



## Full wwPDB EM Validation Report ⓘ

Apr 26, 2022 – 01:51 pm BST

PDB ID : 7PUB  
EMDB ID : EMD-13661  
Title : Late assembly intermediate of the Trypanosoma brucei mitoribosomal small subunit  
Authors : Lenarcic, T.; Leibundgut, M.; Saurer, M.; Ramrath, D.J.F.; Fluegel, T.; Boehringer, D.; Ban, N.  
Deposited on : 2021-09-29  
Resolution : 3.70 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

EMDB validation analysis : 0.0.1.dev7  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.28

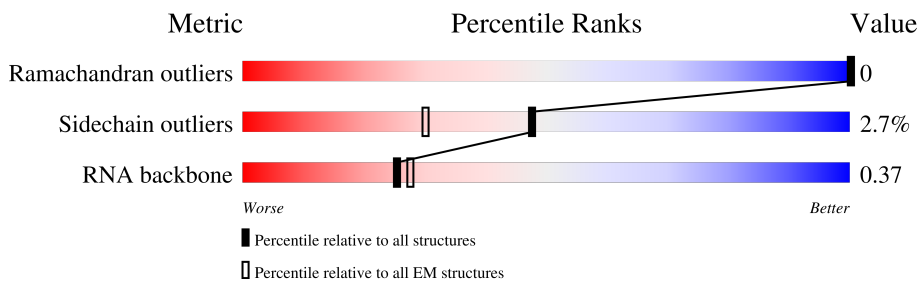
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.70 Å.

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



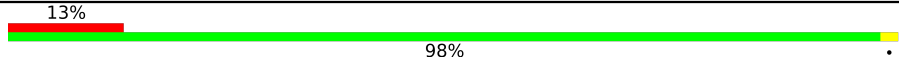
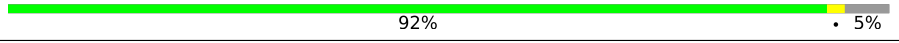

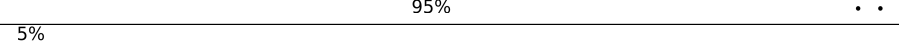
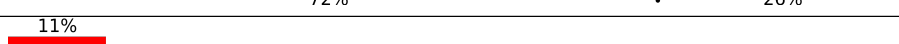
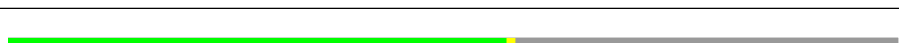
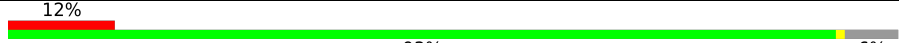
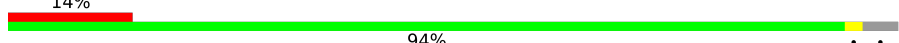


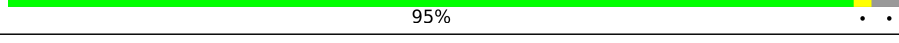
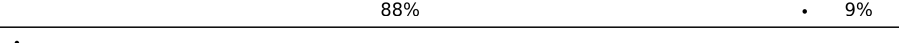
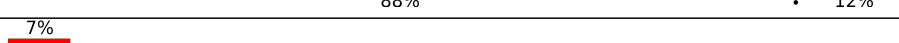



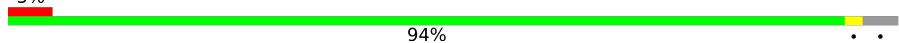



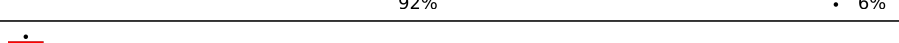
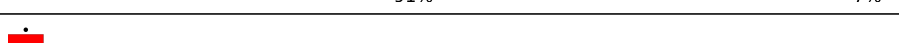



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . 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	CA	621	
2	CC	74	
3	CE	435	
4	CF	160	
5	CH	282	
6	CI	443	
7	CJ	817	
8	CK	326	

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Mol	Chain	Length	Quality of chain
9	CL	87	
10	CN	166	
11	CO	429	
12	CP	188	
13	CQ	307	
14	CR	320	
15	CS	244	
16	CU	193	
17	Ca	602	
18	Cb	325	
19	Cd	440	
20	Cg	498	
21	Ci	181	
22	Cj	257	
23	Ck	874	
24	Cm	215	
25	Cn	250	
26	Cp	187	
27	Cq	263	
28	Cr	439	
29	Cv	1211	
30	DA	1788	
31	DB	1181	
32	DC	1165	
33	DD	812	

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Mol	Chain	Length	Quality of chain
34	DE	747	77% 21%
35	DF	666	86% 12%
36	DG	631	85% 13%
37	DH	581	93%
38	DI	407	94% 5%
39	DJ	396	88% 10%
40	DK	324	78% 19% 5%
41	DL	307	93% 5% 14%
42	DM	294	99%
43	DN	293	84% 14%
44	DO	282	78% 22%
45	DP	274	74% 24%
46	DQ	268	92% 5% 7%
47	DR	270	89% 7%
48	DS	261	92% 7%
49	DT	247	92%
50	DU	228	91% 7% 10%
51	DV	183	84% 13%
52	DW	179	89% 10%
53	DX	169	80% 18%
54	DY	163	93% 6%
55	DZ	94	84% 13% 14%
56	Da	64	52% 47% 16%
57	F3	966	74% 26% 23%
58	F6	676	59% 38% 32%

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Mol	Chain	Length	Quality of chain
59	F7	679	55% 82% 15%
60	F9	608	6% 55% 44%
61	FO	334	5% 77% 20%
62	Ff	848	6% 70% 28%
63	Fg	550	8% 91% 7%
64	Fh	318	15% 84% 14%
65	Fi	629	14% 73% 25%
66	IA	787	5% 86% 12%
67	IB	803	5% 62% 36%
68	U6	21	48% 100%
68	UJ	21	10% 100%
69	U7	40	15% 100%
70	UE	53	19% 100%
71	UF	39	44% 100%
72	UG	13	15% 100%
73	UI	10	20% 100%
74	UK	3	100%
75	UL	20	20% 100%

## 2 Entry composition

There are 83 unique types of molecules in this entry. The entry contains 212864 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 9S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	CA	621	12330	5513	1927	4269	621	0	0

- Molecule 2 is a protein called uS3m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	CC	74	646	451	96	98	1	0	0

- Molecule 3 is a protein called Ribosomal\_S5\_C domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	CE	426	3459	2188	642	613	16	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CE	341	ARG	LYS	variant	UNP Q38AX6

- Molecule 4 is a protein called bS6m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	CF	149	1240	791	217	226	6	0	0

- Molecule 5 is a protein called 30S ribosomal protein S8, putative.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	CH	273	2228	1387	432	398	11	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CH	74	ASN	SER	variant	UNP Q388R7

- Molecule 6 is a protein called uS9m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	CI	427	3410	2148	615	630	17	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CI	370	ALA	VAL	variant	UNP Q57W62

- Molecule 7 is a protein called LysM domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	CJ	803	6535	4133	1152	1221	29	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CJ	311	LEU	TYR	variant	UNP Q57Z45
CJ	484	HIS	ARG	variant	UNP Q57Z45
CJ	488	SER	ASN	variant	UNP Q57Z45
CJ	629	ARG	LYS	variant	UNP Q57Z45

- Molecule 8 is a protein called uS11m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	CK	298	2447	1520	465	445	17	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CK	3	ARG	GLN	variant	UNP Q389T7
CK	138	UNK	ILE	conflict	UNP Q389T7

- Molecule 9 is a protein called uS12m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	CL	87	733	503	113	107	10	0	0

- Molecule 10 is a protein called uS14m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	CN	157	1322	843	251	220	8	0	0

- Molecule 11 is a protein called uS15m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	CO	308	2552	1615	476	448	13	0	0

- Molecule 12 is a protein called bS16m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	CP	180	1489	956	274	250	9	0	0

- Molecule 13 is a protein called 30S Ribosomal protein S17, putative.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	CQ	226	1866	1186	355	317	8	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CQ	138	ALA	VAL	variant	UNP Q38DP8

- Molecule 14 is a protein called bS18m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	CR	267	2210	1398	405	402	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
CR	8	ILE	VAL	variant	UNP Q38AS2



- Molecule 15 is a protein called uS19m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	CS	139	1149	743	205	195	6	0	0

- Molecule 16 is a protein called bS21m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	CU	181	1522	957	303	250	12	0	0

- Molecule 17 is a protein called mS22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Ca	575	4911	3146	875	867	23	0	0

- Molecule 18 is a protein called mS23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	Cb	252	2056	1300	368	380	8	0	0

- Molecule 19 is a protein called mS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	Cd	230	1961	1242	358	350	11	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Cd	299	UNK	GLY	conflict	UNP Q38DK6
Cd	364	UNK	GLY	conflict	UNP Q38DK6

- Molecule 20 is a protein called mS29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	Cg	480	3895	2494	682	699	20	0	0

- Molecule 21 is a protein called mS33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	Ci	164	1343	845	246	243	9	0	0

- Molecule 22 is a protein called mS34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	Cj	227	1799	1142	311	342	4	0	0

- Molecule 23 is a protein called mS35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	Ck	682	5442	3411	990	1016	25	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Ck	107	SER	LEU	variant	UNP Q387C7
Ck	144	PHE	LEU	variant	UNP Q387C7
Ck	253	TYR	PHE	variant	UNP Q387C7
Ck	339	GLU	VAL	variant	UNP Q387C7
Ck	815	GLY	ARG	variant	UNP Q387C7
Ck	871	GLY	GLU	variant	UNP Q387C7

- Molecule 24 is a protein called mS37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	Cm	145	1184	735	230	210	9	0	0

- Molecule 25 is a protein called mS38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	Cn	62	528	345	105	75	3	0	0

- Molecule 26 is a protein called Protein FYV4, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Cp	173	1466	928	265	268	5	0	0

- Molecule 27 is a protein called Superoxide dismutase, putative.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	Cq	252	2005	1285	342	369	9	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Cq	48	THR	ALA	variant	UNP Q586A1
Cq	167	MET	VAL	variant	UNP Q586A1

- Molecule 28 is a protein called Sod\_Fe\_C domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	Cr	267	2083	1317	382	369	15	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Cr	351	LYS	GLU	variant	UNP Q585I1

- Molecule 29 is a protein called ECH\_2 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Cv	1040	8404	5291	1508	1568	37	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Cv	1179	GLU	GLY	variant	UNP Q383R4

- Molecule 30 is a protein called mS48.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	DA	1552	12448	7861	2220	2329	38	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DA	1181	THR	ILE	variant	UNP Q57UJ2
DA	1333	ALA	VAL	variant	UNP Q57UJ2
DA	1700	ARG	HIS	variant	UNP Q57UJ2
DA	1761	LYS	ARG	variant	UNP Q57UJ2

- Molecule 31 is a protein called mS49.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	DB	1111	9148	5691	1717	1711	29	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DB	23	VAL	ALA	variant	UNP Q586P5
DB	359	ILE	THR	variant	UNP Q586P5
DB	384	GLN	HIS	variant	UNP Q586P5
DB	402	THR	ILE	variant	UNP Q586P5
DB	423	THR	ALA	variant	UNP Q586P5
DB	586	ARG	HIS	variant	UNP Q586P5
DB	593	ARG	LYS	variant	UNP Q586P5
DB	647	SER	GLY	variant	UNP Q586P5

- Molecule 32 is a protein called mS50.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	DC	1089	8709	5498	1538	1642	31	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DC	53	ALA	THR	variant	UNP Q57YB5
DC	365	LYS	GLU	variant	UNP Q57YB5
DC	385	THR	ALA	variant	UNP Q57YB5
DC	405	ILE	VAL	variant	UNP Q57YB5
DC	641	SER	PRO	variant	UNP Q57YB5
DC	651	LYS	GLU	variant	UNP Q57YB5
DC	731	GLU	ASP	variant	UNP Q57YB5
DC	814	GLN	HIS	variant	UNP Q57YB5
DC	1097	ALA	VAL	variant	UNP Q57YB5
DC	1113	THR	ILE	variant	UNP Q57YB5

- Molecule 33 is a protein called mS51.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	DD	790	6513	4121	1181	1170	41	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DD	371	PRO	SER	variant	UNP Q385L8
DD	599	ALA	VAL	variant	UNP Q385L8

- Molecule 34 is a protein called mS52.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	DE	588	4798	3052	868	859	19	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DE	378	UNK	LYS	variant	UNP Q386Q7
DE	384	UNK	THR	variant	UNP Q386Q7

- Molecule 35 is a protein called mS53.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	DF	589	4738	2974	895	844	25	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DF	18	THR	ALA	variant	UNP Q38ET1
DF	258	ASP	ASN	variant	UNP Q38ET1
DF	372	ASN	ASP	variant	UNP Q38ET1
DF	406	ASN	SER	variant	UNP Q38ET1
DF	510	ASP	GLY	variant	UNP Q38ET1
DF	577	ALA	VAL	variant	UNP Q38ET1
DF	636	UNK	GLY	conflict	UNP Q38ET1
DF	638	LYS	ARG	variant	UNP Q38ET1

- Molecule 36 is a protein called mS54.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	DG	552	4482	2820	818	813	31	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DG	428	ASN	SER	variant	UNP Q57ZP8
DG	429	GLY	SER	variant	UNP Q57ZP8

- Molecule 37 is a protein called mS55.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	DH	559	4541	2849	843	828	21	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DH	191	HIS	GLN	variant	UNP Q580V1
DH	194	PRO	ARG	variant	UNP Q580V1
DH	488	GLY	SER	variant	UNP Q580V1

- Molecule 38 is a protein called mS56.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	DI	390	3182	2020	554	594	14	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DI	92	GLU	GLY	variant	UNP Q587C2
DI	116	ASP	GLU	variant	UNP Q587C2

- Molecule 39 is a protein called mS57.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	DJ	357	2914	1858	512	530	14	0	0

- Molecule 40 is a protein called mS58.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	DK	263	2083	1312	374	392	5	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DK	61	SER	PRO	variant	UNP Q38BP1
DK	257	GLY	SER	variant	UNP Q38BP1

- Molecule 41 is a protein called mS59.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	DL	291	2360	1495	441	412	12	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DL	274	THR	ALA	variant	UNP Q38BS2

- Molecule 42 is a protein called mS60.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	DM	294	2430	1533	459	426	12	0	0

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DM	69	PHE	TYR	variant	UNP Q57XL2
DM	97	ASN	SER	variant	UNP Q57XL2
DM	138	SER	PRO	variant	UNP Q57XL2
DM	173	ALA	THR	variant	UNP Q57XL2
DM	206	ALA	THR	variant	UNP Q57XL2

- Molecule 43 is a protein called mS61.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	DN	253	2062	1313	374	365	10	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DN	51	GLY	SER	variant	UNP Q38D60

- Molecule 44 is a protein called mS62.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	DO	221	1796	1123	325	338	10	0	0

- Molecule 45 is a protein called mS63.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	DP	207	1760	1132	312	307	9	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DP	3	HIS	ARG	variant	UNP Q38F25

- Molecule 46 is a protein called AKAP7\_NLS domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	DQ	255	2055	1290	388	368	9	0	0

- Molecule 47 is a protein called mS65.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	DR	250	2019	1301	368	340	10	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DR	65	GLY	SER	variant	UNP Q57UA2
DR	94	GLY	GLU	variant	UNP Q57UA2
DR	128	PRO	SER	variant	UNP Q57UA2
DR	229	ARG	GLN	variant	UNP Q57UA2

- Molecule 48 is a protein called mS66.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	DS	243	1950	1216	364	356	14	0	0

- Molecule 49 is a protein called Rhodanese domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	DT	239	2058	1321	364	362	11	0	0

- Molecule 50 is a protein called Ubiquitin-like domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	DU	213	1754	1103	310	335	6	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DU	119	ILE	LEU	variant	UNP Q582T9
DU	152	ILE	VAL	variant	UNP Q582T9

- Molecule 51 is a protein called mS69.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	DV	160	1346	855	252	235	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DV	163	ALA	THR	variant	UNP Q57UZ6

- Molecule 52 is a protein called mS70.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	DW	161	1359	866	260	228	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DW	74	THR	MET	variant	UNP Q383N9

- Molecule 53 is a protein called mS71.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	DX	139	1174	747	223	197	7	0	0

- Molecule 54 is a protein called mS72.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	DY	154	1295	829	247	214	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
DY	34	HIS	ASP	variant	UNP Q57YD4

- Molecule 55 is a protein called mS73.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	DZ	82	697	457	113	123	4	0	0

- Molecule 56 is a protein called mS74.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	Da	34	305	193	67	43	2	0	0

- Molecule 57 is a protein called mt-SAF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	F3	252	2003	1259	354	378	12	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F3	44	THR	ALA	variant	UNP Q38E61
F3	190	VAL	ILE	variant	UNP Q38E61
F3	303	ALA	SER	variant	UNP Q38E61
F3	418	ASP	ASN	variant	UNP Q38E61

- Molecule 58 is a protein called mt-SAF6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	F6	416	3358	2124	580	636	18	0	0

- Molecule 59 is a protein called mt-SAF7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	F7	576	4584	2922	792	837	33	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F7	36	ILE	THR	variant	UNP Q57UW6
F7	470	GLU	LYS	variant	UNP Q57UW6
F7	474	VAL	ALA	variant	UNP Q57UW6

- Molecule 60 is a protein called mt-SAF9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	F9	342	2815	1736	530	539	10	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F9	117	ALA	SER	variant	UNP Q57YC0
F9	145	TYR	HIS	variant	UNP Q57YC0
F9	316	LYS	GLU	variant	UNP Q57YC0
F9	412	GLY	VAL	variant	UNP Q57YC0
F9	449	VAL	ALA	variant	UNP Q57YC0
F9	537	GLY	SER	variant	UNP Q57YC0

- Molecule 61 is a protein called mt-SAF22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	FO	267	2236	1407	432	385	12	0	0

- Molecule 62 is a protein called DNA photolyase, putative.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	Ff	614	4941	3135	885	898	23	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Ff	109	ALA	VAL	variant	UNP Q382U6
Ff	127	UNK	TYR	conflict	UNP Q382U6
Ff	138	GLN	ARG	variant	UNP Q382U6
Ff	200	CYS	SER	variant	UNP Q382U6
Ff	319	ALA	THR	variant	UNP Q382U6
Ff	334	ASN	THR	variant	UNP Q382U6
Ff	350	ILE	THR	variant	UNP Q382U6
Ff	362	ALA	VAL	variant	UNP Q382U6
Ff	844	THR	SER	variant	UNP Q382U6

- Molecule 63 is a protein called Acyl transferase-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	Fg	513	3994	2512	698	754	30	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Fg	90	LYS	ARG	variant	UNP Q38DK4
Fg	152	VAL	LEU	variant	UNP Q38DK4
Fg	159	ILE	VAL	variant	UNP Q38DK4
Fg	363	MET	ARG	variant	UNP Q38DK4
Fg	399	UNK	GLU	conflict	UNP Q38DK4
Fg	525	LYS	ARG	variant	UNP Q38DK4

- Molecule 64 is a protein called mt-SAF37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	Fh	274	2230	1384	420	411	15	0	0

- Molecule 65 is a protein called mt-SAF38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	Fi	469	3734	2363	683	665	23	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Fi	35	THR	SER	variant	UNP Q57ZP1
Fi	69	GLY	SER	variant	UNP Q57ZP1
Fi	185	PRO	HIS	variant	UNP Q57ZP1

- Molecule 66 is a protein called Translation initiation factor IF-2, putative.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	IA	693	5414	3397	972	1018	27	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
IA	373	LYS	GLU	variant	UNP Q57WE3
IA	451	ILE	VAL	variant	UNP Q57WE3
IA	584	ASN	SER	variant	UNP Q57WE3
IA	679	ASP	VAL	variant	UNP Q57WE3

- Molecule 67 is a protein called mt-SAF39.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	IB	511	4103	2561	764	760	18	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
IB	136	LYS	GLU	variant	UNP Q387Q6
IB	226	ASP	ASN	variant	UNP Q387Q6
IB	237	CYS	SER	variant	UNP Q387Q6
IB	259	THR	ARG	variant	UNP Q387Q6
IB	268	GLU	LYS	variant	UNP Q387Q6
IB	275	CYS	TYR	variant	UNP Q387Q6
IB	312	THR	SER	variant	UNP Q387Q6
IB	459	ASP	ALA	variant	UNP Q387Q6
IB	572	HIS	ARG	variant	UNP Q387Q6

- Molecule 68 is a protein called Unk.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
68	U6	21	105	63	21	21	0	0
68	UJ	21	105	63	21	21	0	0

- Molecule 69 is a protein called Unk7.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
69	U7	40	200	120	40	40	0	0

- Molecule 70 is a protein called UnkE.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
70	UE	53	265	159	53	53	0	0

- Molecule 71 is a protein called UnkF.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
71	UF	39	195	117	39	39	0	0

- Molecule 72 is a protein called UnkG.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
72	UG	13	65	39	13	13	0	0

- Molecule 73 is a protein called UnkI.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
73	UI	10	50	30	10	10	0	0

- Molecule 74 is a protein called UnkK.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
74	UK	3	15	9	3	3	0	0

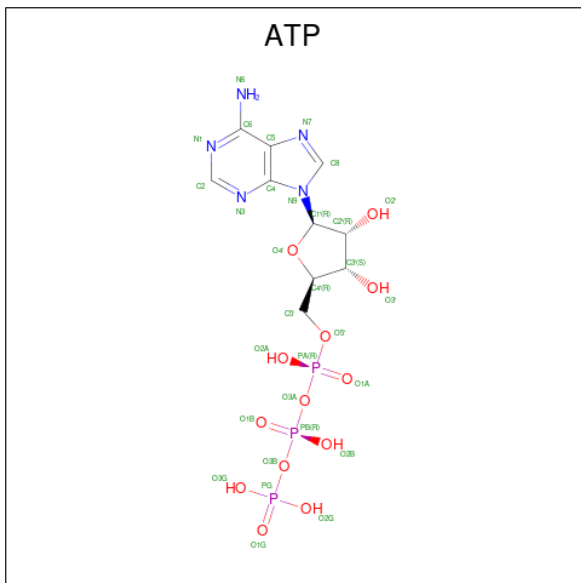
- Molecule 75 is a protein called UnkL.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
75	UL	20	100	60	20	20	0	0

- Molecule 76 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
76	CA	3	3	3	0
76	CQ	1	1	1	0
76	Cg	1	1	1	0
76	IA	1	1	1	0

- Molecule 77 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula:  $C_{10}H_{16}N_5O_{13}P_3$ ).

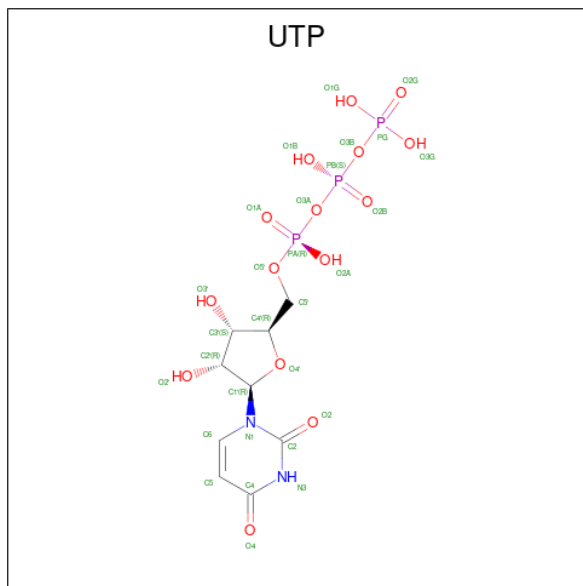


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
77	Cg	1	31	10	5	13	3	0

- Molecule 78 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
78	Cr	1	Total	Zn	0
			1	1	
78	DA	1	Total	Zn	0
			1	1	
78	DS	2	Total	Zn	0
			2	2	

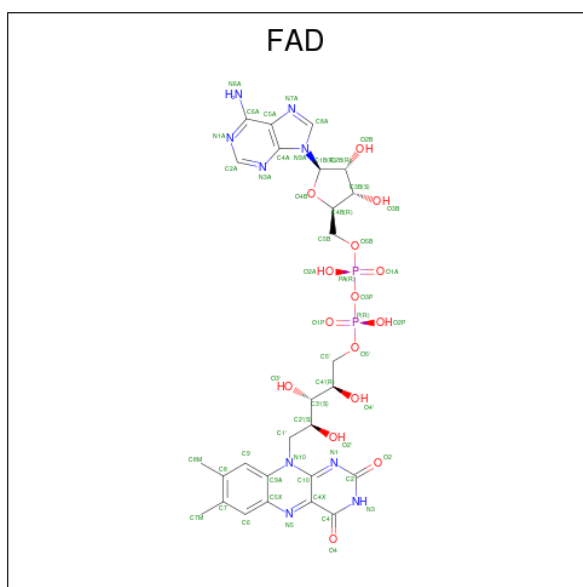
- Molecule 79 is URIDINE 5'-TRIPHOSPHATE (three-letter code: UTP) (formula: C<sub>9</sub>H<sub>15</sub>N<sub>2</sub>O<sub>15</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
79	DJ	1	29	9	2	15	3	0

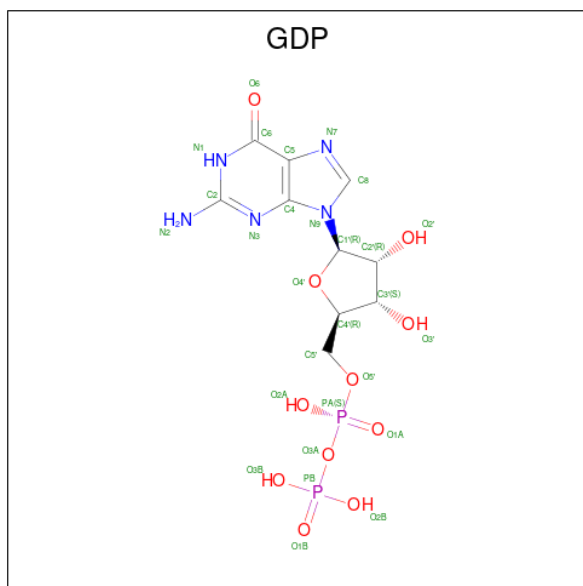
- Molecule 80 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: C<sub>27</sub>H<sub>33</sub>N<sub>9</sub>O<sub>15</sub>P<sub>2</sub>).





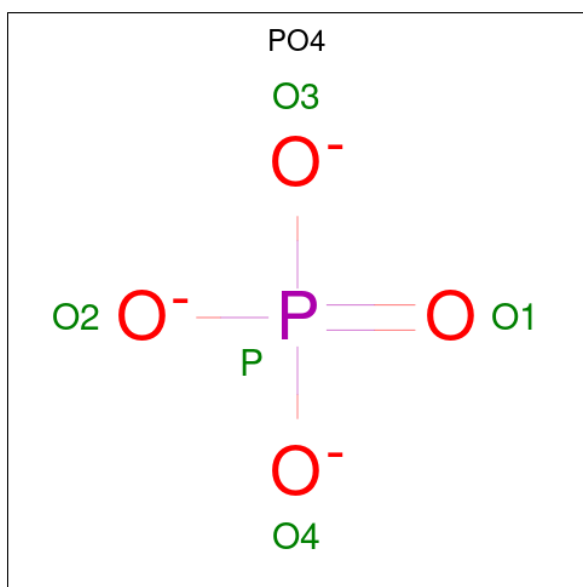
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
80	Ff	1	53	27	9	15	2	0

- Molecule 81 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula:  $C_{10}H_{15}N_5O_{11}P_2$ ).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
81	IA	1	28	10	5	11	2	0

- Molecule 82 is PHOSPHATE ION (three-letter code: PO4) (formula:  $O_4P$ ).



Mol	Chain	Residues	Atoms			AltConf
			Total	O	P	
82	IA	1	5	4	1	0

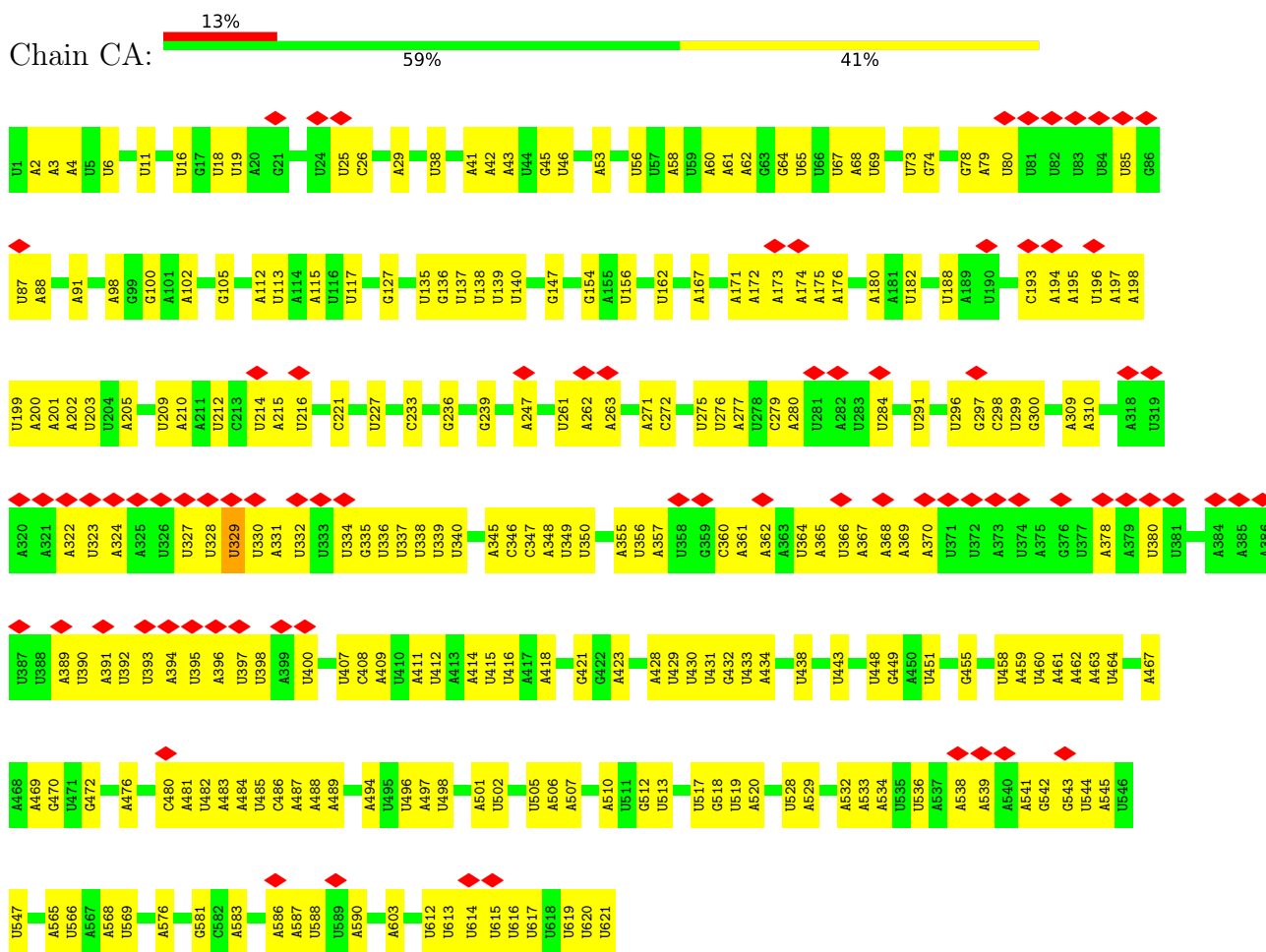
- Molecule 83 is water.

Mol	Chain	Residues	Atoms		AltConf
			Total	O	
83	Cg	3	3	3	0
83	IA	2	2	2	0

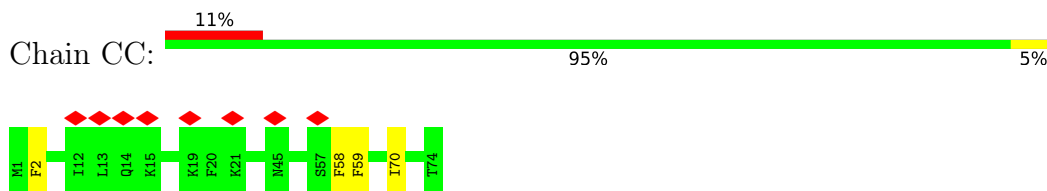
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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.

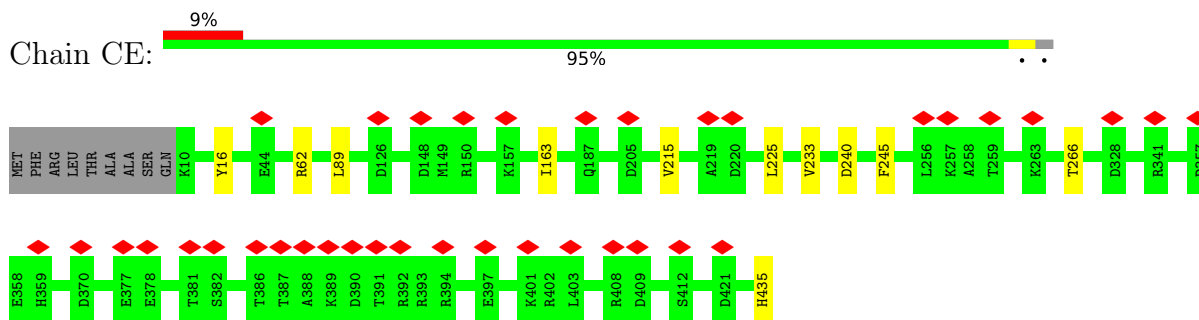
- Molecule 1: 9S rRNA



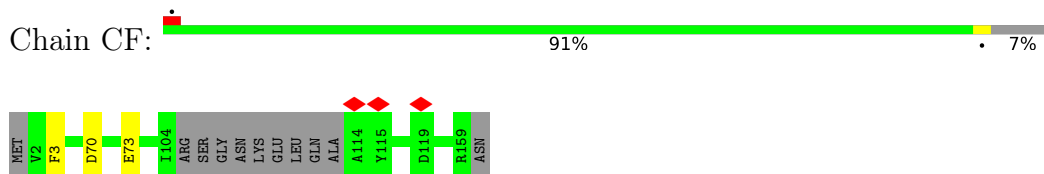
- Molecule 2: uS3m



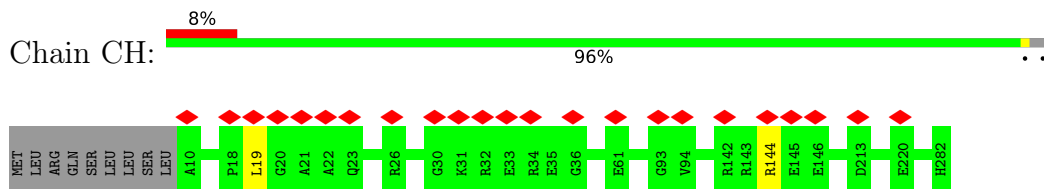
- Molecule 3: Ribosomal\_S5\_C domain-containing protein



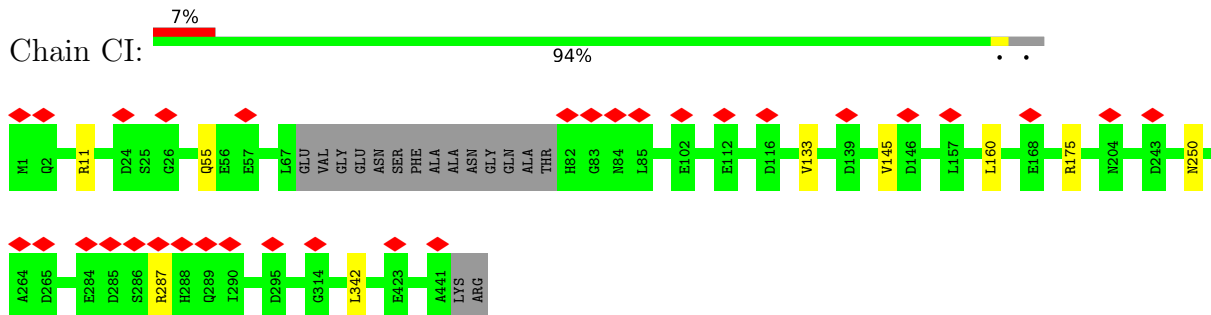
- Molecule 4: bS6m



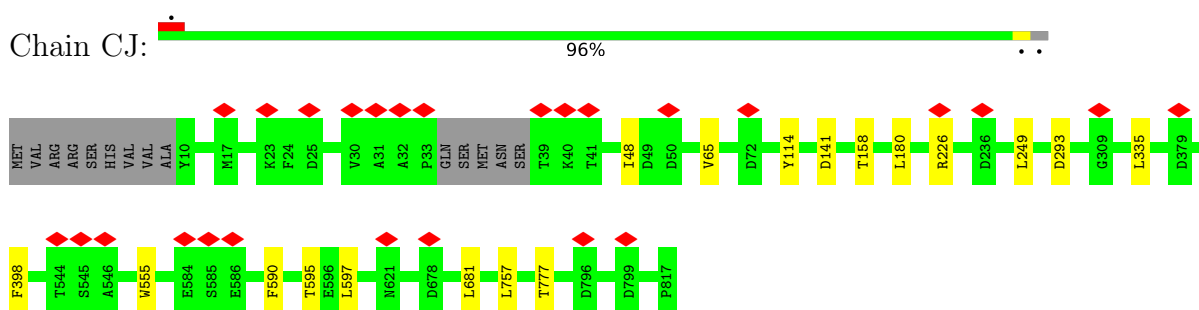
- Molecule 5: 30S ribosomal protein S8, putative



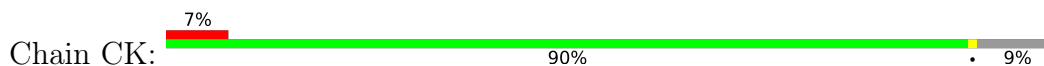
- Molecule 6: uS9m



- Molecule 7: LysM domain-containing protein



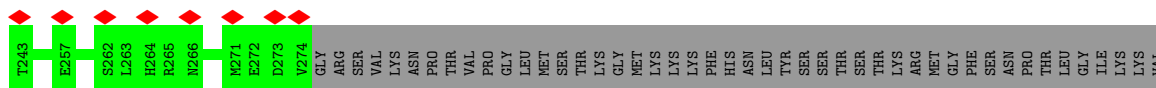
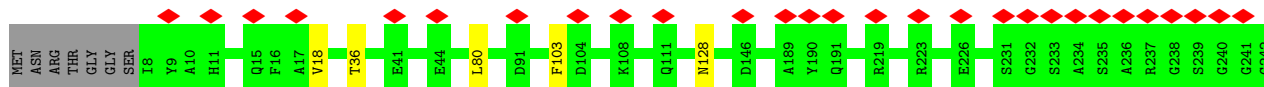
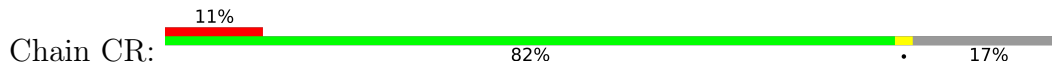
- Molecule 8: uS11m



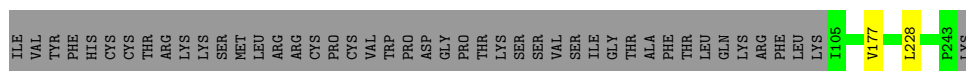
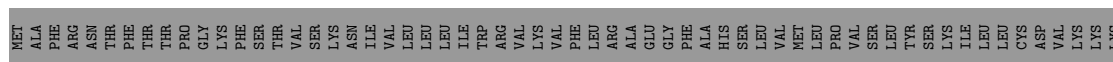


ASN ALA PRO THR ALA ALA LEU ASP ALA SER ASP SER PRO PRO LEU ASP ARG GLY TYR THR VAL VAL GLU GLN ASP THR ARG ASN LYS LYS ASP ASP TYR TRP MET ASN LEU GLN PRO LYS GLU LYS TYR ASP PHE LYS SER PHE LYS SER PRO

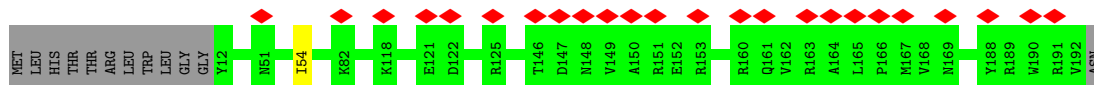
- Molecule 14: bS18m



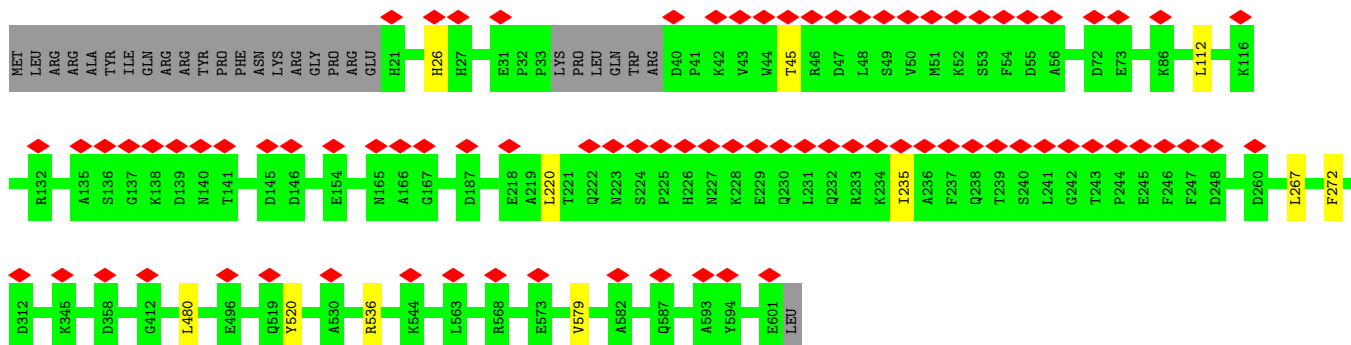
- Molecule 15: uS19m



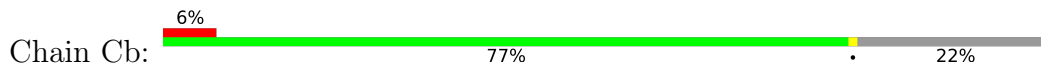
- Molecule 16: bS21m

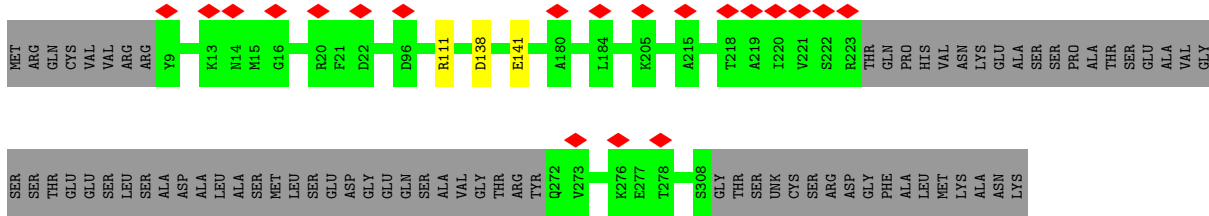


- Molecule 17: mS22

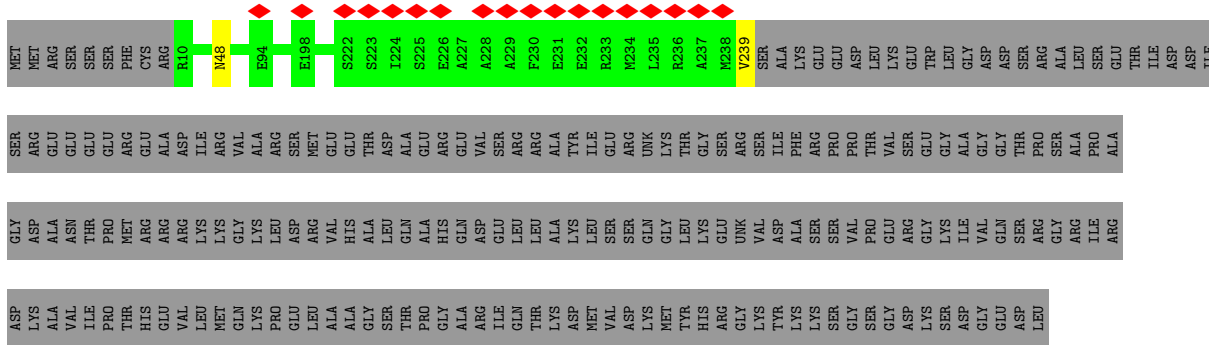


- Molecule 18: mS23





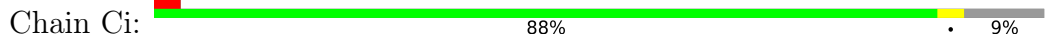
● Molecule 19: mS26



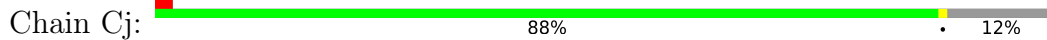
● Molecule 20: mS29



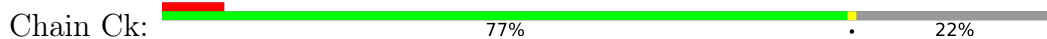
● Molecule 21: mS33



● Molecule 22: mS34

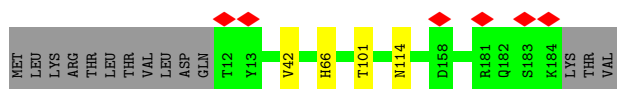
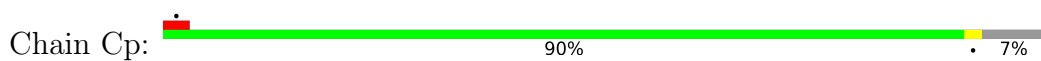


● Molecule 23: mS35

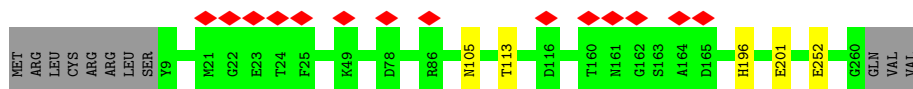




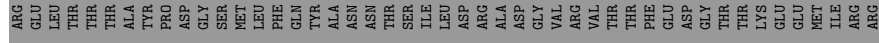
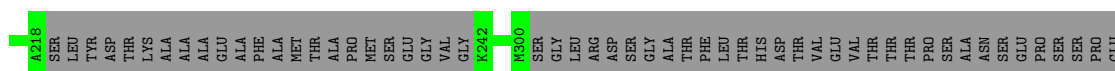
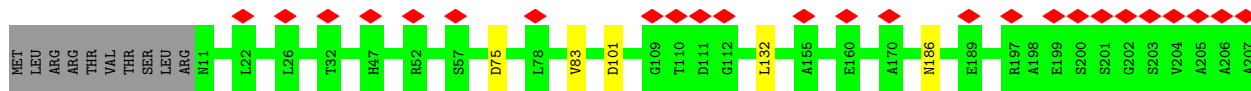




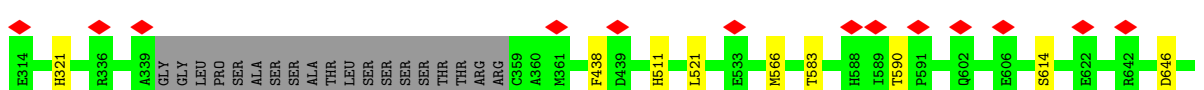
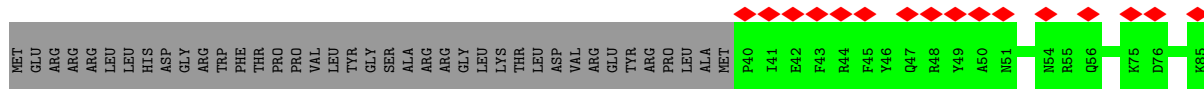
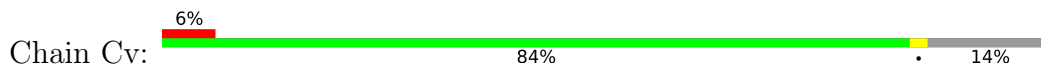
• Molecule 27: Superoxide dismutase, putative

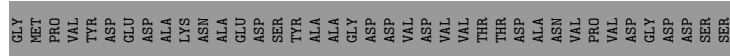
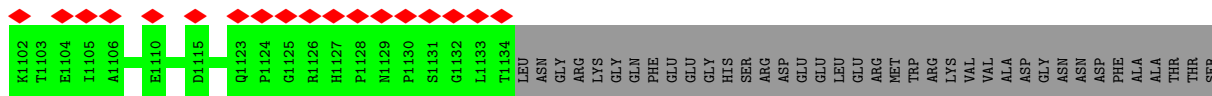


• Molecule 28: Sod\_Fe\_C domain-containing protein

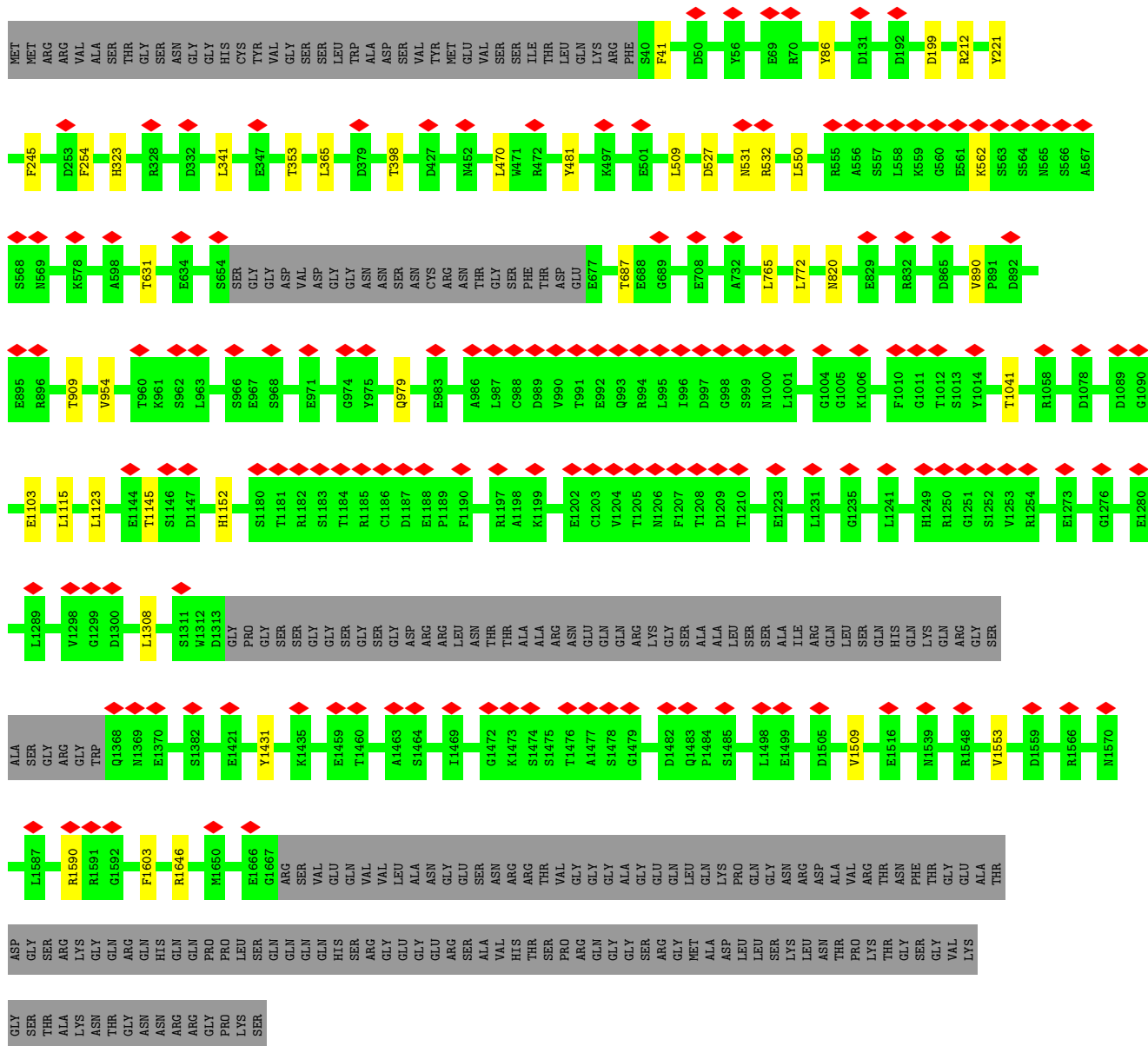
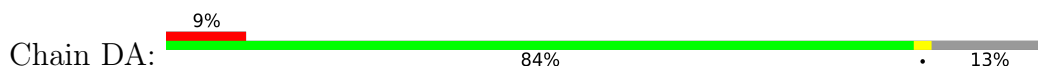


• Molecule 29: ECH\_2 domain-containing protein



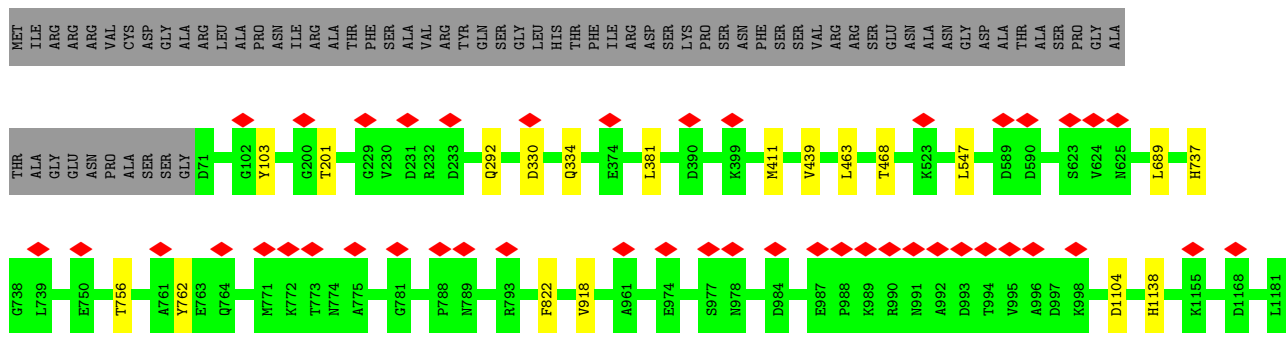


• Molecule 30: mS48

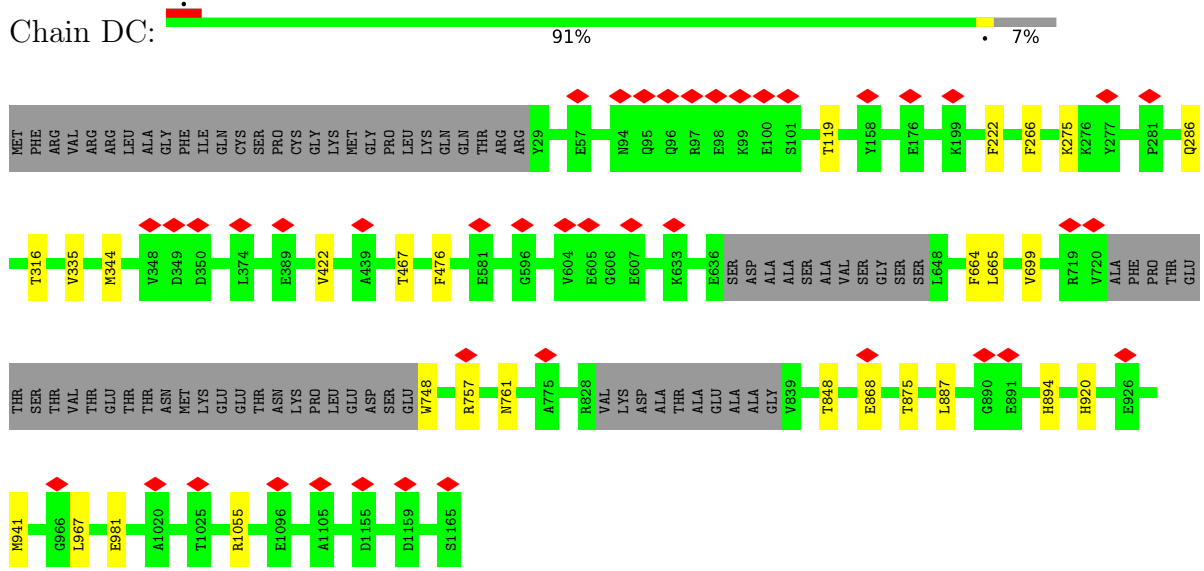


• Molecule 31: mS49

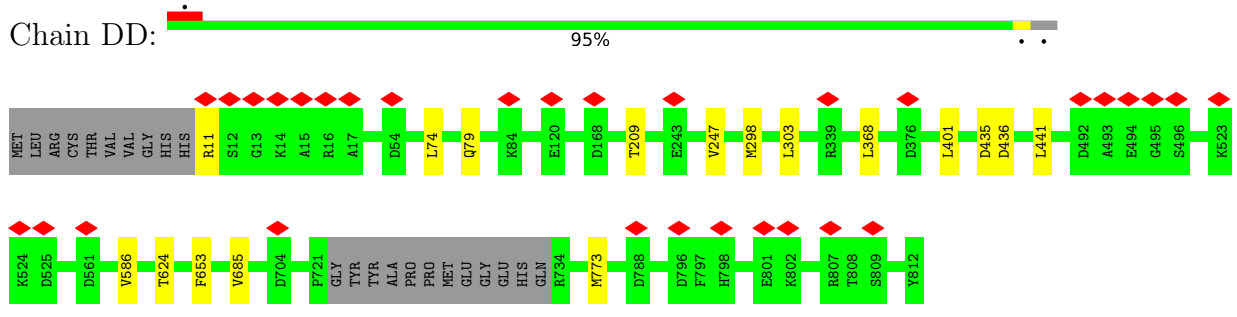




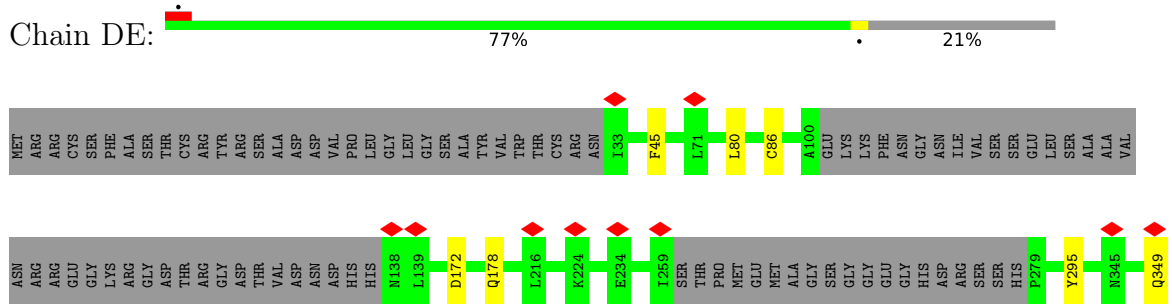
• Molecule 32: mS50

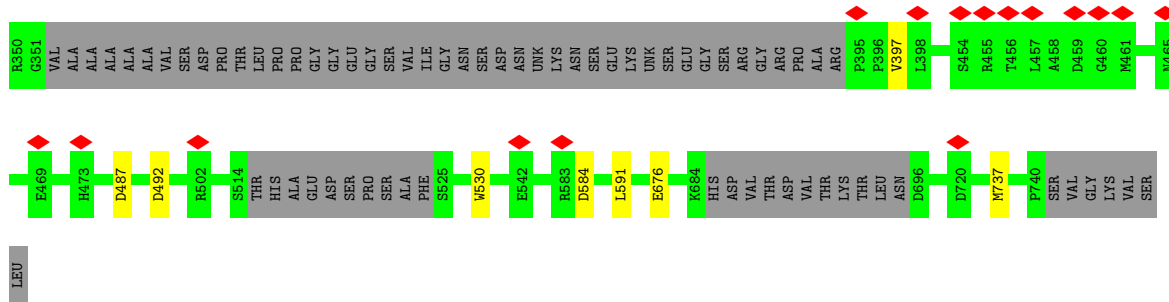


• Molecule 33: mS51

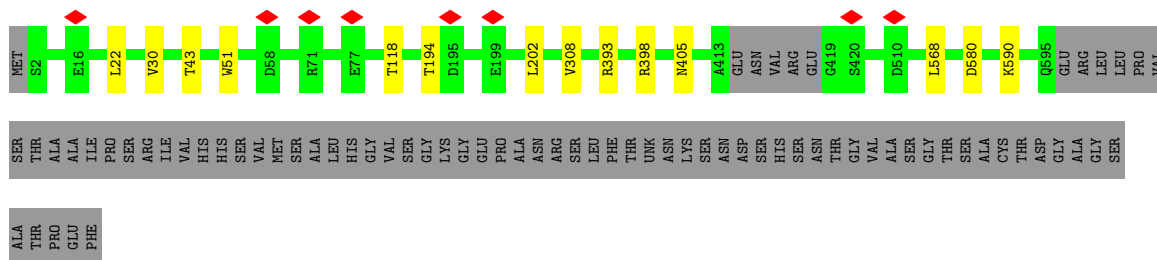
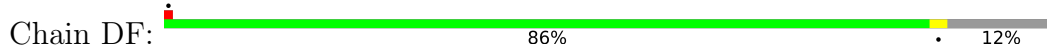


• Molecule 34: mS52

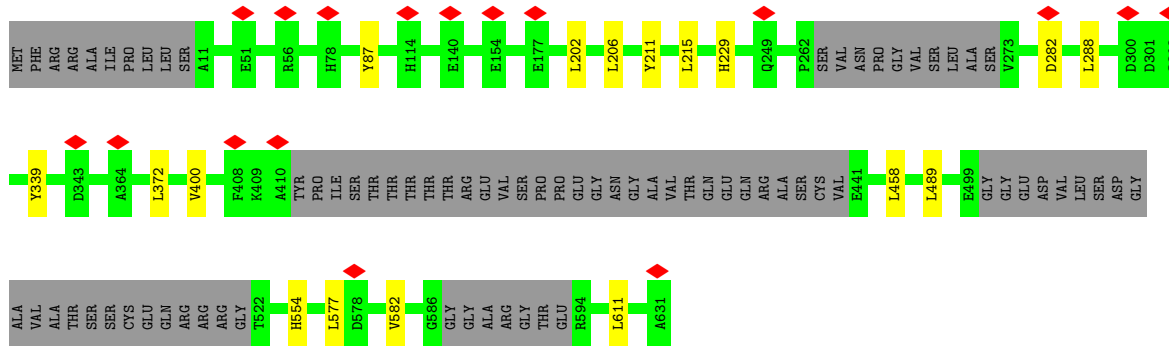
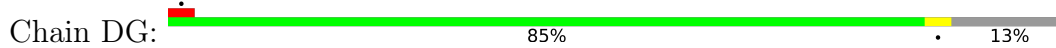




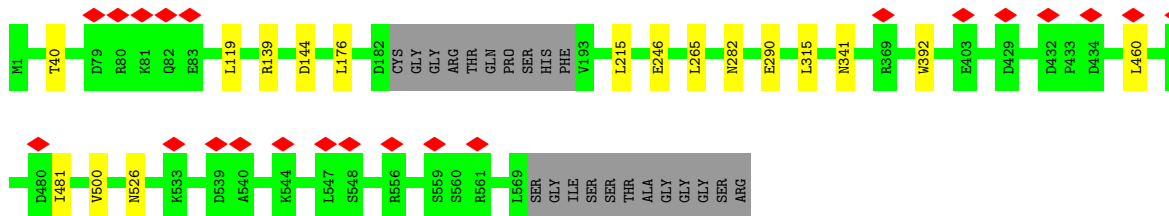
• Molecule 35: mS53



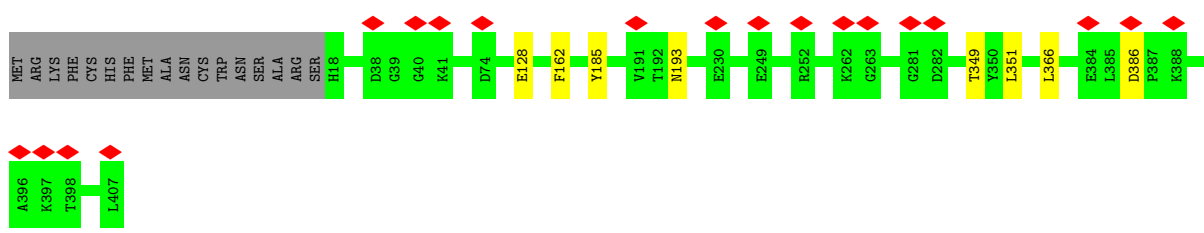
• Molecule 36: mS54



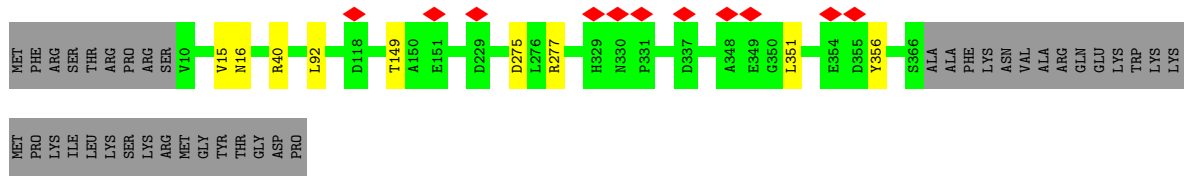
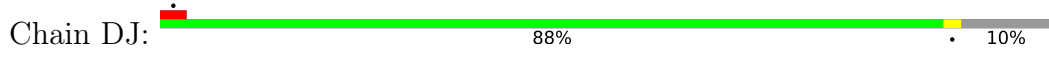
• Molecule 37: mS55



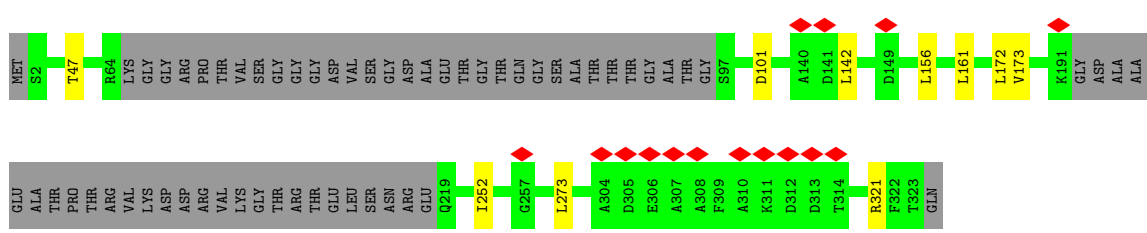
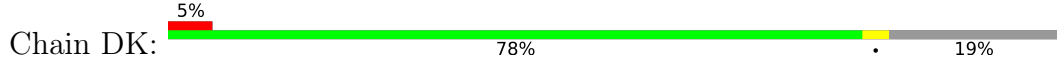
• Molecule 38: mS56



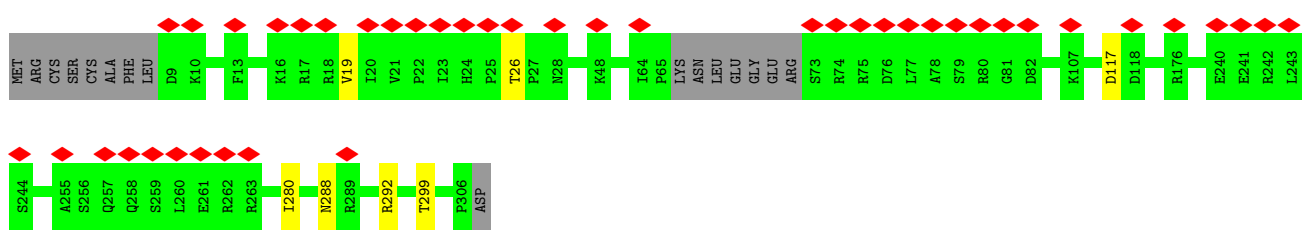
• Molecule 39: mS57



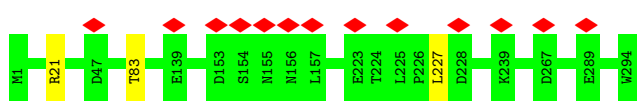
• Molecule 40: mS58



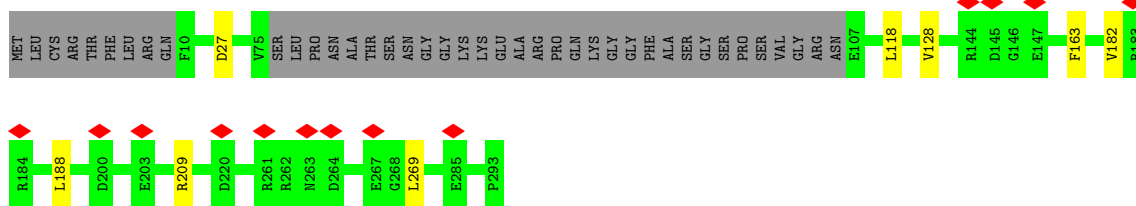
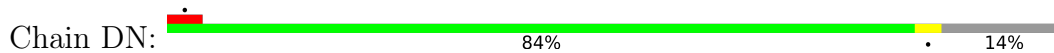
• Molecule 41: mS59



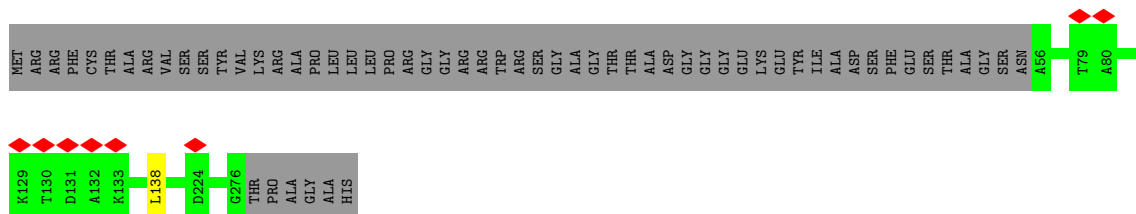
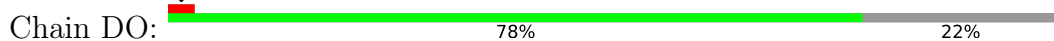
• Molecule 42: mS60



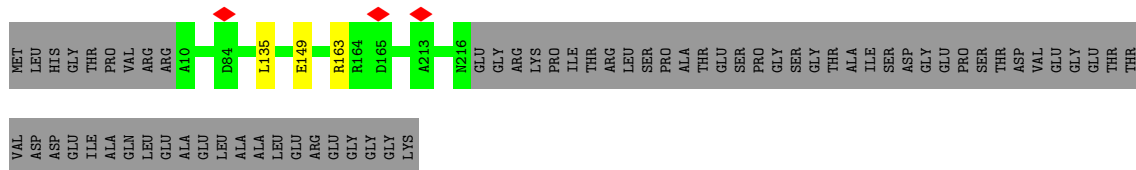
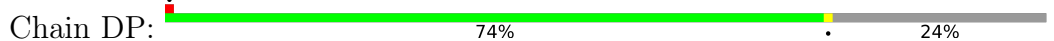
• Molecule 43: mS61



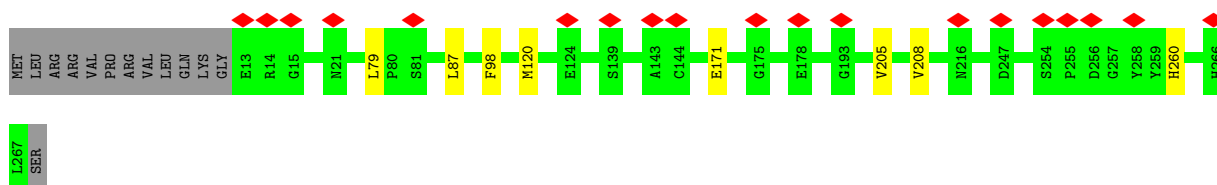
• Molecule 44: mS62



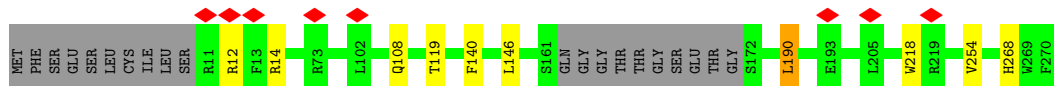
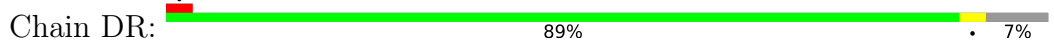
• Molecule 45: mS63



• Molecule 46: AKAP7\_NLS domain-containing protein

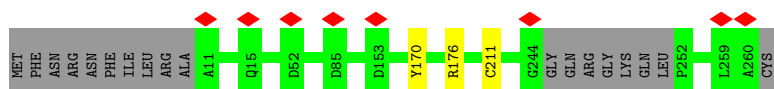


• Molecule 47: mS65



• Molecule 48: mS66

Chain DS:  92% 7%




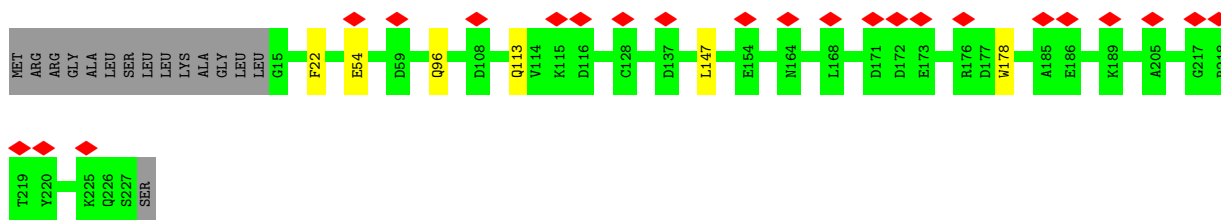
- Molecule 49: Rhodanese domain-containing protein

Chain DT:  92% 7%




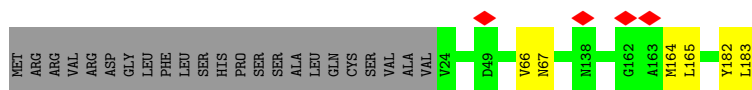
- Molecule 50: Ubiquitin-like domain-containing protein

Chain DU:  10% 91% 7%



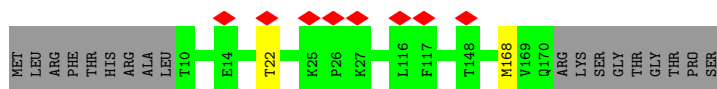
- Molecule 51: mS69

Chain DV:  84% 13%




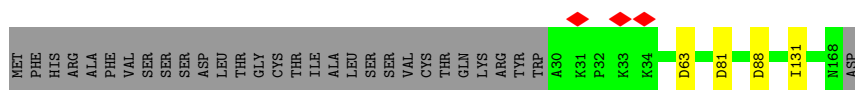
- Molecule 52: mS70

Chain DW:  89% 10%



- Molecule 53: mS71

Chain DX:  80% 18%

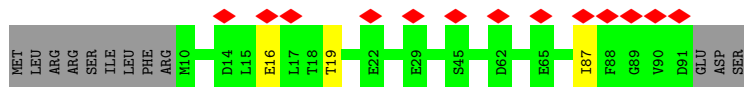
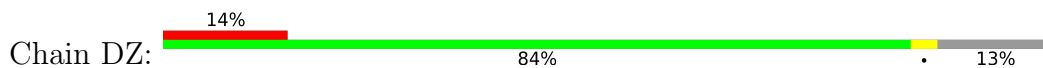


- Molecule 54: mS72

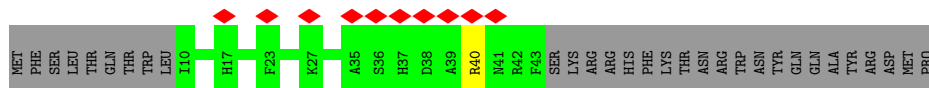
Chain DY:  93% 6%



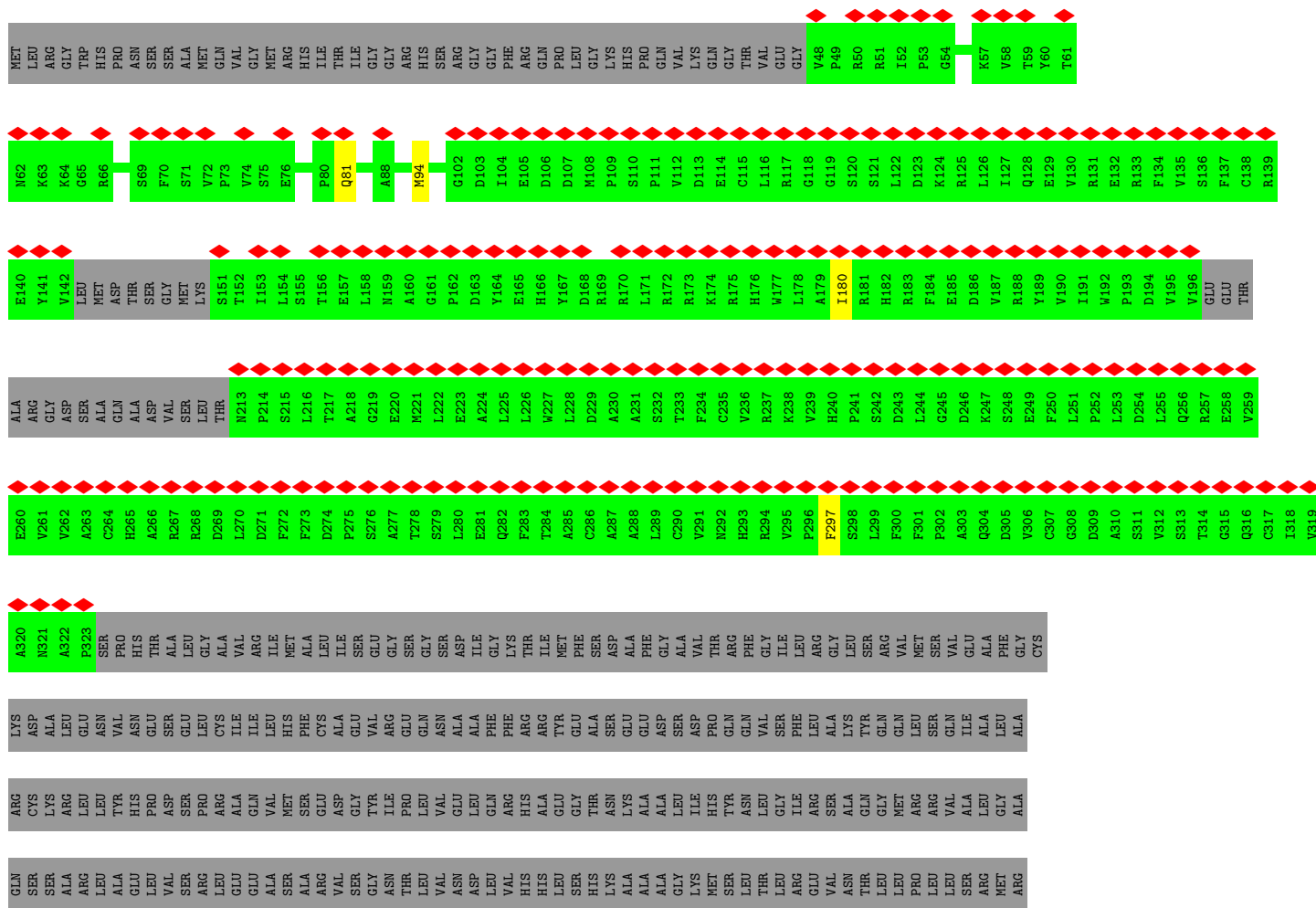
• Molecule 55: mS73



• Molecule 56: mS74



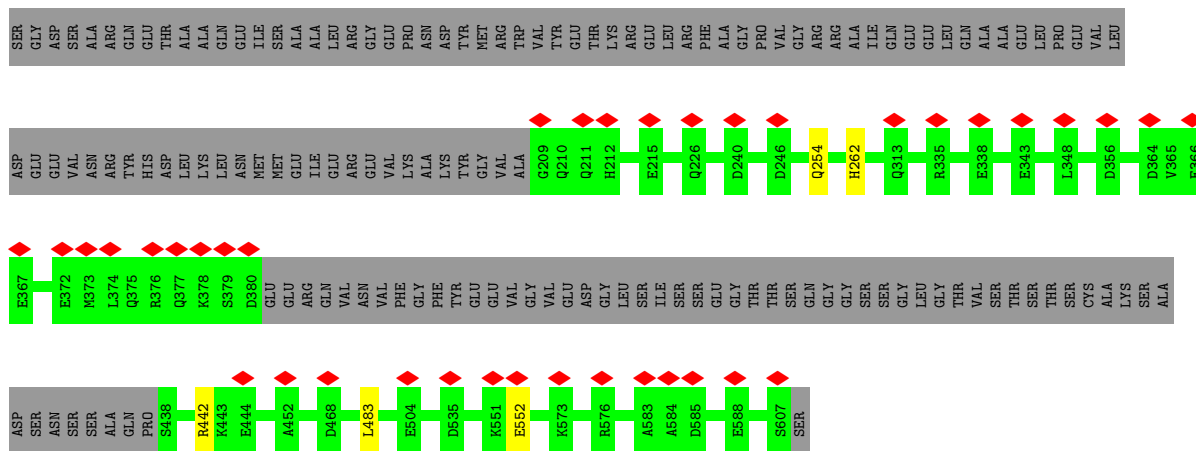
• Molecule 57: mt-SAF3



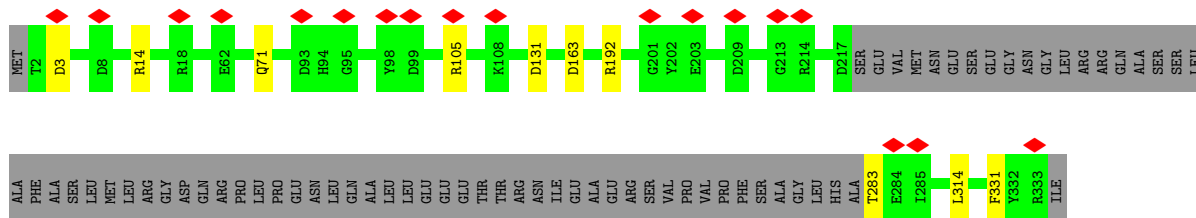
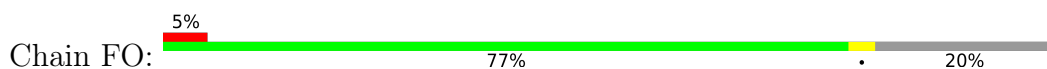




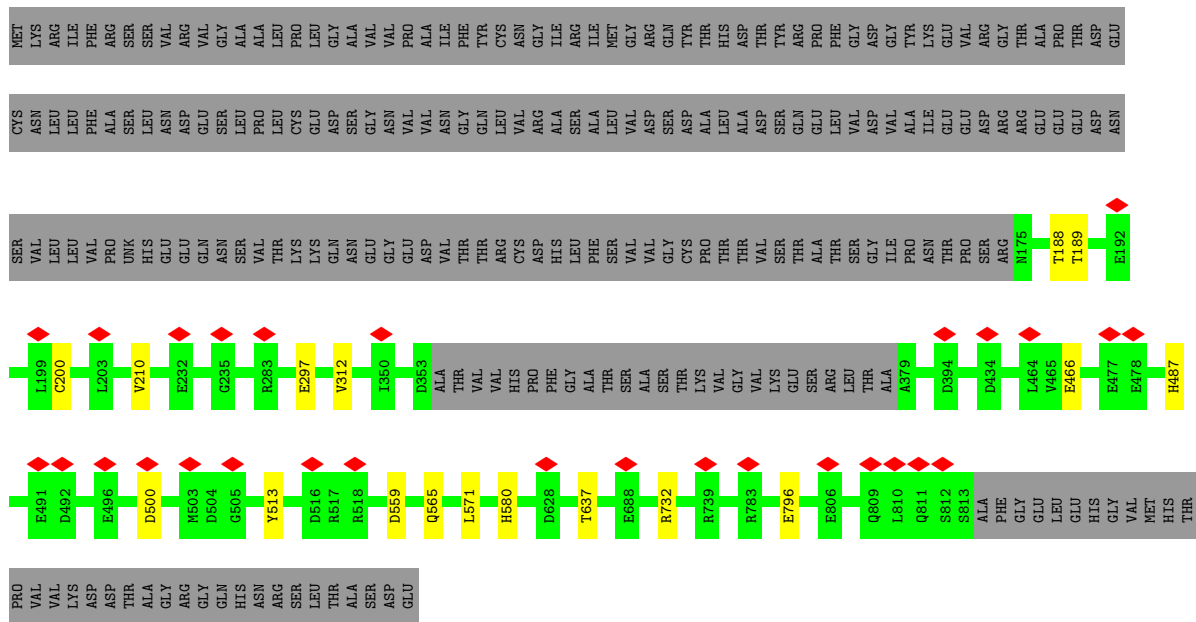




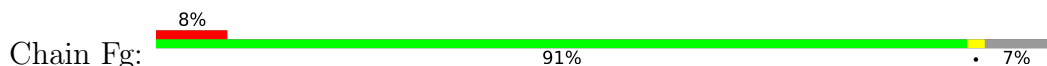
• Molecule 61: mt-SAF22

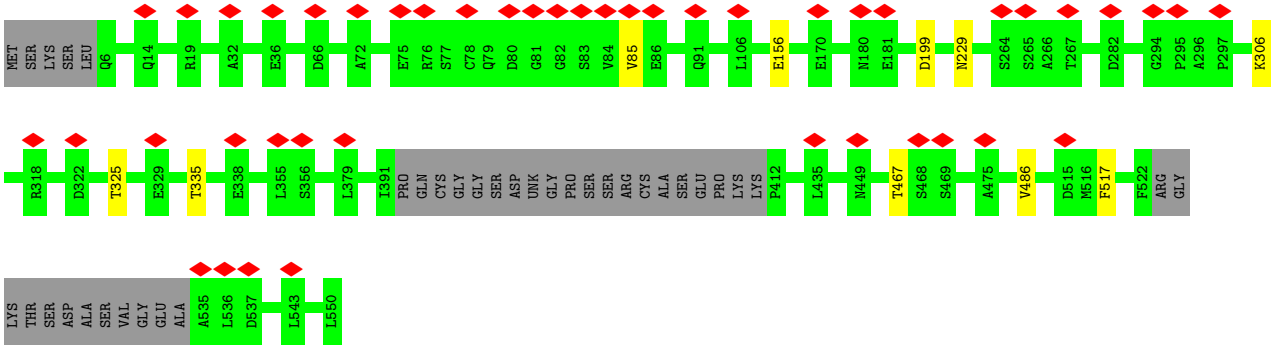


• Molecule 62: DNA photolyase, putative

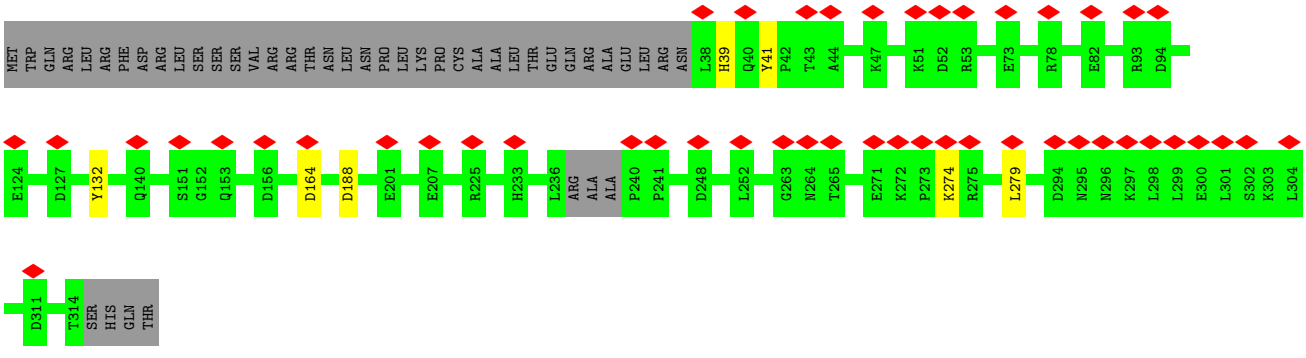
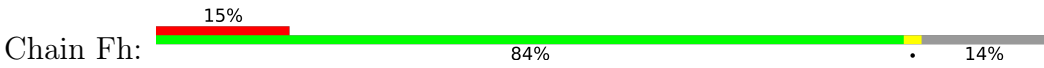


• Molecule 63: Acyl transferase-like protein

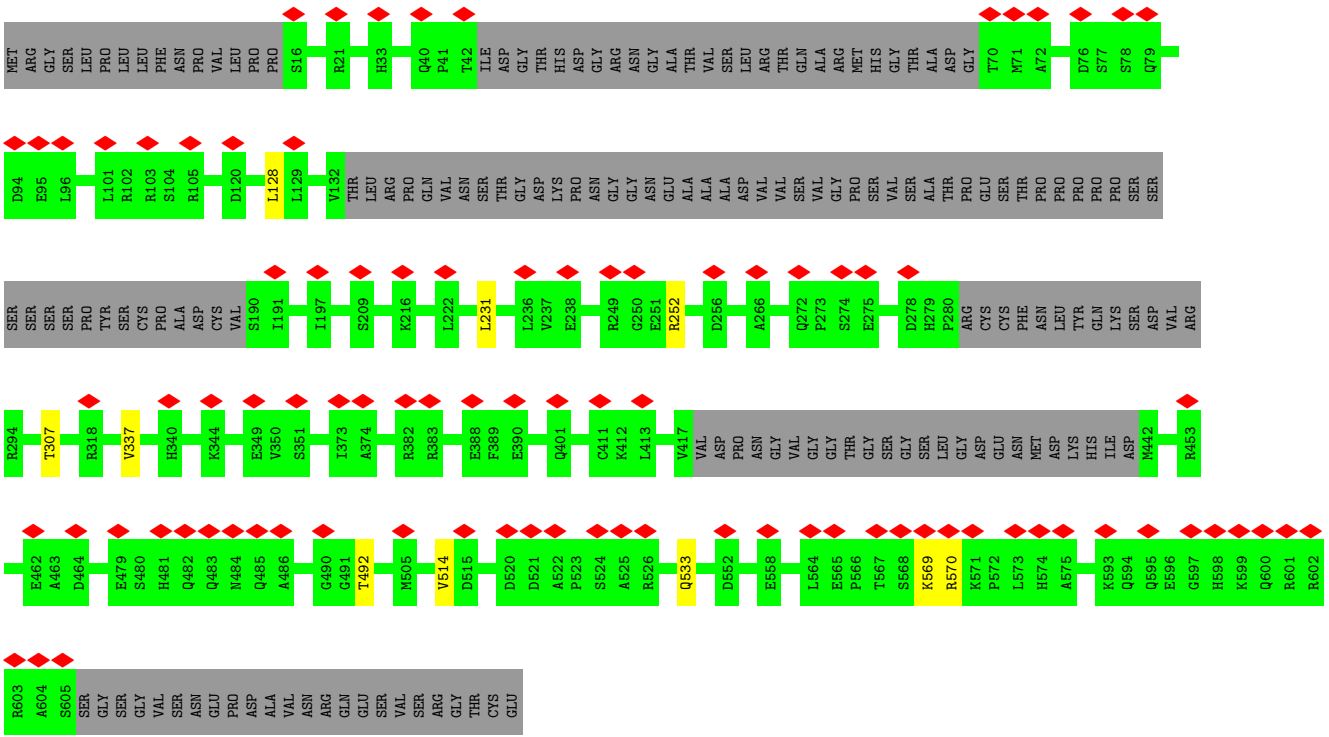
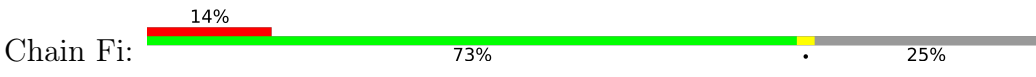




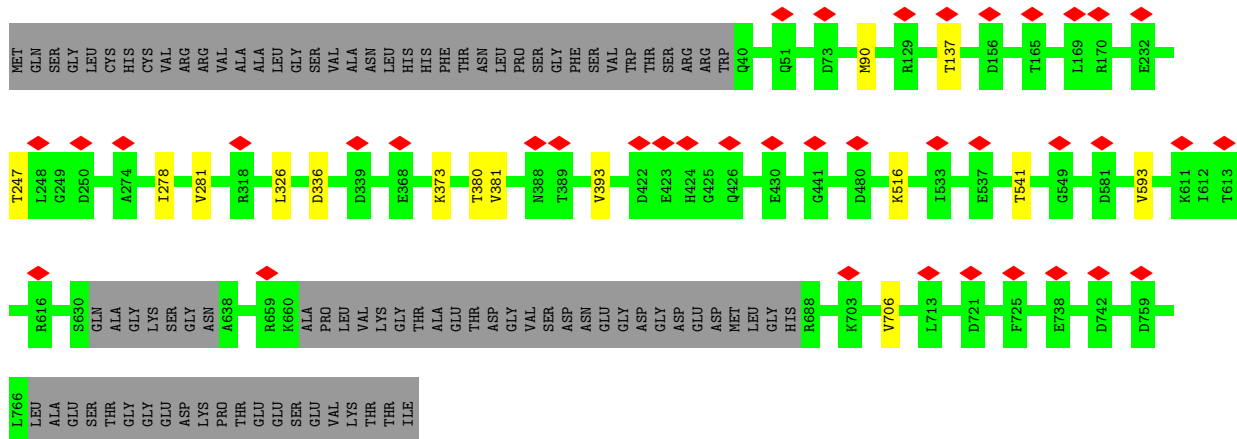
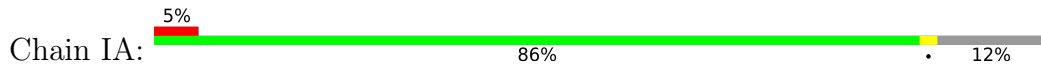
• Molecule 64: mt-SAF37



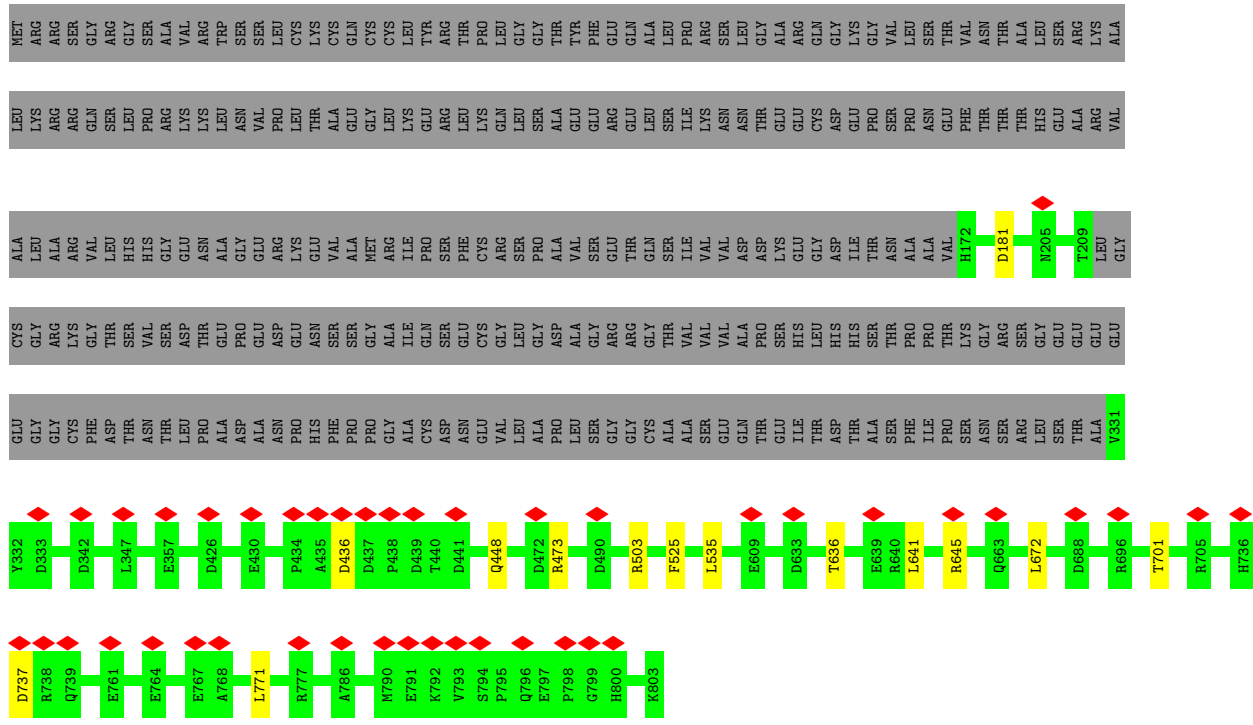
• Molecule 65: mt-SAF38



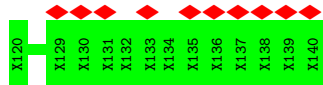
Molecule 66: Translation initiation factor IF-2, putative



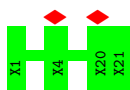
Molecule 67: mt-SAF39



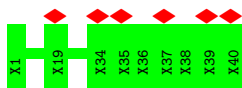
Molecule 68: Unk



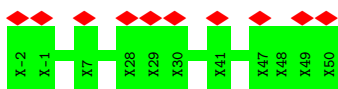
Molecule 68: Unk



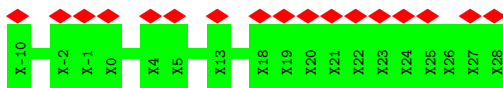
- Molecule 69: Unk7



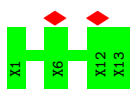
- Molecule 70: UnkE



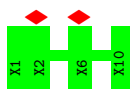
- Molecule 71: UnkF



- Molecule 72: UnkG



- Molecule 73: UnkI

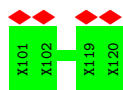


- Molecule 74: UnkK



There are no outlier residues recorded for this chain.

- Molecule 75: UnkL



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	17391	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.222	Depositor
Minimum map value	-0.107	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.009	Depositor
Recommended contour level	0.04	Depositor
Map size (Å)	500.4, 500.4, 500.4	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.39, 1.39, 1.39	Depositor



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ATP, PO4, GDP, UTP, ZN, FAD, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	CA	0.17	0/13759	0.70	1/21382 (0.0%)
2	CC	0.26	0/666	0.43	0/900
3	CE	0.25	0/3547	0.50	0/4798
4	CF	0.25	0/1266	0.51	0/1708
5	CH	0.25	0/2276	0.52	0/3071
6	CI	0.25	0/3479	0.49	0/4693
7	CJ	0.25	0/6725	0.48	0/9152
8	CK	0.25	0/2502	0.51	0/3357
9	CL	0.28	0/759	0.50	0/1026
10	CN	0.25	0/1361	0.47	0/1840
11	CO	0.26	0/2614	0.49	0/3520
12	CP	0.24	0/1533	0.49	0/2074
13	CQ	0.25	0/1919	0.50	0/2595
14	CR	0.25	0/2276	0.48	0/3087
15	CS	0.26	0/1183	0.48	0/1593
16	CU	0.24	0/1560	0.51	0/2094
17	Ca	0.25	0/5066	0.47	0/6852
18	Cb	0.25	0/2105	0.48	0/2842
19	Cd	0.25	0/2016	0.44	0/2715
20	Cg	0.25	0/4016	0.46	0/5455
21	Ci	0.25	0/1383	0.49	0/1871
22	Cj	0.25	0/1849	0.48	0/2521
23	Ck	0.24	0/5540	0.49	0/7490
24	Cm	0.25	0/1215	0.49	0/1630
25	Cn	0.25	0/543	0.52	0/725
26	Cp	0.25	0/1511	0.48	0/2049
27	Cq	0.25	0/2066	0.44	0/2815
28	Cr	0.24	0/2131	0.48	0/2895
29	Cv	0.24	0/8625	0.48	0/11690
30	DA	0.24	0/12744	0.48	0/17248
31	DB	0.24	0/9369	0.50	0/12692
32	DC	0.25	0/8913	0.49	0/12092

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	DD	0.25	0/6699	0.49	0/9072
34	DE	0.25	0/4920	0.49	0/6666
35	DF	0.25	0/4847	0.51	0/6569
36	DG	0.24	0/4578	0.50	0/6202
37	DH	0.25	0/4645	0.50	0/6295
38	DI	0.25	0/3248	0.48	0/4401
39	DJ	0.25	0/2999	0.46	0/4071
40	DK	0.24	0/2123	0.47	0/2865
41	DL	0.25	0/2420	0.51	0/3262
42	DM	0.24	0/2488	0.49	0/3362
43	DN	0.24	0/2118	0.52	0/2874
44	DO	0.25	0/1832	0.50	0/2471
45	DP	0.24	0/1813	0.47	0/2457
46	DQ	0.24	0/2105	0.52	0/2855
47	DR	0.25	0/2084	0.51	1/2841 (0.0%)
48	DS	0.24	0/1997	0.50	0/2694
49	DT	0.25	0/2133	0.47	0/2889
50	DU	0.24	0/1799	0.50	0/2438
51	DV	0.25	0/1382	0.51	0/1871
52	DW	0.24	0/1407	0.49	0/1916
53	DX	0.25	0/1207	0.50	0/1620
54	DY	0.26	0/1337	0.51	0/1814
55	DZ	0.25	0/725	0.43	0/984
56	Da	0.26	0/317	0.54	0/422
57	F3	0.24	0/2049	0.48	0/2782
58	F6	0.24	0/3434	0.47	0/4661
59	F7	0.24	0/4684	0.47	0/6341
60	F9	0.24	0/2863	0.50	0/3835
61	FO	0.24	0/2292	0.52	0/3096
62	Ff	0.25	0/5082	0.48	0/6918
63	Fg	0.24	0/4074	0.48	0/5522
64	Fh	0.24	0/2278	0.50	0/3073
65	Fi	0.24	0/3833	0.50	0/5202
66	IA	0.25	0/5512	0.49	0/7462
67	IB	0.25	0/4193	0.51	0/5672
All	All	0.24	0/218034	0.51	2/297947 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	DR	190	LEU	CA-CB-CG	5.49	127.92	115.30

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	CA	329	U	OP2-P-O3'	5.33	116.94	105.20

There are no chirality outliers.

There are no planarity outliers.

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

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

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	CC	72/74 (97%)	66 (92%)	6 (8%)	0	100	100
3	CE	424/435 (98%)	406 (96%)	18 (4%)	0	100	100
4	CF	145/160 (91%)	139 (96%)	6 (4%)	0	100	100
5	CH	271/282 (96%)	263 (97%)	8 (3%)	0	100	100
6	CI	423/443 (96%)	411 (97%)	12 (3%)	0	100	100
7	CJ	799/817 (98%)	771 (96%)	28 (4%)	0	100	100
8	CK	294/326 (90%)	284 (97%)	10 (3%)	0	100	100
9	CL	85/87 (98%)	81 (95%)	4 (5%)	0	100	100
10	CN	155/166 (93%)	149 (96%)	6 (4%)	0	100	100
11	CO	306/429 (71%)	292 (95%)	14 (5%)	0	100	100
12	CP	178/188 (95%)	171 (96%)	7 (4%)	0	100	100
13	CQ	224/307 (73%)	219 (98%)	5 (2%)	0	100	100
14	CR	265/320 (83%)	258 (97%)	7 (3%)	0	100	100
15	CS	137/244 (56%)	132 (96%)	5 (4%)	0	100	100
16	CU	179/193 (93%)	175 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	Ca	571/602 (95%)	549 (96%)	22 (4%)	0	100	100
18	Cb	248/325 (76%)	236 (95%)	12 (5%)	0	100	100
19	Cd	228/440 (52%)	223 (98%)	5 (2%)	0	100	100
20	Cg	478/498 (96%)	473 (99%)	5 (1%)	0	100	100
21	Ci	162/181 (90%)	156 (96%)	6 (4%)	0	100	100
22	Cj	225/257 (88%)	220 (98%)	5 (2%)	0	100	100
23	Ck	676/874 (77%)	666 (98%)	10 (2%)	0	100	100
24	Cm	143/215 (66%)	138 (96%)	5 (4%)	0	100	100
25	Cn	60/250 (24%)	59 (98%)	1 (2%)	0	100	100
26	Cp	171/187 (91%)	167 (98%)	4 (2%)	0	100	100
27	Cq	250/263 (95%)	241 (96%)	9 (4%)	0	100	100
28	Cr	263/439 (60%)	258 (98%)	5 (2%)	0	100	100
29	Cv	1032/1211 (85%)	994 (96%)	38 (4%)	0	100	100
30	DA	1546/1788 (86%)	1513 (98%)	33 (2%)	0	100	100
31	DB	1109/1181 (94%)	1076 (97%)	33 (3%)	0	100	100
32	DC	1081/1165 (93%)	1023 (95%)	58 (5%)	0	100	100
33	DD	786/812 (97%)	758 (96%)	28 (4%)	0	100	100
34	DE	576/747 (77%)	549 (95%)	27 (5%)	0	100	100
35	DF	585/666 (88%)	559 (96%)	26 (4%)	0	100	100
36	DG	542/631 (86%)	529 (98%)	13 (2%)	0	100	100
37	DH	555/581 (96%)	530 (96%)	25 (4%)	0	100	100
38	DI	388/407 (95%)	372 (96%)	16 (4%)	0	100	100
39	DJ	355/396 (90%)	351 (99%)	4 (1%)	0	100	100
40	DK	257/324 (79%)	249 (97%)	8 (3%)	0	100	100
41	DL	287/307 (94%)	283 (99%)	4 (1%)	0	100	100
42	DM	292/294 (99%)	277 (95%)	15 (5%)	0	100	100
43	DN	249/293 (85%)	243 (98%)	6 (2%)	0	100	100
44	DO	219/282 (78%)	207 (94%)	12 (6%)	0	100	100
45	DP	205/274 (75%)	198 (97%)	7 (3%)	0	100	100
46	DQ	253/268 (94%)	249 (98%)	4 (2%)	0	100	100
47	DR	246/270 (91%)	240 (98%)	6 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	DS	239/261 (92%)	238 (100%)	1 (0%)	0	100	100
49	DT	237/247 (96%)	223 (94%)	14 (6%)	0	100	100
50	DU	211/228 (92%)	204 (97%)	7 (3%)	0	100	100
51	DV	158/183 (86%)	144 (91%)	14 (9%)	0	100	100
52	DW	159/179 (89%)	152 (96%)	7 (4%)	0	100	100
53	DX	137/169 (81%)	129 (94%)	8 (6%)	0	100	100
54	DY	152/163 (93%)	145 (95%)	7 (5%)	0	100	100
55	DZ	80/94 (85%)	78 (98%)	2 (2%)	0	100	100
56	Da	32/64 (50%)	31 (97%)	1 (3%)	0	100	100
57	F3	246/966 (26%)	243 (99%)	3 (1%)	0	100	100
58	F6	410/676 (61%)	402 (98%)	8 (2%)	0	100	100
59	F7	566/679 (83%)	544 (96%)	22 (4%)	0	100	100
60	F9	338/608 (56%)	329 (97%)	9 (3%)	0	100	100
61	FO	263/334 (79%)	255 (97%)	8 (3%)	0	100	100
62	Ff	610/848 (72%)	593 (97%)	17 (3%)	0	100	100
63	Fg	507/550 (92%)	487 (96%)	20 (4%)	0	100	100
64	Fh	270/318 (85%)	259 (96%)	11 (4%)	0	100	100
65	Fi	459/629 (73%)	438 (95%)	21 (5%)	0	100	100
66	IA	687/787 (87%)	668 (97%)	19 (3%)	0	100	100
67	IB	507/803 (63%)	491 (97%)	16 (3%)	0	100	100
All	All	24263/29685 (82%)	23456 (97%)	807 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 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	
2	CC	73/73 (100%)	69 (94%)	4 (6%)	21	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	CE	365/372 (98%)	354 (97%)	11 (3%)	41	66
4	CF	135/144 (94%)	132 (98%)	3 (2%)	52	72
5	CH	237/246 (96%)	235 (99%)	2 (1%)	81	89
6	CI	360/371 (97%)	351 (98%)	9 (2%)	47	70
7	CJ	710/723 (98%)	692 (98%)	18 (2%)	47	70
8	CK	259/283 (92%)	256 (99%)	3 (1%)	71	84
9	CL	79/79 (100%)	77 (98%)	2 (2%)	47	70
10	CN	142/150 (95%)	138 (97%)	4 (3%)	43	67
11	CO	270/377 (72%)	263 (97%)	7 (3%)	46	69
12	CP	160/168 (95%)	158 (99%)	2 (1%)	69	83
13	CQ	201/270 (74%)	195 (97%)	6 (3%)	41	66
14	CR	233/279 (84%)	228 (98%)	5 (2%)	53	74
15	CS	123/220 (56%)	121 (98%)	2 (2%)	62	80
16	CU	159/169 (94%)	158 (99%)	1 (1%)	86	93
17	Ca	518/543 (95%)	507 (98%)	11 (2%)	53	74
18	Cb	219/277 (79%)	216 (99%)	3 (1%)	67	82
19	Cd	207/381 (54%)	205 (99%)	2 (1%)	76	86
20	Cg	424/437 (97%)	415 (98%)	9 (2%)	53	74
21	Ci	144/160 (90%)	139 (96%)	5 (4%)	36	63
22	Cj	194/219 (89%)	192 (99%)	2 (1%)	76	86
23	Ck	589/746 (79%)	579 (98%)	10 (2%)	60	79
24	Cm	124/184 (67%)	120 (97%)	4 (3%)	39	65
25	Cn	54/210 (26%)	51 (94%)	3 (6%)	21	53
26	Cp	161/175 (92%)	157 (98%)	4 (2%)	47	70
27	Cq	210/221 (95%)	205 (98%)	5 (2%)	49	71
28	Cr	223/369 (60%)	218 (98%)	5 (2%)	52	72
29	Cv	894/1033 (86%)	870 (97%)	24 (3%)	44	68
30	DA	1319/1514 (87%)	1277 (97%)	42 (3%)	39	65
31	DB	976/1030 (95%)	957 (98%)	19 (2%)	57	76
32	DC	923/985 (94%)	896 (97%)	27 (3%)	42	66
33	DD	693/711 (98%)	676 (98%)	17 (2%)	47	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
34	DE	514/642 (80%)	499 (97%)	15 (3%)	42	66
35	DF	499/560 (89%)	485 (97%)	14 (3%)	43	67
36	DG	481/543 (89%)	464 (96%)	17 (4%)	36	63
37	DH	489/504 (97%)	472 (96%)	17 (4%)	36	63
38	DI	350/365 (96%)	342 (98%)	8 (2%)	50	71
39	DJ	313/347 (90%)	304 (97%)	9 (3%)	42	66
40	DK	218/261 (84%)	208 (95%)	10 (5%)	27	57
41	DL	249/263 (95%)	242 (97%)	7 (3%)	43	67
42	DM	252/252 (100%)	249 (99%)	3 (1%)	71	84
43	DN	225/256 (88%)	217 (96%)	8 (4%)	35	63
44	DO	185/229 (81%)	184 (100%)	1 (0%)	88	94
45	DP	187/239 (78%)	184 (98%)	3 (2%)	62	80
46	DQ	227/239 (95%)	219 (96%)	8 (4%)	36	63
47	DR	219/235 (93%)	209 (95%)	10 (5%)	27	57
48	DS	213/228 (93%)	210 (99%)	3 (1%)	67	82
49	DT	220/228 (96%)	209 (95%)	11 (5%)	24	55
50	DU	190/201 (94%)	184 (97%)	6 (3%)	39	65
51	DV	145/165 (88%)	139 (96%)	6 (4%)	30	59
52	DW	148/163 (91%)	146 (99%)	2 (1%)	67	82
53	DX	122/149 (82%)	118 (97%)	4 (3%)	38	64
54	DY	137/146 (94%)	134 (98%)	3 (2%)	52	72
55	DZ	72/84 (86%)	69 (96%)	3 (4%)	30	59
56	Da	30/59 (51%)	29 (97%)	1 (3%)	38	64
57	F3	223/809 (28%)	219 (98%)	4 (2%)	59	77
58	F6	368/590 (62%)	350 (95%)	18 (5%)	25	56
59	F7	493/577 (85%)	475 (96%)	18 (4%)	34	61
60	F9	288/504 (57%)	283 (98%)	5 (2%)	60	79
61	FO	234/290 (81%)	224 (96%)	10 (4%)	29	58
62	Ff	519/715 (73%)	502 (97%)	17 (3%)	38	64
63	Fg	441/469 (94%)	431 (98%)	10 (2%)	50	71
64	Fh	242/281 (86%)	235 (97%)	7 (3%)	42	66

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
65	Fi	404/536 (75%)	394 (98%)	10 (2%)	47	70
66	IA	586/661 (89%)	571 (97%)	15 (3%)	46	69
67	IB	435/675 (64%)	421 (97%)	14 (3%)	39	65
All	All	21296/25584 (83%)	20728 (97%)	568 (3%)	48	68

All (568) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	CC	2	PHE
2	CC	58	PHE
2	CC	59	PHE
2	CC	70	ILE
3	CE	16	TYR
3	CE	62	ARG
3	CE	89	LEU
3	CE	163	ILE
3	CE	215	VAL
3	CE	225	LEU
3	CE	233	VAL
3	CE	240	ASP
3	CE	245	PHE
3	CE	266	THR
3	CE	435	HIS
4	CF	3	PHE
4	CF	70	ASP
4	CF	73	GLU
5	CH	19	LEU
5	CH	144	ARG
6	CI	11	ARG
6	CI	55	GLN
6	CI	133	VAL
6	CI	145	VAL
6	CI	160	LEU
6	CI	175	ARG
6	CI	250	ASN
6	CI	287	ARG
6	CI	342	LEU
7	CJ	48	ILE
7	CJ	65	VAL
7	CJ	114	TYR
7	CJ	141	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
7	CJ	158	THR
7	CJ	180	LEU
7	CJ	226	ARG
7	CJ	249	LEU
7	CJ	293	ASP
7	CJ	335	LEU
7	CJ	398	PHE
7	CJ	555	TRP
7	CJ	590	PHE
7	CJ	595	THR
7	CJ	597	LEU
7	CJ	681	LEU
7	CJ	757	LEU
7	CJ	777	THR
8	CK	95	MET
8	CK	121	GLU
8	CK	240	THR
9	CL	75	CYS
9	CL	107	PHE
10	CN	59	VAL
10	CN	60	VAL
10	CN	62	THR
10	CN	98	VAL
11	CO	215	ASP
11	CO	219	THR
11	CO	244	HIS
11	CO	313	THR
11	CO	376	GLU
11	CO	384	GLU
11	CO	418	VAL
12	CP	111	SER
12	CP	134	ILE
13	CQ	34	THR
13	CQ	55	THR
13	CQ	70	ARG
13	CQ	83	LEU
13	CQ	99	VAL
13	CQ	224	PHE
14	CR	18	VAL
14	CR	36	THR
14	CR	80	LEU
14	CR	103	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	CR	128	ASN
15	CS	177	VAL
15	CS	228	LEU
16	CU	54	ILE
17	Ca	26	HIS
17	Ca	45	THR
17	Ca	112	LEU
17	Ca	220	LEU
17	Ca	235	ILE
17	Ca	267	LEU
17	Ca	272	PHE
17	Ca	480	LEU
17	Ca	520	TYR
17	Ca	536	ARG
17	Ca	579	VAL
18	Cb	111	ARG
18	Cb	138	ASP
18	Cb	141	GLU
19	Cd	48	ASN
19	Cd	239	VAL
20	Cg	99	GLN
20	Cg	101	MET
20	Cg	172	VAL
20	Cg	173	THR
20	Cg	205	ARG
20	Cg	296	HIS
20	Cg	311	PHE
20	Cg	312	ASN
20	Cg	375	THR
21	Ci	25	VAL
21	Ci	39	ARG
21	Ci	84	LEU
21	Ci	97	THR
21	Ci	143	GLN
22	Cj	175	PHE
22	Cj	213	ASP
23	Ck	138	PHE
23	Ck	159	THR
23	Ck	191	GLU
23	Ck	252	ASP
23	Ck	278	PHE
23	Ck	392	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
23	Ck	649	THR
23	Ck	801	HIS
23	Ck	821	TYR
23	Ck	832	THR
24	Cm	96	CYS
24	Cm	114	THR
24	Cm	123	ASP
24	Cm	210	ARG
25	Cn	155	ARG
25	Cn	165	LEU
25	Cn	171	MET
26	Cp	42	VAL
26	Cp	66	HIS
26	Cp	101	THR
26	Cp	114	ASN
27	Cq	105	ASN
27	Cq	113	THR
27	Cq	196	HIS
27	Cq	201	GLU
27	Cq	252	GLU
28	Cr	75	ASP
28	Cr	83	VAL
28	Cr	101	ASP
28	Cr	132	LEU
28	Cr	186	ASN
29	Cv	87	GLN
29	Cv	144	PHE
29	Cv	171	PHE
29	Cv	191	LEU
29	Cv	218	ARG
29	Cv	245	ASN
29	Cv	283	ASP
29	Cv	311	LEU
29	Cv	321	HIS
29	Cv	438	PHE
29	Cv	511	HIS
29	Cv	521	LEU
29	Cv	566	MET
29	Cv	583	THR
29	Cv	590	THR
29	Cv	614	SER
29	Cv	646	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
29	Cv	848	LEU
29	Cv	874	GLU
29	Cv	887	ARG
29	Cv	967	VAL
29	Cv	995	VAL
29	Cv	1046	ASN
29	Cv	1093	ASN
30	DA	41	PHE
30	DA	86	TYR
30	DA	199	ASP
30	DA	212	ARG
30	DA	221	TYR
30	DA	245	PHE
30	DA	254	PHE
30	DA	323	HIS
30	DA	341	LEU
30	DA	353	THR
30	DA	365	LEU
30	DA	398	THR
30	DA	470	LEU
30	DA	481	TYR
30	DA	509	LEU
30	DA	527	ASP
30	DA	531	ASN
30	DA	532	ARG
30	DA	550	LEU
30	DA	562	LYS
30	DA	631	THR
30	DA	687	THR
30	DA	765	LEU
30	DA	772	LEU
30	DA	820	ASN
30	DA	890	VAL
30	DA	909	THR
30	DA	954	VAL
30	DA	979	GLN
30	DA	1041	THR
30	DA	1103	GLU
30	DA	1115	LEU
30	DA	1123	LEU
30	DA	1145	THR
30	DA	1152	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
30	DA	1308	LEU
30	DA	1431	TYR
30	DA	1509	VAL
30	DA	1553	VAL
30	DA	1590	ARG
30	DA	1603	PHE
30	DA	1646	ARG
31	DB	103	TYR
31	DB	201	THR
31	DB	292	GLN
31	DB	330	ASP
31	DB	334	GLN
31	DB	381	LEU
31	DB	411	MET
31	DB	439	VAL
31	DB	463	LEU
31	DB	468	THR
31	DB	547	LEU
31	DB	689	LEU
31	DB	737	HIS
31	DB	756	THR
31	DB	762	TYR
31	DB	822	PHE
31	DB	918	VAL
31	DB	1104	ASP
31	DB	1138	HIS
32	DC	119	THR
32	DC	222	PHE
32	DC	266	PHE
32	DC	275	LYS
32	DC	286	GLN
32	DC	316	THR
32	DC	335	VAL
32	DC	344	MET
32	DC	422	VAL
32	DC	467	THR
32	DC	476	PHE
32	DC	664	PHE
32	DC	665	LEU
32	DC	699	VAL
32	DC	748	TRP
32	DC	757	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
32	DC	761	ASN
32	DC	848	THR
32	DC	868	GLU
32	DC	875	THR
32	DC	887	LEU
32	DC	894	HIS
32	DC	920	HIS
32	DC	941	MET
32	DC	967	LEU
32	DC	981	GLU
32	DC	1055	ARG
33	DD	11	ARG
33	DD	74	LEU
33	DD	79	GLN
33	DD	209	THR
33	DD	247	VAL
33	DD	298	MET
33	DD	303	LEU
33	DD	368	LEU
33	DD	401	LEU
33	DD	435	ASP
33	DD	436	ASP
33	DD	441	LEU
33	DD	586	VAL
33	DD	624	THR
33	DD	653	PHE
33	DD	685	VAL
33	DD	773	MET
34	DE	45	PHE
34	DE	80	LEU
34	DE	86	CYS
34	DE	172	ASP
34	DE	178	GLN
34	DE	295	TYR
34	DE	349	GLN
34	DE	397	VAL
34	DE	487	ASP
34	DE	492	ASP
34	DE	530	TRP
34	DE	584	ASP
34	DE	591	LEU
34	DE	676	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
34	DE	737	MET
35	DF	22	LEU
35	DF	30	VAL
35	DF	43	THR
35	DF	51	TRP
35	DF	118	THR
35	DF	194	THR
35	DF	202	LEU
35	DF	308	VAL
35	DF	393	ARG
35	DF	398	ARG
35	DF	405	ASN
35	DF	568	LEU
35	DF	580	ASP
35	DF	590	LYS
36	DG	87	TYR
36	DG	202	LEU
36	DG	206	LEU
36	DG	211	TYR
36	DG	215	LEU
36	DG	229	HIS
36	DG	282	ASP
36	DG	288	LEU
36	DG	339	TYR
36	DG	372	LEU
36	DG	400	VAL
36	DG	458	LEU
36	DG	489	LEU
36	DG	554	HIS
36	DG	577	LEU
36	DG	582	VAL
36	DG	611	LEU
37	DH	40	THR
37	DH	119	LEU
37	DH	139	ARG
37	DH	144	ASP
37	DH	176	LEU
37	DH	215	LEU
37	DH	246	GLU
37	DH	265	LEU
37	DH	282	ASN
37	DH	290	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
37	DH	315	LEU
37	DH	341	ASN
37	DH	392	TRP
37	DH	460	LEU
37	DH	481	ILE
37	DH	500	VAL
37	DH	526	ASN
38	DI	128	GLU
38	DI	162	PHE
38	DI	185	TYR
38	DI	193	ASN
38	DI	349	THR
38	DI	351	LEU
38	DI	366	LEU
38	DI	386	ASP
39	DJ	15	VAL
39	DJ	16	ASN
39	DJ	40	ARG
39	DJ	92	LEU
39	DJ	149	THR
39	DJ	275	ASP
39	DJ	277	ARG
39	DJ	351	LEU
39	DJ	356	TYR
40	DK	47	THR
40	DK	101	ASP
40	DK	142	LEU
40	DK	156	LEU
40	DK	161	LEU
40	DK	172	LEU
40	DK	173	VAL
40	DK	252	ILE
40	DK	273	LEU
40	DK	321	ARG
41	DL	19	VAL
41	DL	26	THR
41	DL	117	ASP
41	DL	280	ILE
41	DL	288	ASN
41	DL	292	ARG
41	DL	299	THR
42	DM	21	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
42	DM	83	THR
42	DM	227	LEU
43	DN	27	ASP
43	DN	118	LEU
43	DN	128	VAL
43	DN	163	PHE
43	DN	182	VAL
43	DN	188	LEU
43	DN	209	ARG
43	DN	269	LEU
44	DO	138	LEU
45	DP	135	LEU
45	DP	149	GLU
45	DP	163	ARG
46	DQ	79	LEU
46	DQ	87	LEU
46	DQ	98	PHE
46	DQ	120	MET
46	DQ	171	GLU
46	DQ	205	VAL
46	DQ	208	VAL
46	DQ	260	HIS
47	DR	12	ARG
47	DR	14	ARG
47	DR	108	GLN
47	DR	119	THR
47	DR	140	PHE
47	DR	146	LEU
47	DR	190	LEU
47	DR	218	TRP
47	DR	254	VAL
47	DR	268	HIS
48	DS	170	TYR
48	DS	176	ARG
48	DS	211	CYS
49	DT	17	HIS
49	DT	58	HIS
49	DT	88	THR
49	DT	95	ARG
49	DT	97	VAL
49	DT	105	ARG
49	DT	133	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
49	DT	137	LEU
49	DT	157	GLN
49	DT	205	VAL
49	DT	212	PHE
50	DU	22	PHE
50	DU	54	GLU
50	DU	96	GLN
50	DU	113	GLN
50	DU	147	LEU
50	DU	178	TRP
51	DV	66	VAL
51	DV	67	ASN
51	DV	164	MET
51	DV	165	LEU
51	DV	182	TYR
51	DV	183	LEU
52	DW	22	THR
52	DW	168	MET
53	DX	63	ASP
53	DX	81	ASP
53	DX	88	ASP
53	DX	131	ILE
54	DY	22	ILE
54	DY	145	ARG
54	DY	151	LEU
55	DZ	16	GLU
55	DZ	19	THR
55	DZ	87	ILE
56	Da	40	ARG
57	F3	81	GLN
57	F3	94	MET
57	F3	180	ILE
57	F3	297	PHE
58	F6	203	GLN
58	F6	207	GLU
58	F6	217	LEU
58	F6	229	LEU
58	F6	236	LEU
58	F6	241	TRP
58	F6	246	VAL
58	F6	267	PHE
58	F6	285	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
58	F6	292	GLN
58	F6	293	TYR
58	F6	298	GLU
58	F6	303	GLU
58	F6	304	LEU
58	F6	326	MET
58	F6	391	LEU
58	F6	473	ASP
58	F6	544	LEU
59	F7	67	TYR
59	F7	75	LEU
59	F7	82	LEU
59	F7	116	ASN
59	F7	127	ARG
59	F7	131	LEU
59	F7	178	GLU
59	F7	202	THR
59	F7	219	LEU
59	F7	301	LEU
59	F7	355	MET
59	F7	381	LEU
59	F7	402	TYR
59	F7	404	MET
59	F7	517	PHE
59	F7	542	ASN
59	F7	564	LEU
59	F7	604	ASP
60	F9	254	GLN
60	F9	262	HIS
60	F9	442	ARG
60	F9	483	LEU
60	F9	552	GLU
61	FO	3	ASP
61	FO	14	ARG
61	FO	71	GLN
61	FO	105	ARG
61	FO	131	ASP
61	FO	163	ASP
61	FO	192	ARG
61	FO	283	THR
61	FO	314	LEU
61	FO	331	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
62	Ff	188	THR
62	Ff	189	THR
62	Ff	200	CYS
62	Ff	210	VAL
62	Ff	297	GLU
62	Ff	312	VAL
62	Ff	466	GLU
62	Ff	487	HIS
62	Ff	500	ASP
62	Ff	513	TYR
62	Ff	559	ASP
62	Ff	565	GLN
62	Ff	571	LEU
62	Ff	580	HIS
62	Ff	637	THR
62	Ff	732	ARG
62	Ff	796	GLU
63	Fg	85	VAL
63	Fg	156	GLU
63	Fg	199	ASP
63	Fg	229	ASN
63	Fg	306	LYS
63	Fg	325	THR
63	Fg	335	THR
63	Fg	467	THR
63	Fg	486	VAL
63	Fg	517	PHE
64	Fh	39	HIS
64	Fh	41	TYR
64	Fh	132	TYR
64	Fh	164	ASP
64	Fh	188	ASP
64	Fh	274	LYS
64	Fh	279	LEU
65	Fi	128	LEU
65	Fi	231	LEU
65	Fi	252	ARG
65	Fi	307	THR
65	Fi	337	VAL
65	Fi	492	THR
65	Fi	514	VAL
65	Fi	533	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
65	Fi	569	LYS
65	Fi	570	ARG
66	IA	90	MET
66	IA	137	THR
66	IA	247	THR
66	IA	278	ILE
66	IA	281	VAL
66	IA	326	LEU
66	IA	336	ASP
66	IA	373	LYS
66	IA	380	THR
66	IA	381	VAL
66	IA	393	VAL
66	IA	516	LYS
66	IA	541	THR
66	IA	593	VAL
66	IA	706	VAL
67	IB	181	ASP
67	IB	436	ASP
67	IB	448	GLN
67	IB	473	ARG
67	IB	503	ARG
67	IB	525	PHE
67	IB	535	LEU
67	IB	636	THR
67	IB	641	LEU
67	IB	645	ARG
67	IB	672	LEU
67	IB	701	THR
67	IB	737	ASP
67	IB	771	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (321) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	CE	115	ASN
3	CE	248	GLN
3	CE	359	HIS
3	CE	433	GLN
3	CE	435	HIS
4	CF	20	GLN
4	CF	96	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
5	CH	55	GLN
5	CH	72	GLN
6	CI	44	HIS
6	CI	174	GLN
6	CI	289	GLN
7	CJ	20	GLN
7	CJ	69	GLN
7	CJ	82	HIS
7	CJ	255	HIS
7	CJ	321	ASN
7	CJ	339	ASN
7	CJ	438	ASN
7	CJ	450	HIS
7	CJ	461	HIS
7	CJ	571	GLN
7	CJ	573	ASN
7	CJ	621	ASN
7	CJ	762	GLN
7	CJ	798	GLN
8	CK	101	ASN
8	CK	111	ASN
8	CK	178	GLN
10	CN	12	HIS
10	CN	23	HIS
10	CN	68	GLN
10	CN	75	GLN
10	CN	78	GLN
10	CN	142	HIS
11	CO	149	GLN
11	CO	203	GLN
11	CO	284	GLN
11	CO	297	GLN
11	CO	360	GLN
11	CO	374	GLN
12	CP	72	GLN
12	CP	84	GLN
13	CQ	15	GLN
13	CQ	149	GLN
13	CQ	158	HIS
13	CQ	231	GLN
14	CR	33	GLN
14	CR	53	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
14	CR	63	GLN
14	CR	207	HIS
14	CR	211	ASN
14	CR	214	GLN
14	CR	250	GLN
14	CR	252	GLN
14	CR	259	GLN
15	CS	182	HIS
15	CS	207	ASN
16	CU	37	HIS
16	CU	72	HIS
16	CU	105	GLN
16	CU	123	GLN
16	CU	182	HIS
17	Ca	63	GLN
17	Ca	105	GLN
17	Ca	306	HIS
17	Ca	351	GLN
17	Ca	539	GLN
18	Cb	139	HIS
19	Cd	48	ASN
19	Cd	90	GLN
19	Cd	143	GLN
19	Cd	155	GLN
20	Cg	60	HIS
20	Cg	68	GLN
20	Cg	99	GLN
20	Cg	127	HIS
20	Cg	215	ASN
20	Cg	242	ASN
20	Cg	296	HIS
20	Cg	372	ASN
20	Cg	400	GLN
21	Ci	19	HIS
21	Ci	96	ASN
21	Ci	125	HIS
21	Ci	136	HIS
22	Cj	142	ASN
22	Cj	162	GLN
23	Ck	30	GLN
23	Ck	32	GLN
23	Ck	288	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
23	Ck	399	ASN
23	Ck	644	HIS
23	Ck	669	ASN
23	Ck	778	GLN
24	Cm	73	HIS
24	Cm	131	HIS
24	Cm	144	ASN
24	Cm	161	HIS
24	Cm	182	ASN
24	Cm	214	ASN
26	Cp	16	HIS
26	Cp	66	HIS
27	Cq	20	GLN
27	Cq	76	GLN
28	Cr	11	ASN
28	Cr	47	HIS
28	Cr	142	ASN
28	Cr	267	GLN
29	Cv	147	HIS
29	Cv	166	HIS
29	Cv	223	ASN
29	Cv	372	ASN
29	Cv	411	ASN
29	Cv	442	ASN
29	Cv	523	HIS
29	Cv	559	GLN
29	Cv	803	GLN
29	Cv	820	GLN
29	Cv	878	ASN
29	Cv	883	HIS
29	Cv	1059	GLN
29	Cv	1066	GLN
30	DA	59	HIS
30	DA	129	ASN
30	DA	145	GLN
30	DA	239	HIS
30	DA	492	ASN
30	DA	541	GLN
30	DA	542	GLN
30	DA	543	GLN
30	DA	582	GLN
30	DA	644	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
30	DA	1096	GLN
30	DA	1117	ASN
30	DA	1176	GLN
30	DA	1179	GLN
30	DA	1456	GLN
30	DA	1600	ASN
31	DB	106	GLN
31	DB	134	HIS
31	DB	254	ASN
31	DB	292	GLN
31	DB	415	GLN
31	DB	510	ASN
31	DB	541	HIS
31	DB	543	GLN
31	DB	551	HIS
31	DB	558	ASN
31	DB	562	GLN
31	DB	615	ASN
31	DB	670	HIS
31	DB	684	GLN
31	DB	711	GLN
31	DB	748	HIS
31	DB	764	GLN
31	DB	855	GLN
31	DB	868	HIS
31	DB	981	HIS
31	DB	1066	ASN
31	DB	1111	GLN
32	DC	76	ASN
32	DC	95	GLN
32	DC	96	GLN
32	DC	205	GLN
32	DC	228	GLN
32	DC	263	GLN
32	DC	424	GLN
32	DC	473	GLN
32	DC	520	ASN
32	DC	530	GLN
32	DC	801	HIS
32	DC	841	HIS
32	DC	916	HIS
32	DC	920	HIS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
32	DC	1049	ASN
32	DC	1064	GLN
32	DC	1160	GLN
33	DD	116	GLN
33	DD	174	HIS
33	DD	176	HIS
33	DD	233	ASN
33	DD	354	HIS
33	DD	402	GLN
33	DD	529	GLN
33	DD	585	ASN
34	DE	38	GLN
34	DE	138	ASN
34	DE	178	GLN
34	DE	202	HIS
34	DE	442	HIS
34	DE	501	HIS
34	DE	596	HIS
35	DF	15	HIS
35	DF	115	HIS
35	DF	175	GLN
35	DF	351	HIS
35	DF	406	ASN
35	DF	446	HIS
35	DF	490	ASN
35	DF	520	GLN
35	DF	543	HIS
36	DG	26	ASN
36	DG	33	HIS
36	DG	65	ASN
36	DG	169	ASN
36	DG	365	GLN
37	DH	4	GLN
37	DH	27	GLN
37	DH	100	HIS
37	DH	198	GLN
37	DH	255	GLN
37	DH	337	GLN
37	DH	423	GLN
37	DH	450	ASN
37	DH	526	ASN
38	DI	75	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
38	DI	85	ASN
38	DI	216	GLN
39	DJ	29	HIS
39	DJ	45	ASN
39	DJ	56	HIS
39	DJ	146	GLN
39	DJ	243	ASN
39	DJ	301	HIS
39	DJ	309	GLN
39	DJ	314	GLN
40	DK	219	GLN
41	DL	219	GLN
42	DM	89	GLN
42	DM	171	GLN
44	DO	88	GLN
44	DO	158	GLN
45	DP	212	ASN
46	DQ	21	ASN
46	DQ	27	HIS
46	DQ	41	GLN
46	DQ	59	GLN
46	DQ	73	HIS
47	DR	26	ASN
47	DR	39	GLN
47	DR	173	ASN
47	DR	191	GLN
48	DS	15	GLN
48	DS	219	ASN
49	DT	23	GLN
49	DT	146	GLN
49	DT	161	ASN
49	DT	178	ASN
49	DT	240	GLN
50	DU	18	GLN
50	DU	63	HIS
50	DU	99	GLN
50	DU	113	GLN
50	DU	199	GLN
51	DV	51	ASN
51	DV	154	GLN
52	DW	44	ASN
52	DW	160	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
53	DX	168	ASN
54	DY	106	GLN
58	F6	230	GLN
58	F6	271	GLN
58	F6	292	GLN
58	F6	299	GLN
58	F6	385	GLN
58	F6	547	GLN
58	F6	551	HIS
58	F6	587	GLN
59	F7	110	GLN
59	F7	116	ASN
59	F7	157	GLN
59	F7	186	HIS
59	F7	190	GLN
59	F7	214	HIS
59	F7	432	GLN
59	F7	444	GLN
60	F9	265	GLN
60	F9	484	ASN
61	FO	97	ASN
61	FO	151	GLN
61	FO	175	HIS
61	FO	182	ASN
61	FO	306	ASN
62	Ff	202	GLN
62	Ff	214	ASN
62	Ff	317	GLN
62	Ff	327	ASN
62	Ff	565	GLN
62	Ff	600	HIS
62	Ff	710	GLN
63	Fg	206	GLN
63	Fg	236	GLN
63	Fg	487	GLN
64	Fh	165	GLN
65	Fi	194	ASN
65	Fi	277	HIS
65	Fi	356	HIS
65	Fi	377	GLN
65	Fi	381	GLN
65	Fi	401	GLN

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Mol	Chain	Res	Type
65	Fi	533	GLN
65	Fi	594	GLN
65	Fi	595	GLN
65	Fi	598	HIS
66	IA	135	GLN
66	IA	139	GLN
66	IA	157	HIS
66	IA	227	ASN
66	IA	231	GLN
66	IA	289	GLN
66	IA	363	GLN
66	IA	462	GLN
66	IA	564	GLN
66	IA	724	GLN
67	IB	393	ASN
67	IB	448	GLN
67	IB	538	HIS
67	IB	570	GLN
67	IB	575	HIS
67	IB	774	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	CA	620/621 (99%)	252 (40%)	2 (0%)

All (252) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	CA	2	A
1	CA	3	A
1	CA	4	A
1	CA	6	U
1	CA	11	U
1	CA	16	U
1	CA	18	U
1	CA	19	U
1	CA	25	U
1	CA	26	C
1	CA	29	A
1	CA	38	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	CA	41	A
1	CA	42	A
1	CA	43	A
1	CA	45	G
1	CA	46	U
1	CA	53	A
1	CA	56	U
1	CA	58	A
1	CA	60	A
1	CA	61	A
1	CA	62	A
1	CA	64	G
1	CA	65	U
1	CA	67	U
1	CA	68	A
1	CA	69	U
1	CA	73	U
1	CA	74	G
1	CA	78	G
1	CA	79	A
1	CA	80	U
1	CA	85	U
1	CA	87	U
1	CA	88	A
1	CA	91	A
1	CA	98	A
1	CA	100	G
1	CA	102	A
1	CA	105	G
1	CA	112	A
1	CA	113	U
1	CA	115	A
1	CA	117	U
1	CA	127	G
1	CA	135	U
1	CA	136	G
1	CA	137	U
1	CA	138	U
1	CA	139	U
1	CA	140	U
1	CA	147	G
1	CA	154	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	CA	156	U
1	CA	162	U
1	CA	167	A
1	CA	171	A
1	CA	172	A
1	CA	173	A
1	CA	174	A
1	CA	175	A
1	CA	176	A
1	CA	180	A
1	CA	182	U
1	CA	188	U
1	CA	193	C
1	CA	194	A
1	CA	195	A
1	CA	196	U
1	CA	197	A
1	CA	198	A
1	CA	199	U
1	CA	200	A
1	CA	201	A
1	CA	202	A
1	CA	203	U
1	CA	205	A
1	CA	209	U
1	CA	210	A
1	CA	212	U
1	CA	214	U
1	CA	215	A
1	CA	216	U
1	CA	221	C
1	CA	227	U
1	CA	233	C
1	CA	236	G
1	CA	239	G
1	CA	247	A
1	CA	261	U
1	CA	262	A
1	CA	263	A
1	CA	271	A
1	CA	272	C
1	CA	275	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	CA	276	U
1	CA	277	A
1	CA	279	C
1	CA	280	A
1	CA	284	U
1	CA	291	U
1	CA	296	U
1	CA	297	G
1	CA	298	C
1	CA	300	G
1	CA	309	A
1	CA	310	A
1	CA	322	A
1	CA	323	U
1	CA	324	A
1	CA	327	U
1	CA	328	U
1	CA	329	U
1	CA	330	U
1	CA	331	A
1	CA	332	U
1	CA	334	U
1	CA	335	G
1	CA	336	U
1	CA	337	U
1	CA	338	U
1	CA	339	U
1	CA	340	U
1	CA	345	A
1	CA	346	C
1	CA	347	C
1	CA	348	A
1	CA	349	U
1	CA	350	U
1	CA	355	A
1	CA	356	U
1	CA	357	A
1	CA	360	C
1	CA	361	A
1	CA	362	A
1	CA	364	U
1	CA	365	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	CA	366	U
1	CA	367	A
1	CA	368	A
1	CA	369	A
1	CA	370	A
1	CA	378	A
1	CA	380	U
1	CA	389	A
1	CA	390	U
1	CA	391	A
1	CA	392	U
1	CA	393	U
1	CA	394	A
1	CA	395	U
1	CA	396	A
1	CA	397	U
1	CA	398	U
1	CA	400	U
1	CA	407	U
1	CA	408	C
1	CA	409	A
1	CA	411	A
1	CA	412	U
1	CA	414	A
1	CA	415	U
1	CA	416	U
1	CA	418	A
1	CA	421	G
1	CA	423	A
1	CA	428	A
1	CA	429	U
1	CA	430	U
1	CA	431	U
1	CA	432	G
1	CA	433	U
1	CA	434	A
1	CA	438	U
1	CA	443	U
1	CA	448	U
1	CA	449	G
1	CA	451	U
1	CA	455	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	CA	458	U
1	CA	459	A
1	CA	460	U
1	CA	461	A
1	CA	462	A
1	CA	463	A
1	CA	464	U
1	CA	467	A
1	CA	469	A
1	CA	470	G
1	CA	472	G
1	CA	476	A
1	CA	480	C
1	CA	481	A
1	CA	482	U
1	CA	483	A
1	CA	484	A
1	CA	485	U
1	CA	486	C
1	CA	487	A
1	CA	488	A
1	CA	489	A
1	CA	494	A
1	CA	496	U
1	CA	497	A
1	CA	498	U
1	CA	501	A
1	CA	502	U
1	CA	505	U
1	CA	506	A
1	CA	507	A
1	CA	510	A
1	CA	513	U
1	CA	517	U
1	CA	518	G
1	CA	519	U
1	CA	520	A
1	CA	528	U
1	CA	529	A
1	CA	532	A
1	CA	533	A
1	CA	534	A

*Continued on next page...*

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Mol	Chain	Res	Type
1	CA	536	U
1	CA	538	A
1	CA	539	A
1	CA	541	A
1	CA	542	G
1	CA	543	G
1	CA	544	U
1	CA	545	A
1	CA	547	U
1	CA	565	A
1	CA	566	U
1	CA	568	A
1	CA	569	U
1	CA	576	A
1	CA	581	G
1	CA	583	A
1	CA	586	A
1	CA	587	A
1	CA	588	U
1	CA	590	A
1	CA	603	A
1	CA	612	U
1	CA	613	U
1	CA	614	U
1	CA	615	U
1	CA	616	U
1	CA	617	U
1	CA	619	U
1	CA	620	U
1	CA	621	U

All (2) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	CA	299	U
1	CA	512	G

#### 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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 15 ligands modelled in this entry, 10 are monoatomic - leaving 5 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
80	FAD	Ff	901	-	51,58,58	1.21	6 (11%)	60,89,89	2.23	8 (13%)
77	ATP	Cg	1000	76	26,33,33	0.61	0	31,52,52	0.75	1 (3%)
79	UTP	DJ	401	-	26,30,30	1.88	4 (15%)	34,47,47	1.10	1 (2%)
82	PO4	IA	1001	76	4,4,4	0.91	0	6,6,6	0.44	0
81	GDP	IA	1000	76	24,30,30	1.17	2 (8%)	31,47,47	1.99	8 (25%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
77	ATP	Cg	1000	76	-	2/18/38/38	0/3/3/3
80	FAD	Ff	901	-	-	11/30/50/50	0/6/6/6
79	UTP	DJ	401	-	-	4/22/38/38	0/2/2/2
81	GDP	IA	1000	76	-	3/12/32/32	0/3/3/3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
79	DJ	401	UTP	C6-C5	-6.73	1.34	1.52
80	Ff	901	FAD	C4X-C10	5.48	1.44	1.38
79	DJ	401	UTP	C6-N1	-5.16	1.37	1.47
81	IA	1000	GDP	C5-C6	4.16	1.48	1.41
80	Ff	901	FAD	C4-N3	2.95	1.38	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
79	DJ	401	UTP	C5-C4	-2.74	1.43	1.50
81	IA	1000	GDP	C5-C4	2.41	1.47	1.40
79	DJ	401	UTP	C2-N1	2.35	1.39	1.35
80	Ff	901	FAD	C4X-C4	2.23	1.45	1.41
80	Ff	901	FAD	C9A-N10	2.16	1.41	1.38
80	Ff	901	FAD	C4X-N5	-2.12	1.30	1.33
80	Ff	901	FAD	C5X-N5	2.07	1.38	1.35

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
80	Ff	901	FAD	C2-N3-C4	12.97	126.09	115.14
80	Ff	901	FAD	C4X-C4-N3	-6.98	113.88	123.43
81	IA	1000	GDP	C2-N3-C4	4.84	120.88	115.36
80	Ff	901	FAD	C10-C4X-N5	4.75	124.55	121.26
81	IA	1000	GDP	C2-N1-C6	4.04	122.34	115.93
81	IA	1000	GDP	C5-C6-N1	-3.94	118.04	123.43
81	IA	1000	GDP	C4-C5-C6	-3.85	117.12	120.80
80	Ff	901	FAD	C10-C4X-C4	-3.78	117.45	119.95
80	Ff	901	FAD	C4X-C10-N10	-3.43	116.78	120.30
79	DJ	401	UTP	C5-C6-N1	3.37	122.70	111.61
81	IA	1000	GDP	PA-O3A-PB	-3.34	121.36	132.83
81	IA	1000	GDP	N3-C2-N1	-3.30	122.82	127.22
80	Ff	901	FAD	C1'-N10-C9A	3.27	120.86	118.29
81	IA	1000	GDP	C3'-C2'-C1'	3.23	105.84	100.98
80	Ff	901	FAD	P-O3P-PA	-2.56	124.04	132.83
81	IA	1000	GDP	C4-C5-N7	-2.53	106.77	109.40
80	Ff	901	FAD	C5A-C6A-N6A	2.30	123.85	120.35
77	Cg	1000	ATP	C5-C6-N6	2.28	123.82	120.35

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
79	DJ	401	UTP	O4'-C1'-N1-C6
80	Ff	901	FAD	C5B-O5B-PA-O3P
80	Ff	901	FAD	N10-C1'-C2'-O2'
80	Ff	901	FAD	C2'-C3'-C4'-O4'
80	Ff	901	FAD	C2'-C3'-C4'-C5'
80	Ff	901	FAD	O3'-C3'-C4'-O4'
80	Ff	901	FAD	O3'-C3'-C4'-C5'
81	IA	1000	GDP	PA-O3A-PB-O3B

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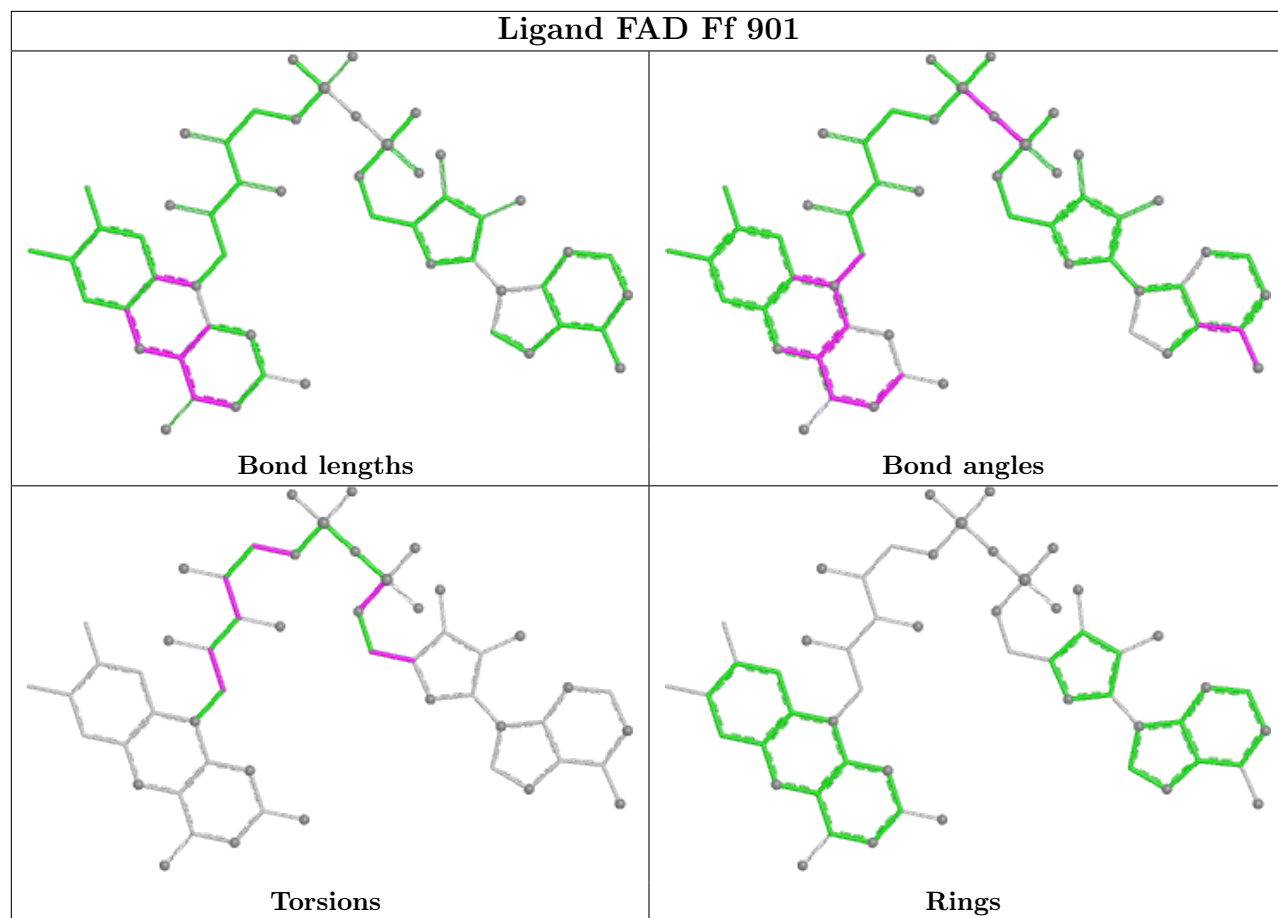
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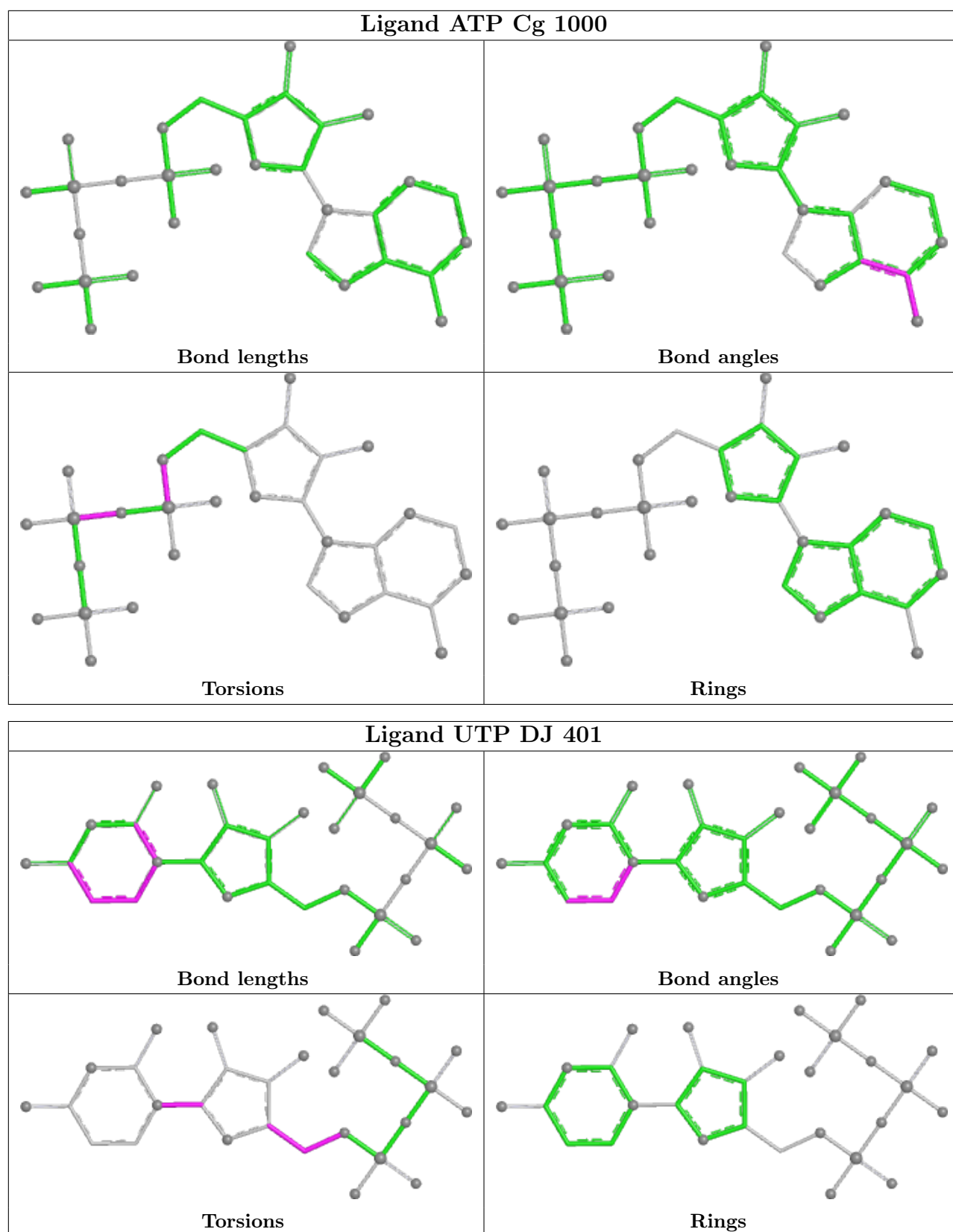
Mol	Chain	Res	Type	Atoms
79	DJ	401	UTP	O4'-C1'-N1-C2
80	Ff	901	FAD	O4B-C4B-C5B-O5B
80	Ff	901	FAD	C3B-C4B-C5B-O5B
81	IA	1000	GDP	PA-O3A-PB-O1B
79	DJ	401	UTP	C4'-C5'-O5'-PA
80	Ff	901	FAD	C4'-C5'-O5'-P
80	Ff	901	FAD	C5B-O5B-PA-O1A
80	Ff	901	FAD	N10-C1'-C2'-C3'
77	Cg	1000	ATP	PA-O3A-PB-O2B
79	DJ	401	UTP	C3'-C4'-C5'-O5'
81	IA	1000	GDP	C5'-O5'-PA-O3A
77	Cg	1000	ATP	C5'-O5'-PA-O1A

There are no ring outliers.

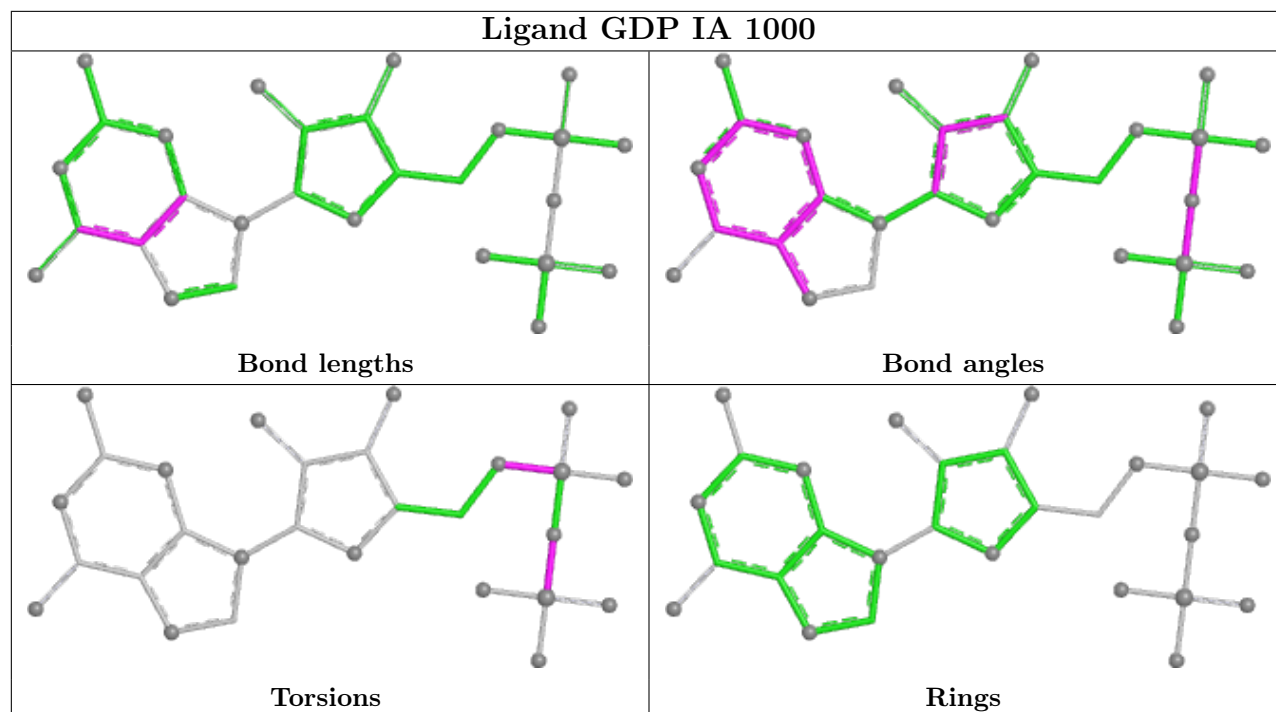
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.









## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

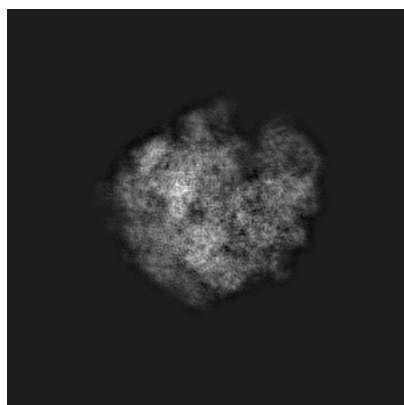
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13661. These allow visual inspection of the internal detail of the map and identification of artifacts.

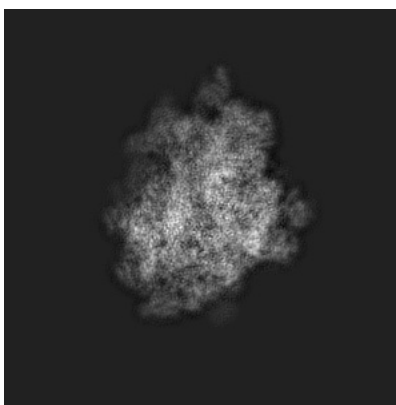
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

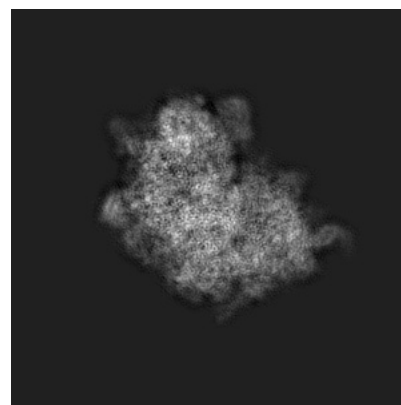
#### 6.1.1 Primary map



X



Y

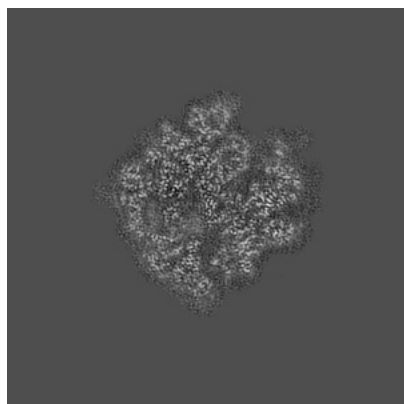


Z

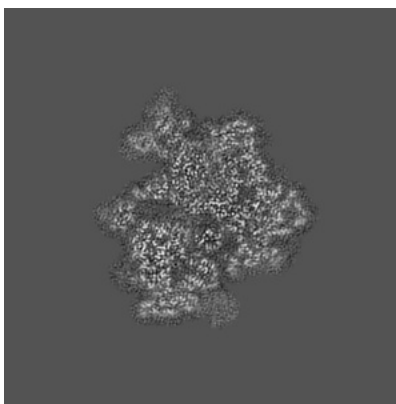
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

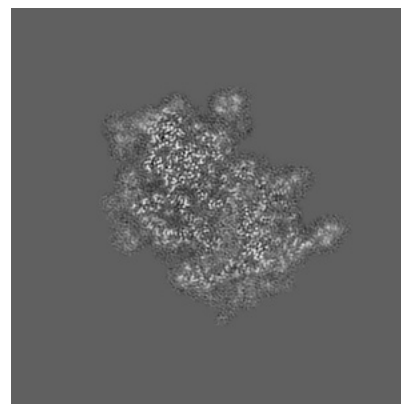
#### 6.2.1 Primary map



X Index: 180



Y Index: 180

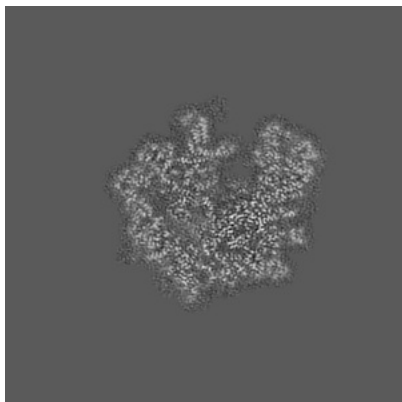


Z Index: 180

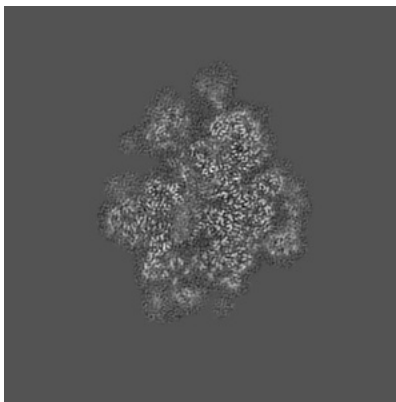
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

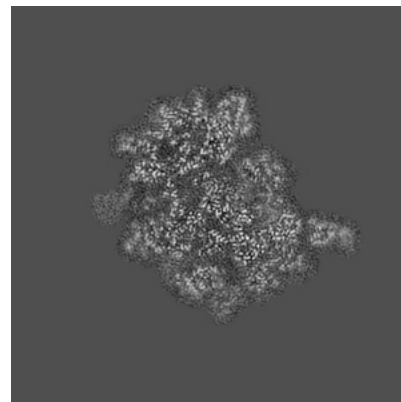
### 6.3.1 Primary map



X Index: 158



Y Index: 165

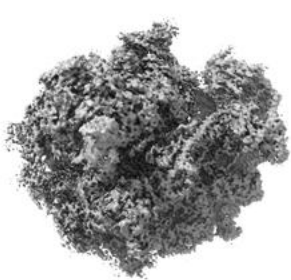


Z Index: 192

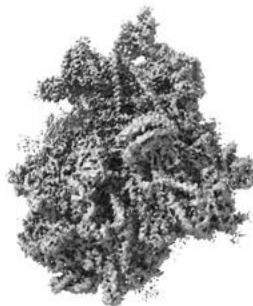
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal surface views [i](#)

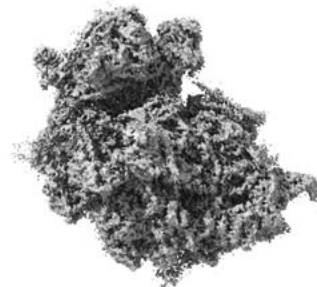
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

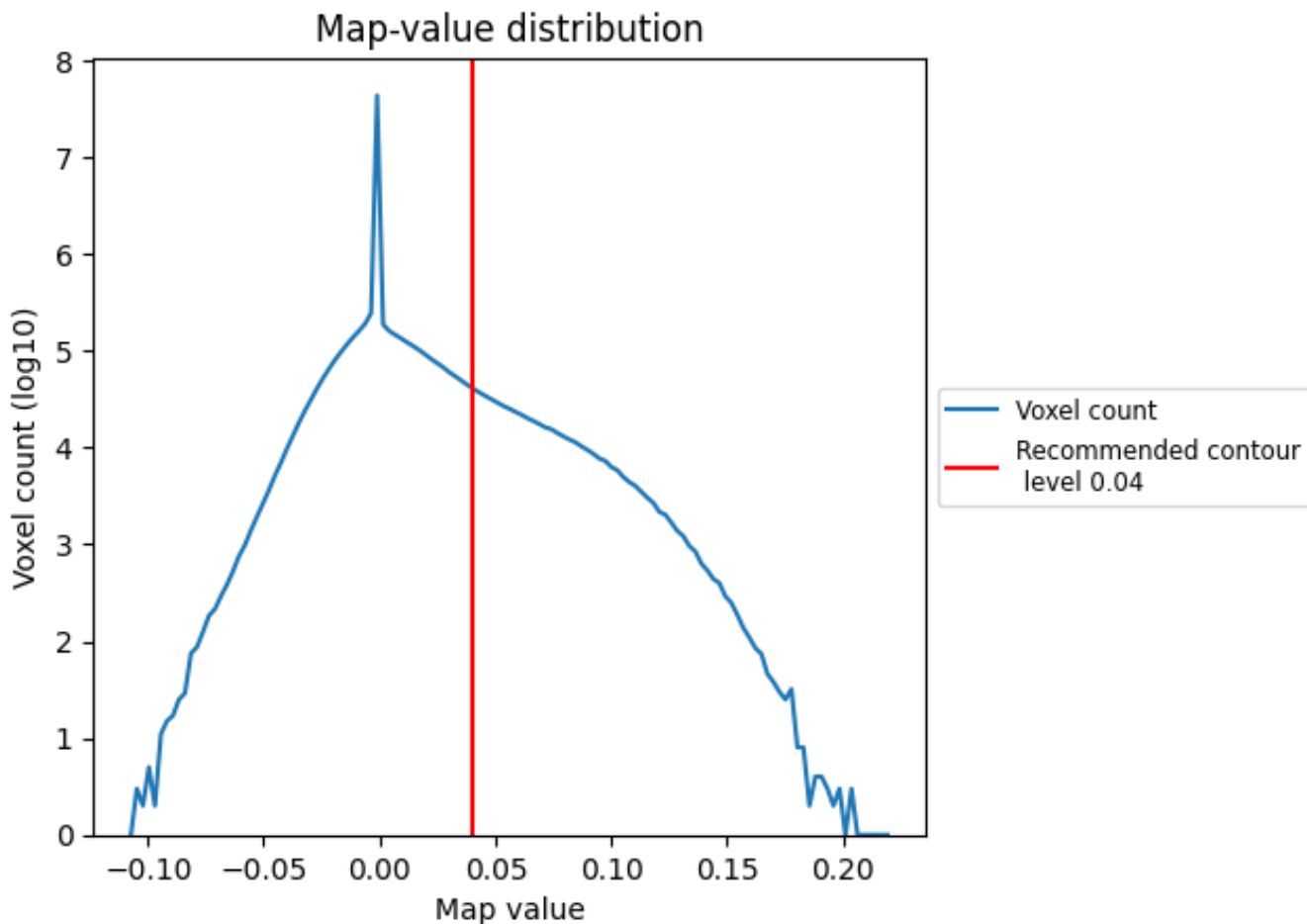
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

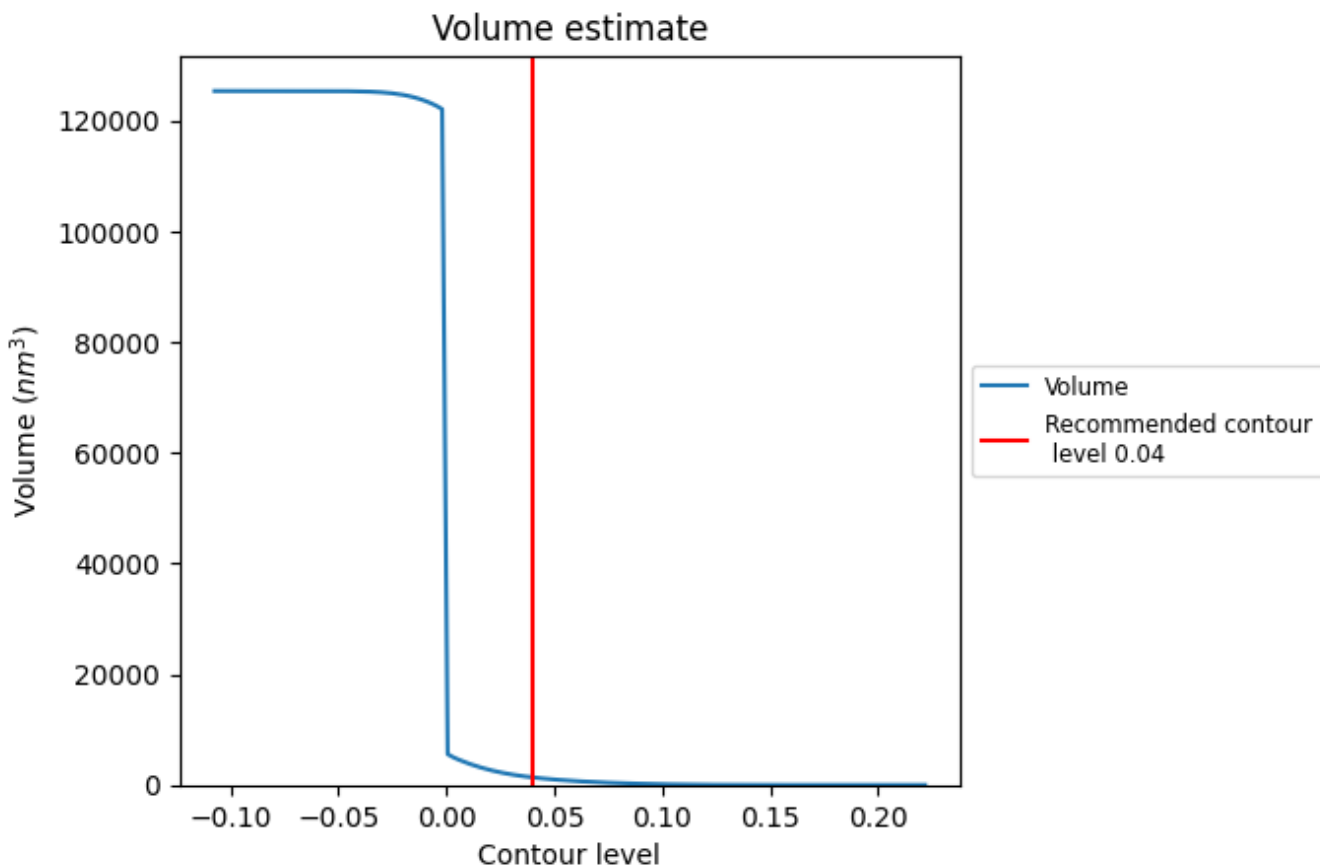
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

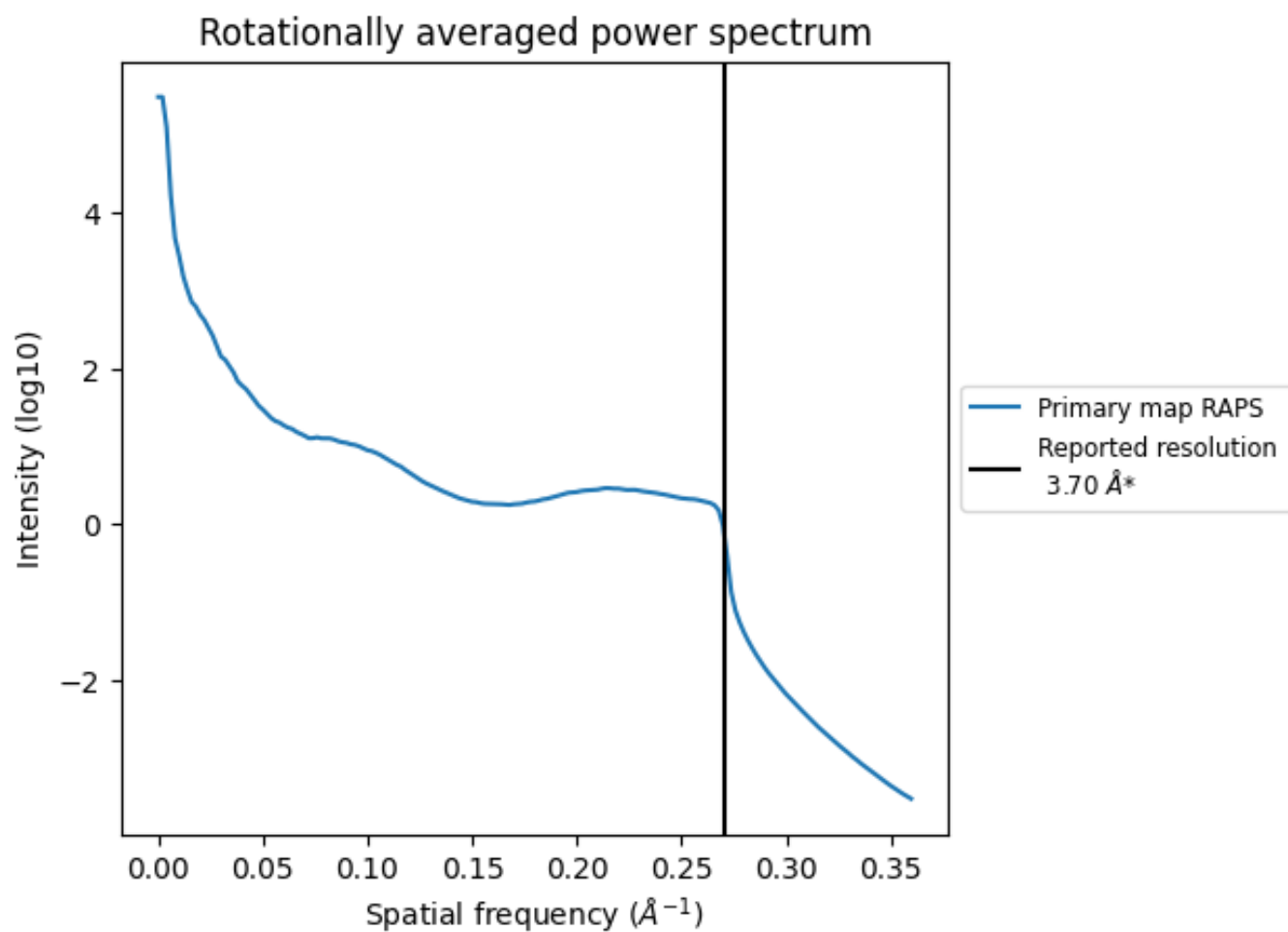
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1367 nm<sup>3</sup>; this corresponds to an approximate mass of 1235 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  $0.270 \text{\AA}^{-1}$

## 8 Fourier-Shell correlation

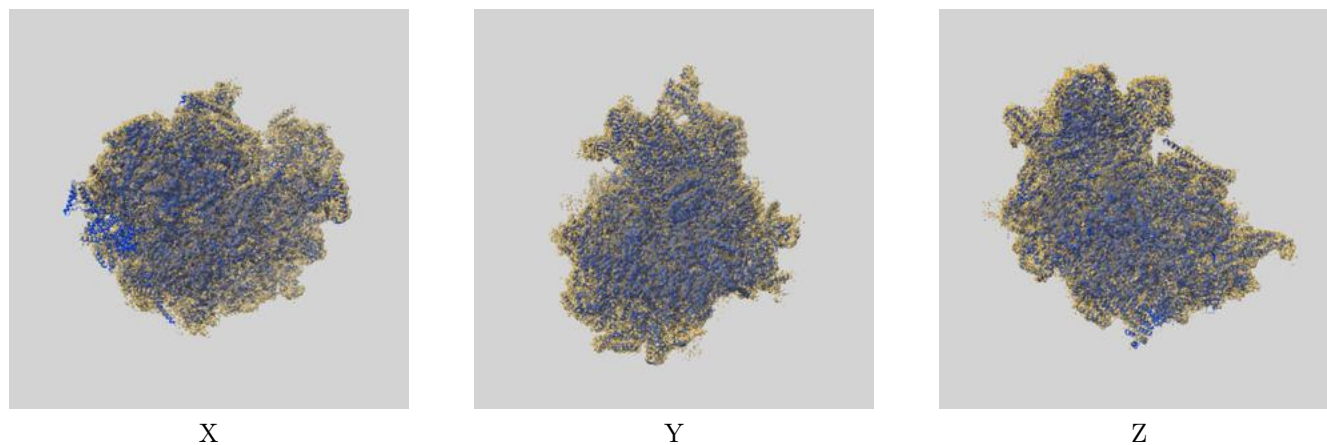
This section was not generated. No FSC curve or half-maps provided.



## 9 Map-model fit [i](#)

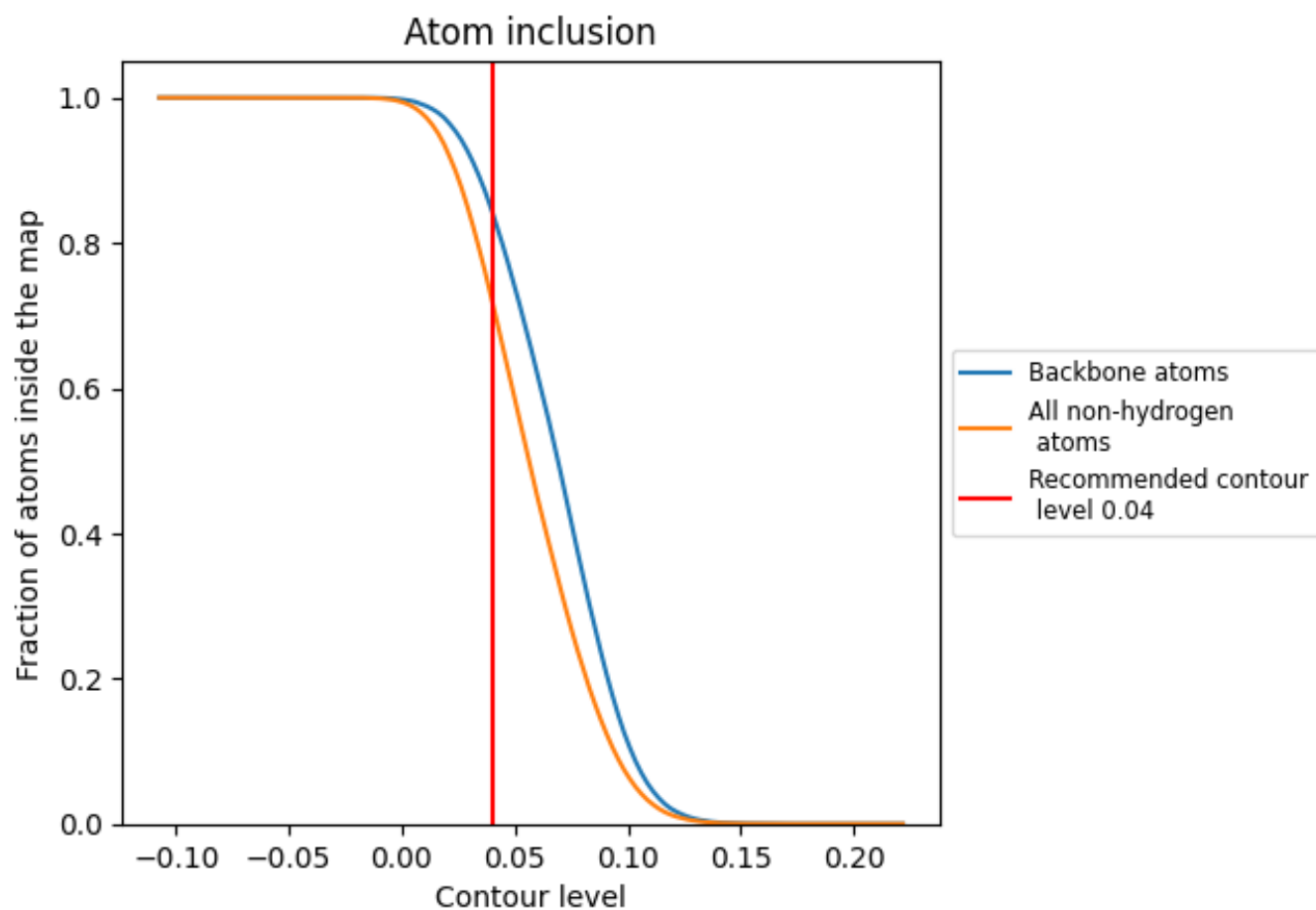
This section contains information regarding the fit between EMDB map EMD-13661 and PDB model 7PUB. Per-residue inclusion information can be found in section 3 on page 27.

### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.04 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 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.