Full wwPDB EM Validation Report ⓘ

Jan 5, 2026 – 06:58 pm GMT

PDB ID	:	9HUS / pdb_00009hus
EMDB ID	:	EMD-52418
Title	:	Structure of WT E.coli ribosome with complexed filament nascent chain at length 31, with P-site tRNAs
Authors	:	Mitropoulou, A.; Wlodarski, T.; Plessa, E.; Cabrita, L.D.; Christodoulou, J.
Deposited on	:	2024-12-23
Resolution	:	2.40 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

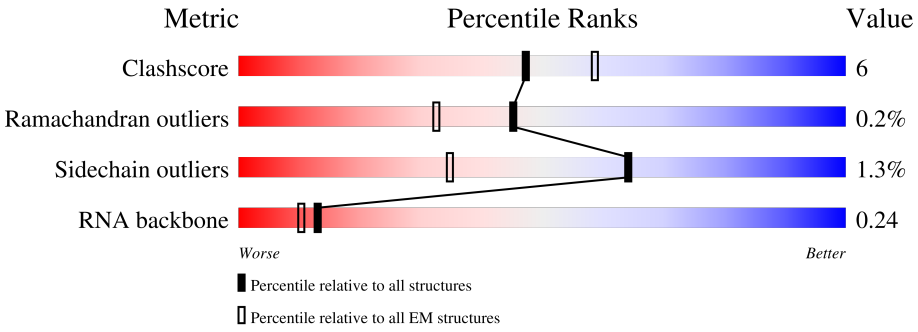
EMDB validation analysis	:	0.0.1.dev129
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

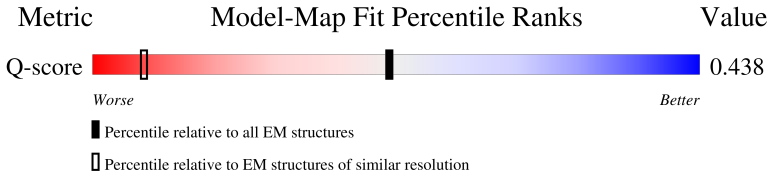
1 Overall quality at a glance

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

The reported resolution of this entry is 2.40 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	5628 (1.90 - 2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	0	78	85% 14%
2	1	63	13% 70% 27%
3	2	59	80% 17%

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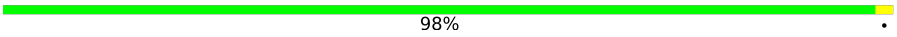
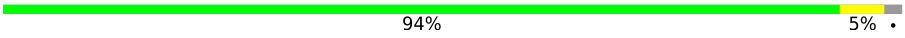
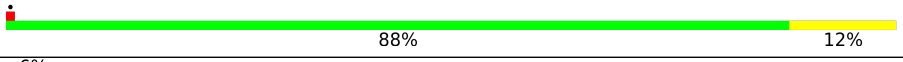
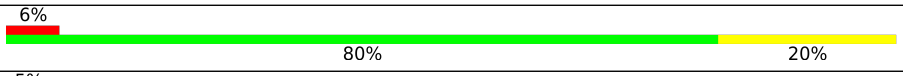
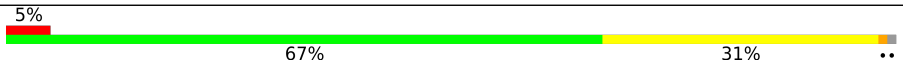
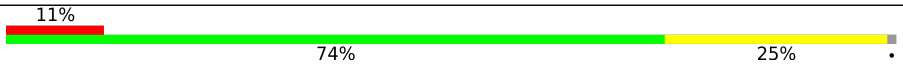
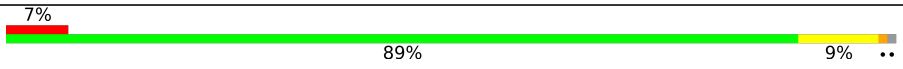
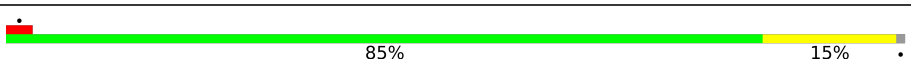
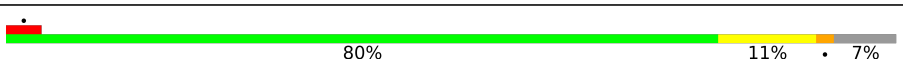
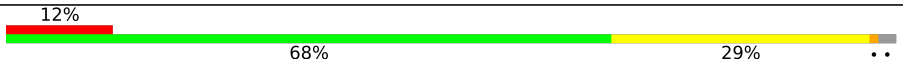
Mol	Chain	Length	Quality of chain
4	3	57	
5	4	55	
6	6	46	
7	7	65	
8	8	50	
9	a	120	
10	b	2904	
11	c	273	
12	d	209	
13	e	201	
14	f	179	
15	g	177	
16	h	149	
17	j	142	
18	k	123	
19	l	144	
20	m	136	
21	n	127	
22	o	117	
23	p	115	
24	q	118	
25	r	103	
26	s	110	
27	t	100	
28	u	104	

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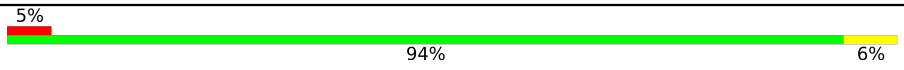
Mol	Chain	Length	Quality of chain
29	w	94	
30	y	85	
31	v	77	
32	z	148	

2 Entry composition

There are 32 unique types of molecules in this entry. The entry contains 90875 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	0	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 2 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	61	Total	C	N	O	S	0	0
			495	305	97	92	1		

- Molecule 3 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	57	Total	C	N	O	S	0	0
			439	276	86	75	2		

- Molecule 4 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	3	55	Total	C	N	O	S	0	0
			434	263	92	78	1		

- Molecule 5 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
5	4	50	Total	C	N	O	0	0
			409	263	75	71		

- Molecule 6 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	6	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 7 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	7	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 8 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	8	38	Total	C	N	O	S	0	0
			301	185	65	47	4		

- Molecule 9 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	a	118	Total	C	N	O	P	0	0
			2529	1126	464	821	118		

- Molecule 10 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	b	2901	Total	C	N	O	P	0	0
			62281	27784	11464	20132	2901		

- Molecule 11 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	c	271	Total	C	N	O	S	0	0
			2082	1288	423	364	7		

- Molecule 12 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	d	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 13 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	e	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 14 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	f	177	Total	C	N	O	S	0	0
			1410	899	249	256	6		

- Molecule 15 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	g	176	Total	C	N	O	S	0	0
			1323	832	243	246	2		

- Molecule 16 is a protein called Large ribosomal subunit protein bL9.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	h	39	Total	C	N	O	S	0	0
			287	184	51	51	1		

- Molecule 17 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	j	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 18 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	k	122	Total	C	N	O	S	0	0
			938	587	180	165	6		

- Molecule 19 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	l	143	Total	C	N	O	S	0	0
			1043	649	206	186	2		

- Molecule 20 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	m	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 21 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	n	120	Total	C	N	O	S	0	0
			960	593	196	166	5		

- Molecule 22 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	o	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 23 is a protein called Large ribosomal subunit protein bL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	p	113	Total	C	N	O	S	0	0
			908	570	177	160	1		

- Molecule 24 is a protein called Large ribosomal subunit protein bL20.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	q	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 25 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	r	102	Total	C	N	O	S	0	0
			810	513	152	143	2		

- Molecule 26 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	s	109	Total	C	N	O	S	0	0
			845	526	162	154	3		

- Molecule 27 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	t	93	Total	C	N	O	S	0	0
			738	466	139	131	2		

- Molecule 28 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	u	102	Total 779	C 492	N 146	O 141	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein bL25.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	w	94	Total 753	C 479	N 137	O 134	S 3	0	0

- Molecule 30 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	y	82	Total 619	C 383	N 127	O 108	S 1	0	0

- Molecule 31 is a RNA chain called P-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	v	77	Total 1646	C 733	N 295	O 541	P 77	0	0

- Molecule 32 is a protein called Gelation factor.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	z	20	Total 181	C 126	N 30	O 25	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
z	1	MET	-	initiating methionine	UNP P13466
z	2	HIS	-	expression tag	UNP P13466
z	3	HIS	-	expression tag	UNP P13466
z	4	HIS	-	expression tag	UNP P13466
z	5	HIS	-	expression tag	UNP P13466
z	6	HIS	-	expression tag	UNP P13466
z	7	HIS	-	expression tag	UNP P13466
z	8	ALA	-	expression tag	UNP P13466
z	9	SER	-	expression tag	UNP P13466
z	130	GLU	-	expression tag	UNP P13466
z	131	LEU	-	expression tag	UNP P13466
z	132	PHE	-	expression tag	UNP P13466
z	133	SER	-	expression tag	UNP P13466

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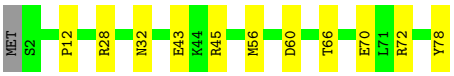
Chain	Residue	Modelled	Actual	Comment	Reference
z	134	THR	-	expression tag	UNP P13466
z	135	PRO	-	expression tag	UNP P13466
z	136	VAL	-	expression tag	UNP P13466
z	137	TRP	-	expression tag	UNP P13466
z	138	ILE	-	expression tag	UNP P13466
z	139	TRP	-	expression tag	UNP P13466
z	140	TRP	-	expression tag	UNP P13466
z	141	TRP	-	expression tag	UNP P13466
z	142	PRO	-	expression tag	UNP P13466
z	143	ARG	-	expression tag	UNP P13466
z	144	ILE	-	expression tag	UNP P13466
z	145	ARG	-	expression tag	UNP P13466
z	146	GLY	-	expression tag	UNP P13466
z	147	PRO	-	expression tag	UNP P13466
z	148	PRO	-	expression tag	UNP P13466

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.

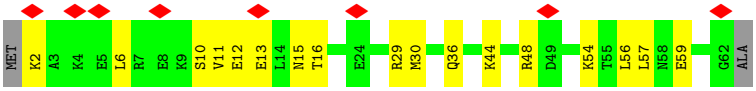
• Molecule 1: Large ribosomal subunit protein bL28

Chain 0:



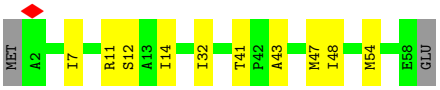
• Molecule 2: Large ribosomal subunit protein uL29

Chain 1:



• Molecule 3: Large ribosomal subunit protein uL30

Chain 2:

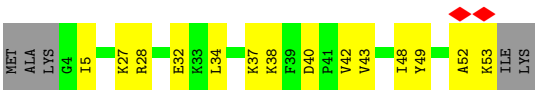


• Molecule 4: Large ribosomal subunit protein bL32

Chain 3:

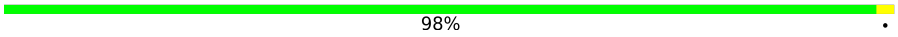
• Molecule 5: Large ribosomal subunit protein bL33

Chain 4:



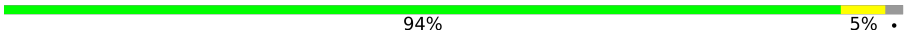
• Molecule 6: Large ribosomal subunit protein bL34

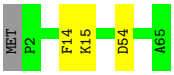
Chain 6:



• Molecule 7: Large ribosomal subunit protein bL35

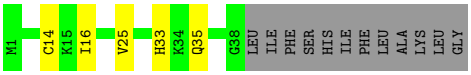
Chain 7:





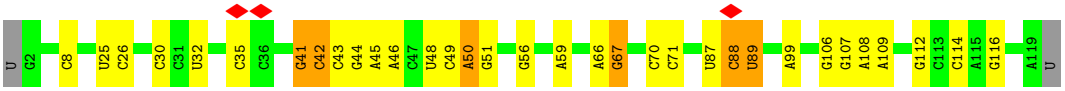
• Molecule 8: 50S ribosomal protein L36

Chain 8:



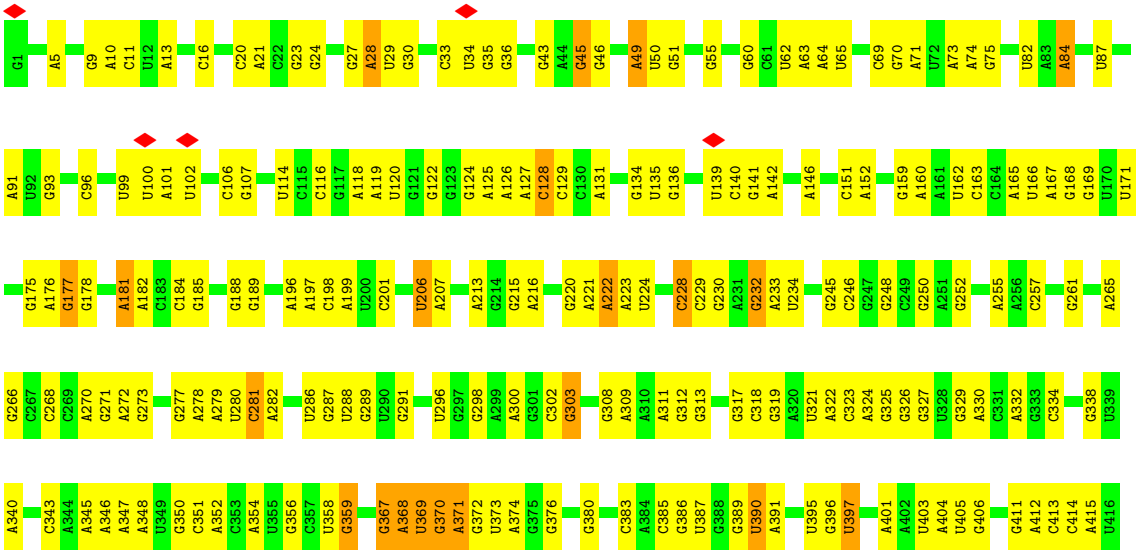
• Molecule 9: 5S rRNA

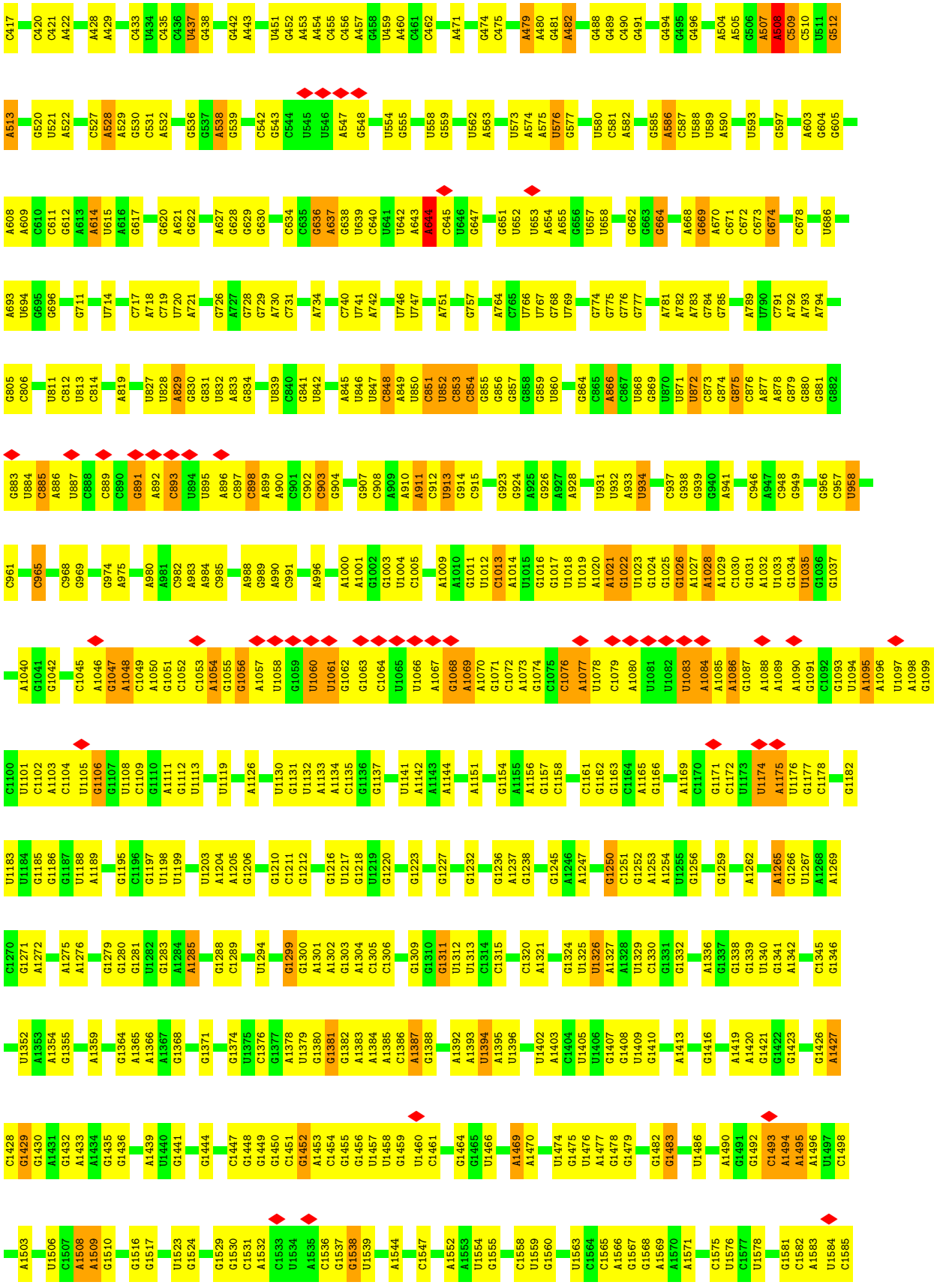
Chain a:

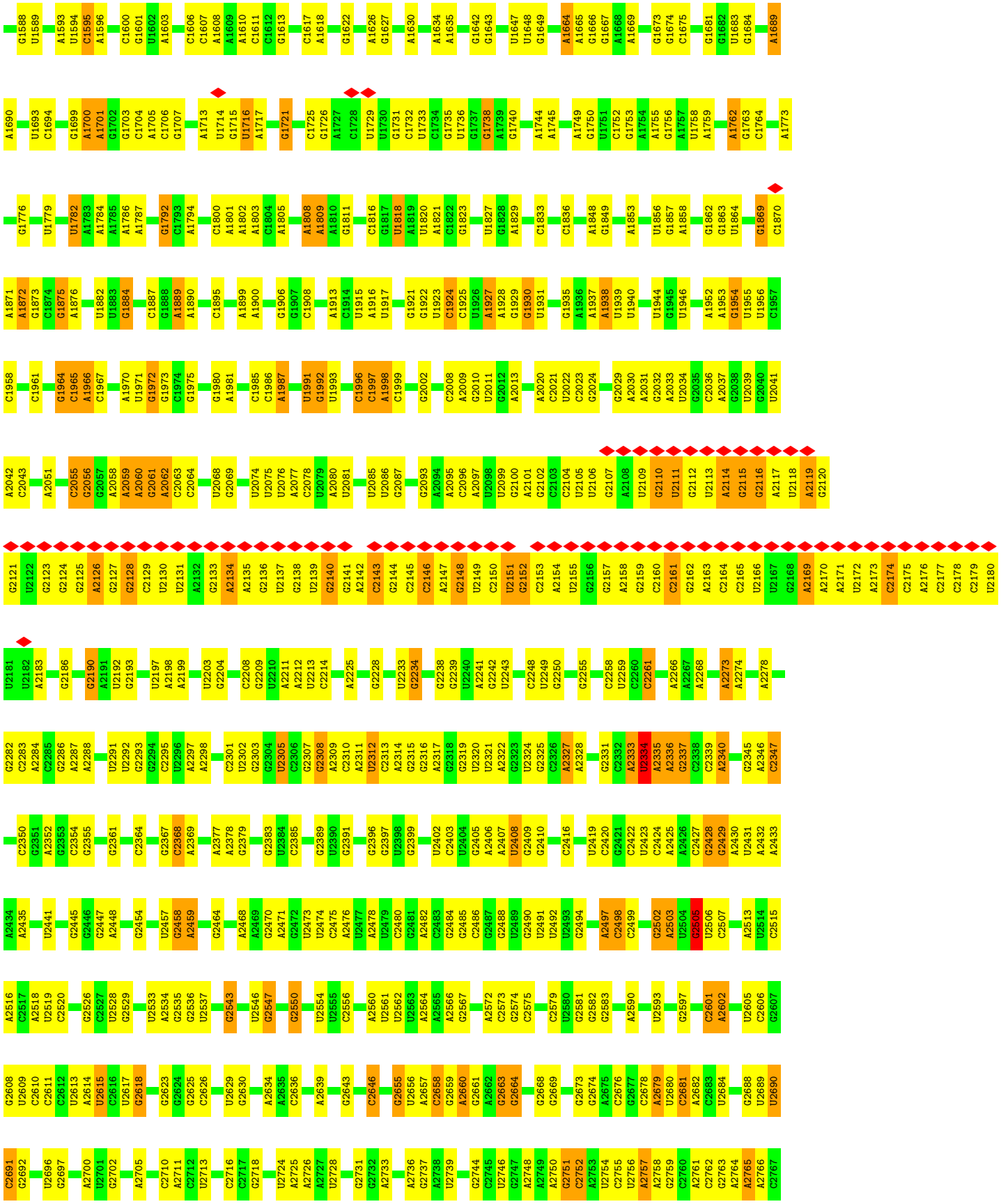


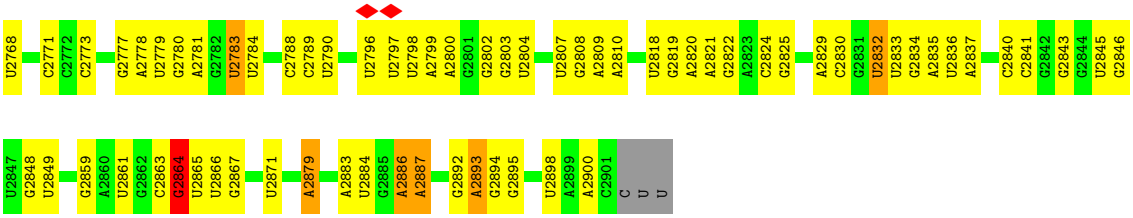
• Molecule 10: 23S rRNA

Chain b:

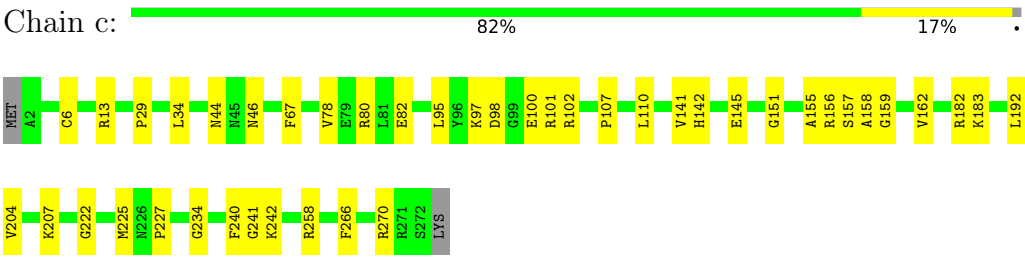




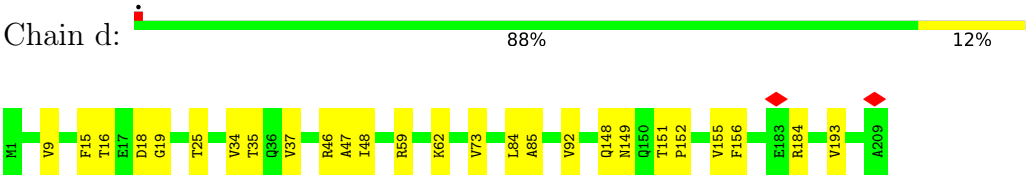




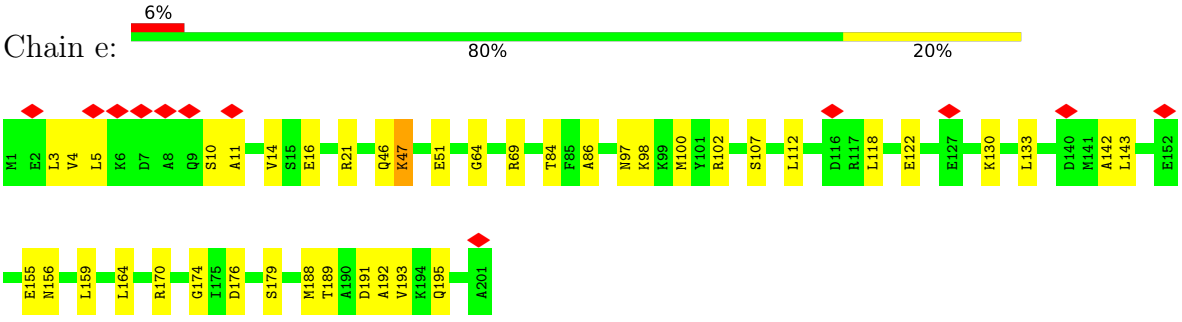
• Molecule 11: Large ribosomal subunit protein uL2



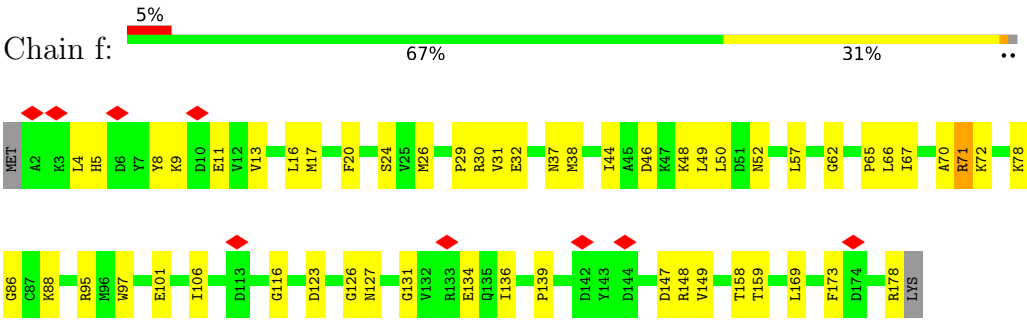
• Molecule 12: 50S ribosomal protein L3



• Molecule 13: Large ribosomal subunit protein uL4

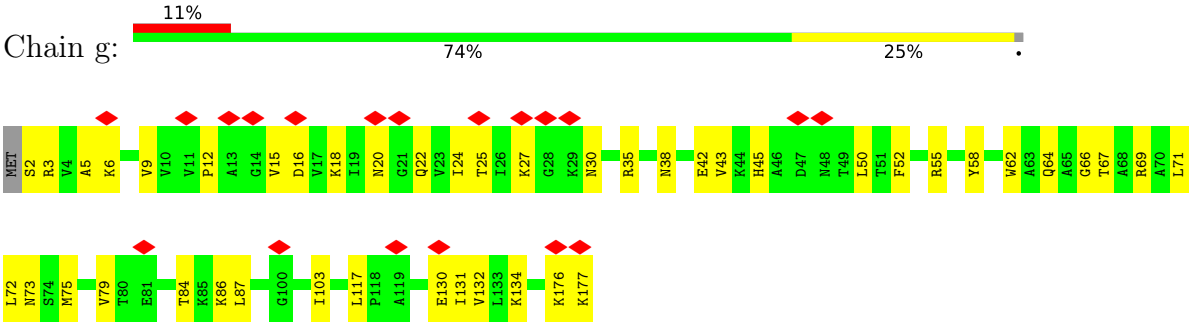


• Molecule 14: Large ribosomal subunit protein uL5



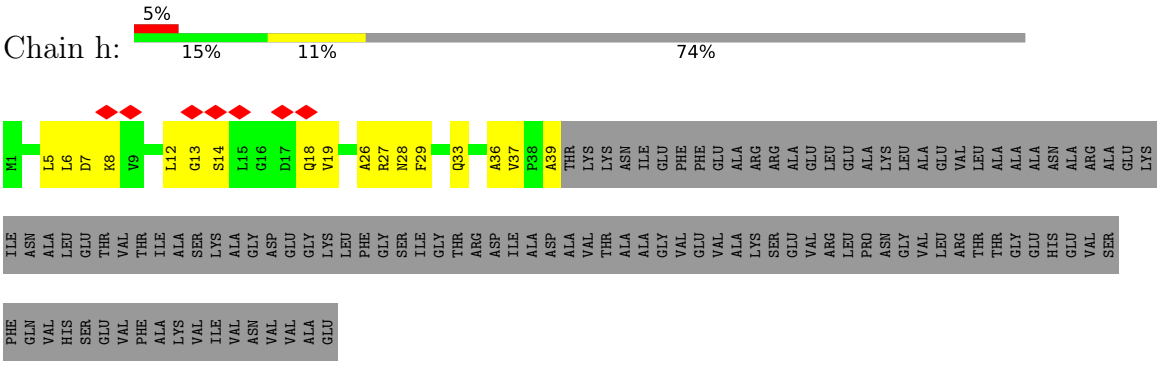
• Molecule 15: Large ribosomal subunit protein uL6

Chain g:



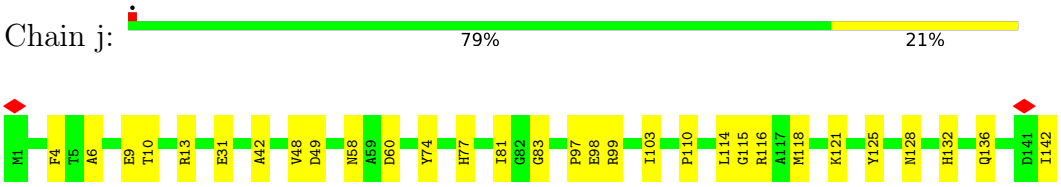
• Molecule 16: Large ribosomal subunit protein bL9

Chain h:



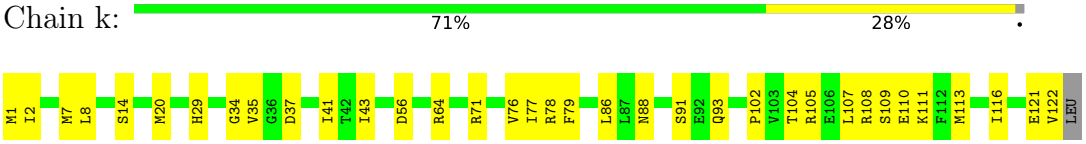
• Molecule 17: Large ribosomal subunit protein uL13

Chain j:



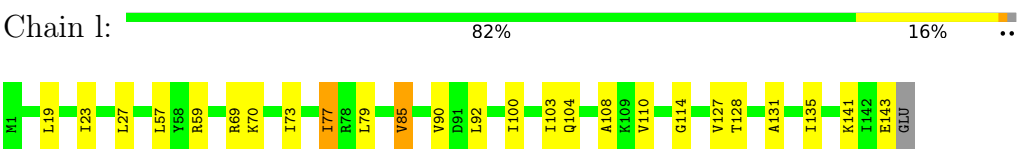
• Molecule 18: Large ribosomal subunit protein uL14

Chain k:



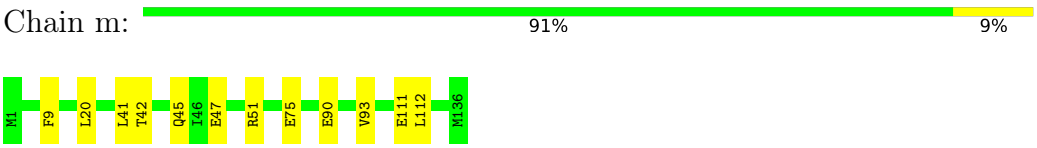
• Molecule 19: Large ribosomal subunit protein uL15

Chain l:



• Molecule 20: 50S ribosomal protein L16

Chain m:

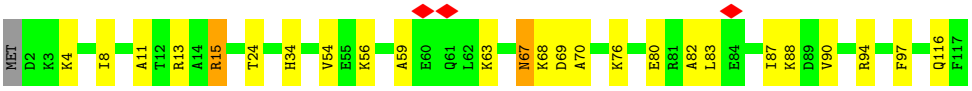


• Molecule 21: Large ribosomal subunit protein bL17

Chain n:

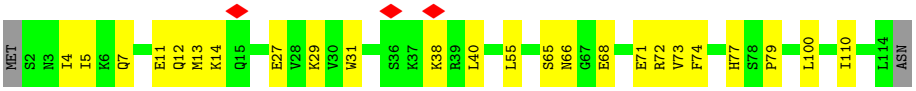
• Molecule 22: Large ribosomal subunit protein uL18

Chain o:



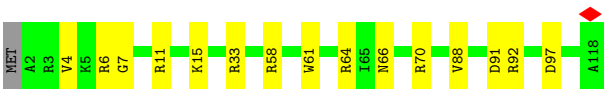
• Molecule 23: Large ribosomal subunit protein bL19

Chain p:



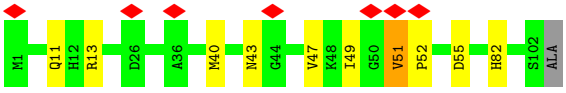
• Molecule 24: Large ribosomal subunit protein bL20

Chain q:



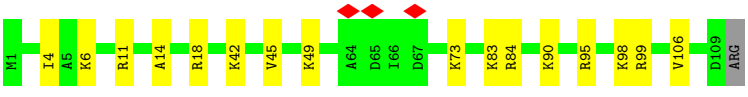
• Molecule 25: Large ribosomal subunit protein bL21

Chain r:



• Molecule 26: Large ribosomal subunit protein uL22

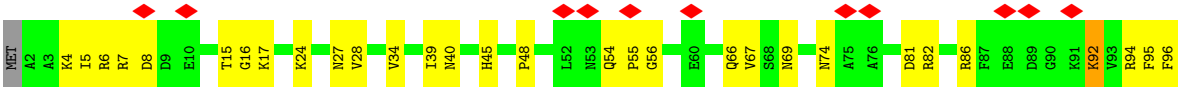
Chain s:

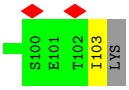


• Molecule 27: Large ribosomal subunit protein uL23

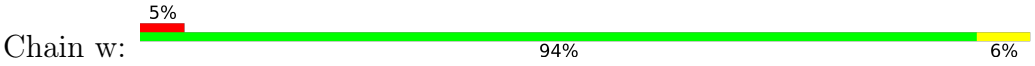
Chain t:

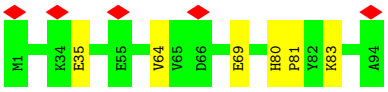
• Molecule 28: Large ribosomal subunit protein uL24





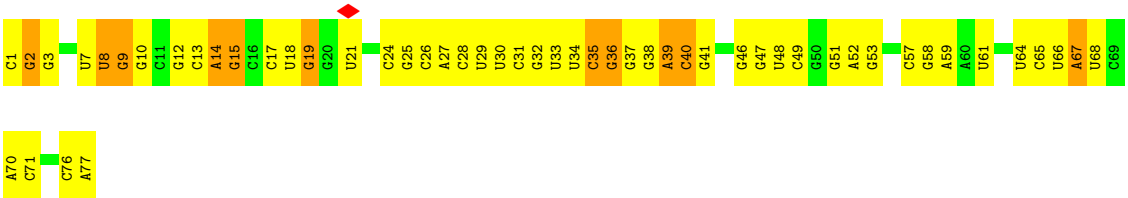
• Molecule 29: Large ribosomal subunit protein bL25



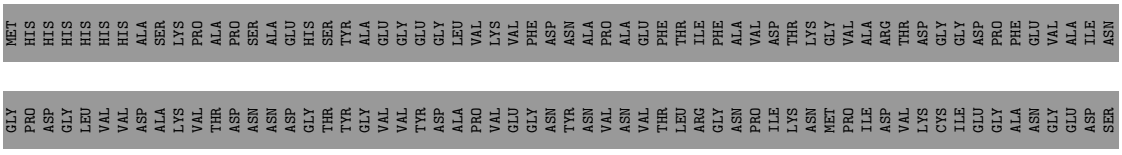


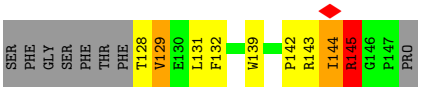
• Molecule 30: Large ribosomal subunit protein bL27

• Molecule 31: P-site tRNA



• Molecule 32: Gelation factor




SER
PHE
GLY
SER
PHE
THR
PHE
T128
V129
E130
L131
F132
W139
P142
R143
I144
R145
G146
P147
PRO

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	169965	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	14.45	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.016	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.0077	Depositor
Map size (Å)	397.44, 397.44, 397.44	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.828, 0.828, 0.828	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	0	0.39	0/635	0.52	0/848
2	1	0.31	0/496	0.46	0/660
3	2	0.35	0/443	0.40	0/593
4	3	0.47	0/440	0.72	0/588
5	4	0.48	0/416	0.66	0/554
6	6	0.39	0/380	0.48	0/498
7	7	0.46	0/513	0.57	0/676
8	8	0.39	0/302	0.48	0/397
9	a	0.38	0/2828	0.36	0/4410
10	b	0.54	4/69757 (0.0%)	0.74	32/108827 (0.0%)
11	c	0.37	0/2121	0.48	0/2852
12	d	0.40	0/1586	0.48	0/2134
13	e	0.33	0/1571	0.43	1/2113 (0.0%)
14	f	0.40	0/1434	0.62	0/1926
15	g	0.35	0/1343	0.52	0/1816
16	h	0.28	0/290	0.63	0/392
17	j	0.42	0/1152	0.47	1/1551 (0.1%)
18	k	0.40	0/947	0.47	0/1268
19	l	0.63	0/1052	0.82	1/1401 (0.1%)
20	m	0.36	0/1093	0.50	0/1460
21	n	0.40	0/973	0.52	0/1301
22	o	0.42	0/902	0.60	0/1209
23	p	0.38	0/920	0.43	0/1231
24	q	0.42	0/960	0.47	0/1278
25	r	0.53	0/823	0.65	0/1100
26	s	0.37	0/852	0.41	0/1142
27	t	0.39	0/744	0.53	0/994
28	u	0.39	0/787	0.57	0/1051
29	w	0.34	0/766	0.43	0/1025
30	y	0.99	6/626 (1.0%)	1.14	10/826 (1.2%)
31	v	0.44	0/1839	0.48	0/2866
32	z	0.95	0/192	1.22	1/267 (0.4%)
All	All	0.51	10/99183 (0.0%)	0.69	46/149254 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
30	y	0	4
32	z	0	2
All	All	0	6

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	b	507	A	O3'-P	28.41	2.03	1.61
10	b	2059	A	O3'-P	25.67	1.99	1.61
10	b	2058	A	O3'-P	20.95	1.92	1.61
10	b	509	C	O3'-P	-20.51	1.30	1.61
30	y	6	ALA	C-O	-13.78	1.06	1.24
30	y	6	ALA	N-CA	7.59	1.55	1.46
30	y	6	ALA	C-N	5.96	1.42	1.33
30	y	5	LYS	C-N	5.63	1.41	1.33
30	y	5	LYS	N-CA	5.53	1.53	1.46
30	y	5	LYS	C-O	-5.15	1.17	1.24

All (46) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	b	509	C	O3'-P-O5'	27.47	145.21	104.00
10	b	507	A	O3'-P-O5'	23.79	139.69	104.00
10	b	2059	A	P-O3'-C3'	-23.47	84.99	120.20
10	b	2058	A	O3'-P-O5'	21.50	136.25	104.00
10	b	507	A	P-O3'-C3'	16.97	145.66	120.20
10	b	509	C	OP2-P-O3'	-12.25	71.25	108.00
30	y	5	LYS	O-C-N	-11.07	107.87	122.59
10	b	2059	A	OP2-P-O3'	10.47	139.41	108.00
30	y	7	GLY	O-C-N	-10.21	109.43	122.70
30	y	3	HIS	O-C-N	-9.29	108.14	123.00
30	y	8	GLY	CA-C-O	8.87	139.43	120.80
10	b	2864	G	C2'-C3'-O3'	8.65	126.67	113.70
30	y	7	GLY	CA-C-N	-8.48	106.43	121.70
30	y	7	GLY	C-N-CA	-8.48	106.43	121.70
10	b	390	U	C2'-C3'-O3'	8.32	121.98	109.50
10	b	507	A	OP1-P-O3'	-7.91	84.26	108.00
10	b	1595	C	C2'-C3'-O3'	7.90	125.55	113.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	b	2832	U	C4'-C3'-O3'	7.79	121.09	109.40
10	b	508	A	P-O3'-C3'	-7.67	108.69	120.20
10	b	2059	A	OP1-P-O3'	-7.45	85.64	108.00
10	b	1626	A	C2'-C3'-O3'	7.05	124.28	113.70
10	b	228	C	C4'-C3'-O3'	6.93	119.80	109.40
10	b	2334	U	C1'-C2'-O2'	-6.78	101.63	111.80
30	y	5	LYS	N-CA-C	6.69	125.05	110.80
10	b	9	G	C2'-C3'-O3'	6.61	123.61	113.70
10	b	479	A	C2'-C3'-O3'	-6.43	99.85	109.50
10	b	2505	G	P-O3'-C3'	-6.35	110.67	120.20
32	z	142	PRO	CB-CG-CD	-6.34	90.82	105.40
10	b	1538	G	C2'-C3'-O3'	6.21	123.02	113.70
10	b	2506	U	P-O3'-C3'	-6.14	110.98	120.20
10	b	2655	G	C4'-C3'-O3'	6.13	118.59	109.40
30	y	6	ALA	N-CA-C	6.01	123.60	110.80
10	b	1930	G	C4'-C3'-O3'	5.95	118.32	109.40
30	y	5	LYS	CB-CA-C	-5.73	99.01	110.42
10	b	45	G	C2'-C3'-O3'	-5.66	105.21	113.70
10	b	2058	A	P-O3'-C3'	5.60	128.60	120.20
30	y	4	LYS	CA-C-O	-5.57	112.61	119.18
10	b	1762	A	C4'-C3'-O3'	-5.57	104.65	113.00
10	b	644	A	O4'-C1'-C2'	-5.36	102.24	107.60
10	b	2655	G	C2'-C3'-O3'	5.35	117.53	109.50
17	j	136	GLN	CA-C-O	-5.34	116.36	120.48
10	b	2055	C	C4'-C3'-O3'	5.29	120.94	113.00
19	l	100	ILE	N-CA-C	-5.28	106.66	111.67
10	b	1299	G	C2'-C3'-O3'	5.15	121.42	113.70
10	b	2055	C	C3'-C2'-O2'	5.08	118.31	110.70
13	e	47	LYS	CB-CG-CD	5.04	122.89	111.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
30	y	3	HIS	Mainchain
30	y	5	LYS	Mainchain
30	y	6	ALA	Mainchain
30	y	7	GLY	Mainchain
32	z	143	ARG	Sidechain
32	z	145	ARG	Sidechain

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	0	625	0	652	7	0
2	1	495	0	526	13	0
3	2	439	0	482	6	0
4	3	434	0	445	11	0
5	4	409	0	440	8	0
6	6	377	0	418	1	0
7	7	504	0	572	2	0
8	8	301	0	341	3	0
9	a	2529	0	1281	14	0
10	b	62281	0	31323	440	0
11	c	2082	0	2154	30	0
12	d	1565	0	1616	24	0
13	e	1552	0	1619	27	0
14	f	1410	0	1444	51	0
15	g	1323	0	1371	27	0
16	h	287	0	307	13	0
17	j	1129	0	1162	21	0
18	k	938	0	1012	25	0
19	l	1043	0	1123	11	0
20	m	1074	0	1157	9	0
21	n	960	0	1000	18	0
22	o	892	0	923	17	0
23	p	908	0	956	22	0
24	q	947	0	1019	16	0
25	r	810	0	834	5	0
26	s	845	0	909	14	0
27	t	738	0	807	9	0
28	u	779	0	831	23	0
29	w	753	0	780	4	0
30	y	619	0	641	22	0
31	v	1646	0	828	86	0
32	z	181	0	174	14	0
All	All	90875	0	59147	862	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (862) close contacts within the same asymmetric unit are listed below, sorted by their clash

magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:1924:C:C3'	31:v:14:A:C8	1.78	1.55
10:b:892:A:H8	10:b:893:C:C6	1.26	1.52
10:b:892:A:C8	10:b:893:C:C6	1.96	1.49
10:b:1924:C:C1'	31:v:14:A:C8	1.95	1.47
10:b:1924:C:C1'	31:v:14:A:H8	1.22	1.47
10:b:1924:C:H2'	31:v:14:A:N7	1.14	1.46
14:f:80:ARG:NH1	31:v:57:C:C4	1.81	1.46
10:b:892:A:C8	10:b:893:C:C5	2.13	1.37
14:f:80:ARG:NH2	31:v:57:C:C6	1.93	1.35
10:b:370:G:OP2	10:b:370:G:C8	1.81	1.32
30:y:8:GLY:C	30:y:9:SER:HB3	1.60	1.25
10:b:1924:C:H2'	31:v:14:A:N9	1.33	1.24
14:f:80:ARG:NH2	31:v:57:C:C5	2.08	1.21
10:b:2059:A:O3'	10:b:2060:A:P	1.99	1.21
10:b:851:C:O2'	10:b:852:U:H5'	1.41	1.20
10:b:1871:A:H5"	10:b:1872:A:C2	1.74	1.20
10:b:1871:A:H5"	10:b:1872:A:N3	1.55	1.19
10:b:1924:C:O2'	31:v:14:A:C8	1.91	1.17
10:b:2059:A:H3'	10:b:2060:A:P	1.84	1.16
10:b:507:A:O3'	10:b:508:A:P	2.03	1.16
10:b:2059:A:C3'	10:b:2060:A:P	2.34	1.15
14:f:80:ARG:NH1	31:v:57:C:N3	1.87	1.11
10:b:892:A:H8	10:b:893:C:C5	1.57	1.11
10:b:1924:C:H2'	31:v:14:A:C5	1.87	1.09
10:b:2503:A:C8	32:z:144:ILE:HG13	1.89	1.07
10:b:368:A:H2'	10:b:369:U:O5'	1.57	1.05
10:b:644:A:H8	10:b:644:A:C5'	1.69	1.05
10:b:1924:C:C2	31:v:14:A:N7	2.24	1.04
10:b:1997:C:H4'	10:b:1997:C:OP1	1.54	1.03
30:y:8:GLY:O	30:y:9:SER:HB3	1.58	1.01
10:b:643:A:H2'	10:b:644:A:H5"	1.43	1.00
10:b:1924:C:C3'	31:v:14:A:H8	1.39	0.99
10:b:368:A:C2'	10:b:369:U:O5'	2.11	0.99
30:y:8:GLY:C	30:y:9:SER:CB	2.35	0.99
10:b:1924:C:H2'	31:v:14:A:C4	1.99	0.97
10:b:851:C:C2'	10:b:852:U:H5'	1.97	0.95
10:b:851:C:H2'	10:b:852:U:H6	1.34	0.93
10:b:644:A:H5'	10:b:644:A:C8	2.03	0.92
10:b:852:U:H2'	10:b:853:C:H6	1.35	0.92
10:b:644:A:H8	10:b:644:A:H5'	1.28	0.91
10:b:2601:C:O2'	10:b:2602:A:OP1	1.88	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:644:A:C5'	10:b:644:A:C8	2.54	0.91
10:b:892:A:H8	10:b:893:C:H6	1.11	0.90
10:b:851:C:H2'	10:b:852:U:C6	2.06	0.90
10:b:1924:C:H3'	31:v:14:A:C8	2.06	0.90
10:b:643:A:C2'	10:b:644:A:H5"	2.02	0.89
10:b:1924:C:C2'	31:v:14:A:N7	1.93	0.89
10:b:1924:C:C2'	31:v:14:A:N9	1.71	0.89
14:f:80:ARG:HH12	31:v:57:C:N4	1.69	0.89
10:b:1871:A:C5'	10:b:1872:A:C2	2.57	0.88
10:b:2041:U:H2'	10:b:2042:A:C8	2.10	0.87
14:f:80:ARG:CZ	31:v:57:C:C4	2.57	0.87
10:b:892:A:N7	10:b:893:C:C6	2.42	0.87
10:b:1997:C:OP1	10:b:1997:C:C4'	2.24	0.86
10:b:874:G:H2'	10:b:875:G:H5'	1.56	0.85
10:b:2783:U:H2'	10:b:2784:U:C6	2.12	0.84
31:v:19:G:O2'	31:v:58:G:N2	2.10	0.84
18:k:110:GLU:H	18:k:113:MET:HE3	1.42	0.84
10:b:370:G:OP2	10:b:370:G:N7	2.10	0.83
10:b:2505:G:OP2	32:z:144:ILE:HG21	1.80	0.82
10:b:270:A:C2	10:b:369:U:H4'	2.15	0.81
10:b:892:A:N7	10:b:893:C:C5	2.48	0.81
10:b:1875:G:H8	10:b:1875:G:H5"	1.46	0.81
10:b:673:C:O2'	10:b:674:G:H5'	1.80	0.80
14:f:80:ARG:NH1	31:v:57:C:N4	2.27	0.80
10:b:1924:C:N1	31:v:14:A:N7	2.28	0.80
10:b:874:G:C2'	10:b:875:G:H5'	2.12	0.79
10:b:852:U:H2'	10:b:853:C:C6	2.16	0.79
10:b:2061:G:C6	32:z:145:ARG:HG3	2.18	0.79
10:b:948:C:O4'	10:b:984:A:C2	2.36	0.78
10:b:1924:C:N1	31:v:14:A:C8	2.50	0.78
10:b:2690:U:H4'	10:b:2691:C:OP1	1.83	0.78
10:b:1871:A:C5'	10:b:1872:A:N3	2.45	0.78
15:g:18:LYS:HB3	15:g:25:THR:HB	1.64	0.78
31:v:31:C:H3'	31:v:32:G:H21	1.47	0.78
10:b:643:A:C3'	10:b:644:A:H5"	2.14	0.77
14:f:80:ARG:CZ	31:v:57:C:C5	2.68	0.77
31:v:9:G:H21	31:v:24:C:H41	1.32	0.76
12:d:15:PHE:H	23:p:12:GLN:HE22	1.32	0.76
10:b:494:G:H4'	26:s:6:LYS:HB2	1.67	0.75
10:b:2059:A:H5"	13:e:64:GLY:O	1.86	0.75
10:b:2682:A:H61	10:b:2728:U:H1'	1.51	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:586:A:H5'	13:e:84:THR:HG21	1.69	0.74
10:b:1875:G:H5"	10:b:1875:G:C8	2.21	0.74
10:b:2657:A:C2'	10:b:2658:C:H5'	2.16	0.74
13:e:130:LYS:HB2	13:e:133:LEU:HD13	1.70	0.74
10:b:2505:G:OP2	32:z:144:ILE:CG2	2.36	0.74
10:b:2601:C:HO2'	10:b:2602:A:P	2.10	0.73
10:b:2059:A:C2	10:b:2503:A:C6	2.75	0.73
28:u:15:THR:OG1	28:u:69:ASN:ND2	2.22	0.73
10:b:281:C:H2'	10:b:282:A:C8	2.23	0.73
10:b:1992:G:N2	10:b:1996:C:O2'	2.22	0.73
10:b:2255:G:O2'	30:y:8:GLY:C	2.31	0.72
10:b:1954:G:H5'	10:b:2550:G:H21	1.53	0.72
4:3:54:VAL:HG23	4:3:55:ILE:HG12	1.70	0.72
10:b:1924:C:O2'	31:v:14:A:N9	2.09	0.72
31:v:32:G:H3'	31:v:33:U:H6	1.55	0.72
10:b:1924:C:C2'	31:v:14:A:C8	0.76	0.71
10:b:1964:G:H4'	10:b:1965:C:OP2	1.89	0.71
30:y:43:THR:O	30:y:45:PHE:N	2.24	0.71
10:b:1889:A:H8	10:b:1889:A:OP2	1.73	0.71
31:v:9:G:N2	31:v:24:C:H41	1.88	0.71
10:b:612:G:C6	10:b:614:A:C8	2.79	0.70
20:m:41:LEU:HA	20:m:45:GLN:HE21	1.54	0.70
31:v:39:A:H2'	31:v:40:C:C6	2.26	0.70
10:b:637:A:H4'	10:b:638:G:O5'	1.91	0.70
10:b:2111:U:H2'	10:b:2143:C:H5"	1.74	0.70
10:b:2758:A:H2'	10:b:2759:G:H5'	1.74	0.70
22:o:67:ASN:H	22:o:70:ALA:HB3	1.57	0.70
10:b:852:U:C2	10:b:853:C:C5	2.80	0.70
10:b:2293:G:H5"	22:o:94:ARG:HH22	1.56	0.70
10:b:1997:C:H2'	10:b:1998:A:H5'	1.72	0.69
4:3:40:ARG:HG3	4:3:41:HIS:ND1	2.08	0.69
15:g:35:ARG:HG2	15:g:75:MET:HE1	1.74	0.69
31:v:7:U:H3'	31:v:8:U:H5'	1.74	0.69
14:f:48:LYS:O	14:f:52:ASN:ND2	2.26	0.69
10:b:1924:C:C2'	31:v:14:A:H8	0.49	0.69
10:b:2690:U:C4'	10:b:2691:C:OP1	2.41	0.69
10:b:851:C:O2'	10:b:852:U:C5'	2.32	0.68
10:b:2059:A:C2	10:b:2503:A:C5	2.81	0.68
10:b:1283:G:N2	10:b:1285:A:H3'	2.08	0.68
10:b:612:G:N2	10:b:617:G:C6	2.61	0.68
17:j:118:MET:HA	17:j:121:LYS:HZ3	1.58	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:612:G:C2	10:b:617:G:O6	2.47	0.68
14:f:116:GLY:O	14:f:178:ARG:NH2	2.27	0.68
10:b:1870:C:O2'	10:b:1871:A:H5'	1.94	0.67
10:b:1250:G:H5"	24:q:6:ARG:HD3	1.74	0.67
15:g:42:GLU:OE1	15:g:55:ARG:NE	2.28	0.67
10:b:272:A:H2'	10:b:273:G:C8	2.29	0.67
10:b:2041:U:H2'	10:b:2042:A:H8	1.59	0.67
23:p:7:GLN:NE2	23:p:11:GLU:OE1	2.25	0.67
10:b:370:G:OP2	10:b:370:G:H8	1.65	0.67
10:b:612:G:C5	10:b:614:A:C8	2.84	0.66
10:b:2758:A:C2'	10:b:2759:G:H5'	2.26	0.66
21:n:12:ARG:HD3	21:n:16:HIS:CD2	2.31	0.66
10:b:2830:C:OP1	12:d:59:ARG:HG3	1.95	0.66
9:a:51:G:OP1	22:o:63:LYS:NZ	2.28	0.66
10:b:644:A:H8	10:b:644:A:H5"	1.59	0.66
21:n:37:THR:HG22	21:n:110:MET:HE1	1.76	0.66
10:b:2061:G:N1	32:z:145:ARG:HG3	2.11	0.66
14:f:46:ASP:HB3	14:f:49:LEU:HD23	1.77	0.66
10:b:1889:A:OP2	10:b:1889:A:C8	2.49	0.65
10:b:2110:G:H22	10:b:2179:C:H2'	1.61	0.65
24:q:91:ASP:HB2	25:r:11:GLN:NE2	2.11	0.65
2:1:11:VAL:O	2:1:15:ASN:ND2	2.30	0.65
31:v:32:G:H3'	31:v:33:U:C6	2.32	0.65
31:v:38:G:H3'	31:v:39:A:H8	1.60	0.65
10:b:612:G:C2	10:b:617:G:C6	2.85	0.65
29:w:64:VAL:HG22	29:w:69:GLU:HG2	1.79	0.65
11:c:67:PHE:CE1	11:c:156:ARG:HD2	2.32	0.65
11:c:182:ARG:NH2	11:c:183:LYS:O	2.30	0.65
28:u:34:VAL:HG13	28:u:67:VAL:HG12	1.79	0.65
10:b:1997:C:C2'	10:b:1998:A:H5'	2.26	0.64
2:1:2:LYS:HE3	2:1:6:LEU:HD11	1.79	0.64
10:b:1924:C:H2'	31:v:14:A:C8	0.34	0.64
10:b:2543:G:H21	10:b:2646:C:H5"	1.61	0.64
31:v:35:C:H3'	31:v:36:G:H8	1.62	0.64
14:f:80:ARG:NH1	31:v:57:C:C2	2.64	0.64
10:b:852:U:C2	10:b:853:C:C6	2.86	0.64
14:f:80:ARG:NH2	31:v:57:C:N1	2.44	0.64
31:v:1:C:H2'	31:v:2:G:C8	2.33	0.64
17:j:49:ASP:OD2	17:j:121:LYS:NZ	2.29	0.64
18:k:78:ARG:NH2	23:p:71:GLU:OE2	2.26	0.64
10:b:1924:C:O2	31:v:14:A:N7	2.29	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:h:12:LEU:HD13	16:h:19:VAL:HG21	1.79	0.64
10:b:902:C:C4	10:b:903:C:C5	2.85	0.64
15:g:103:ILE:HG13	15:g:117:LEU:HD11	1.80	0.64
10:b:2617:U:C2'	10:b:2618:G:H5'	2.28	0.64
10:b:948:C:O4'	10:b:984:A:H2	1.80	0.63
10:b:892:A:C8	10:b:893:C:H6	1.90	0.63
10:b:272:A:H2'	10:b:273:G:H8	1.63	0.63
10:b:1935:G:H1'	10:b:1964:G:N2	2.13	0.63
13:e:98:LYS:HB3	13:e:102:ARG:HH22	1.64	0.63
19:l:79:LEU:HB2	19:l:114:GLY:H	1.64	0.63
7:7:54:ASP:HB3	19:l:57:LEU:HD22	1.80	0.63
31:v:1:C:H2'	31:v:2:G:H8	1.62	0.63
10:b:628:G:O2'	10:b:629:G:H5'	1.99	0.63
15:g:43:VAL:HG23	15:g:52:PHE:HE1	1.64	0.62
26:s:11:ARG:NH2	26:s:98:LYS:HD3	2.14	0.62
10:b:1199:U:H1'	24:q:4:VAL:HG22	1.80	0.62
31:v:38:G:H3'	31:v:39:A:C8	2.35	0.62
11:c:227:PRO:HG3	11:c:234:GLY:H	1.64	0.62
15:g:176:LYS:HG3	15:g:177:LYS:HG3	1.79	0.62
2:1:36:GLN:N	2:1:36:GLN:OE1	2.33	0.62
14:f:66:LEU:O	14:f:67:ILE:HD13	1.99	0.62
21:n:86:ARG:HH21	21:n:117:ASP:HB2	1.65	0.62
31:v:2:G:H2'	31:v:3:G:C8	2.34	0.62
10:b:636:G:OP2	19:l:128:THR:HG22	2.00	0.62
13:e:21:ARG:NH2	13:e:107:SER:OG	2.33	0.62
10:b:933:A:C5'	10:b:934:U:OP2	2.48	0.61
10:b:1924:C:C4'	31:v:14:A:H8	2.10	0.61
10:b:2834:G:H2'	10:b:2879:A:H61	1.65	0.61
28:u:94:ARG:HB3	28:u:103:ILE:HD12	1.82	0.61
10:b:674:G:H1'	13:e:69:ARG:HD3	1.83	0.61
28:u:39:ILE:HG13	28:u:40:ASN:N	2.15	0.61
17:j:114:LEU:HG	17:j:118:MET:HE3	1.81	0.61
24:q:91:ASP:HB2	25:r:11:GLN:HE21	1.64	0.61
12:d:148:GLN:HB2	12:d:152:PRO:HG2	1.82	0.61
21:n:96:ARG:HG3	21:n:116:VAL:HG12	1.83	0.61
31:v:35:C:H3'	31:v:36:G:C8	2.36	0.61
10:b:2657:A:H2'	10:b:2658:C:H5'	1.82	0.60
10:b:851:C:C2	10:b:852:U:C5	2.88	0.60
10:b:2128:G:H1'	10:b:2174:C:H1'	1.82	0.60
9:a:89:U:O2	10:b:958:U:H2'	2.01	0.60
10:b:2074:U:H2'	10:b:2075:U:C6	2.36	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
31:v:33:U:H3'	31:v:34:U:C6	2.37	0.60
11:c:155:ALA:HB2	11:c:162:VAL:HG23	1.82	0.60
14:f:134:GLU:OE1	14:f:136:ILE:HG22	2.02	0.60
10:b:373:U:H2'	10:b:374:A:H8	1.67	0.60
30:y:43:THR:C	30:y:45:PHE:H	2.10	0.60
10:b:874:G:O2'	10:b:875:G:H5'	2.02	0.59
10:b:1269:A:H61	10:b:2011:U:H3	1.48	0.59
23:p:14:LYS:HD2	23:p:77:HIS:HA	1.84	0.59
10:b:671:C:H2'	10:b:672:C:C6	2.36	0.59
10:b:2503:A:H8	32:z:144:ILE:HG13	1.63	0.59
10:b:1924:C:O2'	31:v:14:A:C1'	2.41	0.59
10:b:1820:U:C4	11:c:159:GLY:HA3	2.37	0.59
31:v:34:U:H2'	31:v:36:G:H5"	1.83	0.59
10:b:370:G:C8	10:b:370:G:P	2.94	0.59
18:k:107:LEU:HB2	18:k:116:ILE:HD11	1.84	0.59
14:f:31:VAL:HG12	14:f:158:THR:HG22	1.85	0.59
10:b:669:G:H2'	10:b:669:G:N3	2.16	0.59
28:u:7:ARG:NH1	28:u:28:VAL:HG23	2.18	0.59
31:v:37:G:H2'	31:v:38:G:C8	2.38	0.59
2:1:30:MET:HE1	27:t:14:PRO:HD3	1.85	0.58
8:8:16:ILE:HD13	8:8:25:VAL:HG22	1.84	0.58
18:k:76:VAL:HG12	23:p:73:VAL:HB	1.86	0.58
17:j:118:MET:HA	17:j:121:LYS:NZ	2.19	0.58
24:q:66:ASN:O	24:q:70:ARG:HG3	2.04	0.58
10:b:2059:A:N3	10:b:2503:A:C6	2.72	0.57
14:f:147:ASP:OD1	14:f:148:ARG:N	2.37	0.57
10:b:368:A:O2'	10:b:369:U:O5'	2.22	0.57
10:b:581:C:H2'	10:b:582:A:C8	2.39	0.57
10:b:2324:U:H1'	10:b:2337:G:H5"	1.86	0.57
13:e:98:LYS:HB3	13:e:102:ARG:NH2	2.20	0.57
10:b:2061:G:O6	32:z:145:ARG:CD	2.52	0.57
15:g:35:ARG:HG2	15:g:75:MET:CE	2.33	0.57
21:n:114:GLU:HB2	21:n:118:ARG:HD2	1.85	0.57
2:1:29:ARG:NH2	27:t:11:LEU:O	2.38	0.57
10:b:673:C:C2'	10:b:674:G:H5'	2.34	0.57
11:c:78:VAL:HG21	11:c:110:LEU:HD11	1.87	0.57
14:f:126:GLY:O	14:f:158:THR:OG1	2.20	0.57
10:b:898:C:C2'	10:b:899:A:O5'	2.53	0.57
30:y:77:ARG:HG3	30:y:77:ARG:HH11	1.70	0.57
10:b:2751:G:H3'	10:b:2752:C:H6	1.70	0.57
10:b:833:A:H2'	10:b:834:G:C8	2.40	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:2140:G:H3'	10:b:2141:G:H8	1.69	0.57
10:b:2547:G:H4'	18:k:29:HIS:CE1	2.40	0.56
10:b:2617:U:H2'	10:b:2618:G:H5'	1.86	0.56
15:g:9:VAL:HG12	15:g:50:LEU:HB2	1.87	0.56
17:j:125:TYR:OH	17:j:132:HIS:NE2	2.36	0.56
10:b:28:A:N6	10:b:512:G:H1'	2.19	0.56
10:b:956:G:H2'	10:b:957:C:H2'	1.86	0.56
31:v:64:U:H2'	31:v:65:C:H6	1.70	0.56
10:b:1384:A:H1'	10:b:1405:U:H1'	1.88	0.56
10:b:898:C:H2'	10:b:899:A:O5'	2.06	0.56
10:b:2659:G:H2'	10:b:2660:A:H2'	1.88	0.56
12:d:46:ARG:NH1	12:d:85:ALA:O	2.39	0.56
14:f:57:LEU:HD23	14:f:65:PRO:HB3	1.87	0.56
15:g:43:VAL:HG23	15:g:52:PHE:CE1	2.40	0.56
26:s:4:ILE:HG13	26:s:106:VAL:HG22	1.88	0.56
2:1:44:LYS:O	2:1:48:ARG:HG2	2.06	0.55
9:a:42:C:C4	14:f:66:LEU:HD21	2.41	0.55
10:b:2845:U:H2'	10:b:2846:G:C8	2.42	0.55
15:g:22:GLN:NE2	15:g:38:ASN:O	2.40	0.55
10:b:933:A:H5'	10:b:934:U:OP2	2.06	0.55
10:b:948:C:C4'	10:b:984:A:C2	2.89	0.55
24:q:92:ARG:HG3	24:q:92:ARG:HH11	1.71	0.55
10:b:866:A:H61	10:b:913:U:H1'	1.71	0.55
9:a:87:U:O2'	9:a:88:C:O5'	2.24	0.55
10:b:2333:A:H4'	10:b:2334:U:H3'	1.89	0.55
10:b:1047:G:HO2'	10:b:1048:A:H8	1.53	0.55
10:b:2829:A:C6	10:b:2830:C:C4	2.95	0.55
12:d:9:VAL:HG11	23:p:4:ILE:HD11	1.89	0.55
21:n:29:VAL:O	21:n:78:LYS:NZ	2.30	0.55
28:u:81:ASP:OD1	28:u:82:ARG:N	2.40	0.55
10:b:2061:G:O6	32:z:145:ARG:NE	2.40	0.55
10:b:2273:A:H2'	10:b:2274:A:C8	2.42	0.55
11:c:201:MET:HG3	11:c:202:LEU:HD23	1.89	0.55
2:1:10:SER:N	2:1:13:GLU:OE2	2.25	0.54
10:b:643:A:H2'	10:b:644:A:C5'	2.28	0.54
16:h:6:LEU:HD13	16:h:36:ALA:HA	1.89	0.54
14:f:38:MET:HE2	14:f:57:LEU:HD13	1.89	0.54
28:u:39:ILE:HG13	28:u:40:ASN:H	1.72	0.54
2:1:12:GLU:O	2:1:16:THR:HG23	2.07	0.54
10:b:1469:A:H2'	10:b:1470:A:C8	2.42	0.54
13:e:97:ASN:HB2	13:e:100:MET:HG3	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
28:u:66:GLN:HB2	28:u:69:ASN:OD1	2.08	0.54
1:0:60:ASP:OD2	16:h:27:ARG:NH2	2.41	0.54
10:b:1095:A:H5'	10:b:1096:A:H5"	1.89	0.54
11:c:95:LEU:HD13	11:c:101:ARG:HG3	1.89	0.54
22:o:56:LYS:O	22:o:59:ALA:N	2.39	0.54
10:b:720:U:H2'	10:b:721:A:C8	2.43	0.54
10:b:2233:U:H2'	10:b:2234:G:C8	2.43	0.54
31:v:2:G:H2'	31:v:3:G:H8	1.71	0.54
10:b:2086:U:H2'	10:b:2087:G:C8	2.43	0.54
10:b:2783:U:H2'	10:b:2784:U:H6	1.70	0.54
10:b:852:U:N3	10:b:853:C:C5	2.76	0.54
14:f:80:ARG:HB3	14:f:83:TYR:CZ	2.43	0.54
18:k:121:GLU:HG2	18:k:122:VAL:HG23	1.89	0.54
31:v:67:A:H2'	31:v:68:U:H6	1.73	0.53
10:b:850:U:H2'	10:b:851:C:C6	2.43	0.53
10:b:2074:U:H2'	10:b:2075:U:O4'	2.08	0.53
10:b:2575:C:H5'	12:d:149:ASN:HD22	1.73	0.53
4:3:4:GLN:HA	10:b:2615:U:C2	2.43	0.53
4:3:46:ASP:O	4:3:53:LYS:NZ	2.41	0.53
10:b:507:A:HO3'	10:b:508:A:P	2.27	0.53
15:g:55:ARG:HB2	15:g:58:TYR:HD2	1.73	0.53
1:0:72:ARG:NH1	1:0:78:TYR:OH	2.38	0.53
10:b:1752:C:H2'	10:b:1753:G:C8	2.44	0.53
10:b:2547:G:H1	10:b:2561:U:H3	1.57	0.53
21:n:37:THR:OG1	21:n:40:LYS:HG3	2.08	0.53
21:n:57:THR:HG23	21:n:62:ASN:ND2	2.23	0.53
18:k:121:GLU:OE1	23:p:65:SER:OG	2.26	0.53
27:t:25:GLU:OE1	27:t:26:LYS:NZ	2.29	0.53
5:4:5:ILE:HG21	5:4:28:ARG:NH2	2.23	0.53
8:8:14:CYS:SG	8:8:33:HIS:ND1	2.81	0.53
10:b:605:G:H1'	10:b:657:U:O2'	2.09	0.53
10:b:1311:G:H21	10:b:1603:A:H62	1.57	0.53
22:o:88:LYS:NZ	22:o:116:GLN:HE22	2.06	0.53
11:c:258:ARG:HD3	11:c:270:ARG:NH1	2.24	0.53
19:l:141:LYS:NZ	19:l:143:GLU:OE2	2.42	0.53
15:g:69:ARG:NH1	15:g:73:ASN:HB2	2.24	0.52
14:f:37:ASN:OD1	14:f:38:MET:N	2.42	0.52
23:p:72:ARG:HD2	23:p:74:PHE:CZ	2.45	0.52
26:s:83:LYS:HB3	26:s:95:ARG:HD2	1.91	0.52
10:b:644:A:C8	10:b:644:A:C4'	2.91	0.52
10:b:2618:G:H21	12:d:155:VAL:HG21	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:c:182:ARG:NH2	11:c:266:PHE:HB3	2.24	0.52
12:d:156:PHE:CE1	17:j:81:ILE:HD13	2.45	0.52
13:e:191:ASP:OD1	13:e:192:ALA:N	2.42	0.52
10:b:874:G:C2'	10:b:875:G:C5'	2.85	0.52
17:j:99:ARG:HE	17:j:103:ILE:HG23	1.74	0.52
15:g:67:THR:O	15:g:71:LEU:HG	2.10	0.52
11:c:240:PHE:O	11:c:242:LYS:HE3	2.09	0.52
14:f:50:LEU:HD21	14:f:67:ILE:HG23	1.92	0.52
19:l:110:VAL:HB	19:l:127:VAL:HG22	1.91	0.52
10:b:2010:G:H5"	26:s:42:LYS:HB2	1.92	0.52
10:b:1908:C:O2'	31:v:12:G:H5"	2.10	0.52
14:f:49:LEU:HA	14:f:52:ASN:HD22	1.75	0.52
4:3:40:ARG:HG3	4:3:41:HIS:CE1	2.46	0.51
13:e:47:LYS:HG3	13:e:51:GLU:HB2	1.93	0.51
10:b:1000:A:H2'	10:b:1001:A:C8	2.45	0.51
11:c:141:VAL:HG12	11:c:192:LEU:HD23	1.91	0.51
17:j:31:GLU:HG2	17:j:142:ILE:HD12	1.92	0.51
21:n:41:ALA:HB1	21:n:97:ILE:HD13	1.92	0.51
31:v:67:A:H2'	31:v:68:U:C6	2.44	0.51
10:b:1490:A:H62	11:c:97:LYS:HG2	1.76	0.51
10:b:1964:G:C4'	10:b:1965:C:OP2	2.58	0.51
10:b:1992:G:N2	10:b:1996:C:HO2'	2.07	0.51
15:g:84:THR:HG22	15:g:134:LYS:HG2	1.93	0.51
24:q:88:VAL:HA	25:r:49:ILE:HD12	1.91	0.51
5:4:32:GLU:OE2	5:4:32:GLU:N	2.28	0.51
10:b:1408:G:H1	10:b:1594:U:H3	1.58	0.51
1:0:12:PRO:HG2	1:0:28:ARG:HH21	1.76	0.51
10:b:2663:G:C4	10:b:2664:G:C8	2.99	0.51
10:b:2886:A:H3'	10:b:2887:A:H8	1.75	0.51
10:b:29:U:H2'	10:b:30:G:C8	2.45	0.51
10:b:367:G:C2'	10:b:368:A:H5'	2.41	0.51
10:b:1028:A:H2'	10:b:1029:A:C8	2.46	0.51
22:o:94:ARG:HD2	22:o:97:PHE:O	2.10	0.51
24:q:11:ARG:O	24:q:15:LYS:HG2	2.11	0.51
30:y:8:GLY:O	30:y:9:SER:CB	2.43	0.51
5:4:38:LYS:HB2	5:4:49:TYR:CD2	2.45	0.51
10:b:1802:A:H2'	10:b:1803:A:C8	2.46	0.51
10:b:2291:U:H2'	10:b:2292:U:C6	2.46	0.51
28:u:96:PHE:CE1	28:u:103:ILE:HG12	2.46	0.51
10:b:612:G:N2	10:b:617:G:O6	2.43	0.51
10:b:2125:G:H2'	10:b:2126:A:H4'	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:2663:G:C6	10:b:2664:G:C5	2.98	0.51
16:h:6:LEU:HD11	16:h:37:VAL:HG22	1.92	0.51
28:u:16:GLY:O	28:u:17:LYS:HG3	2.11	0.51
30:y:8:GLY:C	30:y:9:SER:OG	2.52	0.51
12:d:34:VAL:HG12	12:d:92:VAL:HA	1.93	0.51
10:b:2764:A:N6	10:b:2766:A:C6	2.79	0.50
31:v:64:U:H2'	31:v:65:C:C6	2.46	0.50
28:u:82:ARG:HH21	28:u:82:ARG:HG3	1.77	0.50
10:b:1884:G:H5"	10:b:1884:G:H8	1.77	0.50
11:c:29:PRO:HG2	11:c:34:LEU:HD11	1.92	0.50
18:k:14:SER:OG	18:k:86:LEU:HD12	2.11	0.50
28:u:5:ILE:C	28:u:6:ARG:HD2	2.36	0.50
31:v:33:U:H3'	31:v:34:U:H6	1.74	0.50
19:l:85:VAL:HG21	19:l:90:VAL:HA	1.94	0.50
10:b:28:A:H61	10:b:512:G:H1'	1.76	0.50
10:b:2061:G:O6	32:z:145:ARG:HD2	2.11	0.50
11:c:6:CYS:SG	11:c:13:ARG:NH2	2.84	0.50
21:n:103:ARG:HB2	21:n:110:MET:HE3	1.93	0.50
10:b:639:U:H2'	10:b:640:C:C6	2.47	0.50
10:b:643:A:H3'	10:b:644:A:H5"	1.94	0.50
10:b:2151:U:H5"	10:b:2152:G:H8	1.75	0.50
16:h:8:LYS:NZ	16:h:14:SER:HA	2.27	0.50
17:j:6:ALA:HB3	17:j:48:VAL:HG11	1.94	0.50
20:m:42:THR:OG1	20:m:45:GLN:HG2	2.12	0.50
10:b:853:C:H2'	10:b:853:C:O2	2.11	0.50
10:b:1047:G:O2'	10:b:1048:A:C8	2.62	0.50
10:b:2061:G:C6	32:z:145:ARG:CG	2.94	0.50
2:1:54:LYS:HA	2:1:57:LEU:HB2	1.94	0.50
9:a:45:A:C4	9:a:46:A:C8	3.00	0.50
10:b:1265:A:H61	10:b:2013:A:H3'	1.76	0.50
20:m:75:GLU:HB2	20:m:90:GLU:HG3	1.94	0.50
4:3:38:HIS:ND1	4:3:39:LEU:O	2.41	0.50
21:n:41:ALA:O	21:n:42:LYS:HB2	2.11	0.50
26:s:73:LYS:HB2	26:s:106:VAL:HB	1.94	0.50
10:b:589:U:H2'	10:b:590:A:C8	2.47	0.49
12:d:37:VAL:HG22	12:d:48:ILE:HG22	1.92	0.49
10:b:2255:G:O2'	30:y:8:GLY:CA	2.60	0.49
10:b:2255:G:O2'	30:y:8:GLY:N	2.45	0.49
14:f:62:GLY:HA3	14:f:95:ARG:NH2	2.26	0.49
31:v:34:U:O2'	31:v:36:G:H3'	2.12	0.49
10:b:373:U:H2'	10:b:374:A:C8	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:f:85:ILE:HG13	14:f:86:GLY:N	2.26	0.49
18:k:105:ARG:O	18:k:108:ARG:HG3	2.12	0.49
10:b:1326:U:H2'	10:b:1327:A:H8	1.77	0.49
27:t:54:GLU:HG2	27:t:88:LYS:HB2	1.94	0.49
31:v:32:G:H2'	31:v:33:U:O4'	2.12	0.49
10:b:1721:G:H2'	10:b:1738:G:H22	1.77	0.49
10:b:2241:A:H2'	10:b:2242:G:C8	2.48	0.49
10:b:2543:G:H21	10:b:2646:C:C5'	2.25	0.49
10:b:2840:C:H2'	10:b:2841:C:C6	2.48	0.49
17:j:60:ASP:OD1	17:j:60:ASP:N	2.35	0.49
30:y:26:PHE:N	30:y:29:GLU:HG3	2.26	0.49
10:b:1483:G:H1	10:b:1506:U:H3	1.60	0.49
10:b:2408:U:H2'	10:b:2409:G:C8	2.48	0.49
10:b:558:U:H2'	10:b:559:G:H8	1.77	0.49
10:b:612:G:N2	10:b:617:G:C5	2.80	0.49
16:h:26:ALA:O	16:h:27:ARG:HG2	2.12	0.49
17:j:74:TYR:CE1	17:j:103:ILE:HD11	2.48	0.49
30:y:25:ARG:HH11	30:y:31:VAL:HG12	1.78	0.49
30:y:68:LYS:HD2	30:y:83:GLU:OE2	2.13	0.49
31:v:24:C:H2'	31:v:25:G:C8	2.48	0.49
14:f:5:HIS:HB2	14:f:97:TRP:CD1	2.48	0.49
20:m:20:LEU:HD13	29:w:81:PRO:HG2	1.94	0.49
10:b:1818:U:H5"	11:c:157:SER:HB2	1.94	0.49
10:b:1927:A:H2'	10:b:1928:A:C8	2.48	0.49
12:d:184:ARG:NH2	23:p:11:GLU:OE1	2.34	0.49
23:p:13:MET:HE2	23:p:55:LEU:N	2.28	0.49
10:b:184:C:H2'	10:b:185:G:C8	2.48	0.48
10:b:965:C:H4'	10:b:2273:A:H1'	1.94	0.48
2:1:56:LEU:HA	2:1:59:GLU:HG2	1.95	0.48
10:b:854:C:H2'	10:b:854:C:O2	2.12	0.48
10:b:871:U:H2'	10:b:872:U:C6	2.49	0.48
10:b:1339:G:H5"	27:t:19:LYS:HD3	1.95	0.48
14:f:38:MET:HE2	14:f:57:LEU:HB2	1.96	0.48
15:g:2:SER:HB2	15:g:62:TRP:HB3	1.95	0.48
31:v:37:G:H2'	31:v:38:G:H8	1.78	0.48
5:4:38:LYS:HB2	5:4:49:TYR:CE2	2.47	0.48
10:b:2339:C:H2'	10:b:2340:A:C8	2.47	0.48
10:b:2756:U:H1'	10:b:2757:A:H5"	1.94	0.48
11:c:142:HIS:ND1	11:c:193:GLY:O	2.29	0.48
30:y:26:PHE:H	30:y:29:GLU:HG3	1.79	0.48
10:b:184:C:H2'	10:b:185:G:H8	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:2331:G:H4'	30:y:43:THR:H	1.78	0.48
10:b:437:U:H2'	10:b:438:G:C8	2.49	0.48
10:b:585:G:N7	24:q:6:ARG:NH1	2.62	0.48
14:f:13:VAL:O	14:f:17:MET:HG2	2.13	0.48
3:2:12:SER:OG	3:2:14:ILE:HG12	2.13	0.48
10:b:853:C:C2	10:b:854:C:C5	3.01	0.48
10:b:2829:A:C5	10:b:2830:C:C5	3.01	0.48
18:k:102:PRO:HD2	23:p:68:GLU:OE2	2.14	0.48
20:m:47:GLU:OE2	20:m:51:ARG:NH1	2.46	0.48
29:w:35:GLU:OE1	29:w:35:GLU:N	2.44	0.48
10:b:151:C:H2'	10:b:152:A:C8	2.49	0.48
10:b:358:U:H2'	10:b:359:G:C8	2.49	0.48
10:b:2432:A:H2'	10:b:2433:A:C8	2.48	0.48
13:e:3:LEU:HD12	13:e:14:VAL:HG11	1.95	0.48
16:h:7:ASP:OD1	16:h:8:LYS:N	2.46	0.48
10:b:27:G:H22	10:b:512:G:H2'	1.78	0.48
10:b:1174:U:H5"	10:b:1175:A:H8	1.77	0.48
11:c:80:ARG:NE	11:c:82:GLU:OE2	2.42	0.48
30:y:37:ILE:HG21	30:y:80:ILE:HG21	1.94	0.48
10:b:1056:G:H1'	10:b:1086:A:H62	1.78	0.48
10:b:1429:G:H2'	10:b:1430:G:C8	2.48	0.48
10:b:852:U:N3	10:b:853:C:C4	2.81	0.48
10:b:1991:U:H2'	10:b:1992:G:C5'	2.43	0.48
21:n:72:ASP:OD2	21:n:75:ILE:HG12	2.13	0.48
22:o:34:HIS:CE1	22:o:54:VAL:HA	2.49	0.48
28:u:4:LYS:O	28:u:5:ILE:HD13	2.13	0.48
10:b:2008:C:H2'	10:b:2009:A:C8	2.49	0.47
19:l:77:ILE:HD12	19:l:108:ALA:HB1	1.96	0.47
31:v:32:G:C8	31:v:41:G:C2	3.02	0.47
4:3:43:ILE:HD11	21:n:98:LEU:HB3	1.95	0.47
10:b:669:G:N3	10:b:669:G:C2'	2.77	0.47
10:b:903:C:H4'	10:b:903:C:OP1	2.14	0.47
10:b:1021:A:H2'	10:b:1022:G:H4'	1.95	0.47
10:b:1061:U:H1'	10:b:1068:G:H1'	1.95	0.47
10:b:2515:C:H2'	10:b:2516:A:H8	1.78	0.47
14:f:8:TYR:HB2	14:f:173:PHE:HZ	1.79	0.47
17:j:9:GLU:HG2	17:j:10:THR:HG23	1.96	0.47
5:4:40:ASP:HB3	5:4:43:VAL:HG12	1.95	0.47
10:b:1469:A:H2'	10:b:1470:A:H8	1.79	0.47
10:b:2543:G:N2	10:b:2646:C:H5"	2.28	0.47
10:b:482:A:H5"	28:u:45:HIS:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:856:G:H2'	10:b:857:G:C8	2.49	0.47
10:b:1664:A:H2	18:k:1:MET:HE1	1.78	0.47
10:b:2312:U:H5'	14:f:85:ILE:HD11	1.94	0.47
18:k:88:ASN:HB3	18:k:91:SER:O	2.14	0.47
3:2:41:THR:HG22	3:2:43:ALA:H	1.79	0.47
10:b:206:U:H2'	10:b:207:A:H8	1.79	0.47
10:b:459:U:H2'	10:b:460:A:H8	1.80	0.47
10:b:2458:G:H8	10:b:2459:A:H62	1.62	0.47
15:g:24:ILE:HD13	15:g:72:LEU:HD11	1.96	0.47
26:s:14:ALA:O	26:s:18:ARG:HG3	2.14	0.47
10:b:875:G:H3'	10:b:875:G:C8	2.49	0.47
10:b:2061:G:H5'	10:b:2502:G:H5'	1.96	0.47
11:c:222:GLY:O	11:c:225:MET:HG3	2.15	0.47
17:j:77:HIS:CE1	17:j:83:GLY:HA3	2.50	0.47
28:u:48:PRO:HB3	28:u:55:PRO:O	2.15	0.47
10:b:850:U:H3'	10:b:851:C:C5	2.50	0.47
10:b:2173:A:H5"	10:b:2174:C:H5	1.80	0.47
10:b:2305:U:H5"	14:f:131:GLY:HA3	1.96	0.47
20:m:42:THR:HG22	20:m:93:VAL:HG12	1.95	0.47
31:v:24:C:H2'	31:v:25:G:H8	1.79	0.47
10:b:513:A:H2	10:b:582:A:H4'	1.79	0.47
10:b:580:U:H2'	10:b:581:C:C6	2.50	0.47
10:b:2255:G:H2'	30:y:8:GLY:O	2.14	0.47
16:h:8:LYS:HZ3	16:h:14:SER:HA	1.80	0.47
16:h:26:ALA:C	16:h:28:ASN:H	2.23	0.47
9:a:42:C:C5	14:f:66:LEU:HD21	2.50	0.46
10:b:1340:U:H4'	10:b:1394:U:H4'	1.97	0.46
14:f:30:ARG:H	14:f:159:THR:HB	1.80	0.46
10:b:222:A:H3'	10:b:421:C:H5'	1.97	0.46
10:b:1716:U:H2'	10:b:1717:A:H8	1.81	0.46
10:b:2335:A:H5'	22:o:13:ARG:HH12	1.78	0.46
31:v:26:C:C2	31:v:27:A:C8	3.04	0.46
10:b:272:A:C2	10:b:273:G:C5	3.03	0.46
10:b:368:A:O2'	10:b:369:U:C5'	2.63	0.46
10:b:1689:A:H2'	10:b:1690:A:C8	2.51	0.46
10:b:2497:A:H1'	10:b:2498:C:H5	1.79	0.46
10:b:2601:C:O2'	10:b:2602:A:P	2.68	0.46
10:b:2134:A:H1'	10:b:2161:C:H5'	1.98	0.46
10:b:848:C:H2'	10:b:849:A:C8	2.51	0.46
18:k:91:SER:O	18:k:93:GLN:N	2.48	0.46
24:q:58:ARG:HA	24:q:61:TRP:CE3	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:52:ARG:CZ	4:3:54:VAL:HG12	2.45	0.46
10:b:2308:G:H2'	10:b:2310:C:H5	1.79	0.46
18:k:77:ILE:HG12	23:p:72:ARG:HE	1.80	0.46
21:n:8:ARG:HG3	21:n:43:GLU:OE2	2.15	0.46
21:n:12:ARG:HD3	21:n:16:HIS:HD2	1.78	0.46
24:q:97:ASP:OD2	25:r:13:ARG:NE	2.49	0.46
31:v:8:U:H5	31:v:15:G:N7	2.13	0.46
10:b:1076:C:H2'	10:b:1077:A:C8	2.51	0.46
10:b:2233:U:H2'	10:b:2234:G:H8	1.81	0.46
10:b:2346:A:H3'	10:b:2347:C:H5"	1.97	0.46
10:b:414:C:H2'	10:b:415:A:C8	2.51	0.46
4:3:43:ILE:HD13	4:3:49:TYR:HB2	1.98	0.46
10:b:2789:C:H2'	10:b:2893:A:N7	2.31	0.46
14:f:4:LEU:HD13	14:f:101:GLU:HB2	1.98	0.46
16:h:5:LEU:HD11	16:h:13:GLY:HA2	1.98	0.46
26:s:45:VAL:O	26:s:49:LYS:HG2	2.16	0.46
2:1:12:GLU:HG2	2:1:13:GLU:N	2.30	0.45
10:b:581:C:H2'	10:b:582:A:H8	1.79	0.45
10:b:829:A:N7	10:b:2248:C:H5'	2.32	0.45
10:b:2428:G:H5"	10:b:2429:G:H5'	1.98	0.45
18:k:102:PRO:HD3	23:p:66:ASN:HB2	1.97	0.45
1:0:43:GLU:HB3	1:0:45:ARG:HG2	1.98	0.45
10:b:82:U:H5"	10:b:296:U:H5'	1.98	0.45
10:b:903:C:O2	10:b:903:C:H2'	2.15	0.45
10:b:1026:G:H2'	10:b:1027:A:C8	2.51	0.45
10:b:2208:C:H2'	10:b:2209:G:C8	2.51	0.45
12:d:151:THR:HB	12:d:152:PRO:HD3	1.99	0.45
23:p:31:TRP:CE3	23:p:38:LYS:HG2	2.51	0.45
10:b:2765:A:N3	10:b:2765:A:H2'	2.31	0.45
13:e:118:LEU:HD11	13:e:188:MET:HE3	1.96	0.45
18:k:109:SER:C	18:k:111:LYS:H	2.24	0.45
26:s:84:ARG:HA	32:z:129:VAL:HG11	1.98	0.45
31:v:29:U:H2'	31:v:30:U:H6	1.81	0.45
3:2:47:MET:HE3	10:b:850:U:O2'	2.17	0.45
10:b:1493:C:H3'	10:b:1494:A:H8	1.81	0.45
17:j:60:ASP:HB3	17:j:97:PRO:HB3	1.98	0.45
18:k:71:ARG:HA	18:k:71:ARG:HD3	1.67	0.45
1:0:66:THR:O	1:0:70:GLU:HG3	2.17	0.45
6:6:7:PRO:HB2	10:b:1309:G:H4'	1.98	0.45
9:a:48:U:H2'	9:a:49:C:C6	2.52	0.45
10:b:657:U:H2'	10:b:658:U:C6	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:1035:U:O2	10:b:1035:U:H2'	2.17	0.45
13:e:5:LEU:HD13	13:e:10:SER:O	2.15	0.45
5:4:34:LEU:HB3	5:4:52:ALA:HB2	1.98	0.45
10:b:581:C:OP1	24:q:33:ARG:HG3	2.16	0.45
10:b:2099:U:H3	10:b:2190:G:H1	1.65	0.45
10:b:2313:C:H2'	10:b:2314:A:C8	2.52	0.45
10:b:2788:C:H2'	10:b:2789:C:C6	2.52	0.45
18:k:43:ILE:HD12	18:k:56:ASP:HB2	1.99	0.45
19:l:23:ILE:HG12	25:r:82:HIS:CD2	2.52	0.45
30:y:4:LYS:O	30:y:5:LYS:HG3	2.16	0.45
10:b:281:C:H2'	10:b:282:A:H8	1.81	0.45
17:j:110:PRO:O	17:j:115:GLY:HA3	2.17	0.45
27:t:69:ARG:HG2	27:t:74:ILE:HD13	1.99	0.45
31:v:33:U:H2'	31:v:34:U:O4'	2.16	0.45
10:b:891:G:O2'	10:b:893:C:N4	2.49	0.45
10:b:948:C:H2'	10:b:949:G:C8	2.51	0.45
10:b:1394:U:H5'	10:b:1603:A:H4'	1.99	0.45
11:c:100:GLU:OE2	11:c:102:ARG:NE	2.48	0.45
13:e:155:GLU:O	13:e:159:LEU:HG	2.17	0.45
21:n:41:ALA:C	21:n:43:GLU:H	2.25	0.45
26:s:84:ARG:O	26:s:95:ARG:HD3	2.16	0.45
31:v:59:A:O2'	31:v:61:U:OP2	2.26	0.45
9:a:8:C:H5"	22:o:15:ARG:HH12	1.82	0.45
10:b:874:G:H2'	10:b:875:G:C5'	2.38	0.45
12:d:35:THR:HG22	12:d:73:VAL:HG21	1.99	0.45
13:e:46:GLN:HB2	13:e:86:ALA:HB1	1.99	0.45
10:b:741:U:H2'	10:b:742:A:C8	2.52	0.45
15:g:12:PRO:HD2	15:g:15:VAL:HG11	1.99	0.45
18:k:34:GLY:N	18:k:37:ASP:OD2	2.44	0.45
10:b:1683:U:H2'	10:b:1684:G:C8	2.52	0.44
11:c:145:GLU:HG2	11:c:151:GLY:C	2.42	0.44
10:b:1884:G:H5"	10:b:1884:G:C8	2.53	0.44
10:b:2830:C:H3'	12:d:59:ARG:HH11	1.82	0.44
15:g:45:HIS:HA	15:g:50:LEU:HD23	1.99	0.44
16:h:18:GLN:HE22	16:h:39:ALA:HB2	1.82	0.44
4:3:5:GLN:NE2	10:b:2056:G:H4'	2.33	0.44
10:b:488:G:H4'	26:s:49:LYS:HE3	1.99	0.44
10:b:593:U:H3	10:b:664:G:H1	1.65	0.44
28:u:54:GLN:CD	28:u:56:GLY:H	2.25	0.44
30:y:70:GLU:CD	30:y:72:LYS:HE2	2.43	0.44
10:b:371:A:H61	10:b:401:A:H3'	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:g:18:LYS:NZ	15:g:20:ASN:OD1	2.51	0.44
10:b:2331:G:H21	10:b:2336:A:H8	1.66	0.44
12:d:47:ALA:HA	12:d:84:LEU:HD13	1.99	0.44
14:f:123:ASP:OD2	14:f:127:ASN:HB2	2.18	0.44
24:q:7:GLY:O	24:q:11:ARG:HG2	2.18	0.44
10:b:1996:C:O2	10:b:1997:C:H1'	2.16	0.44
14:f:44:ILE:HD12	14:f:78:LYS:HB2	1.98	0.44
16:h:29:PHE:O	16:h:33:GLN:HG2	2.17	0.44
18:k:41:ILE:HD11	18:k:86:LEU:CD2	2.48	0.44
31:v:52:A:O2'	31:v:53:G:H8	2.00	0.44
10:b:813:U:H2'	10:b:814:C:C6	2.53	0.44
10:b:839:U:H3	10:b:939:G:H1	1.64	0.44
10:b:2059:A:C5'	13:e:64:GLY:O	2.61	0.44
10:b:2096:C:H2'	10:b:2097:A:C8	2.53	0.44
10:b:2810:A:H5"	12:d:62:LYS:NZ	2.32	0.44
15:g:5:ALA:HB2	15:g:66:GLY:HA2	2.00	0.44
5:4:37:LYS:HG2	5:4:48:ILE:HD13	2.00	0.44
8:8:33:HIS:O	8:8:35:GLN:HG3	2.17	0.44
10:b:167:A:H2	10:b:2209:G:H4'	1.82	0.44
10:b:368:A:O2'	10:b:369:U:H5'	2.17	0.44
10:b:874:G:O2'	10:b:875:G:C5'	2.66	0.44
10:b:1306:C:H5"	10:b:1606:C:N4	2.33	0.44
10:b:1490:A:H8	11:c:98:ASP:HB3	1.83	0.44
10:b:2327:A:H2'	10:b:2328:A:C8	2.53	0.44
14:f:134:GLU:CD	14:f:136:ILE:H	2.26	0.44
10:b:875:G:C8	10:b:875:G:C3'	3.01	0.44
10:b:1494:A:HO2'	10:b:1495:A:H8	1.64	0.44
10:b:1869:G:H22	10:b:1872:A:H1'	1.83	0.44
10:b:2036:C:H2'	10:b:2037:A:H8	1.82	0.44
10:b:2657:A:O2'	10:b:2658:C:H5'	2.16	0.44
11:c:107:PRO:HD2	11:c:110:LEU:HD22	2.00	0.44
12:d:9:VAL:HG21	23:p:4:ILE:HD11	2.00	0.44
13:e:189:THR:O	13:e:193:VAL:HG23	2.17	0.44
18:k:35:VAL:HG11	18:k:104:THR:HG21	2.00	0.44
28:u:74:ASN:HA	28:u:96:PHE:CE2	2.52	0.44
31:v:30:U:H2'	31:v:31:C:H6	1.83	0.44
10:b:106:C:H2'	10:b:107:G:H8	1.82	0.43
10:b:1426:G:H2'	10:b:1427:A:C8	2.53	0.43
14:f:134:GLU:HG2	14:f:149:VAL:HB	1.99	0.43
15:g:3:ARG:HA	15:g:6:LYS:HG2	2.00	0.43
22:o:4:LYS:O	22:o:8:ILE:HG12	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:p:100:LEU:HD11	23:p:110:ILE:HD11	2.00	0.43
10:b:751:A:H5'	26:s:90:LYS:HA	2.00	0.43
10:b:911:A:C8	20:m:9:PHE:CE2	3.07	0.43
10:b:2751:G:H3'	10:b:2752:C:C6	2.50	0.43
14:f:66:LEU:N	14:f:88:LYS:O	2.29	0.43
17:j:13:ARG:NH1	17:j:49:ASP:O	2.52	0.43
28:u:92:LYS:HB3	28:u:92:LYS:HE3	1.78	0.43
31:v:28:C:H2'	31:v:29:U:H6	1.82	0.43
10:b:832:U:H2'	10:b:833:A:C8	2.53	0.43
10:b:1792:G:H5'	11:c:204:VAL:HG13	2.00	0.43
14:f:16:LEU:HD22	14:f:20:PHE:HE2	1.84	0.43
27:t:1:MET:HE3	27:t:1:MET:HB3	1.69	0.43
31:v:9:G:C8	31:v:46:G:H2'	2.52	0.43
31:v:51:G:O2'	31:v:52:A:H5'	2.18	0.43
9:a:106:G:H2'	9:a:107:G:O4'	2.18	0.43
10:b:222:A:H61	10:b:232:G:H1'	1.83	0.43
10:b:528:A:H8	17:j:116:ARG:NH2	2.17	0.43
10:b:576:U:H2'	10:b:577:G:C8	2.53	0.43
10:b:767:U:H2'	10:b:768:G:H8	1.83	0.43
10:b:1782:U:O4	32:z:139:TRP:CZ2	2.71	0.43
10:b:2765:A:N3	10:b:2765:A:C2'	2.81	0.43
11:c:155:ALA:CB	11:c:162:VAL:HG23	2.48	0.43
17:j:98:GLU:H	17:j:98:GLU:CD	2.26	0.43
10:b:521:U:H2'	10:b:522:A:C8	2.53	0.43
10:b:671:C:H2'	10:b:672:C:H6	1.84	0.43
10:b:891:G:HO2'	10:b:893:C:N4	2.16	0.43
10:b:1508:A:H5'	10:b:1509:A:C4	2.54	0.43
10:b:1700:A:H3'	10:b:1701:A:H8	1.83	0.43
31:v:37:G:H2'	31:v:38:G:O4'	2.17	0.43
31:v:70:A:H2'	31:v:71:C:C6	2.54	0.43
10:b:2061:G:N1	32:z:145:ARG:CG	2.82	0.43
15:g:24:ILE:HD12	15:g:43:VAL:HG21	2.00	0.43
21:n:96:ARG:O	21:n:113:ILE:HA	2.19	0.43
10:b:611:C:O2'	10:b:612:G:H5'	2.19	0.43
15:g:86:LYS:HG2	15:g:132:VAL:HG22	2.01	0.43
17:j:4:PHE:O	24:q:64:ARG:NH1	2.44	0.43
31:v:39:A:H2'	31:v:40:C:H6	1.79	0.43
3:2:12:SER:HB2	3:2:32:ILE:HD11	2.00	0.43
10:b:1013:C:H2'	10:b:1014:A:H8	1.83	0.43
10:b:1744:A:H3'	10:b:1745:A:H8	1.84	0.43
10:b:1915:U:H3'	10:b:1916:A:H8	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:b:2064:C:H5'	31:v:76:C:O2'	2.18	0.43
10:b:2114:A:H5"	10:b:2146:C:H41	1.84	0.43
18:k:2:ILE:HD12	18:k:8:LEU:HD21	1.99	0.43
19:l:19:LEU:HD12	19:l:27:LEU:HD13	2.00	0.43
22:o:82:ALA:HB1	22:o:87:ILE:HB	2.01	0.43
10:b:1381:G:H3'	10:b:1382:G:H21	1.83	0.42
12:d:25:THR:HG21	12:d:193:VAL:HG22	2.01	0.42
14:f:80:ARG:CZ	31:v:57:C:C2	3.01	0.42
18:k:35:VAL:HG11	18:k:104:THR:CG2	2.49	0.42
12:d:184:ARG:NH2	23:p:7:GLN:OE1	2.53	0.42
26:s:11:ARG:HA	26:s:11:ARG:HD2	1.89	0.42
10:b:272:A:N1	10:b:273:G:C6	2.87	0.42
10:b:1924:C:HO2'	31:v:14:A:C1'	2.30	0.42
10:b:2605:U:H2'	10:b:2606:C:C6	2.54	0.42
10:b:2863:C:H2'	10:b:2864:G:C8	2.54	0.42
14:f:106:ILE:HG21	14:f:139:PRO:HG3	2.02	0.42
15:g:87:LEU:HB2	15:g:131:ILE:HB	2.01	0.42
4:3:16:ARG:HE	4:3:16:ARG:HB3	1.32	0.42
10:b:302:C:H2'	10:b:303:G:C8	2.54	0.42
10:b:1047:G:O2'	10:b:1048:A:H8	2.00	0.42
10:b:1069:A:C2	10:b:1095:A:H5"	2.54	0.42
10:b:2075:U:H1'	10:b:2597:G:H21	1.84	0.42
11:c:44:ASN:OD1	11:c:46:ASN:N	2.49	0.42
13:e:4:VAL:HA	13:e:11:ALA:HA	2.02	0.42
31:v:30:U:H2'	31:v:31:C:C6	2.55	0.42
31:v:36:G:H2'	31:v:37:G:C8	2.53	0.42
10:b:608:A:H2'	10:b:609:A:C8	2.54	0.42
10:b:1013:C:H2'	10:b:1014:A:C8	2.55	0.42
3:2:11:ARG:HB2	3:2:54:MET:HB2	2.02	0.42
9:a:49:C:H2'	9:a:50:A:C8	2.54	0.42
10:b:885:C:H2'	10:b:886:A:C8	2.54	0.42
10:b:2116:G:H1'	10:b:2148:G:H21	1.85	0.42
14:f:29:PRO:HB2	14:f:169:LEU:HD22	2.01	0.42
22:o:88:LYS:HZ2	22:o:116:GLN:HE22	1.66	0.42
31:v:66:U:O2'	31:v:67:A:H8	2.02	0.42
10:b:220:G:H1'	10:b:234:U:H1'	2.01	0.42
10:b:351:C:H2'	10:b:352:A:C8	2.55	0.42
10:b:2377:A:H2'	10:b:2378:A:C8	2.55	0.42
10:b:2125:G:C6	10:b:2126:A:H1'	2.55	0.42
10:b:2313:C:H5"	14:f:88:LYS:HD3	2.01	0.42
10:b:2809:A:H2'	10:b:2810:A:C8	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
29:w:80:HIS:CE1	29:w:83:LYS:HD2	2.55	0.42
3:2:7:ILE:HD11	3:2:48:ILE:HD11	2.02	0.42
10:b:2062:A:H2'	10:b:2062:A:N3	2.35	0.42
13:e:176:ASP:CG	13:e:179:SER:HG	2.26	0.42
14:f:32:GLU:OE2	14:f:159:THR:OG1	2.20	0.42
14:f:70:ALA:C	14:f:72:LYS:H	2.27	0.42
22:o:24:THR:HG23	22:o:90:VAL:HG12	2.02	0.42
10:b:558:U:H2'	10:b:559:G:C8	2.54	0.42
10:b:588:U:H2'	10:b:589:U:C6	2.54	0.42
10:b:1704:C:H2'	10:b:1705:A:C8	2.55	0.42
10:b:1871:A:C5'	10:b:1872:A:H2	2.26	0.42
13:e:170:ARG:NH2	13:e:174:GLY:O	2.53	0.42
14:f:70:ALA:O	14:f:72:LYS:N	2.52	0.42
22:o:76:LYS:HG2	22:o:80:GLU:OE1	2.20	0.42
24:q:92:ARG:HG3	24:q:92:ARG:NH1	2.34	0.42
30:y:77:ARG:HG3	30:y:77:ARG:NH1	2.34	0.42
1:0:32:ASN:HB2	10:b:397:U:H5"	2.02	0.41
9:a:70:C:H2'	9:a:71:C:H6	1.85	0.41
10:b:2261:C:C5	30:y:16:SER:HB3	2.55	0.41
10:b:2302:U:H2'	10:b:2303:G:C8	2.55	0.41
10:b:2678:C:H2'	10:b:2679:A:C8	2.55	0.41
10:b:2739:U:H5"	10:b:2763:G:O6	2.19	0.41
10:b:20:C:H2'	10:b:21:A:C8	2.55	0.41
10:b:84:A:H5"	28:u:6:ARG:HG3	2.02	0.41
13:e:155:GLU:HG2	13:e:156:ASN:N	2.35	0.41
13:e:191:ASP:O	13:e:195:GLN:HG3	2.19	0.41
14:f:70:ALA:O	14:f:71:ARG:HG2	2.20	0.41
22:o:11:ALA:HB1	22:o:15:ARG:HE	1.85	0.41
31:v:28:C:C2	31:v:29:U:C5	3.08	0.41
1:0:56:MET:HG2	16:h:27:ARG:NH2	2.35	0.41
9:a:66:A:H4'	9:a:67:G:OP1	2.19	0.41
10:b:308:G:H2'	10:b:309:A:C8	2.56	0.41
10:b:318:C:H2'	10:b:319:G:H8	1.85	0.41
10:b:1188:U:H2'	10:b:1189:A:H8	1.85	0.41
10:b:1364:G:H5'	10:b:1809:A:H1'	2.01	0.41
10:b:2824:C:H2'	10:b:2825:G:O4'	2.20	0.41
10:b:2834:G:H2'	10:b:2879:A:N6	2.34	0.41
13:e:122:GLU:OE1	13:e:122:GLU:N	2.47	0.41
10:b:128:C:H2'	10:b:129:C:C6	2.56	0.41
10:b:2829:A:H2'	10:b:2830:C:O4'	2.20	0.41
12:d:9:VAL:HG12	23:p:5:ILE:HD11	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
28:u:8:ASP:OD1	28:u:24:LYS:NZ	2.51	0.41
10:b:729:G:C6	11:c:207:LYS:HB2	2.56	0.41
10:b:2301:C:H2'	10:b:2302:U:C6	2.56	0.41
28:u:86:ARG:HG2	28:u:95:PHE:CD1	2.55	0.41
31:v:8:U:C5	31:v:15:G:N7	2.88	0.41
31:v:40:C:H2'	31:v:41:G:O4'	2.20	0.41
2:1:11:VAL:HG12	2:1:15:ASN:HD21	1.86	0.41
7:7:14:PHE:O	7:7:15:LYS:HD3	2.20	0.41
10:b:107:G:H21	10:b:346:A:H62	1.68	0.41
10:b:181:A:H1'	10:b:435:C:H5'	2.02	0.41
10:b:696:G:H1	10:b:766:U:H3	1.67	0.41
10:b:1049:C:H1'	10:b:1113:U:H4'	2.02	0.41
10:b:2173:A:H5"	10:b:2174:C:C5	2.56	0.41
13:e:142:ALA:O	13:e:143:LEU:HD23	2.20	0.41
19:l:59:ARG:HE	19:l:59:ARG:HB3	1.74	0.41
28:u:81:ASP:OD2	28:u:96:PHE:HB3	2.20	0.41
2:1:12:GLU:HA	2:1:15:ASN:HD22	1.86	0.41
10:b:452:G:H2'	10:b:453:A:C8	2.56	0.41
10:b:1004:U:H2'	10:b:1011:G:H2'	2.02	0.41
10:b:1026:G:H2'	10:b:1027:A:H8	1.85	0.41
10:b:1432:G:H2'	10:b:1433:A:C8	2.55	0.41
10:b:1808:A:H3'	10:b:1809:A:C8	2.56	0.41
10:b:1972:G:H2'	10:b:1973:G:C8	2.55	0.41
12:d:62:LYS:HE3	12:d:62:LYS:HB2	1.92	0.41
19:l:131:ALA:O	19:l:135:ILE:HG13	2.21	0.41
5:4:27:LYS:NZ	5:4:53:LYS:O	2.34	0.41
10:b:367:G:H2'	10:b:368:A:H5'	2.02	0.41
10:b:1083:U:H2'	10:b:1084:A:H2'	2.02	0.41
10:b:1447:C:H2'	10:b:1448:G:C8	2.56	0.41
12:d:16:THR:OG1	12:d:18:ASP:OD1	2.33	0.41
12:d:19:GLY:HA2	23:p:79:PRO:HG2	2.03	0.41
12:d:48:ILE:HG12	12:d:84:LEU:HD11	2.03	0.41
26:s:99:ARG:HG2	26:s:99:ARG:HH11	1.85	0.41
27:t:6:ARG:O	27:t:10:VAL:HG13	2.20	0.41
9:a:41:G:O2'	9:a:42:C:OP1	2.36	0.41
9:a:50:A:H5"	22:o:67:ASN:HD21	1.85	0.41
10:b:222:A:N6	10:b:232:G:H1'	2.35	0.41
10:b:1965:C:H2'	10:b:1966:A:C8	2.56	0.41
10:b:2334:U:O2'	10:b:2335:A:H4'	2.21	0.41
10:b:2696:U:H2'	10:b:2697:G:C8	2.56	0.41
13:e:112:LEU:HA	13:e:112:LEU:HD23	1.87	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:f:8:TYR:HB2	14:f:173:PHE:CZ	2.56	0.41
18:k:64:ARG:HD2	18:k:79:PHE:CD2	2.55	0.41
23:p:40:LEU:HD23	23:p:40:LEU:HA	1.90	0.41
23:p:100:LEU:HA	23:p:100:LEU:HD23	1.84	0.41
31:v:27:A:C5	31:v:28:C:C5	3.09	0.41
10:b:49:A:H61	10:b:177:G:H2'	1.85	0.41
10:b:1600:C:H2'	10:b:1601:G:C8	2.56	0.41
15:g:38:ASN:HD22	15:g:64:GLN:CD	2.29	0.41
20:m:41:LEU:HA	20:m:45:GLN:NE2	2.29	0.41
23:p:27:GLU:OE1	23:p:29:LYS:HE3	2.21	0.41
10:b:270:A:H2	10:b:369:U:O3'	2.04	0.40
10:b:1054:A:H1'	10:b:1106:G:H22	1.85	0.40
10:b:1060:U:H4'	10:b:1061:U:H4'	2.03	0.40
10:b:1450:G:H21	10:b:1452:G:H1	1.69	0.40
10:b:2597:G:H5'	11:c:241:GLY:HA3	2.03	0.40
15:g:30:ASN:HB2	15:g:79:VAL:HA	2.03	0.40
21:n:56:LYS:HE2	21:n:87:PHE:O	2.21	0.40
28:u:7:ARG:NH1	28:u:27:ASN:HA	2.36	0.40
10:b:1986:C:H2'	10:b:1987:A:O5'	2.20	0.40
15:g:16:ASP:OD1	15:g:27:LYS:HB3	2.21	0.40
20:m:111:GLU:HG2	20:m:112:LEU:N	2.36	0.40
27:t:2:ILE:H	27:t:2:ILE:HG12	1.53	0.40
10:b:1161:C:H2'	10:b:1162:G:C8	2.56	0.40
10:b:1938:A:C6	10:b:2590:A:H1'	2.56	0.40
10:b:2368:C:H2'	10:b:2369:A:C8	2.57	0.40
10:b:2680:U:H2'	10:b:2681:C:C6	2.56	0.40
17:j:58:ASN:OD1	17:j:128:ASN:HB3	2.21	0.40
18:k:7:MET:SD	18:k:20:MET:HB2	2.62	0.40
32:z:144:ILE:H	32:z:144:ILE:HG12	1.53	0.40
10:b:413:C:H2'	10:b:414:C:C6	2.57	0.40
10:b:538:A:H3'	10:b:539:G:H8	1.87	0.40
10:b:1386:C:H2'	10:b:1387:A:C8	2.56	0.40
10:b:2036:C:H2'	10:b:2037:A:C8	2.56	0.40
10:b:2115:G:N2	10:b:2119:A:H62	2.18	0.40
11:c:44:ASN:OD1	11:c:44:ASN:C	2.64	0.40
11:c:157:SER:OG	11:c:158:ALA:N	2.55	0.40
13:e:164:LEU:HD23	13:e:164:LEU:HA	1.89	0.40
17:j:42:ALA:O	24:q:64:ARG:HG2	2.22	0.40
10:b:2169:A:H2'	10:b:2169:A:N3	2.37	0.40
10:b:2710:C:H2'	10:b:2711:A:C8	2.56	0.40
13:e:16:GLU:HA	13:e:16:GLU:OE1	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:o:83:LEU:HD23	22:o:83:LEU:HA	1.76	0.40

There are no symmetry-related clashes.

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	
1	0	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
2	1	59/63 (94%)	56 (95%)	3 (5%)	0	100	100
3	2	55/59 (93%)	53 (96%)	2 (4%)	0	100	100
4	3	53/57 (93%)	49 (92%)	4 (8%)	0	100	100
5	4	48/55 (87%)	45 (94%)	3 (6%)	0	100	100
6	6	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
7	7	62/65 (95%)	59 (95%)	3 (5%)	0	100	100
8	8	36/50 (72%)	35 (97%)	1 (3%)	0	100	100
11	c	269/273 (98%)	258 (96%)	11 (4%)	0	100	100
12	d	207/209 (99%)	197 (95%)	10 (5%)	0	100	100
13	e	199/201 (99%)	196 (98%)	3 (2%)	0	100	100
14	f	175/179 (98%)	164 (94%)	10 (6%)	1 (1%)	22	33
15	g	174/177 (98%)	159 (91%)	15 (9%)	0	100	100
16	h	37/149 (25%)	32 (86%)	5 (14%)	0	100	100
17	j	140/142 (99%)	138 (99%)	2 (1%)	0	100	100
18	k	120/123 (98%)	116 (97%)	4 (3%)	0	100	100
19	l	141/144 (98%)	132 (94%)	9 (6%)	0	100	100
20	m	134/136 (98%)	133 (99%)	1 (1%)	0	100	100
21	n	118/127 (93%)	111 (94%)	7 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
22	o	114/117 (97%)	109 (96%)	5 (4%)	0	100 100
23	p	111/115 (96%)	110 (99%)	1 (1%)	0	100 100
24	q	115/118 (98%)	115 (100%)	0	0	100 100
25	r	100/103 (97%)	93 (93%)	5 (5%)	2 (2%)	6 8
26	s	107/110 (97%)	100 (94%)	7 (6%)	0	100 100
27	t	91/100 (91%)	87 (96%)	4 (4%)	0	100 100
28	u	100/104 (96%)	83 (83%)	17 (17%)	0	100 100
29	w	92/94 (98%)	91 (99%)	1 (1%)	0	100 100
30	y	78/85 (92%)	71 (91%)	5 (6%)	2 (3%)	4 4
32	z	18/148 (12%)	15 (83%)	2 (11%)	1 (6%)	1 1
All	All	3072/3427 (90%)	2924 (95%)	142 (5%)	6 (0%)	45 59

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
25	r	52	PRO
30	y	7	GLY
25	r	51	VAL
30	y	44	LYS
32	z	132	PHE
14	f	71	ARG

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	0	67/68 (98%)	67 (100%)	0	100 100
2	1	54/55 (98%)	54 (100%)	0	100 100
3	2	47/49 (96%)	47 (100%)	0	100 100
4	3	46/48 (96%)	44 (96%)	2 (4%)	25 42
5	4	45/49 (92%)	44 (98%)	1 (2%)	47 67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
6	6	38/38 (100%)	38 (100%)	0	100 100
7	7	51/52 (98%)	51 (100%)	0	100 100
8	8	34/44 (77%)	34 (100%)	0	100 100
11	c	216/218 (99%)	216 (100%)	0	100 100
12	d	164/164 (100%)	164 (100%)	0	100 100
13	e	165/165 (100%)	165 (100%)	0	100 100
14	f	148/150 (99%)	144 (97%)	4 (3%)	40 60
15	g	137/138 (99%)	136 (99%)	1 (1%)	81 91
16	h	30/114 (26%)	30 (100%)	0	100 100
17	j	116/116 (100%)	116 (100%)	0	100 100
18	k	103/104 (99%)	103 (100%)	0	100 100
19	l	102/103 (99%)	94 (92%)	8 (8%)	10 17
20	m	109/109 (100%)	109 (100%)	0	100 100
21	n	100/103 (97%)	100 (100%)	0	100 100
22	o	86/87 (99%)	82 (95%)	4 (5%)	22 38
23	p	98/100 (98%)	98 (100%)	0	100 100
24	q	89/90 (99%)	89 (100%)	0	100 100
25	r	84/84 (100%)	79 (94%)	5 (6%)	16 27
26	s	92/93 (99%)	92 (100%)	0	100 100
27	t	80/84 (95%)	78 (98%)	2 (2%)	42 63
28	u	83/85 (98%)	82 (99%)	1 (1%)	67 82
29	w	78/78 (100%)	78 (100%)	0	100 100
30	y	61/63 (97%)	60 (98%)	1 (2%)	58 76
32	z	19/121 (16%)	14 (74%)	5 (26%)	0 0
All	All	2542/2772 (92%)	2508 (99%)	34 (1%)	64 81

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	3	16	ARG
4	3	18	SER
5	4	42	VAL
14	f	9	LYS
14	f	11	GLU

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Mol	Chain	Res	Type
14	f	24	SER
14	f	26	MET
15	g	130	GLU
19	l	69	ARG
19	l	70	LYS
19	l	73	ILE
19	l	77	ILE
19	l	85	VAL
19	l	92	LEU
19	l	103	ILE
19	l	104	GLN
22	o	15	ARG
22	o	67	ASN
22	o	68	LYS
22	o	69	ASP
25	r	40	MET
25	r	43	ASN
25	r	47	VAL
25	r	51	VAL
25	r	55	ASP
27	t	1	MET
27	t	2	ILE
28	u	92	LYS
30	y	5	LYS
32	z	128	THR
32	z	129	VAL
32	z	131	LEU
32	z	144	ILE
32	z	145	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (46) such sidechains are listed below:

Mol	Chain	Res	Type
1	0	34	HIS
2	1	15	ASN
2	1	27	ASN
4	3	6	ASN
4	3	19	HIS
5	4	45	GLN
6	6	26	ASN
7	7	43	HIS
11	c	117	GLN

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Mol	Chain	Res	Type
11	c	153	GLN
11	c	163	GLN
11	c	200	HIS
11	c	243	HIS
12	d	150	GLN
13	e	29	HIS
13	e	92	HIS
13	e	136	GLN
13	e	163	ASN
14	f	52	ASN
15	g	38	ASN
16	h	18	GLN
17	j	76	HIS
17	j	136	GLN
18	k	29	HIS
18	k	93	GLN
20	m	13	HIS
20	m	45	GLN
21	n	9	GLN
22	o	29	HIS
22	o	67	ASN
22	o	98	GLN
22	o	116	GLN
23	p	10	GLN
23	p	12	GLN
23	p	66	ASN
24	q	44	GLN
24	q	72	ASN
24	q	81	ASN
25	r	11	GLN
26	s	7	HIS
27	t	28	ASN
27	t	70	HIS
28	u	46	GLN
28	u	69	ASN
29	w	24	ASN
30	y	3	HIS

5.3.3 RNA (i)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
10	b	2900/2904 (99%)	1198 (41%)	0
31	v	76/77 (98%)	20 (26%)	0
9	a	117/120 (97%)	21 (17%)	0
All	All	3093/3101 (99%)	1239 (40%)	0

All (1239) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
9	a	25	U
9	a	26	C
9	a	30	C
9	a	32	U
9	a	35	C
9	a	41	G
9	a	42	C
9	a	43	C
9	a	44	G
9	a	50	A
9	a	56	G
9	a	59	A
9	a	67	G
9	a	88	C
9	a	89	U
9	a	99	A
9	a	108	A
9	a	109	A
9	a	112	G
9	a	114	C
9	a	116	G
10	b	5	A
10	b	10	A
10	b	11	C
10	b	13	A
10	b	16	C
10	b	23	G
10	b	24	G
10	b	28	A
10	b	33	C
10	b	34	U
10	b	35	G
10	b	36	G

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Mol	Chain	Res	Type
10	b	43	G
10	b	45	G
10	b	46	G
10	b	49	A
10	b	50	U
10	b	51	G
10	b	55	G
10	b	60	G
10	b	62	U
10	b	63	A
10	b	64	A
10	b	65	U
10	b	69	C
10	b	70	G
10	b	71	A
10	b	73	A
10	b	74	A
10	b	75	G
10	b	84	A
10	b	87	U
10	b	91	A
10	b	93	G
10	b	96	C
10	b	99	U
10	b	100	U
10	b	101	A
10	b	102	U
10	b	114	U
10	b	116	C
10	b	118	A
10	b	119	A
10	b	120	U
10	b	122	G
10	b	124	G
10	b	125	A
10	b	126	A
10	b	127	A
10	b	128	C
10	b	131	A
10	b	134	G
10	b	135	U
10	b	136	G

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Mol	Chain	Res	Type
10	b	139	U
10	b	140	C
10	b	141	G
10	b	142	A
10	b	146	A
10	b	159	G
10	b	160	A
10	b	162	U
10	b	163	C
10	b	165	A
10	b	166	U
10	b	168	G
10	b	169	G
10	b	171	U
10	b	175	G
10	b	176	A
10	b	177	G
10	b	178	G
10	b	181	A
10	b	182	A
10	b	188	G
10	b	189	G
10	b	196	A
10	b	197	A
10	b	198	C
10	b	199	A
10	b	201	C
10	b	206	U
10	b	213	A
10	b	215	G
10	b	216	A
10	b	221	A
10	b	222	A
10	b	223	A
10	b	224	U
10	b	228	C
10	b	229	C
10	b	230	G
10	b	232	G
10	b	233	A
10	b	245	G
10	b	246	C

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Mol	Chain	Res	Type
10	b	248	G
10	b	250	G
10	b	252	G
10	b	255	A
10	b	257	C
10	b	261	G
10	b	265	A
10	b	266	G
10	b	268	C
10	b	271	G
10	b	277	G
10	b	278	A
10	b	279	A
10	b	280	U
10	b	281	C
10	b	286	U
10	b	287	G
10	b	288	U
10	b	289	G
10	b	291	G
10	b	298	G
10	b	300	A
10	b	303	G
10	b	311	A
10	b	312	G
10	b	313	G
10	b	317	G
10	b	321	U
10	b	322	A
10	b	323	C
10	b	324	A
10	b	325	G
10	b	326	G
10	b	327	G
10	b	329	G
10	b	330	A
10	b	332	A
10	b	334	C
10	b	338	G
10	b	340	A
10	b	343	C
10	b	345	A

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Mol	Chain	Res	Type
10	b	347	A
10	b	348	A
10	b	350	G
10	b	354	A
10	b	356	G
10	b	359	G
10	b	367	G
10	b	368	A
10	b	369	U
10	b	370	G
10	b	371	A
10	b	372	G
10	b	376	G
10	b	380	G
10	b	383	C
10	b	385	C
10	b	386	G
10	b	387	U
10	b	389	G
10	b	390	U
10	b	391	A
10	b	395	U
10	b	396	G
10	b	397	U
10	b	403	U
10	b	404	A
10	b	405	U
10	b	406	G
10	b	411	G
10	b	412	A
10	b	417	C
10	b	420	C
10	b	422	A
10	b	428	A
10	b	429	A
10	b	433	C
10	b	437	U
10	b	442	G
10	b	443	A
10	b	451	U
10	b	454	A
10	b	455	C

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Mol	Chain	Res	Type
10	b	456	C
10	b	457	A
10	b	462	C
10	b	471	A
10	b	474	G
10	b	475	C
10	b	479	A
10	b	480	A
10	b	481	G
10	b	482	A
10	b	489	G
10	b	490	C
10	b	491	G
10	b	496	G
10	b	504	A
10	b	505	A
10	b	508	A
10	b	509	C
10	b	510	C
10	b	512	G
10	b	513	A
10	b	520	G
10	b	527	C
10	b	528	A
10	b	529	A
10	b	530	G
10	b	531	C
10	b	532	A
10	b	536	G
10	b	538	A
10	b	542	C
10	b	543	G
10	b	547	A
10	b	548	G
10	b	554	U
10	b	555	G
10	b	562	U
10	b	563	A
10	b	573	U
10	b	574	A
10	b	575	A
10	b	576	U

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Mol	Chain	Res	Type
10	b	586	A
10	b	587	C
10	b	597	G
10	b	603	A
10	b	604	G
10	b	614	A
10	b	615	U
10	b	620	G
10	b	621	A
10	b	622	G
10	b	627	A
10	b	630	G
10	b	634	C
10	b	636	G
10	b	637	A
10	b	642	U
10	b	644	A
10	b	645	C
10	b	647	G
10	b	651	G
10	b	652	U
10	b	653	U
10	b	654	A
10	b	655	A
10	b	662	G
10	b	664	G
10	b	668	A
10	b	669	G
10	b	670	A
10	b	674	G
10	b	678	C
10	b	686	U
10	b	693	A
10	b	694	U
10	b	711	G
10	b	714	U
10	b	717	C
10	b	718	A
10	b	719	C
10	b	726	G
10	b	728	G
10	b	730	A

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Mol	Chain	Res	Type
10	b	731	C
10	b	734	A
10	b	740	C
10	b	746	U
10	b	747	U
10	b	757	G
10	b	764	A
10	b	769	U
10	b	774	G
10	b	775	G
10	b	776	G
10	b	777	G
10	b	781	A
10	b	782	A
10	b	783	A
10	b	784	G
10	b	785	G
10	b	789	A
10	b	791	C
10	b	792	A
10	b	793	A
10	b	794	A
10	b	805	G
10	b	806	C
10	b	811	U
10	b	812	C
10	b	819	A
10	b	827	U
10	b	828	U
10	b	829	A
10	b	830	G
10	b	831	G
10	b	841	G
10	b	842	U
10	b	845	A
10	b	846	U
10	b	847	U
10	b	848	C
10	b	851	C
10	b	852	U
10	b	853	C
10	b	854	C

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Mol	Chain	Res	Type
10	b	855	G
10	b	859	G
10	b	860	U
10	b	864	G
10	b	866	A
10	b	868	U
10	b	869	G
10	b	872	U
10	b	873	C
10	b	875	G
10	b	876	C
10	b	877	A
10	b	878	A
10	b	879	G
10	b	880	G
10	b	881	G
10	b	883	G
10	b	884	U
10	b	885	C
10	b	887	U
10	b	889	C
10	b	891	G
10	b	893	C
10	b	895	U
10	b	896	A
10	b	897	C
10	b	898	C
10	b	900	A
10	b	903	C
10	b	904	G
10	b	907	G
10	b	908	C
10	b	910	A
10	b	911	A
10	b	912	C
10	b	913	U
10	b	914	G
10	b	915	C
10	b	923	G
10	b	924	G
10	b	926	G
10	b	928	A

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Mol	Chain	Res	Type
10	b	931	U
10	b	932	U
10	b	934	U
10	b	937	C
10	b	938	G
10	b	941	A
10	b	946	C
10	b	958	U
10	b	961	C
10	b	965	C
10	b	968	C
10	b	969	G
10	b	974	G
10	b	975	A
10	b	980	A
10	b	982	C
10	b	983	A
10	b	985	C
10	b	988	A
10	b	989	G
10	b	990	A
10	b	991	C
10	b	996	A
10	b	1003	G
10	b	1005	C
10	b	1009	A
10	b	1012	U
10	b	1013	C
10	b	1016	G
10	b	1017	G
10	b	1018	U
10	b	1019	U
10	b	1020	A
10	b	1021	A
10	b	1022	G
10	b	1023	U
10	b	1024	G
10	b	1025	G
10	b	1026	G
10	b	1028	A
10	b	1030	C
10	b	1031	G

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Mol	Chain	Res	Type
10	b	1032	A
10	b	1033	U
10	b	1034	G
10	b	1035	U
10	b	1037	G
10	b	1040	A
10	b	1042	G
10	b	1045	C
10	b	1046	A
10	b	1047	G
10	b	1048	A
10	b	1050	A
10	b	1051	G
10	b	1052	C
10	b	1053	C
10	b	1054	A
10	b	1055	G
10	b	1056	G
10	b	1057	A
10	b	1058	U
10	b	1060	U
10	b	1061	U
10	b	1062	G
10	b	1063	G
10	b	1064	C
10	b	1066	U
10	b	1067	A
10	b	1068	G
10	b	1069	A
10	b	1070	A
10	b	1071	G
10	b	1072	C
10	b	1073	A
10	b	1074	G
10	b	1076	C
10	b	1077	A
10	b	1078	U
10	b	1079	C
10	b	1080	A
10	b	1083	U
10	b	1084	A
10	b	1085	A

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Mol	Chain	Res	Type
10	b	1086	A
10	b	1087	G
10	b	1088	A
10	b	1089	A
10	b	1090	A
10	b	1091	G
10	b	1093	G
10	b	1094	U
10	b	1095	A
10	b	1097	U
10	b	1098	A
10	b	1099	G
10	b	1101	U
10	b	1102	C
10	b	1103	A
10	b	1104	C
10	b	1105	U
10	b	1106	G
10	b	1108	U
10	b	1109	C
10	b	1111	A
10	b	1112	G
10	b	1119	U
10	b	1126	A
10	b	1130	U
10	b	1131	G
10	b	1132	U
10	b	1133	A
10	b	1134	A
10	b	1135	C
10	b	1137	G
10	b	1141	U
10	b	1142	A
10	b	1144	A
10	b	1151	A
10	b	1154	G
10	b	1156	A
10	b	1157	G
10	b	1158	C
10	b	1163	G
10	b	1165	A
10	b	1166	G

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Mol	Chain	Res	Type
10	b	1169	A
10	b	1171	G
10	b	1172	C
10	b	1174	U
10	b	1175	A
10	b	1176	U
10	b	1177	G
10	b	1178	C
10	b	1182	G
10	b	1183	U
10	b	1185	G
10	b	1186	G
10	b	1195	G
10	b	1197	G
10	b	1198	U
10	b	1203	U
10	b	1204	A
10	b	1205	A
10	b	1206	G
10	b	1210	G
10	b	1211	C
10	b	1212	G
10	b	1216	G
10	b	1217	U
10	b	1218	G
10	b	1220	G
10	b	1223	G
10	b	1227	G
10	b	1232	G
10	b	1236	G
10	b	1237	A
10	b	1238	G
10	b	1245	G
10	b	1247	A
10	b	1250	G
10	b	1251	C
10	b	1252	G
10	b	1253	A
10	b	1254	A
10	b	1256	G
10	b	1259	G
10	b	1262	A

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Mol	Chain	Res	Type
10	b	1265	A
10	b	1266	G
10	b	1267	U
10	b	1271	G
10	b	1272	A
10	b	1275	A
10	b	1276	A
10	b	1279	G
10	b	1280	G
10	b	1281	G
10	b	1285	A
10	b	1288	G
10	b	1289	C
10	b	1294	U
10	b	1299	G
10	b	1300	G
10	b	1301	A
10	b	1302	A
10	b	1303	G
10	b	1304	A
10	b	1305	C
10	b	1311	G
10	b	1312	U
10	b	1313	U
10	b	1315	C
10	b	1320	C
10	b	1321	A
10	b	1324	G
10	b	1325	U
10	b	1326	U
10	b	1329	U
10	b	1330	C
10	b	1332	G
10	b	1336	A
10	b	1338	G
10	b	1341	G
10	b	1342	A
10	b	1345	C
10	b	1346	G
10	b	1352	U
10	b	1354	A
10	b	1355	G

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Mol	Chain	Res	Type
10	b	1359	A
10	b	1365	A
10	b	1366	A
10	b	1368	G
10	b	1371	G
10	b	1374	G
10	b	1376	C
10	b	1378	A
10	b	1379	U
10	b	1380	G
10	b	1381	G
10	b	1383	A
10	b	1385	A
10	b	1387	A
10	b	1388	G
10	b	1392	A
10	b	1393	A
10	b	1394	U
10	b	1395	A
10	b	1396	U
10	b	1402	U
10	b	1403	A
10	b	1407	G
10	b	1409	U
10	b	1410	G
10	b	1413	A
10	b	1416	G
10	b	1419	A
10	b	1420	A
10	b	1421	G
10	b	1423	G
10	b	1427	A
10	b	1428	C
10	b	1429	G
10	b	1435	G
10	b	1436	G
10	b	1439	A
10	b	1441	G
10	b	1444	G
10	b	1449	G
10	b	1451	C
10	b	1452	G

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Mol	Chain	Res	Type
10	b	1453	A
10	b	1454	C
10	b	1455	G
10	b	1456	G
10	b	1457	U
10	b	1458	U
10	b	1459	G
10	b	1460	U
10	b	1461	C
10	b	1464	G
10	b	1466	U
10	b	1469	A
10	b	1474	U
10	b	1475	G
10	b	1476	U
10	b	1477	A
10	b	1478	G
10	b	1479	G
10	b	1482	G
10	b	1483	G
10	b	1486	U
10	b	1492	G
10	b	1493	C
10	b	1494	A
10	b	1495	A
10	b	1496	A
10	b	1498	C
10	b	1503	A
10	b	1508	A
10	b	1509	A
10	b	1510	G
10	b	1516	G
10	b	1517	G
10	b	1523	U
10	b	1524	G
10	b	1529	G
10	b	1530	G
10	b	1531	C
10	b	1532	A
10	b	1536	C
10	b	1537	G
10	b	1538	G

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Mol	Chain	Res	Type
10	b	1539	U
10	b	1544	A
10	b	1547	C
10	b	1552	A
10	b	1554	U
10	b	1555	G
10	b	1558	C
10	b	1559	U
10	b	1560	G
10	b	1563	U
10	b	1565	C
10	b	1566	A
10	b	1567	G
10	b	1568	G
10	b	1569	A
10	b	1571	A
10	b	1575	C
10	b	1576	U
10	b	1578	U
10	b	1581	G
10	b	1582	C
10	b	1583	A
10	b	1584	U
10	b	1585	C
10	b	1588	G
10	b	1589	U
10	b	1593	A
10	b	1595	C
10	b	1596	A
10	b	1607	C
10	b	1608	A
10	b	1610	A
10	b	1611	C
10	b	1613	G
10	b	1617	C
10	b	1618	A
10	b	1622	G
10	b	1627	G
10	b	1630	A
10	b	1634	A
10	b	1635	A
10	b	1642	G

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Mol	Chain	Res	Type
10	b	1643	G
10	b	1647	U
10	b	1648	U
10	b	1649	G
10	b	1664	A
10	b	1665	A
10	b	1666	G
10	b	1667	G
10	b	1669	A
10	b	1673	G
10	b	1674	G
10	b	1675	C
10	b	1681	G
10	b	1689	A
10	b	1693	U
10	b	1694	C
10	b	1699	G
10	b	1700	A
10	b	1701	A
10	b	1703	G
10	b	1706	C
10	b	1707	G
10	b	1713	A
10	b	1714	U
10	b	1715	G
10	b	1716	U
10	b	1721	G
10	b	1725	C
10	b	1726	G
10	b	1729	U
10	b	1731	G
10	b	1732	C
10	b	1733	U
10	b	1735	G
10	b	1736	U
10	b	1738	G
10	b	1740	G
10	b	1749	A
10	b	1750	G
10	b	1755	A
10	b	1756	G
10	b	1758	U

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Mol	Chain	Res	Type
10	b	1759	A
10	b	1762	A
10	b	1763	G
10	b	1764	C
10	b	1773	A
10	b	1776	G
10	b	1779	U
10	b	1782	U
10	b	1784	A
10	b	1786	A
10	b	1787	A
10	b	1792	G
10	b	1794	A
10	b	1800	C
10	b	1801	A
10	b	1805	A
10	b	1808	A
10	b	1809	A
10	b	1811	G
10	b	1816	C
10	b	1818	U
10	b	1821	A
10	b	1823	G
10	b	1827	U
10	b	1829	A
10	b	1833	C
10	b	1836	C
10	b	1848	A
10	b	1849	G
10	b	1853	A
10	b	1856	U
10	b	1857	G
10	b	1858	A
10	b	1862	G
10	b	1863	G
10	b	1864	U
10	b	1869	G
10	b	1872	A
10	b	1873	G
10	b	1875	G
10	b	1876	A
10	b	1882	U

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Mol	Chain	Res	Type
10	b	1884	G
10	b	1887	C
10	b	1889	A
10	b	1890	A
10	b	1895	C
10	b	1899	A
10	b	1900	A
10	b	1906	G
10	b	1913	A
10	b	1917	U
10	b	1921	G
10	b	1922	G
10	b	1923	U
10	b	1924	C
10	b	1925	C
10	b	1927	A
10	b	1929	G
10	b	1930	G
10	b	1931	U
10	b	1937	A
10	b	1938	A
10	b	1939	U
10	b	1940	U
10	b	1944	U
10	b	1946	U
10	b	1952	A
10	b	1953	A
10	b	1954	G
10	b	1955	U
10	b	1956	U
10	b	1958	C
10	b	1961	C
10	b	1964	G
10	b	1965	C
10	b	1966	A
10	b	1967	C
10	b	1970	A
10	b	1971	U
10	b	1972	G
10	b	1975	G
10	b	1980	G
10	b	1981	A

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Mol	Chain	Res	Type
10	b	1985	C
10	b	1987	A
10	b	1991	U
10	b	1992	G
10	b	1993	U
10	b	1996	C
10	b	1997	C
10	b	1998	A
10	b	1999	C
10	b	2002	G
10	b	2020	A
10	b	2021	C
10	b	2022	U
10	b	2023	C
10	b	2024	G
10	b	2029	G
10	b	2030	A
10	b	2031	A
10	b	2032	G
10	b	2033	A
10	b	2034	U
10	b	2039	U
10	b	2043	C
10	b	2051	A
10	b	2055	C
10	b	2056	G
10	b	2060	A
10	b	2061	G
10	b	2062	A
10	b	2063	C
10	b	2068	U
10	b	2069	G
10	b	2076	U
10	b	2077	A
10	b	2078	C
10	b	2080	A
10	b	2081	U
10	b	2085	U
10	b	2093	G
10	b	2095	A
10	b	2100	G
10	b	2101	A

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Mol	Chain	Res	Type
10	b	2102	G
10	b	2104	C
10	b	2105	U
10	b	2106	U
10	b	2107	G
10	b	2109	U
10	b	2110	G
10	b	2111	U
10	b	2112	G
10	b	2113	U
10	b	2114	A
10	b	2115	G
10	b	2116	G
10	b	2117	A
10	b	2118	U
10	b	2119	A
10	b	2120	G
10	b	2121	G
10	b	2123	G
10	b	2124	G
10	b	2126	A
10	b	2127	G
10	b	2128	G
10	b	2129	C
10	b	2130	U
10	b	2131	U
10	b	2133	G
10	b	2134	A
10	b	2135	A
10	b	2136	G
10	b	2137	U
10	b	2138	G
10	b	2139	U
10	b	2140	G
10	b	2142	A
10	b	2143	C
10	b	2144	G
10	b	2145	C
10	b	2146	C
10	b	2147	A
10	b	2148	G
10	b	2149	U

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Mol	Chain	Res	Type
10	b	2150	C
10	b	2151	U
10	b	2152	G
10	b	2153	C
10	b	2154	A
10	b	2155	U
10	b	2157	G
10	b	2158	A
10	b	2159	G
10	b	2160	C
10	b	2161	C
10	b	2162	G
10	b	2163	A
10	b	2164	C
10	b	2165	C
10	b	2166	U
10	b	2169	A
10	b	2170	A
10	b	2171	A
10	b	2172	U
10	b	2174	C
10	b	2175	C
10	b	2176	A
10	b	2177	C
10	b	2178	C
10	b	2180	U
10	b	2183	A
10	b	2186	G
10	b	2190	G
10	b	2192	U
10	b	2193	G
10	b	2197	U
10	b	2198	A
10	b	2199	A
10	b	2203	U
10	b	2204	G
10	b	2211	A
10	b	2212	A
10	b	2213	U
10	b	2214	C
10	b	2225	A
10	b	2228	G

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Mol	Chain	Res	Type
10	b	2234	G
10	b	2238	G
10	b	2239	G
10	b	2243	U
10	b	2249	U
10	b	2250	G
10	b	2258	C
10	b	2259	U
10	b	2261	C
10	b	2266	A
10	b	2268	A
10	b	2273	A
10	b	2278	A
10	b	2282	G
10	b	2283	C
10	b	2284	A
10	b	2286	G
10	b	2287	A
10	b	2288	A
10	b	2295	C
10	b	2297	A
10	b	2298	A
10	b	2305	U
10	b	2307	G
10	b	2308	G
10	b	2309	A
10	b	2311	A
10	b	2312	U
10	b	2315	G
10	b	2316	G
10	b	2317	A
10	b	2319	G
10	b	2320	U
10	b	2321	U
10	b	2322	A
10	b	2325	G
10	b	2327	A
10	b	2333	A
10	b	2334	U
10	b	2335	A
10	b	2336	A
10	b	2337	G

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Mol	Chain	Res	Type
10	b	2340	A
10	b	2345	G
10	b	2347	C
10	b	2350	C
10	b	2352	A
10	b	2354	C
10	b	2355	G
10	b	2361	G
10	b	2364	C
10	b	2367	G
10	b	2368	C
10	b	2379	G
10	b	2383	G
10	b	2385	C
10	b	2389	G
10	b	2391	G
10	b	2396	G
10	b	2397	G
10	b	2399	G
10	b	2402	U
10	b	2403	C
10	b	2405	G
10	b	2406	A
10	b	2407	A
10	b	2408	U
10	b	2410	G
10	b	2416	C
10	b	2419	U
10	b	2420	C
10	b	2422	C
10	b	2423	U
10	b	2424	C
10	b	2425	A
10	b	2427	C
10	b	2428	G
10	b	2429	G
10	b	2430	A
10	b	2431	U
10	b	2435	A
10	b	2441	U
10	b	2445	G
10	b	2447	G

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Mol	Chain	Res	Type
10	b	2448	A
10	b	2454	G
10	b	2457	U
10	b	2458	G
10	b	2459	A
10	b	2464	G
10	b	2468	A
10	b	2470	G
10	b	2471	A
10	b	2473	U
10	b	2474	U
10	b	2475	C
10	b	2476	A
10	b	2478	A
10	b	2480	C
10	b	2482	A
10	b	2484	G
10	b	2485	G
10	b	2486	C
10	b	2488	G
10	b	2490	G
10	b	2491	U
10	b	2492	U
10	b	2494	G
10	b	2497	A
10	b	2498	C
10	b	2499	C
10	b	2502	G
10	b	2503	A
10	b	2505	G
10	b	2507	C
10	b	2513	A
10	b	2518	A
10	b	2519	U
10	b	2520	C
10	b	2526	G
10	b	2528	U
10	b	2529	G
10	b	2533	U
10	b	2534	A
10	b	2535	G
10	b	2536	G

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Mol	Chain	Res	Type
10	b	2537	U
10	b	2543	G
10	b	2546	U
10	b	2547	G
10	b	2550	G
10	b	2554	U
10	b	2556	C
10	b	2560	A
10	b	2562	U
10	b	2564	A
10	b	2566	A
10	b	2567	G
10	b	2572	A
10	b	2573	C
10	b	2574	G
10	b	2579	C
10	b	2581	G
10	b	2582	G
10	b	2583	G
10	b	2593	U
10	b	2601	C
10	b	2602	A
10	b	2608	G
10	b	2609	U
10	b	2610	C
10	b	2611	C
10	b	2613	U
10	b	2614	A
10	b	2615	U
10	b	2618	G
10	b	2623	G
10	b	2625	G
10	b	2626	C
10	b	2629	U
10	b	2630	G
10	b	2634	A
10	b	2636	C
10	b	2639	A
10	b	2643	G
10	b	2646	C
10	b	2655	G
10	b	2656	U

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Mol	Chain	Res	Type
10	b	2658	C
10	b	2660	A
10	b	2661	G
10	b	2663	G
10	b	2664	G
10	b	2668	G
10	b	2669	G
10	b	2673	G
10	b	2674	G
10	b	2676	C
10	b	2679	A
10	b	2681	C
10	b	2684	U
10	b	2688	G
10	b	2689	U
10	b	2690	U
10	b	2691	C
10	b	2692	G
10	b	2700	A
10	b	2702	G
10	b	2705	A
10	b	2713	U
10	b	2716	C
10	b	2718	G
10	b	2724	U
10	b	2725	A
10	b	2726	A
10	b	2731	G
10	b	2733	A
10	b	2736	A
10	b	2737	G
10	b	2744	G
10	b	2746	U
10	b	2748	A
10	b	2750	A
10	b	2751	G
10	b	2752	C
10	b	2754	U
10	b	2755	C
10	b	2757	A
10	b	2761	A
10	b	2762	C

Continued on next page...

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Mol	Chain	Res	Type
10	b	2765	A
10	b	2768	U
10	b	2771	C
10	b	2773	C
10	b	2777	G
10	b	2778	A
10	b	2779	U
10	b	2780	G
10	b	2781	A
10	b	2783	U
10	b	2790	U
10	b	2796	U
10	b	2797	U
10	b	2798	U
10	b	2799	A
10	b	2800	A
10	b	2802	G
10	b	2803	G
10	b	2804	U
10	b	2807	U
10	b	2808	G
10	b	2818	U
10	b	2819	G
10	b	2820	A
10	b	2821	A
10	b	2822	G
10	b	2832	U
10	b	2833	U
10	b	2835	A
10	b	2836	U
10	b	2837	A
10	b	2843	G
10	b	2848	G
10	b	2849	U
10	b	2859	G
10	b	2861	U
10	b	2864	G
10	b	2865	U
10	b	2866	U
10	b	2867	G
10	b	2871	U
10	b	2879	A

Continued on next page...

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Mol	Chain	Res	Type
10	b	2883	A
10	b	2884	U
10	b	2886	A
10	b	2887	A
10	b	2892	G
10	b	2893	A
10	b	2894	G
10	b	2895	G
10	b	2898	U
10	b	2900	A
31	v	2	G
31	v	8	U
31	v	9	G
31	v	10	G
31	v	13	C
31	v	14	A
31	v	15	G
31	v	17	C
31	v	18	U
31	v	19	G
31	v	21	U
31	v	35	C
31	v	36	G
31	v	39	A
31	v	40	C
31	v	47	G
31	v	48	U
31	v	49	C
31	v	67	A
31	v	77	A

There are no RNA pucker outliers to report.

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
10	b	4
30	y	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	y	8:GLY	C	9:SER	N	3.63
1	b	507:A	O3'	508:A	P	2.03
1	b	2059:A	O3'	2060:A	P	1.99
1	b	2058:A	O3'	2059:A	P	1.92
1	b	509:C	O3'	510:C	P	1.30

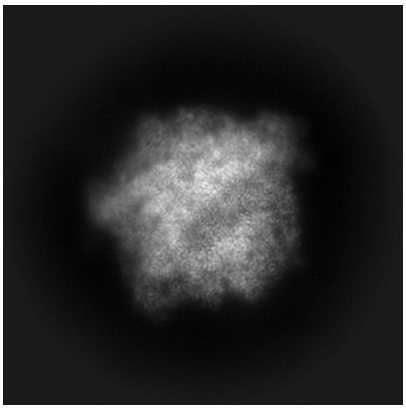
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-52418. These allow visual inspection of the internal detail of the map and identification of artifacts.

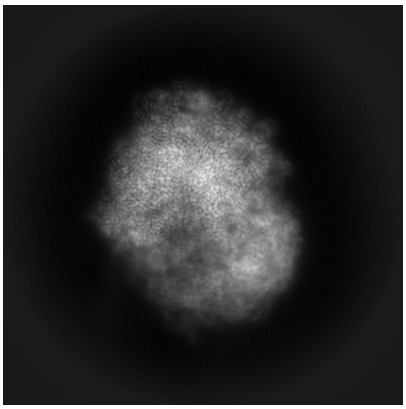
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

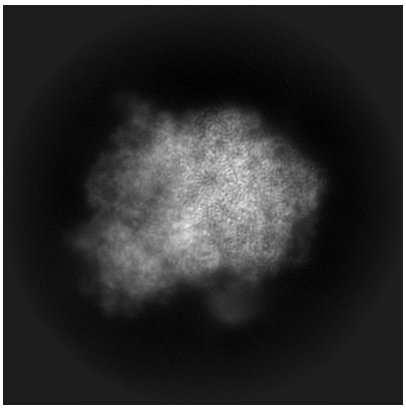
6.1.1 Primary map



X

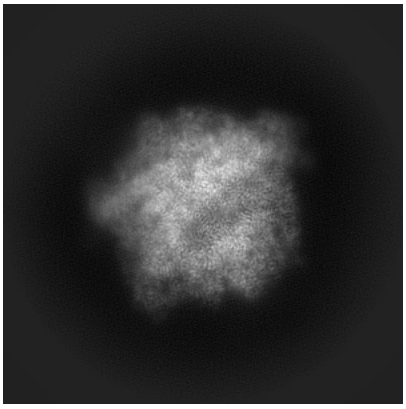


Y

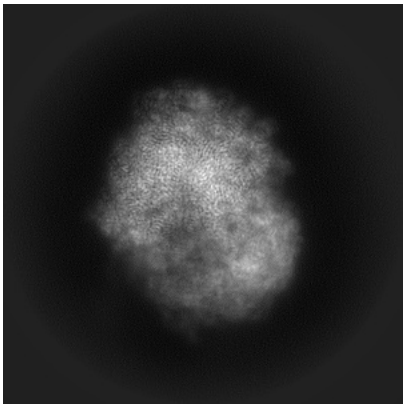


Z

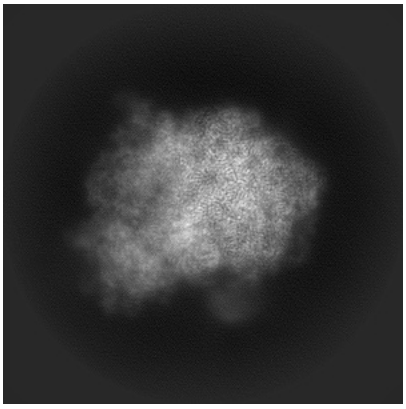
6.1.2 Raw map



X



Y

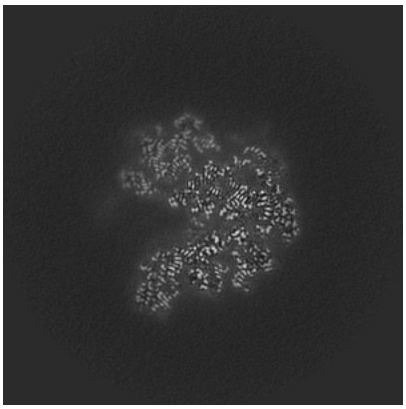


Z

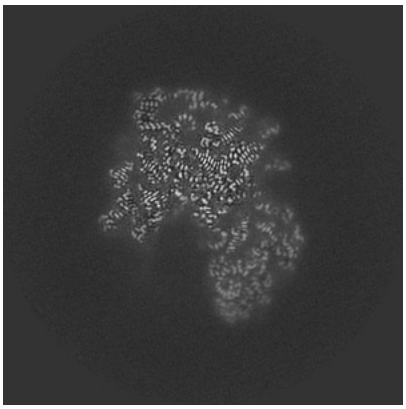
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

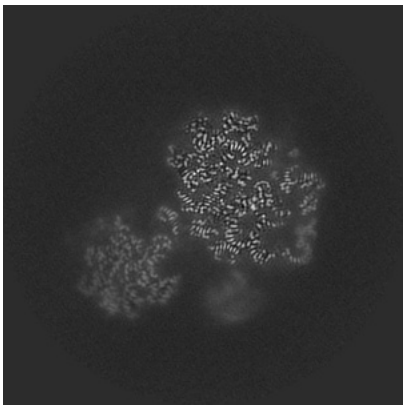
6.2.1 Primary map



X Index: 240

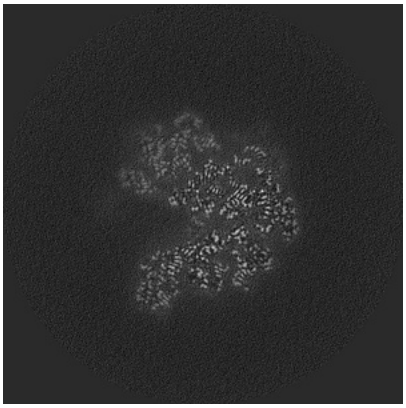


Y Index: 240

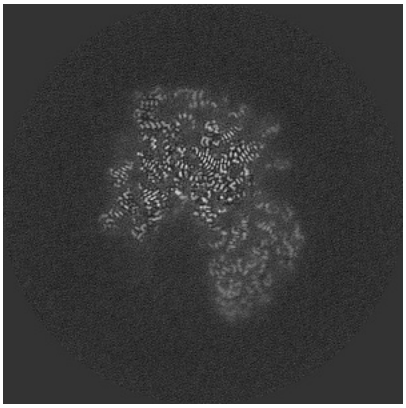


Z Index: 240

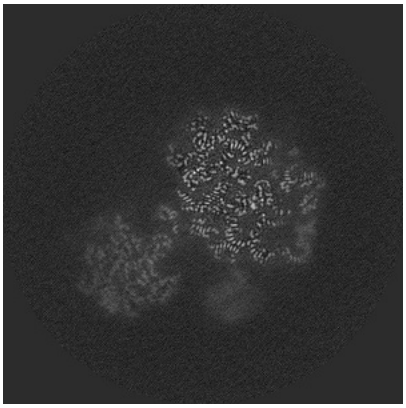
6.2.2 Raw map



X Index: 240



Y Index: 240

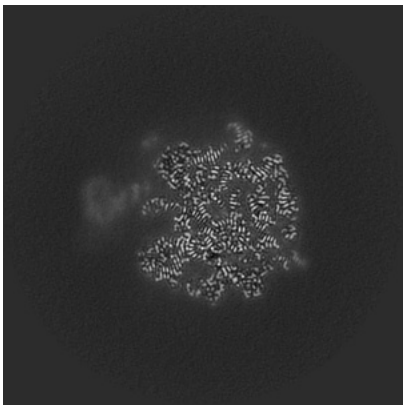


Z Index: 240

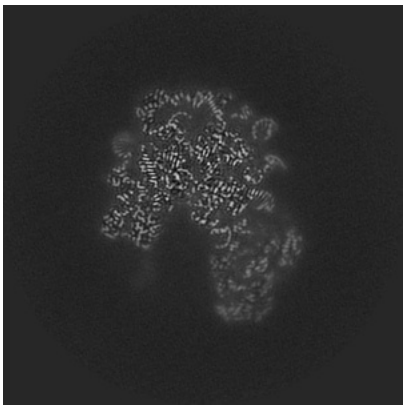
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

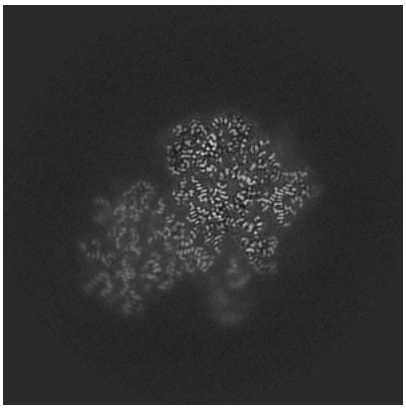
6.3.1 Primary map



X Index: 271

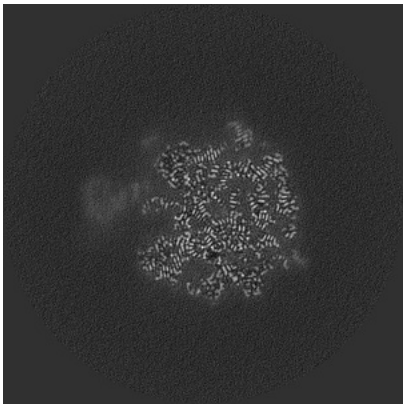


Y Index: 247

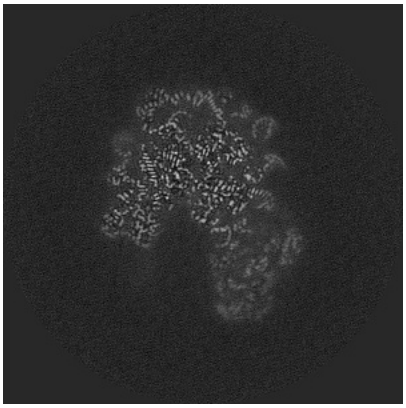


Z Index: 255

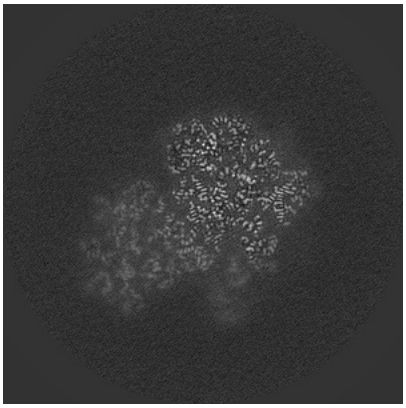
6.3.2 Raw map



X Index: 271



Y Index: 247

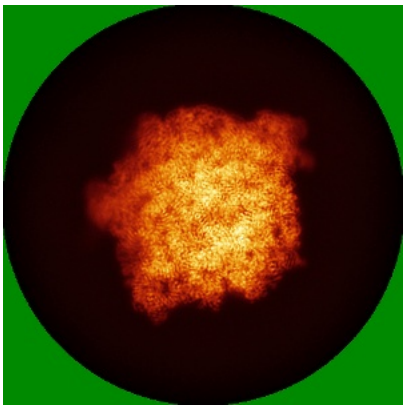


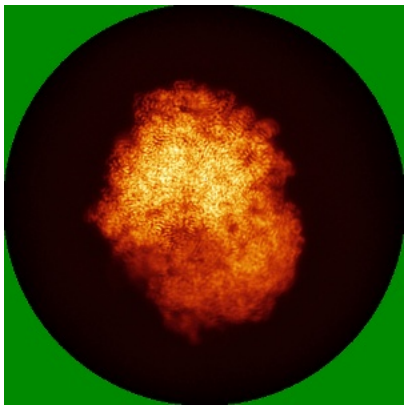
Z Index: 255

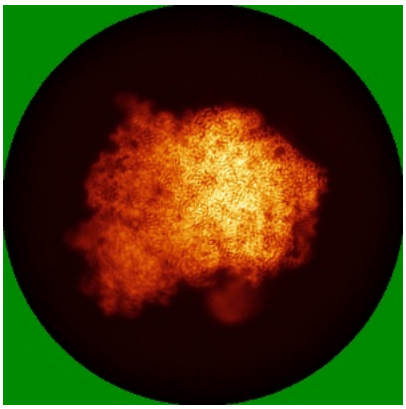
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

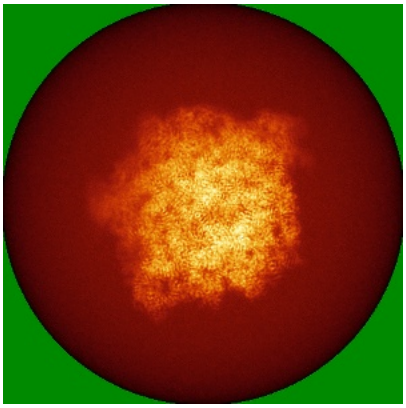
6.4.1 Primary map

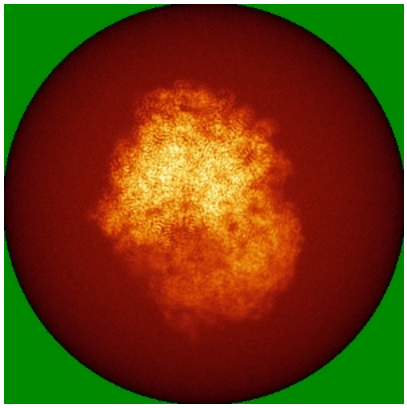

X

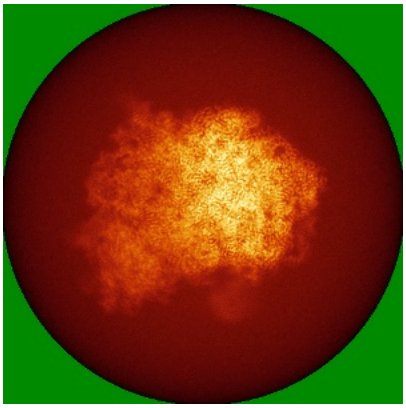

Y


Z

6.4.2 Raw map


X

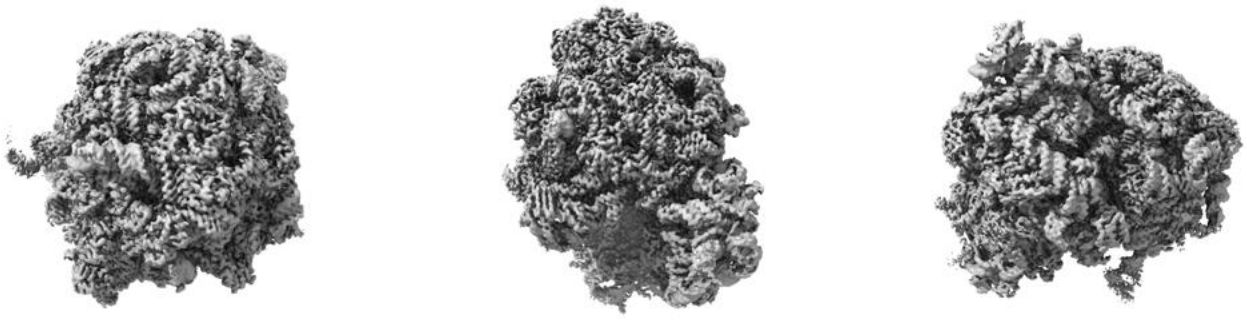

Y


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0077. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X Y Z

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.

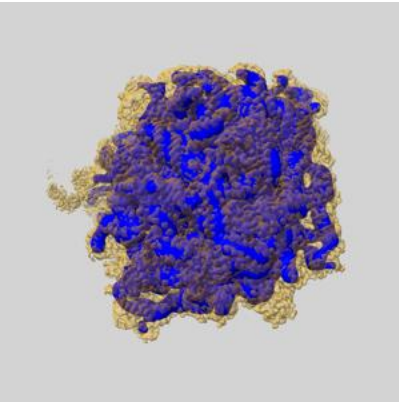
6.6 Mask visualisation (i)

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

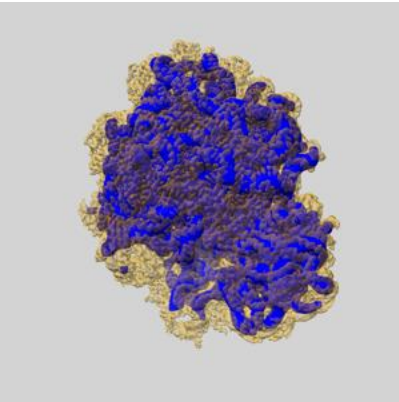
A mask typically either:

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

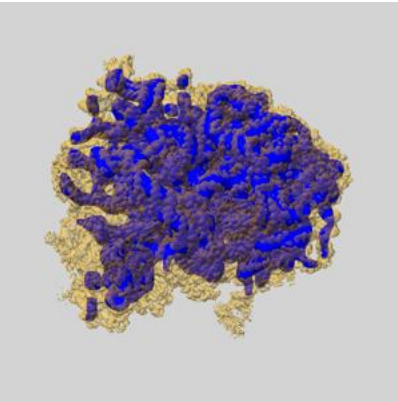
6.6.1 emd_52418_msk_1.map (i)



X



Y

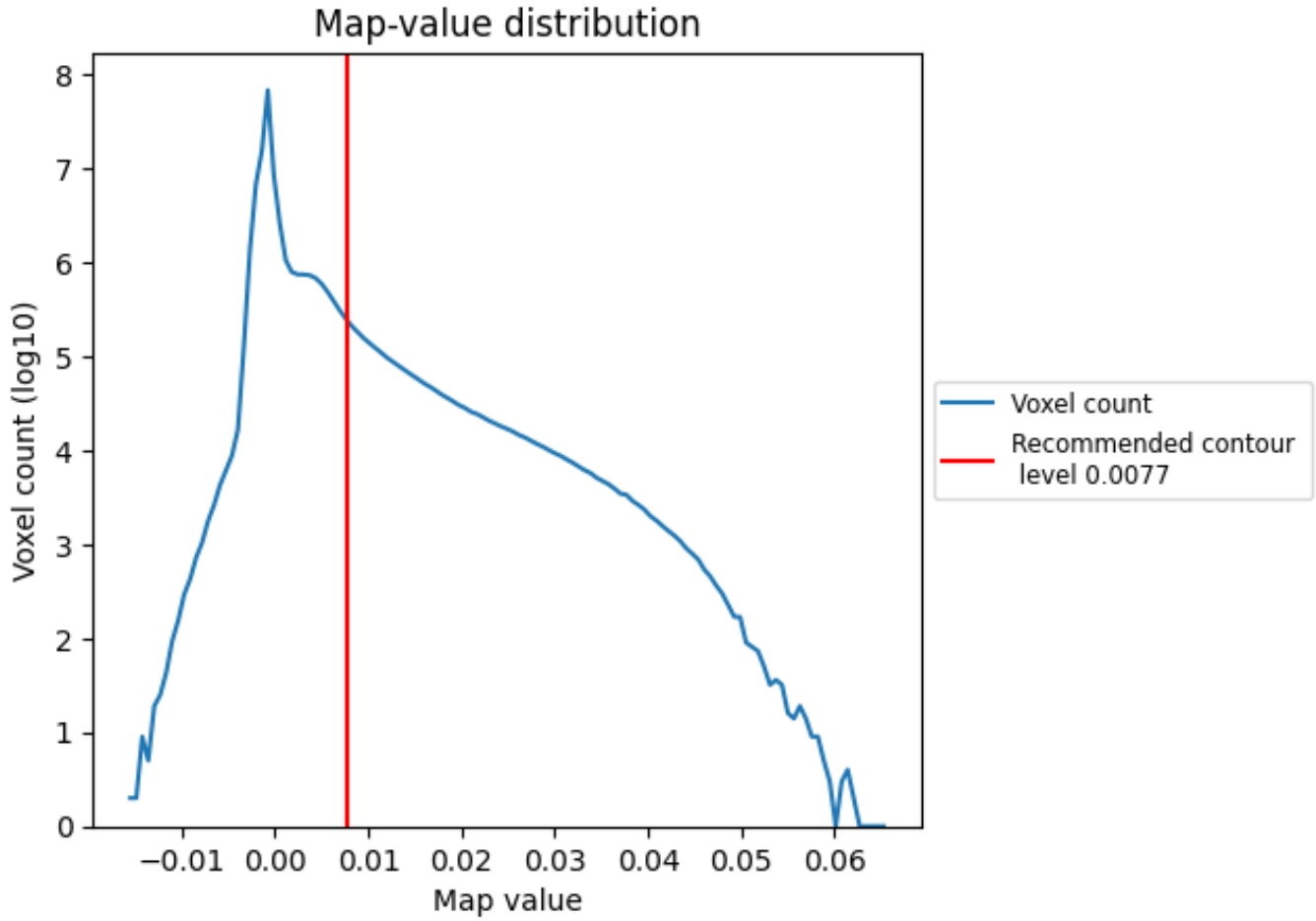


Z

7 Map analysis

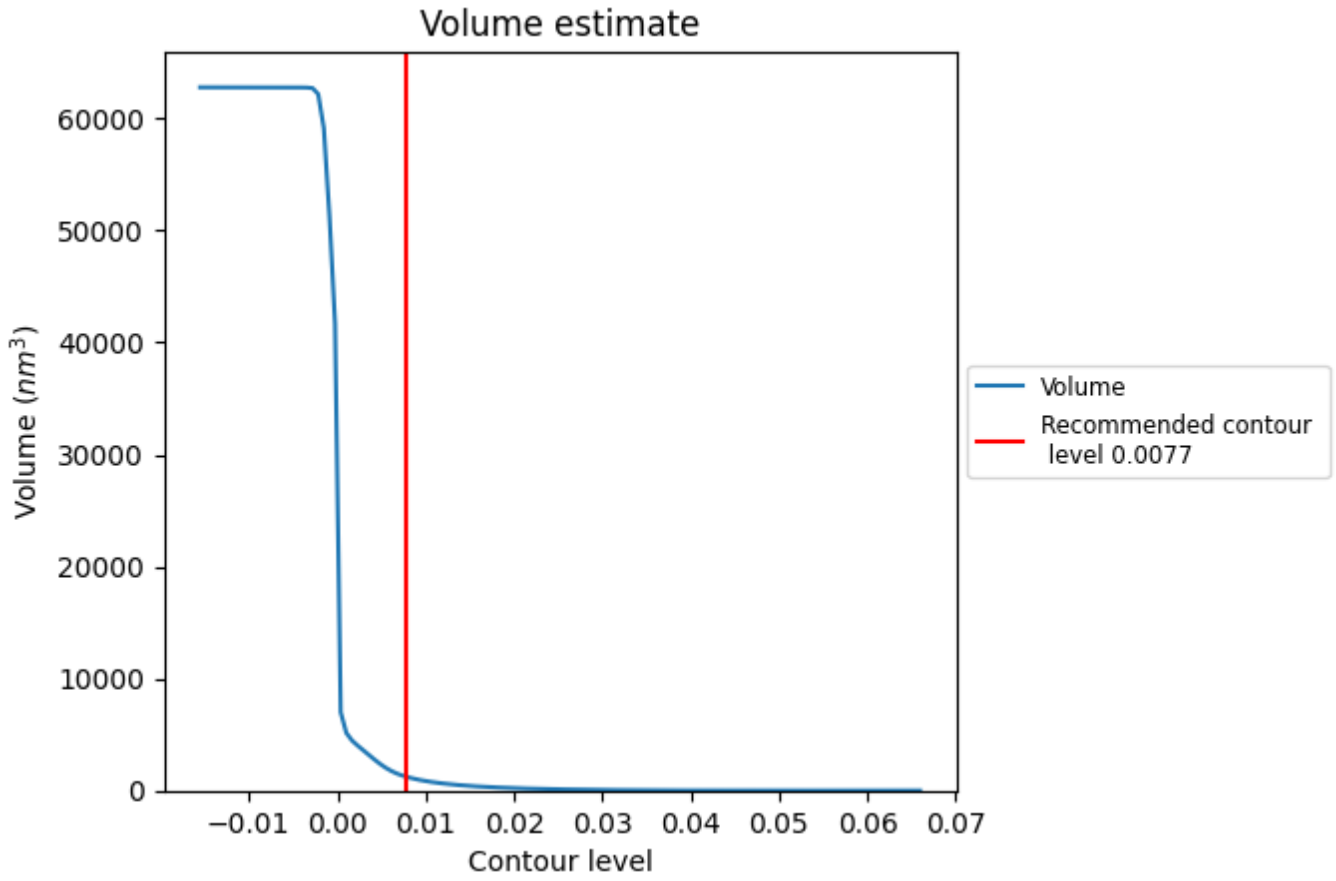
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

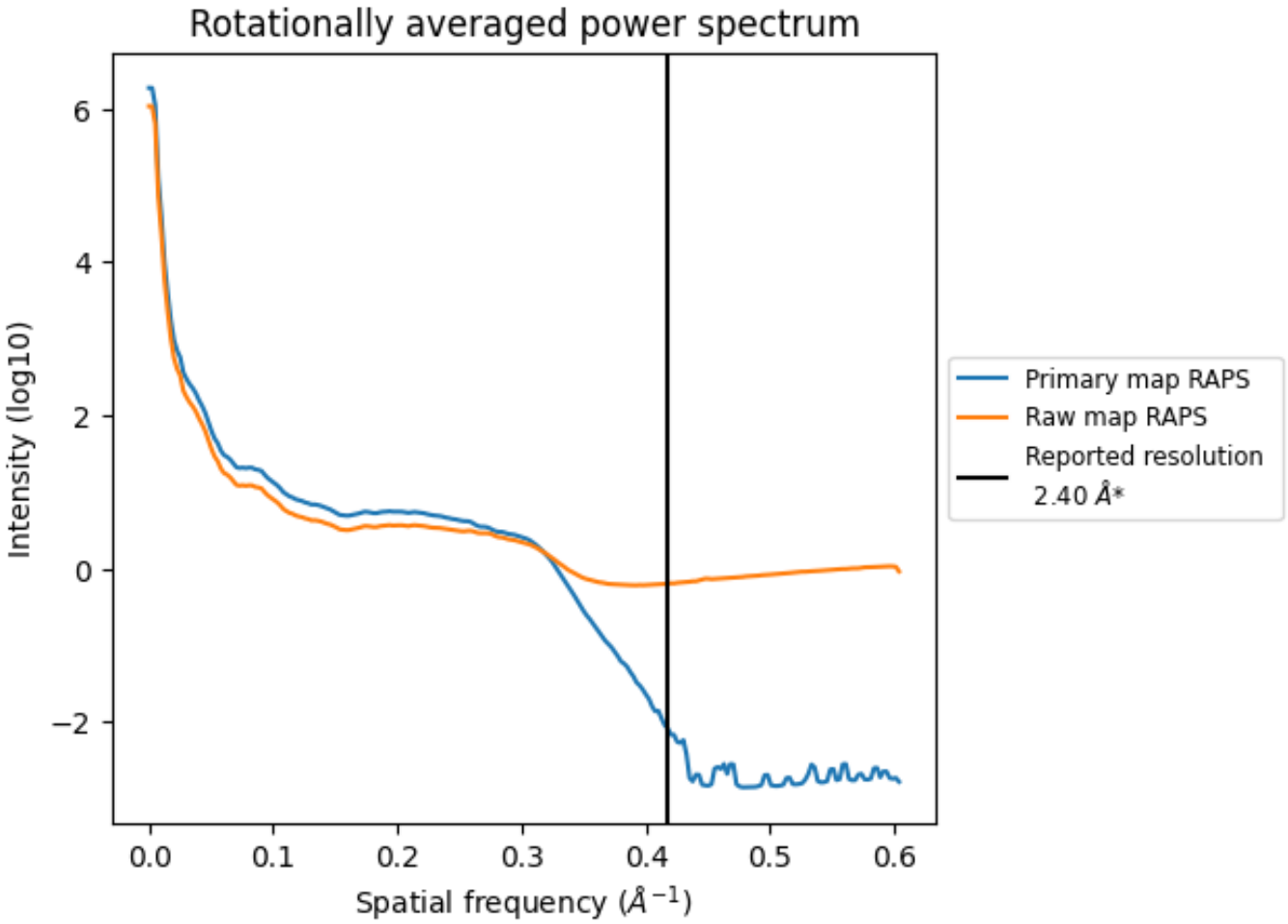
7.2 Volume estimate



The volume at the recommended contour level is 1259 nm^3; this corresponds to an approximate mass of 1137 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)

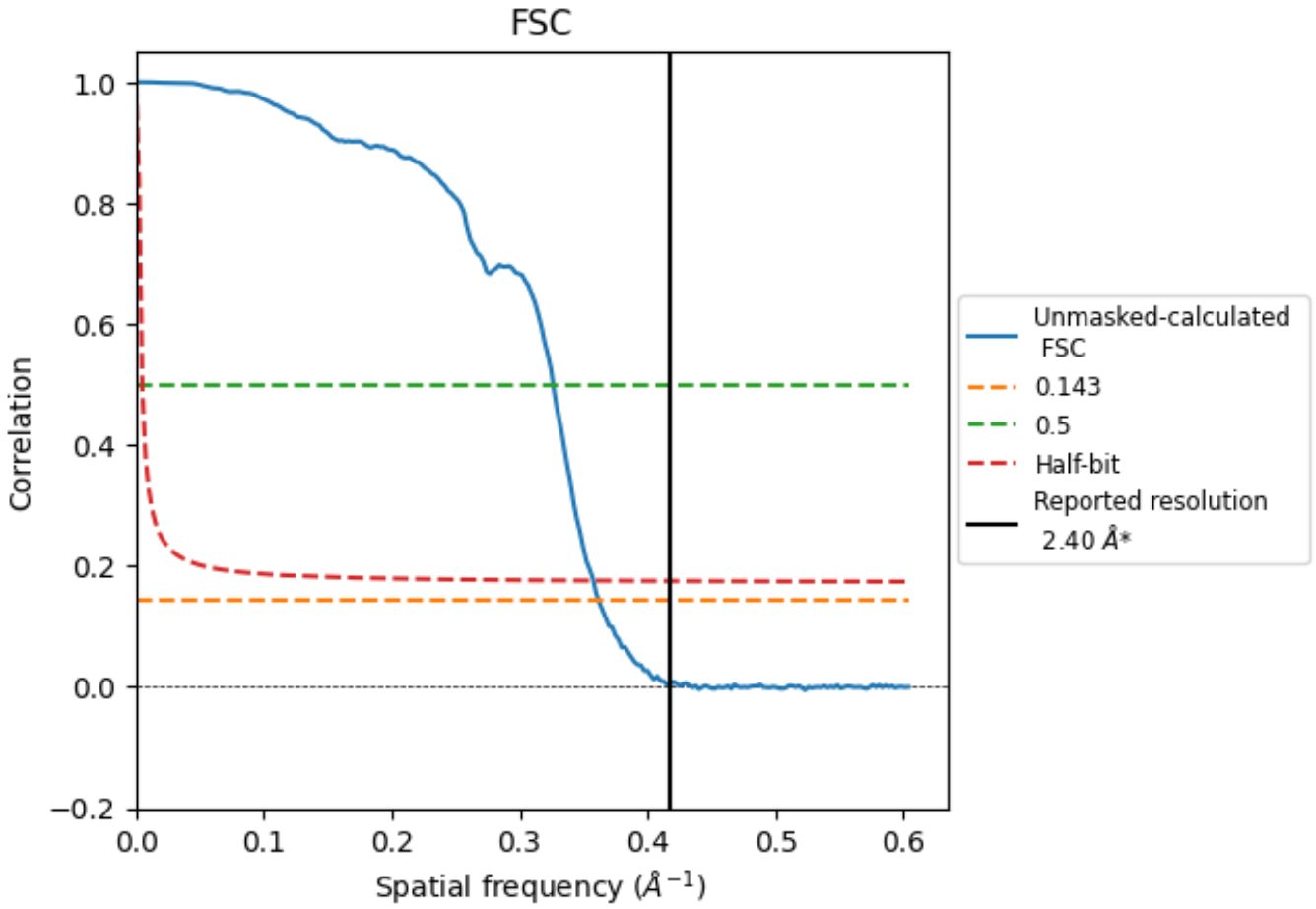


*Reported resolution corresponds to spatial frequency of 0.417 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.417 $Å^{-1}$

8.2 Resolution estimates (i)

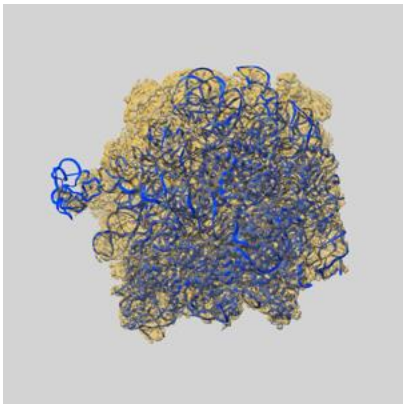
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	2.76	3.06	2.80

*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 2.76 differs from the reported value 2.4 by more than 10 %

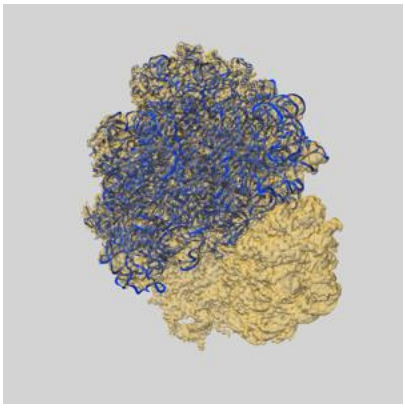
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-52418 and PDB model 9HUS. Per-residue inclusion information can be found in section 3 on page 11.

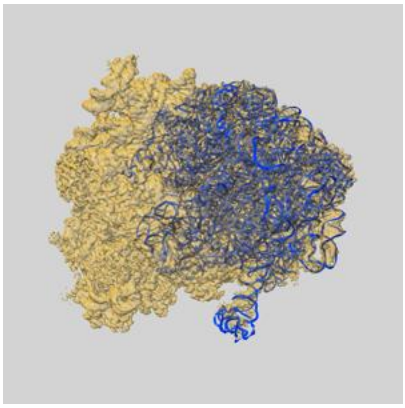
9.1 Map-model overlay



X



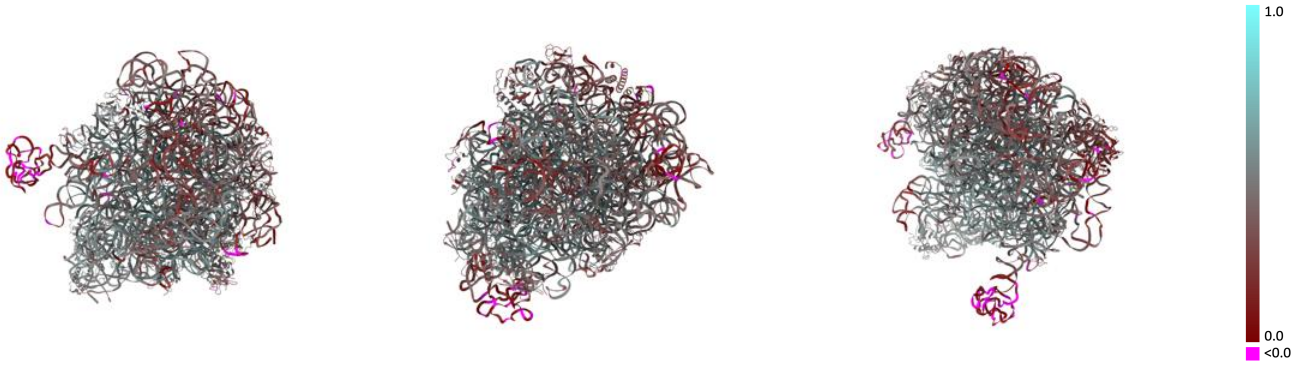
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0077 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.

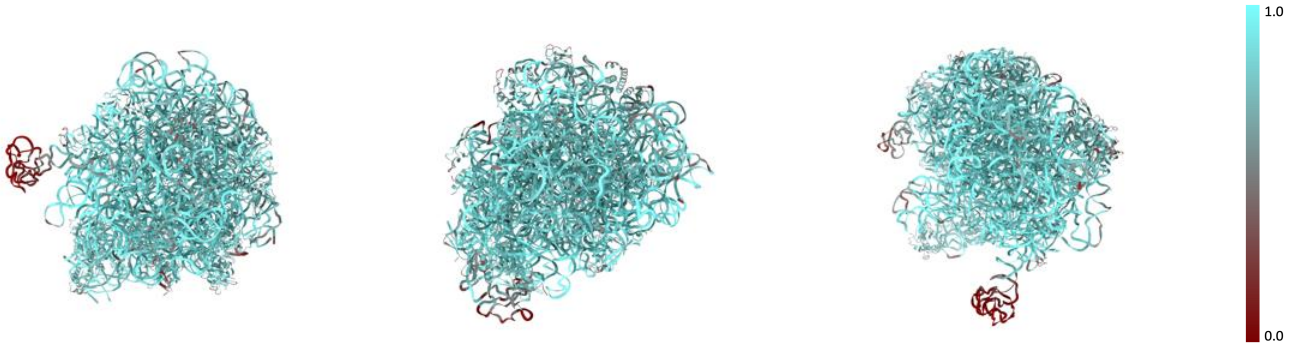
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

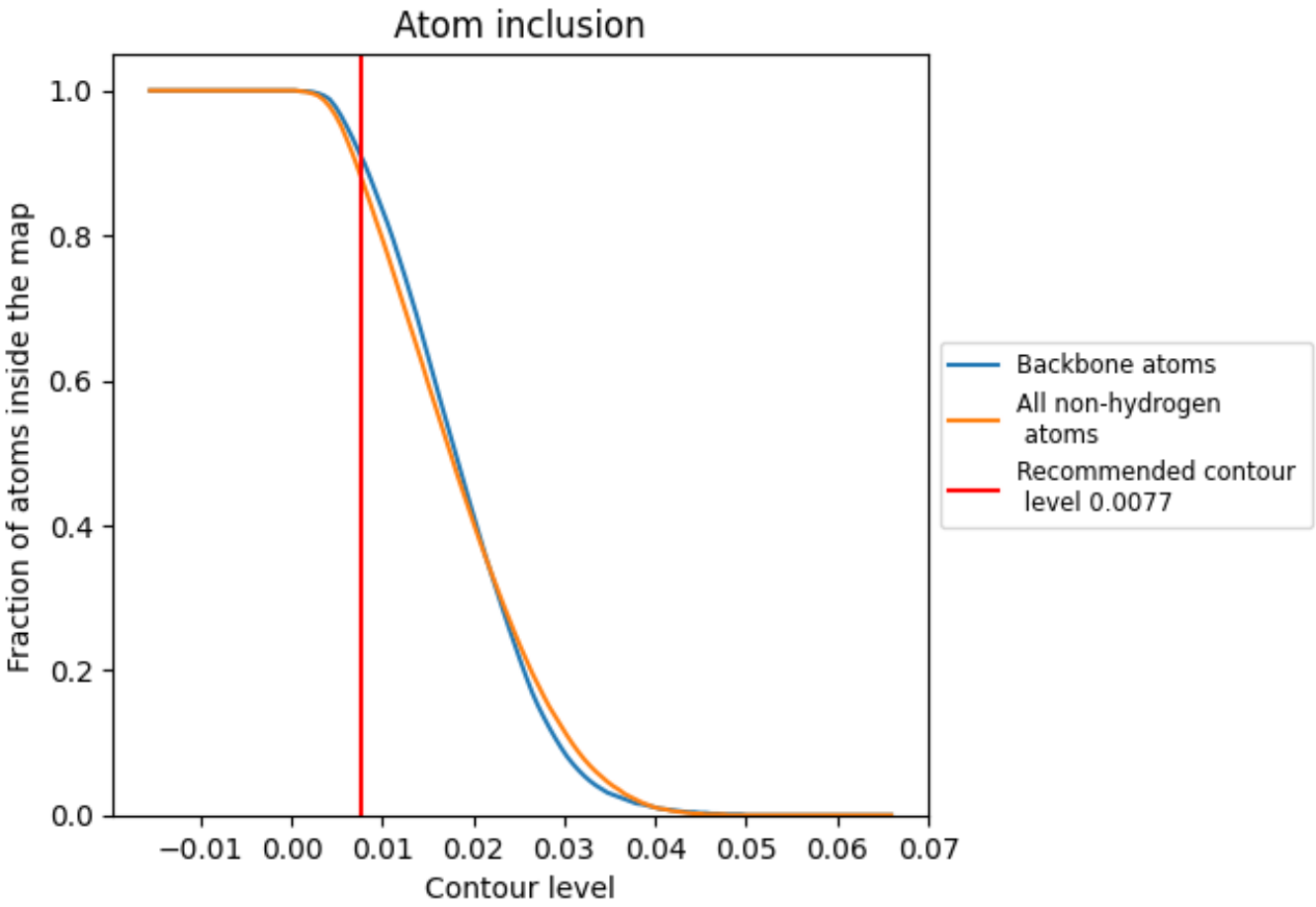
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.0077).

9.4 Atom inclusion (i)



At the recommended contour level, 91% of all backbone atoms, 88% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.0077) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8800	0.4380
0	0.9180	0.5320
1	0.6710	0.2780
2	0.8880	0.5060
3	0.8180	0.4010
4	0.8730	0.5370
6	0.9690	0.5090
7	0.9820	0.5870
8	0.9280	0.5030
a	0.9350	0.4780
b	0.8940	0.4330
c	0.9310	0.4910
d	0.8360	0.4340
e	0.7790	0.4220
f	0.7610	0.4550
g	0.6990	0.3640
h	0.6370	0.4060
j	0.8610	0.4570
k	0.8690	0.4670
l	0.8760	0.5150
m	0.9360	0.5650
n	0.8130	0.3740
o	0.8110	0.4630
p	0.8100	0.3840
q	0.8930	0.4880
r	0.7790	0.4280
s	0.8460	0.4530
t	0.7240	0.3130
u	0.6710	0.3110
v	0.9440	0.4390
w	0.8140	0.4850
y	0.9140	0.5410
z	0.7860	0.2760