



Full wwPDB EM Validation Report ⓘ

Aug 26, 2024 – 10:52 AM EDT

PDB ID : 9BLN
EMDB ID : EMD-44671
Title : The structure of human Pdc4 bound to the 40S-eIF4A-eIF3-eIF1 complex
Authors : Brito Querido, J.; Sokabe, M.; Diaz-Lopez, I.; Gordiyenko, Y.; Zuber, P.; Yifei, D.; Albacete-Albacete, L.; Ramakrishnan, V.; S Fraser, C.
Deposited on : 2024-04-30
Resolution : 3.90 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

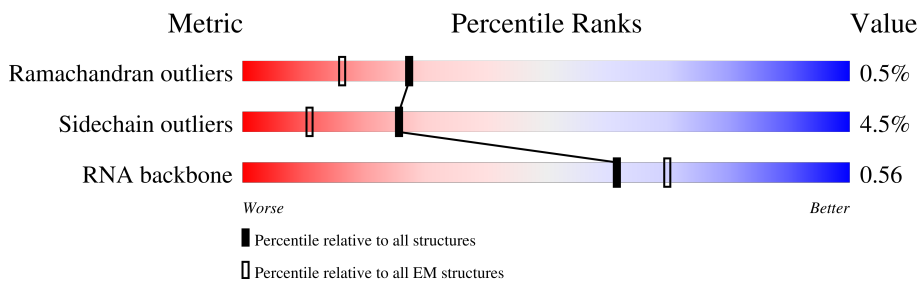
EMDB validation analysis : 0.0.1.dev112
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.38.3

1 Overall quality at a glance

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

The reported resolution of this entry is 3.90 Å.

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





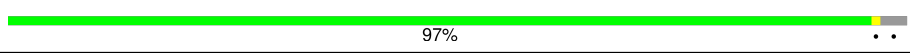
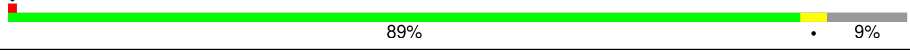
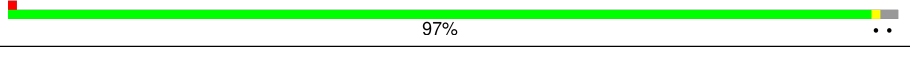


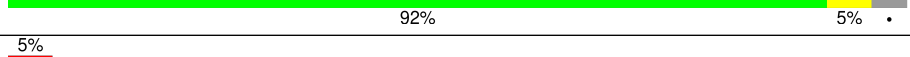
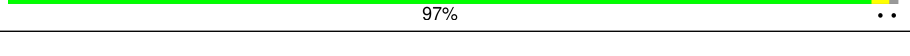
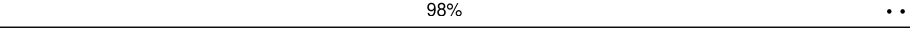
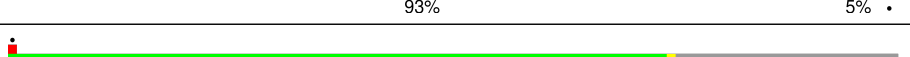
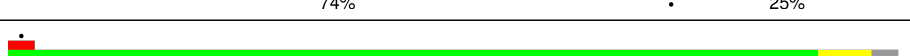
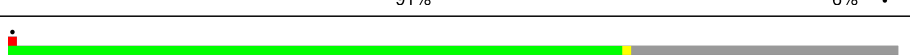
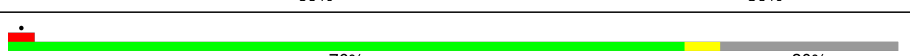
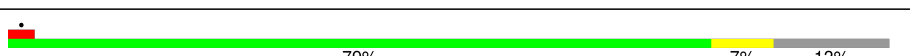
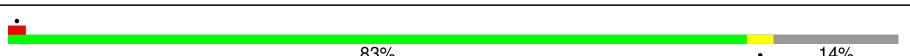
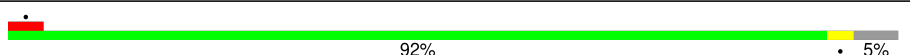




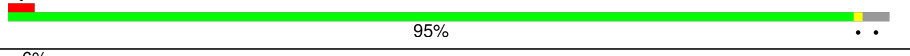
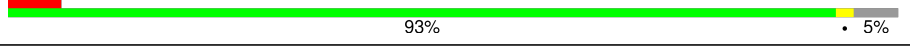
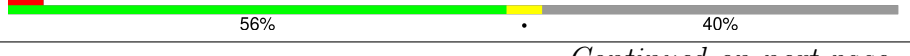

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	X	325	
2	U	661	
3	3	218	
4	4	357	
5	5	564	
6	6	374	
7	8	352	
8	9	25	

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Mol	Chain	Length	Quality of chain
9	A	1719	 74% 22%
10	B	158	 86% 9%
11	C	263	 97%
12	D	194	 89% 9%
13	E	143	 97%
14	F	59	 78% 12% 8%
15	G	194	 10% 82% 7% 11%
16	H	84	 92% 5%
17	I	151	 5% 97%
18	J	130	 98%
19	K	83	 93% 5%
20	L	293	 74% 25%
21	M	135	 91% 6%
22	N	295	 69% 30%
23	O	264	 76% 20%
24	P	151	 79% 7% 13%
25	Q	115	 83% 14%
26	R	208	 92% 5%
27	S	249	 7% 86% 6% 8%
28	T	133	 89% 5% 7%
29	V	204	 85% 5% 10%
30	W	113	 67% 71% 26%
31	Y	146	 95%
32	Z	243	 6% 93% 5%
33	a	165	 56% 40%

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Mol	Chain	Length	Quality of chain
34	b	145	
35	c	317	
36	d	145	
37	e	125	
38	f	152	
39	h	119	
40	i	56	
41	k	156	
42	l	388	
43	m	132	
44	n	69	
45	o	320	
46	p	469	
47	u	1382	
48	v	445	
49	x	548	
50	y	913	

2 Entry composition [i](#)

There are 55 unique types of molecules in this entry. The entry contains 104352 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Eukaryotic translation initiation factor 3 subunit I.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	X	325	1598	947	325	326	0	0

- Molecule 2 is a protein called Eukaryotic translation initiation factor 3 subunit B.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	U	560	2770	1650	560	560	0	0

- Molecule 3 is a protein called Eukaryotic translation initiation factor 3 subunit K.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	3	213	1057	631	213	213	0	0

- Molecule 4 is a protein called Eukaryotic translation initiation factor 3 subunit F.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	4	257	1272	757	257	258	0	0

- Molecule 5 is a protein called Eukaryotic translation initiation factor 3 subunit L.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	5	319	1581	943	319	319	0	0

- Molecule 6 is a protein called Eukaryotic translation initiation factor 3 subunit M.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	6	350	1917	1159	376	380	2	0	0

- Molecule 7 is a protein called Eukaryotic translation initiation factor 3 subunit H.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	8	317	1571	936	317	318	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein eS32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	9	24	230	139	62	26	3	0	0

- Molecule 9 is a RNA chain called rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
9	A	1672	35720	15962	6403	11683	1672	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	B	143	1177	749	222	200	6	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein eS4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	C	256	2035	1302	378	347	8	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	D	177	1477	941	295	239	2	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	E	140	1087	687	215	182	3	0	0

- Molecule 14 is a protein called Small ribosomal subunit protein eS30.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	F	54	Total	C	N	O	S	0	0
			424	262	92	69	1		

- Molecule 15 is a protein called Small ribosomal subunit protein eS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	G	173	Total	C	N	O	S	0	0
			1399	895	255	248	1		

- Molecule 16 is a protein called Small ribosomal subunit protein eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	H	81	Total	C	N	O	S	0	0
			631	397	116	111	7		

- Molecule 17 is a protein called Small ribosomal subunit protein uS15.

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

- Molecule 18 is a protein called Small ribosomal subunit protein uS8.

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

- Molecule 19 is a protein called Small ribosomal subunit protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	K	81	Total	C	N	O	S	0	0
			617	380	114	118	5		

- Molecule 20 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	L	220	Total	C	N	O	S	0	0
			1707	1104	292	301	10		

- Molecule 21 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	M	131	Total	C	N	O	S	0	0
			1064	668	198	194	4		

- Molecule 22 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	N	207	Total	C	N	O	S	0	0
			1633	1040	288	297	8		

- Molecule 23 is a protein called Small ribosomal subunit protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	O	211	Total	C	N	O	S	0	0
			1715	1088	307	306	14		

- Molecule 24 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	P	131	Total	C	N	O	S	0	0
			981	600	193	182	6		

- Molecule 25 is a protein called Small ribosomal subunit protein eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Q	99	Total	C	N	O	S	0	0
			792	492	165	130	5		

- Molecule 26 is a protein called Small ribosomal subunit protein eS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	R	198	Total	C	N	O	S	0	0
			1627	1021	322	279	5		

- Molecule 27 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	S	230	Total	C	N	O	S	0	0
			1862	1164	371	320	7		

- Molecule 28 is a protein called Small ribosomal subunit protein eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	T	124	1011	640	198	168	5	0	0

- Molecule 29 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	V	184	1461	914	276	264	7	0	0

- Molecule 30 is a protein called Eukaryotic translation initiation factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	W	84	683	434	124	123	2	0	0

- Molecule 31 is a protein called Small ribosomal subunit protein uS9.

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

- Molecule 32 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	Z	231	1783	1135	321	319	8	0	0

- Molecule 33 is a protein called Small ribosomal subunit protein eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	a	99	834	544	149	135	6	0	0

- Molecule 34 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	b	118	972	617	182	166	7	0	0

- Molecule 35 is a protein called Receptor of activated protein C kinase 1.

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

- Molecule 36 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	d	142	1105	692	213	197	3	0	0

- Molecule 37 is a protein called Small ribosomal subunit protein eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	e	69	551	356	100	94	1	0	0

- Molecule 38 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	f	142	1176	737	239	199	1	0	0

- Molecule 39 is a protein called Small ribosomal subunit protein uS10.

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

- Molecule 40 is a protein called Small ribosomal subunit protein uS14.

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

- Molecule 41 is a protein called Ubiquitin-40S ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	k	52	429	271	82	69	7	0	0

- Molecule 42 is a protein called Eukaryotic initiation factor 4A-I.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
42	l	345	1706	1016	345	345	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
l	19	MET	-	initiating methionine	UNP P60842

- Molecule 43 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	m	122	950	596	168	177	9	0	0

- Molecule 44 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	n	63	498	302	101	93	2	0	0

- Molecule 45 is a protein called Eukaryotic translation initiation factor 3 subunit G.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
45	o	85	420	249	85	86	0	0

- Molecule 46 is a protein called Programmed cell death protein 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
46	p	346	1839	1100	367	372	0	0

- Molecule 47 is a protein called Eukaryotic translation initiation factor 3 subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	u	572	4708	2975	847	863	23	1	0

- Molecule 48 is a protein called Eukaryotic translation initiation factor 3 subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	v	384	2635	1657	477	489	12	0	0

- Molecule 49 is a protein called Eukaryotic translation initiation factor 3 subunit D.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
49	x	428	2121	1265	428	428	0	0

- Molecule 50 is a protein called Eukaryotic translation initiation factor 3 subunit C.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	y	535	4325	2723	768	801	33	0	0

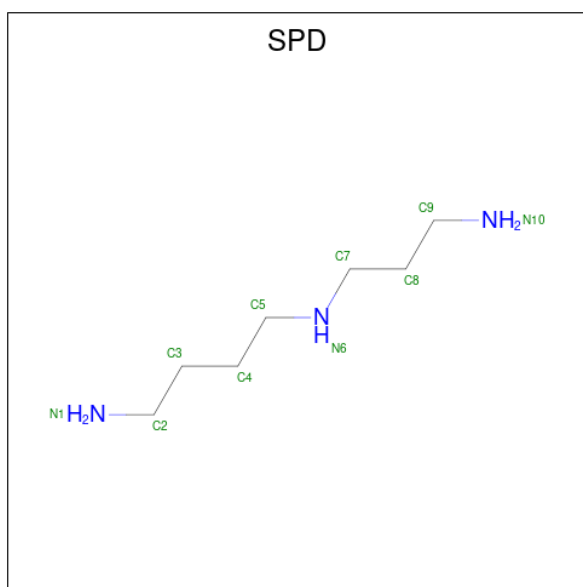
- Molecule 51 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
51	A	87	Total	Mg	0
			87	87	
51	f	1	Total	Mg	0
			1	1	

- Molecule 52 is POTASSIUM ION (three-letter code: K) (formula: K) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
52	A	18	Total	K	0
			18	18	
52	i	1	Total	K	0
			1	1	

- Molecule 53 is SPERMIDINE (three-letter code: SPD) (formula: C₇H₁₉N₃) (labeled as "Ligand of Interest" by depositor).

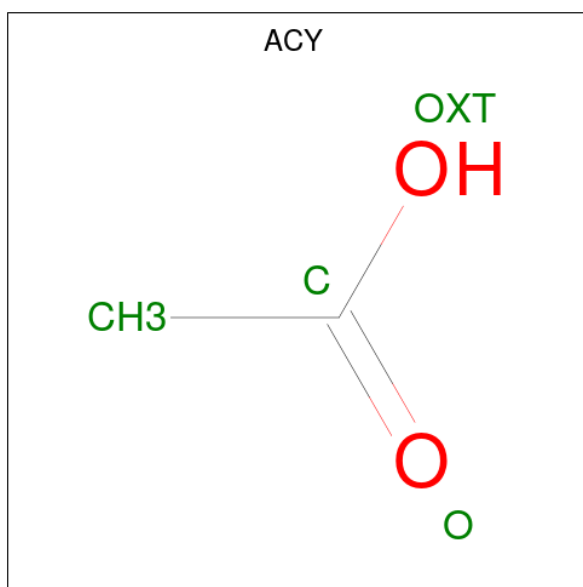


Mol	Chain	Residues	Atoms			AltConf
53	A	1	Total	C	N	0
			10	7	3	

- Molecule 54 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
54	Q	1	Total	Zn	0
			1	1	
54	i	1	Total	Zn	0
			1	1	
54	k	1	Total	Zn	0
			1	1	

- Molecule 55 is ACETIC ACID (three-letter code: ACY) (formula: C₂H₄O₂) (labeled as "Ligand of Interest" by depositor).

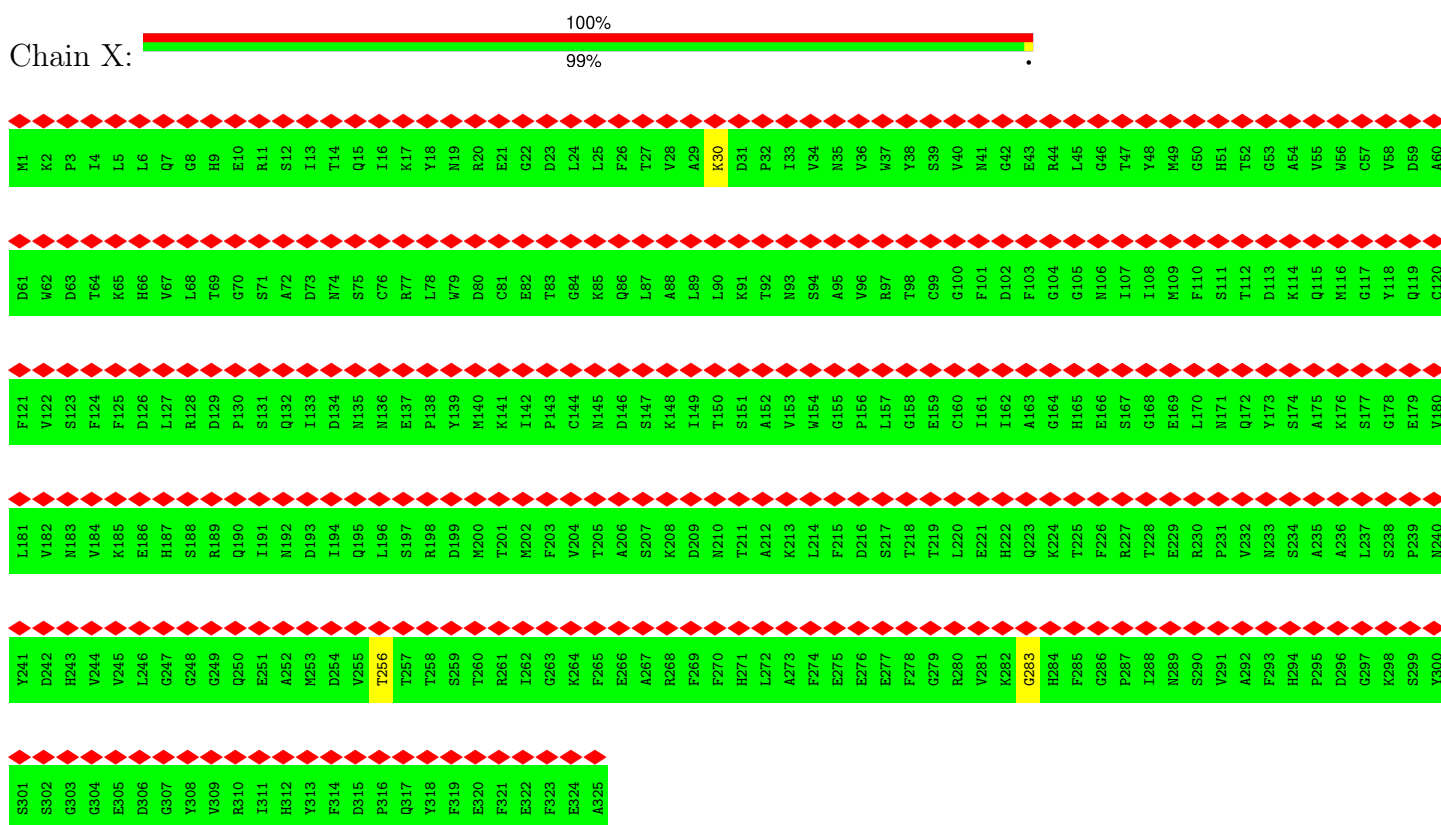


Mol	Chain	Residues	Atoms			AltConf
55	1	1	Total	C	O	0
			3	1	2	

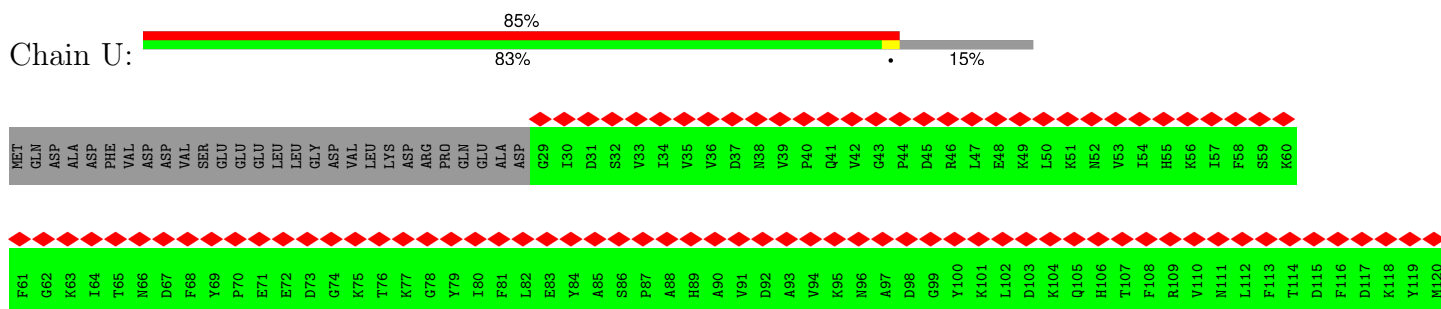
3 Residue-property plots

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

- Molecule 1: Eukaryotic translation initiation factor 3 subunit I



- Molecule 2: Eukaryotic translation initiation factor 3 subunit B



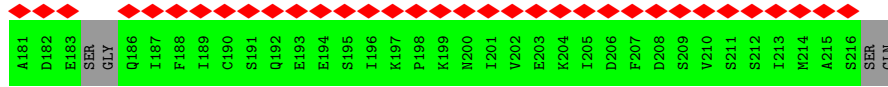
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R181	W182	T183	E184	T185	Y186	V187	R188	W189	S190	P191	K192	G193	T194	Y195	L196	A197	T198	F199	H200	Q201	R202	G203	I204	A205	L206	W207	G208	G209	E210	K211	F212	K213	Q214	L215	Q216	R217	F218	S219	H220	Q221	G222	V223	Q224	L225	I226	D227	F228	S229	P230	C231	E232	R233	Y234	L235	V236	T237	F238	S239	P240	
L241	M242	D243	T244	Q245	D246	K247	P248	Q249	A250	I251	I252	L253	W254	D255	I256	L257	T258	G259	H260	K261	K262	G263	G264	F265	H266	C267	E268	S269	S270	A271	H272	W273	P274	L275	F276	K277	W278	S279	H280	D281	G282	K283	F284	L285	A286	R287	M288	T289	L290	D291	T292	L293	S294	I295	Y296	E297	T298	P299	S300	
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GLU

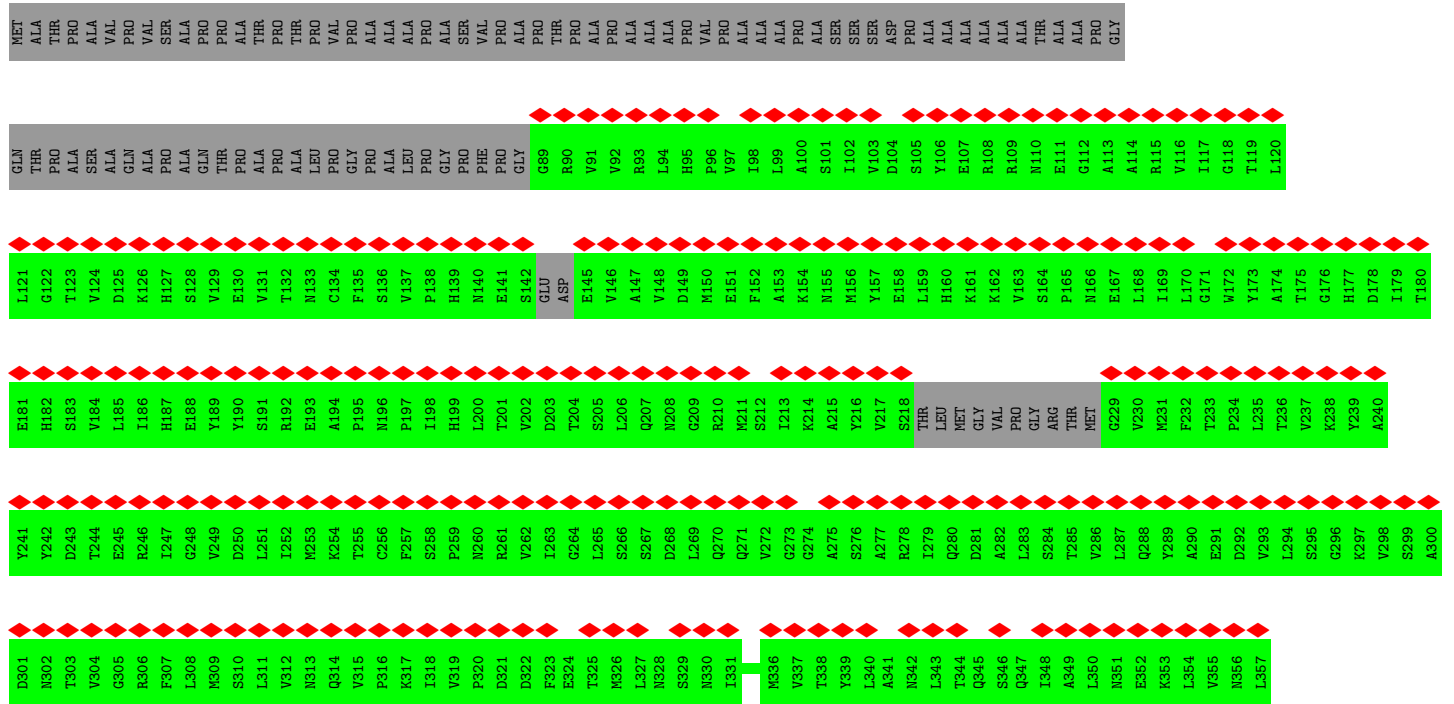
• Molecule 3: Eukaryotic translation initiation factor 3 subunit K



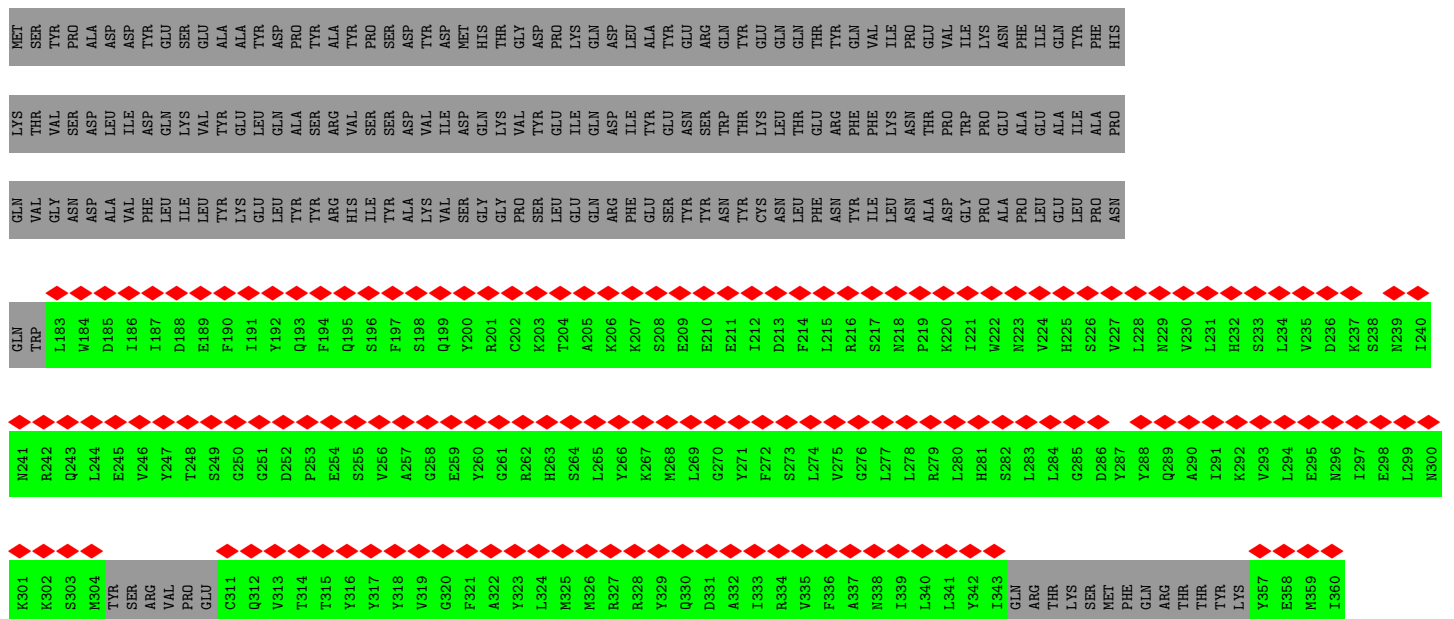
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L121	D122	E123	N124	M125	D126	L127	L128	E129	G130	I131	T132	G133	F134	E135	D136	S137	V138	R139	K140	F141	I142	C143	H144	V145	H146	G147	I148	L149	Y150	Q151	H152	I153	D154	R155	W156	L157	L158	A159	E160	M161	I162	G163	D164	L165	S166	D167	S168	Q169	L170	K171	V172	M173	H174	S175	K176	Y177	G178	W179	S180

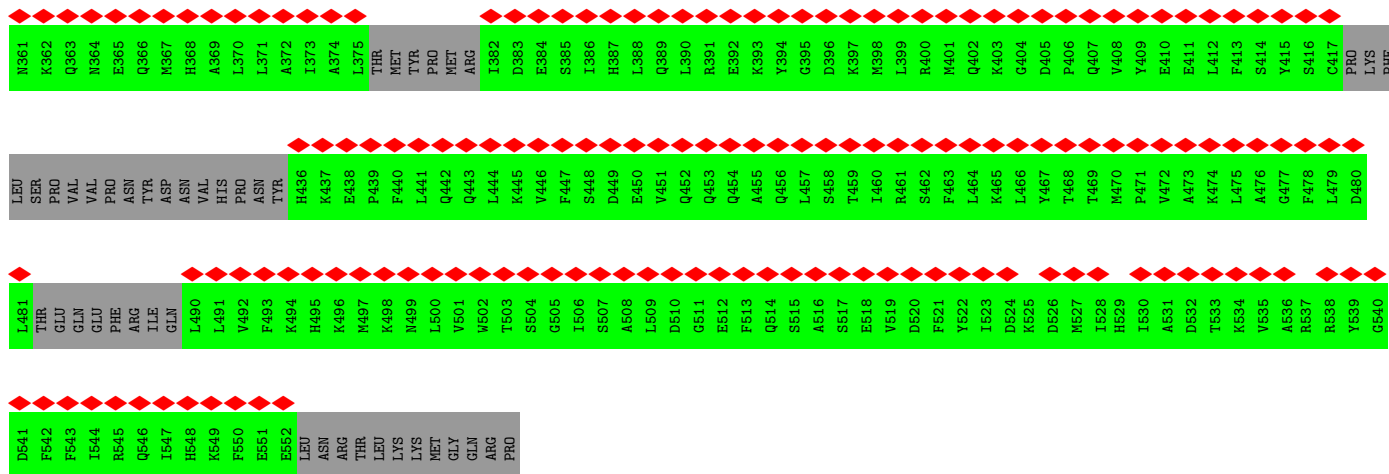


• Molecule 4: Eukaryotic translation initiation factor 3 subunit F

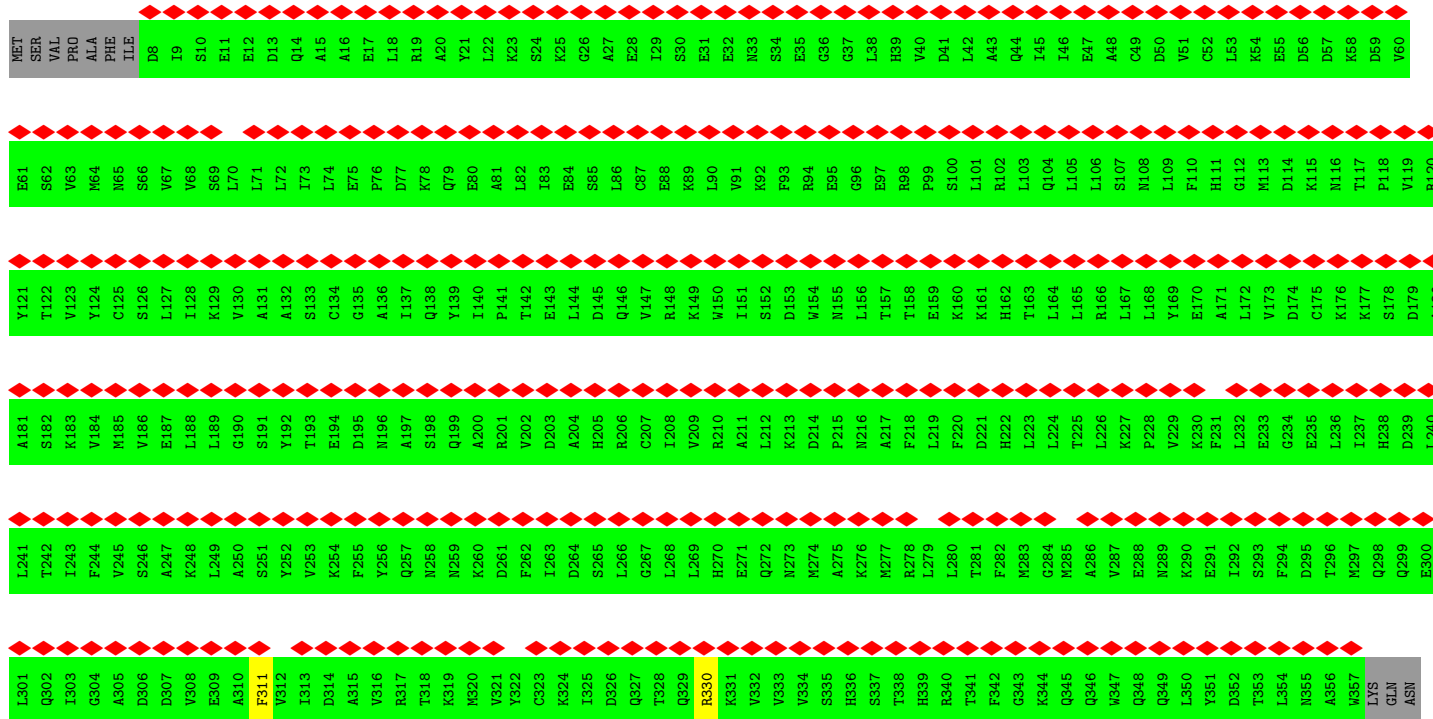
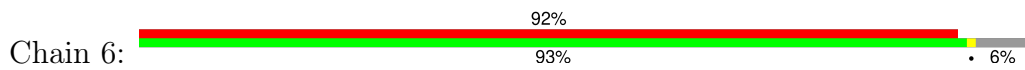


• Molecule 5: Eukaryotic translation initiation factor 3 subunit L

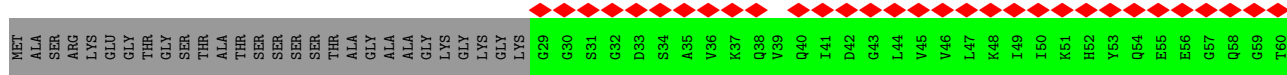
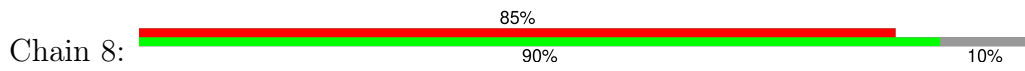


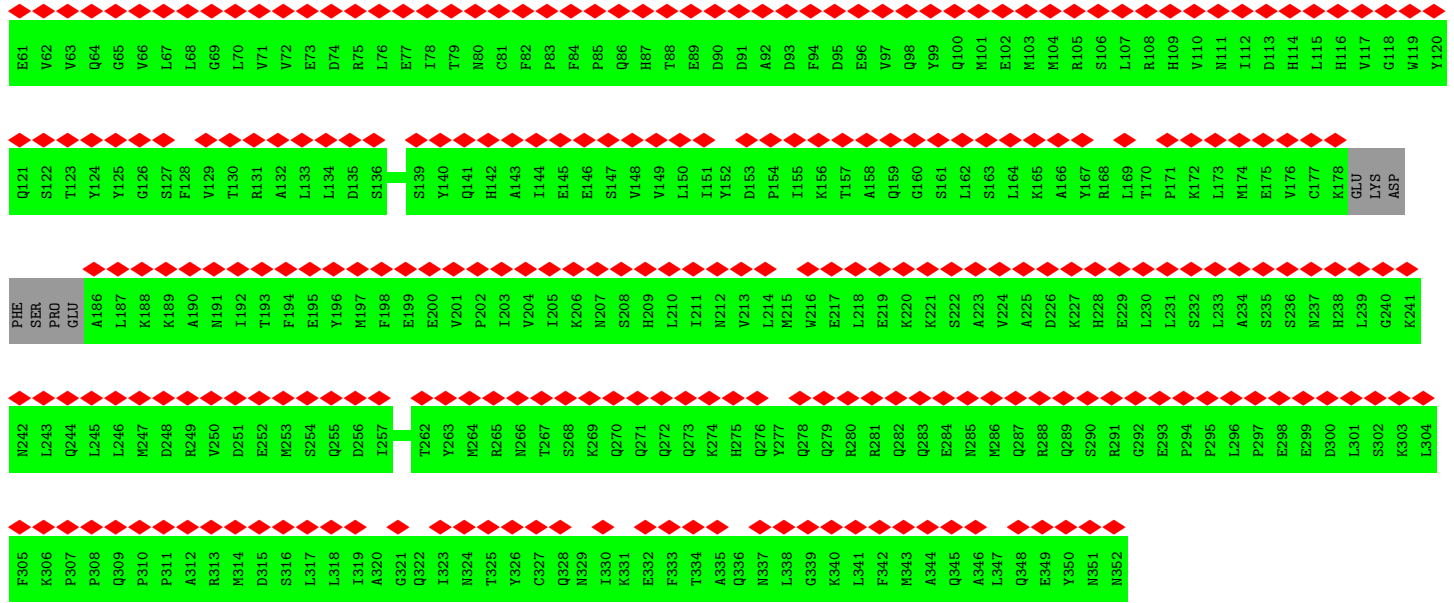


• Molecule 6: Eukaryotic translation initiation factor 3 subunit M

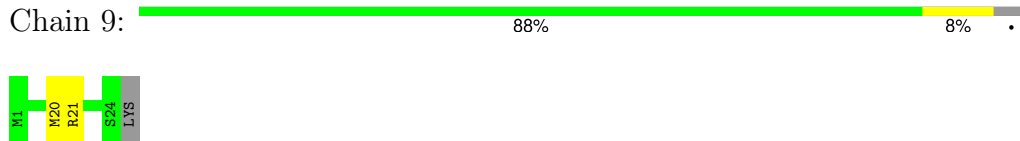


• Molecule 7: Eukaryotic translation initiation factor 3 subunit H

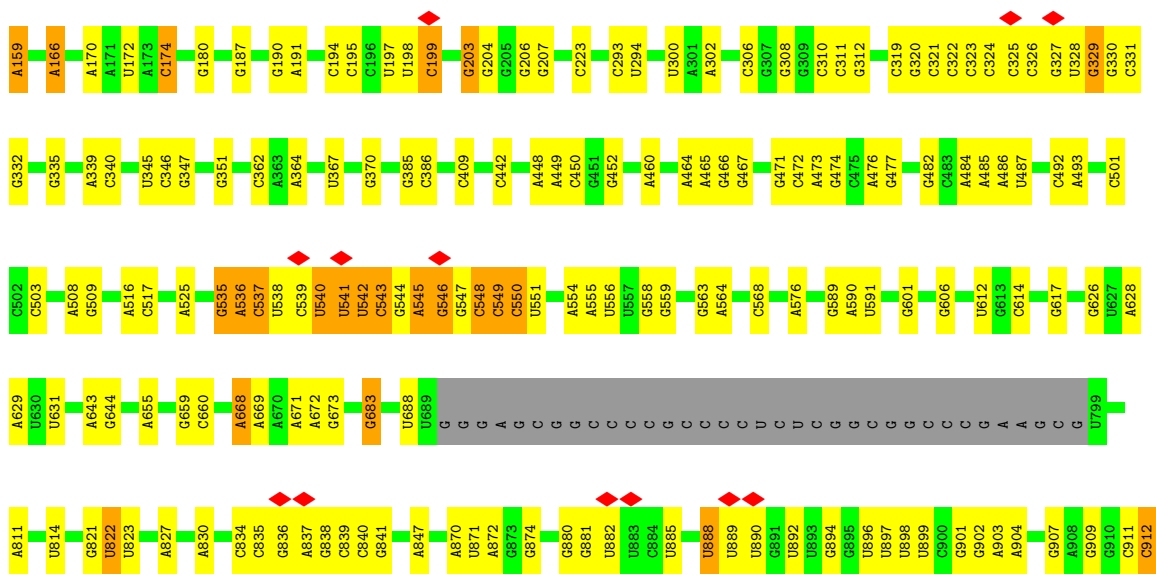
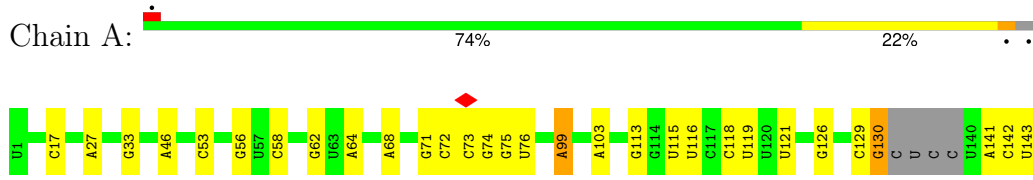


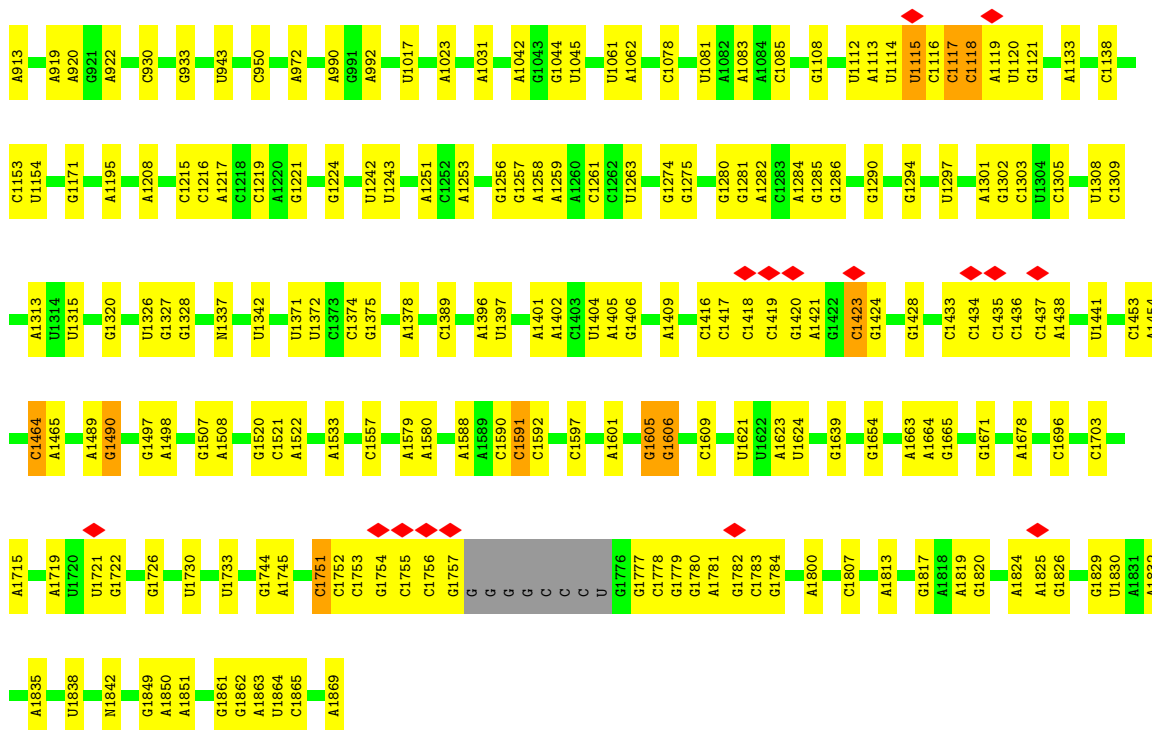


• Molecule 8: Small ribosomal subunit protein eS32

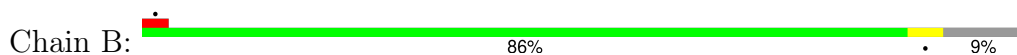


• Molecule 9: rRNA

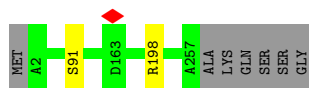




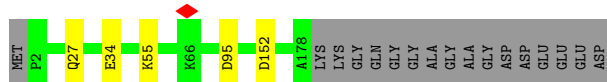
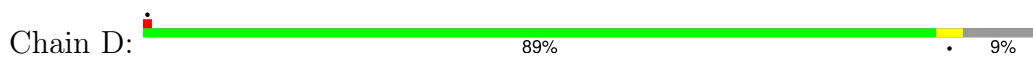
• Molecule 10: Small ribosomal subunit protein uS17



• Molecule 11: Small ribosomal subunit protein eS4, X isoform

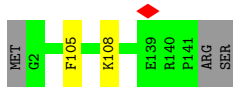


• Molecule 12: Small ribosomal subunit protein uS4

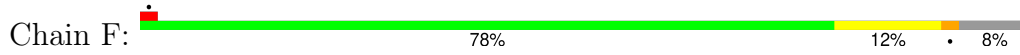


• Molecule 13: Small ribosomal subunit protein uS12

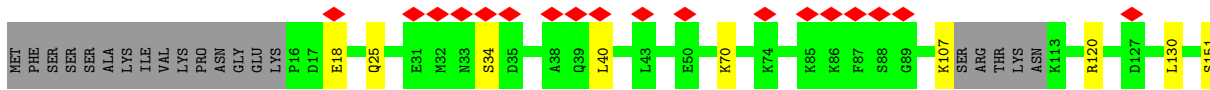
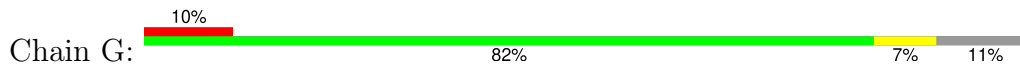




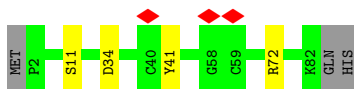
- Molecule 14: Small ribosomal subunit protein eS30



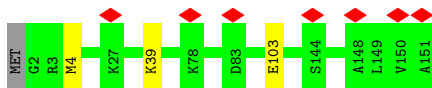
- Molecule 15: Small ribosomal subunit protein eS7



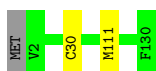
- Molecule 16: Small ribosomal subunit protein eS27



- Molecule 17: Small ribosomal subunit protein uS15



- Molecule 18: Small ribosomal subunit protein uS8

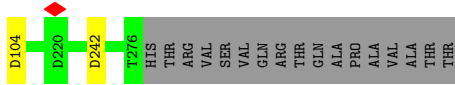
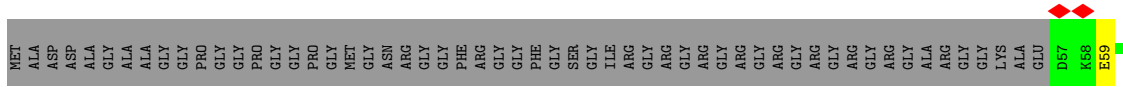


- Molecule 19: Small ribosomal subunit protein eS21

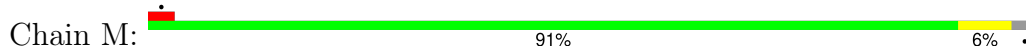




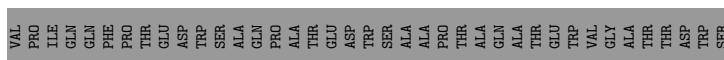
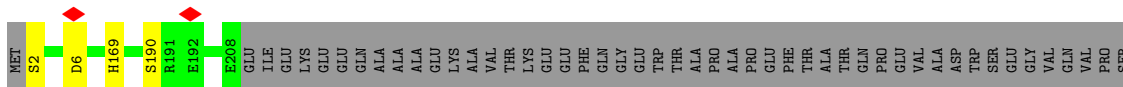
- Molecule 20: Small ribosomal subunit protein uS5



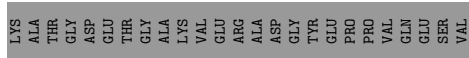
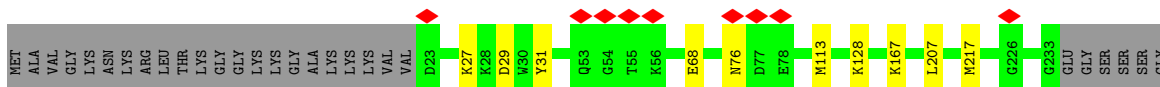
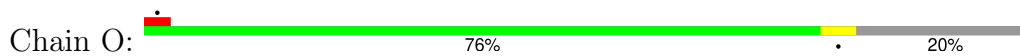
- Molecule 21: Small ribosomal subunit protein eS17



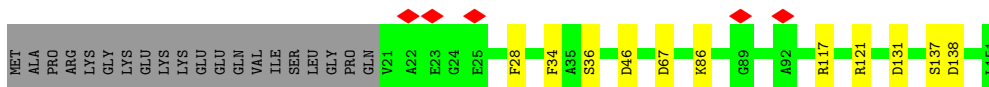
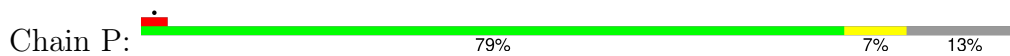
- Molecule 22: Small ribosomal subunit protein uS2



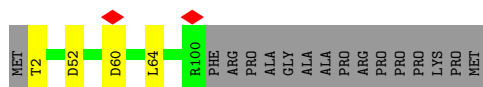
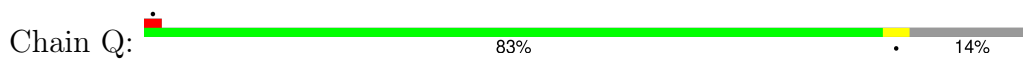
- Molecule 23: Small ribosomal subunit protein eS1



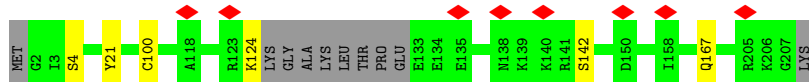
- Molecule 24: 40S ribosomal protein S14



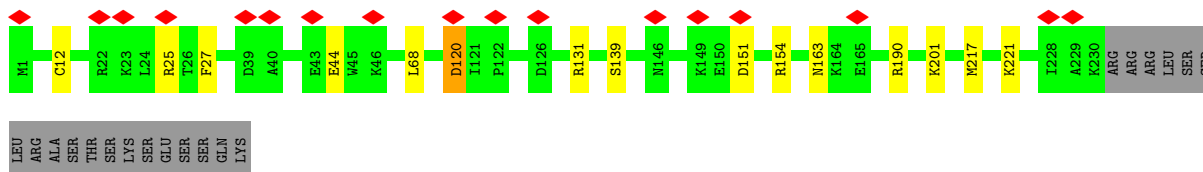
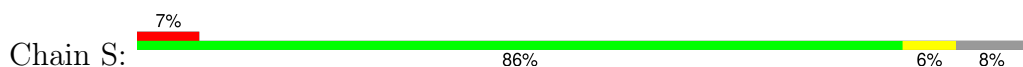
- Molecule 25: Small ribosomal subunit protein eS26



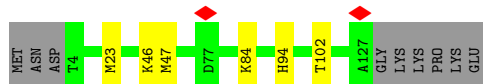
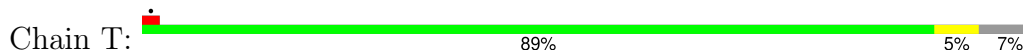
• Molecule 26: Small ribosomal subunit protein eS8



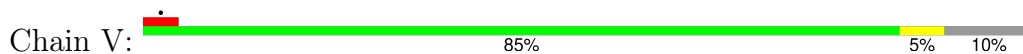
• Molecule 27: Small ribosomal subunit protein eS6



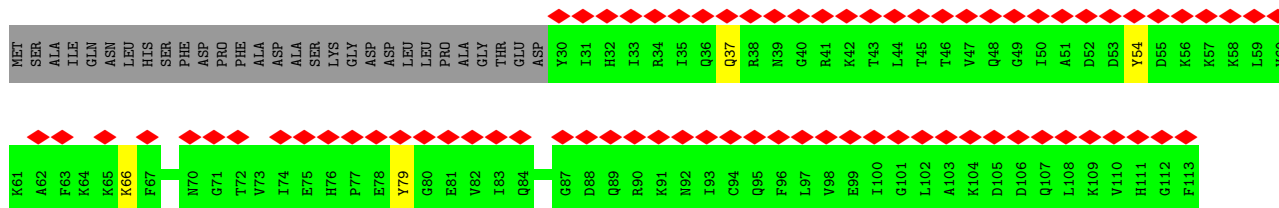
• Molecule 28: Small ribosomal subunit protein eS24



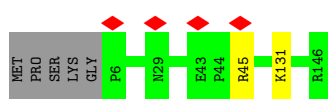
• Molecule 29: Small ribosomal subunit protein uS7



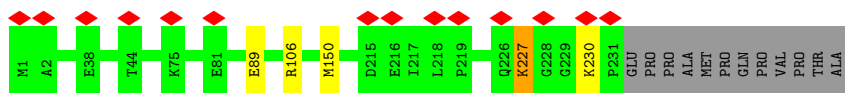
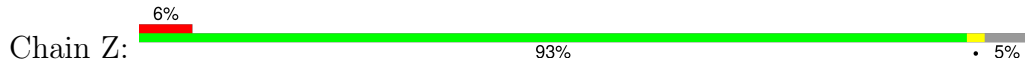
• Molecule 30: Eukaryotic translation initiation factor 1



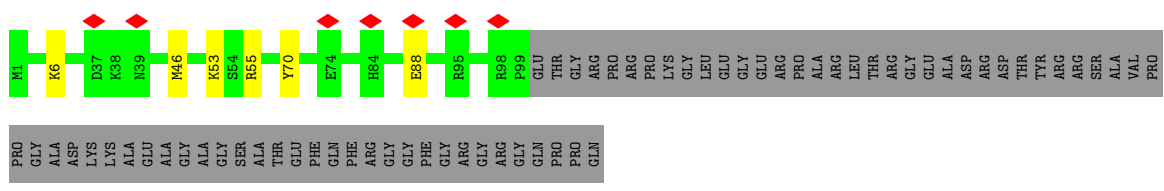
• Molecule 31: Small ribosomal subunit protein uS9



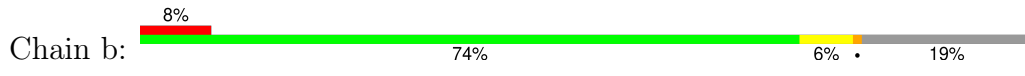
• Molecule 32: Small ribosomal subunit protein uS3



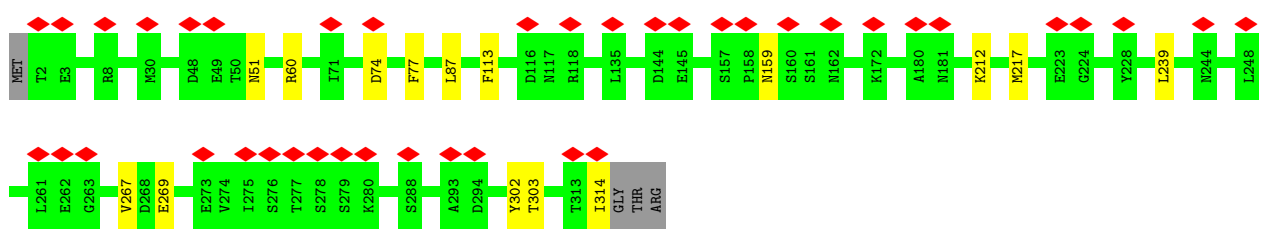
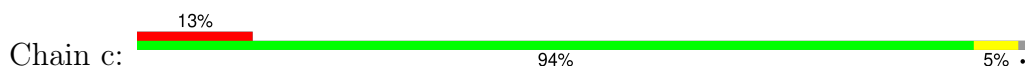
• Molecule 33: Small ribosomal subunit protein eS10



• Molecule 34: Small ribosomal subunit protein uS19

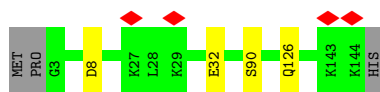


• Molecule 35: Receptor of activated protein C kinase 1

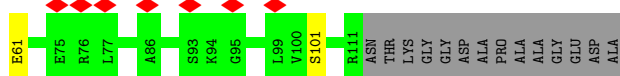
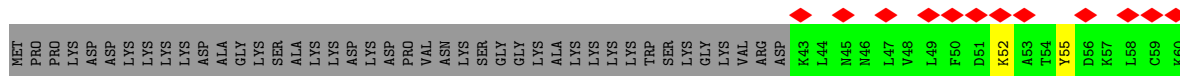


• Molecule 36: Small ribosomal subunit protein eS19

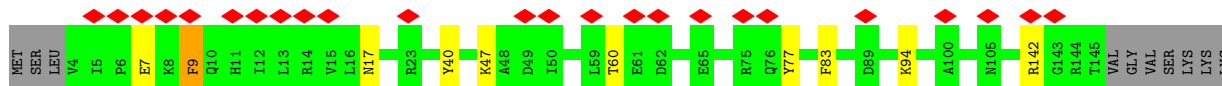
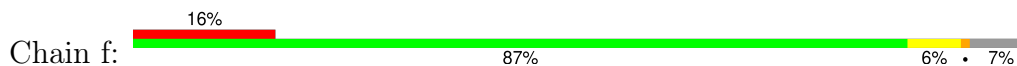




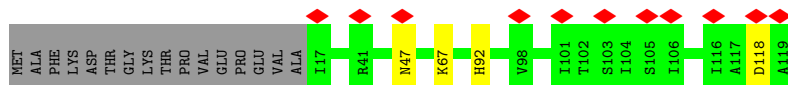
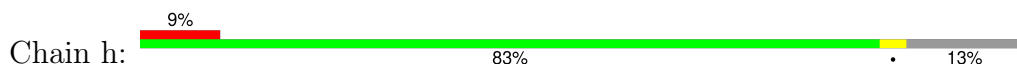
• Molecule 37: Small ribosomal subunit protein eS25



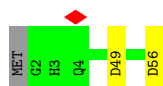
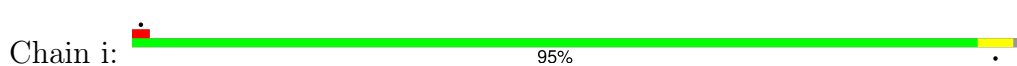
• Molecule 38: Small ribosomal subunit protein uS13



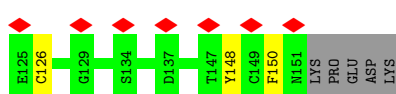
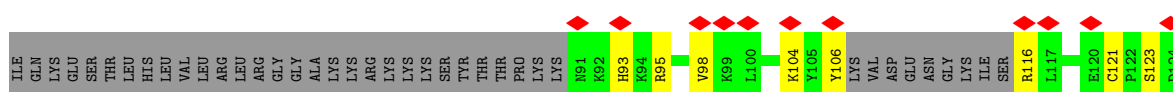
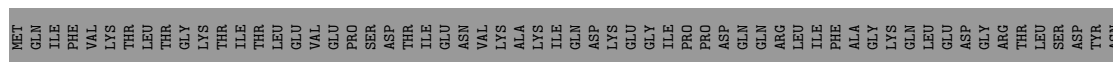
• Molecule 39: Small ribosomal subunit protein uS10



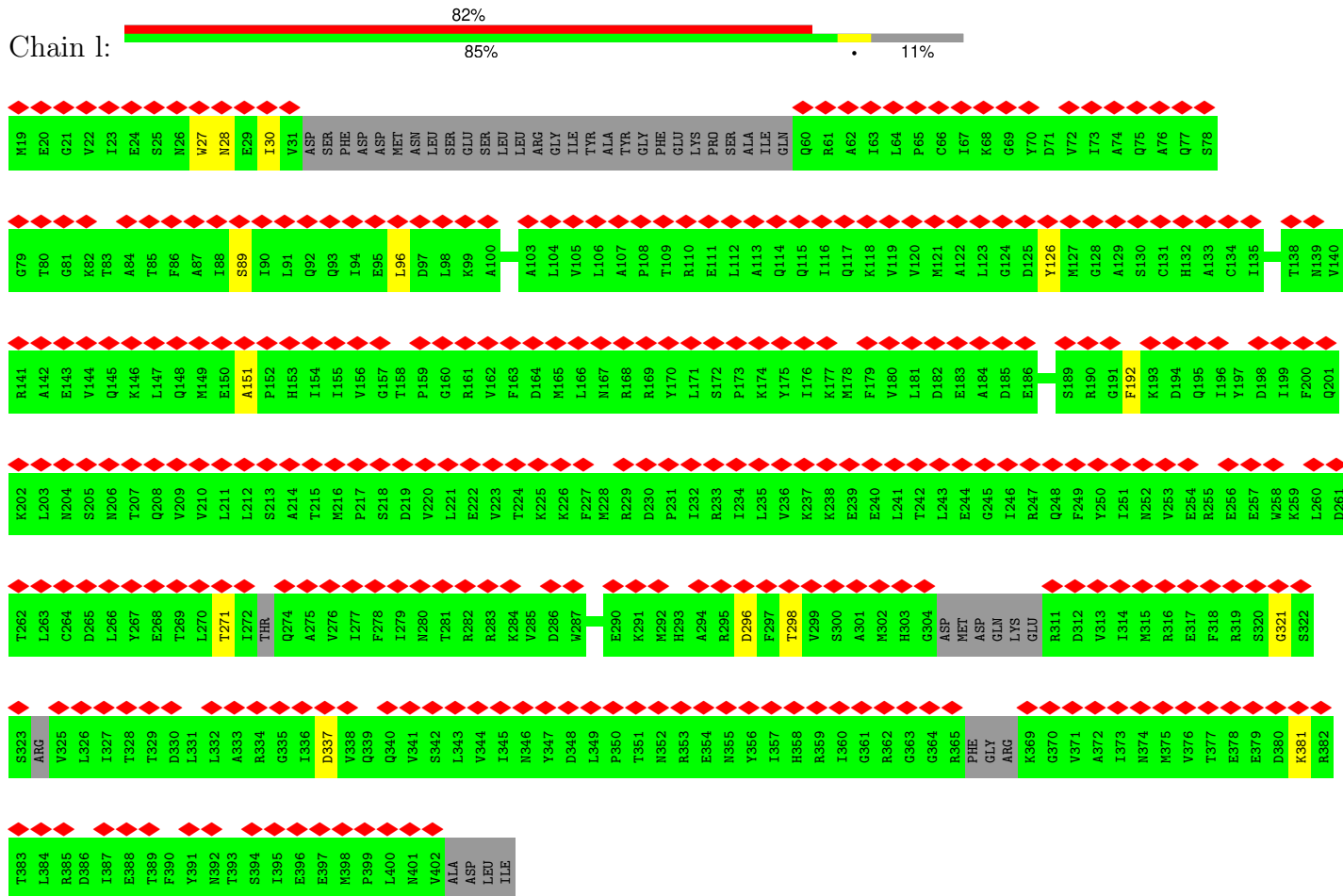
• Molecule 40: Small ribosomal subunit protein uS14



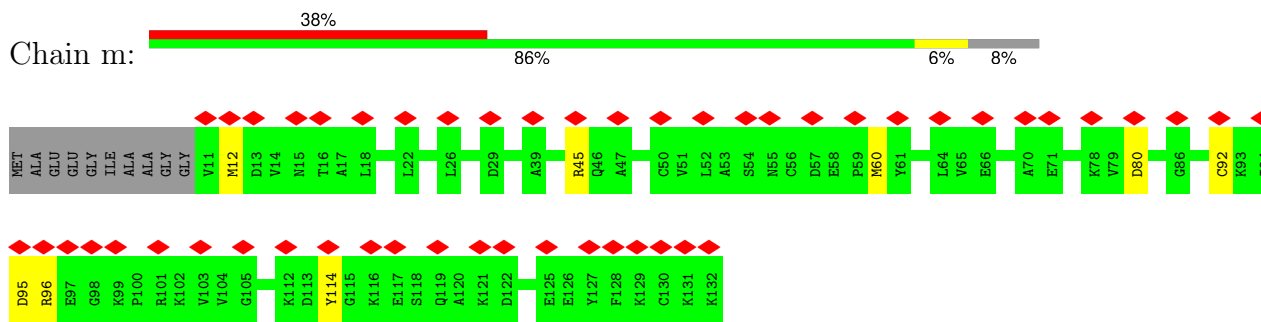
• Molecule 41: Ubiquitin-40S ribosomal protein S27a



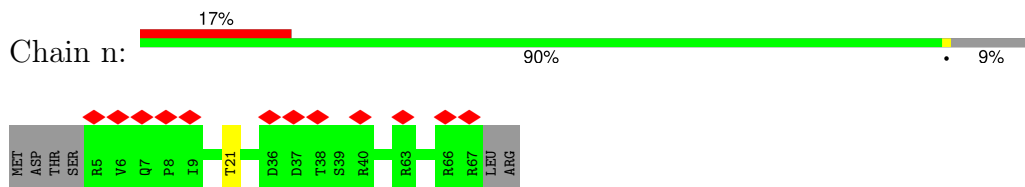
• Molecule 42: Eukaryotic initiation factor 4A-I



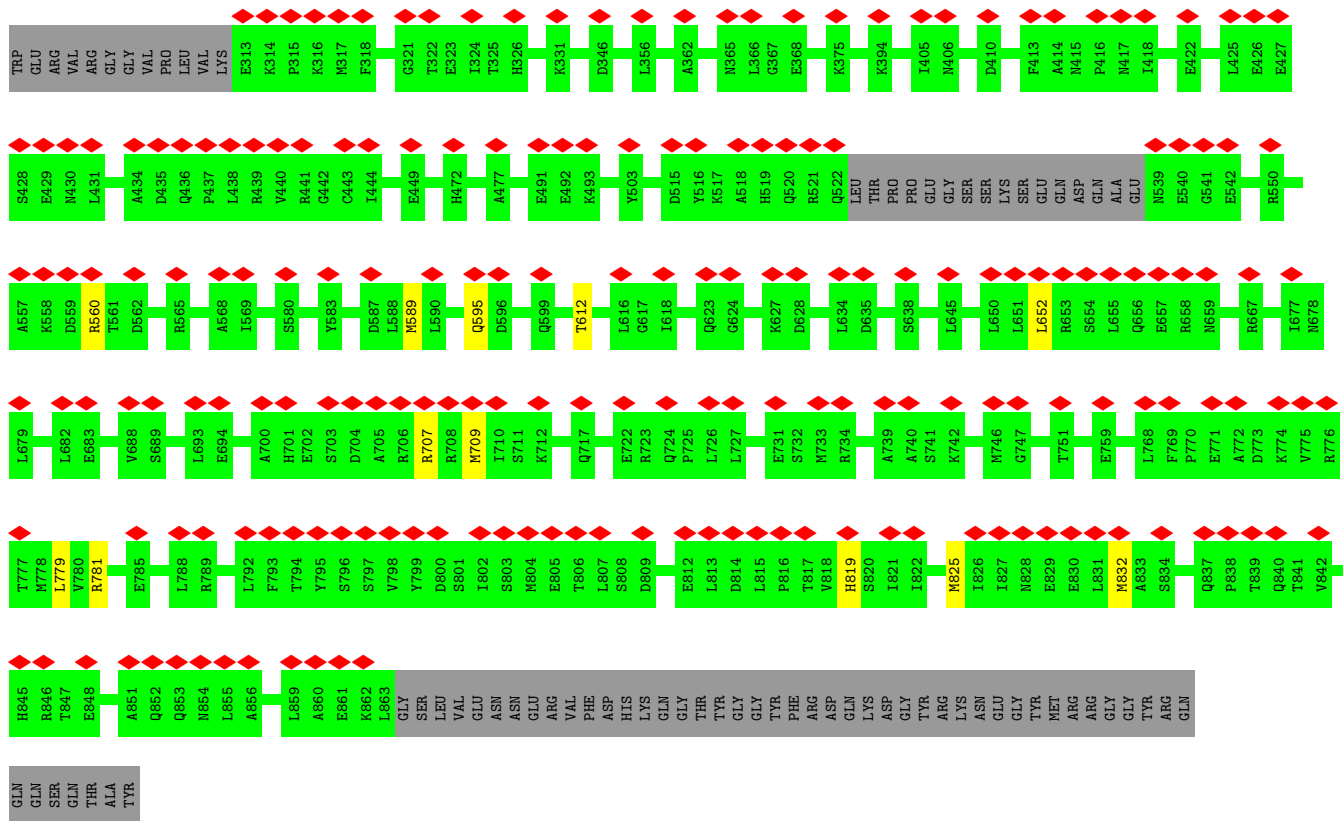
• Molecule 43: Small ribosomal subunit protein eS12



• Molecule 44: Small ribosomal subunit protein eS28



• Molecule 45: Eukaryotic translation initiation factor 3 subunit G



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	8515	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 ($e^-/\text{\AA}^2$)	25	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	0.074	Depositor
Minimum map value	-0.022	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	410.0, 410.0, 410.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.025, 1.025, 1.025	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: OMG, SPD, ACY, MA6, K, OMC, 5MC, 6MZ, PSU, MG, ZN, 5MU, OMU, A2M, 4AC, JMH, UR3

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	X	0.37	0/1597	0.76	0/2216
2	U	0.39	0/2768	0.71	0/3854
3	3	0.23	0/1055	0.39	0/1469
4	4	0.24	0/1269	0.45	0/1762
5	5	0.23	0/1575	0.38	0/2187
6	6	0.26	0/1926	0.51	0/2669
7	8	0.24	0/1569	0.43	0/2183
8	9	0.36	0/231	1.14	2/294 (0.7%)
9	A	0.53	0/39097	0.91	55/60929 (0.1%)
10	B	0.36	0/1197	0.67	0/1599
11	C	0.34	0/2077	0.66	0/2796
12	D	0.36	0/1502	0.78	1/2008 (0.0%)
13	E	0.32	0/1105	0.65	0/1476
14	F	0.42	0/429	0.76	0/566
15	G	0.33	0/1420	0.72	1/1901 (0.1%)
16	H	0.36	0/644	0.64	0/864
17	I	0.32	0/1232	0.65	0/1656
18	J	0.31	0/1051	0.63	0/1406
19	K	0.35	0/623	0.73	1/833 (0.1%)
20	L	0.36	0/1743	0.68	2/2354 (0.1%)
21	M	0.33	0/1078	0.76	2/1447 (0.1%)
22	N	0.31	0/1670	0.63	0/2271
23	O	0.34	0/1742	0.68	0/2330
24	P	0.36	0/993	0.80	1/1330 (0.1%)
25	Q	0.32	0/805	0.73	0/1079
26	R	0.33	0/1654	0.68	0/2203
27	S	0.32	0/1885	0.75	2/2510 (0.1%)
28	T	0.34	0/1028	0.74	0/1366
29	V	0.34	0/1481	0.72	1/1988 (0.1%)
30	W	0.33	0/693	0.69	0/925
31	Y	0.32	0/1142	0.70	0/1528

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	Z	0.33	0/1811	0.66	0/2438
33	a	0.43	0/859	0.80	0/1159
34	b	0.39	0/991	0.86	3/1325 (0.2%)
35	c	0.32	0/2493	0.68	0/3394
36	d	0.31	0/1123	0.66	0/1504
37	e	0.38	0/557	0.83	0/748
38	f	0.33	0/1194	0.76	0/1599
39	h	0.31	0/827	0.74	0/1110
40	i	0.37	0/470	0.80	1/623 (0.2%)
41	k	0.38	0/438	0.70	0/580
42	l	0.64	0/1700	0.77	1/2359 (0.0%)
43	m	0.34	0/960	0.81	1/1286 (0.1%)
44	n	0.34	0/500	0.84	0/669
45	o	0.38	0/419	0.71	0/580
46	p	0.59	0/1834	0.70	0/2517
47	u	0.33	0/4800	0.70	3/6488 (0.0%)
48	v	0.32	0/2672	0.64	0/3647
49	x	0.25	0/2118	0.53	0/2949
50	y	0.32	0/4400	0.70	3/5939 (0.1%)
All	All	0.42	0/108447	0.78	80/154913 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
16	H	0	1
24	P	0	1
46	p	0	2
All	All	0	4

There are no bond length outliers.

All (80) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	550	C	O3'-P-O5'	-19.93	66.12	104.00
9	A	550	C	OP1-P-O3'	12.09	131.80	105.20
9	A	549	C	P-O3'-C3'	-11.43	105.98	119.70
9	A	545	A	P-O3'-C3'	-10.28	107.36	119.70
9	A	536	A	P-O3'-C3'	-10.10	107.59	119.70
9	A	541	U	P-O3'-C3'	-9.38	108.45	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	1117	C	P-O3'-C3'	-9.34	108.50	119.70
9	A	546	G	P-O3'-C3'	-9.15	108.72	119.70
9	A	540	U	P-O3'-C3'	-9.07	108.81	119.70
9	A	538	U	P-O3'-C3'	-8.87	109.06	119.70
27	S	120	ASP	CB-CG-OD2	8.60	126.04	118.30
9	A	543	C	P-O3'-C3'	-8.59	109.39	119.70
12	D	95	ASP	CB-CG-OD1	8.50	125.95	118.30
9	A	1118	C	C4'-C3'-O3'	8.23	129.47	113.00
9	A	535	G	P-O3'-C3'	-7.99	110.11	119.70
43	m	80	ASP	CB-CG-OD1	7.93	125.43	118.30
40	i	56	ASP	CB-CG-OD2	7.81	125.33	118.30
20	L	242	ASP	CB-CG-OD1	7.68	125.21	118.30
9	A	1120	U	P-O3'-C3'	-7.63	110.54	119.70
47	u	504	ASP	CB-CG-OD1	7.36	124.92	118.30
9	A	547	G	P-O3'-C3'	-7.31	110.93	119.70
9	A	550	C	P-O3'-C3'	7.29	128.44	119.70
9	A	1118	C	P-O3'-C3'	-7.27	110.98	119.70
9	A	537	C	P-O3'-C3'	-7.17	111.10	119.70
9	A	542	U	P-O3'-C3'	-7.00	111.30	119.70
29	V	32	ASP	CB-CG-OD1	6.93	124.54	118.30
34	b	23	ASP	CB-CG-OD1	6.88	124.49	118.30
9	A	1520	G	C4-N9-C1'	6.84	135.39	126.50
50	y	832	MET	CG-SD-CE	6.75	111.00	100.20
19	K	67	ASP	CB-CG-OD1	6.71	124.34	118.30
9	A	1597	C	N3-C2-O2	-6.65	117.24	121.90
24	P	131	ASP	CB-CG-OD2	6.52	124.16	118.30
47	u	71	LEU	CA-CB-CG	6.51	130.27	115.30
9	A	1453	C	C2-N1-C1'	6.41	125.85	118.80
9	A	1261	C	C6-N1-C2	-6.34	117.77	120.30
9	A	293	C	C6-N1-C2	-6.33	117.77	120.30
8	9	20	MET	CA-CB-CG	6.28	123.98	113.30
15	G	159	ASP	CB-CG-OD1	6.23	123.91	118.30
9	A	321	C	C6-N1-C2	-6.22	117.81	120.30
9	A	1751	C	C6-N1-C2	-6.21	117.82	120.30
9	A	1464	C	C6-N1-C2	-6.19	117.83	120.30
34	b	70	MET	CA-CB-CG	6.17	123.79	113.30
9	A	1520	G	C8-N9-C1'	-6.06	119.12	127.00
9	A	1113	A	P-O3'-C3'	-6.03	112.47	119.70
9	A	1121	G	P-O3'-C3'	-6.00	112.50	119.70
21	M	110	ASP	CB-CG-OD2	5.98	123.68	118.30
42	l	192	PHE	N-CA-C	5.91	126.95	111.00
9	A	503	C	C6-N1-C2	-5.90	117.94	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	1696	C	C6-N1-C2	-5.70	118.02	120.30
9	A	1591	C	C6-N1-C2	-5.66	118.04	120.30
9	A	1423	C	C6-N1-C2	-5.63	118.05	120.30
21	M	58	MET	CG-SD-CE	5.63	109.20	100.20
27	S	217	MET	CG-SD-CE	5.62	109.19	100.20
9	A	72	C	C6-N1-C2	-5.61	118.06	120.30
9	A	548	C	P-O3'-C3'	-5.60	112.98	119.70
20	L	104	ASP	CB-CG-OD2	5.59	123.33	118.30
9	A	912	C	C6-N1-C2	-5.56	118.08	120.30
9	A	1112	U	P-O3'-C3'	-5.48	113.13	119.70
34	b	93	MET	CB-CG-SD	5.47	128.81	112.40
9	A	130	G	C4-N9-C1'	5.43	133.56	126.50
9	A	1751	C	N3-C2-O2	-5.43	118.10	121.90
9	A	1389	C	C6-N1-C2	-5.42	118.13	120.30
9	A	888	U	C2-N1-C1'	5.40	124.18	117.70
9	A	1605	G	C8-N9-C4	-5.39	104.24	106.40
9	A	1597	C	N1-C2-O2	5.34	122.10	118.90
9	A	1606	G	O4'-C1'-N9	5.32	112.45	108.20
9	A	1751	C	N1-C2-O2	5.31	122.09	118.90
47	u	203	MET	CA-CB-CG	5.29	122.29	113.30
9	A	329	G	C6-C5-N7	-5.26	127.24	130.40
9	A	501	C	C6-N1-C1'	5.26	127.11	120.80
9	A	1396	A	O4'-C1'-N9	5.23	112.38	108.20
9	A	1115	U	P-O3'-C3'	-5.20	113.46	119.70
8	9	20	MET	CG-SD-CE	5.18	108.49	100.20
50	y	825	MET	CA-CB-CG	5.17	122.08	113.30
9	A	550	C	C3'-C2'-C1'	5.12	105.60	101.50
9	A	199	C	C6-N1-C2	-5.08	118.27	120.30
50	y	652	LEU	CA-CB-CG	5.08	126.98	115.30
9	A	203	G	OP1-P-O3'	5.04	116.30	105.20
9	A	203	G	P-O3'-C3'	5.02	125.73	119.70
9	A	659	G	C4-N9-C1'	5.02	133.03	126.50

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
16	H	72	ARG	Sidechain
24	P	137	SER	Peptide
46	p	286	VAL	Peptide
46	p	316	GLY	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	X	323/325 (99%)	311 (96%)	9 (3%)	3 (1%)	14	48
2	U	556/661 (84%)	519 (93%)	25 (4%)	12 (2%)	5	32
3	3	209/218 (96%)	203 (97%)	6 (3%)	0	100	100
4	4	251/357 (70%)	231 (92%)	20 (8%)	0	100	100
5	5	307/564 (54%)	294 (96%)	13 (4%)	0	100	100
6	6	348/374 (93%)	303 (87%)	45 (13%)	0	100	100
7	8	313/352 (89%)	285 (91%)	28 (9%)	0	100	100
8	9	22/25 (88%)	22 (100%)	0	0	100	100
10	B	139/158 (88%)	136 (98%)	3 (2%)	0	100	100
11	C	254/263 (97%)	250 (98%)	4 (2%)	0	100	100
12	D	175/194 (90%)	172 (98%)	3 (2%)	0	100	100
13	E	138/143 (96%)	134 (97%)	4 (3%)	0	100	100
14	F	52/59 (88%)	45 (86%)	3 (6%)	4 (8%)	1	12
15	G	169/194 (87%)	166 (98%)	3 (2%)	0	100	100
16	H	79/84 (94%)	75 (95%)	4 (5%)	0	100	100
17	I	148/151 (98%)	146 (99%)	2 (1%)	0	100	100
18	J	127/130 (98%)	121 (95%)	6 (5%)	0	100	100
19	K	79/83 (95%)	78 (99%)	1 (1%)	0	100	100
20	L	218/293 (74%)	214 (98%)	4 (2%)	0	100	100
21	M	129/135 (96%)	124 (96%)	5 (4%)	0	100	100
22	N	205/295 (70%)	203 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	O	209/264 (79%)	205 (98%)	4 (2%)	0	100	100
24	P	129/151 (85%)	126 (98%)	3 (2%)	0	100	100
25	Q	97/115 (84%)	96 (99%)	1 (1%)	0	100	100
26	R	194/208 (93%)	191 (98%)	3 (2%)	0	100	100
27	S	228/249 (92%)	223 (98%)	5 (2%)	0	100	100
28	T	122/133 (92%)	120 (98%)	2 (2%)	0	100	100
29	V	180/204 (88%)	169 (94%)	11 (6%)	0	100	100
30	W	82/113 (73%)	78 (95%)	4 (5%)	0	100	100
31	Y	139/146 (95%)	132 (95%)	7 (5%)	0	100	100
32	Z	229/243 (94%)	218 (95%)	9 (4%)	2 (1%)	14	48
33	a	97/165 (59%)	94 (97%)	3 (3%)	0	100	100
34	b	116/145 (80%)	113 (97%)	3 (3%)	0	100	100
35	c	311/317 (98%)	288 (93%)	23 (7%)	0	100	100
36	d	140/145 (97%)	134 (96%)	6 (4%)	0	100	100
37	e	67/125 (54%)	65 (97%)	2 (3%)	0	100	100
38	f	140/152 (92%)	131 (94%)	8 (6%)	1 (1%)	19	54
39	h	101/119 (85%)	93 (92%)	8 (8%)	0	100	100
40	i	53/56 (95%)	52 (98%)	1 (2%)	0	100	100
41	k	48/156 (31%)	43 (90%)	5 (10%)	0	100	100
42	l	333/388 (86%)	288 (86%)	32 (10%)	13 (4%)	2	22
43	m	120/132 (91%)	110 (92%)	10 (8%)	0	100	100
44	n	61/69 (88%)	60 (98%)	1 (2%)	0	100	100
45	o	83/320 (26%)	80 (96%)	3 (4%)	0	100	100
46	p	340/469 (72%)	258 (76%)	64 (19%)	18 (5%)	1	18
47	u	571/1382 (41%)	529 (93%)	42 (7%)	0	100	100
48	v	380/445 (85%)	338 (89%)	42 (11%)	0	100	100
49	x	422/548 (77%)	401 (95%)	21 (5%)	0	100	100
50	y	531/913 (58%)	507 (96%)	24 (4%)	0	100	100
All	All	9764/12930 (76%)	9174 (94%)	537 (6%)	53 (0%)	27	60

All (53) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	U	380	THR
42	l	27	TRP
46	p	155	VAL
46	p	158	PRO
2	U	395	ARG
2	U	405	VAL
32	Z	230	LYS
42	l	28	ASN
42	l	96	LEU
42	l	271	THR
42	l	321	GLY
42	l	381	LYS
46	p	192	ASN
46	p	196	MSE
46	p	284	GLY
46	p	321	GLN
1	X	256	THR
2	U	394	PHE
2	U	399	LYS
14	F	120	VAL
32	Z	227	LYS
38	f	9	PHE
42	l	89	SER
46	p	157	LEU
46	p	194	GLY
46	p	195	GLU
1	X	30	LYS
2	U	135	LYS
2	U	388	VAL
2	U	476	ARG
14	F	124	GLY
14	F	126	LYS
42	l	126	TYR
46	p	156	VAL
46	p	421	HIS
2	U	396	MET
2	U	402	PRO
14	F	121	PRO
42	l	296	ASP
46	p	154	THR
46	p	160	ASP
46	p	165	GLU
46	p	173	GLN

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Mol	Chain	Res	Type
46	p	270	GLY
42	l	298	THR
42	l	337	ASP
1	X	283	GLY
2	U	138	GLY
46	p	316	GLY
46	p	171	ILE
2	U	387	VAL
42	l	30	ILE
42	l	151	ALA

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	
6	6	49/335 (15%)	47 (96%)	2 (4%)	26	50
8	9	23/24 (96%)	22 (96%)	1 (4%)	25	49
10	B	130/142 (92%)	123 (95%)	7 (5%)	18	44
11	C	220/225 (98%)	218 (99%)	2 (1%)	75	83
12	D	158/168 (94%)	154 (98%)	4 (2%)	42	62
13	E	112/115 (97%)	110 (98%)	2 (2%)	54	71
14	F	42/48 (88%)	37 (88%)	5 (12%)	4	20
15	G	155/174 (89%)	142 (92%)	13 (8%)	9	32
16	H	73/76 (96%)	70 (96%)	3 (4%)	26	50
17	I	130/131 (99%)	127 (98%)	3 (2%)	45	64
18	J	112/113 (99%)	110 (98%)	2 (2%)	54	71
19	K	65/67 (97%)	62 (95%)	3 (5%)	23	47
20	L	186/225 (83%)	185 (100%)	1 (0%)	86	90
21	M	119/122 (98%)	113 (95%)	6 (5%)	20	45
22	N	173/243 (71%)	169 (98%)	4 (2%)	45	64
23	O	192/231 (83%)	182 (95%)	10 (5%)	19	45

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
24	P	102/119 (86%)	93 (91%)	9 (9%)	8	29
25	Q	86/98 (88%)	82 (95%)	4 (5%)	22	47
26	R	172/180 (96%)	166 (96%)	6 (4%)	31	54
27	S	200/218 (92%)	186 (93%)	14 (7%)	12	36
28	T	107/115 (93%)	101 (94%)	6 (6%)	17	43
29	V	156/170 (92%)	147 (94%)	9 (6%)	17	42
30	W	73/96 (76%)	69 (94%)	4 (6%)	18	44
31	Y	117/121 (97%)	115 (98%)	2 (2%)	56	72
32	Z	190/202 (94%)	186 (98%)	4 (2%)	48	67
33	a	90/136 (66%)	84 (93%)	6 (7%)	13	38
34	b	106/130 (82%)	96 (91%)	10 (9%)	7	26
35	c	272/275 (99%)	257 (94%)	15 (6%)	18	44
36	d	112/115 (97%)	108 (96%)	4 (4%)	30	54
37	e	61/103 (59%)	57 (93%)	4 (7%)	14	38
38	f	123/132 (93%)	113 (92%)	10 (8%)	9	33
39	h	94/107 (88%)	90 (96%)	4 (4%)	25	49
40	i	48/49 (98%)	47 (98%)	1 (2%)	48	67
41	k	46/140 (33%)	35 (76%)	11 (24%)	0	4
43	m	104/108 (96%)	97 (93%)	7 (7%)	13	38
44	n	56/62 (90%)	55 (98%)	1 (2%)	54	71
46	p	38/395 (10%)	29 (76%)	9 (24%)	0	4
47	u	526/1259 (42%)	509 (97%)	17 (3%)	34	56
48	v	206/406 (51%)	194 (94%)	12 (6%)	17	42
50	y	473/811 (58%)	464 (98%)	9 (2%)	52	70
All	All	5497/7986 (69%)	5251 (96%)	246 (4%)	26	48

All (246) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	6	311	PHE
6	6	330	ARG
8	9	21	ARG
10	B	32	LYS
10	B	52	GLU

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Mol	Chain	Res	Type
10	B	60	CYS
10	B	69	ARG
10	B	74	SER
10	B	80	MET
10	B	104	LYS
11	C	91	SER
11	C	198	ARG
12	D	27	GLN
12	D	34	GLU
12	D	55	LYS
12	D	152	ASP
13	E	105	PHE
13	E	108	LYS
14	F	102	LYS
14	F	119	VAL
14	F	120	VAL
14	F	127	LYS
14	F	133	SER
15	G	18	GLU
15	G	25	GLN
15	G	34	SER
15	G	40	LEU
15	G	70	LYS
15	G	107	LYS
15	G	120	ARG
15	G	130	LEU
15	G	151	SER
15	G	162	GLN
15	G	165	ASN
15	G	179	LYS
15	G	192	PHE
16	H	11	SER
16	H	34	ASP
16	H	41	TYR
17	I	4	MET
17	I	39	LYS
17	I	103	GLU
18	J	30	CYS
18	J	111	MET
19	K	41	LYS
19	K	62	MET
19	K	76	ASP

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Mol	Chain	Res	Type
20	L	59	GLU
21	M	32	LYS
21	M	43	SER
21	M	63	ARG
21	M	70	SER
21	M	72	LYS
21	M	101	ASP
22	N	2	SER
22	N	6	ASP
22	N	169	HIS
22	N	190	SER
23	O	27	LYS
23	O	29	ASP
23	O	31	TYR
23	O	68	GLU
23	O	76	ASN
23	O	113	MET
23	O	128	LYS
23	O	167	LYS
23	O	207	LEU
23	O	217	MET
24	P	28	PHE
24	P	34	PHE
24	P	36	SER
24	P	46	ASP
24	P	67	ASP
24	P	86	LYS
24	P	117	ARG
24	P	121	ARG
24	P	138	ASP
25	Q	2	THR
25	Q	52	ASP
25	Q	60	ASP
25	Q	64	LEU
26	R	4	SER
26	R	21	TYR
26	R	100	CYS
26	R	124	LYS
26	R	142	SER
26	R	167	GLN
27	S	12	CYS
27	S	25	ARG

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Mol	Chain	Res	Type
27	S	27	PHE
27	S	44	GLU
27	S	68	LEU
27	S	120	ASP
27	S	131	ARG
27	S	139	SER
27	S	151	ASP
27	S	154	ARG
27	S	163	ASN
27	S	190	ARG
27	S	201	LYS
27	S	221	LYS
28	T	23	MET
28	T	46	LYS
28	T	47	MET
28	T	84	LYS
28	T	94	HIS
28	T	102	THR
29	V	55	ARG
29	V	78	MET
29	V	79	HIS
29	V	123	GLU
29	V	125	SER
29	V	126	THR
29	V	140	ASP
29	V	164	ARG
29	V	193	LYS
30	W	37	GLN
30	W	54	TYR
30	W	66	LYS
30	W	79	TYR
31	Y	45	ARG
31	Y	131	LYS
32	Z	89	GLU
32	Z	106	ARG
32	Z	150	MET
32	Z	227	LYS
33	a	6	LYS
33	a	46	MET
33	a	53	LYS
33	a	55	ARG
33	a	70	TYR

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Mol	Chain	Res	Type
33	a	88	GLU
34	b	21	ASP
34	b	23	ASP
34	b	37	TYR
34	b	50	ARG
34	b	64	LYS
34	b	70	MET
34	b	71	GLU
34	b	89	MET
34	b	104	GLN
34	b	114	HIS
35	c	51	ASN
35	c	60	ARG
35	c	74	ASP
35	c	77	PHE
35	c	87	LEU
35	c	113	PHE
35	c	159	ASN
35	c	212	LYS
35	c	217	MET
35	c	239	LEU
35	c	267	VAL
35	c	269	GLU
35	c	302	TYR
35	c	303	THR
35	c	314	ILE
36	d	8	ASP
36	d	32	GLU
36	d	90	SER
36	d	126	GLN
37	e	52	LYS
37	e	55	TYR
37	e	61	GLU
37	e	101	SER
38	f	7	GLU
38	f	9	PHE
38	f	17	ASN
38	f	40	TYR
38	f	47	LYS
38	f	60	THR
38	f	77	TYR
38	f	83	PHE

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Mol	Chain	Res	Type
38	f	94	LYS
38	f	142	ARG
39	h	47	ASN
39	h	67	LYS
39	h	92	HIS
39	h	118	ASP
40	i	49	ASP
41	k	93	HIS
41	k	95	ARG
41	k	98	VAL
41	k	104	LYS
41	k	106	TYR
41	k	116	ARG
41	k	121	CYS
41	k	123	SER
41	k	126	CYS
41	k	148	TYR
41	k	150	PHE
43	m	12	MET
43	m	45	ARG
43	m	60	MET
43	m	92	CYS
43	m	95	ASP
43	m	96	ARG
43	m	114	TYR
44	n	21	THR
46	p	103	ARG
46	p	129	GLN
46	p	130	VAL
46	p	132	ASP
46	p	133	VAL
46	p	134	GLU
46	p	136	VAL
46	p	139	LYS
46	p	147	GLN
47	u	62	ARG
47	u	84	LYS
47	u	105	LYS
47	u	109	GLN
47	u	184	PHE
47	u	229	HIS
47	u	250	PHE

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Mol	Chain	Res	Type
47	u	272	MET
47	u	306	MET
47	u	318	MET
47	u	344	MET
47	u	351	LYS
47	u	374	MET
47	u	377	PHE
47	u	415	ARG
47	u	433	ASN
47	u	504	ASP
48	v	242	TYR
48	v	256	TYR
48	v	268	ARG
48	v	275	LYS
48	v	282	GLN
48	v	300	TYR
48	v	306	ASP
48	v	315	CYS
48	v	344	PHE
48	v	362	MET
48	v	379	ARG
48	v	393	MET
50	y	560	ARG
50	y	589	MET
50	y	595	GLN
50	y	612	THR
50	y	707	ARG
50	y	709	MET
50	y	779	LEU
50	y	781	ARG
50	y	819	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
23	O	202	GLN
44	n	7	GLN
46	p	129	GLN
46	p	142	ASN
48	v	241	GLN
50	y	415	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
9	A	1660/1719 (96%)	357 (21%)	19 (1%)

All (357) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
9	A	17	C
9	A	33	G
9	A	46	A
9	A	53	C
9	A	56	G
9	A	58	C
9	A	62	G
9	A	64	A
9	A	68	A
9	A	71	G
9	A	73	C
9	A	74	G
9	A	75	G
9	A	76	U
9	A	99	A2M
9	A	103	A
9	A	113	G
9	A	115	U
9	A	118	C
9	A	126	G
9	A	129	C
9	A	130	G
9	A	141	A
9	A	142	C
9	A	143	U
9	A	147	A
9	A	155	G
9	A	159	A2M
9	A	166	A2M
9	A	170	A
9	A	172	U
9	A	174	OMC
9	A	180	G
9	A	187	G
9	A	190	G
9	A	191	A

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Mol	Chain	Res	Type
9	A	194	C
9	A	195	C
9	A	197	U
9	A	198	U
9	A	199	C
9	A	204	G
9	A	206	G
9	A	207	G
9	A	223	C
9	A	294	U
9	A	300	U
9	A	302	A
9	A	306	C
9	A	308	G
9	A	311	C
9	A	312	G
9	A	319	C
9	A	320	G
9	A	322	C
9	A	323	C
9	A	324	C
9	A	325	C
9	A	326	C
9	A	327	G
9	A	328	U
9	A	330	G
9	A	331	C
9	A	332	G
9	A	335	G
9	A	339	A
9	A	340	C
9	A	346	C
9	A	347	G
9	A	351	G
9	A	362	C
9	A	364	A
9	A	367	U
9	A	370	G
9	A	385	G
9	A	386	C
9	A	409	C
9	A	442	C

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Mol	Chain	Res	Type
9	A	448	A
9	A	449	A
9	A	450	C
9	A	452	G
9	A	460	A
9	A	464	A
9	A	465	A
9	A	466	G
9	A	467	G
9	A	471	G
9	A	472	C
9	A	473	A
9	A	474	G
9	A	476	A
9	A	477	G
9	A	482	G
9	A	485	A
9	A	486	A
9	A	487	U
9	A	492	C
9	A	493	A
9	A	508	A
9	A	516	A
9	A	525	A
9	A	535	G
9	A	536	A
9	A	537	C
9	A	539	C
9	A	540	U
9	A	541	U
9	A	542	U
9	A	543	C
9	A	544	G
9	A	545	A
9	A	546	G
9	A	548	C
9	A	549	C
9	A	550	C
9	A	551	U
9	A	554	A
9	A	555	A
9	A	556	U

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Mol	Chain	Res	Type
9	A	558	G
9	A	559	G
9	A	563	G
9	A	564	A
9	A	568	C
9	A	576	A
9	A	589	G
9	A	590	A
9	A	591	U
9	A	606	G
9	A	614	C
9	A	617	G
9	A	626	G
9	A	628	A
9	A	629	A
9	A	631	U
9	A	643	A
9	A	655	A
9	A	660	C
9	A	668	A2M
9	A	669	A
9	A	671	A
9	A	672	A
9	A	673	G
9	A	683	OMG
9	A	688	U
9	A	811	A
9	A	821	G
9	A	822	PSU
9	A	827	A
9	A	830	A
9	A	834	C
9	A	835	C
9	A	836	G
9	A	837	A
9	A	838	G
9	A	839	C
9	A	840	C
9	A	841	G
9	A	847	A
9	A	870	A
9	A	871	U

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Mol	Chain	Res	Type
9	A	872	A
9	A	874	G
9	A	880	G
9	A	881	G
9	A	882	U
9	A	885	U
9	A	888	U
9	A	889	U
9	A	890	U
9	A	892	U
9	A	894	G
9	A	896	U
9	A	897	U
9	A	898	U
9	A	899	U
9	A	901	G
9	A	902	G
9	A	903	A
9	A	904	A
9	A	907	G
9	A	909	G
9	A	912	C
9	A	913	A
9	A	919	A
9	A	920	A
9	A	922	A
9	A	930	C
9	A	933	G
9	A	943	U
9	A	950	C
9	A	972	A
9	A	990	A
9	A	992	A
9	A	1017	U
9	A	1023	A
9	A	1042	A
9	A	1044	G
9	A	1045	U
9	A	1061	U
9	A	1062	A
9	A	1078	C
9	A	1083	A

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Mol	Chain	Res	Type
9	A	1085	C
9	A	1108	G
9	A	1114	U
9	A	1115	U
9	A	1116	C
9	A	1117	C
9	A	1118	C
9	A	1119	A
9	A	1133	A
9	A	1138	C
9	A	1153	C
9	A	1154	U
9	A	1171	G
9	A	1195	A
9	A	1208	A
9	A	1215	C
9	A	1216	C
9	A	1217	A
9	A	1221	G
9	A	1224	G
9	A	1242	U
9	A	1251	A
9	A	1253	A
9	A	1256	G
9	A	1257	G
9	A	1258	A
9	A	1259	A
9	A	1263	U
9	A	1274	G
9	A	1275	G
9	A	1280	G
9	A	1281	G
9	A	1282	A
9	A	1284	A
9	A	1285	G
9	A	1286	G
9	A	1290	G
9	A	1294	G
9	A	1297	U
9	A	1301	A
9	A	1302	G
9	A	1303	C

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Mol	Chain	Res	Type
9	A	1305	C
9	A	1308	U
9	A	1309	C
9	A	1313	A
9	A	1315	U
9	A	1320	G
9	A	1326	U
9	A	1327	G
9	A	1342	U
9	A	1371	U
9	A	1372	U
9	A	1375	G
9	A	1378	A
9	A	1397	U
9	A	1401	A
9	A	1402	A
9	A	1404	U
9	A	1405	A
9	A	1406	G
9	A	1409	A
9	A	1416	C
9	A	1417	C
9	A	1418	C
9	A	1419	C
9	A	1420	G
9	A	1421	A
9	A	1423	C
9	A	1424	G
9	A	1428	G
9	A	1433	C
9	A	1434	C
9	A	1435	C
9	A	1436	C
9	A	1437	C
9	A	1438	A
9	A	1441	U
9	A	1454	A
9	A	1464	C
9	A	1465	A
9	A	1489	A
9	A	1490	OMG
9	A	1497	G

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Mol	Chain	Res	Type
9	A	1498	A
9	A	1507	G
9	A	1508	A
9	A	1521	C
9	A	1522	A
9	A	1533	A
9	A	1557	C
9	A	1579	A
9	A	1580	A
9	A	1588	A
9	A	1590	C
9	A	1591	C
9	A	1592	C
9	A	1601	A
9	A	1605	G
9	A	1606	G
9	A	1609	C
9	A	1621	U
9	A	1623	A
9	A	1624	U
9	A	1639	G
9	A	1654	G
9	A	1663	A
9	A	1664	A
9	A	1665	G
9	A	1671	G
9	A	1715	A
9	A	1719	A
9	A	1721	U
9	A	1722	G
9	A	1726	G
9	A	1730	U
9	A	1733	U
9	A	1744	G
9	A	1745	A
9	A	1751	C
9	A	1752	C
9	A	1753	C
9	A	1754	G
9	A	1755	C
9	A	1756	C
9	A	1757	G

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Mol	Chain	Res	Type
9	A	1777	G
9	A	1778	C
9	A	1779	G
9	A	1780	G
9	A	1781	A
9	A	1782	G
9	A	1783	C
9	A	1784	G
9	A	1800	A
9	A	1807	C
9	A	1813	A
9	A	1817	G
9	A	1819	A
9	A	1820	G
9	A	1824	A
9	A	1825	A
9	A	1826	G
9	A	1829	G
9	A	1835	A
9	A	1838	U
9	A	1849	G
9	A	1861	G
9	A	1862	G
9	A	1863	A
9	A	1864	U
9	A	1865	C
9	A	1869	A

All (19) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
9	A	74	G
9	A	190	G
9	A	198	U
9	A	203	G
9	A	310	C
9	A	329	G
9	A	345	U
9	A	476	A
9	A	535	G
9	A	539	C
9	A	544	G

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Mol	Chain	Res	Type
9	A	548	C
9	A	871	U
9	A	911	C
9	A	1114	U
9	A	1118	C
9	A	1605	G
9	A	1751	C
9	A	1781	A

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
9	A2M	A	668	9,51	18,25,26	4.30	6 (33%)	20,36,39	2.44	7 (35%)
9	JMH	A	1219	9,51	18,22,23	2.71	6 (33%)	23,32,35	0.95	2 (8%)
9	6MZ	A	1832	9,52,51	17,25,26	1.49	3 (17%)	15,36,39	2.67	3 (20%)
9	A2M	A	1678	9	18,25,26	4.45	7 (38%)	20,36,39	2.40	5 (25%)
9	OMU	A	121	9	19,22,23	3.23	8 (42%)	25,31,34	1.81	5 (20%)
9	OMG	A	1490	9,51	19,26,27	2.43	8 (42%)	21,38,41	1.45	4 (19%)
9	PSU	A	1081	9	18,21,22	4.49	8 (44%)	21,30,33	2.12	5 (23%)
9	UR3	A	1830	9	19,22,23	3.05	8 (42%)	26,32,35	1.69	3 (11%)
9	5MC	A	1374	9	19,22,23	3.91	8 (42%)	26,32,35	1.02	2 (7%)
9	MA6	A	1851	9	19,26,27	1.62	3 (15%)	18,38,41	4.11	5 (27%)
9	A2M	A	166	9	18,25,26	4.56	7 (38%)	20,36,39	2.71	7 (35%)
9	A2M	A	484	9	18,25,26	4.31	7 (38%)	20,36,39	2.28	5 (25%)
9	PSU	A	823	9	18,21,22	4.46	7 (38%)	21,30,33	1.92	5 (23%)
9	OMG	A	601	9	19,26,27	2.44	8 (42%)	21,38,41	1.62	5 (23%)
9	PSU	A	119	9	18,21,22	4.53	7 (38%)	21,30,33	1.90	4 (19%)
9	5MU	A	814	9	19,22,23	0.51	0	27,32,35	0.82	1 (3%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
9	PSU	A	822	9	18,21,22	4.48	8 (44%)	21,30,33	2.04	6 (28%)
9	4AC	A	1337	9	21,24,25	3.15	10 (47%)	28,34,37	1.92	6 (21%)
9	OMC	A	1703	9	19,22,23	3.06	8 (42%)	25,31,34	0.73	0
9	A2M	A	99	9,51	18,25,26	4.42	6 (33%)	20,36,39	2.38	6 (30%)
9	OMG	A	644	9	19,26,27	2.41	8 (42%)	21,38,41	1.62	5 (23%)
9	OMG	A	683	9	19,26,27	2.45	8 (42%)	21,38,41	1.57	4 (19%)
9	OMG	A	1328	9,52	19,26,27	2.46	8 (42%)	21,38,41	1.58	5 (23%)
9	4AC	A	1842	9	21,24,25	3.11	10 (47%)	28,34,37	1.14	4 (14%)
9	OMU	A	116	9	19,22,23	3.22	8 (42%)	25,31,34	1.74	5 (20%)
9	OMC	A	517	9	19,22,23	3.03	8 (42%)	25,31,34	0.78	0
9	A2M	A	27	9,51	18,25,26	4.40	6 (33%)	20,36,39	2.34	6 (30%)
9	MA6	A	1850	9	19,26,27	1.54	2 (10%)	18,38,41	4.19	4 (22%)
9	OMC	A	174	9,51	19,22,23	3.10	8 (42%)	25,31,34	0.78	0
9	A2M	A	159	9	18,25,26	4.46	7 (38%)	20,36,39	2.35	4 (20%)
9	OMG	A	509	9,51	19,26,27	2.42	8 (42%)	21,38,41	1.53	4 (19%)
9	PSU	A	1243	9	18,21,22	4.44	7 (38%)	21,30,33	2.00	5 (23%)
9	A2M	A	1031	9	18,25,26	4.43	7 (38%)	20,36,39	2.39	6 (30%)
9	PSU	A	612	9,51	18,21,22	4.46	8 (44%)	21,30,33	2.04	6 (28%)

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
9	A2M	A	668	9,51	-	2/5/27/28	0/3/3/3
9	JMH	A	1219	9,51	-	2/7/25/26	0/2/2/2
9	6MZ	A	1832	9,52,51	-	2/5/27/28	0/3/3/3
9	A2M	A	1678	9	-	0/5/27/28	0/3/3/3
9	OMU	A	121	9	-	0/9/27/28	0/2/2/2
9	OMG	A	1490	9,51	-	1/5/27/28	0/3/3/3
9	PSU	A	1081	9	-	1/7/25/26	0/2/2/2
9	UR3	A	1830	9	-	0/7/25/26	0/2/2/2
9	5MC	A	1374	9	-	0/7/25/26	0/2/2/2
9	MA6	A	1851	9	-	3/7/29/30	0/3/3/3
9	A2M	A	166	9	-	2/5/27/28	0/3/3/3
9	A2M	A	484	9	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	PSU	A	823	9	-	2/7/25/26	0/2/2/2
9	OMG	A	601	9	-	0/5/27/28	0/3/3/3
9	PSU	A	119	9	-	0/7/25/26	0/2/2/2
9	5MU	A	814	9	-	0/7/25/26	0/2/2/2
9	PSU	A	822	9	-	2/7/25/26	0/2/2/2
9	4AC	A	1337	9	-	2/11/29/30	0/2/2/2
9	OMC	A	1703	9	-	1/9/27/28	0/2/2/2
9	A2M	A	99	9,51	-	2/5/27/28	0/3/3/3
9	OMG	A	644	9	-	1/5/27/28	0/3/3/3
9	OMG	A	683	9	-	2/5/27/28	0/3/3/3
9	OMG	A	1328	9,52	-	0/5/27/28	0/3/3/3
9	4AC	A	1842	9	-	0/11/29/30	0/2/2/2
9	OMU	A	116	9	-	0/9/27/28	0/2/2/2
9	OMC	A	517	9	-	0/9/27/28	0/2/2/2
9	A2M	A	27	9,51	-	0/5/27/28	0/3/3/3
9	MA6	A	1850	9	-	1/7/29/30	0/3/3/3
9	OMC	A	174	9,51	-	3/9/27/28	0/2/2/2
9	A2M	A	159	9	-	2/5/27/28	0/3/3/3
9	OMG	A	509	9,51	-	0/5/27/28	0/3/3/3
9	PSU	A	1243	9	-	0/7/25/26	0/2/2/2
9	A2M	A	1031	9	-	0/5/27/28	0/3/3/3
9	PSU	A	612	9,51	-	0/7/25/26	0/2/2/2

All (236) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	166	A2M	O4'-C1'	16.80	1.62	1.40
9	A	159	A2M	O4'-C1'	16.29	1.62	1.40
9	A	1031	A2M	O4'-C1'	16.24	1.62	1.40
9	A	99	A2M	O4'-C1'	16.23	1.62	1.40
9	A	1678	A2M	O4'-C1'	16.19	1.62	1.40
9	A	27	A2M	O4'-C1'	15.97	1.61	1.40
9	A	484	A2M	O4'-C1'	15.51	1.61	1.40
9	A	668	A2M	O4'-C1'	15.47	1.61	1.40
9	A	119	PSU	C6-C5	11.35	1.47	1.35
9	A	612	PSU	C6-C5	11.19	1.47	1.35
9	A	822	PSU	C6-C5	11.10	1.47	1.35
9	A	1081	PSU	C6-C5	10.95	1.47	1.35
9	A	823	PSU	C6-C5	10.89	1.47	1.35
9	A	1243	PSU	C6-C5	10.73	1.47	1.35
9	A	823	PSU	C2-N1	9.95	1.49	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	1243	PSU	C2-N1	9.89	1.49	1.36
9	A	119	PSU	C2-N1	9.87	1.49	1.36
9	A	1081	PSU	C2-N1	9.81	1.49	1.36
9	A	822	PSU	C2-N1	9.58	1.49	1.36
9	A	612	PSU	C2-N1	9.57	1.49	1.36
9	A	1374	5MC	C6-C5	8.96	1.49	1.34
9	A	1830	UR3	C2-N1	7.94	1.49	1.38
9	A	116	OMU	C2-N3	7.86	1.51	1.38
9	A	121	OMU	C2-N3	7.83	1.51	1.38
9	A	174	OMC	C2-N3	7.48	1.51	1.36
9	A	116	OMU	C2-N1	7.39	1.50	1.38
9	A	121	OMU	C2-N1	7.30	1.49	1.38
9	A	1703	OMC	C2-N3	7.27	1.50	1.36
9	A	612	PSU	C2-N3	7.18	1.49	1.37
9	A	517	OMC	C2-N3	7.18	1.50	1.36
9	A	1842	4AC	C4-N3	7.17	1.44	1.32
9	A	1243	PSU	C2-N3	7.13	1.49	1.37
9	A	822	PSU	C2-N3	7.13	1.49	1.37
9	A	1081	PSU	C2-N3	7.05	1.49	1.37
9	A	119	PSU	C2-N3	7.02	1.49	1.37
9	A	1374	5MC	C2-N3	7.00	1.50	1.36
9	A	1337	4AC	C4-N3	7.00	1.44	1.32
9	A	1219	JMH	C2-N1	6.96	1.48	1.38
9	A	668	A2M	O4'-C4'	-6.91	1.29	1.45
9	A	1830	UR3	C6-C5	6.82	1.50	1.35
9	A	823	PSU	C2-N3	6.82	1.48	1.37
9	A	484	A2M	O4'-C4'	-6.79	1.29	1.45
9	A	1678	A2M	O4'-C4'	-6.74	1.30	1.45
9	A	1374	5MC	C4-N4	6.67	1.51	1.34
9	A	27	A2M	O4'-C4'	-6.64	1.30	1.45
9	A	159	A2M	O4'-C4'	-6.59	1.30	1.45
9	A	174	OMC	C6-C5	6.52	1.50	1.35
9	A	1031	A2M	O4'-C4'	-6.50	1.30	1.45
9	A	1703	OMC	C6-C5	6.49	1.50	1.35
9	A	166	A2M	O4'-C4'	-6.48	1.30	1.45
9	A	517	OMC	C6-C5	6.43	1.50	1.35
9	A	99	A2M	O4'-C4'	-6.38	1.30	1.45
9	A	121	OMU	C6-C5	6.19	1.49	1.35
9	A	1374	5MC	C4-N3	6.13	1.44	1.34
9	A	1219	JMH	C6-C5	6.11	1.49	1.35
9	A	1842	4AC	C2-N3	6.09	1.48	1.36
9	A	1337	4AC	C6-C5	6.06	1.49	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	116	OMU	C6-C5	6.06	1.49	1.35
9	A	1374	5MC	C5-C4	6.03	1.48	1.44
9	A	1337	4AC	C2-N3	5.86	1.48	1.36
9	A	1842	4AC	C6-C5	5.84	1.48	1.35
9	A	823	PSU	O4-C4	-5.68	1.12	1.23
9	A	1830	UR3	C2-N3	5.61	1.50	1.39
9	A	822	PSU	O4-C4	-5.58	1.13	1.23
9	A	1081	PSU	O4-C4	-5.58	1.13	1.23
9	A	1243	PSU	O4-C4	-5.57	1.13	1.23
9	A	612	PSU	O4-C4	-5.55	1.13	1.23
9	A	119	PSU	O4-C4	-5.49	1.13	1.23
9	A	1851	MA6	C6-C5	-5.45	1.36	1.44
9	A	119	PSU	C6-N1	5.31	1.45	1.36
9	A	174	OMC	C4-N3	5.30	1.45	1.34
9	A	823	PSU	C6-N1	5.16	1.44	1.36
9	A	509	OMG	C2-N3	5.16	1.45	1.33
9	A	1243	PSU	C6-N1	5.15	1.44	1.36
9	A	1081	PSU	C6-N1	5.15	1.44	1.36
9	A	1490	OMG	C2-N3	5.13	1.45	1.33
9	A	601	OMG	C2-N3	5.13	1.45	1.33
9	A	644	OMG	C2-N3	5.09	1.45	1.33
9	A	1328	OMG	C2-N3	5.09	1.45	1.33
9	A	822	PSU	C6-N1	5.07	1.44	1.36
9	A	683	OMG	C2-N3	5.06	1.45	1.33
9	A	1703	OMC	C4-N3	5.05	1.44	1.34
9	A	1850	MA6	C6-C5	-4.92	1.37	1.44
9	A	517	OMC	C4-N3	4.90	1.44	1.34
9	A	1219	JMH	C2-N3	4.90	1.48	1.39
9	A	612	PSU	C6-N1	4.86	1.44	1.36
9	A	1490	OMG	C4-N3	4.80	1.48	1.37
9	A	509	OMG	C4-N3	4.79	1.48	1.37
9	A	683	OMG	C2-N2	4.79	1.45	1.34
9	A	1328	OMG	C2-N2	4.75	1.45	1.34
9	A	683	OMG	C4-N3	4.73	1.48	1.37
9	A	1328	OMG	C4-N3	4.72	1.48	1.37
9	A	1490	OMG	C2-N2	4.72	1.45	1.34
9	A	601	OMG	C2-N2	4.71	1.45	1.34
9	A	601	OMG	C4-N3	4.67	1.48	1.37
9	A	644	OMG	C4-N3	4.58	1.48	1.37
9	A	644	OMG	C2-N2	4.53	1.44	1.34
9	A	509	OMG	C2-N2	4.51	1.44	1.34
9	A	1374	5MC	C6-N1	4.42	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	1337	4AC	C7-N4	4.40	1.46	1.37
9	A	517	OMC	C2-N1	4.32	1.49	1.40
9	A	1832	6MZ	C6-C5	-4.30	1.38	1.44
9	A	174	OMC	C2-N1	4.24	1.49	1.40
9	A	1703	OMC	C2-N1	4.21	1.48	1.40
9	A	1337	4AC	C4-N4	4.19	1.46	1.39
9	A	1842	4AC	C7-N4	4.15	1.45	1.37
9	A	822	PSU	C4-N3	4.06	1.46	1.38
9	A	612	PSU	C4-N3	4.03	1.46	1.38
9	A	121	OMU	C4-N3	3.98	1.45	1.38
9	A	119	PSU	C4-N3	3.98	1.46	1.38
9	A	1243	PSU	C4-N3	3.98	1.46	1.38
9	A	1842	4AC	C4-N4	3.94	1.45	1.39
9	A	1081	PSU	C4-N3	3.93	1.46	1.38
9	A	116	OMU	C4-N3	3.91	1.45	1.38
9	A	823	PSU	C4-N3	3.84	1.46	1.38
9	A	1374	5MC	C2-N1	3.82	1.48	1.40
9	A	1337	4AC	C5-C4	3.79	1.49	1.41
9	A	1842	4AC	C2-N1	3.75	1.47	1.40
9	A	174	OMC	C4-N4	3.68	1.42	1.33
9	A	517	OMC	C4-N4	3.65	1.42	1.33
9	A	1703	OMC	C4-N4	3.62	1.42	1.33
9	A	1328	OMG	C6-N1	3.60	1.43	1.37
9	A	1337	4AC	C2-N1	3.59	1.47	1.40
9	A	1081	PSU	O2-C2	-3.57	1.15	1.23
9	A	823	PSU	O2-C2	-3.53	1.15	1.23
9	A	119	PSU	O2-C2	-3.51	1.15	1.23
9	A	601	OMG	C6-N1	3.51	1.43	1.37
9	A	822	PSU	O2-C2	-3.50	1.15	1.23
9	A	1243	PSU	O2-C2	-3.43	1.16	1.23
9	A	683	OMG	C6-N1	3.41	1.43	1.37
9	A	1842	4AC	C5-C4	3.40	1.48	1.41
9	A	612	PSU	O2-C2	-3.36	1.16	1.23
9	A	644	OMG	C6-N1	3.34	1.42	1.37
9	A	517	OMC	C6-N1	3.29	1.45	1.38
9	A	1490	OMG	C6-N1	3.29	1.42	1.37
9	A	174	OMC	C6-N1	3.29	1.45	1.38
9	A	1703	OMC	C6-N1	3.28	1.45	1.38
9	A	1830	UR3	O4-C4	-3.22	1.16	1.23
9	A	509	OMG	C6-N1	3.22	1.42	1.37
9	A	166	A2M	O3'-C3'	-3.20	1.35	1.43
9	A	1678	A2M	C6-N6	3.18	1.45	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	159	A2M	C6-N6	3.16	1.45	1.34
9	A	644	OMG	C5-C4	-3.15	1.35	1.43
9	A	166	A2M	C6-N6	3.13	1.45	1.34
9	A	683	OMG	C5-C4	-3.11	1.35	1.43
9	A	99	A2M	C6-N6	3.11	1.45	1.34
9	A	668	A2M	C6-N6	3.10	1.45	1.34
9	A	27	A2M	C6-N6	3.10	1.45	1.34
9	A	1850	MA6	C6-N6	3.07	1.44	1.37
9	A	484	A2M	C6-N6	3.06	1.45	1.34
9	A	27	A2M	O3'-C3'	-3.06	1.35	1.43
9	A	1490	OMG	C5-C4	-3.05	1.35	1.43
9	A	1031	A2M	C6-N6	3.05	1.45	1.34
9	A	509	OMG	C5-C4	-3.05	1.35	1.43
9	A	159	A2M	O3'-C3'	-3.05	1.35	1.43
9	A	1031	A2M	O3'-C3'	-3.03	1.35	1.43
9	A	1328	OMG	C5-C6	3.03	1.53	1.47
9	A	601	OMG	C5-C4	-3.02	1.35	1.43
9	A	644	OMG	C5-C6	3.01	1.53	1.47
9	A	484	A2M	O3'-C3'	-3.00	1.35	1.43
9	A	1328	OMG	C5-C4	-2.99	1.35	1.43
9	A	668	A2M	O3'-C3'	-2.98	1.35	1.43
9	A	1678	A2M	O3'-C3'	-2.94	1.35	1.43
9	A	116	OMU	O4-C4	-2.92	1.18	1.24
9	A	121	OMU	O4-C4	-2.92	1.18	1.24
9	A	1219	JMH	C6-N1	2.91	1.45	1.38
9	A	1703	OMC	O2-C2	-2.91	1.18	1.23
9	A	27	A2M	O2'-C2'	2.88	1.49	1.42
9	A	99	A2M	O3'-C3'	-2.88	1.35	1.43
9	A	1337	4AC	C6-N1	2.87	1.44	1.38
9	A	1337	4AC	O2-C2	-2.87	1.18	1.23
9	A	1678	A2M	O2'-C2'	2.86	1.49	1.42
9	A	484	A2M	O2'-C2'	2.85	1.49	1.42
9	A	1031	A2M	O2'-C2'	2.84	1.49	1.42
9	A	99	A2M	O2'-C2'	2.83	1.49	1.42
9	A	116	OMU	C6-N1	2.80	1.44	1.38
9	A	517	OMC	O2-C2	-2.80	1.18	1.23
9	A	159	A2M	O2'-C2'	2.80	1.49	1.42
9	A	121	OMU	C6-N1	2.77	1.44	1.38
9	A	509	OMG	C5-C6	2.77	1.52	1.47
9	A	1842	4AC	O2-C2	-2.77	1.18	1.23
9	A	166	A2M	O2'-C2'	2.76	1.49	1.42
9	A	683	OMG	C5-C6	2.76	1.52	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	601	OMG	C5-C6	2.74	1.52	1.47
9	A	1328	OMG	C2-N1	2.73	1.44	1.37
9	A	1842	4AC	C6-N1	2.71	1.44	1.38
9	A	1490	OMG	C5-C6	2.69	1.52	1.47
9	A	1830	UR3	C5-C4	2.69	1.50	1.43
9	A	174	OMC	O2-C2	-2.68	1.18	1.23
9	A	1081	PSU	O4'-C1'	-2.68	1.40	1.43
9	A	1219	JMH	C5-C4	2.66	1.49	1.42
9	A	509	OMG	C2-N1	2.65	1.44	1.37
9	A	668	A2M	O2'-C2'	2.65	1.49	1.42
9	A	683	OMG	C2-N1	2.64	1.44	1.37
9	A	644	OMG	C2-N1	2.62	1.44	1.37
9	A	601	OMG	C2-N1	2.61	1.44	1.37
9	A	121	OMU	C5-C4	2.59	1.49	1.43
9	A	1851	MA6	C6-N6	2.58	1.43	1.37
9	A	1490	OMG	C2-N1	2.52	1.43	1.37
9	A	1830	UR3	O2-C2	-2.50	1.17	1.22
9	A	822	PSU	O4'-C1'	-2.43	1.40	1.43
9	A	174	OMC	C5-C4	2.41	1.48	1.42
9	A	1703	OMC	C5-C4	2.40	1.48	1.42
9	A	116	OMU	C5-C4	2.37	1.48	1.43
9	A	517	OMC	C5-C4	2.36	1.48	1.42
9	A	1830	UR3	C6-N1	2.34	1.43	1.38
9	A	159	A2M	C2-N3	2.29	1.35	1.32
9	A	99	A2M	C1'-N9	-2.28	1.44	1.49
9	A	1374	5MC	O2-C2	-2.26	1.19	1.23
9	A	1830	UR3	C4-N3	2.24	1.45	1.40
9	A	1678	A2M	C1'-N9	-2.24	1.44	1.49
9	A	159	A2M	C1'-N9	-2.24	1.44	1.49
9	A	612	PSU	O4'-C1'	-2.23	1.40	1.43
9	A	484	A2M	C1'-N9	-2.21	1.44	1.49
9	A	1337	4AC	O7-C7	-2.19	1.18	1.23
9	A	1842	4AC	O7-C7	-2.18	1.18	1.23
9	A	166	A2M	C1'-N9	-2.18	1.44	1.49
9	A	509	OMG	O6-C6	-2.16	1.18	1.23
9	A	27	A2M	C1'-N9	-2.16	1.44	1.49
9	A	121	OMU	O2-C2	-2.16	1.19	1.23
9	A	601	OMG	O6-C6	-2.14	1.18	1.23
9	A	116	OMU	O2-C2	-2.13	1.19	1.23
9	A	1832	6MZ	C2-N3	2.13	1.35	1.32
9	A	1219	JMH	O2-C2	-2.13	1.18	1.22
9	A	644	OMG	O6-C6	-2.13	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	1490	OMG	O6-C6	-2.12	1.18	1.23
9	A	1031	A2M	C1'-N9	-2.12	1.44	1.49
9	A	683	OMG	O6-C6	-2.10	1.18	1.23
9	A	1832	6MZ	C6-N1	-2.10	1.31	1.34
9	A	1851	MA6	C5-N7	-2.09	1.32	1.39
9	A	1678	A2M	C2-N3	2.08	1.35	1.32
9	A	1328	OMG	O6-C6	-2.06	1.18	1.23
9	A	484	A2M	C2-N3	2.05	1.35	1.32
9	A	1031	A2M	C2-N3	2.05	1.35	1.32
9	A	668	A2M	C1'-N9	-2.04	1.44	1.49
9	A	166	A2M	C2-N3	2.02	1.35	1.32

All (144) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	1851	MA6	N1-C6-N6	-11.90	103.08	116.83
9	A	1850	MA6	N1-C6-N6	-11.23	103.86	116.83
9	A	1850	MA6	C1'-N9-C4	10.82	145.66	126.64
9	A	1851	MA6	C1'-N9-C4	10.08	144.35	126.64
9	A	1337	4AC	CM7-C7-N4	6.93	126.46	115.27
9	A	1832	6MZ	N3-C2-N1	-6.67	119.62	128.67
9	A	1850	MA6	N3-C2-N1	-6.45	119.91	128.67
9	A	1851	MA6	N3-C2-N1	-6.45	119.91	128.67
9	A	99	A2M	N3-C2-N1	-6.40	119.98	128.67
9	A	27	A2M	N3-C2-N1	-6.37	120.02	128.67
9	A	166	A2M	N3-C2-N1	-6.28	120.15	128.67
9	A	668	A2M	N3-C2-N1	-6.23	120.22	128.67
9	A	1678	A2M	N3-C2-N1	-6.13	120.34	128.67
9	A	484	A2M	N3-C2-N1	-6.06	120.45	128.67
9	A	1830	UR3	C4-N3-C2	-6.02	119.74	124.58
9	A	1031	A2M	N3-C2-N1	-6.00	120.53	128.67
9	A	159	A2M	N3-C2-N1	-5.87	120.70	128.67
9	A	166	A2M	C4'-O4'-C1'	-5.69	104.71	109.92
9	A	121	OMU	C4-N3-C2	-5.56	119.71	126.61
9	A	159	A2M	C1'-N9-C4	5.49	136.28	126.64
9	A	1832	6MZ	C1'-N9-C4	5.42	136.16	126.64
9	A	484	A2M	C1'-N9-C4	5.23	135.83	126.64
9	A	1081	PSU	C4-N3-C2	-5.13	119.30	126.37
9	A	116	OMU	C4-N3-C2	-5.08	120.31	126.61
9	A	822	PSU	C4-N3-C2	-5.04	119.43	126.37
9	A	1243	PSU	C4-N3-C2	-5.01	119.48	126.37
9	A	668	A2M	C4'-O4'-C1'	-4.93	105.41	109.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	823	PSU	C4-N3-C2	-4.89	119.64	126.37
9	A	119	PSU	C4-N3-C2	-4.87	119.67	126.37
9	A	1031	A2M	C1'-N9-C4	4.80	135.08	126.64
9	A	612	PSU	C4-N3-C2	-4.80	119.76	126.37
9	A	1832	6MZ	C2-N1-C6	4.80	120.32	116.60
9	A	1678	A2M	C1'-N9-C4	4.76	135.01	126.64
9	A	1081	PSU	N1-C2-N3	4.73	120.16	115.17
9	A	27	A2M	C1'-N9-C4	4.63	134.77	126.64
9	A	166	A2M	C1'-N9-C4	4.59	134.70	126.64
9	A	822	PSU	N1-C2-N3	4.44	119.85	115.17
9	A	1850	MA6	C2-N1-C6	4.43	121.18	116.84
9	A	612	PSU	N1-C2-N3	4.39	119.80	115.17
9	A	823	PSU	N1-C2-N3	4.38	119.79	115.17
9	A	99	A2M	C1'-N9-C4	4.38	134.33	126.64
9	A	1243	PSU	N1-C2-N3	4.34	119.74	115.17
9	A	119	PSU	N1-C2-N3	4.32	119.72	115.17
9	A	1031	A2M	C5-C6-N6	-4.13	114.02	120.31
9	A	1678	A2M	C5-C6-N6	-4.13	114.03	120.31
9	A	166	A2M	C5-C6-N6	-4.08	114.10	120.31
9	A	159	A2M	C5-C6-N6	-3.96	114.28	120.31
9	A	1678	A2M	C4'-O4'-C1'	-3.94	106.32	109.92
9	A	121	OMU	N3-C2-N1	3.92	119.99	114.89
9	A	27	A2M	C5-C6-N6	-3.92	114.34	120.31
9	A	116	OMU	N3-C2-N1	3.90	119.97	114.89
9	A	99	A2M	C5-C6-N6	-3.83	114.48	120.31
9	A	1031	A2M	C4'-O4'-C1'	-3.81	106.44	109.92
9	A	1830	UR3	C5-C4-N3	3.79	120.03	115.04
9	A	644	OMG	C8-N7-C5	3.76	108.95	102.55
9	A	484	A2M	C5-C6-N6	-3.64	114.77	120.31
9	A	121	OMU	C5-C4-N3	3.60	119.84	114.80
9	A	1328	OMG	C8-N7-C5	3.58	108.64	102.55
9	A	683	OMG	C8-N7-C5	3.55	108.60	102.55
9	A	166	A2M	N6-C6-N1	3.54	125.90	118.33
9	A	601	OMG	C8-N7-C5	3.53	108.55	102.55
9	A	99	A2M	N6-C6-N1	3.51	125.84	118.33
9	A	1337	4AC	O7-C7-N4	-3.51	116.37	121.90
9	A	668	A2M	C1'-N9-C4	3.51	132.81	126.64
9	A	1490	OMG	C8-N7-C5	3.50	108.50	102.55
9	A	1031	A2M	N6-C6-N1	3.50	125.80	118.33
9	A	1678	A2M	N6-C6-N1	3.48	125.77	118.33
9	A	99	A2M	C4'-O4'-C1'	-3.46	106.76	109.92
9	A	644	OMG	C2-N1-C6	-3.46	118.78	125.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	612	PSU	C6-N1-C2	-3.44	119.50	122.69
9	A	668	A2M	C5-C6-N6	-3.43	115.08	120.31
9	A	27	A2M	N6-C6-N1	3.42	125.64	118.33
9	A	601	OMG	C2-N1-C6	-3.40	118.88	125.11
9	A	509	OMG	C2-N1-C6	-3.38	118.93	125.11
9	A	509	OMG	C8-N7-C5	3.37	108.29	102.55
9	A	1081	PSU	C6-C5-C4	3.37	120.45	118.17
9	A	159	A2M	N6-C6-N1	3.35	125.49	118.33
9	A	1081	PSU	C6-N1-C2	-3.30	119.63	122.69
9	A	612	PSU	O2-C2-N1	-3.28	119.41	122.79
9	A	119	PSU	C6-N1-C2	-3.27	119.65	122.69
9	A	116	OMU	C5-C4-N3	3.27	119.38	114.80
9	A	1328	OMG	C2-N1-C6	-3.26	119.15	125.11
9	A	601	OMG	C5-C6-N1	3.23	120.22	114.07
9	A	644	OMG	C5-C6-N1	3.22	120.22	114.07
9	A	822	PSU	C6-N1-C2	-3.18	119.74	122.69
9	A	484	A2M	N6-C6-N1	3.17	125.11	118.33
9	A	1328	OMG	C5-C6-N1	3.15	120.08	114.07
9	A	1243	PSU	C6-N1-C2	-3.14	119.78	122.69
9	A	668	A2M	N6-C6-N1	3.13	125.02	118.33
9	A	683	OMG	C5-C6-N1	3.13	120.04	114.07
9	A	509	OMG	C5-C6-N1	3.10	119.98	114.07
9	A	1337	4AC	C5-C4-N3	-3.10	117.75	122.60
9	A	822	PSU	O2-C2-N1	-3.10	119.59	122.79
9	A	1851	MA6	C2-N1-C6	3.08	119.86	116.84
9	A	823	PSU	C6-N1-C2	-3.07	119.84	122.69
9	A	1374	5MC	C5-C6-N1	-3.06	119.99	123.31
9	A	683	OMG	C2-N1-C6	-3.02	119.59	125.11
9	A	1243	PSU	C6-C5-C4	2.93	120.15	118.17
9	A	1490	OMG	C5-C6-N1	2.91	119.62	114.07
9	A	27	A2M	C4'-O4'-C1'	-2.89	107.28	109.92
9	A	1337	4AC	C5-C4-N4	2.86	127.77	122.94
9	A	121	OMU	O4-C4-C5	-2.84	120.26	125.16
9	A	116	OMU	O4-C4-C5	-2.83	120.29	125.16
9	A	1842	4AC	C5-C4-N3	-2.76	118.28	122.60
9	A	1081	PSU	O2-C2-N1	-2.75	119.95	122.79
9	A	1337	4AC	O7-C7-CM7	-2.74	117.17	122.05
9	A	1490	OMG	C2-N1-C6	-2.67	120.22	125.11
9	A	668	A2M	C2'-C1'-N9	2.65	118.45	112.56
9	A	1337	4AC	C6-C5-C4	2.61	120.14	117.00
9	A	166	A2M	O4'-C1'-N9	2.57	112.16	108.75
9	A	823	PSU	O2-C2-N1	-2.57	120.14	122.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	99	A2M	O4'-C1'-N9	2.56	112.14	108.75
9	A	612	PSU	C6-C5-C4	2.55	119.89	118.17
9	A	1243	PSU	O2-C2-N1	-2.55	120.16	122.79
9	A	1374	5MC	CM5-C5-C6	-2.54	119.42	122.85
9	A	1842	4AC	C6-C5-C4	2.45	119.95	117.00
9	A	814	5MU	C6-N1-C2	-2.44	118.87	121.30
9	A	119	PSU	O2-C2-N1	-2.42	120.29	122.79
9	A	1219	JMH	C6-N1-C2	-2.41	119.83	121.80
9	A	484	A2M	C3'-C2'-C1'	2.40	107.40	102.81
9	A	612	PSU	O4'-C1'-C2'	2.37	108.43	105.15
9	A	601	OMG	O6-C6-C5	-2.35	119.66	124.32
9	A	1842	4AC	N4-C4-N3	2.35	117.68	113.87
9	A	27	A2M	O4'-C1'-N9	2.34	111.85	108.75
9	A	823	PSU	C6-C5-C4	2.31	119.74	118.17
9	A	683	OMG	O6-C6-C5	-2.30	119.75	124.32
9	A	822	PSU	C6-C5-C4	2.28	119.71	118.17
9	A	509	OMG	O6-C6-C5	-2.27	119.82	124.32
9	A	1328	OMG	O6-C6-C5	-2.25	119.85	124.32
9	A	644	OMG	O6-C6-C5	-2.24	119.87	124.32
9	A	1830	UR3	C1'-N1-C2	2.24	120.71	117.04
9	A	644	OMG	N2-C2-N1	2.21	121.42	116.76
9	A	1328	OMG	N2-C2-N1	2.21	121.42	116.76
9	A	822	PSU	O4'-C1'-C2'	2.19	108.18	105.15
9	A	166	A2M	C5'-C4'-C3'	-2.15	107.48	115.21
9	A	601	OMG	N2-C2-N1	2.15	121.29	116.76
9	A	1851	MA6	O4'-C1'-N9	2.12	111.56	108.75
9	A	1842	4AC	O7-C7-CM7	-2.11	118.30	122.05
9	A	121	OMU	O2-C2-N1	-2.11	120.06	122.80
9	A	116	OMU	C6-N1-C2	-2.06	118.49	121.00
9	A	668	A2M	O4'-C1'-N9	-2.05	106.03	108.75
9	A	1490	OMG	O6-C6-C5	-2.03	120.29	124.32
9	A	1219	JMH	C5-C4-N3	2.02	119.75	116.07
9	A	1031	A2M	O4'-C1'-N9	2.01	111.41	108.75

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	A	166	A2M	O4'-C4'-C5'-O5'
9	A	683	OMG	O4'-C4'-C5'-O5'
9	A	823	PSU	O4'-C1'-C5-C4
9	A	823	PSU	O4'-C1'-C5-C6

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Mol	Chain	Res	Type	Atoms
9	A	1219	JMH	O4'-C4'-C5'-O5'
9	A	1832	6MZ	N1-C6-N6-C9
9	A	1850	MA6	C5-C6-N6-C9
9	A	1851	MA6	C5-C6-N6-C10
9	A	159	A2M	O4'-C4'-C5'-O5'
9	A	159	A2M	C3'-C4'-C5'-O5'
9	A	166	A2M	C3'-C4'-C5'-O5'
9	A	99	A2M	O4'-C4'-C5'-O5'
9	A	822	PSU	O4'-C4'-C5'-O5'
9	A	1219	JMH	C3'-C4'-C5'-O5'
9	A	1851	MA6	N1-C6-N6-C10
9	A	822	PSU	C3'-C4'-C5'-O5'
9	A	668	A2M	C3'-C4'-C5'-O5'
9	A	683	OMG	C3'-C4'-C5'-O5'
9	A	174	OMC	C3'-C4'-C5'-O5'
9	A	174	OMC	O4'-C4'-C5'-O5'
9	A	668	A2M	O4'-C4'-C5'-O5'
9	A	1337	4AC	O7-C7-N4-C4
9	A	1337	4AC	CM7-C7-N4-C4
9	A	1832	6MZ	C5-C6-N6-C9
9	A	644	OMG	C4'-C5'-O5'-P
9	A	1851	MA6	C4'-C5'-O5'-P
9	A	1703	OMC	O4'-C4'-C5'-O5'
9	A	174	OMC	C4'-C5'-O5'-P
9	A	1081	PSU	C4'-C5'-O5'-P
9	A	1490	OMG	C4'-C5'-O5'-P
9	A	99	A2M	C3'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 112 ligands modelled in this entry, 110 are monoatomic - leaving 2 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
55	ACY	1	501	-	2,2,3	0.67	0	1,1,3	0.14	0
53	SPD	A	2005	-	9,9,9	0.33	0	8,8,8	0.52	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
53	SPD	A	2005	-	-	2/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

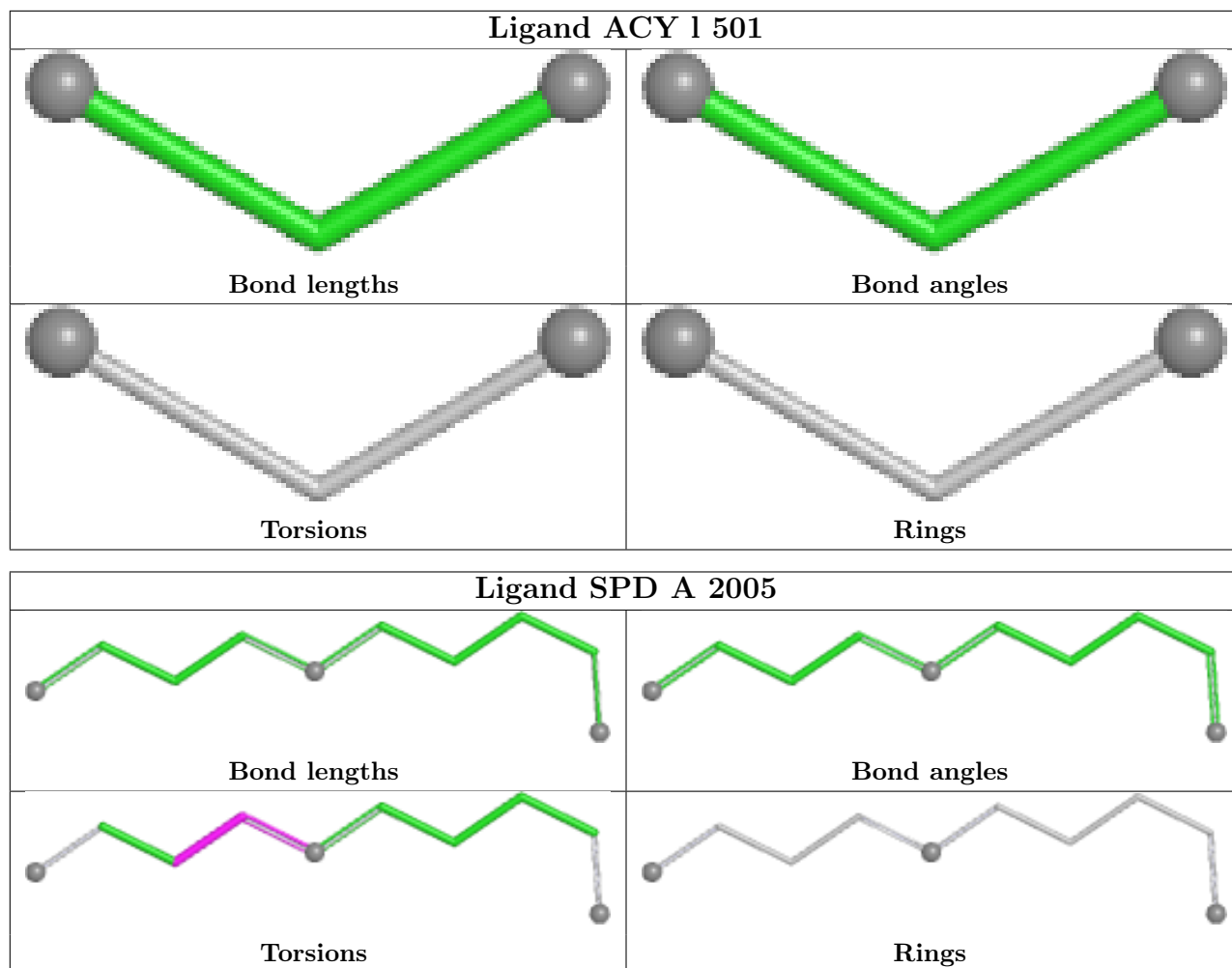
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
53	A	2005	SPD	N6-C7-C8-C9
53	A	2005	SPD	C8-C7-N6-C5

There are no ring outliers.

No monomer is involved in short contacts.

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



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
9	A	2
46	p	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	225:G	O3'	287:U	P	8.10
1	A	1219:JMH	O3'	1220:A	P	3.00

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	p	185:ALA	C	186:GLU	N	2.09
1	p	195:GLU	C	196:MSE	N	1.86

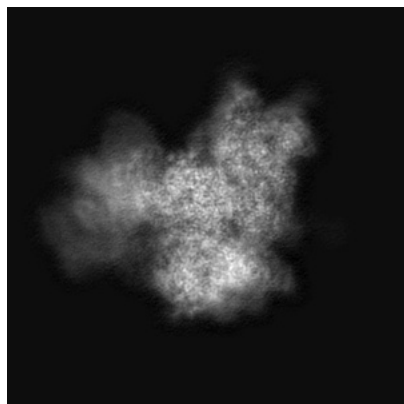
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44671. These allow visual inspection of the internal detail of the map and identification of artifacts.

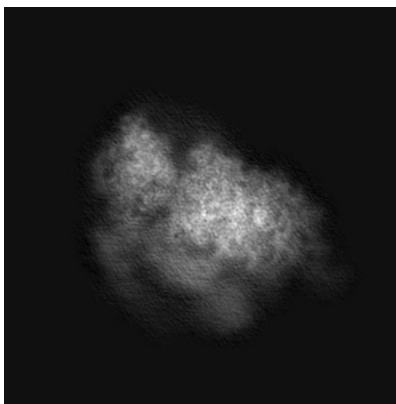
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

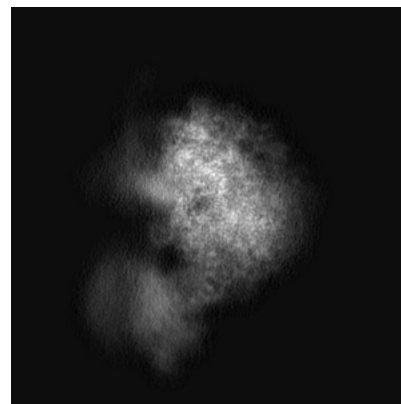
6.1.1 Primary map



X

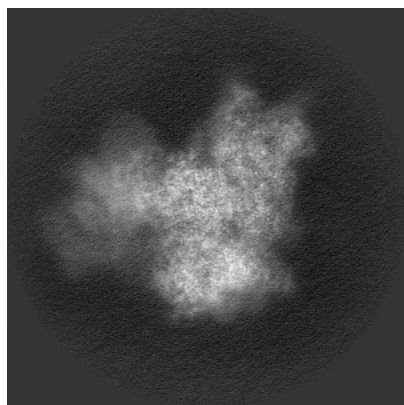


Y

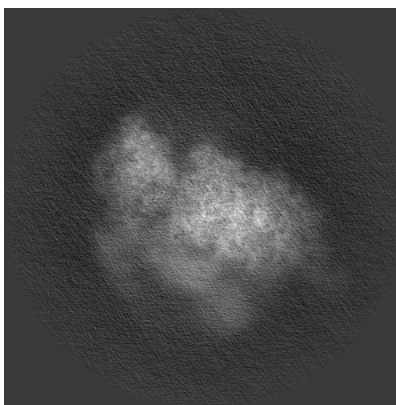


Z

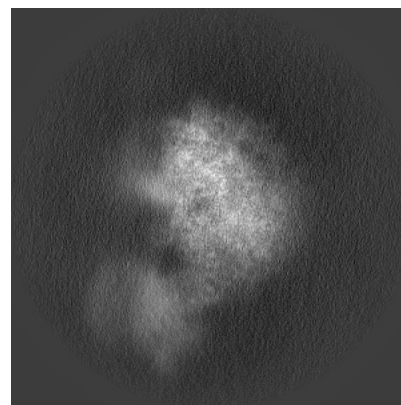
6.1.2 Raw map



X



Y

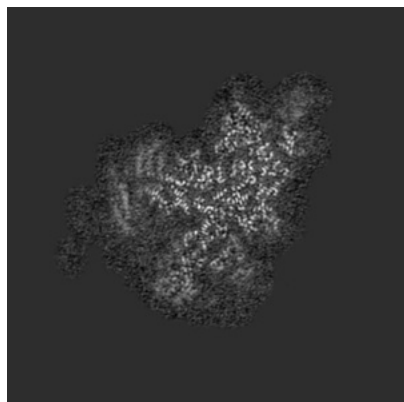


Z

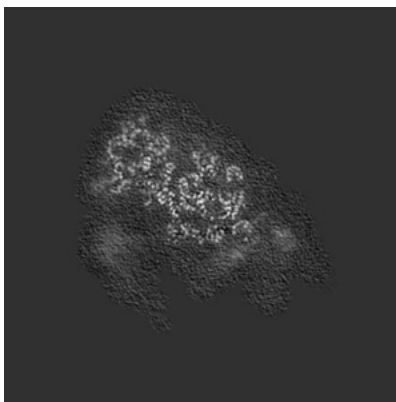
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

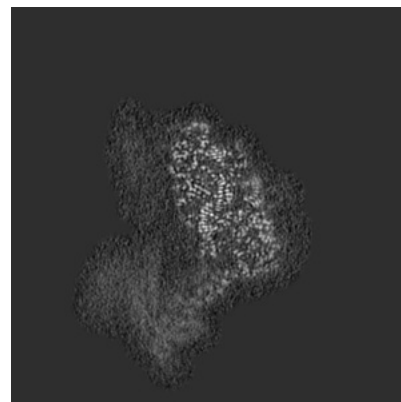
6.2.1 Primary map



X Index: 200

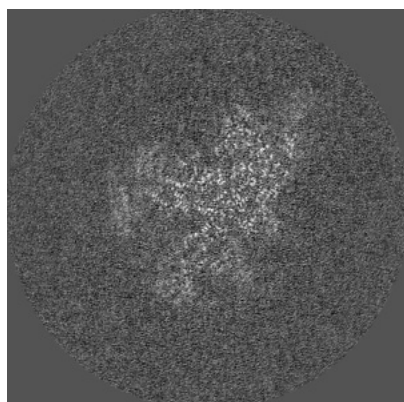


Y Index: 200

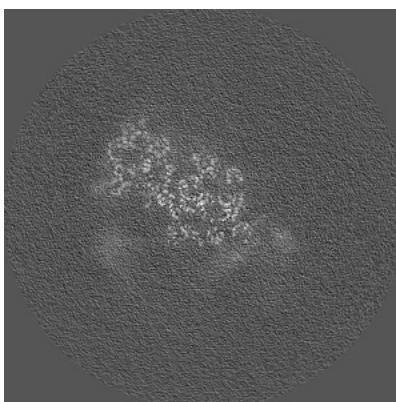


Z Index: 200

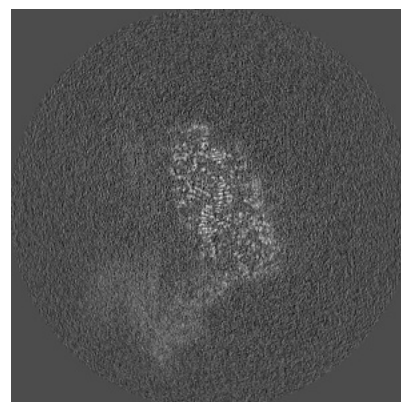
6.2.2 Raw map



X Index: 200



Y Index: 200

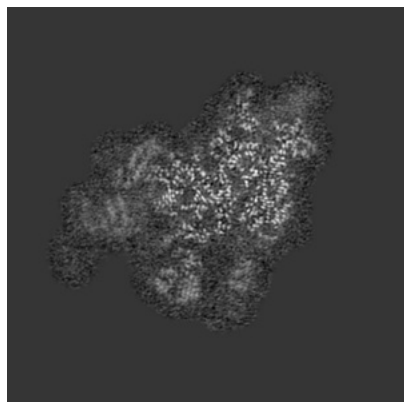


Z Index: 200

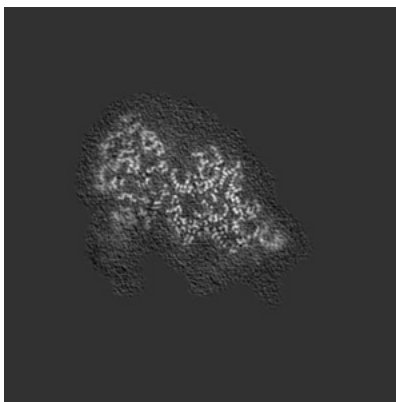
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

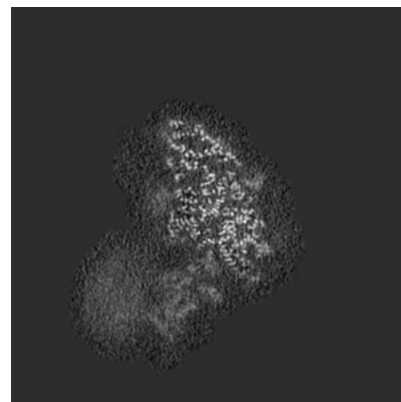
6.3.1 Primary map



X Index: 190

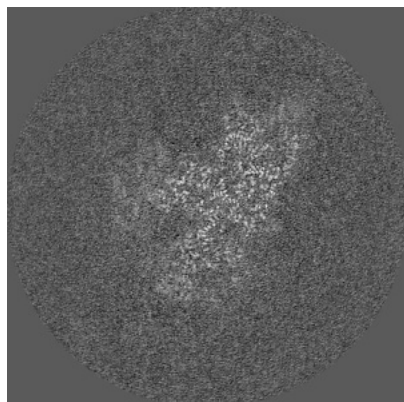


Y Index: 189

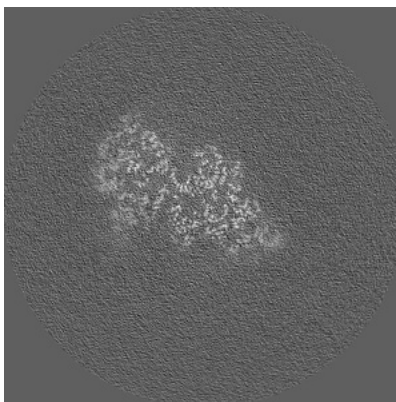


Z Index: 219

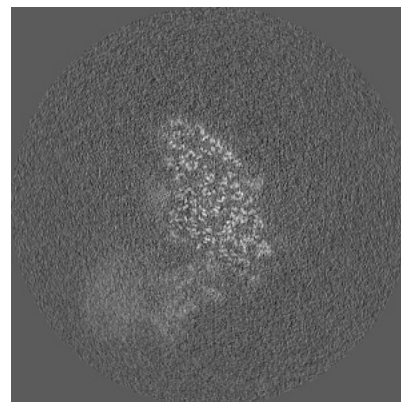
6.3.2 Raw map



X Index: 203



Y Index: 188

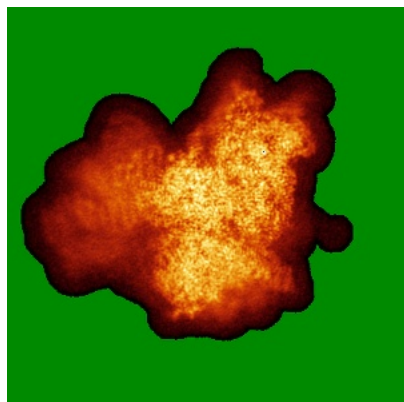


Z Index: 218

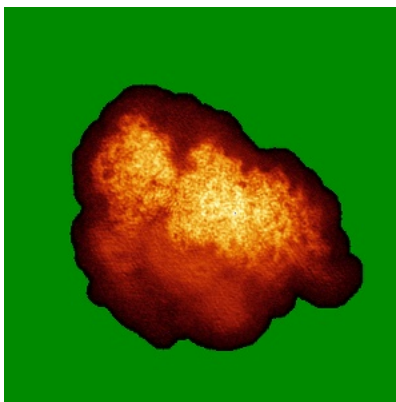
The images above show the largest variance slices of the map in three orthogonal directions.

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

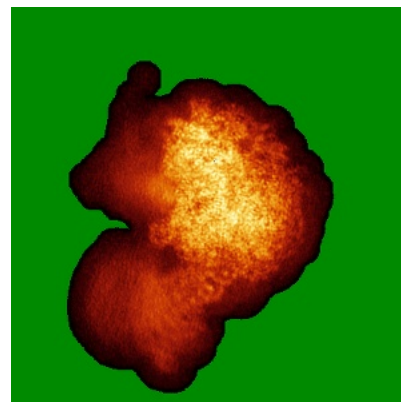
6.4.1 Primary map



X

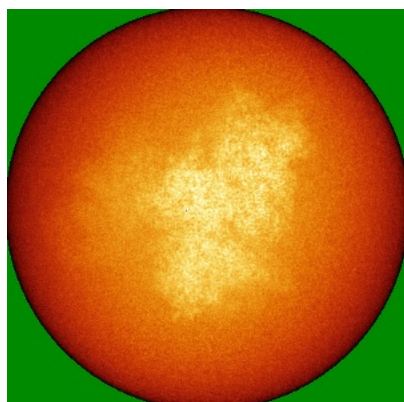


Y

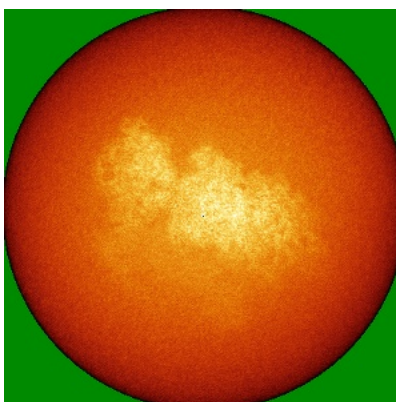


Z

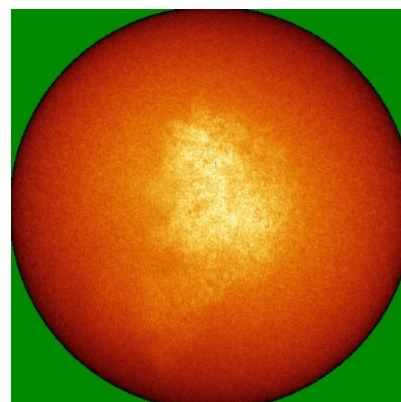
6.4.2 Raw map



X



Y

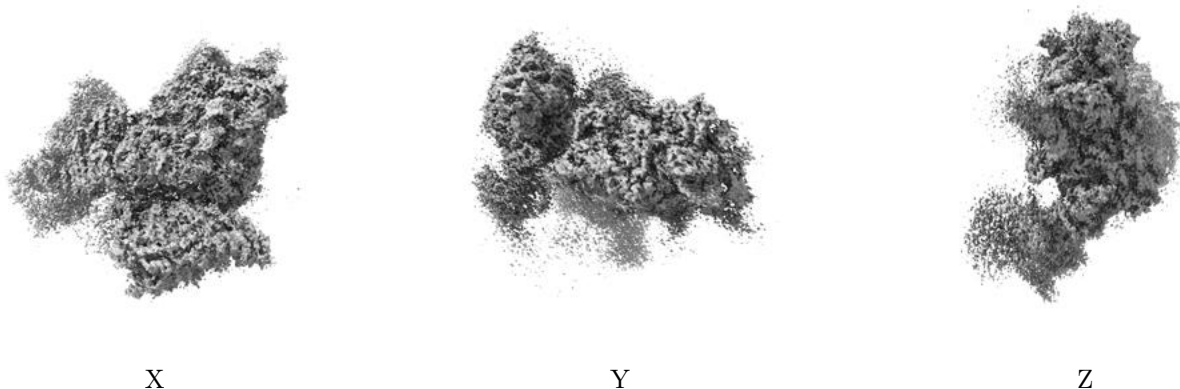


Z

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

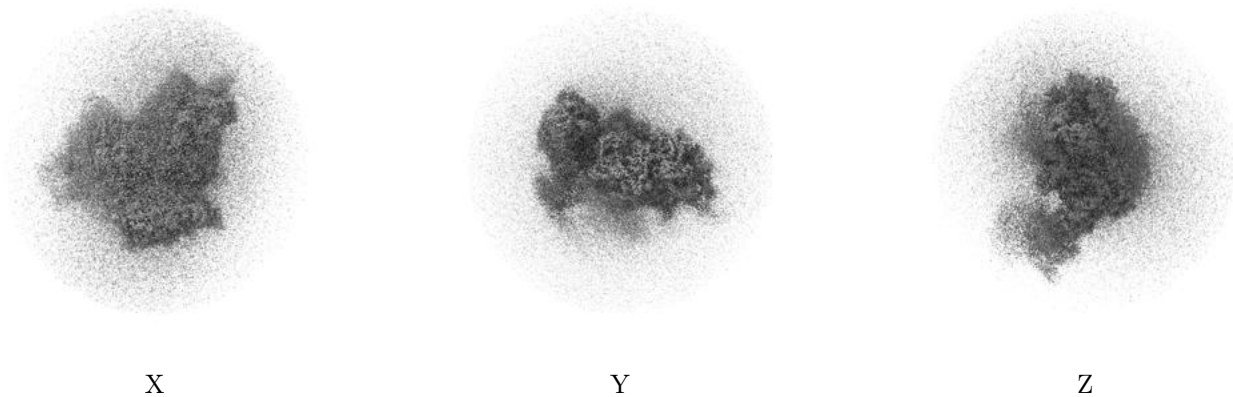
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

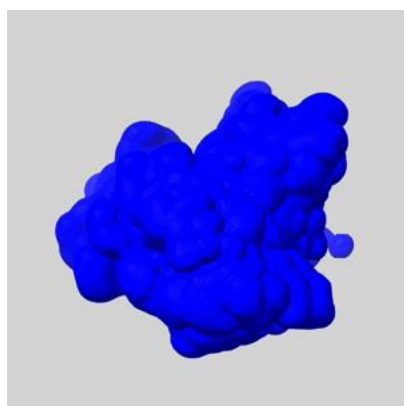
6.6 Mask visualisation [i](#)

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

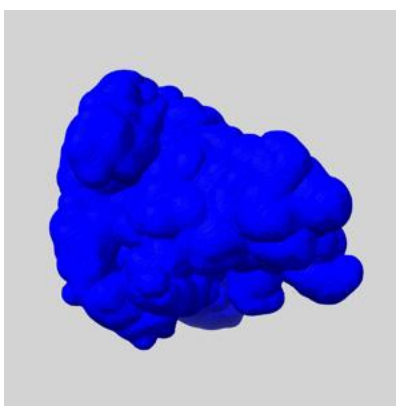
A mask typically either:

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

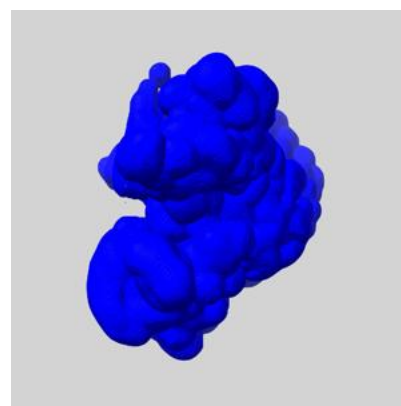
6.6.1 emd_44671_msk_1.map [i](#)



X



Y

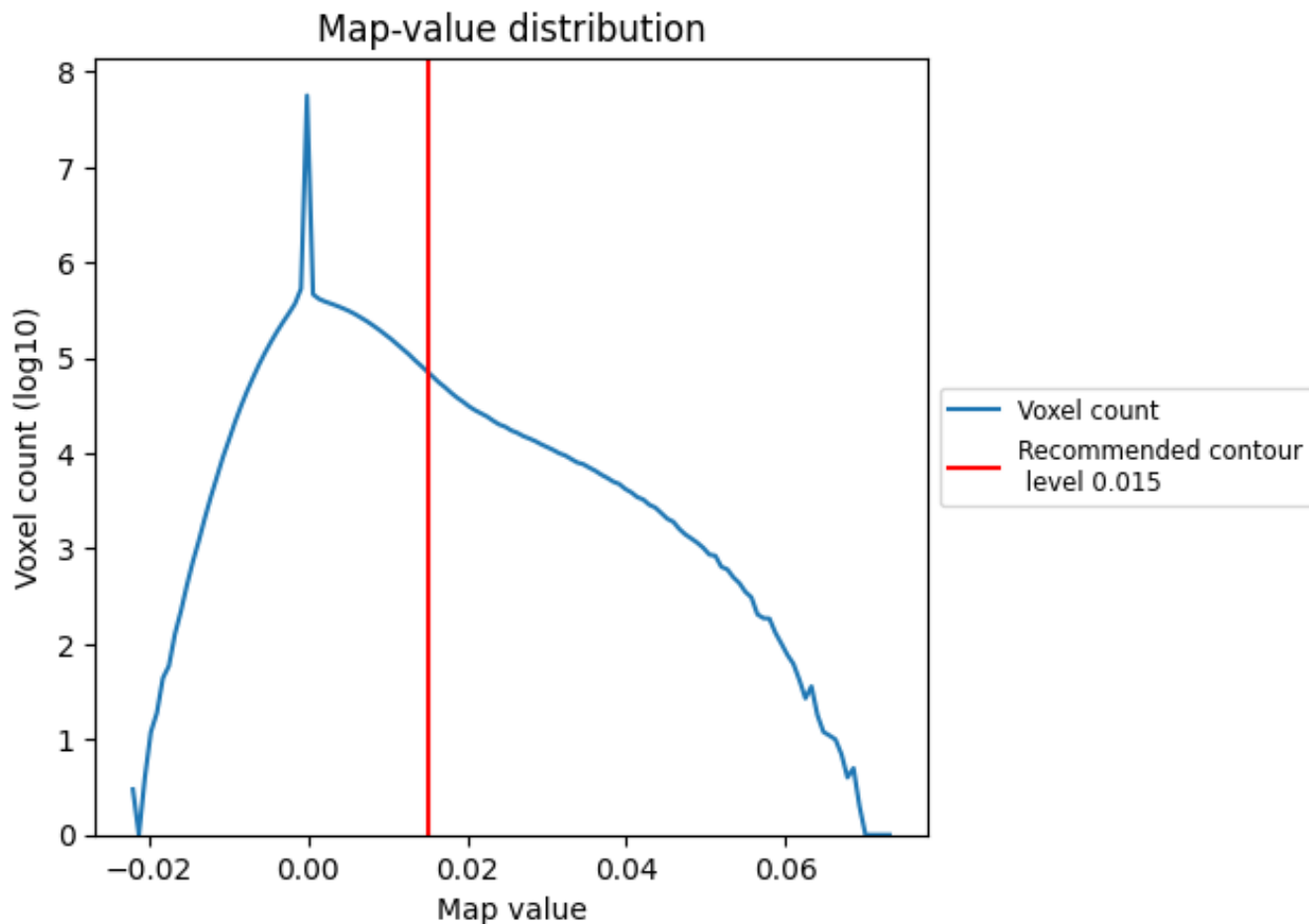


Z

7 Map analysis [i](#)

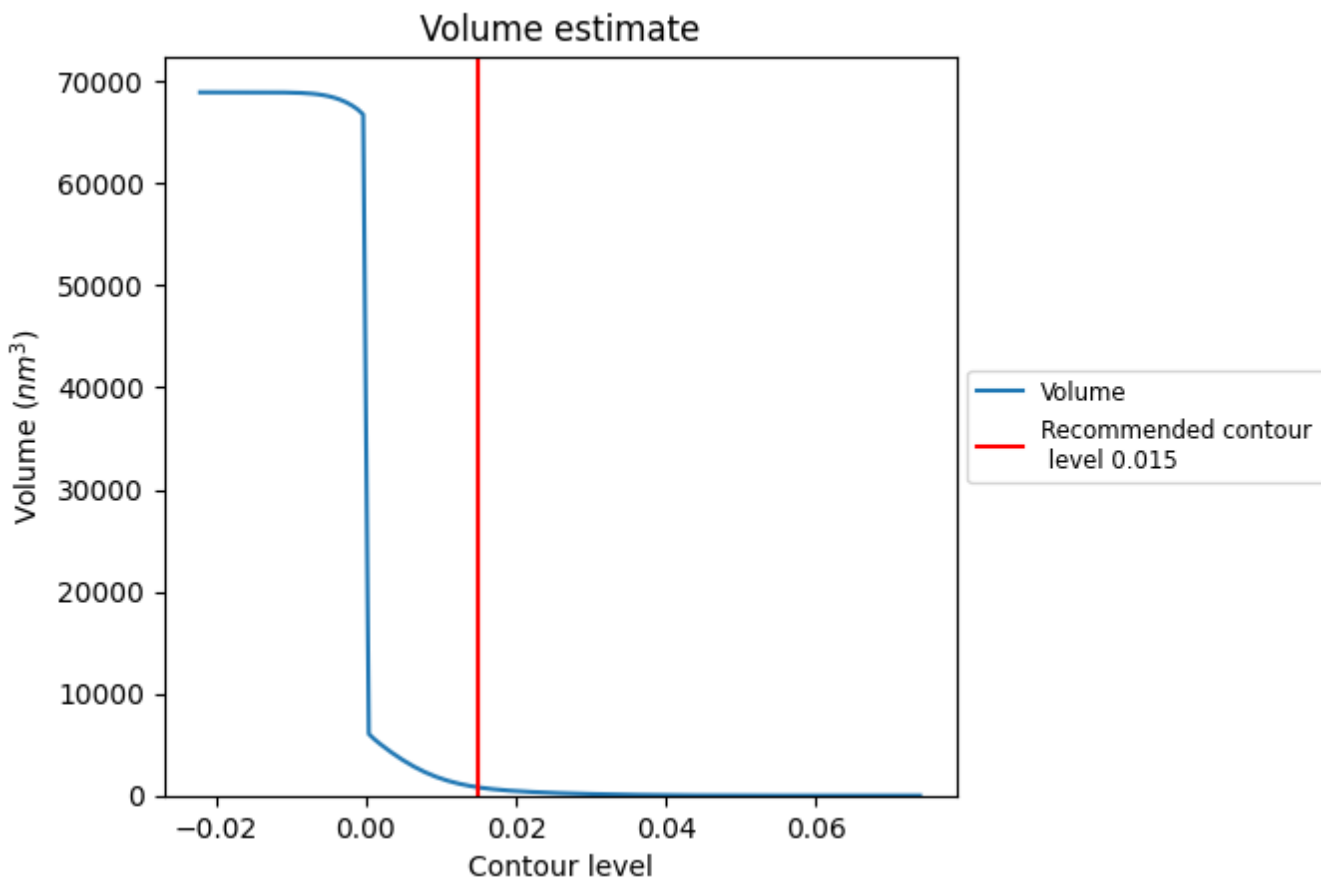
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

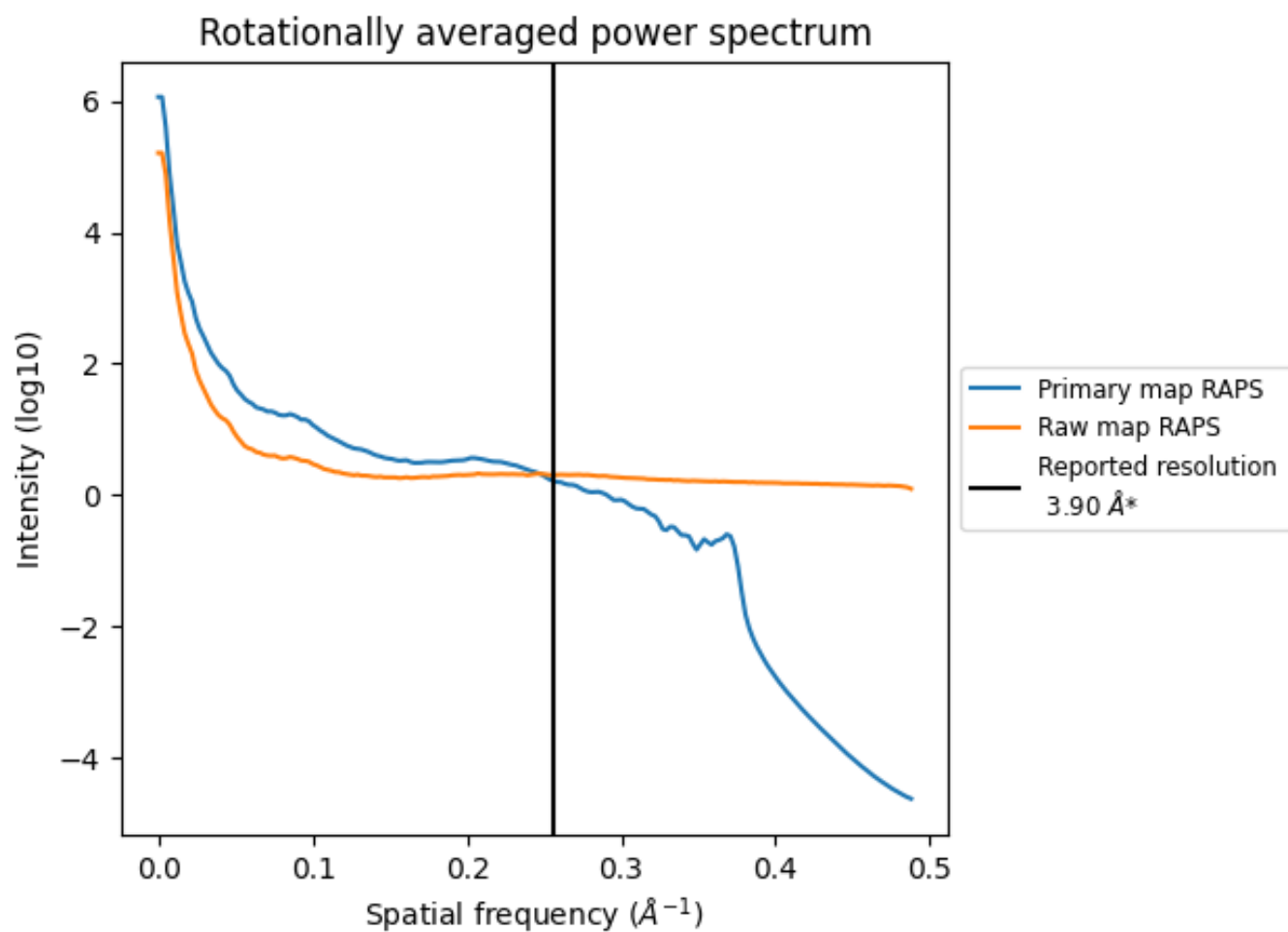
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 809 nm³; this corresponds to an approximate mass of 730 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

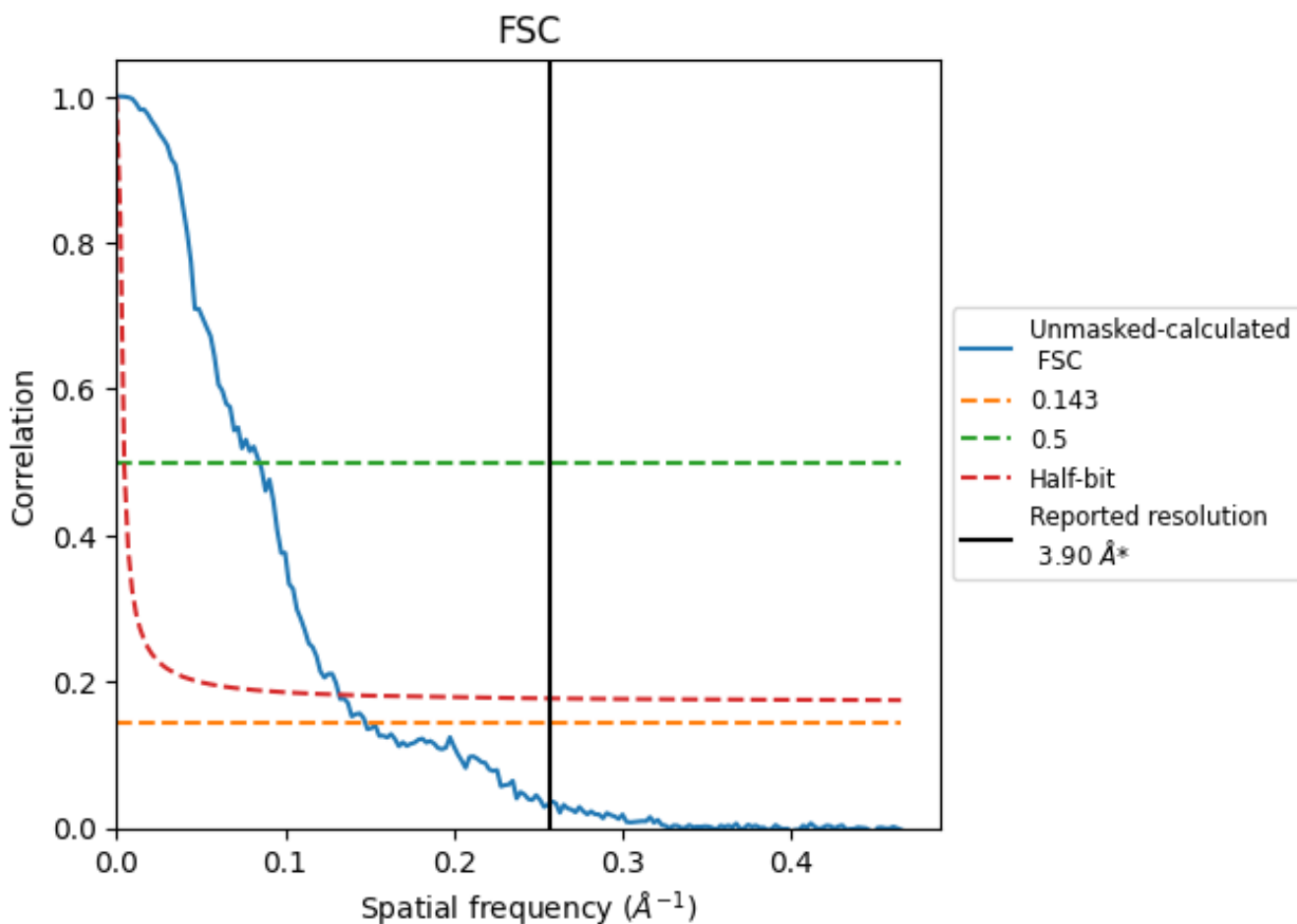


*Reported resolution corresponds to spatial frequency of 0.256 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.256 Å⁻¹

8.2 Resolution estimates [i](#)

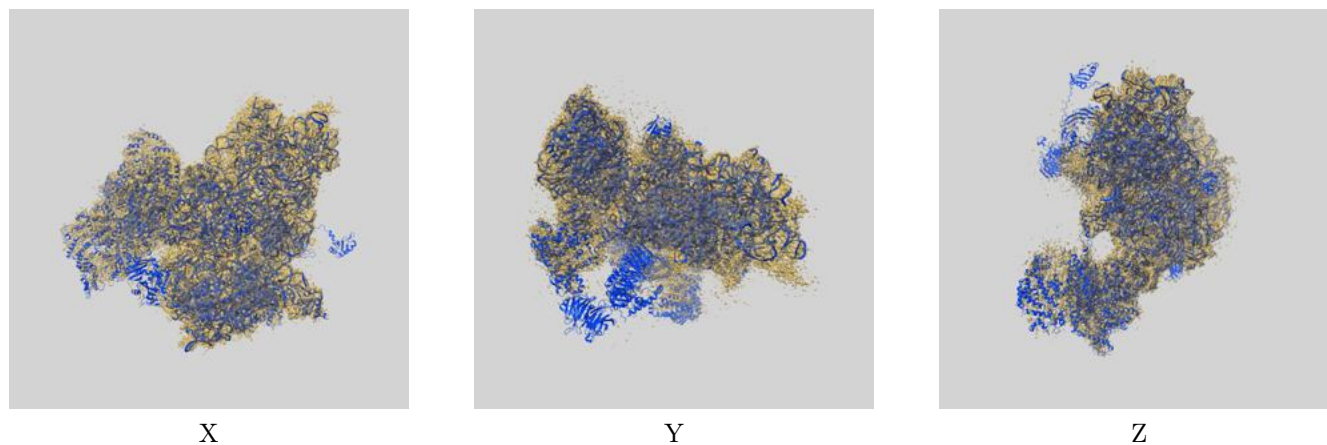
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.78	11.82	7.58

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.78 differs from the reported value 3.9 by more than 10 %

9 Map-model fit [i](#)

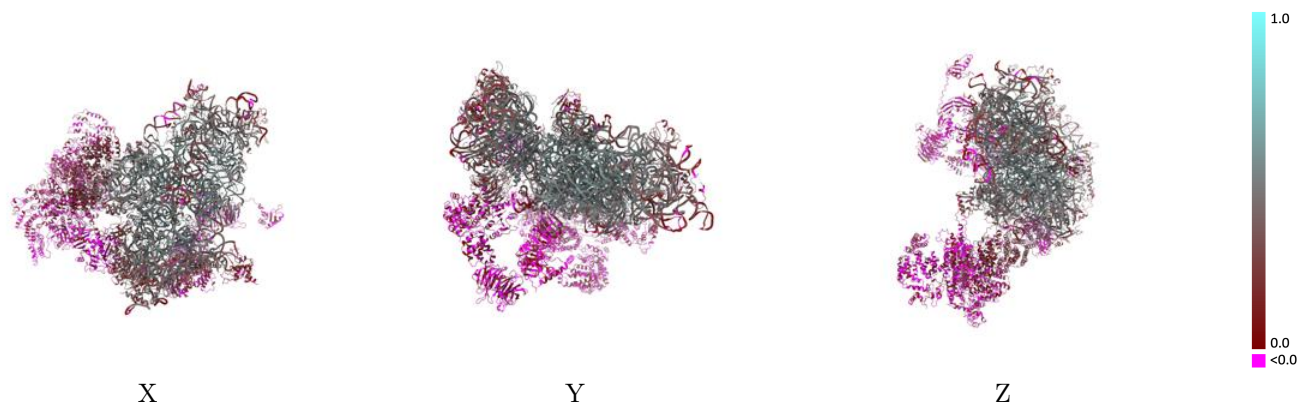
This section contains information regarding the fit between EMDB map EMD-44671 and PDB model 9BLN. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



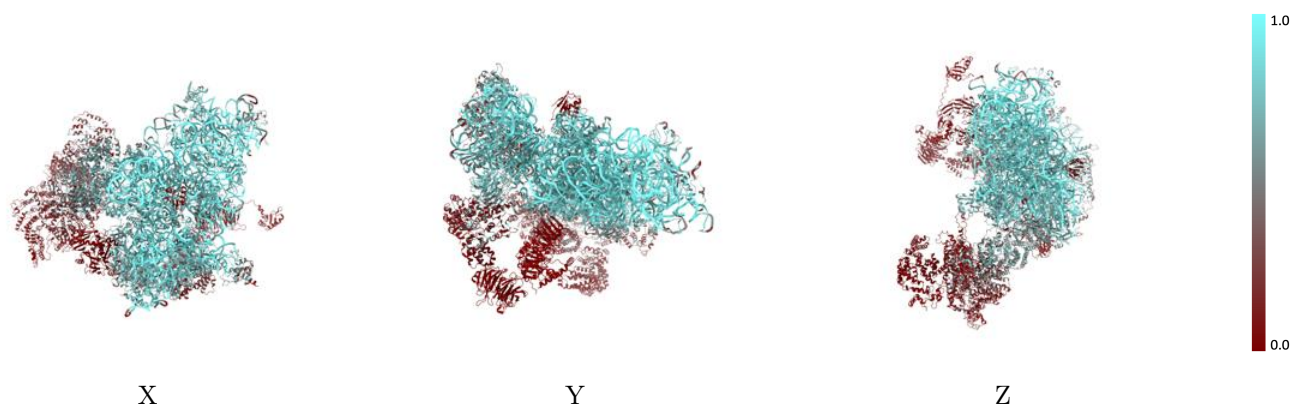
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



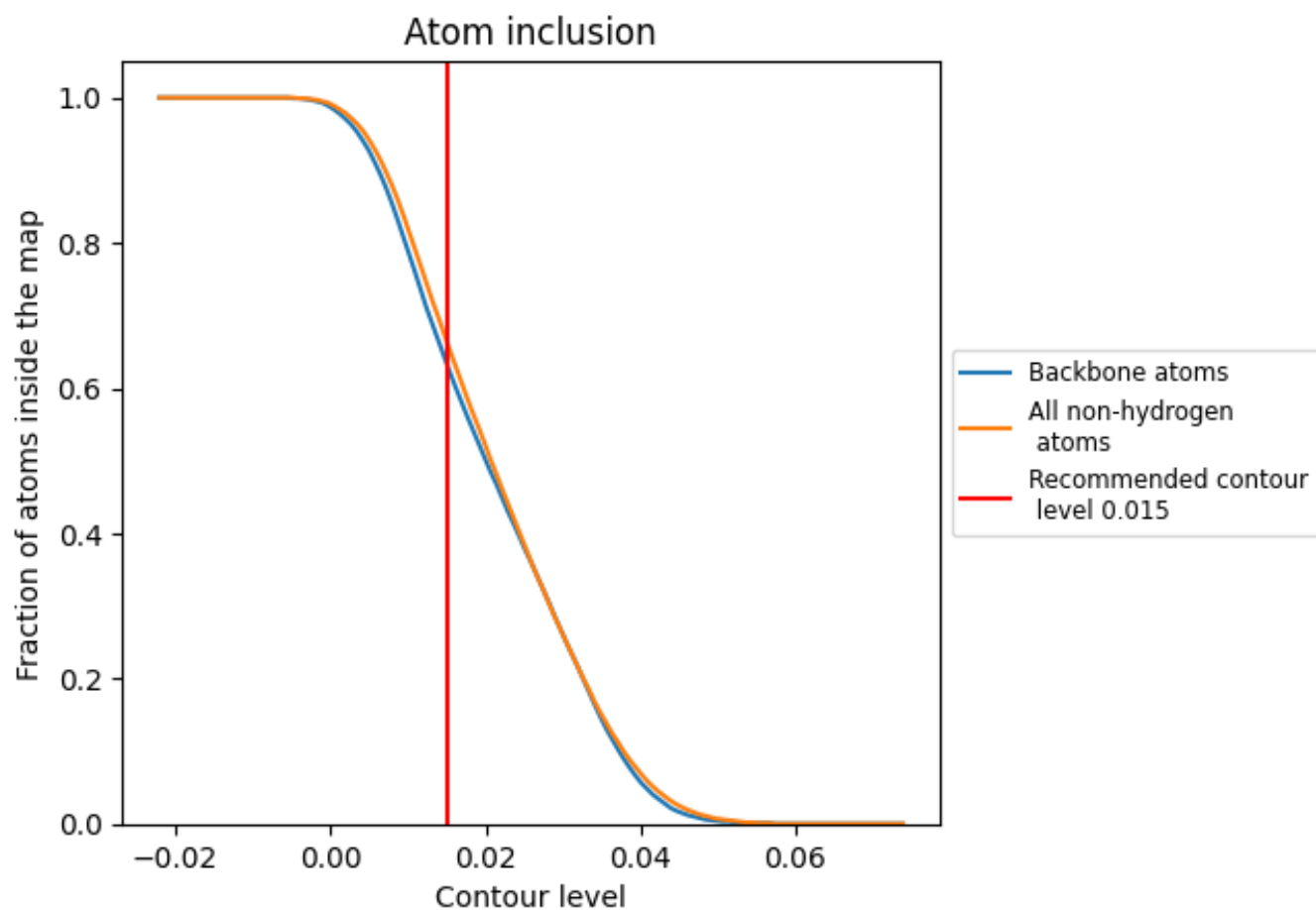
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.015).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 63% of all backbone atoms, 66% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

































The table lists the average atom inclusion at the recommended contour level (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6640	 0.3280
3	 0.0170	 0.0040
4	 0.1080	 0.0320
5	 0.0510	 0.0200
6	 0.0770	 0.0210
8	 0.1150	 0.0260
9	 0.7890	 0.4180
A	 0.9350	 0.4560
B	 0.8560	 0.4670
C	 0.8700	 0.4920
D	 0.8550	 0.4980
E	 0.8740	 0.4990
F	 0.7800	 0.4310
G	 0.6990	 0.3600
H	 0.7880	 0.4350
I	 0.8200	 0.4460
J	 0.8770	 0.5070
K	 0.8560	 0.4770
L	 0.8500	 0.4980
M	 0.7580	 0.4070
N	 0.8510	 0.4890
O	 0.7610	 0.4050
P	 0.7870	 0.4320
Q	 0.8620	 0.4760
R	 0.7950	 0.3880
S	 0.7460	 0.3510
T	 0.8400	 0.4630
U	 0.0170	 0.0290
V	 0.7400	 0.3540
W	 0.1070	 0.1470
X	 0.0020	 -0.0050
Y	 0.8060	 0.4210
Z	 0.7900	 0.4320
a	 0.7720	 0.3970
b	 0.6680	 0.3400



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Chain	Atom inclusion	Q-score
c	 0.6590	 0.2950
d	 0.7930	 0.3910
e	 0.5540	 0.2740
f	 0.6440	 0.3040
h	 0.7310	 0.3730
i	 0.8870	 0.4900
k	 0.5380	 0.2230
l	 0.1420	 0.0080
m	 0.4130	 0.1710
n	 0.6380	 0.3120
o	 0.7290	 0.2790
p	 0.3250	 0.1470
u	 0.3650	 0.1420
v	 0.1870	 0.0450
x	 0.0710	 0.0040
y	 0.4950	 0.1860