



wwPDB EM Validation Summary Report ⓘ

May 12, 2024 – 10:18 am BST

PDB ID : 8RXH
EMDB ID : EMD-19576
Title : CRYO-EM STRUCTURE OF LEISHMANIA MAJOR 80S RIBOSOME
WITH A/P/E-site tRNA AND mRNA : PARENTAL STRAIN
Authors : Rajan, K.S.; Yonath, A.
Deposited on : 2024-02-07
Resolution : 2.93 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

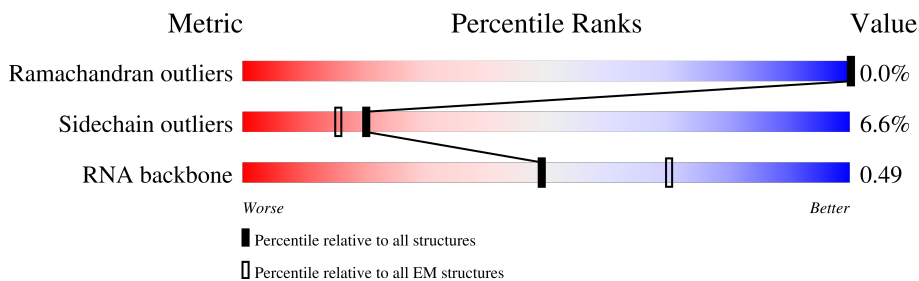
EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

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 2.93 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	L1	1782	 66% 27% 6%
2	L2	1526	 52% 22% 24%
3	L3	216	 61% 23% 15%
4	L4	184	 72% 28%
5	L5	135	 5% 63% 26% 11%
6	L6	73	 52% 45%
7	L7	171	 65% 30%
8	L8	124	 79% 18%

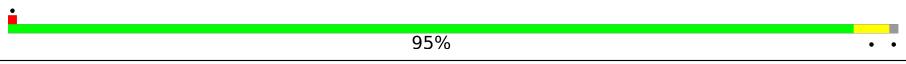
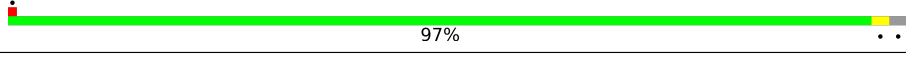
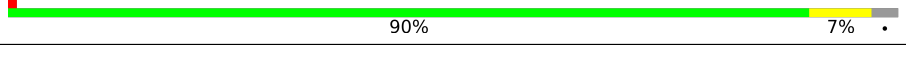

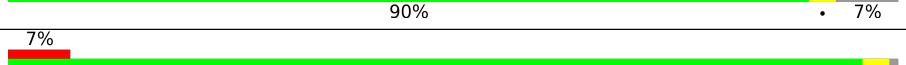
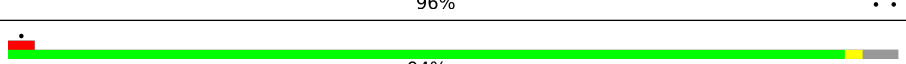
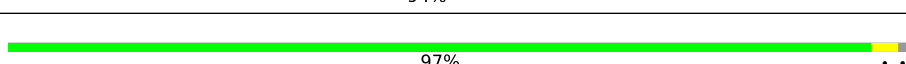
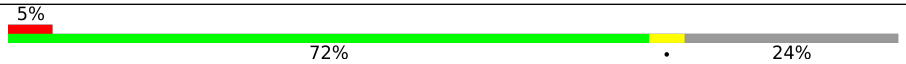
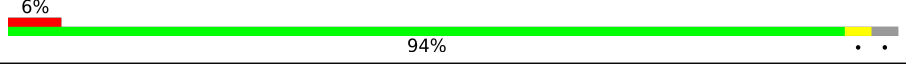
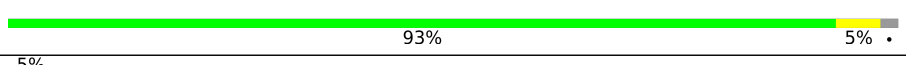
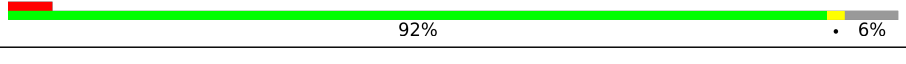
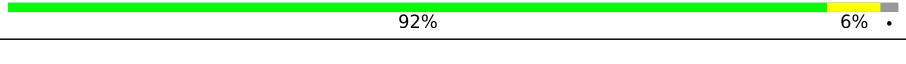

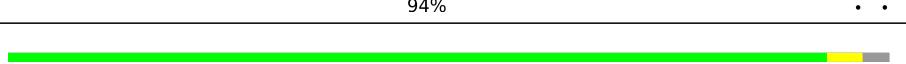
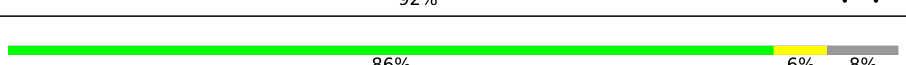







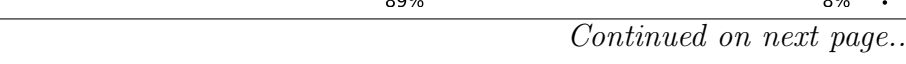


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Mol	Chain	Length	Quality of chain
9	LA	260	95% 5%
10	LB	419	94%
11	LC	373	93% 5%
12	LD	188	87% 6% 7%
13	LE	190	92% 6%
14	LF	195	72% 24%
15	LG	264	88% 9%
16	LH	222	95% 5%
17	LI	220	94%
18	LJ	139	95%
19	LK	175	92% 5%
20	LL	145	94%
21	LM	204	92% 6%
22	LN	213	86% 10%
23	LO	305	94%
24	LP	198	96%
25	LQ	254	75% 21%
26	LR	179	95%
27	LS	159	94% 5%
28	LT	166	89% 8%
29	LU	129	90% 5% 5%
30	LV	145	80% 18%
31	LW	143	82% 15%
32	LX	124	66% 31%
33	LY	134	95%

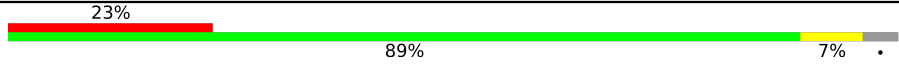
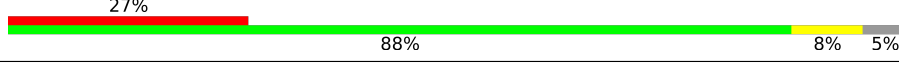
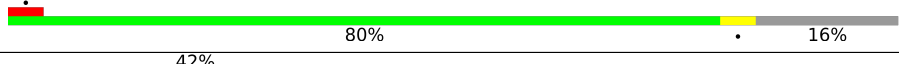

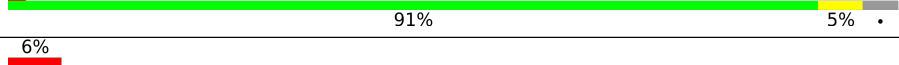
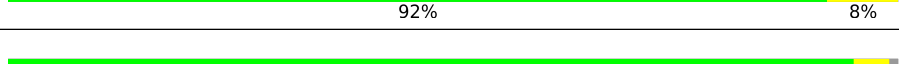
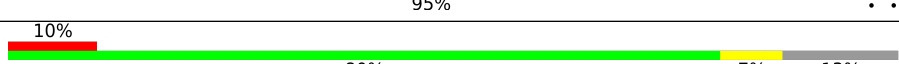
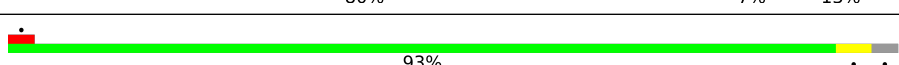
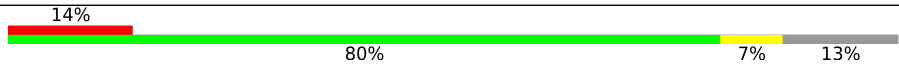

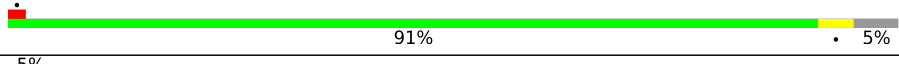
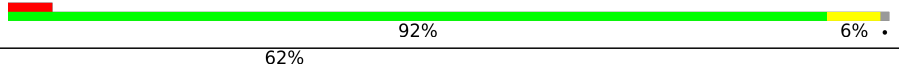
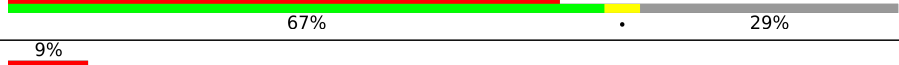

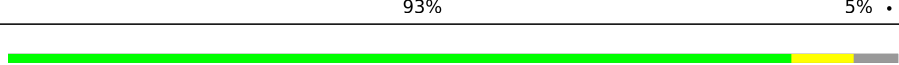



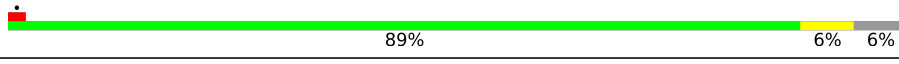
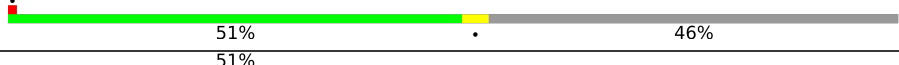





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Mol	Chain	Length	Quality of chain
34	LZ	147	 95%
35	La	127	 97%
36	Lb	70	 90% 7%
37	Lc	252	 88% 9%
38	Ld	104	 5% 90% 7%
39	Le	188	 7% 96%
40	Lf	133	 94%
41	Lg	144	 97%
42	Lh	168	 5% 72% 24%
43	Li	105	 6% 94%
44	Lj	83	 93% 5%
45	Lk	83	 5% 92% 6%
46	Ll	51	 92% 6%
47	Lm	128	 38% 59%
48	Ln	34	 94%
49	Lo	92	 92%
50	Lp	106	 86% 6% 8%
51	S1	2204	 11% 61% 22% 16%
52	S2	76	 80% 62% 38%
53	S3	77	 21% 71% 25%
54	S4	76	 63% 46% 51%
55	S5	13	 8% 46% 46% 8%
56	SA	264	 5% 88% 5% 8%
57	SB	246	 83% 14%
58	SC	219	 10% 89% 8%

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Mol	Chain	Length	Quality of chain
59	SD	190	
60	SE	273	
61	SF	265	
62	SG	249	
63	SH	190	
64	SI	200	
65	SJ	130	
66	SK	220	
67	SL	149	
68	SM	116	
69	SN	168	
70	SO	144	
71	SP	143	
72	SQ	141	
73	SR	153	
74	SS	57	
75	ST	151	
76	SU	173	
77	SV	143	
78	SW	152	
79	SX	161	
80	SY	164	
81	SZ	137	
82	Sa	120	
83	Sb	112	

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Mol	Chain	Length	Quality of chain
84	Sc	86	<p>91% 8%</p>
85	Sd	87	<p>10% 70% 6% 24%</p>
86	Se	66	<p>26% 86% 6% 8%</p>
87	Sf	152	<p>38% 45% 7% 47%</p>
88	Sg	312	<p>33% 90% 7%</p>
89	Sh	235	<p>40% 36% 5% 59%</p>

2 Entry composition

There are 95 unique types of molecules in this entry. The entry contains 216694 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 LSUa_rRNA_chain_1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	L1	1677	35987	16086	6578	11645	1678	1	0

- Molecule 2 is a RNA chain called LSUb_rRNA_chain_2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	L2	1155	24715	11065	4453	8042	1155	0	0

- Molecule 3 is a RNA chain called SR1_chain_3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	L3	183	3877	1735	669	1290	183	0	0

- Molecule 4 is a RNA chain called SR2_chain_4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	L4	184	3937	1756	712	1285	184	0	0

- Molecule 5 is a RNA chain called SR4_chain_5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	L5	120	2555	1140	455	840	120	0	0

- Molecule 6 is a RNA chain called SR6_chain_6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	L6	71	1506	675	271	489	71	0	0

- Molecule 7 is a RNA chain called 5.8S_rRNA_chain_7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	L7	166	3533	1583	626	1159	165	0	0

- Molecule 8 is a RNA chain called 5S_rRNA_chain_8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	L8	120	2551	1141	454	836	120	0	0

- Molecule 9 is a protein called Putative 60S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	LA	258	1962	1223	400	329	10	0	0

- Molecule 10 is a protein called Putative ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	LB	404	3216	2024	638	541	13	0	0

- Molecule 11 is a protein called Putative ribosomal protein L1a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LC	366	2820	1761	561	483	15	0	0

- Molecule 12 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LD	175	1387	875	261	243	8	0	0

- Molecule 13 is a protein called Putative 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LE	186	1477	936	273	262	6	0	0

- Molecule 14 is a protein called Putative 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	LF	149	1151	731	216	202	2	0	0

- Molecule 15 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	LG	241	1905	1199	376	323	7	0	0

- Molecule 16 is a protein called Putative 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	LH	221	1767	1123	353	284	7	0	0

- Molecule 17 is a protein called Putative 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	LI	214	1695	1056	342	289	8	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LI	203	ARG	ASN	conflict	UNP E9AEA8

- Molecule 18 is a protein called Putative 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	LJ	135	1012	638	191	177	6	0	0

- Molecule 19 is a protein called Putative 40S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	LK	169	1336	833	264	231	8	0	0

- Molecule 20 is a protein called Putative 60S ribosomal protein L27A/L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	LL	144	1124	707	226	185	6	0	0

- Molecule 21 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	LM	203	1711	1079	362	262	8	0	0

- Molecule 22 is a protein called Putative 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	LN	205	1665	1050	329	271	15	0	0

- Molecule 23 is a protein called Putative 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	LO	298	2329	1480	437	406	6	0	0

- Molecule 24 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	LP	197	1539	968	307	258	6	0	0

- Molecule 25 is a protein called Putative 60S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	LQ	201	1682	1035	367	274	6	0	0

- Molecule 26 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	LR	178	1455	925	279	246	5	0	0

- Molecule 27 is a protein called Putative 60S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	LS	158	Total	C	N	O	S	0	0
			1261	803	245	209	4		

- Molecule 28 is a protein called Putative 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	LT	152	Total	C	N	O	S	0	0
			1217	761	241	205	10		

- Molecule 29 is a protein called Putative 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	LU	122	Total	C	N	O	S	0	0
			960	624	176	157	3		

- Molecule 30 is a protein called Putative 60S ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	LV	119	Total	C	N	O	S	0	0
			953	604	181	166	2		

- Molecule 31 is a protein called Putative 60S ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	LW	121	Total	C	N	O	S	0	0
			967	603	200	160	4		

- Molecule 32 is a protein called Putative ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	LX	85	Total	C	N	O	S	0	0
			714	461	140	109	4		

- Molecule 33 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	LY	133	Total	C	N	O	S	0	0
			1067	684	215	165	3		

- Molecule 34 is a protein called Putative 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	LZ	145	1117	685	238	189	5	0	0

- Molecule 35 is a protein called Putative 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	La	125	1043	650	217	172	4	0	0

- Molecule 36 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Lb	68	546	335	125	86		0	0

- Molecule 37 is a protein called Putative 60S ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	Lc	229	1862	1185	358	308	11	0	0

- Molecule 38 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	Ld	97	744	464	136	139	5	0	0

- Molecule 39 is a protein called Putative 60S ribosomal subunit protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	Le	186	1469	922	296	247	4	0	0

- Molecule 40 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	Lf	128	1046	658	210	174	4	0	0

- Molecule 41 is a protein called Putative ribosomal protein l35a.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	Lg	143	Total	C	N	O	S	0	0
			1149	714	240	190	5		

- Molecule 42 is a protein called Putative 60S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	Lh	127	Total	C	N	O	S	0	0
			1029	633	224	166	6		

- Molecule 43 is a protein called Putative 60S Ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Li	102	Total	C	N	O	S	0	0
			807	508	163	133	3		

- Molecule 44 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Lj	81	Total	C	N	O	S	0	0
			672	409	154	103	6		

- Molecule 45 is a protein called Putative ribosomal protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Lk	78	Total	C	N	O	S	0	0
			608	383	119	103	3		

- Molecule 46 is a protein called Putative 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Ll	50	Total	C	N	O	S	0	0
			450	291	95	63	1		

- Molecule 47 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	Lm	52	Total	C	N	O	S	0	0
			417	263	85	64	5		

- Molecule 48 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	Ln	33	Total	C	N	O	S	0	0
			296	181	76	37	2		

- Molecule 49 is a protein called 60S ribosomal protein L37a.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	Lo	89	Total	C	N	O	S	0	0
			693	431	143	113	6		

- Molecule 50 is a protein called Putative 60S ribosomal protein L44.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	Lp	97	Total	C	N	O	S	0	0
			784	496	158	125	5		

- Molecule 51 is a RNA chain called SSU_rRNA_chain_S1.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	S1	1844	Total	C	N	O	P	0	0
			39438	17643	7112	12839	1844		

- Molecule 52 is a RNA chain called A-site_tRNA_chain_S2.

Mol	Chain	Residues	Atoms					AltConf	Trace	
52	S2	76	Total	C	N	O	P	S	0	0
			1626	729	290	531	75	1		

- Molecule 53 is a RNA chain called P-site_tRNA_chain_S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	S3	75	Total	C	N	O	P	0	0
			1602	714	292	521	75		

- Molecule 54 is a RNA chain called E-site_tRNA_chain_S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	S4	74	Total	C	N	O	P	0	0
			1574	703	280	518	73		

- Molecule 55 is a RNA chain called mRNA_chain_S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	S5	12	Total	C	N	O	P	0	0
			251	113	43	83	12		

- Molecule 56 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	SA	244	Total	C	N	O	S	0	0
			1943	1213	375	344	11		

- Molecule 57 is a protein called 40S ribosomal protein SA.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	SB	211	Total	C	N	O	S	0	0
			1661	1055	303	292	11		

- Molecule 58 is a protein called Putative 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	SC	212	Total	C	N	O	S	1	0
			1646	1040	302	291	13		

- Molecule 59 is a protein called Putative 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	SD	183	Total	C	N	O	S	0	0
			1508	949	305	246	8		

- Molecule 60 is a protein called 40S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	SE	260	Total	C	N	O	S	0	0
			2054	1301	393	351	9		

- Molecule 61 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	SF	222	Total	C	N	O	S	0	0
			1708	1088	301	309	10		

- Molecule 62 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	SG	229	1829	1140	375	311	3	0	0

- Molecule 63 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	SH	183	1447	899	279	262	7	0	0

- Molecule 64 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	SI	200	1649	1050	320	271	8	0	0

- Molecule 65 is a protein called Putative 40S ribosomal protein S15A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	SJ	129	1021	646	188	179	8	0	0

- Molecule 66 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	SK	192	1550	967	320	261	2	0	0

- Molecule 67 is a protein called Putative 40S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	SL	144	1140	731	210	196	3	0	0

- Molecule 68 is a protein called Putative ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	SM	101	792	496	144	150	2	0	0

- Molecule 69 is a protein called Putative 40S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	SN	100	818	525	143	143	7	0	0

- Molecule 70 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	SO	137	1024	633	200	183	8	0	0

- Molecule 71 is a protein called Putative 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	SP	141	1100	694	217	186	3	0	0

- Molecule 72 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
72	SQ	100	670	411	121	133	5	0	0

- Molecule 73 is a protein called Putative 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
73	SR	142	1138	715	226	192	5	0	0

- Molecule 74 is a protein called Putative ribosomal protein S29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
74	SS	56	452	279	94	73	6	0	0

- Molecule 75 is a protein called Putative 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
75	ST	143	1167	736	231	191	9	0	0

- Molecule 76 is a protein called Ribosomal protein S17 family protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	SU	153	Total	C	N	O	S	0	0
			1257	795	251	206	5		

- Molecule 77 is a protein called Putative 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	SV	122	Total	C	N	O	S	0	0
			992	619	193	175	5		

- Molecule 78 is a protein called Putative 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	SW	115	Total	C	N	O	S	0	0
			928	591	176	157	4		

- Molecule 79 is a protein called 40S ribosomal protein S19-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	SX	152	Total	C	N	O	S	0	0
			1206	766	237	199	4		

- Molecule 80 is a protein called Putative 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	SY	88	Total	C	N	O	S	0	0
			663	409	121	129	4		

- Molecule 81 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	SZ	130	Total	C	N	O	S	0	0
			1051	675	204	169	3		

- Molecule 82 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	Sa	105	Total	C	N	O	S	0	0
			798	502	147	145	4		

- Molecule 83 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
83	Sb	104	825	511	177	130	7	0	0

- Molecule 84 is a protein called Putative 40S ribosomal protein S27-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
84	Sc	85	674	416	131	119	8	0	0

- Molecule 85 is a protein called Putative 40S ribosomal protein S33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
85	Sd	66	496	301	100	91	4	0	0

- Molecule 86 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
86	Se	61	487	307	102	77	1	0	0

- Molecule 87 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
87	Sf	80	659	413	130	110	6	0	0

- Molecule 88 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
88	Sg	303	2354	1475	420	446	13	0	0

- Molecule 89 is a protein called Putative RNA binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
89	Sh	96	768	486	146	133	3	0	0

- Molecule 90 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
90	L1	116	Total 116	Mg 116	0
90	L2	74	Total 74	Mg 74	0
90	L3	4	Total 4	Mg 4	0
90	L4	4	Total 4	Mg 4	0
90	L5	1	Total 1	Mg 1	0
90	L6	1	Total 1	Mg 1	0
90	L7	9	Total 9	Mg 9	0
90	L8	5	Total 5	Mg 5	0
90	LA	1	Total 1	Mg 1	0
90	LB	1	Total 1	Mg 1	0
90	LJ	1	Total 1	Mg 1	0
90	LS	1	Total 1	Mg 1	0
90	LT	1	Total 1	Mg 1	0
90	Lf	1	Total 1	Mg 1	0
90	Lh	1	Total 1	Mg 1	0
90	Lj	1	Total 1	Mg 1	0
90	S1	64	Total 64	Mg 64	0
90	S5	2	Total 2	Mg 2	0
90	SX	1	Total 1	Mg 1	0

- Molecule 91 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		AltConf
91	L1	29	Total 29	Na 29	0

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Mol	Chain	Residues	Atoms		AltConf
91	L2	21	Total 21	Na 21	0
91	L4	4	Total 4	Na 4	0
91	L5	3	Total 3	Na 3	0
91	L8	1	Total 1	Na 1	0
91	LA	2	Total 2	Na 2	0
91	LE	1	Total 1	Na 1	0
91	LH	1	Total 1	Na 1	0
91	LM	2	Total 2	Na 2	0
91	LN	2	Total 2	Na 2	0
91	LR	1	Total 1	Na 1	0
91	Lf	1	Total 1	Na 1	0
91	S1	16	Total 16	Na 16	0
91	SH	1	Total 1	Na 1	0
91	SP	1	Total 1	Na 1	0

- Molecule 92 is POTASSIUM ION (three-letter code: K) (formula: K).

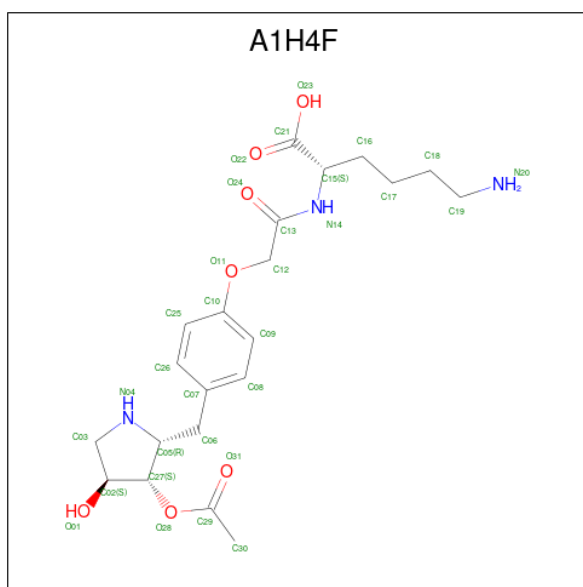
Mol	Chain	Residues	Atoms		AltConf
92	L1	55	Total 55	K 55	0
92	L2	33	Total 33	K 33	0
92	L3	2	Total 2	K 2	0
92	L4	6	Total 6	K 6	0
92	L5	2	Total 2	K 2	0

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Mol	Chain	Residues	Atoms	AltConf
92	L7	5	Total K 5 5	0
92	L8	1	Total K 1 1	0
92	LB	2	Total K 2 2	0
92	LC	2	Total K 2 2	0
92	LZ	1	Total K 1 1	0
92	Lh	1	Total K 1 1	0
92	S1	30	Total K 30 30	0
92	SS	1	Total K 1 1	0
92	ST	1	Total K 1 1	0
92	Sb	1	Total K 1 1	0

- Molecule 93 is (2S)-2-[2-[4-[[[(2R,3S,4S)-3-acetyloxy-4-oxidanyl-pyrrolidin-2-yl]methyl]phenoxy]ethanoylamino]-6-azanyl-hexanoic acid (three-letter code: A1H4F) (formula: C₂₁H₃₁N₃O₇).



Mol	Chain	Residues	Atoms			AltConf	
			Total	C	N		O
93	L2	1	31	21	3	7	0

- Molecule 94 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
94	Lp	1	1	1	0

- Molecule 95 is water.

Mol	Chain	Residues	Atoms		AltConf
			Total	O	
95	L1	152	152	152	0
95	L2	119	119	119	0
95	L3	10	10	10	0
95	L4	11	11	11	0
95	L5	3	3	3	0
95	L7	11	11	11	0
95	L8	1	1	1	0
95	LA	7	7	7	0
95	LB	5	5	5	0
95	LC	4	4	4	0
95	LG	1	1	1	0
95	LH	2	2	2	0
95	LI	2	2	2	0
95	LL	5	5	5	0
95	LM	7	7	7	0
95	LP	2	2	2	0

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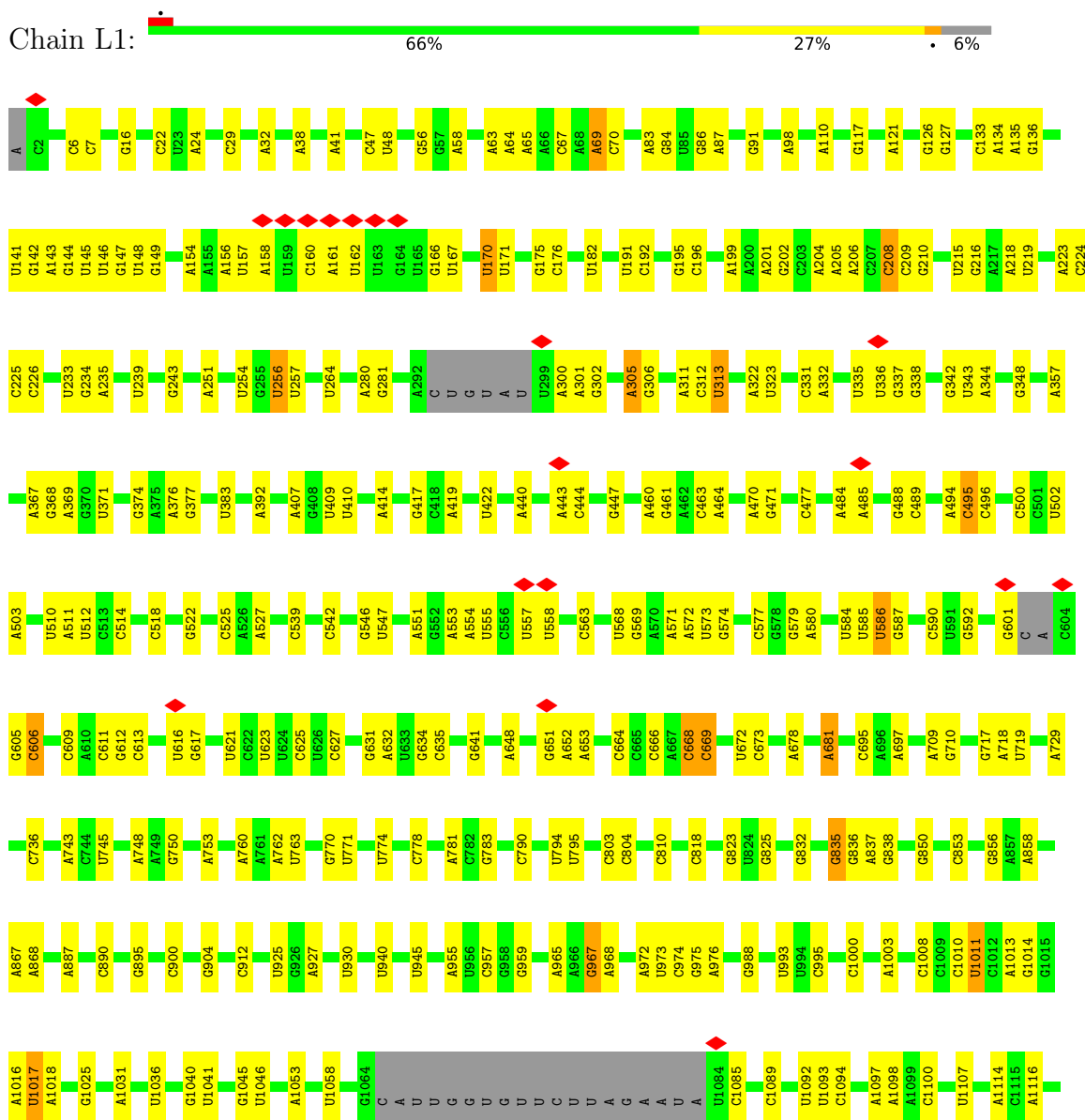
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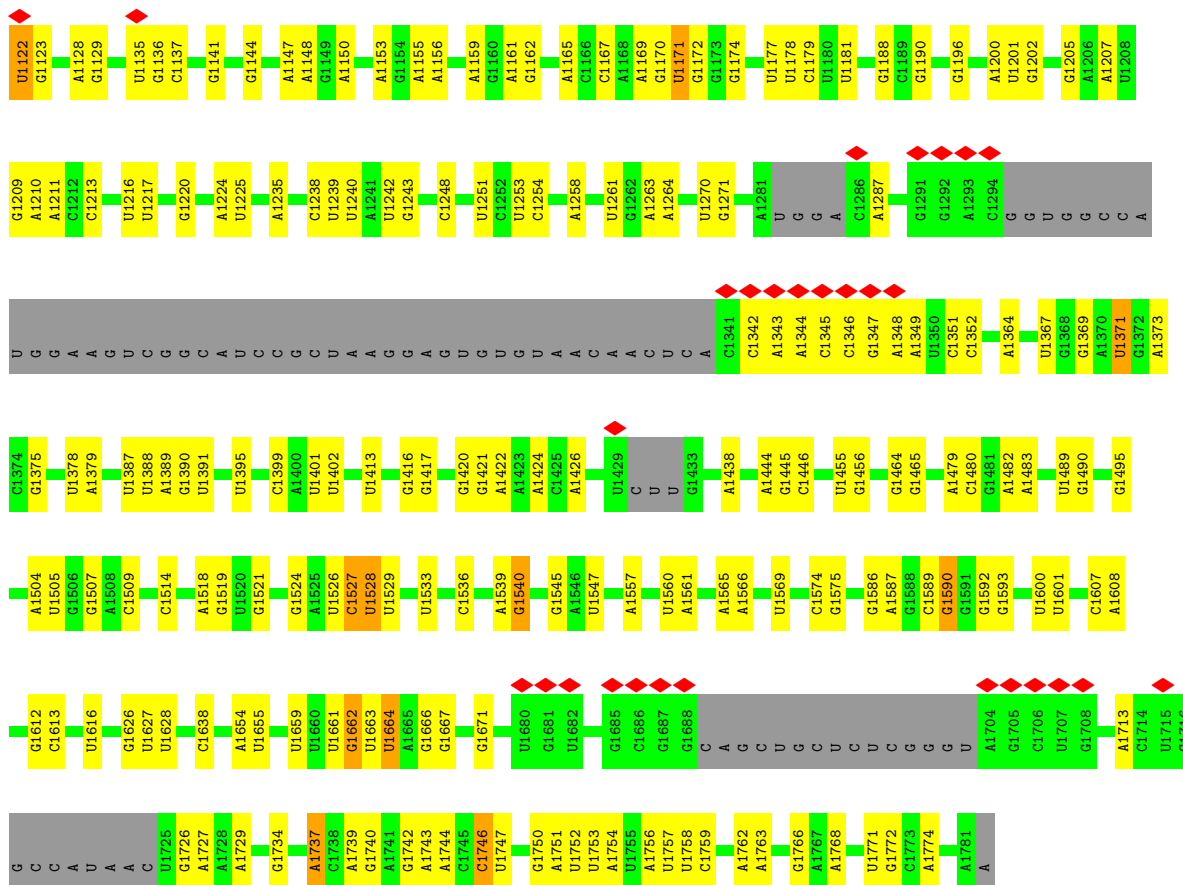
Mol	Chain	Residues	Atoms		AltConf
95	LQ	2	Total 2	O 2	0
95	LS	2	Total 2	O 2	0
95	LT	2	Total 2	O 2	0
95	LV	1	Total 1	O 1	0
95	LW	1	Total 1	O 1	0
95	La	2	Total 2	O 2	0
95	Lb	2	Total 2	O 2	0
95	Le	1	Total 1	O 1	0
95	Lf	2	Total 2	O 2	0
95	Lh	1	Total 1	O 1	0
95	Lj	4	Total 4	O 4	0
95	Lo	1	Total 1	O 1	0
95	Lp	2	Total 2	O 2	0
95	S1	47	Total 47	O 47	0
95	SA	1	Total 1	O 1	0

3 Residue-property plots

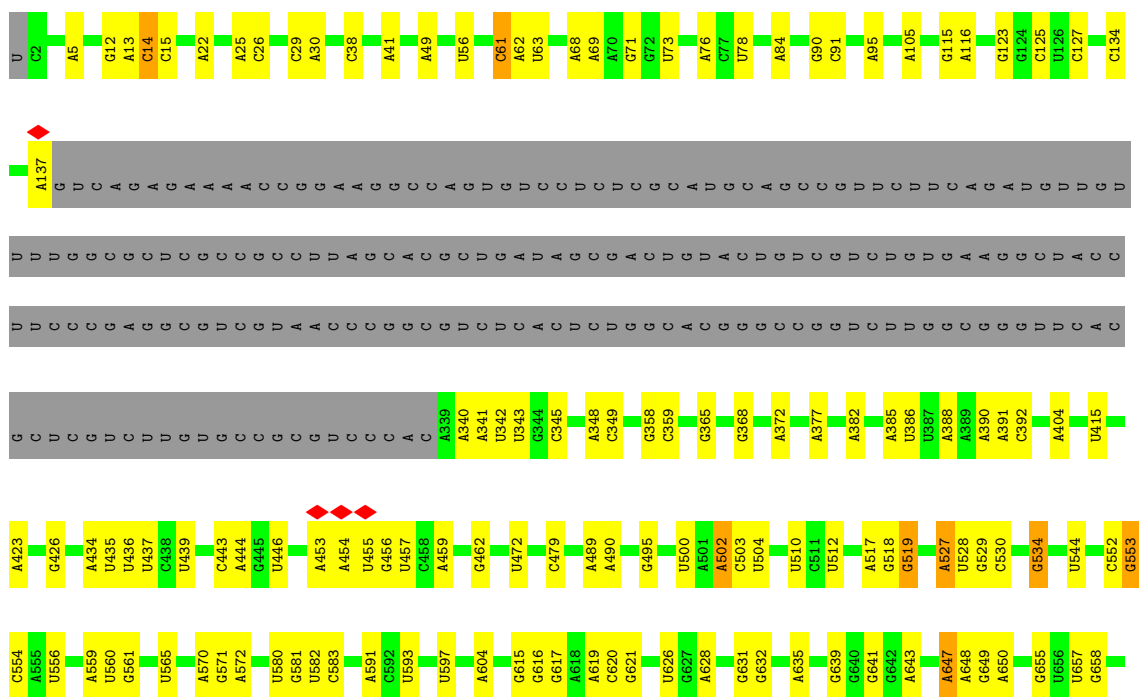
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: LSUa_rRNA_chain_1



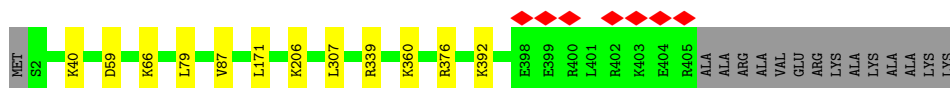


• Molecule 2: LSub_rRNA_chain_2





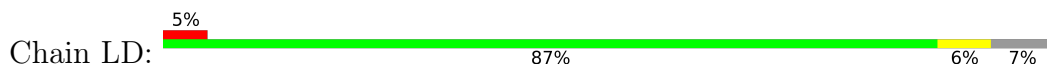
- Molecule 10: Putative ribosomal protein L3



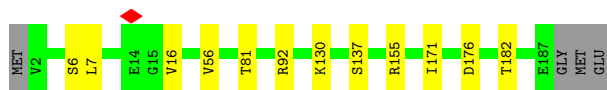
- Molecule 11: Putative ribosomal protein L1a



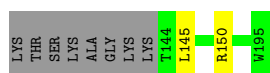
- Molecule 12: 60S ribosomal protein L11



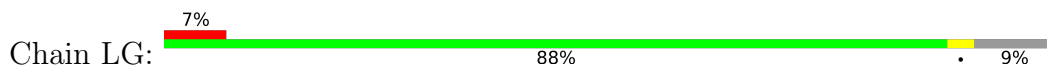
- Molecule 13: Putative 60S ribosomal protein L9



- Molecule 14: Putative 60S ribosomal protein L6



- Molecule 15: 60S ribosomal protein L7a

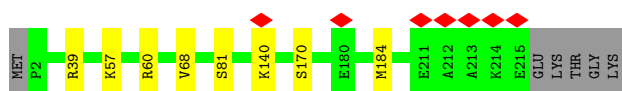




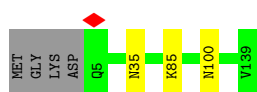
- Molecule 16: Putative 60S ribosomal protein L13a



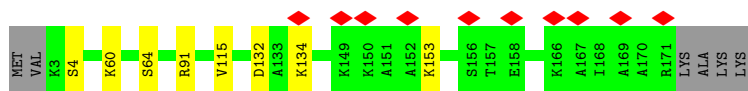
- Molecule 17: Putative 60S ribosomal protein L13



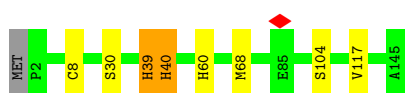
- Molecule 18: Putative 60S ribosomal protein L23



- Molecule 19: Putative 40S ribosomal protein L14



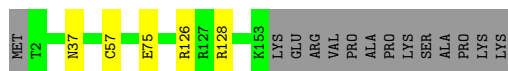
- Molecule 20: Putative 60S ribosomal protein L27A/L29



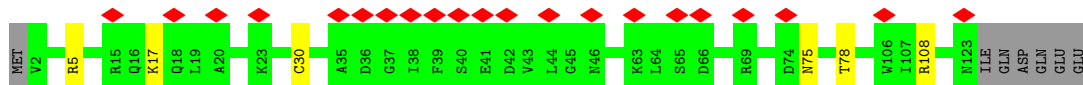
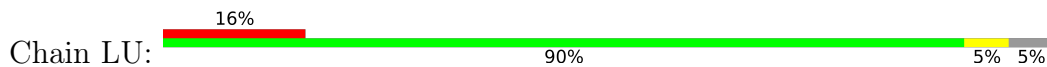
- Molecule 21: Ribosomal protein L15



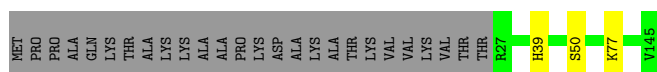
- Molecule 22: Putative 60S ribosomal protein L10



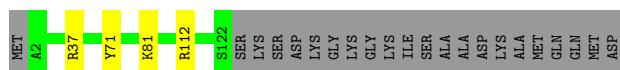
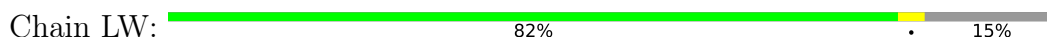
- Molecule 29: Putative 60S ribosomal protein L22



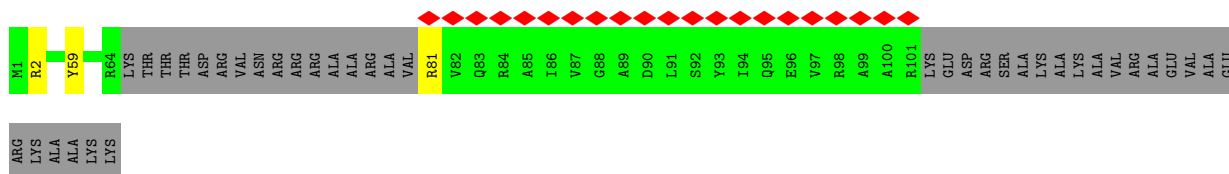
- Molecule 30: Putative 60S ribosomal protein L23a



- Molecule 31: Putative 60S ribosomal protein L26



- Molecule 32: Putative ribosomal protein L24



- Molecule 33: 60S ribosomal protein L27

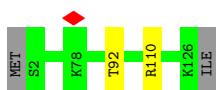


- Molecule 34: Putative 60S ribosomal protein L28

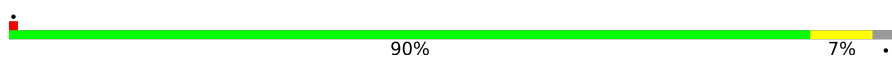


- Molecule 35: Putative 60S ribosomal protein L35

Chain La:  97%




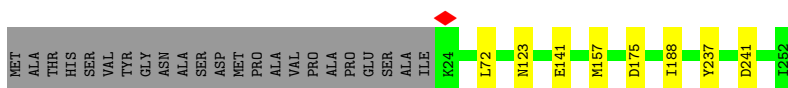
- Molecule 36: 60S ribosomal protein L29

Chain Lb:  90%

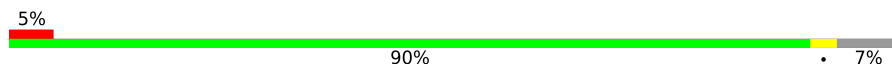


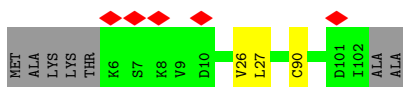
- Molecule 37: Putative 60S ribosomal protein L7

Chain Lc:  88%



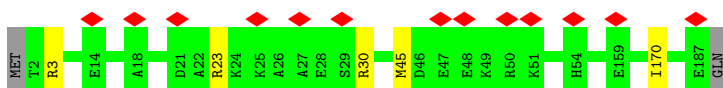
- Molecule 38: 60S ribosomal protein L30

Chain Ld:  5%



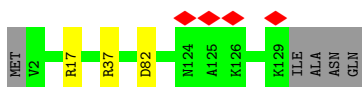
- Molecule 39: Putative 60S ribosomal subunit protein L31

Chain Le:  7%



- Molecule 40: 60S ribosomal protein L32

Chain Lf:  94%

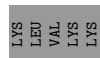
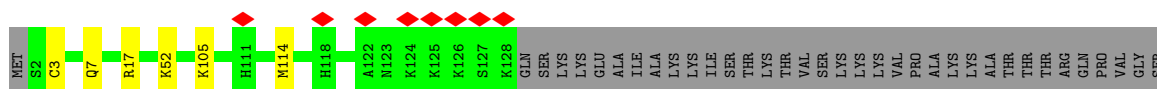
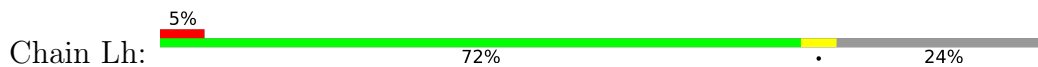


- Molecule 41: Putative ribosomal protein l35a

Chain Lg:  97%



- Molecule 42: Putative 60S ribosomal protein L34



- Molecule 43: Putative 60S Ribosomal protein L36



- Molecule 44: Ribosomal protein L37



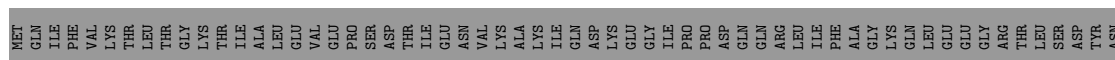
- Molecule 45: Putative ribosomal protein L38

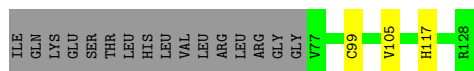


- Molecule 46: Putative 60S ribosomal protein L39



- Molecule 47: Ubiquitin-60S ribosomal protein L40

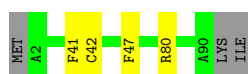




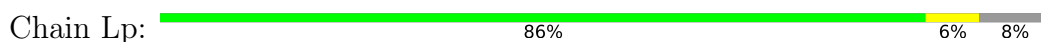
• Molecule 48: 60S ribosomal protein L41



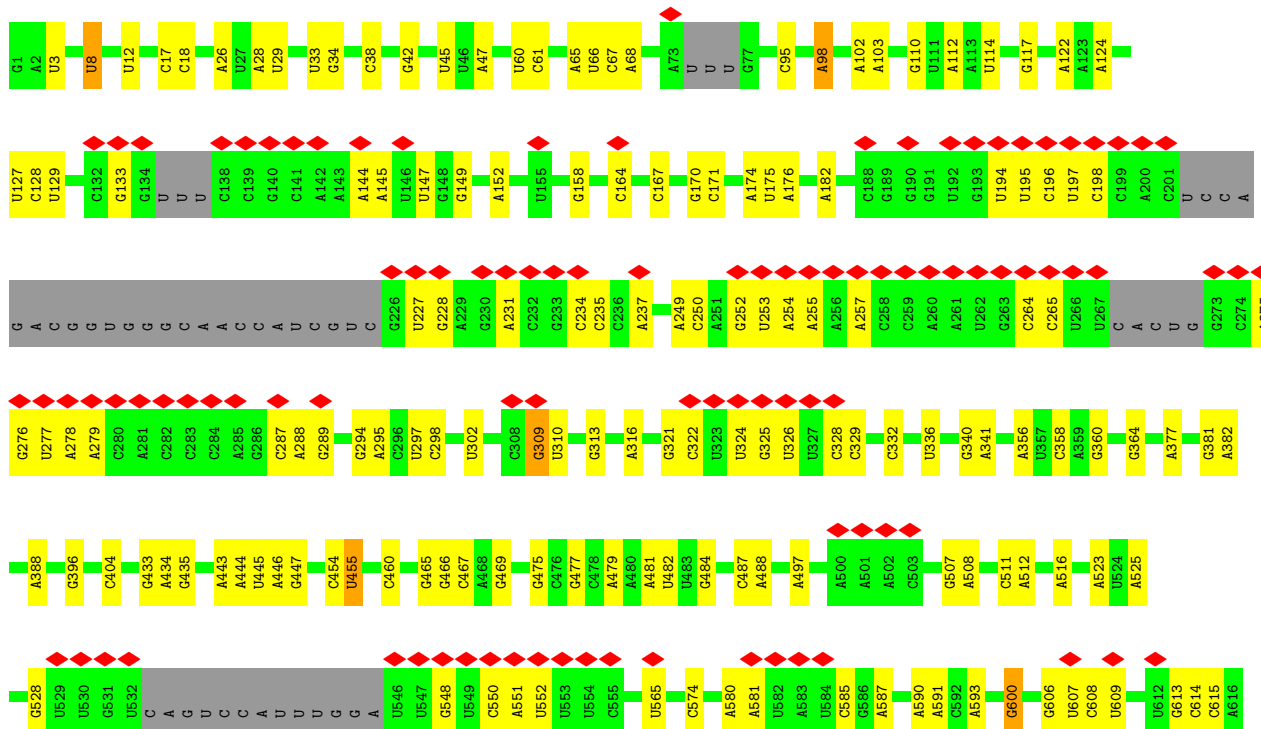
• Molecule 49: 60S ribosomal protein L37a



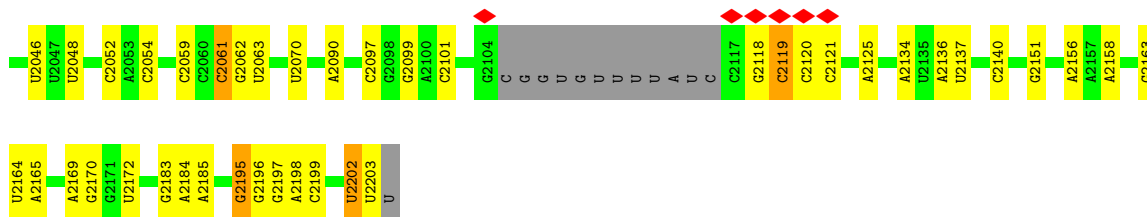
• Molecule 50: Putative 60S ribosomal protein L44



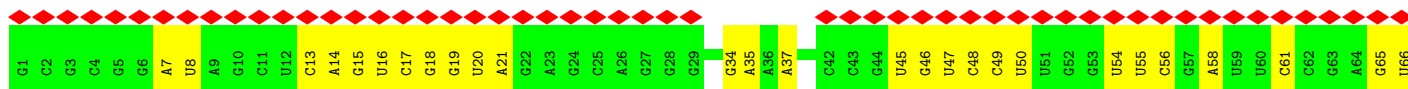
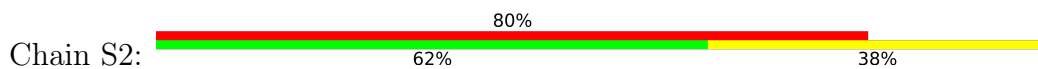
• Molecule 51: SSU_rRNA_chain_S1







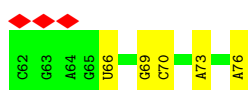
• Molecule 52: A-site_tRNA_chain_S2



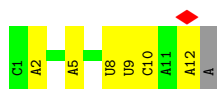
• Molecule 53: P-site_tRNA_chain_S3



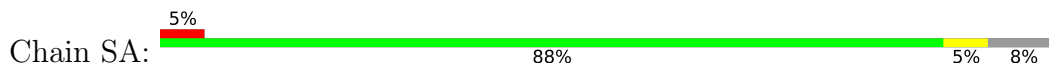
• Molecule 54: E-site_tRNA_chain_S4

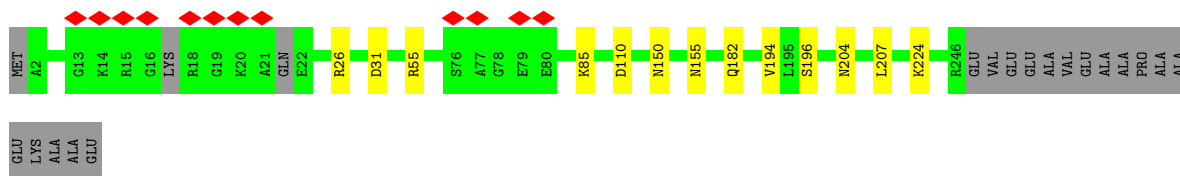


• Molecule 55: mRNA_chain_S5

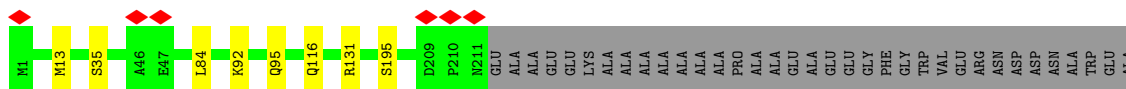
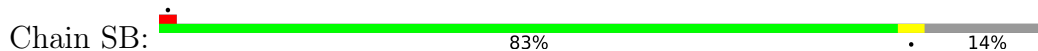


• Molecule 56: 40S ribosomal protein S3a

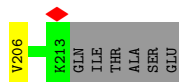
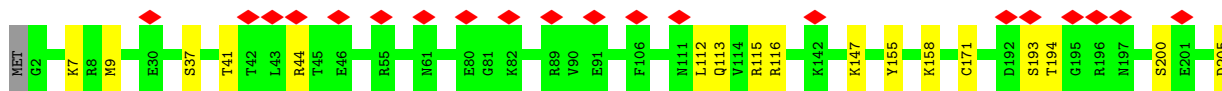
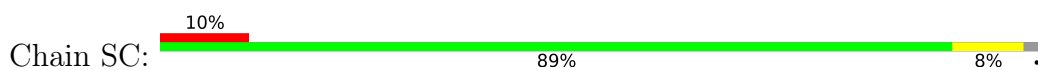




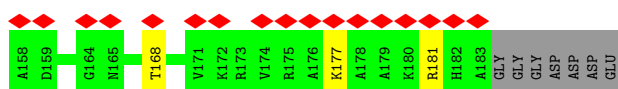
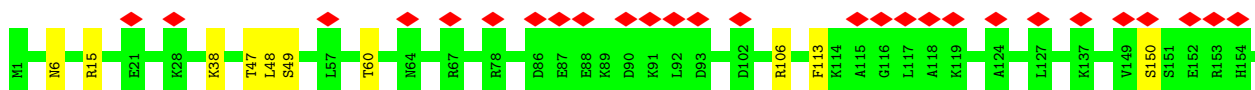
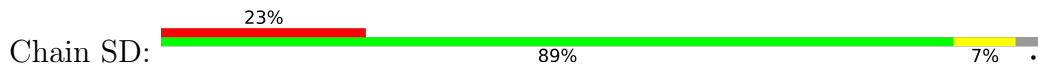
• Molecule 57: 40S ribosomal protein SA



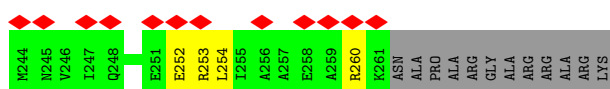
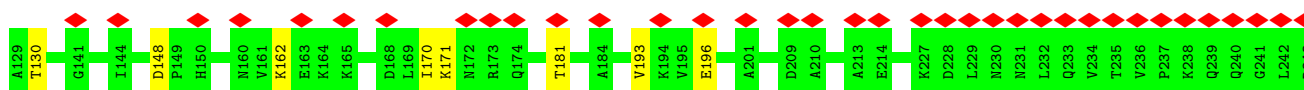
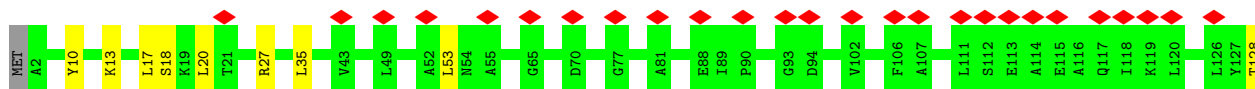
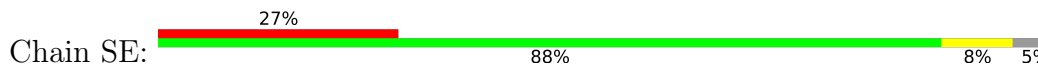
• Molecule 58: Putative 40S ribosomal protein S3



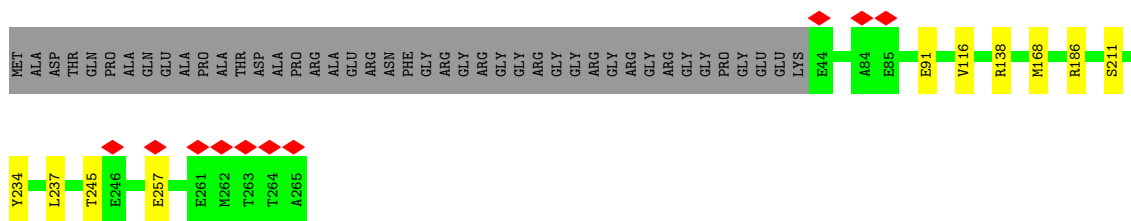
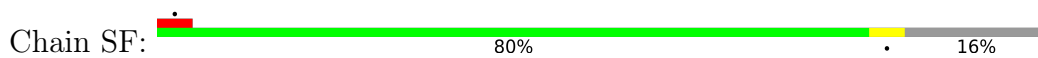
• Molecule 59: Putative 40S ribosomal protein S9



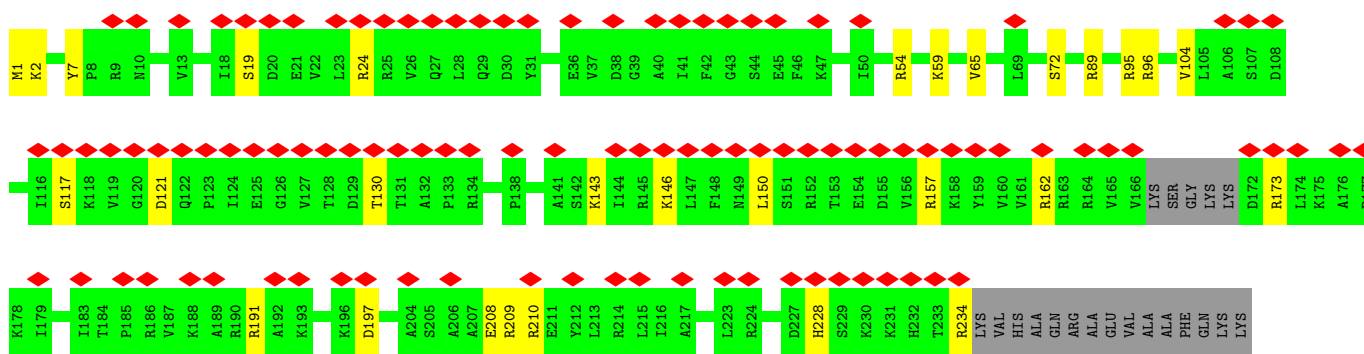
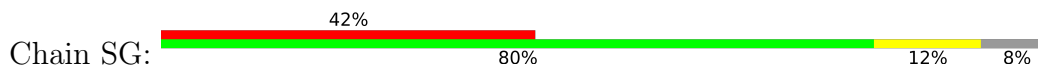
• Molecule 60: 40S ribosomal protein S4



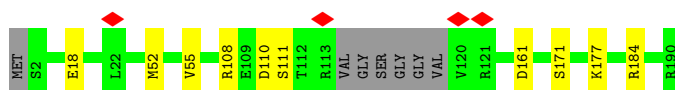
• Molecule 61: 40S ribosomal protein S2



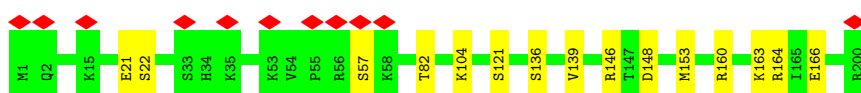
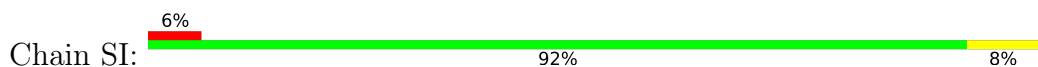
• Molecule 62: 40S ribosomal protein S6



• Molecule 63: 40S ribosomal protein S5



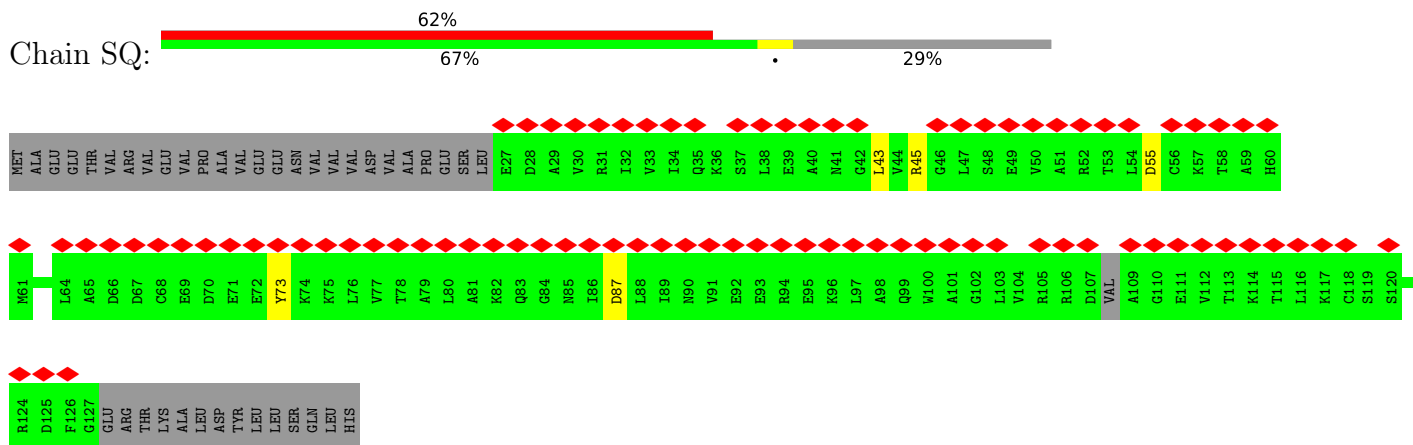
• Molecule 64: 40S ribosomal protein S7



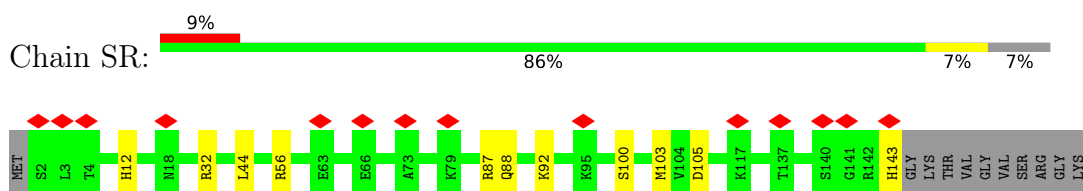
• Molecule 65: Putative 40S ribosomal protein S15A



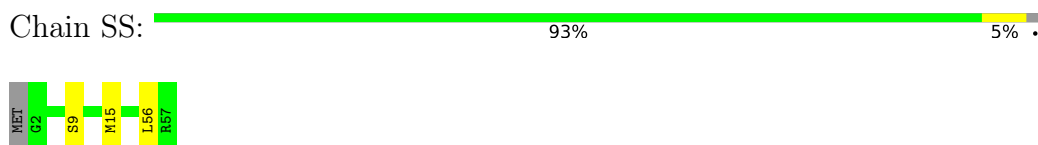
• Molecule 66: 40S ribosomal protein S8



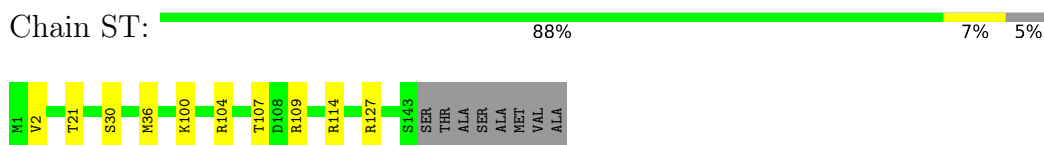
• Molecule 73: Putative 40S ribosomal protein S18



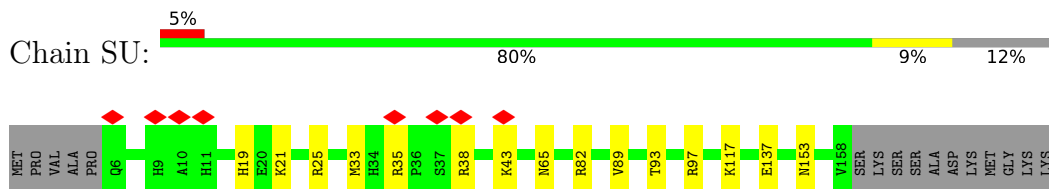
• Molecule 74: Putative ribosomal protein S29



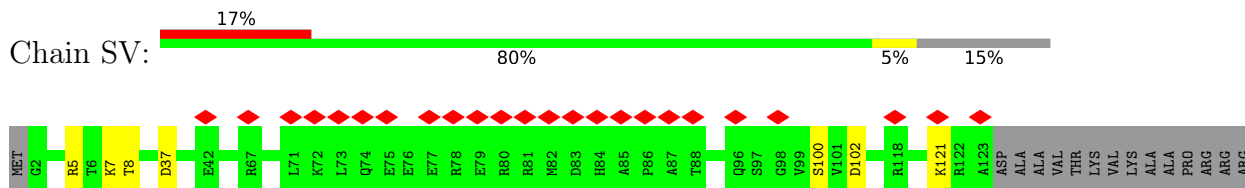
• Molecule 75: Putative 40S ribosomal protein S13



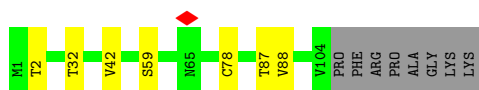
• Molecule 76: Ribosomal protein S17 family protein



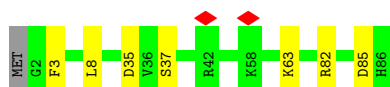
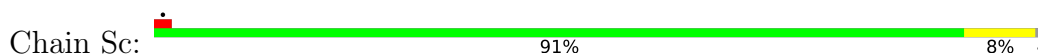
• Molecule 77: Putative 40S ribosomal protein S17



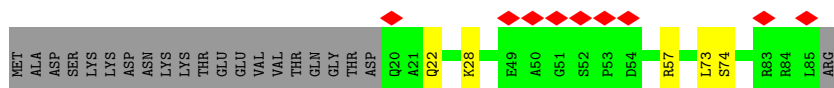
• Molecule 83: 40S ribosomal protein S26



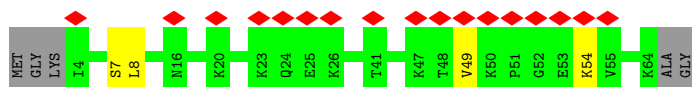
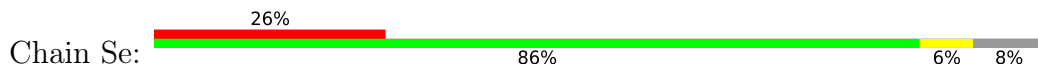
• Molecule 84: Putative 40S ribosomal protein S27-1



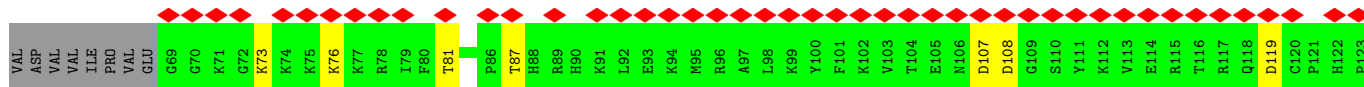
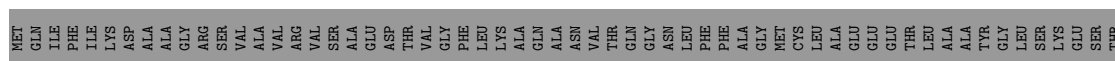
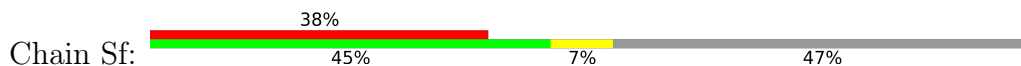
• Molecule 85: Putative 40S ribosomal protein S33



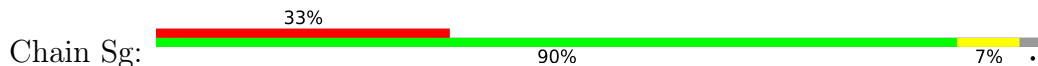
• Molecule 86: 40S ribosomal protein S30

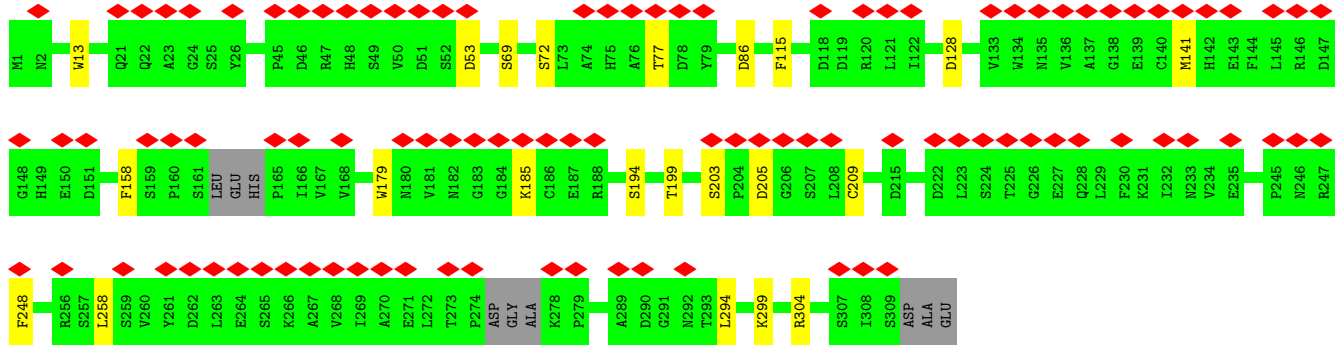


• Molecule 87: Ubiquitin-60S ribosomal protein L40

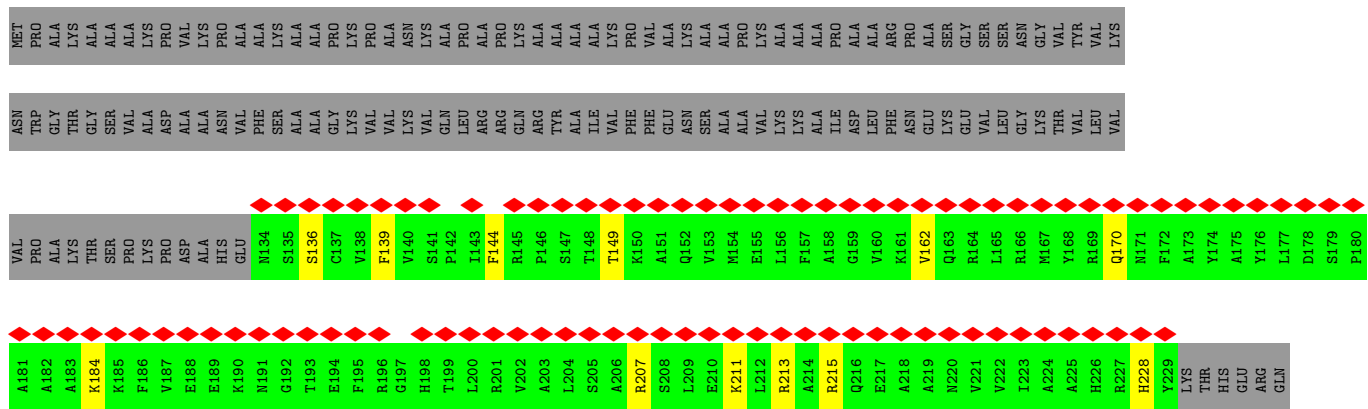
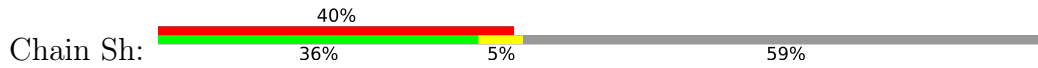


• Molecule 88: Guanine nucleotide-binding protein subunit beta-like protein





• Molecule 89: Putative RNA binding protein



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	419524	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	0.9340390798620625	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1700	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.181	Depositor
Minimum map value	-0.118	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	395.76, 395.76, 395.76	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8245, 0.8245, 0.8245	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: 5MC, PSU, MA6, MG, OMC, ZN, A1H4F, 7MG, A2M, K, MIA, OMU, OMG, B8N, NA

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	L1	0.42	0/39236	0.91	56/61175 (0.1%)
2	L2	0.42	0/25973	0.92	49/40481 (0.1%)
3	L3	0.37	0/4302	0.91	11/6687 (0.2%)
4	L4	0.41	0/4376	0.90	9/6822 (0.1%)
5	L5	0.43	0/2852	0.99	4/4438 (0.1%)
6	L6	0.35	0/1683	0.90	1/2618 (0.0%)
7	L7	0.40	0/3782	1.01	13/5889 (0.2%)
8	L8	0.42	0/2851	0.91	3/4439 (0.1%)
9	LA	0.30	0/2007	0.60	0/2696
10	LB	0.27	0/3283	0.55	0/4412
11	LC	0.26	0/2870	0.53	0/3861
12	LD	0.25	0/1410	0.51	0/1884
13	LE	0.26	0/1497	0.52	0/2017
14	LF	0.26	0/1173	0.52	0/1586
15	LG	0.25	0/1932	0.54	0/2599
16	LH	0.28	0/1803	0.54	0/2422
17	LI	0.27	0/1728	0.54	0/2313
18	LJ	0.28	0/1029	0.52	0/1388
19	LK	0.28	0/1355	0.52	0/1816
20	LL	0.30	0/1151	0.58	1/1538 (0.1%)
21	LM	0.32	0/1751	0.59	0/2338
22	LN	0.27	0/1697	0.57	0/2269
23	LO	0.27	0/2370	0.51	1/3172 (0.0%)
24	LP	0.33	0/1564	0.58	0/2092
25	LQ	0.24	0/1701	0.54	0/2250
26	LR	0.29	0/1489	0.52	0/2008
27	LS	0.31	0/1290	0.60	2/1736 (0.1%)
28	LT	0.27	0/1241	0.52	0/1665
29	LU	0.25	0/976	0.50	0/1303
30	LV	0.26	0/968	0.51	0/1302
31	LW	0.25	0/981	0.56	0/1310
32	LX	0.27	0/735	0.55	0/989

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	LY	0.27	0/1088	0.53	0/1455
34	LZ	0.26	0/1133	0.55	0/1516
35	La	0.24	0/1054	0.53	0/1399
36	Lb	0.30	0/557	0.55	0/743
37	Lc	0.27	0/1896	0.53	0/2540
38	Ld	0.26	0/754	0.47	0/1019
39	Le	0.25	0/1488	0.54	0/1979
40	Lf	0.33	0/1066	0.61	0/1424
41	Lg	0.30	0/1172	0.57	0/1573
42	Lh	0.26	0/1045	0.56	0/1390
43	Li	0.26	0/822	0.53	0/1099
44	Lj	0.31	0/686	0.65	0/915
45	Lk	0.26	0/617	0.52	0/828
46	Ll	0.26	0/463	0.54	0/617
47	Lm	0.26	0/423	0.57	0/563
48	Ln	0.26	0/300	0.70	0/390
49	Lo	0.28	0/705	0.60	0/940
50	Lp	0.29	0/797	0.49	0/1053
51	S1	0.34	0/42995	0.86	33/66976 (0.0%)
52	S2	0.49	0/1783	0.95	0/2776
53	S3	0.39	0/1790	0.88	1/2789 (0.0%)
54	S4	0.26	0/1757	0.88	1/2735 (0.0%)
55	S5	0.28	0/279	0.90	0/431
56	SA	0.25	0/1967	0.55	0/2641
57	SB	0.25	0/1695	0.50	0/2292
58	SC	0.27	0/1674	0.53	0/2240
59	SD	0.25	0/1536	0.58	0/2059
60	SE	0.25	0/2092	0.54	0/2819
61	SF	0.25	0/1744	0.50	1/2362 (0.0%)
62	SG	0.25	0/1851	0.59	0/2474
63	SH	0.24	0/1469	0.51	0/1970
64	SI	0.25	0/1679	0.54	0/2255
65	SJ	0.26	0/1038	0.53	0/1391
66	SK	0.25	0/1573	0.58	0/2107
67	SL	0.28	0/1161	0.49	0/1559
68	SM	0.25	0/802	0.54	0/1088
69	SN	0.25	0/842	0.53	1/1141 (0.1%)
70	SO	0.31	0/1039	0.59	0/1395
71	SP	0.25	0/1120	0.52	0/1500
72	SQ	0.26	0/671	0.58	0/911
73	SR	0.24	0/1158	0.53	0/1553
74	SS	0.25	0/458	0.55	0/607
75	ST	0.28	0/1190	0.55	0/1594

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	SU	0.26	0/1286	0.54	0/1727
77	SV	0.24	0/1002	0.51	0/1334
78	SW	0.25	0/948	0.51	0/1275
79	SX	0.29	0/1237	0.51	0/1661
80	SY	0.24	0/673	0.50	0/913
81	SZ	0.25	0/1071	0.51	0/1425
82	Sa	0.25	0/807	0.51	0/1082
83	Sb	0.26	0/842	0.58	0/1127
84	Sc	0.28	0/688	0.54	0/921
85	Sd	0.23	0/498	0.58	0/668
86	Se	0.36	0/496	0.61	0/658
87	Sf	0.26	0/674	0.52	0/892
88	Sg	0.24	0/2412	0.51	0/3276
89	Sh	0.26	0/783	0.54	0/1053
All	All	0.35	0/227902	0.78	187/334635 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
16	LH	0	1
21	LM	0	4
24	LP	0	1
40	Lf	0	1
44	Lj	0	2
70	SO	0	1
79	SX	0	1
All	All	0	11

There are no bond length outliers.

The worst 5 of 187 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	L7	6	G	O3'-P-O5'	-24.52	57.42	104.00
7	L7	7	U	O5'-P-OP1	-18.18	88.89	110.70
7	L7	6	G	OP1-P-O3'	14.95	138.08	105.20
1	L1	563	C	N1-C2-O2	8.73	124.14	118.90
1	L1	563	C	C2-N1-C1'	8.11	127.72	118.80

There are no chirality outliers.

5 of 11 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
16	LH	108	ARG	Sidechain
21	LM	189	ARG	Sidechain
21	LM	193	ARG	Sidechain
21	LM	194	ARG	Sidechain
21	LM	71	ARG	Sidechain

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	
9	LA	256/260 (98%)	249 (97%)	7 (3%)	0	100	100
10	LB	402/419 (96%)	390 (97%)	12 (3%)	0	100	100
11	LC	364/373 (98%)	353 (97%)	11 (3%)	0	100	100
12	LD	173/188 (92%)	170 (98%)	3 (2%)	0	100	100
13	LE	184/190 (97%)	175 (95%)	9 (5%)	0	100	100
14	LF	145/195 (74%)	138 (95%)	7 (5%)	0	100	100
15	LG	239/264 (90%)	234 (98%)	5 (2%)	0	100	100
16	LH	219/222 (99%)	216 (99%)	3 (1%)	0	100	100
17	LI	212/220 (96%)	206 (97%)	6 (3%)	0	100	100
18	LJ	133/139 (96%)	131 (98%)	2 (2%)	0	100	100
19	LK	167/175 (95%)	161 (96%)	6 (4%)	0	100	100
20	LL	142/145 (98%)	135 (95%)	6 (4%)	1 (1%)	22	52
21	LM	201/204 (98%)	199 (99%)	2 (1%)	0	100	100
22	LN	201/213 (94%)	195 (97%)	6 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	LO	294/305 (96%)	288 (98%)	6 (2%)	0	100	100
24	LP	195/198 (98%)	190 (97%)	4 (2%)	1 (0%)	29	60
25	LQ	199/254 (78%)	198 (100%)	1 (0%)	0	100	100
26	LR	176/179 (98%)	175 (99%)	1 (1%)	0	100	100
27	LS	156/159 (98%)	149 (96%)	7 (4%)	0	100	100
28	LT	150/166 (90%)	146 (97%)	4 (3%)	0	100	100
29	LU	120/129 (93%)	117 (98%)	3 (2%)	0	100	100
30	LV	117/145 (81%)	116 (99%)	1 (1%)	0	100	100
31	LW	119/143 (83%)	117 (98%)	2 (2%)	0	100	100
32	LX	81/124 (65%)	78 (96%)	3 (4%)	0	100	100
33	LY	131/134 (98%)	131 (100%)	0	0	100	100
34	LZ	143/147 (97%)	141 (99%)	2 (1%)	0	100	100
35	La	123/127 (97%)	122 (99%)	1 (1%)	0	100	100
36	Lb	66/70 (94%)	63 (96%)	2 (3%)	1 (2%)	10	32
37	Lc	227/252 (90%)	221 (97%)	6 (3%)	0	100	100
38	Ld	95/104 (91%)	95 (100%)	0	0	100	100
39	Le	184/188 (98%)	183 (100%)	1 (0%)	0	100	100
40	Lf	126/133 (95%)	122 (97%)	4 (3%)	0	100	100
41	Lg	141/144 (98%)	141 (100%)	0	0	100	100
42	Lh	125/168 (74%)	122 (98%)	3 (2%)	0	100	100
43	Li	100/105 (95%)	98 (98%)	2 (2%)	0	100	100
44	Lj	79/83 (95%)	79 (100%)	0	0	100	100
45	Lk	76/83 (92%)	75 (99%)	1 (1%)	0	100	100
46	Ll	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
47	Lm	50/128 (39%)	50 (100%)	0	0	100	100
48	Ln	31/34 (91%)	31 (100%)	0	0	100	100
49	Lo	87/92 (95%)	80 (92%)	7 (8%)	0	100	100
50	Lp	95/106 (90%)	93 (98%)	2 (2%)	0	100	100
56	SA	240/264 (91%)	232 (97%)	8 (3%)	0	100	100
57	SB	209/246 (85%)	202 (97%)	7 (3%)	0	100	100
58	SC	211/219 (96%)	207 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
59	SD	181/190 (95%)	178 (98%)	3 (2%)	0	100	100
60	SE	258/273 (94%)	253 (98%)	5 (2%)	0	100	100
61	SF	220/265 (83%)	220 (100%)	0	0	100	100
62	SG	225/249 (90%)	218 (97%)	7 (3%)	0	100	100
63	SH	179/190 (94%)	177 (99%)	2 (1%)	0	100	100
64	SI	198/200 (99%)	195 (98%)	3 (2%)	0	100	100
65	SJ	127/130 (98%)	125 (98%)	2 (2%)	0	100	100
66	SK	188/220 (86%)	188 (100%)	0	0	100	100
67	SL	142/149 (95%)	138 (97%)	4 (3%)	0	100	100
68	SM	99/116 (85%)	99 (100%)	0	0	100	100
69	SN	98/168 (58%)	93 (95%)	4 (4%)	1 (1%)	15	43
70	SO	135/144 (94%)	131 (97%)	4 (3%)	0	100	100
71	SP	139/143 (97%)	136 (98%)	3 (2%)	0	100	100
72	SQ	96/141 (68%)	93 (97%)	3 (3%)	0	100	100
73	SR	140/153 (92%)	138 (99%)	2 (1%)	0	100	100
74	SS	54/57 (95%)	53 (98%)	1 (2%)	0	100	100
75	ST	141/151 (93%)	139 (99%)	2 (1%)	0	100	100
76	SU	151/173 (87%)	144 (95%)	7 (5%)	0	100	100
77	SV	120/143 (84%)	119 (99%)	1 (1%)	0	100	100
78	SW	113/152 (74%)	113 (100%)	0	0	100	100
79	SX	150/161 (93%)	144 (96%)	6 (4%)	0	100	100
80	SY	86/164 (52%)	86 (100%)	0	0	100	100
81	SZ	128/137 (93%)	122 (95%)	6 (5%)	0	100	100
82	Sa	103/120 (86%)	94 (91%)	9 (9%)	0	100	100
83	Sb	102/112 (91%)	101 (99%)	1 (1%)	0	100	100
84	Sc	83/86 (96%)	82 (99%)	1 (1%)	0	100	100
85	Sd	64/87 (74%)	61 (95%)	3 (5%)	0	100	100
86	Se	59/66 (89%)	57 (97%)	2 (3%)	0	100	100
87	Sf	78/152 (51%)	73 (94%)	5 (6%)	0	100	100
88	Sg	297/312 (95%)	286 (96%)	11 (4%)	0	100	100
89	Sh	94/235 (40%)	92 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	11480/12926 (89%)	11208 (98%)	268 (2%)	4 (0%)	100	100

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
69	SN	40	ASN
36	Lb	10	HIS
20	LL	40	HIS
24	LP	189	SER

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	
9	LA	200/204 (98%)	188 (94%)	12 (6%)	19	46
10	LB	337/351 (96%)	325 (96%)	12 (4%)	35	66
11	LC	291/301 (97%)	271 (93%)	20 (7%)	15	40
12	LD	147/162 (91%)	135 (92%)	12 (8%)	11	31
13	LE	166/172 (96%)	154 (93%)	12 (7%)	14	37
14	LF	122/153 (80%)	114 (93%)	8 (7%)	16	42
15	LG	198/221 (90%)	189 (96%)	9 (4%)	27	58
16	LH	182/188 (97%)	172 (94%)	10 (6%)	21	50
17	LI	178/183 (97%)	170 (96%)	8 (4%)	27	58
18	LJ	106/111 (96%)	103 (97%)	3 (3%)	43	73
19	LK	138/145 (95%)	130 (94%)	8 (6%)	20	48
20	LL	113/114 (99%)	105 (93%)	8 (7%)	14	38
21	LM	178/180 (99%)	164 (92%)	14 (8%)	12	32
22	LN	175/179 (98%)	153 (87%)	22 (13%)	4	13
23	LO	232/242 (96%)	222 (96%)	10 (4%)	29	60
24	LP	163/164 (99%)	157 (96%)	6 (4%)	34	65

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
25	LQ	170/198 (86%)	159 (94%)	11 (6%)	17	43
26	LR	157/159 (99%)	149 (95%)	8 (5%)	24	53
27	LS	132/134 (98%)	123 (93%)	9 (7%)	16	40
28	LT	127/143 (89%)	122 (96%)	5 (4%)	32	63
29	LU	93/114 (82%)	87 (94%)	6 (6%)	17	43
30	LV	102/124 (82%)	99 (97%)	3 (3%)	42	73
31	LW	104/122 (85%)	100 (96%)	4 (4%)	33	64
32	LX	74/104 (71%)	71 (96%)	3 (4%)	30	61
33	LY	111/116 (96%)	105 (95%)	6 (5%)	22	51
34	LZ	114/118 (97%)	108 (95%)	6 (5%)	22	52
35	La	114/118 (97%)	112 (98%)	2 (2%)	59	82
36	Lb	56/58 (97%)	52 (93%)	4 (7%)	14	38
37	Lc	191/209 (91%)	183 (96%)	8 (4%)	30	61
38	Ld	85/89 (96%)	82 (96%)	3 (4%)	36	67
39	Le	154/158 (98%)	149 (97%)	5 (3%)	39	70
40	Lf	111/115 (96%)	109 (98%)	2 (2%)	59	82
41	Lg	120/121 (99%)	116 (97%)	4 (3%)	38	69
42	Lh	107/146 (73%)	101 (94%)	6 (6%)	21	50
43	Li	84/88 (96%)	81 (96%)	3 (4%)	35	66
44	Lj	68/70 (97%)	66 (97%)	2 (3%)	42	73
45	Lk	65/74 (88%)	63 (97%)	2 (3%)	40	71
46	Ll	46/47 (98%)	43 (94%)	3 (6%)	17	43
47	Lm	43/113 (38%)	40 (93%)	3 (7%)	15	39
48	Ln	31/32 (97%)	30 (97%)	1 (3%)	39	70
49	Lo	69/74 (93%)	65 (94%)	4 (6%)	20	48
50	Lp	83/92 (90%)	77 (93%)	6 (7%)	14	37
56	SA	206/222 (93%)	193 (94%)	13 (6%)	18	44
57	SB	178/202 (88%)	170 (96%)	8 (4%)	27	58
58	SC	176/184 (96%)	157 (89%)	19 (11%)	6	19
59	SD	159/164 (97%)	146 (92%)	13 (8%)	11	31
60	SE	216/225 (96%)	195 (90%)	21 (10%)	8	24

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
61	SF	182/208 (88%)	173 (95%)	9 (5%)	25	55
62	SG	190/208 (91%)	161 (85%)	29 (15%)	2	8
63	SH	153/159 (96%)	143 (94%)	10 (6%)	17	43
64	SI	181/186 (97%)	166 (92%)	15 (8%)	11	30
65	SJ	110/111 (99%)	105 (96%)	5 (4%)	27	58
66	SK	157/176 (89%)	142 (90%)	15 (10%)	8	24
67	SL	116/120 (97%)	110 (95%)	6 (5%)	23	53
68	SM	92/104 (88%)	84 (91%)	8 (9%)	10	29
69	SN	88/128 (69%)	81 (92%)	7 (8%)	12	32
70	SO	104/113 (92%)	99 (95%)	5 (5%)	25	56
71	SP	114/117 (97%)	105 (92%)	9 (8%)	12	32
72	SQ	57/120 (48%)	52 (91%)	5 (9%)	10	28
73	SR	120/130 (92%)	109 (91%)	11 (9%)	9	26
74	SS	47/49 (96%)	44 (94%)	3 (6%)	17	43
75	ST	126/132 (96%)	116 (92%)	10 (8%)	12	32
76	SU	135/152 (89%)	120 (89%)	15 (11%)	6	18
77	SV	109/126 (86%)	102 (94%)	7 (6%)	17	43
78	SW	98/130 (75%)	94 (96%)	4 (4%)	30	61
79	SX	122/131 (93%)	114 (93%)	8 (7%)	16	42
80	SY	72/116 (62%)	67 (93%)	5 (7%)	15	40
81	SZ	111/118 (94%)	97 (87%)	14 (13%)	4	13
82	Sa	83/95 (87%)	73 (88%)	10 (12%)	5	15
83	Sb	85/93 (91%)	78 (92%)	7 (8%)	11	31
84	Sc	75/76 (99%)	68 (91%)	7 (9%)	9	25
85	Sd	52/75 (69%)	47 (90%)	5 (10%)	8	24
86	Se	52/54 (96%)	48 (92%)	4 (8%)	13	34
87	Sf	70/126 (56%)	59 (84%)	11 (16%)	2	7
88	Sg	259/265 (98%)	237 (92%)	22 (8%)	10	29
89	Sh	79/177 (45%)	67 (85%)	12 (15%)	3	8
All	All	9711/10798 (90%)	9066 (93%)	645 (7%)	20	42

5 of 645 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
68	SM	110	SER
82	Sa	58	LYS
71	SP	2	THR
68	SM	87	ASP
76	SU	43	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
41	Lg	25	ASN
59	SD	3	ASN
80	SY	66	GLN
23	LO	120	GLN
34	LZ	35	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L1	1667/1782 (93%)	447 (26%)	18 (1%)
2	L2	1148/1526 (75%)	279 (24%)	14 (1%)
3	L3	178/216 (82%)	44 (24%)	3 (1%)
4	L4	183/184 (99%)	43 (23%)	2 (1%)
5	L5	117/135 (86%)	32 (27%)	3 (2%)
51	S1	1819/2204 (82%)	436 (23%)	26 (1%)
52	S2	74/76 (97%)	27 (36%)	8 (10%)
53	S3	74/77 (96%)	19 (25%)	2 (2%)
54	S4	72/76 (94%)	37 (51%)	1 (1%)
55	S5	11/13 (84%)	6 (54%)	0
6	L6	70/73 (95%)	32 (45%)	1 (1%)
7	L7	164/171 (95%)	40 (24%)	2 (1%)
8	L8	119/124 (95%)	19 (15%)	1 (0%)
All	All	5696/6657 (85%)	1461 (25%)	81 (1%)

5 of 1461 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L1	6	C
1	L1	7	C
1	L1	16	G
1	L1	24	A
1	L1	29	C

5 of 81 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
51	S1	937	C
52	S2	13	C
51	S1	1209	C
51	S1	1858	G
52	S2	48	C

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

170 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
51	PSU	S1	1292	90,91,51	18,21,22	4.42	7 (38%)	22,30,33	1.77	5 (22%)
51	OMC	S1	1866	51	19,22,23	2.96	8 (42%)	26,31,34	0.79	0
51	PSU	S1	2048	51	18,21,22	0.87	1 (5%)	22,30,33	0.75	0
7	OMG	L7	75	7	18,26,27	2.56	8 (44%)	19,38,41	1.53	4 (21%)
51	OMC	S1	38	51	19,22,23	3.00	8 (42%)	26,31,34	0.84	0
2	PSU	L2	512	2	18,21,22	4.49	7 (38%)	22,30,33	1.78	5 (22%)
2	A2M	L2	1185	2	18,25,26	4.19	6 (33%)	18,36,39	2.72	3 (16%)
51	MA6	S1	2185	90,51	18,26,27	1.11	1 (5%)	19,38,41	3.17	2 (10%)
7	PSU	L7	166	7,1	18,21,22	4.49	7 (38%)	22,30,33	1.81	5 (22%)
2	OMU	L2	667	2	19,22,23	2.99	8 (42%)	26,31,34	1.72	4 (15%)
2	PSU	L2	1194	2	18,21,22	4.46	7 (38%)	22,30,33	1.77	4 (18%)
2	OMC	L2	583	2	19,22,23	2.93	8 (42%)	26,31,34	0.70	0
2	A2M	L2	570	2,1	18,25,26	4.24	6 (33%)	18,36,39	2.75	3 (16%)
2	PSU	L2	626	2	18,21,22	4.43	7 (38%)	22,30,33	1.71	4 (18%)
2	PSU	L2	1144	2	18,21,22	4.44	7 (38%)	22,30,33	1.88	5 (22%)
1	OMG	L1	1190	90,1	18,26,27	2.51	8 (44%)	19,38,41	1.69	5 (26%)
1	PSU	L1	1533	2,1	18,21,22	4.45	7 (38%)	22,30,33	1.87	5 (22%)
2	A2M	L2	502	2	18,25,26	4.22	8 (44%)	18,36,39	2.71	3 (16%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PSU	L2	1361	92,2,52	18,21,22	4.48	7 (38%)	22,30,33	1.80	5 (22%)
1	OMU	L1	1659	90,1	19,22,23	2.97	8 (42%)	26,31,34	1.68	4 (15%)
51	OMU	S1	8	51	19,22,23	0.24	0	26,31,34	0.60	1 (3%)
2	PSU	L2	1152	2	18,21,22	4.45	7 (38%)	22,30,33	1.93	5 (22%)
51	OMG	S1	2151	51	18,26,27	2.53	8 (44%)	19,38,41	1.57	5 (26%)
2	PSU	L2	510	2	18,21,22	4.45	7 (38%)	22,30,33	1.77	5 (22%)
1	A2M	L1	1539	90,2,1	18,25,26	4.22	7 (38%)	18,36,39	2.73	3 (16%)
2	A2M	L2	1384	90,2	18,25,26	4.24	6 (33%)	18,36,39	2.66	3 (16%)
2	A2M	L2	604	2,1	18,25,26	4.26	6 (33%)	18,36,39	2.63	3 (16%)
2	PSU	L2	1403	2	18,21,22	4.47	7 (38%)	22,30,33	1.87	6 (27%)
51	A2M	S1	28	51	18,25,26	4.27	7 (38%)	18,36,39	2.58	3 (16%)
1	PSU	L1	1177	1	18,21,22	4.46	7 (38%)	22,30,33	1.73	5 (22%)
1	PSU	L1	1181	1	18,21,22	4.47	7 (38%)	22,30,33	1.81	5 (22%)
2	PSU	L2	1060	2	18,21,22	4.44	7 (38%)	22,30,33	1.93	5 (22%)
3	OMU	L3	13	3	19,22,23	3.01	8 (42%)	26,31,34	1.76	4 (15%)
51	OMG	S1	1829	90,51	18,26,27	1.03	3 (16%)	19,38,41	0.64	0
7	PSU	L7	74	7	18,21,22	4.49	7 (38%)	22,30,33	1.82	5 (22%)
2	A2M	L2	1067	2	18,25,26	0.64	1 (5%)	18,36,39	0.75	1 (5%)
2	A2M	L2	591	92,2	18,25,26	4.26	7 (38%)	18,36,39	2.60	3 (16%)
2	OMG	L2	1253	2	18,26,27	2.47	8 (44%)	19,38,41	1.59	5 (26%)
1	PSU	L1	1017	91,1	18,21,22	4.43	7 (38%)	22,30,33	1.82	5 (22%)
2	OMC	L2	14	2,1	19,22,23	0.30	0	26,31,34	0.65	1 (3%)
51	PSU	S1	1657	51	18,21,22	4.46	7 (38%)	22,30,33	1.77	5 (22%)
7	A2M	L7	43	90,7	18,25,26	4.26	6 (33%)	18,36,39	2.82	3 (16%)
1	PSU	L1	1664	1	18,21,22	0.89	1 (5%)	22,30,33	0.65	0
2	OMU	L2	56	2,1	19,22,23	3.01	8 (42%)	26,31,34	1.72	4 (15%)
51	OMU	S1	1979	51	19,22,23	3.05	8 (42%)	26,31,34	1.71	4 (15%)
51	MA6	S1	2184	51	18,26,27	1.16	2 (11%)	19,38,41	2.91	2 (10%)
1	A2M	L1	407	1	18,25,26	4.25	6 (33%)	18,36,39	2.64	3 (16%)
2	OMU	L2	1077	2	19,22,23	3.01	8 (42%)	26,31,34	1.70	4 (15%)
51	PSU	S1	1533	51	18,21,22	4.49	7 (38%)	22,30,33	1.81	5 (22%)
1	OMG	L1	856	1	18,26,27	2.53	8 (44%)	19,38,41	1.55	5 (26%)
1	PSU	L1	510	1	18,21,22	0.90	1 (5%)	22,30,33	0.64	0
51	PSU	S1	2202	51	18,21,22	4.43	8 (44%)	22,30,33	1.71	5 (22%)
51	OMC	S1	2140	51	19,22,23	3.02	8 (42%)	26,31,34	0.78	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	A2M	L2	382	2	18,25,26	4.27	6 (33%)	18,36,39	2.64	3 (16%)
1	A2M	L1	235	1	18,25,26	4.24	7 (38%)	18,36,39	2.67	3 (16%)
2	A2M	L2	527	90,2	18,25,26	4.09	7 (38%)	18,36,39	2.77	4 (22%)
51	PSU	S1	455	51	18,21,22	4.53	7 (38%)	22,30,33	1.72	4 (18%)
2	PSU	L2	437	2	18,21,22	0.85	1 (5%)	22,30,33	0.67	0
2	OMC	L2	359	2	19,22,23	2.99	8 (42%)	26,31,34	0.70	0
7	PSU	L7	69	90,7	18,21,22	4.44	7 (38%)	22,30,33	1.82	6 (27%)
1	PSU	L1	239	1	18,21,22	0.88	1 (5%)	22,30,33	0.65	0
2	PSU	L2	1264	91,2	18,21,22	4.41	8 (44%)	22,30,33	1.70	4 (18%)
51	OMU	S1	1833	51	19,22,23	3.02	8 (42%)	26,31,34	1.81	5 (19%)
51	PSU	S1	2046	51	18,21,22	4.47	7 (38%)	22,30,33	1.82	5 (22%)
51	PSU	S1	12	51	18,21,22	0.88	1 (5%)	22,30,33	0.63	0
2	PSU	L2	662	90,2	18,21,22	4.40	7 (38%)	22,30,33	1.75	5 (22%)
2	OMG	L2	1078	2	18,26,27	2.50	8 (44%)	19,38,41	1.72	5 (26%)
2	OMU	L2	560	2	19,22,23	0.26	0	26,31,34	1.21	3 (11%)
7	PSU	L7	101	7	18,21,22	4.40	8 (44%)	22,30,33	1.81	6 (27%)
51	OMG	S1	1865	51	18,26,27	2.59	8 (44%)	19,38,41	1.57	4 (21%)
2	5MC	L2	524	90,2	18,22,23	0.34	0	26,32,35	0.53	0
51	OMG	S1	1647	51	18,26,27	2.58	8 (44%)	19,38,41	1.62	4 (21%)
1	OMC	L1	695	1	19,22,23	2.90	8 (42%)	26,31,34	0.70	0
2	OMC	L2	1317	2	19,22,23	2.92	8 (42%)	26,31,34	0.75	0
51	7MG	S1	1995	51,53	22,26,27	4.24	10 (45%)	29,39,42	2.06	9 (31%)
1	A2M	L1	697	1	18,25,26	4.24	7 (38%)	18,36,39	2.65	3 (16%)
2	PSU	L2	1318	2	18,21,22	4.44	7 (38%)	22,30,33	1.85	5 (22%)
4	OMG	L4	74	4	18,26,27	1.03	3 (16%)	19,38,41	0.65	0
51	PSU	S1	1539	51	18,21,22	4.48	7 (38%)	22,30,33	1.79	5 (22%)
2	A2M	L2	665	2	18,25,26	4.23	7 (38%)	18,36,39	2.69	3 (16%)
2	OMU	L2	73	92,2	19,22,23	3.02	8 (42%)	26,31,34	1.67	4 (15%)
1	A2M	L1	678	2,1	18,25,26	0.63	1 (5%)	18,36,39	0.77	1 (5%)
2	OMG	L2	534	2	18,26,27	2.53	8 (44%)	19,38,41	1.48	4 (21%)
2	PSU	L2	500	2	18,21,22	4.47	7 (38%)	22,30,33	1.80	5 (22%)
2	A2M	L2	572	2	18,25,26	4.26	7 (38%)	18,36,39	2.66	3 (16%)
51	OMG	S1	1623	91,51	18,26,27	2.55	8 (44%)	19,38,41	1.52	4 (21%)
1	OMG	L1	959	1	18,26,27	1.03	3 (16%)	19,38,41	0.98	1 (5%)
2	PSU	L2	1303	2	18,21,22	4.48	7 (38%)	22,30,33	1.86	6 (27%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	PSU	L1	1526	1	18,21,22	4.46	8 (44%)	22,30,33	1.85	6 (27%)
51	OMU	S1	29	51	19,22,23	3.04	8 (42%)	26,31,34	1.71	5 (19%)
2	OMC	L2	1248	2	19,22,23	2.97	8 (42%)	26,31,34	0.86	0
1	A2M	L1	69	1	18,25,26	4.14	6 (33%)	18,36,39	2.82	5 (27%)
1	A2M	L1	927	1	18,25,26	4.23	7 (38%)	18,36,39	2.60	3 (16%)
1	OMU	L1	1371	1	19,22,23	3.08	8 (42%)	26,31,34	1.87	6 (23%)
2	PSU	L2	1265	2	18,21,22	4.45	7 (38%)	22,30,33	1.70	4 (18%)
1	A2M	L1	681	1	18,25,26	0.60	0	18,36,39	0.74	1 (5%)
2	A2M	L2	1372	2	18,25,26	4.25	6 (33%)	18,36,39	2.72	3 (16%)
2	A2M	L2	647	2	18,25,26	4.19	8 (44%)	18,36,39	2.68	3 (16%)
1	A2M	L1	1373	1	18,25,26	4.22	6 (33%)	18,36,39	2.70	3 (16%)
1	OMU	L1	1107	1	19,22,23	3.01	8 (42%)	26,31,34	1.75	4 (15%)
51	PSU	S1	1192	51	18,21,22	4.46	7 (38%)	22,30,33	1.72	5 (22%)
51	A2M	S1	897	51	18,25,26	4.25	6 (33%)	18,36,39	2.71	3 (16%)
1	OMU	L1	48	1	19,22,23	0.35	0	26,31,34	1.03	2 (7%)
1	OMU	L1	845	1	19,22,23	0.35	0	26,31,34	0.84	0
2	OMU	L2	1359	92,2	19,22,23	2.99	8 (42%)	26,31,34	1.68	4 (15%)
2	A2M	L2	628	2	18,25,26	0.63	1 (5%)	18,36,39	0.73	1 (5%)
1	OMU	L1	847	1	19,22,23	0.23	0	26,31,34	0.62	0
2	OMG	L2	641	2	18,26,27	2.52	8 (44%)	19,38,41	1.60	5 (26%)
1	PSU	L1	774	1	18,21,22	0.87	1 (5%)	22,30,33	0.79	1 (4%)
7	A2M	L7	162	7,1	18,25,26	4.27	6 (33%)	18,36,39	2.62	3 (16%)
1	OMG	L1	1540	2,1	18,26,27	1.04	3 (16%)	19,38,41	0.67	0
2	OMG	L2	1229	2	18,26,27	2.55	8 (44%)	19,38,41	1.53	4 (21%)
51	OMG	S1	1478	51	18,26,27	2.53	8 (44%)	19,38,41	1.59	5 (26%)
2	OMC	L2	1397	2	19,22,23	2.93	8 (42%)	26,31,34	0.79	0
51	OMG	S1	1550	51	18,26,27	1.02	3 (16%)	19,38,41	0.68	0
51	OMG	S1	600	51	18,26,27	2.55	8 (44%)	19,38,41	1.52	4 (21%)
51	OMU	S1	661	51	19,22,23	2.99	8 (42%)	26,31,34	1.67	5 (19%)
2	PSU	L2	1413	2	18,21,22	4.37	7 (38%)	22,30,33	1.82	5 (22%)
2	OMC	L2	1159	2	19,22,23	0.29	0	26,31,34	0.49	0
1	OMG	L1	1626	1	18,26,27	1.01	3 (16%)	19,38,41	0.83	1 (5%)
51	A2M	S1	2021	51	18,25,26	0.61	0	18,36,39	0.81	1 (5%)
2	OMC	L2	443	90,91,2	19,22,23	0.37	0	26,31,34	0.58	0
2	PSU	L2	472	2	18,21,22	4.45	7 (38%)	22,30,33	1.76	5 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
51	OMC	S1	18	51	19,22,23	2.93	8 (42%)	26,31,34	0.80	0
51	A2M	S1	512	51	18,25,26	4.27	7 (38%)	18,36,39	2.61	3 (16%)
2	PSU	L2	1058	2	18,21,22	4.46	7 (38%)	22,30,33	1.95	5 (22%)
2	PSU	L2	802	2	18,21,22	4.49	7 (38%)	22,30,33	1.81	6 (27%)
2	5MC	L2	1308	2	18,22,23	4.65	12 (66%)	26,32,35	1.26	2 (7%)
2	OMG	L2	1360	2,52	18,26,27	2.55	8 (44%)	19,38,41	1.49	4 (21%)
2	OMG	L2	71	92,2	18,26,27	2.58	8 (44%)	19,38,41	1.60	4 (21%)
2	OMU	L2	1419	2	19,22,23	2.97	8 (42%)	26,31,34	1.67	4 (15%)
51	PSU	S1	1246	51	18,21,22	4.49	7 (38%)	22,30,33	1.82	5 (22%)
1	A2M	L1	955	1	18,25,26	0.63	1 (5%)	18,36,39	0.77	1 (5%)
1	PSU	L1	1528	1	18,21,22	4.46	7 (38%)	22,30,33	1.80	5 (22%)
1	OMC	L1	1010	90,91,1	19,22,23	0.31	0	26,31,34	0.44	0
1	PSU	L1	1529	1	18,21,22	4.44	7 (38%)	22,30,33	1.81	5 (22%)
2	PSU	L2	1284	2	18,21,22	4.50	7 (38%)	22,30,33	1.80	5 (22%)
51	PSU	S1	1566	51	18,21,22	4.52	8 (44%)	22,30,33	1.72	4 (18%)
51	A2M	S1	668	90,51	18,25,26	4.14	7 (38%)	18,36,39	2.75	4 (22%)
1	OMG	L1	1524	1	18,26,27	2.56	8 (44%)	19,38,41	1.74	6 (31%)
2	PSU	L2	597	2	18,21,22	4.42	7 (38%)	22,30,33	1.78	5 (22%)
1	PSU	L1	672	90,1	18,21,22	0.85	1 (5%)	22,30,33	0.61	0
1	OMC	L1	1527	90,1	19,22,23	2.95	8 (42%)	26,31,34	0.79	0
51	5MC	S1	1544	51	18,22,23	0.32	0	26,32,35	0.52	0
51	5MC	S1	2061	51	18,22,23	3.48	7 (38%)	26,32,35	0.94	1 (3%)
1	PSU	L1	1171	91,1	18,21,22	4.46	8 (44%)	22,30,33	1.77	4 (18%)
1	A2M	L1	305	1	18,25,26	4.17	8 (44%)	18,36,39	2.76	5 (27%)
2	OMG	L2	686	2	18,26,27	2.57	8 (44%)	19,38,41	1.55	5 (26%)
2	PSU	L2	593	92,2	18,21,22	4.41	7 (38%)	22,30,33	1.70	5 (22%)
51	PSU	S1	33	51	18,21,22	4.52	7 (38%)	22,30,33	1.80	5 (22%)
52	MIA	S2	37	52	24,31,32	2.43	3 (12%)	26,44,47	4.88	10 (38%)
51	OMU	S1	1662	51	19,22,23	3.02	8 (42%)	26,31,34	1.68	4 (15%)
1	PSU	L1	422	1	18,21,22	4.47	7 (38%)	22,30,33	1.73	5 (22%)
1	PSU	L1	940	1	18,21,22	4.45	7 (38%)	22,30,33	1.80	5 (22%)
2	PSU	L2	78	2	18,21,22	4.43	7 (38%)	22,30,33	1.81	5 (22%)
2	OMG	L2	1046	90,2,53	18,26,27	2.53	8 (44%)	19,38,41	1.50	4 (21%)
2	PSU	L2	1213	2	18,21,22	4.43	7 (38%)	22,30,33	1.84	5 (22%)
51	OMC	S1	2059	51	19,22,23	2.99	8 (42%)	26,31,34	1.22	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PSU	L2	565	2	18,21,22	0.87	1 (5%)	22,30,33	0.72	1 (4%)
51	B8N	S1	1543	-	24,29,30	4.25	14 (58%)	29,42,45	2.00	7 (24%)
1	PSU	L1	1011	2,1	18,21,22	0.79	1 (5%)	22,30,33	0.75	0
2	OMG	L2	1231	2	18,26,27	2.52	8 (44%)	19,38,41	1.54	5 (26%)
1	PSU	L1	313	1	18,21,22	4.44	7 (38%)	22,30,33	1.71	4 (18%)
1	A2M	L1	858	1	18,25,26	4.23	6 (33%)	18,36,39	2.70	3 (16%)
2	A2M	L2	95	2	18,25,26	4.25	7 (38%)	18,36,39	2.68	3 (16%)
2	PSU	L2	504	2	18,21,22	4.52	7 (38%)	22,30,33	1.84	5 (22%)
51	OMU	S1	1621	90,51	19,22,23	3.02	8 (42%)	26,31,34	1.72	5 (19%)
51	A2M	S1	479	51	18,25,26	4.24	7 (38%)	18,36,39	2.66	3 (16%)
51	A2M	S1	98	90,51	18,25,26	4.26	7 (38%)	18,36,39	2.60	3 (16%)
2	OMG	L2	655	2	18,26,27	2.55	8 (44%)	19,38,41	1.63	6 (31%)

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
51	PSU	S1	1292	90,91,51	-	0/7/25/26	0/2/2/2
51	OMC	S1	1866	51	-	0/9/27/28	0/2/2/2
51	PSU	S1	2048	51	-	0/7/25/26	0/2/2/2
7	OMG	L7	75	7	-	0/5/27/28	0/3/3/3
51	OMC	S1	38	51	-	0/9/27/28	0/2/2/2
2	PSU	L2	512	2	-	0/7/25/26	0/2/2/2
2	A2M	L2	1185	2	-	2/5/27/28	0/3/3/3
51	MA6	S1	2185	90,51	-	1/7/29/30	0/3/3/3
7	PSU	L7	166	7,1	-	0/7/25/26	0/2/2/2
2	OMU	L2	667	2	-	0/9/27/28	0/2/2/2
2	PSU	L2	1194	2	-	0/7/25/26	0/2/2/2
2	OMC	L2	583	2	-	0/9/27/28	0/2/2/2
2	A2M	L2	570	2,1	-	0/5/27/28	0/3/3/3
2	PSU	L2	626	2	-	0/7/25/26	0/2/2/2
2	PSU	L2	1144	2	-	0/7/25/26	0/2/2/2
1	OMG	L1	1190	90,1	-	0/5/27/28	0/3/3/3
1	PSU	L1	1533	2,1	-	0/7/25/26	0/2/2/2
2	A2M	L2	502	2	-	2/5/27/28	0/3/3/3
2	PSU	L2	1361	92,2,52	-	5/7/25/26	0/2/2/2
1	OMU	L1	1659	90,1	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
51	OMU	S1	8	51	-	7/9/27/28	0/2/2/2
2	PSU	L2	1152	2	-	0/7/25/26	0/2/2/2
51	OMG	S1	2151	51	-	2/5/27/28	0/3/3/3
2	PSU	L2	510	2	-	0/7/25/26	0/2/2/2
1	A2M	L1	1539	90,2,1	-	1/5/27/28	0/3/3/3
2	A2M	L2	1384	90,2	-	0/5/27/28	0/3/3/3
2	A2M	L2	604	2,1	-	0/5/27/28	0/3/3/3
2	PSU	L2	1403	2	-	0/7/25/26	0/2/2/2
51	A2M	S1	28	51	-	0/5/27/28	0/3/3/3
1	PSU	L1	1177	1	-	0/7/25/26	0/2/2/2
1	PSU	L1	1181	1	-	0/7/25/26	0/2/2/2
2	PSU	L2	1060	2	-	0/7/25/26	0/2/2/2
3	OMU	L3	13	3	-	1/9/27/28	0/2/2/2
51	OMG	S1	1829	90,51	-	2/5/27/28	0/3/3/3
7	PSU	L7	74	7	-	0/7/25/26	0/2/2/2
2	A2M	L2	1067	2	-	0/5/27/28	0/3/3/3
2	A2M	L2	591	92,2	-	0/5/27/28	0/3/3/3
2	OMG	L2	1253	2	-	0/5/27/28	0/3/3/3
1	PSU	L1	1017	91,1	-	2/7/25/26	0/2/2/2
2	OMC	L2	14	2,1	-	2/9/27/28	0/2/2/2
51	PSU	S1	1657	51	-	1/7/25/26	0/2/2/2
7	A2M	L7	43	90,7	-	0/5/27/28	0/3/3/3
1	PSU	L1	1664	1	-	2/7/25/26	0/2/2/2
2	OMU	L2	56	2,1	-	1/9/27/28	0/2/2/2
51	OMU	S1	1979	51	-	1/9/27/28	0/2/2/2
51	MA6	S1	2184	51	-	0/7/29/30	0/3/3/3
1	A2M	L1	407	1	-	0/5/27/28	0/3/3/3
2	OMU	L2	1077	2	-	0/9/27/28	0/2/2/2
51	PSU	S1	1533	51	-	0/7/25/26	0/2/2/2
1	OMG	L1	856	1	-	0/5/27/28	0/3/3/3
1	PSU	L1	510	1	-	3/7/25/26	0/2/2/2
51	PSU	S1	2202	51	-	1/7/25/26	0/2/2/2
51	OMC	S1	2140	51	-	3/9/27/28	0/2/2/2
2	A2M	L2	382	2	-	0/5/27/28	0/3/3/3
1	A2M	L1	235	1	-	0/5/27/28	0/3/3/3
2	A2M	L2	527	90,2	-	3/5/27/28	0/3/3/3
51	PSU	S1	455	51	-	2/7/25/26	0/2/2/2
2	PSU	L2	437	2	-	0/7/25/26	0/2/2/2
2	OMC	L2	359	2	-	0/9/27/28	0/2/2/2
7	PSU	L7	69	90,7	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	L1	239	1	-	0/7/25/26	0/2/2/2
2	PSU	L2	1264	91,2	-	2/7/25/26	0/2/2/2
51	OMU	S1	1833	51	-	1/9/27/28	0/2/2/2
51	PSU	S1	2046	51	-	0/7/25/26	0/2/2/2
51	PSU	S1	12	51	-	0/7/25/26	0/2/2/2
2	PSU	L2	662	90,2	-	0/7/25/26	0/2/2/2
2	OMG	L2	1078	2	-	2/5/27/28	0/3/3/3
2	OMU	L2	560	2	-	3/9/27/28	0/2/2/2
7	PSU	L7	101	7	-	0/7/25/26	0/2/2/2
51	OMG	S1	1865	51	-	0/5/27/28	0/3/3/3
2	5MC	L2	524	90,2	-	0/7/25/26	0/2/2/2
51	OMG	S1	1647	51	-	0/5/27/28	0/3/3/3
1	OMC	L1	695	1	-	1/9/27/28	0/2/2/2
2	OMC	L2	1317	2	-	0/9/27/28	0/2/2/2
51	7MG	S1	1995	51,53	-	2/7/37/38	0/3/3/3
1	A2M	L1	697	1	-	0/5/27/28	0/3/3/3
2	PSU	L2	1318	2	-	0/7/25/26	0/2/2/2
4	OMG	L4	74	4	-	3/5/27/28	0/3/3/3
51	PSU	S1	1539	51	-	0/7/25/26	0/2/2/2
2	A2M	L2	665	2	-	2/5/27/28	0/3/3/3
2	OMU	L2	73	92,2	-	0/9/27/28	0/2/2/2
1	A2M	L1	678	2,1	-	0/5/27/28	0/3/3/3
2	OMG	L2	534	2	-	2/5/27/28	0/3/3/3
2	PSU	L2	500	2	-	0/7/25/26	0/2/2/2
2	A2M	L2	572	2	-	0/5/27/28	0/3/3/3
51	OMG	S1	1623	91,51	-	0/5/27/28	0/3/3/3
1	OMG	L1	959	1	-	3/5/27/28	0/3/3/3
2	PSU	L2	1303	2	-	0/7/25/26	0/2/2/2
1	PSU	L1	1526	1	-	4/7/25/26	0/2/2/2
51	OMU	S1	29	51	-	1/9/27/28	0/2/2/2
2	OMC	L2	1248	2	-	1/9/27/28	0/2/2/2
1	A2M	L1	69	1	-	2/5/27/28	0/3/3/3
1	A2M	L1	927	1	-	0/5/27/28	0/3/3/3
1	OMU	L1	1371	1	-	3/9/27/28	0/2/2/2
2	PSU	L2	1265	2	-	0/7/25/26	0/2/2/2
1	A2M	L1	681	1	-	4/5/27/28	0/3/3/3
2	A2M	L2	1372	2	-	0/5/27/28	0/3/3/3
2	A2M	L2	647	2	-	3/5/27/28	0/3/3/3
1	A2M	L1	1373	1	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	OMU	L1	1107	1	-	0/9/27/28	0/2/2/2
51	PSU	S1	1192	51	-	2/7/25/26	0/2/2/2
51	A2M	S1	897	51	-	0/5/27/28	0/3/3/3
1	OMU	L1	48	1	-	2/9/27/28	0/2/2/2
1	OMU	L1	845	1	-	3/9/27/28	0/2/2/2
2	OMU	L2	1359	92,2	-	0/9/27/28	0/2/2/2
2	A2M	L2	628	2	-	0/5/27/28	0/3/3/3
1	OMU	L1	847	1	-	0/9/27/28	0/2/2/2
2	OMG	L2	641	2	-	0/5/27/28	0/3/3/3
1	PSU	L1	774	1	-	0/7/25/26	0/2/2/2
7	A2M	L7	162	7,1	-	1/5/27/28	0/3/3/3
1	OMG	L1	1540	2,1	-	2/5/27/28	0/3/3/3
2	OMG	L2	1229	2	-	2/5/27/28	0/3/3/3
51	OMG	S1	1478	51	-	1/5/27/28	0/3/3/3
2	OMC	L2	1397	2	-	0/9/27/28	0/2/2/2
51	OMG	S1	1550	51	-	1/5/27/28	0/3/3/3
51	OMG	S1	600	51	-	2/5/27/28	0/3/3/3
51	OMU	S1	661	51	-	0/9/27/28	0/2/2/2
2	PSU	L2	1413	2	-	0/7/25/26	0/2/2/2
2	OMC	L2	1159	2	-	0/9/27/28	0/2/2/2
1	OMG	L1	1626	1	-	0/5/27/28	0/3/3/3
51	A2M	S1	2021	51	-	1/5/27/28	0/3/3/3
2	OMC	L2	443	90,91,2	-	4/9/27/28	0/2/2/2
2	PSU	L2	472	2	-	0/7/25/26	0/2/2/2
51	OMC	S1	18	51	-	1/9/27/28	0/2/2/2
51	A2M	S1	512	51	-	2/5/27/28	0/3/3/3
2	PSU	L2	1058	2	-	0/7/25/26	0/2/2/2
2	PSU	L2	802	2	-	2/7/25/26	0/2/2/2
2	5MC	L2	1308	2	-	4/7/25/26	0/2/2/2
2	OMG	L2	1360	2,52	-	0/5/27/28	0/3/3/3
2	OMG	L2	71	92,2	-	0/5/27/28	0/3/3/3
2	OMU	L2	1419	2	-	0/9/27/28	0/2/2/2
51	PSU	S1	1246	51	-	0/7/25/26	0/2/2/2
1	A2M	L1	955	1	-	1/5/27/28	0/3/3/3
1	PSU	L1	1528	1	-	2/7/25/26	0/2/2/2
1	OMC	L1	1010	90,91,1	-	2/9/27/28	0/2/2/2
1	PSU	L1	1529	1	-	0/7/25/26	0/2/2/2
2	PSU	L2	1284	2	-	0/7/25/26	0/2/2/2
51	PSU	S1	1566	51	-	2/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
51	A2M	S1	668	90,51	-	3/5/27/28	0/3/3/3
1	OMG	L1	1524	1	-	1/5/27/28	0/3/3/3
2	PSU	L2	597	2	-	0/7/25/26	0/2/2/2
1	PSU	L1	672	90,1	-	0/7/25/26	0/2/2/2
1	OMC	L1	1527	90,1	-	1/9/27/28	0/2/2/2
51	5MC	S1	1544	51	-	0/7/25/26	0/2/2/2
51	5MC	S1	2061	51	-	2/7/25/26	0/2/2/2
1	PSU	L1	1171	91,1	-	2/7/25/26	0/2/2/2
1	A2M	L1	305	1	-	2/5/27/28	0/3/3/3
2	OMG	L2	686	2	-	2/5/27/28	0/3/3/3
2	PSU	L2	593	92,2	-	0/7/25/26	0/2/2/2
51	PSU	S1	33	51	-	2/7/25/26	0/2/2/2
52	MIA	S2	37	52	-	0/11/33/34	0/3/3/3
51	OMU	S1	1662	51	-	1/9/27/28	0/2/2/2
1	PSU	L1	422	1	-	0/7/25/26	0/2/2/2
1	PSU	L1	940	1	-	0/7/25/26	0/2/2/2
2	PSU	L2	78	2	-	0/7/25/26	0/2/2/2
2	OMG	L2	1046	90,2,53	-	3/5/27/28	0/3/3/3
2	PSU	L2	1213	2	-	0/7/25/26	0/2/2/2
51	OMC	S1	2059	51	-	3/9/27/28	0/2/2/2
2	PSU	L2	565	2	-	0/7/25/26	0/2/2/2
51	B8N	S1	1543	-	-	10/16/34/35	0/2/2/2
1	PSU	L1	1011	2,1	-	0/7/25/26	0/2/2/2
2	OMG	L2	1231	2	-	0/5/27/28	0/3/3/3
1	PSU	L1	313	1	-	2/7/25/26	0/2/2/2
1	A2M	L1	858	1	-	0/5/27/28	0/3/3/3
2	A2M	L2	95	2	-	1/5/27/28	0/3/3/3
2	PSU	L2	504	2	-	0/7/25/26	0/2/2/2
51	OMU	S1	1621	90,51	-	0/9/27/28	0/2/2/2
51	A2M	S1	479	51	-	0/5/27/28	0/3/3/3
51	A2M	S1	98	90,51	-	2/5/27/28	0/3/3/3
2	OMG	L2	655	2	-	0/5/27/28	0/3/3/3

The worst 5 of 1036 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	S1	512	A2M	O4'-C1'	15.43	1.62	1.41
51	S1	28	A2M	O4'-C1'	15.40	1.62	1.41
2	L2	572	A2M	O4'-C1'	15.37	1.62	1.41
2	L2	604	A2M	O4'-C1'	15.34	1.62	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L1	407	A2M	O4'-C1'	15.34	1.62	1.41

The worst 5 of 568 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
52	S2	37	MIA	C1'-N9-C4	17.12	156.72	126.64
51	S1	2185	MA6	N1-C6-N6	-12.27	104.14	117.06
52	S2	37	MIA	C11-S10-C2	11.54	110.89	102.27
51	S1	2184	MA6	N1-C6-N6	-11.14	105.33	117.06
52	S2	37	MIA	S10-C2-N3	8.91	147.02	116.10

There are no chirality outliers.

5 of 157 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	L7	162	A2M	C1'-C2'-O2'-CM'
1	L1	48	OMU	O4'-C1'-N1-C2
1	L1	48	OMU	O4'-C1'-N1-C6
1	L1	305	A2M	O4'-C4'-C5'-O5'
1	L1	510	PSU	C2'-C1'-C5-C6

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 520 ligands modelled in this entry, 519 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
93	A1H4F	L2	1601	-	32,32,32	4.25	11 (34%)	37,42,42	1.42	5 (13%)

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
93	A1H4F	L2	1601	-	-	9/26/39/39	0/2/2/2

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
93	L2	1601	A1H4F	C03-C02	-16.85	1.28	1.53
93	L2	1601	A1H4F	C27-C05	-11.96	1.29	1.53
93	L2	1601	A1H4F	C13-N14	6.04	1.46	1.34
93	L2	1601	A1H4F	C02-C27	5.95	1.65	1.53
93	L2	1601	A1H4F	O28-C29	3.78	1.43	1.35

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
93	L2	1601	A1H4F	O28-C29-C30	5.01	120.30	111.09
93	L2	1601	A1H4F	C12-C13-N14	3.01	121.61	116.37
93	L2	1601	A1H4F	C12-O11-C10	-2.90	112.57	117.67
93	L2	1601	A1H4F	O23-C21-C15	2.26	120.92	113.40
93	L2	1601	A1H4F	O23-C21-O22	-2.08	119.36	124.09

There are no chirality outliers.

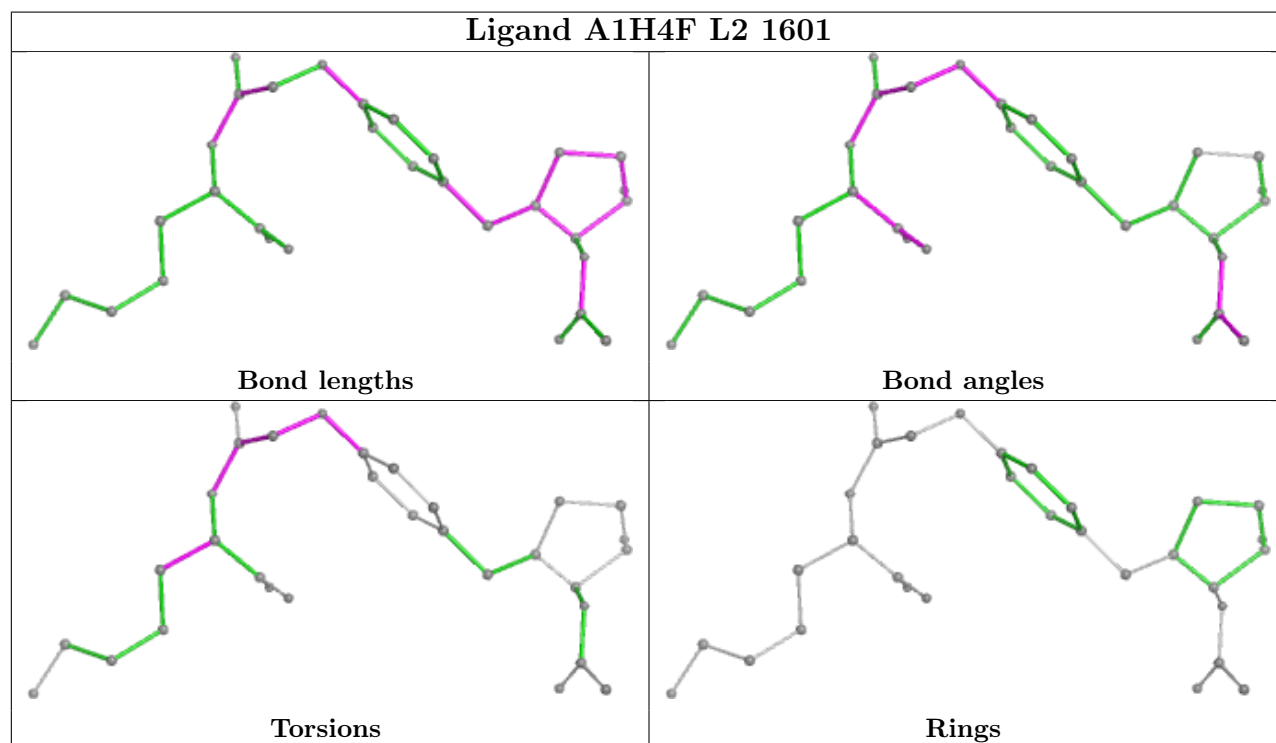
5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
93	L2	1601	A1H4F	C12-C13-N14-C15
93	L2	1601	A1H4F	O24-C13-N14-C15
93	L2	1601	A1H4F	C09-C10-O11-C12
93	L2	1601	A1H4F	C25-C10-O11-C12
93	L2	1601	A1H4F	N14-C15-C16-C17

There are no ring outliers.

No monomer is involved in short contacts.

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



5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
51	S1	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	S1	1543:B8N	O3'	1544:5MC	P	3.54
1	S1	1542:C	O3'	1543:B8N	P	2.98

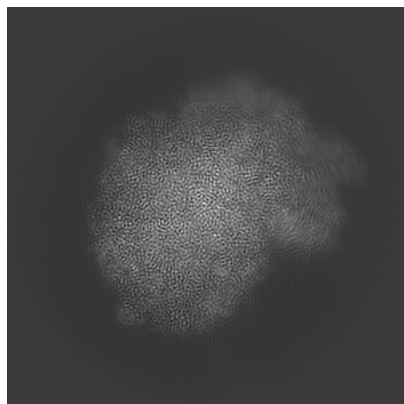
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19576. These allow visual inspection of the internal detail of the map and identification of artifacts.

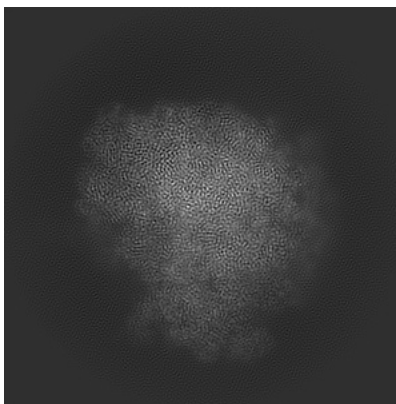
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

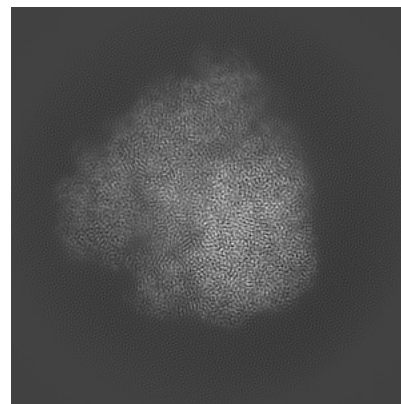
6.1.1 Primary map



X

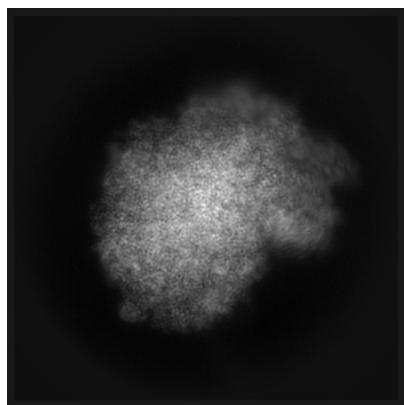


Y

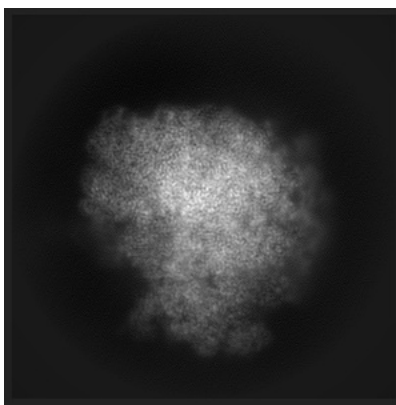


Z

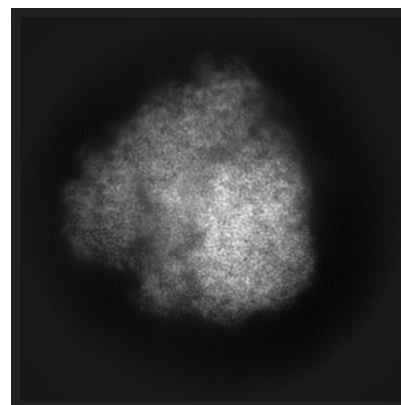
6.1.2 Raw map



X



Y

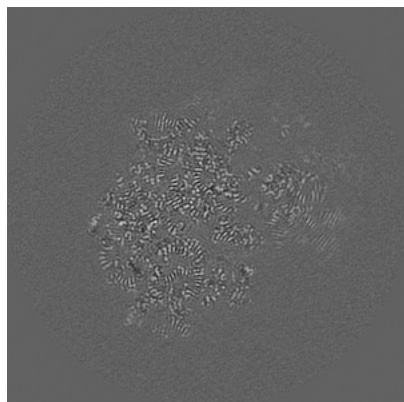


Z

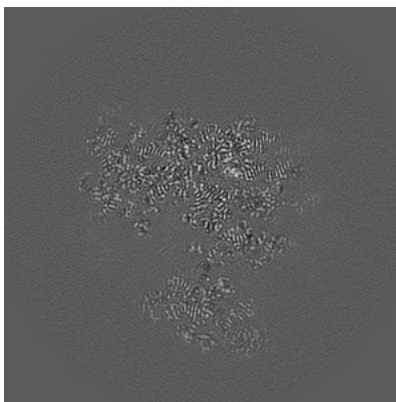
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

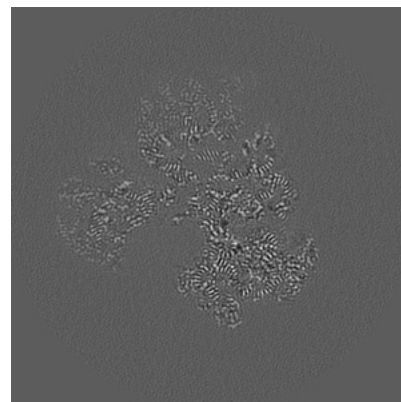
6.2.1 Primary map



X Index: 240

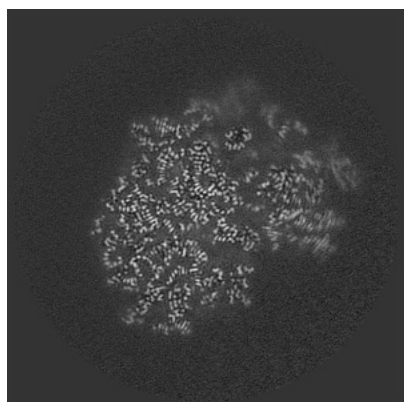


Y Index: 240

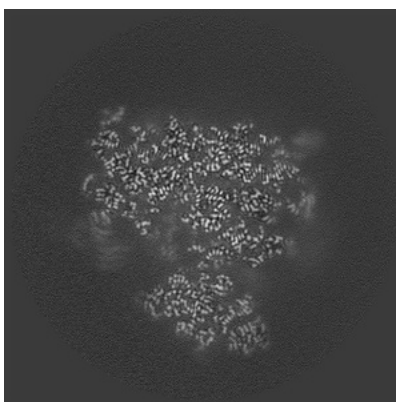


Z Index: 240

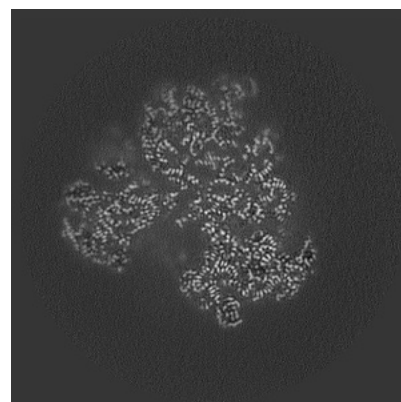
6.2.2 Raw map



X Index: 240



Y Index: 240

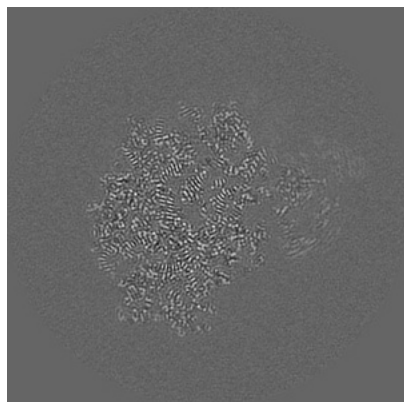


Z Index: 240

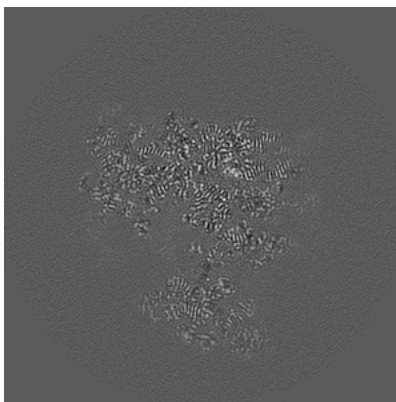
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

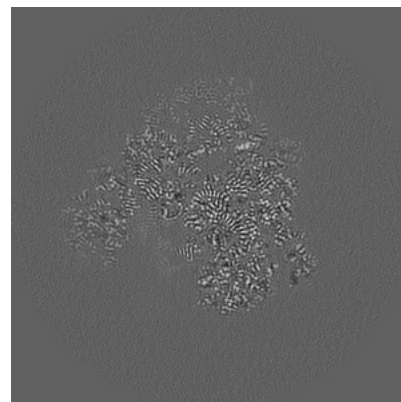
6.3.1 Primary map



X Index: 270

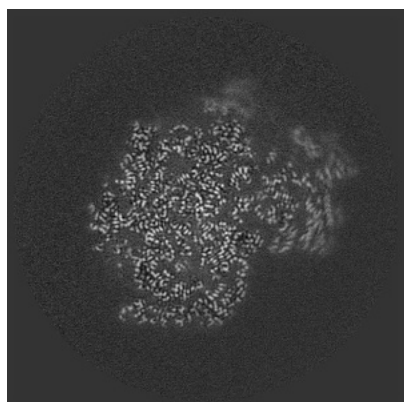


Y Index: 240

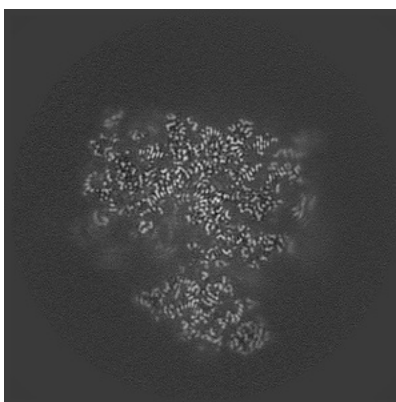


Z Index: 259

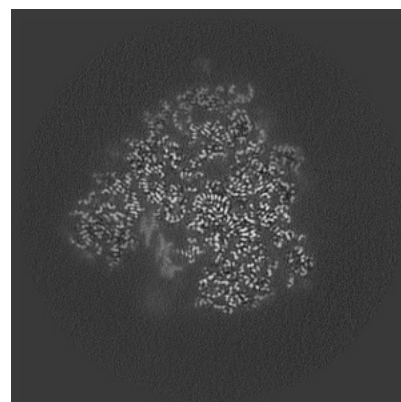
6.3.2 Raw map



X Index: 255



Y Index: 236

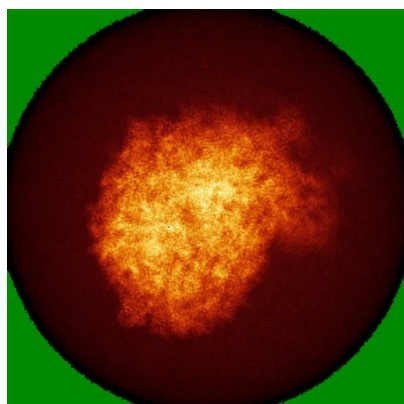


Z Index: 259

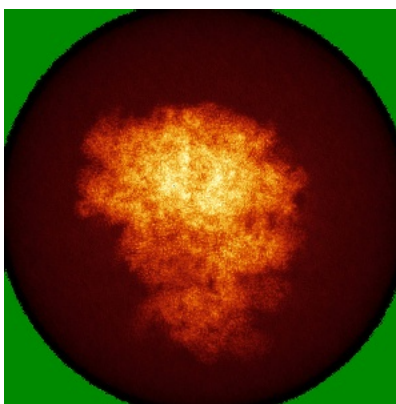
The images above show the largest variance slices of the map in three orthogonal directions.

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

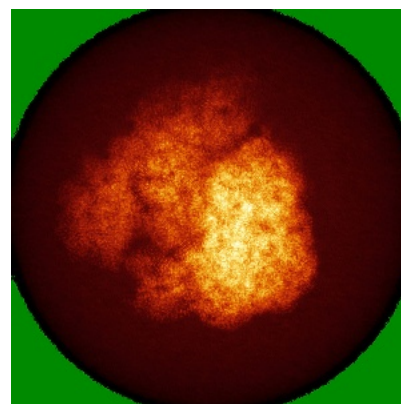
6.4.1 Primary map



X

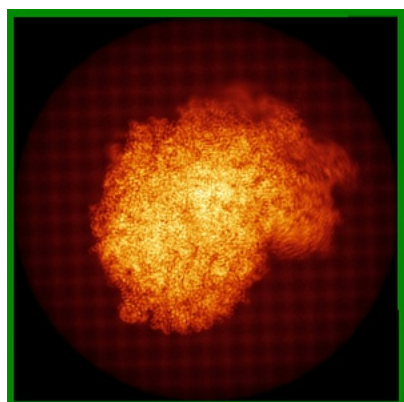


Y

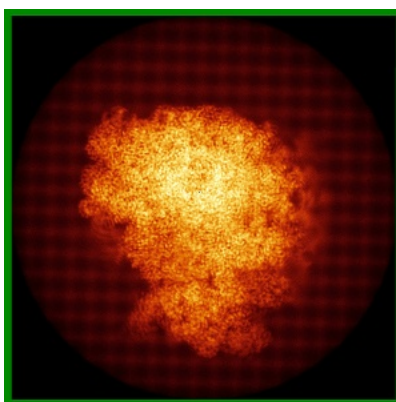


Z

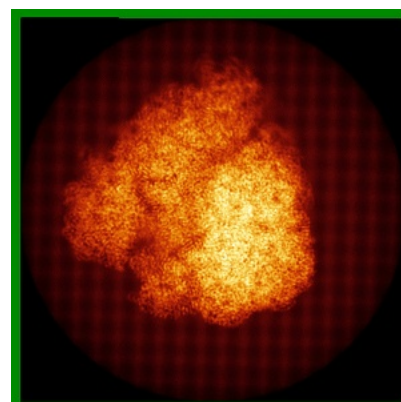
6.4.2 Raw map



X



Y

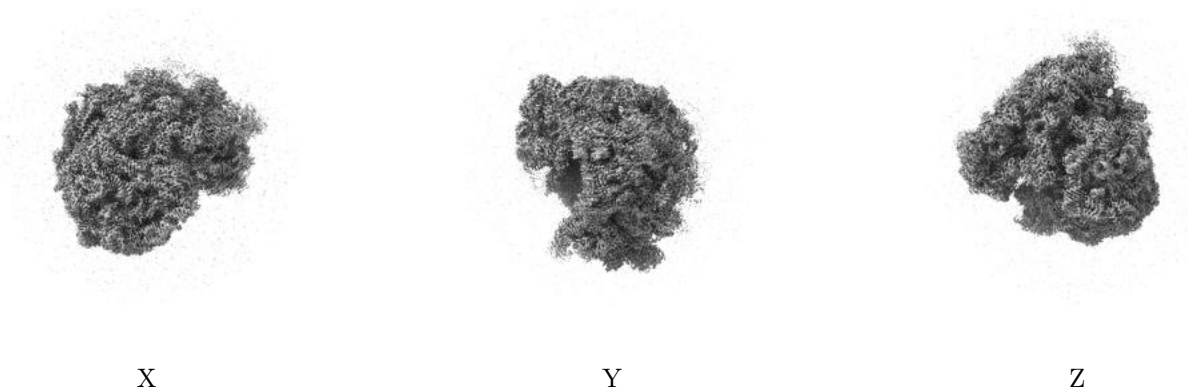


Z

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

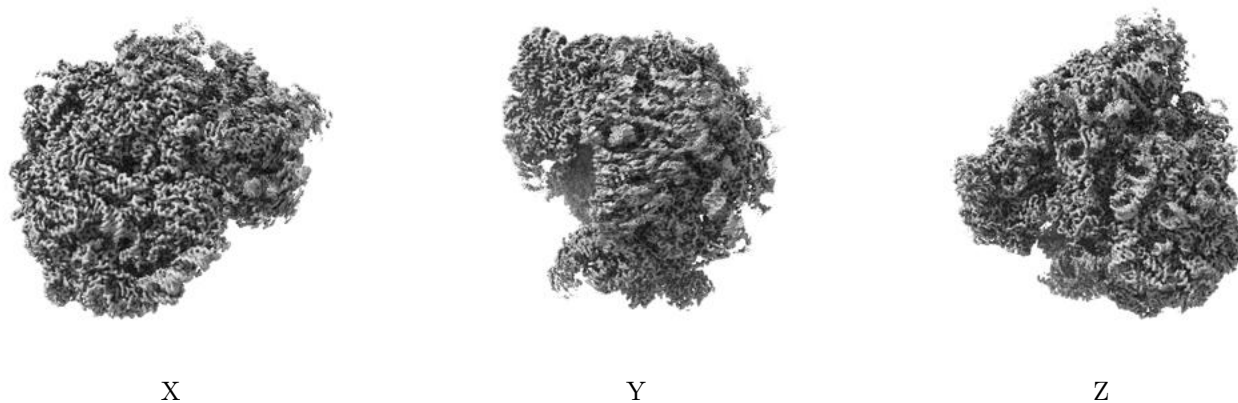
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

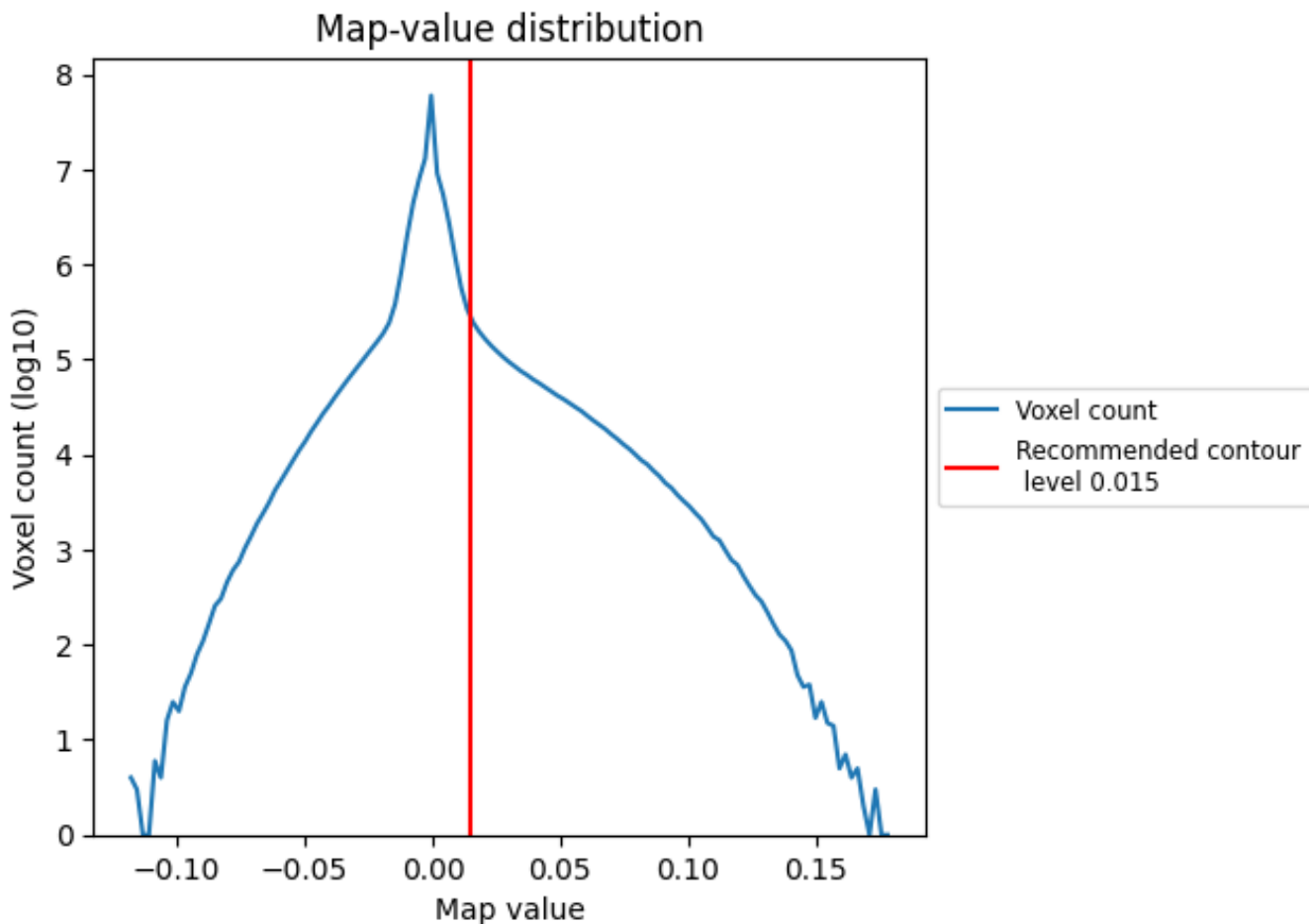
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

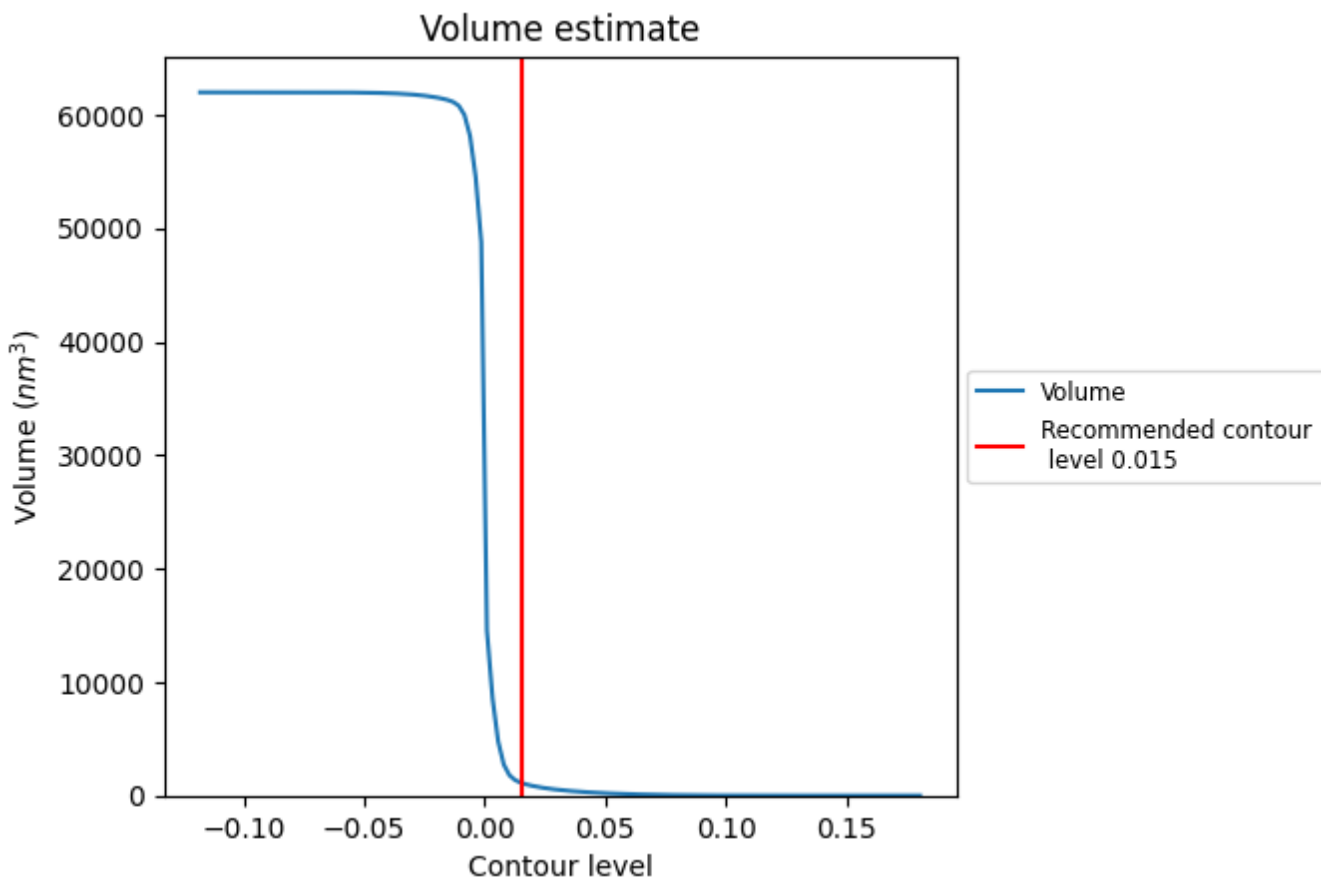
This section contains the results of statistical analysis of the map.

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.

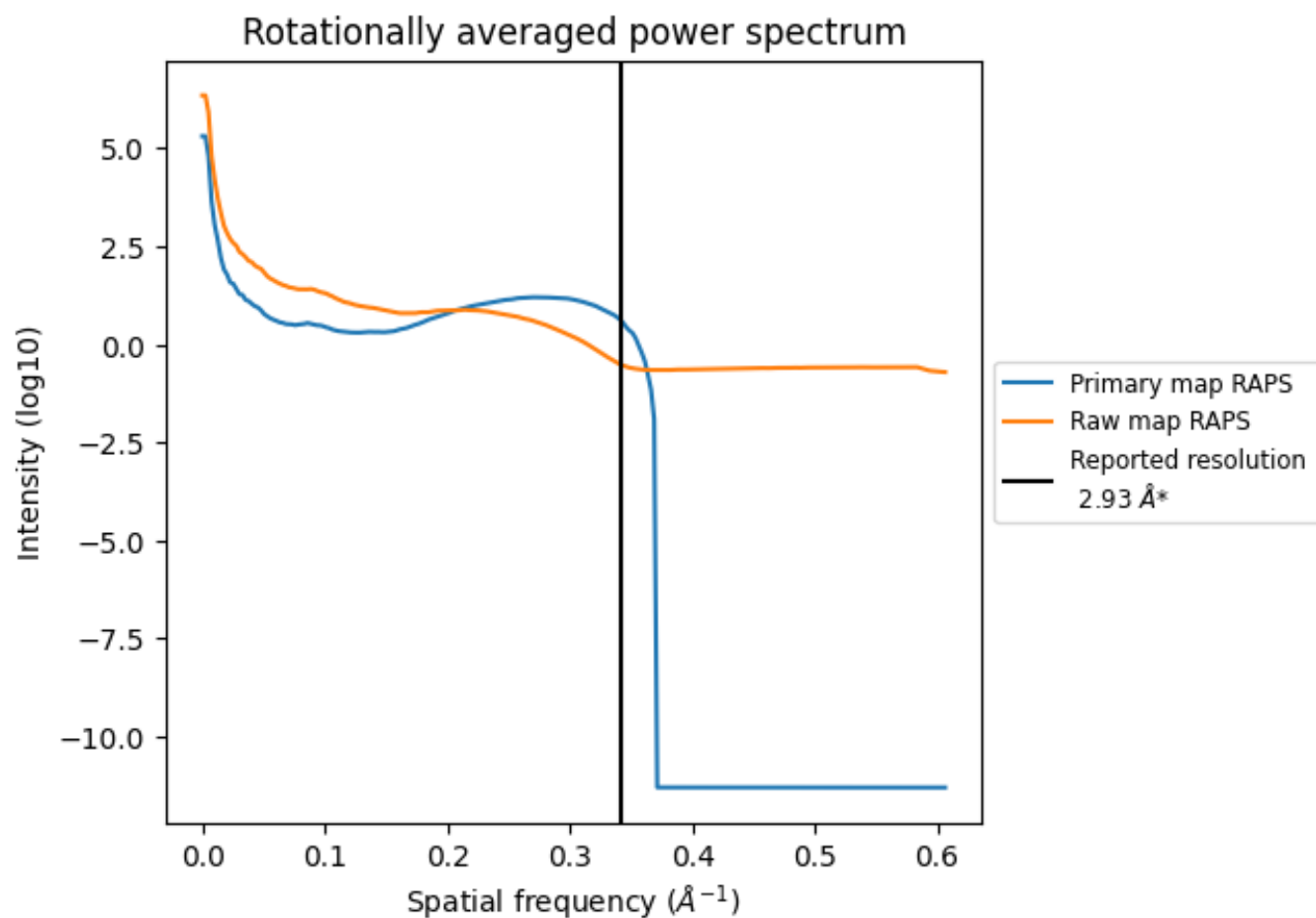
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1131 nm^3 ; this corresponds to an approximate mass of 1022 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](#)

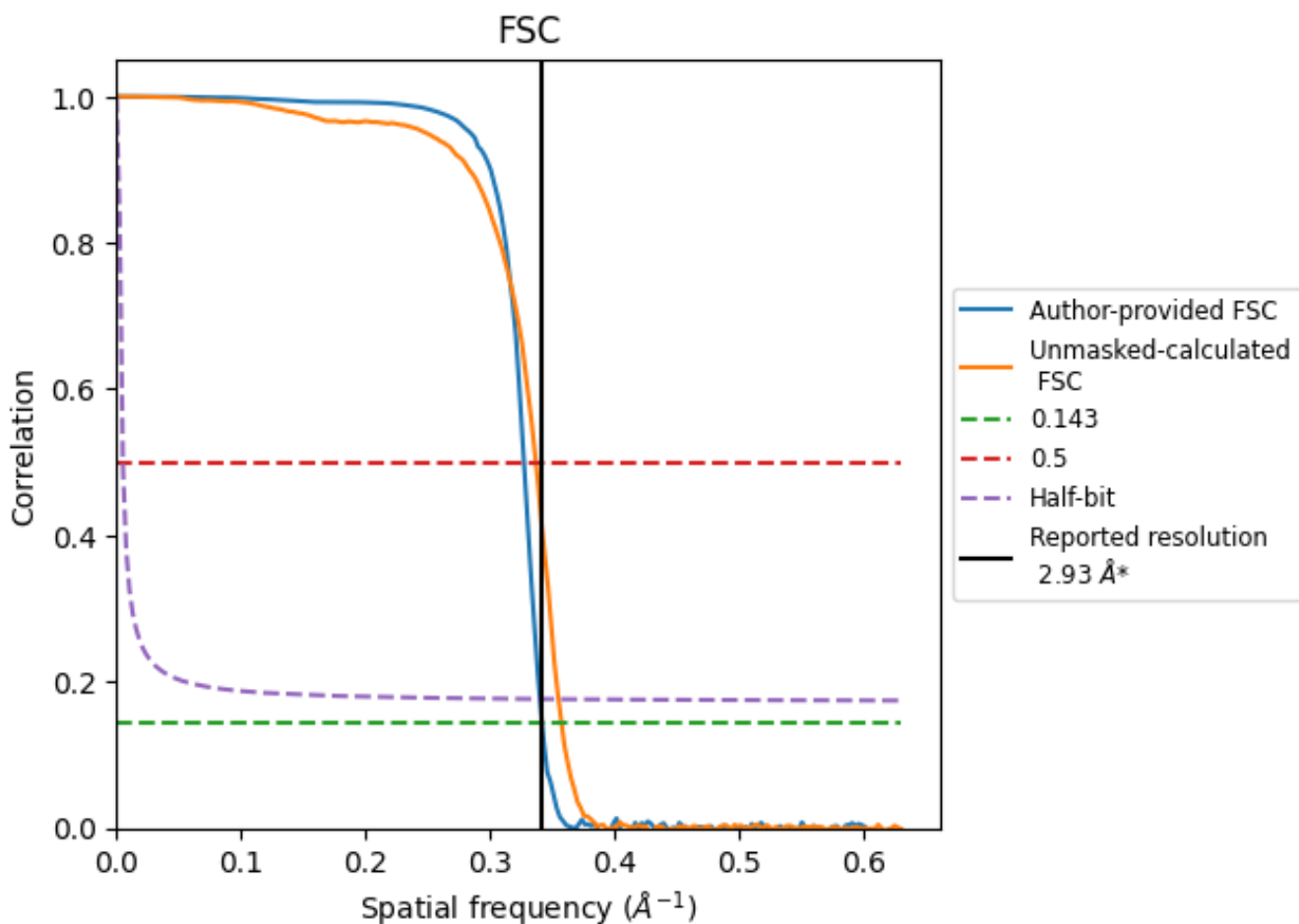


*Reported resolution corresponds to spatial frequency of 0.341 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.341 Å⁻¹

8.2 Resolution estimates [i](#)

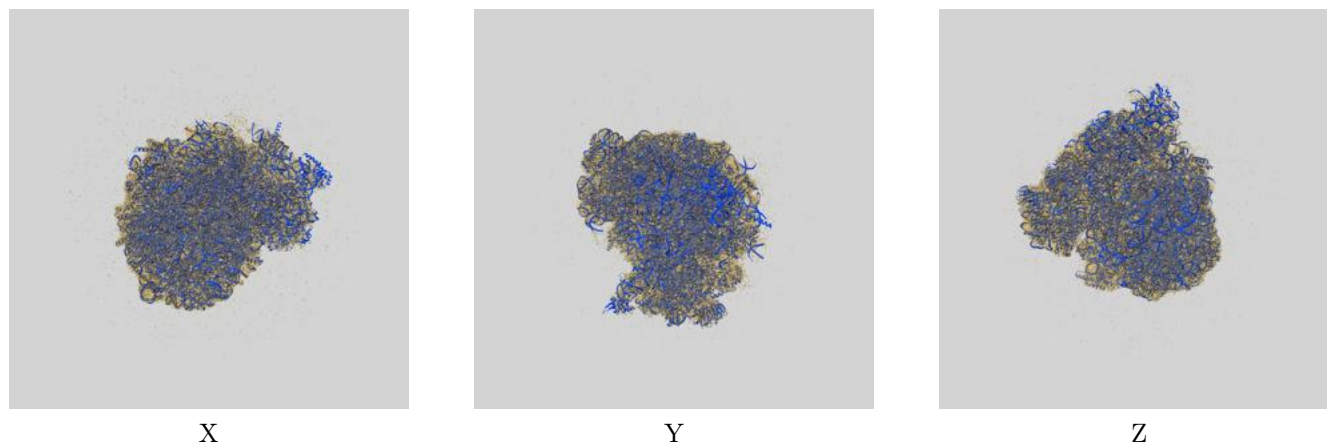
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.93	-	-
Author-provided FSC curve	2.92	3.05	2.94
Unmasked-calculated*	2.80	2.97	2.82

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

9 Map-model fit [i](#)

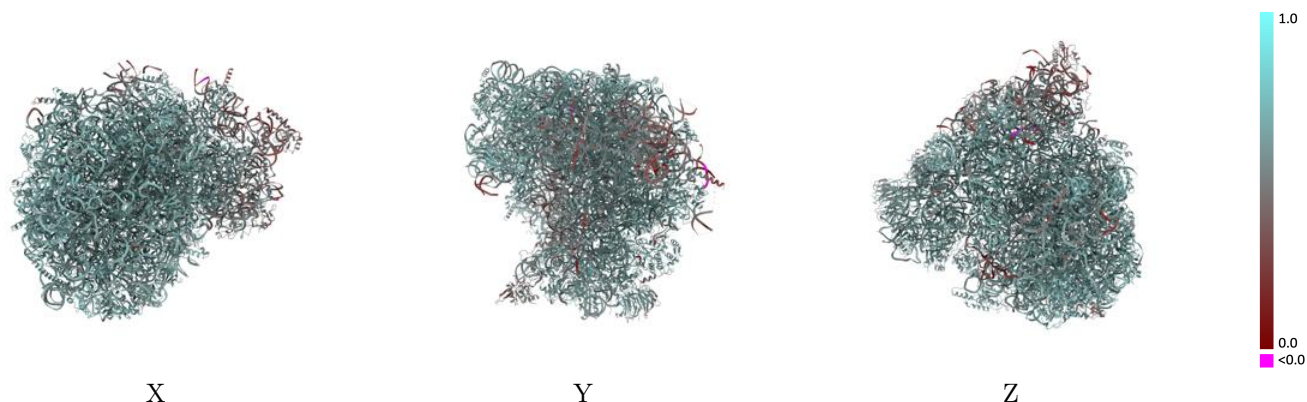
This section contains information regarding the fit between EMDB map EMD-19576 and PDB model 8RXH. Per-residue inclusion information can be found in section [3](#) on page [25](#).

9.1 Map-model overlay [i](#)



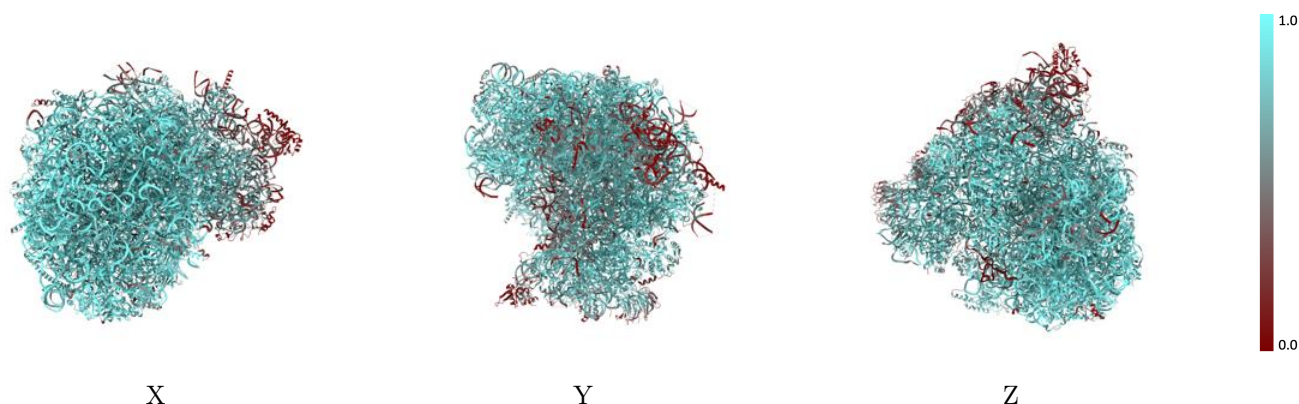
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



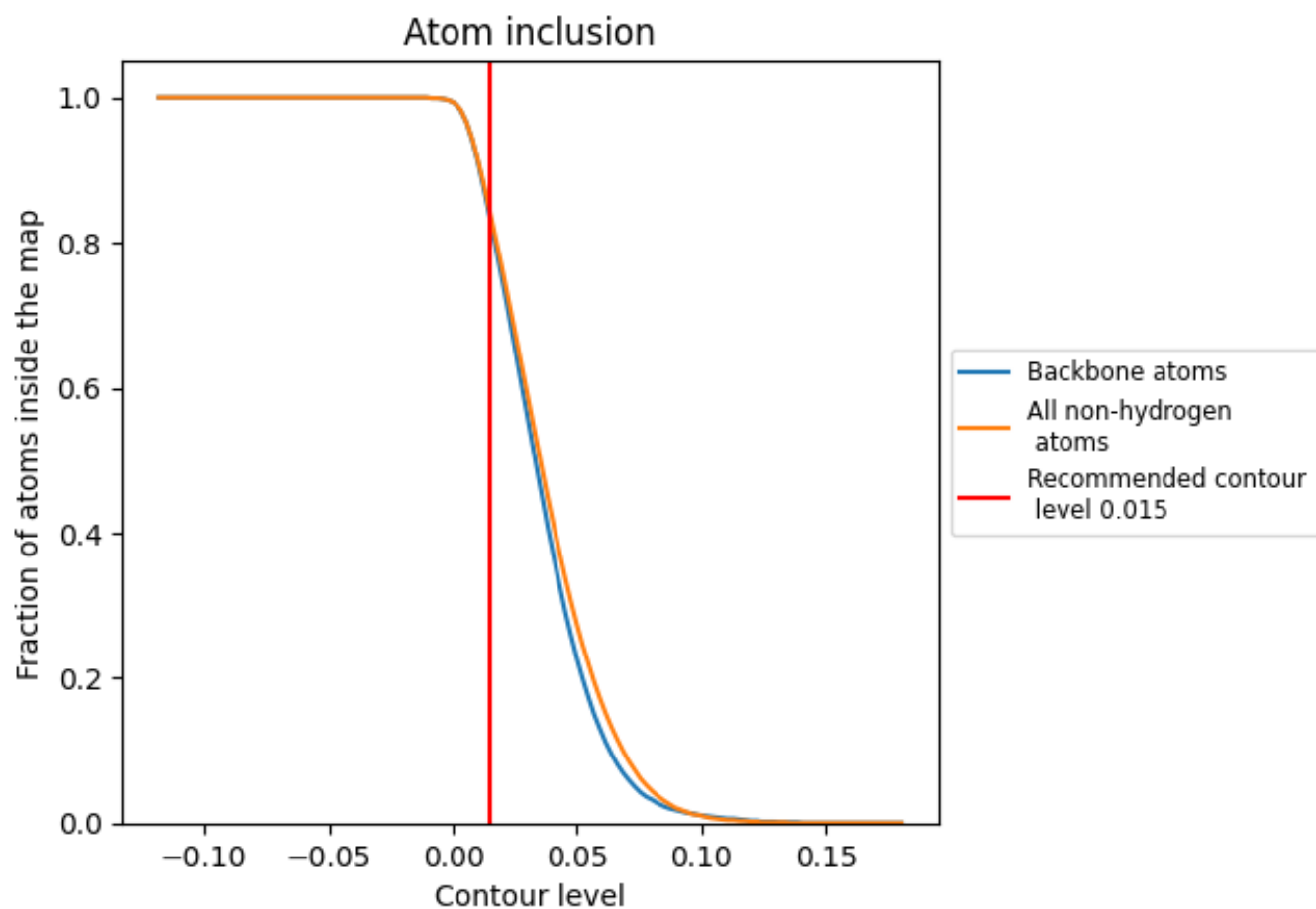
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.015).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 84% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary





















































































The table lists the average atom inclusion at the recommended contour level (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8420	 0.6030
L1	 0.9320	 0.6220
L2	 0.9180	 0.6170
L3	 0.8960	 0.6070
L4	 0.9590	 0.6350
L5	 0.8820	 0.6040
L6	 0.8930	 0.6060
L7	 0.9420	 0.6280
L8	 0.9610	 0.6320
LA	 0.9610	 0.6540
LB	 0.9350	 0.6480
LC	 0.9460	 0.6480
LD	 0.7950	 0.6200
LE	 0.9070	 0.6430
LF	 0.8420	 0.6220
LG	 0.8390	 0.6190
LH	 0.9400	 0.6510
LI	 0.8920	 0.6400
LJ	 0.9370	 0.6450
LK	 0.8420	 0.6300
LL	 0.9530	 0.6560
LM	 0.9800	 0.6600
LN	 0.8920	 0.6370
LO	 0.8180	 0.6190
LP	 0.9580	 0.6520
LQ	 0.7810	 0.6070
LR	 0.9520	 0.6510
LS	 0.9180	 0.6380
LT	 0.9700	 0.6580
LU	 0.6830	 0.6010
LV	 0.9440	 0.6490
LW	 0.9420	 0.6530
LX	 0.7440	 0.5880
LY	 0.8830	 0.6370
LZ	 0.9170	 0.6470





























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Chain	Atom inclusion	Q-score
La	 0.9080	 0.6420
Lb	 0.9470	 0.6470
Lc	 0.9490	 0.6530
Ld	 0.8790	 0.6220
Le	 0.8420	 0.6300
Lf	 0.9300	 0.6430
Lg	 0.9470	 0.6540
Lh	 0.8720	 0.6250
Li	 0.8480	 0.6220
Lj	 0.9760	 0.6570
Lk	 0.8260	 0.6310
Ll	 0.9600	 0.6520
Lm	 0.9080	 0.6390
Ln	 0.9080	 0.6330
Lo	 0.9340	 0.6380
Lp	 0.9490	 0.6520
S1	 0.7820	 0.5580
S2	 0.2470	 0.3850
S3	 0.6870	 0.5430
S4	 0.3680	 0.3940
S5	 0.8180	 0.5790
SA	 0.8530	 0.6310
SB	 0.8440	 0.6220
SC	 0.7350	 0.6070
SD	 0.5680	 0.5300
SE	 0.5580	 0.5210
SF	 0.8710	 0.6360
SG	 0.4640	 0.5130
SH	 0.8320	 0.6220
SI	 0.8130	 0.6140
SJ	 0.9330	 0.6430
SK	 0.7710	 0.5930
SL	 0.8580	 0.6210
SM	 0.6760	 0.5900
SN	 0.6840	 0.5830
SO	 0.9080	 0.6360
SP	 0.7980	 0.5820
SQ	 0.1990	 0.4560
SR	 0.7420	 0.6060
SS	 0.8920	 0.6250
ST	 0.9080	 0.6310
SU	 0.8270	 0.6090

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Chain	Atom inclusion	Q-score
SV	 0.6950	 0.6010
SW	 0.7130	 0.6020
SX	 0.8310	 0.6170
SY	 0.8420	 0.6210
SZ	 0.3880	 0.4940
Sa	 0.6330	 0.5710
Sb	 0.9210	 0.6410
Sc	 0.8460	 0.6120
Sd	 0.7370	 0.6000
Se	 0.5230	 0.4940
Sf	 0.2880	 0.4960
Sg	 0.5490	 0.5650
Sh	 0.0860	 0.4150