



Full wwPDB EM Validation Report ⓘ

Nov 21, 2022 – 09:30 AM EST

PDB ID : 7RR5
EMDB ID : EMD-24652
Title : Structure of ribosomal complex bound with Rbg1/Tma46
Authors : Zeng, F.; Li, X.; Pires-Alves, M.; Chen, X.; Hawk, C.W.; Jin, H.
Deposited on : 2021-08-09
Resolution : 3.23 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

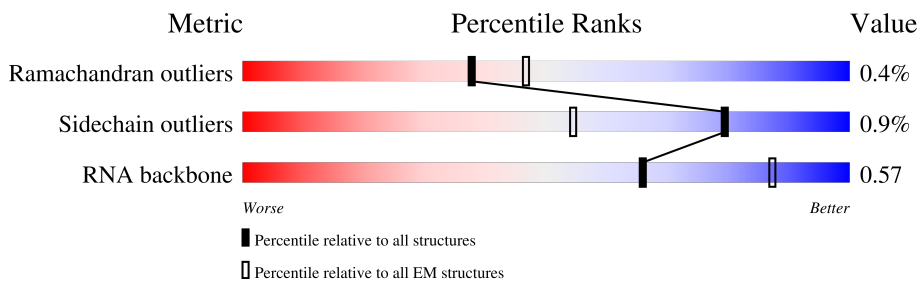
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

1 Overall quality at a glance

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

The reported resolution of this entry is 3.23 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	C1	3396	
2	C4	121	
3	C3	158	
4	LA	254	
5	LB	387	
6	LC	362	
7	LD	297	
8	LE	176	

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Mol	Chain	Length	Quality of chain
9	LF	244	91% 9%
10	LG	256	90% 9%
11	LH	191	99%
12	LI	221	98%
13	LJ	174	96%
14	LL	199	96%
15	LM	138	99%
16	LN	204	100%
17	LO	199	98%
18	LP	184	99%
19	LQ	186	98%
20	LR	189	98%
21	LS	172	99%
22	LT	160	98%
23	LU	121	83% 17%
24	LV	137	99%
25	LW	155	14% 81% 19%
26	LX	142	84% 15%
27	LY	127	98%
28	LZ	136	99%
29	La	149	99%
30	Lb	59	95%
31	Lc	105	91% 9%
32	Ld	113	96%
33	Le	130	98%

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Mol	Chain	Length	Quality of chain
34	Lf	107	96%
35	Lg	121	93% 7%
36	Lh	120	99%
37	Li	100	99%
38	Lj	88	97%
39	Lk	78	99%
40	Ll	51	98%
41	Lm	128	41% 59%
42	Ln	25	100%
43	Lo	106	96%
44	Lp	92	99%
45	P0	312	18% 60% 39%
46	P2	165	16% 56% 43%
47	C2	1800	72% 26%
48	SA	252	82% 18%
49	SB	255	88% 11%
50	SC	254	85% 15%
51	SD	240	92% 8%
52	SE	261	97%
53	SF	225	91% 8%
54	SG	236	95%
55	SH	190	95%
56	SI	200	92% 6%
57	SJ	197	92% 7%
58	SK	105	88% 12%

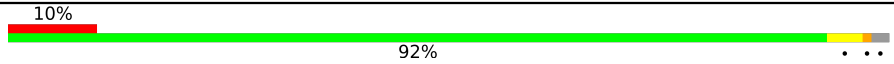


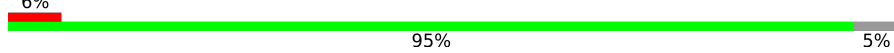
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Mol	Chain	Length	Quality of chain
59	SL	156	90% 8%
60	SM	143	79% 6% 15%
61	SN	151	99%
62	SO	138	92% 8%
63	SP	142	82% 18%
64	SQ	143	97%
65	SR	136	88% 11%
66	SS	146	98%
67	ST	144	99%
68	SU	121	82% 17%
69	SV	87	99%
70	SW	130	99%
71	SX	145	97%
72	SY	135	99%
73	SZ	108	5% 84% 6% 7%
74	Sa	119	79% 18%
75	Sb	82	99%
76	Sc	67	94% 6%
77	Sd	56	95% 5%
78	Se	63	10% 95% 5%
79	Sf	152	44% 52%
80	Sg	319	97%
81	A	76	51% 47%
82	P	76	74% 26%
83	m	16	25% 69% 31%

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Mol	Chain	Length	Quality of chain
84	5	157	
85	R	410	
86	T	345	
87	L1	210	

2 Entry composition

There are 90 unique types of molecules in this entry. The entry contains 212517 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	C1	3221	68888	30771	12409	22487	3221	0	0

- Molecule 2 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	C4	121	2579	1152	461	845	121	0	0

- Molecule 3 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	C3	158	3353	1500	586	1109	158	0	0

- Molecule 4 is a protein called 60S ribosomal protein L2-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	LA	251	1899	1182	385	331	1	0	0

- Molecule 5 is a protein called RPL3 isoform 1.

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

- Molecule 6 is a protein called RPL4A isoform 1.

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

- Molecule 7 is a protein called RPL5 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	LD	294	2351	1484	410	455	2	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	LE	167	1307	843	234	230	0	0

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

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

- Molecule 10 is a protein called 60S ribosomal protein L8-A.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LH	191	1508	957	274	273	4	0	0

- Molecule 12 is a protein called RPL10 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LI	218	1764	1117	334	306	7	0	0

- Molecule 13 is a protein called RPL11B isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LJ	169	1350	846	253	247	4	0	0

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

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

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

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

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

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

- Molecule 17 is a protein called 60S ribosomal protein L16-A.

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
18	LP	183	Total	C	N	O	0	0
			1416	879	284	253		

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
20	LR	188	Total	C	N	O	0	0
			1515	932	323	260		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
21	LS	171	Total	C	N	O	S	0	0
			1437	925	266	243	3		

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
23	LU	100	Total	C	N	O	0	0
			796	516	131	149		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
24	LV	136	Total	C	N	O	S	0	0
			1003	628	189	179	7		

- Molecule 25 is a protein called RPL24A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	LW	126	Total	C	N	O	S	0	0
			849	532	167	149	1		

- Molecule 26 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	LX	121	Total	C	N	O	S	0	0
			964	620	169	173	2		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
27	LY	125	Total	C	N	O	0	0
			984	620	191	173		

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

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

- Molecule 29 is a protein called 60S ribosomal protein L28.

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

- Molecule 30 is a protein called RPL29 isoform 1.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	Lc	96	737	476	123	137	1	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	Ld	109	876	556	167	152	1	0	0

- Molecule 33 is a protein called RPL32 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	Le	127	1017	644	205	167	1	0	0

- Molecule 34 is a protein called 60S ribosomal protein L33-A.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	Lg	112	880	545	179	152	4	0	0

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	Li	99	766	478	154	132	2	0	0

- Molecule 38 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	Lj	85	670	408	146	111	5	0	0

- Molecule 39 is a protein called RPL38 isoform 1.

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	Ln	25	229	139	62	27	1	0	0

- Molecule 43 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	Lo	103	824	517	167	135	5	0	0

- Molecule 44 is a protein called 60S ribosomal protein L43-A.

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

- Molecule 45 is a protein called RPP0 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	P0	189	1473	942	257	270	4	0	0

- Molecule 46 is a protein called RPL12A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	P2	94	723	448	138	135	2	0	0

- Molecule 47 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
47	C2	1771	37604	16807	6624	12402	1771	0	0

- Molecule 48 is a protein called 40S ribosomal protein S0.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	SA	206	1603	1030	284	287	2	0	0

- Molecule 49 is a protein called RPS1A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	SB	226	Total	C	N	O	S	0	0
			1798	1139	330	325	4		

- Molecule 50 is a protein called RPS2 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	SC	216	Total	C	N	O	S	0	0
			1626	1042	287	295	2		

- Molecule 51 is a protein called RPS3 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	SD	222	Total	C	N	O	S	0	0
			1729	1098	312	313	6		

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

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

- Molecule 53 is a protein called Rps5p.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	SF	206	Total	C	N	O	S	0	0
			1605	1005	299	298	3		

- Molecule 54 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	SG	228	Total	C	N	O	S	0	0
			1815	1138	351	323	3		

- Molecule 55 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	SH	184	Total	C	N	O	0	0
			1473	946	263	264		

- Molecule 56 is a protein called RPS8A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	SI	187	1476	916	295	263	2	0	0

- Molecule 57 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	SJ	184	1479	935	285	258	1	0	0

- Molecule 58 is a protein called 40S ribosomal protein S10-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	SK	92	752	487	122	141	2	0	0

- Molecule 59 is a protein called 40S ribosomal protein S11-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	SL	144	1159	742	219	195	3	0	0

- Molecule 60 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	SM	121	875	551	153	169	2	0	0

- Molecule 61 is a protein called 40S ribosomal protein S13.

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

- Molecule 62 is a protein called 40S ribosomal protein S14-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	SO	127	926	569	185	169	3	0	0

- Molecule 63 is a protein called RPS15 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	SP	117	916	583	171	155	7	0	0

- Molecule 64 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	SQ	141	1105	708	203	194		0	0

- Molecule 65 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	SR	121	948	596	179	171	2	0	0

- Molecule 66 is a protein called 40S ribosomal protein S18-B.

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

- Molecule 67 is a protein called 40S ribosomal protein S19-A.

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

- Molecule 68 is a protein called RPS20 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	SU	100	797	506	144	146	1	0	0

- Molecule 69 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	SV	87	673	415	125	131	2	0	0

- Molecule 70 is a protein called RPS22A isoform 1.

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

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

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

- Molecule 72 is a protein called 40S ribosomal protein S24.

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

- Molecule 73 is a protein called RPS25A isoform 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
73	SZ	100	Total	C	N	O	0	0
			771	491	147	133		

- Molecule 74 is a protein called RPS26B isoform 1.

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

- Molecule 75 is a protein called 40S ribosomal protein S27-A.

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

- Molecule 76 is a protein called RPS28A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Sc	63	Total	C	N	O	S	0	0
			491	303	96	91	1		

- Molecule 77 is a protein called RPS29A isoform 1.

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

- Molecule 78 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	Se	60	Total	C	N	O	S	0	0
			472	298	97	76	1		

- Molecule 79 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Sf	73	Total	C	N	O	S	0	0
			556	352	105	95	4		

- Molecule 80 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	Sg	312	Total	C	N	O	S	0	0
			2383	1514	409	452	8		

- Molecule 81 is a RNA chain called A-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	A	76	Total	C	N	O	P	0	0
			1609	720	278	536	75		

- Molecule 82 is a RNA chain called P-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	P	76	Total	C	N	O	P	0	0
			1619	722	288	533	76		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
P	34	U	G	conflict	GB 176436

- Molecule 83 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	m	16	Total	C	N	O	P	0	0
			351	157	72	106	16		

- Molecule 84 is a protein called Eukaryotic translation initiation factor 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
84	5	154	Total	C	N	O	S	0	0
			1143	709	195	230	9		

- Molecule 85 is a protein called Ribosome-interacting GTPase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
85	R	355	Total	C	N	O	S	0	0
			2738	1733	483	513	9		

There are 41 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	370	LYS	-	expression tag	UNP A0A6A5PWT7
R	371	ARG	-	expression tag	UNP A0A6A5PWT7
R	372	ARG	-	expression tag	UNP A0A6A5PWT7
R	373	TRP	-	expression tag	UNP A0A6A5PWT7
R	374	LYS	-	expression tag	UNP A0A6A5PWT7
R	375	LYS	-	expression tag	UNP A0A6A5PWT7
R	376	ASN	-	expression tag	UNP A0A6A5PWT7
R	377	PHE	-	expression tag	UNP A0A6A5PWT7
R	378	ILE	-	expression tag	UNP A0A6A5PWT7
R	379	ALA	-	expression tag	UNP A0A6A5PWT7
R	380	VAL	-	expression tag	UNP A0A6A5PWT7
R	381	SER	-	expression tag	UNP A0A6A5PWT7
R	382	ALA	-	expression tag	UNP A0A6A5PWT7
R	383	ALA	-	expression tag	UNP A0A6A5PWT7
R	384	ASN	-	expression tag	UNP A0A6A5PWT7
R	385	ARG	-	expression tag	UNP A0A6A5PWT7
R	386	PHE	-	expression tag	UNP A0A6A5PWT7
R	387	LYS	-	expression tag	UNP A0A6A5PWT7
R	388	LYS	-	expression tag	UNP A0A6A5PWT7
R	389	ILE	-	expression tag	UNP A0A6A5PWT7
R	390	SER	-	expression tag	UNP A0A6A5PWT7
R	391	SER	-	expression tag	UNP A0A6A5PWT7
R	392	SER	-	expression tag	UNP A0A6A5PWT7
R	393	GLY	-	expression tag	UNP A0A6A5PWT7
R	394	ALA	-	expression tag	UNP A0A6A5PWT7

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Chain	Residue	Modelled	Actual	Comment	Reference
R	395	LEU	-	expression tag	UNP A0A6A5PWT7
R	396	ASP	-	expression tag	UNP A0A6A5PWT7
R	397	TYR	-	expression tag	UNP A0A6A5PWT7
R	398	ASP	-	expression tag	UNP A0A6A5PWT7
R	399	ILE	-	expression tag	UNP A0A6A5PWT7
R	400	PRO	-	expression tag	UNP A0A6A5PWT7
R	401	THR	-	expression tag	UNP A0A6A5PWT7
R	402	THR	-	expression tag	UNP A0A6A5PWT7
R	403	ALA	-	expression tag	UNP A0A6A5PWT7
R	404	SER	-	expression tag	UNP A0A6A5PWT7
R	405	GLU	-	expression tag	UNP A0A6A5PWT7
R	406	ASN	-	expression tag	UNP A0A6A5PWT7
R	407	LEU	-	expression tag	UNP A0A6A5PWT7
R	408	TYR	-	expression tag	UNP A0A6A5PWT7
R	409	PHE	-	expression tag	UNP A0A6A5PWT7
R	410	GLN	-	expression tag	UNP A0A6A5PWT7

- Molecule 86 is a protein called Translation machinery-associated protein 46.

Mol	Chain	Residues	Atoms				AltConf	Trace	
			Total	C	N	O			S
86	T	162	1276	810	221	240	5	0	0

- Molecule 87 is a protein called 60S ribosomal protein L1.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
87	L1	200	1000	600	200	200	0	0

- Molecule 88 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

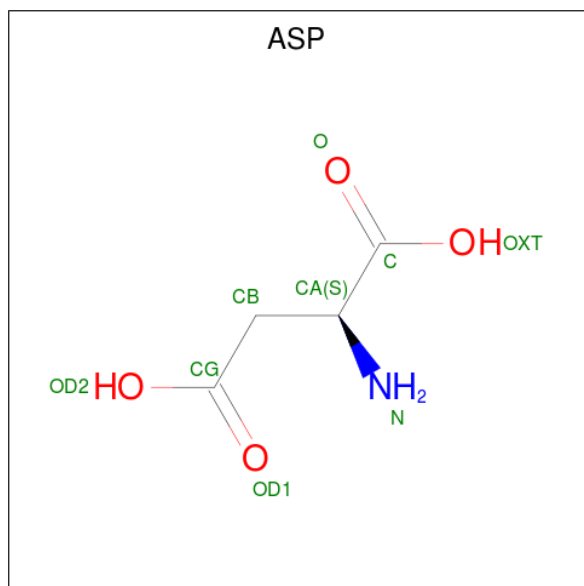
Mol	Chain	Residues	Atoms		AltConf
88	C1	192	Total	Mg	0
			192	192	
88	C4	1	Total	Mg	0
			1	1	
88	LA	2	Total	Mg	0
			2	2	
88	LB	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
88	LN	1	1	1	0
88	LP	1	1	1	0
88	LV	1	1	1	0
88	Le	1	1	1	0
88	C2	82	82	82	0
88	SC	1	1	1	0
88	SX	1	1	1	0
88	Sa	1	1	1	0
88	P	1	1	1	0

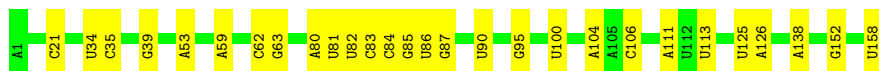
- Molecule 89 is ASPARTIC ACID (three-letter code: ASP) (formula: C₄H₇NO₄).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
89	C1	1	5	3	1	1	0

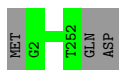
- Molecule 90 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
90	Lg	1	Total 1	Zn 1	0
90	Lj	1	Total 1	Zn 1	0
90	Lm	1	Total 1	Zn 1	0
90	Lo	1	Total 1	Zn 1	0
90	Lp	1	Total 1	Zn 1	0
90	Sd	1	Total 1	Zn 1	0
90	Sf	1	Total 1	Zn 1	0
90	T	1	Total 1	Zn 1	0



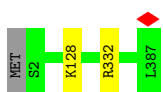
- Molecule 4: 60S ribosomal protein L2-B

Chain LA: 99%



- Molecule 5: RPL3 isoform 1

Chain LB: 99%



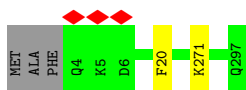
- Molecule 6: RPL4A isoform 1

Chain LC: 99%



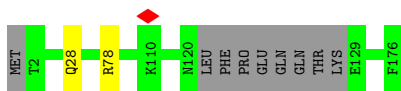
- Molecule 7: RPL5 isoform 1

Chain LD: 98%



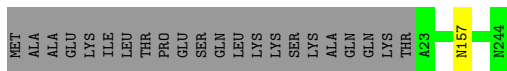
- Molecule 8: 60S ribosomal protein L6

Chain LE: 94% 5%



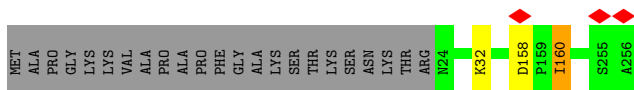
- Molecule 9: 60S ribosomal protein L7-A

Chain LF: 91% 9%



- Molecule 10: 60S ribosomal protein L8-A

Chain LG: 90% 9%



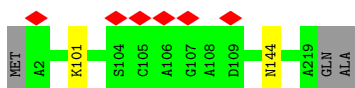
- Molecule 11: 60S ribosomal protein L9-A

Chain LH: 99%



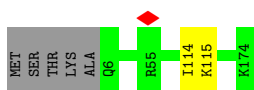
- Molecule 12: RPL10 isoform 1

Chain LI: 98%



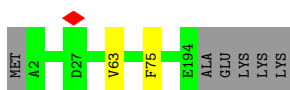
- Molecule 13: RPL11B isoform 1

Chain LJ: 96%



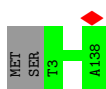
- Molecule 14: 60S ribosomal protein L13

Chain LL: 96%



- Molecule 15: 60S ribosomal protein L14-A

Chain LM: 99%



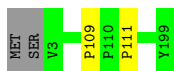
- Molecule 16: 60S ribosomal protein L15-A

Chain LN: 100%



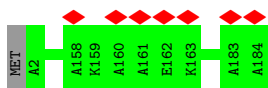
- Molecule 17: 60S ribosomal protein L16-A

Chain LO:  98% ..



- Molecule 18: 60S ribosomal protein L17-A

Chain LP:  99% .



- Molecule 19: 60S ribosomal protein L18-B

Chain LQ:  98% ..



- Molecule 20: 60S ribosomal protein L19-A

Chain LR:  98% ..



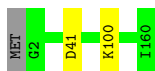
- Molecule 21: 60S ribosomal protein L20-A

Chain LS:  99% ..




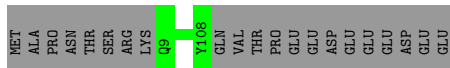
- Molecule 22: 60S ribosomal protein L21-A

Chain LT:  98% ..

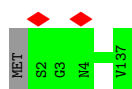


- Molecule 23: 60S ribosomal protein L22-A

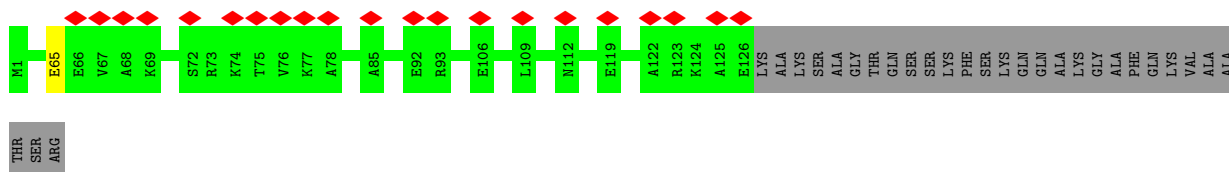
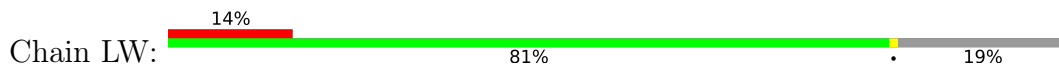
Chain LU:  83% 17%



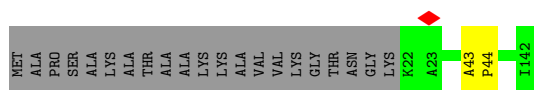
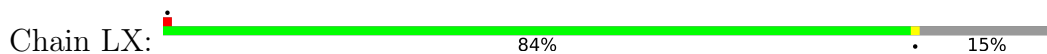
- Molecule 24: 60S ribosomal protein L23-B



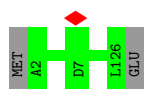
- Molecule 25: RPL24A isoform 1



- Molecule 26: 60S ribosomal protein L25



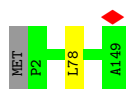
- Molecule 27: 60S ribosomal protein L26-A



- Molecule 28: 60S ribosomal protein L27

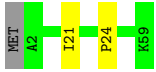


- Molecule 29: 60S ribosomal protein L28



- Molecule 30: RPL29 isoform 1





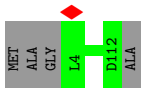
- Molecule 31: 60S ribosomal protein L30

Chain Lc: 91% 9%



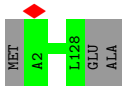
- Molecule 32: 60S ribosomal protein L31-A

Chain Ld: 96%



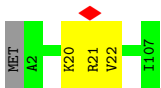
- Molecule 33: RPL32 isoform 1

Chain Le: 98%



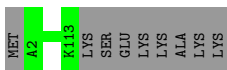
- Molecule 34: 60S ribosomal protein L33-A

Chain Lf: 96%



- Molecule 35: 60S ribosomal protein L34-A

Chain Lg: 93% 7%



- Molecule 36: 60S ribosomal protein L35-A

Chain Lh: 99%



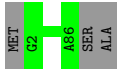
- Molecule 37: 60S ribosomal protein L36-A

Chain Li: 99%



- Molecule 38: Ribosomal protein L37

Chain Lj: 97%



- Molecule 39: RPL38 isoform 1

Chain Lk: 99%



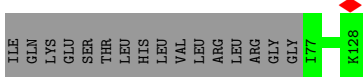
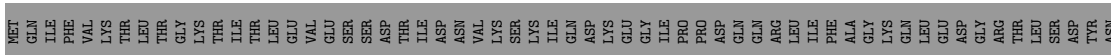
- Molecule 40: 60S ribosomal protein L39

Chain Ll: 98%



- Molecule 41: Ubiquitin-60S ribosomal protein L40

Chain Lm: 41% 59%



- Molecule 42: 60S ribosomal protein L41-A

Chain Ln: 100%

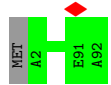


- Molecule 43: 60S ribosomal protein L42-A

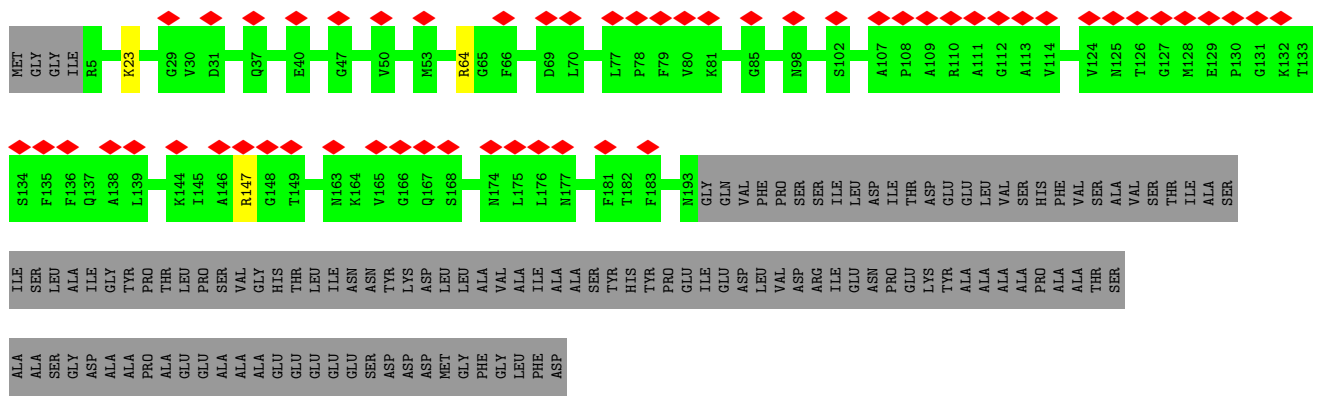
Chain Lo: 96%



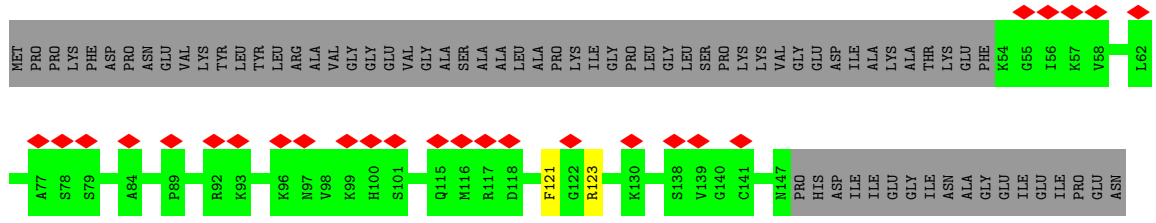
- Molecule 44: 60S ribosomal protein L43-A



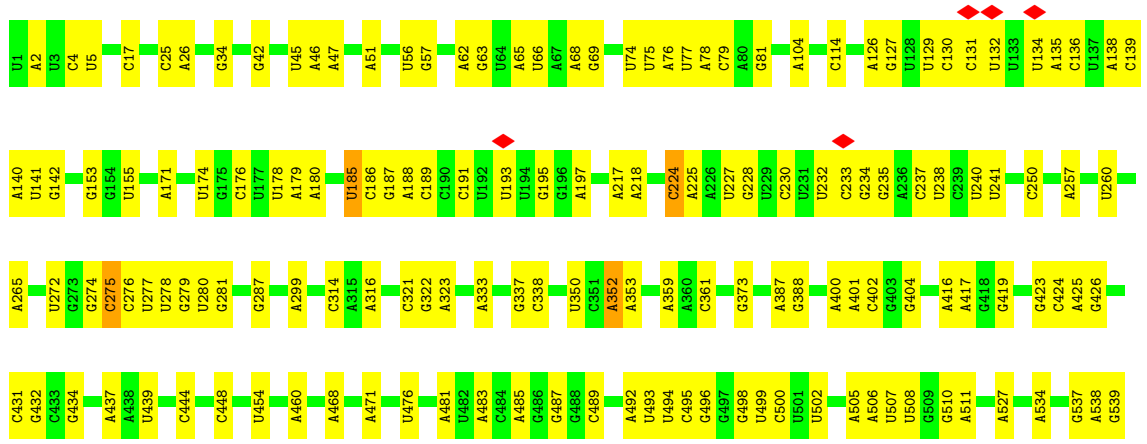
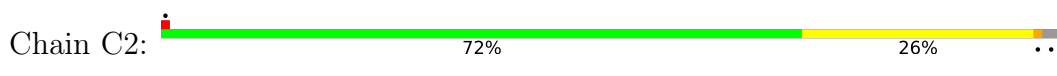
• Molecule 45: RPP0 isoform 1

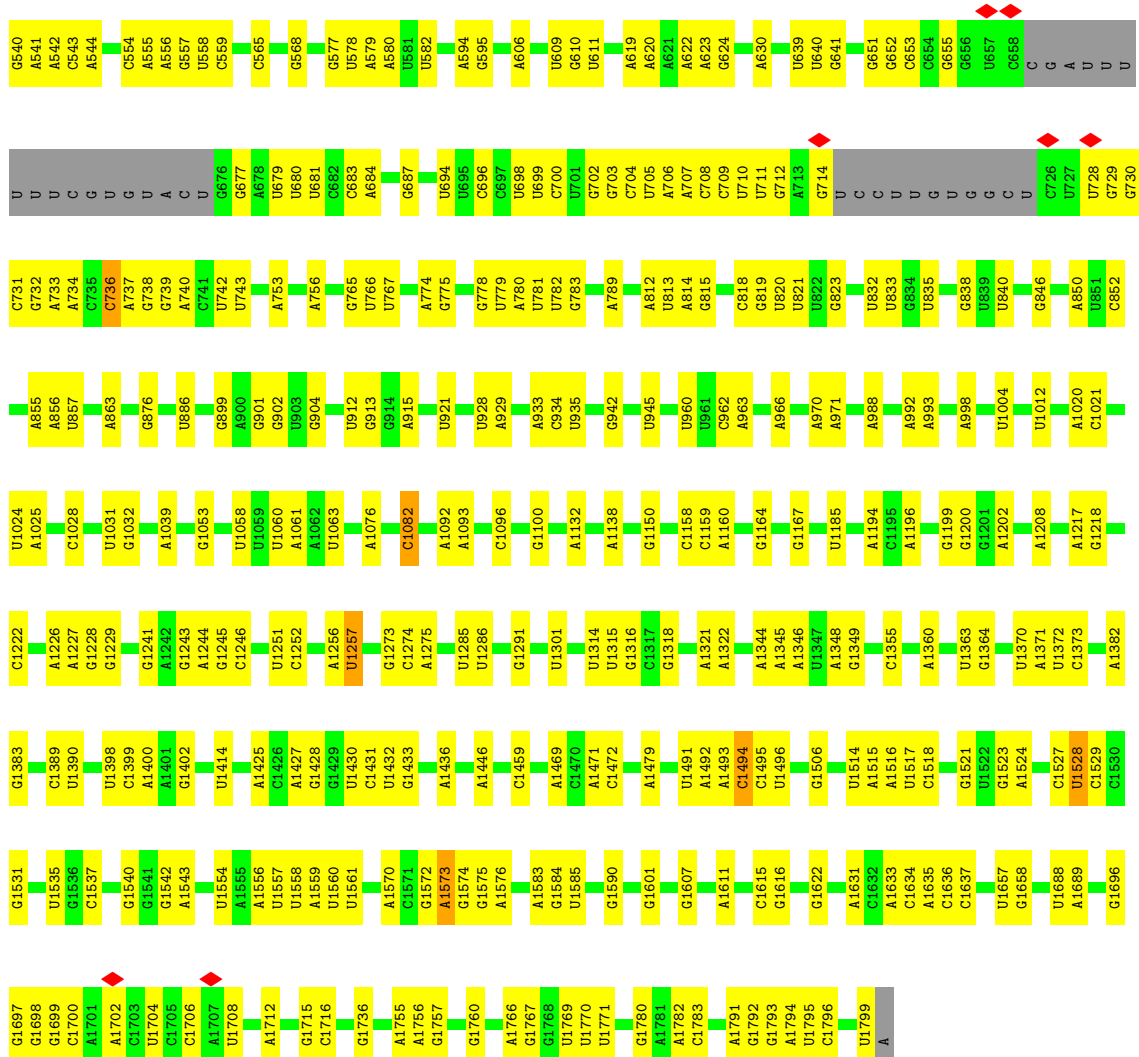


• Molecule 46: RPL12A isoform 1

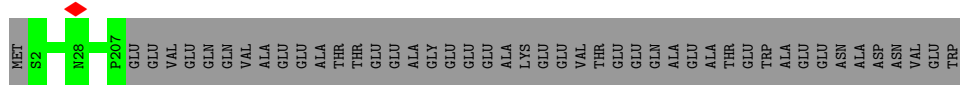
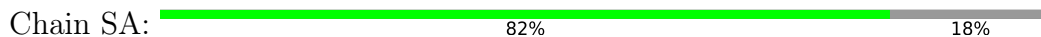


• Molecule 47: 18S rRNA

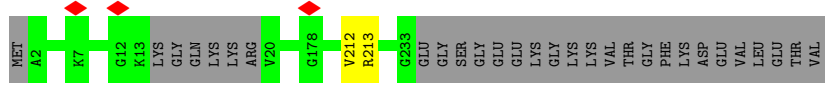
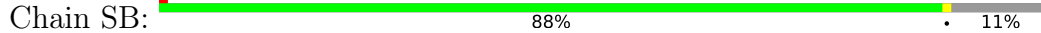




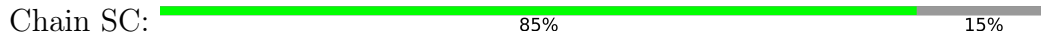
• Molecule 48: 40S ribosomal protein S0

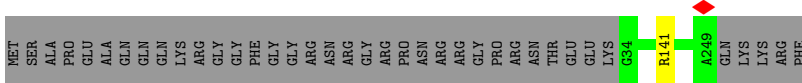


• Molecule 49: RPS1A isoform 1



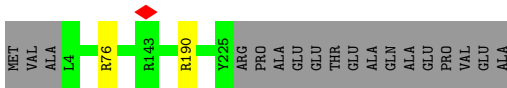
• Molecule 50: RPS2 isoform 1





- Molecule 51: RPS3 isoform 1

Chain SD: 92% 8%



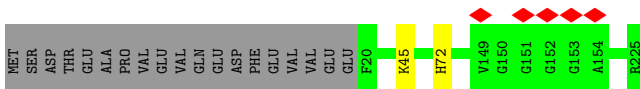
- Molecule 52: 40S ribosomal protein S4

Chain SE: 97% ..



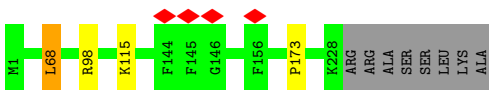
- Molecule 53: Rps5p

Chain SF: 91% 8%



- Molecule 54: 40S ribosomal protein S6

Chain SG: 95% ..



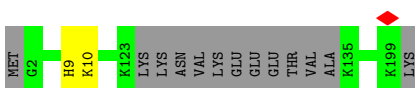
- Molecule 55: 40S ribosomal protein S7

Chain SH: 95% ..



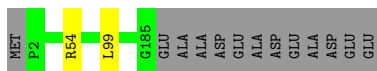
- Molecule 56: RPS8A isoform 1

Chain SI: 92% 6%



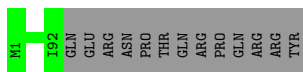
- Molecule 57: 40S ribosomal protein S9-A

Chain SJ:  92% 7%



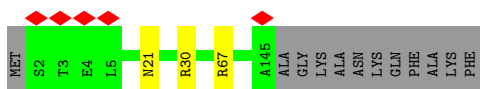
- Molecule 58: 40S ribosomal protein S10-A

Chain SK:  88% 12%




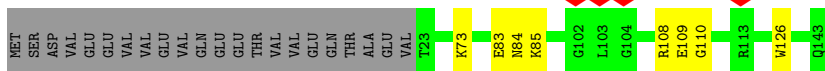
- Molecule 59: 40S ribosomal protein S11-B

Chain SL:  90% 8%



- Molecule 60: 40S ribosomal protein S12

Chain SM:  79% 6% 15%



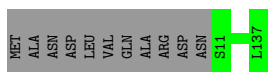
- Molecule 61: 40S ribosomal protein S13

Chain SN:  99%




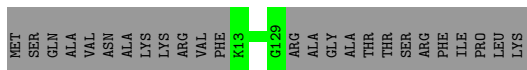
- Molecule 62: 40S ribosomal protein S14-B

Chain SO:  92% 8%

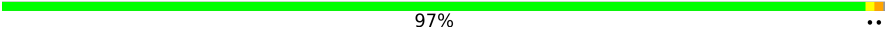


- Molecule 63: RPS15 isoform 1

Chain SP:  82% 18%




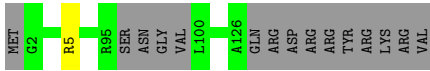
- Molecule 64: 40S ribosomal protein S16-A

Chain SQ:  97%



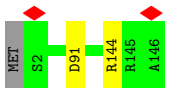
- Molecule 65: 40S ribosomal protein S17-A

Chain SR:  88% 11%



- Molecule 66: 40S ribosomal protein S18-B

Chain SS:  98%




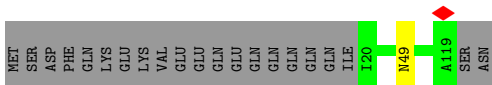
- Molecule 67: 40S ribosomal protein S19-A

Chain ST:  99%



- Molecule 68: RPS20 isoform 1

Chain SU:  82% 17%



- Molecule 69: 40S ribosomal protein S21-A

Chain SV:  99%



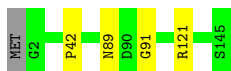
- Molecule 70: RPS22A isoform 1

Chain SW:  99%



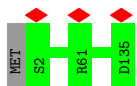
- Molecule 71: 40S ribosomal protein S23

Chain SX:  97%




- Molecule 72: 40S ribosomal protein S24

Chain SY:  99%




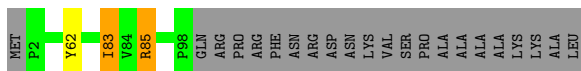
- Molecule 73: RPS25A isoform 1

Chain SZ:  5% 84% 6% 7%



- Molecule 74: RPS26B isoform 1

Chain Sa:  79% 18%



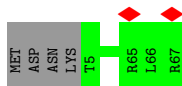
- Molecule 75: 40S ribosomal protein S27-A

Chain Sb:  99%



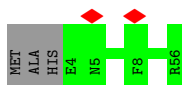
- Molecule 76: RPS28A isoform 1

Chain Sc:  94% 6%

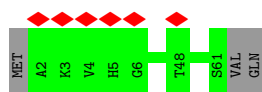


- Molecule 77: RPS29A isoform 1

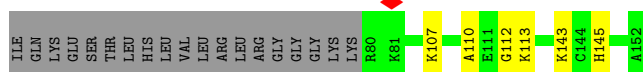
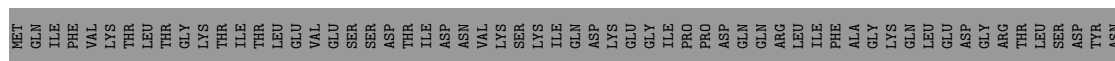
Chain Sd:  95% 5%



- Molecule 78: 40S ribosomal protein S30



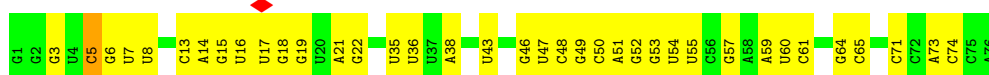
- Molecule 79: Ubiquitin-40S ribosomal protein S31



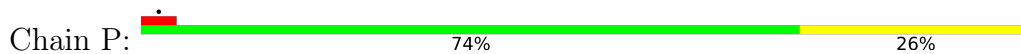
- Molecule 80: Guanine nucleotide-binding protein subunit beta-like protein



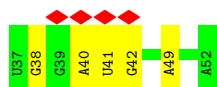
- Molecule 81: A-tRNA



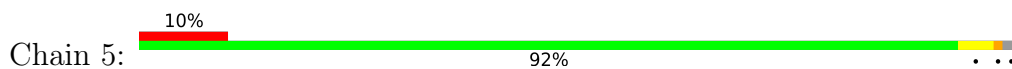
- Molecule 82: P-tRNA



- Molecule 83: mRNA



- Molecule 84: Eukaryotic translation initiation factor 5A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	95380	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	30	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.047	Depositor
Minimum map value	-0.029	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.003	Depositor
Map size (Å)	483.84003, 483.84003, 483.84003	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	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: MG, 5CT, ZN

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	C1	0.20	0/77108	0.81	37/120216 (0.0%)
2	C4	0.16	0/2883	0.75	0/4491
3	C3	0.18	0/3746	0.80	2/5832 (0.0%)
4	LA	0.25	0/1933	0.50	0/2598
5	LB	0.24	0/3146	0.47	0/4228
6	LC	0.25	0/2800	0.46	0/3790
7	LD	0.26	0/2400	0.48	0/3239
8	LE	0.25	0/1329	0.48	0/1794
9	LF	0.26	0/1821	0.43	0/2451
10	LG	0.27	0/1836	0.48	0/2481
11	LH	0.26	0/1529	0.51	0/2060
12	LI	0.25	0/1801	0.47	0/2416
13	LJ	0.26	0/1371	0.54	0/1838
14	LL	0.26	0/1568	0.52	0/2106
15	LM	0.25	0/1068	0.46	0/1438
16	LN	0.24	0/1757	0.46	0/2354
17	LO	0.28	0/1585	0.49	0/2128
18	LP	0.25	0/1439	0.48	0/1938
19	LQ	0.25	0/1465	0.46	0/1965
20	LR	0.26	0/1532	0.48	0/2043
21	LS	0.27	0/1473	0.50	0/1980
22	LT	0.25	0/1300	0.46	0/1743
23	LU	0.27	0/812	0.54	0/1099
24	LV	0.26	0/1018	0.47	0/1369
25	LW	0.25	0/863	0.49	0/1169
26	LX	0.27	0/979	0.52	0/1321
27	LY	0.25	0/995	0.47	0/1329
28	LZ	0.25	0/1118	0.46	0/1497
29	La	0.24	0/1204	0.45	0/1612
30	Lb	0.24	0/473	0.45	0/629
31	Lc	0.26	0/745	0.49	0/1001
32	Ld	0.24	0/890	0.46	0/1196

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	Le	0.24	0/1038	0.46	0/1390
34	Lf	0.25	0/868	0.47	0/1168
35	Lg	0.25	0/890	0.48	0/1189
36	Lh	0.26	0/978	0.48	0/1301
37	Li	0.26	0/772	0.48	0/1026
38	Lj	0.25	0/685	0.51	0/908
39	Lk	0.26	0/618	0.54	0/826
40	Ll	0.23	0/443	0.45	0/588
41	Lm	0.29	0/423	0.53	0/562
42	Ln	0.22	0/230	0.38	0/296
43	Lo	0.26	0/836	0.48	0/1104
44	Lp	0.25	0/701	0.49	0/934
45	P0	0.25	0/1498	0.52	0/2025
46	P2	0.24	0/728	0.51	0/975
47	C2	0.20	0/42053	0.83	27/65522 (0.0%)
48	SA	0.25	0/1644	0.49	0/2249
49	SB	0.25	0/1823	0.54	0/2447
50	SC	0.26	0/1656	0.51	0/2251
51	SD	0.26	0/1754	0.50	0/2361
52	SE	0.25	0/2097	0.50	0/2823
53	SF	0.26	0/1625	0.51	0/2197
54	SG	0.26	0/1839	0.51	1/2460 (0.0%)
55	SH	0.27	0/1498	0.55	0/2019
56	SI	0.25	0/1501	0.48	0/2006
57	SJ	0.25	0/1504	0.48	0/2016
58	SK	0.28	0/769	0.55	0/1039
59	SL	0.25	0/1185	0.47	0/1598
60	SM	0.27	0/883	0.77	3/1199 (0.3%)
61	SN	0.26	0/1215	0.50	0/1638
62	SO	0.25	0/937	0.52	0/1261
63	SP	0.26	0/936	0.53	0/1259
64	SQ	0.27	0/1125	0.54	0/1510
65	SR	0.27	0/957	0.54	0/1283
66	SS	0.25	0/1211	0.52	0/1628
67	ST	0.26	0/1130	0.52	0/1517
68	SU	0.26	0/807	0.59	0/1091
69	SV	0.25	0/682	0.56	0/921
70	SW	0.26	0/1038	0.50	0/1395
71	SX	0.26	0/1139	0.56	0/1518
72	SY	0.26	0/1087	0.52	0/1449
73	SZ	0.26	0/781	0.62	0/1045
74	Sa	0.25	0/782	0.54	0/1047
75	Sb	0.23	0/620	0.54	0/838

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	Sc	0.24	0/493	0.55	0/663
77	Sd	0.25	0/452	0.48	0/600
78	Se	0.26	0/480	0.49	0/639
79	Sf	0.27	0/567	0.62	0/764
80	Sg	0.25	0/2436	0.55	0/3318
81	A	0.27	0/1796	0.96	1/2796 (0.0%)
82	P	0.20	0/1808	0.83	0/2816
83	m	0.18	0/395	0.71	0/615
84	5	0.26	0/1142	0.62	0/1537
85	R	0.25	0/2777	0.51	0/3754
86	T	0.26	0/1301	0.53	0/1745
All	All	0.22	0/226620	0.71	71/332477 (0.0%)

There are no bond length outliers.

All (71) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	1569	U	O4'-C1'-N1	9.26	115.61	108.20
1	C1	1243	G	N1-C6-O6	-7.46	115.42	119.90
1	C1	260	C	N3-C2-O2	-7.32	116.78	121.90
47	C2	276	C	C2-N1-C1'	7.17	126.69	118.80
47	C2	1389	C	C2-N1-C1'	7.10	126.61	118.80
1	C1	2094	C	N3-C2-O2	-7.06	116.96	121.90
1	C1	161	G	N3-C4-C5	-6.72	125.24	128.60
1	C1	1576	G	C4-N9-C1'	6.59	135.07	126.50
1	C1	922	U	C2-N1-C1'	6.58	125.59	117.70
47	C2	1495	C	N3-C2-O2	-6.54	117.32	121.90
47	C2	1494	C	N1-C2-O2	6.53	122.81	118.90
47	C2	276	C	N1-C2-O2	6.47	122.78	118.90
1	C1	1576	G	N3-C4-N9	6.34	129.80	126.00
1	C1	161	G	N3-C4-N9	6.32	129.79	126.00
3	C3	21	C	C2-N1-C1'	6.25	125.68	118.80
47	C2	476	U	P-O3'-C3'	6.03	126.93	119.70
54	SG	68	LEU	CA-CB-CG	5.98	129.05	115.30
1	C1	1576	G	C8-N9-C1'	-5.93	119.29	127.00
60	SM	108	ARG	C-N-CA	5.91	136.49	121.70
1	C1	922	U	N1-C2-O2	5.84	126.89	122.80
1	C1	1248	C	C5-C4-N4	5.84	124.29	120.20
47	C2	1573	A	OP2-P-O3'	5.78	117.91	105.20
1	C1	1642	A	O4'-C1'-N9	-5.78	103.58	108.20
47	C2	1082	C	C2-N1-C1'	5.72	125.10	118.80
47	C2	1527	C	C2-N1-C1'	5.71	125.08	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	C2	224	C	N1-C2-O2	5.68	122.31	118.90
1	C1	1227	C	C2-N1-C1'	5.68	125.05	118.80
1	C1	2112	U	OP2-P-O3'	5.63	117.58	105.20
47	C2	962	C	N3-C2-O2	-5.62	117.96	121.90
1	C1	2541	U	P-O3'-C3'	5.61	126.43	119.70
1	C1	162	G	N3-C4-N9	-5.59	122.65	126.00
47	C2	1528	U	C2-N1-C1'	5.50	124.31	117.70
1	C1	3181	C	N1-C2-O2	5.49	122.19	118.90
47	C2	1495	C	C6-N1-C2	-5.48	118.11	120.30
81	A	5	C	C2-N1-C1'	5.48	124.83	118.80
1	C1	2489	C	N1-C2-O2	5.47	122.18	118.90
47	C2	736	C	C2-N1-C1'	5.46	124.81	118.80
47	C2	1257	U	C2-N1-C1'	5.43	124.21	117.70
1	C1	260	C	C6-N1-C2	-5.42	118.13	120.30
1	C1	922	U	N3-C2-O2	-5.42	118.41	122.20
47	C2	352	A	P-O3'-C3'	5.41	126.19	119.70
47	C2	431	C	C2-N1-C1'	5.39	124.73	118.80
1	C1	543	C	C2-N1-C1'	5.39	124.73	118.80
1	C1	758	C	C2-N1-C1'	5.34	124.67	118.80
1	C1	1576	G	N3-C4-C5	-5.32	125.94	128.60
47	C2	850	A	O4'-C1'-N9	5.30	112.44	108.20
47	C2	1495	C	N1-C2-N3	5.29	122.90	119.20
3	C3	100	U	C2-N1-C1'	5.29	124.05	117.70
47	C2	276	C	N3-C2-O2	-5.29	118.20	121.90
47	C2	275	C	C6-N1-C2	-5.23	118.21	120.30
1	C1	1496	C	C2-N1-C1'	5.22	124.55	118.80
1	C1	3278	C	N1-C2-O2	5.21	122.02	118.90
60	SM	110	GLY	N-CA-C	-5.20	100.09	113.10
47	C2	1082	C	N1-C2-O2	5.20	122.02	118.90
1	C1	2537	U	P-O3'-C3'	5.18	125.91	119.70
47	C2	1560	U	C2-N1-C1'	5.17	123.90	117.70
1	C1	1815	U	P-O3'-C3'	5.15	125.88	119.70
60	SM	110	GLY	C-N-CA	5.15	134.56	121.70
1	C1	3181	C	C2-N1-C1'	5.14	124.46	118.80
1	C1	270	U	C2-N1-C1'	5.14	123.87	117.70
1	C1	1857	C	C2-N1-C1'	5.12	124.44	118.80
1	C1	1563	C	N3-C2-O2	-5.11	118.33	121.90
1	C1	2284	C	N1-C2-O2	5.09	121.95	118.90
47	C2	276	C	O4'-C1'-N1	5.09	112.27	108.20
1	C1	270	U	N1-C2-O2	5.09	126.36	122.80
1	C1	1227	C	N1-C2-O2	5.08	121.95	118.90
1	C1	543	C	N1-C2-O2	5.05	121.93	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	C2	1389	C	C6-N1-C2	-5.03	118.29	120.30
1	C1	2842	U	N1-C2-O2	5.02	126.32	122.80
47	C2	276	C	C6-N1-C1'	-5.01	114.78	120.80
47	C2	185	U	C2-N1-C1'	5.00	123.70	117.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	LA	249/254 (98%)	230 (92%)	19 (8%)	0	100	100
5	LB	384/387 (99%)	354 (92%)	30 (8%)	0	100	100
6	LC	359/362 (99%)	330 (92%)	27 (8%)	2 (1%)	25	61
7	LD	292/297 (98%)	274 (94%)	17 (6%)	1 (0%)	41	73
8	LE	163/176 (93%)	146 (90%)	17 (10%)	0	100	100
9	LF	220/244 (90%)	208 (94%)	12 (6%)	0	100	100
10	LG	231/256 (90%)	214 (93%)	16 (7%)	1 (0%)	34	68
11	LH	189/191 (99%)	173 (92%)	16 (8%)	0	100	100
12	LI	216/221 (98%)	205 (95%)	11 (5%)	0	100	100
13	LJ	167/174 (96%)	146 (87%)	21 (13%)	0	100	100
14	LL	191/199 (96%)	171 (90%)	19 (10%)	1 (0%)	29	64
15	LM	134/138 (97%)	124 (92%)	10 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
16	LN	201/204 (98%)	186 (92%)	15 (8%)	0	100	100
17	LO	195/199 (98%)	189 (97%)	4 (2%)	2 (1%)	15	50
18	LP	181/184 (98%)	168 (93%)	13 (7%)	0	100	100
19	LQ	183/186 (98%)	171 (93%)	12 (7%)	0	100	100
20	LR	186/189 (98%)	179 (96%)	6 (3%)	1 (0%)	29	64
21	LS	169/172 (98%)	161 (95%)	8 (5%)	0	100	100
22	LT	157/160 (98%)	150 (96%)	7 (4%)	0	100	100
23	LU	98/121 (81%)	90 (92%)	8 (8%)	0	100	100
24	LV	134/137 (98%)	133 (99%)	1 (1%)	0	100	100
25	LW	124/155 (80%)	108 (87%)	15 (12%)	1 (1%)	19	55
26	LX	119/142 (84%)	111 (93%)	6 (5%)	2 (2%)	9	39
27	LY	123/127 (97%)	117 (95%)	6 (5%)	0	100	100
28	LZ	133/136 (98%)	124 (93%)	9 (7%)	0	100	100
29	La	146/149 (98%)	130 (89%)	15 (10%)	1 (1%)	22	58
30	Lb	56/59 (95%)	50 (89%)	4 (7%)	2 (4%)	3	20
31	Lc	94/105 (90%)	90 (96%)	4 (4%)	0	100	100
32	Ld	107/113 (95%)	96 (90%)	11 (10%)	0	100	100
33	Le	125/130 (96%)	120 (96%)	5 (4%)	0	100	100
34	Lf	104/107 (97%)	97 (93%)	7 (7%)	0	100	100
35	Lg	110/121 (91%)	106 (96%)	4 (4%)	0	100	100
36	Lh	117/120 (98%)	111 (95%)	6 (5%)	0	100	100
37	Li	97/100 (97%)	92 (95%)	5 (5%)	0	100	100
38	Lj	83/88 (94%)	76 (92%)	7 (8%)	0	100	100
39	Lk	75/78 (96%)	73 (97%)	2 (3%)	0	100	100
40	Ll	48/51 (94%)	47 (98%)	1 (2%)	0	100	100
41	Lm	50/128 (39%)	48 (96%)	2 (4%)	0	100	100
42	Ln	23/25 (92%)	23 (100%)	0	0	100	100
43	Lo	101/106 (95%)	94 (93%)	7 (7%)	0	100	100
44	Lp	89/92 (97%)	84 (94%)	5 (6%)	0	100	100
45	P0	187/312 (60%)	160 (86%)	27 (14%)	0	100	100
46	P2	92/165 (56%)	74 (80%)	18 (20%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	SA	204/252 (81%)	180 (88%)	24 (12%)	0	100	100
49	SB	222/255 (87%)	192 (86%)	28 (13%)	2 (1%)	17	52
50	SC	214/254 (84%)	198 (92%)	16 (8%)	0	100	100
51	SD	220/240 (92%)	212 (96%)	8 (4%)	0	100	100
52	SE	256/261 (98%)	232 (91%)	24 (9%)	0	100	100
53	SF	204/225 (91%)	188 (92%)	16 (8%)	0	100	100
54	SG	226/236 (96%)	197 (87%)	27 (12%)	2 (1%)	17	52
55	SH	182/190 (96%)	167 (92%)	14 (8%)	1 (0%)	29	64
56	SI	183/200 (92%)	163 (89%)	18 (10%)	2 (1%)	14	48
57	SJ	182/197 (92%)	162 (89%)	19 (10%)	1 (0%)	29	64
58	SK	90/105 (86%)	76 (84%)	14 (16%)	0	100	100
59	SL	142/156 (91%)	126 (89%)	16 (11%)	0	100	100
60	SM	119/143 (83%)	81 (68%)	36 (30%)	2 (2%)	9	39
61	SN	148/151 (98%)	133 (90%)	15 (10%)	0	100	100
62	SO	125/138 (91%)	110 (88%)	15 (12%)	0	100	100
63	SP	115/142 (81%)	106 (92%)	9 (8%)	0	100	100
64	SQ	139/143 (97%)	128 (92%)	10 (7%)	1 (1%)	22	58
65	SR	117/136 (86%)	105 (90%)	12 (10%)	0	100	100
66	SS	143/146 (98%)	130 (91%)	12 (8%)	1 (1%)	22	58
67	ST	141/144 (98%)	124 (88%)	17 (12%)	0	100	100
68	SU	98/121 (81%)	92 (94%)	6 (6%)	0	100	100
69	SV	85/87 (98%)	74 (87%)	10 (12%)	1 (1%)	13	46
70	SW	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
71	SX	142/145 (98%)	122 (86%)	17 (12%)	3 (2%)	7	33
72	SY	132/135 (98%)	122 (92%)	10 (8%)	0	100	100
73	SZ	98/108 (91%)	85 (87%)	10 (10%)	3 (3%)	4	24
74	Sa	95/119 (80%)	78 (82%)	14 (15%)	3 (3%)	4	23
75	Sb	79/82 (96%)	70 (89%)	9 (11%)	0	100	100
76	Sc	61/67 (91%)	55 (90%)	6 (10%)	0	100	100
77	Sd	51/56 (91%)	49 (96%)	2 (4%)	0	100	100
78	Se	58/63 (92%)	46 (79%)	12 (21%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
79	Sf	71/152 (47%)	44 (62%)	24 (34%)	3 (4%)	3	17
80	Sg	310/319 (97%)	280 (90%)	29 (9%)	1 (0%)	41	73
84	5	151/157 (96%)	125 (83%)	22 (15%)	4 (3%)	5	28
85	R	351/410 (86%)	330 (94%)	18 (5%)	3 (1%)	17	52
86	T	158/345 (46%)	138 (87%)	19 (12%)	1 (1%)	25	61
All	All	11941/13270 (90%)	10875 (91%)	1018 (8%)	48 (0%)	38	68

All (48) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
17	LO	111[A]	PRO
26	LX	44	PRO
56	SI	10	LYS
60	SM	109	GLU
66	SS	91	ASP
71	SX	42	PRO
71	SX	89	ASN
73	SZ	22	LYS
74	Sa	85	ARG
79	Sf	110	ALA
79	Sf	145	HIS
84	5	113	VAL
14	LL	63	VAL
29	La	78	LEU
73	SZ	23	SER
85	R	90	SER
6	LC	14	GLU
17	LO	109[A]	PRO
25	LW	65	GLU
30	Lb	21	ILE
54	SG	68	LEU
54	SG	173	PRO
69	SV	81	ASN
79	Sf	112	GLY
84	5	77	THR
85	R	103	VAL
20	LR	52	LYS
49	SB	213	ARG
80	Sg	267	PRO
85	R	92	ALA

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Mol	Chain	Res	Type
86	T	215	GLU
7	LD	20	PHE
26	LX	43	ALA
60	SM	126	TRP
64	SQ	40	GLU
73	SZ	24	LYS
74	Sa	62	TYR
74	Sa	83	ILE
56	SI	9	HIS
57	SJ	99	LEU
84	5	97	ASP
71	SX	91	GLY
10	LG	160	ILE
6	LC	4	PRO
84	5	98	GLY
30	Lb	24	PRO
49	SB	212	VAL
55	SH	64	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	LA	190/196 (97%)	190 (100%)	0	100	100
5	LB	319/323 (99%)	317 (99%)	2 (1%)	86	93
6	LC	288/289 (100%)	288 (100%)	0	100	100
7	LD	241/245 (98%)	240 (100%)	1 (0%)	91	95
8	LE	139/155 (90%)	137 (99%)	2 (1%)	67	84
9	LF	186/205 (91%)	185 (100%)	1 (0%)	88	94
10	LG	187/208 (90%)	184 (98%)	3 (2%)	62	82
11	LH	168/171 (98%)	167 (99%)	1 (1%)	86	93
12	LI	185/187 (99%)	183 (99%)	2 (1%)	73	87
13	LJ	146/151 (97%)	144 (99%)	2 (1%)	67	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	LL	154/159 (97%)	153 (99%)	1 (1%)	86	93
15	LM	107/109 (98%)	107 (100%)	0	100	100
16	LN	175/176 (99%)	175 (100%)	0	100	100
17	LO	160/162 (99%)	160 (100%)	0	100	100
18	LP	138/146 (94%)	138 (100%)	0	100	100
19	LQ	150/151 (99%)	148 (99%)	2 (1%)	69	85
20	LR	152/154 (99%)	151 (99%)	1 (1%)	84	92
21	LS	155/156 (99%)	154 (99%)	1 (1%)	86	93
22	LT	136/137 (99%)	134 (98%)	2 (2%)	65	83
23	LU	87/107 (81%)	87 (100%)	0	100	100
24	LV	104/105 (99%)	104 (100%)	0	100	100
25	LW	60/129 (46%)	60 (100%)	0	100	100
26	LX	104/118 (88%)	104 (100%)	0	100	100
27	LY	108/110 (98%)	108 (100%)	0	100	100
28	LZ	115/116 (99%)	115 (100%)	0	100	100
29	La	118/119 (99%)	118 (100%)	0	100	100
30	Lb	46/47 (98%)	46 (100%)	0	100	100
31	Lc	81/88 (92%)	81 (100%)	0	100	100
32	Ld	92/97 (95%)	92 (100%)	0	100	100
33	Le	108/111 (97%)	108 (100%)	0	100	100
34	Lf	90/91 (99%)	87 (97%)	3 (3%)	38	68
35	Lg	95/103 (92%)	95 (100%)	0	100	100
36	Lh	104/105 (99%)	104 (100%)	0	100	100
37	Li	80/82 (98%)	80 (100%)	0	100	100
38	Lj	69/71 (97%)	69 (100%)	0	100	100
39	Lk	68/69 (99%)	68 (100%)	0	100	100
40	Ll	45/46 (98%)	45 (100%)	0	100	100
41	Lm	47/116 (40%)	47 (100%)	0	100	100
42	Ln	22/23 (96%)	22 (100%)	0	100	100
43	Lo	87/91 (96%)	86 (99%)	1 (1%)	73	87
44	Lp	71/72 (99%)	71 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
45	P0	160/254 (63%)	157 (98%)	3 (2%)	57	79
46	P2	81/136 (60%)	79 (98%)	2 (2%)	47	74
48	SA	170/210 (81%)	170 (100%)	0	100	100
49	SB	200/224 (89%)	200 (100%)	0	100	100
50	SC	175/205 (85%)	174 (99%)	1 (1%)	86	93
51	SD	182/195 (93%)	180 (99%)	2 (1%)	73	87
52	SE	220/222 (99%)	216 (98%)	4 (2%)	59	80
53	SF	172/191 (90%)	170 (99%)	2 (1%)	71	86
54	SG	189/201 (94%)	187 (99%)	2 (1%)	73	87
55	SH	163/170 (96%)	160 (98%)	3 (2%)	59	80
56	SI	148/161 (92%)	148 (100%)	0	100	100
57	SJ	156/166 (94%)	155 (99%)	1 (1%)	86	93
58	SK	77/98 (79%)	77 (100%)	0	100	100
59	SL	129/137 (94%)	126 (98%)	3 (2%)	50	76
60	SM	88/119 (74%)	84 (96%)	4 (4%)	27	61
61	SN	127/128 (99%)	126 (99%)	1 (1%)	81	91
62	SO	91/105 (87%)	91 (100%)	0	100	100
63	SP	95/118 (80%)	95 (100%)	0	100	100
64	SQ	117/119 (98%)	115 (98%)	2 (2%)	60	81
65	SR	101/124 (82%)	100 (99%)	1 (1%)	76	88
66	SS	128/129 (99%)	127 (99%)	1 (1%)	81	91
67	ST	115/116 (99%)	115 (100%)	0	100	100
68	SU	93/114 (82%)	92 (99%)	1 (1%)	73	87
69	SV	71/74 (96%)	71 (100%)	0	100	100
70	SW	110/111 (99%)	110 (100%)	0	100	100
71	SX	119/120 (99%)	118 (99%)	1 (1%)	81	91
72	SY	112/113 (99%)	112 (100%)	0	100	100
73	SZ	77/89 (86%)	69 (90%)	8 (10%)	7	27
74	Sa	83/100 (83%)	81 (98%)	2 (2%)	49	75
75	Sb	70/71 (99%)	70 (100%)	0	100	100
76	Sc	55/60 (92%)	55 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
77	Sd	47/49 (96%)	47 (100%)	0	100	100
78	Se	50/54 (93%)	50 (100%)	0	100	100
79	Sf	56/135 (42%)	53 (95%)	3 (5%)	22	55
80	Sg	250/262 (95%)	249 (100%)	1 (0%)	91	95
84	5	118/132 (89%)	111 (94%)	7 (6%)	19	52
85	R	299/353 (85%)	294 (98%)	5 (2%)	60	81
86	T	134/302 (44%)	128 (96%)	6 (4%)	27	61
All	All	10005/11163 (90%)	9914 (99%)	91 (1%)	79	89

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	LB	128	LYS
5	LB	332	ARG
7	LD	271	LYS
8	LE	28	GLN
8	LE	78	ARG
9	LF	157	ASN
10	LG	32	LYS
10	LG	158	ASP
10	LG	160	ILE
11	LH	166	ARG
12	LI	101	LYS
12	LI	144	ASN
13	LJ	114	ILE
13	LJ	115	LYS
14	LL	75	PHE
19	LQ	11	LYS
19	LQ	45	ASN
20	LR	175	GLN
21	LS	8	GLN
22	LT	41	ASP
22	LT	100	LYS
34	Lf	20	LYS
34	Lf	21	ARG
34	Lf	22	VAL
43	Lo	27	GLN
45	P0	23	LYS
45	P0	64	ARG
45	P0	147	ARG

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Mol	Chain	Res	Type
46	P2	121	PHE
46	P2	123	ARG
50	SC	141	ARG
51	SD	76	ARG
51	SD	190	ARG
52	SE	69	HIS
52	SE	148	ARG
52	SE	199	GLU
52	SE	200	ARG
53	SF	45	LYS
53	SF	72	HIS
54	SG	98	ARG
54	SG	115	LYS
55	SH	67	LEU
55	SH	84	LYS
55	SH	150	GLN
57	SJ	54	ARG
59	SL	21	ASN
59	SL	30	ARG
59	SL	67	ARG
60	SM	73	LYS
60	SM	83	GLU
60	SM	84	ASN
60	SM	85	LYS
61	SN	104	ARG
64	SQ	34	SER
64	SQ	40	GLU
65	SR	5	ARG
66	SS	144	ARG
68	SU	49	ASN
71	SX	121	ARG
73	SZ	9	LYS
73	SZ	12	LYS
73	SZ	21	LYS
73	SZ	22	LYS
73	SZ	24	LYS
73	SZ	25	LYS
73	SZ	69	LEU
73	SZ	70	LYS
74	Sa	83	ILE
74	Sa	85	ARG
79	Sf	107	LYS

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Mol	Chain	Res	Type
79	Sf	113	LYS
79	Sf	143	LYS
80	Sg	266	ASP
84	5	24	SER
84	5	48	LYS
84	5	49	THR
84	5	54	HIS
84	5	77	THR
84	5	112	ASP
84	5	113	VAL
85	R	45	SER
85	R	187	LYS
85	R	295	ARG
85	R	346	LYS
85	R	348	GLN
86	T	175	LYS
86	T	176	TYR
86	T	180	TRP
86	T	182	CYS
86	T	308	PHE
86	T	310	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
6	LC	291	ASN
6	LC	296	GLN
8	LE	157	GLN
12	LI	144	ASN
16	LN	15	GLN
16	LN	90	ASN
21	LS	8	GLN
21	LS	142	GLN
24	LV	98	ASN
28	LZ	29	HIS
32	Ld	87	ASN
34	Lf	42	GLN
38	Lj	48	ASN
43	Lo	23	HIS
45	P0	189	GLN
49	SB	101	HIS
50	SC	220	ASN

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Mol	Chain	Res	Type
51	SD	62	ASN
54	SG	139	ASN
55	SH	71	HIS
55	SH	74	GLN
56	SI	159	GLN
57	SJ	123	HIS
59	SL	14	GLN
59	SL	138	ASN
62	SO	65	GLN
66	SS	6	GLN
67	ST	70	GLN
69	SV	7	GLN
71	SX	63	GLN
71	SX	99	ASN
72	SY	63	GLN
76	Sc	43	ASN
80	Sg	314	GLN
85	R	19	GLN
85	R	174	ASN
85	R	268	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	C1	3217/3396 (94%)	565 (17%)	36 (1%)
2	C4	120/121 (99%)	11 (9%)	1 (0%)
3	C3	157/158 (99%)	25 (15%)	1 (0%)
47	C2	1768/1800 (98%)	456 (25%)	45 (2%)
81	A	75/76 (98%)	36 (48%)	3 (4%)
82	P	75/76 (98%)	20 (26%)	0
83	m	15/16 (93%)	5 (33%)	0
All	All	5427/5643 (96%)	1118 (20%)	86 (1%)

All (1118) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	C1	13	A
1	C1	14	U
1	C1	18	G
1	C1	26	A
1	C1	40	A

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Mol	Chain	Res	Type
1	C1	43	A
1	C1	49	A
1	C1	59	G
1	C1	60	A
1	C1	65	A
1	C1	66	A
1	C1	92	G
1	C1	99	A
1	C1	110	G
1	C1	111	C
1	C1	113	C
1	C1	121	A
1	C1	122	A
1	C1	133	U
1	C1	134	U
1	C1	135	C
1	C1	136	G
1	C1	156	G
1	C1	157	A
1	C1	162	G
1	C1	166	C
1	C1	187	A
1	C1	190	U
1	C1	191	U
1	C1	200	C
1	C1	210	U
1	C1	213	A
1	C1	218	G
1	C1	219	A
1	C1	221	A
1	C1	238	A
1	C1	240	U
1	C1	241	G
1	C1	243	G
1	C1	245	U
1	C1	249	U
1	C1	252	U
1	C1	269	G
1	C1	283	G
1	C1	286	U
1	C1	295	A
1	C1	305	U

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Mol	Chain	Res	Type
1	C1	323	A
1	C1	329	U
1	C1	339	C
1	C1	350	C
1	C1	351	A
1	C1	376	G
1	C1	398	A
1	C1	399	A
1	C1	401	U
1	C1	402	A
1	C1	403	C
1	C1	404	G
1	C1	421	G
1	C1	422	A
1	C1	439	C
1	C1	440	A
1	C1	441	U
1	C1	442	G
1	C1	445	G
1	C1	446	U
1	C1	447	U
1	C1	448	U
1	C1	450	G
1	C1	451	U
1	C1	486	U
1	C1	487	U
1	C1	488	U
1	C1	490	A
1	C1	520	U
1	C1	521	A
1	C1	523	A
1	C1	535	G
1	C1	544	C
1	C1	546	C
1	C1	547	G
1	C1	552	G
1	C1	555	U
1	C1	557	A
1	C1	559	A
1	C1	578	A
1	C1	579	G
1	C1	609	G

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Mol	Chain	Res	Type
1	C1	611	A
1	C1	620	U
1	C1	621	A
1	C1	622	A
1	C1	636	C
1	C1	637	C
1	C1	638	C
1	C1	649	A
1	C1	660	A
1	C1	677	A
1	C1	681	U
1	C1	683	U
1	C1	691	A
1	C1	705	A
1	C1	712	G
1	C1	715	A
1	C1	716	A
1	C1	719	U
1	C1	720	A
1	C1	758	C
1	C1	764	U
1	C1	767	U
1	C1	776	U
1	C1	777	U
1	C1	780	A
1	C1	781	G
1	C1	785	G
1	C1	786	A
1	C1	806	A
1	C1	817	A
1	C1	830	A
1	C1	849	C
1	C1	861	C
1	C1	874	U
1	C1	879	U
1	C1	896	A
1	C1	907	G
1	C1	908	G
1	C1	914	A
1	C1	916	G
1	C1	917	A
1	C1	937	G

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Mol	Chain	Res	Type
1	C1	944	C
1	C1	959	C
1	C1	960	U
1	C1	974	G
1	C1	980	A
1	C1	982	C
1	C1	994	G
1	C1	1002	A
1	C1	1010	G
1	C1	1014	U
1	C1	1015	U
1	C1	1017	C
1	C1	1018	G
1	C1	1020	G
1	C1	1021	G
1	C1	1024	G
1	C1	1025	A
1	C1	1026	A
1	C1	1027	A
1	C1	1036	A
1	C1	1047	A
1	C1	1049	C
1	C1	1063	G
1	C1	1064	A
1	C1	1065	A
1	C1	1072	G
1	C1	1081	U
1	C1	1093	A
1	C1	1094	U
1	C1	1095	U
1	C1	1097	G
1	C1	1098	A
1	C1	1103	A
1	C1	1104	G
1	C1	1117	G
1	C1	1131	G
1	C1	1159	A
1	C1	1178	G
1	C1	1180	A
1	C1	1181	U
1	C1	1192	C
1	C1	1193	A

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Mol	Chain	Res	Type
1	C1	1196	C
1	C1	1197	A
1	C1	1201	C
1	C1	1208	U
1	C1	1217	A
1	C1	1220	U
1	C1	1222	G
1	C1	1227	C
1	C1	1230	G
1	C1	1232	C
1	C1	1235	U
1	C1	1236	G
1	C1	1238	C
1	C1	1240	A
1	C1	1241	U
1	C1	1245	A
1	C1	1246	G
1	C1	1247	U
1	C1	1253	U
1	C1	1254	C
1	C1	1256	G
1	C1	1257	C
1	C1	1258	U
1	C1	1259	A
1	C1	1262	G
1	C1	1263	A
1	C1	1264	G
1	C1	1265	U
1	C1	1266	G
1	C1	1269	U
1	C1	1270	A
1	C1	1271	A
1	C1	1272	C
1	C1	1274	A
1	C1	1278	A
1	C1	1279	C
1	C1	1287	A
1	C1	1307	G
1	C1	1308	A
1	C1	1309	U
1	C1	1313	G
1	C1	1330	A

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Mol	Chain	Res	Type
1	C1	1348	U
1	C1	1349	G
1	C1	1351	U
1	C1	1352	A
1	C1	1353	U
1	C1	1354	G
1	C1	1356	U
1	C1	1357	G
1	C1	1380	G
1	C1	1386	A
1	C1	1392	G
1	C1	1399	A
1	C1	1400	G
1	C1	1418	A
1	C1	1419	A
1	C1	1434	G
1	C1	1437	C
1	C1	1446	A
1	C1	1450	G
1	C1	1481	A
1	C1	1483	G
1	C1	1484	U
1	C1	1488	G
1	C1	1508	C
1	C1	1523	U
1	C1	1536	G
1	C1	1555	U
1	C1	1556	C
1	C1	1557	A
1	C1	1560	G
1	C1	1562	C
1	C1	1563	C
1	C1	1565	G
1	C1	1566	A
1	C1	1567	U
1	C1	1568	U
1	C1	1569	U
1	C1	1570	U
1	C1	1572	U
1	C1	1573	G
1	C1	1576	G
1	C1	1580	A

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Mol	Chain	Res	Type
1	C1	1581	C
1	C1	1582	C
1	C1	1583	A
1	C1	1587	A
1	C1	1589	A
1	C1	1605	A
1	C1	1607	U
1	C1	1619	A
1	C1	1620	U
1	C1	1629	U
1	C1	1639	C
1	C1	1642	A
1	C1	1643	A
1	C1	1645	U
1	C1	1657	C
1	C1	1683	A
1	C1	1717	U
1	C1	1724	U
1	C1	1725	C
1	C1	1736	G
1	C1	1741	A
1	C1	1750	A
1	C1	1751	G
1	C1	1760	A
1	C1	1761	C
1	C1	1765	U
1	C1	1766	G
1	C1	1770	G
1	C1	1780	G
1	C1	1797	A
1	C1	1808	G
1	C1	1813	A
1	C1	1814	A
1	C1	1816	A
1	C1	1817	G
1	C1	1820	U
1	C1	1821	U
1	C1	1835	A
1	C1	1839	A
1	C1	1840	U
1	C1	1841	A
1	C1	1842	A

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Mol	Chain	Res	Type
1	C1	1846	C
1	C1	1849	C
1	C1	1866	C
1	C1	1867	A
1	C1	1878	G
1	C1	1880	U
1	C1	1893	A
1	C1	1906	G
1	C1	1952	G
1	C1	1953	G
1	C1	1954	G
1	C1	2101	C
1	C1	2102	U
1	C1	2111	G
1	C1	2112	U
1	C1	2113	A
1	C1	2114	C
1	C1	2121	G
1	C1	2122	G
1	C1	2131	A
1	C1	2158	A
1	C1	2169	G
1	C1	2170	U
1	C1	2188	A
1	C1	2192	C
1	C1	2194	G
1	C1	2206	G
1	C1	2207	A
1	C1	2209	U
1	C1	2210	G
1	C1	2223	A
1	C1	2244	A
1	C1	2249	G
1	C1	2250	G
1	C1	2255	A
1	C1	2256	A
1	C1	2257	C
1	C1	2272	G
1	C1	2273	G
1	C1	2279	A
1	C1	2281	A
1	C1	2282	U

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Mol	Chain	Res	Type
1	C1	2285	C
1	C1	2288	G
1	C1	2307	G
1	C1	2310	U
1	C1	2313	A
1	C1	2314	U
1	C1	2315	G
1	C1	2336	U
1	C1	2373	A
1	C1	2374	C
1	C1	2375	G
1	C1	2385	G
1	C1	2388	U
1	C1	2393	G
1	C1	2397	A
1	C1	2402	A
1	C1	2403	G
1	C1	2404	A
1	C1	2411	U
1	C1	2419	A
1	C1	2435	G
1	C1	2437	G
1	C1	2439	A
1	C1	2440	G
1	C1	2441	A
1	C1	2445	A
1	C1	2446	U
1	C1	2447	A
1	C1	2448	G
1	C1	2450	G
1	C1	2452	G
1	C1	2455	U
1	C1	2456	A
1	C1	2459	A
1	C1	2460	U
1	C1	2461	A
1	C1	2462	A
1	C1	2468	A
1	C1	2469	G
1	C1	2471	U
1	C1	2474	G
1	C1	2476	C

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Mol	Chain	Res	Type
1	C1	2479	C
1	C1	2480	A
1	C1	2482	U
1	C1	2483	G
1	C1	2486	A
1	C1	2487	U
1	C1	2488	A
1	C1	2490	C
1	C1	2491	A
1	C1	2492	C
1	C1	2494	A
1	C1	2495	C
1	C1	2496	C
1	C1	2498	U
1	C1	2499	U
1	C1	2500	A
1	C1	2501	U
1	C1	2502	A
1	C1	2506	U
1	C1	2508	U
1	C1	2514	U
1	C1	2515	A
1	C1	2522	G
1	C1	2524	A
1	C1	2525	G
1	C1	2531	C
1	C1	2533	G
1	C1	2537	U
1	C1	2538	U
1	C1	2539	C
1	C1	2540	A
1	C1	2541	U
1	C1	2542	U
1	C1	2544	U
1	C1	2548	C
1	C1	2549	G
1	C1	2552	C
1	C1	2554	A
1	C1	2561	A
1	C1	2569	A
1	C1	2570	U
1	C1	2571	U

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Mol	Chain	Res	Type
1	C1	2572	C
1	C1	2573	G
1	C1	2585	G
1	C1	2593	A
1	C1	2606	G
1	C1	2607	G
1	C1	2614	G
1	C1	2618	G
1	C1	2626	A
1	C1	2652	U
1	C1	2656	A
1	C1	2674	A
1	C1	2677	G
1	C1	2689	A
1	C1	2691	A
1	C1	2694	A
1	C1	2696	A
1	C1	2704	A
1	C1	2714	G
1	C1	2719	U
1	C1	2720	G
1	C1	2728	G
1	C1	2729	U
1	C1	2737	C
1	C1	2752	U
1	C1	2753	G
1	C1	2755	C
1	C1	2772	C
1	C1	2773	C
1	C1	2777	G
1	C1	2778	G
1	C1	2796	G
1	C1	2800	G
1	C1	2801	A
1	C1	2803	A
1	C1	2810	C
1	C1	2814	G
1	C1	2816	G
1	C1	2817	A
1	C1	2821	C
1	C1	2842	U
1	C1	2844	C

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Mol	Chain	Res	Type
1	C1	2845	A
1	C1	2856	G
1	C1	2867	C
1	C1	2871	G
1	C1	2872	A
1	C1	2875	U
1	C1	2887	A
1	C1	2889	C
1	C1	2898	G
1	C1	2923	U
1	C1	2928	C
1	C1	2935	U
1	C1	2936	A
1	C1	2942	C
1	C1	2947	G
1	C1	2954	U
1	C1	2971	A
1	C1	2979	U
1	C1	2983	C
1	C1	2990	G
1	C1	2996	U
1	C1	2997	G
1	C1	3012	A
1	C1	3023	U
1	C1	3059	G
1	C1	3078	U
1	C1	3080	G
1	C1	3086	A
1	C1	3092	C
1	C1	3093	C
1	C1	3101	G
1	C1	3109	G
1	C1	3119	U
1	C1	3122	A
1	C1	3129	A
1	C1	3130	A
1	C1	3131	U
1	C1	3142	A
1	C1	3143	C
1	C1	3151	U
1	C1	3154	C
1	C1	3155	U

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Mol	Chain	Res	Type
1	C1	3156	U
1	C1	3157	U
1	C1	3165	A
1	C1	3170	A
1	C1	3173	G
1	C1	3174	A
1	C1	3176	G
1	C1	3179	U
1	C1	3181	C
1	C1	3187	A
1	C1	3196	U
1	C1	3207	U
1	C1	3209	A
1	C1	3217	C
1	C1	3218	A
1	C1	3219	G
1	C1	3222	U
1	C1	3229	G
1	C1	3235	C
1	C1	3239	G
1	C1	3243	A
1	C1	3245	A
1	C1	3247	G
1	C1	3259	U
1	C1	3263	G
1	C1	3270	U
1	C1	3276	G
1	C1	3281	U
1	C1	3287	U
1	C1	3288	G
1	C1	3289	G
1	C1	3294	A
1	C1	3295	A
1	C1	3304	U
1	C1	3307	A
1	C1	3313	U
1	C1	3316	A
1	C1	3318	G
1	C1	3319	U
1	C1	3320	A
1	C1	3334	U
1	C1	3341	U

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Mol	Chain	Res	Type
1	C1	3345	G
1	C1	3351	U
1	C1	3352	U
1	C1	3353	G
1	C1	3354	U
1	C1	3355	U
1	C1	3369	G
1	C1	3375	A
1	C1	3378	C
1	C1	3382	U
1	C1	3386	G
1	C1	3389	U
1	C1	3390	G
1	C1	3396	U
2	C4	7	G
2	C4	10	C
2	C4	11	A
2	C4	53	U
2	C4	54	U
2	C4	65	G
2	C4	76	A
2	C4	95	A
2	C4	102	A
2	C4	112	G
2	C4	121	U
3	C3	34	U
3	C3	35	C
3	C3	39	G
3	C3	53	A
3	C3	59	A
3	C3	62	C
3	C3	63	G
3	C3	80	A
3	C3	81	U
3	C3	82	U
3	C3	83	C
3	C3	84	C
3	C3	86	U
3	C3	87	G
3	C3	90	U
3	C3	95	G
3	C3	104	A

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Mol	Chain	Res	Type
3	C3	106	C
3	C3	111	A
3	C3	113	U
3	C3	125	U
3	C3	126	A
3	C3	138	A
3	C3	152	G
3	C3	158	U
47	C2	2	A
47	C2	4	C
47	C2	5	U
47	C2	17	C
47	C2	25	C
47	C2	26	A
47	C2	34	G
47	C2	42	G
47	C2	45	U
47	C2	46	A
47	C2	47	A
47	C2	51	A
47	C2	56	U
47	C2	57	G
47	C2	62	A
47	C2	63	G
47	C2	65	A
47	C2	66	U
47	C2	68	A
47	C2	69	G
47	C2	74	U
47	C2	75	U
47	C2	76	A
47	C2	78	A
47	C2	79	C
47	C2	81	G
47	C2	104	A
47	C2	114	C
47	C2	126	A
47	C2	127	G
47	C2	129	U
47	C2	130	C
47	C2	131	C
47	C2	132	U

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Mol	Chain	Res	Type
47	C2	134	U
47	C2	135	A
47	C2	136	C
47	C2	138	A
47	C2	140	A
47	C2	141	U
47	C2	142	G
47	C2	153	G
47	C2	155	U
47	C2	171	A
47	C2	174	U
47	C2	176	C
47	C2	178	U
47	C2	179	A
47	C2	180	A
47	C2	185	U
47	C2	186	C
47	C2	187	G
47	C2	188	A
47	C2	189	C
47	C2	191	C
47	C2	193	U
47	C2	195	G
47	C2	197	A
47	C2	217	A
47	C2	218	A
47	C2	224	C
47	C2	225	A
47	C2	227	U
47	C2	228	G
47	C2	230	C
47	C2	232	U
47	C2	233	C
47	C2	234	G
47	C2	235	G
47	C2	238	U
47	C2	240	U
47	C2	241	U
47	C2	250	C
47	C2	257	A
47	C2	260	U
47	C2	265	A

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Mol	Chain	Res	Type
47	C2	272	U
47	C2	274	G
47	C2	275	C
47	C2	277	U
47	C2	278	U
47	C2	279	G
47	C2	280	U
47	C2	281	G
47	C2	287	G
47	C2	299	A
47	C2	314	C
47	C2	316	A
47	C2	321	C
47	C2	322	G
47	C2	323	A
47	C2	333	A
47	C2	337	G
47	C2	338	C
47	C2	350	U
47	C2	352	A
47	C2	353	A
47	C2	359	A
47	C2	361	C
47	C2	373	G
47	C2	388	G
47	C2	400	A
47	C2	401	A
47	C2	402	C
47	C2	404	G
47	C2	416	A
47	C2	417	A
47	C2	419	G
47	C2	423	G
47	C2	424	C
47	C2	425	A
47	C2	426	G
47	C2	432	G
47	C2	434	G
47	C2	437	A
47	C2	439	U
47	C2	444	C
47	C2	448	C

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Mol	Chain	Res	Type
47	C2	454	U
47	C2	460	A
47	C2	468	A
47	C2	471	A
47	C2	481	A
47	C2	483	A
47	C2	485	A
47	C2	487	G
47	C2	489	C
47	C2	492	A
47	C2	493	U
47	C2	494	U
47	C2	495	C
47	C2	496	G
47	C2	498	G
47	C2	499	U
47	C2	500	C
47	C2	502	U
47	C2	505	A
47	C2	506	A
47	C2	507	U
47	C2	508	U
47	C2	510	G
47	C2	511	A
47	C2	527	A
47	C2	534	A
47	C2	537	G
47	C2	538	A
47	C2	540	G
47	C2	541	A
47	C2	542	A
47	C2	543	C
47	C2	544	A
47	C2	554	C
47	C2	555	A
47	C2	556	A
47	C2	557	G
47	C2	558	U
47	C2	559	C
47	C2	565	C
47	C2	568	G
47	C2	578	U

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Mol	Chain	Res	Type
47	C2	579	A
47	C2	580	A
47	C2	582	U
47	C2	594	A
47	C2	595	G
47	C2	606	A
47	C2	610	G
47	C2	611	U
47	C2	619	A
47	C2	620	A
47	C2	622	A
47	C2	623	A
47	C2	624	G
47	C2	630	A
47	C2	639	U
47	C2	640	U
47	C2	641	G
47	C2	651	G
47	C2	652	G
47	C2	653	C
47	C2	655	G
47	C2	677	G
47	C2	679	U
47	C2	680	U
47	C2	681	U
47	C2	683	C
47	C2	684	A
47	C2	687	G
47	C2	694	U
47	C2	696	C
47	C2	698	U
47	C2	699	U
47	C2	700	C
47	C2	702	G
47	C2	703	G
47	C2	704	C
47	C2	705	U
47	C2	706	A
47	C2	707	A
47	C2	708	C
47	C2	709	C
47	C2	710	U

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Mol	Chain	Res	Type
47	C2	711	U
47	C2	712	G
47	C2	714	G
47	C2	728	U
47	C2	729	G
47	C2	730	G
47	C2	731	C
47	C2	732	G
47	C2	733	A
47	C2	734	A
47	C2	736	C
47	C2	737	A
47	C2	738	G
47	C2	739	G
47	C2	740	A
47	C2	742	U
47	C2	743	U
47	C2	753	A
47	C2	756	A
47	C2	765	G
47	C2	766	U
47	C2	767	U
47	C2	774	A
47	C2	775	G
47	C2	778	G
47	C2	779	U
47	C2	780	A
47	C2	781	U
47	C2	782	U
47	C2	783	G
47	C2	789	A
47	C2	812	A
47	C2	813	U
47	C2	814	A
47	C2	815	G
47	C2	818	C
47	C2	819	G
47	C2	820	U
47	C2	821	U
47	C2	823	G
47	C2	832	U
47	C2	833	U

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Mol	Chain	Res	Type
47	C2	835	U
47	C2	838	G
47	C2	840	U
47	C2	846	G
47	C2	852	C
47	C2	855	A
47	C2	856	A
47	C2	857	U
47	C2	863	A
47	C2	876	G
47	C2	886	U
47	C2	899	G
47	C2	901	G
47	C2	902	G
47	C2	904	G
47	C2	912	U
47	C2	913	G
47	C2	915	A
47	C2	921	U
47	C2	929	A
47	C2	933	A
47	C2	934	C
47	C2	935	U
47	C2	942	G
47	C2	945	U
47	C2	960	U
47	C2	963	A
47	C2	966	A
47	C2	970	A
47	C2	971	A
47	C2	988	A
47	C2	992	A
47	C2	993	A
47	C2	998	A
47	C2	1004	U
47	C2	1012	U
47	C2	1020	A
47	C2	1021	C
47	C2	1024	U
47	C2	1025	A
47	C2	1028	C
47	C2	1031	U

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Mol	Chain	Res	Type
47	C2	1032	G
47	C2	1039	A
47	C2	1053	G
47	C2	1058	U
47	C2	1060	U
47	C2	1061	A
47	C2	1063	U
47	C2	1076	A
47	C2	1082	C
47	C2	1092	A
47	C2	1093	A
47	C2	1096	C
47	C2	1100	G
47	C2	1132	A
47	C2	1138	A
47	C2	1150	G
47	C2	1158	C
47	C2	1159	C
47	C2	1160	A
47	C2	1164	G
47	C2	1167	G
47	C2	1185	U
47	C2	1194	A
47	C2	1196	A
47	C2	1199	G
47	C2	1200	G
47	C2	1202	A
47	C2	1208	A
47	C2	1217	A
47	C2	1218	G
47	C2	1222	C
47	C2	1227	A
47	C2	1228	G
47	C2	1229	G
47	C2	1241	G
47	C2	1243	G
47	C2	1244	A
47	C2	1245	G
47	C2	1246	C
47	C2	1251	U
47	C2	1252	C
47	C2	1256	A

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Mol	Chain	Res	Type
47	C2	1257	U
47	C2	1274	C
47	C2	1275	A
47	C2	1285	U
47	C2	1286	U
47	C2	1291	G
47	C2	1301	U
47	C2	1314	U
47	C2	1315	U
47	C2	1316	G
47	C2	1318	G
47	C2	1321	A
47	C2	1322	A
47	C2	1344	A
47	C2	1345	A
47	C2	1346	A
47	C2	1348	A
47	C2	1349	G
47	C2	1355	C
47	C2	1360	A
47	C2	1363	U
47	C2	1364	G
47	C2	1370	U
47	C2	1371	A
47	C2	1372	U
47	C2	1373	C
47	C2	1382	A
47	C2	1383	G
47	C2	1390	U
47	C2	1398	U
47	C2	1399	C
47	C2	1400	A
47	C2	1402	G
47	C2	1414	U
47	C2	1425	A
47	C2	1427	A
47	C2	1428	G
47	C2	1431	C
47	C2	1432	U
47	C2	1433	G
47	C2	1436	A
47	C2	1446	A

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Mol	Chain	Res	Type
47	C2	1459	C
47	C2	1469	A
47	C2	1471	A
47	C2	1472	C
47	C2	1479	A
47	C2	1491	U
47	C2	1492	A
47	C2	1493	A
47	C2	1494	C
47	C2	1496	U
47	C2	1506	G
47	C2	1514	U
47	C2	1515	A
47	C2	1516	A
47	C2	1518	C
47	C2	1521	G
47	C2	1523	G
47	C2	1524	A
47	C2	1528	U
47	C2	1529	C
47	C2	1531	G
47	C2	1535	U
47	C2	1537	C
47	C2	1540	G
47	C2	1542	G
47	C2	1543	A
47	C2	1554	U
47	C2	1556	A
47	C2	1557	U
47	C2	1558	U
47	C2	1559	A
47	C2	1561	U
47	C2	1570	A
47	C2	1572	G
47	C2	1573	A
47	C2	1574	G
47	C2	1575	G
47	C2	1576	A
47	C2	1583	A
47	C2	1584	G
47	C2	1585	U
47	C2	1590	G

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Mol	Chain	Res	Type
47	C2	1601	G
47	C2	1607	G
47	C2	1611	A
47	C2	1616	G
47	C2	1622	G
47	C2	1631	A
47	C2	1634	C
47	C2	1635	A
47	C2	1637	C
47	C2	1657	U
47	C2	1658	G
47	C2	1688	U
47	C2	1689	A
47	C2	1696	G
47	C2	1697	G
47	C2	1698	G
47	C2	1699	G
47	C2	1700	C
47	C2	1702	A
47	C2	1704	U
47	C2	1706	C
47	C2	1708	U
47	C2	1712	A
47	C2	1715	G
47	C2	1716	C
47	C2	1736	G
47	C2	1755	A
47	C2	1756	A
47	C2	1757	G
47	C2	1760	G
47	C2	1766	A
47	C2	1767	G
47	C2	1769	U
47	C2	1770	U
47	C2	1771	U
47	C2	1780	G
47	C2	1782	A
47	C2	1783	C
47	C2	1792	G
47	C2	1793	G
47	C2	1794	A
47	C2	1795	U

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Mol	Chain	Res	Type
47	C2	1796	C
47	C2	1799	U
81	A	3	G
81	A	5	C
81	A	6	G
81	A	7	U
81	A	8	U
81	A	14	A
81	A	15	G
81	A	16	U
81	A	17	U
81	A	18	G
81	A	19	G
81	A	21	A
81	A	22	G
81	A	35	U
81	A	36	U
81	A	38	A
81	A	43	U
81	A	46	G
81	A	47	U
81	A	48	C
81	A	49	G
81	A	50	C
81	A	51	A
81	A	52	G
81	A	53	G
81	A	54	U
81	A	55	U
81	A	57	G
81	A	59	A
81	A	60	U
81	A	61	C
81	A	64	G
81	A	65	C
81	A	71	C
81	A	73	A
81	A	74	C
82	P	3	C
82	P	13	C
82	P	15	A
82	P	16	U

Continued on next page...

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Mol	Chain	Res	Type
82	P	17	G
82	P	18	G
82	P	19	U
82	P	21	A
82	P	42	G
82	P	48	U
82	P	50	C
82	P	55	U
82	P	56	C
82	P	58	A
82	P	61	C
82	P	65	G
82	P	73	G
82	P	74	C
82	P	75	C
82	P	76	A
83	m	38	G
83	m	40	A
83	m	41	U
83	m	42	G
83	m	49	A

All (86) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	C1	13	A
1	C1	65	A
1	C1	239	G
1	C1	282	G
1	C1	619	A
1	C1	637	C
1	C1	715	A
1	C1	763	G
1	C1	916	G
1	C1	1064	A
1	C1	1097	G
1	C1	1307	G
1	C1	1348	U
1	C1	1355	A
1	C1	1554	U
1	C1	1562	C
1	C1	1815	U

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Mol	Chain	Res	Type
1	C1	1820	U
1	C1	2101	C
1	C1	2112	U
1	C1	2461	A
1	C1	2500	A
1	C1	2501	U
1	C1	2507	C
1	C1	2537	U
1	C1	2541	U
1	C1	2547	A
1	C1	2843	U
1	C1	3121	U
1	C1	3218	A
1	C1	3228	C
1	C1	3269	U
1	C1	3275	U
1	C1	3319	U
1	C1	3350	C
1	C1	3351	U
2	C4	52	G
3	C3	85	G
47	C2	68	A
47	C2	77	U
47	C2	139	C
47	C2	141	U
47	C2	224	C
47	C2	237	C
47	C2	322	G
47	C2	352	A
47	C2	387	A
47	C2	400	A
47	C2	539	G
47	C2	541	A
47	C2	555	A
47	C2	577	G
47	C2	609	U
47	C2	639	U
47	C2	640	U
47	C2	705	U
47	C2	711	U
47	C2	765	G
47	C2	813	U

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Mol	Chain	Res	Type
47	C2	819	G
47	C2	912	U
47	C2	928	U
47	C2	1226	A
47	C2	1251	U
47	C2	1256	A
47	C2	1273	G
47	C2	1274	C
47	C2	1344	A
47	C2	1382	A
47	C2	1399	C
47	C2	1430	U
47	C2	1471	A
47	C2	1493	A
47	C2	1517	U
47	C2	1556	A
47	C2	1557	U
47	C2	1558	U
47	C2	1573	A
47	C2	1584	G
47	C2	1615	C
47	C2	1633	A
47	C2	1636	C
47	C2	1791	A
81	A	13	C
81	A	15	G
81	A	54	U

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

1 non-standard protein/DNA/RNA residue is 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	$\# Z > 2$
84	5CT	5	51	84	13,14,15	0.66	0	9,15,17	0.89	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
84	5CT	5	51	84	-	8/13/14/16	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
84	5	51	5CT	C2-C1-NZ-CE
84	5	51	5CT	NZ-C1-C2-C3
84	5	51	5CT	NZ-C1-C2-O1
84	5	51	5CT	C2-C3-C4-N1
84	5	51	5CT	C-CA-CB-CG
84	5	51	5CT	N-CA-CB-CG
84	5	51	5CT	CE-CD-CG-CB
84	5	51	5CT	CD-CE-NZ-C1

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 295 ligands modelled in this entry, 294 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
89	ASP	C1	3593	88	3,4,8	0.97	0	2,4,10	0.99	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
89	ASP	C1	3593	88	-	0/0/2/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

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.

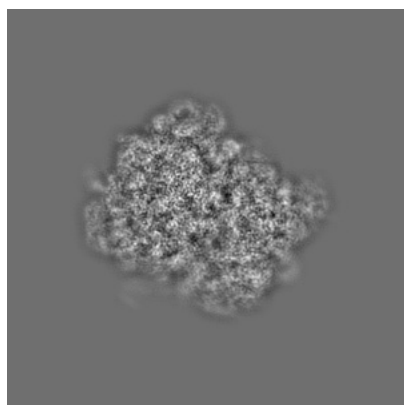
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-24652. These allow visual inspection of the internal detail of the map and identification of artifacts.

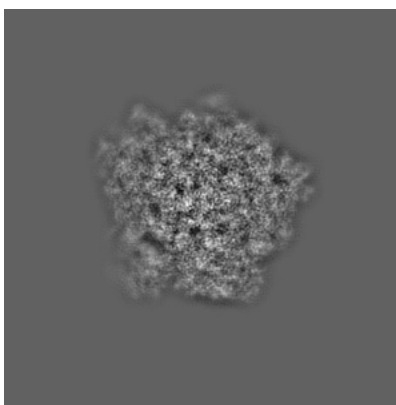
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

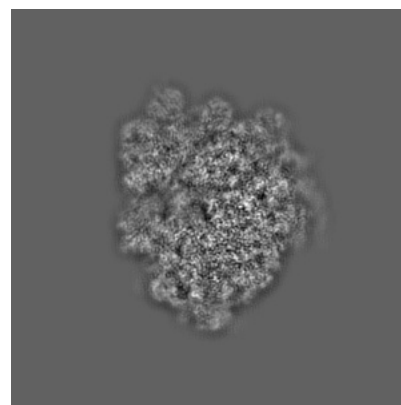
6.1.1 Primary map



X



Y

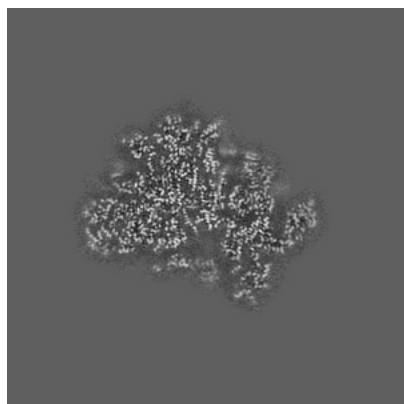


Z

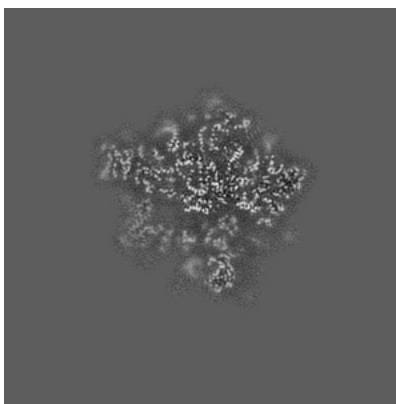
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

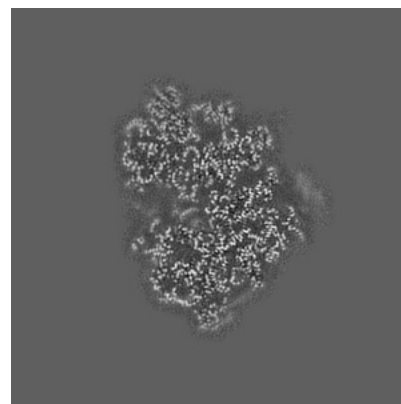
6.2.1 Primary map



X Index: 224



Y Index: 224

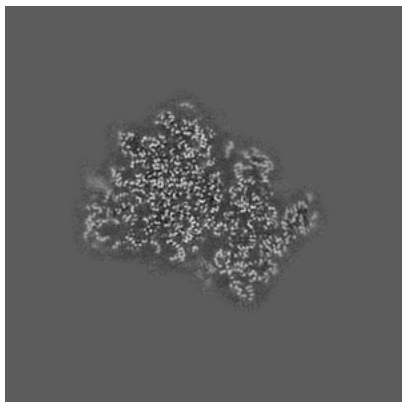


Z Index: 224

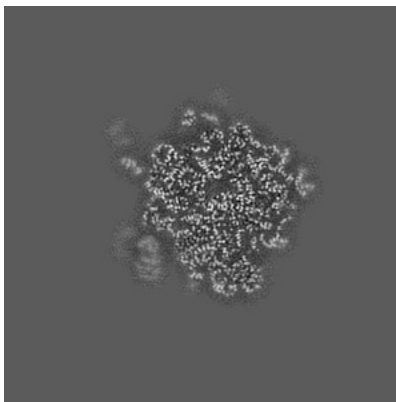
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

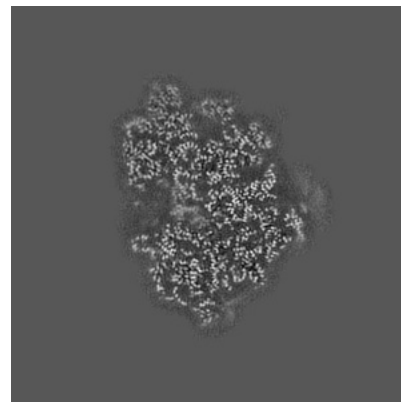
6.3.1 Primary map



X Index: 232



Y Index: 192

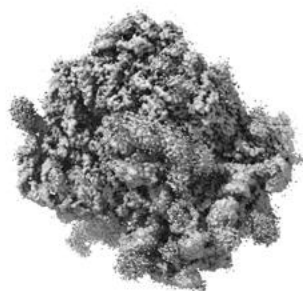


Z Index: 227

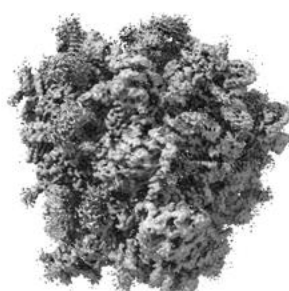
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.003. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

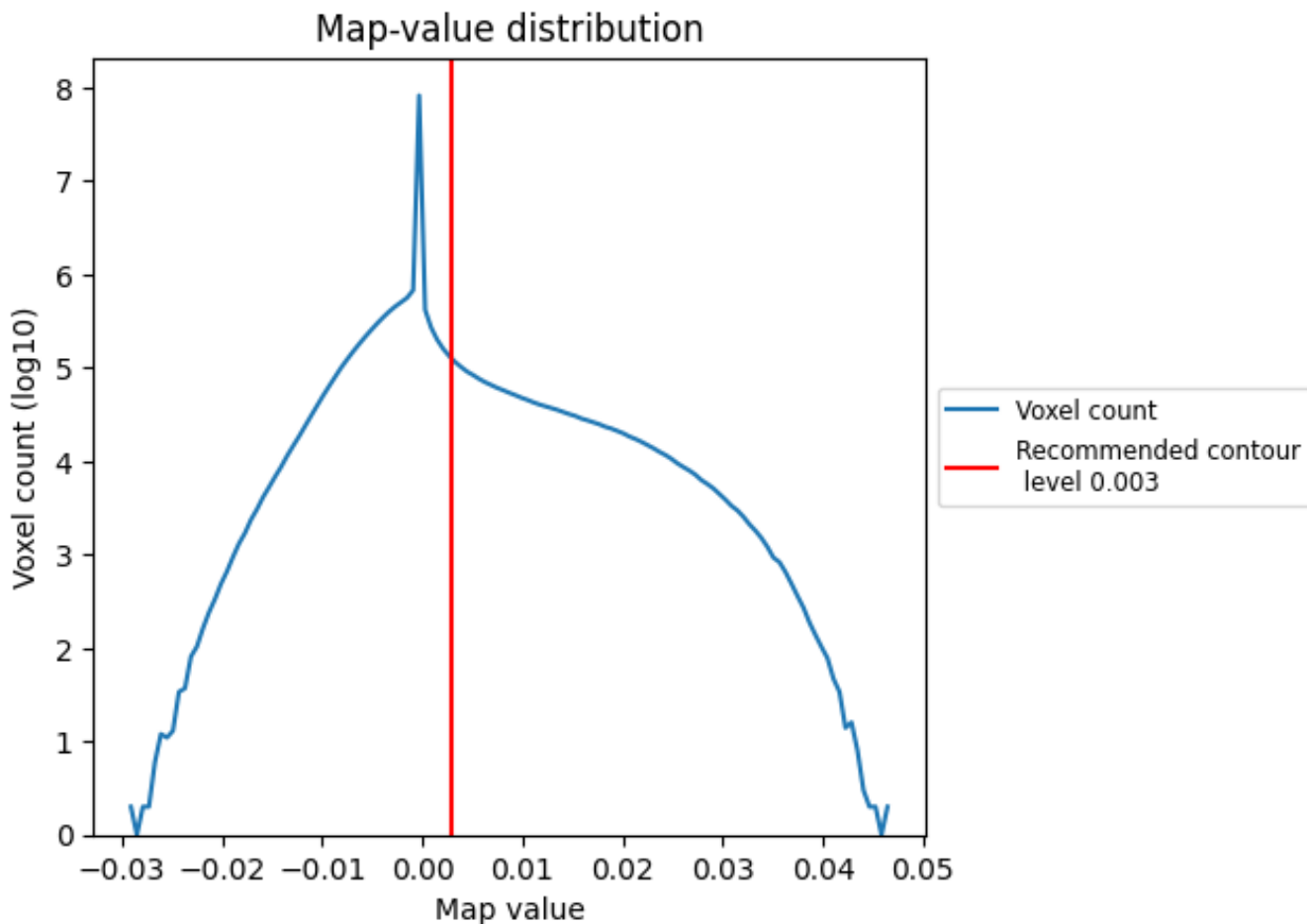
6.5 Mask visualisation

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

7 Map analysis [i](#)

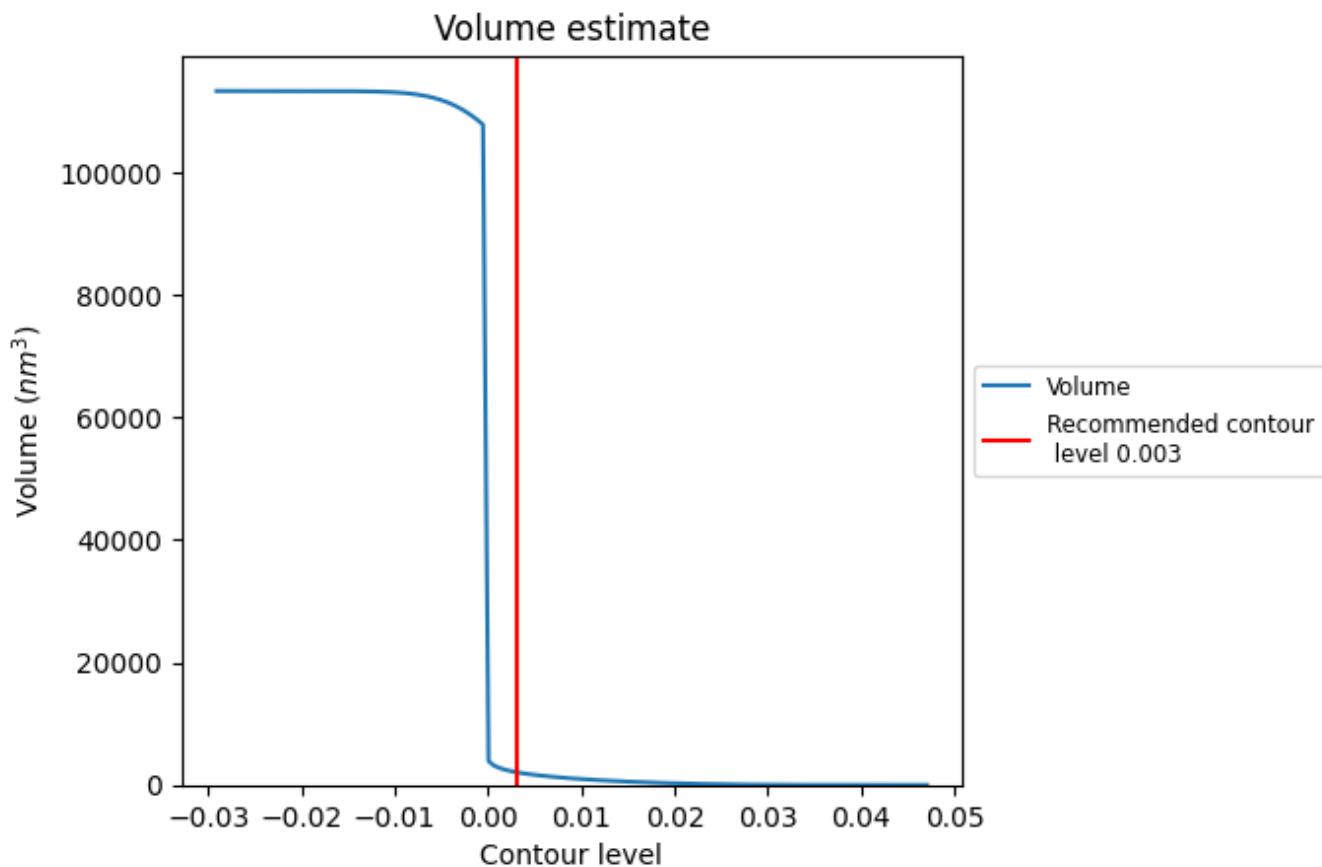
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

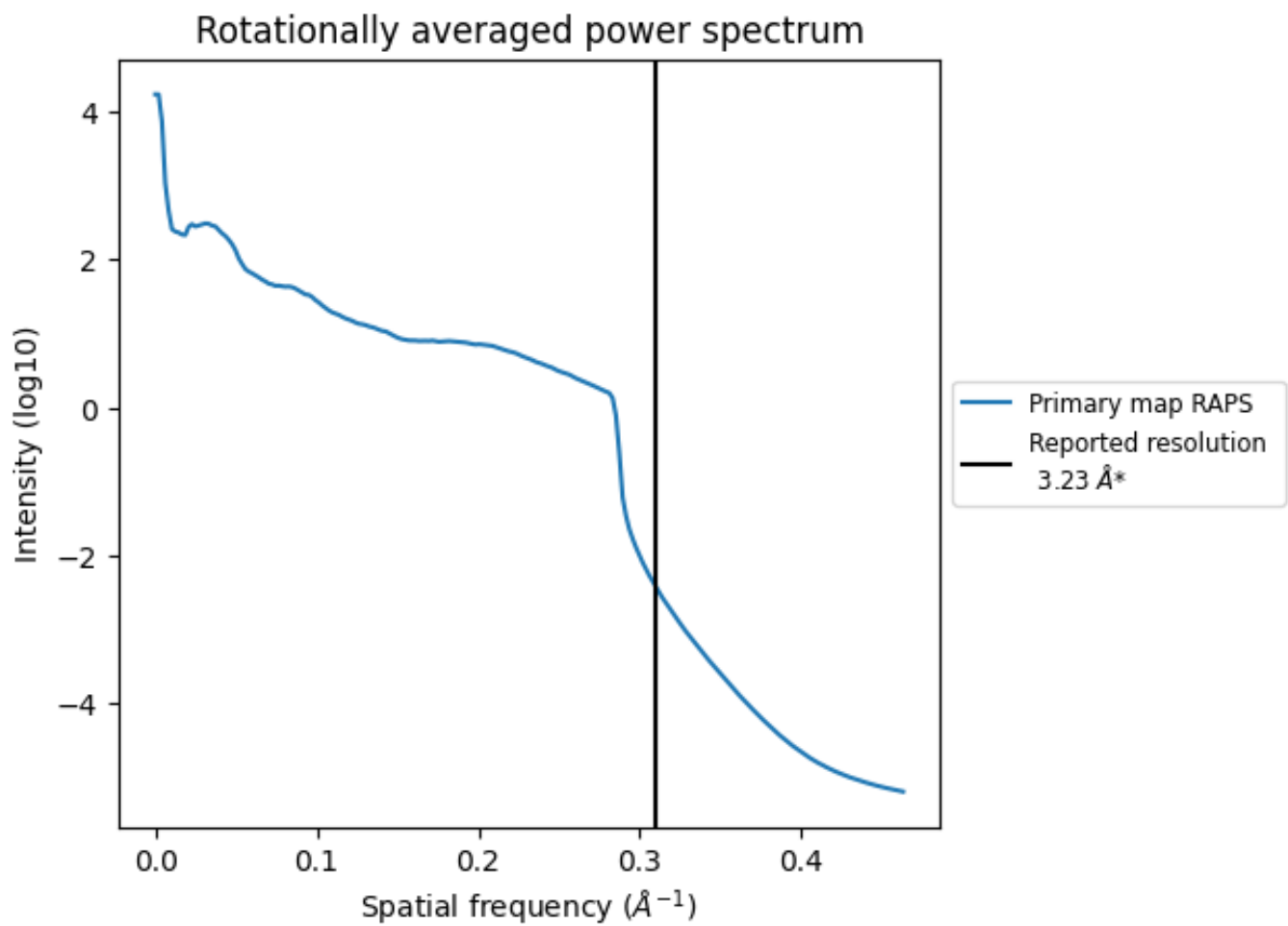
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2093 nm^3 ; this corresponds to an approximate mass of 1891 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)

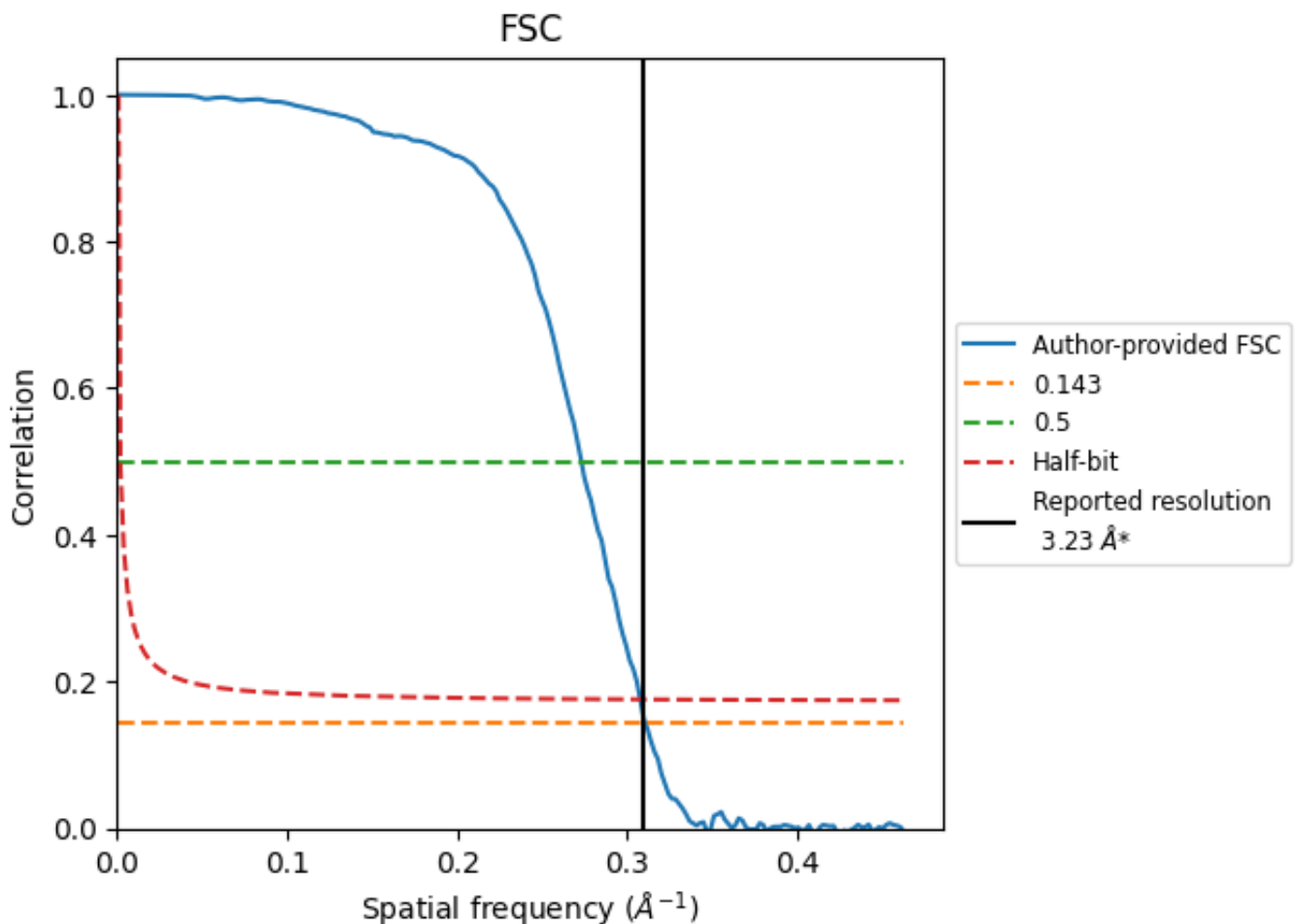


*Reported resolution corresponds to spatial frequency of 0.310\AA^{-1}

8 Fourier-Shell correlation [\(i\)](#)

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

8.1 FSC [\(i\)](#)



*Reported resolution corresponds to spatial frequency of 0.310 Å⁻¹

8.2 Resolution estimates [i](#)

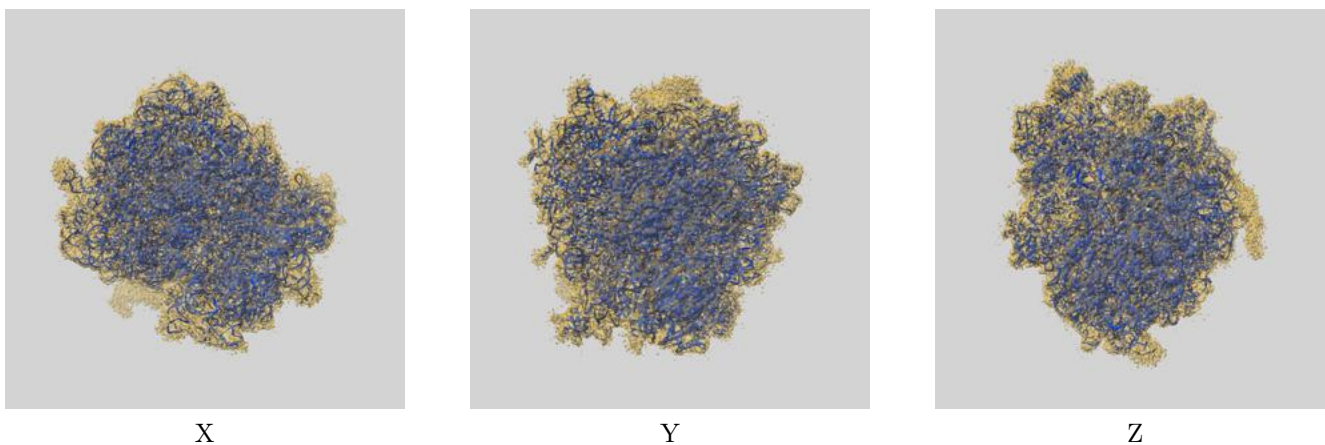
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.23	-	-
Author-provided FSC curve	3.22	3.66	3.25
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

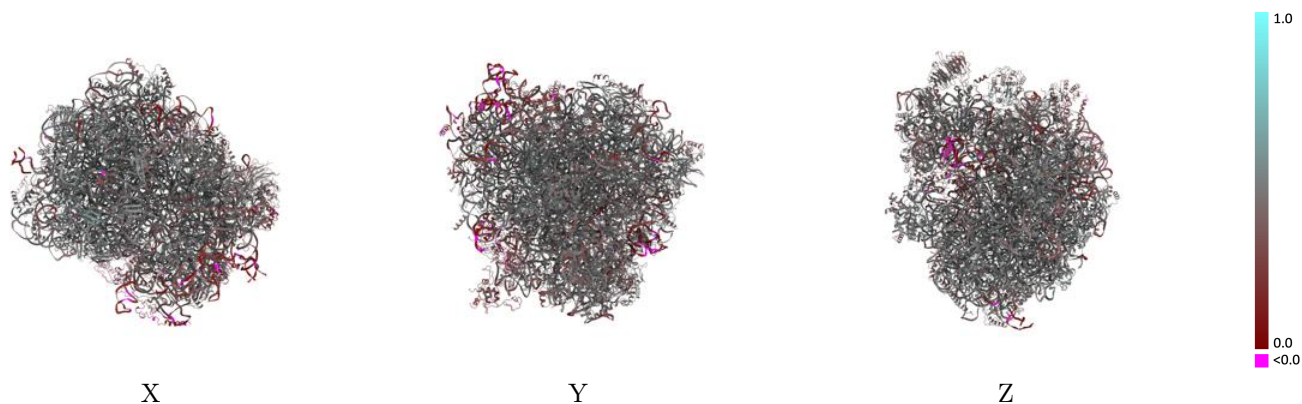
This section contains information regarding the fit between EMDB map EMD-24652 and PDB model 7RR5. Per-residue inclusion information can be found in section 3 on page 23.

9.1 Map-model overlay [i](#)



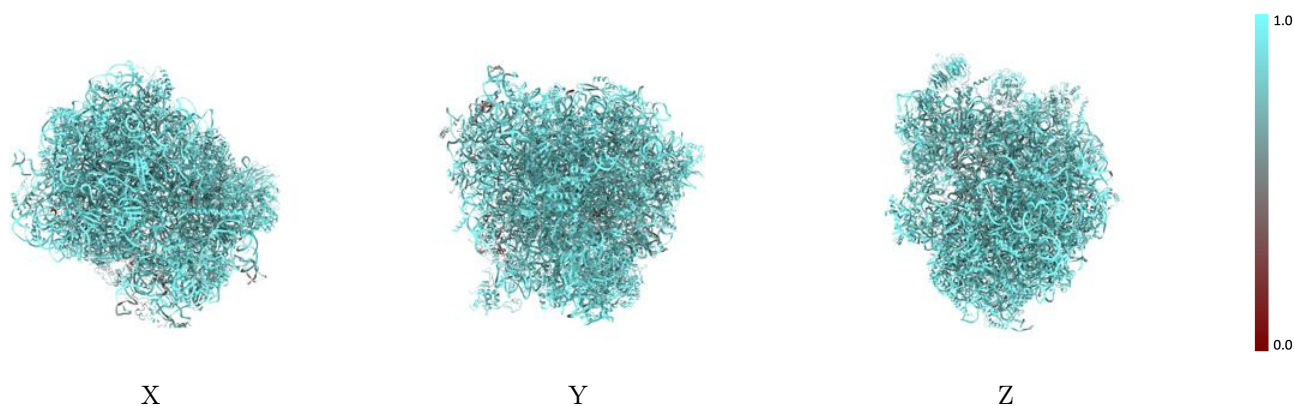
The images above show the 3D surface view of the map at the recommended contour level 0.003 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



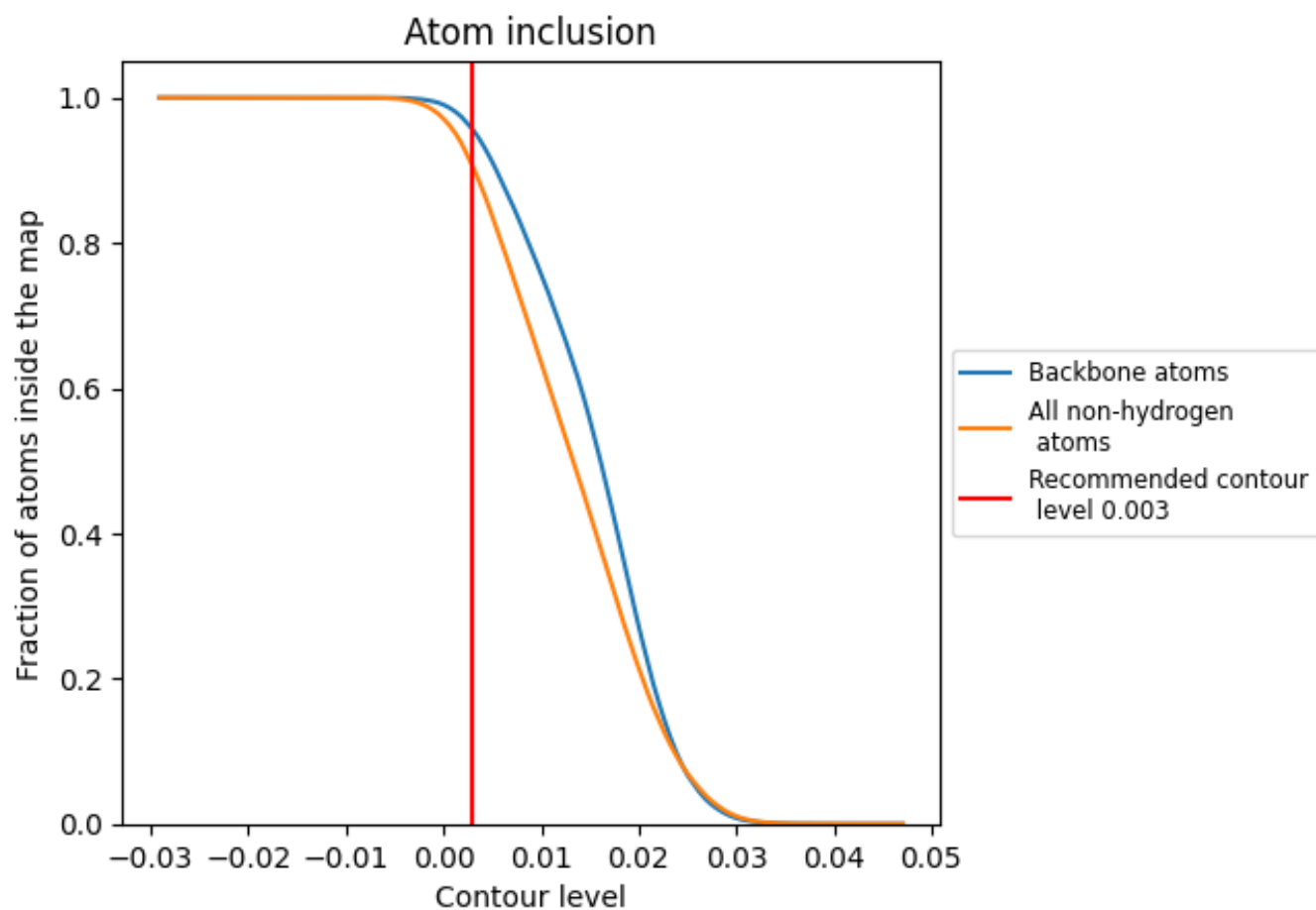
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.003).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 90% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary





















































































The table lists the average atom inclusion at the recommended contour level (0.003) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9049	 0.4370
5	 0.7237	 0.3570
A	 0.9130	 0.3670
C1	 0.9415	 0.4440
C2	 0.9294	 0.4180
C3	 0.9565	 0.4650
C4	 0.9733	 0.4790
L1	 0.8580	 0.3200
LA	 0.8767	 0.5050
LB	 0.9188	 0.5110
LC	 0.9066	 0.4810
LD	 0.9052	 0.4590
LE	 0.8985	 0.4520
LF	 0.8881	 0.4740
LG	 0.9001	 0.4540
LH	 0.9101	 0.4720
LI	 0.8900	 0.4840
LJ	 0.8796	 0.4470
LL	 0.9025	 0.4560
LM	 0.9181	 0.4880
LN	 0.8761	 0.5060
LO	 0.8956	 0.4920
LP	 0.8775	 0.4680
LQ	 0.8810	 0.4830
LR	 0.8948	 0.4390
LS	 0.8895	 0.4880
LT	 0.8895	 0.4960
LU	 0.9386	 0.4610
LV	 0.8837	 0.5050
LW	 0.7503	 0.3550
LX	 0.8577	 0.4600
LY	 0.9227	 0.5030
LZ	 0.8861	 0.4490
La	 0.9116	 0.4960
Lb	 0.8407	 0.4450

























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Chain	Atom inclusion	Q-score
Lc	 0.9324	 0.4680
Ld	 0.8929	 0.4850
Le	 0.8841	 0.5040
Lf	 0.8989	 0.5160
Lg	 0.8533	 0.4700
Lh	 0.9046	 0.4640
Li	 0.8932	 0.4550
Lj	 0.8868	 0.4940
Lk	 0.8982	 0.4450
Ll	 0.8843	 0.5020
Lm	 0.8614	 0.4730
Ln	 0.8510	 0.4700
Lo	 0.8933	 0.4940
Lp	 0.8821	 0.4820
P	 0.9074	 0.3590
P0	 0.5838	 0.1510
P2	 0.6262	 0.0780
R	 0.6920	 0.3460
SA	 0.9079	 0.4490
SB	 0.8528	 0.4130
SC	 0.8931	 0.4760
SD	 0.8539	 0.4290
SE	 0.8706	 0.4560
SF	 0.8666	 0.4290
SG	 0.8653	 0.3990
SH	 0.8594	 0.3560
SI	 0.8925	 0.4690
SJ	 0.8754	 0.4590
SK	 0.8916	 0.4210
SL	 0.8723	 0.4750
SM	 0.8046	 0.2760
SN	 0.8701	 0.4510
SO	 0.8683	 0.4580
SP	 0.9101	 0.4390
SQ	 0.8601	 0.4710
SR	 0.8883	 0.4300
SS	 0.8943	 0.4340
ST	 0.8844	 0.4500
SU	 0.8350	 0.4280
SV	 0.9158	 0.4540
SW	 0.8758	 0.4840
SX	 0.8566	 0.4800

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Chain	Atom inclusion	Q-score
SY	 0.8694	 0.4350
SZ	 0.8418	 0.3920
Sa	 0.8716	 0.4590
Sb	 0.8985	 0.4120
Sc	 0.8562	 0.4340
Sd	 0.8255	 0.4800
Se	 0.8048	 0.4260
Sf	 0.8235	 0.2690
Sg	 0.8900	 0.4080
T	 0.5865	 0.2400
m	 0.7123	 0.3330