



Full wwPDB EM Validation Report ⓘ

Oct 6, 2024 – 07:11 pm BST

PDB ID : 7PHA
EMDB ID : EMD-13411
Title : 70S ribosome with EF-Tu-tRNA and P-site tRNA in chloramphenicol-treated Mycoplasma pneumoniae cells
Authors : Xue, L.; Lenz, S.; Rappsilber, J.; Mahamid, J.
Deposited on : 2021-08-16
Resolution : 8.50 Å (reported)
Based on initial models : 7OOC, 7OOD, 4V7C, 4V5L

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:

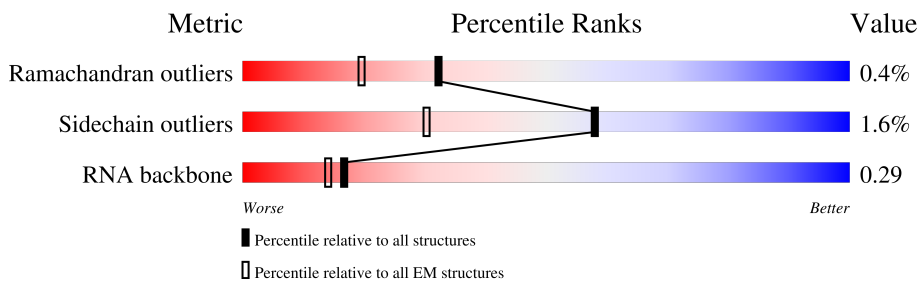
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

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 8.50 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	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	0	48	
2	1	59	
3	2	37	
4	9	394	
5	A	294	
6	B	273	
7	C	205	
8	D	219	

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Mol	Chain	Length	Quality of chain
9	E	215	5% 76% 22%
10	F	155	6% 97%
11	G	142	98%
12	H	132	90% 7%
13	I	108	11% 92% 6%
14	J	121	7% 94% 6%
15	K	139	94%
16	L	124	94% 5%
17	M	61	97%
18	N	86	5% 94%
19	O	94	84% 15%
20	P	85	7% 98%
21	Q	104	60% 38%
22	R	87	95%
23	S	87	87% 11%
24	T	60	87% 12%
25	a	287	99%
26	b	287	79% 20%
27	c	212	5% 96%
28	d	180	7% 96%
29	e	184	94%
30	f	149	45% 94%
31	g	161	8% 70% 6% 24%
32	h	137	18% 93% 7%
33	i	146	98%

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Mol	Chain	Length	Quality of chain
34	j	122	5% 98%
35	k	151	97%
36	l	139	96%
37	m	124	93%
38	n	116	95%
39	o	119	8% 97%
40	p	127	90% 10%
41	q	100	96%
42	r	159	87% 13%
43	s	237	39% 61%
44	t	111	11% 100%
45	u	104	82% 17%
46	v	65	97%
47	w	111	90% 10%
48	x	97	44% 55%
49	y	57	89% 9%
50	z	53	92% 6%
51	3	2907	52% 46%
52	4	108	38% 56%
53	5	1520	56% 40%
54	6	76	51% 43% 5%
54	7	76	34% 63%

2 Entry composition

There are 54 unique types of molecules in this entry. The entry contains 149139 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	47	380	236	81	61	2	0	0

- Molecule 2 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	59	477	300	99	77	1	0	0

- Molecule 3 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	37	304	189	65	46	4	0	0

- Molecule 4 is a protein called Elongation factor Tu.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	9	393	3021	1892	533	583	13	0	0

- Molecule 5 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A	240	1921	1226	334	352	9	0	0

- Molecule 6 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	B	215	1698	1073	313	307	5	0	0

- Molecule 7 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	C	203	Total	C	N	O	S	0	0
			1660	1051	314	290	5		

- Molecule 8 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	D	153	Total	C	N	O	S	0	0
			1173	742	226	202	3		

- Molecule 9 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	E	167	Total	C	N	O	S	0	0
			1362	857	240	263	2		

- Molecule 10 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	F	154	Total	C	N	O	S	0	0
			1246	785	239	216	6		

- Molecule 11 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	G	141	Total	C	N	O	S	0	0
			1110	723	193	192	2		

- Molecule 12 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	H	128	Total	C	N	O	S	0	0
			1028	655	191	181	1		

- Molecule 13 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	I	101	Total	C	N	O	S	0	0
			809	523	142	143	1		

- Molecule 14 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	J	114	Total	C	N	O	S	0	0
			829	514	153	156	6		

- Molecule 15 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	K	136	Total	C	N	O	S	0	0
			1076	680	213	181	2		

- Molecule 16 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L	118	Total	C	N	O	S	0	0
			951	594	191	166			

- Molecule 17 is a protein called 30S ribosomal protein S14 type Z.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	M	60	Total	C	N	O	S	0	0
			474	302	96	72	4		

- Molecule 18 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	N	83	Total	C	N	O	S	0	0
			673	428	125	120			

- Molecule 19 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	O	80	Total	C	N	O	S	0	0
			646	414	119	111	2		

- Molecule 20 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	P	83	Total	C	N	O	S	0	0
			675	425	135	115			

- Molecule 21 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Q	65	Total	C	N	O	S	0	0
			535	342	103	86	4		

- Molecule 22 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	R	84	Total	C	N	O	S	0	0
			682	435	127	118	2		

- Molecule 23 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	S	77	Total	C	N	O	0	0
			629	383	135	111		

- Molecule 24 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	T	53	Total	C	N	O	S	0	0
			471	295	103	72	1		

- Molecule 25 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	a	285	Total	C	N	O	S	0	0
			2225	1385	437	397	6		

- Molecule 26 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	b	229	Total	C	N	O	S	0	0
			1762	1119	318	318	7		

- Molecule 27 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	c	210	Total	C	N	O	S	0	0
			1644	1047	297	297	3		

- Molecule 28 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	d	175	1388	893	245	246	4	0	0

- Molecule 29 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	e	176	1396	899	247	250		0	0

- Molecule 30 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	f	145	1182	763	206	210	3	0	0

- Molecule 31 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	g	123	936	599	160	174	3	0	0

- Molecule 32 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	h	128	959	616	160	177	6	0	0

- Molecule 33 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	i	144	1164	737	213	209	5	0	0

- Molecule 34 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	j	122	944	595	178	167	4	0	0

- Molecule 35 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
35	k	148	1153	731	226	196	0	0

- Molecule 36 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	l	136	1079	694	196	182	7	0	0

- Molecule 37 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	m	119	958	609	175	171	3	0	0

- Molecule 38 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	n	112	889	557	175	155	2	0	0

- Molecule 39 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	o	115	938	592	180	165	1	0	0

- Molecule 40 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	p	114	947	603	188	154	2	0	0

- Molecule 41 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	q	99	811	525	148	134	4	0	0

- Molecule 42 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	r	139	1068	663	207	191	7	0	0

- Molecule 43 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	s	92	720	475	122	122	1	0	0

- Molecule 44 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	t	111	872	550	166	153	3	0	0

- Molecule 45 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	u	86	657	409	130	117	1	0	0

- Molecule 46 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	v	63	513	317	108	87	1	0	0

- Molecule 47 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
47	w	100	818	517	153	148	0	0

- Molecule 48 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	x	44	344	221	55	64	4	0	0

- Molecule 49 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	y	56	Total	C	N	O	S	0	0
			452	274	98	75	5		

- Molecule 50 is a protein called 50S ribosomal protein L33 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	z	50	Total	C	N	O	S	0	0
			408	255	81	68	4		

- Molecule 51 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	3	2878	Total	C	N	O	P	0	0
			61664	27558	11236	19995	2875		

- Molecule 52 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	4	105	Total	C	N	O	P	0	0
			2239	1003	409	724	103		

- Molecule 53 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	5	1493	Total	C	N	O	P	0	0
			31943	14279	5792	10382	1490		

- Molecule 54 is a RNA chain called tRNA-Phe.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	6	76	Total	C	N	O	P	0	0
			1618	723	289	531	75		
54	7	76	Total	C	N	O	P	0	0
			1618	723	289	531	75		

3 Residue-property plots

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

- Molecule 1: 50S ribosomal protein L34

Chain 0:  96%



- Molecule 2: 50S ribosomal protein L35

Chain 1:  100%

There are no outlier residues recorded for this chain.

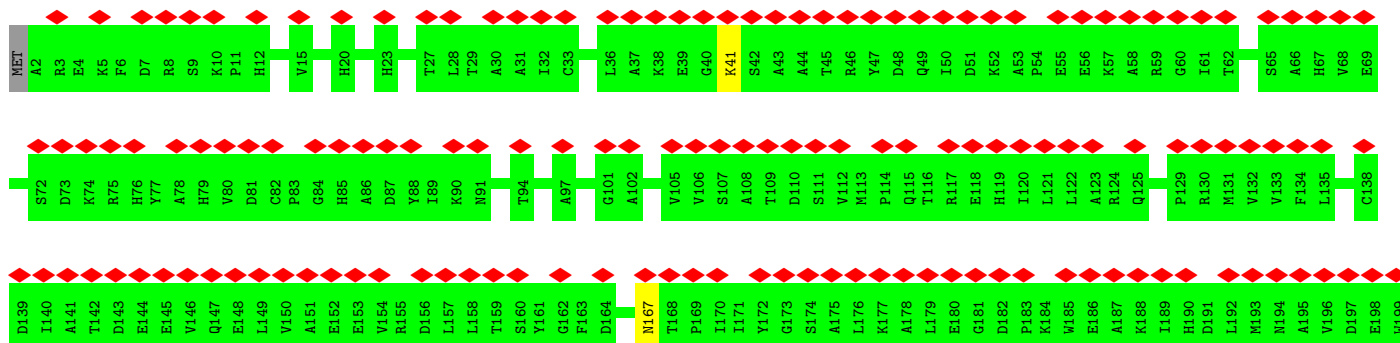
- Molecule 3: 50S ribosomal protein L36

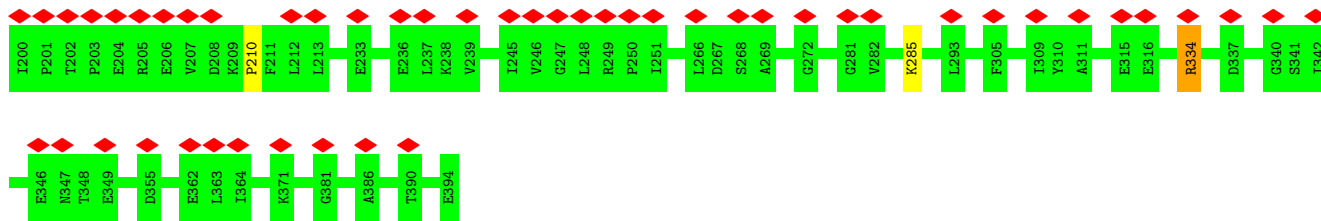
Chain 2:  95%



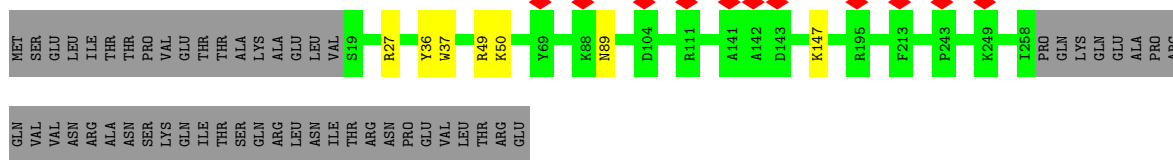
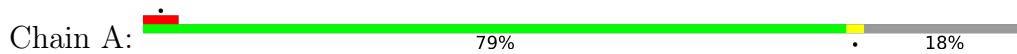
- Molecule 4: Elongation factor Tu

Chain 9:  50% 98%

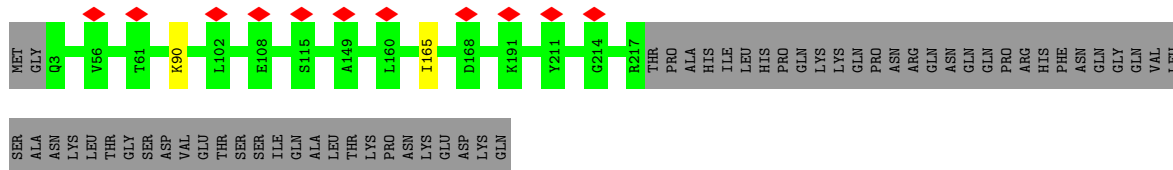
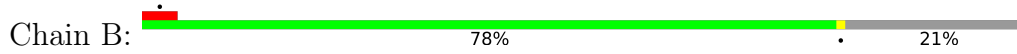




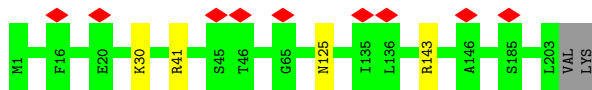
• Molecule 5: 30S ribosomal protein S2



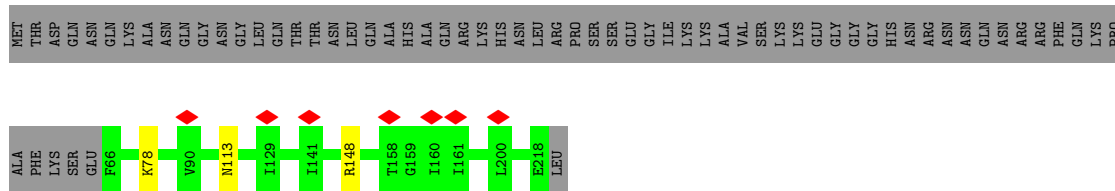
• Molecule 6: 30S ribosomal protein S3



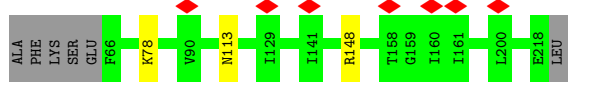
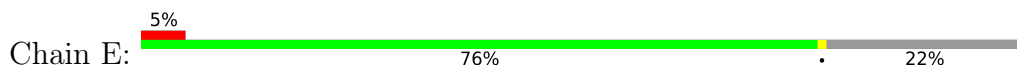
• Molecule 7: 30S ribosomal protein S4

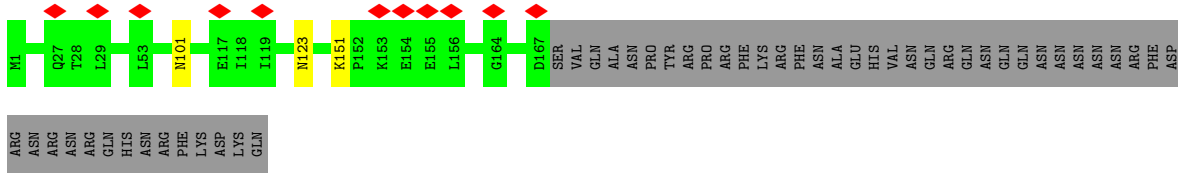


• Molecule 8: 30S ribosomal protein S5

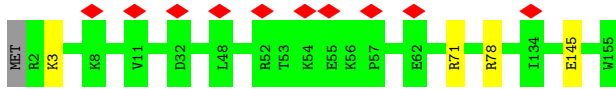


• Molecule 9: 30S ribosomal protein S6

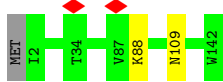




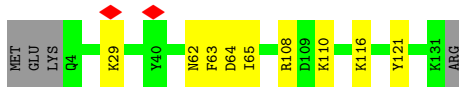
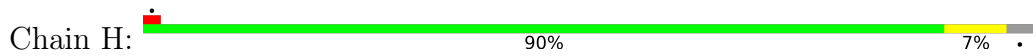
• Molecule 10: 30S ribosomal protein S7



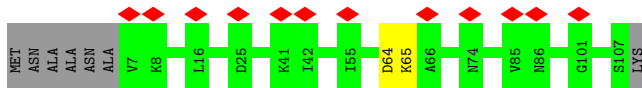
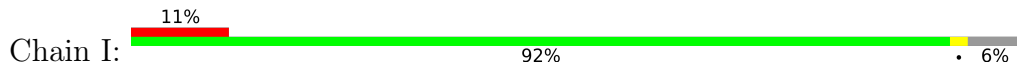
• Molecule 11: 30S ribosomal protein S8



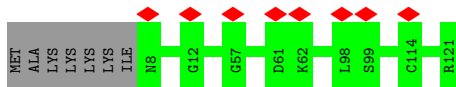
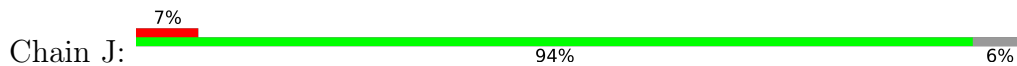
• Molecule 12: 30S ribosomal protein S9



• Molecule 13: 30S ribosomal protein S10

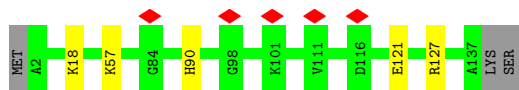


• Molecule 14: 30S ribosomal protein S11

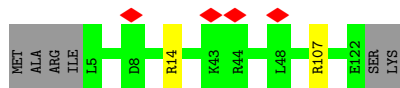
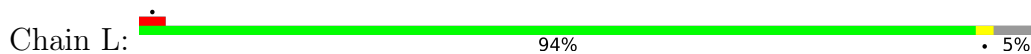


• Molecule 15: 30S ribosomal protein S12

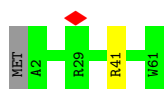




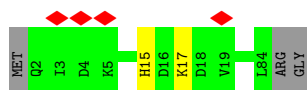
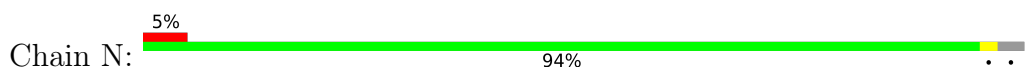
- Molecule 16: 30S ribosomal protein S13



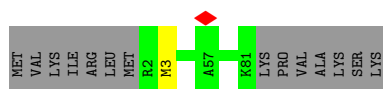
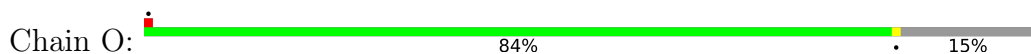
- Molecule 17: 30S ribosomal protein S14 type Z



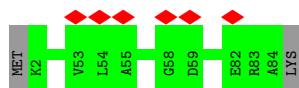
- Molecule 18: 30S ribosomal protein S15



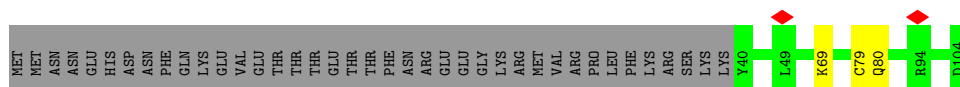
- Molecule 19: 30S ribosomal protein S16



- Molecule 20: 30S ribosomal protein S17

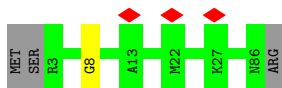


- Molecule 21: 30S ribosomal protein S18




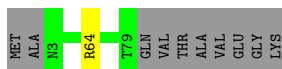
- Molecule 22: 30S ribosomal protein S19

Chain R:  95%




- Molecule 23: 30S ribosomal protein S20

Chain S:  87% 11%



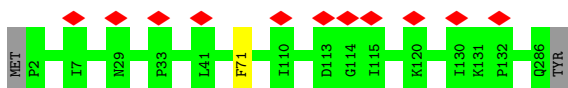
- Molecule 24: 30S ribosomal protein S21

Chain T:  87% 12%




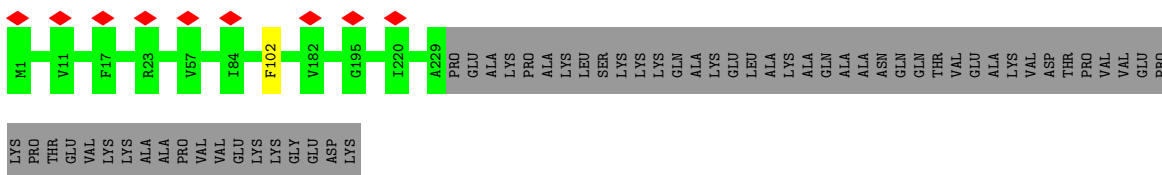
- Molecule 25: 50S ribosomal protein L2

Chain a:  99%



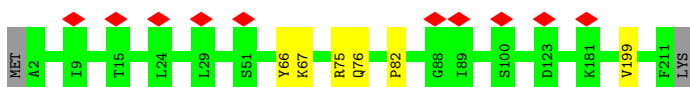
- Molecule 26: 50S ribosomal protein L3

Chain b:  79% 20%



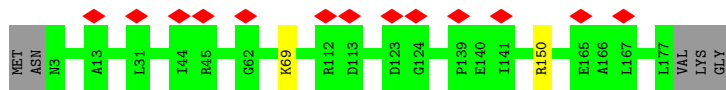
- Molecule 27: 50S ribosomal protein L4

Chain c:  5% 96%



- Molecule 28: 50S ribosomal protein L5

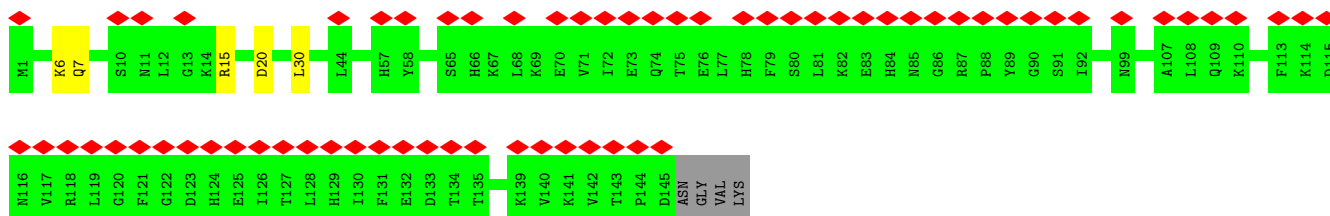
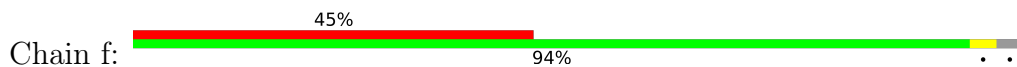
Chain d:  7% 96%



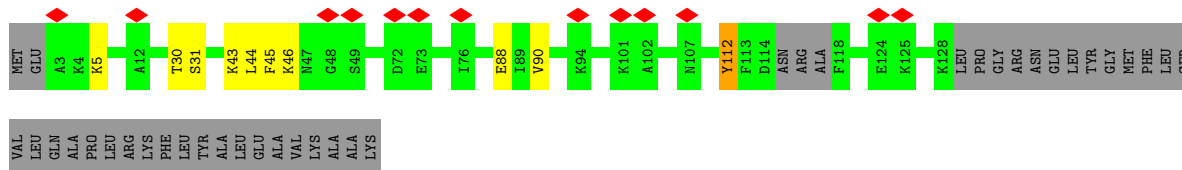
- Molecule 29: 50S ribosomal protein L6



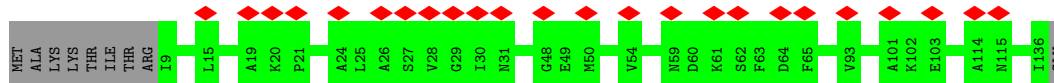
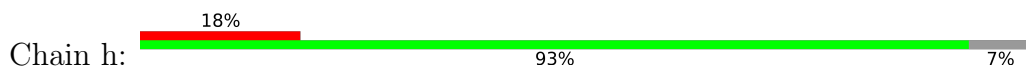
- Molecule 30: 50S ribosomal protein L9



- Molecule 31: 50S ribosomal protein L10



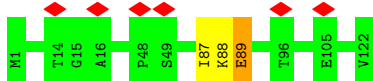
- Molecule 32: 50S ribosomal protein L11



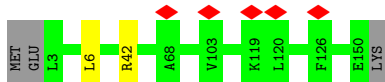
- Molecule 33: 50S ribosomal protein L13



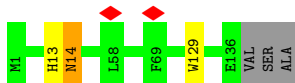
- Molecule 34: 50S ribosomal protein L14



- Molecule 35: 50S ribosomal protein L15



- Molecule 36: 50S ribosomal protein L16



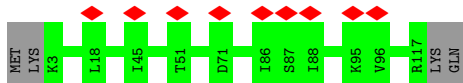
- Molecule 37: 50S ribosomal protein L17



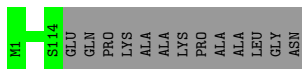
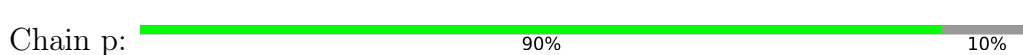
- Molecule 38: 50S ribosomal protein L18



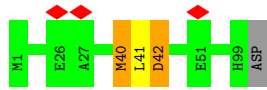
- Molecule 39: 50S ribosomal protein L19



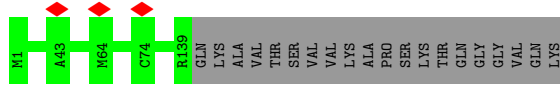
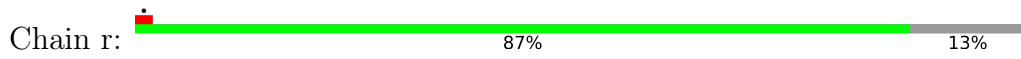
- Molecule 40: 50S ribosomal protein L20



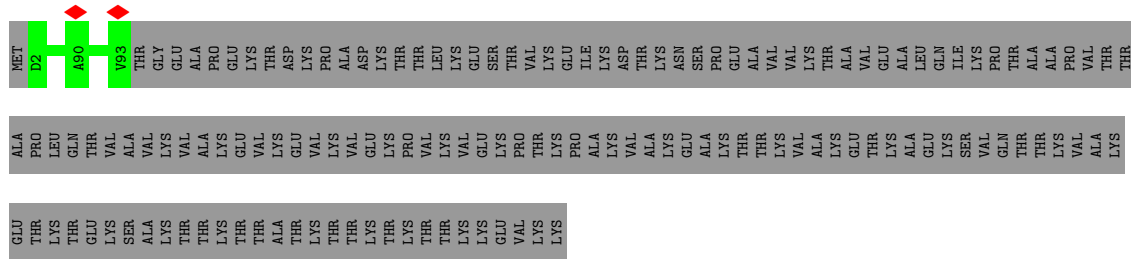
• Molecule 41: 50S ribosomal protein L21



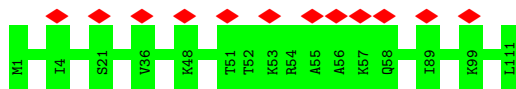
• Molecule 42: 50S ribosomal protein L22



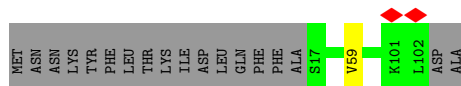
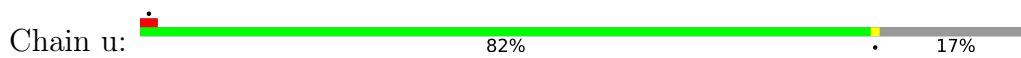
• Molecule 43: 50S ribosomal protein L23



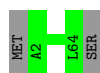
• Molecule 44: 50S ribosomal protein L24



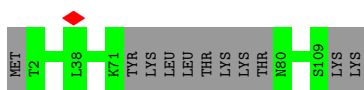
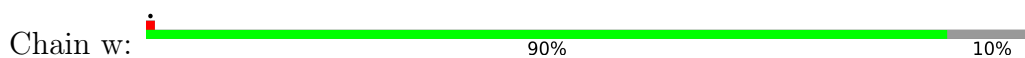
• Molecule 45: 50S ribosomal protein L27



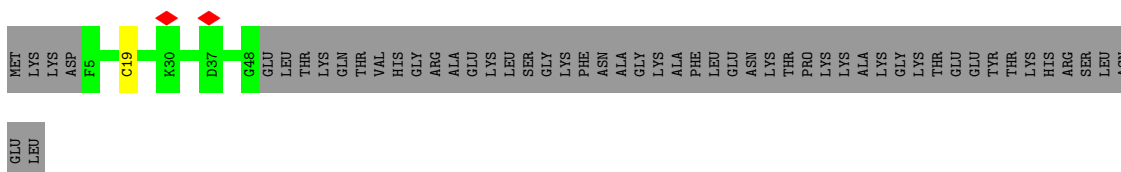
• Molecule 46: 50S ribosomal protein L28



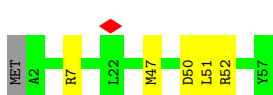
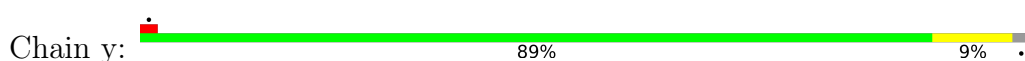
- Molecule 47: 50S ribosomal protein L29



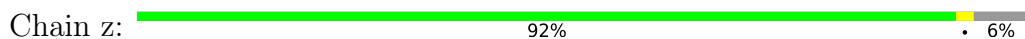
- Molecule 48: 50S ribosomal protein L31



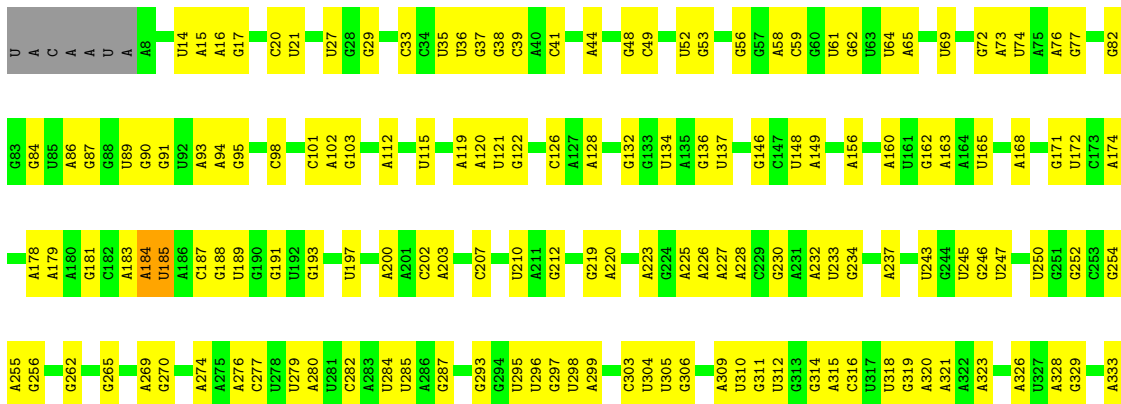
- Molecule 49: 50S ribosomal protein L32



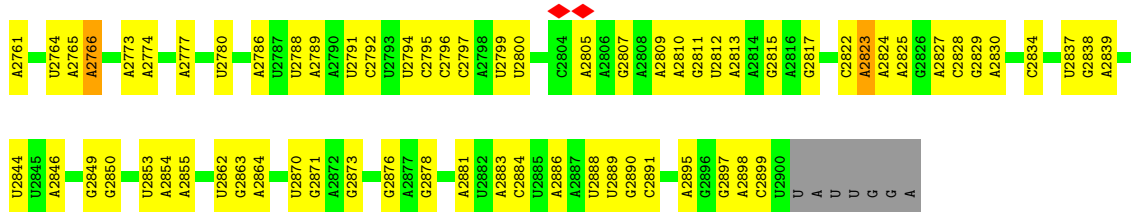
- Molecule 50: 50S ribosomal protein L33 1



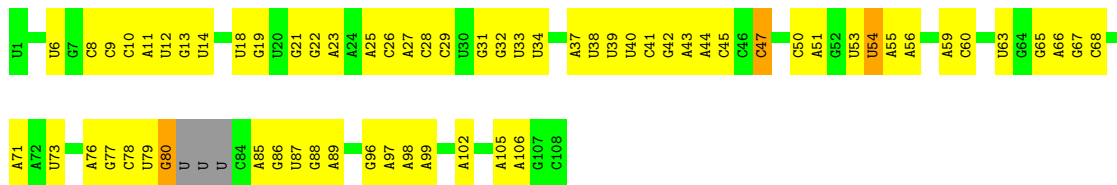
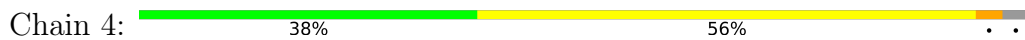
- Molecule 51: 23S ribosomal RNA



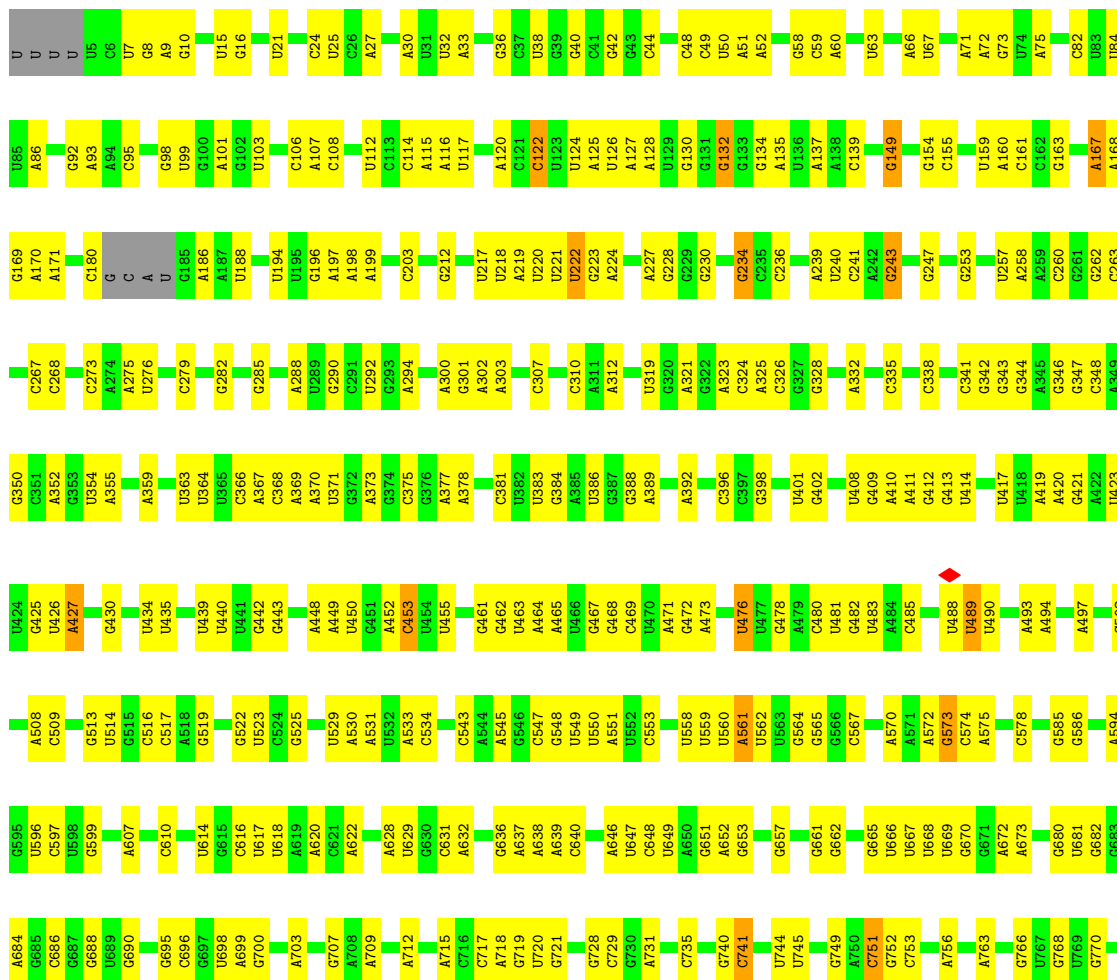
U1539	G1540	A1541	G1542	G1543	G1544	A1545	A1548	G1549	G1550	G1555	U1556	G1557	A1558	A1559	U	C	G	G	U	C	A	A1570	G1571	U1572	A1573	G1574	C1575	G1576	A1577	G1580	U1581	G1582	G1583	A1584	A1585	U1586	U1587	A1588	A1589	U1592	U1593	G1594	C1595	U1596	U1597	U1598	G1599	A1600	A1603	U1604	A1605								
C1378	G1379	U1380	G1388	G1389	G1390	U1391	U1392	A1393	G1402	G1403	A1406	U1407	G1408	A1412	A1413	C1414	A1420	A1421	H1422	A1423	U1424	U1425	C1426	A1431	C1436	A1437	U1438	U1439	A1441	G1442	A1443	C1444	U1445	U1446	A1447	U1448	G1449	C1456	A1457	A1458	A1459	U1459	G1461	A1462	C1463	G1464	U1465	U1466	U1467	A1377									
G1290	C1291	A1292	U1293	U1297	U1298	G1301	C1302	G1303	U1304	G1307	A1308	G1309	U1310	G1311	A1312	G1313	A1314	U1315	U1316	C1317	U1318	A1322	A1323	A1324	C1325	C1326	G1327	A1328	U1329	U1330	G1337	U1340	U1341	C1342	U1343	U1344	U1345	C1349	A1350	G1351	G1356	U1360	U1361	C1362	U1369	A1461	A1462	G1463	G1464	U1465	U1466	A1377							
H1205	U1206	U1207	A1208	U1209	U1210	U1211	C1212	G1215	U1216	G1217	G1218	U1219	G1220	G1221	C1227	A1233	U1234	G1235	G1236	U1240	A1243	U1244	C1247	A1250	G1251	C1252	U1254	G1255	U1256	G1257	C1258	U1259	U1260	U1261	U1262	G1263	U1264	U1268	A1276	A1277	G1278	U1279	G1280	A1281	G1282	G1283	U1284	G1285	G1286	A1204									
G1115	U1116	A1119	A1123	U1124	U1125	C1132	C1144	G1145	A1146	G1147	U1148	G1149	U1150	U1151	U1154	C1156	C1159	G1160	A1161	G1162	A1163	A1164	U1165	A1168	A1169	G1170	G1171	U1172	G1173	G1174	U1175	A1176	A1177	U1178	G1179	U1180	A1181	A1186	C1187	C1188	U1192	U1193	U1196	U1199	A1199	G1203	A1204												
U1085	A1036	U1040	U1041	C1042	C1044	A1045	U1046	A1047	A1048	U1049	A1052	C1053	U1054	A1055	A1056	U1057	U1058	A1061	A1062	A1063	G1066	A1067	U1068	A1073	A1074	U1075	U1076	A1080	A1081	A1082	A1085	A1089	U1095	U1096	G1097	G1098	C1099	U1100	U1101	A1102	G1103	A1104	A1105	G1106	C1107	A1108	G1109												
A947	A948	C949	U952	G953	C959	U966	U967	U968	A969	U970	U971	C972	U973	G974	G975	G978	A981	G982	G989	G990	A993	U994	A995	A996	G997	G1005	U1006	C1007	A1008	A1009	G1010	A1011	G1012	G1013	A1016	A1017	U992	A1018	A1019	A993	U985	G996	A1022	A1024	G1025	U993	A1026	U1027	C1028	A1029	A1032								
G866	U874	C880	A881	C882	A883	C884	U885	U886	A887	U880	A893	G894	G895	U896	C901	U902	A903	U904	U905	C906	A907	U911	A912	U913	U914	A915	G917	C922	A	C	U	A	G928	G929	C930	G931	U932	A933	U934	A854	A855	A856	U857	A858	C766	G859	C860	G862	U861	U862	U863	A864	A946						
G788	A789	G792	U797	C798	A799	C800	U801	A806	G810	G811	G714	U816	A817	A818	U819	U820	A823	U824	U825	C826	G827	U828	A829	C833	A734	G735	U736	U737	G738	A740	A741	G747	U744	U745	G748	U749	G760	G761	A762	G763	G764	U678	A679	A680	U681	C767	G768	A769	U682	U683	A684	U688	U689						
U690	G691	G695	U696	U697	A703	G704	A705	C706	A710	A711	A712	G714	U715	G716	U717	A720	G721	U722	C722	G725	U729	U636	U637	G732	C733	A734	G735	U736	U737	G738	A740	A741	G647	G648	U649	G650	G656	A657	U658	G659	U660	G661	G666	A673	U678	A679	A680	U681	C767	G768	A684	U688	U689						
G597	G598	U599	A605	U606	U607	A608	U609	A610	A611	G618	A619	G620	A623	U624	G625	A628	G629	U630	A631	A632	G633	C634	U636	U637	G638	U641	G647	G648	A649	G650	G656	U667	U668	U669	A653	A654	U654	C558	C562	A653	G566	U667	U668	U669	A576	C577	A578	A581	U582	U583	G584	U585	A493	U493	C494	U495	U496	U500	G501
G504	G505	G509	U510	U511	G512	A513	A514	A515	A516	G517	A518	A519	C520	C521	G530	A531	U532	U533	A540	U543	U544	U545	U546	U547	C558	G460	C461	A465	A466	G566	U667	U668	U669	A653	A654	U654	C558	C562	A653	G566	U667	U668	U669	A576	C577	A578	A581	U582	U583	G584	U585	A493	U493	C494	U495	U496	U500	G501	
A334	G335	C336	U339	U340	G341	G342	A345	G346	C347	G351	C352	G353	C354	A355	A356	A357	G361	U362	G363	A364	C369	G372	U373	A374	U375	A379	A380	U381	U382	U383	G384	U385	U386	U387	U388	C389	A390	U391	A392	C393	A396	G401	A402	U403	C404	U407	A408	A409	G410										

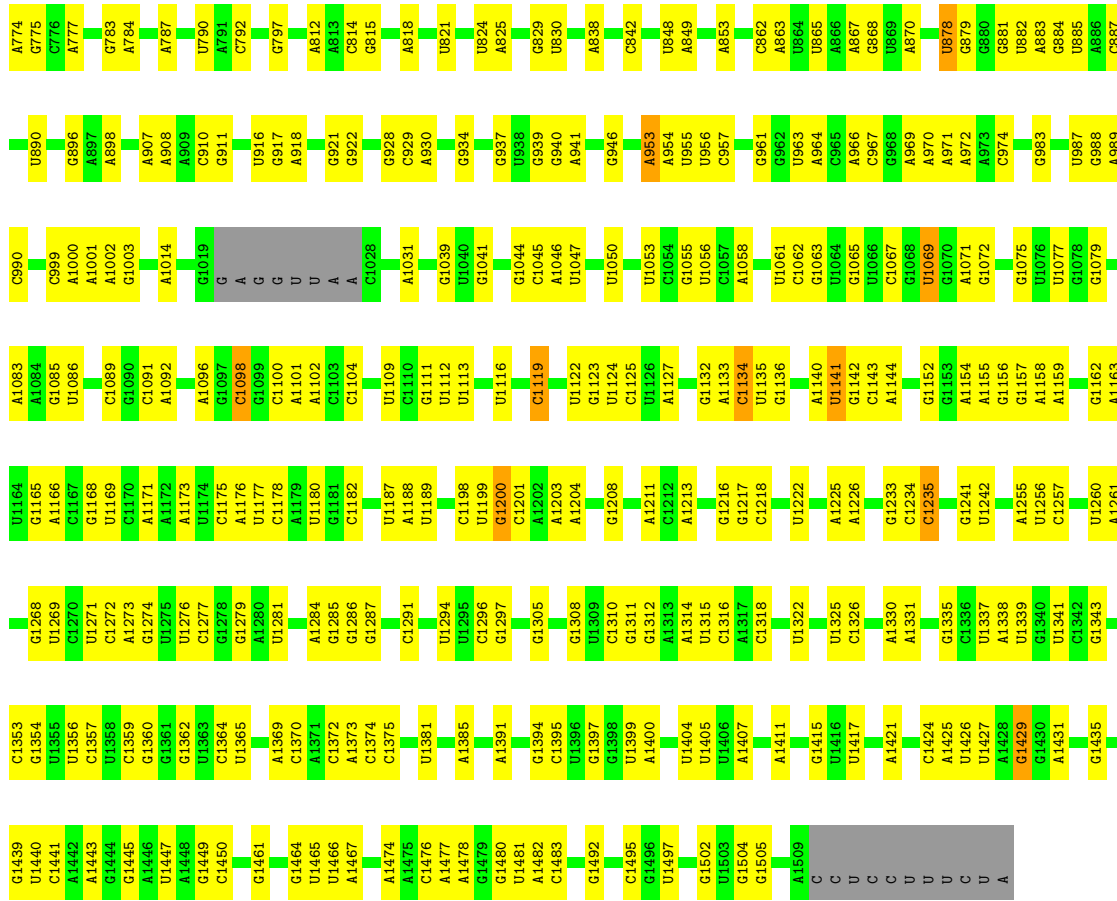


• Molecule 52: 5S ribosomal RNA

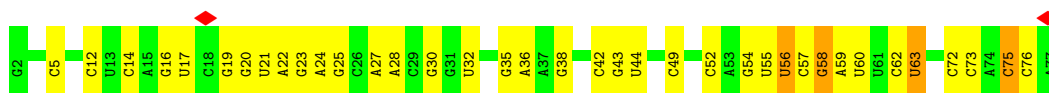


• Molecule 53: 16S ribosomal RNA

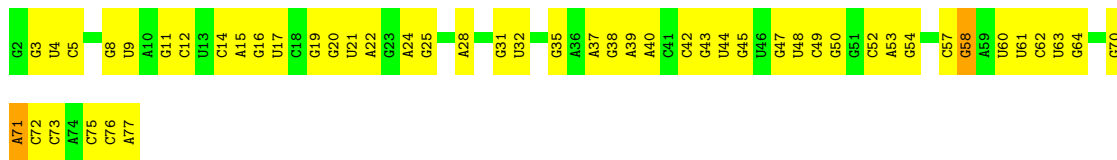




• Molecule 54: tRNA-Phe



• Molecule 54: tRNA-Phe



4 Experimental information

Property	Value	Source
EM reconstruction method	SUBTOMOGRAM AVERAGING	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of subtomograms used	1786	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 ($e^-/\text{\AA}^2$)	3.2	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3750	Depositor
Magnification	81000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.572	Depositor
Minimum map value	-0.560	Depositor
Average map value	0.024	Depositor
Map value standard deviation	0.126	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	435.328, 435.328, 435.328	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.7005, 1.7005, 1.7005	Depositor

5 Model quality i

5.1 Standard geometry i

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	0	0.31	0/383	0.54	0/504
2	1	0.30	0/484	0.58	0/637
3	2	0.36	0/306	0.54	0/401
4	9	0.31	0/3071	0.53	1/4147 (0.0%)
5	A	0.32	0/1954	0.54	1/2642 (0.0%)
6	B	0.33	0/1721	0.54	0/2323
7	C	0.33	0/1691	0.52	0/2267
8	D	0.32	0/1188	0.57	0/1593
9	E	0.39	0/1384	0.60	2/1867 (0.1%)
10	F	0.31	0/1266	0.52	0/1700
11	G	0.35	0/1126	0.59	0/1517
12	H	0.32	0/1044	0.56	1/1395 (0.1%)
13	I	0.33	0/820	0.59	0/1103
14	J	0.34	0/844	0.52	0/1136
15	K	0.32	0/1094	0.58	0/1468
16	L	0.28	0/962	0.51	0/1289
17	M	0.35	0/483	0.54	0/643
18	N	0.29	0/679	0.49	0/907
19	O	0.29	0/659	0.50	0/885
20	P	0.35	0/684	0.56	0/913
21	Q	0.35	0/545	0.66	0/730
22	R	0.34	0/698	0.53	0/936
23	S	0.32	0/631	0.51	0/838
24	T	0.32	0/475	0.51	0/621
25	a	0.32	0/2267	0.56	0/3044
26	b	0.35	0/1795	0.57	0/2412
27	c	0.33	0/1671	0.56	0/2246
28	d	0.34	0/1409	0.56	0/1894
29	e	0.35	0/1420	0.61	1/1912 (0.1%)
30	f	0.29	0/1205	0.58	2/1616 (0.1%)
31	g	3.60	6/944 (0.6%)	0.65	1/1260 (0.1%)
32	h	0.29	0/968	0.50	0/1298
33	i	0.35	0/1186	0.52	0/1592
34	j	0.33	0/953	0.59	0/1275

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	k	0.33	0/1170	0.68	2/1559 (0.1%)
36	l	0.34	0/1104	0.57	0/1481
37	m	0.33	0/973	0.54	0/1309
38	n	0.30	0/897	0.56	0/1198
39	o	0.34	0/948	0.57	0/1262
40	p	0.33	0/961	0.49	0/1278
41	q	0.33	0/828	0.58	1/1111 (0.1%)
42	r	0.32	0/1077	0.53	0/1441
43	s	0.34	0/732	0.57	0/988
44	t	0.31	0/879	0.53	0/1165
45	u	0.32	0/665	0.57	1/884 (0.1%)
46	v	0.32	0/519	0.59	0/695
47	w	0.28	0/826	0.45	0/1104
48	x	0.31	0/353	0.53	0/474
49	y	0.35	0/457	0.56	0/601
50	z	0.32	0/412	0.57	0/547
51	3	0.58	0/69073	1.10	134/107710 (0.1%)
52	4	0.57	0/2505	1.10	4/3902 (0.1%)
53	5	0.56	0/35768	1.07	66/55764 (0.1%)
54	6	0.53	0/1808	1.26	25/2817 (0.9%)
54	7	0.54	0/1808	1.12	3/2817 (0.1%)
All	All	0.58	6/161773 (0.0%)	0.97	245/241118 (0.1%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
31	g	112	TYR	CD2-CE2	62.16	2.32	1.39
31	g	112	TYR	CD1-CE1	61.27	2.31	1.39
31	g	112	TYR	CE1-CZ	38.53	1.88	1.38
31	g	112	TYR	CE2-CZ	37.99	1.88	1.38
31	g	112	TYR	CG-CD2	28.20	1.75	1.39
31	g	112	TYR	CG-CD1	27.57	1.75	1.39

All (245) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
35	k	42	ARG	NE-CZ-NH2	-10.84	114.88	120.30
35	k	42	ARG	NE-CZ-NH1	9.71	125.15	120.30
53	5	573	G	N3-C4-N9	-8.75	120.75	126.00
54	6	30	G	C4-C5-N7	8.53	114.21	110.80
54	6	30	G	C6-C5-N7	-8.48	125.31	130.40
51	3	1507	G	C4-N9-C1'	-8.47	115.49	126.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	3	2796	C	C2-N1-C1'	8.36	128.00	118.80
51	3	2760	C	C2-N1-C1'	8.12	127.73	118.80
54	6	42	C	N1-C2-O2	7.75	123.55	118.90
51	3	739	G	C4-N9-C1'	-7.65	116.56	126.50
29	e	113	SER	C-N-CA	7.64	140.81	121.70
51	3	1507	G	O4'-C1'-N9	7.61	114.29	108.20
51	3	739	G	N3-C4-N9	-7.60	121.44	126.00
53	5	573	G	C4-N9-C1'	-7.58	116.65	126.50
51	3	1868	A	N1-C2-N3	7.57	133.09	129.30
53	5	573	G	C8-N9-C1'	7.56	136.83	127.00
53	5	640	C	C5-C6-N1	7.53	124.77	121.00
51	3	1341	U	C2-N1-C1'	7.48	126.67	117.70
30	f	30	LEU	C-N-CA	-7.47	103.01	121.70
51	3	1507	G	C8-N9-C1'	7.45	136.69	127.00
51	3	1247	C	C2-N1-C1'	-7.42	110.64	118.80
51	3	1486	U	N3-C2-O2	-7.38	117.03	122.20
4	9	167	ASN	C-N-CA	-7.34	103.34	121.70
51	3	2760	C	C6-N1-C1'	-7.34	111.99	120.80
53	5	476	U	O5'-P-OP2	-7.31	99.12	105.70
51	3	1486	U	N1-C2-O2	7.26	127.89	122.80
51	3	2570	U	N1-C2-O2	7.26	127.89	122.80
51	3	1263	G	C5-C6-O6	7.21	132.93	128.60
54	6	56	U	C2-N1-C1'	7.18	126.31	117.70
51	3	1573	A	N1-C6-N6	7.15	122.89	118.60
51	3	1247	C	C6-N1-C1'	7.09	129.30	120.80
54	6	30	G	N9-C4-C5	-7.06	102.58	105.40
51	3	1573	A	C5-C6-N6	-7.04	118.07	123.70
54	6	55	U	C2-N1-C1'	7.01	126.11	117.70
51	3	2796	C	N1-C2-O2	7.01	123.11	118.90
51	3	739	G	N3-C4-C5	6.99	132.09	128.60
53	5	573	G	C6-C5-N7	6.97	134.58	130.40
54	6	56	U	N1-C2-N3	-6.93	110.74	114.90
51	3	1486	U	C2-N1-C1'	6.92	126.00	117.70
51	3	1329	U	N1-C2-O2	6.85	127.59	122.80
54	6	56	U	C6-N1-C1'	-6.76	111.74	121.20
51	3	410	G	N3-C4-N9	-6.73	121.96	126.00
51	3	1534	A	O4'-C1'-N9	6.72	113.58	108.20
51	3	2464	C	C6-N1-C2	-6.70	117.62	120.30
51	3	1263	G	N3-C4-N9	-6.69	121.98	126.00
54	6	55	U	N3-C2-O2	-6.57	117.61	122.20
51	3	882	C	N1-C2-O2	6.53	122.81	118.90
51	3	1109	G	C4-C5-N7	6.52	113.41	110.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	3	1632	C	N1-C2-O2	6.50	122.80	118.90
51	3	2403	C	C5-C6-N1	6.48	124.24	121.00
54	6	55	U	N1-C2-O2	6.46	127.32	122.80
51	3	1759	C	C2-N1-C1'	-6.46	111.70	118.80
51	3	1099	C	N1-C2-O2	6.38	122.73	118.90
54	6	75	C	N1-C2-O2	6.38	122.73	118.90
51	3	1109	G	N9-C4-C5	-6.34	102.86	105.40
54	6	30	G	N3-C4-N9	6.33	129.80	126.00
51	3	2570	U	N3-C2-O2	-6.30	117.79	122.20
51	3	1161	A	O4'-C1'-N9	-6.29	103.17	108.20
51	3	801	U	C5-C6-N1	6.25	125.82	122.70
51	3	739	G	C8-N9-C1'	6.22	135.09	127.00
51	3	1101	U	O4'-C1'-N1	6.20	113.16	108.20
53	5	1134	C	C6-N1-C2	-6.20	117.82	120.30
51	3	410	G	C4-N9-C1'	-6.20	118.45	126.50
51	3	1507	G	N3-C4-N9	-6.18	122.29	126.00
51	3	1697	C	C2-N1-C1'	-6.08	112.11	118.80
54	6	56	U	C2-N3-C4	6.08	130.65	127.00
51	3	1697	C	C6-N1-C1'	6.07	128.08	120.80
51	3	567	U	N1-C2-O2	6.05	127.04	122.80
51	3	2796	C	C6-N1-C1'	-6.02	113.58	120.80
54	6	75	C	N3-C2-O2	-6.00	117.70	121.90
51	3	1573	A	C4-C5-N7	6.00	113.70	110.70
53	5	573	G	N9-C4-C5	5.99	107.80	105.40
51	3	2796	C	N3-C4-N4	5.99	122.19	118.00
51	3	2796	C	C5-C6-N1	5.99	123.99	121.00
51	3	882	C	N3-C2-O2	-5.96	117.73	121.90
51	3	2464	C	C5-C6-N1	5.95	123.97	121.00
54	6	30	G	N7-C8-N9	5.94	116.07	113.10
12	H	63	PHE	CB-CA-C	-5.93	98.54	110.40
51	3	2403	C	C6-N1-C2	-5.92	117.93	120.30
54	7	71	A	OP1-P-O3'	5.92	118.22	105.20
53	5	573	G	N3-C2-N2	-5.91	115.76	119.90
54	7	58	G	O4'-C1'-N9	5.91	112.93	108.20
53	5	167	A	OP1-P-O3'	5.88	118.15	105.20
51	3	456	G	N3-C4-N9	-5.88	122.47	126.00
53	5	132	G	C4-C5-N7	5.88	113.15	110.80
53	5	413	G	C6-C5-N7	-5.87	126.88	130.40
51	3	2823	A	OP1-P-O3'	5.87	118.10	105.20
53	5	1235	C	N1-C2-O2	5.86	122.42	118.90
51	3	410	G	C8-N9-C1'	5.86	134.61	127.00
53	5	413	G	C4-N9-C1'	5.85	134.11	126.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	3	2286	A	C4-C5-C6	-5.85	114.08	117.00
51	3	2797	C	N1-C2-O2	5.84	122.40	118.90
51	3	1580	G	C4-N9-C1'	-5.83	118.92	126.50
54	6	58	G	C5-C6-O6	-5.83	125.10	128.60
51	3	1507	G	N3-C4-C5	5.83	131.52	128.60
51	3	1485	A	O4'-C1'-N9	-5.83	103.54	108.20
51	3	1329	U	C2-N1-C1'	5.82	124.69	117.70
51	3	1708	G	N3-C4-C5	5.82	131.51	128.60
51	3	2070	C	N1-C2-O2	5.82	122.39	118.90
54	6	56	U	O4'-C1'-N1	5.80	112.84	108.20
51	3	1616	G	N3-C4-N9	-5.79	122.53	126.00
53	5	132	G	N9-C4-C5	-5.78	103.09	105.40
51	3	185	U	O5'-P-OP2	-5.76	100.51	105.70
51	3	1508	G	N1-C6-O6	-5.75	116.45	119.90
51	3	1759	C	C6-N1-C1'	5.74	127.68	120.80
51	3	341	G	N9-C1'-C2'	-5.72	105.71	112.00
53	5	573	G	N3-C4-C5	5.71	131.45	128.60
54	6	30	G	C4-N9-C1'	5.70	133.91	126.50
51	3	1616	G	N3-C4-C5	5.69	131.44	128.60
51	3	1329	U	N3-C2-O2	-5.68	118.22	122.20
53	5	1069	U	C2-N1-C1'	5.68	124.52	117.70
51	3	841	C	C4-C5-C6	5.68	120.24	117.40
53	5	1141	U	O4'-C1'-N1	5.68	112.74	108.20
9	E	151	LYS	CD-CE-NZ	-5.67	98.66	111.70
51	3	1708	G	N3-C4-N9	-5.66	122.61	126.00
51	3	2005	G	C8-N9-C1'	5.66	134.35	127.00
54	6	30	G	C5-N7-C8	-5.65	101.47	104.30
51	3	2464	C	N1-C2-O2	5.65	122.29	118.90
53	5	453	C	C2-N3-C4	-5.64	117.08	119.90
53	5	1305	G	N3-C4-C5	5.63	131.42	128.60
45	u	59	VAL	C-N-CA	-5.62	107.66	121.70
51	3	1701	G	C4-N9-C1'	-5.61	119.21	126.50
51	3	2106	G	N3-C2-N2	-5.60	115.98	119.90
51	3	1341	U	N1-C2-O2	5.58	126.71	122.80
53	5	561	A	C4-N9-C1'	5.58	136.35	126.30
53	5	59	C	C6-N1-C2	-5.58	118.07	120.30
53	5	1424	C	C2-N1-C1'	5.57	124.93	118.80
51	3	567	U	N3-C2-O2	-5.57	118.30	122.20
31	g	112	TYR	CB-CG-CD1	-5.57	117.66	121.00
51	3	1725	G	C4-C5-N7	5.56	113.02	110.80
51	3	187	C	N1-C2-O2	5.55	122.23	118.90
51	3	2005	G	N3-C4-N9	-5.55	122.67	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
54	7	71	A	P-O3'-C3'	5.55	126.36	119.70
53	5	1119	C	N1-C2-O2	5.55	122.23	118.90
52	4	47	C	N1-C2-O2	5.55	122.23	118.90
53	5	1182	C	C5-C6-N1	5.54	123.77	121.00
9	E	123	ASN	C-N-CA	-5.53	107.87	121.70
53	5	489	U	C5-C6-N1	5.53	125.47	122.70
53	5	1119	C	C2-N1-C1'	5.53	124.88	118.80
54	6	75	C	C6-N1-C2	-5.51	118.09	120.30
51	3	426	U	C2-N1-C1'	5.49	124.29	117.70
53	5	1200	G	C4-N9-C1'	-5.48	119.38	126.50
54	6	56	U	N1-C2-O2	5.48	126.64	122.80
54	6	55	U	C5-C6-N1	5.47	125.44	122.70
41	q	42	ASP	CB-CA-C	-5.46	99.49	110.40
51	3	1540	G	N3-C4-N9	-5.45	122.73	126.00
51	3	2684	G	N3-C4-N9	-5.45	122.73	126.00
53	5	682	G	N3-C4-C5	5.45	131.32	128.60
51	3	2174	G	N3-C2-N2	-5.44	116.09	119.90
51	3	2728	U	C5-C4-O4	5.44	129.16	125.90
51	3	1263	G	N9-C4-C5	5.43	107.57	105.40
53	5	1069	U	N1-C2-O2	5.43	126.60	122.80
53	5	878	U	C5-C4-O4	5.43	129.16	125.90
51	3	2464	C	N3-C2-O2	-5.42	118.10	121.90
51	3	530	G	C4-N9-C1'	-5.42	119.45	126.50
53	5	1429	G	N9-C4-C5	-5.41	103.23	105.40
51	3	2140	G	O4'-C1'-N9	5.40	112.52	108.20
53	5	665	G	C4-C5-N7	5.40	112.96	110.80
51	3	1573	A	N9-C4-C5	-5.40	103.64	105.80
51	3	1317	C	N1-C2-O2	5.39	122.14	118.90
51	3	609	U	C5-C6-N1	5.39	125.39	122.70
5	A	36	TYR	N-CA-C	-5.39	96.45	111.00
51	3	2766	A	N1-C6-N6	-5.38	115.37	118.60
53	5	92	G	N9-C1'-C2'	-5.37	106.09	112.00
51	3	335	G	C4-N9-C1'	-5.37	119.52	126.50
51	3	1673	U	N3-C2-O2	-5.36	118.45	122.20
53	5	1305	G	C4-N9-C1'	-5.36	119.53	126.50
51	3	1109	G	C6-C5-N7	-5.36	127.19	130.40
51	3	1812	C	C2-N1-C1'	5.35	124.68	118.80
51	3	2286	A	N1-C6-N6	-5.35	115.39	118.60
53	5	279	C	C2-N3-C4	5.34	122.57	119.90
53	5	1424	C	N1-C2-O2	5.34	122.11	118.90
51	3	2323	U	N3-C2-O2	-5.34	118.46	122.20
53	5	243	G	C4-N9-C1'	-5.33	119.57	126.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	3	1048	A	N1-C2-N3	5.33	131.96	129.30
51	3	304	U	N3-C2-O2	-5.32	118.47	122.20
51	3	739	G	O4'-C1'-N9	5.32	112.45	108.20
51	3	1263	G	N1-C6-O6	-5.31	116.71	119.90
51	3	1759	C	O4'-C1'-N1	5.30	112.44	108.20
54	6	75	C	C2-N1-C1'	5.29	124.62	118.80
53	5	367	A	N1-C2-N3	5.29	131.94	129.30
51	3	1573	A	C5-N7-C8	-5.29	101.26	103.90
53	5	427	A	N9-C1'-C2'	-5.28	106.19	112.00
51	3	1341	U	C6-N1-C1'	-5.28	113.81	121.20
51	3	496	A	N1-C6-N6	5.27	121.76	118.60
53	5	953	A	N7-C8-N9	5.27	116.44	113.80
51	3	2005	G	C4-N9-C1'	-5.26	119.66	126.50
51	3	1360	U	N1-C2-O2	5.26	126.48	122.80
53	5	413	G	C8-N9-C1'	-5.26	120.17	127.00
53	5	657	G	N3-C4-C5	5.25	131.22	128.60
51	3	1035	U	C2-N1-C1'	5.25	123.99	117.70
53	5	279	C	C5-C6-N1	5.23	123.61	121.00
53	5	122	C	C2-N1-C1'	5.23	124.55	118.80
53	5	887	C	C5-C6-N1	5.22	123.61	121.00
51	3	184	A	OP2-P-O3'	5.22	116.69	105.20
53	5	561	A	C8-N9-C1'	-5.22	118.31	127.70
51	3	860	C	O4'-C1'-N1	5.21	112.37	108.20
30	f	20	ASP	CB-CG-OD2	5.21	122.99	118.30
51	3	1360	U	N3-C2-O2	-5.20	118.56	122.20
52	4	8	C	N1-C2-O2	5.20	122.02	118.90
53	5	1098	C	C2-N1-C1'	-5.19	113.09	118.80
51	3	1580	G	C8-N9-C1'	5.19	133.75	127.00
53	5	1098	C	C6-N1-C1'	5.18	127.02	120.80
51	3	2725	G	N9-C4-C5	-5.18	103.33	105.40
51	3	1403	G	C8-N9-C1'	5.18	133.73	127.00
53	5	741	C	O4'-C1'-N1	5.16	112.33	108.20
51	3	410	G	N3-C4-C5	5.15	131.17	128.60
53	5	665	G	N9-C4-C5	-5.14	103.34	105.40
51	3	1492	G	N3-C4-C5	5.14	131.17	128.60
53	5	751	C	C2-N1-C1'	5.14	124.45	118.80
53	5	1039	G	C4-N9-C1'	-5.14	119.82	126.50
52	4	54	U	P-O3'-C3'	5.13	125.86	119.70
51	3	496	A	C5-C6-N6	-5.12	119.61	123.70
51	3	2000	U	N3-C2-O2	-5.12	118.62	122.20
54	6	63	U	N1-C2-O2	5.11	126.38	122.80
53	5	1039	G	N3-C4-N9	-5.11	122.93	126.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	3	1725	G	C6-C5-N7	-5.11	127.33	130.40
51	3	2484	A	C2-N3-C4	-5.11	108.05	110.60
53	5	203	C	C2-N1-C1'	-5.10	113.19	118.80
51	3	69	U	N3-C4-O4	5.10	122.97	119.40
51	3	2739	C	C2-N1-C1'	-5.10	113.19	118.80
51	3	2797	C	N3-C2-O2	-5.09	118.34	121.90
53	5	561	A	N3-C4-N9	5.09	131.47	127.40
51	3	1192	U	C2-N1-C1'	5.08	123.80	117.70
51	3	335	G	N3-C4-C5	5.08	131.14	128.60
51	3	1774	G	N9-C1'-C2'	-5.07	106.42	112.00
53	5	548	G	C4-C5-N7	5.07	112.83	110.80
53	5	974	C	N1-C2-O2	5.07	121.94	118.90
51	3	882	C	C2-N1-C1'	5.07	124.38	118.80
51	3	1263	G	C8-N9-C1'	5.07	133.59	127.00
53	5	1200	G	N3-C4-C5	5.07	131.13	128.60
53	5	974	C	C2-N1-C1'	5.07	124.37	118.80
54	6	30	G	C8-N9-C1'	-5.06	120.42	127.00
53	5	149	G	N1-C6-O6	5.06	122.94	119.90
53	5	234	G	C4-N9-C1'	-5.06	119.92	126.50
51	3	1048	A	C6-N1-C2	-5.05	115.57	118.60
53	5	234	G	C8-N9-C1'	5.05	133.56	127.00
51	3	2649	G	N9-C4-C5	-5.04	103.38	105.40
51	3	1797	C	N1-C2-O2	5.04	121.93	118.90
53	5	222	U	N1-C2-O2	5.04	126.33	122.80
51	3	2570	U	C2-N1-C1'	5.03	123.74	117.70
51	3	577	C	N1-C2-O2	5.03	121.92	118.90
52	4	80	G	N3-C4-N9	5.02	129.01	126.00
53	5	149	G	C5-C6-O6	-5.02	125.59	128.60
53	5	640	C	C2-N3-C4	5.01	122.40	119.90

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	45/48 (94%)	44 (98%)	1 (2%)	0	100	100
2	1	57/59 (97%)	44 (77%)	13 (23%)	0	100	100
3	2	35/37 (95%)	33 (94%)	2 (6%)	0	100	100
4	9	391/394 (99%)	347 (89%)	42 (11%)	2 (0%)	25	64
5	A	238/294 (81%)	202 (85%)	35 (15%)	1 (0%)	30	68
6	B	213/273 (78%)	182 (85%)	31 (15%)	0	100	100
7	C	201/205 (98%)	170 (85%)	30 (15%)	1 (0%)	25	64
8	D	151/219 (69%)	132 (87%)	19 (13%)	0	100	100
9	E	165/215 (77%)	126 (76%)	39 (24%)	0	100	100
10	F	152/155 (98%)	126 (83%)	25 (16%)	1 (1%)	19	57
11	G	139/142 (98%)	113 (81%)	25 (18%)	1 (1%)	19	57
12	H	126/132 (96%)	110 (87%)	15 (12%)	1 (1%)	16	55
13	I	99/108 (92%)	84 (85%)	15 (15%)	0	100	100
14	J	112/121 (93%)	100 (89%)	12 (11%)	0	100	100
15	K	134/139 (96%)	107 (80%)	26 (19%)	1 (1%)	19	57
16	L	116/124 (94%)	102 (88%)	14 (12%)	0	100	100
17	M	58/61 (95%)	49 (84%)	9 (16%)	0	100	100
18	N	81/86 (94%)	76 (94%)	5 (6%)	0	100	100
19	O	78/94 (83%)	67 (86%)	11 (14%)	0	100	100
20	P	81/85 (95%)	71 (88%)	10 (12%)	0	100	100
21	Q	63/104 (61%)	45 (71%)	16 (25%)	2 (3%)	3	21
22	R	82/87 (94%)	62 (76%)	19 (23%)	1 (1%)	11	44
23	S	75/87 (86%)	68 (91%)	7 (9%)	0	100	100
24	T	51/60 (85%)	47 (92%)	4 (8%)	0	100	100
25	a	283/287 (99%)	231 (82%)	52 (18%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	b	227/287 (79%)	196 (86%)	31 (14%)	0	100	100
27	c	208/212 (98%)	182 (88%)	24 (12%)	2 (1%)	13	49
28	d	173/180 (96%)	141 (82%)	32 (18%)	0	100	100
29	e	174/184 (95%)	156 (90%)	17 (10%)	1 (1%)	22	60
30	f	143/149 (96%)	120 (84%)	21 (15%)	2 (1%)	9	41
31	g	119/161 (74%)	102 (86%)	16 (13%)	1 (1%)	16	55
32	h	126/137 (92%)	114 (90%)	12 (10%)	0	100	100
33	i	142/146 (97%)	119 (84%)	23 (16%)	0	100	100
34	j	120/122 (98%)	107 (89%)	12 (10%)	1 (1%)	16	55
35	k	146/151 (97%)	124 (85%)	22 (15%)	0	100	100
36	l	134/139 (96%)	111 (83%)	22 (16%)	1 (1%)	19	57
37	m	117/124 (94%)	103 (88%)	13 (11%)	1 (1%)	14	52
38	n	108/116 (93%)	88 (82%)	20 (18%)	0	100	100
39	o	113/119 (95%)	100 (88%)	13 (12%)	0	100	100
40	p	112/127 (88%)	98 (88%)	14 (12%)	0	100	100
41	q	97/100 (97%)	76 (78%)	19 (20%)	2 (2%)	5	30
42	r	137/159 (86%)	116 (85%)	21 (15%)	0	100	100
43	s	90/237 (38%)	74 (82%)	16 (18%)	0	100	100
44	t	109/111 (98%)	94 (86%)	15 (14%)	0	100	100
45	u	84/104 (81%)	72 (86%)	12 (14%)	0	100	100
46	v	61/65 (94%)	52 (85%)	9 (15%)	0	100	100
47	w	96/111 (86%)	79 (82%)	17 (18%)	0	100	100
48	x	42/97 (43%)	37 (88%)	5 (12%)	0	100	100
49	y	54/57 (95%)	46 (85%)	8 (15%)	0	100	100
50	z	48/53 (91%)	40 (83%)	8 (17%)	0	100	100
All	All	6206/7064 (88%)	5285 (85%)	899 (14%)	22 (0%)	32	68

All (22) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	G	109	ASN
12	H	62	ASN
21	Q	79	CYS

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Mol	Chain	Res	Type
21	Q	80	GLN
27	c	76	GLN
30	f	7	GLN
41	q	42	ASP
5	A	89	ASN
41	q	40	MET
4	9	334	ARG
7	C	125	ASN
15	K	90	HIS
31	g	30	THR
34	j	89	GLU
36	l	14	ASN
10	F	145	GLU
37	m	7	PRO
27	c	82	PRO
29	e	167	TYR
30	f	6	LYS
22	R	8	GLY
4	9	210	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	40/41 (98%)	39 (98%)	1 (2%)	42	61
2	1	51/51 (100%)	51 (100%)	0	100	100
3	2	35/35 (100%)	33 (94%)	2 (6%)	17	38
4	9	324/325 (100%)	321 (99%)	3 (1%)	75	83
5	A	212/262 (81%)	207 (98%)	5 (2%)	44	62
6	B	180/232 (78%)	178 (99%)	2 (1%)	70	80
7	C	181/183 (99%)	178 (98%)	3 (2%)	56	72
8	D	123/178 (69%)	120 (98%)	3 (2%)	44	62
9	E	150/196 (76%)	149 (99%)	1 (1%)	81	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
10	F	131/132 (99%)	128 (98%)	3 (2%)	45	64
11	G	123/124 (99%)	122 (99%)	1 (1%)	79	85
12	H	111/115 (96%)	104 (94%)	7 (6%)	15	36
13	I	95/99 (96%)	93 (98%)	2 (2%)	48	66
14	J	91/97 (94%)	91 (100%)	0	100	100
15	K	117/120 (98%)	113 (97%)	4 (3%)	32	51
16	L	100/105 (95%)	98 (98%)	2 (2%)	50	68
17	M	47/48 (98%)	46 (98%)	1 (2%)	48	66
18	N	76/78 (97%)	74 (97%)	2 (3%)	41	59
19	O	69/82 (84%)	68 (99%)	1 (1%)	62	75
20	P	73/75 (97%)	73 (100%)	0	100	100
21	Q	56/94 (60%)	55 (98%)	1 (2%)	54	71
22	R	74/77 (96%)	74 (100%)	0	100	100
23	S	70/77 (91%)	69 (99%)	1 (1%)	62	75
24	T	49/56 (88%)	48 (98%)	1 (2%)	50	68
25	a	241/243 (99%)	240 (100%)	1 (0%)	89	91
26	b	186/233 (80%)	185 (100%)	1 (0%)	86	89
27	c	182/184 (99%)	178 (98%)	4 (2%)	47	65
28	d	150/154 (97%)	148 (99%)	2 (1%)	65	77
29	e	153/159 (96%)	152 (99%)	1 (1%)	81	87
30	f	131/134 (98%)	130 (99%)	1 (1%)	79	85
31	g	99/129 (77%)	90 (91%)	9 (9%)	7	24
32	h	102/110 (93%)	102 (100%)	0	100	100
33	i	126/128 (98%)	125 (99%)	1 (1%)	79	85
34	j	103/103 (100%)	100 (97%)	3 (3%)	37	56
35	k	123/126 (98%)	122 (99%)	1 (1%)	79	85
36	l	113/115 (98%)	110 (97%)	3 (3%)	40	58
37	m	105/109 (96%)	102 (97%)	3 (3%)	37	56
38	n	96/99 (97%)	94 (98%)	2 (2%)	48	66
39	o	101/105 (96%)	101 (100%)	0	100	100
40	p	100/108 (93%)	100 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
41	q	90/91 (99%)	88 (98%)	2 (2%)	47	65
42	r	116/132 (88%)	116 (100%)	0	100	100
43	s	82/208 (39%)	82 (100%)	0	100	100
44	t	96/96 (100%)	96 (100%)	0	100	100
45	u	69/85 (81%)	69 (100%)	0	100	100
46	v	58/60 (97%)	58 (100%)	0	100	100
47	w	87/98 (89%)	87 (100%)	0	100	100
48	x	41/86 (48%)	40 (98%)	1 (2%)	44	62
49	y	48/49 (98%)	43 (90%)	5 (10%)	5	19
50	z	47/50 (94%)	46 (98%)	1 (2%)	48	66
All	All	5423/6076 (89%)	5336 (98%)	87 (2%)	58	73

All (87) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	28	ARG
3	2	34	GLN
3	2	36	GLN
4	9	41	LYS
4	9	285	LYS
4	9	334	ARG
5	A	27	ARG
5	A	37	TRP
5	A	49	ARG
5	A	50	LYS
5	A	147	LYS
6	B	90	LYS
6	B	165	ILE
7	C	30	LYS
7	C	41	ARG
7	C	143	ARG
8	D	78	LYS
8	D	113	ASN
8	D	148	ARG
9	E	101	ASN
10	F	3	LYS
10	F	71	ARG
10	F	78	ARG

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Mol	Chain	Res	Type
11	G	88	LYS
12	H	29	LYS
12	H	64	ASP
12	H	65	ILE
12	H	108	ARG
12	H	110	LYS
12	H	116	LYS
12	H	121	TYR
13	I	64	ASP
13	I	65	LYS
15	K	18	LYS
15	K	57	LYS
15	K	121	GLU
15	K	127	ARG
16	L	14	ARG
16	L	107	ARG
17	M	41	ARG
18	N	15	HIS
18	N	17	LYS
19	O	3	MET
21	Q	69	LYS
23	S	64	ARG
24	T	18	PHE
25	a	71	PHE
26	b	102	PHE
27	c	66	TYR
27	c	67	LYS
27	c	75	ARG
27	c	199	VAL
28	d	69	LYS
28	d	150	ARG
29	e	168	PHE
30	f	15	ARG
31	g	5	LYS
31	g	31	SER
31	g	43	LYS
31	g	44	LEU
31	g	45	PHE
31	g	46	LYS
31	g	88	GLU
31	g	90	VAL
31	g	112	TYR

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Mol	Chain	Res	Type
33	i	15	ARG
34	j	87	ILE
34	j	88	LYS
34	j	89	GLU
35	k	6	LEU
36	l	13	HIS
36	l	14	ASN
36	l	129	TRP
37	m	4	ILE
37	m	6	LYS
37	m	39	LYS
38	n	12	HIS
38	n	85	LYS
41	q	40	MET
41	q	41	LEU
48	x	19	CYS
49	y	7	ARG
49	y	47	MET
49	y	50	ASP
49	y	51	LEU
49	y	52	ARG
50	z	15	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (142) such sidechains are listed below:

Mol	Chain	Res	Type
1	0	38	GLN
2	1	32	HIS
4	9	20	HIS
4	9	79	HIS
4	9	91	ASN
4	9	115	GLN
4	9	147	GLN
4	9	241	GLN
4	9	291	GLN
5	A	63	GLN
5	A	70	ASN
5	A	77	GLN
5	A	79	ASN
5	A	81	GLN
5	A	98	ASN
5	A	128	ASN

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Mol	Chain	Res	Type
5	A	137	GLN
6	B	17	ASN
6	B	27	HIS
6	B	82	ASN
6	B	107	ASN
6	B	125	ASN
7	C	52	GLN
7	C	61	GLN
7	C	70	GLN
7	C	81	GLN
7	C	118	ASN
7	C	121	HIS
8	D	113	ASN
8	D	127	HIS
8	D	202	GLN
9	E	2	GLN
9	E	4	ASN
9	E	17	GLN
9	E	26	GLN
9	E	56	HIS
9	E	66	ASN
9	E	67	GLN
9	E	77	ASN
9	E	81	GLN
9	E	89	ASN
9	E	105	GLN
10	F	39	GLN
10	F	51	GLN
10	F	67	ASN
10	F	141	HIS
11	G	11	HIS
11	G	58	GLN
11	G	73	ASN
12	H	91	GLN
13	I	62	HIS
13	I	70	GLN
15	K	85	HIS
15	K	86	ASN
15	K	125	GLN
16	L	38	ASN
16	L	118	ASN
18	N	15	HIS

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Mol	Chain	Res	Type
18	N	32	GLN
18	N	39	HIS
18	N	43	ASN
19	O	7	HIS
19	O	32	HIS
20	P	18	ASN
20	P	42	HIS
20	P	48	HIS
22	R	47	ASN
22	R	79	ASN
23	S	13	GLN
23	S	18	ASN
23	S	20	ASN
23	S	21	ASN
23	S	31	ASN
23	S	34	ASN
23	S	46	ASN
23	S	63	ASN
23	S	77	ASN
24	T	30	GLN
25	a	11	ASN
25	a	31	ASN
25	a	62	ASN
25	a	91	ASN
25	a	183	GLN
25	a	208	HIS
26	b	34	ASN
26	b	63	ASN
26	b	135	HIS
26	b	225	GLN
27	c	31	GLN
27	c	32	GLN
27	c	126	HIS
27	c	130	GLN
27	c	145	GLN
28	d	55	ASN
28	d	58	HIS
29	e	17	ASN
29	e	33	GLN
29	e	63	GLN
30	f	7	GLN
30	f	28	HIS

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Mol	Chain	Res	Type
30	f	85	ASN
30	f	96	GLN
33	i	17	GLN
33	i	43	ASN
33	i	51	GLN
34	j	13	ASN
34	j	69	GLN
34	j	112	ASN
35	k	36	GLN
35	k	117	HIS
35	k	129	HIS
35	k	134	GLN
35	k	141	ASN
36	l	13	HIS
36	l	71	HIS
36	l	123	HIS
37	m	59	ASN
37	m	117	GLN
38	n	37	ASN
38	n	49	ASN
39	o	15	GLN
39	o	17	GLN
40	p	19	GLN
40	p	40	GLN
40	p	85	HIS
41	q	62	HIS
41	q	73	HIS
42	r	15	GLN
42	r	60	ASN
42	r	94	ASN
42	r	102	ASN
42	r	121	GLN
43	s	20	GLN
44	t	79	GLN
46	v	6	GLN
46	v	30	ASN
46	v	32	ASN
47	w	42	HIS
47	w	46	GLN
47	w	66	GLN
50	z	12	ASN
50	z	18	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
51	3	2875/2907 (98%)	1332 (46%)	45 (1%)
52	4	103/108 (95%)	62 (60%)	4 (3%)
53	5	1490/1520 (98%)	615 (41%)	14 (0%)
54	6	75/76 (98%)	32 (42%)	2 (2%)
54	7	75/76 (98%)	48 (64%)	5 (6%)
All	All	4618/4687 (98%)	2089 (45%)	70 (1%)

All (2089) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
51	3	14	U
51	3	15	A
51	3	16	A
51	3	17	G
51	3	20	C
51	3	21	U
51	3	27	U
51	3	29	G
51	3	33	C
51	3	35	U
51	3	36	U
51	3	37	G
51	3	38	G
51	3	39	C
51	3	41	C
51	3	44	A
51	3	48	G
51	3	49	C
51	3	52	U
51	3	53	G
51	3	56	G
51	3	58	A
51	3	59	C
51	3	61	U
51	3	62	G
51	3	64	U
51	3	65	A
51	3	72	G
51	3	73	A
51	3	74	U
51	3	76	A

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Mol	Chain	Res	Type
51	3	77	G
51	3	82	G
51	3	84	G
51	3	86	A
51	3	87	G
51	3	89	U
51	3	90	G
51	3	91	G
51	3	93	A
51	3	94	A
51	3	95	G
51	3	98	C
51	3	101	C
51	3	102	A
51	3	103	G
51	3	112	A
51	3	115	U
51	3	119	A
51	3	120	A
51	3	121	U
51	3	122	G
51	3	126	C
51	3	128	A
51	3	132	G
51	3	134	U
51	3	136	G
51	3	137	U
51	3	146	G
51	3	148	U
51	3	149	A
51	3	156	A
51	3	160	A
51	3	162	G
51	3	163	A
51	3	165	U
51	3	168	A
51	3	171	G
51	3	172	U
51	3	174	A
51	3	178	A
51	3	179	A
51	3	181	G

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Mol	Chain	Res	Type
51	3	183	A
51	3	184	A
51	3	185	U
51	3	188	G
51	3	189	U
51	3	191	G
51	3	193	G
51	3	197	U
51	3	200	A
51	3	202	C
51	3	203	A
51	3	207	C
51	3	210	U
51	3	212	G
51	3	219	G
51	3	220	A
51	3	223	A
51	3	225	A
51	3	226	A
51	3	227	A
51	3	228	A
51	3	230	G
51	3	232	A
51	3	233	U
51	3	234	G
51	3	237	A
51	3	243	U
51	3	245	U
51	3	246	G
51	3	247	U
51	3	250	U
51	3	252	G
51	3	254	G
51	3	255	A
51	3	256	G
51	3	262	G
51	3	265	G
51	3	269	A
51	3	270	G
51	3	274	A
51	3	276	A
51	3	277	C

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Mol	Chain	Res	Type
51	3	279	U
51	3	280	A
51	3	282	C
51	3	284	U
51	3	285	U
51	3	287	G
51	3	293	G
51	3	295	U
51	3	296	U
51	3	297	G
51	3	298	U
51	3	299	A
51	3	303	C
51	3	305	U
51	3	306	G
51	3	309	A
51	3	310	U
51	3	312	U
51	3	314	G
51	3	315	A
51	3	316	C
51	3	318	U
51	3	319	G
51	3	320	A
51	3	321	A
51	3	323	A
51	3	326	A
51	3	328	A
51	3	329	G
51	3	333	A
51	3	336	C
51	3	339	U
51	3	342	G
51	3	345	A
51	3	347	C
51	3	351	G
51	3	353	G
51	3	355	A
51	3	356	A
51	3	357	A
51	3	361	G
51	3	363	G

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Mol	Chain	Res	Type
51	3	364	A
51	3	369	C
51	3	372	G
51	3	373	U
51	3	375	U
51	3	379	A
51	3	380	A
51	3	382	U
51	3	383	U
51	3	384	G
51	3	385	U
51	3	387	U
51	3	389	C
51	3	391	U
51	3	392	A
51	3	393	C
51	3	396	A
51	3	401	G
51	3	402	A
51	3	403	U
51	3	404	C
51	3	407	U
51	3	408	G
51	3	409	A
51	3	410	G
51	3	411	U
51	3	413	G
51	3	414	C
51	3	418	G
51	3	419	A
51	3	422	A
51	3	424	G
51	3	425	U
51	3	426	U
51	3	430	U
51	3	431	U
51	3	432	G
51	3	437	A
51	3	438	A
51	3	439	U
51	3	440	C
51	3	441	U

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Mol	Chain	Res	Type
51	3	442	G
51	3	443	C
51	3	447	G
51	3	448	A
51	3	457	U
51	3	460	G
51	3	461	C
51	3	465	A
51	3	466	A
51	3	478	G
51	3	479	A
51	3	480	C
51	3	481	C
51	3	483	A
51	3	484	U
51	3	485	A
51	3	487	C
51	3	488	G
51	3	490	A
51	3	491	A
51	3	493	A
51	3	494	G
51	3	495	U
51	3	501	G
51	3	504	G
51	3	505	G
51	3	509	G
51	3	511	U
51	3	513	A
51	3	514	A
51	3	515	A
51	3	516	A
51	3	517	G
51	3	519	A
51	3	520	C
51	3	521	C
51	3	530	G
51	3	531	G
51	3	532	A
51	3	539	U
51	3	540	A
51	3	543	U

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Mol	Chain	Res	Type
51	3	551	C
51	3	553	A
51	3	554	U
51	3	558	C
51	3	562	C
51	3	563	A
51	3	566	G
51	3	567	U
51	3	568	G
51	3	569	U
51	3	571	A
51	3	575	C
51	3	577	C
51	3	578	A
51	3	581	A
51	3	582	A
51	3	583	U
51	3	584	G
51	3	586	G
51	3	587	U
51	3	588	G
51	3	595	U
51	3	596	G
51	3	598	G
51	3	599	U
51	3	605	A
51	3	606	G
51	3	607	U
51	3	608	A
51	3	610	G
51	3	611	A
51	3	618	G
51	3	620	G
51	3	623	A
51	3	625	G
51	3	628	A
51	3	630	C
51	3	631	A
51	3	633	G
51	3	634	C
51	3	636	U
51	3	637	U

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Mol	Chain	Res	Type
51	3	638	A
51	3	641	U
51	3	647	G
51	3	648	G
51	3	649	A
51	3	650	G
51	3	656	G
51	3	657	A
51	3	658	G
51	3	660	U
51	3	661	G
51	3	666	G
51	3	673	A
51	3	678	U
51	3	679	A
51	3	681	A
51	3	682	A
51	3	684	A
51	3	688	U
51	3	689	U
51	3	690	U
51	3	691	G
51	3	695	G
51	3	696	U
51	3	697	U
51	3	703	A
51	3	705	A
51	3	706	C
51	3	710	A
51	3	711	A
51	3	712	A
51	3	713	C
51	3	715	G
51	3	717	U
51	3	720	A
51	3	721	G
51	3	722	C
51	3	725	G
51	3	729	U
51	3	732	G
51	3	734	A
51	3	735	G

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Mol	Chain	Res	Type
51	3	736	G
51	3	738	U
51	3	739	G
51	3	740	A
51	3	741	A
51	3	744	U
51	3	747	A
51	3	749	U
51	3	760	G
51	3	761	G
51	3	763	G
51	3	765	A
51	3	767	C
51	3	769	A
51	3	782	U
51	3	787	C
51	3	789	A
51	3	792	G
51	3	797	U
51	3	799	A
51	3	806	A
51	3	810	G
51	3	811	G
51	3	812	G
51	3	816	A
51	3	817	A
51	3	818	A
51	3	819	U
51	3	820	U
51	3	823	A
51	3	824	A
51	3	825	U
51	3	826	C
51	3	827	G
51	3	828	A
51	3	829	A
51	3	833	C
51	3	835	U
51	3	837	A
51	3	838	U
51	3	840	G
51	3	841	C

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Mol	Chain	Res	Type
51	3	842	U
51	3	844	G
51	3	847	C
51	3	850	G
51	3	854	A
51	3	856	A
51	3	858	A
51	3	859	G
51	3	860	C
51	3	862	U
51	3	863	U
51	3	865	A
51	3	866	G
51	3	874	U
51	3	881	A
51	3	882	C
51	3	883	A
51	3	885	A
51	3	887	A
51	3	890	U
51	3	893	A
51	3	894	G
51	3	895	G
51	3	896	U
51	3	902	U
51	3	903	A
51	3	904	C
51	3	906	G
51	3	907	A
51	3	911	U
51	3	912	A
51	3	913	U
51	3	914	G
51	3	915	A
51	3	917	G
51	3	929	G
51	3	930	C
51	3	932	U
51	3	933	A
51	3	934	C
51	3	936	G
51	3	937	A

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Mol	Chain	Res	Type
51	3	939	U
51	3	942	A
51	3	943	A
51	3	944	U
51	3	946	A
51	3	947	A
51	3	949	C
51	3	952	U
51	3	953	G
51	3	959	C
51	3	966	U
51	3	968	U
51	3	970	U
51	3	971	U
51	3	973	U
51	3	975	G
51	3	978	G
51	3	981	A
51	3	982	G
51	3	989	G
51	3	990	G
51	3	993	A
51	3	994	U
51	3	995	A
51	3	997	G
51	3	1005	G
51	3	1006	U
51	3	1007	C
51	3	1008	A
51	3	1009	A
51	3	1010	G
51	3	1011	A
51	3	1013	G
51	3	1016	A
51	3	1017	A
51	3	1018	G
51	3	1019	A
51	3	1021	C
51	3	1023	C
51	3	1025	G
51	3	1026	A
51	3	1027	U

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Mol	Chain	Res	Type
51	3	1028	C
51	3	1029	A
51	3	1032	A
51	3	1035	U
51	3	1036	A
51	3	1040	U
51	3	1042	C
51	3	1044	C
51	3	1046	A
51	3	1047	A
51	3	1049	U
51	3	1052	A
51	3	1053	C
51	3	1054	U
51	3	1055	A
51	3	1057	G
51	3	1058	U
51	3	1061	A
51	3	1063	A
51	3	1066	G
51	3	1068	U
51	3	1073	A
51	3	1075	G
51	3	1076	U
51	3	1080	A
51	3	1081	A
51	3	1082	A
51	3	1085	A
51	3	1089	A
51	3	1095	U
51	3	1097	G
51	3	1098	G
51	3	1099	C
51	3	1101	U
51	3	1102	A
51	3	1103	G
51	3	1105	A
51	3	1107	C
51	3	1115	G
51	3	1116	U
51	3	1119	A
51	3	1123	A

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Mol	Chain	Res	Type
51	3	1124	G
51	3	1125	U
51	3	1132	C
51	3	1144	C
51	3	1145	G
51	3	1147	G
51	3	1149	G
51	3	1151	U
51	3	1154	U
51	3	1156	C
51	3	1159	C
51	3	1163	G
51	3	1164	A
51	3	1165	U
51	3	1168	A
51	3	1170	C
51	3	1171	G
51	3	1173	G
51	3	1175	C
51	3	1176	U
51	3	1177	A
51	3	1178	A
51	3	1180	U
51	3	1181	A
51	3	1186	A
51	3	1188	C
51	3	1193	U
51	3	1196	U
51	3	1199	A
51	3	1203	G
51	3	1204	A
51	3	1206	U
51	3	1208	A
51	3	1209	U
51	3	1210	A
51	3	1211	U
51	3	1212	C
51	3	1215	G
51	3	1216	U
51	3	1217	G
51	3	1219	U
51	3	1221	G

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Mol	Chain	Res	Type
51	3	1227	C
51	3	1233	A
51	3	1234	U
51	3	1236	G
51	3	1240	U
51	3	1243	A
51	3	1250	A
51	3	1251	G
51	3	1253	G
51	3	1254	U
51	3	1255	G
51	3	1256	A
51	3	1257	G
51	3	1259	A
51	3	1260	U
51	3	1262	G
51	3	1264	U
51	3	1268	U
51	3	1276	A
51	3	1277	A
51	3	1278	G
51	3	1279	U
51	3	1281	A
51	3	1282	G
51	3	1283	A
51	3	1284	A
51	3	1285	U
51	3	1286	G
51	3	1290	G
51	3	1292	A
51	3	1293	U
51	3	1297	U
51	3	1298	A
51	3	1301	G
51	3	1303	U
51	3	1304	U
51	3	1307	G
51	3	1308	A
51	3	1309	G
51	3	1310	U
51	3	1311	G
51	3	1312	A

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Mol	Chain	Res	Type
51	3	1314	A
51	3	1315	A
51	3	1317	C
51	3	1318	U
51	3	1322	A
51	3	1323	A
51	3	1324	A
51	3	1326	C
51	3	1327	G
51	3	1328	A
51	3	1329	U
51	3	1330	U
51	3	1337	G
51	3	1340	U
51	3	1342	C
51	3	1349	C
51	3	1351	G
51	3	1356	G
51	3	1360	U
51	3	1361	U
51	3	1362	C
51	3	1369	U
51	3	1372	U
51	3	1374	U
51	3	1376	G
51	3	1377	A
51	3	1378	C
51	3	1380	U
51	3	1388	G
51	3	1389	G
51	3	1391	U
51	3	1393	A
51	3	1402	G
51	3	1403	G
51	3	1406	A
51	3	1407	U
51	3	1408	G
51	3	1412	A
51	3	1413	A
51	3	1414	C
51	3	1420	A
51	3	1421	A

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Mol	Chain	Res	Type
51	3	1423	A
51	3	1424	U
51	3	1426	C
51	3	1431	A
51	3	1436	C
51	3	1437	A
51	3	1439	U
51	3	1441	A
51	3	1442	G
51	3	1444	C
51	3	1445	U
51	3	1447	A
51	3	1448	U
51	3	1449	G
51	3	1456	C
51	3	1457	A
51	3	1458	A
51	3	1460	G
51	3	1462	A
51	3	1463	G
51	3	1464	G
51	3	1466	U
51	3	1467	U
51	3	1470	C
51	3	1474	C
51	3	1478	U
51	3	1480	A
51	3	1481	U
51	3	1482	U
51	3	1483	G
51	3	1485	A
51	3	1486	U
51	3	1487	U
51	3	1488	U
51	3	1489	G
51	3	1493	A
51	3	1495	A
51	3	1497	A
51	3	1498	U
51	3	1502	A
51	3	1504	G
51	3	1506	U

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Mol	Chain	Res	Type
51	3	1507	G
51	3	1508	G
51	3	1510	A
51	3	1511	C
51	3	1513	A
51	3	1514	U
51	3	1515	A
51	3	1516	G
51	3	1518	C
51	3	1520	A
51	3	1522	U
51	3	1523	C
51	3	1526	U
51	3	1527	U
51	3	1529	U
51	3	1530	G
51	3	1532	A
51	3	1534	A
51	3	1535	A
51	3	1538	U
51	3	1540	G
51	3	1541	A
51	3	1542	G
51	3	1543	U
51	3	1545	A
51	3	1548	A
51	3	1549	U
51	3	1550	G
51	3	1555	G
51	3	1557	G
51	3	1558	A
51	3	1559	A
51	3	1571	G
51	3	1575	C
51	3	1577	A
51	3	1580	G
51	3	1581	U
51	3	1584	U
51	3	1585	A
51	3	1586	U
51	3	1587	U
51	3	1588	A

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Mol	Chain	Res	Type
51	3	1589	A
51	3	1592	A
51	3	1594	G
51	3	1595	C
51	3	1597	U
51	3	1598	U
51	3	1600	A
51	3	1603	A
51	3	1605	A
51	3	1608	C
51	3	1609	U
51	3	1612	U
51	3	1614	G
51	3	1615	G
51	3	1617	U
51	3	1618	U
51	3	1619	A
51	3	1622	C
51	3	1625	G
51	3	1630	A
51	3	1631	A
51	3	1632	C
51	3	1635	G
51	3	1636	U
51	3	1637	A
51	3	1639	C
51	3	1640	G
51	3	1641	A
51	3	1642	G
51	3	1643	A
51	3	1644	A
51	3	1648	A
51	3	1650	A
51	3	1651	C
51	3	1652	A
51	3	1653	C
51	3	1656	A
51	3	1664	A
51	3	1668	G
51	3	1669	A
51	3	1671	C
51	3	1676	G

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Mol	Chain	Res	Type
51	3	1678	U
51	3	1679	U
51	3	1680	A
51	3	1681	G
51	3	1682	C
51	3	1683	G
51	3	1687	G
51	3	1688	A
51	3	1692	A
51	3	1694	A
51	3	1695	G
51	3	1698	A
51	3	1701	G
51	3	1702	A
51	3	1703	A
51	3	1704	C
51	3	1705	U
51	3	1706	C
51	3	1707	U
51	3	1708	G
51	3	1709	C
51	3	1720	C
51	3	1723	A
51	3	1725	G
51	3	1727	U
51	3	1728	A
51	3	1733	G
51	3	1734	A
51	3	1735	A
51	3	1737	G
51	3	1738	G
51	3	1740	U
51	3	1741	G
51	3	1748	U
51	3	1750	A
51	3	1751	A
51	3	1752	A
51	3	1758	C
51	3	1759	C
51	3	1761	C
51	3	1762	A
51	3	1763	G

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Mol	Chain	Res	Type
51	3	1764	U
51	3	1765	G
51	3	1766	A
51	3	1767	A
51	3	1769	A
51	3	1770	A
51	3	1771	C
51	3	1772	G
51	3	1777	G
51	3	1778	G
51	3	1780	A
51	3	1784	U
51	3	1787	A
51	3	1788	A
51	3	1789	C
51	3	1791	A
51	3	1792	A
51	3	1794	A
51	3	1802	C
51	3	1807	C
51	3	1808	C
51	3	1812	C
51	3	1813	C
51	3	1815	U
51	3	1816	A
51	3	1821	G
51	3	1822	A
51	3	1823	U
51	3	1824	G
51	3	1826	A
51	3	1827	U
51	3	1828	A
51	3	1830	G
51	3	1831	G
51	3	1834	U
51	3	1835	G
51	3	1836	A
51	3	1838	A
51	3	1842	G
51	3	1843	C
51	3	1844	C
51	3	1845	C

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Mol	Chain	Res	Type
51	3	1847	G
51	3	1851	U
51	3	1853	G
51	3	1854	A
51	3	1855	A
51	3	1856	G
51	3	1858	U
51	3	1859	U
51	3	1860	A
51	3	1863	G
51	3	1865	A
51	3	1867	G
51	3	1870	G
51	3	1872	U
51	3	1876	G
51	3	1877	C
51	3	1881	C
51	3	1882	G
51	3	1883	A
51	3	1884	A
51	3	1885	G
51	3	1887	U
51	3	1888	U
51	3	1889	U
51	3	1890	U
51	3	1891	A
51	3	1892	A
51	3	1896	A
51	3	1899	C
51	3	1905	U
51	3	1906	G
51	3	1907	A
51	3	1908	A
51	3	1910	G
51	3	1913	G
51	3	1914	G
51	3	1919	A
51	3	1920	A
51	3	1921	C
51	3	1927	C
51	3	1930	U
51	3	1934	A

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Mol	Chain	Res	Type
51	3	1936	G
51	3	1937	G
51	3	1938	U
51	3	1944	A
51	3	1945	A
51	3	1946	U
51	3	1947	U
51	3	1949	C
51	3	1952	G
51	3	1953	U
51	3	1955	G
51	3	1958	U
51	3	1959	A
51	3	1962	U
51	3	1968	C
51	3	1970	C
51	3	1971	G
51	3	1972	C
51	3	1974	U
51	3	1977	A
51	3	1978	U
51	3	1979	G
51	3	1982	G
51	3	1984	A
51	3	1985	A
51	3	1988	A
51	3	1989	U
51	3	1996	A
51	3	1998	U
51	3	2000	U
51	3	2001	C
51	3	2002	U
51	3	2003	C
51	3	2004	G
51	3	2005	G
51	3	2008	A
51	3	2009	U
51	3	2011	G
51	3	2013	C
51	3	2020	A
51	3	2021	A
51	3	2025	C

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Mol	Chain	Res	Type
51	3	2028	G
51	3	2029	U
51	3	2030	A
51	3	2031	C
51	3	2032	G
51	3	2037	A
51	3	2038	A
51	3	2039	G
51	3	2040	A
51	3	2041	C
51	3	2045	C
51	3	2050	G
51	3	2051	G
51	3	2052	C
51	3	2055	A
51	3	2056	A
51	3	2057	C
51	3	2060	G
51	3	2062	C
51	3	2063	G
51	3	2065	A
51	3	2066	A
51	3	2067	A
51	3	2068	G
51	3	2069	A
51	3	2070	C
51	3	2071	C
51	3	2075	U
51	3	2076	G
51	3	2077	A
51	3	2082	U
51	3	2083	U
51	3	2084	A
51	3	2085	C
51	3	2086	U
51	3	2087	G
51	3	2090	G
51	3	2091	C
51	3	2092	U
51	3	2093	U
51	3	2100	G
51	3	2104	A

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Mol	Chain	Res	Type
51	3	2106	G
51	3	2107	A
51	3	2108	C
51	3	2109	A
51	3	2110	U
51	3	2111	U
51	3	2112	A
51	3	2114	C
51	3	2115	A
51	3	2117	G
51	3	2118	U
51	3	2119	A
51	3	2120	G
51	3	2123	A
51	3	2124	A
51	3	2125	U
51	3	2126	A
51	3	2127	G
51	3	2131	G
51	3	2132	G
51	3	2133	A
51	3	2134	G
51	3	2138	U
51	3	2140	G
51	3	2144	C
51	3	2151	G
51	3	2152	C
51	3	2153	U
51	3	2155	G
51	3	2156	G
51	3	2157	A
51	3	2163	U
51	3	2167	G
51	3	2168	C
51	3	2170	A
51	3	2171	A
51	3	2172	A
51	3	2174	G
51	3	2178	A
51	3	2180	U
51	3	2182	C
51	3	2187	C

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Mol	Chain	Res	Type
51	3	2189	U
51	3	2193	U
51	3	2194	G
51	3	2195	U
51	3	2196	G
51	3	2198	G
51	3	2200	U
51	3	2201	G
51	3	2202	U
51	3	2203	U
51	3	2204	C
51	3	2205	U
51	3	2206	A
51	3	2209	U
51	3	2210	G
51	3	2211	G
51	3	2212	U
51	3	2219	U
51	3	2220	A
51	3	2221	U
51	3	2222	C
51	3	2229	C
51	3	2231	A
51	3	2233	A
51	3	2243	G
51	3	2244	U
51	3	2246	G
51	3	2249	A
51	3	2252	U
51	3	2254	G
51	3	2257	U
51	3	2259	G
51	3	2263	G
51	3	2265	U
51	3	2267	G
51	3	2274	A
51	3	2275	A
51	3	2276	A
51	3	2278	G
51	3	2280	U
51	3	2283	C
51	3	2284	G

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Mol	Chain	Res	Type
51	3	2285	G
51	3	2286	A
51	3	2291	U
51	3	2294	A
51	3	2295	A
51	3	2296	A
51	3	2299	U
51	3	2304	U
51	3	2305	C
51	3	2309	A
51	3	2310	C
51	3	2312	G
51	3	2313	U
51	3	2315	G
51	3	2316	G
51	3	2317	A
51	3	2319	A
51	3	2320	U
51	3	2322	G
51	3	2327	U
51	3	2328	A
51	3	2329	G
51	3	2330	A
51	3	2333	G
51	3	2334	U
51	3	2335	A
51	3	2337	U
51	3	2339	G
51	3	2341	G
51	3	2342	U
51	3	2343	A
51	3	2344	A
51	3	2351	U
51	3	2352	U
51	3	2353	G
51	3	2355	C
51	3	2356	U
51	3	2358	U
51	3	2362	A
51	3	2363	C
51	3	2365	U
51	3	2366	A

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Mol	Chain	Res	Type
51	3	2367	C
51	3	2369	G
51	3	2371	U
51	3	2375	A
51	3	2376	C
51	3	2377	A
51	3	2378	G
51	3	2379	G
51	3	2380	U
51	3	2382	A
51	3	2385	A
51	3	2387	U
51	3	2388	C
51	3	2389	A
51	3	2391	G
51	3	2393	C
51	3	2394	A
51	3	2395	U
51	3	2396	A
51	3	2401	U
51	3	2402	C
51	3	2411	C
51	3	2412	A
51	3	2414	U
51	3	2415	A
51	3	2416	U
51	3	2418	G
51	3	2422	G
51	3	2423	G
51	3	2429	G
51	3	2430	C
51	3	2431	U
51	3	2432	C
51	3	2433	A
51	3	2434	A
51	3	2435	C
51	3	2436	G
51	3	2437	G
51	3	2438	A
51	3	2439	U
51	3	2442	A
51	3	2445	C

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Mol	Chain	Res	Type
51	3	2448	C
51	3	2449	U
51	3	2451	C
51	3	2455	G
51	3	2456	A
51	3	2457	U
51	3	2466	G
51	3	2468	U
51	3	2470	C
51	3	2474	C
51	3	2477	A
51	3	2478	G
51	3	2479	A
51	3	2481	U
51	3	2483	C
51	3	2484	A
51	3	2485	U
51	3	2486	A
51	3	2487	U
51	3	2488	C
51	3	2492	G
51	3	2494	C
51	3	2495	A
51	3	2497	U
51	3	2498	G
51	3	2499	U
51	3	2502	G
51	3	2504	C
51	3	2505	A
51	3	2506	C
51	3	2507	C
51	3	2509	C
51	3	2512	U
51	3	2513	G
51	3	2514	U
51	3	2518	C
51	3	2519	U
51	3	2521	A
51	3	2526	A
51	3	2527	U
51	3	2528	C
51	3	2534	G

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Mol	Chain	Res	Type
51	3	2538	A
51	3	2539	A
51	3	2545	U
51	3	2548	G
51	3	2550	A
51	3	2555	U
51	3	2557	G
51	3	2560	U
51	3	2561	G
51	3	2562	U
51	3	2566	C
51	3	2567	C
51	3	2568	G
51	3	2570	U
51	3	2571	U
51	3	2572	A
51	3	2574	A
51	3	2575	G
51	3	2577	G
51	3	2578	A
51	3	2580	A
51	3	2581	C
51	3	2582	G
51	3	2583	U
51	3	2584	G
51	3	2586	G
51	3	2587	U
51	3	2588	U
51	3	2590	G
51	3	2591	G
51	3	2592	U
51	3	2593	U
51	3	2594	C
51	3	2596	A
51	3	2600	G
51	3	2605	G
51	3	2607	G
51	3	2608	A
51	3	2610	A
51	3	2611	G
51	3	2612	G
51	3	2615	G

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Mol	Chain	Res	Type
51	3	2617	U
51	3	2618	C
51	3	2619	C
51	3	2622	A
51	3	2623	U
51	3	2625	U
51	3	2628	U
51	3	2629	G
51	3	2632	C
51	3	2633	C
51	3	2635	G
51	3	2637	A
51	3	2638	G
51	3	2639	G
51	3	2642	G
51	3	2643	A
51	3	2644	U
51	3	2647	A
51	3	2649	G
51	3	2653	G
51	3	2655	U
51	3	2662	A
51	3	2664	U
51	3	2668	A
51	3	2669	G
51	3	2679	G
51	3	2681	G
51	3	2683	G
51	3	2686	C
51	3	2689	C
51	3	2690	U
51	3	2693	U
51	3	2694	A
51	3	2697	C
51	3	2698	U
51	3	2699	C
51	3	2703	U
51	3	2706	U
51	3	2708	G
51	3	2710	G
51	3	2711	C
51	3	2714	G

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Mol	Chain	Res	Type
51	3	2715	C
51	3	2720	C
51	3	2721	C
51	3	2726	G
51	3	2730	G
51	3	2731	U
51	3	2733	A
51	3	2734	C
51	3	2735	G
51	3	2736	U
51	3	2737	G
51	3	2739	C
51	3	2740	U
51	3	2741	A
51	3	2742	U
51	3	2746	A
51	3	2747	U
51	3	2752	G
51	3	2756	A
51	3	2757	A
51	3	2759	G
51	3	2760	C
51	3	2761	A
51	3	2765	A
51	3	2766	A
51	3	2773	A
51	3	2774	A
51	3	2777	A
51	3	2780	U
51	3	2786	A
51	3	2789	A
51	3	2791	U
51	3	2792	C
51	3	2794	U
51	3	2795	C
51	3	2799	U
51	3	2800	U
51	3	2805	A
51	3	2807	G
51	3	2809	A
51	3	2810	A
51	3	2811	G

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Mol	Chain	Res	Type
51	3	2812	U
51	3	2813	A
51	3	2815	G
51	3	2817	G
51	3	2822	C
51	3	2824	A
51	3	2825	A
51	3	2827	A
51	3	2828	C
51	3	2829	G
51	3	2830	A
51	3	2834	C
51	3	2837	U
51	3	2838	G
51	3	2839	A
51	3	2844	U
51	3	2846	A
51	3	2849	G
51	3	2850	G
51	3	2853	U
51	3	2854	A
51	3	2855	A
51	3	2863	G
51	3	2864	A
51	3	2870	U
51	3	2871	G
51	3	2873	G
51	3	2876	G
51	3	2878	G
51	3	2881	A
51	3	2883	A
51	3	2884	C
51	3	2886	A
51	3	2888	U
51	3	2889	U
51	3	2890	G
51	3	2891	C
51	3	2895	A
51	3	2897	G
51	3	2898	A
51	3	2899	C
52	4	6	U

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Mol	Chain	Res	Type
52	4	9	C
52	4	10	C
52	4	11	A
52	4	12	U
52	4	13	G
52	4	14	U
52	4	18	U
52	4	19	G
52	4	22	G
52	4	23	A
52	4	25	A
52	4	26	C
52	4	27	A
52	4	28	C
52	4	29	C
52	4	31	G
52	4	32	G
52	4	33	U
52	4	34	U
52	4	37	A
52	4	38	U
52	4	39	U
52	4	40	U
52	4	41	C
52	4	42	G
52	4	43	A
52	4	44	A
52	4	45	C
52	4	47	C
52	4	50	C
52	4	51	A
52	4	53	U
52	4	54	U
52	4	55	A
52	4	56	A
52	4	59	A
52	4	60	C
52	4	63	U
52	4	65	G
52	4	66	A
52	4	67	G
52	4	68	C

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Mol	Chain	Res	Type
52	4	71	A
52	4	73	U
52	4	76	A
52	4	77	G
52	4	78	C
52	4	79	U
52	4	80	G
52	4	85	A
52	4	86	G
52	4	87	U
52	4	88	G
52	4	89	A
52	4	96	G
52	4	97	A
52	4	98	A
52	4	99	A
52	4	102	A
52	4	105	A
52	4	106	A
53	5	7	U
53	5	8	G
53	5	9	A
53	5	10	G
53	5	15	U
53	5	16	G
53	5	21	U
53	5	24	C
53	5	25	U
53	5	27	A
53	5	30	A
53	5	32	U
53	5	33	A
53	5	36	G
53	5	38	U
53	5	40	G
53	5	42	G
53	5	44	C
53	5	48	C
53	5	49	C
53	5	50	U
53	5	51	A
53	5	52	A

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Mol	Chain	Res	Type
53	5	58	G
53	5	60	A
53	5	63	U
53	5	66	A
53	5	67	U
53	5	71	A
53	5	72	A
53	5	73	G
53	5	75	A
53	5	82	C
53	5	84	U
53	5	86	A
53	5	93	A
53	5	95	C
53	5	98	G
53	5	99	U
53	5	101	A
53	5	103	U
53	5	106	C
53	5	107	A
53	5	108	C
53	5	112	U
53	5	114	C
53	5	115	A
53	5	116	A
53	5	117	U
53	5	120	A
53	5	122	C
53	5	124	U
53	5	125	A
53	5	126	U
53	5	127	A
53	5	128	A
53	5	130	G
53	5	132	G
53	5	134	G
53	5	135	A
53	5	137	A
53	5	139	C
53	5	149	G
53	5	154	G
53	5	155	C

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Mol	Chain	Res	Type
53	5	159	U
53	5	160	A
53	5	161	C
53	5	163	G
53	5	167	A
53	5	168	A
53	5	169	G
53	5	170	A
53	5	171	A
53	5	180	C
53	5	186	A
53	5	188	U
53	5	194	U
53	5	196	G
53	5	197	A
53	5	198	A
53	5	199	A
53	5	212	G
53	5	217	U
53	5	218	U
53	5	220	U
53	5	221	U
53	5	222	U
53	5	223	G
53	5	224	A
53	5	227	A
53	5	228	G
53	5	230	G
53	5	234	G
53	5	236	C
53	5	239	A
53	5	240	U
53	5	241	C
53	5	243	G
53	5	247	G
53	5	253	G
53	5	257	U
53	5	258	A
53	5	260	C
53	5	262	G
53	5	263	C
53	5	267	C

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Mol	Chain	Res	Type
53	5	268	C
53	5	273	C
53	5	275	A
53	5	276	U
53	5	282	G
53	5	285	G
53	5	288	A
53	5	290	G
53	5	292	U
53	5	294	A
53	5	300	A
53	5	301	G
53	5	302	A
53	5	303	A
53	5	307	C
53	5	310	C
53	5	312	A
53	5	319	U
53	5	321	A
53	5	323	A
53	5	324	C
53	5	325	A
53	5	326	C
53	5	328	G
53	5	332	A
53	5	335	C
53	5	338	C
53	5	341	C
53	5	342	G
53	5	343	G
53	5	344	G
53	5	346	G
53	5	347	G
53	5	348	C
53	5	350	G
53	5	352	A
53	5	354	U
53	5	355	A
53	5	359	A
53	5	363	U
53	5	364	U
53	5	366	C

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Mol	Chain	Res	Type
53	5	368	C
53	5	369	A
53	5	370	A
53	5	371	U
53	5	373	A
53	5	375	C
53	5	377	A
53	5	378	A
53	5	381	C
53	5	383	U
53	5	384	G
53	5	386	U
53	5	388	G
53	5	389	A
53	5	392	A
53	5	396	C
53	5	398	G
53	5	401	U
53	5	402	G
53	5	408	U
53	5	409	G
53	5	410	A
53	5	411	A
53	5	412	G
53	5	414	U
53	5	417	U
53	5	419	A
53	5	420	A
53	5	421	G
53	5	423	U
53	5	425	G
53	5	426	U
53	5	427	A
53	5	430	G
53	5	434	U
53	5	435	U
53	5	439	U
53	5	440	U
53	5	442	G
53	5	443	G
53	5	449	A
53	5	450	U

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Mol	Chain	Res	Type
53	5	452	A
53	5	453	C
53	5	455	U
53	5	461	G
53	5	462	G
53	5	463	U
53	5	464	A
53	5	465	A
53	5	467	G
53	5	468	G
53	5	469	C
53	5	471	A
53	5	472	G
53	5	473	A
53	5	476	U
53	5	478	G
53	5	480	C
53	5	481	U
53	5	482	G
53	5	483	U
53	5	485	C
53	5	488	U
53	5	489	U
53	5	490	U
53	5	493	A
53	5	494	A
53	5	497	A
53	5	502	C
53	5	508	A
53	5	509	C
53	5	513	G
53	5	514	U
53	5	516	C
53	5	517	C
53	5	519	G
53	5	522	G
53	5	523	U
53	5	525	G
53	5	529	U
53	5	530	A
53	5	531	A
53	5	533	A

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Mol	Chain	Res	Type
53	5	534	C
53	5	543	C
53	5	545	A
53	5	547	C
53	5	549	U
53	5	550	U
53	5	551	A
53	5	553	C
53	5	558	U
53	5	559	U
53	5	560	U
53	5	561	A
53	5	562	U
53	5	564	G
53	5	565	G
53	5	567	C
53	5	570	A
53	5	572	A
53	5	573	G
53	5	574	C
53	5	575	A
53	5	578	C
53	5	585	G
53	5	586	G
53	5	594	A
53	5	596	U
53	5	597	C
53	5	599	G
53	5	607	A
53	5	610	C
53	5	614	U
53	5	616	C
53	5	617	U
53	5	618	U
53	5	620	A
53	5	622	A
53	5	628	A
53	5	629	U
53	5	631	C
53	5	632	A
53	5	636	G
53	5	637	A

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Mol	Chain	Res	Type
53	5	638	A
53	5	639	A
53	5	646	A
53	5	647	U
53	5	648	C
53	5	649	U
53	5	651	G
53	5	652	A
53	5	653	G
53	5	661	G
53	5	662	G
53	5	666	U
53	5	667	U
53	5	668	U
53	5	669	U
53	5	670	G
53	5	672	A
53	5	673	A
53	5	680	G
53	5	681	U
53	5	684	A
53	5	686	C
53	5	688	G
53	5	690	G
53	5	695	G
53	5	696	C
53	5	698	U
53	5	699	A
53	5	700	G
53	5	703	A
53	5	707	G
53	5	709	A
53	5	712	A
53	5	715	A
53	5	717	C
53	5	718	A
53	5	719	G
53	5	720	U
53	5	721	G
53	5	728	G
53	5	729	C
53	5	731	A

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Mol	Chain	Res	Type
53	5	735	C
53	5	740	G
53	5	741	C
53	5	744	U
53	5	745	U
53	5	749	G
53	5	751	C
53	5	752	G
53	5	753	C
53	5	756	A
53	5	763	A
53	5	766	G
53	5	768	G
53	5	770	G
53	5	774	A
53	5	775	G
53	5	777	A
53	5	783	G
53	5	784	A
53	5	787	A
53	5	790	U
53	5	792	C
53	5	797	G
53	5	812	A
53	5	814	C
53	5	815	G
53	5	818	A
53	5	821	U
53	5	824	U
53	5	825	A
53	5	829	G
53	5	830	U
53	5	838	A
53	5	842	C
53	5	848	U
53	5	849	A
53	5	853	A
53	5	862	C
53	5	863	A
53	5	865	U
53	5	867	A
53	5	868	G

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Mol	Chain	Res	Type
53	5	870	A
53	5	878	U
53	5	879	G
53	5	881	G
53	5	882	U
53	5	883	A
53	5	884	G
53	5	885	U
53	5	890	U
53	5	896	G
53	5	898	A
53	5	907	A
53	5	908	A
53	5	910	C
53	5	911	G
53	5	916	U
53	5	917	G
53	5	918	A
53	5	921	G
53	5	922	G
53	5	929	C
53	5	930	A
53	5	934	G
53	5	937	G
53	5	939	G
53	5	940	G
53	5	941	A
53	5	946	G
53	5	953	A
53	5	954	A
53	5	955	U
53	5	956	U
53	5	957	C
53	5	961	G
53	5	963	U
53	5	964	A
53	5	966	A
53	5	967	C
53	5	969	A
53	5	970	A
53	5	971	A
53	5	972	A

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Mol	Chain	Res	Type
53	5	983	G
53	5	987	U
53	5	988	G
53	5	989	A
53	5	990	C
53	5	999	C
53	5	1000	A
53	5	1001	A
53	5	1002	A
53	5	1003	G
53	5	1014	A
53	5	1031	A
53	5	1041	G
53	5	1044	G
53	5	1045	C
53	5	1046	A
53	5	1047	U
53	5	1050	U
53	5	1053	U
53	5	1055	G
53	5	1056	U
53	5	1058	A
53	5	1061	U
53	5	1062	C
53	5	1063	G
53	5	1065	G
53	5	1067	C
53	5	1069	U
53	5	1071	A
53	5	1072	G
53	5	1075	G
53	5	1077	U
53	5	1079	G
53	5	1083	A
53	5	1085	G
53	5	1086	U
53	5	1089	C
53	5	1091	C
53	5	1092	A
53	5	1096	A
53	5	1098	C
53	5	1100	C

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Mol	Chain	Res	Type
53	5	1101	A
53	5	1102	A
53	5	1104	C
53	5	1109	U
53	5	1111	G
53	5	1112	U
53	5	1113	U
53	5	1116	U
53	5	1119	C
53	5	1122	U
53	5	1123	G
53	5	1124	U
53	5	1125	C
53	5	1127	A
53	5	1132	G
53	5	1133	A
53	5	1134	C
53	5	1135	U
53	5	1136	G
53	5	1140	A
53	5	1141	U
53	5	1142	G
53	5	1143	C
53	5	1144	A
53	5	1152	G
53	5	1154	A
53	5	1155	A
53	5	1156	G
53	5	1157	G
53	5	1158	A
53	5	1159	A
53	5	1162	G
53	5	1163	A
53	5	1165	G
53	5	1166	A
53	5	1168	G
53	5	1169	U
53	5	1171	A
53	5	1173	A
53	5	1175	C
53	5	1176	A
53	5	1177	U

Continued on next page...

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Mol	Chain	Res	Type
53	5	1178	C
53	5	1180	U
53	5	1187	U
53	5	1188	A
53	5	1189	U
53	5	1198	C
53	5	1199	U
53	5	1200	G
53	5	1201	C
53	5	1203	A
53	5	1204	A
53	5	1208	G
53	5	1211	A
53	5	1213	A
53	5	1216	G
53	5	1217	G
53	5	1218	C
53	5	1222	U
53	5	1225	A
53	5	1226	A
53	5	1233	G
53	5	1234	C
53	5	1235	C
53	5	1241	G
53	5	1242	U
53	5	1255	A
53	5	1256	U
53	5	1257	C
53	5	1260	U
53	5	1261	A
53	5	1268	G
53	5	1269	U
53	5	1271	U
53	5	1272	C
53	5	1273	A
53	5	1274	G
53	5	1276	U
53	5	1277	C
53	5	1279	G
53	5	1281	U
53	5	1284	A
53	5	1285	G

Continued on next page...

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Mol	Chain	Res	Type
53	5	1286	G
53	5	1287	G
53	5	1291	C
53	5	1294	U
53	5	1296	C
53	5	1297	G
53	5	1308	G
53	5	1310	C
53	5	1311	G
53	5	1312	G
53	5	1314	A
53	5	1315	U
53	5	1316	C
53	5	1318	C
53	5	1322	U
53	5	1325	U
53	5	1326	C
53	5	1330	A
53	5	1331	A
53	5	1335	G
53	5	1337	U
53	5	1338	A
53	5	1339	U
53	5	1341	U
53	5	1343	G
53	5	1353	C
53	5	1354	G
53	5	1356	U
53	5	1357	C
53	5	1359	C
53	5	1360	G
53	5	1362	G
53	5	1364	C
53	5	1365	U
53	5	1369	A
53	5	1370	C
53	5	1372	C
53	5	1373	A
53	5	1374	C
53	5	1375	C
53	5	1381	U
53	5	1385	A

Continued on next page...

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Mol	Chain	Res	Type
53	5	1391	A
53	5	1394	G
53	5	1395	C
53	5	1397	G
53	5	1399	U
53	5	1400	A
53	5	1404	U
53	5	1405	U
53	5	1407	A
53	5	1411	A
53	5	1415	G
53	5	1417	U
53	5	1421	A
53	5	1425	A
53	5	1426	U
53	5	1427	U
53	5	1429	G
53	5	1431	A
53	5	1435	G
53	5	1439	G
53	5	1440	U
53	5	1441	C
53	5	1443	A
53	5	1445	G
53	5	1447	U
53	5	1449	G
53	5	1450	C
53	5	1461	G
53	5	1464	G
53	5	1465	U
53	5	1466	U
53	5	1467	A
53	5	1474	A
53	5	1476	C
53	5	1477	A
53	5	1478	A
53	5	1480	G
53	5	1481	U
53	5	1482	A
53	5	1483	C
53	5	1492	G
53	5	1495	C

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Mol	Chain	Res	Type
53	5	1497	U
53	5	1502	G
53	5	1504	G
53	5	1505	G
54	6	5	C
54	6	12	C
54	6	14	C
54	6	17	U
54	6	19	G
54	6	20	G
54	6	21	U
54	6	23	G
54	6	24	A
54	6	25	G
54	6	27	A
54	6	28	A
54	6	32	U
54	6	35	G
54	6	36	A
54	6	38	G
54	6	43	G
54	6	44	U
54	6	49	C
54	6	52	C
54	6	54	G
54	6	56	U
54	6	57	C
54	6	58	G
54	6	59	A
54	6	60	U
54	6	62	C
54	6	63	U
54	6	72	C
54	6	73	C
54	6	75	C
54	6	76	C
54	7	3	G
54	7	5	C
54	7	8	G
54	7	9	U
54	7	11	G
54	7	12	C

Continued on next page...

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Mol	Chain	Res	Type
54	7	14	C
54	7	15	A
54	7	17	U
54	7	19	G
54	7	20	G
54	7	21	U
54	7	22	A
54	7	24	A
54	7	25	G
54	7	28	A
54	7	31	G
54	7	32	U
54	7	35	G
54	7	37	A
54	7	38	G
54	7	39	A
54	7	40	A
54	7	42	C
54	7	43	G
54	7	44	U
54	7	45	G
54	7	47	G
54	7	48	U
54	7	49	C
54	7	50	G
54	7	52	C
54	7	53	A
54	7	54	G
54	7	57	C
54	7	58	G
54	7	60	U
54	7	61	U
54	7	62	C
54	7	63	U
54	7	64	G
54	7	70	G
54	7	71	A
54	7	72	C
54	7	73	C
54	7	75	C
54	7	76	C
54	7	77	A

All (70) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
51	3	184	A
51	3	311	G
51	3	315	A
51	3	410	G
51	3	425	U
51	3	431	U
51	3	500	U
51	3	513	A
51	3	605	A
51	3	636	U
51	3	688	U
51	3	824	A
51	3	880	C
51	3	901	C
51	3	936	G
51	3	952	U
51	3	993	A
51	3	1048	A
51	3	1124	G
51	3	1209	U
51	3	1218	G
51	3	1297	U
51	3	1465	U
51	3	1481	U
51	3	1507	G
51	3	1583	G
51	3	1585	A
51	3	1587	U
51	3	1588	A
51	3	1706	C
51	3	1764	U
51	3	1820	U
51	3	1827	U
51	3	2290	G
51	3	2414	U
51	3	2484	A
51	3	2506	C
51	3	2604	U
51	3	2637	A
51	3	2668	A
51	3	2764	U
51	3	2788	U

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Mol	Chain	Res	Type
51	3	2823	A
51	3	2862	U
51	3	2897	G
52	4	10	C
52	4	21	G
52	4	54	U
52	4	59	A
53	5	167	A
53	5	168	A
53	5	196	G
53	5	197	A
53	5	219	A
53	5	425	G
53	5	448	A
53	5	481	U
53	5	928	G
53	5	1123	G
53	5	1133	A
53	5	1199	U
53	5	1338	A
53	5	1466	U
54	6	16	G
54	6	22	A
54	7	4	U
54	7	16	G
54	7	37	A
54	7	48	U
54	7	71	A

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.

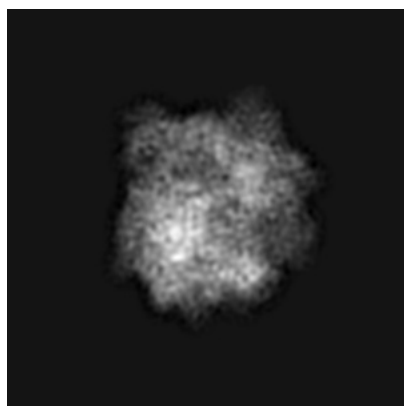
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13411. These allow visual inspection of the internal detail of the map and identification of artifacts.

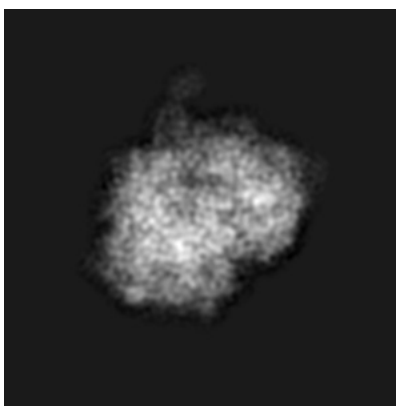
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

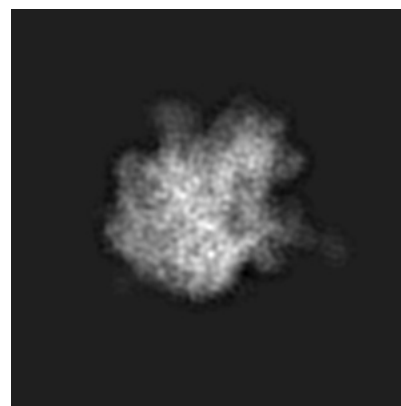
6.1.1 Primary map



X

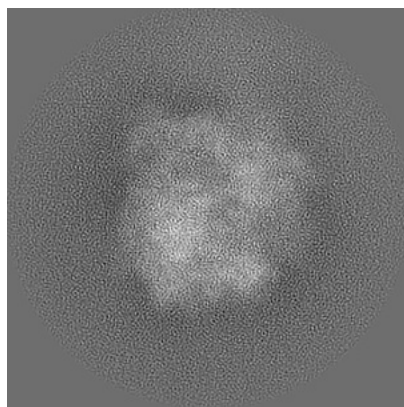


Y

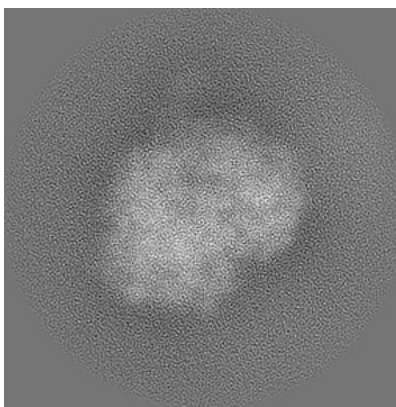


Z

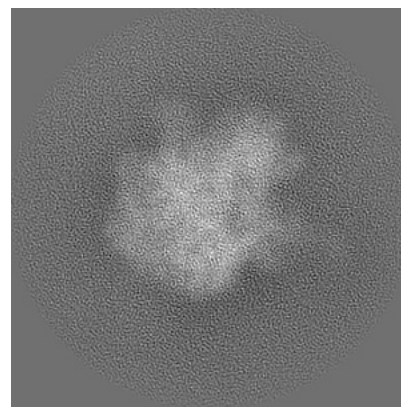
6.1.2 Raw map



X



Y

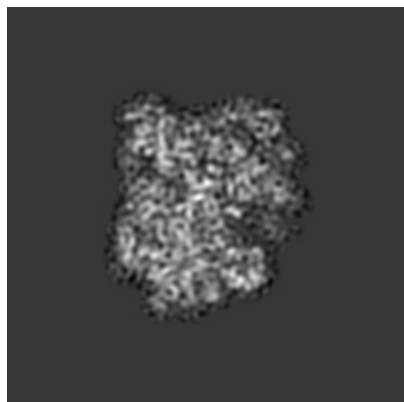


Z

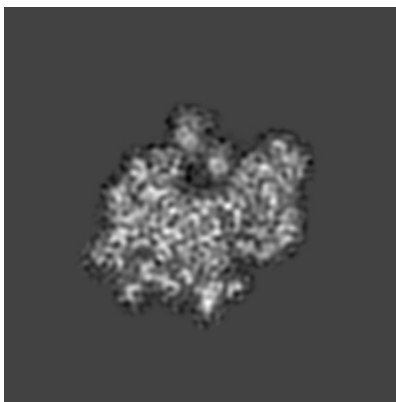
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

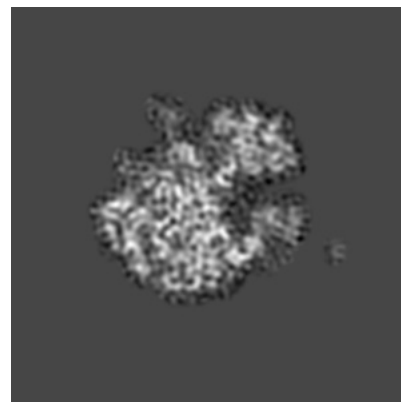
6.2.1 Primary map



X Index: 128

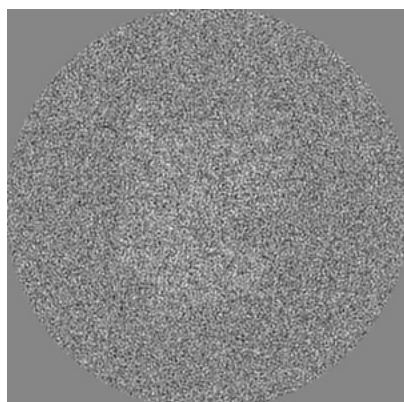


Y Index: 128

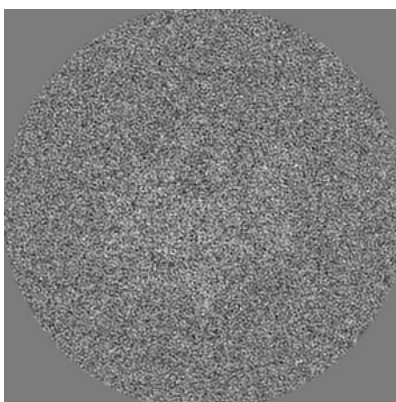


Z Index: 128

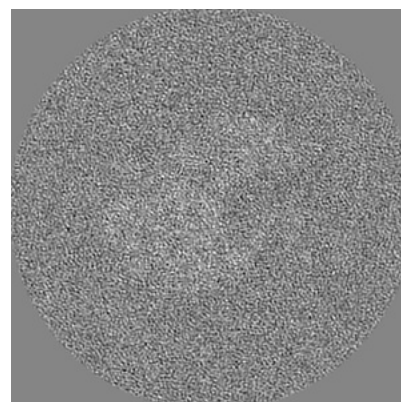
6.2.2 Raw map



X Index: 128



Y Index: 128

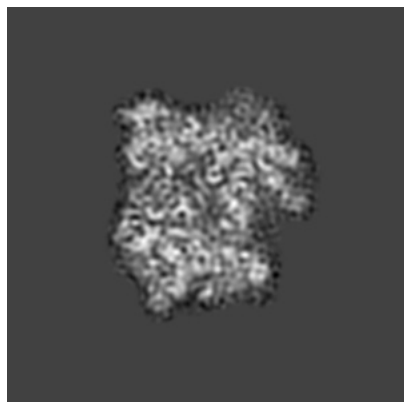


Z Index: 128

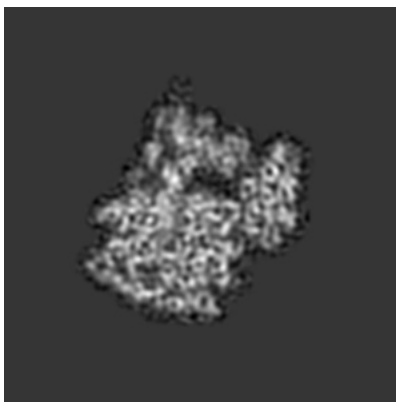
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

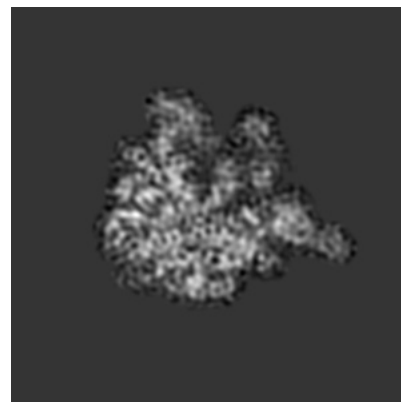
6.3.1 Primary map



X Index: 134

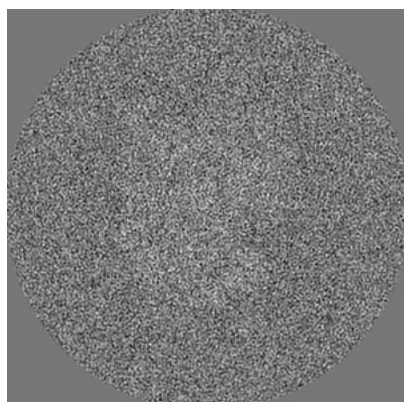


Y Index: 117

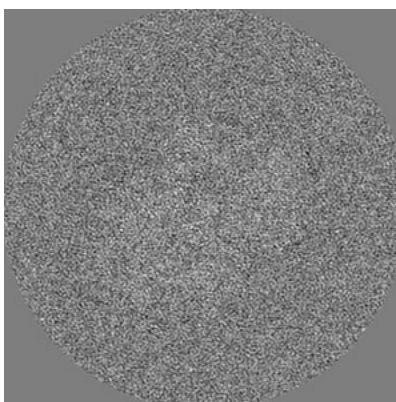


Z Index: 113

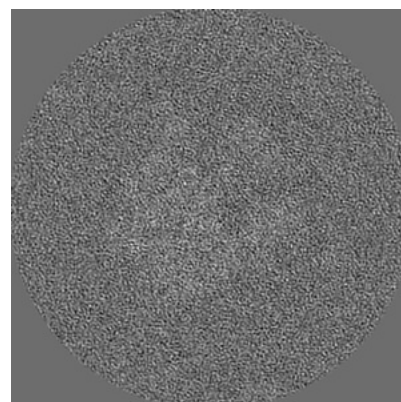
6.3.2 Raw map



X Index: 130



Y Index: 120

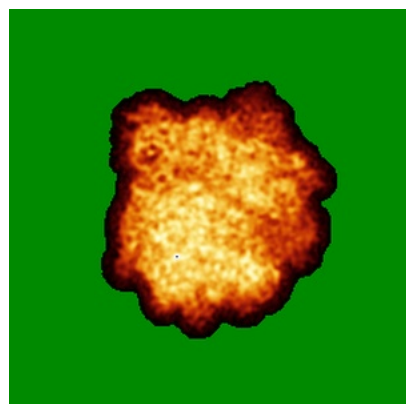


Z Index: 120

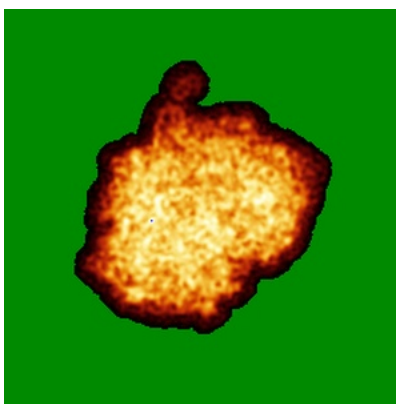
The images above show the largest variance slices of the map in three orthogonal directions.

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

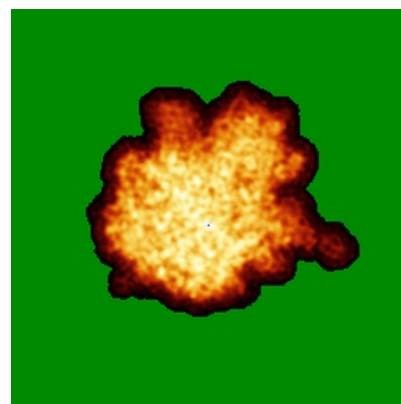
6.4.1 Primary map



X

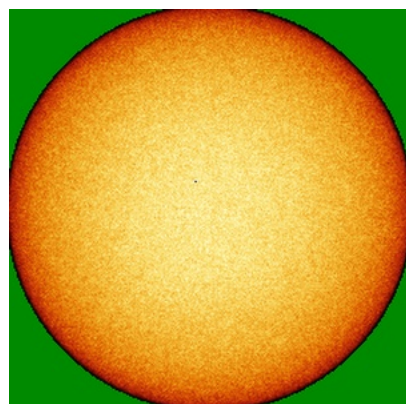


Y

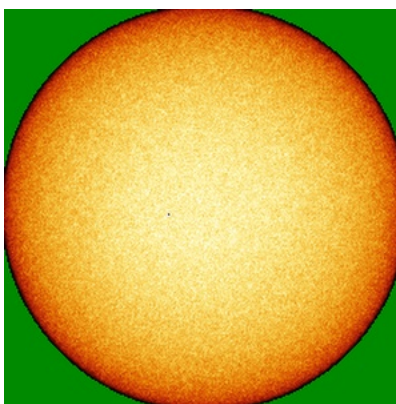


Z

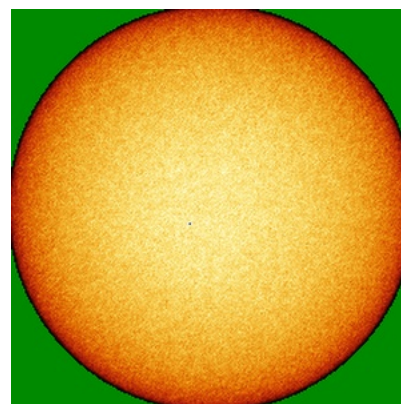
6.4.2 Raw map



X



Y

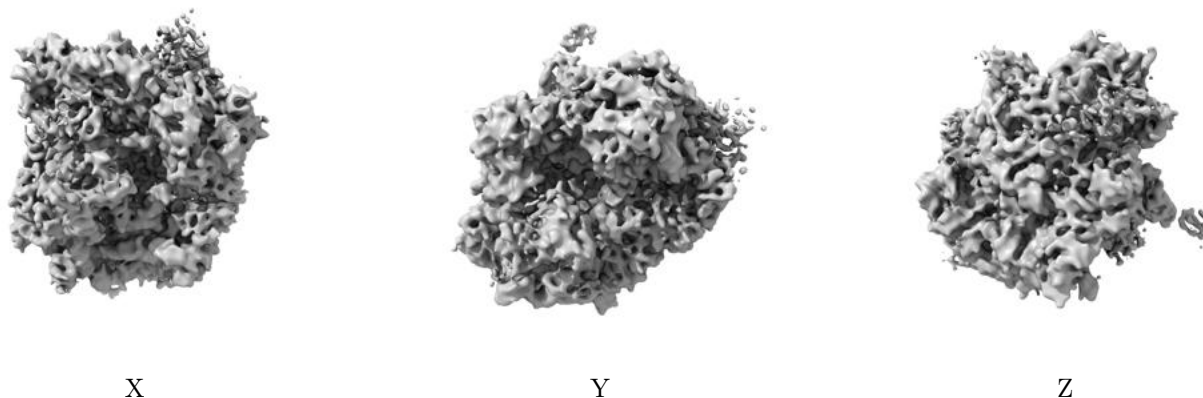


Z

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

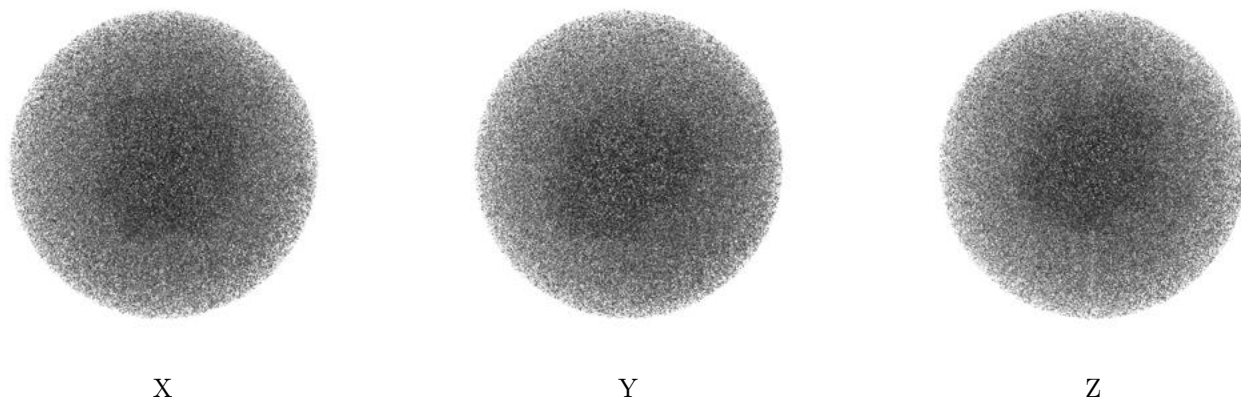
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

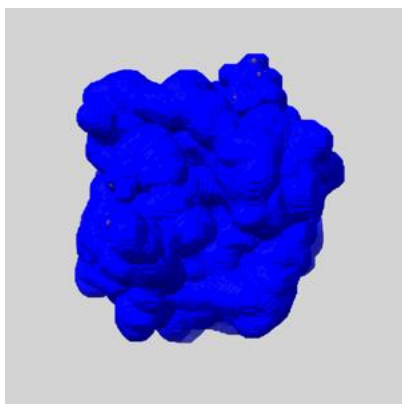
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

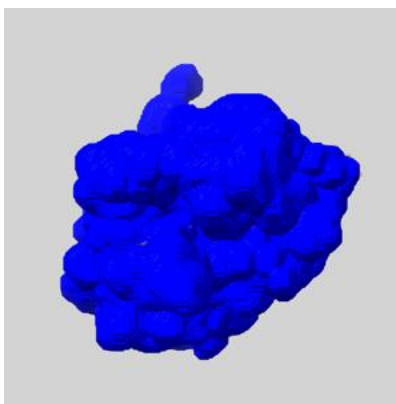
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

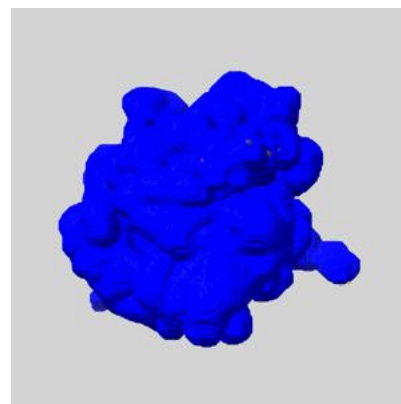
6.6.1 emd_13411_msk_1.map [i](#)



X



Y

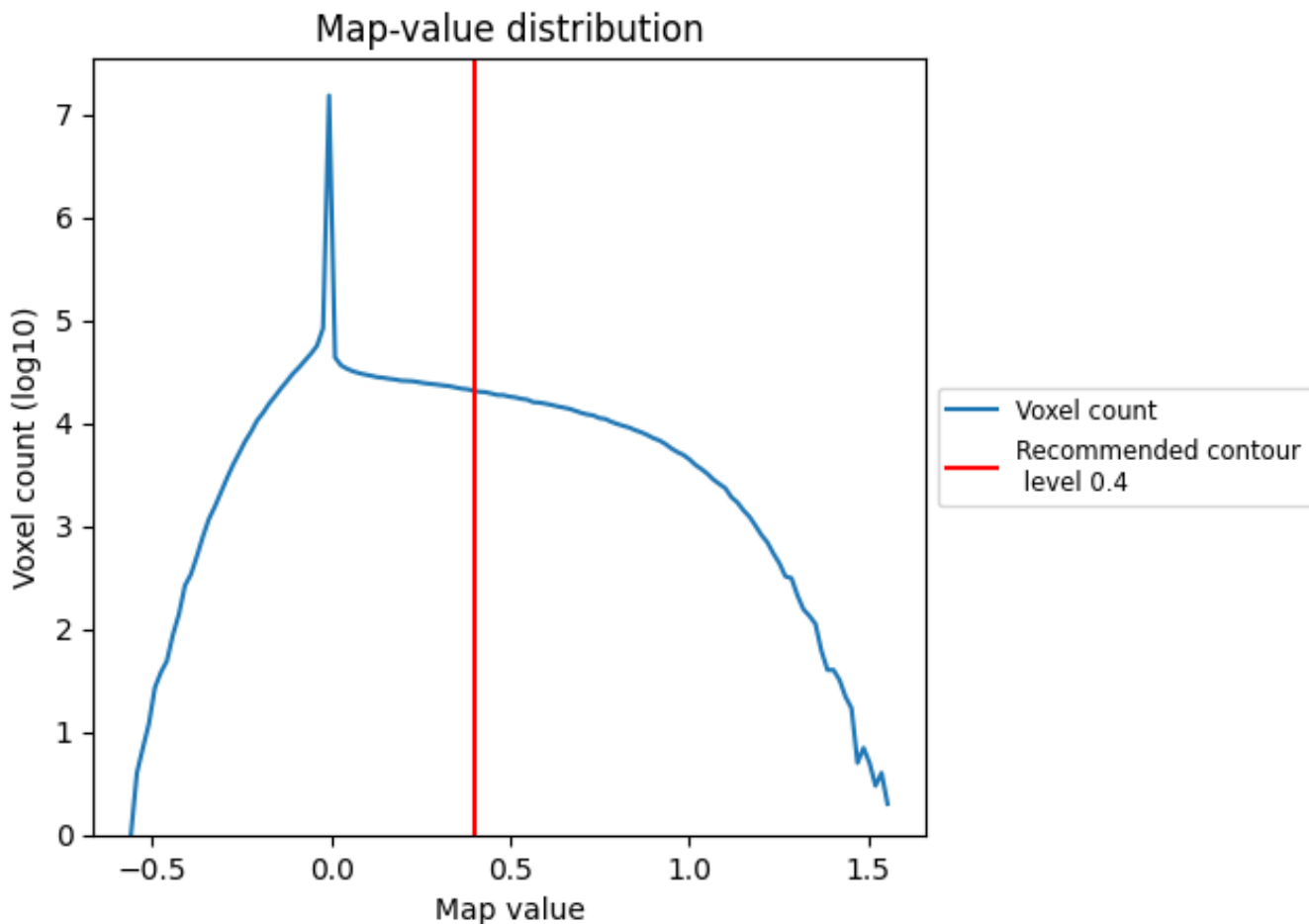


Z

7 Map analysis [i](#)

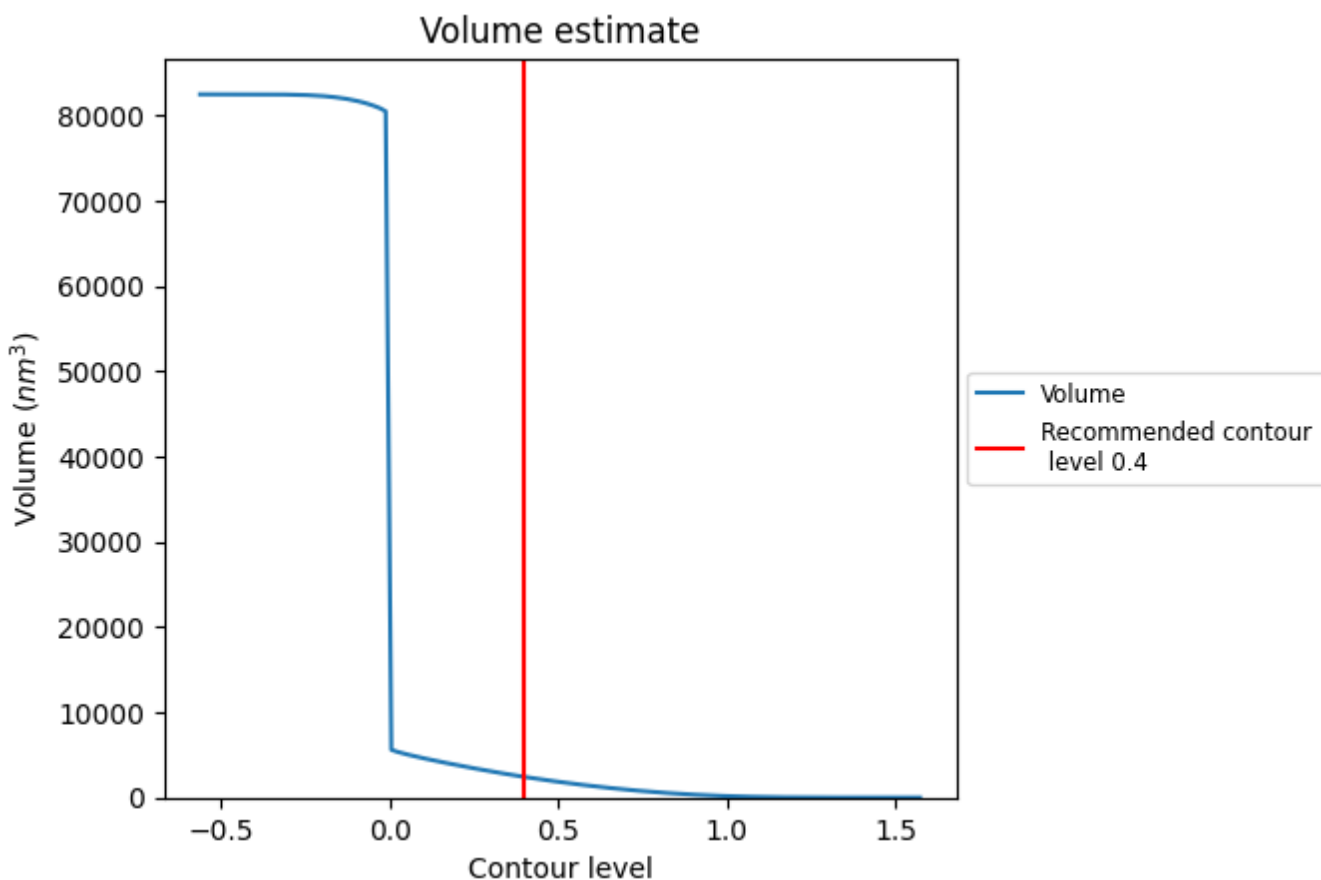
This section contains the results of statistical analysis of the map.

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.

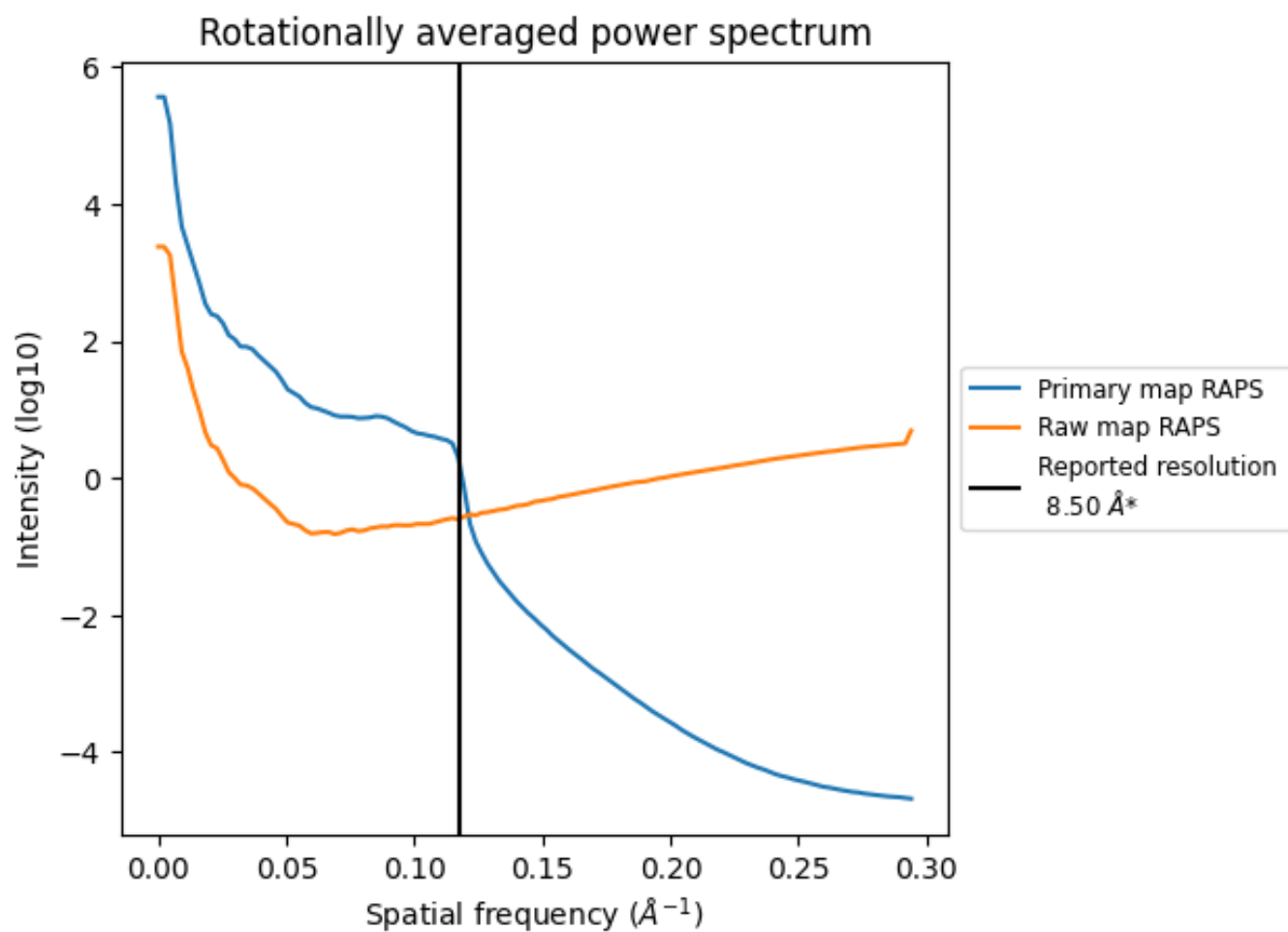
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2426 nm³; this corresponds to an approximate mass of 2192 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

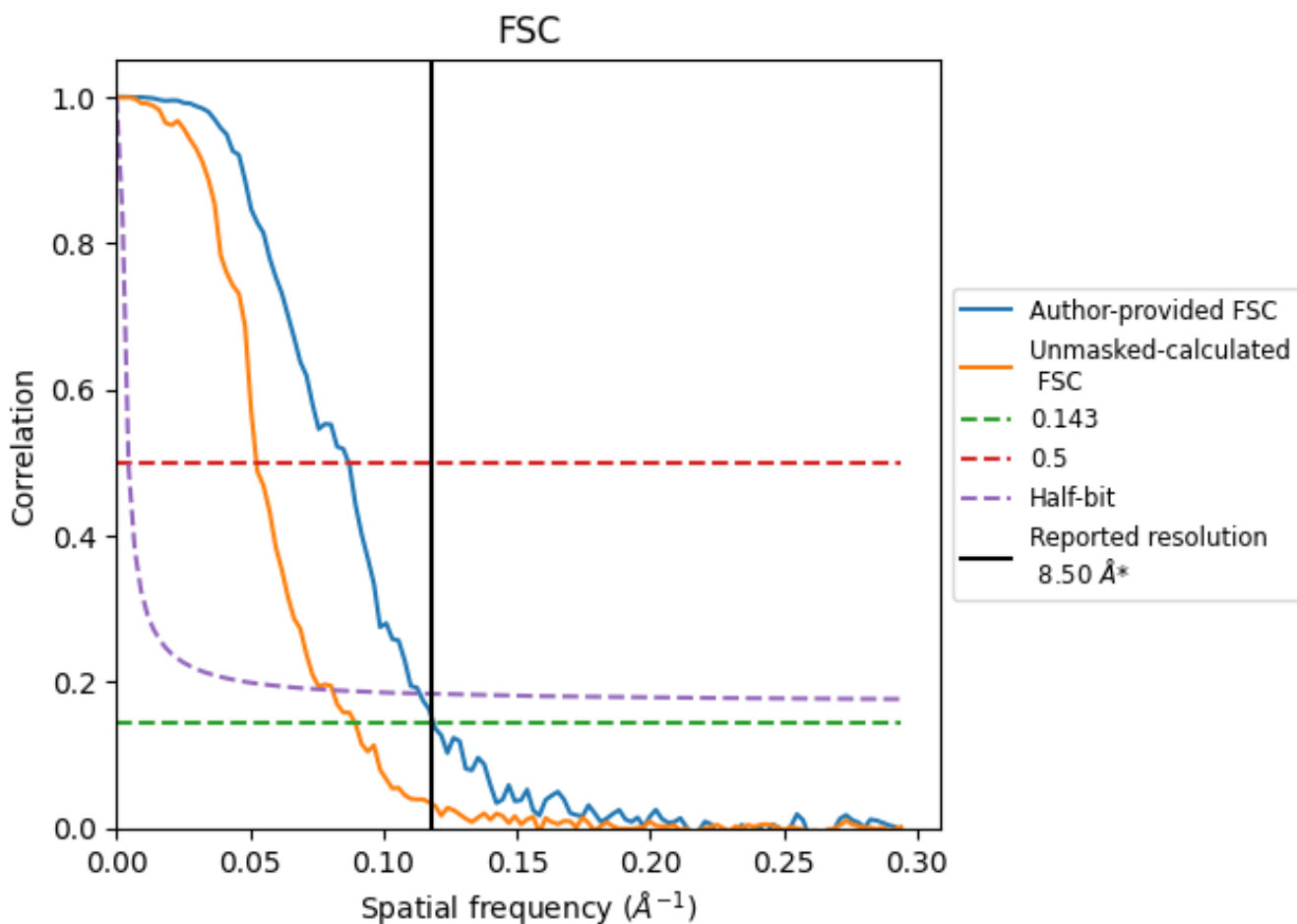


*Reported resolution corresponds to spatial frequency of 0.118 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.118 Å⁻¹

8.2 Resolution estimates [i](#)

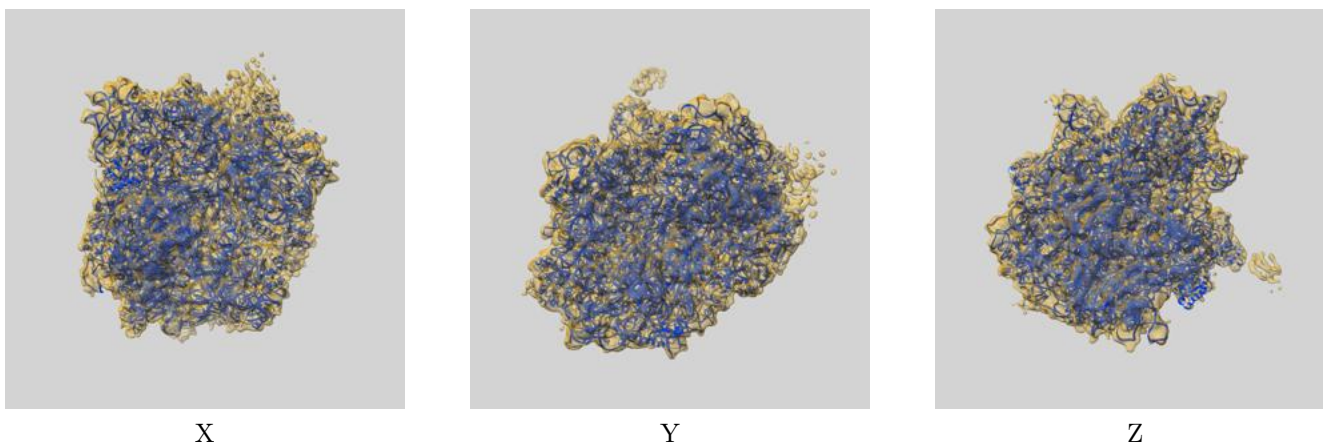
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	8.50	-	-
Author-provided FSC curve	8.42	11.49	8.80
Unmasked-calculated*	11.17	19.05	12.36

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 11.17 differs from the reported value 8.5 by more than 10 %

9 Map-model fit [i](#)

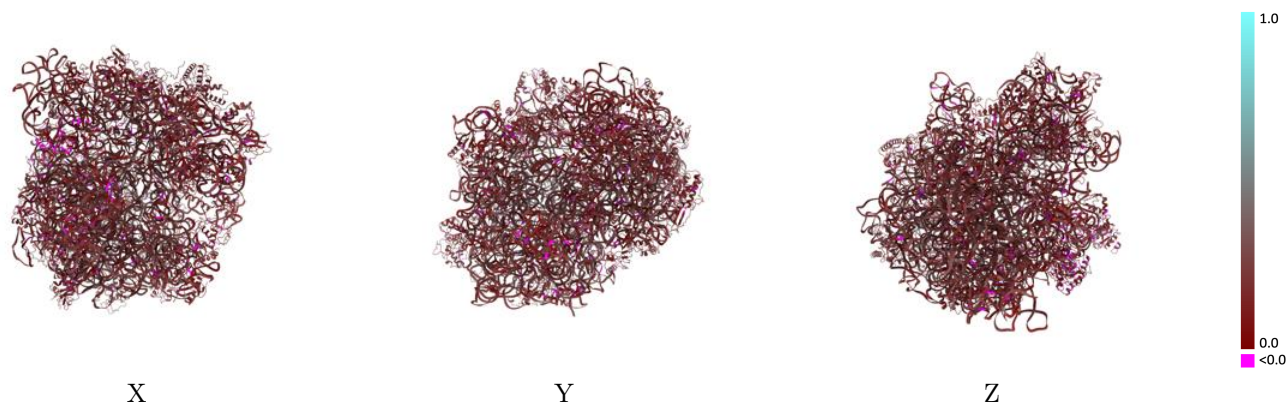
This section contains information regarding the fit between EMDB map EMD-13411 and PDB model 7PHA. Per-residue inclusion information can be found in section 3 on page 13.

9.1 Map-model overlay [i](#)



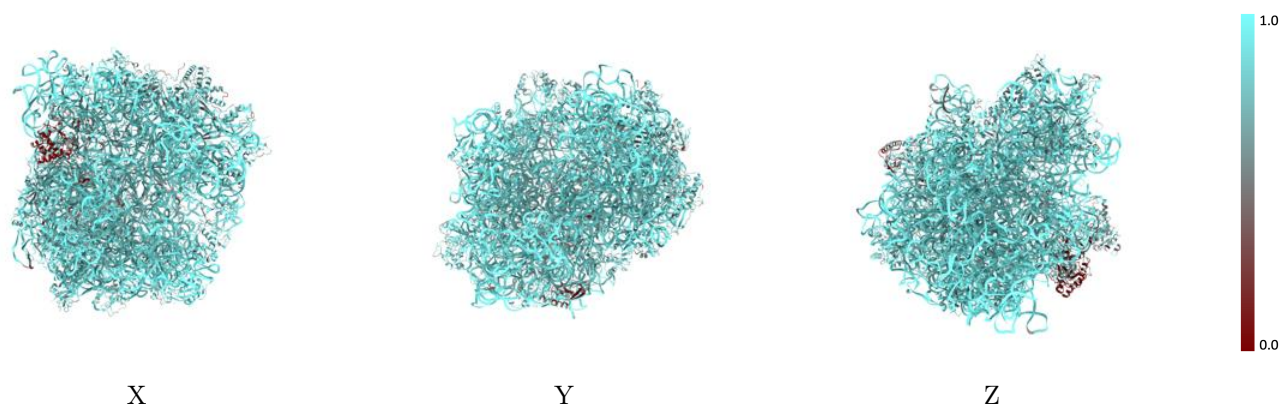
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



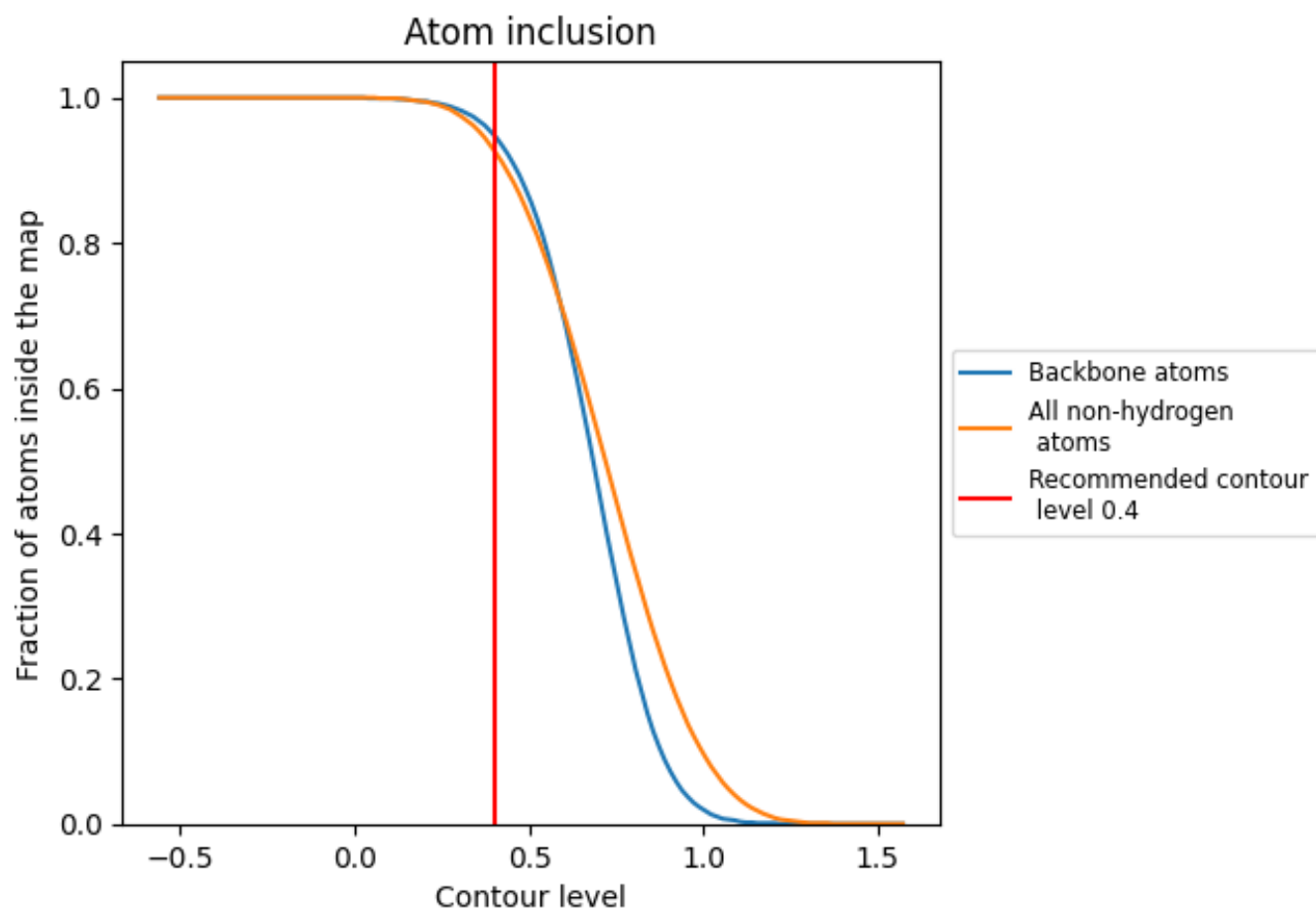
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.4).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 95% of all backbone atoms, 93% 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 (0.4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9270	 0.1960
0	 0.9200	 0.1720
1	 0.9030	 0.1840
2	 0.8550	 0.1370
3	 0.9860	 0.2050
4	 0.9920	 0.2070
5	 0.9890	 0.2070
6	 0.9250	 0.1850
7	 0.9820	 0.1980
9	 0.4360	 0.1500
A	 0.7930	 0.1990
B	 0.8220	 0.1960
C	 0.8350	 0.1790
D	 0.8090	 0.1730
E	 0.7780	 0.2010
F	 0.7950	 0.1730
G	 0.8190	 0.1700
H	 0.8700	 0.1730
I	 0.7800	 0.1650
J	 0.8320	 0.1610
K	 0.8750	 0.1840
L	 0.8480	 0.1860
M	 0.8920	 0.1450
N	 0.8140	 0.1920
O	 0.9050	 0.1770
P	 0.8540	 0.1810
Q	 0.8860	 0.1890
R	 0.8840	 0.1650
S	 0.9080	 0.1900
T	 0.8880	 0.2210
a	 0.8800	 0.1690
b	 0.8540	 0.1650
c	 0.8520	 0.1840
d	 0.8260	 0.1760
e	 0.8230	 0.1930



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Chain	Atom inclusion	Q-score
f	 0.4380	 0.1740
g	 0.7380	 0.1570
h	 0.6830	 0.1800
i	 0.9030	 0.1820
j	 0.8210	 0.1850
k	 0.8760	 0.1700
l	 0.8730	 0.1700
m	 0.8570	 0.1760
n	 0.8820	 0.1820
o	 0.7980	 0.1830
p	 0.9070	 0.1740
q	 0.8410	 0.1860
r	 0.9070	 0.1850
s	 0.8520	 0.1960
t	 0.7680	 0.1820
u	 0.8950	 0.1700
v	 0.9090	 0.1650
w	 0.8760	 0.2150
x	 0.8600	 0.2100
y	 0.9010	 0.1730
z	 0.9240	 0.1940