



Full wwPDB EM Validation Report ⓘ

Dec 10, 2022 – 11:17 pm GMT

PDB ID : 6QZP
EMDB ID : EMD-3883
Title : High-resolution cryo-EM structure of the human 80S ribosome
Authors : Natchiar, S.K.; Myasnikov, A.G.; Kratzat, H.; Hazemann, I.; Klaholz, B.P.
Deposited on : 2019-03-12
Resolution : 2.90 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

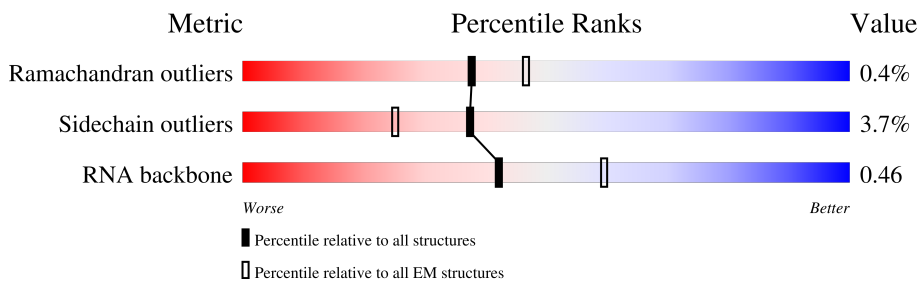
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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.



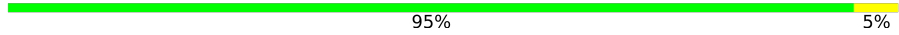
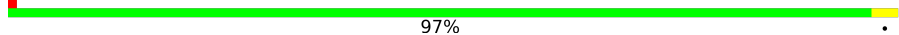
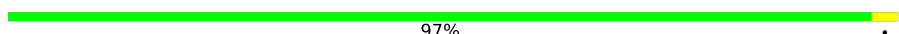
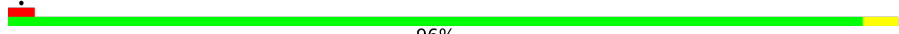


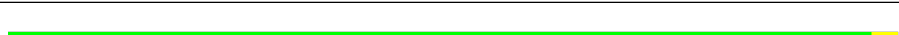
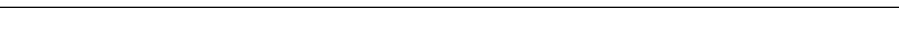
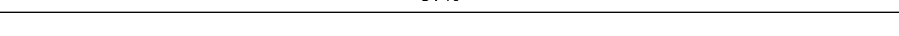
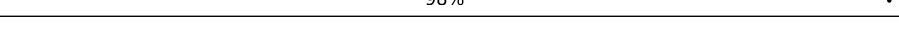
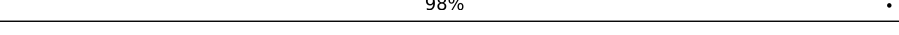
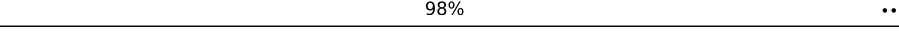
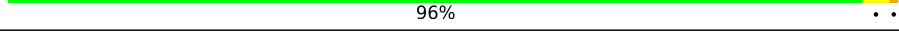
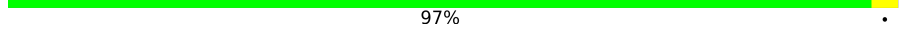
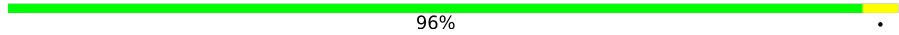
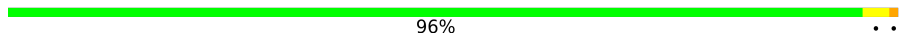







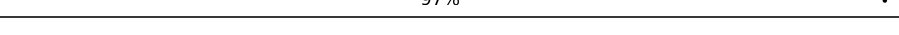
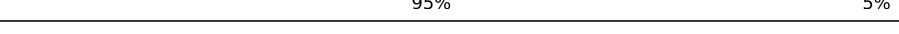
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	L5	3773	
2	L7	120	
3	L8	156	
4	LA	248	
5	LB	402	
6	LC	368	
7	LD	293	
8	LE	236	

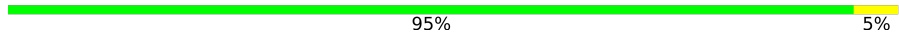
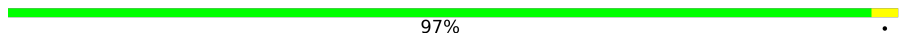
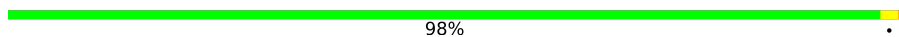
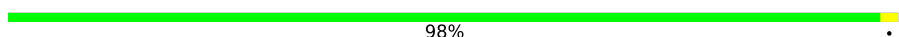

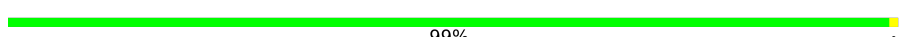




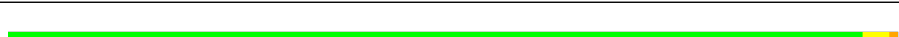


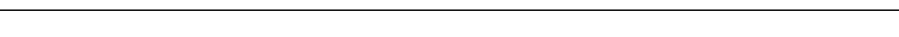
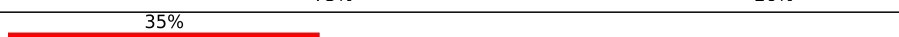
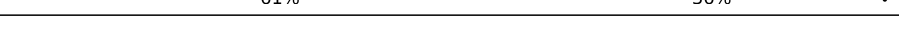

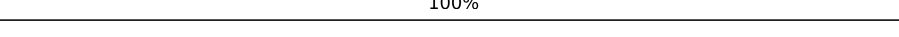
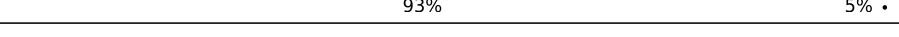
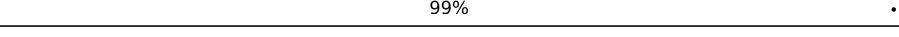
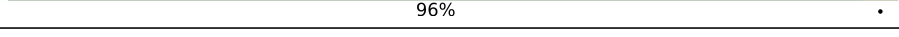

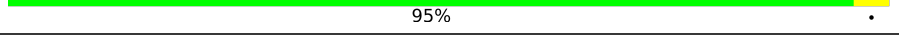
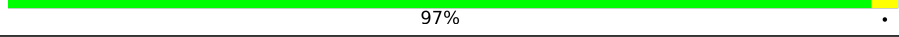
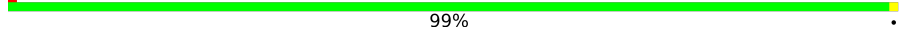
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Mol	Chain	Length	Quality of chain
9	LF	225	 95% 5%
10	LG	241	 97% .
11	LH	190	 97% .
12	LI	213	 96% .
13	LJ	176	 94% 6%
14	LL	210	 97% .
15	LM	139	 97% .
16	LN	203	 97% .
17	LO	201	 98% .
18	LP	153	 98% .
19	LQ	187	 98% ..
20	LR	187	 96% ..
21	LS	175	 97% .
22	LT	159	 96% .
23	LU	101	 96% ..
24	LV	131	 92% 7% .
25	LW	124	 94% 6%
26	LX	120	 99% .
27	LY	134	 97% ..
28	LZ	135	 99% .
29	La	147	 93% 6% .
30	Lb	109	 97% .
31	Lc	98	 95% 5%
32	Ld	107	 99% .
33	Le	128	 95% ..

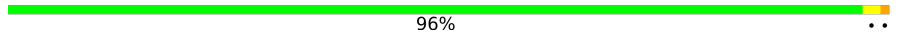
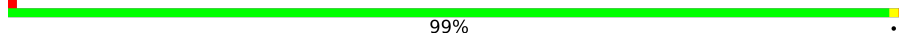
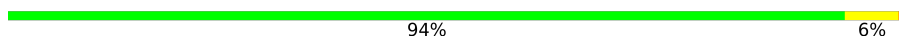
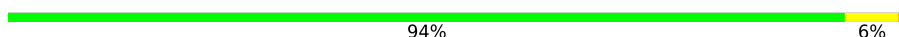
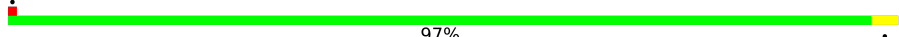
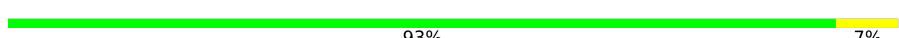
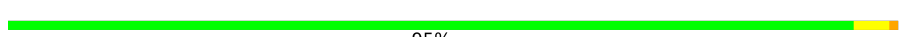



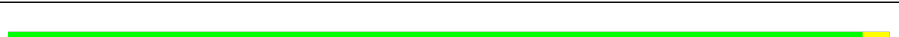


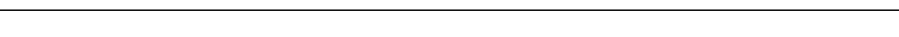
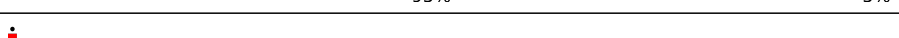
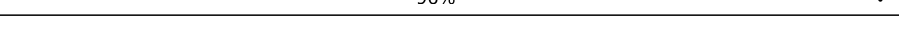
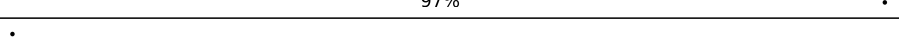
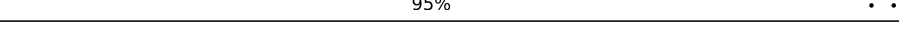
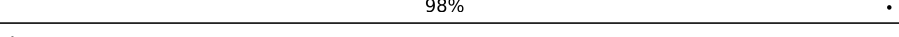
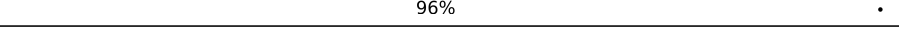

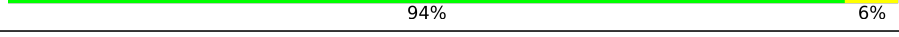
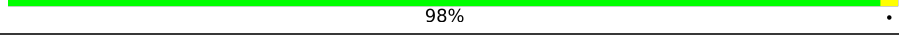
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Mol	Chain	Length	Quality of chain
34	Lf	109	 95% 5%
35	Lg	114	 97% .
36	Lh	122	 98% ..
37	Li	102	 98% .
38	Lj	86	 99% .
39	Lk	69	 99% .
40	Ll	50	 88% 12%
41	Lm	52	 98% .
42	Ln	24	 100%
43	Lo	105	 95% ..
44	Lp	91	 96% ..
45	Lr	125	 94% ..
46	Lz	217	 35% 95% 5%
47	S2	1740	 73% 26% .
48	S6	75	 35% 61% 36% .
49	SA	221	 90% 9% .
50	SB	214	 100%
51	SD	227	 93% 5% .
52	SE	262	 99% .
53	SF	189	 96% .
54	SH	186	 90% 9% .
55	SI	206	 95% .
56	SK	98	 97% .
57	SL	153	 99% .
58	SP	127	 96% .

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Mol	Chain	Length	Quality of chain
59	SQ	141	 96% ..
60	SR	135	 99% ..
61	SS	145	 94% 6% .
62	ST	143	 94% 6% .
63	SU	103	 97% .
64	SV	83	 93% 7%
65	SX	141	 95% ..
66	Sa	102	 95% ..
67	Sc	64	 89% 11% .
68	Sd	55	 93% 7%
69	Sg	313	 96% .
70	SC	222	 98% .
71	SG	237	 94% 6%
72	SJ	185	 95% 5%
73	SM	122	 96% .
74	SN	150	 97% ..
75	SO	140	 95% ..
76	SW	129	 98% .
77	SY	131	 96% .
78	SZ	75	 84% 9% 7%
79	Sb	83	 94% 6%
80	Se	58	 98% .
81	Sf	67	 97% .

2 Entry composition [i](#)

There are 86 unique types of molecules in this entry. The entry contains 219527 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 28S rRNA (3773-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	L5	3773	80201	35717	14590	26122	3772	0	0

- Molecule 2 is a RNA chain called 5S rRNA (120-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	L7	120	2558	1141	456	842	119	0	0

- Molecule 3 is a RNA chain called 5.8S rRNA (156-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	L8	156	3315	1481	585	1094	155	0	0

- Molecule 4 is a protein called 60S ribosomal protein L8.

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

- Molecule 5 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	LB	402	3238	2060	608	556	14	0	0

- Molecule 6 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	LC	368	2928	1841	583	489	15	0	0

- Molecule 7 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	LD	293	2382	1507	434	427	14	0	0

- Molecule 8 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	LE	236	1904	1222	361	317	4	0	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	SER	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	VAL	deletion	UNP Q02878
LE	?	-	GLU	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878
LE	?	-	GLU	deletion	UNP Q02878
LE	?	-	LYS	deletion	UNP Q02878

- Molecule 9 is a protein called 60S ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	LF	225	1878	1207	361	301	9	1	0

- Molecule 10 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	LG	241	1935	1233	374	324	4	1	0

- Molecule 11 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LH	190	1518	956	284	272	6	0	0

- Molecule 12 is a protein called 60S ribosomal protein L10-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LI	213	1711	1082	329	285	15	0	0

- Molecule 13 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LJ	176	1410	888	263	253	6	0	0

- Molecule 14 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	LL	210	1701	1064	352	281	4	0	0

- Molecule 15 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	LM	139	1138	730	218	183	7	0	0

- Molecule 16 is a protein called 60S ribosomal protein L15.

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

- Molecule 17 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	LO	201	1650	1063	321	261	5	0	0

- Molecule 18 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	LP	153	1242	776	241	216	9	0	0

- Molecule 19 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	LQ	187	1513	944	314	250	5	0	0

- Molecule 20 is a protein called 60S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	LR	187	1566	971	336	250	9	0	0

- Molecule 21 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	LS	175	1453	925	283	235	10	0	0

- Molecule 22 is a protein called 60S ribosomal protein L21.

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

- Molecule 23 is a protein called 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	LU	101	825	529	144	150	2	0	0

- Molecule 24 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	LV	131	979	618	184	172	5	0	0

- Molecule 25 is a protein called 60S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	LW	124	1015	634	207	170	4	0	0

- Molecule 26 is a protein called 60S ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	LX	120	985	630	185	169	1	0	0

- Molecule 27 is a protein called 60S ribosomal protein L26.

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

- Molecule 28 is a protein called 60S ribosomal protein L27.

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

- Molecule 29 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	La	147	1162	736	237	186	3	0	0

- Molecule 30 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	Lb	109	882	549	192	137	4	0	0

There are 13 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Lb	?	-	LYS	deletion	UNP P47914
Lb	?	-	PRO	deletion	UNP P47914
Lb	?	-	LYS	deletion	UNP P47914
Lb	?	-	GLU	deletion	UNP P47914
Lb	?	-	VAL	deletion	UNP P47914
Lb	?	-	LYS	deletion	UNP P47914
Lb	?	-	PRO	deletion	UNP P47914
Lb	?	-	LYS	deletion	UNP P47914
Lb	?	-	ILE	deletion	UNP P47914
Lb	?	-	PRO	deletion	UNP P47914
Lb	?	-	LYS	deletion	UNP P47914
Lb	?	-	GLY	deletion	UNP P47914

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Chain	Residue	Modelled	Actual	Comment	Reference
Lb	89	ALA	VAL	conflict	UNP P47914

- Molecule 31 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	Lc	98	764	485	135	138	6	0	0

- Molecule 32 is a protein called 60S ribosomal protein L31.

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

- Molecule 33 is a protein called 60S ribosomal protein L32.

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

- Molecule 34 is a protein called 60S ribosomal protein L35a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	Lf	109	876	555	174	144	3	0	0

- Molecule 35 is a protein called 60S ribosomal protein L34.

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

- Molecule 36 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Lh	122	1015	641	205	168	1	0	0

- Molecule 37 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	Li	102	Total	C	N	O	S	0	0
			832	521	177	129	5		

- Molecule 38 is a protein called 60S ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Lj	86	Total	C	N	O	S	1	0
			713	439	158	111	5		

- Molecule 39 is a protein called 60S ribosomal protein L38.

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

- Molecule 40 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	Ll	50	Total	C	N	O	S	0	0
			444	281	98	64	1		

- Molecule 41 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	Lm	52	Total	C	N	O	S	0	0
			430	267	90	67	6		

- Molecule 42 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	Ln	24	Total	C	N	O	S	0	0
			230	139	62	26	3		

- Molecule 43 is a protein called 60S ribosomal protein L36a.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Lo	105	Total	C	N	O	S	1	0
			870	547	178	139	6		

- Molecule 44 is a protein called 60S ribosomal protein L37a.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Lr	125	Total	C	N	O	S	0	0
			1002	622	207	168	5		

- Molecule 46 is a protein called 60S ribosomal protein L10a.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Lz	217	Total	C	N	O	S	0	0
			1741	1113	312	307	9		

- Molecule 47 is a RNA chain called 18S rRNA (1740-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
47	S2	1740	Total	C	N	O	P	0	0
			36938	16494	6600	12105	1739		

- Molecule 48 is a RNA chain called E site tRNA (75-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
48	S6	75	Total	C	N	O	P	0	0
			1604	717	298	515	74		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
49	SA	221	Total	C	N	O	S	0	0
			1741	1106	305	322	8		

- Molecule 50 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	SB	214	Total	C	N	O	S	0	0
			1738	1103	310	311	14		

- Molecule 51 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	SD	227	1765	1125	317	315	8	0	0

- Molecule 52 is a protein called 40S ribosomal protein S4, X isoform.

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

- Molecule 53 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	SF	189	1495	934	284	270	7	0	0

- Molecule 54 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	SH	186	1497	956	274	266	1	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
SH	?	-	SER	deletion	UNP P62081
SH	?	-	ARG	deletion	UNP P62081
SH	?	-	THR	deletion	UNP P62081

- Molecule 55 is a protein called 40S ribosomal protein S8.

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

- Molecule 56 is a protein called 40S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	SK	98	827	539	148	134	6	0	0

- Molecule 57 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	SL	153	1247	793	234	214	6	0	0

- Molecule 58 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	SP	127	1045	663	198	177	7	0	0

- Molecule 59 is a protein called 40S ribosomal protein S16.

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

- Molecule 60 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	SR	135	1090	685	202	198	5	0	0

- Molecule 61 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	SS	145	1198	751	242	203	2	0	0

- Molecule 62 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	ST	143	1112	697	214	198	3	0	0

- Molecule 63 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	SU	103	817	511	155	147	4	0	0

- Molecule 64 is a protein called 40S ribosomal protein S21.

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

- Molecule 65 is a protein called 40S ribosomal protein S23.

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

- Molecule 66 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	Sa	102	Total	C	N	O	S	1	0
			829	517	174	133	5		

- Molecule 67 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	Sc	64	Total	C	N	O	S	0	0
			506	308	102	94	2		

- Molecule 68 is a protein called 40S ribosomal protein S29.

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

- Molecule 69 is a protein called Receptor of activated protein C kinase 1.

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

- Molecule 70 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	SC	222	Total	C	N	O	S	1	0
			1733	1120	301	302	10		

- Molecule 71 is a protein called 40S ribosomal protein S6.

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

- Molecule 72 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	SJ	185	Total	C	N	O	S	1	0
			1533	974	309	248	2		

- Molecule 73 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	SM	122	Total	C	N	O	S	0	0
			940	590	164	177	9		

- Molecule 74 is a protein called 40S ribosomal protein S13.

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

- Molecule 75 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	SO	140	Total	C	N	O	S	0	0
			1049	642	204	197	6		

- Molecule 76 is a protein called 40S ribosomal protein S15a.

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

- Molecule 77 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	SY	131	Total	C	N	O	S	1	0
			1073	678	212	178	5		

- Molecule 78 is a protein called 40S ribosomal protein S25.

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

- Molecule 79 is a protein called 40S ribosomal protein S27.

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

- Molecule 80 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	Se	58	Total	C	N	O	S	0	0
			459	284	100	74	1		

- Molecule 81 is a protein called Ubiquitin-40S ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	Sf	67	Total	C	N	O	S	0	0
			548	346	102	93	7		

- Molecule 82 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

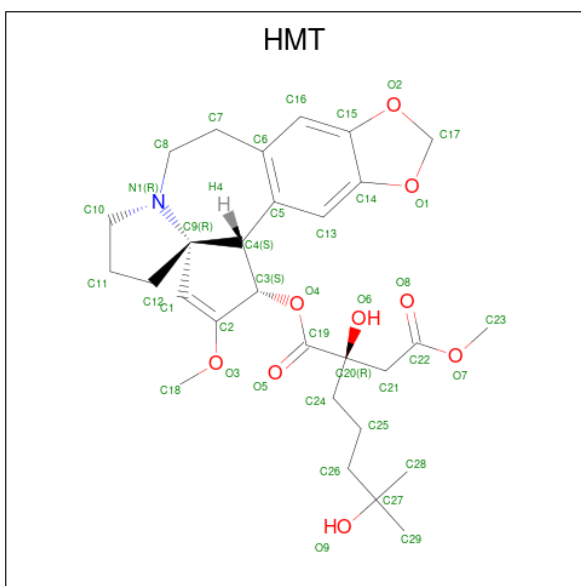
Mol	Chain	Residues	Atoms		AltConf
82	L5	279	Total	Mg	0
			279	279	
82	L7	3	Total	Mg	0
			3	3	
82	L8	6	Total	Mg	0
			6	6	
82	LA	1	Total	Mg	0
			1	1	
82	LI	1	Total	Mg	0
			1	1	
82	LN	1	Total	Mg	0
			1	1	
82	LP	1	Total	Mg	0
			1	1	
82	LS	1	Total	Mg	0
			1	1	
82	LV	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
82	Le	2	Total	Mg	0
			2	2	
82	Lf	1	Total	Mg	0
			1	1	
82	S2	140	Total	Mg	0
			140	140	
82	SF	1	Total	Mg	0
			1	1	

- Molecule 83 is (3beta)-O 3 -[(2R)-2,6-dihydroxy-2-(2-methoxy-2-oxoethyl)-6-methylheptano yl]cephalotaxine (three-letter code: HMT) (formula: C₂₉H₃₉NO₉).



Mol	Chain	Residues	Atoms			AltConf	
83	L5	1	Total	C	N	O	0
			39	29	1	9	

- Molecule 84 is ZINC ION (three-letter code: ZN) (formula: Zn).

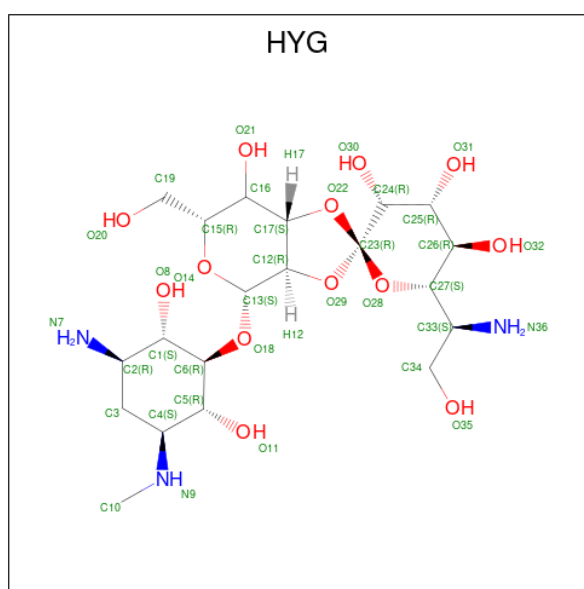
Mol	Chain	Residues	Atoms		AltConf
84	Lg	1	Total	Zn	0
			1	1	
84	Lj	1	Total	Zn	0
			1	1	
84	Lm	1	Total	Zn	0
			1	1	
84	Lo	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
84	Lp	1	Total	Zn	0
			1	1	
84	Sa	1	Total	Zn	0
			1	1	
84	Sd	1	Total	Zn	0
			1	1	
84	Sf	1	Total	Zn	0
			1	1	

- Molecule 85 is HYGROMYCIN B (three-letter code: HYG) (formula: $C_{20}H_{37}N_3O_{13}$).



Mol	Chain	Residues	Atoms				AltConf
85	S2	1	Total	C	N	O	0
			36	20	3	13	

- Molecule 86 is water.

Mol	Chain	Residues	Atoms		AltConf
86	L5	11	Total	O	0
			11	11	
86	LA	1	Total	O	0
			1	1	
86	LB	1	Total	O	0
			1	1	
86	LC	1	Total	O	0
			1	1	

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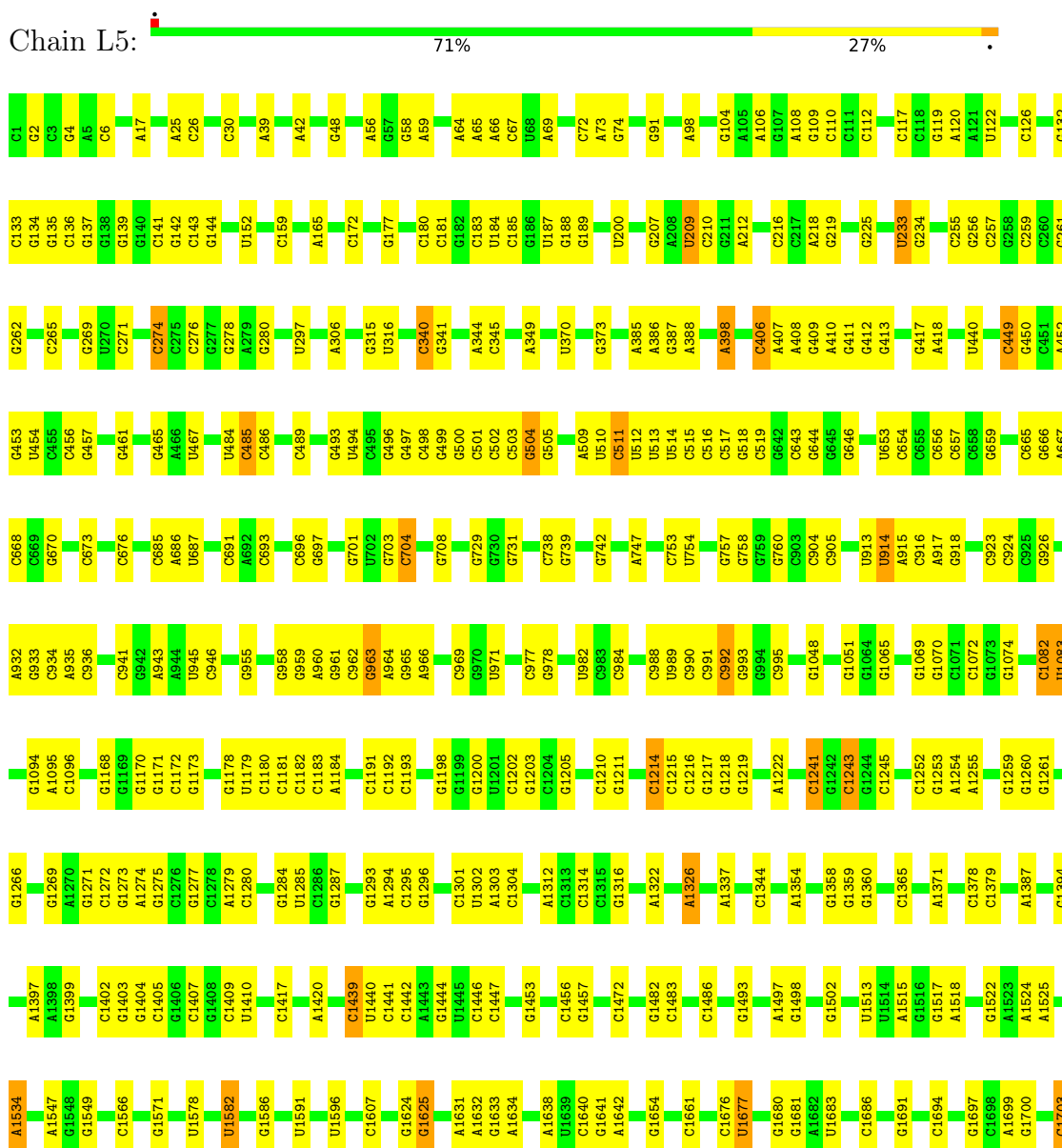
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Mol	Chain	Residues	Atoms	AltConf
86	LF	1	Total O 1 1	0
86	LG	1	Total O 1 1	0
86	LH	1	Total O 1 1	0
86	LI	1	Total O 1 1	0
86	LY	1	Total O 1 1	0
86	La	2	Total O 2 2	0
86	Lb	1	Total O 1 1	0
86	Lf	1	Total O 1 1	0
86	Lm	1	Total O 1 1	0
86	S2	12	Total O 12 12	0
86	SF	1	Total O 1 1	0
86	SL	1	Total O 1 1	0
86	SR	1	Total O 1 1	0
86	SS	1	Total O 1 1	0
86	SV	1	Total O 1 1	0
86	SC	1	Total O 1 1	0
86	SG	1	Total O 1 1	0
86	SN	1	Total O 1 1	0

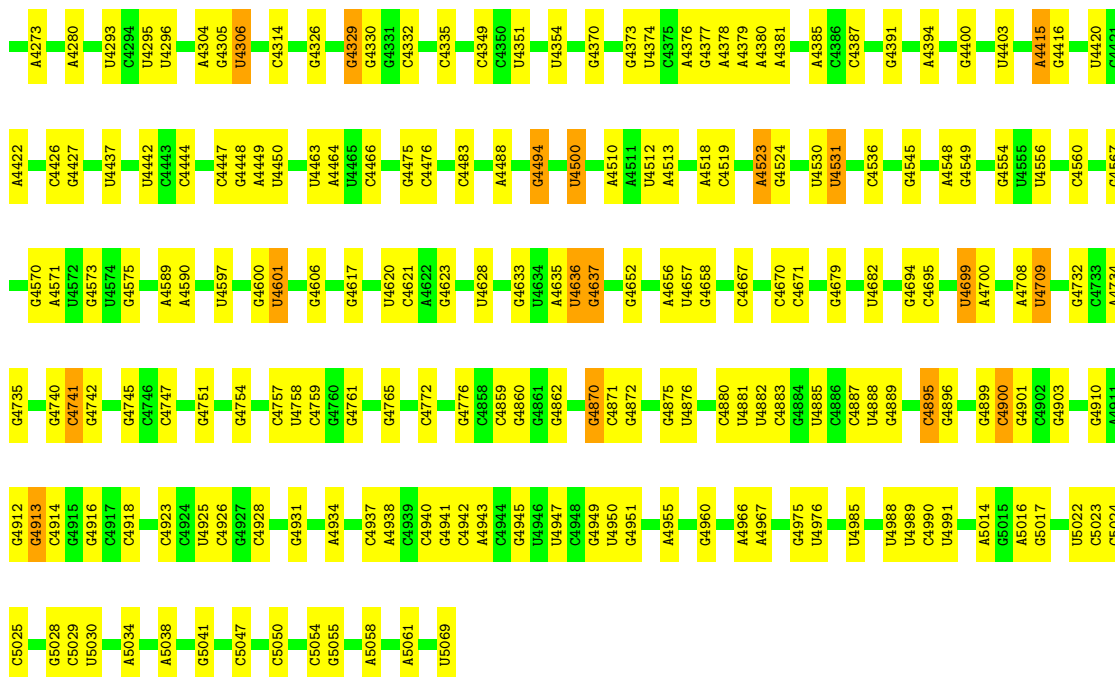
3 Residue-property plots

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.

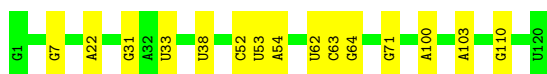
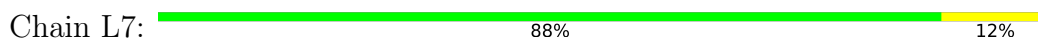
- Molecule 1: 28S rRNA (3773-MER)



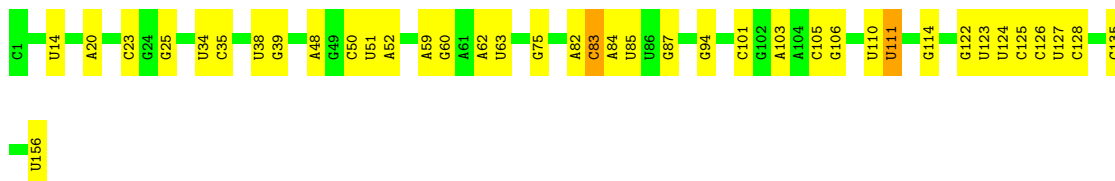
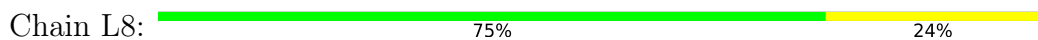
G1704	G1706	G1707	G1716	A1719	G1852	G1853	G1854	G1855	G1860	G1866	G1740	G1741	A1742	G1750	G1753	G1754	U1755	U1756	U1757	G1758	G1759	G1760	G1761	C1762	C1763	G1764	A1766	A1767	G1768	G1769	A1770	U1771	A1775	A1787	G1797	G1803	A1804	C1809	G1810	G1819	G1820	G1821	U1822	G1823	U1834																																																
G1835	G1836	A1837	G1842	U1852	G1853	G1854	G1855	U1860	U1866	G1869	G1870	A1871	U1876	U1882	U1883	G1883	U1888	U1889	G1890	G1758	G1891	G1892	G1893	C1893	A1897	A1917	U1918	G1919	G1920	C1921	G1922	G1925	A1929	U1930	C1931	A1932	C1935	C1936	G1940	G1945	G1946	U1947	G1948	G1951	G1952	U1953																																															
U1959	G1960	G1961	A1962	G1965	C1966	A1967	G1968	G1969	A1970	C1971	U1974	G1975	G1976	C1977	U1980	G1981	A1982	A1983	A1984	U1986	G1987	G1988	G1989	G1990	G1991	G1992	G1993	G1994	G1995	G1996	U1997	A1998	A1999	A2002	G2003	U2004	G2005	U2006	G2007	U2008	A2009	A2010	C2011	A2012	A2013	C2014	U2015	C2016	A2017	C2018	C2019	U2020	A2025																																								
A2026	A2033	U2038	U2044	G2045	U2046	A2047	U2048	G2049	G2050	G2055	G2056	C2062	C2068	A2069	C2084	G2085	G2089	U2090	G2091	G2092	G2093	G2094	A2095	G2096	U2097	G2098	C2101	G2106	C2107	C2110	G2111	G2112	G2152	A2253	C2256	C2257	C2258	G2259	C2260	C2289	A2300	G2301	G2306	A2313	A2316	A2317	A2318	A2319	A2320	A2321	A2322	A2323	A2324	A2325	A2326	U2440	C2441	G2450	A2453	C2464	C2465																																
A2313	G2316	A2332	G2333	C2337	C2338	C2346	A2347	G2348	C2351	G2357	A2360	A2363	G2364	A2370	A2382	A2389	A2395	A2396	G2397	A2401	U2408	U2409	C2410	G2416	A2417	G2421	C2422	G2423	U2425	U2426	U2440	C2441	G2450	A2453	C2464	C2465	C2475	C2478	C2482	G2483	A2484	U2485	C2488	C2489	U2490	C2491	C2501	G2502	G2503	C2504	G2505	A2506	U2508	A2511	A2512	A2513	U2519	C2520	A2529	C2533	A2537	A2543	G2544	U2545	G2546	G2547	U2554	G2555	G2556	G2559	A2565	G2566	A2573	C2583	A2587	G2588																	
G2474	G2475	C2478	C2482	G2483	A2484	U2485	C2488	C2489	U2490	C2491	C2492	G2493	C2501	G2502	G2503	C2504	G2505	A2506	U2508	A2511	A2512	A2513	U2519	C2520	A2529	C2533	A2537	A2543	G2544	U2545	G2546	G2547	U2554	G2555	G2556	G2559	A2565	G2566	A2573	C2583	A2587	G2588																																																			
C2589	A2601	G2602	A2611	G2616	G2618	C2627	U2637	G2652	C2653	G2662	C2669	C2670	G2673	A2674	G2675	A2676	U2687	G2688	G2689	U2707	U2708	C2709	C2710	G2711	G2712	G2721	G2724	A2725	G2726	C2729	G2732	C2739	G2742	A2743	G2754	A2755	G2756	G2760	U2761	G2762	U2763	A2764	C2770	G2773	U2788	A2789	U2790	G2814	A2815	U2826	C2827	G2838	G2842	G2848	G2855	C2856	C2861	C2867	G2877	C2882	U2900	G2902	G2903	U2904	G2905	G2906	G2907	U2908	C2909	G2910	C3584	G3585	G3586	C3587	G3588	G3589	G3590																
C3591	G3592	C3593	C3594	U3595	A3596	G3597	C3602	G3603	A3604	C3605	U3606	G3614	G3615	U3616	G3617	C3618	G3626	A3630	A3635	U3644	U3645	A3646	G3647	A3648	G3649	C3650	A3662	A3663	G3673	G3674	C3680	C3681	A3692	G3710	U3711	A3712	G3713	G3714	U3715	A3718	U3723	A3726	A3727	C3728	C3735	A3736	A3748	A3749	A3750	A3751	A3752	A3753	A3754	A3755	A3756	A3757	A3758	A3759	A3760	C3761	U3762	A3763	U3764	C3771	U3772	A3775	G3776	G3777	C3782	A3785	U3786	G3787	G3792	A3799	U3800	U3801	U3802	C3810	G3811	C3812	A3813	U3814	A3817	U3818	G3819	A3825	U3838	G3839	U3840	U3851	A3867	G3868	C3869
C3870	A3877	C3878	G3879	U3884	G3885	G3886	C3887	A3890	A3891	U3892	C3897	G3898	G3899	G3900	A3901	A3906	G3907	A3908	C3909	U3915	G3916	U3920	U3921	G3922	C3926	A3942	A3943	A3947	C3948	A3949	U3950	G3951	G3952	G3953	A3954	G3955	G3956	U3957	G3958	U3959	A3960	C3961	A3962	A3963	U3964	A3965	A3966	C3967	U3968																																												
G3969	C3970	A3971	G3972	A4004	A4046	A4047	A4048	U4049	C3976	C3977	C3978	C3979	C3988	C3989	C3990	G3991	G3992	U3993	G3994	U3995	C3996	C3997	C3998	C3999	G4000	G4001	G4002	A4003	G4004	G4005	G4006	G4007	C4008	C4009	C4010	G4011	G4012	G4013	G4014	C4015	G4016	U4020	C4021	C4022	G4023	C4024	C4025	G4026	C4027	C4028	G4034	G4035	G4036	G4039	C4041	G4042																																					
G4043	U4044	C4045	A4046	A4047	A4048	U4049	C4050	C4051	C4052	A4053	C4054	U4055	A4056	C4057	U4058	U4059	A4060	A4061	A4062	C4064	U4067	U4068	U4069	G4076	G4201	U4202	A4203	C4206	A4212	A4213	A4220	C4221	G4222	C4223	A4224	G4225	U4229	A4233	G4249	G4250	A4251	G4254	C4255	U4257	U4265	A4268																																															



• Molecule 2: 5S rRNA (120-MER)



• Molecule 3: 5.8S rRNA (156-MER)

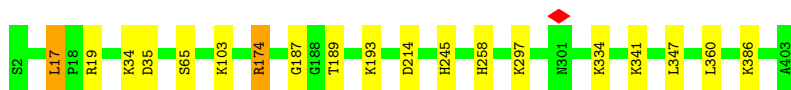


• Molecule 4: 60S ribosomal protein L8



• Molecule 5: 60S ribosomal protein L3

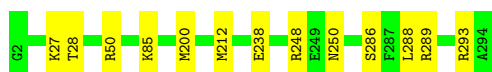




- Molecule 6: 60S ribosomal protein L4



- Molecule 7: 60S ribosomal protein L5



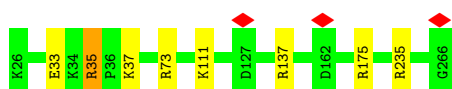
- Molecule 8: 60S ribosomal protein L6



- Molecule 9: 60S ribosomal protein L7



- Molecule 10: 60S ribosomal protein L7a

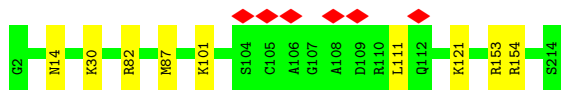


- Molecule 11: 60S ribosomal protein L9



- Molecule 12: 60S ribosomal protein L10-like





- Molecule 13: 60S ribosomal protein L11

Chain LJ: 94% 6%



- Molecule 14: 60S ribosomal protein L13

Chain LL: 97%



- Molecule 15: 60S ribosomal protein L14

Chain LM: 97%



- Molecule 16: 60S ribosomal protein L15

Chain LN: 97%



- Molecule 17: 60S ribosomal protein L13a

Chain LO: 98%



- Molecule 18: 60S ribosomal protein L17

Chain LP: 98%



- Molecule 19: 60S ribosomal protein L18

Chain LQ: 98%



- Molecule 20: 60S ribosomal protein L19

Chain LR: 96% ..



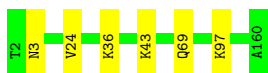
- Molecule 21: 60S ribosomal protein L18a

Chain LS: 97% .



- Molecule 22: 60S ribosomal protein L21

Chain LT: 96% .



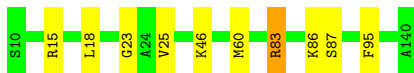
- Molecule 23: 60S ribosomal protein L22

Chain LU: 96% ..



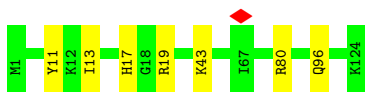
- Molecule 24: 60S ribosomal protein L23

Chain LV: 92% 7% .



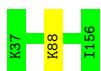
- Molecule 25: 60S ribosomal protein L24

Chain LW: 94% 6% .



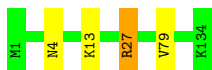
- Molecule 26: 60S ribosomal protein L23a

Chain LX: 99% .



- Molecule 27: 60S ribosomal protein L26

Chain LY: 97% ..



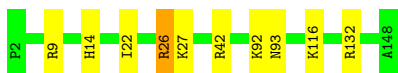
- Molecule 28: 60S ribosomal protein L27

Chain LZ: 99% .



- Molecule 29: 60S ribosomal protein L27a

Chain La: 93% 6% .



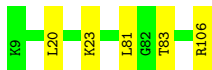
- Molecule 30: 60S ribosomal protein L29

Chain Lb: 97% .



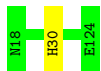
- Molecule 31: 60S ribosomal protein L30

Chain Lc: 95% 5% .



- Molecule 32: 60S ribosomal protein L31

Chain Ld: 99% .



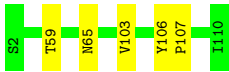
- Molecule 33: 60S ribosomal protein L32

Chain Le: 95% ..



- Molecule 34: 60S ribosomal protein L35a

Chain Lf: 95% 5%



- Molecule 35: 60S ribosomal protein L34

Chain Lg: 97%



- Molecule 36: 60S ribosomal protein L35

Chain Lh: 98%



- Molecule 37: 60S ribosomal protein L36

Chain Li: 98%



- Molecule 38: 60S ribosomal protein L37

Chain Lj: 99%



- Molecule 39: 60S ribosomal protein L38

Chain Lk: 99%



- Molecule 40: 60S ribosomal protein L39

Chain Ll: 88% 12%



- Molecule 41: Ubiquitin-60S ribosomal protein L40

Chain Lm: 98%



- Molecule 42: 60S ribosomal protein L41

Chain Ln: 100%

There are no outlier residues recorded for this chain.

- Molecule 43: 60S ribosomal protein L36a

Chain Lo: 95%



- Molecule 44: 60S ribosomal protein L37a

Chain Lp: 96%



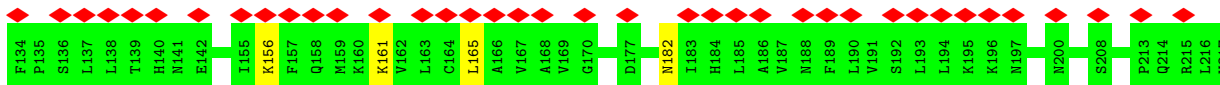
- Molecule 45: 60S ribosomal protein L28

Chain Lr: 94%



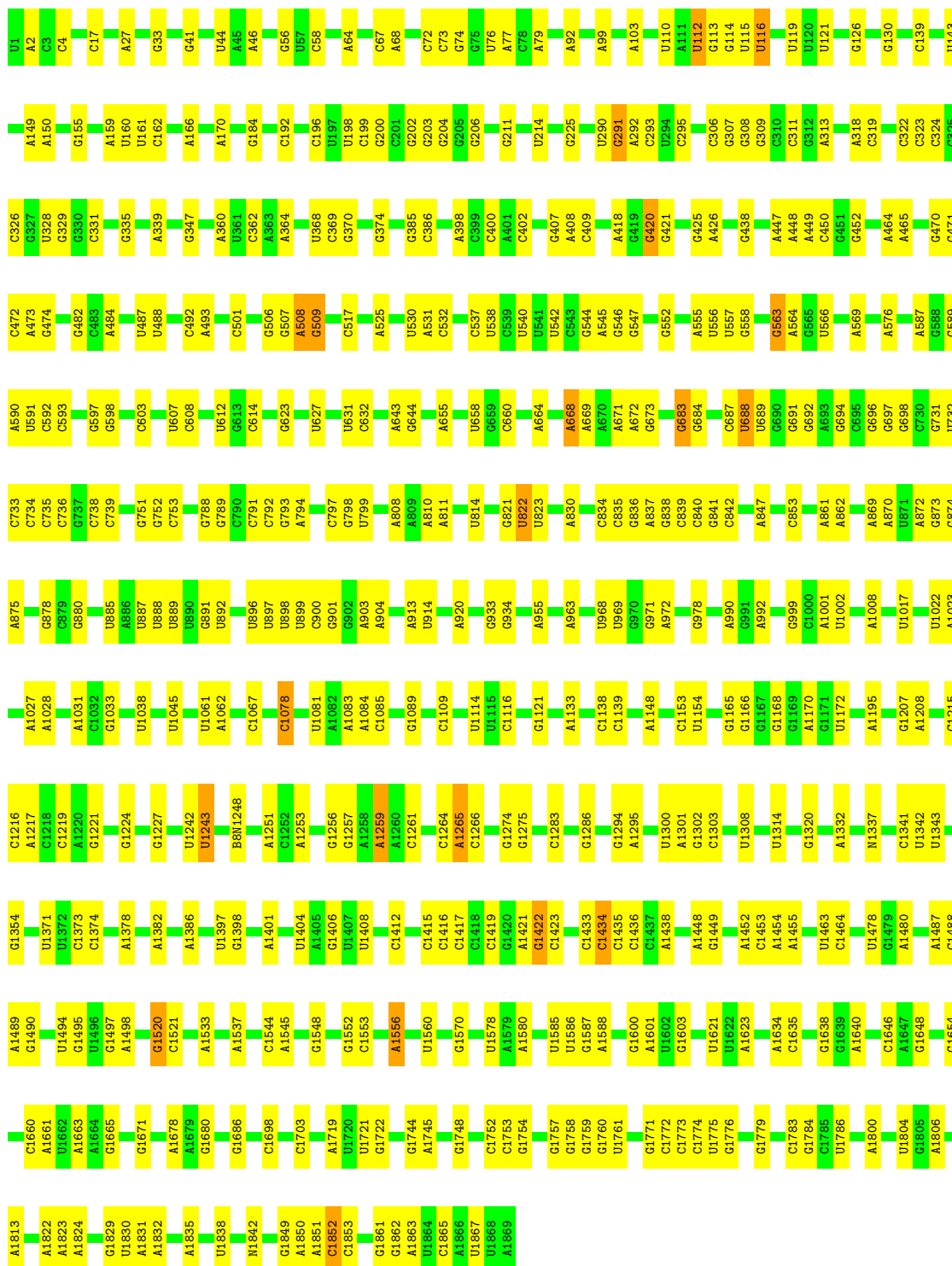
- Molecule 46: 60S ribosomal protein L10a

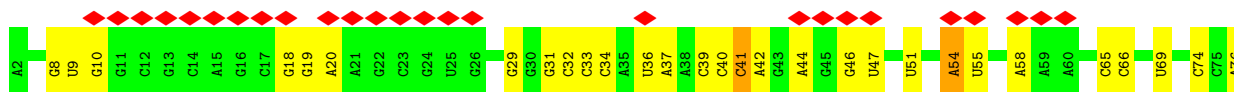
Chain Lz: 35% 95% 5%



- Molecule 47: 18S rRNA (1740-MER)

Chain S2:  73% 26%





- Molecule 49: 40S ribosomal protein SA

Chain SA: 90% 9%



- Molecule 50: 40S ribosomal protein S3a

Chain SB: 100%



- Molecule 51: 40S ribosomal protein S3

Chain SD: 93% 5%



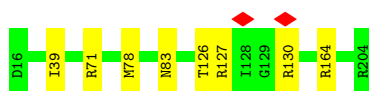
- Molecule 52: 40S ribosomal protein S4, X isoform

Chain SE: 99%



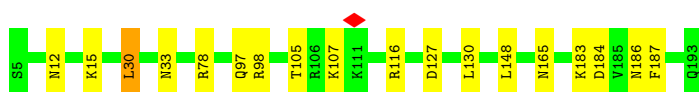
- Molecule 53: 40S ribosomal protein S5

Chain SF: 96%



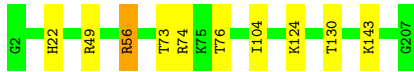
- Molecule 54: 40S ribosomal protein S7

Chain SH: 90% 9%



- Molecule 55: 40S ribosomal protein S8

Chain SI: 95%



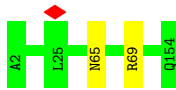
- Molecule 56: 40S ribosomal protein S10

Chain SK: 97%



- Molecule 57: 40S ribosomal protein S11

Chain SL: 99%



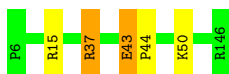
- Molecule 58: 40S ribosomal protein S15

Chain SP: 96%



- Molecule 59: 40S ribosomal protein S16

Chain SQ: 96%



- Molecule 60: 40S ribosomal protein S17

Chain SR: 99%



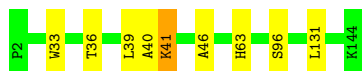
- Molecule 61: 40S ribosomal protein S18

Chain SS: 94% 6%



- Molecule 62: 40S ribosomal protein S19

Chain ST: 94% 6%



- Molecule 63: 40S ribosomal protein S20



- Molecule 64: 40S ribosomal protein S21



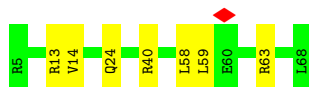
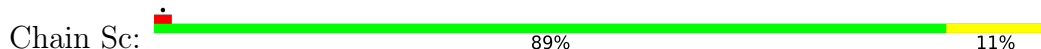
- Molecule 65: 40S ribosomal protein S23



- Molecule 66: 40S ribosomal protein S26



- Molecule 67: 40S ribosomal protein S28



- Molecule 68: 40S ribosomal protein S29



- Molecule 69: Receptor of activated protein C kinase 1





- Molecule 70: 40S ribosomal protein S2

Chain SC: 98%



- Molecule 71: 40S ribosomal protein S6

Chain SG: 94%



- Molecule 72: 40S ribosomal protein S9

Chain SJ: 95%



- Molecule 73: 40S ribosomal protein S12

Chain SM: 96%



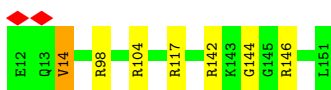
- Molecule 74: 40S ribosomal protein S13

Chain SN: 97%



- Molecule 75: 40S ribosomal protein S14

Chain SO: 95%



- Molecule 76: 40S ribosomal protein S15a

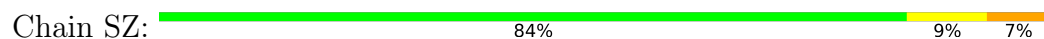
Chain SW: 98%



- Molecule 77: 40S ribosomal protein S24



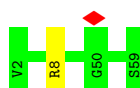
- Molecule 78: 40S ribosomal protein S25



- Molecule 79: 40S ribosomal protein S27



- Molecule 80: 40S ribosomal protein S30



- Molecule 81: Ubiquitin-40S ribosomal protein S27a



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	138234	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	3.5	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.544	Depositor
Minimum map value	-0.311	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.010	Depositor
Recommended contour level	0.007	Depositor
Map size (\AA)	544.0, 544.0, 544.0	wwPDB
Map dimensions	640, 640, 640	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.85, 0.85, 0.85	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: OMG, HMT, MLZ, B8H, MG, UR3, 6MZ, 2MG, OMU, HYG, 5MU, M7A, OMC, 1MA, JMH, B8T, 4AC, PSU, B8N, ZN, A2M, 5MC, MA6

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	L5	0.42	1/87760 (0.0%)	0.91	111/136810 (0.1%)
2	L7	0.36	0/2858	0.85	0/4455
3	L8	0.41	0/3679	0.92	5/5732 (0.1%)
4	LA	0.36	0/1936	0.61	0/2596
5	LB	0.34	0/3306	0.65	4/4424 (0.1%)
6	LC	0.32	0/2971	0.57	0/3988
7	LD	0.30	0/2428	0.55	0/3252
8	LE	0.30	0/1942	0.62	0/2606
9	LF	0.33	0/1916	0.59	0/2553
10	LG	0.32	0/1971	0.60	0/2651
11	LH	0.32	0/1537	0.57	1/2066 (0.0%)
12	LI	0.29	0/1751	0.54	1/2340 (0.0%)
13	LJ	0.29	0/1433	0.66	2/1915 (0.1%)
14	LL	0.31	0/1732	0.57	0/2315
15	LM	0.32	0/1161	0.54	0/1554
16	LN	0.32	0/1746	0.56	0/2338
17	LO	0.35	0/1682	0.53	0/2250
18	LP	0.34	0/1268	0.53	0/1701
19	LQ	0.31	0/1537	0.57	0/2052
20	LR	0.29	0/1582	0.54	0/2091
21	LS	0.31	0/1493	0.49	0/2003
22	LT	0.33	0/1326	0.55	0/1770
23	LU	0.30	0/839	0.62	0/1126
24	LV	0.33	0/993	0.61	0/1332
25	LW	0.30	0/1030	0.56	1/1364 (0.1%)
26	LX	0.29	0/1002	0.54	0/1345
27	LY	0.29	0/1132	0.55	0/1504
28	LZ	0.29	0/1130	0.55	0/1507
29	La	0.32	0/1191	0.53	0/1591
30	Lb	0.26	0/895	0.53	0/1182
31	Lc	0.31	0/774	0.55	0/1038

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	Ld	0.28	0/903	0.55	0/1216
33	Le	0.34	0/1071	0.58	0/1429
34	Lf	0.32	0/895	0.58	0/1198
35	Lg	0.29	0/916	0.53	0/1220
36	Lh	0.25	0/1023	0.49	0/1351
37	Li	0.26	0/843	0.49	0/1115
38	Lj	0.31	0/731	0.57	0/966
39	Lk	0.28	0/575	0.54	0/761
40	Ll	0.32	0/454	0.58	0/599
41	Lm	0.31	0/425	0.53	0/561
42	Ln	0.37	0/231	0.52	0/294
43	Lo	0.33	0/887	0.57	0/1170
44	Lp	0.32	0/718	0.56	0/953
45	Lr	0.30	0/1017	0.53	0/1364
46	Lz	0.28	0/1769	0.60	0/2371
47	S2	0.41	0/40466	0.90	57/63037 (0.1%)
48	S6	0.23	0/1795	0.88	3/2798 (0.1%)
49	SA	0.31	0/1778	0.58	0/2416
50	SB	0.29	0/1765	0.53	0/2362
51	SD	0.32	0/1793	0.60	0/2414
52	SE	0.30	0/2118	0.57	1/2849 (0.0%)
53	SF	0.30	0/1516	0.56	0/2037
54	SH	0.30	0/1519	0.64	2/2033 (0.1%)
55	SI	0.32	0/1715	0.59	0/2287
56	SK	0.30	0/851	0.60	1/1147 (0.1%)
57	SL	0.33	0/1268	0.59	0/1696
58	SP	0.30	0/1065	0.62	1/1423 (0.1%)
59	SQ	0.32	0/1142	0.60	0/1528
60	SR	0.28	0/1105	0.57	0/1484
61	SS	0.29	0/1216	0.54	0/1628
62	ST	0.30	0/1131	0.53	0/1515
63	SU	0.28	0/827	0.55	0/1110
64	SV	0.30	0/643	0.56	0/860
65	SX	0.31	0/1116	0.62	0/1490
66	Sa	0.34	0/847	0.57	0/1135
67	Sc	0.34	0/508	0.68	0/680
68	Sd	0.35	0/470	0.62	0/623
69	Sg	0.28	0/2493	0.64	1/3394 (0.0%)
70	SC	0.39	2/1773 (0.1%)	0.66	0/2395
71	SG	0.28	0/1946	0.59	1/2590 (0.0%)
72	SJ	0.30	0/1561	0.62	0/2083
73	SM	0.27	0/950	0.56	0/1275
74	SN	0.27	0/1232	0.54	0/1656

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
75	SO	0.30	0/1062	0.60	1/1425 (0.1%)
76	SW	0.32	0/1051	0.59	0/1406
77	SY	0.30	0/1094	0.56	0/1452
78	SZ	0.31	0/604	0.68	0/810
79	Sb	0.29	0/665	0.56	0/891
80	Se	0.28	0/465	0.53	0/612
81	Sf	0.29	0/560	0.67	0/745
All	All	0.37	3/232569 (0.0%)	0.80	193/341305 (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
4	LA	0	1
5	LB	0	4
6	LC	0	2
8	LE	0	1
9	LF	0	1
10	LG	0	2
12	LI	0	3
13	LJ	0	3
14	LL	0	2
15	LM	0	1
16	LN	0	2
19	LQ	0	2
20	LR	0	1
23	LU	0	1
24	LV	0	1
25	LW	0	1
27	LY	0	1
29	La	0	3
32	Ld	0	1
33	Le	0	1
34	Lf	0	2
36	Lh	0	2
38	Lj	0	1
39	Lk	0	1
40	Ll	0	1
41	Lm	0	1
43	Lo	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
44	Lp	0	1
45	Lr	0	5
46	Lz	0	2
49	SA	0	4
51	SD	0	6
53	SF	0	5
54	SH	0	1
55	SI	0	3
56	SK	0	1
58	SP	0	2
59	SQ	0	2
60	SR	0	2
61	SS	0	1
62	ST	0	1
63	SU	0	1
65	SX	0	5
66	Sa	0	1
69	Sg	0	1
70	SC	0	3
72	SJ	0	3
74	SN	0	1
75	SO	0	1
77	SY	0	1
All	All	0	97

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L5	4042	G	O3'-P	5.17	1.67	1.61
70	SC	200[A]	ARG	C-O	5.05	1.32	1.23
70	SC	200[B]	ARG	C-O	5.05	1.32	1.23

All (193) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	S2	501	C	N1-C2-O2	14.11	127.36	118.90
47	S2	501	C	C2-N1-C1'	13.84	134.03	118.80
1	L5	485	C	N1-C2-O2	12.80	126.58	118.90
1	L5	485	C	C2-N1-C1'	11.73	131.71	118.80
1	L5	2710	C	N1-C2-O2	10.91	125.45	118.90
47	S2	501	C	N3-C2-O2	-10.84	114.31	121.90
1	L5	485	C	N3-C2-O2	-10.65	114.44	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	2710	C	C2-N1-C1'	10.48	130.32	118.80
47	S2	501	C	C6-N1-C1'	-9.87	108.95	120.80
47	S2	1453	C	C2-N1-C1'	9.46	129.21	118.80
47	S2	1139	C	C2-N1-C1'	9.41	129.16	118.80
47	S2	1139	C	N1-C2-O2	9.22	124.43	118.90
1	L5	2710	C	N3-C2-O2	-8.95	115.63	121.90
1	L5	1241	C	N1-C2-O2	8.93	124.26	118.90
47	S2	1520	G	C4-N9-C1'	8.71	137.83	126.50
1	L5	485	C	C6-N1-C2	-8.63	116.85	120.30
47	S2	1453	C	N1-C2-O2	8.54	124.02	118.90
47	S2	501	C	C6-N1-C2	-8.26	117.00	120.30
47	S2	1139	C	N3-C2-O2	-8.24	116.13	121.90
1	L5	1241	C	C2-N1-C1'	8.13	127.75	118.80
47	S2	1520	G	C8-N9-C1'	-7.97	116.64	127.00
1	L5	1821	G	N3-C4-C5	-7.95	124.62	128.60
1	L5	485	C	C6-N1-C1'	-7.85	111.38	120.80
1	L5	1821	G	C4-N9-C1'	7.69	136.49	126.50
1	L5	1821	G	N3-C4-N9	7.67	130.60	126.00
1	L5	209	U	C2-N1-C1'	7.59	126.81	117.70
1	L5	1083	U	O5'-P-OP1	-7.58	98.87	105.70
47	S2	501	C	C5-C6-N1	7.42	124.71	121.00
1	L5	2710	C	C6-N1-C2	-7.35	117.36	120.30
1	L5	1704	C	C6-N1-C2	-7.28	117.39	120.30
1	L5	1214	C	C2-N1-C1'	7.19	126.71	118.80
5	LB	17	LEU	CA-CB-CG	7.19	131.84	115.30
1	L5	1703	C	N1-C2-O2	7.17	123.20	118.90
1	L5	2710	C	C6-N1-C1'	-7.07	112.31	120.80
1	L5	1214	C	N1-C2-O2	7.03	123.12	118.90
1	L5	504	G	C2'-C3'-O3'	6.97	124.86	113.70
47	S2	1453	C	C6-N1-C1'	-6.96	112.45	120.80
3	L8	101	C	N1-C2-O2	6.93	123.06	118.90
1	L5	209	U	N1-C2-O2	6.88	127.61	122.80
1	L5	1241	C	N3-C2-O2	-6.86	117.10	121.90
54	SH	30	LEU	CA-CB-CG	6.84	131.04	115.30
1	L5	2760	G	P-O3'-C3'	6.84	127.91	119.70
1	L5	233	U	N3-C2-O2	-6.71	117.50	122.20
1	L5	233	U	N1-C2-O2	6.66	127.46	122.80
1	L5	914	U	C2'-C3'-O3'	6.55	124.19	113.70
12	LI	111	LEU	CA-CB-CG	6.55	130.36	115.30
47	S2	1314	U	C2-N1-C1'	6.52	125.53	117.70
47	S2	1265	A	C2-N3-C4	6.45	113.83	110.60
47	S2	688	U	P-O3'-C3'	6.45	127.44	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	1703	C	N3-C2-O2	-6.44	117.39	121.90
1	L5	4709	U	C2-N1-C1'	6.44	125.42	117.70
47	S2	1139	C	C6-N1-C1'	-6.44	113.08	120.80
1	L5	2410	C	N1-C2-O2	6.43	122.76	118.90
1	L5	4709	U	N1-C2-O2	6.40	127.28	122.80
1	L5	4741	C	C2-N1-C1'	6.40	125.84	118.80
1	L5	2675	G	P-O3'-C3'	6.37	127.34	119.70
1	L5	3884	U	C3'-C2'-O2'	6.37	131.77	113.30
5	LB	214	ASP	CB-CG-OD1	6.37	124.03	118.30
47	S2	1139	C	C6-N1-C2	-6.36	117.76	120.30
1	L5	485	C	C5-C6-N1	6.36	124.18	121.00
48	S6	54	A	P-O3'-C3'	6.36	127.33	119.70
1	L5	1821	G	C8-N9-C1'	-6.32	118.79	127.00
1	L5	2416	G	C2'-C3'-O3'	6.28	123.75	113.70
1	L5	4601	U	C5-C6-N1	6.26	125.83	122.70
47	S2	593	C	N1-C2-O2	6.22	122.63	118.90
1	L5	4913	G	P-O3'-C3'	6.18	127.12	119.70
47	S2	1520	G	N3-C4-N9	6.16	129.69	126.00
1	L5	3772	U	C2-N1-C1'	6.14	125.07	117.70
1	L5	209	U	N3-C2-O2	-6.12	117.91	122.20
48	S6	41	C	N1-C2-O2	6.11	122.57	118.90
1	L5	1893	C	N1-C2-O2	6.11	122.57	118.90
47	S2	1660	C	C2-N1-C1'	6.11	125.52	118.80
1	L5	1607	C	N1-C2-O2	6.04	122.53	118.90
1	L5	2014	C	N1-C2-O2	6.04	122.52	118.90
71	SG	68	LEU	CA-CB-CG	6.04	129.18	115.30
1	L5	1082	C	OP1-P-O3'	6.02	118.44	105.20
47	S2	1022	U	C2-N1-C1'	6.00	124.91	117.70
1	L5	1974	U	C5'-C4'-O4'	5.99	116.29	109.10
1	L5	1082	C	P-O3'-C3'	5.99	126.89	119.70
47	S2	1453	C	N3-C2-O2	-5.97	117.72	121.90
1	L5	1821	G	C2-N3-C4	5.97	114.89	111.90
1	L5	2501	C	N1-C2-O2	5.97	122.48	118.90
47	S2	130	G	C4-N9-C1'	5.95	134.24	126.50
1	L5	1241	C	C6-N1-C1'	-5.95	113.66	120.80
3	L8	101	C	N3-C2-O2	-5.94	117.74	121.90
1	L5	1214	C	C6-N1-C2	-5.92	117.93	120.30
1	L5	3673	C	P-O3'-C3'	5.90	126.78	119.70
1	L5	4758	U	N1-C2-O2	5.90	126.93	122.80
1	L5	112	C	N1-C2-O2	5.89	122.43	118.90
69	Sg	144	ASP	CB-CG-OD1	5.88	123.60	118.30
1	L5	511	C	N1-C2-O2	5.87	122.42	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	S2	1434	C	P-O3'-C3'	5.86	126.73	119.70
1	L5	963	G	C4-N9-C1'	5.84	134.09	126.50
47	S2	291	G	P-O3'-C3'	5.81	126.67	119.70
1	L5	1632	A	C2-N3-C4	5.79	113.50	110.60
1	L5	4758	U	C2-N1-C1'	5.79	124.65	117.70
52	SE	139	LEU	CA-CB-CG	5.79	128.63	115.30
47	S2	1422	G	C4-N9-C1'	5.76	133.99	126.50
1	L5	1853	G	C4-N9-C1'	5.74	133.96	126.50
1	L5	511	C	N3-C2-O2	-5.71	117.90	121.90
1	L5	4880	C	N1-C2-O2	5.67	122.31	118.90
47	S2	1022	U	N1-C2-O2	5.66	126.76	122.80
1	L5	3926	C	N1-C2-O2	5.66	122.30	118.90
47	S2	112	U	P-O3'-C3'	5.66	126.49	119.70
47	S2	1314	U	N1-C2-O2	5.65	126.75	122.80
47	S2	420	G	P-O3'-C3'	5.64	126.47	119.70
1	L5	2710	C	C5-C6-N1	5.62	123.81	121.00
1	L5	449	C	N1-C2-O2	5.61	122.27	118.90
1	L5	1404	G	C4-N9-C1'	5.59	133.77	126.50
47	S2	563	G	P-O3'-C3'	5.56	126.37	119.70
47	S2	1422	G	N3-C4-N9	5.54	129.33	126.00
1	L5	2351	C	N1-C2-O2	5.54	122.22	118.90
1	L5	511	C	C6-N1-C2	-5.53	118.09	120.30
1	L5	4601	U	C2-N1-C1'	5.53	124.33	117.70
3	L8	83	C	P-O3'-C3'	5.51	126.32	119.70
47	S2	1422	G	N3-C4-C5	-5.50	125.85	128.60
47	S2	1556	A	C2-N3-C4	5.49	113.34	110.60
47	S2	1578	U	N1-C2-O2	5.48	126.63	122.80
1	L5	4900	C	N1-C2-O2	5.47	122.18	118.90
75	SO	14	VAL	C-N-CA	5.47	135.38	121.70
1	L5	1214	C	N3-C2-O2	-5.47	118.07	121.90
5	LB	360	LEU	CA-CB-CG	5.47	127.87	115.30
47	S2	130	G	N3-C4-N9	5.46	129.28	126.00
1	L5	4709	U	N3-C2-O2	-5.45	118.39	122.20
25	LW	13	ILE	C-N-CA	5.45	135.33	121.70
1	L5	1214	C	C5-C6-N1	5.44	123.72	121.00
1	L5	963	G	N3-C4-C5	-5.44	125.88	128.60
1	L5	4758	U	N3-C2-O2	-5.42	118.41	122.20
47	S2	1852	C	N1-C2-O2	5.41	122.15	118.90
47	S2	593	C	N3-C2-O2	-5.41	118.11	121.90
47	S2	1022	U	N3-C2-O2	-5.41	118.42	122.20
1	L5	1809	C	N1-C2-O2	5.39	122.13	118.90
47	S2	1453	C	C5-C6-N1	5.39	123.69	121.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	L8	101	C	C2-N1-C1'	5.38	124.72	118.80
1	L5	406	C	P-O3'-C3'	5.38	126.15	119.70
47	S2	1314	U	N3-C2-O2	-5.36	118.45	122.20
47	S2	1578	U	N3-C2-O2	-5.34	118.46	122.20
1	L5	4329	G	C4-N9-C1'	5.33	133.43	126.50
1	L5	2505	C	N1-C2-O2	5.31	122.09	118.90
1	L5	274	C	N1-C2-O2	5.31	122.09	118.90
1	L5	2729	C	N1-C2-O2	5.30	122.08	118.90
13	LJ	171	ASP	CB-CG-OD1	5.30	123.07	118.30
1	L5	1439	C	N1-C2-O2	5.27	122.06	118.90
13	LJ	174	ILE	CG1-CB-CG2	-5.27	99.81	111.40
47	S2	1259	A	C2-N3-C4	5.26	113.23	110.60
47	S2	130	G	N3-C4-C5	-5.25	125.97	128.60
1	L5	4918	C	N1-C2-O2	5.25	122.05	118.90
48	S6	41	C	N3-C2-O2	-5.24	118.23	121.90
1	L5	4667	C	C6-N1-C2	-5.24	118.20	120.30
1	L5	4206	C	N1-C2-O2	5.23	122.04	118.90
1	L5	4887	C	N1-C2-O2	5.22	122.03	118.90
47	S2	1078	C	N1-C2-O2	5.22	122.03	118.90
1	L5	209	U	C6-N1-C1'	-5.21	113.90	121.20
3	L8	111	U	C2-N1-C1'	5.21	123.96	117.70
1	L5	1762	C	N1-C2-O2	5.21	122.03	118.90
1	L5	4895	C	N1-C2-O2	5.21	122.03	118.90
1	L5	4709	U	C5-C6-N1	5.20	125.30	122.70
47	S2	1853	C	N3-C4-N4	-5.20	114.36	118.00
1	L5	4621	C	C6-N1-C2	-5.16	118.23	120.30
47	S2	508	A	C1'-C2'-O2'	5.16	126.07	110.60
1	L5	992	C	N1-C2-O2	5.16	121.99	118.90
1	L5	3772	U	N1-C2-O2	5.15	126.41	122.80
5	LB	347	LEU	CA-CB-CG	5.13	127.11	115.30
47	S2	402	C	C5-C6-N1	5.13	123.57	121.00
1	L5	2410	C	C5-C6-N1	5.13	123.57	121.00
47	S2	632	C	C6-N1-C2	-5.12	118.25	120.30
1	L5	1929	A	C4-N9-C1'	5.12	135.52	126.30
1	L5	1243	C	N1-C2-O2	5.12	121.97	118.90
58	SP	80	LEU	CA-CB-CG	5.09	127.01	115.30
1	L5	704	C	N1-C2-O2	5.08	121.95	118.90
1	L5	4699	U	OP1-P-O3'	5.08	116.37	105.20
54	SH	148	LEU	CA-CB-CG	5.08	126.98	115.30
1	L5	3966	A	O4'-C4'-C3'	-5.07	98.93	104.00
1	L5	3920	U	N3-C2-O2	-5.07	118.65	122.20
1	L5	963	G	N3-C4-N9	5.06	129.04	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	2410	C	C2-N1-C1'	5.06	124.37	118.80
1	L5	1853	G	C8-N9-C1'	-5.05	120.43	127.00
1	L5	2410	C	C6-N1-C2	-5.05	118.28	120.30
47	S2	593	C	C2-N1-C1'	5.05	124.36	118.80
47	S2	402	C	C6-N1-C2	-5.04	118.28	120.30
47	S2	1660	C	N1-C2-O2	5.04	121.92	118.90
1	L5	2867	C	N1-C2-O2	5.04	121.92	118.90
1	L5	4682	U	N1-C2-O2	5.04	126.33	122.80
1	L5	2014	C	C2-N1-C1'	5.03	124.34	118.80
47	S2	130	G	C8-N9-C1'	-5.03	120.46	127.00
56	SK	15	LEU	CA-CB-CG	5.03	126.88	115.30
1	L5	3605	C	C6-N1-C2	-5.02	118.29	120.30
47	S2	1261	C	C6-N1-C2	-5.02	118.29	120.30
1	L5	340	C	N1-C2-O2	5.01	121.91	118.90
1	L5	112	C	N3-C2-O2	-5.01	118.39	121.90
1	L5	4945	G	N3-C4-N9	5.01	129.00	126.00
47	S2	1265	A	N3-C4-N9	5.00	131.40	127.40
11	LH	146	LEU	CA-CB-CG	5.00	126.80	115.30

There are no chirality outliers.

All (97) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	LA	30	ARG	Sidechain
5	LB	17	LEU	Peptide
5	LB	174	ARG	Sidechain
5	LB	19	ARG	Sidechain
5	LB	258	HIS	Peptide
6	LC	188	ARG	Sidechain
6	LC	2	ALA	Peptide
8	LE	138	ARG	Sidechain
9	LF	73	ARG	Sidechain
10	LG	35	ARG	Sidechain
10	LG	73	ARG	Sidechain
12	LI	14	ASN	Peptide
12	LI	153	ARG	Sidechain
12	LI	154	ARG	Sidechain
13	LJ	147	ARG	Sidechain
13	LJ	175	LEU	Peptide
13	LJ	35	ARG	Sidechain
14	LL	190	ARG	Sidechain
14	LL	74	ARG	Sidechain

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Mol	Chain	Res	Type	Group
15	LM	109	ARG	Sidechain
16	LN	124	ASP	Peptide
16	LN	41	ARG	Sidechain
19	LQ	143	ARG	Sidechain
19	LQ	15	ARG	Sidechain
20	LR	172	ARG	Sidechain
23	LU	101	ARG	Sidechain
24	LV	83	ARG	Sidechain
25	LW	80	ARG	Sidechain
27	LY	27	ARG	Sidechain
29	La	22	ILE	Peptide
29	La	26	ARG	Sidechain
29	La	9	ARG	Sidechain
32	Ld	30	HIS	Peptide
33	Le	48	ARG	Sidechain
34	Lf	103	VAL	Peptide
34	Lf	106	TYR	Peptide
36	Lh	7	ARG	Sidechain
36	Lh	86	LYS	Peptide
38	Lj	39	TYR	Peptide
39	Lk	17	ARG	Sidechain
40	Ll	21	ARG	Sidechain
41	Lm	111	ARG	Sidechain
43	Lo	57	ARG	Sidechain
43	Lo	81	ARG	Sidechain
44	Lp	85	ARG	Sidechain
45	Lr	103	ARG	Sidechain
45	Lr	66	ARG	Sidechain
45	Lr	67	ARG	Sidechain
45	Lr	79	ARG	Sidechain
45	Lr	87	ARG	Sidechain
46	Lz	17	VAL	Peptide
46	Lz	54	ARG	Sidechain
49	SA	120	ARG	Sidechain
49	SA	186	ARG	Sidechain
49	SA	53	ARG	Sidechain
49	SA	80	ARG	Sidechain
70	SC	200[A]	ARG	Sidechain
70	SC	200[B]	ARG	Sidechain
70	SC	76	LYS	Peptide
51	SD	142	LEU	Peptide
51	SD	143	ARG	Sidechain

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Mol	Chain	Res	Type	Group
51	SD	27	ARG	Sidechain
51	SD	40	ARG	Sidechain
51	SD	54	ARG	Sidechain
51	SD	65	ARG	Sidechain
53	SF	126	THR	Peptide
53	SF	127	ARG	Peptide
53	SF	39	ILE	Peptide
53	SF	71	ARG	Sidechain
53	SF	78	MET	Peptide
54	SH	15	LYS	Peptide
55	SI	130	THR	Peptide
55	SI	49	ARG	Sidechain
55	SI	56	ARG	Sidechain
72	SJ	2	PRO	Peptide
72	SJ	65	GLU	Peptide
72	SJ	70	ARG	Sidechain
56	SK	65	ARG	Sidechain
74	SN	99	ARG	Sidechain
75	SO	104	ARG	Sidechain
58	SP	127	LYS	Peptide
58	SP	18	ARG	Sidechain
59	SQ	37	ARG	Sidechain
59	SQ	43	GLU	Peptide
60	SR	47	ARG	Sidechain
60	SR	67	ARG	Sidechain
61	SS	55	ARG	Sidechain
62	ST	46	ALA	Peptide
63	SU	66	ARG	Sidechain
65	SX	119	ARG	Sidechain
65	SX	125	VAL	Peptide
65	SX	126	ALA	Peptide
65	SX	5	ARG	Sidechain
65	SX	86	PRO	Peptide
77	SY	94	HIS	Peptide
66	Sa	6	ARG	Sidechain
69	Sg	60	ARG	Sidechain

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	LA	246/248 (99%)	223 (91%)	22 (9%)	1 (0%)	34	66
5	LB	400/402 (100%)	373 (93%)	26 (6%)	1 (0%)	41	71
6	LC	365/368 (99%)	337 (92%)	25 (7%)	3 (1%)	19	51
7	LD	291/293 (99%)	268 (92%)	23 (8%)	0	100	100
8	LE	232/236 (98%)	205 (88%)	26 (11%)	1 (0%)	34	66
9	LF	224/225 (100%)	215 (96%)	8 (4%)	1 (0%)	34	66
10	LG	240/241 (100%)	218 (91%)	22 (9%)	0	100	100
11	LH	188/190 (99%)	173 (92%)	15 (8%)	0	100	100
12	LI	211/213 (99%)	183 (87%)	28 (13%)	0	100	100
13	LJ	174/176 (99%)	154 (88%)	20 (12%)	0	100	100
14	LL	208/210 (99%)	187 (90%)	21 (10%)	0	100	100
15	LM	137/139 (99%)	125 (91%)	11 (8%)	1 (1%)	22	54
16	LN	201/203 (99%)	187 (93%)	12 (6%)	2 (1%)	15	45
17	LO	199/201 (99%)	191 (96%)	8 (4%)	0	100	100
18	LP	151/153 (99%)	139 (92%)	12 (8%)	0	100	100
19	LQ	185/187 (99%)	177 (96%)	8 (4%)	0	100	100
20	LR	185/187 (99%)	180 (97%)	5 (3%)	0	100	100
21	LS	173/175 (99%)	162 (94%)	11 (6%)	0	100	100
22	LT	157/159 (99%)	149 (95%)	8 (5%)	0	100	100
23	LU	99/101 (98%)	85 (86%)	14 (14%)	0	100	100
24	LV	129/131 (98%)	117 (91%)	10 (8%)	2 (2%)	9	32
25	LW	122/124 (98%)	104 (85%)	17 (14%)	1 (1%)	19	51
26	LX	118/120 (98%)	109 (92%)	9 (8%)	0	100	100
27	LY	132/134 (98%)	129 (98%)	3 (2%)	0	100	100
28	LZ	133/135 (98%)	118 (89%)	15 (11%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
29	La	145/147 (99%)	133 (92%)	12 (8%)	0	100	100
30	Lb	105/109 (96%)	91 (87%)	14 (13%)	0	100	100
31	Lc	96/98 (98%)	93 (97%)	3 (3%)	0	100	100
32	Ld	105/107 (98%)	98 (93%)	7 (7%)	0	100	100
33	Le	126/128 (98%)	116 (92%)	8 (6%)	2 (2%)	9	32
34	Lf	107/109 (98%)	99 (92%)	7 (6%)	1 (1%)	17	48
35	Lg	112/114 (98%)	110 (98%)	2 (2%)	0	100	100
36	Lh	120/122 (98%)	119 (99%)	1 (1%)	0	100	100
37	Li	100/102 (98%)	96 (96%)	4 (4%)	0	100	100
38	Lj	85/86 (99%)	78 (92%)	7 (8%)	0	100	100
39	Lk	67/69 (97%)	64 (96%)	3 (4%)	0	100	100
40	Ll	48/50 (96%)	42 (88%)	6 (12%)	0	100	100
41	Lm	49/52 (94%)	48 (98%)	1 (2%)	0	100	100
42	Ln	22/24 (92%)	22 (100%)	0	0	100	100
43	Lo	104/105 (99%)	100 (96%)	3 (3%)	1 (1%)	15	45
44	Lp	89/91 (98%)	85 (96%)	4 (4%)	0	100	100
45	Lr	123/125 (98%)	113 (92%)	10 (8%)	0	100	100
46	Lz	215/217 (99%)	156 (73%)	59 (27%)	0	100	100
49	SA	219/221 (99%)	194 (89%)	21 (10%)	4 (2%)	8	29
50	SB	212/214 (99%)	201 (95%)	11 (5%)	0	100	100
51	SD	225/227 (99%)	201 (89%)	24 (11%)	0	100	100
52	SE	260/262 (99%)	243 (94%)	17 (6%)	0	100	100
53	SF	187/189 (99%)	165 (88%)	22 (12%)	0	100	100
54	SH	182/186 (98%)	158 (87%)	24 (13%)	0	100	100
55	SI	204/206 (99%)	185 (91%)	19 (9%)	0	100	100
56	SK	96/98 (98%)	85 (88%)	11 (12%)	0	100	100
57	SL	151/153 (99%)	135 (89%)	16 (11%)	0	100	100
58	SP	125/127 (98%)	116 (93%)	8 (6%)	1 (1%)	19	51
59	SQ	139/141 (99%)	125 (90%)	12 (9%)	2 (1%)	11	36
60	SR	133/135 (98%)	121 (91%)	12 (9%)	0	100	100
61	SS	143/145 (99%)	128 (90%)	14 (10%)	1 (1%)	22	54

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
62	ST	141/143 (99%)	128 (91%)	11 (8%)	2 (1%)	11	36
63	SU	101/103 (98%)	90 (89%)	11 (11%)	0	100	100
64	SV	81/83 (98%)	74 (91%)	5 (6%)	2 (2%)	5	21
65	SX	139/141 (99%)	125 (90%)	12 (9%)	2 (1%)	11	36
66	Sa	101/102 (99%)	91 (90%)	10 (10%)	0	100	100
67	Sc	62/64 (97%)	51 (82%)	11 (18%)	0	100	100
68	Sd	53/55 (96%)	50 (94%)	2 (4%)	1 (2%)	8	28
69	Sg	311/313 (99%)	268 (86%)	40 (13%)	3 (1%)	15	45
70	SC	221/222 (100%)	202 (91%)	17 (8%)	2 (1%)	17	48
71	SG	235/237 (99%)	217 (92%)	16 (7%)	2 (1%)	17	48
72	SJ	184/185 (100%)	167 (91%)	16 (9%)	1 (0%)	29	61
73	SM	120/122 (98%)	109 (91%)	11 (9%)	0	100	100
74	SN	148/150 (99%)	142 (96%)	6 (4%)	0	100	100
75	SO	138/140 (99%)	120 (87%)	17 (12%)	1 (1%)	22	54
76	SW	127/129 (98%)	115 (91%)	12 (9%)	0	100	100
77	SY	130/131 (99%)	123 (95%)	7 (5%)	0	100	100
78	SZ	73/75 (97%)	58 (80%)	7 (10%)	8 (11%)	0	1
79	Sb	81/83 (98%)	72 (89%)	8 (10%)	1 (1%)	13	40
80	Se	56/58 (97%)	50 (89%)	6 (11%)	0	100	100
81	Sf	65/67 (97%)	51 (78%)	14 (22%)	0	100	100
All	All	11561/11713 (99%)	10531 (91%)	980 (8%)	50 (0%)	38	66

All (50) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	LC	3	CYS
16	LN	124	ASP
33	Le	92	ASN
65	SX	127	ASN
70	SC	173	LYS
78	SZ	50	PHE
4	LA	180	LEU
6	LC	222	ARG
9	LF	33	LEU
15	LM	3	PHE

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Mol	Chain	Res	Type
24	LV	23	GLY
49	SA	211	GLU
62	ST	40	ALA
62	ST	41	LYS
64	SV	82	ASN
70	SC	78	LEU
78	SZ	45	ASN
78	SZ	47	LEU
49	SA	141	ASN
59	SQ	44	PRO
65	SX	126	ALA
68	Sd	14	PHE
71	SG	218	LYS
75	SO	144	GLY
33	Le	94	SER
34	Lf	107	PRO
43	Lo	55	ILE
64	SV	80	SER
6	LC	221	PHE
24	LV	18	LEU
25	LW	11	TYR
49	SA	12	GLU
49	SA	23	THR
58	SP	128	HIS
59	SQ	43	GLU
69	Sg	13	GLY
69	Sg	144	ASP
69	Sg	246	TYR
71	SG	174	PRO
78	SZ	76	ARG
78	SZ	77	LEU
78	SZ	80	ARG
8	LE	96	VAL
78	SZ	78	LYS
5	LB	187	GLY
16	LN	84	PRO
78	SZ	81	GLY
61	SS	90	VAL
72	SJ	123	ILE
79	Sb	57	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	LA	190/190 (100%)	175 (92%)	15 (8%)	12	34
5	LB	348/348 (100%)	336 (97%)	12 (3%)	37	71
6	LC	305/305 (100%)	298 (98%)	7 (2%)	50	80
7	LD	246/247 (100%)	233 (95%)	13 (5%)	22	54
8	LE	209/209 (100%)	201 (96%)	8 (4%)	33	67
9	LF	195/194 (100%)	185 (95%)	10 (5%)	24	56
10	LG	204/205 (100%)	196 (96%)	8 (4%)	32	66
11	LH	169/169 (100%)	164 (97%)	5 (3%)	41	75
12	LI	180/180 (100%)	175 (97%)	5 (3%)	43	76
13	LJ	148/148 (100%)	143 (97%)	5 (3%)	37	71
14	LL	176/176 (100%)	170 (97%)	6 (3%)	37	71
15	LM	118/118 (100%)	116 (98%)	2 (2%)	60	86
16	LN	171/171 (100%)	168 (98%)	3 (2%)	59	85
17	LO	173/173 (100%)	168 (97%)	5 (3%)	42	76
18	LP	134/134 (100%)	131 (98%)	3 (2%)	52	81
19	LQ	164/164 (100%)	162 (99%)	2 (1%)	71	91
20	LR	166/166 (100%)	159 (96%)	7 (4%)	30	63
21	LS	156/156 (100%)	151 (97%)	5 (3%)	39	73
22	LT	139/139 (100%)	133 (96%)	6 (4%)	29	62
23	LU	91/91 (100%)	87 (96%)	4 (4%)	28	61
24	LV	101/101 (100%)	93 (92%)	8 (8%)	12	34
25	LW	103/103 (100%)	99 (96%)	4 (4%)	32	66
26	LX	108/108 (100%)	107 (99%)	1 (1%)	78	93
27	LY	124/124 (100%)	120 (97%)	4 (3%)	39	73
28	LZ	117/117 (100%)	116 (99%)	1 (1%)	78	93
29	La	120/120 (100%)	112 (93%)	8 (7%)	16	43

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
30	Lb	89/89 (100%)	86 (97%)	3 (3%)	37	71
31	Lc	83/83 (100%)	78 (94%)	5 (6%)	19	49
32	Ld	98/98 (100%)	98 (100%)	0	100	100
33	Le	114/114 (100%)	110 (96%)	4 (4%)	36	70
34	Lf	88/88 (100%)	86 (98%)	2 (2%)	50	80
35	Lg	98/98 (100%)	95 (97%)	3 (3%)	40	74
36	Lh	109/109 (100%)	107 (98%)	2 (2%)	59	85
37	Li	86/86 (100%)	84 (98%)	2 (2%)	50	80
38	Lj	74/73 (101%)	74 (100%)	0	100	100
39	Lk	64/64 (100%)	64 (100%)	0	100	100
40	Ll	47/47 (100%)	42 (89%)	5 (11%)	6	20
41	Lm	47/47 (100%)	47 (100%)	0	100	100
42	Ln	23/23 (100%)	23 (100%)	0	100	100
43	Lo	94/93 (101%)	90 (96%)	4 (4%)	29	62
44	Lp	74/74 (100%)	70 (95%)	4 (5%)	22	54
45	Lr	109/109 (100%)	103 (94%)	6 (6%)	21	53
46	Lz	195/196 (100%)	186 (95%)	9 (5%)	27	60
49	SA	183/183 (100%)	168 (92%)	15 (8%)	11	32
50	SB	195/195 (100%)	194 (100%)	1 (0%)	88	96
51	SD	190/190 (100%)	178 (94%)	12 (6%)	18	46
52	SE	224/224 (100%)	222 (99%)	2 (1%)	78	93
53	SF	159/159 (100%)	156 (98%)	3 (2%)	57	84
54	SH	166/166 (100%)	150 (90%)	16 (10%)	8	25
55	SI	178/178 (100%)	170 (96%)	8 (4%)	27	61
56	SK	89/89 (100%)	88 (99%)	1 (1%)	73	92
57	SL	137/137 (100%)	135 (98%)	2 (2%)	65	87
58	SP	113/113 (100%)	112 (99%)	1 (1%)	78	93
59	SQ	117/117 (100%)	114 (97%)	3 (3%)	46	77
60	SR	122/122 (100%)	121 (99%)	1 (1%)	81	94
61	SS	126/126 (100%)	118 (94%)	8 (6%)	18	46
62	ST	113/113 (100%)	106 (94%)	7 (6%)	18	47

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
63	SU	94/94 (100%)	92 (98%)	2 (2%)	53	81
64	SV	67/67 (100%)	63 (94%)	4 (6%)	19	49
65	SX	113/113 (100%)	111 (98%)	2 (2%)	59	85
66	Sa	90/89 (101%)	84 (93%)	6 (7%)	16	43
67	Sc	57/57 (100%)	50 (88%)	7 (12%)	4	14
68	Sd	48/48 (100%)	45 (94%)	3 (6%)	18	46
69	Sg	272/272 (100%)	265 (97%)	7 (3%)	46	77
70	SC	189/188 (100%)	188 (100%)	1 (0%)	88	96
71	SG	207/207 (100%)	194 (94%)	13 (6%)	18	46
72	SJ	162/161 (101%)	156 (96%)	6 (4%)	34	68
73	SM	102/104 (98%)	97 (95%)	5 (5%)	25	57
74	SN	130/130 (100%)	125 (96%)	5 (4%)	33	67
75	SO	110/110 (100%)	105 (96%)	5 (4%)	27	61
76	SW	112/112 (100%)	110 (98%)	2 (2%)	59	85
77	SY	114/113 (101%)	110 (96%)	4 (4%)	36	70
78	SZ	66/66 (100%)	57 (86%)	9 (14%)	3	11
79	Sb	75/75 (100%)	71 (95%)	4 (5%)	22	54
80	Se	47/47 (100%)	46 (98%)	1 (2%)	53	81
81	Sf	60/60 (100%)	58 (97%)	2 (3%)	38	72
All	All	10074/10072 (100%)	9700 (96%)	374 (4%)	37	68

All (374) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	LA	6	ARG
4	LA	17	ARG
4	LA	28	ARG
4	LA	29	LEU
4	LA	30	ARG
4	LA	54	ARG
4	LA	64	ARG
4	LA	68	ARG
4	LA	77	ILE
4	LA	125	LYS
4	LA	150	LEU

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Mol	Chain	Res	Type
4	LA	207	VAL
4	LA	237	LEU
4	LA	241	ARG
4	LA	242	ARG
5	LB	34	LYS
5	LB	35	ASP
5	LB	65	SER
5	LB	103	LYS
5	LB	174	ARG
5	LB	189	THR
5	LB	193	LYS
5	LB	245	HIS
5	LB	297	LYS
5	LB	334	LYS
5	LB	341	LYS
5	LB	386	LYS
6	LC	1	MET
6	LC	80	ARG
6	LC	95	MET
6	LC	188	ARG
6	LC	294	LYS
6	LC	312	ARG
6	LC	329	ASN
7	LD	27	LYS
7	LD	28	THR
7	LD	50	ARG
7	LD	85	LYS
7	LD	200	MET
7	LD	212	MET
7	LD	238	GLU
7	LD	248	ARG
7	LD	250	ASN
7	LD	286	SER
7	LD	288	LEU
7	LD	289	ARG
7	LD	293	ARG
8	LE	52	ARG
8	LE	56	ARG
8	LE	96	VAL
8	LE	99	ASP
8	LE	127	SER
8	LE	128	HIS

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Mol	Chain	Res	Type
8	LE	138	ARG
8	LE	183	ARG
9	LF	29	LYS
9	LF	31	LYS
9	LF	32	ARG
9	LF	74	MET
9	LF	96	ARG
9	LF	119	ASN
9	LF	124	LYS
9	LF	169	LEU
9	LF	200	ARG
9	LF	236	ARG
10	LG	33	GLU
10	LG	35	ARG
10	LG	37	LYS
10	LG	111	LYS
10	LG	137[A]	ARG
10	LG	137[B]	ARG
10	LG	175	ARG
10	LG	235	ARG
11	LH	71	ARG
11	LH	116	ASN
11	LH	124	ARG
11	LH	155	SER
11	LH	156	ASN
12	LI	30	LYS
12	LI	82	ARG
12	LI	87	MET
12	LI	101	LYS
12	LI	121	LYS
13	LJ	118	LYS
13	LJ	120	ASP
13	LJ	123	ILE
13	LJ	146	ARG
13	LJ	178	LYS
14	LL	6	ASN
14	LL	63	THR
14	LL	124	LEU
14	LL	146	LEU
14	LL	190	ARG
14	LL	209	LYS
15	LM	4	ARG

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Mol	Chain	Res	Type
15	LM	63	LYS
16	LN	164	LEU
16	LN	169	ARG
16	LN	204	ARG
17	LO	49	ARG
17	LO	82	ARG
17	LO	85	ARG
17	LO	145	VAL
17	LO	201	LEU
18	LP	94	MET
18	LP	96	LYS
18	LP	147	GLU
19	LQ	14	ARG
19	LQ	143	ARG
20	LR	28	GLU
20	LR	78	ILE
20	LR	114	LYS
20	LR	130	ASN
20	LR	139	MET
20	LR	172	ARG
20	LR	186	LYS
21	LS	15	ARG
21	LS	52	LYS
21	LS	83	ARG
21	LS	90	THR
21	LS	95	ARG
22	LT	3	ASN
22	LT	24	VAL
22	LT	36	LYS
22	LT	43	LYS
22	LT	69	GLN
22	LT	97	LYS
23	LU	80	LYS
23	LU	101	ARG
23	LU	105	ASN
23	LU	107	LYS
24	LV	15	ARG
24	LV	25	VAL
24	LV	46	LYS
24	LV	60	MET
24	LV	83	ARG
24	LV	86	LYS

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Mol	Chain	Res	Type
24	LV	87	SER
24	LV	95	PHE
25	LW	17	HIS
25	LW	19	ARG
25	LW	43	LYS
25	LW	96	GLN
26	LX	88	LYS
27	LY	4	ASN
27	LY	13	LYS
27	LY	27	ARG
27	LY	79	VAL
28	LZ	84	ARG
29	La	14	HIS
29	La	26	ARG
29	La	27	LYS
29	La	42	ARG
29	La	92	LYS
29	La	93	ASN
29	La	116	LYS
29	La	132	ARG
30	Lb	12	GLN
30	Lb	60	ASN
30	Lb	68	ARG
31	Lc	20	LEU
31	Lc	23	LYS
31	Lc	81	LEU
31	Lc	83	THR
31	Lc	106	ARG
33	Le	26	ASP
33	Le	43	ASN
33	Le	93	LYS
33	Le	94	SER
34	Lf	59	THR
34	Lf	65	ASN
35	Lg	40	LYS
35	Lg	54	ARG
35	Lg	71	LYS
36	Lh	7	ARG
36	Lh	112	ARG
37	Li	29	ARG
37	Li	56	ARG
40	Ll	5	LYS

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Mol	Chain	Res	Type
40	Ll	9	ILE
40	Ll	36	ARG
40	Ll	42	ARG
40	Ll	51	LEU
43	Lo	2	VAL
43	Lo	53	LYS
43	Lo	55	ILE
43	Lo	81	ARG
44	Lp	25	MET
44	Lp	64	VAL
44	Lp	84	ARG
44	Lp	85	ARG
45	Lr	30	ASN
45	Lr	41	ASN
45	Lr	48	THR
45	Lr	67	ARG
45	Lr	79	ARG
45	Lr	87	ARG
46	Lz	35	GLN
46	Lz	40	ASN
46	Lz	48	ARG
46	Lz	85	MET
46	Lz	96	ASN
46	Lz	156	LYS
46	Lz	161	LYS
46	Lz	165	LEU
46	Lz	182	ASN
49	SA	18	PHE
49	SA	25	LEU
49	SA	50	ASN
49	SA	51	LEU
49	SA	53	ARG
49	SA	54	THR
49	SA	56	GLU
49	SA	57	LYS
49	SA	104	THR
49	SA	107	THR
49	SA	170	SER
49	SA	186	ARG
49	SA	212	LYS
49	SA	213	GLU
49	SA	214	GLU

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Mol	Chain	Res	Type
50	SB	186	ASN
51	SD	1	MET
51	SD	23	GLU
51	SD	27	ARG
51	SD	31	GLU
51	SD	40	ARG
51	SD	76	ARG
51	SD	116	ARG
51	SD	143	ARG
51	SD	160	SER
51	SD	169	ASP
51	SD	190	LEU
51	SD	197	LYS
52	SE	153	LEU
52	SE	198	ARG
53	SF	83	ASN
53	SF	130	ARG
53	SF	164	ARG
54	SH	12	ASN
54	SH	30	LEU
54	SH	33	ASN
54	SH	78	ARG
54	SH	97	GLN
54	SH	98	ARG
54	SH	105	THR
54	SH	107	LYS
54	SH	116	ARG
54	SH	127	ASP
54	SH	130	LEU
54	SH	165	ASN
54	SH	183	LYS
54	SH	184	ASP
54	SH	186	ASN
54	SH	187	PHE
55	SI	22	HIS
55	SI	56	ARG
55	SI	73	THR
55	SI	74	ARG
55	SI	76	THR
55	SI	104	ILE
55	SI	124	LYS
55	SI	143	LYS

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Mol	Chain	Res	Type
56	SK	95	ARG
57	SL	65	ASN
57	SL	69	ARG
58	SP	104	GLN
59	SQ	15	ARG
59	SQ	37	ARG
59	SQ	50	LYS
60	SR	67	ARG
61	SS	1	MET
61	SS	17	ASN
61	SS	51	ASP
61	SS	84	LEU
61	SS	90	VAL
61	SS	94	LYS
61	SS	95	TYR
61	SS	98	VAL
62	ST	33	TRP
62	ST	36	THR
62	ST	39	LEU
62	ST	41	LYS
62	ST	63	HIS
62	ST	96	SER
62	ST	131	LEU
63	SU	41	ARG
63	SU	75	LYS
64	SV	50	PHE
64	SV	71	ARG
64	SV	72	LEU
64	SV	83	PHE
65	SX	119	ARG
65	SX	129	SER
66	Sa	6	ARG
66	Sa	28	ARG
66	Sa	29	CYS
66	Sa	52	ASP
66	Sa	85[A]	ARG
66	Sa	85[B]	ARG
67	Sc	13	ARG
67	Sc	14	VAL
67	Sc	24	GLN
67	Sc	40	ARG
67	Sc	58	LEU

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Mol	Chain	Res	Type
67	Sc	59	LEU
67	Sc	63	ARG
68	Sd	22	ARG
68	Sd	26	ASN
68	Sd	32	ARG
69	Sg	12	LYS
69	Sg	14	HIS
69	Sg	15	ASN
69	Sg	64	HIS
69	Sg	162	ASN
69	Sg	197	THR
69	Sg	225	LYS
70	SC	121	ARG
71	SG	64	LYS
71	SG	82	SER
71	SG	98	ARG
71	SG	119	LYS
71	SG	154	ARG
71	SG	159	ARG
71	SG	175	LYS
71	SG	216	ARG
71	SG	217	MET
71	SG	218	LYS
71	SG	221	LYS
71	SG	223	LYS
71	SG	224	ARG
72	SJ	17	ARG
72	SJ	79	ARG
72	SJ	121	LYS
72	SJ	138[A]	ARG
72	SJ	138[B]	ARG
72	SJ	169	ARG
73	SM	12	MET
73	SM	55	ASN
73	SM	96	ARG
73	SM	121	LYS
73	SM	129	LYS
74	SN	3	ARG
74	SN	4	MET
74	SN	64	ARG
74	SN	99	ARG
74	SN	104	ARG

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Mol	Chain	Res	Type
75	SO	14	VAL
75	SO	98	ARG
75	SO	117	ARG
75	SO	142	ARG
75	SO	146	ARG
76	SW	57	ARG
76	SW	103	VAL
77	SY	10	ARG
77	SY	63	HIS
77	SY	72	PHE
77	SY	124	ASN
78	SZ	45	ASN
78	SZ	47	LEU
78	SZ	48	VAL
78	SZ	49	LEU
78	SZ	51	ASP
78	SZ	62	VAL
78	SZ	76	ARG
78	SZ	77	LEU
78	SZ	78	LYS
79	Sb	17	ARG
79	Sb	55	LEU
79	Sb	56	CYS
79	Sb	63	LEU
80	Se	8	ARG
81	Sf	91	ASN
81	Sf	95	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (100) such sidechains are listed below:

Mol	Chain	Res	Type
4	LA	132	ASN
4	LA	215	ASN
5	LB	175	GLN
5	LB	184	GLN
5	LB	186	ASN
5	LB	328	ASN
6	LC	38	ASN
6	LC	317	ASN
6	LC	329	ASN
7	LD	195	HIS
7	LD	202	GLN

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Mol	Chain	Res	Type
7	LD	250	ASN
11	LH	42	ASN
11	LH	106	GLN
11	LH	116	ASN
11	LH	156	ASN
13	LJ	71	HIS
13	LJ	97	ASN
14	LL	6	ASN
14	LL	188	ASN
15	LM	20	HIS
15	LM	48	GLN
15	LM	70	GLN
18	LP	21	ASN
18	LP	56	GLN
18	LP	97	ASN
18	LP	116	HIS
18	LP	118	GLN
20	LR	7	GLN
20	LR	130	ASN
21	LS	77	ASN
22	LT	22	HIS
23	LU	105	ASN
25	LW	48	GLN
26	LX	93	ASN
26	LX	125	ASN
27	LY	4	ASN
28	LZ	28	ASN
29	La	66	ASN
29	La	93	ASN
30	Lb	12	GLN
31	Lc	19	GLN
33	Le	43	ASN
34	Lf	56	ASN
34	Lf	80	ASN
35	Lg	3	GLN
38	Lj	13	ASN
40	Ll	19	GLN
44	Lp	56	HIS
45	Lr	6	GLN
45	Lr	30	ASN
45	Lr	41	ASN
45	Lr	100	ASN

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Mol	Chain	Res	Type
46	Lz	40	ASN
46	Lz	72	GLN
46	Lz	96	ASN
49	SA	50	ASN
50	SB	186	ASN
52	SE	98	ASN
52	SE	112	HIS
52	SE	142	HIS
52	SE	188	ASN
52	SE	214	ASN
53	SF	83	ASN
53	SF	148	ASN
54	SH	33	ASN
54	SH	91	HIS
54	SH	97	GLN
54	SH	165	ASN
54	SH	186	ASN
55	SI	165	GLN
55	SI	181	GLN
56	SK	44	HIS
57	SL	65	ASN
58	SP	41	GLN
58	SP	53	GLN
58	SP	104	GLN
61	SS	17	ASN
62	ST	63	HIS
63	SU	81	GLN
64	SV	82	ASN
65	SX	23	HIS
67	Sc	24	GLN
68	Sd	26	ASN
69	Sg	14	HIS
69	Sg	15	ASN
69	Sg	62	HIS
69	Sg	117	ASN
69	Sg	162	ASN
70	SC	115	GLN
70	SC	272	HIS
71	SG	13	GLN
71	SG	186	GLN
71	SG	197	GLN
73	SM	19	GLN

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Mol	Chain	Res	Type
73	SM	55	ASN
74	SN	49	GLN
77	SY	124	ASN
78	SZ	45	ASN
81	Sf	91	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L5	3699/3773 (98%)	1013 (27%)	35 (0%)
2	L7	119/120 (99%)	15 (12%)	0
3	L8	155/156 (99%)	37 (23%)	1 (0%)
47	S2	1709/1740 (98%)	430 (25%)	11 (0%)
48	S6	74/75 (98%)	29 (39%)	1 (1%)
All	All	5756/5864 (98%)	1524 (26%)	48 (0%)

All (1524) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L5	2	G
1	L5	4	G
1	L5	6	C
1	L5	17	A
1	L5	25	A
1	L5	26	C
1	L5	30	C
1	L5	39	A
1	L5	42	A
1	L5	48	G
1	L5	56	A
1	L5	58	G
1	L5	59	A
1	L5	64	A
1	L5	65	A
1	L5	66	A
1	L5	67	C
1	L5	69	A
1	L5	72	C
1	L5	73	A
1	L5	74	G
1	L5	91	G

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Mol	Chain	Res	Type
1	L5	98	A
1	L5	104	G
1	L5	106	A
1	L5	108	A
1	L5	109	G
1	L5	110	C
1	L5	117	C
1	L5	119	G
1	L5	120	A
1	L5	122	U
1	L5	126	C
1	L5	132	G
1	L5	133	C
1	L5	134	G
1	L5	135	G
1	L5	136	C
1	L5	137	G
1	L5	139	G
1	L5	141	C
1	L5	142	G
1	L5	143	C
1	L5	144	G
1	L5	152	U
1	L5	159	C
1	L5	165	A
1	L5	172	C
1	L5	177	G
1	L5	180	C
1	L5	181	C
1	L5	183	C
1	L5	184	U
1	L5	185	C
1	L5	187	U
1	L5	188	G
1	L5	189	G
1	L5	200	U
1	L5	207	G
1	L5	209	U
1	L5	210	C
1	L5	212	A
1	L5	216	C
1	L5	218	A

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Mol	Chain	Res	Type
1	L5	219	G
1	L5	225	G
1	L5	233	U
1	L5	234	G
1	L5	255	C
1	L5	256	G
1	L5	257	C
1	L5	259	C
1	L5	261	G
1	L5	262	G
1	L5	265	C
1	L5	269	G
1	L5	271	C
1	L5	274	C
1	L5	276	C
1	L5	278	G
1	L5	280	G
1	L5	297	U
1	L5	306	A
1	L5	315	G
1	L5	316	U
1	L5	340	C
1	L5	341	G
1	L5	344	A
1	L5	345	C
1	L5	349	A
1	L5	370	U
1	L5	386	A
1	L5	387	G
1	L5	388	A
1	L5	398	A2M
1	L5	407	A
1	L5	408	A
1	L5	409	G
1	L5	410	A
1	L5	411	G
1	L5	412	G
1	L5	413	G
1	L5	417	G
1	L5	418	A
1	L5	440	U
1	L5	449	C

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Mol	Chain	Res	Type
1	L5	450	G
1	L5	452	A
1	L5	453	G
1	L5	454	U
1	L5	456	C
1	L5	457	G
1	L5	461	G
1	L5	465	G
1	L5	467	U
1	L5	484	U
1	L5	485	C
1	L5	486	C
1	L5	489	C
1	L5	493	G
1	L5	494	U
1	L5	496	G
1	L5	497	G
1	L5	498	C
1	L5	499	G
1	L5	500	G
1	L5	501	C
1	L5	502	C
1	L5	503	C
1	L5	505	G
1	L5	509	A
1	L5	510	U
1	L5	511	C
1	L5	512	U
1	L5	513	U
1	L5	514	U
1	L5	515	C
1	L5	516	C
1	L5	517	C
1	L5	518	G
1	L5	519	C
1	L5	643	C
1	L5	644	G
1	L5	646	G
1	L5	653	U
1	L5	654	C
1	L5	656	C
1	L5	657	C

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Mol	Chain	Res	Type
1	L5	659	G
1	L5	665	C
1	L5	666	G
1	L5	667	A
1	L5	668	C
1	L5	670	G
1	L5	673	C
1	L5	676	C
1	L5	685	C
1	L5	686	A
1	L5	687	U
1	L5	691	C
1	L5	693	C
1	L5	696	C
1	L5	697	G
1	L5	701	G
1	L5	703	G
1	L5	704	C
1	L5	708	G
1	L5	731	G
1	L5	738	C
1	L5	739	G
1	L5	742	G
1	L5	747	A
1	L5	753	C
1	L5	754	U
1	L5	757	G
1	L5	758	G
1	L5	760	G
1	L5	904	C
1	L5	905	C
1	L5	913	U
1	L5	914	U
1	L5	915	A
1	L5	916	C
1	L5	917	A
1	L5	918	G
1	L5	923	C
1	L5	924	C
1	L5	926	G
1	L5	932	A
1	L5	933	G

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Mol	Chain	Res	Type
1	L5	934	C
1	L5	935	A
1	L5	936	C
1	L5	941	C
1	L5	943	A
1	L5	945	U
1	L5	946	C
1	L5	955	G
1	L5	958	G
1	L5	959	G
1	L5	960	A
1	L5	961	G
1	L5	962	C
1	L5	963	G
1	L5	964	A
1	L5	965	G
1	L5	966	A
1	L5	969	C
1	L5	971	U
1	L5	977	C
1	L5	982	U
1	L5	984	C
1	L5	988	C
1	L5	989	U
1	L5	990	C
1	L5	991	C
1	L5	992	C
1	L5	993	G
1	L5	995	C
1	L5	1048	G
1	L5	1051	G
1	L5	1065	G
1	L5	1069	G
1	L5	1070	G
1	L5	1072	C
1	L5	1074	G
1	L5	1083	U
1	L5	1094	G
1	L5	1095	A
1	L5	1096	C
1	L5	1168	G
1	L5	1170	G

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Mol	Chain	Res	Type
1	L5	1171	G
1	L5	1172	C
1	L5	1173	G
1	L5	1178	G
1	L5	1179	U
1	L5	1180	C
1	L5	1181	C
1	L5	1182	C
1	L5	1183	C
1	L5	1184	A
1	L5	1191	C
1	L5	1192	C
1	L5	1193	C
1	L5	1198	G
1	L5	1200	G
1	L5	1202	C
1	L5	1203	G
1	L5	1205	G
1	L5	1210	C
1	L5	1211	G
1	L5	1214	C
1	L5	1215	C
1	L5	1216	C
1	L5	1217	G
1	L5	1218	G
1	L5	1219	G
1	L5	1222	A
1	L5	1241	C
1	L5	1243	C
1	L5	1245	C
1	L5	1252	C
1	L5	1253	G
1	L5	1254	A
1	L5	1255	A
1	L5	1259	G
1	L5	1260	G
1	L5	1261	G
1	L5	1266	G
1	L5	1269	G
1	L5	1271	G
1	L5	1272	C
1	L5	1273	G

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Mol	Chain	Res	Type
1	L5	1274	A
1	L5	1275	G
1	L5	1277	G
1	L5	1279	A
1	L5	1280	C
1	L5	1284	G
1	L5	1285	U
1	L5	1287	G
1	L5	1293	G
1	L5	1294	A
1	L5	1295	C
1	L5	1296	G
1	L5	1301	C
1	L5	1302	U
1	L5	1303	A
1	L5	1304	C
1	L5	1312	A
1	L5	1314	C
1	L5	1326	A2M
1	L5	1337	A
1	L5	1344	C
1	L5	1354	A
1	L5	1358	G
1	L5	1359	G
1	L5	1360	G
1	L5	1365	C
1	L5	1371	A
1	L5	1378	C
1	L5	1379	C
1	L5	1387	A
1	L5	1394	G
1	L5	1397	A
1	L5	1399	G
1	L5	1402	C
1	L5	1403	G
1	L5	1405	C
1	L5	1407	C
1	L5	1409	C
1	L5	1410	U
1	L5	1417	C
1	L5	1420	A
1	L5	1439	C

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Mol	Chain	Res	Type
1	L5	1440	U
1	L5	1441	C
1	L5	1442	C
1	L5	1444	G
1	L5	1446	C
1	L5	1447	C
1	L5	1453	G
1	L5	1457	G
1	L5	1472	C
1	L5	1482	G
1	L5	1483	C
1	L5	1486	C
1	L5	1493	G
1	L5	1497	A
1	L5	1498	G
1	L5	1502	G
1	L5	1513	U
1	L5	1515	A
1	L5	1518	A
1	L5	1525	A
1	L5	1534	A2M
1	L5	1547	A
1	L5	1549	G
1	L5	1566	C
1	L5	1571	G
1	L5	1578	U
1	L5	1582	PSU
1	L5	1586	G
1	L5	1591	U
1	L5	1596	U
1	L5	1624	G
1	L5	1625	OMG
1	L5	1631	A
1	L5	1633	G
1	L5	1634	A
1	L5	1638	A
1	L5	1640	C
1	L5	1641	G
1	L5	1642	A
1	L5	1654	G
1	L5	1661	C
1	L5	1676	C

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Mol	Chain	Res	Type
1	L5	1677	PSU
1	L5	1680	G
1	L5	1681	G
1	L5	1686	C
1	L5	1691	G
1	L5	1694	C
1	L5	1697	G
1	L5	1699	A
1	L5	1700	G
1	L5	1703	C
1	L5	1704	C
1	L5	1705	G
1	L5	1707	C
1	L5	1716	G
1	L5	1719	A
1	L5	1726	U
1	L5	1729	A
1	L5	1734	G
1	L5	1740	C
1	L5	1741	G
1	L5	1742	A
1	L5	1750	G
1	L5	1753	G
1	L5	1755	C
1	L5	1756	U
1	L5	1757	U
1	L5	1758	G
1	L5	1760	G
1	L5	1761	G
1	L5	1762	C
1	L5	1763	C
1	L5	1764	G
1	L5	1765	A
1	L5	1766	A
1	L5	1768	C
1	L5	1769	G
1	L5	1770	A
1	L5	1771	U
1	L5	1775	A
1	L5	1787	A
1	L5	1797	G
1	L5	1803	G

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Mol	Chain	Res	Type
1	L5	1804	A
1	L5	1810	G
1	L5	1819	G
1	L5	1821	G
1	L5	1822	U
1	L5	1823	G
1	L5	1834	U
1	L5	1836	G
1	L5	1837	A
1	L5	1842	G
1	L5	1852	U
1	L5	1855	G
1	L5	1866	UR3
1	L5	1869	G
1	L5	1876	U
1	L5	1882	U
1	L5	1888	A
1	L5	1889	U
1	L5	1890	G
1	L5	1892	A
1	L5	1897	A
1	L5	1917	A
1	L5	1918	U
1	L5	1919	G
1	L5	1920	C
1	L5	1921	C
1	L5	1922	G
1	L5	1925	G
1	L5	1931	C
1	L5	1932	A
1	L5	1935	C
1	L5	1936	C
1	L5	1940	G
1	L5	1945	G
1	L5	1947	U
1	L5	1948	G
1	L5	1951	G
1	L5	1953	U
1	L5	1959	U
1	L5	1960	A
1	L5	1961	G
1	L5	1962	A

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Mol	Chain	Res	Type
1	L5	1965	G
1	L5	1966	C
1	L5	1967	A
1	L5	1969	G
1	L5	1971	C
1	L5	1974	U
1	L5	1975	G
1	L5	1976	G
1	L5	1977	C
1	L5	1980	U
1	L5	1981	G
1	L5	1982	G
1	L5	1983	A
1	L5	1984	A
1	L5	1985	G
1	L5	1987	C
1	L5	1988	G
1	L5	1989	G
1	L5	1991	A
1	L5	1995	G
1	L5	1996	C
1	L5	1998	A
1	L5	1999	A
1	L5	2002	A
1	L5	2003	G
1	L5	2006	U
1	L5	2007	G
1	L5	2009	A
1	L5	2010	A
1	L5	2011	C
1	L5	2012	A
1	L5	2013	A
1	L5	2015	U
1	L5	2016	C
1	L5	2018	C
1	L5	2020	U
1	L5	2025	A
1	L5	2026	A
1	L5	2033	A
1	L5	2038	U
1	L5	2044	U
1	L5	2046	G

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Mol	Chain	Res	Type
1	L5	2048	U
1	L5	2050	OMG
1	L5	2055	G
1	L5	2056	G
1	L5	2062	C
1	L5	2068	C
1	L5	2069	A
1	L5	2084	C
1	L5	2085	G
1	L5	2089	G
1	L5	2090	U
1	L5	2092	G
1	L5	2093	A
1	L5	2094	G
1	L5	2095	A
1	L5	2096	G
1	L5	2097	U
1	L5	2098	G
1	L5	2101	C
1	L5	2106	G
1	L5	2107	C
1	L5	2110	C
1	L5	2111	G
1	L5	2112	G
1	L5	2252	G
1	L5	2253	A
1	L5	2256	C
1	L5	2258	C
1	L5	2259	G
1	L5	2260	C
1	L5	2289	C
1	L5	2300	A
1	L5	2301	G
1	L5	2306	G
1	L5	2313	A
1	L5	2316	G
1	L5	2332	A
1	L5	2333	G
1	L5	2337	C
1	L5	2338	C
1	L5	2346	C
1	L5	2348	G

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Mol	Chain	Res	Type
1	L5	2351	C
1	L5	2357	G
1	L5	2360	A
1	L5	2370	A
1	L5	2382	A
1	L5	2389	A
1	L5	2395	A
1	L5	2396	A
1	L5	2397	G
1	L5	2408	U
1	L5	2416	G
1	L5	2417	A
1	L5	2421	G
1	L5	2422	OMC
1	L5	2424	OMG
1	L5	2425	U
1	L5	2426	U
1	L5	2440	U
1	L5	2441	C
1	L5	2450	G
1	L5	2453	A
1	L5	2464	C
1	L5	2465	C
1	L5	2474	G
1	L5	2475	G
1	L5	2478	C
1	L5	2482	C
1	L5	2483	G
1	L5	2485	U
1	L5	2488	C
1	L5	2489	C
1	L5	2490	U
1	L5	2491	C
1	L5	2493	G
1	L5	2503	G
1	L5	2504	C
1	L5	2505	C
1	L5	2506	G
1	L5	2511	A
1	L5	2513	A
1	L5	2519	U
1	L5	2520	C

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Mol	Chain	Res	Type
1	L5	2529	A
1	L5	2533	C
1	L5	2537	A
1	L5	2543	A
1	L5	2544	G
1	L5	2546	G
1	L5	2547	G
1	L5	2554	U
1	L5	2556	G
1	L5	2559	G
1	L5	2565	A
1	L5	2566	G
1	L5	2573	A
1	L5	2583	C
1	L5	2587	A
1	L5	2589	C
1	L5	2601	A
1	L5	2602	G
1	L5	2611	A
1	L5	2616	C
1	L5	2618	G
1	L5	2627	C
1	L5	2637	U
1	L5	2652	G
1	L5	2653	C
1	L5	2662	G
1	L5	2669	C
1	L5	2670	C
1	L5	2673	G
1	L5	2676	A
1	L5	2687	U
1	L5	2695	A
1	L5	2696	A
1	L5	2703	G
1	L5	2707	U
1	L5	2708	U
1	L5	2709	C
1	L5	2710	C
1	L5	2711	G
1	L5	2712	G
1	L5	2721	G
1	L5	2724	G

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Mol	Chain	Res	Type
1	L5	2726	G
1	L5	2732	G
1	L5	2739	C
1	L5	2742	G
1	L5	2743	A
1	L5	2754	G
1	L5	2756	G
1	L5	2761	U
1	L5	2763	U
1	L5	2764	A
1	L5	2770	C
1	L5	2788	U
1	L5	2790	U
1	L5	2801	U
1	L5	2814	C
1	L5	2815	A
1	L5	2826	U
1	L5	2827	G
1	L5	2838	G
1	L5	2842	G
1	L5	2848	G
1	L5	2855	G
1	L5	2856	C
1	L5	2867	C
1	L5	2877	G
1	L5	2892	C
1	L5	2900	U
1	L5	2902	G
1	L5	2903	G
1	L5	2904	U
1	L5	2905	C
1	L5	2906	G
1	L5	2907	G
1	L5	2908	U
1	L5	2910	G
1	L5	3585	G
1	L5	3586	G
1	L5	3587	C
1	L5	3588	C
1	L5	3589	G
1	L5	3590	G
1	L5	3591	C

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Mol	Chain	Res	Type
1	L5	3593	C
1	L5	3594	C
1	L5	3595	U
1	L5	3596	A
1	L5	3597	G
1	L5	3602	C
1	L5	3604	A
1	L5	3605	C
1	L5	3606	U
1	L5	3615	G
1	L5	3616	U
1	L5	3618	C
1	L5	3626	G
1	L5	3630	A
1	L5	3635	A
1	L5	3644	U
1	L5	3646	A
1	L5	3648	A
1	L5	3650	C
1	L5	3662	A
1	L5	3663	A
1	L5	3673	C
1	L5	3674	G
1	L5	3680	U
1	L5	3681	G
1	L5	3692	A
1	L5	3710	G
1	L5	3711	A
1	L5	3713	U
1	L5	3714	G
1	L5	3726	A
1	L5	3727	A
1	L5	3729	PSU
1	L5	3734	U
1	L5	3735	G
1	L5	3736	A
1	L5	3748	A
1	L5	3750	G
1	L5	3753	G
1	L5	3758	U
1	L5	3759	A
1	L5	3760	A

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Mol	Chain	Res	Type
1	L5	3764	PSU
1	L5	3771	C
1	L5	3775	A
1	L5	3776	G
1	L5	3777	G
1	L5	3785	A2M
1	L5	3786	U
1	L5	3787	G
1	L5	3799	A
1	L5	3801	U
1	L5	3802	U
1	L5	3810	C
1	L5	3811	G
1	L5	3812	C
1	L5	3814	U
1	L5	3817	A
1	L5	3818	U
1	L5	3819	G
1	L5	3838	U
1	L5	3839	G
1	L5	3840	U
1	L5	3851	U
1	L5	3867	A2M
1	L5	3868	G
1	L5	3870	C
1	L5	3877	A
1	L5	3878	C
1	L5	3879	G
1	L5	3885	G
1	L5	3890	A
1	L5	3892	U
1	L5	3897	G
1	L5	3901	A
1	L5	3906	A
1	L5	3907	G
1	L5	3908	A
1	L5	3915	U
1	L5	3916	G
1	L5	3922	G
1	L5	3926	C
1	L5	3942	A
1	L5	3943	A

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Mol	Chain	Res	Type
1	L5	3947	A
1	L5	3948	C
1	L5	3949	A
1	L5	3950	U
1	L5	3951	G
1	L5	3953	G
1	L5	3955	G
1	L5	3956	G
1	L5	3957	U
1	L5	3958	G
1	L5	3959	U
1	L5	3960	A
1	L5	3961	G
1	L5	3962	A
1	L5	3963	A
1	L5	3964	U
1	L5	3965	A
1	L5	3966	A
1	L5	3967	G
1	L5	3968	U
1	L5	3969	G
1	L5	3970	G
1	L5	3971	G
1	L5	3972	A
1	L5	3973	G
1	L5	3974	G
1	L5	3975	C
1	L5	3977	C
1	L5	4034	G
1	L5	4035	G
1	L5	4036	G
1	L5	4039	G
1	L5	4041	C
1	L5	4042	G
1	L5	4043	G
1	L5	4044	U
1	L5	4045	G
1	L5	4046	A
1	L5	4047	A
1	L5	4048	A
1	L5	4049	U
1	L5	4051	C

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Mol	Chain	Res	Type
1	L5	4052	C
1	L5	4053	A
1	L5	4054	C
1	L5	4055	U
1	L5	4056	A
1	L5	4057	C
1	L5	4059	C
1	L5	4061	G
1	L5	4062	A
1	L5	4064	C
1	L5	4067	U
1	L5	4068	U
1	L5	4069	U
1	L5	4076	G
1	L5	4086	G
1	L5	4091	G
1	L5	4099	G
1	L5	4100	C
1	L5	4102	C
1	L5	4104	G
1	L5	4107	G
1	L5	4108	G
1	L5	4110	C
1	L5	4113	U
1	L5	4115	G
1	L5	4116	C
1	L5	4117	U
1	L5	4119	C
1	L5	4121	G
1	L5	4127	A
1	L5	4133	C
1	L5	4135	G
1	L5	4138	C
1	L5	4139	G
1	L5	4140	C
1	L5	4141	G
1	L5	4142	C
1	L5	4143	G
1	L5	4144	C
1	L5	4145	C
1	L5	4146	G
1	L5	4150	G

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Mol	Chain	Res	Type
1	L5	4162	C
1	L5	4163	U
1	L5	4168	G
1	L5	4170	A
1	L5	4183	G
1	L5	4184	G
1	L5	4191	G
1	L5	4201	G
1	L5	4203	A
1	L5	4212	A
1	L5	4213	A
1	L5	4222	G
1	L5	4224	A
1	L5	4225	G
1	L5	4229	U
1	L5	4233	A
1	L5	4249	G
1	L5	4251	A
1	L5	4254	G
1	L5	4257	A
1	L5	4265	U
1	L5	4268	A
1	L5	4273	A
1	L5	4280	A
1	L5	4295	U
1	L5	4304	A
1	L5	4305	G
1	L5	4306	OMU
1	L5	4314	C
1	L5	4326	G
1	L5	4329	G
1	L5	4330	G
1	L5	4332	C
1	L5	4349	C
1	L5	4351	U
1	L5	4354	U
1	L5	4373	G
1	L5	4374	U
1	L5	4376	A
1	L5	4377	G
1	L5	4378	A
1	L5	4379	A

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Mol	Chain	Res	Type
1	L5	4380	A
1	L5	4381	A
1	L5	4385	A
1	L5	4387	C
1	L5	4391	G
1	L5	4394	A
1	L5	4400	G
1	L5	4415	1MA
1	L5	4416	G
1	L5	4420	U
1	L5	4422	A
1	L5	4426	C
1	L5	4427	G
1	L5	4437	U
1	L5	4444	C
1	L5	4448	G
1	L5	4449	A
1	L5	4463	U
1	L5	4464	A
1	L5	4466	C
1	L5	4475	G
1	L5	4476	C
1	L5	4488	A
1	L5	4494	OMG
1	L5	4500	PSU
1	L5	4510	A
1	L5	4512	U
1	L5	4513	A
1	L5	4518	A
1	L5	4519	C
1	L5	4523	A2M
1	L5	4524	G
1	L5	4531	PSU
1	L5	4545	G
1	L5	4548	A
1	L5	4549	G
1	L5	4554	G
1	L5	4556	U
1	L5	4560	C
1	L5	4567	G
1	L5	4570	G
1	L5	4573	G

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Mol	Chain	Res	Type
1	L5	4575	G
1	L5	4589	A
1	L5	4590	A
1	L5	4600	G
1	L5	4601	U
1	L5	4606	G
1	L5	4617	G
1	L5	4633	G
1	L5	4635	A
1	L5	4636	PSU
1	L5	4637	OMG
1	L5	4652	G
1	L5	4656	A
1	L5	4657	U
1	L5	4658	G
1	L5	4670	C
1	L5	4679	G
1	L5	4694	G
1	L5	4695	C
1	L5	4700	A
1	L5	4708	A
1	L5	4709	U
1	L5	4732	G
1	L5	4734	A
1	L5	4735	G
1	L5	4740	G
1	L5	4741	C
1	L5	4742	G
1	L5	4745	G
1	L5	4747	C
1	L5	4751	G
1	L5	4754	G
1	L5	4757	C
1	L5	4759	C
1	L5	4761	G
1	L5	4765	G
1	L5	4772	C
1	L5	4776	G
1	L5	4859	C
1	L5	4860	G
1	L5	4862	G
1	L5	4870	OMG

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Mol	Chain	Res	Type
1	L5	4871	C
1	L5	4875	G
1	L5	4876	U
1	L5	4881	U
1	L5	4882	U
1	L5	4883	C
1	L5	4885	U
1	L5	4888	U
1	L5	4889	G
1	L5	4895	C
1	L5	4896	G
1	L5	4899	G
1	L5	4900	C
1	L5	4901	G
1	L5	4903	G
1	L5	4910	G
1	L5	4912	G
1	L5	4913	G
1	L5	4914	C
1	L5	4916	G
1	L5	4923	C
1	L5	4925	U
1	L5	4926	C
1	L5	4928	C
1	L5	4931	G
1	L5	4934	A
1	L5	4937	C
1	L5	4938	A
1	L5	4940	C
1	L5	4941	G
1	L5	4942	C
1	L5	4943	A
1	L5	4947	U
1	L5	4949	G
1	L5	4950	U
1	L5	4951	G
1	L5	4955	A
1	L5	4960	G
1	L5	4966	A
1	L5	4967	A
1	L5	4975	G
1	L5	4976	U

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Mol	Chain	Res	Type
1	L5	4985	U
1	L5	4988	U
1	L5	4989	U
1	L5	4990	C
1	L5	4991	U
1	L5	5014	A
1	L5	5016	A
1	L5	5017	G
1	L5	5022	U
1	L5	5023	C
1	L5	5024	C
1	L5	5025	C
1	L5	5028	G
1	L5	5029	C
1	L5	5030	U
1	L5	5034	A
1	L5	5038	A
1	L5	5041	G
1	L5	5047	C
1	L5	5050	C
1	L5	5054	C
1	L5	5055	G
1	L5	5058	A
1	L5	5061	A
1	L5	5069	U
2	L7	7	G
2	L7	22	A
2	L7	31	G
2	L7	33	U
2	L7	38	U
2	L7	52	C
2	L7	53	U
2	L7	54	A
2	L7	62	U
2	L7	63	C
2	L7	64	G
2	L7	71	G
2	L7	100	A
2	L7	103	A
2	L7	110	G
3	L8	20	A
3	L8	23	C

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Mol	Chain	Res	Type
3	L8	25	G
3	L8	34	U
3	L8	35	C
3	L8	38	U
3	L8	39	G
3	L8	48	A
3	L8	50	C
3	L8	51	U
3	L8	52	A
3	L8	59	A
3	L8	60	G
3	L8	62	A
3	L8	63	U
3	L8	75	G
3	L8	82	A
3	L8	83	C
3	L8	84	A
3	L8	85	U
3	L8	87	G
3	L8	94	G
3	L8	103	A
3	L8	105	C
3	L8	106	G
3	L8	110	U
3	L8	111	U
3	L8	114	G
3	L8	122	G
3	L8	123	U
3	L8	124	U
3	L8	125	C
3	L8	126	C
3	L8	127	U
3	L8	128	C
3	L8	135	C
3	L8	156	U
47	S2	2	A
47	S2	4	C
47	S2	17	C
47	S2	33	G
47	S2	41	G
47	S2	44	U
47	S2	46	A

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Mol	Chain	Res	Type
47	S2	56	G
47	S2	58	C
47	S2	64	A
47	S2	67	C
47	S2	68	A
47	S2	72	C
47	S2	73	C
47	S2	74	G
47	S2	76	U
47	S2	77	A
47	S2	79	A
47	S2	92	A
47	S2	99	A
47	S2	103	A
47	S2	110	U
47	S2	113	G
47	S2	114	G
47	S2	115	U
47	S2	116	OMU
47	S2	126	G
47	S2	139	C
47	S2	143	U
47	S2	149	A
47	S2	150	A
47	S2	155	G
47	S2	160	U
47	S2	161	U
47	S2	162	C
47	S2	170	A
47	S2	184	G
47	S2	192	C
47	S2	196	C
47	S2	198	U
47	S2	199	C
47	S2	200	G
47	S2	202	G
47	S2	203	G
47	S2	204	G
47	S2	206	G
47	S2	211	G
47	S2	214	U
47	S2	225	G

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Mol	Chain	Res	Type
47	S2	290	U
47	S2	291	G
47	S2	292	A
47	S2	293	C
47	S2	295	C
47	S2	306	C
47	S2	307	G
47	S2	308	G
47	S2	309	G
47	S2	311	C
47	S2	313	A
47	S2	318	A
47	S2	319	C
47	S2	322	C
47	S2	323	C
47	S2	324	C
47	S2	326	C
47	S2	328	U
47	S2	329	G
47	S2	331	C
47	S2	335	G
47	S2	339	A
47	S2	347	G
47	S2	360	A
47	S2	362	C
47	S2	364	A
47	S2	368	U
47	S2	369	C
47	S2	370	G
47	S2	374	G
47	S2	385	G
47	S2	386	C
47	S2	398	A
47	S2	400	C
47	S2	407	G
47	S2	408	A
47	S2	409	C
47	S2	418	A
47	S2	421	G
47	S2	425	G
47	S2	426	A
47	S2	438	G

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Mol	Chain	Res	Type
47	S2	447	A
47	S2	448	A
47	S2	449	A
47	S2	450	C
47	S2	452	G
47	S2	464	A
47	S2	465	A
47	S2	470	G
47	S2	471	G
47	S2	472	C
47	S2	473	A
47	S2	474	G
47	S2	482	G
47	S2	487	U
47	S2	488	U
47	S2	492	C
47	S2	493	A
47	S2	506	G
47	S2	507	G
47	S2	508	A
47	S2	509	OMG
47	S2	525	A
47	S2	530	U
47	S2	531	A
47	S2	532	C
47	S2	537	C
47	S2	538	U
47	S2	540	U
47	S2	542	U
47	S2	544	G
47	S2	545	A
47	S2	546	G
47	S2	547	G
47	S2	552	G
47	S2	555	A
47	S2	556	U
47	S2	557	U
47	S2	558	G
47	S2	563	G
47	S2	564	A
47	S2	566	U
47	S2	569	A

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Mol	Chain	Res	Type
47	S2	576	A
47	S2	587	A
47	S2	589	G
47	S2	590	A
47	S2	591	U
47	S2	592	C
47	S2	597	G
47	S2	598	G
47	S2	603	C
47	S2	607	U
47	S2	608	C
47	S2	614	C
47	S2	623	G
47	S2	627	U
47	S2	631	U
47	S2	643	A
47	S2	655	A
47	S2	658	U
47	S2	660	C
47	S2	664	A
47	S2	668	A2M
47	S2	669	A
47	S2	671	A
47	S2	672	A
47	S2	673	G
47	S2	683	OMG
47	S2	684	G
47	S2	687	C
47	S2	688	U
47	S2	689	U
47	S2	691	G
47	S2	692	G
47	S2	694	G
47	S2	696	G
47	S2	697	G
47	S2	698	G
47	S2	731	G
47	S2	732	U
47	S2	733	C
47	S2	734	C
47	S2	735	C
47	S2	736	C

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Mol	Chain	Res	Type
47	S2	738	C
47	S2	739	C
47	S2	751	G
47	S2	752	G
47	S2	753	C
47	S2	788	G
47	S2	789	G
47	S2	791	C
47	S2	792	C
47	S2	793	G
47	S2	794	A
47	S2	797	C
47	S2	798	G
47	S2	799	U
47	S2	808	A
47	S2	810	A
47	S2	811	A
47	S2	821	G
47	S2	822	PSU
47	S2	830	A
47	S2	834	C
47	S2	835	C
47	S2	836	G
47	S2	837	A
47	S2	838	G
47	S2	839	C
47	S2	840	C
47	S2	841	G
47	S2	842	C
47	S2	847	A
47	S2	853	C
47	S2	861	A
47	S2	862	A
47	S2	869	A
47	S2	870	A
47	S2	872	A
47	S2	873	G
47	S2	874	G
47	S2	875	A
47	S2	878	G
47	S2	880	G
47	S2	885	U

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Mol	Chain	Res	Type
47	S2	887	U
47	S2	888	U
47	S2	889	U
47	S2	891	G
47	S2	892	U
47	S2	896	U
47	S2	897	U
47	S2	898	U
47	S2	899	U
47	S2	900	C
47	S2	901	G
47	S2	903	A
47	S2	904	A
47	S2	913	A
47	S2	914	U
47	S2	920	A
47	S2	933	G
47	S2	934	G
47	S2	955	A
47	S2	963	A
47	S2	968	U
47	S2	969	U
47	S2	971	G
47	S2	972	A
47	S2	978	G
47	S2	990	A
47	S2	992	A
47	S2	999	G
47	S2	1001	A
47	S2	1002	U
47	S2	1008	A
47	S2	1017	U
47	S2	1023	A
47	S2	1027	A
47	S2	1028	A
47	S2	1033	G
47	S2	1038	U
47	S2	1045	U
47	S2	1061	U
47	S2	1062	A
47	S2	1067	C
47	S2	1078	C

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Mol	Chain	Res	Type
47	S2	1083	A
47	S2	1084	A
47	S2	1085	C
47	S2	1089	G
47	S2	1109	C
47	S2	1114	U
47	S2	1116	C
47	S2	1121	G
47	S2	1133	A
47	S2	1138	C
47	S2	1148	A
47	S2	1153	C
47	S2	1154	U
47	S2	1165	G
47	S2	1166	G
47	S2	1168	G
47	S2	1170	A
47	S2	1172	U
47	S2	1195	A
47	S2	1207	G
47	S2	1208	A
47	S2	1215	C
47	S2	1216	C
47	S2	1217	A
47	S2	1221	G
47	S2	1224	G
47	S2	1227	G
47	S2	1242	U
47	S2	1243	PSU
47	S2	1251	A
47	S2	1253	A
47	S2	1256	G
47	S2	1257	G
47	S2	1259	A
47	S2	1264	C
47	S2	1265	A
47	S2	1266	C
47	S2	1274	G
47	S2	1275	G
47	S2	1283	C
47	S2	1286	G
47	S2	1294	G

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Mol	Chain	Res	Type
47	S2	1295	A
47	S2	1300	U
47	S2	1301	A
47	S2	1302	G
47	S2	1303	C
47	S2	1308	U
47	S2	1320	G
47	S2	1332	A
47	S2	1341	C
47	S2	1342	U
47	S2	1343	U
47	S2	1354	G
47	S2	1371	U
47	S2	1373	C
47	S2	1378	A
47	S2	1382	A
47	S2	1386	A
47	S2	1398	G
47	S2	1401	A
47	S2	1404	U
47	S2	1406	G
47	S2	1408	U
47	S2	1412	C
47	S2	1415	C
47	S2	1416	C
47	S2	1417	C
47	S2	1419	C
47	S2	1421	A
47	S2	1422	G
47	S2	1423	C
47	S2	1433	C
47	S2	1434	C
47	S2	1435	C
47	S2	1436	C
47	S2	1438	A
47	S2	1448	A
47	S2	1449	G
47	S2	1452	A
47	S2	1454	A
47	S2	1455	A
47	S2	1463	U
47	S2	1464	C

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Mol	Chain	Res	Type
47	S2	1478	U
47	S2	1480	A
47	S2	1487	A
47	S2	1488	C
47	S2	1489	A
47	S2	1490	G
47	S2	1494	U
47	S2	1495	G
47	S2	1497	G
47	S2	1498	A
47	S2	1520	G
47	S2	1521	C
47	S2	1533	A
47	S2	1537	A
47	S2	1544	C
47	S2	1545	A
47	S2	1548	G
47	S2	1552	G
47	S2	1553	C
47	S2	1556	A
47	S2	1560	U
47	S2	1570	G
47	S2	1580	A
47	S2	1585	U
47	S2	1586	U
47	S2	1587	G
47	S2	1588	A
47	S2	1600	G
47	S2	1601	A
47	S2	1603	G
47	S2	1621	U
47	S2	1623	A
47	S2	1634	A
47	S2	1635	C
47	S2	1638	G
47	S2	1640	A
47	S2	1646	C
47	S2	1648	G
47	S2	1654	G
47	S2	1661	A
47	S2	1663	A
47	S2	1665	G

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Mol	Chain	Res	Type
47	S2	1671	G
47	S2	1680	G
47	S2	1686	G
47	S2	1698	C
47	S2	1719	A
47	S2	1721	U
47	S2	1722	G
47	S2	1744	G
47	S2	1745	A
47	S2	1748	G
47	S2	1752	C
47	S2	1753	C
47	S2	1754	G
47	S2	1757	G
47	S2	1758	G
47	S2	1759	G
47	S2	1760	G
47	S2	1761	U
47	S2	1771	G
47	S2	1772	C
47	S2	1773	C
47	S2	1774	C
47	S2	1775	U
47	S2	1776	G
47	S2	1779	G
47	S2	1783	C
47	S2	1784	G
47	S2	1786	U
47	S2	1800	A
47	S2	1804	U
47	S2	1813	A
47	S2	1822	A
47	S2	1823	A
47	S2	1824	A
47	S2	1829	G
47	S2	1831	A
47	S2	1835	A
47	S2	1838	U
47	S2	1849	G
47	S2	1852	C
47	S2	1861	G
47	S2	1862	G

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Mol	Chain	Res	Type
47	S2	1863	A
47	S2	1865	C
47	S2	1867	U
48	S6	8	G
48	S6	9	U
48	S6	10	G
48	S6	18	G
48	S6	19	G
48	S6	20	A
48	S6	29	G
48	S6	31	G
48	S6	32	C
48	S6	33	C
48	S6	34	C
48	S6	36	U
48	S6	37	A
48	S6	39	C
48	S6	40	C
48	S6	41	C
48	S6	42	A
48	S6	44	A
48	S6	46	G
48	S6	47	U
48	S6	51	U
48	S6	54	A
48	S6	55	U
48	S6	58	A
48	S6	65	C
48	S6	66	C
48	S6	69	U
48	S6	74	C
48	S6	76	A

All (48) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	L5	58	G
1	L5	73	A
1	L5	385	A
1	L5	406	C
1	L5	417	G
1	L5	504	G

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Mol	Chain	Res	Type
1	L5	913	U
1	L5	914	U
1	L5	935	A
1	L5	959	G
1	L5	961	G
1	L5	988	C
1	L5	989	U
1	L5	1082	C
1	L5	1279	A
1	L5	1654	G
1	L5	2019	C
1	L5	2084	C
1	L5	2096	G
1	L5	2396	A
1	L5	2416	G
1	L5	2675	G
1	L5	2760	G
1	L5	2905	C
1	L5	3614	G
1	L5	3673	C
1	L5	3948	C
1	L5	3959	U
1	L5	3961	G
1	L5	4378	A
1	L5	4475	G
1	L5	4531	PSU
1	L5	4699	U
1	L5	4913	G
1	L5	4949	G
3	L8	83	C
47	S2	112	U
47	S2	291	G
47	S2	420	G
47	S2	508	A
47	S2	563	G
47	S2	688	U
47	S2	797	C
47	S2	861	A
47	S2	1397	U
47	S2	1434	C
47	S2	1744	G
48	S6	54	A

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	A2M	L5	1524	1	18,25,26	0.97	1 (5%)	18,36,39	1.16	2 (11%)
47	OMC	S2	1703	47	19,22,23	0.83	0	26,31,34	0.87	1 (3%)
1	OMG	L5	4623	1	18,26,27	0.96	1 (5%)	19,38,41	1.13	2 (10%)
47	PSU	S2	612	47	18,21,22	1.07	1 (5%)	22,30,33	1.85	5 (22%)
1	PSU	L5	4500	1	18,21,22	1.08	1 (5%)	22,30,33	1.85	4 (18%)
3	OMU	L8	14	3,1	19,22,23	1.24	3 (15%)	26,31,34	1.69	4 (15%)
41	MLZ	Lm	98	41	8,9,10	0.77	0	4,9,11	0.62	0
1	PSU	L5	3764	1	18,21,22	1.06	1 (5%)	22,30,33	1.68	4 (18%)
47	OMG	S2	683	47	18,26,27	0.91	1 (5%)	19,38,41	1.11	2 (10%)
1	A2M	L5	1871	82,1	18,25,26	0.95	1 (5%)	18,36,39	1.29	2 (11%)
1	B8H	L5	3762	1	19,22,23	1.36	3 (15%)	22,32,35	2.00	3 (13%)
6	MLZ	LC	333	6	8,9,10	0.75	0	4,9,11	0.67	0
1	OMG	L5	4196	1	18,26,27	0.94	1 (5%)	19,38,41	1.06	2 (10%)
1	PSU	L5	4636	1	18,21,22	1.08	1 (5%)	22,30,33	1.88	5 (22%)
1	B8T	L5	4483	1	19,22,23	0.77	0	26,31,34	0.88	1 (3%)
1	OMG	L5	1522	1	18,26,27	0.99	1 (5%)	19,38,41	1.12	2 (10%)
1	PSU	L5	3729	1	18,21,22	1.09	1 (5%)	22,30,33	1.68	4 (18%)
1	PSU	L5	4293	1	18,21,22	1.01	1 (5%)	22,30,33	1.72	4 (18%)
47	5MC	S2	1374	47	18,22,23	0.92	2 (11%)	26,32,35	1.10	3 (11%)
1	OMG	L5	1883	1	18,26,27	1.09	1 (5%)	19,38,41	1.26	3 (15%)
47	OMG	S2	509	82,47	18,26,27	1.19	1 (5%)	19,38,41	1.18	2 (10%)
47	A2M	S2	1678	47	18,25,26	0.95	1 (5%)	18,36,39	1.22	2 (11%)
1	OMC	L5	2861	1	19,22,23	0.80	0	26,31,34	0.78	1 (3%)
1	PSU	L5	4628	1	18,21,22	1.09	1 (5%)	22,30,33	1.81	4 (18%)
1	B8H	L5	4296	1	19,22,23	1.36	3 (15%)	22,32,35	2.00	3 (13%)
47	A2M	S2	159	47	18,25,26	1.00	1 (5%)	18,36,39	1.25	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
47	OMC	S2	517	47	19,22,23	0.82	0	26,31,34	0.84	1 (3%)
47	A2M	S2	484	47	18,25,26	0.96	1 (5%)	18,36,39	1.19	2 (11%)
1	OMU	L5	4306	1	19,22,23	1.29	4 (21%)	26,31,34	1.72	7 (26%)
1	5MC	L5	4447	82,1	18,22,23	1.04	2 (11%)	26,32,35	1.63	6 (23%)
1	2MG	L5	729	82,1	18,26,27	0.91	1 (5%)	16,38,41	1.17	2 (12%)
47	A2M	S2	1031	47	18,25,26	0.96	1 (5%)	18,36,39	1.31	3 (16%)
1	A2M	L5	1326	1	18,25,26	0.79	0	18,36,39	1.43	3 (16%)
1	OMG	L5	4494	1	18,26,27	0.95	1 (5%)	19,38,41	1.08	2 (10%)
1	OMG	L5	373	1	18,26,27	1.00	1 (5%)	19,38,41	1.16	2 (10%)
1	A2M	L5	4571	1	18,25,26	0.97	1 (5%)	18,36,39	1.24	2 (11%)
47	PSU	S2	1081	47	18,21,22	0.97	1 (5%)	22,30,33	1.62	5 (22%)
47	4AC	S2	1337	47	21,24,25	1.09	2 (9%)	29,34,37	1.03	3 (10%)
1	A2M	L5	2363	82,1	18,25,26	0.96	1 (5%)	18,36,39	1.19	2 (11%)
1	OMC	L5	3869	1	19,22,23	0.82	0	26,31,34	0.96	1 (3%)
1	OMC	L5	2365	82,1	19,22,23	0.80	0	26,31,34	0.76	0
1	PSU	L5	1582	1	18,21,22	1.50	4 (22%)	22,30,33	2.08	4 (18%)
1	OMC	L5	3701	82,1	19,22,23	0.80	0	26,31,34	0.74	0
1	5MC	L5	4335	1	18,22,23	0.95	2 (11%)	26,32,35	1.18	4 (15%)
1	OMC	L5	2804	1	19,22,23	0.83	0	26,31,34	0.83	1 (3%)
47	A2M	S2	27	82,47	18,25,26	0.96	1 (5%)	18,36,39	1.31	2 (11%)
1	PSU	L5	2508	1	18,21,22	1.05	1 (5%)	22,30,33	1.71	4 (18%)
1	5MU	L5	4083	1	19,22,23	1.43	4 (21%)	28,32,35	2.30	7 (25%)
47	MA6	S2	1850	47	19,26,27	0.87	1 (5%)	18,38,41	1.43	2 (11%)
47	OMU	S2	121	47	19,22,23	1.22	3 (15%)	26,31,34	1.78	6 (23%)
47	OMC	S2	174	82,47	19,22,23	0.81	0	26,31,34	0.78	0
1	A2M	L5	3785	1	18,25,26	0.89	1 (5%)	18,36,39	1.27	2 (11%)
1	1MA	L5	4415	1	16,25,26	1.53	2 (12%)	18,37,40	1.05	2 (11%)
1	OMG	L5	4870	1	18,26,27	0.92	1 (5%)	19,38,41	1.07	2 (10%)
1	5MC	L5	3782	82,1	18,22,23	0.97	2 (11%)	26,32,35	1.17	2 (7%)
1	OMG	L5	2773	1	18,26,27	0.92	1 (5%)	19,38,41	1.08	2 (10%)
47	4AC	S2	1842	47	21,24,25	0.96	1 (4%)	29,34,37	1.33	5 (17%)
1	PSU	L5	4403	1	18,21,22	1.01	1 (5%)	22,30,33	1.63	4 (18%)
1	OMC	L5	4536	1	19,22,23	0.83	0	26,31,34	0.93	1 (3%)
1	OMG	L5	1625	1	18,26,27	0.95	1 (5%)	19,38,41	1.15	2 (10%)
1	OMG	L5	2364	1	18,26,27	0.95	1 (5%)	19,38,41	1.07	2 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
47	PSU	S2	823	47	18,21,22	1.14	1 (5%)	22,30,33	1.73	4 (18%)
47	B8N	S2	1248	47	24,29,30	0.96	1 (4%)	29,42,45	1.47	4 (13%)
1	PSU	L5	4450	82,1	18,21,22	1.04	2 (11%)	22,30,33	1.80	5 (22%)
47	6MZ	S2	1832	82,47	18,25,26	0.88	1 (5%)	16,36,39	1.84	3 (18%)
47	OMC	S2	1710	47	19,22,23	0.81	0	26,31,34	0.76	0
1	PSU	L5	1683	1	18,21,22	1.11	1 (5%)	22,30,33	1.73	4 (18%)
1	JMH	L5	1456	1	18,22,23	1.10	1 (5%)	21,32,35	0.95	1 (4%)
1	OMG	L5	4637	1	18,26,27	0.98	1 (5%)	19,38,41	1.13	2 (10%)
1	PSU	L5	4531	1	18,21,22	1.37	2 (11%)	22,30,33	1.97	4 (18%)
1	6MZ	L5	4220	1	18,25,26	0.84	1 (5%)	16,36,39	2.04	4 (25%)
1	B8H	L5	1860	1	19,22,23	1.37	3 (15%)	22,32,35	1.97	4 (18%)
1	A2M	L5	4523	82,1	18,25,26	0.93	1 (5%)	18,36,39	1.26	2 (11%)
1	UR3	L5	4597	1	19,22,23	0.97	0	26,32,35	1.42	2 (7%)
1	PSU	L5	4442	1	18,21,22	1.04	1 (5%)	22,30,33	1.83	6 (27%)
47	OMU	S2	116	47	19,22,23	1.25	4 (21%)	26,31,34	1.68	6 (23%)
1	PSU	L5	1677	1	18,21,22	1.55	5 (27%)	22,30,33	2.10	4 (18%)
47	PSU	S2	822	47	18,21,22	1.05	1 (5%)	22,30,33	1.80	5 (22%)
1	A2M	L5	398	1	18,25,26	1.02	1 (5%)	18,36,39	1.27	2 (11%)
47	PSU	S2	119	47	18,21,22	1.02	1 (5%)	22,30,33	1.71	4 (18%)
1	OMG	L5	4370	1	18,26,27	0.93	1 (5%)	19,38,41	1.09	2 (10%)
1	A2M	L5	1534	82,1	18,25,26	0.97	1 (5%)	18,36,39	1.29	2 (11%)
47	MA6	S2	1851	47	19,26,27	0.88	1 (5%)	18,38,41	1.40	2 (11%)
1	OMG	L5	2424	1	18,26,27	0.96	1 (5%)	19,38,41	1.04	1 (5%)
1	A2M	L5	3825	1	18,25,26	0.97	1 (5%)	18,36,39	1.26	2 (11%)
1	2MG	L5	4872	1	18,26,27	0.91	1 (5%)	16,38,41	1.36	3 (18%)
1	2MG	L5	978	1	18,26,27	0.90	1 (5%)	16,38,41	1.17	2 (12%)
47	JMH	S2	1219	82,47	18,22,23	1.11	1 (5%)	21,32,35	1.00	2 (9%)
47	M7A	S2	1806	47	20,25,26	1.52	3 (15%)	28,37,40	2.17	6 (21%)
1	B8T	L5	4671	1	19,22,23	0.84	0	26,31,34	1.09	2 (7%)
47	A2M	S2	668	82,47	18,25,26	0.91	1 (5%)	18,36,39	1.36	2 (11%)
1	UR3	L5	1866	1	19,22,23	1.06	2 (10%)	26,32,35	1.52	4 (15%)
1	OMU	L5	4620	1	19,22,23	1.32	3 (15%)	26,31,34	1.86	6 (23%)
1	A2M	L5	3723	1	18,25,26	1.03	1 (5%)	18,36,39	1.19	2 (11%)
1	OMG	L5	2050	1	18,26,27	1.13	1 (5%)	19,38,41	1.13	3 (15%)
47	UR3	S2	1830	47	19,22,23	1.03	2 (10%)	26,32,35	1.74	5 (19%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	OMG	L5	3792	1	18,26,27	0.94	1 (5%)	19,38,41	1.06	2 (10%)
47	5MU	S2	814	47	19,22,23	1.40	6 (31%)	28,32,35	2.05	7 (25%)
1	OMG	L5	1316	82,1	18,26,27	1.17	1 (5%)	19,38,41	1.32	2 (10%)
47	A2M	S2	166	47	18,25,26	1.05	1 (5%)	18,36,39	1.27	2 (11%)
1	A2M	L5	2401	1	18,25,26	0.98	1 (5%)	18,36,39	1.19	2 (11%)
1	OMC	L5	3909	1	19,22,23	0.81	0	26,31,34	0.94	1 (3%)
1	OMC	L5	3887	1	19,22,23	0.82	0	26,31,34	0.84	1 (3%)
1	A2M	L5	3867	1	18,25,26	0.92	1 (5%)	18,36,39	1.25	2 (11%)
1	A2M	L5	3718	1	18,25,26	0.94	1 (5%)	18,36,39	1.20	2 (11%)
47	PSU	S2	1243	47	18,21,22	1.53	5 (27%)	22,30,33	2.12	4 (18%)
1	UR3	L5	4530	1	19,22,23	1.10	1 (5%)	26,32,35	1.58	4 (15%)
1	PSU	L5	3715	82,1	18,21,22	1.10	1 (5%)	22,30,33	1.64	4 (18%)
1	2MG	L5	1517	1	18,26,27	0.90	1 (5%)	16,38,41	1.29	3 (18%)
1	OMC	L5	2422	82,1	19,22,23	0.84	0	26,31,34	0.98	1 (3%)
1	1MA	L5	1322	82,1	16,25,26	1.50	3 (18%)	18,37,40	1.36	4 (22%)
1	OMG	L5	3899	1	18,26,27	1.00	1 (5%)	19,38,41	1.13	2 (10%)
47	OMG	S2	644	47	18,26,27	0.95	1 (5%)	19,38,41	1.10	2 (10%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	A2M	L5	1524	1	-	0/5/27/28	0/3/3/3
47	OMC	S2	1703	47	-	2/9/27/28	0/2/2/2
1	OMG	L5	4623	1	-	0/5/27/28	0/3/3/3
47	PSU	S2	612	47	-	0/7/25/26	0/2/2/2
1	PSU	L5	4500	1	-	3/7/25/26	0/2/2/2
3	OMU	L8	14	3,1	-	1/9/27/28	0/2/2/2
41	MLZ	Lm	98	41	-	0/7/8/10	-
1	PSU	L5	3764	1	-	1/7/25/26	0/2/2/2
47	OMG	S2	683	47	-	2/5/27/28	0/3/3/3
1	A2M	L5	1871	82,1	-	0/5/27/28	0/3/3/3
1	B8H	L5	3762	1	-	2/7/25/26	0/2/2/2
6	MLZ	LC	333	6	-	2/7/8/10	-
1	OMG	L5	4196	1	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	PSU	L5	4636	1	-	4/7/25/26	0/2/2/2
1	B8T	L5	4483	1	-	0/7/27/28	0/2/2/2
1	OMG	L5	1522	1	-	0/5/27/28	0/3/3/3
1	PSU	L5	3729	1	-	2/7/25/26	0/2/2/2
1	PSU	L5	4293	1	-	2/7/25/26	0/2/2/2
47	5MC	S2	1374	47	-	0/7/25/26	0/2/2/2
1	OMG	L5	1883	1	-	3/5/27/28	0/3/3/3
47	OMG	S2	509	82,47	-	2/5/27/28	0/3/3/3
47	A2M	S2	1678	47	-	0/5/27/28	0/3/3/3
1	OMC	L5	2861	1	-	0/9/27/28	0/2/2/2
1	PSU	L5	4628	1	-	0/7/25/26	0/2/2/2
1	B8H	L5	4296	1	-	0/7/25/26	0/2/2/2
47	A2M	S2	159	47	-	0/5/27/28	0/3/3/3
47	OMC	S2	517	47	-	0/9/27/28	0/2/2/2
47	A2M	S2	484	47	-	0/5/27/28	0/3/3/3
1	OMU	L5	4306	1	-	0/9/27/28	0/2/2/2
1	5MC	L5	4447	82,1	-	4/7/25/26	0/2/2/2
1	2MG	L5	729	82,1	-	3/5/27/28	0/3/3/3
47	A2M	S2	1031	47	-	0/5/27/28	0/3/3/3
1	A2M	L5	1326	1	-	1/5/27/28	0/3/3/3
1	OMG	L5	4494	1	-	2/5/27/28	0/3/3/3
1	OMG	L5	373	1	-	0/5/27/28	0/3/3/3
1	A2M	L5	4571	1	-	0/5/27/28	0/3/3/3
47	PSU	S2	1081	47	-	1/7/25/26	0/2/2/2
47	4AC	S2	1337	47	-	2/11/29/30	0/2/2/2
1	A2M	L5	2363	82,1	-	0/5/27/28	0/3/3/3
1	OMC	L5	3869	1	-	0/9/27/28	0/2/2/2
1	OMC	L5	2365	82,1	-	0/9/27/28	0/2/2/2
1	PSU	L5	1582	1	-	2/7/25/26	0/2/2/2
1	OMC	L5	3701	82,1	-	4/9/27/28	0/2/2/2
1	5MC	L5	4335	1	-	0/7/25/26	0/2/2/2
1	OMC	L5	2804	1	-	0/9/27/28	0/2/2/2
47	A2M	S2	27	82,47	-	0/5/27/28	0/3/3/3
1	PSU	L5	2508	1	-	0/7/25/26	0/2/2/2
1	5MU	L5	4083	1	-	0/7/25/26	0/2/2/2
47	MA6	S2	1850	47	-	0/7/29/30	0/3/3/3
47	OMU	S2	121	47	-	0/9/27/28	0/2/2/2
47	OMC	S2	174	82,47	-	0/9/27/28	0/2/2/2
1	A2M	L5	3785	1	-	2/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	1MA	L5	4415	1	-	2/3/25/26	0/3/3/3
1	OMG	L5	4870	1	-	3/5/27/28	0/3/3/3
1	5MC	L5	3782	82,1	-	0/7/25/26	0/2/2/2
1	OMG	L5	2773	1	-	0/5/27/28	0/3/3/3
47	4AC	S2	1842	47	-	0/11/29/30	0/2/2/2
1	PSU	L5	4403	1	-	2/7/25/26	0/2/2/2
1	OMC	L5	4536	1	-	0/9/27/28	0/2/2/2
1	OMG	L5	1625	1	-	1/5/27/28	0/3/3/3
1	OMG	L5	2364	1	-	1/5/27/28	0/3/3/3
47	PSU	S2	823	47	-	0/7/25/26	0/2/2/2
47	B8N	S2	1248	47	-	4/16/34/35	0/2/2/2
1	PSU	L5	4450	82,1	-	3/7/25/26	0/2/2/2
47	6MZ	S2	1832	82,47	-	2/5/27/28	0/3/3/3
47	OMC	S2	1710	47	-	0/9/27/28	0/2/2/2
1	PSU	L5	1683	1	-	0/7/25/26	0/2/2/2
1	JMH	L5	1456	1	-	0/7/25/26	0/2/2/2
1	OMG	L5	4637	1	-	2/5/27/28	0/3/3/3
1	PSU	L5	4531	1	-	2/7/25/26	0/2/2/2
1	6MZ	L5	4220	1	-	2/5/27/28	0/3/3/3
1	B8H	L5	1860	1	-	0/7/25/26	0/2/2/2
1	A2M	L5	4523	82,1	-	2/5/27/28	0/3/3/3
1	UR3	L5	4597	1	-	0/7/25/26	0/2/2/2
1	PSU	L5	4442	1	-	0/7/25/26	0/2/2/2
47	OMU	S2	116	47	-	3/9/27/28	0/2/2/2
1	PSU	L5	1677	1	-	1/7/25/26	0/2/2/2
47	PSU	S2	822	47	-	0/7/25/26	0/2/2/2
1	A2M	L5	398	1	-	2/5/27/28	0/3/3/3
47	PSU	S2	119	47	-	0/7/25/26	0/2/2/2
1	OMG	L5	4370	1	-	0/5/27/28	0/3/3/3
1	A2M	L5	1534	82,1	-	2/5/27/28	0/3/3/3
47	MA6	S2	1851	47	-	5/7/29/30	0/3/3/3
1	OMG	L5	2424	1	-	2/5/27/28	0/3/3/3
1	A2M	L5	3825	1	-	0/5/27/28	0/3/3/3
1	2MG	L5	4872	1	-	2/5/27/28	0/3/3/3
1	2MG	L5	978	1	-	0/5/27/28	0/3/3/3
47	JMH	S2	1219	82,47	-	0/7/25/26	0/2/2/2
47	M7A	S2	1806	47	-	0/7/37/38	0/3/3/3
1	B8T	L5	4671	1	-	0/7/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
47	A2M	S2	668	82,47	-	2/5/27/28	0/3/3/3
1	UR3	L5	1866	1	-	2/7/25/26	0/2/2/2
1	OMU	L5	4620	1	-	0/9/27/28	0/2/2/2
1	A2M	L5	3723	1	-	0/5/27/28	0/3/3/3
1	OMG	L5	2050	1	-	0/5/27/28	0/3/3/3
47	UR3	S2	1830	47	-	2/7/25/26	0/2/2/2
1	OMG	L5	3792	1	-	0/5/27/28	0/3/3/3
47	5MU	S2	814	47	-	0/7/25/26	0/2/2/2
1	OMG	L5	1316	82,1	-	0/5/27/28	0/3/3/3
47	A2M	S2	166	47	-	0/5/27/28	0/3/3/3
1	A2M	L5	2401	1	-	1/5/27/28	0/3/3/3
1	OMC	L5	3909	1	-	0/9/27/28	0/2/2/2
1	OMC	L5	3887	1	-	1/9/27/28	0/2/2/2
1	A2M	L5	3867	1	-	3/5/27/28	0/3/3/3
1	A2M	L5	3718	1	-	0/5/27/28	0/3/3/3
47	PSU	S2	1243	47	-	2/7/25/26	0/2/2/2
1	UR3	L5	4530	1	-	2/7/25/26	0/2/2/2
1	PSU	L5	3715	82,1	-	0/7/25/26	0/2/2/2
1	2MG	L5	1517	1	-	0/5/27/28	0/3/3/3
1	OMC	L5	2422	82,1	-	1/9/27/28	0/2/2/2
1	1MA	L5	1322	82,1	-	2/3/25/26	0/3/3/3
1	OMG	L5	3899	1	-	4/5/27/28	0/3/3/3
47	OMG	S2	644	47	-	1/5/27/28	0/3/3/3

All (145) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L5	4415	1MA	C2-N3	4.72	1.34	1.29
47	S2	1806	M7A	C8-N9	-4.43	1.35	1.45
1	L5	1322	1MA	C2-N3	3.98	1.33	1.29
47	S2	823	PSU	C6-C5	3.66	1.39	1.35
1	L5	1316	OMG	C6-N1	-3.62	1.32	1.37
1	L5	3729	PSU	C6-C5	3.56	1.39	1.35
1	L5	3715	PSU	C6-C5	3.53	1.39	1.35
1	L5	1683	PSU	C6-C5	3.51	1.39	1.35
47	S2	509	OMG	C6-N1	-3.49	1.32	1.37
1	L5	3764	PSU	C6-C5	3.48	1.39	1.35
1	L5	4628	PSU	C6-C5	3.47	1.39	1.35
1	L5	2050	OMG	C6-N1	-3.45	1.32	1.37
1	L5	2508	PSU	C6-C5	3.37	1.39	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L5	4403	PSU	C6-C5	3.33	1.39	1.35
1	L5	4500	PSU	C6-C5	3.33	1.39	1.35
47	S2	612	PSU	C6-C5	3.31	1.39	1.35
1	L5	1582	PSU	C4-N3	-3.26	1.32	1.38
1	L5	4636	PSU	C6-C5	3.25	1.39	1.35
1	L5	1883	OMG	C6-N1	-3.23	1.33	1.37
47	S2	119	PSU	C6-C5	3.23	1.39	1.35
1	L5	4083	5MU	C4-N3	-3.21	1.32	1.38
1	L5	4442	PSU	C6-C5	3.21	1.39	1.35
47	S2	822	PSU	C6-C5	3.20	1.39	1.35
1	L5	4293	PSU	C6-C5	3.19	1.39	1.35
47	S2	1248	B8N	C6-C5	3.18	1.39	1.34
1	L5	1860	B8H	C6-C5	3.15	1.39	1.34
47	S2	1081	PSU	C6-C5	3.11	1.38	1.35
1	L5	4415	1MA	C6-N6	3.11	1.35	1.27
47	S2	1806	M7A	C5-C6	3.08	1.49	1.40
1	L5	4447	5MC	C6-C5	3.07	1.39	1.34
1	L5	1677	PSU	C4-N3	-3.07	1.33	1.38
47	S2	1243	PSU	C4-N3	-3.06	1.33	1.38
1	L5	4620	OMU	C4-N3	-3.05	1.33	1.38
1	L5	4450	PSU	C6-C5	2.97	1.38	1.35
1	L5	1522	OMG	C6-N1	-2.97	1.33	1.37
1	L5	3762	B8H	C6-C5	2.96	1.39	1.34
1	L5	4531	PSU	C4-N3	-2.94	1.33	1.38
1	L5	1322	1MA	C6-N6	2.92	1.35	1.27
1	L5	3762	B8H	C4-N3	-2.88	1.33	1.38
1	L5	373	OMG	C6-N1	-2.88	1.33	1.37
47	S2	1337	4AC	C4-N4	-2.86	1.35	1.39
1	L5	2364	OMG	C6-N1	-2.85	1.33	1.37
47	S2	814	5MU	C4-N3	-2.85	1.33	1.38
1	L5	4623	OMG	C6-N1	-2.84	1.33	1.37
1	L5	4296	B8H	C6-C5	2.81	1.38	1.34
47	S2	644	OMG	C6-N1	-2.80	1.33	1.37
1	L5	4296	B8H	C4-N3	-2.80	1.33	1.38
1	L5	4083	5MU	C6-N1	-2.80	1.33	1.38
1	L5	4637	OMG	C6-N1	-2.78	1.33	1.37
1	L5	3899	OMG	C6-N1	-2.78	1.33	1.37
1	L5	3792	OMG	C6-N1	-2.76	1.33	1.37
1	L5	4306	OMU	C4-N3	-2.74	1.33	1.38
1	L5	4083	5MU	C2-N3	-2.74	1.33	1.38
47	S2	121	OMU	C4-N3	-2.73	1.33	1.38
3	L8	14	OMU	C4-N3	-2.72	1.33	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L5	4494	OMG	C6-N1	-2.72	1.33	1.37
1	L5	4370	OMG	C6-N1	-2.71	1.33	1.37
1	L5	2424	OMG	C6-N1	-2.70	1.33	1.37
1	L5	1625	OMG	C6-N1	-2.68	1.33	1.37
1	L5	1860	B8H	C4-N3	-2.67	1.33	1.38
1	L5	4620	OMU	C2-N3	-2.66	1.33	1.38
1	L5	1582	PSU	C6-C5	2.65	1.38	1.35
1	L5	4196	OMG	C6-N1	-2.65	1.33	1.37
47	S2	1243	PSU	C2-N1	-2.63	1.33	1.36
1	L5	4530	UR3	C2-N1	2.61	1.42	1.38
47	S2	1806	M7A	C4-N9	-2.61	1.33	1.38
1	L5	1517	2MG	C6-N1	-2.61	1.34	1.37
47	S2	683	OMG	C6-N1	-2.60	1.34	1.37
1	L5	729	2MG	C6-N1	-2.59	1.34	1.37
1	L5	1677	PSU	C6-C5	2.59	1.38	1.35
1	L5	4531	PSU	C6-C5	2.59	1.38	1.35
1	L5	3782	5MC	C6-N1	-2.54	1.33	1.38
1	L5	4335	5MC	C6-C5	2.53	1.38	1.34
47	S2	116	OMU	C4-N3	-2.51	1.34	1.38
1	L5	4870	OMG	C6-N1	-2.49	1.34	1.37
1	L5	2773	OMG	C6-N1	-2.47	1.34	1.37
1	L5	4335	5MC	C6-N1	-2.46	1.33	1.38
47	S2	116	OMU	C5-C4	-2.46	1.38	1.43
47	S2	1374	5MC	C6-C5	2.45	1.38	1.34
1	L5	3782	5MC	C6-C5	2.45	1.38	1.34
47	S2	814	5MU	C6-C5	2.44	1.38	1.34
1	L5	978	2MG	C6-N1	-2.43	1.34	1.37
47	S2	1851	MA6	C5-C4	2.43	1.47	1.40
47	S2	1832	6MZ	C5-C4	2.41	1.47	1.40
1	L5	3762	B8H	C2-N3	-2.41	1.33	1.38
1	L5	3723	A2M	C5-C4	2.41	1.47	1.40
1	L5	1582	PSU	C2-N3	-2.39	1.33	1.37
47	S2	159	A2M	C5-C4	2.39	1.47	1.40
47	S2	166	A2M	C5-C4	2.39	1.47	1.40
1	L5	1677	PSU	C2-N1	-2.39	1.33	1.36
47	S2	1850	MA6	C5-C4	2.37	1.47	1.40
47	S2	814	5MU	C6-N1	-2.36	1.34	1.38
3	L8	14	OMU	C2-N3	-2.34	1.33	1.38
1	L5	1866	UR3	C2-N1	2.34	1.41	1.38
47	S2	1243	PSU	C2-N3	-2.32	1.33	1.37
1	L5	398	A2M	C5-C4	2.32	1.47	1.40
1	L5	1524	A2M	C5-C4	2.32	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	S2	484	A2M	C5-C4	2.31	1.47	1.40
1	L5	3825	A2M	C5-C4	2.30	1.47	1.40
1	L5	4296	B8H	C2-N3	-2.30	1.33	1.38
1	L5	1534	A2M	C5-C4	2.30	1.47	1.40
47	S2	121	OMU	C2-N3	-2.30	1.33	1.38
1	L5	4306	OMU	C5-C4	-2.30	1.38	1.43
1	L5	1582	PSU	C2'-C1'	-2.28	1.50	1.53
1	L5	4306	OMU	C2-N1	2.28	1.42	1.38
47	S2	1830	UR3	C2-N1	2.28	1.41	1.38
1	L5	4220	6MZ	C5-C4	2.27	1.46	1.40
1	L5	4306	OMU	C2-N3	-2.27	1.33	1.38
1	L5	3718	A2M	C5-C4	2.27	1.46	1.40
3	L8	14	OMU	C5-C4	-2.27	1.38	1.43
1	L5	2401	A2M	C5-C4	2.27	1.46	1.40
47	S2	1374	5MC	C6-N1	-2.26	1.34	1.38
47	S2	121	OMU	C5-C4	-2.26	1.38	1.43
1	L5	4447	5MC	C6-N1	-2.26	1.34	1.38
1	L5	3867	A2M	C5-C4	2.26	1.46	1.40
47	S2	27	A2M	C5-C4	2.26	1.46	1.40
1	L5	2363	A2M	C5-C4	2.25	1.46	1.40
47	S2	1031	A2M	C5-C4	2.25	1.46	1.40
1	L5	1860	B8H	C2-N3	-2.24	1.34	1.38
1	L5	4571	A2M	C5-C4	2.24	1.46	1.40
47	S2	1219	JMH	C2-N1	2.23	1.41	1.38
47	S2	1678	A2M	C5-C4	2.23	1.46	1.40
1	L5	1871	A2M	C5-C4	2.22	1.46	1.40
47	S2	1243	PSU	C6-C5	2.21	1.37	1.35
1	L5	4872	2MG	C6-N1	-2.21	1.34	1.37
47	S2	668	A2M	C5-C4	2.21	1.46	1.40
47	S2	814	5MU	C2-N3	-2.20	1.34	1.38
47	S2	814	5MU	C4-C5	2.19	1.48	1.44
1	L5	4620	OMU	C5-C4	-2.19	1.38	1.43
1	L5	4083	5MU	C6-C5	2.17	1.38	1.34
1	L5	1677	PSU	C2-N3	-2.16	1.33	1.37
1	L5	1456	JMH	C2-N1	2.16	1.41	1.38
47	S2	1337	4AC	C7-N4	-2.14	1.33	1.37
1	L5	1677	PSU	C2'-C1'	-2.14	1.51	1.53
47	S2	116	OMU	C2-N1	2.13	1.41	1.38
47	S2	1842	4AC	C4-N4	-2.13	1.36	1.39
47	S2	814	5MU	C2-N1	2.12	1.41	1.38
1	L5	3785	A2M	C5-C4	2.11	1.46	1.40
1	L5	4523	A2M	C5-C4	2.10	1.46	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
47	S2	116	OMU	C2-N3	-2.08	1.34	1.38
47	S2	1243	PSU	C2'-C1'	-2.07	1.51	1.53
1	L5	1866	UR3	C5-C4	-2.07	1.38	1.43
1	L5	4450	PSU	C4-C5	-2.04	1.38	1.44
1	L5	1322	1MA	C2'-C1'	-2.02	1.50	1.53
47	S2	1830	UR3	C5-C4	-2.00	1.38	1.43

All (319) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	S2	1806	M7A	N3-C4-N9	6.77	135.42	126.87
1	L5	1677	PSU	N1-C2-N3	6.46	122.45	115.13
47	S2	1243	PSU	N1-C2-N3	6.38	122.36	115.13
1	L5	1582	PSU	N1-C2-N3	6.26	122.22	115.13
47	S2	1806	M7A	N9-C8-N7	6.13	112.14	103.38
1	L5	3762	B8H	N3-C2-N1	6.11	121.74	115.14
47	S2	1832	6MZ	C2-N1-C6	5.90	121.65	116.59
1	L5	4531	PSU	N1-C2-N3	5.89	121.81	115.13
1	L5	4296	B8H	N3-C2-N1	5.88	121.50	115.14
1	L5	1860	B8H	N3-C2-N1	5.70	121.30	115.14
1	L5	4220	6MZ	C2-N1-C6	5.67	121.45	116.59
1	L5	4597	UR3	C4-N3-C2	-5.45	119.43	124.56
1	L5	4083	5MU	C4-N3-C2	-5.43	120.32	127.35
1	L5	4296	B8H	C4-N3-C2	-5.32	120.46	127.35
47	S2	814	5MU	N3-C2-N1	5.27	121.88	114.89
1	L5	3762	B8H	C4-N3-C2	-5.27	120.53	127.35
1	L5	4083	5MU	N3-C2-N1	5.20	121.79	114.89
47	S2	1830	UR3	C4-N3-C2	-5.13	119.74	124.56
47	S2	814	5MU	C4-N3-C2	-5.07	120.78	127.35
1	L5	1860	B8H	C4-N3-C2	-5.05	120.81	127.35
47	S2	1248	B8N	C4-N3-C2	-4.98	119.17	125.46
1	L5	1866	UR3	C4-N3-C2	-4.92	119.93	124.56
1	L5	4636	PSU	C4-N3-C2	-4.88	119.31	126.34
1	L5	4530	UR3	C4-N3-C2	-4.88	119.97	124.56
1	L5	4442	PSU	C4-N3-C2	-4.76	119.48	126.34
1	L5	4447	5MC	C5-C6-N1	-4.72	118.48	123.34
47	S2	612	PSU	N1-C2-N3	4.72	120.48	115.13
1	L5	4500	PSU	C4-N3-C2	-4.71	119.55	126.34
1	L5	4628	PSU	N1-C2-N3	4.70	120.46	115.13
47	S2	612	PSU	C4-N3-C2	-4.70	119.57	126.34
1	L5	4083	5MU	C5-C4-N3	4.69	119.32	115.31
1	L5	4450	PSU	C4-N3-C2	-4.67	119.61	126.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	4500	PSU	N1-C2-N3	4.64	120.39	115.13
47	S2	121	OMU	N3-C2-N1	4.63	121.04	114.89
1	L5	4620	OMU	N3-C2-N1	4.63	121.03	114.89
1	L5	4442	PSU	N1-C2-N3	4.62	120.37	115.13
1	L5	4636	PSU	N1-C2-N3	4.59	120.33	115.13
47	S2	1830	UR3	C1'-N1-C2	4.58	124.73	116.99
47	S2	822	PSU	N1-C2-N3	4.55	120.29	115.13
1	L5	1582	PSU	C4-N3-C2	-4.55	119.79	126.34
1	L5	4628	PSU	C4-N3-C2	-4.54	119.80	126.34
1	L5	1683	PSU	N1-C2-N3	4.54	120.27	115.13
47	S2	823	PSU	C4-N3-C2	-4.52	119.83	126.34
1	L5	4293	PSU	C4-N3-C2	-4.51	119.84	126.34
1	L5	4620	OMU	C4-N3-C2	-4.50	120.65	126.58
47	S2	119	PSU	C4-N3-C2	-4.50	119.86	126.34
1	L5	2508	PSU	N1-C2-N3	4.47	120.20	115.13
1	L5	4450	PSU	N1-C2-N3	4.47	120.19	115.13
1	L5	2508	PSU	C4-N3-C2	-4.45	119.92	126.34
47	S2	119	PSU	N1-C2-N3	4.43	120.15	115.13
47	S2	823	PSU	N1-C2-N3	4.40	120.12	115.13
47	S2	822	PSU	C4-N3-C2	-4.40	120.00	126.34
3	L8	14	OMU	C4-N3-C2	-4.37	120.81	126.58
1	L5	1683	PSU	C4-N3-C2	-4.37	120.05	126.34
1	L5	3764	PSU	N1-C2-N3	4.36	120.07	115.13
1	L5	4293	PSU	N1-C2-N3	4.34	120.04	115.13
1	L5	3729	PSU	N1-C2-N3	4.32	120.03	115.13
47	S2	121	OMU	C4-N3-C2	-4.29	120.92	126.58
47	S2	1243	PSU	C4-N3-C2	-4.28	120.18	126.34
1	L5	4403	PSU	N1-C2-N3	4.26	119.96	115.13
1	L5	3715	PSU	C4-N3-C2	-4.26	120.21	126.34
1	L5	3729	PSU	C4-N3-C2	-4.24	120.23	126.34
47	S2	1850	MA6	C4-C5-N7	-4.23	104.99	109.40
47	S2	1243	PSU	O2-C2-N1	-4.22	118.14	122.79
1	L5	3764	PSU	C4-N3-C2	-4.22	120.26	126.34
1	L5	3715	PSU	N1-C2-N3	4.21	119.91	115.13
3	L8	14	OMU	N3-C2-N1	4.16	120.41	114.89
1	L5	4306	OMU	N3-C2-N1	4.10	120.33	114.89
47	S2	1081	PSU	N1-C2-N3	4.08	119.75	115.13
1	L5	1677	PSU	C4-N3-C2	-4.07	120.48	126.34
47	S2	814	5MU	C5-C4-N3	4.05	118.77	115.31
1	L5	4083	5MU	O4-C4-C5	-4.05	120.21	124.90
1	L5	1677	PSU	O2-C2-N1	-3.99	118.39	122.79
1	L5	4531	PSU	O2-C2-N1	-3.99	118.39	122.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	4403	PSU	C4-N3-C2	-3.99	120.60	126.34
47	S2	1081	PSU	C4-N3-C2	-3.98	120.61	126.34
1	L5	4531	PSU	C4-N3-C2	-3.97	120.62	126.34
47	S2	1851	MA6	C4-C5-N7	-3.96	105.28	109.40
1	L5	4083	5MU	C5-C6-N1	-3.95	119.27	123.34
1	L5	4306	OMU	C4-N3-C2	-3.88	121.46	126.58
47	S2	116	OMU	N3-C2-N1	3.83	119.97	114.89
1	L5	4220	6MZ	C9-N6-C6	-3.80	119.59	122.87
3	L8	14	OMU	C5-C4-N3	3.69	120.36	114.84
47	S2	116	OMU	C4-N3-C2	-3.68	121.72	126.58
47	S2	1806	M7A	C2-N3-C4	3.67	120.42	111.75
47	S2	814	5MU	O4-C4-C5	-3.58	120.75	124.90
47	S2	1850	MA6	N3-C2-N1	-3.57	123.11	128.68
1	L5	4530	UR3	C1'-N1-C2	3.54	122.97	116.99
1	L5	4620	OMU	C5-C4-N3	3.54	120.14	114.84
1	L5	4306	OMU	C5-C4-N3	3.50	120.08	114.84
1	L5	3825	A2M	N3-C2-N1	-3.49	123.23	128.68
47	S2	1031	A2M	N3-C2-N1	-3.44	123.29	128.68
1	L5	4523	A2M	N3-C2-N1	-3.43	123.31	128.68
1	L5	398	A2M	N3-C2-N1	-3.43	123.32	128.68
47	S2	121	OMU	C5-C4-N3	3.41	119.95	114.84
47	S2	1851	MA6	N3-C2-N1	-3.41	123.35	128.68
47	S2	116	OMU	C5-C4-N3	3.41	119.94	114.84
47	S2	1678	A2M	N3-C2-N1	-3.40	123.36	128.68
47	S2	1806	M7A	C5-C4-N3	-3.40	118.65	126.62
47	S2	1842	4AC	O7-C7-N4	3.40	127.32	121.82
1	L5	4530	UR3	C6-N1-C2	-3.38	118.76	121.79
1	L5	1326	A2M	N3-C2-N1	-3.37	123.41	128.68
1	L5	4335	5MC	C5-C6-N1	-3.36	119.88	123.34
47	S2	27	A2M	N3-C2-N1	-3.35	123.44	128.68
1	L5	1534	A2M	N3-C2-N1	-3.34	123.45	128.68
1	L5	3762	B8H	O2-C2-N1	-3.34	119.11	122.87
1	L5	4571	A2M	N3-C2-N1	-3.34	123.46	128.68
47	S2	166	A2M	N3-C2-N1	-3.33	123.47	128.68
1	L5	1871	A2M	N3-C2-N1	-3.30	123.52	128.68
1	L5	2401	A2M	N3-C2-N1	-3.30	123.53	128.68
47	S2	116	OMU	O4-C4-C5	-3.28	119.39	125.16
1	L5	1582	PSU	O2-C2-N1	-3.27	119.19	122.79
47	S2	668	A2M	N3-C2-N1	-3.25	123.60	128.68
1	L5	4083	5MU	C2'-C1'-N1	-3.24	104.04	113.22
1	L5	2363	A2M	N3-C2-N1	-3.23	123.62	128.68
1	L5	4447	5MC	O2-C2-N3	-3.23	117.08	122.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	4296	B8H	O2-C2-N1	-3.22	119.24	122.87
47	S2	1374	5MC	C5-C6-N1	-3.20	120.05	123.34
47	S2	814	5MU	C5-C6-N1	-3.19	120.06	123.34
1	L5	1866	UR3	C6-N1-C2	-3.17	118.95	121.79
1	L5	4220	6MZ	N3-C2-N1	-3.16	123.74	128.68
3	L8	14	OMU	O4-C4-C5	-3.13	119.66	125.16
47	S2	1832	6MZ	N3-C2-N1	-3.12	123.80	128.68
47	S2	484	A2M	N3-C2-N1	-3.10	123.84	128.68
1	L5	3785	A2M	N3-C2-N1	-3.09	123.85	128.68
1	L5	3723	A2M	N3-C2-N1	-3.08	123.86	128.68
1	L5	1524	A2M	N3-C2-N1	-3.07	123.87	128.68
1	L5	1677	PSU	C3'-C2'-C1'	3.07	105.22	101.64
1	L5	2422	OMC	O2-C2-N3	-3.07	117.34	122.33
47	S2	121	OMU	O4-C4-C5	-3.04	119.81	125.16
1	L5	3867	A2M	N3-C2-N1	-3.03	123.94	128.68
1	L5	4500	PSU	O2-C2-N1	-3.03	119.46	122.79
1	L5	4306	OMU	O4-C4-C5	-3.01	119.87	125.16
47	S2	1806	M7A	N3-C2-N1	-2.98	123.95	128.60
1	L5	1866	UR3	C1'-N1-C2	2.95	121.97	116.99
1	L5	3718	A2M	N3-C2-N1	-2.95	124.07	128.68
1	L5	4872	2MG	CM2-N2-C2	-2.94	117.37	123.86
47	S2	1830	UR3	C6-N1-C2	-2.93	119.16	121.79
1	L5	3782	5MC	C5-C4-N3	-2.89	118.55	121.67
1	L5	4628	PSU	O2-C2-N1	-2.89	119.61	122.79
1	L5	4083	5MU	O2-C2-N1	-2.88	118.96	122.79
1	L5	1860	B8H	O2-C2-N1	-2.88	119.63	122.87
1	L5	3782	5MC	C5-C6-N1	-2.88	120.38	123.34
1	L5	1326	A2M	C4-C5-N7	-2.87	106.41	109.40
47	S2	1842	4AC	C5-C4-N3	-2.86	117.98	122.59
1	L5	3869	OMC	O2-C2-N3	-2.83	117.72	122.33
1	L5	1322	1MA	O4'-C1'-C2'	-2.83	102.79	106.93
47	S2	116	OMU	C1'-N1-C2	2.82	122.68	117.57
47	S2	159	A2M	N3-C2-N1	-2.82	124.27	128.68
1	L5	1316	OMG	C5-C6-N1	2.81	118.92	113.95
47	S2	1248	B8N	N3-C2-N1	2.80	120.71	116.76
1	L5	1534	A2M	C4-C5-N7	-2.78	106.50	109.40
1	L5	3909	OMC	O2-C2-N3	-2.78	117.82	122.33
47	S2	27	A2M	C4-C5-N7	-2.75	106.53	109.40
47	S2	1031	A2M	C4-C5-N7	-2.74	106.54	109.40
47	S2	612	PSU	O2-C2-N1	-2.74	119.78	122.79
47	S2	822	PSU	O2-C2-N1	-2.73	119.79	122.79
1	L5	3723	A2M	C4-C5-N7	-2.72	106.57	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	398	A2M	C4-C5-N7	-2.71	106.57	109.40
1	L5	4620	OMU	C2'-C1'-N1	-2.70	108.97	114.22
47	S2	1337	4AC	N4-C4-N3	2.70	118.38	113.85
1	L5	4597	UR3	C6-N1-C2	-2.70	119.37	121.79
47	S2	1842	4AC	C6-C5-C4	2.68	120.24	116.96
1	L5	2050	OMG	C5-C6-N1	2.67	118.67	113.95
1	L5	4450	PSU	O2-C2-N1	-2.67	119.85	122.79
47	S2	1832	6MZ	C4-C5-N7	-2.67	106.61	109.40
1	L5	1322	1MA	N1-C2-N3	-2.67	122.91	126.02
47	S2	159	A2M	C4-C5-N7	-2.67	106.62	109.40
47	S2	1678	A2M	C4-C5-N7	-2.67	106.62	109.40
47	S2	121	OMU	O2-C2-N1	-2.66	119.25	122.79
1	L5	3764	PSU	O2-C2-N1	-2.65	119.87	122.79
1	L5	1883	OMG	C5-C6-N1	2.65	118.62	113.95
1	L5	4447	5MC	O4'-C1'-N1	2.64	114.39	108.36
1	L5	2401	A2M	C4-C5-N7	-2.63	106.66	109.40
1	L5	1517	2MG	C5-C6-N1	2.63	118.60	113.95
1	L5	3729	PSU	O2-C2-N1	-2.63	119.90	122.79
1	L5	4636	PSU	O2-C2-N1	-2.63	119.90	122.79
1	L5	1871	A2M	C4-C5-N7	-2.61	106.68	109.40
1	L5	1683	PSU	C6-N1-C2	-2.59	120.03	122.68
47	S2	823	PSU	O2-C2-N1	-2.58	119.94	122.79
47	S2	484	A2M	C4-C5-N7	-2.58	106.71	109.40
1	L5	4671	B8T	C6-C5-C4	2.58	120.12	116.96
1	L5	4620	OMU	O4-C4-C5	-2.58	120.63	125.16
1	L5	4872	2MG	C8-N7-C5	2.57	107.89	102.99
1	L5	4447	5MC	C5-C4-N3	-2.57	118.90	121.67
1	L5	3718	A2M	C4-C5-N7	-2.57	106.72	109.40
1	L5	2508	PSU	O2-C2-N1	-2.56	119.97	122.79
1	L5	4628	PSU	C6-N1-C2	-2.56	120.07	122.68
47	S2	119	PSU	O2-C2-N1	-2.55	119.98	122.79
47	S2	1219	JMH	C1'-N1-C2	2.55	121.30	116.99
1	L5	4620	OMU	O2-C2-N1	-2.55	119.39	122.79
1	L5	4450	PSU	C6-C5-C4	2.55	119.98	118.20
1	L5	1456	JMH	C6-N1-C2	-2.55	119.51	121.79
1	L5	4415	1MA	C5-C6-N1	2.55	117.69	113.90
1	L5	4335	5MC	C5-C4-N3	-2.54	118.93	121.67
47	S2	1703	OMC	O2-C2-N3	-2.54	118.20	122.33
1	L5	1866	UR3	O2-C2-N3	-2.54	117.76	121.34
1	L5	4872	2MG	C5-C6-N1	2.54	118.43	113.95
1	L5	4370	OMG	C5-C6-N1	2.53	118.43	113.95
1	L5	1683	PSU	O2-C2-N1	-2.53	120.00	122.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	3715	PSU	O2-C2-N1	-2.53	120.01	122.79
1	L5	4530	UR3	O2-C2-N3	-2.53	117.78	121.34
1	L5	373	OMG	C5-C6-N1	2.53	118.41	113.95
1	L5	1316	OMG	C8-N7-C5	2.51	107.78	102.99
1	L5	1322	1MA	C5-C6-N1	2.51	117.64	113.90
1	L5	1326	A2M	O2'-C2'-C1'	-2.51	104.13	109.09
1	L5	3867	A2M	C4-C5-N7	-2.50	106.80	109.40
1	L5	4623	OMG	C5-C6-N1	2.49	118.36	113.95
1	L5	4293	PSU	O2-C2-N1	-2.49	120.05	122.79
1	L5	729	2MG	C5-C6-N1	2.49	118.35	113.95
1	L5	3729	PSU	C6-N1-C2	-2.49	120.14	122.68
1	L5	4442	PSU	O2-C2-N1	-2.48	120.06	122.79
1	L5	4637	OMG	C5-C6-N1	2.48	118.33	113.95
1	L5	3825	A2M	C4-C5-N7	-2.47	106.83	109.40
47	S2	822	PSU	C6-N1-C2	-2.46	120.17	122.68
1	L5	1524	A2M	C4-C5-N7	-2.46	106.83	109.40
1	L5	4403	PSU	O2-C2-N1	-2.46	120.09	122.79
1	L5	1522	OMG	C8-N7-C5	2.45	107.66	102.99
1	L5	3715	PSU	C6-N1-C2	-2.45	120.18	122.68
1	L5	3764	PSU	C6-N1-C2	-2.44	120.19	122.68
47	S2	668	A2M	C4-C5-N7	-2.43	106.86	109.40
1	L5	4571	A2M	C4-C5-N7	-2.43	106.86	109.40
47	S2	166	A2M	C4-C5-N7	-2.43	106.87	109.40
1	L5	4403	PSU	C6-N1-C2	-2.42	120.21	122.68
1	L5	3792	OMG	C5-C6-N1	2.42	118.22	113.95
1	L5	1582	PSU	C5-C6-N1	-2.41	118.49	122.11
47	S2	116	OMU	C6-N1-C2	-2.41	117.90	120.99
47	S2	1337	4AC	O2-C2-N3	-2.41	118.41	122.33
47	S2	1374	5MC	C5-C4-N3	-2.41	119.07	121.67
1	L5	4447	5MC	N1-C2-N3	2.41	123.19	118.81
1	L5	1522	OMG	C5-C6-N1	2.41	118.20	113.95
1	L5	4220	6MZ	C4-C5-N7	-2.41	106.89	109.40
47	S2	822	PSU	O4'-C1'-C2'	2.40	108.53	105.14
1	L5	2364	OMG	C8-N7-C5	2.39	107.54	102.99
1	L5	4196	OMG	C5-C6-N1	2.38	118.15	113.95
1	L5	4306	OMU	C1'-N1-C2	2.37	121.86	117.57
1	L5	4415	1MA	C8-N7-C5	2.37	107.51	102.99
1	L5	2363	A2M	C4-C5-N7	-2.37	106.93	109.40
47	S2	683	OMG	C8-N7-C5	2.37	107.50	102.99
1	L5	4637	OMG	C8-N7-C5	2.36	107.49	102.99
47	S2	509	OMG	C8-N7-C5	2.35	107.46	102.99
1	L5	4536	OMC	O2-C2-N3	-2.34	118.53	122.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L5	729	2MG	C8-N7-C5	2.34	107.44	102.99
1	L5	2364	OMG	C5-C6-N1	2.34	118.08	113.95
1	L5	1625	OMG	C5-C6-N1	2.34	118.08	113.95
1	L5	978	2MG	C5-C6-N1	2.33	118.06	113.95
1	L5	4306	OMU	C6-N1-C2	-2.32	118.02	120.99
47	S2	683	OMG	C5-C6-N1	2.32	118.05	113.95
1	L5	3899	OMG	C5-C6-N1	2.32	118.05	113.95
1	L5	978	2MG	C8-N7-C5	2.32	107.41	102.99
47	S2	644	OMG	C5-C6-N1	2.31	118.04	113.95
47	S2	1248	B8N	C31-N3-C4	2.31	120.72	117.31
1	L5	1883	OMG	O6-C6-C5	-2.31	119.86	124.37
47	S2	612	PSU	C6-N1-C2	-2.31	120.32	122.68
1	L5	3899	OMG	C8-N7-C5	2.31	107.39	102.99
1	L5	2773	OMG	C8-N7-C5	2.30	107.38	102.99
1	L5	373	OMG	C8-N7-C5	2.30	107.37	102.99
1	L5	4623	OMG	C8-N7-C5	2.30	107.37	102.99
1	L5	4196	OMG	C8-N7-C5	2.29	107.36	102.99
47	S2	823	PSU	C6-N1-C2	-2.29	120.34	122.68
1	L5	4870	OMG	C5-C6-N1	2.29	118.00	113.95
1	L5	3785	A2M	C4-C5-N7	-2.28	107.02	109.40
1	L5	4500	PSU	C6-N1-C2	-2.28	120.35	122.68
1	L5	2861	OMC	O2-C2-N3	-2.28	118.62	122.33
1	L5	2508	PSU	C6-N1-C2	-2.28	120.36	122.68
1	L5	2424	OMG	C5-C6-N1	2.27	117.95	113.95
1	L5	4494	OMG	C5-C6-N1	2.26	117.95	113.95
47	S2	644	OMG	C8-N7-C5	2.26	107.30	102.99
1	L5	4483	B8T	C6-C5-C4	2.26	119.72	116.96
1	L5	4636	PSU	C6-C5-C4	2.26	119.78	118.20
47	S2	119	PSU	C6-N1-C2	-2.25	120.38	122.68
47	S2	1374	5MC	O2-C2-N3	-2.25	118.68	122.33
1	L5	3792	OMG	C8-N7-C5	2.24	107.26	102.99
1	L5	2804	OMC	O2-C2-N3	-2.24	118.69	122.33
47	S2	1081	PSU	O4-C4-N3	-2.24	115.83	120.12
1	L5	4370	OMG	C8-N7-C5	2.23	107.25	102.99
1	L5	1883	OMG	C8-N7-C5	2.22	107.22	102.99
1	L5	4636	PSU	O4'-C1'-C2'	2.21	108.26	105.14
47	S2	1830	UR3	O2-C2-N3	-2.21	118.23	121.34
47	S2	509	OMG	C5-C6-N1	2.21	117.85	113.95
1	L5	1322	1MA	C8-N7-C5	2.21	107.19	102.99
47	S2	1219	JMH	C6-N1-C2	-2.20	119.81	121.79
1	L5	4447	5MC	C3'-C2'-C1'	2.20	105.60	101.43
1	L5	1517	2MG	C8-N7-C5	2.20	107.18	102.99

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	S2	517	OMC	O2-C2-N3	-2.19	118.78	122.33
1	L5	4494	OMG	C8-N7-C5	2.18	107.14	102.99
1	L5	4293	PSU	C6-N1-C2	-2.17	120.46	122.68
47	S2	1248	B8N	O36-C34-O35	-2.17	119.16	124.09
47	S2	1830	UR3	C1'-N1-C6	-2.17	116.11	120.84
1	L5	2773	OMG	C5-C6-N1	2.17	117.78	113.95
47	S2	1806	M7A	C2-N1-C6	2.17	122.49	118.77
1	L5	1860	B8H	CN1-N1-C2	2.16	120.64	117.94
47	S2	121	OMU	C6-N1-C2	-2.15	118.24	120.99
1	L5	1625	OMG	C8-N7-C5	2.15	107.08	102.99
1	L5	4442	PSU	C6-C5-C4	2.14	119.70	118.20
1	L5	4335	5MC	CM5-C5-C6	-2.14	119.99	122.85
1	L5	4870	OMG	C8-N7-C5	2.14	107.07	102.99
1	L5	1517	2MG	O6-C6-C5	-2.14	120.19	124.37
47	S2	1337	4AC	C6-C5-C4	2.14	119.58	116.96
1	L5	4523	A2M	C4-C5-N7	-2.14	107.17	109.40
1	L5	2050	OMG	C8-N7-C5	2.13	107.05	102.99
1	L5	4450	PSU	C6-N1-C2	-2.13	120.51	122.68
1	L5	3887	OMC	O2-C2-N3	-2.12	118.88	122.33
1	L5	4671	B8T	O2-C2-N3	-2.12	118.88	122.33
47	S2	1842	4AC	O2-C2-N3	-2.12	118.88	122.33
47	S2	1031	A2M	C2-N1-C6	2.12	122.37	118.75
47	S2	814	5MU	C5M-C5-C4	2.11	121.08	118.77
1	L5	4335	5MC	O2-C2-N3	-2.10	118.91	122.33
47	S2	1081	PSU	C6-N1-C2	-2.09	120.55	122.68
47	S2	1243	PSU	C5-C6-N1	-2.09	118.98	122.11
47	S2	612	PSU	O4'-C1'-C2'	2.09	108.08	105.14
1	L5	4442	PSU	O4'-C1'-C2'	2.07	108.06	105.14
1	L5	4531	PSU	C5-C6-N1	-2.06	119.03	122.11
47	S2	814	5MU	O2-C2-N1	-2.05	120.06	122.79
1	L5	4306	OMU	O2-C2-N3	-2.05	117.69	121.50
1	L5	4442	PSU	C6-N1-C2	-2.03	120.61	122.68
47	S2	1081	PSU	O2-C2-N1	-2.02	120.56	122.79
47	S2	1842	4AC	O7-C7-CM7	-2.02	118.31	122.06
1	L5	2050	OMG	O6-C6-C5	-2.01	120.44	124.37

There are no chirality outliers.

All (113) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	L5	729	2MG	N1-C2-N2-CM2
1	L5	729	2MG	N3-C2-N2-CM2

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Mol	Chain	Res	Type	Atoms
1	L5	1883	OMG	C1'-C2'-O2'-CM2
1	L5	2424	OMG	O4'-C4'-C5'-O5'
1	L5	2424	OMG	C3'-C4'-C5'-O5'
1	L5	3729	PSU	O4'-C4'-C5'-O5'
1	L5	3762	B8H	O4'-C4'-C5'-O5'
1	L5	4403	PSU	O4'-C1'-C5-C4
1	L5	4403	PSU	O4'-C1'-C5-C6
1	L5	4415	1MA	O4'-C4'-C5'-O5'
1	L5	4415	1MA	C3'-C4'-C5'-O5'
1	L5	4500	PSU	C3'-C4'-C5'-O5'
1	L5	4500	PSU	O4'-C4'-C5'-O5'
1	L5	4523	A2M	O4'-C4'-C5'-O5'
1	L5	4531	PSU	O4'-C4'-C5'-O5'
1	L5	4636	PSU	C2'-C1'-C5-C6
1	L5	4636	PSU	C3'-C4'-C5'-O5'
1	L5	4636	PSU	O4'-C4'-C5'-O5'
1	L5	4637	OMG	O4'-C4'-C5'-O5'
1	L5	4870	OMG	O4'-C4'-C5'-O5'
1	L5	4870	OMG	C3'-C4'-C5'-O5'
47	S2	116	OMU	C3'-C4'-C5'-O5'
47	S2	116	OMU	O4'-C4'-C5'-O5'
47	S2	668	A2M	C3'-C4'-C5'-O5'
47	S2	683	OMG	O4'-C4'-C5'-O5'
47	S2	683	OMG	C3'-C4'-C5'-O5'
47	S2	1243	PSU	C3'-C4'-C5'-O5'
47	S2	1243	PSU	O4'-C4'-C5'-O5'
47	S2	1248	B8N	O4'-C4'-C5'-O5'
47	S2	1337	4AC	O7-C7-N4-C4
47	S2	1337	4AC	CM7-C7-N4-C4
47	S2	1832	6MZ	N1-C6-N6-C9
47	S2	1851	MA6	O4'-C4'-C5'-O5'
1	L5	3701	OMC	C2'-C1'-N1-C6
1	L5	1582	PSU	C3'-C4'-C5'-O5'
1	L5	1582	PSU	O4'-C4'-C5'-O5'
1	L5	3729	PSU	C3'-C4'-C5'-O5'
1	L5	3762	B8H	C3'-C4'-C5'-O5'
1	L5	3785	A2M	O4'-C4'-C5'-O5'
1	L5	3785	A2M	C3'-C4'-C5'-O5'
1	L5	3867	A2M	C3'-C4'-C5'-O5'
1	L5	4523	A2M	C3'-C4'-C5'-O5'
1	L5	4531	PSU	C3'-C4'-C5'-O5'
1	L5	4637	OMG	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
47	S2	509	OMG	C3'-C4'-C5'-O5'
47	S2	1248	B8N	C3'-C4'-C5'-O5'
47	S2	1851	MA6	C3'-C4'-C5'-O5'
47	S2	1830	UR3	O4'-C1'-N1-C2
1	L5	398	A2M	O4'-C4'-C5'-O5'
1	L5	1866	UR3	O4'-C4'-C5'-O5'
1	L5	3867	A2M	O4'-C4'-C5'-O5'
1	L5	4220	6MZ	O4'-C4'-C5'-O5'
1	L5	4220	6MZ	C3'-C4'-C5'-O5'
1	L5	4494	OMG	O4'-C4'-C5'-O5'
1	L5	4494	OMG	C3'-C4'-C5'-O5'
47	S2	668	A2M	O4'-C4'-C5'-O5'
1	L5	3701	OMC	C2'-C1'-N1-C2
47	S2	1703	OMC	O4'-C4'-C5'-O5'
6	LC	333	MLZ	CD-CE-NZ-CM
47	S2	1830	UR3	O4'-C1'-N1-C6
1	L5	398	A2M	C3'-C4'-C5'-O5'
1	L5	3899	OMG	C3'-C4'-C5'-O5'
1	L5	4530	UR3	C3'-C4'-C5'-O5'
1	L5	4293	PSU	O4'-C4'-C5'-O5'
47	S2	1851	MA6	C5-C6-N6-C10
1	L5	1866	UR3	C3'-C4'-C5'-O5'
1	L5	1883	OMG	C3'-C4'-C5'-O5'
47	S2	116	OMU	C3'-C2'-O2'-CM2
47	S2	509	OMG	O4'-C4'-C5'-O5'
47	S2	1832	6MZ	C5-C6-N6-C9
1	L5	4447	5MC	C2'-C1'-N1-C6
1	L5	3899	OMG	O4'-C4'-C5'-O5'
1	L5	4293	PSU	C3'-C4'-C5'-O5'
1	L5	4872	2MG	O4'-C4'-C5'-O5'
3	L8	14	OMU	C1'-C2'-O2'-CM2
47	S2	1248	B8N	C31-C32-C33-N34
1	L5	1534	A2M	C4'-C5'-O5'-P
47	S2	644	OMG	C4'-C5'-O5'-P
1	L5	4450	PSU	O4'-C4'-C5'-O5'
1	L5	4530	UR3	O4'-C4'-C5'-O5'
1	L5	3701	OMC	O4'-C1'-N1-C6
1	L5	4447	5MC	O4'-C1'-N1-C6
1	L5	3764	PSU	C4'-C5'-O5'-P
47	S2	1248	B8N	N3-C31-C32-C33
6	LC	333	MLZ	CG-CD-CE-NZ
1	L5	3701	OMC	O4'-C1'-N1-C2

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Mol	Chain	Res	Type	Atoms
1	L5	4447	5MC	O4'-C1'-N1-C2
1	L5	3887	OMC	C4'-C5'-O5'-P
1	L5	1326	A2M	C4'-C5'-O5'-P
1	L5	4500	PSU	C4'-C5'-O5'-P
1	L5	4870	OMG	C4'-C5'-O5'-P
1	L5	4450	PSU	O4'-C1'-C5-C4
47	S2	1703	OMC	C3'-C4'-C5'-O5'
1	L5	1322	1MA	O4'-C4'-C5'-O5'
47	S2	1851	MA6	C5-C6-N6-C9
1	L5	1883	OMG	O4'-C4'-C5'-O5'
1	L5	4872	2MG	C3'-C4'-C5'-O5'
1	L5	3899	OMG	C1'-C2'-O2'-CM2
1	L5	1625	OMG	C4'-C5'-O5'-P
1	L5	729	2MG	O4'-C4'-C5'-O5'
1	L5	2364	OMG	O4'-C4'-C5'-O5'
1	L5	1677	PSU	O4'-C1'-C5-C6
1	L5	4636	PSU	O4'-C1'-C5-C6
1	L5	4447	5MC	C2'-C1'-N1-C2
1	L5	3867	A2M	C4'-C5'-O5'-P
1	L5	2422	OMC	O4'-C4'-C5'-O5'
1	L5	4450	PSU	C3'-C4'-C5'-O5'
47	S2	1851	MA6	C4'-C5'-O5'-P
1	L5	2401	A2M	C3'-C2'-O2'-CM'
1	L5	3899	OMG	C3'-C2'-O2'-CM2
1	L5	1322	1MA	C3'-C4'-C5'-O5'
1	L5	1534	A2M	O4'-C4'-C5'-O5'
47	S2	1081	PSU	C4'-C5'-O5'-P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 448 ligands modelled in this entry, 446 are monoatomic - leaving 2 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
83	HMT	L5	5374	-	40,43,43	1.89	7 (17%)	41,66,66	1.49	6 (14%)
85	HYG	S2	2039	-	35,39,39	0.97	1 (2%)	43,60,60	1.37	5 (11%)

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
83	HMT	L5	5374	-	-	6/27/74/74	0/5/5/5
85	HYG	S2	2039	-	-	3/12/87/87	0/4/4/4

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
83	L5	5374	HMT	C5-C4	-7.13	1.40	1.51
83	L5	5374	HMT	C7-C6	-5.88	1.38	1.51
85	S2	2039	HYG	O28-C23	3.83	1.45	1.40
83	L5	5374	HMT	C3-C2	-3.80	1.40	1.50
83	L5	5374	HMT	C13-C14	-2.81	1.33	1.38
83	L5	5374	HMT	C16-C15	-2.71	1.33	1.38
83	L5	5374	HMT	C12-C9	-2.37	1.50	1.54
83	L5	5374	HMT	C14-C15	-2.16	1.33	1.39

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	S2	2039	HYG	O22-C17-C12	-4.70	96.07	103.58
83	L5	5374	HMT	C25-C24-C20	-3.88	109.71	115.65
83	L5	5374	HMT	C7-C6-C16	-3.71	111.24	119.42
85	S2	2039	HYG	O18-C6-C1	3.55	116.73	107.28
83	L5	5374	HMT	C6-C5-C4	3.30	132.61	121.06
85	S2	2039	HYG	C13-O18-C6	3.17	125.80	117.96
85	S2	2039	HYG	O8-C1-C2	-2.90	104.49	109.81
83	L5	5374	HMT	C7-C6-C5	2.34	130.25	122.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
83	L5	5374	HMT	C3-O4-C19	-2.26	113.68	117.24
83	L5	5374	HMT	C10-N1-C9	-2.14	101.57	107.71
85	S2	2039	HYG	O29-C12-C17	-2.05	100.31	103.58

There are no chirality outliers.

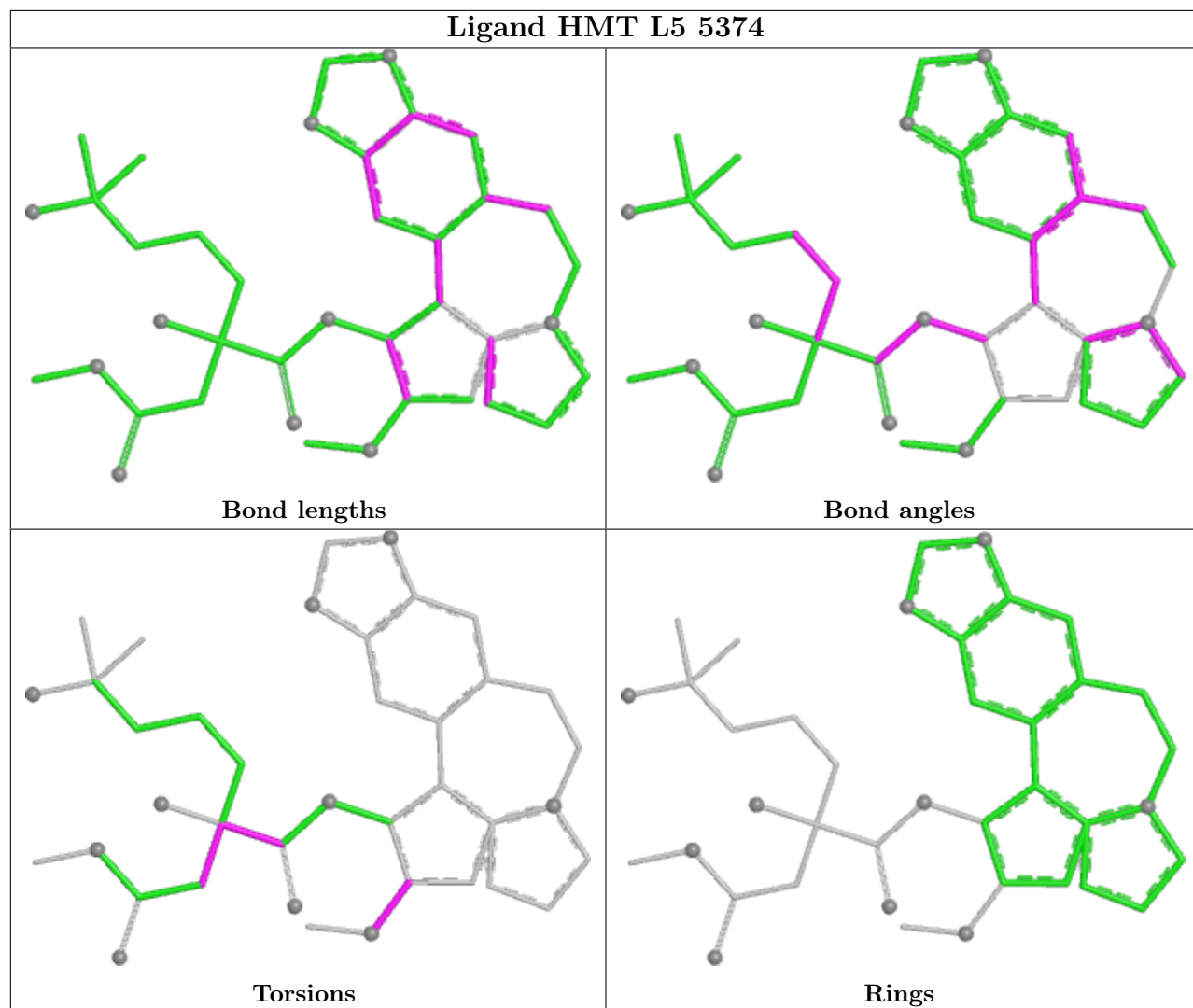
All (9) torsion outliers are listed below:

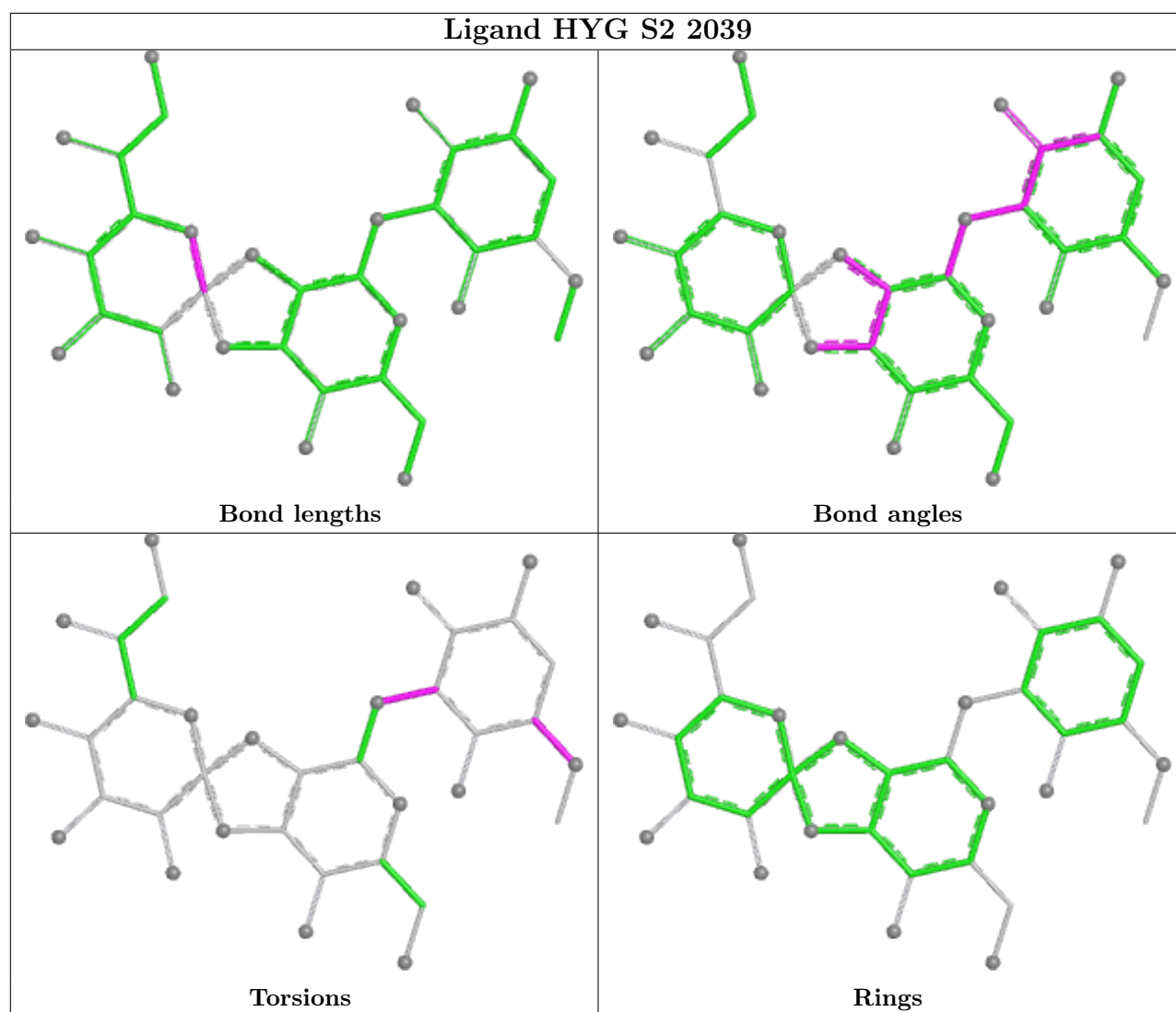
Mol	Chain	Res	Type	Atoms
83	L5	5374	HMT	C1-C2-O3-C18
83	L5	5374	HMT	C3-C2-O3-C18
83	L5	5374	HMT	C19-C20-C21-C22
83	L5	5374	HMT	O6-C20-C21-C22
85	S2	2039	HYG	C5-C4-N9-C10
85	S2	2039	HYG	C1-C6-O18-C13
83	L5	5374	HMT	C24-C20-C21-C22
85	S2	2039	HYG	C3-C4-N9-C10
83	L5	5374	HMT	O4-C19-C20-C24

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
1	L5	10
47	S2	4
30	Lb	1
8	LE	1
54	SH	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	Lb	76:VAL	C	89:ALA	N	34.87
1	LE	76:ALA	C	88:VAL	N	26.61
1	S2	753:C	O3'	785:C	P	24.68
1	L5	2910:G	O3'	3584:C	P	22.67
1	S2	698:G	O3'	730:C	P	17.52
1	L5	519:C	O3'	642:G	P	17.50
1	L5	760:G	O3'	903:C	P	15.47
1	L5	4776:G	O3'	4858:C	P	15.05
1	S2	739:C	O3'	746:C	P	14.29
1	L5	2113:G	O3'	2249:C	P	13.33
1	L5	996:G	O3'	1047:C	P	12.79
1	L5	1222:A	O3'	1234:G	P	11.84
1	L5	1051:G	O3'	1064:G	P	11.72
1	SH	107:LYS	C	111:LYS	N	10.30
1	L5	1709:C	O3'	1714:C	P	8.37
1	L5	1100:U	O3'	1167:C	P	7.56
1	S2	225:G	O3'	287:U	P	7.18

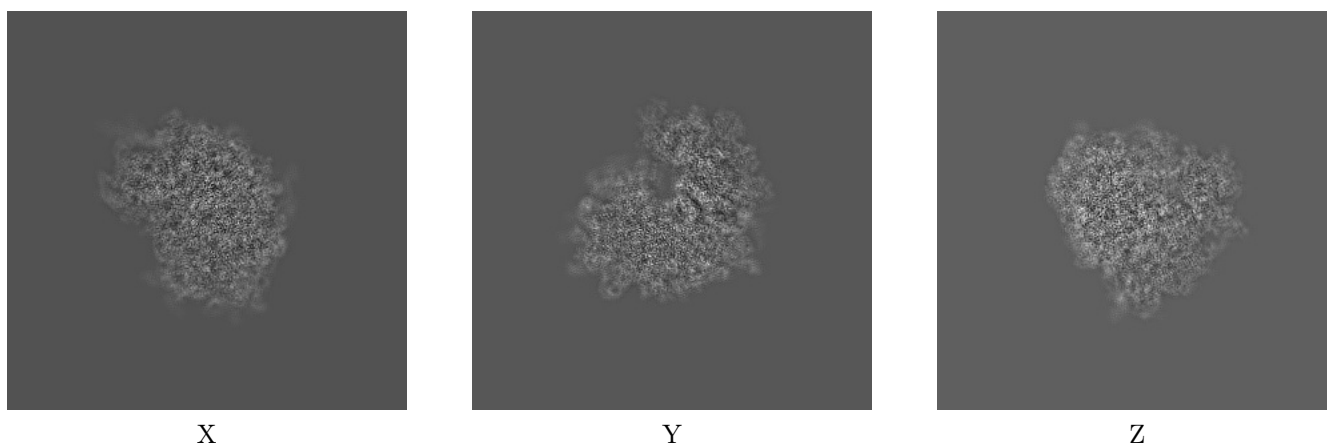
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-3883. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

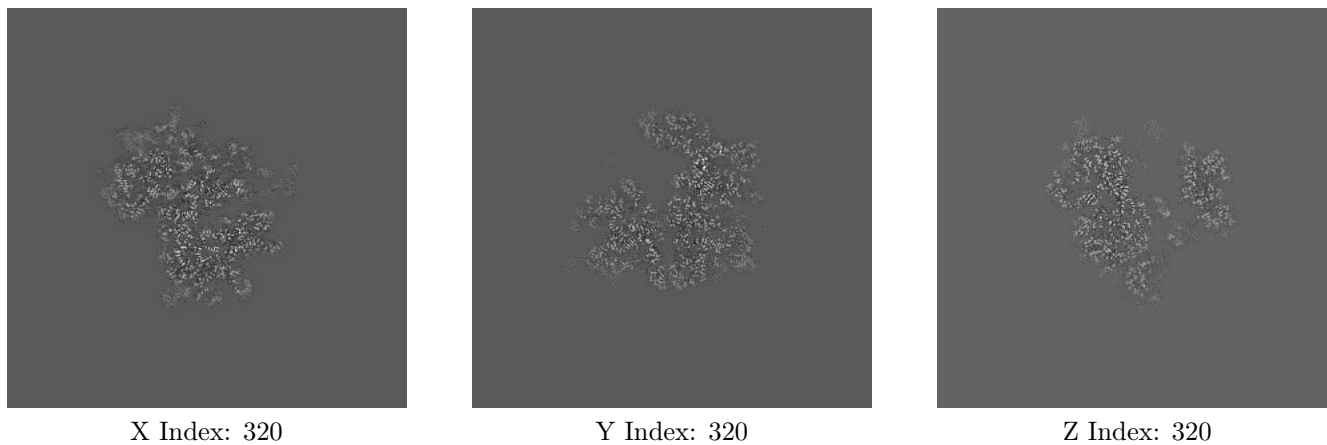
6.1.1 Primary map



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

6.2 Central slices [i](#)

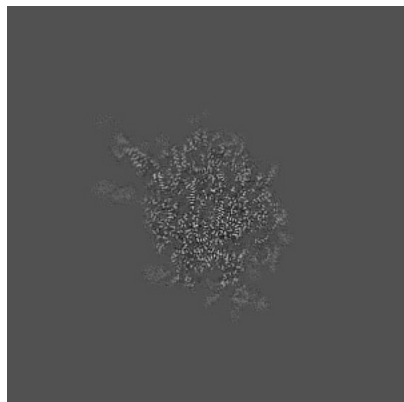
6.2.1 Primary map



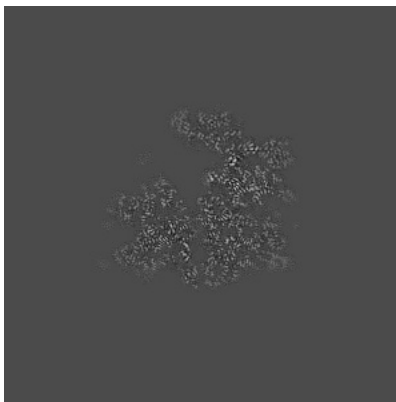
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

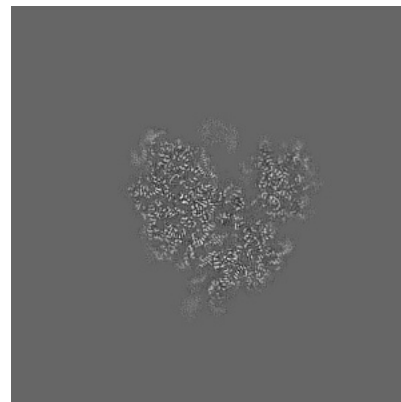
6.3.1 Primary map



X Index: 286



Y Index: 318

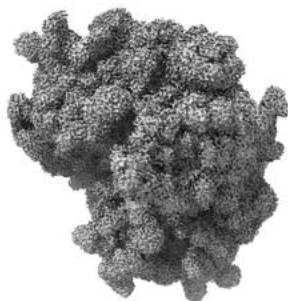


Z Index: 350

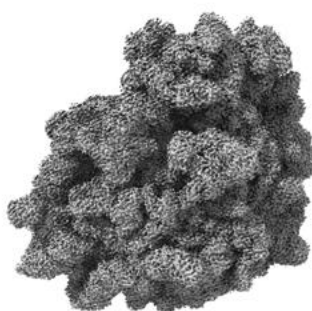
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

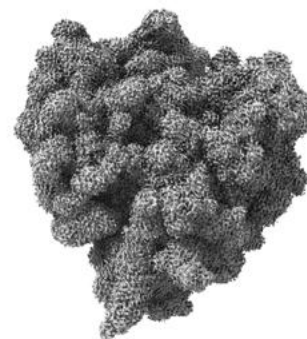
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.007. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

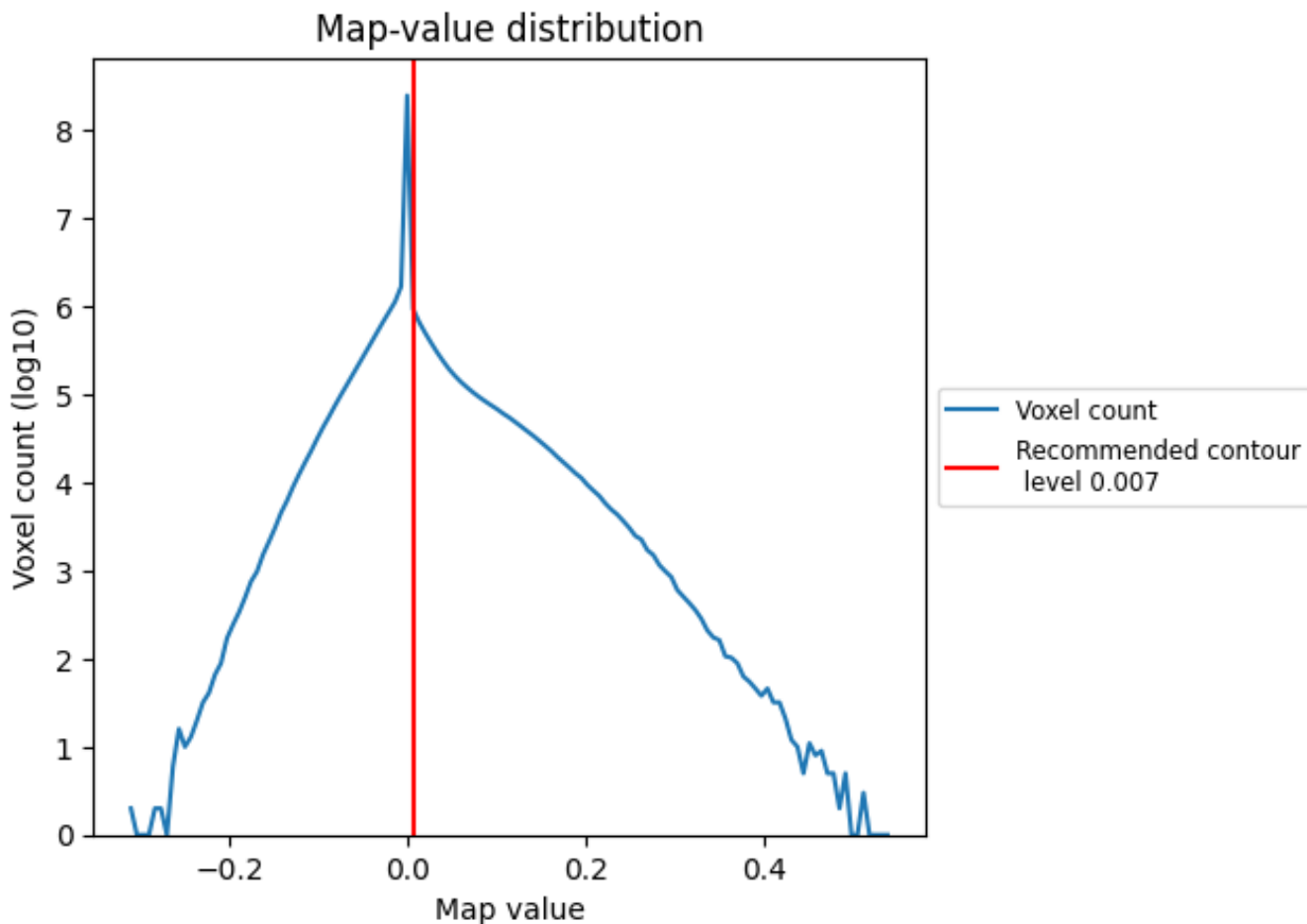
6.5 Mask visualisation

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

7 Map analysis [i](#)

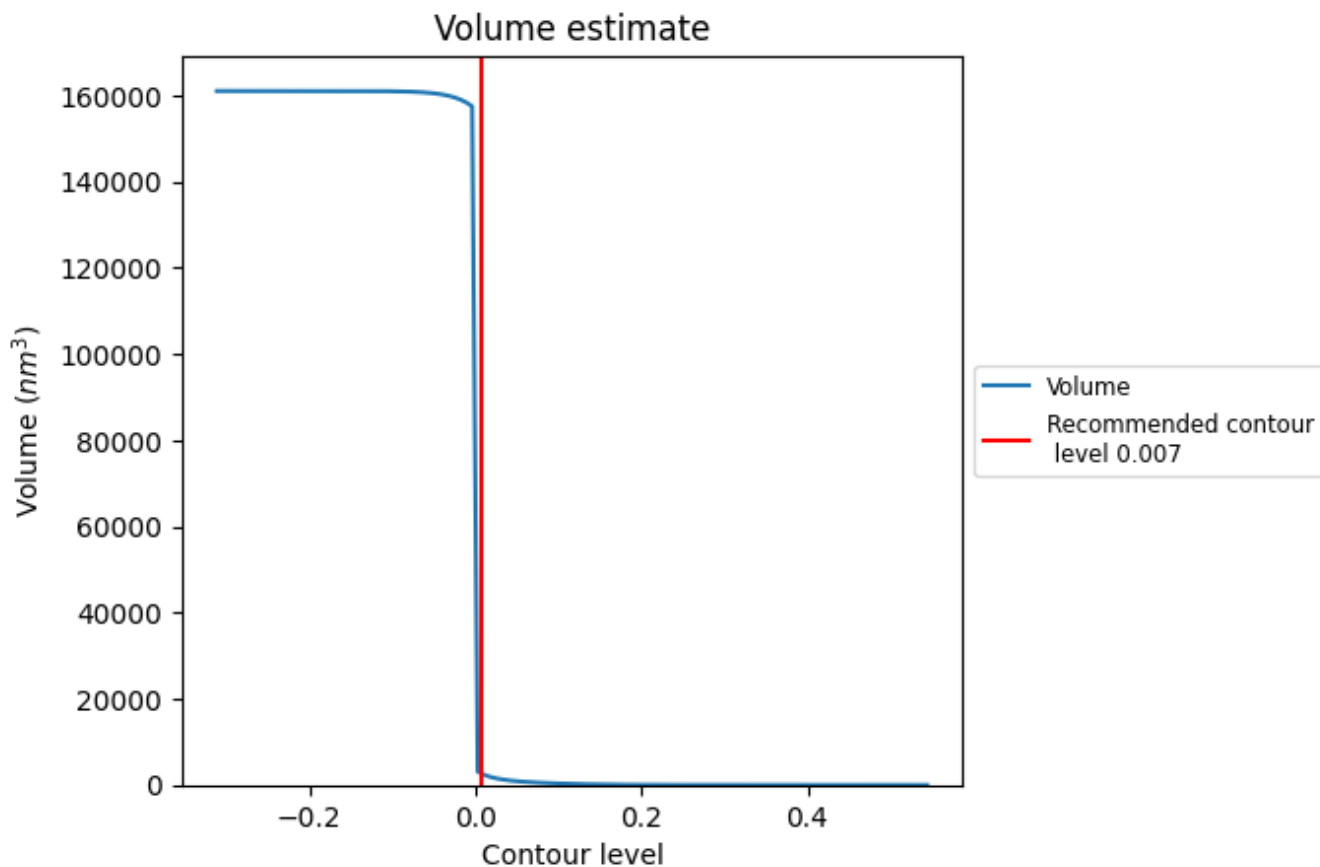
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

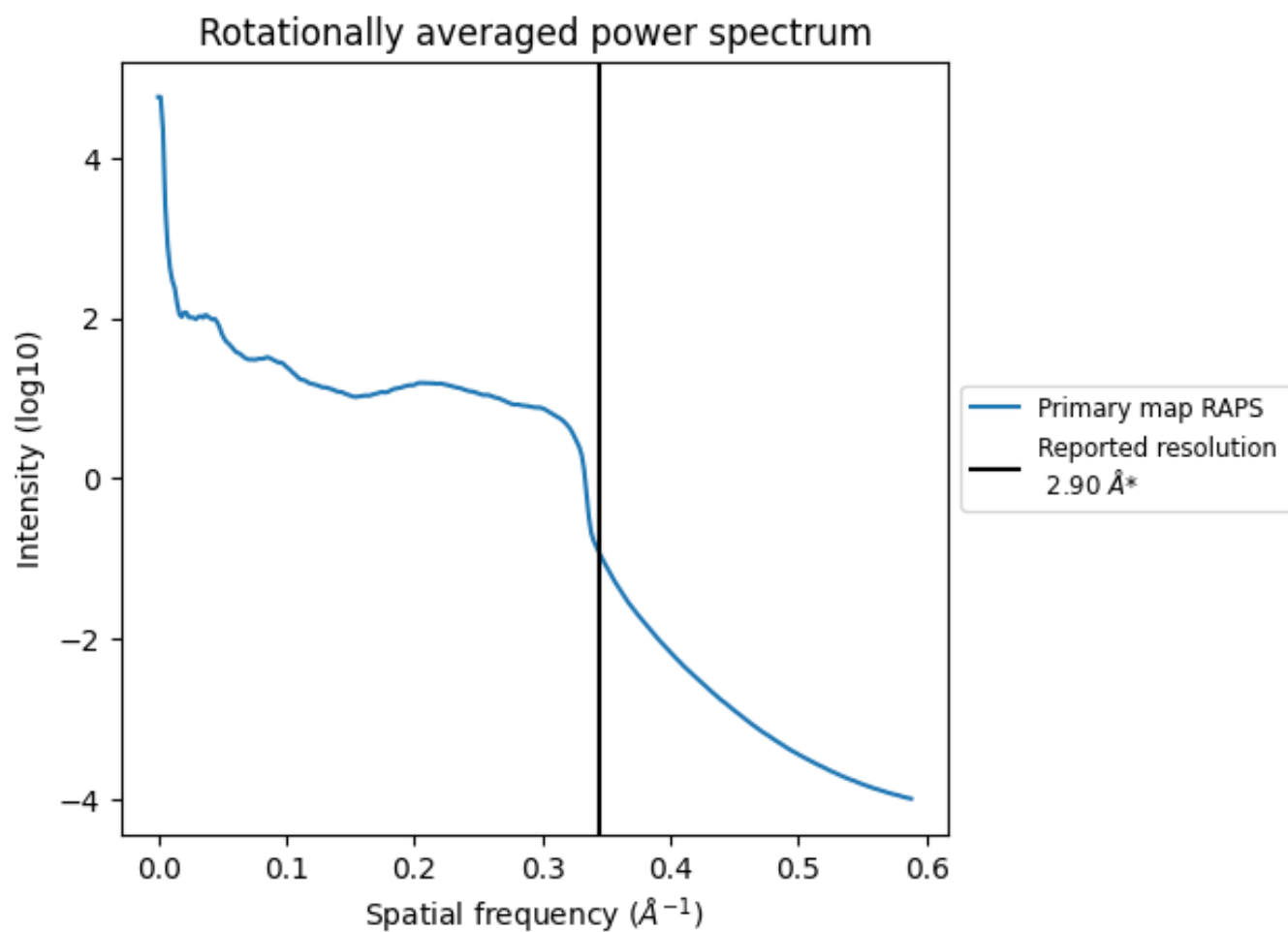
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2699 nm^3 ; this corresponds to an approximate mass of 2438 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](#)

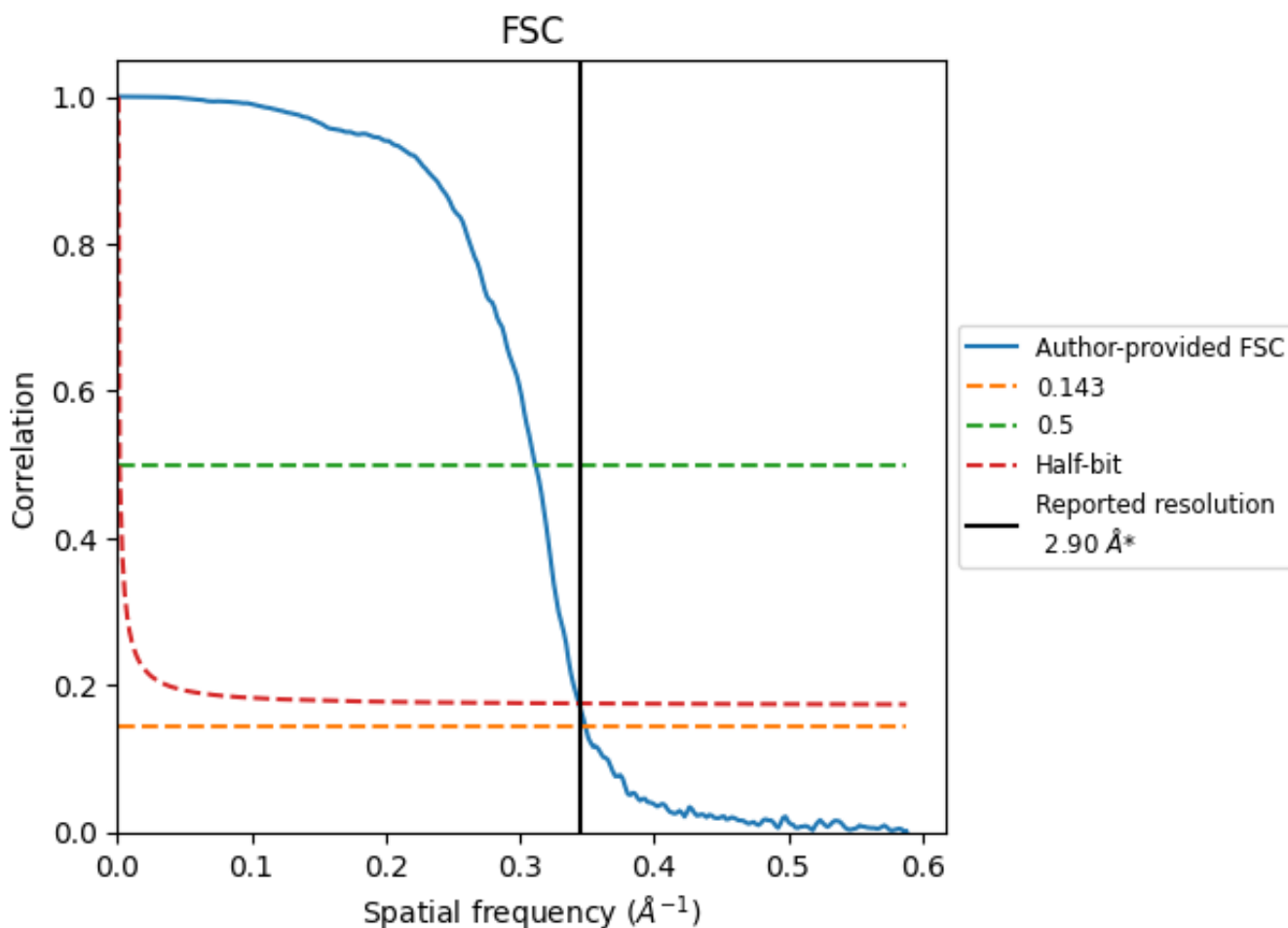


*Reported resolution corresponds to spatial frequency of 0.345\AA^{-1}

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.345 Å⁻¹

8.2 Resolution estimates [i](#)

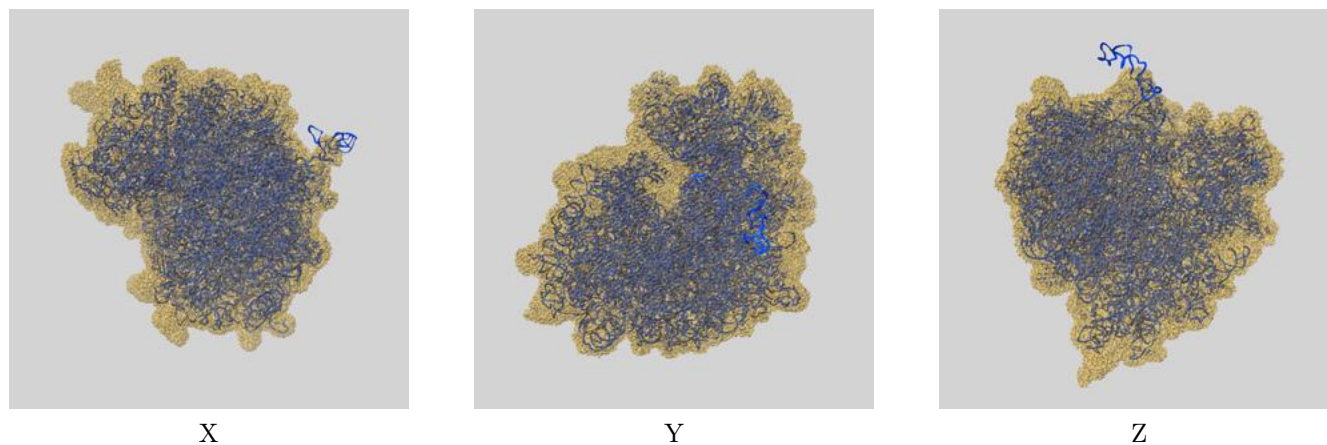
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.87	3.21	2.91
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

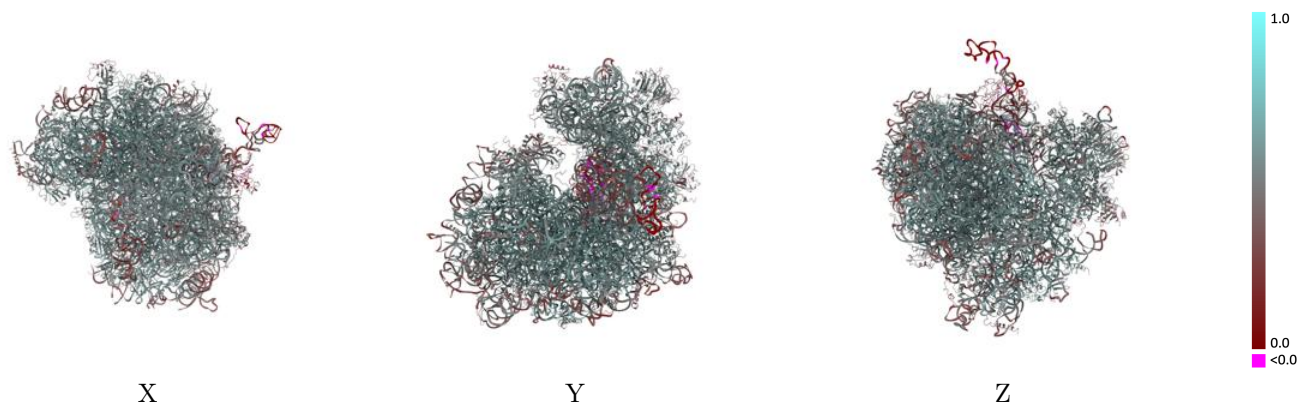
This section contains information regarding the fit between EMDB map EMD-3883 and PDB model 6QZP. Per-residue inclusion information can be found in section 3 on page 22.

9.1 Map-model overlay [i](#)



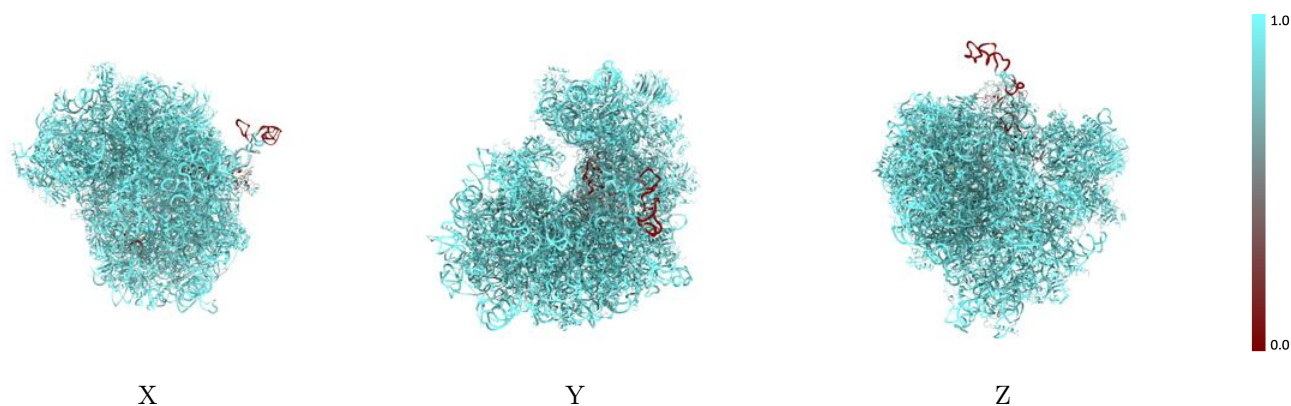
The images above show the 3D surface view of the map at the recommended contour level 0.007 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



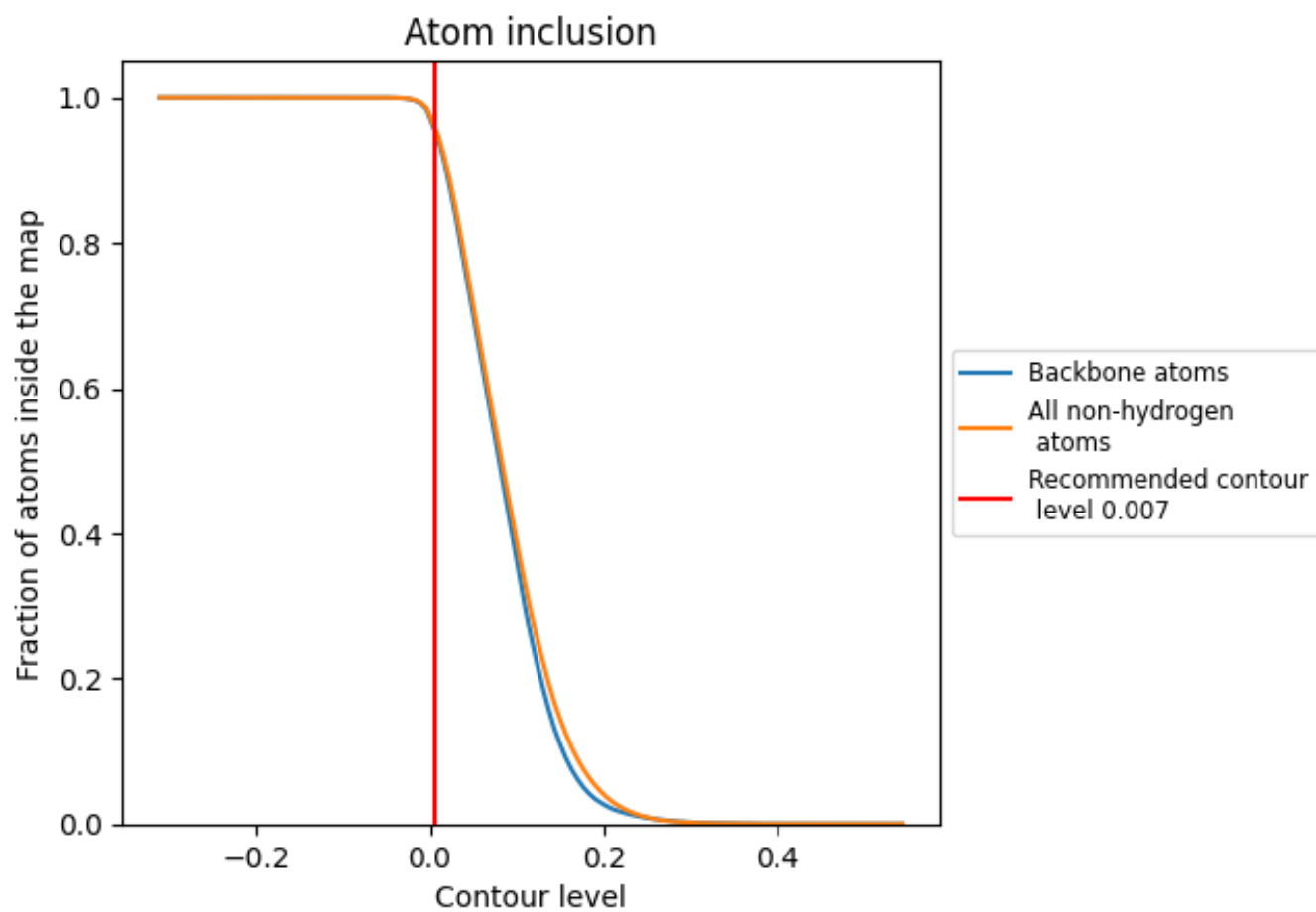
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.007).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 96% 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 (0.007) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9560	 0.5370
L5	 0.9673	 0.5430
L7	 0.9918	 0.5690
L8	 0.9777	 0.5720
LA	 0.9673	 0.5850
LB	 0.9655	 0.5610
LC	 0.9668	 0.5650
LD	 0.9563	 0.5110
LE	 0.9405	 0.5010
LF	 0.9524	 0.5750
LG	 0.9503	 0.5050
LH	 0.9669	 0.5520
LI	 0.9218	 0.5260
LJ	 0.9189	 0.4380
LL	 0.9547	 0.5320
LM	 0.9720	 0.5590
LN	 0.9741	 0.5990
LO	 0.9693	 0.5820
LP	 0.9718	 0.5800
LQ	 0.9613	 0.5770
LR	 0.9540	 0.5310
LS	 0.9807	 0.5840
LT	 0.9660	 0.5590
LU	 0.9418	 0.4470
LV	 0.9687	 0.5640
LW	 0.8980	 0.4490
LX	 0.9530	 0.5540
LY	 0.9583	 0.5470
LZ	 0.9627	 0.5260
La	 0.9752	 0.5890
Lb	 0.9271	 0.5040
Lc	 0.9491	 0.5140
Ld	 0.9557	 0.5430
Le	 0.9617	 0.5860
Lf	 0.9680	 0.5880













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Chain	Atom inclusion	Q-score
Lg	 0.9586	 0.5570
Lh	 0.9602	 0.5420
Li	 0.9649	 0.5340
Lj	 0.9718	 0.5940
Lk	 0.9587	 0.4870
Ll	 0.9598	 0.5650
Lm	 0.9592	 0.5600
Ln	 0.9474	 0.5760
Lo	 0.9642	 0.5550
Lp	 0.9579	 0.5650
Lr	 0.9626	 0.5490
Lz	 0.5029	 0.1930
S2	 0.9823	 0.5540
S6	 0.4869	 0.2120
SA	 0.9688	 0.5320
SB	 0.9596	 0.5330
SC	 0.9622	 0.5510
SD	 0.9413	 0.5010
SE	 0.9674	 0.5650
SF	 0.9182	 0.5040
SG	 0.9542	 0.4980
SH	 0.9388	 0.4620
SI	 0.9539	 0.5330
SJ	 0.9597	 0.5480
SK	 0.9627	 0.5030
SL	 0.9447	 0.5480
SM	 0.8696	 0.3480
SN	 0.9625	 0.5610
SO	 0.9314	 0.5240
SP	 0.9525	 0.5090
SQ	 0.9412	 0.5360
SR	 0.9623	 0.5060
SS	 0.9462	 0.5050
ST	 0.9556	 0.5340
SU	 0.9510	 0.4970
SV	 0.9775	 0.5480
SW	 0.9574	 0.5670
SX	 0.9655	 0.5670
SY	 0.9469	 0.5300
SZ	 0.9365	 0.4770
Sa	 0.9544	 0.5380
Sb	 0.9374	 0.5080

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Chain	Atom inclusion	Q-score
Sc	 0.9198	 0.4630
Sd	 0.9480	 0.5570
Se	 0.9077	 0.4930
Sf	 0.9382	 0.4310
Sg	 0.9440	 0.4810