



## Full wwPDB EM Validation Report ⓘ

Jul 10, 2023 – 12:09 PM EDT

PDB ID : 8FKU  
EMDB ID : EMD-29257  
Title : Human nucleolar pre-60S ribosomal subunit (State C2)  
Authors : Vanden Broeck, A.; Klinge, S.  
Deposited on : 2022-12-21  
Resolution : 2.82 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

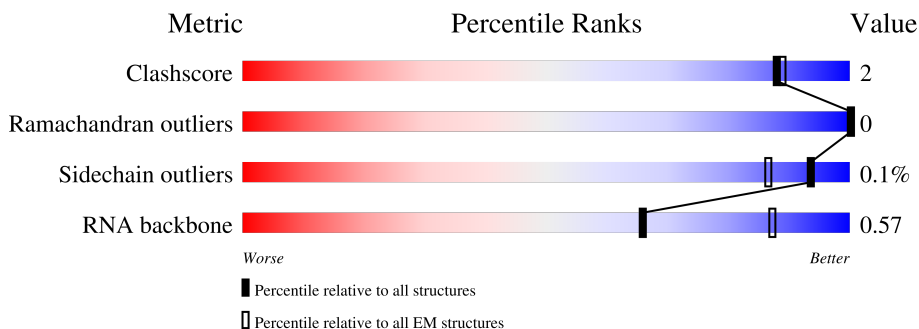
EMDB validation analysis : 0.0.1.dev50  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.34

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.82 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	BA	165	70% (Poor fit), 88% (0 outliers), 8% (1 outlier), 2% (2 outliers), 2% (3+ outliers)
2	BB	217	59% (Poor fit), 98% (0 outliers), 1% (1 outlier), 1% (2 outliers), 1% (3+ outliers)
3	L1	157	7% (Poor fit), 80% (0 outliers), 15% (1 outlier), 2% (2 outliers), 6% (3+ outliers)
4	L2	1167	5% (Poor fit), 94% (0 outliers), 5% (1 outlier)
5	L3	5070	6% (Poor fit), 35% (0 outliers), 8% (1 outlier), 57% (2 outliers)
6	L6	211	51% (Poor fit), 6% (0 outliers), 43% (1 outlier)
7	L7	203	94% (0 outliers), 6% (1 outlier)


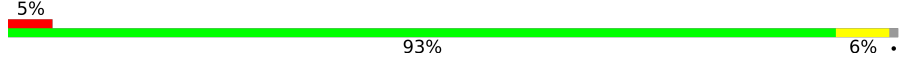

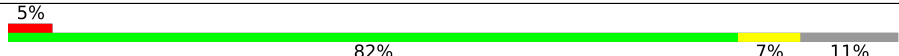
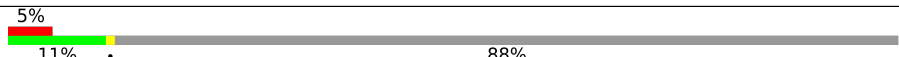
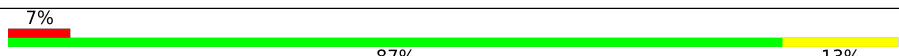
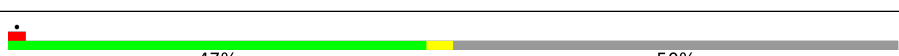
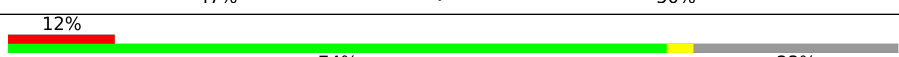

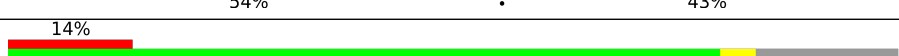
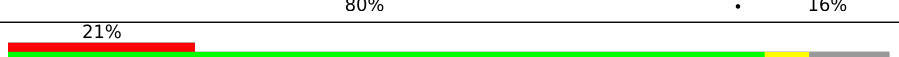


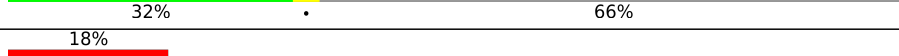




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Mol	Chain	Length	Quality of chain
8	L8	215	
9	L9	204	
10	LA	184	
11	LB	188	
12	LC	176	
13	LE	160	
14	LG	140	
15	LH	156	
16	LI	145	
17	LK	148	
18	LL	137	
19	LN	403	
20	LQ	135	
21	LS	123	
22	LT	110	
23	LU	105	
24	LW	97	
25	NB	549	
26	NF	260	
27	NH	180	
28	NI	881	
29	NK	129	
30	SA	427	
31	SC	288	
32	SD	248	

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Mol	Chain	Length	Quality of chain
33	SE	266	
34	SG	192	
35	SH	293	
36	SI	255	
37	SJ	847	
38	SK	245	
39	SL	490	
40	SM	588	
41	SN	306	
42	SO	353	
43	SQ	239	
44	SR	634	
45	SS	746	
46	ST	365	
47	SV	163	
48	SW	670	
49	SY	812	
50	SZ	178	

## 2 Entry composition

There are 55 unique types of molecules in this entry. The entry contains 125869 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 60S ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	BA	160	1208	749	226	229	4	0	0

- Molecule 2 is a protein called 60S ribosomal protein L10a.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	BB	213	1057	631	213	213	0	0

- Molecule 3 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	L1	152	3234	1443	571	1068	152	0	0

- Molecule 4 is a RNA chain called ITS2 rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	L2	69	1468	653	263	483	69	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	L3	2185	46844	20860	8575	15224	2185	0	0

- Molecule 6 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	L6	120	998	625	218	154	1	0	0

- Molecule 7 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	L7	199	1634	1053	319	257	5	0	0

- Molecule 8 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	L8	135	1111	713	213	178	7	0	0

- Molecule 9 is a protein called 60S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	L9	183	1546	974	325	243	4	0	0

- Molecule 10 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	LA	138	1106	693	208	197	8	0	0

- Molecule 11 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LB	151	1223	768	247	203	5	0	0

- Molecule 12 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LC	176	1461	930	284	236	11	0	0

- Molecule 13 is a protein called 60S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LE	113	747	461	143	142	1	0	0

- Molecule 14 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	LG	134	Total	C	N	O	S	0	0
			993	625	187	176	5		

- Molecule 15 is a protein called 60S ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	LH	133	Total	C	N	O	S	0	0
			813	499	172	142			

- Molecule 16 is a protein called 60S ribosomal protein L26.

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

- Molecule 17 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	LK	108	Total	C	N	O	S	0	0
			642	388	137	115	2		

- Molecule 18 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	LL	122	Total	C	N	O	S	0	0
			980	607	204	165	4		

- Molecule 19 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	LN	358	Total	C	N	O	S	0	0
			2884	1834	531	506	13		

- Molecule 20 is a protein called 60S ribosomal protein L32.

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

- Molecule 21 is a protein called 60S ribosomal protein L35.

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

- Molecule 22 is a protein called 60S ribosomal protein L35a.

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

- Molecule 23 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	LU	102	840	526	180	129	5	1	0

- Molecule 24 is a protein called 60S ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	LW	74	612	379	134	94	5	0	0

- Molecule 25 is a protein called Guanine nucleotide-binding protein-like 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	NB	67	569	355	119	92	3	0	0

- Molecule 26 is a protein called Ribosome biogenesis protein NSA2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	NF	205	1684	1074	319	282	9	0	0

- Molecule 27 is a protein called 60S ribosome subunit biogenesis protein NIP7 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	NH	180	1441	925	245	263	8	0	0

- Molecule 28 is a protein called ATP-dependent RNA helicase DDX54.



Mol	Chain	Residues	Atoms					AltConf	Trace
28	NI	598	Total	C	N	O	S	0	0
			3866	2387	736	737	6		

- Molecule 29 is a protein called Protein LLP homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	NK	67	Total	C	N	O	S	0	0
			581	363	128	88	2		

- Molecule 30 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	SA	358	Total	C	N	O	S	0	0
			2853	1797	570	473	13		

- Molecule 31 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	SC	203	Total	C	N	O	S	0	0
			1627	1049	306	270	2		

- Molecule 32 is a protein called 60S ribosomal protein L7.

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

- Molecule 33 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	SE	185	Total	C	N	O	S	0	0
			1491	946	289	252	4		

- Molecule 34 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	SG	190	Total	C	N	O	S	1	0
			1526	961	287	272	6		

- Molecule 35 is a protein called MKI67 FHA domain-interacting nucleolar phosphoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	SH	150	1267	819	224	220	4	0	0

- Molecule 36 is a protein called 60S ribosomal protein L7-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	SI	228	1887	1224	352	307	4	1	0

- Molecule 37 is a protein called pre-rRNA 2'-O-ribose RNA methyltransferase FTSJ3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	SJ	101	855	537	165	152	1	0	0

- Molecule 38 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	SK	244	1852	1149	318	372	13	0	0

- Molecule 39 is a protein called Ribosomal L1 domain-containing protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	SL	243	1960	1254	344	356	6	0	0

- Molecule 40 is a protein called Pescadillo homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	SM	453	3735	2408	667	648	12	0	0

- Molecule 41 is a protein called Probable rRNA-processing protein EBP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	SN	173	1350	849	251	243	7	0	0

- Molecule 42 is a protein called Ribosome biogenesis protein BRX1 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	SO	296	2460	1583	446	416	15	0	0

- Molecule 43 is a protein called mRNA turnover protein 4 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	SQ	217	1778	1134	313	320	11	1	0

- Molecule 44 is a protein called GTP-binding protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	SR	449	3695	2352	651	675	17	0	0

- Molecule 45 is a protein called Ribosome biogenesis protein BOP1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	N	O	P	S		
45	SS	256	2116	1337	375	394	2	8	0	0

- Molecule 46 is a protein called Ribosome biogenesis regulatory protein homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	ST	116	787	489	152	144	2	0	0

- Molecule 47 is a protein called Probable ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	SV	137	1171	745	227	189	10	0	0

- Molecule 48 is a protein called ATP-dependent RNA helicase DDX18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	SW	444	3549	2282	605	645	17	0	0

- Molecule 49 is a protein called Probable 28S rRNA (cytosine(4447)-C(5))-methyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	SY	378	2985	1887	533	550	15	0	0

- Molecule 50 is a protein called Nucleolar protein 16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	SZ	160	1338	835	260	238	5	0	0

- Molecule 51 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
51	L1	4	Total	Mg	0
			4	4	
51	L2	1	Total	Mg	0
			1	1	
51	L3	46	Total	Mg	0
			46	46	
51	L9	1	Total	Mg	0
			1	1	
51	LQ	1	Total	Mg	0
			1	1	
51	LT	1	Total	Mg	0
			1	1	
51	NI	1	Total	Mg	0
			1	1	
51	SA	1	Total	Mg	0
			1	1	
51	SO	1	Total	Mg	0
			1	1	
51	SR	1	Total	Mg	0
			1	1	

- Molecule 52 is ZINC ION (three-letter code: ZN) (formula: Zn).

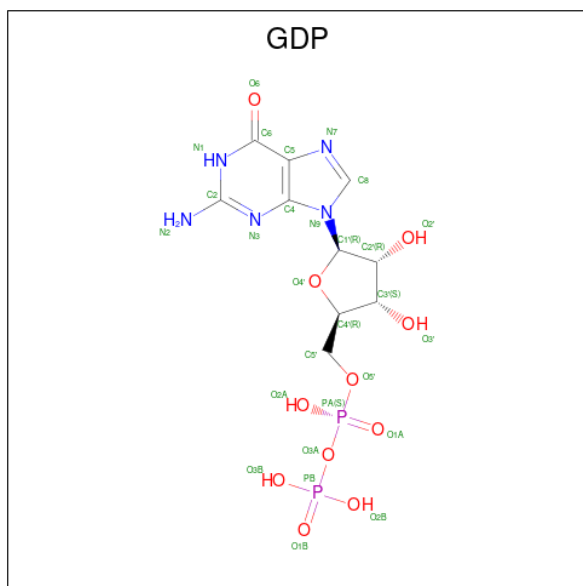
Mol	Chain	Residues	Atoms		AltConf
52	LW	1	Total	Zn	0
			1	1	
52	SV	1	Total	Zn	0
			1	1	

- Molecule 53 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>10</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
53	NI	1	27	10	5	10	2	0

- Molecule 54 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula:  $C_{10}H_{15}N_5O_{11}P_2$ ).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
54	SR	1	28	10	5	11	2	0

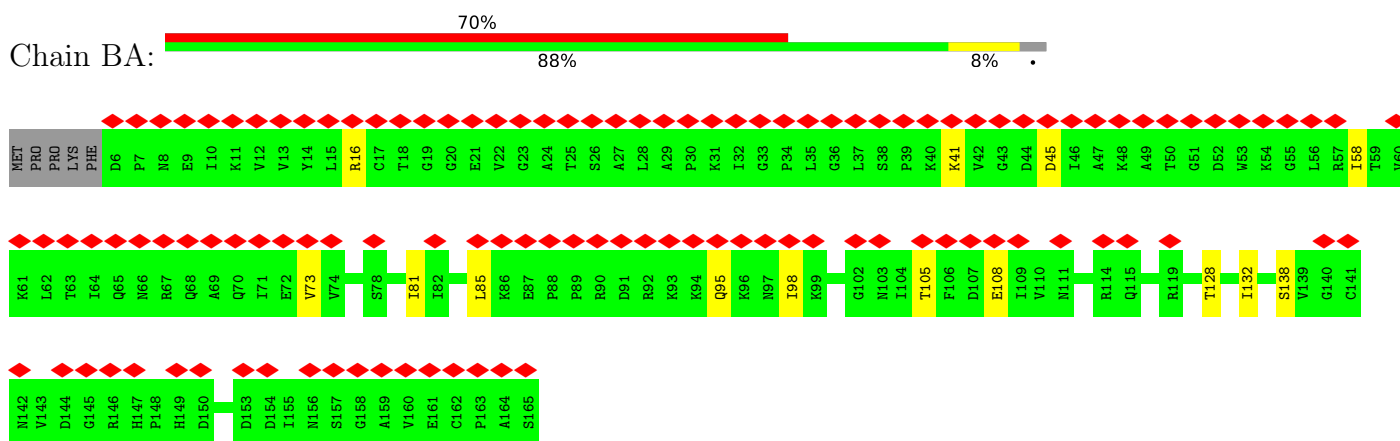
- Molecule 55 is POTASSIUM ION (three-letter code: K) (formula: K).

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
55	SR	1	Total 1	K 1	0

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

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

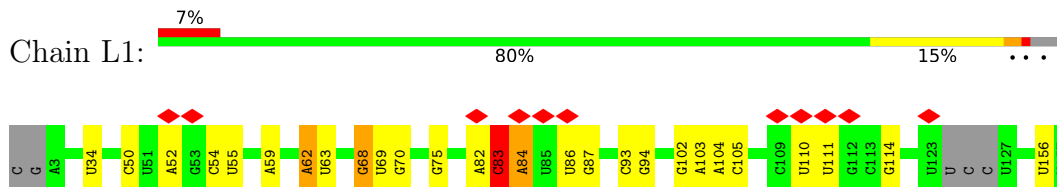
- Molecule 1: 60S ribosomal protein L12



- Molecule 2: 60S ribosomal protein L10a

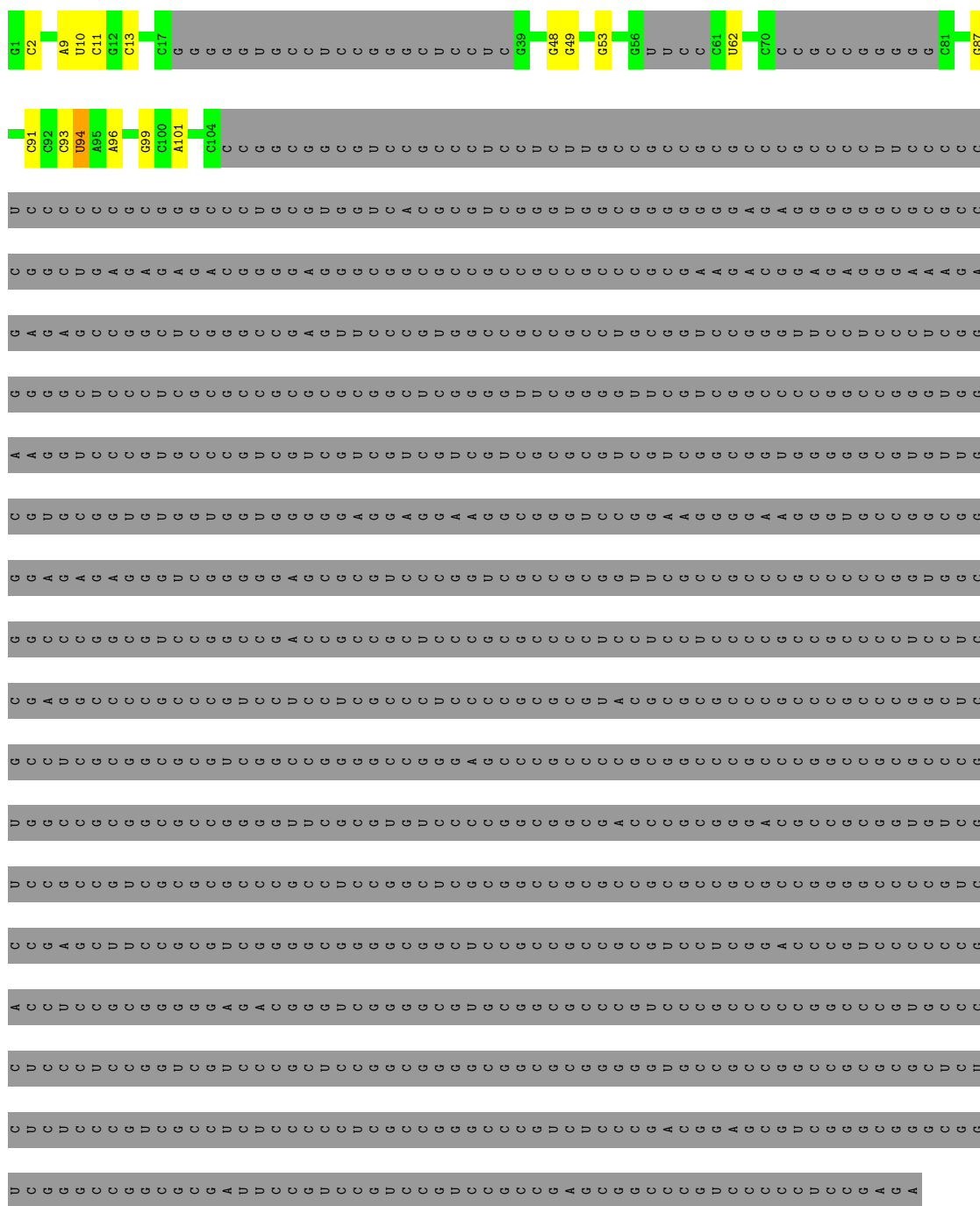


- Molecule 3: 5.8S rRNA



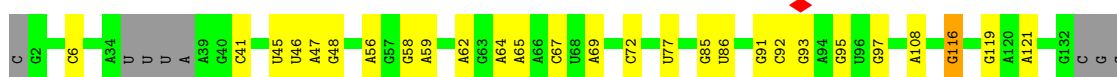
- Molecule 4: ITS2 rRNA

Chain L2: 5% . 94%

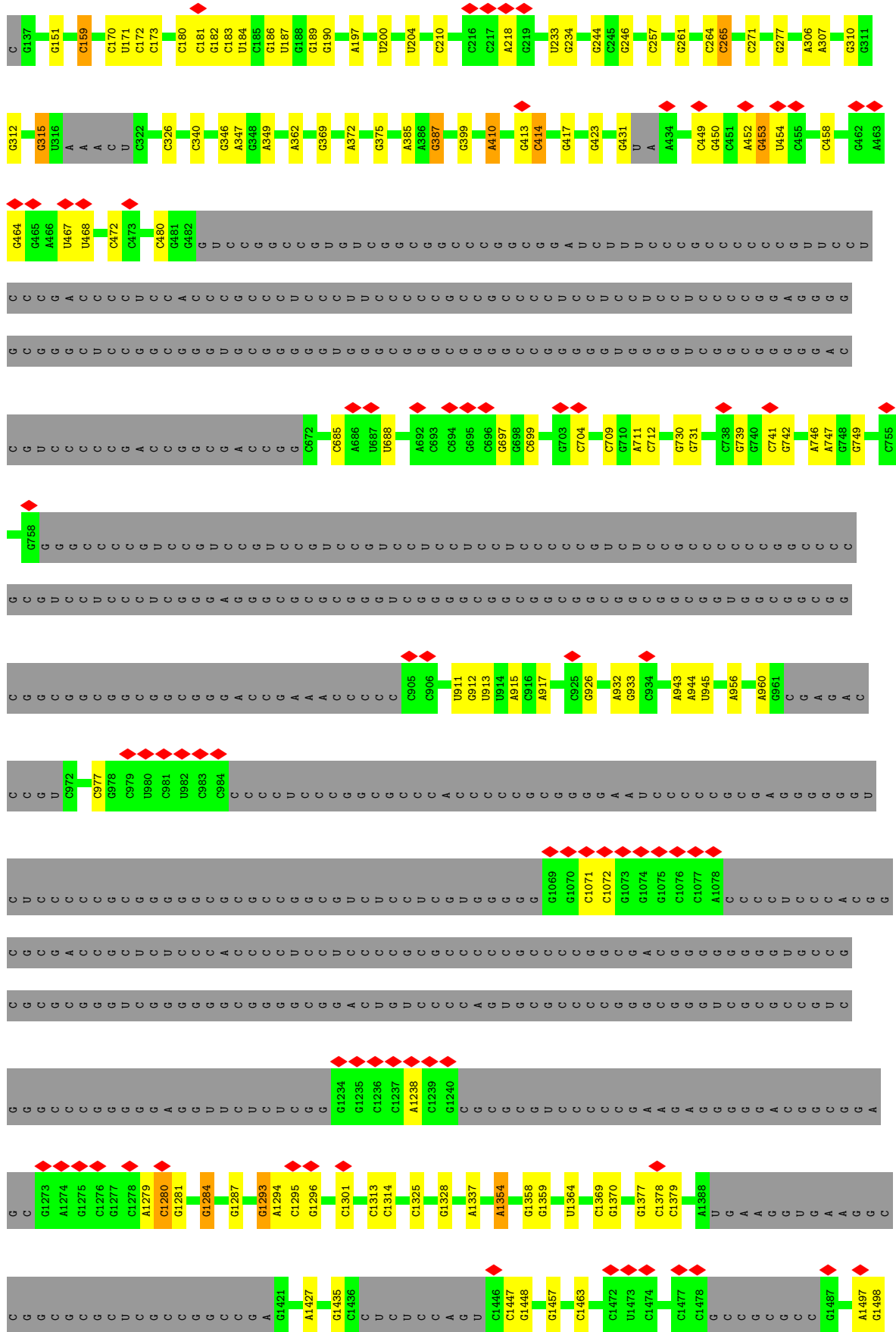


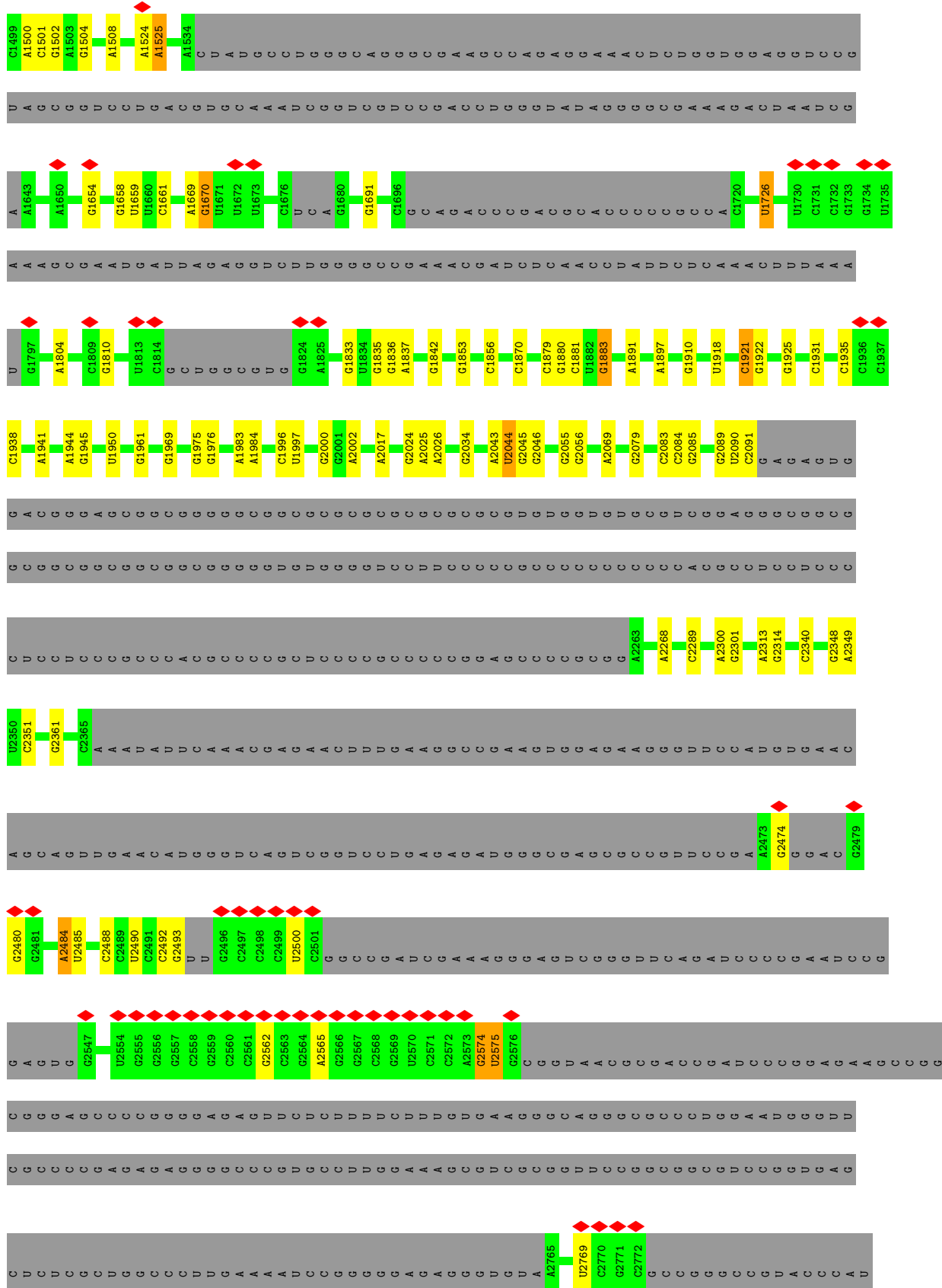
• Molecule 5: 28S rRNA

Chain L3: 6% 35% 8% . 57%

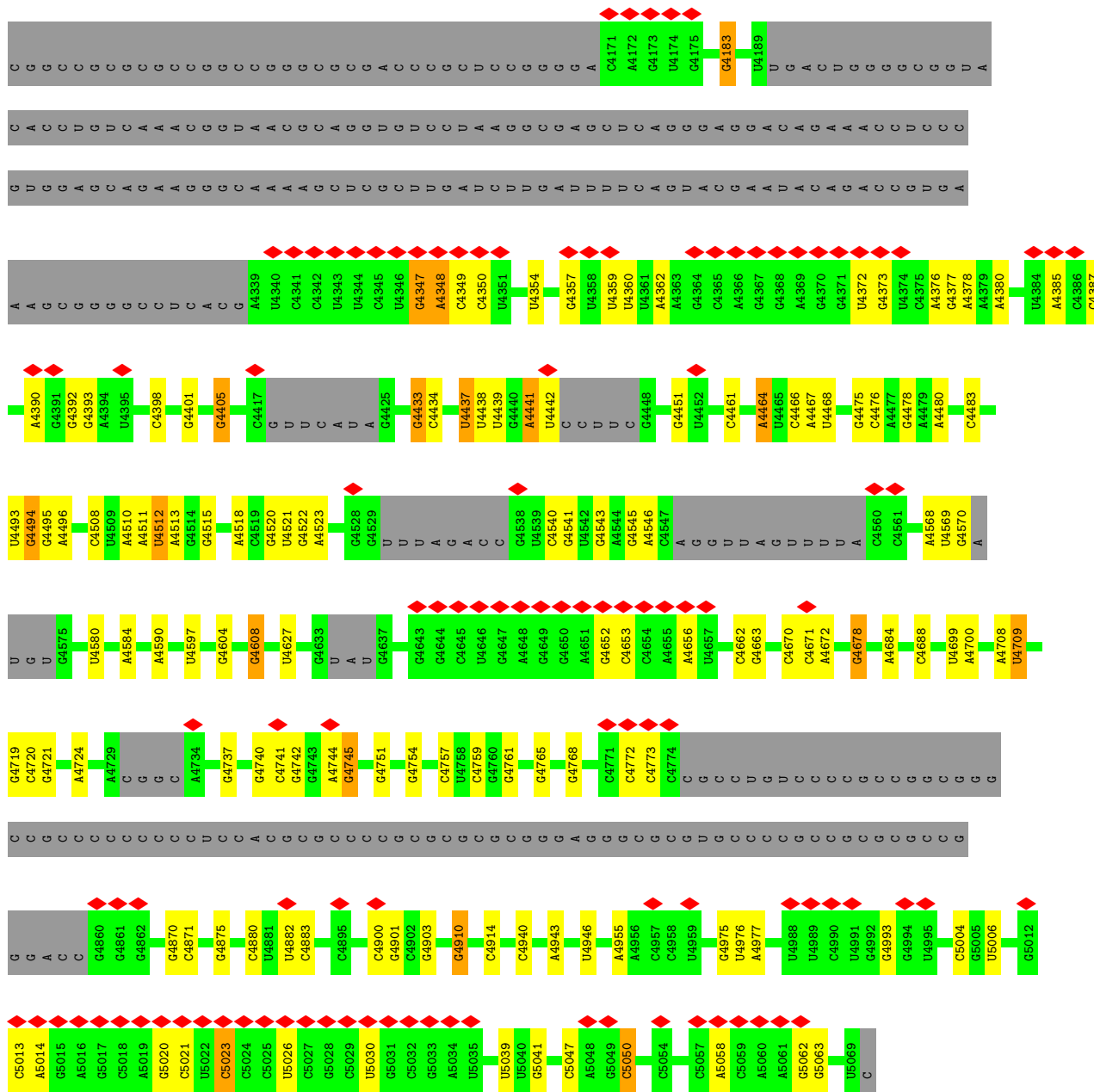




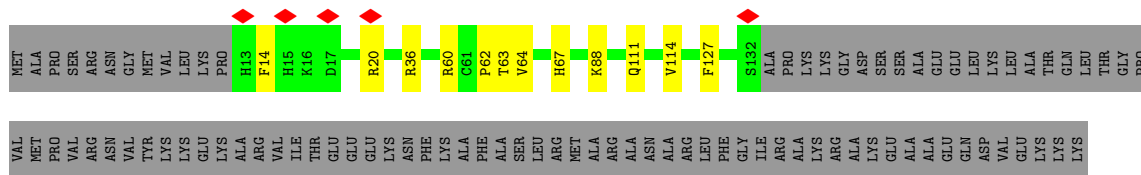








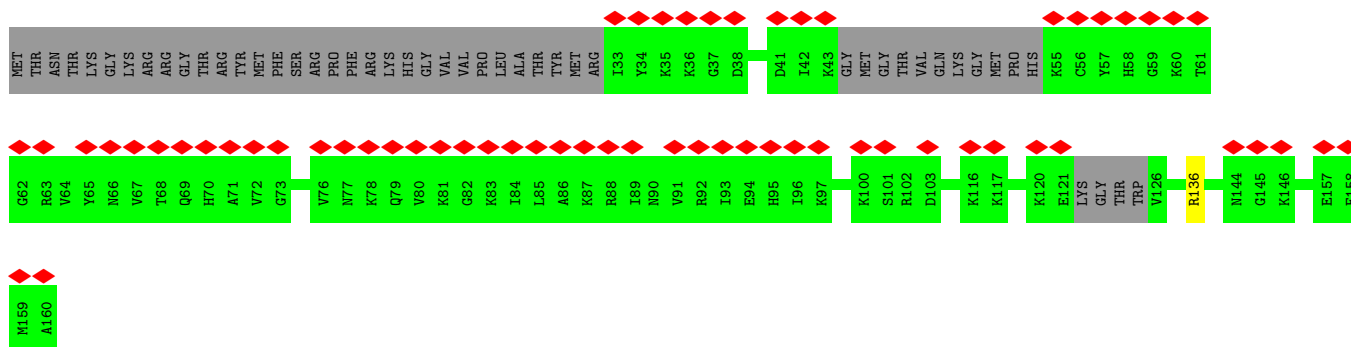
• Molecule 6: 60S ribosomal protein L13



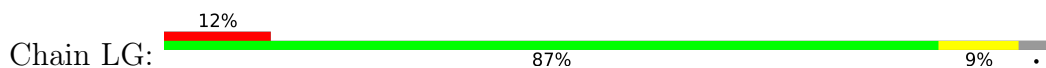
• Molecule 7: 60S ribosomal protein L13a



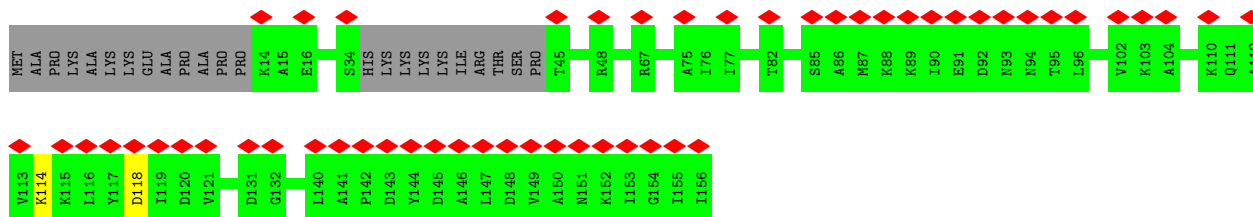
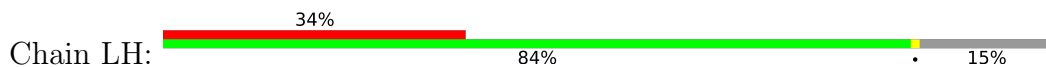




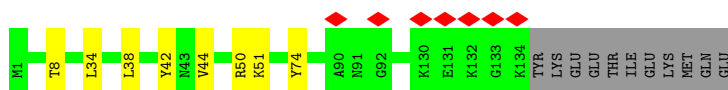
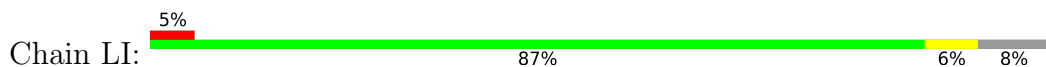
- Molecule 14: 60S ribosomal protein L23



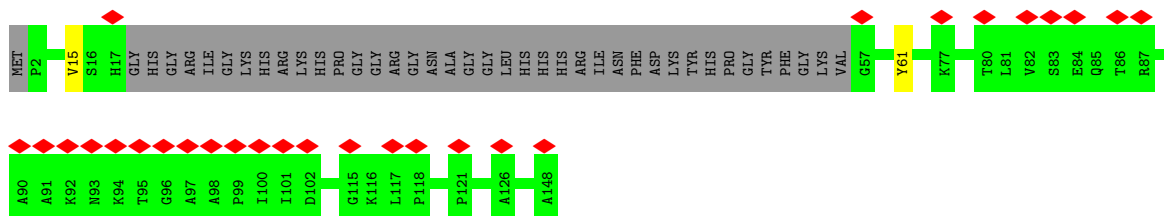
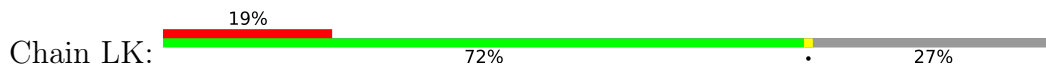
- Molecule 15: 60S ribosomal protein L23a



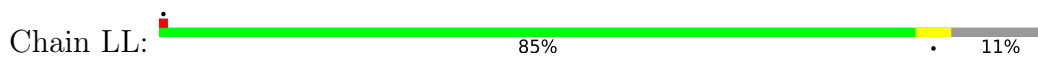
- Molecule 16: 60S ribosomal protein L26



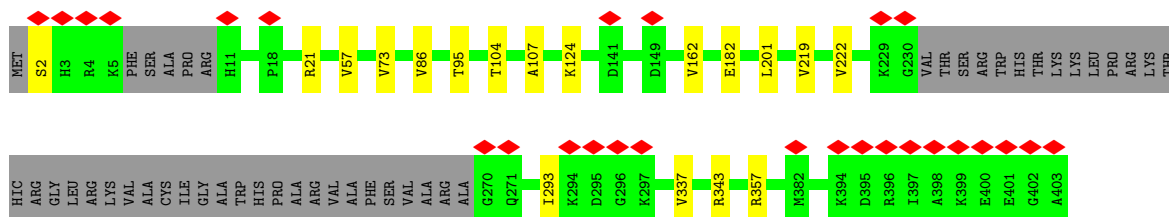
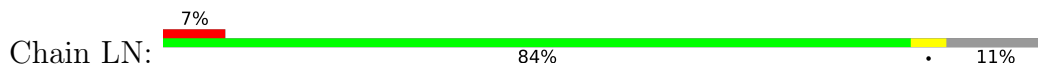
- Molecule 17: 60S ribosomal protein L27a



- Molecule 18: 60S ribosomal protein L28



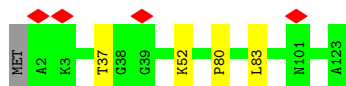
• Molecule 19: 60S ribosomal protein L3



• Molecule 20: 60S ribosomal protein L32



• Molecule 21: 60S ribosomal protein L35



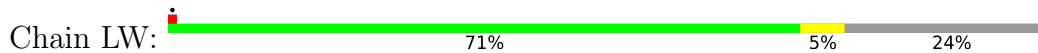
• Molecule 22: 60S ribosomal protein L35a



• Molecule 23: 60S ribosomal protein L36



• Molecule 24: 60S ribosomal protein L37





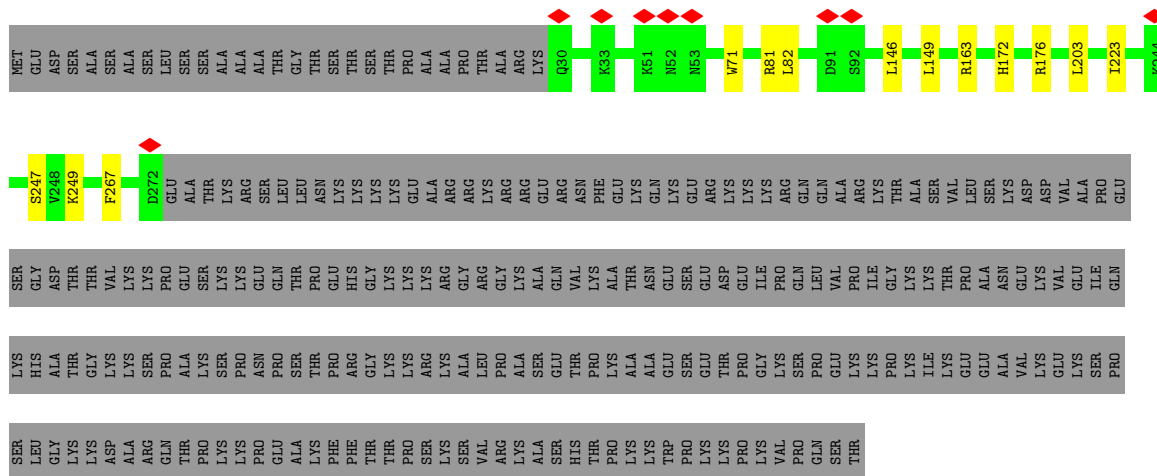




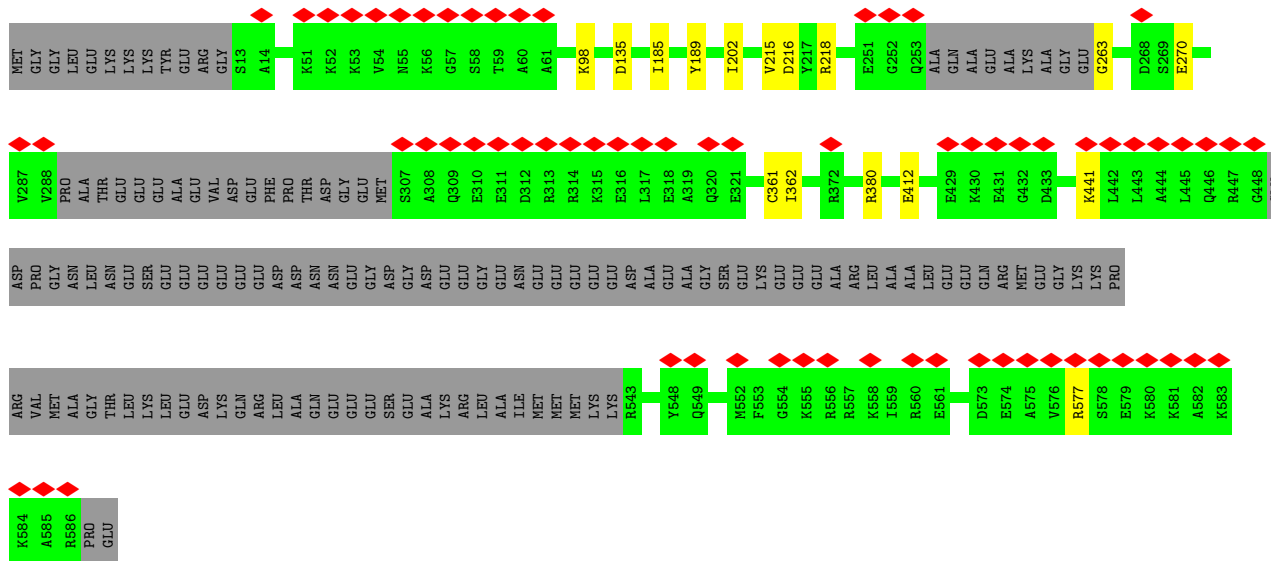
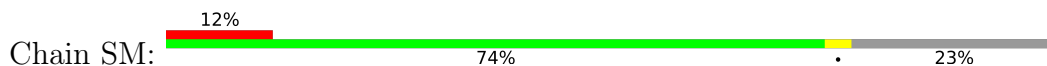




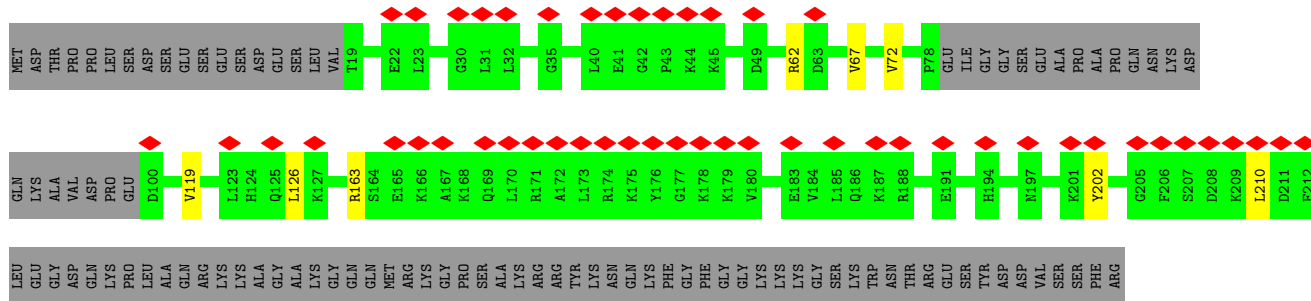




• Molecule 40: Pescadillo homolog



• Molecule 41: Probable rRNA-processing protein EBP2













## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	48037	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	64000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	5.991	Depositor
Minimum map value	-0.126	Depositor
Average map value	0.043	Depositor
Map value standard deviation	0.159	Depositor
Recommended contour level	0.9	Depositor
Map size ( $\text{\AA}$ )	514.56, 514.56, 514.56	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.072, 1.072, 1.072	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: GDP, SEP, MG, K, ADP, 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	BA	0.26	0/1224	0.52	0/1651
2	BB	0.25	0/1056	0.47	0/1472
3	L1	0.70	0/3611	0.79	3/5623 (0.1%)
4	L2	0.62	0/1634	0.79	0/2538
5	L3	0.63	0/52370	0.81	3/81617 (0.0%)
6	L6	0.39	0/1020	0.67	0/1367
7	L7	0.40	0/1666	0.60	0/2228
8	L8	0.37	0/1133	0.58	0/1516
9	L9	0.43	0/1584	0.65	0/2117
10	LA	0.28	0/1127	0.51	0/1511
11	LB	0.37	0/1239	0.63	0/1658
12	LC	0.39	0/1501	0.59	0/2013
13	LE	0.28	0/755	0.50	0/1021
14	LG	0.32	0/1007	0.56	0/1350
15	LH	0.27	0/818	0.53	0/1111
16	LI	0.39	0/1132	0.61	0/1504
17	LK	0.27	0/648	0.54	0/880
18	LL	0.38	0/995	0.62	0/1334
19	LN	0.37	0/2938	0.54	0/3923
20	LQ	0.38	0/1071	0.59	0/1429
21	LS	0.33	0/1023	0.58	0/1351
22	LT	0.44	0/895	0.64	0/1198
23	LU	0.36	0/854	0.64	0/1129
24	LW	0.37	0/626	0.66	0/829
25	NB	0.30	0/576	0.58	0/757
26	NF	0.31	0/1715	0.52	0/2282
27	NH	0.38	0/1473	0.56	0/1988
28	NI	0.25	0/3906	0.49	0/5329
29	NK	0.28	0/587	0.63	0/767
30	SA	0.36	0/2907	0.60	0/3905
31	SC	0.31	0/1657	0.56	0/2226
32	SD	0.37	0/1905	0.57	0/2539

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	SE	0.38	0/1517	0.58	0/2046
34	SG	0.33	0/1548	0.57	0/2081
35	SH	0.39	0/1298	0.54	0/1742
36	SI	0.32	0/1930	0.53	0/2595
37	SJ	0.31	0/868	0.55	0/1153
38	SK	0.33	0/1877	0.55	0/2554
39	SL	0.33	0/1994	0.53	0/2684
40	SM	0.34	0/3819	0.51	0/5139
41	SN	0.29	0/1368	0.50	0/1830
42	SO	0.33	0/2521	0.54	0/3384
43	SQ	0.28	0/1817	0.53	0/2435
44	SR	0.35	0/3768	0.53	0/5086
45	SS	0.34	0/2159	0.54	0/2932
46	ST	0.28	0/795	0.47	0/1072
47	SV	0.37	0/1194	0.61	0/1582
48	SW	0.32	0/3620	0.51	0/4886
49	SY	0.35	0/3046	0.54	0/4117
50	SZ	0.33	0/1364	0.55	0/1826
All	All	0.49	0/133156	0.68	6/191307 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	L3	417	G	O4'-C1'-N9	5.82	112.86	108.20
5	L3	4975	G	O4'-C1'-N9	5.49	112.59	108.20
3	L1	50	C	N3-C2-O2	-5.46	118.08	121.90
5	L3	4709	U	C2-N1-C1'	5.39	124.17	117.70
3	L1	83	C	N1-C2-O2	5.38	122.13	118.90
3	L1	50	C	N1-C2-O2	5.16	122.00	118.90

There are no chirality outliers.

There are no planarity outliers.

## 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	BA	1208	0	1257	9	0
2	BB	1057	0	464	0	0
3	L1	3234	0	1639	9	0
4	L2	1468	0	755	6	0
5	L3	46844	0	23704	139	0
6	L6	998	0	1067	10	0
7	L7	1634	0	1779	7	0
8	L8	1111	0	1174	3	0
9	L9	1546	0	1585	7	0
10	LA	1106	0	1130	9	0
11	LB	1223	0	1330	8	0
12	LC	1461	0	1502	15	0
13	LE	747	0	599	2	0
14	LG	993	0	1050	7	0
15	LH	813	0	640	1	0
16	LI	1115	0	1205	7	0
17	LK	642	0	455	2	0
18	LL	980	0	1041	5	0
19	LN	2884	0	3000	14	0
20	LQ	1053	0	1147	5	0
21	LS	1015	0	1148	3	0
22	LT	876	0	912	8	0
23	LU	840	0	930	8	0
24	LW	612	0	640	4	0
25	NB	569	0	625	2	0
26	NF	1684	0	1792	10	0
27	NH	1441	0	1448	18	0
28	NI	3866	0	3171	5	0
29	NK	581	0	656	3	0
30	SA	2853	0	3028	14	0
31	SC	1627	0	1771	17	0
32	SD	1870	0	1996	5	0
33	SE	1491	0	1592	9	0
34	SG	1526	0	1614	7	0
35	SH	1267	0	1291	2	0
36	SI	1887	0	2011	15	0
37	SJ	855	0	876	8	0
38	SK	1852	0	1828	19	0
39	SL	1960	0	2052	10	0
40	SM	3735	0	3830	13	0
41	SN	1350	0	1345	4	0
42	SO	2460	0	2551	12	0
43	SQ	1778	0	1817	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	SR	3695	0	3753	31	0
45	SS	2116	0	2028	17	0
46	ST	787	0	698	5	0
47	SV	1171	0	1232	7	0
48	SW	3549	0	3628	19	0
49	SY	2985	0	3004	26	0
50	SZ	1338	0	1352	5	0
51	L1	4	0	0	0	0
51	L2	1	0	0	0	0
51	L3	46	0	0	0	0
51	L9	1	0	0	0	0
51	LQ	1	0	0	0	0
51	LT	1	0	0	0	0
51	NI	1	0	0	0	0
51	SA	1	0	0	0	0
51	SO	1	0	0	0	0
51	SR	1	0	0	0	0
52	LW	1	0	0	0	0
52	SV	1	0	0	0	0
53	NI	27	0	12	0	0
54	SR	28	0	12	0	0
55	SR	1	0	0	0	0
All	All	125869	0	101166	422	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 2.

All (422) 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)
39:SL:82:LEU:HD13	39:SL:203:LEU:HD13	1.41	1.00
5:L3:183:C:OP2	42:SO:334:LYS:NZ	2.03	0.91
5:L3:5063:G:O6	19:LN:124:LYS:NZ	2.09	0.86
5:L3:458:C:O2'	31:SC:110:ARG:NH2	2.09	0.85
30:SA:340:ILE:HG21	31:SC:50:LEU:HD13	1.60	0.82
50:SZ:111:LEU:HD11	50:SZ:115:LEU:HD23	1.60	0.82
1:BA:16:ARG:NH2	5:L3:1975:G:O2'	2.12	0.82
4:L2:53:G:OP2	35:SH:81:ARG:NH1	2.15	0.80
3:L1:75:G:OP2	16:LI:74:TYR:OH	1.98	0.80
48:SW:190:THR:HG23	48:SW:274:LEU:HD21	1.62	0.80
5:L3:4678:G:OP1	29:NK:14:ARG:NH1	2.16	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:L2:10:U:OP2	39:SL:163:ARG:NH2	2.16	0.78
27:NH:22:GLU:OE1	46:ST:276:ASN:ND2	2.15	0.78
5:L3:3890:A:OP2	5:L3:4570:G:N2	2.16	0.78
5:L3:4946:U:HO2'	22:LT:2:SER:HG	1.22	0.77
48:SW:249:ARG:NH1	48:SW:250:ASN:OD1	2.16	0.77
26:NF:17:ARG:NH1	34:SG:180:TYR:OH	2.17	0.77
5:L3:5039:U:O3'	47:SV:115:ASN:ND2	2.18	0.77
12:LC:125:GLN:NE2	12:LC:127:MET:SD	2.57	0.77
5:L3:4508:C:O2	14:LG:46:LYS:NZ	2.18	0.77
5:L3:453:G:N2	5:L3:1293:G:O6	2.19	0.75
38:SK:119:PRO:O	38:SK:139:ARG:NH2	2.19	0.75
40:SM:135:ASP:OD2	45:SS:304:LYS:NZ	2.20	0.74
22:LT:33:VAL:HG23	22:LT:38:GLU:HB2	1.70	0.74
5:L3:72:C:N3	6:L6:60:ARG:NH1	2.35	0.73
5:L3:1238:A:OP2	31:SC:60:SER:OG	2.01	0.73
43:SQ:120:THR:OG1	43:SQ:199:GLU:OE1	2.05	0.73
5:L3:2361:G:O6	10:LA:25:HIS:ND1	2.21	0.73
5:L3:2045:G:O6	5:L3:3870:C:O2'	2.05	0.73
42:SO:61:ARG:NH1	45:SS:128:ASP:OD2	2.22	0.73
9:L9:20:ARG:NH2	37:SJ:693:THR:O	2.22	0.73
5:L3:62:A:N3	5:L3:77:U:O2'	2.22	0.73
5:L3:184:U:O2'	5:L3:189:G:OP2	2.06	0.73
5:L3:4441:A:N6	28:NI:445:ASP:O	2.21	0.72
5:L3:1280:C:O2'	30:SA:321:ASN:OD1	2.08	0.72
19:LN:357:ARG:NE	44:SR:407:ASP:OD1	2.23	0.71
5:L3:1524:A:O2'	5:L3:1525:A:O5'	2.07	0.71
5:L3:151:G:OP2	9:L9:4:TYR:OH	2.08	0.71
44:SR:169:ARG:NH1	44:SR:216:ARG:O	2.24	0.71
10:LA:36:ILE:HD11	10:LA:48:LEU:HD21	1.72	0.70
5:L3:2574:G:O2'	5:L3:2575:U:OP1	2.09	0.70
39:SL:82:LEU:CD1	39:SL:203:LEU:HD13	2.20	0.70
11:LB:122:THR:OG1	11:LB:124:ASP:OD1	2.09	0.70
28:NI:579:ASN:O	44:SR:203:LYS:NZ	2.25	0.70
5:L3:1369:C:OP2	5:L3:1370:G:O2'	2.04	0.69
3:L1:93:C:OP1	24:LW:76:HIS:NE2	2.23	0.69
14:LG:111:GLU:OE1	14:LG:131:ARG:NH1	2.26	0.69
5:L3:1983:A:N1	28:NI:579:ASN:ND2	2.41	0.68
5:L3:306:A:OP1	23:LU:53:TYR:OH	2.11	0.68
19:LN:107:ALA:HB2	19:LN:201:LEU:HD22	1.74	0.68
18:LL:20:ARG:NH1	20:LQ:78:LEU:O	2.26	0.68
5:L3:4468:U:HO2'	29:NK:2:ALA:N	1.92	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:LA:40:HIS:NE2	10:LA:110:ASP:O	2.27	0.68
44:SR:441:TYR:OH	47:SV:97:GLU:OE2	2.12	0.67
18:LL:20:ARG:NH2	20:LQ:84:GLU:OE2	2.29	0.66
26:NF:109:LYS:HD2	49:SY:236:LEU:HD11	1.77	0.66
43:SQ:64:ARG:NH1	43:SQ:65:MET:O	2.29	0.66
5:L3:1502:G:OP1	11:LB:65:ARG:NH1	2.29	0.66
5:L3:1883:G:OP1	20:LQ:47:ARG:NH1	2.28	0.65
5:L3:4478:G:N2	5:L3:4608:G:O2'	2.29	0.65
5:L3:1659:U:H2'	17:LK:15:VAL:HG23	1.79	0.65
5:L3:4437:U:O2'	44:SR:143:ARG:NH2	2.30	0.65
5:L3:47:A:OP2	6:L6:20:ARG:NH2	2.29	0.65
24:LW:15:THR:HG23	24:LW:16:HIS:ND1	2.12	0.65
42:SO:223:ILE:HD11	42:SO:230:VAL:HG23	1.78	0.65
44:SR:176:TYR:HH	44:SR:263:HIS:CE1	2.15	0.65
39:SL:223:ILE:HD12	39:SL:223:ILE:H	1.62	0.65
33:SE:106:THR:OG1	33:SE:109:GLU:OE2	2.06	0.65
43:SQ:49:ARG:NH1	43:SQ:125:ALA:O	2.30	0.64
5:L3:1508:A:OP1	30:SA:110:ARG:NH2	2.30	0.64
42:SO:122:LYS:NZ	42:SO:263:ASN:OD1	2.30	0.64
38:SK:228:GLN:OE1	38:SK:228:GLN:N	2.32	0.63
5:L3:4662:C:O2'	5:L3:5004:C:OP1	2.16	0.62
5:L3:4910:G:N2	7:L7:106:ASP:O	2.33	0.62
30:SA:204:ARG:NH1	30:SA:205:ARG:O	2.33	0.62
21:LS:80:PRO:HD2	21:LS:83:LEU:HD12	1.80	0.61
40:SM:189:TYR:CZ	40:SM:202:ILE:HD12	2.35	0.61
4:L2:13:C:OP1	36:SI:86:HIS:NE2	2.31	0.61
36:SI:153:ASN:ND2	40:SM:263:GLY:O	2.34	0.61
4:L2:93:C:O2'	4:L2:94:U:O5'	2.18	0.61
36:SI:92:ASP:OD1	36:SI:242:TYR:OH	2.18	0.61
49:SY:532:LEU:HD23	49:SY:537:VAL:HG23	1.82	0.61
5:L3:977:C:OP1	31:SC:59:ARG:NH2	2.34	0.61
38:SK:174:SER:O	38:SK:178:GLN:N	2.32	0.61
5:L3:4946:U:O2'	22:LT:2:SER:OG	2.00	0.61
41:SN:202:TYR:CZ	41:SN:210:LEU:HD11	2.35	0.61
44:SR:174:CYS:SG	44:SR:244:LEU:HD21	2.41	0.61
5:L3:1961:G:N7	43:SQ:71:LYS:NZ	2.42	0.60
5:L3:2083:C:OP2	11:LB:14:ARG:NH2	2.33	0.60
5:L3:244:G:O6	50:SZ:20:LYS:NZ	2.34	0.60
19:LN:86:VAL:HG13	19:LN:162:VAL:HG13	1.84	0.60
5:L3:4354:U:OP1	49:SY:530:TYR:OH	2.12	0.60
14:LG:27:ASN:OD1	14:LG:28:CYS:N	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
36:SI:143:VAL:O	36:SI:147:VAL:HG12	2.01	0.59
30:SA:339:THR:HG22	30:SA:342:ARG:HH22	1.67	0.59
14:LG:49:LEU:HG	14:LG:52:LEU:HD12	1.84	0.59
31:SC:133:PHE:O	31:SC:138:ARG:NH2	2.36	0.59
16:LI:34:LEU:HD22	16:LI:44:VAL:HG23	1.85	0.59
5:L3:453:G:N1	5:L3:1293:G:N7	2.46	0.59
19:LN:219:VAL:HG11	19:LN:337:VAL:CG2	2.31	0.59
5:L3:4183:G:N7	27:NH:1:MET:N	2.51	0.59
23:LU:21:VAL:HG21	48:SW:321:GLY:HA3	1.85	0.58
23:LU:46:GLU:OE1	45:SS:227:PHE:N	2.34	0.58
45:SS:198:ASP:OD1	45:SS:199:GLU:N	2.36	0.58
5:L3:4597:U:O2'	44:SR:399:ARG:NH2	2.35	0.58
44:SR:270:GLU:O	44:SR:274:ASN:ND2	2.31	0.58
1:BA:128:THR:O	1:BA:132:ILE:HD12	2.03	0.58
3:L1:102:G:OP2	3:L1:104:A:O2'	2.21	0.58
5:L3:4940:C:OP1	31:SC:156:ARG:NH1	2.36	0.58
5:L3:121:A:OP1	33:SE:110:LYS:NZ	2.35	0.58
44:SR:107:ASP:OD1	44:SR:108:ASN:N	2.36	0.58
5:L3:182:G:N7	42:SO:339:ARG:NH1	2.51	0.58
32:SD:105:VAL:HG13	32:SD:136:VAL:HG12	1.86	0.58
5:L3:4493:U:O2'	5:L3:4494:G:O5'	2.22	0.58
25:NB:52:ASN:OD1	25:NB:57:LYS:NZ	2.36	0.58
5:L3:423:G:N3	10:LA:118:GLN:NE2	2.53	0.57
38:SK:175:SER:O	38:SK:178:GLN:NE2	2.37	0.57
5:L3:4663:G:OP2	47:SV:38:LYS:NZ	2.35	0.57
6:L6:62:PRO:O	6:L6:63:THR:OG1	2.18	0.57
14:LG:42:VAL:HG13	14:LG:45:ILE:HG22	1.86	0.57
44:SR:188:VAL:HG23	44:SR:189:THR:HG23	1.87	0.56
32:SD:171:ASP:OD2	32:SD:172:ASN:N	2.38	0.56
48:SW:241:ILE:HG13	48:SW:304:ILE:HD11	1.87	0.56
5:L3:1921:C:O2'	12:LC:160:ARG:NH2	2.38	0.56
5:L3:4903:G:OP2	29:NK:84:LYS:NZ	2.30	0.56
36:SI:252:ARG:NH1	40:SM:270:GLU:OE1	2.39	0.56
12:LC:76:LYS:NZ	12:LC:100:LEU:O	2.34	0.56
10:LA:6:LEU:HD12	10:LA:116:HIS:CD2	2.41	0.56
27:NH:8:GLU:OE1	46:ST:252:ARG:NH1	2.38	0.56
44:SR:269:LEU:HD12	44:SR:306:ILE:HG23	1.86	0.56
27:NH:66:LEU:CD2	49:SY:438:ILE:HG23	2.37	0.55
12:LC:17:LEU:HD21	13:LE:136:ARG:NH1	2.22	0.55
49:SY:555:ARG:O	49:SY:558:ARG:NH1	2.34	0.55
5:L3:265:C:N4	50:SZ:154:VAL:HG21	2.22	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:LC:95:ARG:NH1	12:LC:113:MET:SD	2.79	0.55
22:LT:33:VAL:HG23	22:LT:38:GLU:CB	2.35	0.55
26:NF:115:GLY:O	28:NI:532:LYS:NZ	2.37	0.55
30:SA:124:ILE:HG21	30:SA:264:TYR:OH	2.06	0.55
5:L3:346:G:OP1	16:LI:8:THR:HG23	2.06	0.55
7:L7:190:ASP:OD1	7:L7:191:LYS:N	2.39	0.55
5:L3:4362:A:OP1	49:SY:486:ARG:NH1	2.39	0.55
34:SG:140:GLN:NE2	34:SG:143:GLU:OE2	2.40	0.55
5:L3:67:C:OP2	5:L3:312:G:N2	2.40	0.54
23:LU:46:GLU:OE1	45:SS:228:SER:N	2.39	0.54
5:L3:2044:U:N3	7:L7:63:ASN:OD1	2.40	0.54
5:L3:5039:U:O2'	47:SV:115:ASN:ND2	2.40	0.54
21:LS:37:THR:HG23	21:LS:37:THR:O	2.08	0.54
9:L9:125:SER:OG	37:SJ:712:HIS:O	2.23	0.54
48:SW:335:ALA:O	48:SW:339:LEU:HD23	2.09	0.53
5:L3:2079:G:OP2	20:LQ:64:LYS:NZ	2.41	0.53
48:SW:241:ILE:HD11	48:SW:254:VAL:HG23	1.89	0.53
12:LC:95:ARG:NH2	12:LC:112:ASP:OD2	2.40	0.53
5:L3:4724:A:O2'	19:LN:104:THR:HG22	2.09	0.53
39:SL:81:ARG:C	39:SL:82:LEU:HD12	2.28	0.53
27:NH:51:ILE:HD13	49:SY:411:VAL:HG22	1.90	0.53
5:L3:1996:C:O2	43:SQ:54:LYS:NZ	2.42	0.53
1:BA:138:SER:OG	5:L3:1976:G:N3	2.42	0.53
12:LC:17:LEU:HD21	13:LE:136:ARG:HH11	1.74	0.53
31:SC:161:ARG:O	31:SC:182:ASN:ND2	2.41	0.53
3:L1:83:C:H42	16:LI:50:ARG:NH1	2.06	0.53
5:L3:3961:G:O2'	5:L3:4043:G:N2	2.41	0.53
5:L3:4543:G:N7	27:NH:15:LYS:NZ	2.49	0.53
12:LC:99:ASP:OD2	12:LC:100:LEU:N	2.41	0.52
5:L3:410:A:O2'	5:L3:414:C:O2'	2.11	0.52
27:NH:57:ASN:HD22	49:SY:451:VAL:HG12	1.74	0.52
41:SN:62:ARG:NH1	42:SO:58:ASN:OD1	2.43	0.52
30:SA:211:TYR:OH	30:SA:218:ILE:HD11	2.10	0.52
39:SL:149:LEU:HD21	39:SL:176:ARG:HG3	1.92	0.52
48:SW:289:SER:OG	48:SW:294:GLU:OE2	2.28	0.52
38:SK:132:VAL:HG12	38:SK:133:LEU:HD23	1.92	0.52
30:SA:335:MET:O	30:SA:339:THR:HG23	2.10	0.52
33:SE:229:ARG:NH1	33:SE:230:TYR:OH	2.42	0.52
3:L1:84:A:N6	3:L1:87:G:O6	2.44	0.51
5:L3:2851:G:N2	28:NI:754:GLU:O	2.42	0.51
49:SY:540:VAL:HG22	49:SY:541:PRO:HD2	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:SG:86:LEU:HD22	34:SG:188:GLN:O	2.10	0.51
44:SR:56:GLN:NE2	44:SR:60:ASP:OD2	2.44	0.51
5:L3:116:G:O2'	45:SS:239:ARG:NH1	2.43	0.51
5:L3:1284:G:O4'	31:SC:130:LYS:NZ	2.38	0.51
9:L9:61:ILE:HG21	9:L9:131:GLU:OE2	2.11	0.51
5:L3:45:U:O2'	6:L6:14:PHE:O	2.28	0.50
5:L3:4387:C:O3'	26:NF:169:ARG:NH2	2.42	0.50
5:L3:4910:G:H4'	19:LN:95:THR:HG22	1.93	0.50
38:SK:222:PHE:O	38:SK:224:LEU:N	2.43	0.50
3:L1:62:A:OP1	21:LS:52:LYS:NZ	2.44	0.50
31:SC:50:LEU:HD12	31:SC:51:VAL:N	2.26	0.50
38:SK:107:VAL:HG13	38:SK:118:HIS:HB2	1.93	0.50
41:SN:67:VAL:HG22	41:SN:126:LEU:HD13	1.94	0.50
5:L3:315:G:N7	42:SO:96:ARG:NH2	2.59	0.50
38:SK:122:ASP:OD1	38:SK:125:THR:OG1	2.30	0.50
14:LG:96:LEU:HD11	47:SV:22:VAL:HG23	1.94	0.50
33:SE:132:ARG:NH2	45:SS:245:SER:O	2.45	0.50
44:SR:447:MET:SD	44:SR:447:MET:N	2.85	0.49
1:BA:105:THR:HG22	1:BA:108:GLU:OE2	2.13	0.49
42:SO:223:ILE:HD11	42:SO:230:VAL:CG2	2.43	0.49
5:L3:2562:G:N2	5:L3:2565:A:OP2	2.44	0.49
11:LB:124:ASP:OD1	11:LB:125:GLN:N	2.44	0.49
36:SI:192:ILE:HD12	45:SS:351:ARG:HH11	1.77	0.49
23:LU:48:CYS:SG	23:LU:49:GLY:N	2.85	0.49
38:SK:98:GLU:OE2	47:SV:76:ASN:ND2	2.43	0.49
5:L3:1726:U:H5'	32:SD:135:ILE:HD11	1.94	0.49
5:L3:4434:C:O4'	26:NF:191:THR:HG23	2.12	0.49
27:NH:58:ILE:HD11	49:SY:413:LEU:HD11	1.94	0.49
12:LC:69:GLU:OE1	12:LC:76:LYS:NZ	2.45	0.49
23:LU:77:VAL:HG11	23:LU:82:ARG:HB3	1.95	0.49
43:SQ:42:ILE:HD11	43:SQ:92:VAL:HG13	1.93	0.49
43:SQ:45:VAL:HG23	43:SQ:45:VAL:O	2.13	0.49
45:SS:150:VAL:HG13	45:SS:150:VAL:O	2.13	0.49
1:BA:105:THR:HG23	1:BA:108:GLU:H	1.78	0.49
5:L3:1950:U:O2'	12:LC:116:ARG:NH1	2.45	0.49
36:SI:183:GLU:O	36:SI:187:GLY:N	2.46	0.49
5:L3:709:C:OP1	22:LT:89:ARG:NH2	2.45	0.48
6:L6:127:PHE:HZ	50:SZ:97:LEU:HD22	1.77	0.48
1:BA:95:GLN:HB2	1:BA:98:ILE:HD11	1.94	0.48
44:SR:68:ASP:OD1	44:SR:69:PHE:N	2.47	0.48
5:L3:1284:G:N3	31:SC:130:LYS:NZ	2.53	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
27:NH:69:CYS:O	27:NH:84:THR:OG1	2.22	0.48
36:SI:29:ARG:NH1	45:SS:369:ASP:OD1	2.45	0.48
44:SR:256:ASP:OD2	44:SR:261:CYS:N	2.40	0.48
34:SG:36:ARG:NH1	34:SG:152:GLU:OE2	2.47	0.48
5:L3:4993:G:H22	5:L3:5058:A:H2	1.61	0.48
43:SQ:40:LEU:HD12	43:SQ:104:PHE:CE2	2.49	0.48
4:L2:91:C:OP2	39:SL:176:ARG:NH2	2.47	0.48
5:L3:4768:G:OP1	7:L7:168:TYR:OH	2.29	0.48
5:L3:1328:G:O2'	5:L3:2349:A:OP1	2.32	0.48
23:LU:34:THR:OG1	23:LU:37:THR:HG22	2.14	0.48
42:SO:53:LYS:NZ	45:SS:155:ASP:OD2	2.43	0.47
50:SZ:121:TYR:O	50:SZ:125:ASN:ND2	2.46	0.47
40:SM:412:GLU:OE1	40:SM:412:GLU:N	2.46	0.47
4:L2:99:G:N2	35:SH:129:GLU:OE1	2.47	0.47
5:L3:159:C:O2	6:L6:88:LYS:NZ	2.32	0.47
14:LG:112:MET:SD	14:LG:117:ILE:HD11	2.54	0.47
5:L3:2000:G:O2'	5:L3:2017:A:N1	2.41	0.47
5:L3:5047:C:O2'	5:L3:5050:C:OP2	2.25	0.47
19:LN:219:VAL:HG11	19:LN:337:VAL:HG21	1.95	0.47
27:NH:135:SER:OG	27:NH:136:MET:N	2.47	0.47
33:SE:143:VAL:HG11	33:SE:201:THR:HG21	1.96	0.47
38:SK:2:ALA:CB	38:SK:215:LEU:HD11	2.45	0.47
49:SY:532:LEU:HD11	49:SY:539:LEU:HD23	1.97	0.47
5:L3:5021:C:O2	5:L3:5023:C:N4	2.47	0.47
40:SM:215:VAL:HG23	45:SS:364:PHE:CG	2.50	0.47
5:L3:4483:C:H5''	44:SR:21:LEU:HD13	1.97	0.47
5:L3:369:G:N2	5:L3:372:A:OP2	2.41	0.46
5:L3:4347:G:O2'	5:L3:4348:A:O5'	2.30	0.46
38:SK:61:ARG:O	38:SK:105:GLY:N	2.47	0.46
27:NH:114:LEU:O	27:NH:117:GLY:N	2.47	0.46
30:SA:192:GLY:O	30:SA:195:LYS:NZ	2.47	0.46
49:SY:321:ARG:NE	49:SY:343:LYS:O	2.40	0.46
49:SY:429:LEU:HD12	49:SY:439:ILE:HD11	1.96	0.46
27:NH:58:ILE:HD11	49:SY:413:LEU:CD1	2.46	0.46
22:LT:33:VAL:HG13	22:LT:33:VAL:O	2.16	0.46
36:SI:115:THR:HG23	36:SI:139:MET:HG2	1.97	0.46
49:SY:532:LEU:HD21	49:SY:539:LEU:CD2	2.46	0.46
10:LA:36:ILE:HD12	10:LA:91:LEU:HD13	1.97	0.46
33:SE:58:PRO:HG2	33:SE:61:ILE:HD12	1.97	0.46
5:L3:2562:G:O2'	5:L3:2565:A:N6	2.48	0.46
49:SY:417:ALA:O	49:SY:441:HIS:NE2	2.49	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:L3:2340:C:H4'	30:SA:42:THR:HG23	1.97	0.46
16:LI:50:ARG:NH2	16:LI:51:LYS:O	2.49	0.46
20:LQ:84:GLU:O	20:LQ:87:VAL:HG22	2.16	0.46
36:SI:252:ARG:NH2	40:SM:270:GLU:OE2	2.49	0.46
5:L3:480:C:OP1	18:LL:67:ARG:NH1	2.50	0.46
5:L3:1325:C:O2	37:SJ:833:ARG:NH1	2.45	0.46
38:SK:71:LEU:HD21	38:SK:132:VAL:HG11	1.96	0.46
44:SR:292:ASP:OD1	44:SR:293:VAL:N	2.46	0.46
40:SM:577:ARG:HE	40:SM:577:ARG:HA	1.81	0.45
44:SR:356:VAL:HG12	44:SR:356:VAL:O	2.16	0.45
3:L1:68:G:H5'	24:LW:87:LYS:HZ3	1.81	0.45
31:SC:214:ASP:OD1	31:SC:215:ALA:N	2.48	0.45
5:L3:3923:A:OP2	5:L3:4377:G:O2'	2.26	0.45
9:L9:31:ARG:NH1	37:SJ:708:GLU:OE1	2.49	0.45
49:SY:283:PHE:HE2	49:SY:484:ILE:HD12	1.82	0.45
44:SR:233:ARG:NH1	44:SR:241:ILE:HD11	2.30	0.45
39:SL:146:LEU:HD21	39:SL:172:HIS:CD2	2.51	0.45
27:NH:163:VAL:HG12	27:NH:164:PHE:O	2.17	0.45
5:L3:180:C:N3	42:SO:339:ARG:NH1	2.64	0.45
22:LT:2:SER:N	31:SC:274:VAL:HG11	2.31	0.45
27:NH:66:LEU:HD23	49:SY:438:ILE:HG23	1.97	0.45
36:SI:29:ARG:NH1	45:SS:373:CYS:SG	2.90	0.45
5:L3:4464:A:N7	44:SR:32:THR:OG1	2.42	0.45
5:L3:4493:U:C2'	5:L3:4494:G:O5'	2.65	0.45
27:NH:29:ASP:OD1	46:ST:269:LEU:HD11	2.17	0.45
33:SE:135:VAL:HG22	33:SE:136:LEU:N	2.32	0.45
36:SI:78:LEU:HD13	36:SI:111:LEU:HD23	1.99	0.45
48:SW:590:TYR:CD2	48:SW:604:LEU:HD11	2.52	0.45
5:L3:1354:A:HO2'	17:LK:61:TYR:HH	1.64	0.44
12:LC:81:TRP:NE1	12:LC:92:ASN:OD1	2.48	0.44
46:ST:232:VAL:O	46:ST:232:VAL:HG12	2.17	0.44
5:L3:4745:G:H22	5:L3:4955:A:H2	1.65	0.44
40:SM:185:ILE:HD11	45:SS:342:PHE:CD2	2.53	0.44
32:SD:219:GLY:O	32:SD:246:ARG:NH2	2.51	0.44
44:SR:171:LEU:HD23	44:SR:252:LEU:HD11	2.00	0.44
47:SV:53:LYS:NZ	47:SV:62:GLU:OE2	2.40	0.44
30:SA:14:LYS:HE3	30:SA:14:LYS:HA	1.98	0.44
23:LU:21:VAL:HG21	48:SW:321:GLY:CA	2.48	0.44
44:SR:179:VAL:HG22	44:SR:179:VAL:O	2.18	0.44
5:L3:85:G:O2'	5:L3:86:U:OP2	2.36	0.44
5:L3:85:G:O2'	5:L3:97:G:O6	2.29	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:L9:126:THR:HG21	37:SJ:712:HIS:HD2	1.81	0.44
9:L9:126:THR:HG21	37:SJ:712:HIS:CD2	2.53	0.44
19:LN:57:VAL:HG12	19:LN:73:VAL:HG22	1.98	0.44
38:SK:73:PRO:O	38:SK:76:THR:HG22	2.17	0.44
48:SW:397:VAL:HG22	48:SW:398:ASP:H	1.83	0.44
49:SY:565:SER:O	49:SY:567:ARG:NH1	2.51	0.44
5:L3:375:G:OP2	24:LW:52:LYS:NZ	2.25	0.44
39:SL:249:LYS:HE3	39:SL:267:PHE:CE1	2.52	0.44
5:L3:4467:A:O2'	5:L3:4510:A:N3	2.42	0.43
12:LC:82:LEU:HD12	12:LC:124:ILE:HG23	1.99	0.43
12:LC:92:ASN:ND2	25:NB:49:GLY:O	2.50	0.43
19:LN:293:ILE:HG23	19:LN:293:ILE:O	2.18	0.43
38:SK:123:ARG:HD2	38:SK:123:ARG:N	2.32	0.43
48:SW:351:ILE:HG23	48:SW:358:ARG:HH22	1.82	0.43
8:L8:81:ASP:OD2	8:L8:84:THR:HG22	2.19	0.43
44:SR:354:ASN:OD1	44:SR:355:GLU:N	2.51	0.43
5:L3:911:U:H2'	5:L3:912:G:O4'	2.17	0.43
16:LI:38:LEU:HD22	16:LI:42:TYR:HE2	1.84	0.43
34:SG:105:ILE:CD1	34:SG:112:VAL:HG12	2.48	0.43
42:SO:183:GLU:OE1	42:SO:187:GLN:NE2	2.51	0.43
3:L1:83:C:O2'	3:L1:84:A:N7	2.40	0.43
12:LC:150:ILE:HG23	12:LC:150:ILE:O	2.18	0.43
31:SC:49:VAL:O	31:SC:49:VAL:HG23	2.18	0.43
6:L6:64:VAL:HA	6:L6:67:HIS:ND1	2.33	0.43
30:SA:5:ARG:NH1	30:SA:24:LEU:O	2.52	0.43
31:SC:148:THR:HG22	31:SC:200:LYS:HG2	2.00	0.43
45:SS:197:THR:HG22	45:SS:198:ASP:N	2.34	0.43
48:SW:555:TRP:CE3	48:SW:558:ILE:HD12	2.54	0.43
5:L3:46:U:OP2	5:L3:47:A:O2'	2.23	0.43
5:L3:1279:A:O2'	5:L3:1281:G:N7	2.40	0.43
18:LL:112:ARG:NH2	31:SC:120:ASP:OD2	2.46	0.43
42:SO:226:ASP:O	42:SO:228:ALA:N	2.51	0.43
48:SW:378:SER:OG	48:SW:379:LEU:HD12	2.19	0.43
5:L3:4977:A:O2'	19:LN:21:ARG:NH2	2.52	0.43
22:LT:54:LYS:O	22:LT:66:LYS:NZ	2.44	0.43
31:SC:278:THR:HG22	31:SC:279:ASN:N	2.34	0.43
5:L3:1669:A:H2'	5:L3:1670:G:O4'	2.19	0.43
5:L3:4515:G:OP1	44:SR:49:ARG:NH1	2.43	0.43
7:L7:202:LEU:HD11	8:L8:119:ARG:NH1	2.34	0.43
44:SR:176:TYR:CD1	44:SR:177:PRO:HD2	2.53	0.43
5:L3:747:A:HO2'	5:L3:749:G:H8	1.66	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
36:SI:255:ASN:O	36:SI:255:ASN:ND2	2.52	0.42
48:SW:327:LEU:HD22	48:SW:354:LEU:HD22	2.01	0.42
3:L1:69:U:H2'	3:L1:70:G:O4'	2.20	0.42
5:L3:4511:A:N6	19:LN:2:SER:OG	2.52	0.42
5:L3:4875:G:H2'	12:LC:169:THR:HG22	2.00	0.42
49:SY:569:PHE:HE2	49:SY:581:ILE:HD12	1.84	0.42
5:L3:1504:G:OP1	11:LB:147:GLU:OE2	2.36	0.42
16:LI:34:LEU:HD22	16:LI:44:VAL:CG2	2.49	0.42
40:SM:361:CYS:SG	40:SM:362:ILE:N	2.93	0.42
48:SW:219:LEU:HB3	48:SW:361:MET:HG3	1.99	0.42
49:SY:388:ILE:HG21	49:SY:402:MET:SD	2.59	0.42
5:L3:4433:G:N3	26:NF:191:THR:HG21	2.35	0.42
26:NF:109:LYS:NZ	49:SY:279:SER:OG	2.52	0.42
37:SJ:668:LEU:HD12	37:SJ:731:TRP:HH2	1.83	0.42
5:L3:4493:U:HO2'	5:L3:4494:G:C4'	2.27	0.42
5:L3:4744:A:H2'	5:L3:4745:G:O4'	2.20	0.42
37:SJ:682:ARG:NH1	45:SS:127:SEP:O1P	2.49	0.42
5:L3:1427:A:C2	11:LB:138:LEU:HD23	2.55	0.42
30:SA:109:ARG:O	30:SA:109:ARG:HG2	2.20	0.42
44:SR:233:ARG:HH12	44:SR:241:ILE:HD11	1.84	0.42
36:SI:32:TYR:CE2	36:SI:34:ALA:HB2	2.55	0.42
38:SK:77:THR:HG23	38:SK:80:GLU:H	1.84	0.42
38:SK:150:SER:HA	38:SK:194:ALA:HB3	2.02	0.42
5:L3:4387:C:OP1	26:NF:169:ARG:NH1	2.52	0.42
5:L3:4761:G:OP1	7:L7:37:ARG:NH2	2.47	0.42
6:L6:111:GLN:HA	6:L6:114:VAL:HG22	2.02	0.42
15:LH:114:LYS:O	15:LH:118:ASP:N	2.53	0.42
39:SL:71:TRP:N	39:SL:247:SER:O	2.43	0.42
41:SN:72:VAL:HG11	41:SN:119:VAL:HG22	2.02	0.42
49:SY:335:LEU:HD22	49:SY:346:LEU:HB3	2.02	0.42
5:L3:385:A:HO2'	5:L3:387:G:H8	1.68	0.41
5:L3:2484:A:O2'	40:SM:216:ASP:OD2	2.38	0.41
1:BA:81:ILE:O	1:BA:85:LEU:HD23	2.20	0.41
5:L3:1833:G:N2	5:L3:1835:G:O4'	2.53	0.41
18:LL:97:ILE:HD13	18:LL:107:ARG:HA	2.03	0.41
5:L3:307:A:N3	5:L3:310:G:O2'	2.53	0.41
5:L3:1364:U:OP2	6:L6:36:ARG:NH1	2.53	0.41
5:L3:4493:U:O2'	5:L3:4494:G:O4'	2.21	0.41
5:L3:4569:U:H4'	10:LA:79:THR:HG21	2.02	0.41
44:SR:269:LEU:CD1	44:SR:306:ILE:HG23	2.50	0.41
48:SW:397:VAL:HG22	48:SW:398:ASP:N	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:L3:1457:G:O2'	11:LB:75:ARG:NH2	2.53	0.41
5:L3:1879:C:H2'	5:L3:1880:G:O4'	2.21	0.41
5:L3:4604:G:H4'	26:NF:2:PRO:HG3	2.03	0.41
27:NH:10:ARG:HA	46:ST:271:LEU:HD21	2.03	0.41
33:SE:192:ARG:HE	40:SM:98:LYS:HA	1.86	0.41
48:SW:339:LEU:HD13	48:SW:344:GLU:HB3	2.03	0.41
7:L7:189:ILE:HD12	8:L8:119:ARG:HE	1.84	0.41
10:LA:36:ILE:CD1	10:LA:91:LEU:HD13	2.50	0.41
19:LN:222:VAL:O	19:LN:343:ARG:NH1	2.53	0.41
44:SR:286:VAL:HG21	44:SR:310:LEU:HD23	2.03	0.41
5:L3:4359:U:O2'	5:L3:4360:U:O4'	2.37	0.41
30:SA:100:ARG:HB3	30:SA:100:ARG:CZ	2.51	0.41
36:SI:192:ILE:HD11	40:SM:380:ARG:HE	1.85	0.41
5:L3:1364:U:OP2	6:L6:36:ARG:NH2	2.52	0.41
26:NF:215:THR:HG22	26:NF:216:LYS:N	2.35	0.41
5:L3:4688:C:O2'	34:SG:155:SER:OG	2.38	0.41
10:LA:41:ILE:HD11	10:LA:99:GLU:CG	2.51	0.41
33:SE:157:ILE:HB	33:SE:183:ILE:HD13	2.03	0.41
34:SG:41:ILE:HG22	34:SG:43:VAL:HG13	2.02	0.41
38:SK:19:LEU:HB3	38:SK:198:VAL:HG22	2.03	0.41
1:BA:41:LYS:NZ	1:BA:45:ASP:OD2	2.54	0.40
5:L3:711:A:H2'	5:L3:712:C:C6	2.56	0.40
5:L3:2043:A:O2'	5:L3:4461:C:O2	2.39	0.40
48:SW:423:ASN:O	48:SW:428:LEU:HD11	2.21	0.40
49:SY:532:LEU:HD21	49:SY:539:LEU:HD23	2.03	0.40
5:L3:1501:C:H2'	11:LB:68:ARG:NH1	2.36	0.40
5:L3:3918:G:OP1	27:NH:72:LYS:NZ	2.50	0.40
27:NH:176:GLU:HA	27:NH:176:GLU:OE1	2.21	0.40
32:SD:147:LEU:O	32:SD:151:ASN:ND2	2.54	0.40
49:SY:354:PRO:O	49:SY:358:THR:HG23	2.21	0.40
38:SK:101:LEU:HB3	38:SK:107:VAL:HG21	2.02	0.40
45:SS:272:ARG:NE	45:SS:273:PRO:O	2.54	0.40
48:SW:274:LEU:O	48:SW:274:LEU:HD23	2.22	0.40
49:SY:335:LEU:HD21	49:SY:348:VAL:HG22	2.03	0.40
1:BA:58:ILE:HD11	1:BA:73:VAL:CG1	2.52	0.40
5:L3:688:U:O3'	31:SC:107:VAL:HG12	2.22	0.40
5:L3:1337:A:N1	5:L3:1658:G:O2'	2.45	0.40
5:L3:4405:G:O6	44:SR:24:SER:OG	2.38	0.40
44:SR:324:THR:O	44:SR:326:GLU:N	2.52	0.40
5:L3:4493:U:C5	5:L3:4512:U:H2'	2.57	0.40
5:L3:4580:U:O2'	19:LN:182:GLU:OE2	2.35	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
38:SK:44:ASP:N	38:SK:44:ASP:OD1	2.55	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	BA	158/165 (96%)	156 (99%)	2 (1%)	0	100	100
2	BB	211/217 (97%)	207 (98%)	4 (2%)	0	100	100
6	L6	118/211 (56%)	116 (98%)	2 (2%)	0	100	100
7	L7	197/203 (97%)	195 (99%)	2 (1%)	0	100	100
8	L8	133/215 (62%)	130 (98%)	3 (2%)	0	100	100
9	L9	179/204 (88%)	179 (100%)	0	0	100	100
10	LA	134/184 (73%)	133 (99%)	1 (1%)	0	100	100
11	LB	149/188 (79%)	148 (99%)	1 (1%)	0	100	100
12	LC	174/176 (99%)	171 (98%)	3 (2%)	0	100	100
13	LE	107/160 (67%)	104 (97%)	3 (3%)	0	100	100
14	LG	132/140 (94%)	131 (99%)	1 (1%)	0	100	100
15	LH	129/156 (83%)	128 (99%)	1 (1%)	0	100	100
16	LI	132/145 (91%)	130 (98%)	2 (2%)	0	100	100
17	LK	104/148 (70%)	100 (96%)	4 (4%)	0	100	100
18	LL	120/137 (88%)	120 (100%)	0	0	100	100
19	LN	352/403 (87%)	347 (99%)	5 (1%)	0	100	100
20	LQ	126/135 (93%)	126 (100%)	0	0	100	100
21	LS	120/123 (98%)	120 (100%)	0	0	100	100
22	LT	107/110 (97%)	107 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	LU	101/105 (96%)	99 (98%)	2 (2%)	0	100	100
24	LW	72/97 (74%)	71 (99%)	1 (1%)	0	100	100
25	NB	63/549 (12%)	61 (97%)	2 (3%)	0	100	100
26	NF	197/260 (76%)	193 (98%)	4 (2%)	0	100	100
27	NH	178/180 (99%)	177 (99%)	1 (1%)	0	100	100
28	NI	590/881 (67%)	587 (100%)	3 (0%)	0	100	100
29	NK	63/129 (49%)	63 (100%)	0	0	100	100
30	SA	356/427 (83%)	350 (98%)	6 (2%)	0	100	100
31	SC	197/288 (68%)	191 (97%)	6 (3%)	0	100	100
32	SD	223/248 (90%)	219 (98%)	4 (2%)	0	100	100
33	SE	183/266 (69%)	180 (98%)	3 (2%)	0	100	100
34	SG	189/192 (98%)	187 (99%)	2 (1%)	0	100	100
35	SH	148/293 (50%)	146 (99%)	2 (1%)	0	100	100
36	SI	225/255 (88%)	220 (98%)	5 (2%)	0	100	100
37	SJ	95/847 (11%)	95 (100%)	0	0	100	100
38	SK	242/245 (99%)	232 (96%)	10 (4%)	0	100	100
39	SL	241/490 (49%)	233 (97%)	8 (3%)	0	100	100
40	SM	445/588 (76%)	443 (100%)	2 (0%)	0	100	100
41	SN	169/306 (55%)	169 (100%)	0	0	100	100
42	SO	292/353 (83%)	286 (98%)	6 (2%)	0	100	100
43	SQ	216/239 (90%)	212 (98%)	4 (2%)	0	100	100
44	SR	445/634 (70%)	436 (98%)	9 (2%)	0	100	100
45	SS	250/746 (34%)	242 (97%)	8 (3%)	0	100	100
46	ST	112/365 (31%)	109 (97%)	3 (3%)	0	100	100
47	SV	135/163 (83%)	134 (99%)	1 (1%)	0	100	100
48	SW	440/670 (66%)	428 (97%)	12 (3%)	0	100	100
49	SY	376/812 (46%)	372 (99%)	4 (1%)	0	100	100
50	SZ	156/178 (88%)	154 (99%)	2 (1%)	0	100	100
All	All	9281/14226 (65%)	9137 (98%)	144 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	BA	132/137 (96%)	132 (100%)	0	100	100
6	L6	104/177 (59%)	104 (100%)	0	100	100
7	L7	171/174 (98%)	171 (100%)	0	100	100
8	L8	115/161 (71%)	115 (100%)	0	100	100
9	L9	155/172 (90%)	155 (100%)	0	100	100
10	LA	121/163 (74%)	120 (99%)	1 (1%)	81	94
11	LB	136/165 (82%)	136 (100%)	0	100	100
12	LC	157/157 (100%)	157 (100%)	0	100	100
13	LE	51/140 (36%)	51 (100%)	0	100	100
14	LG	102/107 (95%)	102 (100%)	0	100	100
15	LH	39/133 (29%)	39 (100%)	0	100	100
16	LI	124/135 (92%)	124 (100%)	0	100	100
17	LK	29/121 (24%)	29 (100%)	0	100	100
18	LL	106/121 (88%)	106 (100%)	0	100	100
19	LN	313/348 (90%)	313 (100%)	0	100	100
20	LQ	114/121 (94%)	114 (100%)	0	100	100
21	LS	109/110 (99%)	109 (100%)	0	100	100
22	LT	88/89 (99%)	88 (100%)	0	100	100
23	LU	87/89 (98%)	87 (100%)	0	100	100
24	LW	63/80 (79%)	63 (100%)	0	100	100
25	NB	61/485 (13%)	61 (100%)	0	100	100
26	NF	182/228 (80%)	182 (100%)	0	100	100
27	NH	155/155 (100%)	155 (100%)	0	100	100
28	NI	267/730 (37%)	267 (100%)	0	100	100
29	NK	61/115 (53%)	61 (100%)	0	100	100
30	SA	298/348 (86%)	297 (100%)	1 (0%)	92	97

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
31	SC	180/252 (71%)	180 (100%)	0	100	100
32	SD	194/215 (90%)	194 (100%)	0	100	100
33	SE	158/223 (71%)	158 (100%)	0	100	100
34	SG	170/171 (99%)	170 (100%)	0	100	100
35	SH	140/274 (51%)	140 (100%)	0	100	100
36	SI	205/228 (90%)	203 (99%)	2 (1%)	76	92
37	SJ	91/733 (12%)	91 (100%)	0	100	100
38	SK	212/213 (100%)	212 (100%)	0	100	100
39	SL	226/437 (52%)	226 (100%)	0	100	100
40	SM	401/509 (79%)	399 (100%)	2 (0%)	88	96
41	SN	133/260 (51%)	132 (99%)	1 (1%)	81	94
42	SO	274/319 (86%)	274 (100%)	0	100	100
43	SQ	195/214 (91%)	195 (100%)	0	100	100
44	SR	410/574 (71%)	410 (100%)	0	100	100
45	SS	227/648 (35%)	227 (100%)	0	100	100
46	ST	60/300 (20%)	60 (100%)	0	100	100
47	SV	127/149 (85%)	127 (100%)	0	100	100
48	SW	393/591 (66%)	393 (100%)	0	100	100
49	SY	325/685 (47%)	325 (100%)	0	100	100
50	SZ	141/158 (89%)	141 (100%)	0	100	100
All	All	7602/12114 (63%)	7595 (100%)	7 (0%)	93	98

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
10	LA	69	ARG
30	SA	95	MET
36	SI	171	ASN
36	SI	255	ASN
40	SM	218	ARG
40	SM	441	LYS
41	SN	163	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
6	L6	15	HIS
7	L7	63	ASN
12	LC	125	GLN
19	LN	3	HIS
19	LN	42	HIS
23	LU	26	HIS
25	NB	16	HIS
27	NH	175	HIS
29	NK	89	GLN
31	SC	136	HIS
31	SC	190	HIS
34	SG	140	GLN
36	SI	225	HIS
36	SI	255	ASN
37	SJ	712	HIS
37	SJ	726	HIS
39	SL	218	HIS
40	SM	154	HIS
40	SM	211	HIS
40	SM	323	HIS
44	SR	35	HIS
44	SR	45	HIS
44	SR	157	HIS
44	SR	209	HIS
45	SS	310	HIS
47	SV	115	ASN
48	SW	402	GLN
48	SW	593	HIS
49	SY	430	HIS

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	L1	150/157 (95%)	19 (12%)	0
4	L2	65/1167 (5%)	10 (15%)	0
5	L3	2146/5070 (42%)	296 (13%)	6 (0%)
All	All	2361/6394 (36%)	325 (13%)	6 (0%)

All (325) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	L1	34	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	L1	52	A
3	L1	54	C
3	L1	55	U
3	L1	59	A
3	L1	62	A
3	L1	63	U
3	L1	68	G
3	L1	82	A
3	L1	83	C
3	L1	84	A
3	L1	86	U
3	L1	94	G
3	L1	103	A
3	L1	105	C
3	L1	110	U
3	L1	111	U
3	L1	114	G
3	L1	156	U
4	L2	2	C
4	L2	9	A
4	L2	11	C
4	L2	48	G
4	L2	49	G
4	L2	62	U
4	L2	87	G
4	L2	94	U
4	L2	96	A
4	L2	101	A
5	L3	6	C
5	L3	41	C
5	L3	48	G
5	L3	56	A
5	L3	58	G
5	L3	59	A
5	L3	64	A
5	L3	65	A
5	L3	69	A
5	L3	91	G
5	L3	92	C
5	L3	93	G
5	L3	95	G
5	L3	108	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	116	G
5	L3	119	G
5	L3	159	C
5	L3	170	C
5	L3	171	U
5	L3	172	C
5	L3	173	C
5	L3	181	C
5	L3	186	G
5	L3	187	U
5	L3	190	G
5	L3	197	A
5	L3	200	U
5	L3	204	U
5	L3	210	C
5	L3	218	A
5	L3	233	U
5	L3	234	G
5	L3	246	G
5	L3	257	C
5	L3	261	G
5	L3	264	C
5	L3	265	C
5	L3	271	C
5	L3	277	G
5	L3	315	G
5	L3	326	C
5	L3	340	C
5	L3	347	A
5	L3	349	A
5	L3	362	A
5	L3	387	G
5	L3	399	G
5	L3	410	A
5	L3	413	G
5	L3	414	C
5	L3	431	G
5	L3	449	C
5	L3	450	G
5	L3	452	A
5	L3	453	G
5	L3	454	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	464	G
5	L3	467	U
5	L3	468	U
5	L3	472	C
5	L3	685	C
5	L3	697	G
5	L3	699	C
5	L3	704	C
5	L3	730	G
5	L3	731	G
5	L3	739	G
5	L3	741	C
5	L3	742	G
5	L3	746	A
5	L3	913	U
5	L3	915	A
5	L3	917	A
5	L3	926	G
5	L3	932	A
5	L3	933	G
5	L3	943	A
5	L3	944	A
5	L3	945	U
5	L3	956	A
5	L3	960	A
5	L3	1071	C
5	L3	1072	C
5	L3	1280	C
5	L3	1284	G
5	L3	1287	G
5	L3	1293	G
5	L3	1294	A
5	L3	1295	C
5	L3	1296	G
5	L3	1301	C
5	L3	1313	C
5	L3	1314	C
5	L3	1354	A
5	L3	1358	G
5	L3	1359	G
5	L3	1377	G
5	L3	1378	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	1379	C
5	L3	1435	G
5	L3	1447	C
5	L3	1448	G
5	L3	1463	C
5	L3	1497	A
5	L3	1498	G
5	L3	1500	A
5	L3	1525	A
5	L3	1654	G
5	L3	1661	C
5	L3	1670	G
5	L3	1691	G
5	L3	1726	U
5	L3	1804	A
5	L3	1810	G
5	L3	1836	G
5	L3	1837	A
5	L3	1842	G
5	L3	1853	G
5	L3	1856	C
5	L3	1870	C
5	L3	1881	C
5	L3	1883	G
5	L3	1891	A
5	L3	1897	A
5	L3	1910	G
5	L3	1918	U
5	L3	1921	C
5	L3	1922	G
5	L3	1925	G
5	L3	1931	C
5	L3	1935	C
5	L3	1938	C
5	L3	1941	A
5	L3	1944	A
5	L3	1945	G
5	L3	1969	G
5	L3	1984	A
5	L3	1997	U
5	L3	2002	A
5	L3	2024	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	2025	A
5	L3	2026	A
5	L3	2034	G
5	L3	2044	U
5	L3	2046	G
5	L3	2055	G
5	L3	2056	G
5	L3	2069	A
5	L3	2084	C
5	L3	2085	G
5	L3	2089	G
5	L3	2090	U
5	L3	2091	C
5	L3	2268	A
5	L3	2289	C
5	L3	2300	A
5	L3	2301	G
5	L3	2313	A
5	L3	2314	G
5	L3	2348	G
5	L3	2351	C
5	L3	2474	G
5	L3	2480	G
5	L3	2484	A
5	L3	2485	U
5	L3	2488	C
5	L3	2490	U
5	L3	2492	C
5	L3	2493	G
5	L3	2500	U
5	L3	2575	U
5	L3	2769	U
5	L3	2844	A
5	L3	2845	A
5	L3	2848	G
5	L3	2852	U
5	L3	3845	A
5	L3	3853	U
5	L3	3868	G
5	L3	3870	C
5	L3	3875	G
5	L3	3877	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	3878	C
5	L3	3879	G
5	L3	3889	G
5	L3	3894	A
5	L3	3895	G
5	L3	3897	G
5	L3	3904	G
5	L3	3906	A
5	L3	3907	G
5	L3	3908	A
5	L3	3920	U
5	L3	3926	C
5	L3	3938	G
5	L3	3939	G
5	L3	3940	U
5	L3	3941	G
5	L3	3942	A
5	L3	4049	U
5	L3	4058	U
5	L3	4064	C
5	L3	4183	G
5	L3	4348	A
5	L3	4349	C
5	L3	4350	C
5	L3	4357	G
5	L3	4372	U
5	L3	4373	G
5	L3	4376	A
5	L3	4378	A
5	L3	4380	A
5	L3	4385	A
5	L3	4390	A
5	L3	4392	G
5	L3	4393	G
5	L3	4398	C
5	L3	4401	G
5	L3	4405	G
5	L3	4433	G
5	L3	4437	U
5	L3	4438	U
5	L3	4439	U
5	L3	4441	A

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	4442	U
5	L3	4451	G
5	L3	4464	A
5	L3	4466	C
5	L3	4475	G
5	L3	4476	C
5	L3	4480	A
5	L3	4494	G
5	L3	4495	G
5	L3	4496	A
5	L3	4512	U
5	L3	4513	A
5	L3	4518	A
5	L3	4521	U
5	L3	4522	G
5	L3	4523	A
5	L3	4540	C
5	L3	4541	G
5	L3	4545	G
5	L3	4546	A
5	L3	4568	A
5	L3	4584	A
5	L3	4590	A
5	L3	4608	G
5	L3	4627	U
5	L3	4652	G
5	L3	4653	C
5	L3	4656	A
5	L3	4670	C
5	L3	4671	C
5	L3	4672	A
5	L3	4678	G
5	L3	4684	A
5	L3	4700	A
5	L3	4708	A
5	L3	4709	U
5	L3	4719	G
5	L3	4720	C
5	L3	4721	G
5	L3	4737	G
5	L3	4740	G
5	L3	4741	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	4742	G
5	L3	4745	G
5	L3	4751	G
5	L3	4754	G
5	L3	4757	C
5	L3	4759	C
5	L3	4765	G
5	L3	4772	C
5	L3	4773	C
5	L3	4870	G
5	L3	4871	C
5	L3	4880	C
5	L3	4882	U
5	L3	4883	C
5	L3	4900	C
5	L3	4901	G
5	L3	4910	G
5	L3	4914	C
5	L3	4943	A
5	L3	4976	U
5	L3	5006	U
5	L3	5013	C
5	L3	5014	A
5	L3	5020	G
5	L3	5023	C
5	L3	5026	U
5	L3	5030	U
5	L3	5041	G
5	L3	5050	C
5	L3	5062	G

All (6) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	L3	2084	C
5	L3	2574	G
5	L3	4347	G
5	L3	4520	G
5	L3	4699	U
5	L3	5013	C

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
45	SEP	SS	127	45	8,9,10	1.47	1 (12%)	8,12,14	1.60	2 (25%)
45	SEP	SS	126	45	8,9,10	1.48	1 (12%)	8,12,14	1.60	2 (25%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
45	SEP	SS	127	45	-	1/5/8/10	-
45	SEP	SS	126	45	-	0/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	SS	126	SEP	P-O1P	3.27	1.61	1.50
45	SS	127	SEP	P-O1P	3.23	1.61	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
45	SS	126	SEP	P-OG-CB	-3.11	109.73	118.30
45	SS	127	SEP	P-OG-CB	-2.87	110.38	118.30
45	SS	127	SEP	OG-CB-CA	2.83	110.90	108.14
45	SS	126	SEP	OG-CB-CA	2.66	110.73	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
45	SS	127	SEP	N-CA-CB-OG

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
45	SS	127	SEP	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 63 ligands modelled in this entry, 61 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
54	GDP	SR	1001	55,51	24,30,30	2.56	9 (37%)	30,47,47	1.75	9 (30%)
53	ADP	NI	1001	51	24,29,29	0.91	1 (4%)	29,45,45	1.50	5 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
54	GDP	SR	1001	55,51	-	1/12/32/32	0/3/3/3
53	ADP	NI	1001	51	-	1/12/32/32	0/3/3/3

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
54	SR	1001	GDP	O6-C6	8.25	1.40	1.23
54	SR	1001	GDP	C2-N2	4.70	1.45	1.34
54	SR	1001	GDP	O4'-C1'	4.24	1.47	1.41
54	SR	1001	GDP	C2'-C1'	-2.69	1.49	1.53
54	SR	1001	GDP	PB-O2B	-2.37	1.45	1.54
54	SR	1001	GDP	PB-O3B	-2.36	1.45	1.54
54	SR	1001	GDP	C5-C4	2.25	1.48	1.43
53	NI	1001	ADP	C5-C4	2.25	1.46	1.40
54	SR	1001	GDP	C2'-C3'	-2.19	1.47	1.53
54	SR	1001	GDP	PA-O2A	-2.04	1.45	1.55

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	NI	1001	ADP	N3-C2-N1	-3.80	122.74	128.68
53	NI	1001	ADP	PA-O3A-PB	-3.73	120.01	132.83
54	SR	1001	GDP	C3'-C2'-C1'	3.54	106.31	100.98
54	SR	1001	GDP	C5-C6-N1	3.27	119.72	113.95
54	SR	1001	GDP	PA-O3A-PB	-3.14	122.06	132.83
54	SR	1001	GDP	O3B-PB-O3A	2.98	114.61	104.64
54	SR	1001	GDP	O2B-PB-O3A	2.94	114.49	104.64
54	SR	1001	GDP	C2-N1-C6	-2.88	119.80	125.10
54	SR	1001	GDP	C2'-C3'-C4'	2.63	107.75	102.64
53	NI	1001	ADP	C4-C5-N7	-2.54	106.75	109.40
53	NI	1001	ADP	C3'-C2'-C1'	2.48	104.71	100.98
54	SR	1001	GDP	O2A-PA-O1A	-2.18	101.47	112.24
54	SR	1001	GDP	O6-C6-C5	-2.09	120.29	124.37
53	NI	1001	ADP	C2-N1-C6	2.01	122.19	118.75

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
54	SR	1001	GDP	C5'-O5'-PA-O2A
53	NI	1001	ADP	PA-O3A-PB-O3B

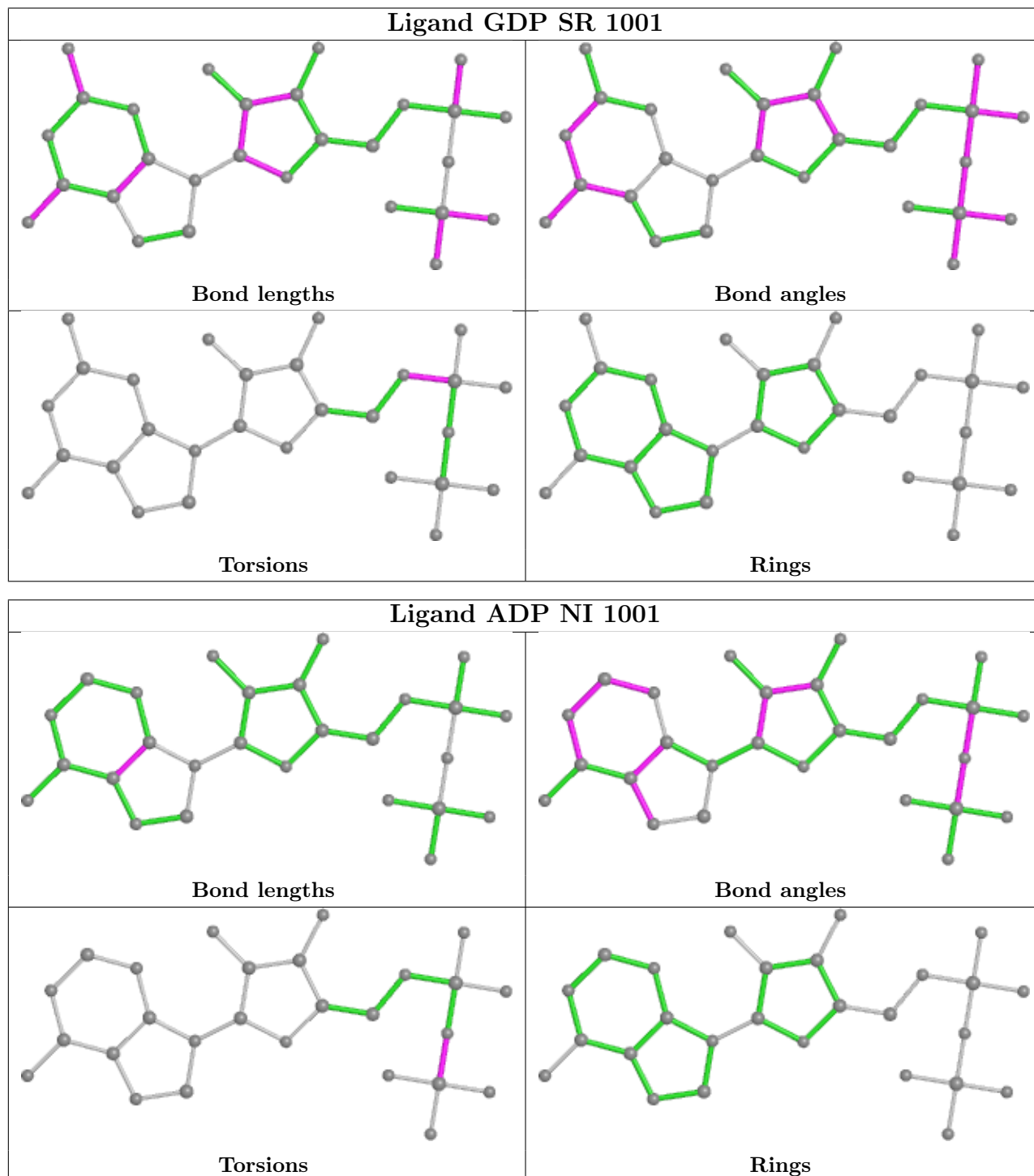
There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is



within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

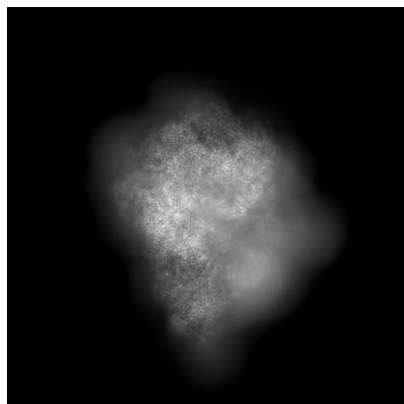
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29257. These allow visual inspection of the internal detail of the map and identification of artifacts.

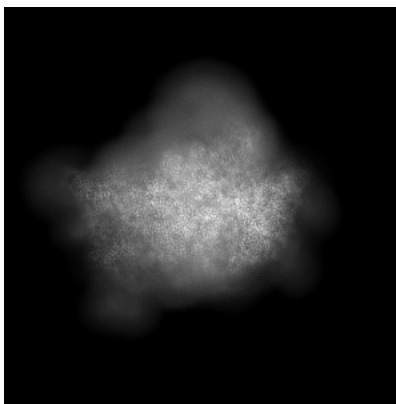
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

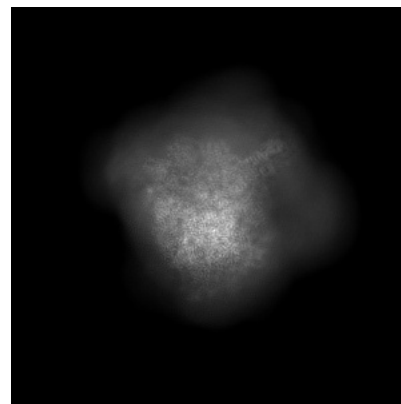
#### 6.1.1 Primary map



X

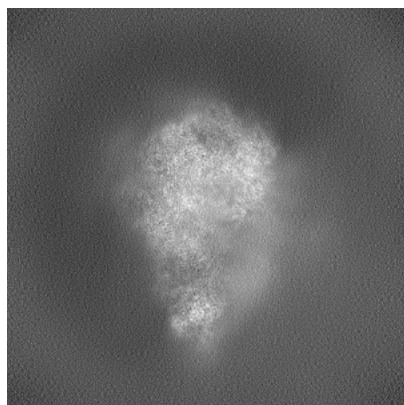


Y

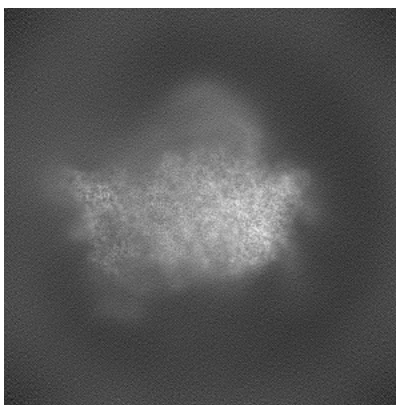


Z

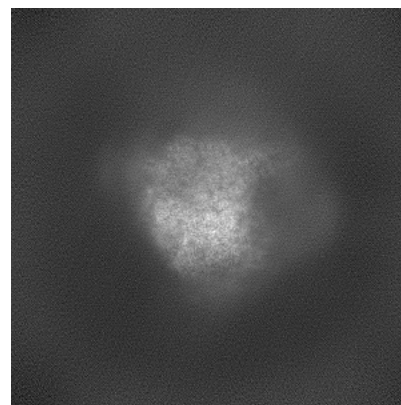
#### 6.1.2 Raw map



X



Y

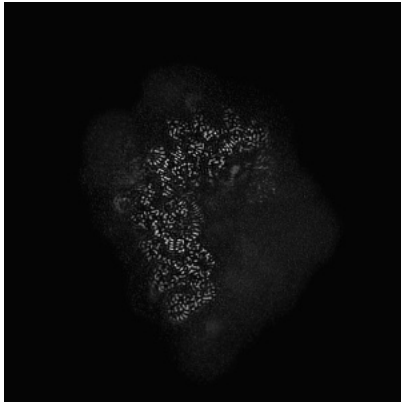


Z

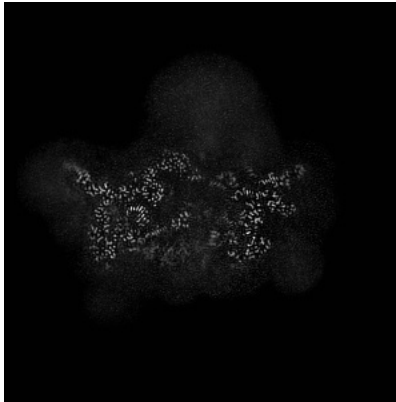
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

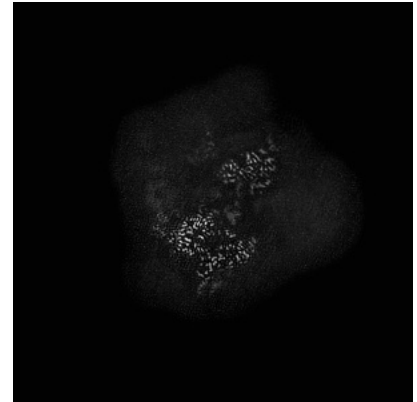
### 6.2.1 Primary map



X Index: 240

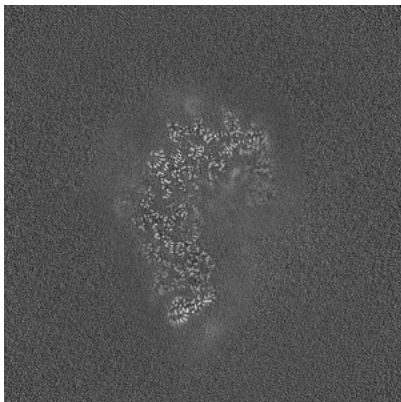


Y Index: 240

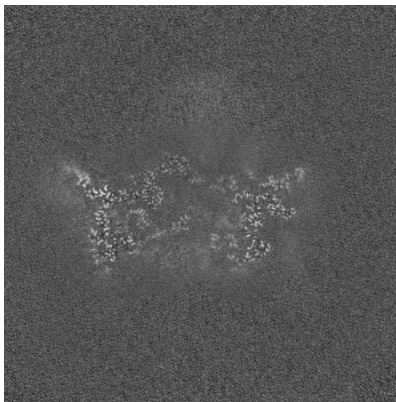


Z Index: 240

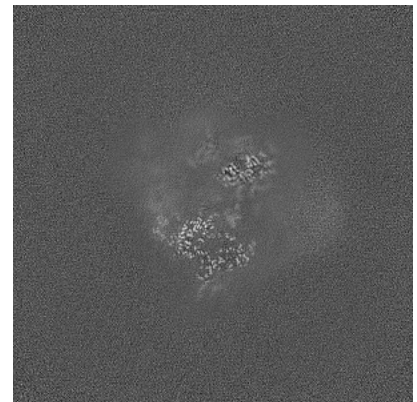
### 6.2.2 Raw map



X Index: 240



Y Index: 240

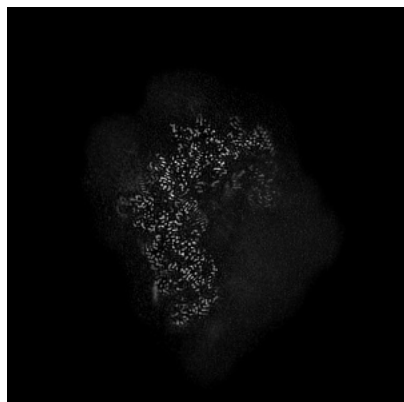


Z Index: 240

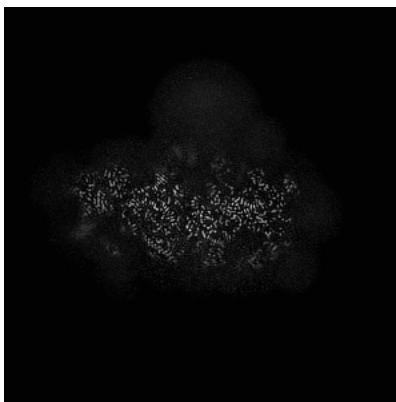
The images above show central slices of the map in three orthogonal directions.

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

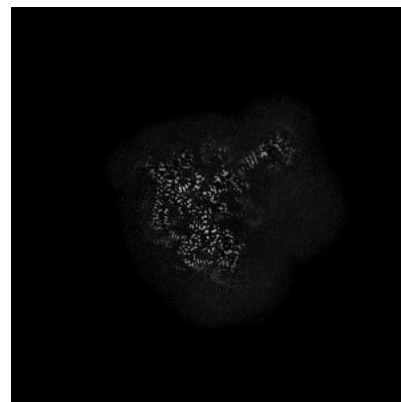
### 6.3.1 Primary map



X Index: 237

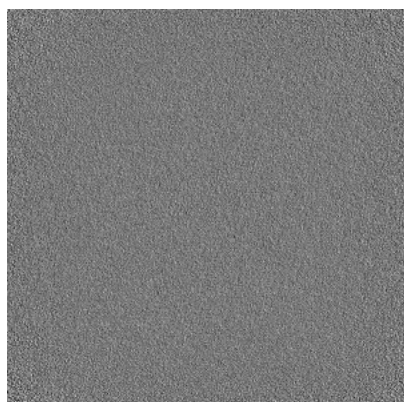


Y Index: 211

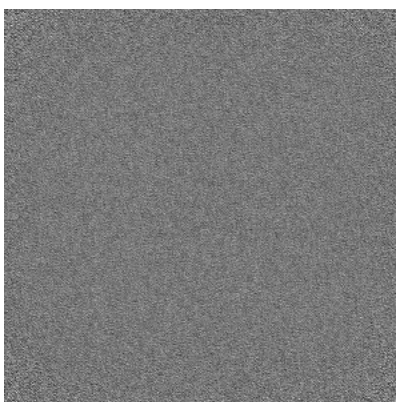


Z Index: 289

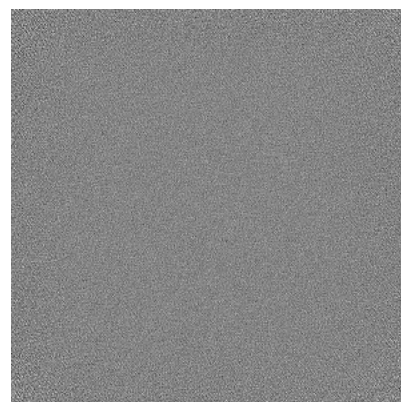
### 6.3.2 Raw map



X Index: 0



Y Index: 0

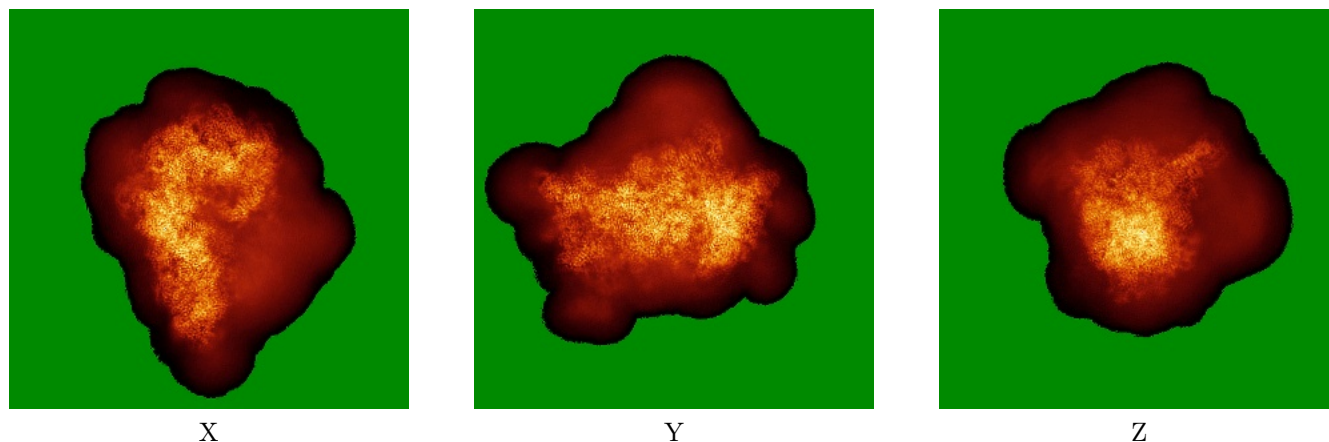


Z Index: 0

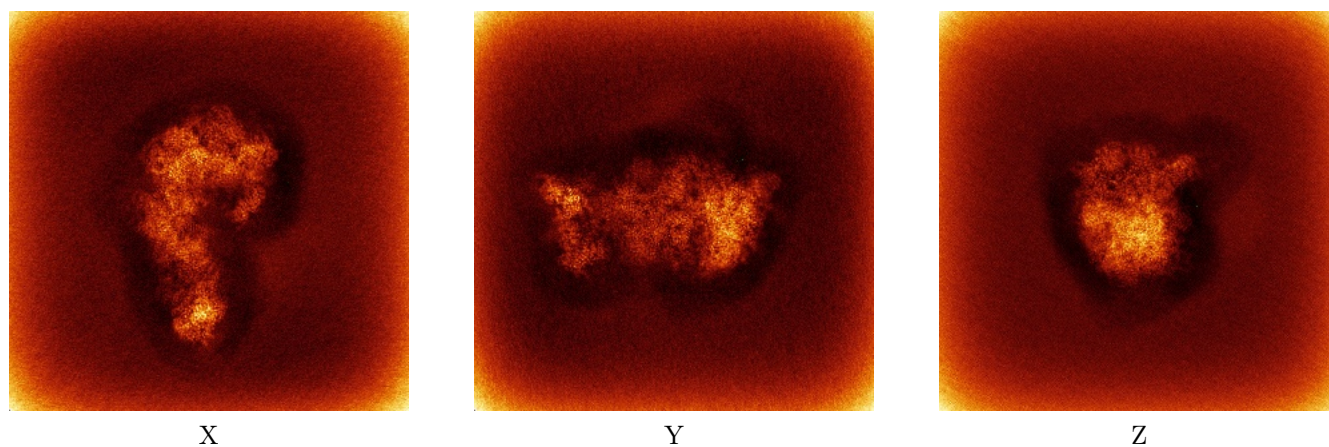
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



### 6.4.2 Raw map



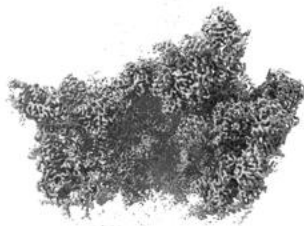
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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

### 6.5.1 Primary map



X



Y



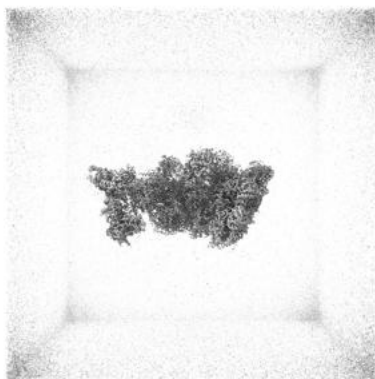
Z

The images above show the 3D surface view of the map at the recommended contour level 0.9. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

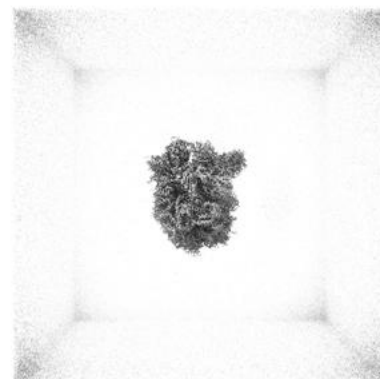
### 6.5.2 Raw map



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.

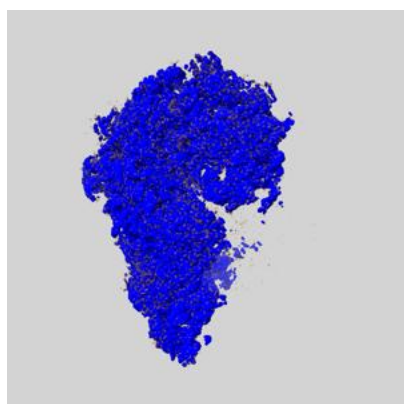
## 6.6 Mask visualisation [i](#)

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

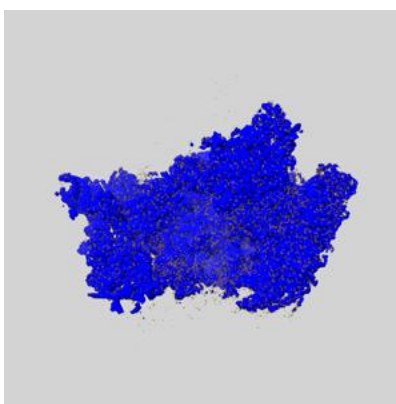
A mask typically either:

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

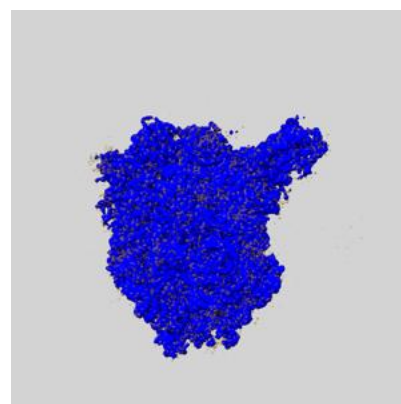
### 6.6.1 emd\_29257\_msk\_1.map [i](#)



X



Y



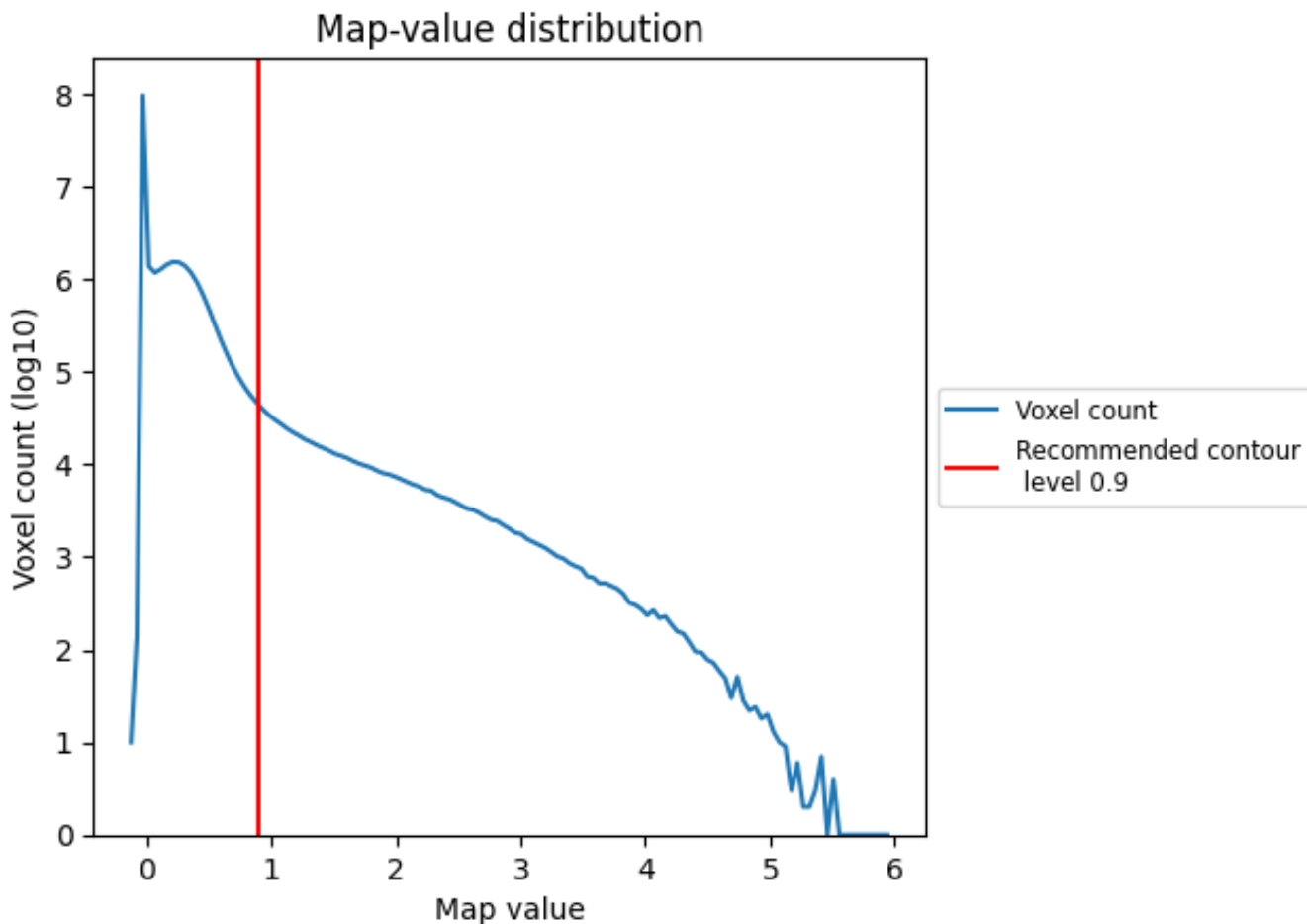
Z



## 7 Map analysis [i](#)

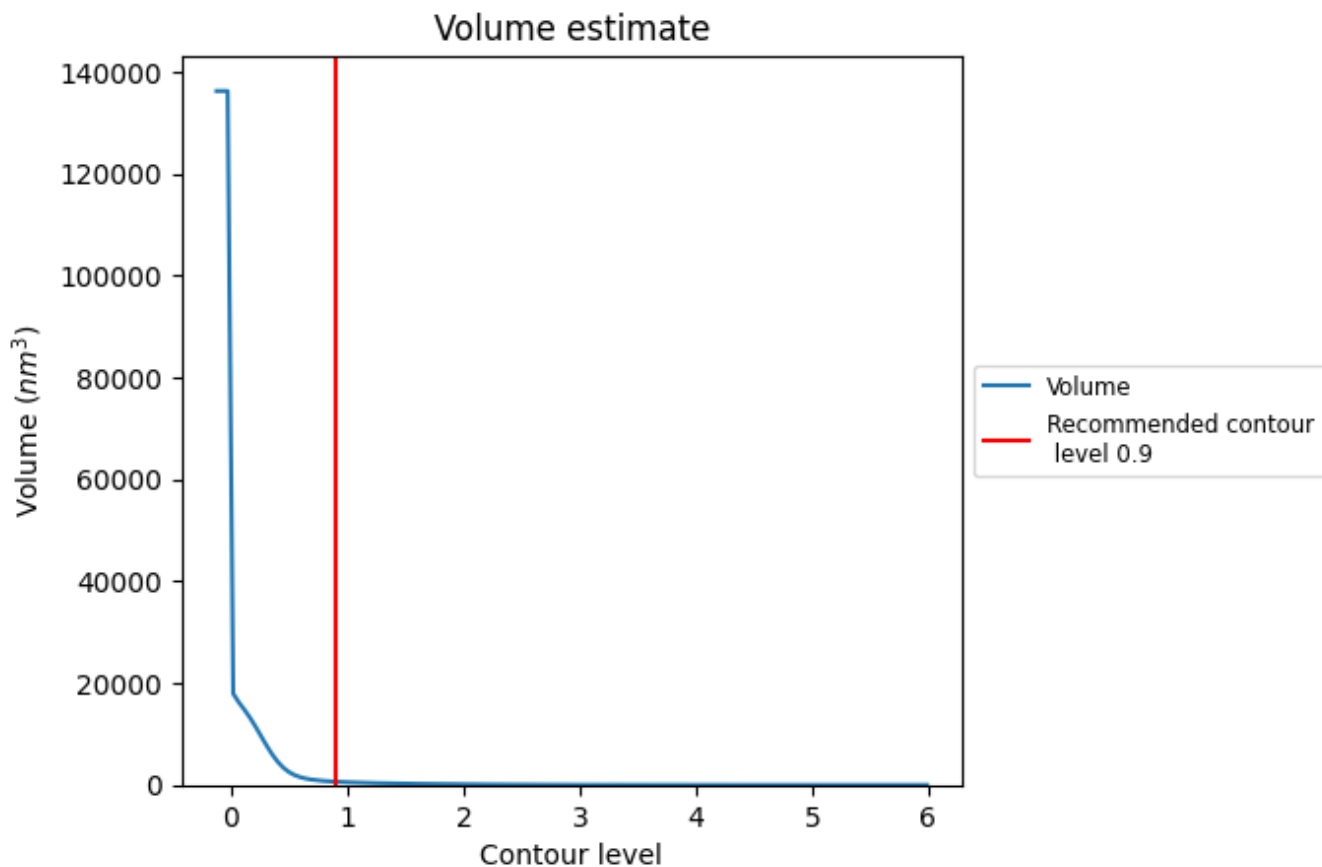
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

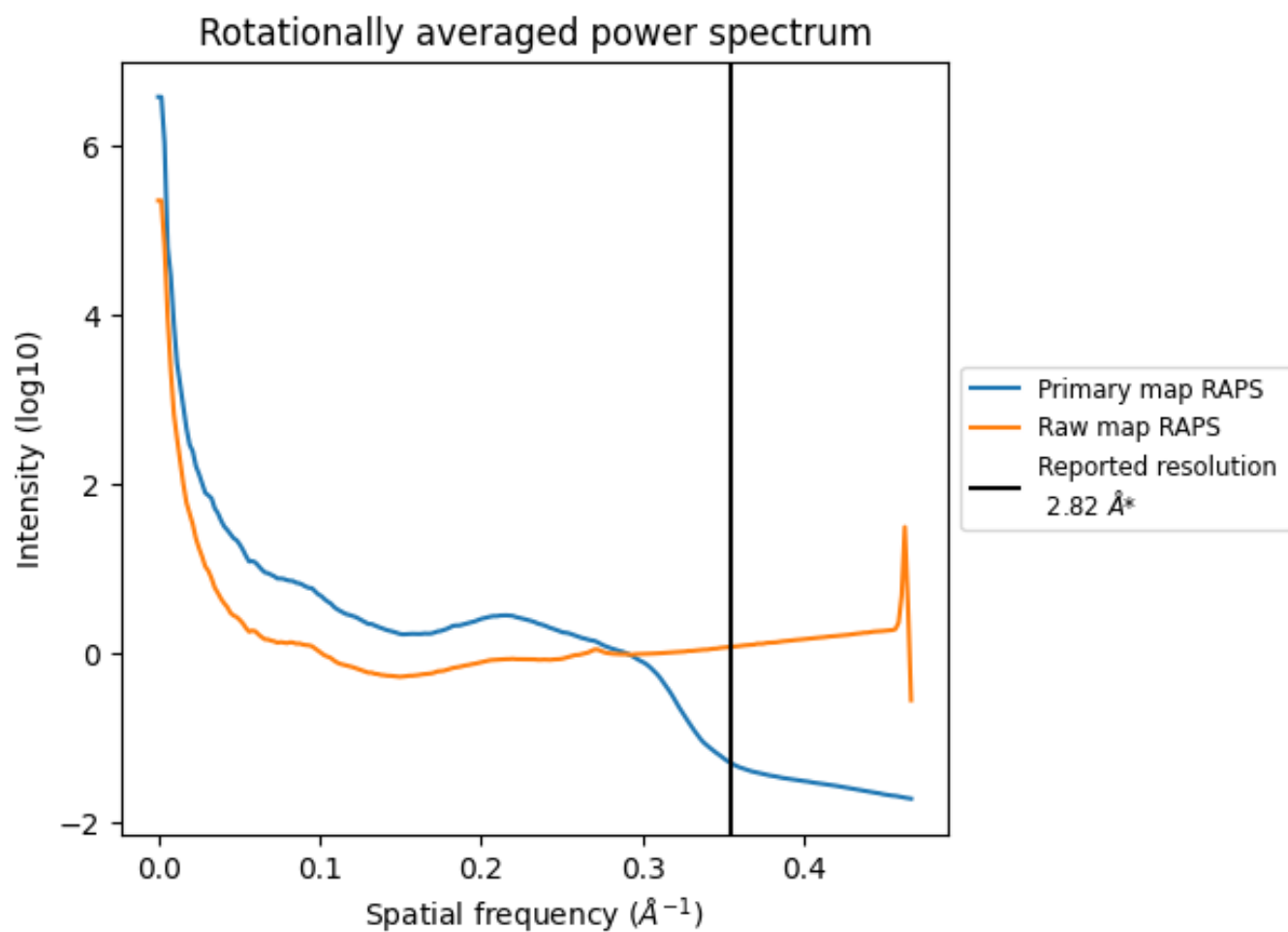
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 640 nm<sup>3</sup>; this corresponds to an approximate mass of 578 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

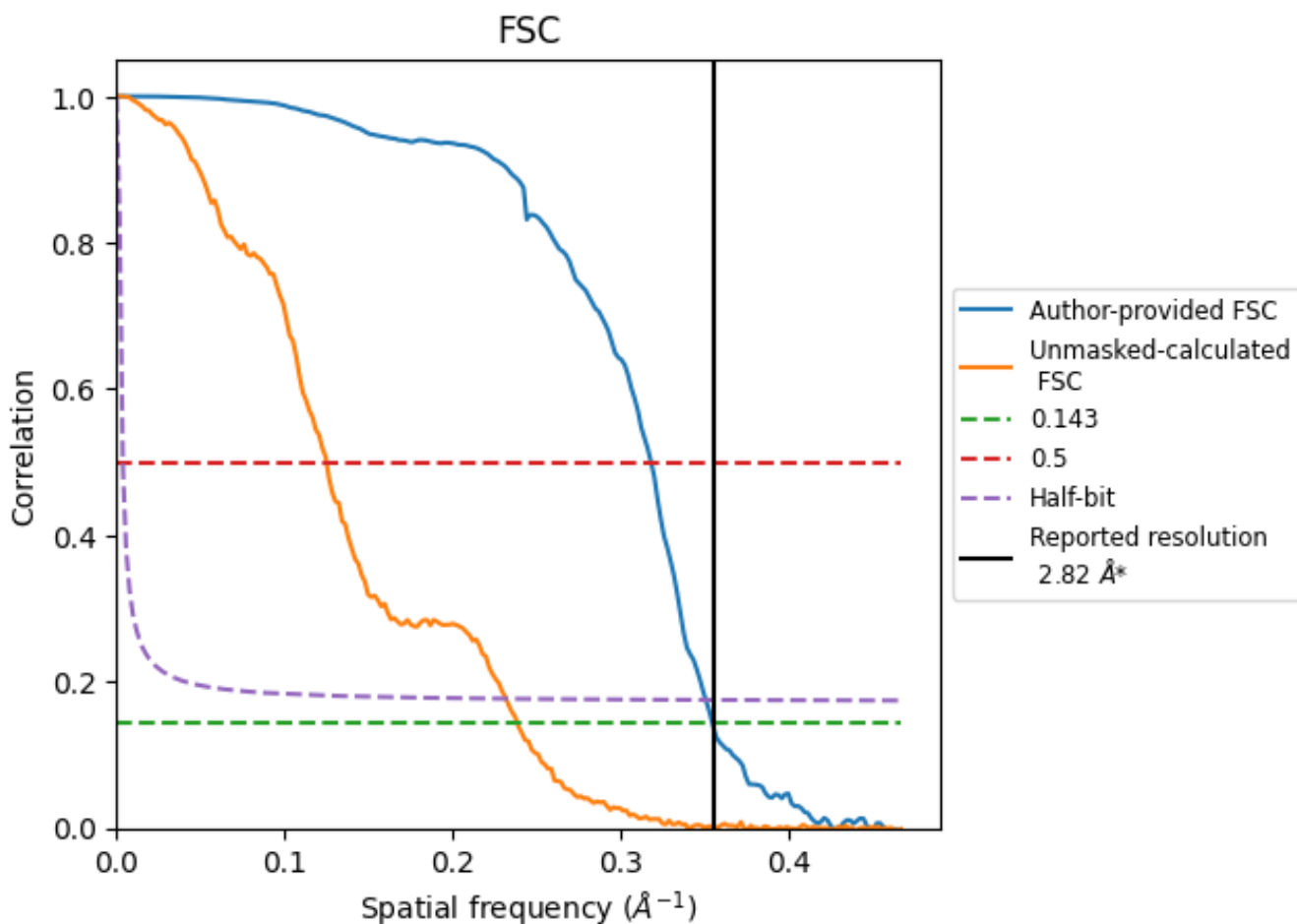


\*Reported resolution corresponds to spatial frequency of  $0.355 \text{ \AA}^{-1}$

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of  $0.355 \text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

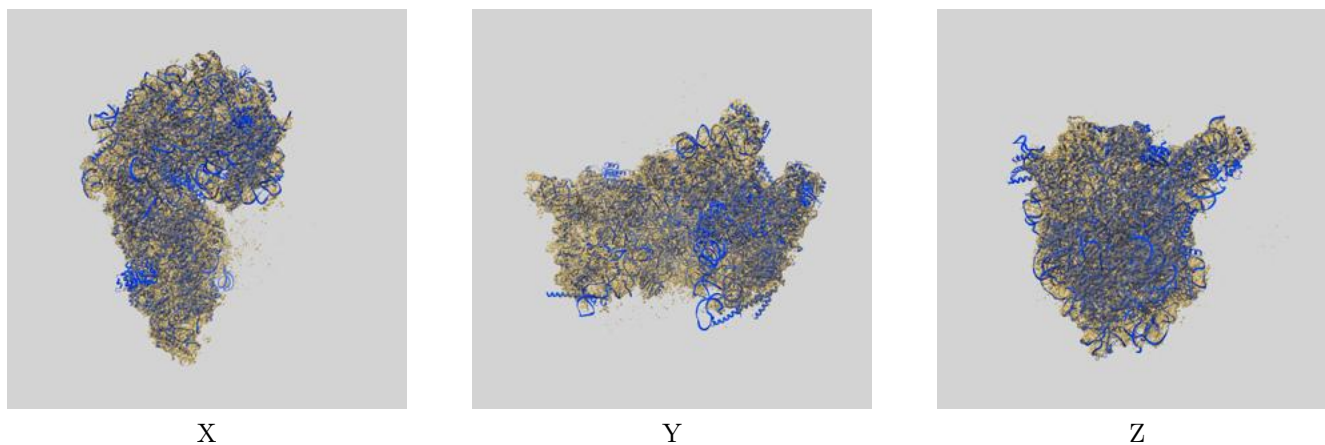
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.82	-	-
Author-provided FSC curve	2.82	3.15	2.85
Unmasked-calculated*	4.20	8.01	4.32

\*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 4.20 differs from the reported value 2.82 by more than 10 %

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

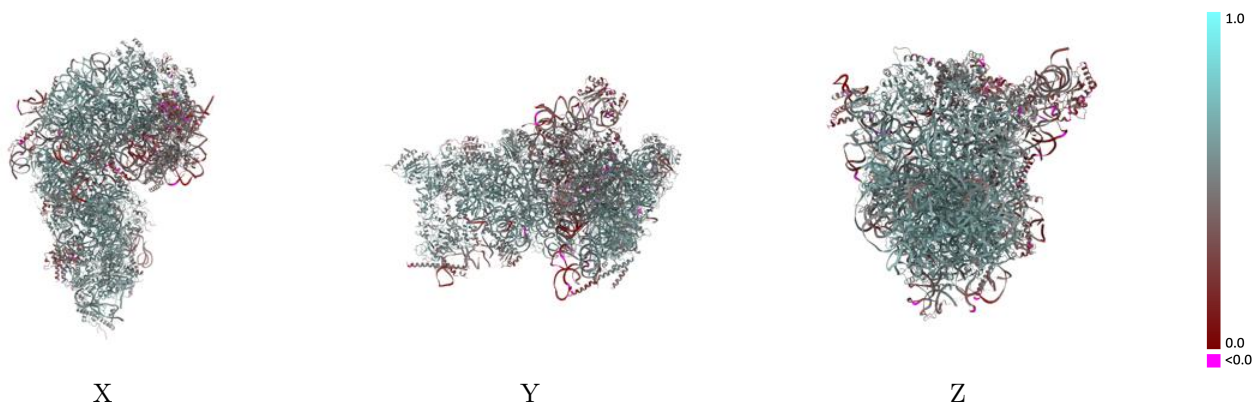
This section contains information regarding the fit between EMDB map EMD-29257 and PDB model 8FKU. Per-residue inclusion information can be found in section 3 on page 15.

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



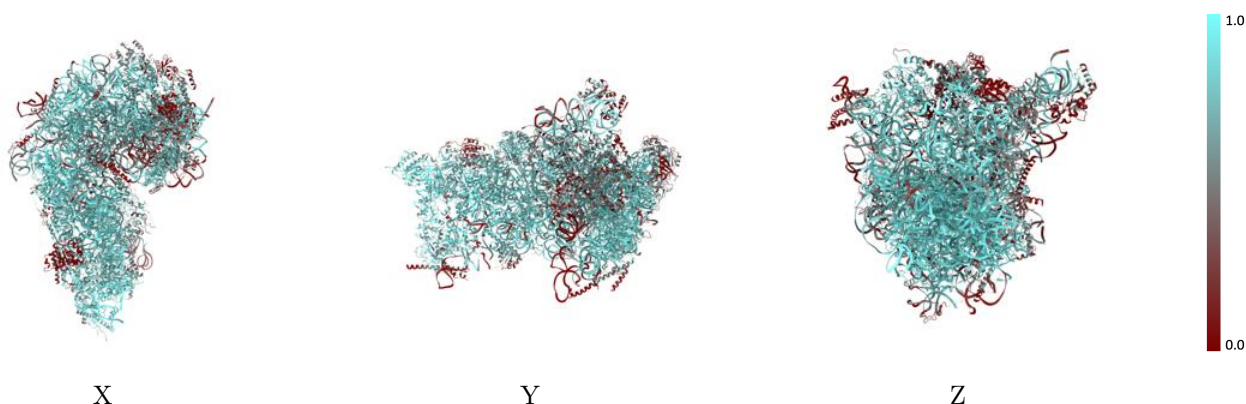
The images above show the 3D surface view of the map at the recommended contour level 0.9 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



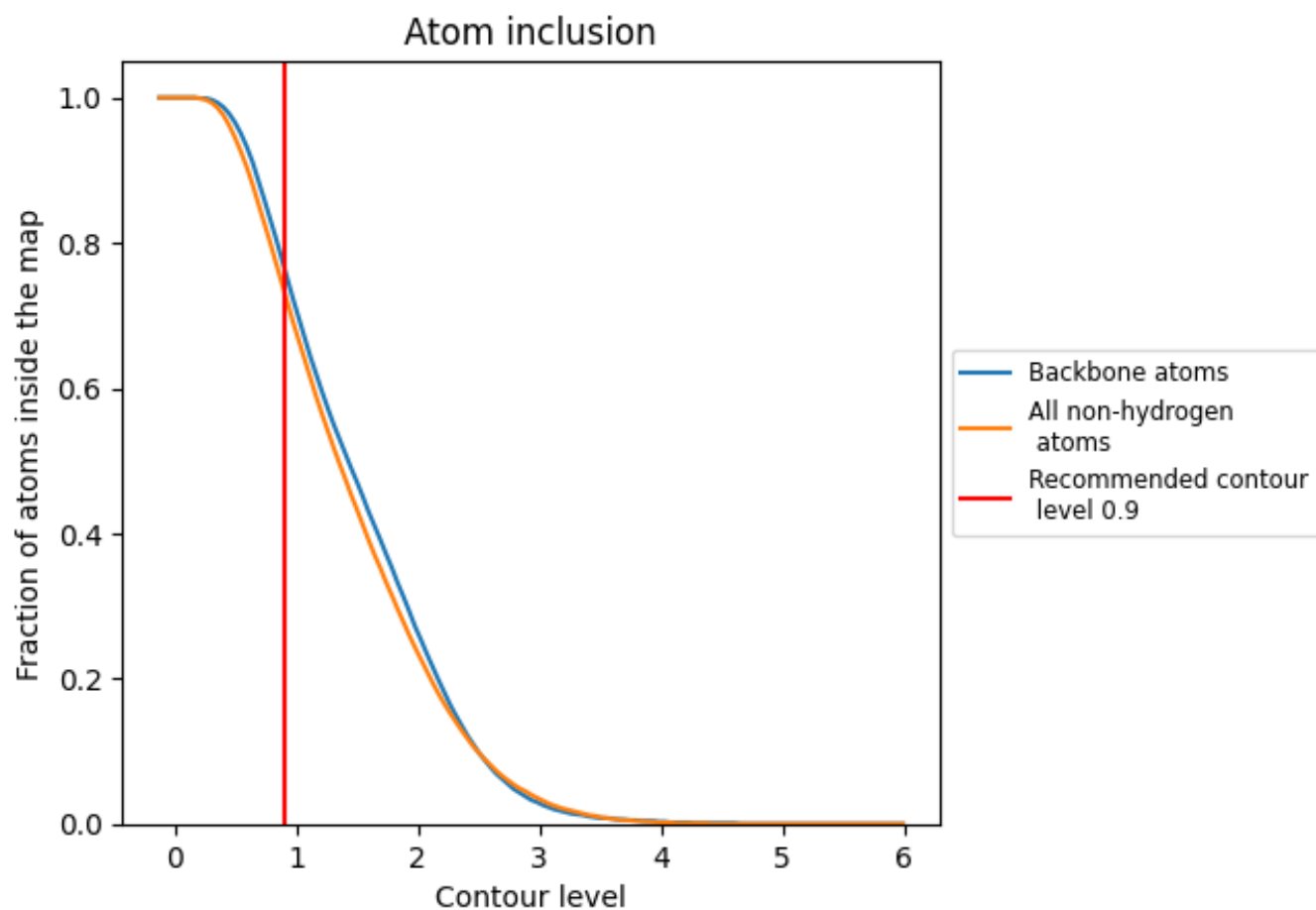
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.9).

## 9.4 Atom inclusion [i](#)









































































At the recommended contour level, 77% of all backbone atoms, 73% 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 (0.9) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7330	 0.5280
BA	 0.2500	 0.4160
BB	 0.3590	 0.3040
L1	 0.8810	 0.5590
L2	 0.9210	 0.5540
L3	 0.7800	 0.5220
L6	 0.8790	 0.5870
L7	 0.8680	 0.6220
L8	 0.8760	 0.6140
L9	 0.9310	 0.6180
LA	 0.6450	 0.5190
LB	 0.9060	 0.6040
LC	 0.8690	 0.6200
LE	 0.4470	 0.4540
LG	 0.6780	 0.5410
LH	 0.5390	 0.4680
LI	 0.8430	 0.5890
LK	 0.6580	 0.4310
LL	 0.8820	 0.5890
LN	 0.8120	 0.6020
LQ	 0.9090	 0.6170
LS	 0.7880	 0.5720
LT	 0.9480	 0.6450
LU	 0.7480	 0.5620
LW	 0.8660	 0.5970
NB	 0.5840	 0.5450
NF	 0.6420	 0.5020
NH	 0.6800	 0.4440
NI	 0.3130	 0.4050
NK	 0.6150	 0.5530
SA	 0.8610	 0.5950
SC	 0.6500	 0.5390
SD	 0.8190	 0.5710
SE	 0.8660	 0.5990
SG	 0.7910	 0.6040



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Chain	Atom inclusion	Q-score
SH	 0.8220	 0.5610
SI	 0.7770	 0.5430
SJ	 0.4310	 0.4670
SK	 0.7650	 0.5410
SL	 0.7880	 0.5480
SM	 0.7200	 0.5240
SN	 0.5520	 0.4750
SO	 0.7000	 0.5350
SQ	 0.5520	 0.5420
SR	 0.6980	 0.5400
SS	 0.6770	 0.5200
ST	 0.3650	 0.3850
SV	 0.6030	 0.4760
SW	 0.4560	 0.4670
SY	 0.6850	 0.4340
SZ	 0.7760	 0.5450