



Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 09:02 am GMT

PDB ID : 6RXV
EMDB ID : EMD-10053
Title : Cryo-EM structure of the 90S pre-ribosome (Kre33-Noc4) from *Chaetomium thermophilum*, state B2
Authors : Cheng, J.; Kellner, N.; Griesel, S.; Berninghausen, O.; Beckmann, R.; Hurt, E.
Deposited on : 2019-06-10
Resolution : 4.00 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

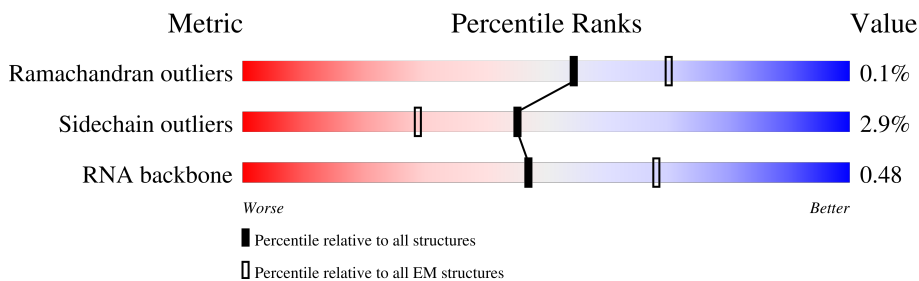
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

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 4.00 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
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 ≥ 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	UA	904	
2	UB	907	
3	UC	648	
4	UD	884	
5	UF	414	
6	UG	558	
7	UJ	1802	
8	UK	270	



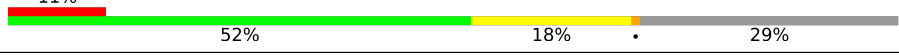
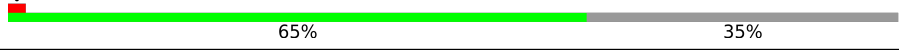
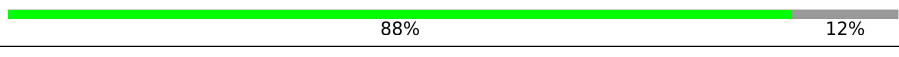

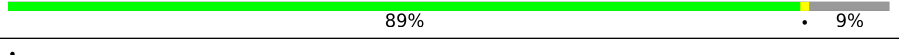
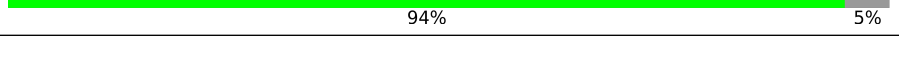
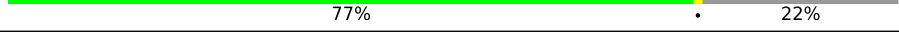
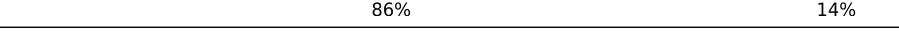
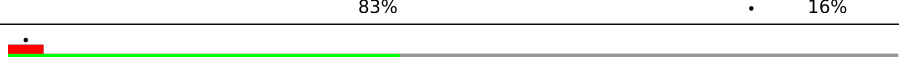
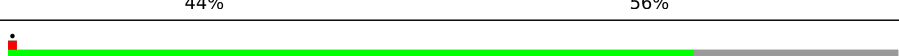

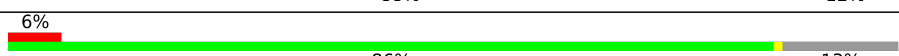
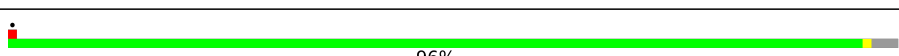
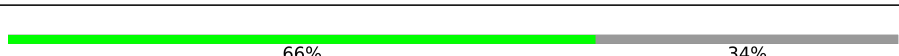



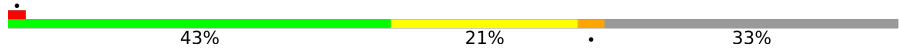

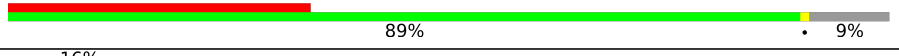

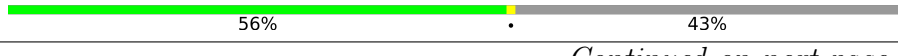

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Mol	Chain	Length	Quality of chain
9	UL	962	81% 18%
10	UM	912	79% 20%
11	UN	938	19% 81%
12	UO	557	90% 10%
13	UQ	960	81% 18%
14	UR	618	72% 28%
15	UU	1049	85% 14%
16	UX	193	98%
17	UZ	391	59% 40%
18	CA	313	77% 23%
18	CB	313	75% 24%
19	CC	523	74% 26%
20	CD	582	72% 28%
21	CE	127	94% 5%
21	CF	127	93% 6%
22	CG	630	66% 34%
23	CH	411	94% 5%
24	CI	1163	70% 29%
25	CJ	183	97%
26	CK	297	99%
27	CL	785	29% 71%
28	CM	446	100%
29	CN	252	89% 10%
29	CO	252	84% 15%
30	CP	322	72% 28%











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Mol	Chain	Length	Quality of chain
31	CQ	259	 67% 32%
32	CR	1073	 52% 18% 29%
32	CS	1073	 11% 52% 18% 29%
33	CT	203	 65% 35%
34	Ca	255	 88% 12%
35	Cb	264	 88% 12%
36	Cc	212	 89% 9%
37	Cd	239	 94% 5%
38	Ce	203	 77% 22%
39	Cf	202	 86% 14%
40	Cg	190	 83% 16%
41	Ch	151	 44% 56%
42	Ci	150	 77% 23%
43	Cj	143	 88% 12%
44	Ck	161	 6% 86% 13%
45	Cm	130	 96%
46	Cn	145	 66% 34%
47	Co	136	 67% 32%
48	Cp	68	 90% 10%
49	CU	311	 56% 43%
50	C1	2352	 43% 21% 33%
51	C2	230	 66% 30%
52	UV	1171	 34% 89% 9%
53	CV	322	 16% 44% 54%
54	CW	668	 56% 43%

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Mol	Chain	Length	Quality of chain
55	UT	2612	 77% 22%
56	UH	930	 38% 61%
57	UE	410	 22% 7% 70%
57	UI	410	 22% 7% 70%
58	US	549	 82% 18%
59	CI	156	 8% 49% 49%
60	CX	480	 5% 55% 44%
61	CY	381	 30% 68%
62	CZ	609	 7% 93%
63	UP	364	 15% 85%

2 Entry composition [i](#)

There are 66 unique types of molecules in this entry. The entry contains 221395 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 Periodic tryptophan protein 2-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	UA	839	6366	4101	1136	1105	24	0	0

- Molecule 2 is a protein called Utp2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	UB	512	4079	2576	781	711	11	0	0

- Molecule 3 is a protein called Utp3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	UC	74	588	371	120	97	0	0

- Molecule 4 is a protein called Utp4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	UD	772	6071	3851	1093	1103	24	0	0

- Molecule 5 is a protein called Utp6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	UF	331	2591	1674	504	399	14	0	0

- Molecule 6 is a protein called Utp7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	UG	479	3717	2369	700	636	12	0	0

- Molecule 7 is a protein called UTP10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	UJ	1090	8416	5408	1452	1525	31	0	0

- Molecule 8 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	UK	217	1687	1062	351	269	5	0	0

- Molecule 9 is a protein called Utp12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	UL	785	6175	3940	1088	1130	17	0	0

- Molecule 10 is a protein called Utp13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	UM	729	5643	3590	995	1045	13	0	0

- Molecule 11 is a protein called Utp14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	UN	177	1401	892	263	239	7	0	0

- Molecule 12 is a protein called Utp15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	UO	504	3819	2422	699	684	14	0	0

- Molecule 13 is a protein called Utp17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	UQ	789	6008	3831	1037	1119	21	0	0

- Molecule 14 is a protein called Utp18.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	UR	447	Total	C	N	O	S	0	0
			3491	2209	656	616	10		

- Molecule 15 is a protein called Utp21.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	UU	902	Total	C	N	O	S	0	0
			6734	4336	1236	1136	26		

- Molecule 16 is a protein called Utp24.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	UX	190	Total	C	N	O	S	0	0
			1470	932	282	246	10		

- Molecule 17 is a protein called Utp30.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	UZ	235	Total	C	N	O	S	0	0
			1815	1184	330	298	3		

- Molecule 18 is a protein called Nop1.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	CA	242	Total	C	N	O	S	0	0
			1778	1149	327	293	9		
18	CB	237	Total	C	N	O	S	0	0
			1816	1154	318	335	9		

- Molecule 19 is a protein called Nop56.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	CC	387	Total	C	N	O	S	0	0
			2866	1836	527	492	11		

- Molecule 20 is a protein called Nop58.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	CD	420	Total	C	N	O	S	0	0
			3150	2023	560	557	10		

- Molecule 21 is a protein called Snu13.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	CE	121	Total	C	N	O	S	0	0
			879	557	165	154	3		
21	CF	120	Total	C	N	O	S	0	0
			864	550	161	150	3		

- Molecule 22 is a protein called Rrp9.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	CG	416	Total	C	N	O	S	0	0
			3245	2065	587	580	13		

- Molecule 23 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	CH	389	Total	C	N	O	S	0	0
			2888	1827	526	525	10		

- Molecule 24 is a protein called Bms1.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	CI	822	Total	C	N	O	S	0	0
			6486	4169	1213	1077	27		

- Molecule 25 is a protein called Imp3.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	CJ	179	Total	C	N	O	S	0	0
			1434	918	283	226	7		

- Molecule 26 is a protein called Imp4.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	CK	297	Total	C	N	O	S	0	0
			2329	1476	445	400	8		

- Molecule 27 is a protein called Mpp10.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	CL	231	Total	C	N	O	S	0	0
			1786	1114	339	327	6		

- Molecule 28 is a protein called Sof1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	CM	445	3501	2195	672	619	15	0	0

- Molecule 29 is a protein called Emg1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	CN	226	1762	1119	306	327	10	0	0
29	CO	215	1683	1067	293	313	10	0	0

- Molecule 30 is a protein called KRR1 small subunit processome component.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	CP	233	1893	1209	340	335	9	0	0

- Molecule 31 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	CQ	175	1361	862	250	242	7	0	0

- Molecule 32 is a protein called Kre33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	CR	760	5989	3851	1024	1087	27	0	0
32	CS	760	5989	3851	1024	1087	27	0	0

- Molecule 33 is a protein called Fcf2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	CT	131	1035	656	197	178	4	0	0

- Molecule 34 is a protein called 40S ribosomal protein S1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	Ca	225	1821	1160	341	315	5	0	0

- Molecule 35 is a protein called 40S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	Cb	232	1851	1179	340	325	7	0	0

- Molecule 36 is a protein called 40S ribosomal protein s5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Cc	192	1464	926	278	253	7	0	0

- Molecule 37 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	Cd	226	1819	1138	363	313	5	0	0

- Molecule 38 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
38	Ce	159	1279	810	237	232	0	0

- Molecule 39 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	Cf	174	1398	872	283	242	1	0	0

- Molecule 40 is a protein called 40S ribosomal protein s9-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	Cg	159	1242	801	255	184	2	0	0

- Molecule 41 is a protein called 40S ribosomal protein S13-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
41	Ch	66	546	355	101	90	0	0

- Molecule 42 is a protein called 40S ribosomal protein S14-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	Ci	115	808	506	156	141	5	0	0

- Molecule 43 is a protein called 40S ribosomal protein S16-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	Cj	126	943	613	177	151	2	0	0

- Molecule 44 is a protein called 40S ribosomal protein S11-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	Ck	140	1163	750	224	184	5	0	0

- Molecule 45 is a protein called 40S ribosomal protein S22-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	Cm	126	985	632	184	164	5	0	0

- Molecule 46 is a protein called 40S ribosomal protein s23-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	Cn	96	702	456	134	110	2	0	0

- Molecule 47 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	Co	92	741	474	139	126	2	0	0

- Molecule 48 is a protein called 40S ribosomal protein S28-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
48	Cp	61	455	284	97	74	0	0

- Molecule 49 is a protein called Faf1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	CU	176	1337	822	265	244	6	0	0

- Molecule 50 is a RNA chain called 35S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
50	C1	1575	33604	14992	6023	11014	1575	0	0

- Molecule 51 is a RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
51	C2	230	4891	2182	856	1623	230	0	0

- Molecule 52 is a protein called U3 small nucleolar RNA-associated protein 22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	UV	1061	8424	5399	1480	1523	22	0	0

- Molecule 53 is a protein called Rrp7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	CV	148	1145	729	198	216	2	0	0

- Molecule 54 is a protein called Ribosome biogenesis protein ENP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	CW	382	2924	1857	530	524	13	0	0

- Molecule 55 is a protein called Utp20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	UT	2033	16049	10336	2819	2826	68	0	0

- Molecule 56 is a protein called Utp8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	UH	359	2809	1773	496	527	13	0	0

- Molecule 57 is a protein called Utp5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	UE	125	972	608	183	175	6	0	0
57	UI	125	972	608	183	175	6	0	0

- Molecule 58 is a protein called Noc4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	US	451	3672	2389	608	660	15	0	0

- Molecule 59 is a protein called Rps18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	CI	80	633	400	115	117	1	0	0

- Molecule 60 is a protein called Enp1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	CX	267	2130	1384	374	362	10	0	0

- Molecule 61 is a protein called U3 small nucleolar ribonucleoprotein protein lcp5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	CY	123	979	592	195	189	3	0	0

- Molecule 62 is a protein called Bfr2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	CZ	44	376	235	76	64	1	0	0

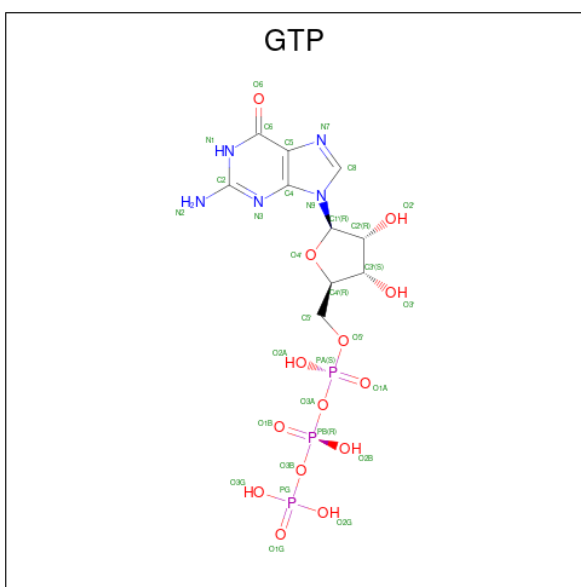
- Molecule 63 is a protein called Utp16.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
63	UP	54	422	264	88	70	0	0

- Molecule 64 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
64	UX	1	1	1	0

- Molecule 65 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).



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

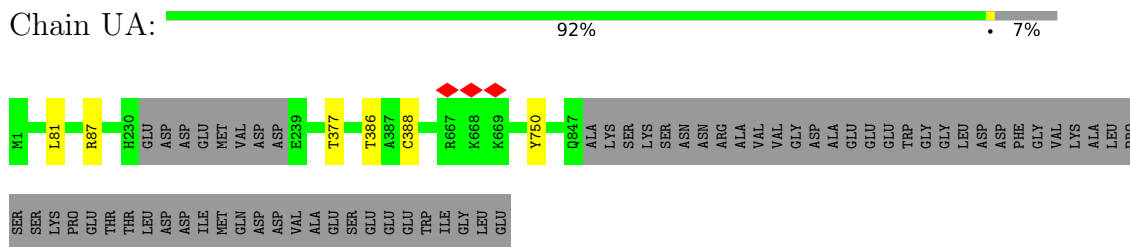
- Molecule 66 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
66	CI	1	1	1	0

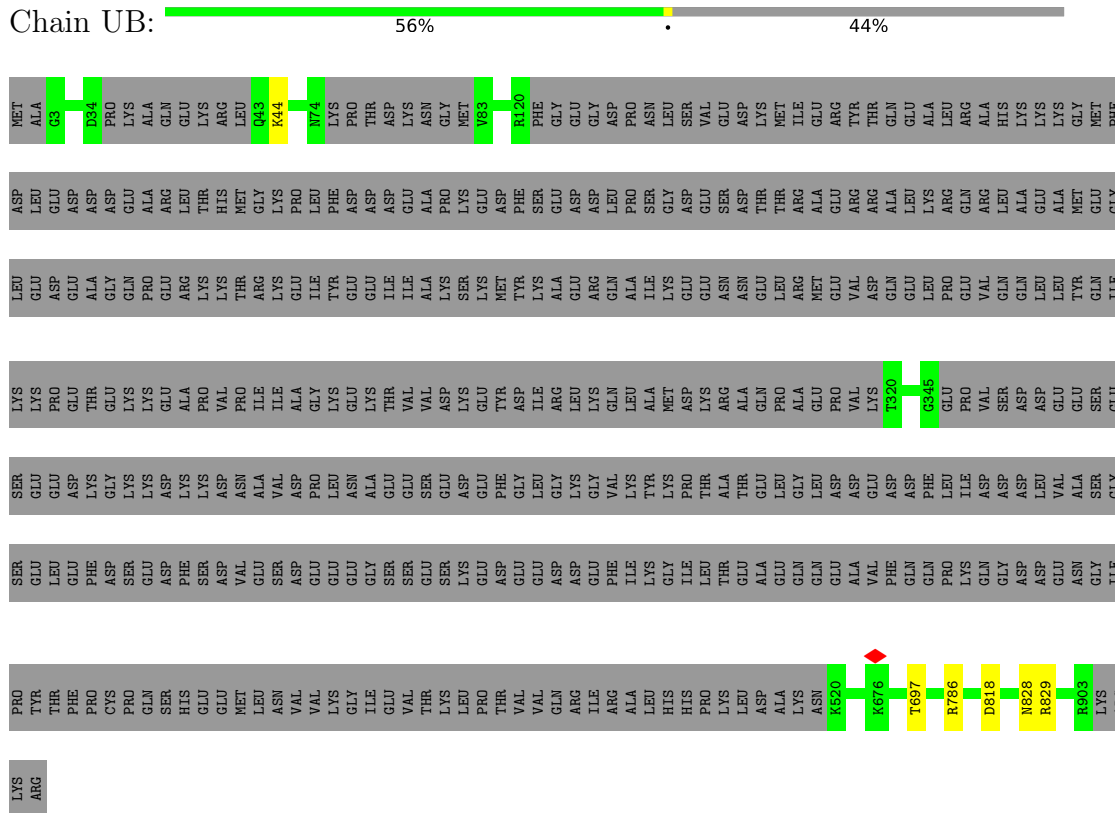
3 Residue-property plots i

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.

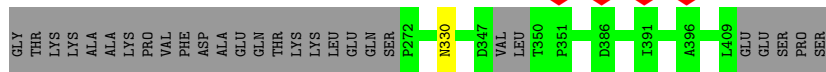
- Molecule 1: Periodic tryptophan protein 2-like protein



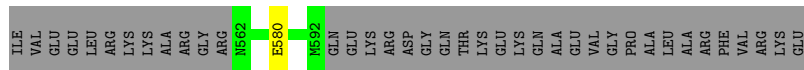
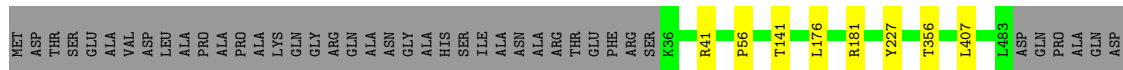
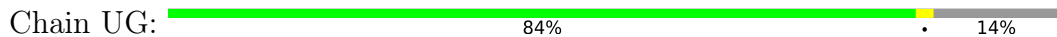
- Molecule 2: Utp2



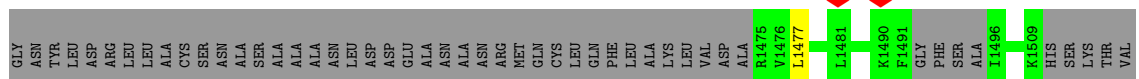
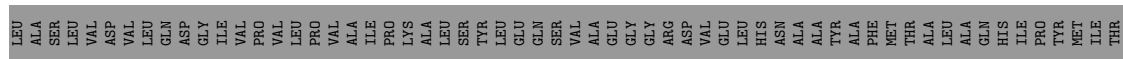
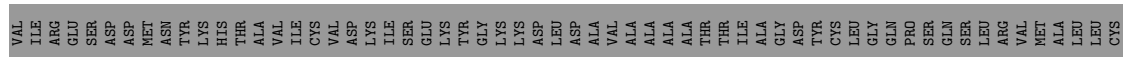
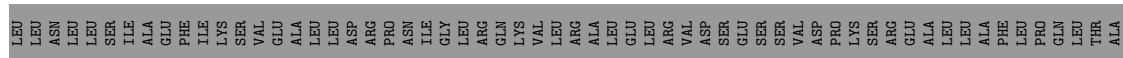
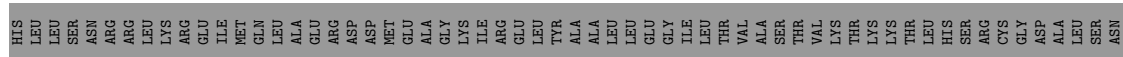
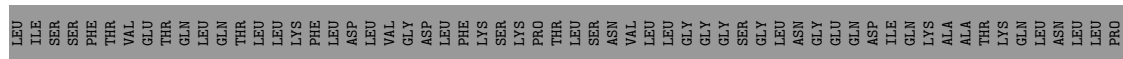
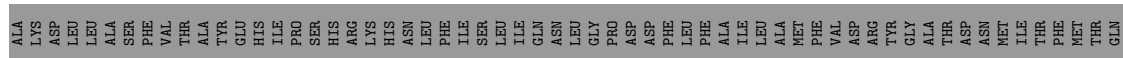
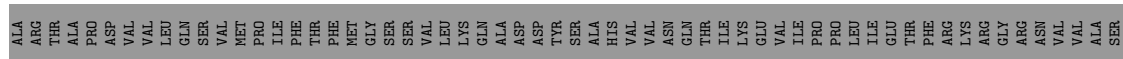
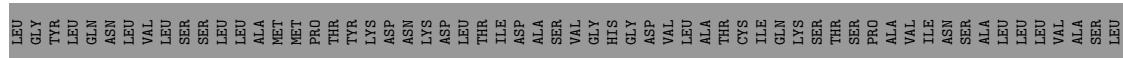
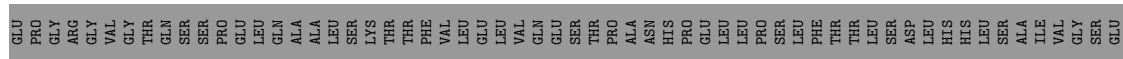
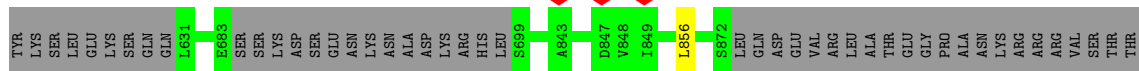
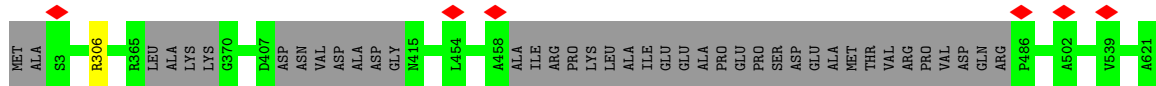
- Molecule 3: Utp3

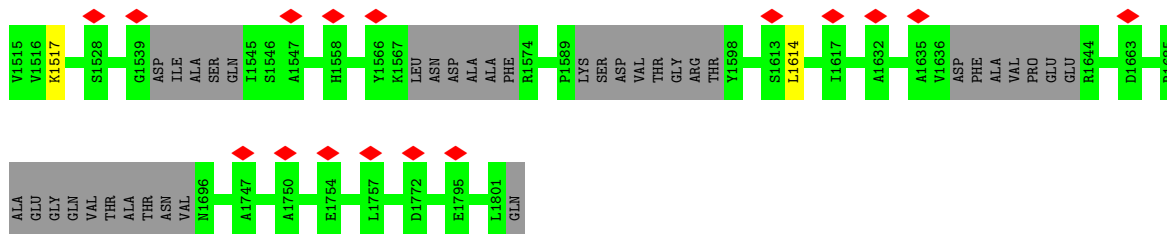


• Molecule 6: Utp7

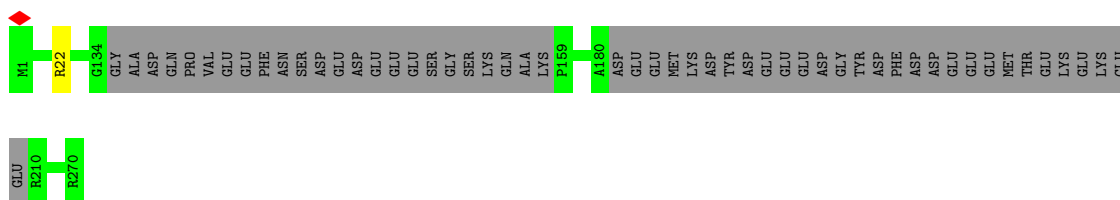
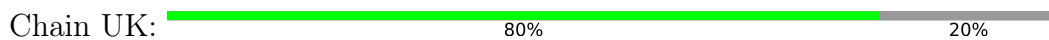


• Molecule 7: UTP10

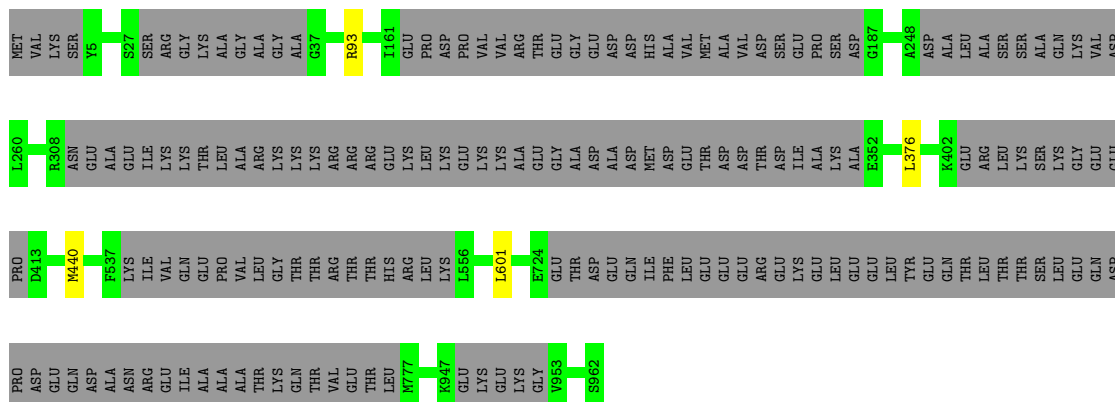
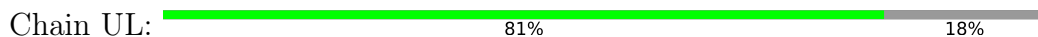




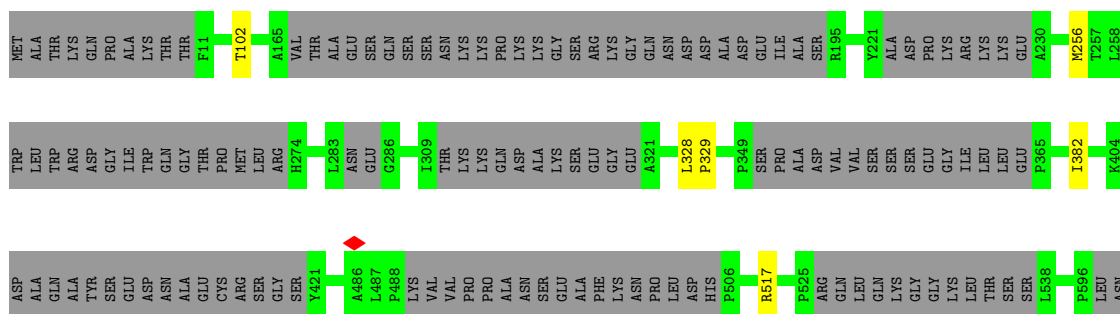
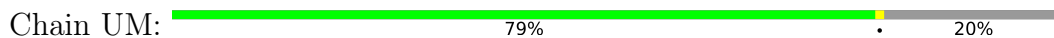
- Molecule 8: U3 small nucleolar RNA-associated protein 11



- Molecule 9: Utp12

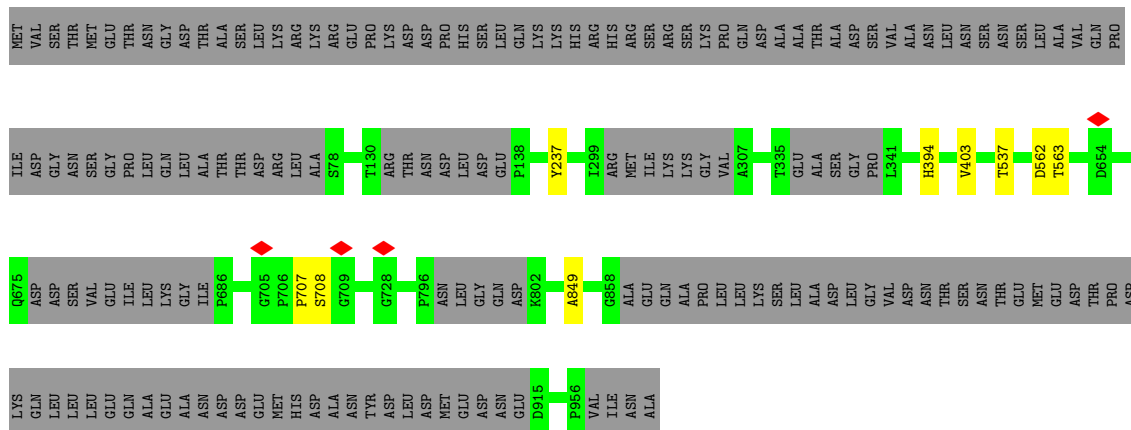


- Molecule 10: Utp13



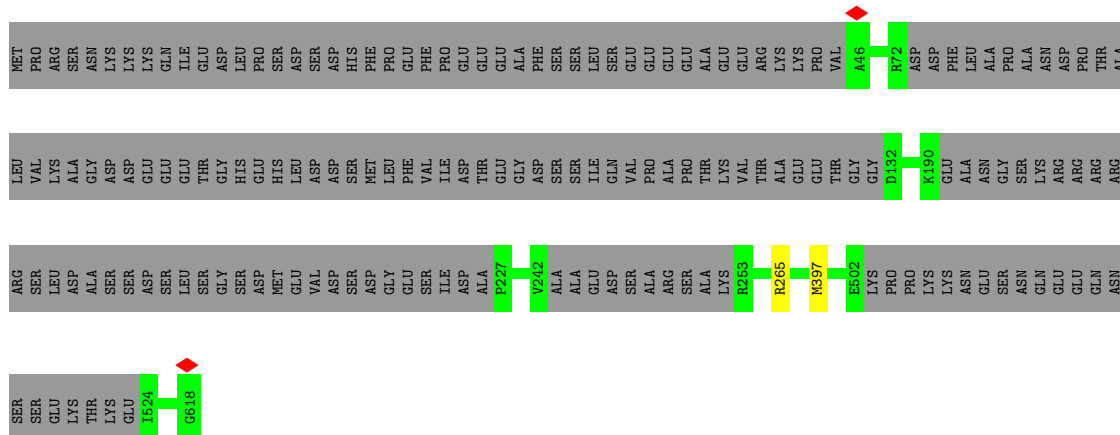
- Molecule 13: Utp17

Chain UQ: 81% 18%



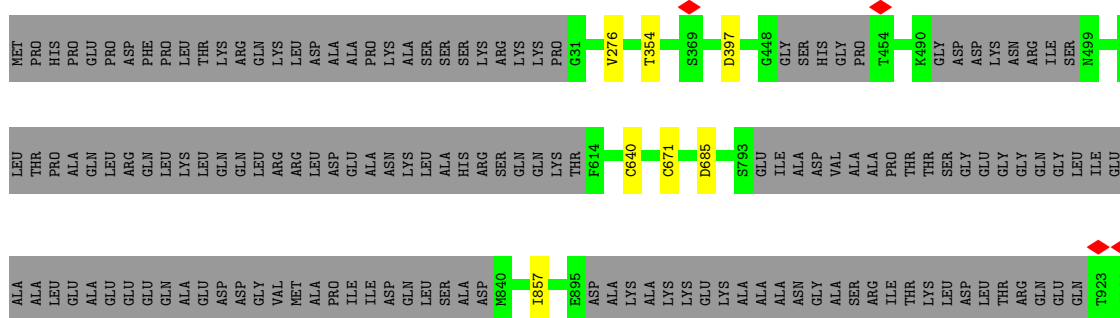
- Molecule 14: Utp18

Chain UR: 72% 28%



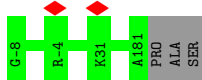
- Molecule 15: Utp21

Chain UU: 85% 14%

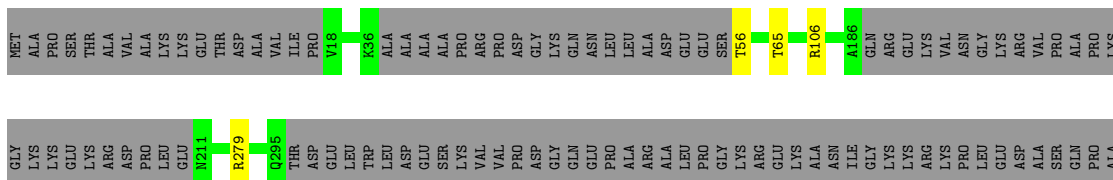




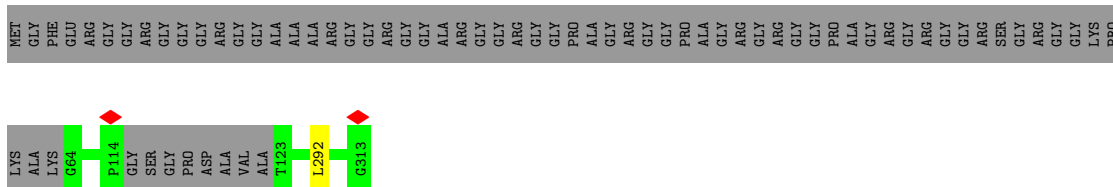
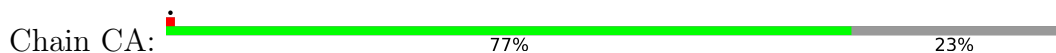
• Molecule 16: Utp24



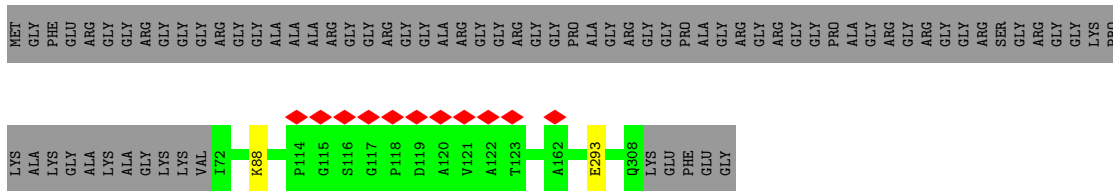
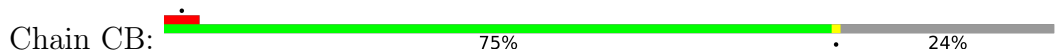
• Molecule 17: Utp30



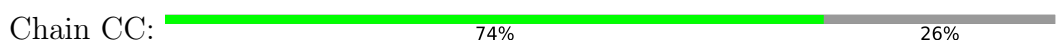
• Molecule 18: Nop1

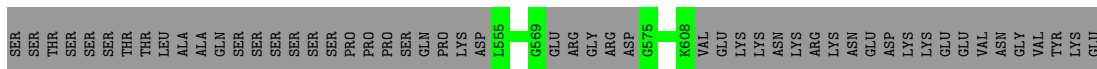


• Molecule 18: Nop1

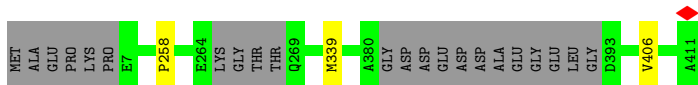


• Molecule 19: Nop56





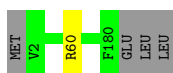
- Molecule 23: RNA 3'-terminal phosphate cyclase-like protein



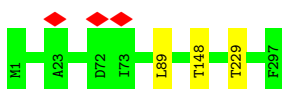
- Molecule 24: Bms1

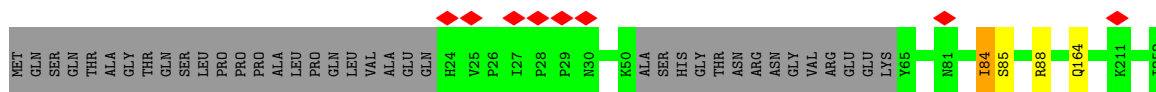


- Molecule 25: Imp3

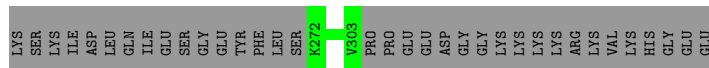
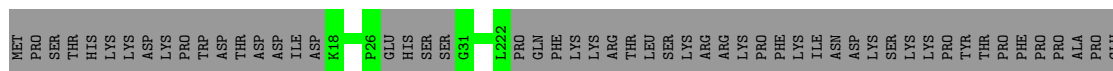


- Molecule 26: Imp4





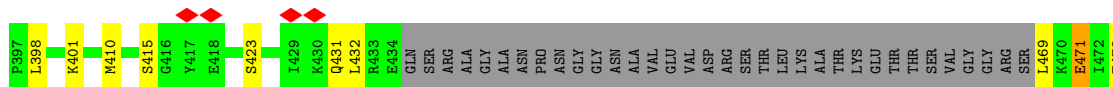
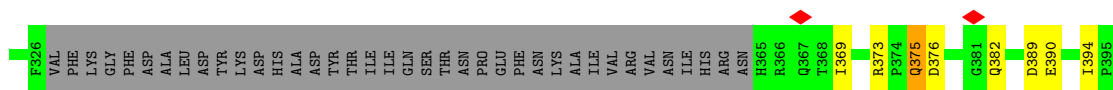
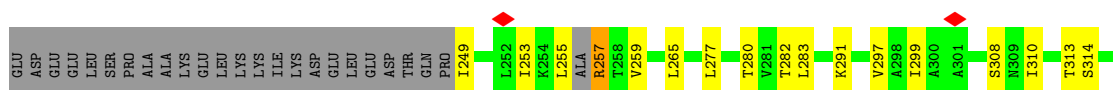
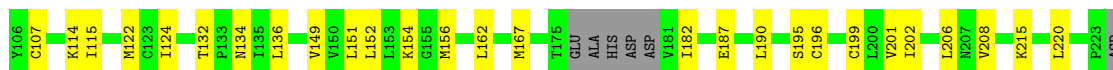
- Molecule 30: KRR1 small subunit processome component

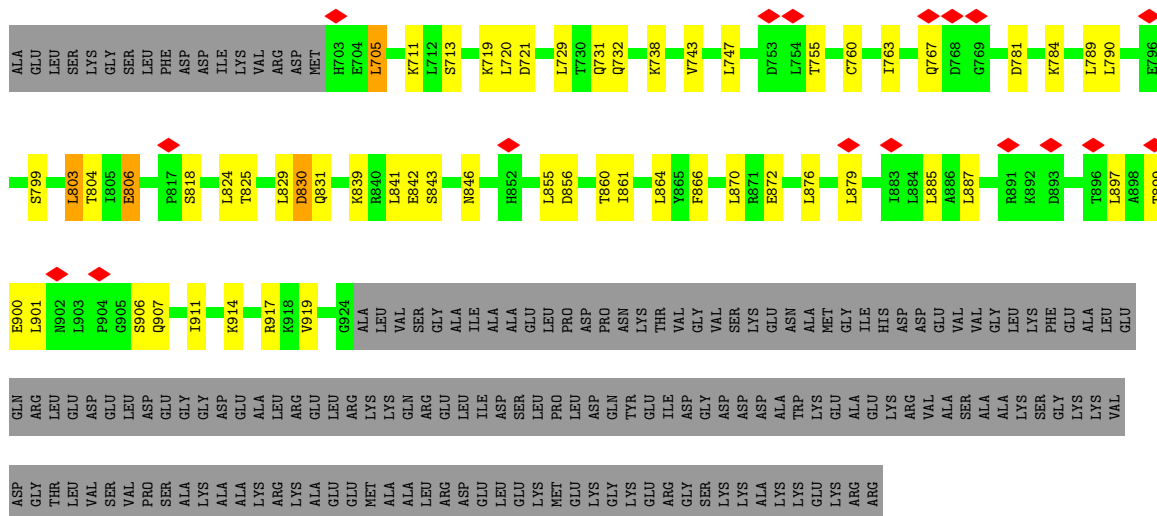


- Molecule 31: Pre-rRNA-processing protein PNO1

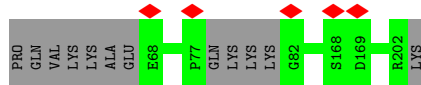
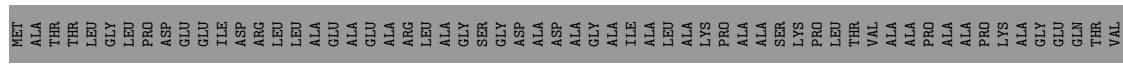


- Molecule 32: Kre33

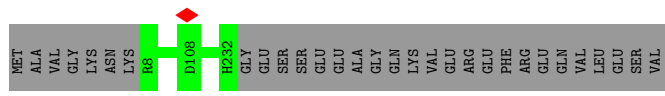
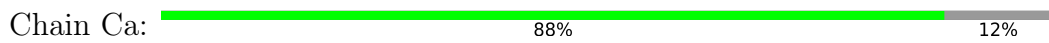




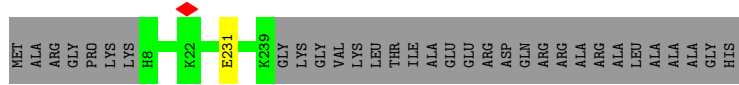
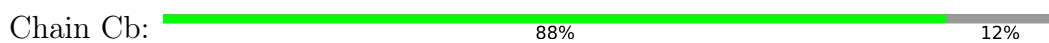
• Molecule 33: Fcf2



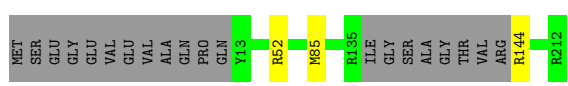
• Molecule 34: 40S ribosomal protein S1



• Molecule 35: 40S ribosomal protein S4

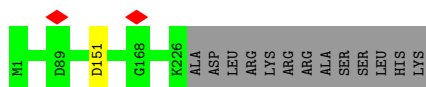


• Molecule 36: 40S ribosomal protein s5-like protein




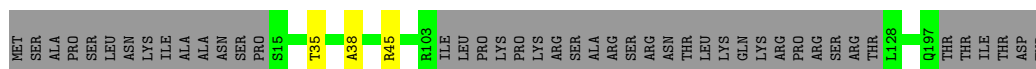
• Molecule 37: 40S ribosomal protein S6

Chain Cd:  94% 5%




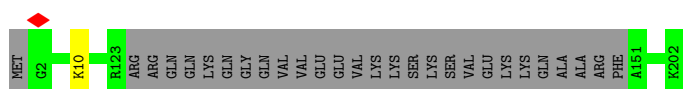
- Molecule 38: 40S ribosomal protein S7

Chain Ce:  77% 22%




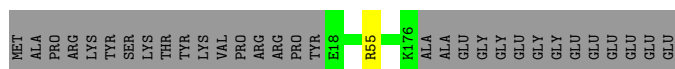
- Molecule 39: 40S ribosomal protein S8

Chain Cf:  86% 14%



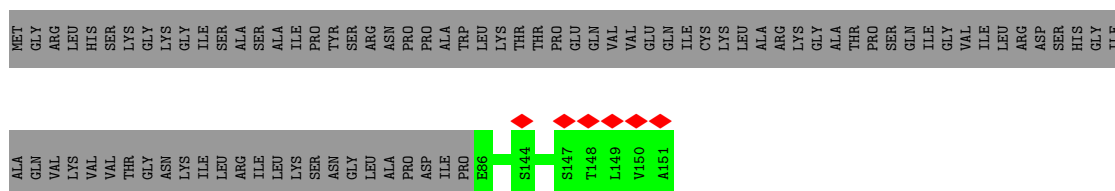
- Molecule 40: 40S ribosomal protein s9-like protein

Chain Cg:  83% 16%




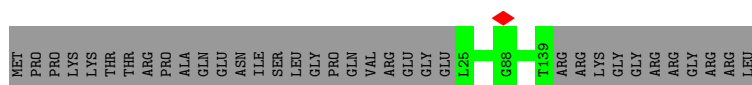
- Molecule 41: 40S ribosomal protein S13-like protein

Chain Ch:  44% 56%




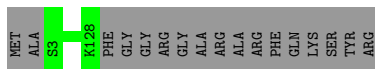
- Molecule 42: 40S ribosomal protein S14-like protein

Chain Ci:  77% 23%

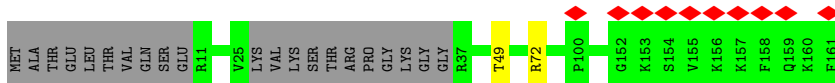
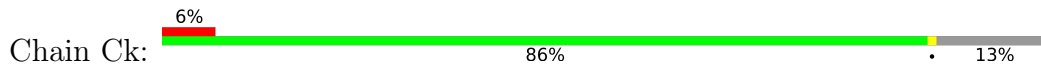


- Molecule 43: 40S ribosomal protein S16-like protein

Chain Cj:  88% 12%



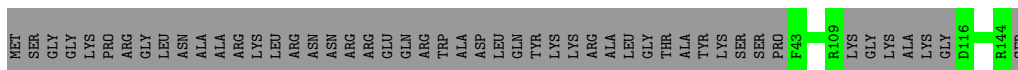
• Molecule 44: 40S ribosomal protein S11-like protein



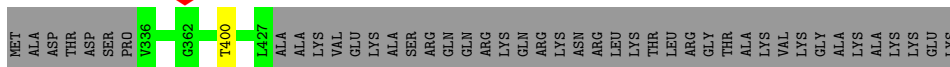
• Molecule 45: 40S ribosomal protein S22-like protein



• Molecule 46: 40S ribosomal protein s23-like protein



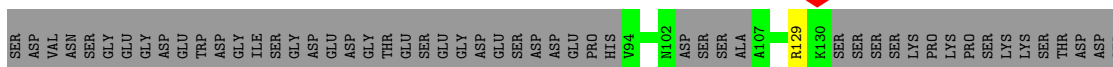
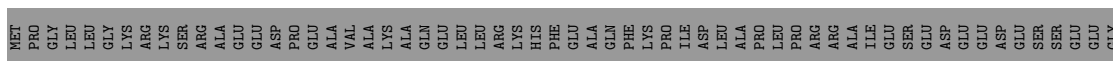
• Molecule 47: 40S ribosomal protein S24

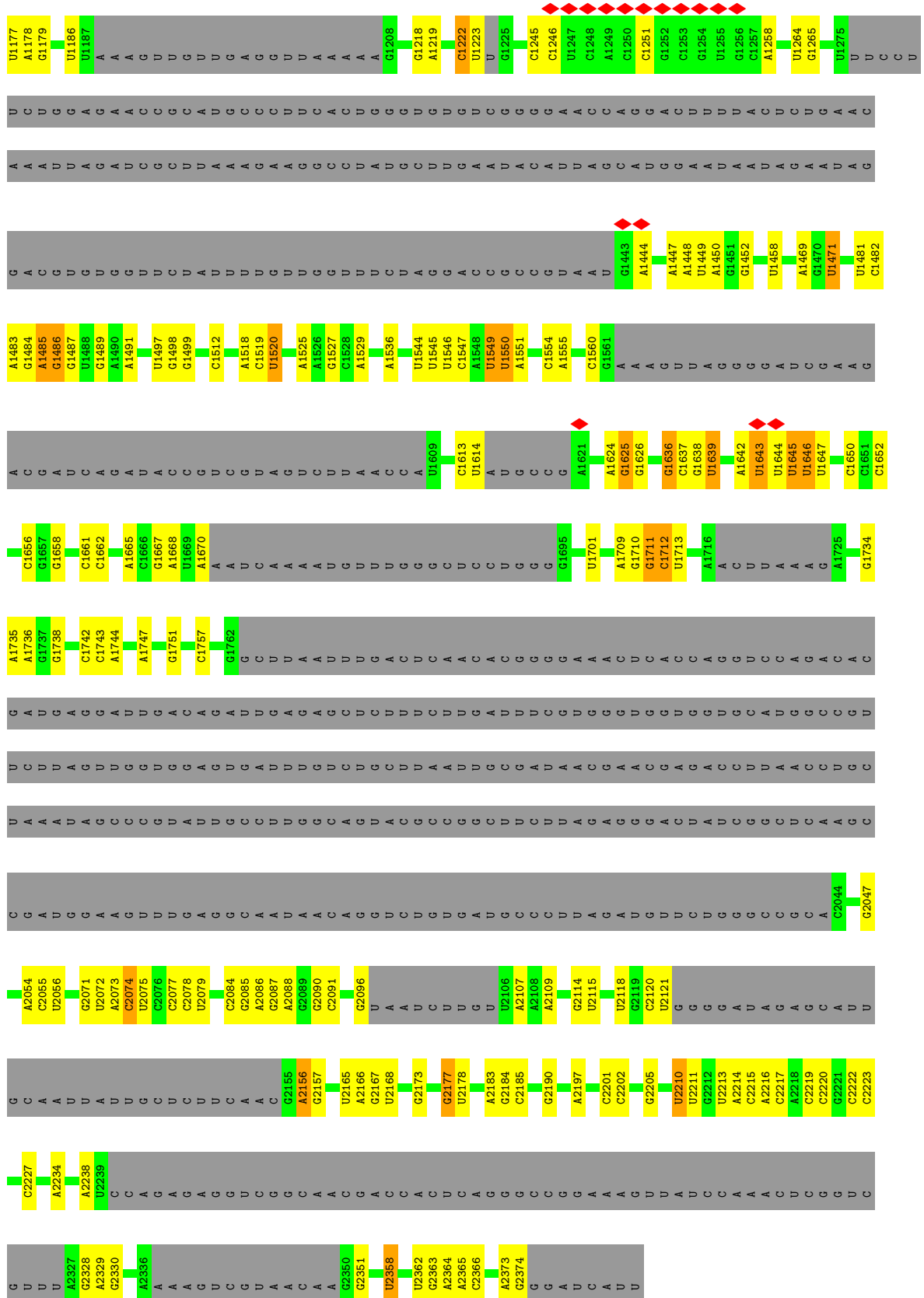


• Molecule 48: 40S ribosomal protein S28-like protein

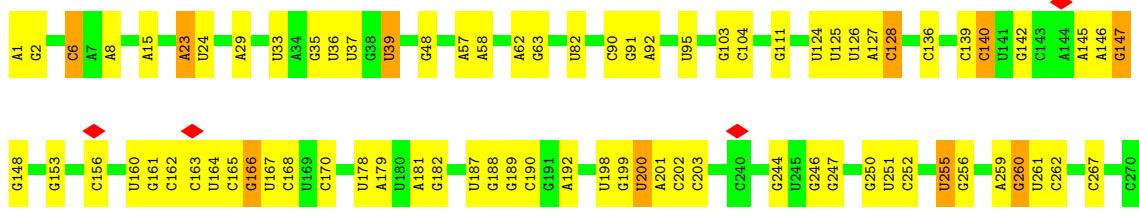


• Molecule 49: Faf1

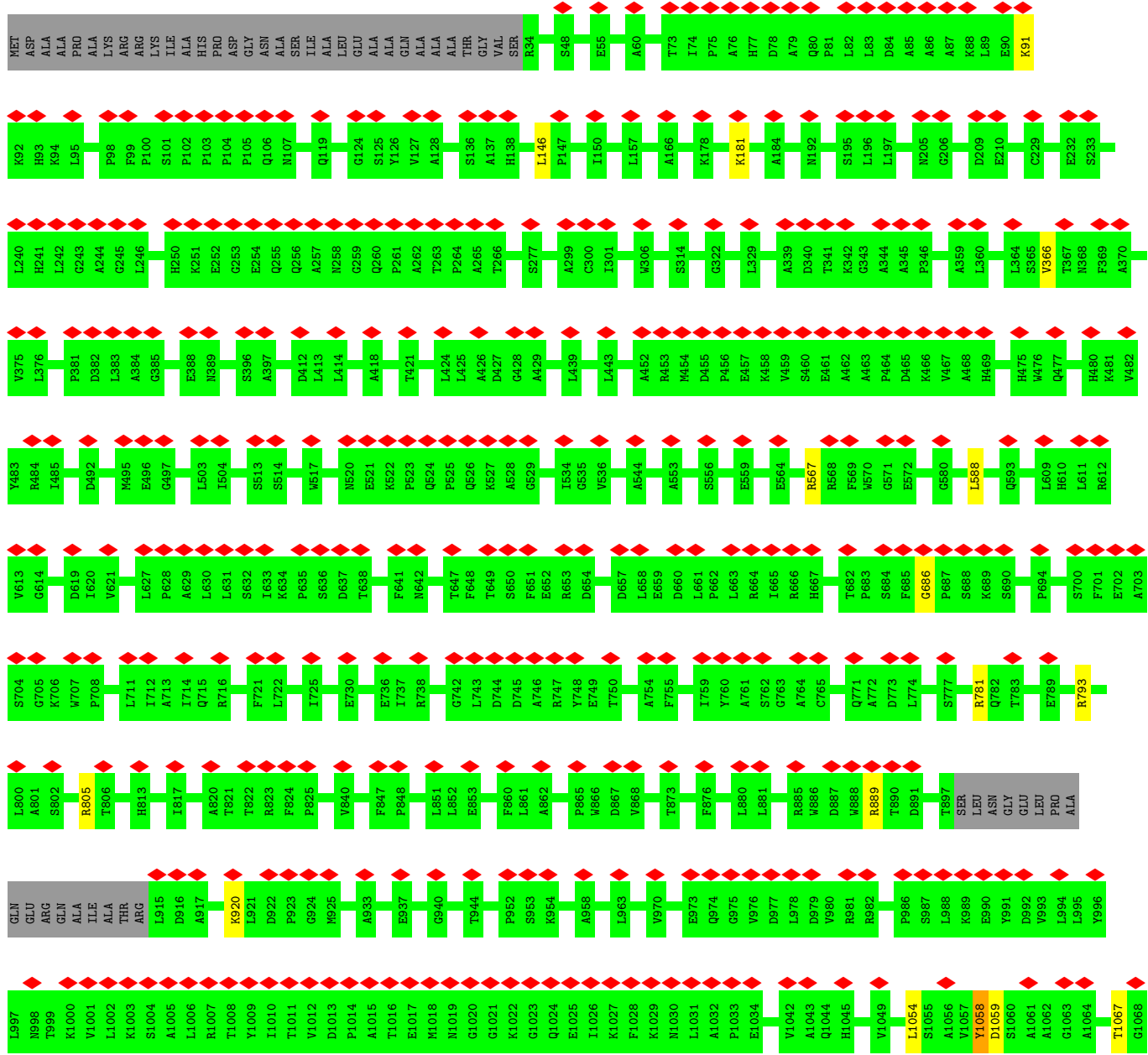
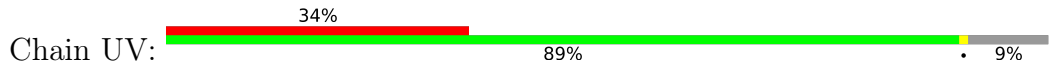


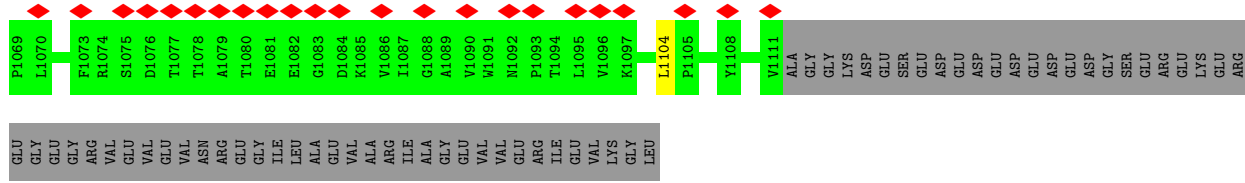


• Molecule 51: U3 snoRNA

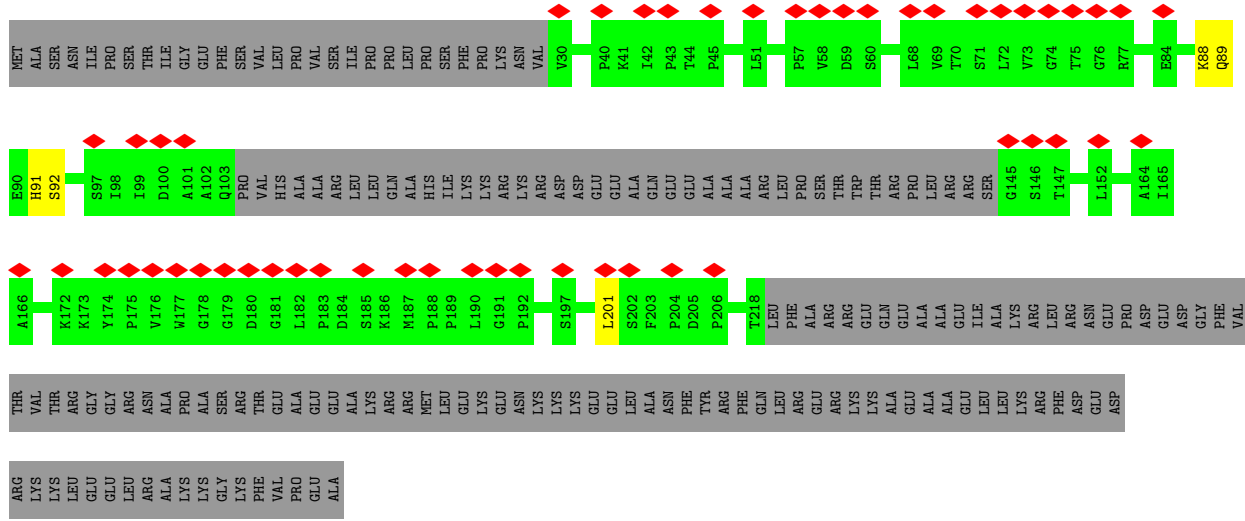
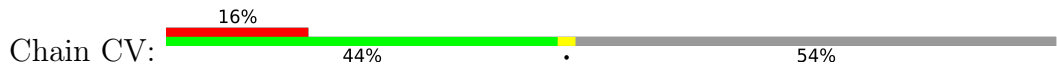


• Molecule 52: U3 small nucleolar RNA-associated protein 22

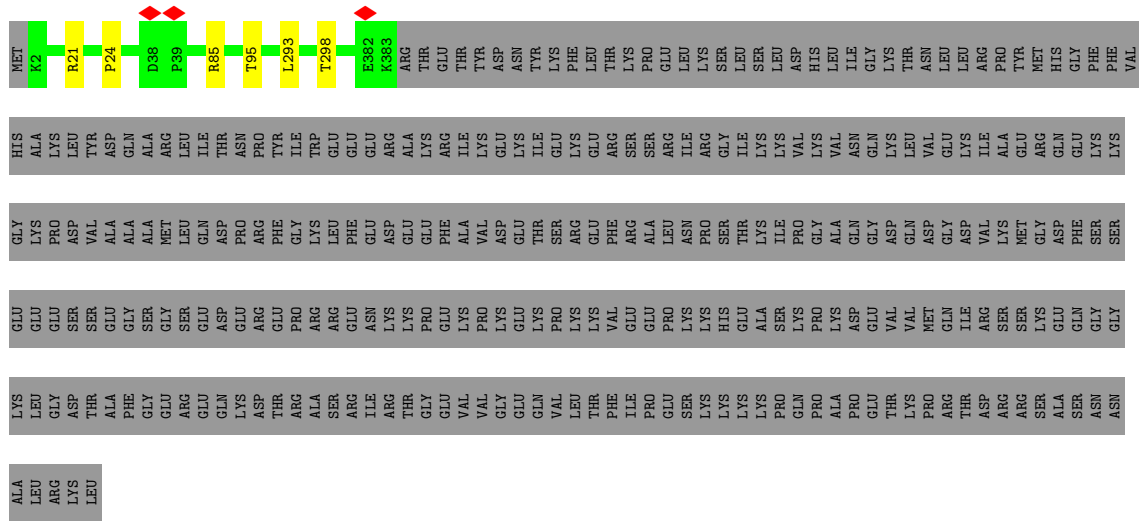




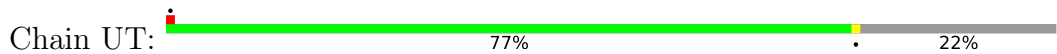
• Molecule 53: Rrp7

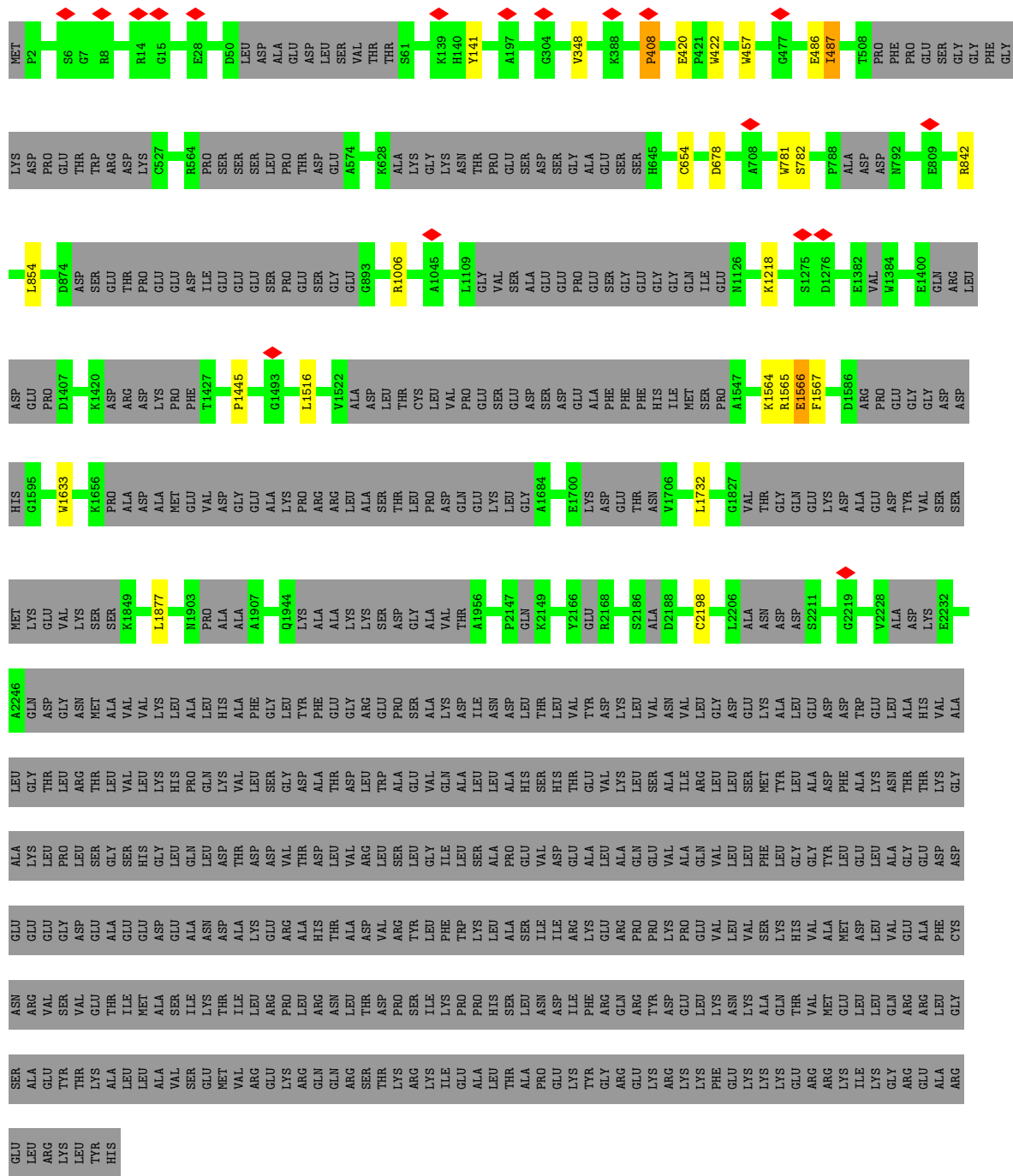


• Molecule 54: Ribosome biogenesis protein ENP2



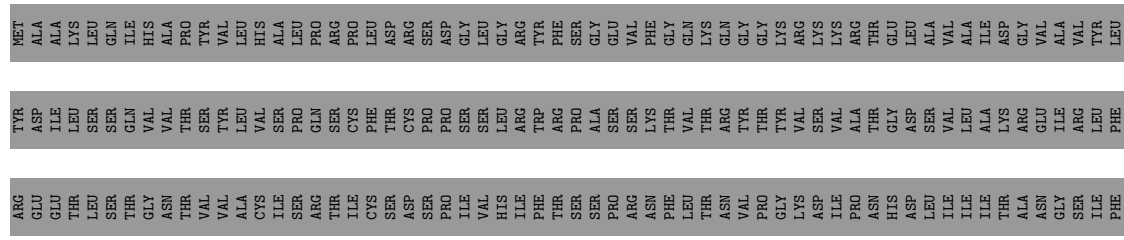
• Molecule 55: Utp20

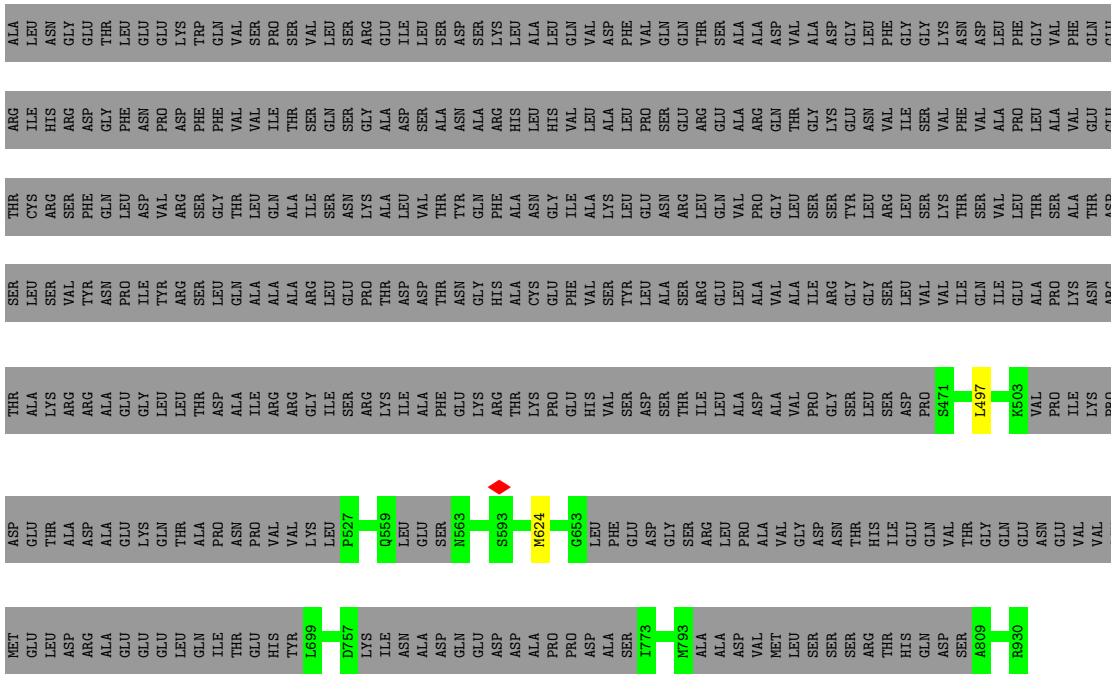




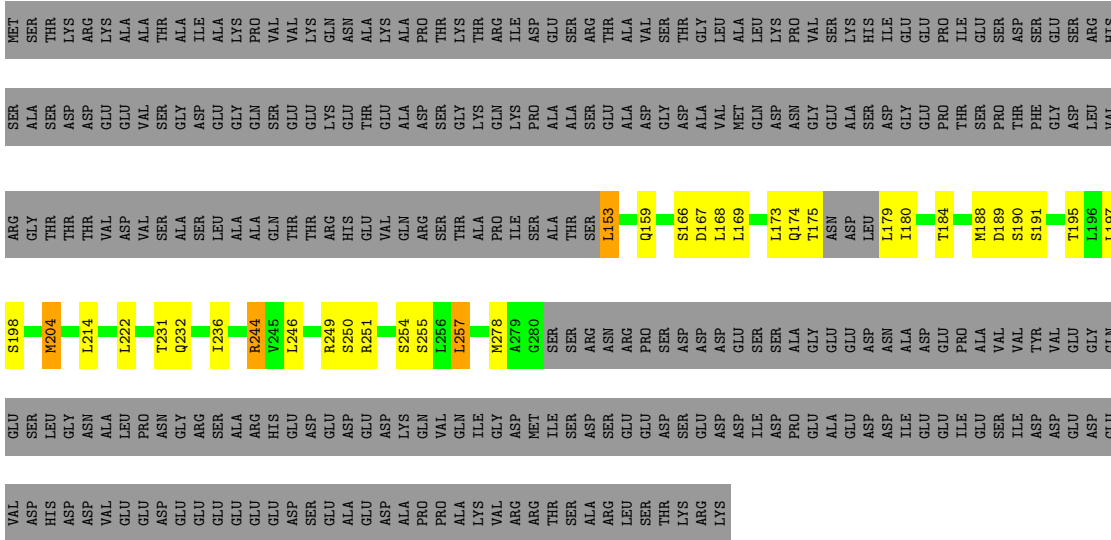
• Molecule 56: Utp8

Chain UH: 38% 61%

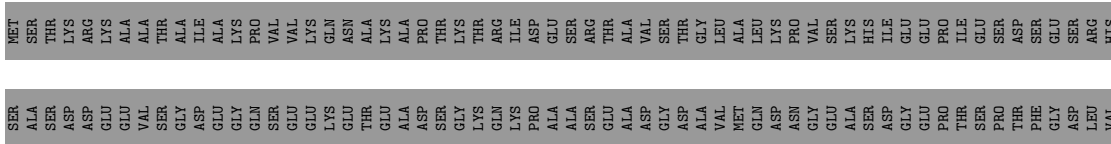


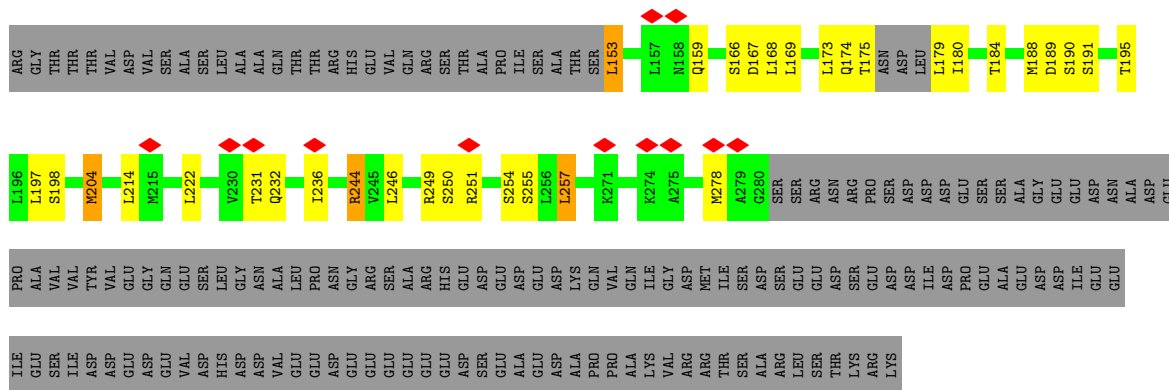


• Molecule 57: Utp5



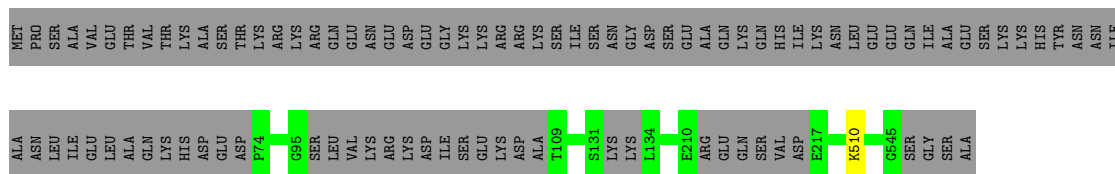
• Molecule 57: Utp5





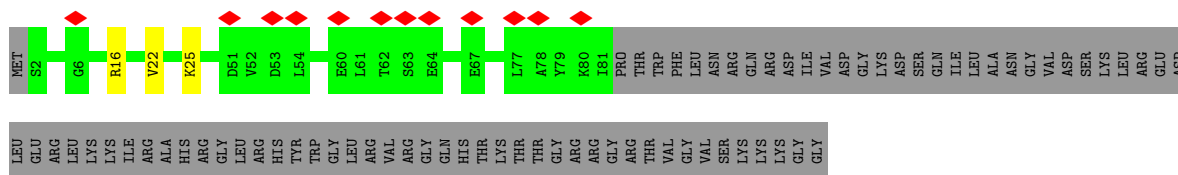
• Molecule 58: Noc4

Chain US: 82% 18%



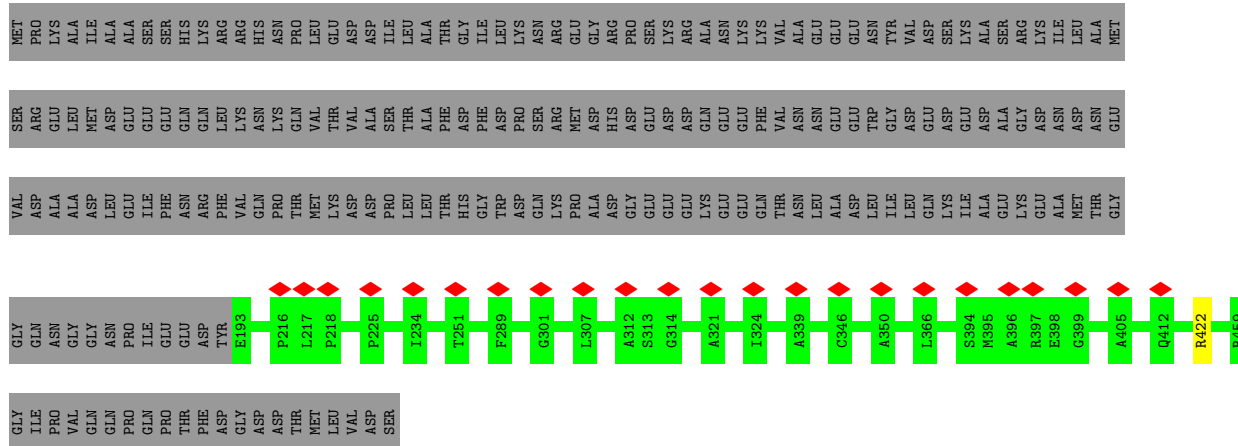
• Molecule 59: Rps18

Chain CI: 8% 49% 49%



• Molecule 60: Enp1

Chain CX: 5% 55% 44%



• Molecule 61: U3 small nucleolar ribonucleoprotein protein lcp5-like protein

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	48335	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 ($e^-/\text{\AA}^2$)	28	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.418	Depositor
Minimum map value	-0.315	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.014	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	520.32, 520.32, 520.32	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.084, 1.084, 1.084	Depositor

5 Model quality i

5.1 Standard geometry i

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

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	UA	0.54	0/6521	0.62	1/8867 (0.0%)
2	UB	0.35	0/4154	0.52	1/5583 (0.0%)
3	UC	0.44	0/595	0.52	0/786
4	UD	0.44	0/6211	0.58	0/8408
5	UF	0.41	0/2657	0.53	1/3596 (0.0%)
6	UG	0.52	0/3790	0.60	0/5120
7	UJ	0.37	0/8567	0.59	3/11619 (0.0%)
8	UK	0.44	0/1701	0.49	0/2251
9	UL	0.43	0/6299	0.61	2/8531 (0.0%)
10	UM	0.38	0/5755	0.60	2/7827 (0.0%)
11	UN	0.44	0/1425	0.54	1/1913 (0.1%)
12	UO	0.46	0/3903	0.58	1/5312 (0.0%)
13	UQ	0.45	1/6136 (0.0%)	0.60	1/8348 (0.0%)
14	UR	0.50	0/3564	0.56	0/4816
15	UU	0.51	1/6903 (0.0%)	0.58	0/9392
16	UX	0.48	0/1493	0.56	0/2011
17	UZ	0.38	0/1857	0.57	0/2526
18	CA	0.51	0/1814	0.57	0/2456
18	CB	0.39	0/1853	0.56	0/2511
19	CC	0.41	0/2911	0.54	0/3937
20	CD	0.39	0/3205	0.57	0/4338
21	CE	0.46	0/891	0.60	1/1214 (0.1%)
21	CF	0.42	0/876	0.62	1/1195 (0.1%)
22	CG	0.42	0/3307	0.58	0/4462
23	CH	0.44	0/2939	0.58	0/3988
24	CI	0.47	0/6631	0.57	3/8943 (0.0%)
25	CJ	0.54	0/1462	0.57	0/1967
26	CK	0.49	0/2376	0.58	1/3214 (0.0%)
27	CL	0.41	0/1812	0.53	0/2437
28	CM	0.55	0/3573	0.58	0/4829
29	CN	0.41	0/1797	0.56	0/2443
29	CO	0.36	0/1714	0.57	1/2325 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
30	CP	0.39	0/1923	0.54	0/2577
31	CQ	0.37	0/1379	0.54	0/1850
32	CR	0.41	0/6108	0.76	17/8266 (0.2%)
32	CS	0.41	0/6108	0.76	17/8266 (0.2%)
33	CT	0.44	0/1053	0.55	0/1413
34	Ca	0.41	0/1850	0.57	0/2486
35	Cb	0.38	0/1890	0.58	0/2548
36	Cc	0.44	0/1485	0.52	0/2008
37	Cd	0.37	0/1850	0.53	0/2474
38	Ce	0.39	0/1298	0.63	0/1750
39	Cf	0.39	0/1429	0.53	0/1915
40	Cg	0.44	0/1259	0.53	0/1687
41	Ch	0.33	0/557	0.47	0/749
42	Ci	0.40	0/819	0.54	0/1107
43	Cj	0.50	0/958	0.57	0/1293
44	Ck	0.35	0/1190	0.52	0/1592
45	Cm	0.43	0/1001	0.54	0/1345
46	Cn	0.53	0/712	0.55	0/954
47	Co	0.38	0/754	0.59	0/1011
48	Cp	0.46	0/458	0.56	0/617
49	CU	0.36	0/1350	0.54	0/1810
50	C1	0.74	0/37546	1.18	257/58475 (0.4%)
51	C2	0.76	0/5459	1.32	47/8498 (0.6%)
52	UV	0.33	0/8638	0.63	7/11725 (0.1%)
53	CV	0.34	0/1172	0.66	2/1592 (0.1%)
54	CW	0.40	0/2996	0.63	1/4075 (0.0%)
55	UT	0.35	0/16367	0.58	3/22149 (0.0%)
56	UH	0.38	0/2852	0.57	1/3846 (0.0%)
57	UE	0.36	0/980	0.86	10/1316 (0.8%)
57	UI	0.36	0/980	0.85	10/1316 (0.8%)
58	US	0.39	0/3765	0.54	0/5100
59	Cl	0.36	0/638	0.62	0/857
60	CX	0.32	0/2180	0.55	0/2956
61	CY	0.41	0/986	0.55	0/1303
62	CZ	0.32	0/384	0.62	0/511
63	UP	0.36	0/428	0.54	0/570
All	All	0.50	2/229494 (0.0%)	0.76	392/319172 (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
1	UA	0	1
5	UF	0	1
6	UG	0	1
10	UM	0	2
12	UO	0	2
13	UQ	0	3
15	UU	0	3
18	CB	0	1
21	CF	0	1
24	CI	0	1
29	CO	0	2
31	CQ	0	1
32	CR	0	3
32	CS	0	3
35	Cb	0	1
37	Cd	0	1
38	Ce	0	1
52	UV	0	4
53	CV	0	1
54	CW	0	1
55	UT	0	9
58	US	0	1
61	CY	0	1
All	All	0	45

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
13	UQ	394	HIS	CA-CB	-6.33	1.40	1.53
15	UU	640	CYS	CB-SG	-5.21	1.73	1.81

All (392) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	C2	2	G	O5'-P-OP1	-30.03	74.66	110.70
51	C2	2	G	OP1-P-OP2	-26.51	79.84	119.60
51	C2	2	G	O5'-P-OP2	18.40	132.78	110.70
51	C2	1	A	OP2-P-O3'	-13.99	74.43	105.20
51	C2	1	A	OP1-P-O3'	13.65	135.22	105.20
50	C1	159	C	N3-C2-O2	-11.88	113.58	121.90
50	C1	55	G	OP1-P-O3'	-11.84	79.16	105.20
50	C1	45	U	OP1-P-O3'	-11.54	79.81	105.20
50	C1	206	C	C2-N1-C1'	11.37	131.30	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
52	UV	1058	TYR	CA-CB-CG	10.93	134.17	113.40
50	C1	1661	C	N3-C2-O2	-10.51	114.54	121.90
50	C1	206	C	N1-C2-O2	10.37	125.12	118.90
50	C1	2168	U	N3-C2-O2	-9.38	115.64	122.20
51	C2	140	C	N3-C2-O2	-9.37	115.34	121.90
50	C1	160	C	N3-C2-O2	-9.37	115.34	121.90
50	C1	1658	G	N3-C4-N9	-9.32	120.41	126.00
50	C1	927	C	N3-C2-O2	-9.26	115.42	121.90
50	C1	915	G	N3-C4-N9	-9.25	120.45	126.00
50	C1	505	C	N3-C2-O2	-9.20	115.46	121.90
50	C1	2168	U	N1-C2-O2	9.15	129.21	122.80
50	C1	1222	C	N1-C2-O2	9.13	124.38	118.90
50	C1	45	U	OP2-P-O3'	-8.95	85.51	105.20
50	C1	1662	C	N3-C2-O2	-8.82	115.73	121.90
50	C1	1547	C	N1-C2-O2	8.80	124.18	118.90
50	C1	758	U	N3-C2-O2	-8.69	116.12	122.20
50	C1	1661	C	N1-C2-O2	8.66	124.10	118.90
50	C1	159	C	N1-C2-O2	8.65	124.09	118.90
50	C1	1520	U	N1-C2-O2	8.62	128.83	122.80
50	C1	1027	C	N3-C2-O2	-8.58	115.89	121.90
50	C1	159	C	C6-N1-C2	-8.54	116.89	120.30
57	UE	244	ARG	NE-CZ-NH1	8.37	124.48	120.30
50	C1	922	C	N3-C2-O2	-8.31	116.08	121.90
57	UI	244	ARG	NE-CZ-NH1	8.30	124.45	120.30
50	C1	1658	G	C5-C6-O6	8.19	133.51	128.60
50	C1	876	U	C5-C4-O4	-8.18	120.99	125.90
55	UT	678	ASP	CB-CG-OD1	8.15	125.63	118.30
50	C1	206	C	C6-N1-C1'	-8.14	111.03	120.80
54	CW	24	PRO	CA-N-CD	-8.13	100.11	111.50
50	C1	206	C	N3-C2-O2	-8.10	116.23	121.90
50	C1	1471	U	C2-N1-C1'	8.07	127.38	117.70
50	C1	2217	C	N1-C2-O2	8.01	123.71	118.90
24	CI	995	VAL	C-N-CA	7.99	141.68	121.70
51	C2	140	C	N1-C2-O2	7.98	123.69	118.90
51	C2	200	U	C2-N1-C1'	7.93	127.21	117.70
50	C1	258	C	N1-C2-O2	7.90	123.64	118.90
51	C2	203	C	N3-C2-O2	-7.88	116.38	121.90
50	C1	33	C	N3-C2-O2	-7.80	116.44	121.90
50	C1	915	G	N9-C4-C5	7.80	108.52	105.40
7	UJ	1477	LEU	CA-CB-CG	7.79	133.22	115.30
50	C1	160	C	C6-N1-C2	-7.77	117.19	120.30
50	C1	504	C	N1-C2-O2	7.75	123.55	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	C1	1658	G	N9-C4-C5	7.70	108.48	105.40
51	C2	200	U	N1-C2-O2	7.68	128.17	122.80
32	CR	257	ARG	NE-CZ-NH1	7.67	124.14	120.30
50	C1	454	C	C2-N1-C1'	7.61	127.17	118.80
50	C1	1636	G	O4'-C1'-N9	7.61	114.29	108.20
51	C2	267	C	N3-C2-O2	-7.61	116.57	121.90
50	C1	1222	C	C2-N1-C1'	7.59	127.16	118.80
50	C1	942	U	N3-C2-O2	-7.59	116.89	122.20
32	CS	257	ARG	NE-CZ-NH1	7.53	124.06	120.30
50	C1	2084	C	N3-C2-O2	-7.53	116.63	121.90
50	C1	449	C	N3-C2-O2	-7.50	116.65	121.90
50	C1	1645	U	N3-C2-O2	-7.49	116.96	122.20
50	C1	80	C	N3-C2-O2	-7.48	116.67	121.90
50	C1	1547	C	N3-C2-O2	-7.47	116.67	121.90
51	C2	6	C	C6-N1-C2	-7.45	117.32	120.30
50	C1	2217	C	N3-C2-O2	-7.43	116.70	121.90
50	C1	758	U	C2-N1-C1'	7.37	126.55	117.70
52	UV	1054	LEU	CA-CB-CG	7.37	132.24	115.30
50	C1	756	C	N3-C2-O2	-7.36	116.75	121.90
50	C1	39	C	C2-N1-C1'	7.35	126.89	118.80
32	CS	82	ILE	CG1-CB-CG2	-7.35	95.23	111.40
32	CR	82	ILE	CG1-CB-CG2	-7.34	95.24	111.40
50	C1	158	C	N1-C2-O2	7.33	123.30	118.90
50	C1	1711	G	C4-N9-C1'	7.30	136.00	126.50
51	C2	6	C	C5-C6-N1	7.28	124.64	121.00
50	C1	1486	G	C4-N9-C1'	7.27	135.95	126.50
50	C1	318	C	N3-C2-O2	-7.23	116.84	121.90
50	C1	491	G	N3-C4-N9	7.23	130.34	126.00
51	C2	252	C	N3-C2-O2	-7.21	116.85	121.90
32	CR	806	GLU	CA-CB-CG	7.18	129.21	113.40
32	CS	806	GLU	CA-CB-CG	7.18	129.20	113.40
50	C1	2217	C	C2-N1-C1'	7.14	126.65	118.80
50	C1	56	C	OP1-P-OP2	7.13	130.30	119.60
50	C1	178	G	N1-C6-O6	-7.13	115.62	119.90
50	C1	1222	C	N3-C2-O2	-7.09	116.94	121.90
50	C1	46	C	OP1-P-OP2	7.08	130.22	119.60
24	CI	197	LEU	CA-CB-CG	7.07	131.56	115.30
32	CS	51	ARG	NE-CZ-NH1	7.06	123.83	120.30
32	CR	51	ARG	NE-CZ-NH1	7.02	123.81	120.30
50	C1	1645	U	C2-N1-C1'	6.97	126.06	117.70
50	C1	707	U	C2-N1-C1'	6.96	126.06	117.70
50	C1	68	U	N1-C2-O2	6.96	127.67	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	C2	39	U	N3-C2-O2	-6.94	117.34	122.20
50	C1	850	A	N1-C6-N6	-6.91	114.45	118.60
57	UE	257	LEU	CB-CG-CD2	6.90	122.73	111.00
50	C1	1246	C	N3-C2-O2	-6.87	117.09	121.90
57	UI	257	LEU	CB-CG-CD2	6.87	122.68	111.00
51	C2	202	C	N1-C2-O2	6.84	123.01	118.90
51	C2	246	G	C4-N9-C1'	6.84	135.39	126.50
50	C1	505	C	N1-C2-O2	6.82	122.99	118.90
51	C2	202	C	N3-C2-O2	-6.81	117.13	121.90
50	C1	722	U	N1-C2-O2	6.81	127.57	122.80
50	C1	448	C	N3-C2-O2	-6.80	117.14	121.90
50	C1	491	G	C4-N9-C1'	6.79	135.33	126.50
50	C1	206	C	C6-N1-C2	-6.78	117.59	120.30
50	C1	55	G	OP2-P-O3'	-6.78	90.28	105.20
50	C1	583	A	O5'-P-OP1	-6.76	99.62	105.70
50	C1	1645	U	N1-C2-O2	6.75	127.53	122.80
32	CS	517	GLU	CA-CB-CG	6.74	128.22	113.40
32	CR	517	GLU	CA-CB-CG	6.73	128.22	113.40
50	C1	1656	C	C2-N1-C1'	6.73	126.21	118.80
50	C1	470	C	C2-N1-C1'	6.70	126.17	118.80
51	C2	200	U	N3-C2-O2	-6.70	117.51	122.20
51	C2	203	C	C6-N1-C2	-6.69	117.62	120.30
50	C1	2168	U	C2-N1-C1'	6.69	125.72	117.70
32	CS	803	LEU	CA-CB-CG	6.68	130.67	115.30
52	UV	1058	TYR	CB-CA-C	-6.67	97.06	110.40
32	CR	803	LEU	CA-CB-CG	6.67	130.64	115.30
51	C2	128	C	O4'-C1'-N1	6.65	113.52	108.20
50	C1	369	U	N1-C2-O2	6.64	127.45	122.80
50	C1	768	C	C2-N1-C1'	6.63	126.09	118.80
50	C1	193	U	N1-C2-O2	6.60	127.42	122.80
50	C1	369	U	N3-C2-O2	-6.60	117.58	122.20
50	C1	1163	A	P-O3'-C3'	6.58	127.59	119.70
50	C1	1711	G	N3-C4-N9	6.58	129.94	126.00
32	CS	257	ARG	CG-CD-NE	6.57	125.60	111.80
51	C2	161	G	C4-N9-C1'	6.57	135.04	126.50
32	CR	257	ARG	CG-CD-NE	6.56	125.58	111.80
32	CS	41	LEU	CA-CB-CG	6.56	130.39	115.30
10	UM	699	LEU	CA-CB-CG	6.56	130.38	115.30
50	C1	447	C	C6-N1-C2	-6.55	117.68	120.30
32	CR	41	LEU	CA-CB-CG	6.55	130.36	115.30
50	C1	318	C	C6-N1-C2	-6.55	117.68	120.30
50	C1	1650	C	N3-C2-O2	-6.53	117.33	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	C2	246	G	C8-N9-C1'	-6.53	118.51	127.00
50	C1	1520	U	N3-C2-O2	-6.52	117.64	122.20
51	C2	128	C	C6-N1-C2	-6.51	117.69	120.30
52	UV	146	LEU	CA-CB-CG	6.51	130.27	115.30
57	UE	204	MET	CB-CG-SD	6.49	131.88	112.40
57	UI	204	MET	CB-CG-SD	6.49	131.88	112.40
50	C1	209	A	P-O3'-C3'	6.49	127.49	119.70
50	C1	1711	G	N3-C4-C5	-6.45	125.38	128.60
50	C1	491	G	C8-N9-C1'	-6.44	118.62	127.00
50	C1	910	G	C5-C6-O6	6.41	132.44	128.60
50	C1	203	C	N1-C2-O2	6.40	122.74	118.90
50	C1	915	G	C5-C6-O6	6.37	132.42	128.60
50	C1	799	U	N3-C2-O2	-6.35	117.75	122.20
1	UA	81	LEU	CA-CB-CG	6.34	129.89	115.30
55	UT	1877	LEU	CA-CB-CG	6.33	129.85	115.30
50	C1	3	G	N3-C4-N9	-6.31	122.22	126.00
50	C1	1471	U	C5-C4-O4	-6.31	122.11	125.90
50	C1	1625	G	N3-C4-N9	6.30	129.78	126.00
50	C1	2091	C	C2-N1-C1'	6.29	125.72	118.80
50	C1	915	G	C8-N9-C1'	6.27	135.15	127.00
50	C1	692	U	N1-C2-O2	6.25	127.17	122.80
51	C2	251	U	N3-C2-O2	-6.23	117.84	122.20
50	C1	1002	G	C4-N9-C1'	6.22	134.59	126.50
50	C1	2074	C	N1-C2-O2	6.21	122.62	118.90
50	C1	776	C	N1-C2-O2	6.20	122.62	118.90
57	UE	244	ARG	CG-CD-NE	6.20	124.82	111.80
51	C2	147	G	N3-C4-N9	6.18	129.71	126.00
57	UI	244	ARG	CG-CD-NE	6.17	124.76	111.80
50	C1	915	G	N1-C6-O6	-6.17	116.20	119.90
50	C1	2177	G	P-O3'-C3'	6.17	127.11	119.70
50	C1	1550	U	C2-N1-C1'	6.17	125.10	117.70
50	C1	1639	U	C2-N1-C1'	6.17	125.10	117.70
50	C1	748	A	N1-C6-N6	-6.16	114.91	118.60
50	C1	178	G	C5-C6-O6	6.14	132.28	128.60
50	C1	1116	U	C2-N1-C1'	6.14	125.06	117.70
50	C1	281	U	P-O3'-C3'	6.13	127.06	119.70
11	UN	901	LEU	CA-CB-CG	6.13	129.40	115.30
51	C2	128	C	C5-C6-N1	6.12	124.06	121.00
50	C1	1650	C	N1-C2-O2	6.11	122.56	118.90
50	C1	148	C	N3-C2-O2	-6.11	117.63	121.90
50	C1	258	C	C2-N1-C1'	6.10	125.51	118.80
50	C1	1711	G	C8-N9-C1'	-6.09	119.08	127.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	C2	255	U	P-O3'-C3'	6.08	127.00	119.70
50	C1	148	C	C6-N1-C2	-6.08	117.87	120.30
50	C1	193	U	C2-N1-C1'	6.07	124.98	117.70
51	C2	140	C	C6-N1-C2	-6.07	117.87	120.30
50	C1	1246	C	C6-N1-C2	-6.04	117.88	120.30
50	C1	776	C	C2-N1-C1'	6.01	125.41	118.80
50	C1	886	U	N3-C2-O2	-6.01	117.99	122.20
50	C1	323	G	N1-C6-O6	-6.00	116.30	119.90
50	C1	1658	G	C4-C5-N7	-6.00	108.40	110.80
50	C1	722	U	C2-N1-C1'	5.99	124.89	117.70
51	C2	260	G	C4-N9-C1'	5.99	134.28	126.50
50	C1	21	C	N3-C2-O2	-5.98	117.71	121.90
50	C1	112	C	N1-C2-O2	5.97	122.48	118.90
50	C1	1002	G	C8-N9-C1'	-5.96	119.26	127.00
50	C1	879	A	C6-N1-C2	-5.95	115.03	118.60
50	C1	454	C	C5-C6-N1	5.94	123.97	121.00
51	C2	161	G	C6-C5-N7	-5.94	126.84	130.40
50	C1	758	U	C2-N3-C4	-5.93	123.44	127.00
50	C1	850	A	C6-N1-C2	-5.93	115.04	118.60
32	CS	705	LEU	CB-CG-CD1	-5.90	100.98	111.00
50	C1	454	C	C6-N1-C2	-5.90	117.94	120.30
50	C1	722	U	N3-C2-O2	-5.90	118.07	122.20
50	C1	1045	G	N3-C4-N9	5.89	129.54	126.00
50	C1	1113	C	N1-C2-O2	5.89	122.44	118.90
32	CR	705	LEU	CB-CG-CD1	-5.89	100.98	111.00
57	UE	204	MET	CG-SD-CE	5.87	109.60	100.20
50	C1	799	U	N1-C2-O2	5.87	126.91	122.80
50	C1	712	A	N1-C6-N6	5.86	122.12	118.60
57	UI	204	MET	CG-SD-CE	5.86	109.58	100.20
32	CS	51	ARG	CG-CD-NE	5.85	124.08	111.80
50	C1	1245	C	N1-C2-O2	5.85	122.41	118.90
50	C1	1471	U	C6-N1-C1'	-5.84	113.02	121.20
50	C1	756	C	N1-C2-O2	5.84	122.40	118.90
50	C1	1662	C	C6-N1-C2	-5.84	117.97	120.30
32	CR	51	ARG	CG-CD-NE	5.83	124.05	111.80
53	CV	92	SER	CB-CA-C	-5.82	99.03	110.10
50	C1	593	G	P-O3'-C3'	5.82	126.69	119.70
50	C1	1486	G	C8-N9-C1'	-5.82	119.44	127.00
50	C1	1458	U	N1-C2-O2	5.81	126.87	122.80
50	C1	1512	C	C6-N1-C2	-5.81	117.98	120.30
50	C1	504	C	N3-C2-O2	-5.80	117.84	121.90
50	C1	1652	C	N3-C2-O2	-5.80	117.84	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	C1	154	C	C2-N1-C1'	5.80	125.18	118.80
50	C1	2090	G	C2-N3-C4	-5.79	109.00	111.90
50	C1	1222	C	C6-N1-C2	-5.79	117.98	120.30
50	C1	346	C	N3-C2-O2	-5.79	117.85	121.90
50	C1	810	G	C4-N9-C1'	5.78	134.02	126.50
51	C2	161	G	C8-N9-C1'	-5.78	119.49	127.00
51	C2	161	G	N3-C4-N9	5.76	129.46	126.00
50	C1	1458	U	N3-C2-O2	-5.74	118.18	122.20
50	C1	277	U	P-O3'-C3'	5.74	126.59	119.70
50	C1	770	C	C2-N1-C1'	5.74	125.11	118.80
50	C1	193	U	N3-C2-O2	-5.73	118.19	122.20
50	C1	258	C	N3-C2-O2	-5.73	117.89	121.90
50	C1	134	C	C6-N1-C2	-5.70	118.02	120.30
50	C1	294	G	C2-N3-C4	-5.70	109.05	111.90
57	UI	244	ARG	CD-NE-CZ	5.70	131.58	123.60
57	UE	244	ARG	NE-CZ-NH2	-5.70	117.45	120.30
50	C1	2096	G	N3-C4-N9	-5.69	122.59	126.00
50	C1	206	C	C5-C6-N1	5.69	123.84	121.00
50	C1	1002	G	N3-C4-N9	5.69	129.41	126.00
52	UV	1058	TYR	CB-CG-CD2	-5.69	117.59	121.00
57	UE	244	ARG	CD-NE-CZ	5.68	131.55	123.60
50	C1	1658	G	N1-C6-O6	-5.67	116.50	119.90
50	C1	1646	U	O4'-C1'-N1	5.67	112.73	108.20
51	C2	103	G	N3-C4-N9	5.66	129.39	126.00
57	UI	153	LEU	CA-CB-CG	5.66	128.31	115.30
50	C1	1736	A	N7-C8-N9	5.65	116.62	113.80
50	C1	886	U	C2-N1-C1'	5.65	124.48	117.70
50	C1	205	C	P-O3'-C3'	5.64	126.47	119.70
50	C1	190	G	N1-C6-O6	-5.63	116.52	119.90
51	C2	260	G	N3-C4-C5	-5.63	125.78	128.60
57	UE	153	LEU	CA-CB-CG	5.63	128.25	115.30
57	UI	244	ARG	NE-CZ-NH2	-5.63	117.48	120.30
50	C1	1486	G	N7-C8-N9	5.62	115.91	113.10
50	C1	1485	A	P-O3'-C3'	5.62	126.44	119.70
50	C1	658	A	C2-N3-C4	-5.62	107.79	110.60
50	C1	730	U	C2-N1-C1'	5.61	124.43	117.70
50	C1	922	C	C6-N1-C2	-5.61	118.06	120.30
50	C1	1120	C	C2-N1-C1'	5.61	124.97	118.80
26	CK	89	LEU	CA-CB-CG	5.60	128.18	115.30
57	UE	204	MET	CA-CB-CG	5.60	122.82	113.30
32	CS	99	ILE	CG1-CB-CG2	-5.60	99.08	111.40
50	C1	68	U	N3-C2-O2	-5.60	118.28	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	C1	2358	U	C2-N1-C1'	5.60	124.42	117.70
32	CR	99	ILE	CG1-CB-CG2	-5.59	99.10	111.40
50	C1	915	G	C6-C5-N7	5.59	133.75	130.40
57	UI	204	MET	CA-CB-CG	5.59	122.80	113.30
50	C1	39	C	C6-N1-C1'	-5.58	114.10	120.80
50	C1	1560	C	N3-C2-O2	-5.57	118.00	121.90
50	C1	2156	A	P-O3'-C3'	5.57	126.39	119.70
50	C1	97	C	C5-C6-N1	5.57	123.78	121.00
10	UM	689	LEU	CA-CB-CG	5.55	128.06	115.30
50	C1	447	C	N3-C2-O2	-5.54	118.02	121.90
50	C1	1652	C	C6-N1-C2	-5.54	118.08	120.30
50	C1	275	C	N1-C2-O2	5.54	122.22	118.90
55	UT	854	LEU	CA-CB-CG	5.53	128.01	115.30
50	C1	2210	U	C5-C4-O4	5.52	129.21	125.90
50	C1	1643	U	C2-N1-C1'	5.50	124.31	117.70
21	CF	103	LEU	CA-CB-CG	5.50	127.96	115.30
50	C1	860	C	C2-N1-C1'	-5.50	112.75	118.80
50	C1	1002	G	O5'-P-OP2	-5.49	100.76	105.70
9	UL	601	LEU	CA-CB-CG	5.49	127.93	115.30
50	C1	1625	G	N3-C4-C5	-5.48	125.86	128.60
50	C1	692	U	N3-C2-O2	-5.46	118.38	122.20
50	C1	39	C	N1-C2-O2	5.45	122.17	118.90
50	C1	190	G	C5-C6-O6	5.45	131.87	128.60
50	C1	491	G	C6-C5-N7	-5.44	127.13	130.40
50	C1	18	G	C4-N9-C1'	5.44	133.58	126.50
50	C1	769	C	C2-N1-C1'	5.44	124.79	118.80
50	C1	886	U	N1-C2-O2	5.44	126.61	122.80
50	C1	446	C	N1-C2-O2	5.43	122.16	118.90
50	C1	404	C	C2-N1-C1'	5.43	124.77	118.80
50	C1	1115	C	C2-N1-C1'	5.42	124.76	118.80
50	C1	1549	U	N3-C4-O4	-5.42	115.61	119.40
51	C2	23	A	P-O3'-C3'	5.42	126.20	119.70
50	C1	727	G	N3-C4-N9	5.41	129.24	126.00
50	C1	18	G	N3-C4-C5	-5.40	125.90	128.60
50	C1	1222	C	C5-C6-N1	5.38	123.69	121.00
52	UV	588	LEU	CA-CB-CG	5.38	127.68	115.30
50	C1	1458	U	C2-N1-C1'	5.38	124.16	117.70
32	CS	855	LEU	CA-CB-CG	5.38	127.67	115.30
50	C1	69	U	N1-C2-O2	5.38	126.56	122.80
32	CR	855	LEU	CA-CB-CG	5.37	127.66	115.30
50	C1	265	G	N3-C4-N9	5.37	129.22	126.00
50	C1	910	G	N1-C6-O6	-5.36	116.69	119.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
32	CR	471	GLU	CA-CB-CG	5.35	125.18	113.40
50	C1	150	C	C6-N1-C2	-5.35	118.16	120.30
32	CS	471	GLU	CA-CB-CG	5.35	125.17	113.40
56	UH	497	LEU	CA-CB-CG	5.35	127.59	115.30
50	C1	135	A	P-O3'-C3'	5.34	126.11	119.70
50	C1	183	C	C2-N1-C1'	5.34	124.67	118.80
51	C2	166	G	N3-C4-C5	-5.34	125.93	128.60
50	C1	446	C	N3-C2-O2	-5.32	118.17	121.90
50	C1	63	C	N1-C2-O2	5.32	122.09	118.90
21	CE	103	LEU	CA-CB-CG	5.32	127.53	115.30
51	C2	200	U	C5-C6-N1	5.32	125.36	122.70
50	C1	491	G	N3-C4-C5	-5.31	125.94	128.60
50	C1	148	C	C6-N1-C1'	5.29	127.14	120.80
50	C1	190	G	N3-C4-N9	-5.29	122.83	126.00
50	C1	802	A	P-O3'-C3'	5.29	126.05	119.70
50	C1	1046	G	C5-C6-O6	5.27	131.76	128.60
50	C1	1712	C	P-O3'-C3'	5.27	126.02	119.70
32	CS	375	GLN	CA-CB-CG	5.26	124.97	113.40
50	C1	505	C	C6-N1-C2	-5.26	118.20	120.30
32	CR	375	GLN	CA-CB-CG	5.25	124.96	113.40
57	UE	257	LEU	CA-CB-CG	5.25	127.38	115.30
57	UI	257	LEU	CA-CB-CG	5.25	127.37	115.30
50	C1	995	C	C6-N1-C2	-5.25	118.20	120.30
29	CO	164	GLN	C-N-CA	5.24	134.81	121.70
50	C1	986	C	C2-N1-C1'	5.24	124.56	118.80
50	C1	203	C	N3-C2-O2	-5.24	118.23	121.90
50	C1	1626	G	N1-C2-N2	-5.23	111.49	116.20
50	C1	1471	U	N3-C4-O4	5.23	123.06	119.40
50	C1	1246	C	C6-N1-C1'	5.22	127.07	120.80
51	C2	166	G	C4-N9-C1'	5.22	133.29	126.50
5	UF	330	ASN	C-N-CA	-5.21	108.67	121.70
52	UV	1058	TYR	CB-CG-CD1	5.21	124.13	121.00
50	C1	915	G	C4-N9-C1'	-5.21	119.73	126.50
50	C1	370	C	C2-N1-C1'	5.20	124.52	118.80
32	CR	789	LEU	CB-CG-CD2	-5.20	102.17	111.00
51	C2	139	C	N1-C2-O2	5.20	122.02	118.90
32	CS	789	LEU	CB-CG-CD2	-5.19	102.17	111.00
50	C1	810	G	C8-N9-C1'	-5.19	120.25	127.00
2	UB	818	ASP	CB-CG-OD2	5.19	122.97	118.30
9	UL	376	LEU	C-N-CA	-5.19	108.72	121.70
50	C1	768	C	C6-N1-C1'	-5.19	114.57	120.80
13	UQ	562	ASP	CB-CG-OD2	5.19	122.97	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	C1	1652	C	N1-C2-N3	5.19	122.83	119.20
12	UO	239	LEU	CA-CB-CG	5.19	127.23	115.30
50	C1	369	U	C2-N1-C1'	5.19	123.93	117.70
50	C1	1549	U	N3-C4-C5	5.19	117.71	114.60
50	C1	281	U	OP1-P-O3'	5.18	116.61	105.20
50	C1	112	C	N3-C2-O2	-5.17	118.28	121.90
50	C1	158	C	C2-N1-C1'	5.17	124.48	118.80
50	C1	80	C	C6-N1-C2	-5.16	118.24	120.30
50	C1	148	C	N1-C2-N3	5.16	122.81	119.20
50	C1	1017	C	P-O3'-C3'	5.16	125.89	119.70
51	C2	246	G	N3-C4-N9	5.16	129.09	126.00
50	C1	622	U	N3-C2-O2	-5.15	118.60	122.20
50	C1	160	C	N1-C2-O2	5.13	121.98	118.90
50	C1	233	C	N3-C2-O2	-5.13	118.31	121.90
24	CI	854	ARG	NE-CZ-NH1	-5.13	117.74	120.30
32	CS	257	ARG	CD-NE-CZ	5.12	130.76	123.60
50	C1	2079	U	N1-C2-O2	5.12	126.38	122.80
50	C1	1001	A	P-O3'-C3'	5.10	125.82	119.70
51	C2	166	G	N3-C4-N9	5.10	129.06	126.00
32	CR	257	ARG	CD-NE-CZ	5.09	130.73	123.60
7	UJ	1614	LEU	CA-CB-CG	5.08	126.99	115.30
51	C2	128	C	C6-N1-C1'	5.08	126.90	120.80
51	C2	200	U	C6-N1-C1'	-5.08	114.08	121.20
51	C2	251	U	N1-C2-O2	5.08	126.36	122.80
50	C1	1124	G	N3-C4-N9	5.07	129.04	126.00
50	C1	1747	A	C6-N1-C2	-5.07	115.56	118.60
53	CV	91	HIS	N-CA-C	5.07	124.69	111.00
51	C2	260	G	N3-C4-N9	5.07	129.04	126.00
50	C1	158	C	N3-C2-O2	-5.06	118.36	121.90
50	C1	865	G	N3-C2-N2	5.06	123.44	119.90
32	CR	555	ASP	CB-CG-OD2	5.05	122.85	118.30
50	C1	692	U	C2-N1-C1'	5.05	123.76	117.70
32	CS	555	ASP	CB-CG-OD2	5.04	122.83	118.30
50	C1	63	C	C2-N1-C1'	5.04	124.34	118.80
50	C1	317	C	N1-C2-O2	5.04	121.92	118.90
50	C1	989	C	C2-N1-C1'	5.04	124.34	118.80
50	C1	1046	G	N1-C6-O6	-5.03	116.88	119.90
50	C1	927	C	N1-C2-O2	5.03	121.92	118.90
50	C1	1757	C	N1-C2-O2	5.02	121.91	118.90
50	C1	684	U	P-O3'-C3'	5.02	125.73	119.70
50	C1	1658	G	N3-C4-C5	5.02	131.11	128.60
7	UJ	856	LEU	CA-CB-CG	5.02	126.84	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
50	C1	2165	U	C2-N1-C1'	5.02	123.72	117.70
50	C1	2177	G	OP2-P-O3'	5.01	116.23	105.20
50	C1	18	G	N3-C4-N9	5.01	129.01	126.00
50	C1	1560	C	N1-C2-O2	5.01	121.91	118.90
51	C2	103	G	N3-C4-C5	-5.00	126.10	128.60

There are no chirality outliers.

All (45) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
18	CB	293	GLU	Peptide
21	CF	60	GLN	Peptide
24	CI	851	TRP	Peptide
29	CO	84	ILE	Peptide
29	CO	88	ARG	Peptide
31	CQ	173	ASP	Peptide
32	CR	830	ASP	Peptide
32	CR	866	PHE	Peptide
32	CR	876	LEU	Peptide
32	CS	830	ASP	Peptide
32	CS	866	PHE	Peptide
32	CS	876	LEU	Peptide
53	CV	88	LYS	Peptide
54	CW	298	THR	Peptide
61	CY	374	ARG	Sidechain
35	Cb	231	GLU	Peptide
37	Cd	151	ASP	Peptide
38	Ce	38	ALA	Peptide
1	UA	386	THR	Peptide
5	UF	120	VAL	Peptide
6	UG	227	TYR	Peptide
10	UM	328	LEU	Peptide
10	UM	382	ILE	Peptide
12	UO	282	ALA	Peptide
12	UO	30	PHE	Peptide
13	UQ	237	TYR	Peptide
13	UQ	707	PRO	Peptide
13	UQ	849	ALA	Peptide
58	US	510	LYS	Peptide
55	UT	141	TYR	Peptide
55	UT	1516	LEU	Peptide
55	UT	1566	GLU	Peptide

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Mol	Chain	Res	Type	Group
55	UT	348	VAL	Peptide
55	UT	408	PRO	Peptide
55	UT	420	GLU	Peptide
55	UT	486	GLU	Peptide
55	UT	487	ILE	Peptide
55	UT	781	TRP	Peptide
15	UU	397	ASP	Peptide
15	UU	685	ASP	Peptide
15	UU	857	ILE	Peptide
52	UV	1058	TYR	Peptide
52	UV	1104	LEU	Peptide
52	UV	366	VAL	Peptide
52	UV	686	GLY	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	UA	835/904 (92%)	753 (90%)	82 (10%)	0	100	100
2	UB	502/907 (55%)	469 (93%)	33 (7%)	0	100	100
3	UC	72/648 (11%)	67 (93%)	5 (7%)	0	100	100
4	UD	754/884 (85%)	705 (94%)	49 (6%)	0	100	100
5	UF	325/414 (78%)	309 (95%)	16 (5%)	0	100	100
6	UG	475/558 (85%)	439 (92%)	33 (7%)	3 (1%)	25	63
7	UJ	1062/1802 (59%)	1007 (95%)	55 (5%)	0	100	100
8	UK	211/270 (78%)	207 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	UL	767/962 (80%)	694 (90%)	73 (10%)	0	100	100
10	UM	705/912 (77%)	645 (92%)	59 (8%)	1 (0%)	51	84
11	UN	171/938 (18%)	161 (94%)	9 (5%)	1 (1%)	25	63
12	UO	498/557 (89%)	465 (93%)	33 (7%)	0	100	100
13	UQ	775/960 (81%)	707 (91%)	67 (9%)	1 (0%)	51	84
14	UR	437/618 (71%)	407 (93%)	30 (7%)	0	100	100
15	UU	890/1049 (85%)	814 (92%)	76 (8%)	0	100	100
16	UX	188/193 (97%)	176 (94%)	12 (6%)	0	100	100
17	UZ	229/391 (59%)	213 (93%)	16 (7%)	0	100	100
18	CA	238/313 (76%)	221 (93%)	17 (7%)	0	100	100
18	CB	235/313 (75%)	217 (92%)	18 (8%)	0	100	100
19	CC	383/523 (73%)	362 (94%)	21 (6%)	0	100	100
20	CD	416/582 (72%)	385 (92%)	31 (8%)	0	100	100
21	CE	119/127 (94%)	112 (94%)	7 (6%)	0	100	100
21	CF	118/127 (93%)	110 (93%)	8 (7%)	0	100	100
22	CG	402/630 (64%)	369 (92%)	33 (8%)	0	100	100
23	CH	383/411 (93%)	351 (92%)	31 (8%)	1 (0%)	41	75
24	CI	812/1163 (70%)	742 (91%)	69 (8%)	1 (0%)	51	84
25	CJ	177/183 (97%)	169 (96%)	8 (4%)	0	100	100
26	CK	295/297 (99%)	272 (92%)	23 (8%)	0	100	100
27	CL	225/785 (29%)	209 (93%)	15 (7%)	1 (0%)	34	71
28	CM	443/446 (99%)	406 (92%)	37 (8%)	0	100	100
29	CN	222/252 (88%)	207 (93%)	15 (7%)	0	100	100
29	CO	211/252 (84%)	192 (91%)	17 (8%)	2 (1%)	17	55
30	CP	227/322 (70%)	216 (95%)	11 (5%)	0	100	100
31	CQ	171/259 (66%)	164 (96%)	7 (4%)	0	100	100
32	CR	746/1073 (70%)	687 (92%)	58 (8%)	1 (0%)	51	84
32	CS	746/1073 (70%)	687 (92%)	58 (8%)	1 (0%)	51	84
33	CT	127/203 (63%)	113 (89%)	14 (11%)	0	100	100
34	Ca	223/255 (88%)	206 (92%)	17 (8%)	0	100	100
35	Cb	230/264 (87%)	209 (91%)	21 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
36	Cc	188/212 (89%)	177 (94%)	11 (6%)	0	100	100
37	Cd	224/239 (94%)	209 (93%)	15 (7%)	0	100	100
38	Ce	155/203 (76%)	138 (89%)	17 (11%)	0	100	100
39	Cf	170/202 (84%)	162 (95%)	8 (5%)	0	100	100
40	Cg	157/190 (83%)	150 (96%)	7 (4%)	0	100	100
41	Ch	64/151 (42%)	62 (97%)	2 (3%)	0	100	100
42	Ci	113/150 (75%)	108 (96%)	5 (4%)	0	100	100
43	Cj	124/143 (87%)	117 (94%)	7 (6%)	0	100	100
44	Ck	136/161 (84%)	127 (93%)	9 (7%)	0	100	100
45	Cm	122/130 (94%)	114 (93%)	8 (7%)	0	100	100
46	Cn	92/145 (63%)	89 (97%)	3 (3%)	0	100	100
47	Co	90/136 (66%)	80 (89%)	10 (11%)	0	100	100
48	Cp	59/68 (87%)	53 (90%)	6 (10%)	0	100	100
49	CU	168/311 (54%)	154 (92%)	14 (8%)	0	100	100
52	UV	1057/1171 (90%)	966 (91%)	89 (8%)	2 (0%)	47	79
53	CV	144/322 (45%)	129 (90%)	14 (10%)	1 (1%)	22	61
54	CW	380/668 (57%)	337 (89%)	43 (11%)	0	100	100
55	UT	1987/2612 (76%)	1877 (94%)	103 (5%)	7 (0%)	34	71
56	UH	349/930 (38%)	328 (94%)	21 (6%)	0	100	100
57	UE	121/410 (30%)	113 (93%)	8 (7%)	0	100	100
57	UI	121/410 (30%)	113 (93%)	8 (7%)	0	100	100
58	US	443/549 (81%)	407 (92%)	36 (8%)	0	100	100
59	Cl	78/156 (50%)	74 (95%)	4 (5%)	0	100	100
60	CX	265/480 (55%)	251 (95%)	14 (5%)	0	100	100
61	CY	119/381 (31%)	112 (94%)	6 (5%)	1 (1%)	19	58
62	CZ	42/609 (7%)	36 (86%)	6 (14%)	0	100	100
63	UP	52/364 (14%)	43 (83%)	8 (15%)	1 (2%)	8	40
All	All	23065/34323 (67%)	21370 (93%)	1670 (7%)	25 (0%)	54	84

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
29	CO	85	SER

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Mol	Chain	Res	Type
52	UV	1059	ASP
13	UQ	708	SER
55	UT	457	TRP
55	UT	487	ILE
6	UG	56	PRO
6	UG	176	LEU
55	UT	408	PRO
55	UT	782	SER
53	CV	89	GLN
55	UT	1566	GLU
55	UT	1567	PHE
10	UM	329	PRO
11	UN	902	ARG
52	UV	567	ARG
6	UG	580	GLU
24	CI	308	THR
32	CR	48	MET
32	CS	48	MET
61	CY	378	GLY
29	CO	84	ILE
55	UT	1445	PRO
23	CH	258	PRO
63	UP	329	PRO
27	CL	640	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	UA	651/775 (84%)	647 (99%)	4 (1%)	86 92
2	UB	425/788 (54%)	420 (99%)	5 (1%)	71 84
3	UC	61/536 (11%)	61 (100%)	0	100 100
4	UD	653/738 (88%)	651 (100%)	2 (0%)	92 95
5	UF	248/341 (73%)	248 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	UG	373/474 (79%)	368 (99%)	5 (1%)	69	82
7	UJ	898/1526 (59%)	896 (100%)	2 (0%)	93	96
8	UK	159/227 (70%)	158 (99%)	1 (1%)	86	92
9	UL	667/821 (81%)	665 (100%)	2 (0%)	92	95
10	UM	606/770 (79%)	602 (99%)	4 (1%)	84	90
11	UN	146/765 (19%)	146 (100%)	0	100	100
12	UO	404/456 (89%)	402 (100%)	2 (0%)	88	93
13	UQ	650/817 (80%)	647 (100%)	3 (0%)	88	93
14	UR	360/524 (69%)	358 (99%)	2 (1%)	86	92
15	UU	672/863 (78%)	669 (100%)	3 (0%)	91	94
16	UX	150/167 (90%)	150 (100%)	0	100	100
17	UZ	186/329 (56%)	182 (98%)	4 (2%)	52	71
18	CA	175/228 (77%)	174 (99%)	1 (1%)	86	92
18	CB	195/228 (86%)	194 (100%)	1 (0%)	88	93
19	CC	287/435 (66%)	287 (100%)	0	100	100
20	CD	319/489 (65%)	318 (100%)	1 (0%)	92	95
21	CE	91/108 (84%)	91 (100%)	0	100	100
21	CF	88/108 (82%)	88 (100%)	0	100	100
22	CG	331/525 (63%)	330 (100%)	1 (0%)	92	95
23	CH	303/320 (95%)	301 (99%)	2 (1%)	84	90
24	CI	661/1009 (66%)	657 (99%)	4 (1%)	86	92
25	CJ	147/169 (87%)	146 (99%)	1 (1%)	84	90
26	CK	245/266 (92%)	243 (99%)	2 (1%)	81	89
27	CL	181/642 (28%)	181 (100%)	0	100	100
28	CM	364/383 (95%)	363 (100%)	1 (0%)	92	95
29	CN	202/223 (91%)	201 (100%)	1 (0%)	88	93
29	CO	193/223 (86%)	193 (100%)	0	100	100
30	CP	202/287 (70%)	202 (100%)	0	100	100
31	CQ	145/215 (67%)	144 (99%)	1 (1%)	84	90
32	CR	654/916 (71%)	457 (70%)	197 (30%)	0	2
32	CS	654/916 (71%)	457 (70%)	197 (30%)	0	2

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	CT	108/167 (65%)	108 (100%)	0	100	100
34	Ca	198/223 (89%)	198 (100%)	0	100	100
35	Cb	199/221 (90%)	199 (100%)	0	100	100
36	Cc	149/178 (84%)	146 (98%)	3 (2%)	55	73
37	Cd	192/204 (94%)	192 (100%)	0	100	100
38	Ce	137/177 (77%)	135 (98%)	2 (2%)	65	80
39	Cf	139/164 (85%)	138 (99%)	1 (1%)	84	90
40	Cg	122/162 (75%)	121 (99%)	1 (1%)	81	89
41	Ch	58/130 (45%)	58 (100%)	0	100	100
42	Ci	78/117 (67%)	78 (100%)	0	100	100
43	Cj	92/115 (80%)	92 (100%)	0	100	100
44	Ck	126/143 (88%)	124 (98%)	2 (2%)	62	79
45	Cm	103/113 (91%)	102 (99%)	1 (1%)	76	86
46	Cn	70/116 (60%)	70 (100%)	0	100	100
47	Co	79/115 (69%)	78 (99%)	1 (1%)	69	82
48	Cp	46/61 (75%)	46 (100%)	0	100	100
49	CU	137/260 (53%)	136 (99%)	1 (1%)	84	90
52	UV	908/989 (92%)	900 (99%)	8 (1%)	78	88
53	CV	129/276 (47%)	128 (99%)	1 (1%)	81	89
54	CW	309/587 (53%)	305 (99%)	4 (1%)	69	82
55	UT	1731/2276 (76%)	1721 (99%)	10 (1%)	86	92
56	UH	301/788 (38%)	300 (100%)	1 (0%)	92	95
57	UE	105/346 (30%)	71 (68%)	34 (32%)	0	2
57	UI	105/346 (30%)	71 (68%)	34 (32%)	0	2
58	US	404/493 (82%)	404 (100%)	0	100	100
59	Cl	71/135 (53%)	68 (96%)	3 (4%)	30	56
60	CX	227/411 (55%)	226 (100%)	1 (0%)	91	94
61	CY	100/322 (31%)	94 (94%)	6 (6%)	19	47
62	CZ	38/519 (7%)	38 (100%)	0	100	100
63	UP	44/314 (14%)	44 (100%)	0	100	100
All	All	19251/29075 (66%)	18688 (97%)	563 (3%)	45	65

All (563) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	UA	87	ARG
1	UA	377	THR
1	UA	388	CYS
1	UA	750	TYR
2	UB	44	LYS
2	UB	697	THR
2	UB	786	ARG
2	UB	828	ASN
2	UB	829	ARG
4	UD	10	ARG
4	UD	278	ASP
6	UG	41	ARG
6	UG	141	THR
6	UG	181	ARG
6	UG	356	THR
6	UG	407	LEU
7	UJ	306	ARG
7	UJ	1517	LYS
8	UK	22	ARG
9	UL	93	ARG
9	UL	440	MET
10	UM	102	THR
10	UM	256	MET
10	UM	517	ARG
10	UM	889	ARG
12	UO	91	PRO
12	UO	125	VAL
13	UQ	403	VAL
13	UQ	537	THR
13	UQ	563	THR
14	UR	265	ARG
14	UR	397	MET
15	UU	276	VAL
15	UU	354	THR
15	UU	671	CYS
17	UZ	56	THR
17	UZ	65	THR
17	UZ	106	ARG
17	UZ	279	ARG
18	CA	292	LEU
18	CB	88	LYS
20	CD	417	VAL

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Mol	Chain	Res	Type
22	CG	352	ARG
23	CH	339	MET
23	CH	406	VAL
24	CI	91	ARG
24	CI	214	TYR
24	CI	840	ARG
24	CI	841	ARG
25	CJ	60	ARG
26	CK	148	THR
26	CK	229	THR
28	CM	360	ARG
29	CN	180	LEU
31	CQ	153	ASP
32	CR	2	THR
32	CR	3	VAL
32	CR	5	LYS
32	CR	9	SER
32	CR	10	ARG
32	CR	19	LEU
32	CR	25	SER
32	CR	26	PHE
32	CR	30	VAL
32	CR	36	GLU
32	CR	38	ILE
32	CR	41	LEU
32	CR	46	SER
32	CR	47	SER
32	CR	49	ASP
32	CR	51	ARG
32	CR	55	SER
32	CR	68	THR
32	CR	69	SER
32	CR	70	HIS
32	CR	72	LYS
32	CR	75	GLU
32	CR	80	LYS
32	CR	82	ILE
32	CR	83	LYS
32	CR	84	ARG
32	CR	87	ARG
32	CR	88	GLU
32	CR	93	ASP

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Mol	Chain	Res	Type
32	CR	96	GLU
32	CR	97	LEU
32	CR	99	ILE
32	CR	101	LEU
32	CR	103	ASP
32	CR	104	ILE
32	CR	105	ARG
32	CR	107	CYS
32	CR	114	LYS
32	CR	115	ILE
32	CR	122	MET
32	CR	124	ILE
32	CR	132	THR
32	CR	134	ASN
32	CR	136	LEU
32	CR	149	VAL
32	CR	151	LEU
32	CR	152	LEU
32	CR	154	LYS
32	CR	156	MET
32	CR	162	LEU
32	CR	167	MET
32	CR	182	ILE
32	CR	187	GLU
32	CR	190	LEU
32	CR	195	SER
32	CR	196	CYS
32	CR	199	CYS
32	CR	201	VAL
32	CR	202	ILE
32	CR	206	LEU
32	CR	208	VAL
32	CR	215	LYS
32	CR	220	LEU
32	CR	249	ILE
32	CR	253	ILE
32	CR	255	LEU
32	CR	257	ARG
32	CR	259	VAL
32	CR	265	LEU
32	CR	277	LEU
32	CR	280	THR

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Mol	Chain	Res	Type
32	CR	282	THR
32	CR	283	LEU
32	CR	291	LYS
32	CR	297	VAL
32	CR	299	ILE
32	CR	308	SER
32	CR	310	ILE
32	CR	313	THR
32	CR	314	SER
32	CR	369	ILE
32	CR	373	ARG
32	CR	375	GLN
32	CR	376	ASP
32	CR	382	GLN
32	CR	389	ASP
32	CR	390	GLU
32	CR	394	ILE
32	CR	396	LEU
32	CR	398	LEU
32	CR	401	LYS
32	CR	410	MET
32	CR	415	SER
32	CR	423	SER
32	CR	431	GLN
32	CR	432	LEU
32	CR	469	LEU
32	CR	471	GLU
32	CR	473	THR
32	CR	474	LEU
32	CR	475	SER
32	CR	488	LYS
32	CR	499	THR
32	CR	517	GLU
32	CR	519	LEU
32	CR	525	THR
32	CR	526	LEU
32	CR	529	PHE
32	CR	534	GLU
32	CR	537	LEU
32	CR	541	VAL
32	CR	545	VAL
32	CR	547	SER

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Mol	Chain	Res	Type
32	CR	549	TYR
32	CR	552	SER
32	CR	561	ASP
32	CR	566	GLU
32	CR	569	VAL
32	CR	571	THR
32	CR	574	ILE
32	CR	575	GLN
32	CR	576	GLU
32	CR	581	GLU
32	CR	586	ILE
32	CR	589	SER
32	CR	593	LYS
32	CR	595	SER
32	CR	614	ILE
32	CR	617	LEU
32	CR	619	SER
32	CR	624	ASP
32	CR	625	ASP
32	CR	631	SER
32	CR	634	ARG
32	CR	643	ASP
32	CR	646	SER
32	CR	647	MET
32	CR	652	LYS
32	CR	654	LEU
32	CR	655	GLN
32	CR	657	LEU
32	CR	658	VAL
32	CR	659	ASP
32	CR	662	GLU
32	CR	705	LEU
32	CR	711	LYS
32	CR	713	SER
32	CR	719	LYS
32	CR	720	LEU
32	CR	721	ASP
32	CR	729	LEU
32	CR	731	GLN
32	CR	732	GLN
32	CR	738	LYS
32	CR	743	VAL

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Mol	Chain	Res	Type
32	CR	747	LEU
32	CR	755	THR
32	CR	760	CYS
32	CR	763	ILE
32	CR	767	GLN
32	CR	781	ASP
32	CR	784	LYS
32	CR	790	LEU
32	CR	799	SER
32	CR	803	LEU
32	CR	804	THR
32	CR	806	GLU
32	CR	818	SER
32	CR	824	LEU
32	CR	825	THR
32	CR	829	LEU
32	CR	830	ASP
32	CR	831	GLN
32	CR	839	LYS
32	CR	841	LEU
32	CR	842	GLU
32	CR	843	SER
32	CR	846	ASN
32	CR	856	ASP
32	CR	860	THR
32	CR	861	ILE
32	CR	864	LEU
32	CR	870	LEU
32	CR	872	GLU
32	CR	879	LEU
32	CR	885	LEU
32	CR	887	LEU
32	CR	897	LEU
32	CR	899	THR
32	CR	900	GLU
32	CR	901	LEU
32	CR	906	SER
32	CR	907	GLN
32	CR	911	ILE
32	CR	914	LYS
32	CR	917	ARG
32	CR	919	VAL

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Mol	Chain	Res	Type
32	CS	2	THR
32	CS	3	VAL
32	CS	5	LYS
32	CS	9	SER
32	CS	10	ARG
32	CS	19	LEU
32	CS	25	SER
32	CS	26	PHE
32	CS	30	VAL
32	CS	36	GLU
32	CS	38	ILE
32	CS	41	LEU
32	CS	46	SER
32	CS	47	SER
32	CS	49	ASP
32	CS	51	ARG
32	CS	55	SER
32	CS	68	THR
32	CS	69	SER
32	CS	70	HIS
32	CS	72	LYS
32	CS	75	GLU
32	CS	80	LYS
32	CS	82	ILE
32	CS	83	LYS
32	CS	84	ARG
32	CS	87	ARG
32	CS	88	GLU
32	CS	93	ASP
32	CS	96	GLU
32	CS	97	LEU
32	CS	99	ILE
32	CS	101	LEU
32	CS	103	ASP
32	CS	104	ILE
32	CS	105	ARG
32	CS	107	CYS
32	CS	114	LYS
32	CS	115	ILE
32	CS	122	MET
32	CS	124	ILE
32	CS	132	THR

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Mol	Chain	Res	Type
32	CS	134	ASN
32	CS	136	LEU
32	CS	149	VAL
32	CS	151	LEU
32	CS	152	LEU
32	CS	154	LYS
32	CS	156	MET
32	CS	162	LEU
32	CS	167	MET
32	CS	182	ILE
32	CS	187	GLU
32	CS	190	LEU
32	CS	195	SER
32	CS	196	CYS
32	CS	199	CYS
32	CS	201	VAL
32	CS	202	ILE
32	CS	206	LEU
32	CS	208	VAL
32	CS	215	LYS
32	CS	220	LEU
32	CS	249	ILE
32	CS	253	ILE
32	CS	255	LEU
32	CS	257	ARG
32	CS	259	VAL
32	CS	265	LEU
32	CS	277	LEU
32	CS	280	THR
32	CS	282	THR
32	CS	283	LEU
32	CS	291	LYS
32	CS	297	VAL
32	CS	299	ILE
32	CS	308	SER
32	CS	310	ILE
32	CS	313	THR
32	CS	314	SER
32	CS	369	ILE
32	CS	373	ARG
32	CS	375	GLN
32	CS	376	ASP

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Mol	Chain	Res	Type
32	CS	382	GLN
32	CS	389	ASP
32	CS	390	GLU
32	CS	394	ILE
32	CS	396	LEU
32	CS	398	LEU
32	CS	401	LYS
32	CS	410	MET
32	CS	415	SER
32	CS	423	SER
32	CS	431	GLN
32	CS	432	LEU
32	CS	469	LEU
32	CS	471	GLU
32	CS	473	THR
32	CS	474	LEU
32	CS	475	SER
32	CS	488	LYS
32	CS	499	THR
32	CS	517	GLU
32	CS	519	LEU
32	CS	525	THR
32	CS	526	LEU
32	CS	529	PHE
32	CS	534	GLU
32	CS	537	LEU
32	CS	541	VAL
32	CS	545	VAL
32	CS	547	SER
32	CS	549	TYR
32	CS	552	SER
32	CS	561	ASP
32	CS	566	GLU
32	CS	569	VAL
32	CS	571	THR
32	CS	574	ILE
32	CS	575	GLN
32	CS	576	GLU
32	CS	581	GLU
32	CS	586	ILE
32	CS	589	SER
32	CS	593	LYS

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Mol	Chain	Res	Type
32	CS	595	SER
32	CS	614	ILE
32	CS	617	LEU
32	CS	619	SER
32	CS	624	ASP
32	CS	625	ASP
32	CS	631	SER
32	CS	634	ARG
32	CS	643	ASP
32	CS	646	SER
32	CS	647	MET
32	CS	652	LYS
32	CS	654	LEU
32	CS	655	GLN
32	CS	657	LEU
32	CS	658	VAL
32	CS	659	ASP
32	CS	662	GLU
32	CS	705	LEU
32	CS	711	LYS
32	CS	713	SER
32	CS	719	LYS
32	CS	720	LEU
32	CS	721	ASP
32	CS	729	LEU
32	CS	731	GLN
32	CS	732	GLN
32	CS	738	LYS
32	CS	743	VAL
32	CS	747	LEU
32	CS	755	THR
32	CS	760	CYS
32	CS	763	ILE
32	CS	767	GLN
32	CS	781	ASP
32	CS	784	LYS
32	CS	790	LEU
32	CS	799	SER
32	CS	803	LEU
32	CS	804	THR
32	CS	806	GLU
32	CS	818	SER

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Mol	Chain	Res	Type
32	CS	824	LEU
32	CS	825	THR
32	CS	829	LEU
32	CS	830	ASP
32	CS	831	GLN
32	CS	839	LYS
32	CS	841	LEU
32	CS	842	GLU
32	CS	843	SER
32	CS	846	ASN
32	CS	856	ASP
32	CS	860	THR
32	CS	861	ILE
32	CS	864	LEU
32	CS	870	LEU
32	CS	872	GLU
32	CS	879	LEU
32	CS	885	LEU
32	CS	887	LEU
32	CS	897	LEU
32	CS	899	THR
32	CS	900	GLU
32	CS	901	LEU
32	CS	906	SER
32	CS	907	GLN
32	CS	911	ILE
32	CS	914	LYS
32	CS	917	ARG
32	CS	919	VAL
36	Cc	52	ARG
36	Cc	85	MET
36	Cc	144	ARG
38	Ce	35	THR
38	Ce	45	ARG
39	Cf	10	LYS
40	Cg	55	ARG
44	Ck	49	THR
44	Ck	72	ARG
45	Cm	97	ARG
47	Co	400	THR
49	CU	129	ARG
52	UV	91	LYS

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Mol	Chain	Res	Type
52	UV	181	LYS
52	UV	781	ARG
52	UV	793	ARG
52	UV	805	ARG
52	UV	889	ARG
52	UV	920	LYS
52	UV	1067	THR
53	CV	201	LEU
54	CW	21	ARG
54	CW	85	ARG
54	CW	95	THR
54	CW	293	LEU
55	UT	422	TRP
55	UT	654	CYS
55	UT	842	ARG
55	UT	1006	ARG
55	UT	1218	LYS
55	UT	1564	LYS
55	UT	1565	ARG
55	UT	1633	TRP
55	UT	1732	LEU
55	UT	2198	CYS
56	UH	624	MET
57	UE	153	LEU
57	UE	159	GLN
57	UE	166	SER
57	UE	167	ASP
57	UE	168	LEU
57	UE	169	LEU
57	UE	173	LEU
57	UE	174	GLN
57	UE	175	THR
57	UE	179	LEU
57	UE	180	ILE
57	UE	184	THR
57	UE	188	MET
57	UE	189	ASP
57	UE	190	SER
57	UE	191	SER
57	UE	195	THR
57	UE	197	LEU
57	UE	198	SER

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Mol	Chain	Res	Type
57	UE	204	MET
57	UE	214	LEU
57	UE	222	LEU
57	UE	231	THR
57	UE	232	GLN
57	UE	236	ILE
57	UE	244	ARG
57	UE	246	LEU
57	UE	249	ARG
57	UE	250	SER
57	UE	251	ARG
57	UE	254	SER
57	UE	255	SER
57	UE	257	LEU
57	UE	278	MET
59	CI	16	ARG
59	CI	22	VAL
59	CI	25	LYS
60	CX	422	ARG
61	CY	254	VAL
61	CY	304	MET
61	CY	374	ARG
61	CY	376	THR
61	CY	377	ARG
61	CY	379	LYS
57	UI	153	LEU
57	UI	159	GLN
57	UI	166	SER
57	UI	167	ASP
57	UI	168	LEU
57	UI	169	LEU
57	UI	173	LEU
57	UI	174	GLN
57	UI	175	THR
57	UI	179	LEU
57	UI	180	ILE
57	UI	184	THR
57	UI	188	MET
57	UI	189	ASP
57	UI	190	SER
57	UI	191	SER
57	UI	195	THR

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Mol	Chain	Res	Type
57	UI	197	LEU
57	UI	198	SER
57	UI	204	MET
57	UI	214	LEU
57	UI	222	LEU
57	UI	231	THR
57	UI	232	GLN
57	UI	236	ILE
57	UI	244	ARG
57	UI	246	LEU
57	UI	249	ARG
57	UI	250	SER
57	UI	251	ARG
57	UI	254	SER
57	UI	255	SER
57	UI	257	LEU
57	UI	278	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (256) such sidechains are listed below:

Mol	Chain	Res	Type
1	UA	207	GLN
1	UA	336	GLN
1	UA	381	HIS
2	UB	22	GLN
2	UB	27	GLN
2	UB	59	GLN
2	UB	525	ASN
2	UB	533	HIS
2	UB	581	HIS
2	UB	645	GLN
2	UB	647	GLN
2	UB	663	ASN
2	UB	765	ASN
4	UD	697	GLN
5	UF	154	ASN
6	UG	159	HIS
6	UG	175	GLN
6	UG	206	ASN
6	UG	221	HIS
6	UG	267	ASN
6	UG	270	ASN

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Mol	Chain	Res	Type
6	UG	299	HIS
6	UG	322	ASN
6	UG	378	GLN
6	UG	391	GLN
7	UJ	43	GLN
7	UJ	143	HIS
7	UJ	243	ASN
7	UJ	379	ASN
7	UJ	700	HIS
7	UJ	731	ASN
7	UJ	1667	GLN
7	UJ	1771	GLN
8	UK	13	HIS
8	UK	213	GLN
9	UL	44	ASN
9	UL	145	GLN
9	UL	398	ASN
9	UL	517	HIS
9	UL	558	GLN
9	UL	594	ASN
9	UL	630	ASN
9	UL	688	GLN
9	UL	823	ASN
9	UL	870	ASN
9	UL	930	GLN
10	UM	42	ASN
10	UM	386	GLN
10	UM	394	ASN
10	UM	478	HIS
10	UM	564	GLN
10	UM	579	GLN
10	UM	643	HIS
10	UM	743	GLN
10	UM	747	ASN
10	UM	772	ASN
11	UN	306	GLN
11	UN	872	ASN
11	UN	879	ASN
11	UN	916	GLN
12	UO	46	HIS
12	UO	103	HIS
12	UO	143	HIS

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Mol	Chain	Res	Type
12	UO	271	ASN
12	UO	333	HIS
12	UO	339	GLN
12	UO	391	ASN
12	UO	462	HIS
13	UQ	112	GLN
13	UQ	152	ASN
13	UQ	167	HIS
13	UQ	262	HIS
13	UQ	310	GLN
13	UQ	383	GLN
13	UQ	418	ASN
13	UQ	477	HIS
13	UQ	606	HIS
13	UQ	783	ASN
13	UQ	784	HIS
13	UQ	815	ASN
14	UR	301	HIS
14	UR	319	HIS
14	UR	364	GLN
14	UR	399	ASN
14	UR	411	GLN
14	UR	579	ASN
15	UU	81	ASN
15	UU	143	GLN
15	UU	197	ASN
15	UU	328	ASN
15	UU	577	GLN
15	UU	621	HIS
15	UU	711	ASN
15	UU	963	ASN
15	UU	973	HIS
16	UX	39	GLN
17	UZ	87	HIS
17	UZ	240	ASN
18	CA	78	HIS
18	CB	78	HIS
18	CB	235	GLN
18	CB	277	GLN
18	CB	289	GLN
18	CB	299	HIS
19	CC	176	HIS

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Mol	Chain	Res	Type
20	CD	137	ASN
20	CD	167	HIS
20	CD	219	ASN
20	CD	256	ASN
20	CD	263	GLN
20	CD	422	ASN
21	CE	27	GLN
21	CF	19	GLN
21	CF	27	GLN
22	CG	165	GLN
22	CG	198	GLN
22	CG	243	GLN
22	CG	245	HIS
22	CG	430	HIS
22	CG	561	ASN
23	CH	100	HIS
23	CH	207	HIS
24	CI	155	ASN
24	CI	284	GLN
24	CI	749	GLN
24	CI	853	ASN
24	CI	1053	ASN
25	CJ	8	HIS
26	CK	48	ASN
26	CK	159	HIS
26	CK	210	HIS
26	CK	225	ASN
28	CM	41	GLN
28	CM	207	GLN
28	CM	248	ASN
28	CM	262	HIS
28	CM	282	HIS
29	CN	23	GLN
29	CN	94	GLN
29	CN	111	GLN
29	CN	154	ASN
31	CQ	137	GLN
32	CR	70	HIS
32	CR	126	GLN
32	CR	170	HIS
32	CR	186	ASN
32	CR	370	GLN

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Mol	Chain	Res	Type
32	CR	620	GLN
32	CR	623	GLN
32	CR	641	ASN
32	CR	703	HIS
32	CR	810	ASN
32	CR	819	ASN
32	CR	846	ASN
32	CR	880	GLN
32	CR	881	GLN
32	CS	70	HIS
32	CS	126	GLN
32	CS	170	HIS
32	CS	186	ASN
32	CS	370	GLN
32	CS	623	GLN
32	CS	641	ASN
32	CS	703	HIS
32	CS	810	ASN
32	CS	819	ASN
32	CS	846	ASN
32	CS	880	GLN
32	CS	881	GLN
32	CS	907	GLN
34	Ca	149	GLN
34	Ca	183	GLN
35	Cb	36	HIS
36	Cc	87	HIS
36	Cc	91	ASN
36	Cc	118	GLN
37	Cd	65	GLN
37	Cd	116	GLN
37	Cd	129	HIS
37	Cd	213	GLN
38	Ce	17	GLN
39	Cf	35	ASN
39	Cf	88	ASN
40	Cg	121	HIS
40	Cg	140	ASN
42	Ci	42	HIS
42	Ci	102	ASN
43	Cj	77	GLN
43	Cj	83	GLN

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Mol	Chain	Res	Type
44	Ck	86	HIS
45	Cm	42	GLN
46	Cn	48	HIS
46	Cn	79	ASN
46	Cn	94	ASN
47	Co	353	GLN
47	Co	360	HIS
47	Co	385	GLN
47	Co	394	GLN
52	UV	77	HIS
52	UV	106	GLN
52	UV	119	GLN
52	UV	192	ASN
52	UV	241	HIS
52	UV	281	GLN
52	UV	477	GLN
52	UV	524	GLN
52	UV	617	GLN
52	UV	667	HIS
52	UV	799	GLN
52	UV	846	HIS
52	UV	936	HIS
52	UV	1103	ASN
53	CV	103	GLN
53	CV	199	ASN
54	CW	43	ASN
54	CW	114	HIS
54	CW	361	ASN
55	UT	22	GLN
55	UT	311	HIS
55	UT	366	GLN
55	UT	377	GLN
55	UT	389	HIS
55	UT	393	ASN
55	UT	414	GLN
55	UT	462	ASN
55	UT	495	GLN
55	UT	692	GLN
55	UT	709	HIS
55	UT	793	HIS
55	UT	816	GLN
55	UT	1272	HIS

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Mol	Chain	Res	Type
55	UT	1314	ASN
55	UT	1366	GLN
55	UT	1436	HIS
55	UT	1696	ASN
55	UT	1729	ASN
55	UT	2026	ASN
55	UT	2180	ASN
56	UH	740	ASN
56	UH	774	GLN
56	UH	814	GLN
56	UH	875	ASN
57	UE	159	GLN
57	UE	174	GLN
58	US	137	HIS
58	US	152	HIS
58	US	184	HIS
58	US	222	ASN
58	US	225	ASN
58	US	264	GLN
58	US	470	ASN
58	US	522	HIS
59	CI	12	ASN
60	CX	364	ASN
60	CX	411	HIS
60	CX	423	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
50	C1	1550/2352 (65%)	481 (31%)	31 (2%)
51	C2	226/230 (98%)	67 (29%)	3 (1%)
All	All	1776/2582 (68%)	548 (30%)	34 (1%)

All (548) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
50	C1	4	G
50	C1	5	G
50	C1	7	A
50	C1	13	G
50	C1	14	G

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Mol	Chain	Res	Type
50	C1	15	G
50	C1	16	U
50	C1	17	C
50	C1	18	G
50	C1	19	C
50	C1	23	G
50	C1	26	C
50	C1	40	A
50	C1	41	G
50	C1	42	C
50	C1	47	G
50	C1	49	G
50	C1	56	C
50	C1	61	G
50	C1	66	G
50	C1	68	U
50	C1	71	A
50	C1	72	U
50	C1	73	A
50	C1	74	C
50	C1	77	C
50	C1	89	G
50	C1	90	A
50	C1	93	G
50	C1	94	G
50	C1	96	C
50	C1	97	C
50	C1	104	U
50	C1	105	A
50	C1	119	G
50	C1	121	G
50	C1	126	C
50	C1	127	C
50	C1	128	G
50	C1	134	C
50	C1	136	C
50	C1	150	C
50	C1	152	G
50	C1	154	C
50	C1	155	G
50	C1	158	C
50	C1	159	C

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Mol	Chain	Res	Type
50	C1	160	C
50	C1	161	A
50	C1	162	G
50	C1	166	A
50	C1	169	G
50	C1	171	G
50	C1	176	G
50	C1	182	C
50	C1	183	C
50	C1	193	U
50	C1	201	G
50	C1	202	A
50	C1	203	C
50	C1	205	C
50	C1	206	C
50	C1	207	U
50	C1	209	A
50	C1	210	G
50	C1	216	A
50	C1	221	A
50	C1	224	C
50	C1	234	G
50	C1	242	U
50	C1	243	U
50	C1	244	G
50	C1	257	G
50	C1	260	U
50	C1	265	G
50	C1	266	C
50	C1	267	U
50	C1	268	G
50	C1	269	G
50	C1	273	G
50	C1	276	C
50	C1	277	U
50	C1	278	A
50	C1	281	U
50	C1	282	C
50	C1	283	A
50	C1	285	A
50	C1	291	C
50	C1	292	G

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Mol	Chain	Res	Type
50	C1	297	U
50	C1	308	U
50	C1	310	G
50	C1	312	G
50	C1	319	U
50	C1	320	A
50	C1	322	C
50	C1	323	G
50	C1	333	C
50	C1	334	U
50	C1	346	C
50	C1	347	C
50	C1	349	C
50	C1	351	U
50	C1	352	G
50	C1	353	G
50	C1	362	G
50	C1	372	U
50	C1	376	G
50	C1	382	U
50	C1	383	G
50	C1	384	C
50	C1	386	G
50	C1	398	C
50	C1	402	U
50	C1	403	G
50	C1	404	C
50	C1	416	U
50	C1	425	C
50	C1	427	G
50	C1	435	A
50	C1	436	A
50	C1	440	G
50	C1	441	A
50	C1	443	G
50	C1	454	C
50	C1	458	A
50	C1	459	C
50	C1	468	C
50	C1	469	G
50	C1	473	G
50	C1	474	A

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Mol	Chain	Res	Type
50	C1	475	C
50	C1	484	G
50	C1	491	G
50	C1	492	C
50	C1	499	G
50	C1	500	C
50	C1	501	U
50	C1	502	A
50	C1	504	C
50	C1	581	C
50	C1	582	G
50	C1	583	A
50	C1	584	U
50	C1	585	A
50	C1	586	G
50	C1	587	U
50	C1	594	G
50	C1	595	U
50	C1	609	A
50	C1	610	G
50	C1	613	A
50	C1	614	U
50	C1	621	G
50	C1	638	A
50	C1	646	C
50	C1	650	G
50	C1	652	A
50	C1	653	U
50	C1	655	A
50	C1	659	A
50	C1	660	U
50	C1	661	U
50	C1	662	A
50	C1	663	U
50	C1	664	A
50	C1	667	G
50	C1	678	A
50	C1	679	A
50	C1	680	U
50	C1	682	G
50	C1	683	C
50	C1	685	C

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Mol	Chain	Res	Type
50	C1	686	A
50	C1	687	U
50	C1	688	U
50	C1	689	A
50	C1	690	A
50	C1	691	A
50	C1	692	U
50	C1	693	C
50	C1	697	U
50	C1	700	C
50	C1	702	U
50	C1	710	A
50	C1	711	U
50	C1	713	G
50	C1	715	A
50	C1	719	U
50	C1	720	A
50	C1	721	C
50	C1	722	U
50	C1	723	A
50	C1	725	A
50	C1	726	U
50	C1	728	G
50	C1	729	A
50	C1	730	U
50	C1	740	A
50	C1	742	U
50	C1	743	U
50	C1	744	C
50	C1	745	U
50	C1	757	A
50	C1	758	U
50	C1	760	C
50	C1	762	G
50	C1	763	A
50	C1	764	A
50	C1	769	C
50	C1	770	C
50	C1	771	G
50	C1	772	A
50	C1	773	C
50	C1	774	U

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Mol	Chain	Res	Type
50	C1	775	U
50	C1	776	C
50	C1	777	G
50	C1	778	G
50	C1	782	G
50	C1	786	G
50	C1	797	A
50	C1	798	U
50	C1	802	A
50	C1	803	A
50	C1	804	A
50	C1	806	C
50	C1	807	A
50	C1	808	A
50	C1	810	G
50	C1	811	C
50	C1	816	C
50	C1	830	G
50	C1	833	U
50	C1	841	A
50	C1	845	C
50	C1	849	A
50	C1	850	A
50	C1	851	U
50	C1	855	A
50	C1	856	C
50	C1	858	G
50	C1	860	C
50	C1	861	U
50	C1	862	U
50	C1	863	G
50	C1	879	A
50	C1	886	U
50	C1	889	C
50	C1	892	C
50	C1	893	C
50	C1	897	U
50	C1	900	A
50	C1	903	U
50	C1	904	U
50	C1	907	A
50	C1	910	G

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Mol	Chain	Res	Type
50	C1	913	G
50	C1	921	G
50	C1	922	C
50	C1	925	G
50	C1	930	G
50	C1	934	A
50	C1	935	C
50	C1	936	A
50	C1	942	U
50	C1	943	A
50	C1	944	A
50	C1	953	U
50	C1	971	A
50	C1	972	A
50	C1	984	A
50	C1	985	A
50	C1	986	C
50	C1	987	G
50	C1	988	G
50	C1	989	C
50	C1	1000	A
50	C1	1001	A
50	C1	1002	G
50	C1	1005	A
50	C1	1007	G
50	C1	1017	C
50	C1	1018	G
50	C1	1021	A
50	C1	1022	A
50	C1	1023	U
50	C1	1024	U
50	C1	1025	A
50	C1	1028	C
50	C1	1029	A
50	C1	1030	A
50	C1	1035	G
50	C1	1036	A
50	C1	1037	C
50	C1	1038	A
50	C1	1039	C
50	C1	1043	G
50	C1	1044	A

Continued on next page...

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Mol	Chain	Res	Type
50	C1	1045	G
50	C1	1054	A
50	C1	1059	A
50	C1	1061	A
50	C1	1064	G
50	C1	1069	A
50	C1	1076	U
50	C1	1077	U
50	C1	1078	U
50	C1	1079	C
50	C1	1085	U
50	C1	1086	U
50	C1	1088	U
50	C1	1089	A
50	C1	1094	G
50	C1	1095	A
50	C1	1097	U
50	C1	1098	G
50	C1	1099	A
50	C1	1103	C
50	C1	1104	A
50	C1	1109	A
50	C1	1116	U
50	C1	1120	C
50	C1	1122	A
50	C1	1123	G
50	C1	1124	G
50	C1	1125	A
50	C1	1126	A
50	C1	1127	C
50	C1	1128	A
50	C1	1129	A
50	C1	1141	G
50	C1	1147	U
50	C1	1148	G
50	C1	1150	C
50	C1	1154	A
50	C1	1156	C
50	C1	1157	C
50	C1	1158	G
50	C1	1163	A
50	C1	1164	A

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Continued from previous page...

Mol	Chain	Res	Type
50	C1	1166	U
50	C1	1167	C
50	C1	1168	C
50	C1	1169	A
50	C1	1170	G
50	C1	1177	U
50	C1	1178	A
50	C1	1179	G
50	C1	1186	U
50	C1	1218	G
50	C1	1219	A
50	C1	1222	C
50	C1	1223	U
50	C1	1251	C
50	C1	1258	A
50	C1	1264	U
50	C1	1265	G
50	C1	1444	A
50	C1	1447	A
50	C1	1448	A
50	C1	1449	U
50	C1	1450	A
50	C1	1452	G
50	C1	1469	A
50	C1	1471	U
50	C1	1481	U
50	C1	1482	C
50	C1	1483	A
50	C1	1484	G
50	C1	1486	G
50	C1	1487	G
50	C1	1489	G
50	C1	1491	A
50	C1	1497	U
50	C1	1498	G
50	C1	1499	G
50	C1	1518	A
50	C1	1519	C
50	C1	1520	U
50	C1	1525	A
50	C1	1527	G
50	C1	1529	A

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Mol	Chain	Res	Type
50	C1	1536	A
50	C1	1544	U
50	C1	1545	U
50	C1	1546	U
50	C1	1549	U
50	C1	1550	U
50	C1	1551	A
50	C1	1554	C
50	C1	1555	A
50	C1	1613	C
50	C1	1614	U
50	C1	1624	A
50	C1	1625	G
50	C1	1636	G
50	C1	1637	C
50	C1	1639	U
50	C1	1642	A
50	C1	1643	U
50	C1	1644	U
50	C1	1645	U
50	C1	1646	U
50	C1	1647	U
50	C1	1665	A
50	C1	1667	G
50	C1	1668	A
50	C1	1670	A
50	C1	1701	U
50	C1	1709	A
50	C1	1710	G
50	C1	1711	G
50	C1	1712	C
50	C1	1713	U
50	C1	1735	A
50	C1	1738	G
50	C1	1742	C
50	C1	1743	C
50	C1	1744	A
50	C1	1751	G
50	C1	2047	G
50	C1	2054	A
50	C1	2055	C
50	C1	2056	U

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Mol	Chain	Res	Type
50	C1	2071	G
50	C1	2072	U
50	C1	2073	A
50	C1	2074	C
50	C1	2075	U
50	C1	2077	C
50	C1	2078	C
50	C1	2085	G
50	C1	2086	A
50	C1	2087	G
50	C1	2088	A
50	C1	2107	A
50	C1	2109	A
50	C1	2114	G
50	C1	2115	U
50	C1	2118	U
50	C1	2120	C
50	C1	2121	U
50	C1	2156	A
50	C1	2157	G
50	C1	2166	A
50	C1	2167	G
50	C1	2173	G
50	C1	2178	U
50	C1	2183	A
50	C1	2184	G
50	C1	2185	C
50	C1	2190	G
50	C1	2197	A
50	C1	2201	C
50	C1	2202	C
50	C1	2205	G
50	C1	2210	U
50	C1	2211	U
50	C1	2213	U
50	C1	2214	A
50	C1	2215	C
50	C1	2216	A
50	C1	2220	C
50	C1	2222	C
50	C1	2223	C
50	C1	2227	C

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Mol	Chain	Res	Type
50	C1	2234	A
50	C1	2238	A
50	C1	2328	G
50	C1	2329	A
50	C1	2330	G
50	C1	2351	G
50	C1	2358	U
50	C1	2362	U
50	C1	2363	G
50	C1	2364	A
50	C1	2365	A
50	C1	2366	C
50	C1	2373	A
50	C1	2374	G
51	C2	6	C
51	C2	8	A
51	C2	15	A
51	C2	23	A
51	C2	24	U
51	C2	29	A
51	C2	33	U
51	C2	36	U
51	C2	37	U
51	C2	39	U
51	C2	48	G
51	C2	57	A
51	C2	58	A
51	C2	62	A
51	C2	63	G
51	C2	82	U
51	C2	90	C
51	C2	91	G
51	C2	92	A
51	C2	95	U
51	C2	104	C
51	C2	111	G
51	C2	124	U
51	C2	125	U
51	C2	126	U
51	C2	127	A
51	C2	128	C
51	C2	136	C

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Mol	Chain	Res	Type
51	C2	140	C
51	C2	142	G
51	C2	145	A
51	C2	146	A
51	C2	147	G
51	C2	148	G
51	C2	153	G
51	C2	156	C
51	C2	160	U
51	C2	162	C
51	C2	163	C
51	C2	164	U
51	C2	165	C
51	C2	166	G
51	C2	167	U
51	C2	168	C
51	C2	170	C
51	C2	178	U
51	C2	179	A
51	C2	181	A
51	C2	182	G
51	C2	187	U
51	C2	188	G
51	C2	189	G
51	C2	190	C
51	C2	192	A
51	C2	198	U
51	C2	199	G
51	C2	200	U
51	C2	201	A
51	C2	244	G
51	C2	247	G
51	C2	250	G
51	C2	255	U
51	C2	256	G
51	C2	259	A
51	C2	260	G
51	C2	261	U
51	C2	262	C

All (34) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
50	C1	89	G
50	C1	96	C
50	C1	135	A
50	C1	150	C
50	C1	205	C
50	C1	209	A
50	C1	277	U
50	C1	281	U
50	C1	424	U
50	C1	582	G
50	C1	593	G
50	C1	684	U
50	C1	771	G
50	C1	802	A
50	C1	906	G
50	C1	1001	A
50	C1	1017	C
50	C1	1068	C
50	C1	1077	U
50	C1	1085	U
50	C1	1087	G
50	C1	1163	A
50	C1	1485	A
50	C1	1638	G
50	C1	1712	C
50	C1	1734	G
50	C1	2054	A
50	C1	2077	C
50	C1	2156	A
50	C1	2177	G
50	C1	2219	C
51	C2	23	A
51	C2	35	G
51	C2	255	U

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 2 are monoatomic - leaving 1 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
65	GTP	CI	1201	24	26,34,34	1.29	2 (7%)	32,54,54	1.90	7 (21%)

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
65	GTP	CI	1201	24	-	4/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
65	CI	1201	GTP	C5-C6	-4.46	1.38	1.47
65	CI	1201	GTP	C2-N3	2.12	1.38	1.33

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
65	CI	1201	GTP	PA-O3A-PB	-5.62	113.55	132.83
65	CI	1201	GTP	PB-O3B-PG	-4.47	117.49	132.83
65	CI	1201	GTP	C5-C6-N1	3.55	120.23	113.95
65	CI	1201	GTP	C2-N1-C6	-3.27	119.08	125.10
65	CI	1201	GTP	C8-N7-C5	2.91	108.54	102.99
65	CI	1201	GTP	C3'-C2'-C1'	2.77	105.15	100.98
65	CI	1201	GTP	O6-C6-C5	-2.34	119.79	124.37

There are no chirality outliers.

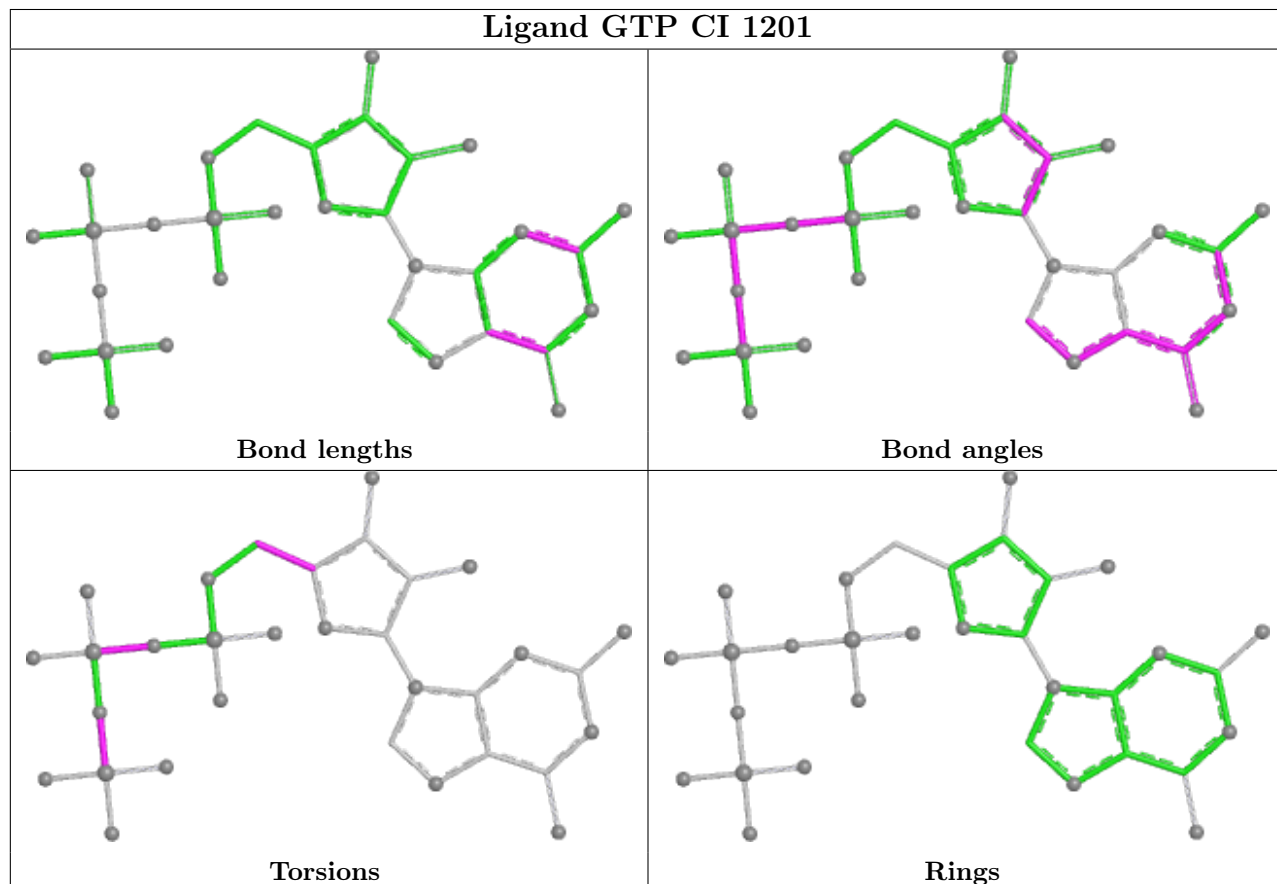
All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
65	CI	1201	GTP	PB-O3B-PG-O3G
65	CI	1201	GTP	O4'-C4'-C5'-O5'
65	CI	1201	GTP	PB-O3B-PG-O1G
65	CI	1201	GTP	PA-O3A-PB-O1B

There are no ring outliers.

No monomer is involved in short contacts.

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



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
51	C2	3

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C2	206:G	O3'	240:C	P	19.22
1	C2	105:C	O3'	110:A	P	16.33
1	C2	119:C	O3'	123:A	P	11.75

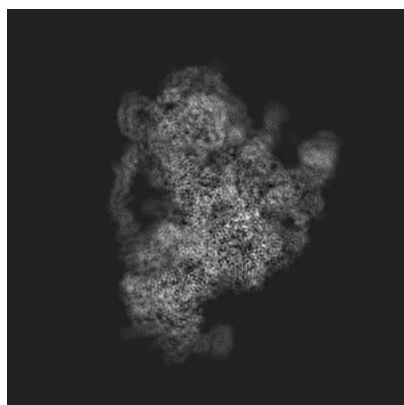
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10053. These allow visual inspection of the internal detail of the map and identification of artifacts.

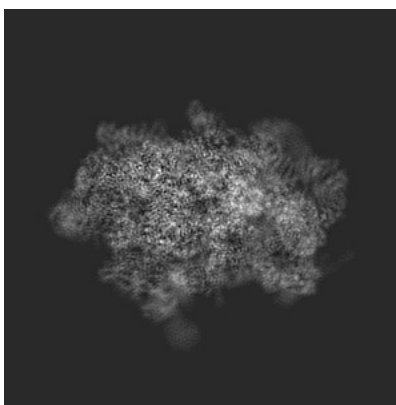
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

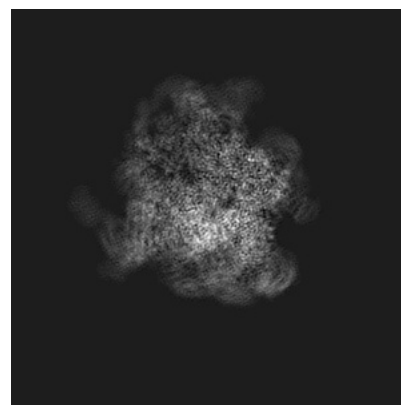
6.1.1 Primary map



X



Y

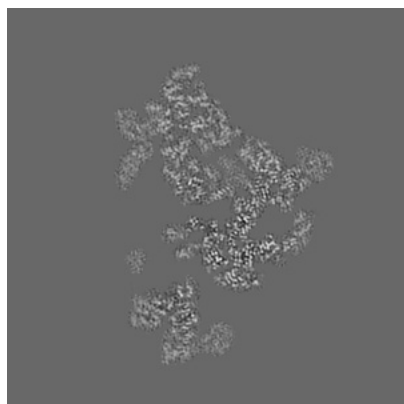


Z

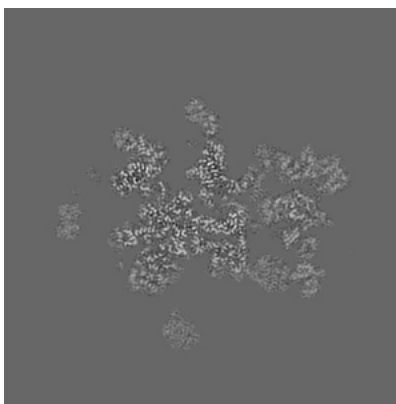
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

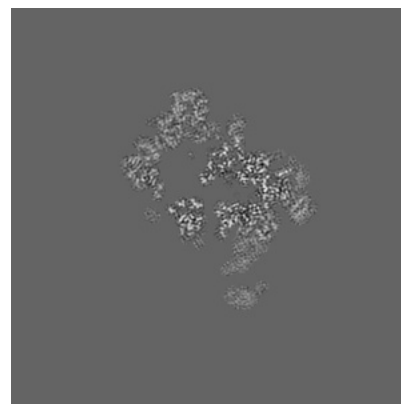
6.2.1 Primary map



X Index: 240



Y Index: 240

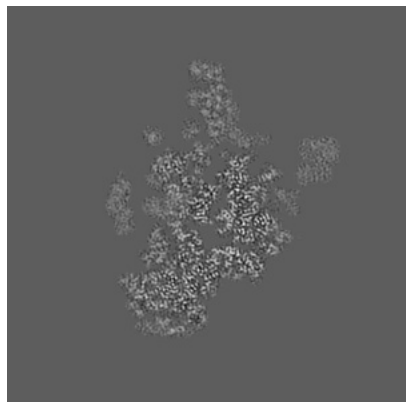


Z Index: 240

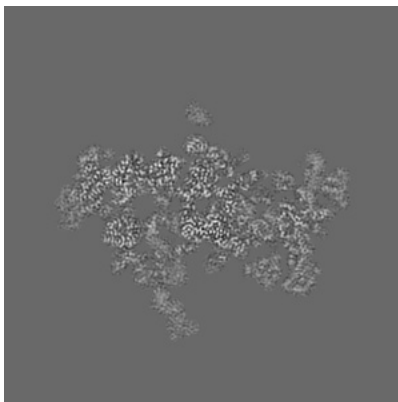
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

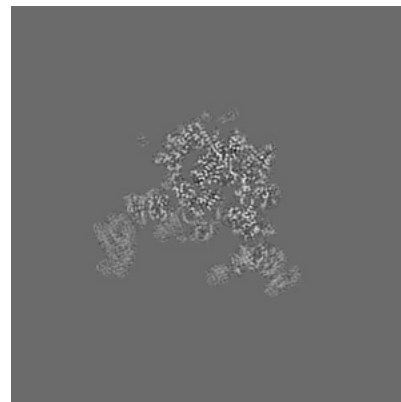
6.3.1 Primary map



X Index: 279



Y Index: 224

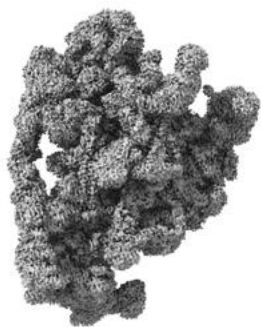


Z Index: 183

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

6.4 Orthogonal surface views [i](#)

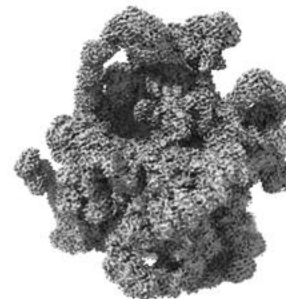
6.4.1 Primary map



X



Y



Z

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

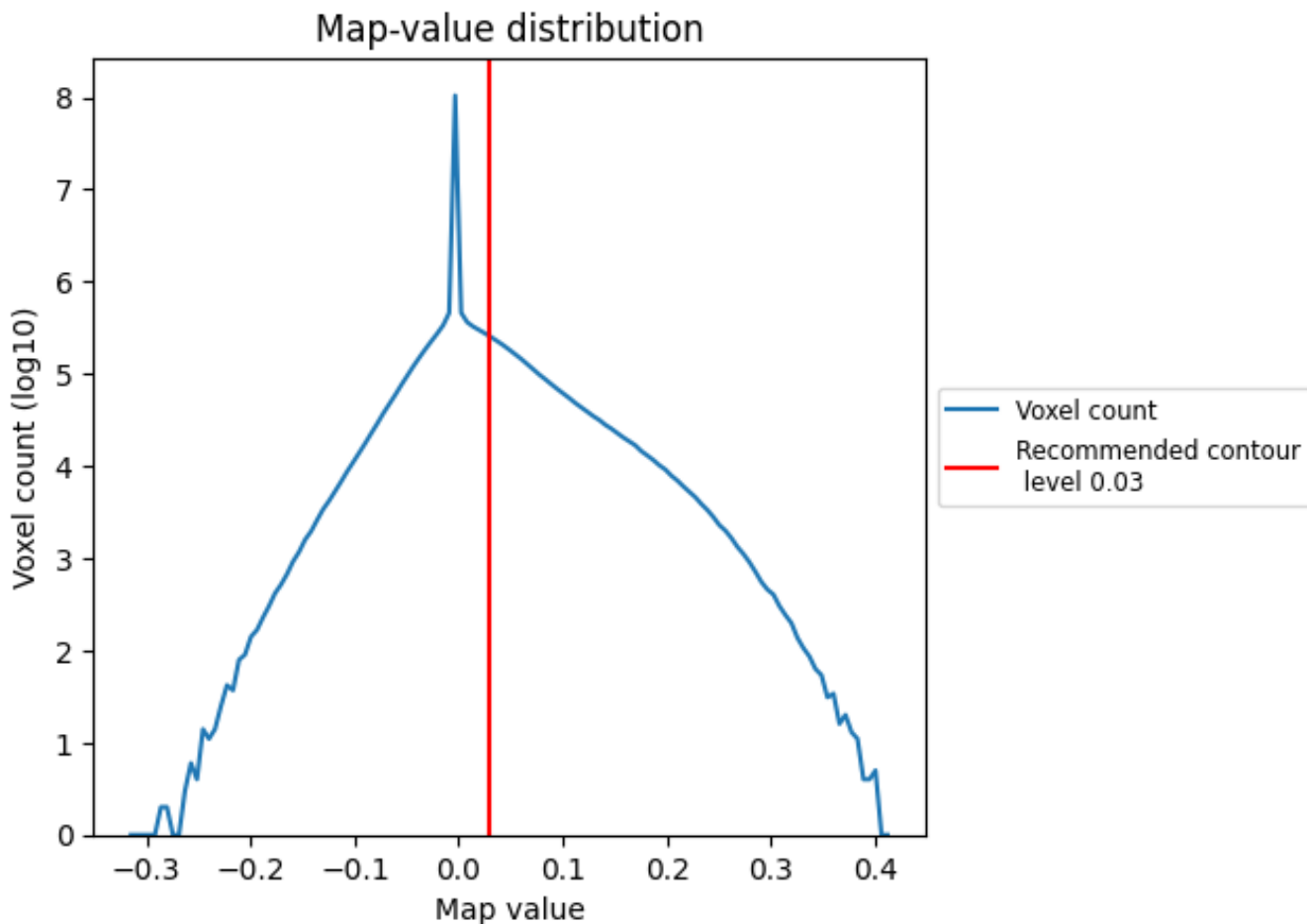
6.5 Mask visualisation

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

7 Map analysis [i](#)

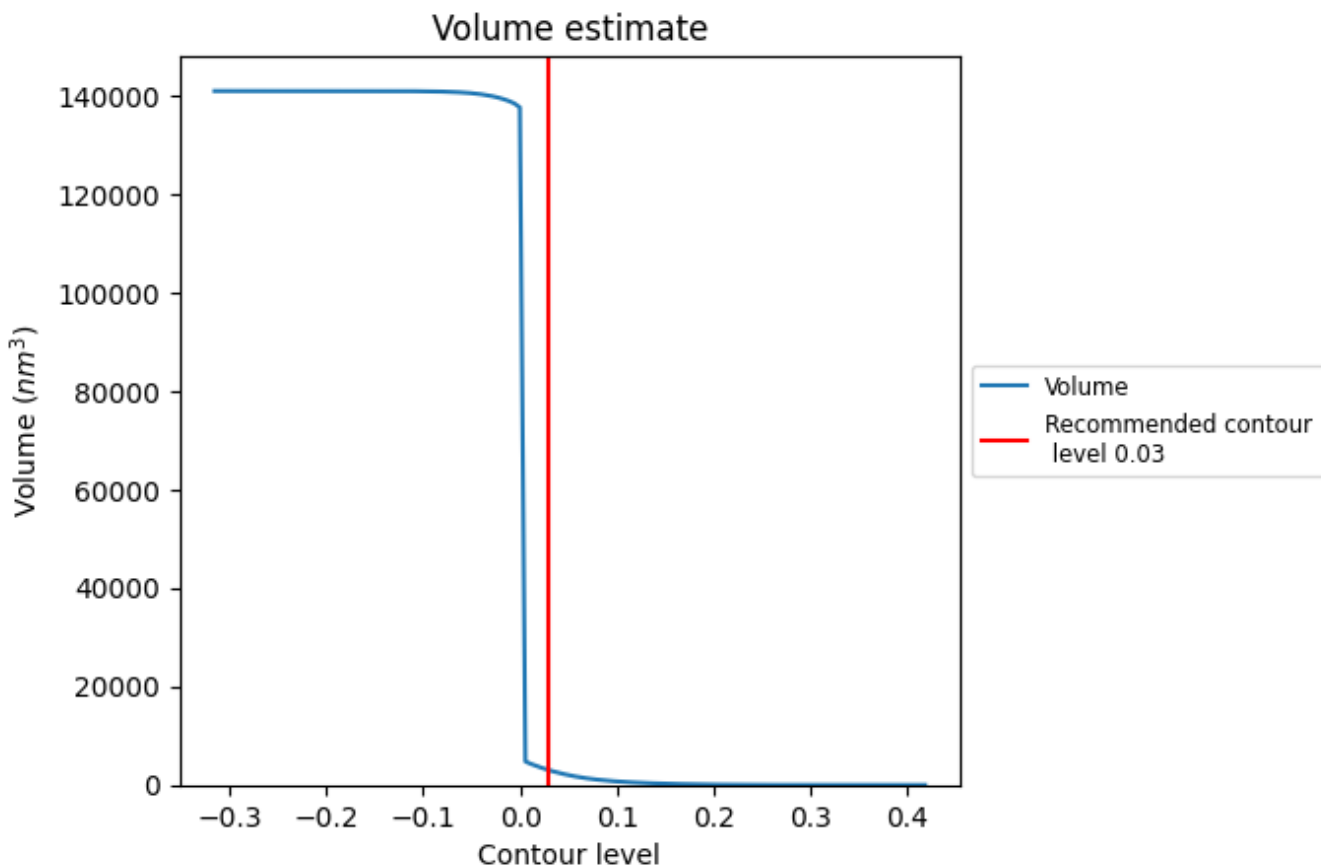
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

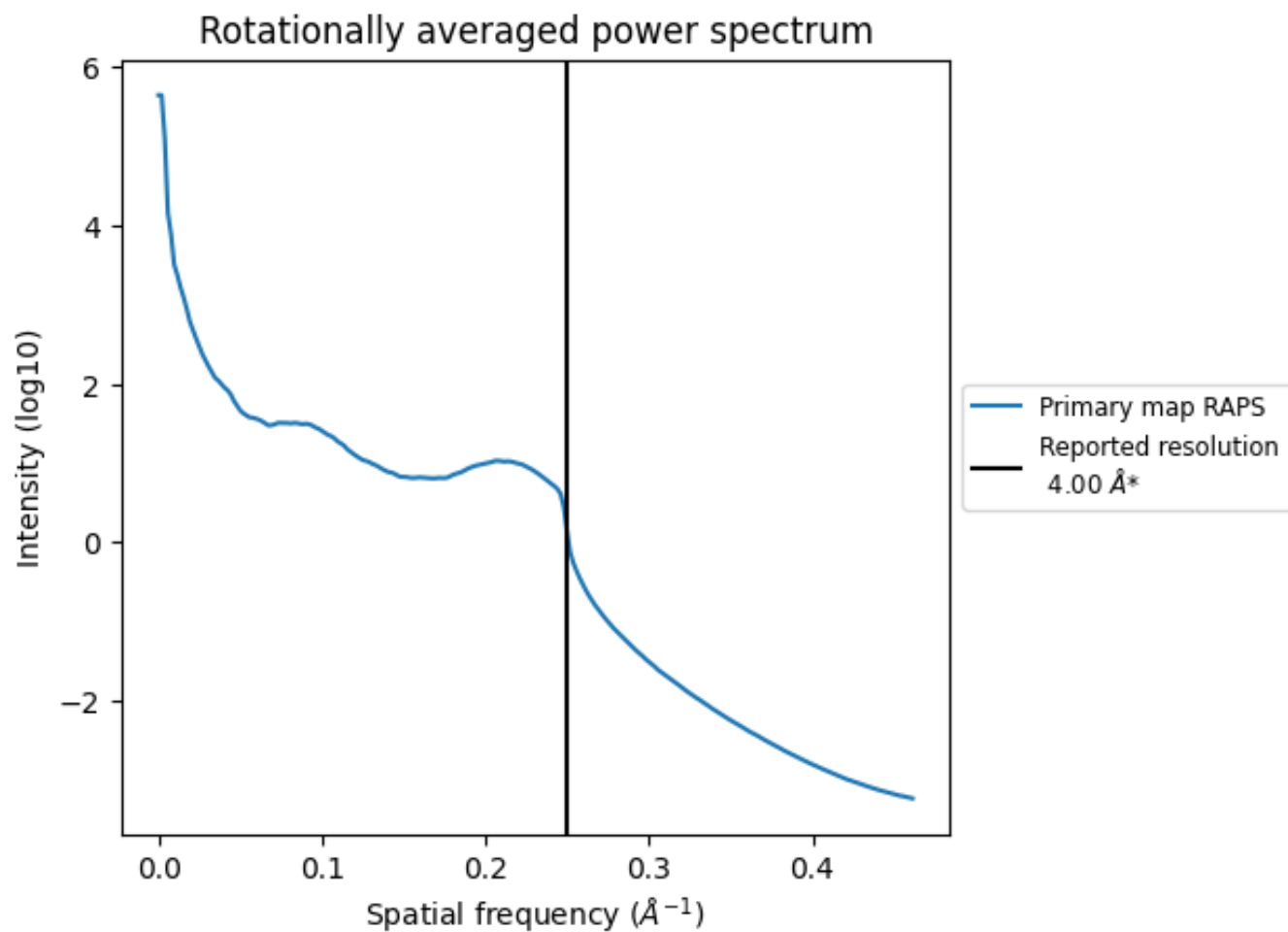
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 3004 nm^3 ; this corresponds to an approximate mass of 2713 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](#)

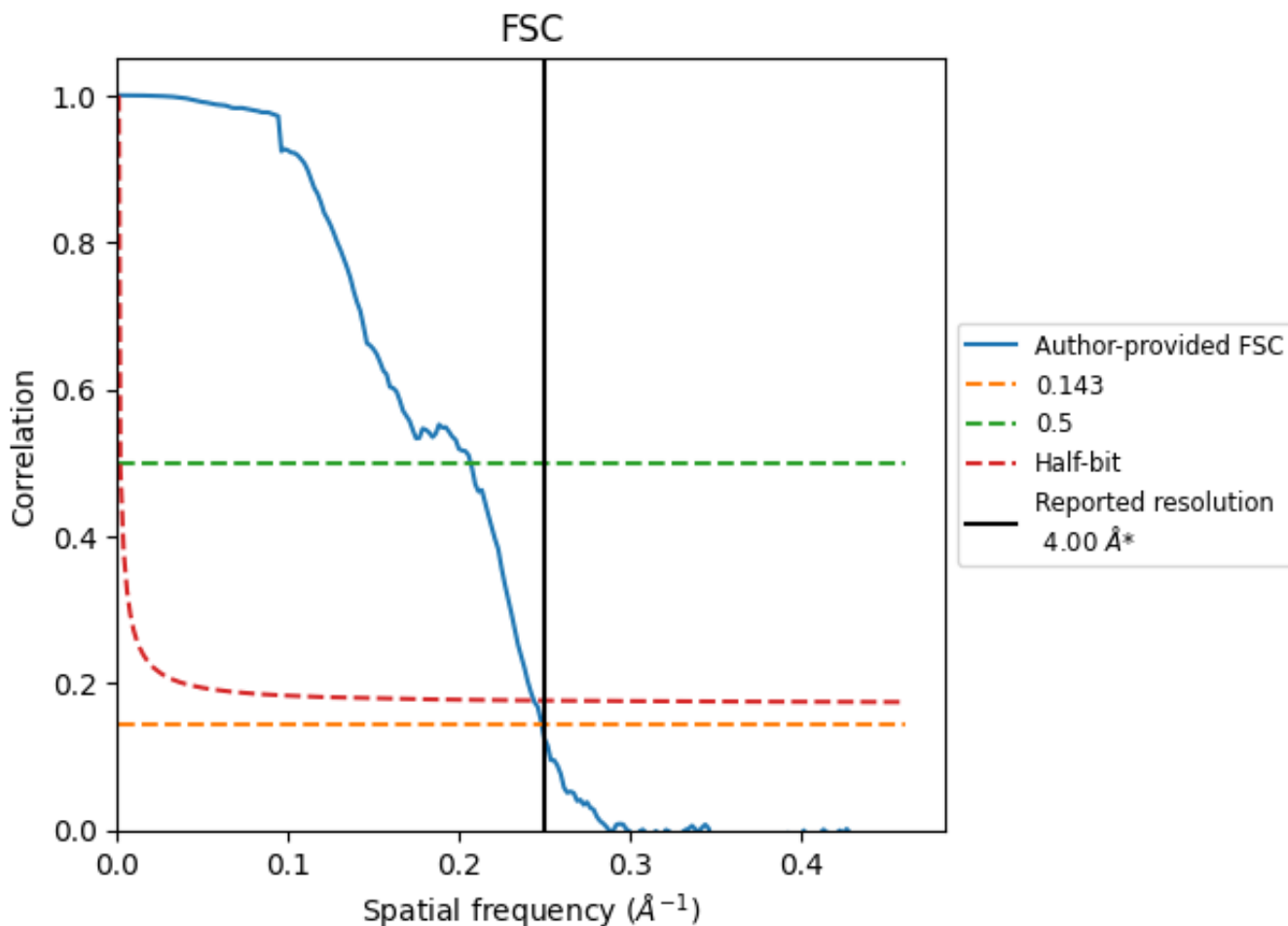


*Reported resolution corresponds to spatial frequency of 0.250\AA^{-1}

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 0.250 Å⁻¹

8.2 Resolution estimates [i](#)

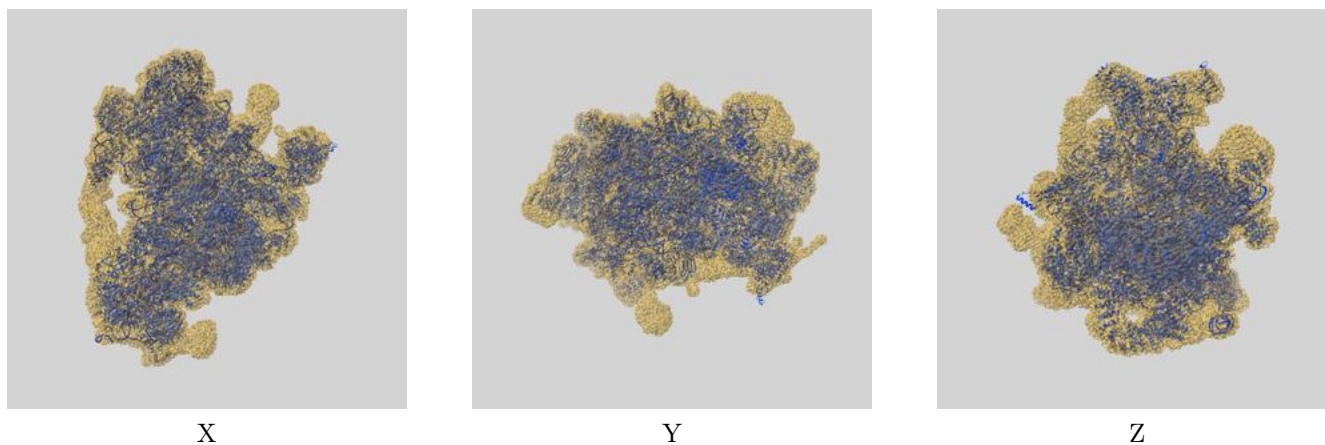
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.00	-	-
Author-provided FSC curve	4.03	4.84	4.10
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

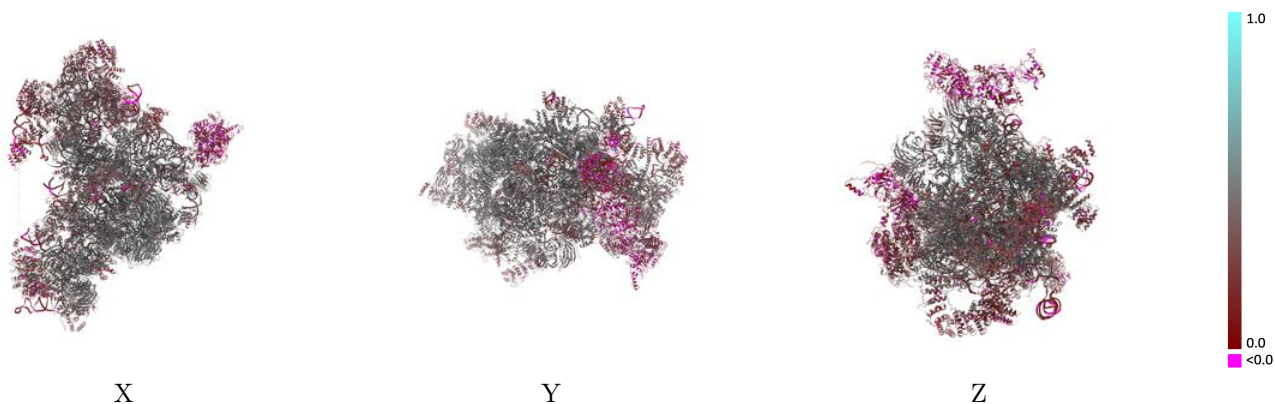
This section contains information regarding the fit between EMDB map EMD-10053 and PDB model 6RXV. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



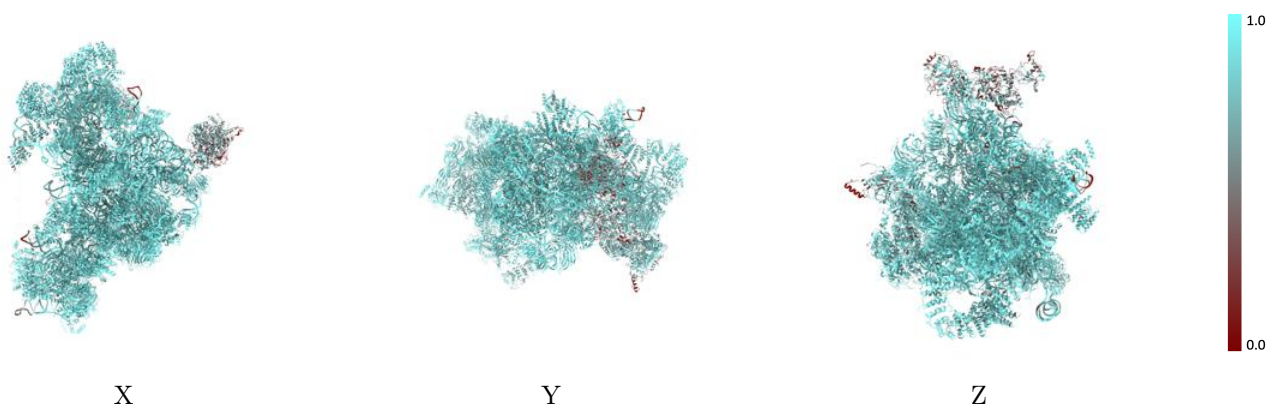
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



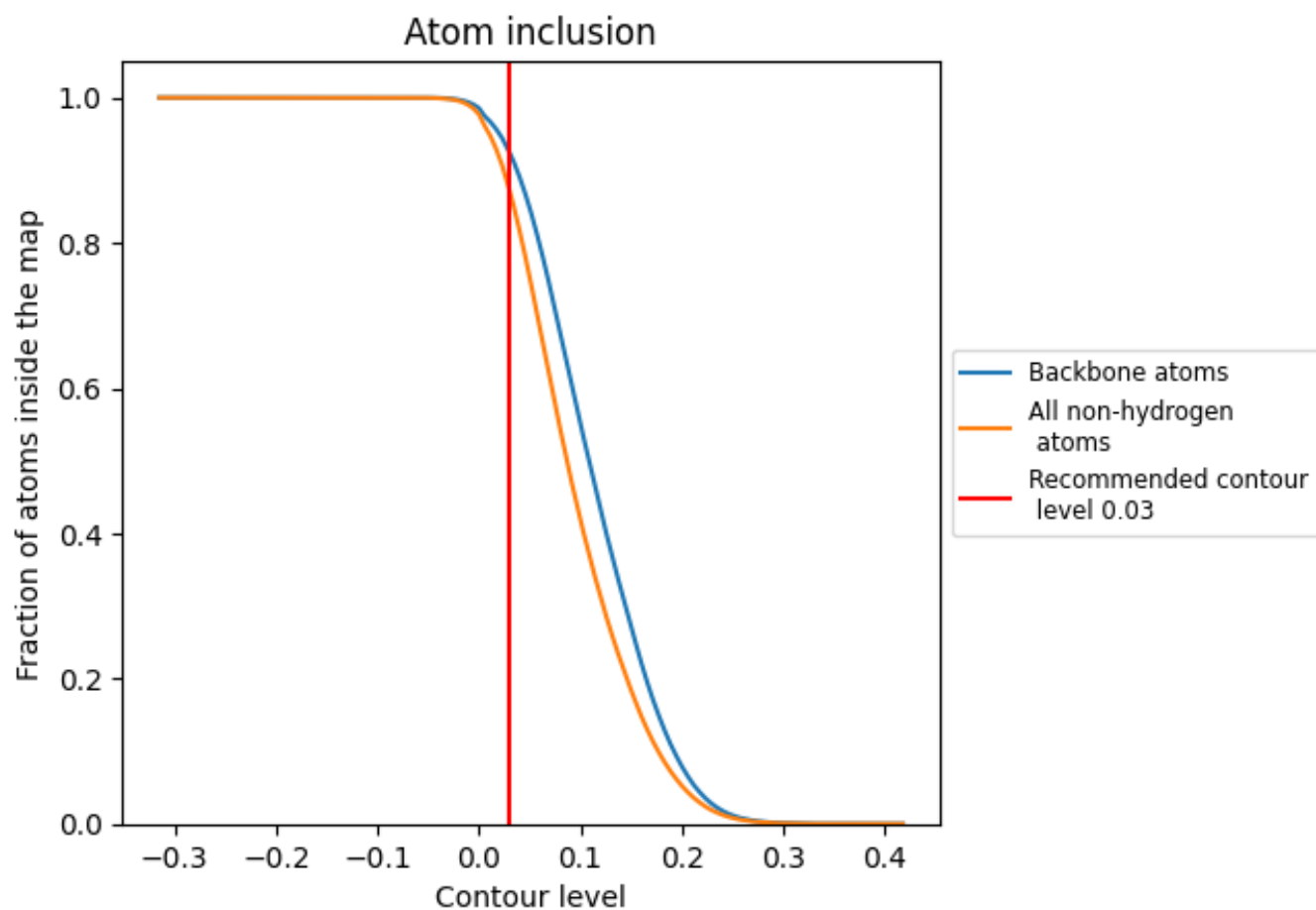
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 87% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8728	 0.3710
C1	 0.9241	 0.3580
C2	 0.8878	 0.3120
CA	 0.9109	 0.4790
CB	 0.8661	 0.4000
CC	 0.8999	 0.4040
CD	 0.8813	 0.3870
CE	 0.8966	 0.4530
CF	 0.8844	 0.4180
CG	 0.8976	 0.4110
CH	 0.8993	 0.4440
CI	 0.9143	 0.4450
CJ	 0.9223	 0.4780
CK	 0.8942	 0.4650
CL	 0.8875	 0.4480
CM	 0.9168	 0.4780
CN	 0.8719	 0.4190
CO	 0.8235	 0.3410
CP	 0.8694	 0.4140
CQ	 0.8743	 0.3620
CR	 0.8251	 0.2970
CS	 0.6748	 0.1460
CT	 0.8762	 0.4520
CU	 0.8769	 0.4340
CV	 0.5098	 0.1020
CW	 0.8812	 0.3900
CX	 0.7572	 0.1610
CY	 0.8339	 0.3890
CZ	 0.8417	 0.3030
Ca	 0.8808	 0.4080
Cb	 0.8751	 0.3870
Cc	 0.8975	 0.4520
Cd	 0.9016	 0.4070
Ce	 0.8621	 0.3540
Cf	 0.8936	 0.3970



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Chain	Atom inclusion	Q-score
Cg	 0.9154	 0.4580
Ch	 0.8463	 0.3570
Ci	 0.9328	 0.4560
Cj	 0.9165	 0.4800
Ck	 0.8265	 0.3540
Cl	 0.7016	 0.3080
Cm	 0.8721	 0.4330
Cn	 0.9132	 0.4790
Co	 0.8703	 0.3840
Cp	 0.9379	 0.4770
UA	 0.9198	 0.4790
UB	 0.9028	 0.3770
UC	 0.8934	 0.4820
UD	 0.9074	 0.4290
UE	 0.8265	 0.3370
UF	 0.9154	 0.3730
UG	 0.9241	 0.4680
UH	 0.9008	 0.3480
UI	 0.7323	 0.1790
UJ	 0.8564	 0.3080
UK	 0.9015	 0.4490
UL	 0.9123	 0.4210
UM	 0.9028	 0.3870
UN	 0.9232	 0.4390
UO	 0.9147	 0.4550
UP	 0.8722	 0.4220
UQ	 0.9200	 0.4420
UR	 0.9249	 0.4670
US	 0.8886	 0.3600
UT	 0.8755	 0.3070
UU	 0.9331	 0.4710
UV	 0.5086	 0.1100
UX	 0.8857	 0.4590
UZ	 0.8933	 0.3920