Full wwPDB EM Validation Report ⓘ

Apr 7, 2025 – 01:43 PM EDT

PDB ID	:	8UJD / pdb_00008ujd
EMDB ID	:	EMD-42319
Title	:	In situ human 60S ribosome with eIF6
Authors	:	Wei, Z.; Yong, X.
Deposited on	:	2023-10-11
Resolution	:	2.96 Å(reported)

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

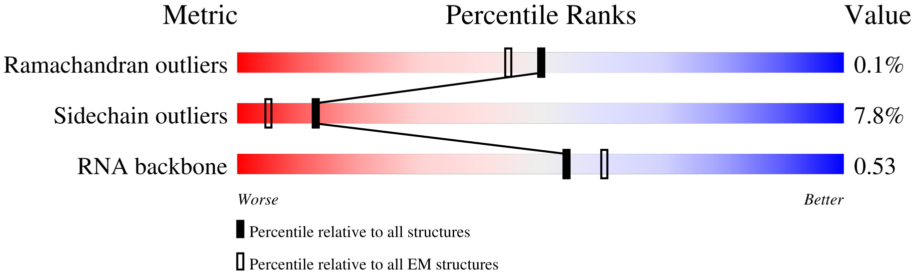
EMDB validation analysis	:	0.0.1.dev117
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

1 Overall quality at a glance ⓘ

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

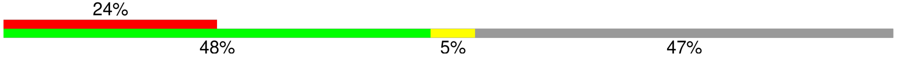
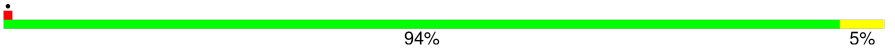
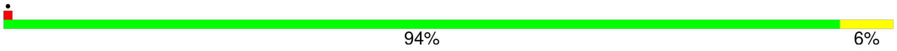
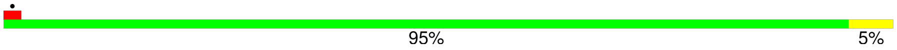
The reported resolution of this entry is 2.96 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	LW	118	
2	L5	5070	
3	L7	120	
4	L8	156	
5	LA	248	
6	LB	402	
7	LC	368	
8	LD	293	

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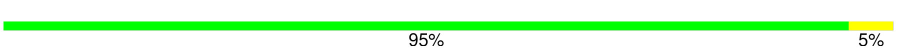
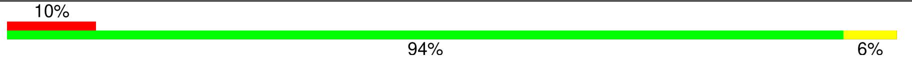
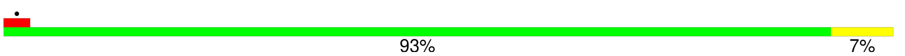
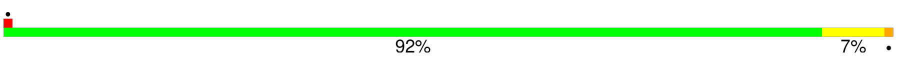
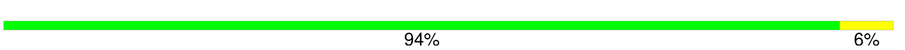
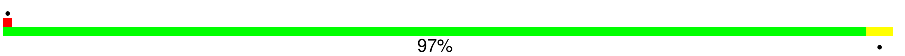
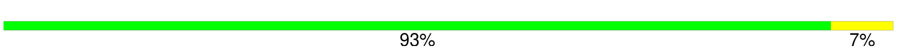
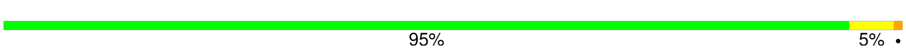
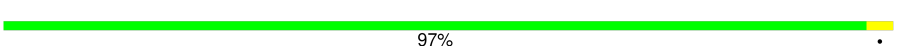
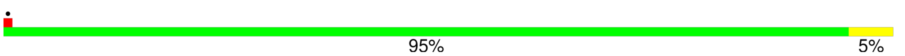
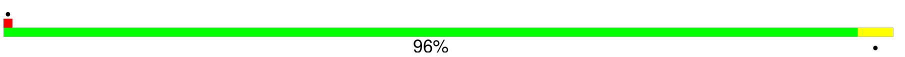
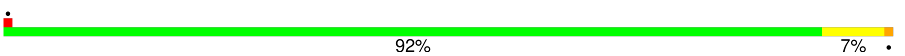
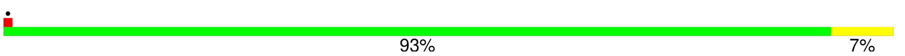
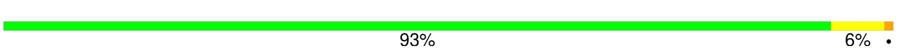
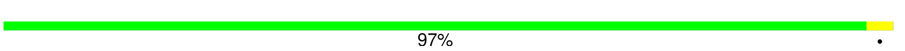
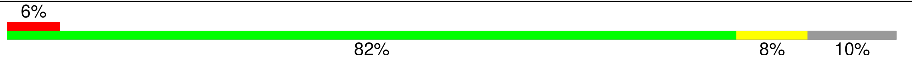
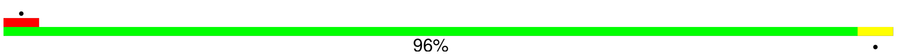
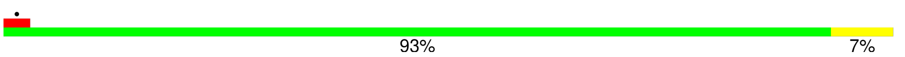
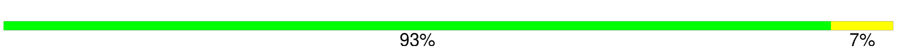
Mol	Chain	Length	Quality of chain
9	LE	242	
10	LF	225	
11	LG	241	
12	LH	190	
13	LI	213	
14	LJ	176	
15	LL	210	
16	LM	139	
17	LN	203	
18	LO	201	
19	LP	153	
20	LQ	187	
21	LR	187	
22	LS	175	
23	LT	159	
24	LU	101	
25	LV	131	
26	LX	120	
27	LY	134	
28	LZ	135	
29	La	147	
30	Lb	121	
31	Lc	98	
32	Ld	107	
33	Le	128	

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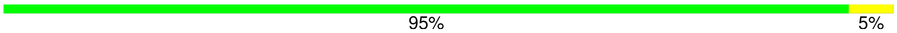
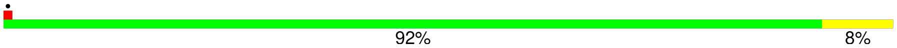
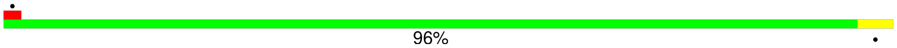
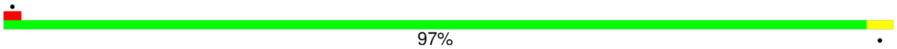
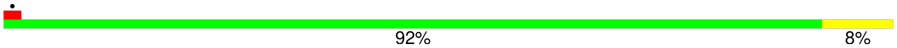
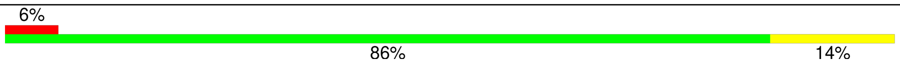
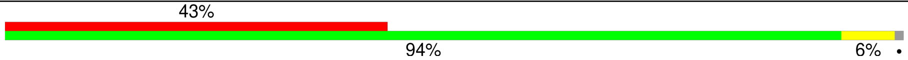
Mol	**Chain**	**Length**	**Quality of chain**
34	Lf	109	
35	Lg	114	
36	Lh	122	
37	Li	102	
38	Lj	86	
39	Lk	69	
40	Ll	50	
41	Lm	52	
42	Lo	105	
43	Lp	91	
44	Lr	125	
45	P	225	
46	CA	356	

2 Entry composition

There are 49 unique types of molecules in this entry. The entry contains 141127 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 Ribosomal protein L24.

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

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LW	?	-	SER	deletion	UNP A0A994J4A5
LW	?	-	GLU	deletion	UNP A0A994J4A5
LW	?	-	GLU	deletion	UNP A0A994J4A5
LW	?	-	ILE	deletion	UNP A0A994J4A5
LW	?	-	GLN	deletion	UNP A0A994J4A5
LW	?	-	LYS	deletion	UNP A0A994J4A5

- Molecule 2 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	L5	3649	78229	34837	14317	25427	3648	0	0

- Molecule 3 is a RNA chain called 5S rRNA [Homo sapiens].

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	L7	120	2561	1141	456	844	120	0	0

- Molecule 4 is a RNA chain called 5.8S rRNA [Homo sapiens].

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	L8	156	3314	1480	585	1094	155	0	0

- Molecule 5 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	LA	248	1898	1189	389	314	6	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	LB	402	3238	2060	608	556	14	0	0

- Molecule 7 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	LC	368	2927	1840	583	489	15	0	0

- Molecule 8 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	LD	293	2382	1507	434	427	14	0	0

- Molecule 9 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	LE	236	1904	1222	361	317	4	0	0

- Molecule 10 is a protein called 60S ribosomal protein L7.

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

- Molecule 11 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LG	241	1927	1228	371	324	4	0	0

- Molecule 12 is a protein called 60S ribosomal protein L9.

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

- Molecule 13 is a protein called Ribosomal protein uL16-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	LI	202	Total 1634	C 1037	N 314	O 269	S 14	0	0

- Molecule 14 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	LJ	176	Total 1410	C 888	N 263	O 253	S 6	0	0

- Molecule 15 is a protein called Large ribosomal subunit protein eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	LL	210	Total 1701	C 1064	N 352	O 281	S 4	0	0

- Molecule 16 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	LM	139	Total 1138	C 730	N 218	O 183	S 7	0	0

- Molecule 17 is a protein called 60S ribosomal protein L15.

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

- Molecule 18 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	LO	201	Total 1650	C 1063	N 321	O 261	S 5	0	0

- Molecule 19 is a protein called 60S ribosomal protein L17.

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

- Molecule 20 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	LQ	187	1513	944	314	250	5	0	0

- Molecule 21 is a protein called 60S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	LR	153	1281	799	276	197	9	0	0

- Molecule 22 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	LS	175	1453	925	283	235	10	0	0

- Molecule 23 is a protein called 60S ribosomal protein L21.

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

- Molecule 24 is a protein called Heparin-binding protein HBp15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	LU	101	825	529	144	150	2	0	0

- Molecule 25 is a protein called 60S ribosomal protein L23.

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

- Molecule 26 is a protein called 60S ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	LX	120	985	630	185	169	1	0	0

- Molecule 27 is a protein called 60S ribosomal protein L26.

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

- Molecule 28 is a protein called 60S ribosomal protein L27.

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

- Molecule 29 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	La	147	1162	736	237	186	3	0	0

- Molecule 30 is a protein called Large ribosomal subunit protein eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	Lb	109	876	546	189	137	4	0	0

- Molecule 31 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	Lc	98	764	485	135	138	6	0	0

- Molecule 32 is a protein called 60S ribosomal protein L31.

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

- Molecule 33 is a protein called 60S ribosomal protein L32.

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

- Molecule 34 is a protein called 60S ribosomal protein L35a.

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

- Molecule 35 is a protein called 60S ribosomal protein L34.

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

- Molecule 36 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Lh	122	1015	641	205	168	1	0	0

- Molecule 37 is a protein called 60S ribosomal protein L36.

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

- Molecule 38 is a protein called 60S ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	Lj	86	705	434	155	111	5	0	0

- Molecule 39 is a protein called 60S ribosomal protein L38.

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

- Molecule 40 is a protein called 60S ribosomal protein L39.

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

- Molecule 41 is a protein called Large ribosomal subunit protein eL40.

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

- Molecule 42 is a protein called 60S ribosomal protein L36a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	Lo	105	862	542	175	139	6	0	0

- Molecule 43 is a protein called 60S ribosomal protein L37a.

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

- Molecule 44 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	Lr	125	1002	622	207	168	5	0	0

- Molecule 45 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	P	225	1712	1065	295	340	12	0	0

- Molecule 46 is a protein called Proliferation-associated protein 2G4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	CA	354	2764	1744	475	528	17	4	0

- Molecule 47 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
47	L5	214	Total Mg 214 214	0
47	L7	3	Total Mg 3 3	0
47	L8	4	Total Mg 4 4	0
47	LA	1	Total Mg 1 1	0
47	LP	1	Total Mg 1 1	0
47	LV	1	Total Mg 1 1	0
47	Le	1	Total Mg 1 1	0
47	Lg	1	Total Mg 1 1	0

- Molecule 48 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
48	Lg	1	Total Zn 1 1	0
48	Lj	1	Total Zn 1 1	0
48	Lm	1	Total Zn 1 1	0
48	Lo	1	Total Zn 1 1	0
48	Lp	1	Total Zn 1 1	0

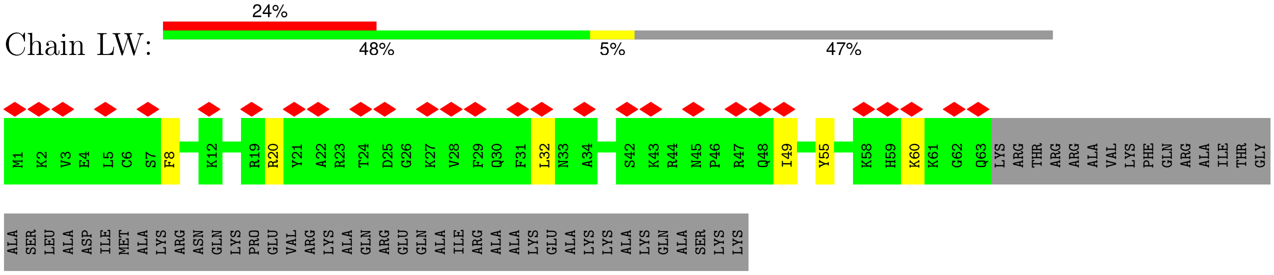
- Molecule 49 is water.

Mol	Chain	Residues	Atoms	AltConf
49	P	1	Total O 1 1	0

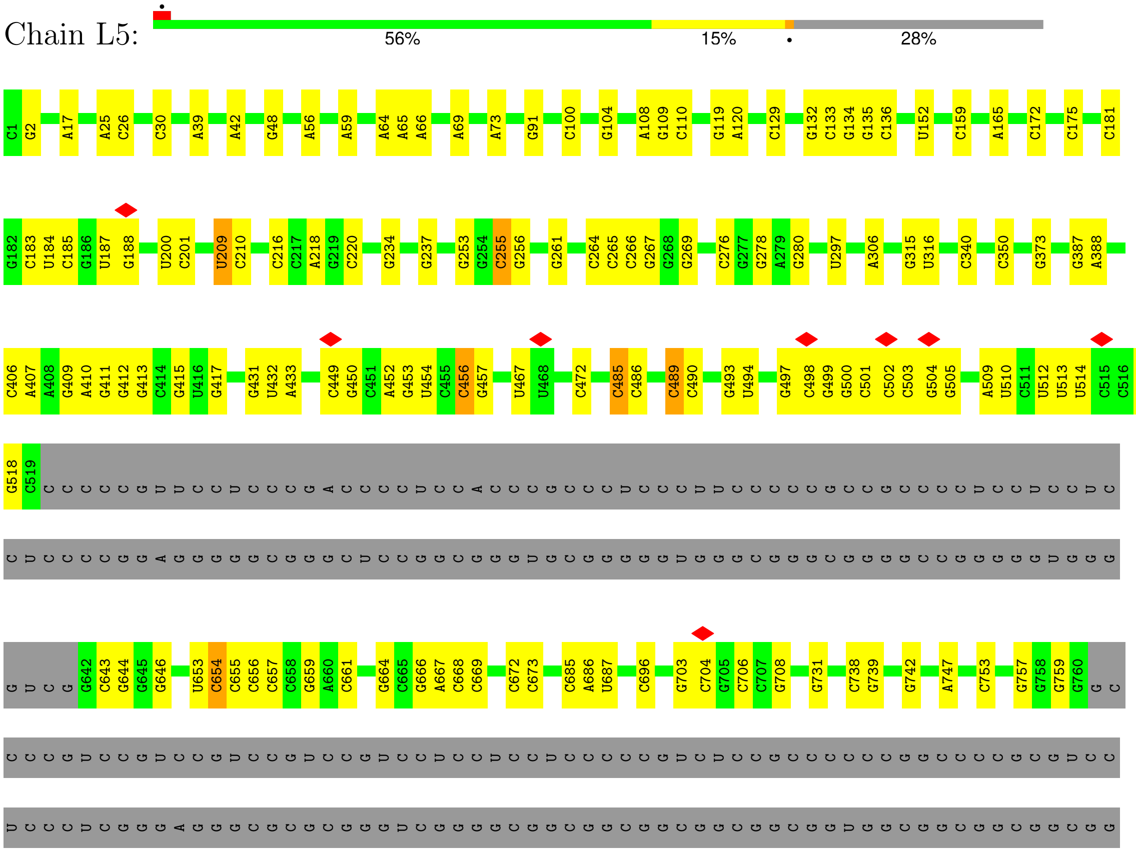
3 Residue-property plots ⓘ

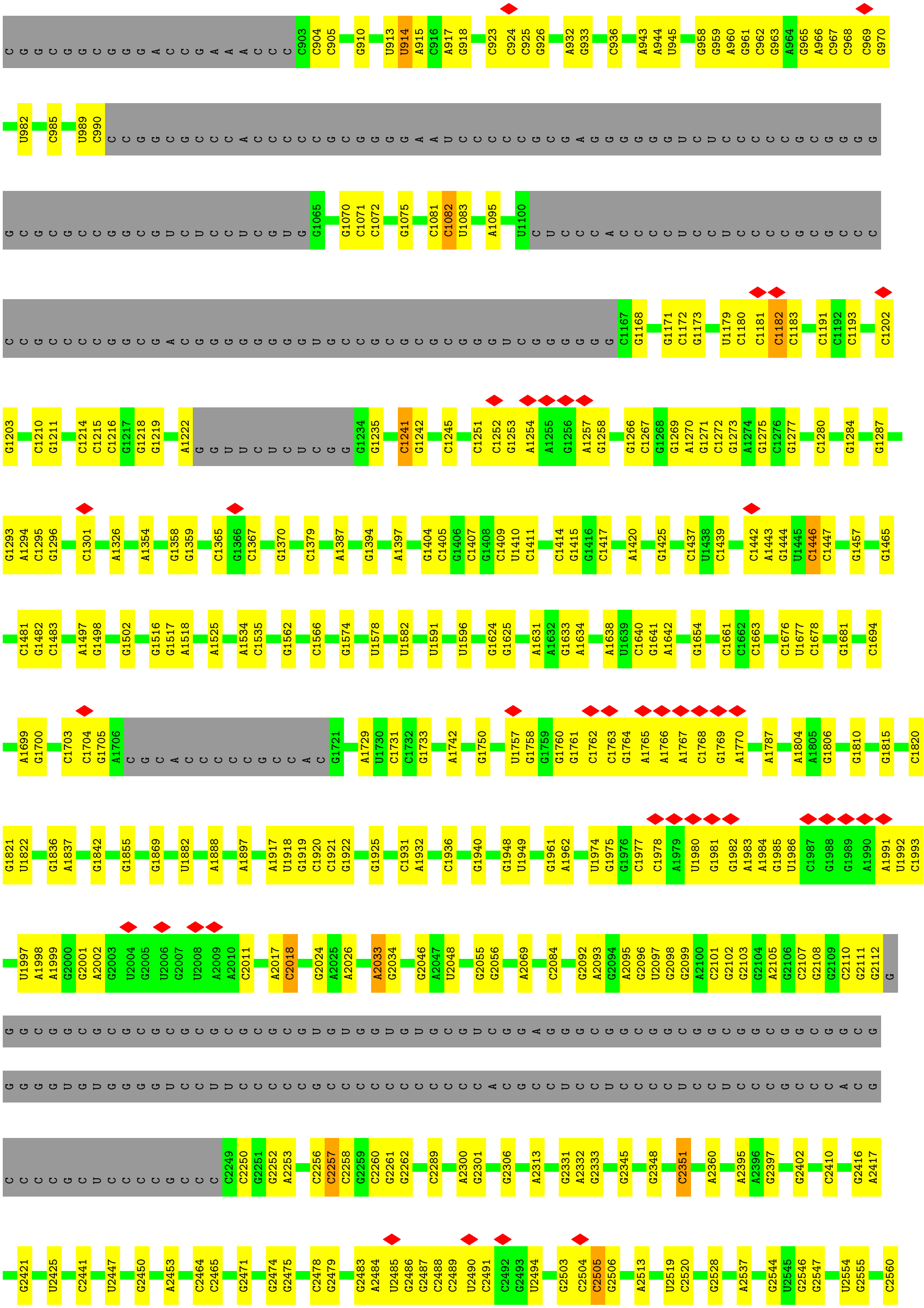
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Ribosomal protein L24



- Molecule 2: 28S rRNA

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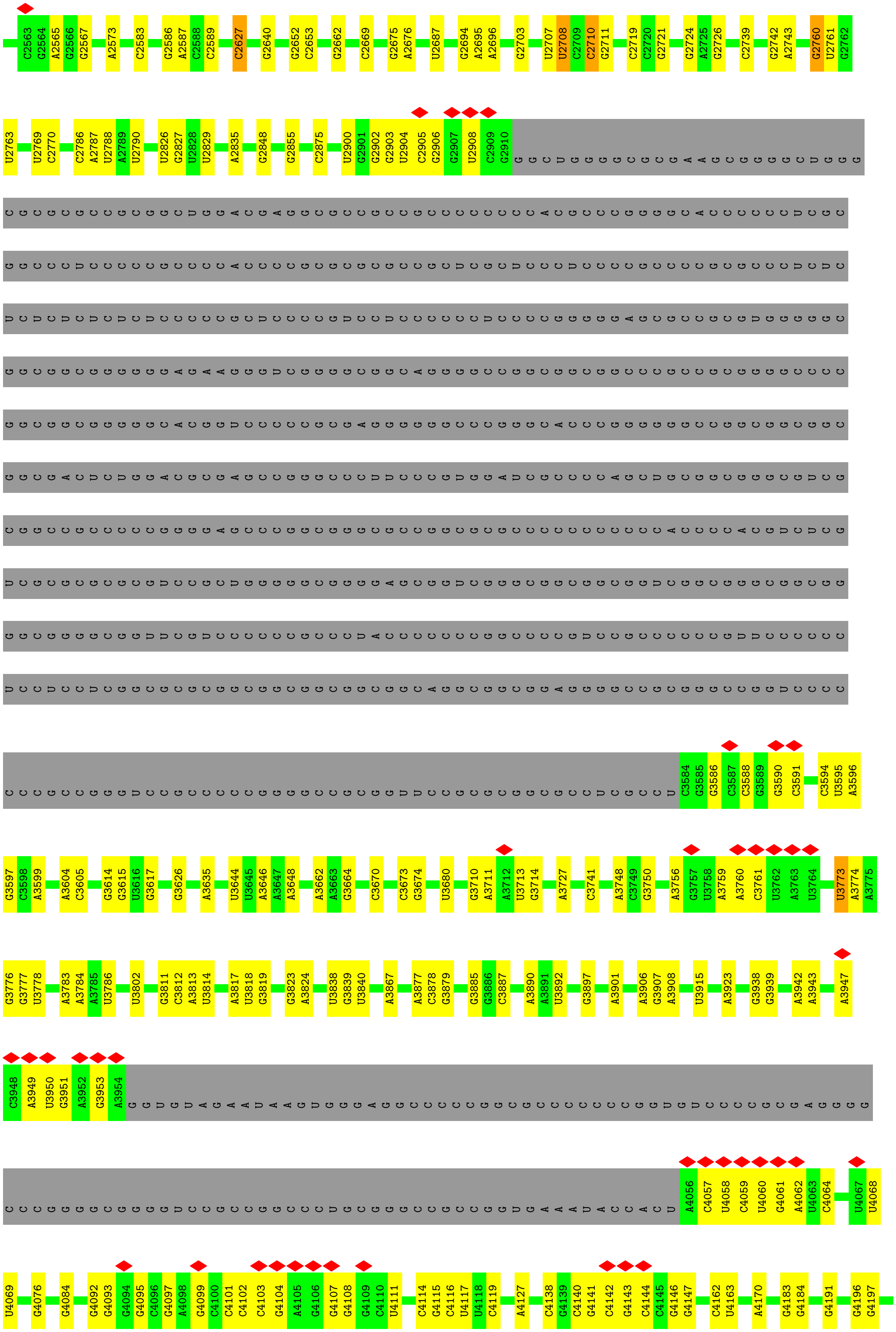
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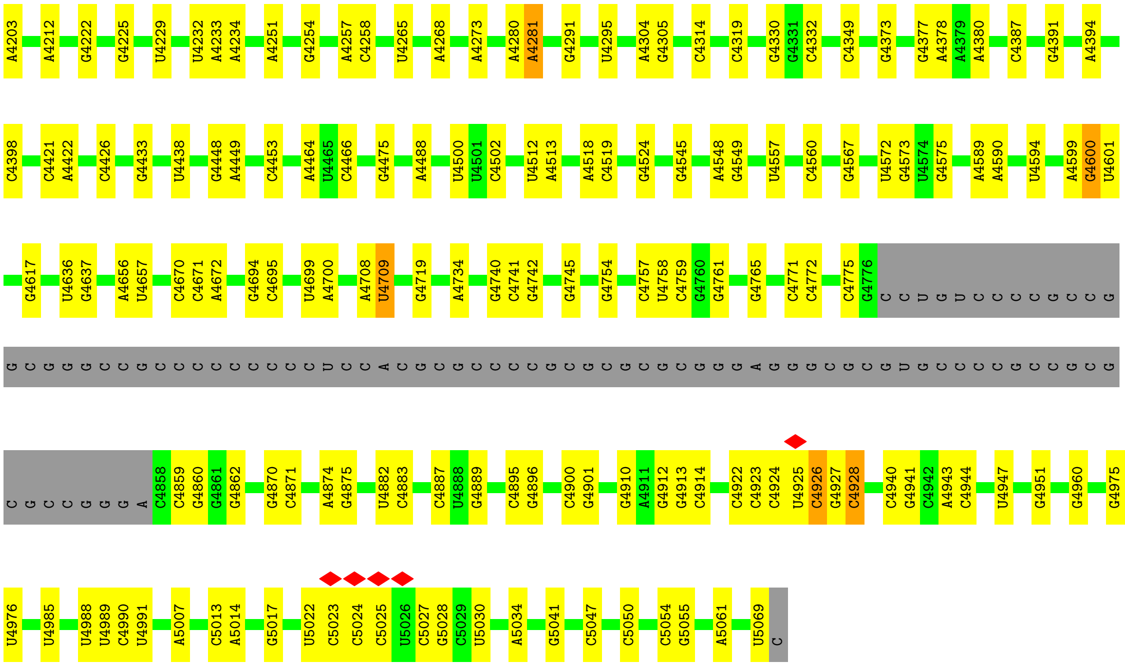
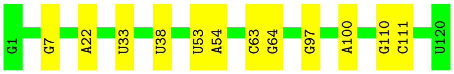


- Molecule 3: 5S rRNA [Homo sapiens]

Chain L7:



- Molecule 4: 5.8S rRNA [Homo sapiens]

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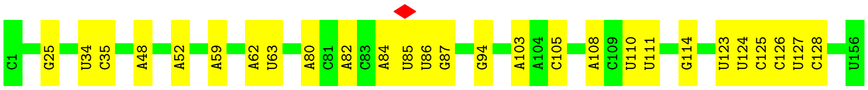
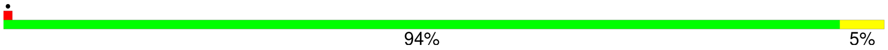
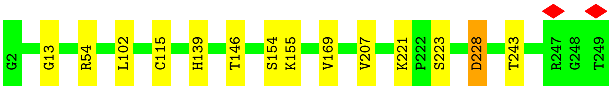


- Molecule 5: 60S ribosomal protein L8

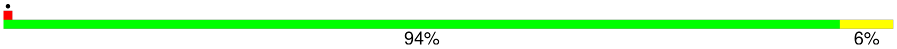
Chain LA:

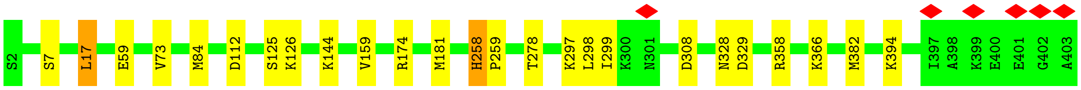




- Molecule 6: Large ribosomal subunit protein uL3

Chain LB:





- Molecule 7: 60S ribosomal protein L4

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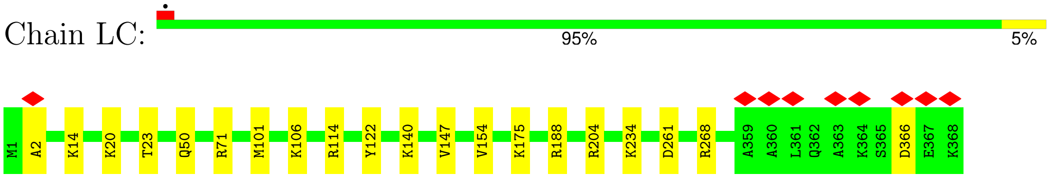

- Molecule 8: Large ribosomal subunit protein uL18

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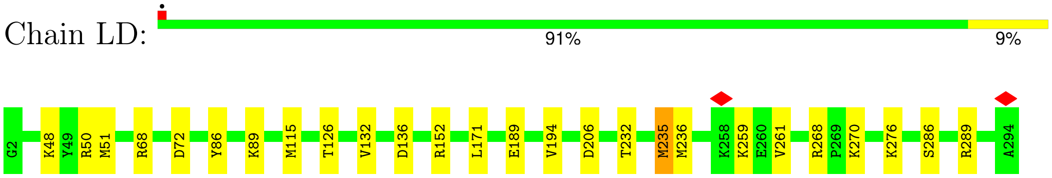

- Molecule 9: 60S ribosomal protein L6

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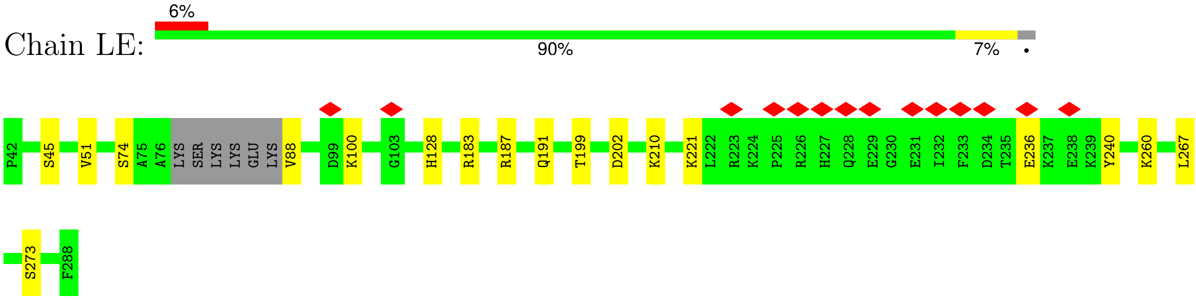
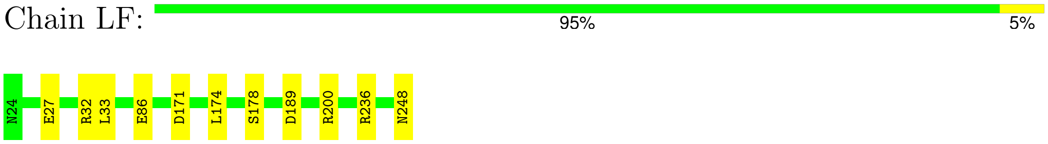


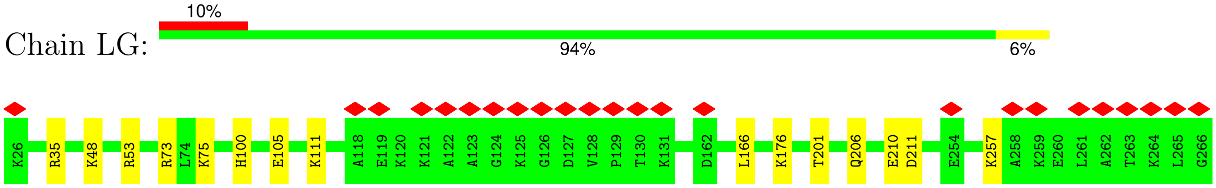
- Molecule 10: 60S ribosomal protein L7

Chain LF:



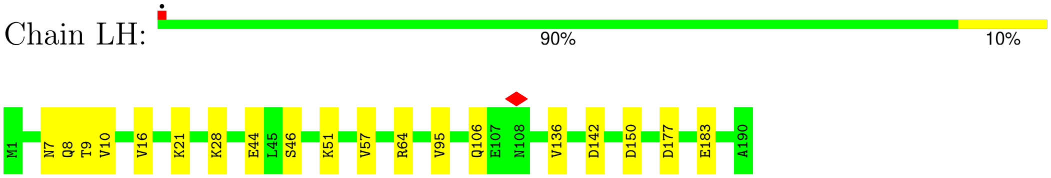
- Molecule 11: 60S ribosomal protein L7a

Chain LG:



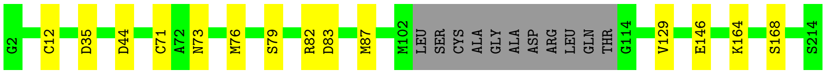
- Molecule 12: 60S ribosomal protein L9

Chain LH:

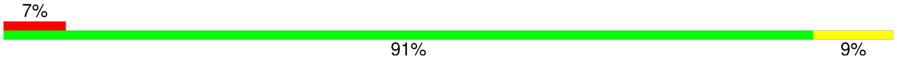


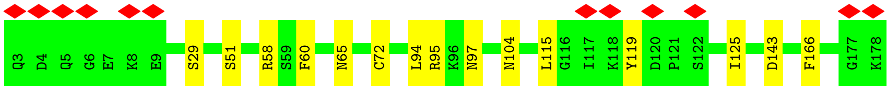
- Molecule 13: Ribosomal protein uL16-like

Chain LI:

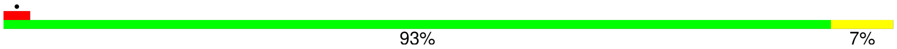


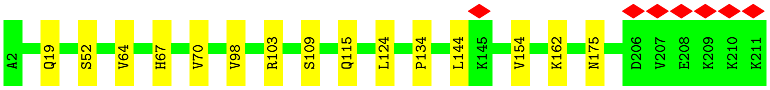
- Molecule 14: 60S ribosomal protein L11

Chain LJ:


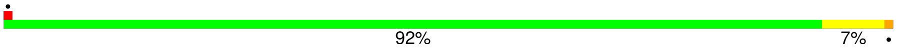


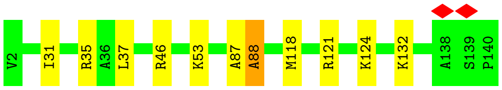
- Molecule 15: Large ribosomal subunit protein eL13

Chain LL:




- Molecule 16: 60S ribosomal protein L14

Chain LM:




- Molecule 17: 60S ribosomal protein L15

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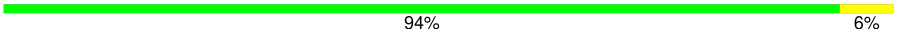

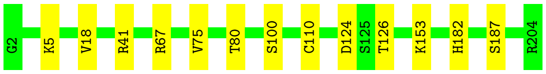

- Molecule 18: 60S ribosomal protein L13a

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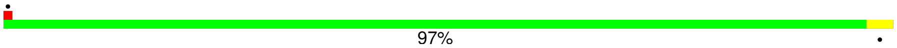
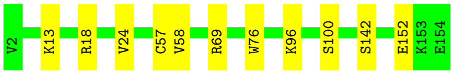


- Molecule 19: 60S ribosomal protein L17

Chain LP:

- Molecule 20: 60S ribosomal protein L18

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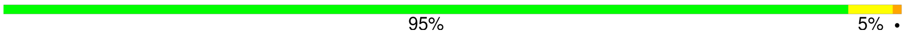

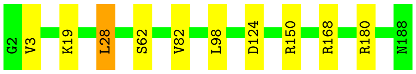

- Molecule 21: 60S ribosomal protein L19

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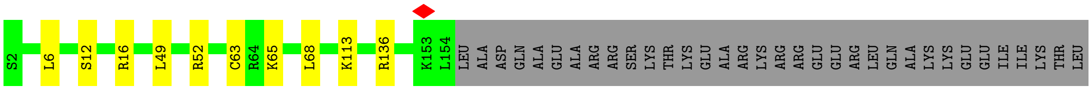
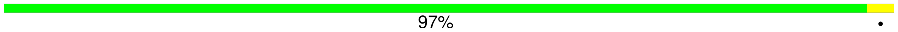
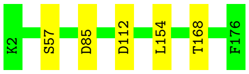


- Molecule 22: 60S ribosomal protein L18a

Chain LS:





- Molecule 23: 60S ribosomal protein L21

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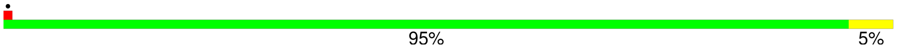
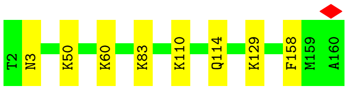
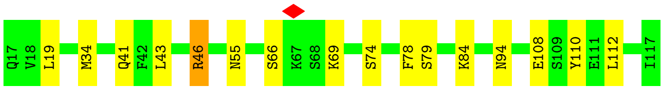




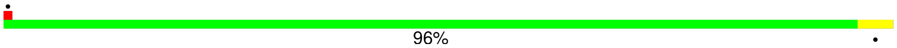
- Molecule 24: Heparin-binding protein HBp15

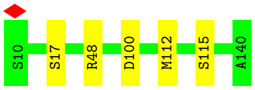
Chain LU:



- Molecule 25: 60S ribosomal protein L23

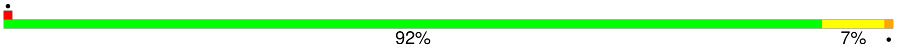
Chain LV:

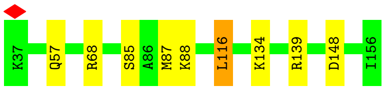




- Molecule 26: 60S ribosomal protein L23a

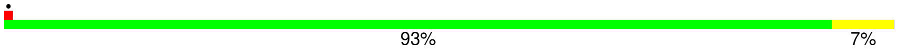
Chain LX:

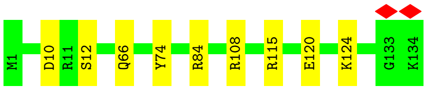




- Molecule 27: 60S ribosomal protein L26

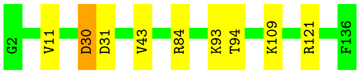
Chain LY:





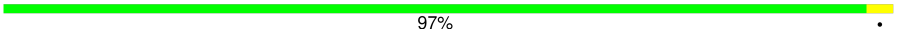
- Molecule 28: 60S ribosomal protein L27

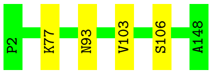
Chain LZ:



- Molecule 29: 60S ribosomal protein L27a

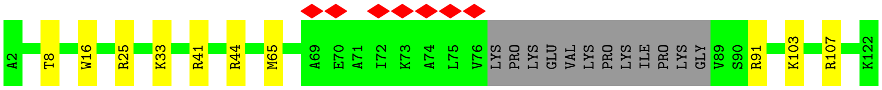
Chain La:





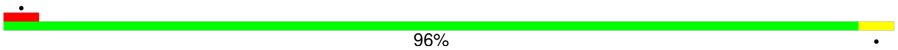
- Molecule 30: Large ribosomal subunit protein eL29

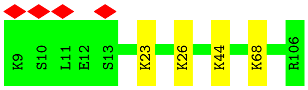
Chain Lb:



- Molecule 31: 60S ribosomal protein L30

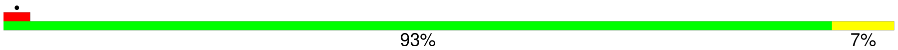
Chain Lc:

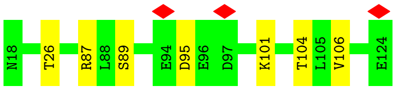




- Molecule 32: 60S ribosomal protein L31

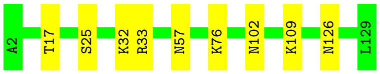
Chain Ld:





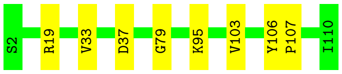
- Molecule 33: 60S ribosomal protein L32

Chain Le:



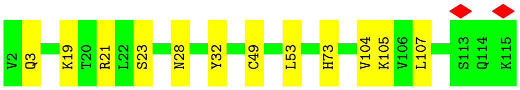
- Molecule 34: 60S ribosomal protein L35a

Chain Lf:



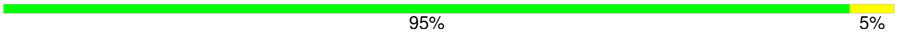
- Molecule 35: 60S ribosomal protein L34

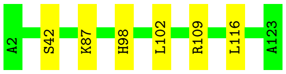
Chain Lg:



- Molecule 36: 60S ribosomal protein L35

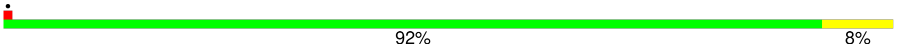
Chain Lh:

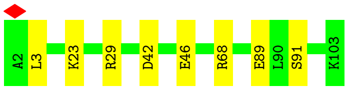




- Molecule 37: 60S ribosomal protein L36

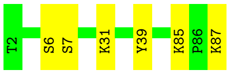
Chain Li:





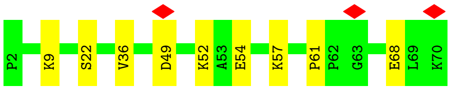
- Molecule 38: 60S ribosomal protein L37

Chain Lj:



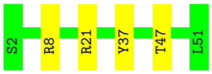
- Molecule 39: 60S ribosomal protein L38

Chain Lk:



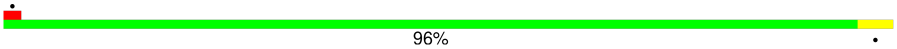
- Molecule 40: 60S ribosomal protein L39

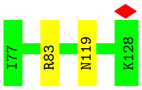
Chain Ll:



- Molecule 41: Large ribosomal subunit protein eL40

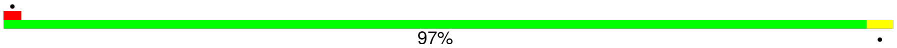
Chain Lm:

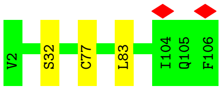




- Molecule 42: 60S ribosomal protein L36a

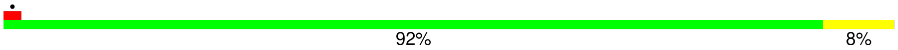
Chain Lo:

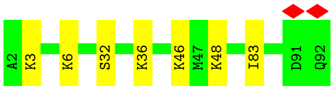




- Molecule 43: 60S ribosomal protein L37a

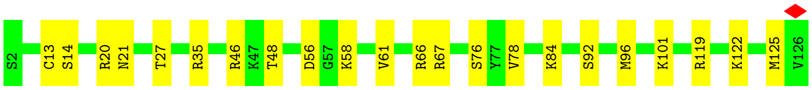
Chain Lp:





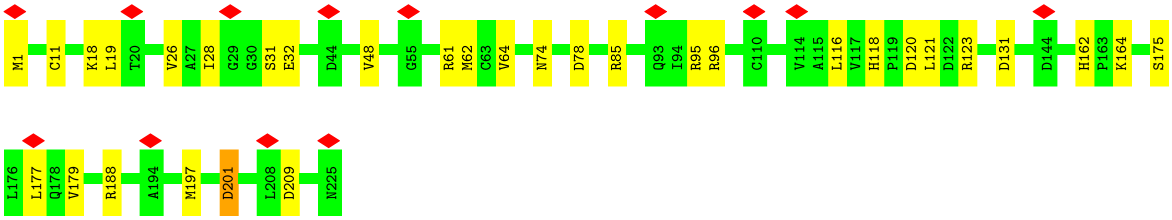
- Molecule 44: 60S ribosomal protein L28

Chain Lr:



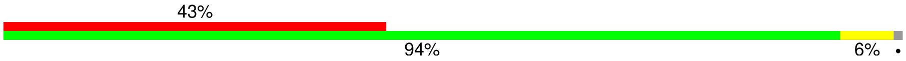
- Molecule 45: Eukaryotic translation initiation factor 6

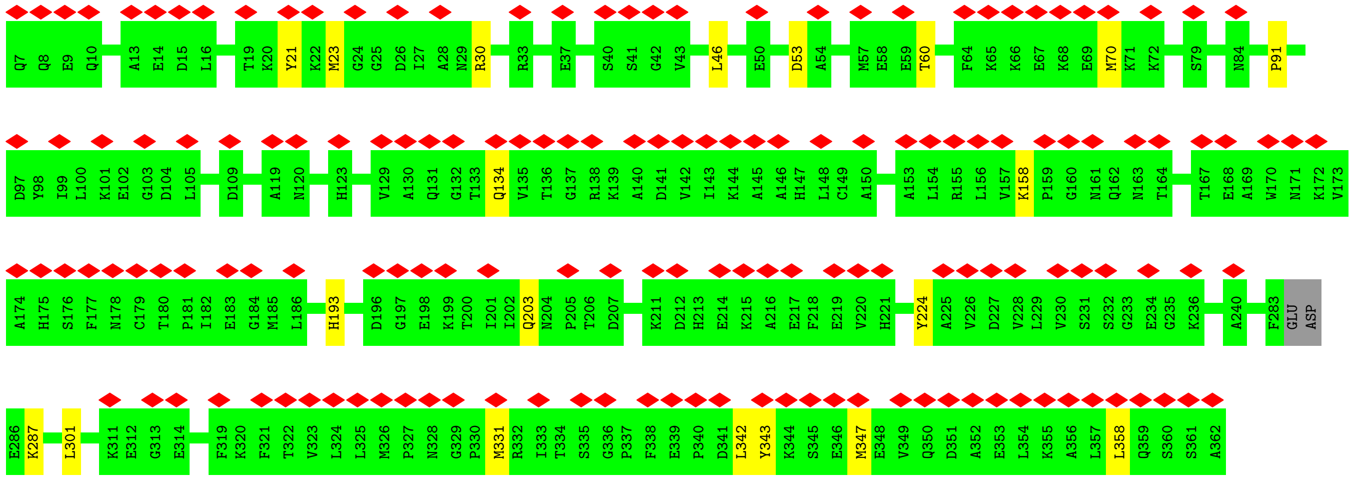
Chain P:



- Molecule 46: Proliferation-associated protein 2G4

Chain CA:




Q7
Q8
E9
Q10
A13
E14
D15
L16
T19
K20
Y21
K22
M23
G24
G25
D26
I27
A28
N29
R30
R33
E37
S40
S41
G42
V43
L46
E50
D53
A54
M57
E58
E59
T60
F64
K65
K66
E67
K68
E69
M70
K71
K72
S79
N84
P91
D97
Y98
I99
L100
K101
E102
G103
D104
L105
D109
A119
N120
H123
V129
A130
Q131
G132
T133
Q134
V135
T136
G137
R138
K139
A140
D141
V142
I143
K144
A145
A146
H147
L148
C149
A150
A153
L154
R155
L156
V157
K158
P159
G160
N161
Q162
N163
T164
T167
E168
A169
W170
N171
K172
V173
A174
H175
S176
F177
N178
C179
T180
P181
I182
E183
G184
M185
L186
H193
D196
G197
E198
K199
T200
I201
I202
Q203
N204
P205
T206
D207
K211
D212
H213
E214
K215
A216
E217
F218
E219
V220
H221
Y224
A225
V226
D227
V228
L229
V230
S231
S232
G233
E234
G235
K236
A240
F283
GLU
ASP
E286
K287
L301
K311
E312
G313
E314
F319
K320
F321
T322
V323
L324
L325
M326
P327
N328
G329
P330
M331
R332
I333
T334
S335
G336
P337
F338
E339
P340
D341
L342
Y343
K344
S345
E346
M347
E348
V349
Q350
D351
A352
E353
L354
K355
A356
L357
L358
Q359
S360
S361
A362

4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	132478	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.629	Depositor
Minimum map value	-0.281	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.022	Depositor
Recommended contour level	0.065	Depositor
Map size (Å)	546.816, 546.816, 546.816	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.068, 1.068, 1.068	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	LW	0.32	0/541	0.60	0/720
2	L5	0.50	0/87512	0.87	104/136518 (0.1%)
3	L7	0.48	0/2861	0.81	0/4459
4	L8	0.50	0/3701	0.81	2/5766 (0.0%)
5	LA	0.35	0/1936	0.63	1/2596 (0.0%)
6	LB	0.34	0/3306	0.60	2/4424 (0.0%)
7	LC	0.33	0/2981	0.59	1/4002 (0.0%)
8	LD	0.32	0/2428	0.56	1/3252 (0.0%)
9	LE	0.31	0/1942	0.60	0/2606
10	LF	0.35	0/1905	0.58	0/2539
11	LG	0.32	0/1960	0.56	0/2637
12	LH	0.33	0/1537	0.61	1/2066 (0.0%)
13	LI	0.33	0/1673	0.59	0/2233
14	LJ	0.31	0/1433	0.65	0/1915
15	LL	0.34	0/1732	0.65	2/2315 (0.1%)
16	LM	0.33	0/1161	0.57	0/1554
17	LN	0.35	0/1746	0.60	0/2338
18	LO	0.34	0/1682	0.57	0/2250
19	LP	0.33	0/1268	0.54	0/1701
20	LQ	0.35	0/1537	0.63	1/2052 (0.0%)
21	LR	0.30	0/1296	0.62	1/1713 (0.1%)
22	LS	0.36	0/1493	0.61	1/2003 (0.0%)
23	LT	0.36	0/1326	0.61	0/1770
24	LU	0.38	0/839	0.72	1/1126 (0.1%)
25	LV	0.34	0/993	0.59	0/1332
26	LX	0.32	0/1002	0.59	1/1345 (0.1%)
27	LY	0.34	0/1132	0.59	0/1504
28	LZ	0.33	0/1130	0.59	1/1507 (0.1%)
29	La	0.34	0/1191	0.54	0/1591
30	Lb	0.27	0/889	0.58	0/1175
31	Lc	0.36	0/774	0.62	0/1038
32	Ld	0.33	0/903	0.59	0/1216

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	Le	0.36	0/1071	0.61	0/1429
34	Lf	0.37	0/895	0.62	0/1198
35	Lg	0.34	0/916	0.63	0/1220
36	Lh	0.30	0/1023	0.59	0/1351
37	Li	0.29	0/843	0.62	0/1115
38	Lj	0.35	0/720	0.62	0/952
39	Lk	0.34	0/575	0.71	1/761 (0.1%)
40	Ll	0.30	0/454	0.61	0/599
41	Lm	0.30	0/435	0.54	0/575
42	Lo	0.32	0/876	0.59	0/1156
43	Lp	0.33	0/718	0.57	0/953
44	Lr	0.32	0/1017	0.59	0/1364
45	P	0.32	0/1736	0.68	1/2362 (0.0%)
46	CA	0.29	0/2810	0.64	3/3780 (0.1%)
All	All	0.44	0/151899	0.78	125/224078 (0.1%)

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
5	LA	0	1
6	LB	0	2
15	LL	0	1
16	LM	0	2
18	LO	0	1
24	LU	0	1
34	Lf	0	3
38	Lj	0	1
All	All	0	12

There are no bond length outliers.

All (125) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	CA	91	PRO	CA-N-CD	-12.06	94.61	111.50
2	L5	485	C	C2-N1-C1'	11.09	131.00	118.80
15	LL	134	PRO	CA-N-CD	-10.56	96.71	111.50
2	L5	2710	C	N1-C2-O2	10.32	125.09	118.90
2	L5	2710	C	C2-N1-C1'	9.21	128.93	118.80
2	L5	654	C	N1-C2-O2	8.99	124.30	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	LH	142	ASP	CB-CG-OD2	8.57	126.01	118.30
2	L5	485	C	C6-N1-C1'	-8.45	110.66	120.80
2	L5	4138	C	N3-C2-O2	-8.44	116.00	121.90
2	L5	2257	C	C2-N1-C1'	8.39	128.03	118.80
2	L5	2257	C	N1-C2-O2	8.37	123.92	118.90
2	L5	456	C	O4'-C1'-N1	8.31	114.85	108.20
2	L5	456	C	N3-C2-O2	-7.96	116.33	121.90
2	L5	1414	C	N1-C2-O2	7.92	123.65	118.90
2	L5	1414	C	N3-C2-O2	-7.89	116.38	121.90
2	L5	2710	C	N3-C2-O2	-7.86	116.40	121.90
24	LU	43	LEU	CA-CB-CG	7.74	133.10	115.30
2	L5	1252	C	N3-C2-O2	-7.56	116.61	121.90
2	L5	925	C	N3-C2-O2	-7.42	116.71	121.90
2	L5	1082	C	O4'-C1'-N1	7.41	114.13	108.20
2	L5	490	C	N3-C2-O2	-7.37	116.74	121.90
2	L5	925	C	N1-C2-O2	7.30	123.28	118.90
2	L5	209	U	C2-N1-C1'	7.14	126.27	117.70
2	L5	1082	C	N3-C2-O2	-7.13	116.91	121.90
2	L5	255	C	N3-C2-O2	-7.06	116.96	121.90
2	L5	4709	U	C2-N1-C1'	7.01	126.12	117.70
2	L5	100	C	C2-N1-C1'	6.95	126.44	118.80
2	L5	175	C	N3-C2-O2	-6.95	117.04	121.90
2	L5	1216	C	C2-N1-C1'	6.85	126.33	118.80
2	L5	129	C	N3-C2-O2	-6.84	117.11	121.90
2	L5	485	C	N1-C2-O2	6.79	122.97	118.90
5	LA	228	ASP	CB-CG-OD2	6.70	124.33	118.30
2	L5	3773	U	N3-C2-O2	-6.66	117.54	122.20
2	L5	4928	C	N1-C2-O2	6.62	122.87	118.90
2	L5	2410	C	C2-N1-C1'	6.55	126.01	118.80
2	L5	4928	C	C2-N1-C1'	6.53	125.99	118.80
2	L5	181	C	C2-N1-C1'	6.42	125.86	118.80
2	L5	1191	C	N3-C2-O2	-6.42	117.41	121.90
2	L5	2710	C	C6-N1-C1'	-6.40	113.12	120.80
2	L5	654	C	C2-N1-C1'	6.36	125.79	118.80
4	L8	128	C	C2-N1-C1'	6.28	125.71	118.80
6	LB	299	ILE	CG1-CB-CG2	-6.28	97.59	111.40
2	L5	3741	C	N3-C2-O2	-6.26	117.52	121.90
2	L5	753	C	N1-C2-O2	6.23	122.64	118.90
2	L5	2257	C	N3-C2-O2	-6.20	117.56	121.90
2	L5	4926	C	N1-C2-O2	6.18	122.61	118.90
45	P	131	ASP	CB-CG-OD2	6.17	123.86	118.30
2	L5	2257	C	C6-N1-C1'	-6.16	113.41	120.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	L5	181	C	N1-C2-O2	6.16	122.59	118.90
2	L5	753	C	C2-N1-C1’	6.12	125.53	118.80
2	L5	4926	C	C2-N1-C1’	6.08	125.49	118.80
2	L5	4924	C	N3-C2-O2	-6.08	117.64	121.90
2	L5	3773	U	C2-N1-C1’	6.07	124.98	117.70
2	L5	4147	G	C5-C6-O6	6.05	132.23	128.60
7	LC	2	ALA	C-N-CA	6.03	136.78	121.70
2	L5	3773	U	N1-C2-O2	6.03	127.02	122.80
15	LL	134	PRO	N-CD-CG	-5.94	94.29	103.20
2	L5	485	C	C5-C6-N1	5.93	123.97	121.00
2	L5	1241	C	C2-N1-C1’	5.88	125.27	118.80
2	L5	2710	C	C6-N1-C2	-5.88	117.95	120.30
28	LZ	30	ASP	CB-CG-OD1	5.87	123.58	118.30
2	L5	4147	G	N1-C6-O6	-5.86	116.39	119.90
2	L5	1216	C	N1-C2-O2	5.83	122.40	118.90
2	L5	1245	C	C2-N1-C1’	5.76	125.14	118.80
2	L5	417	G	O4’-C1’-N9	5.72	112.78	108.20
2	L5	4426	C	C2-N1-C1’	5.70	125.07	118.80
39	Lk	61	PRO	CA-N-CD	-5.70	103.53	111.50
2	L5	4758	U	C2-N1-C1’	5.63	124.46	117.70
2	L5	753	C	N3-C2-O2	-5.60	117.98	121.90
2	L5	1241	C	N1-C2-O2	5.60	122.26	118.90
2	L5	255	C	N1-C2-O2	5.58	122.25	118.90
2	L5	2760	G	P-O3’-C3’	5.57	126.39	119.70
8	LD	235	MET	CA-CB-CG	5.55	122.73	113.30
2	L5	4502	C	N1-C2-O2	5.54	122.22	118.90
2	L5	1663	C	C2-N1-C1’	5.54	124.89	118.80
2	L5	1082	C	P-O3’-C3’	5.52	126.33	119.70
2	L5	2528	G	C4-N9-C1’	5.50	133.65	126.50
2	L5	2262	G	C4-N9-C1’	5.47	133.61	126.50
46	CA	301	LEU	CA-CB-CG	5.46	127.86	115.30
22	LS	112	ASP	CB-CG-OD2	5.43	123.18	118.30
2	L5	2627	C	C2-N1-C1’	5.42	124.76	118.80
2	L5	2627	C	N1-C2-O2	5.39	122.14	118.90
2	L5	4709	U	C6-N1-C1’	-5.39	113.65	121.20
26	LX	116	LEU	CA-CB-CG	5.39	127.69	115.30
2	L5	654	C	N3-C2-O2	-5.38	118.13	121.90
2	L5	654	C	C6-N1-C1’	-5.38	114.35	120.80
2	L5	489	C	N1-C2-O2	5.36	122.11	118.90
2	L5	4107	G	N3-C4-C5	-5.36	125.92	128.60
2	L5	209	U	C6-N1-C1’	-5.35	113.71	121.20
2	L5	1251	C	N1-C2-O2	5.35	122.11	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	L5	2708	U	C2-N1-C1'	5.35	124.12	117.70
2	L5	2708	U	N1-C2-O2	5.34	126.54	122.80
2	L5	4281	A	O4'-C1'-N9	5.33	112.47	108.20
2	L5	1081	C	N1-C2-O2	5.30	122.08	118.90
2	L5	4107	G	C4-N9-C1'	5.29	133.38	126.50
2	L5	4928	C	N3-C2-O2	-5.28	118.20	121.90
2	L5	661	C	N3-C2-O2	-5.28	118.21	121.90
2	L5	914	U	P-O3'-C3'	5.24	125.99	119.70
2	L5	664	G	C5-C6-O6	5.24	131.74	128.60
2	L5	100	C	N3-C2-O2	-5.23	118.24	121.90
2	L5	1082	C	C6-N1-C2	-5.23	118.21	120.30
21	LR	68	LEU	CA-CB-CG	5.23	127.32	115.30
2	L5	100	C	N1-C2-O2	5.21	122.03	118.90
46	CA	358	LEU	CA-CB-CG	5.21	127.28	115.30
2	L5	4600	G	P-O3'-C3'	5.18	125.91	119.70
2	L5	3773	U	O4'-C1'-N1	5.18	112.34	108.20
20	LQ	28	LEU	CA-CB-CG	5.18	127.20	115.30
2	L5	2018	C	C5-C6-N1	5.16	123.58	121.00
2	L5	2505	C	N1-C2-O2	5.15	121.99	118.90
2	L5	2710	C	C5-C6-N1	5.14	123.57	121.00
2	L5	4107	G	N3-C4-N9	5.14	129.08	126.00
2	L5	3741	C	N1-C2-O2	5.12	121.97	118.90
2	L5	2033	A	P-O3'-C3'	5.11	125.84	119.70
2	L5	4138	C	N1-C2-O2	5.10	121.96	118.90
6	LB	259	PRO	CA-N-CD	-5.09	104.37	111.50
2	L5	2528	G	N3-C4-C5	-5.09	126.06	128.60
2	L5	1182	C	C2-N1-C1'	5.08	124.39	118.80
2	L5	1241	C	N3-C2-O2	-5.08	118.35	121.90
2	L5	2351	C	C2-N1-C1'	5.07	124.38	118.80
2	L5	672	C	C2-N1-C1'	5.06	124.36	118.80
2	L5	2528	G	N3-C4-N9	5.05	129.03	126.00
2	L5	4887	C	N1-C2-O2	5.05	121.93	118.90
4	L8	128	C	C6-N1-C1'	-5.02	114.77	120.80
2	L5	1446	C	N1-C2-O2	5.02	121.91	118.90
2	L5	209	U	N1-C2-O2	5.01	126.31	122.80

There are no chirality outliers.

All (12) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
5	LA	13	GLY	Peptide
6	LB	17	LEU	Peptide

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Mol	Chain	Res	Type	Group
6	LB	258	HIS	Peptide
15	LL	154	VAL	Peptide
16	LM	87	ALA	Peptide
16	LM	88	ALA	Peptide
18	LO	110	PRO	Peptide
24	LU	46	ARG	Peptide
34	Lf	103	VAL	Peptide
34	Lf	106	TYR	Peptide
34	Lf	79	GLY	Peptide
38	Lj	39	TYR	Peptide

5.2 Too-close contacts ⓘ

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

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	LW	61/118 (52%)	55 (90%)	6 (10%)	0	100	100
5	LA	246/248 (99%)	220 (89%)	26 (11%)	0	100	100
6	LB	400/402 (100%)	371 (93%)	29 (7%)	0	100	100
7	LC	366/368 (100%)	340 (93%)	26 (7%)	0	100	100
8	LD	291/293 (99%)	274 (94%)	17 (6%)	0	100	100
9	LE	232/242 (96%)	209 (90%)	23 (10%)	0	100	100
10	LF	223/225 (99%)	214 (96%)	9 (4%)	0	100	100
11	LG	239/241 (99%)	223 (93%)	16 (7%)	0	100	100
12	LH	188/190 (99%)	174 (93%)	14 (7%)	0	100	100
13	LI	198/213 (93%)	187 (94%)	11 (6%)	0	100	100
14	LJ	174/176 (99%)	159 (91%)	15 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
15	LL	208/210 (99%)	193 (93%)	15 (7%)	0	100	100
16	LM	137/139 (99%)	126 (92%)	10 (7%)	1 (1%)	19	41
17	LN	201/203 (99%)	189 (94%)	11 (6%)	1 (0%)	25	50
18	LO	199/201 (99%)	191 (96%)	8 (4%)	0	100	100
19	LP	151/153 (99%)	143 (95%)	8 (5%)	0	100	100
20	LQ	185/187 (99%)	178 (96%)	7 (4%)	0	100	100
21	LR	149/187 (80%)	144 (97%)	5 (3%)	0	100	100
22	LS	173/175 (99%)	161 (93%)	12 (7%)	0	100	100
23	LT	157/159 (99%)	144 (92%)	13 (8%)	0	100	100
24	LU	99/101 (98%)	80 (81%)	19 (19%)	0	100	100
25	LV	129/131 (98%)	122 (95%)	7 (5%)	0	100	100
26	LX	118/120 (98%)	117 (99%)	1 (1%)	0	100	100
27	LY	132/134 (98%)	127 (96%)	5 (4%)	0	100	100
28	LZ	133/135 (98%)	127 (96%)	6 (4%)	0	100	100
29	La	145/147 (99%)	136 (94%)	9 (6%)	0	100	100
30	Lb	105/121 (87%)	99 (94%)	6 (6%)	0	100	100
31	Lc	96/98 (98%)	89 (93%)	7 (7%)	0	100	100
32	Ld	105/107 (98%)	97 (92%)	8 (8%)	0	100	100
33	Le	126/128 (98%)	118 (94%)	8 (6%)	0	100	100
34	Lf	107/109 (98%)	97 (91%)	9 (8%)	1 (1%)	14	35
35	Lg	112/114 (98%)	111 (99%)	1 (1%)	0	100	100
36	Lh	120/122 (98%)	117 (98%)	3 (2%)	0	100	100
37	Li	100/102 (98%)	94 (94%)	6 (6%)	0	100	100
38	Lj	84/86 (98%)	78 (93%)	6 (7%)	0	100	100
39	Lk	67/69 (97%)	62 (92%)	5 (8%)	0	100	100
40	Ll	48/50 (96%)	47 (98%)	1 (2%)	0	100	100
41	Lm	50/52 (96%)	49 (98%)	1 (2%)	0	100	100
42	Lo	103/105 (98%)	99 (96%)	4 (4%)	0	100	100
43	Lp	89/91 (98%)	84 (94%)	5 (6%)	0	100	100
44	Lr	123/125 (98%)	115 (94%)	8 (6%)	0	100	100
45	P	223/225 (99%)	209 (94%)	12 (5%)	2 (1%)	14	35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
46	CA	350/356 (98%)	330 (94%)	20 (6%)	0	100	100
All	All	6942/7158 (97%)	6499 (94%)	438 (6%)	5 (0%)	50	72

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
45	P	201	ASP
17	LN	124	ASP
16	LM	88	ALA
45	P	32	GLU
34	Lf	107	PRO

5.3.2 Protein sidechains ⓘ

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	LW	55/97 (57%)	49 (89%)	6 (11%)	5	15
5	LA	190/190 (100%)	177 (93%)	13 (7%)	13	32
6	LB	348/348 (100%)	325 (93%)	23 (7%)	14	33
7	LC	306/306 (100%)	287 (94%)	19 (6%)	15	36
8	LD	246/247 (100%)	220 (89%)	26 (11%)	5	16
9	LE	209/215 (97%)	191 (91%)	18 (9%)	8	23
10	LF	194/194 (100%)	183 (94%)	11 (6%)	17	39
11	LG	203/205 (99%)	188 (93%)	15 (7%)	11	28
12	LH	169/169 (100%)	151 (89%)	18 (11%)	5	15
13	LI	172/180 (96%)	158 (92%)	14 (8%)	9	24
14	LJ	148/148 (100%)	133 (90%)	15 (10%)	6	18
15	LL	176/176 (100%)	163 (93%)	13 (7%)	11	28
16	LM	118/118 (100%)	109 (92%)	9 (8%)	11	27
17	LN	171/171 (100%)	159 (93%)	12 (7%)	12	31

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	LO	173/173 (100%)	167 (96%)	6 (4%)	31	56
19	LP	134/134 (100%)	123 (92%)	11 (8%)	9	24
20	LQ	164/164 (100%)	154 (94%)	10 (6%)	15	36
21	LR	137/166 (82%)	128 (93%)	9 (7%)	14	33
22	LS	156/156 (100%)	152 (97%)	4 (3%)	41	65
23	LT	139/139 (100%)	131 (94%)	8 (6%)	17	38
24	LU	91/91 (100%)	76 (84%)	15 (16%)	2	4
25	LV	101/101 (100%)	96 (95%)	5 (5%)	20	44
26	LX	108/108 (100%)	99 (92%)	9 (8%)	9	24
27	LY	124/124 (100%)	115 (93%)	9 (7%)	11	29
28	LZ	117/117 (100%)	108 (92%)	9 (8%)	10	27
29	La	120/120 (100%)	116 (97%)	4 (3%)	33	58
30	Lb	88/101 (87%)	78 (89%)	10 (11%)	4	14
31	Lc	83/83 (100%)	79 (95%)	4 (5%)	21	46
32	Ld	98/98 (100%)	91 (93%)	7 (7%)	12	31
33	Le	114/114 (100%)	105 (92%)	9 (8%)	10	25
34	Lf	88/88 (100%)	84 (96%)	4 (4%)	23	48
35	Lg	98/98 (100%)	86 (88%)	12 (12%)	4	12
36	Lh	109/109 (100%)	103 (94%)	6 (6%)	18	41
37	Li	86/86 (100%)	78 (91%)	8 (9%)	7	20
38	Lj	73/73 (100%)	68 (93%)	5 (7%)	13	32
39	Lk	64/64 (100%)	56 (88%)	8 (12%)	3	11
40	Ll	47/47 (100%)	43 (92%)	4 (8%)	8	23
41	Lm	48/48 (100%)	46 (96%)	2 (4%)	25	50
42	Lo	93/93 (100%)	90 (97%)	3 (3%)	34	59
43	Lp	74/74 (100%)	67 (90%)	7 (10%)	7	19
44	Lr	109/109 (100%)	87 (80%)	22 (20%)	1	2
45	P	195/195 (100%)	165 (85%)	30 (15%)	2	6
46	CA	303/305 (99%)	286 (94%)	17 (6%)	17	40
All	All	6039/6142 (98%)	5570 (92%)	469 (8%)	13	26

All (469) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	LW	8	PHE
1	LW	20	ARG
1	LW	32	LEU
1	LW	49	ILE
1	LW	55	TYR
1	LW	60	LYS
5	LA	54	ARG
5	LA	102	LEU
5	LA	115	CYS
5	LA	139	HIS
5	LA	146	THR
5	LA	154	SER
5	LA	155	LYS
5	LA	169	VAL
5	LA	207	VAL
5	LA	221	LYS
5	LA	223	SER
5	LA	228	ASP
5	LA	243	THR
6	LB	7	SER
6	LB	17	LEU
6	LB	59	GLU
6	LB	73	VAL
6	LB	84	MET
6	LB	112	ASP
6	LB	125	SER
6	LB	126	LYS
6	LB	144	LYS
6	LB	159	VAL
6	LB	174	ARG
6	LB	181	MET
6	LB	258	HIS
6	LB	278	THR
6	LB	297	LYS
6	LB	298	LEU
6	LB	308	ASP
6	LB	328	ASN
6	LB	329	ASP
6	LB	358	ARG
6	LB	366	LYS
6	LB	382	MET
6	LB	394	LYS
7	LC	14	LYS

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Mol	Chain	Res	Type
7	LC	20	LYS
7	LC	23	THR
7	LC	50	GLN
7	LC	71	ARG
7	LC	101	MET
7	LC	106	LYS
7	LC	114	ARG
7	LC	122	TYR
7	LC	140	LYS
7	LC	147	VAL
7	LC	154	VAL
7	LC	175	LYS
7	LC	188	ARG
7	LC	204	ARG
7	LC	234	LYS
7	LC	261	ASP
7	LC	268	ARG
7	LC	366	ASP
8	LD	48	LYS
8	LD	50	ARG
8	LD	51	MET
8	LD	68	ARG
8	LD	72	ASP
8	LD	86	TYR
8	LD	89	LYS
8	LD	115	MET
8	LD	126	THR
8	LD	132	VAL
8	LD	136	ASP
8	LD	152	ARG
8	LD	171	LEU
8	LD	189	GLU
8	LD	194	VAL
8	LD	206	ASP
8	LD	232	THR
8	LD	235	MET
8	LD	236	MET
8	LD	259	LYS
8	LD	261	VAL
8	LD	268	ARG
8	LD	270	LYS
8	LD	276	LYS

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Mol	Chain	Res	Type
8	LD	286	SER
8	LD	289	ARG
9	LE	45	SER
9	LE	51	VAL
9	LE	74	SER
9	LE	88	VAL
9	LE	100	LYS
9	LE	128	HIS
9	LE	183	ARG
9	LE	187	ARG
9	LE	191	GLN
9	LE	199	THR
9	LE	202	ASP
9	LE	210	LYS
9	LE	221	LYS
9	LE	236	GLU
9	LE	240	TYR
9	LE	260	LYS
9	LE	267	LEU
9	LE	273	SER
10	LF	27	GLU
10	LF	32	ARG
10	LF	33	LEU
10	LF	86	GLU
10	LF	171	ASP
10	LF	174	LEU
10	LF	178	SER
10	LF	189	ASP
10	LF	200	ARG
10	LF	236	ARG
10	LF	248	ASN
11	LG	35	ARG
11	LG	48	LYS
11	LG	53	ARG
11	LG	73	ARG
11	LG	75	LYS
11	LG	100	HIS
11	LG	105	GLU
11	LG	111	LYS
11	LG	166	LEU
11	LG	176	LYS
11	LG	201	THR

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Mol	Chain	Res	Type
11	LG	206	GLN
11	LG	210	GLU
11	LG	211	ASP
11	LG	257	LYS
12	LH	7	ASN
12	LH	8	GLN
12	LH	9	THR
12	LH	10	VAL
12	LH	16	VAL
12	LH	21	LYS
12	LH	28	LYS
12	LH	44	GLU
12	LH	46	SER
12	LH	51	LYS
12	LH	57	VAL
12	LH	64	ARG
12	LH	95	VAL
12	LH	106	GLN
12	LH	136	VAL
12	LH	150	ASP
12	LH	177	ASP
12	LH	183	GLU
13	LI	12	CYS
13	LI	35	ASP
13	LI	44	ASP
13	LI	71	CYS
13	LI	73	ASN
13	LI	76	MET
13	LI	79	SER
13	LI	82	ARG
13	LI	83	ASP
13	LI	87	MET
13	LI	129	VAL
13	LI	146	GLU
13	LI	164	LYS
13	LI	168	SER
14	LJ	29	SER
14	LJ	51	SER
14	LJ	58	ARG
14	LJ	60	PHE
14	LJ	65	ASN
14	LJ	72	CYS

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Mol	Chain	Res	Type
14	LJ	94	LEU
14	LJ	95	ARG
14	LJ	97	ASN
14	LJ	104	ASN
14	LJ	115	LEU
14	LJ	119	TYR
14	LJ	125	ILE
14	LJ	143	ASP
14	LJ	166	PHE
15	LL	19	GLN
15	LL	52	SER
15	LL	64	VAL
15	LL	67	HIS
15	LL	70	VAL
15	LL	98	VAL
15	LL	103	ARG
15	LL	109	SER
15	LL	115	GLN
15	LL	124	LEU
15	LL	144	LEU
15	LL	162	LYS
15	LL	175	ASN
16	LM	31	ILE
16	LM	35	ARG
16	LM	37	LEU
16	LM	46	ARG
16	LM	53	LYS
16	LM	118	MET
16	LM	121	ARG
16	LM	124	LYS
16	LM	132	LYS
17	LN	5	LYS
17	LN	18	VAL
17	LN	41	ARG
17	LN	67	ARG
17	LN	75	VAL
17	LN	80	THR
17	LN	100	SER
17	LN	110	CYS
17	LN	126	THR
17	LN	153	LYS
17	LN	182	HIS

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Mol	Chain	Res	Type
17	LN	187	SER
18	LO	27	VAL
18	LO	100	ASP
18	LO	127	VAL
18	LO	145	VAL
18	LO	169	ARG
18	LO	170	LYS
19	LP	13	LYS
19	LP	18	ARG
19	LP	24	VAL
19	LP	57	CYS
19	LP	58	VAL
19	LP	69	ARG
19	LP	76	TRP
19	LP	96	LYS
19	LP	100	SER
19	LP	142	SER
19	LP	152	GLU
20	LQ	3	VAL
20	LQ	19	LYS
20	LQ	28	LEU
20	LQ	62	SER
20	LQ	82	VAL
20	LQ	98	LEU
20	LQ	124	ASP
20	LQ	150	ARG
20	LQ	168	ARG
20	LQ	180	ARG
21	LR	6	LEU
21	LR	12	SER
21	LR	16	ARG
21	LR	49	LEU
21	LR	52	ARG
21	LR	63	CYS
21	LR	65	LYS
21	LR	113	LYS
21	LR	136	ARG
22	LS	57	SER
22	LS	85	ASP
22	LS	154	LEU
22	LS	168	THR
23	LT	3	ASN

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Mol	Chain	Res	Type
23	LT	50	LYS
23	LT	60	LYS
23	LT	83	LYS
23	LT	110	LYS
23	LT	114	GLN
23	LT	129	LYS
23	LT	158	PHE
24	LU	19	LEU
24	LU	34	MET
24	LU	41	GLN
24	LU	46	ARG
24	LU	55	ASN
24	LU	66	SER
24	LU	69	LYS
24	LU	74	SER
24	LU	78	PHE
24	LU	79	SER
24	LU	84	LYS
24	LU	94	ASN
24	LU	108	GLU
24	LU	110	TYR
24	LU	112	LEU
25	LV	17	SER
25	LV	48	ARG
25	LV	100	ASP
25	LV	112	MET
25	LV	115	SER
26	LX	57	GLN
26	LX	68	ARG
26	LX	85	SER
26	LX	87	MET
26	LX	88	LYS
26	LX	116	LEU
26	LX	134	LYS
26	LX	139	ARG
26	LX	148	ASP
27	LY	10	ASP
27	LY	12	SER
27	LY	66	GLN
27	LY	74	TYR
27	LY	84	ARG
27	LY	108	ARG

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Mol	Chain	Res	Type
27	LY	115	ARG
27	LY	120	GLU
27	LY	124	LYS
28	LZ	11	VAL
28	LZ	30	ASP
28	LZ	31	ASP
28	LZ	43	VAL
28	LZ	84	ARG
28	LZ	93	LYS
28	LZ	94	THR
28	LZ	109	LYS
28	LZ	121	ARG
29	La	77	LYS
29	La	93	ASN
29	La	103	VAL
29	La	106	SER
30	Lb	8	THR
30	Lb	16	TRP
30	Lb	25	ARG
30	Lb	33	LYS
30	Lb	41	ARG
30	Lb	44	ARG
30	Lb	65	MET
30	Lb	91	ARG
30	Lb	103	LYS
30	Lb	107	ARG
31	Lc	23	LYS
31	Lc	26	LYS
31	Lc	44	LYS
31	Lc	68	LYS
32	Ld	26	THR
32	Ld	87	ARG
32	Ld	89	SER
32	Ld	95	ASP
32	Ld	101	LYS
32	Ld	104	THR
32	Ld	106	VAL
33	Le	17	THR
33	Le	25	SER
33	Le	32	LYS
33	Le	33	ARG
33	Le	57	ASN

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Mol	Chain	Res	Type
33	Le	76	LYS
33	Le	102	ASN
33	Le	109	LYS
33	Le	126	ASN
34	Lf	19	ARG
34	Lf	33	VAL
34	Lf	37	ASP
34	Lf	95	LYS
35	Lg	3	GLN
35	Lg	19	LYS
35	Lg	21	ARG
35	Lg	23	SER
35	Lg	28	ASN
35	Lg	32	TYR
35	Lg	49	CYS
35	Lg	53	LEU
35	Lg	73	HIS
35	Lg	104	VAL
35	Lg	105	LYS
35	Lg	107	LEU
36	Lh	42	SER
36	Lh	87	LYS
36	Lh	98	HIS
36	Lh	102	LEU
36	Lh	109	ARG
36	Lh	116	LEU
37	Li	3	LEU
37	Li	23	LYS
37	Li	29	ARG
37	Li	42	ASP
37	Li	46	GLU
37	Li	68	ARG
37	Li	89	GLU
37	Li	91	SER
38	Lj	6	SER
38	Lj	7	SER
38	Lj	31	LYS
38	Lj	85	LYS
38	Lj	87	LYS
39	Lk	9	LYS
39	Lk	22	SER
39	Lk	36	VAL

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Mol	Chain	Res	Type
39	Lk	49	ASP
39	Lk	52	LYS
39	Lk	54	GLU
39	Lk	57	LYS
39	Lk	68	GLU
40	Ll	8	ARG
40	Ll	21	ARG
40	Ll	37	TYR
40	Ll	47	THR
41	Lm	83	ARG
41	Lm	119	ASN
42	Lo	32	SER
42	Lo	77	CYS
42	Lo	83	LEU
43	Lp	3	LYS
43	Lp	6	LYS
43	Lp	32	SER
43	Lp	36	LYS
43	Lp	46	LYS
43	Lp	48	LYS
43	Lp	83	ILE
44	Lr	13	CYS
44	Lr	14	SER
44	Lr	20	ARG
44	Lr	21	ASN
44	Lr	27	THR
44	Lr	35	ARG
44	Lr	46	ARG
44	Lr	48	THR
44	Lr	56	ASP
44	Lr	58	LYS
44	Lr	61	VAL
44	Lr	66	ARG
44	Lr	67	ARG
44	Lr	76	SER
44	Lr	78	VAL
44	Lr	84	LYS
44	Lr	92	SER
44	Lr	96	MET
44	Lr	101	LYS
44	Lr	119	ARG
44	Lr	122	LYS

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Mol	Chain	Res	Type
44	Lr	125	MET
45	P	1	MET
45	P	11	CYS
45	P	18	LYS
45	P	19	LEU
45	P	26	VAL
45	P	28	ILE
45	P	31	SER
45	P	48	VAL
45	P	61	ARG
45	P	62	MET
45	P	64	VAL
45	P	74	ASN
45	P	78	ASP
45	P	85	ARG
45	P	95	ARG
45	P	96	ARG
45	P	116	LEU
45	P	118	HIS
45	P	120	ASP
45	P	121	LEU
45	P	123	ARG
45	P	162	HIS
45	P	164	LYS
45	P	175	SER
45	P	177	LEU
45	P	179	VAL
45	P	188	ARG
45	P	197	MET
45	P	201	ASP
45	P	209	ASP
46	CA	21	TYR
46	CA	23	MET
46	CA	30	ARG
46	CA	46	LEU
46	CA	53	ASP
46	CA	60	THR
46	CA	70	MET
46	CA	134	GLN
46	CA	158	LYS
46	CA	193	HIS
46	CA	203	GLN

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Mol	Chain	Res	Type
46	CA	224	TYR
46	CA	287	LYS
46	CA	331	MET
46	CA	342	LEU
46	CA	343	TYR
46	CA	347	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
6	LB	167	GLN
6	LB	315	ASN
7	LC	310	HIS
8	LD	17	GLN
11	LG	46	GLN
13	LI	147	HIS
15	LL	175	ASN
17	LN	8	GLN
21	LR	134	ASN
45	P	68	HIS
45	P	145	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	L5	3638/5070 (71%)	768 (21%)	18 (0%)
3	L7	119/120 (99%)	12 (10%)	0
4	L8	155/156 (99%)	26 (16%)	0
All	All	3912/5346 (73%)	806 (20%)	18 (0%)

All (806) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	L5	2	G
2	L5	17	A
2	L5	25	A
2	L5	26	C
2	L5	30	C
2	L5	39	A
2	L5	42	A

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Mol	Chain	Res	Type
2	L5	48	G
2	L5	56	A
2	L5	59	A
2	L5	64	A
2	L5	65	A
2	L5	66	A
2	L5	69	A
2	L5	73	A
2	L5	91	G
2	L5	104	G
2	L5	108	A
2	L5	109	G
2	L5	110	C
2	L5	119	G
2	L5	120	A
2	L5	132	G
2	L5	133	C
2	L5	134	G
2	L5	135	G
2	L5	136	C
2	L5	152	U
2	L5	159	C
2	L5	165	A
2	L5	172	C
2	L5	183	C
2	L5	184	U
2	L5	185	C
2	L5	187	U
2	L5	188	G
2	L5	200	U
2	L5	201	C
2	L5	209	U
2	L5	210	C
2	L5	216	C
2	L5	218	A
2	L5	220	C
2	L5	234	G
2	L5	237	G
2	L5	253	G
2	L5	255	C
2	L5	256	G
2	L5	261	G

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Mol	Chain	Res	Type
2	L5	264	C
2	L5	265	C
2	L5	266	C
2	L5	267	G
2	L5	269	G
2	L5	276	C
2	L5	278	G
2	L5	280	G
2	L5	297	U
2	L5	306	A
2	L5	315	G
2	L5	316	U
2	L5	340	C
2	L5	350	C
2	L5	373	G
2	L5	387	G
2	L5	388	A
2	L5	407	A
2	L5	409	G
2	L5	410	A
2	L5	411	G
2	L5	412	G
2	L5	413	G
2	L5	415	G
2	L5	431	G
2	L5	432	U
2	L5	433	A
2	L5	449	C
2	L5	450	G
2	L5	452	A
2	L5	453	G
2	L5	454	U
2	L5	456	C
2	L5	457	G
2	L5	467	U
2	L5	472	C
2	L5	485	C
2	L5	486	C
2	L5	489	C
2	L5	493	G
2	L5	494	U
2	L5	497	G

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Mol	Chain	Res	Type
2	L5	498	C
2	L5	499	G
2	L5	500	G
2	L5	501	C
2	L5	502	C
2	L5	503	C
2	L5	504	G
2	L5	505	G
2	L5	509	A
2	L5	510	U
2	L5	512	U
2	L5	513	U
2	L5	514	U
2	L5	517	C
2	L5	518	G
2	L5	643	C
2	L5	644	G
2	L5	646	G
2	L5	653	U
2	L5	654	C
2	L5	655	C
2	L5	656	C
2	L5	657	C
2	L5	659	G
2	L5	666	G
2	L5	667	A
2	L5	668	C
2	L5	669	C
2	L5	673	C
2	L5	685	C
2	L5	686	A
2	L5	687	U
2	L5	696	C
2	L5	703	G
2	L5	704	C
2	L5	706	C
2	L5	708	G
2	L5	731	G
2	L5	738	C
2	L5	739	G
2	L5	742	G
2	L5	747	A

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Mol	Chain	Res	Type
2	L5	757	G
2	L5	759	G
2	L5	904	C
2	L5	905	C
2	L5	910	G
2	L5	913	U
2	L5	914	U
2	L5	915	A
2	L5	917	A
2	L5	918	G
2	L5	923	C
2	L5	924	C
2	L5	926	G
2	L5	932	A
2	L5	933	G
2	L5	936	C
2	L5	943	A
2	L5	944	A
2	L5	945	U
2	L5	958	G
2	L5	959	G
2	L5	960	A
2	L5	961	G
2	L5	962	C
2	L5	963	G
2	L5	965	G
2	L5	966	A
2	L5	967	C
2	L5	968	C
2	L5	969	C
2	L5	970	G
2	L5	982	U
2	L5	985	C
2	L5	989	U
2	L5	990	C
2	L5	1070	G
2	L5	1071	C
2	L5	1072	C
2	L5	1075	G
2	L5	1082	C
2	L5	1083	U
2	L5	1095	A

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Mol	Chain	Res	Type
2	L5	1168	G
2	L5	1171	G
2	L5	1172	C
2	L5	1173	G
2	L5	1179	U
2	L5	1180	C
2	L5	1181	C
2	L5	1182	C
2	L5	1183	C
2	L5	1193	C
2	L5	1202	C
2	L5	1203	G
2	L5	1210	C
2	L5	1211	G
2	L5	1214	C
2	L5	1215	C
2	L5	1218	G
2	L5	1219	G
2	L5	1222	A
2	L5	1235	G
2	L5	1241	C
2	L5	1242	G
2	L5	1253	G
2	L5	1254	A
2	L5	1257	A
2	L5	1258	G
2	L5	1266	G
2	L5	1267	C
2	L5	1269	G
2	L5	1270	A
2	L5	1271	G
2	L5	1272	C
2	L5	1273	G
2	L5	1275	G
2	L5	1277	G
2	L5	1280	C
2	L5	1284	G
2	L5	1287	G
2	L5	1293	G
2	L5	1294	A
2	L5	1295	C
2	L5	1296	G

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Mol	Chain	Res	Type
2	L5	1301	C
2	L5	1326	A
2	L5	1354	A
2	L5	1358	G
2	L5	1359	G
2	L5	1365	C
2	L5	1367	C
2	L5	1370	G
2	L5	1379	C
2	L5	1387	A
2	L5	1394	G
2	L5	1397	A
2	L5	1404	G
2	L5	1405	C
2	L5	1407	C
2	L5	1409	C
2	L5	1410	U
2	L5	1411	C
2	L5	1415	G
2	L5	1417	C
2	L5	1420	A
2	L5	1425	G
2	L5	1437	C
2	L5	1439	C
2	L5	1442	C
2	L5	1443	A
2	L5	1444	G
2	L5	1446	C
2	L5	1447	C
2	L5	1457	G
2	L5	1465	G
2	L5	1481	C
2	L5	1482	G
2	L5	1483	C
2	L5	1497	A
2	L5	1498	G
2	L5	1502	G
2	L5	1516	G
2	L5	1517	G
2	L5	1518	A
2	L5	1525	A
2	L5	1534	A

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Mol	Chain	Res	Type
2	L5	1535	C
2	L5	1562	G
2	L5	1566	C
2	L5	1574	G
2	L5	1578	U
2	L5	1582	U
2	L5	1591	U
2	L5	1596	U
2	L5	1624	G
2	L5	1625	G
2	L5	1631	A
2	L5	1633	G
2	L5	1634	A
2	L5	1638	A
2	L5	1640	C
2	L5	1641	G
2	L5	1642	A
2	L5	1654	G
2	L5	1661	C
2	L5	1676	C
2	L5	1677	U
2	L5	1678	C
2	L5	1681	G
2	L5	1694	C
2	L5	1699	A
2	L5	1700	G
2	L5	1703	C
2	L5	1704	C
2	L5	1705	G
2	L5	1729	A
2	L5	1731	C
2	L5	1733	G
2	L5	1742	A
2	L5	1750	G
2	L5	1757	U
2	L5	1758	G
2	L5	1760	G
2	L5	1761	G
2	L5	1762	C
2	L5	1763	C
2	L5	1764	G
2	L5	1765	A

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Mol	Chain	Res	Type
2	L5	1766	A
2	L5	1767	A
2	L5	1768	C
2	L5	1769	G
2	L5	1770	A
2	L5	1787	A
2	L5	1804	A
2	L5	1806	G
2	L5	1810	G
2	L5	1815	G
2	L5	1820	C
2	L5	1821	G
2	L5	1822	U
2	L5	1836	G
2	L5	1837	A
2	L5	1842	G
2	L5	1855	G
2	L5	1869	G
2	L5	1882	U
2	L5	1888	A
2	L5	1897	A
2	L5	1917	A
2	L5	1918	U
2	L5	1919	G
2	L5	1920	C
2	L5	1921	C
2	L5	1922	G
2	L5	1925	G
2	L5	1931	C
2	L5	1932	A
2	L5	1936	C
2	L5	1940	G
2	L5	1948	G
2	L5	1949	U
2	L5	1961	G
2	L5	1962	A
2	L5	1974	U
2	L5	1975	G
2	L5	1978	C
2	L5	1980	U
2	L5	1981	G
2	L5	1982	G

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Mol	Chain	Res	Type
2	L5	1983	A
2	L5	1984	A
2	L5	1985	G
2	L5	1986	U
2	L5	1991	A
2	L5	1992	U
2	L5	1993	C
2	L5	1997	U
2	L5	1998	A
2	L5	1999	A
2	L5	2001	G
2	L5	2002	A
2	L5	2011	C
2	L5	2017	A
2	L5	2018	C
2	L5	2024	G
2	L5	2026	A
2	L5	2033	A
2	L5	2034	G
2	L5	2046	G
2	L5	2048	U
2	L5	2055	G
2	L5	2056	G
2	L5	2069	A
2	L5	2084	C
2	L5	2092	G
2	L5	2093	A
2	L5	2095	A
2	L5	2096	G
2	L5	2097	U
2	L5	2098	G
2	L5	2099	G
2	L5	2101	C
2	L5	2102	G
2	L5	2103	G
2	L5	2105	A
2	L5	2107	C
2	L5	2108	G
2	L5	2110	C
2	L5	2111	G
2	L5	2112	G
2	L5	2250	C

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Mol	Chain	Res	Type
2	L5	2252	G
2	L5	2253	A
2	L5	2256	C
2	L5	2257	C
2	L5	2258	C
2	L5	2260	C
2	L5	2261	G
2	L5	2289	C
2	L5	2300	A
2	L5	2301	G
2	L5	2306	G
2	L5	2313	A
2	L5	2331	G
2	L5	2332	A
2	L5	2333	G
2	L5	2345	G
2	L5	2348	G
2	L5	2351	C
2	L5	2360	A
2	L5	2395	A
2	L5	2397	G
2	L5	2402	G
2	L5	2417	A
2	L5	2421	G
2	L5	2425	U
2	L5	2441	C
2	L5	2447	U
2	L5	2450	G
2	L5	2453	A
2	L5	2464	C
2	L5	2465	C
2	L5	2471	G
2	L5	2474	G
2	L5	2475	G
2	L5	2478	C
2	L5	2479	G
2	L5	2483	G
2	L5	2484	A
2	L5	2485	U
2	L5	2486	G
2	L5	2487	G
2	L5	2488	C

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Mol	Chain	Res	Type
2	L5	2489	C
2	L5	2490	U
2	L5	2491	C
2	L5	2494	U
2	L5	2503	G
2	L5	2504	C
2	L5	2505	C
2	L5	2506	G
2	L5	2513	A
2	L5	2519	U
2	L5	2520	C
2	L5	2537	A
2	L5	2544	G
2	L5	2546	G
2	L5	2547	G
2	L5	2554	U
2	L5	2555	G
2	L5	2560	C
2	L5	2565	A
2	L5	2567	G
2	L5	2573	A
2	L5	2583	C
2	L5	2586	G
2	L5	2587	A
2	L5	2589	C
2	L5	2627	C
2	L5	2640	G
2	L5	2652	G
2	L5	2653	C
2	L5	2662	G
2	L5	2669	C
2	L5	2675	G
2	L5	2676	A
2	L5	2687	U
2	L5	2694	G
2	L5	2695	A
2	L5	2696	A
2	L5	2703	G
2	L5	2707	U
2	L5	2708	U
2	L5	2710	C
2	L5	2711	G

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Mol	Chain	Res	Type
2	L5	2719	C
2	L5	2721	G
2	L5	2724	G
2	L5	2726	G
2	L5	2739	C
2	L5	2742	G
2	L5	2743	A
2	L5	2761	U
2	L5	2763	U
2	L5	2769	U
2	L5	2770	C
2	L5	2787	A
2	L5	2788	U
2	L5	2790	U
2	L5	2826	U
2	L5	2827	G
2	L5	2829	U
2	L5	2835	A
2	L5	2848	G
2	L5	2855	G
2	L5	2875	C
2	L5	2900	U
2	L5	2902	G
2	L5	2903	G
2	L5	2904	U
2	L5	2905	C
2	L5	2906	G
2	L5	2908	U
2	L5	3586	G
2	L5	3588	C
2	L5	3590	G
2	L5	3591	C
2	L5	3594	C
2	L5	3595	U
2	L5	3596	A
2	L5	3597	G
2	L5	3599	A
2	L5	3604	A
2	L5	3605	C
2	L5	3615	G
2	L5	3617	G
2	L5	3626	G

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Mol	Chain	Res	Type
2	L5	3635	A
2	L5	3644	U
2	L5	3646	A
2	L5	3648	A
2	L5	3662	A
2	L5	3664	G
2	L5	3670	C
2	L5	3673	C
2	L5	3674	G
2	L5	3680	U
2	L5	3710	G
2	L5	3711	A
2	L5	3713	U
2	L5	3714	G
2	L5	3727	A
2	L5	3748	A
2	L5	3750	G
2	L5	3756	A
2	L5	3759	A
2	L5	3760	A
2	L5	3761	C
2	L5	3773	U
2	L5	3774	A
2	L5	3776	G
2	L5	3777	G
2	L5	3778	U
2	L5	3783	A
2	L5	3784	A
2	L5	3786	U
2	L5	3802	U
2	L5	3811	G
2	L5	3812	C
2	L5	3813	A
2	L5	3814	U
2	L5	3817	A
2	L5	3818	U
2	L5	3819	G
2	L5	3823	G
2	L5	3824	A
2	L5	3838	U
2	L5	3839	G
2	L5	3840	U

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Mol	Chain	Res	Type
2	L5	3867	A
2	L5	3877	A
2	L5	3878	C
2	L5	3879	G
2	L5	3885	G
2	L5	3887	C
2	L5	3890	A
2	L5	3892	U
2	L5	3897	G
2	L5	3901	A
2	L5	3906	A
2	L5	3907	G
2	L5	3908	A
2	L5	3915	U
2	L5	3923	A
2	L5	3938	G
2	L5	3939	G
2	L5	3942	A
2	L5	3943	A
2	L5	3947	A
2	L5	3949	A
2	L5	3950	U
2	L5	3951	G
2	L5	3953	G
2	L5	4057	C
2	L5	4058	U
2	L5	4059	C
2	L5	4060	U
2	L5	4061	G
2	L5	4062	A
2	L5	4064	C
2	L5	4068	U
2	L5	4069	U
2	L5	4076	G
2	L5	4084	G
2	L5	4092	G
2	L5	4093	G
2	L5	4095	G
2	L5	4097	G
2	L5	4099	G
2	L5	4101	C
2	L5	4102	C

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Mol	Chain	Res	Type
2	L5	4103	C
2	L5	4104	G
2	L5	4108	G
2	L5	4111	U
2	L5	4114	C
2	L5	4115	G
2	L5	4116	C
2	L5	4117	U
2	L5	4119	C
2	L5	4127	A
2	L5	4140	C
2	L5	4141	G
2	L5	4142	C
2	L5	4143	G
2	L5	4144	C
2	L5	4146	G
2	L5	4162	C
2	L5	4163	U
2	L5	4170	A
2	L5	4183	G
2	L5	4184	G
2	L5	4191	G
2	L5	4196	G
2	L5	4197	G
2	L5	4203	A
2	L5	4212	A
2	L5	4222	G
2	L5	4225	G
2	L5	4229	U
2	L5	4232	U
2	L5	4233	A
2	L5	4234	A
2	L5	4251	A
2	L5	4254	G
2	L5	4257	A
2	L5	4258	C
2	L5	4265	U
2	L5	4268	A
2	L5	4273	A
2	L5	4280	A
2	L5	4281	A
2	L5	4291	G

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Mol	Chain	Res	Type
2	L5	4295	U
2	L5	4304	A
2	L5	4305	G
2	L5	4314	C
2	L5	4319	C
2	L5	4330	G
2	L5	4332	C
2	L5	4349	C
2	L5	4373	G
2	L5	4377	G
2	L5	4378	A
2	L5	4380	A
2	L5	4387	C
2	L5	4391	G
2	L5	4394	A
2	L5	4398	C
2	L5	4421	C
2	L5	4422	A
2	L5	4433	G
2	L5	4438	U
2	L5	4448	G
2	L5	4449	A
2	L5	4453	C
2	L5	4464	A
2	L5	4466	C
2	L5	4475	G
2	L5	4488	A
2	L5	4500	U
2	L5	4512	U
2	L5	4513	A
2	L5	4518	A
2	L5	4519	C
2	L5	4524	G
2	L5	4545	G
2	L5	4548	A
2	L5	4549	G
2	L5	4557	U
2	L5	4560	C
2	L5	4567	G
2	L5	4572	U
2	L5	4573	G
2	L5	4575	G

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Mol	Chain	Res	Type
2	L5	4589	A
2	L5	4590	A
2	L5	4594	U
2	L5	4599	A
2	L5	4600	G
2	L5	4601	U
2	L5	4617	G
2	L5	4636	U
2	L5	4637	G
2	L5	4656	A
2	L5	4657	U
2	L5	4670	C
2	L5	4671	C
2	L5	4672	A
2	L5	4694	G
2	L5	4695	C
2	L5	4700	A
2	L5	4708	A
2	L5	4709	U
2	L5	4719	G
2	L5	4734	A
2	L5	4740	G
2	L5	4741	C
2	L5	4742	G
2	L5	4745	G
2	L5	4754	G
2	L5	4757	C
2	L5	4759	C
2	L5	4761	G
2	L5	4765	G
2	L5	4771	C
2	L5	4772	C
2	L5	4775	C
2	L5	4859	C
2	L5	4860	G
2	L5	4862	G
2	L5	4870	G
2	L5	4871	C
2	L5	4874	A
2	L5	4875	G
2	L5	4882	U
2	L5	4883	C

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Mol	Chain	Res	Type
2	L5	4889	G
2	L5	4895	C
2	L5	4896	G
2	L5	4900	C
2	L5	4901	G
2	L5	4910	G
2	L5	4912	G
2	L5	4914	C
2	L5	4922	C
2	L5	4923	C
2	L5	4925	U
2	L5	4926	C
2	L5	4927	G
2	L5	4928	C
2	L5	4940	C
2	L5	4941	G
2	L5	4943	A
2	L5	4944	C
2	L5	4947	U
2	L5	4951	G
2	L5	4960	G
2	L5	4975	G
2	L5	4976	U
2	L5	4985	U
2	L5	4988	U
2	L5	4989	U
2	L5	4990	C
2	L5	4991	U
2	L5	5007	A
2	L5	5013	C
2	L5	5014	A
2	L5	5017	G
2	L5	5022	U
2	L5	5023	C
2	L5	5024	C
2	L5	5025	C
2	L5	5027	C
2	L5	5028	G
2	L5	5030	U
2	L5	5034	A
2	L5	5041	G
2	L5	5047	C

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Mol	Chain	Res	Type
2	L5	5050	C
2	L5	5054	C
2	L5	5055	G
2	L5	5061	A
2	L5	5069	U
3	L7	7	G
3	L7	22	A
3	L7	33	U
3	L7	38	U
3	L7	53	U
3	L7	54	A
3	L7	63	C
3	L7	64	G
3	L7	97	G
3	L7	100	A
3	L7	110	G
3	L7	111	C
4	L8	25	G
4	L8	34	U
4	L8	35	C
4	L8	48	A
4	L8	52	A
4	L8	59	A
4	L8	62	A
4	L8	63	U
4	L8	80	A
4	L8	82	A
4	L8	84	A
4	L8	85	U
4	L8	86	U
4	L8	87	G
4	L8	94	G
4	L8	103	A
4	L8	105	C
4	L8	108	A
4	L8	110	U
4	L8	111	U
4	L8	114	G
4	L8	123	U
4	L8	124	U
4	L8	125	C
4	L8	126	C

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Mol	Chain	Res	Type
4	L8	127	U

All (18) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	L5	265	C
2	L5	406	C
2	L5	493	G
2	L5	914	U
2	L5	1082	C
2	L5	1633	G
2	L5	1977	C
2	L5	2033	A
2	L5	2416	G
2	L5	2485	U
2	L5	2675	G
2	L5	2760	G
2	L5	2786	C
2	L5	3614	G
2	L5	3673	C
2	L5	4600	G
2	L5	4699	U
2	L5	4913	G

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 231 ligands modelled in this entry, 231 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
21	LR	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	LR	134:ASN	C	135:LYS	N	2.96

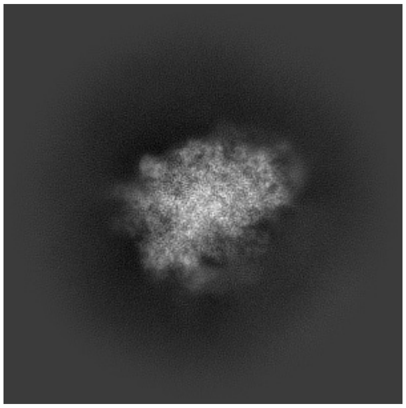
6 Map visualisation

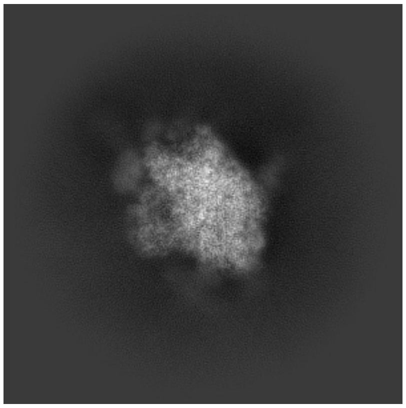
This section contains visualisations of the EMDB entry EMD-42319. These allow visual inspection of the internal detail of the map and identification of artifacts.

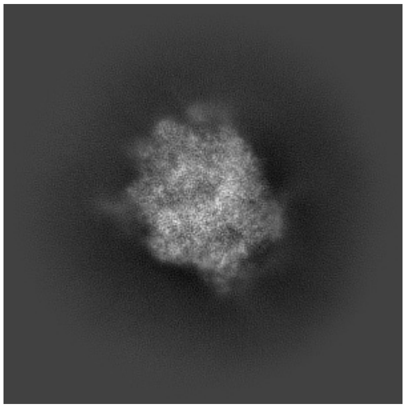
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

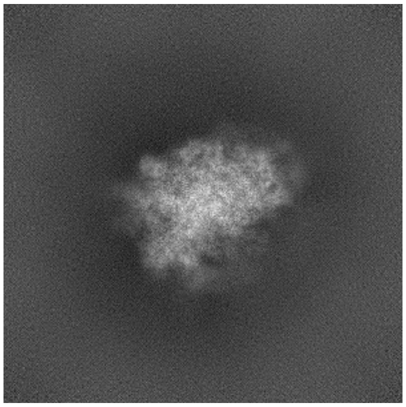
6.1.1 Primary map

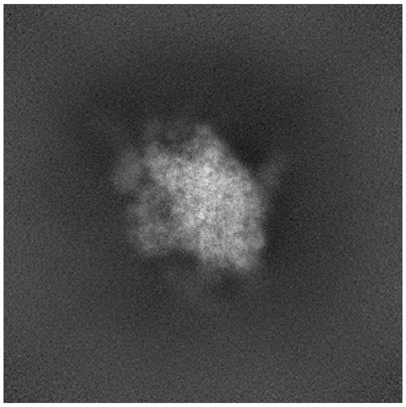

X

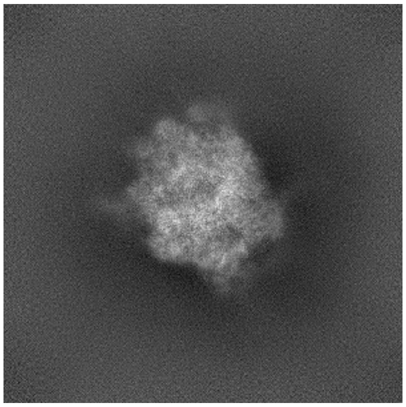

Y


Z

6.1.2 Raw map


X

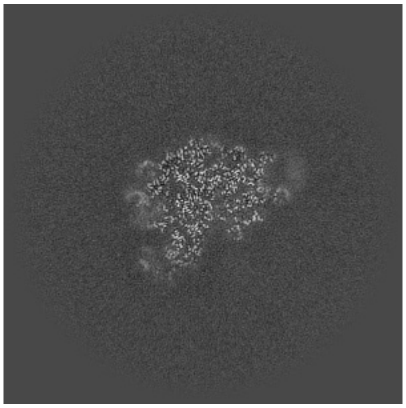

Y


Z

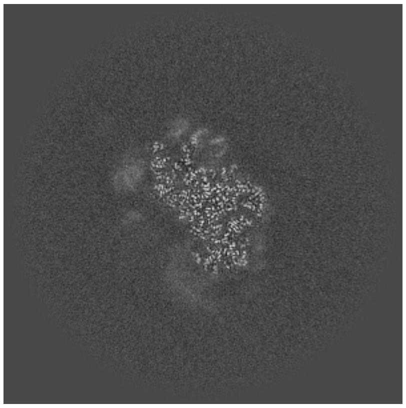
The images above show the map projected in three orthogonal directions.

6.2 Central slices

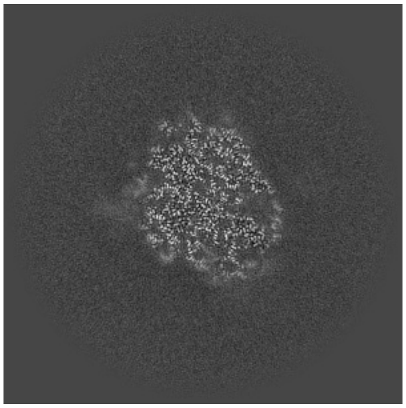
6.2.1 Primary map



X Index: 256

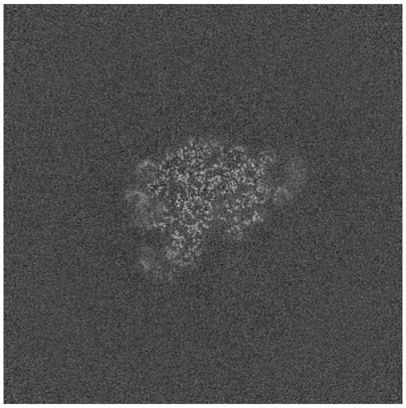


Y Index: 256

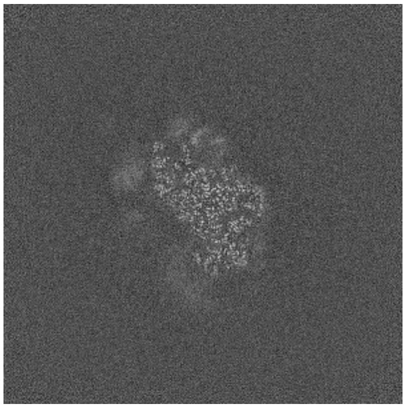


Z Index: 256

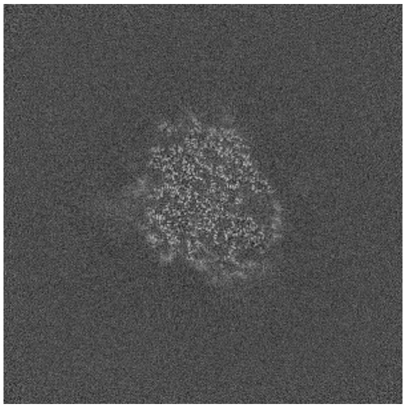
6.2.2 Raw map



X Index: 256



Y Index: 256

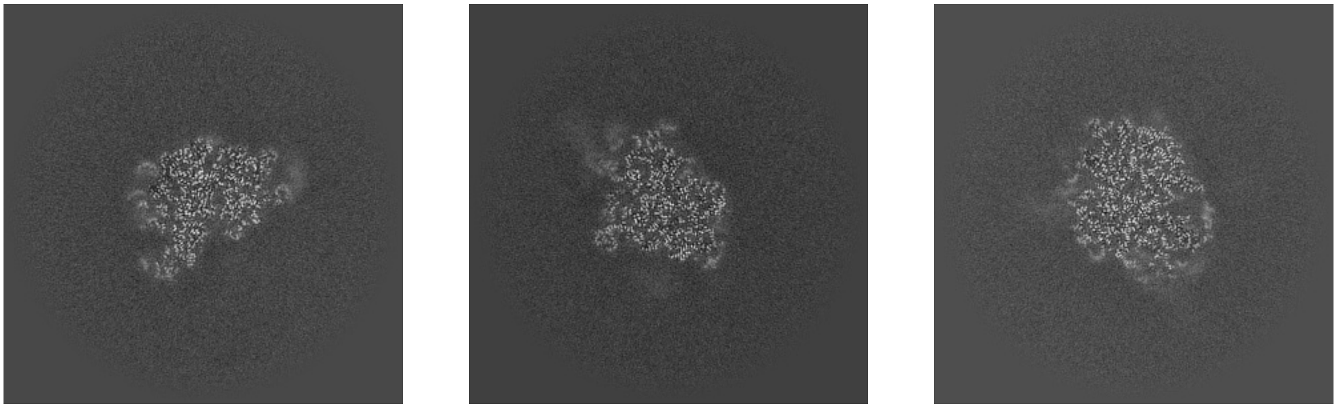


Z Index: 256

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

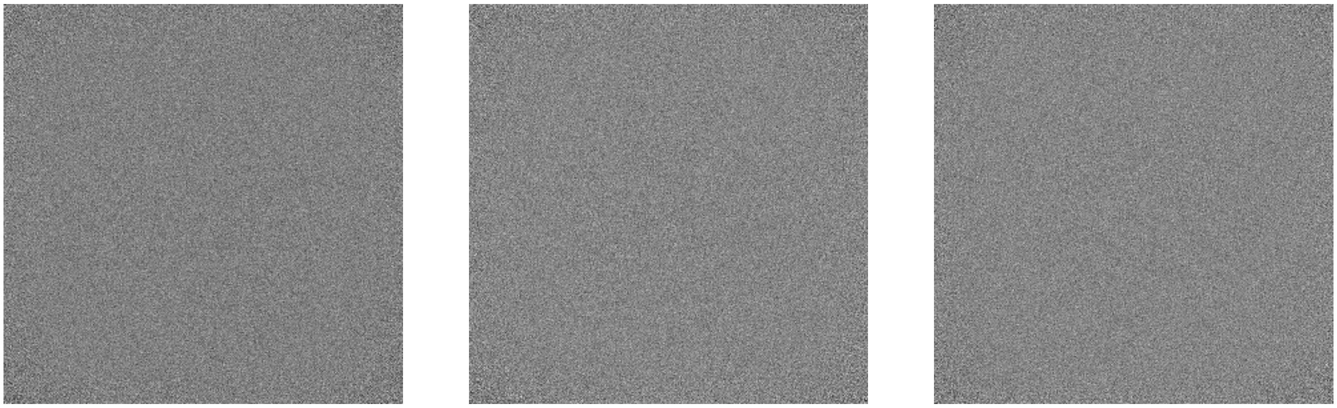
6.3 Largest variance slices

6.3.1 Primary map



X Index: 253 Y Index: 233 Z Index: 258

6.3.2 Raw map

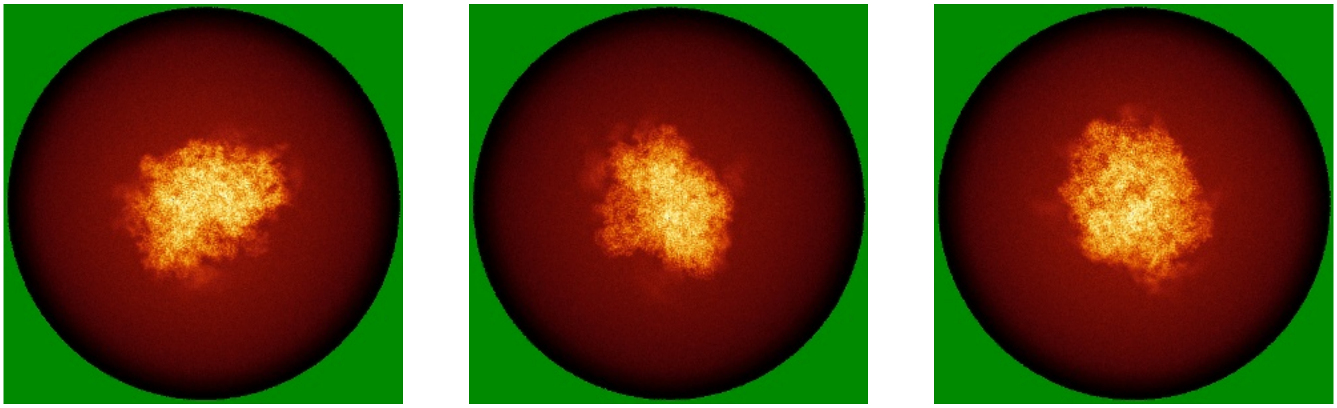


X Index: 0 Y Index: 0 Z Index: 0

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

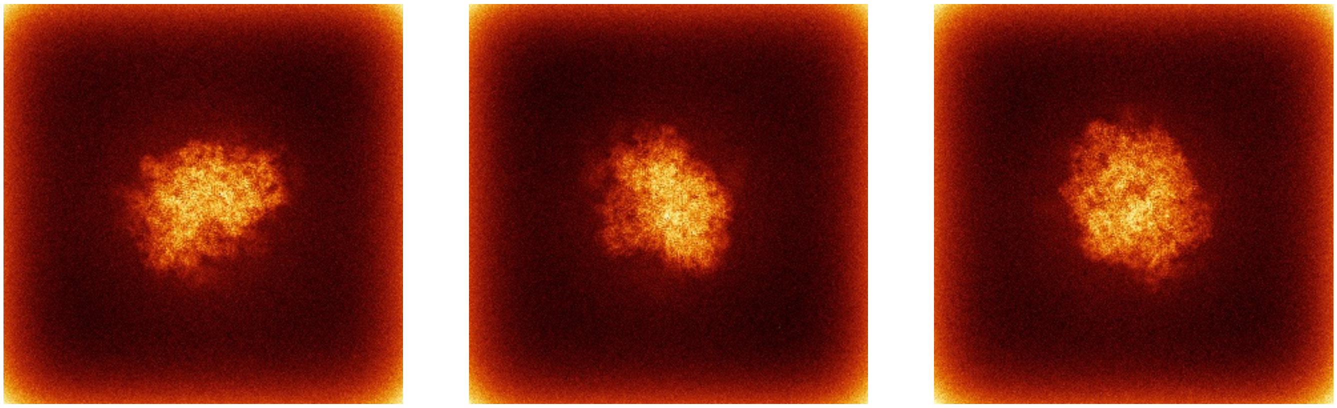
6.4 Orthogonal standard-deviation projections (False-color)

6.4.1 Primary map



X Y Z

6.4.2 Raw map



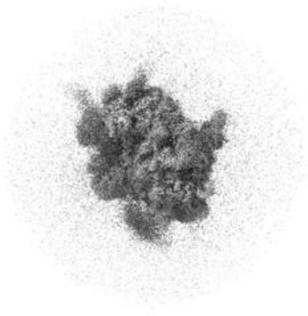
X Y Z

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.

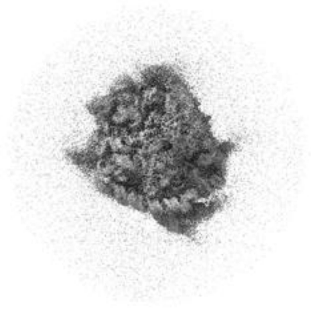
6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X



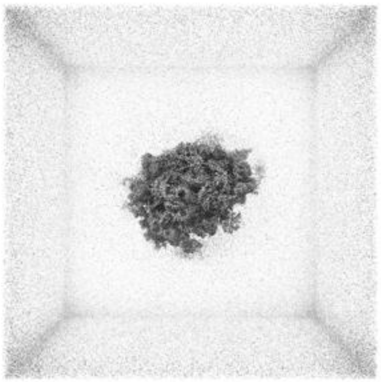
Y



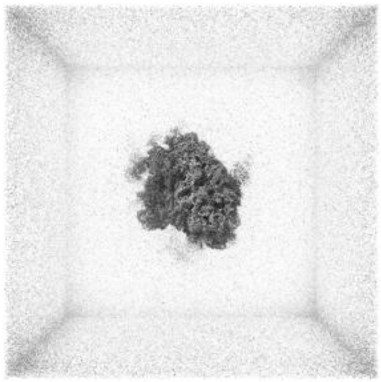
Z

The images above show the 3D surface view of the map at the recommended contour level 0.065. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

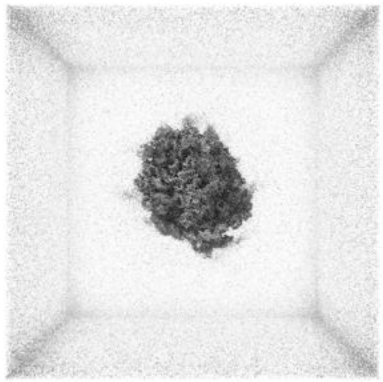
6.5.2 Raw map



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.

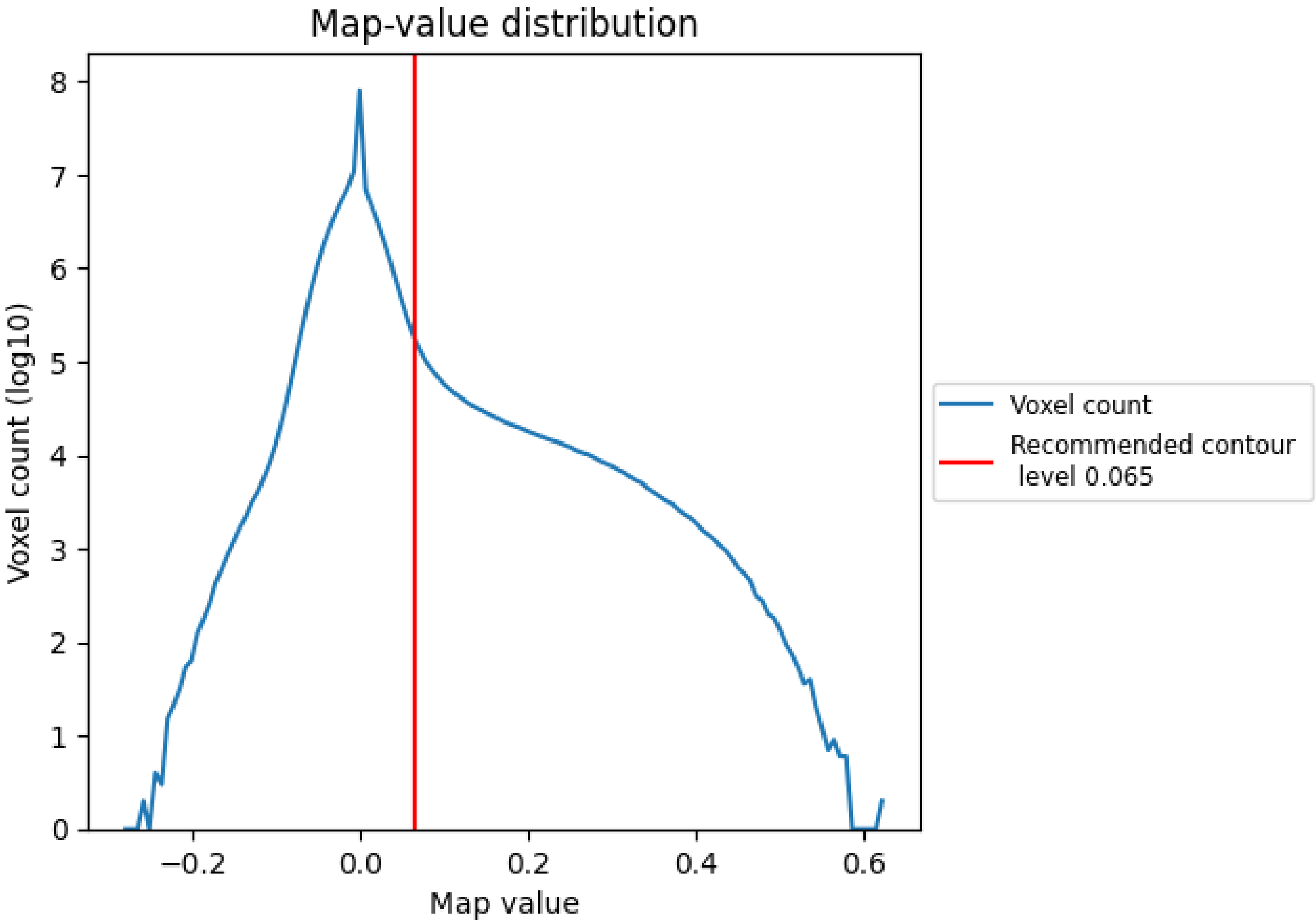
6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

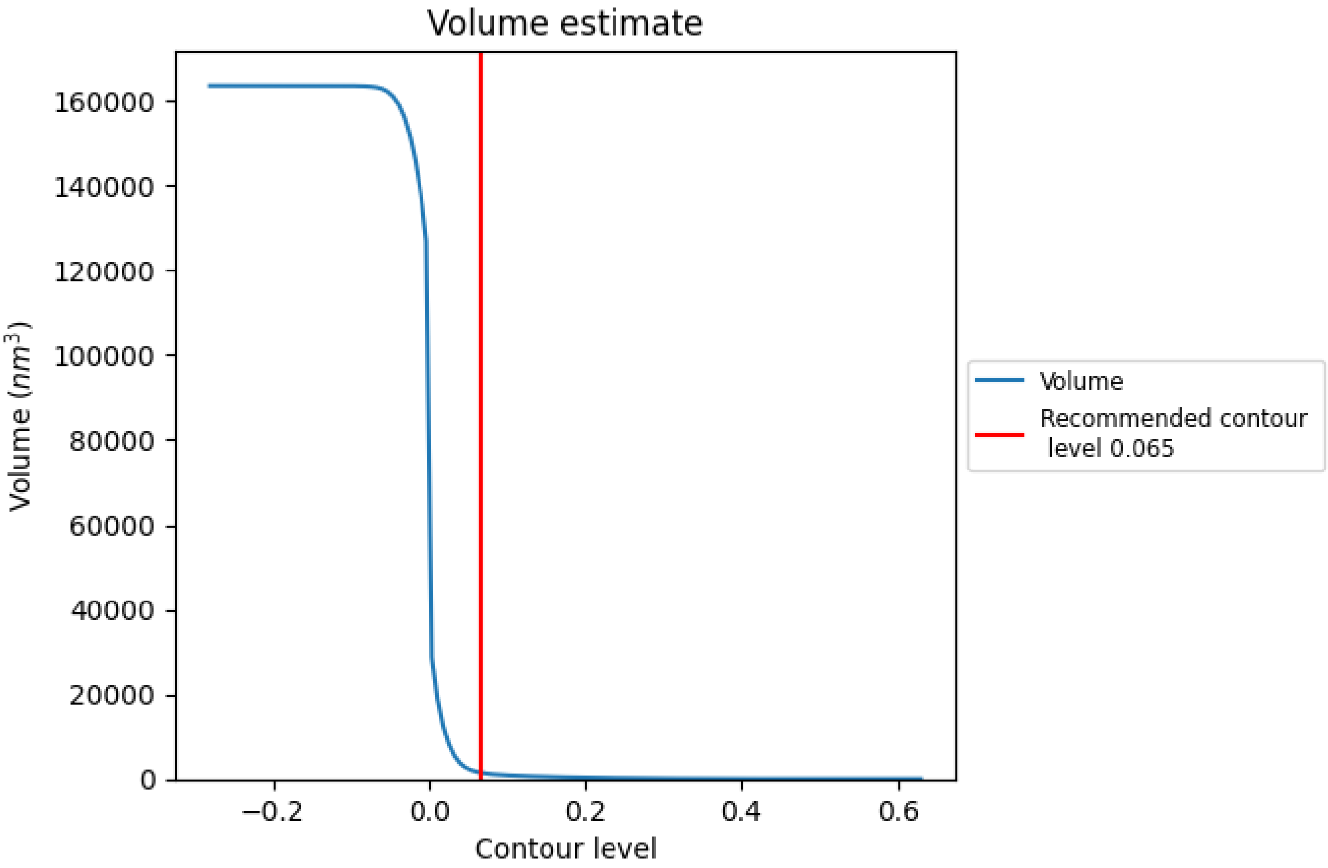
This section contains the results of statistical analysis of the map.

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.

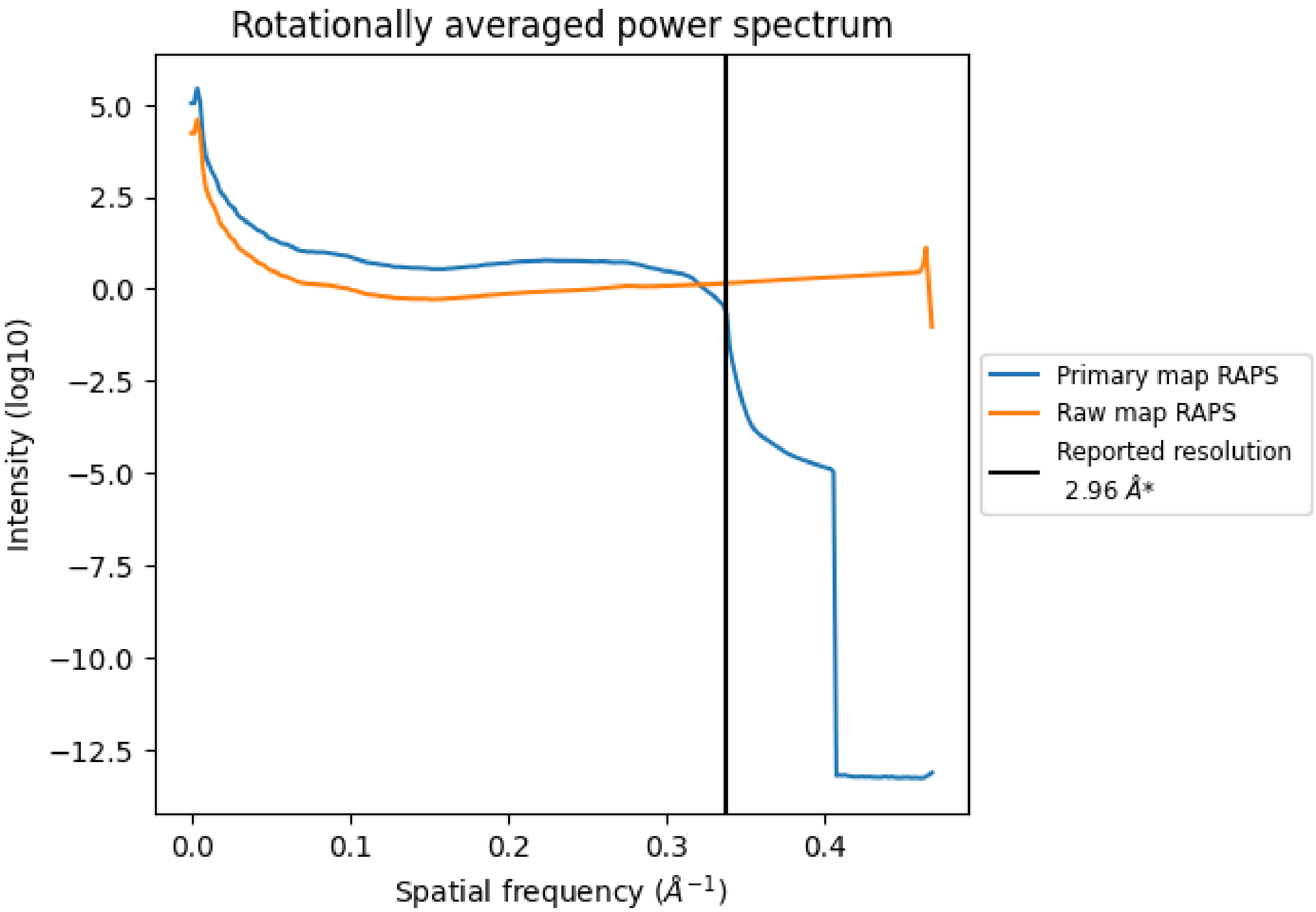
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 1513 nm^3; this corresponds to an approximate mass of 1366 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 ⓘ

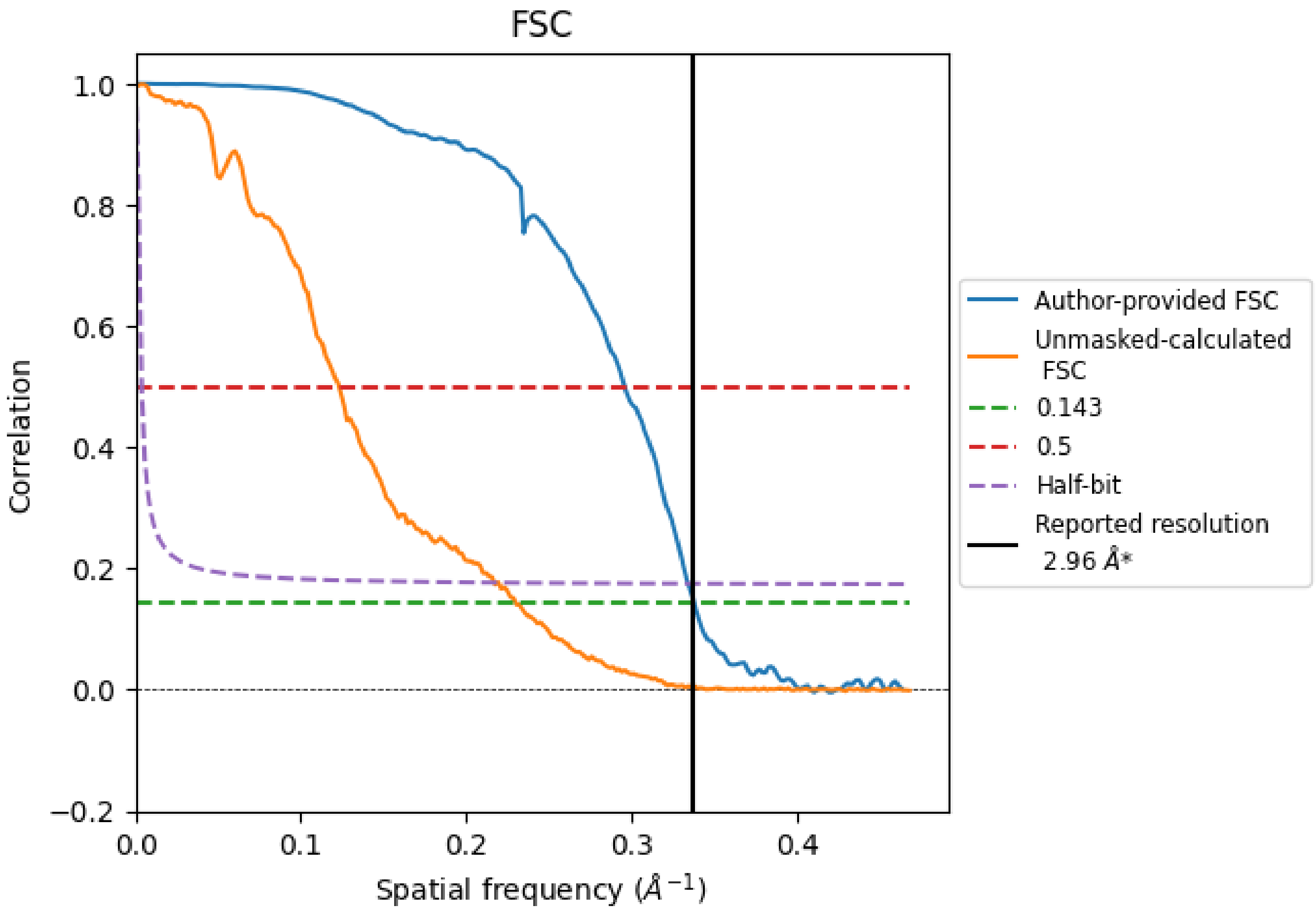


*Reported resolution corresponds to spatial frequency of 0.338 Å^{-1}

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 0.338 $Å^{-1}$

8.2 Resolution estimates ⓘ

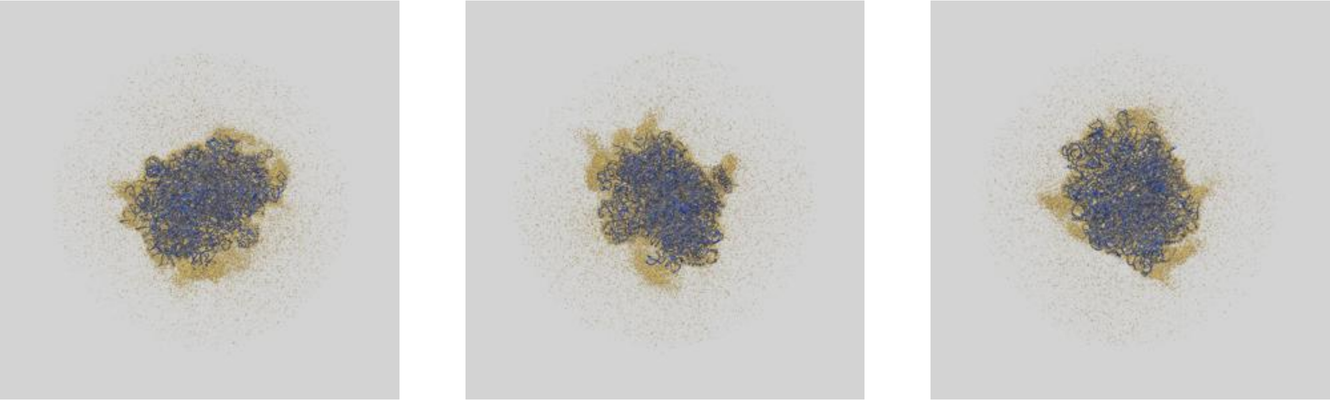
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	2.96	-	-
Author-provided FSC curve	2.96	3.38	2.99
Unmasked-calculated*	4.35	8.13	4.61

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.35 differs from the reported value 2.96 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-42319 and PDB model 8UJD. Per-residue inclusion information can be found in section 3 on page 13.

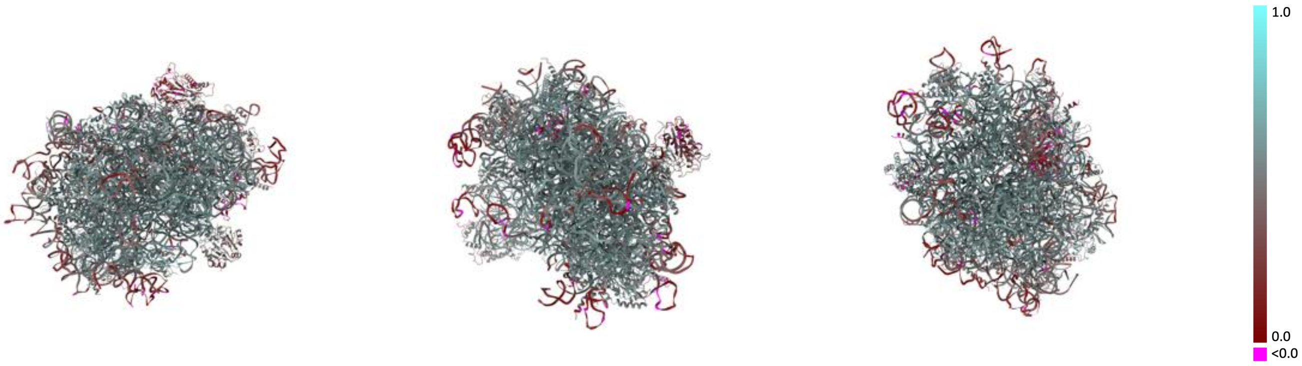
9.1 Map-model overlay ⓘ



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.065 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.

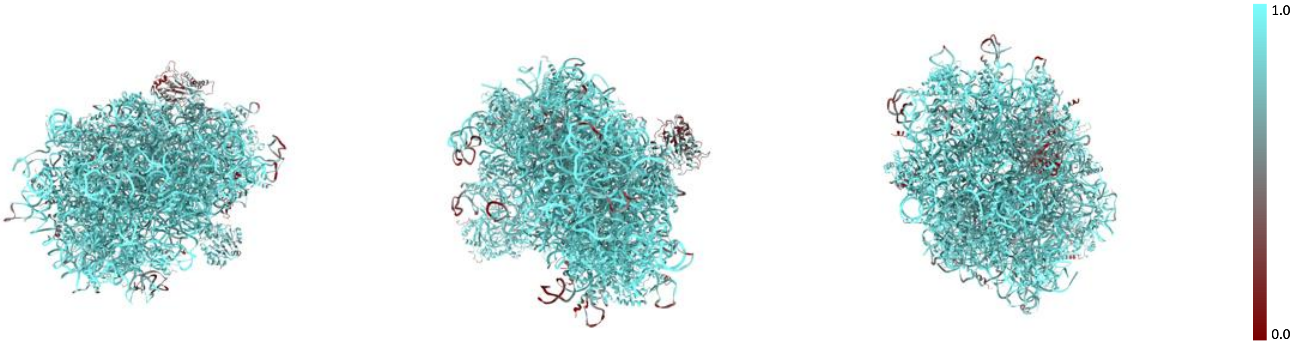
9.2 Q-score mapped to coordinate model ⓘ



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.

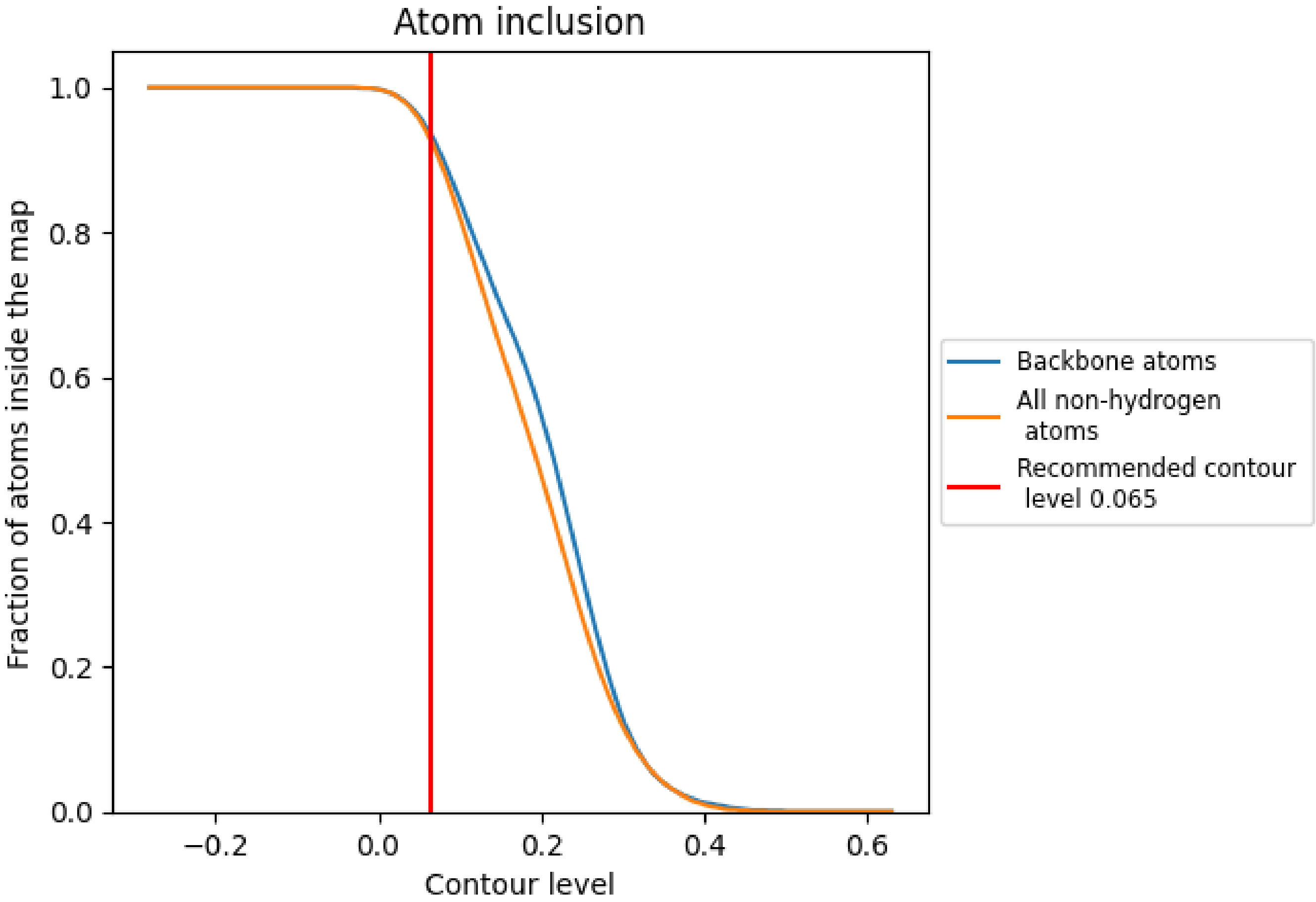
9.3 Atom inclusion mapped to coordinate model ⓘ



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 (0.065).

9.4 Atom inclusion ⓘ



At the recommended contour level, 93% of all backbone atoms, 93% 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 (0.065) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9260	0.5160
CA	0.4860	0.2980
L5	0.9400	0.5010
L7	0.9910	0.5520
L8	0.9650	0.5360
LA	0.9620	0.5800
LB	0.9380	0.5690
LC	0.9400	0.5670
LD	0.9220	0.5260
LE	0.8790	0.5140
LF	0.9650	0.5720
LG	0.8640	0.5080
LH	0.9230	0.5520
LI	0.9230	0.5640
LJ	0.8280	0.4470
LL	0.9090	0.5420
LM	0.9400	0.5540
LN	0.9820	0.5930
LO	0.9530	0.5700
LP	0.9580	0.5880
LQ	0.9660	0.5880
LR	0.9430	0.5530
LS	0.9670	0.5850
LT	0.9360	0.5520
LU	0.8600	0.4300
LV	0.9410	0.5640
LW	0.4640	0.1810
LX	0.9290	0.5620
LY	0.9470	0.5700
LZ	0.9440	0.5490
La	0.9680	0.5900
Lb	0.8940	0.5210
Lc	0.9120	0.5260
Ld	0.9370	0.5460
Le	0.9770	0.5910

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Chain	Atom inclusion	Q-score
Lf	0.9660	0.5890
Lg	0.9320	0.5570
Lh	0.9350	0.5550
Li	0.9260	0.5470
Lj	0.9730	0.5790
Lk	0.8580	0.5030
Ll	0.9570	0.5770
Lm	0.9350	0.5730
Lo	0.9310	0.5640
Lp	0.9420	0.5610
Lr	0.9550	0.5760
P	0.7620	0.4140