



wwPDB EM Validation Summary Report ⓘ

Feb 25, 2024 – 06:52 PM EST

PDB ID : 6WLO
EMDB ID : EMD-21836
Title : hc16 ligase models, 11.0 Angstrom resolution
Authors : Kappel, K.; Zhang, K.; Su, Z.; Watkins, A.M.; Kladwang, W.; Li, S.; Pintilie, G.; Topkar, V.V.; Rangan, R.; Zheludev, I.N.; Yesselman, J.D.; Chiu, W.; Das, R.
Deposited on : 2020-04-20
Resolution : 11.00 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

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.dev70
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

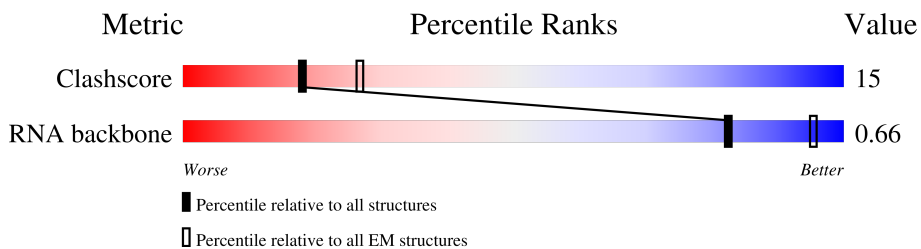
1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 11.00 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)
Clashscore	158937	4297
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	1-A	338	 7% 54% 28% 16%
1	10-A	338	 57% 27% 15%
1	11-A	338	 52% 27% 20%
1	12-A	338	 53% 26% 20%
1	13-A	338	 53% 29% 17%
1	14-A	338	 56% 26% 17%
1	15-A	338	 56% 25% 18%
1	16-A	338	 57% 22% 21%
1	17-A	338	 54% 24% 21%


























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Mol	Chain	Length	Quality of chain		
1	18-A	338	57%	22%	21%
1	19-A	338	55%	28%	17%
1	2-A	338	57%	29%	14%
1	20-A	338	54%	27%	19%
1	21-A	338	61%	26%	13%
1	22-A	338	65%	24%	10%
1	23-A	338	59%	24%	17%
1	24-A	338	60%	25%	15%
1	25-A	338	62%	25%	12%
1	26-A	338	59%	29%	12%
1	27-A	338	55%	29%	16%
1	28-A	338	56%	27%	17%
1	29-A	338	59%	25%	15%
1	3-A	338	53%	27%	19%
1	30-A	338	59%	25%	15%
1	31-A	338	58%	25%	17%
1	32-A	338	60%	23%	17%
1	33-A	338	61%	22%	17%
1	34-A	338	57%	28%	15%
1	35-A	338	58%	26%	15%
1	36-A	338	60%	24%	15%
1	37-A	338	55%	30%	14%
1	38-A	338	57%	29%	14%
1	39-A	338	63%	23%	14%
1	4-A	338	55%	30%	14%






















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Mol	Chain	Length	Quality of chain
1	40-A	338	 57% 23% 18%
1	41-A	338	 53% 28% 18%
1	42-A	338	 52% 29% 17%
1	43-A	338	 51% 28% 19%
1	44-A	338	 50% 31% 18%
1	45-A	338	 53% 27% 19%
1	46-A	338	 57% 25% 18%
1	47-A	338	 51% 28% 21%
1	48-A	338	 54% 27% 17%
1	49-A	338	 55% 28% 16%
1	5-A	338	 54% 30% 14%
1	50-A	338	 52% 31% 17%
1	51-A	338	 56% 25% 18%
1	52-A	338	 55% 25% 20%
1	53-A	338	 54% 28% 18%
1	54-A	338	 59% 26% 14%
1	55-A	338	 51% 33% 15%
1	56-A	338	 53% 31% 15%
1	57-A	338	 53% 27% 18%
1	58-A	338	 55% 27% 17%
1	59-A	338	 54% 25% 19%
1	6-A	338	 54% 26% 19%
1	60-A	338	 53% 28% 18%
1	61-A	338	 62% 24% 14%
1	62-A	338	 58% 26% 16%

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Mol	Chain	Length	Quality of chain
1	63-A	338	 58% 27% 15%
1	64-A	338	 61% 22% 17%
1	65-A	338	 59% 23% 17%
1	66-A	338	 60% 24% 16%
1	67-A	338	 60% 27% 13%
1	68-A	338	 58% 27% 15%
1	69-A	338	 59% 23% 17%
1	7-A	338	 52% 29% 18%
1	70-A	338	 57% 28% 14%
1	71-A	338	 59% 24% 16%
1	72-A	338	 59% 24% 16%
1	73-A	338	 55% 28% 17%
1	74-A	338	 56% 31% 13%
1	75-A	338	 58% 23% 18%
1	76-A	338	 57% 23% 19%
1	77-A	338	 59% 26% 15%
1	78-A	338	 58% 28% 14%
1	79-A	338	 58% 22% 20%
1	8-A	338	 55% 23% 20%
1	80-A	338	 57% 28% 14%
1	9-A	338	 54% 30% 15%

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 870478 atoms, of which 291760 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 RNA (338-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
1	1-A	338	10881	3233	3647	1327	2337	337	0	0
1	2-A	338	10881	3233	3647	1327	2337	337	0	0
1	3-A	338	10881	3233	3647	1327	2337	337	0	0
1	4-A	338	10881	3233	3647	1327	2337	337	0	0
1	5-A	338	10881	3233	3647	1327	2337	337	0	0
1	6-A	338	10881	3233	3647	1327	2337	337	0	0
1	7-A	338	10881	3233	3647	1327	2337	337	0	0
1	8-A	338	10881	3233	3647	1327	2337	337	0	0
1	9-A	338	10881	3233	3647	1327	2337	337	0	0
1	10-A	338	10881	3233	3647	1327	2337	337	0	0
1	11-A	338	10881	3233	3647	1327	2337	337	0	0
1	12-A	338	10881	3233	3647	1327	2337	337	0	0
1	13-A	338	10881	3233	3647	1327	2337	337	0	0
1	14-A	338	10881	3233	3647	1327	2337	337	0	0
1	15-A	338	10881	3233	3647	1327	2337	337	0	0
1	16-A	338	10881	3233	3647	1327	2337	337	0	0
1	17-A	338	10881	3233	3647	1327	2337	337	0	0

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Mol	Chain	Residues	Atoms						AltConf	Trace
1	18-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	19-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	20-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	21-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	22-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	23-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	24-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	25-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	26-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	27-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	28-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	29-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	30-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	31-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	32-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	33-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	34-A	338	Total 10880	C 3233	H 3647	N 1327	O 2336	P 337	0	0
1	35-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	36-A	338	Total 10880	C 3233	H 3647	N 1327	O 2336	P 337	0	0
1	37-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	38-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0

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Mol	Chain	Residues	Atoms						AltConf	Trace
1	39-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	40-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	41-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	42-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	43-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	44-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	45-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	46-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	47-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	48-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	49-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	50-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	51-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	52-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	53-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	54-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	55-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	56-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	57-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	58-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	59-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0

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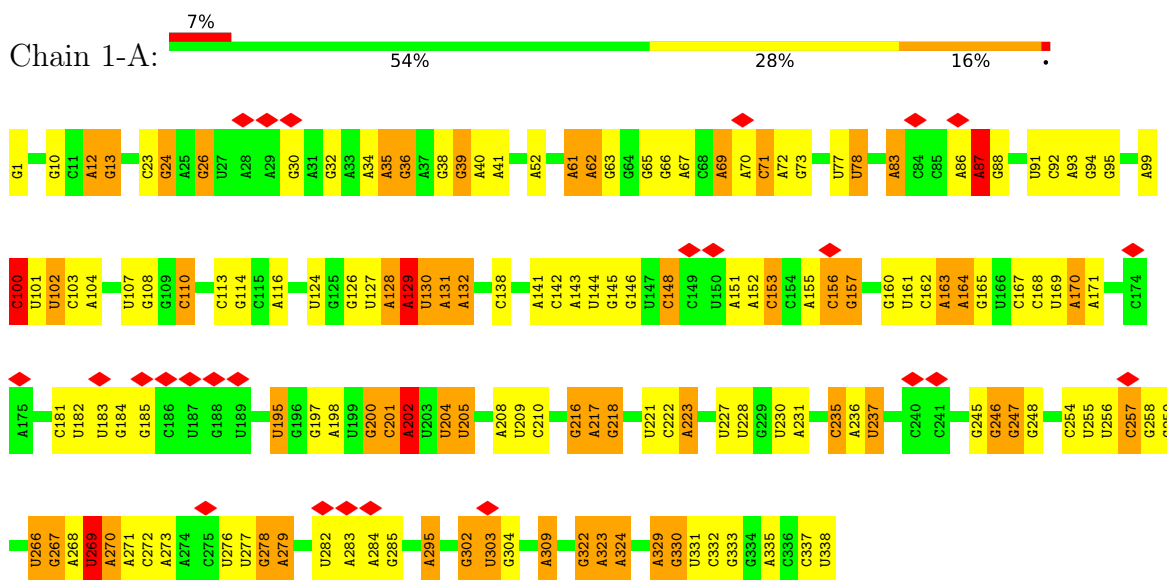
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Mol	Chain	Residues	Atoms						AltConf	Trace
1	60-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	61-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	62-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	63-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	64-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	65-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	66-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	67-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	68-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	69-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	70-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	71-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	72-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	73-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	74-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	75-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	76-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	77-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	78-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	79-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0
1	80-A	338	Total 10881	C 3233	H 3647	N 1327	O 2337	P 337	0	0

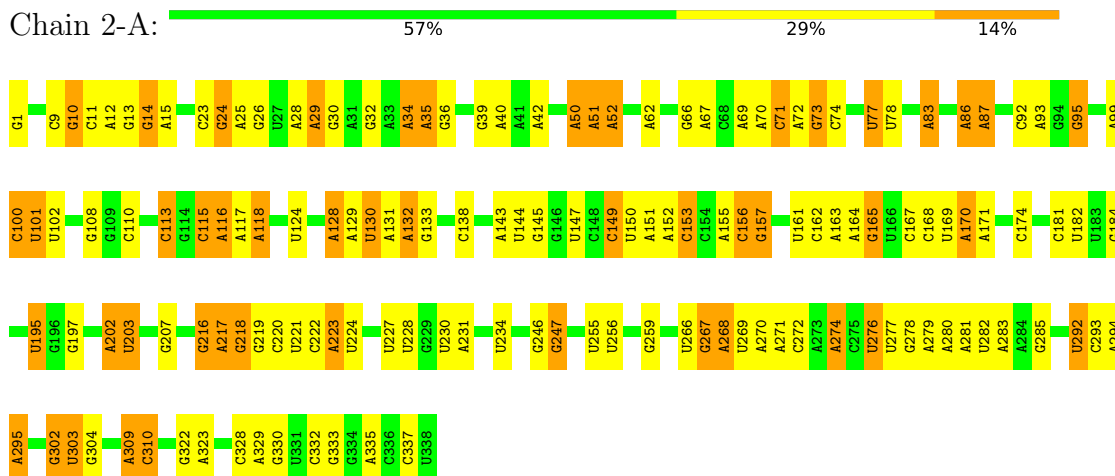
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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: RNA (338-MER)

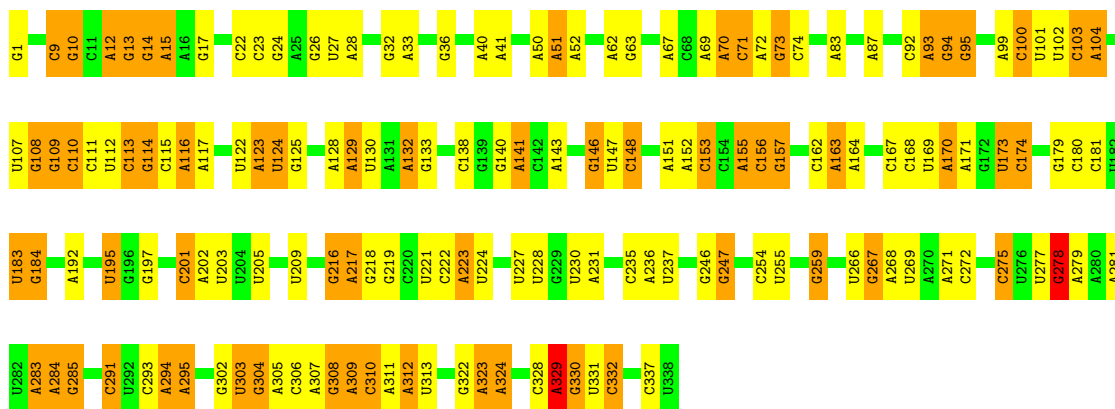


- Molecule 1: RNA (338-MER)



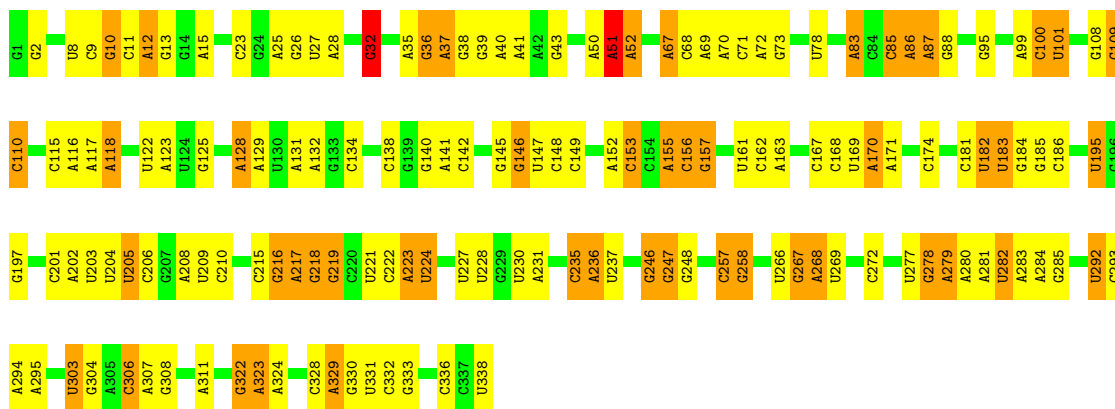
- Molecule 1: RNA (338-MER)

Chain 3-A:  53% 27% 19%



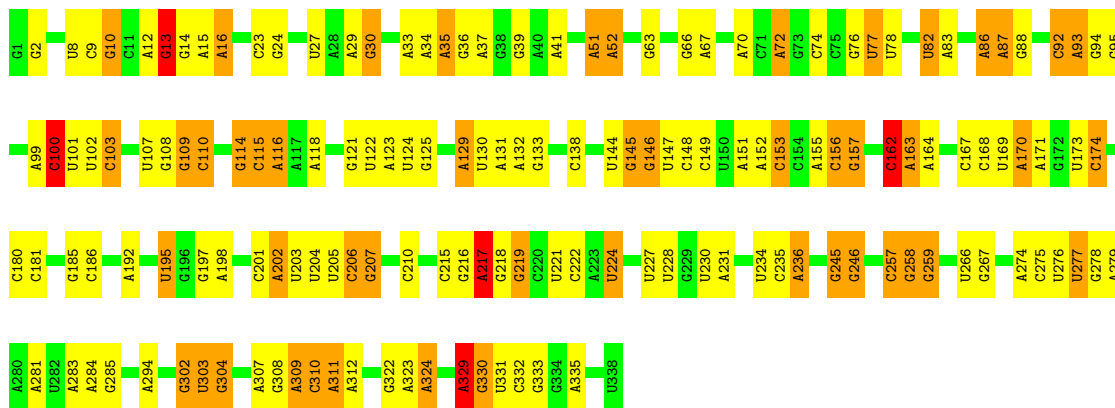
• Molecule 1: RNA (338-MER)

Chain 4-A:  55% 30% 14%



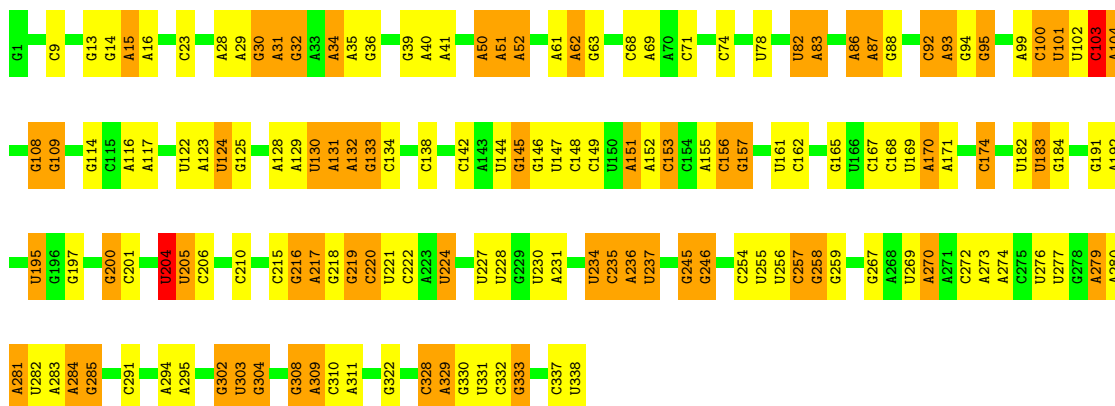
• Molecule 1: RNA (338-MER)

Chain 5-A:  54% 30% 14%



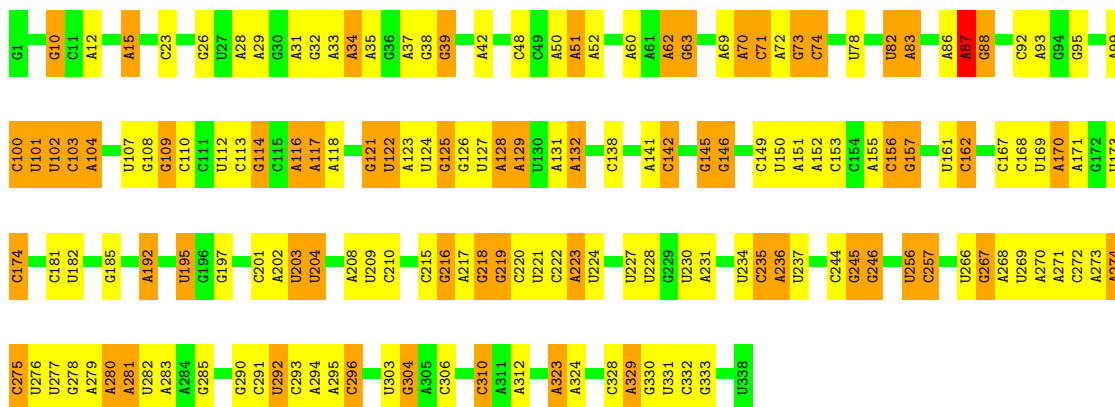
• Molecule 1: RNA (338-MER)

Chain 6-A:  54% 26% 19%



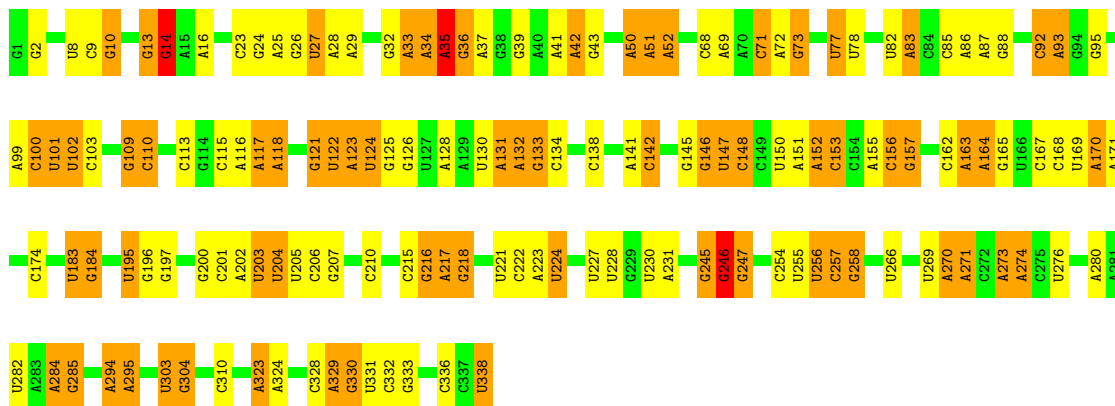
• Molecule 1: RNA (338-MER)

Chain 7-A:  52% 29% 18%



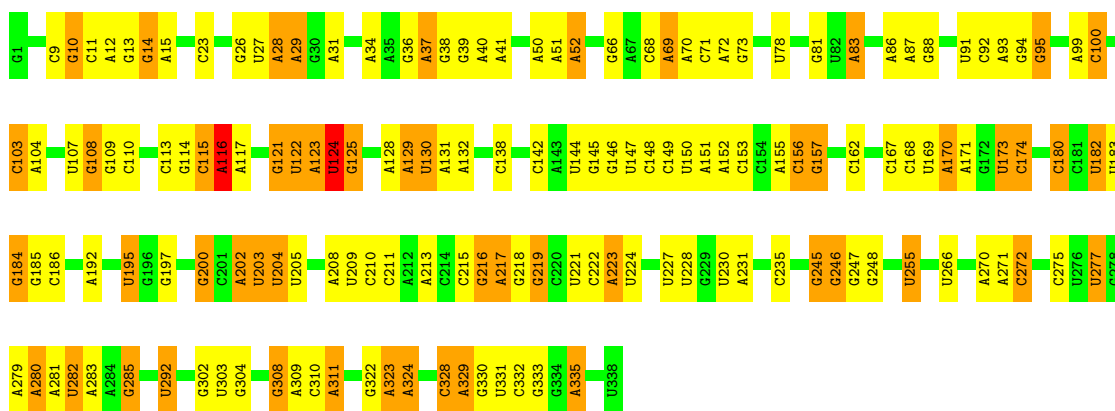
• Molecule 1: RNA (338-MER)

Chain 8-A:  55% 23% 20%



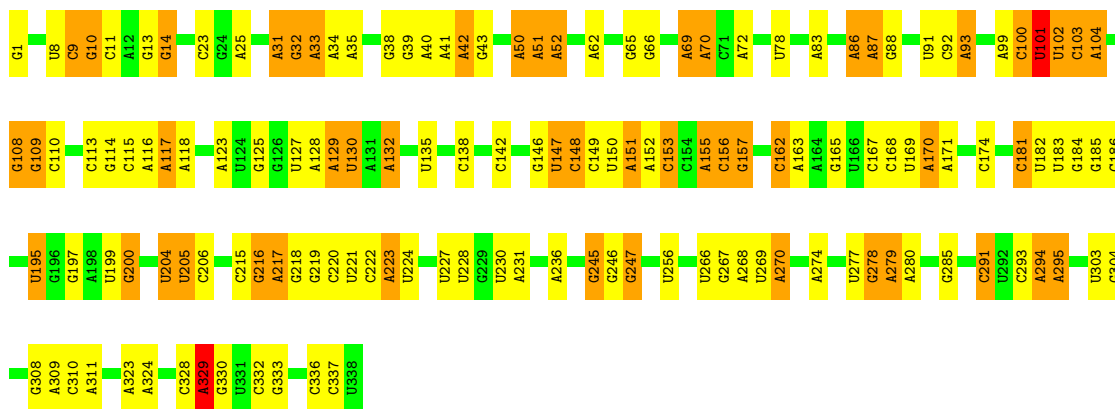
• Molecule 1: RNA (338-MER)

Chain 9-A:  54% 30% 15%



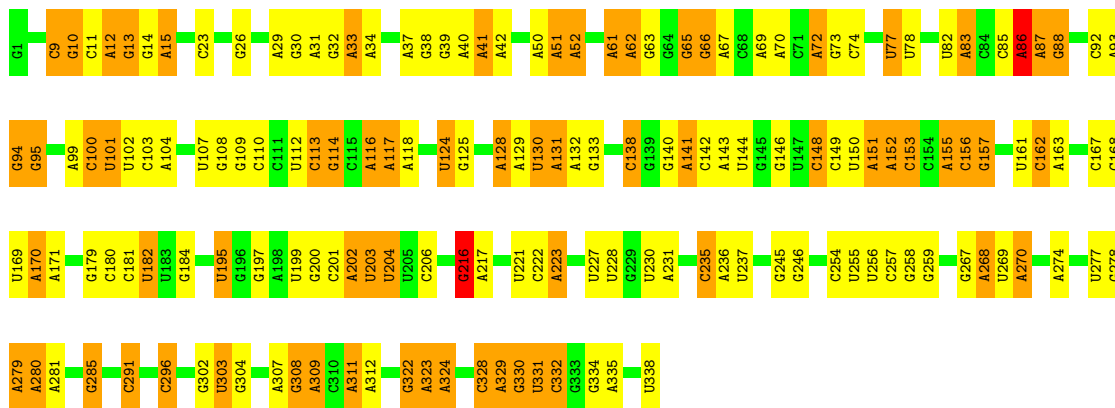
• Molecule 1: RNA (338-MER)

Chain 10-A:  57% 27% 15%

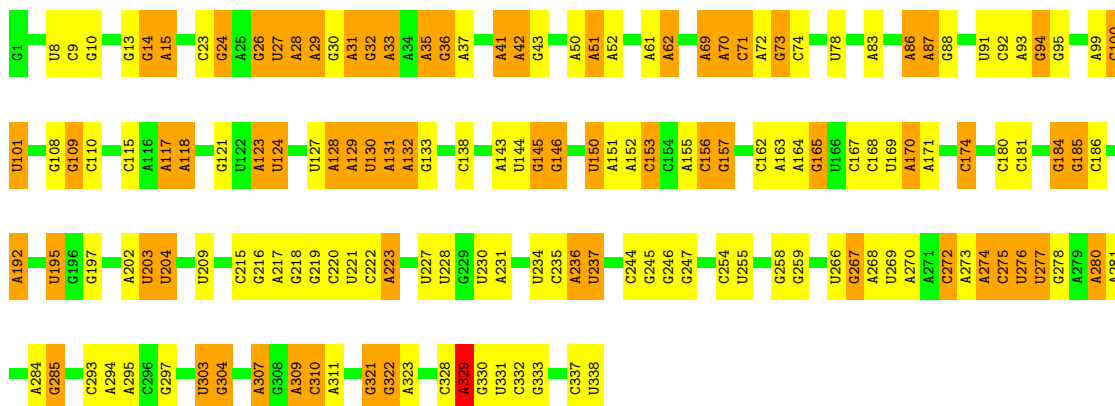


• Molecule 1: RNA (338-MER)

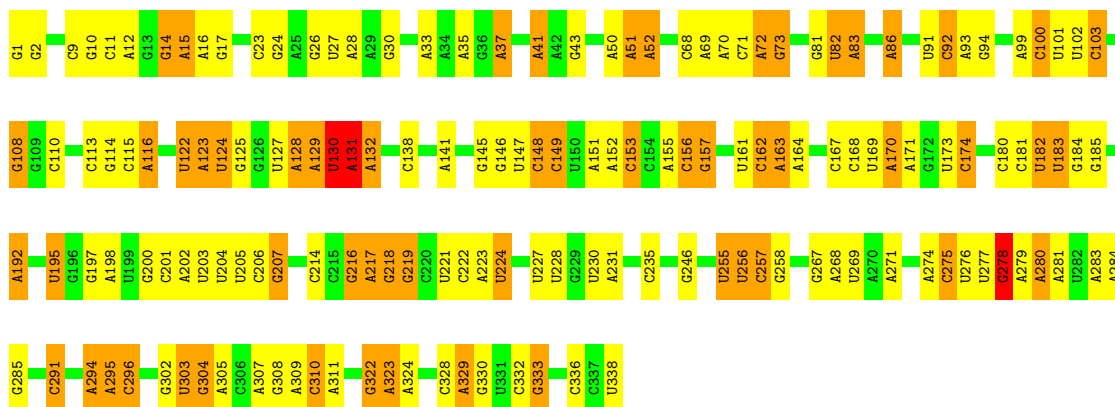
Chain 11-A:  52% 27% 20%



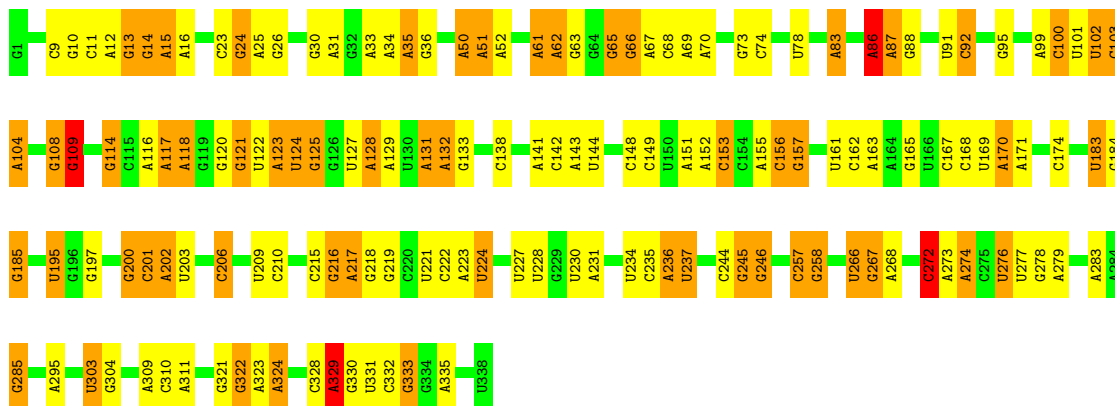
• Molecule 1: RNA (338-MER)



• Molecule 1: RNA (338-MER)

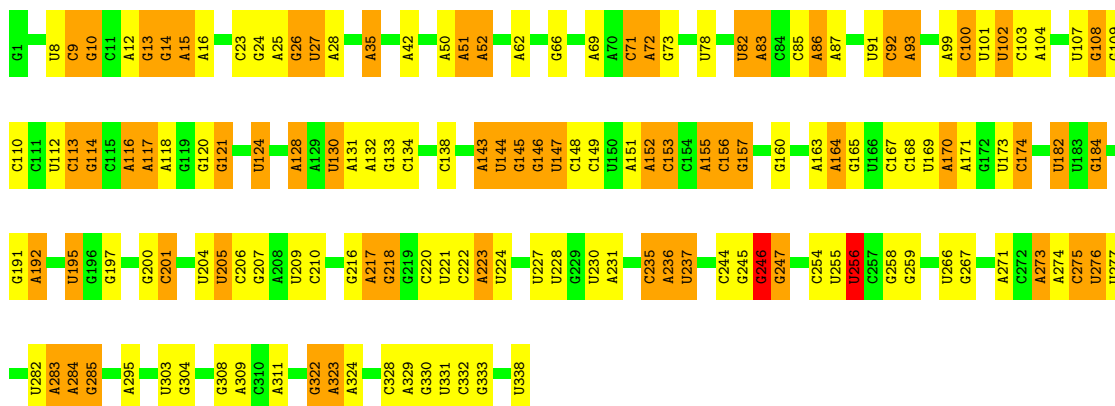


• Molecule 1: RNA (338-MER)



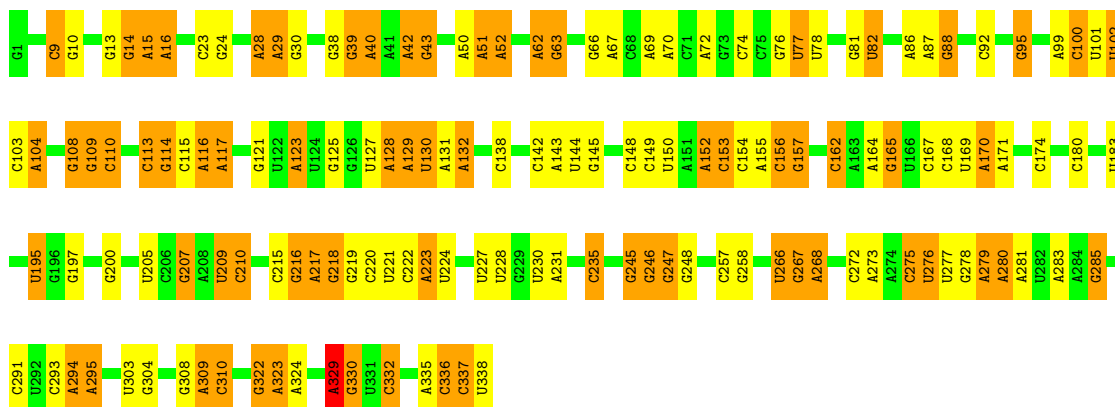
• Molecule 1: RNA (338-MER)

Chain 15-A: 



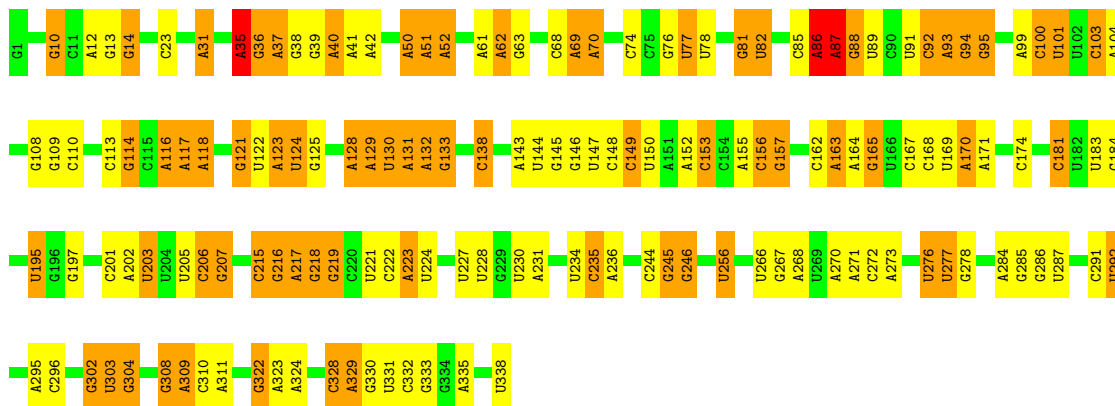
• Molecule 1: RNA (338-MER)

Chain 16-A: 



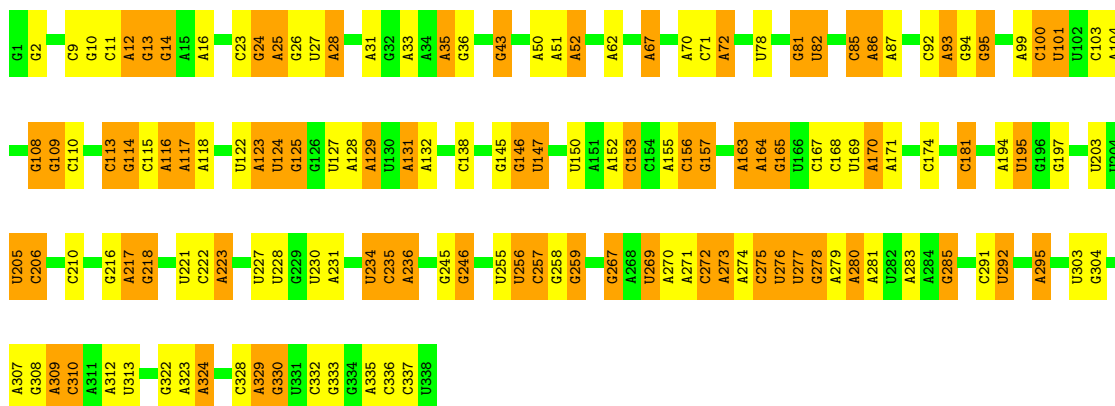
• Molecule 1: RNA (338-MER)

Chain 17-A: 



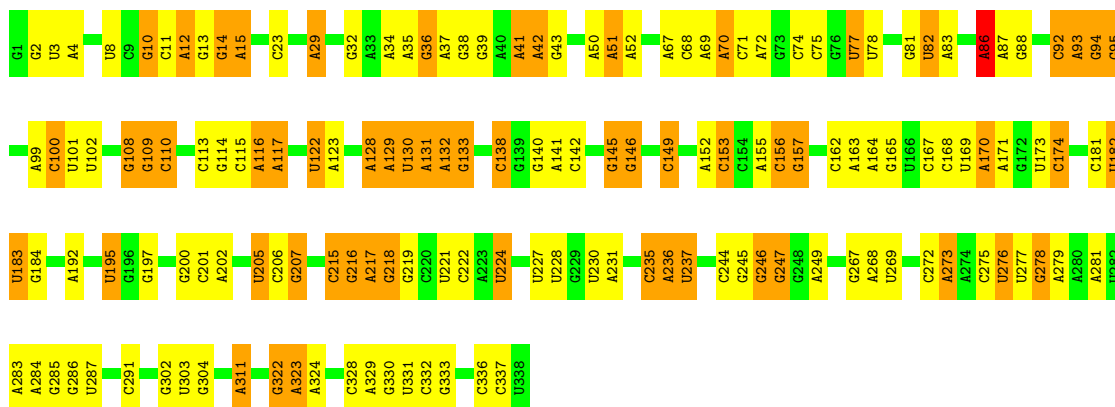
• Molecule 1: RNA (338-MER)

Chain 18-A:  57% 22% 21%



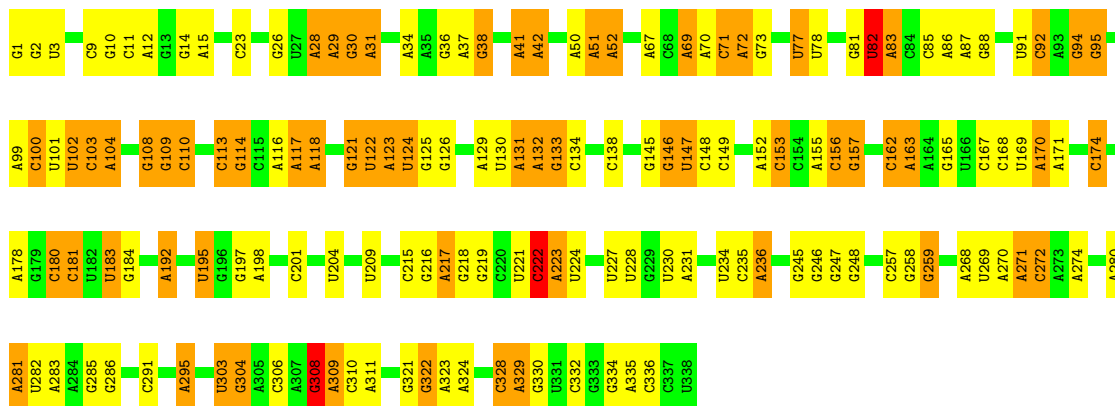
• Molecule 1: RNA (338-MER)

Chain 19-A:  55% 28% 17%



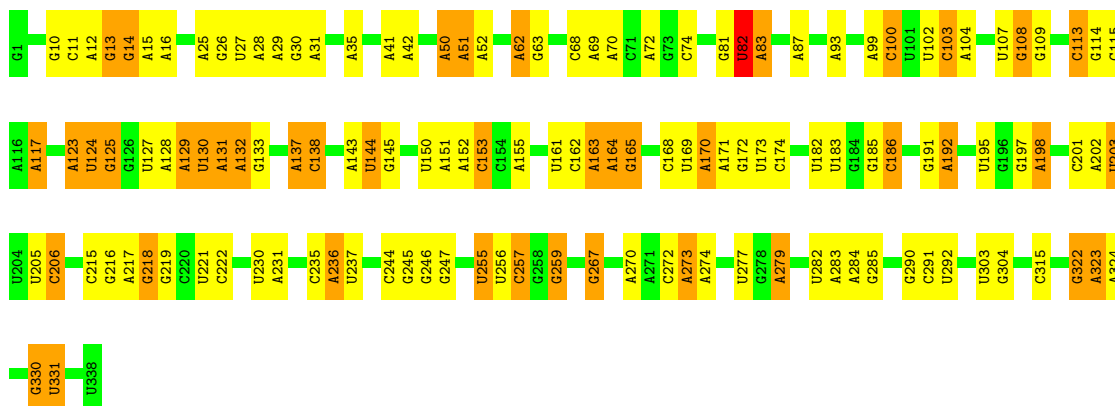
• Molecule 1: RNA (338-MER)

Chain 20-A:  54% 27% 19%



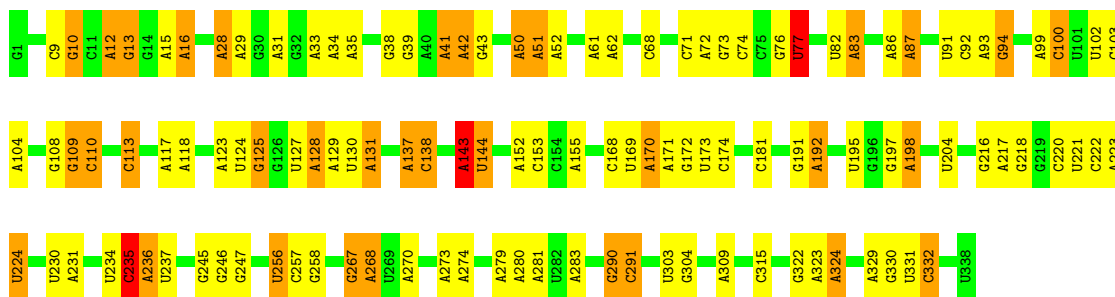
• Molecule 1: RNA (338-MER)

Chain 21-A:  61% 26% 13%



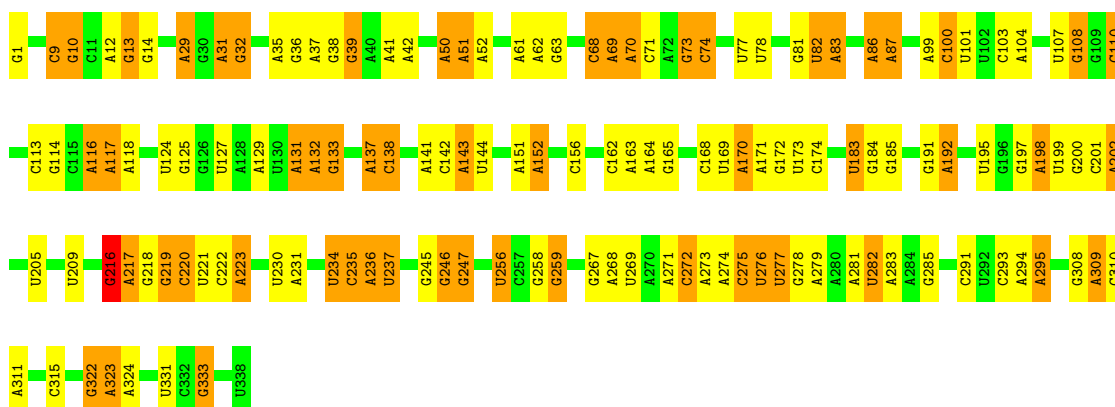
• Molecule 1: RNA (338-MER)

Chain 22-A:  65% 24% 10%



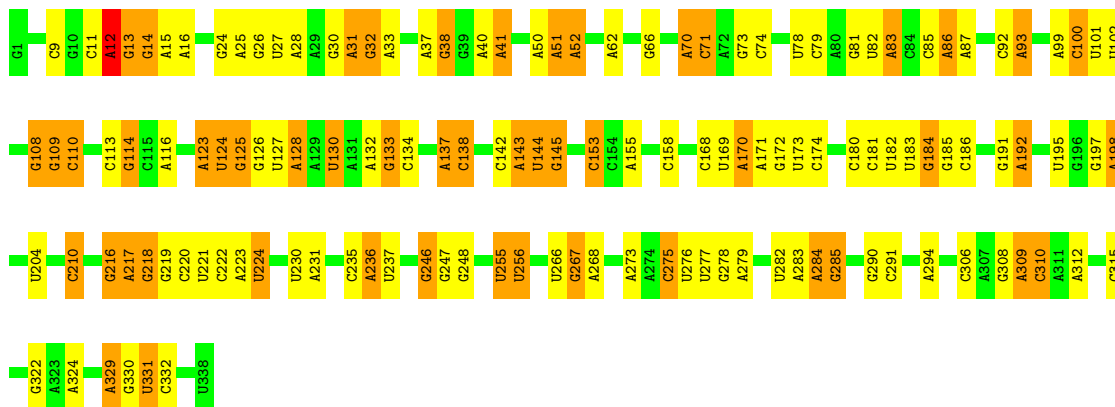
• Molecule 1: RNA (338-MER)

Chain 23-A:  59% 24% 17%

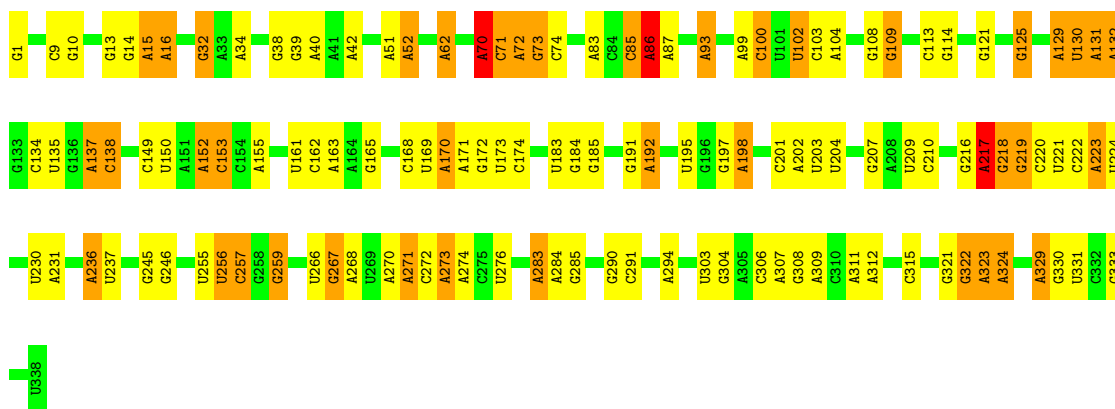


• Molecule 1: RNA (338-MER)

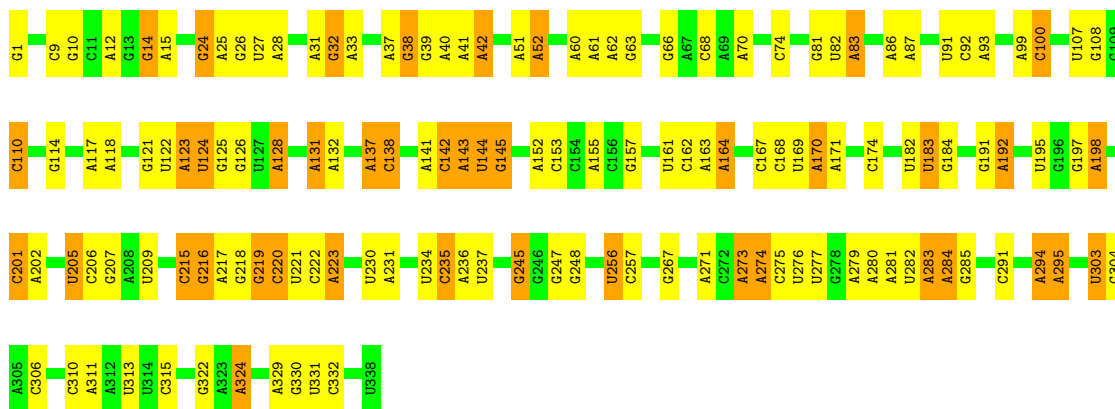
Chain 24-A:  60% 25% 15%



• Molecule 1: RNA (338-MER)

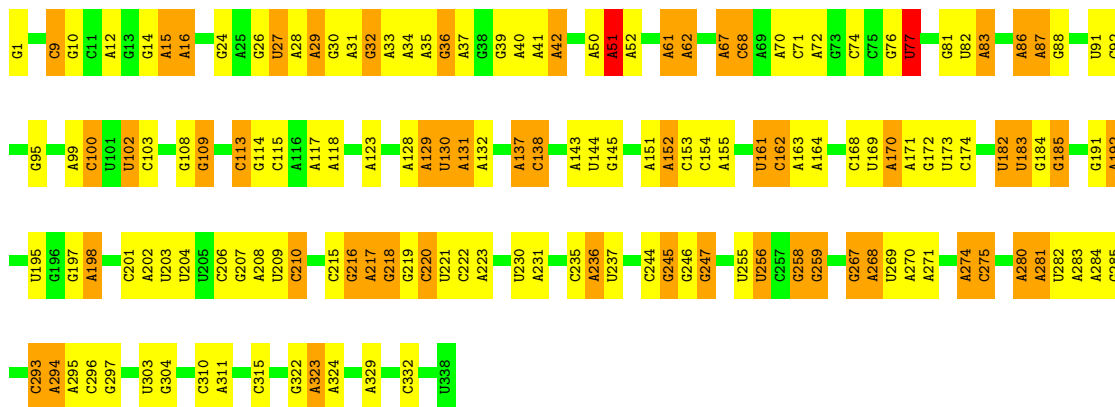


• Molecule 1: RNA (338-MER)

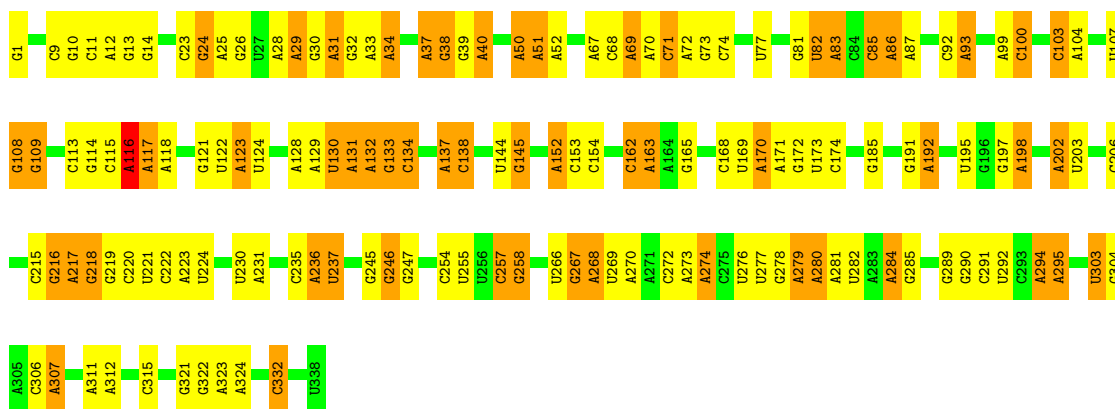


• Molecule 1: RNA (338-MER)

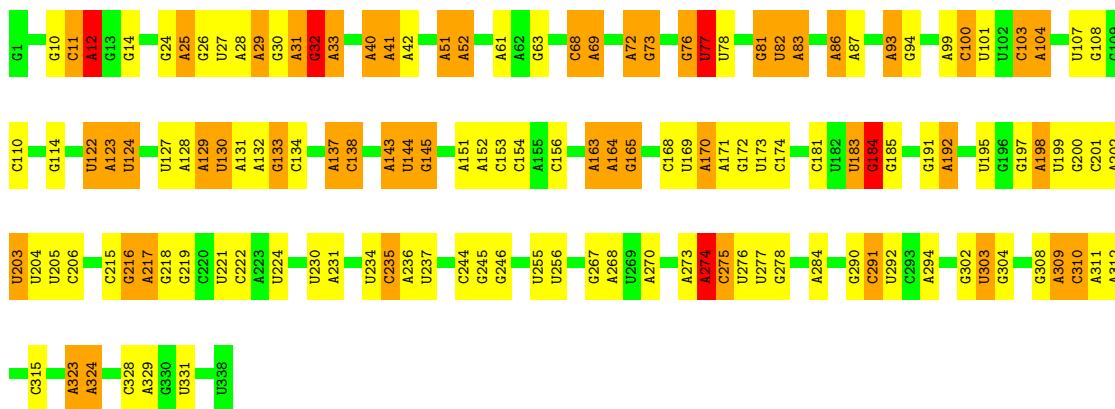




• Molecule 1: RNA (338-MER)

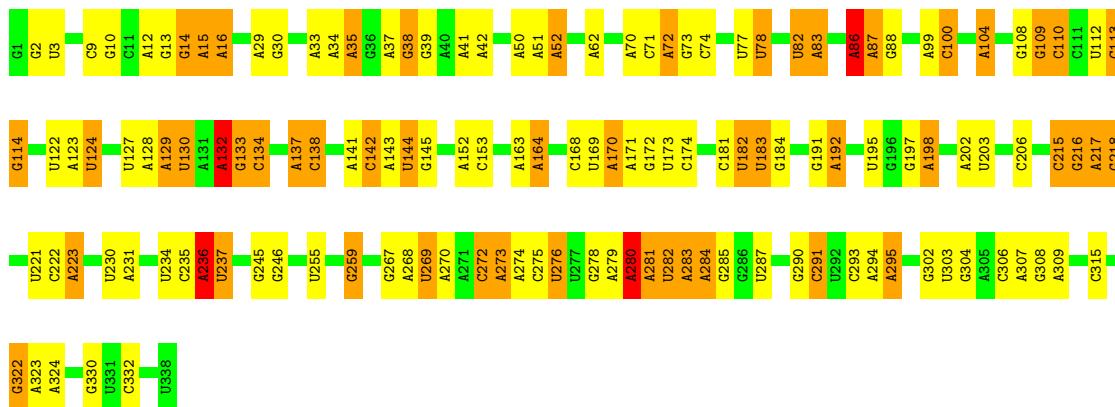


• Molecule 1: RNA (338-MER)

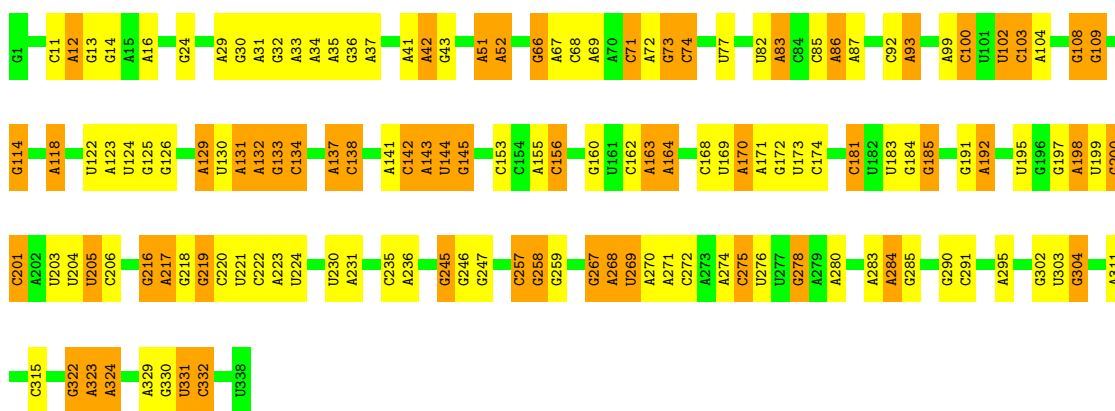


• Molecule 1: RNA (338-MER)

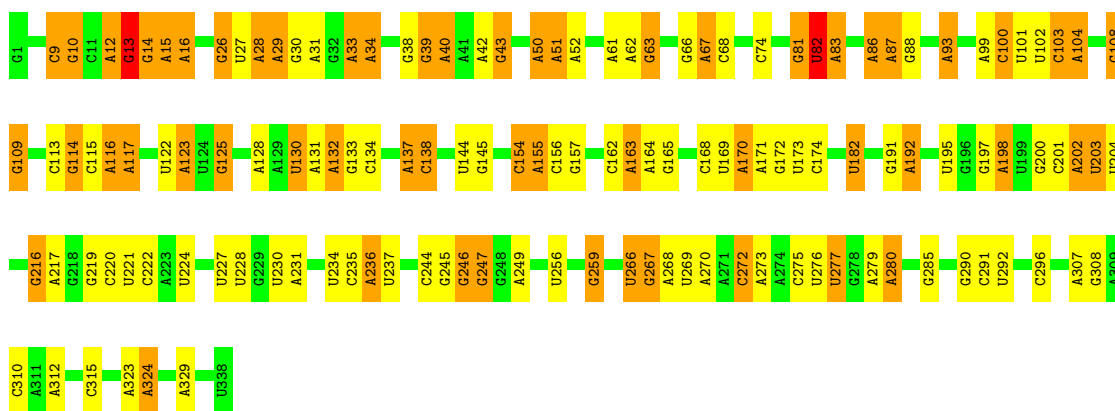




• Molecule 1: RNA (338-MER)

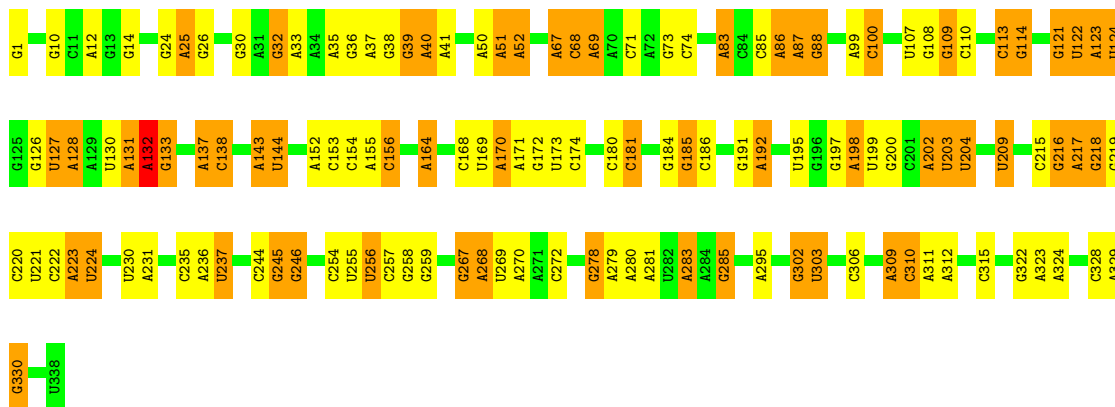


• Molecule 1: RNA (338-MER)

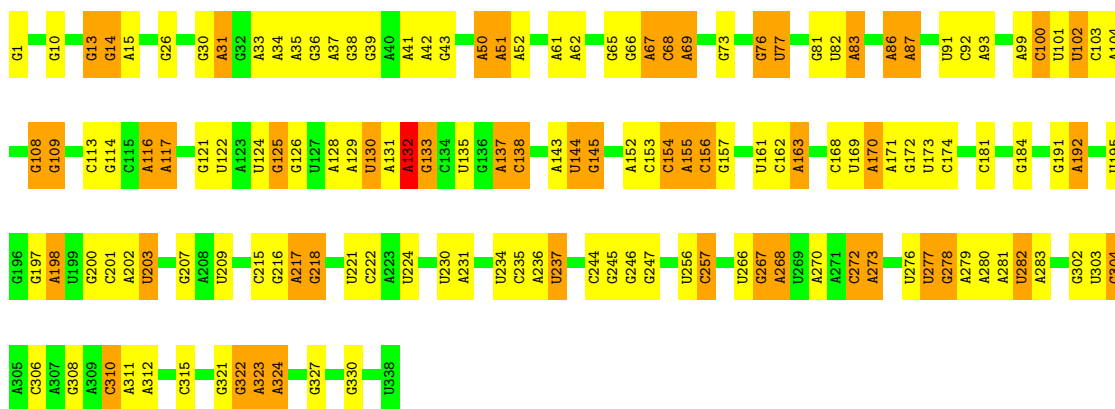


• Molecule 1: RNA (338-MER)

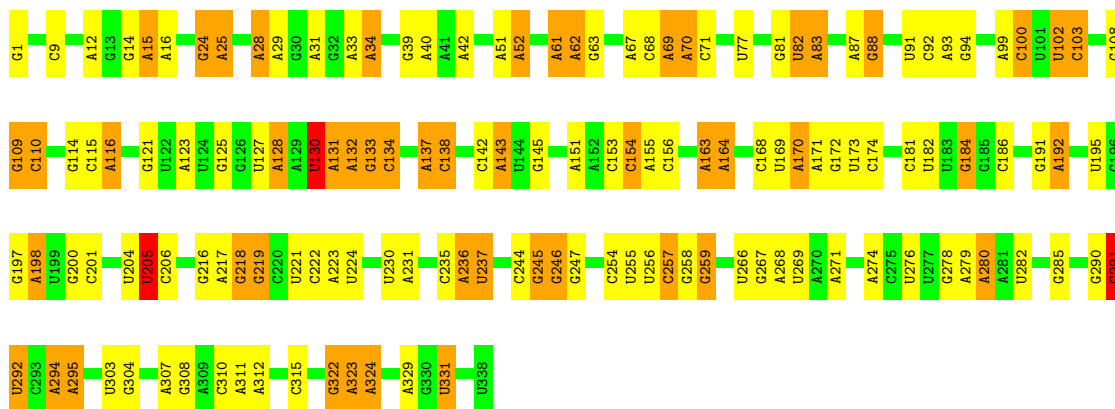




• Molecule 1: RNA (338-MER)

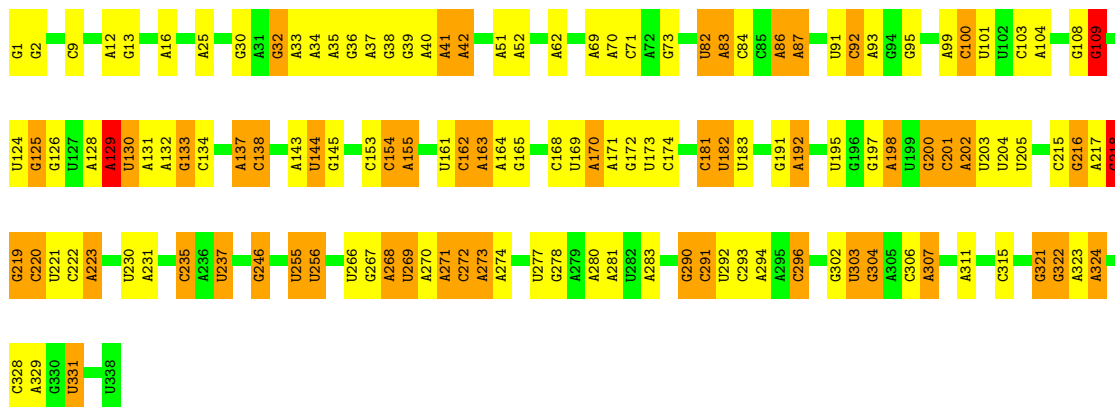


• Molecule 1: RNA (338-MER)

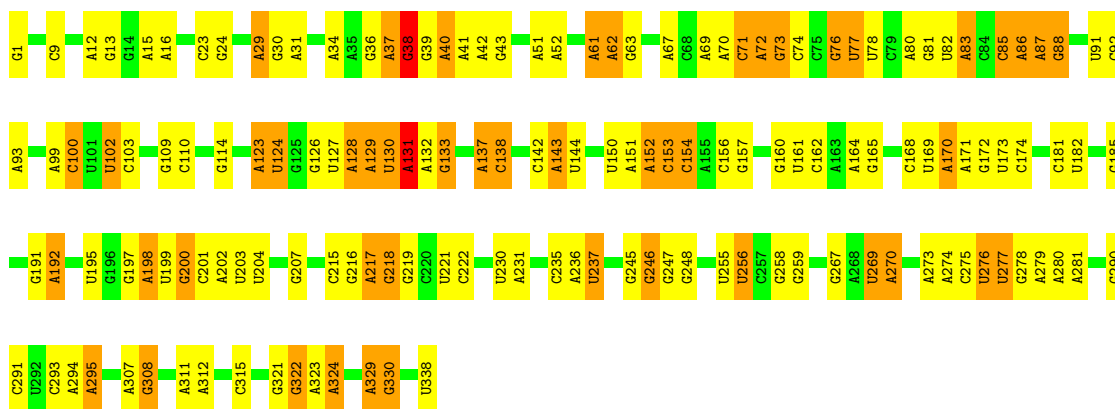


• Molecule 1: RNA (338-MER)

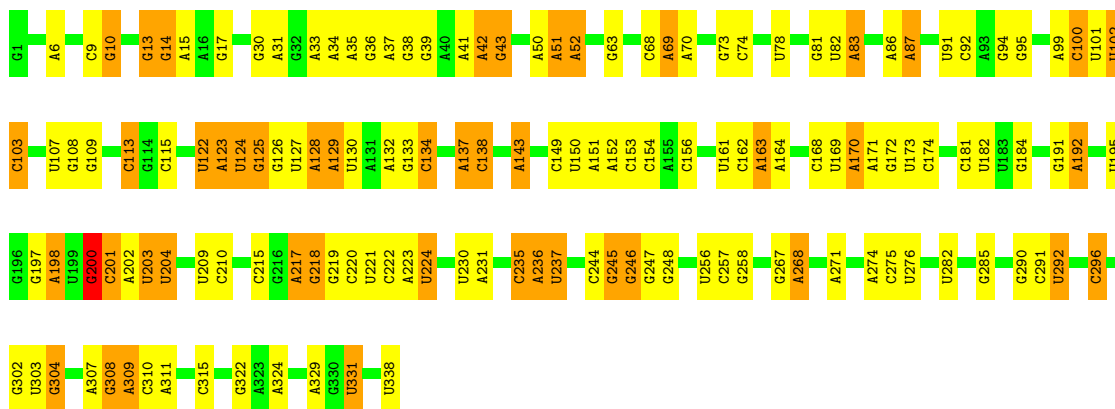




• Molecule 1: RNA (338-MER)

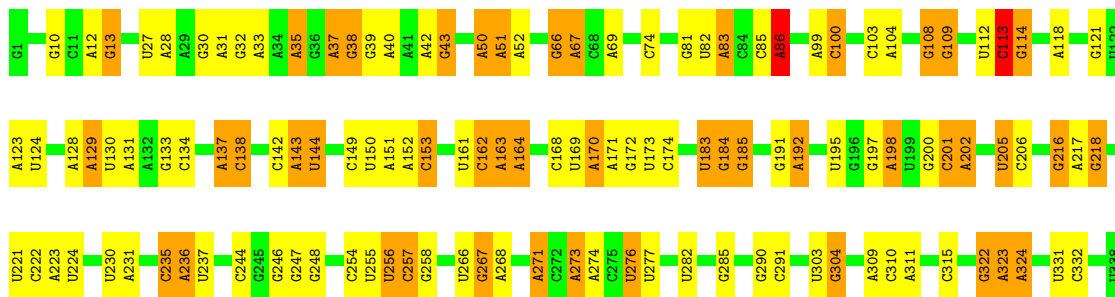


• Molecule 1: RNA (338-MER)



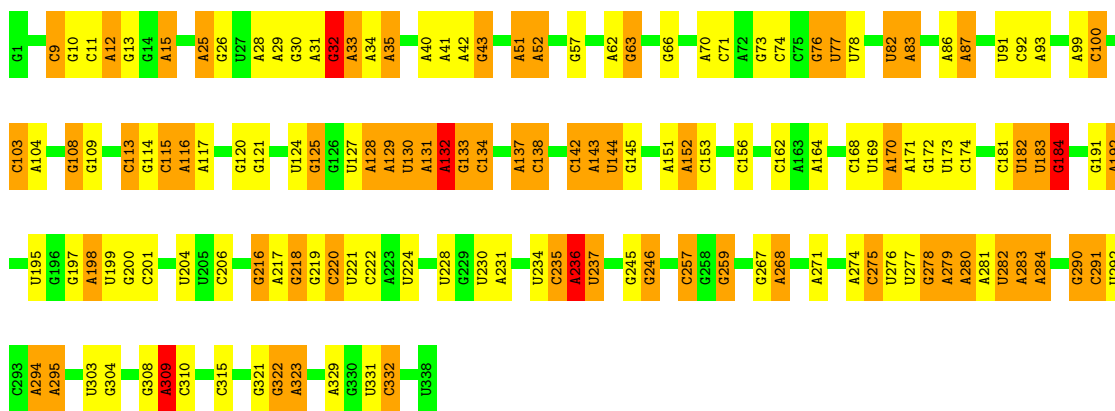
• Molecule 1: RNA (338-MER)





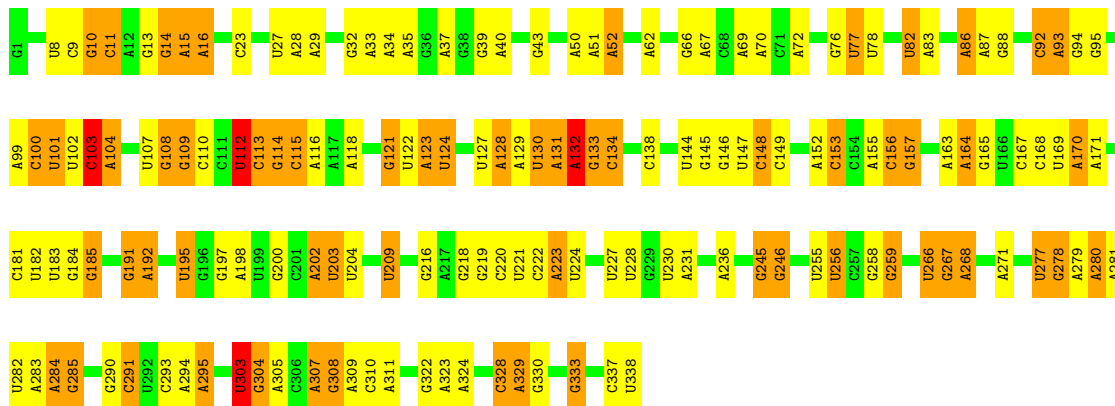
• Molecule 1: RNA (338-MER)

Chain 40-A: 57% 23% 18%



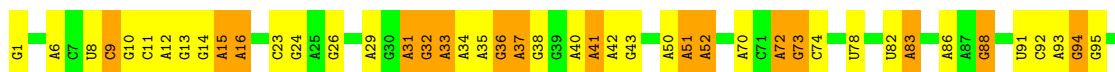
• Molecule 1: RNA (338-MER)

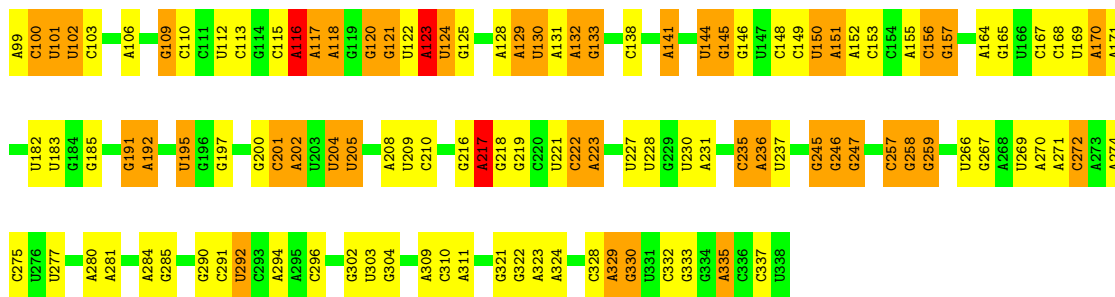
Chain 41-A: 53% 28% 18%



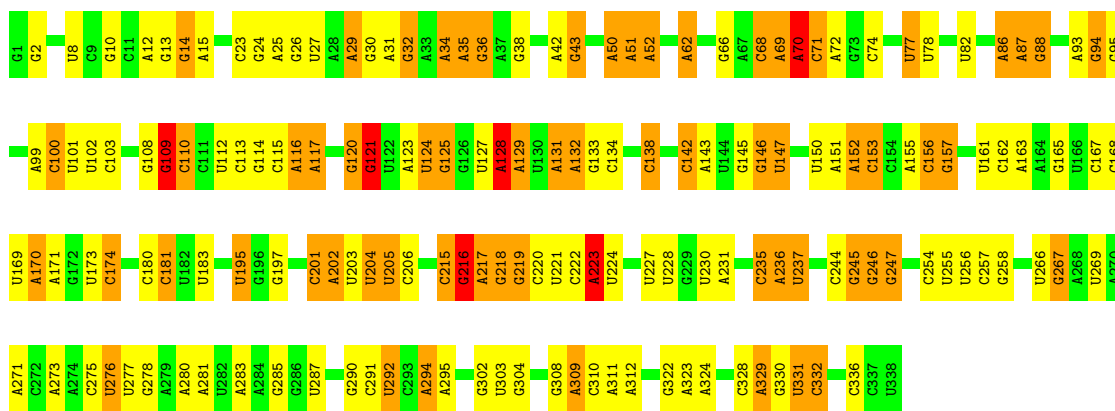
• Molecule 1: RNA (338-MER)

Chain 42-A: 52% 29% 17%

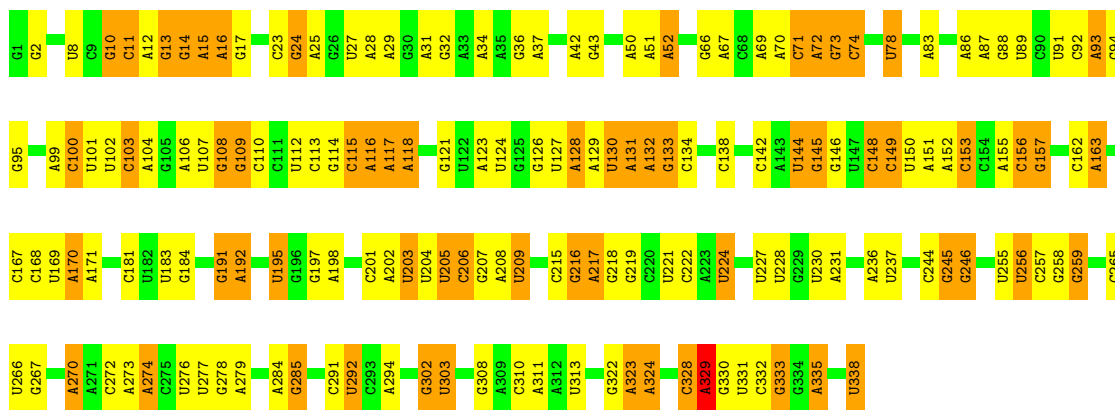




• Molecule 1: RNA (338-MER)

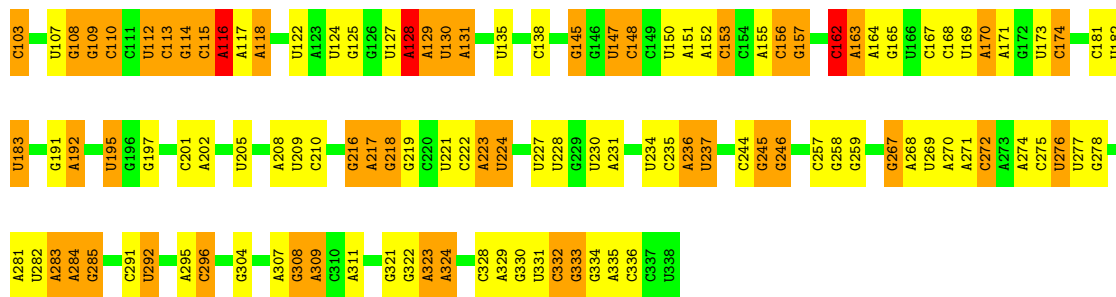


• Molecule 1: RNA (338-MER)



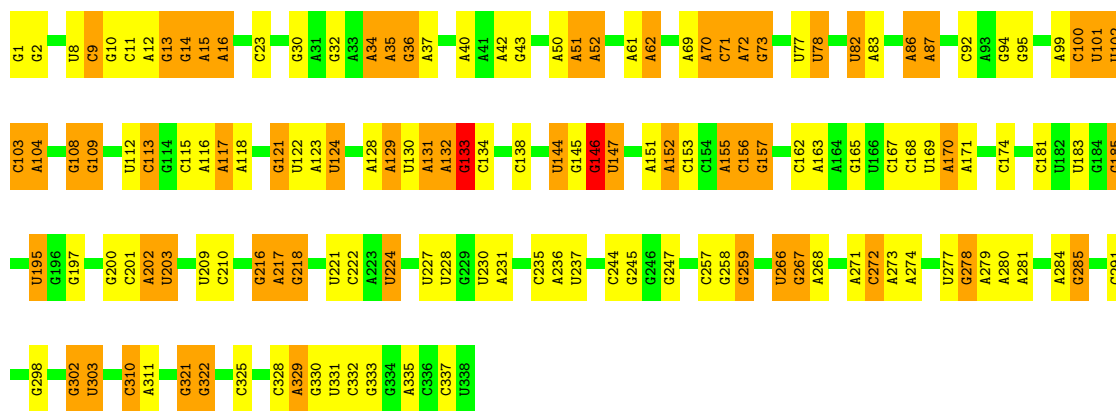
• Molecule 1: RNA (338-MER)





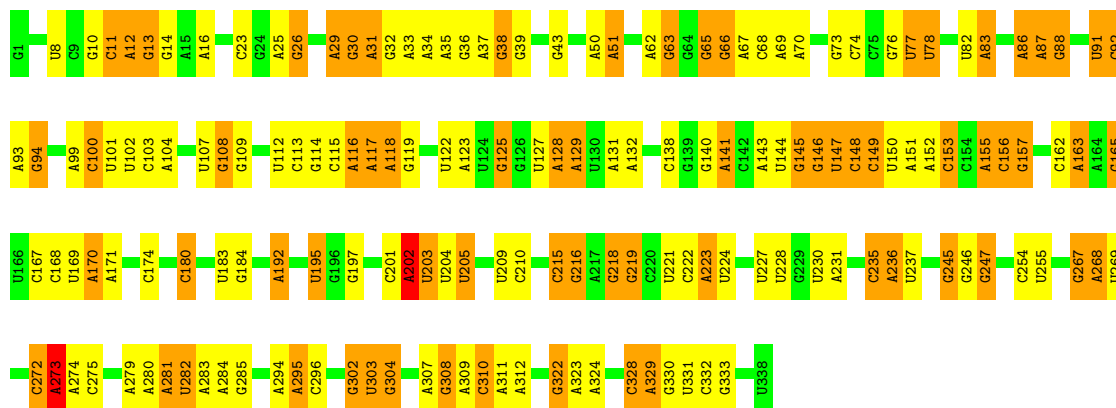
- Molecule 1: RNA (338-MER)

Chain 46-A: 57% 25% 18%



- Molecule 1: RNA (338-MER)

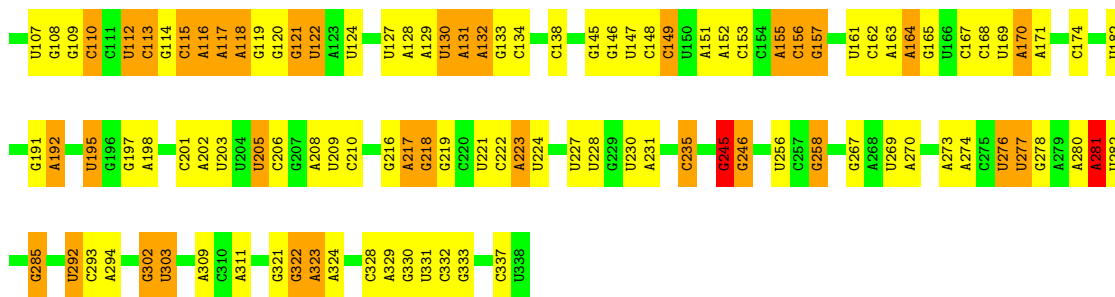
Chain 47-A: 51% 28% 21%



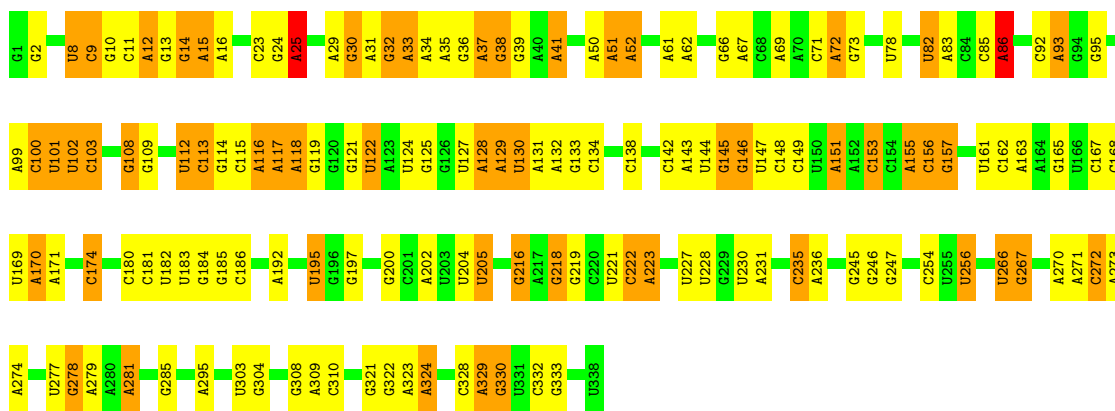
- Molecule 1: RNA (338-MER)

Chain 48-A: 54% 27% 17%

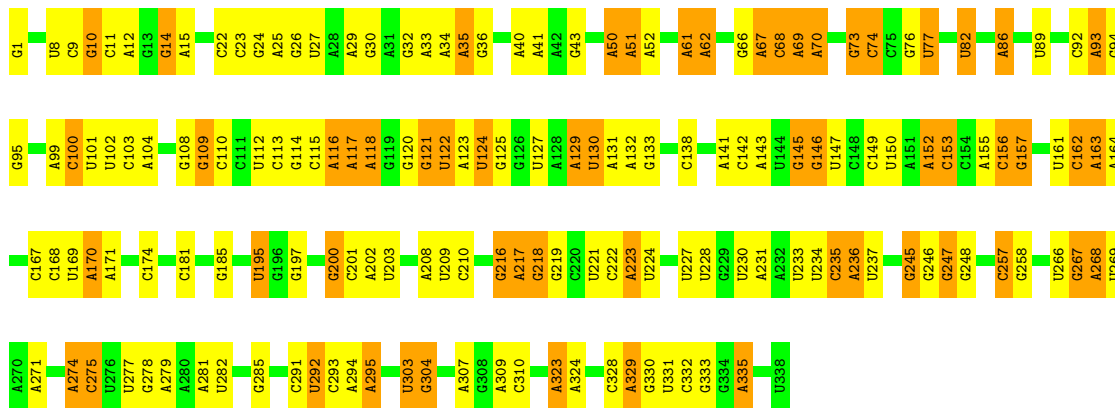




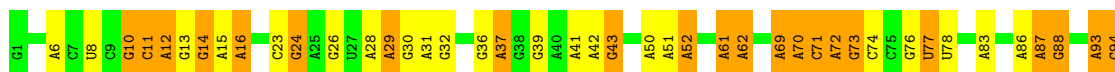
• Molecule 1: RNA (338-MER)

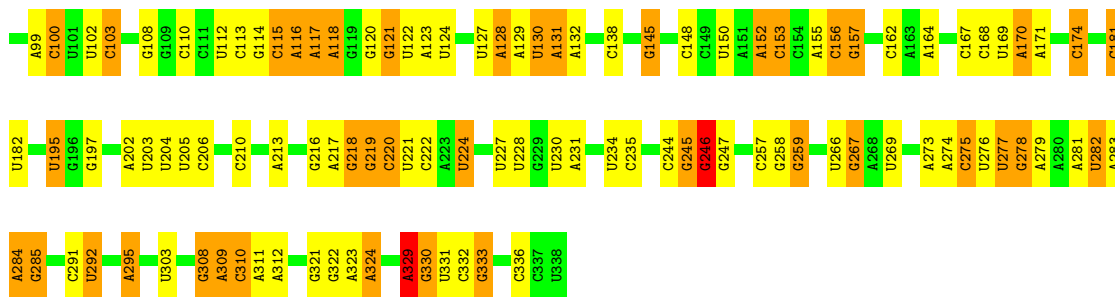


• Molecule 1: RNA (338-MER)

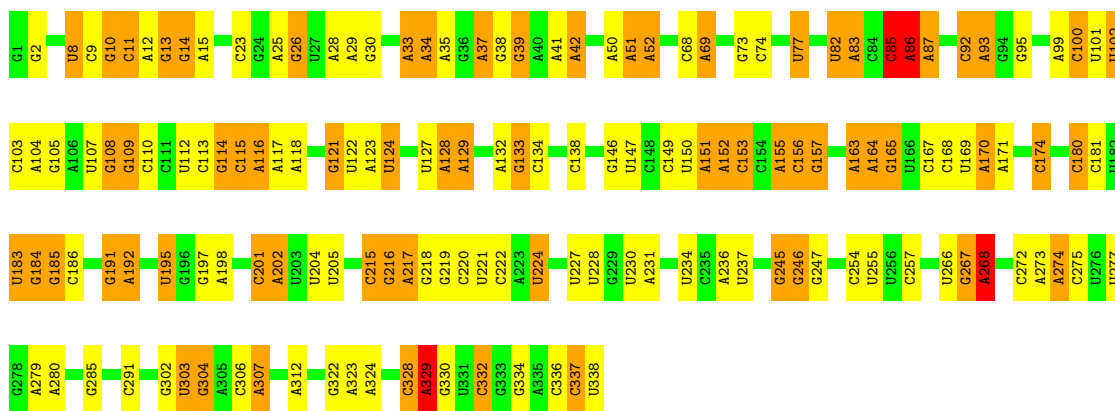


• Molecule 1: RNA (338-MER)

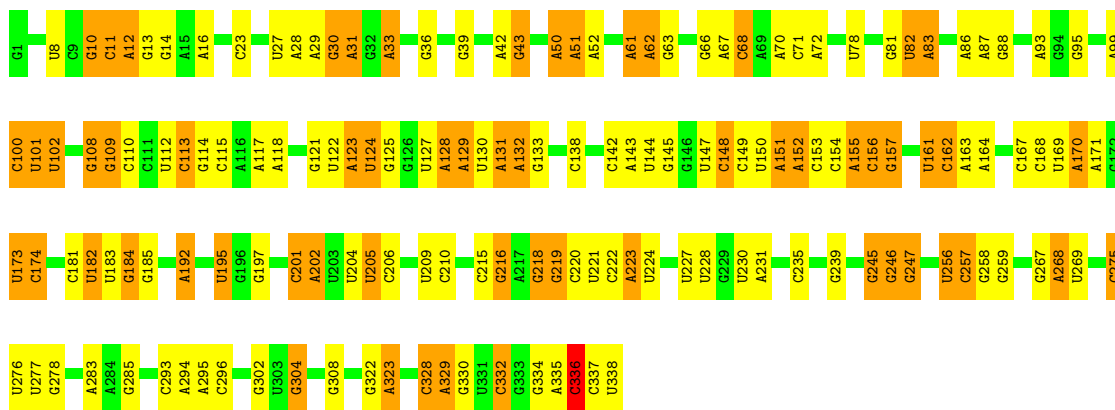




• Molecule 1: RNA (338-MER)

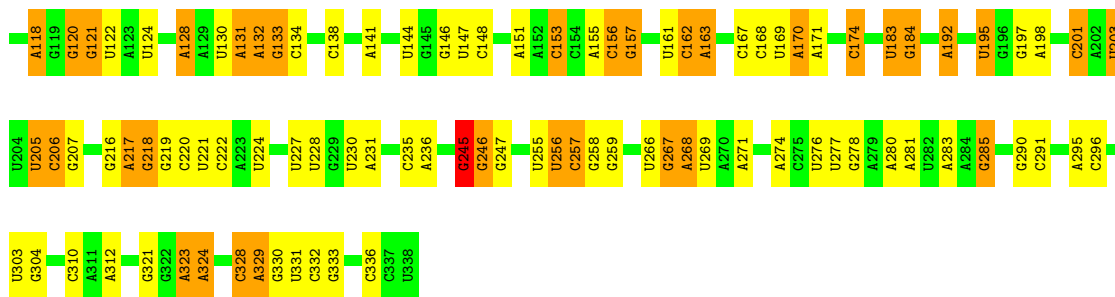


• Molecule 1: RNA (338-MER)

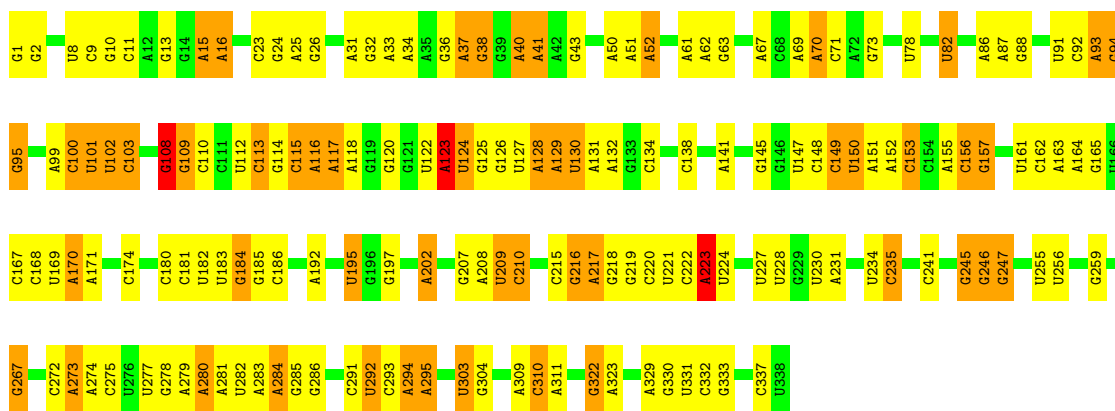


• Molecule 1: RNA (338-MER)

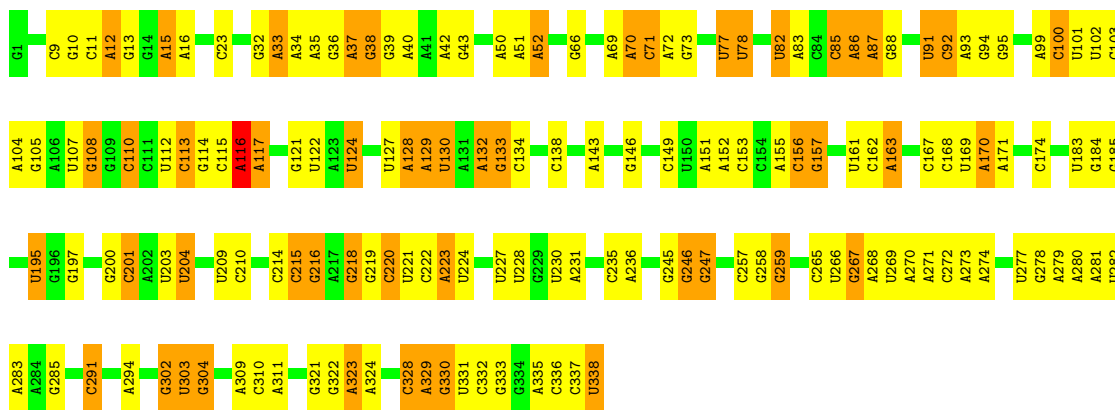




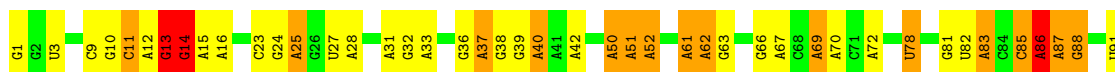
• Molecule 1: RNA (338-MER)

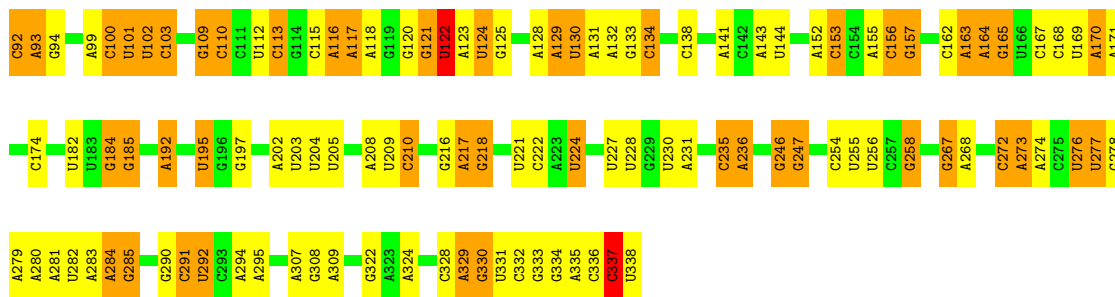


• Molecule 1: RNA (338-MER)

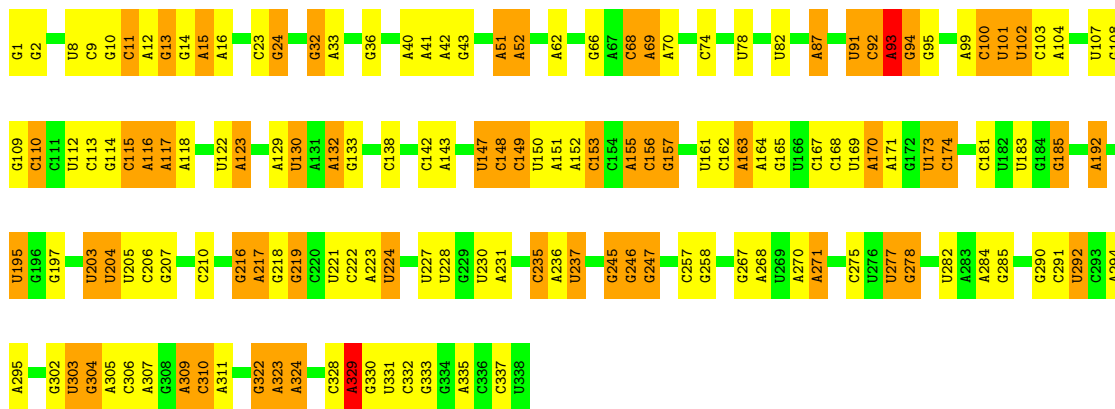


• Molecule 1: RNA (338-MER)

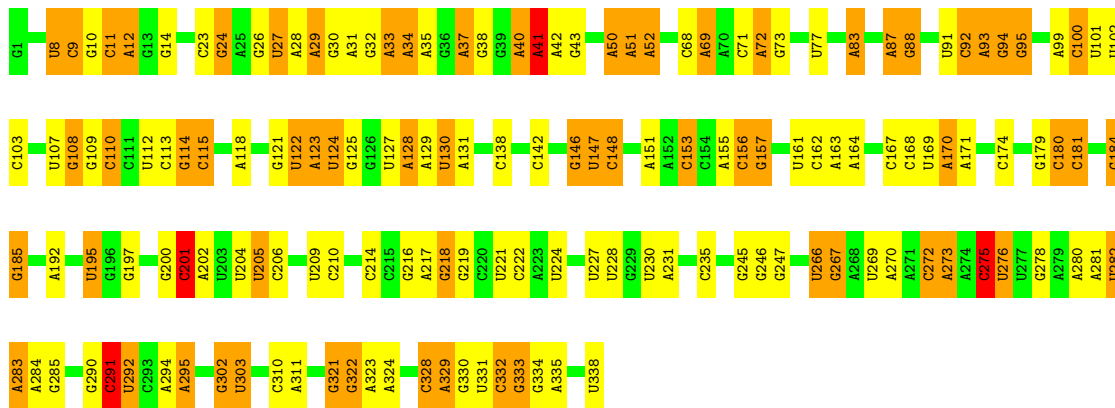




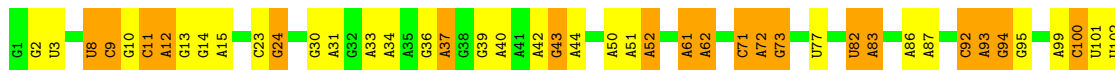
• Molecule 1: RNA (338-MER)

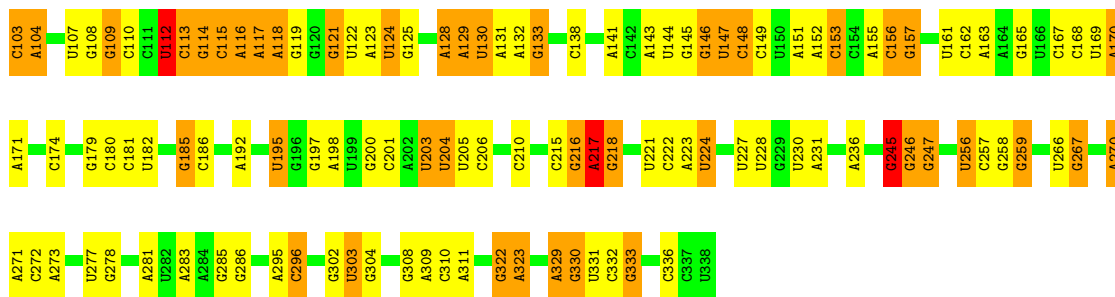


• Molecule 1: RNA (338-MER)

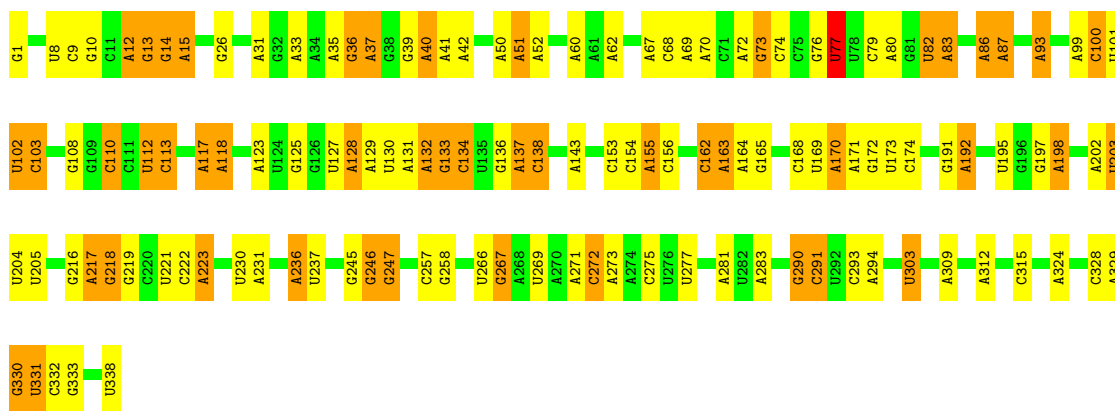


• Molecule 1: RNA (338-MER)

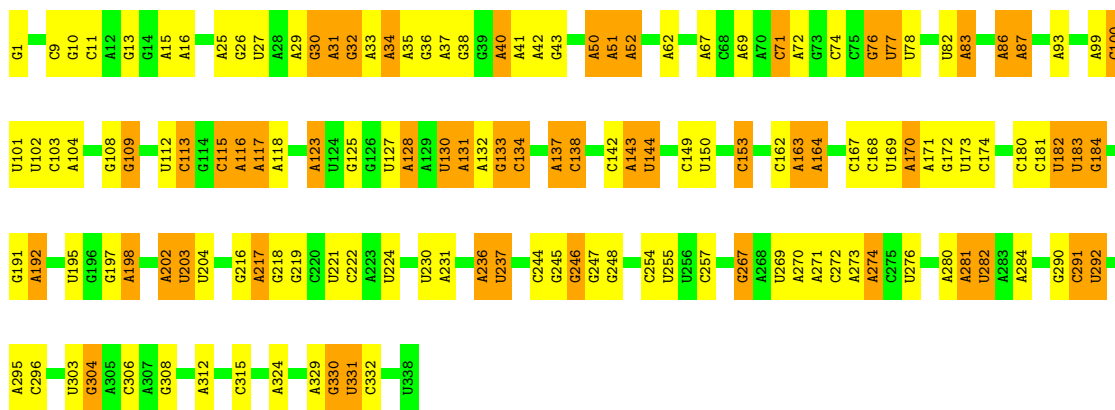




• Molecule 1: RNA (338-MER)

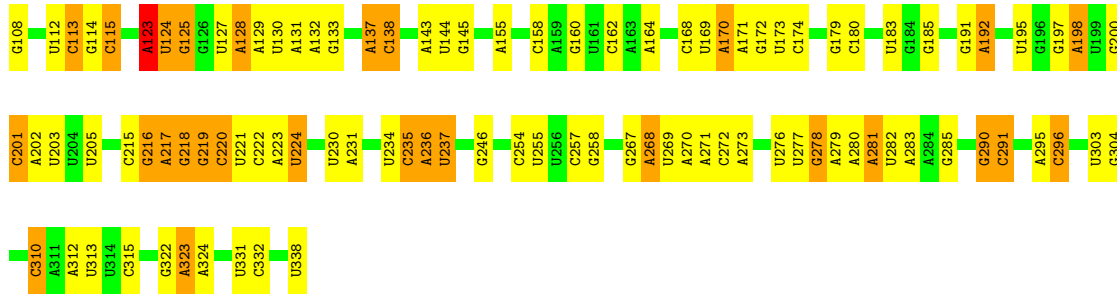


• Molecule 1: RNA (338-MER)

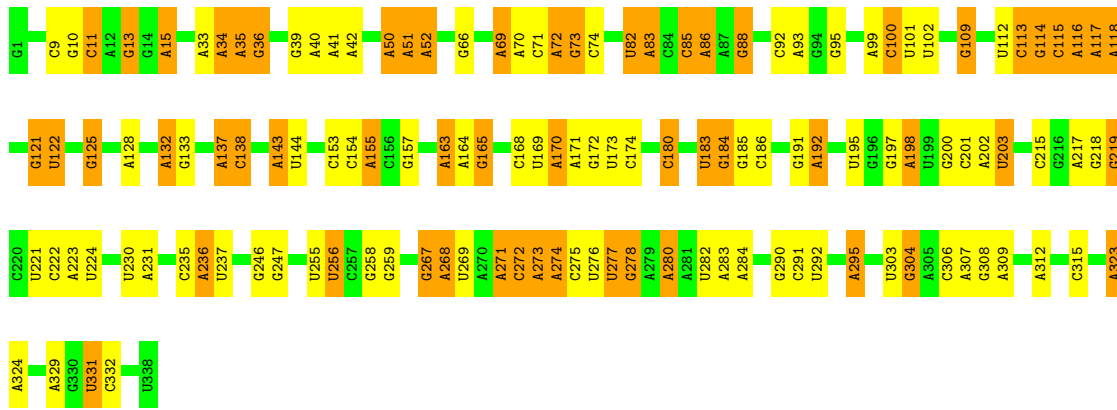


• Molecule 1: RNA (338-MER)

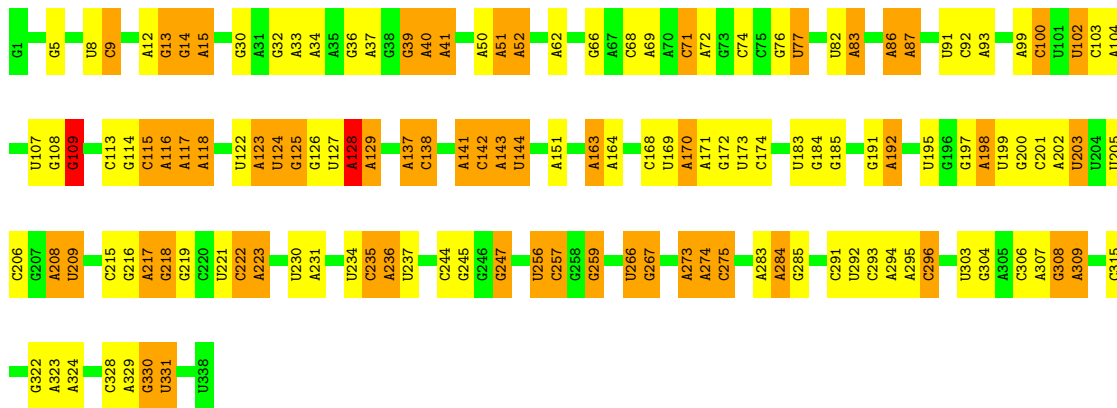




• Molecule 1: RNA (338-MER)

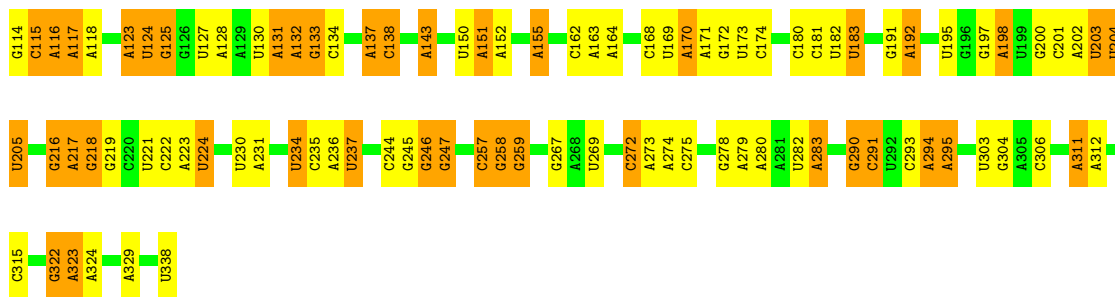


• Molecule 1: RNA (338-MER)

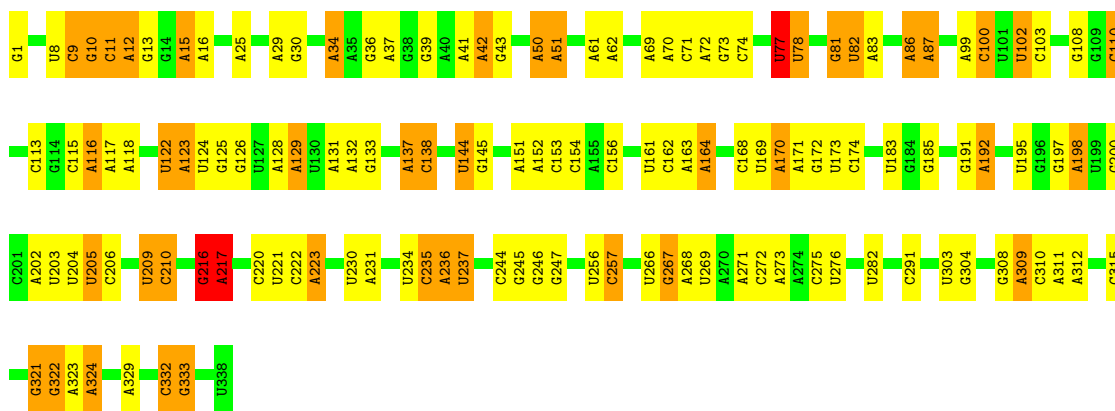


• Molecule 1: RNA (338-MER)

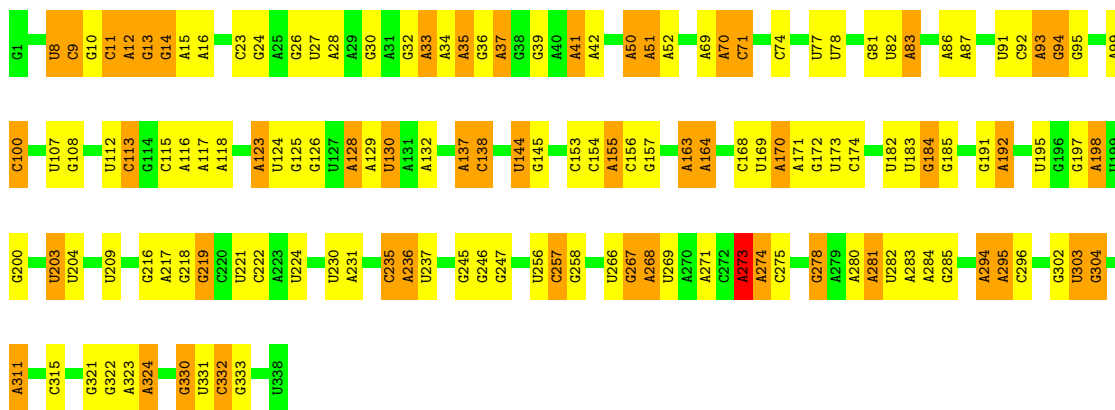




• Molecule 1: RNA (338-MER)

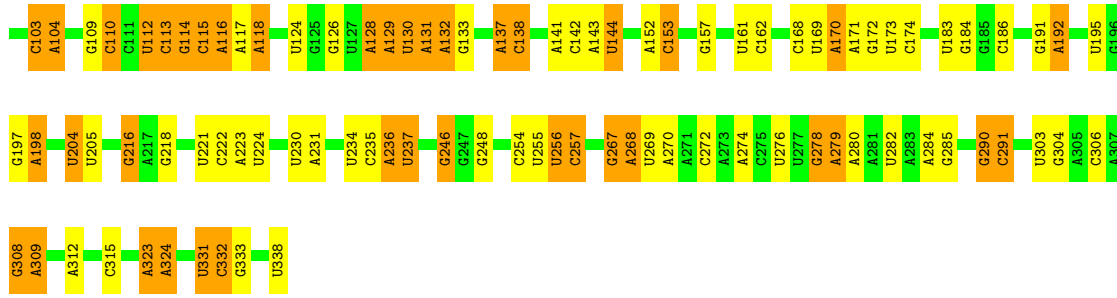


• Molecule 1: RNA (338-MER)

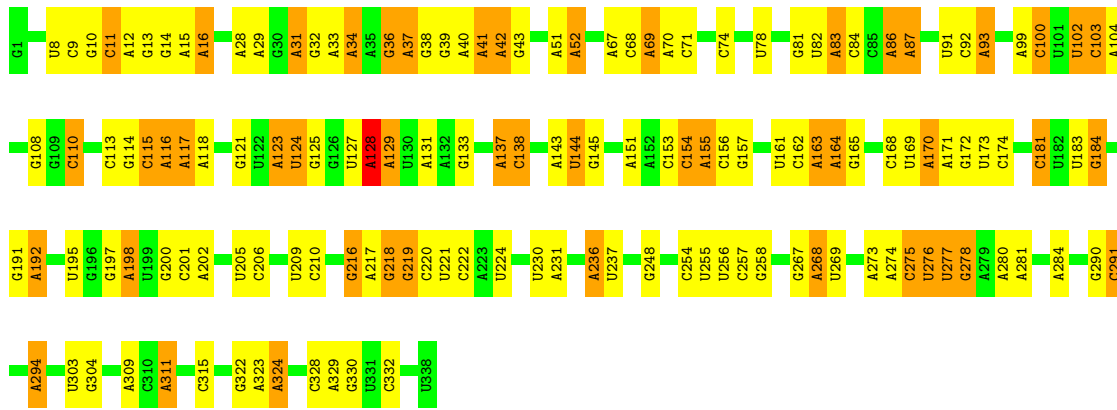


• Molecule 1: RNA (338-MER)

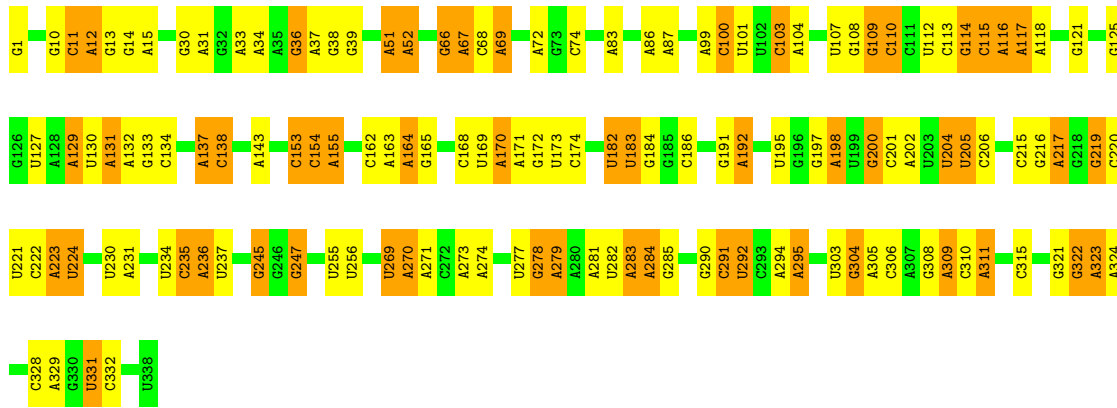




• Molecule 1: RNA (338-MER)

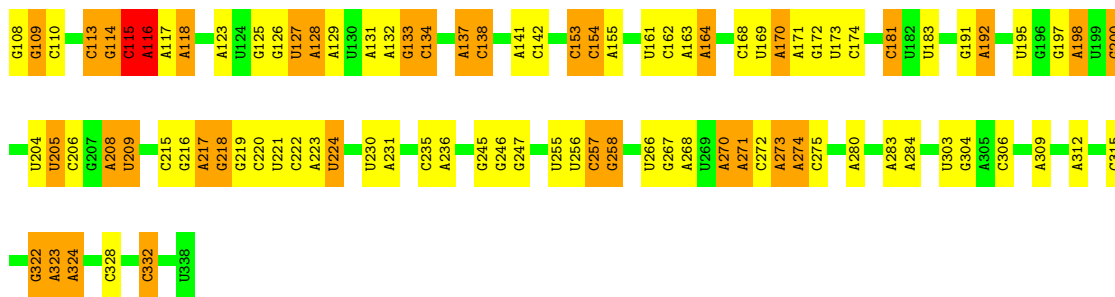


• Molecule 1: RNA (338-MER)

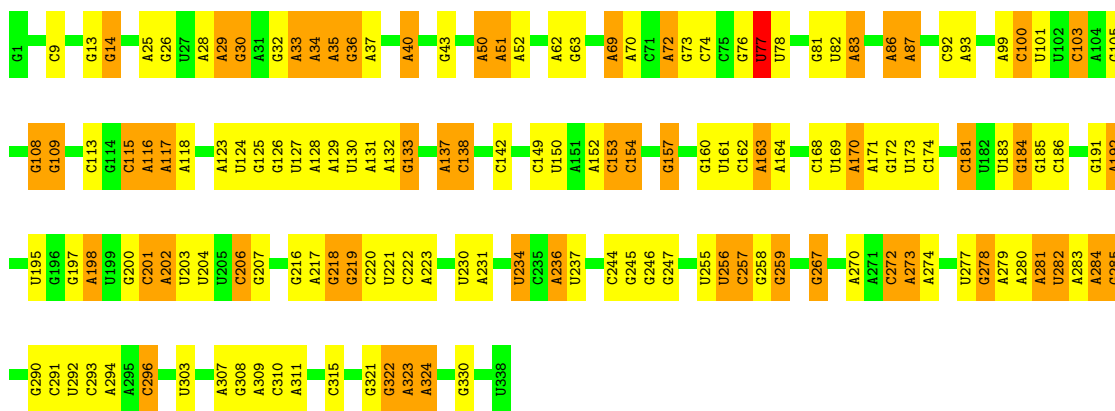


• Molecule 1: RNA (338-MER)

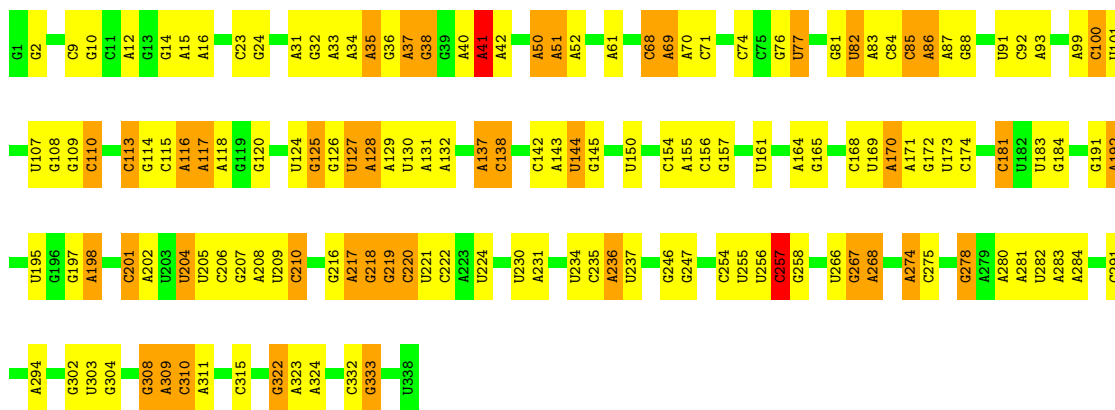




• Molecule 1: RNA (338-MER)

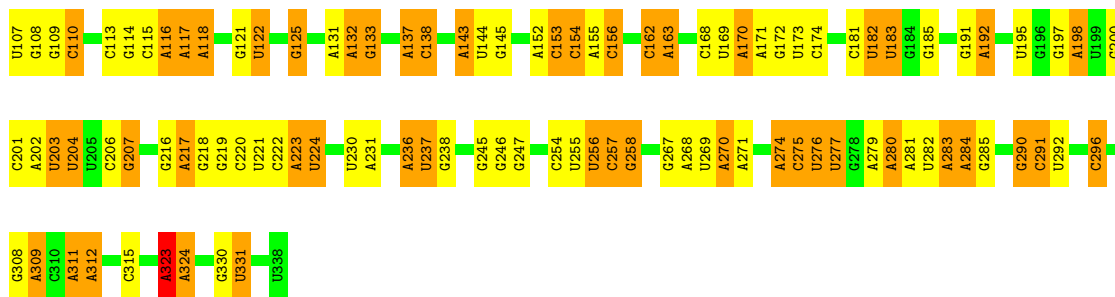


• Molecule 1: RNA (338-MER)



• Molecule 1: RNA (338-MER)

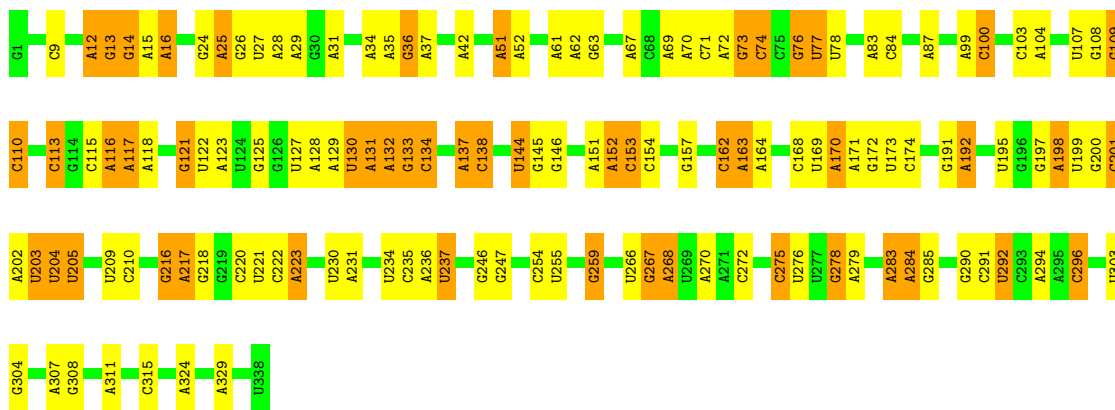




• Molecule 1: RNA (338-MER)

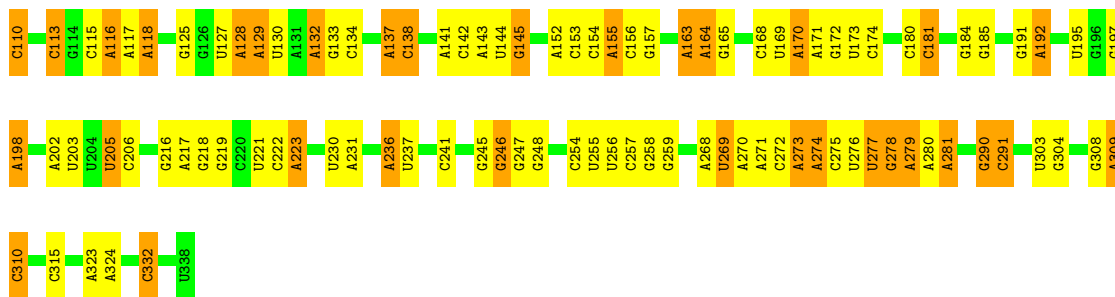


• Molecule 1: RNA (338-MER)



• Molecule 1: RNA (338-MER)

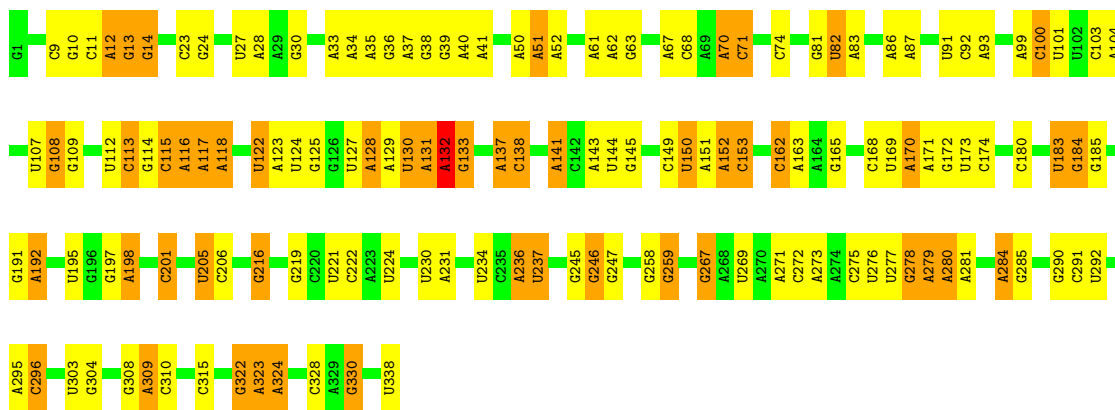




• Molecule 1: RNA (338-MER)



• Molecule 1: RNA (338-MER)



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21263	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	34	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.096	Depositor
Minimum map value	-0.031	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.03	Depositor
Map size (\AA)	239.68001, 239.68001, 239.68001	wwPDB
Map dimensions	224, 224, 224	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.07, 1.07, 1.07	Depositor

5 Model quality i

5.1 Standard geometry i

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-A	0.46	0/8100	0.88	8/12630 (0.1%)
1	2-A	0.45	0/8100	0.87	0/12630
1	3-A	0.46	2/8100 (0.0%)	0.88	3/12630 (0.0%)
1	4-A	0.45	0/8100	0.87	3/12630 (0.0%)
1	5-A	0.48	2/8100 (0.0%)	0.87	4/12630 (0.0%)
1	6-A	0.46	1/8100 (0.0%)	0.88	3/12630 (0.0%)
1	7-A	0.46	1/8100 (0.0%)	0.88	6/12630 (0.0%)
1	8-A	0.47	1/8100 (0.0%)	0.88	3/12630 (0.0%)
1	9-A	0.46	0/8100	0.88	5/12630 (0.0%)
1	10-A	0.46	1/8100 (0.0%)	0.87	4/12630 (0.0%)
1	11-A	0.47	2/8100 (0.0%)	0.87	2/12630 (0.0%)
1	12-A	0.47	1/8100 (0.0%)	0.88	4/12630 (0.0%)
1	13-A	0.46	1/8100 (0.0%)	0.88	4/12630 (0.0%)
1	14-A	0.46	2/8100 (0.0%)	0.87	4/12630 (0.0%)
1	15-A	0.47	3/8100 (0.0%)	0.88	6/12630 (0.0%)
1	16-A	0.47	1/8100 (0.0%)	0.87	4/12630 (0.0%)
1	17-A	0.47	1/8100 (0.0%)	0.88	9/12630 (0.1%)
1	18-A	0.45	0/8100	0.87	1/12630 (0.0%)
1	19-A	0.47	1/8100 (0.0%)	0.87	4/12630 (0.0%)
1	20-A	0.47	2/8100 (0.0%)	0.88	6/12630 (0.0%)
1	21-A	0.46	1/8100 (0.0%)	0.87	3/12630 (0.0%)
1	22-A	0.49	2/8100 (0.0%)	0.86	2/12630 (0.0%)
1	23-A	0.45	0/8100	0.85	1/12630 (0.0%)
1	24-A	0.45	0/8100	0.86	1/12630 (0.0%)
1	25-A	0.46	2/8100 (0.0%)	0.88	4/12630 (0.0%)
1	26-A	0.45	0/8100	0.86	0/12630
1	27-A	0.52	2/8100 (0.0%)	0.86	5/12630 (0.0%)
1	28-A	0.46	0/8100	0.87	2/12630 (0.0%)
1	29-A	0.47	0/8100	0.87	8/12630 (0.1%)
1	30-A	0.46	2/8100 (0.0%)	0.88	7/12630 (0.1%)
1	31-A	0.47	1/8100 (0.0%)	0.88	4/12630 (0.0%)
1	32-A	0.47	1/8100 (0.0%)	0.86	3/12630 (0.0%)
1	33-A	0.45	0/8100	0.87	6/12630 (0.0%)
1	34-A	0.47	1/8099 (0.0%)	0.89	9/12627 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	35-A	0.48	1/8100 (0.0%)	0.88	3/12630 (0.0%)
1	36-A	0.48	2/8099 (0.0%)	0.89	9/12627 (0.1%)
1	37-A	0.46	2/8100 (0.0%)	0.86	1/12630 (0.0%)
1	38-A	0.46	0/8100	0.87	4/12630 (0.0%)
1	39-A	0.45	0/8100	0.86	4/12630 (0.0%)
1	40-A	0.46	0/8100	0.88	8/12630 (0.1%)
1	41-A	0.48	3/8099 (0.0%)	0.87	5/12626 (0.0%)
1	42-A	0.54	1/8100 (0.0%)	0.87	4/12630 (0.0%)
1	43-A	0.46	2/8099 (0.0%)	0.87	7/12626 (0.1%)
1	44-A	0.46	0/8099	0.87	5/12626 (0.0%)
1	45-A	0.53	5/8098 (0.1%)	0.89	7/12622 (0.1%)
1	46-A	0.57	3/8100 (0.0%)	0.87	4/12630 (0.0%)
1	47-A	0.46	1/8099 (0.0%)	0.87	1/12626 (0.0%)
1	48-A	0.67	3/8100 (0.0%)	0.89	6/12630 (0.0%)
1	49-A	0.73	2/8100 (0.0%)	0.91	6/12630 (0.0%)
1	50-A	0.46	0/8099	0.87	1/12626 (0.0%)
1	51-A	0.45	0/8099	0.87	2/12626 (0.0%)
1	52-A	0.48	2/8099 (0.0%)	0.88	7/12626 (0.1%)
1	53-A	0.46	0/8099	0.88	4/12626 (0.0%)
1	54-A	0.62	1/8100 (0.0%)	0.87	3/12630 (0.0%)
1	55-A	0.46	2/8099 (0.0%)	0.87	5/12626 (0.0%)
1	56-A	0.46	2/8099 (0.0%)	0.86	1/12626 (0.0%)
1	57-A	0.46	0/8099	0.89	7/12626 (0.1%)
1	58-A	0.45	1/8098 (0.0%)	0.87	3/12622 (0.0%)
1	59-A	0.62	3/8099 (0.0%)	0.90	8/12626 (0.1%)
1	60-A	0.70	2/8100 (0.0%)	0.95	5/12630 (0.0%)
1	61-A	0.45	0/8100	0.88	7/12630 (0.1%)
1	62-A	0.44	0/8100	0.85	0/12630
1	63-A	0.45	2/8100 (0.0%)	0.86	2/12630 (0.0%)
1	64-A	0.52	1/8100 (0.0%)	0.86	2/12630 (0.0%)
1	65-A	0.45	1/8100 (0.0%)	0.86	2/12630 (0.0%)
1	66-A	0.47	1/8100 (0.0%)	0.87	2/12630 (0.0%)
1	67-A	0.47	2/8100 (0.0%)	0.87	6/12630 (0.0%)
1	68-A	0.58	2/8100 (0.0%)	0.88	5/12630 (0.0%)
1	69-A	0.46	0/8100	0.87	4/12630 (0.0%)
1	70-A	0.44	0/8100	0.86	3/12630 (0.0%)
1	71-A	0.45	0/8100	0.86	2/12630 (0.0%)
1	72-A	0.52	2/8100 (0.0%)	0.89	4/12630 (0.0%)
1	73-A	0.46	1/8100 (0.0%)	0.86	2/12630 (0.0%)
1	74-A	0.45	0/8100	0.87	4/12630 (0.0%)
1	75-A	0.46	1/8100 (0.0%)	0.86	0/12630
1	76-A	0.45	0/8100	0.86	4/12630 (0.0%)
1	77-A	0.45	0/8100	0.85	0/12630

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	78-A	0.45	0/8100	0.86	4/12630 (0.0%)
1	79-A	0.46	1/8100 (0.0%)	0.85	1/12630 (0.0%)
1	80-A	0.45	0/8100	0.86	2/12630 (0.0%)
All	All	0.48	86/647982 (0.0%)	0.87	314/1010330 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	8-A	1	0
1	34-A	1	0
1	35-A	1	0
1	41-A	1	0
1	48-A	1	0
1	57-A	1	0
All	All	6	0

The worst 5 of 86 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	49-A	112	U	O3'-P	44.08	2.14	1.61
1	60-A	8	U	O3'-P	43.91	2.13	1.61
1	48-A	112	U	O3'-P	43.63	2.13	1.61
1	54-A	112	U	O3'-P	38.01	2.06	1.61
1	59-A	8	U	O3'-P	36.34	2.04	1.61

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	60-A	8	U	P-O3'-C3'	-41.78	69.56	119.70
1	49-A	8	U	P-O3'-C3'	-24.20	90.66	119.70
1	72-A	115	C	P-O3'-C3'	18.84	142.30	119.70
1	36-A	129	A	P-O3'-C3'	16.57	139.58	119.70
1	59-A	275	C	P-O3'-C3'	16.01	138.91	119.70

5 of 6 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	8-A	35	A	C3'
1	34-A	86	A	C3'

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Mol	Chain	Res	Type	Atom
1	35-A	205	U	C3'
1	41-A	277	U	C3'
1	48-A	42	A	C3'

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	1-A	7234	3647	3648	190	0
1	2-A	7234	3647	3648	154	0
1	3-A	7234	3647	3648	171	0
1	4-A	7234	3647	3648	148	0
1	5-A	7234	3647	3648	157	0
1	6-A	7234	3647	3648	171	0
1	7-A	7234	3647	3648	192	0
1	8-A	7234	3647	3648	188	0
1	9-A	7234	3647	3648	140	0
1	10-A	7234	3647	3648	140	0
1	11-A	7234	3647	3648	183	0
1	12-A	7234	3647	3648	174	0
1	13-A	7234	3647	3648	183	0
1	14-A	7234	3647	3648	151	0
1	15-A	7234	3647	3648	163	0
1	16-A	7234	3647	3648	162	0
1	17-A	7234	3647	3648	190	0
1	18-A	7234	3647	3648	168	0
1	19-A	7234	3647	3648	163	0
1	20-A	7234	3647	3648	171	0
1	21-A	7234	3647	3648	133	0
1	22-A	7234	3647	3648	123	0
1	23-A	7234	3647	3648	177	0
1	24-A	7234	3647	3648	157	0
1	25-A	7234	3647	3647	130	0
1	26-A	7234	3647	3648	134	0
1	27-A	7234	3647	3648	132	0
1	28-A	7234	3647	3648	152	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	29-A	7234	3647	3648	142	0
1	30-A	7234	3647	3648	132	0
1	31-A	7234	3647	3648	165	0
1	32-A	7234	3647	3648	151	0
1	33-A	7234	3647	3647	145	0
1	34-A	7233	3647	3648	143	0
1	35-A	7234	3647	3647	176	0
1	36-A	7233	3647	3648	159	0
1	37-A	7234	3647	3648	138	0
1	38-A	7234	3647	3648	149	0
1	39-A	7234	3647	3648	127	0
1	40-A	7234	3647	3648	174	0
1	41-A	7234	3647	3649	167	0
1	42-A	7234	3647	3648	172	0
1	43-A	7234	3647	3649	178	0
1	44-A	7234	3647	3649	172	0
1	45-A	7234	3647	3649	194	0
1	46-A	7234	3647	3648	167	0
1	47-A	7234	3647	3649	176	0
1	48-A	7234	3647	3649	160	0
1	49-A	7234	3647	3649	149	0
1	50-A	7234	3647	3649	160	0
1	51-A	7234	3647	3648	184	0
1	52-A	7234	3647	3648	182	0
1	53-A	7234	3647	3649	172	0
1	54-A	7234	3647	3649	142	0
1	55-A	7234	3647	3649	156	0
1	56-A	7234	3647	3649	167	0
1	57-A	7234	3647	3649	186	0
1	58-A	7234	3647	3650	169	0
1	59-A	7234	3647	3650	185	0
1	60-A	7234	3647	3649	214	0
1	61-A	7234	3647	3648	138	0
1	62-A	7234	3647	3648	149	0
1	63-A	7234	3647	3648	146	0
1	64-A	7234	3647	3648	146	0
1	65-A	7234	3647	3648	185	0
1	66-A	7234	3647	3648	144	0
1	67-A	7234	3647	3648	126	0
1	68-A	7234	3647	3648	141	0
1	69-A	7234	3647	3647	140	0
1	70-A	7234	3647	3648	156	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	71-A	7234	3647	3648	146	0
1	72-A	7234	3647	3648	175	0
1	73-A	7234	3647	3648	154	0
1	74-A	7234	3647	3648	120	0
1	75-A	7234	3647	3648	169	0
1	76-A	7234	3647	3648	174	0
1	77-A	7234	3647	3648	134	0
1	78-A	7234	3647	3648	107	0
1	79-A	7234	3647	3647	161	0
1	80-A	7234	3647	3647	148	0
All	All	578718	291760	291852	12709	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 15.

The worst 5 of 12709 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:292:U:H6	1:A:292:U:P	1.26	1.59
1:A:62:A:OP1	1:A:62:A:C8	1.63	1.51
1:A:224:U:C6	1:A:224:U:OP2	1.65	1.46
1:A:292:U:OP1	1:A:292:U:C5	1.67	1.46
1:A:87:A:H5'	1:A:87:A:N3	1.23	1.46

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

There are no protein molecules in this entry.

5.3.2 Protein sidechains [i](#)

There are no protein molecules in this entry.

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1-A	337/338 (99%)	67 (19%)	16 (4%)
1	10-A	337/338 (99%)	75 (22%)	9 (2%)
1	11-A	337/338 (99%)	84 (24%)	14 (4%)
1	12-A	337/338 (99%)	89 (26%)	15 (4%)
1	13-A	337/338 (99%)	78 (23%)	16 (4%)
1	14-A	337/338 (99%)	75 (22%)	15 (4%)
1	15-A	337/338 (99%)	76 (22%)	14 (4%)
1	16-A	337/338 (99%)	91 (27%)	18 (5%)
1	17-A	337/338 (99%)	85 (25%)	17 (5%)
1	18-A	337/338 (99%)	84 (24%)	15 (4%)
1	19-A	337/338 (99%)	78 (23%)	12 (3%)
1	2-A	337/338 (99%)	68 (20%)	11 (3%)
1	20-A	337/338 (99%)	86 (25%)	12 (3%)
1	21-A	337/338 (99%)	60 (17%)	9 (2%)
1	22-A	337/338 (99%)	55 (16%)	9 (2%)
1	23-A	337/338 (99%)	78 (23%)	11 (3%)
1	24-A	337/338 (99%)	64 (18%)	11 (3%)
1	25-A	337/338 (99%)	65 (19%)	9 (2%)
1	26-A	337/338 (99%)	73 (21%)	6 (1%)
1	27-A	337/338 (99%)	73 (21%)	11 (3%)
1	28-A	337/338 (99%)	76 (22%)	10 (2%)
1	29-A	337/338 (99%)	66 (19%)	19 (5%)
1	3-A	337/338 (99%)	85 (25%)	15 (4%)
1	30-A	337/338 (99%)	73 (21%)	11 (3%)
1	31-A	337/338 (99%)	78 (23%)	11 (3%)
1	32-A	337/338 (99%)	75 (22%)	9 (2%)
1	33-A	337/338 (99%)	66 (19%)	17 (5%)
1	34-A	337/338 (99%)	72 (21%)	10 (2%)
1	35-A	337/338 (99%)	65 (19%)	17 (5%)
1	36-A	337/338 (99%)	64 (18%)	11 (3%)
1	37-A	337/338 (99%)	69 (20%)	13 (3%)
1	38-A	337/338 (99%)	66 (19%)	10 (2%)
1	39-A	337/338 (99%)	66 (19%)	12 (3%)
1	4-A	337/338 (99%)	67 (19%)	11 (3%)
1	40-A	337/338 (99%)	85 (25%)	15 (4%)
1	41-A	336/338 (99%)	74 (22%)	17 (5%)
1	42-A	337/338 (99%)	84 (24%)	16 (4%)
1	43-A	336/338 (99%)	79 (23%)	12 (3%)
1	44-A	336/338 (99%)	85 (25%)	11 (3%)
1	45-A	335/338 (99%)	76 (22%)	16 (4%)
1	46-A	337/338 (99%)	71 (21%)	17 (5%)
1	47-A	336/338 (99%)	92 (27%)	17 (5%)
1	48-A	337/338 (99%)	74 (21%)	16 (4%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	49-A	337/338 (99%)	74 (21%)	9 (2%)
1	5-A	337/338 (99%)	72 (21%)	14 (4%)
1	50-A	336/338 (99%)	75 (22%)	15 (4%)
1	51-A	336/338 (99%)	83 (24%)	11 (3%)
1	52-A	336/338 (99%)	82 (24%)	16 (4%)
1	53-A	336/338 (99%)	73 (21%)	18 (5%)
1	54-A	337/338 (99%)	71 (21%)	12 (3%)
1	55-A	336/338 (99%)	85 (25%)	11 (3%)
1	56-A	336/338 (99%)	72 (21%)	11 (3%)
1	57-A	336/338 (99%)	79 (23%)	18 (5%)
1	58-A	335/338 (99%)	75 (22%)	10 (2%)
1	59-A	336/338 (99%)	77 (22%)	22 (6%)
1	6-A	337/338 (99%)	87 (25%)	14 (4%)
1	60-A	337/338 (99%)	81 (24%)	14 (4%)
1	61-A	337/338 (99%)	61 (18%)	12 (3%)
1	62-A	337/338 (99%)	67 (19%)	14 (4%)
1	63-A	337/338 (99%)	70 (20%)	12 (3%)
1	64-A	337/338 (99%)	72 (21%)	13 (3%)
1	65-A	337/338 (99%)	67 (19%)	18 (5%)
1	66-A	337/338 (99%)	69 (20%)	15 (4%)
1	67-A	337/338 (99%)	63 (18%)	13 (3%)
1	68-A	337/338 (99%)	70 (20%)	11 (3%)
1	69-A	337/338 (99%)	73 (21%)	16 (4%)
1	7-A	337/338 (99%)	75 (22%)	12 (3%)
1	70-A	337/338 (99%)	74 (21%)	10 (2%)
1	71-A	337/338 (99%)	69 (20%)	9 (2%)
1	72-A	337/338 (99%)	72 (21%)	16 (4%)
1	73-A	337/338 (99%)	72 (21%)	12 (3%)
1	74-A	337/338 (99%)	75 (22%)	8 (2%)
1	75-A	337/338 (99%)	71 (21%)	18 (5%)
1	76-A	337/338 (99%)	75 (22%)	17 (5%)
1	77-A	337/338 (99%)	71 (21%)	12 (3%)
1	78-A	337/338 (99%)	76 (22%)	10 (2%)
1	79-A	337/338 (99%)	82 (24%)	18 (5%)
1	8-A	337/338 (99%)	80 (23%)	20 (5%)
1	80-A	337/338 (99%)	71 (21%)	7 (2%)
1	9-A	337/338 (99%)	78 (23%)	12 (3%)
All	All	26944/27040 (99%)	5951 (22%)	1063 (3%)

5 of 5951 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1-A	10	G

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Mol	Chain	Res	Type
1	1-A	12	A
1	1-A	13	G
1	1-A	24	G
1	1-A	26	G

5 of 1063 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	70-A	41	A
1	72-A	137	A
1	69-A	331	U
1	79-A	68	C
1	31-A	102	U

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](#)

There are no ligands in this entry.

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	45-A	3
1	52-A	2
1	58-A	2

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Mol	Chain	Number of breaks
1	59-A	2
1	49-A	2
1	60-A	2
1	56-A	1
1	57-A	1
1	53-A	1
1	50-A	1
1	43-A	1
1	55-A	1
1	47-A	1
1	44-A	1
1	51-A	1
1	41-A	1
1	48-A	1
1	54-A	1
1	68-A	1
1	46-A	1
1	42-A	1
1	64-A	1
1	27-A	1
1	36-A	1
1	72-A	1

The worst 5 of 32 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
56	A	8:U	O3'	9:C	P	3.59
57	A	8:U	O3'	9:C	P	3.59
53	A	8:U	O3'	9:C	P	3.50
50	A	8:U	O3'	9:C	P	3.36
43	A	8:U	O3'	9:C	P	3.00

6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21836. 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: 112



Y Index: 112



Z Index: 112

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: 107



Y Index: 139

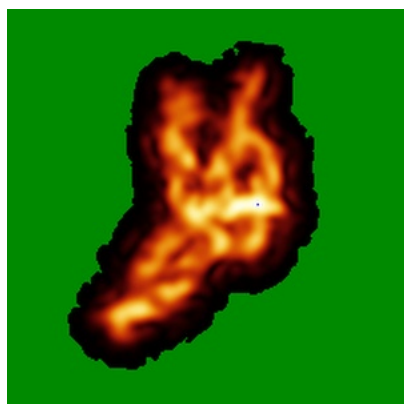


Z Index: 113

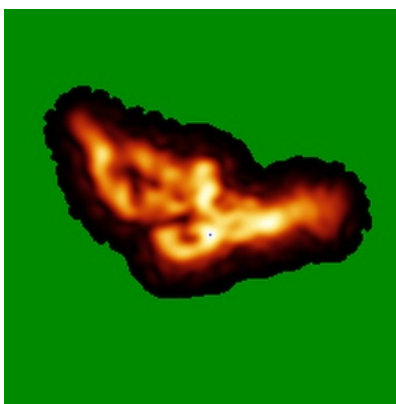
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

6.4.1 Primary map



X



Y

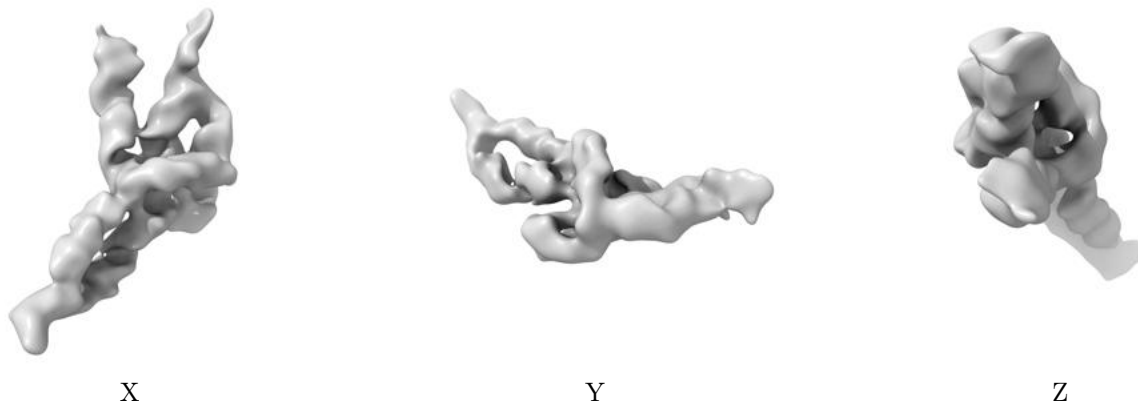


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

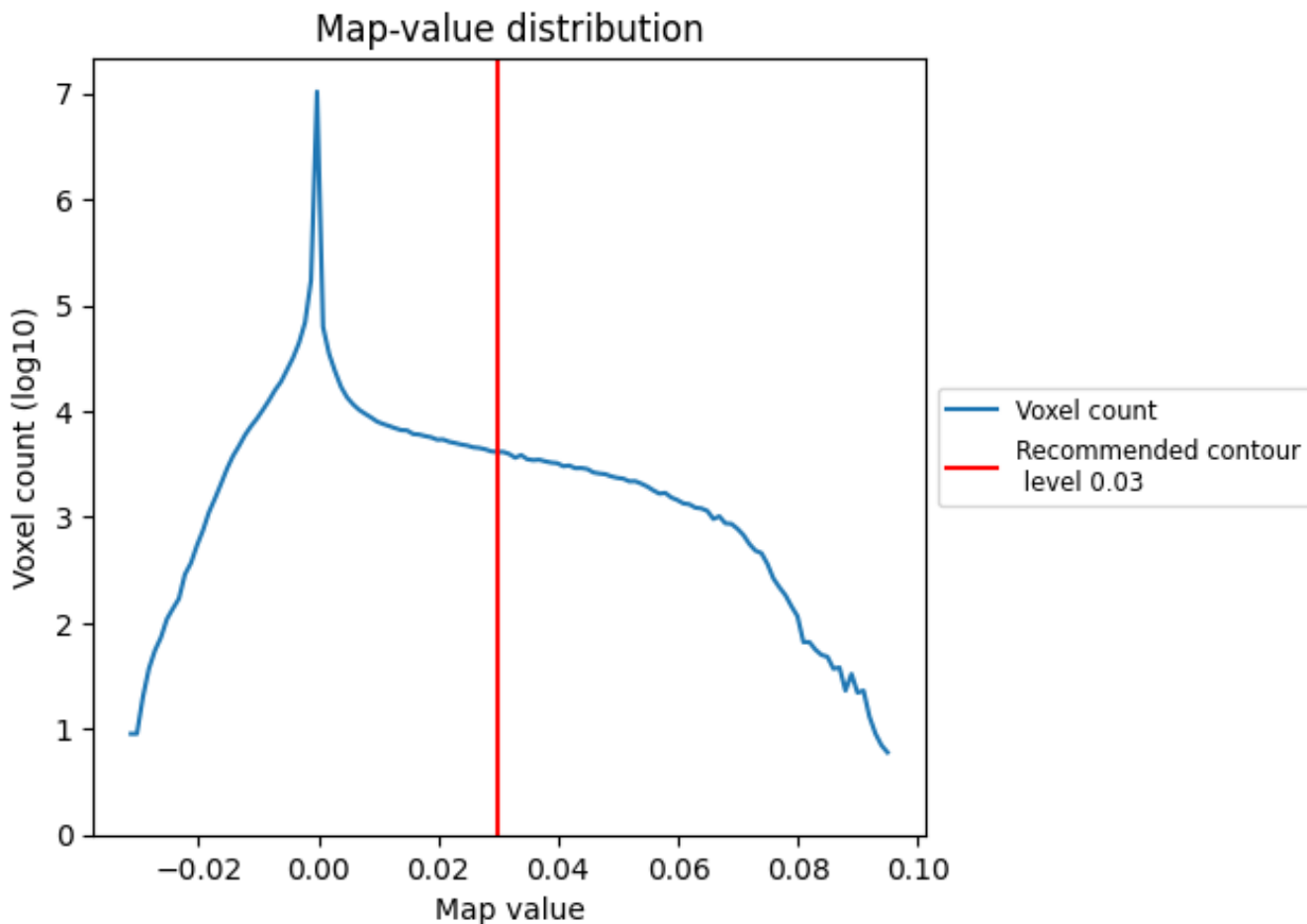
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

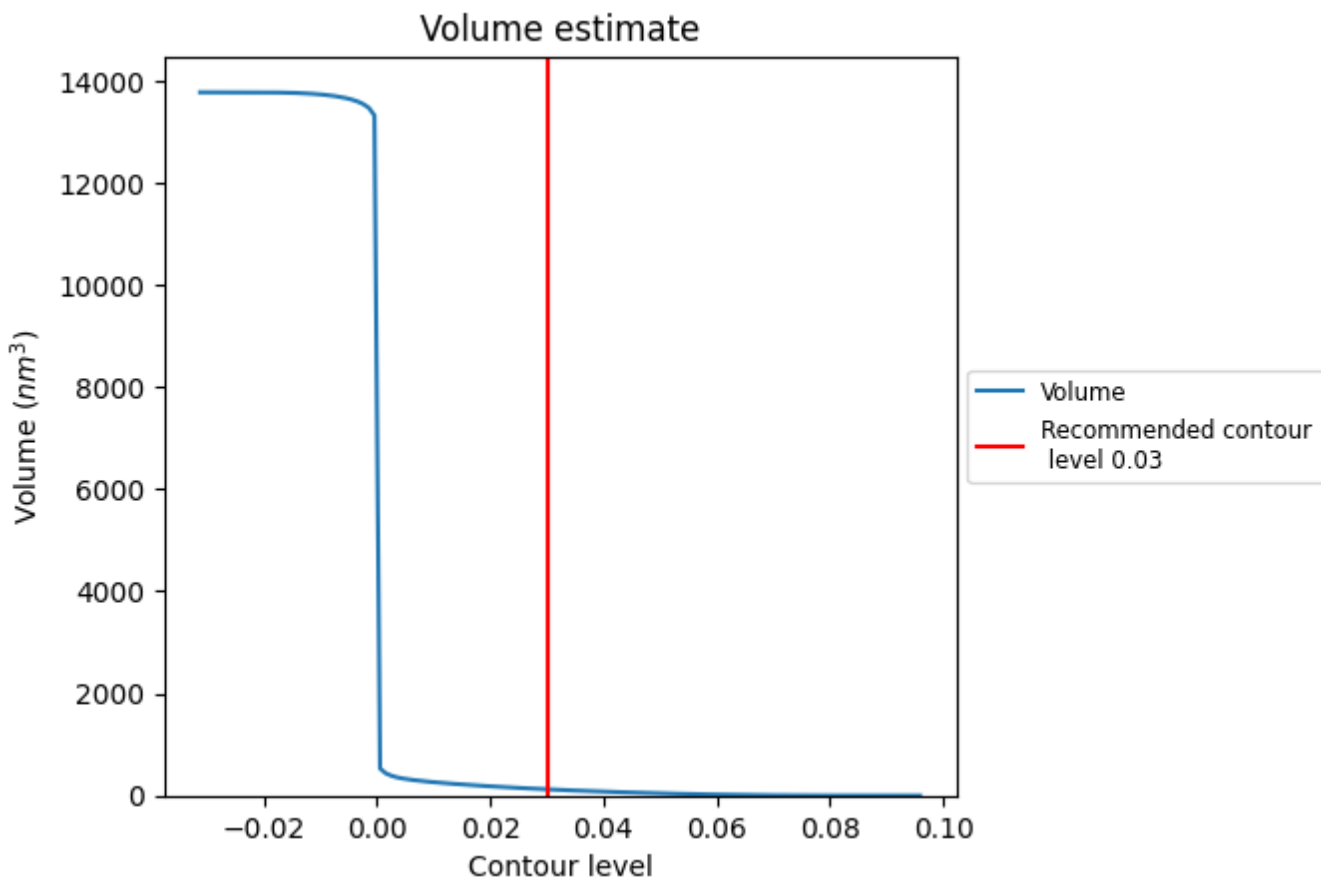
This section contains the results of statistical analysis of the map.

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.

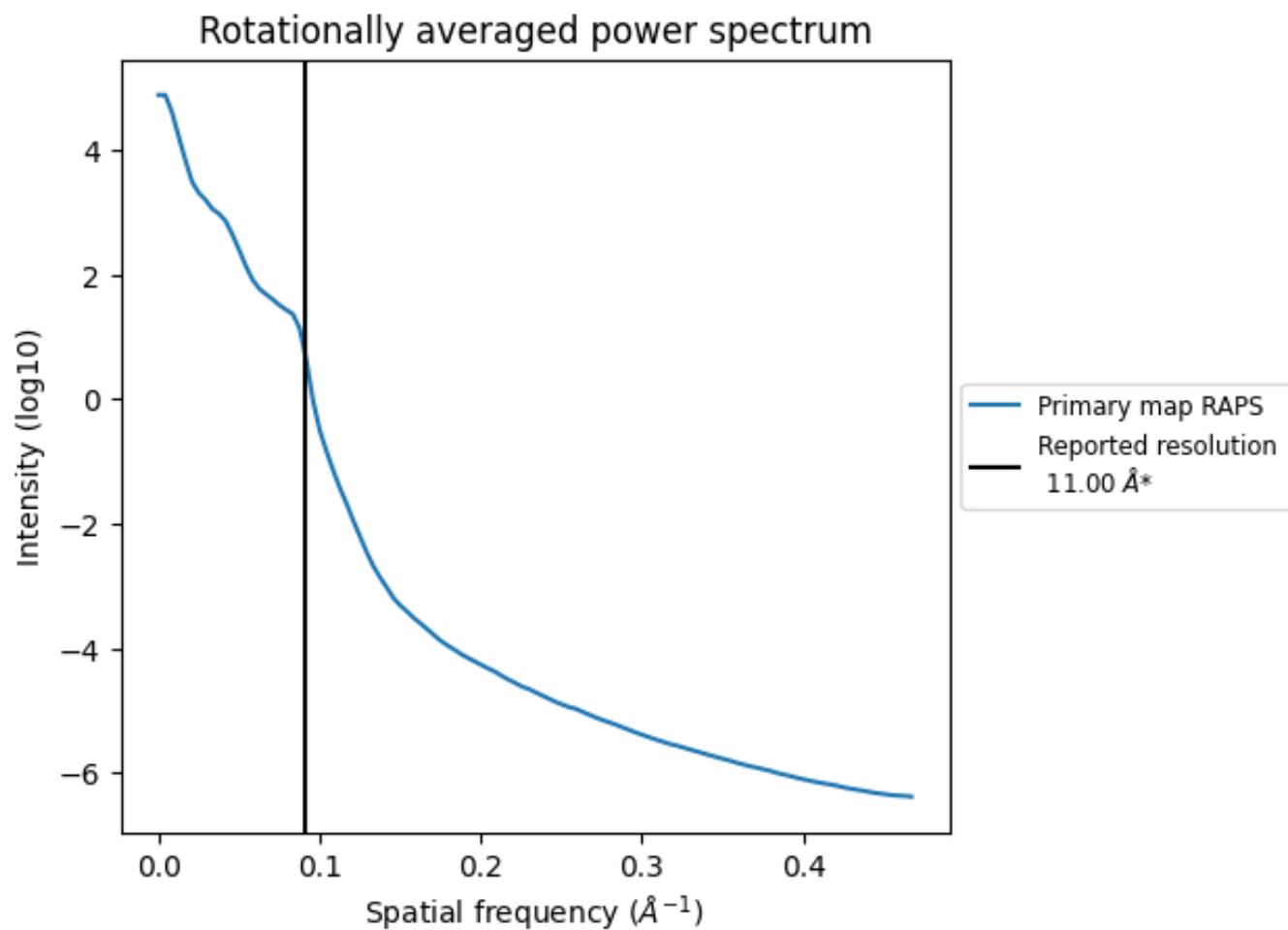
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 123 nm³; this corresponds to an approximate mass of 111 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 0.091 Å⁻¹

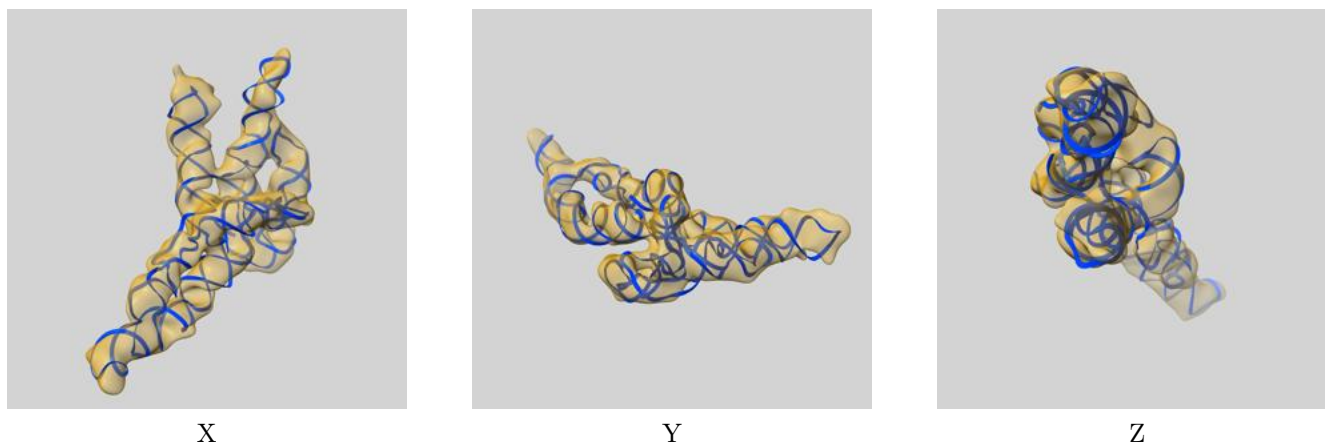
8 Fourier-Shell correlation

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-21836 and PDB model 6WLO. Per-residue inclusion information can be found in section 3 on page 10.

9.1 Map-model overlay [i](#)

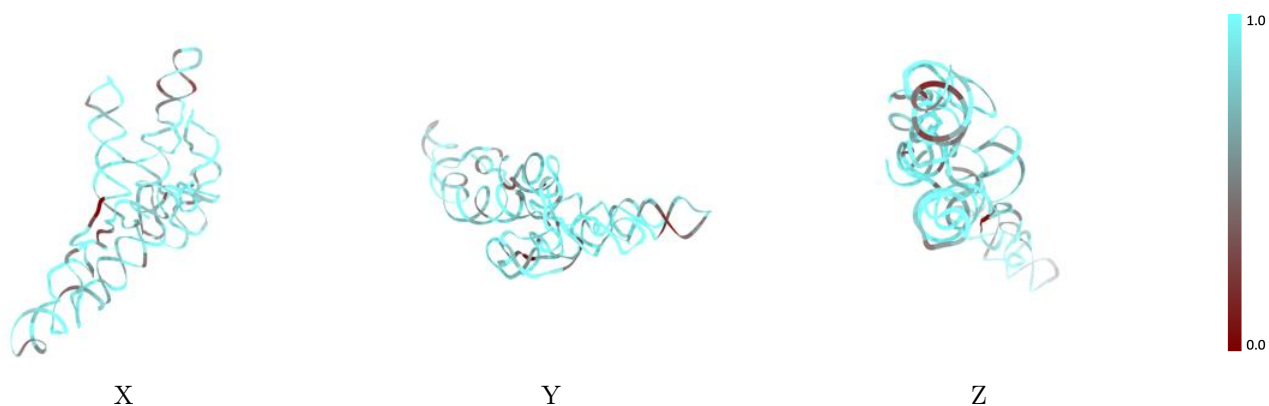


The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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

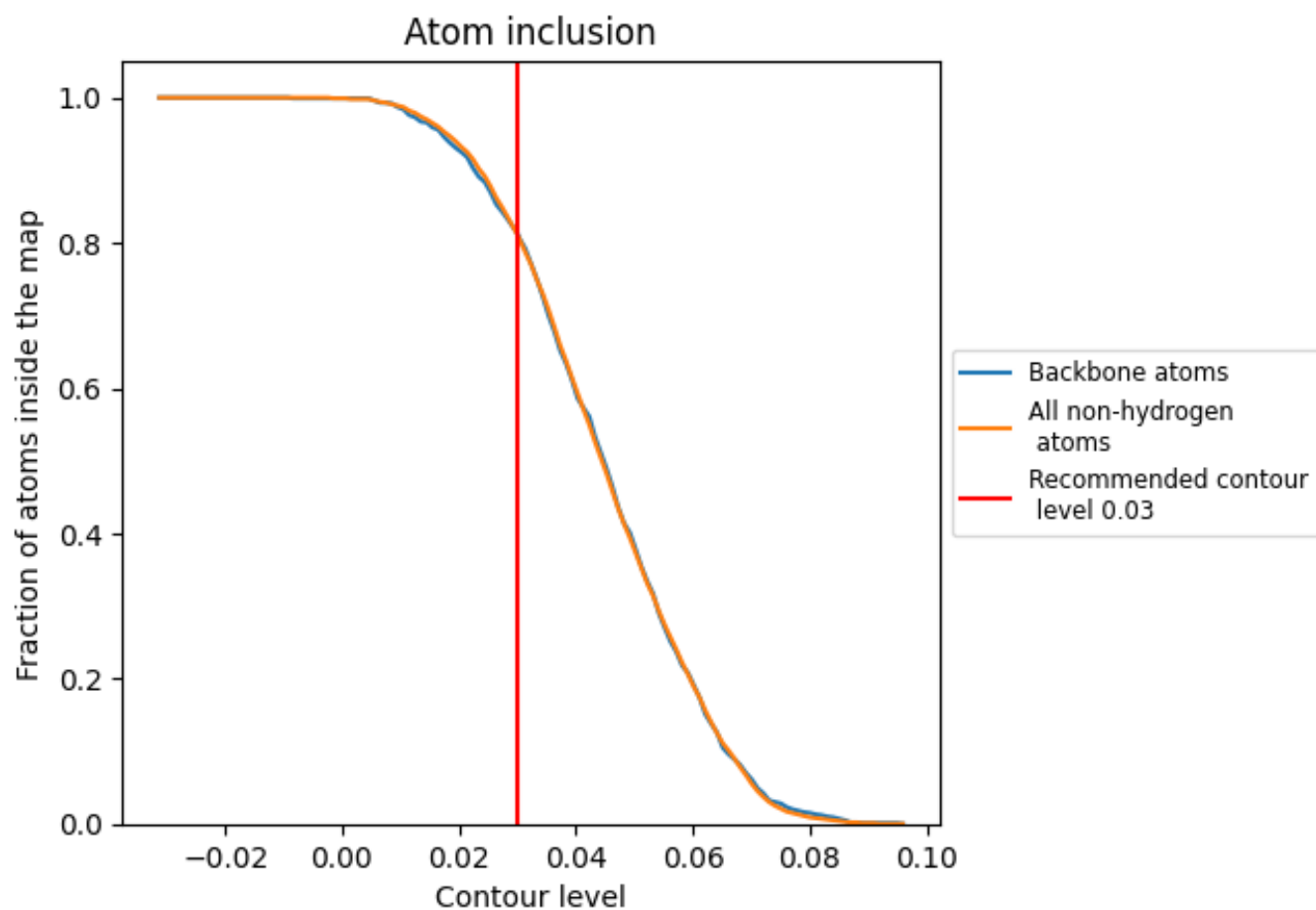
This section was not generated.

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).



9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 81% of all non-hydrogen atoms, are inside the map.

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

The table lists the average atom inclusion at the recommended contour level (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	 0.8110
A	 0.8070

