



## Full wwPDB EM Validation Report ⓘ

Aug 19, 2024 – 01:13 pm BST

PDB ID : 8Q87  
EMDB ID : EMD-18169  
Title : Structure of the *G. gallus* 80S rotated ribosome in complex with eEF2 and SERBP1  
Authors : Nurullina, L.; Jenner, L.; Yusupov, M.  
Deposited on : 2023-08-18  
Resolution : 2.40 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

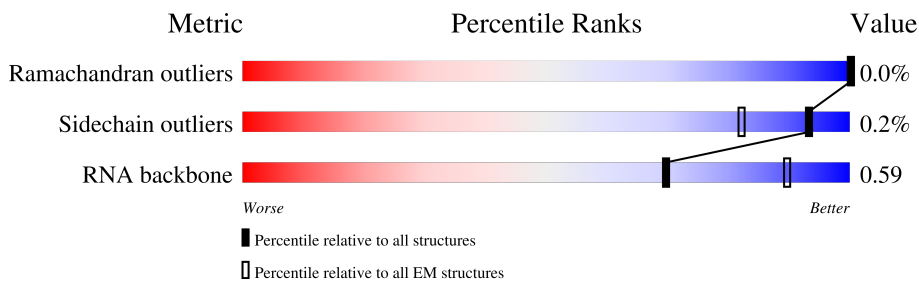
EMDB validation analysis : 0.0.1.dev92  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 2.40 Å.

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



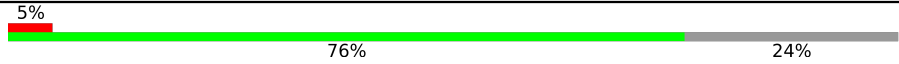
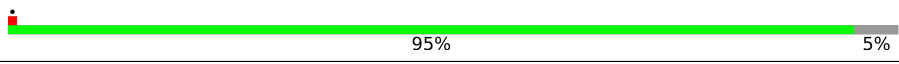
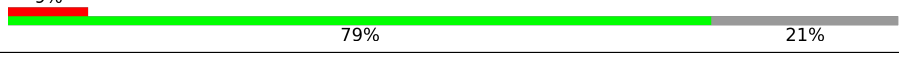
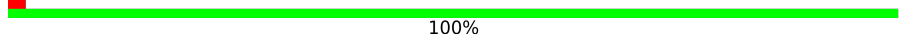
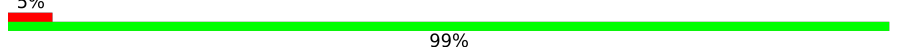
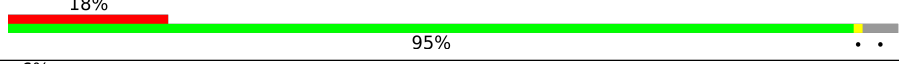
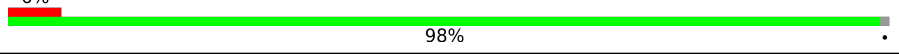
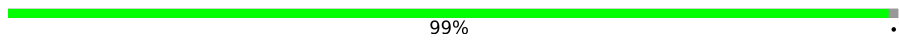
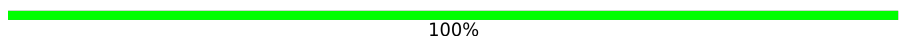
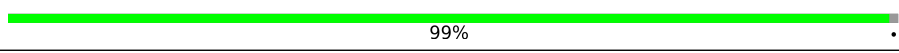

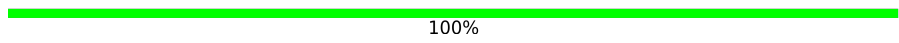
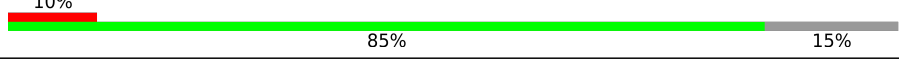
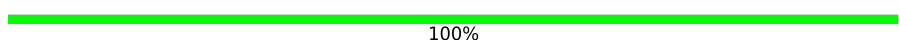
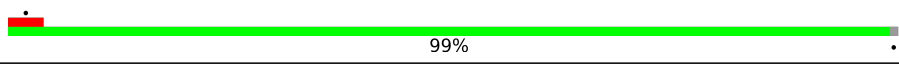

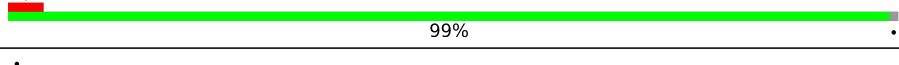


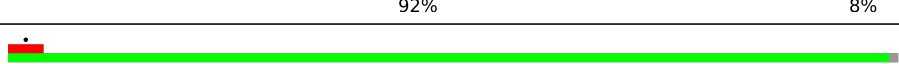
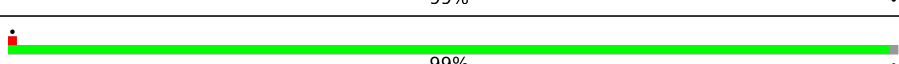
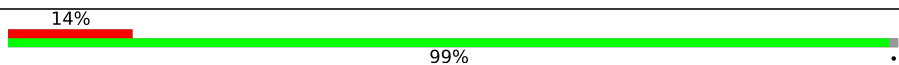



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	B5	4441	
2	B8	157	
3	B7	119	
4	Az	25	
5	BA	257	
6	BB	403	
7	BC	421	
8	BD	297	

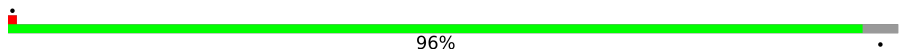
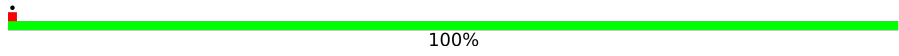
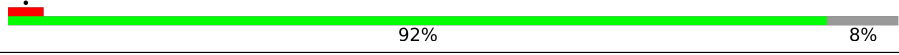
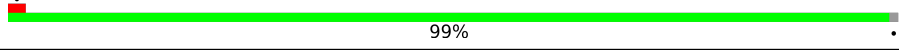
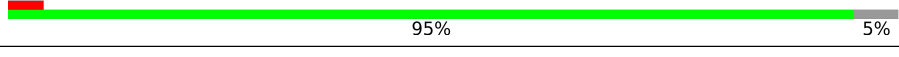
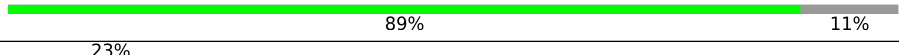
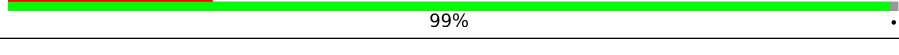
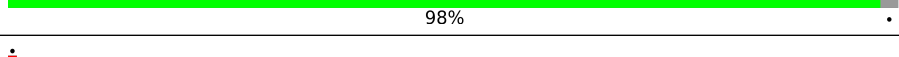
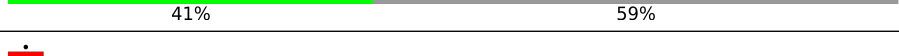
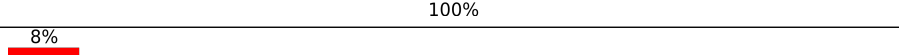
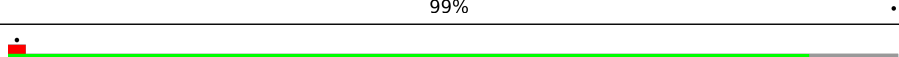
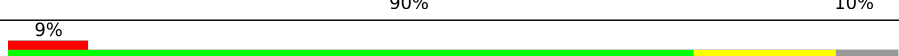

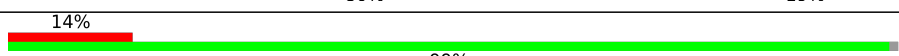
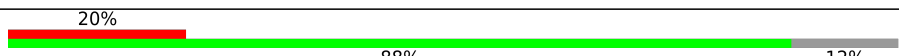
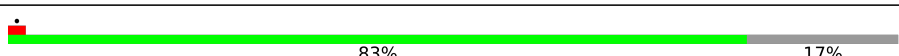
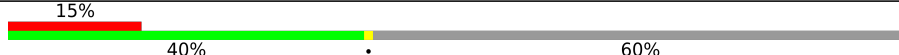
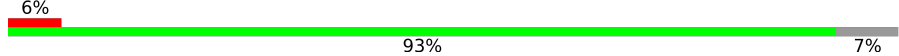
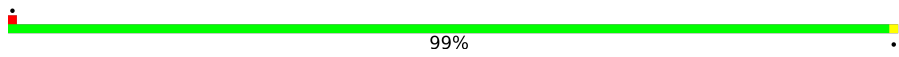


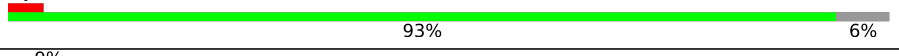
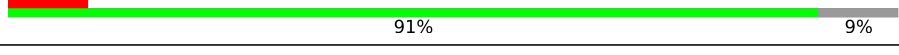
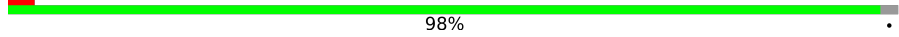

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Mol	Chain	Length	Quality of chain
9	BE	298	 5% 76% 24%
10	BF	246	 5% 95% 5%
11	BG	266	 9% 79% 21%
12	BH	192	 100%
13	BI	214	 5% 99%
14	BJ	178	 18% 95%
15	BL	211	 6% 98%
16	BM	131	 99%
17	BN	204	 100%
18	BO	203	 99%
19	BP	184	 84% 16%
20	BQ	187	 100%
21	BR	196	 10% 85% 15%
22	BS	176	 100%
23	BT	160	 99%
24	BU	128	 19% 78% 22%
25	BV	140	 99%
26	BW	157	 39% 61%
27	BX	155	 77% 23%
28	BY	145	 92% 8%
29	BZ	136	 99%
30	Ba	148	 99%
31	Bb	71	 14% 99%
32	Bc	115	 7% 83% 17%
33	Bd	176	 5% 60% 40%

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Mol	Chain	Length	Quality of chain
34	Be	135	 96%
35	Bf	110	 100%
36	Bg	117	 92% 8%
37	Bh	123	 99%
38	Bi	105	 95% 5%
39	Bj	97	 89% 11%
40	Bk	70	 23% 99%
41	Bl	51	 98%
42	Bm	128	 41% 59%
43	Bo	105	 100%
44	Bp	92	 8% 99%
45	Br	138	 90% 10%
46	A2	1823	 9% 77% 16% 7%
47	Aa	264	 9% 80% 19%
48	AA	84	 14% 99%
49	AB	69	 20% 88% 12%
50	Ab	264	 83% 17%
51	AC	156	 15% 40% 60%
52	Ac	243	 6% 93% 7%
53	Ad	263	 99%
54	AD	133	 10% 43% 57%
55	AE	115	 8% 86% 14%
56	Ae	204	 93% 6%
57	Af	249	 9% 91% 9%
58	AF	317	 98%

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Mol	Chain	Length	Quality of chain
59	Ag	194	21% 96%
60	AG	171	32% 68%
61	Ah	207	9% 98%
62	Ai	194	92% 8%
63	Aj	165	58% 42%
64	Ak	158	10% 94% 5%
65	Al	132	30% 83% 16%
66	Am	151	6% 99%
67	An	151	11% 89% 10%
68	Ao	145	8% 88% 12%
69	Aq	135	17% 95%
70	Ar	152	95% 5%
71	As	145	98%
72	At	119	87% 13%
73	Au	83	99%
74	Av	130	99%
75	Aw	143	99%
76	Ax	131	95% 5%
77	Ay	125	55% 44%
78	AZ	296	70% 30%
79	Ap	146	97%
80	V	76	17% 80% 20%
81	S	404	10% 90%
82	A	858	32% 100%
83	Bs	316	58% 63% 37%

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Mol	Chain	Length	Quality of chain
84	Bt	165	 91% 8%
85	Bv	217	 99% 98%

## 2 Entry composition [i](#)

There are 89 unique types of molecules in this entry. The entry contains 228127 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 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	B5	3638	78070	34789	14272	25371	3638	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B5	3295	UY1	U	conflict	GB KT445934.2

- Molecule 2 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B8	157	3338	1490	588	1103	157	0	0

- Molecule 3 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	B7	119	2536	1130	449	838	119	0	0

- Molecule 4 is a protein called 60S ribosomal protein L41.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	BA	246	1887	1185	385	311	6	0	0

- Molecule 6 is a protein called Ribosomal protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	BB	398	3209	2042	603	550	14	0	0

- Molecule 7 is a protein called 60S ribosomal protein L4 C-terminal domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	BC	361	2888	1816	574	484	14	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	BD	296	2388	1506	437	433	12	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	BE	225	1820	1167	355	296	2	0	0

- Molecule 10 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	BF	234	1939	1245	377	309	8	0	0

- Molecule 11 is a protein called Large ribosomal subunit protein eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	BG	210	1704	1089	326	284	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	BH	192	1533	962	288	277	6	0	0

- Molecule 13 is a protein called Ribosomal protein uL16, Large ribosomal subunit protein uL16, Large ribosomal subunit protein uL16.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	BI	213	1710	1082	334	279	15	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	BJ	170	1362	861	255	241	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	BL	208	1691	1060	350	276	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	BM	130	1077	688	209	172	8	0	0

- Molecule 17 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	BN	203	1700	1071	359	266	4	0	0

- Molecule 18 is a protein called Ribosomal protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	BO	201	1642	1058	321	258	5	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	BP	155	1259	788	244	218	9	0	0

- Molecule 20 is a protein called Ribosomal protein eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	BQ	187	Total	C	N	O	S	0	0
			1502	939	314	244	5		

- Molecule 21 is a protein called Ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	BR	166	Total	C	N	O	S	0	0
			1378	856	295	217	10		

- Molecule 22 is a protein called Ribosomal protein eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	BS	176	Total	C	N	O	S	0	0
			1463	931	286	235	11		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
23	BT	159	Total	C	N	O	S	0	0
			1299	825	252	216	6		

- Molecule 24 is a protein called Large ribosomal subunit protein eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	BU	100	Total	C	N	O	S	0	0
			817	523	143	149	2		

- Molecule 25 is a protein called Ribosomal protei uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	BV	139	Total	C	N	O	S	0	0
			1033	648	199	181	5		

- Molecule 26 is a protein called Ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	BW	62	Total	C	N	O	S	0	0
			519	332	101	83	3		

- Molecule 27 is a protein called Ribosomal protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	BX	119	976	624	183	168	1	0	0

- Molecule 28 is a protein called Ribosomal protein L26 like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	BY	133	1106	694	224	185	3	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein eL27.

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

- Molecule 30 is a protein called Ribosomal protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	Ba	147	1179	748	240	187	4	0	0

- Molecule 31 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	Bb	70	582	360	126	94	2	0	0

- Molecule 32 is a protein called Large ribosomal subunit protein eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	Bc	95	738	468	131	133	6	0	0

- Molecule 33 is a protein called 60S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	Bd	105	867	549	168	148	2	0	0

- Molecule 34 is a protein called Ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	Be	130	1074	681	219	169	5	0	0

- Molecule 35 is a protein called Ribosomal protein eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	Bf	110	886	559	178	144	5	0	0

- Molecule 36 is a protein called 60S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Bg	108	860	540	178	137	5	0	0

- Molecule 37 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	Bh	122	1023	646	208	168	1	1	0

- Molecule 38 is a protein called Large ribosomal subunit protein eL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	Bi	100	821	515	173	127	6	0	0

- Molecule 39 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	Bj	86	704	432	155	112	5	0	0

- Molecule 40 is a protein called 60S ribosomal protein L38.

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

- Molecule 41 is a protein called Large ribosomal subunit protein eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	Bl	50	Total	C	N	O	S	0	0
			442	281	96	64	1		

- Molecule 42 is a protein called Ubiquitin-60S ribosomal protein L40.

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

- Molecule 43 is a protein called Ribosomal protein L36a like.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Bo	105	Total	C	N	O	S	0	0
			861	540	177	138	6		

- Molecule 44 is a protein called Large ribosomal subunit protein eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Bp	91	Total	C	N	O	S	0	0
			706	445	134	120	7		

- Molecule 45 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Br	124	Total	C	N	O	S	0	0
			1007	624	213	167	3		

- Molecule 46 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	A2	1697	Total	C	N	O	P	0	0
			36242	16199	6484	11862	1697		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A2	1206	B8N	U	conflict	GB KT445934.2
A2	1295	4AC	C	conflict	GB KT445934.2
A2	1796	4AC	C	conflict	GB KT445934.2

- Molecule 47 is a protein called Ribosomal protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	Aa	213	1730	1098	309	309	14	0	0

- Molecule 48 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	AA	83	657	410	125	115	7	0	0

- Molecule 49 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	AB	61	476	290	93	91	2	0	0

- Molecule 50 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	Ab	219	1698	1099	291	299	9	0	0

- Molecule 51 is a protein called Ubiquitin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	AC	63	516	325	98	86	7	0	0

- Molecule 52 is a protein called DNA-(apurinic or apyrimidinic site) lyase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	Ac	225	1752	1117	315	313	7	0	0

- Molecule 53 is a protein called Small ribosomal subunit protein eS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	Ad	262	2076	1324	387	357	8	0	0

- Molecule 54 is a protein called Ribosomal protein eS30.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	AD	57	Total	C	N	O	S	0	0
			452	279	99	73	1		

- Molecule 55 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	AE	99	Total	C	N	O	S	0	0
			793	492	165	131	5		

- Molecule 56 is a protein called Ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	Ae	191	Total	C	N	O	S	0	0
			1508	943	286	272	7		

- Molecule 57 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	Af	227	Total	C	N	O	S	0	0
			1838	1144	367	320	7		

- Molecule 58 is a protein called Small ribosomal subunit protein RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	AF	311	Total	C	N	O	S	0	0
			2420	1526	422	460	12		

- Molecule 59 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	Ag	187	Total	C	N	O	S	0	0
			1500	956	276	267	1		

- Molecule 60 is a protein called 40S ribosomal protein S29.

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

- Molecule 61 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	Ah	203	1669	1050	328	286	5	1	0

- Molecule 62 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	Ai	179	1495	953	299	241	2	0	0

- Molecule 63 is a protein called Ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	Aj	96	812	532	143	131	6	0	0

- Molecule 64 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	Ak	150	1218	773	229	210	6	0	0

- Molecule 65 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	Al	111	860	540	151	161	8	0	0

- Molecule 66 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	Am	150	1208	773	229	205	1	0	0

- Molecule 67 is a protein called Ribosomal protein S14.

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

There is a discrepancy between the modelled and reference sequences:



Chain	Residue	Modelled	Actual	Comment	Reference
An	138	IAS	ASP	conflict	UNP Q5ZHW8

- Molecule 68 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	Ao	128	1050	666	198	179	7	0	0

- Molecule 69 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	Aq	133	1073	673	200	196	4	0	0

- Molecule 70 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	Ar	144	1191	748	241	201	1	0	0

- Molecule 71 is a protein called Ribosomal protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	As	143	1115	698	216	199	2	0	0

- Molecule 72 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
72	At	103	815	511	154	146	4	0	0

- Molecule 73 is a protein called Ribosomal protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
73	Au	83	640	394	118	124	4	0	0

- Molecule 74 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	Av	129	Total	C	N	O	S	0	0
			1035	659	193	177	6		

- Molecule 75 is a protein called Ribosomal protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	Aw	142	Total	C	N	O	S	0	0
			1104	696	220	185	3		

- Molecule 76 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Ax	125	Total	C	N	O	S	0	0
			1015	642	199	169	5		

- Molecule 77 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	Ay	70	Total	C	N	O	S	0	0
			555	357	101	96	1		

- Molecule 78 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	AZ	206	Total	C	N	O	S	0	0
			1626	1036	287	295	8		

- Molecule 79 is a protein called Ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Ap	141	Total	C	N	O	S	0	0
			1123	715	212	193	3		

- Molecule 80 is a RNA chain called Phe tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	V	76	Total	C	N	O	P	0	0
			1628	727	302	524	75		

- Molecule 81 is a protein called SERPINE1 mRNA binding protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
81	S	42	Total	C	N	O	0	0
			325	190	69	66		

- Molecule 82 is a protein called Elongation factor 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	A	857	Total	C	N	O	S	0	0
			6690	4244	1151	1249	46		

- Molecule 83 is a protein called Large ribosomal subunit protein uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	Bs	199	Total	C	N	O	S	0	0
			1527	972	266	279	10		

- Molecule 84 is a protein called 60S ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
84	Bt	152	Total	C	N	O	S	0	0
			1135	704	210	217	4		

- Molecule 85 is a protein called Ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
85	Bv	215	Total	C	N	O	S	0	0
			1722	1107	303	305	7		

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

Mol	Chain	Residues	Atoms		AltConf
86	B5	337	Total	Mg	0
			337	337	
86	B8	8	Total	Mg	0
			8	8	
86	B7	6	Total	Mg	0
			6	6	
86	BA	3	Total	Mg	0
			3	3	
86	BB	1	Total	Mg	0
			1	1	
86	BH	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
86	BI	1	Total 1	Mg 1	0
86	BN	2	Total 2	Mg 2	0
86	BP	2	Total 2	Mg 2	0
86	BV	1	Total 1	Mg 1	0
86	Ba	1	Total 1	Mg 1	0
86	Bb	2	Total 2	Mg 2	0
86	Be	2	Total 2	Mg 2	0
86	Bf	1	Total 1	Mg 1	0
86	Bg	1	Total 1	Mg 1	0
86	Bo	1	Total 1	Mg 1	0
86	A2	116	Total 116	Mg 116	0
86	AG	1	Total 1	Mg 1	0
86	Ak	1	Total 1	Mg 1	0
86	An	1	Total 1	Mg 1	0
86	As	1	Total 1	Mg 1	0
86	At	1	Total 1	Mg 1	0
86	A	1	Total 1	Mg 1	0

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

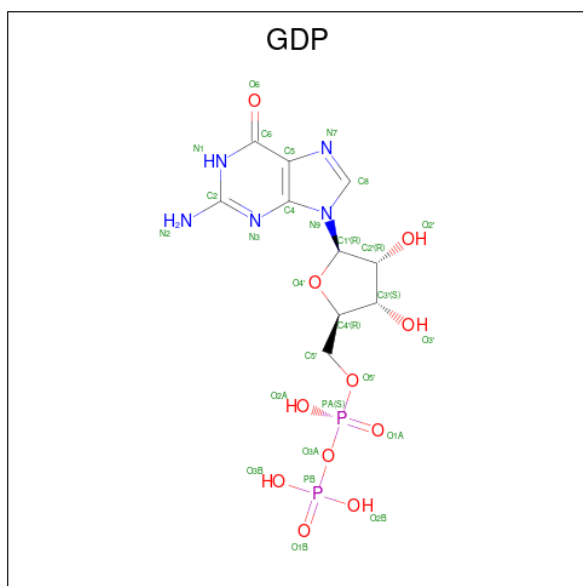
Mol	Chain	Residues	Atoms		AltConf
87	Bg	1	Total 1	Zn 1	0
87	Bj	1	Total 1	Zn 1	0

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Mol	Chain	Residues	Atoms		AltConf
87	Bm	1	Total	Zn	0
			1	1	
87	Bo	1	Total	Zn	0
			1	1	
87	Bp	1	Total	Zn	0
			1	1	
87	AC	1	Total	Zn	0
			1	1	
87	AE	1	Total	Zn	0
			1	1	
87	AG	1	Total	Zn	0
			1	1	

- Molecule 88 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula:  $C_{10}H_{15}N_5O_{11}P_2$ ).



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

- Molecule 89 is water.

Mol	Chain	Residues	Atoms		AltConf
89	B5	2982	Total	O	0
			2982	2982	
89	B8	81	Total	O	0
			81	81	

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Mol	Chain	Residues	Atoms		AltConf
89	B7	69	Total 69	O 69	0
89	Az	1	Total 1	O 1	0
89	BA	18	Total 18	O 18	0
89	BB	21	Total 21	O 21	0
89	BC	30	Total 30	O 30	0
89	BD	25	Total 25	O 25	0
89	BE	10	Total 10	O 10	0
89	BF	9	Total 9	O 9	0
89	BG	1	Total 1	O 1	0
89	BH	11	Total 11	O 11	0
89	BI	21	Total 21	O 21	0
89	BL	24	Total 24	O 24	0
89	BM	10	Total 10	O 10	0
89	BN	32	Total 32	O 32	0
89	BO	24	Total 24	O 24	0
89	BP	22	Total 22	O 22	0
89	BQ	28	Total 28	O 28	0
89	BR	8	Total 8	O 8	0
89	BS	14	Total 14	O 14	0
89	BT	16	Total 16	O 16	0
89	BV	7	Total 7	O 7	0

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Mol	Chain	Residues	Atoms		AltConf
89	BW	3	Total 3	O 3	0
89	BX	6	Total 6	O 6	0
89	BY	10	Total 10	O 10	0
89	Ba	25	Total 25	O 25	0
89	Bb	7	Total 7	O 7	0
89	Bc	1	Total 1	O 1	0
89	Bd	5	Total 5	O 5	0
89	Be	29	Total 29	O 29	0
89	Bf	24	Total 24	O 24	0
89	Bg	14	Total 14	O 14	0
89	Bh	7	Total 7	O 7	0
89	Bi	12	Total 12	O 12	0
89	Bj	9	Total 9	O 9	0
89	Bl	4	Total 4	O 4	0
89	Bm	12	Total 12	O 12	0
89	Bo	15	Total 15	O 15	0
89	Bp	9	Total 9	O 9	0
89	Br	7	Total 7	O 7	0
89	A2	197	Total 197	O 197	0
89	Ab	8	Total 8	O 8	0
89	Ad	1	Total 1	O 1	0

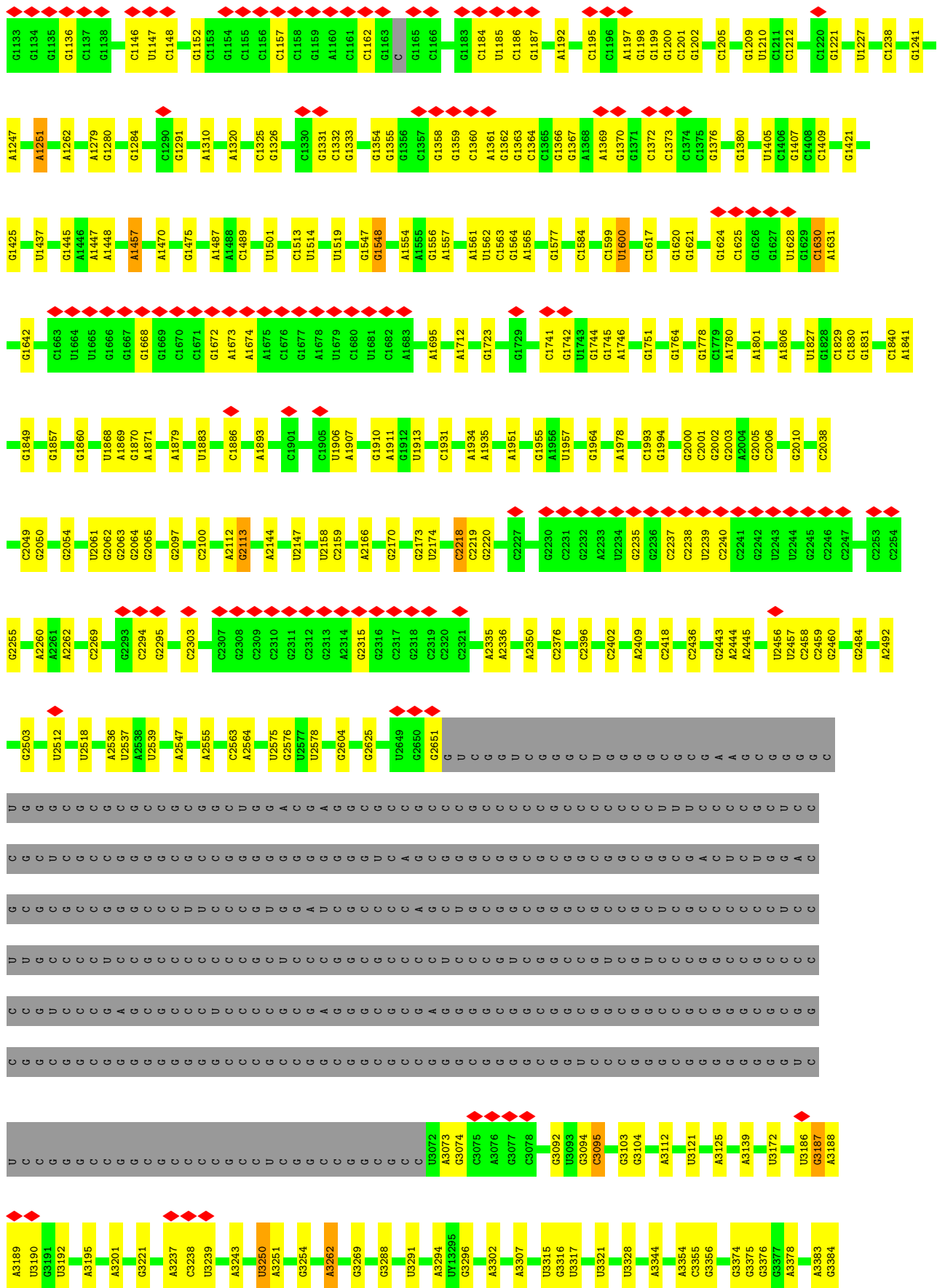
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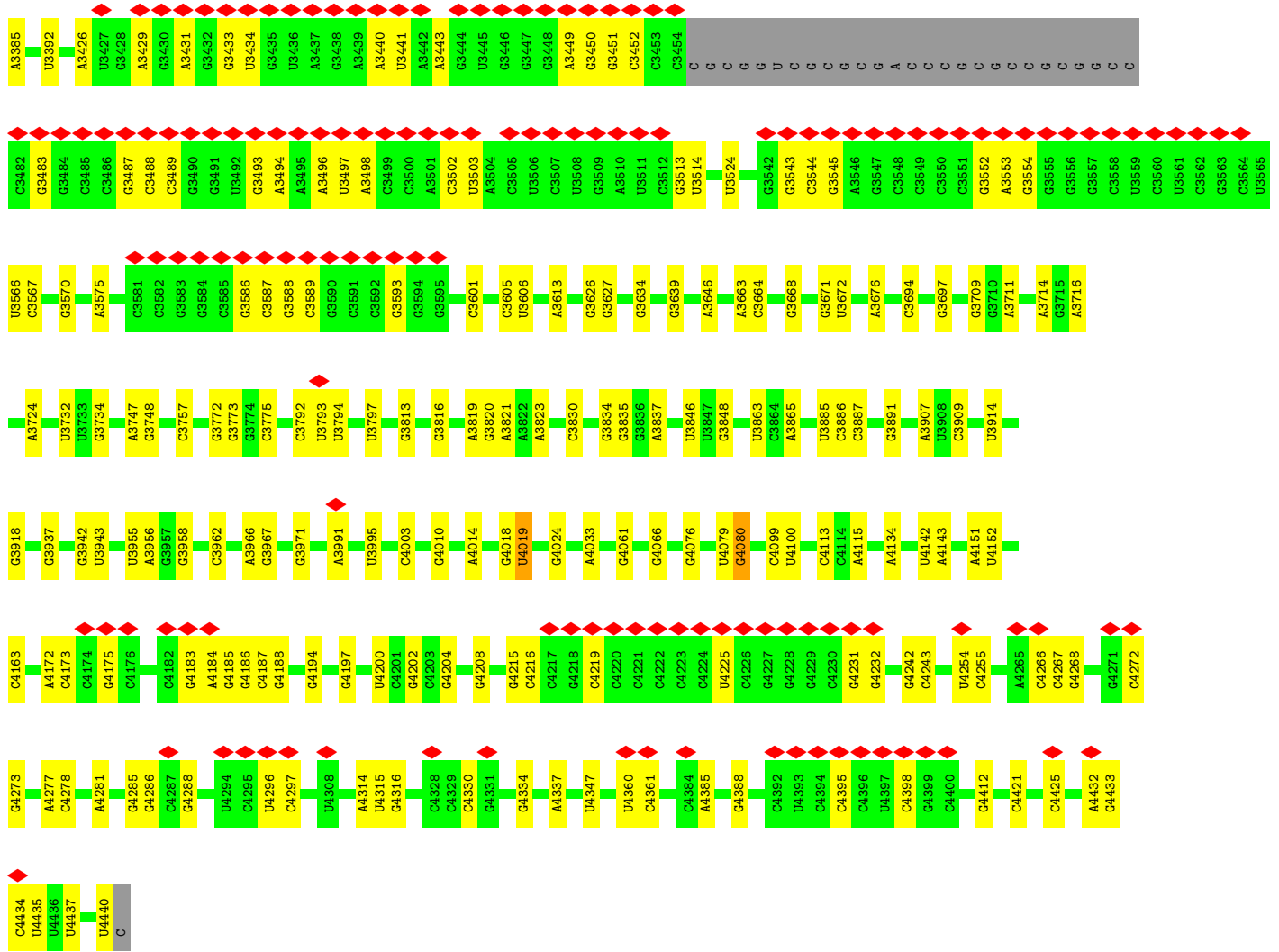
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Mol	Chain	Residues	Atoms		AltConf
89	AE	2	Total 2	O 2	0
89	Ae	1	Total 1	O 1	0
89	AG	1	Total 1	O 1	0
89	Ak	1	Total 1	O 1	0
89	Am	1	Total 1	O 1	0
89	An	1	Total 1	O 1	0
89	Ar	2	Total 2	O 2	0
89	As	1	Total 1	O 1	0
89	Au	1	Total 1	O 1	0
89	Av	2	Total 2	O 2	0
89	Ax	1	Total 1	O 1	0
89	AZ	1	Total 1	O 1	0
89	V	9	Total 9	O 9	0
89	A	2	Total 2	O 2	0

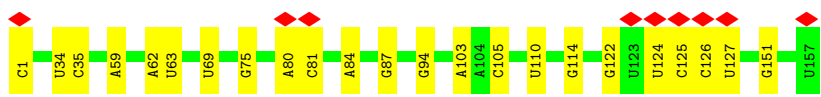
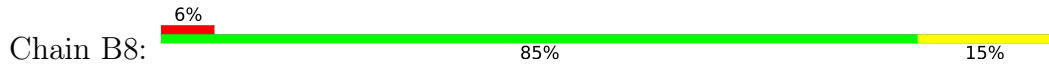








• Molecule 2: 5.8S rRNA



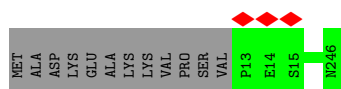
• Molecule 3: 5S rRNA



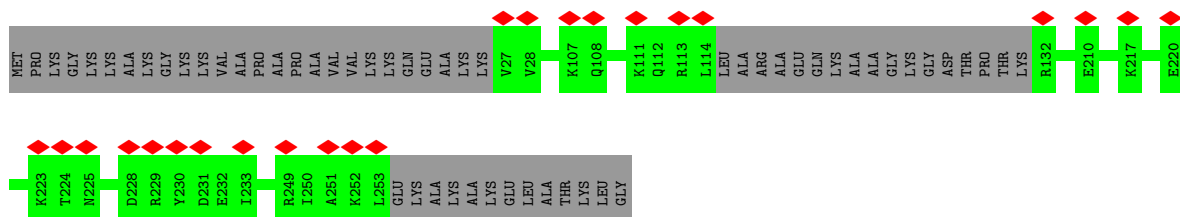
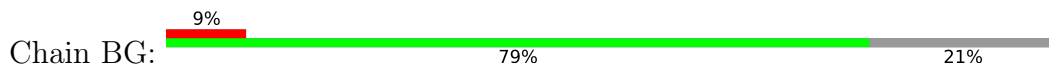
• Molecule 4: 60S ribosomal protein L41



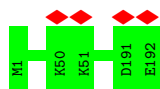




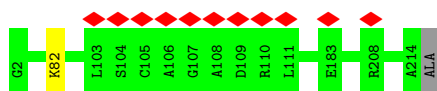
- Molecule 11: Large ribosomal subunit protein eL8



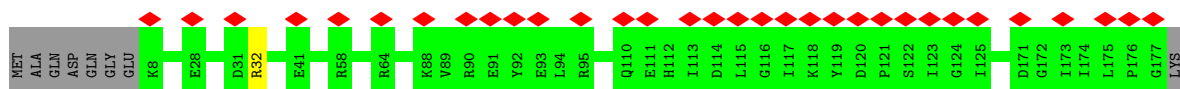
- Molecule 12: 60S ribosomal protein L9



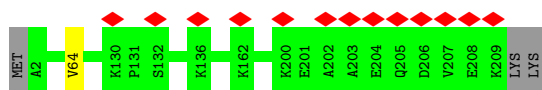
- Molecule 13: Ribosomal protein uL16, Large ribosomal subunit protein uL16, Large ribosomal subunit protein uL16



- Molecule 14: 60S ribosomal protein L11



- Molecule 15: Large ribosomal subunit protein eL13



- Molecule 16: 60S ribosomal protein L14

Chain BM:  99%



- Molecule 17: Ribosomal protein L15

Chain BN:  100%




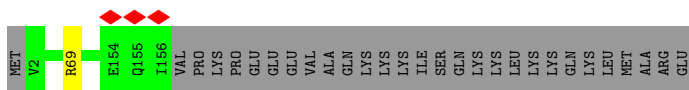
- Molecule 18: Ribosomal protein uL13

Chain BO:  99%



- Molecule 19: 60S ribosomal protein L17

Chain BP:  84% 16%




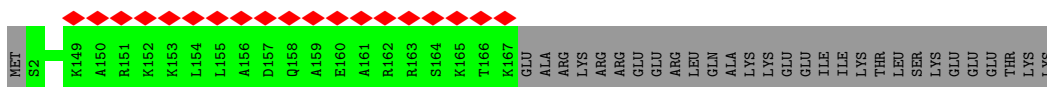
- Molecule 20: Ribosomal protein eL18

Chain BQ:  100%

There are no outlier residues recorded for this chain.

- Molecule 21: Ribosomal protein L19

Chain BR:  10% 85% 15%



- Molecule 22: Ribosomal protein eL20

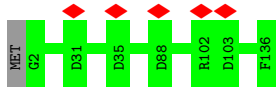
Chain BS:  100%

There are no outlier residues recorded for this chain.

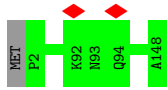
- Molecule 23: 60S ribosomal protein L21

Chain BT:  99%

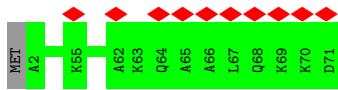




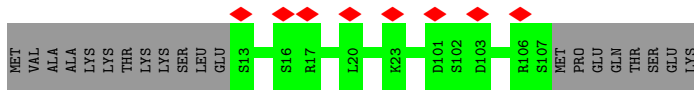
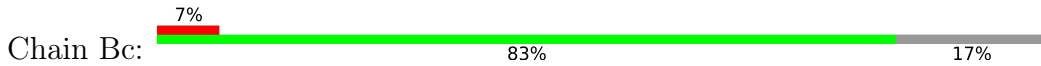
- Molecule 30: Ribosomal protein uL15



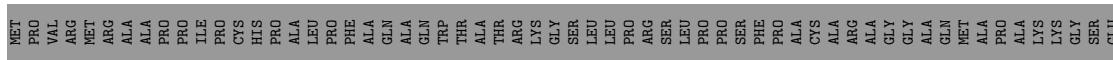
- Molecule 31: 60S ribosomal protein L29



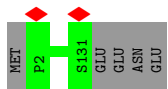
- Molecule 32: Large ribosomal subunit protein eL30



- Molecule 33: 60S ribosomal protein L31



- Molecule 34: Ribosomal protein L32



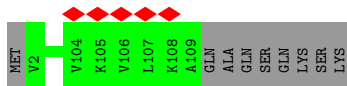
- Molecule 35: Ribosomal protein eL33







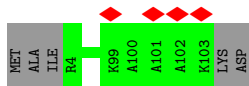
- Molecule 36: 60S ribosomal protein L34



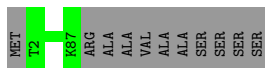
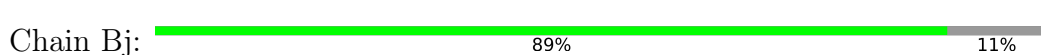
- Molecule 37: Large ribosomal subunit protein uL29



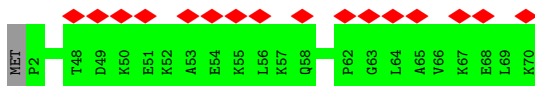
- Molecule 38: Large ribosomal subunit protein eL36



- Molecule 39: Ribosomal protein L37



- Molecule 40: 60S ribosomal protein L38



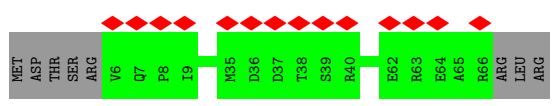
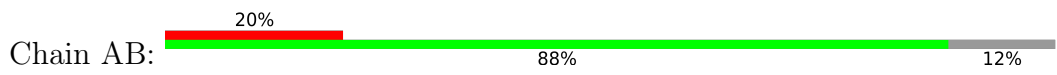
- Molecule 41: Large ribosomal subunit protein eL39



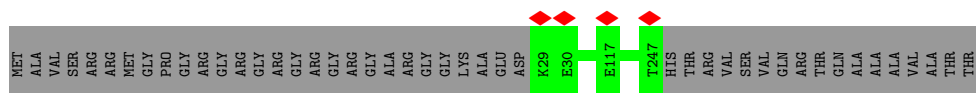
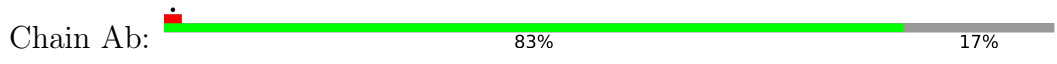
- Molecule 42: Ubiquitin-60S ribosomal protein L40



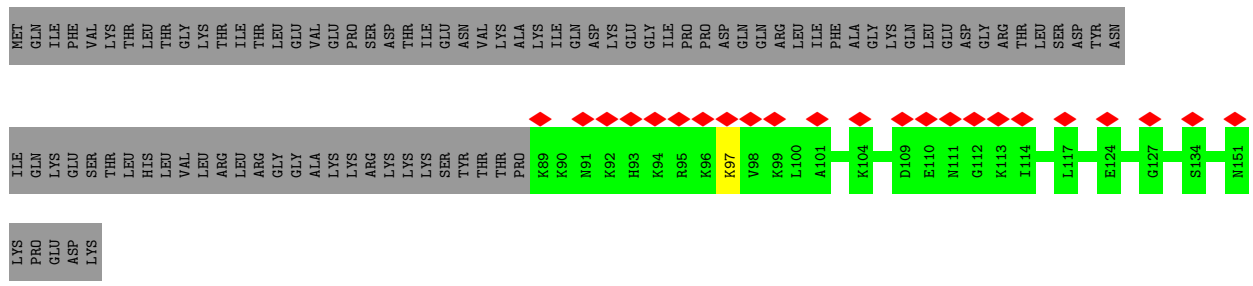




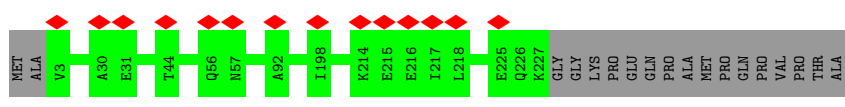
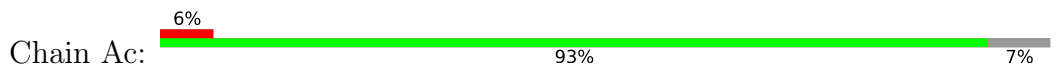
• Molecule 50: 40S ribosomal protein S2



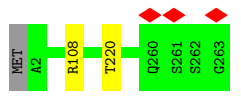
• Molecule 51: Ubiquitin



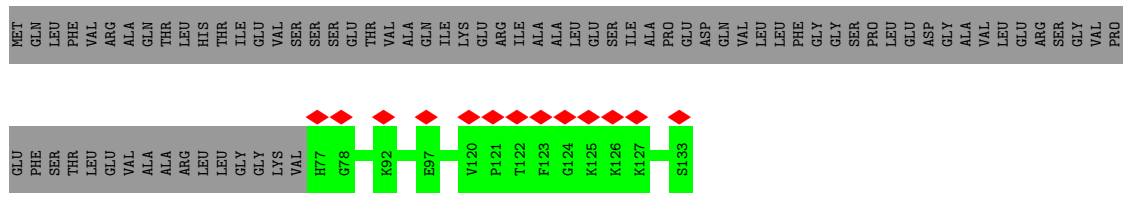
• Molecule 52: DNA-(apurinic or apyrimidinic site) lyase



• Molecule 53: Small ribosomal subunit protein eS4

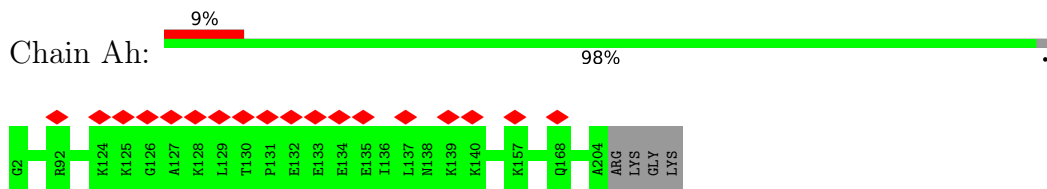


• Molecule 54: Ribosomal protein eS30

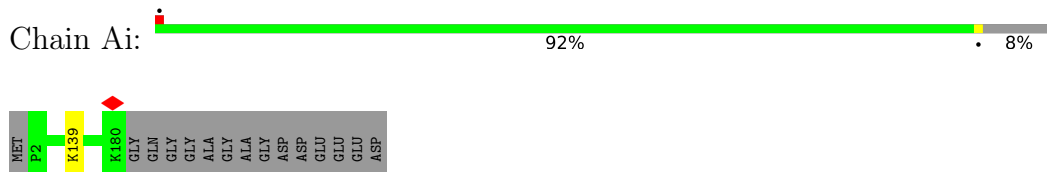




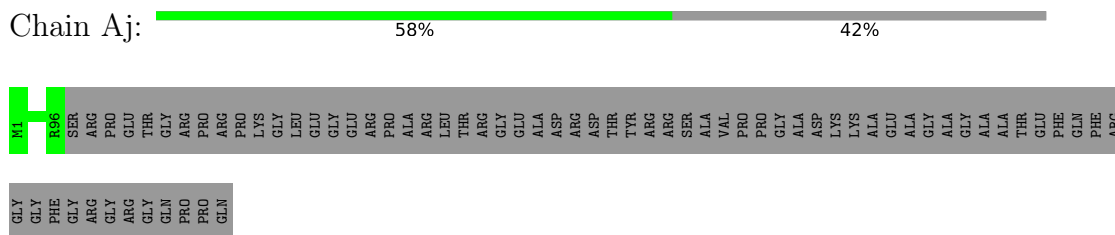
• Molecule 61: 40S ribosomal protein S8



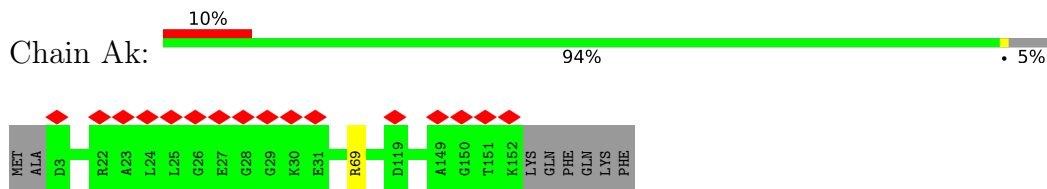
• Molecule 62: 40S ribosomal protein S9



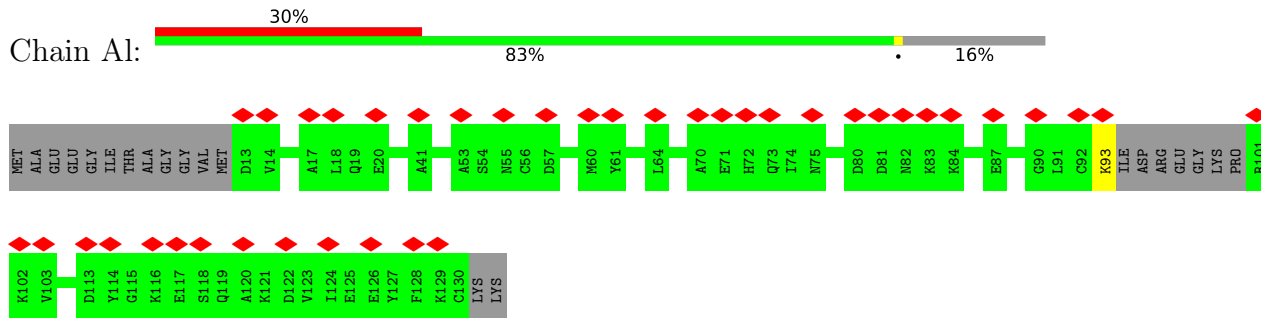
• Molecule 63: Ribosomal protein S10



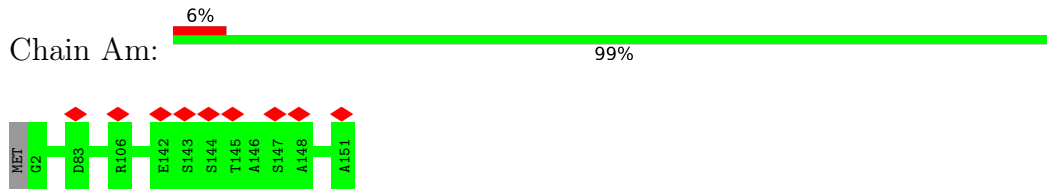
• Molecule 64: 40S ribosomal protein S11



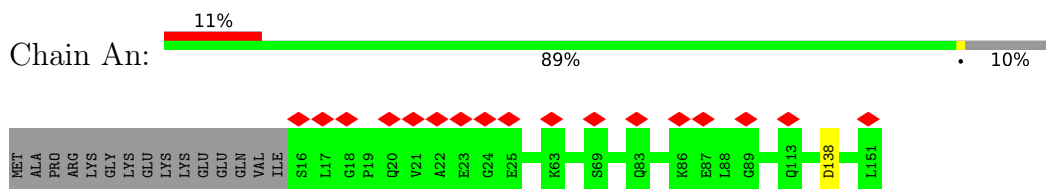
• Molecule 65: Small ribosomal subunit protein eS12



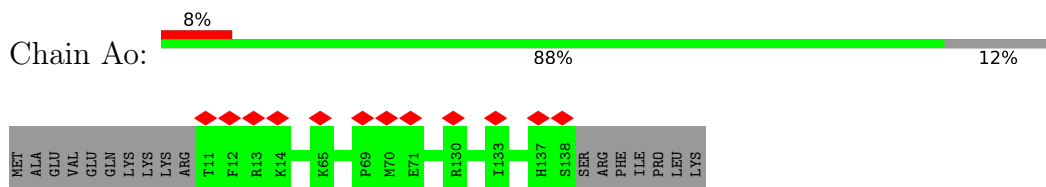
• Molecule 66: Small ribosomal subunit protein uS15



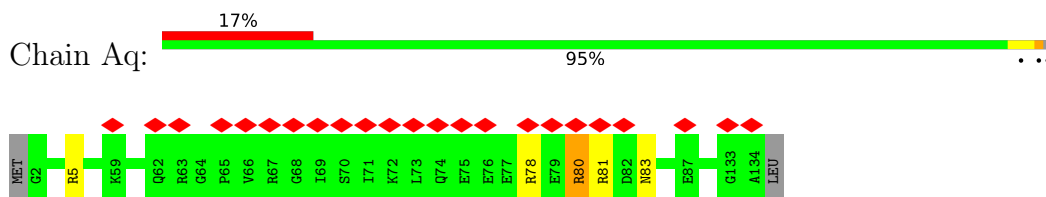
- Molecule 67: Ribosomal protein S14



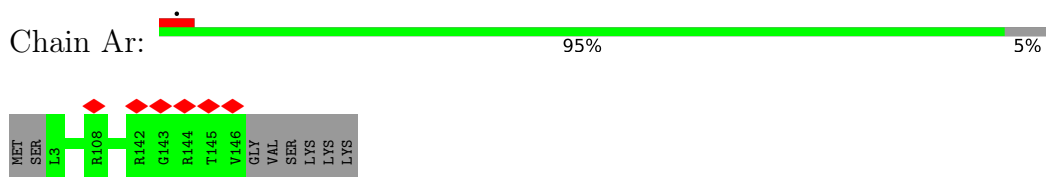
- Molecule 68: Small ribosomal subunit protein uS19



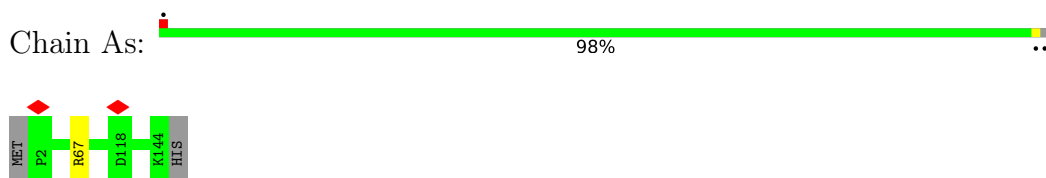
- Molecule 69: Small ribosomal subunit protein eS17



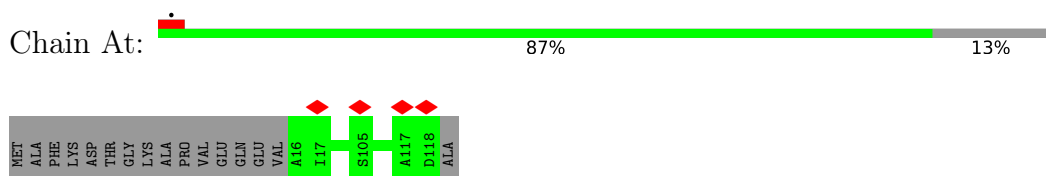
- Molecule 70: 40S ribosomal protein S18



- Molecule 71: Ribosomal protein eS19



- Molecule 72: 40S ribosomal protein S20



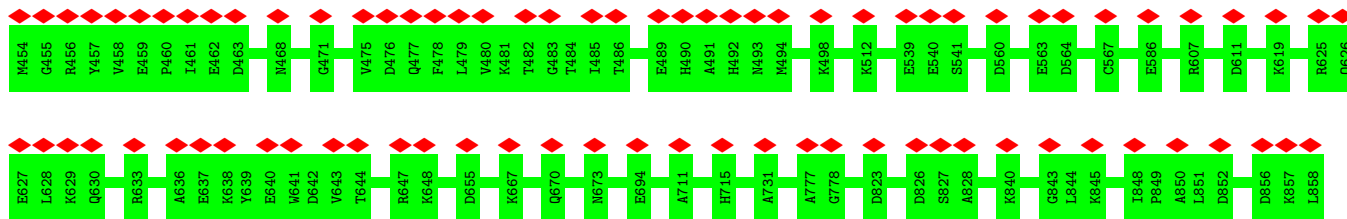
- Molecule 73: Ribosomal protein eS21



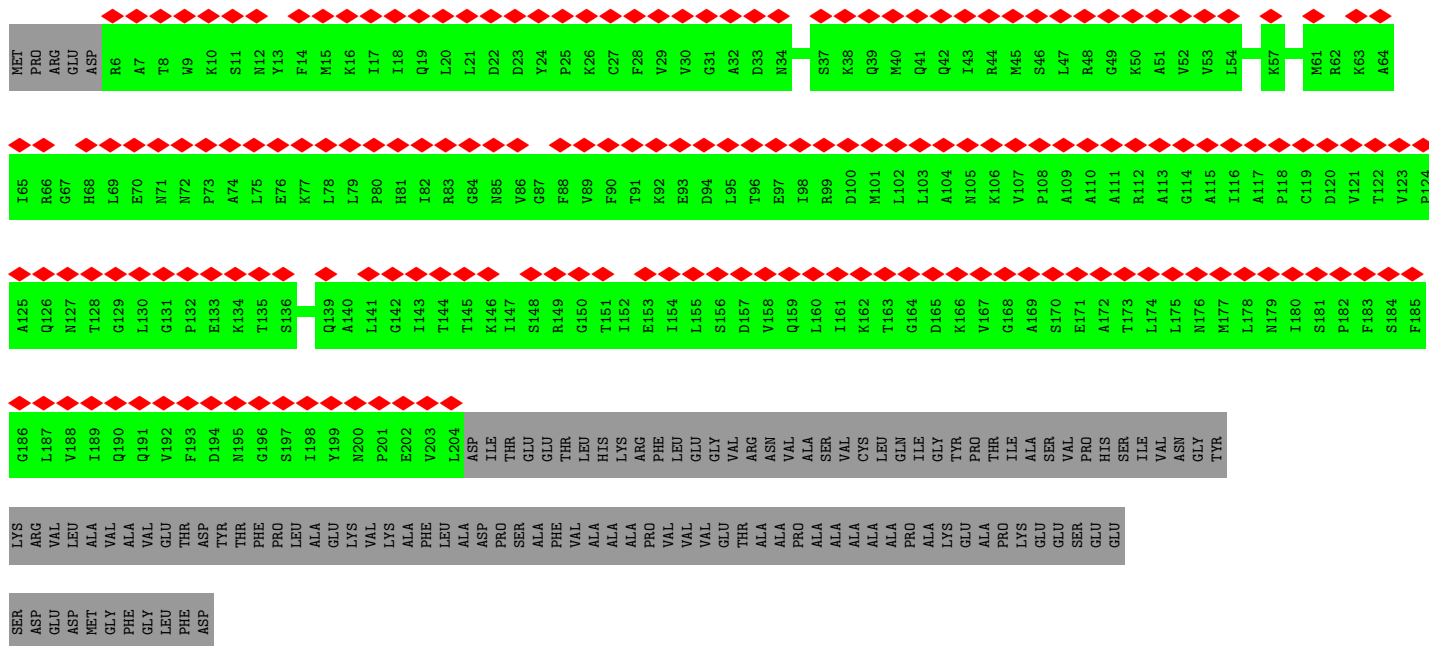




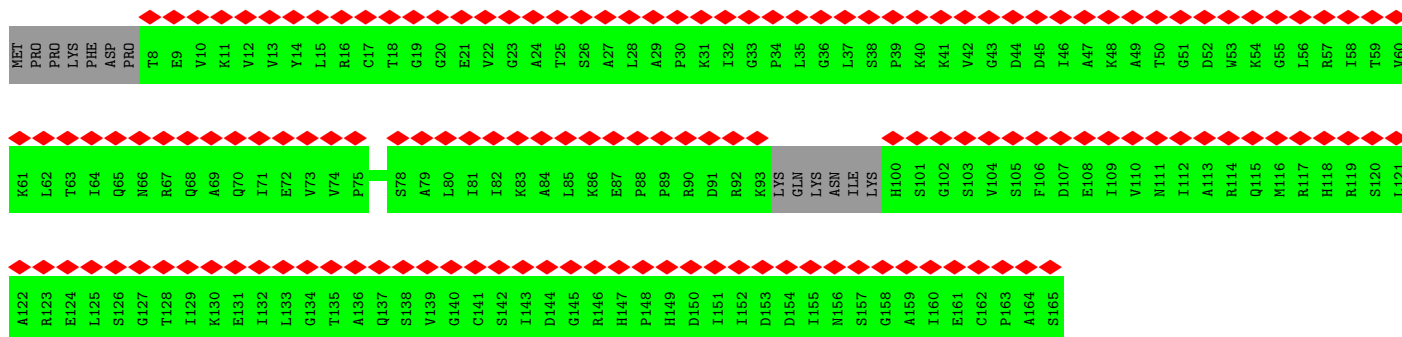




• Molecule 83: Large ribosomal subunit protein uL10



• Molecule 84: 60S ribosomal protein L12



• Molecule 85: Ribosomal protein





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	100204	Depositor
Resolution determination method	FSC 3 SIGMA CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	300	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	96000	Depositor
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	35.598	Depositor
Minimum map value	-17.913	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	1.080	Depositor
Recommended contour level	3.0	Depositor
Map size ( $\text{\AA}$ )	465.74, 465.74, 465.74	wwPDB
Map dimensions	580, 580, 580	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.803, 0.803, 0.803	Depositor

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 6MZ, OMG, 5MC, DDE, OMU, HIC, 1MA, ZN, OMC, 4AC, UY1, MLZ, MG, A2M, B8N, SAC, AME, GDP, PSU, MA6, UR3, NMM, IAS

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	B5	0.38	1/85039 (0.0%)	0.79	29/132680 (0.0%)
2	B8	0.40	1/3656 (0.0%)	0.74	1/5693 (0.0%)
3	B7	0.36	0/2832	0.77	0/4413
4	Az	0.22	0/240	0.68	0/305
5	BA	0.28	0/1926	0.57	0/2582
6	BB	0.29	0/3264	0.53	0/4363
7	BC	0.27	0/2942	0.53	0/3950
8	BD	0.28	0/2431	0.50	0/3255
9	BE	0.27	0/1854	0.52	0/2477
10	BF	0.27	0/1975	0.52	0/2634
11	BG	0.26	0/1736	0.51	0/2342
12	BH	0.27	0/1552	0.52	0/2086
13	BI	0.27	0/1751	0.54	0/2342
14	BJ	0.27	0/1385	0.54	0/1852
15	BL	0.26	0/1723	0.55	0/2302
16	BM	0.26	0/1097	0.50	0/1460
17	BN	0.27	0/1745	0.56	0/2337
18	BO	0.27	0/1674	0.52	0/2239
19	BP	0.27	0/1285	0.51	0/1723
20	BQ	0.28	0/1526	0.59	0/2038
21	BR	0.24	0/1394	0.54	0/1845
22	BS	0.29	0/1502	0.55	0/2016
23	BT	0.28	0/1327	0.50	0/1771
24	BU	0.25	0/831	0.49	0/1115
25	BV	0.28	0/1047	0.53	0/1402
26	BW	0.28	0/532	0.51	0/708
27	BX	0.26	0/993	0.51	0/1334
28	BY	0.28	0/1123	0.56	0/1493
29	BZ	0.28	0/1130	0.51	0/1507
30	Ba	0.28	0/1209	0.52	0/1615
31	Bb	0.26	0/593	0.49	0/782

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
32	Bc	0.27	0/748	0.47	0/1004
33	Bd	0.26	0/882	0.55	0/1187
34	Be	0.27	0/1093	0.54	0/1457
35	Bf	0.29	0/905	0.57	0/1211
36	Bg	0.26	0/870	0.57	0/1159
37	Bh	0.27	0/1034	0.52	0/1365
38	Bi	0.26	0/832	0.55	0/1100
39	Bj	0.28	0/718	0.58	0/948
40	Bk	0.26	0/575	0.49	0/761
41	Bl	0.25	0/452	0.54	0/596
42	Bm	0.26	0/435	0.54	0/575
43	Bo	0.28	0/864	0.52	0/1139
44	Bp	0.26	0/716	0.51	0/950
45	Br	0.26	0/1024	0.57	0/1374
46	A2	0.36	1/39536 (0.0%)	0.78	12/61603 (0.0%)
47	Aa	0.27	0/1757	0.50	0/2352
48	AA	0.28	0/670	0.53	0/897
49	AB	0.28	0/478	0.62	0/641
50	Ab	0.28	0/1734	0.48	0/2342
51	AC	0.29	0/526	0.55	0/696
52	Ac	0.28	0/1780	0.52	0/2396
53	Ad	0.32	0/2118	0.55	0/2848
54	AD	0.26	0/458	0.54	0/602
55	AE	0.26	0/806	0.56	0/1080
56	Ae	0.29	0/1530	0.53	0/2059
57	Af	0.27	0/1861	0.55	0/2481
58	AF	0.28	0/2477	0.52	0/3372
59	Ag	0.26	0/1522	0.51	0/2039
60	AG	0.29	0/470	0.54	0/623
61	Ah	0.29	0/1702	0.55	0/2273
62	Ai	0.33	0/1520	0.56	0/2030
63	Aj	0.29	0/836	0.48	0/1128
64	Ak	0.31	0/1239	0.55	0/1657
65	Al	0.25	0/868	0.48	0/1165
66	Am	0.26	0/1232	0.50	0/1656
67	An	0.27	0/1020	0.56	0/1366
68	Ao	0.30	0/1071	0.53	0/1432
69	Aq	0.27	0/1087	0.52	0/1459
70	Ar	0.28	0/1209	0.58	0/1620
71	As	0.28	0/1120	0.48	0/1499
72	At	0.26	0/825	0.57	0/1108
73	Au	0.27	0/635	0.51	0/851
74	Av	0.30	0/1052	0.54	0/1408

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
75	Aw	0.30	0/1122	0.54	0/1498
76	Ax	0.30	0/1032	0.54	0/1371
77	Ay	0.29	0/561	0.52	0/755
78	AZ	0.29	0/1654	0.50	0/2249
79	Ap	0.29	0/1141	0.55	0/1527
80	V	0.25	0/1822	0.76	0/2841
81	S	0.25	0/331	0.55	0/436
82	A	0.26	0/6798	0.51	0/9181
83	Bs	0.25	0/1551	0.50	0/2094
84	Bt	0.24	0/1149	0.54	0/1549
85	Bv	0.25	0/1749	0.54	0/2344
All	All	0.33	3/236511 (0.0%)	0.69	42/346015 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	A2	1	U	OP3-P	-10.88	1.48	1.61
2	B8	1	C	OP3-P	-10.59	1.48	1.61
1	B5	1	C	OP3-P	-10.56	1.48	1.61

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
46	A2	194	C	C2-N1-C1'	9.27	129.00	118.80
1	B5	3250	U	C2-N1-C1'	8.71	128.15	117.70
1	B5	3095	C	C2-N1-C1'	8.69	128.36	118.80
46	A2	194	C	N1-C2-O2	8.54	124.02	118.90
1	B5	3095	C	N1-C2-O2	8.36	123.92	118.90
1	B5	3095	C	N3-C2-O2	-7.86	116.40	121.90
1	B5	2218	C	C2-N1-C1'	7.53	127.08	118.80
46	A2	1418	U	C2-N1-C1'	7.43	126.62	117.70
1	B5	1562	U	C2-N1-C1'	7.23	126.38	117.70
1	B5	418	G	O4'-C1'-N9	6.72	113.58	108.20
1	B5	2158	U	C2-N1-C1'	6.66	125.69	117.70
46	A2	194	C	N3-C2-O2	-6.59	117.28	121.90
46	A2	194	C	C6-N1-C1'	-6.44	113.07	120.80
1	B5	1931	C	N3-C2-O2	-6.40	117.42	121.90
1	B5	3250	U	N3-C2-O2	-6.31	117.78	122.20
1	B5	3250	U	N1-C2-O2	6.20	127.14	122.80
46	A2	1074	C	C2-N1-C1'	6.04	125.45	118.80
46	A2	194	C	C6-N1-C2	-6.04	117.89	120.30
1	B5	3095	C	C6-N1-C2	-6.03	117.89	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B5	3095	C	C6-N1-C1'	-5.99	113.61	120.80
46	A2	1418	U	N3-C2-O2	-5.89	118.08	122.20
46	A2	1418	U	N1-C2-O2	5.86	126.90	122.80
1	B5	3187	G	C4-N9-C1'	5.85	134.10	126.50
46	A2	1475	G	C4-N9-C1'	5.53	133.69	126.50
1	B5	3250	U	C6-N1-C1'	-5.52	113.47	121.20
1	B5	3187	G	N3-C4-N9	5.44	129.26	126.00
1	B5	2159	C	C2-N1-C1'	5.32	124.65	118.80
1	B5	2218	C	C6-N1-C2	-5.30	118.18	120.30
1	B5	4398	C	C2-N1-C1'	5.28	124.60	118.80
1	B5	281	G	P-O3'-C3'	5.27	126.03	119.70
1	B5	2158	U	N1-C2-O2	5.25	126.47	122.80
1	B5	1931	C	N1-C2-O2	5.19	122.01	118.90
1	B5	1630	C	C2-N1-C1'	5.16	124.47	118.80
2	B8	127	U	C2-N1-C1'	5.13	123.85	117.70
1	B5	2218	C	C6-N1-C1'	-5.12	114.65	120.80
1	B5	1372	C	C2-N1-C1'	5.08	124.39	118.80
1	B5	3187	G	C8-N9-C1'	-5.08	120.40	127.00
46	A2	1074	C	N1-C2-O2	5.08	121.95	118.90
1	B5	1475	G	O4'-C1'-N9	5.04	112.23	108.20
1	B5	2158	U	N3-C2-O2	-5.04	118.67	122.20
1	B5	1562	U	N1-C2-O2	5.01	126.31	122.80
46	A2	1475	G	C8-N9-C1'	-5.01	120.49	127.00

There are no chirality outliers.

There are no planarity outliers.

## 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	
4	Az	23/25 (92%)	23 (100%)	0	0	100	100
5	BA	244/257 (95%)	235 (96%)	9 (4%)	0	100	100
6	BB	395/403 (98%)	387 (98%)	8 (2%)	0	100	100
7	BC	359/421 (85%)	354 (99%)	5 (1%)	0	100	100
8	BD	294/297 (99%)	282 (96%)	12 (4%)	0	100	100
9	BE	219/298 (74%)	211 (96%)	8 (4%)	0	100	100
10	BF	232/246 (94%)	225 (97%)	7 (3%)	0	100	100
11	BG	206/266 (77%)	198 (96%)	8 (4%)	0	100	100
12	BH	190/192 (99%)	188 (99%)	2 (1%)	0	100	100
13	BI	211/214 (99%)	207 (98%)	4 (2%)	0	100	100
14	BJ	168/178 (94%)	164 (98%)	4 (2%)	0	100	100
15	BL	206/211 (98%)	200 (97%)	5 (2%)	1 (0%)	29	41
16	BM	128/131 (98%)	126 (98%)	2 (2%)	0	100	100
17	BN	201/204 (98%)	197 (98%)	4 (2%)	0	100	100
18	BO	199/203 (98%)	196 (98%)	3 (2%)	0	100	100
19	BP	153/184 (83%)	150 (98%)	3 (2%)	0	100	100
20	BQ	185/187 (99%)	183 (99%)	2 (1%)	0	100	100
21	BR	164/196 (84%)	164 (100%)	0	0	100	100
22	BS	174/176 (99%)	170 (98%)	4 (2%)	0	100	100
23	BT	157/160 (98%)	154 (98%)	3 (2%)	0	100	100
24	BU	98/128 (77%)	97 (99%)	1 (1%)	0	100	100
25	BV	137/140 (98%)	136 (99%)	1 (1%)	0	100	100
26	BW	60/157 (38%)	59 (98%)	1 (2%)	0	100	100
27	BX	117/155 (76%)	114 (97%)	3 (3%)	0	100	100
28	BY	131/145 (90%)	130 (99%)	1 (1%)	0	100	100
29	BZ	133/136 (98%)	129 (97%)	4 (3%)	0	100	100
30	Ba	145/148 (98%)	140 (97%)	5 (3%)	0	100	100
31	Bb	68/71 (96%)	68 (100%)	0	0	100	100
32	Bc	93/115 (81%)	93 (100%)	0	0	100	100
33	Bd	103/176 (58%)	101 (98%)	2 (2%)	0	100	100
34	Be	128/135 (95%)	128 (100%)	0	0	100	100
35	Bf	108/110 (98%)	108 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
36	Bg	106/117 (91%)	105 (99%)	1 (1%)	0	100	100
37	Bh	121/123 (98%)	120 (99%)	1 (1%)	0	100	100
38	Bi	98/105 (93%)	98 (100%)	0	0	100	100
39	Bj	84/97 (87%)	84 (100%)	0	0	100	100
40	Bk	67/70 (96%)	66 (98%)	1 (2%)	0	100	100
41	Bl	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
42	Bm	50/128 (39%)	50 (100%)	0	0	100	100
43	Bo	102/105 (97%)	99 (97%)	3 (3%)	0	100	100
44	Bp	89/92 (97%)	86 (97%)	3 (3%)	0	100	100
45	Br	122/138 (88%)	119 (98%)	3 (2%)	0	100	100
47	Aa	211/264 (80%)	204 (97%)	7 (3%)	0	100	100
48	AA	81/84 (96%)	77 (95%)	4 (5%)	0	100	100
49	AB	59/69 (86%)	58 (98%)	1 (2%)	0	100	100
50	Ab	217/264 (82%)	216 (100%)	1 (0%)	0	100	100
51	AC	61/156 (39%)	58 (95%)	3 (5%)	0	100	100
52	Ac	223/243 (92%)	216 (97%)	7 (3%)	0	100	100
53	Ad	260/263 (99%)	256 (98%)	4 (2%)	0	100	100
54	AD	55/133 (41%)	55 (100%)	0	0	100	100
55	AE	97/115 (84%)	97 (100%)	0	0	100	100
56	Ae	189/204 (93%)	180 (95%)	8 (4%)	1 (0%)	29	41
57	Af	225/249 (90%)	221 (98%)	4 (2%)	0	100	100
58	AF	309/317 (98%)	290 (94%)	19 (6%)	0	100	100
59	Ag	185/194 (95%)	173 (94%)	12 (6%)	0	100	100
60	AG	53/171 (31%)	53 (100%)	0	0	100	100
61	Ah	202/207 (98%)	194 (96%)	8 (4%)	0	100	100
62	Ai	177/194 (91%)	175 (99%)	2 (1%)	0	100	100
63	Aj	94/165 (57%)	92 (98%)	2 (2%)	0	100	100
64	Ak	148/158 (94%)	141 (95%)	7 (5%)	0	100	100
65	Al	107/132 (81%)	96 (90%)	11 (10%)	0	100	100
66	Am	148/151 (98%)	146 (99%)	2 (1%)	0	100	100
67	An	132/151 (87%)	128 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
68	Ao	126/145 (87%)	121 (96%)	5 (4%)	0	100	100
69	Aq	131/135 (97%)	122 (93%)	7 (5%)	2 (2%)	10	14
70	Ar	142/152 (93%)	132 (93%)	10 (7%)	0	100	100
71	As	140/145 (97%)	137 (98%)	3 (2%)	0	100	100
72	At	101/119 (85%)	94 (93%)	7 (7%)	0	100	100
73	Au	81/83 (98%)	80 (99%)	1 (1%)	0	100	100
74	Av	127/130 (98%)	125 (98%)	2 (2%)	0	100	100
75	Aw	140/143 (98%)	137 (98%)	3 (2%)	0	100	100
76	Ax	123/131 (94%)	123 (100%)	0	0	100	100
77	Ay	68/125 (54%)	66 (97%)	2 (3%)	0	100	100
78	AZ	204/296 (69%)	201 (98%)	3 (2%)	0	100	100
79	Ap	139/146 (95%)	134 (96%)	5 (4%)	0	100	100
81	S	40/404 (10%)	37 (92%)	3 (8%)	0	100	100
82	A	854/858 (100%)	813 (95%)	41 (5%)	0	100	100
83	Bs	197/316 (62%)	194 (98%)	3 (2%)	0	100	100
84	Bt	148/165 (90%)	132 (89%)	16 (11%)	0	100	100
85	Bv	213/217 (98%)	192 (90%)	20 (9%)	1 (0%)	29	41
All	All	12523/14685 (85%)	12156 (97%)	362 (3%)	5 (0%)	100	100

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
15	BL	64	VAL
56	Ae	42	GLU
69	Aq	80	ARG
85	Bv	28	PHE
69	Aq	81	ARG

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	Az	24/24 (100%)	24 (100%)	0	100	100
5	BA	189/199 (95%)	189 (100%)	0	100	100
6	BB	346/349 (99%)	346 (100%)	0	100	100
7	BC	305/338 (90%)	305 (100%)	0	100	100
8	BD	248/249 (100%)	248 (100%)	0	100	100
9	BE	196/256 (77%)	196 (100%)	0	100	100
10	BF	201/211 (95%)	201 (100%)	0	100	100
11	BG	186/225 (83%)	186 (100%)	0	100	100
12	BH	171/171 (100%)	171 (100%)	0	100	100
13	BI	178/178 (100%)	177 (99%)	1 (1%)	86	94
14	BJ	142/148 (96%)	141 (99%)	1 (1%)	84	92
15	BL	175/178 (98%)	175 (100%)	0	100	100
16	BM	112/113 (99%)	112 (100%)	0	100	100
17	BN	171/172 (99%)	171 (100%)	0	100	100
18	BO	172/173 (99%)	172 (100%)	0	100	100
19	BP	136/163 (83%)	135 (99%)	1 (1%)	84	92
20	BQ	159/159 (100%)	159 (100%)	0	100	100
21	BR	147/175 (84%)	147 (100%)	0	100	100
22	BS	157/157 (100%)	157 (100%)	0	100	100
23	BT	139/140 (99%)	139 (100%)	0	100	100
24	BU	90/113 (80%)	90 (100%)	0	100	100
25	BV	106/107 (99%)	106 (100%)	0	100	100
26	BW	54/127 (42%)	54 (100%)	0	100	100
27	BX	107/134 (80%)	107 (100%)	0	100	100
28	BY	123/135 (91%)	123 (100%)	0	100	100
29	BZ	117/118 (99%)	117 (100%)	0	100	100
30	Ba	121/122 (99%)	121 (100%)	0	100	100
31	Bb	61/62 (98%)	61 (100%)	0	100	100
32	Bc	80/98 (82%)	80 (100%)	0	100	100
33	Bd	95/148 (64%)	95 (100%)	0	100	100
34	Be	118/123 (96%)	118 (100%)	0	100	100
35	Bf	89/89 (100%)	89 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
36	Bg	93/101 (92%)	93 (100%)	0	100	100
37	Bh	110/110 (100%)	110 (100%)	0	100	100
38	Bi	85/89 (96%)	85 (100%)	0	100	100
39	Bj	73/80 (91%)	73 (100%)	0	100	100
40	Bk	64/65 (98%)	64 (100%)	0	100	100
41	Bl	47/48 (98%)	47 (100%)	0	100	100
42	Bm	48/115 (42%)	48 (100%)	0	100	100
43	Bo	92/92 (100%)	92 (100%)	0	100	100
44	Bp	74/75 (99%)	74 (100%)	0	100	100
45	Br	109/118 (92%)	109 (100%)	0	100	100
47	Aa	194/228 (85%)	193 (100%)	1 (0%)	88	95
48	AA	75/76 (99%)	75 (100%)	0	100	100
49	AB	54/62 (87%)	54 (100%)	0	100	100
50	Ab	185/214 (86%)	185 (100%)	0	100	100
51	AC	56/140 (40%)	55 (98%)	1 (2%)	59	76
52	Ac	189/202 (94%)	189 (100%)	0	100	100
53	Ad	223/224 (100%)	221 (99%)	2 (1%)	78	90
54	AD	46/108 (43%)	46 (100%)	0	100	100
55	AE	87/99 (88%)	87 (100%)	0	100	100
56	Ae	161/170 (95%)	161 (100%)	0	100	100
57	Af	199/219 (91%)	199 (100%)	0	100	100
58	AF	270/275 (98%)	270 (100%)	0	100	100
59	Ag	167/174 (96%)	167 (100%)	0	100	100
60	AG	48/130 (37%)	48 (100%)	0	100	100
61	Ah	176/178 (99%)	176 (100%)	0	100	100
62	Ai	160/168 (95%)	159 (99%)	1 (1%)	86	94
63	Aj	88/136 (65%)	88 (100%)	0	100	100
64	Ak	133/140 (95%)	132 (99%)	1 (1%)	81	91
65	Al	94/109 (86%)	93 (99%)	1 (1%)	73	87
66	Am	130/131 (99%)	130 (100%)	0	100	100
67	An	105/118 (89%)	105 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
68	Ao	114/130 (88%)	114 (100%)	0	100	100
69	Aq	119/121 (98%)	115 (97%)	4 (3%)	37	56
70	Ar	125/132 (95%)	125 (100%)	0	100	100
71	As	112/114 (98%)	112 (100%)	0	100	100
72	At	94/106 (89%)	94 (100%)	0	100	100
73	Au	68/68 (100%)	68 (100%)	0	100	100
74	Av	112/113 (99%)	112 (100%)	0	100	100
75	Aw	114/115 (99%)	113 (99%)	1 (1%)	78	90
76	Ax	107/113 (95%)	107 (100%)	0	100	100
77	Ay	61/102 (60%)	60 (98%)	1 (2%)	62	79
78	AZ	171/245 (70%)	171 (100%)	0	100	100
79	Ap	116/119 (98%)	116 (100%)	0	100	100
81	S	33/312 (11%)	33 (100%)	0	100	100
82	A	729/730 (100%)	728 (100%)	1 (0%)	93	98
83	Bs	167/259 (64%)	167 (100%)	0	100	100
84	Bt	124/137 (90%)	124 (100%)	0	100	100
85	Bv	194/196 (99%)	192 (99%)	2 (1%)	76	88
All	All	10910/12460 (88%)	10891 (100%)	19 (0%)	93	97

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
13	BI	82	LYS
14	BJ	32	ARG
19	BP	69	ARG
47	Aa	56	LYS
51	AC	97	LYS
53	Ad	108	ARG
53	Ad	220	THR
62	Ai	139	LYS
64	Ak	69	ARG
65	Al	93	LYS
69	Aq	5	ARG
69	Aq	78	ARG
69	Aq	80	ARG
69	Aq	83	ASN

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Mol	Chain	Res	Type
75	Aw	60	LYS
77	Ay	60	LYS
82	A	50	ARG
85	Bv	26	ARG
85	Bv	27	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
7	BC	119	GLN
10	BF	21	GLN
11	BG	38	ASN
11	BG	43	GLN
15	BL	67	HIS
24	BU	105	ASN
28	BY	72	GLN
49	AB	29	GLN
49	AB	45	ASN
82	A	493	ASN
83	Bs	68	HIS
83	Bs	159	GLN
85	Bv	171	HIS

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	B5	3630/4441 (81%)	562 (15%)	30 (0%)
2	B8	156/157 (99%)	19 (12%)	0
3	B7	118/119 (99%)	9 (7%)	0
46	A2	1685/1823 (92%)	277 (16%)	4 (0%)
80	V	75/76 (98%)	13 (17%)	2 (2%)
All	All	5664/6616 (85%)	880 (15%)	36 (0%)

All (880) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	B5	2	G
1	B5	25	A
1	B5	39	A
1	B5	42	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	58	G
1	B5	59	A
1	B5	64	A
1	B5	65	A
1	B5	66	A
1	B5	71	C
1	B5	72	G
1	B5	85	G
1	B5	91	G
1	B5	98	A
1	B5	109	G
1	B5	110	C
1	B5	119	G
1	B5	120	A
1	B5	135	G
1	B5	142	G
1	B5	143	C
1	B5	144	G
1	B5	159	C
1	B5	179	G
1	B5	181	C
1	B5	184	U
1	B5	185	C
1	B5	187	C
1	B5	188	G
1	B5	189	G
1	B5	200	U
1	B5	201	C
1	B5	209	U
1	B5	210	C
1	B5	216	C
1	B5	217	C
1	B5	218	A
1	B5	234	G
1	B5	265	C
1	B5	268	G
1	B5	269	G
1	B5	282	U
1	B5	298	U
1	B5	310	C
1	B5	316	G
1	B5	317	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	323	C
1	B5	335	A
1	B5	341	C
1	B5	388	G
1	B5	411	A
1	B5	413	G
1	B5	433	U
1	B5	446	U
1	B5	450	C
1	B5	451	G
1	B5	453	A
1	B5	454	G
1	B5	455	U
1	B5	457	G
1	B5	464	A
1	B5	468	U
1	B5	482	C
1	B5	484	A
1	B5	485	A
1	B5	486	G
1	B5	488	U
1	B5	490	G
1	B5	495	G
1	B5	496	C
1	B5	498	C
1	B5	501	G
1	B5	504	C
1	B5	509	G
1	B5	511	A
1	B5	524	C
1	B5	525	C
1	B5	583	C
1	B5	584	G
1	B5	598	G
1	B5	601	C
1	B5	602	G
1	B5	603	G
1	B5	604	C
1	B5	605	G
1	B5	606	U
1	B5	607	C
1	B5	624	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	626	U
1	B5	636	G
1	B5	641	U
1	B5	643	C
1	B5	669	G
1	B5	670	G
1	B5	677	U
1	B5	679	C
1	B5	684	G
1	B5	687	C
1	B5	688	A
1	B5	700	G
1	B5	701	C
1	B5	704	C
1	B5	707	G
1	B5	709	G
1	B5	710	C
1	B5	711	G
1	B5	713	C
1	B5	714	C
1	B5	718	G
1	B5	723	U
1	B5	725	A
1	B5	727	A
1	B5	736	G
1	B5	742	A
1	B5	743	U
1	B5	744	C
1	B5	745	G
1	B5	750	C
1	B5	752	A
1	B5	753	A
1	B5	754	U
1	B5	765	A
1	B5	768	G
1	B5	769	A
1	B5	771	A
1	B5	772	G
1	B5	774	A
1	B5	775	C
1	B5	776	C
1	B5	777	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	778	C
1	B5	789	U
1	B5	792	C
1	B5	793	C
1	B5	1099	C
1	B5	1107	C
1	B5	1115	C
1	B5	1128	C
1	B5	1136	G
1	B5	1146	C
1	B5	1147	U
1	B5	1148	C
1	B5	1152	G
1	B5	1157	C
1	B5	1162	C
1	B5	1184	C
1	B5	1185	U
1	B5	1186	C
1	B5	1187	G
1	B5	1192	A
1	B5	1195	C
1	B5	1198	G
1	B5	1199	G
1	B5	1200	G
1	B5	1201	C
1	B5	1202	G
1	B5	1205	C
1	B5	1209	G
1	B5	1210	U
1	B5	1212	C
1	B5	1221	G
1	B5	1227	U
1	B5	1238	C
1	B5	1251	A2M
1	B5	1262	A
1	B5	1279	A
1	B5	1280	G
1	B5	1284	G
1	B5	1291	G
1	B5	1310	A
1	B5	1320	A
1	B5	1326	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	1331	G
1	B5	1332	C
1	B5	1333	G
1	B5	1354	G
1	B5	1355	G
1	B5	1358	G
1	B5	1359	G
1	B5	1360	C
1	B5	1361	A
1	B5	1362	G
1	B5	1363	G
1	B5	1364	C
1	B5	1366	G
1	B5	1367	G
1	B5	1369	A
1	B5	1370	G
1	B5	1373	C
1	B5	1376	G
1	B5	1380	G
1	B5	1405	U
1	B5	1407	G
1	B5	1409	C
1	B5	1421	G
1	B5	1425	G
1	B5	1437	U
1	B5	1448	A
1	B5	1457	A2M
1	B5	1470	A
1	B5	1487	A
1	B5	1489	C
1	B5	1501	U
1	B5	1514	U
1	B5	1519	U
1	B5	1547	G
1	B5	1548	OMG
1	B5	1554	A
1	B5	1556	G
1	B5	1557	A
1	B5	1561	A
1	B5	1563	C
1	B5	1564	G
1	B5	1565	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	1577	G
1	B5	1584	C
1	B5	1599	C
1	B5	1600	PSU
1	B5	1617	C
1	B5	1621	G
1	B5	1624	G
1	B5	1625	C
1	B5	1628	U
1	B5	1630	C
1	B5	1631	A
1	B5	1642	G
1	B5	1668	G
1	B5	1672	G
1	B5	1673	A
1	B5	1674	A
1	B5	1695	A
1	B5	1712	A
1	B5	1723	G
1	B5	1741	C
1	B5	1742	G
1	B5	1744	G
1	B5	1745	G
1	B5	1746	A
1	B5	1751	G
1	B5	1764	G
1	B5	1778	G
1	B5	1801	A
1	B5	1806	A
1	B5	1827	U
1	B5	1829	C
1	B5	1830	C
1	B5	1831	G
1	B5	1840	C
1	B5	1841	A
1	B5	1849	G
1	B5	1857	G
1	B5	1860	G
1	B5	1868	U
1	B5	1869	A
1	B5	1870	G
1	B5	1871	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	1879	A
1	B5	1883	U
1	B5	1886	C
1	B5	1893	A
1	B5	1906	U
1	B5	1907	A
1	B5	1910	G
1	B5	1911	A
1	B5	1913	U
1	B5	1934	A
1	B5	1935	A
1	B5	1951	A
1	B5	1955	G
1	B5	1957	U
1	B5	1964	G
1	B5	1978	A
1	B5	1993	C
1	B5	1994	G
1	B5	2001	C
1	B5	2002	G
1	B5	2003	G
1	B5	2006	C
1	B5	2010	G
1	B5	2038	C
1	B5	2049	C
1	B5	2050	G
1	B5	2054	G
1	B5	2062	G
1	B5	2063	G
1	B5	2064	G
1	B5	2065	G
1	B5	2097	G
1	B5	2100	OMC
1	B5	2113	OMG
1	B5	2144	A
1	B5	2147	U
1	B5	2166	A
1	B5	2170	G
1	B5	2174	U
1	B5	2218	C
1	B5	2219	C
1	B5	2220	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	2235	G
1	B5	2238	C
1	B5	2239	U
1	B5	2240	C
1	B5	2255	G
1	B5	2260	A
1	B5	2262	A
1	B5	2269	C
1	B5	2294	C
1	B5	2295	G
1	B5	2303	C
1	B5	2315	G
1	B5	2335	A
1	B5	2336	A
1	B5	2350	A
1	B5	2376	C
1	B5	2396	C
1	B5	2402	C
1	B5	2409	A
1	B5	2418	C
1	B5	2436	C
1	B5	2443	G
1	B5	2444	A
1	B5	2445	A
1	B5	2456	U
1	B5	2457	U
1	B5	2458	C
1	B5	2459	C
1	B5	2460	G
1	B5	2484	G
1	B5	2492	A
1	B5	2503	G
1	B5	2512	U
1	B5	2518	U
1	B5	2537	U
1	B5	2539	U
1	B5	2547	A
1	B5	2555	A
1	B5	2563	C
1	B5	2575	U
1	B5	2576	G
1	B5	2578	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	2604	G
1	B5	2651	G
1	B5	3073	A
1	B5	3074	G
1	B5	3092	G
1	B5	3094	G
1	B5	3095	C
1	B5	3103	G
1	B5	3112	A
1	B5	3121	U
1	B5	3125	A
1	B5	3139	A
1	B5	3172	PSU
1	B5	3186	U
1	B5	3187	G
1	B5	3188	A
1	B5	3189	A
1	B5	3190	U
1	B5	3192	PSU
1	B5	3237	A
1	B5	3238	C
1	B5	3239	U
1	B5	3243	A
1	B5	3250	U
1	B5	3251	A
1	B5	3254	G
1	B5	3262	A2M
1	B5	3288	G
1	B5	3291	U
1	B5	3294	A
1	B5	3296	G
1	B5	3315	U
1	B5	3316	G
1	B5	3317	U
1	B5	3321	U
1	B5	3328	U
1	B5	3354	A
1	B5	3355	C
1	B5	3356	G
1	B5	3374	G
1	B5	3375	G
1	B5	3378	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	3383	A
1	B5	3384	G
1	B5	3385	A
1	B5	3392	U
1	B5	3426	A
1	B5	3429	A
1	B5	3431	A
1	B5	3433	G
1	B5	3434	U
1	B5	3440	A
1	B5	3441	U
1	B5	3443	A
1	B5	3449	A
1	B5	3450	G
1	B5	3451	G
1	B5	3452	C
1	B5	3483	G
1	B5	3487	G
1	B5	3488	C
1	B5	3489	C
1	B5	3493	G
1	B5	3494	A
1	B5	3496	A
1	B5	3497	U
1	B5	3498	A
1	B5	3502	C
1	B5	3503	U
1	B5	3513	G
1	B5	3514	U
1	B5	3524	U
1	B5	3543	G
1	B5	3544	C
1	B5	3545	G
1	B5	3552	G
1	B5	3553	A
1	B5	3554	G
1	B5	3566	U
1	B5	3567	C
1	B5	3570	G
1	B5	3575	A
1	B5	3586	G
1	B5	3587	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	3588	G
1	B5	3589	C
1	B5	3593	G
1	B5	3601	C
1	B5	3605	C
1	B5	3606	U
1	B5	3613	A
1	B5	3626	G
1	B5	3627	G
1	B5	3634	G
1	B5	3646	A
1	B5	3664	C
1	B5	3668	G
1	B5	3672	U
1	B5	3676	A
1	B5	3694	C
1	B5	3697	G
1	B5	3709	G
1	B5	3711	A
1	B5	3714	A
1	B5	3716	A
1	B5	3724	A
1	B5	3732	U
1	B5	3734	G
1	B5	3747	A
1	B5	3748	G
1	B5	3757	C
1	B5	3772	G
1	B5	3773	G
1	B5	3775	C
1	B5	3792	C
1	B5	3793	U
1	B5	3794	U
1	B5	3797	U
1	B5	3816	G
1	B5	3819	A
1	B5	3820	G
1	B5	3821	A
1	B5	3823	A
1	B5	3830	C
1	B5	3834	G
1	B5	3837	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	3848	G
1	B5	3863	U
1	B5	3865	A
1	B5	3886	C
1	B5	3887	C
1	B5	3891	G
1	B5	3907	A
1	B5	3909	C
1	B5	3914	U
1	B5	3918	G
1	B5	3943	U
1	B5	3955	U
1	B5	3956	A
1	B5	3958	G
1	B5	3962	C
1	B5	3967	G
1	B5	3971	G
1	B5	3991	A
1	B5	3995	PSU
1	B5	4003	C
1	B5	4010	G
1	B5	4018	G
1	B5	4019	PSU
1	B5	4024	G
1	B5	4033	A
1	B5	4076	G
1	B5	4079	U
1	B5	4080	OMG
1	B5	4099	C
1	B5	4100	U
1	B5	4113	C
1	B5	4115	A
1	B5	4134	A
1	B5	4143	A
1	B5	4151	A
1	B5	4152	U
1	B5	4163	C
1	B5	4172	A
1	B5	4173	C
1	B5	4175	G
1	B5	4183	G
1	B5	4184	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	4185	G
1	B5	4186	G
1	B5	4187	C
1	B5	4188	G
1	B5	4194	G
1	B5	4197	G
1	B5	4200	U
1	B5	4202	G
1	B5	4204	G
1	B5	4208	G
1	B5	4215	G
1	B5	4216	C
1	B5	4219	C
1	B5	4225	U
1	B5	4231	G
1	B5	4232	G
1	B5	4242	G
1	B5	4243	C
1	B5	4254	U
1	B5	4255	C
1	B5	4266	C
1	B5	4267	C
1	B5	4268	G
1	B5	4272	C
1	B5	4273	G
1	B5	4277	A
1	B5	4278	C
1	B5	4281	A
1	B5	4285	G
1	B5	4286	G
1	B5	4288	G
1	B5	4296	U
1	B5	4297	C
1	B5	4314	A
1	B5	4315	U
1	B5	4316	G
1	B5	4330	C
1	B5	4334	G
1	B5	4337	A
1	B5	4347	U
1	B5	4360	U
1	B5	4361	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	4385	A
1	B5	4388	G
1	B5	4395	C
1	B5	4412	G
1	B5	4421	C
1	B5	4425	C
1	B5	4432	A
1	B5	4433	G
1	B5	4434	C
1	B5	4435	U
1	B5	4437	U
1	B5	4440	U
2	B8	34	U
2	B8	35	C
2	B8	59	A
2	B8	62	A
2	B8	63	U
2	B8	80	A
2	B8	81	C
2	B8	84	A
2	B8	87	G
2	B8	94	G
2	B8	103	A
2	B8	105	C
2	B8	110	U
2	B8	114	G
2	B8	122	G
2	B8	124	U
2	B8	125	C
2	B8	126	C
2	B8	151	G
3	B7	7	G
3	B7	33	U
3	B7	41	G
3	B7	50	A
3	B7	53	U
3	B7	54	A
3	B7	64	G
3	B7	110	G
3	B7	119	U
46	A2	3	C
46	A2	4	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	17	C
46	A2	33	G
46	A2	41	G
46	A2	44	U
46	A2	46	A
46	A2	56	G
46	A2	59	U
46	A2	67	C
46	A2	68	A
46	A2	73	C
46	A2	74	G
46	A2	76	U
46	A2	77	A
46	A2	79	A
46	A2	103	A
46	A2	113	G
46	A2	114	G
46	A2	115	U
46	A2	126	G
46	A2	128	U
46	A2	141	C
46	A2	142	U
46	A2	148	A
46	A2	154	G
46	A2	161	C
46	A2	162	U
46	A2	167	C
46	A2	174	A
46	A2	181	C
46	A2	183	A
46	A2	191	C
46	A2	193	U
46	A2	194	C
46	A2	196	G
46	A2	198	G
46	A2	206	G
46	A2	258	PSU
46	A2	259	A
46	A2	264	A
46	A2	266	C
46	A2	268	C
46	A2	269	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	271	G
46	A2	274	G
46	A2	281	C
46	A2	286	C
46	A2	287	C
46	A2	288	G
46	A2	289	U
46	A2	290	G
46	A2	291	G
46	A2	296	G
46	A2	308	G
46	A2	323	C
46	A2	325	A
46	A2	329	U
46	A2	330	C
46	A2	345	U
46	A2	346	G
46	A2	347	C
46	A2	361	C
46	A2	368	A
46	A2	370	C
46	A2	382	G
46	A2	399	G
46	A2	408	A
46	A2	409	A
46	A2	410	A
46	A2	411	C
46	A2	425	A
46	A2	432	G
46	A2	433	C
46	A2	434	A
46	A2	435	G
46	A2	443	G
46	A2	448	U
46	A2	453	C
46	A2	468	G
46	A2	477	A
46	A2	495	G
46	A2	497	A
46	A2	504	C
46	A2	508	G
46	A2	516	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	521	A
46	A2	524	G
46	A2	525	A
46	A2	531	C
46	A2	537	A
46	A2	546	C
46	A2	548	A
46	A2	550	G
46	A2	552	U
46	A2	553	C
46	A2	567	G
46	A2	569	C
46	A2	575	C
46	A2	578	G
46	A2	589	A
46	A2	592	U
46	A2	593	C
46	A2	604	A
46	A2	605	OMG
46	A2	616	A
46	A2	621	C
46	A2	629	A2M
46	A2	630	A
46	A2	632	A
46	A2	633	A
46	A2	634	G
46	A2	648	C
46	A2	656	C
46	A2	657	G
46	A2	659	G
46	A2	687	C
46	A2	690	C
46	A2	697	A
46	A2	698	G
46	A2	705	U
46	A2	706	C
46	A2	707	U
46	A2	709	U
46	A2	711	G
46	A2	712	G
46	A2	713	C
46	A2	716	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	717	C
46	A2	718	C
46	A2	747	G
46	A2	748	G
46	A2	755	A
46	A2	757	C
46	A2	758	G
46	A2	759	U
46	A2	761	U
46	A2	775	PSU
46	A2	781	G
46	A2	782	PSU
46	A2	790	A
46	A2	791	G
46	A2	796	G
46	A2	797	C
46	A2	799	G
46	A2	805	A
46	A2	826	G
46	A2	828	A
46	A2	829	U
46	A2	830	A
46	A2	831	G
46	A2	832	G
46	A2	837	C
46	A2	839	G
46	A2	840	U
46	A2	846	U
46	A2	849	G
46	A2	850	U
46	A2	857	U
46	A2	858	C
46	A2	860	G
46	A2	863	A
46	A2	865	G
46	A2	871	A
46	A2	872	U
46	A2	875	U
46	A2	878	A
46	A2	880	A
46	A2	888	C
46	A2	891	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	901	U
46	A2	928	G
46	A2	929	G
46	A2	948	A
46	A2	950	A
46	A2	975	U
46	A2	981	A
46	A2	1019	U
46	A2	1020	A
46	A2	1041	A
46	A2	1043	C
46	A2	1047	G
46	A2	1067	C
46	A2	1073	U
46	A2	1074	C
46	A2	1075	C
46	A2	1079	G
46	A2	1095	C
46	A2	1102	A
46	A2	1107	A
46	A2	1111	C
46	A2	1112	U
46	A2	1153	A
46	A2	1165	G
46	A2	1166	A
46	A2	1173	C
46	A2	1182	G
46	A2	1200	U
46	A2	1209	A
46	A2	1211	A
46	A2	1214	G
46	A2	1215	G
46	A2	1217	A
46	A2	1223	A
46	A2	1232	G
46	A2	1233	G
46	A2	1244	G
46	A2	1245	A
46	A2	1246	U
46	A2	1260	G
46	A2	1261	C
46	A2	1262	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	1270	G
46	A2	1278	G
46	A2	1300	U
46	A2	1306	G
46	A2	1315	A
46	A2	1316	U
46	A2	1329	U
46	A2	1330	U
46	A2	1336	A
46	A2	1340	A
46	A2	1355	U
46	A2	1360	A
46	A2	1361	C
46	A2	1363	A
46	A2	1364	G
46	A2	1377	C
46	A2	1381	C
46	A2	1382	G
46	A2	1391	C
46	A2	1392	C
46	A2	1393	A
46	A2	1394	A
46	A2	1409	A
46	A2	1418	U
46	A2	1419	C
46	A2	1420	A
46	A2	1435	A
46	A2	1441	A
46	A2	1444	A
46	A2	1445	OMG
46	A2	1449	U
46	A2	1452	G
46	A2	1464	U
46	A2	1476	C
46	A2	1488	A
46	A2	1503	U
46	A2	1535	A
46	A2	1543	A
46	A2	1555	G
46	A2	1556	A
46	A2	1561	G
46	A2	1576	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	A2	1578	A
46	A2	1609	G
46	A2	1619	A
46	A2	1620	G
46	A2	1626	G
46	A2	1653	C
46	A2	1676	U
46	A2	1677	G
46	A2	1699	G
46	A2	1738	G
46	A2	1739	U
46	A2	1769	A
46	A2	1783	G
46	A2	1785	A
46	A2	1789	A
46	A2	1790	G
46	A2	1792	U
46	A2	1803	G
46	A2	1815	G
46	A2	1816	G
46	A2	1817	A
46	A2	1818	U
46	A2	1819	C
80	V	9	A
80	V	10	G
80	V	13	C
80	V	16	U
80	V	17	U
80	V	18	G
80	V	19	G
80	V	20	G
80	V	23	A
80	V	47	U
80	V	59	U
80	V	74	C
80	V	76	A

All (36) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B5	216	C
1	B5	281	G

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Mol	Chain	Res	Type
1	B5	489	C
1	B5	503	G
1	B5	508	C
1	B5	583	C
1	B5	706	C
1	B5	712	G
1	B5	771	A
1	B5	777	G
1	B5	792	C
1	B5	1186	C
1	B5	1197	A
1	B5	1325	C
1	B5	1366	G
1	B5	1513	C
1	B5	1556	G
1	B5	1620	G
1	B5	1624	G
1	B5	1993	C
1	B5	2000	G
1	B5	2002	G
1	B5	2005	G
1	B5	2061	U
1	B5	2237	C
1	B5	3440	A
1	B5	3502	C
1	B5	3885	PSU
1	B5	4142	U
1	B5	4432	A
46	A2	796	G
46	A2	1305	U
46	A2	1418	U
46	A2	1737	C
80	V	8	U
80	V	58	A

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

145 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
1	PSU	B5	4019	1	18,21,22	0.75	1 (5%)	22,30,33	0.55	0
46	PSU	A2	1039	46	18,21,22	0.66	1 (5%)	22,30,33	0.66	0
46	OMG	A2	1286	46	18,26,27	0.92	1 (5%)	19,38,41	0.63	0
46	PSU	A2	93	46	18,21,22	0.52	0	22,30,33	0.56	0
1	PSU	B5	1769	1	18,21,22	0.50	0	22,30,33	0.59	0
46	6MZ	A2	1786	86,46	18,25,26	0.71	0	16,36,39	0.83	1 (6%)
1	OMG	B5	2173	1	18,26,27	0.97	2 (11%)	19,38,41	0.57	0
1	A2M	B5	4014	1	18,25,26	0.65	0	18,36,39	0.70	1 (5%)
1	OMC	B5	3899	1	19,22,23	0.30	0	26,31,34	0.40	0
46	A2M	A2	989	46	18,25,26	0.65	0	18,36,39	0.80	1 (5%)
1	OMU	B5	4063	1	19,22,23	0.33	0	26,31,34	0.67	0
1	OMG	B5	3639	1	18,26,27	0.99	3 (16%)	19,38,41	0.60	0
46	PSU	A2	647	46	18,21,22	1.50	5 (27%)	22,30,33	2.11	5 (22%)
1	PSU	B5	3742	1	18,21,22	0.53	0	22,30,33	0.57	0
46	4AC	A2	1295	46	21,24,25	0.34	0	29,34,37	0.41	0
1	OMG	B5	1241	86,1	18,26,27	1.03	3 (16%)	19,38,41	0.71	0
2	PSU	B8	55	2	18,21,22	0.49	0	22,30,33	0.60	0
1	PSU	B5	4071	1	18,21,22	0.53	0	22,30,33	0.56	0
1	PSU	B5	3736	1	18,21,22	0.53	0	22,30,33	0.57	0
1	A2M	B5	2564	1	18,25,26	0.66	0	18,36,39	0.70	1 (5%)
1	OMC	B5	3285	1	19,22,23	0.31	0	26,31,34	0.37	0
1	OMU	B5	3749	1	19,22,23	0.31	0	26,31,34	0.48	0
46	OMU	A2	171	46	19,22,23	0.27	0	26,31,34	0.63	0
1	PSU	B5	1652	1	18,21,22	0.48	0	22,30,33	0.58	0
1	PSU	B5	3739	1	18,21,22	0.47	0	22,30,33	0.62	0
1	OMG	B5	3221	1	18,26,27	0.96	3 (16%)	19,38,41	0.63	0
1	OMC	B5	3364	1	19,22,23	0.34	0	26,31,34	0.46	0
46	PSU	A2	1132	86,46	18,21,22	0.50	0	22,30,33	0.59	0
46	PSU	A2	258	46	18,21,22	0.53	0	22,30,33	0.61	0
1	OMG	B5	3104	1	18,26,27	0.96	3 (16%)	19,38,41	0.67	0
2	PSU	B8	69	86,2	18,21,22	0.54	0	22,30,33	0.63	1 (4%)
1	PSU	B5	3874	1	18,21,22	0.50	0	22,30,33	0.61	0
46	OMG	A2	1445	86,46	18,26,27	0.95	2 (11%)	19,38,41	0.57	0
1	1MA	B5	1247	86,1	16,25,26	0.84	1 (6%)	18,37,40	0.62	0
43	MLZ	Bo	53	43	8,9,10	0.70	0	4,9,11	0.57	0
46	OMU	A2	121	46	19,22,23	0.31	0	26,31,34	0.49	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
46	OMU	A2	389	46	19,22,23	0.28	0	26,31,34	0.46	0
78	SAC	AZ	2	78	7,8,9	0.96	0	8,9,11	0.80	0
1	OMU	B5	3402	1	19,22,23	0.33	0	26,31,34	0.53	0
1	A2M	B5	3201	1	18,25,26	0.66	0	18,36,39	0.72	1 (5%)
1	A2M	B5	3966	86,1	18,25,26	0.67	0	18,36,39	0.87	1 (5%)
73	AME	Au	1	73	9,10,11	0.48	0	9,11,13	0.82	1 (11%)
1	PSU	B5	3397	86,1	18,21,22	0.51	0	22,30,33	0.59	0
1	OMC	B5	3346	1	19,22,23	0.30	0	26,31,34	0.41	0
6	HIC	BB	245	6	8,11,12	1.59	2 (25%)	6,14,16	1.03	0
46	OMC	A2	478	46	19,22,23	0.31	0	26,31,34	0.39	0
1	PSU	B5	3995	1	18,21,22	0.50	0	22,30,33	0.64	0
46	OMG	A2	470	86,46	18,26,27	0.97	3 (16%)	19,38,41	0.63	0
1	OMC	B5	1265	1	19,22,23	0.29	0	26,31,34	0.45	0
1	OMG	B5	3376	1	18,26,27	1.00	3 (16%)	19,38,41	0.68	0
46	PSU	A2	642	46	18,21,22	0.52	0	22,30,33	0.62	0
1	OMU	B5	3670	1	19,22,23	0.33	0	26,31,34	0.46	0
1	PSU	B5	3172	1	18,21,22	0.48	0	22,30,33	0.63	0
1	PSU	B5	1606	86,1	18,21,22	0.52	0	22,30,33	0.61	0
1	A2M	B5	3302	1	18,25,26	0.66	0	18,36,39	0.78	1 (5%)
1	OMG	B5	1548	86,1	18,26,27	0.98	2 (11%)	19,38,41	0.63	0
1	OMG	B5	3835	1	18,26,27	0.93	3 (16%)	19,38,41	0.57	0
1	OMG	B5	4061	1	18,26,27	0.93	3 (16%)	19,38,41	0.67	0
1	OMG	B5	3942	1	18,26,27	0.98	3 (16%)	19,38,41	0.63	0
1	PSU	B5	3116	1	18,21,22	0.51	0	22,30,33	0.57	0
46	PSU	A2	821	46	18,21,22	0.54	0	22,30,33	0.54	0
1	PSU	B5	2257	1	18,21,22	0.47	0	22,30,33	0.61	0
1	OMU	B5	3941	86,1	19,22,23	0.30	0	26,31,34	0.44	0
46	A2M	A2	1341	46	18,25,26	0.66	0	18,36,39	0.82	1 (5%)
46	PSU	A2	774	46	18,21,22	0.53	0	22,30,33	0.55	0
1	A2M	B5	3344	1	18,25,26	0.66	0	18,36,39	0.74	1 (5%)
1	5MC	B5	3890	86,1	18,22,23	0.36	0	26,32,35	0.65	0
1	OMG	B5	2625	1	18,26,27	0.94	2 (11%)	19,38,41	0.58	0
46	MA6	A2	1805	46	18,26,27	0.75	0	19,38,41	0.73	0
1	OMC	B5	2553	1	19,22,23	0.30	0	26,31,34	0.39	0
1	OMC	B5	2610	1	19,22,23	0.28	0	26,31,34	0.34	0
1	A2M	B5	1447	1	18,25,26	0.65	0	18,36,39	0.76	1 (5%)
1	A2M	B5	1251	1	18,25,26	0.64	0	18,36,39	0.74	1 (5%)
46	PSU	A2	775	46	18,21,22	0.54	0	22,30,33	0.61	0
1	OMC	B5	3979	86,1	19,22,23	0.31	0	26,31,34	0.44	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	A2M	B5	2112	86,1	18,25,26	0.65	0	18,36,39	0.72	1 (5%)
1	PSU	B5	1771	1	18,21,22	0.47	0	22,30,33	0.58	0
1	PSU	B5	3900	1	18,21,22	0.53	0	22,30,33	0.58	0
46	A2M	A2	27	86,46	18,25,26	0.66	0	18,36,39	0.74	1 (5%)
46	A2M	A2	165	46	18,25,26	0.66	0	18,36,39	0.90	2 (11%)
46	A2M	A2	551	46	18,25,26	0.65	0	18,36,39	0.78	1 (5%)
1	OMC	B5	3178	86,1	19,22,23	0.26	0	26,31,34	0.50	0
1	PSU	B5	1600	86,1	18,21,22	0.85	1 (5%)	22,30,33	0.62	0
1	PSU	B5	4116	1	18,21,22	0.52	0	22,30,33	0.57	0
1	PSU	B5	4372	86,1	18,21,22	0.50	0	22,30,33	0.57	0
46	PSU	A2	610	46	18,21,22	0.49	0	22,30,33	0.61	0
1	PSU	B5	3885	1	18,21,22	0.45	0	22,30,33	0.89	0
46	MA6	A2	1804	46	18,26,27	0.75	0	19,38,41	0.71	0
46	OMG	A2	605	46	18,26,27	0.94	2 (11%)	19,38,41	0.72	0
1	PSU	B5	3114	86,1	18,21,22	0.47	0	22,30,33	0.59	0
1	A2M	B5	3307	1	18,25,26	0.66	0	18,36,39	0.78	1 (5%)
46	PSU	A2	109	86,46	18,21,22	0.54	0	22,30,33	0.56	0
1	OMU	B5	2586	1	19,22,23	0.33	0	26,31,34	0.55	0
1	OMG	B5	1445	1	18,26,27	0.95	3 (16%)	19,38,41	0.63	0
2	OMG	B8	75	2	18,26,27	0.96	3 (16%)	19,38,41	0.62	0
1	A2M	B5	401	1	18,25,26	0.65	0	18,36,39	0.71	1 (5%)
1	A2M	B5	1457	86,1	18,25,26	0.67	0	18,36,39	0.82	1 (5%)
1	OMC	B5	3318	1	19,22,23	0.30	0	26,31,34	0.40	0
46	A2M	A2	99	86,46	18,25,26	0.65	0	18,36,39	0.77	1 (5%)
46	A2M	A2	445	46	18,25,26	0.64	0	18,36,39	0.72	1 (5%)
1	A2M	B5	2536	1	18,25,26	0.66	0	18,36,39	0.89	1 (5%)
1	OMG	B5	4066	1	18,26,27	0.96	3 (16%)	19,38,41	0.70	0
1	PSU	B5	3975	1	18,21,22	0.56	0	22,30,33	0.55	0
1	PSU	B5	1700	1	18,21,22	0.46	0	22,30,33	0.68	0
1	OMG	B5	3937	1	18,26,27	1.00	3 (16%)	19,38,41	0.60	0
67	IAS	An	138	67	6,7,8	1.04	0	6,8,10	1.29	1 (16%)
1	PSU	B5	3796	1	18,21,22	0.50	0	22,30,33	0.56	0
1	A2M	B5	1780	86,1	18,25,26	0.65	0	18,36,39	0.88	1 (5%)
1	PSU	B5	3866	1	18,21,22	0.52	0	22,30,33	0.56	0
1	OMC	B5	2171	86,1	19,22,23	0.31	0	26,31,34	0.45	0
1	OMG	B5	4080	1	18,26,27	0.98	2 (11%)	19,38,41	0.62	0
1	PSU	B5	4132	1	18,21,22	0.52	0	22,30,33	0.62	0
1	A2M	B5	3262	1	18,25,26	0.64	0	18,36,39	0.85	1 (5%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
46	OMU	A2	315	46	19,22,23	0.32	0	26,31,34	0.58	0
46	OMG	A2	562	46	18,26,27	0.97	3 (16%)	19,38,41	0.59	0
1	OMG	B5	2113	1	18,26,27	0.93	3 (16%)	19,38,41	0.64	0
46	OMU	A2	1284	86,46	19,22,23	0.24	0	26,31,34	0.48	0
71	NMM	As	67	71	9,11,12	1.56	1 (11%)	6,12,14	4.10	2 (33%)
46	OMC	A2	1658	46	19,22,23	0.27	0	26,31,34	0.43	0
1	OMG	B5	3269	1	18,26,27	0.94	2 (11%)	19,38,41	0.58	0
46	B8N	A2	1206	46	24,29,30	0.57	0	29,42,45	0.64	0
1	A2M	B5	3195	1	18,25,26	0.67	0	18,36,39	0.75	1 (5%)
1	OMG	B5	3671	1	18,26,27	0.94	2 (11%)	19,38,41	0.74	0
1	UY1	B5	3295	86,1	19,22,23	0.49	0	22,31,34	0.56	0
1	PSU	B5	3804	1	18,21,22	0.49	0	22,30,33	0.61	0
1	A2M	B5	399	1	18,25,26	0.65	0	18,36,39	0.74	1 (5%)
1	PSU	B5	3964	86,1	18,21,22	0.53	0	22,30,33	0.59	0
46	A2M	A2	629	86,46	18,25,26	0.63	0	18,36,39	0.79	1 (5%)
1	OMG	B5	3813	1	18,26,27	0.95	3 (16%)	19,38,41	0.60	0
46	OMU	A2	116	46	19,22,23	0.28	0	26,31,34	0.42	0
1	PSU	B5	4343	86,1	18,21,22	0.50	0	22,30,33	0.57	0
46	PSU	A2	782	46	18,21,22	0.63	1 (5%)	22,30,33	0.67	1 (4%)
1	OMC	B5	2100	1	19,22,23	0.34	0	26,31,34	0.42	0
46	4AC	A2	1796	46	21,24,25	0.30	0	29,34,37	0.30	0
1	5MC	B5	3259	86,1	18,22,23	0.31	0	26,32,35	0.42	0
1	PSU	B5	1690	1	18,21,22	0.49	0	22,30,33	0.58	0
1	OMC	B5	1790	86,1	19,22,23	0.30	0	26,31,34	0.63	0
1	PSU	B5	3846	1	18,21,22	0.56	0	22,30,33	0.61	1 (4%)
1	6MZ	B5	3663	1	18,25,26	0.72	0	16,36,39	0.71	1 (6%)
46	OMG	A2	644	46	18,26,27	0.96	3 (16%)	19,38,41	0.68	0
1	PSU	B5	4022	1	18,21,22	0.53	0	22,30,33	0.59	0
82	DDE	A	715	82	14,20,21	0.48	0	14,28,30	0.57	0
1	PSU	B5	3755	1	18,21,22	0.49	0	22,30,33	0.58	0
1	UR3	B5	3973	1	19,22,23	0.31	0	26,32,35	0.30	0
1	PSU	B5	3192	1	18,21,22	0.55	0	22,30,33	0.59	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
1	PSU	B5	4019	1	-	2/7/25/26	0/2/2/2
46	PSU	A2	1039	46	-	1/7/25/26	0/2/2/2
46	OMG	A2	1286	46	-	0/5/27/28	0/3/3/3
46	PSU	A2	93	46	-	0/7/25/26	0/2/2/2
1	PSU	B5	1769	1	-	0/7/25/26	0/2/2/2
46	6MZ	A2	1786	86,46	-	0/5/27/28	0/3/3/3
1	OMG	B5	2173	1	-	0/5/27/28	0/3/3/3
1	A2M	B5	4014	1	-	0/5/27/28	0/3/3/3
1	OMC	B5	3899	1	-	0/9/27/28	0/2/2/2
46	A2M	A2	989	46	-	0/5/27/28	0/3/3/3
1	OMU	B5	4063	1	-	0/9/27/28	0/2/2/2
1	OMG	B5	3639	1	-	1/5/27/28	0/3/3/3
46	PSU	A2	647	46	-	0/7/25/26	0/2/2/2
1	PSU	B5	3742	1	-	0/7/25/26	0/2/2/2
46	4AC	A2	1295	46	-	2/11/29/30	0/2/2/2
1	OMG	B5	1241	86,1	-	0/5/27/28	0/3/3/3
2	PSU	B8	55	2	-	0/7/25/26	0/2/2/2
1	PSU	B5	4071	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	3736	1	-	0/7/25/26	0/2/2/2
1	A2M	B5	2564	1	-	0/5/27/28	0/3/3/3
1	OMC	B5	3285	1	-	0/9/27/28	0/2/2/2
1	OMU	B5	3749	1	-	0/9/27/28	0/2/2/2
46	OMU	A2	171	46	-	0/9/27/28	0/2/2/2
1	PSU	B5	1652	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	3739	1	-	0/7/25/26	0/2/2/2
1	OMG	B5	3221	1	-	0/5/27/28	0/3/3/3
1	OMC	B5	3364	1	-	0/9/27/28	0/2/2/2
46	PSU	A2	1132	86,46	-	0/7/25/26	0/2/2/2
46	PSU	A2	258	46	-	2/7/25/26	0/2/2/2
1	OMG	B5	3104	1	-	0/5/27/28	0/3/3/3
2	PSU	B8	69	86,2	-	0/7/25/26	0/2/2/2
1	PSU	B5	3874	1	-	0/7/25/26	0/2/2/2
46	OMG	A2	1445	86,46	-	1/5/27/28	0/3/3/3
1	1MA	B5	1247	86,1	-	0/3/25/26	0/3/3/3
43	MLZ	Bo	53	43	-	1/7/8/10	-
46	OMU	A2	121	46	-	0/9/27/28	0/2/2/2
46	OMU	A2	389	46	-	4/9/27/28	0/2/2/2
78	SAC	AZ	2	78	-	4/7/8/10	-
1	OMU	B5	3402	1	-	0/9/27/28	0/2/2/2
1	A2M	B5	3201	1	-	1/5/27/28	0/3/3/3
1	A2M	B5	3966	86,1	-	0/5/27/28	0/3/3/3
73	AME	Au	1	73	-	2/9/10/12	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	B5	3397	86,1	-	0/7/25/26	0/2/2/2
1	OMC	B5	3346	1	-	0/9/27/28	0/2/2/2
6	HIC	BB	245	6	-	0/5/6/8	0/1/1/1
46	OMC	A2	478	46	-	0/9/27/28	0/2/2/2
1	PSU	B5	3995	1	-	0/7/25/26	0/2/2/2
46	OMG	A2	470	86,46	-	1/5/27/28	0/3/3/3
1	OMC	B5	1265	1	-	0/9/27/28	0/2/2/2
1	OMG	B5	3376	1	-	0/5/27/28	0/3/3/3
46	PSU	A2	642	46	-	0/7/25/26	0/2/2/2
1	OMU	B5	3670	1	-	0/9/27/28	0/2/2/2
1	PSU	B5	3172	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	1606	86,1	-	0/7/25/26	0/2/2/2
1	A2M	B5	3302	1	-	0/5/27/28	0/3/3/3
1	OMG	B5	1548	86,1	-	1/5/27/28	0/3/3/3
1	OMG	B5	3835	1	-	0/5/27/28	0/3/3/3
1	OMG	B5	4061	1	-	0/5/27/28	0/3/3/3
1	OMG	B5	3942	1	-	0/5/27/28	0/3/3/3
1	PSU	B5	3116	1	-	0/7/25/26	0/2/2/2
46	PSU	A2	821	46	-	0/7/25/26	0/2/2/2
1	PSU	B5	2257	1	-	0/7/25/26	0/2/2/2
1	OMU	B5	3941	86,1	-	0/9/27/28	0/2/2/2
46	A2M	A2	1341	46	-	0/5/27/28	0/3/3/3
46	PSU	A2	774	46	-	0/7/25/26	0/2/2/2
1	A2M	B5	3344	1	-	1/5/27/28	0/3/3/3
1	5MC	B5	3890	86,1	-	3/7/25/26	0/2/2/2
1	OMG	B5	2625	1	-	0/5/27/28	0/3/3/3
46	MA6	A2	1805	46	-	1/7/29/30	0/3/3/3
1	OMC	B5	2553	1	-	0/9/27/28	0/2/2/2
1	OMC	B5	2610	1	-	0/9/27/28	0/2/2/2
1	A2M	B5	1447	1	-	0/5/27/28	0/3/3/3
1	A2M	B5	1251	1	-	0/5/27/28	0/3/3/3
46	PSU	A2	775	46	-	2/7/25/26	0/2/2/2
1	OMC	B5	3979	86,1	-	0/9/27/28	0/2/2/2
1	A2M	B5	2112	86,1	-	1/5/27/28	0/3/3/3
1	PSU	B5	1771	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	3900	1	-	0/7/25/26	0/2/2/2
46	A2M	A2	27	86,46	-	0/5/27/28	0/3/3/3
46	A2M	A2	165	46	-	0/5/27/28	0/3/3/3
46	A2M	A2	551	46	-	0/5/27/28	0/3/3/3
1	OMC	B5	3178	86,1	-	4/9/27/28	0/2/2/2
1	PSU	B5	1600	86,1	-	0/7/25/26	0/2/2/2
1	PSU	B5	4116	1	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	B5	4372	86,1	-	0/7/25/26	0/2/2/2
46	PSU	A2	610	46	-	0/7/25/26	0/2/2/2
1	PSU	B5	3885	1	-	0/7/25/26	0/2/2/2
46	MA6	A2	1804	46	-	0/7/29/30	0/3/3/3
46	OMG	A2	605	46	-	3/5/27/28	0/3/3/3
1	PSU	B5	3114	86,1	-	0/7/25/26	0/2/2/2
1	A2M	B5	3307	1	-	0/5/27/28	0/3/3/3
46	PSU	A2	109	86,46	-	0/7/25/26	0/2/2/2
1	OMU	B5	2586	1	-	0/9/27/28	0/2/2/2
1	OMG	B5	1445	1	-	0/5/27/28	0/3/3/3
2	OMG	B8	75	2	-	0/5/27/28	0/3/3/3
1	A2M	B5	401	1	-	0/5/27/28	0/3/3/3
1	A2M	B5	1457	86,1	-	2/5/27/28	0/3/3/3
1	OMC	B5	3318	1	-	0/9/27/28	0/2/2/2
46	A2M	A2	99	86,46	-	0/5/27/28	0/3/3/3
46	A2M	A2	445	46	-	0/5/27/28	0/3/3/3
1	A2M	B5	2536	1	-	1/5/27/28	0/3/3/3
1	OMG	B5	4066	1	-	0/5/27/28	0/3/3/3
1	PSU	B5	3975	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	1700	1	-	1/7/25/26	0/2/2/2
1	OMG	B5	3937	1	-	1/5/27/28	0/3/3/3
67	IAS	An	138	67	-	2/7/7/8	-
1	PSU	B5	3796	1	-	0/7/25/26	0/2/2/2
1	A2M	B5	1780	86,1	-	0/5/27/28	0/3/3/3
1	PSU	B5	3866	1	-	0/7/25/26	0/2/2/2
1	OMC	B5	2171	86,1	-	2/9/27/28	0/2/2/2
1	OMG	B5	4080	1	-	0/5/27/28	0/3/3/3
1	PSU	B5	4132	1	-	0/7/25/26	0/2/2/2
1	A2M	B5	3262	1	-	1/5/27/28	0/3/3/3
46	OMU	A2	315	46	-	0/9/27/28	0/2/2/2
46	OMG	A2	562	46	-	0/5/27/28	0/3/3/3
1	OMG	B5	2113	1	-	2/5/27/28	0/3/3/3
46	OMU	A2	1284	86,46	-	0/9/27/28	0/2/2/2
71	NMM	As	67	71	-	4/9/11/13	-
46	OMC	A2	1658	46	-	0/9/27/28	0/2/2/2
1	OMG	B5	3269	1	-	0/5/27/28	0/3/3/3
46	B8N	A2	1206	46	-	3/16/34/35	0/2/2/2
1	A2M	B5	3195	1	-	0/5/27/28	0/3/3/3
1	OMG	B5	3671	1	-	1/5/27/28	0/3/3/3
1	UY1	B5	3295	86,1	-	2/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	B5	3804	1	-	0/7/25/26	0/2/2/2
1	A2M	B5	399	1	-	1/5/27/28	0/3/3/3
1	PSU	B5	3964	86,1	-	2/7/25/26	0/2/2/2
46	A2M	A2	629	86,46	-	3/5/27/28	0/3/3/3
1	OMG	B5	3813	1	-	2/5/27/28	0/3/3/3
46	OMU	A2	116	46	-	0/9/27/28	0/2/2/2
1	PSU	B5	4343	86,1	-	0/7/25/26	0/2/2/2
46	PSU	A2	782	46	-	0/7/25/26	0/2/2/2
1	OMC	B5	2100	1	-	3/9/27/28	0/2/2/2
46	4AC	A2	1796	46	-	0/11/29/30	0/2/2/2
1	5MC	B5	3259	86,1	-	0/7/25/26	0/2/2/2
1	PSU	B5	1690	1	-	0/7/25/26	0/2/2/2
1	OMC	B5	1790	86,1	-	0/9/27/28	0/2/2/2
1	PSU	B5	3846	1	-	0/7/25/26	0/2/2/2
1	6MZ	B5	3663	1	-	0/5/27/28	0/3/3/3
46	OMG	A2	644	46	-	1/5/27/28	0/3/3/3
1	PSU	B5	4022	1	-	0/7/25/26	0/2/2/2
82	DDE	A	715	82	-	6/20/21/23	0/1/1/1
1	PSU	B5	3755	1	-	0/7/25/26	0/2/2/2
1	UR3	B5	3973	1	-	0/7/25/26	0/2/2/2
1	PSU	B5	3192	1	-	2/7/25/26	0/2/2/2

All (81) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
71	As	67	NMM	CZ-NH2	4.16	1.44	1.34
6	BB	245	HIC	CD2-CG	3.40	1.41	1.36
46	A2	647	PSU	C4-N3	-3.24	1.32	1.38
1	B5	1600	PSU	O4'-C1'	-3.21	1.39	1.43
1	B5	1241	OMG	C5-C6	-2.53	1.42	1.47
1	B5	3942	OMG	C5-C6	-2.47	1.42	1.47
1	B5	3937	OMG	C5-C6	-2.47	1.42	1.47
46	A2	1445	OMG	C5-C6	-2.46	1.42	1.47
1	B5	2173	OMG	C5-C6	-2.44	1.42	1.47
1	B5	4019	PSU	O4'-C1'	-2.43	1.40	1.43
1	B5	1548	OMG	C5-C6	-2.42	1.42	1.47
46	A2	1039	PSU	O4'-C1'	-2.41	1.40	1.43
1	B5	4080	OMG	C5-C6	-2.40	1.42	1.47
1	B5	3639	OMG	C5-C6	-2.37	1.42	1.47
1	B5	3221	OMG	C5-C6	-2.36	1.42	1.47
46	A2	562	OMG	C5-C6	-2.36	1.42	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B5	3269	OMG	C5-C6	-2.29	1.42	1.47
46	A2	470	OMG	C5-C6	-2.29	1.42	1.47
46	A2	647	PSU	C2-N3	-2.29	1.33	1.37
46	A2	647	PSU	C6-C5	2.28	1.38	1.35
46	A2	782	PSU	O4'-C1'	-2.27	1.40	1.43
46	A2	644	OMG	C5-C6	-2.27	1.42	1.47
1	B5	2625	OMG	C5-C6	-2.26	1.42	1.47
1	B5	3376	OMG	C8-N7	-2.25	1.31	1.35
1	B5	1445	OMG	C5-C6	-2.25	1.42	1.47
46	A2	647	PSU	C2-N1	-2.24	1.33	1.36
1	B5	3104	OMG	C5-C6	-2.24	1.42	1.47
2	B8	75	OMG	C5-C6	-2.23	1.42	1.47
1	B5	3376	OMG	C5-C6	-2.23	1.42	1.47
1	B5	1241	OMG	C8-N7	-2.22	1.31	1.35
46	A2	1286	OMG	C5-C6	-2.22	1.42	1.47
1	B5	3639	OMG	C8-N7	-2.22	1.31	1.35
1	B5	2625	OMG	C8-N7	-2.22	1.31	1.35
1	B5	3937	OMG	C8-N7	-2.21	1.31	1.35
1	B5	3671	OMG	C5-C6	-2.20	1.42	1.47
1	B5	3835	OMG	C5-C6	-2.20	1.42	1.47
1	B5	4080	OMG	C8-N7	-2.20	1.31	1.35
1	B5	4066	OMG	C5-C6	-2.19	1.43	1.47
1	B5	1548	OMG	C8-N7	-2.18	1.31	1.35
46	A2	562	OMG	C8-N7	-2.17	1.31	1.35
1	B5	2173	OMG	C8-N7	-2.16	1.31	1.35
1	B5	3376	OMG	C5-C4	-2.16	1.37	1.43
1	B5	3813	OMG	C5-C6	-2.15	1.43	1.47
1	B5	1247	1MA	C8-N7	-2.15	1.31	1.35
1	B5	2113	OMG	C5-C4	-2.14	1.37	1.43
1	B5	4061	OMG	C5-C6	-2.14	1.43	1.47
1	B5	3639	OMG	C5-C4	-2.13	1.37	1.43
1	B5	3813	OMG	C8-N7	-2.13	1.31	1.35
46	A2	605	OMG	C5-C4	-2.12	1.37	1.43
2	B8	75	OMG	C8-N7	-2.11	1.31	1.35
46	A2	470	OMG	C8-N7	-2.11	1.31	1.35
46	A2	644	OMG	C5-C4	-2.11	1.37	1.43
1	B5	1241	OMG	C5-C4	-2.10	1.37	1.43
1	B5	3269	OMG	C8-N7	-2.10	1.31	1.35
46	A2	470	OMG	C5-C4	-2.10	1.37	1.43
1	B5	3813	OMG	C5-C4	-2.09	1.37	1.43
1	B5	3671	OMG	C5-C4	-2.09	1.37	1.43
46	A2	605	OMG	C8-N7	-2.09	1.31	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	A2	647	PSU	C2'-C1'	-2.08	1.51	1.53
6	BB	245	HIC	CZ-NE2	-2.08	1.42	1.48
1	B5	3835	OMG	C8-N7	-2.08	1.31	1.35
1	B5	4066	OMG	C8-N7	-2.06	1.31	1.35
1	B5	2113	OMG	C5-C6	-2.06	1.43	1.47
2	B8	75	OMG	C5-C4	-2.06	1.37	1.43
1	B5	2113	OMG	C8-N7	-2.05	1.31	1.35
1	B5	3104	OMG	C8-N7	-2.04	1.31	1.35
1	B5	3942	OMG	C8-N7	-2.04	1.31	1.35
1	B5	4061	OMG	C8-N7	-2.04	1.31	1.35
1	B5	3221	OMG	C8-N7	-2.04	1.31	1.35
46	A2	644	OMG	C8-N7	-2.03	1.31	1.35
1	B5	3942	OMG	C5-C4	-2.03	1.37	1.43
1	B5	3104	OMG	C5-C4	-2.03	1.37	1.43
1	B5	1445	OMG	C8-N7	-2.03	1.31	1.35
1	B5	1445	OMG	C5-C4	-2.02	1.37	1.43
46	A2	1445	OMG	C8-N7	-2.02	1.31	1.35
1	B5	3835	OMG	C5-C4	-2.02	1.37	1.43
1	B5	4066	OMG	C5-C4	-2.01	1.37	1.43
1	B5	3937	OMG	C5-C4	-2.01	1.37	1.43
1	B5	4061	OMG	C5-C4	-2.01	1.38	1.43
46	A2	562	OMG	C5-C4	-2.01	1.38	1.43
1	B5	3221	OMG	C5-C4	-2.00	1.38	1.43

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
71	As	67	NMM	NE-CZ-NH2	-8.97	111.26	119.48
46	A2	647	PSU	N1-C2-N3	6.48	122.47	115.13
46	A2	647	PSU	C4-N3-C2	-4.44	119.95	126.34
71	As	67	NMM	NE-CZ-NH1	4.25	128.22	120.26
46	A2	647	PSU	O2-C2-N1	-3.64	118.78	122.79
46	A2	647	PSU	C3'-C2'-C1'	2.80	104.90	101.64
46	A2	1786	6MZ	C2-N1-C6	2.57	118.80	116.59
67	An	138	IAS	OD1-CG-CB	-2.40	118.42	125.43
46	A2	629	A2M	C5-C6-N6	2.40	123.99	120.35
46	A2	989	A2M	C5-C6-N6	2.37	123.96	120.35
1	B5	2112	A2M	C5-C6-N6	2.37	123.95	120.35
46	A2	27	A2M	C5-C6-N6	2.34	123.91	120.35
1	B5	1457	A2M	C5-C6-N6	2.34	123.91	120.35
1	B5	401	A2M	C5-C6-N6	2.33	123.89	120.35
1	B5	3307	A2M	C5-C6-N6	2.33	123.89	120.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B5	3195	A2M	C5-C6-N6	2.33	123.89	120.35
46	A2	445	A2M	C5-C6-N6	2.32	123.88	120.35
1	B5	3201	A2M	C5-C6-N6	2.32	123.88	120.35
1	B5	2536	A2M	C5-C6-N6	2.31	123.87	120.35
46	A2	551	A2M	C5-C6-N6	2.31	123.87	120.35
73	Au	1	AME	O-C-CA	-2.31	118.72	124.78
1	B5	399	A2M	C5-C6-N6	2.31	123.86	120.35
1	B5	1780	A2M	C5-C6-N6	2.31	123.86	120.35
1	B5	1447	A2M	C5-C6-N6	2.30	123.85	120.35
46	A2	165	A2M	C5-C6-N6	2.30	123.85	120.35
1	B5	3302	A2M	C5-C6-N6	2.30	123.84	120.35
46	A2	99	A2M	C5-C6-N6	2.29	123.84	120.35
46	A2	1341	A2M	C5-C6-N6	2.29	123.84	120.35
1	B5	3966	A2M	C5-C6-N6	2.29	123.83	120.35
1	B5	2564	A2M	C5-C6-N6	2.29	123.83	120.35
1	B5	4014	A2M	C5-C6-N6	2.28	123.82	120.35
1	B5	1251	A2M	C5-C6-N6	2.27	123.80	120.35
46	A2	647	PSU	C5-C6-N1	-2.27	118.71	122.11
1	B5	3344	A2M	C5-C6-N6	2.26	123.79	120.35
1	B5	3262	A2M	C5-C6-N6	2.25	123.77	120.35
2	B8	69	PSU	O4'-C1'-C2'	2.21	108.26	105.14
46	A2	782	PSU	O4'-C1'-C2'	2.16	108.19	105.14
1	B5	3663	6MZ	C2-N1-C6	2.09	118.38	116.59
1	B5	3846	PSU	O4'-C1'-C2'	2.08	108.07	105.14
46	A2	165	A2M	C2'-C3'-C4'	-2.00	97.64	101.99

There are no chirality outliers.

All (80) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	B5	399	A2M	C1'-C2'-O2'-CM'
1	B5	2536	A2M	C1'-C2'-O2'-CM'
1	B5	3178	OMC	C2'-C1'-N1-C6
1	B5	3192	PSU	C3'-C4'-C5'-O5'
1	B5	3201	A2M	C1'-C2'-O2'-CM'
1	B5	3639	OMG	C1'-C2'-O2'-CM2
1	B5	4019	PSU	C3'-C4'-C5'-O5'
1	B5	4019	PSU	O4'-C4'-C5'-O5'
46	A2	258	PSU	C3'-C4'-C5'-O5'
46	A2	258	PSU	O4'-C4'-C5'-O5'
46	A2	470	OMG	C1'-C2'-O2'-CM2
46	A2	775	PSU	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
46	A2	775	PSU	O4'-C4'-C5'-O5'
78	AZ	2	SAC	N-CA-CB-OG
78	AZ	2	SAC	C-CA-CB-OG
82	A	715	DDE	CAU-CAT-CE1-NE2
82	A	715	DDE	CBI-CBW-NCB-CAA
46	A2	1206	B8N	O4'-C4'-C5'-O5'
46	A2	1206	B8N	C3'-C4'-C5'-O5'
46	A2	1206	B8N	N3-C31-C32-C33
71	As	67	NMM	C-CA-CB-CG
71	As	67	NMM	N-CA-CB-CG
71	As	67	NMM	O-C-CA-CB
1	B5	2113	OMG	O4'-C4'-C5'-O5'
1	B5	3192	PSU	O4'-C4'-C5'-O5'
46	A2	605	OMG	O4'-C4'-C5'-O5'
73	Au	1	AME	CT2-CT1-N-CA
73	Au	1	AME	OT-CT1-N-CA
71	As	67	NMM	NE-CD-CG-CB
1	B5	3178	OMC	C2'-C1'-N1-C2
1	B5	2113	OMG	C3'-C4'-C5'-O5'
46	A2	605	OMG	C3'-C4'-C5'-O5'
1	B5	1548	OMG	C3'-C2'-O2'-CM2
46	A2	389	OMU	C2'-C1'-N1-C6
46	A2	629	A2M	O4'-C4'-C5'-O5'
1	B5	2171	OMC	O4'-C4'-C5'-O5'
1	B5	2171	OMC	C3'-C4'-C5'-O5'
67	An	138	IAS	CA-CB-CG-OD1
1	B5	3937	OMG	C3'-C2'-O2'-CM2
46	A2	1295	4AC	O7-C7-N4-C4
46	A2	1295	4AC	CM7-C7-N4-C4
1	B5	1457	A2M	C4'-C5'-O5'-P
1	B5	3813	OMG	C1'-C2'-O2'-CM2
1	B5	3890	5MC	O4'-C1'-N1-C6
46	A2	1805	MA6	C4'-C5'-O5'-P
82	A	715	DDE	CAU-CBW-NCB-CAA
43	Bo	53	MLZ	CG-CD-CE-NZ
78	AZ	2	SAC	C-CA-N-C1A
78	AZ	2	SAC	CB-CA-N-C1A
1	B5	3813	OMG	C3'-C2'-O2'-CM2
1	B5	3178	OMC	O4'-C1'-N1-C6
46	A2	389	OMU	O4'-C1'-N1-C6
46	A2	389	OMU	C2'-C1'-N1-C2
1	B5	3890	5MC	C2'-C1'-N1-C6

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Mol	Chain	Res	Type	Atoms
1	B5	3178	OMC	O4'-C1'-N1-C2
46	A2	1445	OMG	C4'-C5'-O5'-P
1	B5	3295	UY1	C4'-C5'-O5'-P
46	A2	629	A2M	C3'-C4'-C5'-O5'
46	A2	605	OMG	C4'-C5'-O5'-P
82	A	715	DDE	CAT-CAU-CBW-NCB
82	A	715	DDE	NAD-CBI-CBW-NCB
1	B5	3890	5MC	O4'-C1'-N1-C2
46	A2	389	OMU	O4'-C1'-N1-C2
67	An	138	IAS	N-CA-CB-CG
1	B5	3964	PSU	O4'-C1'-C5-C4
1	B5	3295	UY1	O4'-C1'-C5-C4
46	A2	1039	PSU	C4'-C5'-O5'-P
1	B5	2100	OMC	C2'-C1'-N1-C6
1	B5	1457	A2M	O4'-C4'-C5'-O5'
82	A	715	DDE	CBI-CBW-NCB-CAC
46	A2	644	OMG	O4'-C4'-C5'-O5'
1	B5	3344	A2M	C3'-C4'-C5'-O5'
46	A2	629	A2M	C1'-C2'-O2'-CM'
1	B5	1700	PSU	O4'-C4'-C5'-O5'
1	B5	3964	PSU	O4'-C1'-C5-C6
1	B5	2100	OMC	C2'-C1'-N1-C2
1	B5	2100	OMC	O4'-C4'-C5'-O5'
1	B5	2112	A2M	C3'-C2'-O2'-CM'
1	B5	3671	OMG	C3'-C2'-O2'-CM2
1	B5	3262	A2M	O4'-C4'-C5'-O5'

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 501 ligands modelled in this entry, 500 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The

Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
88	GDP	A	901	-	24,30,30	0.87	1 (4%)	30,47,47	0.89	1 (3%)

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	GDP	A	901	-	-	1/12/32/32	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
88	A	901	GDP	C5-C6	-2.11	1.43	1.47

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
88	A	901	GDP	PA-O3A-PB	3.35	144.33	132.83

There are no chirality outliers.

All (1) torsion outliers are listed below:

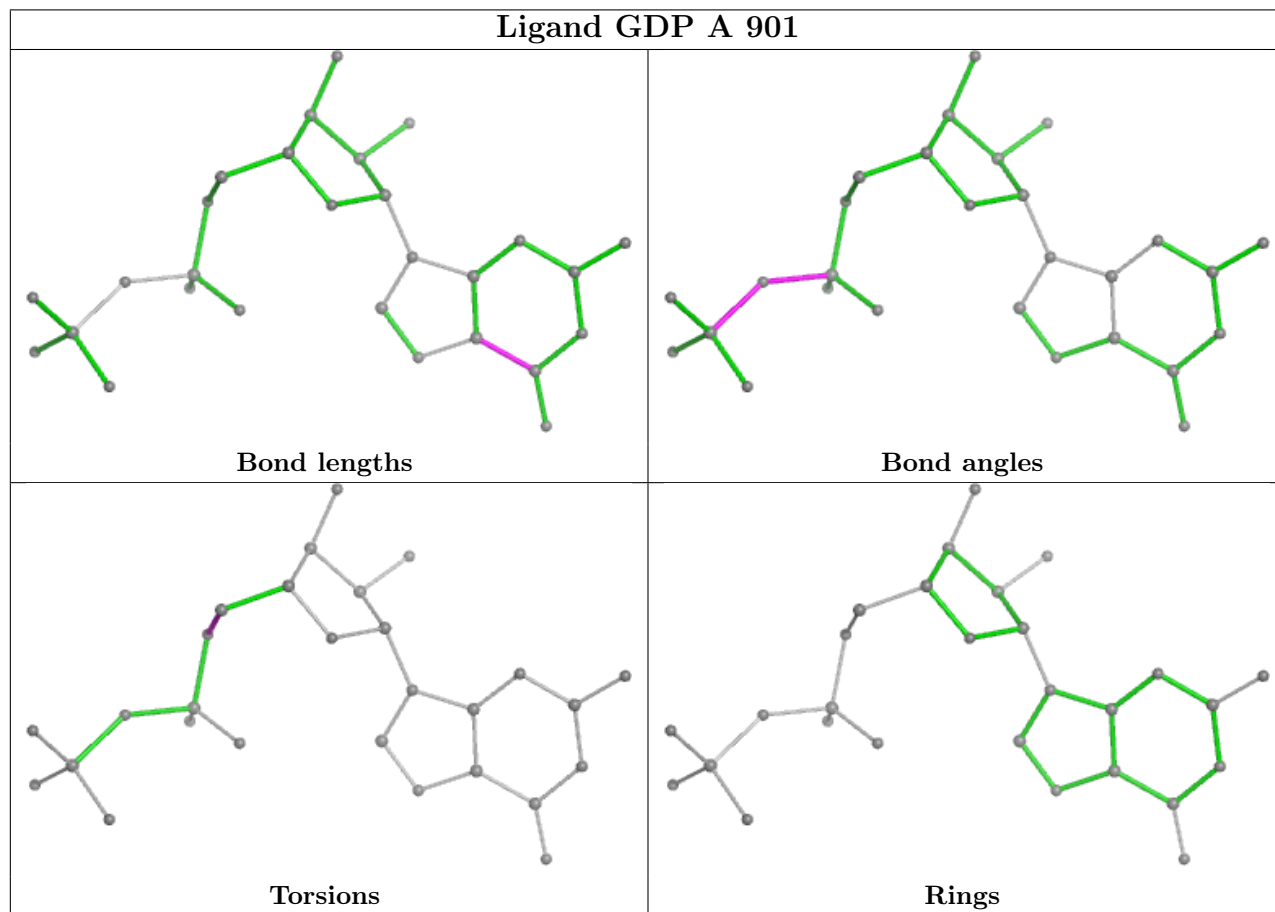
Mol	Chain	Res	Type	Atoms
88	A	901	GDP	C4'-C5'-O5'-PA

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

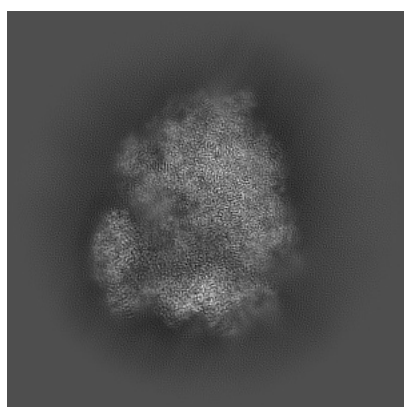
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-18169. These allow visual inspection of the internal detail of the map and identification of artifacts.

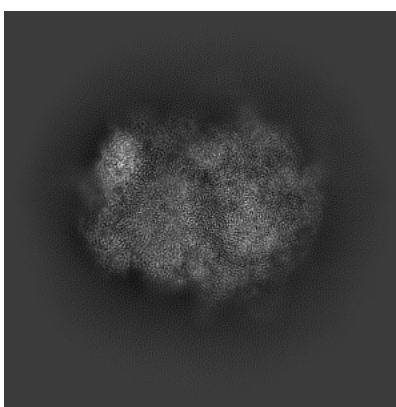
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

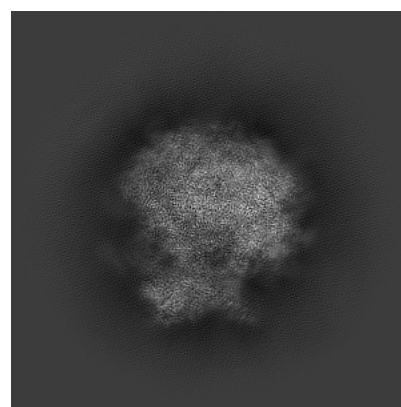
#### 6.1.1 Primary map



X



Y

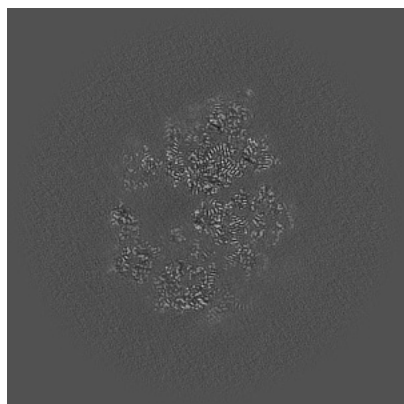


Z

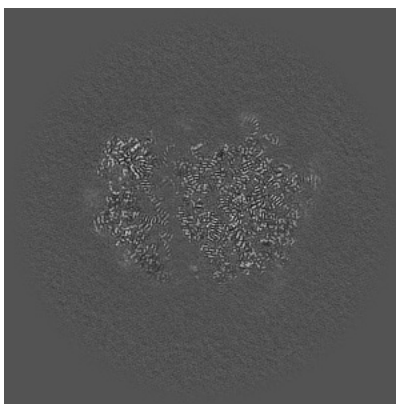
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

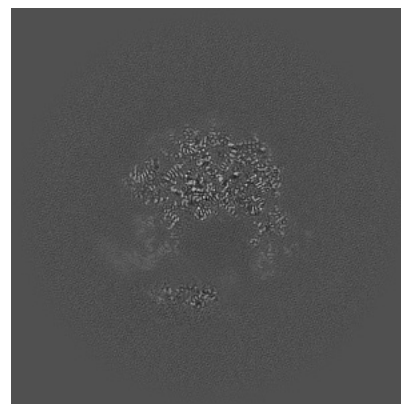
#### 6.2.1 Primary map



X Index: 290



Y Index: 290

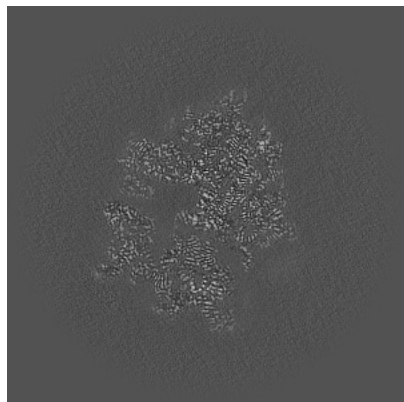


Z Index: 290

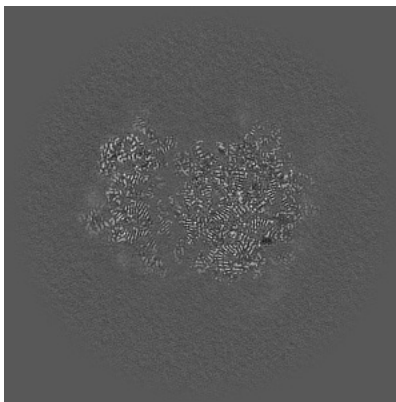
The images above show central slices of the map in three orthogonal directions.

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

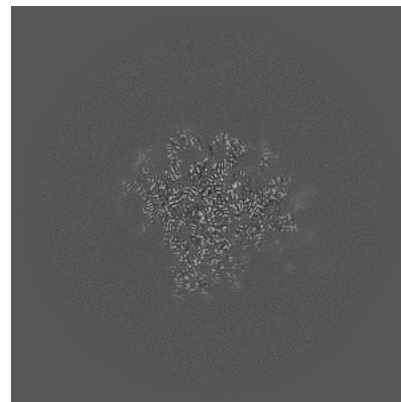
### 6.3.1 Primary map



X Index: 270



Y Index: 298

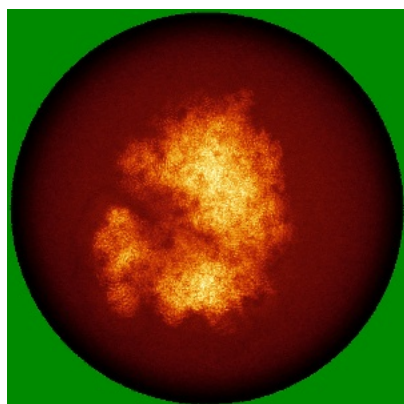


Z Index: 348

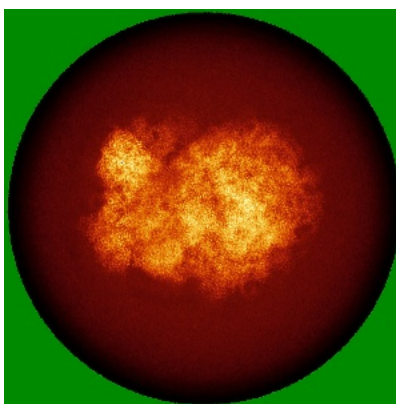
The images above show the largest variance slices of the map in three orthogonal directions.

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

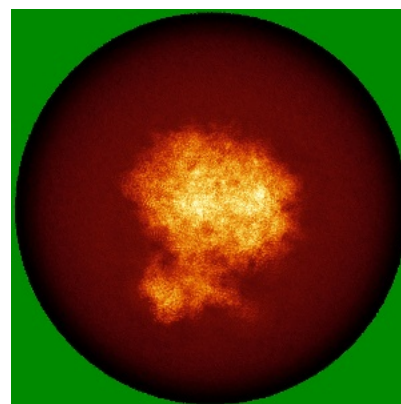
### 6.4.1 Primary map



X



Y



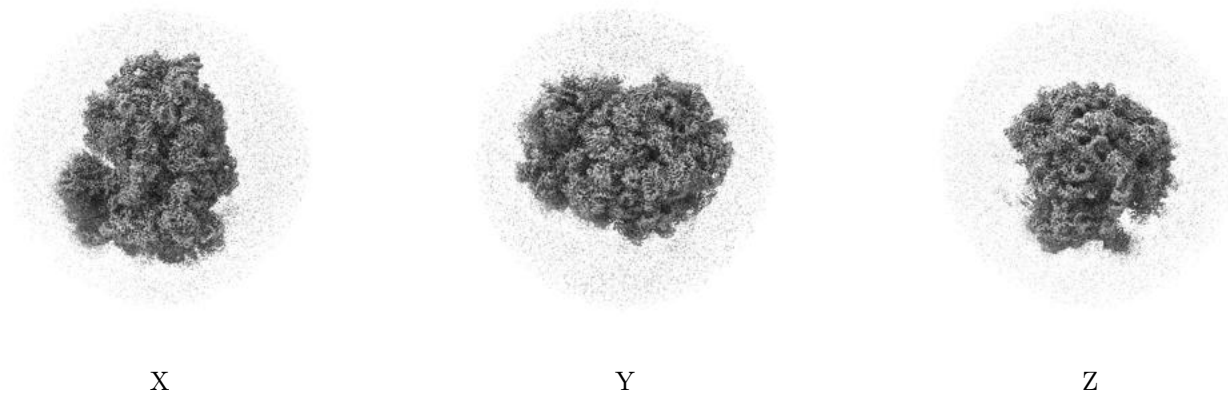
Z

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



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

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 3.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

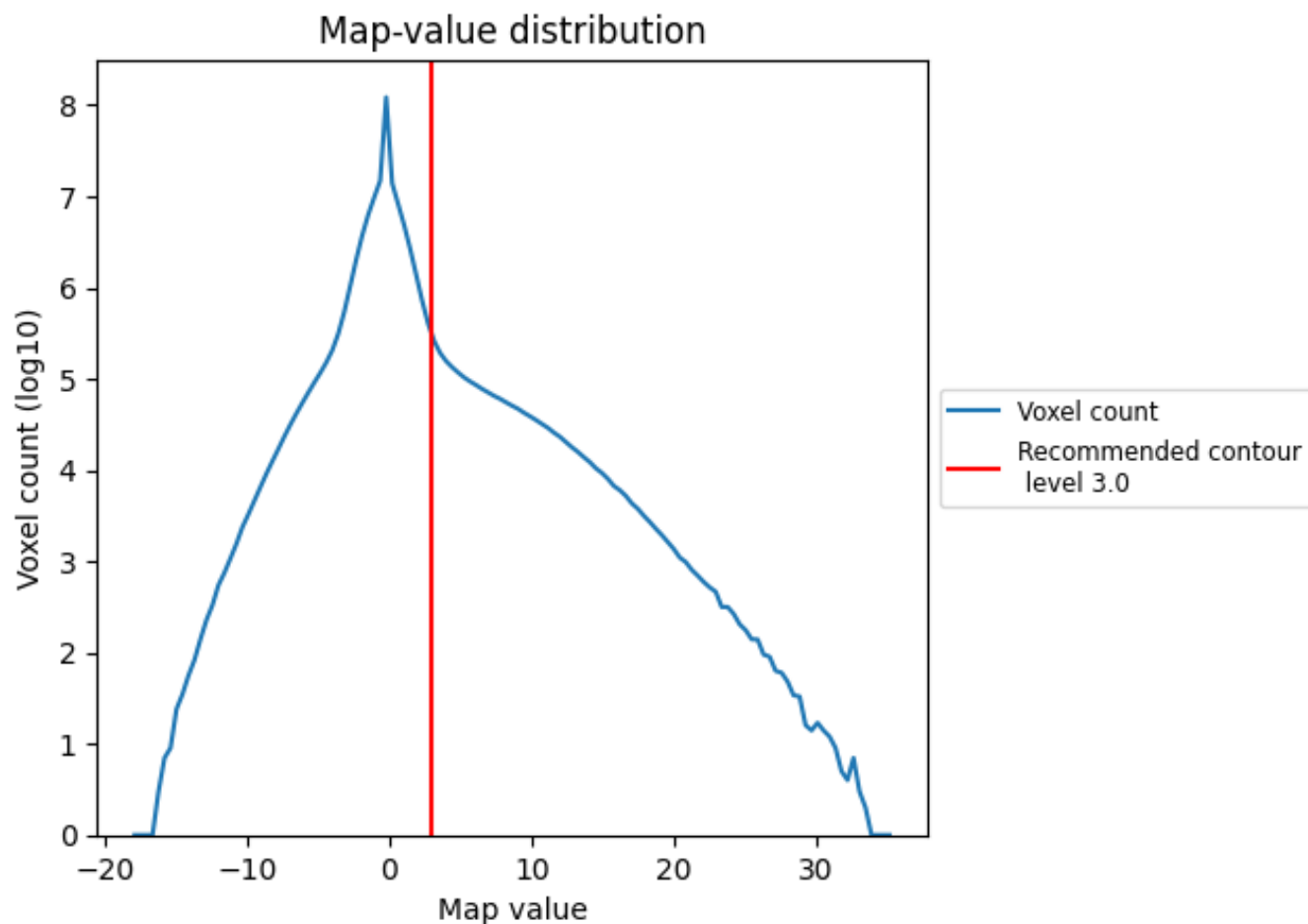
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

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

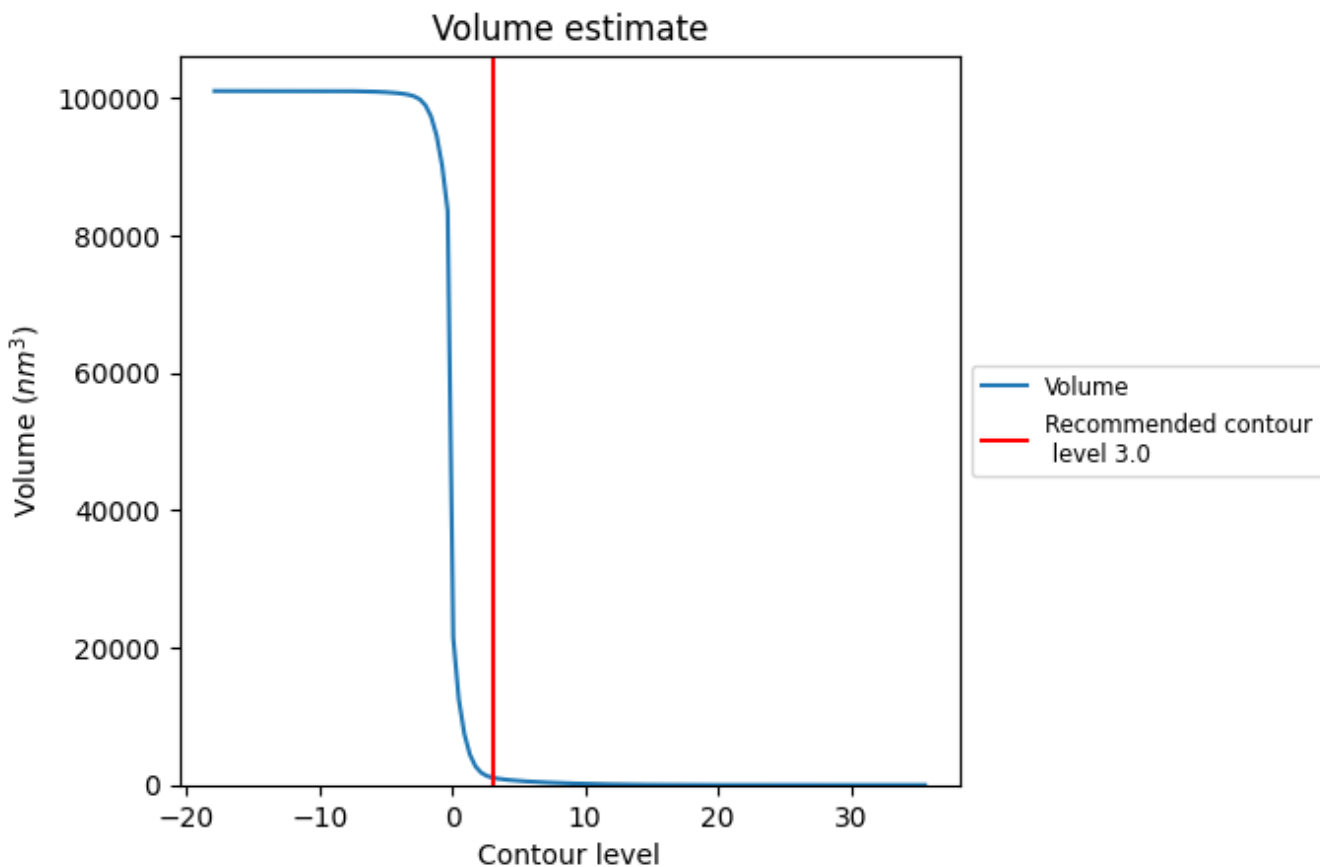
### 7.1 Map-value distribution [i](#)



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



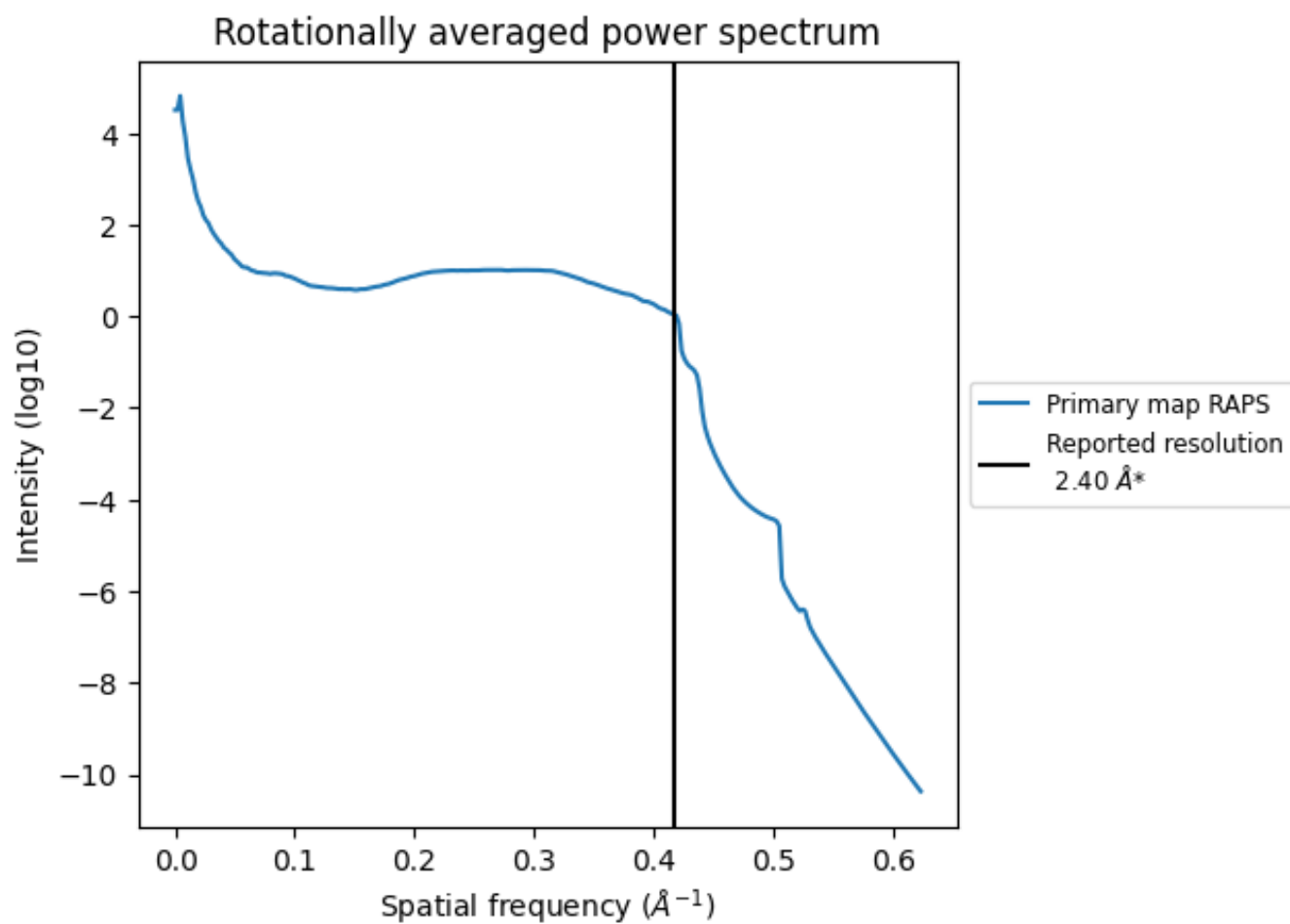
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1075  $\text{nm}^3$ ; this corresponds to an approximate mass of 971 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum [\(i\)](#)



\*Reported resolution corresponds to spatial frequency of  $0.417 \text{\AA}^{-1}$

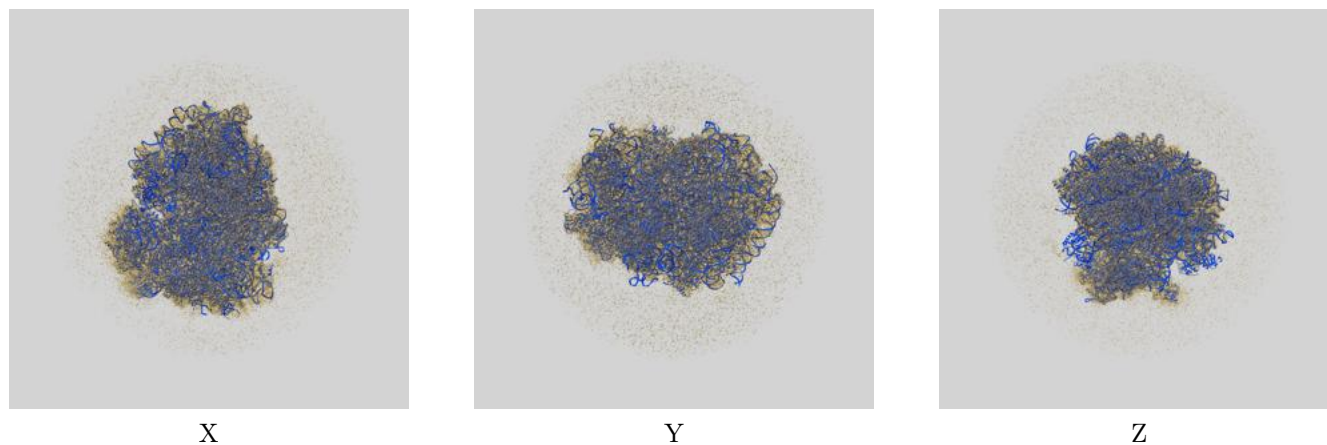
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

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

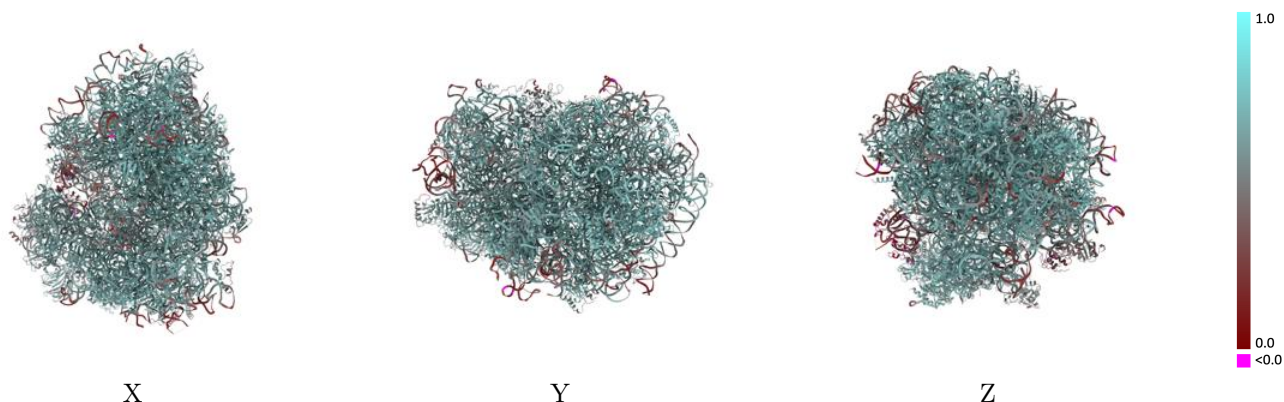
This section contains information regarding the fit between EMDB map EMD-18169 and PDB model 8Q87. Per-residue inclusion information can be found in section [3](#) on page [25](#).

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



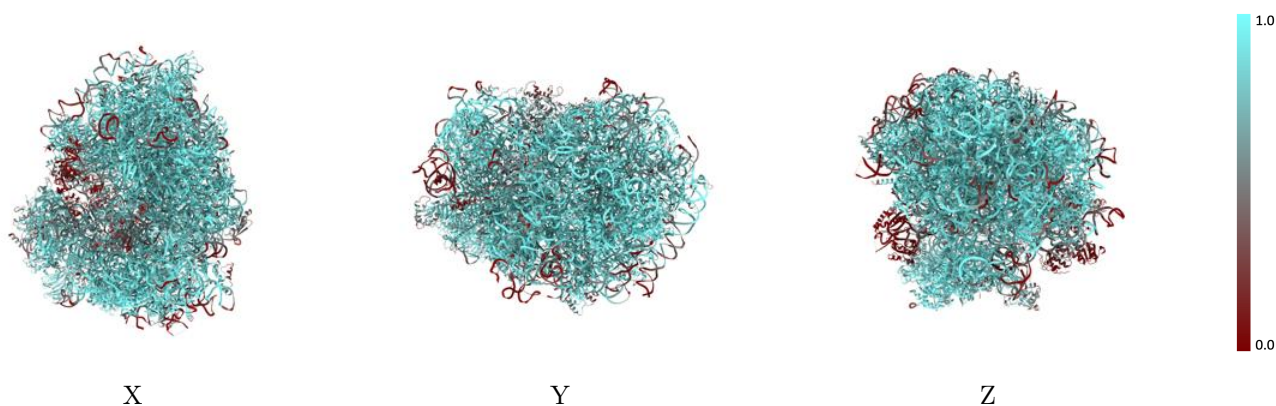
The images above show the 3D surface view of the map at the recommended contour level 3.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



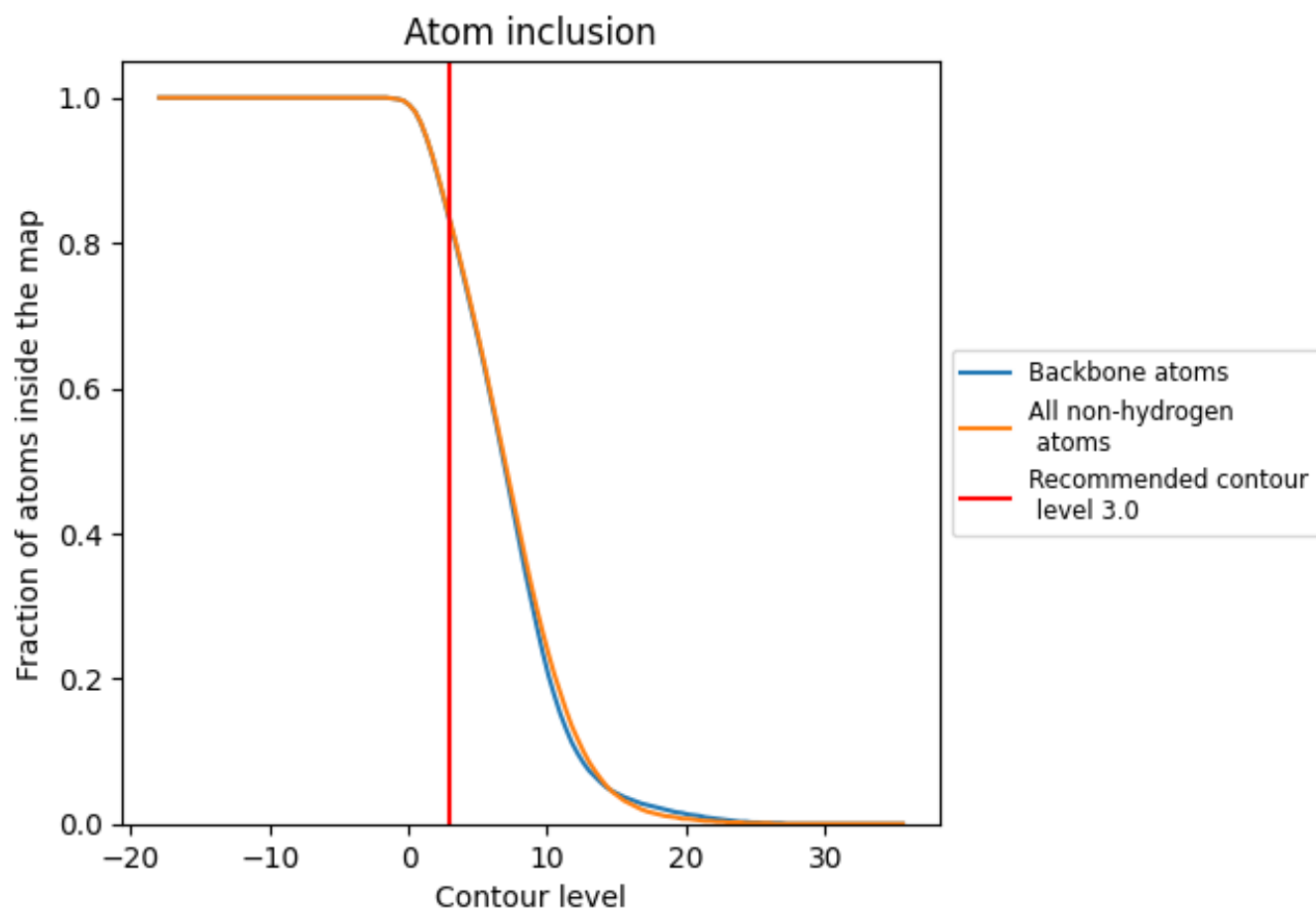
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (3.0).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 83% 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 (3.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8320	 0.6210
A	 0.5550	 0.5490
A2	 0.8430	 0.6100
AA	 0.7770	 0.5950
AB	 0.6130	 0.5490
AC	 0.5290	 0.4900
AD	 0.6680	 0.5920
AE	 0.7950	 0.6360
AF	 0.8910	 0.6120
AG	 0.9460	 0.6720
AZ	 0.9240	 0.6550
Aa	 0.7530	 0.5970
Ab	 0.9070	 0.6600
Ac	 0.8050	 0.6120
Ad	 0.9730	 0.6610
Ae	 0.8900	 0.6330
Af	 0.7970	 0.5950
Ag	 0.6480	 0.5430
Ah	 0.8140	 0.6110
Ai	 0.9560	 0.6540
Aj	 0.9380	 0.6270
Ak	 0.8510	 0.6340
Al	 0.5210	 0.4410
Am	 0.8190	 0.6330
An	 0.7150	 0.6000
Ao	 0.8360	 0.6320
Ap	 0.9520	 0.6600
Aq	 0.7090	 0.5810
Ar	 0.8930	 0.6360
As	 0.9510	 0.6630
At	 0.8530	 0.5940
Au	 0.9390	 0.6510
Av	 0.9770	 0.6730
Aw	 0.8600	 0.6540
Ax	 0.9240	 0.6420



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Chain	Atom inclusion	Q-score
Ay	0.9150	0.6300
Az	0.7250	0.6440
B5	0.8480	0.6160
B7	0.9710	0.6670
B8	0.8960	0.6430
BA	0.9500	0.6980
BB	0.9380	0.6910
BC	0.9400	0.6880
BD	0.8500	0.6400
BE	0.8610	0.6510
BF	0.9430	0.6940
BG	0.7900	0.6220
BH	0.9170	0.6810
BI	0.8870	0.6640
BJ	0.6850	0.5990
BL	0.8750	0.6540
BM	0.9460	0.6900
BN	0.9930	0.7100
BO	0.9520	0.6890
BP	0.9350	0.6860
BQ	0.9700	0.7020
BR	0.8430	0.6510
BS	0.9710	0.6970
BT	0.8890	0.6670
BU	0.5960	0.5680
BV	0.8720	0.6810
BW	0.8760	0.6750
BX	0.8990	0.6610
BY	0.9050	0.6640
BZ	0.8600	0.6500
Ba	0.9590	0.7010
Bb	0.7950	0.6340
Bc	0.8290	0.6570
Bd	0.8780	0.6650
Be	0.9620	0.6960
Bf	0.9650	0.7040
Bg	0.9220	0.6730
Bh	0.8900	0.6600
Bi	0.8690	0.6590
Bj	0.9780	0.7000
Bk	0.6550	0.5910
Bl	0.9050	0.6660

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Chain	Atom inclusion	Q-score
Bm	 0.9380	 0.6810
Bo	 0.8970	 0.6760
Bp	 0.8640	 0.6760
Br	 0.9360	 0.6780
Bs	 0.1530	 0.4360
Bt	 0.0510	 0.2570
Bv	 0.0170	 0.2360
S	 0.6620	 0.6280
V	 0.6090	 0.5160