



## Full wwPDB EM Validation Report ⓘ

Nov 20, 2022 – 01:06 am GMT

PDB ID : 6FRK  
EMDB ID : EMD-4300  
Title : Structure of a prehandover mammalian ribosomal SRP and SRP receptor targeting complex  
Authors : Kobayashi, K.; Jomaa, A.; Ban, N.  
Deposited on : 2018-02-16  
Resolution : 3.70 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

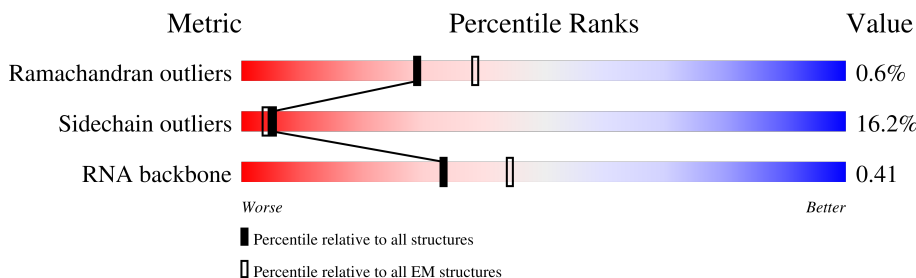
EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.70 Å.

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













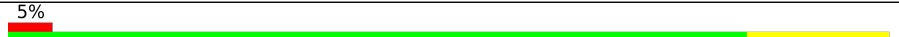


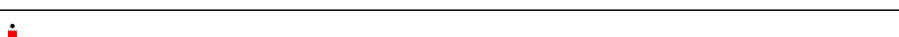
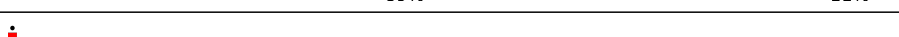
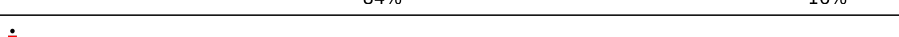



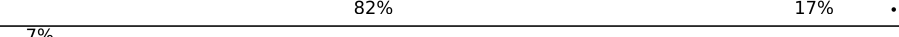





Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	1	299	
2	2	76	
3	3	125	
4	4	163	
5	5	3658	
6	6	202	
7	7	120	
8	8	156	




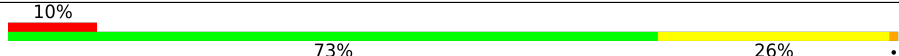
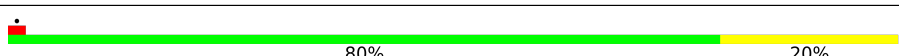
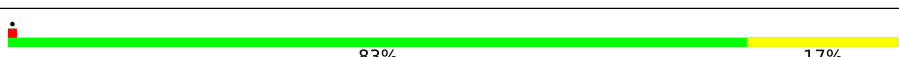
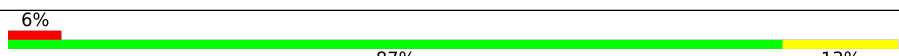
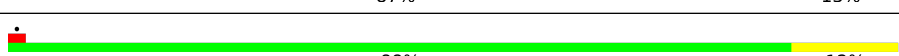
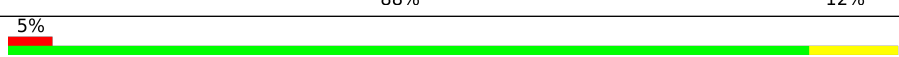

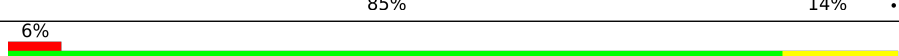
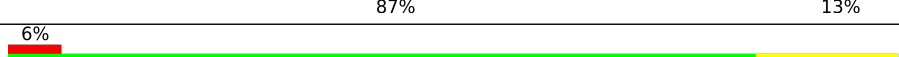

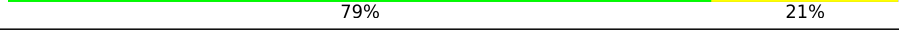
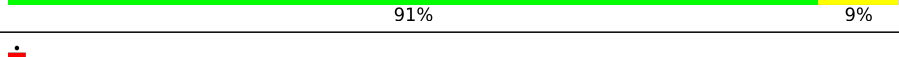


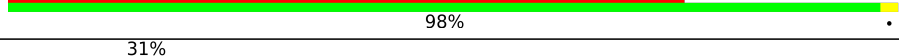
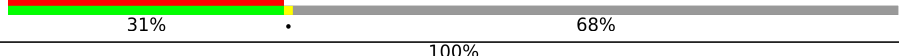
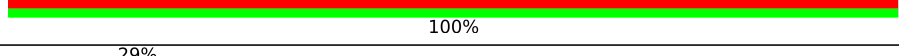

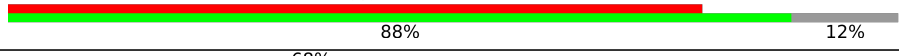



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Mol	Chain	Length	Quality of chain
9	A	244	 82% 18%
10	B	394	 84% 15%
11	C	367	 83% 17%
12	D	292	 79% 20%
13	E	236	 11% 74% 25%
14	F	225	 84% 16%
15	G	238	 8% 82% 18%
16	H	190	 85% 14%
17	I	213	 79% 19%
18	J	170	 5% 82% 18%
19	L	210	 5% 83% 16%
20	M	138	 84% 16%
21	N	203	 85% 15%
22	O	201	 89% 11%
23	P	153	 84% 16%
24	Q	187	 84% 16%
25	R	180	 6% 81% 19%
26	S	175	 81% 19%
27	T	159	 82% 17%
28	U	99	 7% 81% 19%
29	V	131	 85% 15%
30	W	63	 8% 81% 19%
31	X	119	 88% 12%
32	Y	134	 84% 16%
33	Z	135	 83% 17%

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Mol	Chain	Length	Quality of chain
34	a	147	
35	b	75	
36	c	94	
37	d	107	
38	e	128	
39	f	109	
40	g	114	
41	h	122	
42	i	102	
43	j	86	
44	k	69	
45	l	50	
46	m	52	
47	n	23	
48	o	104	
49	p	91	
50	q	105	
51	r	605	
52	t	11	
53	u	568	
54	v	213	
55	w	74	
56	x	504	
57	y	657	
58	z	110	

## 2 Entry composition [i](#)

There are 62 unique types of molecules in this entry. The entry contains 159957 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 Canis lupus familiaris RNA, 7SL, cytoplasmic 1 (RN7SL1), SRP RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	258	5534	2463	1012	1801	258	0	0

- Molecule 2 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	76	1616	723	290	528	75	0	0

- Molecule 3 is a protein called Ribosomal protein eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	3	125	1001	622	206	168	5	0	0

- Molecule 4 is a protein called Ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	4	163	1238	773	230	230	5	0	0

- Molecule 5 is a RNA chain called 28S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	5	3658	78406	34911	14352	25486	3657	0	0

- Molecule 6 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	6	202	1556	989	272	286	9	0	0

- Molecule 7 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	7	120	2558	1141	456	842	119	0	0

- Molecule 8 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	8	156	3314	1480	585	1094	155	0	0

- Molecule 9 is a protein called Ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	A	244	1868	1171	382	309	6	0	0

- Molecule 10 is a protein called Ribosomal protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	B	394	3147	2005	591	538	13	0	0

- Molecule 11 is a protein called Ribosomal protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	C	367	2919	1836	582	486	15	0	0

- Molecule 12 is a protein called Ribosomal protein uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	D	292	2380	1508	434	426	12	0	0

- Molecule 13 is a protein called Ribosomal protein eL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	E	236	1904	1219	364	316	5	0	0

- Molecule 14 is a protein called Ribosomal protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	F	225	1870	1202	358	301	9	0	0

- Molecule 15 is a protein called Ribosomal protein eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	G	238	1912	1218	368	322	4	0	0

- Molecule 16 is a protein called Ribosomal protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	H	190	1518	956	284	272	6	0	0

- Molecule 17 is a protein called Ribosomal protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	I	213	1713	1083	331	284	15	0	0

- Molecule 18 is a protein called Ribosomal protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	J	170	1359	856	256	241	6	0	0

- Molecule 19 is a protein called Ribosomal protein eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	L	210	1703	1064	354	280	5	0	0

- Molecule 20 is a protein called Ribosomal protein eL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	M	138	1131	727	216	181	7	0	0

- Molecule 21 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	N	203	1701	1072	359	266	4	0	0

- Molecule 22 is a protein called Ribosomal protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	O	201	1651	1063	323	260	5	0	0

- Molecule 23 is a protein called Ribosomal protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	P	153	1242	776	241	216	9	0	0

- Molecule 24 is a protein called Ribosomal protein eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	Q	187	1506	941	311	249	5	0	0

- Molecule 25 is a protein called Ribosomal protein eL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	R	180	1508	933	328	238	9	0	0

- Molecule 26 is a protein called Ribosomal protein eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	S	175	1454	925	284	235	10	0	0

- Molecule 27 is a protein called Ribosomal protein eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	T	159	1298	823	252	217	6	0	0

- Molecule 28 is a protein called Ribosomal protein eL22.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	U	99	808	518	141	147	2	0	0

- Molecule 29 is a protein called Ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	V	131	979	618	184	172	5	0	0

- Molecule 30 is a protein called Ribosomal protein eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	W	63	528	337	103	85	3	0	0

- Molecule 31 is a protein called Ribosomal protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	X	119	976	624	183	168	1	0	0

- Molecule 32 is a protein called Ribosomal protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	Y	134	1115	700	226	186	3	0	0

- Molecule 33 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	Z	135	1107	714	208	182	3	0	0

- Molecule 34 is a protein called Ribosomal protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	a	147	1163	735	239	185	4	0	0

- Molecule 35 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	b	75	Total	C	N	O	S	0	0
			610	378	130	99	3		

- Molecule 36 is a protein called Ribosomal protein eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	c	94	Total	C	N	O	S	0	0
			732	465	130	131	6		

- Molecule 37 is a protein called Ribosomal protein eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	d	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 38 is a protein called Ribosomal protein eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	e	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 39 is a protein called Ribosomal protein eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	f	109	Total	C	N	O	S	0	0
			876	555	174	144	3		

- Molecule 40 is a protein called Ribosomal protein eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	g	114	Total	C	N	O	S	0	0
			906	566	187	147	6		

- Molecule 41 is a protein called Ribosomal protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	h	122	Total	C	N	O	S	0	0
			1015	642	205	167	1		

- Molecule 42 is a protein called Ribosomal protein eL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	i	102	832	521	177	129	5	0	0

- Molecule 43 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	j	86	706	436	155	110	5	0	0

- Molecule 44 is a protein called Ribosomal protein eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	k	69	569	366	103	99	1	0	0

- Molecule 45 is a protein called Ribosomal protein eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	l	50	444	281	98	64	1	0	0

- Molecule 46 is a protein called Ribosomal protein eL40.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	m	52	429	266	90	67	6	0	0

- Molecule 47 is a protein called Ribosomal protein eL41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	n	23	222	134	61	25	2	0	0

- Molecule 48 is a protein called Ribosomal protein eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	o	104	851	533	174	138	6	0	0

- Molecule 49 is a protein called Ribosomal protein eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	p	91	708	445	136	120	7	0	0

- Molecule 50 is a protein called Signal recognition particle subunit SRP19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	q	105	844	534	152	152	6	0	0

- Molecule 51 is a protein called Signal recognition particle subunit SRP72,Signal recognition particle subunit SRP72,Signal recognition particle subunit SRP72.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	r	195	1540	970	274	291	5	1	0

- Molecule 52 is a protein called Signal sequence.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
52	t	11	88	66	11	11	0	0

- Molecule 53 is a protein called Signal recognition particle subunit SRP68.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	u	218	1819	1151	335	325	8	0	0

- Molecule 54 is a protein called SRP receptor beta subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	v	188	1486	943	259	279	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
v	59	MET	-	initiating methionine	UNP G1STG2

- Molecule 55 is a protein called Signal recognition particle 9 kDa protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	w	74	607	386	106	110	5	0	0

- Molecule 56 is a protein called Signal recognition particle 54 kDa protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	x	374	2915	1848	495	550	22	0	0

- Molecule 57 is a protein called SRP receptor alpha subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	y	424	3298	2093	572	615	18	0	0

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
y	-19	HIS	-	expression tag	UNP G1TCX6
y	-18	HIS	-	expression tag	UNP G1TCX6
y	-17	HIS	-	expression tag	UNP G1TCX6
y	-16	HIS	-	expression tag	UNP G1TCX6
y	-15	HIS	-	expression tag	UNP G1TCX6
y	-14	HIS	-	expression tag	UNP G1TCX6
y	-13	ASP	-	expression tag	UNP G1TCX6
y	-12	TYR	-	expression tag	UNP G1TCX6
y	-11	ASP	-	expression tag	UNP G1TCX6
y	-10	ILE	-	expression tag	UNP G1TCX6
y	-9	PRO	-	expression tag	UNP G1TCX6
y	-8	THR	-	expression tag	UNP G1TCX6
y	-7	THR	-	expression tag	UNP G1TCX6
y	-6	GLU	-	expression tag	UNP G1TCX6
y	-5	ASN	-	expression tag	UNP G1TCX6
y	-4	LEU	-	expression tag	UNP G1TCX6
y	-3	TYR	-	expression tag	UNP G1TCX6
y	-2	PHE	-	expression tag	UNP G1TCX6
y	-1	GLN	-	expression tag	UNP G1TCX6
y	0	GLY	-	expression tag	UNP G1TCX6

- Molecule 58 is a protein called Signal recognition particle 14 kDa protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	z	76	Total	C	N	O	S	0	0
			604	384	105	111	4		

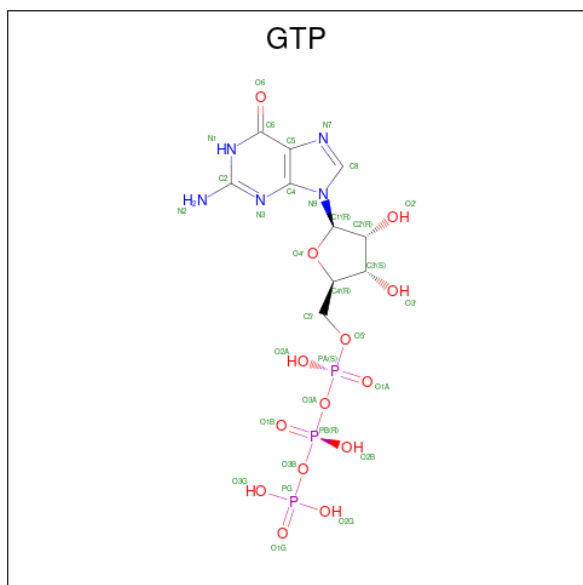
- Molecule 59 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
59	5	119	Total	Mg	0
			119	119	
59	7	5	Total	Mg	0
			5	5	
59	8	3	Total	Mg	0
			3	3	
59	P	1	Total	Mg	0
			1	1	
59	V	1	Total	Mg	0
			1	1	
59	g	1	Total	Mg	0
			1	1	
59	v	1	Total	Mg	0
			1	1	
59	x	1	Total	Mg	0
			1	1	
59	y	1	Total	Mg	0
			1	1	

- Molecule 60 is ZINC ION (three-letter code: ZN) (formula: Zn).

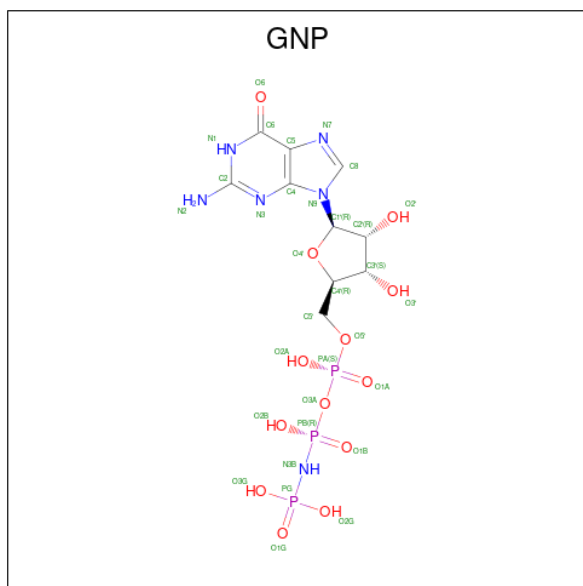
Mol	Chain	Residues	Atoms		AltConf
60	j	1	Total	Zn	0
			1	1	
60	m	1	Total	Zn	0
			1	1	
60	o	1	Total	Zn	0
			1	1	

- Molecule 61 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>14</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
61	v	1	32	10	5	14	3	0

- Molecule 62 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula:  $C_{10}H_{17}N_6O_{13}P_3$ ).

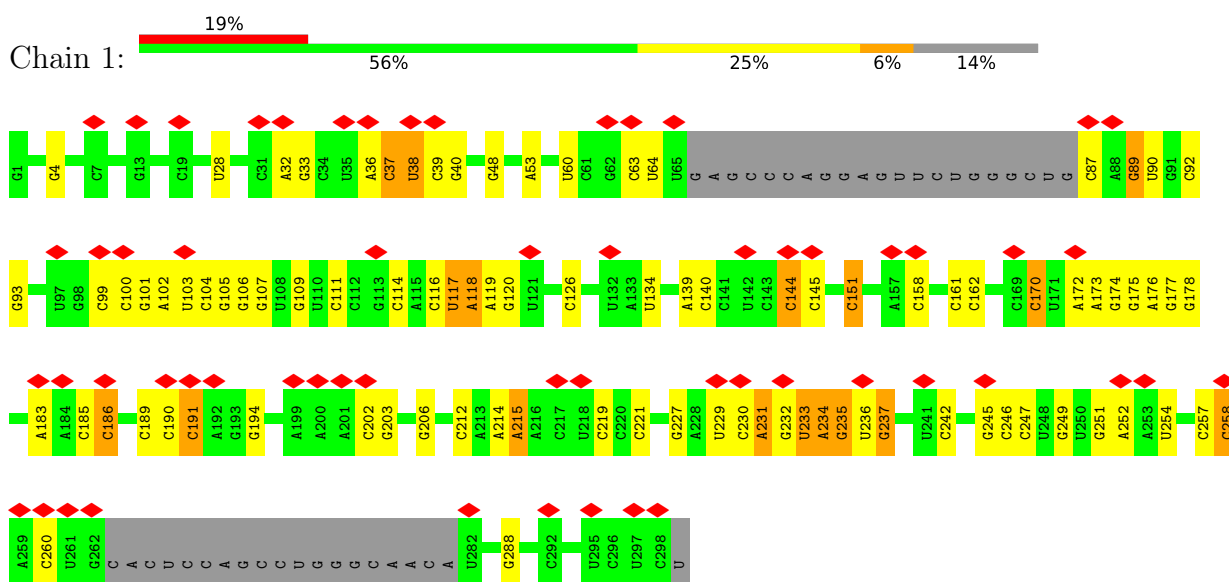


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
62	x	1	32	10	6	13	3	0
62	y	1	32	10	6	13	3	0

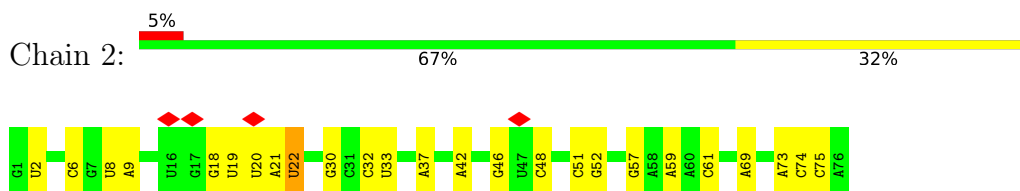
### 3 Residue-property plots [i](#)

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.

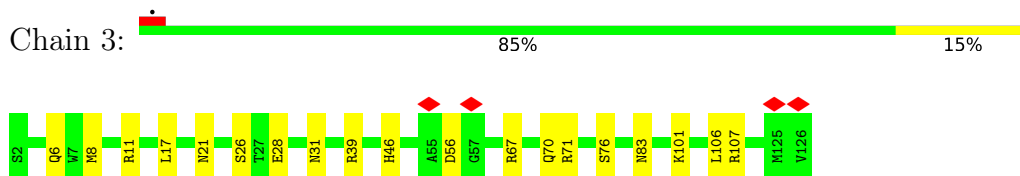
- Molecule 1: *Canis lupus familiaris* RNA, 7SL, cytoplasmic 1 (RN7SL1), SRP RNA



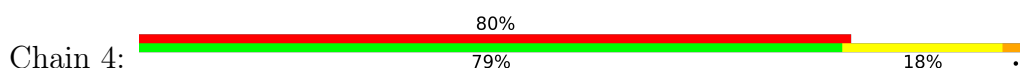
- Molecule 2: tRNA



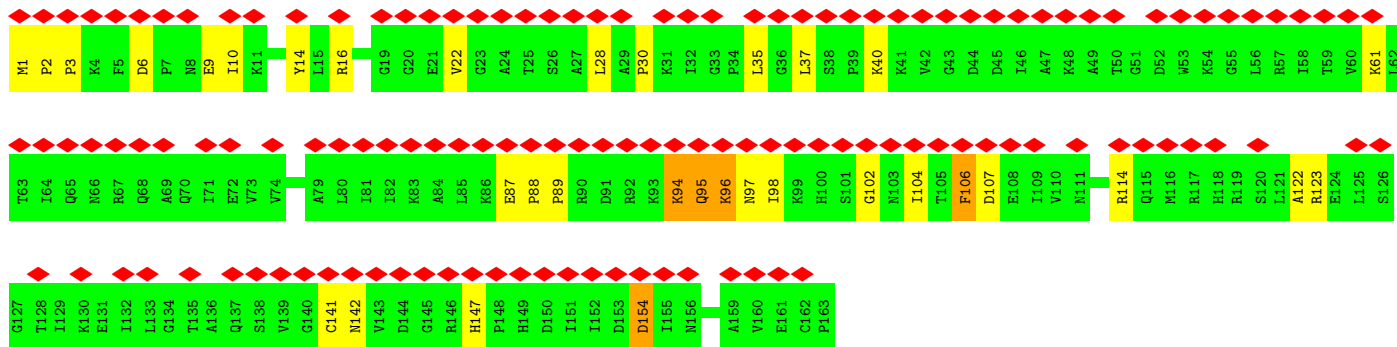
- Molecule 3: Ribosomal protein eL28



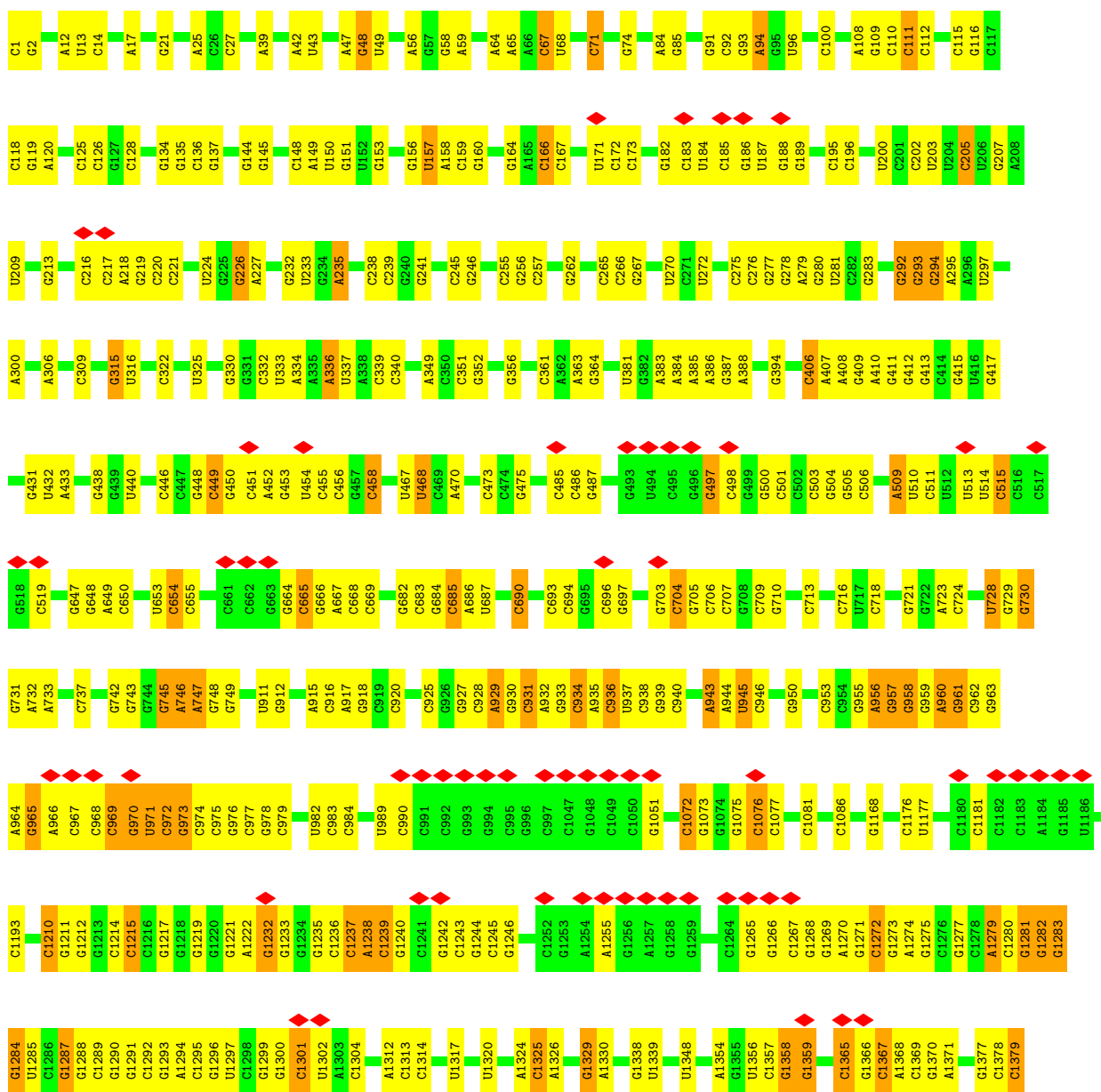
- Molecule 4: Ribosomal protein L12

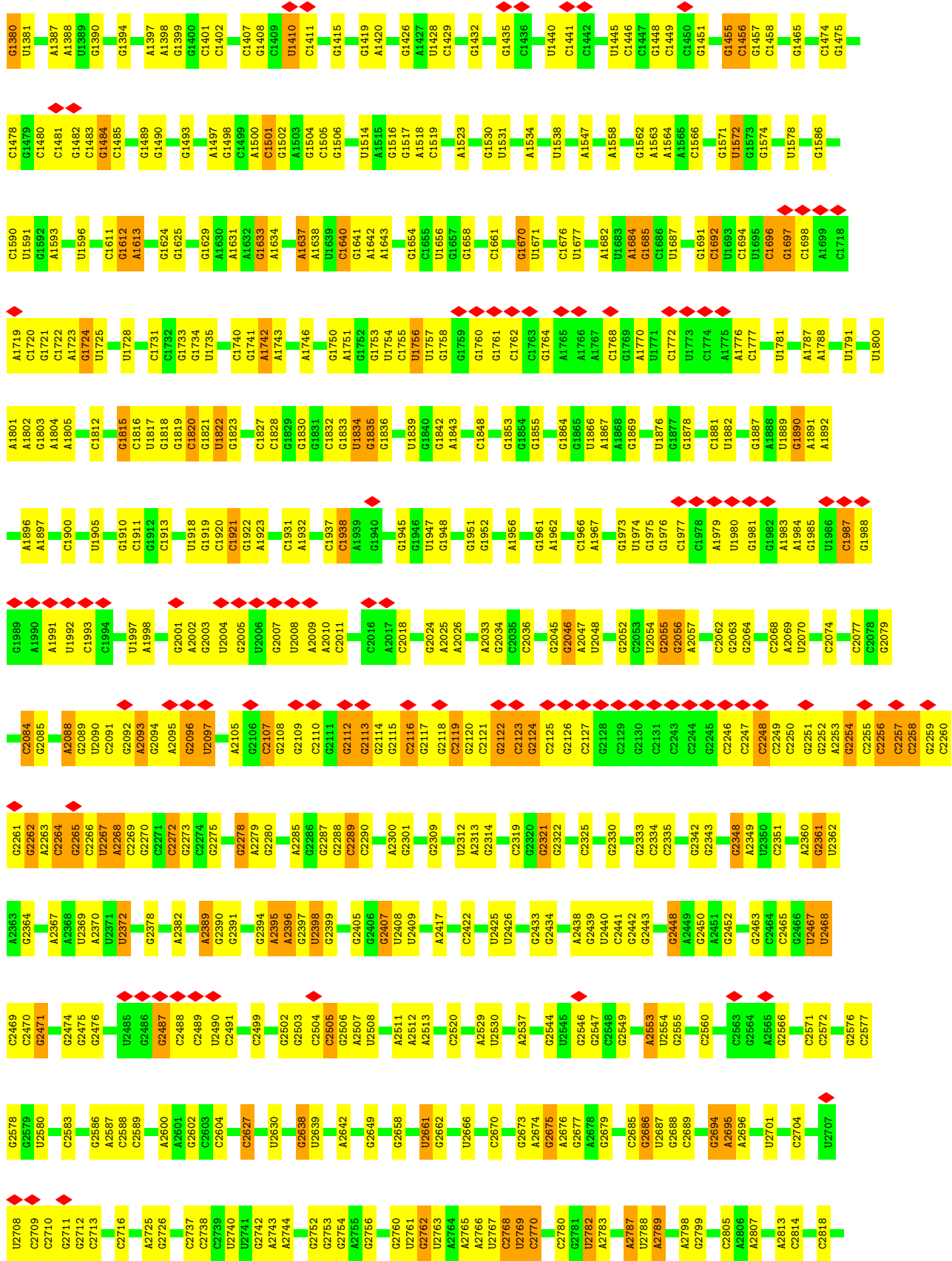


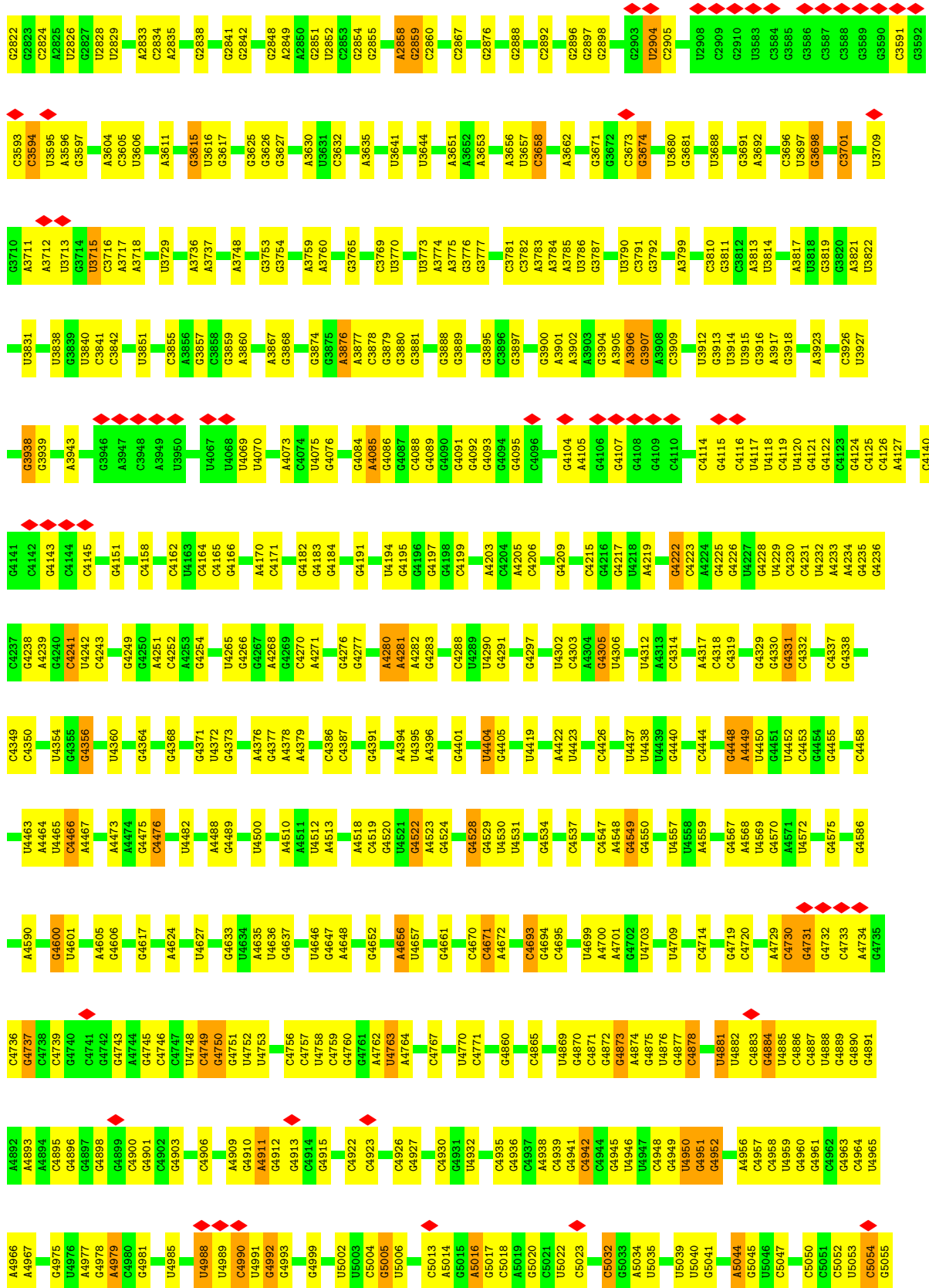


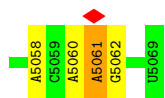


• Molecule 5: 28S ribosomal RNA

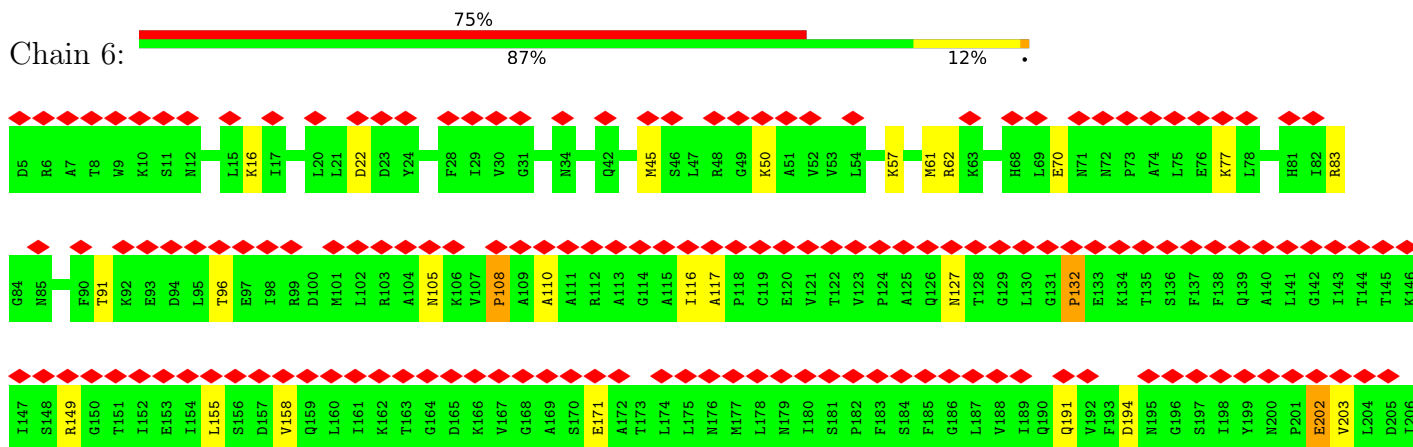




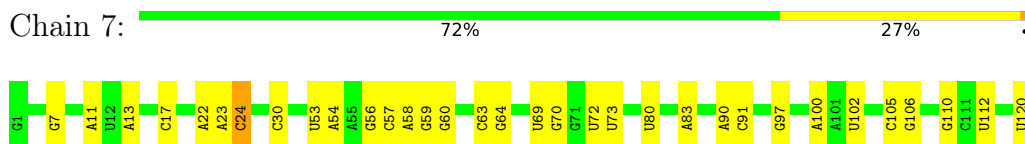




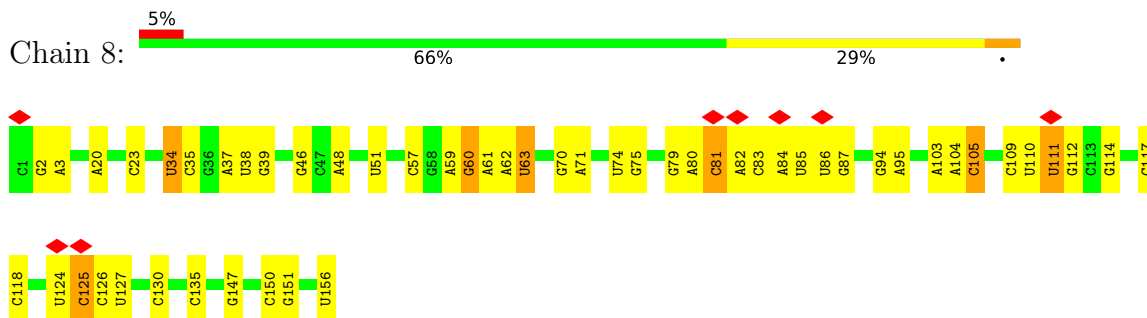
• Molecule 6: 60S acidic ribosomal protein P0



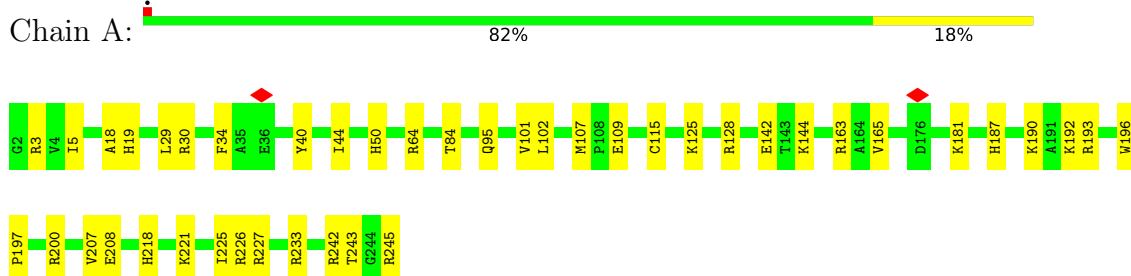
• Molecule 7: 5S ribosomal RNA



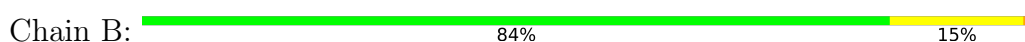
• Molecule 8: 5.8S ribosomal RNA

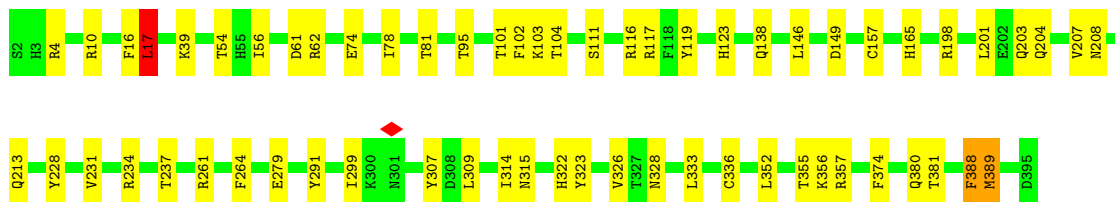


• Molecule 9: Ribosomal protein L8

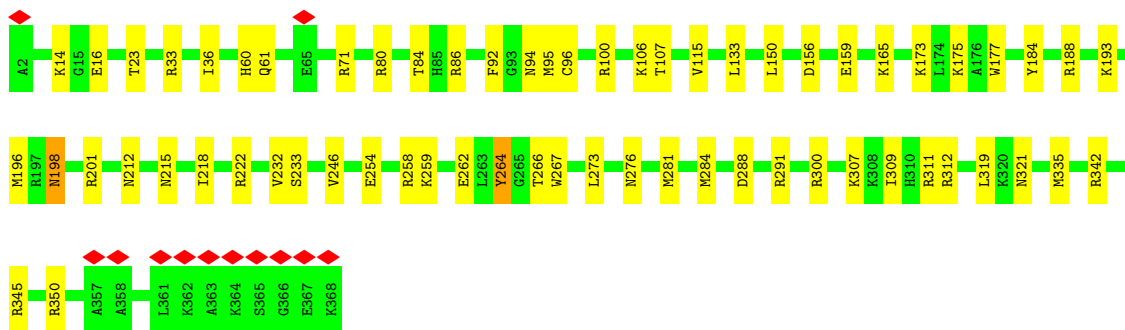
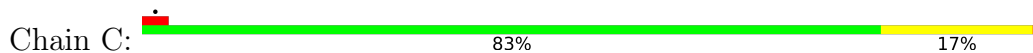


• Molecule 10: Ribosomal protein uL3

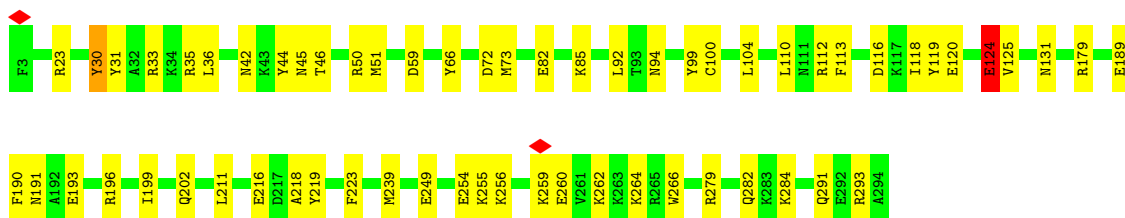
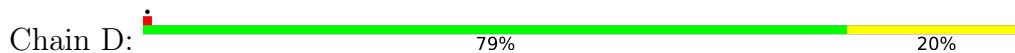




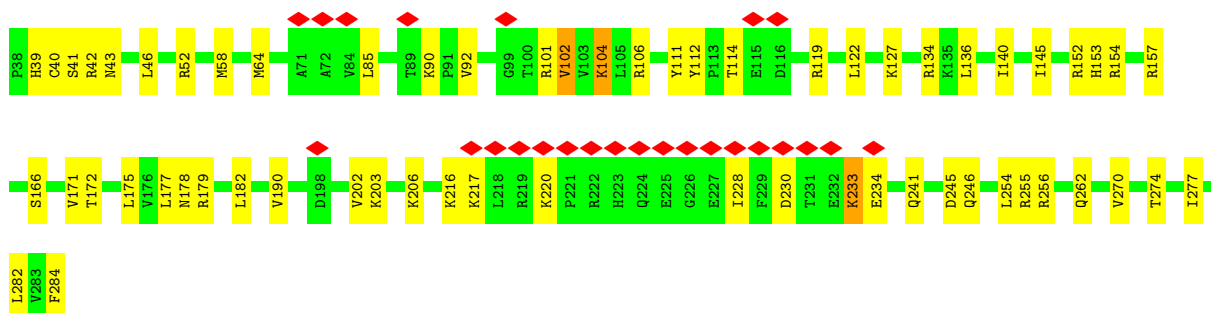
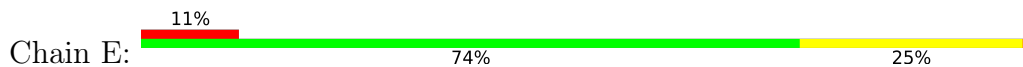
- Molecule 11: Ribosomal protein uL4



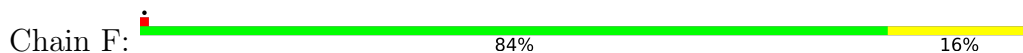
- Molecule 12: Ribosomal protein uL18



- Molecule 13: Ribosomal protein eL6

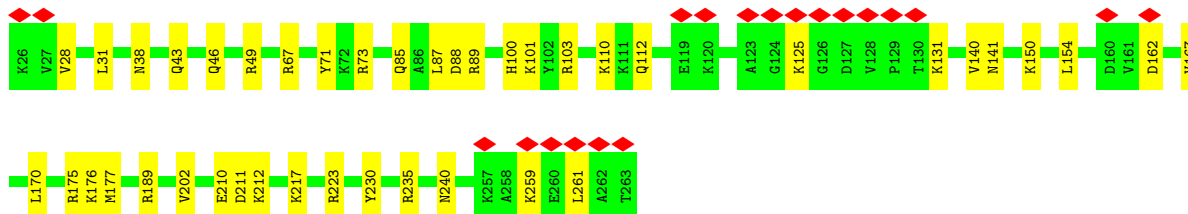
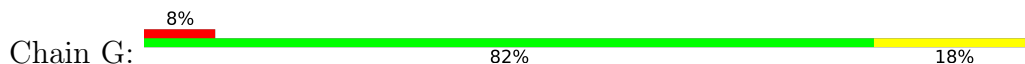


- Molecule 14: Ribosomal protein uL30

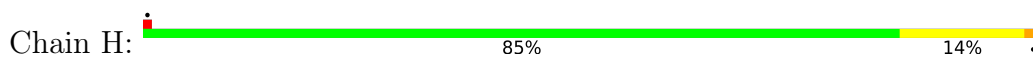




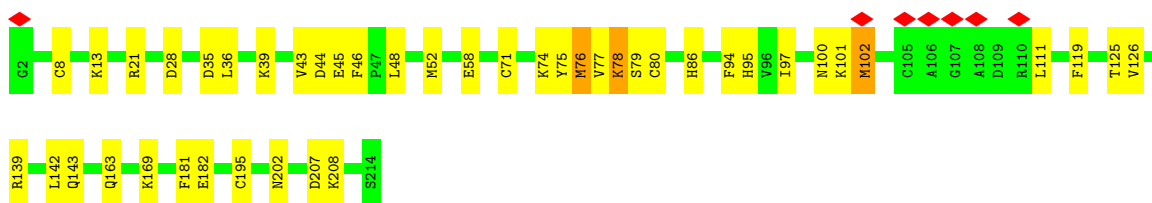
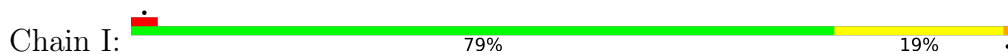
• Molecule 15: Ribosomal protein eL8



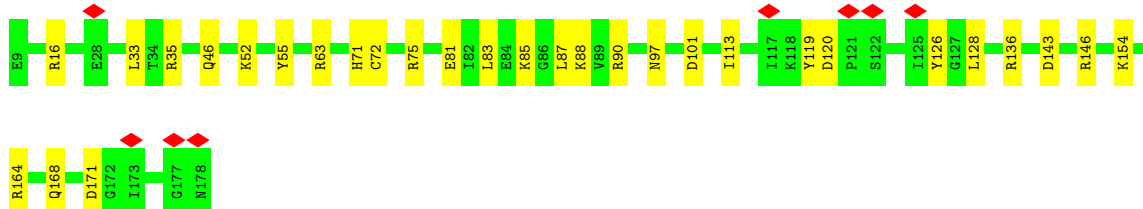
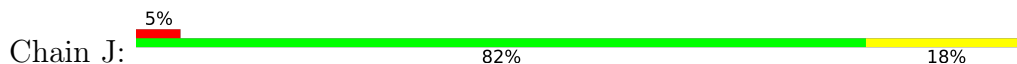
• Molecule 16: Ribosomal protein uL6



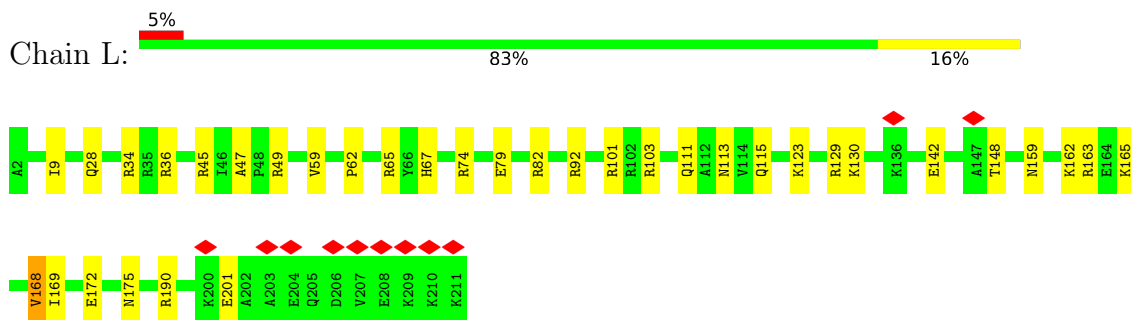
• Molecule 17: Ribosomal protein uL16



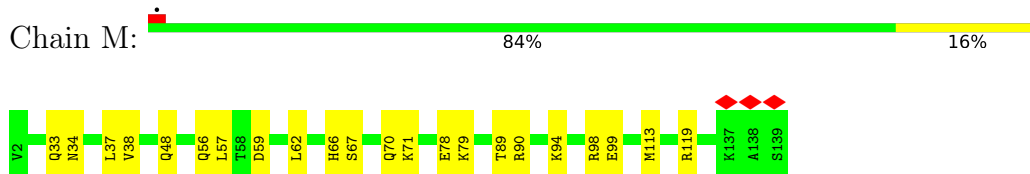
• Molecule 18: Ribosomal protein uL5



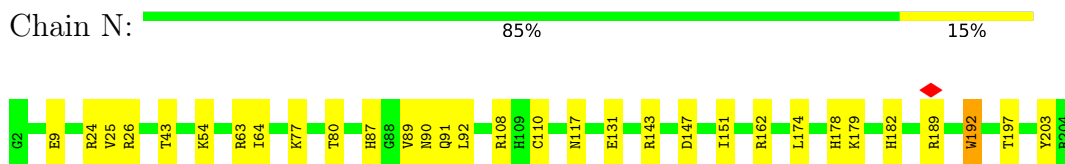
• Molecule 19: Ribosomal protein eL13



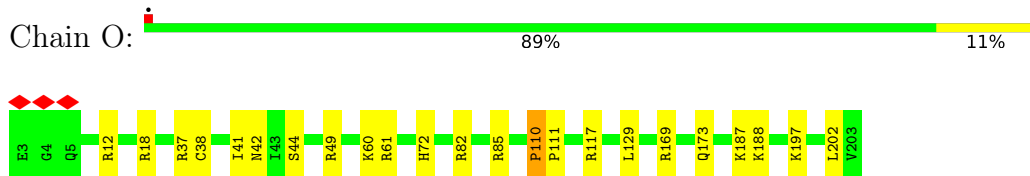
• Molecule 20: Ribosomal protein eL14



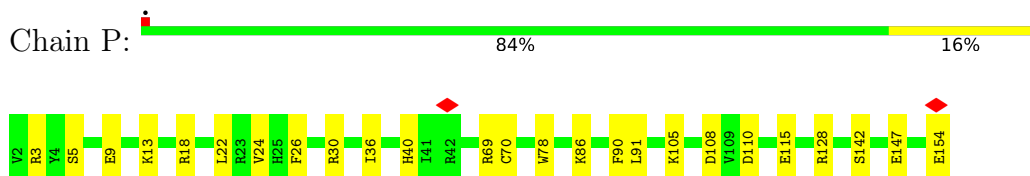
• Molecule 21: Ribosomal protein L15



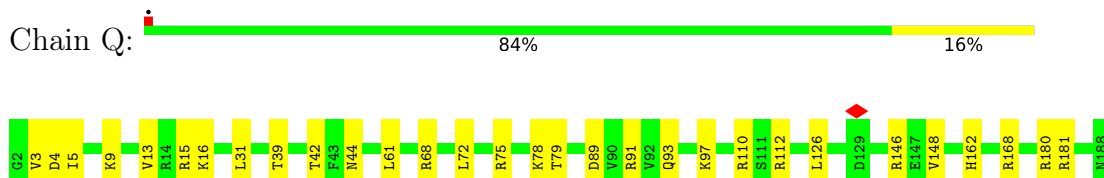
• Molecule 22: Ribosomal protein uL13



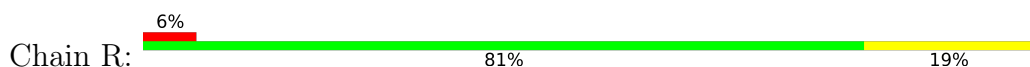
• Molecule 23: Ribosomal protein uL22

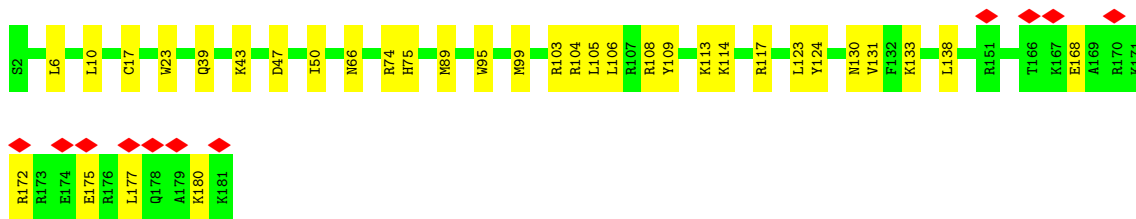


• Molecule 24: Ribosomal protein eL18

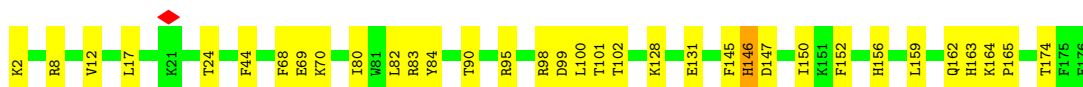
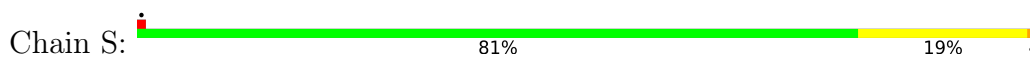


• Molecule 25: Ribosomal protein eL19

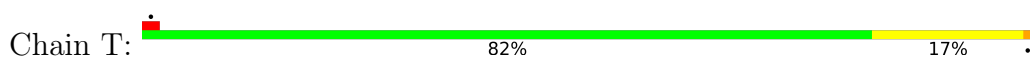




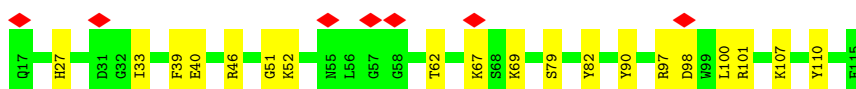
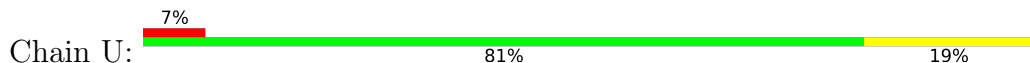
- Molecule 26: Ribosomal protein eL20



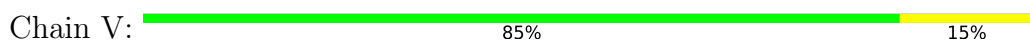
- Molecule 27: Ribosomal protein eL21



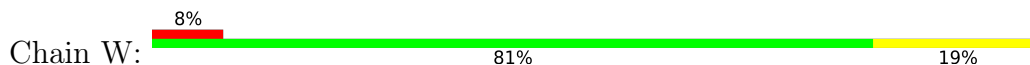
- Molecule 28: Ribosomal protein eL22



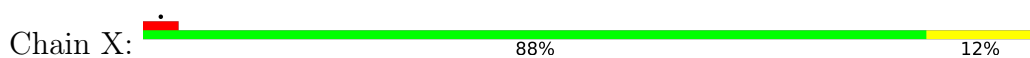
- Molecule 29: Ribosomal protein L23



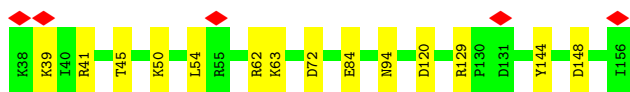
- Molecule 30: Ribosomal protein eL24



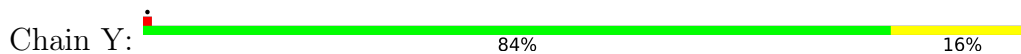
- Molecule 31: Ribosomal protein uL23



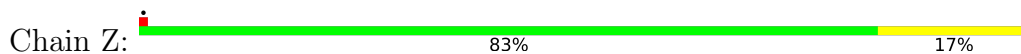




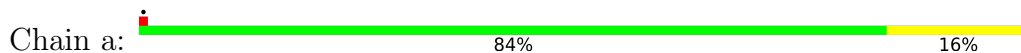
- Molecule 32: Ribosomal protein uL24



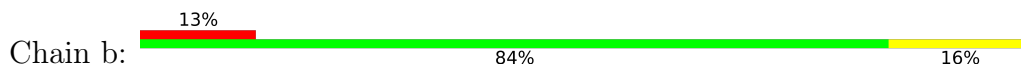
- Molecule 33: 60S ribosomal protein L27



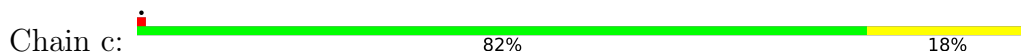
- Molecule 34: Ribosomal protein uL15



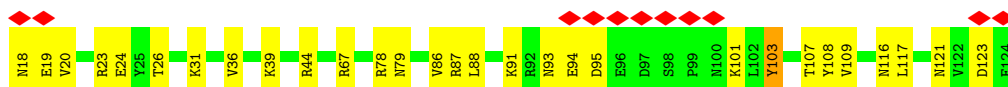
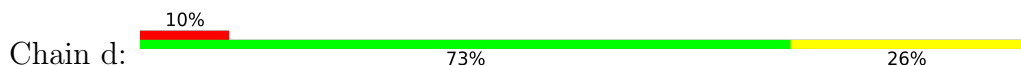
- Molecule 35: 60S ribosomal protein L29



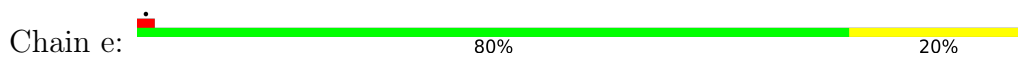
- Molecule 36: Ribosomal protein eL30



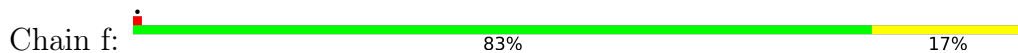
- Molecule 37: Ribosomal protein eL31



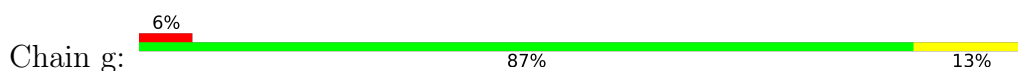
- Molecule 38: Ribosomal protein eL32



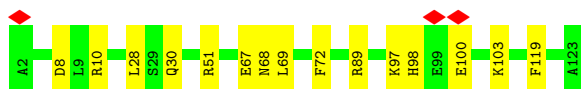
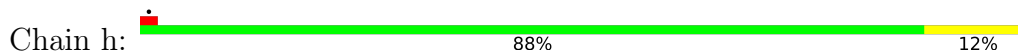
- Molecule 39: Ribosomal protein eL33



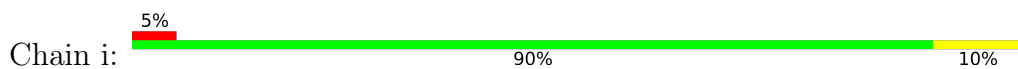
- Molecule 40: Ribosomal protein eL34



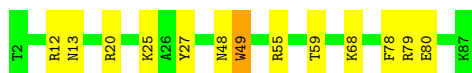
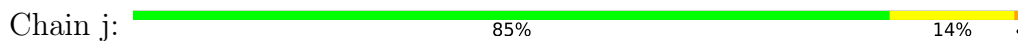
- Molecule 41: Ribosomal protein uL29



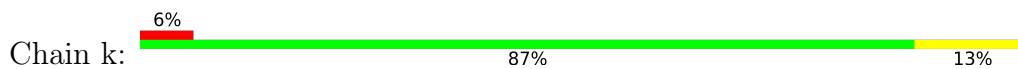
- Molecule 42: Ribosomal protein eL36



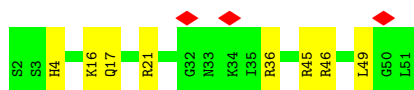
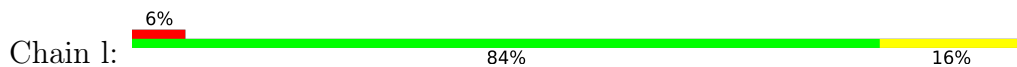
- Molecule 43: Ribosomal protein L37



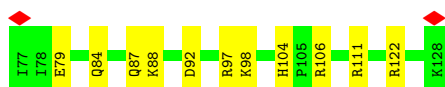
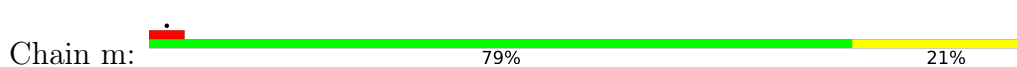
- Molecule 44: Ribosomal protein eL38



• Molecule 45: Ribosomal protein eL39



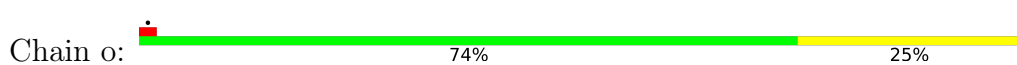
• Molecule 46: Ribosomal protein eL40



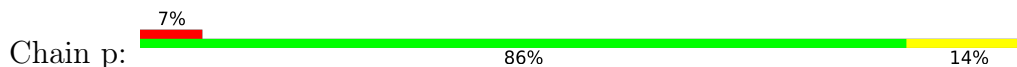
• Molecule 47: Ribosomal protein eL41



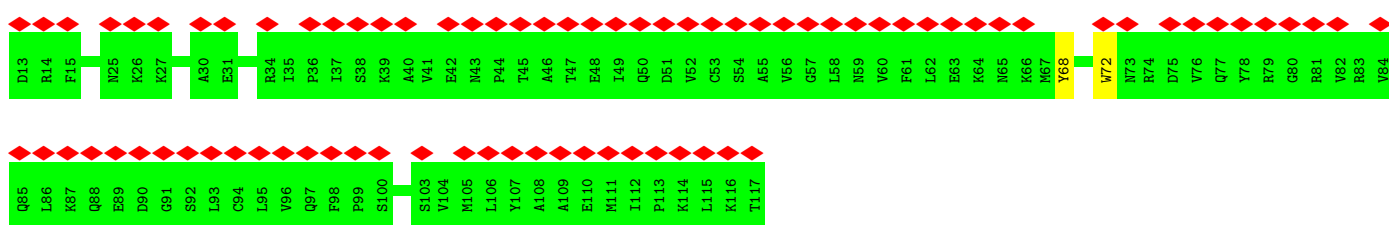
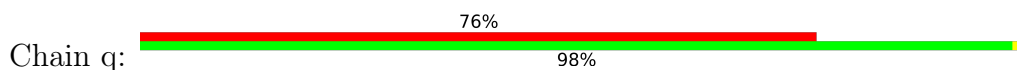
• Molecule 48: Ribosomal protein eL42



• Molecule 49: Ribosomal protein eL43

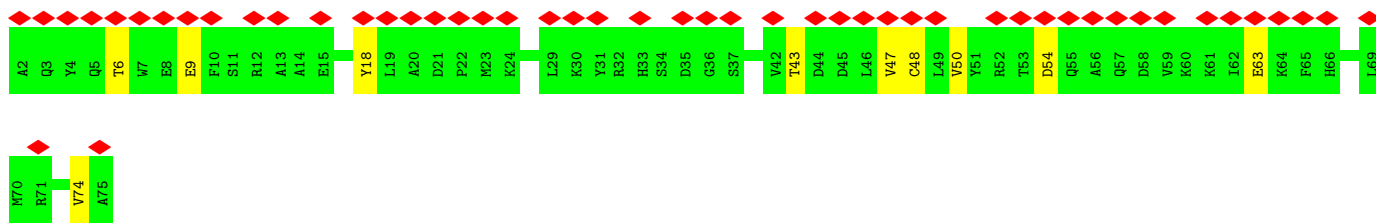


• Molecule 50: Signal recognition particle subunit SRP19

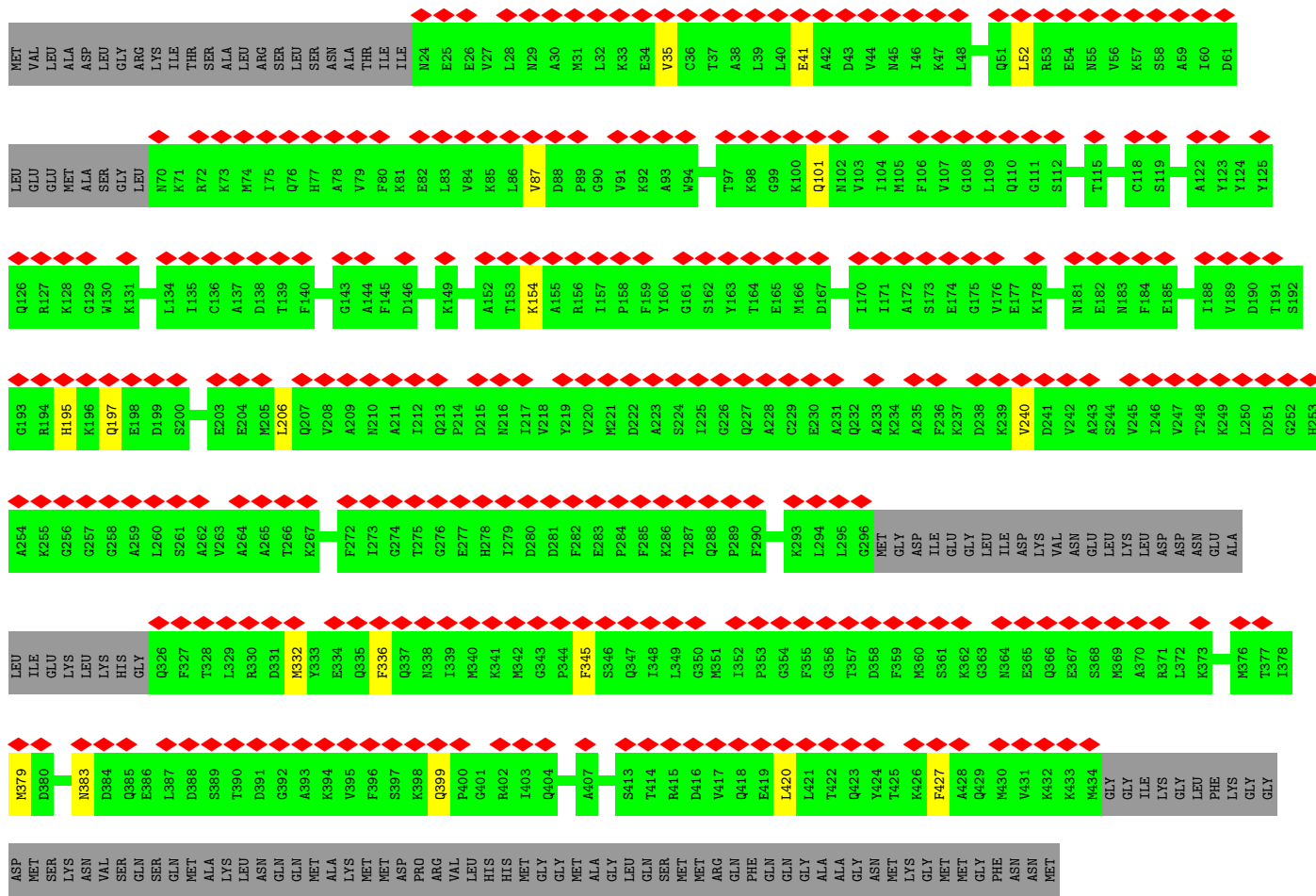




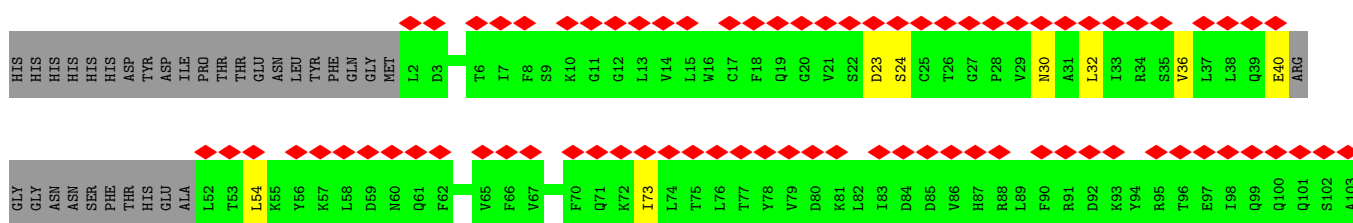


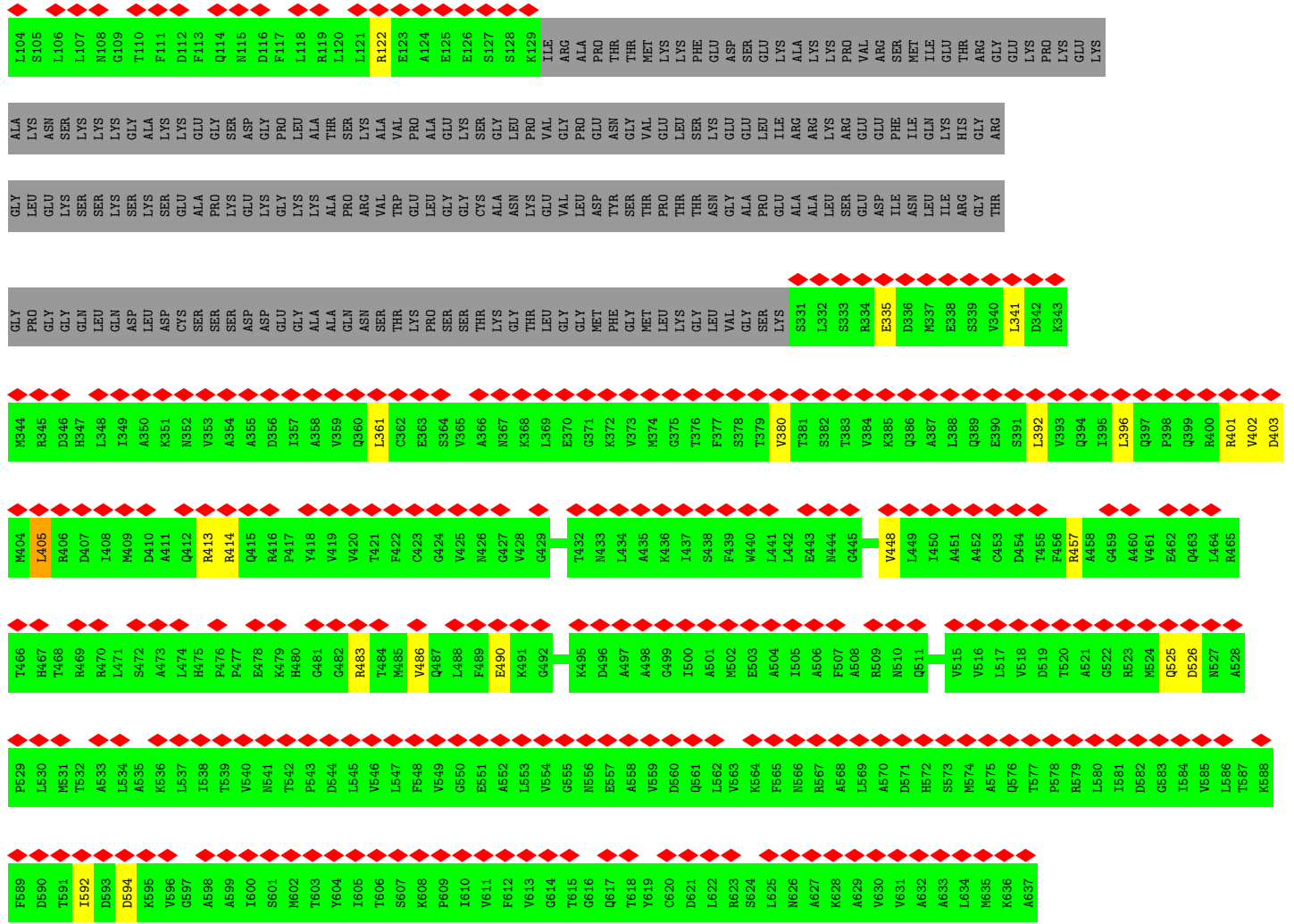


• Molecule 56: Signal recognition particle 54 kDa protein

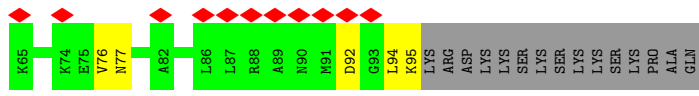
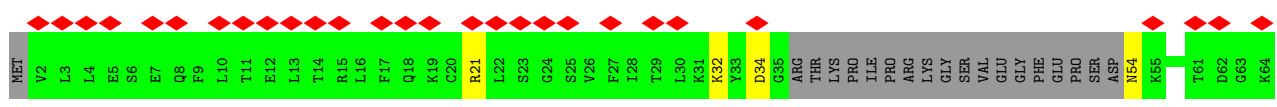


• Molecule 57: SRP receptor alpha subunit





● Molecule 58: Signal recognition particle 14 kDa protein



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	45800	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	59000	Depositor
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.504	Depositor
Minimum map value	-0.309	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.064	Depositor
Map size ( $\text{\AA}$ )	444.8, 444.8, 444.8	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.39, 1.39, 1.39	Depositor



## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, GTP, MG, GNP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	1	0.61	0/6188	1.36	72/9649 (0.7%)
2	2	0.35	0/1805	0.98	3/2809 (0.1%)
3	3	0.40	0/1017	0.63	0/1365
4	4	0.39	0/1257	0.75	3/1697 (0.2%)
5	5	0.54	10/87705 (0.0%)	1.28	692/136813 (0.5%)
6	6	0.28	0/1580	0.53	0/2133
7	7	0.46	0/2858	1.11	5/4455 (0.1%)
8	8	0.54	0/3701	1.26	18/5766 (0.3%)
9	A	0.43	0/1906	0.63	0/2556
10	B	0.41	0/3214	0.61	1/4308 (0.0%)
11	C	0.40	0/2973	0.60	1/3990 (0.0%)
12	D	0.39	0/2426	0.59	0/3252
13	E	0.37	0/1941	0.70	0/2601
14	F	0.41	0/1905	0.58	0/2539
15	G	0.35	0/1944	0.56	0/2618
16	H	0.37	0/1537	0.60	0/2066
17	I	0.37	0/1753	0.58	0/2343
18	J	0.33	0/1382	0.56	0/1849
19	L	0.37	0/1734	0.57	0/2318
20	M	0.38	0/1152	0.55	0/1539
21	N	0.40	0/1746	0.61	1/2338 (0.0%)
22	O	0.40	0/1684	0.55	0/2251
23	P	0.38	0/1268	0.60	1/1701 (0.1%)
24	Q	0.41	0/1530	0.59	0/2041
25	R	0.34	0/1524	0.56	0/2013
26	S	0.43	0/1493	0.60	0/2002
27	T	0.38	0/1326	0.59	1/1770 (0.1%)
28	U	0.32	0/822	0.57	0/1103
29	V	0.49	1/993 (0.1%)	0.56	0/1332
30	W	0.40	0/541	0.57	0/720
31	X	0.35	0/993	0.57	0/1334
32	Y	0.42	0/1132	0.57	0/1504

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	Z	0.39	0/1130	0.59	0/1507
34	a	0.41	0/1192	0.61	0/1591
35	b	0.38	0/620	0.53	0/819
36	c	0.37	0/742	0.60	0/996
37	d	0.45	0/903	0.61	0/1216
38	e	0.41	0/1071	0.61	0/1429
39	f	0.43	0/895	0.64	0/1198
40	g	0.39	0/916	0.58	0/1220
41	h	0.39	0/1023	0.54	0/1350
42	i	0.35	0/843	0.54	0/1115
43	j	0.43	0/721	0.65	1/953 (0.1%)
44	k	0.36	0/575	0.61	0/761
45	l	0.35	0/454	0.52	0/599
46	m	0.34	0/435	0.57	0/575
47	n	0.46	0/223	0.54	0/284
48	o	0.34	0/864	0.63	0/1140
49	p	0.39	0/718	0.60	0/953
50	q	0.49	0/858	0.57	0/1156
51	r	0.38	0/1442	0.55	0/1947
52	t	0.43	0/87	0.77	0/118
53	u	0.35	0/1853	0.53	1/2485 (0.0%)
54	v	0.44	0/1504	0.57	0/2020
55	w	0.29	0/617	0.51	0/829
56	x	0.41	0/2959	0.53	1/3971 (0.0%)
57	y	0.42	0/3344	0.56	0/4514
58	z	0.28	0/608	0.45	0/808
All	All	0.49	11/171627 (0.0%)	1.07	801/252329 (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	1	1	0
3	3	0	1
4	4	0	10
6	6	0	6
9	A	0	2
10	B	0	2
11	C	0	1
12	D	0	4

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Mol	Chain	#Chirality outliers	#Planarity outliers
13	E	0	14
16	H	0	2
17	I	0	2
19	L	0	1
20	M	0	1
22	O	0	1
26	S	0	3
39	f	0	2
48	o	0	1
All	All	1	53

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	5	4941	G	P-O5'	8.48	1.68	1.59
29	V	10	SER	C-N	8.11	1.47	1.33
5	5	960	A	N9-C4	7.54	1.42	1.37
5	5	149	A	N9-C4	-6.67	1.33	1.37
5	5	1890	G	N9-C4	-6.59	1.32	1.38
5	5	723	A	N9-C4	-5.80	1.34	1.37
5	5	1358	G	N9-C4	5.59	1.42	1.38
5	5	3906	A	N9-C4	-5.55	1.34	1.37
5	5	747	A	N9-C4	5.42	1.41	1.37
5	5	1684	A	N9-C4	-5.22	1.34	1.37
5	5	4280	A	N9-C4	-5.03	1.34	1.37

All (801) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	3594	C	C6-N1-C2	-11.99	115.51	120.30
5	5	960	A	C2-N3-C4	11.22	116.21	110.60
5	5	1890	G	N3-C4-C5	11.11	134.16	128.60
5	5	2036	C	N3-C2-O2	-10.97	114.22	121.90
5	5	960	A	C5-C6-N1	10.40	122.90	117.70
5	5	2258	C	N1-C2-O2	10.28	125.07	118.90
5	5	1358	G	C8-N9-C4	-9.92	102.43	106.40
5	5	1359	G	C8-N9-C4	-9.91	102.44	106.40
1	1	92	C	C6-N1-C2	-9.83	116.37	120.30
1	1	186	C	C6-N1-C2	-9.82	116.37	120.30
5	5	3594	C	C2-N1-C1'	9.81	129.59	118.80
5	5	1358	G	N3-C4-C5	-9.78	123.71	128.60
1	1	118	A	O4'-C1'-N9	9.77	116.01	108.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	3787	G	N1-C6-O6	9.59	125.66	119.90
1	1	37	C	N1-C2-O2	9.47	124.58	118.90
5	5	2258	C	N3-C2-O2	-9.36	115.35	121.90
5	5	2036	C	C6-N1-C2	-9.36	116.56	120.30
5	5	728	U	N3-C2-O2	-9.26	115.72	122.20
5	5	4305	G	N1-C6-O6	9.17	125.41	119.90
5	5	1987	C	C2-N1-C1'	9.13	128.84	118.80
5	5	1359	G	N9-C4-C5	9.12	109.05	105.40
5	5	166	C	N1-C2-O2	9.10	124.36	118.90
5	5	2852	U	N3-C2-O2	-9.05	115.86	122.20
5	5	2852	U	C6-N1-C2	-8.92	115.65	121.00
5	5	166	C	C2-N1-C1'	8.91	128.60	118.80
5	5	2119	C	C6-N1-C2	8.84	123.84	120.30
5	5	2505	C	C6-N1-C2	-8.84	116.77	120.30
5	5	1072	C	C2-N1-C1'	8.80	128.48	118.80
5	5	1358	G	C2-N3-C4	8.77	116.28	111.90
5	5	2361	G	C8-N9-C4	8.76	109.91	106.40
5	5	654	C	C6-N1-C2	-8.69	116.83	120.30
1	1	37	C	N3-C2-O2	-8.62	115.87	121.90
5	5	2036	C	N1-C2-O2	8.50	124.00	118.90
5	5	166	C	C6-N1-C2	-8.45	116.92	120.30
5	5	943	A	C8-N9-C4	8.45	109.18	105.80
5	5	1379	C	O4'-C1'-N1	8.41	114.93	108.20
5	5	2851	G	N1-C6-O6	8.40	124.94	119.90
1	1	161	C	C6-N1-C2	-8.38	116.95	120.30
5	5	2055	G	C8-N9-C4	8.37	109.75	106.40
5	5	973	G	C5-C6-O6	-8.37	123.58	128.60
5	5	2675	G	C8-N9-C4	8.37	109.75	106.40
1	1	37	C	C2-N1-C1'	8.35	127.98	118.80
5	5	2471	G	C2-N3-C4	-8.34	107.73	111.90
5	5	4522	G	N9-C4-C5	-8.32	102.07	105.40
5	5	973	G	N1-C6-O6	8.31	124.88	119.90
5	5	3594	C	N1-C2-O2	8.30	123.88	118.90
5	5	4946	U	N3-C2-O2	-8.21	116.45	122.20
8	8	63	U	N3-C2-O2	-8.21	116.45	122.20
5	5	3594	C	C5-C6-N1	8.18	125.09	121.00
5	5	1612	G	C6-C5-N7	-8.17	125.50	130.40
1	1	260	C	C6-N1-C2	-8.16	117.04	120.30
5	5	166	C	N3-C2-O2	-8.15	116.19	121.90
5	5	1076	C	C6-N1-C2	-8.15	117.04	120.30
5	5	1938	C	N3-C4-C5	8.07	125.13	121.90
5	5	1670	G	N1-C6-O6	-8.01	115.09	119.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	2694	G	N3-C2-N2	8.01	125.50	119.90
5	5	2852	U	C2-N1-C1'	7.96	127.26	117.70
5	5	2334	C	C6-N1-C2	7.89	123.46	120.30
5	5	149	A	C2-N3-C4	-7.88	106.66	110.60
5	5	685	C	C6-N1-C2	-7.87	117.15	120.30
5	5	5034	A	N1-C6-N6	7.85	123.31	118.60
5	5	4303	C	N1-C2-O2	7.85	123.61	118.90
5	5	2694	G	N9-C4-C5	-7.85	102.26	105.40
5	5	3594	C	N3-C2-O2	-7.84	116.41	121.90
5	5	1428	U	C5-C6-N1	7.82	126.61	122.70
5	5	4231	C	N1-C2-O2	7.82	123.59	118.90
5	5	969	C	O5'-P-OP1	-7.81	98.67	105.70
1	1	233	U	N3-C4-O4	-7.80	113.94	119.40
5	5	2694	G	C4-C5-N7	7.77	113.91	110.80
5	5	4547	C	C6-N1-C2	7.76	123.41	120.30
5	5	685	C	N1-C2-O2	7.74	123.55	118.90
5	5	148	C	N3-C2-O2	-7.71	116.50	121.90
5	5	1890	G	N3-C4-N9	-7.69	121.39	126.00
5	5	1358	G	N3-C4-N9	7.67	130.60	126.00
8	8	105	C	C6-N1-C2	7.58	123.33	120.30
5	5	148	C	C6-N1-C2	-7.58	117.27	120.30
5	5	4231	C	C2-N1-C1'	7.58	127.14	118.80
5	5	655	C	C6-N1-C2	-7.54	117.28	120.30
5	5	931	C	N1-C2-O2	7.51	123.41	118.90
5	5	1835	G	C6-C5-N7	-7.50	125.90	130.40
5	5	2258	C	C2-N1-C1'	7.48	127.03	118.80
5	5	723	A	C2-N3-C4	-7.47	106.86	110.60
5	5	960	A	N3-C4-C5	-7.46	121.58	126.80
5	5	2256	C	C2-N1-C1'	7.40	126.94	118.80
5	5	1938	C	C6-N1-C2	7.38	123.25	120.30
5	5	3653	A	C8-N9-C4	7.38	108.75	105.80
5	5	1890	G	C2-N3-C4	-7.36	108.22	111.90
5	5	2268	A	C8-N9-C4	7.35	108.74	105.80
5	5	2580	U	N3-C2-O2	-7.34	117.06	122.20
5	5	1348	U	N3-C4-O4	7.34	124.54	119.40
5	5	957	G	P-O3'-C3'	7.34	128.50	119.70
5	5	2055	G	N9-C4-C5	-7.32	102.47	105.40
5	5	4946	U	N1-C2-O2	7.32	127.92	122.80
5	5	48	G	P-O3'-C3'	7.28	128.44	119.70
5	5	3810	C	N1-C2-O2	7.26	123.26	118.90
5	5	2055	G	N3-C4-C5	7.26	132.23	128.60
1	1	194	G	C8-N9-C4	-7.26	103.50	106.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	1367	C	C6-N1-C2	-7.26	117.40	120.30
1	1	140	C	C6-N1-C2	-7.25	117.40	120.30
5	5	1670	G	C5-C6-O6	7.24	132.94	128.60
5	5	931	C	C6-N1-C2	-7.23	117.41	120.30
1	1	233	U	N3-C4-C5	7.22	118.93	114.60
5	5	336	A	N1-C6-N6	7.20	122.92	118.60
5	5	4978	G	O4'-C1'-N9	7.20	113.96	108.20
5	5	4884	G	C4-C5-N7	7.20	113.68	110.80
5	5	336	A	N7-C8-N9	7.20	117.40	113.80
5	5	1338	G	N3-C4-C5	7.19	132.20	128.60
5	5	2046	G	P-O3'-C3'	7.17	128.30	119.70
5	5	3783	A	N1-C6-N6	7.15	122.89	118.60
5	5	4466	C	C6-N1-C2	7.15	123.16	120.30
5	5	2852	U	C5-C6-N1	7.15	126.28	122.70
5	5	4303	C	N3-C2-O2	-7.14	116.90	121.90
5	5	654	C	C2-N1-C1'	7.13	126.64	118.80
5	5	961	G	OP1-P-O3'	7.12	120.87	105.20
5	5	207	G	C6-C5-N7	-7.12	126.13	130.40
5	5	685	C	C2-N1-C1'	7.12	126.63	118.80
5	5	724	C	N3-C2-O2	-7.11	116.93	121.90
5	5	4952	G	O5'-P-OP1	-7.10	99.31	105.70
5	5	5061	A	P-O3'-C3'	7.10	128.22	119.70
5	5	4990	C	C2-N1-C1'	7.09	126.60	118.80
21	N	192	TRP	CA-CB-CG	7.09	127.17	113.70
5	5	1937	C	N3-C2-O2	-7.09	116.94	121.90
5	5	2056	G	N1-C6-O6	7.06	124.14	119.90
5	5	509	A	C8-N9-C4	7.05	108.62	105.80
5	5	2904	U	N3-C2-O2	-7.05	117.27	122.20
5	5	1987	C	N1-C2-O2	7.04	123.13	118.90
5	5	2084	C	C6-N1-C2	-7.04	117.48	120.30
5	5	1613	A	C8-N9-C4	7.03	108.61	105.80
5	5	1287	G	N9-C4-C5	-7.02	102.59	105.40
4	4	154	ASP	CB-CG-OD1	-7.02	111.98	118.30
5	5	2264	C	N3-C4-C5	-7.02	119.09	121.90
5	5	943	A	N9-C4-C5	-7.02	102.99	105.80
5	5	685	C	N3-C2-O2	-7.01	116.99	121.90
5	5	336	A	C6-C5-N7	-6.99	127.41	132.30
5	5	4231	C	N3-C2-O2	-6.98	117.01	121.90
5	5	916	C	N1-C2-O2	6.97	123.08	118.90
5	5	1742	A	N9-C4-C5	-6.96	103.02	105.80
5	5	3904	G	C8-N9-C4	6.96	109.19	106.40
8	8	135	C	C6-N1-C2	-6.96	117.52	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	1210	C	C2-N1-C1'	6.95	126.44	118.80
5	5	5044	A	C8-N9-C4	-6.95	103.02	105.80
5	5	728	U	N1-C2-O2	6.93	127.65	122.80
5	5	2768	C	C6-N1-C2	-6.92	117.53	120.30
5	5	515	C	C6-N1-C2	-6.92	117.53	120.30
5	5	1890	G	C4-C5-N7	6.90	113.56	110.80
5	5	3787	G	C6-C5-N7	-6.90	126.26	130.40
5	5	1272	C	O4'-C1'-N1	6.87	113.70	108.20
5	5	5016	A	N7-C8-N9	6.87	117.23	113.80
56	x	420	LEU	CA-CB-CG	6.86	131.07	115.30
5	5	956	A	P-O3'-C3'	6.85	127.92	119.70
5	5	3842	C	C6-N1-C2	6.85	123.04	120.30
5	5	970	G	C8-N9-C4	-6.84	103.67	106.40
7	7	24	C	C6-N1-C2	-6.84	117.56	120.30
5	5	515	C	C2-N1-C1'	6.83	126.31	118.80
5	5	1642	A	N9-C4-C5	-6.83	103.07	105.80
8	8	46	G	C8-N9-C4	-6.83	103.67	106.40
5	5	167	C	C6-N1-C2	-6.82	117.57	120.30
5	5	931	C	N3-C2-O2	-6.81	117.14	121.90
5	5	279	A	N1-C6-N6	6.80	122.68	118.60
5	5	1890	G	N1-C6-O6	6.79	123.97	119.90
5	5	1987	C	C6-N1-C2	-6.77	117.59	120.30
5	5	3874	G	C2-N3-C4	-6.76	108.52	111.90
5	5	1742	A	C8-N9-C4	6.76	108.50	105.80
5	5	1359	G	C4-C5-N7	-6.74	108.10	110.80
5	5	1456	C	C6-N1-C2	-6.73	117.61	120.30
5	5	4749	C	C2-N1-C1'	6.71	126.18	118.80
5	5	2264	C	C2-N3-C4	6.71	123.25	119.90
5	5	953	C	N3-C2-O2	-6.70	117.21	121.90
5	5	4759	C	N3-C2-O2	-6.70	117.21	121.90
1	1	87	C	C6-N1-C2	-6.69	117.62	120.30
5	5	3841	C	C6-N1-C2	6.68	122.97	120.30
8	8	63	U	N1-C2-O2	6.68	127.48	122.80
1	1	37	C	C6-N1-C2	-6.68	117.63	120.30
5	5	356	G	N1-C6-O6	6.67	123.90	119.90
5	5	4958	C	N1-C2-O2	6.66	122.90	118.90
5	5	2782	U	P-O3'-C3'	6.65	127.68	119.70
5	5	1612	G	N1-C6-O6	6.65	123.89	119.90
1	1	235	G	N3-C4-N9	6.64	129.99	126.00
5	5	5005	G	C8-N9-C4	6.64	109.06	106.40
5	5	4884	G	N9-C4-C5	-6.63	102.75	105.40
5	5	3907	G	N1-C6-O6	6.62	123.88	119.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	2407	G	N1-C6-O6	-6.62	115.93	119.90
5	5	2638	G	C2-N3-C4	-6.62	108.59	111.90
5	5	973	G	N3-C4-C5	6.61	131.90	128.60
5	5	1913	C	C6-N1-C2	6.59	122.94	120.30
5	5	4633	G	C8-N9-C4	6.59	109.04	106.40
5	5	1072	C	C6-N1-C1'	-6.58	112.90	120.80
5	5	955	G	N9-C4-C5	-6.58	102.77	105.40
5	5	2762	G	N3-C4-C5	6.58	131.89	128.60
5	5	5016	A	N1-C6-N6	6.57	122.54	118.60
1	1	234	A	C8-N9-C4	-6.57	103.17	105.80
5	5	4978	G	N1-C6-O6	6.57	123.84	119.90
5	5	1937	C	N1-C2-O2	6.56	122.84	118.90
5	5	336	A	O4'-C1'-N9	6.56	113.45	108.20
5	5	2695	A	P-O3'-C3'	6.56	127.57	119.70
5	5	2586	G	C6-C5-N7	-6.55	126.47	130.40
5	5	1358	G	N7-C8-N9	6.55	116.38	113.10
5	5	2586	G	N1-C6-O6	6.55	123.83	119.90
5	5	2248	C	C6-N1-C2	-6.55	117.68	120.30
1	1	234	A	N7-C8-N9	6.53	117.06	113.80
5	5	1890	G	C4-N9-C1'	-6.52	118.02	126.50
5	5	1835	G	C2-N3-C4	-6.52	108.64	111.90
5	5	2675	G	N9-C4-C5	-6.52	102.79	105.40
5	5	4283	G	N9-C4-C5	-6.51	102.79	105.40
5	5	4568	A	C8-N9-C4	6.51	108.40	105.80
5	5	972	C	N3-C2-O2	-6.50	117.35	121.90
5	5	292	G	N3-C4-C5	6.49	131.84	128.60
5	5	2287	G	C8-N9-C4	6.49	109.00	106.40
5	5	2904	U	N1-C2-O2	6.49	127.34	122.80
5	5	1210	C	N1-C2-O2	6.48	122.79	118.90
5	5	1905	U	C5-C6-N1	-6.47	119.47	122.70
5	5	2852	U	N1-C2-O2	6.47	127.33	122.80
5	5	4522	G	C8-N9-C4	6.47	108.99	106.40
5	5	1348	U	N3-C4-C5	-6.46	110.72	114.60
5	5	332	C	C6-N1-C2	-6.45	117.72	120.30
1	1	258	C	C5-C6-N1	6.44	124.22	121.00
5	5	1338	G	C2-N3-C4	-6.44	108.68	111.90
1	1	221	C	C6-N1-C2	-6.43	117.73	120.30
5	5	2859	G	C2-N3-C4	-6.43	108.69	111.90
5	5	704	C	C2-N1-C1'	6.42	125.87	118.80
5	5	4978	G	C2-N3-C4	-6.42	108.69	111.90
5	5	1325	C	N3-C2-O2	-6.41	117.41	121.90
5	5	468	U	C2-N1-C1'	6.41	125.39	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	2055	G	C4-C5-N7	6.41	113.36	110.80
5	5	1428	U	C6-N1-C2	-6.40	117.16	121.00
1	1	104	C	C6-N1-C2	-6.39	117.74	120.30
5	5	2256	C	N1-C2-O2	6.39	122.73	118.90
5	5	3691	G	C5-C6-O6	6.38	132.43	128.60
5	5	4283	G	C4-C5-N7	6.38	113.35	110.80
1	1	186	C	C2-N1-C1'	6.38	125.82	118.80
1	1	237	G	N9-C4-C5	6.38	107.95	105.40
5	5	4281	A	O4'-C1'-N9	6.38	113.30	108.20
5	5	166	C	C5-C6-N1	6.37	124.19	121.00
5	5	2361	G	OP2-P-O3'	6.37	119.21	105.20
5	5	1215	C	N1-C2-O2	6.35	122.71	118.90
5	5	1239	C	P-O3'-C3'	6.33	127.30	119.70
53	u	90	ARG	NE-CZ-NH1	6.33	123.47	120.30
5	5	2265	G	OP1-P-O3'	6.33	119.12	105.20
5	5	973	G	C4-C5-N7	6.32	113.33	110.80
5	5	1629	G	N1-C6-O6	6.32	123.69	119.90
5	5	1822	U	N3-C2-O2	-6.32	117.77	122.20
5	5	956	A	OP2-P-O3'	6.32	119.10	105.20
5	5	1348	U	C6-N1-C2	-6.30	117.22	121.00
5	5	3855	C	C6-N1-C2	6.30	122.82	120.30
5	5	1359	G	N3-C4-C5	-6.29	125.46	128.60
1	1	92	C	N3-C4-C5	-6.28	119.39	121.90
5	5	475	G	C2-N3-C4	6.28	115.04	111.90
5	5	960	A	N3-C4-N9	6.28	132.43	127.40
5	5	2280	G	C8-N9-C4	-6.28	103.89	106.40
5	5	4305	G	C5-C6-O6	-6.27	124.84	128.60
5	5	1456	C	C5-C6-N1	6.27	124.14	121.00
5	5	2280	G	C4-N9-C1'	6.27	134.65	126.50
5	5	4881	U	N3-C2-O2	-6.27	117.81	122.20
5	5	2361	G	N9-C4-C5	-6.26	102.89	105.40
1	1	38	U	C2-N1-C1'	6.25	125.20	117.70
5	5	931	C	P-O3'-C3'	6.25	127.20	119.70
5	5	2904	U	C2-N1-C1'	6.25	125.19	117.70
5	5	2851	G	C6-C5-N7	-6.23	126.66	130.40
5	5	1484	G	C4-N9-C1'	-6.22	118.42	126.50
5	5	4281	A	N7-C8-N9	6.22	116.91	113.80
5	5	1815	G	C2-N3-C4	-6.21	108.79	111.90
5	5	2264	C	C6-N1-C2	-6.21	117.81	120.30
5	5	2334	C	N3-C4-C5	6.21	124.38	121.90
5	5	4458	C	C6-N1-C2	6.21	122.78	120.30
5	5	2258	C	C6-N1-C2	-6.21	117.82	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	4270	C	C6-N1-C2	6.21	122.78	120.30
5	5	2256	C	C6-N1-C1'	-6.21	113.35	120.80
5	5	4458	C	N3-C4-C5	6.19	124.38	121.90
5	5	1740	C	C6-N1-C2	6.18	122.77	120.30
5	5	1338	G	N1-C6-O6	6.18	123.61	119.90
5	5	1987	C	C5-C6-N1	6.17	124.09	121.00
1	1	145	C	C6-N1-C2	-6.17	117.83	120.30
5	5	111	C	C6-N1-C2	6.17	122.77	120.30
5	5	1642	A	C8-N9-C4	6.17	108.27	105.80
5	5	945	U	N3-C2-O2	-6.17	117.88	122.20
8	8	150	C	C6-N1-C2	-6.16	117.84	120.30
5	5	149	A	N1-C6-N6	6.15	122.29	118.60
5	5	2586	G	C4-N9-C1'	6.15	134.50	126.50
5	5	1756	U	C2-N1-C1'	6.14	125.07	117.70
5	5	4942	C	C6-N1-C2	-6.14	117.84	120.30
1	1	257	C	C6-N1-C2	-6.14	117.84	120.30
5	5	2471	G	N3-C4-C5	6.13	131.67	128.60
5	5	3783	A	C6-C5-N7	-6.13	128.01	132.30
5	5	351	C	C6-N1-C2	6.13	122.75	120.30
5	5	654	C	C5-C6-N1	6.13	124.06	121.00
5	5	2056	G	C2-N3-C4	-6.12	108.84	111.90
5	5	3810	C	C2-N1-C1'	6.12	125.53	118.80
5	5	1822	U	C6-N1-C2	-6.11	117.34	121.00
5	5	3909	C	C2-N1-C1'	6.10	125.51	118.80
5	5	5016	A	C6-C5-N7	-6.10	128.03	132.30
5	5	4763	U	C5-C6-N1	-6.09	119.66	122.70
5	5	100	C	N1-C2-O2	6.08	122.55	118.90
5	5	1072	C	N1-C2-O2	6.08	122.55	118.90
5	5	1380	G	C8-N9-C4	-6.08	103.97	106.40
5	5	4990	C	C6-N1-C2	-6.07	117.87	120.30
5	5	4549	G	N3-C4-C5	6.07	131.63	128.60
5	5	1987	C	C6-N1-C1'	-6.07	113.52	120.80
8	8	63	U	C2-N1-C1'	6.06	124.98	117.70
1	1	260	C	N3-C4-C5	-6.06	119.48	121.90
5	5	4750	G	N1-C6-O6	6.06	123.53	119.90
5	5	936	C	P-O3'-C3'	6.06	126.97	119.70
5	5	2088	A	C8-N9-C4	6.05	108.22	105.80
5	5	3783	A	C4-C5-C6	6.04	120.02	117.00
5	5	4305	G	N3-C2-N2	-6.04	115.67	119.90
5	5	1282	G	O5'-P-OP1	-6.03	100.28	105.70
5	5	1484	G	N3-C4-C5	6.03	131.61	128.60
5	5	315	G	N3-C4-N9	6.02	129.61	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	4693	C	C6-N1-C1'	-6.01	113.58	120.80
5	5	1682	A	C8-N9-C4	6.01	108.20	105.80
5	5	960	A	C6-N1-C2	-6.01	114.99	118.60
5	5	2097	U	N3-C2-O2	-6.01	117.99	122.20
5	5	336	A	C4-C5-C6	6.01	120.00	117.00
5	5	2036	C	C2-N1-C1'	6.00	125.40	118.80
5	5	945	U	C6-N1-C2	-6.00	117.40	121.00
5	5	724	C	N1-C2-O2	5.99	122.50	118.90
5	5	2398	U	P-O3'-C3'	5.99	126.89	119.70
1	1	260	C	C5-C6-N1	5.99	124.00	121.00
5	5	5052	C	C2-N1-C1'	5.99	125.39	118.80
5	5	157	U	C5-C6-N1	-5.99	119.70	122.70
5	5	2679	G	N3-C4-C5	-5.99	125.61	128.60
5	5	3787	G	N9-C4-C5	-5.98	103.01	105.40
5	5	71	C	C6-N1-C2	5.97	122.69	120.30
5	5	4158	C	C2-N1-C1'	5.97	125.36	118.80
1	1	134	U	C5-C6-N1	5.96	125.68	122.70
5	5	4283	G	N1-C6-O6	5.96	123.48	119.90
5	5	5016	A	C8-N9-C4	-5.96	103.42	105.80
5	5	934	C	C6-N1-C2	5.95	122.68	120.30
5	5	4466	C	N3-C4-C5	5.95	124.28	121.90
5	5	438	G	N9-C4-C5	-5.95	103.02	105.40
5	5	4449	A	P-O3'-C3'	5.94	126.83	119.70
5	5	2249	C	C6-N1-C2	-5.93	117.93	120.30
5	5	1685	G	N1-C6-O6	5.93	123.46	119.90
1	1	126	C	C6-N1-C2	-5.93	117.93	120.30
5	5	1320	U	C6-N1-C2	5.92	124.55	121.00
5	5	2805	C	C6-N1-C2	5.92	122.67	120.30
5	5	4266	G	C2-N3-C4	-5.91	108.94	111.90
5	5	1640	C	C6-N1-C2	5.91	122.66	120.30
5	5	2858	A	N7-C8-N9	5.91	116.75	113.80
5	5	2738	C	C6-N1-C2	5.91	122.66	120.30
1	1	118	A	C2-N3-C4	5.90	113.55	110.60
1	1	161	C	N3-C4-C5	-5.90	119.54	121.90
5	5	2769	U	C2-N1-C1'	5.89	124.77	117.70
1	1	186	C	N3-C2-O2	-5.89	117.78	121.90
5	5	149	A	N3-C4-C5	5.89	130.93	126.80
5	5	3876	A	P-O3'-C3'	5.89	126.77	119.70
5	5	1301	C	C2-N1-C1'	5.88	125.27	118.80
5	5	2505	C	C2-N1-C1'	5.88	125.27	118.80
1	1	92	C	C5-C6-N1	5.87	123.94	121.00
1	1	161	C	C5-C6-N1	5.87	123.94	121.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	665	C	N1-C2-O2	5.87	122.42	118.90
5	5	2097	U	N1-C2-O2	5.87	126.91	122.80
5	5	2505	C	N3-C2-O2	-5.86	117.80	121.90
1	1	189	C	C6-N1-C2	-5.86	117.95	120.30
5	5	2405	G	N9-C4-C5	-5.86	103.06	105.40
5	5	4281	A	C8-N9-C4	-5.86	103.46	105.80
5	5	1501	C	O4'-C1'-N1	5.85	112.88	108.20
5	5	1317	U	N1-C2-O2	-5.84	118.71	122.80
5	5	955	G	C8-N9-C4	5.84	108.73	106.40
5	5	4656	A	P-O3'-C3'	5.84	126.70	119.70
5	5	4951	G	P-O3'-C3'	5.84	126.70	119.70
8	8	34	U	P-O3'-C3'	5.84	126.70	119.70
5	5	1410	U	P-O3'-C3'	5.83	126.70	119.70
5	5	2096	G	C2-N3-C4	5.83	114.82	111.90
5	5	2321	G	N1-C2-N3	5.83	127.40	123.90
5	5	2471	G	N1-C6-O6	5.83	123.40	119.90
5	5	4878	C	N1-C2-O2	5.83	122.40	118.90
5	5	2888	G	N3-C4-N9	5.83	129.50	126.00
5	5	3787	G	C4-C5-N7	5.83	113.13	110.80
5	5	2505	C	N1-C2-O2	5.83	122.39	118.90
5	5	3594	C	C2-N3-C4	5.82	122.81	119.90
5	5	654	C	N1-C2-O2	5.82	122.39	118.90
5	5	1210	C	C6-N1-C1'	-5.82	113.82	120.80
5	5	2116	C	C2-N1-C1'	5.81	125.19	118.80
5	5	1365	C	P-O3'-C3'	5.81	126.67	119.70
1	1	237	G	C4-C5-N7	-5.81	108.48	110.80
1	1	158	C	C6-N1-C2	-5.80	117.98	120.30
5	5	4549	G	C2-N3-C4	-5.80	109.00	111.90
5	5	2487	G	OP1-P-O3'	5.80	117.97	105.20
5	5	728	U	C5-C6-N1	-5.80	119.80	122.70
5	5	4750	G	C6-C5-N7	-5.80	126.92	130.40
5	5	2452	G	N3-C4-N9	5.80	129.48	126.00
5	5	3775	A	O4'-C1'-N9	5.80	112.84	108.20
5	5	4549	G	C8-N9-C4	5.80	108.72	106.40
5	5	3615	G	C5-C6-O6	-5.79	125.12	128.60
8	8	111	U	N1-C2-O2	5.79	126.86	122.80
5	5	1517	G	N3-C4-C5	5.79	131.49	128.60
5	5	4939	C	C2-N1-C1'	5.78	125.16	118.80
5	5	2685	C	N1-C2-O2	-5.78	115.43	118.90
5	5	2586	G	C4-C5-C6	5.78	122.27	118.80
5	5	2762	G	C4-N9-C1'	-5.77	119.00	126.50
10	B	17	LEU	CA-CB-CG	5.77	128.58	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	4671	C	C6-N1-C2	5.77	122.61	120.30
43	j	49	TRP	CA-CB-CG	5.76	124.65	113.70
5	5	747	A	N3-C4-C5	-5.76	122.77	126.80
5	5	1287	G	C4-C5-N7	5.76	113.10	110.80
1	1	170	C	C6-N1-C2	-5.76	118.00	120.30
5	5	4737	G	C8-N9-C4	-5.76	104.10	106.40
5	5	955	G	C4-C5-N7	5.76	113.10	110.80
5	5	2452	G	N3-C4-C5	-5.75	125.73	128.60
1	1	38	U	P-O3'-C3'	5.75	126.59	119.70
5	5	4873	G	C4-C5-N7	5.75	113.10	110.80
5	5	2112	G	C4-N9-C1'	5.74	133.97	126.50
5	5	2287	G	C2-N3-C4	-5.74	109.03	111.90
5	5	2264	C	C5-C6-N1	5.74	123.87	121.00
5	5	2604	C	C6-N1-C2	5.73	122.59	120.30
5	5	3701	C	C6-N1-C2	5.73	122.59	120.30
5	5	706	C	N3-C4-C5	5.73	124.19	121.90
5	5	4277	G	N9-C4-C5	-5.73	103.11	105.40
1	1	233	U	O5'-P-OP1	-5.72	100.55	105.70
5	5	2119	C	P-O3'-C3'	5.72	126.57	119.70
5	5	71	C	N3-C4-C5	5.72	124.19	121.90
5	5	2395	A	C6-C5-N7	-5.72	128.30	132.30
8	8	130	C	C6-N1-C2	5.72	122.59	120.30
5	5	449	C	C6-N1-C2	-5.71	118.02	120.30
5	5	3651	A	O5'-P-OP1	-5.71	100.56	105.70
1	1	231	A	C5-C6-N6	5.70	128.26	123.70
5	5	1072	C	C5-C6-N1	5.70	123.85	121.00
5	5	4911	A	C8-N9-C4	5.70	108.08	105.80
5	5	1287	G	C8-N9-C4	5.70	108.68	106.40
5	5	1517	G	N3-C4-N9	-5.70	122.58	126.00
5	5	1890	G	C8-N9-C1'	5.70	134.40	127.00
5	5	148	C	N1-C2-O2	5.69	122.32	118.90
5	5	48	G	OP2-P-O3'	5.69	117.72	105.20
5	5	1911	C	C5-C6-N1	-5.69	118.16	121.00
5	5	4371	G	C8-N9-C4	5.69	108.67	106.40
1	1	103	U	C6-N1-C2	-5.68	117.59	121.00
5	5	3907	G	C6-C5-N7	-5.68	126.99	130.40
1	1	235	G	C6-C5-N7	-5.68	126.99	130.40
5	5	336	A	C5-N7-C8	-5.67	101.06	103.90
5	5	4941	G	O5'-P-OP1	-5.67	100.59	105.70
2	2	32	C	C6-N1-C2	-5.67	118.03	120.30
5	5	417	G	P-O3'-C3'	5.67	126.50	119.70
5	5	2268	A	N9-C4-C5	-5.67	103.53	105.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	458	C	C2-N1-C1'	5.67	125.03	118.80
5	5	4635	A	N1-C6-N6	5.67	122.00	118.60
5	5	1574	G	C5-C6-N1	-5.66	108.67	111.50
5	5	1822	U	C2-N1-C1'	5.66	124.50	117.70
5	5	4277	G	C8-N9-C4	5.66	108.67	106.40
5	5	2851	G	C5-C6-O6	-5.66	125.20	128.60
1	1	186	C	C5-C6-N1	5.66	123.83	121.00
1	1	118	A	N1-C2-N3	-5.65	126.47	129.30
5	5	1232	G	OP2-P-O3'	5.65	117.62	105.20
5	5	3715	U	N3-C2-O2	-5.65	118.25	122.20
5	5	1835	G	C4-C5-C6	5.64	122.19	118.80
8	8	60	G	P-O3'-C3'	5.64	126.47	119.70
5	5	4305	G	C6-C5-N7	-5.63	127.02	130.40
5	5	1966	C	C6-N1-C2	-5.63	118.05	120.30
5	5	5044	A	N7-C8-N9	5.63	116.62	113.80
5	5	3860	A	N1-C6-N6	5.63	121.98	118.60
5	5	2321	G	C8-N9-C4	-5.63	104.15	106.40
5	5	2394	G	N1-C6-O6	5.63	123.28	119.90
8	8	111	U	C2-N1-C1'	5.63	124.45	117.70
5	5	654	C	N3-C2-O2	-5.62	117.96	121.90
5	5	1658	G	OP1-P-O3'	5.62	117.57	105.20
5	5	1812	C	C6-N1-C2	-5.62	118.05	120.30
5	5	3906	A	N1-C6-N6	5.61	121.97	118.60
5	5	356	G	C6-C5-N7	-5.61	127.03	130.40
5	5	4522	G	C4-C5-N7	5.61	113.04	110.80
5	5	2852	U	N3-C4-C5	-5.61	111.23	114.60
5	5	1365	C	OP1-P-O3'	5.61	117.53	105.20
5	5	3656	A	C8-N9-C4	5.61	108.04	105.80
5	5	3938	G	N1-C6-O6	5.61	123.26	119.90
5	5	2278	G	P-O3'-C3'	5.60	126.42	119.70
7	7	59	G	C8-N9-C4	5.60	108.64	106.40
5	5	1317	U	N3-C2-O2	5.60	126.12	122.20
5	5	2409	U	C2-N3-C4	-5.60	123.64	127.00
1	1	89	G	C2-N3-C4	5.60	114.70	111.90
5	5	2407	G	C8-N9-C4	5.60	108.64	106.40
5	5	2553	A	O4'-C1'-N9	5.60	112.68	108.20
5	5	3810	C	N3-C2-O2	-5.60	117.98	121.90
1	1	144	C	C5-C6-N1	5.59	123.80	121.00
5	5	1458	C	C6-N1-C2	-5.59	118.06	120.30
5	5	3698	G	C2-N3-C4	-5.59	109.10	111.90
5	5	2576	G	C8-N9-C4	5.58	108.63	106.40
5	5	3874	G	N3-C4-C5	5.57	131.39	128.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	3909	C	C6-N1-C2	-5.57	118.07	120.30
5	5	4693	C	C2-N1-C1'	5.57	124.93	118.80
5	5	747	A	OP2-P-O3'	5.57	117.46	105.20
5	5	3787	G	C5-C6-O6	-5.57	125.26	128.60
5	5	4759	C	N1-C2-O2	5.57	122.24	118.90
5	5	4762	A	C2-N3-C4	-5.57	107.81	110.60
5	5	1697	G	P-O3'-C3'	5.57	126.38	119.70
5	5	2309	G	C6-C5-N7	-5.57	127.06	130.40
5	5	704	C	C6-N1-C1'	-5.56	114.12	120.80
5	5	1358	G	N3-C2-N2	5.56	123.79	119.90
5	5	1292	C	C2-N1-C1'	5.56	124.92	118.80
5	5	1505	C	C6-N1-C2	5.56	122.52	120.30
5	5	1685	G	C6-C5-N7	-5.56	127.07	130.40
5	5	1633	G	P-O3'-C3'	5.55	126.36	119.70
5	5	2123	C	P-O3'-C3'	5.55	126.37	119.70
5	5	1077	C	C6-N1-C2	-5.55	118.08	120.30
1	1	87	C	C5-C6-N1	5.55	123.78	121.00
5	5	3857	G	C8-N9-C4	5.55	108.62	106.40
5	5	4730	C	C6-N1-C2	-5.55	118.08	120.30
1	1	215	A	C8-N9-C4	-5.55	103.58	105.80
5	5	1637	A	C8-N9-C4	5.55	108.02	105.80
5	5	728	U	P-O3'-C3'	5.55	126.36	119.70
5	5	2627	C	N1-C2-O2	5.55	122.23	118.90
7	7	83	A	N1-C6-N6	5.55	121.93	118.60
5	5	1338	G	N3-C4-N9	-5.55	122.67	126.00
5	5	965	G	C2-N3-C4	5.54	114.67	111.90
5	5	1502	G	C2-N3-C4	-5.54	109.13	111.90
5	5	733	A	O4'-C1'-N9	5.54	112.63	108.20
5	5	3904	G	N9-C4-C5	-5.54	103.19	105.40
5	5	2787	A	N1-C6-N6	5.54	121.92	118.60
5	5	4600	G	O4'-C1'-N9	5.54	112.63	108.20
5	5	1484	G	N3-C4-N9	-5.53	122.68	126.00
5	5	1301	C	N1-C2-O2	5.53	122.22	118.90
5	5	3781	C	C6-N1-C2	5.53	122.51	120.30
5	5	1987	C	N3-C2-O2	-5.53	118.03	121.90
5	5	4331	G	N9-C4-C5	-5.53	103.19	105.40
5	5	690	C	C5-C6-N1	5.53	123.76	121.00
5	5	2348	G	C6-C5-N7	-5.53	127.08	130.40
8	8	63	U	C6-N1-C2	-5.53	117.69	121.00
5	5	1612	G	C4-C5-C6	5.52	122.11	118.80
5	5	3775	A	N1-C6-N6	5.52	121.91	118.60
5	5	2257	C	P-O3'-C3'	5.51	126.31	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	8	125	C	P-O3'-C3'	5.51	126.31	119.70
5	5	2287	G	N3-C4-C5	5.51	131.35	128.60
5	5	4522	G	C8-N9-C1'	-5.50	119.84	127.00
5	5	1835	G	N1-C6-O6	5.50	123.20	119.90
5	5	2738	C	C5-C6-N1	-5.50	118.25	121.00
5	5	4878	C	N3-C2-O2	-5.50	118.05	121.90
1	1	258	C	C6-N1-C2	-5.50	118.10	120.30
5	5	336	A	C4-N9-C1'	5.50	136.20	126.30
5	5	4923	C	C6-N1-C2	-5.50	118.10	120.30
1	1	219	C	C6-N1-C2	-5.50	118.10	120.30
5	5	1835	G	C5-C6-N1	-5.49	108.75	111.50
5	5	4281	A	N1-C6-N6	5.49	121.89	118.60
4	4	94	LYS	C-N-CA	5.48	135.41	121.70
5	5	438	G	C8-N9-C4	5.47	108.59	106.40
8	8	81	C	C2-N1-C1'	5.47	124.81	118.80
5	5	2122	G	O4'-C1'-N9	5.46	112.57	108.20
5	5	1506	G	C2-N3-C4	-5.46	109.17	111.90
5	5	961	G	N3-C4-C5	-5.45	125.87	128.60
5	5	1724	G	OP2-P-O3'	5.45	117.20	105.20
5	5	929	A	C2-N3-C4	5.45	113.33	110.60
5	5	953	C	N1-C2-O2	5.45	122.17	118.90
5	5	1484	G	C8-N9-C1'	5.45	134.09	127.00
5	5	4992	G	C5-C6-O6	-5.45	125.33	128.60
5	5	2762	G	C8-N9-C4	5.45	108.58	106.40
5	5	3775	A	C6-C5-N7	-5.45	128.49	132.30
5	5	14	C	C6-N1-C2	-5.44	118.12	120.30
5	5	961	G	C2-N3-C4	5.44	114.62	111.90
5	5	1455	G	P-O3'-C3'	5.44	126.23	119.70
5	5	2113	G	C8-N9-C4	-5.44	104.23	106.40
5	5	723	A	N3-C4-C5	5.43	130.60	126.80
5	5	1572	U	N3-C2-O2	-5.42	118.40	122.20
5	5	1367	C	C2-N3-C4	5.42	122.61	119.90
5	5	2780	C	C6-N1-C2	5.42	122.47	120.30
5	5	515	C	C5-C6-N1	5.42	123.71	121.00
5	5	1176	C	C6-N1-C2	-5.42	118.13	120.30
5	5	4737	G	N7-C8-N9	5.42	115.81	113.10
5	5	279	A	C2-N3-C4	-5.41	107.89	110.60
5	5	705	G	C8-N9-C4	5.41	108.56	106.40
5	5	4978	G	C5-N7-C8	-5.41	101.59	104.30
5	5	156	G	N1-C6-O6	5.41	123.14	119.90
5	5	704	C	N1-C2-O2	5.41	122.14	118.90
5	5	1237	C	N3-C2-O2	-5.41	118.11	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	2285	A	C8-N9-C4	5.41	107.96	105.80
5	5	3701	C	N3-C2-O2	5.40	125.68	121.90
5	5	1839	U	N3-C2-O2	-5.40	118.42	122.20
1	1	37	C	C6-N1-C1'	-5.39	114.33	120.80
5	5	4085	A	C8-N9-C4	5.39	107.96	105.80
5	5	3821	A	C8-N9-C4	5.39	107.96	105.80
1	1	235	G	N3-C4-C5	-5.39	125.91	128.60
27	T	30	TYR	CA-CB-CG	5.39	123.64	113.40
5	5	2396	A	P-O3'-C3'	5.39	126.17	119.70
5	5	2409	U	N3-C4-C5	5.38	117.83	114.60
5	5	3782	C	N1-C2-O2	5.38	122.13	118.90
5	5	4939	C	N1-C2-O2	5.38	122.13	118.90
5	5	1815	G	C5-C6-N1	-5.38	108.81	111.50
5	5	709	C	N1-C2-O2	5.38	122.13	118.90
5	5	1853	G	N9-C4-C5	-5.38	103.25	105.40
5	5	1735	U	C6-N1-C2	5.38	124.22	121.00
5	5	2770	C	C4-C5-C6	5.37	120.09	117.40
5	5	3641	U	C5-C6-N1	-5.37	120.02	122.70
5	5	2289	C	C6-N1-C2	5.36	122.45	120.30
1	1	158	C	C5-C6-N1	5.36	123.68	121.00
5	5	2394	G	C6-C5-N7	-5.36	127.18	130.40
1	1	140	C	N3-C4-C5	-5.36	119.75	121.90
5	5	4476	C	C6-N1-C2	-5.36	118.16	120.30
5	5	936	C	N1-C2-O2	5.36	122.11	118.90
5	5	2467	U	O4'-C1'-N1	5.35	112.48	108.20
5	5	515	C	N1-C2-O2	5.35	122.11	118.90
5	5	2409	U	C6-N1-C2	5.35	124.21	121.00
5	5	4873	G	C2-N3-C4	-5.35	109.22	111.90
5	5	5004	C	N1-C2-O2	-5.35	115.69	118.90
5	5	235	A	O4'-C1'-N9	5.35	112.48	108.20
5	5	2505	C	C5-C6-N1	5.35	123.67	121.00
5	5	5032	C	C6-N1-C2	-5.35	118.16	120.30
5	5	293	G	C8-N9-C1'	5.35	133.95	127.00
5	5	2254	G	O4'-C1'-N9	5.34	112.48	108.20
5	5	5052	C	C6-N1-C1'	-5.34	114.39	120.80
5	5	232	G	N9-C4-C5	-5.34	103.26	105.40
23	P	91	LEU	CA-CB-CG	5.34	127.58	115.30
5	5	417	G	C4-N9-C1'	-5.34	119.56	126.50
5	5	4701	A	N9-C4-C5	-5.34	103.67	105.80
5	5	965	G	N3-C4-N9	5.33	129.20	126.00
5	5	1281	G	C4-N9-C1'	-5.33	119.57	126.50
5	5	1890	G	C5-N7-C8	-5.33	101.63	104.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	1735	U	C5-C6-N1	-5.33	120.03	122.70
4	4	102	GLY	N-CA-C	5.33	126.42	113.10
5	5	970	G	N3-C4-C5	-5.33	125.94	128.60
5	5	4528	G	N3-C4-N9	5.32	129.19	126.00
5	5	931	C	C2-N1-C1'	5.32	124.65	118.80
5	5	1835	G	N1-C2-N3	5.32	127.09	123.90
5	5	1531	U	C6-N1-C2	5.31	124.19	121.00
5	5	226	G	P-O3'-C3'	5.31	126.08	119.70
5	5	2876	G	N3-C4-N9	5.31	129.19	126.00
5	5	2093	A	OP2-P-O3'	5.31	116.88	105.20
8	8	20	A	C8-N9-C4	5.31	107.92	105.80
5	5	747	A	N3-C4-N9	5.31	131.65	127.40
5	5	1283	G	C4-C5-N7	5.31	112.92	110.80
5	5	4158	C	C6-N1-C2	-5.30	118.18	120.30
5	5	4231	C	C6-N1-C1'	-5.30	114.44	120.80
5	5	2272	C	P-O3'-C3'	5.30	126.06	119.70
5	5	973	G	N9-C4-C5	-5.30	103.28	105.40
5	5	1367	C	C5-C6-N1	5.30	123.65	121.00
5	5	4281	A	C6-C5-N7	-5.29	128.59	132.30
5	5	2642	A	C8-N9-C4	5.29	107.92	105.80
5	5	4356	G	C6-C5-N7	-5.29	127.22	130.40
5	5	2580	U	N1-C2-O2	5.29	126.50	122.80
5	5	3857	G	N9-C4-C5	-5.29	103.28	105.40
1	1	186	C	N3-C4-C5	-5.29	119.78	121.90
5	5	2487	G	P-O3'-C3'	5.29	126.05	119.70
5	5	4305	G	C8-N9-C4	-5.29	104.29	106.40
5	5	241	G	N3-C4-N9	5.28	129.17	126.00
5	5	2116	C	C5-C6-N1	5.28	123.64	121.00
5	5	2694	G	N3-C4-N9	5.28	129.17	126.00
5	5	166	C	C6-N1-C1'	-5.28	114.47	120.80
5	5	1696	C	P-O3'-C3'	5.27	126.03	119.70
1	1	191	C	C6-N1-C2	-5.27	118.19	120.30
5	5	2709	C	C6-N1-C2	-5.27	118.19	120.30
5	5	458	C	N1-C2-O2	5.27	122.06	118.90
5	5	1945	G	C8-N9-C4	5.26	108.50	106.40
5	5	4731	G	C4-N9-C1'	5.26	133.34	126.50
5	5	509	A	N7-C8-N9	-5.26	111.17	113.80
5	5	1076	C	C5-C6-N1	5.26	123.63	121.00
5	5	5054	C	C6-N1-C2	-5.26	118.20	120.30
5	5	4281	A	C4-C5-C6	5.25	119.63	117.00
5	5	1692	C	C6-N1-C2	5.25	122.40	120.30
5	5	3909	C	N3-C2-O2	-5.25	118.22	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	1284	G	C8-N9-C4	5.25	108.50	106.40
5	5	3658	C	C6-N1-C2	5.25	122.40	120.30
5	5	2679	G	C8-N9-C4	-5.25	104.30	106.40
5	5	4693	C	N3-C4-C5	5.25	124.00	121.90
5	5	3906	A	N9-C4-C5	-5.25	103.70	105.80
5	5	2661	U	P-O3'-C3'	5.25	125.99	119.70
5	5	1367	C	N3-C4-C5	-5.24	119.80	121.90
5	5	2586	G	O4'-C1'-N9	5.24	112.39	108.20
5	5	2769	U	C5-C6-N1	5.24	125.32	122.70
5	5	4283	G	C5-C6-O6	-5.24	125.46	128.60
8	8	105	C	N3-C4-C5	5.24	124.00	121.90
1	1	203	G	N9-C4-C5	5.24	107.50	105.40
5	5	4701	A	C8-N9-C4	5.24	107.89	105.80
1	1	235	G	C4-N9-C1'	5.23	133.30	126.50
5	5	356	G	C2-N3-C4	-5.23	109.28	111.90
5	5	2262	G	C4-N9-C1'	5.22	133.29	126.50
5	5	1743	A	N1-C6-N6	5.22	121.73	118.60
5	5	3674	G	C2-N3-C4	-5.22	109.29	111.90
5	5	4395	U	C6-N1-C2	5.22	124.13	121.00
5	5	4627	U	C2-N1-C1'	5.22	123.97	117.70
5	5	292	G	C2-N3-C4	-5.22	109.29	111.90
5	5	2107	C	P-O3'-C3'	5.22	125.96	119.70
5	5	1449	C	C5-C6-N1	5.22	123.61	121.00
5	5	1921	C	P-O3'-C3'	5.22	125.96	119.70
5	5	1574	G	C2-N3-C4	-5.21	109.29	111.90
5	5	4601	U	N1-C2-O2	5.21	126.45	122.80
5	5	3907	G	C5-C6-O6	-5.21	125.47	128.60
5	5	94	A	C2-N3-C4	-5.21	107.99	110.60
5	5	3691	G	C4-C5-N7	-5.21	108.72	110.80
5	5	4241	C	N1-C2-O2	5.21	122.03	118.90
5	5	315	G	N9-C4-C5	-5.21	103.32	105.40
5	5	1642	A	C4-C5-N7	5.21	113.30	110.70
5	5	3927	U	N1-C2-O2	5.21	126.44	122.80
1	1	145	C	N3-C4-C5	-5.20	119.82	121.90
5	5	2627	C	N3-C2-O2	-5.20	118.26	121.90
5	5	972	C	N3-C4-N4	-5.20	114.36	118.00
5	5	4222	G	N3-C4-C5	5.20	131.20	128.60
1	1	151	C	C5-C6-N1	5.19	123.60	121.00
5	5	1905	U	C6-N1-C2	5.19	124.12	121.00
5	5	2468	U	P-O3'-C3'	5.19	125.93	119.70
5	5	4522	G	N3-C4-N9	5.19	129.12	126.00
5	5	1358	G	C5-C6-N1	5.19	114.09	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	2112	G	N3-C4-C5	-5.19	126.01	128.60
5	5	4528	G	N3-C4-C5	-5.19	126.01	128.60
5	5	100	C	C2-N1-C1'	5.18	124.50	118.80
5	5	2471	G	C5-C6-N1	-5.18	108.91	111.50
5	5	4242	U	C6-N1-C2	5.18	124.11	121.00
5	5	2787	A	N7-C8-N9	5.18	116.39	113.80
11	C	133	LEU	CA-CB-CG	5.18	127.22	115.30
5	5	730	G	C2-N3-C4	-5.18	109.31	111.90
5	5	971	U	C2-N1-C1'	5.18	123.91	117.70
5	5	2268	A	P-O3'-C3'	5.18	125.91	119.70
5	5	2116	C	P-O3'-C3'	5.17	125.91	119.70
5	5	4884	G	C5-C6-O6	-5.17	125.50	128.60
5	5	3859	G	C4-C5-N7	5.17	112.87	110.80
5	5	745	G	C2-N3-C4	5.16	114.48	111.90
1	1	221	C	N3-C4-C5	-5.16	119.84	121.90
5	5	4455	G	C2-N3-C4	-5.16	109.32	111.90
5	5	5016	A	C5-N7-C8	-5.16	101.32	103.90
5	5	1279	A	C3'-C2'-C1'	5.16	105.62	101.50
5	5	1682	A	N9-C4-C5	-5.15	103.74	105.80
5	5	43	U	C5-C6-N1	-5.15	120.13	122.70
5	5	3775	A	N7-C8-N9	5.15	116.37	113.80
5	5	4303	C	N3-C4-N4	-5.15	114.40	118.00
2	2	22	U	C2-N1-C1'	5.14	123.87	117.70
5	5	1801	A	C8-N9-C4	5.14	107.86	105.80
5	5	2124	G	P-O3'-C3'	5.14	125.87	119.70
5	5	2267	U	N3-C2-O2	-5.14	118.60	122.20
5	5	1834	U	N1-C2-O2	5.14	126.40	122.80
5	5	2586	G	C5-C6-N1	-5.14	108.93	111.50
5	5	1896	A	C8-N9-C4	5.14	107.86	105.80
5	5	4627	U	N1-C2-O2	5.13	126.39	122.80
5	5	4978	G	C4-C5-N7	5.13	112.85	110.80
8	8	81	C	N1-C2-O2	5.13	121.98	118.90
5	5	1451	G	N1-C6-O6	-5.13	116.82	119.90
1	1	260	C	C2-N3-C4	5.12	122.46	119.90
5	5	497	G	OP2-P-O3'	5.12	116.47	105.20
5	5	957	G	OP2-P-O3'	5.12	116.47	105.20
5	5	1329	G	P-O3'-C3'	5.12	125.85	119.70
5	5	2367	A	N1-C6-N6	5.12	121.67	118.60
5	5	3615	G	C4-C5-N7	5.12	112.85	110.80
5	5	4978	G	C6-C5-N7	-5.12	127.33	130.40
5	5	2389	A	P-O3'-C3'	5.12	125.84	119.70
5	5	149	A	C5-C6-N1	-5.12	115.14	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	5	957	G	N3-C4-C5	5.11	131.16	128.60
5	5	958	G	O5'-P-OP2	-5.11	101.10	105.70
1	1	231	A	C3'-C2'-C1'	5.11	105.59	101.50
5	5	4749	C	O4'-C1'-N1	5.11	112.29	108.20
7	7	11	A	C8-N9-C4	5.11	107.84	105.80
5	5	4404	U	P-O3'-C3'	5.11	125.83	119.70
5	5	351	C	C5-C6-N1	-5.11	118.45	121.00
5	5	746	A	P-O3'-C3'	5.10	125.83	119.70
5	5	2694	G	C5-C6-N1	5.10	114.05	111.50
5	5	710	G	C2-N3-C4	-5.10	109.35	111.90
5	5	2372	U	C6-N1-C2	5.10	124.06	121.00
1	1	162	C	C6-N1-C2	-5.10	118.26	120.30
5	5	1593	A	N1-C6-N6	5.10	121.66	118.60
5	5	2686	G	N1-C6-O6	5.09	122.96	119.90
5	5	279	A	O4'-C1'-N9	5.09	112.27	108.20
5	5	2448	G	N1-C6-O6	-5.09	116.85	119.90
5	5	4922	C	C6-N1-C2	-5.09	118.26	120.30
5	5	2409	U	C5-C6-N1	-5.09	120.16	122.70
5	5	205	C	N1-C2-O2	5.09	121.95	118.90
5	5	283	G	C6-C5-N7	-5.09	127.35	130.40
5	5	153	G	N9-C4-C5	-5.08	103.37	105.40
5	5	4978	G	N3-C4-C5	5.08	131.14	128.60
5	5	960	A	N1-C6-N6	-5.07	115.56	118.60
5	5	3775	A	C4-C5-C6	5.07	119.54	117.00
5	5	4305	G	C5-N7-C8	-5.07	101.76	104.30
1	1	87	C	N3-C4-C5	-5.07	119.87	121.90
5	5	2321	G	C4-C5-C6	5.07	121.84	118.80
5	5	4988	U	N3-C2-O2	-5.07	118.65	122.20
1	1	93	G	C8-N9-C4	-5.07	104.37	106.40
1	1	117	U	P-O3'-C3'	5.07	125.78	119.70
5	5	1410	U	OP2-P-O3'	5.07	116.34	105.20
5	5	4979	A	N1-C6-N6	5.07	121.64	118.60
5	5	1835	G	C3'-C2'-C1'	5.06	105.55	101.50
5	5	2649	G	C8-N9-C4	-5.06	104.38	106.40
5	5	3632	C	C6-N1-C2	5.06	122.32	120.30
5	5	4730	C	N3-C2-O2	-5.06	118.36	121.90
1	1	258	C	C2-N3-C4	5.06	122.43	119.90
5	5	356	G	C5-C6-N1	-5.06	108.97	111.50
5	5	1697	G	OP1-P-O3'	5.06	116.33	105.20
5	5	27	C	C6-N1-C2	5.05	122.32	120.30
5	5	68	U	C5-C6-N1	-5.05	120.17	122.70
5	5	4950	U	C2-N1-C1'	5.05	123.76	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	7	58	A	N9-C4-C5	-5.05	103.78	105.80
5	5	5034	A	C4-C5-N7	5.05	113.22	110.70
5	5	965	G	N3-C4-C5	-5.05	126.08	128.60
5	5	1312	A	C8-N9-C4	5.05	107.82	105.80
5	5	1802	A	C8-N9-C4	5.05	107.82	105.80
5	5	4331	G	C8-N9-C4	5.05	108.42	106.40
5	5	1820	C	O4'-C1'-N1	5.05	112.24	108.20
5	5	4448	G	P-O3'-C3'	5.05	125.76	119.70
5	5	4423	U	C2-N1-C1'	5.04	123.75	117.70
5	5	4423	U	N1-C2-O2	5.04	126.33	122.80
5	5	1913	C	N3-C4-C5	5.04	123.92	121.90
5	5	406	C	C6-N1-C2	-5.04	118.28	120.30
5	5	1238	A	C3'-C2'-C1'	5.04	105.53	101.50
5	5	1232	G	P-O3'-C3'	5.03	125.74	119.70
5	5	4749	C	C6-N1-C1'	-5.03	114.76	120.80
1	1	235	G	C8-N9-C1'	-5.03	120.46	127.00
5	5	943	A	C6-N1-C2	5.03	121.61	118.60
5	5	2074	C	C6-N1-C2	5.03	122.31	120.30
1	1	186	C	N1-C2-O2	5.02	121.91	118.90
5	5	1359	G	N1-C6-O6	-5.02	116.89	119.90
5	5	3914	U	N3-C2-O2	5.01	125.71	122.20
2	2	30	G	N3-C4-C5	-5.01	126.09	128.60
5	5	1887	G	N3-C4-N9	5.01	129.01	126.00
5	5	4305	G	N7-C8-N9	5.01	115.60	113.10
5	5	67	C	C6-N1-C2	5.01	122.30	120.30
5	5	5005	G	N7-C8-N9	-5.01	110.60	113.10
5	5	2265	G	C4-N9-C1'	5.00	133.01	126.50
5	5	2034	G	C8-N9-C4	5.00	108.40	106.40
5	5	2789	A	C8-N9-C4	5.00	107.80	105.80
5	5	4238	G	C8-N9-C4	5.00	108.40	106.40
5	5	4386	C	C6-N1-C2	5.00	122.30	120.30
5	5	294	G	C6-C5-N7	-5.00	127.40	130.40

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	1	118	A	C1'

All (53) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	3	76	SER	Peptide

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>Group</b>
4	4	122	ALA	Peptide
4	4	123	ARG	Peptide
4	4	141	CYS	Peptide
4	4	154	ASP	Peptide
4	4	87	GLU	Peptide
4	4	88	PRO	Peptide
4	4	89	PRO	Peptide
4	4	94	LYS	Peptide
4	4	95	GLN	Peptide
4	4	97	ASN	Peptide
6	6	108	PRO	Peptide
6	6	110	ALA	Peptide
6	6	116	ILE	Peptide
6	6	117	ALA	Peptide
6	6	132	PRO	Peptide
6	6	202	GLU	Peptide
9	A	18	ALA	Peptide
9	A	196	TRP	Peptide
10	B	16	PHE	Peptide
10	B	17	LEU	Peptide
11	C	264	TYR	Peptide
12	D	124	GLU	Peptide
12	D	218	ALA	Peptide
12	D	282	GLN	Peptide
12	D	30	TYR	Peptide
13	E	102	VAL	Peptide
13	E	104	LYS	Peptide
13	E	122	LEU	Peptide
13	E	152	ARG	Peptide
13	E	172	THR	Peptide
13	E	182	LEU	Peptide
13	E	202	VAL	Peptide
13	E	216	LYS	Peptide
13	E	220	LYS	Peptide
13	E	230	ASP	Peptide
13	E	233	LYS	Peptide
13	E	41	SER	Peptide
13	E	58	MET	Peptide
13	E	90	LYS	Peptide
16	H	51	LYS	Peptide
16	H	59	LYS	Peptide
17	I	75	TYR	Peptide

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Mol	Chain	Res	Type	Group
17	I	76	MET	Peptide
19	L	168	VAL	Peptide
20	M	94	LYS	Peptide
22	O	110	PRO	Peptide
26	S	145	PHE	Peptide
26	S	163	HIS	Peptide
26	S	164	LYS	Peptide
39	f	53	ALA	Peptide
39	f	69	VAL	Peptide
48	o	98	LYS	Peptide

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

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

## 5.3 Torsion angles [i](#)

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

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

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	3	123/125 (98%)	109 (89%)	14 (11%)	0	100	100
4	4	161/163 (99%)	108 (67%)	46 (29%)	7 (4%)	2	24
6	6	200/202 (99%)	158 (79%)	40 (20%)	2 (1%)	15	51
9	A	242/244 (99%)	203 (84%)	38 (16%)	1 (0%)	34	69
10	B	392/394 (100%)	334 (85%)	55 (14%)	3 (1%)	19	56
11	C	365/367 (100%)	317 (87%)	46 (13%)	2 (0%)	29	66
12	D	290/292 (99%)	252 (87%)	36 (12%)	2 (1%)	22	59
13	E	232/236 (98%)	171 (74%)	56 (24%)	5 (2%)	6	37
14	F	223/225 (99%)	202 (91%)	21 (9%)	0	100	100
15	G	236/238 (99%)	209 (89%)	27 (11%)	0	100	100
16	H	188/190 (99%)	164 (87%)	21 (11%)	3 (2%)	9	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	I	211/213 (99%)	188 (89%)	19 (9%)	4 (2%)	8	40
18	J	168/170 (99%)	145 (86%)	23 (14%)	0	100	100
19	L	208/210 (99%)	175 (84%)	30 (14%)	3 (1%)	11	45
20	M	136/138 (99%)	118 (87%)	17 (12%)	1 (1%)	22	59
21	N	201/203 (99%)	179 (89%)	21 (10%)	1 (0%)	29	66
22	O	199/201 (99%)	186 (94%)	11 (6%)	2 (1%)	15	51
23	P	151/153 (99%)	138 (91%)	13 (9%)	0	100	100
24	Q	185/187 (99%)	164 (89%)	21 (11%)	0	100	100
25	R	178/180 (99%)	160 (90%)	18 (10%)	0	100	100
26	S	173/175 (99%)	151 (87%)	20 (12%)	2 (1%)	13	48
27	T	157/159 (99%)	138 (88%)	18 (12%)	1 (1%)	25	62
28	U	97/99 (98%)	83 (86%)	13 (13%)	1 (1%)	15	51
29	V	129/131 (98%)	123 (95%)	6 (5%)	0	100	100
30	W	61/63 (97%)	60 (98%)	1 (2%)	0	100	100
31	X	117/119 (98%)	110 (94%)	7 (6%)	0	100	100
32	Y	132/134 (98%)	120 (91%)	12 (9%)	0	100	100
33	Z	133/135 (98%)	119 (90%)	14 (10%)	0	100	100
34	a	145/147 (99%)	122 (84%)	23 (16%)	0	100	100
35	b	73/75 (97%)	64 (88%)	9 (12%)	0	100	100
36	c	92/94 (98%)	82 (89%)	10 (11%)	0	100	100
37	d	105/107 (98%)	89 (85%)	15 (14%)	1 (1%)	15	51
38	e	126/128 (98%)	116 (92%)	10 (8%)	0	100	100
39	f	107/109 (98%)	94 (88%)	13 (12%)	0	100	100
40	g	112/114 (98%)	106 (95%)	6 (5%)	0	100	100
41	h	120/122 (98%)	111 (92%)	9 (8%)	0	100	100
42	i	100/102 (98%)	95 (95%)	5 (5%)	0	100	100
43	j	84/86 (98%)	72 (86%)	12 (14%)	0	100	100
44	k	67/69 (97%)	54 (81%)	13 (19%)	0	100	100
45	l	48/50 (96%)	38 (79%)	10 (21%)	0	100	100
46	m	50/52 (96%)	46 (92%)	4 (8%)	0	100	100
47	n	21/23 (91%)	21 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	o	102/104 (98%)	87 (85%)	13 (13%)	2 (2%)	7	39
49	p	89/91 (98%)	82 (92%)	7 (8%)	0	100	100
50	q	103/105 (98%)	99 (96%)	4 (4%)	0	100	100
51	r	172/605 (28%)	156 (91%)	15 (9%)	1 (1%)	25	62
52	t	9/11 (82%)	9 (100%)	0	0	100	100
53	u	214/568 (38%)	207 (97%)	7 (3%)	0	100	100
54	v	182/213 (85%)	174 (96%)	8 (4%)	0	100	100
55	w	72/74 (97%)	63 (88%)	9 (12%)	0	100	100
56	x	368/504 (73%)	361 (98%)	7 (2%)	0	100	100
57	y	418/657 (64%)	389 (93%)	26 (6%)	3 (1%)	22	59
58	z	72/110 (66%)	71 (99%)	1 (1%)	0	100	100
All	All	8339/9666 (86%)	7392 (89%)	900 (11%)	47 (1%)	29	62

All (47) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	4	96	LYS
4	4	106	PHE
10	B	389	MET
13	E	153	HIS
16	H	60	TRP
16	H	61	TRP
17	I	77	VAL
17	I	78	LYS
22	O	111	PRO
51	r	570	VAL
4	4	95	GLN
16	H	52	LYS
17	I	79	SER
48	o	97	LYS
4	4	142	ASN
10	B	388	PHE
13	E	42	ARG
13	E	234	GLU
17	I	102	MET
22	O	110	PRO
48	o	78	ARG
57	y	24	SER

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Mol	Chain	Res	Type
57	y	405	LEU
11	C	23	THR
11	C	198	ASN
12	D	124	GLU
19	L	47	ALA
20	M	70	GLN
21	N	77	LYS
37	d	103	TYR
4	4	3	PRO
4	4	30	PRO
9	A	197	PRO
12	D	125	VAL
26	S	146	HIS
27	T	18	PRO
10	B	111	SER
26	S	165	PRO
4	4	2	PRO
6	6	108	PRO
13	E	43	ASN
19	L	62	PRO
19	L	169	ILE
28	U	51	GLY
57	y	73	ILE
13	E	127	LYS
6	6	132	PRO

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	3	109/109 (100%)	91 (84%)	18 (16%)	<b>2</b> <b>14</b>
4	4	136/136 (100%)	117 (86%)	19 (14%)	<b>3</b> <b>20</b>
6	6	170/170 (100%)	148 (87%)	22 (13%)	<b>4</b> <b>22</b>
9	A	187/187 (100%)	147 (79%)	40 (21%)	<b>1</b> <b>7</b>
10	B	335/335 (100%)	275 (82%)	60 (18%)	<b>2</b> <b>11</b>

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
11	C	305/305 (100%)	243 (80%)	62 (20%)	1	8
12	D	246/247 (100%)	188 (76%)	58 (24%)	1	5
13	E	209/209 (100%)	164 (78%)	45 (22%)	1	7
14	F	194/194 (100%)	159 (82%)	35 (18%)	1	11
15	G	204/206 (99%)	162 (79%)	42 (21%)	1	7
16	H	169/169 (100%)	142 (84%)	27 (16%)	2	15
17	I	180/180 (100%)	139 (77%)	41 (23%)	1	6
18	J	143/143 (100%)	113 (79%)	30 (21%)	1	7
19	L	176/176 (100%)	144 (82%)	32 (18%)	1	11
20	M	116/116 (100%)	96 (83%)	20 (17%)	2	13
21	N	171/171 (100%)	141 (82%)	30 (18%)	2	12
22	O	172/172 (100%)	151 (88%)	21 (12%)	5	24
23	P	134/134 (100%)	110 (82%)	24 (18%)	2	11
24	Q	163/163 (100%)	133 (82%)	30 (18%)	1	10
25	R	159/159 (100%)	125 (79%)	34 (21%)	1	7
26	S	156/156 (100%)	126 (81%)	30 (19%)	1	9
27	T	139/139 (100%)	112 (81%)	27 (19%)	1	9
28	U	89/89 (100%)	71 (80%)	18 (20%)	1	8
29	V	101/101 (100%)	83 (82%)	18 (18%)	2	12
30	W	55/55 (100%)	43 (78%)	12 (22%)	1	6
31	X	107/107 (100%)	93 (87%)	14 (13%)	4	22
32	Y	124/124 (100%)	103 (83%)	21 (17%)	2	13
33	Z	117/117 (100%)	94 (80%)	23 (20%)	1	8
34	a	119/119 (100%)	96 (81%)	23 (19%)	1	9
35	b	63/63 (100%)	51 (81%)	12 (19%)	1	9
36	c	79/79 (100%)	62 (78%)	17 (22%)	1	7
37	d	98/98 (100%)	69 (70%)	29 (30%)	0	2
38	e	114/114 (100%)	88 (77%)	26 (23%)	1	6
39	f	88/88 (100%)	72 (82%)	16 (18%)	1	11
40	g	98/98 (100%)	83 (85%)	15 (15%)	2	17
41	h	109/109 (100%)	94 (86%)	15 (14%)	3	21

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
42	i	86/86 (100%)	76 (88%)	10 (12%)	5	27
43	j	73/73 (100%)	60 (82%)	13 (18%)	2	12
44	k	64/64 (100%)	55 (86%)	9 (14%)	3	20
45	l	47/47 (100%)	39 (83%)	8 (17%)	2	13
46	m	48/48 (100%)	37 (77%)	11 (23%)	1	6
47	n	22/22 (100%)	20 (91%)	2 (9%)	9	36
48	o	92/92 (100%)	67 (73%)	25 (27%)	0	3
49	p	74/74 (100%)	61 (82%)	13 (18%)	2	12
50	q	92/94 (98%)	90 (98%)	2 (2%)	52	72
51	r	158/503 (31%)	153 (97%)	5 (3%)	39	65
52	t	11/11 (100%)	11 (100%)	0	100	100
53	u	192/498 (39%)	186 (97%)	6 (3%)	40	65
54	v	165/183 (90%)	164 (99%)	1 (1%)	86	93
55	w	66/66 (100%)	56 (85%)	10 (15%)	3	17
56	x	317/420 (76%)	300 (95%)	17 (5%)	22	54
57	y	360/550 (66%)	332 (92%)	28 (8%)	12	42
58	z	69/100 (69%)	60 (87%)	9 (13%)	4	22
All	All	7270/8268 (88%)	6095 (84%)	1175 (16%)	5	15

All (1175) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	3	6	GLN
3	3	8	MET
3	3	11	ARG
3	3	17	LEU
3	3	21	ASN
3	3	26	SER
3	3	28	GLU
3	3	31	ASN
3	3	39	ARG
3	3	46	HIS
3	3	56	ASP
3	3	67	ARG
3	3	70	GLN
3	3	71	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	3	83	ASN
3	3	101	LYS
3	3	106	LEU
3	3	107	ARG
4	4	1	MET
4	4	6	ASP
4	4	9	GLU
4	4	10	ILE
4	4	14	TYR
4	4	16	ARG
4	4	22	VAL
4	4	28	LEU
4	4	35	LEU
4	4	37	LEU
4	4	40	LYS
4	4	61	LYS
4	4	96	LYS
4	4	98	ILE
4	4	104	ILE
4	4	106	PHE
4	4	107	ASP
4	4	114	ARG
4	4	147	HIS
6	6	16	LYS
6	6	22	ASP
6	6	45	MET
6	6	50	LYS
6	6	57	LYS
6	6	61	MET
6	6	62	ARG
6	6	70	GLU
6	6	77	LYS
6	6	83	ARG
6	6	91	THR
6	6	96	THR
6	6	105	ASN
6	6	127	ASN
6	6	149	ARG
6	6	155	LEU
6	6	158	VAL
6	6	171	GLU
6	6	191	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
6	6	194	ASP
6	6	202	GLU
6	6	203	VAL
9	A	3	ARG
9	A	5	ILE
9	A	19	HIS
9	A	29	LEU
9	A	30	ARG
9	A	34	PHE
9	A	40	TYR
9	A	44	ILE
9	A	50	HIS
9	A	64	ARG
9	A	84	THR
9	A	95	GLN
9	A	101	VAL
9	A	102	LEU
9	A	107	MET
9	A	109	GLU
9	A	115	CYS
9	A	125	LYS
9	A	128	ARG
9	A	142	GLU
9	A	144	LYS
9	A	163	ARG
9	A	165	VAL
9	A	181	LYS
9	A	187	HIS
9	A	190	LYS
9	A	192	LYS
9	A	193	ARG
9	A	200	ARG
9	A	207	VAL
9	A	208	GLU
9	A	218	HIS
9	A	221	LYS
9	A	225	ILE
9	A	226	ARG
9	A	227	ARG
9	A	233	ARG
9	A	242	ARG
9	A	243	THR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
9	A	245	ARG
10	B	4	ARG
10	B	10	ARG
10	B	17	LEU
10	B	39	LYS
10	B	54	THR
10	B	56	ILE
10	B	61	ASP
10	B	62	ARG
10	B	74	GLU
10	B	78	ILE
10	B	81	THR
10	B	95	THR
10	B	101	THR
10	B	102	PHE
10	B	103	LYS
10	B	104	THR
10	B	116	ARG
10	B	117	ARG
10	B	119	TYR
10	B	123	HIS
10	B	138	GLN
10	B	146	LEU
10	B	149	ASP
10	B	157	CYS
10	B	165	HIS
10	B	198	ARG
10	B	201	LEU
10	B	203	GLN
10	B	204	GLN
10	B	207	VAL
10	B	208	ASN
10	B	213	GLN
10	B	228	TYR
10	B	231	VAL
10	B	234	ARG
10	B	237	THR
10	B	261	ARG
10	B	264	PHE
10	B	279	GLU
10	B	291	TYR
10	B	299	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
10	B	307	TYR
10	B	309	LEU
10	B	314	ILE
10	B	315	ASN
10	B	322	HIS
10	B	323	TYR
10	B	326	VAL
10	B	328	ASN
10	B	333	LEU
10	B	336	CYS
10	B	352	LEU
10	B	355	THR
10	B	356	LYS
10	B	357	ARG
10	B	374	PHE
10	B	380	GLN
10	B	381	THR
10	B	388	PHE
10	B	389	MET
11	C	14	LYS
11	C	16	GLU
11	C	33	ARG
11	C	36	ILE
11	C	60	HIS
11	C	61	GLN
11	C	71	ARG
11	C	80	ARG
11	C	84	THR
11	C	86	ARG
11	C	92	PHE
11	C	94	ASN
11	C	95	MET
11	C	96	CYS
11	C	100	ARG
11	C	106	LYS
11	C	107	THR
11	C	115	VAL
11	C	150	LEU
11	C	156	ASP
11	C	159	GLU
11	C	165	LYS
11	C	173	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	C	175	LYS
11	C	177	TRP
11	C	184	TYR
11	C	188	ARG
11	C	193	LYS
11	C	196	MET
11	C	198	ASN
11	C	201	ARG
11	C	212	ASN
11	C	215	ASN
11	C	218	ILE
11	C	222	ARG
11	C	232	VAL
11	C	233	SER
11	C	246	VAL
11	C	254	GLU
11	C	258	ARG
11	C	259	LYS
11	C	262	GLU
11	C	264	TYR
11	C	266	THR
11	C	267	TRP
11	C	273	LEU
11	C	276	ASN
11	C	281	MET
11	C	284	MET
11	C	288	ASP
11	C	291	ARG
11	C	300	ARG
11	C	307	LYS
11	C	309	ILE
11	C	311	ARG
11	C	312	ARG
11	C	319	LEU
11	C	321	ASN
11	C	335	MET
11	C	342	ARG
11	C	345	ARG
11	C	350	ARG
12	D	23	ARG
12	D	30	TYR
12	D	31	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
12	D	33	ARG
12	D	35	ARG
12	D	36	LEU
12	D	42	ASN
12	D	44	TYR
12	D	45	ASN
12	D	46	THR
12	D	50	ARG
12	D	51	MET
12	D	59	ASP
12	D	66	TYR
12	D	72	ASP
12	D	73	MET
12	D	82	GLU
12	D	85	LYS
12	D	92	LEU
12	D	94	ASN
12	D	99	TYR
12	D	100	CYS
12	D	104	LEU
12	D	110	LEU
12	D	112	ARG
12	D	113	PHE
12	D	116	ASP
12	D	118	ILE
12	D	119	TYR
12	D	120	GLU
12	D	124	GLU
12	D	131	ASN
12	D	179	ARG
12	D	189	GLU
12	D	190	PHE
12	D	191	ASN
12	D	193	GLU
12	D	196	ARG
12	D	199	ILE
12	D	202	GLN
12	D	211	LEU
12	D	216	GLU
12	D	219	TYR
12	D	223	PHE
12	D	239	MET

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
12	D	249	GLU
12	D	254	GLU
12	D	255	LYS
12	D	256	LYS
12	D	259	LYS
12	D	260	GLU
12	D	262	LYS
12	D	264	LYS
12	D	266	TRP
12	D	279	ARG
12	D	284	LYS
12	D	291	GLN
12	D	293	ARG
13	E	39	HIS
13	E	40	CYS
13	E	46	LEU
13	E	52	ARG
13	E	64	MET
13	E	85	LEU
13	E	92	VAL
13	E	101	ARG
13	E	102	VAL
13	E	104	LYS
13	E	106	ARG
13	E	111	TYR
13	E	112	TYR
13	E	114	THR
13	E	119	ARG
13	E	134	ARG
13	E	136	LEU
13	E	140	ILE
13	E	145	ILE
13	E	154	ARG
13	E	157	ARG
13	E	166	SER
13	E	171	VAL
13	E	175	LEU
13	E	177	LEU
13	E	178	ASN
13	E	179	ARG
13	E	190	VAL
13	E	203	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
13	E	206	LYS
13	E	217	LYS
13	E	228	ILE
13	E	233	LYS
13	E	241	GLN
13	E	245	ASP
13	E	246	GLN
13	E	254	LEU
13	E	255	ARG
13	E	256	ARG
13	E	262	GLN
13	E	270	VAL
13	E	274	THR
13	E	277	ILE
13	E	282	LEU
13	E	284	PHE
14	F	27	PHE
14	F	33	LYS
14	F	34	ARG
14	F	44	LEU
14	F	49	ARG
14	F	68	ARG
14	F	69	THR
14	F	72	ARG
14	F	82	ASN
14	F	90	LYS
14	F	91	LEU
14	F	96	ARG
14	F	100	ILE
14	F	101	ASN
14	F	103	VAL
14	F	104	SER
14	F	119	ILE
14	F	120	PHE
14	F	121	ASN
14	F	133	ASN
14	F	137	ILE
14	F	148	ASN
14	F	154	GLU
14	F	191	ASP
14	F	192	LEU
14	F	194	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	F	195	GLU
14	F	202	ARG
14	F	209	PHE
14	F	224	LYS
14	F	234	ASP
14	F	239	GLU
14	F	240	ASP
14	F	245	LEU
14	F	250	ASN
15	G	28	VAL
15	G	31	LEU
15	G	38	ASN
15	G	43	GLN
15	G	46	GLN
15	G	49	ARG
15	G	67	ARG
15	G	71	TYR
15	G	73	ARG
15	G	85	GLN
15	G	87	LEU
15	G	88	ASP
15	G	89	ARG
15	G	100	HIS
15	G	101	LYS
15	G	103	ARG
15	G	110	LYS
15	G	112	GLN
15	G	125	LYS
15	G	131	LYS
15	G	140	VAL
15	G	141	ASN
15	G	150	LYS
15	G	154	LEU
15	G	162	ASP
15	G	167	VAL
15	G	170	LEU
15	G	175	ARG
15	G	176	LYS
15	G	177	MET
15	G	189	ARG
15	G	202	VAL
15	G	210	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
15	G	211	ASP
15	G	212	LYS
15	G	217	LYS
15	G	223	ARG
15	G	230	TYR
15	G	235	ARG
15	G	240	ASN
15	G	259	LYS
15	G	261	LEU
16	H	4	ILE
16	H	11	ASP
16	H	16	VAL
16	H	23	ARG
16	H	42	ASN
16	H	51	LYS
16	H	52	LYS
16	H	57	VAL
16	H	59	LYS
16	H	74	CYS
16	H	84	VAL
16	H	85	THR
16	H	92	MET
16	H	104	VAL
16	H	106	GLN
16	H	107	GLU
16	H	111	LEU
16	H	113	GLU
16	H	118	LEU
16	H	123	ILE
16	H	125	ARG
16	H	128	MET
16	H	141	LYS
16	H	161	ILE
16	H	168	LYS
16	H	173	ARG
16	H	177	ASP
17	I	8	CYS
17	I	13	LYS
17	I	21	ARG
17	I	28	ASP
17	I	35	ASP
17	I	36	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
17	I	39	LYS
17	I	43	VAL
17	I	44	ASP
17	I	45	GLU
17	I	46	PHE
17	I	48	LEU
17	I	52	MET
17	I	58	GLU
17	I	71	CYS
17	I	74	LYS
17	I	76	MET
17	I	78	LYS
17	I	80	CYS
17	I	86	HIS
17	I	94	PHE
17	I	95	HIS
17	I	97	ILE
17	I	100	ASN
17	I	101	LYS
17	I	102	MET
17	I	111	LEU
17	I	119	PHE
17	I	125	THR
17	I	126	VAL
17	I	139	ARG
17	I	142	LEU
17	I	143	GLN
17	I	163	GLN
17	I	169	LYS
17	I	181	PHE
17	I	182	GLU
17	I	195	CYS
17	I	202	ASN
17	I	207	ASP
17	I	208	LYS
18	J	16	ARG
18	J	33	LEU
18	J	35	ARG
18	J	46	GLN
18	J	52	LYS
18	J	55	TYR
18	J	63	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
18	J	71	HIS
18	J	72	CYS
18	J	75	ARG
18	J	81	GLU
18	J	83	LEU
18	J	85	LYS
18	J	87	LEU
18	J	88	LYS
18	J	90	ARG
18	J	97	ASN
18	J	101	ASP
18	J	113	ILE
18	J	119	TYR
18	J	120	ASP
18	J	126	TYR
18	J	128	LEU
18	J	136	ARG
18	J	143	ASP
18	J	146	ARG
18	J	154	LYS
18	J	164	ARG
18	J	168	GLN
18	J	171	ASP
19	L	9	ILE
19	L	28	GLN
19	L	34	ARG
19	L	36	ARG
19	L	45	ARG
19	L	49	ARG
19	L	59	VAL
19	L	65	ARG
19	L	67	HIS
19	L	74	ARG
19	L	79	GLU
19	L	82	ARG
19	L	92	ARG
19	L	101	ARG
19	L	103	ARG
19	L	111	GLN
19	L	113	ASN
19	L	115	GLN
19	L	123	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
19	L	129	ARG
19	L	130	LYS
19	L	142	GLU
19	L	148	THR
19	L	159	ASN
19	L	162	LYS
19	L	163	ARG
19	L	165	LYS
19	L	168	VAL
19	L	172	GLU
19	L	175	ASN
19	L	190	ARG
19	L	201	GLU
20	M	33	GLN
20	M	34	ASN
20	M	37	LEU
20	M	38	VAL
20	M	48	GLN
20	M	56	GLN
20	M	57	LEU
20	M	59	ASP
20	M	62	LEU
20	M	66	HIS
20	M	67	SER
20	M	71	LYS
20	M	78	GLU
20	M	79	LYS
20	M	89	THR
20	M	90	ARG
20	M	98	ARG
20	M	99	GLU
20	M	113	MET
20	M	119	ARG
21	N	9	GLU
21	N	24	ARG
21	N	25	VAL
21	N	26	ARG
21	N	43	THR
21	N	54	LYS
21	N	63	ARG
21	N	64	ILE
21	N	80	THR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
21	N	87	HIS
21	N	89	VAL
21	N	90	ASN
21	N	91	GLN
21	N	92	LEU
21	N	108	ARG
21	N	110	CYS
21	N	117	ASN
21	N	131	GLU
21	N	143	ARG
21	N	147	ASP
21	N	151	ILE
21	N	162	ARG
21	N	174	LEU
21	N	178	HIS
21	N	179	LYS
21	N	182	HIS
21	N	189	ARG
21	N	192	TRP
21	N	197	THR
21	N	203	TYR
22	O	12	ARG
22	O	18	ARG
22	O	37	ARG
22	O	38	CYS
22	O	41	ILE
22	O	42	ASN
22	O	44	SER
22	O	49	ARG
22	O	60	LYS
22	O	61	ARG
22	O	72	HIS
22	O	82	ARG
22	O	85	ARG
22	O	117	ARG
22	O	129	LEU
22	O	169	ARG
22	O	173	GLN
22	O	187	LYS
22	O	188	LYS
22	O	197	LYS
22	O	202	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
23	P	3	ARG
23	P	5	SER
23	P	9	GLU
23	P	13	LYS
23	P	18	ARG
23	P	22	LEU
23	P	24	VAL
23	P	26	PHE
23	P	30	ARG
23	P	36	ILE
23	P	40	HIS
23	P	69	ARG
23	P	70	CYS
23	P	78	TRP
23	P	86	LYS
23	P	90	PHE
23	P	105	LYS
23	P	108	ASP
23	P	110	ASP
23	P	115	GLU
23	P	128	ARG
23	P	142	SER
23	P	147	GLU
23	P	154	GLU
24	Q	3	VAL
24	Q	4	ASP
24	Q	5	ILE
24	Q	9	LYS
24	Q	13	VAL
24	Q	15	ARG
24	Q	16	LYS
24	Q	31	LEU
24	Q	39	THR
24	Q	42	THR
24	Q	44	ASN
24	Q	61	LEU
24	Q	68	ARG
24	Q	72	LEU
24	Q	75	ARG
24	Q	78	LYS
24	Q	79	THR
24	Q	89	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
24	Q	91	ARG
24	Q	93	GLN
24	Q	97	LYS
24	Q	110	ARG
24	Q	112	ARG
24	Q	126	LEU
24	Q	146	ARG
24	Q	148	VAL
24	Q	162	HIS
24	Q	168	ARG
24	Q	180	ARG
24	Q	181	ARG
25	R	6	LEU
25	R	10	LEU
25	R	17	CYS
25	R	23	TRP
25	R	39	GLN
25	R	43	LYS
25	R	47	ASP
25	R	50	ILE
25	R	66	ASN
25	R	74	ARG
25	R	75	HIS
25	R	89	MET
25	R	95	TRP
25	R	99	MET
25	R	103	ARG
25	R	104	ARG
25	R	105	LEU
25	R	106	LEU
25	R	108	ARG
25	R	109	TYR
25	R	113	LYS
25	R	114	LYS
25	R	117	ARG
25	R	123	LEU
25	R	124	TYR
25	R	130	ASN
25	R	131	VAL
25	R	133	LYS
25	R	138	LEU
25	R	168	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
25	R	172	ARG
25	R	175	GLU
25	R	177	LEU
25	R	180	LYS
26	S	2	LYS
26	S	8	ARG
26	S	12	VAL
26	S	17	LEU
26	S	24	THR
26	S	44	PHE
26	S	68	PHE
26	S	69	GLU
26	S	70	LYS
26	S	80	ILE
26	S	82	LEU
26	S	83	ARG
26	S	84	TYR
26	S	90	THR
26	S	95	ARG
26	S	98	ARG
26	S	99	ASP
26	S	100	LEU
26	S	101	THR
26	S	102	THR
26	S	128	LYS
26	S	131	GLU
26	S	146	HIS
26	S	147	ASP
26	S	150	ILE
26	S	152	PHE
26	S	156	HIS
26	S	159	LEU
26	S	162	GLN
26	S	174	THR
27	T	5	LYS
27	T	9	ARG
27	T	12	ARG
27	T	13	TYR
27	T	17	ARG
27	T	30	TYR
27	T	32	ARG
27	T	33	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
27	T	35	LYS
27	T	36	LYS
27	T	41	ASP
27	T	60	LYS
27	T	67	VAL
27	T	70	HIS
27	T	80	VAL
27	T	98	HIS
27	T	102	ARG
27	T	105	PHE
27	T	107	LYS
27	T	113	ASP
27	T	118	GLU
27	T	127	GLN
27	T	137	GLU
27	T	142	ARG
27	T	144	ASN
27	T	152	GLU
27	T	159	MET
28	U	27	HIS
28	U	33	ILE
28	U	39	PHE
28	U	40	GLU
28	U	46	ARG
28	U	52	LYS
28	U	62	THR
28	U	67	LYS
28	U	69	LYS
28	U	79	SER
28	U	82	TYR
28	U	90	TYR
28	U	97	ARG
28	U	98	ASP
28	U	100	LEU
28	U	101	ARG
28	U	107	LYS
28	U	110	TYR
29	V	13	LYS
29	V	15	ARG
29	V	18	LEU
29	V	30	ASP
29	V	36	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	V	40	ILE
29	V	46	LYS
29	V	48	ARG
29	V	59	ASP
29	V	60	MET
29	V	75	LYS
29	V	77	HIS
29	V	91	LYS
29	V	96	LEU
29	V	98	PHE
29	V	109	LYS
29	V	111	GLU
29	V	123	LYS
30	W	3	VAL
30	W	8	PHE
30	W	12	LYS
30	W	17	HIS
30	W	24	THR
30	W	28	VAL
30	W	33	ASN
30	W	37	GLU
30	W	43	LYS
30	W	50	ASN
30	W	55	TYR
30	W	56	ARG
31	X	39	LYS
31	X	41	ARG
31	X	45	THR
31	X	50	LYS
31	X	54	LEU
31	X	62	ARG
31	X	63	LYS
31	X	72	ASP
31	X	84	GLU
31	X	94	ASN
31	X	120	ASP
31	X	129	ARG
31	X	144	TYR
31	X	148	ASP
32	Y	2	LYS
32	Y	11	ARG
32	Y	24	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
32	Y	27	ARG
32	Y	36	LYS
32	Y	45	ARG
32	Y	49	ILE
32	Y	50	ARG
32	Y	59	ARG
32	Y	62	TYR
32	Y	63	LYS
32	Y	65	GLN
32	Y	72	GLN
32	Y	74	TYR
32	Y	87	ARG
32	Y	91	ASN
32	Y	104	VAL
32	Y	115	ARG
32	Y	121	ARG
32	Y	126	ARG
32	Y	127	GLN
33	Z	3	LYS
33	Z	4	PHE
33	Z	19	SER
33	Z	21	ARG
33	Z	30	ASP
33	Z	36	ARG
33	Z	38	TYR
33	Z	42	LEU
33	Z	47	ASP
33	Z	57	MET
33	Z	60	LYS
33	Z	73	LYS
33	Z	78	ASN
33	Z	84	ARG
33	Z	88	ASP
33	Z	91	LEU
33	Z	92	ASP
33	Z	93	LYS
33	Z	98	LYS
33	Z	109	LYS
33	Z	112	ARG
33	Z	121	ARG
33	Z	135	ARG
34	a	7	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
34	a	12	ARG
34	a	14	HIS
34	a	16	SER
34	a	22	ILE
34	a	27	LYS
34	a	46	ASP
34	a	49	HIS
34	a	52	TYR
34	a	59	ARG
34	a	61	TYR
34	a	67	GLN
34	a	76	ASP
34	a	77	LYS
34	a	84	GLU
34	a	85	GLN
34	a	86	THR
34	a	95	THR
34	a	102	ASP
34	a	105	ARG
34	a	116	LYS
34	a	122	VAL
34	a	127	LYS
35	b	16	TRP
35	b	22	LYS
35	b	27	GLN
35	b	28	ARG
35	b	36	ASP
35	b	39	PHE
35	b	41	ARG
35	b	43	MET
35	b	44	ARG
35	b	51	LYS
35	b	55	LYS
35	b	65	MET
36	c	14	ILE
36	c	27	TYR
36	c	31	TYR
36	c	37	MET
36	c	40	GLN
36	c	42	LYS
36	c	44	LYS
36	c	55	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
36	c	59	GLU
36	c	66	LEU
36	c	74	TYR
36	c	77	ASN
36	c	78	ASN
36	c	81	LEU
36	c	88	TYR
36	c	92	CYS
36	c	94	LEU
37	d	18	ASN
37	d	19	GLU
37	d	20	VAL
37	d	23	ARG
37	d	24	GLU
37	d	26	THR
37	d	31	LYS
37	d	36	VAL
37	d	39	LYS
37	d	44	ARG
37	d	67	ARG
37	d	78	ARG
37	d	79	ASN
37	d	86	VAL
37	d	87	ARG
37	d	88	LEU
37	d	91	LYS
37	d	93	ASN
37	d	94	GLU
37	d	95	ASP
37	d	101	LYS
37	d	103	TYR
37	d	107	THR
37	d	108	TYR
37	d	109	VAL
37	d	116	ASN
37	d	117	LEU
37	d	121	ASN
37	d	123	ASP
38	e	11	LYS
38	e	16	ARG
38	e	21	ILE
38	e	22	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
38	e	26	ASP
38	e	28	TYR
38	e	41	ILE
38	e	46	ARG
38	e	47	ARG
38	e	48	ARG
38	e	49	PHE
38	e	58	ILE
38	e	60	TYR
38	e	64	LYS
38	e	77	PHE
38	e	78	LEU
38	e	80	HIS
38	e	85	LEU
38	e	92	ASN
38	e	95	TYR
38	e	106	LYS
38	e	107	ASN
38	e	117	GLN
38	e	118	LEU
38	e	126	ASN
38	e	128	ARG
39	f	14	TYR
39	f	16	ARG
39	f	19	ARG
39	f	24	HIS
39	f	25	THR
39	f	33	VAL
39	f	37	ASP
39	f	38	GLU
39	f	47	CYS
39	f	51	TYR
39	f	54	LYS
39	f	87	LYS
39	f	100	ARG
39	f	101	ILE
39	f	104	MET
39	f	109	ARG
40	g	4	ARG
40	g	11	LEU
40	g	14	ASN
40	g	32	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
40	g	52	ARG
40	g	54	ARG
40	g	60	ARG
40	g	64	LEU
40	g	66	ARG
40	g	73	HIS
40	g	81	SER
40	g	88	ARG
40	g	97	ILE
40	g	114	GLN
40	g	115	LYS
41	h	8	ASP
41	h	10	ARG
41	h	28	LEU
41	h	30	GLN
41	h	51	ARG
41	h	67	GLU
41	h	68	ASN
41	h	69	LEU
41	h	72	PHE
41	h	89	ARG
41	h	97	LYS
41	h	98	HIS
41	h	100	GLU
41	h	103	LYS
41	h	119	PHE
42	i	4	ARG
42	i	12	ASN
42	i	29	ARG
42	i	30	ARG
42	i	33	LEU
42	i	41	ARG
42	i	42	ASP
42	i	85	ARG
42	i	87	ARG
42	i	103	LYS
43	j	12	ARG
43	j	13	ASN
43	j	20	ARG
43	j	25	LYS
43	j	27	TYR
43	j	48	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
43	j	49	TRP
43	j	55	ARG
43	j	59	THR
43	j	68	LYS
43	j	78	PHE
43	j	79	ARG
43	j	80	GLU
44	k	14	THR
44	k	28	ASN
44	k	35	LYS
44	k	37	ARG
44	k	44	THR
44	k	51	GLU
44	k	56	LEU
44	k	60	LEU
44	k	70	LYS
45	l	4	HIS
45	l	16	LYS
45	l	17	GLN
45	l	21	ARG
45	l	36	ARG
45	l	45	ARG
45	l	46	ARG
45	l	49	LEU
46	m	79	GLU
46	m	84	GLN
46	m	87	GLN
46	m	88	LYS
46	m	92	ASP
46	m	97	ARG
46	m	98	LYS
46	m	104	HIS
46	m	106	ARG
46	m	111	ARG
46	m	122	ARG
47	n	9	ARG
47	n	21	ARG
48	o	8	ARG
48	o	11	PHE
48	o	17	LYS
48	o	24	THR
48	o	26	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
48	o	28	LYS
48	o	33	LEU
48	o	36	GLN
48	o	43	ARG
48	o	46	SER
48	o	48	TYR
48	o	56	PHE
48	o	59	LYS
48	o	61	LYS
48	o	63	THR
48	o	64	LYS
48	o	69	ARG
48	o	76	ASN
48	o	78	ARG
48	o	82	MET
48	o	83	LEU
48	o	89	LYS
48	o	99	ARG
48	o	102	GLN
48	o	104	ILE
49	p	3	LYS
49	p	4	ARG
49	p	5	THR
49	p	16	THR
49	p	30	GLU
49	p	31	ILE
49	p	48	LYS
49	p	49	ARG
49	p	54	ILE
49	p	69	TRP
49	p	71	TYR
49	p	84	ARG
49	p	87	LYS
50	q	68	TYR
50	q	72	TRP
51	r	11	VAL
51	r	140	GLN
51	r	566	TYR
51	r	569	LYS
51	r	577	TRP
53	u	97	PHE
53	u	113	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
53	u	134	TYR
53	u	147	ARG
53	u	168	ARG
53	u	251	GLN
54	v	150	ARG
55	w	6	THR
55	w	9	GLU
55	w	18	TYR
55	w	43	THR
55	w	47	VAL
55	w	48	CYS
55	w	50	VAL
55	w	54	ASP
55	w	63	GLU
55	w	74	VAL
56	x	35	VAL
56	x	41	GLU
56	x	52	LEU
56	x	87	VAL
56	x	101	GLN
56	x	154	LYS
56	x	195	HIS
56	x	197	GLN
56	x	206	LEU
56	x	240	VAL
56	x	332	MET
56	x	336	PHE
56	x	345	PHE
56	x	379	MET
56	x	383	ASN
56	x	399	GLN
56	x	427	PHE
57	y	23	ASP
57	y	30	ASN
57	y	32	LEU
57	y	36	VAL
57	y	40	GLU
57	y	54	LEU
57	y	122	ARG
57	y	335	GLU
57	y	341	LEU
57	y	361	LEU

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Mol	Chain	Res	Type
57	y	380	VAL
57	y	392	LEU
57	y	396	LEU
57	y	401	ARG
57	y	402	VAL
57	y	403	ASP
57	y	405	LEU
57	y	413	ARG
57	y	414	ARG
57	y	448	VAL
57	y	457	ARG
57	y	483	ARG
57	y	486	VAL
57	y	490	GLU
57	y	525	GLN
57	y	526	ASP
57	y	592	ILE
57	y	594	ASP
58	z	21	ARG
58	z	32	LYS
58	z	34	ASP
58	z	54	ASN
58	z	76	VAL
58	z	77	ASN
58	z	92	ASP
58	z	94	LEU
58	z	95	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (202) such sidechains are listed below:

Mol	Chain	Res	Type
3	3	6	GLN
3	3	12	ASN
3	3	36	ASN
3	3	41	ASN
3	3	70	GLN
4	4	70	GLN
4	4	147	HIS
4	4	149	HIS
6	6	68	HIS
6	6	85	ASN
6	6	191	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
9	A	50	HIS
9	A	100	ASN
9	A	140	ASN
9	A	217	GLN
10	B	25	HIS
10	B	68	ASN
10	B	179	HIS
10	B	203	GLN
10	B	204	GLN
10	B	289	GLN
10	B	301	ASN
10	B	302	ASN
11	C	50	GLN
11	C	85	HIS
11	C	94	ASN
11	C	112	HIS
11	C	116	ASN
11	C	119	GLN
11	C	178	ASN
11	C	187	GLN
11	C	215	ASN
11	C	223	ASN
11	C	278	ASN
12	D	45	ASN
12	D	81	HIS
12	D	122	GLN
12	D	157	ASN
12	D	195	HIS
12	D	202	GLN
12	D	250	ASN
13	E	43	ASN
13	E	153	HIS
13	E	178	ASN
13	E	186	HIS
13	E	207	HIS
13	E	246	GLN
13	E	280	HIS
14	F	26	ASN
14	F	65	GLN
14	F	82	ASN
14	F	112	GLN
14	F	148	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	F	153	ASN
14	F	165	ASN
14	F	241	GLN
14	F	243	ASN
14	F	250	ASN
15	G	43	GLN
15	G	64	GLN
15	G	112	GLN
15	G	195	HIS
15	G	208	ASN
15	G	227	ASN
16	H	106	GLN
16	H	108	ASN
17	I	86	HIS
17	I	100	ASN
17	I	147	HIS
17	I	213	HIS
18	J	112	HIS
18	J	155	HIS
19	L	19	GLN
19	L	27	ASN
19	L	28	GLN
19	L	113	ASN
19	L	159	ASN
20	M	33	GLN
20	M	34	ASN
20	M	56	GLN
21	N	86	HIS
21	N	87	HIS
21	N	90	ASN
21	N	99	GLN
21	N	145	ASN
21	N	178	HIS
21	N	181	HIS
21	N	182	HIS
22	O	65	ASN
22	O	173	GLN
22	O	184	ASN
22	O	199	HIS
23	P	28	ASN
23	P	54	GLN
23	P	64	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
23	P	80	GLN
23	P	145	HIS
24	Q	40	ASN
24	Q	93	GLN
25	R	66	ASN
25	R	118	HIS
25	R	130	ASN
26	S	37	HIS
26	S	77	ASN
26	S	91	HIS
26	S	92	ASN
26	S	122	HIS
26	S	156	HIS
26	S	163	HIS
27	T	54	HIS
27	T	70	HIS
27	T	77	ASN
27	T	79	GLN
27	T	98	HIS
27	T	127	GLN
28	U	27	HIS
29	V	36	ASN
29	V	135	ASN
30	W	17	HIS
30	W	30	GLN
30	W	45	ASN
30	W	59	HIS
30	W	63	GLN
31	X	93	ASN
32	Y	24	HIS
32	Y	56	GLN
32	Y	65	GLN
32	Y	86	GLN
32	Y	100	HIS
32	Y	127	GLN
33	Z	79	HIS
34	a	28	HIS
34	a	66	ASN
34	a	67	GLN
34	a	93	ASN
34	a	120	GLN
35	b	12	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
35	b	27	GLN
35	b	42	ASN
35	b	49	HIS
35	b	58	GLN
36	c	15	ASN
36	c	19	GLN
36	c	40	GLN
36	c	77	ASN
36	c	78	ASN
37	d	30	HIS
37	d	93	ASN
37	d	121	ASN
38	e	24	GLN
38	e	43	ASN
38	e	57	ASN
39	f	20	ASN
39	f	55	ASN
39	f	56	ASN
39	f	78	HIS
39	f	80	ASN
40	g	18	ASN
40	g	110	GLN
40	g	112	GLN
41	h	30	GLN
41	h	68	ASN
41	h	108	GLN
42	i	12	ASN
42	i	20	ASN
42	i	80	HIS
43	j	16	HIS
43	j	48	ASN
45	l	4	HIS
45	l	43	HIS
46	m	87	GLN
48	o	3	ASN
48	o	45	GLN
48	o	90	HIS
48	o	102	GLN
49	p	92	GLN
50	q	59	ASN
50	q	85	GLN
51	r	24	ASN

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Mol	Chain	Res	Type
51	r	41	ASN
51	r	78	ASN
51	r	96	ASN
51	r	117	GLN
53	u	74	HIS
53	u	88	GLN
54	v	93	GLN
55	w	68	GLN
56	x	51	GLN
56	x	126	GLN
56	x	181	ASN
56	x	197	GLN
56	x	232	GLN
56	x	364	ASN
56	x	385	GLN
56	x	404	GLN
56	x	429	GLN
57	y	99	GLN
57	y	108	ASN
57	y	114	GLN
57	y	397	GLN
57	y	399	GLN
58	z	85	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	255/299 (85%)	71 (27%)	11 (4%)
2	2	74/76 (97%)	23 (31%)	1 (1%)
5	5	3644/3658 (99%)	1236 (33%)	185 (5%)
7	7	119/120 (99%)	27 (22%)	2 (1%)
8	8	155/156 (99%)	46 (29%)	6 (3%)
All	All	4247/4309 (98%)	1403 (33%)	205 (4%)

All (1403) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	4	G
1	1	28	U
1	1	32	A
1	1	33	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	36	A
1	1	38	U
1	1	39	C
1	1	40	G
1	1	48	G
1	1	53	A
1	1	60	U
1	1	63	C
1	1	64	U
1	1	89	G
1	1	90	U
1	1	99	C
1	1	100	C
1	1	101	G
1	1	102	A
1	1	105	G
1	1	106	G
1	1	107	G
1	1	109	G
1	1	111	C
1	1	114	C
1	1	116	C
1	1	117	U
1	1	118	A
1	1	119	A
1	1	120	G
1	1	139	A
1	1	144	C
1	1	151	C
1	1	170	C
1	1	172	A
1	1	173	A
1	1	174	G
1	1	175	G
1	1	176	A
1	1	177	G
1	1	178	G
1	1	183	A
1	1	185	C
1	1	186	C
1	1	190	C
1	1	191	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	202	C
1	1	206	G
1	1	212	C
1	1	214	A
1	1	215	A
1	1	227	G
1	1	229	U
1	1	230	C
1	1	231	A
1	1	232	G
1	1	233	U
1	1	234	A
1	1	235	G
1	1	236	U
1	1	237	G
1	1	242	C
1	1	245	G
1	1	246	C
1	1	247	C
1	1	249	G
1	1	251	G
1	1	252	A
1	1	254	U
1	1	258	C
1	1	288	G
2	2	2	U
2	2	6	C
2	2	8	U
2	2	9	A
2	2	18	G
2	2	19	U
2	2	20	U
2	2	21	A
2	2	22	U
2	2	33	U
2	2	37	A
2	2	42	A
2	2	46	G
2	2	48	C
2	2	51	C
2	2	52	G
2	2	57	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	2	59	A
2	2	61	C
2	2	69	A
2	2	73	A
2	2	74	C
2	2	75	C
5	5	2	G
5	5	12	A
5	5	13	U
5	5	17	A
5	5	21	G
5	5	25	A
5	5	39	A
5	5	42	A
5	5	48	G
5	5	49	U
5	5	56	A
5	5	58	G
5	5	59	A
5	5	64	A
5	5	65	A
5	5	67	C
5	5	71	C
5	5	74	G
5	5	85	G
5	5	91	G
5	5	92	C
5	5	93	G
5	5	94	A
5	5	96	U
5	5	108	A
5	5	109	G
5	5	110	C
5	5	111	C
5	5	112	C
5	5	115	C
5	5	116	G
5	5	118	C
5	5	119	G
5	5	120	A
5	5	126	C
5	5	128	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	134	G
5	5	135	G
5	5	136	C
5	5	137	G
5	5	144	G
5	5	145	G
5	5	150	U
5	5	151	G
5	5	157	U
5	5	158	A
5	5	159	C
5	5	160	G
5	5	164	G
5	5	166	C
5	5	171	U
5	5	172	C
5	5	173	C
5	5	182	G
5	5	183	C
5	5	184	U
5	5	185	C
5	5	186	G
5	5	187	U
5	5	188	G
5	5	189	G
5	5	195	C
5	5	196	C
5	5	200	U
5	5	202	C
5	5	203	U
5	5	205	C
5	5	209	U
5	5	213	G
5	5	216	C
5	5	217	C
5	5	218	A
5	5	219	G
5	5	220	C
5	5	221	C
5	5	224	U
5	5	226	G
5	5	227	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	233	U
5	5	235	A
5	5	238	C
5	5	239	C
5	5	245	C
5	5	246	G
5	5	255	C
5	5	256	G
5	5	257	C
5	5	262	G
5	5	265	C
5	5	266	C
5	5	267	G
5	5	270	U
5	5	272	U
5	5	275	C
5	5	276	C
5	5	277	G
5	5	278	G
5	5	280	G
5	5	281	U
5	5	292	G
5	5	293	G
5	5	294	G
5	5	295	A
5	5	297	U
5	5	300	A
5	5	306	A
5	5	309	C
5	5	315	G
5	5	316	U
5	5	322	C
5	5	325	U
5	5	330	G
5	5	334	A
5	5	336	A
5	5	337	U
5	5	339	C
5	5	340	C
5	5	349	A
5	5	352	G
5	5	361	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	363	A
5	5	381	U
5	5	383	A
5	5	384	A
5	5	386	A
5	5	387	G
5	5	388	A
5	5	394	G
5	5	406	C
5	5	407	A
5	5	408	A
5	5	409	G
5	5	410	A
5	5	411	G
5	5	412	G
5	5	413	G
5	5	415	G
5	5	431	G
5	5	432	U
5	5	433	A
5	5	440	U
5	5	446	C
5	5	448	G
5	5	449	C
5	5	450	G
5	5	451	C
5	5	452	A
5	5	453	G
5	5	454	U
5	5	455	C
5	5	456	C
5	5	458	C
5	5	467	U
5	5	468	U
5	5	470	A
5	5	473	C
5	5	485	C
5	5	486	C
5	5	487	G
5	5	498	C
5	5	500	G
5	5	501	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	503	C
5	5	504	G
5	5	506	C
5	5	509	A
5	5	510	U
5	5	511	C
5	5	513	U
5	5	514	U
5	5	515	C
5	5	519	C
5	5	647	G
5	5	649	A
5	5	650	C
5	5	653	U
5	5	654	C
5	5	664	G
5	5	665	C
5	5	666	G
5	5	667	A
5	5	668	C
5	5	669	C
5	5	682	G
5	5	683	C
5	5	684	G
5	5	685	C
5	5	686	A
5	5	687	U
5	5	690	C
5	5	694	C
5	5	696	C
5	5	697	G
5	5	703	G
5	5	704	C
5	5	707	C
5	5	713	C
5	5	716	C
5	5	718	C
5	5	721	G
5	5	728	U
5	5	729	G
5	5	730	G
5	5	731	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	732	A
5	5	737	C
5	5	742	G
5	5	743	G
5	5	745	G
5	5	746	A
5	5	747	A
5	5	748	G
5	5	749	G
5	5	912	G
5	5	915	A
5	5	918	G
5	5	920	C
5	5	925	C
5	5	927	G
5	5	928	C
5	5	929	A
5	5	930	G
5	5	931	C
5	5	932	A
5	5	933	G
5	5	934	C
5	5	935	A
5	5	936	C
5	5	937	U
5	5	938	C
5	5	939	G
5	5	940	C
5	5	944	A
5	5	945	U
5	5	946	C
5	5	950	G
5	5	957	G
5	5	958	G
5	5	959	G
5	5	960	A
5	5	961	G
5	5	962	C
5	5	963	G
5	5	964	A
5	5	965	G
5	5	966	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	967	C
5	5	968	C
5	5	969	C
5	5	970	G
5	5	971	U
5	5	972	C
5	5	973	G
5	5	974	C
5	5	975	C
5	5	976	G
5	5	977	C
5	5	978	G
5	5	979	C
5	5	982	U
5	5	983	C
5	5	984	C
5	5	989	U
5	5	990	C
5	5	1051	G
5	5	1072	C
5	5	1073	G
5	5	1075	G
5	5	1076	C
5	5	1081	C
5	5	1086	C
5	5	1168	G
5	5	1177	U
5	5	1181	C
5	5	1193	C
5	5	1210	C
5	5	1211	G
5	5	1212	G
5	5	1214	C
5	5	1215	C
5	5	1217	G
5	5	1219	G
5	5	1221	G
5	5	1222	A
5	5	1233	G
5	5	1235	G
5	5	1236	C
5	5	1237	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1238	A
5	5	1239	C
5	5	1240	G
5	5	1242	G
5	5	1243	C
5	5	1244	G
5	5	1245	C
5	5	1246	G
5	5	1255	A
5	5	1265	G
5	5	1267	C
5	5	1268	G
5	5	1269	G
5	5	1270	A
5	5	1271	G
5	5	1272	C
5	5	1273	G
5	5	1274	A
5	5	1275	G
5	5	1277	G
5	5	1279	A
5	5	1280	C
5	5	1281	G
5	5	1282	G
5	5	1283	G
5	5	1284	G
5	5	1285	U
5	5	1287	G
5	5	1288	G
5	5	1289	C
5	5	1290	G
5	5	1291	G
5	5	1293	G
5	5	1294	A
5	5	1295	C
5	5	1296	G
5	5	1297	U
5	5	1299	G
5	5	1300	G
5	5	1301	C
5	5	1302	U
5	5	1304	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1313	C
5	5	1314	C
5	5	1325	C
5	5	1326	A
5	5	1330	A
5	5	1339	U
5	5	1354	A
5	5	1357	C
5	5	1358	G
5	5	1359	G
5	5	1366	G
5	5	1367	C
5	5	1368	A
5	5	1369	C
5	5	1370	G
5	5	1371	A
5	5	1377	G
5	5	1378	C
5	5	1379	C
5	5	1380	G
5	5	1381	U
5	5	1387	A
5	5	1388	A
5	5	1390	G
5	5	1394	G
5	5	1397	A
5	5	1398	A
5	5	1399	G
5	5	1401	C
5	5	1402	C
5	5	1407	C
5	5	1408	G
5	5	1410	U
5	5	1411	C
5	5	1415	G
5	5	1420	A
5	5	1426	G
5	5	1429	C
5	5	1432	G
5	5	1435	G
5	5	1440	U
5	5	1441	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1445	U
5	5	1446	C
5	5	1448	G
5	5	1455	G
5	5	1456	C
5	5	1457	G
5	5	1465	G
5	5	1474	C
5	5	1475	G
5	5	1478	C
5	5	1480	C
5	5	1481	C
5	5	1482	G
5	5	1483	C
5	5	1484	G
5	5	1485	C
5	5	1489	G
5	5	1490	G
5	5	1493	G
5	5	1497	A
5	5	1498	G
5	5	1501	C
5	5	1504	G
5	5	1514	U
5	5	1516	G
5	5	1518	A
5	5	1519	C
5	5	1523	A
5	5	1530	G
5	5	1534	A
5	5	1538	U
5	5	1547	A
5	5	1558	A
5	5	1562	G
5	5	1563	A
5	5	1564	A
5	5	1566	C
5	5	1571	G
5	5	1572	U
5	5	1578	U
5	5	1586	G
5	5	1590	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1591	U
5	5	1596	U
5	5	1611	C
5	5	1612	G
5	5	1613	A
5	5	1624	G
5	5	1625	G
5	5	1631	A
5	5	1633	G
5	5	1634	A
5	5	1637	A
5	5	1638	A
5	5	1640	C
5	5	1641	G
5	5	1643	A
5	5	1654	G
5	5	1656	U
5	5	1661	C
5	5	1670	G
5	5	1671	U
5	5	1676	C
5	5	1677	U
5	5	1684	A
5	5	1685	G
5	5	1687	U
5	5	1691	G
5	5	1692	C
5	5	1694	C
5	5	1696	C
5	5	1697	G
5	5	1698	C
5	5	1719	A
5	5	1720	C
5	5	1721	G
5	5	1722	C
5	5	1723	A
5	5	1724	G
5	5	1725	U
5	5	1728	U
5	5	1731	C
5	5	1734	G
5	5	1741	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1742	A
5	5	1746	A
5	5	1750	G
5	5	1751	A
5	5	1753	G
5	5	1754	U
5	5	1755	C
5	5	1756	U
5	5	1757	U
5	5	1758	G
5	5	1760	G
5	5	1761	G
5	5	1762	C
5	5	1764	G
5	5	1768	C
5	5	1770	A
5	5	1772	C
5	5	1776	A
5	5	1777	C
5	5	1781	U
5	5	1787	A
5	5	1788	A
5	5	1791	U
5	5	1800	U
5	5	1803	G
5	5	1804	A
5	5	1805	A
5	5	1815	G
5	5	1816	C
5	5	1817	U
5	5	1818	G
5	5	1819	G
5	5	1820	C
5	5	1821	G
5	5	1822	U
5	5	1823	G
5	5	1827	C
5	5	1828	C
5	5	1830	G
5	5	1832	C
5	5	1833	G
5	5	1834	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1835	G
5	5	1836	G
5	5	1842	G
5	5	1843	A
5	5	1848	C
5	5	1855	G
5	5	1864	G
5	5	1866	U
5	5	1867	A
5	5	1869	G
5	5	1876	U
5	5	1878	G
5	5	1881	C
5	5	1882	U
5	5	1889	U
5	5	1890	G
5	5	1891	A
5	5	1892	A
5	5	1897	A
5	5	1900	C
5	5	1910	G
5	5	1918	U
5	5	1919	G
5	5	1920	C
5	5	1921	C
5	5	1922	G
5	5	1923	A
5	5	1931	C
5	5	1932	A
5	5	1938	C
5	5	1947	U
5	5	1948	G
5	5	1951	G
5	5	1952	G
5	5	1956	A
5	5	1961	G
5	5	1962	A
5	5	1967	A
5	5	1973	G
5	5	1975	G
5	5	1976	G
5	5	1977	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1979	A
5	5	1980	U
5	5	1981	G
5	5	1983	A
5	5	1984	A
5	5	1985	G
5	5	1987	C
5	5	1988	G
5	5	1991	A
5	5	1992	U
5	5	1993	C
5	5	1997	U
5	5	1998	A
5	5	2001	G
5	5	2002	A
5	5	2003	G
5	5	2004	U
5	5	2005	G
5	5	2007	G
5	5	2008	U
5	5	2009	A
5	5	2010	A
5	5	2011	C
5	5	2018	C
5	5	2024	G
5	5	2025	A
5	5	2026	A
5	5	2033	A
5	5	2045	G
5	5	2046	G
5	5	2047	A
5	5	2048	U
5	5	2052	G
5	5	2054	U
5	5	2055	G
5	5	2056	G
5	5	2057	A
5	5	2062	C
5	5	2063	G
5	5	2064	G
5	5	2069	A
5	5	2070	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2077	C
5	5	2079	G
5	5	2084	C
5	5	2085	G
5	5	2088	A
5	5	2089	G
5	5	2090	U
5	5	2091	C
5	5	2092	G
5	5	2093	A
5	5	2094	G
5	5	2095	A
5	5	2096	G
5	5	2097	U
5	5	2105	A
5	5	2107	C
5	5	2108	G
5	5	2109	G
5	5	2110	C
5	5	2112	G
5	5	2113	G
5	5	2114	G
5	5	2115	G
5	5	2116	C
5	5	2117	G
5	5	2118	G
5	5	2119	C
5	5	2120	G
5	5	2121	C
5	5	2122	G
5	5	2123	C
5	5	2124	G
5	5	2125	C
5	5	2126	G
5	5	2127	C
5	5	2247	C
5	5	2248	C
5	5	2250	C
5	5	2251	G
5	5	2252	G
5	5	2253	A
5	5	2254	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2255	C
5	5	2256	C
5	5	2257	C
5	5	2258	C
5	5	2259	G
5	5	2260	C
5	5	2261	G
5	5	2263	A
5	5	2264	C
5	5	2265	G
5	5	2266	C
5	5	2267	U
5	5	2268	A
5	5	2269	C
5	5	2270	G
5	5	2273	G
5	5	2275	G
5	5	2279	A
5	5	2288	G
5	5	2289	C
5	5	2290	C
5	5	2300	A
5	5	2301	G
5	5	2312	U
5	5	2313	A
5	5	2314	G
5	5	2319	C
5	5	2321	G
5	5	2322	G
5	5	2325	C
5	5	2330	G
5	5	2333	G
5	5	2335	C
5	5	2342	G
5	5	2343	G
5	5	2348	G
5	5	2349	A
5	5	2351	C
5	5	2360	A
5	5	2361	G
5	5	2362	U
5	5	2364	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2369	U
5	5	2370	A
5	5	2372	U
5	5	2378	G
5	5	2382	A
5	5	2390	G
5	5	2391	G
5	5	2395	A
5	5	2396	A
5	5	2397	G
5	5	2399	G
5	5	2407	G
5	5	2408	U
5	5	2417	A
5	5	2422	C
5	5	2425	U
5	5	2426	U
5	5	2433	G
5	5	2434	G
5	5	2438	A
5	5	2439	G
5	5	2440	U
5	5	2441	C
5	5	2442	G
5	5	2443	G
5	5	2448	G
5	5	2450	G
5	5	2463	G
5	5	2465	C
5	5	2467	U
5	5	2469	C
5	5	2470	C
5	5	2471	G
5	5	2474	G
5	5	2475	G
5	5	2476	G
5	5	2487	G
5	5	2488	C
5	5	2489	C
5	5	2490	U
5	5	2491	C
5	5	2499	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2503	G
5	5	2504	C
5	5	2505	C
5	5	2506	G
5	5	2507	A
5	5	2508	U
5	5	2511	A
5	5	2512	A
5	5	2513	A
5	5	2520	C
5	5	2529	A
5	5	2530	U
5	5	2537	A
5	5	2544	G
5	5	2546	G
5	5	2547	G
5	5	2549	G
5	5	2553	A
5	5	2554	U
5	5	2555	G
5	5	2560	C
5	5	2566	G
5	5	2571	C
5	5	2572	C
5	5	2577	C
5	5	2578	G
5	5	2583	C
5	5	2587	A
5	5	2588	C
5	5	2589	C
5	5	2600	A
5	5	2602	G
5	5	2627	C
5	5	2630	U
5	5	2638	G
5	5	2639	U
5	5	2658	G
5	5	2661	U
5	5	2662	G
5	5	2666	U
5	5	2670	C
5	5	2673	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2674	A
5	5	2675	G
5	5	2676	A
5	5	2677	G
5	5	2686	G
5	5	2687	U
5	5	2688	G
5	5	2689	C
5	5	2694	G
5	5	2695	A
5	5	2696	A
5	5	2701	U
5	5	2704	C
5	5	2710	C
5	5	2711	G
5	5	2712	G
5	5	2713	C
5	5	2716	C
5	5	2725	A
5	5	2726	G
5	5	2737	C
5	5	2740	U
5	5	2742	G
5	5	2743	A
5	5	2744	A
5	5	2752	G
5	5	2753	G
5	5	2754	G
5	5	2756	G
5	5	2760	G
5	5	2761	U
5	5	2762	G
5	5	2763	U
5	5	2765	A
5	5	2766	A
5	5	2767	U
5	5	2768	C
5	5	2769	U
5	5	2770	C
5	5	2783	A
5	5	2787	A
5	5	2788	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2789	A
5	5	2798	A
5	5	2799	G
5	5	2807	A
5	5	2813	A
5	5	2814	C
5	5	2818	C
5	5	2822	G
5	5	2824	C
5	5	2826	U
5	5	2828	U
5	5	2829	U
5	5	2833	A
5	5	2834	C
5	5	2835	A
5	5	2838	G
5	5	2841	G
5	5	2842	G
5	5	2848	G
5	5	2849	A
5	5	2854	G
5	5	2855	G
5	5	2858	A
5	5	2859	G
5	5	2860	C
5	5	2867	C
5	5	2892	C
5	5	2896	G
5	5	2897	G
5	5	2898	G
5	5	2904	U
5	5	2905	C
5	5	3591	C
5	5	3593	C
5	5	3594	C
5	5	3595	U
5	5	3596	A
5	5	3597	G
5	5	3604	A
5	5	3605	C
5	5	3606	U
5	5	3611	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	3615	G
5	5	3616	U
5	5	3617	G
5	5	3625	G
5	5	3626	G
5	5	3627	G
5	5	3630	A
5	5	3635	A
5	5	3644	U
5	5	3657	U
5	5	3658	C
5	5	3662	A
5	5	3671	G
5	5	3673	C
5	5	3674	G
5	5	3680	U
5	5	3681	G
5	5	3688	U
5	5	3692	A
5	5	3696	C
5	5	3698	G
5	5	3701	C
5	5	3709	U
5	5	3711	A
5	5	3712	A
5	5	3713	U
5	5	3715	U
5	5	3717	A
5	5	3718	A
5	5	3729	U
5	5	3736	A
5	5	3737	A
5	5	3748	A
5	5	3753	G
5	5	3754	G
5	5	3759	A
5	5	3760	A
5	5	3765	G
5	5	3769	C
5	5	3770	U
5	5	3773	U
5	5	3774	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	3776	G
5	5	3777	G
5	5	3784	A
5	5	3785	A
5	5	3786	U
5	5	3791	C
5	5	3792	G
5	5	3799	A
5	5	3811	G
5	5	3813	A
5	5	3814	U
5	5	3817	A
5	5	3819	G
5	5	3822	U
5	5	3831	U
5	5	3838	U
5	5	3840	U
5	5	3851	U
5	5	3867	A
5	5	3868	G
5	5	3876	A
5	5	3877	A
5	5	3878	C
5	5	3879	G
5	5	3880	G
5	5	3881	G
5	5	3889	G
5	5	3895	G
5	5	3897	G
5	5	3900	G
5	5	3901	A
5	5	3902	A
5	5	3905	A
5	5	3906	A
5	5	3907	G
5	5	3912	U
5	5	3913	G
5	5	3915	U
5	5	3916	G
5	5	3917	A
5	5	3918	G
5	5	3923	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	3926	C
5	5	3938	G
5	5	3939	G
5	5	3943	A
5	5	4069	U
5	5	4070	U
5	5	4073	A
5	5	4075	U
5	5	4076	G
5	5	4084	G
5	5	4085	A
5	5	4086	G
5	5	4088	C
5	5	4089	G
5	5	4091	G
5	5	4092	G
5	5	4093	G
5	5	4095	G
5	5	4104	G
5	5	4105	A
5	5	4107	G
5	5	4114	C
5	5	4115	G
5	5	4116	C
5	5	4117	U
5	5	4118	U
5	5	4119	C
5	5	4120	U
5	5	4121	G
5	5	4122	G
5	5	4125	C
5	5	4126	C
5	5	4127	A
5	5	4140	C
5	5	4143	G
5	5	4145	C
5	5	4151	G
5	5	4162	C
5	5	4164	C
5	5	4165	C
5	5	4166	G
5	5	4171	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4182	G
5	5	4183	G
5	5	4184	G
5	5	4191	G
5	5	4194	U
5	5	4195	G
5	5	4197	G
5	5	4199	C
5	5	4203	A
5	5	4205	A
5	5	4206	C
5	5	4209	G
5	5	4215	C
5	5	4217	G
5	5	4219	A
5	5	4222	G
5	5	4223	C
5	5	4225	G
5	5	4226	G
5	5	4228	G
5	5	4229	U
5	5	4230	C
5	5	4232	U
5	5	4233	A
5	5	4234	A
5	5	4235	G
5	5	4236	G
5	5	4239	A
5	5	4241	C
5	5	4243	C
5	5	4249	G
5	5	4251	A
5	5	4252	C
5	5	4254	G
5	5	4265	U
5	5	4268	A
5	5	4271	A
5	5	4276	G
5	5	4280	A
5	5	4281	A
5	5	4282	A
5	5	4288	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4290	U
5	5	4291	G
5	5	4297	G
5	5	4302	U
5	5	4305	G
5	5	4306	U
5	5	4312	U
5	5	4314	C
5	5	4317	A
5	5	4318	C
5	5	4319	C
5	5	4329	G
5	5	4330	G
5	5	4331	G
5	5	4332	C
5	5	4337	C
5	5	4338	G
5	5	4349	C
5	5	4350	C
5	5	4354	U
5	5	4356	G
5	5	4360	U
5	5	4364	G
5	5	4368	G
5	5	4372	U
5	5	4373	G
5	5	4376	A
5	5	4377	G
5	5	4378	A
5	5	4379	A
5	5	4387	C
5	5	4391	G
5	5	4394	A
5	5	4396	A
5	5	4401	G
5	5	4405	G
5	5	4419	U
5	5	4422	A
5	5	4426	C
5	5	4437	U
5	5	4438	U
5	5	4440	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4444	C
5	5	4448	G
5	5	4449	A
5	5	4450	U
5	5	4452	U
5	5	4453	C
5	5	4463	U
5	5	4464	A
5	5	4465	U
5	5	4466	C
5	5	4467	A
5	5	4473	A
5	5	4475	G
5	5	4476	C
5	5	4482	U
5	5	4488	A
5	5	4489	G
5	5	4500	U
5	5	4510	A
5	5	4512	U
5	5	4513	A
5	5	4518	A
5	5	4519	C
5	5	4520	G
5	5	4522	G
5	5	4523	A
5	5	4524	G
5	5	4528	G
5	5	4529	G
5	5	4530	U
5	5	4531	U
5	5	4534	G
5	5	4537	C
5	5	4548	A
5	5	4549	G
5	5	4550	G
5	5	4557	U
5	5	4559	A
5	5	4567	G
5	5	4569	U
5	5	4570	G
5	5	4572	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4575	G
5	5	4586	G
5	5	4590	A
5	5	4600	G
5	5	4605	A
5	5	4606	G
5	5	4617	G
5	5	4624	A
5	5	4636	U
5	5	4637	G
5	5	4646	U
5	5	4647	G
5	5	4648	A
5	5	4652	G
5	5	4656	A
5	5	4657	U
5	5	4661	G
5	5	4670	C
5	5	4671	C
5	5	4672	A
5	5	4693	C
5	5	4694	G
5	5	4695	C
5	5	4700	A
5	5	4703	U
5	5	4709	U
5	5	4714	C
5	5	4720	C
5	5	4729	A
5	5	4730	C
5	5	4731	G
5	5	4732	G
5	5	4733	C
5	5	4734	A
5	5	4736	C
5	5	4737	G
5	5	4739	C
5	5	4743	G
5	5	4745	G
5	5	4746	C
5	5	4748	U
5	5	4749	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4750	G
5	5	4751	G
5	5	4752	U
5	5	4753	U
5	5	4756	C
5	5	4757	C
5	5	4758	U
5	5	4760	G
5	5	4763	U
5	5	4764	A
5	5	4767	C
5	5	4770	U
5	5	4771	C
5	5	4860	G
5	5	4865	C
5	5	4869	U
5	5	4870	G
5	5	4871	C
5	5	4872	G
5	5	4873	G
5	5	4874	A
5	5	4875	G
5	5	4876	U
5	5	4877	G
5	5	4878	C
5	5	4881	U
5	5	4882	U
5	5	4883	C
5	5	4884	G
5	5	4886	C
5	5	4888	U
5	5	4889	G
5	5	4890	G
5	5	4891	G
5	5	4893	A
5	5	4895	C
5	5	4896	G
5	5	4898	G
5	5	4900	C
5	5	4901	G
5	5	4903	G
5	5	4906	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	4910	G
5	5	4911	A
5	5	4912	G
5	5	4913	G
5	5	4915	G
5	5	4926	C
5	5	4927	G
5	5	4930	C
5	5	4932	U
5	5	4936	G
5	5	4938	A
5	5	4942	C
5	5	4945	G
5	5	4948	C
5	5	4949	G
5	5	4950	U
5	5	4951	G
5	5	4952	G
5	5	4956	A
5	5	4957	C
5	5	4959	U
5	5	4960	G
5	5	4961	G
5	5	4963	G
5	5	4964	C
5	5	4965	U
5	5	4966	A
5	5	4967	A
5	5	4975	G
5	5	4977	A
5	5	4979	A
5	5	4981	G
5	5	4985	U
5	5	4988	U
5	5	4989	U
5	5	4990	C
5	5	4991	U
5	5	4992	G
5	5	4993	G
5	5	4999	G
5	5	5002	U
5	5	5005	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	5006	U
5	5	5013	C
5	5	5014	A
5	5	5016	A
5	5	5017	G
5	5	5018	C
5	5	5020	G
5	5	5022	U
5	5	5023	C
5	5	5032	C
5	5	5035	U
5	5	5039	U
5	5	5040	U
5	5	5041	G
5	5	5044	A
5	5	5045	G
5	5	5047	C
5	5	5050	C
5	5	5053	U
5	5	5054	C
5	5	5055	G
5	5	5058	A
5	5	5061	A
5	5	5062	G
7	7	7	G
7	7	13	A
7	7	17	C
7	7	22	A
7	7	23	A
7	7	24	C
7	7	30	C
7	7	53	U
7	7	54	A
7	7	57	C
7	7	60	G
7	7	63	C
7	7	64	G
7	7	69	U
7	7	70	G
7	7	73	U
7	7	80	U
7	7	90	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
7	7	91	C
7	7	97	G
7	7	100	A
7	7	102	U
7	7	105	C
7	7	106	G
7	7	110	G
7	7	112	U
7	7	120	U
8	8	2	G
8	8	3	A
8	8	23	C
8	8	34	U
8	8	35	C
8	8	37	A
8	8	38	U
8	8	39	G
8	8	48	A
8	8	51	U
8	8	57	C
8	8	59	A
8	8	61	A
8	8	62	A
8	8	63	U
8	8	70	G
8	8	71	A
8	8	74	U
8	8	75	G
8	8	79	G
8	8	80	A
8	8	81	C
8	8	82	A
8	8	83	C
8	8	84	A
8	8	85	U
8	8	86	U
8	8	87	G
8	8	94	G
8	8	95	A
8	8	103	A
8	8	104	A
8	8	105	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
8	8	109	C
8	8	110	U
8	8	111	U
8	8	112	G
8	8	114	G
8	8	117	C
8	8	118	C
8	8	125	C
8	8	126	C
8	8	127	U
8	8	147	G
8	8	151	G
8	8	156	U

All (205) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	1	37	C
1	1	38	U
1	1	39	C
1	1	117	U
1	1	118	A
1	1	231	A
1	1	232	G
1	1	233	U
1	1	234	A
1	1	235	G
1	1	236	U
2	2	19	U
5	5	1	C
5	5	12	A
5	5	47	A
5	5	48	G
5	5	84	A
5	5	92	C
5	5	125	C
5	5	136	C
5	5	187	U
5	5	216	C
5	5	219	G
5	5	224	U
5	5	226	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	245	C
5	5	265	C
5	5	275	C
5	5	276	C
5	5	333	U
5	5	364	G
5	5	385	A
5	5	406	C
5	5	451	C
5	5	454	U
5	5	486	C
5	5	497	G
5	5	505	G
5	5	648	G
5	5	664	G
5	5	668	C
5	5	684	G
5	5	693	C
5	5	746	A
5	5	911	U
5	5	917	A
5	5	930	G
5	5	931	C
5	5	932	A
5	5	936	C
5	5	943	A
5	5	956	A
5	5	957	G
5	5	958	G
5	5	961	G
5	5	965	G
5	5	968	C
5	5	970	G
5	5	974	C
5	5	978	G
5	5	989	U
5	5	1211	G
5	5	1214	C
5	5	1232	G
5	5	1236	C
5	5	1238	A
5	5	1239	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	1266	G
5	5	1268	G
5	5	1279	A
5	5	1280	C
5	5	1281	G
5	5	1296	G
5	5	1324	A
5	5	1329	G
5	5	1356	U
5	5	1357	C
5	5	1365	C
5	5	1370	G
5	5	1397	A
5	5	1407	C
5	5	1410	U
5	5	1419	G
5	5	1440	U
5	5	1445	U
5	5	1455	G
5	5	1474	C
5	5	1480	C
5	5	1484	G
5	5	1500	A
5	5	1501	C
5	5	1633	G
5	5	1637	A
5	5	1696	C
5	5	1697	G
5	5	1724	G
5	5	1733	G
5	5	1804	A
5	5	1815	G
5	5	1835	G
5	5	1890	G
5	5	1921	C
5	5	1974	U
5	5	1975	G
5	5	2009	A
5	5	2046	G
5	5	2056	G
5	5	2068	C
5	5	2089	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2093	A
5	5	2096	G
5	5	2107	C
5	5	2116	C
5	5	2119	C
5	5	2122	G
5	5	2123	C
5	5	2124	G
5	5	2246	C
5	5	2251	G
5	5	2256	C
5	5	2257	C
5	5	2260	C
5	5	2262	G
5	5	2263	A
5	5	2265	G
5	5	2266	C
5	5	2268	A
5	5	2272	C
5	5	2278	G
5	5	2313	A
5	5	2361	G
5	5	2389	A
5	5	2396	A
5	5	2398	U
5	5	2438	A
5	5	2468	U
5	5	2474	G
5	5	2487	G
5	5	2502	G
5	5	2506	G
5	5	2546	G
5	5	2554	U
5	5	2588	C
5	5	2661	U
5	5	2695	A
5	5	2708	U
5	5	2768	C
5	5	2769	U
5	5	2782	U
5	5	2828	U
5	5	2833	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	5	2848	G
5	5	3625	G
5	5	3673	C
5	5	3697	U
5	5	3716	C
5	5	3773	U
5	5	3790	U
5	5	3791	C
5	5	3876	A
5	5	3888	G
5	5	3901	A
5	5	4069	U
5	5	4075	U
5	5	4084	G
5	5	4119	C
5	5	4121	G
5	5	4124	G
5	5	4170	A
5	5	4194	U
5	5	4232	U
5	5	4404	U
5	5	4448	G
5	5	4449	A
5	5	4452	U
5	5	4463	U
5	5	4464	A
5	5	4528	G
5	5	4656	A
5	5	4670	C
5	5	4693	C
5	5	4699	U
5	5	4719	G
5	5	4730	C
5	5	4885	U
5	5	4887	C
5	5	4888	U
5	5	4889	G
5	5	4900	C
5	5	4909	A
5	5	4935	C
5	5	4948	C
5	5	4951	G

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Mol	Chain	Res	Type
5	5	5022	U
5	5	5054	C
5	5	5060	A
5	5	5061	A
7	7	56	G
7	7	72	U
8	8	34	U
8	8	60	G
8	8	94	G
8	8	124	U
8	8	125	C
8	8	126	C

## 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](#)

Of 139 ligands modelled in this entry, 136 are monoatomic - leaving 3 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
62	GNP	x	601	59	29,34,34	1.65	8 (27%)	33,54,54	2.13	6 (18%)
62	GNP	y	701	59	29,34,34	1.52	7 (24%)	33,54,54	2.22	8 (24%)
61	GTP	v	302	59,54	26,34,34	1.05	2 (7%)	32,54,54	1.64	8 (25%)

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
62	GNP	x	601	59	-	2/14/38/38	0/3/3/3
62	GNP	y	701	59	-	8/14/38/38	0/3/3/3
61	GTP	v	302	59,54	-	0/18/38/38	0/3/3/3

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
62	x	601	GNP	PG-O1G	4.49	1.53	1.46
62	x	601	GNP	PB-O3A	3.57	1.63	1.59
62	y	701	GNP	C6-N1	3.56	1.39	1.33
62	y	701	GNP	PB-O3A	3.44	1.63	1.59
61	v	302	GTP	C5-C6	-3.42	1.40	1.47
62	x	601	GNP	C6-N1	3.35	1.38	1.33
62	y	701	GNP	PB-O1B	2.98	1.50	1.46
62	y	701	GNP	PG-O1G	2.75	1.50	1.46
62	x	601	GNP	PB-O1B	2.58	1.50	1.46
61	v	302	GTP	C2-N3	2.57	1.39	1.33
62	x	601	GNP	PB-O2B	-2.31	1.50	1.56
62	y	701	GNP	PB-O2B	-2.28	1.50	1.56
62	y	701	GNP	PG-N3B	2.26	1.69	1.63
62	x	601	GNP	PG-N3B	2.24	1.69	1.63
62	y	701	GNP	C5-C6	2.22	1.45	1.41
62	x	601	GNP	C5-C6	2.19	1.45	1.41
62	x	601	GNP	PG-O2G	-2.14	1.51	1.56

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
62	y	701	GNP	C5-C6-N1	-8.63	111.63	123.43
62	x	601	GNP	C5-C6-N1	-8.47	111.84	123.43
62	y	701	GNP	C2-N1-C6	6.05	125.54	115.93
62	x	601	GNP	C2-N1-C6	5.94	125.36	115.93
61	v	302	GTP	C5-C6-N1	3.79	120.65	113.95
61	v	302	GTP	C8-N7-C5	3.32	109.31	102.99
61	v	302	GTP	C3'-C2'-C1'	3.03	105.54	100.98
61	v	302	GTP	PB-O3B-PG	-2.89	122.91	132.83
61	v	302	GTP	N1-C2-N3	-2.80	118.08	123.32
62	x	601	GNP	C4-C5-C6	-2.78	118.14	120.80
62	x	601	GNP	N3-C2-N1	-2.75	123.56	127.22
62	y	701	GNP	N3-C2-N1	-2.74	123.57	127.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
62	y	701	GNP	C4-C5-C6	-2.71	118.21	120.80
62	y	701	GNP	PB-O3A-PA	-2.64	123.33	132.62
61	v	302	GTP	PA-O3A-PB	-2.56	124.04	132.83
61	v	302	GTP	C2-N1-C6	-2.55	120.41	125.10
62	x	601	GNP	O1B-PB-N3B	-2.30	108.39	111.77
62	y	701	GNP	O1G-PG-N3B	-2.25	108.45	111.77
62	y	701	GNP	O3G-PG-O1G	-2.24	107.83	113.45
62	y	701	GNP	C2-N3-C4	-2.20	112.85	115.36
61	v	302	GTP	O6-C6-C5	-2.18	120.12	124.37
62	x	601	GNP	C2-N3-C4	-2.14	112.91	115.36

There are no chirality outliers.

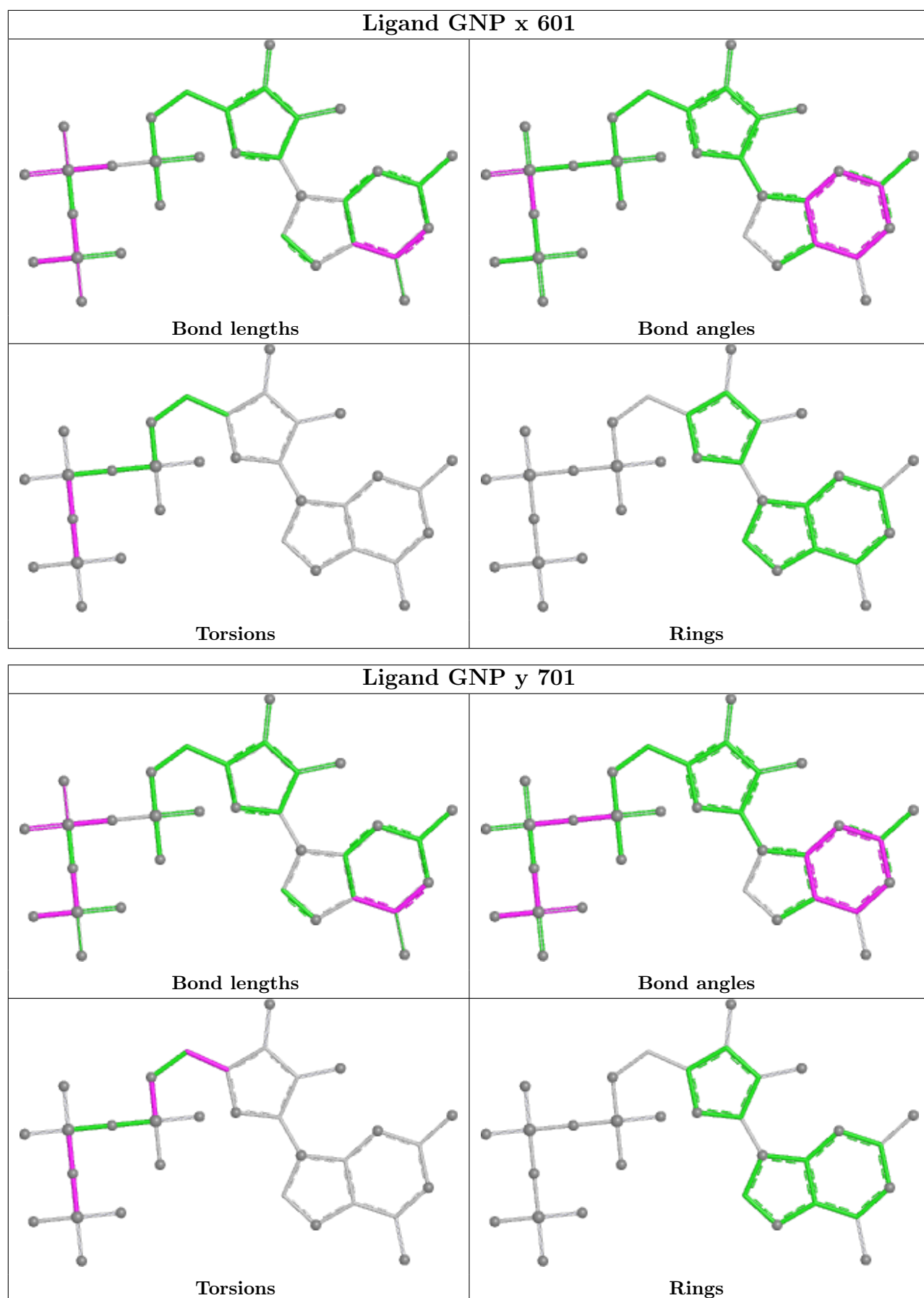
All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
62	x	601	GNP	PB-N3B-PG-O1G
62	x	601	GNP	PG-N3B-PB-O1B
62	y	701	GNP	PB-N3B-PG-O1G
62	y	701	GNP	PG-N3B-PB-O1B
62	y	701	GNP	C5'-O5'-PA-O3A
62	y	701	GNP	C3'-C4'-C5'-O5'
62	y	701	GNP	O4'-C4'-C5'-O5'
62	y	701	GNP	C5'-O5'-PA-O1A
62	y	701	GNP	C5'-O5'-PA-O2A
62	y	701	GNP	PG-N3B-PB-O3A

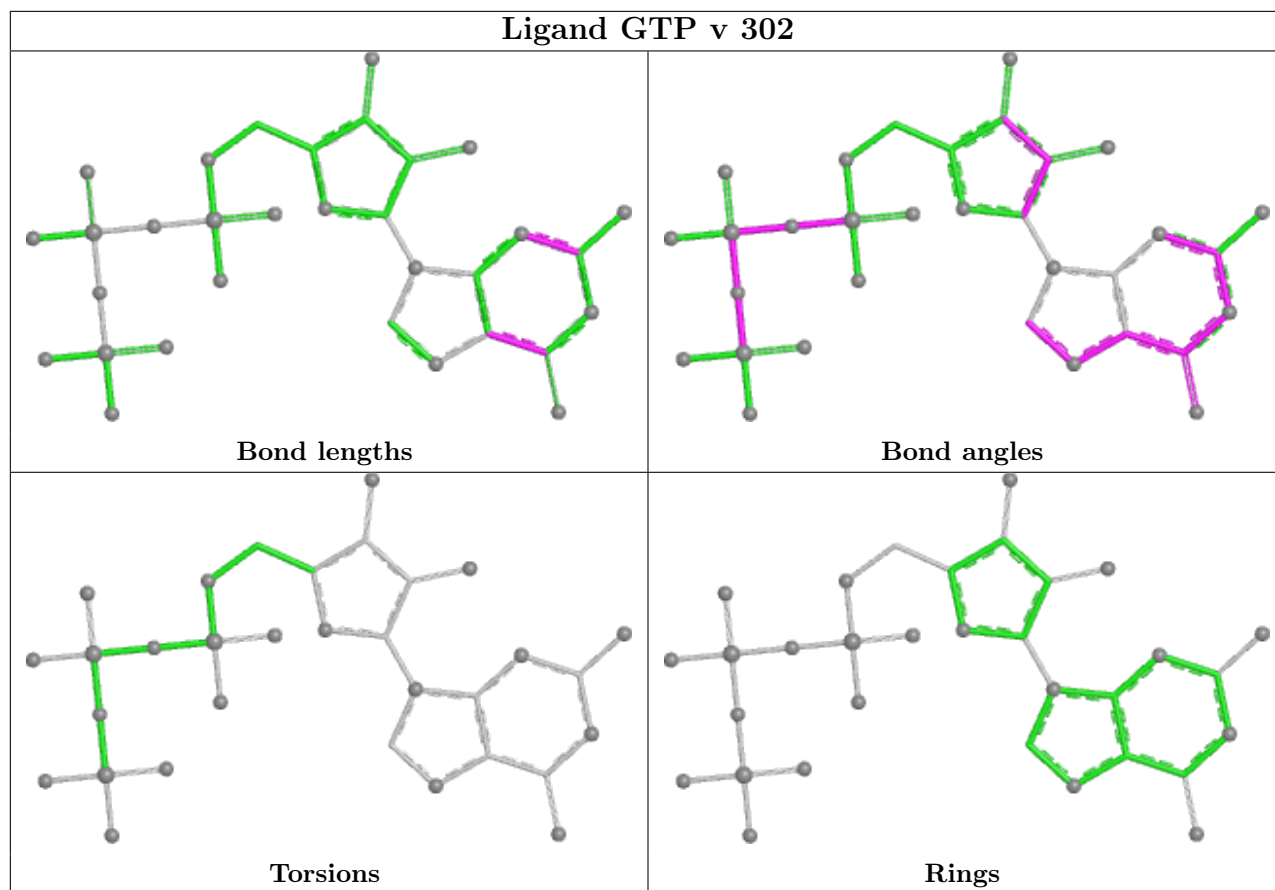
There are no ring outliers.

No monomer is involved in short contacts.

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







## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
5	5	13
13	E	1
2	2	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	E	72:ALA	C	84:VAL	N	24.42
1	5	4776:G	O3'	4859:C	P	17.73
1	5	757:G	O3'	906:C	P	17.30
1	5	519:C	O3'	642:G	P	16.88

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	5	2910:G	O3'	3583:U	P	16.78
1	5	2131:C	O3'	2243:C	P	15.12
1	5	3950:U	O3'	4065:G	P	14.33
1	5	997:C	O3'	1047:C	P	12.99
1	5	5023:C	O3'	5028:G	P	12.81
1	5	1051:G	O3'	1064:G	P	9.62
1	5	1699:A	O3'	1718:C	P	4.41
1	2	46:G	O3'	47:U	P	4.07
1	5	1222:A	O3'	1232:G	P	3.98
1	5	1100:U	O3'	1167:C	P	3.55
1	5	4942:C	O3'	4944:C	P	3.23

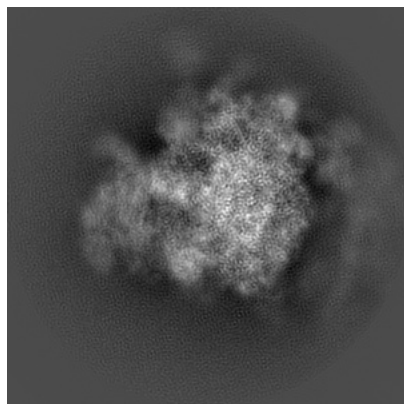
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4300. These allow visual inspection of the internal detail of the map and identification of artifacts.

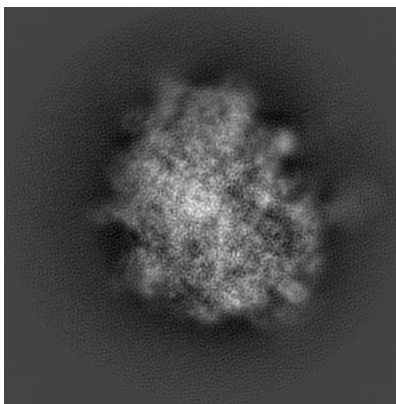
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

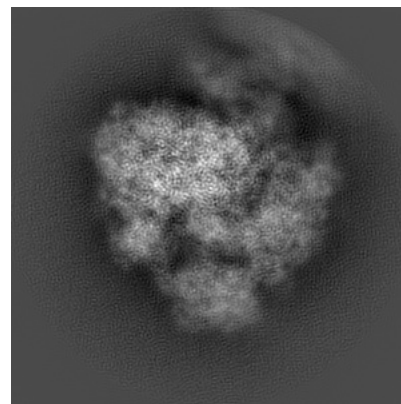
#### 6.1.1 Primary map



X

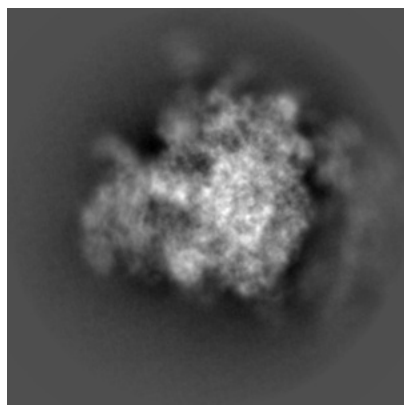


Y

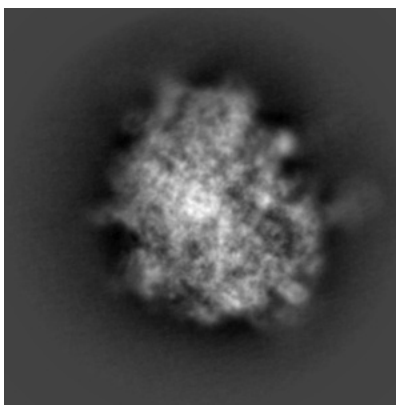


Z

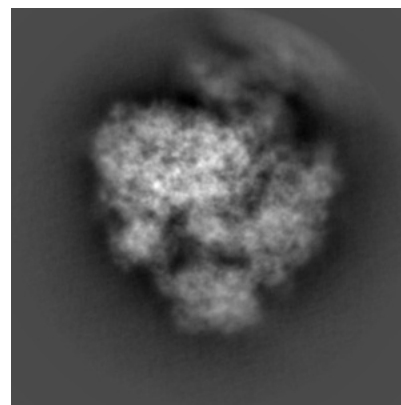
#### 6.1.2 Raw map



X



Y

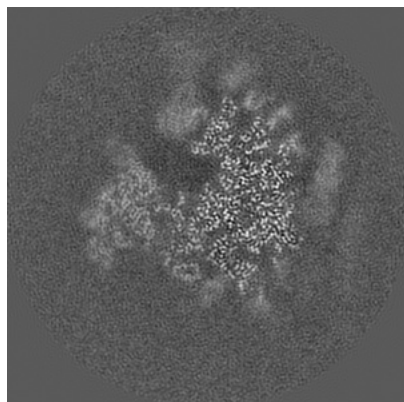


Z

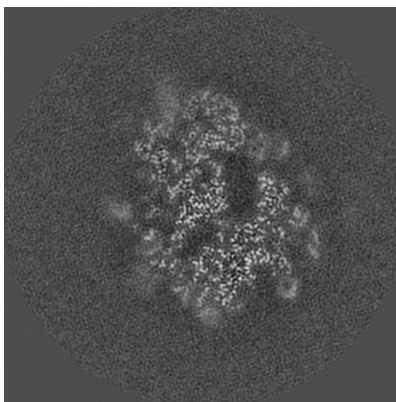
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

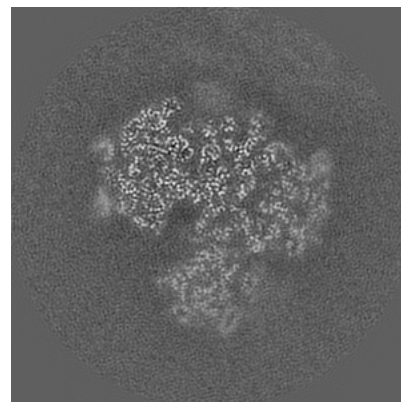
### 6.2.1 Primary map



X Index: 160

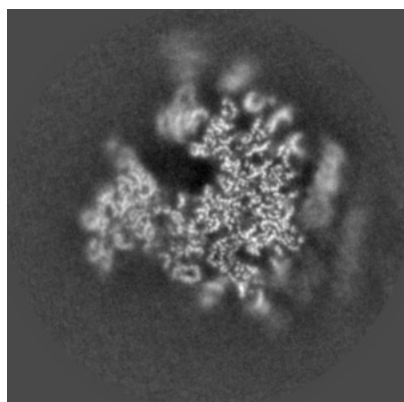


Y Index: 160

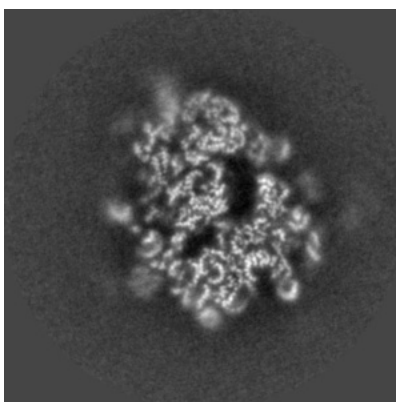


Z Index: 160

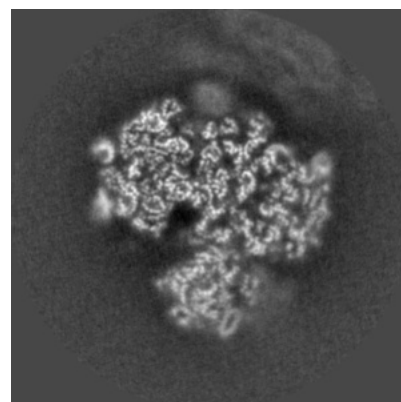
### 6.2.2 Raw map



X Index: 160



Y Index: 160

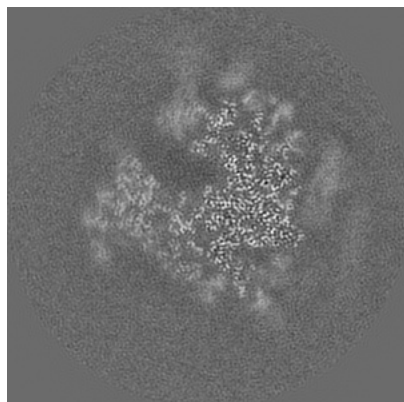


Z Index: 160

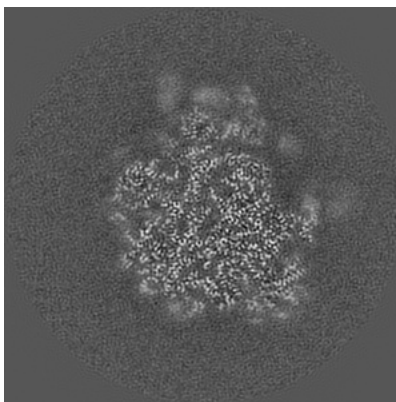
The images above show central slices of the map in three orthogonal directions.

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

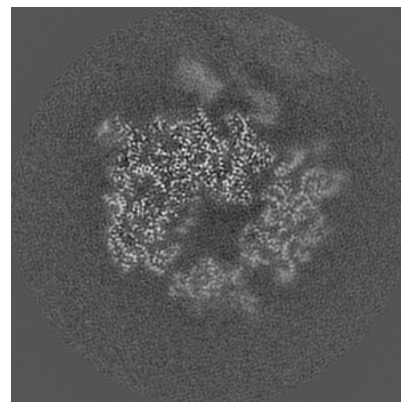
### 6.3.1 Primary map



X Index: 158

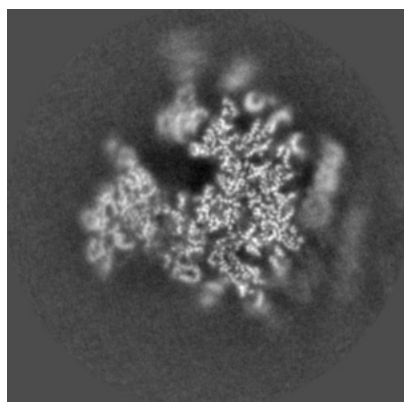


Y Index: 192

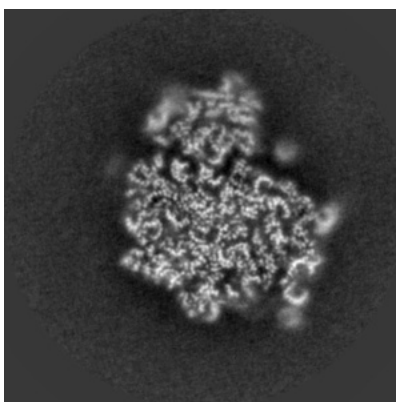


Z Index: 181

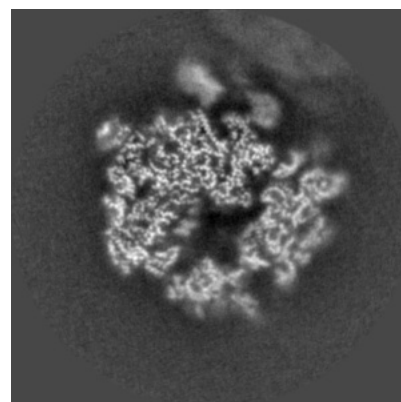
### 6.3.2 Raw map



X Index: 161



Y Index: 177

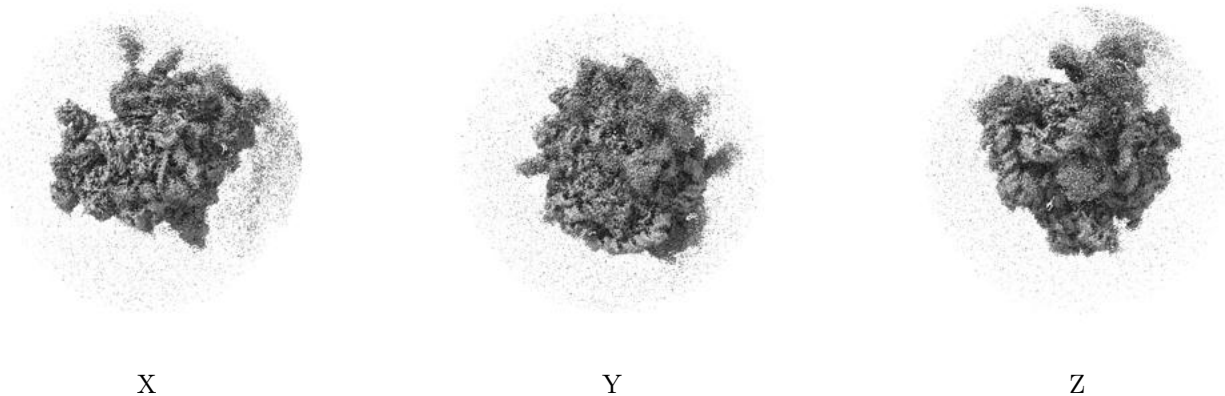


Z Index: 180

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

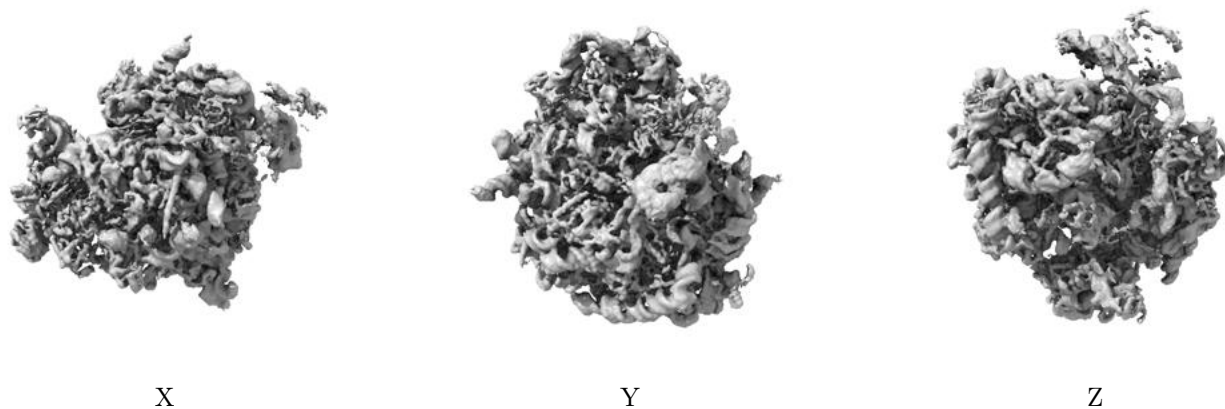
## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.064. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.4.2 Raw map



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

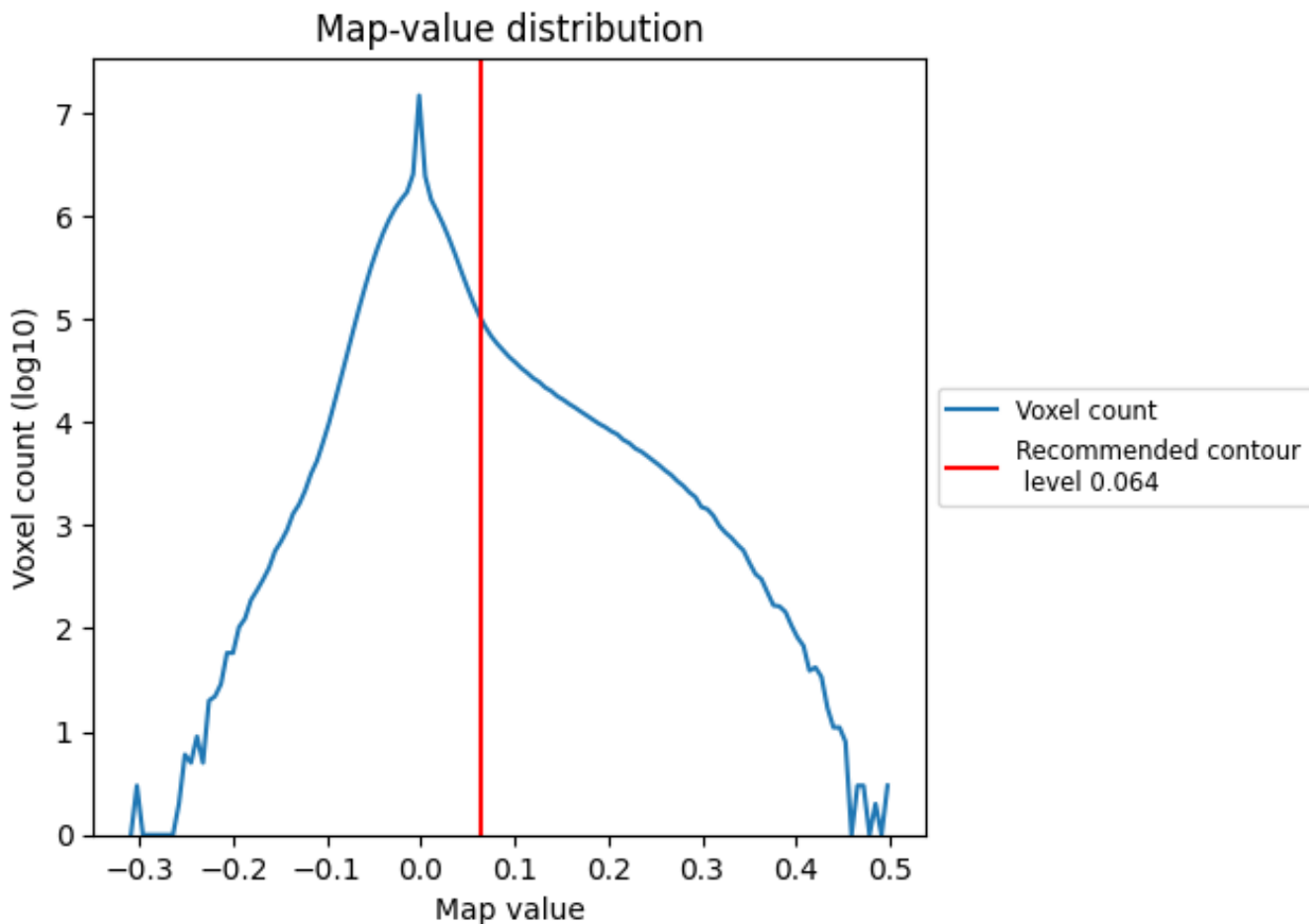
## 6.5 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

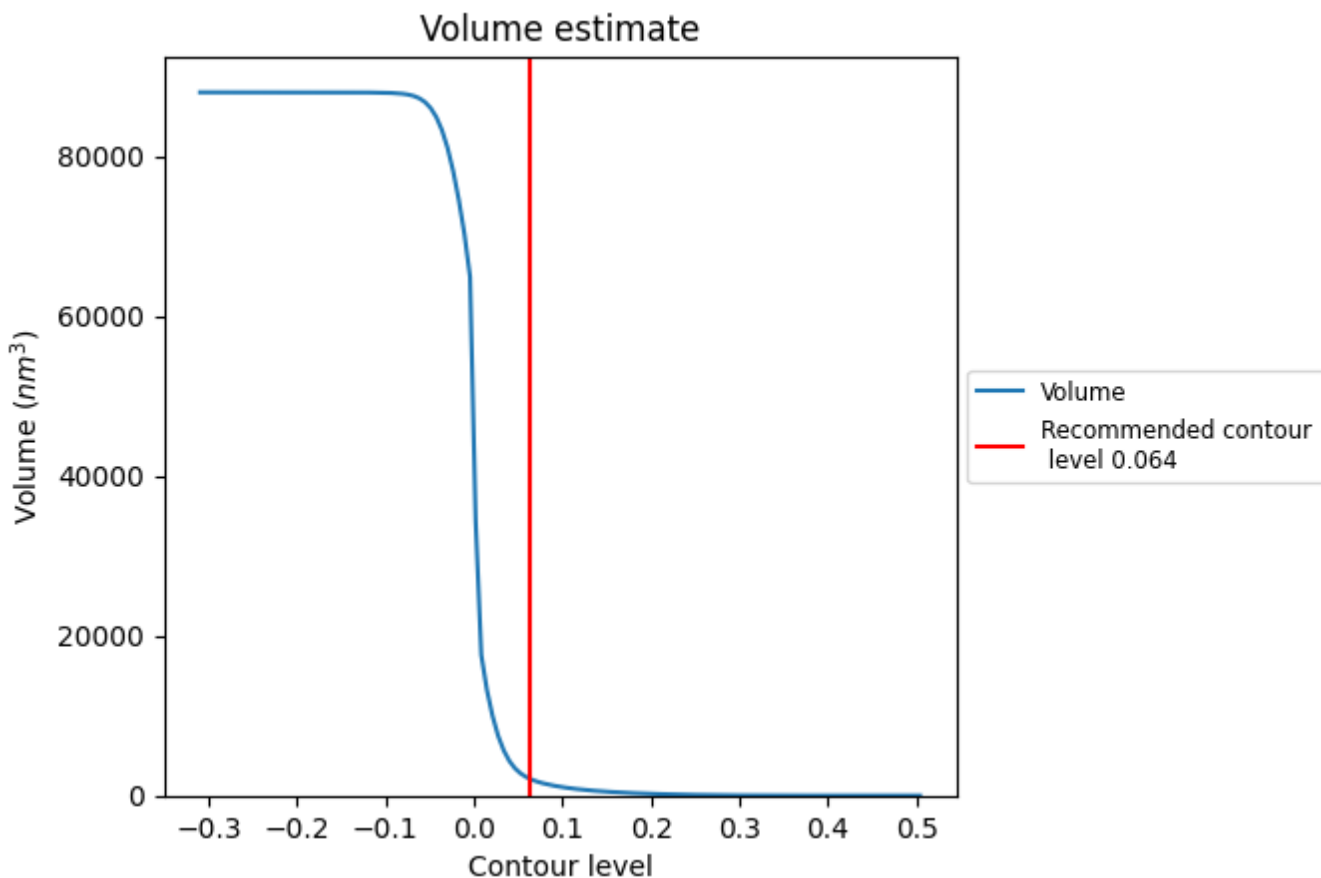
This section contains the results of statistical analysis of the map.

### 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 [\(i\)](#)

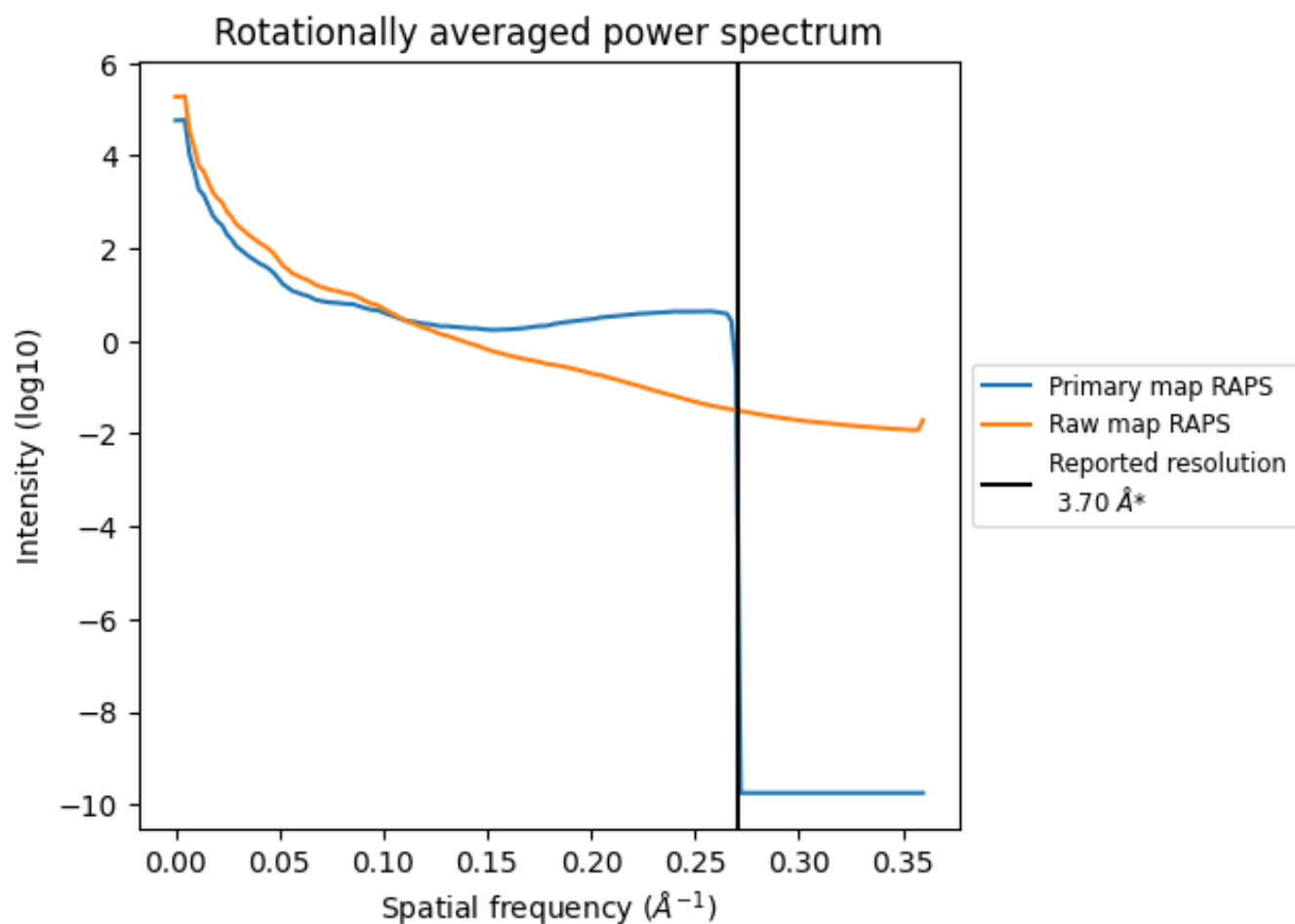


The volume at the recommended contour level is 2065  $\text{nm}^3$ ; this corresponds to an approximate mass of 1865 kDa.

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



### 7.3 Rotationally averaged power spectrum [i](#)

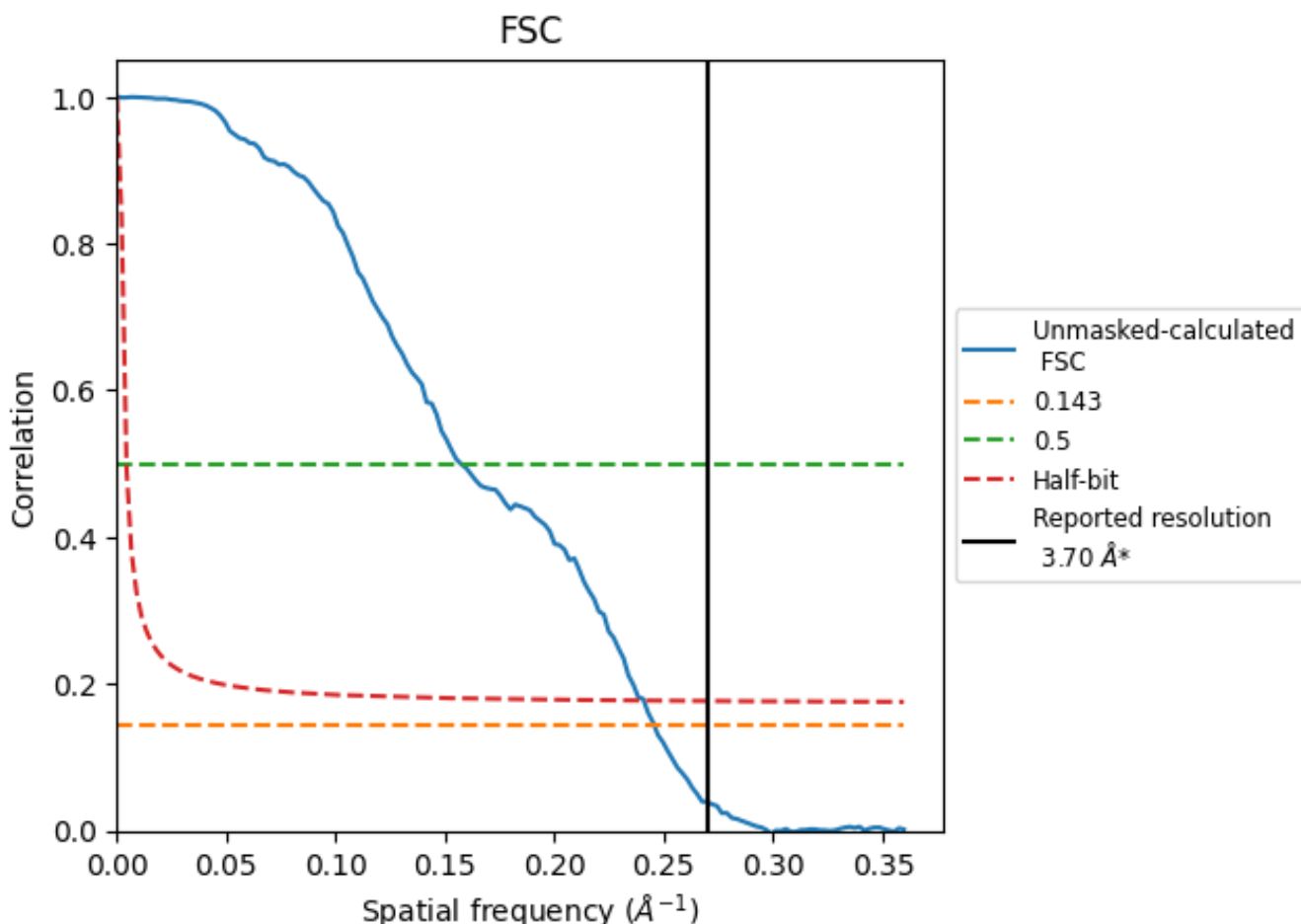


\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.270 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

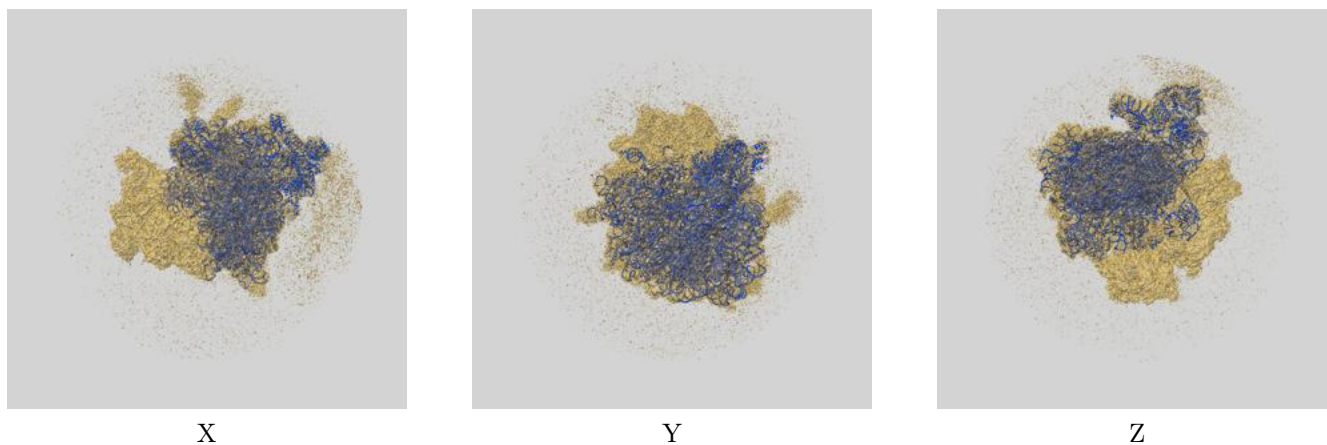
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.07	6.37	4.15

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.07 differs from the reported value 3.7 by more than 10 %

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

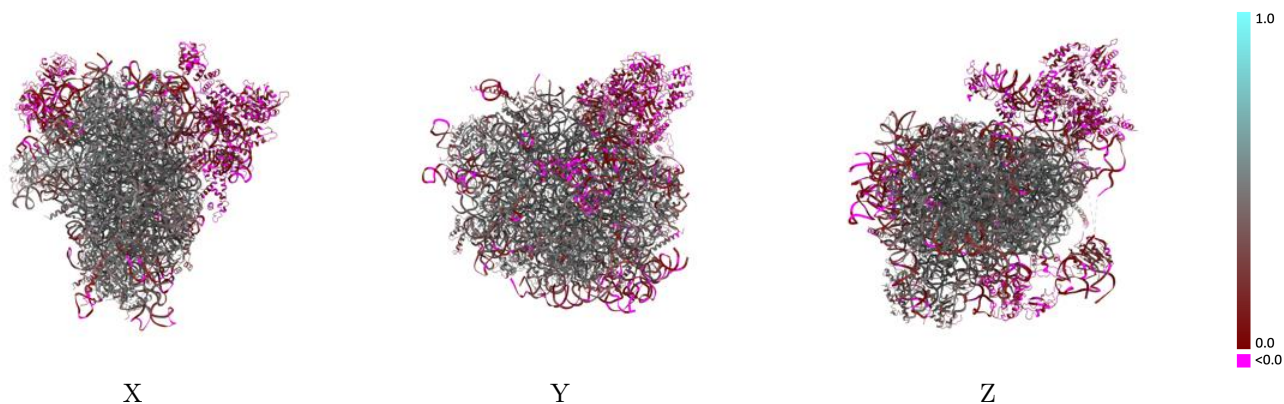
This section contains information regarding the fit between EMDB map EMD-4300 and PDB model 6FRK. Per-residue inclusion information can be found in section 3 on page 16.

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



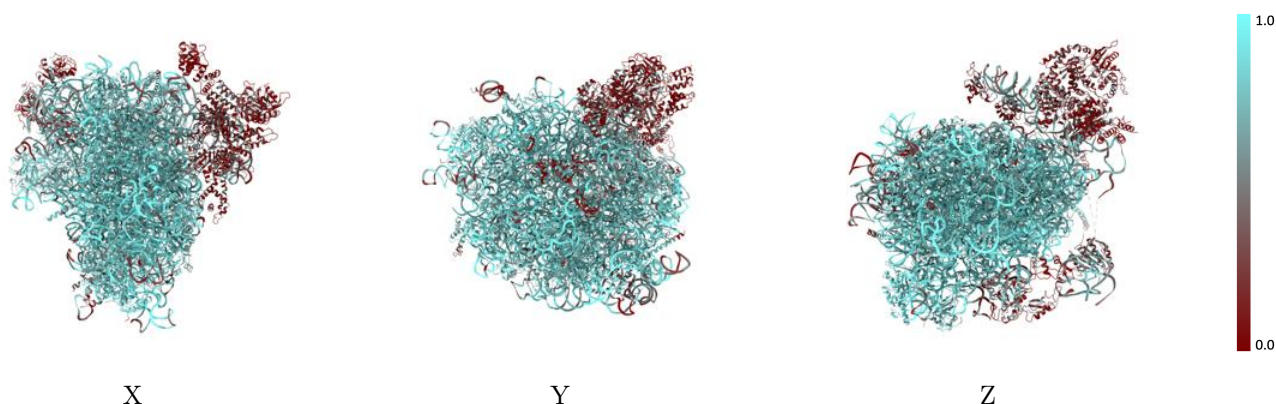
The images above show the 3D surface view of the map at the recommended contour level 0.064 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



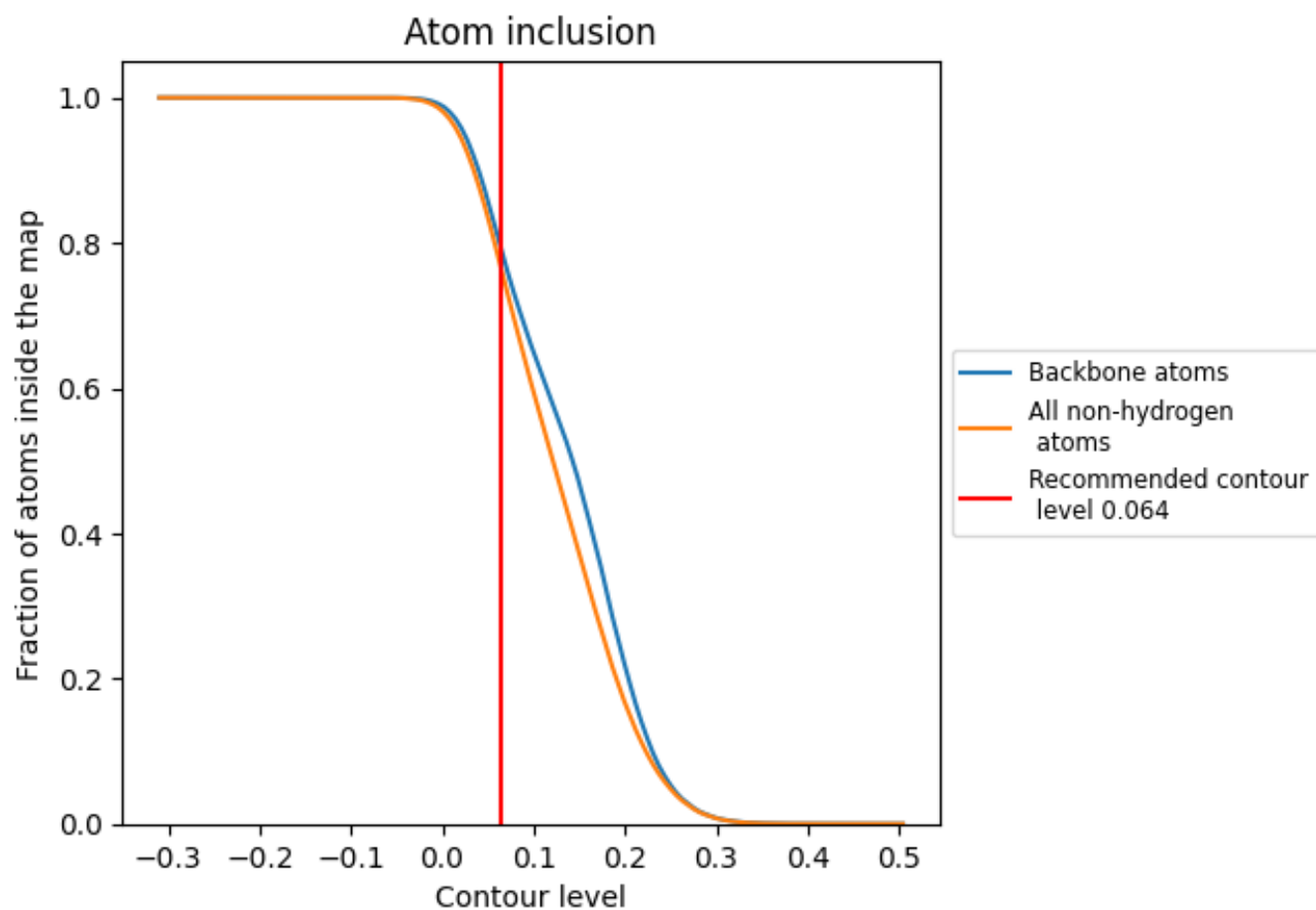
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.064).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 77% 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 (0.064) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7668	 0.3630
1	 0.5636	 0.0980
2	 0.7580	 0.3260
3	 0.8247	 0.4660
4	 0.1842	 0.0010
5	 0.8614	 0.3770
6	 0.2343	 0.0670
7	 0.9668	 0.4490
8	 0.8815	 0.3960
A	 0.8113	 0.4860
B	 0.7969	 0.4720
C	 0.8108	 0.4630
D	 0.8463	 0.4260
E	 0.7546	 0.3860
F	 0.8091	 0.4620
G	 0.7621	 0.4150
H	 0.8054	 0.4640
I	 0.7901	 0.4540
J	 0.7786	 0.4030
L	 0.7913	 0.4260
M	 0.8551	 0.4590
N	 0.8481	 0.4890
O	 0.8083	 0.4660
P	 0.7920	 0.4850
Q	 0.8150	 0.4780
R	 0.7370	 0.4040
S	 0.8414	 0.4830
T	 0.8100	 0.4690
U	 0.7063	 0.3710
V	 0.7693	 0.4790
W	 0.7485	 0.4350
X	 0.7629	 0.4450
Y	 0.8126	 0.4540
Z	 0.8276	 0.4370
a	 0.8707	 0.4870



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Chain	Atom inclusion	Q-score
b	 0.7306	 0.3950
c	 0.8154	 0.4460
d	 0.7048	 0.4350
e	 0.8220	 0.4760
f	 0.8492	 0.4890
g	 0.7747	 0.4510
h	 0.7790	 0.4280
i	 0.7982	 0.4230
j	 0.8576	 0.4810
k	 0.6786	 0.3830
l	 0.7683	 0.4710
m	 0.8029	 0.4590
n	 0.7363	 0.4400
o	 0.7736	 0.4430
p	 0.7602	 0.4670
q	 0.2293	 0.0270
r	 0.0863	 0.0610
t	 0.0455	 -0.0330
u	 0.2603	 0.0510
v	 0.1668	 0.0640
w	 0.3395	 0.2040
x	 0.2299	 0.1160
y	 0.1927	 0.0840
z	 0.4074	 0.2630