



wwPDB EM Validation Summary Report ⓘ

Dec 10, 2022 – 09:35 am GMT

PDB ID : 5AA0
EMDB ID : EMD-6397
Title : Complex of Thermosus thermophilus ribosome (A-and P-site tRNA) bound to BipA-GDPCP
Authors : Kumar, V.; Chen, Y.; Ahmed, T.; Tan, J.; Ero, R.; Bhushan, S.; Gao, Y.-G.
Deposited on : 2015-07-23
Resolution : 5.00 Å(reported)
Based on initial model : 4V4Y

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

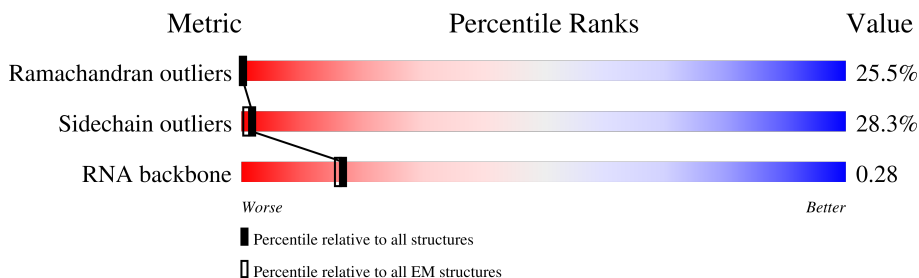
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance

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

The reported resolution of this entry is 5.00 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 ≥ 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	AA	2889	
2	AB	123	
3	AC	228	
4	AD	272	
5	AE	206	
6	AF	208	
7	AG	182	
8	AH	174	








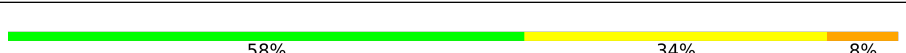
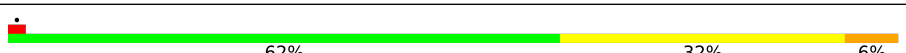
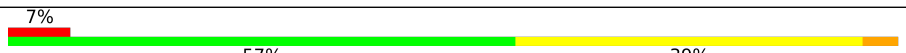
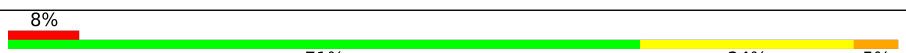


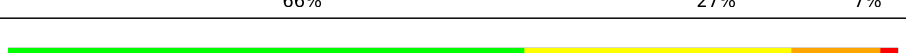
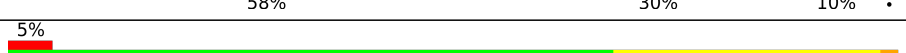

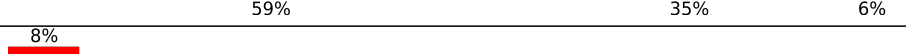
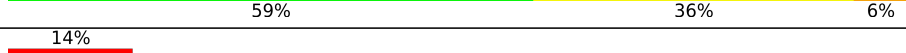





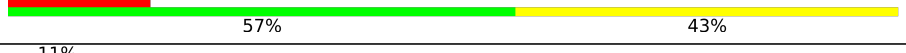
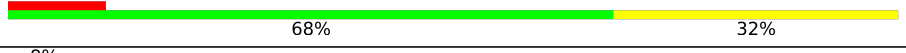
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Mol	Chain	Length	Quality of chain
9	AK	139	41% 50% 9%
10	AL	122	6% 45% 44% 11%
11	AM	145	9% 44% 47% 8%
12	AN	136	38% 50% 11%
13	AO	117	66% 26% 9%
14	AP	110	53% 41% 5%
15	AQ	117	5% 42% 44% 14%
16	AR	117	57% 35% 8%
17	AS	101	50% 39% 11%
18	AT	110	60% 36% 4%
19	AU	94	63% 34% 3%
20	AV	110	15% 53% 45% 7%
21	AW	180	45% 59% 34% 7%
22	AX	85	15% 71% 27% 7%
23	AY	67	64% 31% 5%
24	AZ	59	5% 51% 44% 5%
25	Aa	71	37% 46% 15%
26	Ab	57	5% 37% 49% 12%
27	Ac	49	24% 53% 22%
28	Ad	49	53% 37% 10%
29	Ae	64	50% 42% 8%
30	Af	37	62% 32% 5%
31	AI	153	45% 80% 20% 5%
32	AJ	134	16% 59% 30% 11%
33	Ag	128	96% 100%

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Mol	Chain	Length	Quality of chain
34	BA	1515	 56% 37% 6%
35	BF	234	 51% 37% 12%
36	BG	206	 60% 35%
37	BH	208	 56% 38% 6%
38	BI	150	 65% 33%
39	BJ	101	 55% 38% 7%
40	BK	155	 63% 29% 8%
41	BL	138	 58% 34% 8%
42	BM	127	 62% 32% 6%
43	BN	98	 57% 39%
44	BO	119	 71% 24% 5%
45	BP	124	 52% 40% 7%
46	BQ	114	 66% 27% 7%
47	BR	60	 58% 30% 10%
48	BS	88	 68% 30%
49	BT	83	 59% 35% 6%
50	BU	104	 59% 36% 6%
51	BV	73	 62% 27% 11%
52	BW	80	 51% 42% 6%
53	BX	99	 58% 38%
54	BY	24	 71% 21% 8%
55	BC	76	 66% 34%
56	BD	75	 57% 43%
56	BE	75	 68% 32%
57	BZ	605	 59% 34% 6%

2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 155482 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 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	AA	2889	62218	27691	11629	20009	2889	0	0

There are 23 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	A	deletion	GB 37223181
AA	?	-	A	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	A	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	G	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	?	-	C	deletion	GB 37223181
AA	1134	G	UNK	conflict	GB 37223181

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	AB	123	2641	1175	488	855	123	0	0

- Molecule 3 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	AC	228	1742	1102	318	319	3	0	0

- Molecule 4 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	AD	272	2124	1339	424	358	3	0	0

- Molecule 5 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	AE	206	1578	997	302	273	6	0	0

- Molecule 6 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	AF	208	1625	1034	303	286	2	0	0

- Molecule 7 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	AG	182	1482	947	269	261	5	0	0

- Molecule 8 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	AH	174	1328	844	248	235	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	AK	139	1113	717	207	186	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	AL	122	932	587	171	170	4	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	AM	145	1106	688	226	190	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	AN	136	1080	688	204	183	5	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	AO	117	960	599	202	159	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	AP	110	877	553	175	149	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	AQ	117	976	614	197	164	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
16	AR	117	Total	C	N	O	S	0	0
			964	610	202	151	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
17	AS	101	Total	C	N	O	S	0	0
			779	501	142	135	1		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
18	AT	110	Total	C	N	O	S	0	0
			876	552	171	151	2		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
19	AU	94	Total	C	N	O	0	0
			742	483	133	126		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
20	AV	110	Total	C	N	O	S	0	0
			844	539	158	141	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
21	AW	180	Total	C	N	O	S	0	0
			1435	916	256	260	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	AX	85	Total	C	N	O	S	0	0
			670	415	141	112	2		

- Molecule 23 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	AY	67	567	350	116	99	2	0	0

- Molecule 24 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	AZ	59	469	298	90	81	0	0

- Molecule 25 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	Aa	71	581	364	108	104	5	0	0

- Molecule 26 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Ab	57	445	279	87	74	5	0	0

- Molecule 27 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	Ac	49	426	265	87	70	4	0	0

- Molecule 28 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	Ad	49	430	263	108	57	2	0	0

- Molecule 29 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Ae	64	515	331	102	79	3	0	0

- Molecule 30 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Af	37	Total	C	N	O	S	0	0
			307	188	68	47	4		

- Molecule 31 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	AI	153	Total	C	N	O	0	0
			752	446	153	153		

- Molecule 32 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	AJ	134	Total	C	N	O	S	0	0
			993	632	175	181	5		

- Molecule 33 is a protein called Unknown peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	Ag	128	Total	C	N	O	0	5
			620	369	128	123		

- Molecule 34 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	BA	1515	Total	C	N	O	P	0	0
			32554	14490	6022	10527	1515		

- Molecule 35 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	BF	234	Total	C	N	O	S	0	0
			1900	1213	341	341	5		

- Molecule 36 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	BG	206	Total	C	N	O	S	0	0
			1612	1016	314	281	1		

- Molecule 37 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	BH	208	1703	1066	339	291	7	0	0

- Molecule 38 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	BI	150	1146	724	217	201	4	0	0

- Molecule 39 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	BJ	101	843	531	155	154	3	0	0

- Molecule 40 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	BK	155	1257	781	252	218	6	0	0

- Molecule 41 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	BL	138	1116	705	215	193	3	0	0

- Molecule 42 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
42	BM	127	1010	639	197	174	0	0

- Molecule 43 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	BN	98	794	499	156	138	1	0	0

- Molecule 44 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	BO	119	Total	C	N	O	S	0	0
			885	549	168	165	3		

- Molecule 45 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	BP	124	Total	C	N	O	S	0	0
			970	611	195	163	1		

- Molecule 46 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	BQ	114	Total	C	N	O	S	0	0
			914	565	189	158	2		

- Molecule 47 is a protein called 30S ribosomal protein S14 type Z.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	BR	60	Total	C	N	O	S	0	0
			492	312	104	72	4		

- Molecule 48 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	BS	88	Total	C	N	O	S	0	0
			734	459	147	126	2		

- Molecule 49 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	BT	83	Total	C	N	O	S	0	0
			700	443	139	117	1		

- Molecule 50 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	BU	104	Total	C	N	O	S	0	0
			857	547	161	147	2		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BU	96	GLN	GLU	conflict	UNP Q5SHP7

- Molecule 51 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
51	BV	73	597	380	118	99	0	0

- Molecule 52 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	BW	80	647	414	119	112	2	0	0

- Molecule 53 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	BX	99	763	470	162	129	2	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
54	BY	24	208	128	50	30	0	0

- Molecule 55 is a RNA chain called tRNA chain 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
55	BC	76	1619	723	290	531	75	0	0

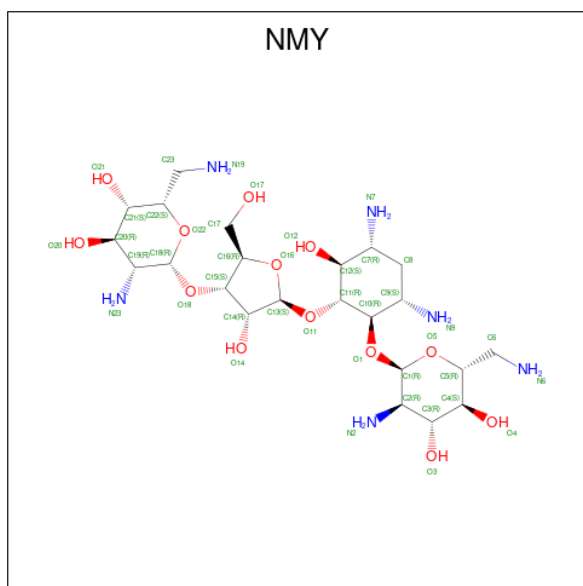
- Molecule 56 is a RNA chain called tRNA chain 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
56	BD	75	1597	713	285	525	74	0	0
56	BE	75	1597	713	285	525	74	0	0

- Molecule 57 is a protein called GTP-binding protein.

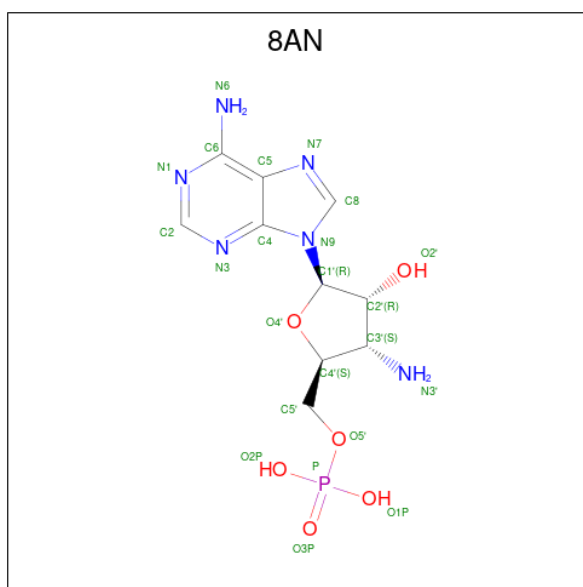
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	BZ	605	4610	2902	807	883	18	0	0

- Molecule 58 is NEOMYCIN (three-letter code: NMY) (formula: $C_{23}H_{46}N_6O_{13}$).



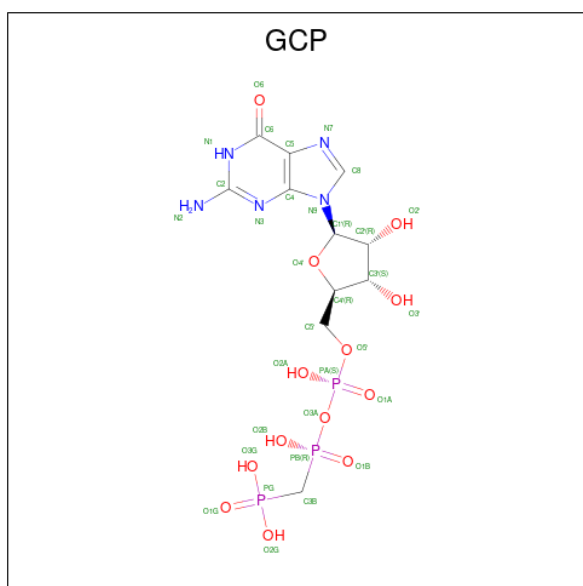
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
58	AA	1	42	23	6	13	0
58	BA	1	42	23	6	13	0

- Molecule 59 is 3'-amino-3'-deoxyadenosine 5'-(dihydrogen phosphate) (three-letter code: 8AN) (formula: $C_{10}H_{15}N_6O_6P$).



Mol	Chain	Residues	Atoms					AltConf
59	AA	1	Total	C	N	O	P	0
			44	20	12	10	2	
59	AA	1	Total	C	N	O	P	0
			44	20	12	10	2	

- Molecule 60 is PHOSPHOMETHYLPHOSPHONIC ACID GUANYLATE ESTER (three-letter code: GCP) (formula: $C_{11}H_{18}N_5O_{13}P_3$).

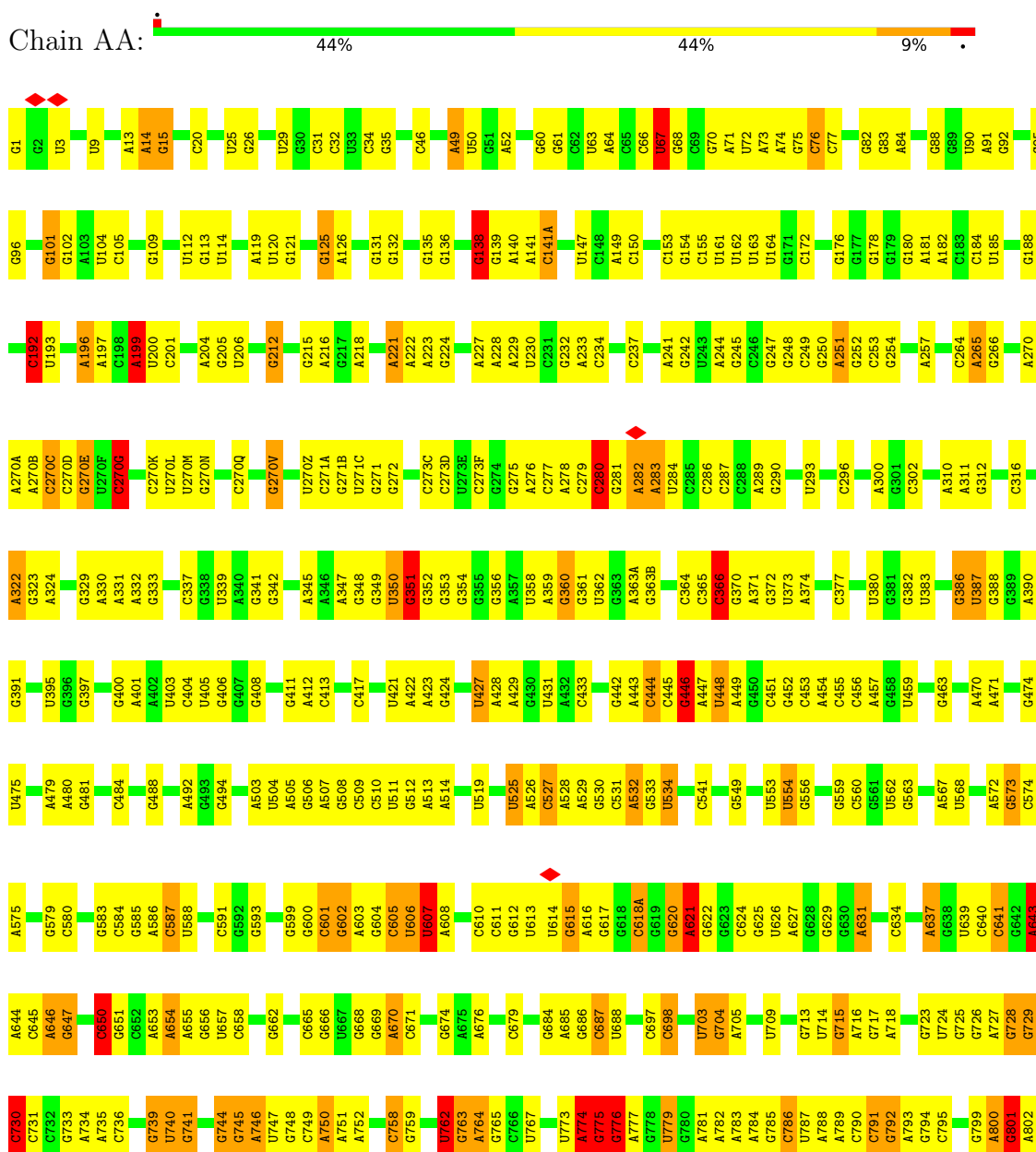


Mol	Chain	Residues	Atoms					AltConf
60	BZ	1	Total	C	N	O	P	0
			32	11	5	13	3	

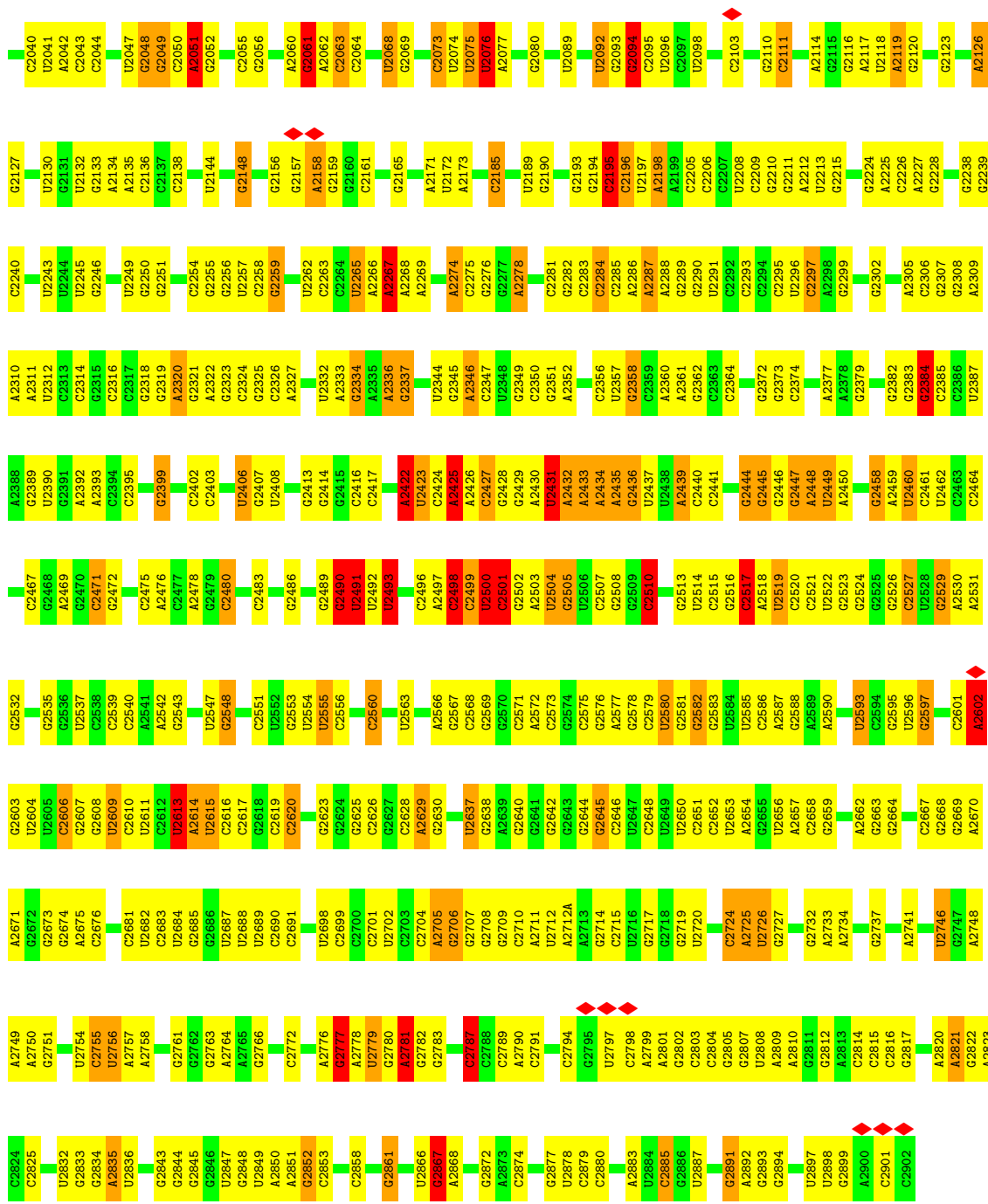
3 Residue-property plots [i](#)

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.

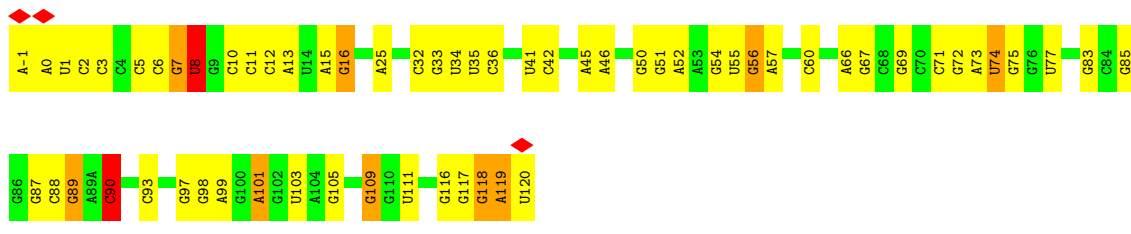
- Molecule 1: 23S ribosomal RNA



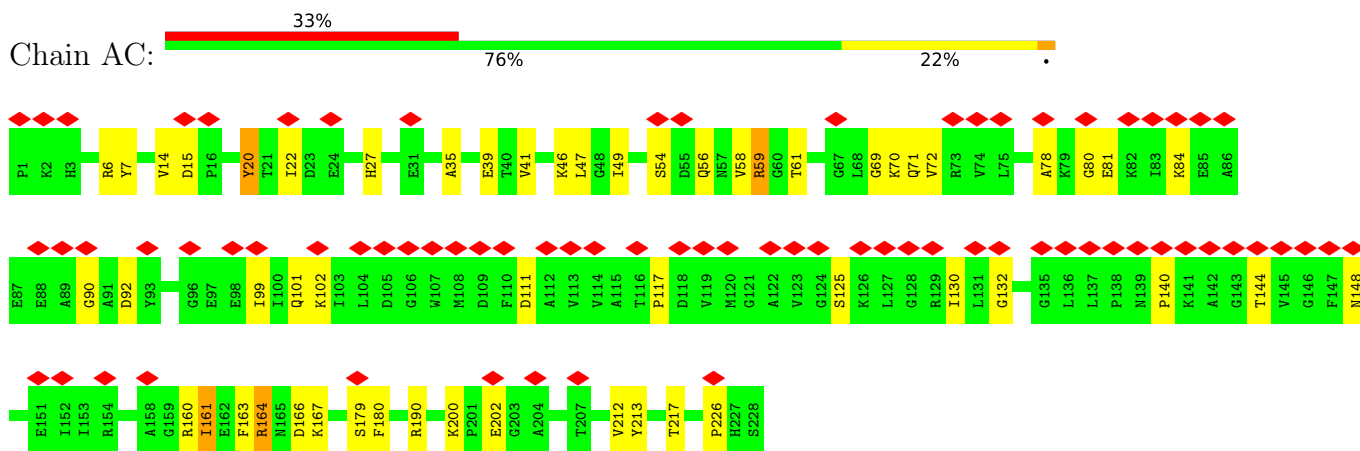
U1956	C1858	U1777	A1616	U1688	A1616	U1541	A1471	U1372	C1200	C1109	G1043	C965	U803
C1987	C1878	U1778	C1617	U1689	C1617	G1542	A1472	A1378	C1201	G1110	G1042	C965	A804
C1988	C1879	U1779	C1618	U1690	C1618	G1543	A1473	A1379	C1202	A1111	C1043	U969	G805
C1989	C1880	U1780	C1619	U1691	C1619	G1544	A1474	A1384	G1203	G1112	G1044	U969	C806
G1983	C1881	C1782	G1623	U1692	G1623	G1552	A1477	A1388	A1204	U1113	A1045	C971	U807
G1984	A1884	A1783	G1624	A1698	G1624	G1553	A1478	A1392	G1205	C1116	A1046	C972	U811
C1966	A1784	A1785	C1625	U1699	C1625	G1554	G1479	A1398	C1207	A1126	A1047	A973	C812
C1967	A1786	A1786	C1626	U1700	C1626	G1555	G1480	A1399	C1208	A1127	A1048	A974	C816
G1968	A1790	A1700	C1627	A1701	C1627	G1558	G1482	A1393	G1209	A1128	A1050	A899	A899
A1969	C1790	G1702	C1628	U1702	C1628	G1559	A1482	A1393	A1210	A1129	G1051	A900	A899
G1970	A1791	G1703	A1631	G1703	A1631	G1560	G1485	U1394	G1211	C976	C1052	A901	A899
A1971	C1792	G1704	A1634	U1704	A1634	G1561	U1488	A1395	G1212	U1130	C1053	C902	A899
A1972	C1793	U1705	A1634	U1705	A1634	G1562	U1489	U1396	A1213	G1131	G1056	G963	A821
A1977	U1794	U1706	G1635	U1706	G1635	G1564	A1489	U1397	A1220	U1132	A1057	C904	U822
A1978	U1798	G1707	G1636	U1707	G1636	G1565	A1490	A1301	A1221	U1133	A1058	U905	G823
C1979	G1799	U1708	C1640	U1708	C1640	G1566	G1491	A1302	C1222	G1134	G1059	G906	A824
G1980	C1800	C1710	A1641	U1709	A1641	G1567	C493	G1303	C1225	C1135	C982	U907	A824
A1981	A1801	C1711	C1644	C1711	C1644	G1568	A1494	C1304	C1226	C1140	U1061	C908	U827
C1982	A1802	U1712	G1645	A1569	G1645	G1569	A1495	G1310	C1228	U1141	U1062	A909	U828
C1983	A1803	U1716	C1646	A1570	C1646	G1571	A1496	G1311	G1229	U1142	C985	A910	A829
G1984	U1917	G1717	G1647	A1572	C1647	G1572	U1497	U1312	C1230	A1142	C986	A911	G830
G1985	U1805	G1718	G1648	G1573	C1648	G1573	C1498	U1313	C1231	A143	C987	C912	G831
G1989	U1808	G1725	G1649	C1574	G1649	G1574	C1499	U1321	C1232	G1154	U1065	C913	G832
G1992	U1809	U1726	G1650	U1575	G1650	G1575	A1507	A1322	A1237	G1155	U1066	C914	U833
U1993	A1810	U1727	G1651	A1576	G1651	G1576	A1508	U1323	G1238	A1156	U1067	C915	C834
C1924	A1811	G1728	G1652	C1577	G1652	G1577	C1509	G1324	C1239	G1157	A1069	C924	A835
A1927	A1815	A1730	A1654	A1578	C1578	G1578	C1510	A1241	A1241	G1157	A1070	C924	G843
A1927	G1817	U1730	A1655	A1579	C1579	G1579	A1511	G1325	A1242	G1157	A1071	C924	G844
A1928	G1818	C1731	A1656	A1580	C1580	G1580	A1512	U1326	G1243	G1160	C1072	C924	G845
A1929	A1819	A1732	C1657	A1581	C1657	G1581	A1513	U1327	G1244	G1161	A1073	C924	G846
A1930	A1818	G1733	C1658	A1582	C1658	G1582	U1514	G1328	G1244	G1162	G1074	C924	U847
A1931	A1820	C1734	C1659	A1583	C1659	G1583	A1427	C1330	A1247	G1169	C1076	C924	G848
U1931	U1931	C1735	C1660	A1584	C1660	G1584	A1428	U1335	U1249	G1170	A1077	C924	U858
A1932	A1821	G1741	G1661	A1585	C1661	G1585	G1429	U1340	U1250	G1171	A1078	C924	G859
A1932	G1822	C1742	G1661	A1587	C1661	G1587	G1429	U1341	G1252	G1173	C1079	C924	U860
A2005	G1826	G1743	A1664	U1590	C1664	G1590	U1438	U1342	G1253	G1174	C1080	A933	A851
A2014	G1827	G1746	A1664	G1591	C1664	G1591	U1439	U1343	A1253	U1175	U1083	A933	C865
A2015	G1828	G1747	G1667	G1592	C1667	G1592	G1440	G1343	A1254	U1176	A1084	G959	U868
U2017	A1829	A1755	A1668	A1597	C1668	G1597	A1441A	G1344	U1255	U1177	A1085	G940	U869
G2018	C1830	G1756	A1669	U1600	C1669	G1600	C1445	G1345	G1256	U1178	A1086	A941	G874
A2019	G1831	U1757	C1670	G1601	C1670	G1601	G1450	G1346	C1257	C1180	G1087	G942	A870
A2020	U1834	U1758	U1673	G1602	C1673	G1602	C1451	U1347	G1258	C1181	A1088	U943	G874
C2021	U1839	A1759	G1674	U1603	C1674	G1603	C1452	G1348	G1259	A1182	G1022	U943	G875
C2022	G1840	U1762	A1675	A1604	C1675	G1604	A1529	A1349	G1260	G1183	U1023	A945	G875
C2023	U1944	G1763	A1676	C1605	C1676	G1605	U1454	G1350	G1261	G1184	G1091	A945	G875
U1945	G1945	G1764	A1677	G1606	C1677	G1606	G1455	C1351	A1262	C1185	C1092	G950	A878
U1946	C1843	C1765	G1678	G1607	C1678	G1607	G1456	U1357	U1263	G1186	G1093	U950	G879
C1947	A1847	U1766	G1681	A1608	C1679	G1608	G1459	G1358	G1264	A1027	A1027	G880	G880
G1950	A1848	U1767	G1682	A1609	C1682	G1609	U1460	A1359	A1265	A1189	G1099	C955	G881
U1951	C1882	U1768	G1683	A1610	C1683	G1610	G1461	A1363	G1266	G1190	G1100	G956	G882
A1952	C1882	A1773	C1684	G1612	C1684	G1612	C1462	G1363	A1267	G1191	U1101	G957	G883
A2033	A1953	C1774	C1685	G1613	C1685	G1613	C1463	A1365	U1268	A1194	C1102	U958	C884
U2034	G1954	U1775	C1686	A1614	C1686	G1614	C1467	A1366	C1270	G1195	A1103	A959	C885
G2035	U1955	G1857	G1687	C1615	C1687	G1615	C1468	A1367	G1271	U1199	C1104	A960	C886
											U1108	C1038	A887
												C1040	C888



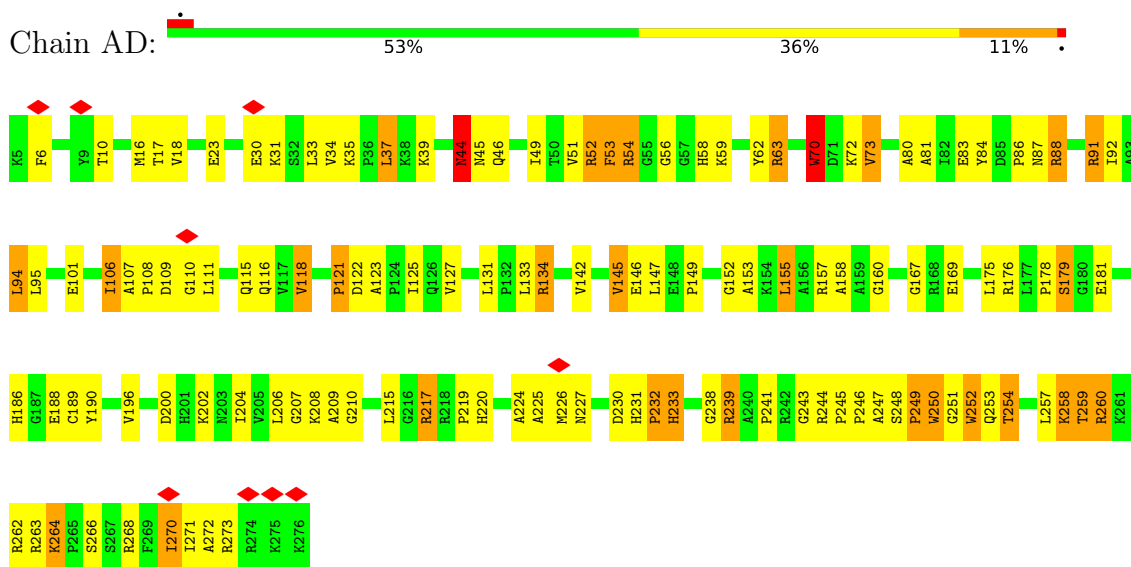
• Molecule 2: 5S ribosomal RNA



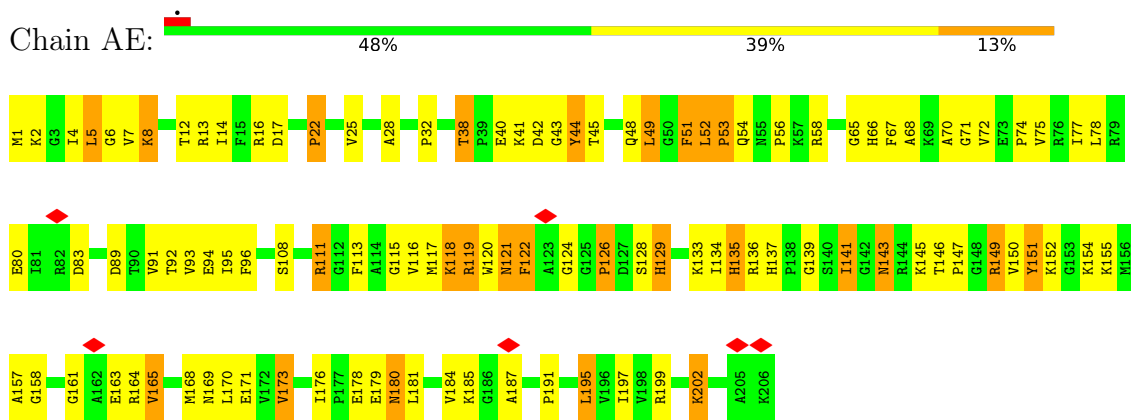
• Molecule 3: 50S ribosomal protein L1



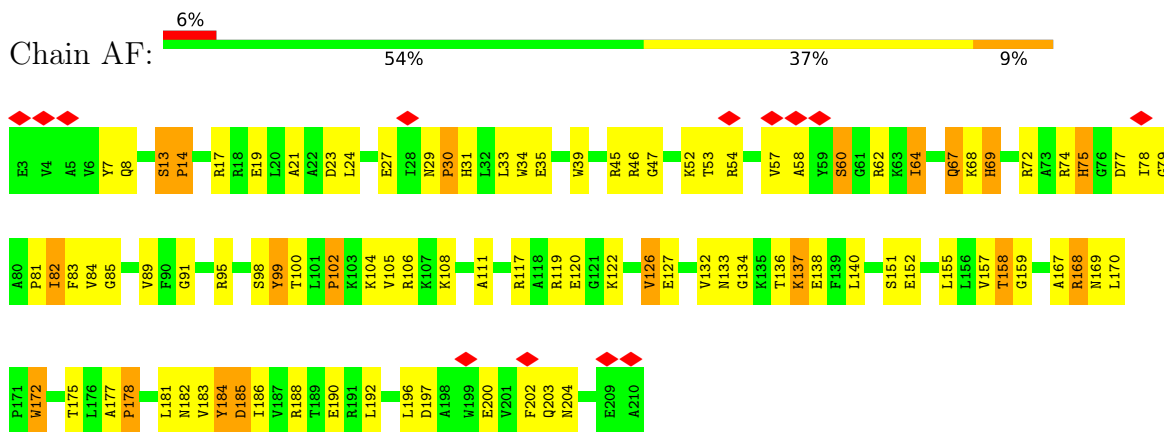
• Molecule 4: 50S ribosomal protein L2



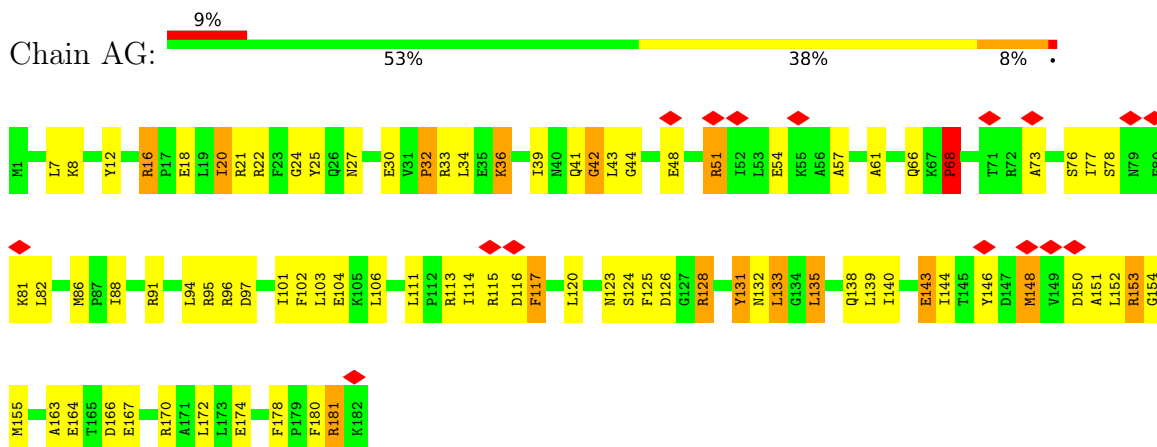
• Molecule 5: 50S ribosomal protein L3



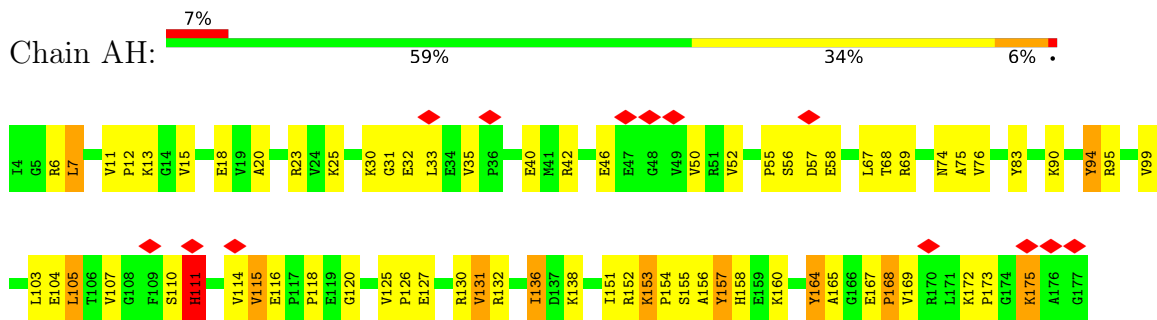
• Molecule 6: 50S ribosomal protein L4



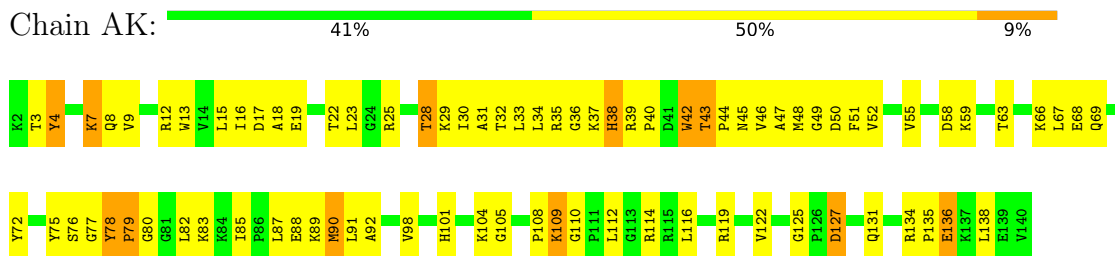
- Molecule 7: 50S ribosomal protein L5



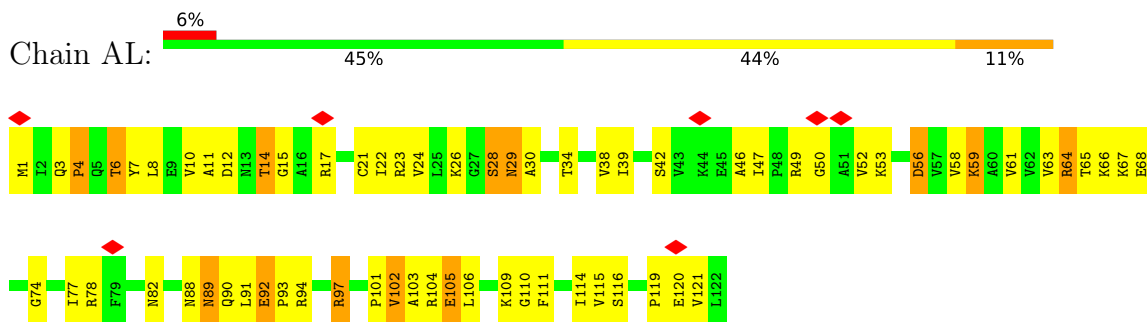
- Molecule 8: 50S ribosomal protein L6



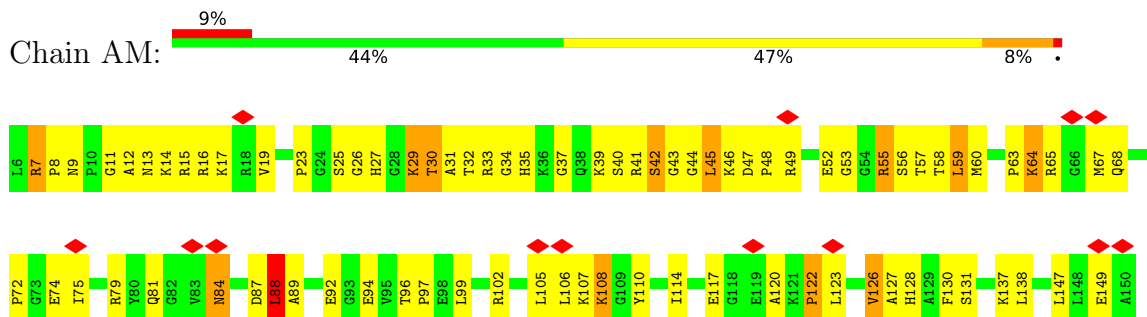
- Molecule 9: 50S ribosomal protein L13



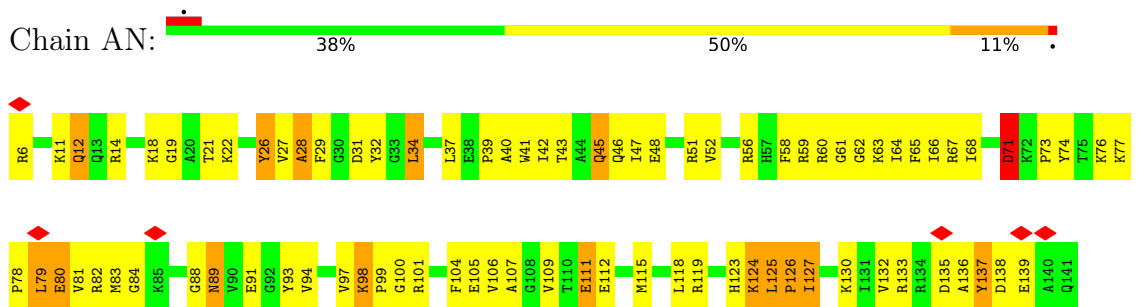
- Molecule 10: 50S ribosomal protein L14



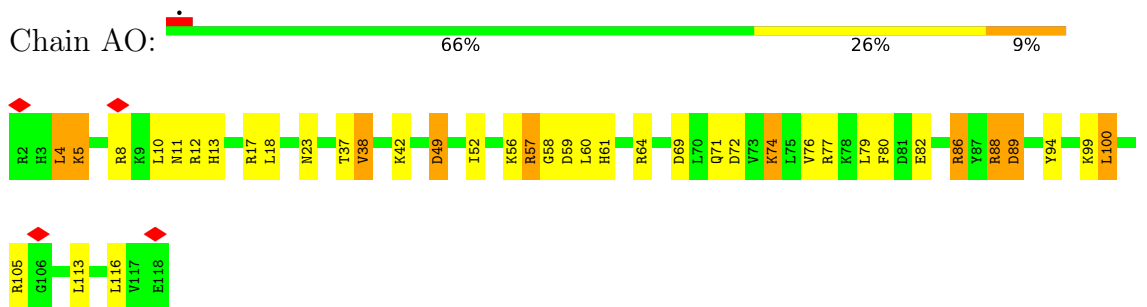
• Molecule 11: 50S ribosomal protein L15



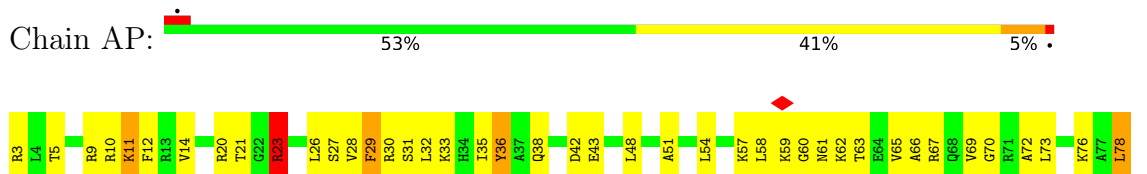
• Molecule 12: 50S ribosomal protein L16

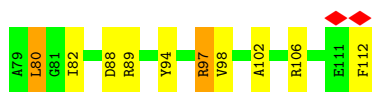


• Molecule 13: 50S ribosomal protein L17

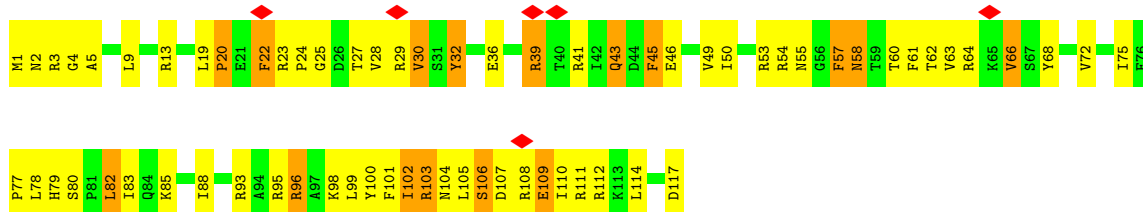
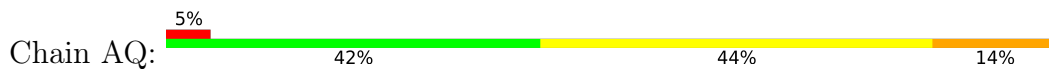


• Molecule 14: 50S ribosomal protein L18

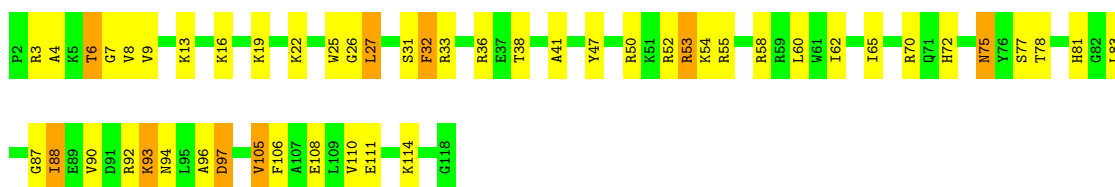




• Molecule 15: 50S ribosomal protein L19



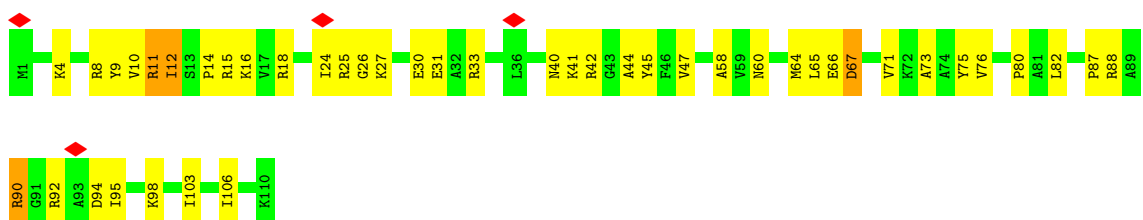
• Molecule 16: 50S ribosomal protein L20



• Molecule 17: 50S ribosomal protein L21

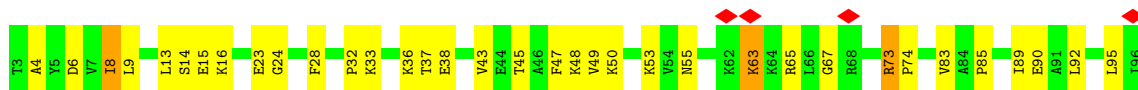


• Molecule 18: 50S ribosomal protein L22

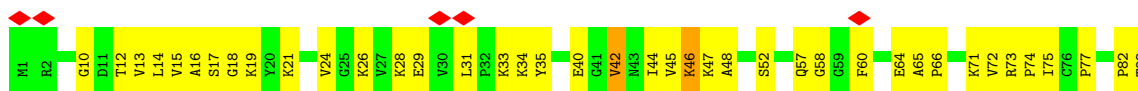


• Molecule 19: 50S ribosomal protein L23

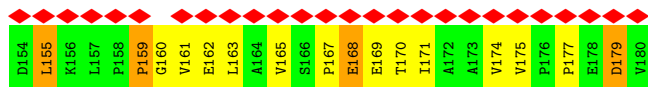
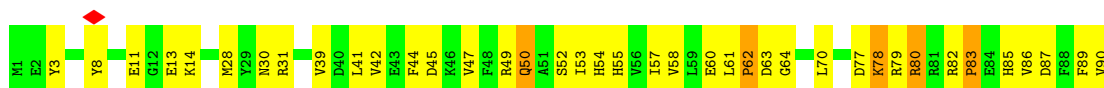




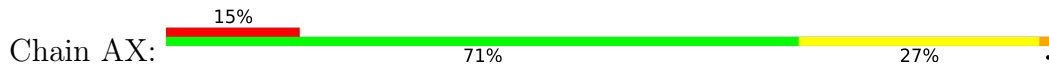
• Molecule 20: 50S ribosomal protein L24



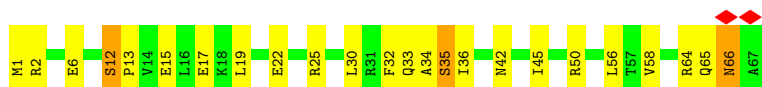
• Molecule 21: 50S ribosomal protein L25



• Molecule 22: 50S ribosomal protein L27

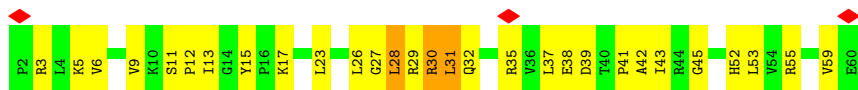


• Molecule 23: 50S ribosomal protein L29



• Molecule 24: 50S ribosomal protein L30





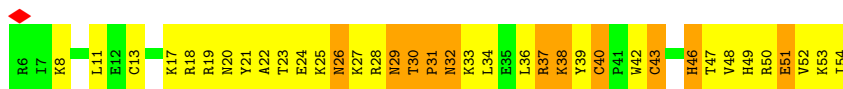
• Molecule 25: 50S ribosomal protein L31



• Molecule 26: 50S ribosomal protein L32



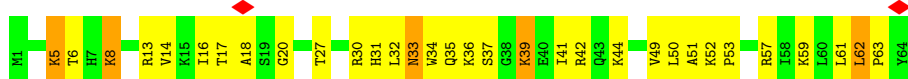
• Molecule 27: 50S ribosomal protein L33



• Molecule 28: 50S ribosomal protein L34

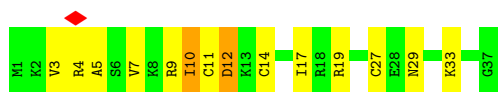


• Molecule 29: 50S ribosomal protein L35

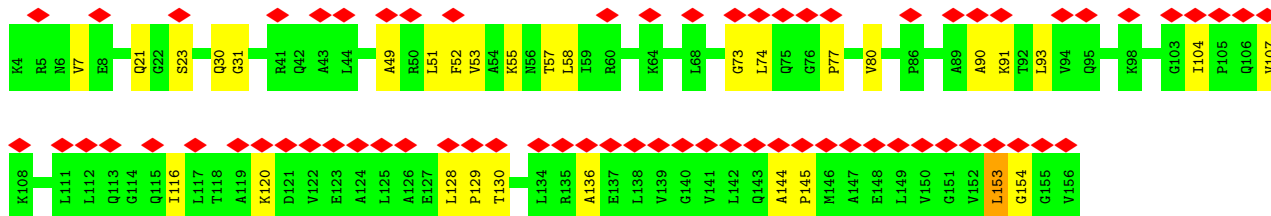
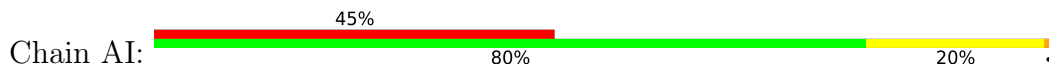


• Molecule 30: 50S ribosomal protein L36

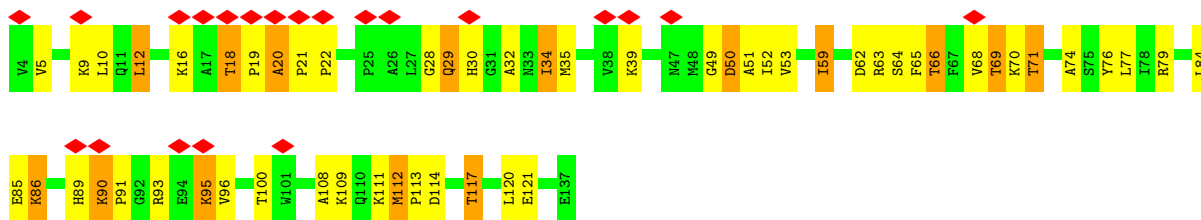




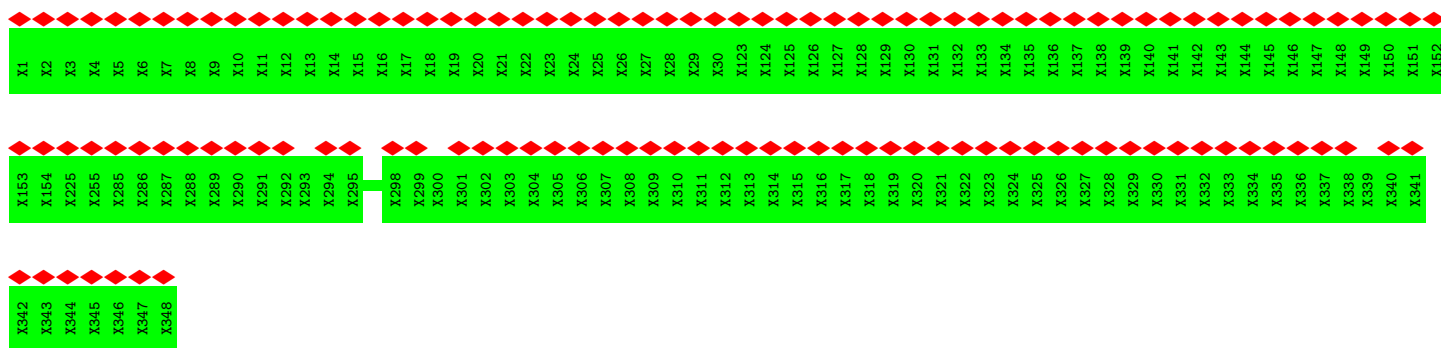
• Molecule 31: 50S ribosomal protein L10



• Molecule 32: 50S ribosomal protein L11



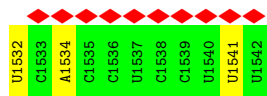
• Molecule 33: Unknown peptide



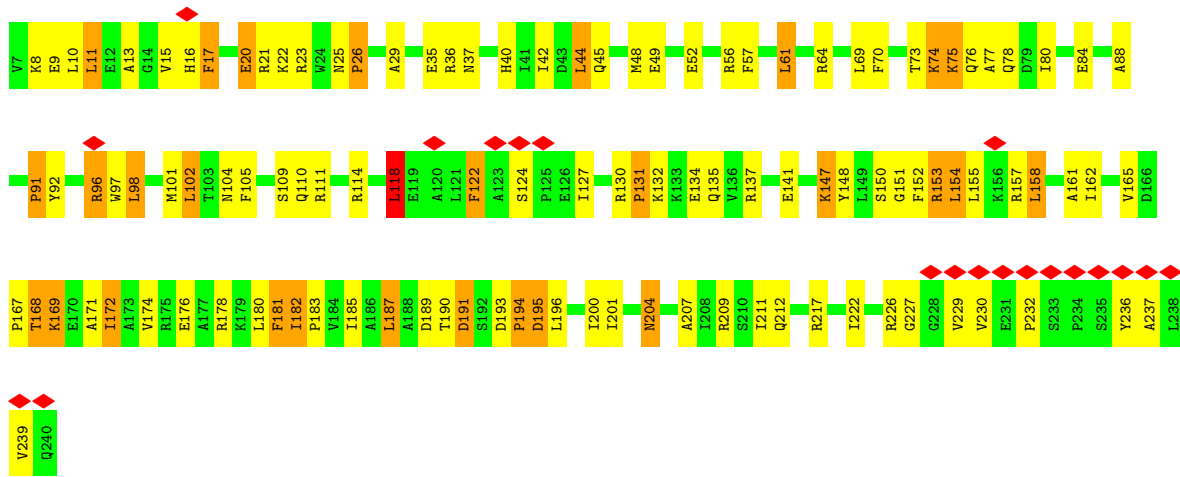
• Molecule 34: 16S ribosomal RNA



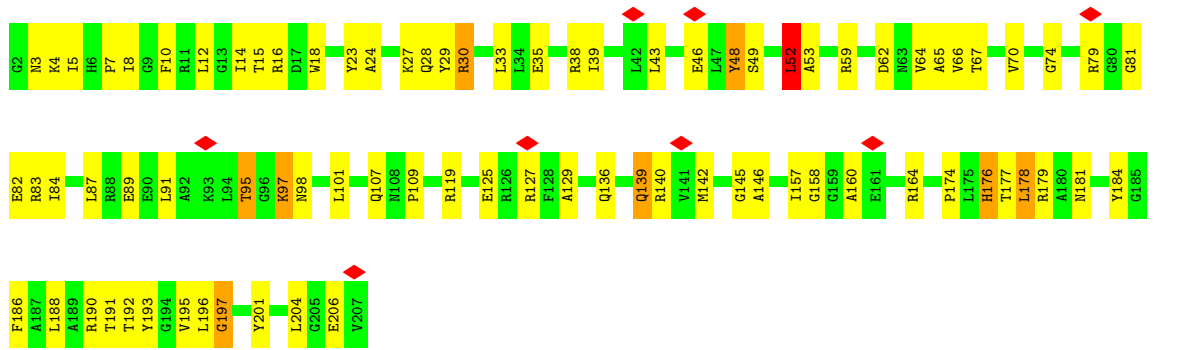
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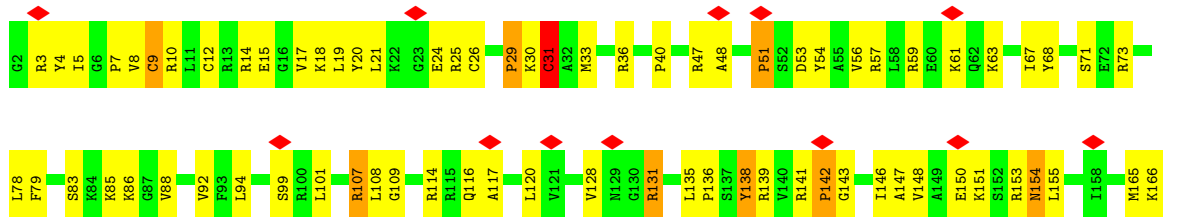
• Molecule 35: 30S ribosomal protein S2



• Molecule 36: 30S ribosomal protein S3

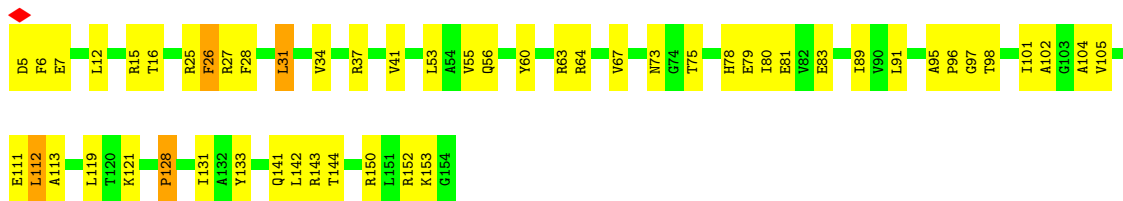


• Molecule 37: 30S ribosomal protein S4

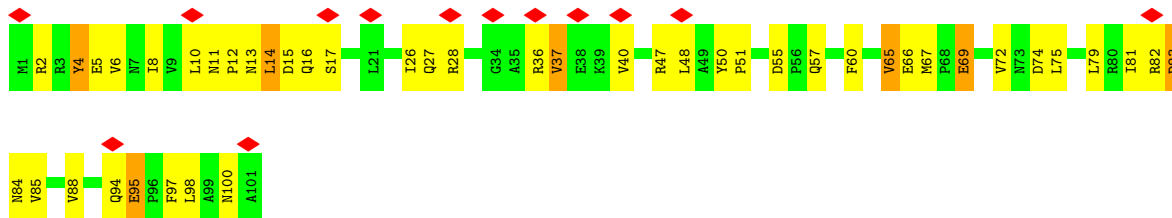




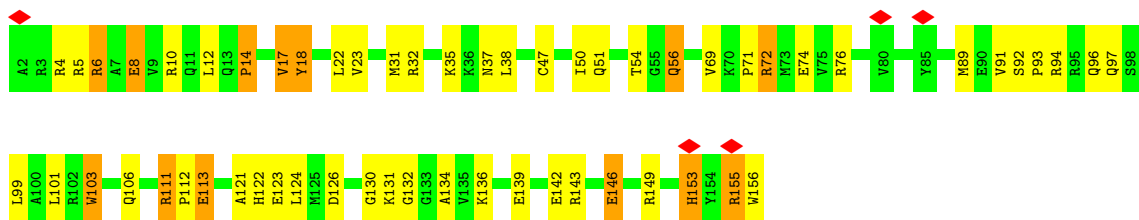
• Molecule 38: 30S ribosomal protein S5



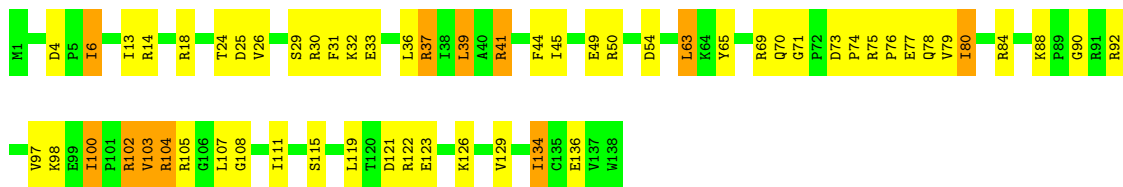
• Molecule 39: 30S ribosomal protein S6



• Molecule 40: 30S ribosomal protein S7

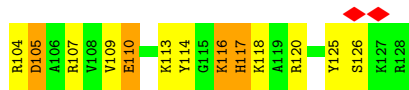
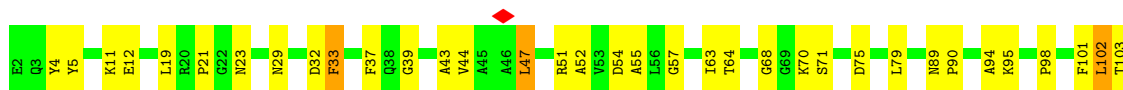


• Molecule 41: 30S ribosomal protein S8

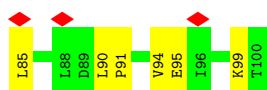
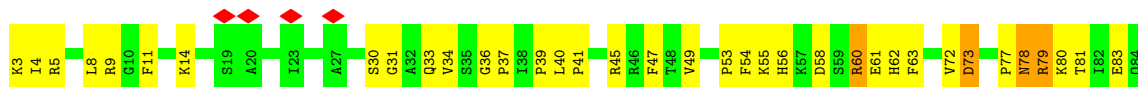


• Molecule 42: 30S ribosomal protein S9

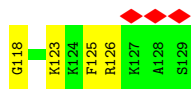
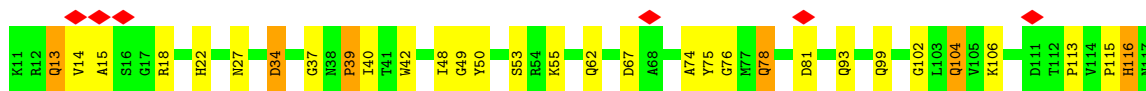
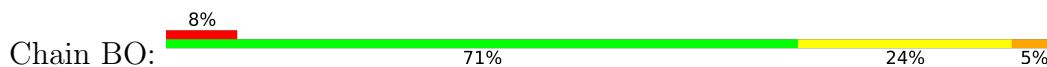




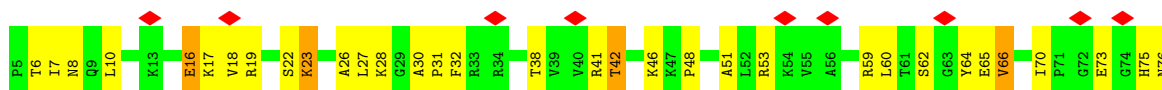
• Molecule 43: 30S ribosomal protein S10



• Molecule 44: 30S ribosomal protein S11



• Molecule 45: 30S ribosomal protein S12

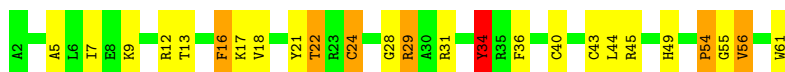


• Molecule 46: 30S ribosomal protein S13

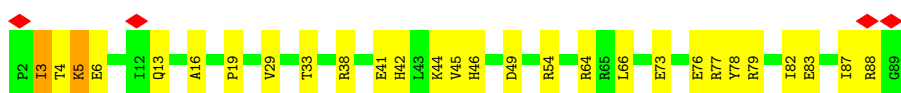




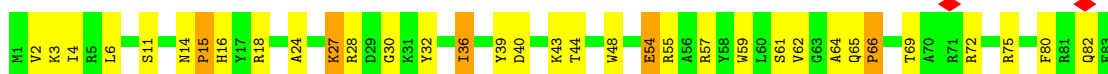
- Molecule 47: 30S ribosomal protein S14 type Z



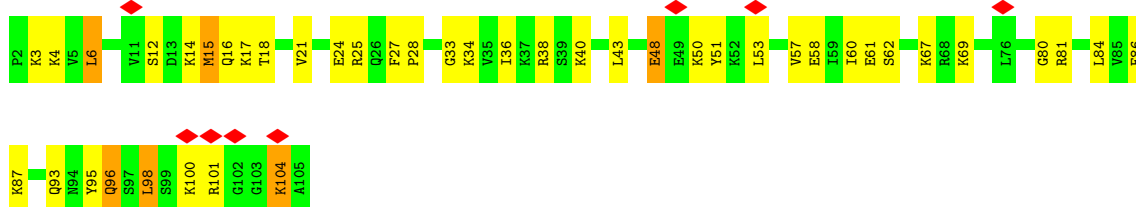
- Molecule 48: 30S ribosomal protein S15



- Molecule 49: 30S ribosomal protein S16



- Molecule 50: 30S ribosomal protein S17

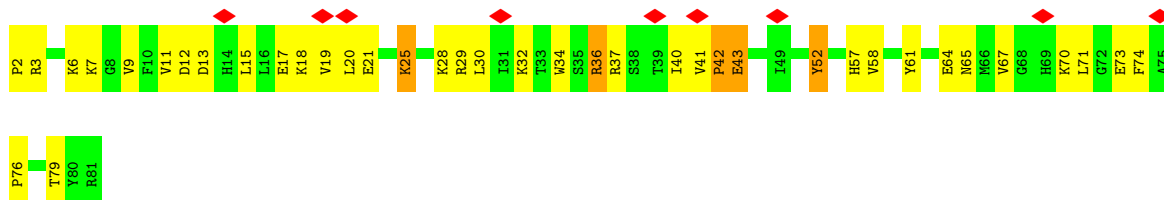


- Molecule 51: 30S ribosomal protein S18

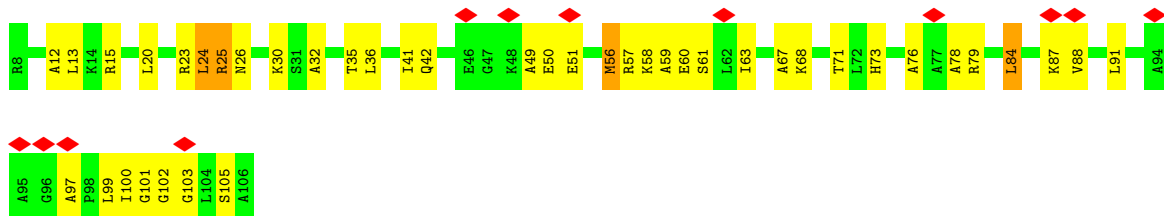


- Molecule 52: 30S ribosomal protein S19





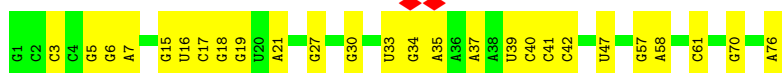
• Molecule 53: 30S ribosomal protein S20



• Molecule 54: 30S ribosomal protein Thx



• Molecule 55: tRNA chain 1



• Molecule 56: tRNA chain 2

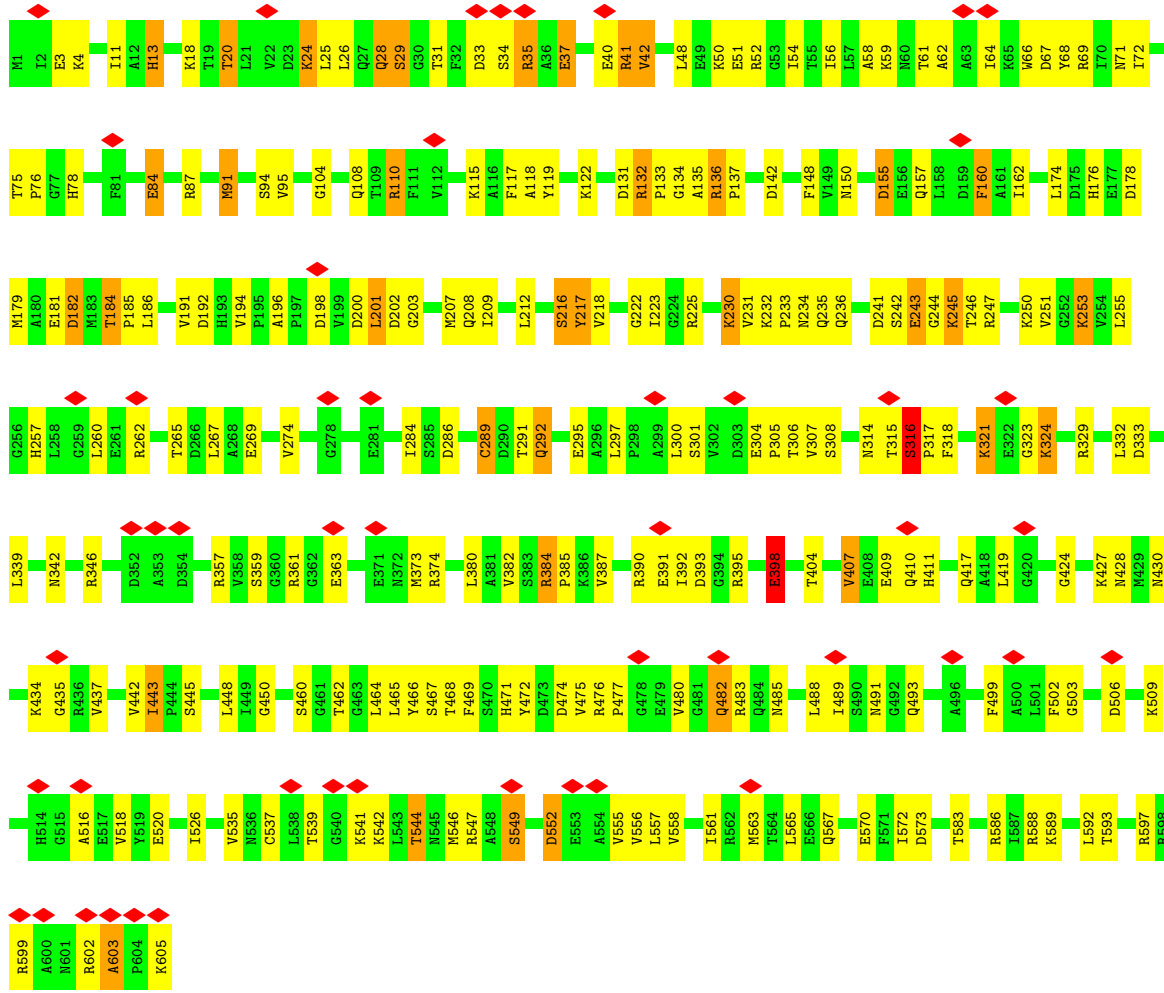


• Molecule 56: tRNA chain 2



• Molecule 57: GTP-binding protein





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	77127	Depositor
Resolution determination method	Not provided	
CTF correction method	CTFFIND3	Depositor
Microscope	FEI TECNAI F20	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	20	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	73684	Depositor
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.359	Depositor
Minimum map value	-0.095	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.017	Depositor
Recommended contour level	0.0392	Depositor
Map size (\AA)	460.8, 460.8, 460.8	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.28, 1.28, 1.28	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, 8AN, NMY

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	AA	1.00	107/69678 (0.2%)	1.08	348/108758 (0.3%)
2	AB	0.83	4/2954 (0.1%)	0.99	7/4606 (0.2%)
3	AC	0.54	0/1772	0.87	0/2383
4	AD	0.72	2/2174 (0.1%)	1.19	13/2927 (0.4%)
5	AE	0.75	0/1611	1.16	13/2171 (0.6%)
6	AF	0.64	0/1660	1.03	4/2247 (0.2%)
7	AG	0.62	0/1507	1.06	4/2027 (0.2%)
8	AH	0.59	0/1354	0.98	4/1831 (0.2%)
9	AK	0.78	1/1140 (0.1%)	1.16	8/1537 (0.5%)
10	AL	0.92	1/942 (0.1%)	1.31	10/1268 (0.8%)
11	AM	0.71	0/1123	1.12	5/1493 (0.3%)
12	AN	0.72	0/1100	1.19	8/1470 (0.5%)
13	AO	0.70	0/974	1.06	2/1302 (0.2%)
14	AP	0.72	0/887	1.06	4/1180 (0.3%)
15	AQ	0.85	0/990	1.31	9/1325 (0.7%)
16	AR	0.76	0/982	1.08	0/1306
17	AS	0.87	1/790 (0.1%)	1.28	9/1057 (0.9%)
18	AT	0.66	0/886	1.04	1/1189 (0.1%)
19	AU	0.57	0/756	0.93	0/1015
20	AV	0.54	0/857	1.05	2/1142 (0.2%)
21	AW	0.66	0/1467	1.11	7/1992 (0.4%)
22	AX	0.65	0/679	1.04	1/902 (0.1%)
23	AY	0.59	0/569	0.88	0/751
24	AZ	0.59	0/474	1.10	2/635 (0.3%)
25	Aa	0.84	1/594 (0.2%)	1.31	8/795 (1.0%)
26	Ab	0.72	0/459	1.16	3/621 (0.5%)
27	Ac	0.85	1/433 (0.2%)	1.36	5/576 (0.9%)
28	Ad	0.73	0/438	1.01	0/575
29	Ae	0.59	0/523	1.14	5/690 (0.7%)
30	Af	0.59	0/310	1.08	1/407 (0.2%)
31	AI	0.50	1/751 (0.1%)	0.82	4/1042 (0.4%)
32	AJ	0.52	0/1012	0.64	8/1373 (0.6%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
34	BA	0.92	26/36437 (0.1%)	1.10	139/56865 (0.2%)
35	BF	0.65	0/1935	1.00	4/2609 (0.2%)
36	BG	0.55	0/1636	0.92	4/2205 (0.2%)
37	BH	0.64	1/1733 (0.1%)	0.98	3/2318 (0.1%)
38	BI	0.63	0/1162	1.01	3/1564 (0.2%)
39	BJ	0.60	0/856	0.95	0/1154
40	BK	0.57	0/1276	0.90	3/1709 (0.2%)
41	BL	0.62	0/1136	1.01	3/1527 (0.2%)
42	BM	0.54	0/1029	0.83	0/1379
43	BN	0.48	0/807	0.89	1/1085 (0.1%)
44	BO	0.62	0/900	0.98	0/1213
45	BP	0.60	0/986	1.00	3/1320 (0.2%)
46	BQ	0.33	0/924	0.45	2/1238 (0.2%)
47	BR	0.55	0/501	0.97	1/664 (0.2%)
48	BS	0.62	0/745	0.95	0/992
49	BT	0.62	0/716	0.95	1/963 (0.1%)
50	BU	0.68	1/870 (0.1%)	0.99	2/1159 (0.2%)
51	BV	0.59	0/603	1.01	1/799 (0.1%)
52	BW	0.53	1/661 (0.2%)	1.34	5/890 (0.6%)
53	BX	0.65	0/765	1.00	2/1007 (0.2%)
54	BY	0.45	0/212	0.80	0/277
55	BC	0.36	0/1809	0.67	0/2819
56	BD	0.37	0/1784	0.68	0/2780
56	BE	0.35	0/1784	0.70	0/2780
57	BZ	0.37	0/4678	0.50	16/6310 (0.3%)
All	All	0.86	148/167791 (0.1%)	1.05	688/250219 (0.3%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	AA	0	432
2	AB	0	17
3	AC	0	1
5	AE	0	1
6	AF	0	1
9	AK	0	1
12	AN	0	1
15	AQ	0	1
17	AS	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
25	Aa	0	1
26	Ab	0	1
31	AI	0	2
34	BA	0	170
37	BH	0	1
39	BJ	0	1
44	BO	0	1
47	BR	0	1
All	All	0	634

The worst 5 of 148 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	AA	1060	U	O3'-P	-80.27	0.64	1.61
34	BA	1317	C	O3'-P	-70.10	0.77	1.61
1	AA	1203	G	O3'-P	-34.75	1.19	1.61
34	BA	1167	A	O3'-P	20.86	1.86	1.61
1	AA	2500	U	C4-O4	18.56	1.38	1.23

The worst 5 of 688 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
34	BA	1064	G	N1-C2-N2	-71.66	51.71	116.20
34	BA	1064	G	N3-C2-N2	57.63	160.24	119.90
34	BA	1317	C	P-O3'-C3'	-48.78	61.17	119.70
34	BA	1317	C	O3'-P-O5'	30.58	162.11	104.00
1	AA	1060	U	O3'-P-O5'	28.68	158.49	104.00

There are no chirality outliers.

5 of 634 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AA	14	A	Sidechain
1	AA	25	U	Sidechain
1	AA	3	U	Sidechain
1	AA	31	C	Sidechain
1	AA	9	U	Sidechain

5.2 Too-close contacts

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	
3	AC	220/228 (96%)	153 (70%)	39 (18%)	28 (13%)	0	5
4	AD	270/272 (99%)	125 (46%)	59 (22%)	86 (32%)	0	0
5	AE	204/206 (99%)	117 (57%)	31 (15%)	56 (28%)	0	0
6	AF	206/208 (99%)	109 (53%)	46 (22%)	51 (25%)	0	1
7	AG	180/182 (99%)	79 (44%)	47 (26%)	54 (30%)	0	0
8	AH	172/174 (99%)	80 (46%)	46 (27%)	46 (27%)	0	0
9	AK	137/139 (99%)	64 (47%)	28 (20%)	45 (33%)	0	0
10	AL	120/122 (98%)	59 (49%)	23 (19%)	38 (32%)	0	0
11	AM	143/145 (99%)	57 (40%)	36 (25%)	50 (35%)	0	0
12	AN	134/136 (98%)	49 (37%)	33 (25%)	52 (39%)	0	0
13	AO	115/117 (98%)	57 (50%)	39 (34%)	19 (16%)	0	3
14	AP	108/110 (98%)	48 (44%)	28 (26%)	32 (30%)	0	0
15	AQ	115/117 (98%)	52 (45%)	26 (23%)	37 (32%)	0	0
16	AR	115/117 (98%)	35 (30%)	50 (44%)	30 (26%)	0	1
17	AS	99/101 (98%)	52 (52%)	19 (19%)	28 (28%)	0	0
18	AT	108/110 (98%)	63 (58%)	24 (22%)	21 (19%)	0	2
19	AU	92/94 (98%)	57 (62%)	16 (17%)	19 (21%)	0	2
20	AV	108/110 (98%)	43 (40%)	32 (30%)	33 (31%)	0	0
21	AW	178/180 (99%)	96 (54%)	43 (24%)	39 (22%)	0	1
22	AX	83/85 (98%)	52 (63%)	21 (25%)	10 (12%)	0	6
23	AY	65/67 (97%)	36 (55%)	20 (31%)	9 (14%)	0	4
24	AZ	57/59 (97%)	34 (60%)	8 (14%)	15 (26%)	0	1
25	Aa	69/71 (97%)	23 (33%)	15 (22%)	31 (45%)	0	0
26	Ab	55/57 (96%)	14 (26%)	19 (34%)	22 (40%)	0	0
27	Ac	47/49 (96%)	14 (30%)	7 (15%)	26 (55%)	0	0

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	Ad	47/49 (96%)	20 (43%)	12 (26%)	15 (32%)	0	0
29	Ae	62/64 (97%)	23 (37%)	17 (27%)	22 (36%)	0	0
30	Af	35/37 (95%)	20 (57%)	5 (14%)	10 (29%)	0	0
31	AI	151/153 (99%)	89 (59%)	33 (22%)	29 (19%)	0	2
32	AJ	132/134 (98%)	56 (42%)	44 (33%)	32 (24%)	0	1
35	BF	232/234 (99%)	114 (49%)	41 (18%)	77 (33%)	0	0
36	BG	204/206 (99%)	107 (52%)	46 (22%)	51 (25%)	0	1
37	BH	206/208 (99%)	95 (46%)	58 (28%)	53 (26%)	0	1
38	BI	148/150 (99%)	93 (63%)	38 (26%)	17 (12%)	0	6
39	BJ	99/101 (98%)	58 (59%)	19 (19%)	22 (22%)	0	1
40	BK	153/155 (99%)	73 (48%)	45 (29%)	35 (23%)	0	1
41	BL	136/138 (99%)	68 (50%)	35 (26%)	33 (24%)	0	1
42	BM	125/127 (98%)	62 (50%)	33 (26%)	30 (24%)	0	1
43	BN	96/98 (98%)	52 (54%)	20 (21%)	24 (25%)	0	1
44	BO	117/119 (98%)	65 (56%)	29 (25%)	23 (20%)	0	2
45	BP	122/124 (98%)	50 (41%)	30 (25%)	42 (34%)	0	0
46	BQ	112/114 (98%)	64 (57%)	28 (25%)	20 (18%)	0	3
47	BR	58/60 (97%)	24 (41%)	16 (28%)	18 (31%)	0	0
48	BS	86/88 (98%)	36 (42%)	35 (41%)	15 (17%)	0	3
49	BT	81/83 (98%)	42 (52%)	24 (30%)	15 (18%)	0	2
50	BU	102/104 (98%)	62 (61%)	23 (22%)	17 (17%)	0	3
51	BV	71/73 (97%)	26 (37%)	26 (37%)	19 (27%)	0	0
52	BW	78/80 (98%)	30 (38%)	25 (32%)	23 (30%)	0	0
53	BX	97/99 (98%)	38 (39%)	32 (33%)	27 (28%)	0	0
54	BY	22/24 (92%)	9 (41%)	6 (27%)	7 (32%)	0	0
57	BZ	603/605 (100%)	280 (46%)	200 (33%)	123 (20%)	0	2
All	All	6575/6683 (98%)	3224 (49%)	1675 (26%)	1676 (26%)	0	1

5 of 1676 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	AC	35	ALA
3	AC	39	GLU

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Mol	Chain	Res	Type
3	AC	54	SER
3	AC	61	THR
3	AC	72	VAL

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	
3	AC	180/180 (100%)	151 (84%)	29 (16%)	2	14
4	AD	215/215 (100%)	153 (71%)	62 (29%)	0	3
5	AE	166/166 (100%)	102 (61%)	64 (39%)	0	0
6	AF	164/164 (100%)	105 (64%)	59 (36%)	0	1
7	AG	156/156 (100%)	112 (72%)	44 (28%)	0	3
8	AH	143/143 (100%)	108 (76%)	35 (24%)	0	4
9	AK	118/118 (100%)	79 (67%)	39 (33%)	0	2
10	AL	100/100 (100%)	69 (69%)	31 (31%)	0	2
11	AM	111/111 (100%)	71 (64%)	40 (36%)	0	1
12	AN	106/106 (100%)	65 (61%)	41 (39%)	0	0
13	AO	100/100 (100%)	71 (71%)	29 (29%)	0	3
14	AP	87/87 (100%)	63 (72%)	24 (28%)	0	3
15	AQ	105/105 (100%)	68 (65%)	37 (35%)	0	1
16	AR	93/93 (100%)	64 (69%)	29 (31%)	0	2
17	AS	82/82 (100%)	57 (70%)	25 (30%)	0	2
18	AT	90/90 (100%)	64 (71%)	26 (29%)	0	2
19	AU	76/76 (100%)	57 (75%)	19 (25%)	0	4
20	AV	91/91 (100%)	72 (79%)	19 (21%)	1	7
21	AW	159/159 (100%)	120 (76%)	39 (24%)	0	4
22	AX	67/67 (100%)	51 (76%)	16 (24%)	0	5
23	AY	62/62 (100%)	44 (71%)	18 (29%)	0	3

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
24	AZ	51/51 (100%)	36 (71%)	15 (29%)	0	2
25	Aa	63/63 (100%)	45 (71%)	18 (29%)	0	3
26	Ab	50/50 (100%)	31 (62%)	19 (38%)	0	1
27	Ac	48/48 (100%)	32 (67%)	16 (33%)	0	2
28	Ad	42/42 (100%)	29 (69%)	13 (31%)	0	2
29	Ae	54/54 (100%)	44 (82%)	10 (18%)	1	10
30	Af	34/34 (100%)	29 (85%)	5 (15%)	3	16
32	AJ	101/101 (100%)	71 (70%)	30 (30%)	0	2
35	BF	202/202 (100%)	138 (68%)	64 (32%)	0	2
36	BG	160/160 (100%)	123 (77%)	37 (23%)	1	5
37	BH	180/180 (100%)	131 (73%)	49 (27%)	0	3
38	BI	115/115 (100%)	78 (68%)	37 (32%)	0	2
39	BJ	90/90 (100%)	61 (68%)	29 (32%)	0	2
40	BK	126/126 (100%)	93 (74%)	33 (26%)	0	4
41	BL	119/119 (100%)	86 (72%)	33 (28%)	0	3
42	BM	98/98 (100%)	73 (74%)	25 (26%)	0	4
43	BN	88/88 (100%)	67 (76%)	21 (24%)	0	5
44	BO	90/90 (100%)	73 (81%)	17 (19%)	1	9
45	BP	104/104 (100%)	81 (78%)	23 (22%)	1	6
46	BQ	92/92 (100%)	67 (73%)	25 (27%)	0	3
47	BR	49/49 (100%)	36 (74%)	13 (26%)	0	4
48	BS	79/79 (100%)	64 (81%)	15 (19%)	1	9
49	BT	72/72 (100%)	49 (68%)	23 (32%)	0	2
50	BU	96/96 (100%)	67 (70%)	29 (30%)	0	2
51	BV	64/64 (100%)	48 (75%)	16 (25%)	0	4
52	BW	71/71 (100%)	52 (73%)	19 (27%)	0	3
53	BX	76/76 (100%)	59 (78%)	17 (22%)	1	6
54	BY	19/19 (100%)	17 (90%)	2 (10%)	7	26
57	BZ	486/514 (95%)	338 (70%)	148 (30%)	0	2
All	All	5390/5418 (100%)	3864 (72%)	1526 (28%)	2	3

5 of 1526 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
36	BG	48	TYR
42	BM	63	ILE
37	BH	8	VAL
36	BG	46	GLU
39	BJ	5	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 192 such sidechains are listed below:

Mol	Chain	Res	Type
38	BI	56	GLN
43	BN	56	HIS
39	BJ	13	ASN
40	BK	106	GLN
44	BO	38	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	2881/2889 (99%)	1265 (43%)	253 (8%)
2	AB	122/123 (99%)	46 (37%)	3 (2%)
34	BA	1514/1515 (99%)	484 (31%)	140 (9%)
55	BC	75/76 (98%)	26 (34%)	0
56	BD	74/75 (98%)	31 (41%)	2 (2%)
56	BE	74/75 (98%)	23 (31%)	1 (1%)
All	All	4740/4753 (99%)	1875 (39%)	399 (8%)

5 of 1875 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	13	A
1	AA	14	A
1	AA	15	G
1	AA	20	C
1	AA	26	G

5 of 399 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	AA	2610	C
34	BA	327	A
1	AA	2690	C

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Mol	Chain	Res	Type
34	BA	47	C
34	BA	495	A

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

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](#)

5 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
60	GCP	BZ	701	-	27,34,34	1.84	7 (25%)	34,54,54	1.99	8 (23%)
58	NMY	AA	3001	-	45,45,45	0.51	0	63,67,67	1.19	7 (11%)
59	8AN	AA	3002	-	19,24,25	1.10	1 (5%)	13,35,38	1.70	4 (30%)
58	NMY	BA	1601	-	45,45,45	0.51	0	63,67,67	1.06	6 (9%)
59	8AN	AA	3003	56	19,24,25	1.09	1 (5%)	13,35,38	1.70	4 (30%)

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
60	GCP	BZ	701	-	-	5/15/38/38	0/3/3/3
58	NMY	AA	3001	-	-	4/18/94/94	1/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
59	8AN	AA	3002	-	-	2/3/25/26	0/3/3/3
58	NMY	BA	1601	-	-	5/18/94/94	0/4/4/4
59	8AN	AA	3003	56	-	3/3/25/26	0/3/3/3

The worst 5 of 9 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	BZ	701	GCP	PG-O1G	5.39	1.61	1.50
60	BZ	701	GCP	C5-C6	4.19	1.48	1.41
60	BZ	701	GCP	PG-O2G	-2.85	1.48	1.54
60	BZ	701	GCP	PG-O3G	2.85	1.61	1.54
60	BZ	701	GCP	PB-O3A	2.72	1.61	1.58

The worst 5 of 29 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	BZ	701	GCP	C2-N3-C4	5.02	121.09	115.36
60	BZ	701	GCP	C2-N1-C6	3.99	122.27	115.93
60	BZ	701	GCP	C5-C6-N1	-3.93	118.06	123.43
60	BZ	701	GCP	PB-O3A-PA	-3.80	120.51	132.56
60	BZ	701	GCP	C4-C5-C6	-3.75	117.22	120.80

There are no chirality outliers.

5 of 19 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
58	AA	3001	NMY	C19-C18-O18-C15
58	BA	1601	NMY	O5-C5-C6-N6
58	BA	1601	NMY	C14-C13-O11-C11
59	AA	3003	8AN	C4'-C5'-O5'-P
59	AA	3003	8AN	O4'-C4'-C5'-O5'

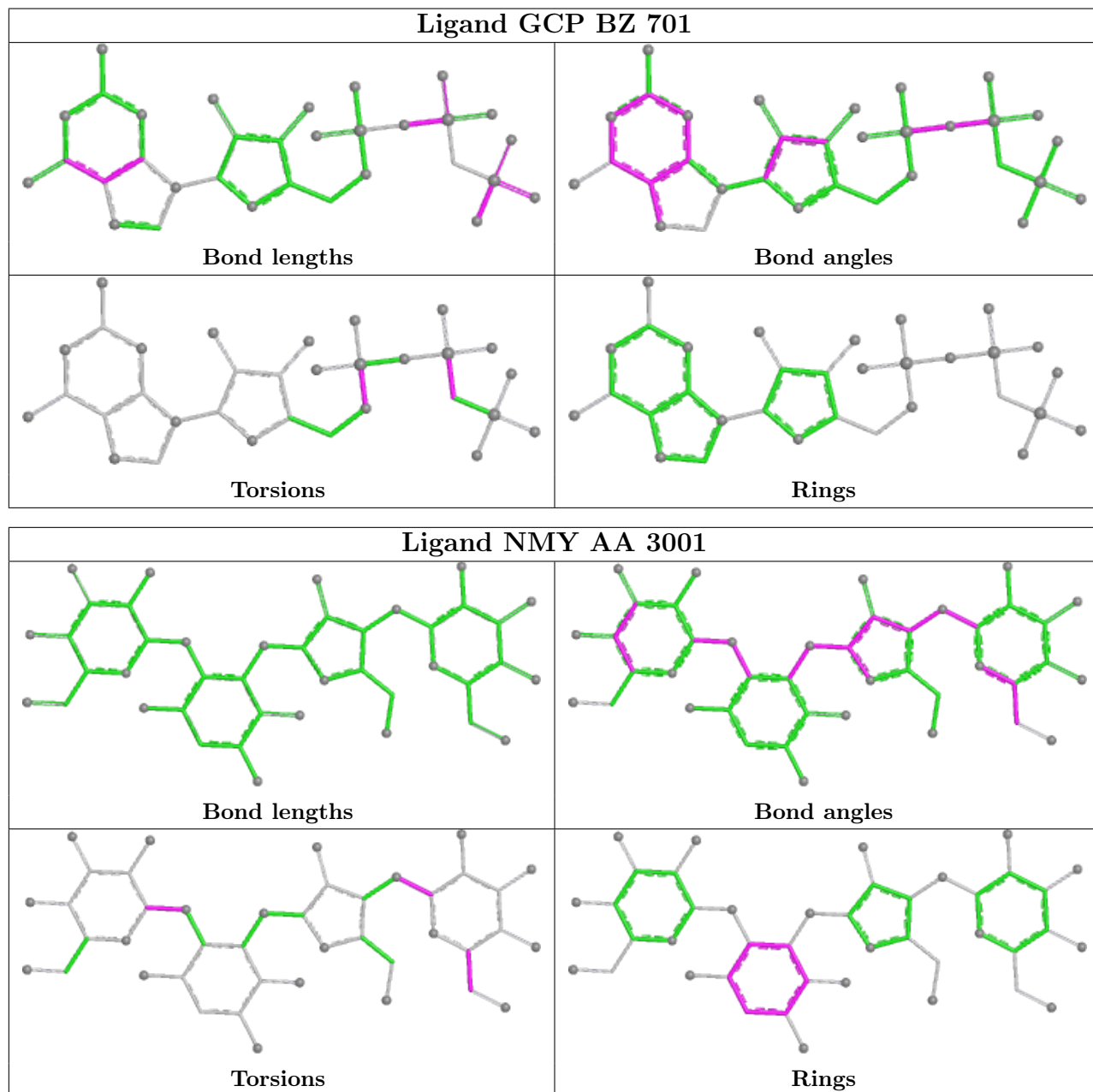
All (1) ring outliers are listed below:

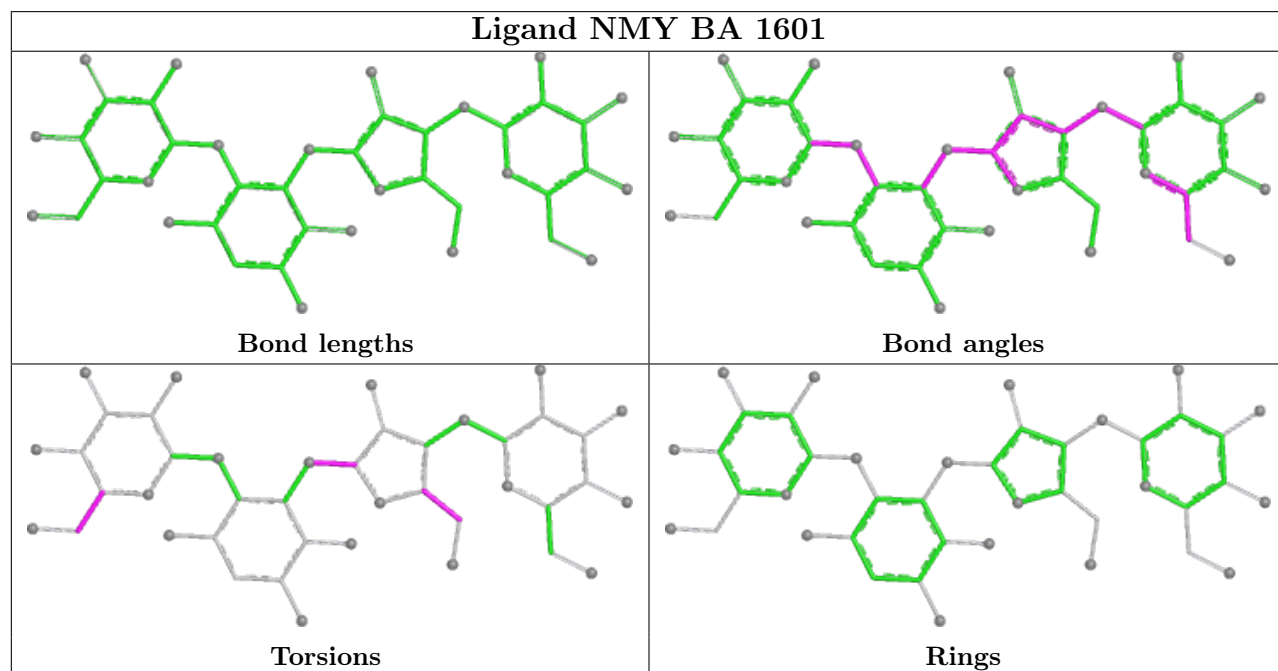
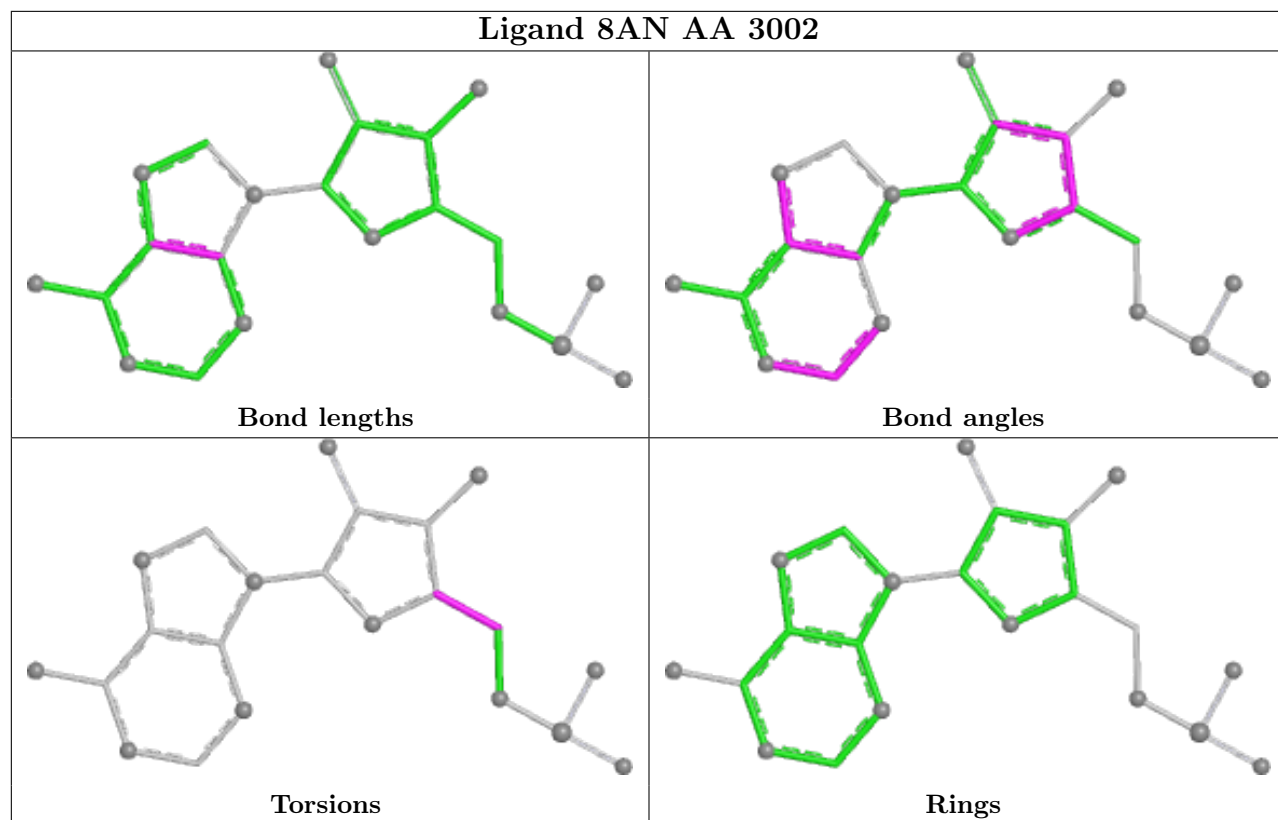
Mol	Chain	Res	Type	Atoms
58	AA	3001	NMY	C10-C11-C12-C7-C8-C9

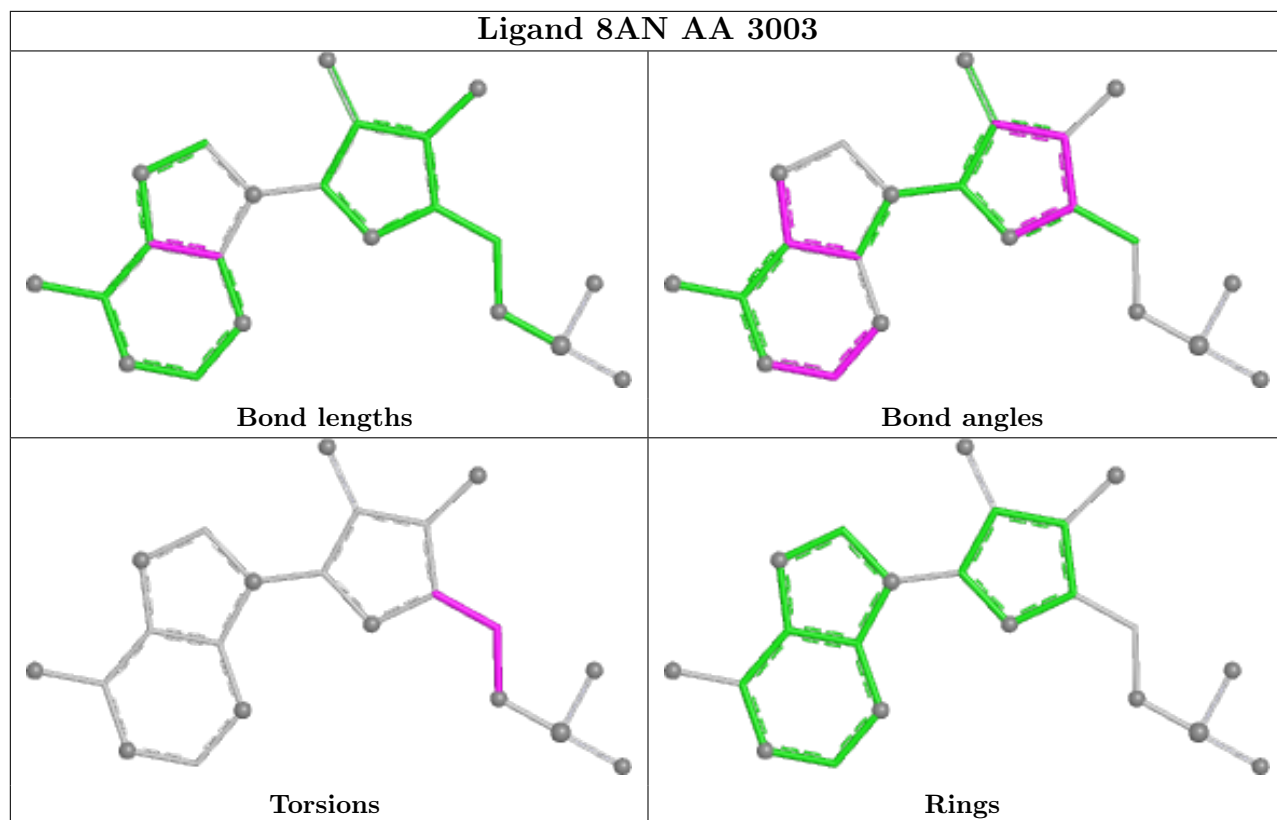
No monomer is involved in short contacts.

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
1	AA	10
3	AC	3
34	BA	3
33	Ag	2
31	AI	1

The worst 5 of 19 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	Ag	30:UNK	C	123:UNK	N	31.39
1	AA	164:U	O3'	171:G	P	7.68
1	AA	2893:G	O3'	2894:G	P	5.34
1	AA	2107:C	O3'	2108:C	P	4.97

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	AC	180:PHE	C	181:PRO	N	4.62

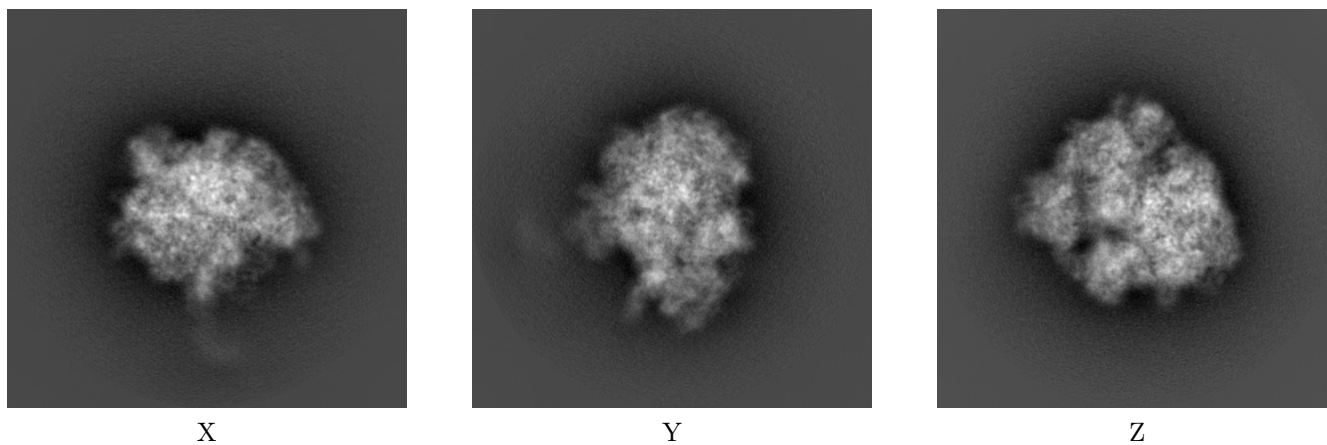
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6397. 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](#)

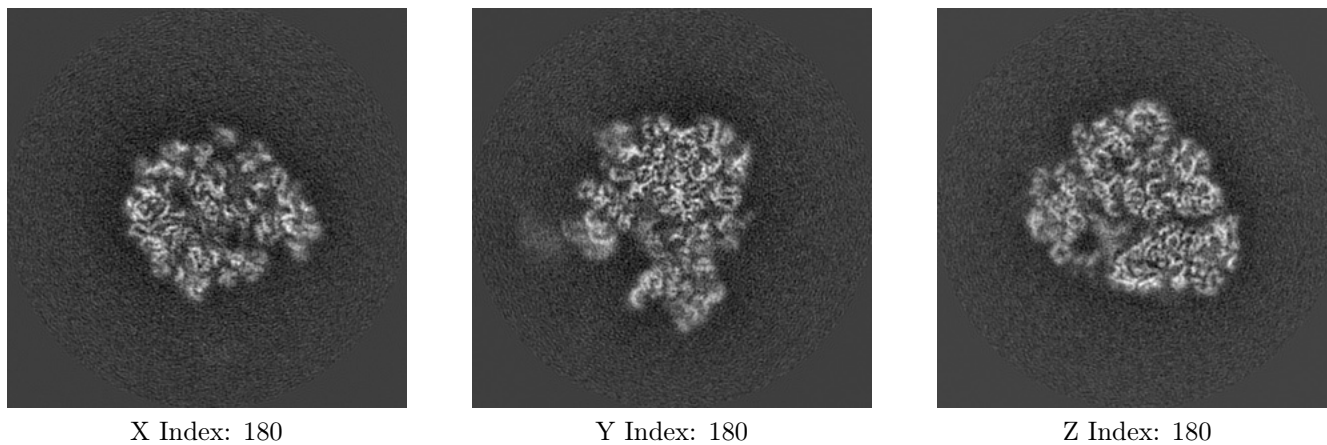
6.1.1 Primary map



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

6.2 Central slices [i](#)

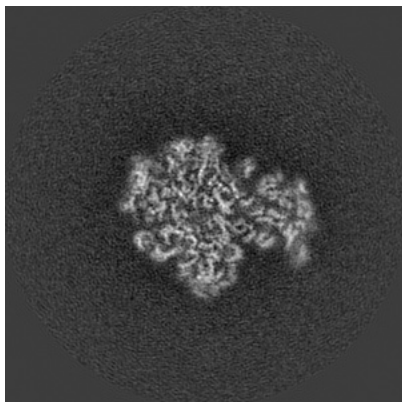
6.2.1 Primary map



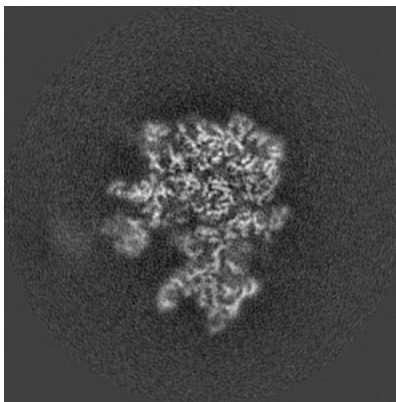
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

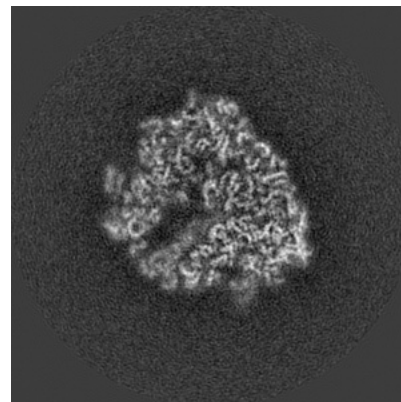
6.3.1 Primary map



X Index: 189



Y Index: 185



Z Index: 173

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 0.0392. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

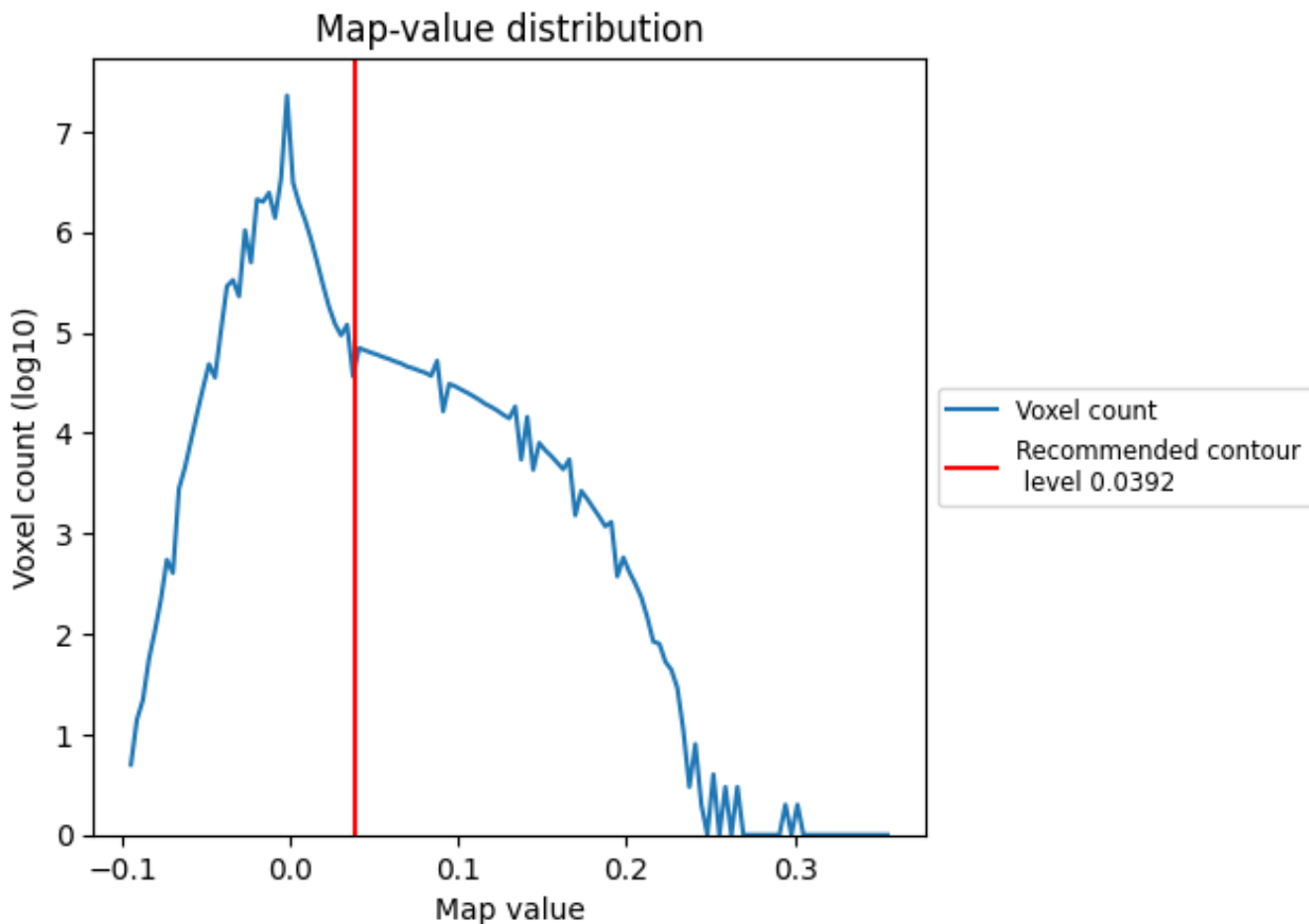
6.5 Mask visualisation

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

7 Map analysis [i](#)

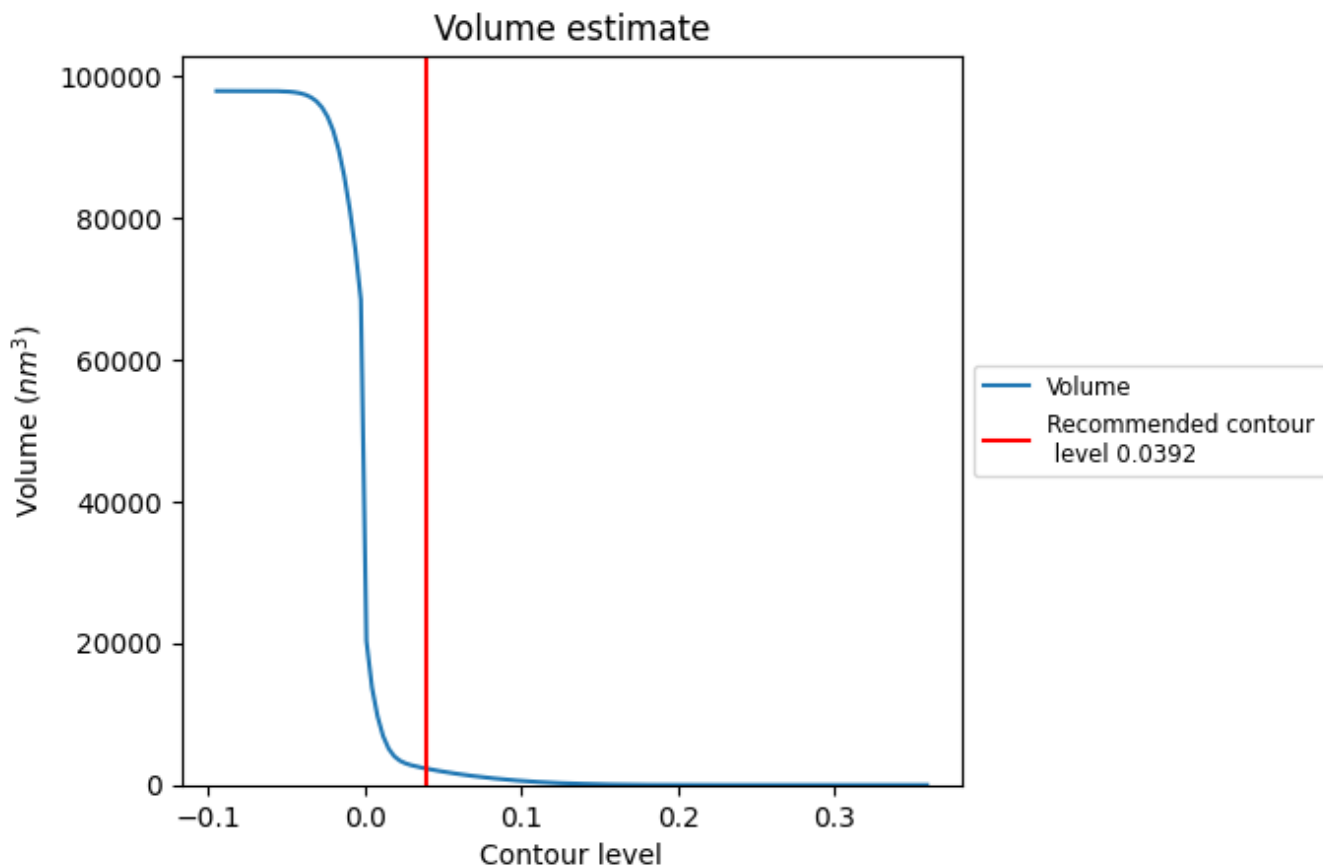
This section contains the results of statistical analysis of the map.

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.

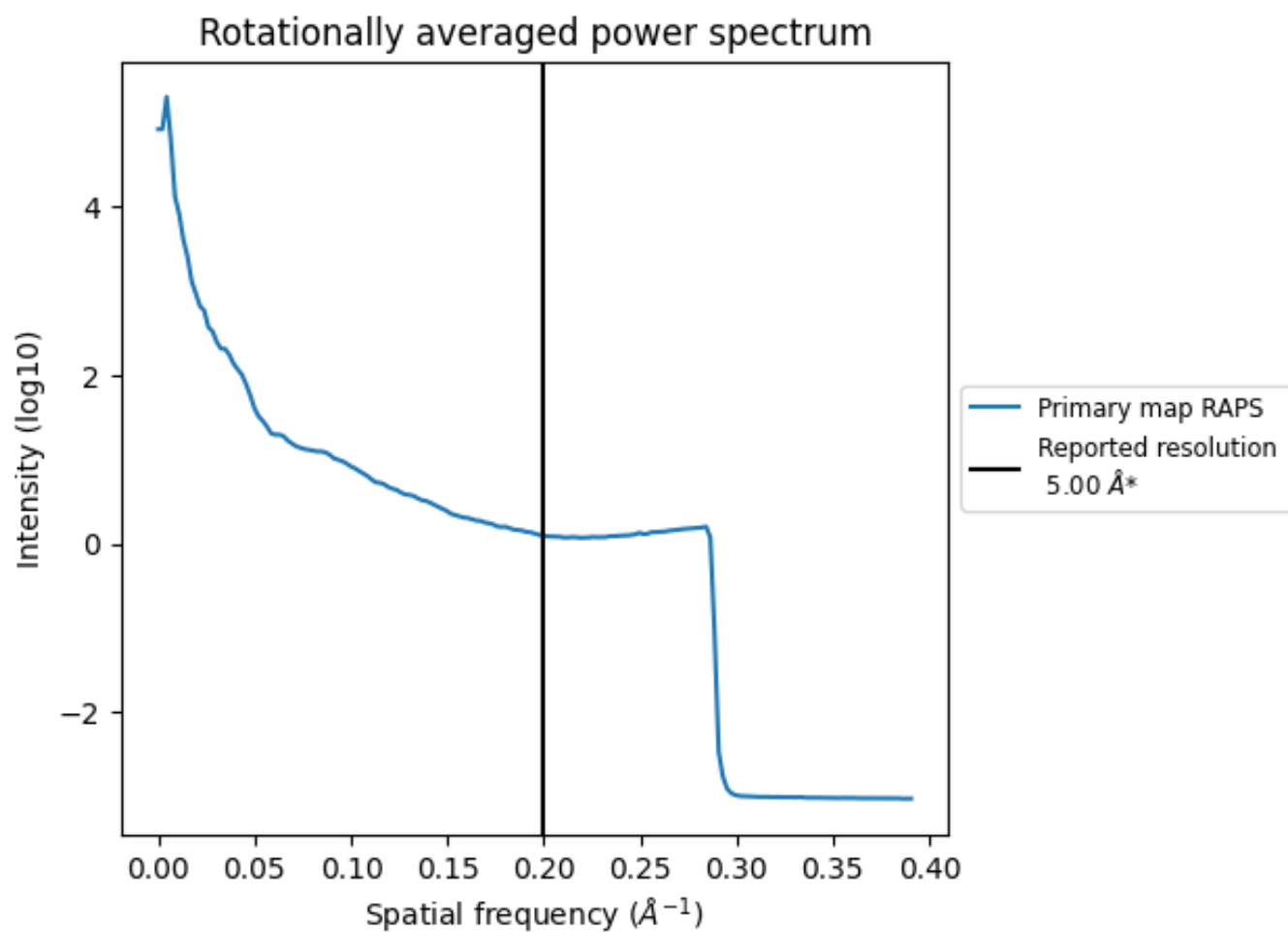
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 2310 nm^3 ; this corresponds to an approximate mass of 2087 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 0.200 Å⁻¹

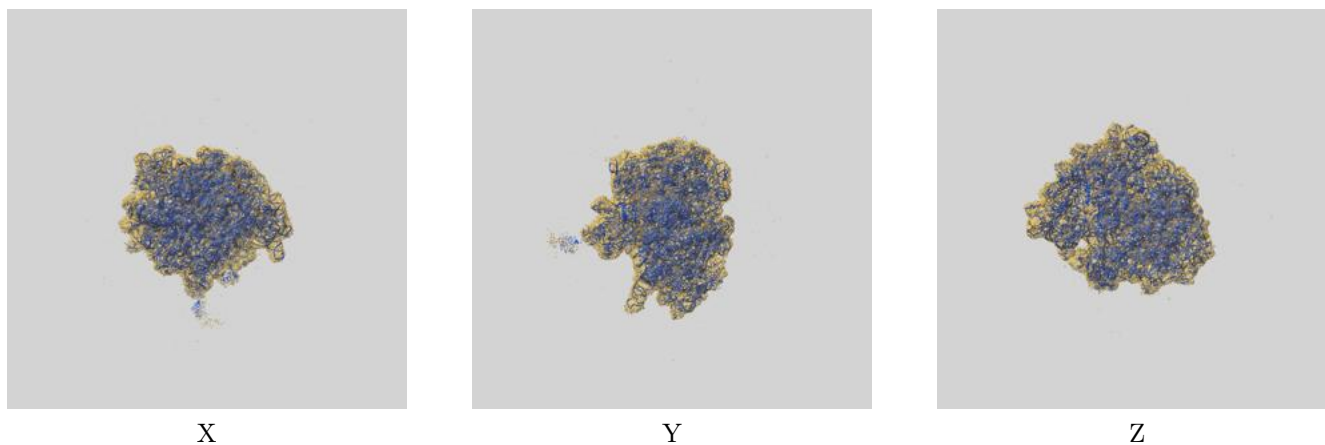
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

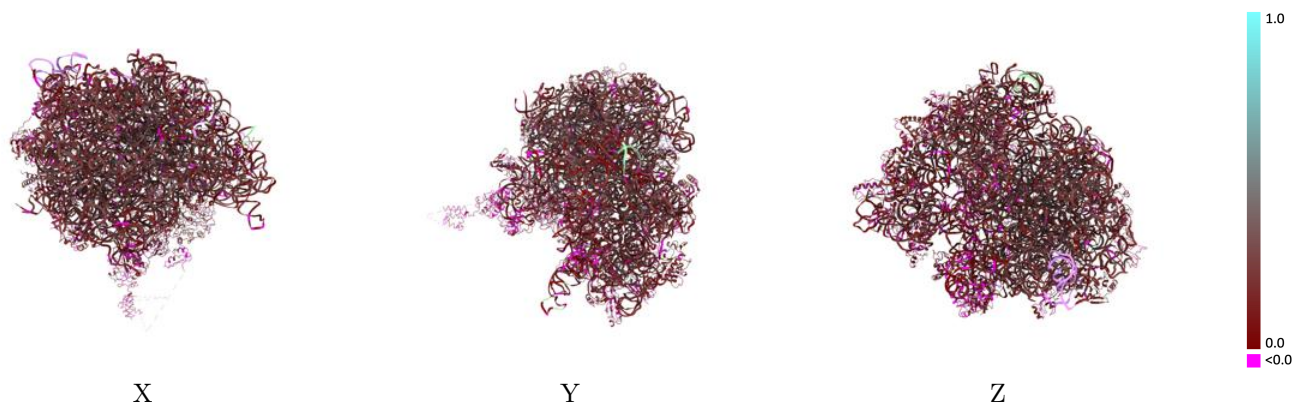
This section contains information regarding the fit between EMDB map EMD-6397 and PDB model 5AA0. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



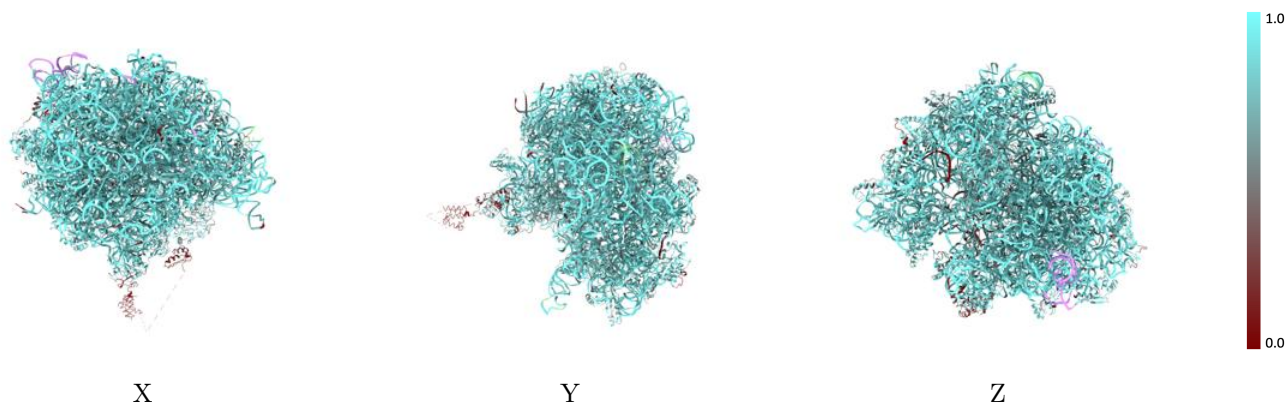
The images above show the 3D surface view of the map at the recommended contour level 0.0392 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



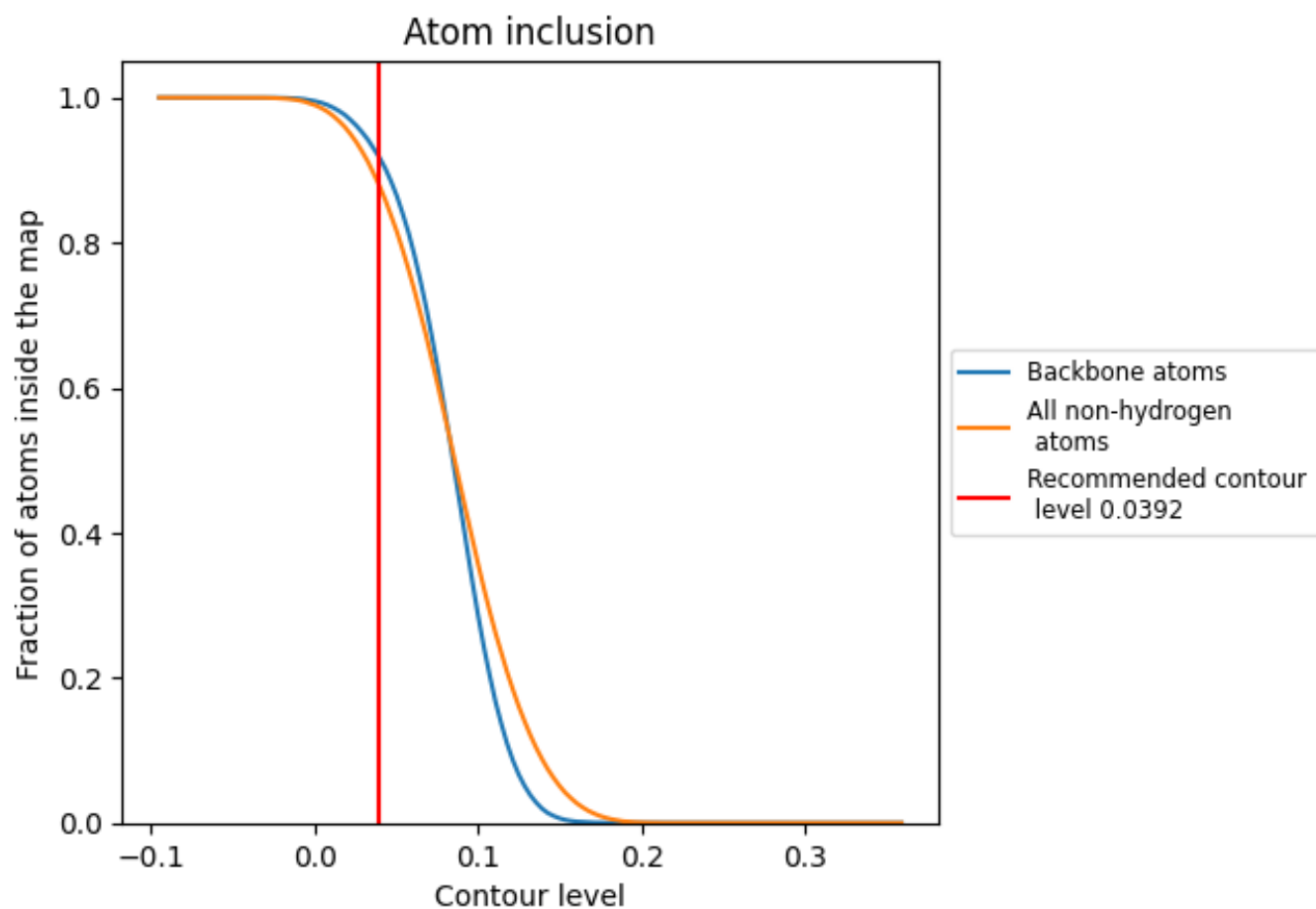
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0392).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 88% 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 (0.0392) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8821	 0.2090
AA	 0.9585	 0.2510
AB	 0.9652	 0.2250
AC	 0.6046	 0.0530
AD	 0.7908	 0.2240
AE	 0.8381	 0.2250
AF	 0.7986	 0.2090
AG	 0.7882	 0.1390
AH	 0.8149	 0.1570
AI	 0.5160	 0.0600
AJ	 0.7137	 0.0610
AK	 0.8201	 0.2220
AL	 0.7495	 0.2390
AM	 0.7589	 0.1540
AN	 0.7684	 0.2120
AO	 0.8096	 0.2250
AP	 0.8553	 0.1900
AQ	 0.7720	 0.2120
AR	 0.8438	 0.2120
AS	 0.8241	 0.1840
AT	 0.7995	 0.2290
AU	 0.8033	 0.2180
AV	 0.7231	 0.1390
AW	 0.5104	 0.1160
AX	 0.7601	 0.1740
AY	 0.7971	 0.1880
AZ	 0.7917	 0.1800
Aa	 0.7625	 0.1890
Ab	 0.8037	 0.2150
Ac	 0.8117	 0.1740
Ad	 0.7663	 0.2270
Ae	 0.7356	 0.2190
Af	 0.7891	 0.2040
Ag	 0.0774	 -0.0030
BA	 0.9479	 0.2080



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Chain	Atom inclusion	Q-score
BC	 0.8672	 0.1270
BD	 0.6450	 0.1440
BE	 0.7038	 0.1190
BF	 0.7673	 0.1800
BG	 0.8073	 0.1710
BH	 0.7465	 0.1310
BI	 0.7930	 0.2130
BJ	 0.7454	 0.1320
BK	 0.8071	 0.1720
BL	 0.8662	 0.2100
BM	 0.8416	 0.1450
BN	 0.7662	 0.1360
BO	 0.7995	 0.1660
BP	 0.6724	 0.1320
BQ	 0.7865	 0.1020
BR	 0.8287	 0.1150
BS	 0.8051	 0.1600
BT	 0.8486	 0.1850
BU	 0.7349	 0.1380
BV	 0.7334	 0.1350
BW	 0.7639	 0.0140
BX	 0.7226	 0.1530
BY	 0.9110	 0.1500
BZ	 0.7425	 0.1900