Full wwPDB EM Validation Report

Oct 28, 2026 – 05:34 pm GMT

PDB ID	:	9SJ4 / pdb_00009sj4
EMDB ID	:	EMD-54937
Title	:	Structure of a circMbl 48S translation initiation complex in the scanning state
Authors	:	Zuber, P.K.; Li, X.; Du, Y.; Gordiyenko, Y.; Haddad, T.F.M.; Ramakrishnan, V.
Deposited on	:	2025-08-29
Resolution	:	3.10 Å(reported)
Based on initial models	:	6ZMW, 1YFG

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 (i) 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 (1)) were used in the production of this report:

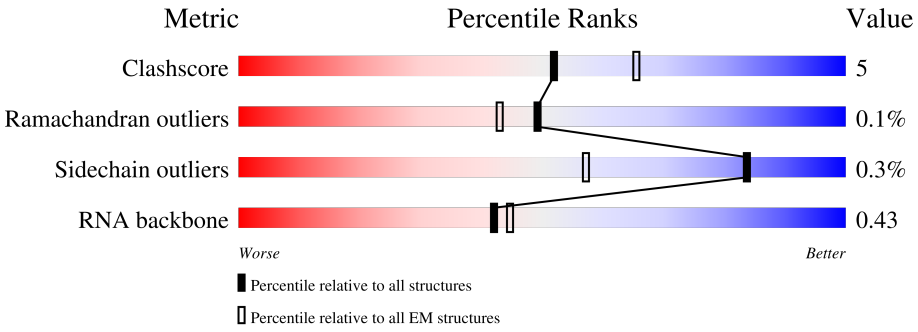
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.2
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

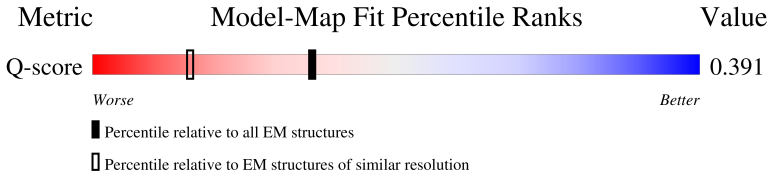
1 Overall quality at a glance

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

The reported resolution of this entry is 3.10 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.





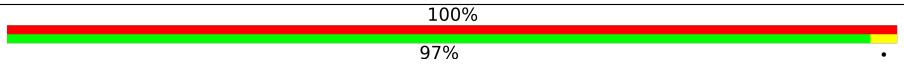
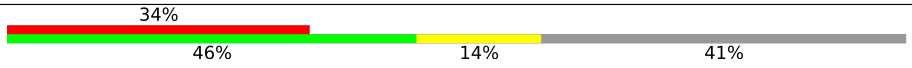
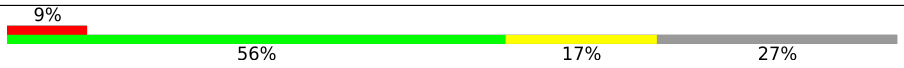
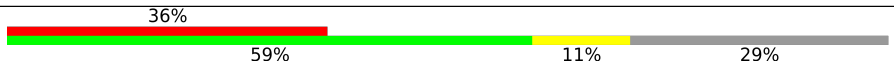
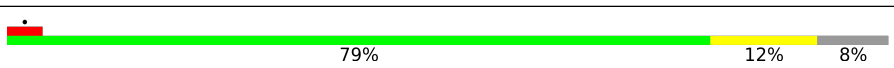
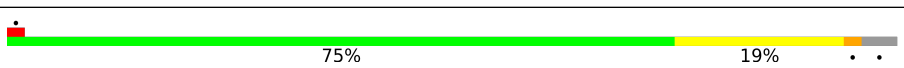
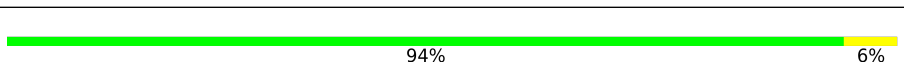
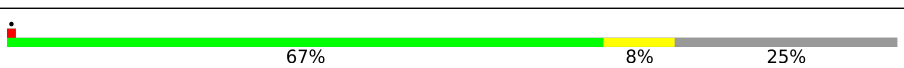
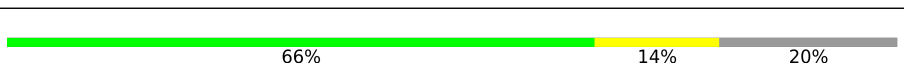
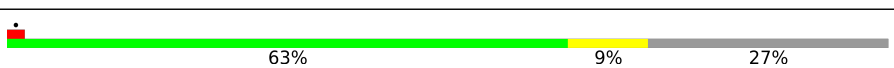
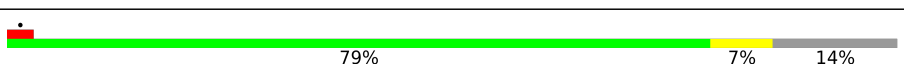
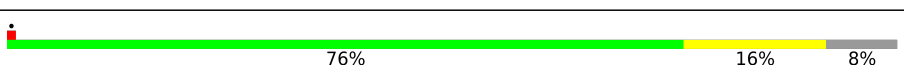
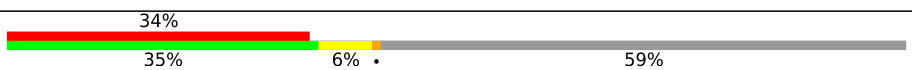
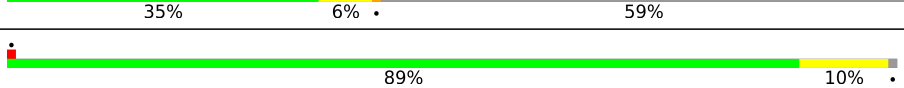
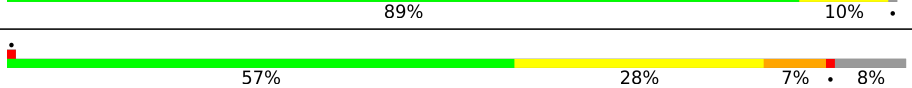
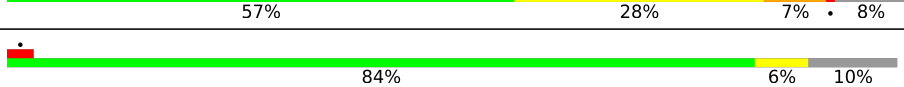
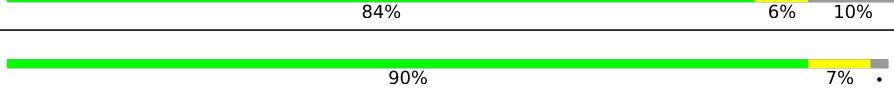
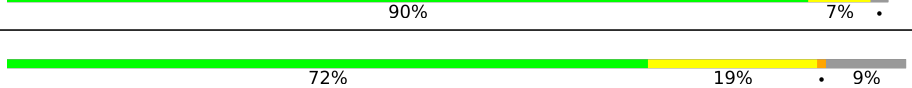
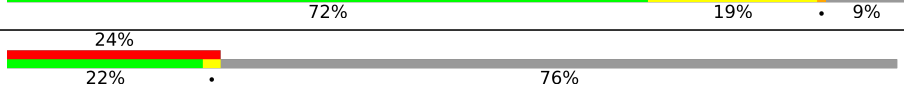
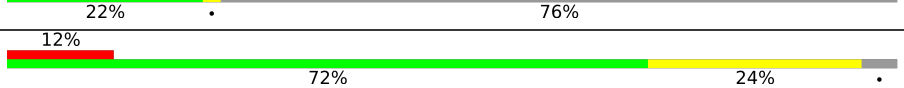
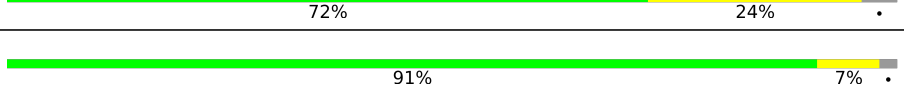
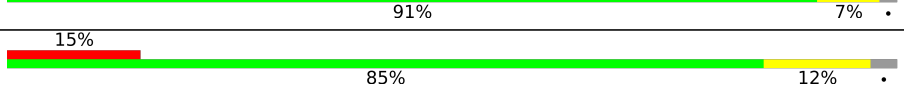
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	14724 (2.60 - 3.60)

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	A	1382	36% 47% 6% 47%
2	B	445	76% 82% 9% 9%
3	D	315	42% 71% 16% 13%

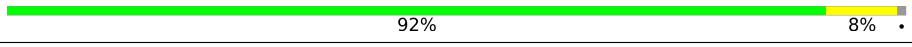
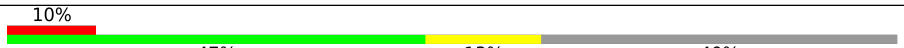
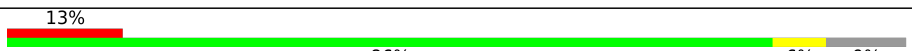
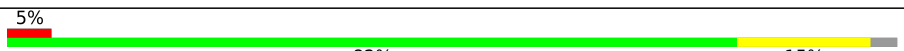
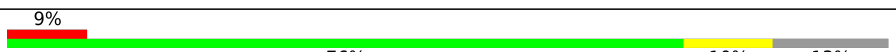
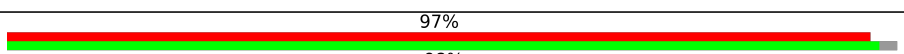
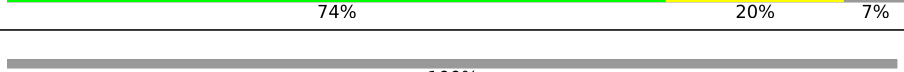
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Mol	Chain	Length	Quality of chain
4	E	472	
5	F	325	
6	G	147	
7	H	116	
8	I	814	
9	J	913	
10	L	194	
11	M	84	
12	N	83	
13	O	293	
14	P	264	
15	Q	295	
16	R	115	
17	S	249	
18	T	151	
19	U	333	
20	V	151	
21	W	1869	
22	X	158	
23	Y	263	
24	Z	194	
25	7	320	
26	9	25	
27	a	143	
28	b	59	

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Mol	Chain	Length	Quality of chain
29	c	130	
30	d	208	
31	e	133	
32	f	204	
33	g	146	
34	h	243	
35	i	165	
36	j	145	
37	k	317	
38	m	125	
39	o	56	
40	p	80	
41	q	132	
42	s	69	
43	v	135	
44	w	119	
45	x	548	
46	6	374	
47	4	357	
48	8	352	
49	3	218	
50	l	145	
51	y	75	
52	n	152	
53	z	774	

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Mol	Chain	Length	Quality of chain
54	5	564	

2 Entry composition

There are 57 unique types of molecules in this entry. The entry contains 113724 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	733	5518	3460	1009	1026	23	1	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	405	2740	1720	498	510	12	0	0

- Molecule 3 is a protein called Eukaryotic translation initiation factor 2 subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	275	2215	1398	387	418	12	0	0

- Molecule 4 is a protein called Eukaryotic translation initiation factor 2 subunit 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	E	356	1750	1038	356	356	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	F	325	1598	947	325	326	0	0

- Molecule 6 is a protein called Eukaryotic translation initiation factor 1A, X-chromosomal.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	G	87	705	446	128	127	4	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-2	GLY	-	expression tag	UNP P47813
G	-1	ALA	-	expression tag	UNP P47813
G	0	HIS	-	expression tag	UNP P47813

- Molecule 7 is a protein called Eukaryotic translation initiation factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	85	Total	C	N	O	S	0	0
			691	438	125	126	2		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-2	GLY	-	expression tag	UNP P41567
H	-1	ALA	-	expression tag	UNP P41567
H	0	HIS	-	expression tag	UNP P41567

- Molecule 8 is a protein called Eukaryotic translation initiation factor 3 subunit B.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	575	Total	C	N	O	S	0	0
			4569	2935	788	828	18		

- Molecule 9 is a protein called Eukaryotic translation initiation factor 3 subunit C.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	645	Total	C	N	O	S	0	0
			4940	3096	888	923	33		

- Molecule 10 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	178	Total	C	N	O	S	0	0
			1439	923	262	253	1		

- Molecule 11 is a protein called 40S ribosomal protein S27.

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

- Molecule 12 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	N	83	Total	C	N	O	S	0	0
			636	393	117	121	5		

- Molecule 13 is a protein called 40S ribosomal protein S2.

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

- Molecule 14 is a protein called 40S ribosomal protein S3a.

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

- Molecule 15 is a protein called 40S ribosomal protein SA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	Q	214	Total	C	N	O	S	0	0
			1695	1077	297	313	8		

- Molecule 16 is a protein called 40S ribosomal protein S26.

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

- Molecule 17 is a protein called 40S ribosomal protein S6.

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

- Molecule 18 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	T	133	Total	C	N	O	S	0	0
			998	610	196	186	6		

- Molecule 19 is a protein called Eukaryotic translation initiation factor 2 subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	U	138	Total	C	N	O	S	0	0
			1123	709	206	199	9		

- Molecule 20 is a protein called 40S ribosomal protein S13.

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

- Molecule 21 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	W	1716	Total	C	N	O	P	0	0
			36675	16396	6572	11991	1716		

- Molecule 22 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	X	142	Total	C	N	O	S	0	0
			1166	743	218	199	6		

- Molecule 23 is a protein called Small ribosomal subunit protein eS4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Y	257	Total	C	N	O	S	0	0
			2041	1305	379	349	8		

- Molecule 24 is a protein called 40S ribosomal protein S9.

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

- Molecule 25 is a protein called Eukaryotic translation initiation factor 3 subunit G.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	7	77	Total	C	N	O	0	0
			616	389	111	116		

- Molecule 26 is a protein called 60S ribosomal protein L41.

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

- Molecule 27 is a protein called 40S ribosomal protein S23.

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

- Molecule 28 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	b	57	Total	C	N	O	S	0	0
			452	279	99	73	1		

- Molecule 29 is a protein called 40S ribosomal protein S15a.

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

- Molecule 30 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	d	198	Total	C	N	O	S	0	0
			1628	1021	322	280	5		

- Molecule 31 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	e	125	Total	C	N	O	S	0	0
			1015	642	199	169	5		

- Molecule 32 is a protein called 40S ribosomal protein S5.

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

- Molecule 33 is a protein called 40S ribosomal protein S16.

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

- Molecule 34 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	h	225	Total	C	N	O	S	0	0
			1752	1117	315	313	7		

- Molecule 35 is a protein called 40S ribosomal protein S10.

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

- Molecule 36 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	j	113	Total	C	N	O	S	0	0
			936	596	172	161	7		

- Molecule 37 is a protein called Receptor of activated protein C kinase 1.

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

- Molecule 38 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	m	70	Total	C	N	O	S	0	0
			559	360	102	96	1		

- Molecule 39 is a protein called 40S ribosomal protein S29.

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

- Molecule 40 is a protein called Ubiquitin-ribosomal protein eS31 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	p	53	Total	C	N	O	S	0	0
			435	276	82	70	7		

- Molecule 41 is a protein called 40S ribosomal protein S12.

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

- Molecule 42 is a protein called 40S ribosomal protein S28.

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

- Molecule 43 is a protein called 40S ribosomal protein S17.

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

- Molecule 44 is a protein called 40S ribosomal protein S20.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
45	x	423	Total	C	N	O	S	0	0
			2838	1749	522	557	10		

- Molecule 46 is a protein called Eukaryotic translation initiation factor 3 subunit M.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	6	350	Total	C	N	O	S	0	0
			2099	1287	395	410	7		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
47	4	257	Total 1272	C 757	N 257	O 258	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
48	8	317	Total 1574	C 937	N 318	O 319	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
49	3	213	Total 1057	C 631	N 213	O 213	0	0

- Molecule 50 is a protein called 40S ribosomal protein S19.

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

- Molecule 51 is a RNA chain called tRNAi-Met.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	y	73	Total 1597	C 715	N 290	O 518	P 74	0	0

- Molecule 52 is a protein called 40S ribosomal protein S18.

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

- Molecule 53 is a RNA chain called circMbl-FLAG.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	z	3	Total 67	C 30	N 15	O 19	P 3	0	0

- Molecule 54 is a protein called Eukaryotic translation initiation factor 3 subunit L.

Mol	Chain	Residues	Atoms				AltConf	Trace
54	5	319	Total	C	N	O	0	0
			1581	943	319	319		

- Molecule 55 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
55	R	1	Total	Zn	0
			1	1	
55	o	1	Total	Zn	0
			1	1	
55	p	1	Total	Zn	0
			1	1	

- Molecule 56 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
56	S	1	Total	Mg	0
			1	1	
56	W	75	Total	Mg	0
			75	75	

- Molecule 57 is POTASSIUM ION (CCD ID: K) (formula: K).

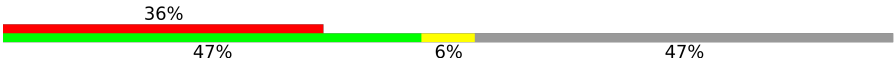
Mol	Chain	Residues	Atoms		AltConf
57	W	1	Total	K	0
			1	1	

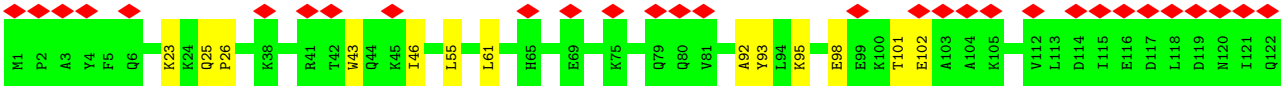
3 Residue-property plots (i)

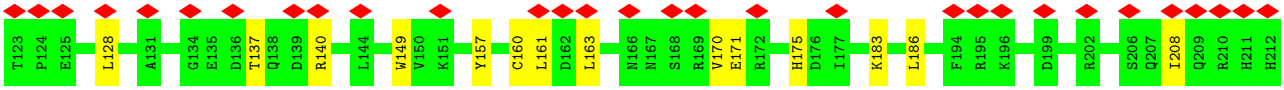
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

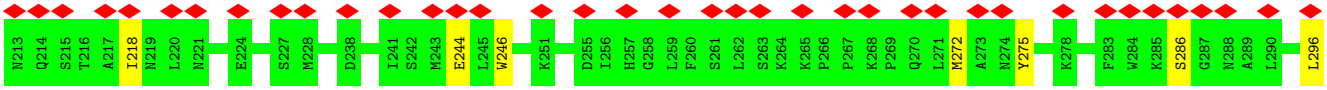
• Molecule 1: Eukaryotic translation initiation factor 3 subunit A

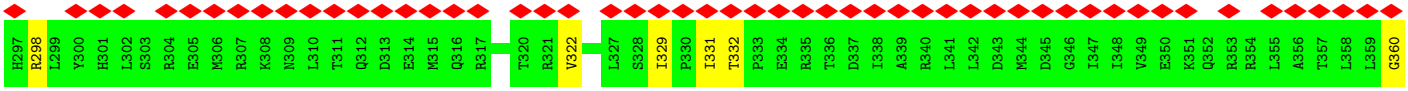
Chain A:

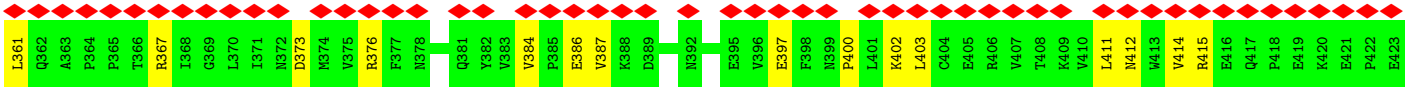


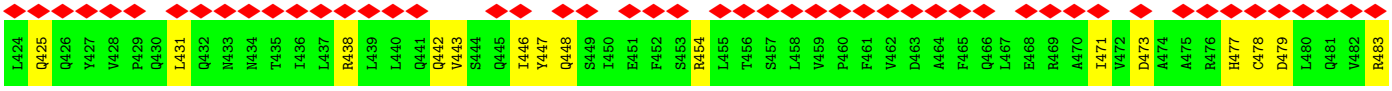


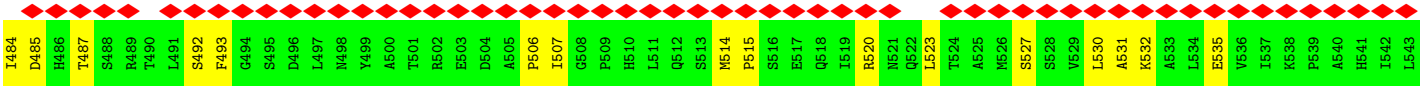




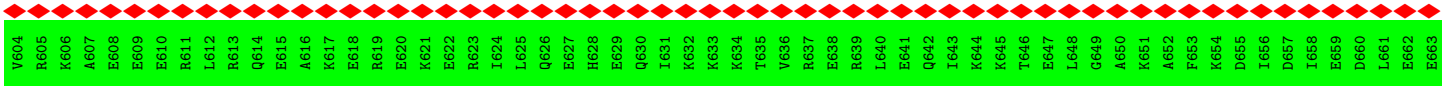


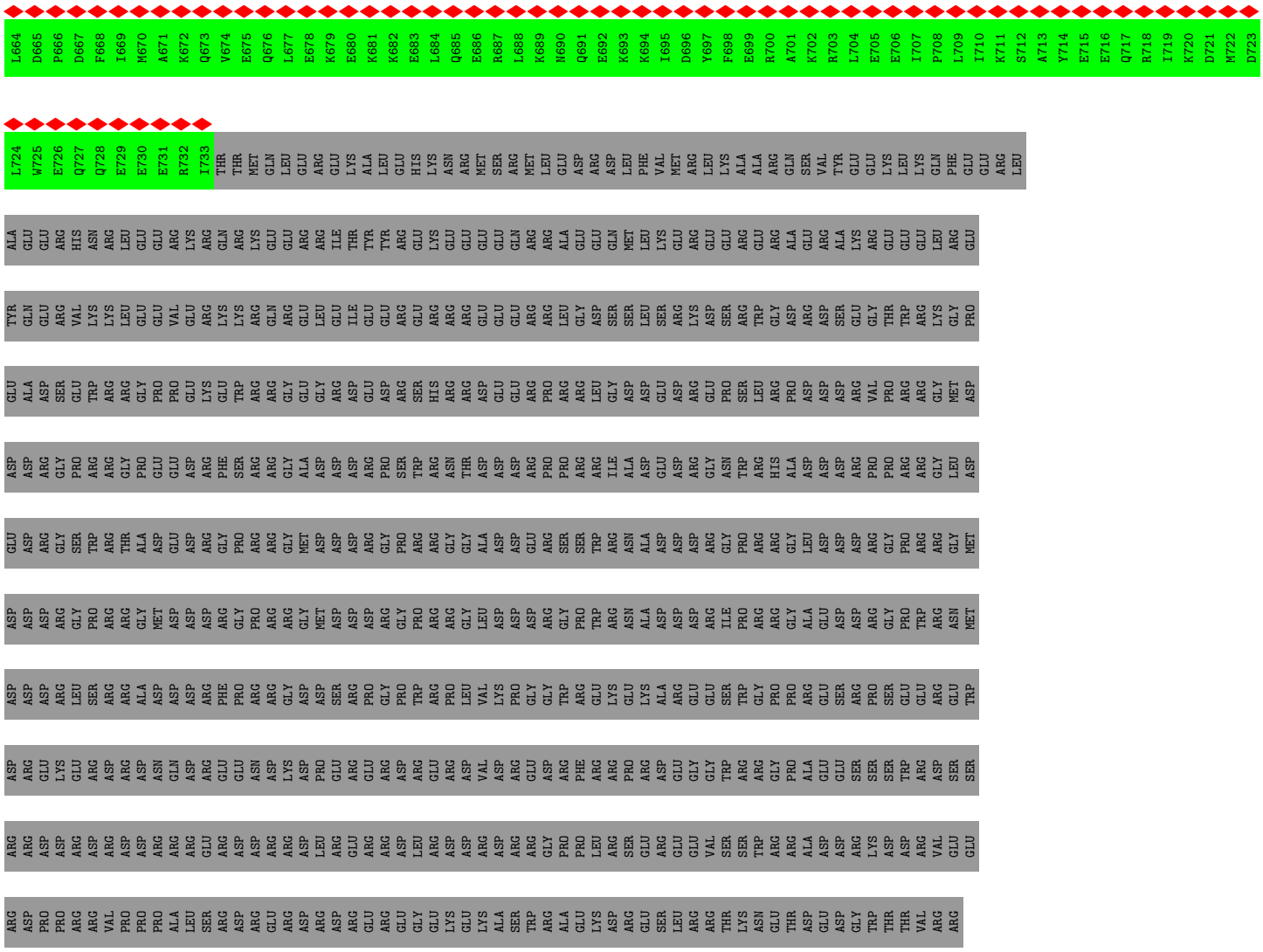








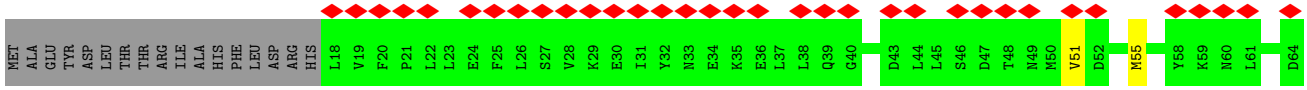


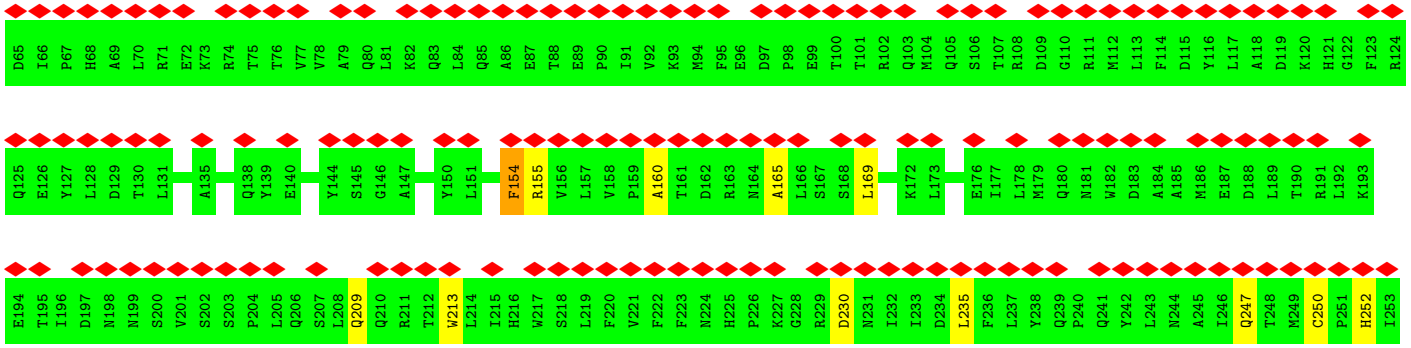


• Molecule 2: Eukaryotic translation initiation factor 3 subunit E

Chain B:





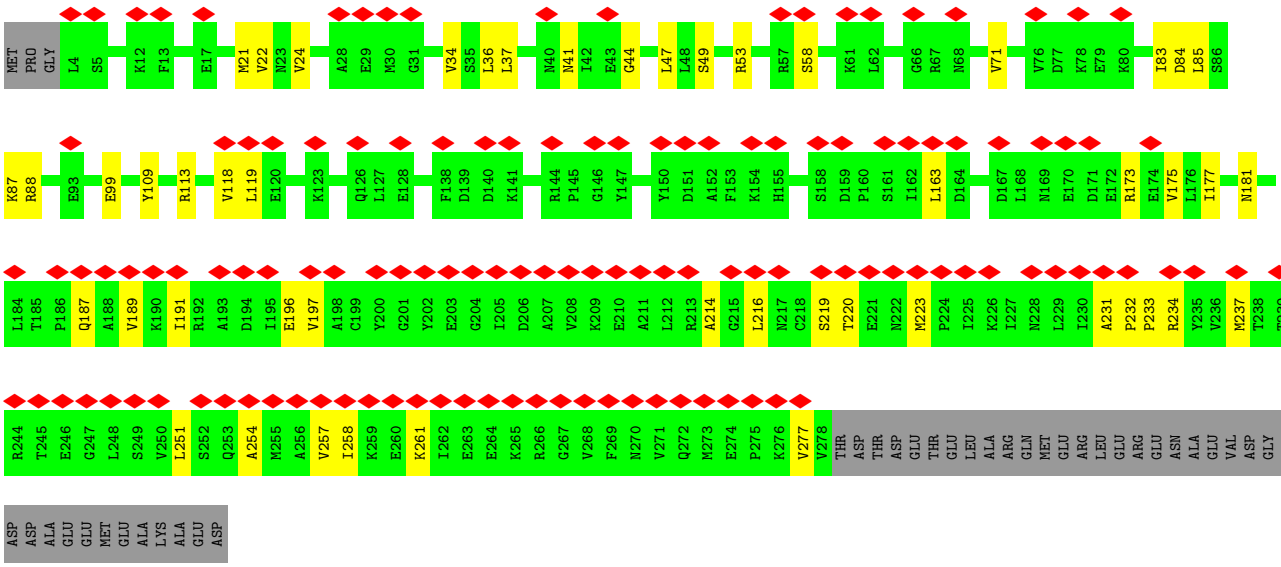




• Molecule 3: Eukaryotic translation initiation factor 2 subunit 1

Chain D:

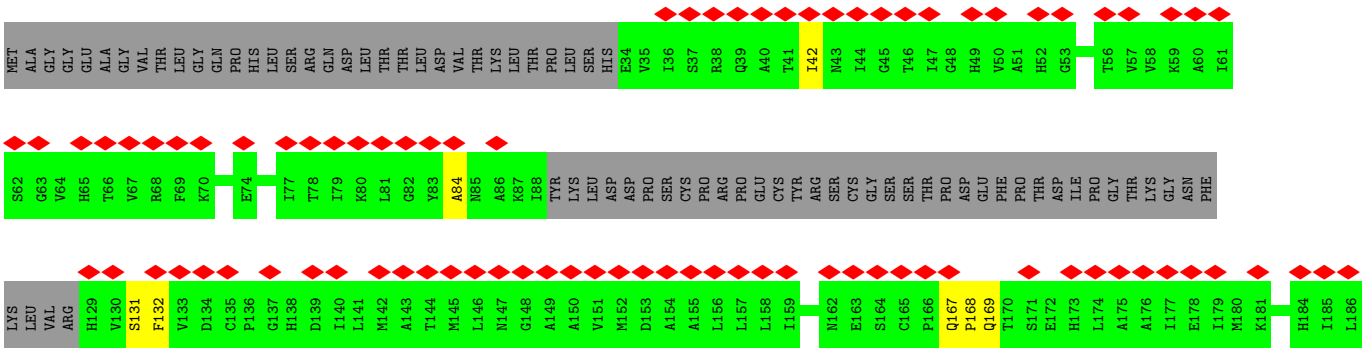


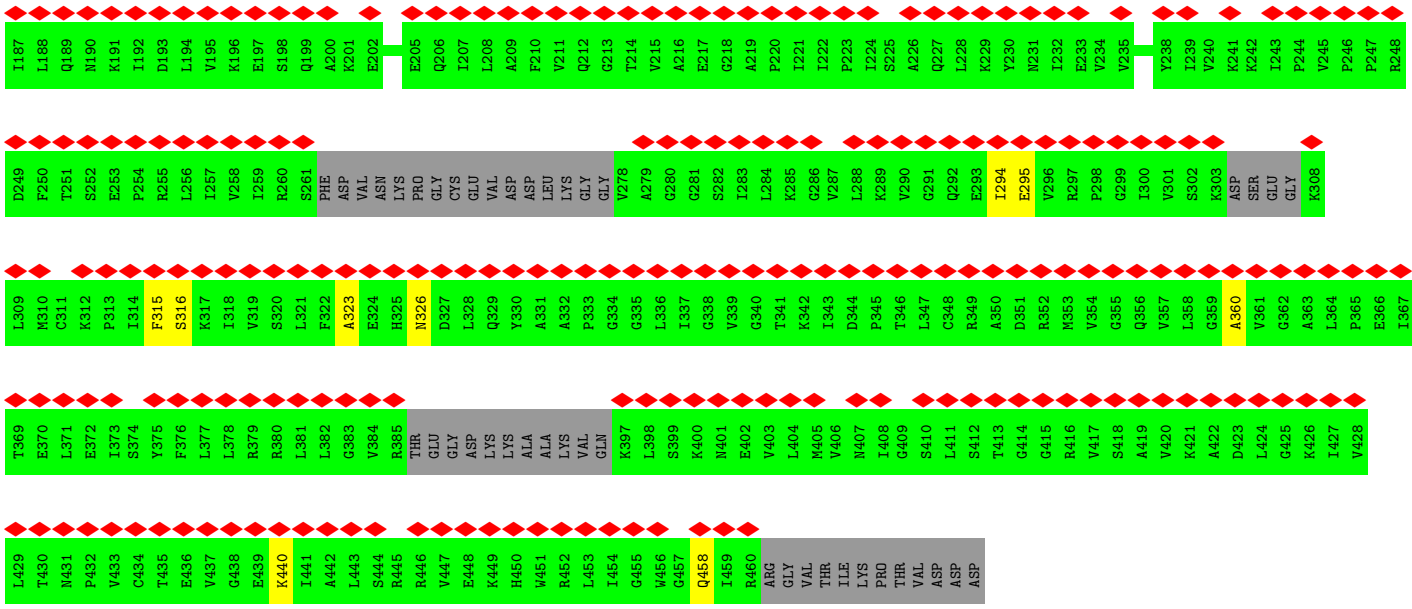


• Molecule 4: Eukaryotic translation initiation factor 2 subunit 3

Chain E:



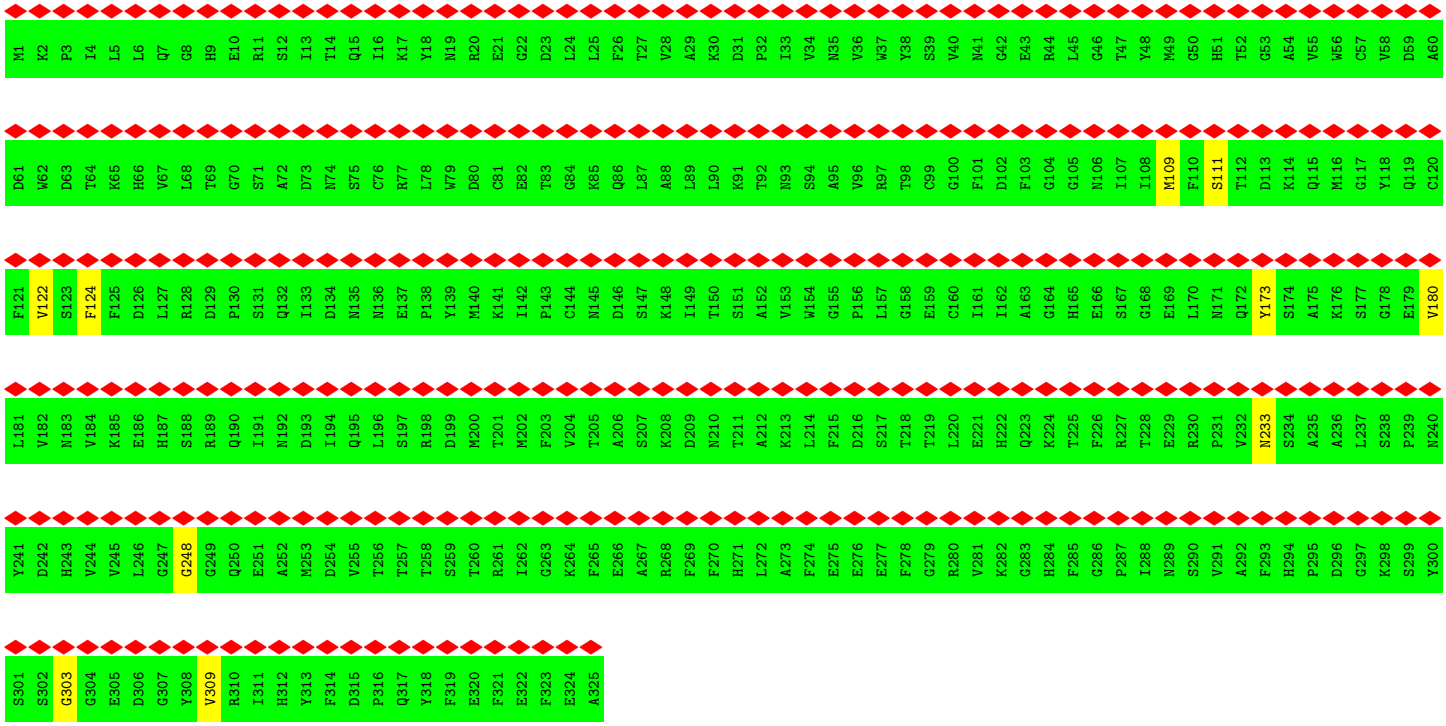




• Molecule 5: Eukaryotic translation initiation factor 3 subunit I

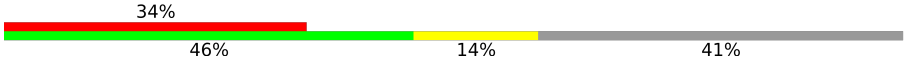
Chain F:

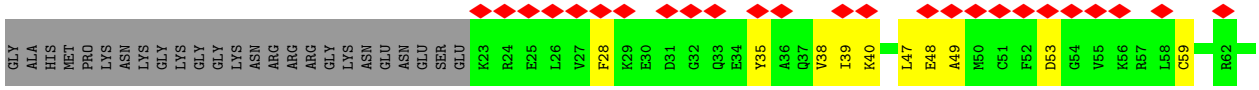


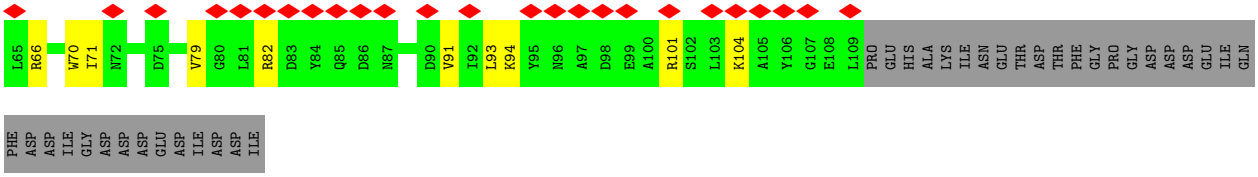


• Molecule 6: Eukaryotic translation initiation factor 1A, X-chromosomal

Chain G:







• Molecule 7: Eukaryotic translation initiation factor 1

Chain H:

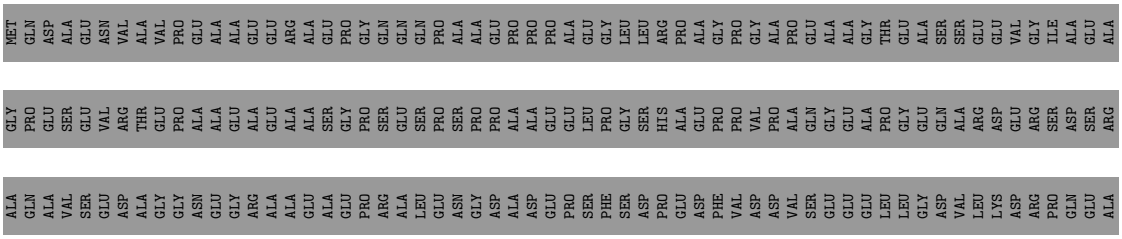




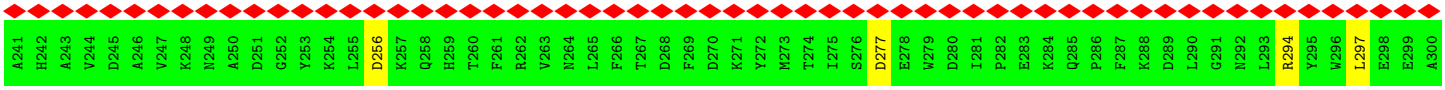
• Molecule 8: Eukaryotic translation initiation factor 3 subunit B

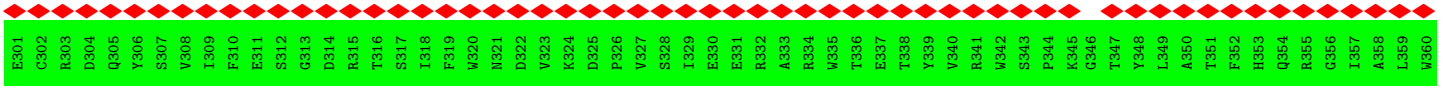
Chain I:

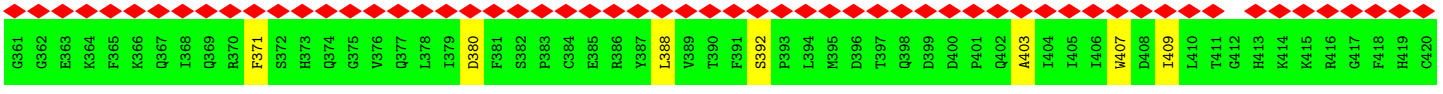


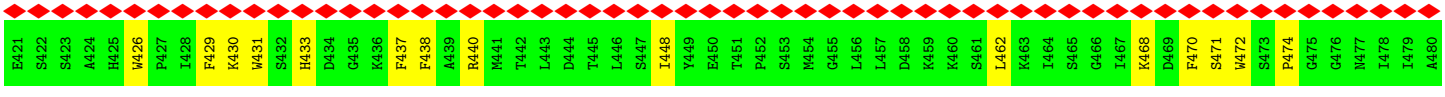


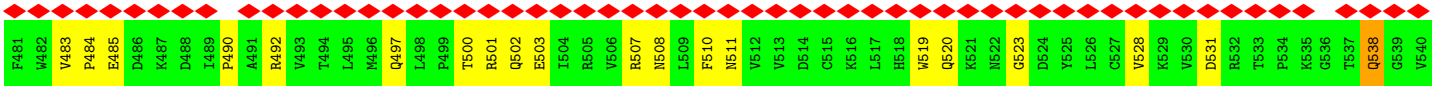


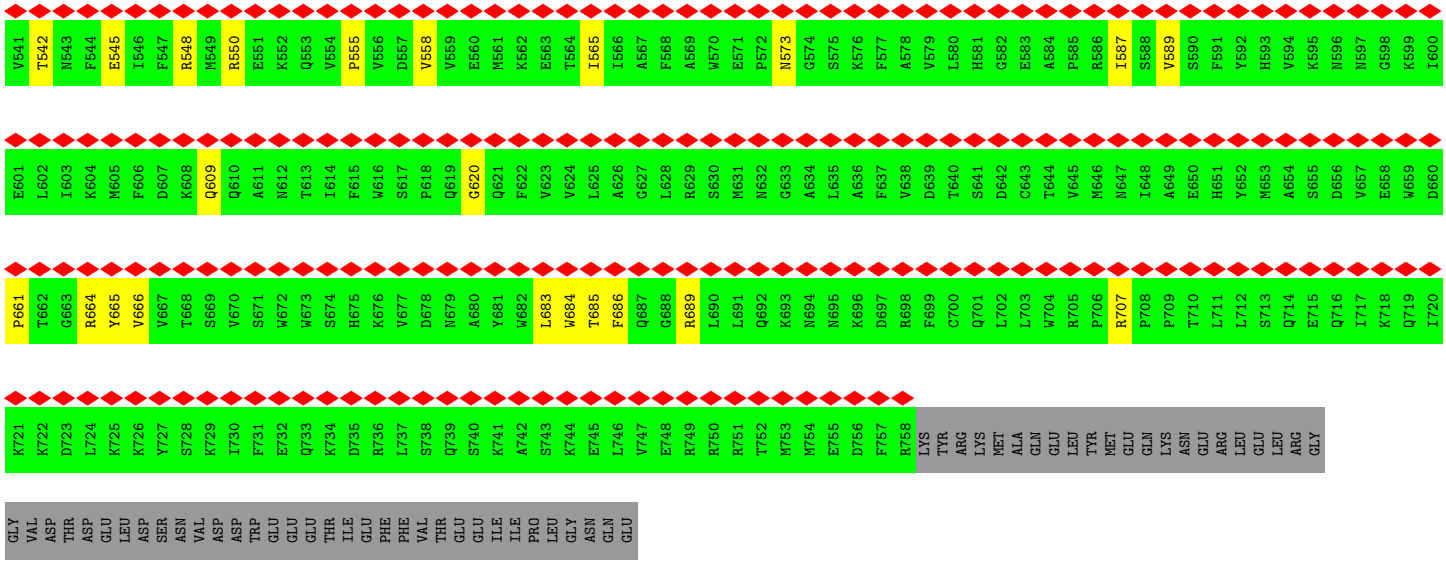








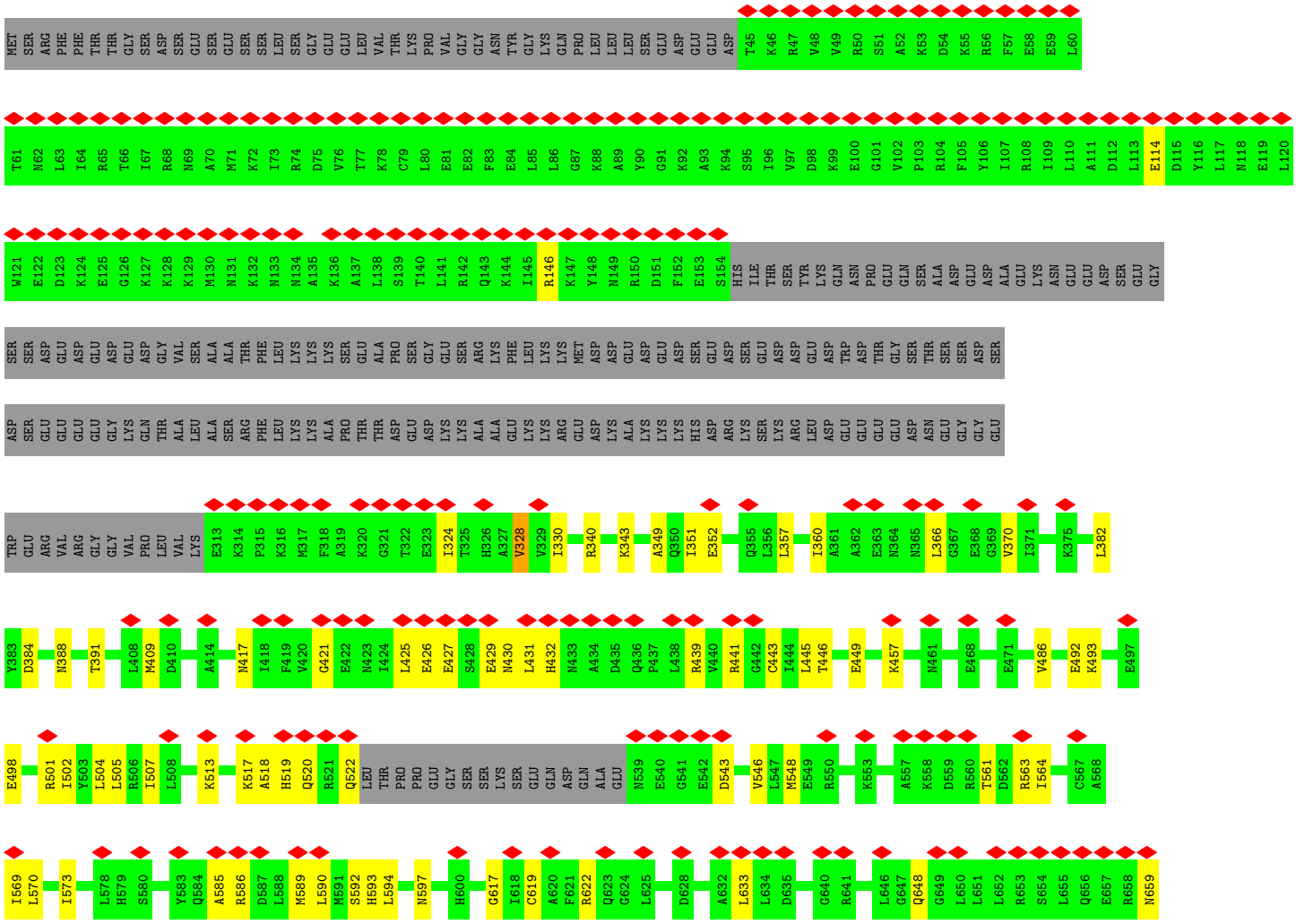


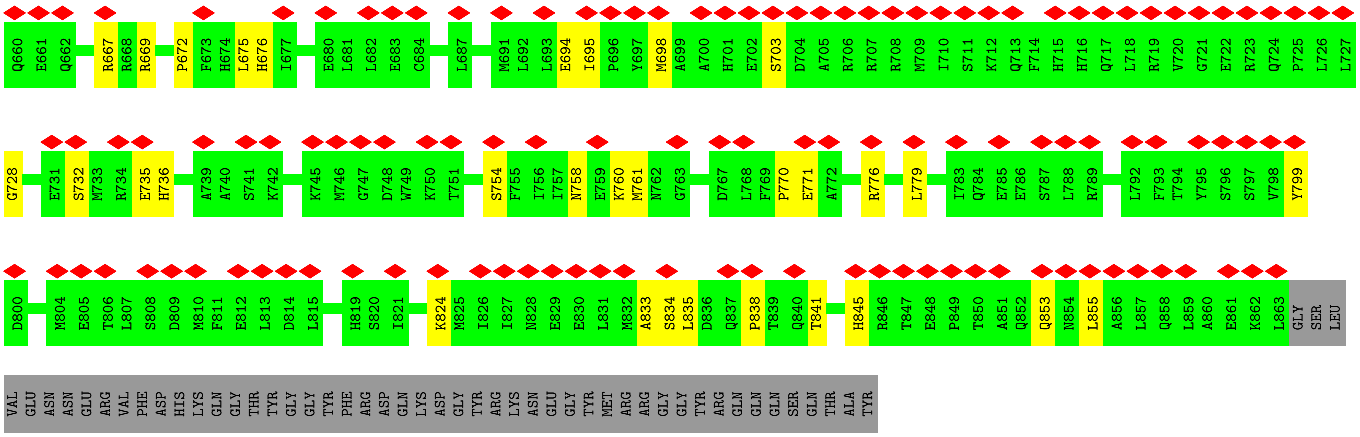


• Molecule 9: Eukaryotic translation initiation factor 3 subunit C

Chain J:



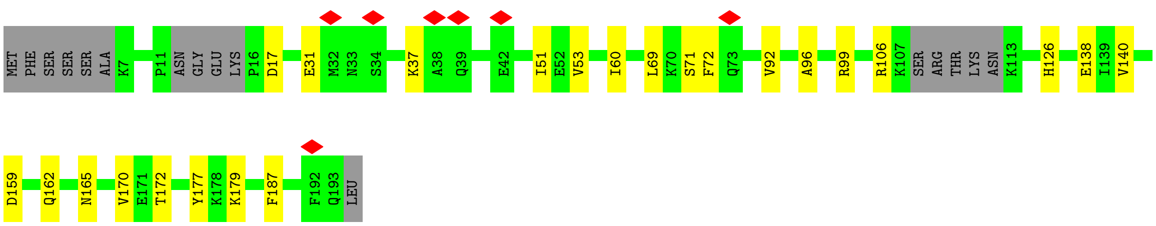




- Molecule 10: 40S ribosomal protein S7

Chain L:

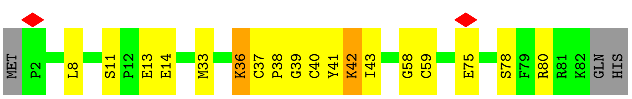




- Molecule 11: 40S ribosomal protein S27

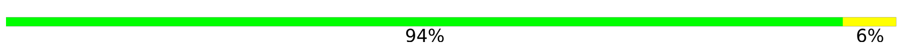
Chain M:

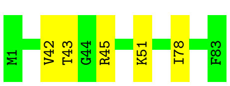




- Molecule 12: 40S ribosomal protein S21

Chain N:

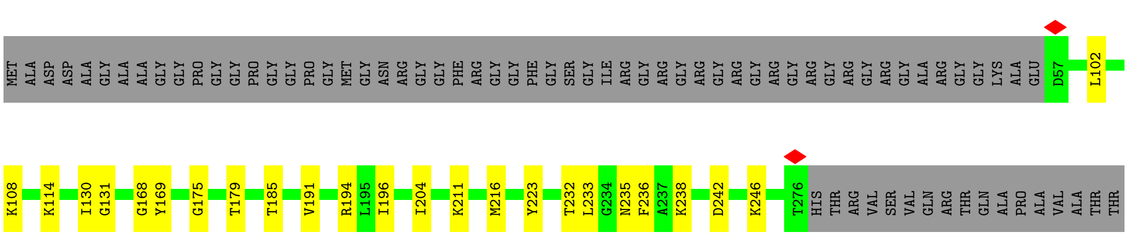




- Molecule 13: 40S ribosomal protein S2

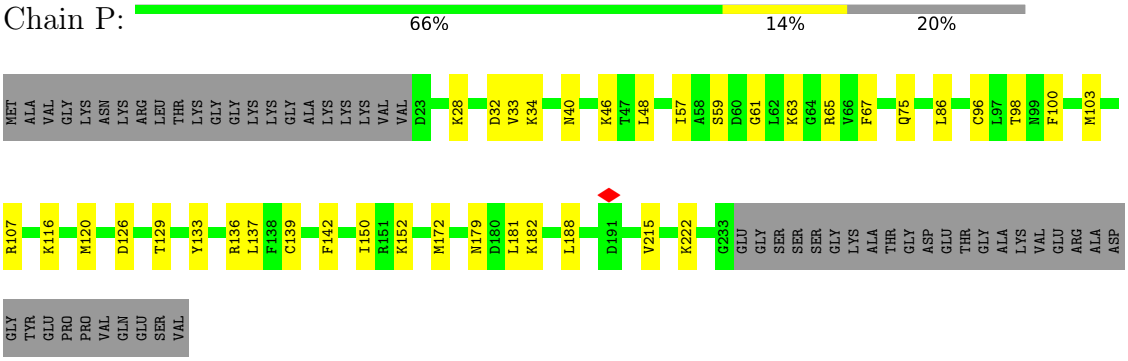
Chain O:





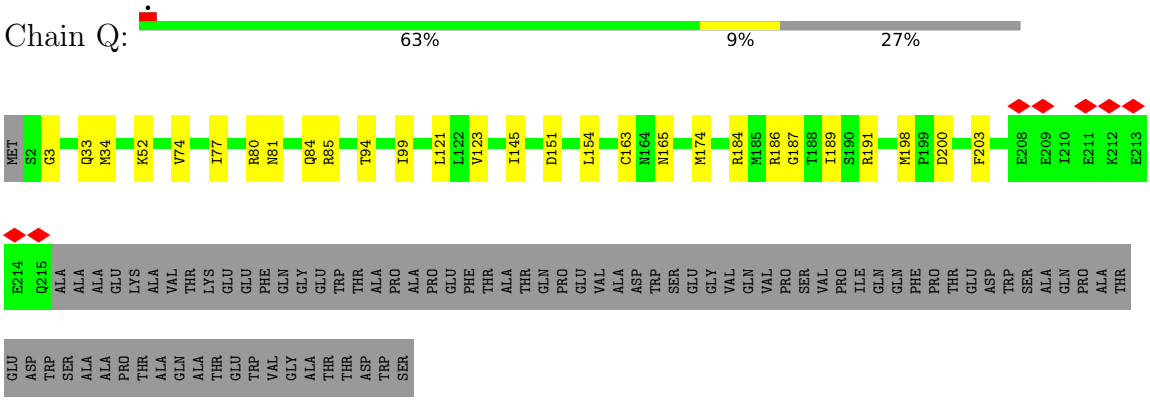
• Molecule 14: 40S ribosomal protein S3a

Chain P:



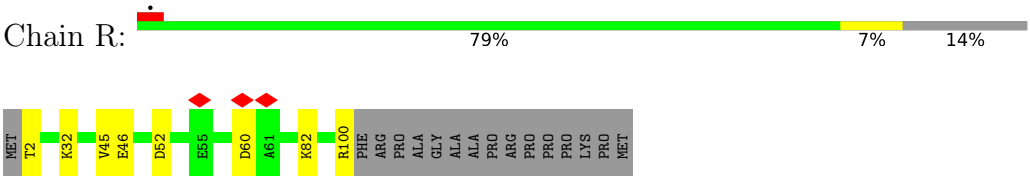
• Molecule 15: 40S ribosomal protein SA

Chain Q:



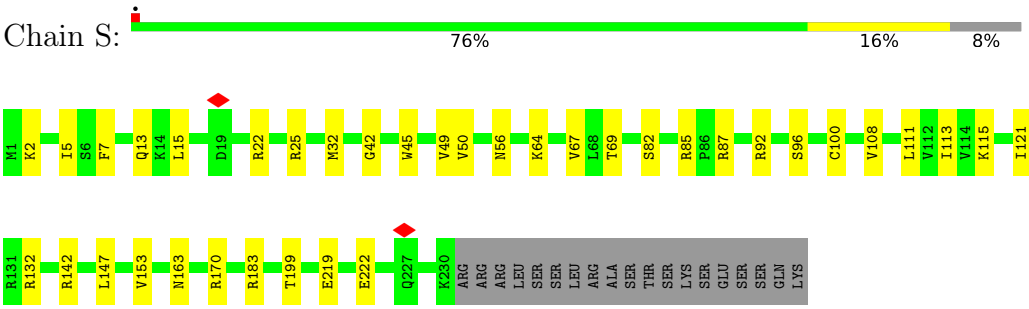
• Molecule 16: 40S ribosomal protein S26

Chain R:



• Molecule 17: 40S ribosomal protein S6

Chain S:



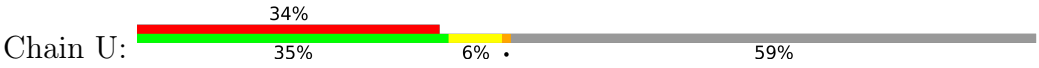
• Molecule 18: 40S ribosomal protein S14

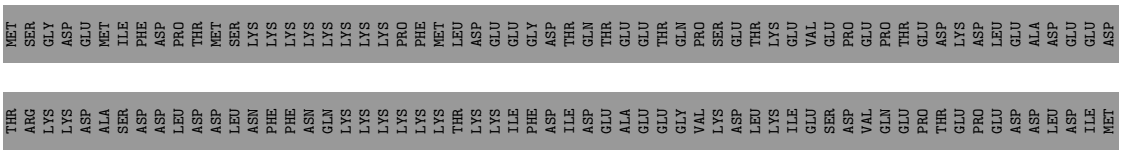
Chain T:

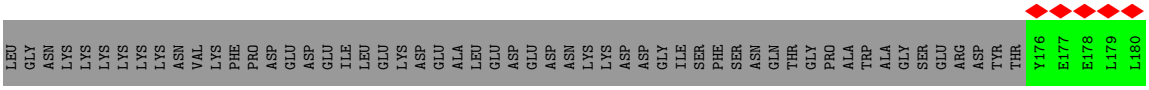


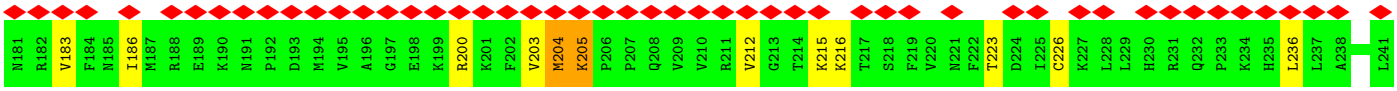


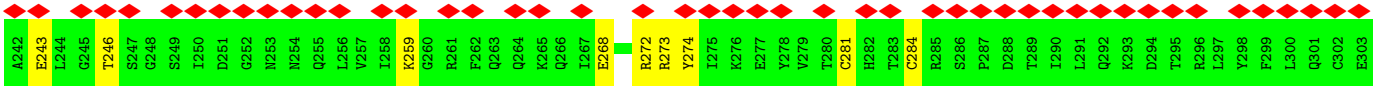
• Molecule 19: Eukaryotic translation initiation factor 2 subunit 2

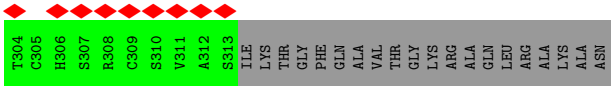




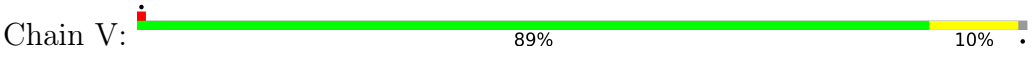


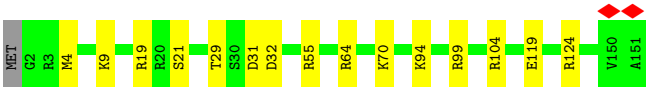






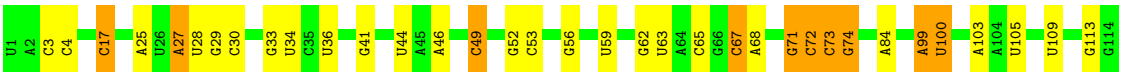
• Molecule 20: 40S ribosomal protein S13

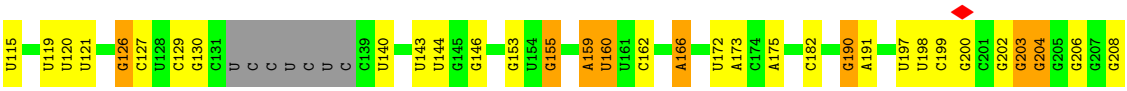




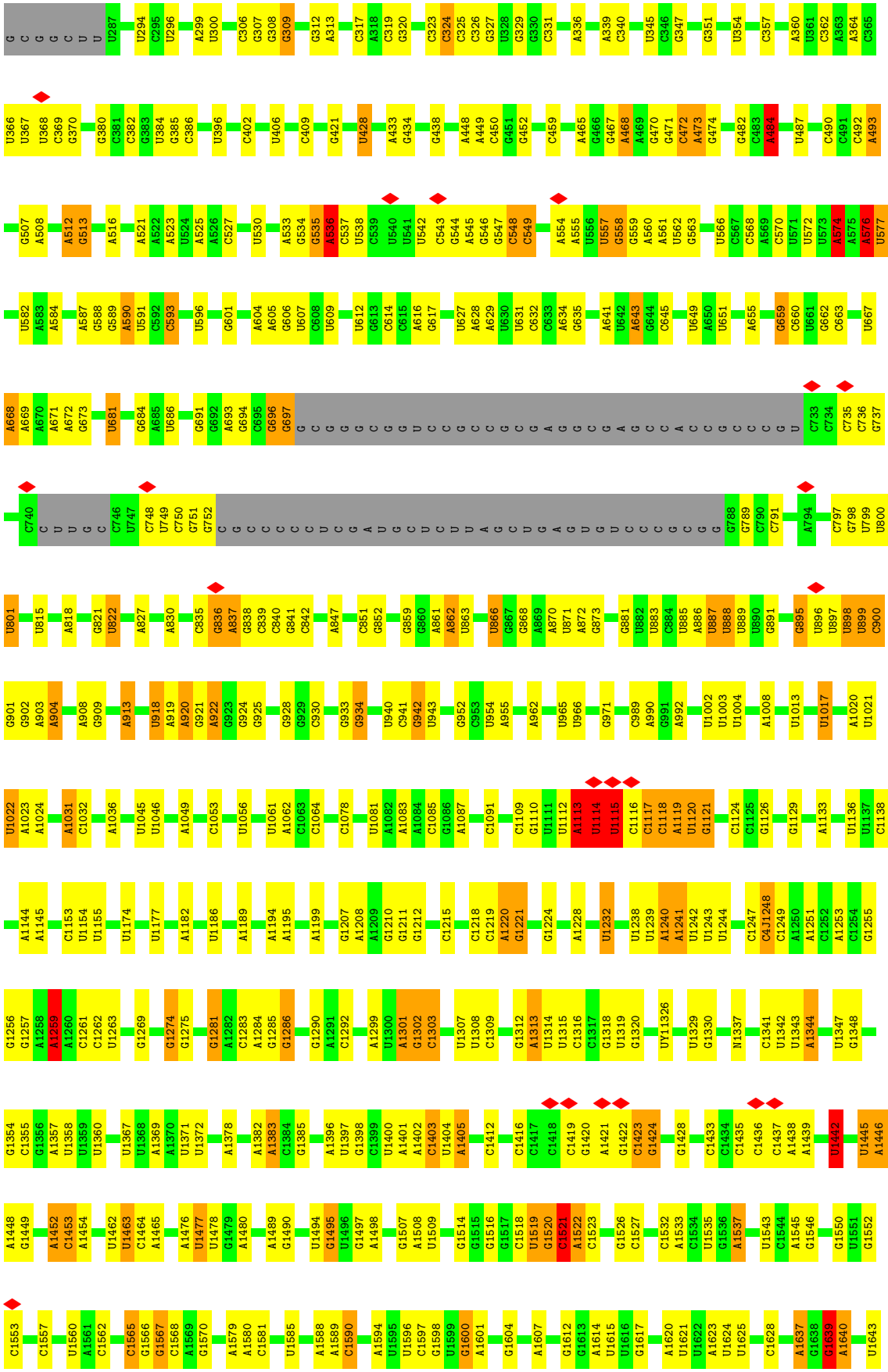
• Molecule 21: 18S rRNA

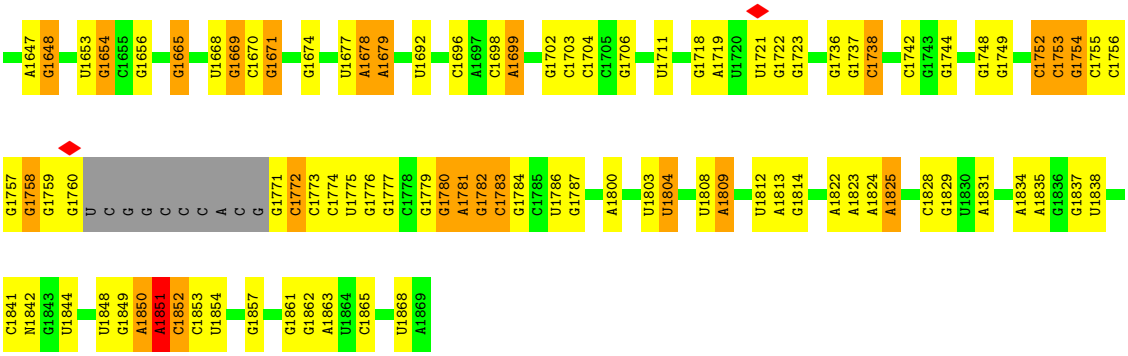




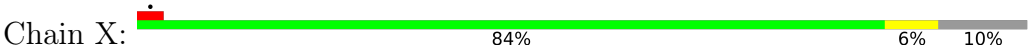


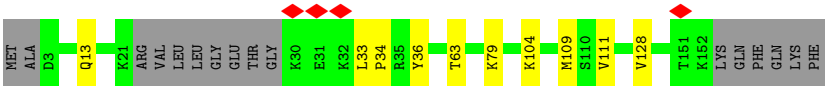




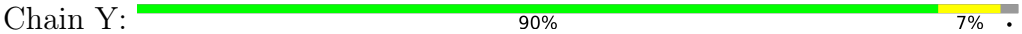


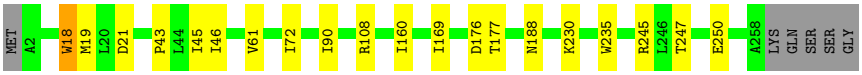
• Molecule 22: 40S ribosomal protein S11





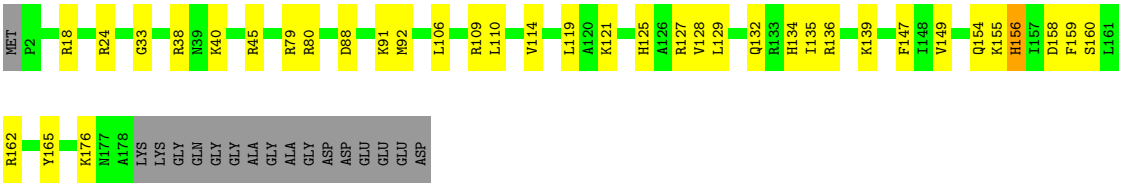
• Molecule 23: Small ribosomal subunit protein eS4, X isoform





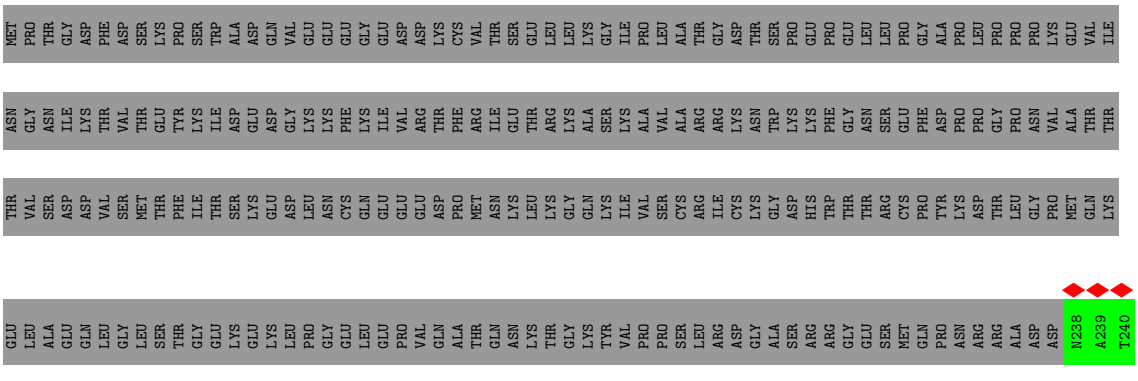
• Molecule 24: 40S ribosomal protein S9





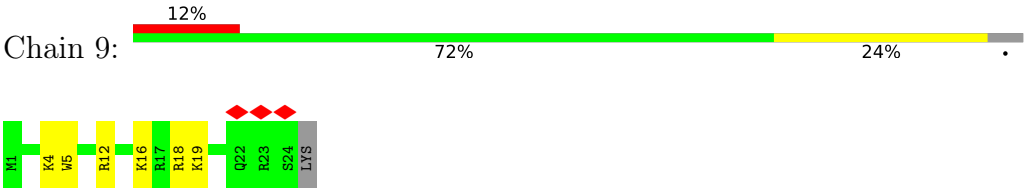
• Molecule 25: Eukaryotic translation initiation factor 3 subunit G



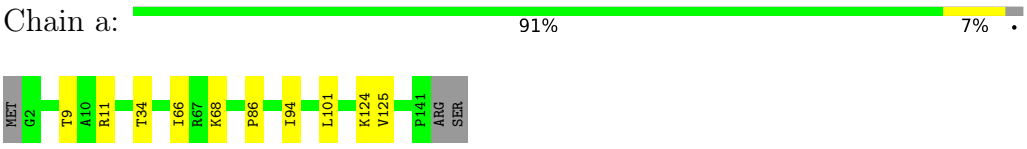




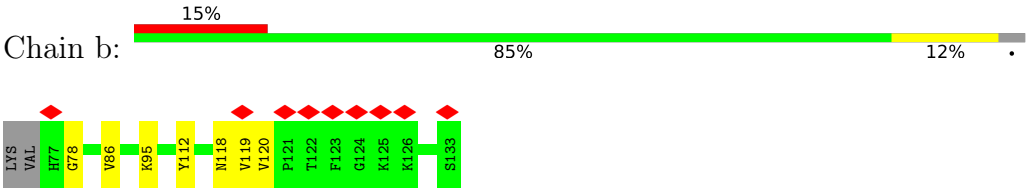
• Molecule 26: 60S ribosomal protein L41



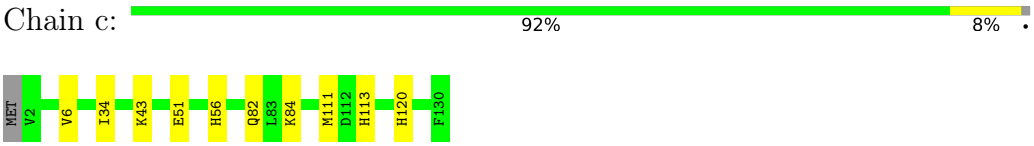
• Molecule 27: 40S ribosomal protein S23



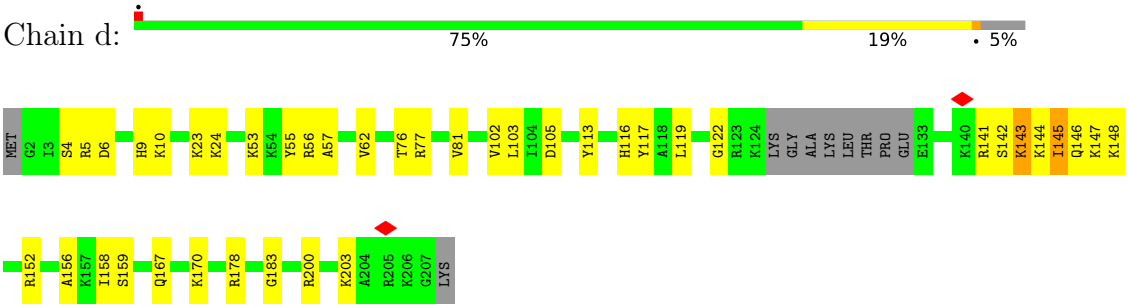
• Molecule 28: 40S ribosomal protein S30



• Molecule 29: 40S ribosomal protein S15a

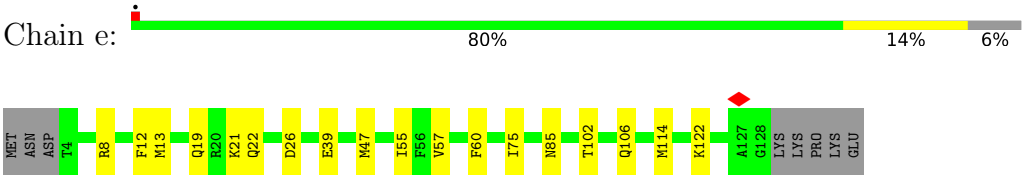


• Molecule 30: 40S ribosomal protein S8



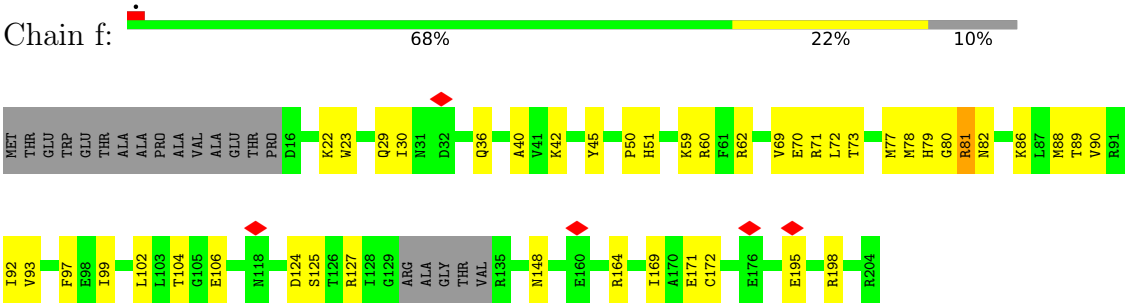
• Molecule 31: 40S ribosomal protein S24

Chain e:



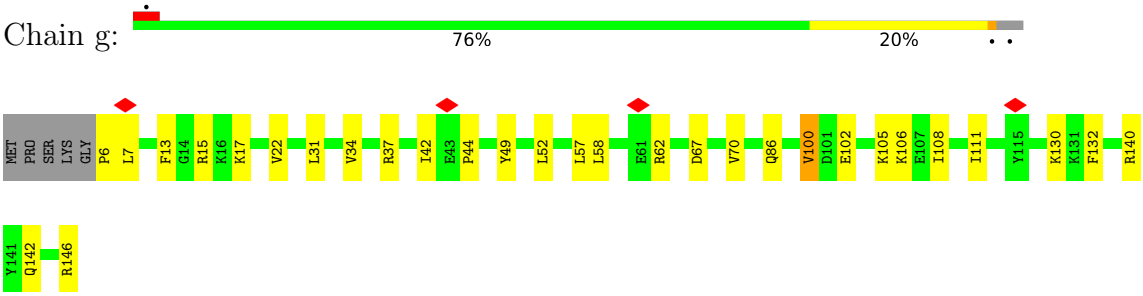
• Molecule 32: 40S ribosomal protein S5

Chain f:



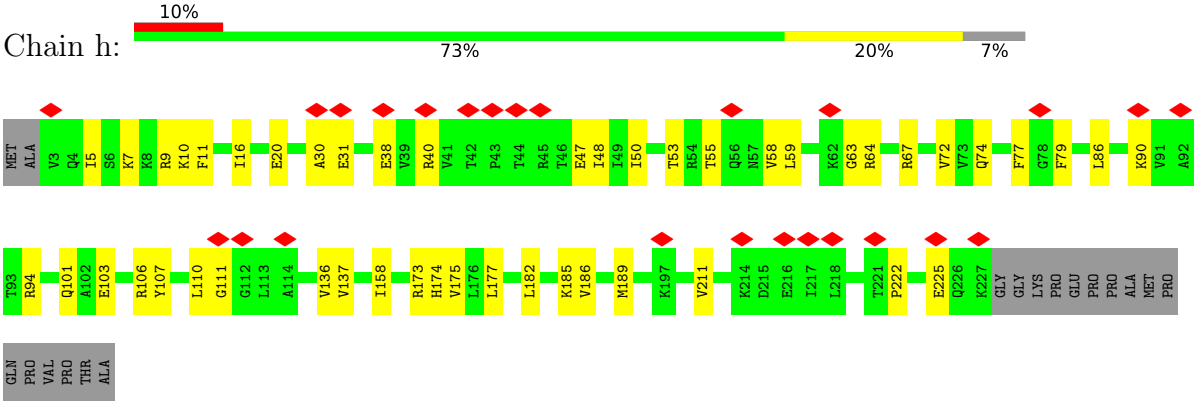
• Molecule 33: 40S ribosomal protein S16

Chain g:



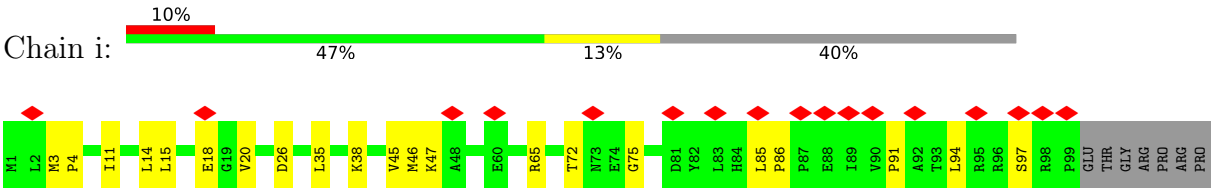
• Molecule 34: 40S ribosomal protein S3

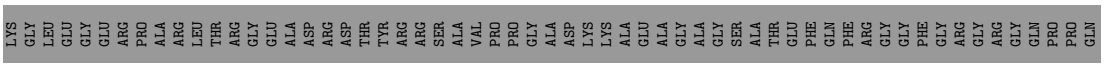
Chain h:



• Molecule 35: 40S ribosomal protein S10

Chain i:

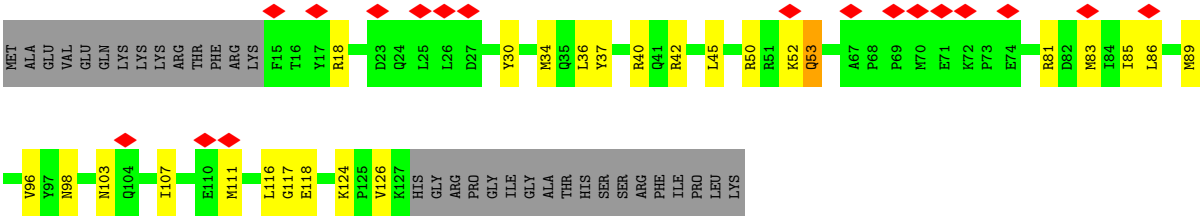




• Molecule 36: 40S ribosomal protein S15

Chain j:

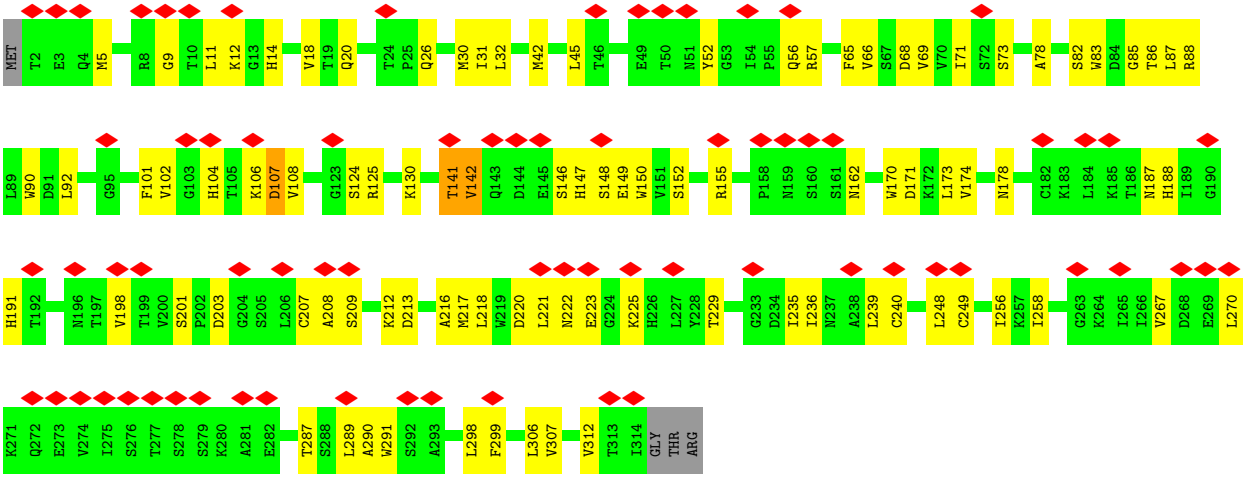




• Molecule 37: Receptor of activated protein C kinase 1

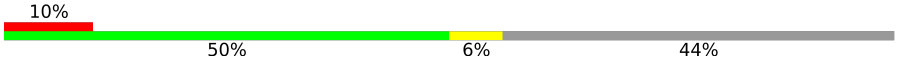
Chain k:

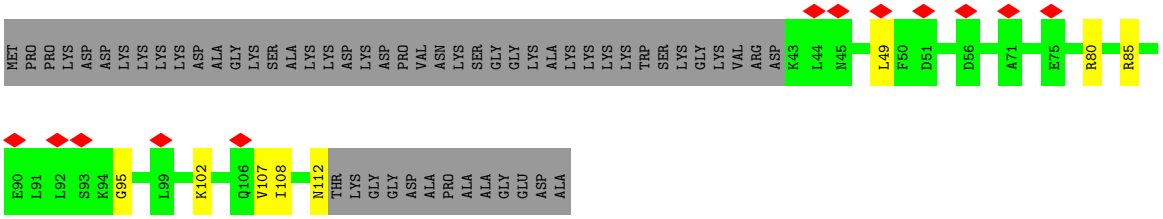




• Molecule 38: 40S ribosomal protein S25

Chain m:

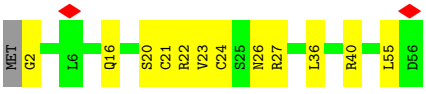




• Molecule 39: 40S ribosomal protein S29

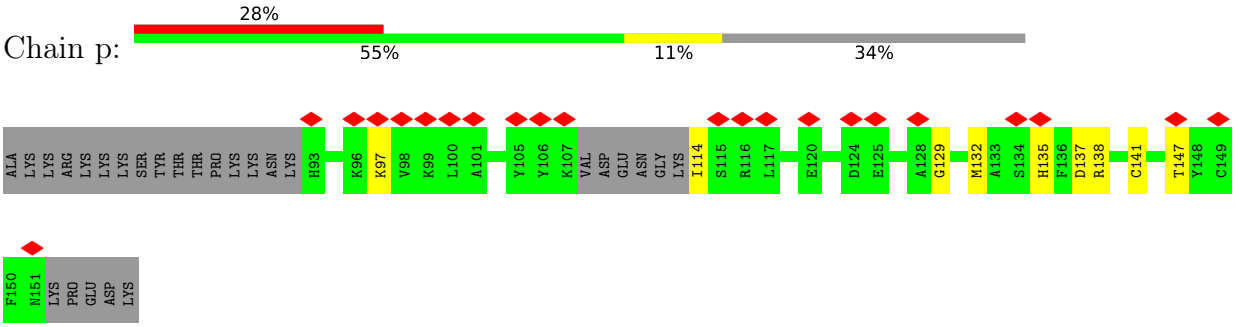
Chain o:





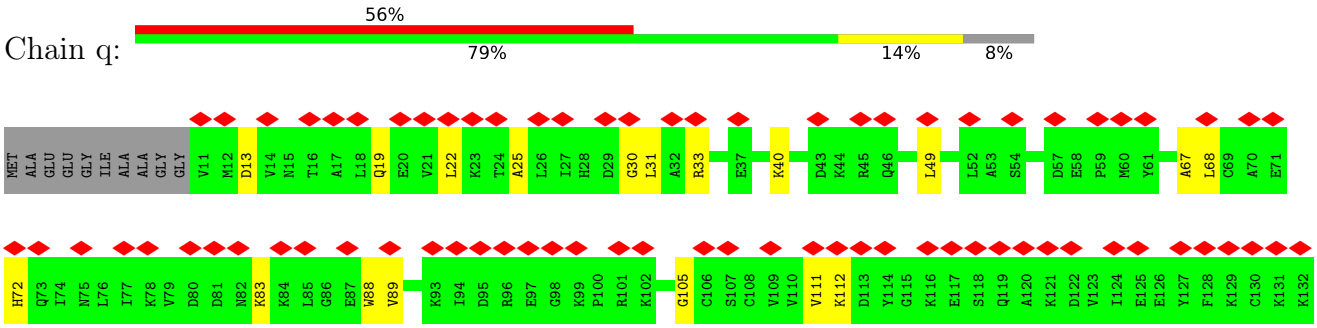
• Molecule 40: Ubiquitin-ribosomal protein eS31 fusion protein

Chain p:



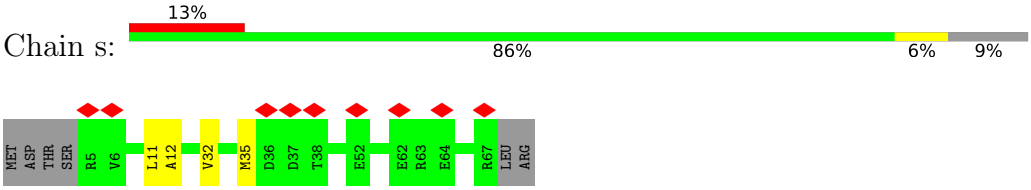
• Molecule 41: 40S ribosomal protein S12

Chain q:



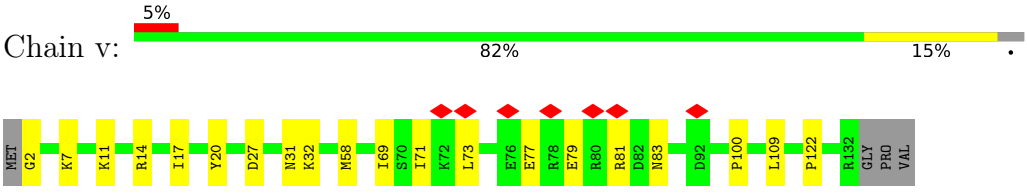
• Molecule 42: 40S ribosomal protein S28

Chain s:



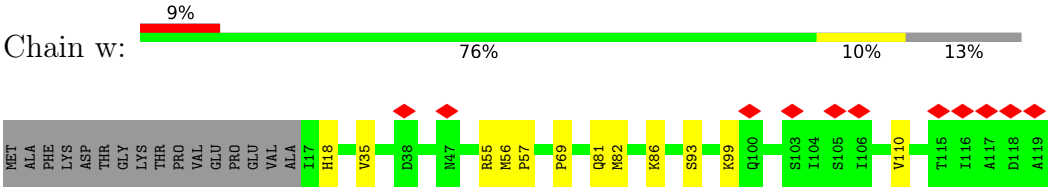
• Molecule 43: 40S ribosomal protein S17

Chain v:



• Molecule 44: 40S ribosomal protein S20

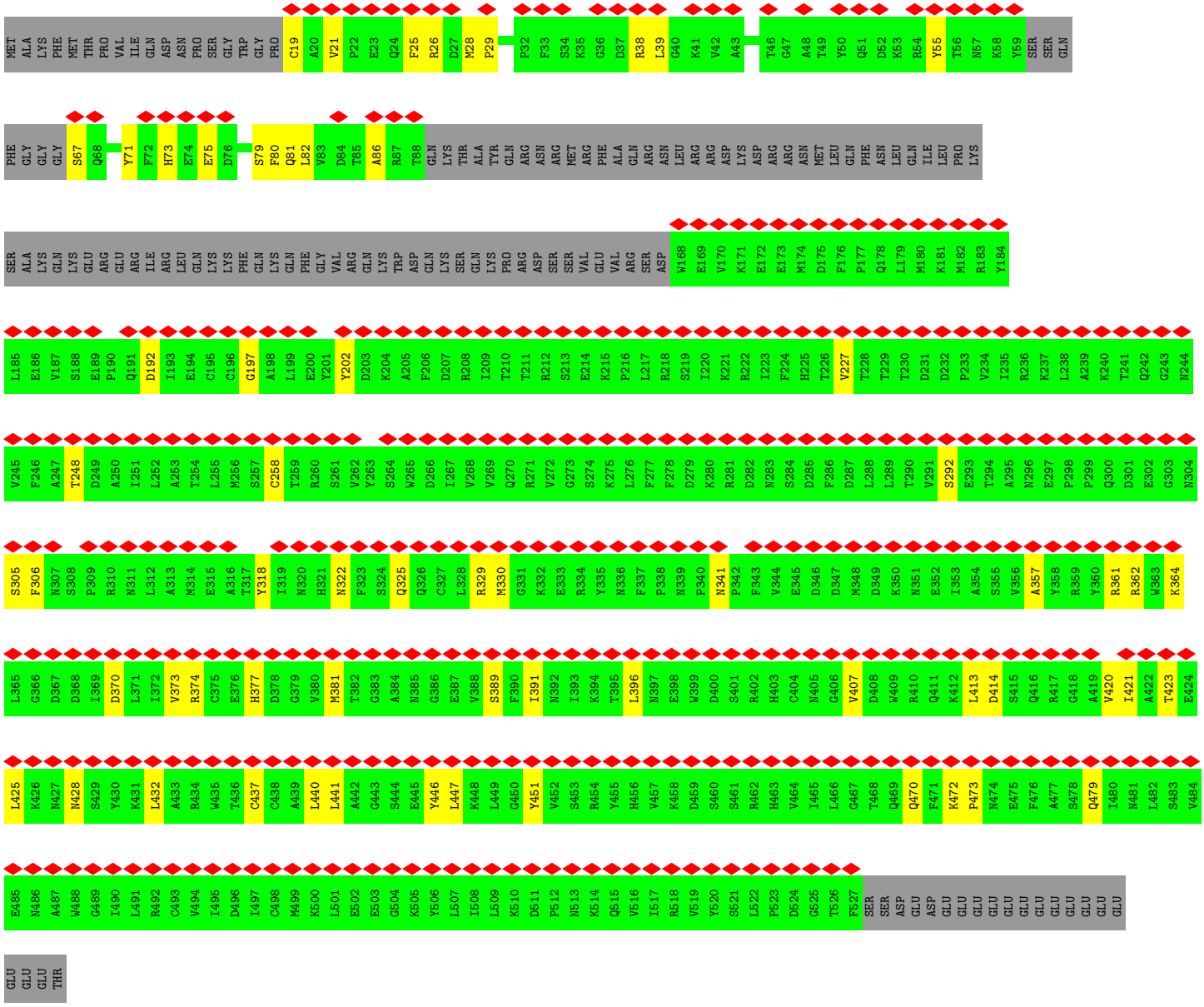
Chain w:



• Molecule 45: Eukaryotic translation initiation factor 3 subunit D

Chain x:

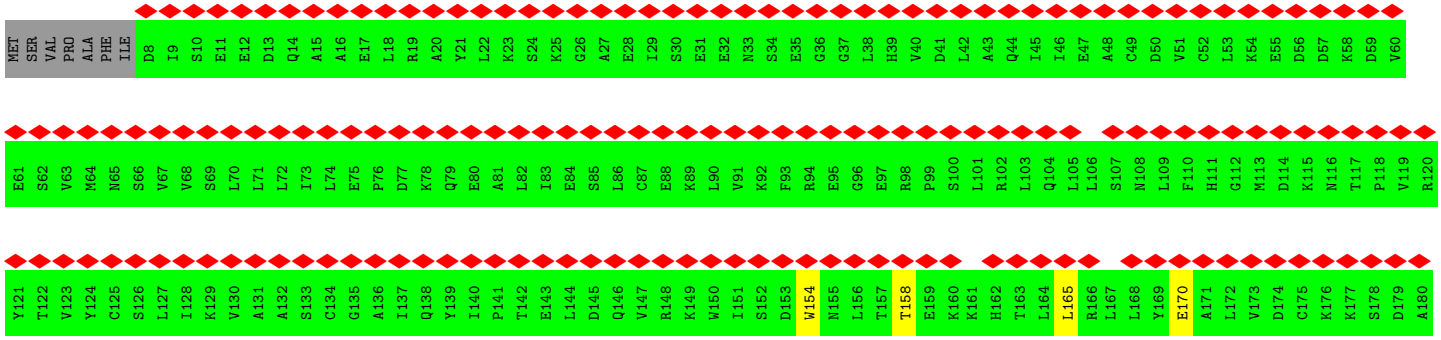




• Molecule 46: Eukaryotic translation initiation factor 3 subunit M

Chain 6:



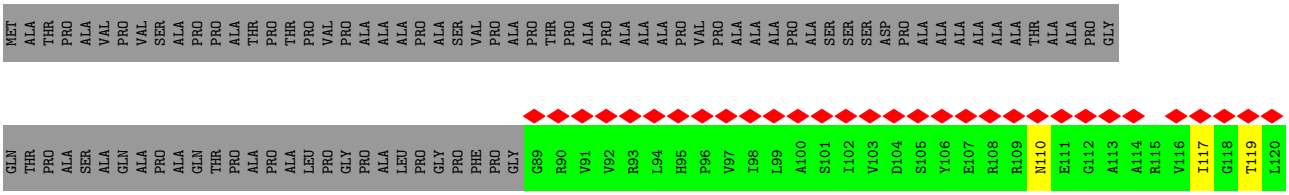


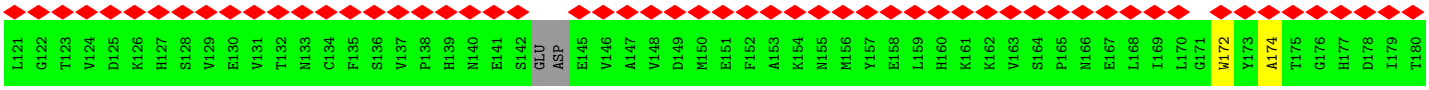


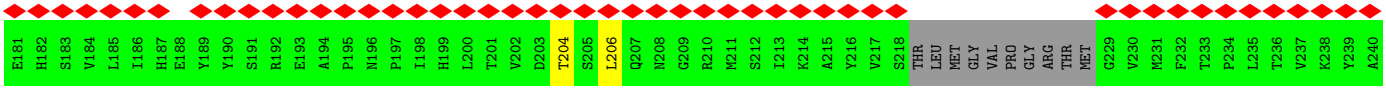
• Molecule 47: Eukaryotic translation initiation factor 3 subunit F

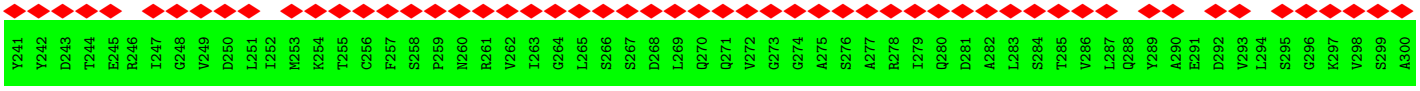
Chain 4:

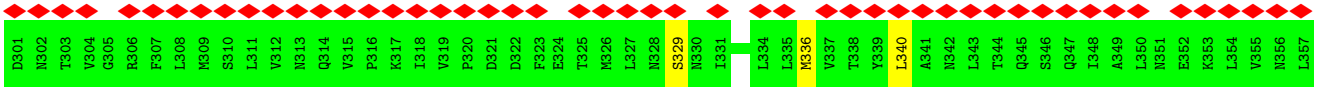






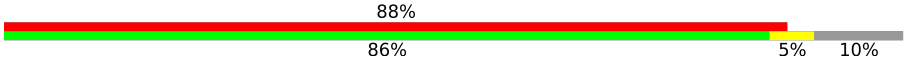


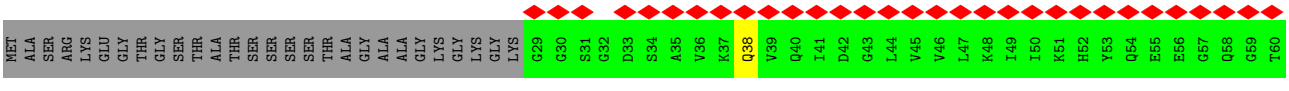


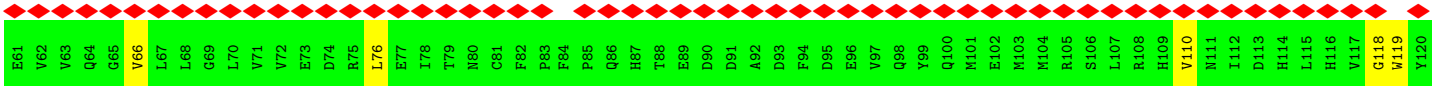


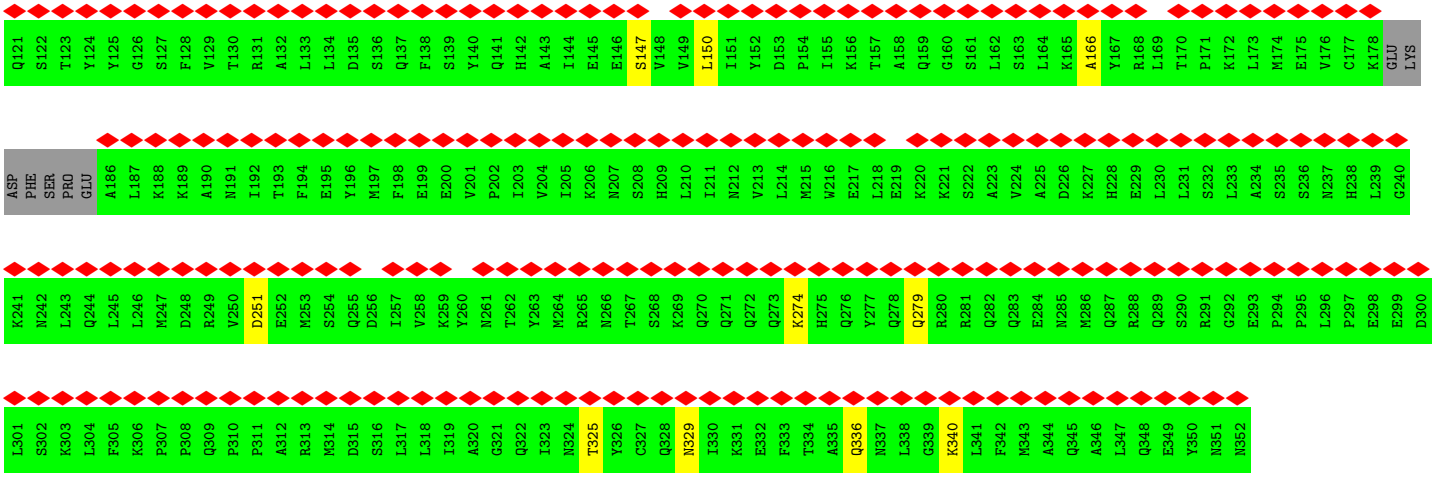
• Molecule 48: Eukaryotic translation initiation factor 3 subunit H

Chain 8:



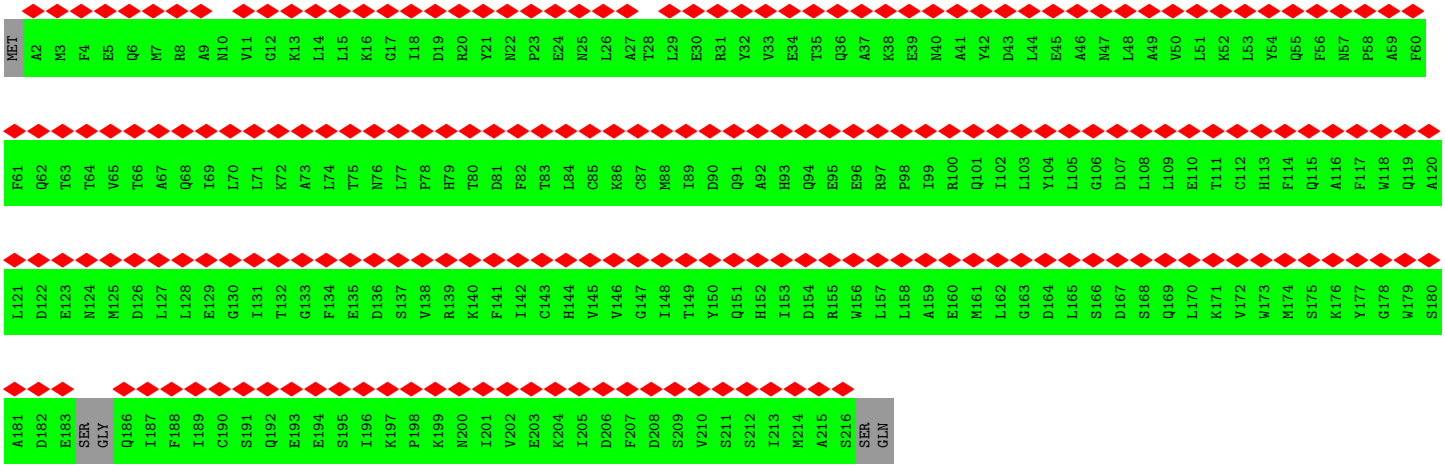




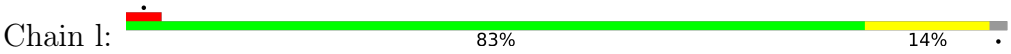


• Molecule 49: Eukaryotic translation initiation factor 3 subunit K





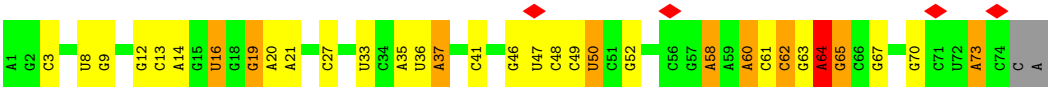
• Molecule 50: 40S ribosomal protein S19





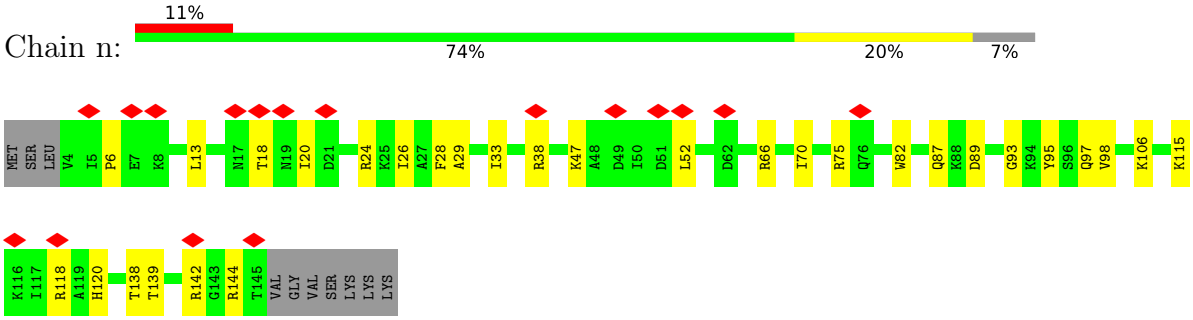
• Molecule 51: tRNAi-Met





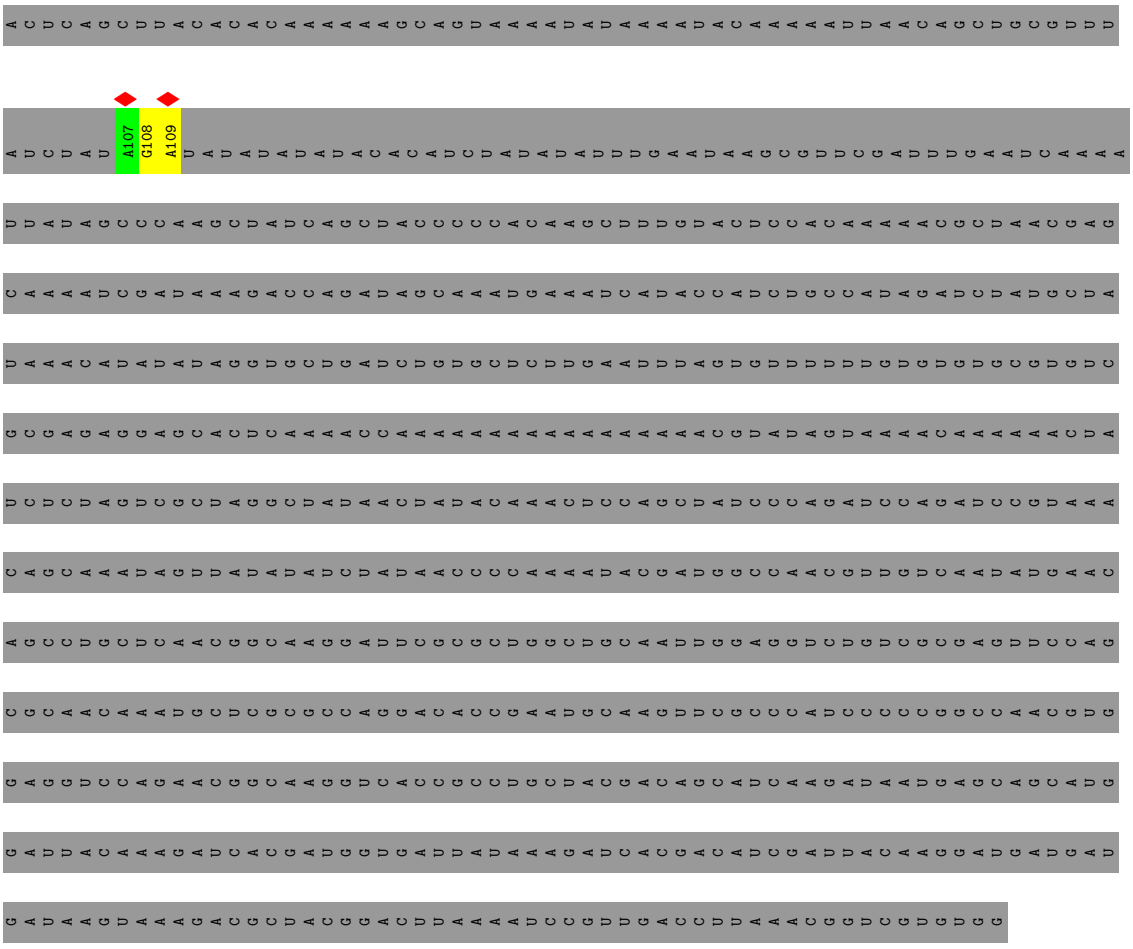
• Molecule 52: 40S ribosomal protein S18

Chain n:



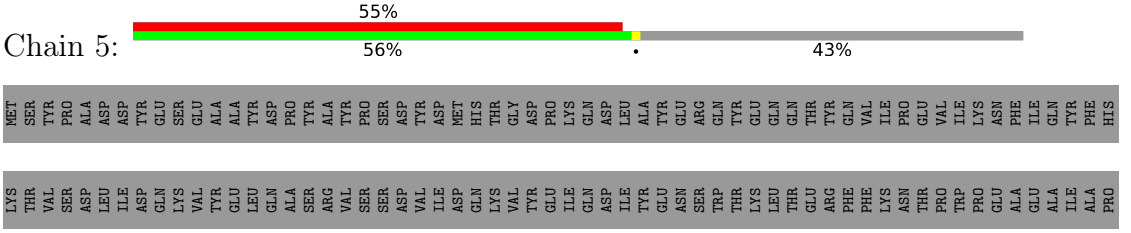
• Molecule 53: circMbl-FLAG

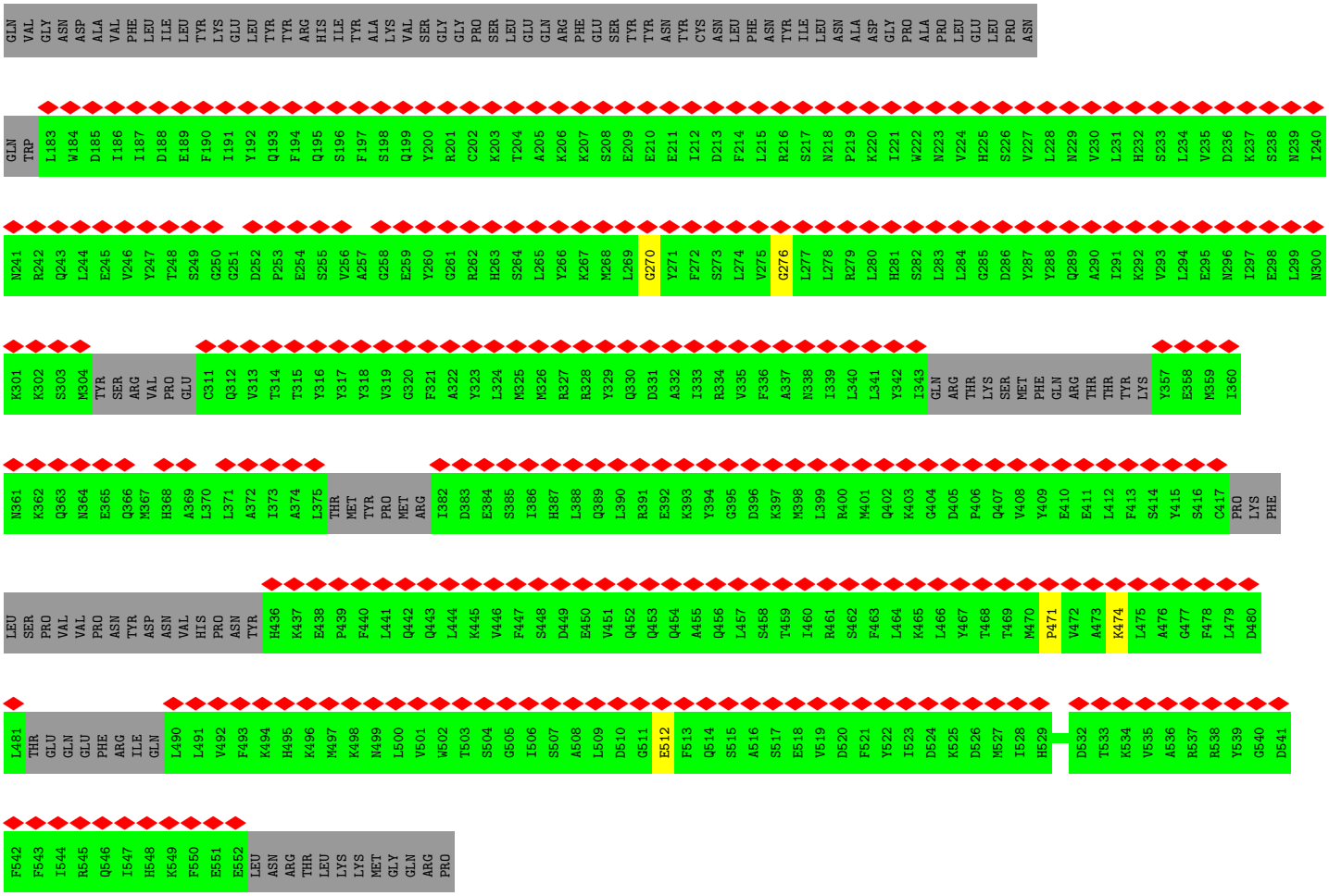
Chain z:



• Molecule 54: Eukaryotic translation initiation factor 3 subunit L

Chain 5:




GLN VAL GLY ASN ASP ALA VAL PHE LEU ILE LEU TYR LYS GLU LEU TYR TYR ARG HIS ILE TYR ALA LYS VAL SER GLY GLY PRO SER LEU GLU GLN ARG PHE GLU SER TYR TYR ASN TYR CYS ASN LEU PHE ASN TYR ILE LEU ASN ALA ASP GLY PRO ALA PRO LEU GLU LEU PRO ASN
GLN TRP L183 W184 D185 I186 I187 D188 E189 F190 I191 Y192 Q193 F194 Q195 S196 F197 S198 Q199 Y200 R201 C202 K203 T204 A205 K206 K207 S208 E209 E210 E211 I212 D213 F214 L215 R216 S217 N218 P219 K220 I221 W222 N223 V224 H225 S226 V227 L228 N229 V230 L231 H232 S233 L234 V235 D236 K237 S238 N239 I240
N241 R242 Q243 L244 E245 V246 Y247 T248 S249 G250 G251 D252 P253 E254 S255 V256 A257 G258 E259 Y260 G261 R262 H263 S264 L265 Y266 K267 M268 L269 G270 Y271 F272 S273 L274 V275 G276 L277 L278 R279 L280 H281 S282 L283 L284 G285 D286 Y287 Y288 Q289 A290 I291 K292 V293 L294 E295 N296 I297 E298 L299 N300
K301 K302 S303 M304 TYR SER ARG VAL PRO GLU C311 Q312 V313 T314 T315 Y316 Y317 Y318 V319 G320 F321 A322 Y323 L324 M325 M326 R327 R328 Y329 Q330 D331 A332 I333 R334 V335 F336 A337 N338 I339 L340 L341 Y342 I343 GLN ARG THR LYS SER MET PHE GLN ARG THR THR TYR LYS Y357 E358 M359 I360
N361 K362 Q363 N364 E365 Q366 M367 H368 A369 L370 L371 A372 I373 A374 L375 THR MET TYR PRO MET ARG I382 D383 E384 S385 I386 H387 L388 Q389 L390 R391 E392 K393 Y394 G395 D396 K397 M398 L399 R400 M401 Q402 K403 G404 D405 P406 Q407 V408 Y409 E410 E411 L412 F413 S414 Y415 S416 C417 PRO LYS PHE
LEU SER PRO VAL VAL PRO ASN TYR ASP ASN VAL HIS PRO ASN TYR H436 K437 E438 P439 F440 L441 Q442 Q443 L444 K445 V446 F447 S448 D449 E450 V451 Q452 Q453 Q454 A455 Q456 L457 S458 T459 I460 R461 S462 F463 L464 K465 L466 Y467 T468 T469 M470 P471 V472 A473 K474 L475 A476 G477 F478 L479 D480
L481 THR GLU GLN GLU PHE ARG ILE GLN L490 L491 V492 F493 K494 H495 K496 M497 K498 N499 L500 V501 W502 T503 S504 G505 I506 S507 A508 L509 D510 G511 E512 F513 Q514 S515 A516 S517 E518 V519 D520 F521 Y522 I523 D524 K525 D526 M527 I528 H529 D532 T533 K534 V535 A536 R537 R538 Y539 G540 D541
F542 P543 I544 R545 Q546 I547 H548 K549 P550 E551 E552 LEU ASN ARG THR LEU LYS LYS MET GLY GLN ARG PRO

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	21721	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40.0	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.034	Depositor
Minimum map value	-0.012	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.0045	Depositor
Map size (Å)	494.4, 494.4, 494.4	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.824, 0.824, 0.824	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: 4AC, 7MG, M2G, K, RIA, MG, MA6, JMH, OMG, 2MG, 1MA, ZN, G7M, C4J, H2U, OMC, OMU, UY1, T6A, 5MC, PSU, 1MG, 5MU, A2M, 6MZ

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	A	0.26	0/5610	0.66	1/7621 (0.0%)
2	B	0.30	0/2778	0.66	0/3797
3	D	0.24	0/2247	0.53	0/3029
4	E	0.13	0/1745	0.36	0/2417
5	F	0.13	0/1597	0.34	0/2216
6	G	0.25	0/713	0.62	0/951
7	H	0.42	0/701	0.82	0/936
8	I	0.23	0/4696	0.54	0/6379
9	J	0.22	0/5018	0.61	5/6791 (0.1%)
10	L	0.28	0/1460	0.57	0/1953
11	M	0.37	0/644	0.66	0/864
12	N	0.28	0/643	0.53	0/860
13	O	0.27	0/1743	0.48	0/2354
14	P	0.28	0/1742	0.57	0/2330
15	Q	0.26	0/1732	0.48	0/2353
16	R	0.28	0/805	0.50	0/1079
17	S	0.22	0/1885	0.51	0/2510
18	T	0.31	0/1011	0.62	0/1355
19	U	0.29	0/1142	0.65	0/1534
20	V	0.24	0/1232	0.40	0/1656
21	W	0.56	6/38756 (0.0%)	0.89	33/60400 (0.1%)
22	X	0.26	0/1186	0.39	0/1585
23	Y	0.36	0/2083	0.58	1/2805 (0.0%)
24	Z	0.31	0/1502	0.56	4/2008 (0.2%)
25	7	0.26	0/628	0.66	0/846
26	9	0.30	0/231	0.57	0/294
27	a	0.36	0/1105	0.53	0/1476
28	b	0.27	0/458	0.64	0/602
29	c	0.38	0/1051	0.66	2/1406 (0.1%)
30	d	0.27	0/1655	0.52	1/2205 (0.0%)
31	e	0.22	0/1032	0.45	0/1371

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	f	0.36	0/1481	0.71	1/1988 (0.1%)
33	g	0.30	0/1142	0.65	0/1528
34	h	0.23	0/1780	0.52	0/2397
35	i	0.26	0/859	0.64	0/1159
36	j	0.22	0/953	0.58	0/1274
37	k	0.31	0/2493	0.62	2/3394 (0.1%)
38	m	0.18	0/565	0.47	0/759
39	o	0.39	0/470	0.60	0/623
40	p	0.17	0/444	0.47	0/588
41	q	0.22	0/960	0.57	0/1286
42	s	0.27	0/500	0.60	0/669
43	v	0.22	0/1078	0.51	0/1447
44	w	0.21	0/827	0.48	0/1110
45	x	0.24	0/2881	0.61	0/3936
46	6	0.36	0/2115	0.71	4/2905 (0.1%)
47	4	0.13	0/1269	0.36	0/1762
48	8	0.14	0/1572	0.44	0/2187
49	3	0.11	0/1055	0.34	0/1469
50	l	0.19	0/1123	0.49	0/1504
51	y	0.43	1/1484 (0.1%)	0.84	1/2311 (0.0%)
52	n	0.20	0/1194	0.47	0/1599
53	z	0.26	0/75	0.68	0/115
54	5	0.12	0/1575	0.38	0/2187
All	All	0.39	7/116726 (0.0%)	0.70	55/166180 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	D	0	1
18	T	0	1
All	All	0	2

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	y	64	RIA	O3'-P	5.70	1.61	1.56
21	W	468	A2M	O3'-P	5.57	1.61	1.56
21	W	1031	A2M	O3'-P	5.44	1.61	1.56
21	W	1383	A2M	O3'-P	5.43	1.61	1.56

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
21	W	576	A2M	O3'-P	5.41	1.61	1.56
21	W	27	A2M	O3'-P	5.20	1.61	1.56
21	W	590	A2M	O3'-P	5.03	1.61	1.56

All (55) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	170	VAL	N-CA-C	-7.20	104.25	111.88
9	J	694	GLU	CA-C-N	7.19	124.77	120.24
9	J	694	GLU	C-N-CA	7.19	124.77	120.24
37	k	141	THR	CA-C-N	6.56	133.77	121.97
37	k	141	THR	C-N-CA	6.56	133.77	121.97
9	J	328	VAL	N-CA-C	-6.53	107.51	113.71
46	6	258	ASN	N-CA-C	-6.50	104.83	112.89
23	Y	18	TRP	N-CA-C	-6.50	105.34	113.20
29	c	113	HIS	CA-CB-CG	6.47	120.27	113.80
21	W	324	C	N1-C2-O2	5.98	122.49	118.90
51	y	64	RIA	O3'-P-O5'	5.92	115.25	104.00
21	W	1115	U	C2-N1-C1'	5.92	124.80	117.70
21	W	1113	A	P-O3'-C3'	5.91	126.79	119.70
21	W	1114	U	P-O3'-C3'	5.87	126.74	119.70
21	W	536	A	P-O3'-C3'	5.87	126.74	119.70
21	W	593	C	N1-C2-O2	5.86	122.42	118.90
21	W	659	G	C4-N9-C1'	5.84	134.09	126.50
21	W	1259	A	C2-N3-C4	5.84	113.52	110.60
21	W	1329	U	C2-N1-C1'	5.73	124.58	117.70
21	W	1696	C	N1-C2-O2	5.66	122.30	118.90
21	W	577	U	O5'-C5'-C4'	5.62	113.89	109.40
32	f	72	LEU	N-CA-C	-5.61	105.08	111.14
24	Z	155	LYS	CA-CB-CG	5.55	125.19	114.10
21	W	1600	G	C4-N9-C1'	5.54	133.71	126.50
24	Z	155	LYS	N-CA-CB	-5.52	102.49	110.56
21	W	1857	G	C4'-C3'-C2'	-5.52	97.08	102.60
21	W	1521	C	C1'-O4'-C4'	-5.52	105.84	109.70
21	W	1463	U	P-O3'-C3'	5.49	126.28	119.70
24	Z	155	LYS	CB-CA-C	5.47	119.81	110.56
24	Z	156	HIS	CB-CA-C	-5.44	103.70	112.07
21	W	942	G	C6-C5-N7	-5.39	127.16	130.40
21	W	574	A	O5'-C5'-C4'	5.39	113.71	109.40
21	W	942	G	N7-C8-N9	5.36	115.78	113.10
21	W	1314	U	C2-N1-C1'	5.35	124.12	117.70
46	6	332	VAL	CA-C-N	-5.35	117.73	122.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	6	332	VAL	C-N-CA	-5.35	117.73	122.97
9	J	703	SER	CA-C-N	5.34	131.74	121.54
9	J	703	SER	C-N-CA	5.34	131.74	121.54
21	W	345	U	N3-C2-O2	-5.28	118.50	122.20
21	W	513	G	O5'-C5'-C4'	5.28	113.62	109.40
21	W	1286	G	O5'-C5'-C4'	5.27	113.61	109.40
21	W	402	C	C5-C6-N1	5.25	123.62	121.00
30	d	144	LYS	N-CA-C	-5.25	105.68	111.71
21	W	632	C	C6-N1-C2	-5.22	118.21	120.30
29	c	111	MET	CB-CA-C	-5.22	103.09	114.10
21	W	659	G	C8-N9-C1'	-5.22	120.22	127.00
21	W	345	U	C6-N1-C2	-5.19	117.89	121.00
21	W	1772	C	C6-N1-C2	-5.18	118.23	120.30
21	W	1772	C	N1-C2-O2	5.14	121.99	118.90
21	W	942	G	C8-N9-C4	-5.14	104.34	106.40
21	W	49	C	N1-C2-O2	5.12	121.97	118.90
46	6	297	MET	CB-CG-SD	5.12	128.07	112.70
21	W	402	C	C6-N1-C2	-5.06	118.28	120.30
21	W	1078	C	N1-C2-O2	5.06	121.94	118.90
21	W	1590	C	O5'-C5'-C4'	5.05	113.44	109.40

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	D	232	PRO	Peptide
18	T	147	ARG	Sidechain

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5518	0	5141	63	0
2	B	2740	0	2251	27	0
3	D	2215	0	2266	36	0
4	E	1750	0	806	8	0
5	F	1598	0	723	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	G	705	0	729	13	0
7	H	691	0	706	13	0
8	I	4569	0	4317	50	0
9	J	4940	0	4682	68	0
10	L	1439	0	1533	15	0
11	M	631	0	657	16	0
12	N	636	0	637	4	0
13	O	1707	0	1794	14	0
14	P	1715	0	1785	26	0
15	Q	1695	0	1696	17	0
16	R	792	0	841	8	0
17	S	1862	0	2018	29	0
18	T	998	0	1021	21	0
19	U	1123	0	1153	12	0
20	V	1208	0	1294	13	0
21	W	36675	0	18554	240	0
22	X	1166	0	1233	8	0
23	Y	2041	0	2143	11	0
24	Z	1477	0	1589	28	0
25	7	616	0	600	5	0
26	9	230	0	276	5	0
27	a	1087	0	1154	6	0
28	b	452	0	494	5	0
29	c	1034	0	1080	6	0
30	d	1628	0	1706	27	0
31	e	1015	0	1086	11	0
32	f	1461	0	1511	31	0
33	g	1124	0	1193	24	0
34	h	1752	0	1848	33	0
35	i	834	0	861	15	0
36	j	936	0	981	17	0
37	k	2436	0	2389	62	0
38	m	559	0	616	6	0
39	o	459	0	448	12	0
40	p	435	0	434	8	0
41	q	950	0	985	12	0
42	s	498	0	525	4	0
43	v	1064	0	1118	12	0
44	w	817	0	882	10	0
45	x	2838	0	2198	47	0
46	6	2099	0	1435	33	0
47	4	1272	0	564	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
48	8	1574	0	687	9	0
49	3	1057	0	475	0	0
50	l	1105	0	1138	13	0
51	y	1597	0	828	20	0
52	n	1176	0	1233	21	0
53	z	67	0	34	0	0
54	5	1581	0	689	3	0
55	R	1	0	0	0	0
55	o	1	0	0	0	0
55	p	1	0	0	0	0
56	S	1	0	0	0	0
56	W	75	0	0	0	0
57	W	1	0	0	0	0
All	All	113724	0	89037	1024	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (1024) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:1113:A:H62	21:W:1118:C:H2'	1.35	0.92
21:W:1301:A:HO2'	39:o:2:GLY:N	1.71	0.88
32:f:92:ILE:HD13	32:f:169:ILE:HD13	1.64	0.80
21:W:1532:C:H3'	21:W:1637:A:H62	1.49	0.78
8:I:538:GLN:HA	8:I:538:GLN:HE21	1.47	0.77
10:L:106:ARG:HH12	21:W:861:A:H2'	1.50	0.76
21:W:1113:A:N6	21:W:1118:C:H2'	2.02	0.74
9:J:343:LYS:HG3	21:W:1120:U:H5	1.50	0.74
46:6:260:LYS:HB3	46:6:265:SER:HA	1.67	0.74
21:W:928:G:H1	21:W:1013:U:H3	1.36	0.73
7:H:50:ILE:HG13	7:H:52:ASP:H	1.55	0.72
3:D:231:ALA:HB1	51:y:73:A:H1'	1.71	0.72
21:W:940:U:H3	21:W:1002:U:H3	1.39	0.71
21:W:1263:U:H5"	39:o:27:ARG:HH22	1.56	0.71
1:A:483:ARG:HB2	1:A:492:SER:HB3	1.75	0.69
32:f:73:THR:HG22	32:f:93:VAL:HG21	1.73	0.69
6:G:82:ARG:HB3	28:b:78:GLY:HA3	1.75	0.68
45:x:38:ARG:HD2	45:x:55:TYR:HB2	1.75	0.68
21:W:1520:G:H3'	21:W:1521:C:C6	2.29	0.68
51:y:60:A:H5'	51:y:61:C:H5	1.59	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:925:G:H1	21:W:1017:U:H3	1.41	0.67
46:6:268:LEU:CD2	46:6:271:GLU:HB3	2.24	0.67
21:W:320:G:H1	21:W:331:C:H42	1.42	0.67
3:D:21:MET:HE1	3:D:99:GLU:HG3	1.76	0.67
8:I:661:PRO:HG2	8:I:707:ARG:H	1.60	0.67
1:A:448:GLN:HA	1:A:493:PHE:HB2	1.78	0.66
37:k:240:CYS:SG	37:k:291:TRP:NE1	2.70	0.65
25:7:245:ASN:HD21	34:h:90:LYS:H	1.44	0.65
43:v:100:PRO:HG2	43:v:122:PRO:HG3	1.78	0.65
20:V:124:ARG:NH2	21:W:1024:A:OP2	2.30	0.65
9:J:343:LYS:HG3	21:W:1120:U:C5	2.31	0.65
32:f:80:GLY:O	32:f:82:ASN:N	2.30	0.65
34:h:40:ARG:HB2	34:h:47:GLU:HB2	1.78	0.65
34:h:64:ARG:HH11	35:i:94:LEU:HD23	1.62	0.64
1:A:520:ARG:HH22	46:6:334:VAL:HG11	1.62	0.64
3:D:197:VAL:O	3:D:233:PRO:HB3	1.97	0.64
40:p:132:MET:HG2	40:p:141:CYS:HB2	1.80	0.64
33:g:105:LYS:HA	33:g:108:ILE:HG22	1.80	0.63
11:M:78:SER:HB2	45:x:82:LEU:HD12	1.79	0.63
21:W:1780:G:H2'	21:W:1781:A:H5'	1.79	0.63
23:Y:19:MET:HE3	23:Y:108:ARG:HD2	1.80	0.63
33:g:42:ILE:HG22	33:g:44:PRO:HD2	1.81	0.63
37:k:5:MET:HG2	37:k:312:VAL:HG12	1.79	0.63
8:I:587:ILE:HG22	8:I:609:GLN:HE21	1.64	0.63
15:Q:74:VAL:HG12	15:Q:121:LEU:HB3	1.81	0.63
17:S:2:LYS:HB2	17:S:108:VAL:HG23	1.79	0.63
3:D:163:LEU:HB3	3:D:173:ARG:HH22	1.63	0.62
8:I:431:TRP:CD1	8:I:438:PHE:HB2	2.35	0.62
11:M:36:LYS:HG2	45:x:80:PHE:CE2	2.34	0.62
15:Q:77:ILE:HG12	15:Q:99:ILE:HB	1.80	0.62
11:M:8:LEU:HD11	29:c:51:GLU:HG3	1.80	0.62
15:Q:34:MET:HE3	15:Q:154:LEU:HD11	1.82	0.62
17:S:147:LEU:HG	17:S:153:VAL:HG12	1.81	0.62
21:W:1639:G7M:H2'	21:W:1640:A:C8	2.35	0.62
23:Y:43:PRO:HG2	23:Y:46:ILE:HD12	1.81	0.62
37:k:87:LEU:HB2	37:k:101:PHE:HB2	1.82	0.62
46:6:260:LYS:CB	46:6:265:SER:HA	2.30	0.62
36:j:118:GLU:HB3	52:n:120:HIS:H	1.64	0.62
3:D:196:GLU:HB3	3:D:233:PRO:HB2	1.82	0.62
12:N:42:VAL:HG13	12:N:43:THR:HG23	1.80	0.62
16:R:46:GLU:OE1	18:T:113:GLN:NE2	2.32	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
52:n:18:THR:HG21	52:n:33:ILE:HG13	1.82	0.62
2:B:250:CYS:SG	2:B:252:HIS:ND1	2.69	0.62
7:H:42:LYS:NZ	21:W:1829:G:OP2	2.33	0.62
7:H:45:THR:HG21	7:H:89:GLN:H	1.63	0.62
9:J:330:ILE:HG12	9:J:431:LEU:HD21	1.81	0.62
44:w:56:MET:HG3	44:w:86:LYS:HD2	1.82	0.62
3:D:177:ILE:O	3:D:181:ASN:ND2	2.33	0.61
8:I:508:ASN:ND2	24:Z:165:TYR:O	2.33	0.61
9:J:695:ILE:HA	9:J:698:MET:HB2	1.83	0.61
21:W:1674:G:N7	33:g:17:LYS:NZ	2.48	0.61
24:Z:110:LEU:HB2	24:Z:147:PHE:HB3	1.82	0.61
18:T:52:THR:HG21	21:W:952:G:H21	1.65	0.61
9:J:443:CYS:HB3	9:J:446:THR:HG22	1.82	0.61
18:T:97:LEU:HD11	18:T:112:ALA:HB1	1.83	0.61
21:W:887:U:H2'	21:W:888:U:H2'	1.82	0.61
51:y:50:U:H3	51:y:64:RIA:HN62	1.48	0.61
30:d:81:VAL:HG12	30:d:102:VAL:HG12	1.82	0.61
45:x:447:LEU:HG	45:x:473:PRO:HG3	1.83	0.60
45:x:292:SER:H	45:x:428:ASN:HB3	1.66	0.60
51:y:60:A:H5'	51:y:61:C:C5	2.35	0.60
9:J:672:PRO:HD2	9:J:675:LEU:HD12	1.83	0.60
14:P:139:CYS:HB2	14:P:172:MET:HE1	1.84	0.60
32:f:78:MET:HG2	32:f:79:HIS:H	1.67	0.60
18:T:66:ARG:HG3	21:W:962:A:H5"	1.83	0.60
9:J:761:MET:SD	9:J:761:MET:N	2.75	0.59
45:x:357:ALA:HB3	45:x:377:HIS:HB2	1.83	0.59
21:W:883:U:O2	21:W:904:A:N6	2.34	0.59
3:D:231:ALA:CB	51:y:73:A:H1'	2.32	0.59
37:k:26:GLN:NE2	37:k:73:SER:O	2.34	0.59
37:k:87:LEU:HD21	37:k:108:VAL:HG11	1.84	0.59
8:I:507:ARG:HA	24:Z:158:ASP:OD2	2.02	0.59
13:O:102:LEU:HD22	13:O:130:ILE:HG12	1.85	0.59
21:W:4:C:O2'	24:Z:18:ARG:NH2	2.35	0.59
34:h:222:PRO:O	37:k:225:LYS:NZ	2.36	0.59
1:A:296:LEU:HB3	1:A:322:VAL:HG23	1.85	0.59
21:W:1543:U:OP1	33:g:37:ARG:NH2	2.35	0.59
9:J:593:HIS:O	9:J:597:ASN:ND2	2.36	0.59
21:W:1240:A:H2'	21:W:1241:A:C8	2.37	0.59
21:W:1533:A:OP2	32:f:164:ARG:NH1	2.35	0.59
17:S:170:ARG:NH2	21:W:71:G:N7	2.50	0.59
21:W:3:C:O2	24:Z:18:ARG:NH1	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
37:k:220:ASP:HB3	37:k:223:GLU:HB2	1.84	0.59
45:x:227:VAL:H	45:x:374:ARG:HH22	1.51	0.59
37:k:191:HIS:HE2	37:k:209:SER:HG	1.51	0.58
37:k:207:CYS:HB2	37:k:221:LEU:HD11	1.84	0.58
33:g:49:TYR:HA	33:g:52:LEU:HB2	1.84	0.58
46:6:220:PHE:O	46:6:341:THR:OG1	2.20	0.58
52:n:24:ARG:NH1	52:n:28:PHE:O	2.35	0.58
10:L:31:GLU:O	10:L:37:LYS:NZ	2.36	0.58
19:U:204:MET:O	19:U:205:LYS:C	2.46	0.58
20:V:55:ARG:HD3	21:W:1017:U:H5'	1.85	0.58
16:R:82:LYS:NZ	21:W:1210:G:OP1	2.37	0.58
21:W:380:G:OP1	30:d:56:ARG:NH2	2.36	0.58
21:W:1446:A:H1'	44:w:55:ARG:HD3	1.86	0.58
24:Z:129:LEU:HG	24:Z:135:ILE:HD11	1.84	0.58
33:g:146:ARG:NH2	51:y:33:U:OP2	2.37	0.58
8:I:545:GLU:HG3	8:I:558:VAL:HG22	1.86	0.58
21:W:1446:A:H2'	21:W:1447:OMG:H8	1.69	0.58
3:D:233:PRO:HD2	3:D:234:ARG:CZ	2.34	0.57
32:f:195:GLU:HA	32:f:198:ARG:HG2	1.86	0.57
34:h:137:VAL:HB	34:h:185:LYS:HB2	1.85	0.57
1:A:397:GLU:OE1	1:A:402:LYS:NZ	2.37	0.57
8:I:510:PHE:HE2	24:Z:125:HIS:HE1	1.50	0.57
8:I:664:ARG:HA	8:I:686:PHE:HB2	1.86	0.57
32:f:30:ILE:O	45:x:479:GLN:NE2	2.37	0.57
37:k:152:SER:HB3	37:k:170:TRP:HE1	1.69	0.57
32:f:89:THR:O	32:f:90:VAL:C	2.47	0.57
34:h:7:LYS:HA	34:h:10:LYS:HB3	1.86	0.57
21:W:1706:G:N2	21:W:1850:MA6:N3	2.53	0.57
22:X:104:LYS:O	27:a:11:ARG:NH2	2.35	0.57
34:h:94:ARG:O	34:h:101:GLN:NE2	2.36	0.57
4:E:440:LYS:HA	4:E:458:GLN:HA	1.86	0.57
34:h:59:LEU:HD12	34:h:63:GLY:HA2	1.85	0.57
41:q:49:LEU:HB3	41:q:111:VAL:HB	1.85	0.57
8:I:380:ASP:HB3	8:I:426:TRP:HH2	1.70	0.57
17:S:130:PRO:HB2	17:S:132:ARG:HD3	1.87	0.57
32:f:71:ARG:NH2	32:f:148:ASN:OD1	2.37	0.57
21:W:1522:A:OP2	52:n:144:ARG:NH1	2.38	0.57
36:j:18:ARG:NH1	36:j:36:LEU:O	2.38	0.57
2:B:298:CYS:HA	2:B:301:VAL:HG22	1.85	0.57
21:W:1615:U:O4	36:j:40:ARG:NH2	2.37	0.57
22:X:33:LEU:HD12	22:X:34:PRO:HD2	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:197:U:O4	21:W:202:G:N2	2.37	0.57
32:f:59:LYS:HG2	32:f:62:ARG:HD2	1.87	0.57
18:T:138:ASP:OD2	21:W:942:G:N2	2.26	0.56
1:A:414:VAL:O	1:A:425:GLN:NE2	2.38	0.56
8:I:538:GLN:HE21	8:I:538:GLN:CA	2.17	0.56
46:6:268:LEU:HD22	46:6:272:GLN:HE21	1.69	0.56
46:6:268:LEU:HD21	46:6:271:GLU:HB3	1.86	0.56
46:6:273:ASN:OD1	46:6:274:MET:N	2.38	0.56
46:6:300:GLU:HG2	46:6:301:LEU:HG	1.88	0.56
1:A:483:ARG:HH22	9:J:845:HIS:HB3	1.69	0.56
21:W:1597:C:OP2	38:m:85:ARG:NH2	2.36	0.56
38:m:49:LEU:HD21	52:n:6:PRO:HD2	1.86	0.56
51:y:64:RIA:O3’	51:y:65:G:H4’	2.04	0.56
1:A:373:ASP:OD1	1:A:376:ARG:NH2	2.39	0.56
21:W:1119:A:H4’	21:W:1119:A:OP1	2.04	0.56
11:M:80:ARG:HH12	45:x:79:SER:HB2	1.69	0.56
27:a:66:ILE:HG22	27:a:68:LYS:HD2	1.88	0.56
15:Q:198:MET:HG3	15:Q:200:ASP:H	1.70	0.56
37:k:107:ASP:OD1	37:k:107:ASP:N	2.38	0.56
37:k:239:LEU:HD12	37:k:248:LEU:HD11	1.88	0.56
9:J:573:ILE:HG23	9:J:585:ALA:HB1	1.87	0.56
21:W:1604:G:OP2	52:n:38:ARG:NH2	2.39	0.56
24:Z:18:ARG:O	24:Z:24:ARG:NH1	2.38	0.56
34:h:67:ARG:NH1	35:i:97:SER:OG	2.39	0.56
3:D:196:GLU:CB	3:D:233:PRO:HB2	2.36	0.56
14:P:28:LYS:HB3	14:P:48:LEU:HD12	1.87	0.56
17:S:50:VAL:HG12	17:S:113:ILE:HG13	1.87	0.56
17:S:219:GLU:HA	17:S:222:GLU:HB2	1.88	0.56
21:W:851:C:H5”	21:W:852:G:H5’	1.88	0.56
26:9:16:LYS:HA	26:9:19:LYS:HE2	1.88	0.56
21:W:1112:U:H2’	21:W:1119:A:H61	1.71	0.56
21:W:1803:U:H2’	21:W:1804:OMU:H6	1.87	0.56
2:B:165:ALA:O	2:B:169:LEU:N	2.35	0.55
9:J:853:GLN:NE2	48:8:251:ASP:O	2.36	0.55
37:k:212:LYS:HA	37:k:235:ILE:HG23	1.87	0.55
8:I:548:ARG:HH12	8:I:550:ARG:HB2	1.70	0.55
21:W:1562:C:H5”	50:l:71:GLY:HA3	1.88	0.55
3:D:196:GLU:HG2	3:D:233:PRO:HG2	1.88	0.55
9:J:622:ARG:HH22	9:J:770:PRO:HD2	1.70	0.55
15:Q:81:ASN:HA	15:Q:84:GLN:HG3	1.88	0.55
30:d:122:GLY:HA2	30:d:167:GLN:HG3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
46:6:278:ARG:NH1	46:6:311:PHE:O	2.39	0.55
5:F:233:ASN:H	5:F:248:GLY:HA3	1.71	0.55
21:W:1263:U:H4'	39:o:27:ARG:HH12	1.70	0.55
31:e:57:VAL:HB	31:e:60:PHE:HE2	1.72	0.55
18:T:101:GLY:HA3	18:T:134:PRO:HG2	1.89	0.55
21:W:918:PSU:O2'	29:c:56:HIS:O	2.24	0.55
46:6:261:ASP:C	46:6:265:SER:HB3	2.32	0.55
21:W:1400:U:O4	21:W:1401:A:N6	2.38	0.55
1:A:471:ILE:HD12	1:A:484:ILE:HG12	1.88	0.55
13:O:204:ILE:O	13:O:211:LYS:NZ	2.40	0.55
21:W:1527:C:OP1	33:g:142:GLN:NE2	2.40	0.55
43:v:79:GLU:O	43:v:83:ASN:ND2	2.39	0.55
46:6:273:ASN:O	46:6:277:MET:N	2.39	0.55
51:y:61:C:H2'	51:y:62:C:C6	2.41	0.55
8:I:437:PHE:HB3	8:I:448:ILE:HD11	1.88	0.55
9:J:421:GLY:HA2	9:J:441:ARG:H	1.72	0.55
21:W:1115:U:OP1	21:W:1118:C:N4	2.38	0.55
39:o:22:ARG:HG3	39:o:23:VAL:HG23	1.89	0.55
33:g:58:LEU:HD11	33:g:108:ILE:HG13	1.88	0.54
8:I:519:TRP:CD1	8:I:520:GLN:H	2.25	0.54
21:W:1850:MA6:H103	21:W:1851:MA6:H102	1.89	0.54
33:g:57:LEU:HD12	33:g:111:ILE:HG12	1.88	0.54
46:6:293:SER:N	46:6:296:THR:OG1	2.40	0.54
21:W:534:G:O6	21:W:548:C:N4	2.41	0.54
8:I:433:HIS:HB3	8:I:474:PRO:HA	1.88	0.54
21:W:1446:A:H2'	21:W:1447:OMG:C8	2.43	0.54
35:i:72:THR:HG23	35:i:75:GLY:H	1.72	0.54
46:6:268:LEU:HD23	46:6:271:GLU:HB3	1.88	0.54
50:l:42:HIS:ND1	50:l:93:SER:OG	2.40	0.54
3:D:118:VAL:HG13	3:D:119:LEU:HG	1.88	0.54
8:I:294:ARG:HB2	8:I:297:LEU:HD12	1.90	0.54
10:L:140:VAL:HG12	20:V:19:ARG:HD2	1.89	0.54
21:W:1117:C:H2'	21:W:1117:C:O2	2.08	0.54
45:x:227:VAL:O	45:x:374:ARG:NH2	2.41	0.54
1:A:331:ILE:HG21	1:A:438:ARG:HH22	1.72	0.54
7:H:35:ILE:HD11	7:H:43:THR:HB	1.90	0.54
9:J:498:GLU:HA	9:J:501:ARG:HD3	1.90	0.54
9:J:617:GLY:HA3	9:J:633:LEU:HD21	1.88	0.54
8:I:665:TYR:HB3	8:I:683:LEU:HD11	1.89	0.54
21:W:681:PSU:H4'	27:a:9:THR:HG22	1.89	0.54
30:d:103:LEU:HD22	30:d:170:LYS:HB3	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
30:d:141:ARG:HD3	30:d:145:ILE:HG22	1.89	0.54
9:J:834:SER:HA	9:J:841:THR:HA	1.88	0.54
21:W:1445:PSU:H4'	44:w:57:PRO:HG3	1.90	0.54
30:d:116:HIS:O	30:d:152:ARG:NH2	2.40	0.54
35:i:65:ARG:NH1	39:o:20:SER:OG	2.41	0.54
41:q:83:LYS:HA	41:q:105:GLY:HA3	1.90	0.54
50:l:6:VAL:O	50:l:11:GLN:NE2	2.41	0.54
3:D:118:VAL:HG11	3:D:175:VAL:HG21	1.89	0.54
17:S:7:PHE:HB2	17:S:124:LEU:HD23	1.89	0.54
36:j:50:ARG:H	36:j:53:GLN:HB2	1.73	0.54
46:6:218:PHE:HA	46:6:279:LEU:HD13	1.88	0.54
31:e:13:MET:SD	31:e:22:GLN:NE2	2.77	0.54
21:W:1281:G:H1	21:W:1316:C:H42	1.54	0.53
34:h:20:GLU:HG3	34:h:77:PHE:HE1	1.73	0.53
1:A:515:PRO:HG2	1:A:523:LEU:HD11	1.88	0.53
9:J:357:LEU:HD13	9:J:360:ILE:HD13	1.89	0.53
21:W:527:C:O2'	24:Z:121:LYS:NZ	2.38	0.53
30:d:145:ILE:O	30:d:148:LYS:N	2.41	0.53
52:n:66:ARG:HH21	52:n:70:ILE:HG21	1.73	0.53
8:I:430:LYS:NZ	8:I:471:SER:HA	2.22	0.53
34:h:31:GLU:HA	34:h:107:TYR:HE2	1.72	0.53
52:n:138:THR:HG23	52:n:139:THR:HG23	1.89	0.53
1:A:298:ARG:NH1	1:A:360:GLY:O	2.41	0.53
10:L:53:VAL:HG21	10:L:172:THR:HA	1.90	0.53
21:W:73:C:H5"	21:W:74:G:H5'	1.90	0.53
37:k:213:ASP:N	37:k:213:ASP:OD1	2.41	0.53
2:B:405:ILE:HG12	9:J:855:LEU:HD21	1.90	0.53
17:S:85:ARG:O	17:S:87:ARG:NH1	2.41	0.53
21:W:1446:A:H4'	21:W:1447:OMG:OP1	2.07	0.53
46:6:268:LEU:HD22	46:6:272:GLN:HG2	1.91	0.53
9:J:388:ASN:HA	11:M:75:GLU:HB3	1.91	0.53
9:J:754:SER:O	9:J:758:ASN:ND2	2.40	0.53
25:7:245:ASN:ND2	25:7:311:ASN:OD1	2.42	0.53
33:g:105:LYS:O	33:g:106:LYS:C	2.51	0.53
35:i:14:LEU:HG	35:i:35:LEU:HD21	1.90	0.53
18:T:74:ALA:HB1	18:T:115:ALA:HB2	1.90	0.53
32:f:93:VAL:HG12	32:f:97:PHE:CE2	2.43	0.53
14:P:57:ILE:HG22	14:P:59:SER:H	1.74	0.53
15:Q:184:ARG:HD3	15:Q:191:ARG:HG3	1.91	0.53
29:c:82:GLN:OE1	29:c:84:LYS:NZ	2.40	0.53
37:k:20:GLN:HG2	37:k:69:VAL:H	1.74	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
45:x:197:GLY:HA3	45:x:357:ALA:HA	1.91	0.53
2:B:399:SER:HA	2:B:403:GLN:H	1.73	0.52
8:I:204:LYS:O	8:I:208:HIS:ND1	2.42	0.52
15:Q:163:CYS:HB3	15:Q:174:MET:HE2	1.91	0.52
21:W:1307:U:O2'	40:p:138:ARG:NH2	2.42	0.52
21:W:1841:C:N4	21:W:1842:4AC:HM72	2.24	0.52
37:k:66:VAL:HA	37:k:82:SER:HA	1.91	0.52
3:D:24:VAL:HA	3:D:34:VAL:HG23	1.91	0.52
3:D:58:SER:OG	51:y:41:C:OP1	2.26	0.52
6:G:28:PHE:O	6:G:35:TYR:OH	2.27	0.52
21:W:1241:A:N1	21:W:1516:G:O2'	2.36	0.52
16:R:45:VAL:HA	18:T:113:GLN:HE22	1.74	0.52
21:W:1261:C:H2'	21:W:1262:C:O4'	2.10	0.52
21:W:1614:A:OP2	36:j:42:ARG:NH2	2.42	0.52
3:D:220:THR:OG1	3:D:223:MET:O	2.27	0.52
16:R:32:LYS:NZ	21:W:989:C:O2	2.43	0.52
45:x:414:ASP:OD1	45:x:414:ASP:N	2.42	0.52
1:A:400:PRO:HG3	1:A:442:GLN:HG3	1.91	0.52
1:A:478:CYS:HB3	1:A:507:ILE:HB	1.91	0.52
12:N:51:LYS:HG3	12:N:78:ILE:HD11	1.90	0.52
17:S:22:ARG:HA	17:S:25:ARG:HH21	1.75	0.52
21:W:1532:C:H2'	21:W:1637:A:N7	2.25	0.52
3:D:49:SER:O	3:D:88:ARG:NH1	2.42	0.52
20:V:70:LYS:NZ	21:W:1020:A:N7	2.57	0.52
21:W:49:C:N4	21:W:473:A:OP2	2.43	0.52
21:W:493:A:H1'	21:W:574:A:H5"	1.91	0.52
31:e:102:THR:HG23	31:e:106:GLN:HE21	1.75	0.52
9:J:561:THR:HG22	9:J:563:ARG:H	1.75	0.52
2:B:349:GLN:HB2	9:J:833:ALA:HB1	1.91	0.52
9:J:492:GLU:HG2	9:J:493:LYS:HG3	1.91	0.52
37:k:11:LEU:HB2	37:k:307:VAL:HB	1.92	0.52
41:q:33:ARG:NH1	41:q:89:VAL:O	2.43	0.52
1:A:552:LEU:O	1:A:556:ALA:N	2.40	0.52
21:W:1117:C:O2'	21:W:1118:C:O2	2.24	0.52
30:d:57:ALA:HB2	30:d:183:GLY:HA2	1.92	0.51
21:W:1396:A:O2'	21:W:1398:G:N7	2.43	0.51
21:W:1495:G:H4'	39:o:26:ASN:ND2	2.25	0.51
1:A:98:GLU:OE2	1:A:157:TYR:OH	2.28	0.51
15:Q:94:THR:O	15:Q:186:ARG:NH1	2.43	0.51
17:S:49:VAL:HB	17:S:115:LYS:HB3	1.92	0.51
38:m:95:GLY:O	38:m:112:ASN:ND2	2.41	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
43:v:17:ILE:HD12	43:v:58:MET:HE3	1.92	0.51
46:6:203:ASP:O	46:6:207:CYS:N	2.42	0.51
17:S:32:MET:HG2	17:S:100:CYS:HB2	1.91	0.51
21:W:380:G:O6	30:d:178:ARG:NH2	2.44	0.51
9:J:732:SER:O	9:J:736:HIS:ND1	2.38	0.51
21:W:1639:G7M:N3	51:y:41:C:O2'	2.44	0.51
21:W:1852:C:H2'	21:W:1853:C:C6	2.44	0.51
30:d:103:LEU:HD13	30:d:170:LYS:HD2	1.92	0.51
34:h:158:ILE:HG12	34:h:189:MET:HE3	1.93	0.51
3:D:214:ALA:HB1	3:D:258:ILE:HG12	1.93	0.51
14:P:100:PHE:HB3	14:P:181:LEU:HD21	1.91	0.51
21:W:1021:U:H4'	21:W:1022:U:O5'	2.10	0.51
21:W:1598:G:OP1	38:m:80:ARG:NH1	2.43	0.51
43:v:27:ASP:O	43:v:31:ASN:ND2	2.35	0.51
45:x:325:GLN:HG2	45:x:330:MET:HE3	1.93	0.51
2:B:349:GLN:N	9:J:834:SER:O	2.43	0.51
21:W:190:G:O2'	21:W:209:A:N6	2.44	0.51
21:W:1446:A:HO2'	21:W:1447:OMG:C5'	2.23	0.51
23:Y:72:ILE:HG12	23:Y:90:ILE:HG13	1.93	0.51
24:Z:134:HIS:O	24:Z:160:SER:N	2.33	0.51
34:h:72:VAL:HG12	35:i:20:VAL:HG11	1.93	0.51
34:h:103:GLU:OE2	34:h:173:ARG:NE	2.44	0.51
1:A:384:VAL:HB	1:A:387:VAL:HG22	1.93	0.51
21:W:582:U:OP1	24:Z:162:ARG:NH1	2.43	0.51
21:W:818:A:OP1	24:Z:80:ARG:NH2	2.40	0.51
21:W:1113:A:H1'	21:W:1114:U:H3'	1.93	0.51
37:k:18:VAL:O	37:k:287:THR:OG1	2.28	0.51
51:y:20:A:N3	51:y:60:A:N6	2.58	0.51
16:R:60:ASP:N	16:R:60:ASP:OD1	2.44	0.51
21:W:1239:U:H5"	36:j:124:LYS:HD3	1.93	0.51
36:j:37:TYR:OH	36:j:85:ILE:O	2.26	0.51
45:x:21:VAL:O	45:x:26:ARG:NH2	2.41	0.51
3:D:84:ASP:OD1	32:f:198:ARG:NH2	2.42	0.51
5:F:303:GLY:HA2	5:F:309:VAL:HA	1.93	0.51
19:U:215:LYS:NZ	51:y:27:C:OP1	2.43	0.51
21:W:1299:A:O2'	21:W:1301:A:OP1	2.28	0.51
35:i:85:LEU:HD12	35:i:86:PRO:HD2	1.93	0.51
39:o:40:ARG:NH2	44:w:69:PRO:O	2.43	0.51
45:x:370:ASP:OD1	45:x:370:ASP:N	2.44	0.51
4:E:167:GLN:O	4:E:169:GLN:N	2.44	0.50
10:L:99:ARG:NH1	21:W:913:A:OP2	2.44	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:R:100:ARG:NH2	21:W:1868:U:O2'	2.44	0.50
1:A:171:GLU:OE1	1:A:175:HIS:NE2	2.44	0.50
1:A:208:ILE:HD13	1:A:218:ILE:HD11	1.94	0.50
3:D:109:TYR:OH	3:D:113:ARG:NH1	2.44	0.50
19:U:268:GLU:O	19:U:272:ARG:N	2.45	0.50
33:g:31:LEU:N	33:g:67:ASP:OD1	2.44	0.50
29:c:6:VAL:HG12	29:c:34:ILE:HD11	1.93	0.50
51:y:63:G:H2'	51:y:64:RIA:O4'	2.11	0.50
2:B:160:ALA:HB1	2:B:165:ALA:HB2	1.92	0.50
6:G:71:ILE:HA	6:G:94:LYS:HZ2	1.76	0.50
11:M:40:CYS:HB2	11:M:59:CYS:SG	2.52	0.50
33:g:58:LEU:HD21	33:g:108:ILE:HD11	1.93	0.50
52:n:26:ILE:HD11	52:n:52:LEU:HA	1.93	0.50
2:B:247:GLN:HG2	2:B:250:CYS:H	1.76	0.50
19:U:281:CYS:SG	19:U:284:CYS:N	2.85	0.50
21:W:1398:G:O2'	37:k:88:ARG:NH1	2.40	0.50
31:e:114:MET:O	31:e:122:LYS:NZ	2.43	0.50
2:B:294:GLU:HA	2:B:297:GLU:HG2	1.92	0.50
7:H:39:ASN:ND2	51:y:36:U:O2'	2.45	0.50
33:g:62:ARG:HD3	33:g:108:ILE:HD12	1.93	0.50
45:x:364:LYS:HB3	45:x:370:ASP:HB3	1.94	0.50
45:x:391:ILE:HG22	45:x:446:TYR:HB2	1.93	0.50
1:A:101:THR:OG1	1:A:102:GLU:OE1	2.30	0.50
9:J:594:LEU:HA	9:J:597:ASN:HB2	1.94	0.50
11:M:11:SER:OG	11:M:14:GLU:OE1	2.30	0.50
15:Q:52:LYS:HB2	43:v:109:LEU:HD11	1.93	0.50
21:W:1292:C:HO2'	40:p:147:THR:HG1	1.59	0.50
45:x:192:ASP:HA	45:x:361:ARG:HG3	1.94	0.50
45:x:381:MET:HB3	45:x:389:SER:HB2	1.93	0.50
14:P:86:LEU:HB3	14:P:98:THR:HB	1.94	0.50
21:W:920:A:O2'	21:W:922:A:OP1	2.29	0.50
21:W:1354:G:N2	21:W:1357:A:OP2	2.35	0.50
21:W:1369:A:OP1	43:v:2:GLY:N	2.44	0.50
31:e:55:ILE:HD12	31:e:75:ILE:HG12	1.94	0.50
34:h:106:ARG:HG2	34:h:175:VAL:HG22	1.94	0.50
2:B:373:ASN:O	2:B:377:ASN:ND2	2.41	0.50
7:H:56:LYS:NZ	7:H:81:GLU:O	2.44	0.50
7:H:64:LYS:HD3	7:H:71:GLY:H	1.76	0.50
8:I:430:LYS:HD3	8:I:470:PHE:CE2	2.47	0.50
14:P:103:MET:HE2	14:P:188:LEU:HD22	1.93	0.50
14:P:107:ARG:NH1	18:T:133:THR:O	2.35	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:J:340:ARG:NH1	9:J:384:ASP:OD2	2.44	0.49
9:J:586:ARG:HD3	45:x:39:LEU:HD21	1.94	0.49
10:L:138:GLU:OE2	20:V:21:SER:OG	2.28	0.49
21:W:1452:A:H4'	21:W:1453:C:O5'	2.12	0.49
37:k:82:SER:OG	37:k:83:TRP:N	2.44	0.49
37:k:155:ARG:NE	37:k:198:VAL:O	2.45	0.49
1:A:473:ASP:O	1:A:477:HIS:ND1	2.42	0.49
10:L:60:ILE:HB	10:L:92:VAL:HG12	1.94	0.49
17:S:142:ARG:HG3	17:S:147:LEU:HB2	1.95	0.49
9:J:570:LEU:HG	9:J:589:MET:HE1	1.94	0.49
21:W:1654:G:OP1	50:l:90:SER:OG	2.30	0.49
41:q:25:ALA:O	41:q:30:GLY:N	2.44	0.49
45:x:202:TYR:O	45:x:329:ARG:NH1	2.46	0.49
1:A:43:TRP:HZ3	1:A:46:ILE:HG22	1.77	0.49
2:B:337:ARG:HA	2:B:340:ILE:HD12	1.95	0.49
7:H:106:ASP:O	7:H:109:LYS:NZ	2.46	0.49
21:W:562:U:H4'	24:Z:132:GLN:HB3	1.94	0.49
21:W:1446:A:H1'	44:w:55:ARG:CD	2.42	0.49
21:W:1452:A:OP2	43:v:32:LYS:NZ	2.46	0.49
21:W:1852:C:H2'	21:W:1853:C:H6	1.77	0.49
32:f:99:ILE:HD13	32:f:171:GLU:HB3	1.94	0.49
1:A:412:ASN:HA	1:A:415:ARG:HD2	1.95	0.49
3:D:231:ALA:HB1	3:D:234:ARG:HH21	1.78	0.49
8:I:497:GLN:OE1	8:I:500:THR:OG1	2.28	0.49
19:U:243:GLU:OE2	19:U:273:ARG:NH2	2.46	0.49
21:W:1518:C:H5"	21:W:1519:U:H5"	1.95	0.49
36:j:86:LEU:H	36:j:89:MET:HE2	1.77	0.49
40:p:129:GLY:HA2	41:q:40:LYS:HE3	1.94	0.49
52:n:97:GLN:NE2	52:n:98:VAL:O	2.45	0.49
21:W:84:A:H5'	31:e:122:LYS:HD2	1.94	0.49
21:W:1669:G:H5"	33:g:130:LYS:HB3	1.95	0.49
24:Z:176:LYS:O	24:Z:176:LYS:NZ	2.37	0.49
20:V:64:ARG:NH2	21:W:919:A:OP2	2.39	0.49
24:Z:158:ASP:OD1	24:Z:159:PHE:N	2.45	0.49
9:J:425:LEU:H	9:J:432:HIS:HB3	1.78	0.49
51:y:3:C:H42	51:y:70:G:H1	1.61	0.49
2:B:280:VAL:HG23	2:B:281:ILE:HG23	1.93	0.49
7:H:35:ILE:HB	7:H:90:ARG:HD2	1.95	0.49
8:I:388:LEU:HG	8:I:409:ILE:HG12	1.94	0.49
8:I:573:ASN:HD21	8:I:620:GLY:HA3	1.78	0.49
13:O:191:VAL:HG11	13:O:236:PHE:HA	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
45:x:413:LEU:HD23	45:x:420:VAL:HG21	1.95	0.49
2:B:209:GLN:HG3	45:x:21:VAL:HG23	1.95	0.48
21:W:566:U:H3	21:W:584:A:H61	1.61	0.48
21:W:1520:G:N3	21:W:1520:G:H2'	2.28	0.48
34:h:177:LEU:HD12	34:h:182:LEU:HD13	1.94	0.48
9:J:324:ILE:HG23	9:J:328:VAL:HG11	1.95	0.48
14:P:46:LYS:HE2	18:T:19:PRO:HB3	1.94	0.48
21:W:696:G:O6	21:W:697:G:N2	2.42	0.48
40:p:114:ILE:HD11	41:q:67:ALA:HB1	1.95	0.48
40:p:135:HIS:HB3	40:p:138:ARG:HG2	1.95	0.48
51:y:61:C:H2'	51:y:62:C:H6	1.77	0.48
9:J:417:ASN:ND2	9:J:427:GLU:OE2	2.46	0.48
17:S:5:ILE:HG22	17:S:111:LEU:HB2	1.94	0.48
18:T:151:LEU:HD13	21:W:1064:C:H4'	1.95	0.48
21:W:641:A:OP1	24:Z:40:LYS:NZ	2.38	0.48
1:A:25:GLN:OE1	1:A:25:GLN:N	2.45	0.48
2:B:369:ARG:NH1	54:5:474:LYS:O	2.46	0.48
41:q:31:LEU:HA	41:q:111:VAL:HA	1.96	0.48
45:x:318:TYR:O	45:x:322:ASN:ND2	2.43	0.48
50:l:40:ALA:HB3	50:l:43:LYS:HG2	1.96	0.48
21:W:1274:G:H4'	35:i:47:LYS:HE2	1.95	0.48
32:f:29:GLN:HG3	45:x:472:LYS:HD3	1.95	0.48
34:h:211:VAL:O	43:v:20:TYR:OH	2.29	0.48
21:W:1448:A:H2'	21:W:1449:G:C8	2.49	0.48
8:I:485:GLU:OE2	8:I:511:ASN:N	2.44	0.48
21:W:468:A2M:HM'2	21:W:468:A2M:H1'	1.69	0.48
21:W:837:A:H61	31:e:47:MET:HE3	1.79	0.48
8:I:542:THR:HG21	8:I:565:ILE:HD11	1.95	0.48
14:P:129:THR:OG1	14:P:179:ASN:O	2.31	0.48
21:W:120:U:H2'	21:W:121:OMU:H6	1.96	0.48
21:W:635:G:H5"	28:b:95:LYS:HD3	1.96	0.48
21:W:1189:A:H4'	27:a:34:THR:HG21	1.94	0.48
35:i:26:ASP:H	35:i:46:MET:HE1	1.77	0.48
46:6:255:PHE:O	46:6:259:ASN:N	2.47	0.48
8:I:502:GLN:NE2	8:I:503:GLU:O	2.47	0.48
9:J:592:SER:HB2	9:J:594:LEU:HD23	1.95	0.48
21:W:1579:A:H4'	21:W:1581:C:H5	1.79	0.48
21:W:1780:G:O6	21:W:1782:G:N1	2.38	0.48
30:d:200:ARG:HA	30:d:203:LYS:HE3	1.95	0.48
39:o:26:ASN:OD1	39:o:27:ARG:N	2.47	0.48
45:x:407:VAL:HG12	45:x:423:THR:HG21	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
54:5:471:PRO:HA	54:5:512:GLU:HA	1.96	0.48
5:F:111:SER:HA	5:F:122:VAL:HA	1.95	0.48
21:W:203:G:O5'	30:d:147:LYS:NZ	2.45	0.48
45:x:21:VAL:HG13	45:x:26:ARG:HH12	1.79	0.48
52:n:13:LEU:HB3	52:n:20:ILE:HB	1.96	0.48
4:E:294:ILE:HA	4:E:360:ALA:HA	1.96	0.47
9:J:590:LEU:O	9:J:593:HIS:NE2	2.47	0.47
20:V:29:THR:OG1	20:V:31:ASP:OD1	2.33	0.47
21:W:1677:U:H2'	21:W:1678:A2M:H8	1.96	0.47
22:X:13:GLN:HE21	22:X:63:THR:HG23	1.79	0.47
30:d:113:TYR:OH	30:d:156:ALA:O	2.32	0.47
6:G:70:TRP:O	6:G:94:LYS:NZ	2.47	0.47
17:S:64:LYS:NZ	17:S:82:SER:OG	2.46	0.47
21:W:17:C:O2'	21:W:1194:A:N1	2.41	0.47
37:k:256:ILE:HD12	37:k:289:LEU:HD11	1.95	0.47
41:q:68:LEU:O	41:q:72:HIS:ND1	2.38	0.47
9:J:569:ILE:HG13	9:J:570:LEU:HD12	1.96	0.47
45:x:29:PRO:HG2	45:x:67:SER:HB3	1.96	0.47
19:U:204:MET:SD	19:U:204:MET:N	2.87	0.47
21:W:1013:U:OP1	21:W:1129:G:O2'	2.31	0.47
21:W:1119:A:H2'	21:W:1121:G:N7	2.29	0.47
21:W:1783:C:H4'	21:W:1784:G:H8	1.80	0.47
3:D:216:LEU:O	3:D:219:SER:OG	2.31	0.47
9:J:391:THR:O	9:J:457:LYS:NZ	2.38	0.47
9:J:486:VAL:HG23	9:J:502:ILE:HD11	1.95	0.47
21:W:1232:PSU:HN3	21:W:1526:G:H1	1.61	0.47
21:W:1446:A:O2'	21:W:1447:OMG:O5'	2.33	0.47
32:f:81:ARG:HE	32:f:82:ASN:HD21	1.63	0.47
36:j:30:TYR:HD2	36:j:45:LEU:HD21	1.79	0.47
37:k:107:ASP:OD2	37:k:125:ARG:NH1	2.48	0.47
1:A:384:VAL:HG12	1:A:386:GLU:H	1.80	0.47
18:T:150:ARG:O	18:T:151:LEU:C	2.57	0.47
21:W:27:A2M:H1'	21:W:27:A2M:HM'3	1.74	0.47
21:W:523:A:OP2	24:Z:127:ARG:NH2	2.45	0.47
21:W:1758:G:N7	21:W:1771:G:N2	2.63	0.47
48:8:150:LEU:HA	48:8:166:ALA:HA	1.97	0.47
1:A:244:GLU:OE1	1:A:246:TRP:NE1	2.48	0.47
1:A:531:ALA:O	1:A:535:GLU:N	2.45	0.47
10:L:162:GLN:NE2	10:L:165:ASN:OD1	2.47	0.47
21:W:861:A:O2'	21:W:862:A:N7	2.48	0.47
22:X:111:VAL:HG11	22:X:128:VAL:HG11	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
30:d:62:VAL:HA	30:d:77:ARG:HA	1.97	0.47
32:f:169:ILE:HA	32:f:172:CYS:HB2	1.96	0.47
34:h:106:ARG:NH1	34:h:174:HIS:O	2.41	0.47
2:B:213:TRP:HE1	45:x:19:CYS:HB2	1.80	0.47
2:B:401:TYR:OH	47:4:329:SER:O	2.31	0.47
6:G:93:LEU:HD12	6:G:94:LYS:H	1.80	0.47
11:M:40:CYS:SG	11:M:42:LYS:HB2	2.54	0.47
13:O:168:GLY:N	13:O:179:THR:O	2.48	0.47
18:T:151:LEU:HA	21:W:1064:C:H5'	1.97	0.47
21:W:428:OMU:H6	21:W:428:OMU:H2'	1.65	0.47
21:W:1448:A:H2'	21:W:1449:G:O4'	2.14	0.47
33:g:105:LYS:O	33:g:108:ILE:N	2.48	0.47
37:k:42:MET:SD	37:k:56:GLN:N	2.80	0.47
8:I:371:PHE:HB3	8:I:407:TRP:HZ3	1.78	0.47
9:J:619:CYS:HA	9:J:622:ARG:HG2	1.97	0.47
9:J:776:ARG:HG2	9:J:779:LEU:HD12	1.96	0.47
15:Q:123:VAL:HG22	15:Q:145:ILE:HB	1.96	0.47
37:k:291:TRP:HA	37:k:298:LEU:HA	1.96	0.47
1:A:332:THR:H	1:A:367:ARG:HG2	1.80	0.47
10:L:126:HIS:O	10:L:177:TYR:OH	2.33	0.47
10:L:170:VAL:HG13	10:L:187:PHE:HB2	1.96	0.47
21:W:1290:G:N7	40:p:97:LYS:NZ	2.53	0.47
21:W:1719:A:N6	21:W:1814:G:O2'	2.48	0.47
35:i:18:GLU:OE1	35:i:18:GLU:N	2.47	0.47
1:A:483:ARG:O	1:A:492:SER:N	2.48	0.46
18:T:149:ARG:NH2	21:W:1064:C:O3'	2.48	0.46
34:h:16:ILE:HD11	39:o:36:LEU:HD23	1.97	0.46
10:L:69:LEU:HD13	10:L:96:ALA:HB2	1.97	0.46
20:V:99:ARG:NH2	20:V:119:GLU:OE2	2.47	0.46
21:W:309:G:OP2	30:d:53:LYS:NZ	2.46	0.46
21:W:1521:C:H4'	36:j:126:VAL:HG21	1.97	0.46
23:Y:230:LYS:HE2	23:Y:235:TRP:HZ2	1.80	0.46
34:h:38:GLU:OE2	34:h:40:ARG:NE	2.48	0.46
43:v:77:GLU:HG3	43:v:81:ARG:HD3	1.96	0.46
1:A:527:SER:HA	1:A:530:LEU:HB2	1.97	0.46
8:I:184:ASP:OD1	8:I:184:ASP:N	2.46	0.46
14:P:61:GLY:O	14:P:65:ARG:NE	2.48	0.46
21:W:28:U:H2'	21:W:29:G:H8	1.79	0.46
50:l:104:LEU:HD13	50:l:121:ARG:HD2	1.97	0.46
7:H:97:LEU:HB3	7:H:103:ALA:HB3	1.97	0.46
21:W:643:A:OP1	24:Z:38:ARG:NH1	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:1240:A:N6	36:j:98:ASN:O	2.49	0.46
37:k:174:VAL:HB	37:k:188:HIS:HB2	1.96	0.46
11:M:13:GLU:OE1	11:M:13:GLU:N	2.48	0.46
21:W:1423:C:H1'	21:W:1424:G:C8	2.50	0.46
23:Y:176:ASP:OD1	23:Y:177:THR:N	2.49	0.46
37:k:12:LYS:HD2	37:k:306:LEU:HD11	1.97	0.46
4:E:323:ALA:N	4:E:326:ASN:O	2.44	0.46
5:F:109:MET:HA	5:F:124:PHE:HA	1.97	0.46
14:P:150:ILE:HG12	21:W:1124:C:H5"	1.96	0.46
1:A:562:ARG:HE	47:4:206:LEU:HA	1.81	0.46
13:O:169:TYR:OH	13:O:175:GLY:O	2.32	0.46
21:W:160:U:O2'	21:W:162:C:OP2	2.34	0.46
21:W:490:C:O2'	21:W:574:A:N1	2.49	0.46
31:e:8:ARG:HB2	31:e:26:ASP:HB3	1.97	0.46
32:f:42:LYS:NZ	45:x:470:GLN:O	2.44	0.46
51:y:19:G:H5'	51:y:60:A:H61	1.81	0.46
1:A:286:SER:HA	9:J:728:GLY:HA2	1.98	0.46
14:P:126:ASP:OD1	14:P:136:ARG:NE	2.49	0.46
14:P:137:LEU:HG	14:P:215:VAL:HG22	1.98	0.46
15:Q:33:GLN:HB2	15:Q:154:LEU:HD13	1.97	0.46
46:6:206:ARG:O	46:6:210:ARG:N	2.47	0.46
50:l:76:THR:HB	50:l:94:ARG:HB3	1.98	0.46
14:P:33:VAL:HG12	14:P:96:CYS:HB2	1.98	0.46
21:W:53:C:O2'	21:W:507:G:N7	2.41	0.46
21:W:899:U:O2'	21:W:900:C:O4'	2.34	0.46
30:d:10:LYS:HB3	30:d:10:LYS:HE3	1.72	0.46
45:x:248:THR:HA	45:x:373:VAL:HA	1.97	0.46
21:W:1752:C:H2'	21:W:1780:G:H1	1.81	0.46
21:W:1848:U:O4	26:9:12:ARG:NH2	2.49	0.46
34:h:175:VAL:N	34:h:182:LEU:O	2.45	0.46
45:x:396:LEU:HD12	45:x:451:TYR:HE1	1.81	0.46
46:6:308:VAL:HA	46:6:311:PHE:HB2	1.98	0.46
2:B:154:PHE:O	2:B:155:ARG:C	2.59	0.45
9:J:659:ASN:HD21	9:J:667:ARG:HD3	1.80	0.45
21:W:1550:G:H3'	21:W:1579:A:H61	1.81	0.45
30:d:23:LYS:HE2	30:d:23:LYS:HB3	1.81	0.45
33:g:13:PHE:HB3	33:g:22:VAL:HG22	1.97	0.45
3:D:22:VAL:HG12	3:D:34:VAL:HG22	1.97	0.45
9:J:409:MET:HE2	9:J:486:VAL:HG12	1.97	0.45
21:W:1568:C:OP1	50:l:96:SER:OG	2.34	0.45
44:w:35:VAL:HG21	44:w:110:VAL:HG21	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:514:MET:HE1	46:6:321:VAL:HA	1.97	0.45
2:B:302:ASN:HA	9:J:824:LYS:HE2	1.98	0.45
2:B:341:PHE:HA	2:B:344:PHE:HB3	1.99	0.45
21:W:836:G:H1'	21:W:837:A:N7	2.31	0.45
21:W:1036:A:N3	21:W:1844:U:O2'	2.48	0.45
21:W:1283:C:O2'	21:W:1313:A:N1	2.49	0.45
21:W:1808:U:H2'	21:W:1809:A:C8	2.51	0.45
31:e:12:PHE:HZ	31:e:21:LYS:HD2	1.82	0.45
52:n:47:LYS:O	52:n:66:ARG:NH2	2.46	0.45
2:B:51:VAL:O	2:B:55:MET:N	2.50	0.45
3:D:71:VAL:HG21	3:D:85:LEU:HD13	1.97	0.45
21:W:166:A2M:H1'	21:W:166:A2M:HM'2	1.68	0.45
37:k:201:SER:OG	37:k:203:ASP:OD1	2.26	0.45
46:6:271:GLU:C	46:6:273:ASN:N	2.68	0.45
1:A:411:LEU:HD11	1:A:431:LEU:HD23	1.98	0.45
17:S:183:ARG:NH2	21:W:317:C:OP2	2.50	0.45
21:W:588:G:OP2	21:W:588:G:N2	2.44	0.45
21:W:1119:A:OP2	45:x:86:ALA:HA	2.16	0.45
21:W:1447:OMG:HM23	21:W:1447:OMG:H1'	1.62	0.45
36:j:52:LYS:HA	36:j:52:LYS:HD2	1.77	0.45
37:k:220:ASP:CB	37:k:223:GLU:HB2	2.45	0.45
6:G:40:LYS:HB2	6:G:48:GLU:HB3	1.98	0.45
9:J:429:GLU:O	9:J:432:HIS:NE2	2.50	0.45
9:J:732:SER:OG	9:J:735:GLU:OE1	2.30	0.45
21:W:1259:A:N6	21:W:1519:U:O4'	2.47	0.45
31:e:39:GLU:OE1	31:e:39:GLU:N	2.49	0.45
32:f:22:LYS:HB2	32:f:23:TRP:CD1	2.51	0.45
45:x:305:SER:OG	45:x:306:PHE:N	2.50	0.45
8:I:531:ASP:HA	8:I:542:THR:HG22	1.99	0.45
10:L:159:ASP:OD1	10:L:159:ASP:N	2.49	0.45
11:M:39:GLY:O	11:M:40:CYS:C	2.59	0.45
21:W:535:G:H22	21:W:549:C:H42	1.65	0.45
48:8:118:GLY:HA2	48:8:147:SER:HA	1.99	0.45
48:8:274:LYS:O	48:8:279:GLN:N	2.48	0.45
1:A:160:CYS:HA	1:A:163:LEU:HB3	1.99	0.45
7:H:38:ARG:O	7:H:39:ASN:C	2.59	0.45
8:I:224:GLU:HG2	8:I:229:THR:HG22	1.99	0.45
21:W:1831:A:H1'	21:W:1852:C:H5'	1.99	0.45
1:A:286:SER:O	1:A:286:SER:OG	2.32	0.45
6:G:38:VAL:HA	6:G:49:ALA:HA	1.98	0.45
14:P:116:LYS:HE3	21:W:989:C:H5"	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:V:4:MET:HE3	21:W:924:G:H5'	1.99	0.45
21:W:521:A:OP1	24:Z:45:ARG:NH1	2.45	0.45
21:W:535:G:H1'	21:W:536:A:H2'	1.99	0.45
21:W:1031:A2M:H1'	21:W:1031:A2M:HM'2	1.72	0.45
36:j:81:ARG:NH2	36:j:117:GLY:O	2.50	0.45
37:k:20:GLN:NE2	37:k:68:ASP:OD1	2.46	0.45
37:k:65:PHE:O	37:k:83:TRP:N	2.50	0.45
37:k:225:LYS:HA	37:k:225:LYS:HD2	1.73	0.45
40:p:137:ASP:OD1	40:p:137:ASP:N	2.49	0.45
8:I:666:VAL:HB	8:I:684:TRP:HB2	1.99	0.45
11:M:78:SER:OG	45:x:81:GLN:O	2.24	0.45
19:U:246:THR:OG1	19:U:259:LYS:O	2.30	0.45
21:W:1383:A2M:H1'	21:W:1383:A2M:HM'2	1.72	0.45
25:7:267:ARG:O	25:7:286:SER:OG	2.34	0.45
37:k:141:THR:OG1	37:k:142:VAL:N	2.50	0.45
47:4:119:THR:HA	47:4:172:TRP:HA	1.99	0.45
3:D:254:ALA:HA	3:D:257:VAL:HG12	1.98	0.44
9:J:439:ARG:HH21	11:M:58:GLY:H	1.65	0.44
23:Y:18:TRP:O	23:Y:19:MET:C	2.59	0.44
24:Z:88:ASP:HB3	24:Z:91:LYS:HG2	1.99	0.44
8:I:490:PRO:HG2	8:I:508:ASN:HD22	1.82	0.44
8:I:685:THR:HG1	8:I:689:ARG:H	1.59	0.44
21:W:294:U:OP1	22:X:36:TYR:OH	2.29	0.44
21:W:1703:OMC:H2'	21:W:1704:C:O4'	2.16	0.44
25:7:246:LEU:HB2	25:7:281:GLY:HA2	1.99	0.44
30:d:142:SER:O	30:d:143:LYS:C	2.58	0.44
31:e:19:GLN:OE1	31:e:85:ASN:ND2	2.51	0.44
33:g:146:ARG:NH1	51:y:35:A:OP2	2.50	0.44
34:h:53:THR:O	34:h:90:LYS:NZ	2.40	0.44
42:s:11:LEU:HB3	42:s:35:MET:HE1	1.99	0.44
50:l:124:THR:OG1	50:l:127:GLY:N	2.42	0.44
2:B:160:ALA:CB	2:B:165:ALA:HB2	2.48	0.44
21:W:72:C:OP2	21:W:73:C:N4	2.50	0.44
21:W:534:G:H1	21:W:549:C:H42	1.65	0.44
21:W:576:A2M:HM'3	21:W:576:A2M:H1'	1.78	0.44
21:W:1228:A:O3'	52:n:142:ARG:NH2	2.50	0.44
33:g:34:VAL:HG12	33:g:70:VAL:HB	1.98	0.44
3:D:237:MET:HB3	3:D:251:LEU:HD11	1.97	0.44
13:O:131:GLY:HA3	13:O:216:MET:HB3	2.00	0.44
14:P:32:ASP:O	14:P:96:CYS:N	2.49	0.44
14:P:133:TYR:HD2	14:P:181:LEU:HD13	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:S:56:ASN:HB2	17:S:108:VAL:HG12	2.00	0.44
21:W:1182:A:OP1	26:9:18:ARG:NH2	2.50	0.44
21:W:1656:G:H1	21:W:1668:U:H3	1.64	0.44
21:W:1786:U:H2'	21:W:1787:G:H8	1.83	0.44
32:f:51:HIS:CD2	32:f:86:LYS:HD2	2.52	0.44
33:g:15:ARG:O	33:g:86:GLN:NE2	2.50	0.44
34:h:50:ILE:HD11	34:h:86:LEU:HD23	2.00	0.44
37:k:146:SER:OG	37:k:147:HIS:N	2.49	0.44
37:k:216:ALA:HB2	37:k:236:ILE:HD13	1.99	0.44
45:x:197:GLY:HA2	45:x:341:ASN:H	1.83	0.44
46:6:200:ALA:O	46:6:204:ALA:N	2.49	0.44
52:n:75:ARG:HH22	52:n:95:TYR:HB3	1.82	0.44
8:I:392:SER:OG	8:I:403:ALA:O	2.31	0.44
9:J:504:LEU:HD12	9:J:564:ILE:HG23	1.98	0.44
11:M:36:LYS:HG2	45:x:80:PHE:CD2	2.53	0.44
21:W:1703:OMC:H1'	21:W:1703:OMC:HM23	1.72	0.44
37:k:78:ALA:HB3	37:k:90:TRP:HB2	1.99	0.44
37:k:290:ALA:O	37:k:299:PHE:N	2.49	0.44
3:D:214:ALA:HB2	3:D:261:LYS:HD2	2.00	0.44
9:J:835:LEU:HG	9:J:838:PRO:HD2	1.99	0.44
14:P:34:LYS:O	14:P:98:THR:OG1	2.29	0.44
16:R:2:THR:N	21:W:1199:A:OP1	2.50	0.44
17:S:142:ARG:HE	17:S:153:VAL:HG11	1.82	0.44
21:W:693:A:H2'	21:W:694:G:H8	1.83	0.44
21:W:1344:A:N1	21:W:1385:G:O2'	2.45	0.44
21:W:1831:A:C1'	21:W:1852:C:H5'	2.48	0.44
15:Q:80:ARG:NH2	15:Q:165:ASN:O	2.37	0.44
17:S:121:ILE:HG22	17:S:123:GLY:H	1.82	0.44
37:k:208:ALA:HB2	37:k:218:LEU:HG	1.98	0.44
10:L:51:ILE:HG21	10:L:179:LYS:HG2	1.99	0.44
13:O:242:ASP:OD1	13:O:246:LYS:NZ	2.43	0.44
17:S:170:ARG:NH2	21:W:72:C:N3	2.66	0.44
33:g:102:GLU:OE1	37:k:57:ARG:N	2.51	0.44
33:g:105:LYS:O	33:g:108:ILE:HG22	2.17	0.44
36:j:34:MET:HE1	36:j:45:LEU:HD23	1.99	0.44
8:I:589:VAL:HB	8:I:609:GLN:HE22	1.81	0.44
32:f:36:GLN:HE22	45:x:421:ILE:HD11	1.83	0.44
37:k:85:GLY:HA2	37:k:108:VAL:HG23	1.99	0.44
37:k:147:HIS:NE2	37:k:173:LEU:O	2.51	0.44
1:A:298:ARG:HH22	1:A:361:LEU:HB2	1.83	0.43
20:V:94:LYS:HB2	20:V:94:LYS:HE2	1.77	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:895:G:N2	21:W:898:U:OP2	2.50	0.43
32:f:102:LEU:HD22	38:m:108:ILE:HD12	1.99	0.43
37:k:5:MET:HE3	37:k:270:LEU:HD21	2.00	0.43
37:k:9:GLY:HA3	37:k:52:TYR:HB2	1.99	0.43
37:k:148:SER:OG	37:k:149:GLU:OE1	2.32	0.43
52:n:89:ASP:HB2	52:n:93:GLY:H	1.82	0.43
2:B:331:ASP:OD1	2:B:331:ASP:N	2.51	0.43
9:J:351:ILE:HD11	9:J:382:LEU:HG	2.00	0.43
14:P:40:ASN:HB2	14:P:75:GLN:HA	2.00	0.43
21:W:1220:A:H2'	21:W:1221:G:O4'	2.18	0.43
21:W:1476:A:H4'	21:W:1477:U:H5"	2.00	0.43
37:k:86:THR:HG23	37:k:102:VAL:HG12	1.99	0.43
41:q:19:GLN:HE22	41:q:88:TRP:CG	2.37	0.43
42:s:35:MET:SD	42:s:35:MET:N	2.91	0.43
44:w:99:LYS:HA	44:w:99:LYS:HD3	1.85	0.43
9:J:543:ASP:HB3	9:J:546:VAL:HG12	1.99	0.43
14:P:222:LYS:HD3	14:P:222:LYS:HA	1.82	0.43
43:v:7:LYS:HG3	43:v:11:LYS:HE2	2.00	0.43
45:x:425:LEU:HA	45:x:432:LEU:HD21	1.99	0.43
8:I:430:LYS:HZ3	8:I:471:SER:HA	1.83	0.43
24:Z:128:VAL:O	24:Z:132:GLN:HG3	2.19	0.43
34:h:55:THR:HA	34:h:58:VAL:HG12	2.00	0.43
36:j:96:VAL:O	36:j:103:ASN:N	2.45	0.43
46:6:154:TRP:O	46:6:158:THR:N	2.51	0.43
51:y:58:1MA:N3	51:y:60:A:H5"	2.33	0.43
4:E:42:ILE:O	4:E:131:SER:N	2.51	0.43
9:J:426:GLU:N	9:J:426:GLU:OE1	2.51	0.43
21:W:191:A:OP1	30:d:145:ILE:HG13	2.18	0.43
30:d:158:ILE:HG13	30:d:159:SER:H	1.83	0.43
32:f:50:PRO:HB3	32:f:69:VAL:HG13	2.00	0.43
32:f:124:ASP:OD1	32:f:125:SER:N	2.52	0.43
38:m:102:LYS:HA	38:m:107:VAL:HG12	1.99	0.43
44:w:18:HIS:N	44:w:93:SER:O	2.48	0.43
47:4:110:ASN:HA	48:8:110:VAL:HA	2.00	0.43
1:A:483:ARG:NH2	9:J:799:TYR:O	2.51	0.43
3:D:231:ALA:HB3	3:D:234:ARG:HE	1.82	0.43
8:I:468:LYS:HD2	8:I:484:PRO:HD3	2.01	0.43
8:I:520:GLN:HB2	8:I:523:GLY:H	1.84	0.43
23:Y:45:ILE:HA	23:Y:61:VAL:HG11	1.99	0.43
41:q:13:ASP:N	41:q:13:ASP:OD1	2.51	0.43
1:A:403:LEU:HD11	1:A:438:ARG:HG3	1.99	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:I:555:PRO:HB3	24:Z:156:HIS:NE2	2.34	0.43
13:O:238:LYS:NZ	21:W:1355:C:O3'	2.52	0.43
21:W:30:C:O2'	21:W:596:U:OP1	2.35	0.43
21:W:1679:A:H2'	32:f:60:ARG:HD3	2.01	0.43
21:W:1781:A:H1'	21:W:1782:G:N7	2.33	0.43
21:W:1853:C:H2'	21:W:1854:U:C6	2.53	0.43
27:a:101:LEU:HB3	27:a:124:LYS:HB2	2.01	0.43
32:f:36:GLN:HE21	45:x:479:GLN:NE2	2.15	0.43
37:k:217:MET:HB3	37:k:229:THR:HG23	2.01	0.43
52:n:82:TRP:HA	52:n:87:GLN:HE22	1.83	0.43
54:5:270:GLY:HA2	54:5:276:GLY:H	1.82	0.43
3:D:37:LEU:HA	3:D:41:ASN:HA	1.99	0.43
4:E:84:ALA:O	4:E:132:PHE:N	2.50	0.43
5:F:173:TYR:HA	5:F:180:VAL:HA	2.01	0.43
19:U:223:THR:HA	19:U:226:CYS:HB3	2.00	0.43
21:W:1446:A:O2'	21:W:1447:OMG:O4'	2.37	0.43
32:f:104:THR:HG23	32:f:106:GLU:H	1.83	0.43
37:k:14:HIS:ND1	37:k:18:VAL:HG22	2.33	0.43
43:v:14:ARG:HG2	43:v:69:ILE:HD11	2.00	0.43
1:A:183:LYS:HA	1:A:186:LEU:HB3	2.00	0.43
1:A:331:ILE:HD13	1:A:367:ARG:HD3	2.00	0.43
7:H:31:ILE:HD13	7:H:49:GLY:HA3	2.00	0.43
9:J:698:MET:HE3	9:J:698:MET:HB3	1.92	0.43
21:W:384:U:O4	30:d:5:ARG:NH1	2.39	0.43
22:X:109:MET:HE2	22:X:109:MET:HB3	1.81	0.43
35:i:91:PRO:HD2	35:i:94:LEU:HD12	2.01	0.43
45:x:361:ARG:NH2	45:x:441:LEU:O	2.52	0.43
8:I:462:LEU:HD21	8:I:501:ARG:HE	1.83	0.43
17:S:15:LEU:HD22	21:W:155:G:H4'	2.00	0.43
20:V:104:ARG:H	20:V:104:ARG:HG2	1.70	0.43
21:W:1144:A:H2'	21:W:1145:A:C8	2.54	0.43
30:d:117:TYR:HB3	30:d:119:LEU:HD23	2.00	0.43
37:k:78:ALA:O	37:k:90:TRP:N	2.52	0.43
39:o:55:LEU:HB2	44:w:81:GLN:HE21	1.84	0.43
6:G:66:ARG:NH2	21:W:1825:A:OP2	2.46	0.42
8:I:430:LYS:HE2	8:I:472:TRP:HD1	1.84	0.42
9:J:445:LEU:O	9:J:449:GLU:N	2.45	0.42
12:N:78:ILE:O	15:Q:3:GLY:N	2.52	0.42
13:O:108:LYS:HD2	13:O:233:LEU:HD13	2.00	0.42
14:P:63:LYS:HB2	14:P:63:LYS:HE2	1.82	0.42
21:W:535:G:O6	21:W:548:C:N4	2.43	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
24:Z:79:ARG:HH11	24:Z:92:MET:HE1	1.84	0.42
24:Z:114:VAL:HG13	24:Z:119:LEU:HB2	2.01	0.42
29:c:120:HIS:O	29:c:120:HIS:ND1	2.52	0.42
34:h:74:GLN:HA	34:h:79:PHE:HB2	2.01	0.42
37:k:162:ASN:ND2	37:k:222:ASN:OD1	2.52	0.42
43:v:71:ILE:HG22	43:v:73:LEU:H	1.84	0.42
46:6:323:CYS:SG	46:6:331:LYS:NZ	2.79	0.42
52:n:24:ARG:HD3	52:n:29:ALA:HA	2.00	0.42
8:I:430:LYS:HE3	8:I:430:LYS:HB2	1.72	0.42
13:O:194:ARG:HD3	13:O:196:ILE:HD11	2.01	0.42
14:P:152:LYS:HB3	14:P:152:LYS:HE2	1.85	0.42
17:S:163:ASN:HA	21:W:67:C:H41	1.84	0.42
21:W:1852:C:H5	26:9:5:TRP:HB3	1.84	0.42
33:g:58:LEU:HG	33:g:62:ARG:HD2	2.01	0.42
36:j:83:MET:HB3	36:j:116:LEU:HD13	2.01	0.42
37:k:125:ARG:HG2	37:k:150:TRP:CG	2.53	0.42
1:A:562:ARG:NH2	47:4:204:THR:O	2.53	0.42
13:O:114:LYS:HD2	21:W:1358:U:H5'	2.01	0.42
16:R:52:ASP:OD2	18:T:117:ARG:NH1	2.53	0.42
21:W:1648:G:O2'	21:W:1674:G:O6	2.31	0.42
41:q:22:LEU:HD21	41:q:89:VAL:HG23	2.00	0.42
3:D:223:MET:HG2	3:D:241:THR:HG21	2.02	0.42
34:h:11:PHE:HB3	44:w:82:MET:HE1	2.02	0.42
3:D:191:ILE:HG12	3:D:277:VAL:HB	2.01	0.42
4:E:295:GLU:HA	4:E:315:PHE:HA	2.02	0.42
13:O:185:THR:OG1	21:W:1155:U:OP1	2.32	0.42
15:Q:151:ASP:OD1	15:Q:151:ASP:N	2.52	0.42
20:V:9:LYS:NZ	21:W:1091:C:OP1	2.41	0.42
21:W:396:U:OP2	22:X:79:LYS:NZ	2.45	0.42
21:W:1665:G:P	50:l:91:HIS:HE2	2.43	0.42
21:W:1698:C:HO2'	21:W:1699:A:P	2.43	0.42
21:W:1754:G:N2	21:W:1780:G:O2'	2.53	0.42
23:Y:188:ASN:HA	23:Y:245:ARG:HH12	1.85	0.42
32:f:40:ALA:HB1	32:f:45:TYR:CG	2.54	0.42
33:g:132:PHE:O	33:g:140:ARG:NH1	2.49	0.42
34:h:136:VAL:HG22	34:h:186:VAL:HG12	2.00	0.42
39:o:21:CYS:SG	39:o:24:CYS:N	2.91	0.42
1:A:443:VAL:HG22	1:A:447:TYR:HB2	2.02	0.42
7:H:38:ARG:N	7:H:42:LYS:O	2.51	0.42
21:W:659:G:O2'	21:W:662:G:O2'	2.31	0.42
46:6:297:MET:HB3	46:6:298:GLN:NE2	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:43:TRP:CZ3	1:A:46:ILE:HG22	2.55	0.42
1:A:101:THR:HG22	1:A:149:TRP:HB3	2.01	0.42
2:B:307:GLY:HA2	2:B:311:LYS:HG2	2.02	0.42
9:J:366:LEU:HD21	9:J:430:ASN:HD22	1.85	0.42
9:J:519:HIS:NE2	9:J:771:GLU:OE2	2.52	0.42
21:W:99:A2M:HM'3	21:W:99:A2M:H1'	1.82	0.42
25:7:242:ARG:HD3	25:7:282:PHE:HZ	1.84	0.42
37:k:30:MET:HE2	37:k:92:LEU:HD21	2.00	0.42
37:k:240:CYS:HB3	37:k:249:CYS:HB2	1.32	0.42
45:x:362:ARG:HB3	45:x:370:ASP:HB2	2.01	0.42
6:G:39:ILE:HG23	6:G:40:LYS:HG2	2.01	0.42
9:J:507:ILE:HB	9:J:548:MET:HE3	2.00	0.42
18:T:149:ARG:HG2	18:T:151:LEU:HB2	2.01	0.42
21:W:1112:U:H2'	21:W:1119:A:N6	2.35	0.42
21:W:1535:U:O2'	32:f:82:ASN:ND2	2.50	0.42
37:k:87:LEU:O	37:k:101:PHE:N	2.51	0.42
45:x:25:PHE:HE2	45:x:28:MET:HB3	1.85	0.42
46:6:260:LYS:CA	46:6:265:SER:HA	2.50	0.42
46:6:292:ILE:HB	46:6:330:ARG:HG3	2.02	0.42
1:A:55:LEU:HD13	1:A:93:TYR:HB2	2.02	0.42
1:A:329:ILE:HB	1:A:367:ARG:HH11	1.84	0.42
3:D:53:ARG:HB2	3:D:88:ARG:HD2	2.01	0.42
6:G:79:VAL:HA	6:G:91:VAL:HA	2.02	0.42
8:I:492:ARG:NH1	8:I:508:ASN:HD21	2.18	0.42
9:J:517:LYS:HA	9:J:520:GLN:HB2	2.02	0.42
12:N:45:ARG:HH22	15:Q:187:GLY:N	2.18	0.42
21:W:1842:4AC:OP2	26:9:4:LYS:HG3	2.19	0.42
29:c:43:LYS:HA	29:c:43:LYS:HD2	1.75	0.42
46:6:165:LEU:O	46:6:170:GLU:N	2.47	0.42
1:A:446:ILE:HG13	1:A:447:TYR:HD1	1.85	0.42
17:S:67:VAL:HG12	17:S:69:THR:HG22	2.02	0.42
17:S:92:ARG:NH1	21:W:1738:C:OP1	2.48	0.42
21:W:601:OMG:HM23	21:W:601:OMG:H1'	1.92	0.42
21:W:934:G:H22	21:W:1008:A:H2	1.67	0.42
21:W:1567:G:H21	21:W:1628:C:H4'	1.84	0.42
27:a:94:ILE:HG22	27:a:125:VAL:HG21	2.02	0.42
30:d:6:ASP:OD1	30:d:9:HIS:ND1	2.52	0.42
34:h:48:ILE:HB	34:h:86:LEU:HG	2.01	0.42
52:n:13:LEU:O	52:n:20:ILE:N	2.53	0.42
14:P:136:ARG:NH2	21:W:941:C:OP1	2.53	0.41
21:W:1302:G:H22	21:W:1307:U:H3	1.67	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:1565:C:N4	21:W:1566:G:O6	2.53	0.41
21:W:1753:C:OP2	21:W:1782:G:H5'	2.20	0.41
30:d:4:SER:HB3	30:d:24:LYS:HE2	2.02	0.41
34:h:225:GLU:HG3	37:k:187:ASN:HB3	2.02	0.41
42:s:35:MET:HG2	45:x:425:LEU:HD22	2.01	0.41
1:A:447:TYR:HE2	1:A:454:ARG:HH12	1.68	0.41
8:I:201:GLU:O	8:I:205:ASN:ND2	2.45	0.41
8:I:429:PHE:CE1	8:I:440:ARG:HB3	2.55	0.41
8:I:519:TRP:HD1	8:I:520:GLN:H	1.66	0.41
10:L:71:SER:OG	10:L:72:PHE:N	2.53	0.41
13:O:232:THR:HG22	13:O:235:ASN:H	1.85	0.41
23:Y:247:THR:OG1	23:Y:250:GLU:OE1	2.37	0.41
24:Z:33:GLY:HA3	28:b:112:TYR:CG	2.55	0.41
35:i:3:MET:HA	35:i:4:PRO:HD3	1.88	0.41
37:k:258:ILE:HG23	37:k:267:VAL:HB	2.01	0.41
52:n:24:ARG:HB2	52:n:29:ALA:HB2	2.02	0.41
3:D:22:VAL:HG22	3:D:36:LEU:HA	2.03	0.41
14:P:120:MET:HG3	14:P:142:PHE:CE2	2.56	0.41
17:S:96:SER:OG	21:W:468:A2M:OP1	2.36	0.41
18:T:96:LYS:HD3	18:T:132:VAL:HG21	2.01	0.41
23:Y:19:MET:CE	23:Y:108:ARG:HD2	2.48	0.41
46:6:270:HIS:HA	46:6:273:ASN:ND2	2.35	0.41
2:B:322:ASP:HB3	2:B:325:LEU:HB2	2.02	0.41
3:D:87:LYS:HB3	3:D:87:LYS:HE2	1.78	0.41
6:G:101:ARG:HA	6:G:104:LYS:HG2	2.03	0.41
9:J:518:ALA:HA	9:J:522:GLN:HA	2.03	0.41
11:M:33:MET:HE3	11:M:33:MET:HB2	1.87	0.41
17:S:42:GLY:HA3	17:S:45:TRP:HD1	1.86	0.41
18:T:63:LYS:HD2	18:T:63:LYS:HA	1.83	0.41
34:h:30:ALA:HB1	34:h:103:GLU:HB3	2.03	0.41
35:i:11:ILE:O	35:i:15:LEU:N	2.54	0.41
50:l:39:LEU:HD21	50:l:52:TRP:CD2	2.56	0.41
52:n:98:VAL:HG11	52:n:106:LYS:HG3	2.02	0.41
1:A:246:TRP:CD1	9:J:728:GLY:HA3	2.55	0.41
4:E:294:ILE:O	4:E:316:SER:N	2.49	0.41
13:O:196:ILE:HB	13:O:223:TYR:HB2	2.02	0.41
15:Q:85:ARG:NH1	15:Q:203:PHE:O	2.46	0.41
17:S:199:THR:HG21	21:W:126:G:H8	1.86	0.41
28:b:118:ASN:O	28:b:120:VAL:N	2.48	0.41
36:j:107:ILE:HG23	36:j:111:MET:HG3	2.02	0.41
46:6:325:ILE:HD11	46:6:331:LYS:HE3	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
46:6:347:TRP:HZ3	46:6:350:LEU:HD13	1.85	0.41
48:8:325:THR:O	48:8:329:ASN:N	2.46	0.41
9:J:114:GLU:OE2	9:J:146:ARG:NH1	2.53	0.41
20:V:32:ASP:OD1	20:V:32:ASP:N	2.52	0.41
21:W:49:C:H2'	21:W:472:C:H41	1.84	0.41
21:W:203:G:O2'	21:W:204:G:O4'	2.38	0.41
21:W:557:U:H2'	21:W:558:G:C8	2.55	0.41
21:W:1828:C:O5'	21:W:1828:C:H6	2.03	0.41
42:s:12:ALA:HB1	42:s:32:VAL:HB	2.01	0.41
1:A:128:LEU:HD11	9:J:513:LYS:HE3	2.02	0.41
1:A:479:ASP:HB2	1:A:506:PRO:HB3	2.03	0.41
21:W:641:A:O2'	21:W:645:C:OP1	2.31	0.41
24:Z:136:ARG:HD2	24:Z:139:LYS:HA	2.02	0.41
1:A:161:LEU:HD23	1:A:161:LEU:HA	1.95	0.41
3:D:47:LEU:HD23	3:D:47:LEU:HA	1.95	0.41
9:J:505:LEU:HD12	9:J:505:LEU:HA	1.73	0.41
11:M:41:TYR:OH	45:x:75:GLU:OE1	2.32	0.41
14:P:67:PHE:HD2	18:T:47:LEU:HG	1.86	0.41
17:S:2:LYS:HD3	17:S:15:LEU:HD21	2.03	0.41
34:h:5:ILE:HG23	34:h:9:ARG:HH21	1.86	0.41
34:h:107:TYR:O	34:h:111:GLY:N	2.54	0.41
37:k:106:LYS:HB3	37:k:125:ARG:HB2	2.02	0.41
37:k:171:ASP:OD1	37:k:171:ASP:N	2.42	0.41
41:q:30:GLY:O	41:q:112:LYS:N	2.52	0.41
47:4:117:ILE:HA	47:4:174:ALA:HA	2.03	0.41
50:l:107:LEU:HD23	50:l:110:LEU:HD12	2.03	0.41
1:A:367:ARG:O	1:A:367:ARG:NE	2.44	0.41
2:B:372:VAL:HA	2:B:375:ILE:HG12	2.03	0.41
8:I:528:VAL:HG12	8:I:545:GLU:HB2	2.01	0.41
15:Q:184:ARG:HG3	15:Q:189:ILE:HD11	2.03	0.41
17:S:13:GLN:NE2	21:W:153:G:N3	2.67	0.41
19:U:200:ARG:NH1	19:U:272:ARG:HH12	2.18	0.41
19:U:236:LEU:HD13	19:U:274:TYR:CZ	2.56	0.41
21:W:309:G:OP2	30:d:55:TYR:OH	2.31	0.41
21:W:1403:C:OP2	21:W:1405:A:N6	2.42	0.41
21:W:1448:A:H2'	21:W:1449:G:H8	1.84	0.41
21:W:1617:G:N1	21:W:1620:A:OP2	2.53	0.41
22:X:13:GLN:NE2	22:X:36:TYR:O	2.50	0.41
30:d:76:THR:HG23	30:d:105:ASP:HB2	2.03	0.41
30:d:145:ILE:O	30:d:146:GLN:C	2.63	0.41
32:f:70:GLU:O	32:f:73:THR:OG1	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
32:f:127:ARG:HD2	32:f:127:ARG:HA	1.94	0.41
37:k:124:SER:OG	37:k:125:ARG:N	2.54	0.41
45:x:437:CYS:HA	45:x:440:LEU:HB2	2.02	0.41
50:l:39:LEU:HD13	50:l:99:VAL:HG11	2.03	0.41
52:n:115:LYS:O	52:n:118:ARG:NH1	2.54	0.41
1:A:272:MET:HA	1:A:275:TYR:HB3	2.03	0.41
1:A:400:PRO:HD2	46:6:313:ILE:HD12	2.03	0.41
9:J:669:ARG:HE	9:J:669:ARG:HB2	1.65	0.41
17:S:142:ARG:HA	17:S:147:LEU:HD23	2.02	0.41
21:W:1442:OMU:HM23	21:W:1442:OMU:H1'	1.91	0.41
32:f:69:VAL:O	32:f:73:THR:HG23	2.20	0.41
34:h:107:TYR:HA	34:h:110:LEU:HB2	2.03	0.41
37:k:32:LEU:HD12	37:k:71:ILE:HG12	2.03	0.41
37:k:104:HIS:CE1	37:k:130:LYS:HD3	2.56	0.41
45:x:71:TYR:HE2	45:x:73:HIS:HB3	1.86	0.41
47:4:336:MET:O	47:4:340:LEU:N	2.46	0.41
51:y:8:U:O2'	51:y:21:A:N1	2.52	0.41
8:I:483:VAL:HG12	8:I:492:ARG:HB2	2.03	0.40
9:J:736:HIS:CE1	9:J:760:LYS:HD2	2.56	0.40
18:T:149:ARG:HE	18:T:151:LEU:HD22	1.86	0.40
19:U:212:VAL:HG22	19:U:216:LYS:HB2	2.03	0.40
23:Y:160:ILE:HD12	23:Y:169:ILE:HG12	2.02	0.40
35:i:11:ILE:HD11	35:i:45:VAL:HG22	2.03	0.40
48:8:38:GLN:O	48:8:76:LEU:N	2.46	0.40
1:A:23:LYS:HB3	1:A:26:PRO:HD2	2.04	0.40
1:A:61:LEU:HD12	1:A:61:LEU:HA	1.90	0.40
3:D:44:GLY:HA2	3:D:83:ILE:HB	2.03	0.40
8:I:277:ASP:OD1	8:I:277:ASP:N	2.54	0.40
10:L:106:ARG:HG3	10:L:106:ARG:HH11	1.85	0.40
11:M:37:CYS:O	11:M:38:PRO:C	2.63	0.40
18:T:147:ARG:HB2	18:T:150:ARG:HH21	1.87	0.40
19:U:183:VAL:HA	19:U:186:ILE:HG12	2.03	0.40
21:W:616:A:H1'	28:b:86:VAL:HG23	2.03	0.40
21:W:1533:A:H2	21:W:1537:A:H1'	1.86	0.40
33:g:6:PRO:HB2	33:g:7:LEU:H	1.67	0.40
1:A:92:ALA:HA	1:A:95:LYS:HG2	2.02	0.40
1:A:137:THR:HA	1:A:140:ARG:HB3	2.03	0.40
1:A:438:ARG:HA	1:A:438:ARG:HD3	1.95	0.40
1:A:485:ASP:OD2	1:A:487:THR:OG1	2.37	0.40
1:A:532:LYS:HA	1:A:532:LYS:HD2	1.86	0.40
6:G:53:ASP:OD1	6:G:53:ASP:N	2.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:W:484:A2M:O5'	21:W:484:A2M:H8	2.21	0.40
24:Z:106:LEU:HD23	24:Z:109:ARG:HD2	2.02	0.40
35:i:38:LYS:HE3	35:i:38:LYS:HB2	1.78	0.40
3:D:187:GLN:HG2	3:D:189:VAL:HG13	2.04	0.40
6:G:47:LEU:O	6:G:59:CYS:N	2.53	0.40
8:I:256:ASP:N	8:I:256:ASP:OD1	2.53	0.40
14:P:182:LYS:HE3	14:P:182:LYS:HB3	1.97	0.40
21:W:1401:A:H61	21:W:1446:A:H61	1.69	0.40
21:W:1546:G:N2	21:W:1670:C:O2	2.53	0.40
21:W:1653:U:H3	21:W:1671:G:H1	1.70	0.40
24:Z:147:PHE:HD2	24:Z:149:VAL:HG22	1.86	0.40
2:B:230:ASP:O	2:B:235:LEU:N	2.55	0.40
9:J:349:ALA:HA	9:J:352:GLU:HG3	2.03	0.40
9:J:366:LEU:HD22	9:J:370:VAL:HB	2.02	0.40
9:J:648:GLN:HE22	9:J:676:HIS:HB3	1.87	0.40
21:W:1303:C:OP1	39:o:2:GLY:N	2.54	0.40
37:k:31:ILE:HD11	37:k:45:LEU:HD21	2.04	0.40
37:k:235:ILE:H	37:k:235:ILE:HD12	1.87	0.40
48:8:66:VAL:HA	48:8:119:TRP:HA	2.04	0.40
48:8:336:GLN:O	48:8:340:LYS:N	2.52	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	732/1382 (53%)	685 (94%)	47 (6%)	0	100 100
2	B	403/445 (91%)	365 (91%)	37 (9%)	1 (0%)	43 73
3	D	273/315 (87%)	259 (95%)	14 (5%)	0	100 100
4	E	346/472 (73%)	318 (92%)	27 (8%)	1 (0%)	36 67

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	F	323/325 (99%)	310 (96%)	13 (4%)	0	100	100
6	G	85/147 (58%)	74 (87%)	11 (13%)	0	100	100
7	H	83/116 (72%)	76 (92%)	7 (8%)	0	100	100
8	I	573/814 (70%)	536 (94%)	37 (6%)	0	100	100
9	J	639/913 (70%)	606 (95%)	33 (5%)	0	100	100
10	L	172/194 (89%)	161 (94%)	11 (6%)	0	100	100
11	M	79/84 (94%)	74 (94%)	5 (6%)	0	100	100
12	N	81/83 (98%)	78 (96%)	3 (4%)	0	100	100
13	O	218/293 (74%)	215 (99%)	3 (1%)	0	100	100
14	P	209/264 (79%)	196 (94%)	13 (6%)	0	100	100
15	Q	212/295 (72%)	204 (96%)	8 (4%)	0	100	100
16	R	97/115 (84%)	96 (99%)	1 (1%)	0	100	100
17	S	228/249 (92%)	218 (96%)	10 (4%)	0	100	100
18	T	131/151 (87%)	123 (94%)	8 (6%)	0	100	100
19	U	136/333 (41%)	117 (86%)	19 (14%)	0	100	100
20	V	148/151 (98%)	144 (97%)	4 (3%)	0	100	100
22	X	138/158 (87%)	133 (96%)	5 (4%)	0	100	100
23	Y	255/263 (97%)	249 (98%)	5 (2%)	1 (0%)	30	61
24	Z	175/194 (90%)	171 (98%)	4 (2%)	0	100	100
25	7	75/320 (23%)	66 (88%)	9 (12%)	0	100	100
26	9	22/25 (88%)	22 (100%)	0	0	100	100
27	a	138/143 (96%)	133 (96%)	4 (3%)	1 (1%)	18	49
28	b	55/59 (93%)	50 (91%)	4 (7%)	1 (2%)	6	28
29	c	127/130 (98%)	121 (95%)	6 (5%)	0	100	100
30	d	194/208 (93%)	183 (94%)	9 (5%)	2 (1%)	12	41
31	e	123/133 (92%)	122 (99%)	1 (1%)	0	100	100
32	f	180/204 (88%)	171 (95%)	8 (4%)	1 (1%)	21	52
33	g	139/146 (95%)	132 (95%)	6 (4%)	1 (1%)	18	49
34	h	223/243 (92%)	216 (97%)	7 (3%)	0	100	100
35	i	97/165 (59%)	90 (93%)	7 (7%)	0	100	100
36	j	111/145 (77%)	109 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
37	k	311/317 (98%)	277 (89%)	32 (10%)	2 (1%)	21 52
38	m	68/125 (54%)	64 (94%)	4 (6%)	0	100 100
39	o	53/56 (95%)	50 (94%)	3 (6%)	0	100 100
40	p	49/80 (61%)	43 (88%)	6 (12%)	0	100 100
41	q	120/132 (91%)	107 (89%)	13 (11%)	0	100 100
42	s	61/69 (88%)	57 (93%)	4 (7%)	0	100 100
43	v	129/135 (96%)	121 (94%)	8 (6%)	0	100 100
44	w	101/119 (85%)	93 (92%)	8 (8%)	0	100 100
45	x	417/548 (76%)	372 (89%)	44 (11%)	1 (0%)	43 73
46	6	348/374 (93%)	308 (88%)	39 (11%)	1 (0%)	36 67
47	4	251/357 (70%)	238 (95%)	13 (5%)	0	100 100
48	8	313/352 (89%)	291 (93%)	22 (7%)	0	100 100
49	3	209/218 (96%)	199 (95%)	10 (5%)	0	100 100
50	l	140/145 (97%)	134 (96%)	6 (4%)	0	100 100
52	n	140/152 (92%)	136 (97%)	4 (3%)	0	100 100
54	5	307/564 (54%)	298 (97%)	9 (3%)	0	100 100
All	All	10237/13420 (76%)	9611 (94%)	613 (6%)	13 (0%)	49 78

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	168	PRO
30	d	143	LYS
32	f	81	ARG
37	k	142	VAL
46	6	290	LYS
37	k	178	ASN
45	x	258	CYS
2	B	154	PHE
23	Y	21	ASP
33	g	100	VAL
27	a	86	PRO
28	b	119	VAL
30	d	145	ILE

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	528/1259 (42%)	528 (100%)	0	100	100
2	B	206/406 (51%)	206 (100%)	0	100	100
3	D	247/280 (88%)	247 (100%)	0	100	100
6	G	74/124 (60%)	74 (100%)	0	100	100
7	H	74/97 (76%)	74 (100%)	0	100	100
8	I	470/702 (67%)	469 (100%)	1 (0%)	87	89
9	J	489/811 (60%)	489 (100%)	0	100	100
10	L	160/174 (92%)	159 (99%)	1 (1%)	78	83
11	M	73/76 (96%)	70 (96%)	3 (4%)	27	59
12	N	67/67 (100%)	67 (100%)	0	100	100
13	O	186/225 (83%)	186 (100%)	0	100	100
14	P	192/231 (83%)	192 (100%)	0	100	100
15	Q	180/243 (74%)	180 (100%)	0	100	100
16	R	86/98 (88%)	86 (100%)	0	100	100
17	S	200/218 (92%)	200 (100%)	0	100	100
18	T	104/119 (87%)	104 (100%)	0	100	100
19	U	128/304 (42%)	125 (98%)	3 (2%)	44	70
20	V	130/131 (99%)	130 (100%)	0	100	100
22	X	129/142 (91%)	129 (100%)	0	100	100
23	Y	220/225 (98%)	220 (100%)	0	100	100
24	Z	158/168 (94%)	157 (99%)	1 (1%)	78	83
25	7	64/277 (23%)	64 (100%)	0	100	100
26	9	23/24 (96%)	23 (100%)	0	100	100
27	a	112/115 (97%)	112 (100%)	0	100	100
28	b	46/48 (96%)	46 (100%)	0	100	100
29	c	112/113 (99%)	112 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
30	d	172/180 (96%)	172 (100%)	0	100	100
31	e	107/115 (93%)	107 (100%)	0	100	100
32	f	156/170 (92%)	154 (99%)	2 (1%)	61	77
33	g	117/121 (97%)	116 (99%)	1 (1%)	70	80
34	h	189/202 (94%)	189 (100%)	0	100	100
35	i	90/136 (66%)	90 (100%)	0	100	100
36	j	103/130 (79%)	102 (99%)	1 (1%)	68	79
37	k	272/275 (99%)	271 (100%)	1 (0%)	84	86
38	m	62/103 (60%)	62 (100%)	0	100	100
39	o	48/49 (98%)	47 (98%)	1 (2%)	47	71
40	p	47/72 (65%)	47 (100%)	0	100	100
41	q	104/108 (96%)	104 (100%)	0	100	100
42	s	56/62 (90%)	56 (100%)	0	100	100
43	v	119/122 (98%)	119 (100%)	0	100	100
44	w	94/107 (88%)	94 (100%)	0	100	100
45	x	206/494 (42%)	206 (100%)	0	100	100
46	6	100/335 (30%)	96 (96%)	4 (4%)	28	60
48	8	1/310 (0%)	1 (100%)	0	100	100
50	l	112/115 (97%)	112 (100%)	0	100	100
52	n	123/132 (93%)	123 (100%)	0	100	100
All	All	6736/10015 (67%)	6717 (100%)	19 (0%)	84	87

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
8	I	538	GLN
10	L	17	ASP
11	M	36	LYS
11	M	42	LYS
11	M	43	ILE
19	U	203	VAL
19	U	204	MET
19	U	205	LYS
24	Z	154	GLN
32	f	77	MET

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Mol	Chain	Res	Type
32	f	88	MET
33	g	100	VAL
36	j	53	GLN
37	k	107	ASP
39	o	16	GLN
46	6	258	ASN
46	6	260	LYS
46	6	261	ASP
46	6	280	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (63) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	80	GLN
1	A	167	ASN
1	A	392	ASN
1	A	512	GLN
1	A	560	ASN
1	A	566	GLN
2	B	206	GLN
2	B	225	HIS
2	B	239	GLN
2	B	309	GLN
2	B	373	ASN
2	B	402	GLN
3	D	68	ASN
3	D	132	GLN
7	H	39	ASN
8	I	249	ASN
8	I	353	HIS
8	I	377	GLN
8	I	508	ASN
8	I	511	ASN
8	I	609	GLN
8	I	692	GLN
8	I	701	GLN
9	J	334	ASN
9	J	355	GLN
9	J	436	GLN
9	J	597	ASN
9	J	623	GLN
9	J	713	GLN

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Mol	Chain	Res	Type
9	J	784	GLN
9	J	852	GLN
10	L	68	GLN
11	M	65	GLN
13	O	172	ASN
15	Q	132	GLN
20	V	58	HIS
20	V	62	GLN
23	Y	36	HIS
24	Z	154	GLN
24	Z	156	HIS
25	7	245	ASN
25	7	256	GLN
28	b	89	GLN
28	b	132	ASN
29	c	24	GLN
30	d	138	ASN
32	f	83	ASN
32	f	137	GLN
32	f	203	ASN
33	g	86	GLN
34	h	4	GLN
35	i	39	ASN
36	j	53	GLN
37	k	119	GLN
37	k	285	GLN
41	q	82	ASN
43	v	74	GLN
43	v	83	ASN
45	x	68	GLN
45	x	307	ASN
45	x	479	GLN
46	6	258	ASN
46	6	272	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
21	W	1708/1869 (91%)	434 (25%)	23 (1%)
51	y	72/75 (96%)	19 (26%)	0
53	z	2/774 (0%)	2 (100%)	0

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
All	All	1782/2718 (65%)	455 (25%)	23 (1%)

All (455) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
21	W	17	C
21	W	25	A
21	W	33	G
21	W	41	G
21	W	44	U
21	W	46	A
21	W	52	G
21	W	56	G
21	W	59	U
21	W	62	G
21	W	65	C
21	W	67	C
21	W	68	A
21	W	71	G
21	W	72	C
21	W	73	C
21	W	74	G
21	W	100	PSU
21	W	103	A
21	W	113	G
21	W	115	U
21	W	126	G
21	W	127	C
21	W	129	C
21	W	130	G
21	W	140	U
21	W	143	U
21	W	144	U
21	W	146	G
21	W	155	G
21	W	159	A2M
21	W	160	U
21	W	173	A
21	W	175	A
21	W	182	C
21	W	190	G
21	W	198	U

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Mol	Chain	Res	Type
21	W	199	C
21	W	200	G
21	W	203	G
21	W	204	G
21	W	206	G
21	W	208	G
21	W	209	A
21	W	219	U
21	W	299	A
21	W	306	C
21	W	307	G
21	W	308	G
21	W	309	G
21	W	312	G
21	W	313	A
21	W	319	C
21	W	323	C
21	W	324	C
21	W	325	C
21	W	326	C
21	W	327	G
21	W	329	G
21	W	336	A
21	W	339	A
21	W	340	C
21	W	347	G
21	W	351	G
21	W	357	C
21	W	360	A
21	W	362	C
21	W	364	A
21	W	367	U
21	W	368	U
21	W	369	C
21	W	370	G
21	W	382	C
21	W	385	G
21	W	386	C
21	W	409	C
21	W	421	G
21	W	428	OMU
21	W	434	G

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Mol	Chain	Res	Type
21	W	438	G
21	W	448	A
21	W	449	A
21	W	450	C
21	W	452	G
21	W	459	C
21	W	465	A
21	W	467	G
21	W	470	G
21	W	471	G
21	W	472	C
21	W	473	A
21	W	474	G
21	W	482	G
21	W	484	A2M
21	W	487	U
21	W	492	C
21	W	493	A
21	W	508	A
21	W	512	A2M
21	W	513	G
21	W	516	A
21	W	525	A
21	W	530	U
21	W	533	A
21	W	535	G
21	W	536	A
21	W	537	C
21	W	538	U
21	W	542	U
21	W	543	C
21	W	544	G
21	W	545	A
21	W	546	G
21	W	547	G
21	W	548	C
21	W	549	C
21	W	554	A
21	W	555	A
21	W	557	U
21	W	558	G
21	W	559	G

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Mol	Chain	Res	Type
21	W	560	A
21	W	561	A
21	W	563	G
21	W	568	C
21	W	570	C
21	W	574	A
21	W	576	A2M
21	W	577	U
21	W	587	A
21	W	589	G
21	W	590	A2M
21	W	591	U
21	W	593	C
21	W	604	A
21	W	605	A
21	W	606	G
21	W	607	U
21	W	614	C
21	W	617	G
21	W	627	U
21	W	628	A
21	W	629	A
21	W	631	U
21	W	634	A
21	W	643	A
21	W	655	A
21	W	660	C
21	W	663	C
21	W	668	A2M
21	W	669	A
21	W	671	A
21	W	672	A
21	W	673	G
21	W	684	G
21	W	691	G
21	W	696	G
21	W	697	G
21	W	735	C
21	W	736	C
21	W	737	G
21	W	748	C
21	W	749	U

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Mol	Chain	Res	Type
21	W	750	C
21	W	751	G
21	W	752	G
21	W	789	G
21	W	791	C
21	W	797	C
21	W	798	G
21	W	799	U
21	W	800	U
21	W	801	PSU
21	W	821	G
21	W	822	PSU
21	W	827	A
21	W	830	A
21	W	835	C
21	W	836	G
21	W	837	A
21	W	838	G
21	W	839	C
21	W	840	C
21	W	841	G
21	W	842	C
21	W	847	A
21	W	859	G
21	W	862	A
21	W	866	PSU
21	W	868	G
21	W	870	A
21	W	871	U
21	W	872	A
21	W	873	G
21	W	881	G
21	W	885	U
21	W	886	A
21	W	887	U
21	W	888	U
21	W	889	U
21	W	891	G
21	W	895	G
21	W	896	U
21	W	897	U
21	W	898	U

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Mol	Chain	Res	Type
21	W	899	U
21	W	900	C
21	W	901	G
21	W	902	G
21	W	903	A
21	W	904	A
21	W	908	A
21	W	909	G
21	W	913	A
21	W	920	A
21	W	921	G
21	W	922	A
21	W	930	C
21	W	933	G
21	W	934	G
21	W	943	U
21	W	954	U
21	W	955	A
21	W	965	U
21	W	971	G
21	W	990	A
21	W	992	A
21	W	1017	U
21	W	1022	U
21	W	1023	A
21	W	1032	C
21	W	1049	A
21	W	1053	C
21	W	1061	U
21	W	1062	A
21	W	1083	A
21	W	1085	C
21	W	1087	A
21	W	1109	C
21	W	1110	G
21	W	1114	U
21	W	1115	U
21	W	1116	C
21	W	1117	C
21	W	1118	C
21	W	1119	A
21	W	1120	U

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Mol	Chain	Res	Type
21	W	1121	G
21	W	1126	G
21	W	1133	A
21	W	1138	C
21	W	1153	C
21	W	1154	U
21	W	1195	A
21	W	1207	G
21	W	1208	A
21	W	1211	G
21	W	1212	G
21	W	1215	C
21	W	1218	C
21	W	1220	A
21	W	1221	G
21	W	1224	G
21	W	1240	A
21	W	1241	A
21	W	1242	U
21	W	1243	U
21	W	1247	C
21	W	1248	C4J
21	W	1249	C
21	W	1251	A
21	W	1253	A
21	W	1255	G
21	W	1256	G
21	W	1257	G
21	W	1259	A
21	W	1269	G
21	W	1274	G
21	W	1275	G
21	W	1281	G
21	W	1284	A
21	W	1285	G
21	W	1286	G
21	W	1301	A
21	W	1302	G
21	W	1303	C
21	W	1308	U
21	W	1309	C
21	W	1312	G

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Mol	Chain	Res	Type
21	W	1313	A
21	W	1315	U
21	W	1319	U
21	W	1320	G
21	W	1330	G
21	W	1341	C
21	W	1342	U
21	W	1343	U
21	W	1344	A
21	W	1348	G
21	W	1371	U
21	W	1372	U
21	W	1378	A
21	W	1382	A
21	W	1397	U
21	W	1402	A
21	W	1403	C
21	W	1404	U
21	W	1405	A
21	W	1412	C
21	W	1416	C
21	W	1419	C
21	W	1421	A
21	W	1422	G
21	W	1423	C
21	W	1424	G
21	W	1428	G
21	W	1433	C
21	W	1435	C
21	W	1436	C
21	W	1437	C
21	W	1438	A
21	W	1439	A
21	W	1442	OMU
21	W	1447	OMG
21	W	1452	A
21	W	1453	C
21	W	1454	A
21	W	1462	U
21	W	1463	U
21	W	1464	C
21	W	1465	A

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Mol	Chain	Res	Type
21	W	1477	U
21	W	1478	U
21	W	1480	A
21	W	1489	A
21	W	1490	OMG
21	W	1494	U
21	W	1495	G
21	W	1497	G
21	W	1498	A
21	W	1507	G
21	W	1508	A
21	W	1509	U
21	W	1514	G
21	W	1519	U
21	W	1520	G
21	W	1521	C
21	W	1522	A
21	W	1523	C
21	W	1537	A
21	W	1545	A
21	W	1552	G
21	W	1553	C
21	W	1557	C
21	W	1560	U
21	W	1565	C
21	W	1567	G
21	W	1570	G
21	W	1580	A
21	W	1585	U
21	W	1588	A
21	W	1589	A
21	W	1590	C
21	W	1594	A
21	W	1600	G
21	W	1601	A
21	W	1607	A
21	W	1612	G
21	W	1621	U
21	W	1623	A
21	W	1624	U
21	W	1637	A
21	W	1639	G7M

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Mol	Chain	Res	Type
21	W	1640	A
21	W	1647	A
21	W	1648	G
21	W	1654	G
21	W	1665	G
21	W	1669	G
21	W	1671	G
21	W	1679	A
21	W	1699	A
21	W	1702	G
21	W	1711	U
21	W	1718	G
21	W	1721	U
21	W	1722	G
21	W	1723	G
21	W	1736	G
21	W	1737	G
21	W	1738	C
21	W	1742	C
21	W	1744	G
21	W	1748	G
21	W	1749	G
21	W	1752	C
21	W	1753	C
21	W	1754	G
21	W	1755	C
21	W	1756	C
21	W	1757	G
21	W	1758	G
21	W	1759	G
21	W	1760	G
21	W	1772	C
21	W	1773	C
21	W	1774	C
21	W	1775	U
21	W	1776	G
21	W	1777	G
21	W	1779	G
21	W	1780	G
21	W	1781	A
21	W	1782	G
21	W	1783	C

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Mol	Chain	Res	Type
21	W	1800	A
21	W	1809	A
21	W	1812	U
21	W	1813	A
21	W	1822	A
21	W	1823	A
21	W	1824	A
21	W	1825	A
21	W	1834	A
21	W	1835	A
21	W	1837	G
21	W	1838	U
21	W	1849	G
21	W	1851	MA6
21	W	1852	C
21	W	1861	G
21	W	1862	G
21	W	1863	A
21	W	1865	C
51	y	9	1MG
51	y	12	G
51	y	13	C
51	y	14	A
51	y	16	H2U
51	y	19	G
51	y	37	T6A
51	y	47	H2U
51	y	48	5MC
51	y	49	5MC
51	y	50	U
51	y	52	G
51	y	58	1MA
51	y	60	A
51	y	62	C
51	y	64	RIA
51	y	65	G
51	y	67	G
51	y	73	A
53	z	108	G
53	z	109	A

All (23) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
21	W	72	C
21	W	368	U
21	W	433	A
21	W	536	A
21	W	836	G
21	W	837	A
21	W	1113	A
21	W	1114	U
21	W	1117	C
21	W	1118	C
21	W	1240	A
21	W	1242	U
21	W	1318	G
21	W	1420	G
21	W	1423	C
21	W	1446	A
21	W	1452	A
21	W	1463	U
21	W	1519	U
21	W	1520	G
21	W	1521	C
21	W	1782	G
21	W	1823	A

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

106 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	$\#\|Z\| > 2$
21	4AC	W	1842	21	21,24,25	0.50	0	29,34,37	0.47	0
21	PSU	W	119	21	18,21,22	1.00	1 (5%)	22,30,33	0.68	0
21	PSU	W	100	21	18,21,22	1.01	1 (5%)	22,30,33	0.77	0
51	H2U	y	16	51	18,21,22	0.51	0	21,30,33	0.75	1 (4%)
21	PSU	W	1081	21	18,21,22	1.07	2 (11%)	22,30,33	0.76	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
21	PSU	W	296	21	18,21,22	1.01	1 (5%)	22,30,33	0.74	0
21	PSU	W	918	21	18,21,22	1.05	2 (11%)	22,30,33	0.84	1 (4%)
21	A2M	W	1678	21	22,25,26	0.27	0	31,36,39	1.50	3 (9%)
51	7MG	y	46	51	22,26,27	1.12	1 (4%)	29,39,42	0.73	1 (3%)
21	UY1	W	1326	21,56	19,22,23	0.96	1 (5%)	22,31,34	0.62	0
21	PSU	W	1232	21	18,21,22	1.01	1 (5%)	22,30,33	0.77	0
51	1MA	y	58	51	21,25,26	0.40	0	31,37,40	0.66	0
21	PSU	W	1360	21	18,21,22	1.01	1 (5%)	22,30,33	0.76	0
51	RIA	y	64	51	35,38,39	0.38	0	53,57,60	0.62	0
21	PSU	W	1056	21	18,21,22	1.01	1 (5%)	22,30,33	0.68	0
51	5MC	y	49	51	18,22,23	0.40	0	26,32,35	0.53	0
21	A2M	W	99	21,56	22,25,26	0.22	0	31,36,39	1.45	3 (9%)
21	OMG	W	644	21	23,26,27	0.39	0	33,38,41	0.43	0
21	PSU	W	1045	21	18,21,22	0.99	1 (5%)	22,30,33	0.72	0
21	OMC	W	1703	21	19,22,23	0.33	0	26,31,34	0.36	0
21	OMU	W	116	21	19,22,23	0.43	0	26,31,34	0.67	0
21	PSU	W	815	21	18,21,22	1.01	1 (5%)	22,30,33	0.73	0
21	PSU	W	651	21	18,21,22	1.01	1 (5%)	22,30,33	0.73	0
21	PSU	W	1186	21	18,21,22	1.01	1 (5%)	22,30,33	0.78	0
21	PSU	W	612	21	18,21,22	1.01	1 (5%)	22,30,33	0.70	0
21	OMG	W	436	21	23,26,27	0.41	0	33,38,41	0.49	0
21	5MU	W	814	21	19,22,23	0.49	0	28,32,35	0.69	0
21	PSU	W	863	21	18,21,22	1.02	1 (5%)	22,30,33	0.67	0
21	A2M	W	576	21	22,25,26	0.22	0	31,36,39	1.41	2 (6%)
51	1MG	y	9	51	22,26,27	0.52	0	33,39,42	0.67	0
21	MA6	W	1851	21	23,26,27	0.31	0	34,38,41	0.76	1 (2%)
51	2MG	y	10	51	23,26,27	0.40	0	32,38,41	0.41	0
21	4AC	W	1337	21	21,24,25	0.47	0	29,34,37	0.81	1 (3%)
21	OMU	W	1442	21	19,22,23	0.54	0	26,31,34	0.82	1 (3%)
51	M2G	y	26	51	24,27,28	0.46	0	35,40,43	0.39	0
21	MA6	W	1850	21	23,26,27	0.33	0	34,38,41	0.65	1 (2%)
21	PSU	W	218	21	18,21,22	0.97	1 (5%)	22,30,33	0.72	0
21	PSU	W	63	21	18,21,22	1.01	1 (5%)	22,30,33	0.82	0
21	PSU	W	34	21	18,21,22	0.99	1 (5%)	22,30,33	0.72	0
21	5MC	W	1374	21	18,22,23	0.41	0	26,32,35	0.54	0
21	PSU	W	1238	21	18,21,22	0.99	1 (5%)	22,30,33	0.75	0
21	A2M	W	1031	21	22,25,26	0.23	0	31,36,39	1.50	3 (9%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
21	PSU	W	1367	21	18,21,22	1.00	1 (5%)	22,30,33	0.71	0
21	OMC	W	517	21	19,22,23	0.50	0	26,31,34	0.65	0
21	OMG	W	867	21	23,26,27	0.39	0	33,38,41	0.42	0
21	OMG	W	1328	21	23,26,27	0.35	0	33,38,41	0.38	0
21	PSU	W	1136	21	18,21,22	0.99	1 (5%)	22,30,33	0.73	0
21	OMC	W	1272	21	19,22,23	0.48	0	26,31,34	0.68	0
21	PSU	W	1177	21	18,21,22	1.00	1 (5%)	22,30,33	0.74	0
21	OMU	W	172	21	19,22,23	0.33	0	26,31,34	1.00	1 (3%)
21	PSU	W	1596	21	18,21,22	0.98	1 (5%)	22,30,33	0.75	0
21	OMC	W	462	21	19,22,23	0.47	0	26,31,34	0.66	0
21	PSU	W	109	21	18,21,22	0.99	1 (5%)	22,30,33	0.71	0
21	PSU	W	966	21	18,21,22	1.00	1 (5%)	22,30,33	0.73	0
21	PSU	W	667	21	18,21,22	1.06	1 (5%)	22,30,33	0.71	0
21	OMU	W	1288	21	19,22,23	0.51	0	26,31,34	0.80	0
21	PSU	W	822	21	18,21,22	1.00	2 (11%)	22,30,33	0.76	1 (4%)
21	PSU	W	609	21	18,21,22	0.97	1 (5%)	22,30,33	0.71	0
21	PSU	W	1003	21	18,21,22	1.01	1 (5%)	22,30,33	0.70	0
21	A2M	W	159	21	22,25,26	0.24	0	31,36,39	0.92	3 (9%)
21	OMG	W	601	21	23,26,27	0.39	0	33,38,41	0.38	0
21	PSU	W	1004	21	18,21,22	1.03	1 (5%)	22,30,33	0.73	0
21	OMG	W	1490	21,56	23,26,27	0.34	0	33,38,41	0.43	0
21	PSU	W	1046	21	18,21,22	1.01	1 (5%)	22,30,33	0.66	0
21	A2M	W	484	21	22,25,26	0.18	0	31,36,39	1.15	3 (9%)
21	6MZ	W	1832	21,56	22,25,26	0.49	0	30,36,39	0.61	0
21	G7M	W	1639	21,51	23,26,27	0.69	1 (4%)	35,39,42	0.80	1 (2%)
21	OMU	W	1804	21	19,22,23	0.46	0	26,31,34	0.75	1 (3%)
21	A2M	W	166	21	22,25,26	0.23	0	31,36,39	1.43	3 (9%)
21	JMH	W	1219	21,56	18,22,23	0.60	1 (5%)	21,32,35	0.70	0
21	PSU	W	406	21	18,21,22	1.00	1 (5%)	22,30,33	0.77	0
21	OMG	W	509	21,56	23,26,27	0.39	0	33,38,41	0.43	0
21	PSU	W	1625	21	18,21,22	1.01	1 (5%)	22,30,33	0.67	0
21	PSU	W	1174	21	18,21,22	1.01	1 (5%)	22,30,33	0.72	0
21	PSU	W	1347	21	18,21,22	0.99	1 (5%)	22,30,33	0.75	0
21	C4J	W	1248	21	24,29,30	0.80	1 (4%)	29,42,45	0.73	0
21	OMU	W	121	21	19,22,23	0.45	0	26,31,34	0.61	0
21	PSU	W	801	21	18,21,22	0.99	1 (5%)	22,30,33	0.65	0
21	A2M	W	590	21	22,25,26	0.28	0	31,36,39	1.05	4 (12%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
21	A2M	W	468	21	22,25,26	0.23	0	31,36,39	1.44	3 (9%)
21	PSU	W	681	21	18,21,22	1.03	1 (5%)	22,30,33	0.74	0
51	5MC	y	48	51	18,22,23	0.33	0	26,32,35	0.54	0
21	PSU	W	1445	21	18,21,22	0.87	1 (5%)	22,30,33	0.65	0
21	A2M	W	512	21	22,25,26	0.23	0	31,36,39	1.42	4 (12%)
21	PSU	W	866	21	18,21,22	1.04	1 (5%)	22,30,33	0.63	0
21	OMC	W	1391	21	19,22,23	0.49	0	26,31,34	0.68	0
51	T6A	y	37	51	31,34,35	0.52	0	44,49,52	0.92	2 (4%)
21	PSU	W	366	21	18,21,22	0.99	1 (5%)	22,30,33	0.74	0
21	PSU	W	36	21	18,21,22	1.02	1 (5%)	22,30,33	0.71	0
21	PSU	W	572	21	18,21,22	0.99	1 (5%)	22,30,33	0.73	0
21	OMG	W	1447	21	23,26,27	0.29	0	33,38,41	0.37	0
21	PSU	W	300	21	18,21,22	0.99	1 (5%)	22,30,33	0.78	0
21	PSU	W	1643	21	18,21,22	0.99	1 (5%)	22,30,33	0.69	0
51	H2U	y	47	51	18,21,22	0.55	0	21,30,33	0.52	0
21	PSU	W	649	21	18,21,22	1.02	1 (5%)	22,30,33	0.76	0
21	A2M	W	668	21,56	22,25,26	0.19	0	31,36,39	1.02	2 (6%)
21	A2M	W	27	21,56	22,25,26	0.21	0	31,36,39	1.44	3 (9%)
21	PSU	W	1692	21	18,21,22	0.87	1 (5%)	22,30,33	0.70	0
21	OMC	W	174	21,56	19,22,23	0.48	0	26,31,34	0.64	0
21	OMG	W	683	21	23,26,27	0.42	0	33,38,41	0.46	0
21	PSU	W	105	21	18,21,22	1.03	1 (5%)	22,30,33	0.72	0
21	OMU	W	354	21	19,22,23	0.48	0	26,31,34	0.82	1 (3%)
21	PSU	W	1244	21	18,21,22	0.87	1 (5%)	22,30,33	0.57	0
21	PSU	W	686	21	18,21,22	1.00	1 (5%)	22,30,33	0.73	0
21	OMU	W	428	21	19,22,23	0.35	0	26,31,34	0.51	0
21	A2M	W	1383	21	22,25,26	0.22	0	31,36,39	1.57	3 (9%)

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
21	4AC	W	1842	21	-	4/11/29/30	0/2/2/2
21	PSU	W	119	21	-	0/7/25/26	0/2/2/2
21	PSU	W	100	21	-	2/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
51	H2U	y	16	51	-	3/7/38/39	0/2/2/2
21	PSU	W	1081	21	-	1/7/25/26	0/2/2/2
21	PSU	W	296	21	-	2/7/25/26	0/2/2/2
21	PSU	W	918	21	-	0/7/25/26	0/2/2/2
21	A2M	W	1678	21	-	1/9/27/28	0/3/3/3
51	7MG	y	46	51	-	3/7/37/38	0/3/3/3
21	UY1	W	1326	21,56	-	1/9/27/28	0/2/2/2
21	PSU	W	1232	21	-	0/7/25/26	0/2/2/2
51	1MA	y	58	51	-	0/7/25/26	0/3/3/3
21	PSU	W	1360	21	-	0/7/25/26	0/2/2/2
51	RIA	y	64	51	-	8/17/51/52	0/4/4/4
21	PSU	W	1056	21	-	0/7/25/26	0/2/2/2
51	5MC	y	49	51	-	0/7/25/26	0/2/2/2
21	A2M	W	99	21,56	-	1/9/27/28	0/3/3/3
21	OMG	W	644	21	-	2/9/27/28	0/3/3/3
21	PSU	W	1045	21	-	0/7/25/26	0/2/2/2
21	OMC	W	1703	21	-	1/9/27/28	0/2/2/2
21	OMU	W	116	21	-	0/9/27/28	0/2/2/2
21	PSU	W	815	21	-	0/7/25/26	0/2/2/2
21	PSU	W	651	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1186	21	-	0/7/25/26	0/2/2/2
21	PSU	W	612	21	-	0/7/25/26	0/2/2/2
21	OMG	W	436	21	-	0/9/27/28	0/3/3/3
21	5MU	W	814	21	-	0/7/25/26	0/2/2/2
21	PSU	W	863	21	-	0/7/25/26	0/2/2/2
21	A2M	W	576	21	-	2/9/27/28	0/3/3/3
51	1MG	y	9	51	-	0/7/25/26	0/3/3/3
21	MA6	W	1851	21	-	2/11/29/30	0/3/3/3
51	2MG	y	10	51	-	0/9/27/28	0/3/3/3
21	4AC	W	1337	21	-	0/11/29/30	0/2/2/2
21	OMU	W	1442	21	-	3/9/27/28	0/2/2/2
51	M2G	y	26	51	-	2/11/29/30	0/3/3/3
21	MA6	W	1850	21	-	0/11/29/30	0/3/3/3
21	PSU	W	218	21	-	0/7/25/26	0/2/2/2
21	PSU	W	63	21	-	0/7/25/26	0/2/2/2
21	PSU	W	34	21	-	0/7/25/26	0/2/2/2
21	5MC	W	1374	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1238	21	-	0/7/25/26	0/2/2/2
21	A2M	W	1031	21	-	1/9/27/28	0/3/3/3
21	PSU	W	1367	21	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
21	OMC	W	517	21	-	0/9/27/28	0/2/2/2
21	OMG	W	867	21	-	0/9/27/28	0/3/3/3
21	OMG	W	1328	21	-	0/9/27/28	0/3/3/3
21	PSU	W	1136	21	-	0/7/25/26	0/2/2/2
21	OMC	W	1272	21	-	0/9/27/28	0/2/2/2
21	PSU	W	1177	21	-	0/7/25/26	0/2/2/2
21	OMU	W	172	21	-	1/9/27/28	0/2/2/2
21	PSU	W	1596	21	-	0/7/25/26	0/2/2/2
21	OMC	W	462	21	-	0/9/27/28	0/2/2/2
21	PSU	W	109	21	-	0/7/25/26	0/2/2/2
21	PSU	W	966	21	-	0/7/25/26	0/2/2/2
21	PSU	W	667	21	-	0/7/25/26	0/2/2/2
21	OMU	W	1288	21	-	1/9/27/28	0/2/2/2
21	PSU	W	822	21	-	2/7/25/26	0/2/2/2
21	PSU	W	609	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1003	21	-	0/7/25/26	0/2/2/2
21	A2M	W	159	21	-	1/9/27/28	0/3/3/3
21	OMG	W	601	21	-	0/9/27/28	0/3/3/3
21	PSU	W	1004	21	-	0/7/25/26	0/2/2/2
21	OMG	W	1490	21,56	-	3/9/27/28	0/3/3/3
21	PSU	W	1046	21	-	0/7/25/26	0/2/2/2
21	A2M	W	484	21	-	3/9/27/28	0/3/3/3
21	6MZ	W	1832	21,56	-	0/9/27/28	0/3/3/3
21	G7M	W	1639	21,51	-	2/7/25/26	0/3/3/3
21	OMU	W	1804	21	-	0/9/27/28	0/2/2/2
21	A2M	W	166	21	-	1/9/27/28	0/3/3/3
21	JMH	W	1219	21,56	-	0/7/25/26	0/2/2/2
21	PSU	W	406	21	-	0/7/25/26	0/2/2/2
21	OMG	W	509	21,56	-	1/9/27/28	0/3/3/3
21	PSU	W	1625	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1174	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1347	21	-	0/7/25/26	0/2/2/2
21	C4J	W	1248	21	-	3/16/34/35	0/2/2/2
21	OMU	W	121	21	-	0/9/27/28	0/2/2/2
21	PSU	W	801	21	-	2/7/25/26	0/2/2/2
21	A2M	W	590	21	-	4/9/27/28	0/3/3/3
21	A2M	W	468	21	-	3/9/27/28	0/3/3/3
21	PSU	W	681	21	-	0/7/25/26	0/2/2/2
51	5MC	y	48	51	-	0/7/25/26	0/2/2/2
21	PSU	W	1445	21	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
21	A2M	W	512	21	-	4/9/27/28	0/3/3/3
21	PSU	W	866	21	-	2/7/25/26	0/2/2/2
21	OMC	W	1391	21	-	0/9/27/28	0/2/2/2
51	T6A	y	37	51	-	5/23/41/42	0/3/3/3
21	PSU	W	366	21	-	0/7/25/26	0/2/2/2
21	PSU	W	36	21	-	0/7/25/26	0/2/2/2
21	PSU	W	572	21	-	0/7/25/26	0/2/2/2
21	OMG	W	1447	21	-	1/9/27/28	0/3/3/3
21	PSU	W	300	21	-	0/7/25/26	0/2/2/2
21	PSU	W	1643	21	-	0/7/25/26	0/2/2/2
51	H2U	y	47	51	-	5/7/38/39	0/2/2/2
21	PSU	W	649	21	-	0/7/25/26	0/2/2/2
21	A2M	W	668	21,56	-	4/9/27/28	0/3/3/3
21	A2M	W	27	21,56	-	3/9/27/28	0/3/3/3
21	PSU	W	1692	21	-	0/7/25/26	0/2/2/2
21	OMC	W	174	21,56	-	0/9/27/28	0/2/2/2
21	OMG	W	683	21	-	0/9/27/28	0/3/3/3
21	PSU	W	105	21	-	0/7/25/26	0/2/2/2
21	OMU	W	354	21	-	0/9/27/28	0/2/2/2
21	PSU	W	1244	21	-	0/7/25/26	0/2/2/2
21	PSU	W	686	21	-	0/7/25/26	0/2/2/2
21	OMU	W	428	21	-	5/9/27/28	0/2/2/2
21	A2M	W	1383	21	-	1/9/27/28	0/3/3/3

All (56) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	y	46	7MG	C5-N7	4.70	1.41	1.35
21	W	1232	PSU	C6-C5	3.45	1.39	1.35
21	W	105	PSU	C6-C5	3.43	1.39	1.35
21	W	866	PSU	C6-C5	3.42	1.39	1.35
21	W	1625	PSU	C6-C5	3.42	1.39	1.35
21	W	63	PSU	C6-C5	3.41	1.39	1.35
21	W	1238	PSU	C6-C5	3.41	1.39	1.35
21	W	1004	PSU	C6-C5	3.40	1.39	1.35
21	W	1596	PSU	C6-C5	3.40	1.39	1.35
21	W	815	PSU	C6-C5	3.40	1.39	1.35
21	W	1174	PSU	C6-C5	3.39	1.39	1.35
21	W	863	PSU	C6-C5	3.39	1.39	1.35
21	W	801	PSU	C6-C5	3.39	1.39	1.35
21	W	296	PSU	C6-C5	3.37	1.39	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
21	W	300	PSU	C6-C5	3.36	1.39	1.35
21	W	406	PSU	C6-C5	3.36	1.39	1.35
21	W	686	PSU	C6-C5	3.36	1.39	1.35
21	W	667	PSU	C6-C5	3.36	1.39	1.35
21	W	1046	PSU	C6-C5	3.36	1.39	1.35
21	W	609	PSU	C6-C5	3.36	1.39	1.35
21	W	1326	UY1	C6-C5	3.36	1.39	1.35
21	W	1056	PSU	C6-C5	3.35	1.39	1.35
21	W	651	PSU	C6-C5	3.35	1.39	1.35
21	W	1045	PSU	C6-C5	3.35	1.39	1.35
21	W	649	PSU	C6-C5	3.34	1.39	1.35
21	W	1003	PSU	C6-C5	3.34	1.39	1.35
21	W	366	PSU	C6-C5	3.33	1.39	1.35
21	W	1367	PSU	C6-C5	3.33	1.39	1.35
21	W	1177	PSU	C6-C5	3.33	1.39	1.35
21	W	1244	PSU	C6-C5	3.33	1.39	1.35
21	W	966	PSU	C6-C5	3.33	1.39	1.35
21	W	1186	PSU	C6-C5	3.33	1.39	1.35
21	W	36	PSU	C6-C5	3.32	1.39	1.35
21	W	119	PSU	C6-C5	3.32	1.39	1.35
21	W	100	PSU	C6-C5	3.32	1.39	1.35
21	W	218	PSU	C6-C5	3.32	1.39	1.35
21	W	109	PSU	C6-C5	3.31	1.39	1.35
21	W	572	PSU	C6-C5	3.31	1.39	1.35
21	W	612	PSU	C6-C5	3.30	1.39	1.35
21	W	34	PSU	C6-C5	3.30	1.39	1.35
21	W	918	PSU	C6-C5	3.30	1.39	1.35
21	W	1445	PSU	C6-C5	3.28	1.39	1.35
21	W	1347	PSU	C6-C5	3.27	1.39	1.35
21	W	1360	PSU	C6-C5	3.27	1.39	1.35
21	W	1081	PSU	C6-C5	3.26	1.39	1.35
21	W	822	PSU	C6-C5	3.26	1.39	1.35
21	W	1136	PSU	C6-C5	3.25	1.39	1.35
21	W	681	PSU	C6-C5	3.25	1.39	1.35
21	W	1643	PSU	C6-C5	3.24	1.39	1.35
21	W	1248	C4J	C6-C5	3.00	1.39	1.34
21	W	1692	PSU	C6-C5	2.87	1.38	1.35
21	W	1081	PSU	O4'-C1'	-2.48	1.40	1.43
21	W	1639	G7M	C8-N7	2.31	1.37	1.33
21	W	918	PSU	O4'-C1'	-2.26	1.40	1.43
21	W	1219	JMH	C5-C4	-2.13	1.38	1.42
21	W	822	PSU	O4'-C1'	-2.03	1.41	1.43

All (53) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	W	1678	A2M	O3'-C3'-C2'	5.75	127.50	111.17
21	W	1383	A2M	O3'-C3'-C4'	5.46	126.85	111.05
21	W	1383	A2M	C2'-C1'-N9	-5.13	104.90	113.53
21	W	468	A2M	O3'-C3'-C4'	5.03	125.59	111.05
21	W	166	A2M	O3'-C3'-C4'	4.99	125.49	111.05
21	W	1031	A2M	O3'-C3'-C4'	4.91	125.25	111.05
21	W	99	A2M	C2'-C1'-N9	-4.88	105.31	113.53
21	W	576	A2M	C2'-C1'-N9	-4.86	105.35	113.53
21	W	1031	A2M	C2'-C1'-N9	-4.81	105.43	113.53
21	W	27	A2M	O3'-C3'-C4'	4.66	124.53	111.05
21	W	99	A2M	O3'-C3'-C4'	4.65	124.49	111.05
21	W	27	A2M	C2'-C1'-N9	-4.64	105.72	113.53
21	W	468	A2M	C2'-C1'-N9	-4.32	106.25	113.53
21	W	576	A2M	O3'-C3'-C4'	4.18	123.13	111.05
21	W	1678	A2M	O3'-C3'-C4'	4.11	122.93	111.05
21	W	512	A2M	C2'-C1'-N9	-4.08	106.67	113.53
51	y	37	T6A	C5-C6-N6	4.07	129.48	118.71
21	W	512	A2M	O3'-C3'-C4'	3.98	122.56	111.05
21	W	668	A2M	O3'-C3'-C2'	3.95	122.37	111.17
21	W	166	A2M	C2'-C1'-N9	-3.89	106.98	113.53
21	W	172	OMU	O2'-C2'-C1'	3.85	116.58	109.08
21	W	166	A2M	O3'-C3'-C2'	3.83	122.03	111.17
21	W	484	A2M	O3'-C3'-C2'	3.70	121.67	111.17
21	W	1031	A2M	O3'-C3'-C2'	3.68	121.61	111.17
21	W	1383	A2M	O3'-C3'-C2'	3.40	120.83	111.17
21	W	468	A2M	O3'-C3'-C2'	3.30	120.54	111.17
21	W	484	A2M	C2'-C1'-N9	-3.22	108.11	113.53
21	W	1678	A2M	C2'-C1'-N9	-3.21	108.13	113.53
21	W	159	A2M	O3'-C3'-C2'	3.15	120.10	111.17
21	W	512	A2M	O3'-C3'-C2'	2.90	119.41	111.17
21	W	1850	MA6	C2-N1-C6	2.89	118.57	111.75
21	W	1851	MA6	C2-N1-C6	2.88	118.56	111.75
21	W	590	A2M	O3'-C3'-C4'	2.74	118.97	111.05
21	W	590	A2M	O3'-C3'-C2'	2.59	118.51	111.17
21	W	354	OMU	C2'-C1'-N1	-2.56	109.25	114.22
51	y	37	T6A	C12-N11-C10	2.55	126.18	121.94
21	W	668	A2M	C2'-C1'-N9	-2.47	109.38	113.53
21	W	1337	4AC	C5-C4-N4	2.46	127.19	122.92
21	W	512	A2M	O4'-C1'-N9	-2.38	103.37	108.06
21	W	27	A2M	O3'-C3'-C2'	2.36	117.87	111.17
21	W	918	PSU	O4'-C1'-C2'	2.35	108.46	105.14
21	W	1639	G7M	O3'-C3'-C2'	2.30	119.26	111.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	W	590	A2M	C4-N9-C1'	2.29	132.04	126.59
21	W	159	A2M	C2'-C1'-N9	-2.26	109.73	113.53
21	W	484	A2M	O3'-C3'-C4'	2.21	117.44	111.05
21	W	99	A2M	O3'-C3'-C2'	2.18	117.37	111.17
21	W	822	PSU	O4'-C1'-C2'	2.17	108.21	105.14
21	W	1442	OMU	O2-C2-N1	2.17	125.67	122.79
21	W	1804	OMU	C2'-C1'-N1	-2.13	110.09	114.22
21	W	590	A2M	C1'-N9-C8	-2.04	122.53	127.14
51	y	16	H2U	O2-C2-N1	-2.02	120.57	123.11
51	y	46	7MG	C5-C4-N9	2.01	108.95	106.35
21	W	159	A2M	O3'-C3'-C4'	2.00	116.84	111.05

There are no chirality outliers.

All (96) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
21	W	27	A2M	C1'-C2'-O2'-CM'
21	W	99	A2M	C1'-C2'-O2'-CM'
21	W	100	PSU	C3'-C4'-C5'-O5'
21	W	159	A2M	C1'-C2'-O2'-CM'
21	W	166	A2M	C1'-C2'-O2'-CM'
21	W	172	OMU	C1'-C2'-O2'-CM2
21	W	428	OMU	C2'-C1'-N1-C2
21	W	428	OMU	C2'-C1'-N1-C6
21	W	468	A2M	C1'-C2'-O2'-CM'
21	W	484	A2M	C1'-C2'-O2'-CM'
21	W	512	A2M	C1'-C2'-O2'-CM'
21	W	576	A2M	C1'-C2'-O2'-CM'
21	W	668	A2M	C3'-C4'-C5'-O5'
21	W	822	PSU	C3'-C4'-C5'-O5'
21	W	866	PSU	C3'-C4'-C5'-O5'
21	W	1031	A2M	C1'-C2'-O2'-CM'
21	W	1248	C4J	C3'-C4'-C5'-O5'
21	W	1248	C4J	O4'-C4'-C5'-O5'
21	W	1248	C4J	C4'-C5'-O5'-P
21	W	1383	A2M	C1'-C2'-O2'-CM'
21	W	1447	OMG	C1'-C2'-O2'-CM2
21	W	1678	A2M	C1'-C2'-O2'-CM'
21	W	1703	OMC	C1'-C2'-O2'-CM2
21	W	1842	4AC	O7-C7-N4-C4
21	W	1842	4AC	CM7-C7-N4-C4
21	W	1851	MA6	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
21	W	1851	MA6	C3'-C4'-C5'-O5'
51	y	37	T6A	O4'-C4'-C5'-O5'
51	y	37	T6A	C3'-C4'-C5'-O5'
51	y	37	T6A	N6-C10-N11-C12
51	y	37	T6A	O10-C10-N11-C12
51	y	47	H2U	O4'-C1'-N1-C6
51	y	64	RIA	C4A-C5A-O5A-P
51	y	64	RIA	C2'-C1'-O2A-C2A
51	y	64	RIA	C3'-C4'-C5'-O5'
51	y	64	RIA	C4'-C5'-O5'-P'
51	y	64	RIA	C5'-O5'-P'-O3X
21	W	100	PSU	O4'-C4'-C5'-O5'
21	W	296	PSU	C3'-C4'-C5'-O5'
21	W	428	OMU	O4'-C4'-C5'-O5'
21	W	801	PSU	C3'-C4'-C5'-O5'
21	W	822	PSU	O4'-C4'-C5'-O5'
21	W	1442	OMU	O4'-C4'-C5'-O5'
21	W	1639	G7M	O4'-C4'-C5'-O5'
21	W	1639	G7M	C3'-C4'-C5'-O5'
51	y	47	H2U	C4'-C5'-O5'-P
21	W	296	PSU	O4'-C4'-C5'-O5'
21	W	866	PSU	O4'-C4'-C5'-O5'
21	W	1490	OMG	O4'-C4'-C5'-O5'
21	W	1490	OMG	C3'-C4'-C5'-O5'
51	y	64	RIA	O1'-C4'-C5'-O5'
51	y	46	7MG	C2'-C1'-N9-C8
21	W	27	A2M	C3'-C4'-C5'-O5'
21	W	484	A2M	C3'-C4'-C5'-O5'
21	W	1442	OMU	C3'-C4'-C5'-O5'
51	y	26	M2G	C3'-C4'-C5'-O5'
21	W	668	A2M	O4'-C4'-C5'-O5'
21	W	801	PSU	O4'-C4'-C5'-O5'
51	y	16	H2U	C2'-C1'-N1-C6
51	y	47	H2U	O4'-C1'-N1-C2
21	W	468	A2M	C3'-C4'-C5'-O5'
51	y	64	RIA	C5'-O5'-P'-O1X
21	W	668	A2M	C4'-C5'-O5'-P
21	W	590	A2M	C2'-C1'-N9-C4
51	y	26	M2G	O4'-C4'-C5'-O5'
51	y	64	RIA	C5'-O5'-P'-O2X
21	W	512	A2M	C4'-C5'-O5'-P
21	W	576	A2M	C4'-C5'-O5'-P

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Mol	Chain	Res	Type	Atoms
21	W	590	A2M	C4'-C5'-O5'-P
21	W	512	A2M	C3'-C4'-C5'-O5'
21	W	590	A2M	C2'-C1'-N9-C8
21	W	644	OMG	C4'-C5'-O5'-P
21	W	1490	OMG	C4'-C5'-O5'-P
51	y	37	T6A	C4'-C5'-O5'-P
21	W	468	A2M	O4'-C4'-C5'-O5'
21	W	484	A2M	O4'-C4'-C5'-O5'
21	W	512	A2M	O4'-C4'-C5'-O5'
51	y	47	H2U	C3'-C4'-C5'-O5'
21	W	27	A2M	O4'-C4'-C5'-O5'
21	W	509	OMG	O4'-C4'-C5'-O5'
21	W	428	OMU	O4'-C1'-N1-C6
21	W	668	A2M	C2'-C1'-N9-C8
51	y	16	H2U	O4'-C1'-N1-C2
51	y	16	H2U	C2'-C1'-N1-C2
21	W	428	OMU	O4'-C1'-N1-C2
51	y	47	H2U	O4'-C4'-C5'-O5'
21	W	1442	OMU	C2'-C1'-N1-C2
21	W	590	A2M	O4'-C1'-N9-C8
51	y	46	7MG	C4'-C5'-O5'-P
51	y	46	7MG	O4'-C4'-C5'-O5'
21	W	1326	UY1	O4'-C1'-C5-C6
21	W	644	OMG	C3'-C4'-C5'-O5'
21	W	1842	4AC	N3-C4-N4-C7
21	W	1842	4AC	C5-C4-N4-C7
21	W	1288	OMU	C2'-C1'-N1-C2
21	W	1081	PSU	C4'-C5'-O5'-P

There are no ring outliers.

26 monomers are involved in 38 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
21	W	1842	4AC	2	0
21	W	918	PSU	1	0
21	W	1678	A2M	1	0
21	W	1232	PSU	1	0
51	y	58	1MA	1	0
51	y	64	RIA	3	0
21	W	99	A2M	1	0
21	W	1703	OMC	2	0
21	W	576	A2M	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
21	W	1851	MA6	1	0
21	W	1442	OMU	1	0
21	W	1850	MA6	2	0
21	W	1031	A2M	1	0
21	W	601	OMG	1	0
21	W	484	A2M	1	0
21	W	1639	G7M	2	0
21	W	1804	OMU	1	0
21	W	166	A2M	1	0
21	W	121	OMU	1	0
21	W	468	A2M	2	0
21	W	681	PSU	1	0
21	W	1445	PSU	1	0
21	W	1447	OMG	7	0
21	W	27	A2M	1	0
21	W	428	OMU	1	0
21	W	1383	A2M	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 80 ligands modelled in this entry, 80 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

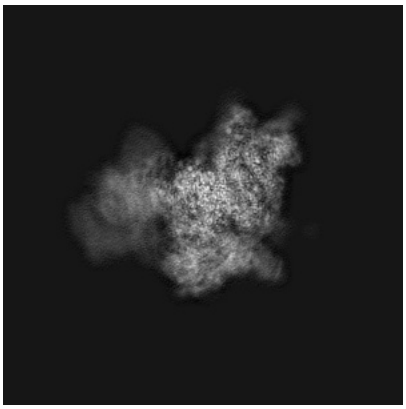
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-54937. These allow visual inspection of the internal detail of the map and identification of artifacts.

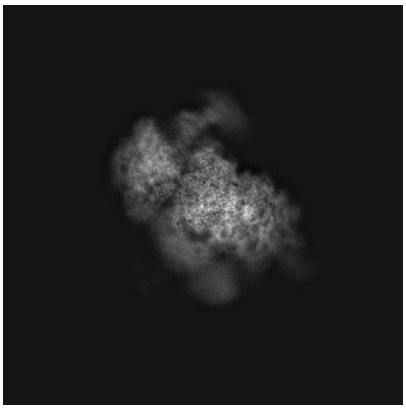
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

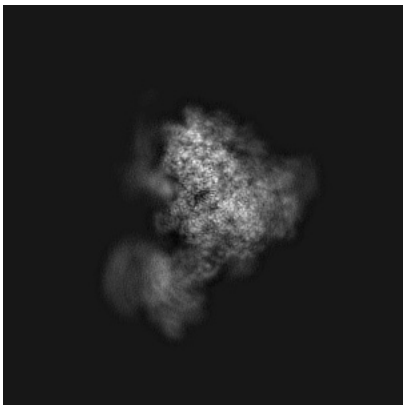
6.1.1 Primary map



X

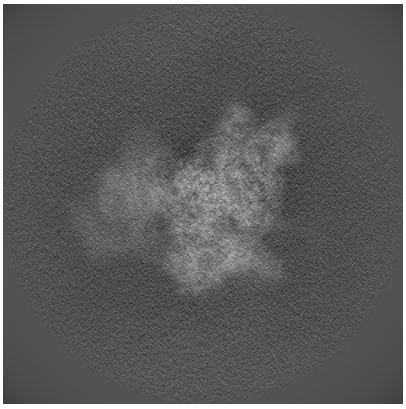


Y

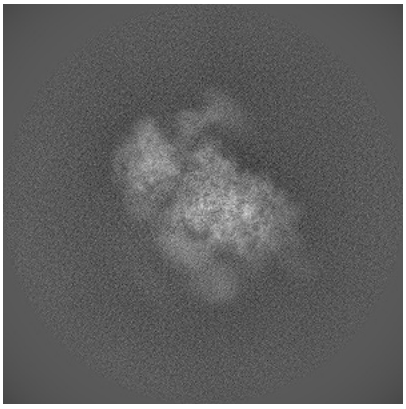


Z

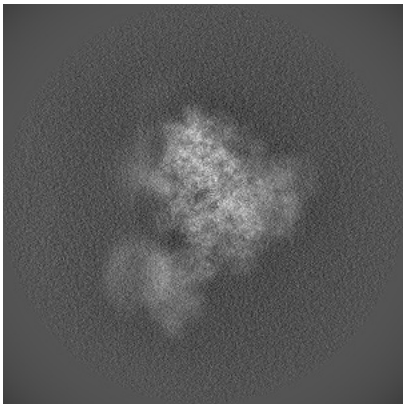
6.1.2 Raw map



X



Y

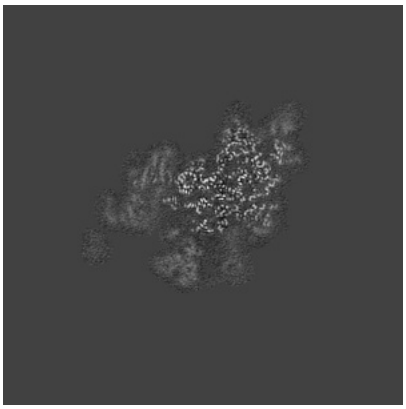


Z

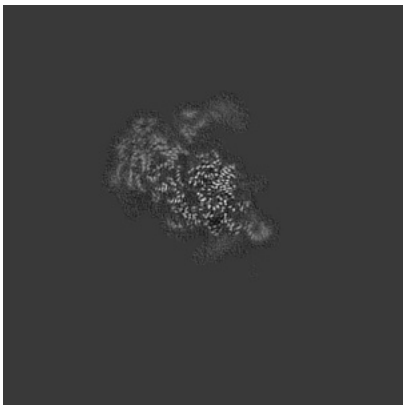
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

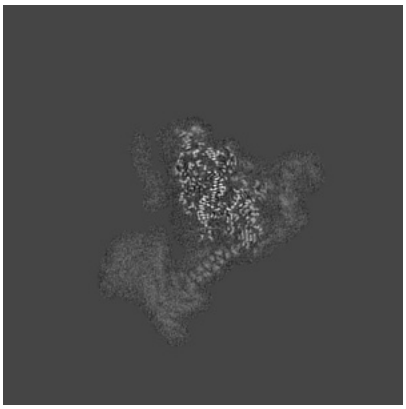
6.2.1 Primary map



X Index: 300

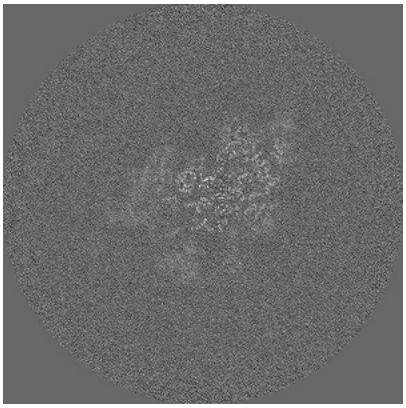


Y Index: 300

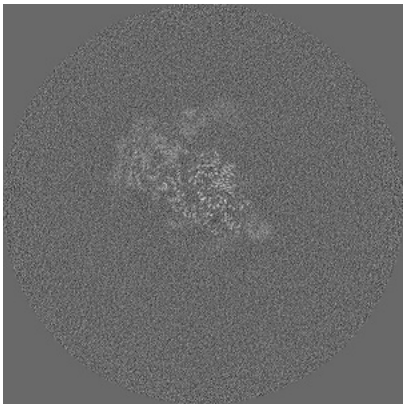


Z Index: 300

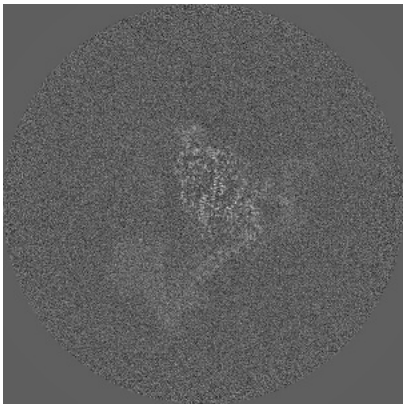
6.2.2 Raw map



X Index: 300



Y Index: 300

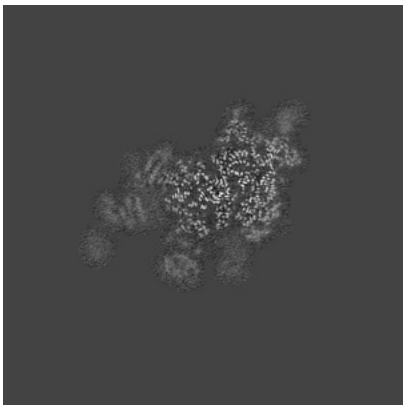


Z Index: 300

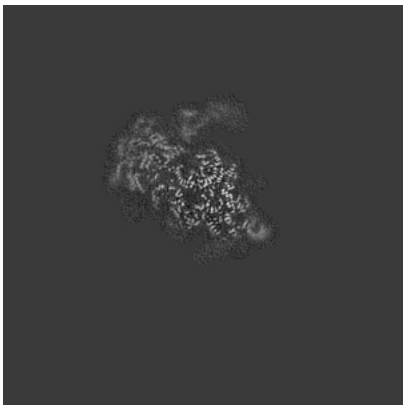
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

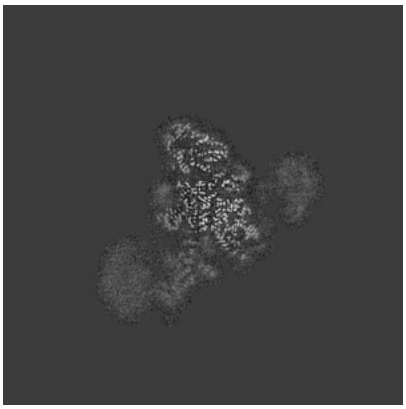
6.3.1 Primary map



X Index: 293

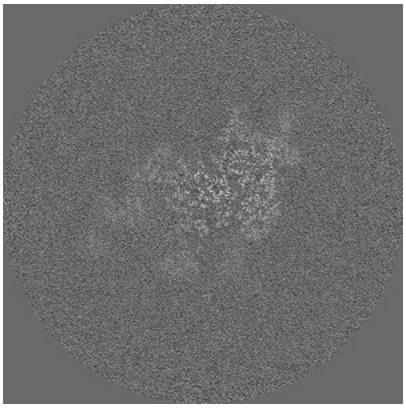


Y Index: 297

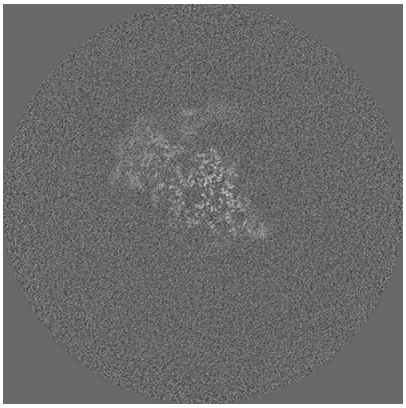


Z Index: 327

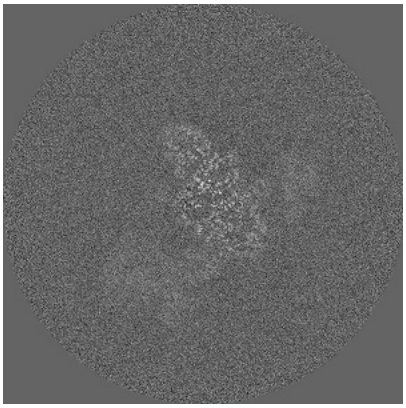
6.3.2 Raw map



X Index: 293



Y Index: 297

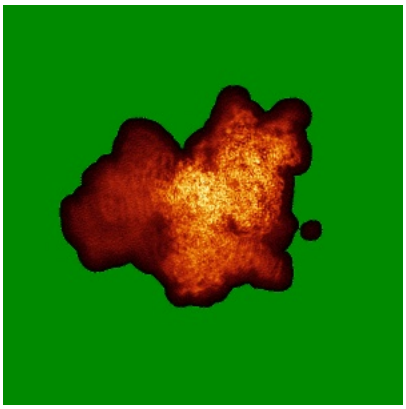


Z Index: 313

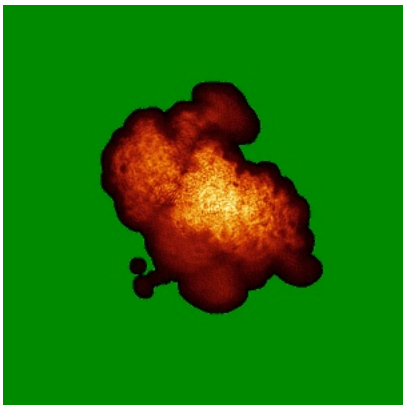
The images above show the largest variance slices of the map in three orthogonal directions.

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

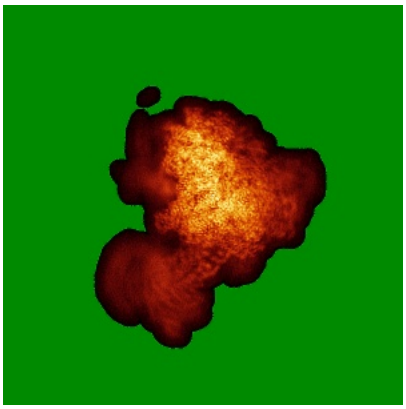
6.4.1 Primary map



X

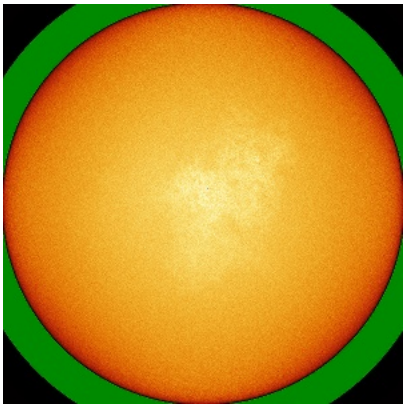


Y

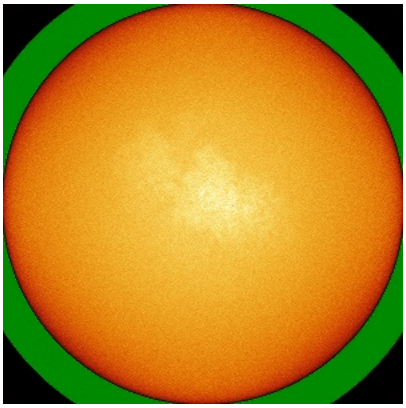


Z

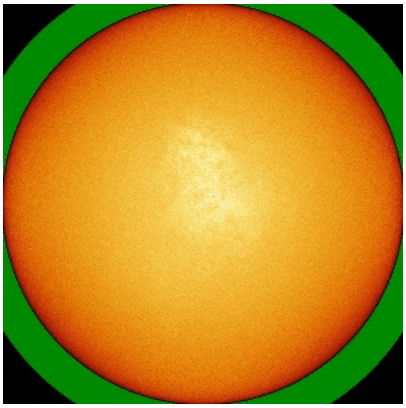
6.4.2 Raw map



X



Y

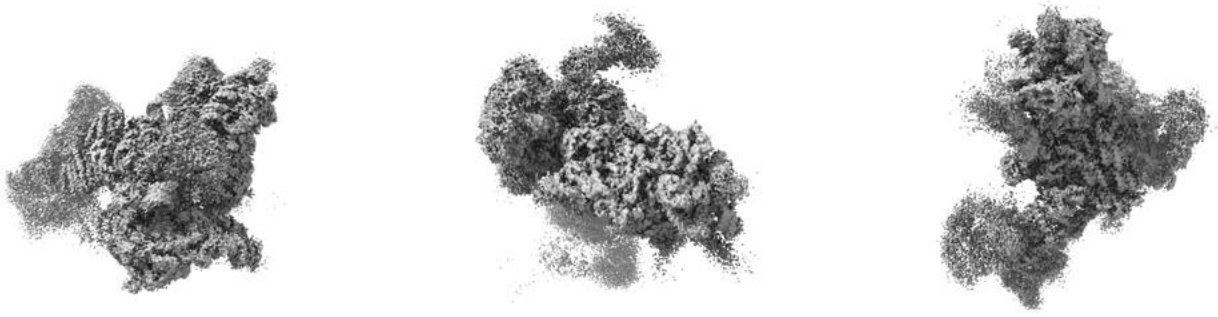


Z

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)

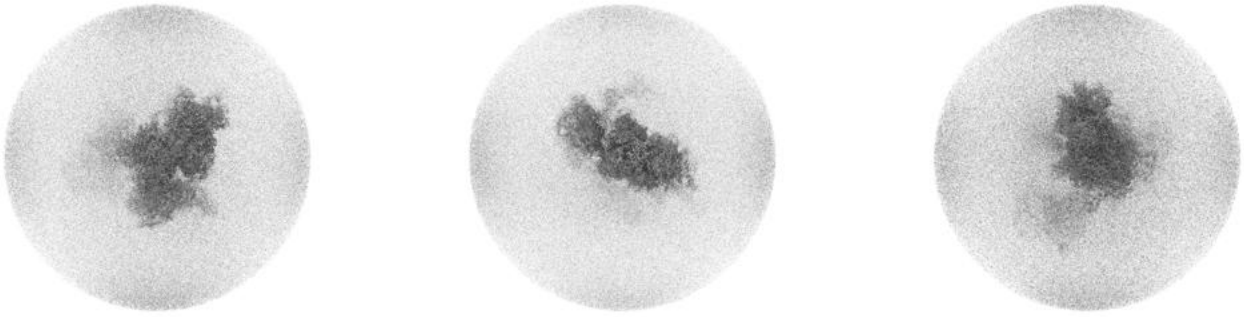
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045. 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.

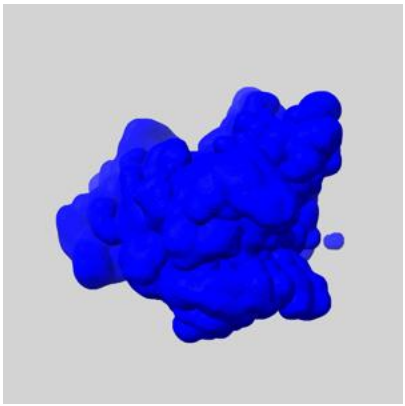
6.6 Mask visualisation

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

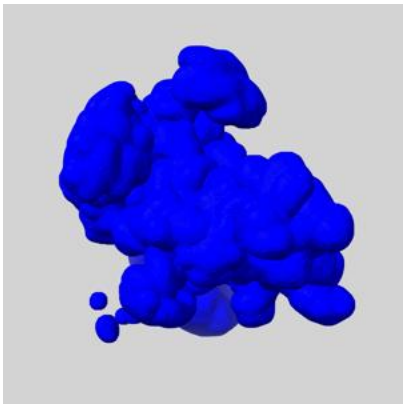
A mask typically either:

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

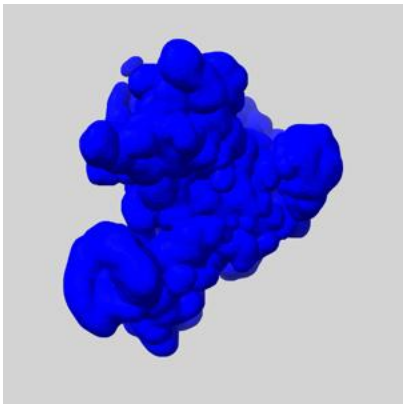
6.6.1 emd_54937_msk_1.map



X



Y

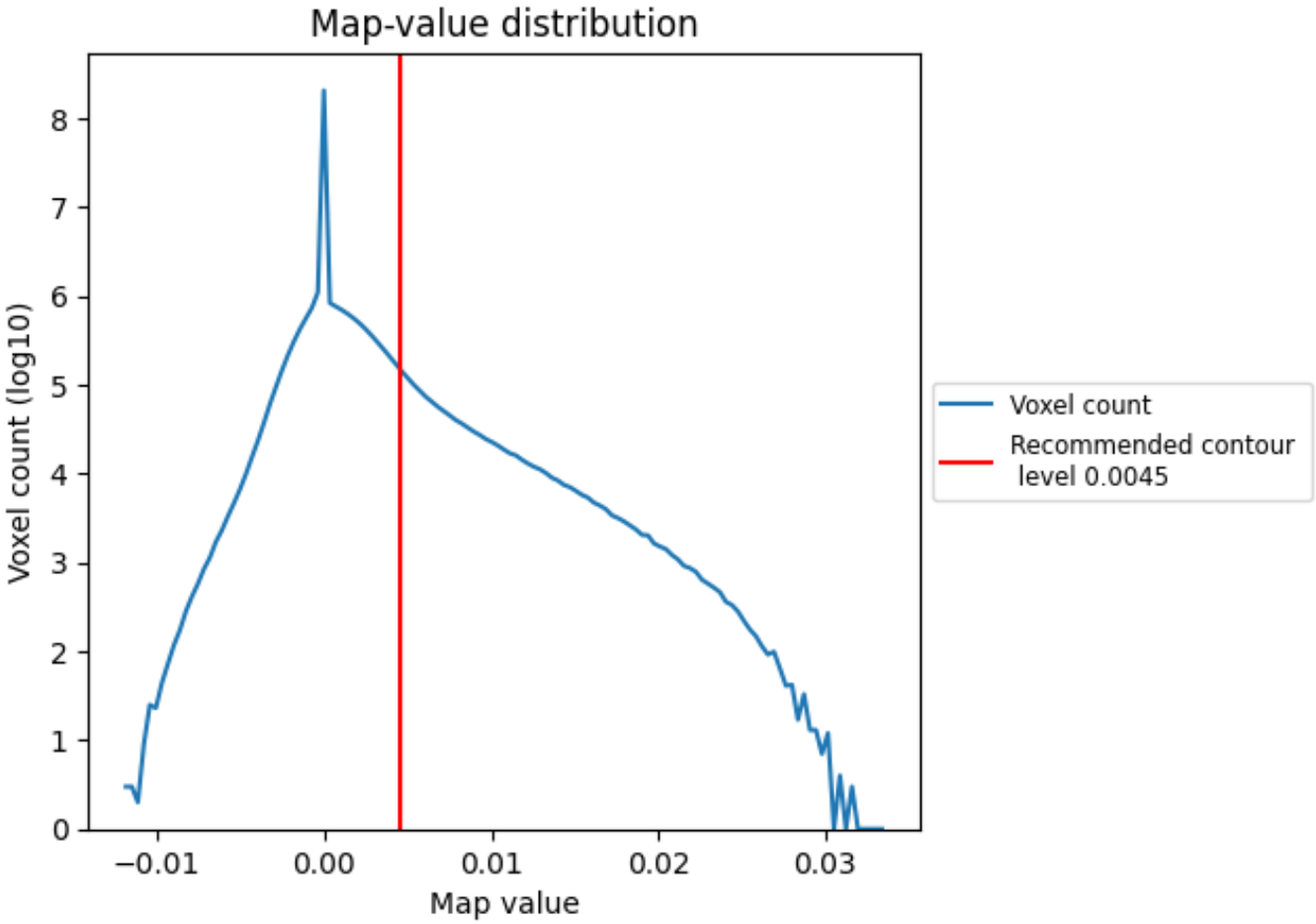


Z

7 Map analysis

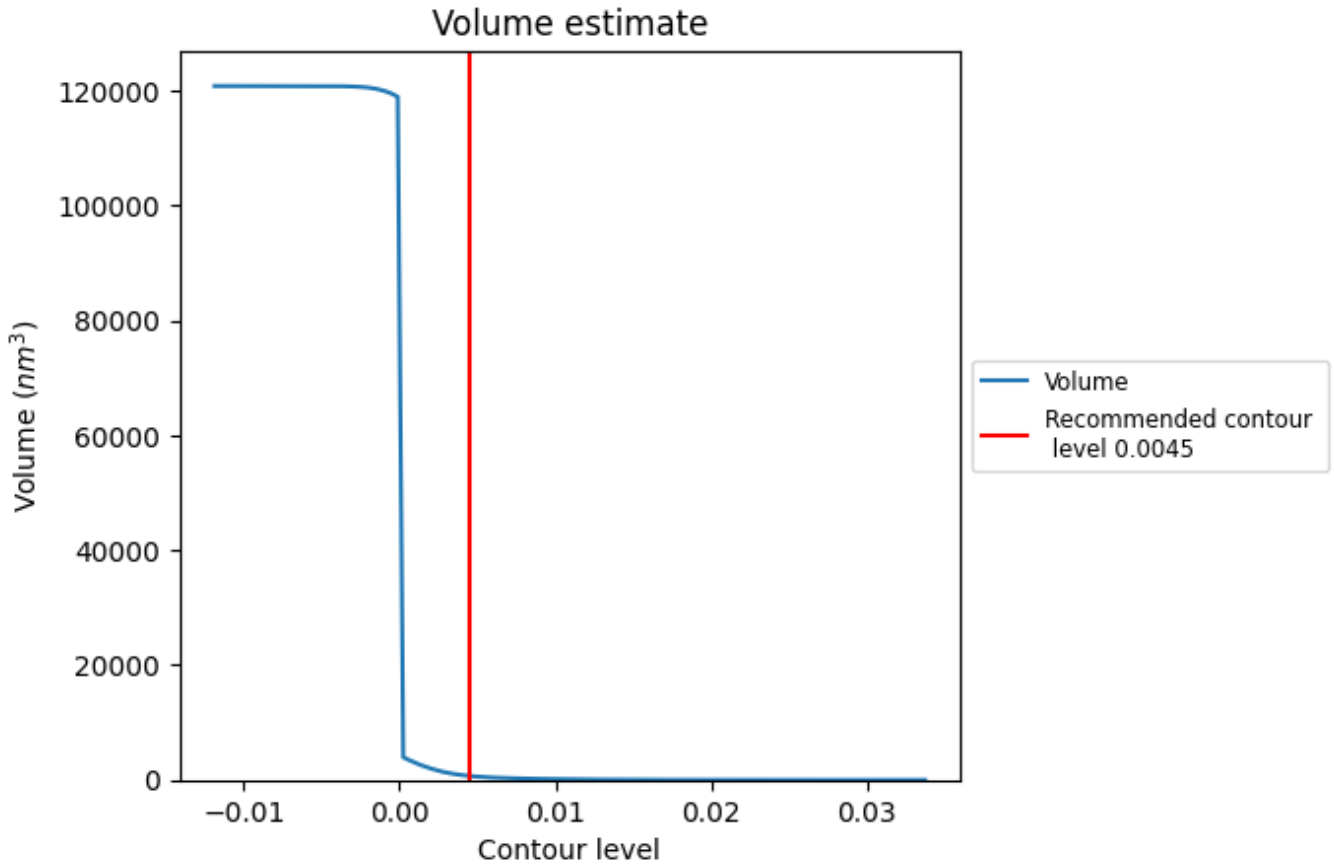
This section contains the results of statistical analysis of the map.

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.

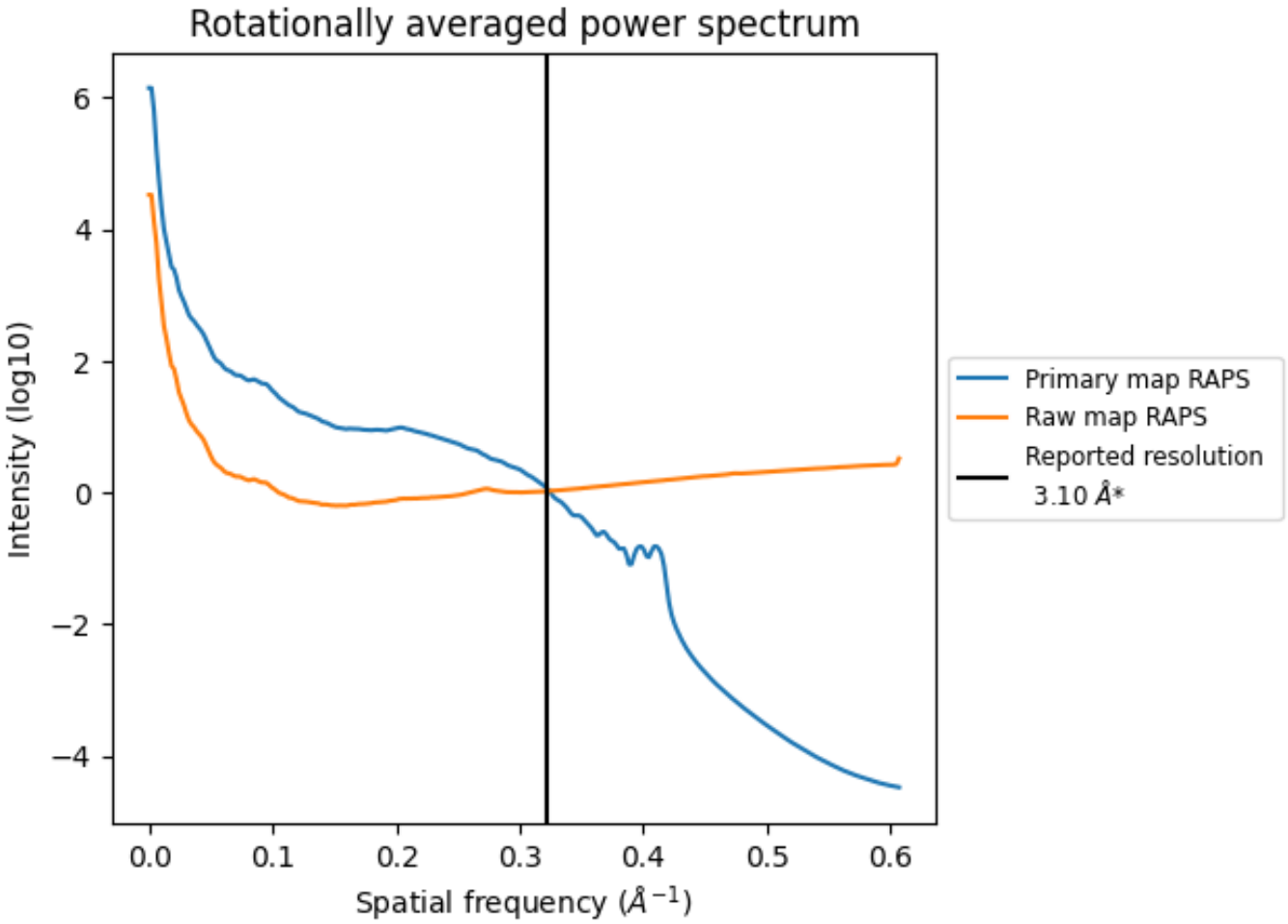
7.2 Volume estimate



The volume at the recommended contour level is 695 nm^3; this corresponds to an approximate mass of 628 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)

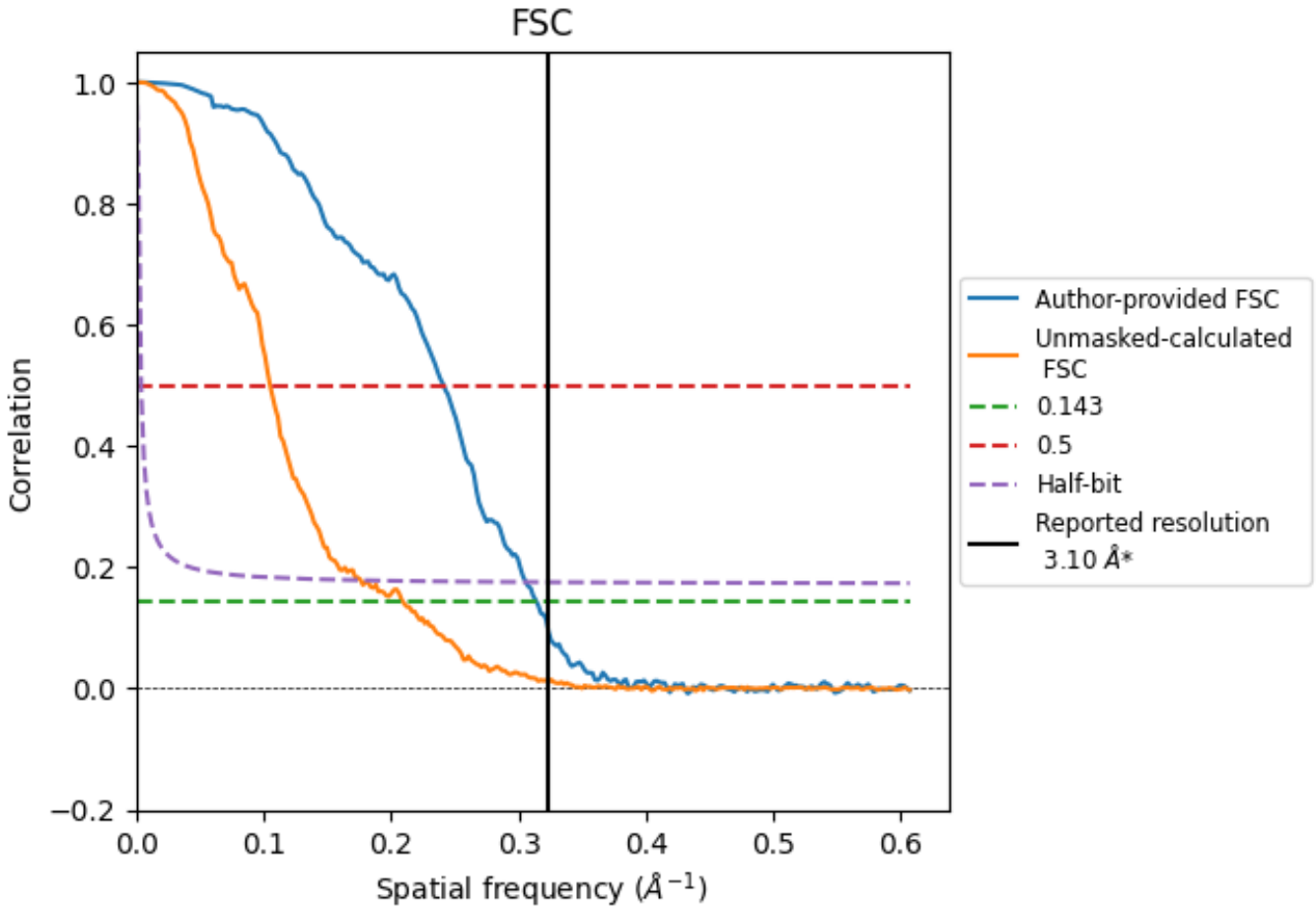


*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

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 0.323 Å^{-1}

8.2 Resolution estimates (i)

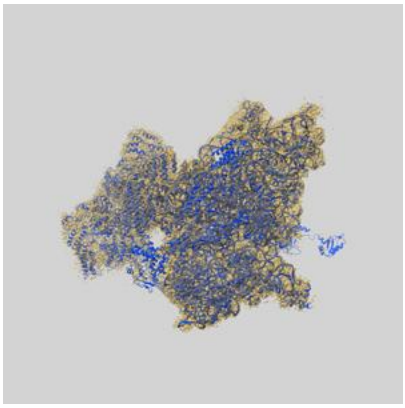
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	3.18	4.15	3.27
Unmasked-calculated*	4.78	9.51	5.68

*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 4.78 differs from the reported value 3.1 by more than 10 %

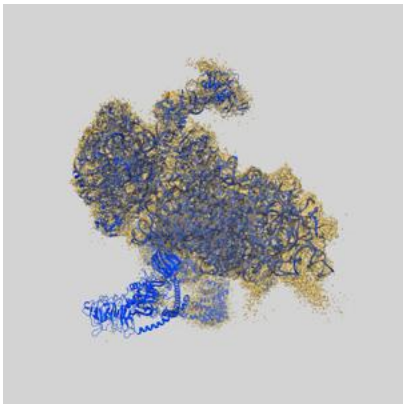
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-54937 and PDB model 9SJ4. Per-residue inclusion information can be found in section 3 on page 15.

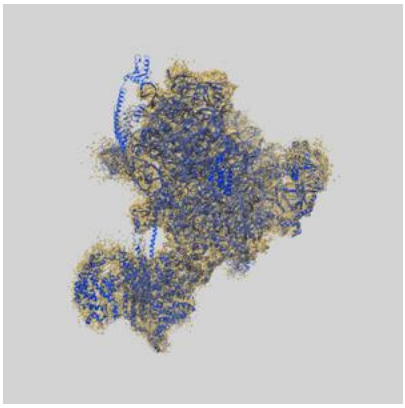
9.1 Map-model overlay



X



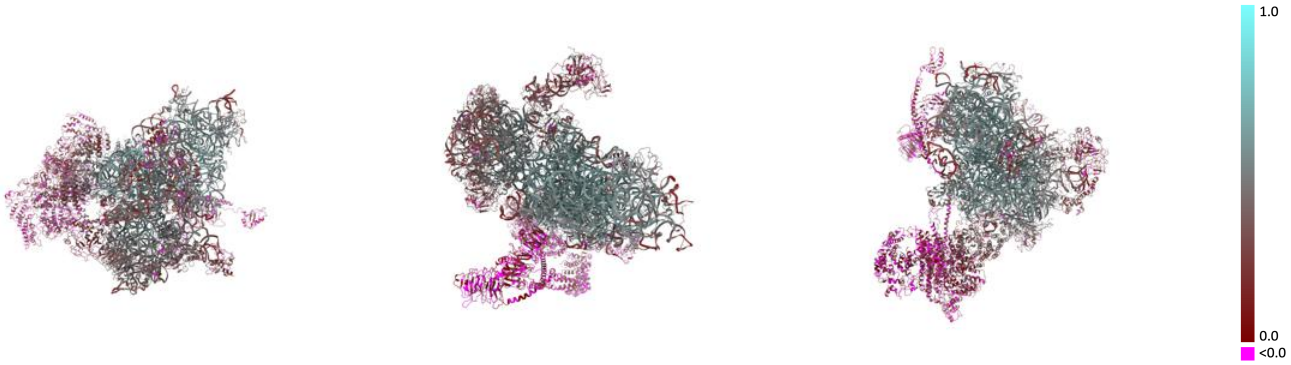
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

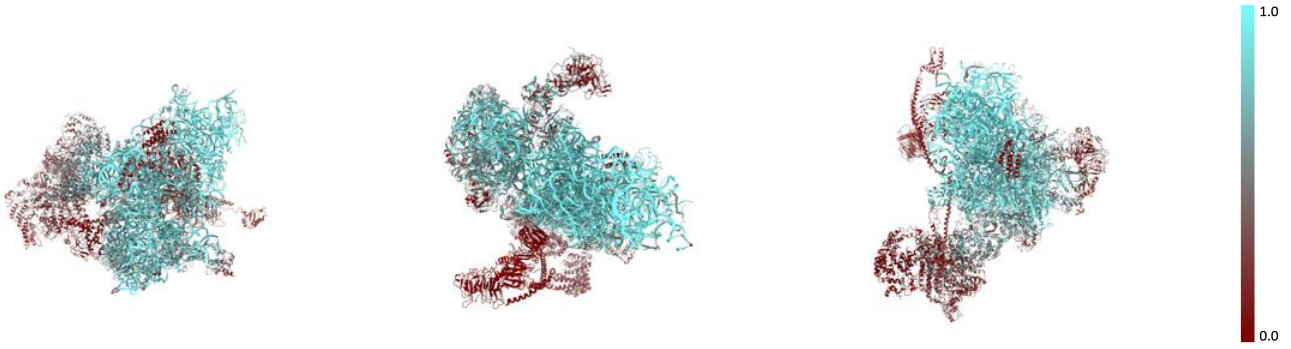
9.2 Q-score mapped to coordinate model (i)



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.

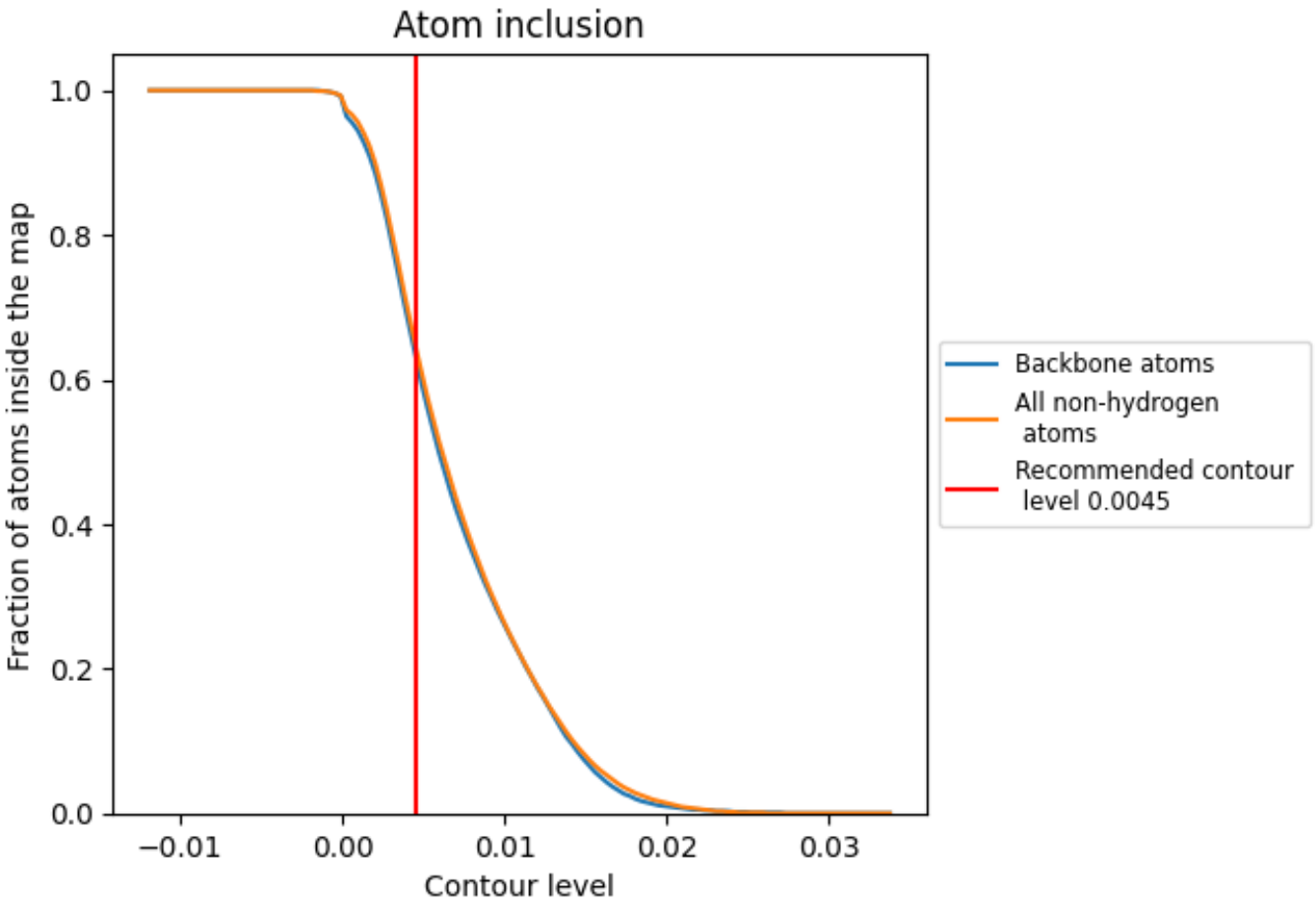
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0045).

9.4 Atom inclusion (i)



At the recommended contour level, 63% of all backbone atoms, 65% 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 (0.0045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6470	0.3910
3	0.0800	0.0770
4	0.1460	0.1090
5	0.0960	0.0750
6	0.1410	0.0880
7	0.0800	0.2090
8	0.1110	0.0660
9	0.8130	0.5370
A	0.3100	0.2050
B	0.2270	0.1210
D	0.4170	0.3210
E	0.2150	0.2400
F	0.0000	0.0080
G	0.3450	0.2880
H	0.6720	0.4430
I	0.0140	0.0860
J	0.4050	0.2530
L	0.7580	0.4680
M	0.8470	0.5350
N	0.8710	0.5510
O	0.8720	0.5760
P	0.8500	0.5170
Q	0.8390	0.5420
R	0.8790	0.5620
S	0.8470	0.4660
T	0.8610	0.5260
U	0.2230	0.2820
V	0.8770	0.5550
W	0.9360	0.5110
X	0.8870	0.5700
Y	0.9020	0.5690
Z	0.8700	0.5560
a	0.9100	0.5820
b	0.7390	0.5020
c	0.9160	0.5960



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Chain	Atom inclusion	Q-score
d	0.8740	0.5180
e	0.8860	0.5310
f	0.7470	0.4690
g	0.7810	0.4700
h	0.6660	0.4460
i	0.6400	0.3820
j	0.6640	0.3780
k	0.5750	0.3380
l	0.7530	0.4200
m	0.6350	0.3690
n	0.6470	0.3750
o	0.8050	0.4960
p	0.4790	0.2710
q	0.3320	0.2730
s	0.6630	0.4740
v	0.7420	0.4900
w	0.6880	0.4550
x	0.1250	0.2400
y	0.7590	0.3540
z	0.2540	0.3800