Full wwPDB EM Validation Report ⓘ

Oct 15, 2024 – 09:21 am BST

PDB ID	:	8S8E
EMDB ID	:	EMD-19802
Title	:	Structure of a yeast 48S-AUC preinitiation complex in closed conformation (model py48S-AUC-3.1)
Authors	:	Villamayor-Belinchon, L.; Sharma, P.; Llacer, J.L.; Hussain, T.
Deposited on	:	2024-03-06
Resolution	:	3.85 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:

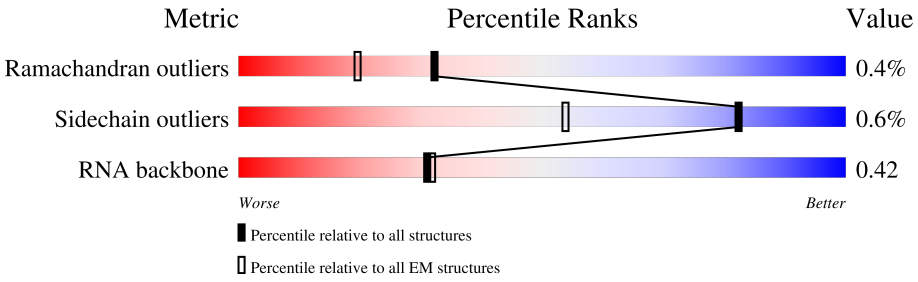
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance

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

The reported resolution of this entry is 3.85 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 <=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	2	1798	8% 64% 35%
2	A	254	6% 86% 14%
3	B	255	9% 87% 12%
4	C	259	85% 15%
5	E	261	100%
6	G	236	5% 96%
7	H	190	14% 96%
8	I	201	9% 94% 6%

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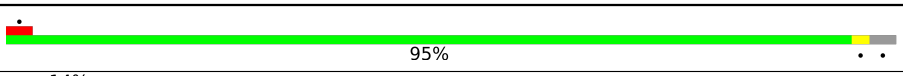
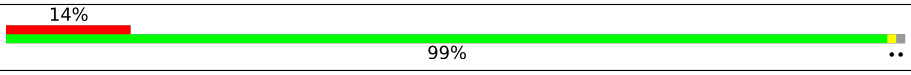
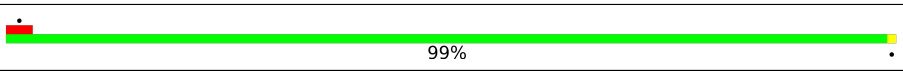
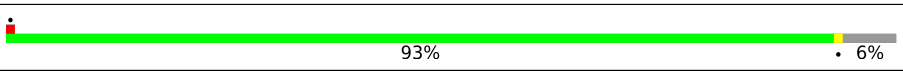
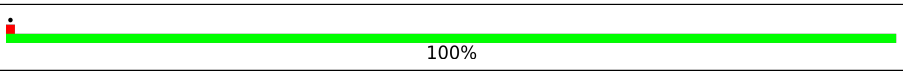
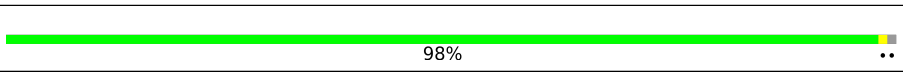
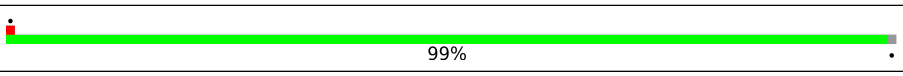
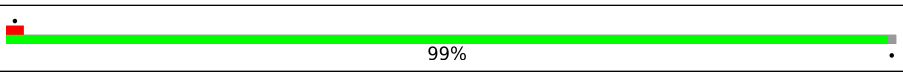
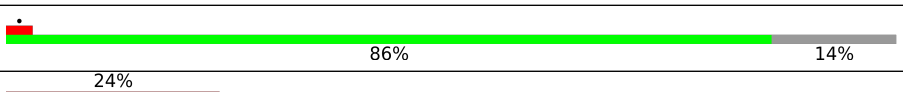
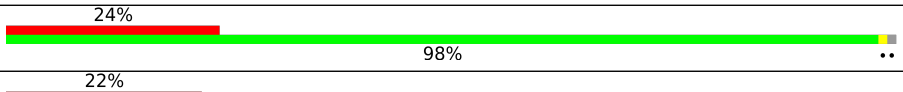
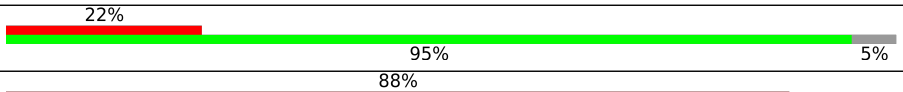
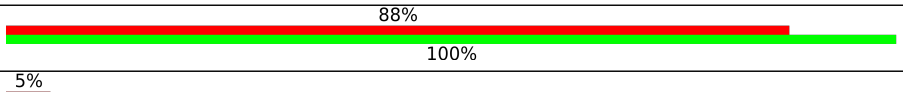
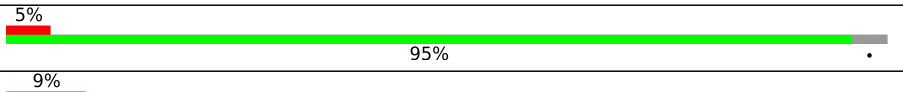
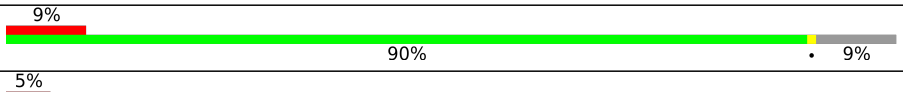
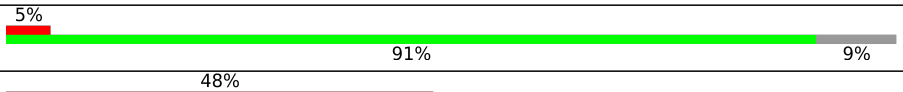
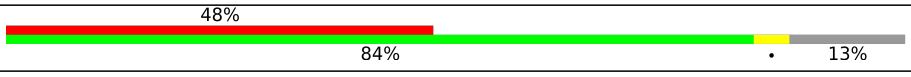
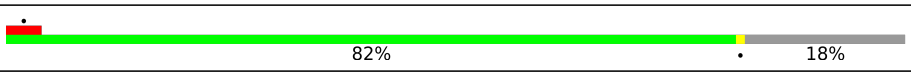
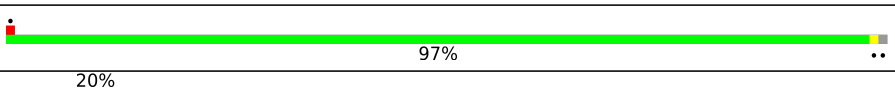
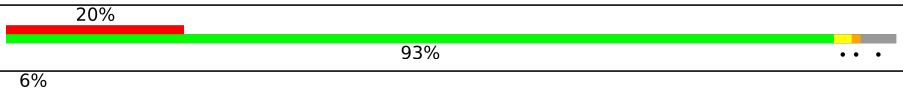
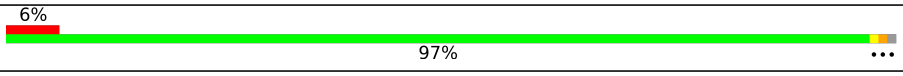
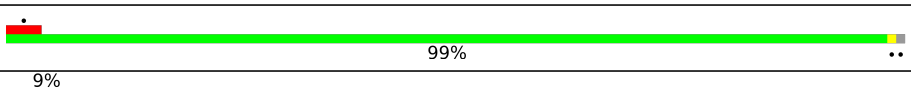
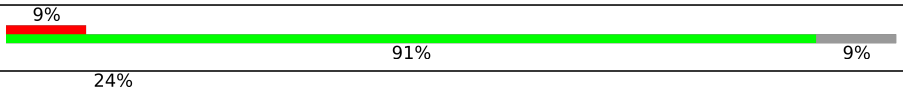
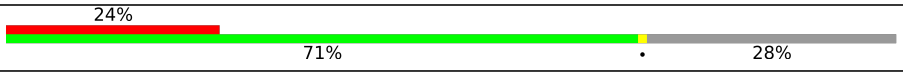
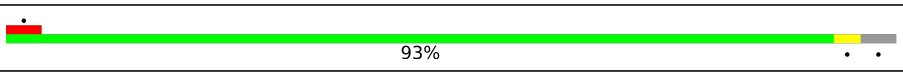
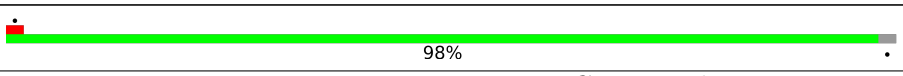
Mol	Chain	Length	Quality of chain
9	J	188	
10	L	156	
11	N	151	
12	O	137	
13	V	87	
14	W	130	
15	X	145	
16	Y	135	
17	a	119	
18	b	82	
19	e	63	
20	h	25	
21	D	237	
22	F	227	
23	K	106	
24	M	134	
25	P	142	
26	Q	143	
27	R	136	
28	S	146	
29	T	144	
30	U	117	
31	Z	108	
32	c	67	
33	d	56	

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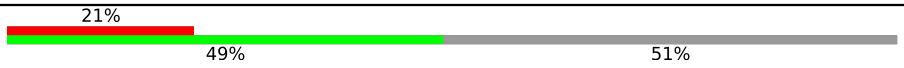
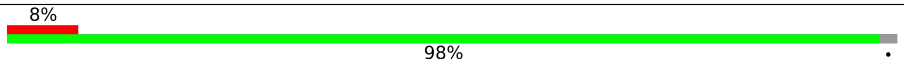
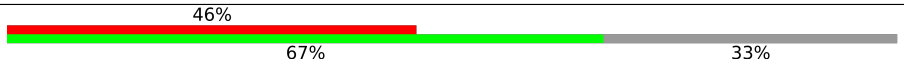
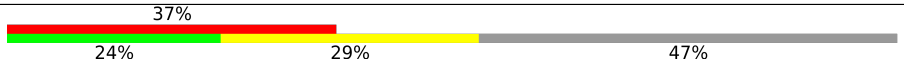
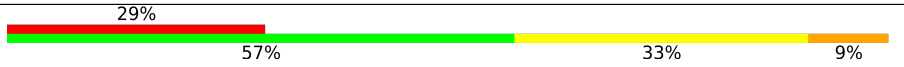
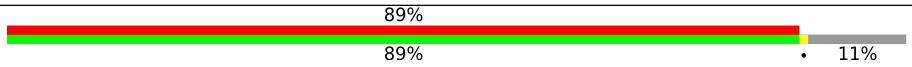
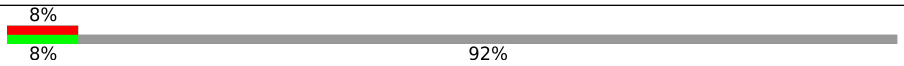
Mol	Chain	Length	Quality of chain
34	f	150	
35	g	326	
36	i	153	
37	3	49	
38	1	75	
39	j	304	
40	k	527	
41	l	285	
42	o	964	
43	p	812	

2 Entry composition

There are 48 unique types of molecules in this entry. The entry contains 94182 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1798	38190	17073	6722	12597	1798	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	219	1702	1085	299	316	2	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	225	1796	1135	330	328	3	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	220	1648	1053	291	300	4	0	0

- Molecule 5 is a protein called 40S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	260	2078	1322	393	359	4	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	G	230	1832	1146	352	330	4	0	0

- Molecule 7 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	H	184	Total	C	N	O	0	0
			1483	950	270	263		

- Molecule 8 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	188	Total	C	N	O	S	0	0
			1489	923	300	265	1		

- Molecule 9 is a protein called KLLA0E23673p.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	182	Total	C	N	O	S	0	0
			1471	929	287	254	1		

- Molecule 10 is a protein called KLLA0A10483p.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	155	Total	C	N	O	S	0	0
			1248	798	237	210	3		

- Molecule 11 is a protein called KLLA0F18040p.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	N	151	Total	C	N	O	S	0	0
			1195	761	224	207	3		

- Molecule 12 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	O	129	Total	C	N	O	S	0	0
			955	585	191	176	3		

- Molecule 13 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	V	87	Total	C	N	O	S	0	0
			687	424	126	135	2		

- Molecule 14 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	W	129	Total	C	N	O	S	0	0
			1021	651	187	180	3		

- Molecule 15 is a protein called KLLA0B11231p.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	X	144	Total	C	N	O	S	0	0
			1119	708	218	191	2		

- Molecule 16 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	Y	134	Total	C	N	O	0	0
			1061	665	207	189		

- Molecule 17 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	a	102	Total	C	N	O	S	0	0
			797	492	168	132	5		

- Molecule 18 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	b	81	Total	C	N	O	S	0	0
			609	379	112	113	5		

- Molecule 19 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	e	60	Total	C	N	O	S	0	0
			472	295	96	80	1		

- Molecule 20 is a protein called 40S ribosomal protein L41-A.

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

- Molecule 21 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	D	227	Total	C	N	O	S	0	0
			1774	1126	320	323	5		

- Molecule 22 is a protein called KLLA0D10659p.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	F	206	Total	C	N	O	S	0	0
			1609	1008	298	300	3		

- Molecule 23 is a protein called KLLA0B08173p.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	K	96	Total	C	N	O	S	0	0
			809	533	129	146	1		

- Molecule 24 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	M	117	Total	C	N	O	0	0
			885	553	161	171		

- Molecule 25 is a protein called KLLA0F07843p.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	P	117	Total	C	N	O	S	0	0
			923	592	165	161	5		

- Molecule 26 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	Q	141	Total	C	N	O	0	0
			1105	709	204	192		

- Molecule 27 is a protein called KLLA0B01474p.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	R	130	Total	C	N	O	S	0	0
			1033	643	194	193	3		

- Molecule 28 is a protein called KLLA0B01562p.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	S	145	Total	C	N	O	S	0	0
			1189	739	239	209	2		

- Molecule 29 is a protein called KLLA0A07194p.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	T	143	Total	C	N	O	0	0
			1110	693	210	207		

- Molecule 30 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	U	106	Total	C	N	O	S	0	0
			845	540	152	152	1		

- Molecule 31 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	Z	78	Total	C	N	O	S	0	0
			594	376	111	106	1		

- Molecule 32 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	c	64	Total	C	N	O	S	0	0
			499	308	99	91	1		

- Molecule 33 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	d	55	Total	C	N	O	S	0	0
			461	289	93	78	1		

- Molecule 34 is a protein called Small ribosomal subunit protein eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	f	74	Total	C	N	O	S	0	0
			584	374	111	95	4		

- Molecule 35 is a protein called KLLA0E12277p.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	g	320	Total	C	N	O	S	0	0
			2469	1561	432	471	5		

- Molecule 36 is a protein called Eukaryotic translation initiation factor 1A.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	i	102	Total	C	N	O	S	0	0
			820	506	158	151	5		

- Molecule 37 is a RNA chain called mRNA (5'-R(P*AP*AP*U)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
37	3	26	Total	C	N	O	P	0	0
			536	242	84	184	26		

- Molecule 38 is a RNA chain called Met-tRNAi.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	1	75	Total	C	N	O	P	0	0
			1639	734	298	531	76		

- Molecule 39 is a protein called Eukaryotic translation initiation factor 2 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	j	267	Total	C	N	O	S	0	0
			2139	1366	355	407	11		

- Molecule 40 is a protein called Eukaryotic translation initiation factor 2 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	k	470	Total	C	N	O	S	0	0
			3596	2279	633	666	18		

- Molecule 41 is a protein called Eukaryotic translation initiation factor 2 subunit beta.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	l	23	Total	C	N	O	0	0
			190	124	32	34		

- Molecule 42 is a protein called Eukaryotic translation initiation factor 3 subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	o	451	Total	C	N	O	S	0	0
			3683	2366	619	691	7		

- Molecule 43 is a protein called Eukaryotic translation initiation factor 3 subunit C.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	p	544	Total	C	N	O	S	0	0
			4442	2845	736	849	12		

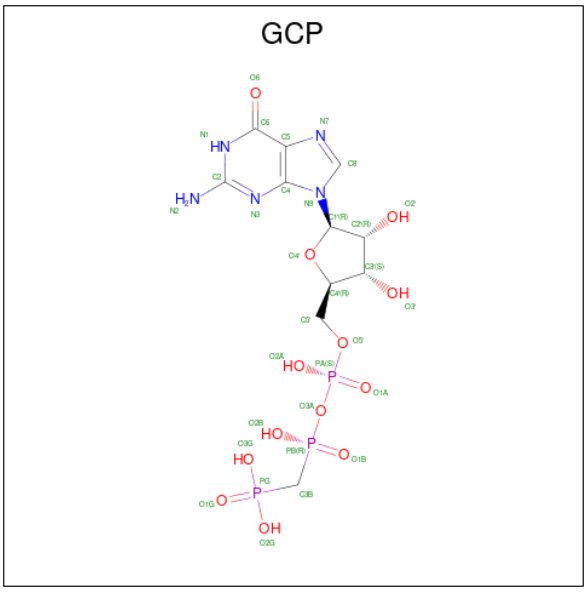
- Molecule 44 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
44	2	113	Total	Mg	0
			113	113	
44	T	1	Total	Mg	0
			1	1	
44	i	1	Total	Mg	0
			1	1	
44	k	1	Total	Mg	0
			1	1	

- Molecule 45 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

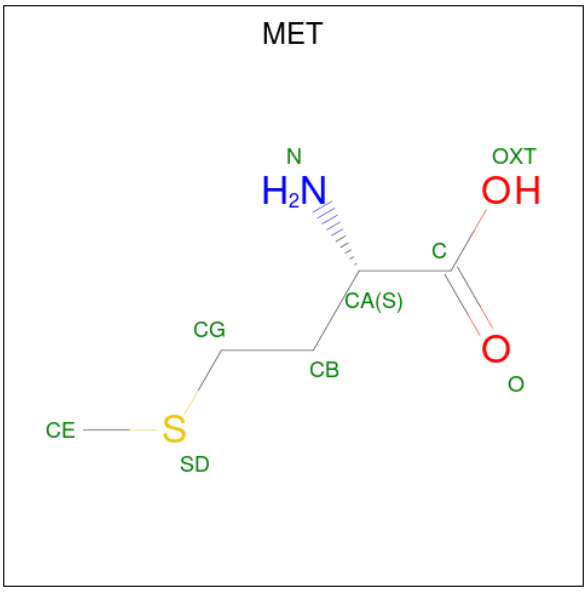
Mol	Chain	Residues	Atoms		AltConf
45	a	1	Total	Zn	0
			1	1	
45	b	1	Total	Zn	0
			1	1	
45	f	1	Total	Zn	0
			1	1	

- Molecule 46 is PHOSPHOMETHYLPHOSPHONIC ACID GUANYLATE ESTER (three-letter code: GCP) (formula: $C_{11}H_{18}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
46	k	1	Total	C	N	O	P	0
			32	11	5	13	3	

- Molecule 47 is METHIONINE (three-letter code: MET) (formula: $C_5H_{11}NO_2S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
47	k	1	Total	C	N	O	S	0
			8	5	1	1	1	

- Molecule 48 is water.

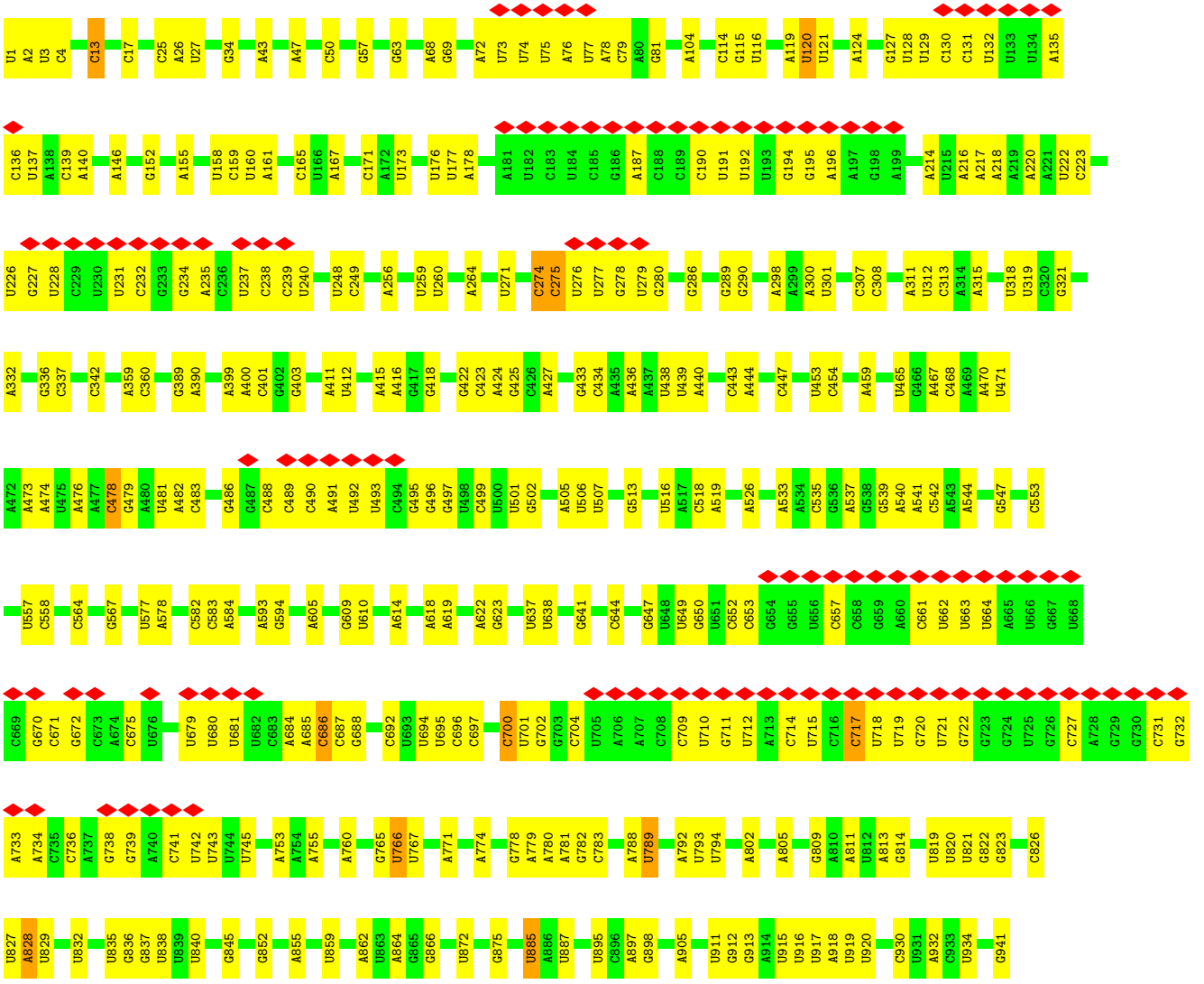
Mol	Chain	Residues	Atoms		AltConf
48	2	3	Total	O	0
			3	3	

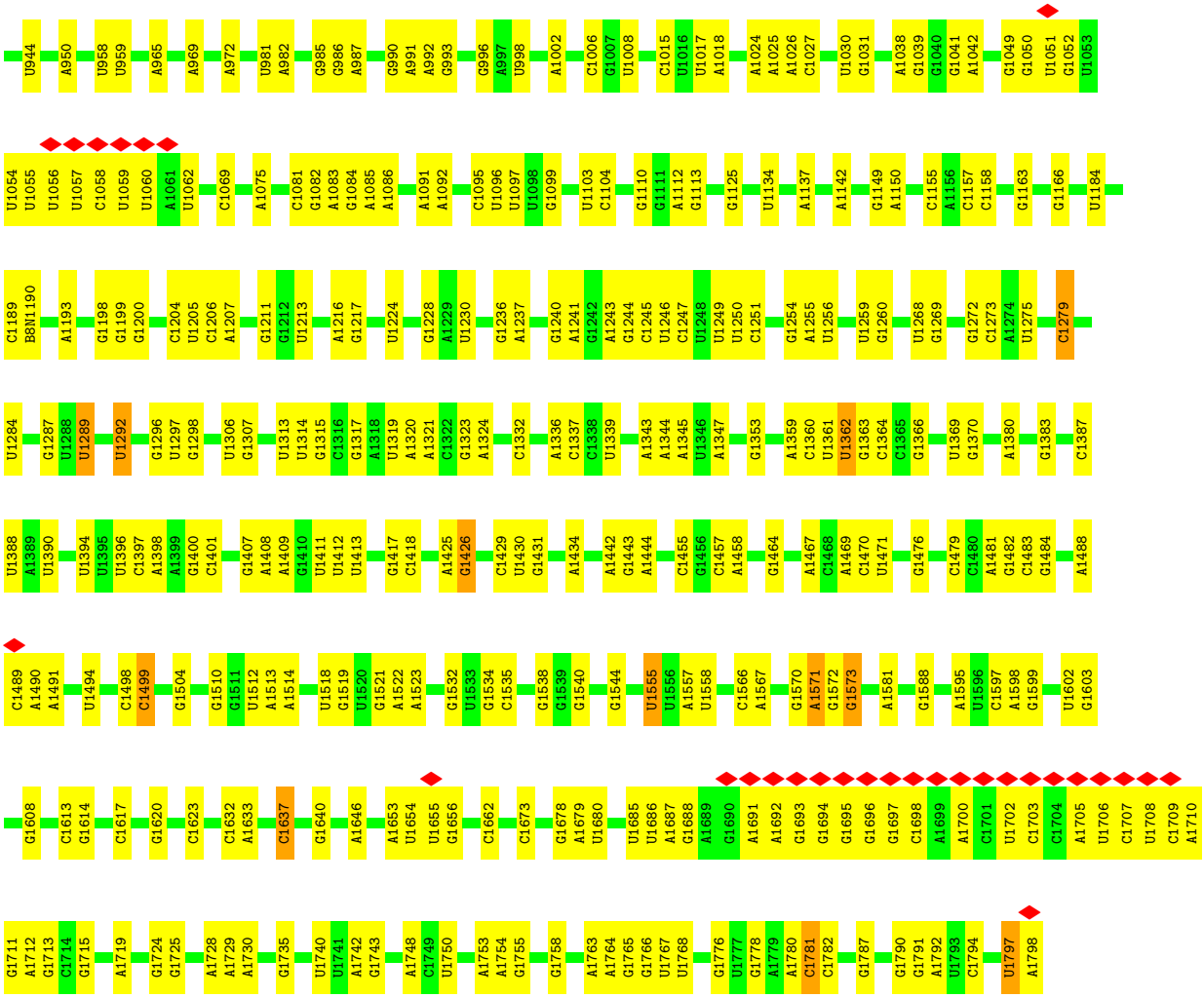
3 Residue-property plots (i)

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

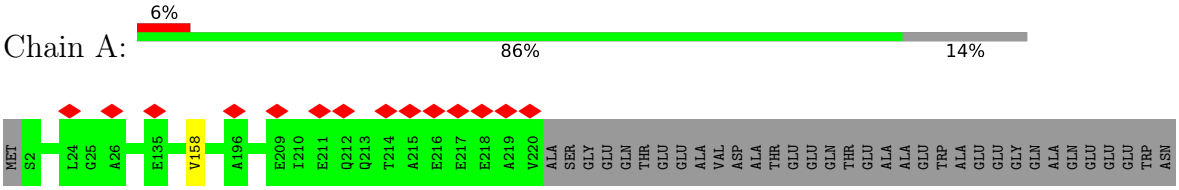
- Molecule 1: 18S ribosomal RNA

Chain 2:

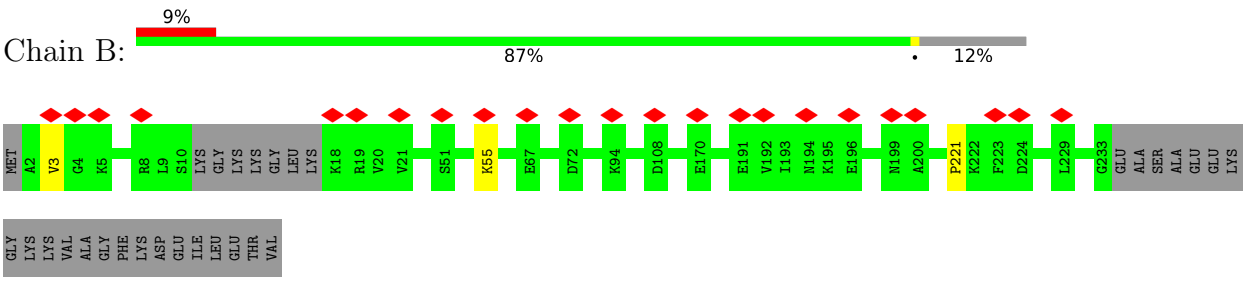




• Molecule 2: Small ribosomal subunit protein uS2

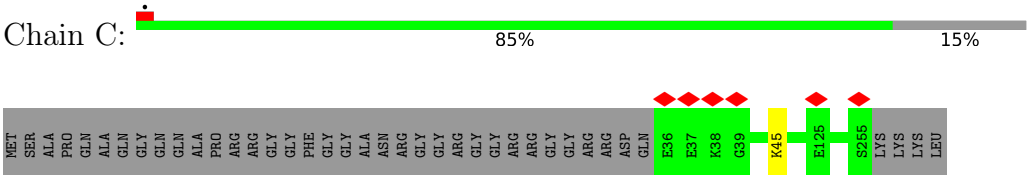


• Molecule 3: Small ribosomal subunit protein eS1



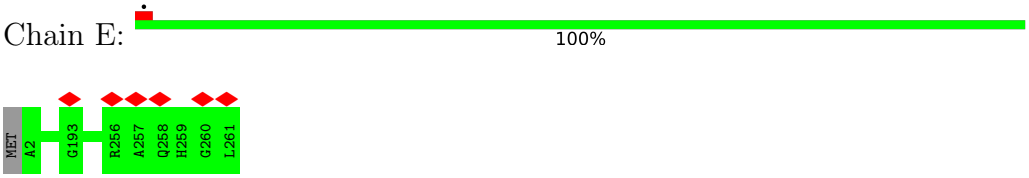
• Molecule 4: Small ribosomal subunit protein uS5

Chain C:



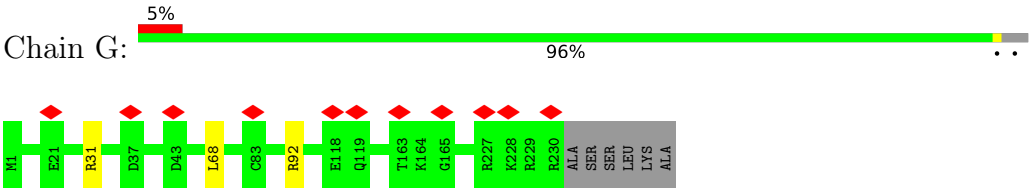
• Molecule 5: 40S ribosomal protein S4

Chain E:



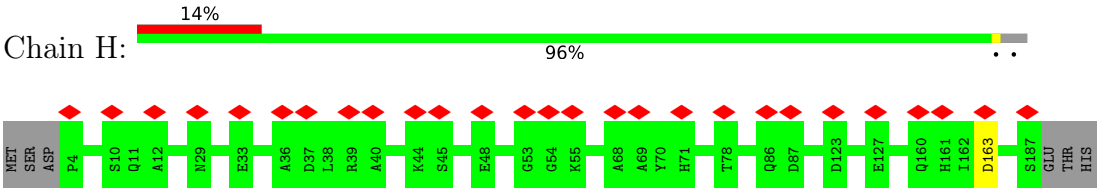
• Molecule 6: Small ribosomal subunit protein eS6

Chain G:



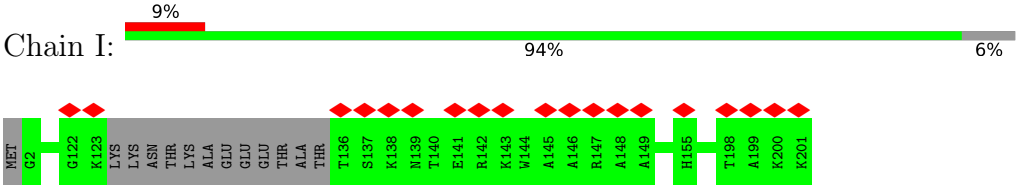
• Molecule 7: 40S ribosomal protein S7

Chain H:



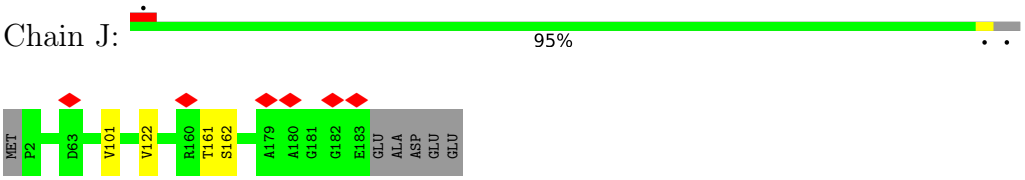
• Molecule 8: 40S ribosomal protein S8

Chain I:



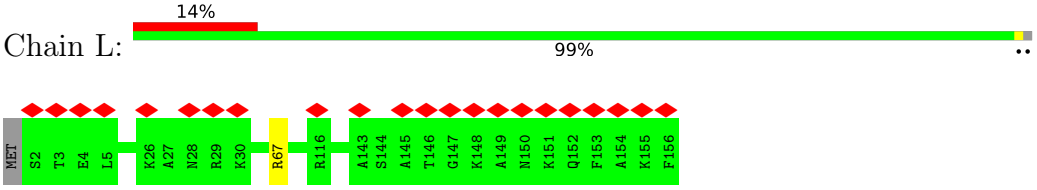
• Molecule 9: KLLA0E23673p

Chain J:



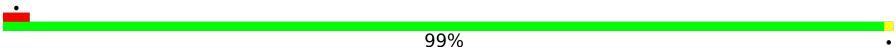
• Molecule 10: KLLA0A10483p

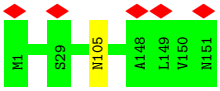
Chain L:



• Molecule 11: KLLA0F18040p

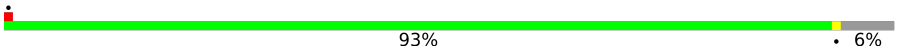
Chain N:

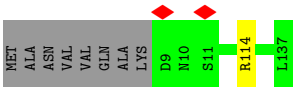




• Molecule 12: Small ribosomal subunit protein uS11

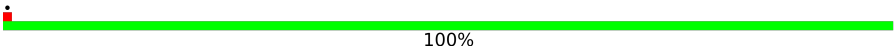
Chain O:

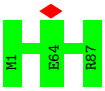




• Molecule 13: 40S ribosomal protein S21

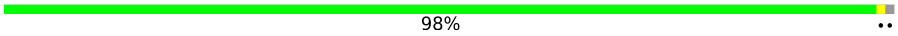
Chain V:

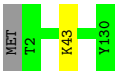




• Molecule 14: Small ribosomal subunit protein uS8

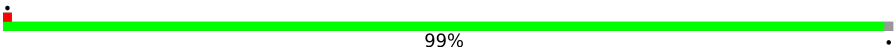
Chain W:

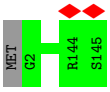




• Molecule 15: KLLA0B11231p

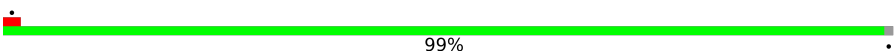
Chain X:

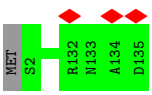




• Molecule 16: 40S ribosomal protein S24

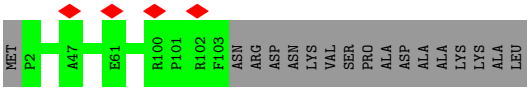
Chain Y:



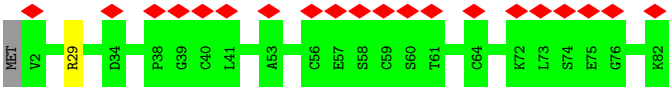


• Molecule 17: 40S ribosomal protein S26

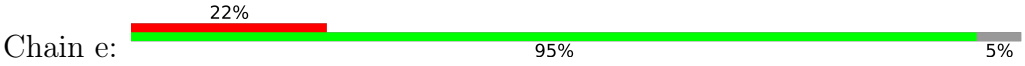
Chain a:

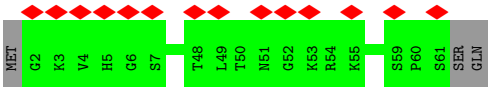


• Molecule 18: 40S ribosomal protein S27

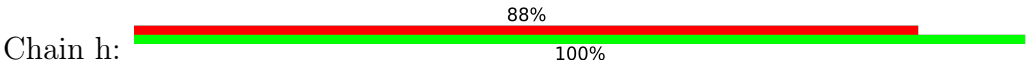


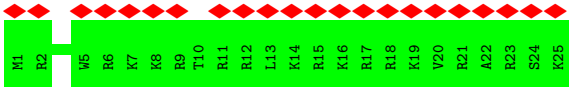
• Molecule 19: 40S ribosomal protein S30



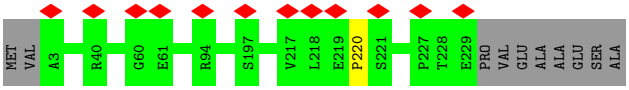


• Molecule 20: 40S ribosomal protein L41-A

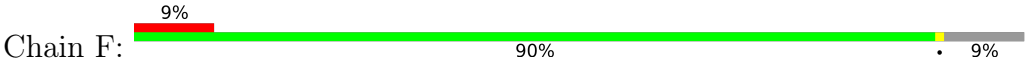


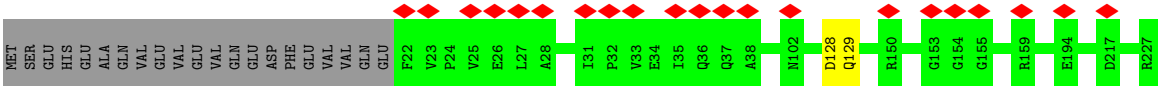


• Molecule 21: 40S ribosomal protein S3

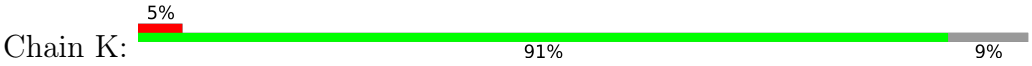


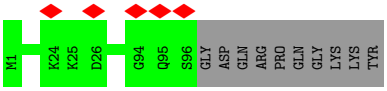
• Molecule 22: KLLA0D10659p





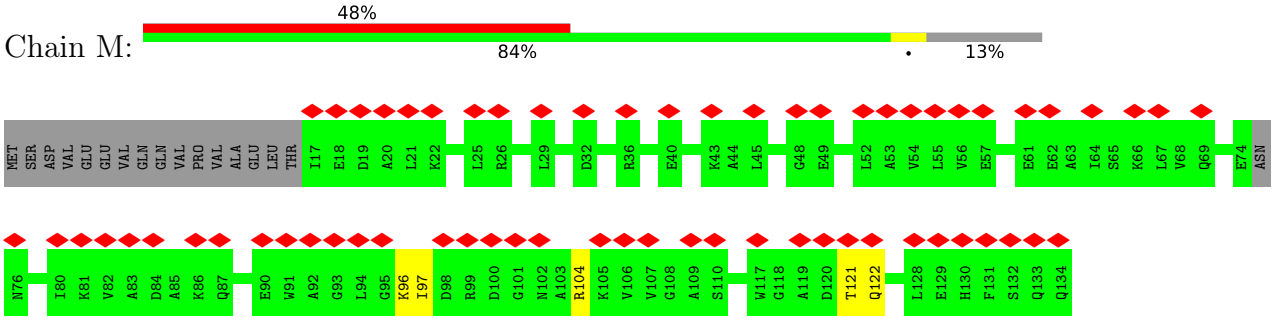
• Molecule 23: KLLA0B08173p





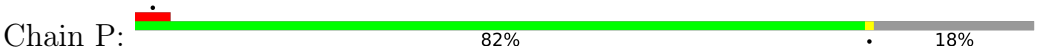
• Molecule 24: 40S ribosomal protein S12

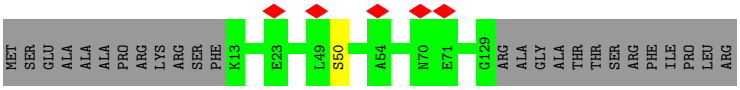
Chain M:



- Molecule 25: KLLA0F07843p

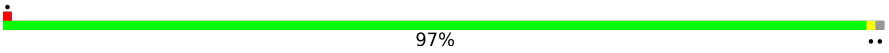
Chain P:





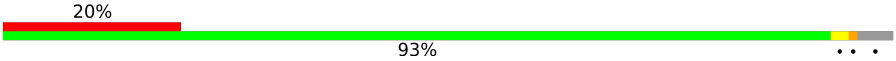
- Molecule 26: Small ribosomal subunit protein uS9

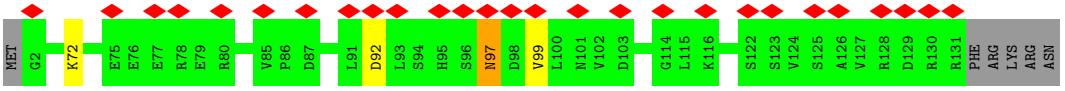
Chain Q:



- Molecule 27: KLLA0B01474p

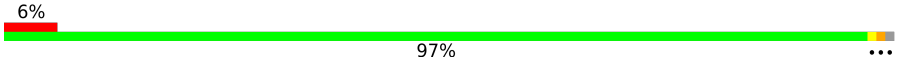
Chain R:

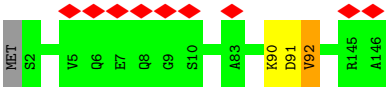




- Molecule 28: KLLA0B01562p

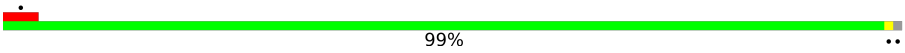
Chain S:

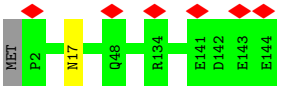




- Molecule 29: KLLA0A07194p

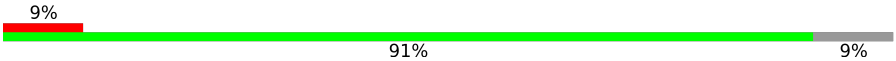
Chain T:

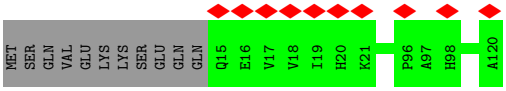




- Molecule 30: Small ribosomal subunit protein uS10

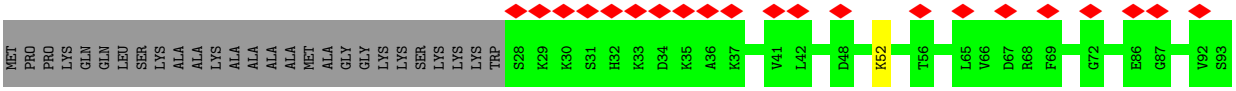
Chain U:

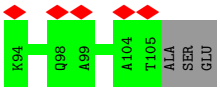




• Molecule 31: 40S ribosomal protein S25

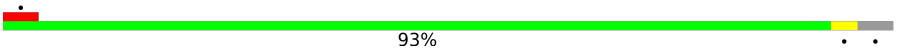
Chain Z:

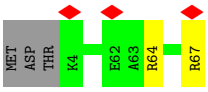




• Molecule 32: Small ribosomal subunit protein eS28

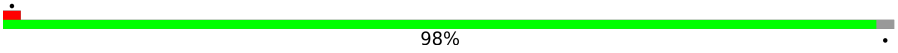
Chain c:

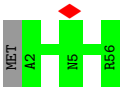




• Molecule 33: Small ribosomal subunit protein uS14

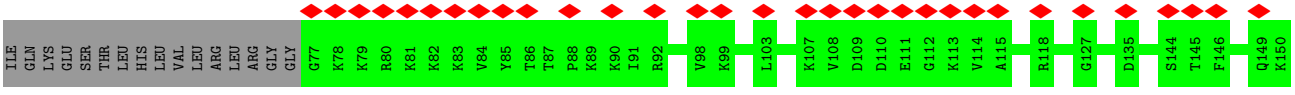
Chain d:





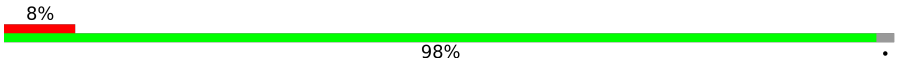
• Molecule 34: Small ribosomal subunit protein eS31

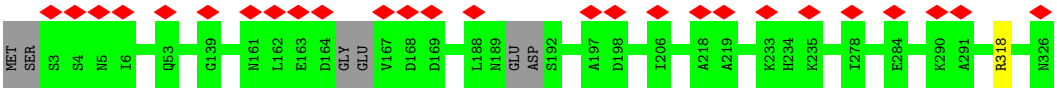
Chain f:



• Molecule 35: KLLA0E12277p

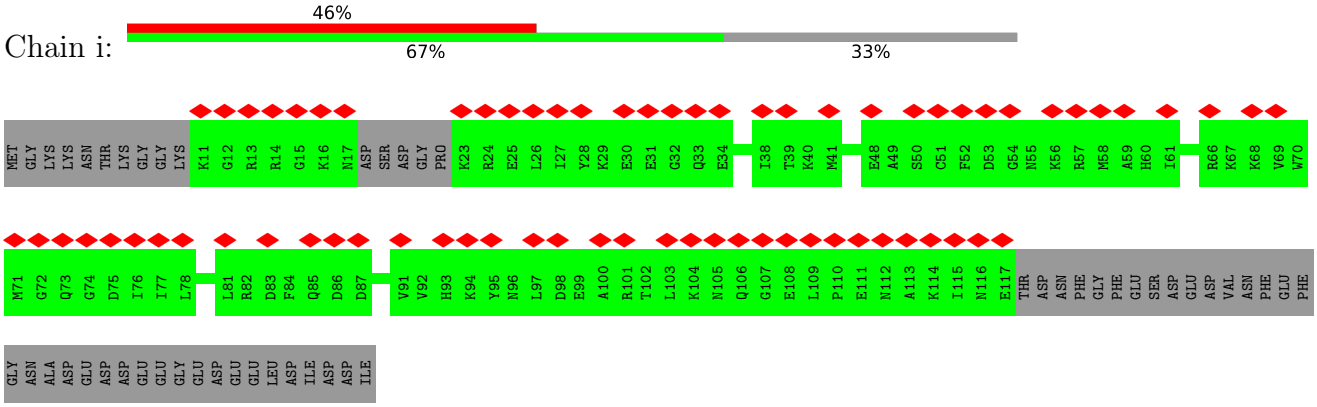
Chain g:





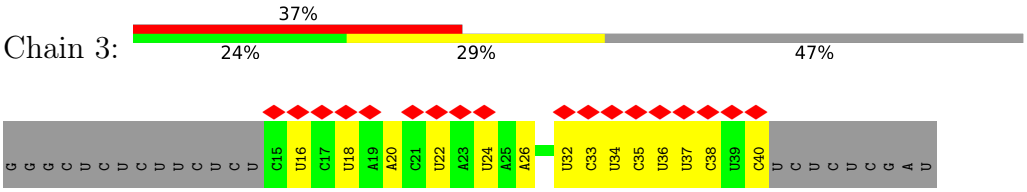
• Molecule 36: Eukaryotic translation initiation factor 1A

Chain i:



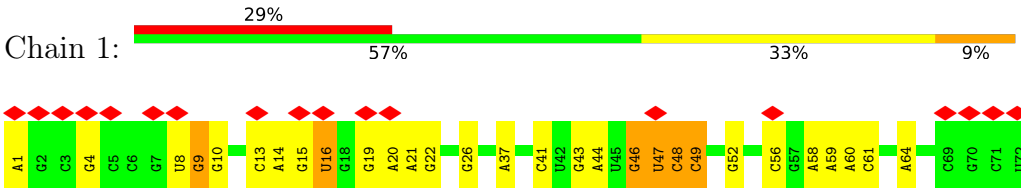
• Molecule 37: mRNA (5'-R(P*AP*AP*U)-3')

Chain 3:



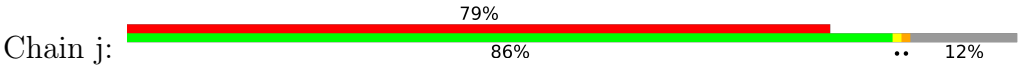
• Molecule 38: Met-tRNAi

Chain 1:



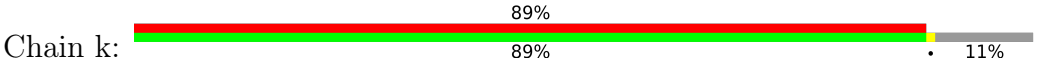
• Molecule 39: Eukaryotic translation initiation factor 2 subunit alpha

Chain j:



• Molecule 40: Eukaryotic translation initiation factor 2 subunit gamma

Chain k:



MET SER ASP LEU GLN ASP GLN GLU PRO SER ILE ILE ILE ASN GLY ASN LEU GLU PRO VAL GLY GLU PRO ASP ILE VAL GLU GLU THR GLU VAL VAL ALA ALA GLN GLU THR GLN GLU THR GLN ASP ALA ASP LYS PRO LYS LYS LYS VAL ALA PHE THR GLY LEU GLU GLU ASP G58 E59 T60

E61 E62 E63 K64 R65 K66 R67 E68 F69 E70 E71 G72 G73 G74 L75 P76 E77 Q78 P79 L80 N81 P82 D83 F84 S85 K86 L87 N88 P89 L90 S91 A92 E93 I94 I95 N96 R97 Q98 A99 T100 I101 N102 I103 G104 T105 I106 G107 H108 V109 A110 H111 G112 K113 S114 T115 V116 V117 R118 A119 I120

S121 G122 V123 Q124 T125 V126 R127 F128 K129 D130 E131 L132 E133 R134 N135 I136 T137 I138 K139 L140 G141 Y142 A143 N144 A145 K146 I147 Y148 K149 C150 Q151 E152 P153 T154 C155 P156 E157 P158 D159 C160 Y161 R162 S163 F164 K165 S166 D167 K168 E169 I170 S171 P172 K173 C174 Q175 R176 P177 G178 C179 P180

G181 R182 Y183 K184 L185 V186 R187 H188 V189 S190 F191 V192 D193 C194 P195 G196 H197 D198 I199 L200 M201 S202 T203 M204 L205 S206 G207 A208 A209 V210 M211 D212 A213 A214 L215 L216 L217 I218 A219 G220 N221 E222 S223 C224 P225 Q226 P227 Q228 T229 S230 E231 H232 L233 A234 A235 I236 E237 I238 M239 K240

L241 K242 H243 V244 I245 I246 L247 Q248 N249 K250 V251 D252 L253 M254 R255 E256 E257 S258 A259 L260 E261 H262 Q263 K264 S265 I266 L267 K268 F269 I270 R271 G272 T273 I274 A275 D276 G277 A278 P279 I280 V281 P282 I283 S284 A285 Q286 L287 K288 Y289 N290 I291 D292 A293 V294 N295 E296 F297 I298 V299 K300

T301 I302 P303 V304 P305 P306 R307 D308 F309 M310 I311 S312 P313 R314 L315 I316 V317 I318 R319 S320 F321 D322 V323 N324 K325 P326 G327 A328 E329 I330 E331 D332 L333 K334 G335 G336 V337 A338 G339 G340 S341 I342 L343 N344 G345 V346 F347 K348 L349 G350 D351 E352 I353 E354 I355 R356 P357 G358 I359 V360

T361 K362 D363 D364 K365 G366 K367 I368 Q369 C370 K371 P372 I373 F374 S375 N376 I377 V378 S379 L380 F381 A382 E383 Q384 N385 D386 L387 K388 F389 A390 V391 P392 G393 G394 L395 I396 G397 V398 G399 T400 K401 V402 D403 P404 T405 L406 C407 R408 A409 D410 R411 L412 V413 G414 Q415 V416 V417 G418 A419 K420

G421 H422 L423 P424 N425 I426 Y427 T428 D429 I430 E431 I432 N433 Y434 F435 L436 L437 R438 R439 L440 L441 G442 V443 K444 T445 D446 G447 Q448 K449 Q450 A451 K452 V453 R454 K455 L456 E457 P458 N459 E460 V461 L462 M463 V464 N465 I466 G467 S468 T469 A470 T471 G472 A473 R474 V475 V476 A477 V478 K479 A480

D481 M482 A483 R484 L485 Q486 L487 T488 S489 P490 A491 C492 T493 E494 I495 N496 E497 K498 I499 A500 L501 S502 R503 R504 I505 E506 K507 H508 W509 R510 L511 I512 G513 W514 A515 T516 I517 K518 K519 G520 T521 T522 L523 E524 P525 I526 A527

• Molecule 41: Eukaryotic translation initiation factor 2 subunit beta

Chain l:

MET SER SER ASP LEU ALA ALA GLU LEU GLY PHE ASP PRO ALA LEU LYS LYS LYS LYS LYS THR LYS LYS VAL ILE PRO ASP ASP PHE ASP ALA ALA VAL ASN GLY LYS GLU ASN GLY SER GLY ASP ASP LEU PHE ALA GLY LEU LYS LYS LYS LYS LYS LYS SER LYS SER VAL SER ALA

ASP ALA GLU ALA GLU LYS GLU PRO THR ASP ASP ILE ALA GLU ALA ALA LEU GLY GLU LEU SER LEU LYS LYS LYS LYS LYS LYS THR LYS ASP SER SER VAL ASP ALA PHE GLU LYS GLU LEU ALA LYS ALA GLY LEU ASP ASN VAL ASP ALA GLU SER LYS GLU GLY THR PRO SER ALA ASN

SER SER ILE GLN GLN GLU V127 G128 L129 P130 Y131 S132 E133 L134 L135 S136 R137 F138 F139 N140 I141 L142 R143 T144 N145 N146 P147 E148 L149 ALA GLY ASP ARG SER GLY PRO LYS PHE ARG ILE PRO PRO PRO VAL CYS LEU LEU ARG ASP GLY LYS LYS THR ILE PHE SER ASN ILE GLN ASP ILE

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

SER ILE ASN THR GLU LEU LYS ARG GLU GLN SER ASN ARG LEU PHE PHE MET VAL CYS LYS SER CYS GLY SER THR ARG SER VAL SER SER ILE LYS THR GLY PHE GLN ALA THR VAL GLY LYS ARG ARG MET

• Molecule 42: Eukaryotic translation initiation factor 3 subunit A

Chain o:

MET ALA PRO PRO PRO F6 R7 P8 E9 N10 A11 I12 K13 R14 A15 D16 E17 L18 I19 S20 V21 G22 E23 K24 Q25 A26 A27 L28 Q29 S30 L31 H32 D33 F34 I35 T36 A37 R38 R39 I40 R41 W42 A43 T44 P45 S46 T47 V48 E49 P50 V51 V52 F53 K54 F55 L56 E57 I58 G59 V60

E61 L62 K63 K64 G65 K66 L67 L68 K69 D70 G71 L72 H73 Q74 Y75 K76 K77 L78 I79 Q80 G81 S82 T83 E84 G85 L86 V87 S88 V89 G90 A91 V92 A93 R94 K95 F96 I97 D98 L99 V100 E101 S102 K103 I104 A105 S106 E107 Q108 T109 R110 A111 D112 E113 L114 Q115 K116 Q117 E118 I119 D120

ASP ASP LEU GLU GLY GLY VAL THR PRO GLU ASN LEU LEU ILE SER VAL TYR GLU SER ASP GLN SER VAL ALA GLY PHE ASN ASP GLU A150 I151 T152 S153 W154 L155 R156 F157 T158 W159 E160 S161 Y162 R163 A164 V165 L166 D167 L168 L169 R170 N171 N172 A173 L174 L175 E176 I177 T178 Y179 S180

G181 V182 V183 K184 K185 T186 M187 H188 F189 C190 L191 K192 Y193 Q194 R195 K196 N197 E198 F199 K200 R201 L202 A203 E204 M205 L206 R207 Q208 H209 L210 D211 A212 A213 N214 Y215 Q216 Q217 SER LYS SER GLY ASN ASN LEU VAL ASP LEU S228 D229 A230 D231 T232 L233 Q234 R235 Y236 L237 D238 Q239 R240

F241 Q242 Q243 V244 D245 V246 S247 V248 K249 L250 E251 L252 W253 H254 E255 A256 Y257 R258 S259 I260 E261 D262 V263 F264 H265 L266 M267 K268 I269 S270 K271 R272 A273 P274 K275 P276 S277 T278 L279 A280 N281 Y282 Y283 E284 N285 L286 V287 K288 V289 F290 F291 V292 S293 G294 D295 P296 L297 L298 H299 T300

T301 A302 W303 K304 K305 F306 Y307 K308 L309 Y310 S311 T312 N313 P314 R315 A316 T317 E318 E319 E320 F321 K322 T323 Y324 S325 S326 T327 I328 F329 L330 S331 A332 I333 S334 T335 Q336 L337 D338 E339 I340 P341 S342 I343 G344 Y345 D346 P347 H348 L349 R350 M351 Y352 R353 L354 L355 N356 L357 D358 A359 K360

P361 T362 R363 K364 E365 M366 L367 Q368 S369 I370 I371 E372 D373 E374 S375 I376 Y377 G378 K379 V380 D381 E382 E383 L384 K385 E386 L387 Y388 D389 I390 I391 E392 V393 N394 F395 D396 V397 D398 T399 V400 K401 Q402 Q403 L404 E405 N406 L407 L408 V409 K410 L411 S412 S413 K414 T415 Y416 F417 S418 Q419 Y420

I421 A422 P423 L424 R425 D426 V427 I428 M429 R430 R431 V432 F433 V434 A435 A436 S437 Q438 K439 F440 T441 T442 V443 S444 Q445 S446 E447 L448 Y449 K450 L451 A452 T453 L454 P455 A456 P457 L458 D459 L460 S461 A462 W463 D464 I465 E466 K467 S468 L469 L470 Q471 A472 A473 V474 E475 D476 Y477 V478 S479 I480

T481 I482 D483 H484 E485 S486 A487 K488 V489 T490 F491 A492 K493 D494 P495 PHE ASP ILE PHE ALA SER THR ALA SER LYS GLU VAL SER GLU GLU GLU ASN THR GLU PRO GLU VAL GLN GLU GLU LYS GLU GLU THR ASP GLU ALA LEU GLY PRO GLN GLU THR GLU ASP GLY GLU GLU LYS GLU

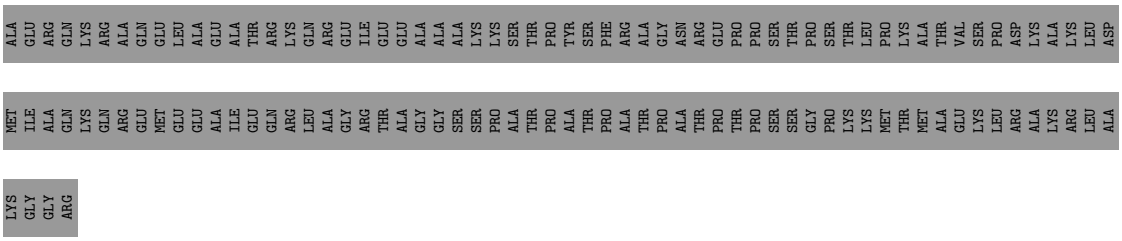
GLU GLU SER ASP PRO VAL ILE ILE ARG ASN SER TYR ILE HIS ASN LYS LEU LEU GLU LEU SER ASN VAL LEU HIS ASP VAL ASP SER PHE ASN GLN ASN ALA SER GLU GLU TYR MET GLU LYS VAL ARG ILE ALA ARG GLU THR LEU ILE LYS LYS ASN LYS ASP ASP LEU GLU GLY LYS ILE SER LYS ILE

VAL ASP GLU ARG VAL LYS ARG SER GLN GLU GLN LYS GLN HIS LYS HIS MET GLU HIS ALA ALA LEU HIS ALA GLU GLN ASP ALA GLU VAL ARG GLN GLN ARG ILE LEU GLU GLU ASP LEU GLU ALA ALA ILE GLU ALA ALA LYS LEU GLU GLU GLU ALA HIS ARG ARG LEU ILE GLU LYS LYS LYS ARG GLU

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

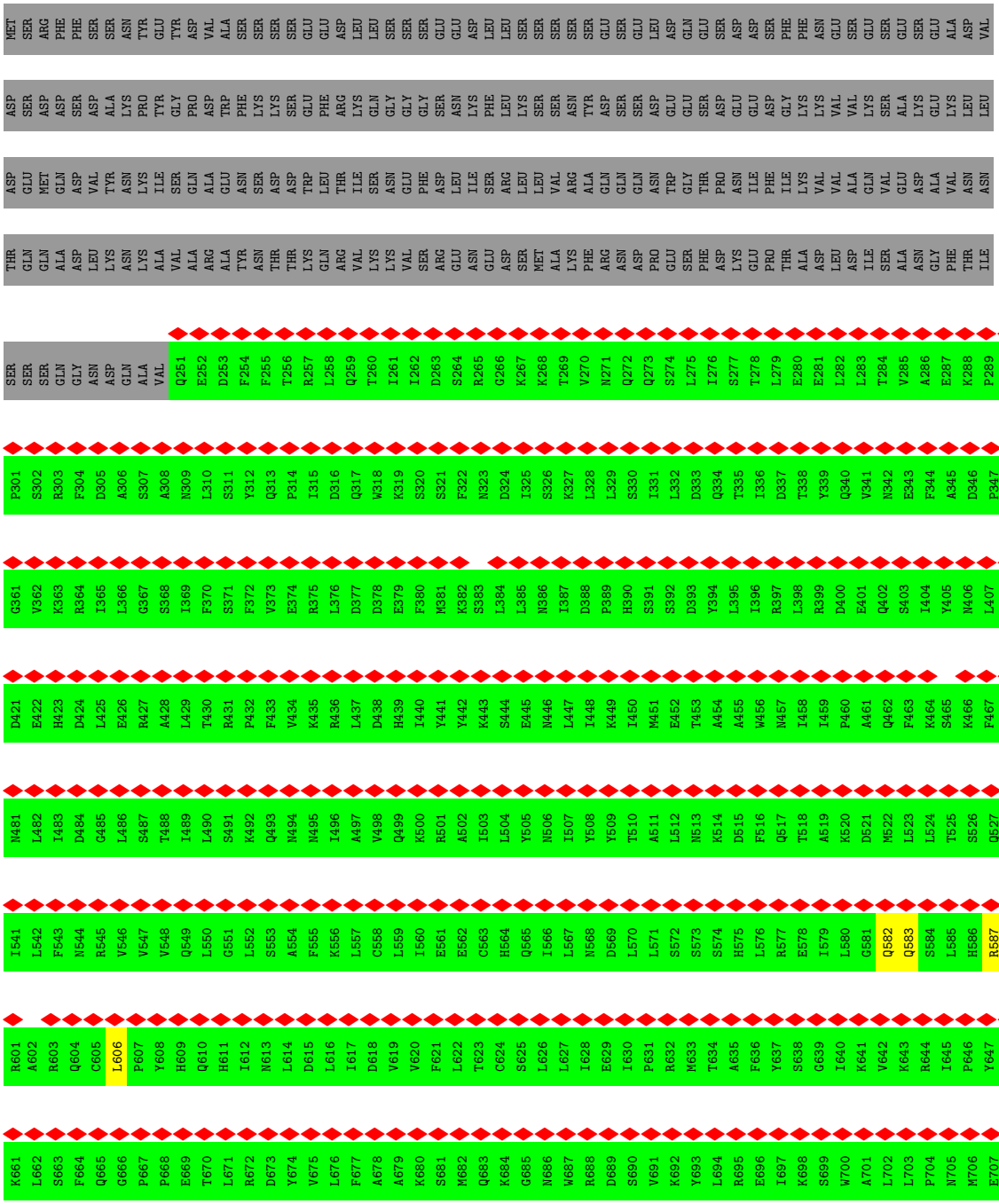
LYS LYS LEU ASP HIS THR GLU ARG LYS VAL LEU ARG ALA LEU ARG LYS VAL GLU VAL ASP LYS LEU GLN GLU THR ASP THR ALA ASN TYR GLU ALA MET LYS LYS LYS ILE VAL ASP ALA ALA LYS ALA GLU GLU TYR GLU GLU ALA ARG MET ALA ALA ASP ARG LYS ASN LEU VAL MET

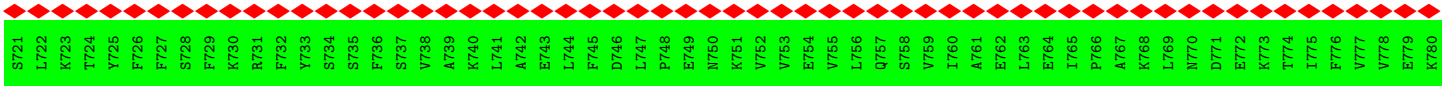
VAL TYR ASP ASP TYR LEU LYS PHE LYS GLU HIS VAL SER GLY THR LYS GLU SER GLU LEU ALA ALA ILE ARG ASN GLN LYS LYS ALA GLU LEU GLU GLU ALA LEU GLU GLU ALA ALA LYS LYS ALA ARG ILE GLU GLU VAL ARG LYS ARG ARG TYR GLU GLU ALA ALA ILE ALA ARG ARG LYS GLU GLU ILE ALA ASN

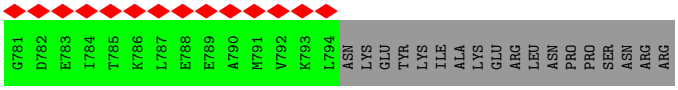


• Molecule 43: Eukaryotic translation initiation factor 3 subunit C

Chain p:




S721 L722 K723 T724 Y725 F726 F727 S728 F729 K730 R731 F732 Y733 S734 S735 F736 S737 V738 A739 K740 L741 A742 E743 L744 F745 D746 L747 P748 E749 N750 K751 V752 V753 E754 V755 L756 Q757 S758 V759 I760 A761 E762 L763 E764 I765 P766 A767 K768 L769 N770 D771 E772 K773 T774 I775 F776 V777 V778 E779 K780


G781 D782 E783 I784 T785 K786 L787 E788 E789 A790 M791 V792 K793 L794 ASN LYS GLU TYR LYS ILE ALA LYS GLU ARG LEU ASN PRO PRO SER ASN ARG ARG

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	34495	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 ($e^-/Å^2$)	30	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	59000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.427	Depositor
Minimum map value	-0.192	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.021	Depositor
Recommended contour level	0.07	Depositor
Map size (Å)	402.0, 402.0, 402.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 7MG, 1MA, MG, H2U, B8N, T6A, RIA, M2G, GCP, 5MC, 1MG, 2MG, MA6, PSU

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	2	0.61	0/42410	0.92	46/66079 (0.1%)
2	A	0.37	0/1742	0.59	0/2383
3	B	0.32	0/1820	0.56	0/2448
4	C	0.39	0/1678	0.61	0/2277
5	E	0.38	0/2122	0.63	0/2861
6	G	0.31	0/1855	0.56	1/2479 (0.0%)
7	H	0.31	0/1507	0.57	0/2028
8	I	0.34	0/1515	0.60	0/2029
9	J	0.39	0/1495	0.69	0/2001
10	L	0.41	0/1276	0.57	0/1718
11	N	0.36	0/1218	0.57	0/1638
12	O	0.34	0/966	0.64	0/1297
13	V	0.39	0/696	0.61	0/938
14	W	0.42	0/1039	0.62	0/1399
15	X	0.38	0/1137	0.62	0/1516
16	Y	0.34	0/1075	0.59	0/1433
17	a	0.36	0/810	0.63	0/1087
18	b	0.31	0/619	0.56	0/837
19	e	0.32	0/480	0.63	0/640
20	h	0.27	0/234	0.75	0/300
21	D	0.34	0/1800	0.57	0/2421
22	F	0.35	0/1628	0.57	0/2198
23	K	0.37	0/831	0.51	0/1123
24	M	0.31	0/891	0.59	0/1201
25	P	0.35	0/942	0.63	0/1269
26	Q	0.39	0/1125	0.63	0/1510
27	R	0.35	0/1044	0.64	0/1402
28	S	0.36	0/1208	0.63	0/1624
29	T	0.34	0/1129	0.55	0/1520
30	U	0.35	0/857	0.58	0/1158
31	Z	0.31	0/603	0.61	0/814
32	c	0.35	0/501	0.70	0/673

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	d	0.39	0/473	0.65	0/629
34	f	0.30	0/597	0.60	0/795
35	g	0.33	0/2523	0.56	0/3434
36	i	0.30	0/828	0.58	0/1099
37	3	0.34	0/595	0.75	0/920
38	1	0.48	1/1529 (0.1%)	0.94	4/2376 (0.2%)
39	j	0.30	0/2171	0.55	0/2924
40	k	0.26	0/3657	0.52	0/4946
41	l	0.25	0/194	0.51	0/263
42	o	0.26	0/3755	0.52	0/5074
43	p	0.26	0/4525	0.48	0/6120
All	All	0.47	1/99100 (0.0%)	0.76	51/142881 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
38	1	1	A	OP3-P	-10.70	1.48	1.61

All (51) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1362	U	N1-C2-O2	8.24	128.56	122.80
1	2	1782	C	N3-C2-O2	-7.87	116.39	121.90
1	2	1	U	C2-N1-C1'	7.68	126.92	117.70
1	2	1362	U	N3-C2-O2	-7.50	116.95	122.20
1	2	1	U	N1-C2-O2	7.38	127.97	122.80
1	2	1499	C	N3-C2-O2	-7.31	116.78	121.90
1	2	1362	U	C2-N1-C1'	7.26	126.41	117.70
1	2	1623	C	N3-C2-O2	-6.84	117.11	121.90
1	2	1673	C	N3-C2-O2	-6.81	117.13	121.90
1	2	1256	U	C2-N1-C1'	6.76	125.81	117.70
1	2	1782	C	C6-N1-C2	-6.71	117.61	120.30
1	2	275	C	C2-N1-C1'	-6.70	111.43	118.80
1	2	1781	C	N1-C2-O2	6.58	122.85	118.90
1	2	1	U	N3-C2-O2	-6.55	117.62	122.20
1	2	1498	C	C2-N1-C1'	6.49	125.94	118.80
1	2	1498	C	N1-C2-O2	6.38	122.73	118.90
1	2	1387	C	C2-N1-C1'	6.26	125.69	118.80
1	2	275	C	C6-N1-C1'	6.17	128.21	120.80
1	2	1623	C	C6-N1-C2	-6.11	117.86	120.30
1	2	700	C	N1-C2-O2	6.11	122.56	118.90
1	2	1499	C	C6-N1-C2	-6.07	117.87	120.30

Continued on next page...

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	789	U	C4-C5-C6	6.00	123.30	119.70
1	2	1279	C	N3-C2-O2	-5.80	117.84	121.90
1	2	1797	U	OP2-P-O3'	5.60	117.52	105.20
1	2	717	C	C2-N1-C1'	5.60	124.96	118.80
1	2	1781	C	C2-N1-C1'	5.58	124.94	118.80
1	2	582	C	C2-N1-C1'	5.58	124.93	118.80
1	2	13	C	C2-N1-C1'	5.57	124.93	118.80
1	2	274	C	N3-C2-O2	-5.48	118.07	121.90
1	2	1292	U	N3-C2-O2	-5.35	118.45	122.20
1	2	760	A	C6-N1-C2	-5.35	115.39	118.60
1	2	1455	C	C2-N1-C1'	5.34	124.68	118.80
1	2	1060	U	C2-N1-C1'	5.33	124.09	117.70
1	2	1498	C	C6-N1-C1'	-5.30	114.44	120.80
1	2	686	C	O4'-C1'-N1	5.29	112.44	108.20
1	2	828	A	P-O3'-C3'	5.28	126.04	119.70
1	2	700	C	C2-N1-C1'	5.26	124.59	118.80
1	2	885	U	C2-N1-C1'	5.25	124.00	117.70
1	2	478	C	C2-N3-C4	-5.24	117.28	119.90
1	2	1781	C	C6-N1-C1'	-5.18	114.58	120.80
1	2	1623	C	N1-C2-N3	5.16	122.81	119.20
6	G	68	LEU	CA-CB-CG	5.14	127.13	115.30
38	1	56	C	N3-C2-O2	-5.13	118.31	121.90
38	1	74	C	OP2-P-O3'	5.13	116.49	105.20
1	2	1555	U	C2-N1-C1'	-5.10	111.58	117.70
1	2	1571	A	OP2-P-O3'	5.05	116.31	105.20
1	2	1776	G	N1-C6-O6	-5.04	116.87	119.90
38	1	56	C	N1-C2-O2	5.04	121.92	118.90
1	2	222	U	OP2-P-O3'	5.02	116.24	105.20
38	1	74	C	P-O3'-C3'	5.01	125.72	119.70
1	2	1782	C	N1-C2-N3	5.00	122.70	119.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	A	217/254 (85%)	187 (86%)	29 (13%)	1 (0%)	25 60
3	B	221/255 (87%)	196 (89%)	22 (10%)	3 (1%)	9 39
4	C	218/259 (84%)	201 (92%)	16 (7%)	1 (0%)	25 60
5	E	258/261 (99%)	233 (90%)	25 (10%)	0	100 100
6	G	228/236 (97%)	212 (93%)	16 (7%)	0	100 100
7	H	182/190 (96%)	158 (87%)	23 (13%)	1 (0%)	25 60
8	I	184/201 (92%)	165 (90%)	19 (10%)	0	100 100
9	J	180/188 (96%)	154 (86%)	24 (13%)	2 (1%)	12 45
10	L	153/156 (98%)	137 (90%)	16 (10%)	0	100 100
11	N	149/151 (99%)	139 (93%)	10 (7%)	0	100 100
12	O	127/137 (93%)	107 (84%)	20 (16%)	0	100 100
13	V	85/87 (98%)	75 (88%)	10 (12%)	0	100 100
14	W	127/130 (98%)	117 (92%)	10 (8%)	0	100 100
15	X	142/145 (98%)	117 (82%)	25 (18%)	0	100 100
16	Y	132/135 (98%)	118 (89%)	14 (11%)	0	100 100
17	a	100/119 (84%)	80 (80%)	20 (20%)	0	100 100
18	b	79/82 (96%)	64 (81%)	15 (19%)	0	100 100
19	e	58/63 (92%)	49 (84%)	9 (16%)	0	100 100
20	h	23/25 (92%)	23 (100%)	0	0	100 100
21	D	225/237 (95%)	211 (94%)	13 (6%)	1 (0%)	30 65
22	F	204/227 (90%)	172 (84%)	30 (15%)	2 (1%)	13 46
23	K	94/106 (89%)	81 (86%)	13 (14%)	0	100 100
24	M	113/134 (84%)	90 (80%)	21 (19%)	2 (2%)	7 35
25	P	115/142 (81%)	98 (85%)	16 (14%)	1 (1%)	14 48
26	Q	139/143 (97%)	127 (91%)	12 (9%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
27	R	128/136 (94%)	108 (84%)	17 (13%)	3 (2%)	5 32
28	S	143/146 (98%)	121 (85%)	20 (14%)	2 (1%)	9 39
29	T	141/144 (98%)	132 (94%)	9 (6%)	0	100 100
30	U	104/117 (89%)	94 (90%)	10 (10%)	0	100 100
31	Z	76/108 (70%)	68 (90%)	8 (10%)	0	100 100
32	c	62/67 (92%)	58 (94%)	4 (6%)	0	100 100
33	d	53/56 (95%)	50 (94%)	3 (6%)	0	100 100
34	f	72/150 (48%)	55 (76%)	17 (24%)	0	100 100
35	g	314/326 (96%)	287 (91%)	27 (9%)	0	100 100
36	i	98/153 (64%)	90 (92%)	8 (8%)	0	100 100
39	j	263/304 (86%)	233 (89%)	28 (11%)	2 (1%)	16 51
40	k	468/527 (89%)	433 (92%)	32 (7%)	3 (1%)	22 57
41	l	21/285 (7%)	20 (95%)	1 (5%)	0	100 100
42	o	445/964 (46%)	421 (95%)	24 (5%)	0	100 100
43	p	542/812 (67%)	505 (93%)	37 (7%)	0	100 100
All	All	6683/8358 (80%)	5986 (90%)	673 (10%)	24 (0%)	32 65

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
24	M	122	GLN
28	S	92	VAL
39	j	41	ASN
40	k	130	ASP
3	B	3	VAL
4	C	45	LYS
9	J	101	VAL
22	F	129	GLN
27	R	92	ASP
3	B	221	PRO
24	M	121	THR
40	k	507	LYS
22	F	128	ASP
27	R	97	ASN
27	R	99	VAL
3	B	55	LYS
7	H	163	ASP

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Mol	Chain	Res	Type
9	J	122	VAL
25	P	50	SER
28	S	91	ASP
39	j	7	ARG
21	D	220	PRO
40	k	126	VAL
2	A	158	VAL

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	A	180/211 (85%)	180 (100%)	0	100	100
3	B	202/228 (89%)	202 (100%)	0	100	100
4	C	177/203 (87%)	177 (100%)	0	100	100
5	E	223/224 (100%)	223 (100%)	0	100	100
6	G	192/200 (96%)	190 (99%)	2 (1%)	73	81
7	H	164/170 (96%)	164 (100%)	0	100	100
8	I	147/159 (92%)	147 (100%)	0	100	100
9	J	153/158 (97%)	151 (99%)	2 (1%)	65	76
10	L	136/137 (99%)	135 (99%)	1 (1%)	81	86
11	N	128/128 (100%)	127 (99%)	1 (1%)	79	84
12	O	97/104 (93%)	96 (99%)	1 (1%)	73	81
13	V	73/73 (100%)	73 (100%)	0	100	100
14	W	110/111 (99%)	109 (99%)	1 (1%)	75	83
15	X	119/120 (99%)	119 (100%)	0	100	100
16	Y	108/109 (99%)	108 (100%)	0	100	100
17	a	83/100 (83%)	83 (100%)	0	100	100
18	b	71/72 (99%)	70 (99%)	1 (1%)	62	75
19	e	51/55 (93%)	51 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
20	h	23/23 (100%)	23 (100%)	0	100	100
21	D	188/196 (96%)	188 (100%)	0	100	100
22	F	174/194 (90%)	174 (100%)	0	100	100
23	K	88/96 (92%)	88 (100%)	0	100	100
24	M	93/109 (85%)	90 (97%)	3 (3%)	34	57
25	P	99/119 (83%)	99 (100%)	0	100	100
26	Q	117/119 (98%)	115 (98%)	2 (2%)	56	72
27	R	116/124 (94%)	114 (98%)	2 (2%)	56	72
28	S	127/129 (98%)	125 (98%)	2 (2%)	58	73
29	T	117/118 (99%)	116 (99%)	1 (1%)	75	83
30	U	96/107 (90%)	96 (100%)	0	100	100
31	Z	59/88 (67%)	58 (98%)	1 (2%)	56	72
32	c	55/59 (93%)	53 (96%)	2 (4%)	30	54
33	d	47/48 (98%)	47 (100%)	0	100	100
34	f	60/133 (45%)	60 (100%)	0	100	100
35	g	264/272 (97%)	263 (100%)	1 (0%)	89	91
36	i	85/130 (65%)	85 (100%)	0	100	100
39	j	239/274 (87%)	233 (98%)	6 (2%)	42	63
40	k	393/449 (88%)	393 (100%)	0	100	100
41	l	22/246 (9%)	22 (100%)	0	100	100
42	o	406/846 (48%)	405 (100%)	1 (0%)	92	94
43	p	506/749 (68%)	502 (99%)	4 (1%)	79	84
All	All	5788/7190 (80%)	5754 (99%)	34 (1%)	82	88

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	G	31	ARG
6	G	92	ARG
9	J	161	THR
9	J	162	SER
10	L	67	ARG
11	N	105	ASN
12	O	114	ARG

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Mol	Chain	Res	Type
14	W	43	LYS
18	b	29	ARG
24	M	96	LYS
24	M	97	ILE
24	M	104	ARG
26	Q	42	GLU
26	Q	68	LYS
27	R	72	LYS
27	R	97	ASN
28	S	90	LYS
28	S	92	VAL
29	T	17	ASN
31	Z	52	LYS
32	c	64	ARG
32	c	67	ARG
35	g	318	ARG
39	j	7	ARG
39	j	41	ASN
39	j	42	ILE
39	j	97	LYS
39	j	99	GLU
39	j	101	LYS
42	o	41	ARG
43	p	582	GLN
43	p	583	GLN
43	p	587	ARG
43	p	606	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
3	B	124	ASN
3	B	149	GLN
3	B	194	ASN
3	B	209	ASN
3	B	232	HIS
5	E	98	ASN
5	E	201	HIS
7	H	5	GLN
8	I	111	GLN
9	J	38	ASN
9	J	142	ASN

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Mol	Chain	Res	Type
10	L	8	GLN
10	L	14	GLN
13	V	74	GLN
16	Y	22	GLN
21	D	162	GLN
22	F	118	HIS
23	K	29	GLN
23	K	39	ASN
26	Q	83	GLN
26	Q	100	GLN
28	S	75	ASN
28	S	103	ASN
30	U	20	HIS
32	c	27	GLN
36	i	88	GLN
40	k	415	GLN
40	k	465	ASN
42	o	285	ASN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1795/1798 (99%)	620 (34%)	24 (1%)
37	3	25/49 (51%)	14 (56%)	0
38	1	71/75 (94%)	24 (33%)	4 (5%)
All	All	1891/1922 (98%)	658 (34%)	28 (1%)

All (658) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	3	U
1	2	4	C
1	2	13	C
1	2	17	C
1	2	25	C
1	2	26	A
1	2	27	U
1	2	34	G
1	2	43	A
1	2	47	A

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Mol	Chain	Res	Type
1	2	50	C
1	2	57	G
1	2	63	G
1	2	68	A
1	2	69	G
1	2	72	A
1	2	73	U
1	2	74	U
1	2	75	U
1	2	76	A
1	2	77	U
1	2	78	A
1	2	79	C
1	2	81	G
1	2	104	A
1	2	114	C
1	2	115	G
1	2	116	U
1	2	119	A
1	2	120	PSU
1	2	121	U
1	2	124	A
1	2	127	G
1	2	128	U
1	2	129	U
1	2	130	C
1	2	131	C
1	2	132	U
1	2	135	A
1	2	136	C
1	2	137	U
1	2	139	C
1	2	140	A
1	2	146	A
1	2	152	G
1	2	155	A
1	2	158	U
1	2	159	C
1	2	160	U
1	2	161	A
1	2	165	C
1	2	167	A

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Mol	Chain	Res	Type
1	2	171	C
1	2	173	U
1	2	176	U
1	2	177	U
1	2	178	A
1	2	187	A
1	2	190	C
1	2	191	U
1	2	192	U
1	2	194	G
1	2	195	G
1	2	196	A
1	2	214	A
1	2	217	A
1	2	218	A
1	2	220	A
1	2	223	C
1	2	226	U
1	2	227	G
1	2	228	U
1	2	231	U
1	2	232	C
1	2	234	G
1	2	235	A
1	2	237	U
1	2	238	C
1	2	239	C
1	2	240	U
1	2	248	U
1	2	249	C
1	2	256	A
1	2	259	U
1	2	260	U
1	2	264	A
1	2	271	U
1	2	274	C
1	2	275	C
1	2	276	U
1	2	278	G
1	2	279	U
1	2	280	G
1	2	286	G

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Mol	Chain	Res	Type
1	2	289	G
1	2	290	G
1	2	298	A
1	2	300	A
1	2	301	U
1	2	307	C
1	2	308	C
1	2	311	A
1	2	312	U
1	2	313	C
1	2	315	A
1	2	318	U
1	2	319	U
1	2	321	G
1	2	332	A
1	2	336	G
1	2	337	C
1	2	342	C
1	2	359	A
1	2	360	C
1	2	389	G
1	2	390	A
1	2	399	A
1	2	400	A
1	2	401	C
1	2	403	G
1	2	411	A
1	2	412	U
1	2	415	A
1	2	416	A
1	2	418	G
1	2	422	G
1	2	423	C
1	2	424	A
1	2	425	G
1	2	427	A
1	2	433	G
1	2	434	C
1	2	436	A
1	2	438	U
1	2	439	U
1	2	440	A

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Mol	Chain	Res	Type
1	2	443	C
1	2	444	A
1	2	447	C
1	2	453	U
1	2	454	C
1	2	459	A
1	2	467	A
1	2	468	C
1	2	470	A
1	2	471	U
1	2	473	A
1	2	474	A
1	2	476	A
1	2	478	C
1	2	479	G
1	2	481	U
1	2	482	A
1	2	483	C
1	2	486	G
1	2	488	C
1	2	489	C
1	2	490	C
1	2	491	A
1	2	492	U
1	2	493	U
1	2	495	G
1	2	496	G
1	2	497	G
1	2	499	C
1	2	501	U
1	2	502	G
1	2	505	A
1	2	506	U
1	2	507	U
1	2	513	G
1	2	516	U
1	2	518	C
1	2	519	A
1	2	526	A
1	2	533	A
1	2	535	C
1	2	537	A

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Mol	Chain	Res	Type
1	2	539	G
1	2	540	A
1	2	541	A
1	2	542	C
1	2	544	A
1	2	547	G
1	2	553	C
1	2	557	U
1	2	558	C
1	2	564	C
1	2	567	G
1	2	577	U
1	2	578	A
1	2	583	C
1	2	584	A
1	2	593	A
1	2	594	G
1	2	605	A
1	2	609	G
1	2	610	U
1	2	614	A
1	2	618	A
1	2	619	A
1	2	622	A
1	2	623	G
1	2	637	U
1	2	638	U
1	2	641	G
1	2	644	C
1	2	647	G
1	2	649	U
1	2	650	G
1	2	652	C
1	2	653	C
1	2	657	C
1	2	661	C
1	2	662	U
1	2	663	U
1	2	664	U
1	2	671	C
1	2	672	G
1	2	675	C

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Mol	Chain	Res	Type
1	2	679	U
1	2	680	U
1	2	681	U
1	2	684	A
1	2	685	A
1	2	686	C
1	2	687	C
1	2	688	G
1	2	692	C
1	2	694	U
1	2	695	U
1	2	696	C
1	2	697	C
1	2	701	U
1	2	702	G
1	2	704	C
1	2	709	C
1	2	710	U
1	2	711	G
1	2	712	U
1	2	714	C
1	2	715	U
1	2	717	C
1	2	718	U
1	2	719	U
1	2	720	G
1	2	721	U
1	2	722	G
1	2	727	C
1	2	731	C
1	2	732	G
1	2	733	A
1	2	734	A
1	2	736	C
1	2	738	G
1	2	739	G
1	2	741	C
1	2	742	U
1	2	743	U
1	2	745	U
1	2	753	A
1	2	755	A

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Mol	Chain	Res	Type
1	2	765	G
1	2	766	PSU
1	2	767	U
1	2	771	A
1	2	774	A
1	2	778	G
1	2	779	A
1	2	780	A
1	2	781	A
1	2	782	G
1	2	783	C
1	2	788	A
1	2	789	U
1	2	792	A
1	2	793	U
1	2	794	U
1	2	802	A
1	2	805	A
1	2	809	G
1	2	811	A
1	2	813	A
1	2	814	G
1	2	819	U
1	2	820	U
1	2	821	U
1	2	822	G
1	2	823	G
1	2	826	C
1	2	827	U
1	2	828	A
1	2	829	U
1	2	832	U
1	2	835	U
1	2	836	G
1	2	837	G
1	2	838	U
1	2	840	U
1	2	845	G
1	2	852	G
1	2	855	A
1	2	859	U
1	2	862	A

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Mol	Chain	Res	Type
1	2	864	A
1	2	866	G
1	2	872	U
1	2	875	G
1	2	885	U
1	2	887	U
1	2	895	U
1	2	897	A
1	2	898	G
1	2	905	A
1	2	911	U
1	2	912	G
1	2	913	G
1	2	915	U
1	2	916	U
1	2	917	U
1	2	918	A
1	2	919	U
1	2	920	U
1	2	930	C
1	2	932	A
1	2	934	U
1	2	941	G
1	2	944	U
1	2	950	A
1	2	958	U
1	2	959	U
1	2	965	A
1	2	969	A
1	2	972	A
1	2	981	U
1	2	982	A
1	2	985	G
1	2	986	G
1	2	987	A
1	2	990	G
1	2	991	A
1	2	992	A
1	2	993	G
1	2	996	G
1	2	1002	A
1	2	1008	U

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Mol	Chain	Res	Type
1	2	1015	C
1	2	1017	U
1	2	1018	A
1	2	1024	A
1	2	1025	A
1	2	1026	A
1	2	1027	C
1	2	1030	U
1	2	1031	G
1	2	1038	A
1	2	1039	G
1	2	1041	G
1	2	1042	A
1	2	1049	G
1	2	1050	G
1	2	1051	U
1	2	1052	G
1	2	1054	U
1	2	1055	U
1	2	1056	U
1	2	1057	U
1	2	1058	C
1	2	1059	U
1	2	1062	U
1	2	1069	C
1	2	1075	A
1	2	1081	C
1	2	1082	G
1	2	1083	A
1	2	1084	G
1	2	1085	A
1	2	1086	A
1	2	1091	A
1	2	1092	A
1	2	1095	C
1	2	1096	U
1	2	1097	U
1	2	1099	G
1	2	1103	U
1	2	1104	C
1	2	1110	G
1	2	1112	A

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Mol	Chain	Res	Type
1	2	1113	G
1	2	1125	G
1	2	1134	U
1	2	1137	A
1	2	1142	A
1	2	1149	G
1	2	1150	A
1	2	1155	C
1	2	1157	C
1	2	1158	C
1	2	1163	G
1	2	1166	G
1	2	1184	U
1	2	1189	C
1	2	1193	A
1	2	1198	G
1	2	1199	G
1	2	1200	G
1	2	1205	U
1	2	1207	A
1	2	1211	G
1	2	1213	U
1	2	1216	A
1	2	1217	G
1	2	1224	U
1	2	1228	G
1	2	1230	U
1	2	1236	G
1	2	1237	A
1	2	1240	G
1	2	1241	A
1	2	1243	A
1	2	1244	G
1	2	1245	C
1	2	1246	U
1	2	1247	C
1	2	1249	U
1	2	1250	U
1	2	1251	C
1	2	1254	G
1	2	1255	A
1	2	1259	U

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Mol	Chain	Res	Type
1	2	1260	G
1	2	1268	U
1	2	1269	G
1	2	1272	G
1	2	1273	C
1	2	1275	U
1	2	1279	C
1	2	1284	U
1	2	1287	G
1	2	1289	PSU
1	2	1292	U
1	2	1296	G
1	2	1297	U
1	2	1298	G
1	2	1306	U
1	2	1307	G
1	2	1313	U
1	2	1314	U
1	2	1315	G
1	2	1317	G
1	2	1319	U
1	2	1320	A
1	2	1321	A
1	2	1323	G
1	2	1324	A
1	2	1332	C
1	2	1336	A
1	2	1337	C
1	2	1339	U
1	2	1343	A
1	2	1344	A
1	2	1345	A
1	2	1347	A
1	2	1353	G
1	2	1359	A
1	2	1360	C
1	2	1361	U
1	2	1362	U
1	2	1363	G
1	2	1364	C
1	2	1366	G
1	2	1369	U

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Mol	Chain	Res	Type
1	2	1370	G
1	2	1380	A
1	2	1383	G
1	2	1388	U
1	2	1390	U
1	2	1394	U
1	2	1396	U
1	2	1397	C
1	2	1398	A
1	2	1400	G
1	2	1401	C
1	2	1407	G
1	2	1408	A
1	2	1409	A
1	2	1411	U
1	2	1412	U
1	2	1413	U
1	2	1417	G
1	2	1418	C
1	2	1425	A
1	2	1426	2MG
1	2	1429	C
1	2	1431	G
1	2	1434	A
1	2	1442	A
1	2	1443	G
1	2	1444	A
1	2	1457	C
1	2	1458	A
1	2	1464	G
1	2	1467	A
1	2	1469	A
1	2	1471	U
1	2	1476	G
1	2	1479	C
1	2	1481	A
1	2	1482	G
1	2	1483	C
1	2	1484	G
1	2	1488	A
1	2	1489	C
1	2	1490	A

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Mol	Chain	Res	Type
1	2	1491	A
1	2	1494	U
1	2	1499	C
1	2	1504	G
1	2	1510	G
1	2	1512	U
1	2	1513	A
1	2	1514	A
1	2	1518	U
1	2	1519	G
1	2	1521	G
1	2	1522	A
1	2	1523	A
1	2	1532	G
1	2	1534	G
1	2	1535	C
1	2	1538	G
1	2	1540	G
1	2	1544	G
1	2	1555	U
1	2	1557	A
1	2	1558	U
1	2	1566	C
1	2	1567	A
1	2	1572	G
1	2	1573	7MG
1	2	1581	A
1	2	1588	G
1	2	1595	A
1	2	1597	C
1	2	1598	A
1	2	1599	G
1	2	1602	U
1	2	1603	G
1	2	1608	G
1	2	1614	G
1	2	1617	C
1	2	1620	G
1	2	1632	C
1	2	1633	A
1	2	1637	5MC
1	2	1640	G

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Mol	Chain	Res	Type
1	2	1646	A
1	2	1653	A
1	2	1654	U
1	2	1655	U
1	2	1656	G
1	2	1662	C
1	2	1678	G
1	2	1679	A
1	2	1680	U
1	2	1685	U
1	2	1686	U
1	2	1687	A
1	2	1688	G
1	2	1691	A
1	2	1692	A
1	2	1693	G
1	2	1694	G
1	2	1695	G
1	2	1696	G
1	2	1697	G
1	2	1698	C
1	2	1700	A
1	2	1702	U
1	2	1703	C
1	2	1705	A
1	2	1706	U
1	2	1707	C
1	2	1708	U
1	2	1709	C
1	2	1710	A
1	2	1711	G
1	2	1712	A
1	2	1713	G
1	2	1715	G
1	2	1719	A
1	2	1724	G
1	2	1725	G
1	2	1728	A
1	2	1729	A
1	2	1730	A
1	2	1735	G
1	2	1740	U

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Mol	Chain	Res	Type
1	2	1742	A
1	2	1743	G
1	2	1748	A
1	2	1750	U
1	2	1753	A
1	2	1754	A
1	2	1755	G
1	2	1758	G
1	2	1763	A
1	2	1764	A
1	2	1766	G
1	2	1767	U
1	2	1768	U
1	2	1778	G
1	2	1781	C
1	2	1787	G
1	2	1790	G
1	2	1791	G
1	2	1792	A
1	2	1794	C
1	2	1798	A
37	3	16	U
37	3	18	U
37	3	20	A
37	3	22	U
37	3	24	U
37	3	26	A
37	3	32	U
37	3	33	C
37	3	34	U
37	3	35	C
37	3	36	U
37	3	37	U
37	3	38	C
37	3	40	C
38	1	4	G
38	1	8	U
38	1	9	1MG
38	1	13	C
38	1	14	A
38	1	15	G
38	1	16	H2U

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Mol	Chain	Res	Type
38	1	19	G
38	1	20	A
38	1	21	A
38	1	22	G
38	1	41	C
38	1	44	A
38	1	46	7MG
38	1	47	H2U
38	1	48	5MC
38	1	49	5MC
38	1	52	G
38	1	59	A
38	1	60	A
38	1	61	C
38	1	74	C
38	1	75	C
38	1	76	A

All (28) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	74	U
1	2	78	A
1	2	216	A
1	2	239	C
1	2	277	U
1	2	279	U
1	2	649	U
1	2	670	G
1	2	686	C
1	2	695	U
1	2	700	C
1	2	828	A
1	2	1198	G
1	2	1204	C
1	2	1206	C
1	2	1343	A
1	2	1430	U
1	2	1470	C
1	2	1513	A
1	2	1566	C
1	2	1571	A

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Mol	Chain	Res	Type
1	2	1613	C
1	2	1765	G
1	2	1797	U
38	1	8	U
38	1	43	G
38	1	48	5MC
38	1	74	C

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

23 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	$\#\|Z\| > 2$
1	2MG	2	1426	1,44	18,26,27	2.34	7 (38%)	16,38,41	1.47	4 (25%)
38	2MG	1	10	38	18,26,27	2.50	7 (38%)	16,38,41	1.33	3 (18%)
1	PSU	2	1289	1	18,21,22	4.09	7 (38%)	22,30,33	1.83	5 (22%)
38	H2U	1	16	38	18,21,22	3.03	4 (22%)	21,30,33	2.00	5 (23%)
1	5MC	2	1637	1	18,22,23	3.43	7 (38%)	26,32,35	0.96	2 (7%)
38	1MG	1	9	38	18,26,27	2.98	6 (33%)	19,39,42	1.53	3 (15%)
1	2MG	2	1570	1	18,26,27	2.43	7 (38%)	16,38,41	1.42	4 (25%)
38	M2G	1	26	38	20,27,28	3.70	8 (40%)	22,40,43	1.64	5 (22%)
38	7MG	1	46	38	22,26,27	3.76	10 (45%)	29,39,42	1.96	8 (27%)
38	RIA	1	64	38	31,38,39	5.08	13 (41%)	39,57,60	2.08	5 (12%)
1	MA6	2	1780	1	18,26,27	1.09	2 (11%)	19,38,41	3.42	2 (10%)
38	H2U	1	47	38	18,21,22	3.12	4 (22%)	21,30,33	1.88	4 (19%)
38	5MC	1	49	38	18,22,23	3.64	7 (38%)	26,32,35	1.02	1 (3%)
1	PSU	2	766	1	18,21,22	4.11	8 (44%)	22,30,33	2.07	5 (22%)
1	PSU	2	465	1,44	18,21,22	4.09	7 (38%)	22,30,33	1.75	4 (18%)
1	7MG	2	1573	1	22,26,27	3.62	10 (45%)	29,39,42	2.06	9 (31%)
1	PSU	2	120	1	18,21,22	4.19	7 (38%)	22,30,33	1.76	5 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
38	5MC	1	48	38	18,22,23	3.53	7 (38%)	26,32,35	1.16	2 (7%)
38	T6A	1	37	38	27,34,35	2.10	7 (25%)	29,49,52	2.14	6 (20%)
1	PSU	2	998	1	18,21,22	4.19	8 (44%)	22,30,33	1.85	5 (22%)
1	B8N	2	1190	1	24,29,30	3.01	7 (29%)	29,42,45	1.82	8 (27%)
38	1MA	1	58	38	16,25,26	4.30	4 (25%)	18,37,40	1.69	3 (16%)
1	5MC	2	1006	1	18,22,23	3.29	7 (38%)	26,32,35	1.34	3 (11%)

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
1	2MG	2	1426	1,44	-	0/5/27/28	0/3/3/3
38	2MG	1	10	38	-	2/5/27/28	0/3/3/3
1	PSU	2	1289	1	-	2/7/25/26	0/2/2/2
38	H2U	1	16	38	-	2/7/38/39	0/2/2/2
1	5MC	2	1637	1	-	2/7/25/26	0/2/2/2
38	1MG	1	9	38	-	3/3/25/26	0/3/3/3
1	2MG	2	1570	1	-	0/5/27/28	0/3/3/3
38	M2G	1	26	38	-	1/7/29/30	0/3/3/3
38	7MG	1	46	38	-	2/7/37/38	0/3/3/3
38	RIA	1	64	38	-	3/13/51/52	0/4/4/4
1	MA6	2	1780	1	-	7/7/29/30	0/3/3/3
38	H2U	1	47	38	-	5/7/38/39	0/2/2/2
38	5MC	1	49	38	-	3/7/25/26	0/2/2/2
1	PSU	2	766	1	-	2/7/25/26	0/2/2/2
1	PSU	2	465	1,44	-	2/7/25/26	0/2/2/2
1	7MG	2	1573	1	-	2/7/37/38	0/3/3/3
1	PSU	2	120	1	-	2/7/25/26	0/2/2/2
38	5MC	1	48	38	-	3/7/25/26	0/2/2/2
38	T6A	1	37	38	-	6/19/41/42	0/3/3/3
1	PSU	2	998	1	-	4/7/25/26	0/2/2/2
1	B8N	2	1190	1	-	4/16/34/35	0/2/2/2
38	1MA	1	58	38	-	0/3/25/26	0/3/3/3
1	5MC	2	1006	1	-	0/7/25/26	0/2/2/2

All (161) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
38	1	64	RIA	C1'-C2'	-16.22	1.32	1.52
38	1	64	RIA	O4'-C1A	15.87	1.63	1.41
38	1	58	1MA	C2-N3	15.49	1.47	1.29
38	1	26	M2G	C2-N3	12.81	1.46	1.30
1	2	120	PSU	C6-C5	10.87	1.48	1.35
1	2	998	PSU	C6-C5	10.74	1.47	1.35
1	2	465	PSU	C6-C5	10.74	1.47	1.35
38	1	64	RIA	O1'-C1'	10.68	1.60	1.41
1	2	766	PSU	C6-C5	10.41	1.47	1.35
1	2	1289	PSU	C6-C5	10.34	1.47	1.35
38	1	46	7MG	C8-N9	9.67	1.51	1.46
38	1	47	H2U	C2-N1	9.67	1.49	1.35
1	2	1573	7MG	C8-N9	9.40	1.51	1.46
38	1	16	H2U	C2-N1	9.38	1.49	1.35
38	1	49	5MC	C6-C5	9.36	1.50	1.34
1	2	998	PSU	C2-N1	9.25	1.49	1.36
1	2	120	PSU	C2-N1	9.23	1.49	1.36
1	2	766	PSU	C2-N1	9.22	1.49	1.36
1	2	1289	PSU	C2-N1	9.12	1.49	1.36
1	2	465	PSU	C2-N1	8.93	1.48	1.36
38	1	48	5MC	C6-C5	8.92	1.49	1.34
38	1	9	1MG	C2-N2	8.88	1.50	1.34
1	2	1637	5MC	C6-C5	8.66	1.48	1.34
1	2	1006	5MC	C6-C5	8.07	1.47	1.34
1	2	1190	B8N	C6-N1	7.94	1.56	1.36
38	1	46	7MG	C5-N7	7.74	1.44	1.35
1	2	1190	B8N	C4-N3	-7.68	1.26	1.40
1	2	998	PSU	C2-N3	7.28	1.50	1.37
1	2	120	PSU	C2-N3	7.22	1.49	1.37
1	2	1289	PSU	C2-N3	7.20	1.49	1.37
1	2	766	PSU	C2-N3	7.13	1.49	1.37
1	2	465	PSU	C2-N3	6.92	1.49	1.37
38	1	64	RIA	O1'-C4'	-6.75	1.29	1.45
1	2	1573	7MG	C5-N7	6.72	1.43	1.35
38	1	48	5MC	C4-N3	6.59	1.45	1.34
38	1	47	H2U	C2-N3	6.54	1.49	1.38
38	1	49	5MC	C4-N3	6.52	1.45	1.34
38	1	37	T6A	C10-N11	6.39	1.49	1.35
1	2	1637	5MC	C4-N3	6.35	1.44	1.34
38	1	16	H2U	C2-N3	6.31	1.49	1.38
1	2	1006	5MC	C4-N3	6.22	1.44	1.34
38	1	49	5MC	C2-N3	6.12	1.48	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
38	1	48	5MC	C2-N3	6.09	1.48	1.36
38	1	26	M2G	C2-N2	5.95	1.46	1.35
1	2	1006	5MC	C2-N3	5.95	1.48	1.36
1	2	1573	7MG	C2-N3	5.94	1.47	1.33
38	1	64	RIA	O4'-C4A	-5.89	1.31	1.45
1	2	1637	5MC	C2-N3	5.88	1.48	1.36
38	1	46	7MG	C2-N3	5.73	1.47	1.33
38	1	10	2MG	C2-N2	5.60	1.45	1.33
38	1	46	7MG	C4-N3	5.45	1.47	1.34
38	1	9	1MG	C2-N3	5.43	1.44	1.34
1	2	1573	7MG	C4-N3	5.41	1.47	1.34
1	2	1190	B8N	C2-N1	5.37	1.55	1.39
1	2	1570	2MG	C2-N2	5.30	1.45	1.33
38	1	58	1MA	C2-N1	5.26	1.45	1.35
38	1	37	T6A	C10-N6	5.21	1.48	1.37
1	2	120	PSU	C6-N1	5.16	1.44	1.36
38	1	10	2MG	C4-N3	5.15	1.49	1.37
1	2	465	PSU	C6-N1	5.08	1.44	1.36
1	2	1289	PSU	C6-N1	5.08	1.44	1.36
1	2	1573	7MG	C4-N9	5.07	1.43	1.37
1	2	998	PSU	C6-N1	5.06	1.44	1.36
38	1	47	H2U	C4-N3	5.01	1.46	1.37
1	2	1426	2MG	C2-N2	4.99	1.44	1.33
1	2	766	PSU	C6-N1	4.95	1.44	1.36
38	1	46	7MG	C4-N9	4.94	1.43	1.37
1	2	1190	B8N	C6-C5	4.88	1.41	1.34
38	1	16	H2U	C4-N3	4.87	1.45	1.37
38	1	26	M2G	C4-N3	4.82	1.49	1.37
1	2	1570	2MG	C4-N3	4.79	1.49	1.37
38	1	46	7MG	C2-N2	4.77	1.45	1.34
38	1	9	1MG	C4-N3	4.69	1.48	1.37
38	1	10	2MG	C2-N1	4.68	1.44	1.36
1	2	1573	7MG	C2-N2	4.65	1.45	1.34
38	1	49	5MC	C6-N1	4.65	1.46	1.38
1	2	1190	B8N	C1'-C5	-4.63	1.39	1.50
1	2	1570	2MG	C2-N1	4.59	1.44	1.36
1	2	1426	2MG	C2-N1	4.49	1.43	1.36
38	1	49	5MC	C2-N1	4.44	1.49	1.40
1	2	1426	2MG	C4-N3	4.44	1.48	1.37
38	1	49	5MC	C4-N4	4.39	1.45	1.34
38	1	48	5MC	C6-N1	4.36	1.45	1.38
1	2	1637	5MC	C6-N1	4.28	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
38	1	64	RIA	C6-N6	4.24	1.49	1.34
38	1	48	5MC	C2-N1	4.20	1.49	1.40
38	1	48	5MC	C4-N4	4.20	1.45	1.34
1	2	1637	5MC	C4-N4	4.18	1.45	1.34
1	2	1006	5MC	C4-N4	4.06	1.44	1.34
38	1	37	T6A	C6-N6	4.06	1.43	1.36
38	1	58	1MA	C4-N3	3.99	1.49	1.37
1	2	1006	5MC	C2-N1	3.94	1.48	1.40
38	1	26	M2G	C6-N1	3.92	1.43	1.37
1	2	1637	5MC	C2-N1	3.86	1.48	1.40
38	1	46	7MG	C2-N1	3.81	1.47	1.37
38	1	9	1MG	O6-C6	-3.80	1.15	1.22
1	2	120	PSU	C4-N3	3.71	1.45	1.38
1	2	1006	5MC	C6-N1	3.66	1.44	1.38
1	2	998	PSU	C4-N3	3.65	1.45	1.38
1	2	465	PSU	C4-N3	3.58	1.45	1.38
1	2	1573	7MG	C2-N1	3.55	1.46	1.37
1	2	1289	PSU	C4-N3	3.55	1.45	1.38
1	2	766	PSU	C4-N3	3.53	1.45	1.38
1	2	1570	2MG	C6-N1	3.50	1.43	1.37
38	1	46	7MG	C5-C6	3.38	1.52	1.43
38	1	64	RIA	O3A-C3A	-3.38	1.35	1.43
38	1	10	2MG	C6-N1	3.35	1.42	1.37
38	1	26	M2G	C5-C6	3.29	1.54	1.47
38	1	46	7MG	C6-N1	3.26	1.44	1.38
38	1	26	M2G	C2-N1	3.26	1.44	1.36
38	1	64	RIA	O2'-C2'	3.14	1.50	1.43
1	2	1573	7MG	C5-C6	3.13	1.51	1.43
38	1	64	RIA	O2A-C2A	3.02	1.51	1.43
1	2	1006	5MC	O2-C2	-2.95	1.18	1.23
1	2	1637	5MC	O2-C2	-2.95	1.18	1.23
38	1	10	2MG	C5-C6	2.92	1.53	1.47
1	2	1426	2MG	C6-N1	2.91	1.42	1.37
1	2	1570	2MG	C5-C6	2.89	1.53	1.47
1	2	1573	7MG	C6-N1	2.88	1.44	1.38
1	2	1289	PSU	O4-C4	-2.87	1.18	1.23
1	2	1780	MA6	C5-C4	-2.80	1.33	1.40
1	2	998	PSU	O4-C4	-2.79	1.18	1.23
38	1	48	5MC	O2-C2	-2.76	1.18	1.23
1	2	1573	7MG	O6-C6	-2.74	1.18	1.23
38	1	49	5MC	O2-C2	-2.72	1.18	1.23
1	2	766	PSU	O4-C4	-2.71	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	1426	2MG	C5-C6	2.71	1.52	1.47
1	2	766	PSU	O4'-C1'	-2.70	1.40	1.43
1	2	1426	2MG	C5-C4	-2.69	1.36	1.43
38	1	64	RIA	C2-N3	2.67	1.36	1.32
1	2	465	PSU	O4-C4	-2.65	1.18	1.23
38	1	46	7MG	O6-C6	-2.62	1.18	1.23
1	2	120	PSU	O4-C4	-2.62	1.18	1.23
1	2	1426	2MG	O6-C6	-2.56	1.18	1.23
1	2	1570	2MG	C5-C4	-2.55	1.36	1.43
38	1	64	RIA	O3'-C3'	-2.54	1.37	1.43
38	1	26	M2G	C5-C4	-2.53	1.36	1.43
38	1	16	H2U	O2-C2	-2.51	1.18	1.23
38	1	10	2MG	C5-C4	-2.46	1.36	1.43
1	2	465	PSU	O2-C2	-2.42	1.18	1.23
1	2	1780	MA6	C2-N3	2.41	1.36	1.32
38	1	37	T6A	C5-C4	-2.38	1.34	1.40
38	1	64	RIA	P'-O5'	2.37	1.67	1.60
38	1	47	H2U	O2-C2	-2.36	1.18	1.23
1	2	1190	B8N	O2-C2	-2.35	1.18	1.22
1	2	998	PSU	O4'-C1'	-2.32	1.40	1.43
1	2	766	PSU	O2-C2	-2.29	1.18	1.23
38	1	10	2MG	O6-C6	-2.29	1.18	1.23
38	1	37	T6A	ODA-C13	2.27	1.29	1.22
38	1	9	1MG	C5-C4	-2.27	1.37	1.43
1	2	120	PSU	O2-C2	-2.24	1.18	1.23
1	2	1570	2MG	O6-C6	-2.24	1.18	1.23
1	2	1289	PSU	O2-C2	-2.23	1.18	1.23
38	1	58	1MA	CM1-N1	-2.18	1.42	1.46
38	1	26	M2G	O6-C6	-2.16	1.18	1.23
1	2	998	PSU	O2-C2	-2.16	1.18	1.23
38	1	37	T6A	O10-C10	-2.14	1.18	1.23
38	1	9	1MG	C5-C6	2.08	1.53	1.47
38	1	37	T6A	C2-N3	2.07	1.35	1.32
1	2	1190	B8N	O4-C4	-2.03	1.18	1.23
38	1	64	RIA	C2-N1	2.02	1.37	1.33

All (101) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1780	MA6	N1-C6-N6	-13.70	102.64	117.06
38	1	64	RIA	C5-C6-N6	8.03	132.55	120.35
38	1	16	H2U	C4-N3-C2	-6.78	120.16	125.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
38	1	47	H2U	C4-N3-C2	-6.38	120.50	125.79
38	1	64	RIA	N3-C2-N1	-5.66	119.83	128.68
38	1	37	T6A	N3-C2-N1	-5.58	119.95	128.68
1	2	1780	MA6	N3-C2-N1	-5.47	120.12	128.68
38	1	64	RIA	N6-C6-N1	-5.44	107.28	118.57
1	2	1573	7MG	C5-C6-N1	5.08	119.94	110.99
1	2	766	PSU	C4-N3-C2	-5.05	119.06	126.34
1	2	1190	B8N	C5-C4-N3	5.00	125.44	116.17
38	1	58	1MA	N1-C2-N3	-4.93	120.27	126.02
38	1	46	7MG	C5-C6-N1	4.92	119.66	110.99
38	1	37	T6A	C2-N1-C6	4.78	120.69	116.59
1	2	1289	PSU	C4-N3-C2	-4.71	119.56	126.34
1	2	998	PSU	C4-N3-C2	-4.58	119.73	126.34
38	1	37	T6A	N6-C10-N11	4.57	120.14	113.76
38	1	26	M2G	N1-C2-N2	4.55	121.91	118.04
1	2	766	PSU	N1-C2-N3	4.52	120.25	115.13
1	2	1006	5MC	C5-C6-N1	-4.49	118.72	123.34
1	2	1190	B8N	C4-N3-C2	-4.43	119.86	125.46
38	1	9	1MG	C5-C6-N1	4.34	120.42	113.90
1	2	465	PSU	C4-N3-C2	-4.33	120.10	126.34
1	2	120	PSU	C4-N3-C2	-4.30	120.14	126.34
1	2	1573	7MG	C5-C4-N3	-4.22	120.08	128.13
38	1	46	7MG	C2-N3-C4	4.20	119.77	112.30
1	2	1573	7MG	C2-N3-C4	4.14	119.67	112.30
1	2	465	PSU	N1-C2-N3	4.13	119.81	115.13
1	2	1289	PSU	N1-C2-N3	4.10	119.78	115.13
1	2	998	PSU	N1-C2-N3	4.10	119.77	115.13
38	1	58	1MA	C5-C6-N1	4.03	119.90	113.90
1	2	120	PSU	N1-C2-N3	4.01	119.67	115.13
38	1	48	5MC	C5-C6-N1	-3.94	119.28	123.34
38	1	64	RIA	C1'-O2A-C2A	-3.89	108.34	117.96
38	1	37	T6A	C12-N11-C10	3.88	128.40	121.94
1	2	766	PSU	C6-C5-C4	3.79	120.84	118.20
38	1	46	7MG	C5-C4-N3	-3.75	120.99	128.13
38	1	37	T6A	O10-C10-N6	-3.54	117.64	123.62
38	1	10	2MG	C5-C6-N1	3.52	120.17	113.95
38	1	37	T6A	N6-C6-N1	3.42	123.30	118.72
38	1	26	M2G	C5-C6-N1	3.41	119.98	113.95
1	2	1426	2MG	C5-C6-N1	3.39	119.94	113.95
1	2	1573	7MG	C4-C5-N7	3.38	110.22	105.53
1	2	1570	2MG	C5-C6-N1	3.33	119.83	113.95
1	2	465	PSU	C6-N1-C2	-3.27	119.34	122.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1426	2MG	CM2-N2-C2	-3.26	116.67	123.86
1	2	998	PSU	C6-N1-C2	-3.25	119.36	122.68
1	2	1190	B8N	N3-C2-N1	3.25	121.35	116.76
38	1	16	H2U	N3-C2-N1	3.19	120.02	116.65
38	1	49	5MC	C5-C6-N1	-3.16	120.09	123.34
1	2	1573	7MG	C5-C4-N9	3.15	110.44	106.35
1	2	1573	7MG	C2-N1-C6	-3.10	119.45	125.10
38	1	46	7MG	C4-C5-N7	3.09	109.82	105.53
1	2	120	PSU	C6-N1-C2	-3.09	119.52	122.68
38	1	46	7MG	C5-C4-N9	3.06	110.32	106.35
1	2	1637	5MC	C5-C6-N1	-3.05	120.20	123.34
1	2	766	PSU	C6-N1-C2	-2.92	119.69	122.68
38	1	46	7MG	O6-C6-C5	-2.91	120.40	127.54
1	2	1289	PSU	C6-N1-C2	-2.91	119.71	122.68
1	2	1573	7MG	O6-C6-C5	-2.87	120.49	127.54
38	1	47	H2U	C5-C6-N1	2.87	121.06	111.61
38	1	47	H2U	N3-C2-N1	2.86	119.68	116.65
1	2	1190	B8N	C31-N3-C4	2.86	121.53	117.31
38	1	16	H2U	C5-C4-N3	2.84	119.84	116.65
38	1	47	H2U	C5-C4-N3	2.83	119.83	116.65
38	1	26	M2G	C2-N1-C6	-2.83	119.02	123.71
1	2	1006	5MC	CM5-C5-C6	-2.78	119.14	122.85
38	1	9	1MG	C8-N7-C5	2.77	108.26	102.99
1	2	998	PSU	O2-C2-N1	-2.73	119.78	122.79
1	2	766	PSU	O2-C2-N1	-2.73	119.78	122.79
38	1	46	7MG	C2-N1-C6	-2.72	120.14	125.10
38	1	58	1MA	C8-N7-C5	2.72	108.17	102.99
1	2	1573	7MG	N9-C4-N3	2.68	129.48	125.47
1	2	1289	PSU	O2-C2-N1	-2.67	119.85	122.79
38	1	26	M2G	C8-N7-C5	2.64	108.02	102.99
38	1	16	H2U	C5-C6-N1	2.63	120.26	111.61
1	2	120	PSU	C6-C5-C4	2.62	120.03	118.20
1	2	1289	PSU	C6-C5-C4	2.59	120.01	118.20
38	1	16	H2U	O2-C2-N1	-2.58	119.87	123.11
1	2	1570	2MG	C8-N7-C5	2.48	107.72	102.99
38	1	10	2MG	C8-N7-C5	2.47	107.70	102.99
1	2	120	PSU	O2-C2-N1	-2.47	120.07	122.79
1	2	1190	B8N	O4-C4-N3	-2.44	115.83	119.98
1	2	465	PSU	O2-C2-N1	-2.44	120.11	122.79
1	2	1426	2MG	C8-N7-C5	2.43	107.62	102.99
38	1	9	1MG	O6-C6-C5	-2.42	119.91	124.19
1	2	1573	7MG	N9-C8-N7	2.39	106.79	103.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1570	2MG	CM2-N2-C2	-2.35	118.67	123.86
38	1	26	M2G	O6-C6-C5	-2.33	119.82	124.37
1	2	1570	2MG	O6-C6-C5	-2.32	119.84	124.37
38	1	10	2MG	O6-C6-C5	-2.28	119.93	124.37
1	2	1190	B8N	O4'-C1'-C2'	2.22	108.28	105.14
1	2	1637	5MC	CM5-C5-C6	-2.22	119.88	122.85
38	1	46	7MG	N9-C4-N3	2.15	128.69	125.47
1	2	1426	2MG	O6-C6-C5	-2.14	120.19	124.37
1	2	998	PSU	C6-C5-C4	2.12	119.68	118.20
1	2	1190	B8N	O2-C2-N3	-2.10	119.08	121.99
38	1	64	RIA	O2A-C1'-C2'	2.09	112.29	107.96
1	2	1190	B8N	O36-C34-C33	2.04	120.34	113.38
38	1	48	5MC	C5-C4-N4	-2.04	118.43	121.48
1	2	1006	5MC	C5-C4-N4	-2.01	118.48	121.48

There are no chirality outliers.

All (57) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	2	120	PSU	C3'-C4'-C5'-O5'
1	2	120	PSU	O4'-C4'-C5'-O5'
1	2	766	PSU	C3'-C4'-C5'-O5'
1	2	1190	B8N	O4'-C4'-C5'-O5'
1	2	1780	MA6	O4'-C4'-C5'-O5'
1	2	1780	MA6	C5-C6-N6-C9
1	2	1780	MA6	C5-C6-N6-C10
1	2	1780	MA6	N1-C6-N6-C9
1	2	1780	MA6	N1-C6-N6-C10
38	1	9	1MG	O4'-C4'-C5'-O5'
38	1	9	1MG	C3'-C4'-C5'-O5'
38	1	16	H2U	C4'-C5'-O5'-P
38	1	37	T6A	C14-C12-N11-C10
38	1	37	T6A	C13-C12-C14-O14
38	1	37	T6A	C13-C12-C14-C15
38	1	47	H2U	O4'-C4'-C5'-O5'
38	1	47	H2U	C3'-C4'-C5'-O5'
38	1	48	5MC	C4'-C5'-O5'-P
38	1	49	5MC	O4'-C4'-C5'-O5'
1	2	766	PSU	O4'-C4'-C5'-O5'
1	2	1190	B8N	C3'-C4'-C5'-O5'
1	2	1637	5MC	O4'-C4'-C5'-O5'
1	2	1780	MA6	C3'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
38	1	49	5MC	C3'-C4'-C5'-O5'
1	2	1573	7MG	O4'-C4'-C5'-O5'
1	2	1573	7MG	C3'-C4'-C5'-O5'
1	2	1637	5MC	C3'-C4'-C5'-O5'
1	2	465	PSU	O4'-C4'-C5'-O5'
1	2	998	PSU	O4'-C4'-C5'-O5'
38	1	10	2MG	O4'-C4'-C5'-O5'
38	1	48	5MC	O4'-C4'-C5'-O5'
38	1	46	7MG	C4'-C5'-O5'-P
38	1	47	H2U	C4'-C5'-O5'-P
38	1	64	RIA	C4A-C5A-O5A-P
38	1	37	T6A	N11-C12-C14-C15
1	2	998	PSU	C3'-C4'-C5'-O5'
38	1	26	M2G	C3'-C4'-C5'-O5'
1	2	1780	MA6	C4'-C5'-O5'-P
38	1	9	1MG	C4'-C5'-O5'-P
38	1	46	7MG	C3'-C4'-C5'-O5'
38	1	64	RIA	C4'-C5'-O5'-P'
1	2	1289	PSU	C3'-C4'-C5'-O5'
38	1	37	T6A	C13-C12-N11-C10
38	1	47	H2U	C2'-C1'-N1-C6
1	2	998	PSU	O4'-C1'-C5-C4
1	2	1190	B8N	O4'-C1'-C5-C4
1	2	465	PSU	C3'-C4'-C5'-O5'
38	1	10	2MG	C3'-C4'-C5'-O5'
1	2	1190	B8N	N34-C33-C34-O36
38	1	16	H2U	C2'-C1'-N1-C6
38	1	47	H2U	C2'-C1'-N1-C2
38	1	48	5MC	C3'-C4'-C5'-O5'
38	1	37	T6A	N11-C12-C13-ODA
1	2	1289	PSU	O4'-C4'-C5'-O5'
1	2	998	PSU	O4'-C1'-C5-C6
38	1	64	RIA	C2'-C1'-O2A-C2A
38	1	49	5MC	C4'-C5'-O5'-P

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 121 ligands modelled in this entry, 119 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	$\#\|Z\| > 2$
47	MET	k	603	-	6,7,8	0.49	0	2,7,9	0.52	0
46	GCP	k	601	-	27,34,34	4.78	10 (37%)	34,54,54	1.66	7 (20%)

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
47	MET	k	603	-	-	1/5/6/8	-
46	GCP	k	601	-	-	3/15/38/38	0/3/3/3

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	k	601	GCP	C2'-C1'	-15.27	1.30	1.53
46	k	601	GCP	O4'-C1'	14.94	1.61	1.41
46	k	601	GCP	PB-O3A	6.22	1.65	1.58
46	k	601	GCP	O4'-C4'	-6.21	1.31	1.45
46	k	601	GCP	C2-N2	5.91	1.45	1.33
46	k	601	GCP	O2'-C2'	2.98	1.50	1.43
46	k	601	GCP	O3'-C3'	-2.89	1.36	1.43
46	k	601	GCP	C5-C4	-2.62	1.34	1.40
46	k	601	GCP	O6-C6	-2.25	1.18	1.24
46	k	601	GCP	PB-O2B	-2.15	1.51	1.56

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	k	601	GCP	N3-C2-N1	-5.33	120.12	127.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	k	601	GCP	C2-N3-C4	4.07	120.01	115.36
46	k	601	GCP	C5-C6-N1	-2.69	119.75	123.43
46	k	601	GCP	PB-O3A-PA	-2.68	124.06	132.56
46	k	601	GCP	C2-N1-C6	2.63	120.10	115.93
46	k	601	GCP	N2-C2-N3	2.23	121.43	117.79
46	k	601	GCP	C3'-C2'-C1'	2.02	104.02	100.98

There are no chirality outliers.

All (4) torsion outliers are listed below:

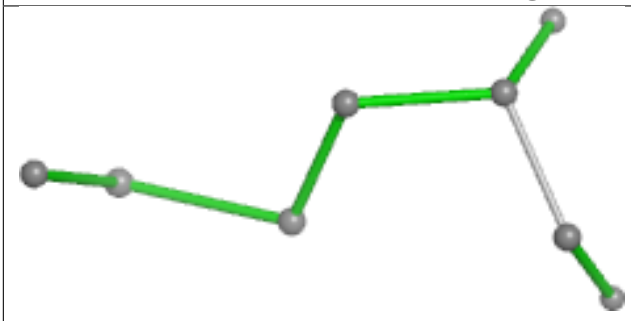
Mol	Chain	Res	Type	Atoms
46	k	601	GCP	C5'-O5'-PA-O3A
46	k	601	GCP	C5'-O5'-PA-O2A
46	k	601	GCP	C5'-O5'-PA-O1A
47	k	603	MET	C-CA-CB-CG

There are no ring outliers.

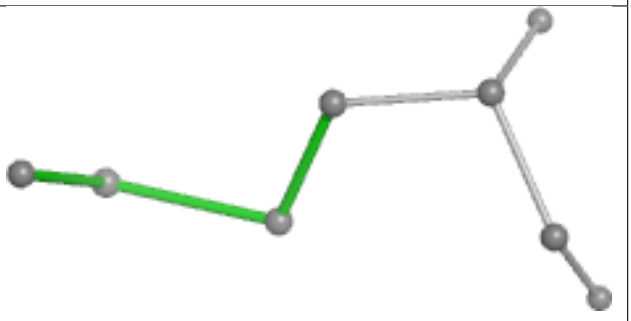
No monomer is involved in short contacts.

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 then 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.

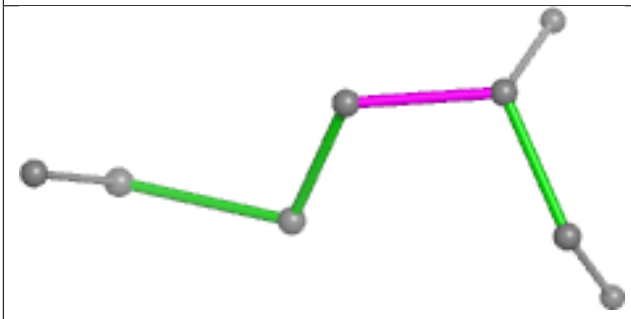
Ligand MET k 603



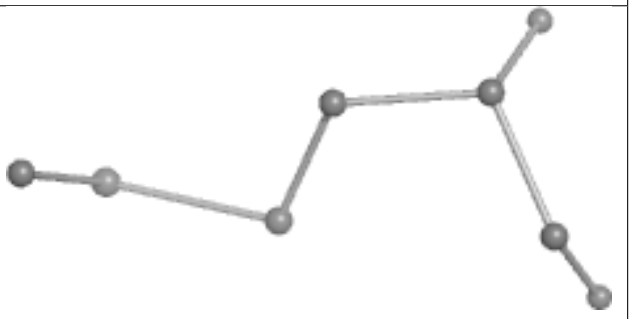
Bond lengths



Bond angles

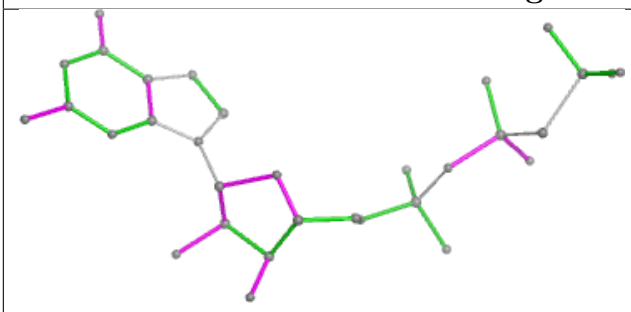


Torsions

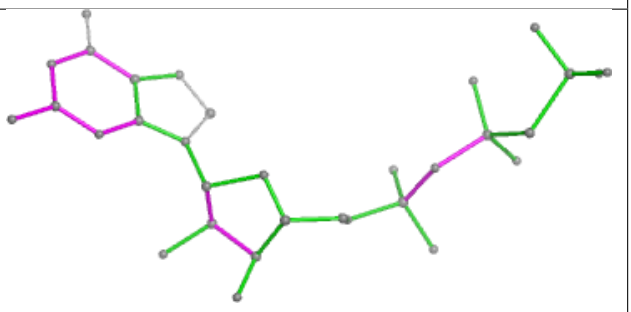


Rings

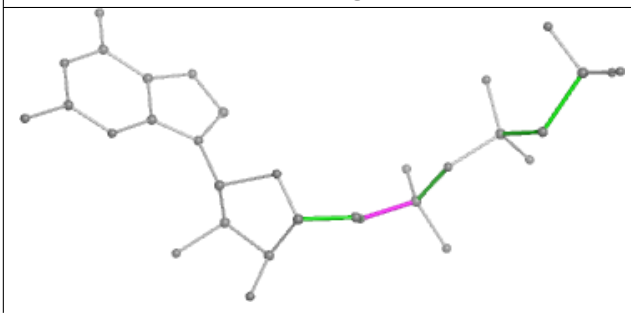
Ligand GCP k 601



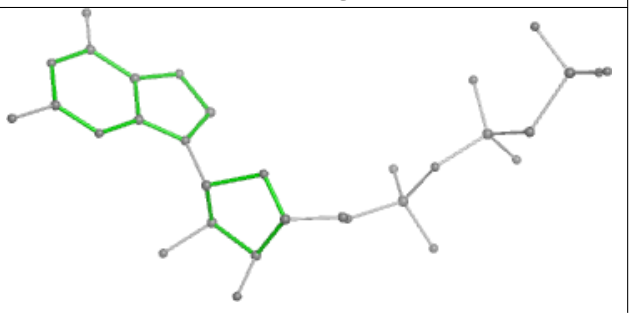
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

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
38	1	3

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	1	64:RIA	O3'	65:G	P	9.12
1	1	63:G	O3'	64:RIA	P	4.29
1	1	16:H2U	O3'	18:G	P	4.10

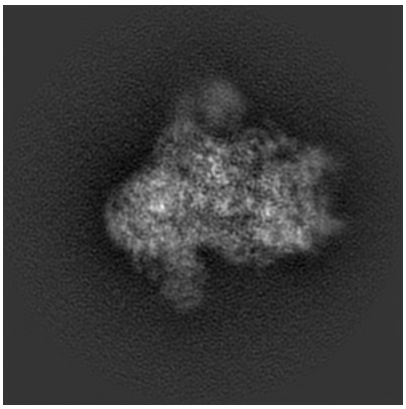
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-19802. These allow visual inspection of the internal detail of the map and identification of artifacts.

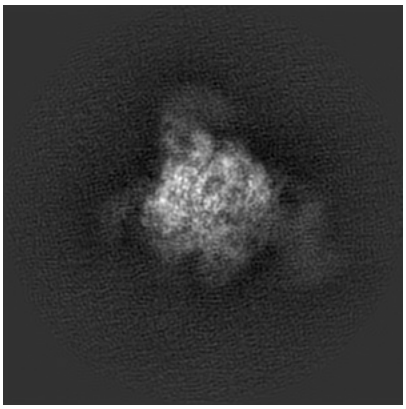
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

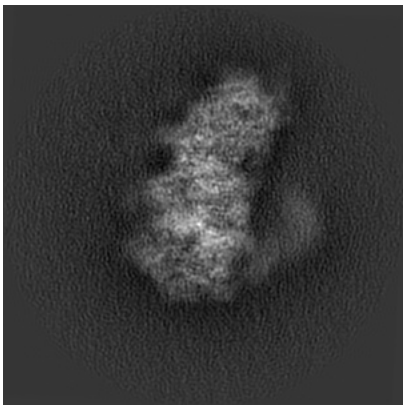
6.1.1 Primary map



X

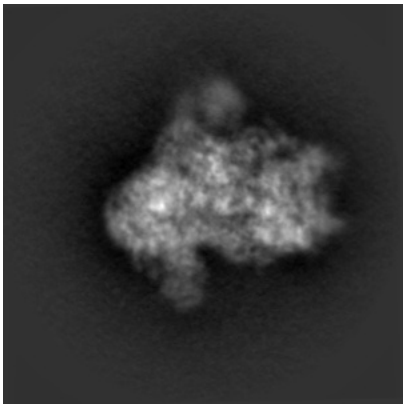


Y

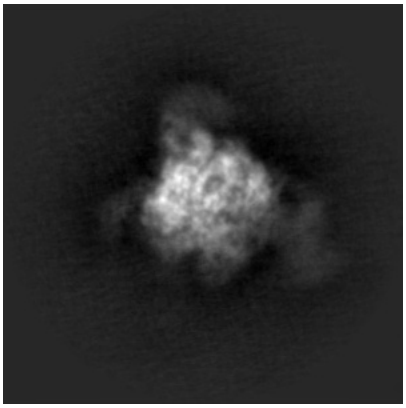


Z

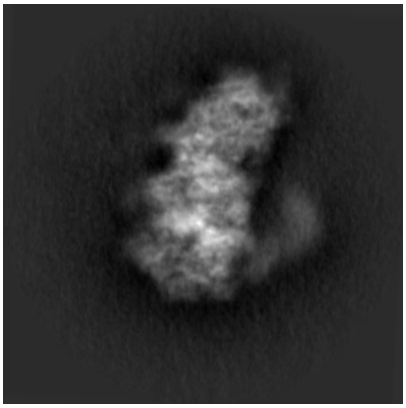
6.1.2 Raw map



X



Y

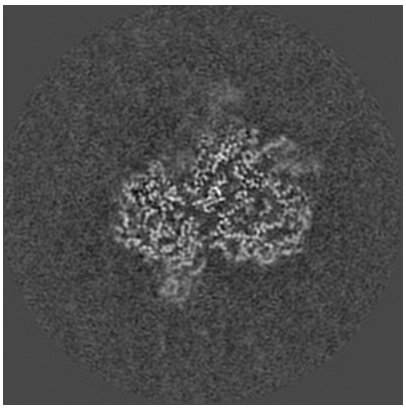


Z

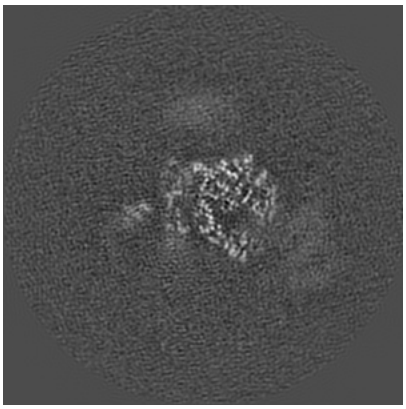
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

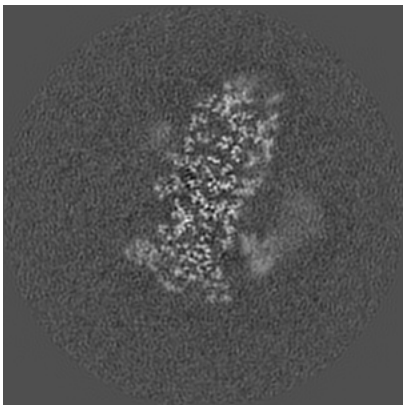
6.2.1 Primary map



X Index: 150

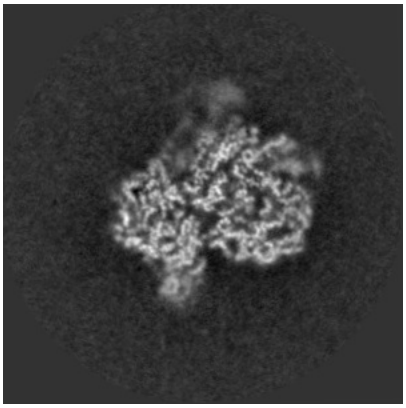


Y Index: 150

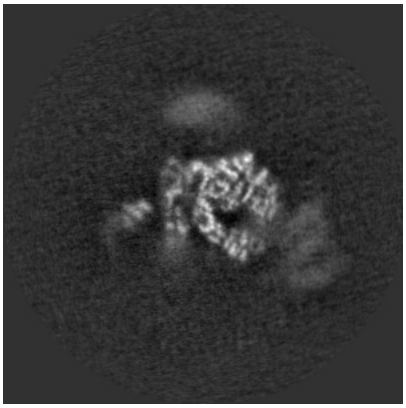


Z Index: 150

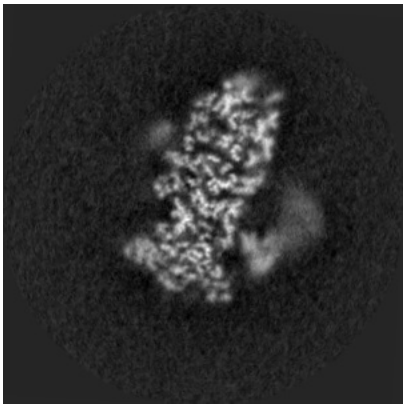
6.2.2 Raw map



X Index: 150



Y Index: 150

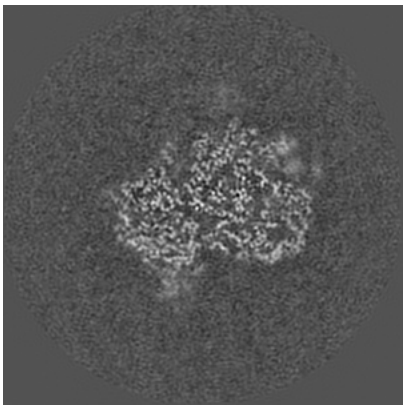


Z Index: 150

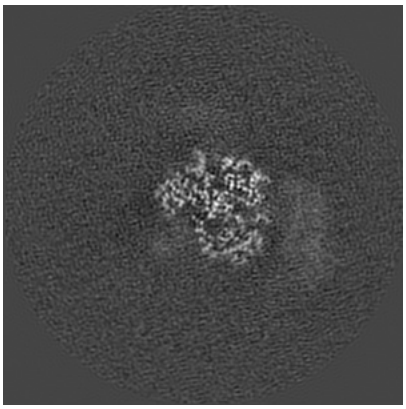
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

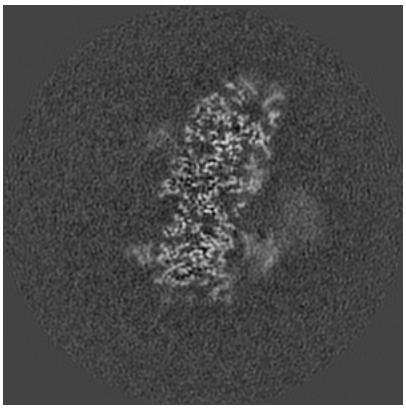
6.3.1 Primary map



X Index: 152

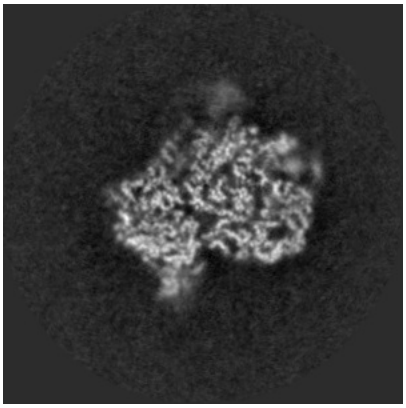


Y Index: 161

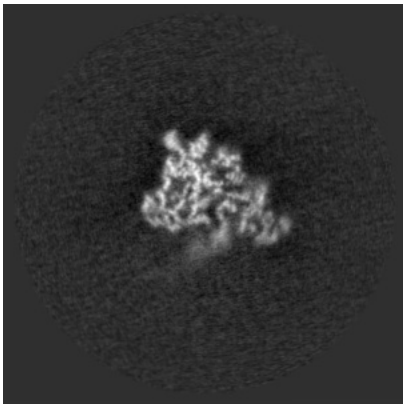


Z Index: 147

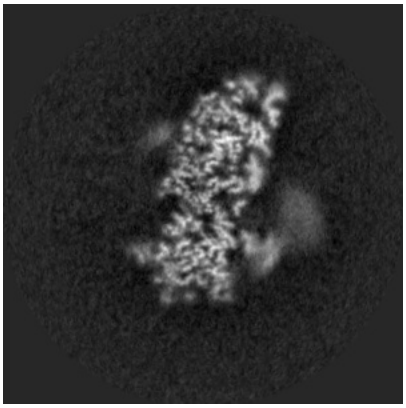
6.3.2 Raw map



X Index: 152



Y Index: 198

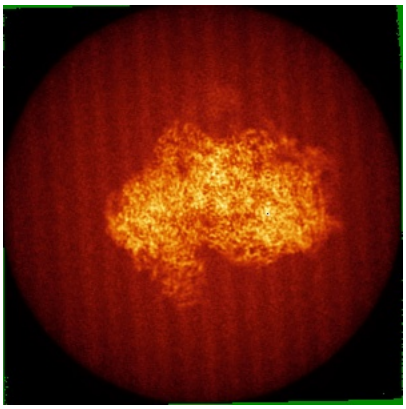


Z Index: 146

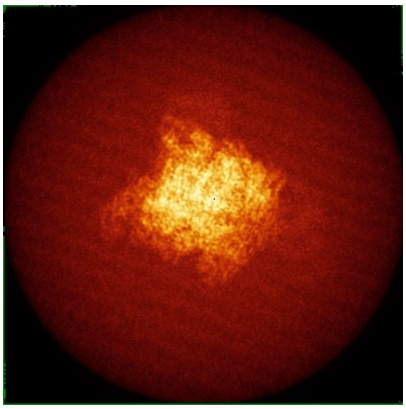
The images above show the largest variance slices of the map in three orthogonal directions.

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

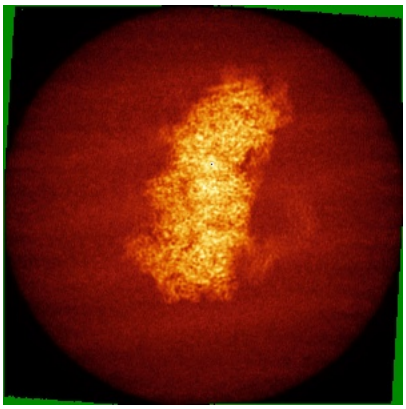
6.4.1 Primary map



X

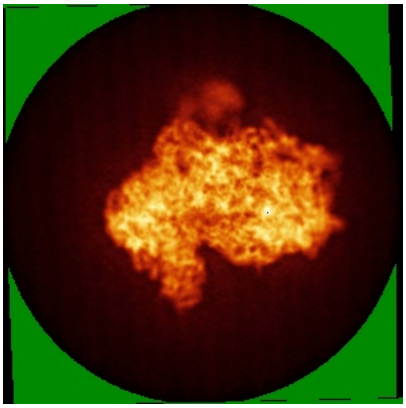


Y

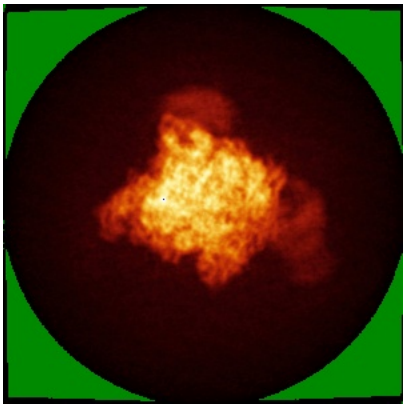


Z

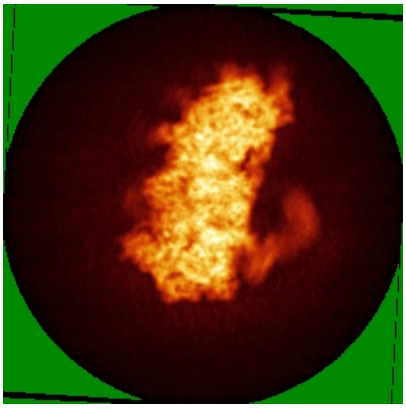
6.4.2 Raw map



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

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.07. 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

X Y Z

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.

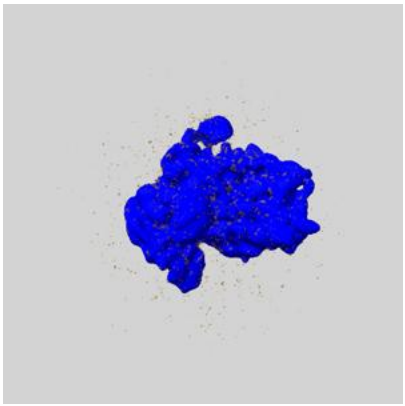
6.6 Mask visualisation (i)

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

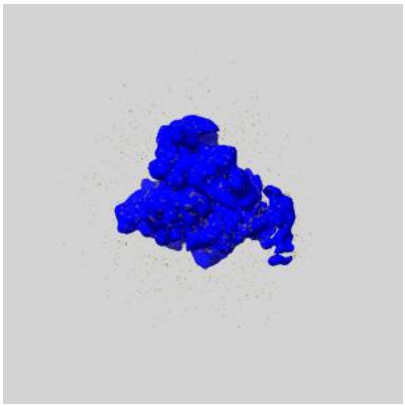
A mask typically either:

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

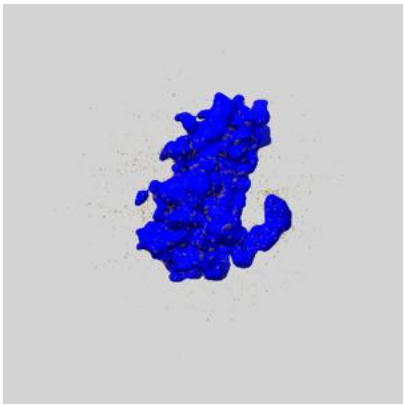
6.6.1 emd_19802_msk_1.map (i)



X



Y

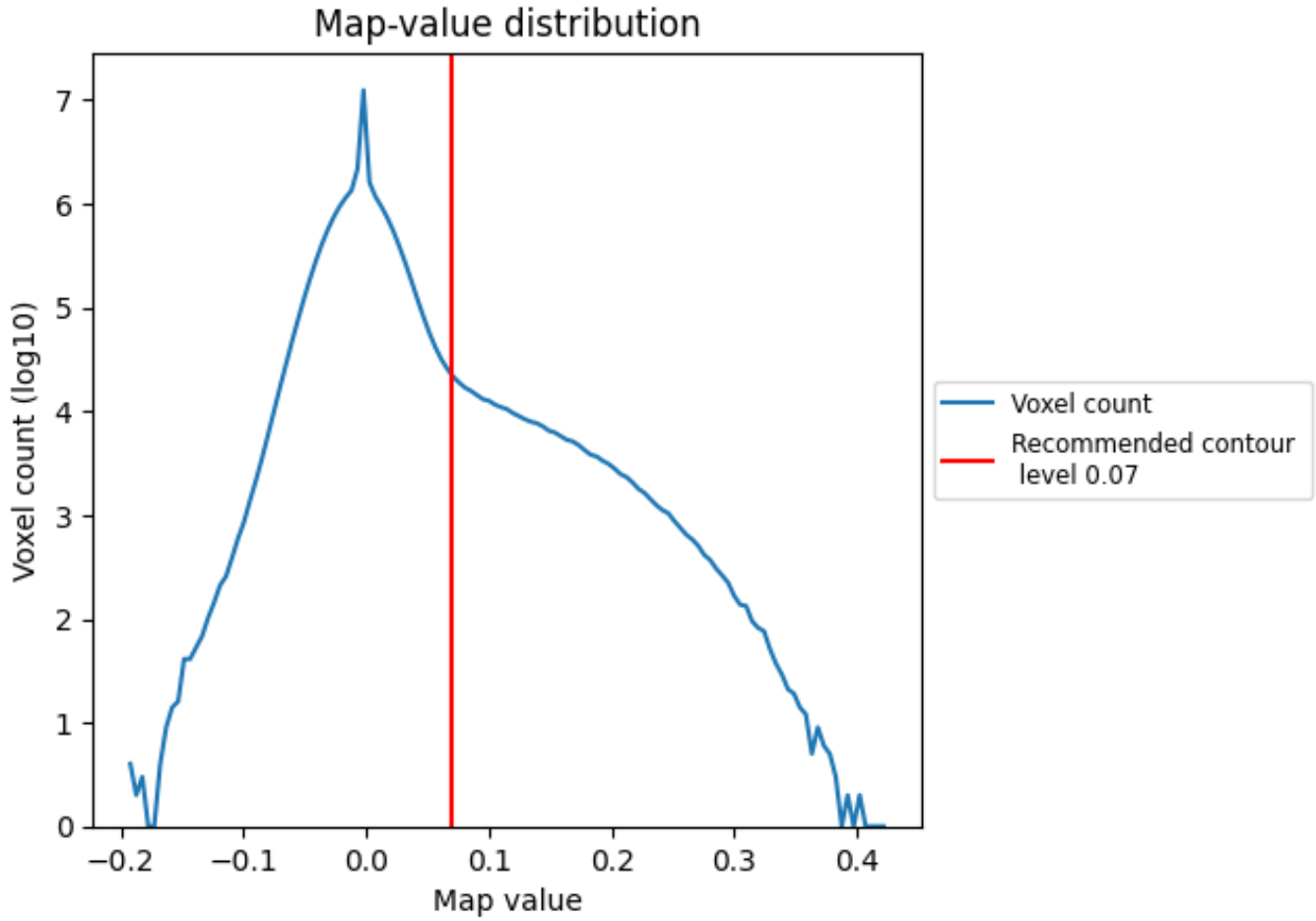


Z

7 Map analysis

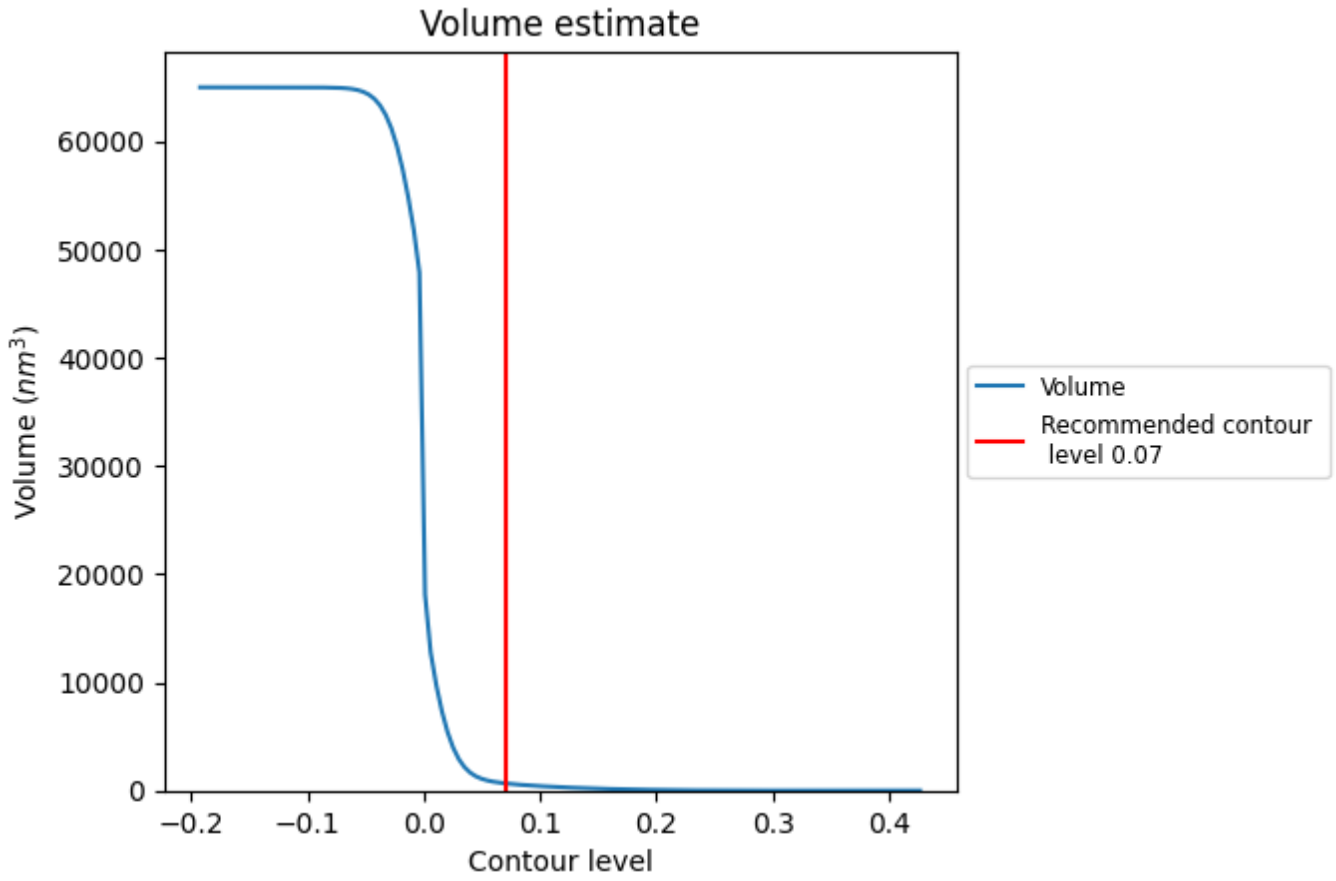
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

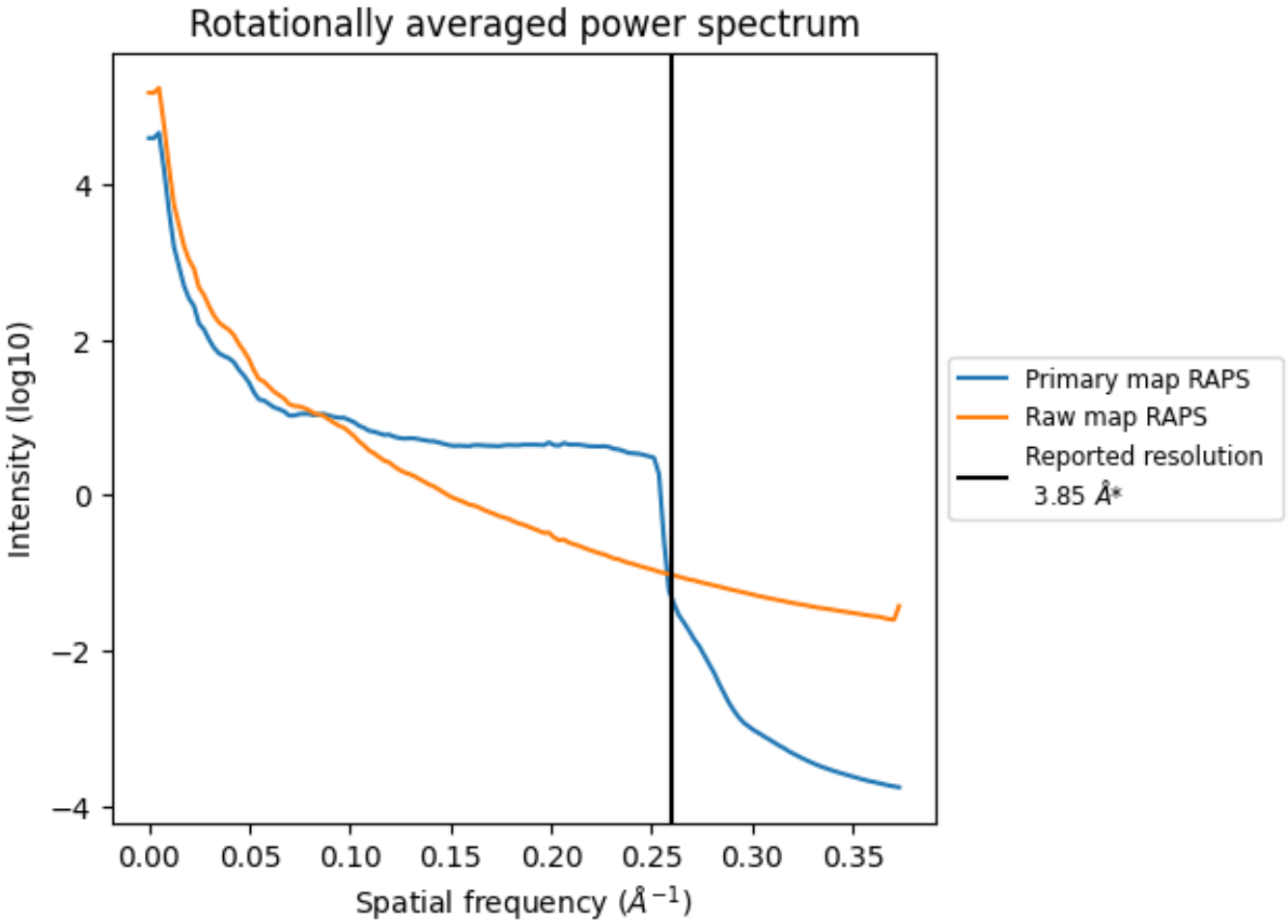
7.2 Volume estimate



The volume at the recommended contour level is 666 nm^3; this corresponds to an approximate mass of 601 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)

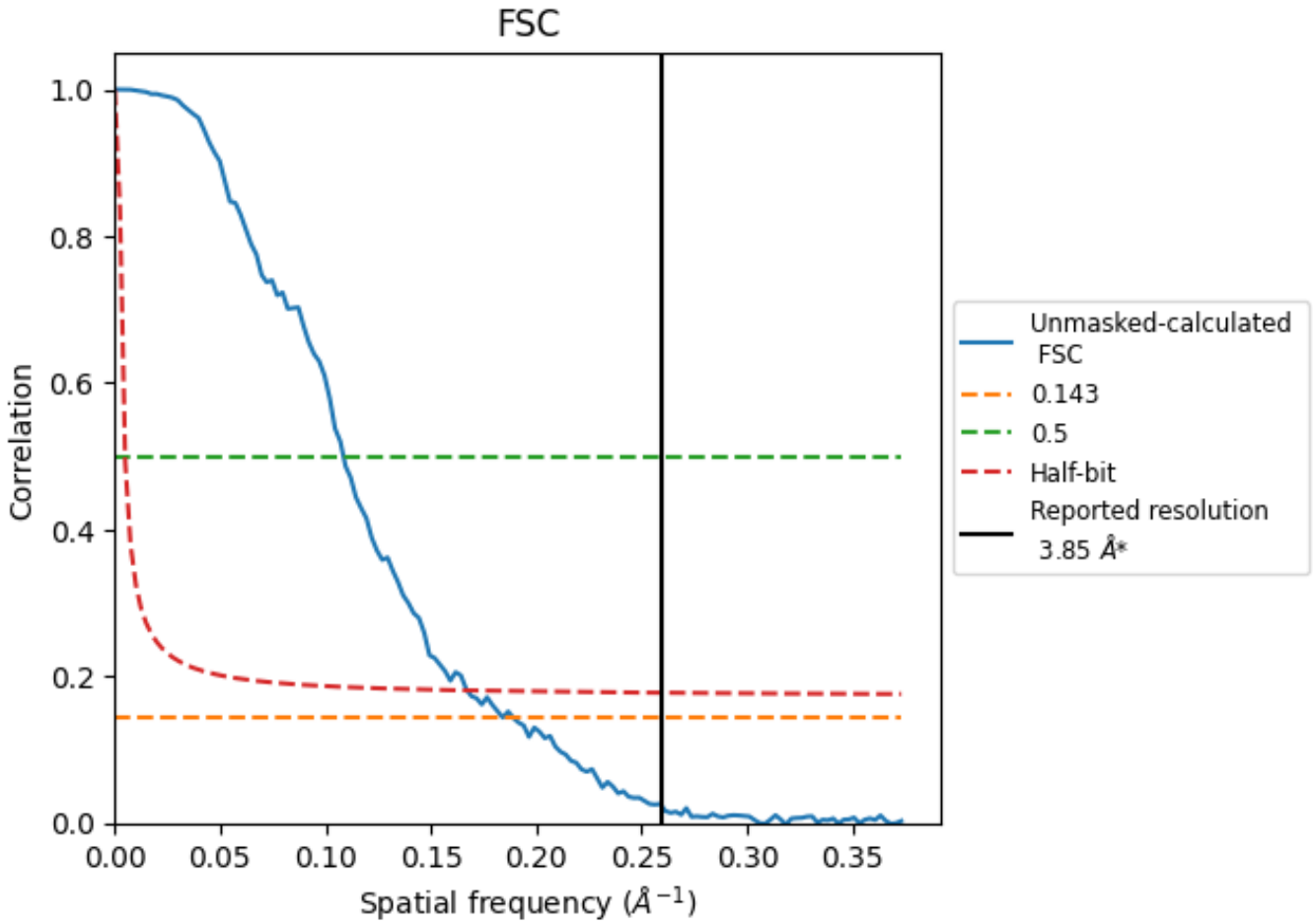


*Reported resolution corresponds to spatial frequency of 0.260 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.260 Å^{-1}

8.2 Resolution estimates (i)

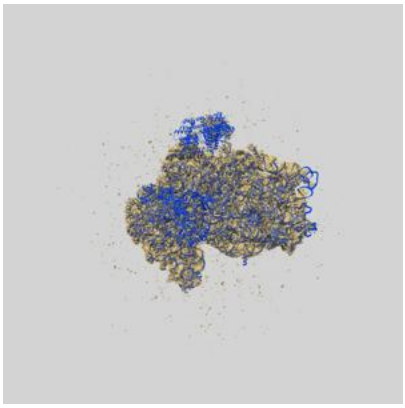
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.85	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.29	9.23	5.98

*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 5.29 differs from the reported value 3.85 by more than 10 %

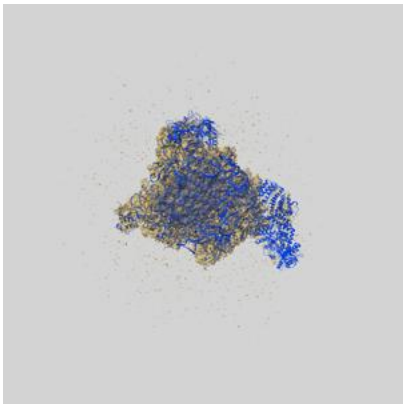
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-19802 and PDB model 8S8E. Per-residue inclusion information can be found in section 3 on page 14.

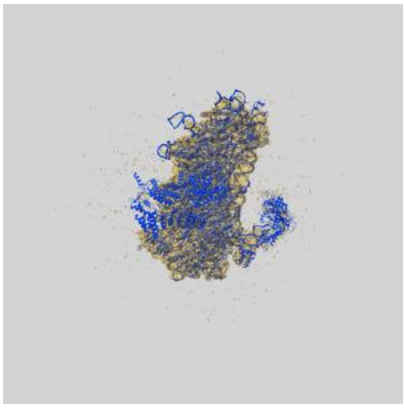
9.1 Map-model overlay



X



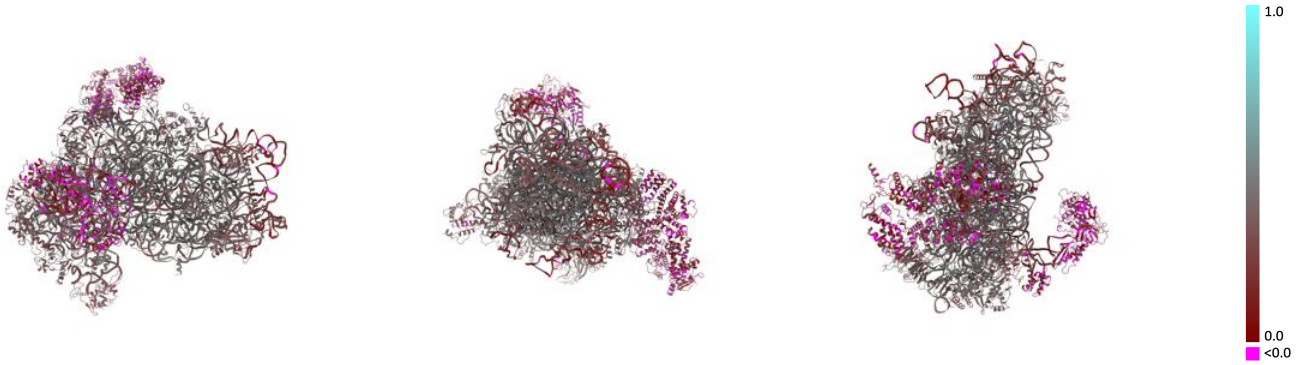
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.07 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.

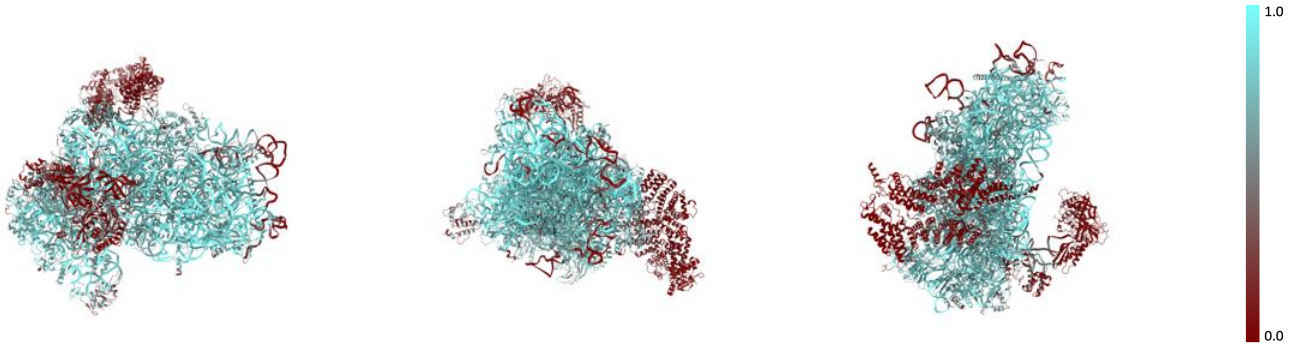
9.2 Q-score mapped to coordinate model



X Y Z

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

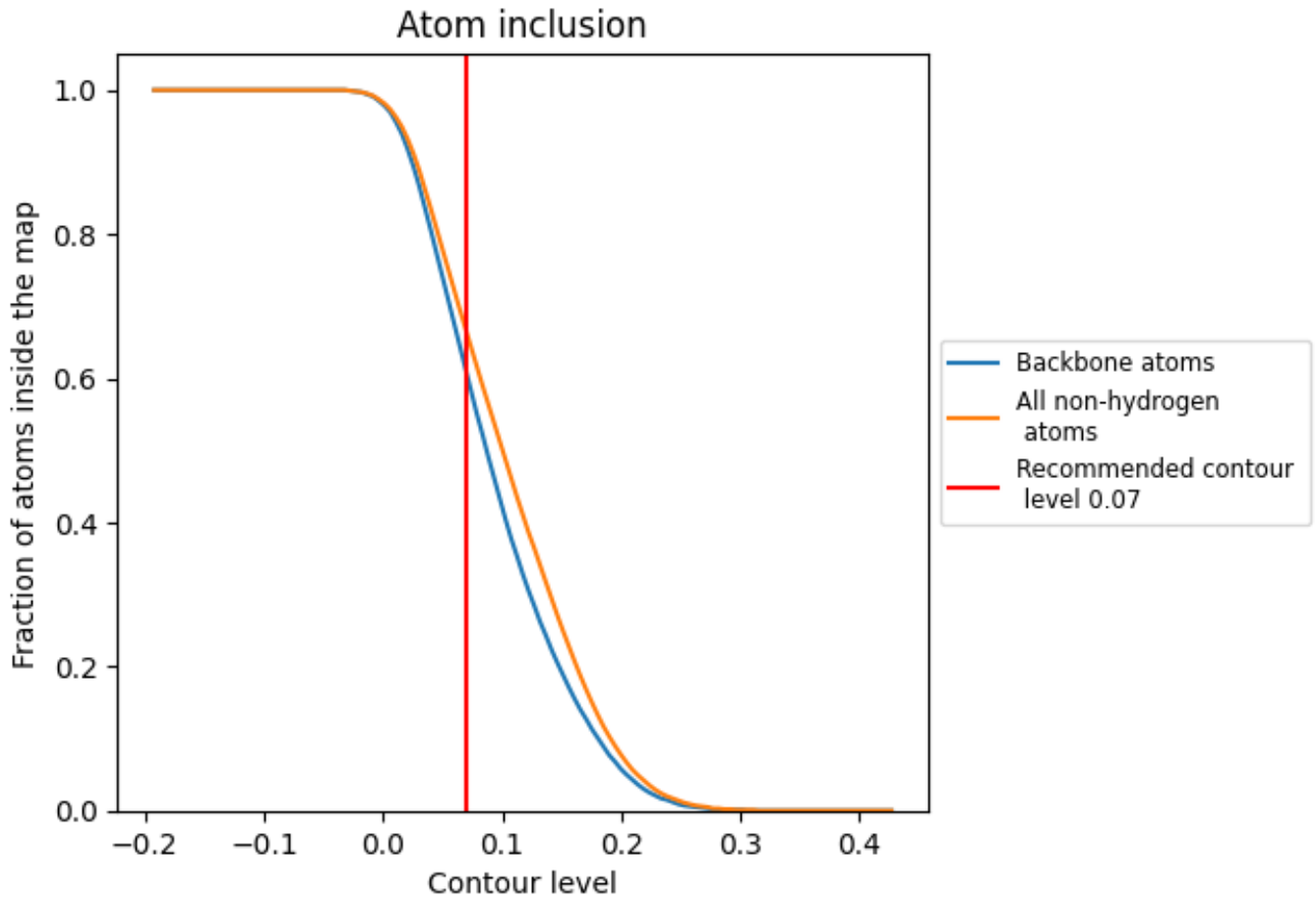
9.3 Atom inclusion mapped to coordinate model



X Y Z

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 (0.07).

9.4 Atom inclusion (i)



At the recommended contour level, 61% 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 (0.07) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6640	0.3470
1	0.5800	0.2250
2	0.8660	0.3830
3	0.3360	0.2790
A	0.7460	0.3960
B	0.6940	0.4000
C	0.7670	0.4320
D	0.7040	0.4140
E	0.7840	0.4330
F	0.7250	0.3990
G	0.7440	0.3630
H	0.6330	0.3740
I	0.7390	0.3990
J	0.7720	0.4190
K	0.7500	0.3760
L	0.7110	0.4220
M	0.3650	0.2660
N	0.7750	0.4140
O	0.7660	0.4020
P	0.7680	0.3720
Q	0.8010	0.4170
R	0.6540	0.3790
S	0.7550	0.3790
T	0.7980	0.3850
U	0.6610	0.3820
V	0.7980	0.4090
W	0.7910	0.4380
X	0.7710	0.4530
Y	0.7920	0.3990
Z	0.5530	0.3290
a	0.7740	0.4550
b	0.5810	0.4100
c	0.7040	0.4260
d	0.8260	0.4330
e	0.6270	0.3880

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Chain	Atom inclusion	Q-score
f	0.4990	0.2860
g	0.7090	0.3660
h	0.1560	0.2870
i	0.3120	0.3800
j	0.1340	0.1730
k	0.0220	0.0870
l	0.0110	0.0520
o	0.0210	0.1460
p	0.0280	0.1400