



## Full wwPDB EM Validation Report ⓘ

Apr 16, 2024 – 02:44 pm BST

PDB ID : 8CDL  
EMDB ID : EMD-16591  
Title : 80S *S. cerevisiae* ribosome with ligands in hybrid-2 pre-translocation (PRE-H2) complex  
Authors : Milicevic, N.; Jenner, L.; Myasnikov, A.; Yusupov, M.; Yusupova, G.  
Deposited on : 2023-01-31  
Resolution : 2.72 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

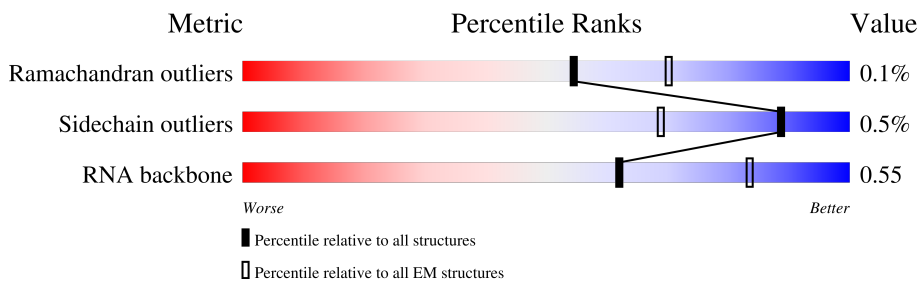
EMDB validation analysis : 0.0.1.dev92  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson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

# 1 Overall quality at a glance

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

The reported resolution of this entry is 2.72 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	0	135	
2	1	108	
3	2	119	
4	3	82	
5	4	67	
6	5	56	
7	6	63	
8	7	319	
9	8	152	

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Mol	Chain	Length	Quality of chain
10	A	199	98%
11	AA	3396	79% 15% 6%
12	B	184	84% 16%
13	BB	121	91% 9%
14	Bb	76	59% 41%
15	C	186	99%
16	CC	158	86% 14%
17	Cc	77	81% 19%
18	D	189	93% 7%
19	DD	312	63% 37%
20	Dd	39	33% 64%
21	E	172	100%
22	EE	254	99%
23	Ee	165	95%
24	F	160	99%
25	FF	387	99%
26	G	121	80% 20%
27	GG	362	99%
28	H	129	100%
29	HH	297	100%
30	I	155	41% 59%
31	II	176	88% 12%
32	J	142	85% 15%
33	JJ	244	91% 9%
34	K	127	97%

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Mol	Chain	Length	Quality of chain
35	KK	256	91% 9%
36	L	136	99% ..
37	LL	191	98% .
38	M	149	99% ..
39	MM	221	97% .
40	N	59	97% ..
41	NN	174	97% .
42	O	105	92% 8%
43	OO	199	96% ..
44	P	113	96% .
45	PP	138	99% .
46	Pp	2	100%
47	Q	130	98% .
48	QQ	204	100%
49	R	107	99% .
50	S	121	90% 10%
51	T	120	99% .
52	U	100	98% ..
53	V	88	95% 5%
54	W	78	99% .
55	X	51	98% .
56	Y	128	41% 59%
57	Z	25	100%
58	a	106	95% ..
59	b	92	99% .

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Mol	Chain	Length	Quality of chain
60	c	1800	72% 16% 11%
61	d	252	82% 18%
62	e	255	83% 17%
63	f	254	85% 15%
64	g	240	86% 14%
65	h	261	99% .
66	i	225	88% . 12%
67	j	236	92% . 7%
68	k	190	96% ..
69	l	200	91% . 8%
70	m	197	94% 6%
71	n	105	85% .. 13%
72	o	156	90% . 9%
73	p	151	99% .
74	q	137	93% 7%
75	r	142	73% 27%
76	s	143	95% ..
77	t	136	79% 9% . 11%
78	u	146	98% ..
79	v	144	99% ..
80	w	121	80% . 17%
81	x	87	99% .
82	y	130	99% .
83	z	145	99% .

## 2 Entry composition

There are 88 unique types of molecules in this entry. The entry contains 201553 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	0	134	1073	676	208	189	0	0

- Molecule 2 is a protein called 40S ribosomal protein S25-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	1	70	563	360	104	99	0	0

- Molecule 3 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	97	769	475	160	129	5	0	0

- Molecule 4 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	81	610	382	110	113	5	0	0

- Molecule 5 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	63	497	306	99	91	1	0	0

- Molecule 6 is a protein called HLJ1\_G0030400.mRNA.1.CDS.1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	5	53	442	274	92	72	4	0	0

- Molecule 7 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	6	53	427	269	88	69	1	0	0

- Molecule 8 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	7	318	2436	1541	418	469	8	0	0

- Molecule 9 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	8	36	276	173	54	45	4	0	0

- Molecule 10 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	A	197	1555	1003	289	262	1	0	0

- Molecule 11 is a RNA chain called 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
11	AA	3190	68285	30524	12313	22258	3190	0	0

- Molecule 12 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	B	154	1222	761	237	224	0	0

- Molecule 13 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
13	BB	121	2579	1152	461	845	121	0	0

- Molecule 14 is a RNA chain called Transfer RNA Phe.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
14	Bb	76	1638	736	294	533	75	0	0

- Molecule 15 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	C	185	1441	908	290	241	2	0	0

- Molecule 16 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
16	CC	158	3353	1500	586	1109	158	0	0

- Molecule 17 is a RNA chain called Transfer RNA fMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
17	Cc	77	1644	732	298	537	77	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Cc	18	C	U	conflict	GB 170517292

- Molecule 18 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
18	D	176	1423	875	308	240	0	0

- Molecule 19 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	DD	197	1531	980	266	281	4	0	0

- Molecule 20 is a RNA chain called Messenger RNA.



Mol	Chain	Residues	Atoms					AltConf	Trace
20	Dd	14	Total	C	N	O	P	0	0
			298	134	52	98	14		

- Molecule 21 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	E	172	Total	C	N	O	S	0	0
			1445	930	267	244	4		

- Molecule 22 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	EE	252	Total	C	N	O	S	0	0
			1914	1191	388	334	1		

- Molecule 23 is a protein called 60S ribosomal protein L12-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Ee	158	Total	C	N	O	S	0	0
			1196	750	216	228	2		

- Molecule 24 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	F	159	Total	C	N	O	S	0	0
			1276	805	246	221	4		

- Molecule 25 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	FF	386	Total	C	N	O	S	0	0
			3075	1950	584	533	8		

- Molecule 26 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	G	97	Total	C	N	O	0	0
			770	499	126	145		

- Molecule 27 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	GG	361	Total	C	N	O	S	0	0
			2748	1729	522	494	3		

- Molecule 28 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	H	129	Total	C	N	O	S	0	0
			963	607	180	169	7		

- Molecule 29 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	HH	296	Total	C	N	O	S	0	0
			2375	1501	414	458	2		

- Molecule 30 is a protein called 60S ribosomal protein L24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	I	63	Total	C	N	O	S	0	0
			521	336	102	82	1		

- Molecule 31 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	II	155	Total	C	N	O	S	0	0
			1230	795	221	213	1		

- Molecule 32 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	J	120	Total	C	N	O	S	0	0
			959	617	168	172	2		

- Molecule 33 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	JJ	222	Total	C	N	O	S	0	0
			1784	1151	324	308	1		

- Molecule 34 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	K	126	Total	C	N	O	0	0
			993	625	192	176		

- Molecule 35 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	KK	233	Total	C	N	O	S	0	0
			1804	1151	323	327	3		

- Molecule 36 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	L	135	Total	C	N	O	0	0
			1092	710	202	180		

- Molecule 37 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	LL	191	Total	C	N	O	S	0	0
			1518	963	274	277	4		

- Molecule 38 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	M	148	Total	C	N	O	S	0	0
			1173	749	231	190	3		

- Molecule 39 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	MM	215	Total	C	N	O	S	0	0
			1743	1102	331	303	7		

- Molecule 40 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	N	58	Total	C	N	O	0	0
			462	289	100	73		

- Molecule 41 is a protein called 60S ribosomal protein L11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	NN	169	Total	C	N	O	S	0	0
			1353	847	253	249	4		

- Molecule 42 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	O	97	Total	C	N	O	S	0	0
			742	479	124	138	1		

- Molecule 43 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	OO	193	Total	C	N	O	0	0
			1543	962	315	266		

- Molecule 44 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	P	109	Total	C	N	O	S	0	0
			883	559	167	156	1		

- Molecule 45 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	PP	136	Total	C	N	O	S	0	0
			1053	675	199	177	2		

- Molecule 46 is a protein called dipeptide.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	Pp	2	Total	C	N	O	S	0	0
			19	14	2	2	1		

- Molecule 47 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	Q	127	Total	C	N	O	S	0	0
			1020	647	205	167	1		

- Molecule 48 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	QQ	203	1720	1077	361	281	1	0	0

- Molecule 49 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	R	106	850	540	165	144	1	0	0

- Molecule 50 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	S	109	861	533	175	149	4	0	0

- Molecule 51 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	T	119	969	615	186	167	1	0	0

- Molecule 52 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	U	99	771	481	156	132	2	0	0

- Molecule 53 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	V	84	665	405	145	110	5	0	0

- Molecule 54 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
54	W	77	612	391	115	106	0	0

- Molecule 55 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	X	50	Total	C	N	O	S	0	0
			436	272	97	65	2		

- Molecule 56 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	Y	52	Total	C	N	O	S	0	0
			417	259	86	67	5		

- Molecule 57 is a protein called 60S ribosomal protein L41-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	Z	25	Total	C	N	O	S	0	0
			233	142	63	27	1		

- Molecule 58 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	a	102	Total	C	N	O	S	0	0
			819	514	166	134	5		

- Molecule 59 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	b	91	Total	C	N	O	S	0	0
			694	429	138	121	6		

- Molecule 60 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	c	1604	Total	C	N	O	P	0	0
			34236	15322	6079	11231	1604		

- Molecule 61 is a protein called 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	d	206	Total	C	N	O	S	0	0
			1583	1017	281	283	2		

- Molecule 62 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	e	212	Total	C	N	O	S	0	0
			1689	1073	303	309	4		

- Molecule 63 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	f	217	Total	C	N	O	S	0	0
			1635	1047	289	297	2		

- Molecule 64 is a protein called RPS3 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	g	206	Total	C	N	O	S	0	0
			1601	1014	294	287	6		

- Molecule 65 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	h	258	Total	C	N	O	S	0	0
			2056	1308	387	358	3		

- Molecule 66 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	i	199	Total	C	N	O	S	0	0
			1572	987	290	292	3		

- Molecule 67 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	j	219	Total	C	N	O	S	0	0
			1766	1108	341	314	3		

- Molecule 68 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
68	k	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 69 is a protein called 40S ribosomal protein S8-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	l	184	1457	906	291	258	2	0	0

- Molecule 70 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	m	185	1494	943	289	261	1	0	0

- Molecule 71 is a protein called 40S ribosomal protein S10-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	n	91	772	503	123	144	2	0	0

- Molecule 72 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
72	o	142	1146	735	217	191	3	0	0

- Molecule 73 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
73	p	150	1192	759	224	207	2	0	0

- Molecule 74 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
74	q	127	891	545	182	163	1	0	0

- Molecule 75 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
75	r	104	837	533	155	143	6	0	0

- Molecule 76 is a protein called 40S ribosomal protein S16-A.



Mol	Chain	Residues	Atoms				AltConf	Trace
76	s	137	Total	C	N	O	0	0
			1080	692	199	189		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
77	t	121	Total	C	N	O	S	0	0
			961	599	182	178	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
78	u	145	Total	C	N	O	S	0	0
			1192	743	237	210	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
79	v	143	Total	C	N	O	S	0	0
			1112	694	208	208	2		

- Molecule 80 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	w	100	Total	C	N	O	S	0	0
			800	509	144	146	1		

- Molecule 81 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	x	87	Total	C	N	O	S	0	0
			684	420	125	137	2		

- Molecule 82 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	y	129	Total	C	N	O	S	0	0
			1021	650	188	180	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
83	z	144	1121	708	220	191	2	0	0

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

Mol	Chain	Residues	Atoms		AltConf
84	2	1	Total 1	Zn 1	0
84	5	1	Total 1	Zn 1	0
84	8	1	Total 1	Zn 1	0
84	S	1	Total 1	Zn 1	0
84	V	1	Total 1	Zn 1	0
84	Y	1	Total 1	Zn 1	0
84	a	1	Total 1	Zn 1	0
84	b	1	Total 1	Zn 1	0

- Molecule 85 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
85	AA	191	Total 191	Mg 191	0
85	B	1	Total 1	Mg 1	0
85	BB	4	Total 4	Mg 4	0
85	Bb	1	Total 1	Mg 1	0
85	CC	4	Total 4	Mg 4	0
85	Cc	1	Total 1	Mg 1	0
85	Dd	1	Total 1	Mg 1	0
85	FF	1	Total 1	Mg 1	0
85	H	1	Total 1	Mg 1	0

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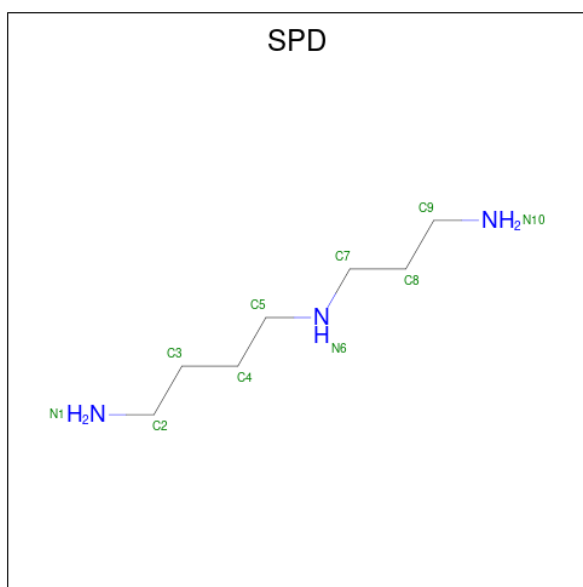
*Continued from previous page...*

Mol	Chain	Residues	Atoms		AltConf
85	JJ	1	Total 1	Mg 1	0
85	MM	1	Total 1	Mg 1	0
85	QQ	2	Total 2	Mg 2	0
85	V	1	Total 1	Mg 1	0
85	a	1	Total 1	Mg 1	0
85	c	46	Total 46	Mg 46	0
85	q	1	Total 1	Mg 1	0

- Molecule 86 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
86	AA	11	Total 11	K 11	0
86	EE	1	Total 1	K 1	0
86	MM	1	Total 1	K 1	0
86	Q	1	Total 1	K 1	0
86	S	1	Total 1	K 1	0
86	a	1	Total 1	K 1	0
86	c	4	Total 4	K 4	0
86	q	1	Total 1	K 1	0

- Molecule 87 is SPERMIDINE (three-letter code: SPD) (formula: C<sub>7</sub>H<sub>19</sub>N<sub>3</sub>).



Mol	Chain	Residues	Atoms	AltConf
87	AA	1	Total C N 10 7 3	0
87	AA	1	Total C N 10 7 3	0
87	AA	1	Total C N 10 7 3	0
87	c	1	Total C N 10 7 3	0

- Molecule 88 is water.

Mol	Chain	Residues	Atoms	AltConf
88	2	2	Total O 2 2	0
88	A	3	Total O 3 3	0
88	AA	804	Total O 804 804	0
88	BB	12	Total O 12 12	0
88	Bb	5	Total O 5 5	0
88	CC	18	Total O 18 18	0
88	Cc	5	Total O 5 5	0
88	D	4	Total O 4 4	0

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Mol	Chain	Residues	Atoms		AltConf
88	Dd	4	Total 4	O 4	0
88	EE	6	Total 6	O 6	0
88	F	4	Total 4	O 4	0
88	FF	5	Total 5	O 5	0
88	GG	3	Total 3	O 3	0
88	H	3	Total 3	O 3	0
88	J	2	Total 2	O 2	0
88	LL	2	Total 2	O 2	0
88	M	3	Total 3	O 3	0
88	MM	2	Total 2	O 2	0
88	N	1	Total 1	O 1	0
88	OO	1	Total 1	O 1	0
88	P	1	Total 1	O 1	0
88	Q	3	Total 3	O 3	0
88	QQ	6	Total 6	O 6	0
88	S	2	Total 2	O 2	0
88	V	3	Total 3	O 3	0
88	a	4	Total 4	O 4	0
88	c	170	Total 170	O 170	0
88	f	1	Total 1	O 1	0
88	o	1	Total 1	O 1	0

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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>AltConf</b>
88	p	1	Total 1	O 1	0
88	q	2	Total 2	O 2	0
88	z	1	Total 1	O 1	0

### 3 Residue-property plots [i](#)

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. 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. 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.

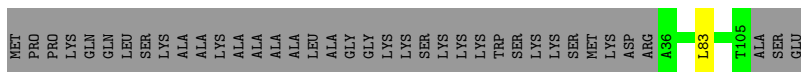
- Molecule 1: 40S ribosomal protein S24-A

Chain 0:  98% ..




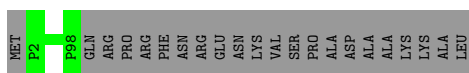
- Molecule 2: 40S ribosomal protein S25-A

Chain 1:  64% . 35%



- Molecule 3: 40S ribosomal protein S26

Chain 2:  82% 18%



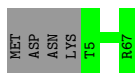
- Molecule 4: 40S ribosomal protein S27-A

Chain 3:  98% ..



- Molecule 5: 40S ribosomal protein S28-A

Chain 4:  94% 6%



- Molecule 6: HLJ1\_G0030400.mRNA.1.CDS.1

Chain 5:  95% 5%




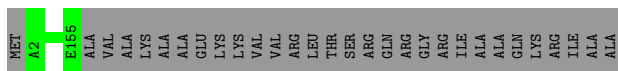


A635	A649	A677	A678	U651	A691	A705	G712	U719	C758	A761	U766	U767	C768	U776	G781	G785	A786	G805	A806	A807	A817	A830	G835	U850	C861	G867	C873	U874	A876	U879	G880	A896	U897	U898										
G907	G908	A914	A915	G916	A917	A921	U922	C923	A925	G937	C944	C959	U960	C961	G974	A980	U1015	C1016	C1017	G1018	C1023	A1026	A1027	U1028	G1029	C1032	U1033	U1034	G1035	A1036	C1037	A1047	A1064	G1072	U1081	G1087	U1096	U1097	A1098					
A1103	G1104	G1117	G1131	C1132	A1133	A1143	U1144	C1155	A1159	G1178	A1179	U1180	U1181	A1182	U1191	C1192	A1193	C1196	C1201	C1017	U1208	G1209	A1217	G1222	A1231	C1232	G1236	U1034	G1237	A1244	A1245	G1246	U1247	C1248	G1249	U1253	C1254	C1257	U1258	G1262	A1263	G1264	U1265	
C1272	C1275	G1281	C1284	G1285	A1286	A1287	A1302	G1307	A1308	U1309	A1330	U1331	G1345	U1348	G1349	A1350	U1351	A1352	A1355	U1356	G1357	A1386	C1391	A1389	G1400	G1417	A1418	G1421	G1434	C1437	G1443	A1446	A1449	G1450	A1468	A1481	A1482							
G1483	U1484	G1487	C1496	C1508	C1556	G1560	C1562	C1563	A1566	U1567	U1568	U1569	U1570	A1571	U1572	A1580	C1581	A1583	A1589	A1605	U1630	C1639	A1642	A1643	C1657	U1688	U1724	A1741	U1742	A1750	C1751	A1752	C1759	C1762	U1763	U1764	U1765	G1766						
C1767	U1768	G1769	C1773	G1775	A1797	G1808	G1812	U1815	A1816	G1817	U1821	A1842	C1866	G1878	A1879	U1880	A1886	A1887	U1888	A1893	G1906	G1952	G	G	G	U	A	G	C	G	C	C	U	A	U	U	A	G	C	G	C			
G	C	A	C	C	G	U	C	G	C	U	C	U	G	U	C	G	U	C	U	G	C	C	C	C	U	G	A	C	G	C	C	U	C	C	U	A	U	A	C	C	C	G		
U	G	C	U	U	G	U	A	A	C	U	U	A	G	U	U	G	U	C	U	G	A	C	A	C	U	G	U	C	U	U	C	C	U	A	C	A	C	U	A	G	C	C		
C2101	U2102	G2111	U2112	A2113	C2114	G2122	A2126	A2131	U2140	U2141	A2142	A2143	A2144	A2158	A2168	G2169	U2170	G2171	U2176	A2188	G2204	A2207	A2208	U2209	A2220	A2223	A2224	U2225	A2244	G2253	U2254	A2255	A2256	U2266	C2267	U2268	U2269	G2454	A2458	A2459	U2460	A2461		
A2279	A2280	A2281	G2288	G2307	C2308	A2309	U2310	A2313	U2314	G2315	U2336	C2374	G2375	G2393	A2397	A2402	G2403	A2404	U2411	U2417	U2418	U2420	A2421	G2442	A2443	C2444	A2447	G2448	A2449	G2450	U2453	G2454	A2458	A2459	U2460	A2461								
A2462	G2463	U2464	G2465	G2466	A2468	G2469	C2470	U2471	U2472	C2473	G2474	G2475	C2476	G2477	C2478	C2479	A2480	U2487	A2488	C2489	A2490	A2491	C2492	U2493	A2494	C2495	U2496	A2498	A2500	U2501	A2502	G2503	A2511	U2514	A2515	U2536	U2543	G2549	U2550	G2551	C2552	U2553	A2554	C2560
A2561	A2569	U2570	U2571	C2572	G2573	G2585	A2601	A2602	A2608	C2609	C2610	G2614	G2619	A2626	U2634	A2640	U2652	A2656	A2657	G2672	A2673	A2674	G2677	A2678	A2689	G2690	A2691	A2696	A2704	G2714	C2754	U2724	G2728	U2729	G2753	G2754	C2755	C2772	A2777	G2778				
G2791	A2792	G2793	A2794	U2795	G2796	G2800	A2801	A2802	A2808	C2809	C2810	G2814	G2815	C2816	A2817	C2836	U2843	C2844	A2845	U2846	C2867	G2871	A2872	U2873	G2874	A2887	U2888	C2889	C2899	A2911	U2921	G2922	U2923	A2933	U2934	A2936	A3180	C3181	A2946	G2947	C2948			
A2971	G2972	G2977	C2983	G2990	G2997	A3012	U3056	U3057	U3058	G3059	U3078	C3092	A3093	A3094	G3101	C3115	U3121	A3122	A3130	U3131	A3142	C3143	U3153	C3154	U3155	U3156	U3157	A3168	U3169	A3170	U3171	A3172	G3173	G3176	U3179	A3180	C3181	A3187	C3206	U3207				
A3210	U3214	A3215	G3216	C3217	A3218	G3219	A3243	G3247	G3276	U3277	C3278	U3281	A3294	U3304	U3313	A3316	A3335	U3341	G3345	U3352	G3353	U	U	G3356	G3369	C3378	U3389	G3390	C3396															

• Molecule 12: 60S ribosomal protein L17-A



Chain B:  84% 16%



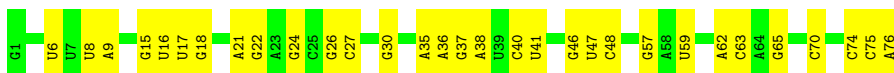
- Molecule 13: 5S ribosomal RNA

Chain BB:  91% 9%



- Molecule 14: Transfer RNA Phe

Chain Bb:  59% 41%




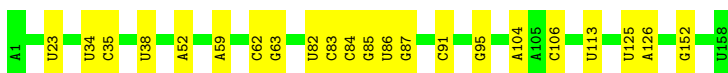
- Molecule 15: 60S ribosomal protein L18-A

Chain C:  99%




- Molecule 16: 5.8S ribosomal RNA

Chain CC:  86% 14%



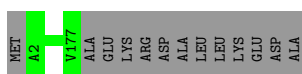
- Molecule 17: Transfer RNA fMet

Chain Cc:  81% 19%



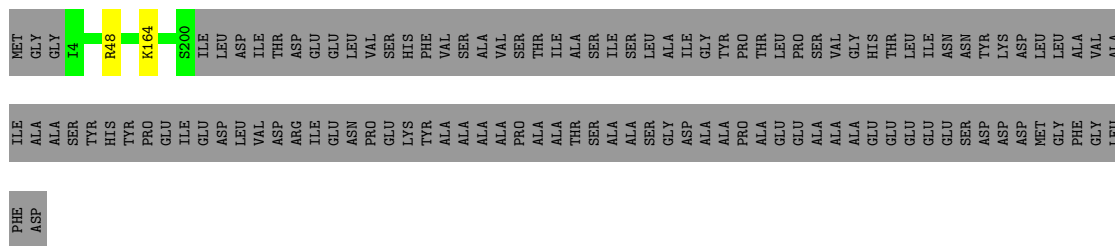
- Molecule 18: 60S ribosomal protein L19-A

Chain D:  93% 7%

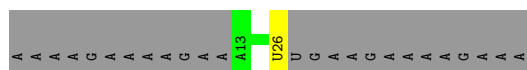


- Molecule 19: 60S acidic ribosomal protein P0

Chain DD:  63% 37%



- Molecule 20: Messenger RNA



- Molecule 21: 60S ribosomal protein L20-A

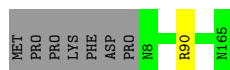


There are no outlier residues recorded for this chain.

- Molecule 22: 60S ribosomal protein L2-A



- Molecule 23: 60S ribosomal protein L12-A




- Molecule 24: 60S ribosomal protein L21-A



- Molecule 25: 60S ribosomal protein L3



- Molecule 26: 60S ribosomal protein L22-A

Chain G:  80% 20%



- Molecule 27: 60S ribosomal protein L4-A

Chain GG:  99%



- Molecule 28: 60S ribosomal protein L23-A

Chain H:  100%

There are no outlier residues recorded for this chain.

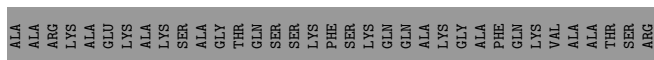
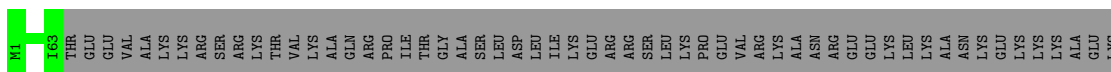
- Molecule 29: 60S ribosomal protein L5

Chain HH:  100%




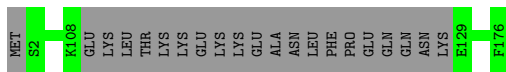
- Molecule 30: 60S ribosomal protein L24-A

Chain I:  41% 59%




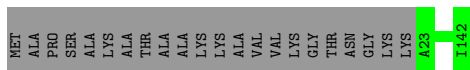
- Molecule 31: 60S ribosomal protein L6-A

Chain II:  88% 12%




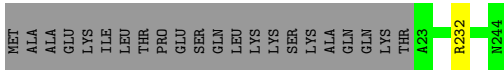
- Molecule 32: 60S ribosomal protein L25

Chain J:  85% 15%



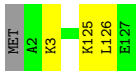
- Molecule 33: 60S ribosomal protein L7-A

Chain JJ:  91% 9%



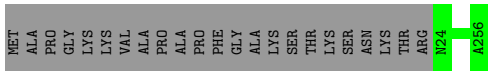
- Molecule 34: 60S ribosomal protein L26-A

Chain K:  97% ..



- Molecule 35: 60S ribosomal protein L8-A

Chain KK:  91% 9%



- Molecule 36: 60S ribosomal protein L27-A

Chain L:  99% ..



- Molecule 37: 60S ribosomal protein L9-A

Chain LL:  98% .



- Molecule 38: 60S ribosomal protein L28

Chain M:  99% ..



- Molecule 39: 60S ribosomal protein L10

Chain MM:  97% .



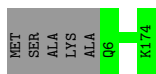
- Molecule 40: 60S ribosomal protein L29

Chain N:  97%



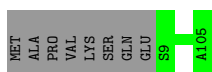
- Molecule 41: 60S ribosomal protein L11-A

Chain NN:  97%



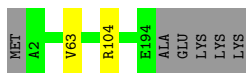
- Molecule 42: 60S ribosomal protein L30

Chain O:  92%



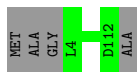
- Molecule 43: 60S ribosomal protein L13-A

Chain OO:  96%



- Molecule 44: 60S ribosomal protein L31-A

Chain P:  96%



- Molecule 45: 60S ribosomal protein L14-A

Chain PP:  99%



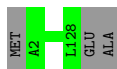
- Molecule 46: dipeptide

Chain Pp:  100%

There are no outlier residues recorded for this chain.

- Molecule 47: 60S ribosomal protein L32

Chain Q:  98%



- Molecule 48: 60S ribosomal protein L15-A

Chain QQ: 100%



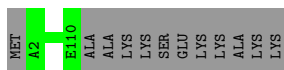
- Molecule 49: 60S ribosomal protein L33-A

Chain R: 99%



- Molecule 50: 60S ribosomal protein L34-A

Chain S: 90% 10%



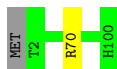
- Molecule 51: 60S ribosomal protein L35-A

Chain T: 99%



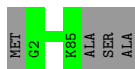
- Molecule 52: 60S ribosomal protein L36-A

Chain U: 98%



- Molecule 53: 60S ribosomal protein L37-A

Chain V: 95% 5%



- Molecule 54: 60S ribosomal protein L38

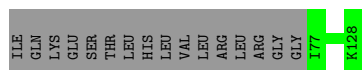
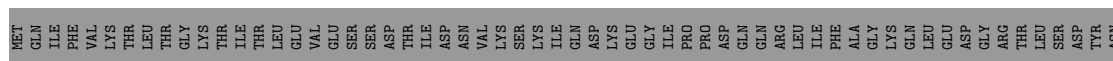
Chain W: 99%



- Molecule 55: 60S ribosomal protein L39



- Molecule 56: Ubiquitin-60S ribosomal protein L40

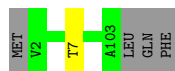


- Molecule 57: 60S ribosomal protein L41-A



There are no outlier residues recorded for this chain.

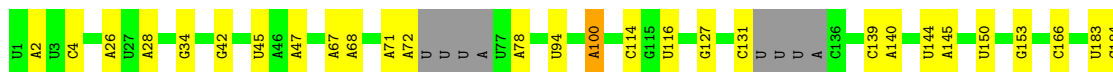
- Molecule 58: 60S ribosomal protein L42-A



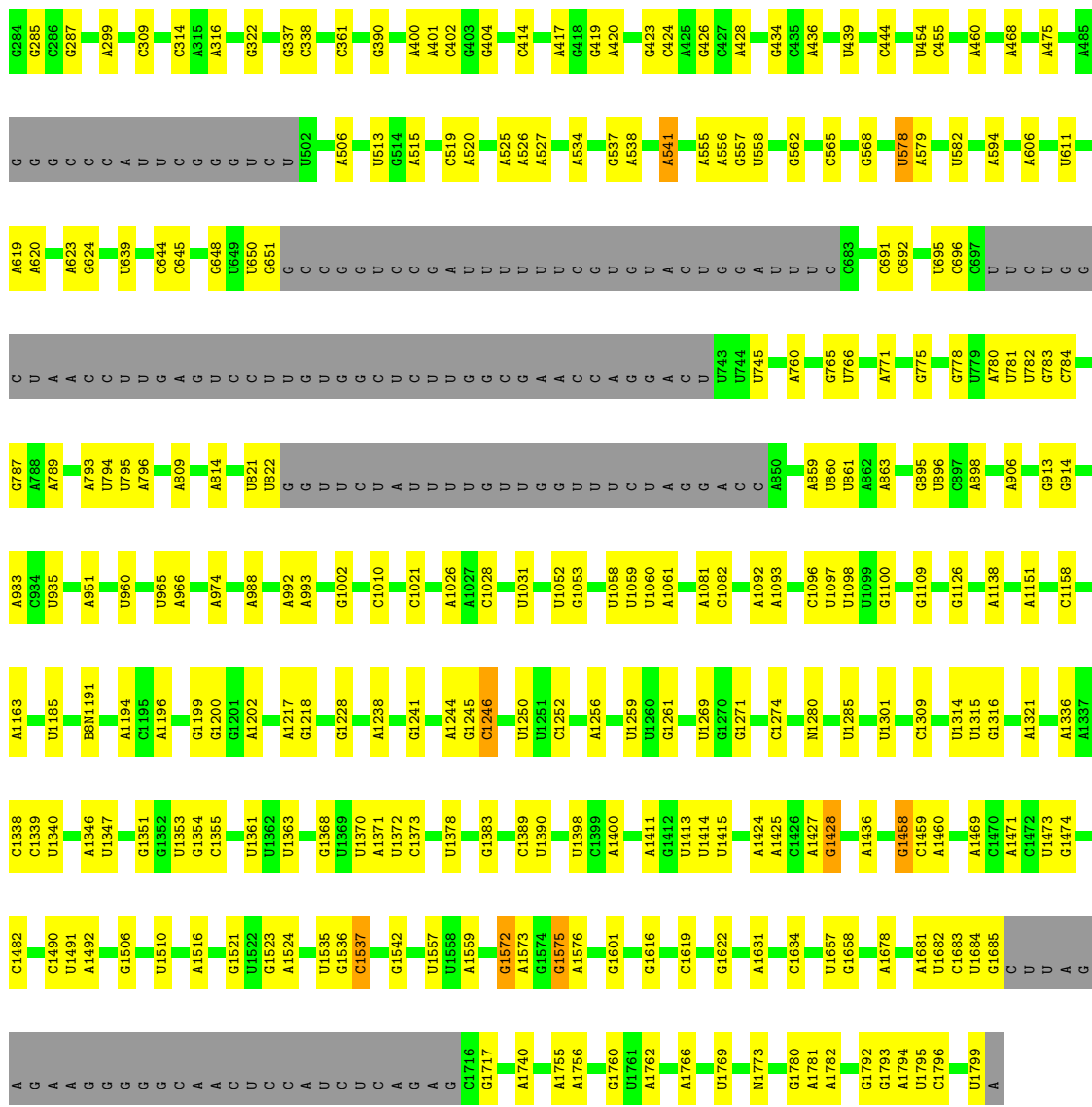
- Molecule 59: 60S ribosomal protein L43-A



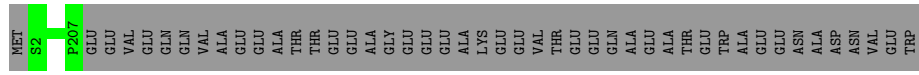
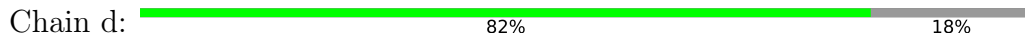
- Molecule 60: 18S ribosomal RNA



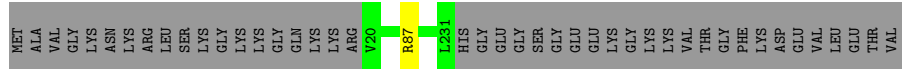
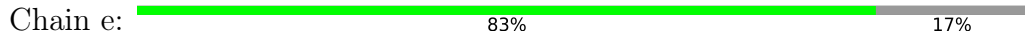




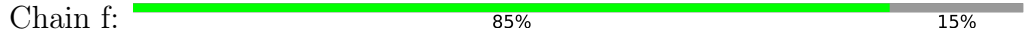
• Molecule 61: 40S ribosomal protein S0-A

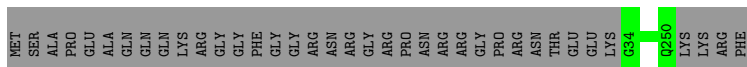


• Molecule 62: 40S ribosomal protein S1-A

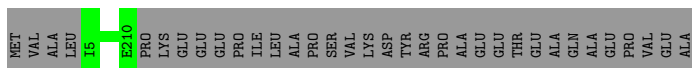
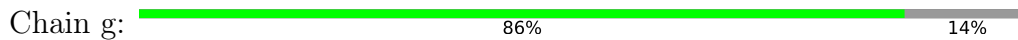


• Molecule 63: 40S ribosomal protein S2

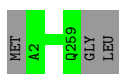




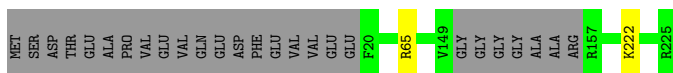
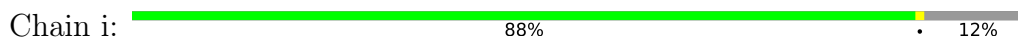
- Molecule 64: RPS3 isoform 1



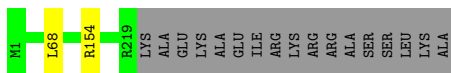
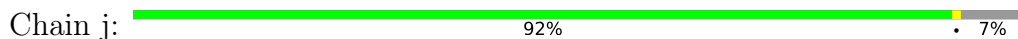
- Molecule 65: 40S ribosomal protein S4-A



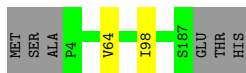
- Molecule 66: 40S ribosomal protein S5



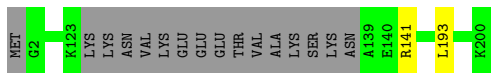
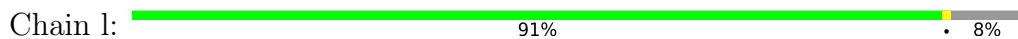
- Molecule 67: 40S ribosomal protein S6-A



- Molecule 68: 40S ribosomal protein S7-A

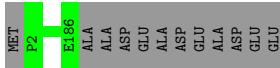


- Molecule 69: 40S ribosomal protein S8-B



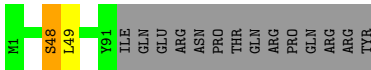
- Molecule 70: 40S ribosomal protein S9-A





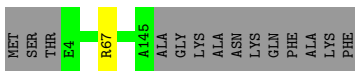
- Molecule 71: 40S ribosomal protein S10-A

Chain n: 85% 13%



- Molecule 72: 40S ribosomal protein S11-A

Chain o: 90% 9%



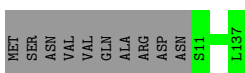
- Molecule 73: 40S ribosomal protein S13

Chain p: 99%



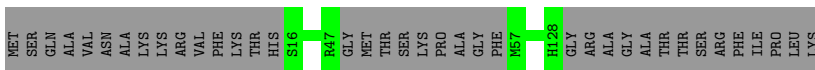
- Molecule 74: 40S ribosomal protein S14-A

Chain q: 93% 7%



- Molecule 75: 40S ribosomal protein S15

Chain r: 73% 27%



- Molecule 76: 40S ribosomal protein S16-A

Chain s: 95%



- Molecule 77: 40S ribosomal protein S17-A

Chain t: 79% 9% 11%



- Molecule 78: 40S ribosomal protein S18-A

Chain u: 98%



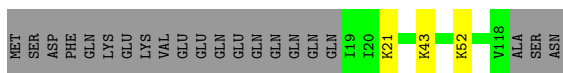
- Molecule 79: 40S ribosomal protein S19-A

Chain v: 99%



- Molecule 80: 40S ribosomal protein S20

Chain w: 80% 17%



- Molecule 81: 40S ribosomal protein S21-A

Chain x: 99%



- Molecule 82: 40S ribosomal protein S22-A

Chain y: 99%



- Molecule 83: 40S ribosomal protein S23-A

Chain z: 99%



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	68945	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	1000	Depositor
Magnification	165000	Depositor
Image detector	FEI FALCON IV (4k x 4k)	Depositor

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: K, B8N, 1MA, SPD, 5MC, 4AC, OMC, OMU, UR3, A2M, YYG, ZN, OMG, G7M, MA6, MG

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	0	0.26	0/1087	0.55	0/1449
2	1	0.26	0/571	0.63	1/768 (0.1%)
3	2	0.25	0/782	0.56	0/1047
4	3	0.26	0/620	0.54	0/838
5	4	0.26	0/499	0.63	0/670
6	5	0.27	0/452	0.57	0/600
7	6	0.26	0/433	0.63	0/575
8	7	0.26	0/2489	0.57	0/3389
9	8	0.24	0/279	0.53	0/369
10	A	0.29	0/1585	0.51	0/2128
11	AA	0.33	0/75384	0.79	31/117530 (0.0%)
12	B	0.28	0/1245	0.52	0/1676
13	BB	0.29	0/2883	0.74	0/4491
14	Bb	0.27	0/1788	0.95	7/2786 (0.3%)
15	C	0.28	0/1465	0.56	0/1965
16	CC	0.33	0/3746	0.77	0/5832
17	Cc	0.34	1/1836 (0.1%)	0.75	0/2859
18	D	0.26	0/1440	0.56	0/1921
19	DD	0.25	0/1558	0.52	0/2107
20	Dd	0.25	0/333	0.71	0/516
21	E	0.28	0/1481	0.56	0/1990
22	EE	0.28	0/1948	0.55	0/2617
23	Ee	0.24	0/1210	0.52	0/1627
24	F	0.27	0/1300	0.52	0/1743
25	FF	0.28	0/3146	0.55	0/4228
26	G	0.27	0/786	0.51	0/1065
27	GG	0.26	0/2800	0.51	0/3790
28	H	0.29	0/978	0.56	0/1316
29	HH	0.26	0/2425	0.50	0/3271
30	I	0.29	0/533	0.53	0/707
31	II	0.27	0/1251	0.51	0/1682
32	J	0.28	0/974	0.51	0/1314

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	JJ	0.27	0/1821	0.47	0/2451
34	K	0.28	0/1004	0.60	1/1341 (0.1%)
35	KK	0.26	0/1836	0.47	0/2481
36	L	0.29	0/1118	0.53	0/1497
37	LL	0.28	0/1539	0.54	0/2073
38	M	0.29	0/1204	0.55	0/1612
39	MM	0.27	0/1779	0.53	0/2386
40	N	0.25	0/473	0.50	0/629
41	NN	0.27	0/1374	0.58	0/1842
42	O	0.27	0/750	0.45	0/1008
43	OO	0.27	0/1568	0.56	0/2106
44	P	0.27	0/897	0.55	0/1205
45	PP	0.26	0/1068	0.49	0/1438
46	Pp	0.31	0/19	0.20	0/23
47	Q	0.26	0/1041	0.51	0/1394
48	QQ	0.26	0/1757	0.57	0/2354
49	R	0.31	0/868	0.55	0/1168
50	S	0.27	0/871	0.57	0/1164
51	T	0.26	0/978	0.51	0/1301
52	U	0.26	0/778	0.58	0/1034
53	V	0.28	0/680	0.60	0/901
54	W	0.30	0/618	0.59	0/826
55	X	0.25	0/443	0.64	0/588
56	Y	0.26	0/423	0.56	0/562
57	Z	0.23	0/234	0.69	0/300
58	a	0.28	0/831	0.55	0/1097
59	b	0.27	0/701	0.58	0/934
60	c	0.28	0/37665	0.80	20/58663 (0.0%)
61	d	0.26	0/1623	0.53	0/2222
62	e	0.26	0/1714	0.55	0/2308
63	f	0.26	0/1665	0.53	0/2263
64	g	0.27	0/1622	0.58	0/2180
65	h	0.25	0/2097	0.54	0/2823
66	i	0.25	0/1591	0.55	0/2151
67	j	0.25	0/1790	0.60	1/2393 (0.0%)
68	k	0.27	0/1506	0.58	1/2028 (0.0%)
69	l	0.26	0/1482	0.60	1/1980 (0.1%)
70	m	0.27	0/1519	0.56	0/2035
71	n	0.31	0/792	0.53	0/1071
72	o	0.27	0/1172	0.56	0/1580
73	p	0.26	0/1215	0.52	0/1638
74	q	0.28	0/901	0.63	0/1217
75	r	0.28	0/853	0.60	0/1145

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
76	s	0.26	0/1099	0.54	0/1473
77	t	0.29	0/971	0.61	0/1303
78	u	0.26	0/1211	0.60	1/1628 (0.1%)
79	v	0.26	0/1130	0.53	0/1517
80	w	0.25	0/810	0.55	0/1095
81	x	0.29	0/693	0.58	0/935
82	y	0.27	0/1038	0.53	0/1395
83	z	0.26	0/1139	0.53	0/1518
All	All	0.30	1/213278 (0.0%)	0.71	64/313142 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
33	JJ	0	1
36	L	0	1
58	a	0	1
66	i	0	1
68	k	0	1
71	n	0	1
76	s	0	1
78	u	0	1
All	All	0	8

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	Cc	1	C	OP3-P	-10.64	1.48	1.61

All (64) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	c	94	U	C2-N3-C4	14.35	135.61	127.00
14	Bb	37	YYG	OP2-P-O3'	12.21	132.06	105.20
14	Bb	37	YYG	O3'-P-O5'	-9.82	85.33	104.00
11	AA	2269	U	N1-C2-O2	7.91	128.33	122.80
11	AA	3278	C	N1-C2-O2	7.75	123.55	118.90
11	AA	2490	C	C2-N1-C1'	7.75	127.32	118.80
11	AA	2269	U	N3-C2-O2	-7.74	116.78	122.20
11	AA	2269	U	C2-N1-C1'	7.58	126.79	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	AA	2490	C	N1-C2-O2	7.54	123.42	118.90
11	AA	3278	C	C2-N1-C1'	7.26	126.78	118.80
60	c	1537	C	C2-N1-C1'	7.16	126.68	118.80
60	c	1285	U	C2-N1-C1'	7.13	126.26	117.70
14	Bb	57	G	C5-C6-O6	-7.06	124.36	128.60
60	c	1389	C	C2-N1-C1'	7.01	126.51	118.80
60	c	1537	C	N1-C2-O2	6.94	123.06	118.90
60	c	94	U	N3-C4-C5	6.82	118.69	114.60
11	AA	620	U	C2-N1-C1'	6.79	125.84	117.70
11	AA	922	U	C2-N1-C1'	6.77	125.82	117.70
60	c	94	U	N1-C2-N3	6.66	118.90	114.90
11	AA	620	U	N1-C2-O2	6.62	127.44	122.80
11	AA	406	G	O4'-C1'-N9	6.57	113.46	108.20
60	c	965	U	C2-N1-C1'	6.56	125.57	117.70
11	AA	1222	G	O4'-C1'-N9	6.50	113.40	108.20
14	Bb	37	YYG	P-O3'-C3'	-6.39	112.03	119.70
11	AA	3278	C	N3-C2-O2	-6.35	117.46	121.90
34	K	126	LEU	CA-CB-CG	6.34	129.89	115.30
11	AA	1767	C	C2-N1-C1'	6.29	125.72	118.80
60	c	1285	U	N1-C2-O2	6.26	127.19	122.80
60	c	1096	C	N1-C2-O2	6.23	122.64	118.90
11	AA	1496	C	C2-N1-C1'	6.21	125.64	118.80
2	1	83	LEU	CA-CB-CG	6.19	129.54	115.30
69	l	193	LEU	CA-CB-CG	6.19	129.53	115.30
60	c	1458	G	C4-N9-C1'	6.14	134.48	126.50
11	AA	620	U	N3-C2-O2	-6.12	117.92	122.20
11	AA	2490	C	N3-C2-O2	-6.09	117.64	121.90
78	u	18	LEU	CA-CB-CG	5.89	128.85	115.30
11	AA	922	U	N1-C2-O2	5.84	126.89	122.80
60	c	1096	C	C2-N1-C1'	5.78	125.16	118.80
14	Bb	57	G	C4-C5-N7	5.69	113.08	110.80
11	AA	922	U	N3-C2-O2	-5.63	118.26	122.20
14	Bb	57	G	N1-C6-O6	5.60	123.26	119.90
60	c	1537	C	N3-C2-O2	-5.55	118.01	121.90
11	AA	2983	C	C2-N1-C1'	5.55	124.90	118.80
67	j	68	LEU	CA-CB-CG	5.53	128.02	115.30
11	AA	3058	U	C2-N1-C1'	5.49	124.29	117.70
60	c	1458	G	C8-N9-C1'	-5.49	119.86	127.00
60	c	1285	U	N3-C2-O2	-5.46	118.38	122.20
68	k	98	ILE	C-N-CA	-5.41	108.19	121.70
11	AA	2836	C	C2-N1-C1'	5.39	124.73	118.80
11	AA	3057	U	N1-C2-O2	5.36	126.55	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	c	166	C	N1-C2-O2	5.36	122.12	118.90
11	AA	2490	C	C6-N1-C1'	-5.35	114.38	120.80
11	AA	1724	U	O4'-C1'-N1	5.32	112.46	108.20
60	c	1246	C	C2-N1-C1'	5.29	124.62	118.80
11	AA	3181	C	C2-N1-C1'	5.27	124.60	118.80
60	c	1473	U	C2-N1-C1'	5.22	123.97	117.70
60	c	1096	C	N3-C2-O2	-5.17	118.28	121.90
11	AA	2836	C	C6-N1-C2	-5.12	118.25	120.30
11	AA	2490	C	C6-N1-C2	-5.09	118.26	120.30
14	Bb	57	G	C6-C5-N7	-5.09	127.35	130.40
11	AA	2495	C	C2-N1-C1'	5.06	124.37	118.80
11	AA	3278	C	C6-N1-C1'	-5.06	114.73	120.80
11	AA	3214	U	C2-N1-C1'	5.03	123.73	117.70
60	c	1537	C	C6-N1-C1'	-5.02	114.77	120.80

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
33	JJ	232	ARG	Peptide
36	L	102	GLU	Peptide
58	a	7	THR	Peptide
66	i	65	ARG	Peptide
68	k	64	VAL	Peptide
71	n	48	SER	Peptide
76	s	40	GLU	Peptide
78	u	90	ASN	Peptide

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

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

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	132/135 (98%)	129 (98%)	3 (2%)	0	100	100
2	1	68/108 (63%)	60 (88%)	8 (12%)	0	100	100
3	2	95/119 (80%)	87 (92%)	8 (8%)	0	100	100
4	3	79/82 (96%)	75 (95%)	4 (5%)	0	100	100
5	4	61/67 (91%)	60 (98%)	1 (2%)	0	100	100
6	5	51/56 (91%)	51 (100%)	0	0	100	100
7	6	51/63 (81%)	49 (96%)	2 (4%)	0	100	100
8	7	316/319 (99%)	293 (93%)	23 (7%)	0	100	100
9	8	32/152 (21%)	26 (81%)	6 (19%)	0	100	100
10	A	195/199 (98%)	193 (99%)	2 (1%)	0	100	100
12	B	152/184 (83%)	150 (99%)	2 (1%)	0	100	100
15	C	183/186 (98%)	181 (99%)	2 (1%)	0	100	100
18	D	174/189 (92%)	170 (98%)	4 (2%)	0	100	100
19	DD	195/312 (62%)	190 (97%)	5 (3%)	0	100	100
21	E	170/172 (99%)	163 (96%)	7 (4%)	0	100	100
22	EE	250/254 (98%)	248 (99%)	2 (1%)	0	100	100
23	Ee	156/165 (94%)	148 (95%)	8 (5%)	0	100	100
24	F	157/160 (98%)	154 (98%)	3 (2%)	0	100	100
25	FF	384/387 (99%)	373 (97%)	11 (3%)	0	100	100
26	G	95/121 (78%)	95 (100%)	0	0	100	100
27	GG	359/362 (99%)	348 (97%)	11 (3%)	0	100	100
28	H	127/129 (98%)	126 (99%)	1 (1%)	0	100	100
29	HH	294/297 (99%)	289 (98%)	5 (2%)	0	100	100
30	I	61/155 (39%)	61 (100%)	0	0	100	100
31	II	151/176 (86%)	147 (97%)	4 (3%)	0	100	100
32	J	118/142 (83%)	115 (98%)	3 (2%)	0	100	100
33	JJ	220/244 (90%)	217 (99%)	3 (1%)	0	100	100
34	K	124/127 (98%)	124 (100%)	0	0	100	100
35	KK	231/256 (90%)	228 (99%)	3 (1%)	0	100	100
36	L	133/136 (98%)	129 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	LL	189/191 (99%)	183 (97%)	6 (3%)	0	100	100
38	M	146/149 (98%)	140 (96%)	5 (3%)	1 (1%)	22	45
39	MM	213/221 (96%)	208 (98%)	5 (2%)	0	100	100
40	N	56/59 (95%)	53 (95%)	3 (5%)	0	100	100
41	NN	167/174 (96%)	160 (96%)	7 (4%)	0	100	100
42	O	95/105 (90%)	95 (100%)	0	0	100	100
43	OO	191/199 (96%)	177 (93%)	13 (7%)	1 (0%)	29	53
44	P	107/113 (95%)	102 (95%)	5 (5%)	0	100	100
45	PP	134/138 (97%)	132 (98%)	2 (2%)	0	100	100
47	Q	125/130 (96%)	125 (100%)	0	0	100	100
48	QQ	201/204 (98%)	194 (96%)	7 (4%)	0	100	100
49	R	104/107 (97%)	104 (100%)	0	0	100	100
50	S	107/121 (88%)	107 (100%)	0	0	100	100
51	T	117/120 (98%)	113 (97%)	4 (3%)	0	100	100
52	U	97/100 (97%)	90 (93%)	7 (7%)	0	100	100
53	V	82/88 (93%)	80 (98%)	2 (2%)	0	100	100
54	W	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
55	X	48/51 (94%)	44 (92%)	4 (8%)	0	100	100
56	Y	50/128 (39%)	50 (100%)	0	0	100	100
57	Z	23/25 (92%)	23 (100%)	0	0	100	100
58	a	100/106 (94%)	97 (97%)	3 (3%)	0	100	100
59	b	89/92 (97%)	88 (99%)	1 (1%)	0	100	100
61	d	204/252 (81%)	190 (93%)	14 (7%)	0	100	100
62	e	210/255 (82%)	199 (95%)	11 (5%)	0	100	100
63	f	215/254 (85%)	206 (96%)	9 (4%)	0	100	100
64	g	204/240 (85%)	196 (96%)	8 (4%)	0	100	100
65	h	256/261 (98%)	248 (97%)	8 (3%)	0	100	100
66	i	195/225 (87%)	187 (96%)	8 (4%)	0	100	100
67	j	217/236 (92%)	208 (96%)	9 (4%)	0	100	100
68	k	182/190 (96%)	173 (95%)	9 (5%)	0	100	100
69	l	180/200 (90%)	171 (95%)	9 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
70	m	183/197 (93%)	178 (97%)	5 (3%)	0	100	100
71	n	89/105 (85%)	83 (93%)	4 (4%)	2 (2%)	6	15
72	o	140/156 (90%)	132 (94%)	8 (6%)	0	100	100
73	p	148/151 (98%)	144 (97%)	4 (3%)	0	100	100
74	q	125/137 (91%)	119 (95%)	6 (5%)	0	100	100
75	r	100/142 (70%)	98 (98%)	2 (2%)	0	100	100
76	s	135/143 (94%)	126 (93%)	9 (7%)	0	100	100
77	t	119/136 (88%)	102 (86%)	14 (12%)	3 (2%)	5	13
78	u	143/146 (98%)	132 (92%)	11 (8%)	0	100	100
79	v	141/144 (98%)	137 (97%)	4 (3%)	0	100	100
80	w	98/121 (81%)	97 (99%)	1 (1%)	0	100	100
81	x	85/87 (98%)	80 (94%)	5 (6%)	0	100	100
82	y	127/130 (98%)	125 (98%)	2 (2%)	0	100	100
83	z	142/145 (98%)	129 (91%)	13 (9%)	0	100	100
All	All	10968/12206 (90%)	10575 (96%)	386 (4%)	7 (0%)	54	77

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
77	t	88	VAL
43	OO	63	VAL
71	n	48	SER
71	n	49	LEU
77	t	72	LYS
77	t	86	PRO
38	M	78	LEU

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	112/113 (99%)	110 (98%)	2 (2%)	59	82
2	1	61/89 (68%)	61 (100%)	0	100	100
3	2	83/101 (82%)	83 (100%)	0	100	100
4	3	70/71 (99%)	69 (99%)	1 (1%)	67	85
5	4	56/60 (93%)	56 (100%)	0	100	100
6	5	47/49 (96%)	47 (100%)	0	100	100
7	6	46/54 (85%)	46 (100%)	0	100	100
8	7	259/262 (99%)	259 (100%)	0	100	100
9	8	30/135 (22%)	30 (100%)	0	100	100
10	A	160/162 (99%)	159 (99%)	1 (1%)	86	94
12	B	125/146 (86%)	125 (100%)	0	100	100
15	C	150/151 (99%)	150 (100%)	0	100	100
18	D	143/154 (93%)	143 (100%)	0	100	100
19	DD	167/254 (66%)	165 (99%)	2 (1%)	71	88
21	E	156/156 (100%)	156 (100%)	0	100	100
22	EE	193/196 (98%)	193 (100%)	0	100	100
23	Ee	129/136 (95%)	128 (99%)	1 (1%)	81	92
24	F	136/137 (99%)	135 (99%)	1 (1%)	84	93
25	FF	320/323 (99%)	318 (99%)	2 (1%)	86	94
26	G	84/107 (78%)	84 (100%)	0	100	100
27	GG	288/289 (100%)	287 (100%)	1 (0%)	92	97
28	H	101/101 (100%)	101 (100%)	0	100	100
29	HH	244/245 (100%)	244 (100%)	0	100	100
30	I	55/129 (43%)	55 (100%)	0	100	100
31	II	133/153 (87%)	133 (100%)	0	100	100
32	J	104/118 (88%)	104 (100%)	0	100	100
33	JJ	186/205 (91%)	186 (100%)	0	100	100
34	K	109/110 (99%)	107 (98%)	2 (2%)	59	82
35	KK	187/208 (90%)	187 (100%)	0	100	100
36	L	115/116 (99%)	115 (100%)	0	100	100
37	LL	171/171 (100%)	168 (98%)	3 (2%)	59	82
38	M	118/119 (99%)	118 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
39	MM	184/187 (98%)	184 (100%)	0	100	100
40	N	46/47 (98%)	45 (98%)	1 (2%)	52	78
41	NN	147/150 (98%)	147 (100%)	0	100	100
42	O	81/88 (92%)	81 (100%)	0	100	100
43	OO	154/159 (97%)	153 (99%)	1 (1%)	86	94
44	P	94/97 (97%)	94 (100%)	0	100	100
45	PP	107/109 (98%)	107 (100%)	0	100	100
46	Pp	2/2 (100%)	2 (100%)	0	100	100
47	Q	109/111 (98%)	109 (100%)	0	100	100
48	QQ	175/176 (99%)	175 (100%)	0	100	100
49	R	90/91 (99%)	90 (100%)	0	100	100
50	S	94/103 (91%)	94 (100%)	0	100	100
51	T	104/105 (99%)	104 (100%)	0	100	100
52	U	81/82 (99%)	80 (99%)	1 (1%)	71	88
53	V	69/71 (97%)	69 (100%)	0	100	100
54	W	68/69 (99%)	68 (100%)	0	100	100
55	X	45/46 (98%)	45 (100%)	0	100	100
56	Y	47/116 (40%)	47 (100%)	0	100	100
57	Z	23/23 (100%)	23 (100%)	0	100	100
58	a	87/91 (96%)	87 (100%)	0	100	100
59	b	71/72 (99%)	71 (100%)	0	100	100
61	d	165/210 (79%)	165 (100%)	0	100	100
62	e	189/224 (84%)	188 (100%)	1 (0%)	88	95
63	f	176/205 (86%)	176 (100%)	0	100	100
64	g	167/195 (86%)	167 (100%)	0	100	100
65	h	220/222 (99%)	220 (100%)	0	100	100
66	i	172/191 (90%)	171 (99%)	1 (1%)	86	94
67	j	188/201 (94%)	187 (100%)	1 (0%)	88	95
68	k	165/170 (97%)	165 (100%)	0	100	100
69	l	146/161 (91%)	145 (99%)	1 (1%)	84	93
70	m	158/166 (95%)	158 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
71	n	84/98 (86%)	84 (100%)	0	100	100
72	o	127/137 (93%)	126 (99%)	1 (1%)	81	92
73	p	127/128 (99%)	127 (100%)	0	100	100
74	q	81/105 (77%)	81 (100%)	0	100	100
75	r	89/118 (75%)	89 (100%)	0	100	100
76	s	114/119 (96%)	114 (100%)	0	100	100
77	t	105/124 (85%)	92 (88%)	13 (12%)	4	10
78	u	128/129 (99%)	128 (100%)	0	100	100
79	v	115/116 (99%)	114 (99%)	1 (1%)	78	91
80	w	94/114 (82%)	91 (97%)	3 (3%)	39	67
81	x	74/74 (100%)	73 (99%)	1 (1%)	67	85
82	y	110/111 (99%)	110 (100%)	0	100	100
83	z	119/120 (99%)	119 (100%)	0	100	100
All	All	9329/10253 (91%)	9287 (100%)	42 (0%)	89	95

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	112	LYS
1	0	127	LYS
4	3	29	ARG
10	A	117	ARG
19	DD	48	ARG
19	DD	164	LYS
23	Ee	90	ARG
24	F	83	ARG
25	FF	104	THR
25	FF	332	ARG
27	GG	12	THR
34	K	3	LYS
34	K	125	LYS
37	LL	23	ARG
37	LL	50	ASN
37	LL	157	ASN
40	N	18	ARG
43	OO	104	ARG
52	U	70	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
62	e	87	ARG
66	i	222	LYS
67	j	154	ARG
69	l	141	ARG
72	o	67	ARG
77	t	5	ARG
77	t	72	LYS
77	t	73	LEU
77	t	74	GLN
77	t	77	GLU
77	t	78	ARG
77	t	79	GLU
77	t	81	LYS
77	t	82	ASP
77	t	84	TYR
77	t	85	VAL
77	t	88	VAL
77	t	91	LEU
79	v	89	ARG
80	w	21	LYS
80	w	43	LYS
80	w	52	LYS
81	x	21	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	0	22	GLN
12	B	34	GLN
18	D	166	ASN
19	DD	103	ASN
23	Ee	65	GLN
28	H	98	ASN
32	J	85	GLN
41	NN	101	ASN
51	T	108	GLN
55	X	33	ASN
66	i	63	GLN
68	k	110	GLN
73	p	49	GLN
77	t	62	GLN

## 5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	AA	3185/3396 (93%)	473 (14%)	16 (0%)
13	BB	120/121 (99%)	10 (8%)	1 (0%)
14	Bb	75/76 (98%)	29 (38%)	0
16	CC	157/158 (99%)	22 (14%)	0
17	Cc	76/77 (98%)	14 (18%)	0
20	Dd	13/39 (33%)	1 (7%)	0
60	c	1589/1800 (88%)	278 (17%)	0
All	All	5215/5667 (92%)	827 (15%)	17 (0%)

All (827) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	AA	6	A
11	AA	26	A
11	AA	40	A
11	AA	43	A
11	AA	49	A
11	AA	59	G
11	AA	60	A
11	AA	65	A
11	AA	66	A
11	AA	86	G
11	AA	92	G
11	AA	99	A
11	AA	110	G
11	AA	111	C
11	AA	116	A
11	AA	117	U
11	AA	122	A
11	AA	135	C
11	AA	136	G
11	AA	147	U
11	AA	156	G
11	AA	157	A
11	AA	190	U
11	AA	200	C
11	AA	219	A
11	AA	220	G
11	AA	241	G
11	AA	243	G
11	AA	249	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	251	G
11	AA	252	U
11	AA	266	A
11	AA	269	G
11	AA	286	U
11	AA	295	A
11	AA	305	U
11	AA	329	U
11	AA	376	G
11	AA	397	A
11	AA	398	A
11	AA	399	A
11	AA	401	U
11	AA	402	A
11	AA	403	C
11	AA	420	G
11	AA	421	G
11	AA	422	A
11	AA	520	U
11	AA	521	A
11	AA	523	A
11	AA	532	A
11	AA	533	A
11	AA	534	U
11	AA	545	U
11	AA	548	G
11	AA	555	U
11	AA	557	A
11	AA	558	U
11	AA	559	A
11	AA	560	G
11	AA	592	A
11	AA	602	A
11	AA	603	A
11	AA	604	G
11	AA	607	A
11	AA	611	A
11	AA	620	U
11	AA	621	A
11	AA	636	C
11	AA	649	A2M
11	AA	677	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	678	G
11	AA	681	U
11	AA	691	A
11	AA	705	A
11	AA	712	G
11	AA	719	U
11	AA	758	C
11	AA	761	A
11	AA	766	U
11	AA	767	U
11	AA	768	C
11	AA	776	U
11	AA	781	G
11	AA	785	G
11	AA	786	A
11	AA	817	A2M
11	AA	830	A
11	AA	835	G
11	AA	850	U
11	AA	861	C
11	AA	874	U
11	AA	879	U
11	AA	880	G
11	AA	896	A
11	AA	907	G
11	AA	908	OMG
11	AA	914	A
11	AA	916	G
11	AA	917	A
11	AA	921	A
11	AA	923	C
11	AA	925	A
11	AA	937	G
11	AA	944	C
11	AA	959	C
11	AA	960	U
11	AA	961	C
11	AA	974	G
11	AA	980	A
11	AA	1015	U
11	AA	1017	C
11	AA	1018	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	1023	C
11	AA	1026	A
11	AA	1027	A
11	AA	1028	U
11	AA	1029	G
11	AA	1032	C
11	AA	1034	U
11	AA	1036	A
11	AA	1037	C
11	AA	1047	A
11	AA	1064	A
11	AA	1072	G
11	AA	1081	U
11	AA	1087	G
11	AA	1096	U
11	AA	1097	G
11	AA	1098	A
11	AA	1103	A
11	AA	1104	G
11	AA	1117	G
11	AA	1131	G
11	AA	1143	A
11	AA	1144	U
11	AA	1155	C
11	AA	1159	A
11	AA	1178	G
11	AA	1179	A
11	AA	1180	A
11	AA	1181	U
11	AA	1182	A
11	AA	1191	U
11	AA	1193	A
11	AA	1196	C
11	AA	1201	C
11	AA	1208	U
11	AA	1209	G
11	AA	1217	A
11	AA	1222	G
11	AA	1231	A
11	AA	1232	C
11	AA	1236	G
11	AA	1237	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	1244	A
11	AA	1245	A
11	AA	1246	G
11	AA	1247	U
11	AA	1249	G
11	AA	1253	U
11	AA	1254	C
11	AA	1257	C
11	AA	1258	U
11	AA	1262	G
11	AA	1263	A
11	AA	1264	G
11	AA	1265	U
11	AA	1272	C
11	AA	1275	C
11	AA	1281	G
11	AA	1284	C
11	AA	1285	G
11	AA	1286	A
11	AA	1287	A
11	AA	1302	A
11	AA	1307	G
11	AA	1308	A
11	AA	1309	U
11	AA	1330	A
11	AA	1331	U
11	AA	1345	G
11	AA	1348	U
11	AA	1349	G
11	AA	1351	U
11	AA	1352	A
11	AA	1355	A
11	AA	1356	U
11	AA	1357	G
11	AA	1386	A
11	AA	1391	C
11	AA	1399	A
11	AA	1400	G
11	AA	1417	G
11	AA	1418	A
11	AA	1421	G
11	AA	1434	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	1437	OMC
11	AA	1443	G
11	AA	1446	A
11	AA	1450	OMG
11	AA	1468	A
11	AA	1481	A
11	AA	1483	G
11	AA	1484	U
11	AA	1487	G
11	AA	1508	C
11	AA	1556	C
11	AA	1560	G
11	AA	1562	C
11	AA	1563	C
11	AA	1566	A
11	AA	1568	U
11	AA	1569	U
11	AA	1571	A
11	AA	1572	U
11	AA	1580	A
11	AA	1581	C
11	AA	1583	A
11	AA	1589	A
11	AA	1605	A
11	AA	1630	U
11	AA	1639	C
11	AA	1642	A
11	AA	1643	A
11	AA	1657	C
11	AA	1688	U
11	AA	1724	U
11	AA	1741	A
11	AA	1742	U
11	AA	1750	A
11	AA	1751	G
11	AA	1752	A
11	AA	1759	C
11	AA	1762	C
11	AA	1763	U
11	AA	1765	U
11	AA	1769	G
11	AA	1773	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	1775	G
11	AA	1797	A
11	AA	1808	G
11	AA	1812	G
11	AA	1815	U
11	AA	1816	A
11	AA	1817	G
11	AA	1821	U
11	AA	1842	A
11	AA	1866	C
11	AA	1878	G
11	AA	1879	A
11	AA	1880	U
11	AA	1886	A
11	AA	1893	A
11	AA	1906	G
11	AA	2102	U
11	AA	2111	G
11	AA	2112	U
11	AA	2114	C
11	AA	2122	G
11	AA	2126	A
11	AA	2131	A
11	AA	2140	U
11	AA	2144	A
11	AA	2158	A
11	AA	2168	A
11	AA	2169	G
11	AA	2170	U
11	AA	2171	G
11	AA	2176	U
11	AA	2188	A
11	AA	2204	C
11	AA	2207	A
11	AA	2208	A
11	AA	2209	U
11	AA	2223	A
11	AA	2225	U
11	AA	2244	A
11	AA	2254	U
11	AA	2266	U
11	AA	2267	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	2268	U
11	AA	2271	A
11	AA	2273	G
11	AA	2274	U
11	AA	2279	A
11	AA	2281	A2M
11	AA	2307	G
11	AA	2308	C
11	AA	2309	A
11	AA	2310	U
11	AA	2313	A
11	AA	2315	G
11	AA	2336	U
11	AA	2363	A
11	AA	2373	A
11	AA	2374	C
11	AA	2375	G
11	AA	2393	G
11	AA	2397	A
11	AA	2402	A
11	AA	2403	G
11	AA	2404	A
11	AA	2411	U
11	AA	2418	G
11	AA	2435	G
11	AA	2438	A
11	AA	2442	G
11	AA	2444	C
11	AA	2447	A
11	AA	2449	A
11	AA	2450	G
11	AA	2453	U
11	AA	2454	G
11	AA	2458	A
11	AA	2459	A
11	AA	2460	U
11	AA	2461	A
11	AA	2462	A
11	AA	2464	U
11	AA	2465	G
11	AA	2466	G
11	AA	2467	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	2468	A
11	AA	2470	C
11	AA	2471	U
11	AA	2472	U
11	AA	2473	C
11	AA	2474	G
11	AA	2475	G
11	AA	2476	C
11	AA	2477	G
11	AA	2478	C
11	AA	2479	C
11	AA	2480	A
11	AA	2487	U
11	AA	2488	A
11	AA	2489	C
11	AA	2490	C
11	AA	2492	C
11	AA	2493	U
11	AA	2494	A
11	AA	2495	C
11	AA	2496	C
11	AA	2497	U
11	AA	2499	U
11	AA	2501	U
11	AA	2503	G
11	AA	2511	A
11	AA	2514	U
11	AA	2515	A
11	AA	2549	G
11	AA	2550	U
11	AA	2552	C
11	AA	2554	A
11	AA	2560	C
11	AA	2561	A
11	AA	2569	A
11	AA	2570	U
11	AA	2571	U
11	AA	2572	C
11	AA	2573	G
11	AA	2585	G
11	AA	2593	A
11	AA	2606	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	2607	G
11	AA	2614	G
11	AA	2626	A
11	AA	2652	U
11	AA	2656	A
11	AA	2657	A
11	AA	2672	G
11	AA	2674	A
11	AA	2677	G
11	AA	2678	A
11	AA	2689	A
11	AA	2691	A
11	AA	2696	A
11	AA	2704	A
11	AA	2714	G
11	AA	2728	G
11	AA	2729	OMU
11	AA	2753	G
11	AA	2755	C
11	AA	2772	C
11	AA	2777	G
11	AA	2778	G
11	AA	2793	OMG
11	AA	2795	U
11	AA	2796	G
11	AA	2800	G
11	AA	2801	A
11	AA	2802	A
11	AA	2808	A
11	AA	2810	C
11	AA	2814	G
11	AA	2817	A
11	AA	2844	C
11	AA	2845	A
11	AA	2846	U
11	AA	2867	C
11	AA	2871	G
11	AA	2872	A
11	AA	2873	U
11	AA	2875	U
11	AA	2876	C
11	AA	2887	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	2889	C
11	AA	2899	C
11	AA	2911	A
11	AA	2922	OMG
11	AA	2923	U
11	AA	2933	A
11	AA	2935	U
11	AA	2936	A
11	AA	2942	C
11	AA	2947	G
11	AA	2971	A
11	AA	2972	G
11	AA	2977	G
11	AA	2983	C
11	AA	2990	G
11	AA	2997	G
11	AA	3012	A
11	AA	3056	U
11	AA	3059	G
11	AA	3078	U
11	AA	3092	C
11	AA	3094	A
11	AA	3101	G
11	AA	3115	C
11	AA	3122	A
11	AA	3130	A
11	AA	3131	U
11	AA	3142	A
11	AA	3143	C
11	AA	3153	U
11	AA	3154	C
11	AA	3155	U
11	AA	3156	U
11	AA	3157	U
11	AA	3168	A
11	AA	3170	A
11	AA	3172	A
11	AA	3173	G
11	AA	3176	G
11	AA	3179	U
11	AA	3181	C
11	AA	3187	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
11	AA	3207	U
11	AA	3210	A
11	AA	3216	G
11	AA	3217	C
11	AA	3218	A
11	AA	3219	G
11	AA	3243	A
11	AA	3247	G
11	AA	3276	G
11	AA	3277	U
11	AA	3281	U
11	AA	3294	A
11	AA	3304	U
11	AA	3313	U
11	AA	3316	A
11	AA	3335	A
11	AA	3341	U
11	AA	3345	G
11	AA	3352	U
11	AA	3353	G
11	AA	3369	G
11	AA	3378	C
11	AA	3389	U
11	AA	3390	G
13	BB	7	G
13	BB	11	A
13	BB	54	U
13	BB	55	A
13	BB	65	G
13	BB	73	C
13	BB	74	C
13	BB	76	A
13	BB	99	G
13	BB	112	G
14	Bb	6	U
14	Bb	8	U
14	Bb	9	A
14	Bb	15	G
14	Bb	16	U
14	Bb	17	U
14	Bb	18	G
14	Bb	21	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	Bb	22	G
14	Bb	24	G
14	Bb	26	G
14	Bb	27	C
14	Bb	30	G
14	Bb	35	A
14	Bb	36	A
14	Bb	38	A
14	Bb	40	C
14	Bb	41	U
14	Bb	46	G
14	Bb	47	U
14	Bb	48	C
14	Bb	59	U
14	Bb	62	A
14	Bb	63	C
14	Bb	65	G
14	Bb	70	C
14	Bb	74	C
14	Bb	75	C
14	Bb	76	A
16	CC	23	U
16	CC	34	U
16	CC	35	C
16	CC	38	U
16	CC	52	A
16	CC	59	A
16	CC	62	C
16	CC	63	G
16	CC	82	U
16	CC	83	C
16	CC	84	C
16	CC	85	G
16	CC	86	U
16	CC	87	G
16	CC	91	C
16	CC	95	G
16	CC	104	A
16	CC	106	C
16	CC	113	U
16	CC	125	U
16	CC	126	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
16	CC	152	G
17	Cc	18	C
17	Cc	19	G
17	Cc	20	G
17	Cc	21	U
17	Cc	22	A
17	Cc	48	U
17	Cc	52	C
17	Cc	56	U
17	Cc	58	A
17	Cc	60	A
17	Cc	62	C
17	Cc	63	C
17	Cc	76	C
17	Cc	77	A
20	Dd	26	U
60	c	2	A
60	c	4	C
60	c	26	A
60	c	34	G
60	c	42	G
60	c	45	U
60	c	47	A
60	c	67	A
60	c	68	A
60	c	71	A
60	c	72	A
60	c	78	A
60	c	100	A2M
60	c	114	C
60	c	116	U
60	c	127	G
60	c	131	C
60	c	139	C
60	c	140	A
60	c	144	U
60	c	145	A
60	c	150	U
60	c	153	G
60	c	183	U
60	c	184	C
60	c	185	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	202	A
60	c	249	U
60	c	261	U
60	c	262	U
60	c	272	U
60	c	277	U
60	c	278	U
60	c	279	G
60	c	280	U
60	c	283	U
60	c	285	G
60	c	287	G
60	c	299	A
60	c	309	C
60	c	314	C
60	c	316	A
60	c	322	G
60	c	337	G
60	c	338	C
60	c	361	C
60	c	390	G
60	c	400	A
60	c	401	A
60	c	402	C
60	c	404	G
60	c	414	OMC
60	c	417	A
60	c	419	G
60	c	423	G
60	c	424	C
60	c	426	G
60	c	428	A
60	c	434	G
60	c	439	U
60	c	444	C
60	c	454	U
60	c	455	C
60	c	460	A
60	c	468	A
60	c	475	A
60	c	506	A
60	c	513	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	515	A
60	c	519	C
60	c	520	A
60	c	525	A
60	c	526	A
60	c	527	A
60	c	534	A
60	c	537	G
60	c	538	A
60	c	541	A2M
60	c	555	A
60	c	556	A
60	c	557	G
60	c	558	U
60	c	565	C
60	c	568	G
60	c	578	OMU
60	c	579	A
60	c	582	U
60	c	594	A
60	c	606	A
60	c	611	U
60	c	620	A
60	c	623	A
60	c	624	G
60	c	639	U
60	c	644	C
60	c	645	C
60	c	648	G
60	c	650	U
60	c	651	G
60	c	691	C
60	c	692	C
60	c	695	U
60	c	696	C
60	c	745	U
60	c	760	A
60	c	765	G
60	c	766	U
60	c	771	A
60	c	775	G
60	c	778	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	780	A
60	c	781	U
60	c	782	U
60	c	783	G
60	c	784	C
60	c	787	G
60	c	789	A
60	c	793	A
60	c	794	U
60	c	795	U
60	c	809	A
60	c	814	A
60	c	821	U
60	c	822	U
60	c	859	A
60	c	860	U
60	c	861	U
60	c	863	A
60	c	895	G
60	c	896	U
60	c	898	A
60	c	906	A
60	c	913	G
60	c	914	G
60	c	933	A
60	c	935	U
60	c	951	A
60	c	960	U
60	c	966	A
60	c	988	A
60	c	992	A
60	c	993	A
60	c	1002	G
60	c	1010	C
60	c	1021	C
60	c	1026	A
60	c	1028	C
60	c	1031	U
60	c	1052	U
60	c	1053	G
60	c	1058	U
60	c	1059	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	1060	U
60	c	1061	A
60	c	1081	A
60	c	1082	C
60	c	1092	A
60	c	1093	A
60	c	1097	U
60	c	1098	U
60	c	1100	G
60	c	1109	G
60	c	1138	A
60	c	1151	A
60	c	1158	C
60	c	1163	A
60	c	1185	U
60	c	1194	A
60	c	1196	A
60	c	1199	G
60	c	1200	G
60	c	1202	A
60	c	1217	A
60	c	1218	G
60	c	1228	G
60	c	1238	A
60	c	1241	G
60	c	1244	A
60	c	1245	G
60	c	1246	C
60	c	1250	U
60	c	1252	C
60	c	1256	A
60	c	1259	U
60	c	1261	G
60	c	1274	C
60	c	1301	U
60	c	1309	C
60	c	1314	U
60	c	1315	U
60	c	1316	G
60	c	1321	A
60	c	1336	A
60	c	1338	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	1339	C
60	c	1340	U
60	c	1346	A
60	c	1347	U
60	c	1351	G
60	c	1353	U
60	c	1354	G
60	c	1355	C
60	c	1361	U
60	c	1363	U
60	c	1368	G
60	c	1370	U
60	c	1371	A
60	c	1372	U
60	c	1373	C
60	c	1378	U
60	c	1383	G
60	c	1390	U
60	c	1398	U
60	c	1400	A
60	c	1411	A
60	c	1413	U
60	c	1414	U
60	c	1415	U
60	c	1424	A
60	c	1425	A
60	c	1427	A
60	c	1428	OMG
60	c	1436	A
60	c	1458	G
60	c	1459	C
60	c	1460	A
60	c	1469	A
60	c	1471	A
60	c	1474	G
60	c	1482	C
60	c	1490	C
60	c	1491	U
60	c	1492	A
60	c	1506	G
60	c	1510	U
60	c	1516	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
60	c	1521	G
60	c	1523	G
60	c	1524	A
60	c	1535	U
60	c	1536	G
60	c	1537	C
60	c	1542	G
60	c	1557	U
60	c	1559	A
60	c	1572	OMG
60	c	1573	A
60	c	1575	G7M
60	c	1576	A
60	c	1601	G
60	c	1616	G
60	c	1619	C
60	c	1622	G
60	c	1631	A
60	c	1634	C
60	c	1657	U
60	c	1658	G
60	c	1678	A
60	c	1681	A
60	c	1682	U
60	c	1683	C
60	c	1684	U
60	c	1685	G
60	c	1717	G
60	c	1740	A
60	c	1755	A
60	c	1756	A
60	c	1760	G
60	c	1762	A
60	c	1766	A
60	c	1769	U
60	c	1780	G
60	c	1792	G
60	c	1793	G
60	c	1794	A
60	c	1795	U
60	c	1796	C
60	c	1799	U

All (17) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
11	AA	601	U
11	AA	619	A
11	AA	873	C
11	AA	916	G
11	AA	1033	U
11	AA	1348	U
11	AA	1562	C
11	AA	2101	C
11	AA	2253	G
11	AA	2487	U
11	AA	2500	A
11	AA	2792	A
11	AA	2843	U
11	AA	2971	A
11	AA	3121	U
11	AA	3206	C
13	BB	72	A

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

67 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
11	A2M	AA	807	11	18,25,26	3.61	7 (38%)	18,36,39	3.36	4 (22%)
11	OMC	AA	2948	11	19,22,23	0.57	0	26,31,34	0.91	2 (7%)
11	OMG	AA	2619	11	18,26,27	1.14	2 (11%)	19,38,41	0.86	1 (5%)
60	A2M	c	100	60,85	18,25,26	3.61	8 (44%)	18,36,39	3.31	3 (16%)
11	1MA	AA	2142	85,11	16,25,26	0.96	2 (12%)	18,37,40	1.06	2 (11%)
60	4AC	c	1280	60	21,24,25	3.54	10 (47%)	29,34,37	1.68	6 (20%)
60	OMG	c	1572	60	18,26,27	1.13	2 (11%)	19,38,41	0.87	1 (5%)
60	OMC	c	1007	60	19,22,23	0.53	0	26,31,34	0.66	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
60	MA6	c	1781	60	18,26,27	1.05	2 (11%)	19,38,41	3.42	2 (10%)
11	OMG	AA	805	11	18,26,27	1.14	2 (11%)	19,38,41	0.89	1 (5%)
11	OMU	AA	2347	11	19,22,23	3.02	8 (42%)	26,31,34	1.69	5 (19%)
11	A2M	AA	817	85,11	18,25,26	3.60	8 (44%)	18,36,39	3.45	3 (16%)
11	OMU	AA	2921	11	19,22,23	2.99	8 (42%)	26,31,34	1.68	5 (19%)
14	YYG	Bb	37	14	31,42,43	1.98	7 (22%)	33,62,65	1.84	10 (30%)
11	OMG	AA	1450	11	18,26,27	1.16	2 (11%)	19,38,41	0.84	1 (5%)
60	A2M	c	28	60	18,25,26	3.61	8 (44%)	18,36,39	3.36	3 (16%)
11	5MC	AA	2278	85,11,57	18,22,23	0.57	0	26,32,35	0.65	0
11	OMU	AA	2417	11	19,22,23	3.00	8 (42%)	26,31,34	1.70	4 (15%)
60	A2M	c	420	60	18,25,26	3.58	8 (44%)	18,36,39	3.36	3 (16%)
60	A2M	c	974	60	18,25,26	3.62	8 (44%)	18,36,39	3.32	4 (22%)
11	OMU	AA	2421	11	19,22,23	3.00	8 (42%)	26,31,34	1.72	5 (19%)
11	A2M	AA	1449	85,11	18,25,26	3.60	8 (44%)	18,36,39	3.33	4 (22%)
60	OMG	c	1126	60	18,26,27	1.17	2 (11%)	19,38,41	0.87	1 (5%)
60	A2M	c	619	60,85	18,25,26	3.65	9 (50%)	18,36,39	3.44	3 (16%)
11	A2M	AA	2640	11	18,25,26	3.62	8 (44%)	18,36,39	3.31	4 (22%)
11	OMG	AA	2288	11	18,26,27	1.15	2 (11%)	19,38,41	0.83	1 (5%)
11	OMG	AA	2815	11	18,26,27	1.14	2 (11%)	19,38,41	0.85	1 (5%)
11	A2M	AA	2281	11	18,25,26	3.66	9 (50%)	18,36,39	3.36	4 (22%)
11	OMU	AA	1888	11	19,22,23	3.00	8 (42%)	26,31,34	1.75	5 (19%)
60	OMC	c	1639	60,85	19,22,23	0.55	0	26,31,34	0.61	0
11	A2M	AA	2280	11	18,25,26	3.60	8 (44%)	18,36,39	3.37	4 (22%)
11	A2M	AA	876	11	18,25,26	3.60	8 (44%)	18,36,39	3.37	4 (22%)
11	A2M	AA	2256	11	18,25,26	3.59	8 (44%)	18,36,39	3.51	5 (27%)
11	OMC	AA	2337	11	19,22,23	0.56	0	26,31,34	0.69	0
11	UR3	AA	2634	11	19,22,23	2.85	7 (36%)	26,32,35	1.34	3 (11%)
60	OMU	c	578	60	19,22,23	3.05	8 (42%)	26,31,34	1.69	5 (19%)
60	OMC	c	414	60	19,22,23	0.55	0	26,31,34	0.69	0
11	A2M	AA	1133	85,11	18,25,26	3.60	8 (44%)	18,36,39	3.39	3 (16%)
60	OMG	c	562	60	18,26,27	1.12	2 (11%)	19,38,41	0.85	1 (5%)
11	5MC	AA	2870	86,11	18,22,23	0.67	0	26,32,35	0.60	0
60	OMU	c	1269	60	19,22,23	3.03	8 (42%)	26,31,34	1.73	5 (19%)
11	A2M	AA	2946	85,11	18,25,26	3.59	7 (38%)	18,36,39	3.35	3 (16%)
60	G7M	c	1575	60,17	20,26,27	2.41	7 (35%)	17,39,42	1.26	1 (5%)
11	OMG	AA	2791	11	18,26,27	1.14	2 (11%)	19,38,41	0.86	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
11	OMG	AA	2793	11	18,26,27	1.15	2 (11%)	19,38,41	0.91	1 (5%)
60	A2M	c	796	60	18,25,26	3.63	8 (44%)	18,36,39	3.33	4 (22%)
11	OMG	AA	867	86,11	18,26,27	1.14	2 (11%)	19,38,41	0.87	1 (5%)
11	OMU	AA	898	11	19,22,23	2.99	8 (42%)	26,31,34	1.66	4 (15%)
11	OMG	AA	2922	14,11	18,26,27	1.16	2 (11%)	19,38,41	0.83	1 (5%)
60	MA6	c	1782	60	18,26,27	1.01	2 (11%)	19,38,41	3.53	2 (10%)
11	OMU	AA	2724	11	19,22,23	3.00	8 (42%)	26,31,34	1.69	4 (15%)
60	4AC	c	1773	60	21,24,25	3.46	10 (47%)	29,34,37	1.58	5 (17%)
11	OMG	AA	908	11	18,26,27	1.19	2 (11%)	19,38,41	0.85	1 (5%)
60	A2M	c	436	60	18,25,26	3.63	8 (44%)	18,36,39	3.35	4 (22%)
60	A2M	c	541	60	18,25,26	3.60	8 (44%)	18,36,39	3.36	4 (22%)
11	OMC	AA	2959	11	19,22,23	0.58	0	26,31,34	0.68	0
11	A2M	AA	649	11	18,25,26	3.61	8 (44%)	18,36,39	3.35	4 (22%)
11	OMC	AA	1437	85,11	19,22,23	0.59	0	26,31,34	1.07	2 (7%)
11	OMU	AA	2729	11	19,22,23	2.98	8 (42%)	26,31,34	1.67	5 (19%)
11	OMC	AA	2197	86,11	19,22,23	0.54	0	26,31,34	0.63	0
60	B8N	c	1191	60	24,29,30	3.03	7 (29%)	29,42,45	1.79	7 (24%)
11	1MA	AA	645	85,11	16,25,26	0.93	2 (12%)	18,37,40	1.06	2 (11%)
60	OMG	c	1428	60,85	18,26,27	1.15	2 (11%)	19,38,41	0.84	1 (5%)
11	A2M	AA	2220	11	18,25,26	3.59	8 (44%)	18,36,39	3.34	3 (16%)
11	OMC	AA	650	85,11	19,22,23	0.57	0	26,31,34	0.67	0
11	OMC	AA	663	11	19,22,23	0.56	0	26,31,34	0.73	0
60	OMG	c	1271	60	18,26,27	1.13	2 (11%)	19,38,41	0.87	1 (5%)

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
11	A2M	AA	807	11	-	0/5/27/28	0/3/3/3
11	OMC	AA	2948	11	-	1/9/27/28	0/2/2/2
11	OMG	AA	2619	11	-	1/5/27/28	0/3/3/3
60	A2M	c	100	60,85	-	2/5/27/28	0/3/3/3
11	1MA	AA	2142	85,11	-	0/3/25/26	0/3/3/3
60	4AC	c	1280	60	-	5/11/29/30	0/2/2/2
60	OMG	c	1572	60	-	3/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
60	OMC	c	1007	60	-	0/9/27/28	0/2/2/2
60	MA6	c	1781	60	-	0/7/29/30	0/3/3/3
11	OMG	AA	805	11	-	0/5/27/28	0/3/3/3
11	OMU	AA	2347	11	-	0/9/27/28	0/2/2/2
11	A2M	AA	817	85,11	-	2/5/27/28	0/3/3/3
11	OMU	AA	2921	11	-	0/9/27/28	0/2/2/2
14	YYG	Bb	37	14	-	13/20/42/43	0/3/4/4
11	OMG	AA	1450	11	-	2/5/27/28	0/3/3/3
60	A2M	c	28	60	-	1/5/27/28	0/3/3/3
11	5MC	AA	2278	85,11,57	-	0/7/25/26	0/2/2/2
11	OMU	AA	2417	11	-	1/9/27/28	0/2/2/2
60	A2M	c	420	60	-	1/5/27/28	0/3/3/3
60	A2M	c	974	60	-	0/5/27/28	0/3/3/3
11	OMU	AA	2421	11	-	0/9/27/28	0/2/2/2
11	A2M	AA	1449	85,11	-	0/5/27/28	0/3/3/3
60	OMG	c	1126	60	-	0/5/27/28	0/3/3/3
60	A2M	c	619	60,85	-	1/5/27/28	0/3/3/3
11	A2M	AA	2640	11	-	1/5/27/28	0/3/3/3
11	OMG	AA	2288	11	-	0/5/27/28	0/3/3/3
11	OMG	AA	2815	11	-	0/5/27/28	0/3/3/3
11	A2M	AA	2281	11	-	3/5/27/28	0/3/3/3
11	OMU	AA	1888	11	-	0/9/27/28	0/2/2/2
60	OMC	c	1639	60,85	-	0/9/27/28	0/2/2/2
11	A2M	AA	2280	11	-	2/5/27/28	0/3/3/3
11	A2M	AA	876	11	-	0/5/27/28	0/3/3/3
11	A2M	AA	2256	11	-	3/5/27/28	0/3/3/3
11	OMC	AA	2337	11	-	0/9/27/28	0/2/2/2
11	UR3	AA	2634	11	-	0/7/25/26	0/2/2/2
60	OMU	c	578	60	-	8/9/27/28	0/2/2/2
60	OMC	c	414	60	-	2/9/27/28	0/2/2/2
11	A2M	AA	1133	85,11	-	0/5/27/28	0/3/3/3
60	OMG	c	562	60	-	0/5/27/28	0/3/3/3
11	5MC	AA	2870	86,11	-	4/7/25/26	0/2/2/2
60	OMU	c	1269	60	-	0/9/27/28	0/2/2/2
11	A2M	AA	2946	85,11	-	0/5/27/28	0/3/3/3
60	G7M	c	1575	60,17	-	2/3/25/26	0/3/3/3
11	OMG	AA	2791	11	-	0/5/27/28	0/3/3/3
11	OMG	AA	2793	11	-	0/5/27/28	0/3/3/3
60	A2M	c	796	60	-	0/5/27/28	0/3/3/3
11	OMG	AA	867	86,11	-	2/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
11	OMU	AA	898	11	-	1/9/27/28	0/2/2/2
11	OMG	AA	2922	14,11	-	2/5/27/28	0/3/3/3
60	MA6	c	1782	60	-	2/7/29/30	0/3/3/3
11	OMU	AA	2724	11	-	1/9/27/28	0/2/2/2
60	4AC	c	1773	60	-	2/11/29/30	0/2/2/2
11	OMG	AA	908	11	-	1/5/27/28	0/3/3/3
60	A2M	c	436	60	-	0/5/27/28	0/3/3/3
60	A2M	c	541	60	-	3/5/27/28	0/3/3/3
11	OMC	AA	2959	11	-	0/9/27/28	0/2/2/2
11	A2M	AA	649	11	-	1/5/27/28	0/3/3/3
11	OMC	AA	1437	85,11	-	4/9/27/28	0/2/2/2
11	OMU	AA	2729	11	-	1/9/27/28	0/2/2/2
11	OMC	AA	2197	86,11	-	4/9/27/28	0/2/2/2
60	B8N	c	1191	60	-	5/16/34/35	0/2/2/2
11	1MA	AA	645	85,11	-	0/3/25/26	0/3/3/3
60	OMG	c	1428	60,85	-	2/5/27/28	0/3/3/3
11	A2M	AA	2220	11	-	1/5/27/28	0/3/3/3
11	OMC	AA	650	85,11	-	0/9/27/28	0/2/2/2
11	OMC	AA	663	11	-	1/9/27/28	0/2/2/2
60	OMG	c	1271	60	-	1/5/27/28	0/3/3/3

All (326) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	807	A2M	C3'-C4'	-9.00	1.30	1.53
11	AA	2946	A2M	C3'-C4'	-8.90	1.30	1.53
60	c	619	A2M	C3'-C4'	-8.90	1.30	1.53
11	AA	1133	A2M	C3'-C4'	-8.89	1.30	1.53
60	c	796	A2M	C3'-C4'	-8.88	1.30	1.53
60	c	100	A2M	C3'-C4'	-8.86	1.30	1.53
11	AA	2640	A2M	C3'-C4'	-8.85	1.30	1.53
11	AA	817	A2M	C3'-C4'	-8.84	1.30	1.53
60	c	541	A2M	C3'-C4'	-8.82	1.30	1.53
11	AA	2280	A2M	C3'-C4'	-8.82	1.30	1.53
60	c	28	A2M	C3'-C4'	-8.81	1.30	1.53
60	c	420	A2M	C3'-C4'	-8.80	1.30	1.53
11	AA	876	A2M	C3'-C4'	-8.80	1.30	1.53
60	c	974	A2M	C3'-C4'	-8.80	1.30	1.53
60	c	436	A2M	C3'-C4'	-8.79	1.30	1.53
11	AA	2220	A2M	C3'-C4'	-8.78	1.30	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	1449	A2M	C3'-C4'	-8.75	1.30	1.53
11	AA	649	A2M	C3'-C4'	-8.70	1.30	1.53
11	AA	2256	A2M	C3'-C4'	-8.47	1.31	1.53
11	AA	2281	A2M	C3'-C4'	-8.39	1.31	1.53
11	AA	2281	A2M	O4'-C1'	-7.91	1.30	1.41
60	c	1191	B8N	C6-N1	7.80	1.55	1.36
60	c	420	A2M	O4'-C4'	7.78	1.62	1.45
11	AA	2256	A2M	O4'-C4'	7.77	1.62	1.45
60	c	796	A2M	O4'-C4'	7.76	1.62	1.45
60	c	100	A2M	O4'-C4'	7.74	1.62	1.45
60	c	974	A2M	O4'-C4'	7.68	1.62	1.45
11	AA	2281	A2M	O4'-C4'	7.65	1.62	1.45
11	AA	2220	A2M	O4'-C4'	7.64	1.62	1.45
60	c	436	A2M	O4'-C4'	7.63	1.62	1.45
11	AA	2640	A2M	O4'-C4'	7.60	1.62	1.45
60	c	28	A2M	O4'-C4'	7.60	1.62	1.45
11	AA	1133	A2M	O4'-C4'	7.59	1.62	1.45
11	AA	2946	A2M	O4'-C4'	7.59	1.62	1.45
60	c	619	A2M	O4'-C1'	-7.54	1.30	1.41
11	AA	649	A2M	O4'-C4'	7.53	1.61	1.45
60	c	541	A2M	O4'-C4'	7.53	1.61	1.45
11	AA	817	A2M	O4'-C4'	7.52	1.61	1.45
60	c	1191	B8N	C4-N3	-7.52	1.26	1.40
11	AA	876	A2M	O4'-C4'	7.48	1.61	1.45
11	AA	2280	A2M	O4'-C4'	7.48	1.61	1.45
11	AA	1449	A2M	O4'-C4'	7.44	1.61	1.45
60	c	619	A2M	O4'-C4'	7.41	1.61	1.45
11	AA	649	A2M	O4'-C1'	-7.39	1.30	1.41
11	AA	807	A2M	O4'-C4'	7.34	1.61	1.45
11	AA	2256	A2M	O4'-C1'	-7.33	1.30	1.41
11	AA	1449	A2M	O4'-C1'	-7.31	1.30	1.41
60	c	436	A2M	O4'-C1'	-7.30	1.30	1.41
11	AA	2280	A2M	O4'-C1'	-7.29	1.30	1.41
60	c	1280	4AC	C4-N3	7.26	1.45	1.32
11	AA	807	A2M	O4'-C1'	-7.26	1.31	1.41
11	AA	876	A2M	O4'-C1'	-7.23	1.31	1.41
11	AA	2640	A2M	O4'-C1'	-7.21	1.31	1.41
11	AA	817	A2M	O4'-C1'	-7.21	1.31	1.41
60	c	28	A2M	O4'-C1'	-7.20	1.31	1.41
60	c	974	A2M	O4'-C1'	-7.20	1.31	1.41
60	c	1773	4AC	C4-N3	7.19	1.45	1.32
60	c	541	A2M	O4'-C1'	-7.18	1.31	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	2347	OMU	C2-N1	7.13	1.49	1.38
60	c	578	OMU	C2-N1	7.11	1.49	1.38
11	AA	2220	A2M	O4'-C1'	-7.05	1.31	1.41
11	AA	1133	A2M	O4'-C1'	-7.00	1.31	1.41
11	AA	2417	OMU	C2-N1	6.99	1.49	1.38
60	c	100	A2M	O4'-C1'	-6.99	1.31	1.41
60	c	796	A2M	O4'-C1'	-6.99	1.31	1.41
11	AA	2724	OMU	C2-N1	6.99	1.49	1.38
11	AA	2946	A2M	O4'-C1'	-6.99	1.31	1.41
11	AA	898	OMU	C2-N1	6.98	1.49	1.38
11	AA	2421	OMU	C2-N1	6.98	1.49	1.38
60	c	1269	OMU	C2-N1	6.96	1.49	1.38
11	AA	1888	OMU	C2-N1	6.96	1.49	1.38
11	AA	2921	OMU	C2-N1	6.90	1.49	1.38
60	c	1773	4AC	C6-C5	6.86	1.51	1.35
11	AA	2729	OMU	C2-N1	6.83	1.49	1.38
60	c	1280	4AC	C6-C5	6.83	1.50	1.35
60	c	420	A2M	O4'-C1'	-6.83	1.31	1.41
11	AA	2634	UR3	C2-N1	6.82	1.48	1.38
60	c	578	OMU	C2-N3	6.76	1.50	1.38
11	AA	2724	OMU	C2-N3	6.69	1.49	1.38
11	AA	2634	UR3	C6-C5	6.68	1.50	1.35
60	c	1269	OMU	C2-N3	6.68	1.49	1.38
11	AA	1888	OMU	C2-N3	6.68	1.49	1.38
11	AA	2347	OMU	C2-N3	6.68	1.49	1.38
11	AA	2417	OMU	C2-N3	6.67	1.49	1.38
11	AA	2421	OMU	C2-N3	6.64	1.49	1.38
11	AA	2729	OMU	C2-N3	6.62	1.49	1.38
11	AA	898	OMU	C2-N3	6.62	1.49	1.38
11	AA	2921	OMU	C2-N3	6.60	1.49	1.38
14	Bb	37	YYG	O23-C21	6.47	1.45	1.34
60	c	1269	OMU	C6-C5	5.75	1.48	1.35
11	AA	2634	UR3	C2-N3	5.74	1.50	1.39
60	c	1191	B8N	C2-N1	5.74	1.56	1.39
60	c	1280	4AC	C7-N4	5.72	1.47	1.37
60	c	578	OMU	C6-C5	5.70	1.48	1.35
11	AA	1888	OMU	C6-C5	5.65	1.48	1.35
11	AA	2421	OMU	C6-C5	5.65	1.48	1.35
11	AA	2921	OMU	C6-C5	5.63	1.48	1.35
11	AA	2729	OMU	C6-C5	5.63	1.48	1.35
11	AA	2417	OMU	C6-C5	5.60	1.48	1.35
11	AA	2347	OMU	C6-C5	5.58	1.48	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	2724	OMU	C6-C5	5.58	1.48	1.35
11	AA	898	OMU	C6-C5	5.57	1.48	1.35
60	c	1773	4AC	C7-N4	5.49	1.47	1.37
60	c	1191	B8N	C6-C5	5.42	1.42	1.34
60	c	1280	4AC	C2-N1	5.33	1.51	1.40
60	c	1575	G7M	C2-N3	5.32	1.46	1.33
60	c	1280	4AC	C4-N4	5.22	1.47	1.39
14	Bb	37	YYG	O18-C16	5.10	1.45	1.33
60	c	1280	4AC	C2-N3	5.08	1.46	1.36
60	c	1773	4AC	C2-N3	5.04	1.46	1.36
60	c	1773	4AC	C4-N4	5.03	1.47	1.39
60	c	1773	4AC	C2-N1	4.99	1.50	1.40
60	c	1575	G7M	C4-N3	4.87	1.49	1.37
60	c	1575	G7M	C2-N2	4.64	1.45	1.34
60	c	578	OMU	C4-N3	4.29	1.46	1.38
60	c	1269	OMU	C4-N3	4.23	1.46	1.38
60	c	1280	4AC	CM7-C7	4.21	1.59	1.50
11	AA	898	OMU	C4-N3	4.13	1.46	1.38
11	AA	2417	OMU	C4-N3	4.13	1.46	1.38
11	AA	2421	OMU	C4-N3	4.12	1.45	1.38
11	AA	2921	OMU	C4-N3	4.10	1.45	1.38
11	AA	2729	OMU	C4-N3	4.09	1.45	1.38
11	AA	1888	OMU	C4-N3	4.09	1.45	1.38
11	AA	2724	OMU	C4-N3	4.08	1.45	1.38
11	AA	2347	OMU	C4-N3	4.04	1.45	1.38
60	c	1280	4AC	C5-C4	4.02	1.49	1.40
60	c	1773	4AC	C5-C4	3.97	1.49	1.40
60	c	1773	4AC	CM7-C7	3.94	1.58	1.50
60	c	1191	B8N	C1'-C5	3.90	1.59	1.50
60	c	1575	G7M	C6-N1	3.65	1.43	1.37
14	Bb	37	YYG	O6-C6	-3.38	1.18	1.22
11	AA	2634	UR3	C6-N1	3.26	1.45	1.38
60	c	541	A2M	C6-N6	3.16	1.45	1.34
60	c	1575	G7M	C5-C6	3.16	1.53	1.45
60	c	436	A2M	C6-N6	3.15	1.45	1.34
11	AA	2256	A2M	C6-N6	3.14	1.45	1.34
60	c	420	A2M	C6-N6	3.14	1.45	1.34
60	c	974	A2M	C6-N6	3.14	1.45	1.34
60	c	619	A2M	C6-N6	3.13	1.45	1.34
60	c	796	A2M	C6-N6	3.13	1.45	1.34
11	AA	1133	A2M	C6-N6	3.12	1.45	1.34
60	c	28	A2M	C6-N6	3.11	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	2220	A2M	C6-N6	3.11	1.45	1.34
11	AA	2946	A2M	C6-N6	3.10	1.45	1.34
11	AA	2640	A2M	C6-N6	3.10	1.45	1.34
11	AA	2280	A2M	C6-N6	3.10	1.45	1.34
11	AA	1449	A2M	C6-N6	3.10	1.45	1.34
11	AA	807	A2M	C6-N6	3.10	1.45	1.34
60	c	100	A2M	C6-N6	3.09	1.45	1.34
11	AA	649	A2M	C6-N6	3.09	1.45	1.34
11	AA	817	A2M	C6-N6	3.08	1.45	1.34
11	AA	876	A2M	C6-N6	3.07	1.45	1.34
11	AA	2417	OMU	O4-C4	-3.06	1.18	1.24
11	AA	2724	OMU	O4-C4	-3.05	1.18	1.24
11	AA	2921	OMU	O4-C4	-3.02	1.18	1.24
11	AA	2281	A2M	C6-N6	3.01	1.45	1.34
60	c	436	A2M	O3'-C3'	3.01	1.50	1.43
11	AA	2347	OMU	O4-C4	-3.00	1.18	1.24
11	AA	2729	OMU	O4-C4	-3.00	1.18	1.24
11	AA	2421	OMU	O4-C4	-2.99	1.18	1.24
60	c	1269	OMU	O4-C4	-2.99	1.18	1.24
11	AA	2281	A2M	O3'-C3'	2.98	1.50	1.43
11	AA	2256	A2M	O3'-C3'	2.95	1.49	1.43
60	c	578	OMU	O4-C4	-2.95	1.18	1.24
11	AA	1888	OMU	O4-C4	-2.94	1.18	1.24
11	AA	898	OMU	O4-C4	-2.94	1.18	1.24
60	c	796	A2M	O3'-C3'	2.94	1.49	1.43
11	AA	908	OMG	C8-N7	-2.93	1.30	1.35
60	c	619	A2M	O3'-C3'	2.93	1.49	1.43
60	c	541	A2M	O3'-C3'	2.92	1.49	1.43
11	AA	1450	OMG	C8-N7	-2.91	1.30	1.35
11	AA	1449	A2M	O3'-C3'	2.90	1.49	1.43
11	AA	2288	OMG	C8-N7	-2.90	1.30	1.35
60	c	578	OMU	C6-N1	2.90	1.45	1.38
14	Bb	37	YYG	C2-N1	-2.87	1.31	1.37
11	AA	649	A2M	O3'-C3'	2.87	1.49	1.43
60	c	1428	OMG	C8-N7	-2.87	1.30	1.35
60	c	1269	OMU	C6-N1	2.87	1.44	1.38
60	c	100	A2M	O3'-C3'	2.86	1.49	1.43
11	AA	2791	OMG	C8-N7	-2.85	1.30	1.35
11	AA	807	A2M	O3'-C3'	2.85	1.49	1.43
11	AA	2220	A2M	O3'-C3'	2.85	1.49	1.43
11	AA	2640	A2M	O3'-C3'	2.85	1.49	1.43
60	c	28	A2M	O3'-C3'	2.83	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	c	420	A2M	O3'-C3'	2.83	1.49	1.43
11	AA	817	A2M	O3'-C3'	2.83	1.49	1.43
11	AA	2281	A2M	C5-C4	-2.82	1.33	1.40
11	AA	2280	A2M	O3'-C3'	2.82	1.49	1.43
11	AA	876	A2M	O3'-C3'	2.82	1.49	1.43
11	AA	867	OMG	C8-N7	-2.82	1.30	1.35
11	AA	805	OMG	C8-N7	-2.81	1.30	1.35
11	AA	1133	A2M	C5-C4	-2.81	1.33	1.40
11	AA	649	A2M	C5-C4	-2.80	1.33	1.40
60	c	974	A2M	O3'-C3'	2.80	1.49	1.43
60	c	562	OMG	C8-N7	-2.80	1.30	1.35
11	AA	2729	OMU	C6-N1	2.80	1.44	1.38
11	AA	2347	OMU	C6-N1	2.80	1.44	1.38
11	AA	2946	A2M	C5-C4	-2.80	1.33	1.40
11	AA	807	A2M	C5-C4	-2.79	1.33	1.40
11	AA	2921	OMU	C6-N1	2.79	1.44	1.38
11	AA	2815	OMG	C8-N7	-2.79	1.30	1.35
11	AA	2619	OMG	C8-N7	-2.79	1.30	1.35
11	AA	2922	OMG	C8-N7	-2.79	1.30	1.35
11	AA	2421	OMU	C6-N1	2.78	1.44	1.38
11	AA	1888	OMU	C6-N1	2.78	1.44	1.38
11	AA	2417	OMU	C6-N1	2.78	1.44	1.38
11	AA	1133	A2M	O3'-C3'	2.78	1.49	1.43
11	AA	898	OMU	C6-N1	2.78	1.44	1.38
11	AA	817	A2M	C5-C4	-2.77	1.33	1.40
60	c	974	A2M	C5-C4	-2.77	1.33	1.40
60	c	1126	OMG	C8-N7	-2.77	1.30	1.35
60	c	1271	OMG	C8-N7	-2.75	1.30	1.35
14	Bb	37	YYG	C13-C12	2.75	1.58	1.50
11	AA	2946	A2M	O3'-C3'	2.75	1.49	1.43
60	c	796	A2M	C5-C4	-2.75	1.33	1.40
11	AA	2793	OMG	C8-N7	-2.75	1.30	1.35
11	AA	1449	A2M	C5-C4	-2.74	1.33	1.40
60	c	619	A2M	C5-C4	-2.73	1.33	1.40
11	AA	2724	OMU	C6-N1	2.73	1.44	1.38
14	Bb	37	YYG	C4-N3	-2.73	1.35	1.40
11	AA	2256	A2M	C5-C4	-2.72	1.33	1.40
11	AA	2640	A2M	C5-C4	-2.72	1.33	1.40
60	c	100	A2M	C5-C4	-2.72	1.33	1.40
11	AA	876	A2M	C5-C4	-2.71	1.33	1.40
60	c	796	A2M	O2'-C2'	-2.71	1.35	1.42
11	AA	2280	A2M	C5-C4	-2.70	1.33	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	2220	A2M	C5-C4	-2.70	1.33	1.40
60	c	436	A2M	C5-C4	-2.68	1.33	1.40
60	c	1782	MA6	C5-C4	-2.68	1.33	1.40
11	AA	2946	A2M	O2'-C2'	-2.67	1.35	1.42
60	c	28	A2M	C5-C4	-2.67	1.33	1.40
60	c	28	A2M	O2'-C2'	-2.66	1.35	1.42
11	AA	2281	A2M	O2'-C2'	-2.65	1.35	1.42
60	c	1781	MA6	C5-C4	-2.65	1.33	1.40
60	c	1575	G7M	C2-N1	2.65	1.44	1.37
60	c	619	A2M	O2'-C2'	-2.65	1.35	1.42
60	c	436	A2M	O2'-C2'	-2.65	1.35	1.42
60	c	100	A2M	O2'-C2'	-2.64	1.35	1.42
11	AA	1449	A2M	O2'-C2'	-2.64	1.35	1.42
11	AA	807	A2M	O2'-C2'	-2.63	1.35	1.42
60	c	420	A2M	C5-C4	-2.63	1.34	1.40
60	c	541	A2M	C5-C4	-2.61	1.34	1.40
11	AA	2142	1MA	C8-N7	-2.61	1.30	1.35
14	Bb	37	YYG	C10-C11	2.61	1.54	1.50
11	AA	1133	A2M	O2'-C2'	-2.61	1.35	1.42
11	AA	2640	A2M	O2'-C2'	-2.61	1.35	1.42
60	c	1572	OMG	C8-N7	-2.60	1.30	1.35
60	c	420	A2M	O2'-C2'	-2.59	1.36	1.42
60	c	541	A2M	O2'-C2'	-2.59	1.36	1.42
11	AA	817	A2M	O2'-C2'	-2.59	1.36	1.42
60	c	974	A2M	O2'-C2'	-2.57	1.36	1.42
11	AA	876	A2M	O2'-C2'	-2.56	1.36	1.42
11	AA	2220	A2M	O2'-C2'	-2.56	1.36	1.42
11	AA	649	A2M	O2'-C2'	-2.55	1.36	1.42
11	AA	2280	A2M	O2'-C2'	-2.55	1.36	1.42
11	AA	2347	OMU	O2-C2	-2.53	1.18	1.23
60	c	578	OMU	C5-C4	2.50	1.49	1.43
60	c	1126	OMG	C5-C6	-2.50	1.42	1.47
11	AA	2724	OMU	O2-C2	-2.47	1.18	1.23
11	AA	1450	OMG	C5-C6	-2.47	1.42	1.47
60	c	1773	4AC	C6-N1	2.47	1.44	1.38
60	c	1428	OMG	C5-C6	-2.47	1.42	1.47
11	AA	2922	OMG	C5-C6	-2.46	1.42	1.47
11	AA	645	1MA	C8-N7	-2.45	1.30	1.35
11	AA	2421	OMU	O2-C2	-2.44	1.18	1.23
60	c	1781	MA6	C2-N3	2.44	1.36	1.32
11	AA	2815	OMG	C5-C6	-2.43	1.42	1.47
11	AA	2921	OMU	O2-C2	-2.43	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	AA	867	OMG	C5-C6	-2.43	1.42	1.47
60	c	1280	4AC	C6-N1	2.43	1.43	1.38
60	c	1269	OMU	C5-C4	2.43	1.49	1.43
11	AA	898	OMU	O2-C2	-2.42	1.18	1.23
11	AA	908	OMG	C5-C6	-2.40	1.42	1.47
11	AA	2791	OMG	C5-C6	-2.40	1.42	1.47
11	AA	2619	OMG	C5-C6	-2.39	1.42	1.47
11	AA	2417	OMU	O2-C2	-2.39	1.18	1.23
11	AA	2288	OMG	C5-C6	-2.38	1.42	1.47
11	AA	805	OMG	C5-C6	-2.38	1.42	1.47
11	AA	1888	OMU	O2-C2	-2.37	1.18	1.23
60	c	562	OMG	C5-C6	-2.37	1.42	1.47
60	c	1269	OMU	O2-C2	-2.37	1.18	1.23
11	AA	2793	OMG	C5-C6	-2.37	1.42	1.47
11	AA	2921	OMU	C5-C4	2.34	1.48	1.43
60	c	1572	OMG	C5-C6	-2.33	1.42	1.47
11	AA	2729	OMU	O2-C2	-2.32	1.18	1.23
11	AA	2729	OMU	C5-C4	2.32	1.48	1.43
60	c	1773	4AC	O7-C7	-2.31	1.18	1.23
60	c	578	OMU	O2-C2	-2.30	1.18	1.23
11	AA	2421	OMU	C5-C4	2.30	1.48	1.43
60	c	1271	OMG	C5-C6	-2.29	1.42	1.47
11	AA	645	1MA	C5-C4	-2.29	1.37	1.43
11	AA	2142	1MA	C5-C4	-2.28	1.37	1.43
11	AA	2724	OMU	C5-C4	2.28	1.48	1.43
60	c	1782	MA6	C2-N3	2.27	1.35	1.32
11	AA	898	OMU	C5-C4	2.27	1.48	1.43
11	AA	2256	A2M	O2'-C2'	-2.24	1.36	1.42
11	AA	2347	OMU	C5-C4	2.23	1.48	1.43
60	c	1280	4AC	O7-C7	-2.23	1.18	1.23
11	AA	1888	OMU	C5-C4	2.23	1.48	1.43
60	c	420	A2M	C2-N3	2.20	1.35	1.32
60	c	1575	G7M	O6-C6	-2.19	1.18	1.23
60	c	619	A2M	O5'-C5'	-2.19	1.39	1.44
11	AA	2417	OMU	C5-C4	2.17	1.48	1.43
11	AA	2280	A2M	C2-N3	2.17	1.35	1.32
11	AA	2634	UR3	C4-N3	2.16	1.45	1.40
11	AA	2634	UR3	C5-C4	2.15	1.49	1.43
60	c	100	A2M	C2-N3	2.15	1.35	1.32
60	c	541	A2M	C2-N3	2.15	1.35	1.32
60	c	796	A2M	C2-N3	2.13	1.35	1.32
11	AA	2634	UR3	O2-C2	-2.12	1.18	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	c	1191	B8N	O4-C4	-2.10	1.18	1.23
11	AA	817	A2M	C2-N3	2.10	1.35	1.32
11	AA	2220	A2M	C2-N3	2.10	1.35	1.32
60	c	436	A2M	C2-N3	2.09	1.35	1.32
11	AA	876	A2M	C2-N3	2.09	1.35	1.32
11	AA	2640	A2M	C2-N3	2.08	1.35	1.32
60	c	28	A2M	C2-N3	2.08	1.35	1.32
11	AA	2256	A2M	C2-N3	2.08	1.35	1.32
60	c	974	A2M	C2-N3	2.07	1.35	1.32
11	AA	2281	A2M	C2-N3	2.07	1.35	1.32
60	c	619	A2M	C2-N3	2.06	1.35	1.32
60	c	1191	B8N	O2-C2	-2.05	1.18	1.22
11	AA	2281	A2M	O5'-C5'	-2.04	1.39	1.44
11	AA	1449	A2M	C2-N3	2.03	1.35	1.32
11	AA	649	A2M	C2-N3	2.02	1.35	1.32
11	AA	1133	A2M	C2-N3	2.00	1.35	1.32

All (179) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
60	c	1782	MA6	N1-C6-N6	-14.07	102.25	117.06
60	c	1781	MA6	N1-C6-N6	-13.68	102.66	117.06
11	AA	817	A2M	C5-C6-N6	10.75	136.68	120.35
60	c	619	A2M	C5-C6-N6	10.63	136.50	120.35
11	AA	1133	A2M	C5-C6-N6	10.60	136.46	120.35
60	c	420	A2M	C5-C6-N6	10.54	136.37	120.35
11	AA	876	A2M	C5-C6-N6	10.54	136.37	120.35
11	AA	807	A2M	C5-C6-N6	10.54	136.36	120.35
60	c	28	A2M	C5-C6-N6	10.54	136.36	120.35
60	c	541	A2M	C5-C6-N6	10.53	136.35	120.35
11	AA	2220	A2M	C5-C6-N6	10.53	136.35	120.35
11	AA	2256	A2M	C5-C6-N6	10.51	136.32	120.35
11	AA	649	A2M	C5-C6-N6	10.49	136.29	120.35
11	AA	2280	A2M	C5-C6-N6	10.49	136.29	120.35
60	c	436	A2M	C5-C6-N6	10.46	136.25	120.35
11	AA	1449	A2M	C5-C6-N6	10.45	136.23	120.35
60	c	974	A2M	C5-C6-N6	10.41	136.18	120.35
11	AA	2946	A2M	C5-C6-N6	10.41	136.17	120.35
60	c	100	A2M	C5-C6-N6	10.40	136.15	120.35
11	AA	2640	A2M	C5-C6-N6	10.38	136.13	120.35
60	c	796	A2M	C5-C6-N6	10.36	136.10	120.35
11	AA	2281	A2M	C5-C6-N6	10.15	135.78	120.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	AA	817	A2M	N6-C6-N1	-7.47	103.07	118.57
60	c	619	A2M	N6-C6-N1	-7.26	103.50	118.57
60	c	420	A2M	N6-C6-N1	-7.23	103.56	118.57
11	AA	2946	A2M	N6-C6-N1	-7.18	103.66	118.57
60	c	28	A2M	N6-C6-N1	-7.18	103.67	118.57
11	AA	1133	A2M	N6-C6-N1	-7.16	103.70	118.57
11	AA	1449	A2M	N6-C6-N1	-7.16	103.70	118.57
11	AA	2220	A2M	N6-C6-N1	-7.16	103.70	118.57
60	c	541	A2M	N6-C6-N1	-7.16	103.71	118.57
60	c	100	A2M	N6-C6-N1	-7.16	103.72	118.57
11	AA	807	A2M	N6-C6-N1	-7.15	103.72	118.57
11	AA	2280	A2M	N6-C6-N1	-7.15	103.73	118.57
11	AA	649	A2M	N6-C6-N1	-7.15	103.74	118.57
11	AA	2256	A2M	N6-C6-N1	-7.14	103.75	118.57
11	AA	876	A2M	N6-C6-N1	-7.14	103.75	118.57
60	c	436	A2M	N6-C6-N1	-7.12	103.79	118.57
60	c	974	A2M	N6-C6-N1	-7.12	103.79	118.57
11	AA	2281	A2M	N6-C6-N1	-7.06	103.92	118.57
11	AA	2640	A2M	N6-C6-N1	-7.05	103.93	118.57
60	c	796	A2M	N6-C6-N1	-7.02	104.01	118.57
11	AA	1133	A2M	N3-C2-N1	-5.75	119.69	128.68
60	c	28	A2M	N3-C2-N1	-5.70	119.77	128.68
60	c	1773	4AC	CM7-C7-N4	5.64	125.06	115.29
11	AA	2281	A2M	N3-C2-N1	-5.63	119.87	128.68
11	AA	2946	A2M	N3-C2-N1	-5.63	119.87	128.68
60	c	1280	4AC	CM7-C7-N4	5.61	125.00	115.29
60	c	796	A2M	N3-C2-N1	-5.60	119.92	128.68
60	c	974	A2M	N3-C2-N1	-5.58	119.95	128.68
11	AA	817	A2M	N3-C2-N1	-5.57	119.97	128.68
11	AA	649	A2M	N3-C2-N1	-5.57	119.98	128.68
11	AA	2220	A2M	N3-C2-N1	-5.56	119.98	128.68
60	c	100	A2M	N3-C2-N1	-5.54	120.02	128.68
11	AA	2280	A2M	N3-C2-N1	-5.54	120.02	128.68
11	AA	2256	A2M	N3-C2-N1	-5.54	120.03	128.68
11	AA	876	A2M	N3-C2-N1	-5.53	120.03	128.68
60	c	1782	MA6	N3-C2-N1	-5.53	120.04	128.68
60	c	420	A2M	N3-C2-N1	-5.52	120.04	128.68
11	AA	1449	A2M	N3-C2-N1	-5.51	120.06	128.68
60	c	436	A2M	N3-C2-N1	-5.48	120.11	128.68
60	c	619	A2M	N3-C2-N1	-5.48	120.11	128.68
60	c	541	A2M	N3-C2-N1	-5.45	120.16	128.68
60	c	1781	MA6	N3-C2-N1	-5.43	120.19	128.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	AA	2640	A2M	N3-C2-N1	-5.39	120.26	128.68
11	AA	807	A2M	N3-C2-N1	-5.36	120.30	128.68
60	c	1269	OMU	C4-N3-C2	-5.33	119.55	126.58
60	c	578	OMU	C4-N3-C2	-5.31	119.58	126.58
11	AA	2421	OMU	C4-N3-C2	-5.25	119.66	126.58
11	AA	2921	OMU	C4-N3-C2	-5.21	119.70	126.58
11	AA	1888	OMU	C4-N3-C2	-5.20	119.72	126.58
11	AA	2724	OMU	C4-N3-C2	-5.19	119.73	126.58
11	AA	2729	OMU	C4-N3-C2	-5.17	119.76	126.58
11	AA	2417	OMU	C4-N3-C2	-5.15	119.78	126.58
11	AA	898	OMU	C4-N3-C2	-5.12	119.83	126.58
11	AA	2347	OMU	C4-N3-C2	-5.08	119.88	126.58
60	c	1191	B8N	C5-C4-N3	4.99	125.41	116.17
11	AA	2634	UR3	C4-N3-C2	-4.86	119.98	124.56
60	c	1191	B8N	C4-N3-C2	-4.36	119.95	125.46
14	Bb	37	YYG	O23-C21-N20	4.08	117.96	110.80
11	AA	2421	OMU	N3-C2-N1	3.97	120.16	114.89
11	AA	1888	OMU	N3-C2-N1	3.88	120.04	114.89
60	c	1269	OMU	N3-C2-N1	3.88	120.04	114.89
11	AA	2921	OMU	N3-C2-N1	3.82	119.96	114.89
11	AA	2724	OMU	N3-C2-N1	3.77	119.90	114.89
11	AA	2417	OMU	N3-C2-N1	3.73	119.83	114.89
11	AA	898	OMU	N3-C2-N1	3.69	119.79	114.89
60	c	578	OMU	N3-C2-N1	3.67	119.76	114.89
11	AA	2347	OMU	N3-C2-N1	3.66	119.75	114.89
11	AA	2729	OMU	N3-C2-N1	3.65	119.74	114.89
14	Bb	37	YYG	O23-C21-O22	-3.57	119.33	124.58
60	c	578	OMU	C5-C4-N3	3.46	120.02	114.84
11	AA	2724	OMU	C5-C4-N3	3.39	119.91	114.84
11	AA	2347	OMU	C5-C4-N3	3.39	119.91	114.84
11	AA	1437	OMC	C1'-N1-C2	3.38	125.97	118.42
14	Bb	37	YYG	O18-C16-C15	3.38	120.18	111.52
11	AA	2417	OMU	C5-C4-N3	3.38	119.89	114.84
14	Bb	37	YYG	C24-O23-C21	3.34	119.60	115.66
11	AA	2729	OMU	C5-C4-N3	3.34	119.83	114.84
60	c	1269	OMU	C5-C4-N3	3.33	119.83	114.84
11	AA	2921	OMU	C5-C4-N3	3.30	119.78	114.84
14	Bb	37	YYG	C3-N3-C2	-3.25	117.09	120.13
11	AA	898	OMU	C5-C4-N3	3.24	119.69	114.84
11	AA	1888	OMU	C5-C4-N3	3.24	119.68	114.84
11	AA	2421	OMU	C5-C4-N3	3.23	119.68	114.84
60	c	1191	B8N	N3-C2-N1	3.18	121.25	116.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	AA	2256	A2M	O2'-C2'-C1'	3.17	115.38	109.09
60	c	1575	G7M	C2-N1-C6	-3.07	119.45	125.10
14	Bb	37	YYG	C5-C6-N1	3.06	118.53	113.96
11	AA	2417	OMU	O4-C4-C5	-2.97	119.93	125.16
60	c	1280	4AC	C6-C5-C4	2.94	120.56	116.96
60	c	1191	B8N	C31-N3-C4	2.91	121.59	117.31
11	AA	1888	OMU	O4-C4-C5	-2.90	120.06	125.16
11	AA	2347	OMU	O4-C4-C5	-2.89	120.07	125.16
11	AA	2724	OMU	O4-C4-C5	-2.85	120.15	125.16
60	c	1269	OMU	O4-C4-C5	-2.85	120.15	125.16
11	AA	898	OMU	O4-C4-C5	-2.84	120.16	125.16
60	c	578	OMU	O4-C4-C5	-2.84	120.17	125.16
14	Bb	37	YYG	C8-N7-C5	2.83	108.38	102.99
11	AA	2921	OMU	O4-C4-C5	-2.82	120.20	125.16
11	AA	2421	OMU	O4-C4-C5	-2.80	120.23	125.16
11	AA	2948	OMC	C1'-N1-C2	2.76	124.59	118.42
60	c	1280	4AC	O7-C7-N4	-2.76	117.34	121.82
14	Bb	37	YYG	C3-N3-C4	2.73	121.57	116.71
60	c	1280	4AC	C5-C4-N3	-2.71	118.23	122.59
60	c	1773	4AC	C6-C5-C4	2.67	120.23	116.96
60	c	1773	4AC	O7-C7-N4	-2.66	117.51	121.82
11	AA	2729	OMU	O4-C4-C5	-2.65	120.50	125.16
11	AA	1437	OMC	C1'-N1-C6	-2.65	115.07	120.84
11	AA	2281	A2M	O4'-C1'-C2'	-2.59	102.10	106.59
60	c	1773	4AC	C5-C4-N3	-2.58	118.45	122.59
11	AA	2640	A2M	C1'-N9-C4	2.55	131.12	126.64
60	c	1280	4AC	O2-C2-N3	-2.52	118.24	122.33
60	c	541	A2M	C1'-N9-C4	2.51	131.05	126.64
60	c	1773	4AC	O7-C7-CM7	-2.49	117.44	122.06
11	AA	876	A2M	C1'-N9-C4	2.49	131.01	126.64
11	AA	805	OMG	O6-C6-C5	2.48	129.21	124.37
60	c	1271	OMG	O6-C6-C5	2.43	129.12	124.37
11	AA	2791	OMG	O6-C6-C5	2.41	129.09	124.37
11	AA	2347	OMU	C1'-N1-C2	2.41	121.94	117.57
11	AA	2815	OMG	O6-C6-C5	2.41	129.08	124.37
11	AA	2619	OMG	O6-C6-C5	2.39	129.05	124.37
14	Bb	37	YYG	O18-C16-O17	-2.38	119.18	123.84
11	AA	2142	1MA	N1-C6-N6	2.38	125.81	119.77
11	AA	2288	OMG	O6-C6-C5	2.37	129.01	124.37
11	AA	867	OMG	O6-C6-C5	2.37	129.00	124.37
11	AA	2793	OMG	O6-C6-C5	2.37	129.00	124.37
60	c	1280	4AC	O7-C7-CM7	-2.37	117.66	122.06

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	AA	2256	A2M	O4'-C1'-C2'	-2.36	102.50	106.59
60	c	562	OMG	O6-C6-C5	2.35	128.96	124.37
60	c	1428	OMG	O6-C6-C5	2.35	128.95	124.37
11	AA	2922	OMG	O6-C6-C5	2.34	128.95	124.37
60	c	1269	OMU	O2-C2-N1	-2.34	119.68	122.79
11	AA	807	A2M	C1'-N9-C4	2.34	130.75	126.64
60	c	1126	OMG	O6-C6-C5	2.34	128.94	124.37
60	c	1572	OMG	O6-C6-C5	2.32	128.91	124.37
11	AA	1450	OMG	O6-C6-C5	2.31	128.89	124.37
11	AA	2634	UR3	C6-N1-C2	-2.27	119.75	121.79
60	c	1191	B8N	O4-C4-N3	-2.27	116.12	119.98
11	AA	908	OMG	O6-C6-C5	2.26	128.78	124.37
11	AA	645	1MA	N1-C6-N6	2.23	125.43	119.77
11	AA	1888	OMU	O2-C2-N1	-2.23	119.83	122.79
11	AA	2280	A2M	C1'-N9-C4	2.17	130.46	126.64
11	AA	649	A2M	C1'-N9-C4	2.16	130.43	126.64
60	c	796	A2M	C1'-N9-C4	2.15	130.41	126.64
11	AA	2921	OMU	O2-C2-N1	-2.14	119.94	122.79
11	AA	645	1MA	C5-C6-N1	-2.13	110.72	113.90
11	AA	1449	A2M	C1'-N9-C4	2.11	130.34	126.64
11	AA	2142	1MA	C5-C6-N1	-2.10	110.76	113.90
11	AA	2634	UR3	C1'-N1-C2	2.09	120.52	116.99
60	c	974	A2M	C1'-N9-C4	2.07	130.28	126.64
60	c	1191	B8N	C32-C31-N3	2.07	115.87	112.00
14	Bb	37	YYG	O6-C6-C5	-2.05	120.53	124.17
11	AA	2421	OMU	O2-C2-N1	-2.05	120.07	122.79
60	c	1191	B8N	O4'-C1'-C2'	2.04	108.02	105.14
11	AA	2948	OMC	C1'-N1-C6	-2.04	116.39	120.84
60	c	578	OMU	O2-C2-N1	-2.02	120.10	122.79
60	c	436	A2M	C1'-N9-C4	2.02	130.19	126.64
11	AA	2729	OMU	O2-C2-N1	-2.02	120.11	122.79

There are no chirality outliers.

All (92) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	AA	649	A2M	C1'-C2'-O2'-CM'
11	AA	663	OMC	C1'-C2'-O2'-CM2
11	AA	867	OMG	C3'-C4'-C5'-O5'
11	AA	898	OMU	C1'-C2'-O2'-CM2
11	AA	1437	OMC	C1'-C2'-O2'-CM2
11	AA	1450	OMG	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
11	AA	1450	OMG	C3'-C4'-C5'-O5'
11	AA	2197	OMC	C2'-C1'-N1-C2
11	AA	2197	OMC	C2'-C1'-N1-C6
11	AA	2220	A2M	C1'-C2'-O2'-CM'
11	AA	2256	A2M	C1'-C2'-O2'-CM'
11	AA	2417	OMU	C1'-C2'-O2'-CM2
11	AA	2619	OMG	C1'-C2'-O2'-CM2
11	AA	2640	A2M	C1'-C2'-O2'-CM'
11	AA	2724	OMU	C1'-C2'-O2'-CM2
11	AA	2729	OMU	C1'-C2'-O2'-CM2
11	AA	2922	OMG	O4'-C4'-C5'-O5'
14	Bb	37	YYG	N1-C12-C13-C14
14	Bb	37	YYG	C11-C12-C13-C14
14	Bb	37	YYG	C12-C13-C14-C15
14	Bb	37	YYG	C13-C14-C15-N20
14	Bb	37	YYG	O22-C21-N20-C15
14	Bb	37	YYG	O23-C21-N20-C15
14	Bb	37	YYG	N20-C21-O23-C24
14	Bb	37	YYG	O22-C21-O23-C24
60	c	28	A2M	C1'-C2'-O2'-CM'
60	c	414	OMC	C3'-C4'-C5'-O5'
60	c	414	OMC	O4'-C4'-C5'-O5'
60	c	420	A2M	C1'-C2'-O2'-CM'
60	c	541	A2M	O4'-C4'-C5'-O5'
60	c	541	A2M	C3'-C4'-C5'-O5'
60	c	578	OMU	O4'-C4'-C5'-O5'
60	c	1191	B8N	N34-C33-C34-O35
60	c	1191	B8N	C31-C32-C33-N34
60	c	1271	OMG	C1'-C2'-O2'-CM2
60	c	1428	OMG	C1'-C2'-O2'-CM2
60	c	1572	OMG	O4'-C4'-C5'-O5'
60	c	1572	OMG	C3'-C4'-C5'-O5'
60	c	1782	MA6	O4'-C4'-C5'-O5'
14	Bb	37	YYG	C15-C16-O18-C19
60	c	578	OMU	C2'-C1'-N1-C6
11	AA	867	OMG	O4'-C4'-C5'-O5'
11	AA	2922	OMG	C3'-C4'-C5'-O5'
60	c	1575	G7M	C3'-C4'-C5'-O5'
60	c	1782	MA6	C3'-C4'-C5'-O5'
14	Bb	37	YYG	O17-C16-O18-C19
60	c	1191	B8N	N34-C33-C34-O36
11	AA	2281	A2M	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
60	c	100	A2M	O4'-C4'-C5'-O5'
60	c	1575	G7M	O4'-C4'-C5'-O5'
11	AA	2870	5MC	C2'-C1'-N1-C6
60	c	578	OMU	C2'-C1'-N1-C2
11	AA	2280	A2M	O4'-C4'-C5'-O5'
14	Bb	37	YYG	C13-C14-C15-C16
11	AA	2281	A2M	C3'-C4'-C5'-O5'
14	Bb	37	YYG	C14-C15-C16-O18
14	Bb	37	YYG	C14-C15-C16-O17
11	AA	2256	A2M	O4'-C4'-C5'-O5'
60	c	1280	4AC	C3'-C4'-C5'-O5'
11	AA	2870	5MC	C2'-C1'-N1-C2
60	c	541	A2M	C4'-C5'-O5'-P
11	AA	2870	5MC	O4'-C1'-N1-C6
60	c	1280	4AC	O7-C7-N4-C4
60	c	1280	4AC	CM7-C7-N4-C4
60	c	1773	4AC	O7-C7-N4-C4
60	c	1773	4AC	CM7-C7-N4-C4
60	c	100	A2M	C3'-C4'-C5'-O5'
60	c	578	OMU	O4'-C1'-N1-C6
60	c	619	A2M	C3'-C4'-C5'-O5'
11	AA	2870	5MC	O4'-C1'-N1-C2
11	AA	817	A2M	C4'-C5'-O5'-P
11	AA	2197	OMC	O4'-C1'-N1-C2
60	c	578	OMU	O4'-C1'-N1-C2
11	AA	2256	A2M	C3'-C4'-C5'-O5'
11	AA	2197	OMC	O4'-C1'-N1-C6
60	c	1572	OMG	C4'-C5'-O5'-P
11	AA	2281	A2M	C3'-C2'-O2'-CM'
60	c	578	OMU	C3'-C2'-O2'-CM2
60	c	1428	OMG	C4'-C5'-O5'-P
11	AA	1437	OMC	C2'-C1'-N1-C6
60	c	578	OMU	C3'-C4'-C5'-O5'
11	AA	1437	OMC	C2'-C1'-N1-C2
60	c	1280	4AC	O4'-C4'-C5'-O5'
60	c	1191	B8N	C32-C33-C34-O35
11	AA	2280	A2M	C3'-C4'-C5'-O5'
60	c	578	OMU	C1'-C2'-O2'-CM2
11	AA	908	OMG	C3'-C4'-C5'-O5'
60	c	1191	B8N	C32-C33-C34-O36
60	c	1280	4AC	C2'-C1'-N1-C2
11	AA	1437	OMC	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
11	AA	2948	OMC	C2'-C1'-N1-C2
11	AA	817	A2M	O4'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 291 ligands modelled in this entry, 287 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
87	SPD	AA	3603	-	9,9,9	0.33	0	8,8,8	0.85	0
87	SPD	AA	3605	-	9,9,9	0.32	0	8,8,8	0.89	0
87	SPD	c	1951	-	9,9,9	0.34	0	8,8,8	0.87	0
87	SPD	AA	3604	-	9,9,9	0.32	0	8,8,8	0.79	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
87	SPD	AA	3603	-	-	2/7/7/7	-
87	SPD	AA	3605	-	-	2/7/7/7	-
87	SPD	c	1951	-	-	2/7/7/7	-
87	SPD	AA	3604	-	-	4/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
87	AA	3605	SPD	C8-C7-N6-C5
87	c	1951	SPD	N6-C7-C8-C9
87	AA	3604	SPD	C3-C4-C5-N6
87	AA	3604	SPD	C2-C3-C4-C5
87	AA	3604	SPD	C7-C8-C9-N10
87	c	1951	SPD	C2-C3-C4-C5
87	AA	3604	SPD	N1-C2-C3-C4
87	AA	3605	SPD	C4-C5-N6-C7
87	AA	3603	SPD	C4-C5-N6-C7
87	AA	3603	SPD	C8-C7-N6-C5

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-16591. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

### 6.1 Orthogonal projections

This section was not generated.

### 6.2 Central slices

This section was not generated.

### 6.3 Largest variance slices

This section was not generated.

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

This section was not generated.

### 6.5 Orthogonal surface views

This section was not generated.

### 6.6 Mask visualisation

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

## 7 Map analysis

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

### 7.1 Map-value distribution

This section was not generated.

### 7.2 Volume estimate versus contour level

This section was not generated.

### 7.3 Rotationally averaged power spectrum

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

## 8 Fourier-Shell correlation

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

## 9 Map-model fit

This section was not generated.