



## wwPDB EM Validation Summary Report ⓘ

Apr 16, 2024 – 12:33 pm BST

PDB ID : 7ZJW  
EMDB ID : EMD-14751  
Title : Rabbit 80S ribosome as it decodes the Sec-UGA codon  
Authors : Hilal, T.; Simonovic, M.; Spahn, C.M.T.  
Deposited on : 2022-04-12  
Resolution : 2.80 Å (reported)  
Based on initial model : 7O7Y

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev92  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

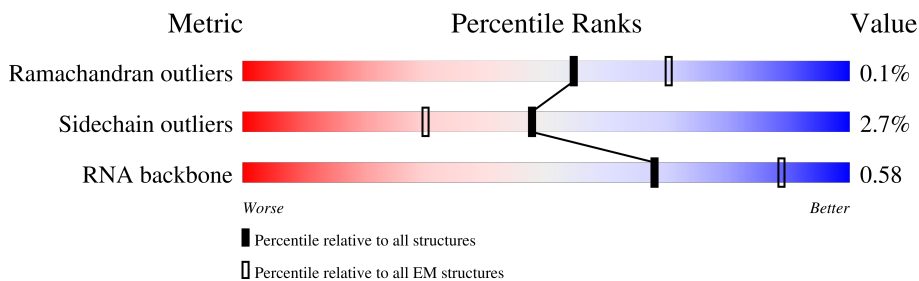
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.80 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	E	616	
2	F	90	
3	I	1072	
4	S	855	
5	B	854	
6	L5	4808	
7	L7	119	
8	L8	158	
9	LD	257	


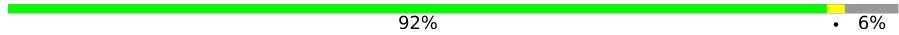

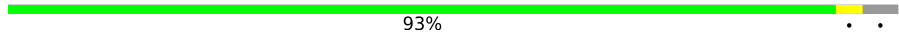
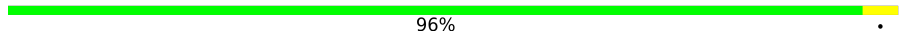
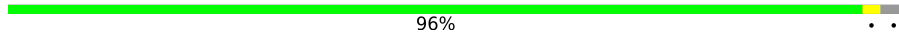
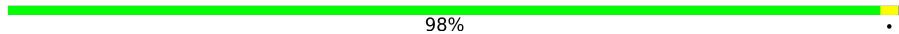
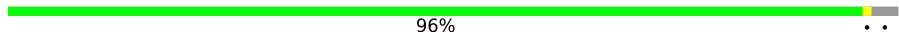

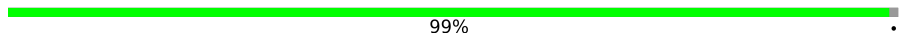
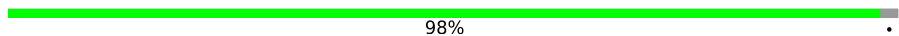

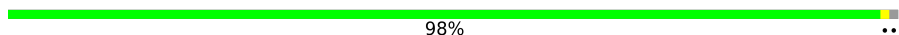





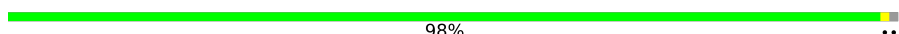





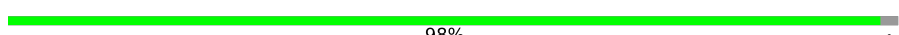
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Mol	Chain	Length	Quality of chain
10	LE	403	96%
11	LF	413	86%
12	LG	297	97%
13	LH	291	78%
14	LI	247	89%
15	LJ	266	85%
16	LK	192	98%
17	LL	214	95%
18	LM	178	92%
19	LO	211	98%
20	LP	218	62%
21	LQ	204	99%
22	LR	203	97%
23	LS	184	85%
24	LT	188	98%
25	LU	196	87%
26	LV	176	98%
27	LW	160	96%
28	LX	128	77%
29	LY	140	99%
30	LZ	157	58%
31	La	156	74%
32	Lb	145	90%
33	Lc	136	99%
34	Ld	148	95%





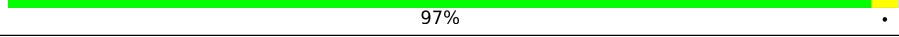

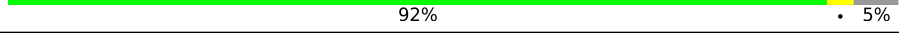

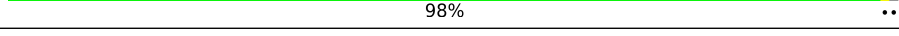
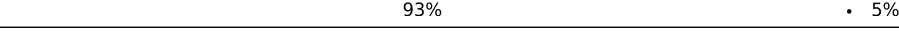
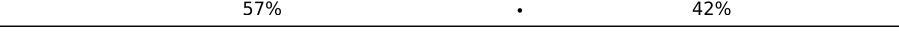
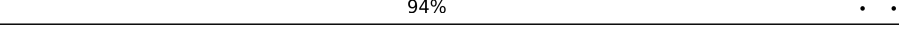

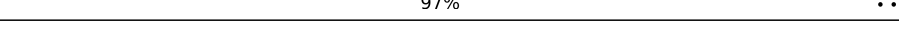


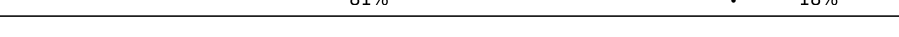
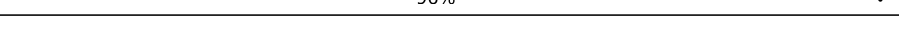
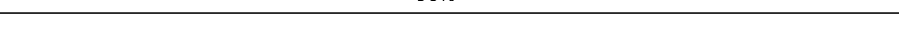






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Mol	Chain	Length	Quality of chain
35	Le	245	 42% 56%
36	Lf	115	 92% 6%
37	Lg	125	 83% 14%
38	Lh	135	 93%
39	Li	110	 96%
40	Lj	117	 96%
41	Lk	123	 98%
42	Ll	105	 96%
43	Lm	97	 87% 11%
44	Ln	70	 99%
45	Lo	51	 98%
46	Lp	128	 41% 59%
47	Lq	106	 98%
48	Lr	92	 98%
49	Ls	137	 88% 8%
50	Lt	318	 36% 64%
51	Lx	217	 90% 10%
52	S2	1870	 76% 18% 5%
53	SB	84	 98%
54	SC	69	 87% 9%
55	SD	156	 45% 53%
56	SE	133	 41% 57%
57	SF	115	 87% 12%
58	SG	317	 97%
59	SH	56	 98%



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Mol	Chain	Length	Quality of chain
60	SL	295	 74% 25%
61	SM	264	 84% 15%
62	SN	293	 73% 25%
63	SO	281	 78% 20%
64	SP	263	 97%
65	SQ	204	 89% 6%
66	SR	249	 92% 5%
67	SS	432	 43% 56%
68	ST	208	 98%
69	SU	194	 93% 5%
70	SV	165	 57% 42%
71	SW	158	 94%
72	SX	132	 90% 6%
73	SY	151	 97%
74	SZ	151	 87% 10%
75	Sa	145	 85% 12%
76	Sb	172	 81% 18%
77	Sc	135	 96%
78	Sd	152	 96%
79	Se	145	 97%
80	Sf	119	 85% 13%
81	Sg	83	 96%
82	Sh	130	 97%
83	Si	143	 95%
84	Sj	130	 95%

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Mol	Chain	Length	Quality of chain
85	Sk	124	 58% 40%
86	Sl	25	 100%

## 2 Entry composition

There are 93 unique types of molecules in this entry. The entry contains 230266 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called eEFSec.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	E	519	3335	2110	616	599	10	0	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-19	MET	-	initiating methionine	UNP P57772
E	-18	GLY	-	expression tag	UNP P57772
E	-17	SER	-	expression tag	UNP P57772
E	-16	SER	-	expression tag	UNP P57772
E	-15	HIS	-	expression tag	UNP P57772
E	-14	HIS	-	expression tag	UNP P57772
E	-13	HIS	-	expression tag	UNP P57772
E	-12	HIS	-	expression tag	UNP P57772
E	-11	HIS	-	expression tag	UNP P57772
E	-10	HIS	-	expression tag	UNP P57772
E	-9	SER	-	expression tag	UNP P57772
E	-8	SER	-	expression tag	UNP P57772
E	-7	GLY	-	expression tag	UNP P57772
E	-6	LEU	-	expression tag	UNP P57772
E	-5	VAL	-	expression tag	UNP P57772
E	-4	PRO	-	expression tag	UNP P57772
E	-3	ARG	-	expression tag	UNP P57772
E	-2	GLY	-	expression tag	UNP P57772
E	-1	SER	-	expression tag	UNP P57772
E	0	HIS	-	expression tag	UNP P57772
E	409	GLU	GLN	conflict	UNP P57772

- Molecule 2 is a RNA chain called human Ser-tRNA-Sec.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	F	90	1914	853	334	637	90	0	0

- Molecule 3 is a RNA chain called CrPV IRES.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	I	183	3882	1739	675	1285	183	0	0

- Molecule 4 is a RNA chain called GPX4 SECIS element.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	S	46	983	438	179	320	46	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	1118	U	C	conflict	GB 25123295
S	1126	A	C	conflict	GB 25123295
S	1132	A	U	conflict	GB 25123295
S	1133	G	-	insertion	GB 25123295
S	1134	C	-	insertion	GB 25123295
S	1135	C	-	insertion	GB 25123295
S	1136	C	-	insertion	GB 25123295
S	1150	U	A	conflict	GB 25123295

- Molecule 5 is a protein called SECIS Binding Protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	B	204	1379	881	257	238	3	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	687	ARG	LYS	conflict	UNP Q96T21
B	692	ILE	VAL	conflict	UNP Q96T21

- Molecule 6 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	L5	3764	80771	36002	14762	26243	3764	0	0

- Molecule 7 is a RNA chain called 5S rRNA.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	L7	119	2538	1131	451	837	119	0	0

- Molecule 8 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	L8	156	3319	1481	585	1097	156	0	0

- Molecule 9 is a protein called 60S ribosomal protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	LD	253	1939	1214	396	323	6	0	0

- Molecule 10 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	LE	398	3206	2042	605	546	13	0	0

- Molecule 11 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LF	362	2886	1814	577	481	14	0	0

- Molecule 12 is a protein called Ribosomal\_L18\_c domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LG	294	2398	1516	439	429	14	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LG	2	AAC	GLY	conflict	UNP G1SYJ6

- Molecule 13 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LH	232	1859	1197	354	305	3	0	0

- Molecule 14 is a protein called 60S ribosomal Protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	LI	226	1886	1211	362	304	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LI	182	ASN	GLY	conflict	UNP A0A7J8C453
LI	199	HIS	ARG	conflict	UNP A0A7J8C453

- Molecule 15 is a protein called 60S ribosomal protein eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	LJ	233	1877	1197	361	315	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LJ	184	LEU	ILE	conflict	UNP P62424

- Molecule 16 is a protein called 60S ribosomal protein L9.

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

- Molecule 17 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	LL	213	1717	1086	332	285	14	0	0

- Molecule 18 is a protein called 60S ribosomal protein L11.

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

- Molecule 19 is a protein called 60S ribosomal protein eL13.

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

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LO	74	ARG	HIS	conflict	UNP G1TKB3
LO	190	ARG	HIS	conflict	UNP G1TKB3

- Molecule 20 is a protein called 60S ribosomal protein L14.

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

- Molecule 21 is a protein called 60S ribosomal protein L15.

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

- Molecule 22 is a protein called 60S ribosomal protein uL13.

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

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LR	174	LEU	ILE	conflict	UNP A0A0N8ETI8
LR	194	ASP	GLU	conflict	UNP A0A0N8ETI8

- Molecule 23 is a protein called 60S ribosomal protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	LS	159	1288	808	249	222	9	0	0

- Molecule 24 is a protein called 60S ribosomal Protein eL18.

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

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LT	134	ARG	CYS	conflict	UNP F6QKI9

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

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

- Molecule 26 is a protein called 60S ribosomal protein eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	LV	176	1457	924	288	234	11	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LV	36	ASN	ILE	conflict	UNP A0A1Z5LHJ5

- Molecule 27 is a protein called 60S ribosomal protein eL21.

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

- Molecule 28 is a protein called 60S ribosomal protein eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	LX	99	806	516	141	147	2	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LX	60	ALA	VAL	conflict	UNP Q4R5I3

- Molecule 29 is a protein called 60S ribosomal protein L23.

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

- Molecule 30 is a protein called 60S ribosomal protein eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	LZ	93	766	480	153	129	4	0	0

- Molecule 31 is a protein called 60S ribosomal protein uL23.

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

- Molecule 32 is a protein called 60S ribosomal protein L26.

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

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

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

- Molecule 34 is a protein called 60S ribosomal protein L27a.

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

- Molecule 35 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	Le	108	Total	C	N	O	S	0	0
			881	548	196	134	3		

- Molecule 36 is a protein called 60S ribosomal protein eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	Lf	108	Total	C	N	O	S	0	0
			836	530	148	151	7		

- Molecule 37 is a protein called 60S ribosomal protein eL31.

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

- Molecule 38 is a protein called 60S ribosomal protein eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Lh	130	Total	C	N	O	S	0	0
			1070	676	221	168	5		

- Molecule 39 is a protein called 60S ribosomal protein eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	Li	110	Total	C	N	O	S	0	0
			884	560	175	144	5		

- Molecule 40 is a protein called 60S ribosomal protein L34.

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

- Molecule 41 is a protein called 60S ribosomal protein uL29.

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

- Molecule 42 is a protein called 60S ribosomal protein L36.

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

- Molecule 43 is a protein called 60S ribosomal protein L37.

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

- Molecule 44 is a protein called 60S ribosomal protein eL38.

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

- Molecule 45 is a protein called 60S ribosomal protein eL39.

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

- Molecule 46 is a protein called 60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Lp	52	Total	C	N	O	S	0	0
			431	269	90	66	6		

- Molecule 47 is a protein called 60S ribosomal protein eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	Lq	105	Total	C	N	O	S	0	0
			863	543	175	139	6		

- Molecule 48 is a protein called 60S ribosomal protein eL43.

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

- Molecule 49 is a protein called 60S ribosomal protein eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	Ls	126	1014	629	209	170	6	0	0

- Molecule 50 is a protein called 60S ribosomal protein P0.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
50	Lt	115	567	337	115	115	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Lt	106	LEU	LYS	conflict	UNP G1SPK4

- Molecule 51 is a protein called 60S ribosomal protein uL1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
51	Lx	196	972	580	196	196	0	0

- Molecule 52 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
52	S2	1770	37825	16906	6780	12369	1770	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S2	251	C	U	conflict	GB 37956930
S2	583	U	C	conflict	GB 37956930
S2	584	A	C	conflict	GB 37956930
S2	585	A	G	conflict	GB 37956930
S2	1338	4AC	C	conflict	GB 37956930
S2	1843	4AC	C	conflict	GB 37956930

- Molecule 53 is a protein called 40S ribosomal protein S27.

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



- Molecule 54 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	SC	63	495	302	98	93	2	0	0

- Molecule 55 is a protein called 40S ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	SD	74	610	385	117	101	7	0	0

- Molecule 56 is a protein called 40S ribosomal protein S30.

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

- Molecule 57 is a protein called Ribosomal protein eS26.

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

- Molecule 58 is a protein called RACK1.

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

- Molecule 59 is a protein called 40S ribosomal protein uS14.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	SL	221	1743	1107	305	323	8	0	0

- Molecule 61 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	SM	224	1815	1152	328	321	14	0	0

- Molecule 62 is a protein called 40S ribosomal protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	SN	220	1706	1105	292	300	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
SN	33	ILE	VAL	conflict	UNP O18789
SN	101	ALA	SER	conflict	UNP O18789

- Molecule 63 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	SO	225	1751	1116	315	313	7	0	0

- Molecule 64 is a protein called 40S ribosomal protein eS4.

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

- Molecule 65 is a protein called Ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	SQ	191	1509	943	286	273	7	0	0

- Molecule 66 is a protein called 40S ribosomal protein S6.

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

- Molecule 67 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	SS	190	Total	C	N	O	S	0	0
			1529	975	281	272	1		

- Molecule 68 is a protein called 40S ribosomal protein S8.

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

- Molecule 69 is a protein called 40S ribosomal protein S9.

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

- Molecule 70 is a protein called 40S ribosomal protein eS10.

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

- Molecule 71 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	SW	154	Total	C	N	O	S	0	0
			1262	804	236	216	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
72	SX	124	Total	C	N	O	S	0	0
			958	600	170	179	9		

- Molecule 73 is a protein called 40S ribosomal protein uS15.

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

- Molecule 74 is a protein called 40S ribosomal protein uS11.

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

- Molecule 75 is a protein called 40S ribosomal protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	Sa	128	Total	C	N	O	S	0	0
			1048	665	197	179	7		

- Molecule 76 is a protein called 40S ribosomal protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Sb	141	Total	C	N	O	S	0	0
			1124	715	212	194	3		

- Molecule 77 is a protein called 40S ribosomal protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	Sc	134	Total	C	N	O	S	0	0
			1080	678	201	197	4		

- Molecule 78 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	Sd	148	Total	C	N	O	S	0	0
			1217	763	245	208	1		

- Molecule 79 is a protein called 40S Ribosomal protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Se	143	Total	C	N	O	S	0	0
			1113	698	214	198	3		

- Molecule 80 is a protein called 40S ribosomal protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	Sf	104	Total	C	N	O	S	0	0
			821	514	155	148	4		

- Molecule 81 is a protein called 40S ribosomal protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	Sg	83	Total	C	N	O	S	0	0
			640	394	117	124	5		

- Molecule 82 is a protein called 40S ribosomal protein S15a.

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

- Molecule 83 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	Si	141	Total	C	N	O	S	0	0
			1099	693	219	184	3		

- Molecule 84 is a protein called 40S ribosomal protein S24.

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

- Molecule 85 is a protein called 40S ribosomal protein S25.

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

- Molecule 86 is a protein called 60S ribosomal protein L41.

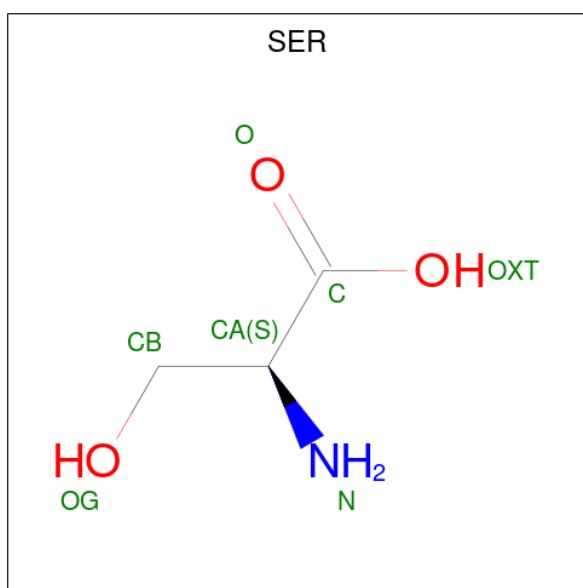
Mol	Chain	Residues	Atoms					AltConf	Trace
86	Sl	25	Total	C	N	O	S	0	0
			239	145	64	27	3		

- Molecule 87 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula:  $C_{10}H_{16}N_5O_{14}P_3$ ).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
87	E	1	32	10	5	14	3	0
87	L7	1	32	10	5	14	3	0

- Molecule 88 is SERINE (three-letter code: SER) (formula: C<sub>3</sub>H<sub>7</sub>NO<sub>3</sub>).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
88	F	1	6	3	1	2	0

- Molecule 89 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
89	I	2	Total Mg 2 2	0
89	L5	162	Total Mg 162 162	0
89	L7	2	Total Mg 2 2	0
89	L8	1	Total Mg 1 1	0
89	LD	1	Total Mg 1 1	0
89	LS	1	Total Mg 1 1	0
89	LY	1	Total Mg 1 1	0
89	S2	55	Total Mg 55 55	0

- Molecule 90 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	AltConf
90	L5	17	Total K 17 17	0
90	S2	1	Total K 1 1	0

- Molecule 91 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
91	Lj	1	Total Zn 1 1	0
91	Lm	1	Total Zn 1 1	0
91	Lp	1	Total Zn 1 1	0
91	Lq	1	Total Zn 1 1	0
91	Lr	1	Total Zn 1 1	0
91	SD	1	Total Zn 1 1	0
91	SF	2	Total Zn 2 2	0
91	SH	1	Total Zn 1 1	0

- Molecule 92 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		AltConf
92	SZ	1	Total 1	Na 1	0

- Molecule 93 is water.

Mol	Chain	Residues	Atoms		AltConf
93	L5	56	Total 56	O 56	0
93	L7	1	Total 1	O 1	0
93	L8	1	Total 1	O 1	0
93	LD	1	Total 1	O 1	0
93	LE	1	Total 1	O 1	0
93	LH	1	Total 1	O 1	0
93	LK	1	Total 1	O 1	0
93	LL	1	Total 1	O 1	0
93	LQ	1	Total 1	O 1	0
93	LV	1	Total 1	O 1	0
93	Ld	1	Total 1	O 1	0
93	S2	34	Total 34	O 34	0
93	SF	1	Total 1	O 1	0
93	SH	1	Total 1	O 1	0
93	SW	1	Total 1	O 1	0
93	Sd	1	Total 1	O 1	0
93	Se	1	Total 1	O 1	0
93	Si	2	Total 2	O 2	0














- Molecule 7: 5S rRNA

Chain L7:  93% 7%



- Molecule 8: 5.8S rRNA

Chain L8:  85% 13% ..



- Molecule 9: 60S ribosomal protein uL2

Chain LD:  97% ..




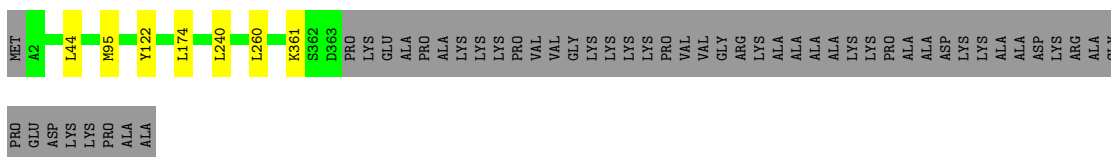
- Molecule 10: 60S ribosomal protein L3

Chain LE:  96% ..



- Molecule 11: 60S ribosomal protein L4

Chain LF:  86% 12%




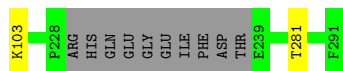
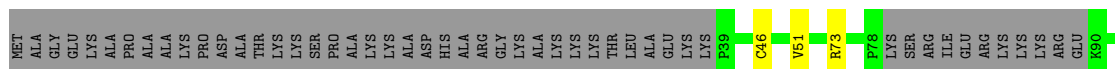
- Molecule 12: Ribosomal\_L18\_c domain-containing protein

Chain LG:  97% ..



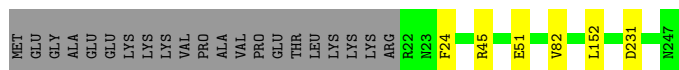
- Molecule 13: 60S ribosomal protein L6

Chain LH:  78% 20%



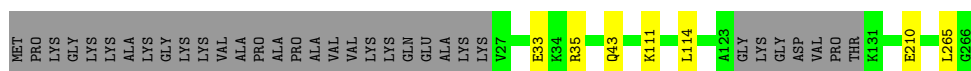
- Molecule 14: 60S ribosomal Protein uL30

Chain LI: 89% 9%



- Molecule 15: 60S ribosomal protein eL8

Chain LJ: 85% 12%



- Molecule 16: 60S ribosomal protein L9

Chain LK: 98%



- Molecule 17: 60S ribosomal protein L10

Chain LL: 95% 5%



- Molecule 18: 60S ribosomal protein L11

Chain LM: 92%



- Molecule 19: 60S ribosomal protein eL13

Chain LO: 98%

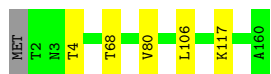


- Molecule 20: 60S ribosomal protein L14

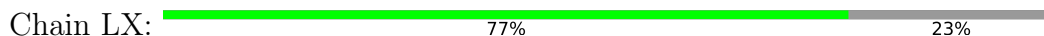




• Molecule 27: 60S ribosomal protein eL21



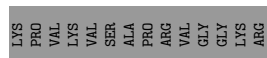
• Molecule 28: 60S ribosomal protein eL22



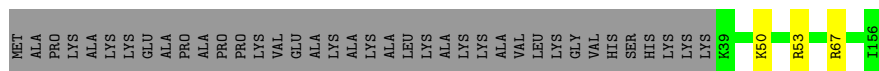
• Molecule 29: 60S ribosomal protein L23



• Molecule 30: 60S ribosomal protein eL24



• Molecule 31: 60S ribosomal protein uL23



• Molecule 32: 60S ribosomal protein L26



• Molecule 33: 60S ribosomal protein L27

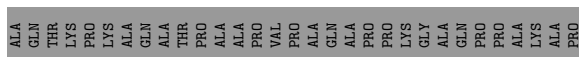
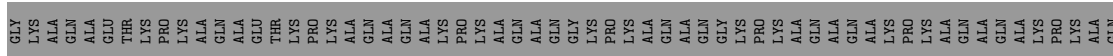
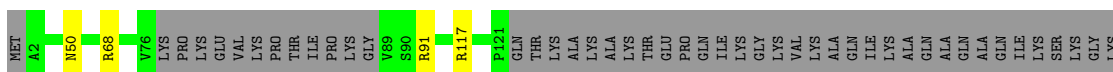




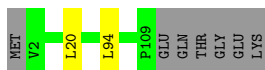
- Molecule 34: 60S ribosomal protein L27a



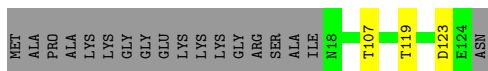
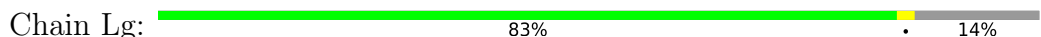
- Molecule 35: 60S ribosomal protein L29



- Molecule 36: 60S ribosomal protein eL30



- Molecule 37: 60S ribosomal protein eL31



- Molecule 38: 60S ribosomal protein eL32



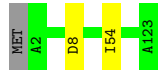
- Molecule 39: 60S ribosomal protein eL33



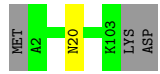
- Molecule 40: 60S ribosomal protein L34



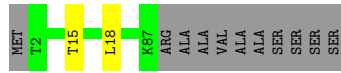
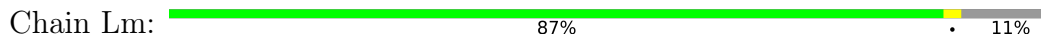
- Molecule 41: 60S ribosomal protein uL29



- Molecule 42: 60S ribosomal protein L36



- Molecule 43: 60S ribosomal protein L37



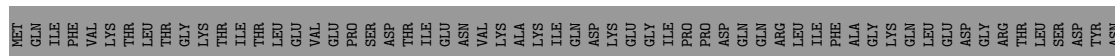
- Molecule 44: 60S ribosomal protein eL38

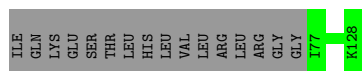


- Molecule 45: 60S ribosomal protein eL39

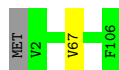


- Molecule 46: 60S ribosomal protein L40





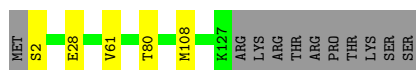
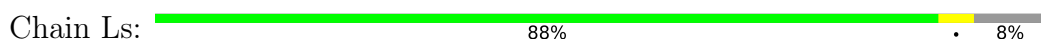
- Molecule 47: 60S ribosomal protein eL42



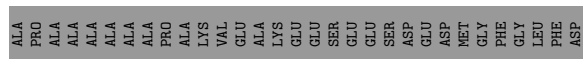
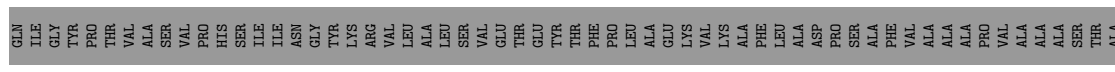
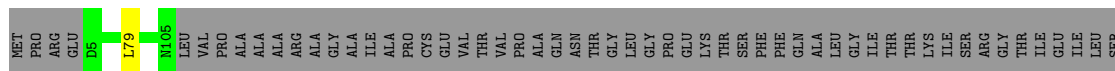
- Molecule 48: 60S ribosomal protein eL43



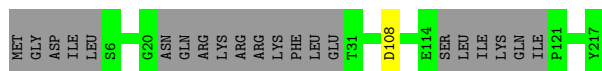
- Molecule 49: 60S ribosomal protein eL28



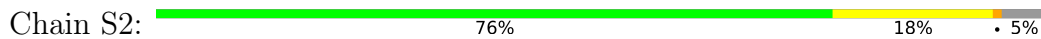
- Molecule 50: 60S ribosomal protein P0

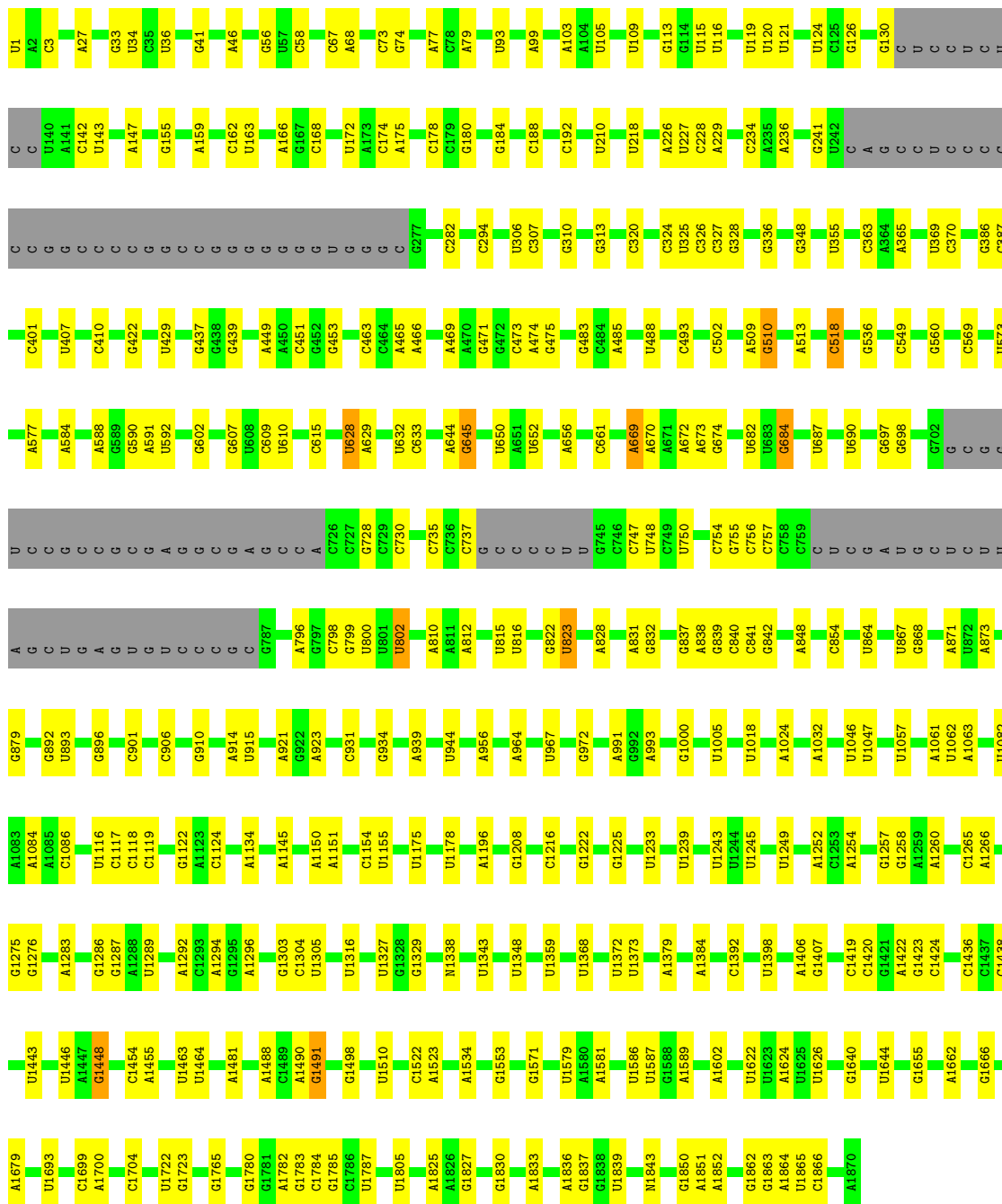


- Molecule 51: 60S ribosomal protein uL1



- Molecule 52: 18S rRNA





- Molecule 53: 40S ribosomal protein S27

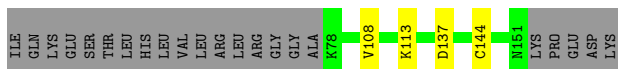
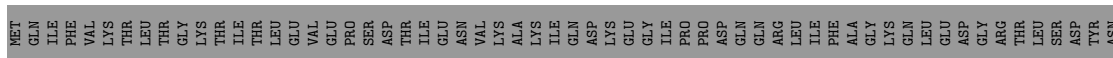


- Molecule 54: 40S ribosomal protein S28

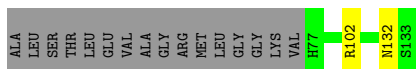
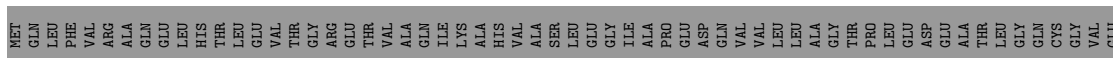




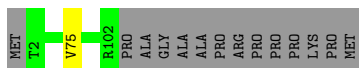
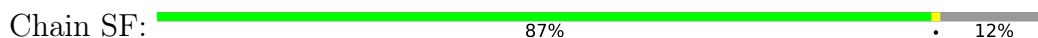
- Molecule 55: 40S ribosomal protein S27a



- Molecule 56: 40S ribosomal protein S30



- Molecule 57: Ribosomal protein eS26



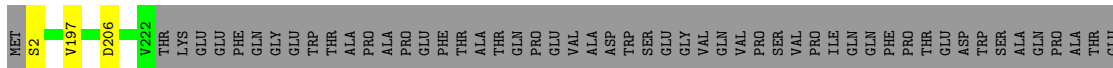
- Molecule 58: RACK1



- Molecule 59: 40S ribosomal protein uS14



- Molecule 60: 40S ribosomal protein SA









Chain SX:  90% 6%




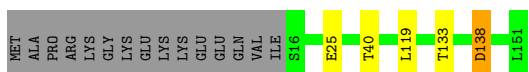
- Molecule 73: 40S ribosomal protein uS15

Chain SY:  97% ..




- Molecule 74: 40S ribosomal protein uS11

Chain SZ:  87% .. 10%




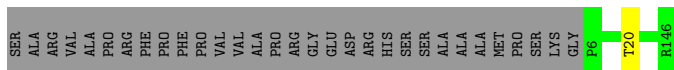
- Molecule 75: 40S ribosomal protein uS19

Chain Sa:  85% . 12%



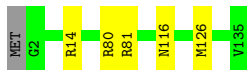
- Molecule 76: 40S ribosomal protein uS9

Chain Sb:  81% . 18%



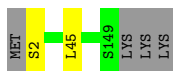
- Molecule 77: 40S ribosomal protein eS17

Chain Sc:  96% ..



- Molecule 78: 40S ribosomal protein S18

Chain Sd:  96% ..




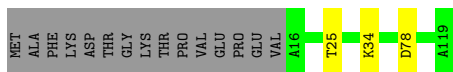
- Molecule 79: 40S Ribosomal protein eS19

Chain Se:  97% ..



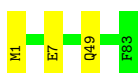
- Molecule 80: 40S ribosomal protein uS10

Chain Sf:  85% 13%



- Molecule 81: 40S ribosomal protein eS21

Chain Sg:  96% .



- Molecule 82: 40S ribosomal protein S15a

Chain Sh:  97% ..



- Molecule 83: 40S ribosomal protein S23

Chain Si:  95% ..



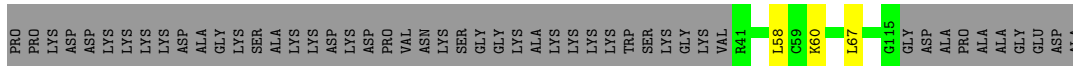
- Molecule 84: 40S ribosomal protein S24

Chain Sj:  95% ..



- Molecule 85: 40S ribosomal protein S25

Chain Sk:  58% 40%



- Molecule 86: 60S ribosomal protein L41

Chain SI:  100%

There are no outlier residues recorded for this chain.

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	77142	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 ( $e^-/\text{\AA}^2$ )	30	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NMM, OMG, PSU, A2M, MA6, AME, M3L, 5MC, 1MA, AAC, UR3, 6MZ, 4AC, MG, OMC, ZN, OMU, GTP, HIC, SAC, AYA, 7MG, K, NA, HY3, MLZ

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	E	0.25	0/3403	0.49	2/4656 (0.0%)
2	F	0.41	3/2136 (0.1%)	0.84	5/3325 (0.2%)
3	I	0.19	0/4335	0.72	1/6738 (0.0%)
4	S	0.18	0/1098	0.77	2/1710 (0.1%)
5	B	0.27	0/1398	0.45	0/1905
6	L5	0.36	1/87426 (0.0%)	0.70	10/136397 (0.0%)
7	L7	0.36	0/2835	0.69	0/4418
8	L8	0.40	1/3635 (0.0%)	0.71	3/5661 (0.1%)
9	LD	0.29	0/1977	0.55	0/2651
10	LE	0.28	0/3261	0.51	0/4364
11	LF	0.27	0/2932	0.52	0/3939
12	LG	0.28	0/2437	0.49	0/3264
13	LH	0.27	0/1896	0.50	0/2541
14	LI	0.28	0/1922	0.50	0/2563
15	LJ	0.26	0/1908	0.49	0/2566
16	LK	0.27	0/1535	0.51	0/2063
17	LL	0.28	0/1756	0.51	0/2346
18	LM	0.26	0/1385	0.52	0/1852
19	LO	0.27	0/1733	0.54	0/2316
20	LP	0.28	0/1158	0.50	0/1547
21	LQ	0.29	0/1746	0.55	0/2338
22	LR	0.28	0/1662	0.51	0/2222
23	LS	0.27	0/1315	0.50	0/1763
24	LT	0.28	0/1539	0.56	0/2054
25	LU	0.25	0/1524	0.54	0/2013
26	LV	0.29	0/1497	0.53	0/2008
27	LW	0.28	0/1326	0.49	0/1770
28	LX	0.26	0/820	0.49	0/1100
29	LY	0.28	0/1048	0.52	0/1402
30	LZ	0.28	0/779	0.50	0/1034
31	La	0.27	0/984	0.50	0/1323

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
32	Lb	0.27	0/1132	0.53	0/1504
33	Lc	0.28	0/1130	0.50	0/1507
34	Ld	0.29	0/1191	0.52	0/1590
35	Le	0.25	0/884	0.53	0/1169
36	Lf	0.27	0/847	0.45	0/1134
37	Lg	0.27	0/903	0.53	0/1216
38	Lh	0.28	0/1088	0.52	0/1451
39	Li	0.30	0/903	0.54	0/1208
40	Lj	0.28	0/916	0.56	0/1220
41	Lk	0.25	0/1021	0.49	0/1348
42	Ll	0.25	0/841	0.52	0/1112
43	Lm	0.29	0/720	0.58	0/952
44	Ln	0.26	0/575	0.47	0/761
45	Lo	0.25	0/459	0.53	0/608
46	Lp	0.26	0/425	0.51	0/562
47	Lq	0.28	0/866	0.52	0/1141
48	Lr	0.27	0/718	0.50	0/953
49	Ls	0.27	0/1020	0.54	0/1366
50	Lt	0.24	0/565	0.38	0/783
51	Lx	0.24	0/969	0.43	0/1347
52	S2	0.27	1/40365 (0.0%)	0.70	12/62915 (0.0%)
53	SB	0.25	0/665	0.47	0/891
54	SC	0.24	0/497	0.57	0/666
55	SD	0.25	0/622	0.50	0/822
56	SE	0.24	0/462	0.55	0/607
57	SF	0.25	0/828	0.54	0/1109
58	SG	0.24	0/2493	0.48	0/3394
59	SH	0.27	0/470	0.51	0/623
60	SL	0.25	0/1771	0.47	0/2406
61	SM	0.25	0/1841	0.48	0/2459
62	SN	0.26	0/1742	0.46	0/2354
63	SO	0.26	0/1779	0.50	0/2395
64	SP	0.25	0/2118	0.51	0/2849
65	SQ	0.24	0/1531	0.49	0/2059
66	SR	0.24	0/1946	0.54	0/2590
67	SS	0.25	0/1552	0.48	0/2079
68	ST	0.25	0/1715	0.53	0/2287
69	SU	0.25	0/1550	0.53	0/2069
70	SV	0.25	0/834	0.45	0/1125
71	SW	0.26	0/1284	0.53	0/1717
72	SX	0.23	0/968	0.44	0/1296
73	SY	0.24	0/1232	0.48	0/1656
74	SZ	0.26	0/1029	0.54	0/1380

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
75	Sa	0.26	0/1069	0.50	0/1429
76	Sb	0.25	0/1142	0.51	0/1528
77	Sc	0.24	0/1094	0.50	0/1469
78	Sd	0.25	0/1226	0.55	0/1643
79	Se	0.24	0/1119	0.47	0/1498
80	Sf	0.24	0/831	0.53	0/1115
81	Sg	0.26	0/636	0.50	0/852
82	Sh	0.25	0/1051	0.50	0/1406
83	Si	0.25	0/1107	0.51	0/1475
84	Sj	0.24	0/1032	0.53	0/1371
85	Sk	0.23	0/604	0.50	0/810
86	Sl	0.23	0/240	0.65	0/305
All	All	0.31	6/242024 (0.0%)	0.64	35/355430 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
83	Si	0	1

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	52	C	C4-N4	-11.56	1.23	1.33
52	S2	1	U	OP3-P	-10.65	1.48	1.61
6	L5	1	C	OP3-P	-10.65	1.48	1.61
8	L8	1	C	OP3-P	-10.63	1.48	1.61
2	F	1	G	OP3-P	-10.55	1.48	1.61

The worst 5 of 35 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	52	C	N3-C4-C5	-18.51	114.50	121.90
2	F	52	C	C2-N3-C4	14.32	127.06	119.90
2	F	52	C	C5-C4-N4	8.12	125.89	120.20
6	L5	2312	C	C2-N1-C1'	7.34	126.87	118.80
52	S2	1454	C	C2-N1-C1'	7.25	126.78	118.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
83	Si	62	HY3	Mainchain

## 5.2 Too-close contacts [i](#)

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

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	509/616 (83%)	460 (90%)	46 (9%)	3 (1%)	25	56
5	B	200/854 (23%)	171 (86%)	28 (14%)	1 (0%)	29	61
9	LD	251/257 (98%)	241 (96%)	10 (4%)	0	100	100
10	LE	395/403 (98%)	386 (98%)	9 (2%)	0	100	100
11	LF	360/413 (87%)	355 (99%)	5 (1%)	0	100	100
12	LG	291/297 (98%)	287 (99%)	4 (1%)	0	100	100
13	LH	226/291 (78%)	220 (97%)	6 (3%)	0	100	100
14	LI	224/247 (91%)	217 (97%)	7 (3%)	0	100	100
15	LJ	229/266 (86%)	227 (99%)	2 (1%)	0	100	100
16	LK	188/192 (98%)	187 (100%)	1 (0%)	0	100	100
17	LL	211/214 (99%)	209 (99%)	2 (1%)	0	100	100
18	LM	168/178 (94%)	162 (96%)	6 (4%)	0	100	100
19	LO	208/211 (99%)	204 (98%)	4 (2%)	0	100	100
20	LP	136/218 (62%)	135 (99%)	1 (1%)	0	100	100
21	LQ	201/204 (98%)	198 (98%)	3 (2%)	0	100	100
22	LR	197/203 (97%)	195 (99%)	2 (1%)	0	100	100
23	LS	157/184 (85%)	153 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
24	LT	185/188 (98%)	184 (100%)	1 (0%)	0	100	100
25	LU	178/196 (91%)	178 (100%)	0	0	100	100
26	LV	174/176 (99%)	171 (98%)	3 (2%)	0	100	100
27	LW	157/160 (98%)	156 (99%)	1 (1%)	0	100	100
28	LX	97/128 (76%)	94 (97%)	3 (3%)	0	100	100
29	LY	137/140 (98%)	134 (98%)	3 (2%)	0	100	100
30	LZ	89/157 (57%)	89 (100%)	0	0	100	100
31	La	116/156 (74%)	115 (99%)	1 (1%)	0	100	100
32	Lb	132/145 (91%)	129 (98%)	3 (2%)	0	100	100
33	Lc	133/136 (98%)	132 (99%)	1 (1%)	0	100	100
34	Ld	145/148 (98%)	140 (97%)	4 (3%)	1 (1%)	22	53
35	Le	103/245 (42%)	102 (99%)	1 (1%)	0	100	100
36	Lf	106/115 (92%)	106 (100%)	0	0	100	100
37	Lg	105/125 (84%)	105 (100%)	0	0	100	100
38	Lh	128/135 (95%)	127 (99%)	1 (1%)	0	100	100
39	Li	108/110 (98%)	108 (100%)	0	0	100	100
40	Lj	112/117 (96%)	112 (100%)	0	0	100	100
41	Lk	120/123 (98%)	118 (98%)	2 (2%)	0	100	100
42	Ll	100/105 (95%)	99 (99%)	1 (1%)	0	100	100
43	Lm	84/97 (87%)	83 (99%)	1 (1%)	0	100	100
44	Ln	67/70 (96%)	67 (100%)	0	0	100	100
45	Lo	48/51 (94%)	47 (98%)	1 (2%)	0	100	100
46	Lp	49/128 (38%)	49 (100%)	0	0	100	100
47	Lq	102/106 (96%)	101 (99%)	1 (1%)	0	100	100
48	Lr	89/92 (97%)	87 (98%)	2 (2%)	0	100	100
49	Ls	124/137 (90%)	121 (98%)	3 (2%)	0	100	100
50	Lt	111/318 (35%)	105 (95%)	5 (4%)	1 (1%)	17	46
51	Lx	190/217 (88%)	172 (90%)	17 (9%)	1 (0%)	29	61
53	SB	81/84 (96%)	80 (99%)	1 (1%)	0	100	100
54	SC	61/69 (88%)	60 (98%)	1 (2%)	0	100	100
55	SD	72/156 (46%)	71 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
56	SE	55/133 (41%)	54 (98%)	1 (2%)	0	100	100
57	SF	99/115 (86%)	99 (100%)	0	0	100	100
58	SG	311/317 (98%)	297 (96%)	14 (4%)	0	100	100
59	SH	53/56 (95%)	52 (98%)	1 (2%)	0	100	100
60	SL	219/295 (74%)	213 (97%)	6 (3%)	0	100	100
61	SM	220/264 (83%)	216 (98%)	4 (2%)	0	100	100
62	SN	218/293 (74%)	216 (99%)	2 (1%)	0	100	100
63	SO	223/281 (79%)	219 (98%)	4 (2%)	0	100	100
64	SP	260/263 (99%)	252 (97%)	8 (3%)	0	100	100
65	SQ	189/204 (93%)	183 (97%)	6 (3%)	0	100	100
66	SR	235/249 (94%)	232 (99%)	3 (1%)	0	100	100
67	SS	188/432 (44%)	183 (97%)	5 (3%)	0	100	100
68	ST	204/208 (98%)	197 (97%)	7 (3%)	0	100	100
69	SU	183/194 (94%)	176 (96%)	7 (4%)	0	100	100
70	SV	94/165 (57%)	91 (97%)	3 (3%)	0	100	100
71	SW	152/158 (96%)	148 (97%)	4 (3%)	0	100	100
72	SX	122/132 (92%)	116 (95%)	6 (5%)	0	100	100
73	SY	148/151 (98%)	146 (99%)	2 (1%)	0	100	100
74	SZ	134/151 (89%)	127 (95%)	6 (4%)	1 (1%)	22	53
75	Sa	126/145 (87%)	123 (98%)	3 (2%)	0	100	100
76	Sb	139/172 (81%)	132 (95%)	7 (5%)	0	100	100
77	Sc	132/135 (98%)	132 (100%)	0	0	100	100
78	Sd	146/152 (96%)	144 (99%)	2 (1%)	0	100	100
79	Se	140/145 (97%)	138 (99%)	2 (1%)	0	100	100
80	Sf	102/119 (86%)	99 (97%)	3 (3%)	0	100	100
81	Sg	81/83 (98%)	79 (98%)	2 (2%)	0	100	100
82	Sh	127/130 (98%)	126 (99%)	1 (1%)	0	100	100
83	Si	137/143 (96%)	136 (99%)	1 (1%)	0	100	100
84	Sj	123/130 (95%)	122 (99%)	1 (1%)	0	100	100
85	Sk	73/124 (59%)	72 (99%)	1 (1%)	0	100	100
86	Sl	23/25 (92%)	23 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	12310/15142 (81%)	11992 (97%)	310 (2%)	8 (0%)	54	81

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	546	PRO
51	Lx	108	ASP
50	Lt	79	LEU
1	E	297	LEU
5	B	703	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	
1	E	227/524 (43%)	224 (99%)	3 (1%)	69	91
5	B	102/761 (13%)	99 (97%)	3 (3%)	42	76
9	LD	195/199 (98%)	192 (98%)	3 (2%)	65	89
10	LE	344/347 (99%)	332 (96%)	12 (4%)	36	70
11	LF	302/337 (90%)	295 (98%)	7 (2%)	50	82
12	LG	247/250 (99%)	241 (98%)	6 (2%)	49	81
13	LH	205/251 (82%)	200 (98%)	5 (2%)	49	81
14	LI	197/215 (92%)	191 (97%)	6 (3%)	41	75
15	LJ	199/223 (89%)	192 (96%)	7 (4%)	36	70
16	LK	169/171 (99%)	168 (99%)	1 (1%)	86	96
17	LL	180/181 (99%)	170 (94%)	10 (6%)	21	51
18	LM	143/149 (96%)	136 (95%)	7 (5%)	25	57
19	LO	175/176 (99%)	171 (98%)	4 (2%)	50	82
20	LP	117/161 (73%)	114 (97%)	3 (3%)	46	79
21	LQ	171/172 (99%)	169 (99%)	2 (1%)	71	92
22	LR	171/173 (99%)	169 (99%)	2 (1%)	71	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	LS	139/163 (85%)	137 (99%)	2 (1%)	67	90
24	LT	164/165 (99%)	162 (99%)	2 (1%)	71	92
25	LU	159/175 (91%)	149 (94%)	10 (6%)	18	46
26	LV	154/154 (100%)	150 (97%)	4 (3%)	46	79
27	LW	139/140 (99%)	134 (96%)	5 (4%)	35	69
28	LX	88/113 (78%)	88 (100%)	0	100	100
29	LY	106/107 (99%)	105 (99%)	1 (1%)	78	94
30	LZ	79/126 (63%)	77 (98%)	2 (2%)	47	80
31	La	106/134 (79%)	103 (97%)	3 (3%)	43	77
32	Lb	124/135 (92%)	121 (98%)	3 (2%)	49	81
33	Lc	117/118 (99%)	116 (99%)	1 (1%)	78	94
34	Ld	119/120 (99%)	114 (96%)	5 (4%)	30	63
35	Le	87/183 (48%)	83 (95%)	4 (5%)	27	60
36	Lf	92/98 (94%)	90 (98%)	2 (2%)	52	83
37	Lg	98/110 (89%)	95 (97%)	3 (3%)	40	74
38	Lh	116/121 (96%)	112 (97%)	4 (3%)	37	71
39	Li	89/89 (100%)	85 (96%)	4 (4%)	27	60
40	Lj	98/100 (98%)	96 (98%)	2 (2%)	55	84
41	Lk	109/110 (99%)	107 (98%)	2 (2%)	59	86
42	Ll	86/89 (97%)	85 (99%)	1 (1%)	71	92
43	Lm	73/80 (91%)	71 (97%)	2 (3%)	44	78
44	Ln	64/65 (98%)	64 (100%)	0	100	100
45	Lo	47/48 (98%)	47 (100%)	0	100	100
46	Lp	47/115 (41%)	47 (100%)	0	100	100
47	Lq	92/93 (99%)	91 (99%)	1 (1%)	73	92
48	Lr	74/75 (99%)	73 (99%)	1 (1%)	67	90
49	Ls	109/120 (91%)	105 (96%)	4 (4%)	34	68
53	SB	75/76 (99%)	74 (99%)	1 (1%)	69	91
54	SC	56/62 (90%)	53 (95%)	3 (5%)	22	53
55	SD	67/140 (48%)	63 (94%)	4 (6%)	19	48
56	SE	47/106 (44%)	45 (96%)	2 (4%)	29	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
57	SF	88/98 (90%)	87 (99%)	1 (1%)	73	92
58	SG	272/275 (99%)	265 (97%)	7 (3%)	46	79
59	SH	48/49 (98%)	48 (100%)	0	100	100
60	SL	182/243 (75%)	180 (99%)	2 (1%)	73	92
61	SM	203/231 (88%)	200 (98%)	3 (2%)	65	89
62	SN	185/223 (83%)	178 (96%)	7 (4%)	33	67
63	SO	189/232 (82%)	184 (97%)	5 (3%)	46	79
64	SP	224/225 (100%)	217 (97%)	7 (3%)	40	74
65	SQ	161/170 (95%)	152 (94%)	9 (6%)	21	51
66	SR	207/218 (95%)	200 (97%)	7 (3%)	37	71
67	SS	170/360 (47%)	164 (96%)	6 (4%)	36	70
68	ST	178/180 (99%)	175 (98%)	3 (2%)	60	87
69	SU	161/168 (96%)	156 (97%)	5 (3%)	40	74
70	SV	87/136 (64%)	85 (98%)	2 (2%)	50	82
71	SW	139/142 (98%)	133 (96%)	6 (4%)	29	62
72	SX	104/108 (96%)	99 (95%)	5 (5%)	25	58
73	SY	130/131 (99%)	127 (98%)	3 (2%)	50	82
74	SZ	106/119 (89%)	101 (95%)	5 (5%)	26	59
75	Sa	114/130 (88%)	109 (96%)	5 (4%)	28	61
76	Sb	117/140 (84%)	116 (99%)	1 (1%)	78	94
77	Sc	120/121 (99%)	115 (96%)	5 (4%)	30	63
78	Sd	127/131 (97%)	126 (99%)	1 (1%)	81	94
79	Se	112/114 (98%)	110 (98%)	2 (2%)	59	86
80	Sf	94/107 (88%)	91 (97%)	3 (3%)	39	73
81	Sg	67/67 (100%)	65 (97%)	2 (3%)	41	75
82	Sh	112/113 (99%)	109 (97%)	3 (3%)	44	78
83	Si	112/114 (98%)	108 (96%)	4 (4%)	35	69
84	Sj	107/112 (96%)	106 (99%)	1 (1%)	78	94
85	Sk	66/102 (65%)	63 (96%)	3 (4%)	27	60
86	Sl	24/24 (100%)	24 (100%)	0	100	100
All	All	10170/12403 (82%)	9898 (97%)	272 (3%)	48	78

5 of 272 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
72	SX	102	LYS
74	SZ	40	THR
81	Sg	49	GLN
26	LV	82	LEU
25	LU	163	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
56	SE	89	GLN
57	SF	7	ASN
79	Se	11	GLN
77	Sc	31	ASN
78	Sd	105	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	F	89/90 (98%)	26 (29%)	0
3	I	178/1072 (16%)	103 (57%)	1 (0%)
4	S	45/855 (5%)	22 (48%)	1 (2%)
52	S2	1759/1870 (94%)	266 (15%)	1 (0%)
6	L5	3751/4808 (78%)	523 (13%)	3 (0%)
7	L7	118/119 (99%)	8 (6%)	0
8	L8	155/158 (98%)	17 (10%)	0
All	All	6095/8972 (67%)	965 (15%)	6 (0%)

5 of 965 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	F	10	A
2	F	12	C
2	F	14	U
2	F	16	A
2	F	19	G

5 of 6 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	L5	1892	U
6	L5	4445	U
52	S2	1265	C
4	S	1111	A
3	I	66	G

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

218 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
6	OMU	L5	3973	6	19,22,23	1.00	2 (10%)	26,31,34	1.83	6 (23%)
52	OMG	S2	1491	89,52	18,26,27	1.97	2 (11%)	19,38,41	1.66	4 (21%)
6	OMU	L5	4366	29,6	19,22,23	1.00	2 (10%)	26,31,34	1.81	6 (23%)
52	PSU	S2	652	52	18,21,22	1.39	3 (16%)	22,30,33	1.84	4 (18%)
52	PSU	S2	864	82,52	18,21,22	1.43	3 (16%)	22,30,33	1.81	4 (18%)
6	OMC	L5	1284	6	19,22,23	1.16	2 (10%)	26,31,34	0.86	0
6	PSU	L5	3616	6	18,21,22	1.34	3 (16%)	22,30,33	1.86	5 (22%)
52	A2M	S2	1384	52	18,25,26	2.01	5 (27%)	18,36,39	2.18	5 (27%)
52	PSU	S2	1693	52	18,21,22	1.36	3 (16%)	22,30,33	1.86	5 (22%)
6	OMG	L5	1260	38,6	18,26,27	2.00	2 (11%)	19,38,41	1.73	5 (26%)
6	PSU	L5	3554	6	18,21,22	1.36	3 (16%)	22,30,33	1.81	5 (22%)
6	PSU	L5	4045	6	18,21,22	1.35	3 (16%)	22,30,33	1.83	4 (18%)
52	OMU	S2	1443	89,52	19,22,23	0.99	2 (10%)	26,31,34	1.74	4 (15%)
6	PSU	L5	4298	6	18,21,22	1.34	3 (16%)	22,30,33	1.83	4 (18%)
52	PSU	S2	34	52	18,21,22	1.39	3 (16%)	22,30,33	1.87	4 (18%)
52	OMG	S2	1329	52	18,26,27	1.95	2 (11%)	19,38,41	1.68	5 (26%)
6	PSU	L5	4177	6	18,21,22	1.33	3 (16%)	22,30,33	1.86	5 (22%)
6	PSU	L5	1537	6	18,21,22	1.38	3 (16%)	22,30,33	1.81	4 (18%)
6	OMG	L5	2267	6	18,26,27	1.98	2 (11%)	19,38,41	1.66	4 (21%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
52	PSU	S2	1047	52	18,21,22	1.39	3 (16%)	22,30,33	1.79	4 (18%)
83	HY3	Si	62	83	6,8,9	1.32	1 (16%)	5,10,12	1.43	1 (20%)
6	OMU	L5	2258	6	19,22,23	0.99	2 (10%)	26,31,34	1.77	5 (19%)
6	PSU	L5	1638	34,90,6	18,21,22	1.34	3 (16%)	22,30,33	1.87	5 (22%)
6	PSU	L5	3496	6	18,21,22	1.37	3 (16%)	22,30,33	1.84	5 (22%)
6	OMC	L5	3573	6	19,22,23	1.13	2 (10%)	26,31,34	0.89	2 (7%)
6	A2M	L5	1270	6	18,25,26	1.89	5 (27%)	18,36,39	2.16	5 (27%)
52	PSU	S2	1239	52	18,21,22	1.37	3 (16%)	22,30,33	1.83	5 (22%)
52	PSU	S2	93	52	18,21,22	1.42	3 (16%)	22,30,33	1.76	3 (13%)
6	A2M	L5	3557	6	18,25,26	1.93	5 (27%)	18,36,39	2.13	4 (22%)
6	OMG	L5	4116	6	18,26,27	1.97	2 (11%)	19,38,41	1.68	5 (26%)
52	OMU	S2	1289	52,55	19,22,23	0.97	1 (5%)	26,31,34	1.76	5 (19%)
6	PSU	L5	4058	6	18,21,22	1.37	3 (16%)	22,30,33	1.80	5 (22%)
6	A2M	L5	3562	6	18,25,26	1.92	5 (27%)	18,36,39	2.18	5 (27%)
6	A2M	L5	4317	6	18,25,26	1.96	5 (27%)	18,36,39	2.11	4 (22%)
6	PSU	L5	1683	90,6	18,21,22	1.36	3 (16%)	22,30,33	1.82	4 (18%)
6	OMG	L5	3476	6	18,26,27	1.98	2 (11%)	19,38,41	1.68	4 (21%)
6	PSU	L5	1491	6	18,21,22	1.34	3 (16%)	22,30,33	1.85	4 (18%)
6	OMG	L5	4138	6	18,26,27	1.98	2 (11%)	19,38,41	1.70	5 (26%)
6	OMC	L5	3540	6	19,22,23	1.10	2 (10%)	26,31,34	0.89	2 (7%)
6	PSU	L5	3502	6	18,21,22	1.39	3 (16%)	22,30,33	1.83	4 (18%)
6	PSU	L5	3583	6	18,21,22	1.33	3 (16%)	22,30,33	1.90	5 (22%)
52	PSU	S2	105	52	18,21,22	1.39	3 (16%)	22,30,33	1.81	4 (18%)
6	PSU	L5	4374	6	18,21,22	1.36	3 (16%)	22,30,33	1.82	5 (22%)
52	OMG	S2	1448	52	18,26,27	1.96	2 (11%)	19,38,41	1.65	4 (21%)
52	MA6	S2	1851	52	18,26,27	0.93	1 (5%)	19,38,41	1.67	6 (31%)
6	PSU	L5	3466	6	18,21,22	1.40	3 (16%)	22,30,33	1.86	4 (18%)
6	PSU	L5	4246	6	18,21,22	1.39	3 (16%)	22,30,33	1.88	5 (22%)
6	OMC	L5	4282	6	19,22,23	1.15	2 (10%)	26,31,34	0.91	1 (3%)
52	A2M	S2	591	52	18,25,26	2.00	5 (27%)	18,36,39	2.31	5 (27%)
52	PSU	S2	218	52	18,21,22	1.38	3 (16%)	22,30,33	1.81	4 (18%)
6	OMC	L5	3433	90,6	19,22,23	1.16	2 (10%)	26,31,34	0.92	1 (3%)
52	7MG	S2	1640	52	22,26,27	1.22	2 (9%)	29,39,42	2.14	9 (31%)
52	A2M	S2	485	52	18,25,26	1.91	5 (27%)	18,36,39	2.22	4 (22%)
6	PSU	L5	3427	6	18,21,22	1.36	3 (16%)	22,30,33	1.81	5 (22%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
52	PSU	S2	1626	52	18,21,22	1.40	3 (16%)	22,30,33	1.79	5 (22%)
52	OMG	S2	510	89,52	18,26,27	1.96	2 (11%)	19,38,41	1.69	5 (26%)
52	PSU	S2	1368	52	18,21,22	1.41	3 (16%)	22,30,33	1.85	5 (22%)
6	PSU	L5	1632	6	18,21,22	1.41	3 (16%)	22,30,33	1.74	4 (18%)
6	OMU	L5	4244	6	19,22,23	1.00	2 (10%)	26,31,34	1.83	5 (19%)
8	OMG	L8	75	8	18,26,27	1.98	2 (11%)	19,38,41	1.65	4 (21%)
6	A2M	L5	2244	6	18,25,26	1.95	5 (27%)	18,36,39	2.20	5 (27%)
6	PSU	L5	2351	6	18,21,22	1.34	3 (16%)	22,30,33	1.86	4 (18%)
49	SAC	Ls	2	49	7,8,9	0.53	0	8,9,11	0.84	1 (12%)
6	PSU	L5	1799	6	18,21,22	1.38	3 (16%)	22,30,33	1.86	5 (22%)
6	OMG	L5	3942	6	18,26,27	1.96	2 (11%)	19,38,41	1.66	4 (21%)
52	A2M	S2	513	52	18,25,26	1.97	5 (27%)	18,36,39	2.15	4 (22%)
52	PSU	S2	1005	52	18,21,22	1.63	5 (27%)	22,30,33	2.85	6 (27%)
52	PSU	S2	119	52	18,21,22	1.41	3 (16%)	22,30,33	1.78	4 (18%)
10	HIC	LE	245	10	8,11,12	0.86	0	6,14,16	0.81	0
6	OMG	L5	3524	6	18,26,27	1.97	2 (11%)	19,38,41	1.67	5 (26%)
8	PSU	L8	55	8	18,21,22	1.36	3 (16%)	22,30,33	1.84	4 (18%)
52	4AC	S2	1338	52	21,24,25	1.12	2 (9%)	29,34,37	1.21	3 (10%)
6	1MA	L5	1266	89,6	16,25,26	2.54	3 (18%)	18,37,40	2.27	3 (16%)
6	OMG	L5	1580	6	18,26,27	1.98	2 (11%)	19,38,41	1.67	4 (21%)
6	5MC	L5	4193	6	18,22,23	1.24	3 (16%)	26,32,35	1.53	3 (11%)
6	OMG	L5	3631	6	18,26,27	2.01	2 (11%)	19,38,41	1.70	5 (26%)
6	PSU	L5	4382	37,6	18,21,22	1.42	4 (22%)	22,30,33	2.01	3 (13%)
6	PSU	L5	3652	89,6	18,21,22	1.31	3 (16%)	22,30,33	1.86	4 (18%)
6	PSU	L5	4325	6	18,21,22	1.35	3 (16%)	22,30,33	1.85	5 (22%)
52	PSU	S2	802	52	18,21,22	1.40	3 (16%)	22,30,33	1.77	4 (18%)
52	OMG	S2	437	52	18,26,27	1.96	2 (11%)	19,38,41	1.66	4 (21%)
6	PSU	L5	4749	6	18,21,22	1.39	3 (16%)	22,30,33	1.84	4 (18%)
6	OMG	L5	2719	6	18,26,27	1.97	2 (11%)	19,38,41	1.68	5 (26%)
6	PSU	L5	4217	16,6	18,21,22	1.34	3 (16%)	22,30,33	1.81	5 (22%)
6	PSU	L5	3490	6	18,21,22	1.35	3 (16%)	22,30,33	1.81	4 (18%)
52	A2M	S2	159	52	18,25,26	1.96	5 (27%)	18,36,39	2.09	5 (27%)
52	PSU	S2	867	52	18,21,22	1.44	3 (16%)	22,30,33	1.81	4 (18%)
6	PSU	L5	3494	6	18,21,22	1.39	3 (16%)	22,30,33	1.78	5 (22%)
52	OMC	S2	174	52	19,22,23	1.20	3 (15%)	26,31,34	0.88	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
52	OMU	S2	116	52	19,22,23	1.01	2 (10%)	26,31,34	1.80	6 (23%)
52	PSU	S2	573	84,52	18,21,22	1.43	3 (16%)	22,30,33	1.84	4 (18%)
52	PSU	S2	610	52	18,21,22	1.40	3 (16%)	22,30,33	1.79	4 (18%)
52	6MZ	S2	1833	89,52	18,25,26	0.87	1 (5%)	16,36,39	1.81	4 (25%)
6	A2M	L5	1810	89,6	18,25,26	1.95	5 (27%)	18,36,39	2.26	6 (33%)
6	OMG	L5	3974	6	18,26,27	1.98	2 (11%)	19,38,41	1.70	4 (21%)
6	PSU	L5	4188	6	18,21,22	1.33	3 (16%)	22,30,33	1.93	4 (18%)
6	UR3	L5	4276	6	19,22,23	1.30	3 (15%)	26,32,35	1.20	2 (7%)
6	PSU	L5	4419	6	18,21,22	1.34	3 (16%)	22,30,33	1.84	5 (22%)
6	A2M	L5	400	6	18,25,26	1.98	5 (27%)	18,36,39	2.15	4 (22%)
52	4AC	S2	1843	86,52	21,24,25	1.15	2 (9%)	29,34,37	1.10	2 (6%)
6	PSU	L5	1720	6	18,21,22	1.36	3 (16%)	22,30,33	1.82	5 (22%)
6	OMC	L5	2208	89,6	19,22,23	1.13	2 (10%)	26,31,34	0.91	1 (3%)
6	PSU	L5	4099	6	18,21,22	1.35	3 (16%)	22,30,33	1.90	5 (22%)
6	PSU	L5	4435	6	18,21,22	1.35	3 (16%)	22,30,33	1.84	4 (18%)
52	PSU	S2	407	52	18,21,22	1.39	3 (16%)	22,30,33	1.85	4 (18%)
6	OMC	L5	2647	6	19,22,23	1.14	2 (10%)	26,31,34	0.88	1 (3%)
8	PSU	L8	69	8	18,21,22	1.36	3 (16%)	22,30,33	1.90	5 (22%)
6	PSU	L5	4042	6	18,21,22	1.36	3 (16%)	22,30,33	1.87	4 (18%)
47	MLZ	Lq	53	47	8,9,10	0.46	0	4,9,11	0.08	0
52	OMC	S2	518	52	19,22,23	1.15	2 (10%)	26,31,34	0.91	1 (3%)
6	OMG	L5	3676	6	18,26,27	1.94	2 (11%)	19,38,41	1.68	4 (21%)
6	OMG	L5	4383	90,6	18,26,27	1.97	2 (11%)	19,38,41	1.68	5 (26%)
6	A2M	L5	4269	89,6	18,25,26	1.96	5 (27%)	18,36,39	2.21	5 (27%)
6	OMU	L5	4052	24,6	19,22,23	1.00	2 (10%)	26,31,34	1.74	4 (15%)
6	OMC	L5	1820	89,6	19,22,23	1.15	2 (10%)	26,31,34	0.89	0
52	PSU	S2	1178	52	18,21,22	1.39	3 (16%)	22,30,33	1.80	4 (18%)
52	A2M	S2	1032	52	18,25,26	1.92	5 (27%)	18,36,39	2.14	4 (22%)
6	OMG	L5	4369	6	18,26,27	1.98	2 (11%)	19,38,41	1.68	4 (21%)
6	OMU	L5	3657	6	19,22,23	1.01	2 (10%)	26,31,34	1.82	5 (19%)
52	OMU	S2	1805	52	19,22,23	0.98	2 (10%)	26,31,34	1.80	5 (19%)
52	OMU	S2	429	52	19,22,23	1.02	2 (10%)	26,31,34	1.79	5 (19%)
78	SAC	Sd	2	78	7,8,9	0.52	0	8,9,11	0.90	1 (12%)
52	PSU	S2	816	52	18,21,22	1.43	3 (16%)	22,30,33	1.83	5 (22%)
6	6MZ	L5	3966	27,6	18,25,26	0.82	1 (5%)	16,36,39	2.03	4 (25%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	A2M	L5	3456	6	18,25,26	1.96	5 (27%)	18,36,39	2.10	4 (22%)
52	OMC	S2	1704	89,52	19,22,23	1.13	2 (10%)	26,31,34	0.89	1 (3%)
52	OMU	S2	355	71,52	19,22,23	0.98	2 (10%)	26,31,34	1.83	5 (19%)
52	MA6	S2	1852	52	18,26,27	0.94	1 (5%)	19,38,41	1.62	5 (26%)
52	PSU	S2	687	67,52	18,21,22	1.41	3 (16%)	22,30,33	1.84	5 (22%)
6	A2M	L5	3492	89,6	18,25,26	2.00	5 (27%)	18,36,39	2.17	5 (27%)
52	PSU	S2	1446	52	18,21,22	1.40	3 (16%)	22,30,33	1.85	4 (18%)
52	A2M	S2	166	52	18,25,26	2.00	5 (27%)	18,36,39	2.21	6 (33%)
6	PSU	L5	4107	6	18,21,22	1.33	3 (16%)	22,30,33	1.79	3 (13%)
6	A2M	L5	1479	6	18,25,26	1.89	5 (27%)	18,36,39	2.22	4 (22%)
52	PSU	S2	1233	52	18,21,22	1.37	3 (16%)	22,30,33	1.81	5 (22%)
6	OMC	L5	2704	6	19,22,23	1.14	2 (10%)	26,31,34	0.86	0
6	PSU	L5	3369	89,90,6	18,21,22	1.29	3 (16%)	22,30,33	1.87	4 (18%)
6	PSU	L5	3462	6	18,21,22	1.38	3 (16%)	22,30,33	1.80	5 (22%)
81	AME	Sg	1	81	9,10,11	0.47	0	9,11,13	0.88	1 (11%)
6	PSU	L5	4149	6	18,21,22	1.33	3 (16%)	22,30,33	1.93	5 (22%)
6	A2M	L5	4336	6	18,25,26	1.99	5 (27%)	18,36,39	2.26	5 (27%)
52	PSU	S2	210	52	18,21,22	1.45	3 (16%)	22,30,33	1.84	4 (18%)
11	AYA	LF	2	11	6,7,8	0.75	0	5,8,10	0.25	0
6	OMC	L5	2667	6	19,22,23	1.14	2 (10%)	26,31,34	0.87	0
6	PSU	L5	4322	6	18,21,22	1.39	3 (16%)	22,30,33	1.79	5 (22%)
6	OMU	L5	2680	6	19,22,23	0.99	2 (10%)	26,31,34	1.82	6 (23%)
6	PSU	L5	4740	10,6	18,21,22	1.38	3 (16%)	22,30,33	1.78	3 (13%)
6	PSU	L5	1721	6	18,21,22	1.35	3 (16%)	22,30,33	1.83	5 (22%)
52	OMU	S2	121	52	19,22,23	0.99	2 (10%)	26,31,34	1.75	5 (19%)
6	PSU	L5	4039	6	18,21,22	1.35	3 (16%)	22,30,33	1.87	5 (22%)
6	A2M	L5	2658	89,6	18,25,26	1.95	5 (27%)	18,36,39	2.11	5 (27%)
6	PSU	L5	4169	6	18,21,22	1.37	3 (16%)	22,30,33	1.85	5 (22%)
52	OMU	S2	628	52	19,22,23	1.01	2 (10%)	26,31,34	1.82	6 (23%)
52	PSU	S2	1245	52	18,21,22	1.36	3 (16%)	22,30,33	1.85	4 (18%)
52	PSU	S2	1644	89,52	18,21,22	1.36	3 (16%)	22,30,33	1.83	4 (18%)
6	A2M	L5	2630	6	18,25,26	1.97	5 (27%)	18,36,39	2.34	5 (27%)
52	PSU	S2	1082	52	18,21,22	1.33	3 (16%)	22,30,33	1.82	4 (18%)
6	PSU	L5	4203	6	18,21,22	1.33	3 (16%)	22,30,33	1.81	4 (18%)
6	OMC	L5	2194	6	19,22,23	1.11	2 (10%)	26,31,34	0.95	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
52	A2M	S2	27	52	18,25,26	1.97	5 (27%)	18,36,39	2.12	4 (22%)
6	OMG	L5	4245	6	18,26,27	1.98	2 (11%)	19,38,41	1.67	5 (26%)
52	PSU	S2	1348	52	18,21,22	1.38	3 (16%)	22,30,33	1.81	3 (13%)
52	A2M	S2	669	89,52	18,25,26	1.86	5 (27%)	18,36,39	2.21	4 (22%)
52	OMC	S2	463	52	19,22,23	1.16	2 (10%)	26,31,34	0.90	0
6	A2M	L5	398	6	18,25,26	1.95	5 (27%)	18,36,39	2.15	5 (27%)
6	OMC	L5	4202	6	19,22,23	1.14	2 (10%)	26,31,34	0.93	1 (3%)
6	OMC	L5	2265	89,6	19,22,23	1.12	2 (10%)	26,31,34	0.90	2 (7%)
35	MLZ	Le	5	35	8,9,10	0.47	0	4,9,11	0.13	0
6	OMG	L5	1477	11,6	18,26,27	1.97	2 (11%)	19,38,41	1.69	4 (21%)
6	A2M	L5	1489	89,6	18,25,26	1.91	5 (27%)	18,36,39	2.10	3 (16%)
52	OMU	S2	172	52	19,22,23	0.99	2 (10%)	26,31,34	1.85	7 (26%)
52	PSU	S2	109	52	18,21,22	1.42	3 (16%)	22,30,33	1.80	5 (22%)
6	PSU	L5	4166	6	18,21,22	1.38	3 (16%)	22,30,33	1.79	4 (18%)
6	PSU	L5	1718	12,6	18,21,22	1.35	3 (16%)	22,30,33	1.82	4 (18%)
6	PSU	L5	1801	17,6	18,21,22	1.35	3 (16%)	22,30,33	1.83	3 (13%)
52	PSU	S2	1046	52	18,21,22	1.35	3 (16%)	22,30,33	1.88	4 (18%)
52	OMU	S2	1327	89,52	19,22,23	1.00	2 (10%)	26,31,34	1.79	5 (19%)
6	PSU	L5	3371	6	18,21,22	1.33	3 (16%)	22,30,33	1.82	5 (22%)
6	PSU	L5	1731	6	18,21,22	1.35	3 (16%)	22,30,33	1.83	4 (18%)
6	PSU	L5	3576	6	18,21,22	1.36	3 (16%)	22,30,33	1.77	4 (18%)
52	OMG	S2	684	52	18,26,27	1.96	2 (11%)	19,38,41	1.74	5 (26%)
52	PSU	S2	823	52	18,21,22	1.40	3 (16%)	22,30,33	1.80	4 (18%)
52	OMG	S2	868	52	18,26,27	1.95	2 (11%)	19,38,41	1.67	4 (21%)
52	A2M	S2	1679	52	18,25,26	1.97	5 (27%)	18,36,39	2.13	4 (22%)
52	PSU	S2	967	52	18,21,22	1.40	3 (16%)	22,30,33	1.79	4 (18%)
6	PSU	L5	4278	6	18,21,22	1.38	3 (16%)	22,30,33	1.79	4 (18%)
52	A2M	S2	469	52	18,25,26	1.96	5 (27%)	18,36,39	2.18	5 (27%)
60	SAC	SL	2	60	7,8,9	0.53	0	8,9,11	0.86	1 (12%)
6	PSU	L5	3447	6	18,21,22	1.36	3 (16%)	22,30,33	1.81	4 (18%)
52	PSU	S2	682	52	18,21,22	1.36	3 (16%)	22,30,33	1.86	5 (22%)
6	A2M	L5	2206	89,6	18,25,26	1.95	5 (27%)	18,36,39	2.15	5 (27%)
6	OMC	L5	3601	6	19,22,23	1.16	2 (10%)	26,31,34	0.89	0
6	PSU	L5	2475	6	18,21,22	1.37	3 (16%)	22,30,33	1.82	5 (22%)
52	PSU	S2	36	52	18,21,22	1.41	3 (16%)	22,30,33	1.82	5 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	PSU	L5	4711	6	18,21,22	1.35	3 (16%)	22,30,33	1.82	5 (22%)
52	PSU	S2	650	52	18,21,22	1.38	3 (16%)	22,30,33	1.83	4 (18%)
46	M3L	Lp	98	46	10,11,12	0.51	0	9,14,16	0.47	0
52	PSU	S2	1057	52	18,21,22	1.37	3 (16%)	22,30,33	1.84	5 (22%)
6	A2M	L5	3450	6	18,25,26	1.90	5 (27%)	18,36,39	2.15	4 (22%)
6	PSU	L5	4267	89,6	18,21,22	1.33	3 (16%)	22,30,33	1.93	4 (18%)
6	OMG	L5	2207	6	18,26,27	2.00	2 (11%)	19,38,41	1.67	4 (21%)
52	OMG	S2	602	52	18,26,27	1.96	2 (11%)	19,38,41	1.66	5 (26%)
52	A2M	S2	577	52	18,25,26	1.98	5 (27%)	18,36,39	2.25	6 (33%)
52	PSU	S2	815	52	18,21,22	1.38	3 (16%)	22,30,33	1.83	4 (18%)
52	A2M	S2	99	89,52	18,25,26	1.98	5 (27%)	18,36,39	2.12	5 (27%)
52	PSU	S2	1175	52	18,21,22	1.36	3 (16%)	22,30,33	1.84	5 (22%)
52	OMG	S2	645	52	18,26,27	1.96	2 (11%)	19,38,41	1.73	5 (26%)
79	NMM	Se	67	79	9,11,12	1.56	1 (11%)	6,12,14	3.48	2 (33%)
6	PSU	L5	3500	6	18,21,22	1.36	3 (16%)	22,30,33	1.84	4 (18%)
6	PSU	L5	3585	89,6	18,21,22	1.32	3 (16%)	22,30,33	1.83	4 (18%)
6	A2M	L5	3599	6	18,25,26	1.92	5 (27%)	18,36,39	2.13	5 (27%)
6	OMC	L5	3619	22,6	19,22,23	1.14	2 (10%)	26,31,34	0.93	1 (3%)
6	5MC	L5	3514	89,6	18,22,23	1.27	3 (16%)	26,32,35	1.26	4 (15%)
6	OMG	L5	4364	6	18,26,27	1.97	2 (11%)	19,38,41	1.68	5 (26%)
52	OMC	S2	1392	52	19,22,23	1.16	2 (10%)	26,31,34	0.94	1 (3%)
6	OMG	L5	4240	6	18,26,27	1.99	2 (11%)	19,38,41	1.69	5 (26%)
6	OMG	L5	3359	6	18,26,27	1.97	2 (11%)	19,38,41	1.69	5 (26%)
6	A2M	L5	3517	6	18,25,26	1.79	4 (22%)	18,36,39	2.28	5 (27%)

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
6	OMU	L5	3973	6	-	0/9/27/28	0/2/2/2
52	OMG	S2	1491	89,52	-	1/5/27/28	0/3/3/3
6	OMU	L5	4366	29,6	-	0/9/27/28	0/2/2/2
52	PSU	S2	652	52	-	0/7/25/26	0/2/2/2
52	PSU	S2	864	82,52	-	0/7/25/26	0/2/2/2
6	OMC	L5	1284	6	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	PSU	L5	3616	6	-	0/7/25/26	0/2/2/2
52	A2M	S2	1384	52	-	0/5/27/28	0/3/3/3
52	PSU	S2	1693	52	-	0/7/25/26	0/2/2/2
6	OMG	L5	1260	38,6	-	0/5/27/28	0/3/3/3
6	PSU	L5	3554	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	4045	6	-	0/7/25/26	0/2/2/2
52	OMU	S2	1443	89,52	-	0/9/27/28	0/2/2/2
6	PSU	L5	4298	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	34	52	-	0/7/25/26	0/2/2/2
52	OMG	S2	1329	52	-	0/5/27/28	0/3/3/3
6	PSU	L5	4177	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	1537	6	-	0/7/25/26	0/2/2/2
6	OMG	L5	2267	6	-	0/5/27/28	0/3/3/3
52	PSU	S2	1047	52	-	0/7/25/26	0/2/2/2
83	HY3	Si	62	83	-	1/1/12/14	0/1/1/1
6	OMU	L5	2258	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	1638	34,90,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3496	6	-	0/7/25/26	0/2/2/2
6	OMC	L5	3573	6	-	0/9/27/28	0/2/2/2
6	A2M	L5	1270	6	-	1/5/27/28	0/3/3/3
52	PSU	S2	1239	52	-	0/7/25/26	0/2/2/2
52	PSU	S2	93	52	-	0/7/25/26	0/2/2/2
6	A2M	L5	3557	6	-	0/5/27/28	0/3/3/3
6	OMG	L5	4116	6	-	0/5/27/28	0/3/3/3
52	OMU	S2	1289	52,55	-	0/9/27/28	0/2/2/2
6	PSU	L5	4058	6	-	0/7/25/26	0/2/2/2
6	A2M	L5	3562	6	-	0/5/27/28	0/3/3/3
6	A2M	L5	4317	6	-	0/5/27/28	0/3/3/3
6	PSU	L5	1683	90,6	-	0/7/25/26	0/2/2/2
6	OMG	L5	3476	6	-	0/5/27/28	0/3/3/3
6	PSU	L5	1491	6	-	0/7/25/26	0/2/2/2
6	OMG	L5	4138	6	-	0/5/27/28	0/3/3/3
6	OMC	L5	3540	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	3502	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3583	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	105	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	4374	6	-	0/7/25/26	0/2/2/2
52	OMG	S2	1448	52	-	3/5/27/28	0/3/3/3
52	MA6	S2	1851	52	-	2/7/29/30	0/3/3/3
6	PSU	L5	3466	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	4246	6	-	1/7/25/26	0/2/2/2
6	OMC	L5	4282	6	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
52	A2M	S2	591	52	-	0/5/27/28	0/3/3/3
52	PSU	S2	218	52	-	0/7/25/26	0/2/2/2
6	OMC	L5	3433	90,6	-	4/9/27/28	0/2/2/2
52	7MG	S2	1640	52	-	0/7/37/38	0/3/3/3
52	A2M	S2	485	52	-	1/5/27/28	0/3/3/3
6	PSU	L5	3427	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	1626	52	-	0/7/25/26	0/2/2/2
52	OMG	S2	510	89,52	-	2/5/27/28	0/3/3/3
52	PSU	S2	1368	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	1632	6	-	1/7/25/26	0/2/2/2
6	OMU	L5	4244	6	-	0/9/27/28	0/2/2/2
8	OMG	L8	75	8	-	0/5/27/28	0/3/3/3
6	A2M	L5	2244	6	-	1/5/27/28	0/3/3/3
6	PSU	L5	2351	6	-	0/7/25/26	0/2/2/2
49	SAC	Ls	2	49	-	0/7/8/10	-
6	PSU	L5	1799	6	-	0/7/25/26	0/2/2/2
6	OMG	L5	3942	6	-	0/5/27/28	0/3/3/3
52	A2M	S2	513	52	-	0/5/27/28	0/3/3/3
52	PSU	S2	1005	52	-	1/7/25/26	0/2/2/2
52	PSU	S2	119	52	-	0/7/25/26	0/2/2/2
10	HIC	LE	245	10	-	1/5/6/8	0/1/1/1
6	OMG	L5	3524	6	-	0/5/27/28	0/3/3/3
8	PSU	L8	55	8	-	0/7/25/26	0/2/2/2
52	4AC	S2	1338	52	-	4/11/29/30	0/2/2/2
6	1MA	L5	1266	89,6	-	0/3/25/26	0/3/3/3
6	OMG	L5	1580	6	-	1/5/27/28	0/3/3/3
6	5MC	L5	4193	6	-	3/7/25/26	0/2/2/2
6	OMG	L5	3631	6	-	0/5/27/28	0/3/3/3
6	PSU	L5	4382	37,6	-	2/7/25/26	0/2/2/2
6	PSU	L5	3652	89,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	4325	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	802	52	-	3/7/25/26	0/2/2/2
52	OMG	S2	437	52	-	0/5/27/28	0/3/3/3
6	PSU	L5	4749	6	-	0/7/25/26	0/2/2/2
6	OMG	L5	2719	6	-	1/5/27/28	0/3/3/3
6	PSU	L5	4217	16,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3490	6	-	0/7/25/26	0/2/2/2
52	A2M	S2	159	52	-	0/5/27/28	0/3/3/3
52	PSU	S2	867	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	3494	6	-	2/7/25/26	0/2/2/2
52	OMC	S2	174	52	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
52	OMU	S2	116	52	-	0/9/27/28	0/2/2/2
52	PSU	S2	573	84,52	-	0/7/25/26	0/2/2/2
52	PSU	S2	610	52	-	0/7/25/26	0/2/2/2
52	6MZ	S2	1833	89,52	-	1/5/27/28	0/3/3/3
6	A2M	L5	1810	89,6	-	0/5/27/28	0/3/3/3
6	OMG	L5	3974	6	-	0/5/27/28	0/3/3/3
6	PSU	L5	4188	6	-	0/7/25/26	0/2/2/2
6	UR3	L5	4276	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	4419	6	-	0/7/25/26	0/2/2/2
6	A2M	L5	400	6	-	0/5/27/28	0/3/3/3
52	4AC	S2	1843	86,52	-	2/11/29/30	0/2/2/2
6	PSU	L5	1720	6	-	0/7/25/26	0/2/2/2
6	OMC	L5	2208	89,6	-	0/9/27/28	0/2/2/2
6	PSU	L5	4099	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	4435	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	407	52	-	0/7/25/26	0/2/2/2
6	OMC	L5	2647	6	-	0/9/27/28	0/2/2/2
8	PSU	L8	69	8	-	0/7/25/26	0/2/2/2
6	PSU	L5	4042	6	-	0/7/25/26	0/2/2/2
47	MLZ	Lq	53	47	-	0/7/8/10	-
52	OMC	S2	518	52	-	2/9/27/28	0/2/2/2
6	OMG	L5	3676	6	-	1/5/27/28	0/3/3/3
6	OMG	L5	4383	90,6	-	0/5/27/28	0/3/3/3
6	A2M	L5	4269	89,6	-	0/5/27/28	0/3/3/3
6	OMU	L5	4052	24,6	-	0/9/27/28	0/2/2/2
6	OMC	L5	1820	89,6	-	0/9/27/28	0/2/2/2
52	PSU	S2	1178	52	-	0/7/25/26	0/2/2/2
52	A2M	S2	1032	52	-	0/5/27/28	0/3/3/3
6	OMG	L5	4369	6	-	2/5/27/28	0/3/3/3
6	OMU	L5	3657	6	-	0/9/27/28	0/2/2/2
52	OMU	S2	1805	52	-	0/9/27/28	0/2/2/2
52	OMU	S2	429	52	-	4/9/27/28	0/2/2/2
78	SAC	Sd	2	78	-	0/7/8/10	-
52	PSU	S2	816	52	-	0/7/25/26	0/2/2/2
6	6MZ	L5	3966	27,6	-	0/5/27/28	0/3/3/3
6	A2M	L5	3456	6	-	0/5/27/28	0/3/3/3
52	OMC	S2	1704	89,52	-	0/9/27/28	0/2/2/2
52	OMU	S2	355	71,52	-	0/9/27/28	0/2/2/2
52	MA6	S2	1852	52	-	2/7/29/30	0/3/3/3
52	PSU	S2	687	67,52	-	0/7/25/26	0/2/2/2
6	A2M	L5	3492	89,6	-	3/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
52	PSU	S2	1446	52	-	0/7/25/26	0/2/2/2
52	A2M	S2	166	52	-	0/5/27/28	0/3/3/3
6	PSU	L5	4107	6	-	0/7/25/26	0/2/2/2
6	A2M	L5	1479	6	-	0/5/27/28	0/3/3/3
52	PSU	S2	1233	52	-	0/7/25/26	0/2/2/2
6	OMC	L5	2704	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	3369	89,90,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3462	6	-	0/7/25/26	0/2/2/2
81	AME	Sg	1	81	-	2/9/10/12	-
6	PSU	L5	4149	6	-	0/7/25/26	0/2/2/2
6	A2M	L5	4336	6	-	2/5/27/28	0/3/3/3
52	PSU	S2	210	52	-	0/7/25/26	0/2/2/2
11	AYA	LF	2	11	-	2/4/6/8	-
6	OMC	L5	2667	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	4322	6	-	0/7/25/26	0/2/2/2
6	OMU	L5	2680	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	4740	10,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	1721	6	-	0/7/25/26	0/2/2/2
52	OMU	S2	121	52	-	0/9/27/28	0/2/2/2
6	PSU	L5	4039	6	-	0/7/25/26	0/2/2/2
6	A2M	L5	2658	89,6	-	1/5/27/28	0/3/3/3
6	PSU	L5	4169	6	-	0/7/25/26	0/2/2/2
52	OMU	S2	628	52	-	6/9/27/28	0/2/2/2
52	PSU	S2	1245	52	-	0/7/25/26	0/2/2/2
52	PSU	S2	1644	89,52	-	0/7/25/26	0/2/2/2
6	A2M	L5	2630	6	-	0/5/27/28	0/3/3/3
52	PSU	S2	1082	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	4203	6	-	0/7/25/26	0/2/2/2
6	OMC	L5	2194	6	-	1/9/27/28	0/2/2/2
52	A2M	S2	27	52	-	0/5/27/28	0/3/3/3
6	OMG	L5	4245	6	-	0/5/27/28	0/3/3/3
52	PSU	S2	1348	52	-	0/7/25/26	0/2/2/2
52	A2M	S2	669	89,52	-	2/5/27/28	0/3/3/3
52	OMC	S2	463	52	-	0/9/27/28	0/2/2/2
6	A2M	L5	398	6	-	0/5/27/28	0/3/3/3
6	OMC	L5	4202	6	-	0/9/27/28	0/2/2/2
6	OMC	L5	2265	89,6	-	2/9/27/28	0/2/2/2
35	MLZ	Le	5	35	-	2/7/8/10	-
6	OMG	L5	1477	11,6	-	3/5/27/28	0/3/3/3
6	A2M	L5	1489	89,6	-	2/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
52	OMU	S2	172	52	-	0/9/27/28	0/2/2/2
52	PSU	S2	109	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	4166	6	-	2/7/25/26	0/2/2/2
6	PSU	L5	1718	12,6	-	0/7/25/26	0/2/2/2
6	PSU	L5	1801	17,6	-	0/7/25/26	0/2/2/2
52	PSU	S2	1046	52	-	0/7/25/26	0/2/2/2
52	OMU	S2	1327	89,52	-	0/9/27/28	0/2/2/2
6	PSU	L5	3371	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	1731	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3576	6	-	1/7/25/26	0/2/2/2
52	OMG	S2	684	52	-	2/5/27/28	0/3/3/3
52	PSU	S2	823	52	-	2/7/25/26	0/2/2/2
52	OMG	S2	868	52	-	0/5/27/28	0/3/3/3
52	A2M	S2	1679	52	-	0/5/27/28	0/3/3/3
52	PSU	S2	967	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	4278	6	-	0/7/25/26	0/2/2/2
52	A2M	S2	469	52	-	0/5/27/28	0/3/3/3
60	SAC	SL	2	60	-	1/7/8/10	-
6	PSU	L5	3447	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	682	52	-	0/7/25/26	0/2/2/2
6	A2M	L5	2206	89,6	-	0/5/27/28	0/3/3/3
6	OMC	L5	3601	6	-	0/9/27/28	0/2/2/2
6	PSU	L5	2475	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	36	52	-	0/7/25/26	0/2/2/2
6	PSU	L5	4711	6	-	0/7/25/26	0/2/2/2
52	PSU	S2	650	52	-	0/7/25/26	0/2/2/2
46	M3L	Lp	98	46	-	0/9/10/12	-
52	PSU	S2	1057	52	-	0/7/25/26	0/2/2/2
6	A2M	L5	3450	6	-	0/5/27/28	0/3/3/3
6	PSU	L5	4267	89,6	-	0/7/25/26	0/2/2/2
6	OMG	L5	2207	6	-	0/5/27/28	0/3/3/3
52	OMG	S2	602	52	-	0/5/27/28	0/3/3/3
52	A2M	S2	577	52	-	1/5/27/28	0/3/3/3
52	PSU	S2	815	52	-	0/7/25/26	0/2/2/2
52	A2M	S2	99	89,52	-	1/5/27/28	0/3/3/3
52	PSU	S2	1175	52	-	0/7/25/26	0/2/2/2
52	OMG	S2	645	52	-	3/5/27/28	0/3/3/3
79	NMM	Se	67	79	-	3/9/11/13	-
6	PSU	L5	3500	6	-	0/7/25/26	0/2/2/2
6	PSU	L5	3585	89,6	-	0/7/25/26	0/2/2/2
6	A2M	L5	3599	6	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	OMC	L5	3619	22,6	-	2/9/27/28	0/2/2/2
6	5MC	L5	3514	89,6	-	0/7/25/26	0/2/2/2
6	OMG	L5	4364	6	-	0/5/27/28	0/3/3/3
52	OMC	S2	1392	52	-	2/9/27/28	0/2/2/2
6	OMG	L5	4240	6	-	1/5/27/28	0/3/3/3
6	OMG	L5	3359	6	-	0/5/27/28	0/3/3/3
6	A2M	L5	3517	6	-	2/5/27/28	0/3/3/3

The worst 5 of 613 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	L5	1266	1MA	C2-N3	8.67	1.39	1.29
6	L5	2207	OMG	C5-C6	-7.25	1.32	1.47
6	L5	3631	OMG	C5-C6	-7.11	1.33	1.47
6	L5	4138	OMG	C5-C6	-7.09	1.33	1.47
6	L5	2267	OMG	C5-C6	-7.07	1.33	1.47

The worst 5 of 867 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
52	S2	1005	PSU	C4-N3-C2	-8.37	114.28	126.34
79	Se	67	NMM	NE-CZ-NH2	-7.51	112.59	119.48
6	L5	1266	1MA	N1-C2-N3	-7.11	117.73	126.02
52	S2	485	A2M	N3-C2-N1	-6.85	117.97	128.68
6	L5	2630	A2M	N3-C2-N1	-6.84	117.99	128.68

There are no chirality outliers.

5 of 101 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
10	LE	245	HIC	CA-CB-CG-ND1
11	LF	2	AYA	OT-CT-N-CA
11	LF	2	AYA	CM-CT-N-CA
35	Le	5	MLZ	N-CA-CB-CG
35	Le	5	MLZ	C-CA-CB-CG

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 256 ligands modelled in this entry, 253 are monoatomic - leaving 3 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
87	GTP	L7	203	7	26,34,34	0.90	1 (3%)	32,54,54	1.34	3 (9%)
88	SER	F	101	2	4,5,6	0.57	0	0,5,7	-	-
87	GTP	E	1001	1	26,34,34	1.14	2 (7%)	32,54,54	1.45	6 (18%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
87	GTP	L7	203	7	-	0/18/38/38	0/3/3/3
88	SER	F	101	2	-	0/2/4/6	-
87	GTP	E	1001	1	-	6/18/38/38	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
87	E	1001	GTP	C5-C6	-4.12	1.39	1.47
87	L7	203	GTP	C6-N1	-2.36	1.34	1.37
87	E	1001	GTP	C2-N3	2.12	1.38	1.33

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
87	L7	203	GTP	PB-O3B-PG	-3.61	120.43	132.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
87	L7	203	GTP	PA-O3A-PB	-3.61	120.44	132.83
87	E	1001	GTP	C5-C6-N1	3.04	119.32	113.95
87	E	1001	GTP	C3'-C2'-C1'	2.96	105.44	100.98
87	E	1001	GTP	PA-O3A-PB	-2.94	122.75	132.83

There are no chirality outliers.

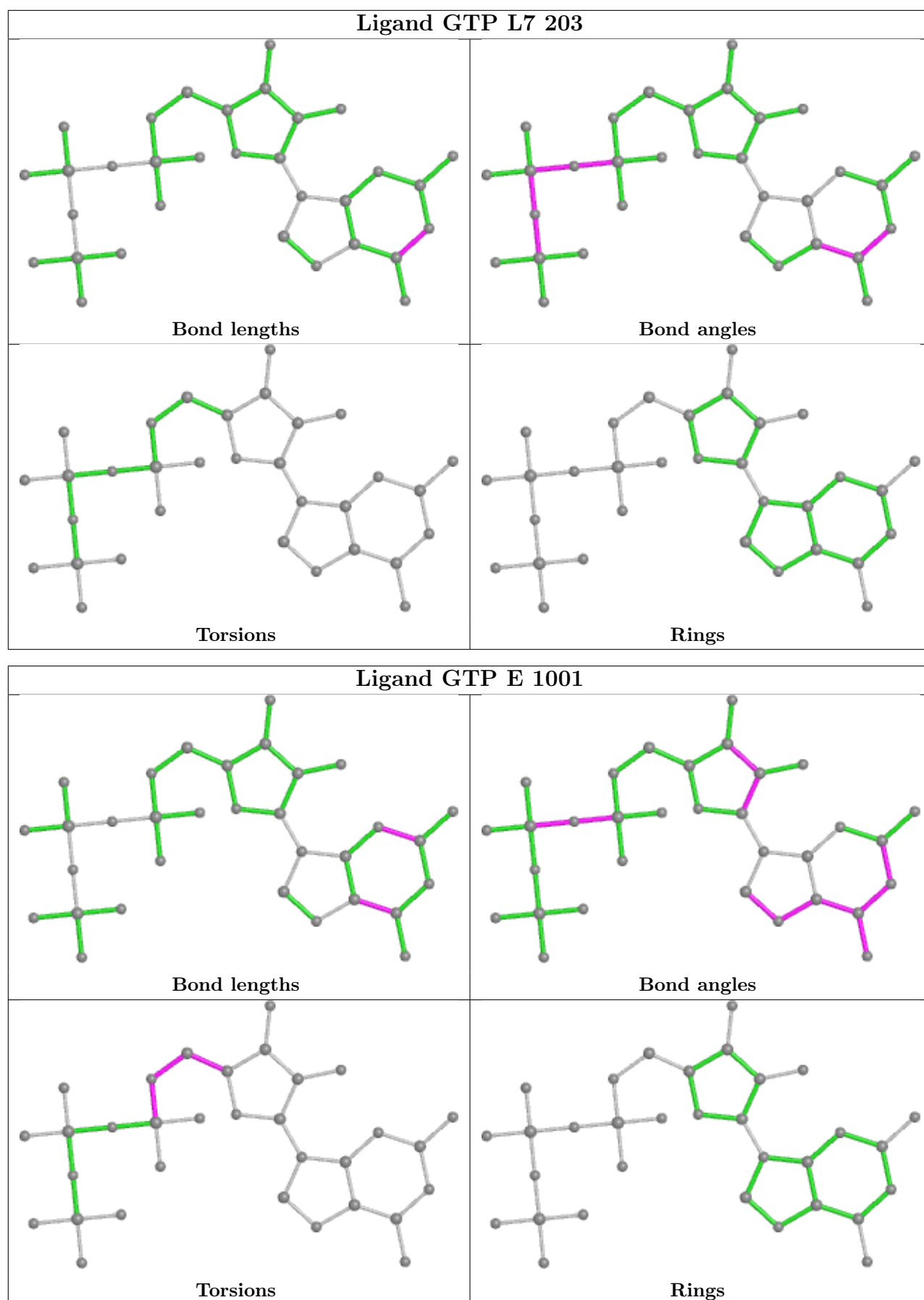
5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
87	E	1001	GTP	C5'-O5'-PA-O3A
87	E	1001	GTP	O4'-C4'-C5'-O5'
87	E	1001	GTP	C3'-C4'-C5'-O5'
87	E	1001	GTP	C5'-O5'-PA-O1A
87	E	1001	GTP	C5'-O5'-PA-O2A

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
83	Si	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	Si	61:GLN	C	62:HY3	N	3.10

## 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-14751. 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

This section was not generated.

### 6.2 Central slices

This section was not generated.

### 6.3 Largest variance slices

This section was not generated.

### 6.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

### 6.5 Orthogonal surface views

This section was not generated.

### 6.6 Mask visualisation

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



## 7 Map analysis

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

### 7.1 Map-value distribution

This section was not generated.

### 7.2 Volume estimate versus contour level

This section was not generated.

### 7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

## 8 Fourier-Shell correlation

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

## 9 Map-model fit

This section was not generated.