



## wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 04:35 am GMT

PDB ID : 6GQV  
EMDB ID : EMD-0049  
Title : Cryo-EM reconstruction of yeast 80S ribosome in complex with mRNA, tRNA and eEF2 (GMPPCP)  
Authors : Pellegrino, S.; Yusupov, M.; Yusupova, G.; Hashem, Y.  
Deposited on : 2018-06-08  
Resolution : 4.00 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/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>.

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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) : 2.31.2

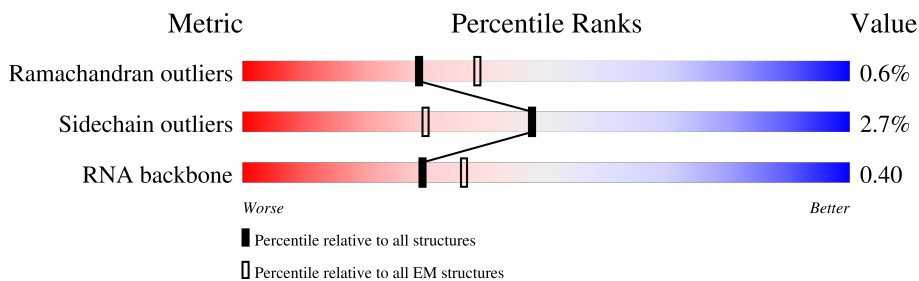
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.00 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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1	3396	
2	3	121	
3	4	158	
4	P0	189	
5	P2	94	
6	A	252	
7	B	386	
8	C	361	

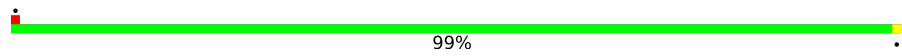

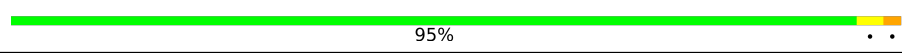
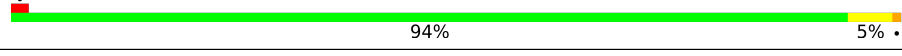
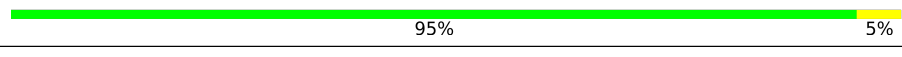
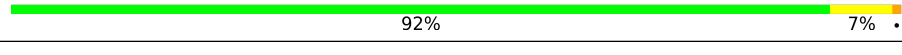
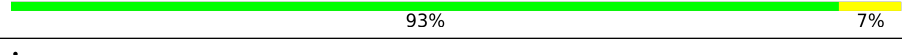
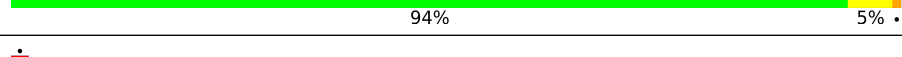
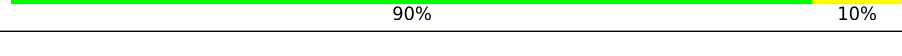
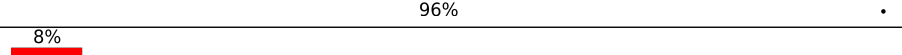
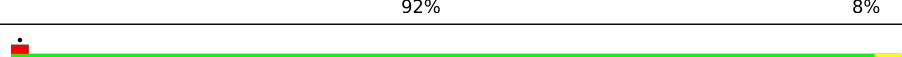
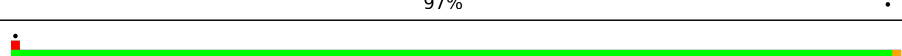
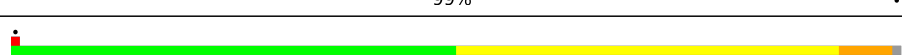
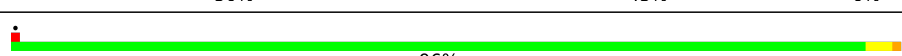
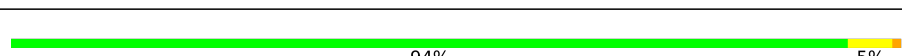
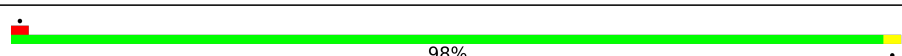
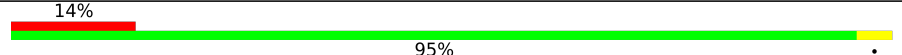
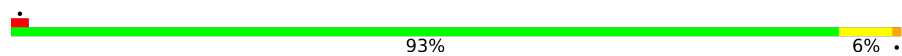
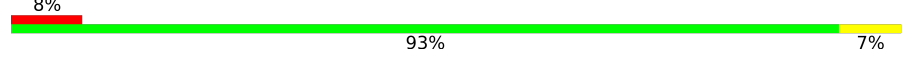
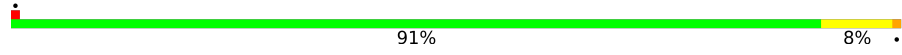
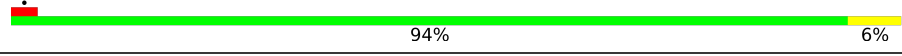
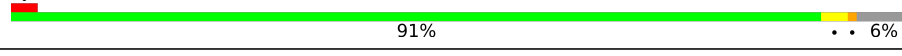
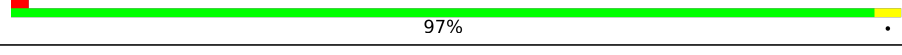
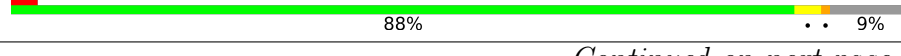

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Mol	Chain	Length	Quality of chain
9	D	296	96%
10	E	175	85% 5% 11%
11	F	222	95% 5%
12	G	233	98%
13	H	191	96%
14	I	220	94%
15	J	169	91% 8%
16	L	193	93% 7%
17	M	136	96%
18	N	203	95% 5%
19	O	197	93% 7%
20	P	183	98%
21	Q	185	97%
22	R	188	94% 6%
23	S	172	96%
24	T	159	97%
25	U	100	99%
26	V	136	97%
27	W	62	97%
28	X	121	98%
29	Y	126	99%
30	Z	135	97%
31	a	148	96%
32	b	58	5% 95% 5%
33	c	97	98%

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Mol	Chain	Length	Quality of chain
34	d	109	 99%
35	e	127	 100%
36	f	106	 95%
37	g	112	 94%
38	h	119	 95%
39	i	99	 92%
40	j	87	 93%
41	k	77	 94%
42	l	50	 90%
43	m	52	 96%
44	n	25	 8%
45	o	105	 97%
46	p	91	 99%
47	2	1797	 50%
48	q	206	 96%
49	r	214	 94%
50	s	217	 98%
51	t	223	 14%
52	u	260	 93%
53	v	206	 8%
54	w	223	 91%
55	x	184	 94%
56	y	199	 91%
57	z	185	 97%
58	AA	105	 88%

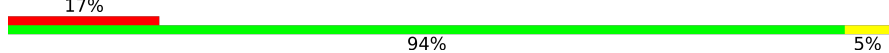
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Mol	Chain	Length	Quality of chain
59	AB	153	8% 93% 7%
60	AC	124	69% 97% .
61	AD	150	. 94% 5% .
62	AE	127	. 94% 6%
63	AF	124	6% 94% 6%
64	AG	141	11% 96% .
65	AH	125	10% 92% .. .
66	AI	145	8% 96% ..
67	AJ	143	. 98% ..
68	AK	107	12% 96% .
69	AL	87	. 93% 5% .
70	AM	129	. 97% .
71	AN	144	. 96% .
72	AO	134	. 97% .
73	AP	70	23% 96% ..
74	AQ	97	. 94% 6%
75	AR	81	. 96% .
76	AS	63	21% 97% ..
77	AT	53	. 96% .
78	AU	60	8% 93% ..
79	AV	318	12% 99% .
80	AW	37	14% 95% 5%
81	AX	837	7% 94% 5%
82	AY	76	55% 34% 11%
83	AZ	7	57% 71% 29%

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Mol	Chain	Length	Quality of chain
84	BA	204	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a red segment on the left labeled '17%', a large green segment in the middle labeled '94%', and a small yellow segment on the right labeled '5%'.</p>

## 2 Entry composition

There are 86 unique types of molecules in this entry. The entry contains 212058 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 RNA chain called 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	3223	68931	30790	12416	22502	3223	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	3	121	2579	1152	461	845	121	0	0

- Molecule 3 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	4	158	3353	1500	586	1109	158	0	0

- Molecule 4 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	P0	189	1473	942	257	270	4	0	0

- Molecule 5 is a protein called 60S ribosomal protein L12-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	P2	94	723	448	138	135	2	0	0

- Molecule 6 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	A	252	1914	1191	388	334	1	0	0

- Molecule 7 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	B	386	3075	1950	584	533	8	0	0

- Molecule 8 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	C	361	2748	1729	522	494	3	0	0

- Molecule 9 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	D	296	2375	1501	414	458	2	0	0

- Molecule 10 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	E	156	1239	800	222	216	1	0	0

- Molecule 11 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	222	1784	1151	324	308	1	0	0

- Molecule 12 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	G	233	1804	1151	323	327	3	0	0

- Molecule 13 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	H	191	1518	963	274	277	4	0	0

- Molecule 14 is a protein called 60S ribosomal protein L10.



Mol	Chain	Residues	Atoms					AltConf	Trace
14	I	211	Total	C	N	O	S	0	0
			1705	1083	322	294	6		

- Molecule 15 is a protein called 60S ribosomal protein L11-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	J	169	Total	C	N	O	S	0	0
			1353	847	253	249	4		

- Molecule 16 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L	193	Total	C	N	O	S	0	0
			1543	962	315	266			

- Molecule 17 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	M	136	Total	C	N	O	S	0	0
			1053	675	199	177	2		

- Molecule 18 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	N	203	Total	C	N	O	S	0	0
			1720	1077	361	281	1		

- Molecule 19 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	O	197	Total	C	N	O	S	0	0
			1555	1003	289	262	1		

- Molecule 20 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	P	183	Total	C	N	O	S	0	0
			1420	882	281	257			

- Molecule 21 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	Q	185	1441	908	290	241	2	0	0

- Molecule 22 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	R	188	1521	935	326	260		0	0

- Molecule 23 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	S	172	1445	930	267	244	4	0	0

- Molecule 24 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	T	159	1276	805	246	221	4	0	0

- Molecule 25 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	U	100	796	516	131	149		0	0

- Molecule 26 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	V	136	997	625	186	179	7	0	0

- Molecule 27 is a protein called 60S ribosomal protein L24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	W	62	513	330	101	81	1	0	0

- Molecule 28 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	X	121	964	620	169	173	2	0	0

- Molecule 29 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Y	126	993	625	192	176		0	0

- Molecule 30 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	Z	135	1092	710	202	180		0	0

- Molecule 31 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	a	148	1173	749	231	190	3	0	0

- Molecule 32 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	b	58	462	289	100	73		0	0

- Molecule 33 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	c	97	743	479	124	139	1	0	0

- Molecule 34 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	d	109	883	559	167	156	1	0	0

- Molecule 35 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	e	127	Total	C	N	O	S	0	0
			1020	647	205	167	1		

- Molecule 36 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	f	106	Total	C	N	O	S	0	0
			850	540	165	144	1		

- Molecule 37 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	g	112	Total	C	N	O	S	0	0
			880	545	179	152	4		

- Molecule 38 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	h	119	Total	C	N	O	S	0	0
			969	615	186	167	1		

- Molecule 39 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	i	99	Total	C	N	O	S	0	0
			771	481	156	132	2		

- Molecule 40 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	j	87	Total	C	N	O	S	0	0
			681	414	148	114	5		

- Molecule 41 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	k	77	Total	C	N	O	0	0
			612	391	115	106		

- Molecule 42 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	l	50	Total	C	N	O	S	0	0
			436	272	97	65	2		

- Molecule 43 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	m	52	Total	C	N	O	S	0	0
			417	259	86	67	5		

- Molecule 44 is a protein called 60S ribosomal protein L41-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	n	25	Total	C	N	O	S	0	0
			233	142	63	27	1		

- Molecule 45 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	o	105	Total	C	N	O	S	0	0
			847	534	170	138	5		

- Molecule 46 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	p	91	Total	C	N	O	S	0	0
			694	429	138	121	6		

- Molecule 47 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	2	1776	Total	C	N	O	P	0	0
			37845	16918	6702	12449	1776		

- Molecule 48 is a protein called 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	q	206	Total	C	N	O	S	0	0
			1577	1014	278	283	2		

- Molecule 49 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	r	214	Total	C	N	O	S	0	0
			1709	1084	310	311	4		

- Molecule 50 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	s	217	Total	C	N	O	S	0	0
			1635	1047	289	297	2		

- Molecule 51 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	t	223	Total	C	N	O	S	0	0
			1734	1101	313	314	6		

- Molecule 52 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	u	260	Total	C	N	O	S	0	0
			2068	1316	389	360	3		

- Molecule 53 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	v	206	Total	C	N	O	S	0	0
			1609	1007	300	299	3		

- Molecule 54 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	w	223	Total	C	N	O	S	0	0
			1790	1123	346	318	3		

- Molecule 55 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	x	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 56 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	y	188	1489	925	298	264	2	0	0

- Molecule 57 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	z	185	1494	943	289	261	1	0	0

- Molecule 58 is a protein called 40S ribosomal protein S10-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	AA	96	772	499	126	145	2	0	0

- Molecule 59 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	AB	153	1220	780	231	206	3	0	0

- Molecule 60 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	AC	124	890	560	156	172	2	0	0

- Molecule 61 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	AD	150	1192	759	224	207	2	0	0

- Molecule 62 is a protein called 40S ribosomal protein S14-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	AE	127	891	545	182	163	1	0	0

- Molecule 63 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	AF	124	977	622	182	166	7	0	0

- Molecule 64 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	AG	141	1105	708	203	194		0	0

- Molecule 65 is a protein called 40S ribosomal protein S17-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	AH	120	926	577	177	170	2	0	0

- Molecule 66 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	AI	145	1192	743	237	210	2	0	0

- Molecule 67 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	AJ	143	1112	694	208	208	2	0	0

- Molecule 68 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	AK	107	855	539	156	159	1	0	0

- Molecule 69 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	AL	87	684	420	125	137	2	0	0

- Molecule 70 is a protein called 40S ribosomal protein S22-A.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	AM	129	1021	650	188	180	3	0	0

- Molecule 71 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	AN	144	1121	708	220	191	2	0	0

- Molecule 72 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
72	AO	134	1073	676	208	189	0	0

- Molecule 73 is a protein called 40S ribosomal protein S25-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
73	AP	70	563	360	104	99	0	0

- Molecule 74 is a protein called 40S ribosomal protein S26-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
74	AQ	97	769	475	160	129	5	0	0

- Molecule 75 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
75	AR	81	610	382	110	113	5	0	0

- Molecule 76 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
76	AS	63	497	306	99	91	1	0	0

- Molecule 77 is a protein called 40S ribosomal protein S29-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	AT	53	Total	C	N	O	S	0	0
			442	274	92	72	4		

- Molecule 78 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	AU	60	Total	C	N	O	S	0	0
			475	299	98	77	1		

- Molecule 79 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	AV	318	Total	C	N	O	S	0	0
			2437	1541	418	470	8		

- Molecule 80 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	AW	37	Total	C	N	O	S	0	0
			287	177	57	49	4		

- Molecule 81 is a protein called Elongation factor 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	AX	837	Total	C	N	O	S	0	0
			6523	4143	1120	1231	29		

- Molecule 82 is a RNA chain called Transfer RNA - Phe.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	AY	76	Total	C	N	O	P	0	0
			1626	725	293	532	76		

- Molecule 83 is a RNA chain called Messenger RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	AZ	7	Total	C	N	O	P	0	0
			144	65	21	51	7		

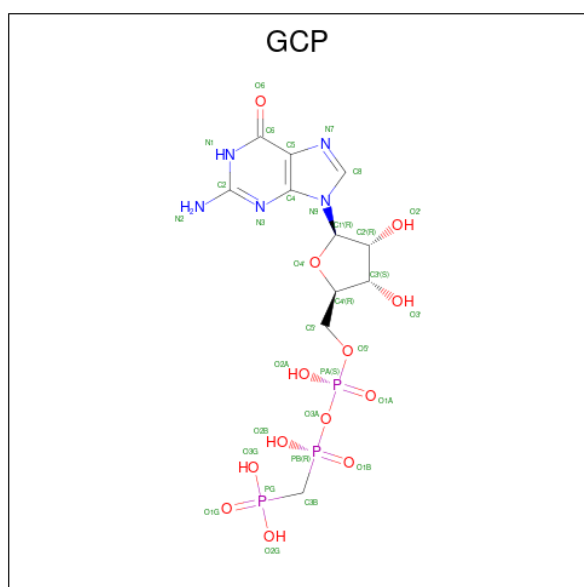
- Molecule 84 is a protein called 60S ribosomal protein L1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
84	BA	204	1609	1031	279	290	9	0	0

- Molecule 85 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
85	j	1	Total	Zn	0
			1	1	
85	m	1	Total	Zn	0
			1	1	
85	o	1	Total	Zn	0
			1	1	
85	p	1	Total	Zn	0
			1	1	
85	AQ	1	Total	Zn	0
			1	1	
85	AR	1	Total	Zn	0
			1	1	
85	AT	1	Total	Zn	0
			1	1	
85	AW	1	Total	Zn	0
			1	1	

- Molecule 86 is PHOSPHOMETHYLPHOSPHONIC ACID GUANYLATE ESTER (three-letter code: GCP) (formula: C<sub>11</sub>H<sub>18</sub>N<sub>5</sub>O<sub>13</sub>P<sub>3</sub>).

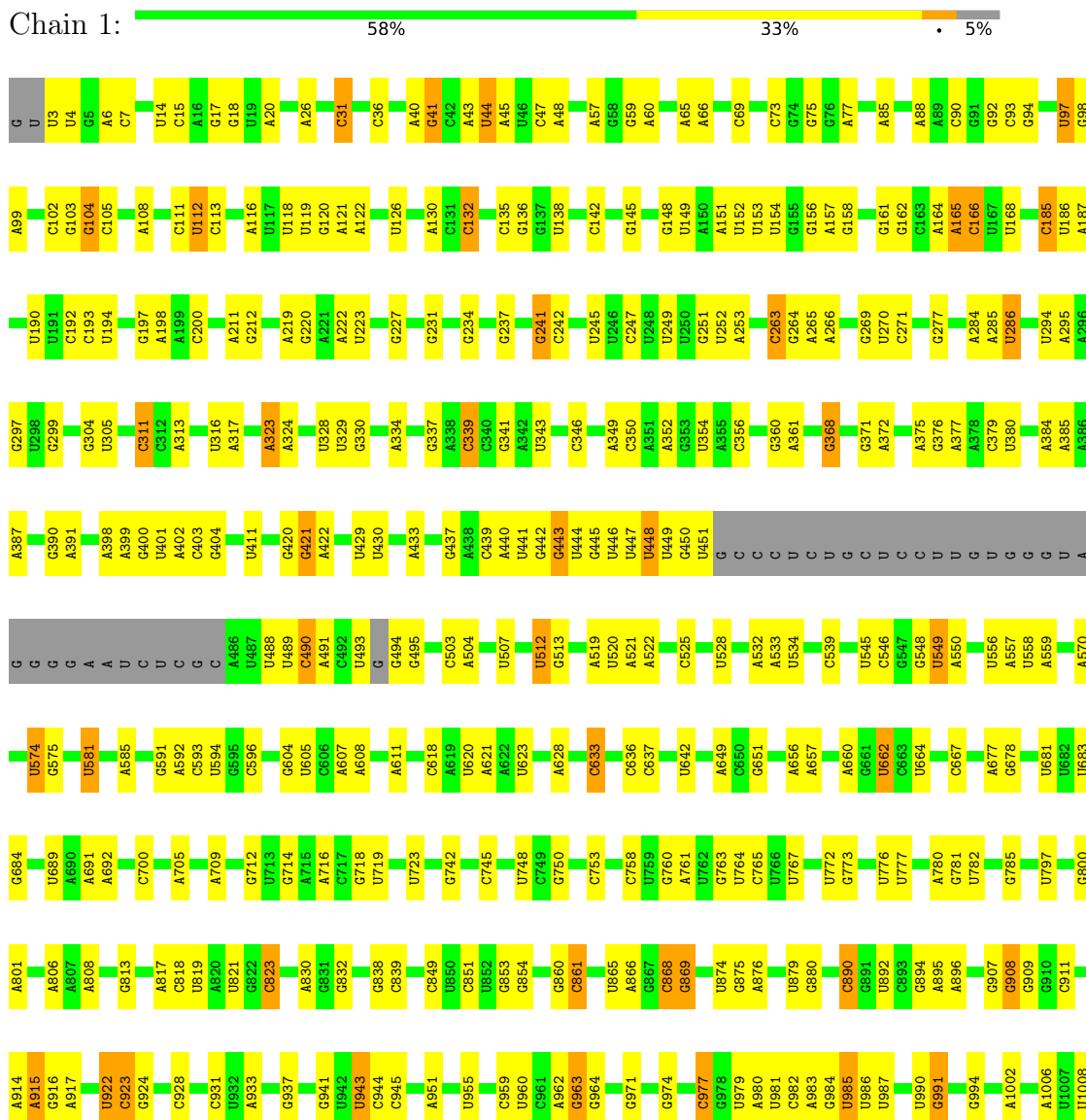


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
86	AX	1	32	11	5	13	3	0

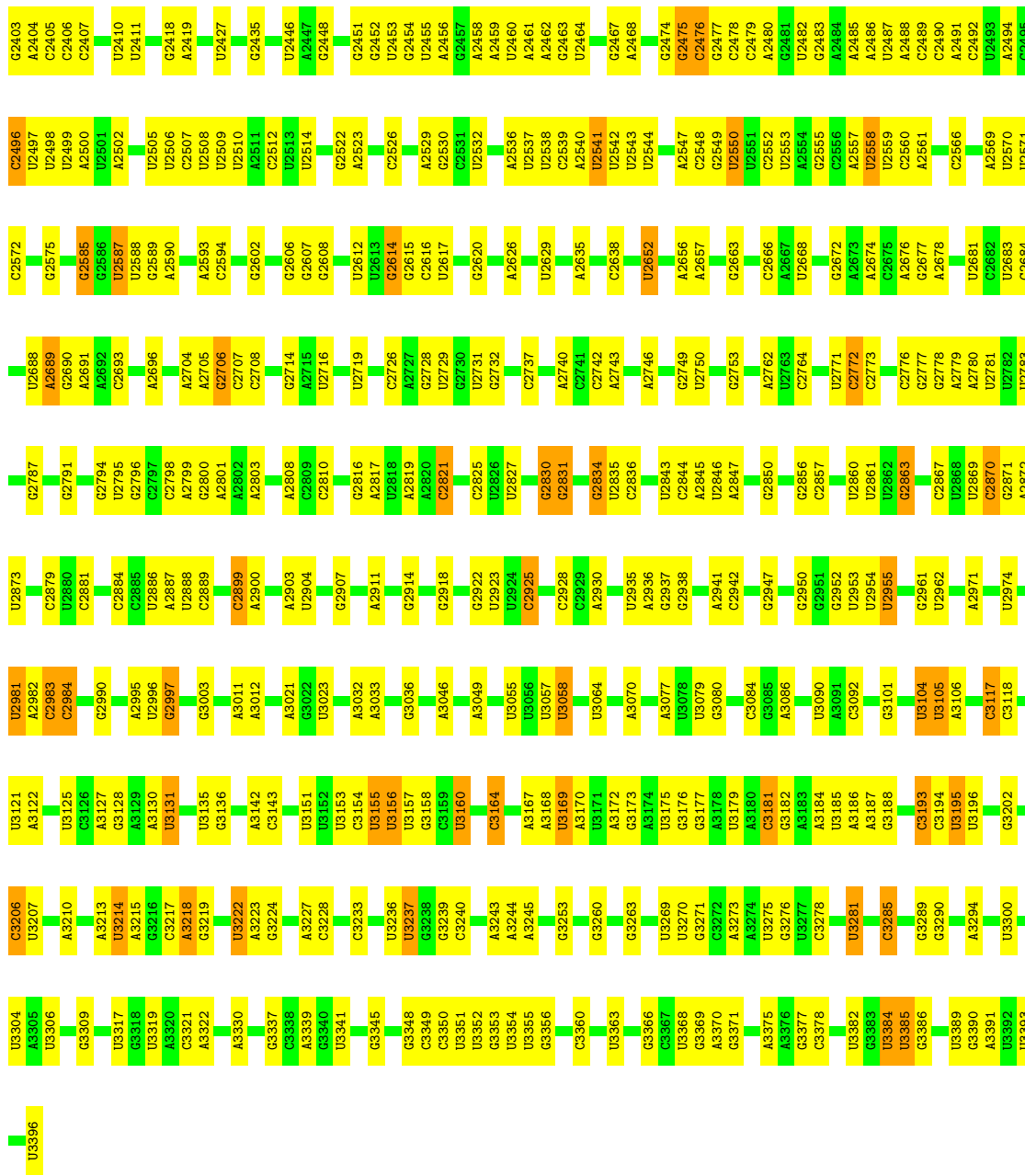
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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: 25S ribosomal RNA



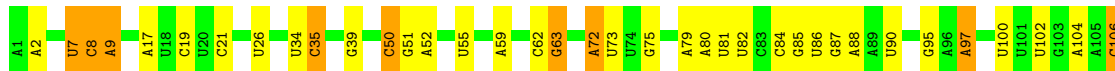
A1009	U1088	U1191	U1258	U1341	A1449	C1562	G1666	G1770	U1877	C	A	A2168	G2300
G1013	G1089	C1192	A1259	C1342	G1450	C1563	C1671	G1773	G1878	U	G	U2189	U2301
U1014	U1093	A1193	G1261	U1348	A1452	G1565	A1678	C1774	A1879	A	C	C2192	C2304
U1015	A1094	C1196	U1261	G1349	U1455	U1568	G1679	G1775	U1880	U	U	U2193	G2305
U1016	A1095	A1197	A1262	A1350	A1456	U1569	A1678	G1776	U1881	C	C	C2194	C2306
C1017	U1096	C1198	G1264	U1351	U1457	U1570	G1680	U1777	A1886	G	G	A2093	G2307
G1018	U1097	C1199	U1267	A1352	U1458	A1571	A1683	G1778	G1889	C	C	U2205	C2308
G1019	A1098	A1200	U1267	U1353	C1459	U1572	C1690	C1779	G1890	U	U	G2206	A2309
U1020	A1099	C1201	U1271	G1354	A1460	U1573	C1690	C1780	G1891	C	C	A2207	U2310
G1021	U1100	A1202	C1272	U1355	A1466	C1574	U1702	C1781	G1892	C	A	U2102	A2313
U1022	A1103	G1206	C1275	G1357	G1466	A1575	U1703	G1784	A1895	U	C	G2210	G2315
G1024	U1111	G1209	C1279	A1362	C1469	G1576	A1704	G1788	A1896	C	C	A2213	U2318
A1025	U1111	U1210	C1280	G1362	U1470	C1579	U1705	C1788	G1897	G	G	A2214	U2318
A1026	G1115	U1211	G1281	C1364	U1482	A1580	C1706	C1793	G1898	U	U	A2215	A2324
A1027	G1116	U1212	G1282	G1370	U1483	C1581	G1711	C1799	G1899	C	C	G2110	A2324
U1028	G1117	A1212	C1283	U1370	U1484	C1582	G1712	G1794	G1900	U	U	G2111	G2333
G1029	U1127	U1215	C1284	G1374	U1485	C1583	G1713	U1795	A1901	G	G	U2112	G2333
A1030	G1127	C1216	G1285	G1374	G1485	U1584	A1714	G1796	G1905	C	C	A2113	C2333
C1031	U1128	A1217	A1286	G1375	G1490	A1587	A1715	A1797	G1906	U	U	C2114	A2222
C1032	A1129	U1218	A1287	A1386	A1491	A1588	U1716	A1797	G1907	C	C	G2115	A2223
U1033	U1130	C1219	A1287	A1386	A1491	A1589	U1717	C1805	C1907	C	C	A2224	A2224
U1034	G1131	U1220	A1291	A1386	A1491	A1589	G1718	C1805	C1907	C	C	G2116	U2225
G1035	A1136	U1221	C1292	A1390	C1496	A1593	G1718	A1813	U1912	U	U	A2117	C2339
A1036	C1137	A1222	C1292	C1391	C1502	A1593	U1724	A1814	U1912	C	C	G2122	U2347
A1037	C1141	G1223	G1295	C1392	G1507	C1596	U1724	U1815	C1917	C	C	G2123	A2348
C1038	G1142	A1224	G1295	A1393	C1508	C1597	G1728	A1816	U1917	U	U	U2123	U2349
U1042	A1143	G1225	A1301	A1394	U1511	C1599	G1729	U1820	U1918	C	C	A2131	C2350
C1043	A1144	G1226	A1302	A1397	U1512	C1599	G1730	U1821	U1919	C	C	C2132	U2351
A1047	A1144	C1227	A1303	C1397	U1513	C1600	A1731	U1824	A1922	U	U	U2137	A2352
U1048	G1145	C1228	A1304	U1399	U1514	G1604	A1732	U1824	A1923	C	C	A2138	C2359
C1049	U1151	G1229	U1305	G1400	U1515	U1607	U1732	A1841	A1933	U	U	A2139	U2349
U1050	A1154	G1230	G1306	G1405	A1516	C1608	G1735	C1843	A1934	C	C	U2140	C2362
U1051	C1155	A1231	A1307	U1406	C1516	A1613	G1736	U1837	G1935	C	C	U2141	C2362
U1052	A1159	C1232	A1308	A1406	C1516	C1614	G1736	G1838	U1935	C	C	A2142	C2366
G1059	A1171	G1233	A1309	C1411	U1523	C1614	U1739	U1839	U1936	U	U	A2145	U2260
U1060	U1172	U1234	G1310	C1411	A1524	U1620	C1738	U1840	A1937	C	C	C2265	A2372
U1061	U1173	G1235	G1311	C1415	G1525	A1621	A1740	A1842	A1938	U	U	U2269	A2373
A1064	U1174	U1236	G1312	U1415	U1526	A1621	G1748	C1843	G1934	C	C	A2270	C2374
G1072	U1177	G1237	G1313	C1416	U1526	A1621	A1749	U1846	G1935	C	C	A2271	G2375
C1076	G1176	C1238	G1313	G1417	U1533	U1629	A1749	C1846	U1935	U	U	A2272	C2378
A1079	G1178	A1244	C1316	U1418	U1533	U1629	A1750	A1847	G1948	A	A	A2158	C2378
U1080	A1180	U1241	A1317	A1418	G1536	A1632	G1751	A1847	G1948	C	C	U2159	A2386
U1081	U1181	U1242	A1318	A1419	G1536	C1633	A1752	A1850	G1953	C	C	G2166	A2387
U1082	U1182	G1249	G1319	A1425	A1546	C1633	G1753	G1851	G1954	C	C	U2167	U2388
G1083	G1186	A1252	A1320	U1425	A1546	A1642	C1754	G1851	G1954	C	C	G2169	C2389
A1084	A1190	C1254	G1321	G1434	C1551	A1643	C1756	U1855	U1965	U	U	U2170	A2390
A1085	A1257	C1257	A1337	U1448	C1551	A1644	C1756	U1855	U1965	C	C	A2175	U2282
			A1338	U1448	C1554	A1644	A1760	G1863	G1965	C	C	U2176	G2283
			A1339	U1448	U1554	A1645	A1761	A1864	A1965	C	C	U2177	C2284
			C1338	U1448	U1555	A1646	G1762	C1866	A1966	C	C	U2178	C2285
			C1340	U1448	U1556	A1647	G1763	C1867	A1967	C	C	U2179	U2286
				U1448	U1557	A1647	G1764	A1867	A1968	C	C	G2180	C2287
				U1448	U1558	A1648	U1764	A1868	A1969	C	C	C2181	G2288
				U1448	U1559	A1649	U1765	G1868	A1970	C	C	A2182	A2397
				U1448	U1560	A1650	G1766	G1868	A1971	C	C	A2183	A2398
				U1448	U1561	A1651	G1767	C1872	A1972	C	C	U2184	A2401
				U1448	U1561	A1652	G1767	C1872	A1973	C	C	U2185	A2402

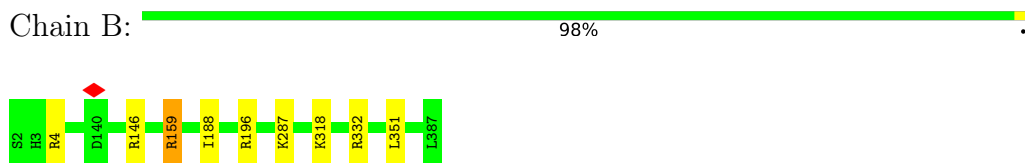
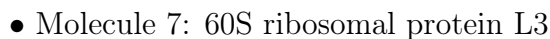
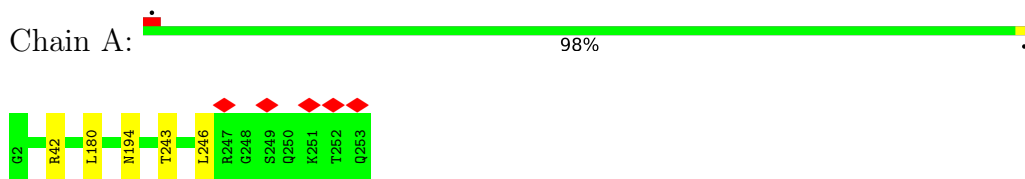
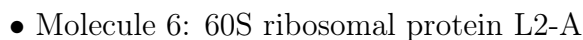
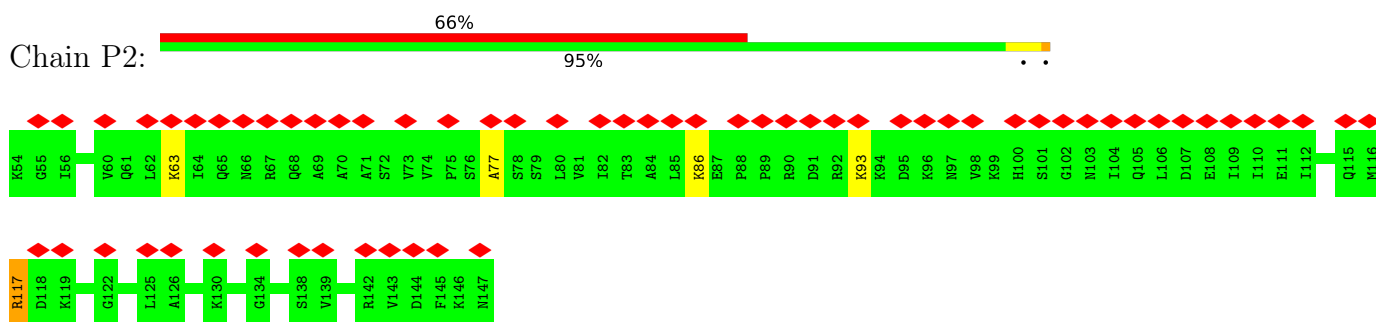
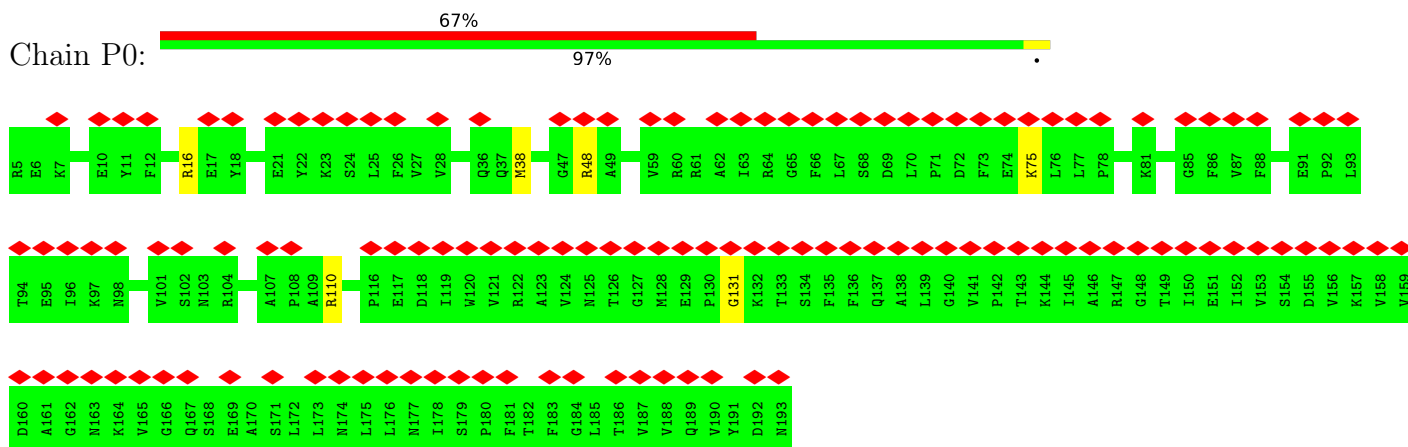
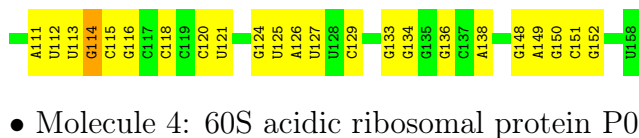


- Molecule 2: 5S ribosomal RNA



- Molecule 3: 5.8S ribosomal RNA





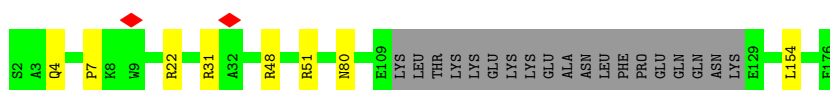
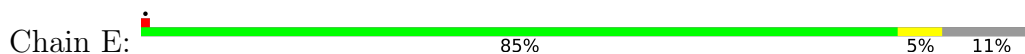




- Molecule 9: 60S ribosomal protein L5



- Molecule 10: 60S ribosomal protein L6-A



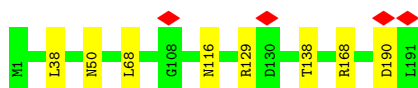
- Molecule 11: 60S ribosomal protein L7-A



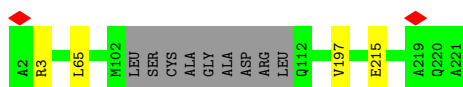
- Molecule 12: 60S ribosomal protein L8-A




- Molecule 13: 60S ribosomal protein L9-A

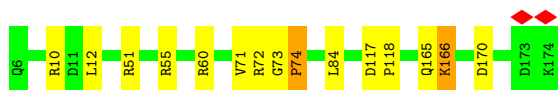


- Molecule 14: 60S ribosomal protein L10

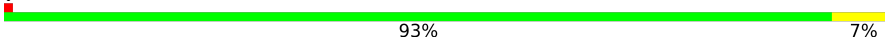


- Molecule 15: 60S ribosomal protein L11-B

Chain J:  91% 8%



- Molecule 16: 60S ribosomal protein L13-A

Chain L:  93% 7%



- Molecule 17: 60S ribosomal protein L14-A

Chain M:  96%

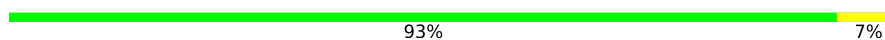


- Molecule 18: 60S ribosomal protein L15-A

Chain N:  95% 5%



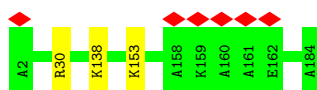
- Molecule 19: 60S ribosomal protein L16-A

Chain O:  93% 7%



- Molecule 20: 60S ribosomal protein L17-A

Chain P:  98%



- Molecule 21: 60S ribosomal protein L18-A

Chain Q:  97%



- Molecule 22: 60S ribosomal protein L19-A

Chain R:  94% 6%



- Molecule 23: 60S ribosomal protein L20-A

Chain S:  96%



- Molecule 24: 60S ribosomal protein L21-A

Chain T:  97%



- Molecule 25: 60S ribosomal protein L22-A

Chain U:  99%



- Molecule 26: 60S ribosomal protein L23-A

Chain V:  97%



- Molecule 27: 60S ribosomal protein L24-A

Chain W:  97%



- Molecule 28: 60S ribosomal protein L25

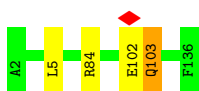
Chain X:  98%



- Molecule 29: 60S ribosomal protein L26-A



- Molecule 30: 60S ribosomal protein L27-A



- Molecule 31: 60S ribosomal protein L28



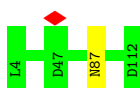
- Molecule 32: 60S ribosomal protein L29



- Molecule 33: 60S ribosomal protein L30



- Molecule 34: 60S ribosomal protein L31-A



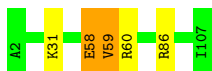
- Molecule 35: 60S ribosomal protein L32

Chain e:  100%



- Molecule 36: 60S ribosomal protein L33-A

Chain f:  95%



- Molecule 37: 60S ribosomal protein L34-A

Chain g:  94%




- Molecule 38: 60S ribosomal protein L35-A

Chain h:  95%



- Molecule 39: 60S ribosomal protein L36-A

Chain i:  92%



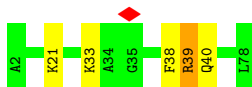
- Molecule 40: 60S ribosomal protein L37-A

Chain j:  93%

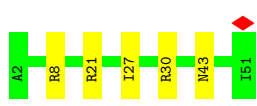
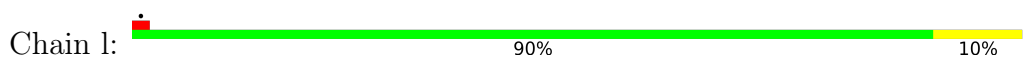


- Molecule 41: 60S ribosomal protein L38

Chain k:  94%



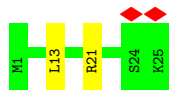
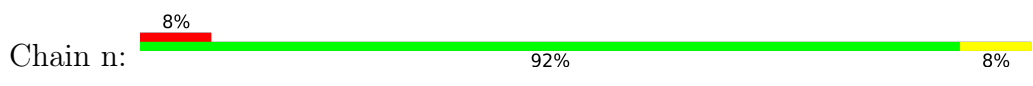
- Molecule 42: 60S ribosomal protein L39



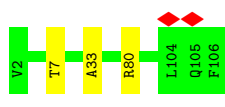
• Molecule 43: Ubiquitin-60S ribosomal protein L40



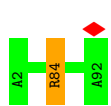
• Molecule 44: 60S ribosomal protein L41-B



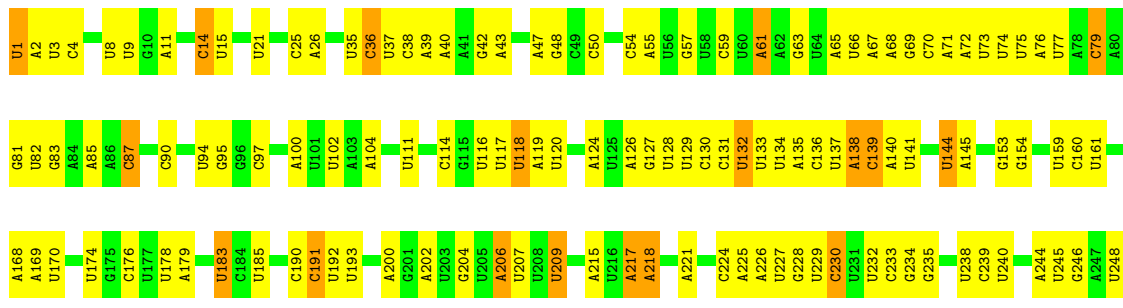
• Molecule 45: 60S ribosomal protein L42-A



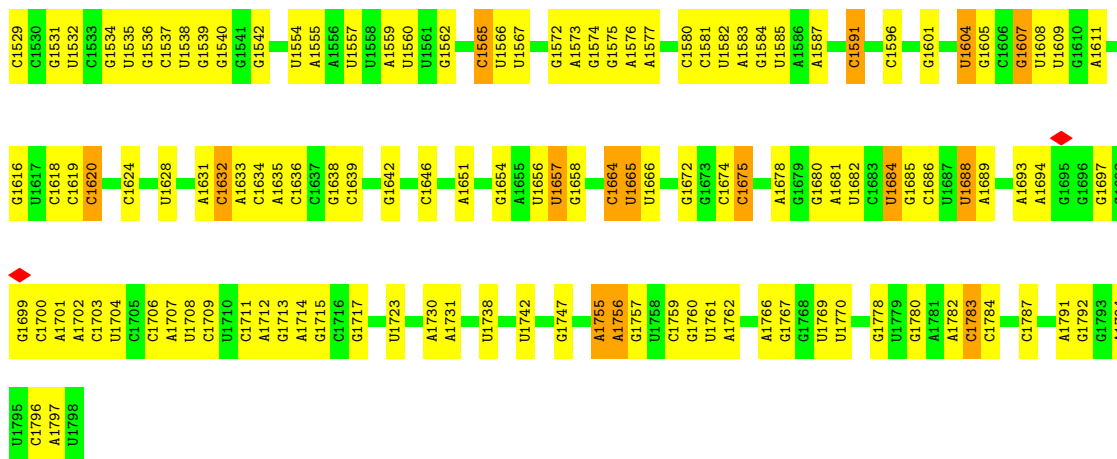
• Molecule 46: 60S ribosomal protein L43-A



• Molecule 47: 18S ribosomal RNA



U1443	U1444	U1445	U1446	U1447	U1381	U1382	U1383	U1384	U1385	U1386	U1387	U1314	U1315	U1320	U1390	U1391	U1392	U1393	U1394	U1395	U1396	U1397	U1398	U1399	U1400	U1401	U1402	U1403	U1404	U1405	U1406	U1407	U1408	U1409	U1410	U1411	U1412	U1413	U1414	U1415	U1416	U1419	U1420	U1421	U1425	U1426	U1427	U1428	U1429	U1432	U1433	U1434	U1435	U1436	U1523	U1524	U1525	U1526	U1527	U1528																				
G1299	A1300	U1301	C1378	C1379	C1306	U1381	U1382	U1383	U1384	U1385	U1386	U1387	U1314	U1315	U1320	U1390	U1391	U1392	U1393	U1394	U1395	U1396	U1397	U1398	U1399	U1400	U1401	U1402	U1403	U1404	U1405	U1406	U1407	U1408	U1409	U1410	U1411	U1412	U1413	U1414	U1415	U1416	U1419	U1420	U1421	U1425	U1426	U1427	U1428	U1429	U1432	U1433	U1434	U1435	U1436	U1523	U1524	U1525	U1526	U1527	U1528																			
G1228	G1229	A1230	U1231	U1232	U1233	A1234	U1235	A1236	U1237	U1238	U1239	U1240	G1241	A1242	G1243	A1244	U1245	U1246	U1247	U1248	U1249	U1250	U1251	U1252	U1253	U1254	U1255	U1256	U1257	U1258	U1259	U1260	U1261	U1262	U1263	U1264	U1265	U1266	U1267	G1270	G1271	U1272	G1273	C1274	U1275	U1276	U1277	U1278	U1279	U1280	U1281	U1282	U1283	U1284	U1285	U1286	U1287	U1288	U1289	U1290	U1293	U1298																		
C1162	A1163	G1164	U1165	A1166	U1167	U1168	U1169	U1170	A1171	U1172	U1173	C1174	U1175	G1178	U1179	U1180	U1181	U1182	U1183	U1184	U1185	U1186	U1187	U1188	U1189	U1190	U1191	U1192	U1193	U1194	U1195	U1196	U1197	U1198	U1199	U1200	G1201	A1202	U1203	U1204	U1205	U1206	U1207	U1208	U1209	U1214	U1215	U1216	U1217	U1218	U1219	U1220	U1221	U1222	U1223	U1224	U1225	U1226	A1227																					
U	U	U	U	A	A1062	C1070	U1071	A1076	U1080	A1081	C1082	U1083	A1091	A1092	C1096	U1097	U1098	U1099	G1100	G1101	G1102	U1103	U1104	A1105	U1106	U1107	U1108	U1109	G1110	U1111	U1112	U1113	U1114	U1115	A1116	U1117	U1118	U1119	A1120	U1121	U1122	U1123	U1124	U1125	A1126	U1127	U1128	U1129	U1130	U1131	U1132	U1133	U1134	U1135	U1136	U1137	U1138	U1139	U1140	U1141	U1142	U1143	U1144	U1145	U1146	U1147	U1148	U1149	U1150	U1151	U1152	U1153	U1154	U1155	U1156	U1157	U1158	U1159	U1160	U1161
U841	C842	U843	U844	G845	C849	A850	U851	C852	U853	A859	U860	A863	U864	U873	A881	U885	U889	U890	C910	U911	U912	G913	U914	A915	U916	U919	U920	U921	U922	A923	A924	U928	C931	U932	C934	U935	U936	U937	U938	U939	U940	U941	U942	U943	U944	U945	A951																																	
A760	G765	C766	U767	C768	G775	U776	U777	U778	A780	U781	U782	U783	U784	U789	U790	U791	U792	U793	U794	U795	U799	U800	G801	A806	G810	A811	U812	U813	A814	U815	U816	U817	U818	U819	U820	U821	G824	U825	U826	C827	U831	U832	U833	U834	U835	U836	U839	U840																																
U687	C691	U692	A606	U694	U695	U611	A619	U698	U699	U620	A623	G624	U627	A630	A635	U636	U637	U638	U639	U640	U641	U642	U643	U644	U645	U646	U647	U648	U649	U650	U651	U652	U653	U654	U655	U656	U657	U658	U659	U660	U661	U662	U663	U664	U665	U666	U667	U668	U669	U670	U671	U672	U673	U674	U675	U676	U677	U678	U679	U680	U681	C686																		
G597	G510	A511	A515	U516	U517	A518	C519	U522	A525	U532	U533	A534	U535	U536	U537	U538	U539	U540	U541	U542	U543	U544	U545	U546	U547	U548	U549	U550	U551	U552	U553	U554	U555	U556	U557	U558	U559	U560	U561	U562	U563	U564	U565	U566	U567	U568	U569	U570	U571	U572	U573	U574	U575	U576	U577	U578	U579	U580	U581	U582	U583	U584	U585	U586	U587	U588	U589	U590	U591	U592	U593	U594	U595	U596						
U349	C350	A351	U352	U353	U354	U355	U356	U357	U358	U359	U360	U361	U362	U363	U364	U365	U366	U367	U368	U369	U370	U371	U372	U373	U374	U375	U376	U377	U378	U379	U380	U381	U382	U383	U384	U385	U386	U387	U388	U389	U390	U391	U392	U393	U394	U395	U396	U397	U398	U399	U400	U401	U402	U403	U404	U405	U406	U407	U408	U409	U410	U411	U412	U413	U414	U415	U416	U417	U418	U419	U420	U421	U422	U423	U424	U425	U426	U427	U428	U429
A333	G334	G337	C338	C339	U345	C351	U352	A359	U360	C361	G365	U366	A370	G373	U377	U378	U379	U380	U381	U382	U383	U384	U385	U386	U387	U388	U389	U390	U391	U392	U393	U394	U395	U396	U397	U398	U399	U400	U401	U402	U403	U404	U405	U406	U407	U408	U409	U410	U411	U412	U413	U414	U415	U416	U417	U418	U419	U420	U421	U422	U423	U424	U425	U426	U427	U428	U429													
G430	C431	G432	C433	G434	C435	U436	A437	U438	U439	U440	A441	C444	U445	U447	U448	U449	U450	U451	U452	U453	U454	U455	U456	U457	U458	U459	U460	U461	U462	U463	U464	U465	U466	U467	U468	U469	U470	U471	U472	U473	U474	U475	U476	U477	U478	U479	U480	U481	U482	U483	U484	U485	U486	U487	U488	U489	U490	U491	U492	U493	U494	U495	U496	U497	U498	U499	U500	U501	U502	U503	U504	U505	U506	U507	U508					
A443	U444	U445	U446	U447	U448	U449	U450	U451	U452	U453	U454	U455	U456	U457	U458	U459	U460	U461	U462	U463	U464	U465	U466	U467	U468	U469	U470	U471	U472	U473	U474	U475	U476	U477	U478	U479	U480	U481	U482	U483	U484	U485	U486	U487	U488	U489	U490	U491	U492	U493	U494	U495	U496	U497	U498	U499	U500	U501	U502	U503	U504	U505	U506	U507	U508															
G509	G510	A511	A515	U516	U517	A518	C519	U522	A525	U532	U533	A534	U535	U536	U537	U538	U539	U540	U541	U542	U543	U544	U545	U546	U547	U548	U549	U550	U551	U552	U553	U554	U555	U556	U557	U558	U559	U560	U561	U562	U563	U564	U565	U566	U567	U568	U569	U570	U571	U572	U573	U574	U575	U576	U577	U578	U579	U580	U581	U582	U583	U584	U585	U586	U587	U588	U589	U590	U591	U592	U593	U594	U595	U596						



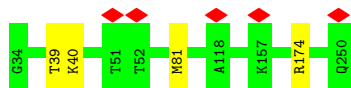
• Molecule 48: 40S ribosomal protein S0-A



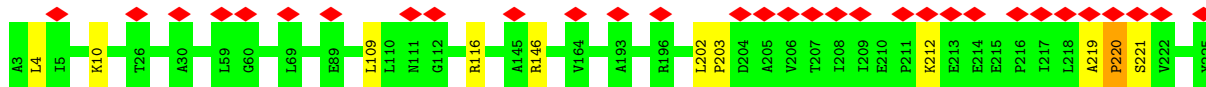
• Molecule 49: 40S ribosomal protein S1-A



• Molecule 50: 40S ribosomal protein S2



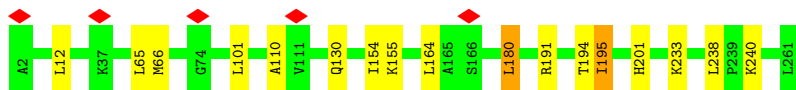
• Molecule 51: 40S ribosomal protein S3



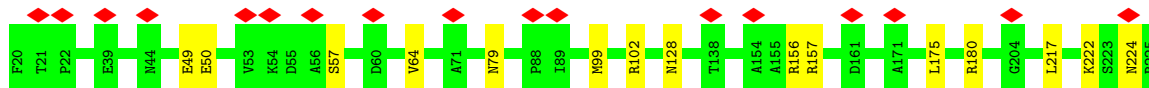
• Molecule 52: 40S ribosomal protein S4-A



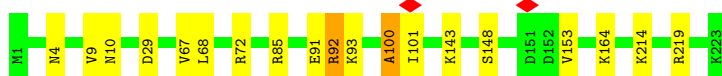
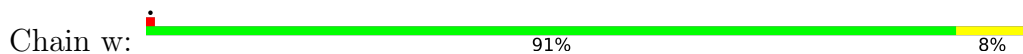




- Molecule 53: 40S ribosomal protein S5



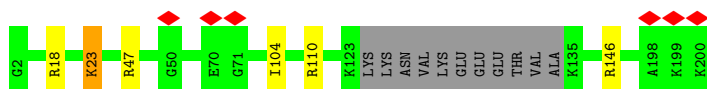
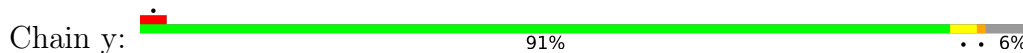
- Molecule 54: 40S ribosomal protein S6-A



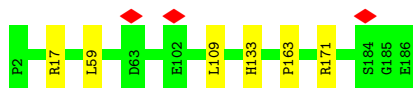
- Molecule 55: 40S ribosomal protein S7-A



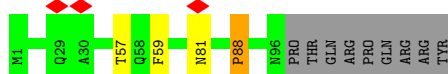
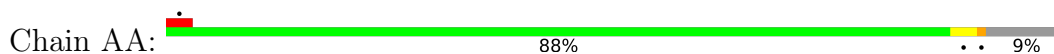
- Molecule 56: 40S ribosomal protein S8-A



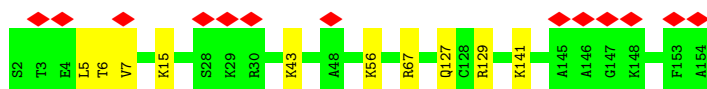
- Molecule 57: 40S ribosomal protein S9-A



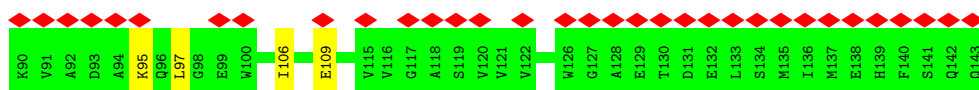
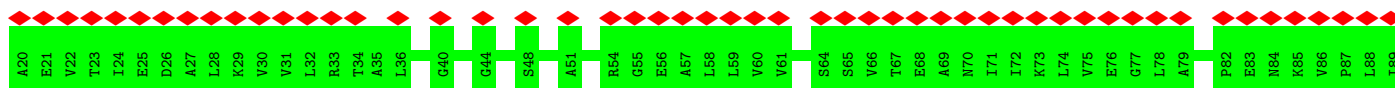
- Molecule 58: 40S ribosomal protein S10-A



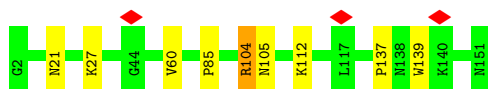
- Molecule 59: 40S ribosomal protein S11-A



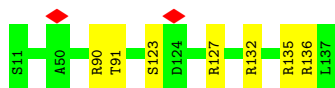
- Molecule 60: 40S ribosomal protein S12



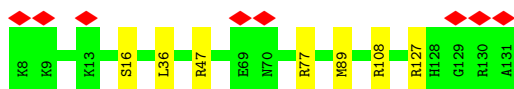
- Molecule 61: 40S ribosomal protein S13



- Molecule 62: 40S ribosomal protein S14-B



- Molecule 63: 40S ribosomal protein S15

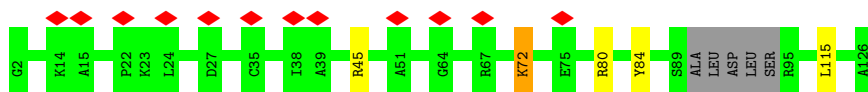


- Molecule 64: 40S ribosomal protein S16-A

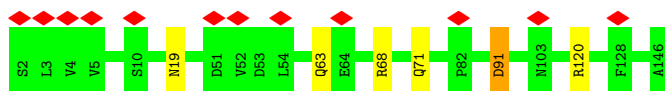


- Molecule 65: 40S ribosomal protein S17-B

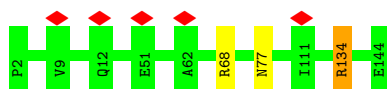




- Molecule 66: 40S ribosomal protein S18-A



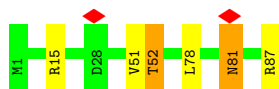
- Molecule 67: 40S ribosomal protein S19-A



- Molecule 68: 40S ribosomal protein S20



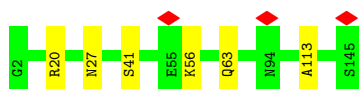
- Molecule 69: 40S ribosomal protein S21-A



- Molecule 70: 40S ribosomal protein S22-A



- Molecule 71: 40S ribosomal protein S23-A



- Molecule 72: 40S ribosomal protein S24-A

Chain AO:  97%



- Molecule 73: 40S ribosomal protein S25-A

Chain AP:  23% 96%



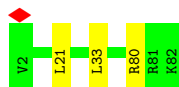
- Molecule 74: 40S ribosomal protein S26-B

Chain AQ:  94% 6%



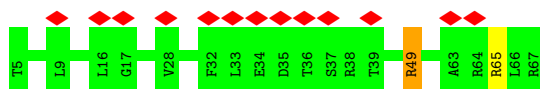
- Molecule 75: 40S ribosomal protein S27-A

Chain AR:  96%



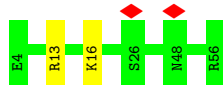
- Molecule 76: 40S ribosomal protein S28-A

Chain AS:  21% 97%



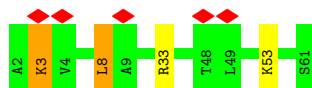
- Molecule 77: 40S ribosomal protein S29-A

Chain AT:  96%

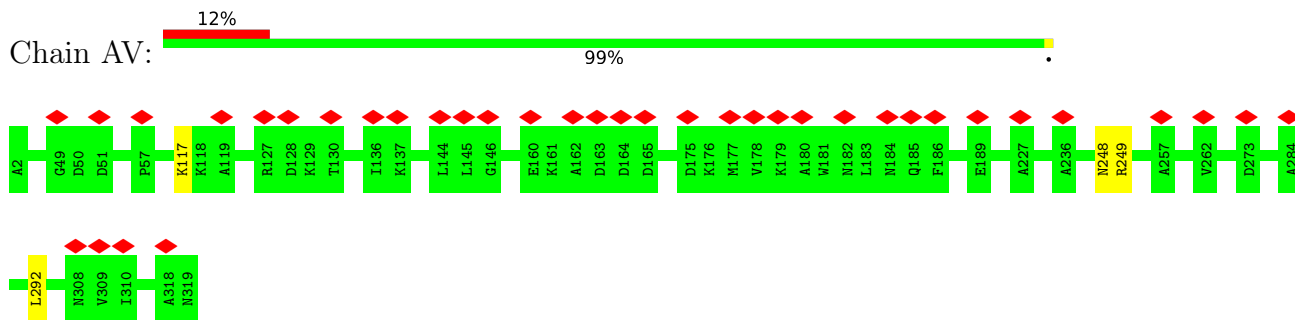


- Molecule 78: 40S ribosomal protein S30-A

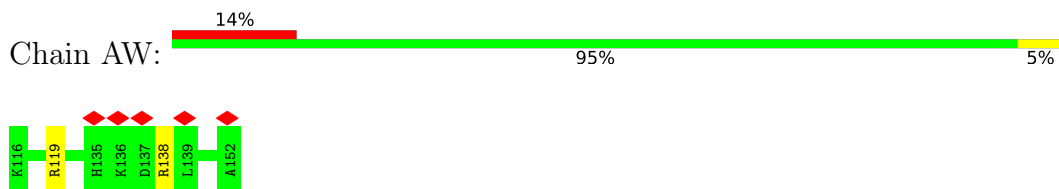
Chain AU:  8% 93%



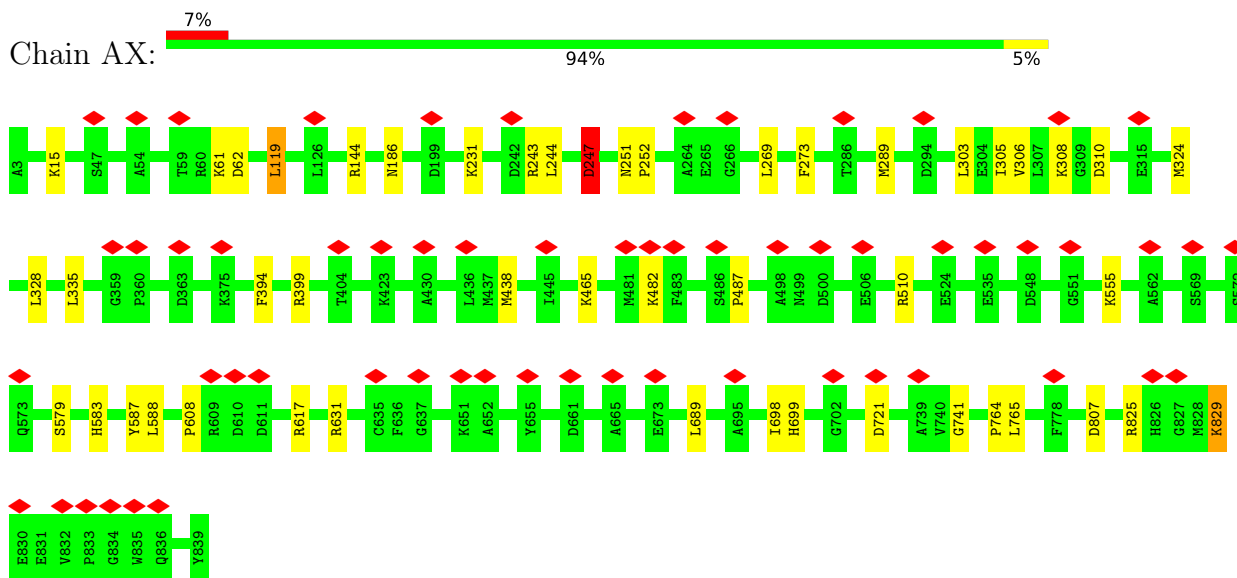
- Molecule 79: Guanine nucleotide-binding protein subunit beta-like protein



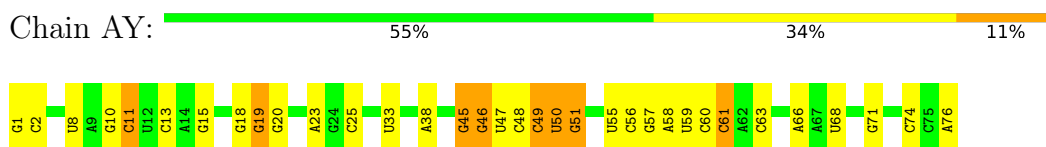
- Molecule 80: Ubiquitin-40S ribosomal protein S31



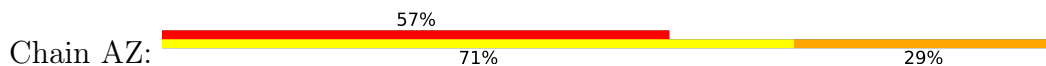
- Molecule 81: Elongation factor 2



- Molecule 82: Transfer RNA - Phe

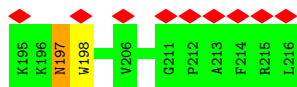
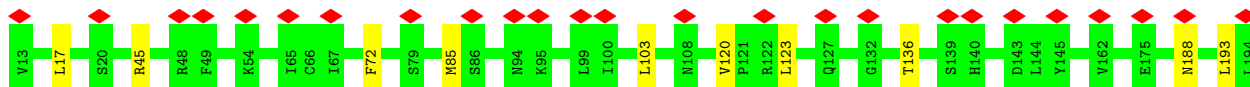


- Molecule 83: Messenger RNA





• Molecule 84: 60S ribosomal protein L1-A



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	86500	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 II (4k x 4k)	Depositor
Maximum map value	0.306	Depositor
Minimum map value	-0.179	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.016	Depositor
Recommended contour level	0.033	Depositor
Map size (Å)	396.0, 396.0, 396.0	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	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: GCP, DDE, ZN

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	1	0.68	1/77157 (0.0%)	1.24	613/120295 (0.5%)
2	3	0.59	0/2883	1.18	20/4491 (0.4%)
3	4	0.67	0/3746	1.26	37/5832 (0.6%)
4	P0	0.32	0/1498	0.65	1/2025 (0.0%)
5	P2	0.34	0/728	0.78	2/975 (0.2%)
6	A	0.41	0/1948	0.71	2/2617 (0.1%)
7	B	0.37	0/3146	0.67	1/4228 (0.0%)
8	C	0.38	0/2800	0.68	1/3790 (0.0%)
9	D	0.35	0/2425	0.67	2/3271 (0.1%)
10	E	0.33	0/1260	0.66	0/1694
11	F	0.39	0/1821	0.68	0/2451
12	G	0.35	0/1836	0.64	1/2481 (0.0%)
13	H	0.37	0/1539	0.71	4/2073 (0.2%)
14	I	0.39	0/1741	0.64	0/2335
15	J	0.34	0/1374	0.74	1/1842 (0.1%)
16	L	0.36	0/1568	0.67	1/2106 (0.0%)
17	M	0.32	0/1068	0.62	0/1438
18	N	0.42	0/1757	0.67	1/2354 (0.0%)
19	O	0.40	0/1585	0.66	2/2128 (0.1%)
20	P	0.37	0/1443	0.62	0/1944
21	Q	0.37	0/1465	0.66	1/1965 (0.1%)
22	R	0.32	0/1538	0.67	3/2050 (0.1%)
23	S	0.39	0/1481	0.66	1/1990 (0.1%)
24	T	0.40	0/1300	0.62	0/1743
25	U	0.35	0/812	0.64	0/1099
26	V	0.41	0/1012	0.70	0/1362
27	W	0.36	0/525	0.65	1/696 (0.1%)
28	X	0.35	0/979	0.63	0/1321
29	Y	0.33	0/1004	0.65	1/1341 (0.1%)
30	Z	0.39	0/1118	0.66	1/1497 (0.1%)
31	a	0.37	0/1204	0.69	2/1612 (0.1%)
32	b	0.34	0/473	0.60	0/629



Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	c	0.33	0/751	0.62	0/1008
34	d	0.40	0/897	0.68	0/1205
35	e	0.38	0/1041	0.64	0/1394
36	f	0.40	0/868	0.67	0/1168
37	g	0.38	0/890	0.72	1/1189 (0.1%)
38	h	0.32	0/978	0.70	1/1301 (0.1%)
39	i	0.36	0/778	0.73	2/1034 (0.2%)
40	j	0.38	0/696	0.72	0/923
41	k	0.32	0/618	0.79	1/826 (0.1%)
42	l	0.35	0/443	0.75	1/588 (0.2%)
43	m	0.36	0/423	0.63	0/562
44	n	0.34	0/234	0.67	0/300
45	o	0.37	0/860	0.71	0/1136
46	p	0.46	0/701	0.68	0/934
47	2	0.56	2/42328 (0.0%)	1.28	445/65955 (0.7%)
48	q	0.33	0/1617	0.69	0/2215
49	r	0.34	0/1735	0.81	5/2335 (0.2%)
50	s	0.32	0/1665	0.68	0/2263
51	t	0.32	0/1759	0.68	0/2368
52	u	0.33	0/2109	0.77	4/2839 (0.1%)
53	v	0.31	0/1629	0.74	3/2202 (0.1%)
54	w	0.34	0/1814	0.82	2/2425 (0.1%)
55	x	0.32	0/1506	0.74	1/2028 (0.0%)
56	y	0.33	0/1514	0.67	0/2021
57	z	0.33	0/1519	0.72	0/2035
58	AA	0.32	0/789	0.70	1/1067 (0.1%)
59	AB	0.37	0/1247	0.67	1/1681 (0.1%)
60	AC	0.28	0/898	0.69	1/1220 (0.1%)
61	AD	0.33	0/1215	0.72	1/1638 (0.1%)
62	AE	0.33	0/901	0.69	0/1217
63	AF	0.35	0/998	0.77	0/1341
64	AG	0.33	0/1125	0.71	0/1510
65	AH	0.32	0/935	0.71	0/1254
66	AI	0.31	0/1211	0.69	0/1628
67	AJ	0.30	0/1130	0.63	0/1517
68	AK	0.31	0/865	0.71	1/1169 (0.1%)
69	AL	0.36	0/693	0.82	1/935 (0.1%)
70	AM	0.34	0/1038	0.66	1/1395 (0.1%)
71	AN	0.38	0/1139	0.71	0/1518
72	AO	0.33	0/1087	0.63	0/1449
73	AP	0.34	0/571	0.75	0/768
74	AQ	0.34	0/782	0.77	0/1047
75	AR	0.30	0/620	0.79	2/838 (0.2%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
76	AS	0.29	0/499	0.73	0/670
77	AT	0.36	0/452	0.65	0/600
78	AU	0.30	0/483	0.71	1/643 (0.2%)
79	AV	0.30	0/2490	0.69	0/3389
80	AW	0.29	0/292	0.65	0/390
81	AX	0.35	0/6626	0.78	12/8970 (0.1%)
82	AY	0.57	1/1818 (0.1%)	1.42	33/2831 (1.2%)
83	AZ	0.66	1/159 (0.6%)	1.65	5/244 (2.0%)
84	BA	0.33	0/1634	0.74	2/2195 (0.1%)
All	All	0.53	5/227304 (0.0%)	1.07	1227/333053 (0.4%)

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
4	P0	0	2
5	P2	0	1
7	B	0	1
8	C	0	1
9	D	0	4
10	E	0	2
11	F	0	2
12	G	0	3
14	I	0	3
15	J	0	6
16	L	0	2
17	M	0	2
18	N	0	1
19	O	0	3
22	R	0	1
23	S	0	2
30	Z	0	1
31	a	0	2
32	b	0	1
34	d	0	1
36	f	0	2
37	g	0	4
38	h	0	2
39	i	0	3
40	j	0	3

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Mol	Chain	#Chirality outliers	#Planarity outliers
41	k	0	2
45	o	0	2
46	p	0	1
48	q	0	2
49	r	0	3
50	s	0	1
51	t	0	4
52	u	0	7
53	v	0	4
54	w	0	6
55	x	0	3
56	y	0	1
57	z	0	3
58	AA	0	2
59	AB	0	1
61	AD	0	2
62	AE	0	3
63	AF	0	2
64	AG	0	4
65	AH	0	1
66	AI	0	1
67	AJ	0	1
68	AK	0	2
69	AL	0	2
71	AN	0	2
73	AP	0	1
74	AQ	0	3
75	AR	0	1
76	AS	0	1
78	AU	0	1
80	AW	0	1
81	AX	0	15
84	BA	0	3
All	All	0	143

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
82	AY	1	G	OP3-P	-10.64	1.48	1.61
47	2	506	A	N9-C4	6.05	1.41	1.37
83	AZ	48	U	O3'-P	5.16	1.67	1.61
1	1	2149	A	N9-C4	-5.08	1.34	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	2	218	A	N9-C4	5.08	1.40	1.37

The worst 5 of 1227 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	2	94	U	C2-N3-C4	21.52	139.91	127.00
47	2	1706	C	N1-C2-O2	12.82	126.59	118.90
1	1	3155	U	N1-C2-O2	11.63	130.94	122.80
1	1	3155	U	C2-N1-C1'	11.51	131.52	117.70
47	2	94	U	N3-C4-C5	11.26	121.35	114.60

There are no chirality outliers.

5 of 143 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	B	159	ARG	Peptide
8	C	93	MET	Peptide
4	P0	16	ARG	Peptide
4	P0	38	MET	Peptide
5	P2	77	ALA	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 [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	
4	P0	187/189 (99%)	145 (78%)	42 (22%)	0	100	100
5	P2	92/94 (98%)	64 (70%)	28 (30%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	A	250/252 (99%)	217 (87%)	33 (13%)	0	100	100
7	B	384/386 (100%)	335 (87%)	48 (12%)	1 (0%)	41	75
8	C	359/361 (99%)	305 (85%)	52 (14%)	2 (1%)	25	63
9	D	294/296 (99%)	248 (84%)	43 (15%)	3 (1%)	15	53
10	E	152/175 (87%)	137 (90%)	15 (10%)	0	100	100
11	F	220/222 (99%)	194 (88%)	25 (11%)	1 (0%)	29	67
12	G	231/233 (99%)	204 (88%)	27 (12%)	0	100	100
13	H	189/191 (99%)	168 (89%)	20 (11%)	1 (0%)	29	67
14	I	207/220 (94%)	178 (86%)	29 (14%)	0	100	100
15	J	167/169 (99%)	130 (78%)	34 (20%)	3 (2%)	8	41
16	L	191/193 (99%)	166 (87%)	23 (12%)	2 (1%)	15	53
17	M	134/136 (98%)	121 (90%)	12 (9%)	1 (1%)	22	61
18	N	201/203 (99%)	172 (86%)	29 (14%)	0	100	100
19	O	195/197 (99%)	171 (88%)	21 (11%)	3 (2%)	10	45
20	P	181/183 (99%)	161 (89%)	20 (11%)	0	100	100
21	Q	183/185 (99%)	165 (90%)	18 (10%)	0	100	100
22	R	186/188 (99%)	170 (91%)	16 (9%)	0	100	100
23	S	170/172 (99%)	151 (89%)	19 (11%)	0	100	100
24	T	157/159 (99%)	146 (93%)	11 (7%)	0	100	100
25	U	98/100 (98%)	89 (91%)	9 (9%)	0	100	100
26	V	134/136 (98%)	120 (90%)	14 (10%)	0	100	100
27	W	60/62 (97%)	57 (95%)	3 (5%)	0	100	100
28	X	119/121 (98%)	111 (93%)	8 (7%)	0	100	100
29	Y	124/126 (98%)	115 (93%)	9 (7%)	0	100	100
30	Z	133/135 (98%)	115 (86%)	17 (13%)	1 (1%)	19	58
31	a	146/148 (99%)	118 (81%)	25 (17%)	3 (2%)	7	39
32	b	56/58 (97%)	46 (82%)	10 (18%)	0	100	100
33	c	95/97 (98%)	90 (95%)	5 (5%)	0	100	100
34	d	107/109 (98%)	95 (89%)	12 (11%)	0	100	100
35	e	125/127 (98%)	103 (82%)	22 (18%)	0	100	100
36	f	104/106 (98%)	90 (86%)	11 (11%)	3 (3%)	4	32

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	g	110/112 (98%)	98 (89%)	10 (9%)	2 (2%)	8	41
38	h	117/119 (98%)	100 (86%)	17 (14%)	0	100	100
39	i	97/99 (98%)	75 (77%)	21 (22%)	1 (1%)	15	53
40	j	85/87 (98%)	67 (79%)	16 (19%)	2 (2%)	6	36
41	k	75/77 (97%)	54 (72%)	19 (25%)	2 (3%)	5	34
42	l	48/50 (96%)	36 (75%)	11 (23%)	1 (2%)	7	39
43	m	50/52 (96%)	46 (92%)	4 (8%)	0	100	100
44	n	23/25 (92%)	22 (96%)	1 (4%)	0	100	100
45	o	103/105 (98%)	78 (76%)	25 (24%)	0	100	100
46	p	89/91 (98%)	78 (88%)	11 (12%)	0	100	100
48	q	204/206 (99%)	162 (79%)	39 (19%)	3 (2%)	10	45
49	r	212/214 (99%)	167 (79%)	41 (19%)	4 (2%)	8	40
50	s	215/217 (99%)	187 (87%)	27 (13%)	1 (0%)	29	67
51	t	221/223 (99%)	182 (82%)	37 (17%)	2 (1%)	17	55
52	u	258/260 (99%)	195 (76%)	61 (24%)	2 (1%)	19	58
53	v	204/206 (99%)	162 (79%)	41 (20%)	1 (0%)	29	67
54	w	221/223 (99%)	167 (76%)	47 (21%)	7 (3%)	4	31
55	x	182/184 (99%)	145 (80%)	34 (19%)	3 (2%)	9	44
56	y	184/199 (92%)	148 (80%)	36 (20%)	0	100	100
57	z	183/185 (99%)	147 (80%)	36 (20%)	0	100	100
58	AA	94/105 (90%)	76 (81%)	17 (18%)	1 (1%)	14	51
59	AB	151/153 (99%)	131 (87%)	18 (12%)	2 (1%)	12	48
60	AC	122/124 (98%)	93 (76%)	27 (22%)	2 (2%)	9	44
61	AD	148/150 (99%)	118 (80%)	27 (18%)	3 (2%)	7	40
62	AE	125/127 (98%)	104 (83%)	21 (17%)	0	100	100
63	AF	122/124 (98%)	89 (73%)	33 (27%)	0	100	100
64	AG	139/141 (99%)	111 (80%)	27 (19%)	1 (1%)	22	61
65	AH	116/125 (93%)	98 (84%)	17 (15%)	1 (1%)	17	55
66	AI	143/145 (99%)	117 (82%)	24 (17%)	2 (1%)	11	46
67	AJ	141/143 (99%)	126 (89%)	15 (11%)	0	100	100
68	AK	105/107 (98%)	90 (86%)	15 (14%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
69	AL	85/87 (98%)	64 (75%)	19 (22%)	2 (2%)	6	36
70	AM	127/129 (98%)	115 (91%)	11 (9%)	1 (1%)	19	58
71	AN	142/144 (99%)	108 (76%)	34 (24%)	0	100	100
72	AO	132/134 (98%)	115 (87%)	17 (13%)	0	100	100
73	AP	68/70 (97%)	52 (76%)	15 (22%)	1 (2%)	10	45
74	AQ	95/97 (98%)	70 (74%)	25 (26%)	0	100	100
75	AR	79/81 (98%)	58 (73%)	21 (27%)	0	100	100
76	AS	61/63 (97%)	49 (80%)	12 (20%)	0	100	100
77	AT	51/53 (96%)	48 (94%)	3 (6%)	0	100	100
78	AU	58/60 (97%)	42 (72%)	16 (28%)	0	100	100
79	AV	316/318 (99%)	252 (80%)	64 (20%)	0	100	100
80	AW	35/37 (95%)	21 (60%)	14 (40%)	0	100	100
81	AX	834/837 (100%)	676 (81%)	155 (19%)	3 (0%)	34	71
84	BA	202/204 (99%)	153 (76%)	47 (23%)	2 (1%)	15	53
All	All	12203/12421 (98%)	10189 (84%)	1938 (16%)	76 (1%)	29	63

5 of 76 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
39	i	98	ARG
40	j	65	ARG
42	l	30	ARG
48	q	113	ARG
54	w	68	LEU

### 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	
4	P0	160/160 (100%)	157 (98%)	3 (2%)	57	75
5	P2	81/81 (100%)	78 (96%)	3 (4%)	34	60

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	A	193/194 (100%)	190 (98%)	3 (2%)	62	79
7	B	321/322 (100%)	314 (98%)	7 (2%)	52	71
8	C	288/288 (100%)	281 (98%)	7 (2%)	49	69
9	D	244/244 (100%)	241 (99%)	3 (1%)	71	84
10	E	134/152 (88%)	128 (96%)	6 (4%)	27	55
11	F	186/186 (100%)	179 (96%)	7 (4%)	33	59
12	G	187/191 (98%)	186 (100%)	1 (0%)	88	93
13	H	171/171 (100%)	168 (98%)	3 (2%)	59	77
14	I	177/186 (95%)	176 (99%)	1 (1%)	86	92
15	J	147/147 (100%)	140 (95%)	7 (5%)	25	53
16	L	154/154 (100%)	145 (94%)	9 (6%)	20	48
17	M	107/107 (100%)	103 (96%)	4 (4%)	34	60
18	N	175/175 (100%)	167 (95%)	8 (5%)	27	54
19	O	160/160 (100%)	155 (97%)	5 (3%)	40	63
20	P	140/145 (97%)	137 (98%)	3 (2%)	53	72
21	Q	150/150 (100%)	146 (97%)	4 (3%)	44	66
22	R	153/153 (100%)	144 (94%)	9 (6%)	19	48
23	S	156/156 (100%)	152 (97%)	4 (3%)	46	67
24	T	136/136 (100%)	132 (97%)	4 (3%)	42	65
25	U	87/87 (100%)	86 (99%)	1 (1%)	73	85
26	V	103/104 (99%)	99 (96%)	4 (4%)	32	58
27	W	54/54 (100%)	53 (98%)	1 (2%)	57	75
28	X	104/105 (99%)	102 (98%)	2 (2%)	57	75
29	Y	109/109 (100%)	109 (100%)	0	100	100
30	Z	115/115 (100%)	113 (98%)	2 (2%)	60	78
31	a	118/118 (100%)	117 (99%)	1 (1%)	81	89
32	b	46/46 (100%)	44 (96%)	2 (4%)	29	56
33	c	81/81 (100%)	79 (98%)	2 (2%)	47	68
34	d	94/96 (98%)	94 (100%)	0	100	100
35	e	109/109 (100%)	109 (100%)	0	100	100
36	f	90/90 (100%)	88 (98%)	2 (2%)	52	71

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	g	95/95 (100%)	94 (99%)	1 (1%)	73	85
38	h	104/104 (100%)	101 (97%)	3 (3%)	42	65
39	i	81/81 (100%)	78 (96%)	3 (4%)	34	60
40	j	70/70 (100%)	69 (99%)	1 (1%)	67	81
41	k	68/68 (100%)	67 (98%)	1 (2%)	65	80
42	l	45/45 (100%)	42 (93%)	3 (7%)	16	44
43	m	47/47 (100%)	45 (96%)	2 (4%)	29	56
44	n	23/23 (100%)	21 (91%)	2 (9%)	10	35
45	o	90/90 (100%)	89 (99%)	1 (1%)	73	85
46	p	71/71 (100%)	70 (99%)	1 (1%)	67	81
48	q	164/173 (95%)	158 (96%)	6 (4%)	34	60
49	r	191/191 (100%)	187 (98%)	4 (2%)	53	72
50	s	176/176 (100%)	174 (99%)	2 (1%)	73	85
51	t	182/182 (100%)	176 (97%)	6 (3%)	38	62
52	u	221/221 (100%)	215 (97%)	6 (3%)	44	66
53	v	173/173 (100%)	166 (96%)	7 (4%)	31	57
54	w	189/191 (99%)	183 (97%)	6 (3%)	39	62
55	x	165/165 (100%)	161 (98%)	4 (2%)	49	69
56	y	150/160 (94%)	144 (96%)	6 (4%)	31	57
57	z	158/158 (100%)	155 (98%)	3 (2%)	57	75
58	AA	77/98 (79%)	76 (99%)	1 (1%)	69	82
59	AB	133/134 (99%)	127 (96%)	6 (4%)	27	55
60	AC	88/100 (88%)	87 (99%)	1 (1%)	73	85
61	AD	127/127 (100%)	123 (97%)	4 (3%)	40	63
62	AE	81/96 (84%)	77 (95%)	4 (5%)	25	52
63	AF	101/104 (97%)	96 (95%)	5 (5%)	24	52
64	AG	117/117 (100%)	116 (99%)	1 (1%)	78	88
65	AH	94/113 (83%)	90 (96%)	4 (4%)	29	56
66	AI	128/128 (100%)	124 (97%)	4 (3%)	40	63
67	AJ	115/115 (100%)	112 (97%)	3 (3%)	46	67
68	AK	100/100 (100%)	99 (99%)	1 (1%)	76	86

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
69	AL	74/74 (100%)	71 (96%)	3 (4%)	30	57
70	AM	110/110 (100%)	108 (98%)	2 (2%)	59	77
71	AN	119/119 (100%)	115 (97%)	4 (3%)	37	61
72	AO	112/112 (100%)	108 (96%)	4 (4%)	35	61
73	AP	61/61 (100%)	59 (97%)	2 (3%)	38	62
74	AQ	83/83 (100%)	80 (96%)	3 (4%)	35	61
75	AR	70/70 (100%)	70 (100%)	0	100	100
76	AS	56/56 (100%)	54 (96%)	2 (4%)	35	61
77	AT	47/47 (100%)	45 (96%)	2 (4%)	29	56
78	AU	51/51 (100%)	47 (92%)	4 (8%)	12	39
79	AV	259/261 (99%)	255 (98%)	4 (2%)	65	80
80	AW	31/31 (100%)	30 (97%)	1 (3%)	39	62
81	AX	708/709 (100%)	687 (97%)	21 (3%)	41	64
84	BA	185/185 (100%)	179 (97%)	6 (3%)	39	62
All	All	10320/10457 (99%)	10042 (97%)	278 (3%)	48	66

5 of 278 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
72	AO	102	LYS
76	AS	49	ARG
81	AX	310	ASP
24	T	83	ARG
23	S	48	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 124 such sidechains are listed below:

Mol	Chain	Res	Type
31	a	74	ASN
79	AV	17	ASN
48	q	140	ASN
78	AU	57	ASN
81	AX	186	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	3220/3396 (94%)	1076 (33%)	33 (1%)
2	3	120/121 (99%)	28 (23%)	3 (2%)
3	4	157/158 (99%)	47 (29%)	5 (3%)
47	2	1774/1797 (98%)	779 (43%)	38 (2%)
82	AY	75/76 (98%)	29 (38%)	0
83	AZ	6/7 (85%)	5 (83%)	2 (33%)
All	All	5352/5555 (96%)	1964 (36%)	81 (1%)

5 of 1964 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	4	U
1	1	6	A
1	1	14	U
1	1	15	C
1	1	17	G

5 of 81 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
47	2	706	A
47	2	1481	C
47	2	740	A
47	2	1181	U
47	2	1680	G

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

1 non-standard protein/DNA/RNA residue is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
81	DDE	AX	699	81	14,20,21	1.95	3 (21%)	14,28,30	1.82	5 (35%)

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
81	DDE	AX	699	81	-	6/20/21/23	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
81	AX	699	DDE	CBI-NAD	5.57	1.46	1.32
81	AX	699	DDE	CAT-CE1	3.11	1.54	1.50
81	AX	699	DDE	OAG-CBI	-2.23	1.19	1.23

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
81	AX	699	DDE	CAC-NCB-CAB	3.78	118.43	108.10
81	AX	699	DDE	OAG-CBI-NAD	-2.91	117.94	123.00
81	AX	699	DDE	CBW-CBI-NAD	2.64	118.64	115.28
81	AX	699	DDE	OAG-CBI-CBW	2.31	123.41	120.49
81	AX	699	DDE	CG-ND1-CE1	2.07	109.17	103.05

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
81	AX	699	DDE	N-CA-CB-CG
81	AX	699	DDE	C-CA-CB-CG
81	AX	699	DDE	CAU-CAT-CE1-ND1
81	AX	699	DDE	CAT-CAU-CBW-CBI
81	AX	699	DDE	OAG-CBI-CBW-CAU

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 9 ligands modelled in this entry, 8 are monoatomic - leaving 1 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
86	GCP	AX	901	-	27,34,34	1.05	3 (11%)	34,54,54	2.18	8 (23%)

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
86	GCP	AX	901	-	-	5/15/38/38	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
86	AX	901	GCP	C6-N1	2.91	1.38	1.33
86	AX	901	GCP	PG-O1G	2.20	1.54	1.50
86	AX	901	GCP	PG-O3G	-2.11	1.50	1.54

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
86	AX	901	GCP	C5-C6-N1	-7.92	112.59	123.43
86	AX	901	GCP	C2-N1-C6	5.66	124.92	115.93
86	AX	901	GCP	O1B-PB-C3B	4.06	119.81	109.07
86	AX	901	GCP	N3-C2-N1	-3.06	123.14	127.22
86	AX	901	GCP	O1G-PG-C3B	-2.70	105.42	111.24

There are no chirality outliers.

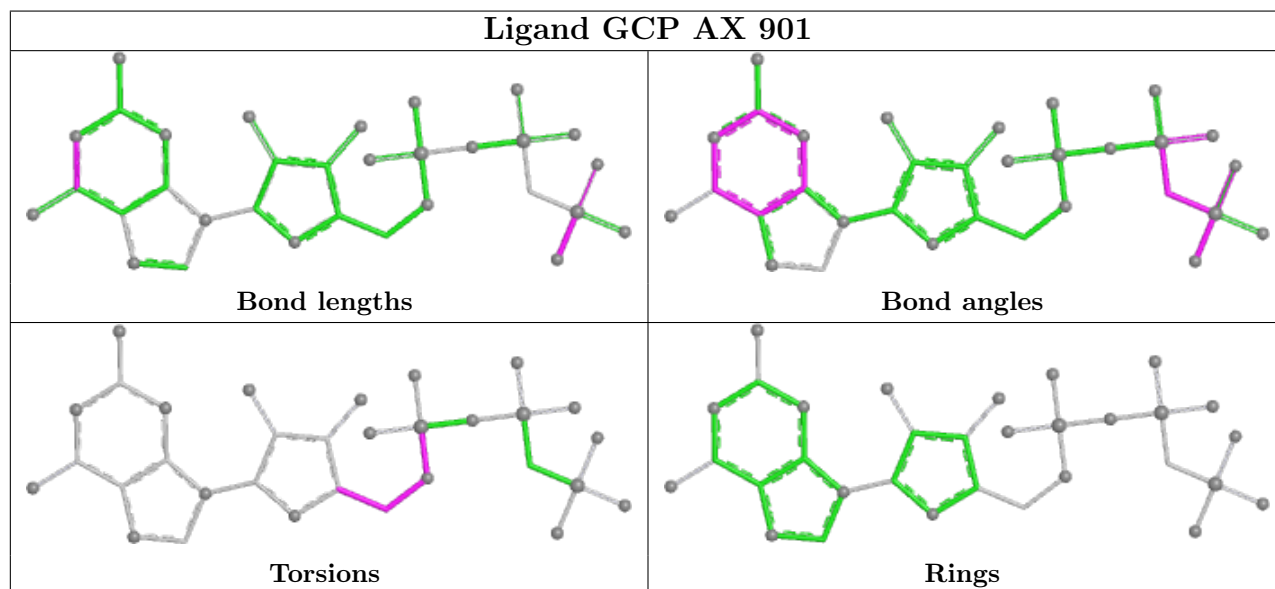
All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
86	AX	901	GCP	C5'-O5'-PA-O1A
86	AX	901	GCP	C5'-O5'-PA-O2A
86	AX	901	GCP	C4'-C5'-O5'-PA
86	AX	901	GCP	C5'-O5'-PA-O3A
86	AX	901	GCP	C3'-C4'-C5'-O5'

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

There are no chain breaks in this entry.

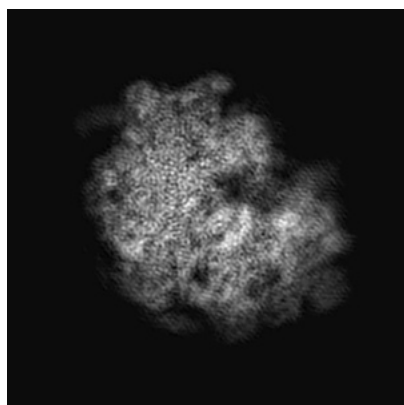
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0049. These allow visual inspection of the internal detail of the map and identification of artifacts.

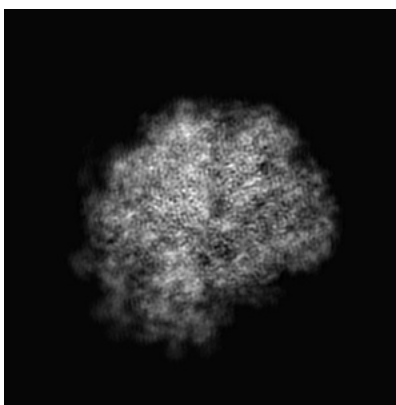
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

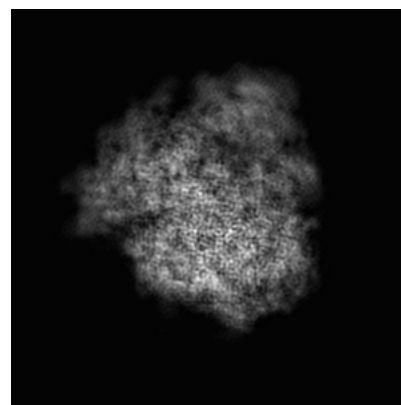
#### 6.1.1 Primary map



X



Y

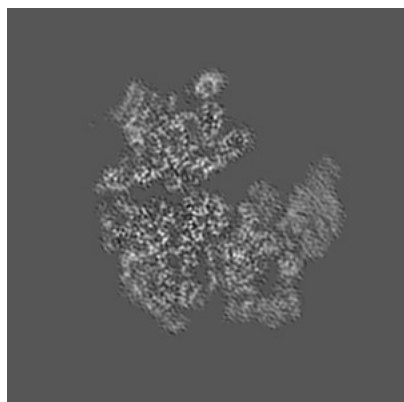


Z

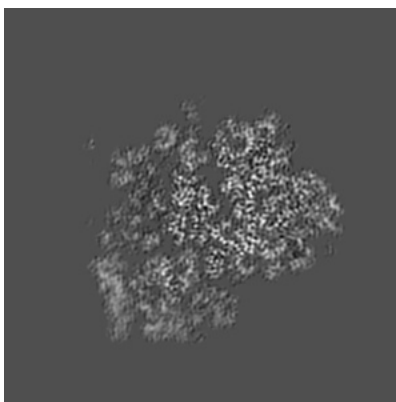
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

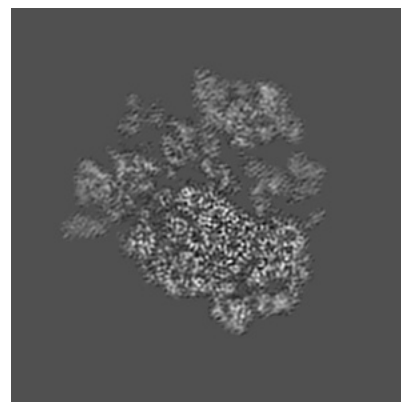
#### 6.2.1 Primary map



X Index: 180



Y Index: 180



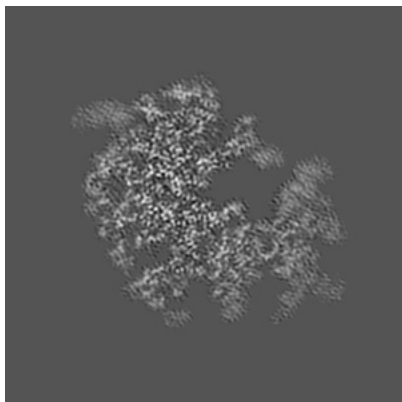
Z Index: 180



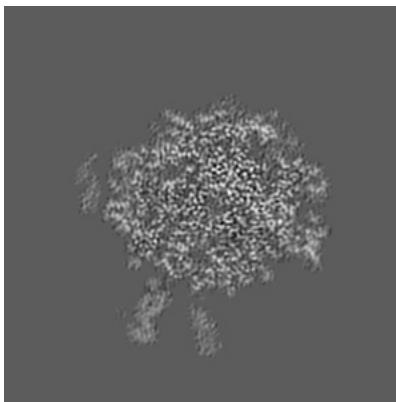
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

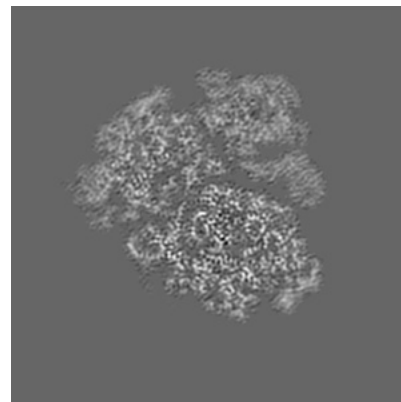
### 6.3.1 Primary map



X Index: 194



Y Index: 158



Z Index: 166

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

## 6.4 Orthogonal surface views [i](#)

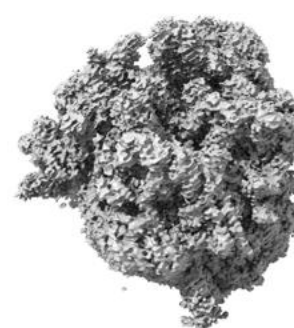
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.033. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

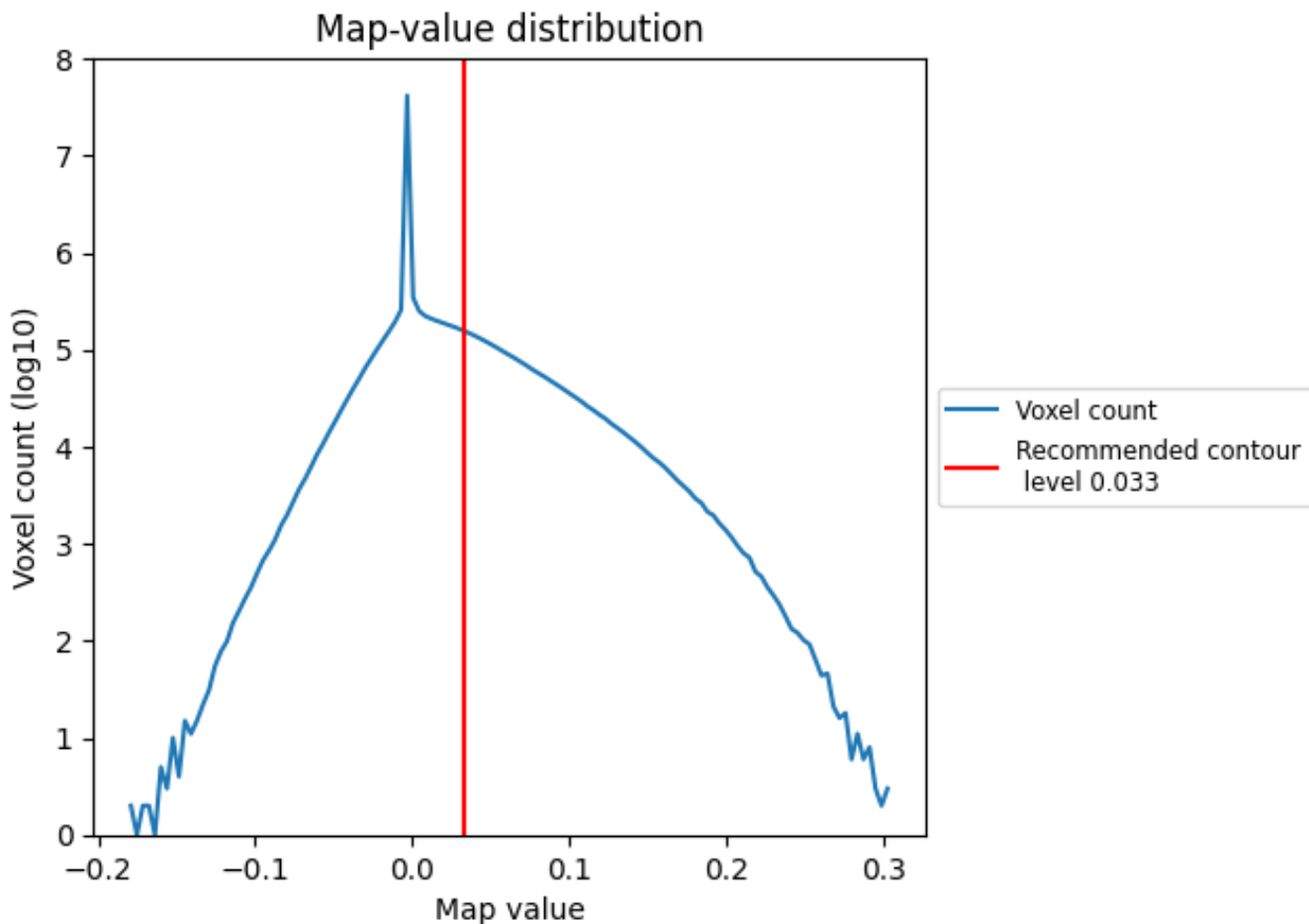
## 6.5 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

## 7 Map analysis [i](#)

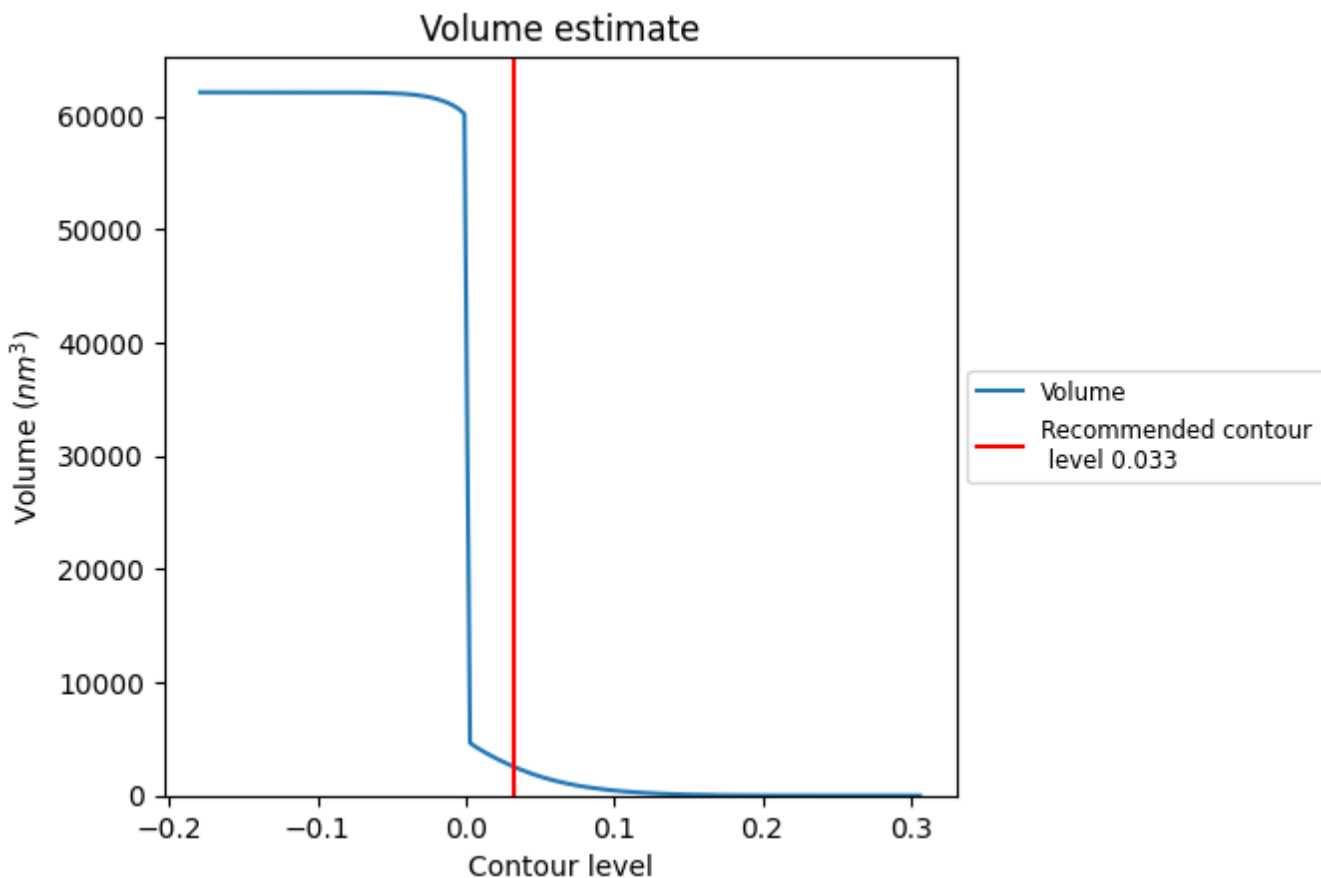
This section contains the results of statistical analysis of the map.

### 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.

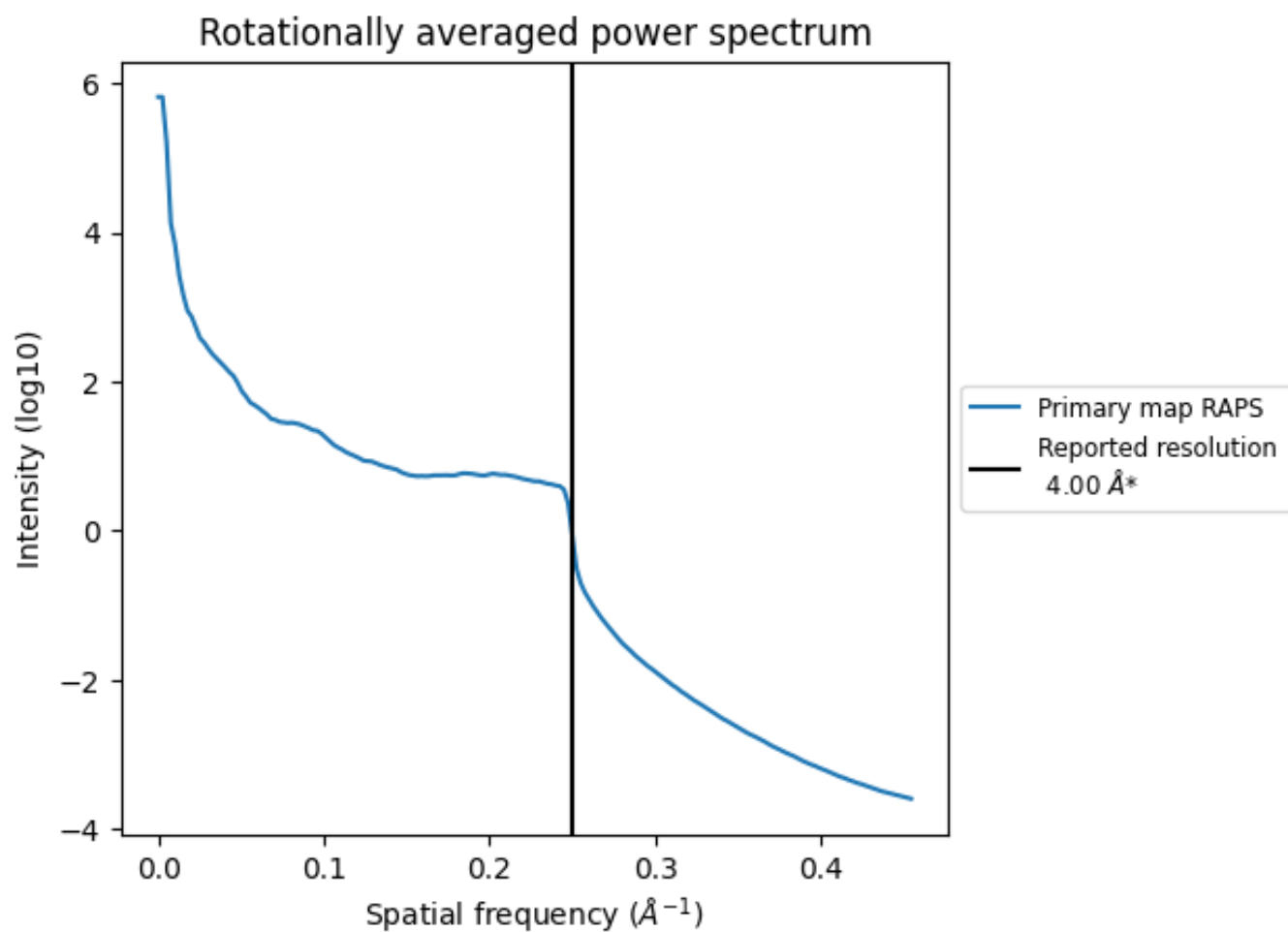
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 2513 nm<sup>3</sup>; this corresponds to an approximate mass of 2270 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  $0.250 \text{\AA}^{-1}$

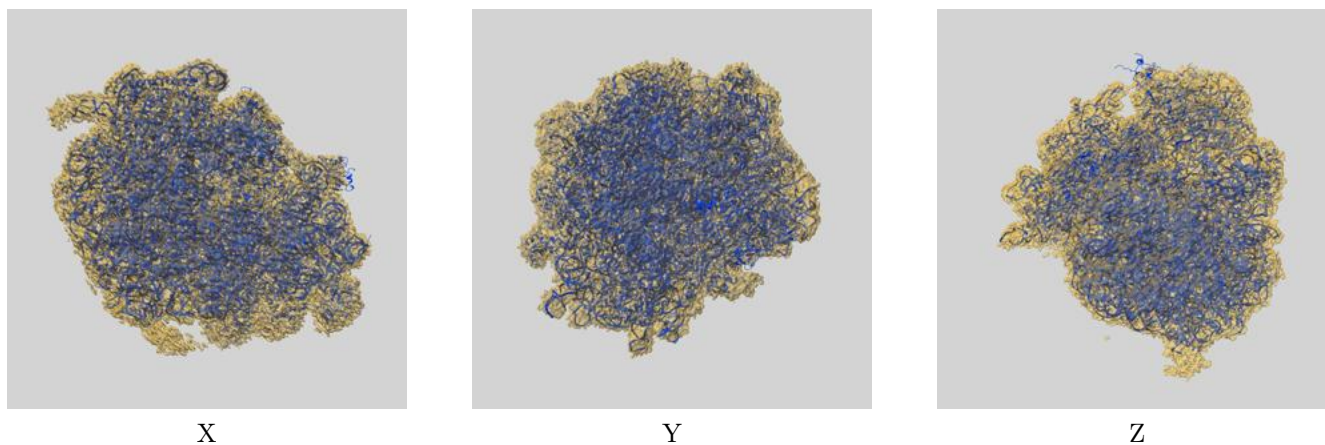
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

## 9 Map-model fit [i](#)

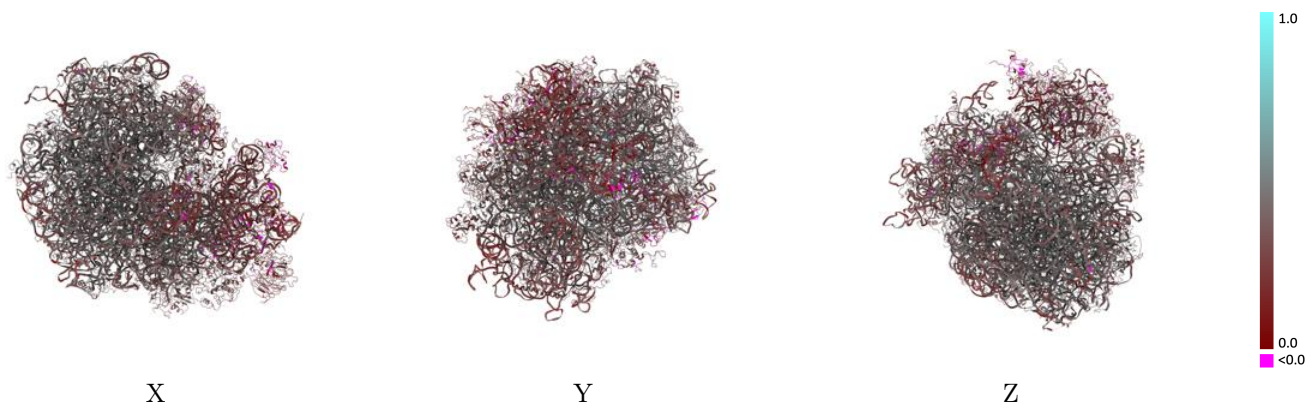
This section contains information regarding the fit between EMDB map EMD-0049 and PDB model 6GQV. Per-residue inclusion information can be found in section [3](#) on page [21](#).

### 9.1 Map-model overlay [i](#)



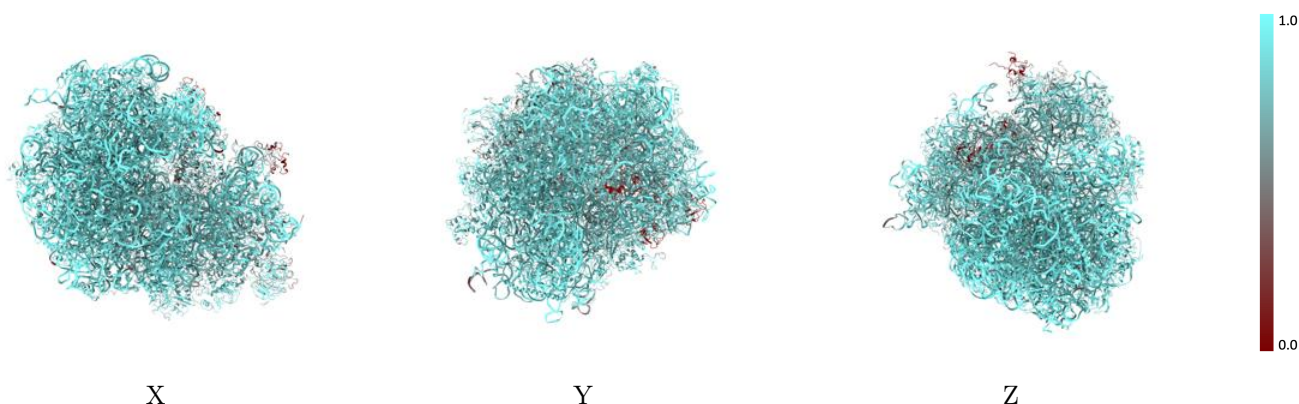
The images above show the 3D surface view of the map at the recommended contour level 0.033 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

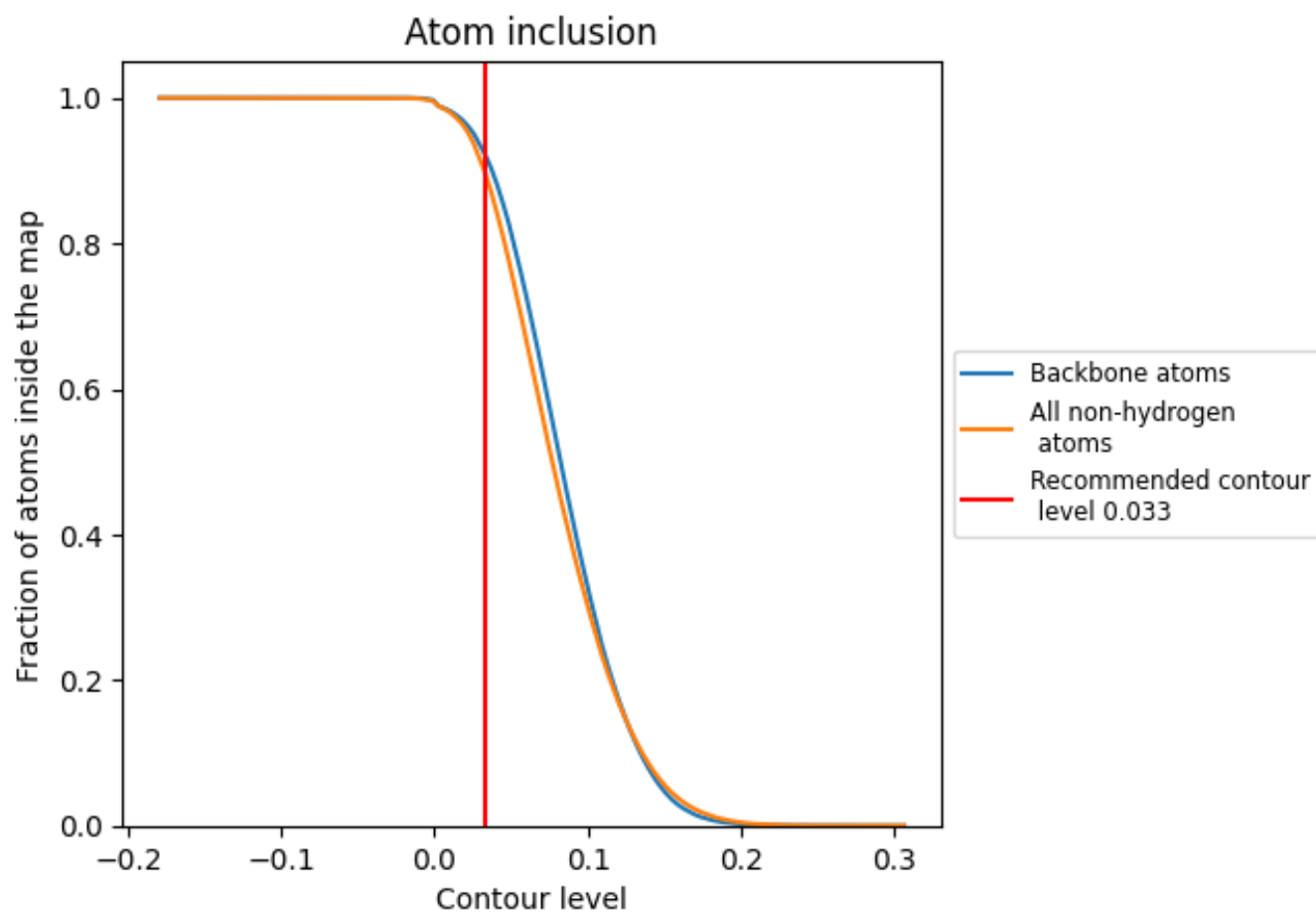
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.033).









































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 90% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary





















































































The table lists the average atom inclusion at the recommended contour level (0.033) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8971	 0.3780
1	 0.9617	 0.4060
2	 0.9300	 0.3390
3	 0.9810	 0.3960
4	 0.9708	 0.4200
A	 0.8625	 0.4620
AA	 0.8668	 0.2720
AB	 0.7906	 0.3950
AC	 0.2455	 0.1250
AD	 0.8667	 0.3920
AE	 0.8886	 0.3890
AF	 0.8082	 0.2840
AG	 0.7618	 0.2500
AH	 0.7467	 0.2820
AI	 0.7790	 0.2900
AJ	 0.8076	 0.2680
AK	 0.6881	 0.2810
AL	 0.8283	 0.3480
AM	 0.8547	 0.4190
AN	 0.8108	 0.4140
AO	 0.8751	 0.3220
AP	 0.6252	 0.2320
AQ	 0.8554	 0.3750
AR	 0.8738	 0.3780
AS	 0.6373	 0.2470
AT	 0.8703	 0.3180
AU	 0.8105	 0.3710
AV	 0.7495	 0.2590
AW	 0.6643	 0.2630
AX	 0.7636	 0.3440
AY	 0.8383	 0.2940
AZ	 0.4444	 0.3240
B	 0.8997	 0.4470
BA	 0.6631	 0.2530
C	 0.9278	 0.4430



















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Chain	Atom inclusion	Q-score
D	 0.9010	 0.3750
E	 0.9093	 0.4020
F	 0.9024	 0.4280
G	 0.9018	 0.4100
H	 0.8785	 0.4080
I	 0.8959	 0.4300
J	 0.8662	 0.3700
L	 0.9233	 0.4270
M	 0.9103	 0.4030
N	 0.9071	 0.4580
O	 0.8996	 0.4250
P	 0.8983	 0.4500
P0	 0.2763	 0.1750
P2	 0.3047	 0.1930
Q	 0.9147	 0.4480
R	 0.9013	 0.4200
S	 0.9066	 0.4280
T	 0.8935	 0.4360
U	 0.8977	 0.3800
V	 0.8318	 0.4470
W	 0.8491	 0.4290
X	 0.8917	 0.4150
Y	 0.9172	 0.4220
Z	 0.9048	 0.4140
a	 0.9256	 0.4490
b	 0.8916	 0.4260
c	 0.8960	 0.4210
d	 0.8821	 0.4400
e	 0.8934	 0.4460
f	 0.9001	 0.4490
g	 0.8813	 0.4480
h	 0.8908	 0.4170
i	 0.9060	 0.4080
j	 0.9284	 0.4760
k	 0.8614	 0.3850
l	 0.8843	 0.4430
m	 0.8936	 0.4490
n	 0.7877	 0.4600
o	 0.8770	 0.4430
p	 0.8478	 0.4440
q	 0.8607	 0.3510
r	 0.8987	 0.3770

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Chain	Atom inclusion	Q-score
s	 0.8626	 0.4010
t	 0.7253	 0.2790
u	 0.8774	 0.3550
v	 0.7479	 0.2720
w	 0.8767	 0.3310
x	 0.8423	 0.3220
y	 0.8419	 0.3460
z	 0.8877	 0.3620