



Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 02:56 pm GMT

PDB ID : 6SGC
EMDB ID : EMD-10181
Title : Rabbit 80S ribosome stalled on a poly(A) tail
Authors : Chandrasekaran, V.; Juszkievicz, S.; Choi, J.; Puglisi, J.D.; Brown, A.; Shao, S.; Ramakrishnan, V.; Hegde, R.S.
Deposited on : 2019-08-03
Resolution : 2.80 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:

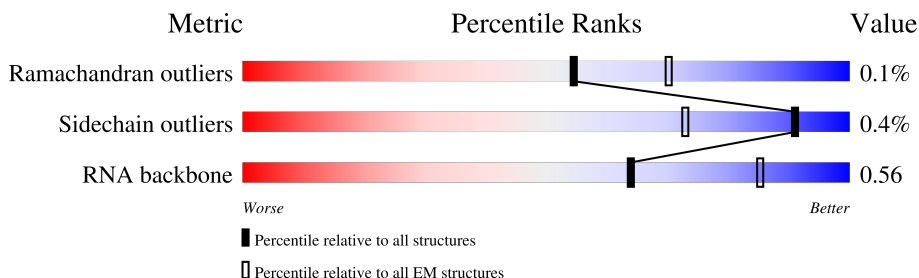
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation 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 2.80 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	A1	1869	
2	B1	295	
3	C1	264	
4	D1	293	
5	E1	243	
6	F1	263	
7	G1	204	
8	H1	249	

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Mol	Chain	Length	Quality of chain
9	I1	194	15% 95% 5%
10	J1	208	8% 99% .
11	K1	194	6% 95% 5%
12	L1	165	5% 58% 42%
13	M1	158	7% 90% 9%
14	N1	132	52% 88% 11%
15	O1	151	. 99% .
16	P1	168	5% 81% 19%
17	Q1	145	12% 88% 11%
18	R1	146	5% 97% .
19	S1	135	9% 97% ..
20	T1	152	11% 95% 5%
21	U1	145	6% 97% ..
22	V1	119	20% 84% 16%
23	W1	83	100%
24	X1	130	99% .
25	Y1	143	. 97% ...
26	Z1	130	5% 95% 5%
27	a1	125	6% 60% 40%
28	b1	115	5% 88% 12%
29	c1	84	10% 99% .
30	d1	69	13% 88% 10%
31	e1	56	. 98% .
32	f1	133	9% 43% 57%
33	g1	156	21% 43% 56%

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Mol	Chain	Length	Quality of chain
34	h1	317	15% 99%
35	i1	10	20% 90% 10%
36	A2	257	96%
37	B2	403	97%
38	C2	425	84% 15%
39	D2	297	99%
40	E2	291	74% 26%
41	F2	247	91% 9%
42	G2	319	8% 72% 27%
43	H2	192	98%
44	I2	214	96%
45	J2	178	96%
46	L2	211	7% 99%
47	M2	218	63% 37%
48	N2	204	100%
49	O2	203	98%
50	P2	184	83% 17%
51	Q2	188	99%
52	R2	196	5% 91% 8%
53	S2	176	100%
54	T2	160	99%
55	U2	128	9% 77% 23%
56	V2	140	7% 99%
57	W2	157	14% 68% 32%
58	X2	156	76% 24%

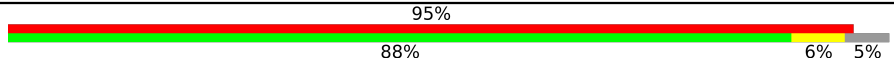


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Mol	Chain	Length	Quality of chain
59	Y2	145	92% 8%
60	Z2	136	99%
61	a2	148	99%
62	b2	245	7% 42% 58%
63	c2	115	5% 85% 15%
64	d2	125	6% 86% 14%
65	e2	135	95% 5%
66	f2	110	98%
67	g2	116	7% 98%
68	h2	123	99%
69	i2	105	97%
70	j2	97	89% 11%
71	k2	70	6% 99%
72	l2	51	98%
73	m2	102	51% 49%
74	n2	25	96%
75	o2	106	98%
76	p2	92	99%
77	r2	137	91% 9%
78	s2	318	60% 62% 38%
79	t2	165	93% 90% 7%
80	54	3603	6% 80% 20%
81	74	120	92% 8%
82	84	156	80% 17%
83	XX	16	94% 88% 12%

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Mol	Chain	Length	Quality of chain
84	B	217	 <p>95% 88% 6% 5%</p>
85	23	76	 <p>16% 62% 30% 8%</p>
85	33	76	 <p>91% 62% 30% 8%</p>

2 Entry composition [i](#)

There are 88 unique types of molecules in this entry. The entry contains 218966 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A1	1697	36229	16171	6507	11855	1696	0	0

- Molecule 2 is a protein called uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B1	217	1710	1086	300	316	8	0	0

- Molecule 3 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C1	213	1729	1098	309	308	14	0	0

- Molecule 4 is a protein called uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D1	221	1716	1111	295	301	9	0	0

- Molecule 5 is a protein called uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E1	228	1768	1126	318	316	8	0	0

- Molecule 6 is a protein called 40S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F1	262	2076	1324	386	358	8	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F1	25	GLY	SER	conflict	UNP G1TK17
F1	51	ARG	LYS	conflict	UNP G1TK17
F1	78	THR	ALA	conflict	UNP G1TK17
F1	156	VAL	MET	conflict	UNP G1TK17

- Molecule 7 is a protein called Ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G1	185	1471	921	277	266	7	0	0

- Molecule 8 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	H1	237	1923	1200	387	329	7	0	0

- Molecule 9 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	I1	185	1488	952	271	264	1	0	0

- Molecule 10 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	J1	206	1686	1058	332	291	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J1	47	ARG	GLY	conflict	UNP G1TJW1

- Molecule 11 is a protein called Ribosomal protein S9 (Predicted).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K1	185	1525	969	306	248	2	0	0

- Molecule 12 is a protein called S10_ plectin domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	L1	96	810	530	143	131	6	0	0

- Molecule 13 is a protein called Ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	M1	143	1175	749	222	198	6	0	0

- Molecule 14 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	N1	117	908	570	161	169	8	0	0

- Molecule 15 is a protein called Ribosomal_S13_N domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	O1	149	1202	770	228	203	1	0	0

- Molecule 16 is a protein called uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	P1	136	1016	621	199	190	6	0	0

- Molecule 17 is a protein called uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Q1	129	1058	670	201	180	7	0	0

- Molecule 18 is a protein called Ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	R1	142	1128	717	213	195	3	0	0

- Molecule 19 is a protein called eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	S1	132	1068	670	199	195	4	0	0

- Molecule 20 is a protein called eS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	T1	144	1190	746	241	202	1	0	0

- Molecule 21 is a protein called eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	U1	141	1097	688	211	195	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
U1	119	GLY	TRP	conflict	UNP G1TN62

- Molecule 22 is a protein called Ribosomal_S10 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	V1	100	795	498	152	141	4	0	0

- Molecule 23 is a protein called eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	W1	83	636	393	117	121	5	0	0

- Molecule 24 is a protein called Ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	X1	129	1034	659	193	176	6	0	0

- Molecule 25 is a protein called uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Y1	141	Total	C	N	O	S	0	0
			1098	693	219	183	3		

- Molecule 26 is a protein called eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z1	124	Total	C	N	O	S	0	0
			1011	640	198	168	5		

- Molecule 27 is a protein called eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	a1	75	Total	C	N	O	S	0	0
			598	382	111	104	1		

- Molecule 28 is a protein called eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	b1	101	Total	C	N	O	S	0	0
			814	507	170	132	5		

- Molecule 29 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	c1	83	Total	C	N	O	S	0	0
			651	408	121	115	7		

- Molecule 30 is a protein called Ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	d1	62	Total	C	N	O	S	0	0
			488	297	97	92	2		

- Molecule 31 is a protein called uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	e1	55	Total	C	N	O	S	0	0
			459	286	94	74	5		

- Molecule 32 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	f1	57	Total	C	N	O	S	0	0
			457	282	101	73	1		

- Molecule 33 is a protein called Ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	g1	68	Total	C	N	O	S	0	0
			555	351	103	94	7		

- Molecule 34 is a protein called WD_REPEATS_REGION domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	h1	313	Total	C	N	O	S	0	0
			2436	1535	424	465	12		

- Molecule 35 is a RNA chain called polyA mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	i1	10	Total	C	N	O	P	0	0
			220	100	50	60	10		

- Molecule 36 is a protein called Ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	A2	248	Total	C	N	O	S	0	0
			1898	1189	389	314	6		

- Molecule 37 is a protein called uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	B2	394	Total	C	N	O	S	0	0
			3172	2020	597	542	13		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B2	1	MET	-	initiating methionine	UNP G1TL06

- Molecule 38 is a protein called uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	C2	362	2883	1812	577	480	14	0	0

- Molecule 39 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	D2	293	2391	1512	438	427	14	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D2	1	MET	-	initiating methionine	UNP G1SYJ6

- Molecule 40 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	E2	216	1729	1115	329	282	3	0	0

- Molecule 41 is a protein called uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	F2	225	1875	1205	358	303	9	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F2	61	ARG	GLY	conflict	UNP G1TUB1
F2	93	ARG	GLY	conflict	UNP G1TUB1
F2	131	MET	VAL	conflict	UNP G1TUB1
F2	153	ILE	VAL	conflict	UNP G1TUB1

- Molecule 42 is a protein called eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	G2	233	1879	1199	361	315	4	0	0

- Molecule 43 is a protein called uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	H2	190	1516	954	284	272	6	0	0

- Molecule 44 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	I2	205	1664	1056	321	274	13	0	0

- Molecule 45 is a protein called Ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	J2	170	1362	861	254	241	6	0	0

- Molecule 46 is a protein called eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	L2	210	1702	1065	354	279	4	0	0

- Molecule 47 is a protein called Ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	M2	138	1137	727	221	182	7	0	0

- Molecule 48 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	N2	203	1701	1072	359	266	4	0	0

- Molecule 49 is a protein called uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	O2	199	1630	1051	319	255	5	0	0

- Molecule 50 is a protein called uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	P2	153	1242	777	241	215	9	0	0

- Molecule 51 is a protein called eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	Q2	187	1515	946	315	250	4	0	0

- Molecule 52 is a protein called eL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	R2	180	1508	933	328	238	9	0	0

- Molecule 53 is a protein called eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	S2	176	1462	930	285	236	11	0	0

- Molecule 54 is a protein called eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	T2	159	1298	823	252	217	6	0	0

- Molecule 55 is a protein called eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	U2	99	809	519	141	147	2	0	0

- Molecule 56 is a protein called Ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	V2	139	1034	648	199	182	5	0	0

- Molecule 57 is a protein called TRASH domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	W2	106	860	538	174	144	4	0	0

- Molecule 58 is a protein called Ribosomal_L23eN domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	X2	118	967	618	181	167	1	0	0

- Molecule 59 is a protein called Ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	Y2	134	1115	700	226	186	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	Z2	135	1107	714	208	182	3	0	0

- Molecule 61 is a protein called Ribosomal_L18e/L15P domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	a2	147	1162	734	239	185	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a2	1	MET	-	initiating methionine	UNP G1SNY0

- Molecule 62 is a protein called eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	b2	104	848	527	189	129	3	0	0

- Molecule 63 is a protein called Ribosomal_L7Ae domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	c2	98	Total	C	N	O	S	0	0
			761	481	134	140	6		

- Molecule 64 is a protein called eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	d2	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 65 is a protein called eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	e2	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 66 is a protein called eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	f2	109	Total	C	N	O	S	0	0
			876	555	174	143	4		

- Molecule 67 is a protein called eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	g2	114	Total	C	N	O	S	0	0
			906	566	187	147	6		

- Molecule 68 is a protein called uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	h2	122	Total	C	N	O	S	0	0
			1013	640	204	168	1		

- Molecule 69 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	i2	102	Total	C	N	O	S	0	0
			830	520	176	129	5		

- Molecule 70 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	j2	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 71 is a protein called eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	k2	69	Total	C	N	O	S	0	0
			569	366	103	99	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k2	24	LYS	ASN	conflict	UNP G1U001

- Molecule 72 is a protein called eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	l2	50	Total	C	N	O	S	0	0
			447	286	96	64	1		

- Molecule 73 is a protein called eL40.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	m2	52	Total	C	N	O	S	0	0
			429	266	90	67	6		

- Molecule 74 is a protein called 60s ribosomal protein l41.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	n2	25	Total	C	N	O	S	0	0
			239	145	64	27	3		

- Molecule 75 is a protein called eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	o2	104	Total	C	N	O	S	0	0
			851	533	174	138	6		

- Molecule 76 is a protein called eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
76	p2	91	708	445	136	120	7	0	0

- Molecule 77 is a protein called Ribosomal_L28e domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
77	r2	124	994	616	205	167	6	0	0

- Molecule 78 is a protein called uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
78	s2	196	1507	959	263	276	9	0	0

- Molecule 79 is a protein called Ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
79	t2	153	1160	722	218	217	3	0	0

- Molecule 80 is a RNA chain called 28S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
80	54	3603	77264	34409	14151	25101	3603	0	0

- Molecule 81 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
81	74	119	2538	1132	454	834	118	0	0

- Molecule 82 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
82	84	151	3208	1432	564	1062	150	0	0

- Molecule 83 is a protein called poly-lysine nascent chain.

Mol	Chain	Residues	Atoms				AltConf	Trace
83	XX	16	Total	C	N	O	0	0
			100	63	21	16		

- Molecule 84 is a protein called Ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
84	B	206	Total	C	N	O	S	0	0
			1654	1058	297	291	8		

- Molecule 85 is a RNA chain called tRNA (Lys3).

Mol	Chain	Residues	Atoms						AltConf	Trace
85	23	76	Total	C	N	O	P	S	0	0
			1636	736	286	537	75	2		
85	33	76	Total	C	N	O	P	S	0	0
			1636	736	286	537	75	2		

- Molecule 86 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
86	A1	70	Total	Mg	0
			70	70	
86	A2	1	Total	Mg	0
			1	1	
86	B2	1	Total	Mg	0
			1	1	
86	I2	1	Total	Mg	0
			1	1	
86	P2	1	Total	Mg	0
			1	1	
86	Q2	1	Total	Mg	0
			1	1	
86	V2	1	Total	Mg	0
			1	1	
86	a2	2	Total	Mg	0
			2	2	
86	e2	1	Total	Mg	0
			1	1	
86	g2	1	Total	Mg	0
			1	1	
86	j2	2	Total	Mg	0
			2	2	

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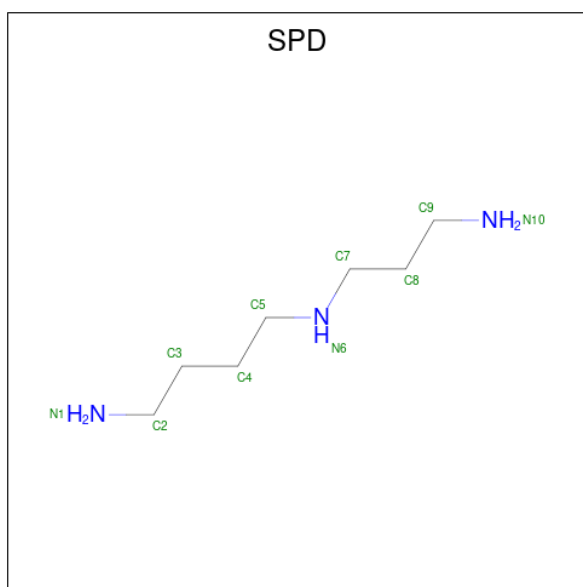
Continued from previous page...

Mol	Chain	Residues	Atoms		AltConf
86	54	182	Total 182	Mg 182	0
86	74	6	Total 6	Mg 6	0
86	84	5	Total 5	Mg 5	0

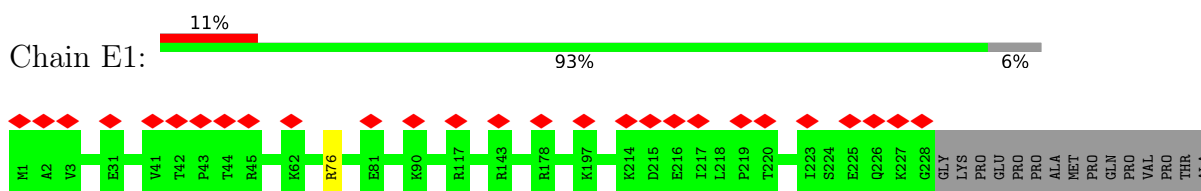
- Molecule 87 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
87	b1	1	Total 1	Zn 1	0
87	e1	1	Total 1	Zn 1	0
87	g1	1	Total 1	Zn 1	0
87	g2	1	Total 1	Zn 1	0
87	j2	1	Total 1	Zn 1	0
87	m2	1	Total 1	Zn 1	0
87	o2	1	Total 1	Zn 1	0
87	p2	1	Total 1	Zn 1	0

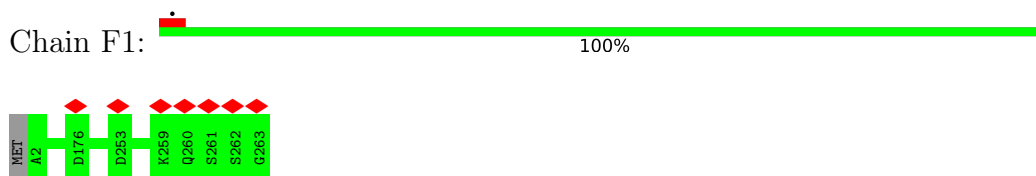
- Molecule 88 is SPERMIDINE (three-letter code: SPD) (formula: C₇H₁₉N₃).



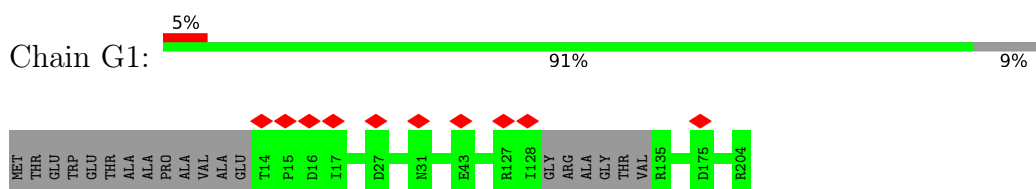
Mol	Chain	Residues	Atoms			AltConf
88	54	1	Total	C	N	0
			20	14	6	
88	54	1	Total	C	N	0
			20	14	6	



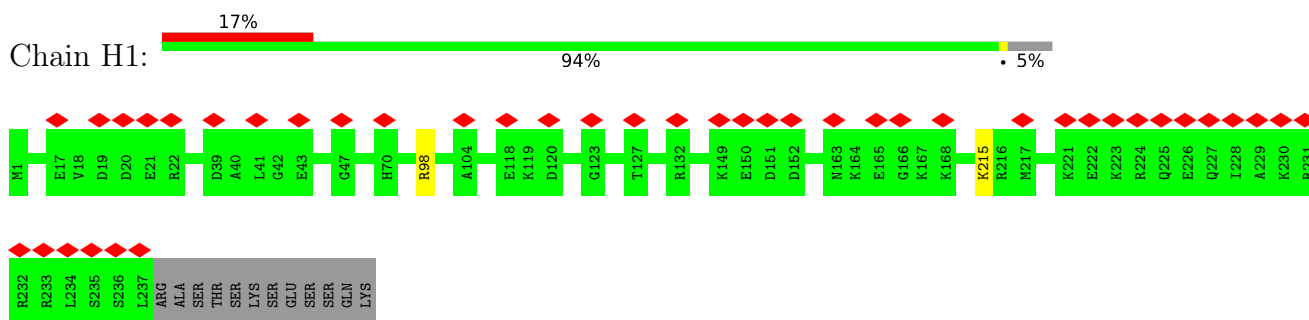
- Molecule 6: 40S ribosomal protein S4



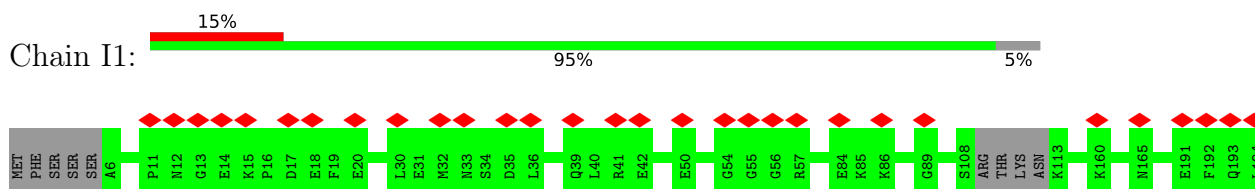
- Molecule 7: Ribosomal protein S5



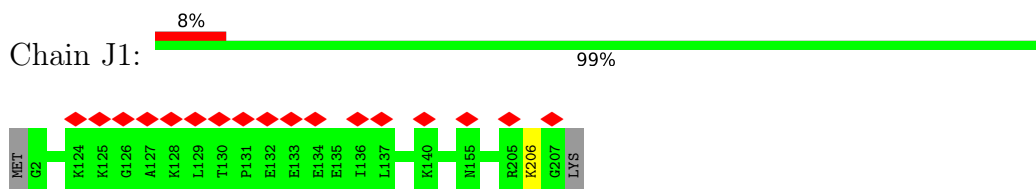
- Molecule 8: 40S ribosomal protein S6



- Molecule 9: 40S ribosomal protein S7

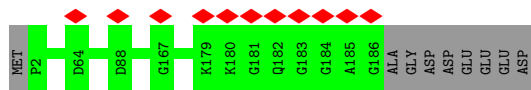


- Molecule 10: 40S ribosomal protein S8

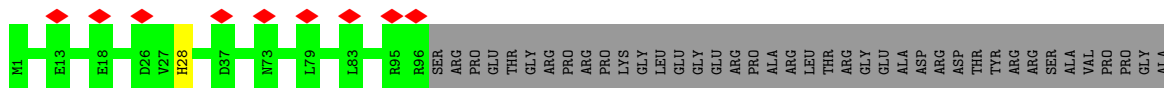


- Molecule 11: Ribosomal protein S9 (Predicted)

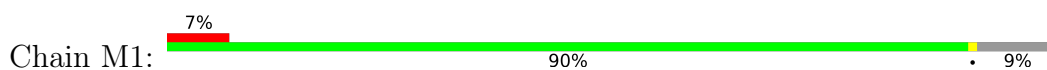




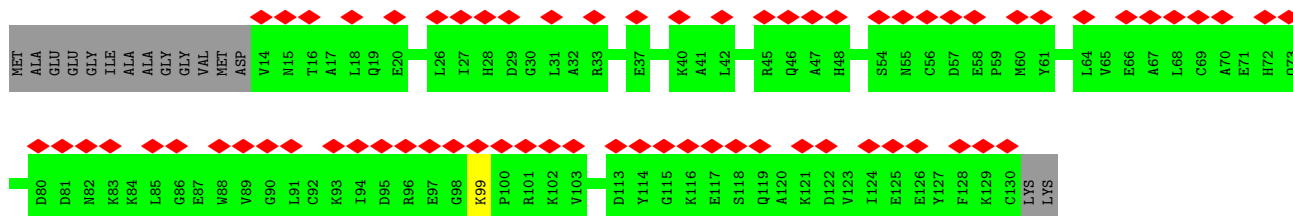
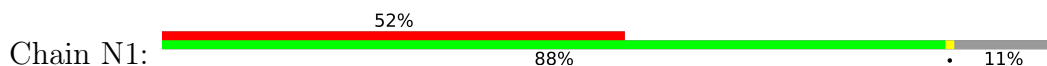
- Molecule 12: S10_ plectin domain-containing protein



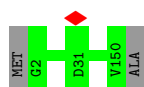
- Molecule 13: Ribosomal protein S11



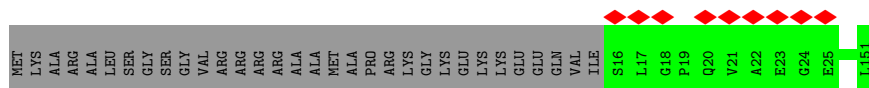
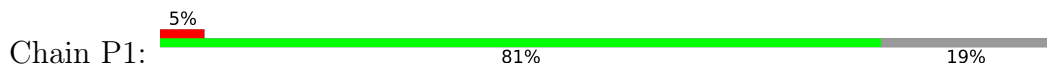
- Molecule 14: 40S ribosomal protein S12



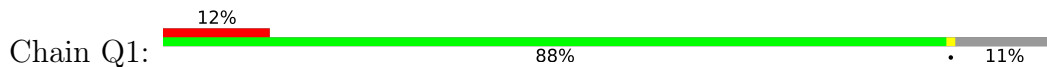
- Molecule 15: Ribosomal_S13_N domain-containing protein

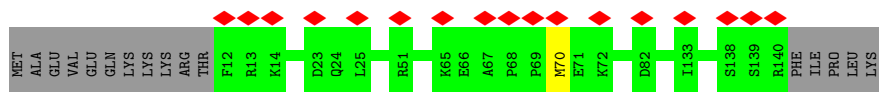


- Molecule 16: uS11

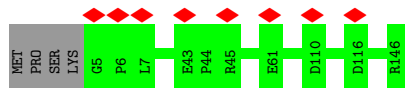


- Molecule 17: uS19

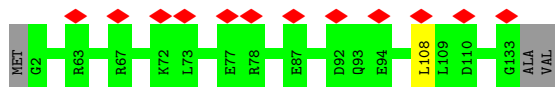




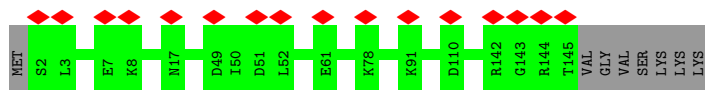
- Molecule 18: Ribosomal protein S16



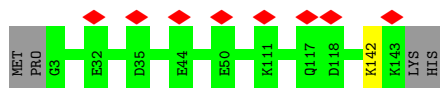
- Molecule 19: eS17



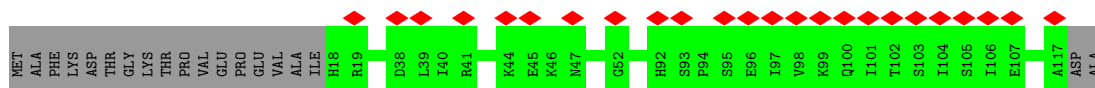
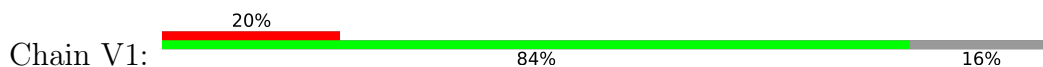
- Molecule 20: eS13



- Molecule 21: eS19



- Molecule 22: Ribosomal_S10 domain-containing protein



- Molecule 23: eS21



There are no outlier residues recorded for this chain.

- Molecule 24: Ribosomal protein S15a

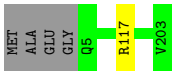


GLN PRO PRO LYS ALA ALA GLN LYS GLY GLN LYS LYS PRO PRO PRO PRO ALA ALA GLN LYS LYS ALA ALA PRO LYS LYS SER SER GLY LYS LYS ALA

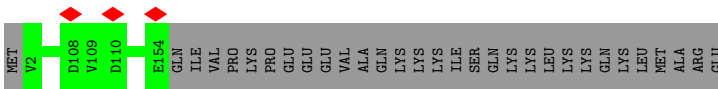
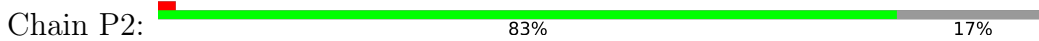
• Molecule 48: Ribosomal protein L15



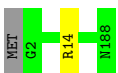
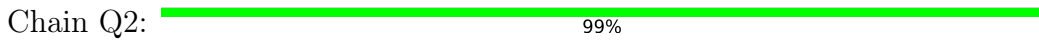
• Molecule 49: uL13



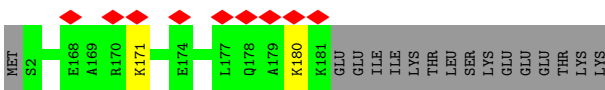
• Molecule 50: uL22



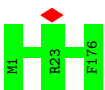
• Molecule 51: eL18



• Molecule 52: eL19

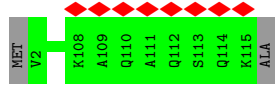


• Molecule 53: eL20

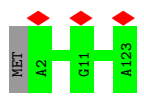


• Molecule 54: eL21

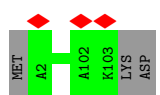




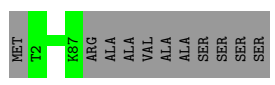
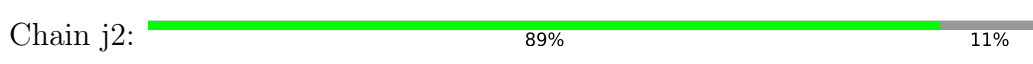
• Molecule 68: uL29



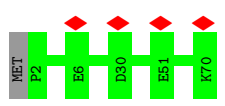
• Molecule 69: 60S ribosomal protein L36



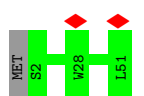
• Molecule 70: Ribosomal protein L37



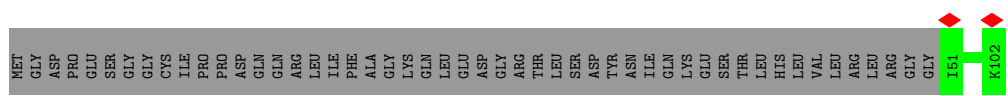
• Molecule 71: eL38

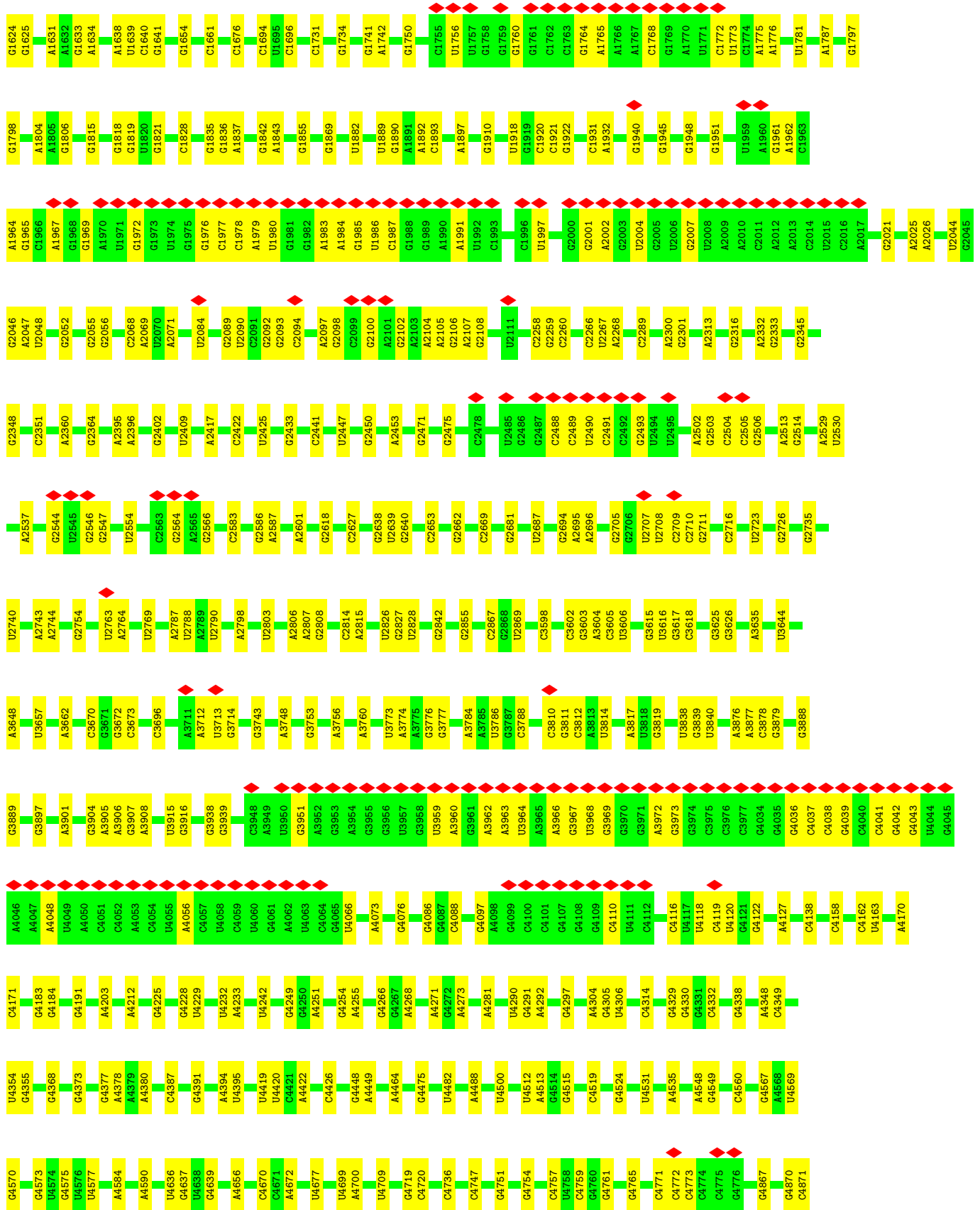


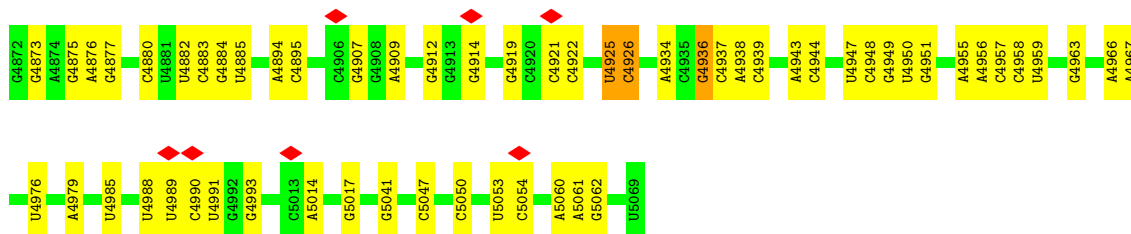
• Molecule 72: eL39



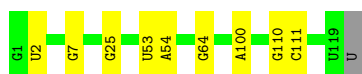
• Molecule 73: eL40



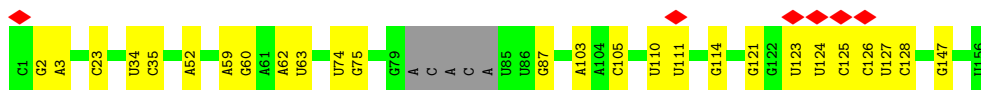
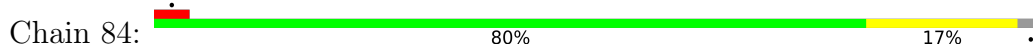




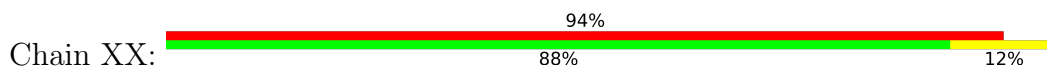
• Molecule 81: 5S ribosomal RNA



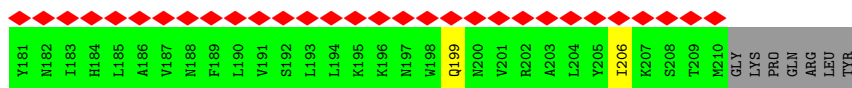
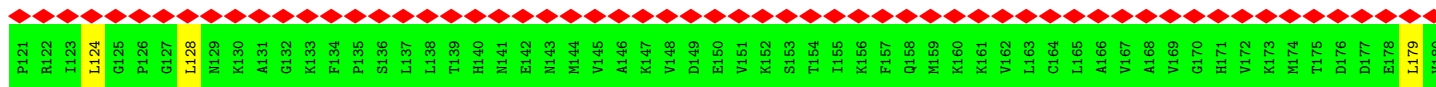
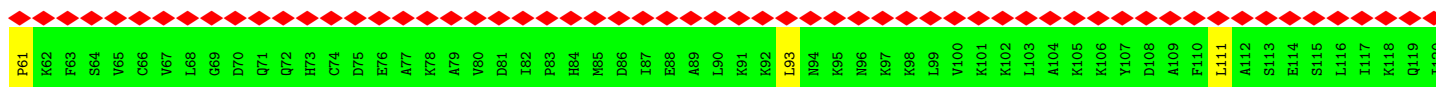
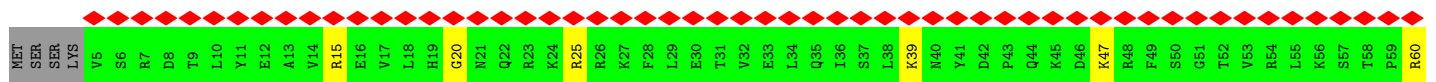
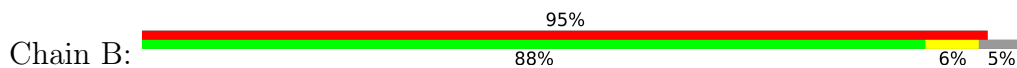
• Molecule 82: 5.8S ribosomal RNA



• Molecule 83: poly-lysine nascent chain



• Molecule 84: Ribosomal protein



• Molecule 85: tRNA (Lys3)

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	148615	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 ($e^-/\text{\AA}^2$)	41.8, 41.8	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k), FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.573	Depositor
Minimum map value	-0.276	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.011	Depositor
Recommended contour level	0.05	Depositor
Map size (\AA)	555.52, 555.52, 555.52	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.085, 1.085, 1.085	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: H2U, PSU, ZN, 12A, 1MA, 5MC, 7MG, MG, 70U, SPD, 2MU

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	A1	0.26	0/40502	0.75	23/63100 (0.0%)
2	B1	0.25	0/1747	0.42	0/2374
3	C1	0.25	0/1756	0.45	0/2350
4	D1	0.25	0/1753	0.43	0/2369
5	E1	0.25	0/1796	0.44	0/2417
6	F1	0.25	0/2118	0.44	0/2849
7	G1	0.24	0/1492	0.41	0/2005
8	H1	0.24	0/1946	0.44	0/2590
9	I1	0.25	0/1510	0.44	0/2022
10	J1	0.24	0/1715	0.46	0/2287
11	K1	0.24	0/1550	0.42	0/2069
12	L1	0.24	0/834	0.41	1/1125 (0.1%)
13	M1	0.26	0/1195	0.44	0/1597
14	N1	0.26	0/918	0.49	0/1233
15	O1	0.24	0/1226	0.41	0/1649
16	P1	0.26	0/1029	0.47	0/1380
17	Q1	0.26	0/1079	0.44	0/1441
18	R1	0.24	0/1146	0.43	0/1534
19	S1	0.24	0/1082	0.44	0/1452
20	T1	0.24	0/1208	0.46	0/1618
21	U1	0.25	0/1115	0.44	0/1493
22	V1	0.25	0/805	0.47	0/1081
23	W1	0.25	0/643	0.43	0/860
24	X1	0.26	0/1051	0.44	0/1406
25	Y1	0.26	0/1116	0.44	0/1490
26	Z1	0.24	0/1028	0.42	0/1366
27	a1	0.24	0/604	0.45	0/810
28	b1	0.26	0/828	0.44	0/1109
29	c1	0.24	0/665	0.41	0/891
30	d1	0.24	0/490	0.45	0/656
31	e1	0.26	0/470	0.42	0/623
32	f1	0.24	0/462	0.46	0/607

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	g1	0.25	0/567	0.48	0/753
34	h1	0.26	0/2493	0.47	0/3394
35	i1	0.25	0/249	0.76	0/386
36	A2	0.27	0/1936	0.46	0/2596
37	B2	0.26	0/3240	0.45	0/4339
38	C2	0.25	0/2937	0.43	0/3946
39	D2	0.26	0/2437	0.41	0/3264
40	E2	0.25	0/1762	0.45	0/2362
41	F2	0.25	0/1911	0.40	0/2549
42	G2	0.25	0/1910	0.43	0/2569
43	H2	0.25	0/1535	0.45	0/2063
44	I2	0.26	0/1702	0.42	0/2272
45	J2	0.25	0/1385	0.42	0/1852
46	L2	0.25	0/1733	0.41	0/2316
47	M2	0.26	0/1158	0.41	0/1547
48	N2	0.25	0/1746	0.41	0/2338
49	O2	0.25	0/1662	0.39	0/2222
50	P2	0.26	0/1268	0.42	0/1700
51	Q2	0.25	0/1539	0.44	0/2054
52	R2	0.23	0/1524	0.39	0/2013
53	S2	0.27	0/1501	0.43	0/2012
54	T2	0.27	0/1326	0.44	0/1770
55	U2	0.26	0/823	0.47	0/1104
56	V2	0.27	0/1048	0.45	0/1402
57	W2	0.26	0/873	0.43	0/1158
58	X2	0.25	0/984	0.41	0/1323
59	Y2	0.27	0/1132	0.42	0/1504
60	Z2	0.26	0/1130	0.42	0/1507
61	a2	0.27	0/1191	0.43	0/1590
62	b2	0.23	0/861	0.39	0/1138
63	c2	0.25	0/771	0.40	0/1034
64	d2	0.25	0/903	0.44	0/1216
65	e2	0.25	0/1071	0.41	0/1429
66	f2	0.28	0/895	0.47	0/1198
67	g2	0.25	0/916	0.42	0/1220
68	h2	0.23	0/1021	0.38	0/1348
69	i2	0.24	0/841	0.38	0/1112
70	j2	0.25	0/720	0.44	0/952
71	k2	0.25	0/575	0.45	0/761
72	l2	0.24	0/459	0.41	0/608
73	m2	0.25	0/435	0.42	0/575
74	n2	0.22	0/240	0.37	0/305
75	o2	0.26	0/864	0.42	0/1140

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	p2	0.25	0/718	0.46	0/953
77	r2	0.25	0/1010	0.42	0/1354
78	s2	0.26	0/1530	0.49	0/2064
79	t2	0.24	0/1174	0.52	1/1582 (0.1%)
80	54	0.30	0/86419	0.74	10/134760 (0.0%)
81	74	0.28	0/2836	0.69	0/4421
82	84	0.29	0/3581	0.72	0/5577
83	XX	0.36	0/99	0.92	0/129
84	B	0.35	0/1680	0.76	3/2255 (0.1%)
85	23	0.82	5/1525 (0.3%)	1.56	8/2372 (0.3%)
85	33	0.82	5/1525 (0.3%)	1.56	8/2372 (0.3%)
All	All	0.29	10/234250 (0.0%)	0.66	54/343633 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
19	S1	0	1
25	Y1	0	1
37	B2	0	1
66	f2	0	1
84	B	0	3
All	All	0	7

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
85	33	35	U	O5'-C5'	16.13	1.70	1.44
85	23	35	U	O5'-C5'	16.07	1.70	1.44
85	23	35	U	C5'-C4'	13.23	1.67	1.51
85	33	35	U	C5'-C4'	13.18	1.67	1.51
85	23	35	U	P-O5'	11.29	1.71	1.59
85	33	35	U	P-O5'	11.29	1.71	1.59
85	33	35	U	C3'-O3'	9.58	1.55	1.42
85	23	35	U	C3'-O3'	9.56	1.55	1.42
85	23	35	U	C4'-C3'	8.46	1.62	1.53
85	33	35	U	C4'-C3'	8.41	1.62	1.53

All (54) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	23	35	U	O5'-P-OP1	-53.13	46.94	110.70
85	33	35	U	O5'-P-OP1	-53.13	46.95	110.70
85	33	35	U	O5'-P-OP2	23.09	138.41	110.70
85	23	35	U	O5'-P-OP2	23.06	138.38	110.70
85	23	35	U	OP1-P-OP2	-16.02	95.57	119.60
85	23	35	U	C4'-C3'-O3'	16.01	145.02	113.00
85	33	35	U	C4'-C3'-O3'	16.00	145.00	113.00
85	33	35	U	OP1-P-OP2	-16.00	95.60	119.60
85	33	35	U	C2'-C3'-O3'	-13.71	79.35	109.50
85	23	35	U	C2'-C3'-O3'	-13.70	79.36	109.50
85	23	35	U	P-O5'-C5'	10.63	137.91	120.90
85	33	35	U	P-O5'-C5'	10.62	137.89	120.90
85	33	35	U	C5'-C4'-C3'	10.20	132.32	116.00
85	23	35	U	C5'-C4'-C3'	10.19	132.30	116.00
1	A1	501	C	C2-N1-C1'	8.80	128.49	118.80
85	33	35	U	O5'-C5'-C4'	8.54	127.93	111.70
85	23	35	U	O5'-C5'-C4'	8.53	127.91	111.70
1	A1	501	C	N1-C2-O2	8.16	123.80	118.90
1	A1	356	C	C2-N1-C1'	7.64	127.20	118.80
1	A1	356	C	N1-C2-O2	7.59	123.45	118.90
1	A1	1453	C	N1-C2-O2	7.05	123.13	118.90
1	A1	1453	C	C2-N1-C1'	6.96	126.46	118.80
1	A1	501	C	C6-N1-C1'	-6.60	112.88	120.80
80	54	1639	U	C2-N1-C1'	6.26	125.21	117.70
1	A1	1535	U	C2-N1-C1'	6.22	125.16	117.70
1	A1	293	C	N1-C2-O2	6.17	122.60	118.90
1	A1	293	C	C2-N1-C1'	6.16	125.57	118.80
84	B	179	LEU	CA-CB-CG	6.10	129.33	115.30
1	A1	356	C	N3-C2-O2	-5.94	117.74	121.90
1	A1	55	U	C2-N1-C1'	5.75	124.61	117.70
1	A1	501	C	N3-C2-O2	-5.74	117.88	121.90
80	54	4925	U	OP2-P-O3'	5.58	117.48	105.20
12	L1	28	HIS	C-N-CA	-5.53	107.88	121.70
1	A1	1022	U	C2-N1-C1'	5.45	124.23	117.70
1	A1	853	C	C2-N1-C1'	5.44	124.79	118.80
1	A1	627	U	P-O3'-C3'	5.43	126.21	119.70
80	54	1639	U	N1-C2-O2	5.40	126.58	122.80
1	A1	1453	C	N3-C2-O2	-5.37	118.14	121.90
1	A1	356	C	C6-N1-C1'	-5.36	114.37	120.80
80	54	4880	C	C2-N1-C1'	5.32	124.65	118.80
1	A1	1139	C	N1-C2-O2	5.28	122.07	118.90
1	A1	1139	C	C2-N1-C1'	5.27	124.59	118.80
1	A1	1535	U	N1-C2-O2	5.25	126.47	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A1	630	U	C2-N1-C1'	5.22	123.97	117.70
80	54	4936	G	P-O3'-C3'	5.21	125.95	119.70
80	54	4925	U	P-O3'-C3'	5.21	125.95	119.70
84	B	124	LEU	CA-CB-CG	5.20	127.25	115.30
79	t2	80	LEU	CA-CB-CG	5.18	127.22	115.30
84	B	111	LEU	CA-CB-CG	5.07	126.95	115.30
80	54	978	G	N3-C4-N9	-5.03	122.98	126.00
80	54	1381	U	C2-N1-C1'	5.03	123.73	117.70
80	54	4926	C	C2-N1-C1'	5.03	124.33	118.80
1	A1	1016	U	N1-C2-O2	5.03	126.32	122.80
80	54	4936	G	OP1-P-O3'	5.01	116.22	105.20

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
84	B	128	LEU	Peptide
84	B	20	GLY	Peptide
84	B	60	ARG	Peptide
37	B2	258	HIS	Peptide
19	S1	108	LEU	Peptide
25	Y1	61	GLN	Peptide
66	f2	106	TYR	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
2	B1	215/295 (73%)	211 (98%)	4 (2%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C1	211/264 (80%)	201 (95%)	10 (5%)	0	100	100
4	D1	219/293 (75%)	215 (98%)	4 (2%)	0	100	100
5	E1	226/243 (93%)	215 (95%)	11 (5%)	0	100	100
6	F1	260/263 (99%)	252 (97%)	8 (3%)	0	100	100
7	G1	181/204 (89%)	168 (93%)	13 (7%)	0	100	100
8	H1	235/249 (94%)	229 (97%)	6 (3%)	0	100	100
9	I1	181/194 (93%)	171 (94%)	10 (6%)	0	100	100
10	J1	204/208 (98%)	194 (95%)	10 (5%)	0	100	100
11	K1	183/194 (94%)	181 (99%)	2 (1%)	0	100	100
12	L1	94/165 (57%)	90 (96%)	4 (4%)	0	100	100
13	M1	139/158 (88%)	131 (94%)	8 (6%)	0	100	100
14	N1	115/132 (87%)	100 (87%)	15 (13%)	0	100	100
15	O1	147/151 (97%)	145 (99%)	2 (1%)	0	100	100
16	P1	134/168 (80%)	130 (97%)	4 (3%)	0	100	100
17	Q1	127/145 (88%)	122 (96%)	5 (4%)	0	100	100
18	R1	140/146 (96%)	136 (97%)	4 (3%)	0	100	100
19	S1	130/135 (96%)	123 (95%)	7 (5%)	0	100	100
20	T1	142/152 (93%)	136 (96%)	6 (4%)	0	100	100
21	U1	139/145 (96%)	132 (95%)	7 (5%)	0	100	100
22	V1	98/119 (82%)	93 (95%)	5 (5%)	0	100	100
23	W1	81/83 (98%)	80 (99%)	1 (1%)	0	100	100
24	X1	127/130 (98%)	124 (98%)	3 (2%)	0	100	100
25	Y1	139/143 (97%)	133 (96%)	4 (3%)	2 (1%)	11	34
26	Z1	122/130 (94%)	119 (98%)	3 (2%)	0	100	100
27	a1	73/125 (58%)	71 (97%)	2 (3%)	0	100	100
28	b1	99/115 (86%)	95 (96%)	4 (4%)	0	100	100
29	c1	81/84 (96%)	79 (98%)	2 (2%)	0	100	100
30	d1	60/69 (87%)	59 (98%)	1 (2%)	0	100	100
31	e1	53/56 (95%)	53 (100%)	0	0	100	100
32	f1	55/133 (41%)	54 (98%)	1 (2%)	0	100	100
33	g1	66/156 (42%)	61 (92%)	5 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
34	h1	311/317 (98%)	288 (93%)	23 (7%)	0	100	100
36	A2	246/257 (96%)	235 (96%)	11 (4%)	0	100	100
37	B2	392/403 (97%)	382 (97%)	10 (3%)	0	100	100
38	C2	360/425 (85%)	349 (97%)	10 (3%)	1 (0%)	41	72
39	D2	291/297 (98%)	286 (98%)	5 (2%)	0	100	100
40	E2	208/291 (72%)	203 (98%)	5 (2%)	0	100	100
41	F2	223/247 (90%)	216 (97%)	7 (3%)	0	100	100
42	G2	229/319 (72%)	228 (100%)	1 (0%)	0	100	100
43	H2	188/192 (98%)	180 (96%)	8 (4%)	0	100	100
44	I2	201/214 (94%)	197 (98%)	4 (2%)	0	100	100
45	J2	168/178 (94%)	166 (99%)	2 (1%)	0	100	100
46	L2	208/211 (99%)	197 (95%)	9 (4%)	2 (1%)	15	44
47	M2	136/218 (62%)	131 (96%)	5 (4%)	0	100	100
48	N2	201/204 (98%)	196 (98%)	5 (2%)	0	100	100
49	O2	197/203 (97%)	195 (99%)	2 (1%)	0	100	100
50	P2	151/184 (82%)	146 (97%)	5 (3%)	0	100	100
51	Q2	185/188 (98%)	176 (95%)	9 (5%)	0	100	100
52	R2	178/196 (91%)	175 (98%)	3 (2%)	0	100	100
53	S2	174/176 (99%)	167 (96%)	7 (4%)	0	100	100
54	T2	157/160 (98%)	148 (94%)	9 (6%)	0	100	100
55	U2	97/128 (76%)	91 (94%)	6 (6%)	0	100	100
56	V2	137/140 (98%)	135 (98%)	2 (2%)	0	100	100
57	W2	102/157 (65%)	99 (97%)	3 (3%)	0	100	100
58	X2	116/156 (74%)	115 (99%)	1 (1%)	0	100	100
59	Y2	132/145 (91%)	130 (98%)	2 (2%)	0	100	100
60	Z2	133/136 (98%)	127 (96%)	6 (4%)	0	100	100
61	a2	145/148 (98%)	135 (93%)	10 (7%)	0	100	100
62	b2	100/245 (41%)	96 (96%)	4 (4%)	0	100	100
63	c2	96/115 (84%)	95 (99%)	1 (1%)	0	100	100
64	d2	105/125 (84%)	100 (95%)	5 (5%)	0	100	100
65	e2	126/135 (93%)	122 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
66	f2	107/110 (97%)	105 (98%)	2 (2%)	0	100	100
67	g2	112/116 (97%)	112 (100%)	0	0	100	100
68	h2	120/123 (98%)	118 (98%)	2 (2%)	0	100	100
69	i2	100/105 (95%)	98 (98%)	2 (2%)	0	100	100
70	j2	84/97 (87%)	84 (100%)	0	0	100	100
71	k2	67/70 (96%)	64 (96%)	3 (4%)	0	100	100
72	l2	48/51 (94%)	45 (94%)	3 (6%)	0	100	100
73	m2	50/102 (49%)	49 (98%)	1 (2%)	0	100	100
74	n2	23/25 (92%)	23 (100%)	0	0	100	100
75	o2	102/106 (96%)	100 (98%)	2 (2%)	0	100	100
76	p2	89/92 (97%)	87 (98%)	2 (2%)	0	100	100
77	r2	122/137 (89%)	120 (98%)	2 (2%)	0	100	100
78	s2	194/318 (61%)	179 (92%)	15 (8%)	0	100	100
79	t2	151/165 (92%)	126 (83%)	24 (16%)	1 (1%)	22	53
83	XX	14/16 (88%)	5 (36%)	7 (50%)	2 (14%)	0	0
84	B	204/217 (94%)	171 (84%)	32 (16%)	1 (0%)	29	61
All	All	11756/13607 (86%)	11295 (96%)	452 (4%)	9 (0%)	54	81

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
83	XX	1016	LYS
46	L2	64	VAL
83	XX	1022	LYS
25	Y1	62	PRO
25	Y1	61	GLN
84	B	61	PRO
79	t2	54	LYS
38	C2	81	GLY
46	L2	62	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	
2	B1	180/245 (74%)	180 (100%)	0	100	100
3	C1	194/231 (84%)	194 (100%)	0	100	100
4	D1	187/225 (83%)	186 (100%)	1 (0%)	88	96
5	E1	190/202 (94%)	189 (100%)	1 (0%)	88	96
6	F1	224/225 (100%)	224 (100%)	0	100	100
7	G1	158/170 (93%)	158 (100%)	0	100	100
8	H1	207/218 (95%)	205 (99%)	2 (1%)	76	93
9	I1	165/174 (95%)	165 (100%)	0	100	100
10	J1	178/180 (99%)	177 (99%)	1 (1%)	86	96
11	K1	161/168 (96%)	161 (100%)	0	100	100
12	L1	87/136 (64%)	87 (100%)	0	100	100
13	M1	130/142 (92%)	129 (99%)	1 (1%)	81	94
14	N1	99/108 (92%)	98 (99%)	1 (1%)	76	93
15	O1	130/131 (99%)	130 (100%)	0	100	100
16	P1	106/130 (82%)	106 (100%)	0	100	100
17	Q1	115/130 (88%)	114 (99%)	1 (1%)	78	94
18	R1	117/121 (97%)	117 (100%)	0	100	100
19	S1	119/121 (98%)	119 (100%)	0	100	100
20	T1	125/132 (95%)	125 (100%)	0	100	100
21	U1	111/115 (96%)	110 (99%)	1 (1%)	78	94
22	V1	92/107 (86%)	92 (100%)	0	100	100
23	W1	67/67 (100%)	67 (100%)	0	100	100
24	X1	112/113 (99%)	112 (100%)	0	100	100
25	Y1	113/115 (98%)	113 (100%)	0	100	100
26	Z1	107/112 (96%)	107 (100%)	0	100	100
27	a1	66/103 (64%)	66 (100%)	0	100	100
28	b1	88/98 (90%)	88 (100%)	0	100	100
29	c1	75/76 (99%)	75 (100%)	0	100	100
30	d1	55/62 (89%)	54 (98%)	1 (2%)	59	86
31	e1	48/49 (98%)	48 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
32	f1	47/106 (44%)	47 (100%)	0	100	100
33	g1	61/140 (44%)	60 (98%)	1 (2%)	62	88
34	h1	272/275 (99%)	272 (100%)	0	100	100
36	A2	190/199 (96%)	189 (100%)	1 (0%)	88	96
37	B2	342/348 (98%)	341 (100%)	1 (0%)	92	98
38	C2	302/347 (87%)	300 (99%)	2 (1%)	84	95
39	D2	247/250 (99%)	247 (100%)	0	100	100
40	E2	190/251 (76%)	189 (100%)	1 (0%)	88	96
41	F2	196/215 (91%)	196 (100%)	0	100	100
42	G2	200/272 (74%)	197 (98%)	3 (2%)	65	89
43	H2	169/171 (99%)	168 (99%)	1 (1%)	86	96
44	I2	175/181 (97%)	175 (100%)	0	100	100
45	J2	143/149 (96%)	143 (100%)	0	100	100
46	L2	175/176 (99%)	175 (100%)	0	100	100
47	M2	117/161 (73%)	117 (100%)	0	100	100
48	N2	171/172 (99%)	171 (100%)	0	100	100
49	O2	171/173 (99%)	170 (99%)	1 (1%)	86	96
50	P2	134/163 (82%)	134 (100%)	0	100	100
51	Q2	164/165 (99%)	163 (99%)	1 (1%)	86	96
52	R2	159/175 (91%)	157 (99%)	2 (1%)	69	91
53	S2	157/157 (100%)	157 (100%)	0	100	100
54	T2	139/140 (99%)	139 (100%)	0	100	100
55	U2	89/114 (78%)	89 (100%)	0	100	100
56	V2	106/107 (99%)	105 (99%)	1 (1%)	78	94
57	W2	86/126 (68%)	86 (100%)	0	100	100
58	X2	106/134 (79%)	106 (100%)	0	100	100
59	Y2	124/135 (92%)	124 (100%)	0	100	100
60	Z2	117/118 (99%)	117 (100%)	0	100	100
61	a2	119/120 (99%)	119 (100%)	0	100	100
62	b2	84/184 (46%)	83 (99%)	1 (1%)	71	92
63	c2	84/98 (86%)	84 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
64	d2	98/110 (89%)	98 (100%)	0	100	100
65	e2	114/121 (94%)	114 (100%)	0	100	100
66	f2	88/89 (99%)	88 (100%)	0	100	100
67	g2	98/99 (99%)	98 (100%)	0	100	100
68	h2	109/110 (99%)	109 (100%)	0	100	100
69	i2	86/89 (97%)	86 (100%)	0	100	100
70	j2	73/80 (91%)	73 (100%)	0	100	100
71	k2	64/65 (98%)	64 (100%)	0	100	100
72	l2	47/48 (98%)	47 (100%)	0	100	100
73	m2	48/90 (53%)	48 (100%)	0	100	100
74	n2	24/24 (100%)	23 (96%)	1 (4%)	30	63
75	o2	92/94 (98%)	92 (100%)	0	100	100
76	p2	74/75 (99%)	74 (100%)	0	100	100
77	r2	108/121 (89%)	108 (100%)	0	100	100
78	s2	164/258 (64%)	164 (100%)	0	100	100
79	t2	126/137 (92%)	124 (98%)	2 (2%)	62	88
83	XX	5/16 (31%)	5 (100%)	0	100	100
84	B	186/196 (95%)	179 (96%)	7 (4%)	33	67
All	All	10246/11550 (89%)	10210 (100%)	36 (0%)	91	97

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	D1	167	ARG
5	E1	76	ARG
8	H1	98	ARG
8	H1	215	LYS
10	J1	206	LYS
13	M1	69	ARG
14	N1	99	LYS
17	Q1	70	MET
21	U1	142	LYS
30	d1	66	ARG
33	g1	138	ARG
36	A2	163	ARG
37	B2	261	ARG

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Mol	Chain	Res	Type
38	C2	100	ARG
38	C2	188	ARG
40	E2	58	ARG
42	G2	164	LYS
42	G2	228	ARG
42	G2	308	LYS
43	H2	50	LYS
49	O2	117	ARG
51	Q2	14	ARG
52	R2	171	LYS
52	R2	180	LYS
56	V2	48	ARG
62	b2	117	ARG
74	n2	25	LYS
79	t2	57	ARG
79	t2	90	ARG
84	B	15	ARG
84	B	25	ARG
84	B	39	LYS
84	B	47	LYS
84	B	93	LEU
84	B	199	GLN
84	B	206	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (148) such sidechains are listed below:

Mol	Chain	Res	Type
2	B1	113	GLN
3	C1	101	HIS
3	C1	163	GLN
4	D1	172	ASN
4	D1	272	HIS
5	E1	22	ASN
5	E1	57	ASN
6	F1	67	GLN
6	F1	112	HIS
6	F1	142	HIS
6	F1	161	GLN
7	G1	65	GLN
7	G1	114	ASN
8	H1	146	ASN
8	H1	197	GLN

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Mol	Chain	Res	Type
9	I1	68	GLN
10	J1	84	ASN
10	J1	88	ASN
10	J1	111	GLN
10	J1	165	GLN
11	K1	124	HIS
11	K1	125	HIS
12	L1	66	HIS
13	M1	18	GLN
13	M1	19	ASN
13	M1	65	ASN
13	M1	112	HIS
13	M1	121	GLN
14	N1	19	GLN
14	N1	28	HIS
14	N1	46	GLN
14	N1	75	ASN
15	O1	49	GLN
16	P1	94	HIS
17	Q1	32	GLN
18	R1	11	GLN
18	R1	24	HIS
18	R1	80	GLN
18	R1	97	GLN
19	S1	127	ASN
20	T1	72	GLN
20	T1	105	ASN
22	V1	28	ASN
24	X1	64	ASN
24	X1	113	HIS
25	Y1	46	HIS
25	Y1	77	ASN
26	Z1	94	HIS
27	a1	89	GLN
28	b1	17	HIS
29	c1	65	GLN
30	d1	26	GLN
31	e1	4	GLN
32	f1	76	HIS
32	f1	88	GLN
34	h1	26	GLN
34	h1	64	HIS

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Mol	Chain	Res	Type
34	h1	117	ASN
34	h1	119	GLN
34	h1	133	ASN
34	h1	305	ASN
36	A2	95	GLN
36	A2	216	HIS
37	B2	3	HIS
37	B2	158	GLN
37	B2	175	GLN
37	B2	258	HIS
37	B2	354	GLN
38	C2	187	GLN
39	D2	175	HIS
39	D2	198	HIS
39	D2	202	GLN
39	D2	225	GLN
39	D2	267	ASN
40	E2	131	HIS
40	E2	193	HIS
40	E2	214	HIS
40	E2	253	GLN
40	E2	287	HIS
41	F2	79	ASN
41	F2	118	ASN
41	F2	238	GLN
41	F2	247	ASN
42	G2	99	GLN
42	G2	134	ASN
42	G2	206	GLN
42	G2	261	ASN
43	H2	39	ASN
43	H2	42	ASN
43	H2	78	GLN
43	H2	106	GLN
44	I2	59	GLN
44	I2	95	HIS
44	I2	112	GLN
44	I2	213	HIS
45	J2	104	ASN
45	J2	167	GLN
46	L2	19	GLN
46	L2	28	GLN

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Mol	Chain	Res	Type
46	L2	67	HIS
46	L2	113	ASN
46	L2	188	ASN
48	N2	87	HIS
48	N2	182	HIS
48	N2	196	ASN
50	P2	25	HIS
50	P2	28	ASN
50	P2	56	GLN
50	P2	97	ASN
50	P2	116	HIS
50	P2	118	GLN
50	P2	120	ASN
51	Q2	93	GLN
52	R2	27	ASN
53	S2	91	HIS
53	S2	156	HIS
53	S2	163	HIS
54	T2	95	HIS
55	U2	41	GLN
56	V2	77	HIS
56	V2	135	ASN
57	W2	17	HIS
57	W2	96	GLN
58	X2	125	ASN
58	X2	151	ASN
59	Y2	72	GLN
61	a2	14	HIS
61	a2	28	HIS
61	a2	66	ASN
62	b2	60	ASN
64	d2	30	HIS
64	d2	100	ASN
65	e2	92	ASN
65	e2	107	ASN
68	h2	108	GLN
69	i2	15	HIS
69	i2	26	HIS
70	j2	28	HIS
70	j2	76	HIS
72	l2	4	HIS
75	o2	76	ASN

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Mol	Chain	Res	Type
76	p2	33	GLN
77	r2	4	HIS
77	r2	45	HIS
78	s2	105	ASN
78	s2	190	GLN
79	t2	65	GLN
79	t2	147	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A1	1678/1869 (89%)	301 (17%)	17 (1%)
35	i1	9/10 (90%)	1 (11%)	0
80	54	3573/3603 (99%)	682 (19%)	59 (1%)
81	74	118/120 (98%)	9 (7%)	0
82	84	149/156 (95%)	25 (16%)	1 (0%)
85	23	72/76 (94%)	22 (30%)	7 (9%)
85	33	72/76 (94%)	22 (30%)	7 (9%)
All	All	5671/5910 (95%)	1062 (18%)	91 (1%)

All (1062) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A1	2	A
1	A1	3	C
1	A1	17	C
1	A1	23	G
1	A1	25	A
1	A1	33	G
1	A1	41	G
1	A1	44	U
1	A1	46	A
1	A1	56	G
1	A1	58	C
1	A1	67	C
1	A1	68	A
1	A1	72	C
1	A1	73	C
1	A1	74	G
1	A1	75	G
1	A1	77	A

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Mol	Chain	Res	Type
1	A1	79	A
1	A1	100	U
1	A1	103	A
1	A1	111	A
1	A1	113	G
1	A1	114	G
1	A1	115	U
1	A1	116	U
1	A1	124	U
1	A1	126	G
1	A1	130	G
1	A1	143	U
1	A1	147	A
1	A1	155	G
1	A1	162	C
1	A1	163	U
1	A1	173	A
1	A1	180	G
1	A1	183	G
1	A1	184	G
1	A1	185	G
1	A1	186	C
1	A1	188	C
1	A1	192	C
1	A1	206	G
1	A1	302	A
1	A1	307	G
1	A1	308	G
1	A1	309	G
1	A1	312	G
1	A1	319	C
1	A1	347	G
1	A1	362	C
1	A1	364	A
1	A1	368	U
1	A1	369	C
1	A1	370	G
1	A1	385	G
1	A1	386	C
1	A1	398	A
1	A1	400	C
1	A1	407	G

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Mol	Chain	Res	Type
1	A1	408	A
1	A1	409	C
1	A1	418	A
1	A1	441	C
1	A1	447	A
1	A1	448	A
1	A1	450	C
1	A1	464	A
1	A1	465	A
1	A1	466	G
1	A1	471	G
1	A1	472	C
1	A1	473	A
1	A1	474	G
1	A1	482	G
1	A1	483	C
1	A1	487	U
1	A1	492	C
1	A1	516	A
1	A1	517	C
1	A1	531	A
1	A1	532	C
1	A1	533	A
1	A1	535	G
1	A1	542	U
1	A1	547	G
1	A1	548	C
1	A1	549	C
1	A1	550	C
1	A1	551	U
1	A1	554	A
1	A1	556	U
1	A1	559	G
1	A1	561	A
1	A1	562	U
1	A1	568	C
1	A1	576	A
1	A1	583	A
1	A1	587	A
1	A1	588	G
1	A1	590	A
1	A1	591	U

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Mol	Chain	Res	Type
1	A1	603	C
1	A1	606	G
1	A1	607	U
1	A1	608	C
1	A1	614	C
1	A1	621	C
1	A1	627	U
1	A1	628	A
1	A1	631	U
1	A1	632	C
1	A1	643	A
1	A1	644	G
1	A1	655	A
1	A1	660	C
1	A1	664	A
1	A1	668	A
1	A1	669	A
1	A1	670	A
1	A1	671	A
1	A1	672	A
1	A1	673	G
1	A1	684	G
1	A1	689	U
1	A1	752	G
1	A1	753	C
1	A1	754	G
1	A1	808	A
1	A1	811	A
1	A1	821	G
1	A1	822	U
1	A1	830	A
1	A1	844	U
1	A1	847	A
1	A1	859	G
1	A1	868	G
1	A1	870	A
1	A1	871	U
1	A1	872	A
1	A1	874	G
1	A1	875	A
1	A1	878	G
1	A1	879	C

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Mol	Chain	Res	Type
1	A1	888	U
1	A1	889	U
1	A1	893	U
1	A1	898	U
1	A1	901	G
1	A1	908	A
1	A1	909	G
1	A1	913	A
1	A1	914	U
1	A1	920	A
1	A1	922	A
1	A1	933	G
1	A1	963	A
1	A1	971	G
1	A1	978	G
1	A1	990	A
1	A1	992	A
1	A1	999	G
1	A1	1017	U
1	A1	1023	A
1	A1	1060	A
1	A1	1062	A
1	A1	1078	C
1	A1	1080	A
1	A1	1083	A
1	A1	1085	C
1	A1	1107	G
1	A1	1115	U
1	A1	1116	C
1	A1	1117	C
1	A1	1118	C
1	A1	1121	G
1	A1	1126	G
1	A1	1138	C
1	A1	1148	A
1	A1	1153	C
1	A1	1154	U
1	A1	1195	A
1	A1	1203	G
1	A1	1207	G
1	A1	1208	A
1	A1	1215	C

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Mol	Chain	Res	Type
1	A1	1221	G
1	A1	1224	G
1	A1	1242	U
1	A1	1248	U
1	A1	1251	A
1	A1	1253	A
1	A1	1256	G
1	A1	1257	G
1	A1	1259	A
1	A1	1265	A
1	A1	1274	G
1	A1	1275	G
1	A1	1282	A
1	A1	1284	A
1	A1	1285	G
1	A1	1286	G
1	A1	1292	C
1	A1	1299	A
1	A1	1301	A
1	A1	1302	G
1	A1	1303	C
1	A1	1308	U
1	A1	1309	C
1	A1	1310	U
1	A1	1313	A
1	A1	1318	G
1	A1	1341	C
1	A1	1342	U
1	A1	1348	G
1	A1	1371	U
1	A1	1372	U
1	A1	1378	A
1	A1	1395	C
1	A1	1396	A
1	A1	1397	U
1	A1	1401	A
1	A1	1402	A
1	A1	1404	U
1	A1	1406	G
1	A1	1428	G
1	A1	1429	G
1	A1	1447	G

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Mol	Chain	Res	Type
1	A1	1452	A
1	A1	1454	A
1	A1	1462	U
1	A1	1463	U
1	A1	1466	G
1	A1	1476	A
1	A1	1480	A
1	A1	1487	A
1	A1	1489	A
1	A1	1490	G
1	A1	1495	G
1	A1	1497	G
1	A1	1498	A
1	A1	1519	U
1	A1	1521	C
1	A1	1533	A
1	A1	1544	C
1	A1	1548	G
1	A1	1552	G
1	A1	1553	C
1	A1	1554	C
1	A1	1555	U
1	A1	1556	A
1	A1	1560	U
1	A1	1570	G
1	A1	1574	C
1	A1	1580	A
1	A1	1585	U
1	A1	1586	U
1	A1	1587	G
1	A1	1588	A
1	A1	1601	A
1	A1	1603	G
1	A1	1621	U
1	A1	1623	A
1	A1	1637	A
1	A1	1638	G
1	A1	1639	G
1	A1	1648	G
1	A1	1654	G
1	A1	1664	A
1	A1	1665	G

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Mol	Chain	Res	Type
1	A1	1671	G
1	A1	1680	G
1	A1	1697	A
1	A1	1699	A
1	A1	1721	U
1	A1	1722	G
1	A1	1726	G
1	A1	1744	G
1	A1	1748	G
1	A1	1750	C
1	A1	1753	C
1	A1	1774	C
1	A1	1783	C
1	A1	1784	G
1	A1	1785	C
1	A1	1805	G
1	A1	1823	A
1	A1	1825	A
1	A1	1829	G
1	A1	1831	A
1	A1	1835	A
1	A1	1836	G
1	A1	1838	U
1	A1	1849	G
1	A1	1851	A
1	A1	1860	A
1	A1	1861	G
1	A1	1862	G
1	A1	1863	A
1	A1	1865	C
1	A1	1869	A
35	i1	22	A
80	54	17	A
80	54	25	A
80	54	35	U
80	54	39	A
80	54	42	A
80	54	56	A
80	54	58	G
80	54	59	A
80	54	64	A
80	54	65	A

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Mol	Chain	Res	Type
80	54	66	A
80	54	73	A
80	54	74	G
80	54	91	G
80	54	98	A
80	54	104	G
80	54	108	A
80	54	109	G
80	54	110	C
80	54	117	C
80	54	118	C
80	54	119	G
80	54	120	A
80	54	126	C
80	54	134	G
80	54	135	G
80	54	136	C
80	54	146	G
80	54	159	C
80	54	170	C
80	54	172	C
80	54	173	C
80	54	177	G
80	54	182	G
80	54	200	U
80	54	201	C
80	54	209	U
80	54	210	C
80	54	216	C
80	54	218	A
80	54	219	G
80	54	224	U
80	54	233	U
80	54	234	G
80	54	246	G
80	54	265	C
80	54	266	C
80	54	267	G
80	54	268	G
80	54	276	C
80	54	280	G
80	54	297	U

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Mol	Chain	Res	Type
80	54	306	A
80	54	309	C
80	54	310	G
80	54	315	G
80	54	316	U
80	54	334	A
80	54	340	C
80	54	350	C
80	54	362	A
80	54	363	A
80	54	379	G
80	54	386	A
80	54	387	G
80	54	407	A
80	54	410	A
80	54	412	G
80	54	413	G
80	54	431	G
80	54	432	U
80	54	446	C
80	54	449	C
80	54	450	G
80	54	452	A
80	54	453	G
80	54	454	U
80	54	455	C
80	54	463	A
80	54	467	U
80	54	468	U
80	54	481	G
80	54	481(A)	C
80	54	482	G
80	54	485	C
80	54	486	C
80	54	492	U
80	54	497	G
80	54	498	C
80	54	499	G
80	54	505	G
80	54	510	U
80	54	658	C
80	54	661	C

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Mol	Chain	Res	Type
80	54	666	G
80	54	667	A
80	54	672	C
80	54	685	C
80	54	686	A
80	54	696	C
80	54	697	G
80	54	704	C
80	54	705	G
80	54	729	G
80	54	730	G
80	54	731	G
80	54	738	C
80	54	739	G
80	54	742	G
80	54	746	A
80	54	747	A
80	54	749	G
80	54	758	G
80	54	913	U
80	54	914	U
80	54	917	A
80	54	918	G
80	54	923	C
80	54	925	C
80	54	926	G
80	54	929	A
80	54	931	C
80	54	932	A
80	54	933	G
80	54	935	A
80	54	935(A)	G
80	54	936	C
80	54	938	C
80	54	939	G
80	54	941	C
80	54	943	A
80	54	944	A
80	54	945	U
80	54	946	C
80	54	959	G
80	54	960	A

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Mol	Chain	Res	Type
80	54	961	G
80	54	966	A
80	54	967	C
80	54	969	C
80	54	972	C
80	54	979	C
80	54	983	C
80	54	1070	G
80	54	1072	C
80	54	1073	G
80	54	1079	C
80	54	1080	C
80	54	1082	C
80	54	1174	G
80	54	1179	U
80	54	1195	G
80	54	1196	G
80	54	1198	G
80	54	1210	C
80	54	1211	G
80	54	1212	G
80	54	1214	C
80	54	1215	C
80	54	1234	G
80	54	1235	G
80	54	1236	C
80	54	1237	C
80	54	1239	C
80	54	1249	C
80	54	1273	G
80	54	1275	G
80	54	1276	C
80	54	1277	G
80	54	1280	C
80	54	1284	G
80	54	1285	U
80	54	1287	G
80	54	1292	C
80	54	1293	G
80	54	1295	U
80	54	1296	G
80	54	1301	C

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Mol	Chain	Res	Type
80	54	1303	A
80	54	1326	A
80	54	1337	A
80	54	1354	A
80	54	1358	G
80	54	1359	G
80	54	1371	A
80	54	1377	G
80	54	1378	C
80	54	1387	A
80	54	1394	G
80	54	1397	A
80	54	1398	A
80	54	1400	G
80	54	1406(A)	G
80	54	1414	C
80	54	1420	A
80	54	1437	C
80	54	1438	U
80	54	1441	C
80	54	1445	U
80	54	1446	C
80	54	1456	C
80	54	1457	G
80	54	1476	C
80	54	1477	C
80	54	1478	C
80	54	1480	C
80	54	1482	G
80	54	1483	C
80	54	1497	A
80	54	1498	G
80	54	1502	G
80	54	1514	U
80	54	1523	A
80	54	1534	A
80	54	1547	A
80	54	1566	C
80	54	1578	U
80	54	1582	U
80	54	1586	G
80	54	1588	U

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Mol	Chain	Res	Type
80	54	1591	U
80	54	1596	U
80	54	1602	U
80	54	1612	G
80	54	1613	A
80	54	1624	G
80	54	1625	G
80	54	1631	A
80	54	1633	G
80	54	1634	A
80	54	1638	A
80	54	1640	C
80	54	1641	G
80	54	1654	G
80	54	1661	C
80	54	1676	C
80	54	1694	C
80	54	1696	C
80	54	1731	C
80	54	1734	G
80	54	1741	G
80	54	1742	A
80	54	1750	G
80	54	1756	U
80	54	1760	G
80	54	1764	G
80	54	1765	A
80	54	1768	C
80	54	1772	C
80	54	1773	U
80	54	1775	A
80	54	1776	A
80	54	1781	U
80	54	1787	A
80	54	1797	G
80	54	1798	G
80	54	1804	A
80	54	1806	G
80	54	1815	G
80	54	1819	G
80	54	1821	G
80	54	1828	C

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Mol	Chain	Res	Type
80	54	1835	G
80	54	1836	G
80	54	1837	A
80	54	1842	G
80	54	1843	A
80	54	1855	G
80	54	1869	G
80	54	1882	U
80	54	1889	U
80	54	1890	G
80	54	1892	A
80	54	1893	C
80	54	1897	A
80	54	1910	G
80	54	1918	U
80	54	1920	C
80	54	1921	C
80	54	1922	G
80	54	1931	C
80	54	1932	A
80	54	1940	G
80	54	1945	G
80	54	1948	G
80	54	1951	G
80	54	1961	G
80	54	1962	A
80	54	1964	A
80	54	1965	G
80	54	1967	A
80	54	1969	G
80	54	1972	G
80	54	1976	G
80	54	1977	C
80	54	1978	C
80	54	1979	A
80	54	1980	U
80	54	1983	A
80	54	1984	A
80	54	1985	G
80	54	1986	U
80	54	1987	C
80	54	1991	A

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Mol	Chain	Res	Type
80	54	1997	U
80	54	2001	G
80	54	2002	A
80	54	2004	U
80	54	2007	G
80	54	2021	G
80	54	2025	A
80	54	2026	A
80	54	2044	U
80	54	2046	G
80	54	2047	A
80	54	2048	U
80	54	2052	G
80	54	2055	G
80	54	2056	G
80	54	2069	A
80	54	2071	A
80	54	2084	U
80	54	2090	U
80	54	2092	G
80	54	2093	G
80	54	2094	C
80	54	2097	A
80	54	2098	G
80	54	2100	G
80	54	2102	G
80	54	2104	A
80	54	2105	A
80	54	2106	G
80	54	2107	A
80	54	2108	G
80	54	2259	G
80	54	2260	C
80	54	2267	U
80	54	2268	A
80	54	2289	C
80	54	2300	A
80	54	2301	G
80	54	2313	A
80	54	2316	G
80	54	2332	A
80	54	2333	G

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Mol	Chain	Res	Type
80	54	2345	G
80	54	2348	G
80	54	2351	C
80	54	2360	A
80	54	2364	G
80	54	2395	A
80	54	2396	A
80	54	2402	G
80	54	2409	U
80	54	2417	A
80	54	2422	C
80	54	2425	U
80	54	2433	G
80	54	2441	C
80	54	2447	U
80	54	2450	G
80	54	2453	A
80	54	2471	G
80	54	2475	G
80	54	2488	C
80	54	2489	C
80	54	2490	U
80	54	2491	C
80	54	2493	G
80	54	2503	G
80	54	2504	C
80	54	2505	C
80	54	2506	G
80	54	2513	A
80	54	2514	G
80	54	2529	A
80	54	2530	U
80	54	2537	A
80	54	2544	G
80	54	2546	G
80	54	2547	G
80	54	2554	U
80	54	2564	G
80	54	2566	G
80	54	2583	C
80	54	2586	G
80	54	2587	A

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Mol	Chain	Res	Type
80	54	2601	A
80	54	2618	G
80	54	2627	C
80	54	2638	G
80	54	2640	G
80	54	2653	C
80	54	2662	G
80	54	2669	C
80	54	2681	G
80	54	2687	U
80	54	2694	G
80	54	2695	A
80	54	2696	A
80	54	2705	G
80	54	2707	U
80	54	2708	U
80	54	2709	C
80	54	2710	C
80	54	2711	G
80	54	2716	C
80	54	2723	U
80	54	2726	G
80	54	2735	G
80	54	2740	U
80	54	2743	A
80	54	2744	A
80	54	2754	G
80	54	2763	U
80	54	2764	A
80	54	2769	U
80	54	2787	A
80	54	2788	U
80	54	2790	U
80	54	2798	A
80	54	2803	U
80	54	2806	A
80	54	2807	A
80	54	2808	G
80	54	2814	C
80	54	2815	A
80	54	2826	U
80	54	2827	G

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Mol	Chain	Res	Type
80	54	2828	U
80	54	2842	G
80	54	2855	G
80	54	2867	C
80	54	2869	U
80	54	3598	C
80	54	3602	C
80	54	3603	G
80	54	3604	A
80	54	3605	C
80	54	3606	U
80	54	3615	G
80	54	3616	U
80	54	3617	G
80	54	3618	C
80	54	3625	G
80	54	3626	G
80	54	3635	A
80	54	3644	U
80	54	3648	A
80	54	3657	U
80	54	3662	A
80	54	3670	C
80	54	3673	C
80	54	3696	C
80	54	3712	A
80	54	3713	U
80	54	3714	G
80	54	3743	G
80	54	3748	A
80	54	3753	G
80	54	3756	A
80	54	3760	A
80	54	3773	U
80	54	3774	A
80	54	3776	G
80	54	3777	G
80	54	3784	A
80	54	3786	U
80	54	3788	C
80	54	3810	C
80	54	3811	G

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Mol	Chain	Res	Type
80	54	3812	C
80	54	3814	U
80	54	3817	A
80	54	3819	G
80	54	3838	U
80	54	3839	G
80	54	3840	U
80	54	3876	A
80	54	3877	A
80	54	3878	C
80	54	3879	G
80	54	3889	G
80	54	3897	G
80	54	3901	A
80	54	3905	A
80	54	3906	A
80	54	3907	G
80	54	3908	A
80	54	3915	U
80	54	3916	G
80	54	3938	G
80	54	3939	G
80	54	3951	G
80	54	3960	A
80	54	3962	A
80	54	3963	A
80	54	3964	U
80	54	3966	A
80	54	3967	G
80	54	3969	G
80	54	3972	A
80	54	3973	G
80	54	4037	C
80	54	4038	C
80	54	4039	G
80	54	4041	C
80	54	4043	G
80	54	4048	A
80	54	4056	A
80	54	4066	U
80	54	4073	A
80	54	4076	G

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Mol	Chain	Res	Type
80	54	4086	G
80	54	4088	C
80	54	4097	G
80	54	4110	C
80	54	4116	C
80	54	4118	U
80	54	4119	C
80	54	4120	U
80	54	4122	G
80	54	4127	A
80	54	4138	C
80	54	4158	C
80	54	4162	C
80	54	4163	U
80	54	4170	A
80	54	4171	C
80	54	4183	G
80	54	4184	G
80	54	4191	G
80	54	4203	A
80	54	4212	A
80	54	4225	G
80	54	4228	G
80	54	4229	U
80	54	4232	U
80	54	4233	A
80	54	4242	U
80	54	4249	G
80	54	4251	A
80	54	4254	G
80	54	4255	A
80	54	4266	G
80	54	4268	A
80	54	4271	A
80	54	4273	A
80	54	4281	A
80	54	4290	U
80	54	4291	G
80	54	4292	A
80	54	4297	G
80	54	4304	A
80	54	4305	G

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Mol	Chain	Res	Type
80	54	4306	U
80	54	4314	C
80	54	4329	G
80	54	4330	G
80	54	4332	C
80	54	4338	G
80	54	4348	A
80	54	4349	C
80	54	4354	U
80	54	4355	G
80	54	4368	G
80	54	4373	G
80	54	4377	G
80	54	4378	A
80	54	4380	A
80	54	4387	C
80	54	4391	G
80	54	4394	A
80	54	4395	U
80	54	4419	U
80	54	4420	U
80	54	4422	A
80	54	4426	C
80	54	4448	G
80	54	4449	A
80	54	4464	A
80	54	4475	G
80	54	4482	U
80	54	4488	A
80	54	4500	U
80	54	4512	U
80	54	4513	A
80	54	4515	G
80	54	4519	C
80	54	4524	G
80	54	4531	U
80	54	4535	A
80	54	4548	A
80	54	4549	G
80	54	4560	C
80	54	4567	G
80	54	4569	U

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Mol	Chain	Res	Type
80	54	4570	G
80	54	4573	G
80	54	4575	G
80	54	4577	U
80	54	4584	A
80	54	4590	A
80	54	4636	U
80	54	4637	G
80	54	4639	G
80	54	4656	A
80	54	4670	C
80	54	4672	A
80	54	4677	U
80	54	4700	A
80	54	4709	U
80	54	4719	G
80	54	4720	C
80	54	4736	C
80	54	4747	C
80	54	4751	G
80	54	4754	G
80	54	4757	C
80	54	4759	C
80	54	4761	G
80	54	4765	G
80	54	4771	C
80	54	4772	C
80	54	4773	C
80	54	4867	G
80	54	4870	G
80	54	4871	C
80	54	4873	G
80	54	4875	G
80	54	4876	A
80	54	4877	G
80	54	4882	U
80	54	4883	C
80	54	4885	U
80	54	4894	A
80	54	4895	C
80	54	4907	G
80	54	4909	A

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Mol	Chain	Res	Type
80	54	4912	G
80	54	4914	G
80	54	4919	G
80	54	4921	C
80	54	4922	C
80	54	4926	C
80	54	4934	A
80	54	4937	C
80	54	4938	A
80	54	4939	C
80	54	4943	A
80	54	4944	C
80	54	4948	C
80	54	4949	G
80	54	4950	U
80	54	4951	G
80	54	4955	A
80	54	4956	A
80	54	4957	C
80	54	4958	C
80	54	4959	U
80	54	4963	G
80	54	4966	A
80	54	4967	A
80	54	4976	U
80	54	4979	A
80	54	4985	U
80	54	4988	U
80	54	4989	U
80	54	4990	C
80	54	4991	U
80	54	4993	G
80	54	5014	A
80	54	5017	G
80	54	5041	G
80	54	5047	C
80	54	5050	C
80	54	5053	U
80	54	5054	C
80	54	5060	A
80	54	5061	A
80	54	5062	G

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Mol	Chain	Res	Type
81	74	2	U
81	74	7	G
81	74	25	G
81	74	53	U
81	74	54	A
81	74	64	G
81	74	100	A
81	74	110	G
81	74	111	C
82	84	2	G
82	84	3	A
82	84	23	C
82	84	34	U
82	84	35	C
82	84	52	A
82	84	59	A
82	84	60	G
82	84	62	A
82	84	63	U
82	84	74	U
82	84	75	G
82	84	87	G
82	84	103	A
82	84	105	C
82	84	110	U
82	84	111	U
82	84	114	G
82	84	121	G
82	84	123	U
82	84	125	C
82	84	126	C
82	84	127	U
82	84	128	C
82	84	147	G
85	23	8	U
85	23	13	C
85	23	14	A
85	23	16	C
85	23	17	C
85	23	18	G
85	23	19	G
85	23	20	H2U

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Mol	Chain	Res	Type
85	23	21	A
85	23	33	U
85	23	35	U
85	23	42	G
85	23	45	G
85	23	46	7MG
85	23	47	H2U
85	23	48	5MC
85	23	49	5MC
85	23	57	A
85	23	63	C
85	23	67	U
85	23	75	C
85	23	76	A
85	33	8	U
85	33	13	C
85	33	14	A
85	33	16	C
85	33	17	C
85	33	18	G
85	33	19	G
85	33	20	H2U
85	33	21	A
85	33	33	U
85	33	35	U
85	33	42	G
85	33	45	G
85	33	46	7MG
85	33	47	H2U
85	33	48	5MC
85	33	49	5MC
85	33	57	A
85	33	63	C
85	33	67	U
85	33	75	C
85	33	76	A

All (91) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A1	24	C
1	A1	110	U

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Mol	Chain	Res	Type
1	A1	417	C
1	A1	465	A
1	A1	532	C
1	A1	553	U
1	A1	561	A
1	A1	627	U
1	A1	688	U
1	A1	752	G
1	A1	870	A
1	A1	874	G
1	A1	1061	U
1	A1	1137	U
1	A1	1308	U
1	A1	1395	C
1	A1	1637	A
80	54	125	C
80	54	134	G
80	54	217	C
80	54	245	C
80	54	265	C
80	54	267	G
80	54	275	C
80	54	385	A
80	54	406	C
80	54	449	C
80	54	480	C
80	54	485	C
80	54	504	G
80	54	685	C
80	54	922(B)	C
80	54	930	G
80	54	959	G
80	54	1072	C
80	54	1211	G
80	54	1236	C
80	54	1238	A
80	54	1291	G
80	54	1370	G
80	54	1440	U
80	54	1445	U
80	54	1455	G
80	54	1477	C

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Mol	Chain	Res	Type
80	54	1633	G
80	54	1818	G
80	54	1979	A
80	54	1983	A
80	54	2046	G
80	54	2068	C
80	54	2089	G
80	54	2258	C
80	54	2266	C
80	54	2502	A
80	54	2639	U
80	54	2695	A
80	54	3603	G
80	54	3625	G
80	54	3672	G
80	54	3876	A
80	54	3888	G
80	54	3904	G
80	54	3959	U
80	54	3968	U
80	54	4036	G
80	54	4042	G
80	54	4119	C
80	54	4232	U
80	54	4354	U
80	54	4448	G
80	54	4699	U
80	54	4719	G
80	54	4884	G
80	54	4925	U
80	54	4936	G
80	54	4947	U
82	84	124	U
85	23	16	C
85	23	17	C
85	23	18	G
85	23	19	G
85	23	35	U
85	23	47	H2U
85	23	48	5MC
85	33	16	C
85	33	17	C

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Mol	Chain	Res	Type
85	33	18	G
85	33	19	G
85	33	35	U
85	33	47	H2U
85	33	48	5MC

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
85	H2U	23	20	85	18,21,22	4.28	5 (27%)	21,30,33	4.88	7 (33%)
85	1MA	33	58	85	16,25,26	1.37	2 (12%)	18,37,40	1.19	2 (11%)
85	PSU	33	55	85	18,21,22	1.49	4 (22%)	22,30,33	2.22	6 (27%)
85	H2U	33	20	85	18,21,22	4.28	5 (27%)	21,30,33	4.88	7 (33%)
85	5MC	23	49	85	18,22,23	1.08	1 (5%)	26,32,35	1.62	6 (23%)
85	PSU	33	39	85	18,21,22	2.02	4 (22%)	22,30,33	1.92	4 (18%)
85	PSU	23	27	85	18,21,22	1.98	4 (22%)	22,30,33	1.96	4 (18%)
85	7MG	33	46	85	22,26,27	1.84	4 (18%)	29,39,42	2.71	8 (27%)
85	5MC	23	48	85	18,22,23	1.34	1 (5%)	26,32,35	1.79	7 (26%)
85	5MC	33	48	85	18,22,23	1.34	1 (5%)	26,32,35	1.79	7 (26%)
85	2MU	23	54	85	20,23,24	1.49	3 (15%)	28,33,36	2.53	7 (25%)
85	H2U	23	47	85	18,21,22	1.00	2 (11%)	21,30,33	2.09	3 (14%)
85	2MU	33	54	85	20,23,24	1.49	3 (15%)	28,33,36	2.54	7 (25%)
85	70U	33	34	27,85	22,26,27	3.36	9 (40%)	28,37,40	3.76	13 (46%)
85	1MA	23	58	85	16,25,26	1.38	2 (12%)	18,37,40	1.19	2 (11%)
85	PSU	23	55	85	18,21,22	1.49	4 (22%)	22,30,33	2.22	6 (27%)
85	70U	23	34	85,35	22,26,27	3.36	9 (40%)	28,37,40	3.76	13 (46%)
85	H2U	33	47	85	18,21,22	1.00	2 (11%)	21,30,33	2.09	3 (14%)
85	12A	23	37	85	29,36,37	1.65	3 (10%)	34,52,55	1.60	7 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
85	12A	33	37	85	29,36,37	1.65	3 (10%)	34,52,55	1.60	7 (20%)
85	5MC	33	49	85	18,22,23	1.07	1 (5%)	26,32,35	1.62	6 (23%)
85	7MG	23	46	85	22,26,27	1.85	4 (18%)	29,39,42	2.72	8 (27%)
85	PSU	23	39	85	18,21,22	2.02	4 (22%)	22,30,33	1.93	4 (18%)
85	PSU	33	27	85	18,21,22	1.98	4 (22%)	22,30,33	1.97	4 (18%)

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
85	H2U	23	20	85	-	5/7/38/39	0/2/2/2
85	1MA	33	58	85	-	0/3/25/26	0/3/3/3
85	PSU	33	55	85	-	2/7/25/26	0/2/2/2
85	H2U	33	20	85	-	5/7/38/39	0/2/2/2
85	5MC	23	49	85	-	1/7/25/26	0/2/2/2
85	PSU	33	39	85	-	0/7/25/26	0/2/2/2
85	PSU	23	27	85	-	0/7/25/26	0/2/2/2
85	7MG	33	46	85	-	1/7/37/38	0/3/3/3
85	5MC	23	48	85	-	2/7/25/26	0/2/2/2
85	5MC	33	48	85	-	2/7/25/26	0/2/2/2
85	2MU	23	54	85	-	1/9/27/28	0/2/2/2
85	H2U	23	47	85	-	2/7/38/39	0/2/2/2
85	2MU	33	54	85	-	1/9/27/28	0/2/2/2
85	70U	33	34	27,85	-	4/13/31/32	0/2/2/2
85	1MA	23	58	85	-	0/3/25/26	0/3/3/3
85	PSU	23	55	85	-	2/7/25/26	0/2/2/2
85	70U	23	34	85,35	-	4/13/31/32	0/2/2/2
85	H2U	33	47	85	-	2/7/38/39	0/2/2/2
85	12A	23	37	85	-	8/21/43/44	0/3/3/3
85	12A	33	37	85	-	8/21/43/44	0/3/3/3
85	5MC	33	49	85	-	1/7/25/26	0/2/2/2
85	7MG	23	46	85	-	1/7/37/38	0/3/3/3
85	PSU	23	39	85	-	0/7/25/26	0/2/2/2
85	PSU	33	27	85	-	0/7/25/26	0/2/2/2

All (84) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
85	33	20	H2U	O4-C4	10.14	1.43	1.23
85	23	20	H2U	O4-C4	10.12	1.43	1.23
85	23	34	70U	C2-S2	-9.04	1.53	1.67
85	33	34	70U	C2-S2	-9.01	1.53	1.67
85	33	20	H2U	C2-N1	9.00	1.48	1.35
85	23	20	H2U	C2-N1	8.99	1.48	1.35
85	33	20	H2U	O2-C2	8.42	1.38	1.23
85	23	20	H2U	O2-C2	8.41	1.38	1.23
85	23	37	12A	C2-S2	-6.76	1.70	1.75
85	33	37	12A	C2-S2	-6.74	1.70	1.75
85	23	20	H2U	C2-N3	6.58	1.49	1.38
85	33	20	H2U	C2-N3	6.56	1.49	1.38
85	33	34	70U	O3'-C3'	-6.40	1.27	1.43
85	23	34	70U	O3'-C3'	-6.39	1.27	1.43
85	23	34	70U	C4-N3	-5.74	1.28	1.38
85	33	34	70U	C4-N3	-5.72	1.28	1.38
85	23	46	7MG	C4-N9	-5.48	1.31	1.37
85	33	46	7MG	C4-N9	-5.47	1.31	1.37
85	23	20	H2U	C4-N3	5.34	1.46	1.37
85	33	20	H2U	C4-N3	5.33	1.46	1.37
85	33	34	70U	C6-N1	-4.51	1.30	1.38
85	23	34	70U	C6-N1	-4.50	1.30	1.38
85	33	39	PSU	C6-C5	4.45	1.40	1.35
85	33	27	PSU	C6-C5	4.42	1.40	1.35
85	23	39	PSU	C6-C5	4.40	1.40	1.35
85	23	27	PSU	C6-C5	4.38	1.40	1.35
85	23	46	7MG	C5-N7	-4.26	1.30	1.35
85	33	46	7MG	C5-N7	-4.22	1.30	1.35
85	23	39	PSU	C2-N1	-4.19	1.31	1.36
85	33	39	PSU	C2-N1	-4.17	1.31	1.36
85	23	34	70U	C2-N3	-4.14	1.28	1.37
85	33	34	70U	C2-N3	-4.14	1.28	1.37
85	33	27	PSU	C2-N1	-4.10	1.31	1.36
85	23	27	PSU	C2-N1	-4.10	1.31	1.36
85	33	34	70U	O9-C8	3.94	1.45	1.33
85	23	39	PSU	O4-C4	-3.94	1.16	1.23
85	23	34	70U	O9-C8	3.92	1.45	1.33
85	33	39	PSU	O4-C4	-3.92	1.16	1.23
85	23	27	PSU	O4-C4	-3.92	1.16	1.23
85	33	27	PSU	O4-C4	-3.88	1.16	1.23
85	23	48	5MC	C6-N1	-3.74	1.31	1.38
85	33	48	5MC	C6-N1	-3.71	1.31	1.38
85	23	54	2MU	C4-N3	-3.62	1.32	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
85	33	54	2MU	C4-N3	-3.61	1.32	1.38
85	33	34	70U	C3'-C4'	-3.47	1.44	1.53
85	23	34	70U	C3'-C4'	-3.46	1.44	1.53
85	23	46	7MG	C6-N1	-3.40	1.32	1.38
85	23	58	1MA	C2-N3	3.40	1.33	1.29
85	33	46	7MG	C6-N1	-3.40	1.32	1.38
85	33	58	1MA	C2-N3	3.36	1.33	1.29
85	23	49	5MC	C6-N1	-3.32	1.32	1.38
85	33	49	5MC	C6-N1	-3.30	1.32	1.38
85	33	55	PSU	C4-N3	-3.13	1.33	1.38
85	23	55	PSU	C4-N3	-3.12	1.33	1.38
85	23	39	PSU	C4-N3	-2.96	1.33	1.38
85	33	54	2MU	C2-N3	-2.94	1.32	1.38
85	33	39	PSU	C4-N3	-2.93	1.33	1.38
85	23	54	2MU	C2-N3	-2.92	1.32	1.38
85	23	27	PSU	C4-N3	-2.88	1.33	1.38
85	33	27	PSU	C4-N3	-2.88	1.33	1.38
85	33	58	1MA	C6-N6	2.74	1.34	1.27
85	23	58	1MA	C6-N6	2.73	1.34	1.27
85	23	47	H2U	C4-N3	-2.70	1.33	1.37
85	23	34	70U	C3'-C2'	-2.68	1.46	1.53
85	33	34	70U	C3'-C2'	-2.67	1.46	1.53
85	33	47	H2U	C4-N3	-2.67	1.33	1.37
85	23	54	2MU	C6-N1	-2.64	1.33	1.38
85	33	55	PSU	C2-N1	-2.63	1.33	1.36
85	23	55	PSU	C2-N1	-2.62	1.33	1.36
85	33	54	2MU	C6-N1	-2.62	1.33	1.38
85	33	37	12A	C5-C4	2.40	1.47	1.40
85	23	37	12A	C5-C4	2.38	1.47	1.40
85	23	55	PSU	C6-N1	-2.36	1.32	1.36
85	33	55	PSU	C6-N1	-2.33	1.32	1.36
85	23	47	H2U	C2-N3	-2.24	1.34	1.38
85	33	47	H2U	C2-N3	-2.23	1.34	1.38
85	33	34	70U	C5'-C4'	2.20	1.58	1.51
85	23	34	70U	C5'-C4'	2.18	1.58	1.51
85	23	55	PSU	C2-N3	-2.13	1.33	1.37
85	33	55	PSU	C2-N3	-2.12	1.33	1.37
85	23	46	7MG	C5-C4	2.02	1.44	1.38
85	33	46	7MG	C5-C4	2.01	1.44	1.38
85	23	37	12A	CC-N6	-2.01	1.33	1.37
85	33	37	12A	CC-N6	-2.01	1.33	1.37

All (148) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	23	20	H2U	C4-N3-C2	-14.39	113.86	125.79
85	33	20	H2U	C4-N3-C2	-14.39	113.86	125.79
85	33	20	H2U	O2-C2-N1	-10.99	109.31	123.11
85	23	20	H2U	O2-C2-N1	-10.98	109.32	123.11
85	23	46	7MG	N9-C4-N3	9.25	139.31	125.47
85	33	46	7MG	N9-C4-N3	9.20	139.22	125.47
85	33	34	70U	C3'-C2'-C1'	-8.76	84.78	101.43
85	23	34	70U	C3'-C2'-C1'	-8.76	84.78	101.43
85	33	47	H2U	C4-N3-C2	-8.03	119.13	125.79
85	23	47	H2U	C4-N3-C2	-8.00	119.16	125.79
85	23	34	70U	O4'-C4'-C3'	-8.00	89.29	105.11
85	33	34	70U	O4'-C4'-C3'	-7.98	89.32	105.11
85	23	34	70U	C2'-C3'-C4'	7.88	117.95	102.64
85	33	34	70U	C2'-C3'-C4'	7.86	117.91	102.64
85	23	20	H2U	O4-C4-N3	-7.30	108.72	120.28
85	33	20	H2U	O4-C4-N3	-7.29	108.72	120.28
85	23	20	H2U	O2-C2-N3	-6.98	108.50	121.50
85	33	20	H2U	O2-C2-N3	-6.98	108.50	121.50
85	33	54	2MU	C5-C4-N3	6.60	120.94	115.31
85	23	54	2MU	C5-C4-N3	6.56	120.91	115.31
85	33	46	7MG	N9-C8-N7	-6.44	94.16	103.38
85	23	46	7MG	N9-C8-N7	-6.44	94.17	103.38
85	23	55	PSU	N1-C2-N3	6.22	122.18	115.13
85	33	55	PSU	N1-C2-N3	6.21	122.16	115.13
85	33	54	2MU	C4-N3-C2	-6.21	119.32	127.35
85	23	20	H2U	O4-C4-C5	-6.19	108.95	122.17
85	33	20	H2U	O4-C4-C5	-6.18	108.98	122.17
85	23	54	2MU	C4-N3-C2	-6.17	119.36	127.35
85	33	27	PSU	N1-C2-N3	6.07	122.01	115.13
85	23	27	PSU	N1-C2-N3	6.01	121.94	115.13
85	23	39	PSU	N1-C2-N3	5.97	121.90	115.13
85	33	39	PSU	N1-C2-N3	5.94	121.86	115.13
85	23	46	7MG	C5-C4-N3	-5.43	117.79	128.13
85	33	46	7MG	C5-C4-N3	-5.41	117.82	128.13
85	23	34	70U	O9-C8-C5M	5.10	120.71	111.27
85	33	34	70U	O9-C8-C5M	5.09	120.69	111.27
85	33	54	2MU	N3-C2-N1	5.09	121.64	114.89
85	23	48	5MC	C5-C6-N1	-5.04	118.16	123.34
85	23	54	2MU	N3-C2-N1	5.03	121.57	114.89
85	33	48	5MC	C5-C6-N1	-5.03	118.16	123.34
85	33	54	2MU	O4-C4-C5	-4.84	119.29	124.90
85	23	54	2MU	O4-C4-C5	-4.84	119.30	124.90
85	23	34	70U	C5-C4-N3	4.82	121.74	114.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	33	34	70U	C5-C4-N3	4.80	121.71	114.97
85	23	34	70U	C5M-C5-C4	4.73	124.16	118.27
85	33	34	70U	C5M-C5-C4	4.72	124.15	118.27
85	23	34	70U	O3'-C3'-C4'	-4.62	97.69	111.05
85	33	34	70U	O3'-C3'-C4'	-4.62	97.70	111.05
85	23	34	70U	O5'-C5'-C4'	4.42	124.01	108.99
85	33	34	70U	O5'-C5'-C4'	4.41	124.00	108.99
85	33	34	70U	O4'-C4'-C5'	4.41	123.89	109.37
85	23	34	70U	O4'-C4'-C5'	4.40	123.86	109.37
85	33	20	H2U	N3-C2-N1	-4.38	112.02	116.65
85	23	20	H2U	N3-C2-N1	-4.34	112.06	116.65
85	33	55	PSU	C4-N3-C2	-4.34	120.08	126.34
85	23	55	PSU	C4-N3-C2	-4.34	120.08	126.34
85	23	55	PSU	O2-C2-N1	-4.30	118.06	122.79
85	33	55	PSU	O2-C2-N1	-4.28	118.08	122.79
85	23	34	70U	C5-C6-N1	-4.27	117.18	122.91
85	33	34	70U	C5-C6-N1	-4.25	117.21	122.91
85	23	54	2MU	C5-C6-N1	-4.23	118.99	123.34
85	33	54	2MU	C5-C6-N1	-4.21	119.01	123.34
85	23	37	12A	C2-N3-C4	4.14	121.03	115.32
85	33	37	12A	C2-N3-C4	4.14	121.03	115.32
85	33	27	PSU	C4-N3-C2	-4.10	120.43	126.34
85	23	27	PSU	C4-N3-C2	-4.07	120.48	126.34
85	23	39	PSU	C4-N3-C2	-3.96	120.64	126.34
85	33	39	PSU	C4-N3-C2	-3.95	120.65	126.34
85	23	46	7MG	C2-N3-C4	3.61	118.72	112.30
85	33	46	7MG	C2-N3-C4	3.58	118.67	112.30
85	23	37	12A	C5-C6-N1	-3.56	117.85	120.81
85	33	37	12A	C5-C6-N1	-3.55	117.86	120.81
85	23	39	PSU	O2-C2-N1	-3.38	119.07	122.79
85	33	27	PSU	O2-C2-N1	-3.38	119.07	122.79
85	33	39	PSU	O2-C2-N1	-3.36	119.09	122.79
85	23	27	PSU	O2-C2-N1	-3.33	119.13	122.79
85	33	49	5MC	O2-C2-N3	-3.23	117.08	122.33
85	23	49	5MC	O2-C2-N3	-3.21	117.11	122.33
85	23	34	70U	O4'-C1'-N1	-3.15	101.16	108.36
85	33	34	70U	O4'-C1'-N1	-3.13	101.20	108.36
85	33	37	12A	N6-CC-N	3.02	117.99	113.76
85	23	37	12A	N6-CC-N	3.02	117.98	113.76
85	23	20	H2U	C5-C4-N3	-2.99	113.29	116.65
85	33	37	12A	C2M-S2-C2	-2.99	100.03	102.27
85	33	20	H2U	C5-C4-N3	-2.97	113.31	116.65

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	23	37	12A	C2M-S2-C2	-2.96	100.06	102.27
85	23	49	5MC	C5-C6-N1	-2.90	120.35	123.34
85	23	49	5MC	O3'-C3'-C2'	2.90	121.19	111.82
85	33	49	5MC	O3'-C3'-C2'	2.89	121.16	111.82
85	33	48	5MC	O3'-C3'-C4'	2.87	119.34	111.05
85	33	49	5MC	C5-C6-N1	-2.86	120.39	123.34
85	23	48	5MC	O3'-C3'-C4'	2.86	119.31	111.05
85	23	48	5MC	C2'-C3'-C4'	2.86	108.19	102.64
85	33	48	5MC	C2'-C3'-C4'	2.85	108.19	102.64
85	33	48	5MC	O3'-C3'-C2'	2.84	121.00	111.82
85	23	48	5MC	O3'-C3'-C2'	2.84	121.00	111.82
85	33	46	7MG	O6-C6-C5	-2.83	120.60	127.54
85	23	46	7MG	O6-C6-C5	-2.83	120.61	127.54
85	23	55	PSU	O2'-C2'-C1'	-2.82	104.50	111.23
85	33	55	PSU	O2'-C2'-C1'	-2.81	104.53	111.23
85	33	34	70U	O4-C4-N3	-2.80	114.75	120.12
85	23	34	70U	O4-C4-N3	-2.80	114.76	120.12
85	23	37	12A	C2-N1-C6	2.77	122.15	117.19
85	33	37	12A	C2-N1-C6	2.77	122.15	117.19
85	23	54	2MU	C2'-C1'-N1	-2.76	108.86	114.22
85	23	49	5MC	C2'-C3'-C4'	2.75	107.99	102.64
85	33	54	2MU	C2'-C1'-N1	-2.75	108.88	114.22
85	33	49	5MC	C2'-C3'-C4'	2.75	107.98	102.64
85	23	48	5MC	CM5-C5-C6	-2.72	119.21	122.85
85	33	48	5MC	CM5-C5-C6	-2.72	119.22	122.85
85	23	46	7MG	C5-C4-N9	-2.65	102.90	106.35
85	23	37	12A	C4-C5-N7	-2.63	106.66	109.40
85	33	49	5MC	O3'-C3'-C4'	2.62	118.63	111.05
85	33	37	12A	C4-C5-N7	-2.62	106.67	109.40
85	23	58	1MA	C8-N7-C5	2.62	107.98	102.99
85	33	58	1MA	C8-N7-C5	2.62	107.97	102.99
85	33	46	7MG	C5-C4-N9	-2.61	102.95	106.35
85	23	49	5MC	O3'-C3'-C4'	2.60	118.58	111.05
85	33	34	70U	O3'-C3'-C2'	2.56	120.09	111.82
85	23	46	7MG	C5-C6-N1	2.56	115.49	110.99
85	23	34	70U	O3'-C3'-C2'	2.54	120.05	111.82
85	33	46	7MG	C5-C6-N1	2.54	115.46	110.99
85	23	48	5MC	O2-C2-N3	-2.40	118.42	122.33
85	33	37	12A	N3-C2-N1	-2.40	122.57	126.98
85	23	37	12A	N3-C2-N1	-2.39	122.58	126.98
85	33	48	5MC	O2-C2-N3	-2.38	118.45	122.33
85	33	55	PSU	C5'-C4'-C3'	-2.28	106.63	115.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	23	55	PSU	C5'-C4'-C3'	-2.28	106.64	115.18
85	23	58	1MA	C5-C6-N1	2.26	117.27	113.90
85	33	27	PSU	C5-C6-N1	-2.24	118.76	122.11
85	33	58	1MA	C5-C6-N1	2.23	117.22	113.90
85	33	55	PSU	C5-C6-N1	-2.23	118.77	122.11
85	23	27	PSU	C5-C6-N1	-2.23	118.77	122.11
85	33	54	2MU	O2-C2-N3	-2.21	117.38	121.50
85	23	54	2MU	O2-C2-N3	-2.21	117.38	121.50
85	23	55	PSU	C5-C6-N1	-2.21	118.80	122.11
85	33	47	H2U	C3'-C2'-C1'	2.19	105.59	101.43
85	23	47	H2U	C3'-C2'-C1'	2.17	105.55	101.43
85	33	49	5MC	C5-C4-N3	-2.16	119.34	121.67
85	23	49	5MC	C5-C4-N3	-2.15	119.36	121.67
85	23	46	7MG	C2-N1-C6	-2.13	121.21	125.10
85	23	47	H2U	C2'-C3'-C4'	2.13	106.77	102.64
85	33	46	7MG	C2-N1-C6	-2.12	121.24	125.10
85	33	39	PSU	C5-C6-N1	-2.11	118.94	122.11
85	33	47	H2U	C2'-C3'-C4'	2.10	106.73	102.64
85	23	39	PSU	C5-C6-N1	-2.08	118.99	122.11
85	23	48	5MC	C5'-C4'-C3'	-2.08	107.40	115.18
85	33	48	5MC	C5'-C4'-C3'	-2.07	107.42	115.18

There are no chirality outliers.

All (52) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
85	23	20	H2U	O4'-C4'-C5'-O5'
85	23	20	H2U	O4'-C1'-N1-C2
85	23	20	H2U	O4'-C1'-N1-C6
85	33	20	H2U	O4'-C4'-C5'-O5'
85	33	20	H2U	O4'-C1'-N1-C2
85	33	20	H2U	O4'-C1'-N1-C6
85	23	34	70U	C5M-C8-O9-C9
85	33	34	70U	C5M-C8-O9-C9
85	23	37	12A	OO-CC-N6-C6
85	23	37	12A	N-CC-N6-C6
85	23	37	12A	N6-CC-N-CA
85	33	37	12A	OO-CC-N6-C6
85	33	37	12A	N-CC-N6-C6
85	33	37	12A	N6-CC-N-CA
85	23	48	5MC	C3'-C4'-C5'-O5'
85	33	48	5MC	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
85	23	55	PSU	C2'-C1'-C5-C6
85	33	55	PSU	C2'-C1'-C5-C6
85	23	34	70U	O8-C8-O9-C9
85	33	34	70U	O8-C8-O9-C9
85	23	37	12A	OO-CC-N-CA
85	33	37	12A	OO-CC-N-CA
85	23	20	H2U	C3'-C4'-C5'-O5'
85	33	20	H2U	C3'-C4'-C5'-O5'
85	23	48	5MC	O4'-C4'-C5'-O5'
85	33	48	5MC	O4'-C4'-C5'-O5'
85	23	37	12A	C3'-C4'-C5'-O5'
85	33	37	12A	C3'-C4'-C5'-O5'
85	23	37	12A	C5-C6-N6-CC
85	33	37	12A	C5-C6-N6-CC
85	23	37	12A	O4'-C4'-C5'-O5'
85	33	37	12A	O4'-C4'-C5'-O5'
85	23	20	H2U	C4'-C5'-O5'-P
85	33	20	H2U	C4'-C5'-O5'-P
85	23	47	H2U	C3'-C4'-C5'-O5'
85	33	47	H2U	C3'-C4'-C5'-O5'
85	23	34	70U	C4'-C5'-O5'-P
85	33	34	70U	C4'-C5'-O5'-P
85	23	54	2MU	C3'-C2'-O2'-C6'
85	33	54	2MU	C3'-C2'-O2'-C6'
85	33	49	5MC	O4'-C4'-C5'-O5'
85	23	49	5MC	O4'-C4'-C5'-O5'
85	23	34	70U	C3'-C4'-C5'-O5'
85	33	34	70U	C3'-C4'-C5'-O5'
85	23	47	H2U	O4'-C4'-C5'-O5'
85	33	47	H2U	O4'-C4'-C5'-O5'
85	23	37	12A	C-CA-N-CC
85	33	37	12A	C-CA-N-CC
85	23	55	PSU	O4'-C1'-C5-C6
85	33	55	PSU	O4'-C1'-C5-C6
85	23	46	7MG	C4'-C5'-O5'-P
85	33	46	7MG	C4'-C5'-O5'-P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 285 ligands modelled in this entry, 283 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
88	SPD	54	5284	-	9,9,9	0.33	0	8,8,8	0.52	0
88	SPD	54	5283	-	9,9,9	0.32	0	8,8,8	0.41	0

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
88	SPD	54	5284	-	-	6/7/7/7	-
88	SPD	54	5283	-	-	6/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
88	54	5284	SPD	C8-C7-N6-C5
88	54	5283	SPD	C3-C4-C5-N6
88	54	5283	SPD	C8-C7-N6-C5
88	54	5284	SPD	C3-C4-C5-N6
88	54	5283	SPD	C7-C8-C9-N10
88	54	5283	SPD	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
88	54	5284	SPD	C2-C3-C4-C5
88	54	5284	SPD	C4-C5-N6-C7
88	54	5284	SPD	N6-C7-C8-C9
88	54	5283	SPD	N1-C2-C3-C4
88	54	5284	SPD	C7-C8-C9-N10
88	54	5283	SPD	C4-C5-N6-C7

There are no ring outliers.

No monomer is involved in short contacts.

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
80	54	32
1	A1	7

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	54	2113:G	O3'	2258:C	P	42.26
1	54	1252:C	O3'	1271:G	P	35.14
1	54	1219:G	O3'	1233:G	P	20.13
1	54	523:C	O3'	638:G	P	18.09
1	54	1406(C):G	O3'	1411:C	P	17.23
1	54	4138:C	O3'	4146:G	P	17.14
1	54	3977:C	O3'	4034:G	P	17.10
1	54	990:C	O3'	1064:G	P	17.04
1	54	4777:C	O3'	4859:C	P	15.69
1	54	1696:C	O3'	1720:C	P	15.53
1	54	760:G	O3'	904:C	P	15.38
1	54	182:G	O3'	189:G	P	14.79
1	54	5022:U	O3'	5028:G	P	14.76
1	54	4101:C	O3'	4107:G	P	13.82
1	54	1364:U	O3'	1368:A	P	13.78

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	54	2901:G	O3'	3597:G	P	12.28
1	54	1180:C	O3'	1183:C	P	10.19
1	54	512:U	O3'	515:C	P	10.11
1	54	4729:A	O3'	4735:G	P	8.47
1	54	500:G	O3'	504:G	P	6.70
1	A1	689:U	O3'	690:G	P	6.53
1	54	4064:C	O3'	4065:G	P	6.26
1	A1	322:C	O3'	323:C	P	6.07
1	54	4740:G	O3'	4743:G	P	5.77
1	54	1956:A	O3'	1957:U	P	5.11
1	A1	798:G	O3'	799:U	P	4.57
1	54	3948:C	O3'	3949:A	P	4.51
1	54	1100:U	O3'	1168:G	P	4.36
1	A1	902:G	O3'	903:A	P	4.19
1	A1	304:C	O3'	305:U	P	4.03
1	54	1239:C	O3'	1244:G	P	3.87
1	54	5020:G	O3'	5021:C	P	3.59
1	54	1957:U	O3'	1958:A	P	3.48
1	54	170:C	O3'	171:U	P	3.39
1	54	1438:U	O3'	1440:U	P	3.39
1	A1	903:A	O3'	904:A	P	3.29
1	A1	886:A	O3'	887:U	P	3.27
1	54	751:G	O3'	752:G	P	3.27
1	54	4899:G	O3'	4902:C	P	3.13

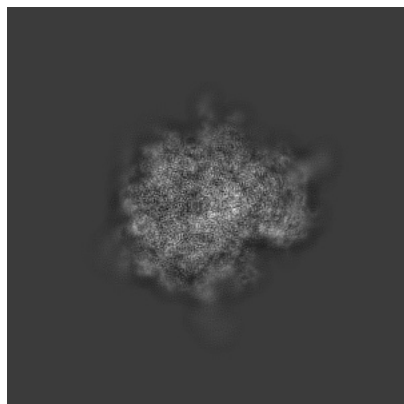
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10181. These allow visual inspection of the internal detail of the map and identification of artifacts.

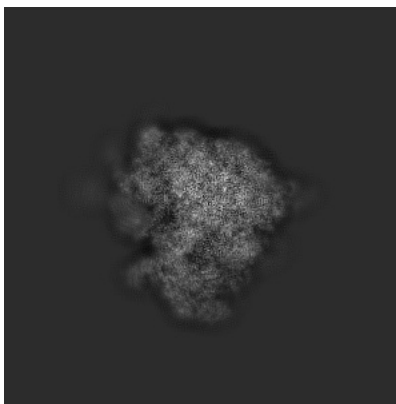
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

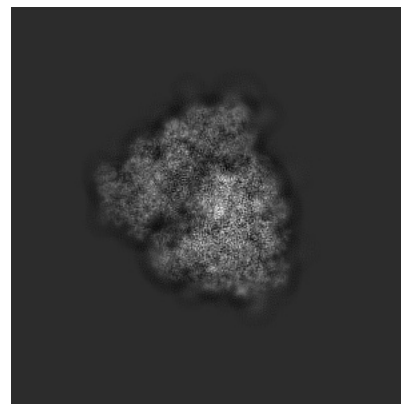
6.1.1 Primary map



X

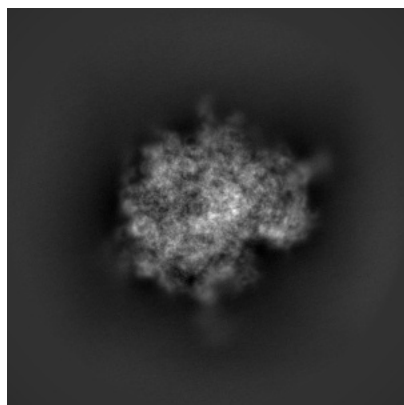


Y

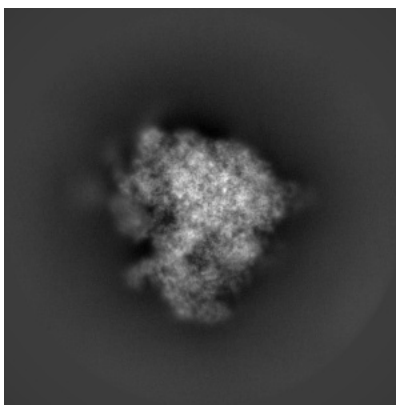


Z

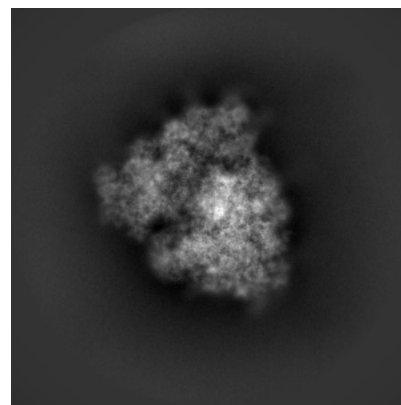
6.1.2 Raw map



X



Y

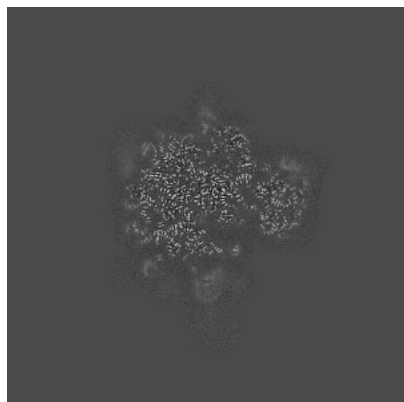


Z

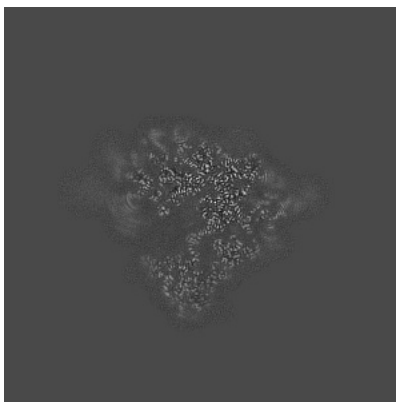
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

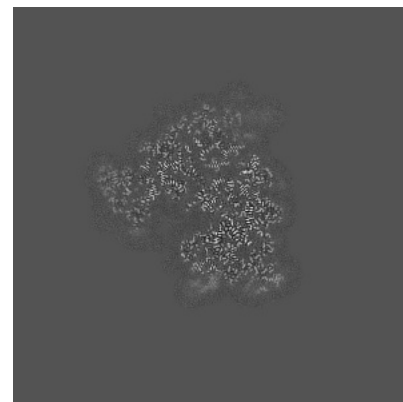
6.2.1 Primary map



X Index: 256

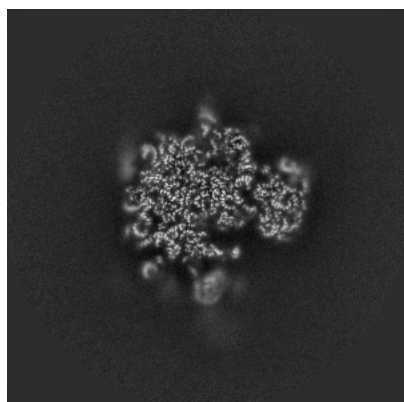


Y Index: 256

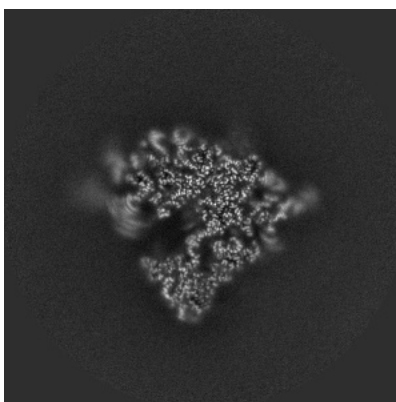


Z Index: 256

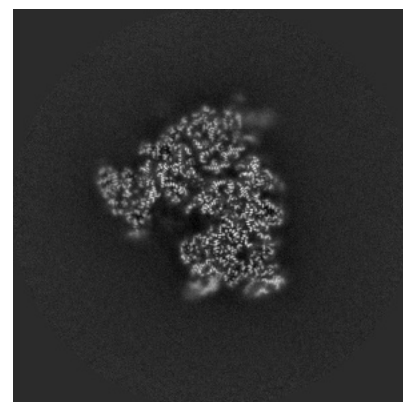
6.2.2 Raw map



X Index: 256



Y Index: 256

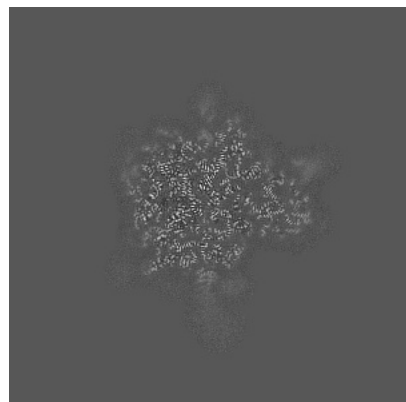


Z Index: 256

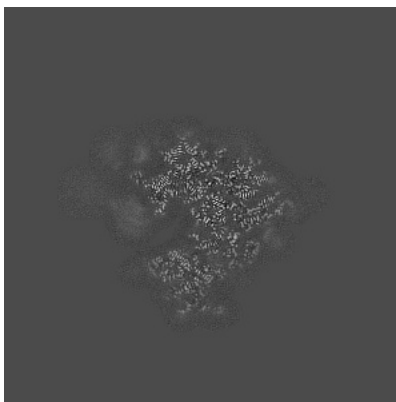
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

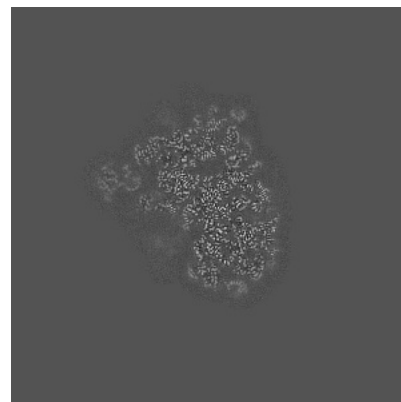
6.3.1 Primary map



X Index: 269

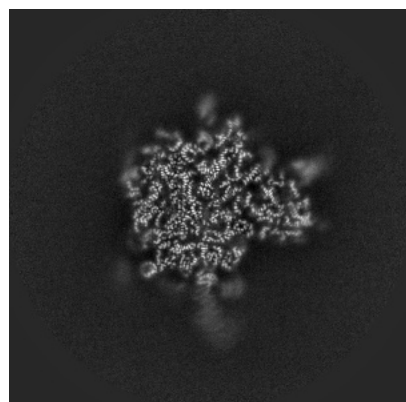


Y Index: 267

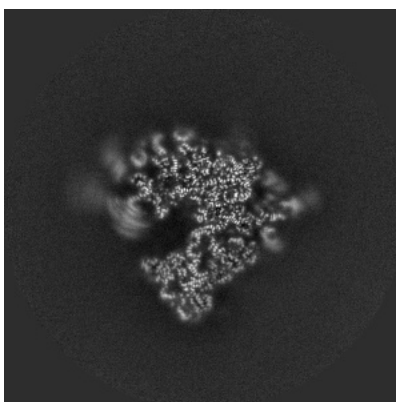


Z Index: 278

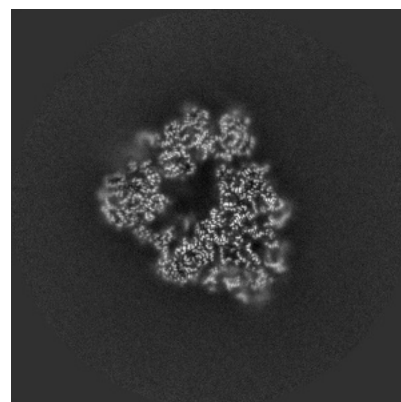
6.3.2 Raw map



X Index: 270



Y Index: 260

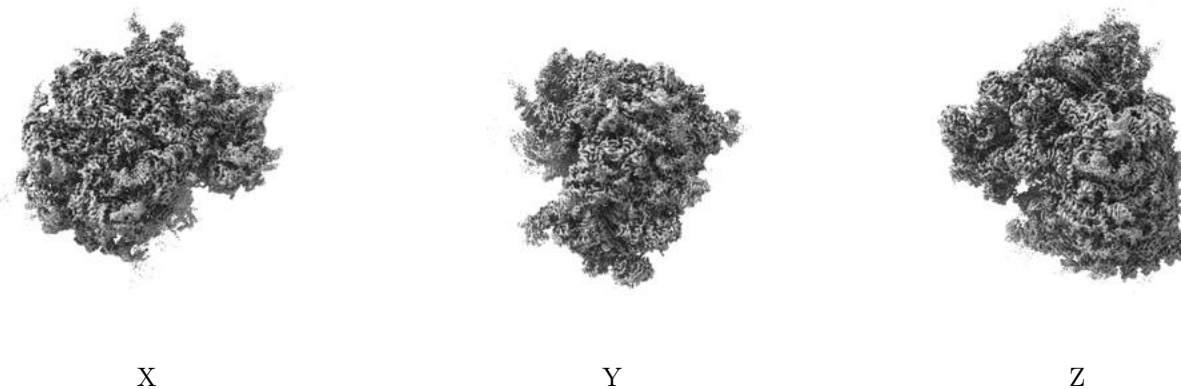


Z Index: 225

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



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

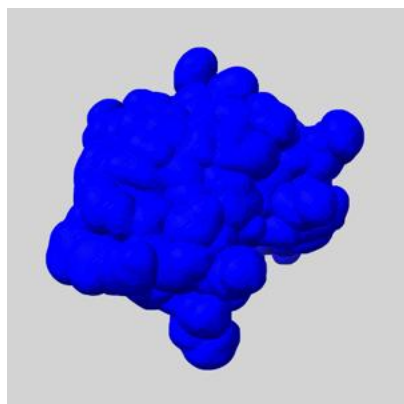
6.5 Mask visualisation [i](#)

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

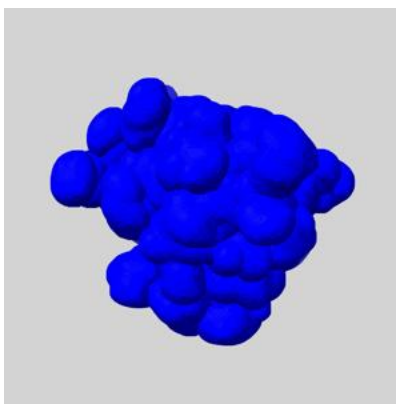
A mask typically either:

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

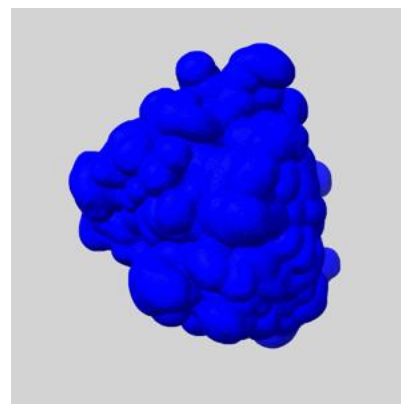
6.5.1 emd_10181_msk_1.map [i](#)



X



Y

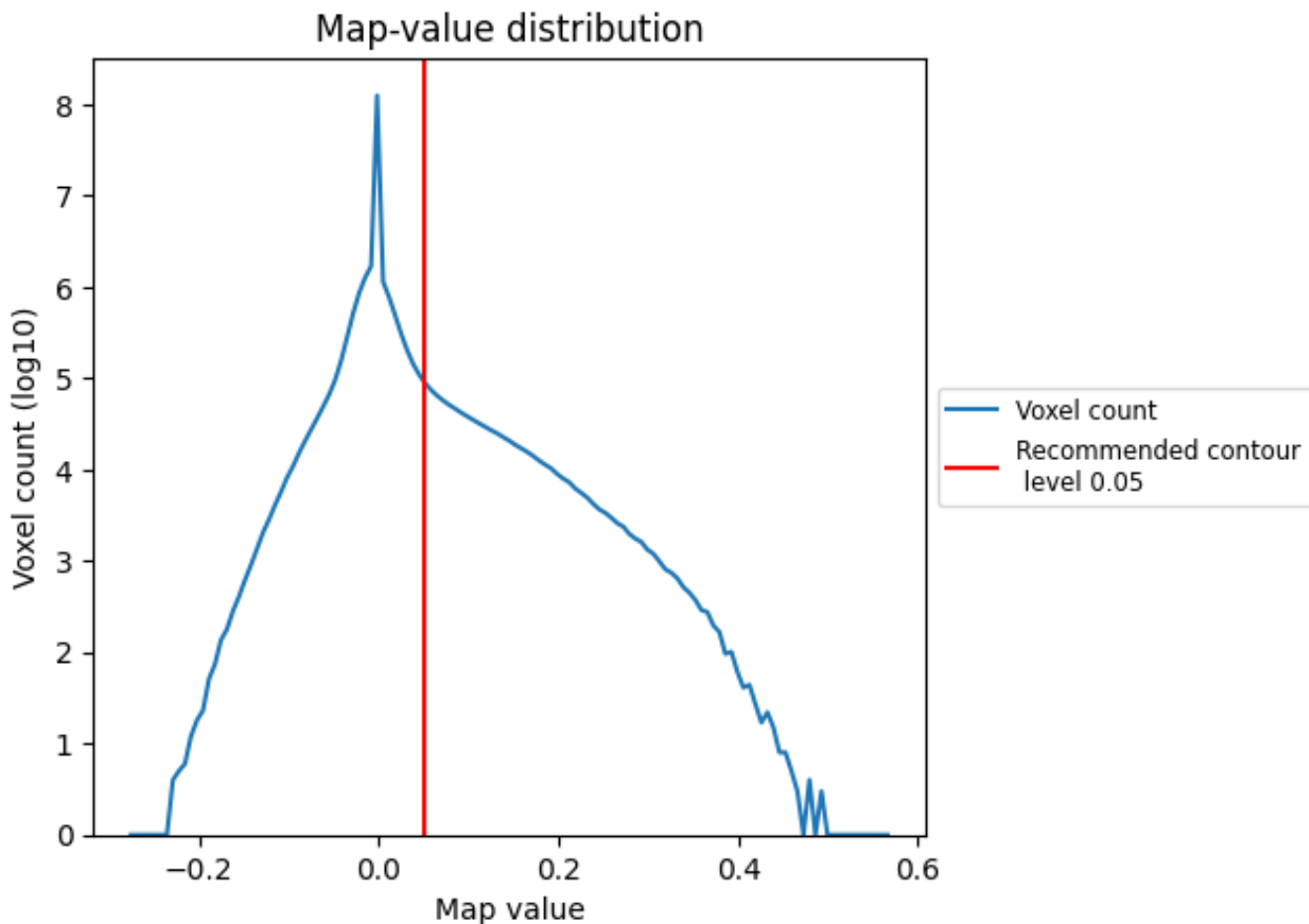


Z

7 Map analysis [i](#)

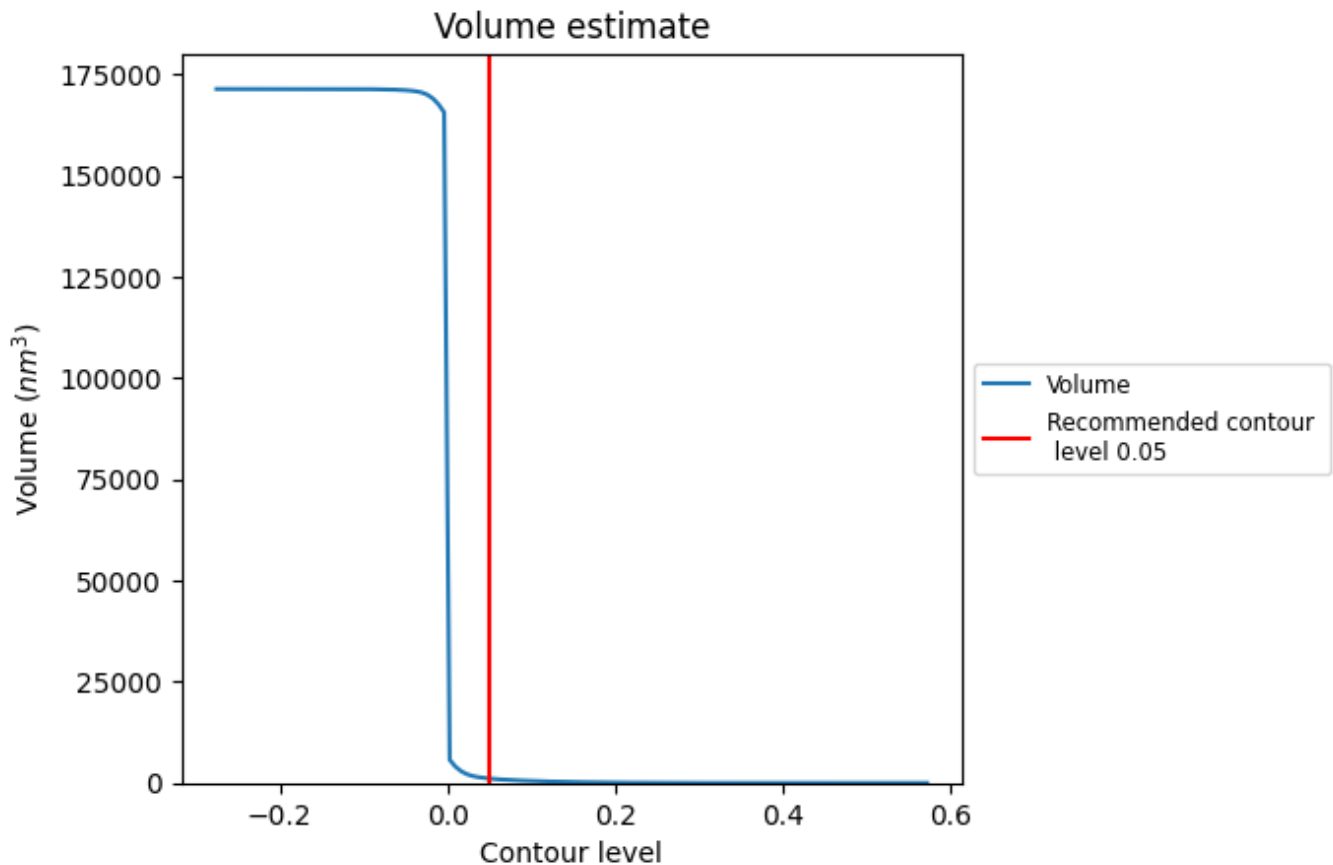
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

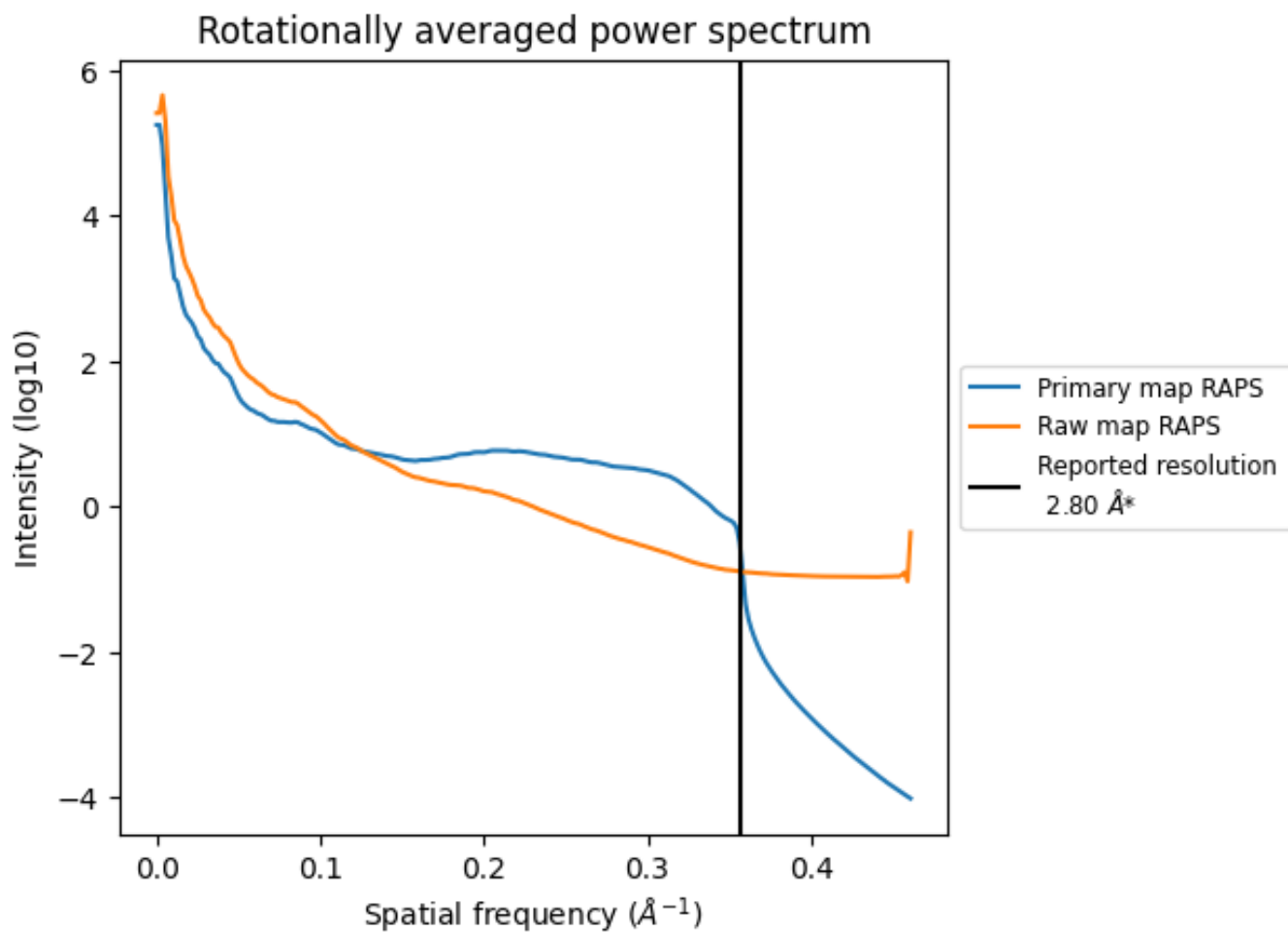
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1093 nm³; this corresponds to an approximate mass of 988 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

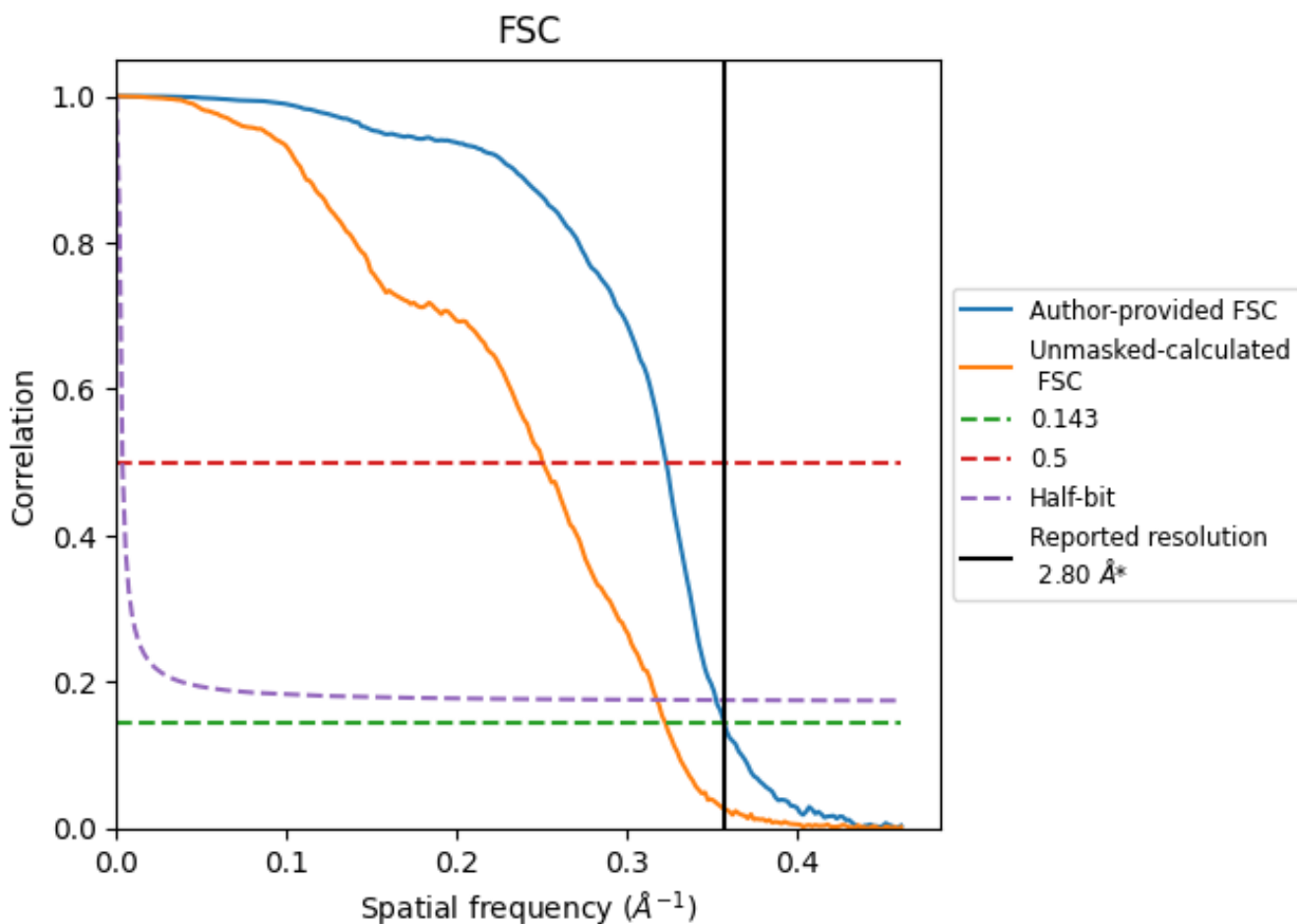


*Reported resolution corresponds to spatial frequency of 0.357 \AA^{-1}

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 0.357 Å⁻¹

8.2 Resolution estimates [i](#)

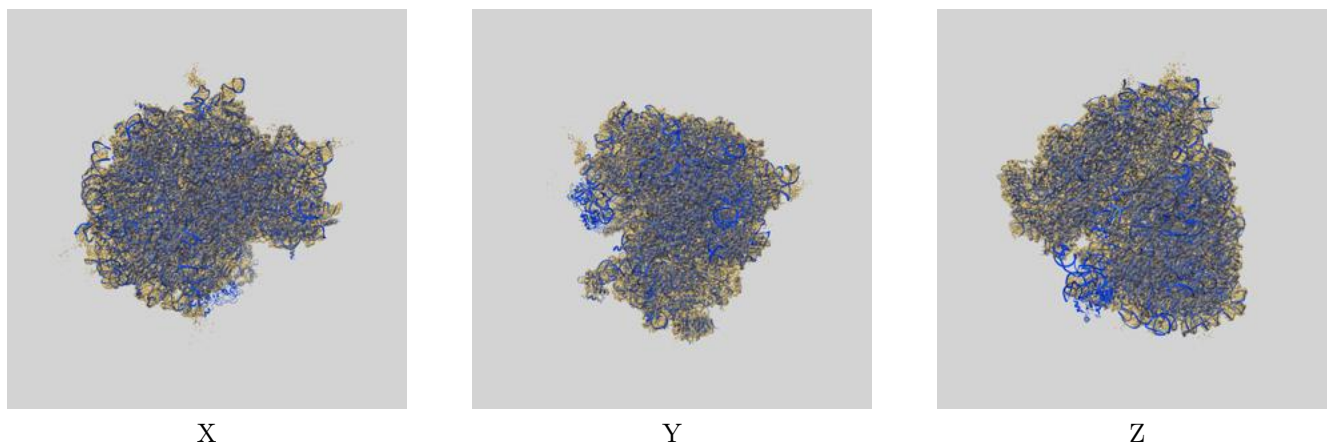
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	2.80	3.10	2.84
Unmasked-calculated*	3.10	4.00	3.15

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.10 differs from the reported value 2.8 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-10181 and PDB model 6SGC. Per-residue inclusion information can be found in section 3 on page 23.

9.1 Map-model overlay [i](#)

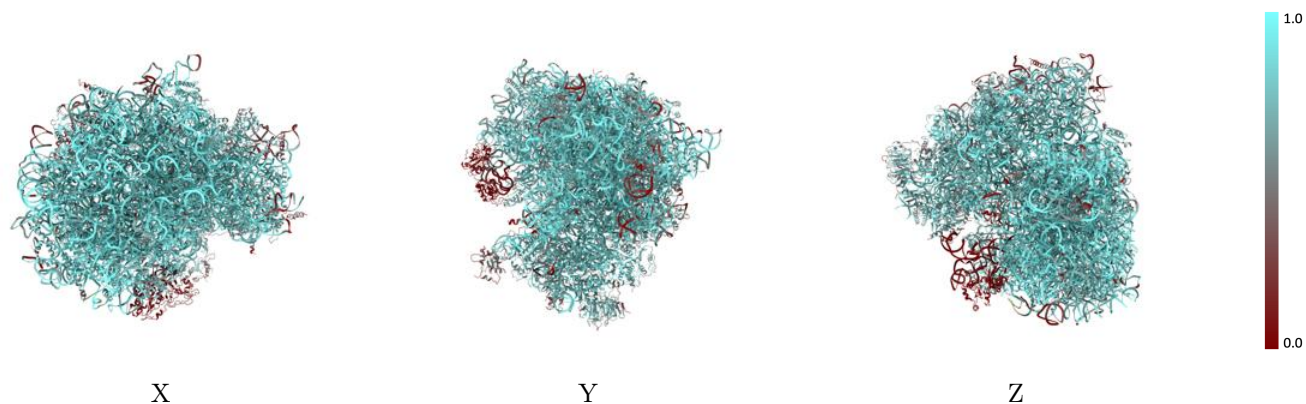


The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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

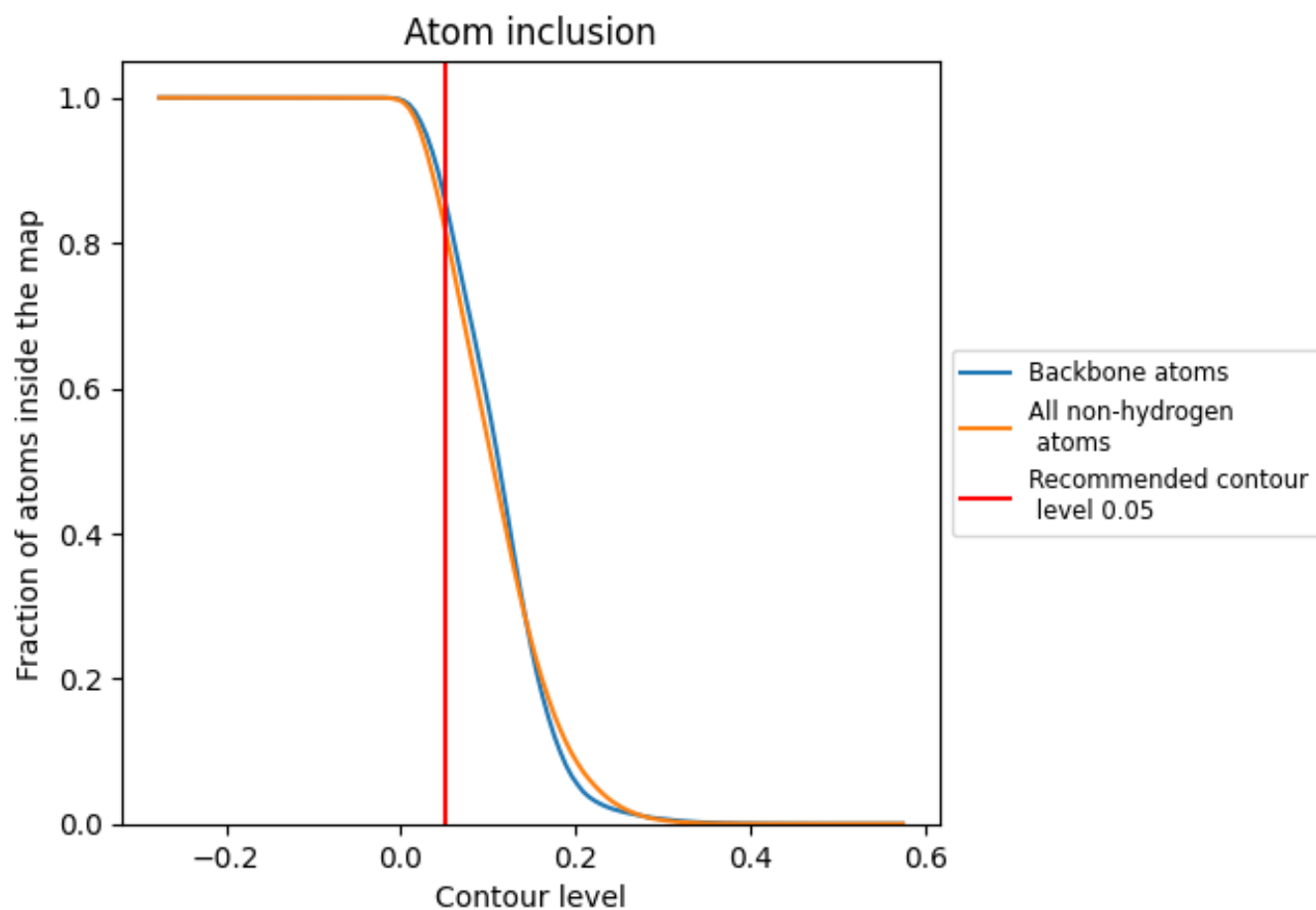
This section was not generated.

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 (0.05).




































9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 82% 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 (0.05) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	 0.8214
23	 0.6681
33	 0.0043
54	 0.8842
74	 0.9803
84	 0.9256
A1	 0.8889
A2	 0.9085
B	 0.0031
B1	 0.7993
B2	 0.8670
C1	 0.7699
C2	 0.8682
D1	 0.8094
D2	 0.8443
E1	 0.6429
E2	 0.8273
F1	 0.7714
F2	 0.8864
G1	 0.7193
G2	 0.7627
H1	 0.6571
H2	 0.8065
I1	 0.6639
I2	 0.8341
J1	 0.7744
J2	 0.7661
K1	 0.7747
L1	 0.6835
L2	 0.8164
M1	 0.8184
M2	 0.8435
N1	 0.3266
N2	 0.9167
O1	 0.8250













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Chain	Atom inclusion
O2	 0.8865
P1	 0.7994
P2	 0.8832
Q1	 0.6680
Q2	 0.8704
R1	 0.7418
R2	 0.8126
S1	 0.6927
S2	 0.8814
T1	 0.7004
T2	 0.8155
U1	 0.7470
U2	 0.6903
V1	 0.6214
V2	 0.8127
W1	 0.7701
W2	 0.6931
X1	 0.8495
X2	 0.8160
XX	 0.0900
Y1	 0.8049
Y2	 0.8423
Z1	 0.7329
Z2	 0.8378
a1	 0.6741
a2	 0.9035
b1	 0.7903
b2	 0.7031
c1	 0.7167
c2	 0.8347
d1	 0.6553
d2	 0.8086
e1	 0.8326
e2	 0.8743
f1	 0.6091
f2	 0.9002
g1	 0.4011
g2	 0.8335
h1	 0.6131
h2	 0.8161
i1	 0.7318
i2	 0.7915

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Chain	Atom inclusion
j2	 0.8963
k2	 0.7271
l2	 0.8407
m2	 0.8510
n2	 0.8165
o2	 0.8354
p2	 0.8157
r2	 0.8746
s2	 0.0465
t2	 0.0132