C	5.78	127.13	112.10
78	X6	383	LEU	CA-CB-CG	5.78	128.58	115.30
86	A6	1193	U	N3-C2-O2	-5.77	118.16	122.20
3	A3	2274	A	O4'-C1'-N9	5.77	112.81	108.20
3	A3	3056	C	C6-N1-C2	-5.77	117.99	120.30
3	A3	1823	A	P-O3'-C3'	5.76	126.61	119.70
3	A3	1993	A	C4-N9-C1'	5.76	136.66	126.30
33	63	335	LEU	CA-CB-CG	5.75	128.53	115.30
86	A6	702	C	C6-N1-C2	-5.75	118.00	120.30
3	A3	1707	C	N3-C2-O2	-5.75	117.87	121.90
87	FE	30	G	N9-C4-C5	5.75	107.70	105.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	2832	A	C4-N9-C1'	5.75	136.64	126.30
87	24	30	G	N9-C4-C5	5.75	107.70	105.40
86	A6	1499	C	C5-C6-N1	5.74	123.87	121.00
3	A3	3093	C	C6-N1-C2	-5.74	118.00	120.30
86	A6	714	U	N1-C2-O2	5.74	126.82	122.80
3	A3	1808	A	OP1-P-O3'	5.73	117.81	105.20
3	A3	1828	A	N3-C4-C5	5.73	130.81	126.80
3	A3	2280	C	N1-C2-O2	5.73	122.34	118.90
8	D	194	PHE	CA-CB-CG	5.73	127.64	113.90
3	A3	2445	U	N1-C2-O2	5.72	126.81	122.80
82	b6	320	LEU	CA-CB-CG	5.72	128.46	115.30
3	A3	2173	G	O5'-P-OP1	-5.72	100.56	105.70
3	A3	2379	C	N1-C2-O2	5.71	122.33	118.90
3	A3	3108	U	C5-C6-N1	5.71	125.56	122.70
3	A3	2599	U	C2-N1-C1'	5.70	124.54	117.70
3	A3	3212	C	C6-N1-C2	-5.70	118.02	120.30
30	33	173	VAL	CG1-CB-CG2	-5.69	101.79	110.90
87	FE	40	U	C2-N1-C1'	5.69	124.53	117.70
61	G6	373	ASP	CB-CG-OD1	-5.69	113.18	118.30
87	24	31	C	C6-N1-C1'	5.69	127.62	120.80
3	A3	3228	U	N3-C2-O2	-5.68	118.22	122.20
87	24	40	U	C2-N1-C1'	5.68	124.52	117.70
3	A3	3093	C	C5-C6-N1	5.68	123.84	121.00
86	A6	797	C	N1-C2-O2	5.68	122.31	118.90
86	A6	809	C	C6-N1-C2	-5.68	118.03	120.30
86	A6	1250	U	P-O3'-C3'	5.68	126.51	119.70
3	A3	2280	C	C6-N1-C2	-5.67	118.03	120.30
77	W6	130	ASP	CB-CG-OD1	5.67	123.40	118.30
3	A3	2347	C	C6-N1-C2	-5.67	118.03	120.30
86	A6	1193	U	C6-N1-C1'	-5.66	113.28	121.20
87	FE	31	C	C6-N1-C1'	5.66	127.59	120.80
3	A3	2235	C	C6-N1-C2	-5.65	118.04	120.30
86	A6	791	C	N1-C2-O2	5.65	122.29	118.90
86	A6	1282	C	N1-C2-O2	5.65	122.29	118.90
85	e6	147	PRO	N-CA-CB	5.65	110.08	103.30
3	A3	2557	C	N3-C2-O2	-5.65	117.95	121.90
86	A6	1536	C	N1-C2-O2	5.64	122.29	118.90
3	A3	1904	C	C6-N1-C2	-5.64	118.05	120.30
3	A3	2171	U	C6-N1-C1'	-5.64	113.31	121.20
86	A6	1266	C	N3-C2-O2	-5.64	117.95	121.90
86	A6	1541	C	C5-C6-N1	5.63	123.81	121.00
3	A3	2024	C	N1-C2-O2	5.62	122.27	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	2832	A	N7-C8-N9	5.61	116.60	113.80
3	A3	2780	C	C6-N1-C1'	-5.60	114.08	120.80
87	24	30	G	P-O3'-C3'	5.60	126.42	119.70
87	FE	30	G	P-O3'-C3'	5.59	126.41	119.70
3	A3	3077	C	C5-C6-N1	5.59	123.80	121.00
3	A3	2235	C	C6-N1-C1'	-5.59	114.09	120.80
68	N6	70	PRO	CA-CB-CG	-5.58	93.39	104.00
3	A3	2569	C	N3-C2-O2	-5.58	117.99	121.90
58	D6	345	LEU	CA-CB-CG	5.58	128.13	115.30
86	A6	1436	U	N1-C2-O2	5.58	126.70	122.80
3	A3	2096	U	C6-N1-C1'	-5.58	113.39	121.20
3	A3	2489	C	C6-N1-C2	-5.58	118.07	120.30
3	A3	3123	G	OP2-P-O3'	5.58	117.47	105.20
3	A3	2282	C	N1-C2-O2	5.57	122.24	118.90
3	A3	1707	C	C2-N1-C1'	5.57	124.92	118.80
3	A3	2757	A	OP1-P-O3'	5.57	117.45	105.20
86	A6	801	C	N1-C2-O2	5.56	122.24	118.90
86	A6	951	U	N3-C2-O2	-5.56	118.31	122.20
16	P3	74	ARG	NE-CZ-NH2	5.55	123.08	120.30
63	I6	186	CYS	C-N-CA	-5.55	107.83	121.70
3	A3	1984	A	C4-N9-C1'	5.55	136.28	126.30
3	A3	2653	C	C5-C6-N1	5.55	123.77	121.00
3	A3	2005	C	C6-N1-C2	-5.54	118.08	120.30
3	A3	3102	U	N3-C2-O2	-5.53	118.33	122.20
3	A3	2067	C	C5-C6-N1	5.53	123.76	121.00
3	A3	2374	A	P-O3'-C3'	5.52	126.33	119.70
13	M3	154	ILE	CG1-CB-CG2	-5.52	99.26	111.40
86	A6	836	U	N1-C2-O2	5.52	126.66	122.80
86	A6	1213	C	C6-N1-C2	-5.52	118.09	120.30
86	A6	1051	A	C2-N3-C4	5.51	113.36	110.60
86	A6	1288	U	N1-C2-O2	5.51	126.66	122.80
3	A3	2096	U	O4'-C1'-N1	5.51	112.61	108.20
3	A3	2530	A	OP2-P-O3'	5.51	117.32	105.20
3	A3	2484	C	N3-C2-O2	-5.50	118.05	121.90
3	A3	3170	C	N3-C2-O2	-5.50	118.05	121.90
86	A6	1451	G	N3-C4-N9	5.50	129.30	126.00
3	A3	2443	C	N3-C2-O2	-5.49	118.06	121.90
3	A3	2522	U	C5-C6-N1	5.49	125.44	122.70
56	B6	251	ARG	NE-CZ-NH2	-5.48	117.56	120.30
86	A6	1472	U	N3-C2-O2	-5.48	118.36	122.20
40	e3	173	LEU	CA-CB-CG	5.48	127.90	115.30
86	A6	1127	C	N3-C2-O2	-5.48	118.06	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	2379	C	C2-N1-C1'	5.47	124.82	118.80
4	B3	1648	U	N1-C2-O2	5.47	126.63	122.80
86	A6	801	C	N3-C2-O2	-5.47	118.07	121.90
3	A3	2445	U	N3-C2-O2	-5.47	118.37	122.20
1	r1	317	LEU	CA-CB-CG	5.46	127.87	115.30
3	A3	1823	A	N7-C8-N9	5.46	116.53	113.80
86	A6	801	C	C6-N1-C2	-5.46	118.11	120.30
85	e6	500	LEU	CA-CB-CG	5.45	127.83	115.30
3	A3	2079	C	C6-N1-C1'	-5.45	114.26	120.80
3	A3	2135	A	C2-N3-C4	5.45	113.32	110.60
44	i3	80	LEU	CB-CG-CD1	5.45	120.26	111.00
86	A6	1433	C	OP2-P-O3'	5.44	117.18	105.20
86	A6	921	C	C6-N1-C2	-5.44	118.12	120.30
86	A6	1196	C	N1-C2-O2	5.44	122.16	118.90
3	A3	2080	U	C6-N1-C1'	-5.43	113.59	121.20
76	V6	181	LEU	CA-CB-CG	-5.43	102.81	115.30
86	A6	1156	A	N3-C4-N9	5.43	131.74	127.40
86	A6	715	U	C5-C6-N1	5.43	125.42	122.70
3	A3	2684	C	C2-N1-C1'	5.42	124.77	118.80
3	A3	1780	U	C5-C4-O4	-5.42	122.65	125.90
87	24	31	C	C2-N1-C1'	-5.42	112.84	118.80
3	A3	2771	C	C5-C6-N1	5.42	123.71	121.00
3	A3	2771	C	C6-N1-C2	-5.42	118.13	120.30
3	A3	2523	C	C6-N1-C2	-5.41	118.14	120.30
3	A3	2434	A	O4'-C1'-N9	5.41	112.53	108.20
86	A6	1266	C	N1-C2-O2	5.40	122.14	118.90
3	A3	2569	C	C2-N1-C1'	5.40	124.74	118.80
3	A3	2112	A	C5-C6-N6	-5.40	119.38	123.70
86	A6	714	U	C6-N1-C1'	-5.39	113.65	121.20
87	FE	31	C	C2-N1-C1'	-5.39	112.87	118.80
86	A6	1156	A	C8-N9-C1'	-5.39	118.00	127.70
3	A3	2284	C	N1-C2-O2	5.39	122.13	118.90
45	j3	79	LEU	CA-CB-CG	5.38	127.69	115.30
86	A6	1447	U	N3-C2-O2	-5.38	118.43	122.20
3	A3	2789	C	N1-C2-O2	5.38	122.13	118.90
86	A6	1472	U	N1-C2-O2	5.38	126.56	122.80
43	h3	64	GLU	C-N-CA	5.38	135.14	121.70
86	A6	1472	U	C5-C6-N1	5.38	125.39	122.70
3	A3	2655	G	O4'-C1'-N9	-5.37	103.90	108.20
86	A6	1345	C	C6-N1-C2	-5.37	118.15	120.30
86	A6	926	C	C6-N1-C2	-5.37	118.15	120.30
3	A3	2784	A	OP1-P-O3'	5.37	117.01	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
41	f3	50	THR	C-N-CA	5.37	135.12	121.70
4	B3	1607	U	P-O3'-C3'	5.37	126.14	119.70
86	A6	1297	C	N3-C2-O2	-5.36	118.15	121.90
3	A3	2441	C	N1-C2-O2	5.36	122.12	118.90
3	A3	1813	C	C6-N1-C2	-5.36	118.16	120.30
3	A3	2186	C	P-O3'-C3'	5.36	126.13	119.70
3	A3	2282	C	C2-N1-C1'	5.35	124.68	118.80
3	A3	2865	C	C2-N1-C1'	5.35	124.68	118.80
3	A3	2112	A	C5-C6-N1	5.35	120.37	117.70
3	A3	2507	A	P-O3'-C3'	5.35	126.12	119.70
81	a6	118	LEU	CA-CB-CG	5.35	127.60	115.30
87	24	30	G	C5-N7-C8	-5.33	101.63	104.30
40	e3	83	LEU	CA-CB-CG	5.33	127.55	115.30
79	Y6	358	LEU	CA-CB-CG	5.33	127.55	115.30
43	h3	63	PRO	C-N-CA	5.33	135.02	121.70
3	A3	2628	U	P-O3'-C3'	5.33	126.09	119.70
73	S6	90	PRO	CA-N-CD	-5.32	104.05	111.50
10	J3	71	LEU	CA-CB-CG	5.32	127.54	115.30
87	FE	30	G	C5-N7-C8	-5.32	101.64	104.30
3	A3	3127	G	C8-N9-C4	-5.32	104.27	106.40
68	N6	53	ASP	CB-CG-OD1	5.32	123.08	118.30
3	A3	3102	U	N1-C2-O2	5.31	126.52	122.80
16	P3	84	ARG	NE-CZ-NH1	5.31	122.96	120.30
33	63	336	ASP	CB-CG-OD1	5.31	123.08	118.30
86	A6	1265	C	N1-C2-O2	5.31	122.09	118.90
3	A3	2900	C	C5-C6-N1	5.30	123.65	121.00
3	A3	2906	C	C5-C6-N1	5.30	123.65	121.00
3	A3	2523	C	N3-C2-O2	-5.29	118.19	121.90
6	E3	246	GLY	N-CA-C	5.29	126.33	113.10
65	K6	81	ASP	CB-CG-OD2	5.29	123.06	118.30
3	A3	3041	U	OP1-P-O3'	5.29	116.83	105.20
35	93	86	LEU	CA-CB-CG	5.29	127.46	115.30
89	n	92	TYR	CB-CG-CD1	-5.29	117.83	121.00
3	A3	2295	C	N1-C2-O2	5.28	122.07	118.90
3	A3	3201	A	C4-N9-C1'	5.28	135.81	126.30
3	A3	1699	C	C5-C6-N1	5.28	123.64	121.00
37	b3	117	LYS	CA-CB-CG	5.28	125.00	113.40
86	A6	1373	U	C5-C6-N1	5.27	125.34	122.70
14	N3	87	PHE	CB-CG-CD2	-5.27	117.11	120.80
3	A3	3204	C	C6-N1-C2	-5.27	118.19	120.30
78	X6	344	LEU	CA-CB-CG	5.27	127.42	115.30
3	A3	2445	U	C2-N1-C1'	5.26	124.02	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
24	X3	222	ASP	CB-CG-OD1	5.26	123.04	118.30
88	A	183	PRO	C-N-CA	5.26	134.86	121.70
19	S3	172	MET	CG-SD-CE	-5.26	91.78	100.20
3	A3	1984	A	C6-C5-N7	-5.26	128.62	132.30
87	24	33	C	N3-C2-O2	-5.26	118.22	121.90
3	A3	1890	C	C6-N1-C2	-5.26	118.20	120.30
35	93	127	LEU	CA-CB-CG	5.26	127.39	115.30
86	A6	1318	C	C6-N1-C2	-5.25	118.20	120.30
3	A3	2280	C	N3-C2-O2	-5.25	118.23	121.90
86	A6	1207	C	N1-C2-O2	5.25	122.05	118.90
86	A6	1093	U	N1-C2-O2	5.25	126.47	122.80
86	A6	1025	U	OP2-P-O3'	5.25	116.74	105.20
69	O6	213	LEU	CA-CB-CG	5.24	127.36	115.30
86	A6	1127	C	C2-N1-C1'	5.24	124.56	118.80
19	S3	182	LYS	CD-CE-NZ	-5.24	99.66	111.70
4	B3	1648	U	C5-C6-N1	5.23	125.32	122.70
3	A3	1828	A	N3-C4-N9	-5.23	123.22	127.40
3	A3	2326	C	C6-N1-C2	-5.23	118.21	120.30
87	FE	33	C	N3-C2-O2	-5.22	118.25	121.90
69	O6	96	ARG	NE-CZ-NH2	-5.21	117.69	120.30
3	A3	2157	U	N1-C2-O2	5.21	126.45	122.80
3	A3	2171	U	O4'-C1'-N1	5.21	112.37	108.20
3	A3	2187	C	N1-C2-O2	5.21	122.03	118.90
87	FE	42	C	N1-C2-O2	5.21	122.03	118.90
3	A3	3228	U	C6-N1-C1'	-5.21	113.91	121.20
86	A6	901	C	C5-C6-N1	5.20	123.60	121.00
86	A6	809	C	O4'-C1'-N1	5.20	112.36	108.20
3	A3	1984	A	C5-N7-C8	-5.19	101.30	103.90
3	A3	2898	U	O4'-C1'-N1	5.19	112.35	108.20
1	r1	62	LEU	CA-CB-CG	5.19	127.23	115.30
86	A6	1318	C	C5-C6-N1	5.19	123.59	121.00
86	A6	1156	A	C2-N3-C4	5.18	113.19	110.60
3	A3	1946	C	C6-N1-C2	-5.18	118.23	120.30
3	A3	3172	C	N1-C2-O2	5.18	122.01	118.90
3	A3	2511	C	C2-N1-C1'	5.18	124.50	118.80
82	b6	138	ASP	C-N-CA	5.17	134.62	121.70
1	r1	207	LEU	CB-CA-C	5.17	120.01	110.20
87	24	42	C	N1-C2-O2	5.16	122.00	118.90
86	A6	1526	U	N1-C2-O2	5.16	126.41	122.80
5	D3	235	GLN	CA-CB-CG	5.15	124.72	113.40
86	A6	957	U	C2-N1-C1'	5.14	123.87	117.70
76	V6	154	LYS	C-N-CA	5.14	134.55	121.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A3	3201	A	C2-N3-C4	5.14	113.17	110.60
86	A6	969	C	N1-C2-O2	5.14	121.98	118.90
3	A3	1837	C	C6-N1-C2	-5.13	118.25	120.30
4	B3	1663	C	N1-C2-O2	5.13	121.98	118.90
87	FE	40	U	N1-C2-O2	5.13	126.39	122.80
3	A3	1880	C	C6-N1-C2	-5.13	118.25	120.30
3	A3	2186	C	N1-C2-O2	5.13	121.98	118.90
86	A6	709	C	N1-C2-O2	5.12	121.97	118.90
3	A3	2583	C	C5-C6-N1	5.12	123.56	121.00
3	A3	3041	U	P-O3'-C3'	5.12	125.84	119.70
86	A6	1373	U	C6-N1-C2	-5.11	117.93	121.00
3	A3	2282	C	N3-C2-O2	-5.11	118.32	121.90
62	H6	180	LEU	CA-CB-CG	5.11	127.06	115.30
3	A3	2708	C	N1-C2-O2	5.11	121.96	118.90
3	A3	2771	C	N3-C2-O2	-5.11	118.32	121.90
3	A3	1786	C	C6-N1-C2	-5.11	118.26	120.30
87	24	45	A	C2-N3-C4	5.11	113.15	110.60
3	A3	1725	C	N3-C2-O2	-5.10	118.33	121.90
72	R6	208	ILE	CG1-CB-CG2	-5.10	100.17	111.40
3	A3	2898	U	C6-N1-C1'	-5.10	114.06	121.20
69	O6	162	LEU	CA-CB-CG	5.10	127.03	115.30
3	A3	1689	C	N3-C2-O2	-5.10	118.33	121.90
3	A3	1823	A	C8-N9-C4	-5.10	103.76	105.80
86	A6	1541	C	C2-N1-C1'	5.09	124.40	118.80
1	r1	470	ILE	CG1-CB-CG2	-5.09	100.19	111.40
3	A3	2684	C	N1-C2-O2	5.09	121.95	118.90
86	A6	1472	U	C2-N1-C1'	5.09	123.81	117.70
3	A3	3122	U	N3-C2-O2	-5.09	118.64	122.20
86	A6	675	U	N1-C2-O2	5.08	126.36	122.80
20	T3	161	ARG	N-CA-C	-5.08	97.28	111.00
22	V3	91	LEU	CA-CB-CG	5.08	126.99	115.30
3	A3	2852	C	N3-C2-O2	-5.08	118.35	121.90
86	A6	678	U	N1-C2-O2	5.08	126.35	122.80
3	A3	2386	C	C2-N1-C1'	5.07	124.38	118.80
3	A3	3123	G	P-O3'-C3'	5.07	125.79	119.70
1	r1	365	PHE	CA-C-N	5.07	126.34	116.20
87	24	40	U	N1-C2-O2	5.07	126.35	122.80
3	A3	2583	C	C6-N1-C2	-5.07	118.27	120.30
39	d3	231	LEU	CA-CB-CG	5.07	126.96	115.30
86	A6	1447	U	C2-N1-C1'	5.07	123.78	117.70
3	A3	3170	C	C6-N1-C2	-5.07	118.27	120.30
3	A3	1984	A	N9-C4-C5	-5.06	103.78	105.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
86	A6	1451	G	C4-N9-C1'	5.06	133.08	126.50
86	A6	1127	C	C6-N1-C2	-5.06	118.28	120.30
1	r1	567	LEU	CA-CB-CG	5.05	126.93	115.30
87	FE	45	A	C2-N3-C4	5.05	113.12	110.60
86	A6	887	U	O5'-P-OP1	5.05	116.76	110.70
81	a6	135	MET	CB-CG-SD	-5.05	97.25	112.40
81	a6	78	ARG	NE-CZ-NH1	-5.04	117.78	120.30
86	A6	1324	G	O4'-C1'-N9	5.04	112.23	108.20
88	A	180	PRO	C-N-CD	-5.04	109.52	120.60
1	r1	79	VAL	CG1-CB-CG2	-5.03	102.85	110.90
3	A3	2489	C	C5-C6-N1	5.03	123.52	121.00
3	A3	2824	C	C6-N1-C2	-5.03	118.29	120.30
13	M3	244	LEU	CA-CB-CG	5.03	126.87	115.30
3	A3	2372	U	C6-N1-C1'	-5.03	114.16	121.20
3	A3	3187	C	C6-N1-C2	-5.03	118.29	120.30
3	A3	1693	C	C5-C6-N1	5.03	123.51	121.00
3	A3	2357	C	N3-C2-O2	-5.03	118.38	121.90
87	24	33	C	C6-N1-C2	-5.02	118.29	120.30
61	G6	302	LEU	CA-CB-CG	5.02	126.85	115.30
28	13	20	MET	CB-CG-SD	5.02	127.45	112.40
76	V6	180	LEU	CA-CB-CG	5.02	126.84	115.30
86	A6	1502	C	N1-C2-O2	5.01	121.91	118.90
86	A6	806	C	C6-N1-C2	-5.01	118.30	120.30
3	A3	1984	A	C8-N9-C1'	-5.01	118.68	127.70
3	A3	3206	C	N1-C2-O2	5.01	121.91	118.90
1	r1	725	PRO	C-N-CA	5.01	134.22	121.70
6	E3	247	ASP	CB-CG-OD1	5.01	122.81	118.30
3	A3	3206	C	P-O3'-C3'	5.00	125.71	119.70
35	93	91	LEU	CA-CB-CG	5.00	126.81	115.30
3	A3	1993	A	N3-C4-N9	5.00	131.40	127.40
3	A3	2135	A	C4-N9-C1'	5.00	135.30	126.30
67	M6	65	LEU	CA-CB-CG	5.00	126.80	115.30
86	A6	715	U	C6-N1-C1'	-5.00	114.20	121.20

There are no chirality outliers.

All (125) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
27	03	151	ALA	Peptide
27	03	177	ARG	Peptide
28	13	25	GLY	Peptide
28	13	62	ILE	Peptide

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Mol	Chain	Res	Type	Group
32	53	223	ARG	Peptide
32	53	268	CYS	Peptide
32	53	269	ASN	Peptide
32	53	347	THR	Peptide
33	63	221	LEU	Peptide
33	63	49	GLU	Peptide
35	93	45	THR	Peptide
88	A	181	PRO	Peptide
88	A	182	ILE	Peptide
88	A	184	ASN	Peptide
88	A	185	TYR	Peptide
88	A	201	GLN	Peptide
88	A	57	ASP	Peptide
56	B6	164	GLU	Peptide
8	D	193	PHE	Peptide
8	D	205	THR	Peptide
5	D3	206	TYR	Peptide
58	D6	284	ARG	Peptide
58	D6	286	GLU	Peptide
58	D6	422	TRP	Peptide
58	D6	425	LEU	Peptide
6	E3	126	ASP	Peptide
6	E3	169	GLY	Peptide
6	E3	244	ALA	Peptide
6	E3	250	ARG	Peptide
6	E3	85	TRP	Peptide
7	F3	129	PRO	Peptide
7	F3	140	SER	Peptide
60	F6	147	GLN	Peptide
60	F6	159	VAL	Peptide
60	F6	160	PRO	Mainchain
60	F6	161	ILE	Peptide
61	G6	103	ASP	Peptide
8	H3	63	PRO	Peptide
9	I3	102	VAL	Peptide
63	I6	144	VAL	Peptide
63	I6	94	ASN	Peptide
10	J3	44	VAL	Peptide
10	J3	45	SER	Peptide
64	J6	130	TYR	Peptide
11	K3	3	SER	Peptide
11	K3	5	SER	Peptide

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Mol	Chain	Res	Type	Group
13	M3	109	ARG	Peptide
13	M3	18	GLY	Peptide
13	M3	264	GLN	Peptide
13	M3	286	THR	Peptide
14	N3	237	HIS	Peptide
14	N3	78	GLU	Peptide
68	N6	109	PRO	Peptide
15	O3	104	TYR	Peptide
69	O6	53	ASP	Peptide
69	O6	55	PRO	Peptide
69	O6	98	ASN	Peptide
70	P6	139	ARG	Peptide
70	P6	64	LYS	Peptide
70	P6	65	CYS	Peptide
17	Q3	182	ARG	Peptide
18	R3	137	GLU	Peptide
72	R6	132	LEU	Peptide
72	R6	154	THR	Peptide
72	R6	291	ARG	Peptide
73	S6	107	GLN	Peptide
20	T3	160	GLY	Peptide
75	U6	128	GLU	Peptide
75	U6	62	HIS	Peptide
22	V3	100	LYS	Peptide
22	V3	170	TRP	Peptide
76	V6	155	GLU	Peptide
76	V6	44	GLU	Peptide
24	X3	51	LYS	Peptide
2	Y2	21	UNK	Peptide
2	Y2	22	UNK	Peptide
26	Z3	141	SER	Peptide
81	a6	21	LEU	Peptide
82	b6	228	VAL	Peptide
38	c3	63	LYS	Peptide
83	c6	38	ARG	Peptide
39	d3	191	PRO	Peptide
39	d3	230	ARG	Peptide
39	d3	231	LEU	Peptide
39	d3	268	PRO	Peptide
39	d3	271	PRO	Peptide
85	e6	64	THR	Peptide
85	e6	67	LYS	Peptide

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Mol	Chain	Res	Type	Group
41	f3	50	THR	Peptide
41	f3	84	THR	Peptide
41	f3	85	ASP	Peptide
41	f3	86	TYR	Peptide
42	g3	110	ILE	Peptide
43	h3	138	SER	Peptide
43	h3	65	ASP	Peptide
44	i3	57	TYR	Peptide
45	j3	25	GLY	Peptide
89	n	222	SER	Peptide
49	o3	42	GLU	Peptide
51	q3	78	SER	Peptide
1	r1	162	MET	Peptide
1	r1	169	PHE	Peptide
1	r1	207	LEU	Peptide
1	r1	247	THR	Peptide
1	r1	249	HIS	Peptide
1	r1	256	CYS	Peptide
1	r1	296	PHE	Peptide
1	r1	341	ILE	Peptide
1	r1	364	ARG	Peptide
1	r1	401	MET	Peptide
1	r1	402	HIS	Peptide
1	r1	441	MET	Peptide
1	r1	53	ALA	Peptide
1	r1	57	SER	Peptide
1	r1	597	GLY	Peptide
1	r1	678	GLN	Peptide
1	r1	681	VAL	Peptide
1	r1	723	CYS	Peptide
1	r1	724	LEU	Peptide
1	r1	726	SER	Peptide
1	r1	735	TYR	Peptide
1	r1	78	GLU	Peptide
1	r1	98	ARG	Peptide
53	s3	270	LYS	Peptide
53	s3	283	PHE	Peptide

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

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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 PDB entries followed by that with respect to all EM entries.

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	
1	r1	694/751 (92%)	523 (75%)	159 (23%)	12 (2%)	9	42
5	D3	234/305 (77%)	216 (92%)	17 (7%)	1 (0%)	34	69
6	E3	296/348 (85%)	258 (87%)	38 (13%)	0	100	100
7	F3	248/311 (80%)	224 (90%)	24 (10%)	0	100	100
8	D	78/267 (29%)	60 (77%)	18 (23%)	0	100	100
8	H3	93/267 (35%)	84 (90%)	9 (10%)	0	100	100
9	I3	154/261 (59%)	145 (94%)	9 (6%)	0	100	100
10	J3	138/192 (72%)	124 (90%)	14 (10%)	0	100	100
11	K3	175/178 (98%)	153 (87%)	19 (11%)	3 (2%)	9	42
12	L3	113/145 (78%)	104 (92%)	9 (8%)	0	100	100
13	M3	285/296 (96%)	254 (89%)	30 (10%)	1 (0%)	34	69
14	N3	203/251 (81%)	189 (93%)	12 (6%)	2 (1%)	15	51
15	O3	150/175 (86%)	130 (87%)	19 (13%)	1 (1%)	22	59
16	P3	129/179 (72%)	118 (92%)	11 (8%)	0	100	100
17	Q3	217/292 (74%)	192 (88%)	25 (12%)	0	100	100
18	R3	138/149 (93%)	128 (93%)	10 (7%)	0	100	100
19	S3	154/205 (75%)	139 (90%)	15 (10%)	0	100	100
20	T3	164/212 (77%)	152 (93%)	12 (7%)	0	100	100
21	U3	109/153 (71%)	96 (88%)	13 (12%)	0	100	100
22	V3	183/216 (85%)	155 (85%)	26 (14%)	2 (1%)	14	50
23	W3	109/148 (74%)	103 (94%)	6 (6%)	0	100	100
24	X3	241/256 (94%)	220 (91%)	20 (8%)	1 (0%)	34	69
25	Y3	174/250 (70%)	161 (92%)	12 (7%)	1 (1%)	25	62
26	Z3	118/161 (73%)	108 (92%)	10 (8%)	0	100	100
27	03	106/188 (56%)	94 (89%)	11 (10%)	1 (1%)	17	54

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	13	50/65 (77%)	46 (92%)	3 (6%)	1 (2%)	7	39
29	23	44/92 (48%)	42 (96%)	2 (4%)	0	100	100
30	33	93/188 (50%)	89 (96%)	4 (4%)	0	100	100
31	43	34/103 (33%)	34 (100%)	0	0	100	100
32	53	368/423 (87%)	326 (89%)	40 (11%)	2 (0%)	29	66
33	63	313/380 (82%)	283 (90%)	30 (10%)	0	100	100
34	73	258/338 (76%)	233 (90%)	25 (10%)	0	100	100
35	93	105/137 (77%)	88 (84%)	17 (16%)	0	100	100
36	a3	78/142 (55%)	74 (95%)	4 (5%)	0	100	100
37	b3	146/155 (94%)	132 (90%)	13 (9%)	1 (1%)	22	59
38	c3	271/332 (82%)	251 (93%)	20 (7%)	0	100	100
39	d3	156/306 (51%)	139 (89%)	15 (10%)	2 (1%)	12	47
40	e3	211/279 (76%)	193 (92%)	18 (8%)	0	100	100
41	f3	125/194 (64%)	103 (82%)	19 (15%)	3 (2%)	6	35
42	g3	127/166 (76%)	119 (94%)	8 (6%)	0	100	100
43	h3	96/158 (61%)	84 (88%)	11 (12%)	1 (1%)	15	51
44	i3	95/128 (74%)	87 (92%)	8 (8%)	0	100	100
45	j3	83/123 (68%)	78 (94%)	4 (5%)	1 (1%)	13	48
46	k3	82/112 (73%)	66 (80%)	16 (20%)	0	100	100
47	l3	21/138 (15%)	21 (100%)	0	0	100	100
48	m3	43/128 (34%)	36 (84%)	7 (16%)	0	100	100
49	o3	92/102 (90%)	86 (94%)	6 (6%)	0	100	100
50	p3	119/206 (58%)	113 (95%)	6 (5%)	0	100	100
51	q3	126/222 (57%)	119 (94%)	5 (4%)	2 (2%)	9	43
52	r3	140/196 (71%)	125 (89%)	15 (11%)	0	100	100
53	s3	366/439 (83%)	340 (93%)	26 (7%)	0	100	100
55	A5	26/435 (6%)	17 (65%)	9 (35%)	0	100	100
56	B6	215/296 (73%)	200 (93%)	15 (7%)	0	100	100
57	C6	130/167 (78%)	122 (94%)	8 (6%)	0	100	100
58	D6	316/430 (74%)	272 (86%)	44 (14%)	0	100	100
59	E6	120/125 (96%)	113 (94%)	6 (5%)	1 (1%)	19	56

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
60	F6	197/242 (81%)	182 (92%)	14 (7%)	1 (0%)	29	66
61	G6	301/396 (76%)	276 (92%)	25 (8%)	0	100	100
62	H6	120/201 (60%)	103 (86%)	17 (14%)	0	100	100
63	I6	134/194 (69%)	122 (91%)	12 (9%)	0	100	100
64	J6	106/138 (77%)	93 (88%)	13 (12%)	0	100	100
65	K6	99/128 (77%)	88 (89%)	11 (11%)	0	100	100
66	L6	162/257 (63%)	151 (93%)	11 (7%)	0	100	100
67	M6	114/137 (83%)	100 (88%)	14 (12%)	0	100	100
68	N6	105/130 (81%)	93 (89%)	12 (11%)	0	100	100
69	O6	183/258 (71%)	159 (87%)	24 (13%)	0	100	100
70	P6	94/142 (66%)	82 (87%)	12 (13%)	0	100	100
71	Q6	84/87 (97%)	75 (89%)	9 (11%)	0	100	100
72	R6	240/360 (67%)	210 (88%)	30 (12%)	0	100	100
73	S6	124/190 (65%)	110 (89%)	14 (11%)	0	100	100
74	T6	160/173 (92%)	140 (88%)	19 (12%)	1 (1%)	25	62
75	U6	171/205 (83%)	159 (93%)	12 (7%)	0	100	100
76	V6	320/414 (77%)	287 (90%)	33 (10%)	0	100	100
77	W6	95/187 (51%)	81 (85%)	14 (15%)	0	100	100
78	X6	310/398 (78%)	264 (85%)	45 (14%)	1 (0%)	41	74
79	Y6	106/395 (27%)	96 (91%)	10 (9%)	0	100	100
80	Z6	85/106 (80%)	79 (93%)	6 (7%)	0	100	100
81	a6	197/218 (90%)	174 (88%)	23 (12%)	0	100	100
82	b6	252/323 (78%)	223 (88%)	29 (12%)	0	100	100
83	c6	114/118 (97%)	98 (86%)	15 (13%)	1 (1%)	17	54
84	d6	67/199 (34%)	62 (92%)	5 (8%)	0	100	100
85	e6	362/689 (52%)	328 (91%)	29 (8%)	5 (1%)	11	45
88	A	158/206 (77%)	139 (88%)	19 (12%)	0	100	100
89	n	216/286 (76%)	166 (77%)	50 (23%)	0	100	100
All	All	13828/19638 (70%)	12301 (89%)	1479 (11%)	48 (0%)	44	74

All (48) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	r1	365	PHE
1	r1	598	PRO
1	r1	623	GLU
1	r1	724	LEU
1	r1	725	PRO
22	V3	101	THR
39	d3	231	LEU
41	f3	51	LYS
85	e6	68	VAL
85	e6	147	PRO
1	r1	599	LEU
1	r1	682	GLU
11	K3	160	GLN
13	M3	265	ILE
22	V3	194	LEU
24	X3	52	ILE
32	53	270	ILE
51	q3	43	GLU
60	F6	161	ILE
1	r1	404	ASP
14	N3	238	LYS
27	03	178	ASP
28	13	63	ARG
41	f3	50	THR
41	f3	85	ASP
51	q3	42	PRO
78	X6	342	PRO
1	r1	679	ASP
5	D3	207	ILE
83	c6	60	GLU
1	r1	403	ALA
11	K3	4	PHE
45	j3	35	ALA
85	e6	146	GLU
85	e6	274	GLN
11	K3	159	THR
14	N3	237	HIS
43	h3	66	LEU
1	r1	79	VAL
32	53	349	GLY
85	e6	149	ILE
39	d3	164	VAL
74	T6	148	PRO

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Mol	Chain	Res	Type
1	r1	341	ILE
25	Y3	203	PRO
59	E6	15	ARG
15	O3	111	PRO
37	b3	117	LYS

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	
1	r1	592/630 (94%)	591 (100%)	1 (0%)	93	97
5	D3	190/245 (78%)	190 (100%)	0	100	100
6	E3	255/290 (88%)	255 (100%)	0	100	100
7	F3	217/262 (83%)	216 (100%)	1 (0%)	88	94
8	D	73/228 (32%)	73 (100%)	0	100	100
8	H3	86/228 (38%)	86 (100%)	0	100	100
9	I3	145/232 (62%)	145 (100%)	0	100	100
10	J3	113/150 (75%)	113 (100%)	0	100	100
11	K3	155/156 (99%)	154 (99%)	1 (1%)	86	93
12	L3	98/124 (79%)	98 (100%)	0	100	100
13	M3	245/249 (98%)	243 (99%)	2 (1%)	81	89
14	N3	172/211 (82%)	172 (100%)	0	100	100
15	O3	133/150 (89%)	133 (100%)	0	100	100
16	P3	115/154 (75%)	113 (98%)	2 (2%)	60	79
17	Q3	201/256 (78%)	201 (100%)	0	100	100
18	R3	118/126 (94%)	118 (100%)	0	100	100
19	S3	141/180 (78%)	140 (99%)	1 (1%)	84	91
20	T3	146/182 (80%)	146 (100%)	0	100	100
21	U3	99/135 (73%)	98 (99%)	1 (1%)	76	86
22	V3	169/191 (88%)	168 (99%)	1 (1%)	86	93

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	W3	91/119 (76%)	91 (100%)	0	100	100
24	X3	217/227 (96%)	216 (100%)	1 (0%)	88	94
25	Y3	159/223 (71%)	159 (100%)	0	100	100
26	Z3	111/147 (76%)	111 (100%)	0	100	100
27	03	97/164 (59%)	97 (100%)	0	100	100
28	13	49/60 (82%)	49 (100%)	0	100	100
29	23	40/72 (56%)	40 (100%)	0	100	100
30	33	88/166 (53%)	88 (100%)	0	100	100
31	43	35/89 (39%)	35 (100%)	0	100	100
32	53	337/368 (92%)	335 (99%)	2 (1%)	86	93
33	63	266/332 (80%)	265 (100%)	1 (0%)	91	95
34	73	242/303 (80%)	242 (100%)	0	100	100
35	93	91/112 (81%)	91 (100%)	0	100	100
36	a3	78/133 (59%)	78 (100%)	0	100	100
37	b3	130/135 (96%)	129 (99%)	1 (1%)	81	89
38	c3	241/288 (84%)	241 (100%)	0	100	100
39	d3	151/274 (55%)	151 (100%)	0	100	100
40	e3	188/236 (80%)	187 (100%)	1 (0%)	88	94
41	f3	117/173 (68%)	117 (100%)	0	100	100
42	g3	119/148 (80%)	119 (100%)	0	100	100
43	h3	95/148 (64%)	95 (100%)	0	100	100
44	i3	86/110 (78%)	86 (100%)	0	100	100
45	j3	68/97 (70%)	68 (100%)	0	100	100
46	k3	74/90 (82%)	74 (100%)	0	100	100
47	l3	23/116 (20%)	23 (100%)	0	100	100
48	m3	40/113 (35%)	39 (98%)	1 (2%)	47	70
49	o3	80/87 (92%)	80 (100%)	0	100	100
50	p3	117/181 (65%)	116 (99%)	1 (1%)	78	88
51	q3	110/178 (62%)	110 (100%)	0	100	100
52	r3	133/169 (79%)	133 (100%)	0	100	100
53	s3	326/381 (86%)	326 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
56	B6	191/249 (77%)	190 (100%)	1 (0%)	88	94
57	C6	115/143 (80%)	115 (100%)	0	100	100
58	D6	269/357 (75%)	269 (100%)	0	100	100
59	E6	104/107 (97%)	104 (100%)	0	100	100
60	F6	178/209 (85%)	178 (100%)	0	100	100
61	G6	265/342 (78%)	264 (100%)	1 (0%)	91	95
62	H6	112/180 (62%)	112 (100%)	0	100	100
63	I6	104/147 (71%)	104 (100%)	0	100	100
64	J6	93/118 (79%)	93 (100%)	0	100	100
65	K6	91/113 (80%)	91 (100%)	0	100	100
66	L6	152/226 (67%)	152 (100%)	0	100	100
67	M6	95/113 (84%)	95 (100%)	0	100	100
68	N6	93/115 (81%)	93 (100%)	0	100	100
69	O6	166/230 (72%)	165 (99%)	1 (1%)	86	93
70	P6	87/123 (71%)	87 (100%)	0	100	100
71	Q6	78/79 (99%)	78 (100%)	0	100	100
72	R6	224/318 (70%)	222 (99%)	2 (1%)	78	88
73	S6	109/164 (66%)	109 (100%)	0	100	100
74	T6	150/157 (96%)	149 (99%)	1 (1%)	84	91
75	U6	149/174 (86%)	149 (100%)	0	100	100
76	V6	295/364 (81%)	295 (100%)	0	100	100
77	W6	84/158 (53%)	84 (100%)	0	100	100
78	X6	275/351 (78%)	274 (100%)	1 (0%)	91	95
79	Y6	99/357 (28%)	99 (100%)	0	100	100
80	Z6	80/95 (84%)	80 (100%)	0	100	100
81	a6	176/190 (93%)	175 (99%)	1 (1%)	86	93
82	b6	237/291 (81%)	236 (100%)	1 (0%)	91	95
83	c6	99/101 (98%)	97 (98%)	2 (2%)	55	74
84	d6	63/166 (38%)	63 (100%)	0	100	100
85	e6	226/609 (37%)	226 (100%)	0	100	100
88	A	151/190 (80%)	151 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
89	n	194/254 (76%)	194 (100%)	0	100	100
All	All	12266/16608 (74%)	12237 (100%)	29 (0%)	93	97

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	r1	628	ARG
7	F3	125	ARG
11	K3	70	ASN
13	M3	44	ARG
13	M3	182	ARG
16	P3	54	ASN
16	P3	176	ARG
19	S3	118	ASN
21	U3	69	ARG
22	V3	208	ARG
24	X3	96	LYS
32	53	83	LYS
32	53	275	ASN
33	63	292	GLN
37	b3	123	ASN
40	e3	185	ARG
48	m3	72	ARG
50	p3	82	ARG
56	B6	113	HIS
61	G6	276	ARG
69	O6	145	LYS
72	R6	106	MET
72	R6	127	LYS
74	T6	70	MET
78	X6	312	GLN
81	a6	27	ARG
82	b6	211	ARG
83	c6	37	ARG
83	c6	38	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	r1	77	HIS
1	r1	152	GLN

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Mol	Chain	Res	Type
1	r1	196	HIS
1	r1	542	GLN
1	r1	548	GLN
6	E3	72	GLN
10	J3	103	GLN
16	P3	54	ASN
17	Q3	158	GLN
19	S3	179	ASN
22	V3	73	GLN
32	53	275	ASN
35	93	134	ASN
46	k3	35	GLN
63	I6	98	GLN
66	L6	172	ASN
70	P6	71	HIS
70	P6	115	GLN
74	T6	59	ASN
74	T6	128	ASN
76	V6	245	HIS
78	X6	190	ASN
79	Y6	295	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	8	7/1559 (0%)	4 (57%)	0
3	A3	1490/1559 (95%)	415 (27%)	38 (2%)
4	B3	51/73 (69%)	15 (29%)	1 (1%)
54	u3	1/2 (50%)	0	0
86	A6	921/954 (96%)	267 (28%)	14 (1%)
87	24	73/73 (100%)	38 (52%)	1 (1%)
87	FE	73/73 (100%)	38 (52%)	1 (1%)
All	All	2616/4293 (60%)	777 (29%)	55 (2%)

All (777) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	A3	1674	A
3	A3	1676	A
3	A3	1678	C
3	A3	1679	U

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Mol	Chain	Res	Type
3	A3	1680	A
3	A3	1681	G
3	A3	1685	C
3	A3	1689	C
3	A3	1692	A
3	A3	1693	C
3	A3	1694	U
3	A3	1699	C
3	A3	1700	U
3	A3	1701	U
3	A3	1704	U
3	A3	1707	C
3	A3	1708	A
3	A3	1709	G
3	A3	1713	A
3	A3	1714	C
3	A3	1715	C
3	A3	1716	U
3	A3	1717	U
3	A3	1724	A
3	A3	1727	A
3	A3	1728	U
3	A3	1741	A
3	A3	1748	G
3	A3	1750	G
3	A3	1751	A
3	A3	1767	G
3	A3	1770	G
3	A3	1774	U
3	A3	1777	A
3	A3	1780	U
3	A3	1781	A
3	A3	1782	G
3	A3	1791	G
3	A3	1794	A
3	A3	1804	A
3	A3	1805	A
3	A3	1806	U
3	A3	1807	U
3	A3	1808	A
3	A3	1809	U
3	A3	1810	A

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Mol	Chain	Res	Type
3	A3	1811	A
3	A3	1812	C
3	A3	1813	C
3	A3	1817	C
3	A3	1821	A
3	A3	1824	U
3	A3	1827	C
3	A3	1828	A
3	A3	1829	A
3	A3	1832	A
3	A3	1836	A
3	A3	1844	A
3	A3	1849	C
3	A3	1854	U
3	A3	1856	A
3	A3	1867	A
3	A3	1869	A
3	A3	1870	A
3	A3	1872	U
3	A3	1873	A
3	A3	1874	A
3	A3	1878	U
3	A3	1882	A
3	A3	1883	G
3	A3	1887	A
3	A3	1888	G
3	A3	1890	C
3	A3	1893	A
3	A3	1902	C
3	A3	1903	C
3	A3	1909	A
3	A3	1918	G
3	A3	1922	C
3	A3	1935	A
3	A3	1939	G
3	A3	1940	A
3	A3	1944	C
3	A3	1966	G
3	A3	1968	G
3	A3	1974	A
3	A3	1975	U
3	A3	1985	G

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Mol	Chain	Res	Type
3	A3	1987	G
3	A3	1992	C
3	A3	1993	A
3	A3	1994	A
3	A3	1995	A
3	A3	2000	C
3	A3	2001	C
3	A3	2002	G
3	A3	2015	G
3	A3	2020	U
3	A3	2021	U
3	A3	2022	G
3	A3	2029	A
3	A3	2031	A
3	A3	2032	G
3	A3	2036	C
3	A3	2037	U
3	A3	2053	U
3	A3	2055	U
3	A3	2057	C
3	A3	2059	C
3	A3	2060	A
3	A3	2065	A
3	A3	2074	A
3	A3	2079	C
3	A3	2083	U
3	A3	2085	A
3	A3	2093	U
3	A3	2097	A
3	A3	2098	G
3	A3	2099	U
3	A3	2110	A
3	A3	2113	G
3	A3	2124	A
3	A3	2125	C
3	A3	2132	A
3	A3	2135	A
3	A3	2141	U
3	A3	2142	A
3	A3	2147	G
3	A3	2154	A
3	A3	2157	U

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Mol	Chain	Res	Type
3	A3	2159	U
3	A3	2163	A
3	A3	2165	C
3	A3	2166	C
3	A3	2168	U
3	A3	2171	U
3	A3	2172	A
3	A3	2173	G
3	A3	2177	U
3	A3	2180	A
3	A3	2182	G
3	A3	2183	C
3	A3	2184	A
3	A3	2187	C
3	A3	2190	C
3	A3	2193	U
3	A3	2194	U
3	A3	2195	A
3	A3	2197	G
3	A3	2198	A
3	A3	2200	A
3	A3	2202	C
3	A3	2210	C
3	A3	2216	A
3	A3	2229	A
3	A3	2230	A
3	A3	2231	A
3	A3	2233	U
3	A3	2237	A
3	A3	2239	A
3	A3	2241	A
3	A3	2243	A
3	A3	2244	U
3	A3	2245	A
3	A3	2246	A
3	A3	2262	C
3	A3	2263	C
3	A3	2283	C
3	A3	2284	C
3	A3	2285	U
3	A3	2290	A
3	A3	2294	A

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Mol	Chain	Res	Type
3	A3	2297	A
3	A3	2299	U
3	A3	2300	G
3	A3	2309	A
3	A3	2322	C
3	A3	2323	A
3	A3	2324	U
3	A3	2329	C
3	A3	2331	C
3	A3	2332	C
3	A3	2345	G
3	A3	2364	C
3	A3	2369	A
3	A3	2370	A
3	A3	2371	U
3	A3	2372	U
3	A3	2374	A
3	A3	2375	C
3	A3	2379	C
3	A3	2380	C
3	A3	2381	A
3	A3	2387	U
3	A3	2389	C
3	A3	2390	A
3	A3	2393	C
3	A3	2394	A
3	A3	2400	C
3	A3	2401	A
3	A3	2404	U
3	A3	2405	C
3	A3	2407	U
3	A3	2414	C
3	A3	2415	C
3	A3	2416	U
3	A3	2426	C
3	A3	2427	C
3	A3	2429	A
3	A3	2435	G
3	A3	2443	C
3	A3	2444	A
3	A3	2445	U
3	A3	2446	A

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Mol	Chain	Res	Type
3	A3	2447	A
3	A3	2452	A
3	A3	2478	G
3	A3	2493	C
3	A3	2500	A
3	A3	2506	A
3	A3	2508	C
3	A3	2511	C
3	A3	2520	C
3	A3	2521	A
3	A3	2522	U
3	A3	2523	C
3	A3	2524	A
3	A3	2527	A
3	A3	2530	A
3	A3	2531	U
3	A3	2532	U
3	A3	2536	G
3	A3	2539	A
3	A3	2540	C
3	A3	2557	C
3	A3	2558	A
3	A3	2559	U
3	A3	2560	G
3	A3	2563	U
3	A3	2567	G
3	A3	2570	C
3	A3	2581	A
3	A3	2582	A
3	A3	2592	G
3	A3	2593	G
3	A3	2594	U
3	A3	2596	G
3	A3	2601	A
3	A3	2603	C
3	A3	2618	U
3	A3	2626	U
3	A3	2627	G
3	A3	2629	A
3	A3	2630	U
3	A3	2632	A
3	A3	2633	A

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Mol	Chain	Res	Type
3	A3	2634	U
3	A3	2635	G
3	A3	2643	G
3	A3	2645	G
3	A3	2654	U
3	A3	2655	G
3	A3	2656	U
3	A3	2660	U
3	A3	2683	C
3	A3	2686	G
3	A3	2694	A
3	A3	2696	A
3	A3	2706	A
3	A3	2708	C
3	A3	2709	A
3	A3	2718	C
3	A3	2719	G
3	A3	2723	A
3	A3	2724	G
3	A3	2725	A
3	A3	2732	G
3	A3	2733	G
3	A3	2740	A
3	A3	2745	A
3	A3	2749	A
3	A3	2750	U
3	A3	2757	A
3	A3	2758	G
3	A3	2761	C
3	A3	2762	C
3	A3	2763	U
3	A3	2764	A
3	A3	2765	A
3	A3	2766	C
3	A3	2767	A
3	A3	2768	A
3	A3	2769	A
3	A3	2771	C
3	A3	2773	A
3	A3	2774	C
3	A3	2775	A
3	A3	2776	G

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Mol	Chain	Res	Type
3	A3	2777	G
3	A3	2778	U
3	A3	2779	C
3	A3	2780	C
3	A3	2781	U
3	A3	2782	A
3	A3	2783	A
3	A3	2784	A
3	A3	2785	C
3	A3	2786	U
3	A3	2787	A
3	A3	2788	C
3	A3	2789	C
3	A3	2790	A
3	A3	2791	A
3	A3	2792	A
3	A3	2804	A
3	A3	2810	G
3	A3	2814	G
3	A3	2823	U
3	A3	2831	G
3	A3	2832	A
3	A3	2833	A
3	A3	2842	C
3	A3	2844	G
3	A3	2847	C
3	A3	2851	A
3	A3	2854	U
3	A3	2861	A
3	A3	2864	U
3	A3	2865	C
3	A3	2870	G
3	A3	2871	U
3	A3	2879	A
3	A3	2893	A
3	A3	2896	G
3	A3	2901	A
3	A3	2906	C
3	A3	2910	A
3	A3	2913	A
3	A3	2916	G
3	A3	2917	G

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Mol	Chain	Res	Type
3	A3	2918	A
3	A3	2919	A
3	A3	2922	A
3	A3	2926	A
3	A3	2928	C
3	A3	2932	G
3	A3	2934	G
3	A3	2935	A
3	A3	2936	U
3	A3	2955	U
3	A3	2956	A
3	A3	2963	A
3	A3	2968	A
3	A3	2971	A
3	A3	2981	A
3	A3	2989	G
3	A3	2990	A
3	A3	2991	U
3	A3	2992	G
3	A3	2994	U
3	A3	3000	A
3	A3	3005	A
3	A3	3012	U
3	A3	3016	G
3	A3	3022	G
3	A3	3029	A
3	A3	3041	U
3	A3	3042	U
3	A3	3053	A
3	A3	3054	G
3	A3	3056	C
3	A3	3060	C
3	A3	3063	G
3	A3	3065	U
3	A3	3070	G
3	A3	3072	U
3	A3	3077	C
3	A3	3086	U
3	A3	3089	A
3	A3	3093	C
3	A3	3096	U
3	A3	3100	U

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Mol	Chain	Res	Type
3	A3	3102	U
3	A3	3108	U
3	A3	3109	U
3	A3	3114	U
3	A3	3123	G
3	A3	3124	U
3	A3	3128	A
3	A3	3129	A
3	A3	3131	G
3	A3	3135	A
3	A3	3141	A
3	A3	3150	U
3	A3	3155	C
3	A3	3157	C
3	A3	3158	A
3	A3	3160	A
3	A3	3161	G
3	A3	3162	C
3	A3	3168	C
3	A3	3169	C
3	A3	3172	C
3	A3	3176	A
3	A3	3180	A
3	A3	3184	C
3	A3	3189	C
3	A3	3190	A
3	A3	3202	U
3	A3	3204	C
3	A3	3207	A
3	A3	3217	A
3	A3	3218	A
3	A3	3220	A
3	A3	3228	U
4	B3	1607	U
4	B3	1608	G
4	B3	1609	U
4	B3	1611	G
4	B3	1614	U
4	B3	1615	A
4	B3	1625	A
4	B3	1631	C
4	B3	1632	U

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Mol	Chain	Res	Type
4	B3	1634	A
4	B3	1641	G
4	B3	1644	G
4	B3	1645	A
4	B3	1665	C
4	B3	1667	C
86	A6	654	U
86	A6	655	A
86	A6	675	U
86	A6	678	U
86	A6	682	U
86	A6	684	U
86	A6	686	A
86	A6	692	A
86	A6	694	U
86	A6	695	A
86	A6	698	C
86	A6	701	G
86	A6	707	A
86	A6	708	U
86	A6	709	C
86	A6	715	U
86	A6	716	C
86	A6	717	C
86	A6	722	A
86	A6	724	U
86	A6	725	U
86	A6	726	C
86	A6	727	A
86	A6	749	A
86	A6	757	A
86	A6	761	A
86	A6	765	A
86	A6	768	A
86	A6	770	G
86	A6	774	C
86	A6	775	A
86	A6	777	U
86	A6	786	A
86	A6	787	A
86	A6	792	U
86	A6	795	G

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Mol	Chain	Res	Type
86	A6	797	C
86	A6	798	U
86	A6	799	A
86	A6	800	G
86	A6	811	A
86	A6	812	C
86	A6	813	G
86	A6	816	A
86	A6	818	A
86	A6	819	C
86	A6	820	A
86	A6	821	G
86	A6	831	A
86	A6	834	U
86	A6	836	U
86	A6	839	C
86	A6	840	A
86	A6	850	A
86	A6	851	G
86	A6	853	U
86	A6	857	C
86	A6	859	A
86	A6	865	U
86	A6	869	A
86	A6	872	C
86	A6	873	C
86	A6	874	C
86	A6	884	C
86	A6	886	A
86	A6	887	U
86	A6	889	U
86	A6	894	C
86	A6	903	G
86	A6	907	U
86	A6	908	C
86	A6	909	A
86	A6	923	A
86	A6	924	G
86	A6	931	G
86	A6	937	G
86	A6	938	G
86	A6	942	A

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Mol	Chain	Res	Type
86	A6	943	A
86	A6	946	A
86	A6	947	G
86	A6	951	U
86	A6	952	U
86	A6	954	A
86	A6	957	U
86	A6	958	C
86	A6	959	A
86	A6	970	A
86	A6	971	A
86	A6	981	A
86	A6	982	A
86	A6	989	U
86	A6	992	G
86	A6	996	U
86	A6	997	A
86	A6	1005	C
86	A6	1006	C
86	A6	1011	G
86	A6	1012	A
86	A6	1015	C
86	A6	1018	A
86	A6	1019	A
86	A6	1023	A
86	A6	1026	A
86	A6	1032	G
86	A6	1035	G
86	A6	1036	C
86	A6	1038	U
86	A6	1043	A
86	A6	1046	U
86	A6	1050	A
86	A6	1053	A
86	A6	1056	C
86	A6	1069	C
86	A6	1085	U
86	A6	1086	A
86	A6	1102	C
86	A6	1107	A
86	A6	1109	C
86	A6	1110	C

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Mol	Chain	Res	Type
86	A6	1113	A
86	A6	1125	A
86	A6	1129	A
86	A6	1130	A
86	A6	1133	U
86	A6	1141	A
86	A6	1142	G
86	A6	1146	A
86	A6	1148	U
86	A6	1155	C
86	A6	1157	C
86	A6	1158	A
86	A6	1170	A
86	A6	1171	A
86	A6	1183	G
86	A6	1184	U
86	A6	1189	C
86	A6	1191	U
86	A6	1192	A
86	A6	1193	U
86	A6	1194	C
86	A6	1195	C
86	A6	1196	C
86	A6	1198	C
86	A6	1207	C
86	A6	1210	G
86	A6	1218	A
86	A6	1219	U
86	A6	1220	C
86	A6	1224	A
86	A6	1226	A
86	A6	1227	C
86	A6	1229	C
86	A6	1230	C
86	A6	1233	U
86	A6	1235	A
86	A6	1236	A
86	A6	1241	A
86	A6	1247	U
86	A6	1249	U
86	A6	1250	U
86	A6	1251	G

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Mol	Chain	Res	Type
86	A6	1252	C
86	A6	1254	C
86	A6	1255	A
86	A6	1256	G
86	A6	1258	C
86	A6	1261	U
86	A6	1265	C
86	A6	1274	U
86	A6	1275	C
86	A6	1276	A
86	A6	1287	A
86	A6	1288	U
86	A6	1289	G
86	A6	1291	A
86	A6	1294	C
86	A6	1296	A
86	A6	1297	C
86	A6	1298	A
86	A6	1299	A
86	A6	1300	A
86	A6	1301	G
86	A6	1304	A
86	A6	1330	A
86	A6	1331	G
86	A6	1333	U
86	A6	1334	C
86	A6	1336	A
86	A6	1346	C
86	A6	1347	A
86	A6	1348	U
86	A6	1355	G
86	A6	1357	A
86	A6	1358	A
86	A6	1359	G
86	A6	1360	A
86	A6	1363	U
86	A6	1371	A
86	A6	1372	U
86	A6	1373	U
86	A6	1375	U
86	A6	1380	C
86	A6	1381	C

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Mol	Chain	Res	Type
86	A6	1382	C
86	A6	1383	A
86	A6	1385	A
86	A6	1394	A
86	A6	1395	U
86	A6	1397	G
86	A6	1400	C
86	A6	1401	U
86	A6	1406	A
86	A6	1407	A
86	A6	1420	A
86	A6	1421	A
86	A6	1423	G
86	A6	1424	U
86	A6	1428	U
86	A6	1434	A
86	A6	1436	U
86	A6	1441	U
86	A6	1444	G
86	A6	1448	A
86	A6	1451	G
86	A6	1452	U
86	A6	1456	U
86	A6	1458	G
86	A6	1460	U
86	A6	1466	G
86	A6	1469	C
86	A6	1470	C
86	A6	1485	C
86	A6	1486	A
86	A6	1498	C
86	A6	1506	A
86	A6	1516	A
86	A6	1521	A
86	A6	1522	C
86	A6	1529	C
86	A6	1531	A
86	A6	1536	C
86	A6	1537	C
86	A6	1538	C
86	A6	1539	U
86	A6	1540	A

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Mol	Chain	Res	Type
86	A6	1541	C
86	A6	1542	G
86	A6	1543	C
86	A6	1544	A
86	A6	1545	U
86	A6	1547	U
86	A6	1551	U
86	A6	1562	A
86	A6	1563	G
86	A6	1566	G
86	A6	1568	A
86	A6	1572	U
86	A6	1575	U
86	A6	1576	A
86	A6	1586	G
86	A6	1588	A
86	A6	1595	C
86	A6	1598	G
86	A6	1599	G
86	A6	1603	A
86	A6	1604	A
87	24	2	U
87	24	3	U
87	24	7	G
87	24	8	U
87	24	9	A
87	24	12	U
87	24	13	U
87	24	14	A
87	24	16	A
87	24	17	U
87	24	18	U
87	24	19	A
87	24	20	U
87	24	21	C
87	24	22	A
87	24	27	A
87	24	28	A
87	24	30	G
87	24	31	C
87	24	32	A
87	24	35	G

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Mol	Chain	Res	Type
87	24	41	G
87	24	45	A
87	24	46	G
87	24	51	G
87	24	52	C
87	24	54	U
87	24	55	C
87	24	56	A
87	24	57	C
87	24	58	A
87	24	59	G
87	24	62	C
87	24	65	U
87	24	67	A
87	24	71	C
87	24	72	C
87	24	73	A
3	8	18	A
3	8	19	A
3	8	21	U
3	8	23	A
87	FE	2	U
87	FE	3	U
87	FE	7	G
87	FE	8	U
87	FE	9	A
87	FE	12	U
87	FE	13	U
87	FE	14	A
87	FE	16	A
87	FE	17	U
87	FE	18	U
87	FE	19	A
87	FE	20	U
87	FE	21	C
87	FE	22	A
87	FE	27	A
87	FE	28	A
87	FE	30	G
87	FE	31	C
87	FE	32	A
87	FE	35	G

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Mol	Chain	Res	Type
87	FE	41	G
87	FE	45	A
87	FE	46	G
87	FE	51	G
87	FE	52	C
87	FE	54	U
87	FE	55	C
87	FE	56	A
87	FE	57	C
87	FE	58	A
87	FE	59	G
87	FE	62	C
87	FE	65	U
87	FE	67	A
87	FE	71	C
87	FE	72	C
87	FE	73	A

All (55) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	A3	1703	C
3	A3	1805	A
3	A3	1806	U
3	A3	1807	U
3	A3	1809	U
3	A3	1823	A
3	A3	1871	A
3	A3	1901	C
3	A3	1994	A
3	A3	2165	C
3	A3	2172	A
3	A3	2182	G
3	A3	2186	C
3	A3	2243	A
3	A3	2245	A
3	A3	2315	A
3	A3	2374	A
3	A3	2507	A
3	A3	2523	C
3	A3	2530	A
3	A3	2558	A

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Mol	Chain	Res	Type
3	A3	2559	U
3	A3	2628	U
3	A3	2653	C
3	A3	2744	U
3	A3	2757	A
3	A3	2779	C
3	A3	2784	A
3	A3	2788	C
3	A3	2789	C
3	A3	2905	A
3	A3	2989	G
3	A3	3041	U
3	A3	3092	U
3	A3	3123	G
3	A3	3157	C
3	A3	3201	A
3	A3	3206	C
4	B3	1607	U
86	A6	721	G
86	A6	797	C
86	A6	886	A
86	A6	1025	U
86	A6	1034	G
86	A6	1045	A
86	A6	1170	A
86	A6	1193	U
86	A6	1250	U
86	A6	1335	A
86	A6	1419	G
86	A6	1433	C
86	A6	1538	C
86	A6	1541	C
87	24	1	G
87	FE	1	G

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 138 ligands modelled in this entry, 135 are monoatomic - leaving 3 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
95	GDP	X6	500	-	24,30,30	0.95	1 (4%)	30,47,47	1.29	4 (13%)
93	SPD	A3	3396	-	9,9,9	0.35	0	8,8,8	0.50	0
91	GCP	r1	801	1,92	27,34,34	3.59	11 (40%)	34,54,54	5.22	13 (38%)

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
95	GDP	X6	500	-	-	4/12/32/32	0/3/3/3
93	SPD	A3	3396	-	-	6/7/7/7	-
91	GCP	r1	801	1,92	-	8/15/38/38	0/3/3/3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
91	r1	801	GCP	O4'-C1'	-8.41	1.29	1.41
91	r1	801	GCP	C2'-C3'	-8.15	1.31	1.53
91	r1	801	GCP	PB-O3A	6.28	1.65	1.58
91	r1	801	GCP	C2-N2	6.23	1.46	1.33
91	r1	801	GCP	O6-C6	6.18	1.40	1.24
91	r1	801	GCP	C2'-C1'	5.48	1.62	1.53
91	r1	801	GCP	O4'-C4'	4.14	1.54	1.45
91	r1	801	GCP	O3'-C3'	3.13	1.50	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
91	r1	801	GCP	C5'-C4'	-3.02	1.42	1.51
95	X6	500	GDP	C6-N1	-2.55	1.34	1.37
91	r1	801	GCP	PB-O2B	-2.29	1.51	1.56
91	r1	801	GCP	PG-O3G	-2.20	1.49	1.54

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
91	r1	801	GCP	O3G-PG-C3B	-16.88	65.45	106.40
91	r1	801	GCP	O3G-PG-O1G	-14.36	74.41	112.39
91	r1	801	GCP	O1G-PG-C3B	13.11	139.50	111.24
91	r1	801	GCP	O3G-PG-O2G	12.05	143.27	108.08
91	r1	801	GCP	PB-O3A-PA	-4.10	119.55	132.56
91	r1	801	GCP	C2-N3-C4	3.84	119.74	115.36
91	r1	801	GCP	C3'-C2'-C1'	3.72	106.58	100.98
91	r1	801	GCP	C4-C5-C6	-3.69	117.27	120.80
95	X6	500	GDP	C3'-C2'-C1'	3.68	106.51	100.98
91	r1	801	GCP	N3-C2-N1	-3.55	122.49	127.22
95	X6	500	GDP	PA-O3A-PB	-3.11	122.17	132.83
91	r1	801	GCP	C4-C5-N7	-2.93	106.34	109.40
91	r1	801	GCP	C2-N1-C6	2.49	119.88	115.93
91	r1	801	GCP	C5-C6-N1	-2.43	120.11	123.43
95	X6	500	GDP	C5-C6-N1	2.33	118.06	113.95
91	r1	801	GCP	O2G-PG-O1G	-2.28	106.37	112.39
95	X6	500	GDP	C8-N7-C5	2.22	107.22	102.99

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
91	r1	801	GCP	PG-C3B-PB-O1B
91	r1	801	GCP	PG-C3B-PB-O2B
91	r1	801	GCP	PG-C3B-PB-O3A
91	r1	801	GCP	C5'-O5'-PA-O1A
95	X6	500	GDP	C5'-O5'-PA-O1A
95	X6	500	GDP	C3'-C4'-C5'-O5'
93	A3	3396	SPD	N6-C7-C8-C9
93	A3	3396	SPD	C3-C4-C5-N6
95	X6	500	GDP	O4'-C4'-C5'-O5'
93	A3	3396	SPD	C8-C7-N6-C5
93	A3	3396	SPD	C7-C8-C9-N10
91	r1	801	GCP	O4'-C4'-C5'-O5'

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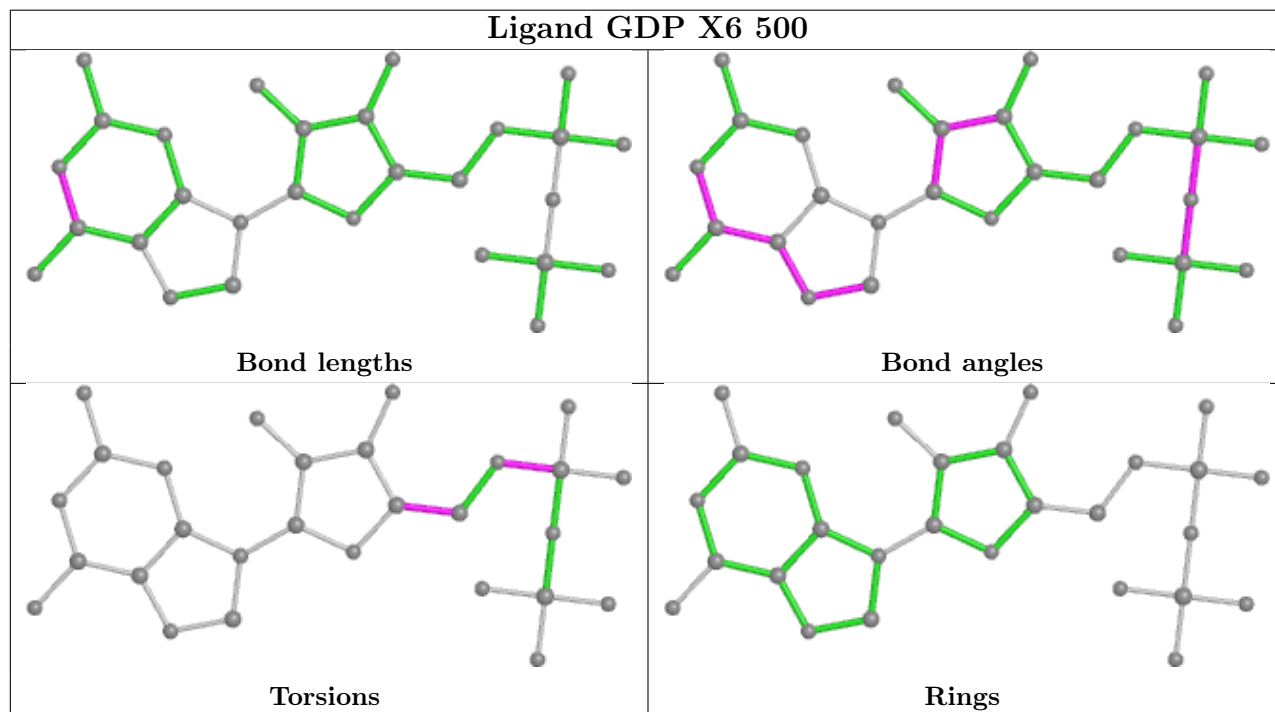
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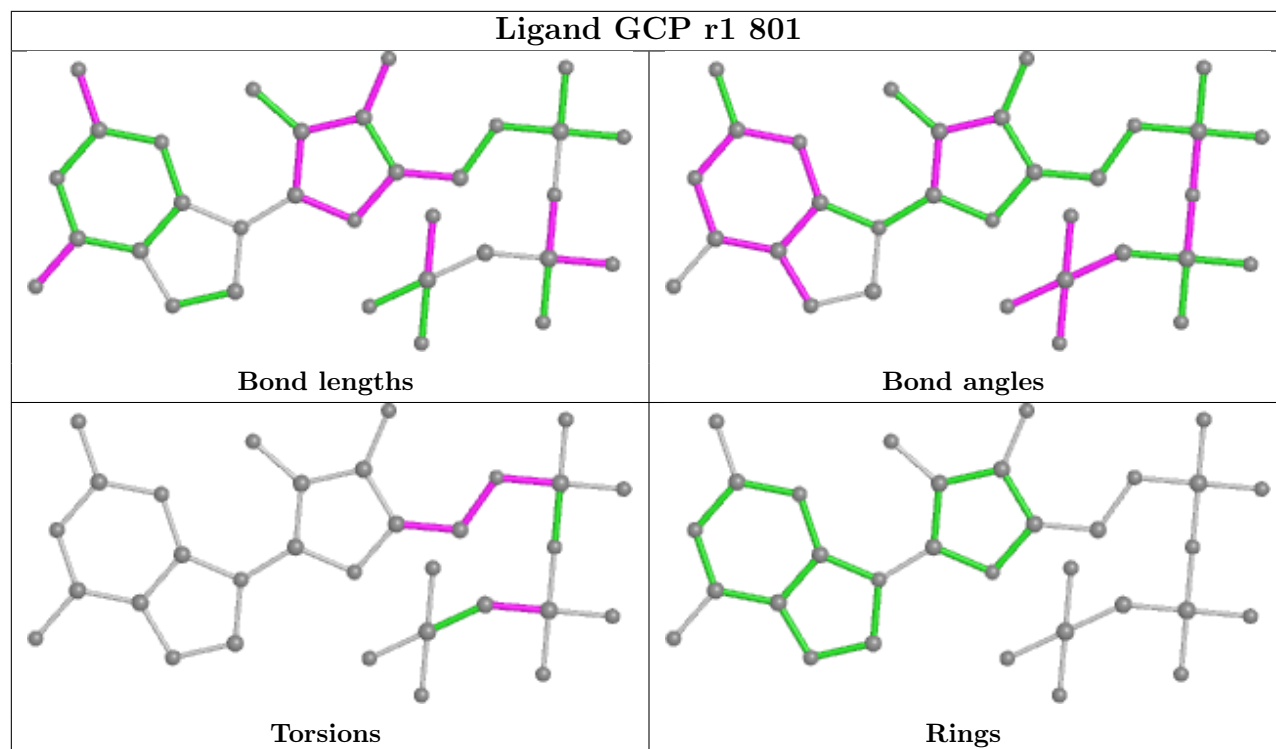
Mol	Chain	Res	Type	Atoms
91	r1	801	GCP	C3'-C4'-C5'-O5'
93	A3	3396	SPD	N1-C2-C3-C4
91	r1	801	GCP	C4'-C5'-O5'-PA
95	X6	500	GDP	C5'-O5'-PA-O3A
93	A3	3396	SPD	C2-C3-C4-C5
91	r1	801	GCP	C5'-O5'-PA-O3A

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
13	M3	1
25	Y3	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	M3	61:THR	C	62:ARG	N	1.19
1	Y3	123:ARG	C	124:LEU	N	1.19

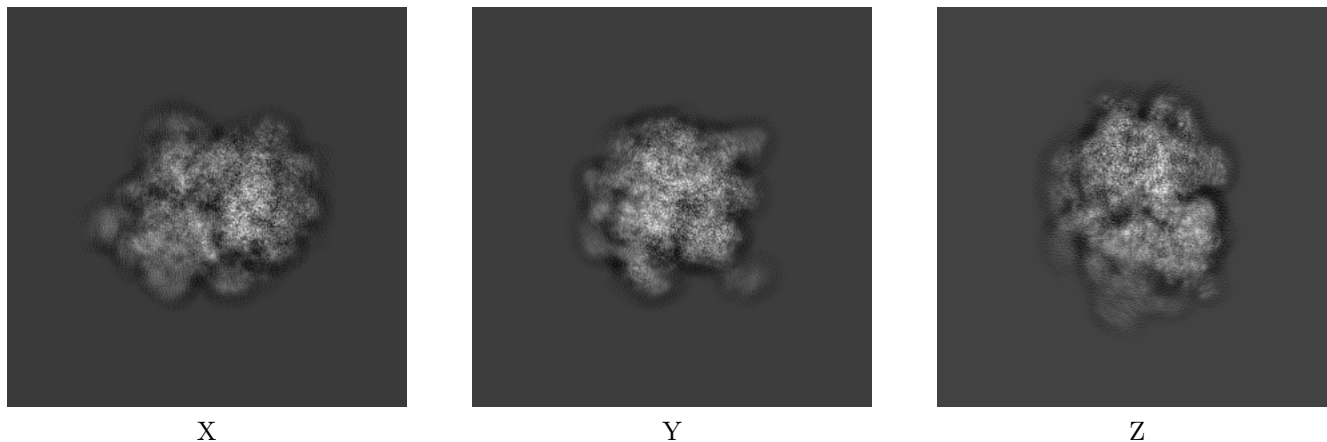
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11646. These allow visual inspection of the internal detail of the map and identification of artifacts.

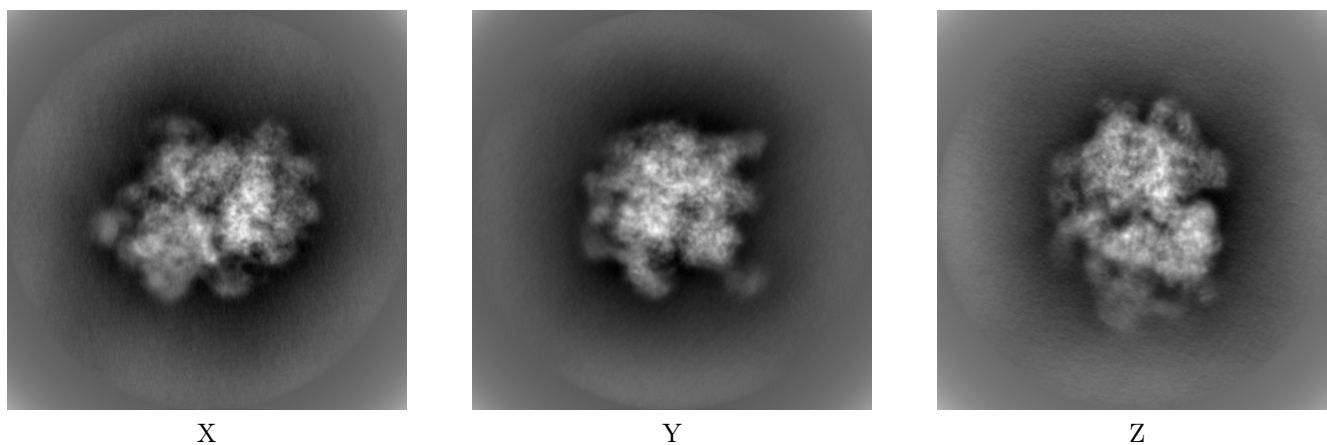
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



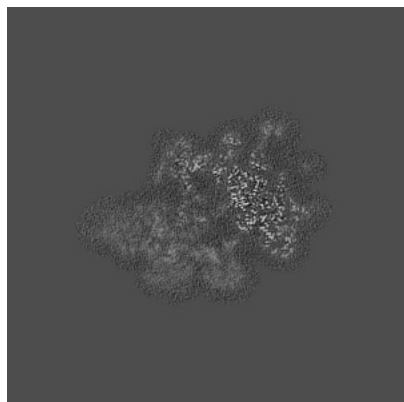
6.1.2 Raw map



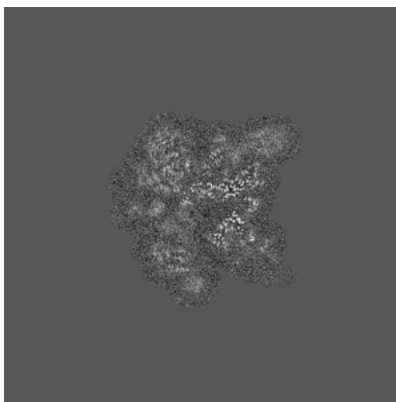
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

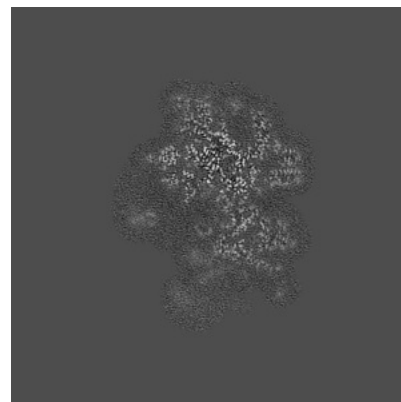
6.2.1 Primary map



X Index: 256

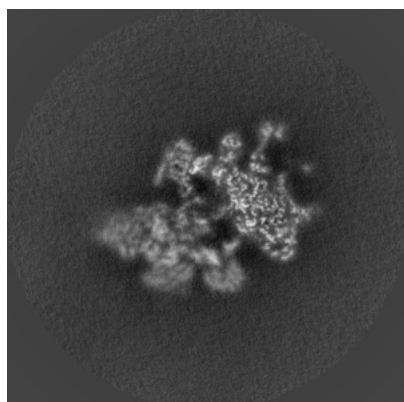


Y Index: 256

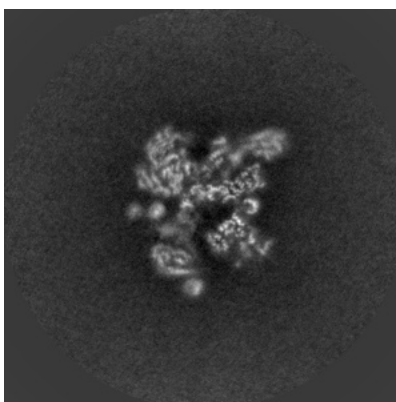


Z Index: 256

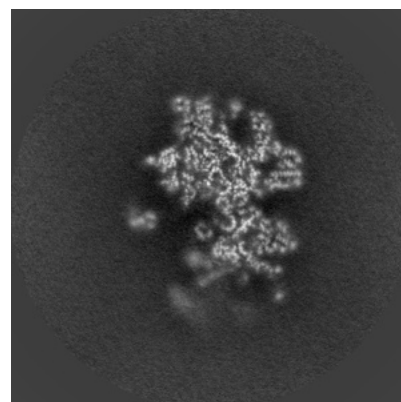
6.2.2 Raw map



X Index: 256



Y Index: 256

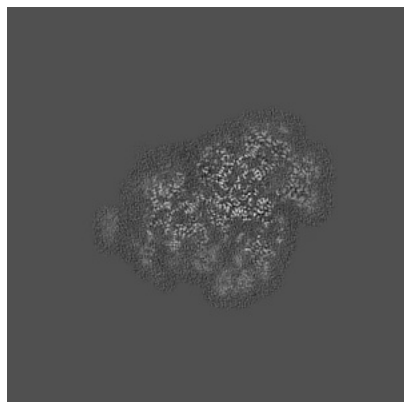


Z Index: 256

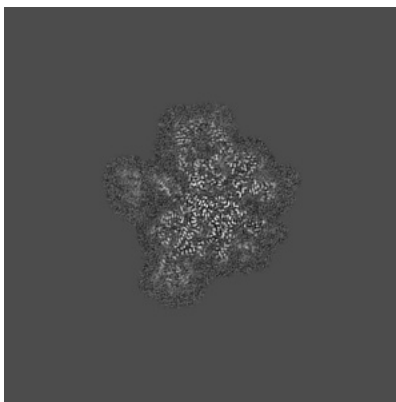
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

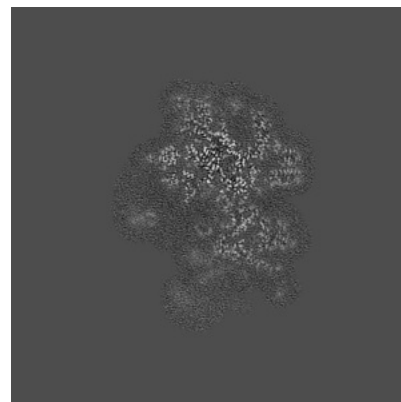
6.3.1 Primary map



X Index: 286

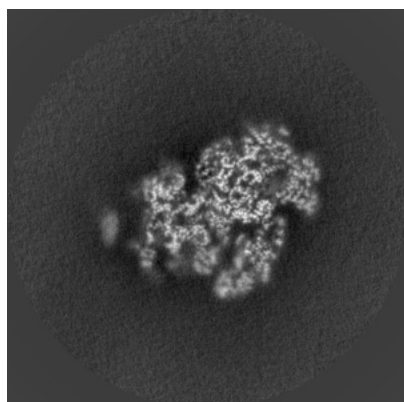


Y Index: 305

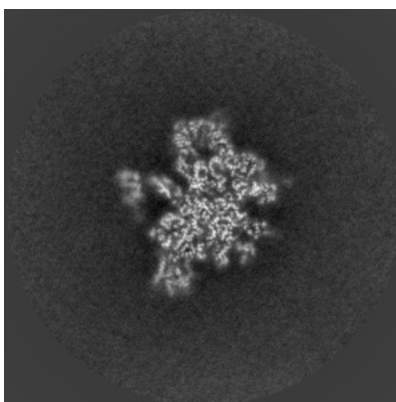


Z Index: 256

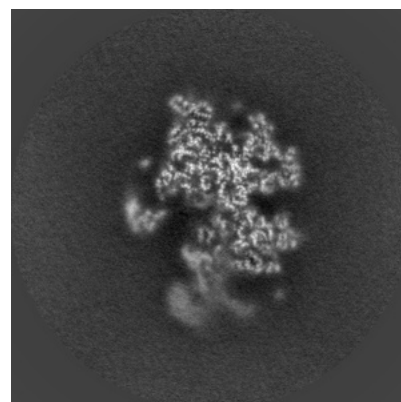
6.3.2 Raw map



X Index: 286



Y Index: 305

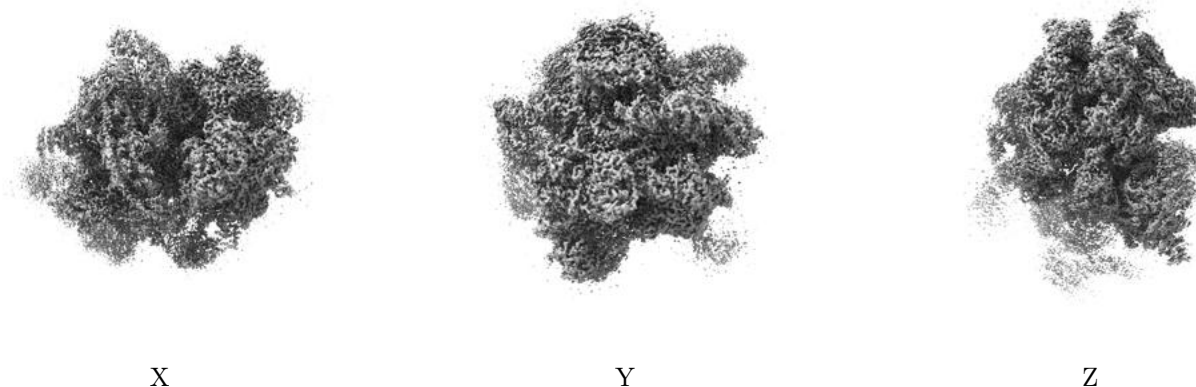


Z Index: 247

The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

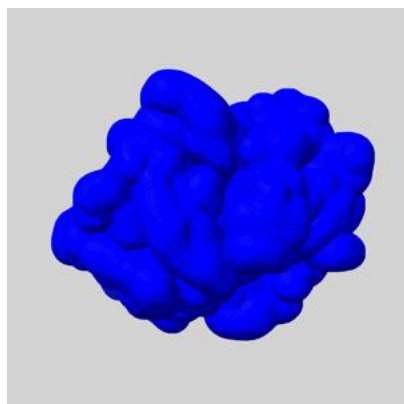
6.5 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

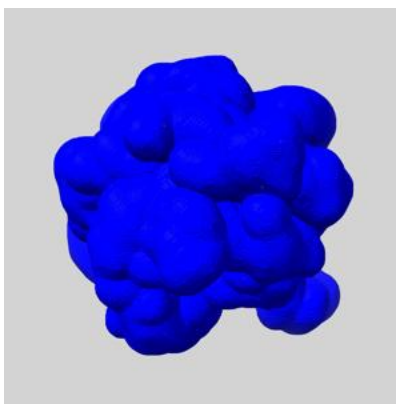
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

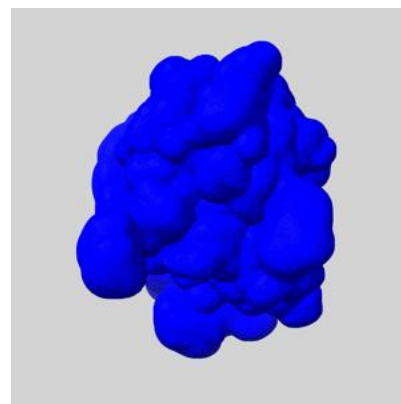
6.5.1 emd_11646_msk_1.map [i](#)



X



Y

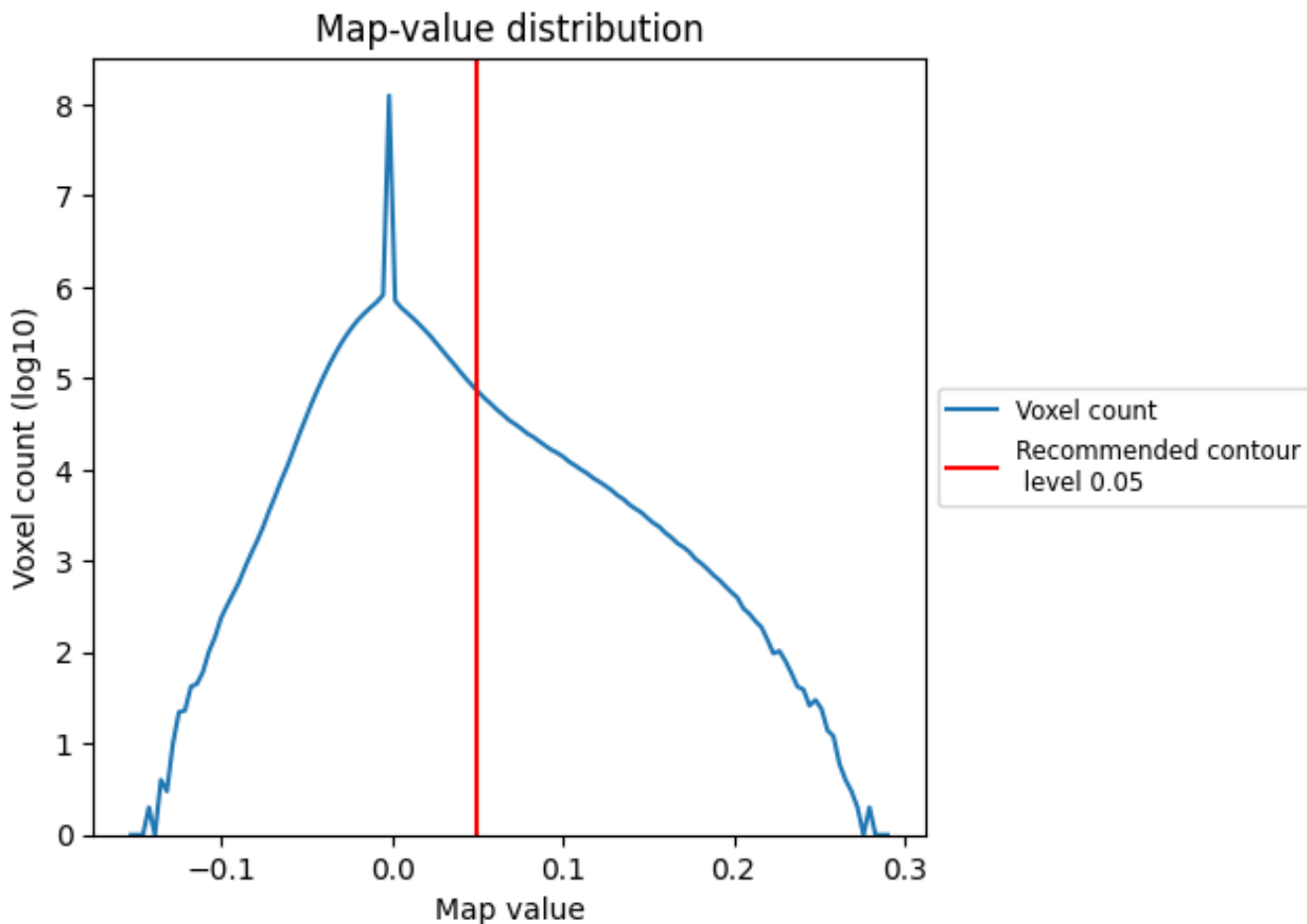


Z

7 Map analysis [i](#)

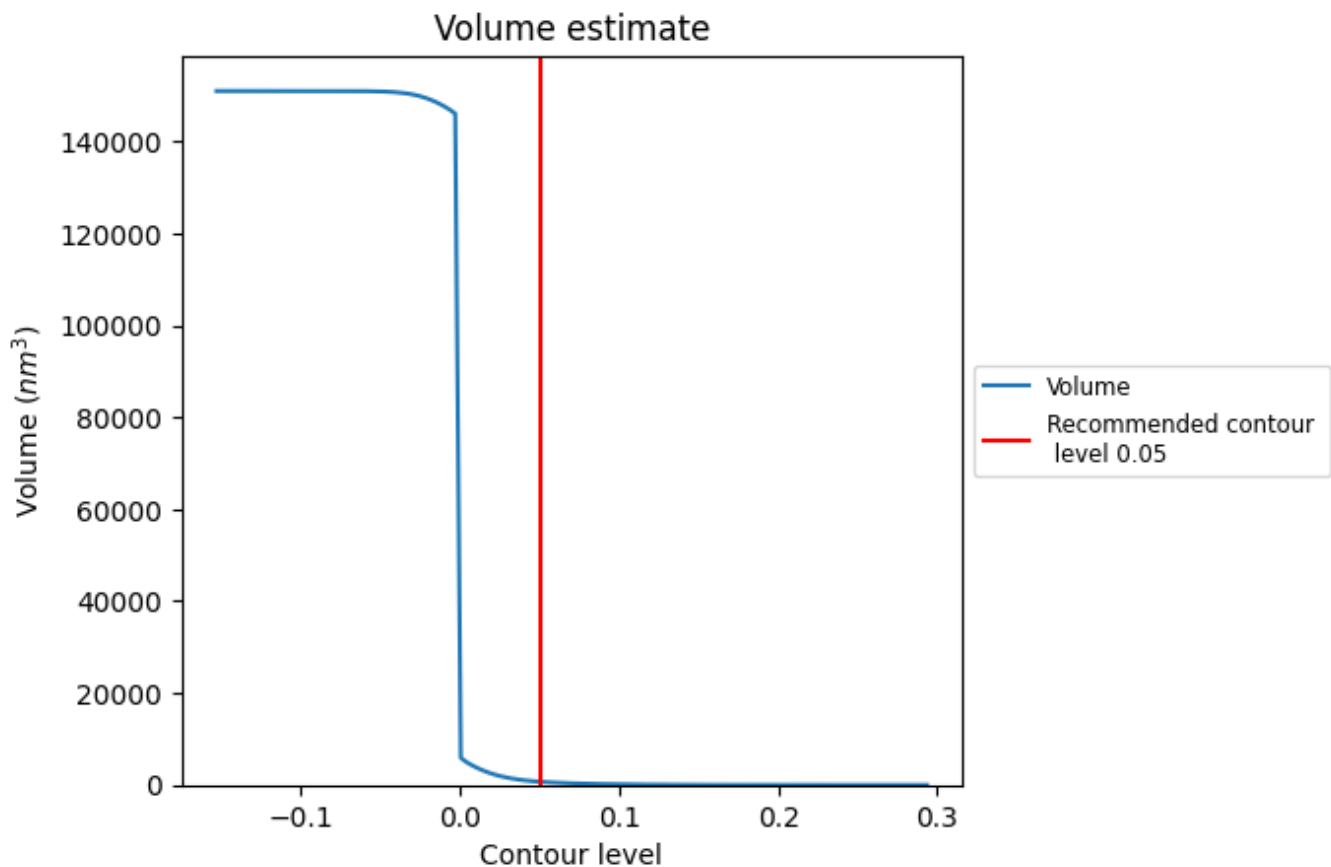
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

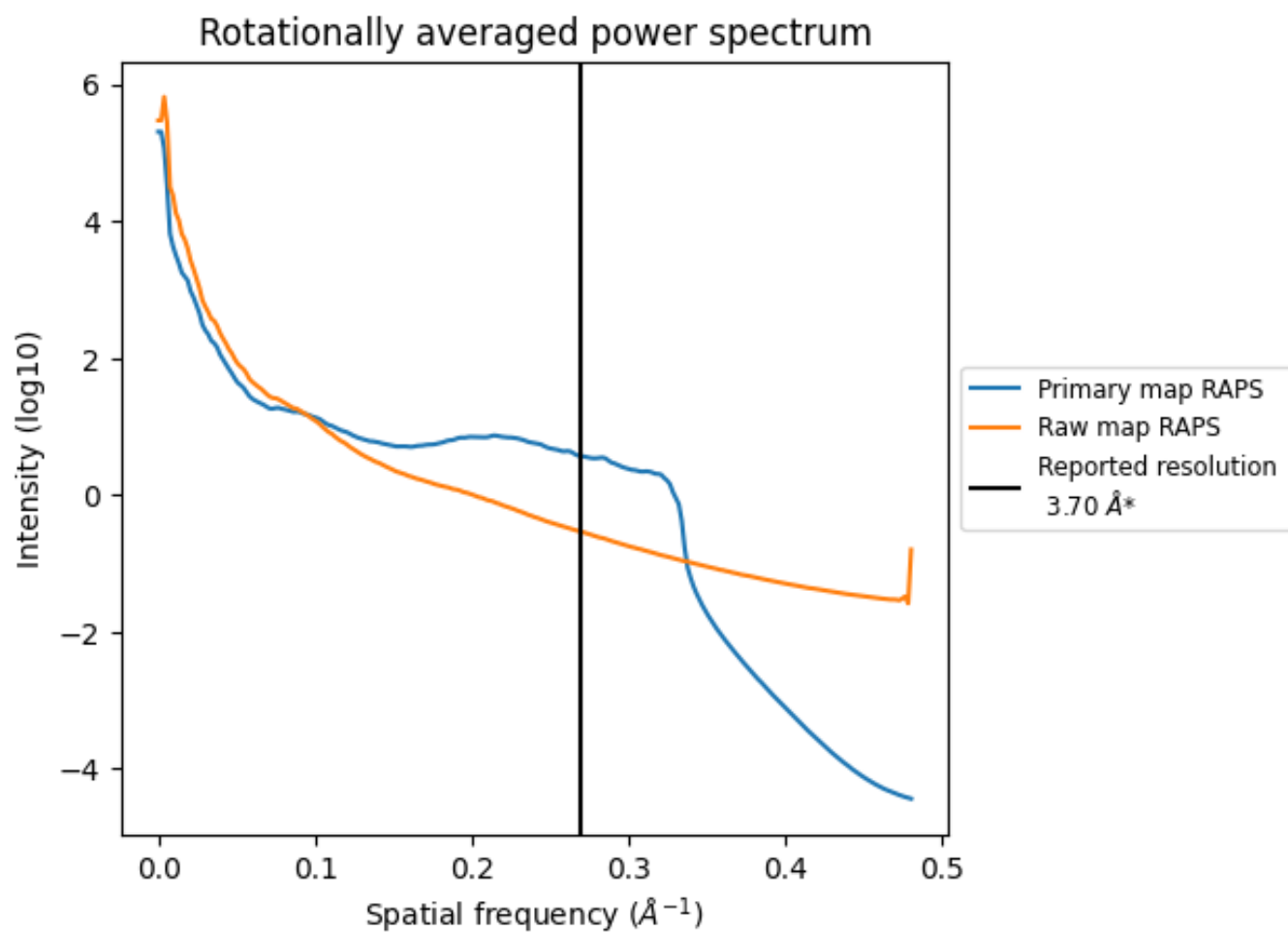
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 706 nm³; this corresponds to an approximate mass of 638 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum [i](#)

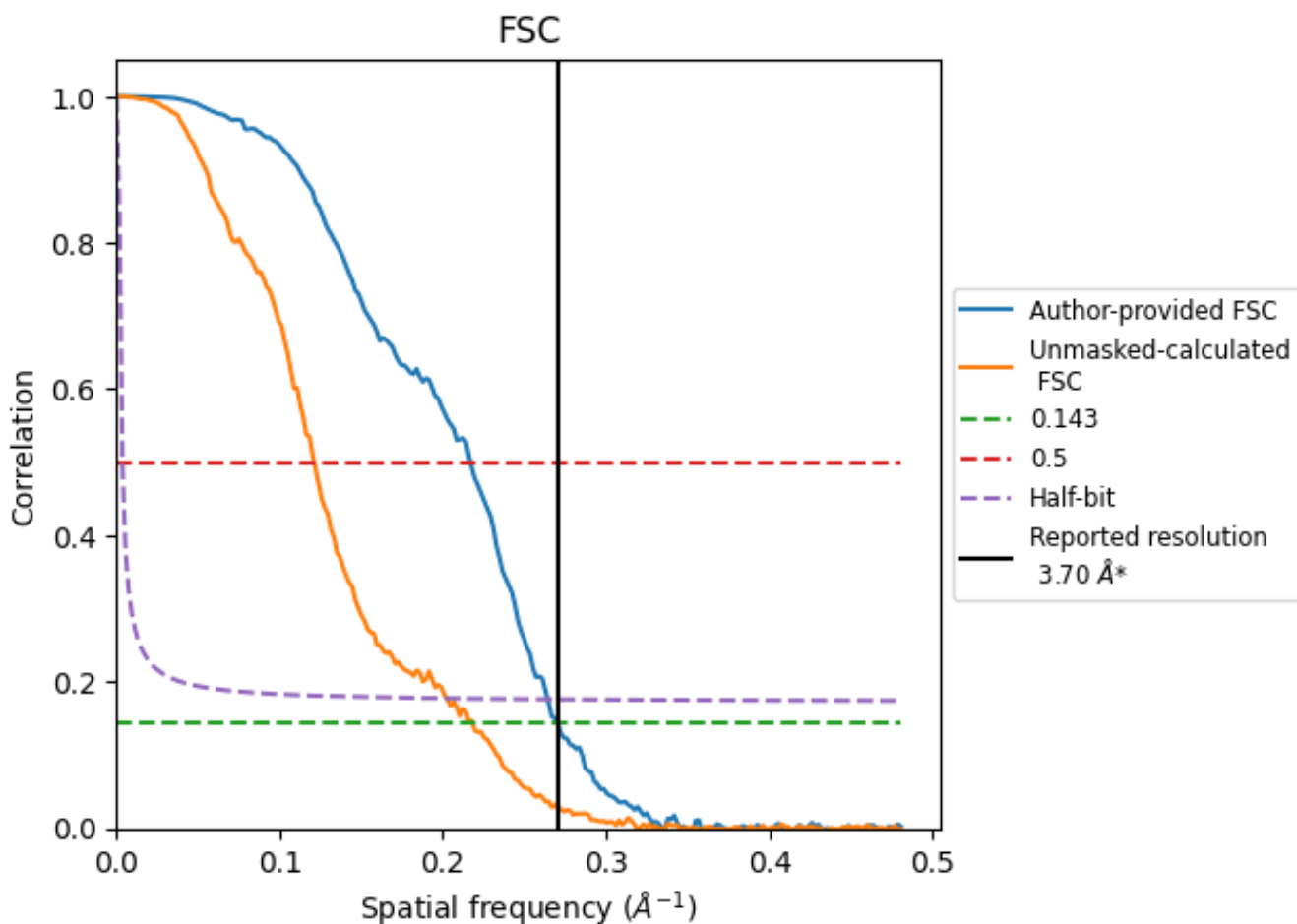


*Reported resolution corresponds to spatial frequency of 0.270 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.270 Å⁻¹

8.2 Resolution estimates [i](#)

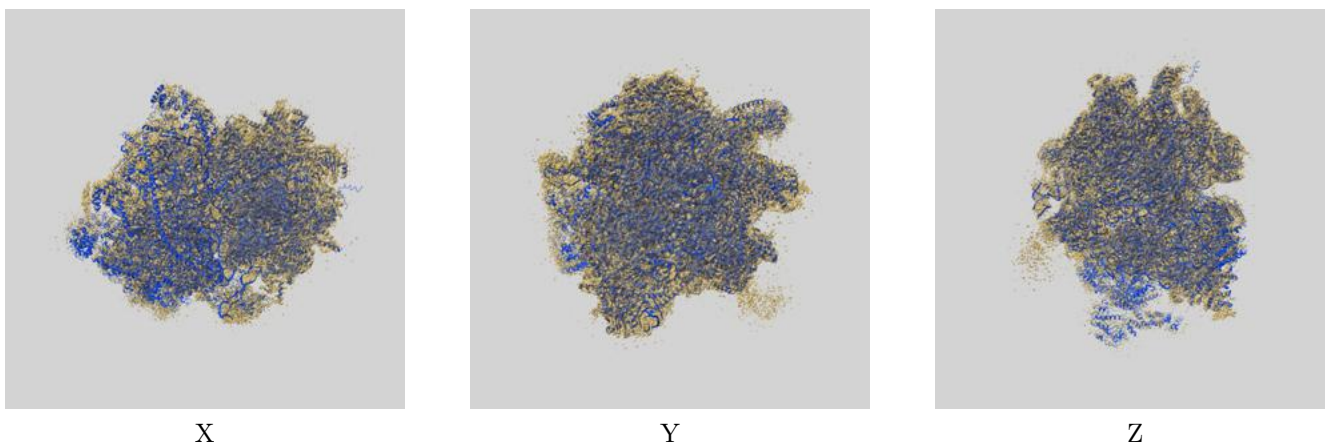
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.70	4.61	3.78
Unmasked-calculated*	4.58	8.26	4.94

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.58 differs from the reported value 3.7 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-11646 and PDB model 7A5K. Per-residue inclusion information can be found in section 3 on page 23.

9.1 Map-model overlay [i](#)

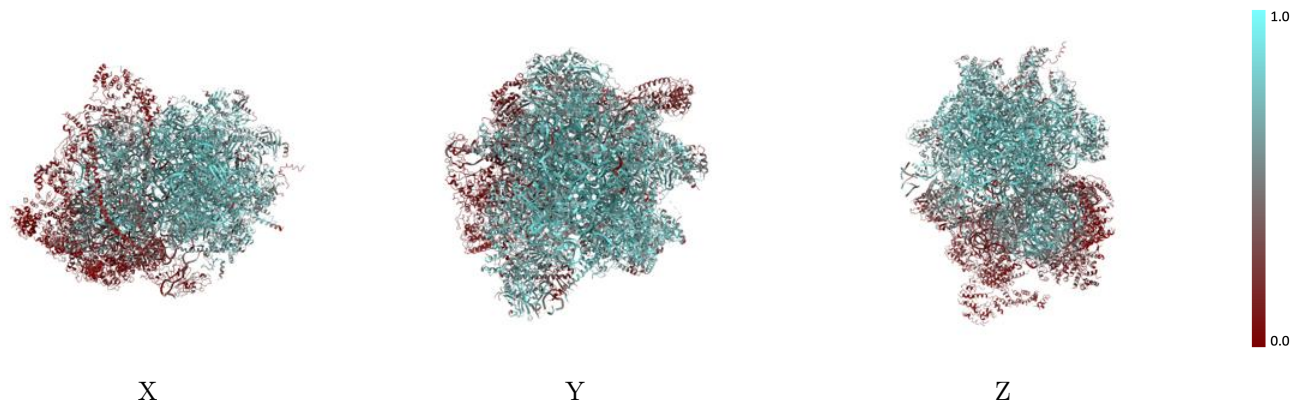


The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)

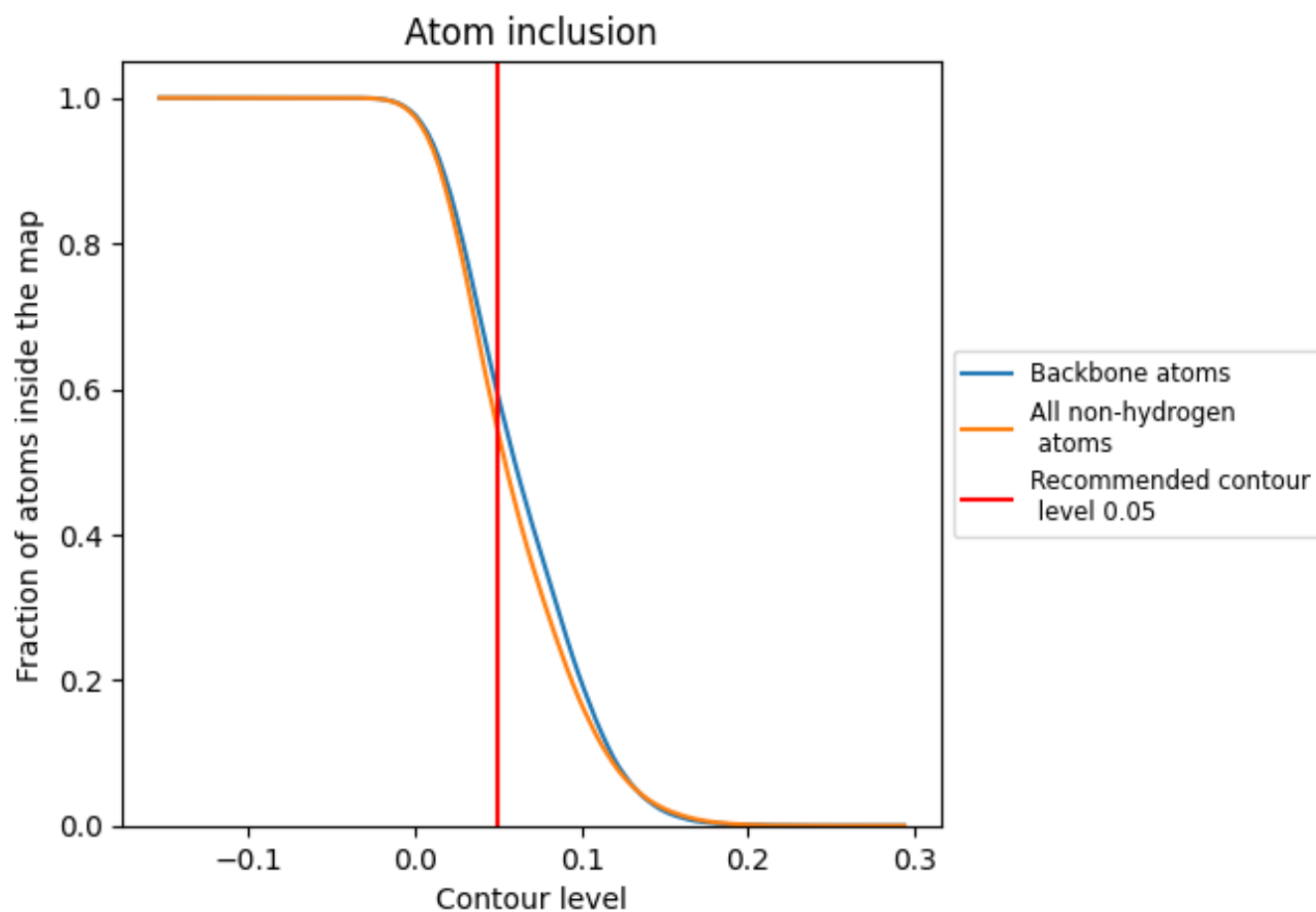
This section was not generated.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.05).

9.4 Atom inclusion [i](#)



At the recommended contour level, 59% of all backbone atoms, 54% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary [i](#)











































The table lists the average atom inclusion at the recommended contour level (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	0.5403
03	0.6659
13	0.6714
23	0.7889
24	0.1138
33	0.7807
43	0.7850
53	0.6443
63	0.6389
73	0.6060
8	0.1486
93	0.6365
A	0.2203
A3	0.8367
A5	0.0000
A6	0.5826
B	0.3000
B3	0.6331
B6	0.3386
C6	0.0752
D	0.1997
D3	0.6719
D6	0.3431
E3	0.7274
E6	0.2540
F3	0.7219
F6	0.0375
FE	0.2864
G6	0.1465
H3	0.5831
H6	0.0962
I3	0.4944
I6	0.2779
J3	0.3244
J6	0.5644




















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Chain	Atom inclusion
K3	 0.7544
K6	 0.1152
L3	 0.6371
L6	 0.3696
M3	 0.7177
M6	 0.3202
N3	 0.7013
N6	 0.4547
O3	 0.7108
O6	 0.2784
P3	 0.6715
P6	 0.2852
Q3	 0.6368
Q6	 0.4077
R3	 0.7292
R6	 0.1849
S3	 0.7250
S6	 0.2376
T3	 0.7151
T6	 0.3367
U3	 0.7556
U6	 0.2359
V3	 0.5650
V6	 0.1583
W3	 0.7368
W6	 0.1952
X3	 0.6322
X6	 0.0481
Y2	 0.1655
Y3	 0.6990
Y6	 0.0631
Z3	 0.7312
Z6	 0.0766
a3	 0.7128
a6	 0.2410
b3	 0.7144
b6	 0.0747
c3	 0.6528
c6	 0.2302
d3	 0.5691
d6	 0.5447
e3	 0.2203

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Chain	Atom inclusion
e6	 0.0488
f3	 0.3717
g3	 0.6987
h3	 0.5665
i3	 0.7472
j3	 0.6657
k3	 0.4540
l3	 0.7136
m3	 0.3598
n	 0.0909
o3	 0.7546
p3	 0.5773
q3	 0.5620
r1	 0.4441
r3	 0.7461
s3	 0.6872
u3	 0.8571