Full wwPDB EM Validation Report ⓘ

Jan 10, 2024 – 10:21 AM JST

PDB ID	:	7EVO
EMDB ID	:	EMD-31334
Title	:	The cryo-EM structure of the human 17S U2 snRNP
Authors	:	Zhang, X.; Zhan, X.; Shi, Y.
Deposited on	:	2021-05-21
Resolution	:	2.50 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

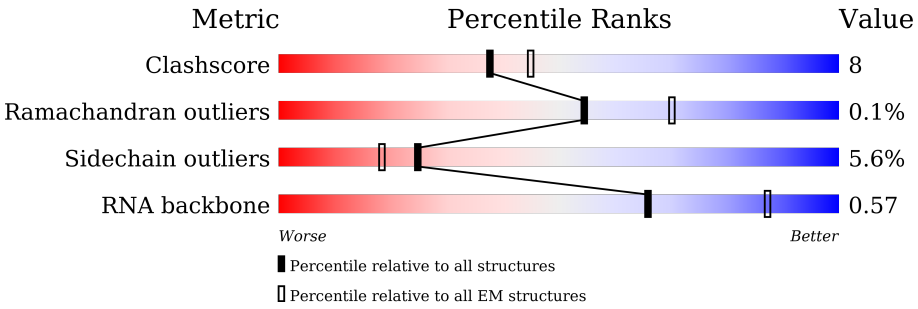
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.50 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=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	H	188	68%; 45%, 25%, 8%, 21%
2	1	1304	47%, 15%, 38%
3	2	895	9%; 17%, 80%
4	3	1217	16%; 73%, 23%
5	4	424	38%; 38%, 62%
6	5	86	60%, 16%, 23%
7	6	110	64%, 14%, 23%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
8	A	793	16% 16% 84%
9	B	464	22% 22% 78%
10	C	501	65% 77% 6% 16%
11	D	755	13% 22% 74%
12	E	1052	41% 41% 57%
13	F	255	64% 64% 36%
14	G	225	74% 73% 26%
15	a	118	76% 76% 24%
16	b	86	86% 86% 14%
17	c	92	86% 86% 14%
18	d	76	97% 97%
19	e	126	66% 66% 34%
20	f	240	30% 30% 70%
21	g	119	69% 69% 31%

2 Entry composition

There are 23 unique types of molecules in this entry. The entry contains 32104 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	H	148	3142	1406	551	1039	146	0	0

- Molecule 2 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	815	6487	4163	1121	1164	39	0	0

- Molecule 3 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	182	1210	754	229	225	2	0	0

- Molecule 4 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	1180	9247	5872	1571	1759	45	0	0

- Molecule 5 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	4	160	664	344	160	160	0	0

- Molecule 6 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	5	66	539	342	93	99	5	0	0

- Molecule 7 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	6	85	Total	C	N	O	S	0	0
			645	396	114	122	13		

- Molecule 8 is a protein called Splicing factor 3A subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	A	123	Total	C	N	O	0	0
			504	258	123	123		

- Molecule 9 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	B	100	Total	C	N	O	0	0
			421	221	100	100		

- Molecule 10 is a protein called Splicing factor 3A subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	C	422	Total	C	N	O	S	0	0
			2103	1174	466	459	4		

- Molecule 11 is a protein called HIV Tat-specific factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	D	200	Total	C	N	O	S	3	0
			1308	788	246	269	5		

- Molecule 12 is a protein called RNA helicase.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	E	455	Total	C	N	O	S	0	0
			2153	1157	487	507	2		

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-19	MET	-	initiating methionine	UNP A0A0C4DG89
E	-18	ALA	-	expression tag	UNP A0A0C4DG89
E	-17	SER	-	expression tag	UNP A0A0C4DG89
E	-16	ASP	-	expression tag	UNP A0A0C4DG89

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
E	-15	TYR	-	expression tag	UNP A0A0C4DG89
E	-14	LYS	-	expression tag	UNP A0A0C4DG89
E	-13	ASP	-	expression tag	UNP A0A0C4DG89
E	-12	ASP	-	expression tag	UNP A0A0C4DG89
E	-11	ASP	-	expression tag	UNP A0A0C4DG89
E	-10	ASP	-	expression tag	UNP A0A0C4DG89
E	-9	LYS	-	expression tag	UNP A0A0C4DG89
E	-8	ALA	-	expression tag	UNP A0A0C4DG89
E	-7	SER	-	expression tag	UNP A0A0C4DG89
E	-6	ASP	-	expression tag	UNP A0A0C4DG89
E	-5	GLU	-	expression tag	UNP A0A0C4DG89
E	-4	VAL	-	expression tag	UNP A0A0C4DG89
E	-3	ASP	-	expression tag	UNP A0A0C4DG89
E	-2	ALA	-	expression tag	UNP A0A0C4DG89
E	-1	GLY	-	expression tag	UNP A0A0C4DG89
E	0	THR	-	expression tag	UNP A0A0C4DG89

- Molecule 13 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	F	162	Total	C	N	O	0	0
			666	342	162	162		

- Molecule 14 is a protein called U2 small nuclear ribonucleoprotein B".

Mol	Chain	Residues	Atoms				AltConf	Trace
14	G	166	Total	C	N	O	0	0
			685	353	166	166		

- Molecule 15 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms				AltConf	Trace
15	a	90	Total	C	N	O	0	0
			372	192	90	90		

- Molecule 16 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	b	74	Total	C	N	O	0	0
			308	160	74	74		

- Molecule 17 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	c	79	Total 319	C 161	N 79	O 79	0	0

- Molecule 18 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	d	74	Total 305	C 157	N 74	O 74	0	0

- Molecule 19 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	e	83	Total 341	C 175	N 83	O 83	0	0

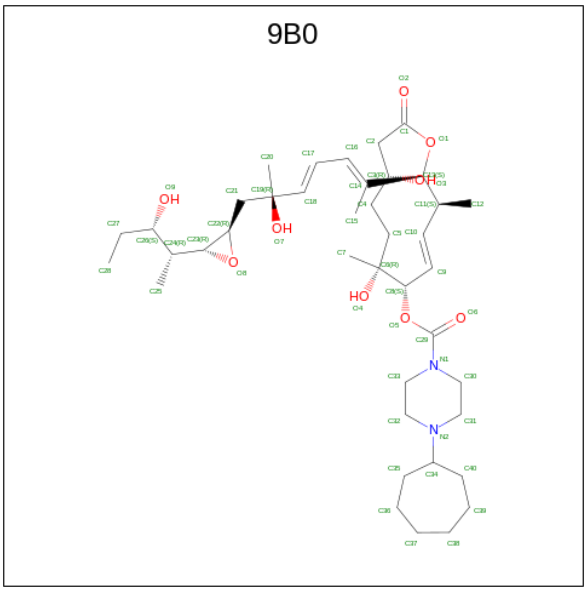
- Molecule 20 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	f	71	Total 293	C 151	N 71	O 71	0	0

- Molecule 21 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	g	82	Total 337	C 173	N 82	O 82	0	0

- Molecule 22 is [(2 {S},3 {S},4 {E},6 {S},7 {R},10 {R})-3,7-dimethyl-2-[(2 {E},4 {E},6 {R})-6-methyl-6-oxidanyl-7-[(2 {R},3 {R})-3-[(2 {R},3 {S})-3-oxidanylpentan-2-yl]oxiran-2-yl]hepta-2,4-dien-2-yl]-7,10-bis(oxidanyl)-12-oxidanylidene-1-oxacyclododec-4-en-6-yl] 4-cycloheptylpiperazine-1-carboxylate (three-letter code: 9B0) (formula: $C_{40}H_{66}N_2O_9$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
22	1	1	Total C N O 51 40 2 9	0

- Molecule 23 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

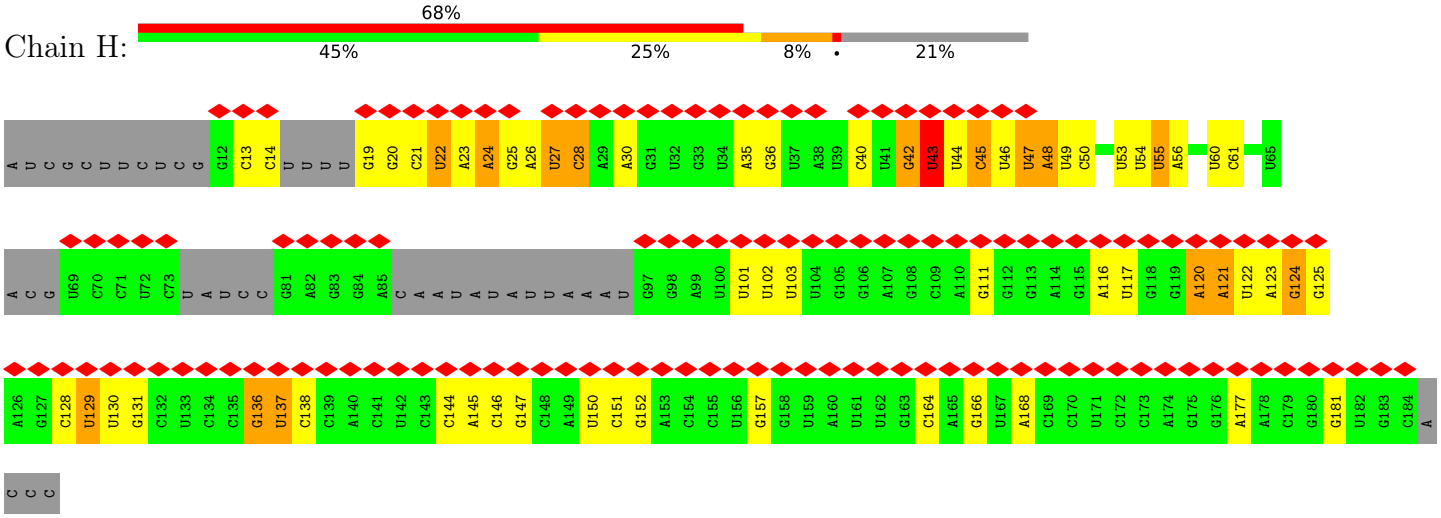
Mol	Chain	Residues	Atoms	AltConf
23	6	3	Total Zn 3 3	0
23	C	1	Total Zn 1 1	0

3 Residue-property plots (i)

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

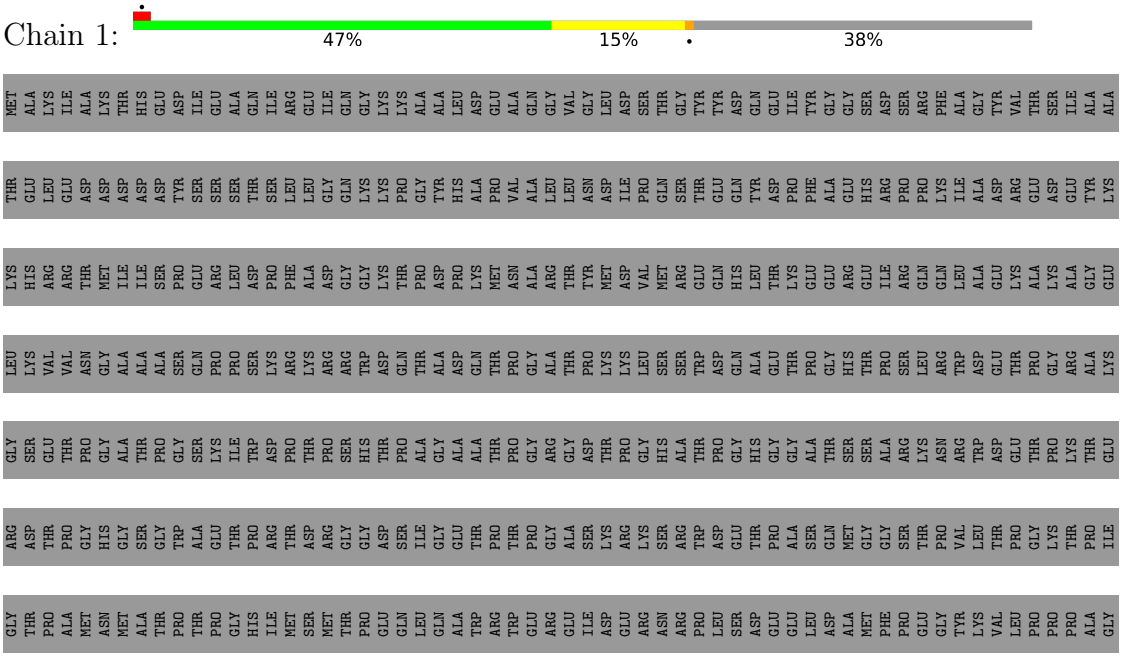
• Molecule 1: U2 snRNA

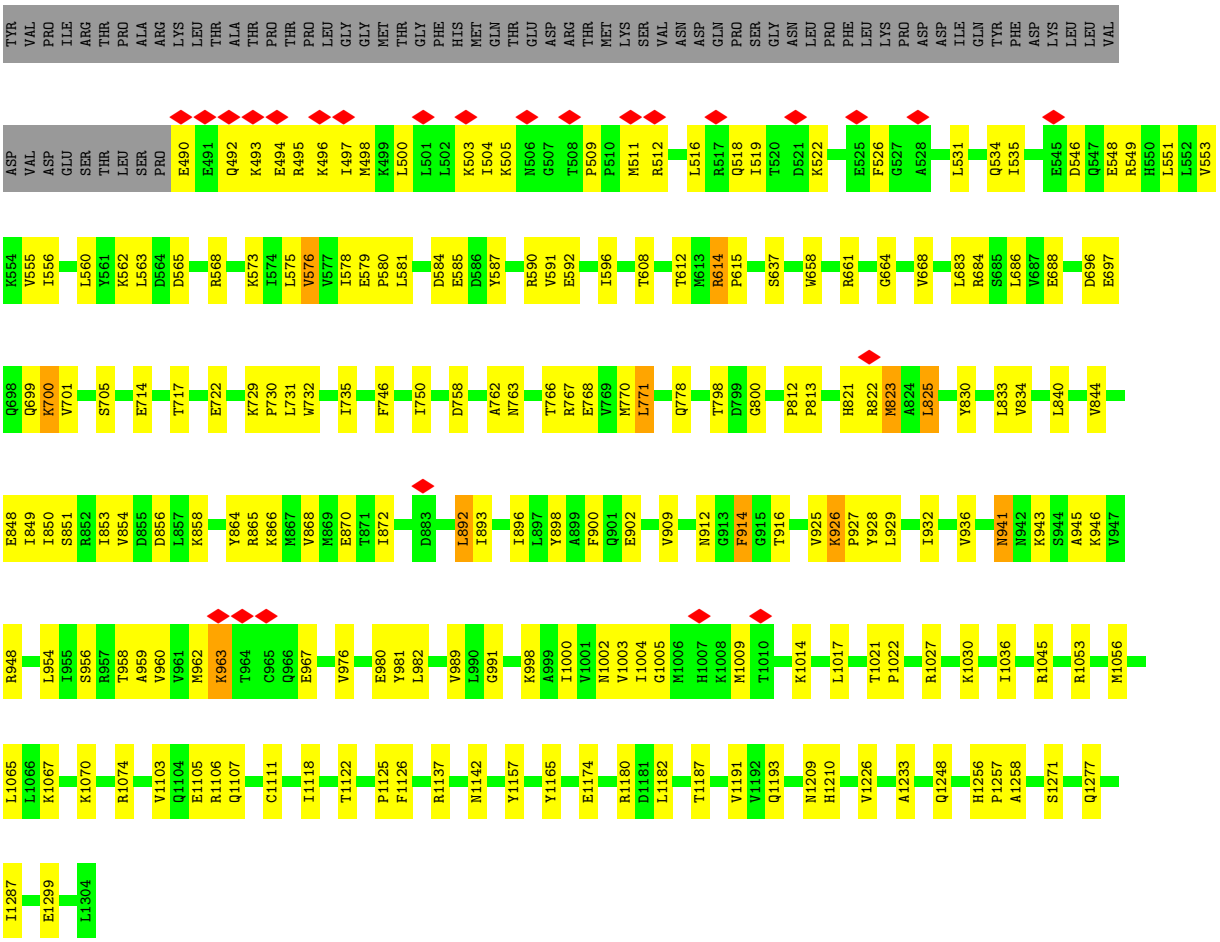
Chain H:



• Molecule 2: Splicing factor 3B subunit 1

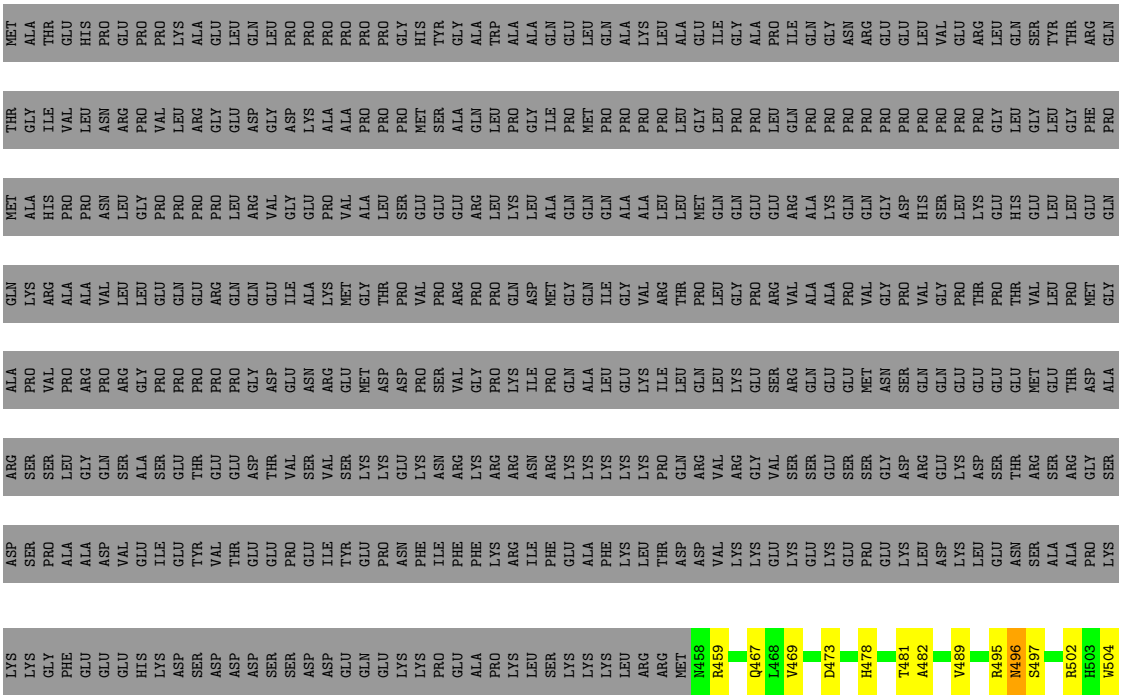
Chain 1:

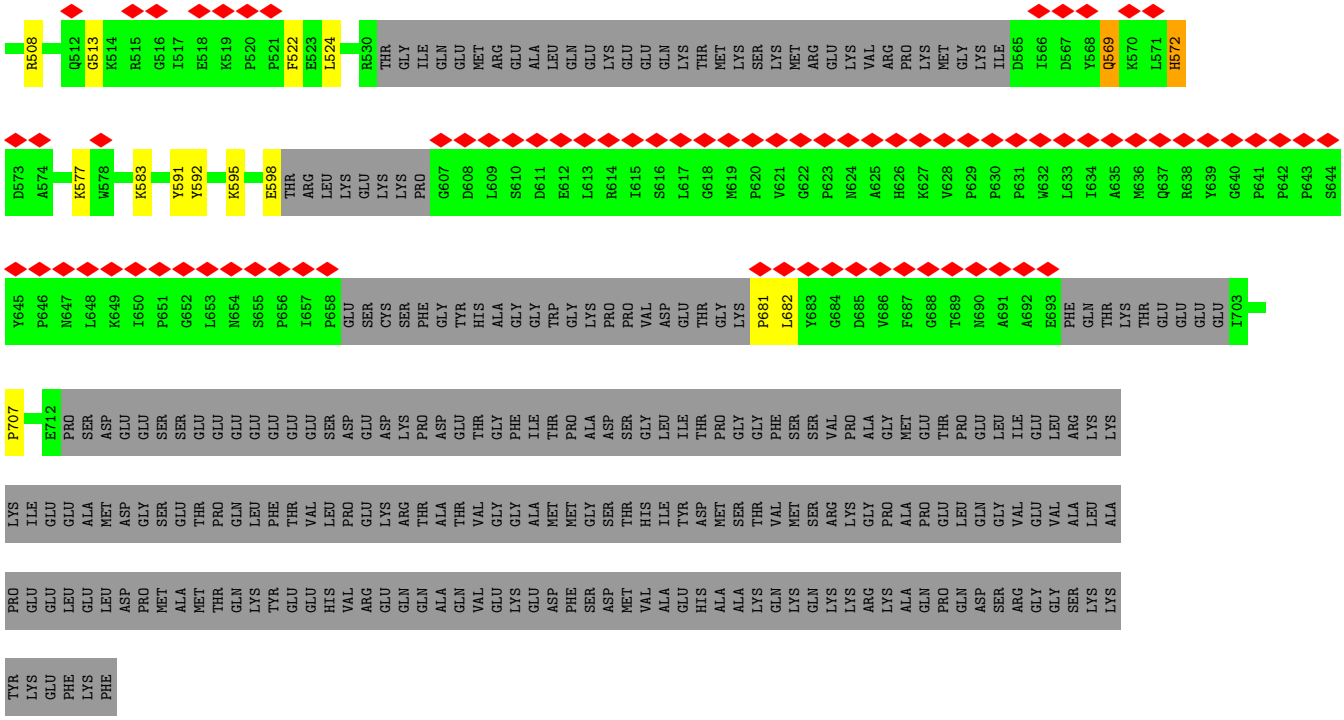




• Molecule 3: Splicing factor 3B subunit 2

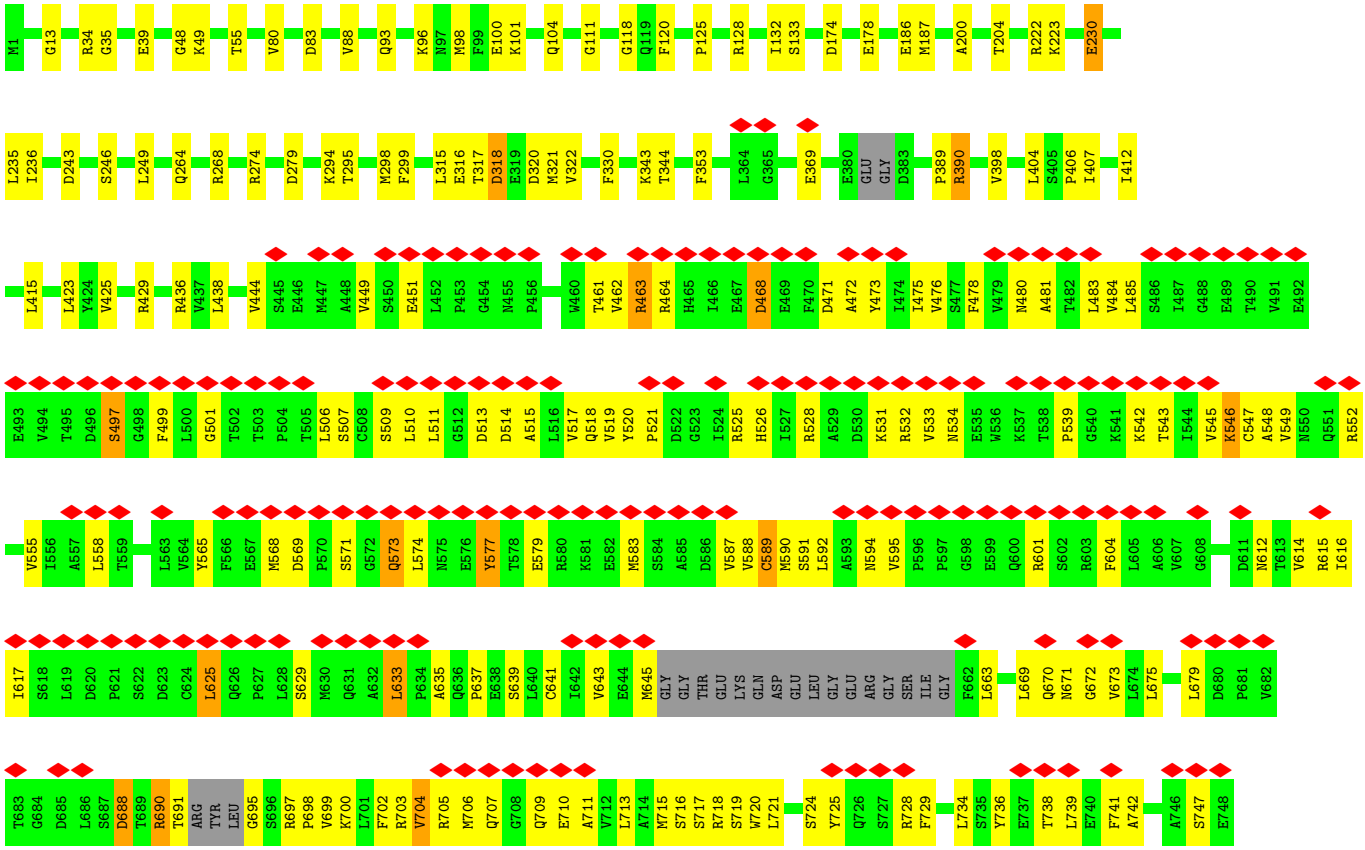
Chain 2:

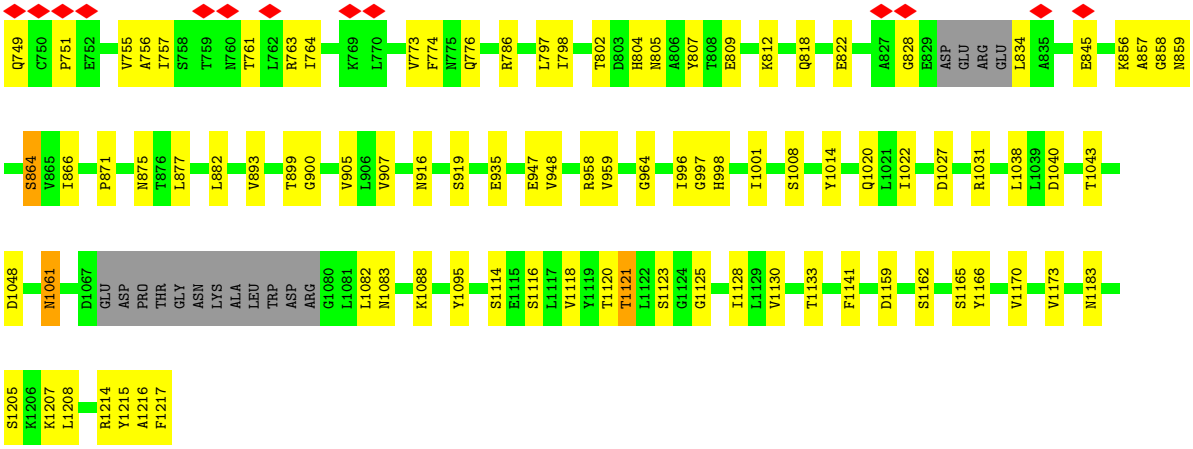




• Molecule 4: Splicing factor 3B subunit 3

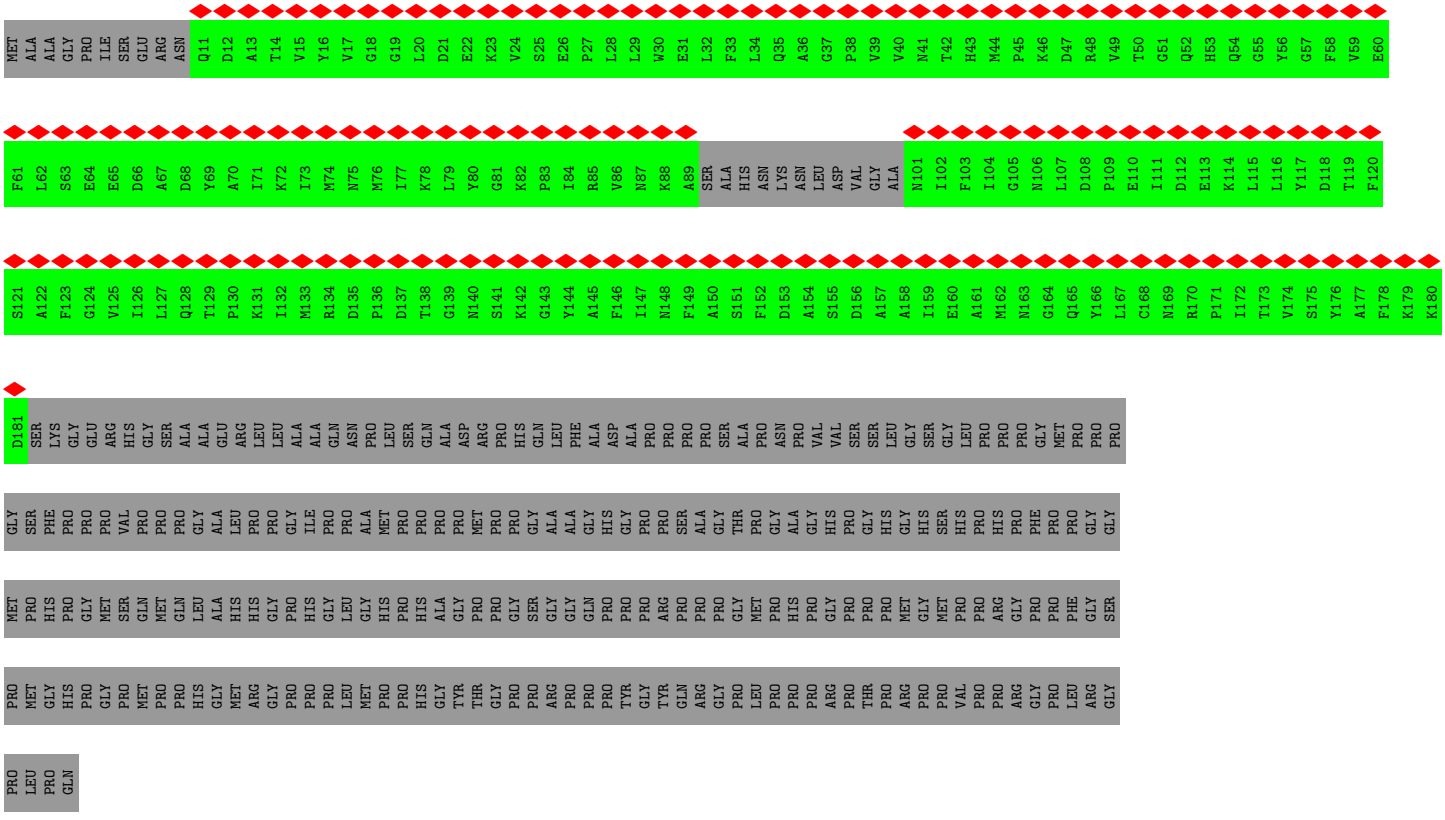
Chain 3:





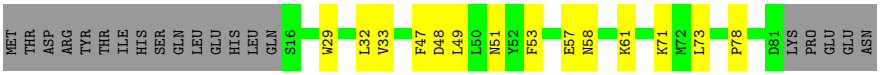
• Molecule 5: Splicing factor 3B subunit 4

Chain 4:



• Molecule 6: Splicing factor 3B subunit 5

Chain 5:

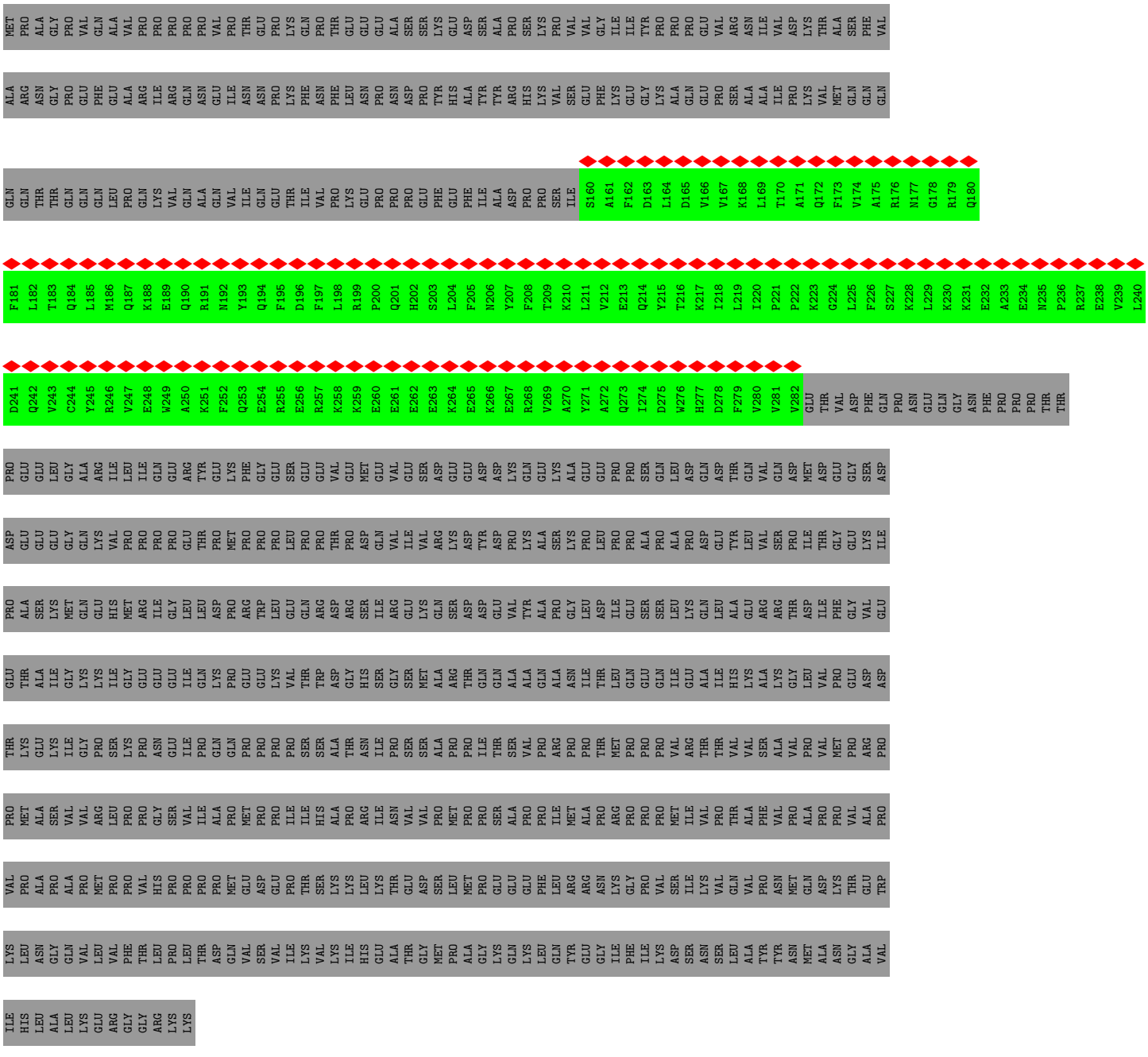


• Molecule 7: PHD finger-like domain-containing protein 5A

Chain 6:

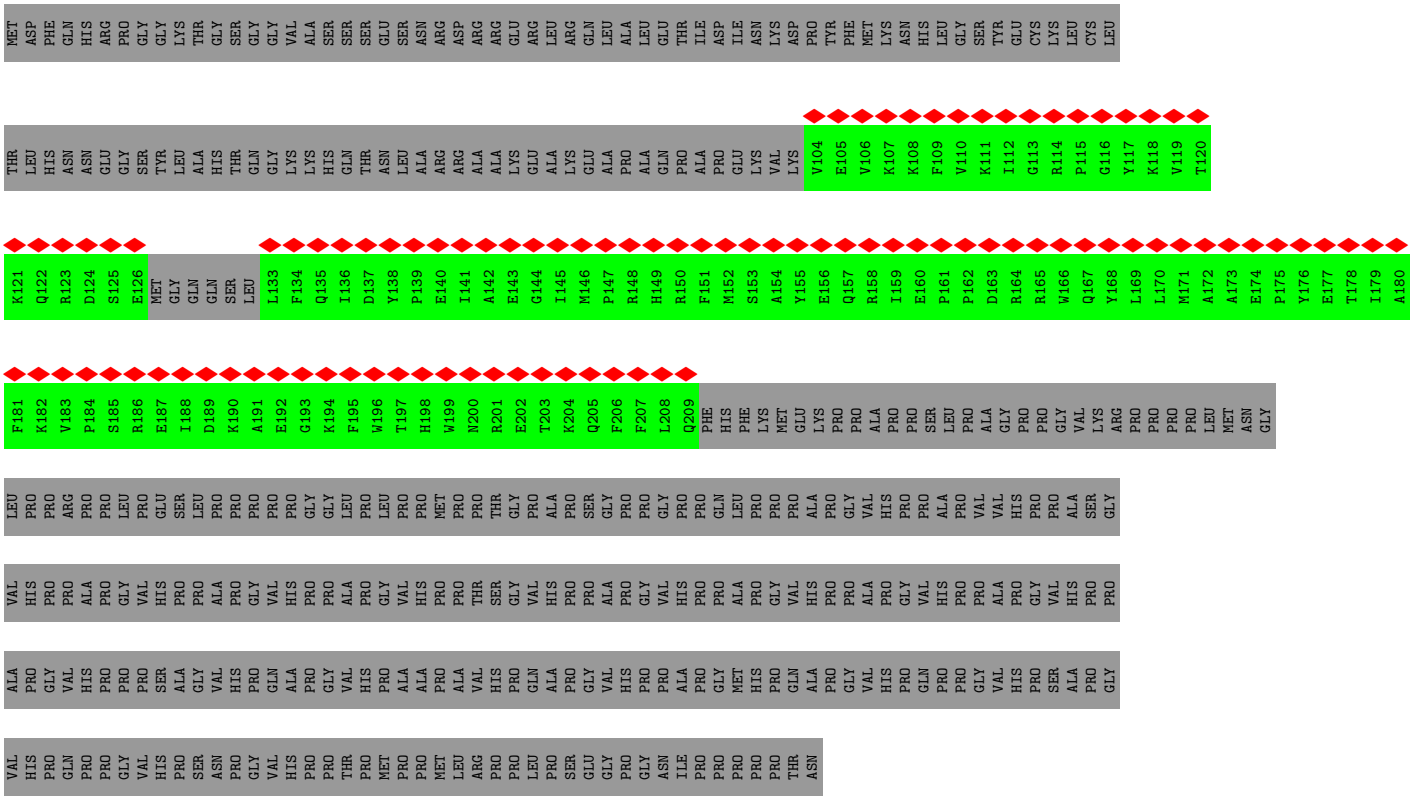
• Molecule 8: Splicing factor 3A subunit 1

Chain A:



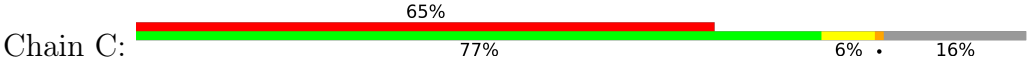
• Molecule 9: Splicing factor 3A subunit 2

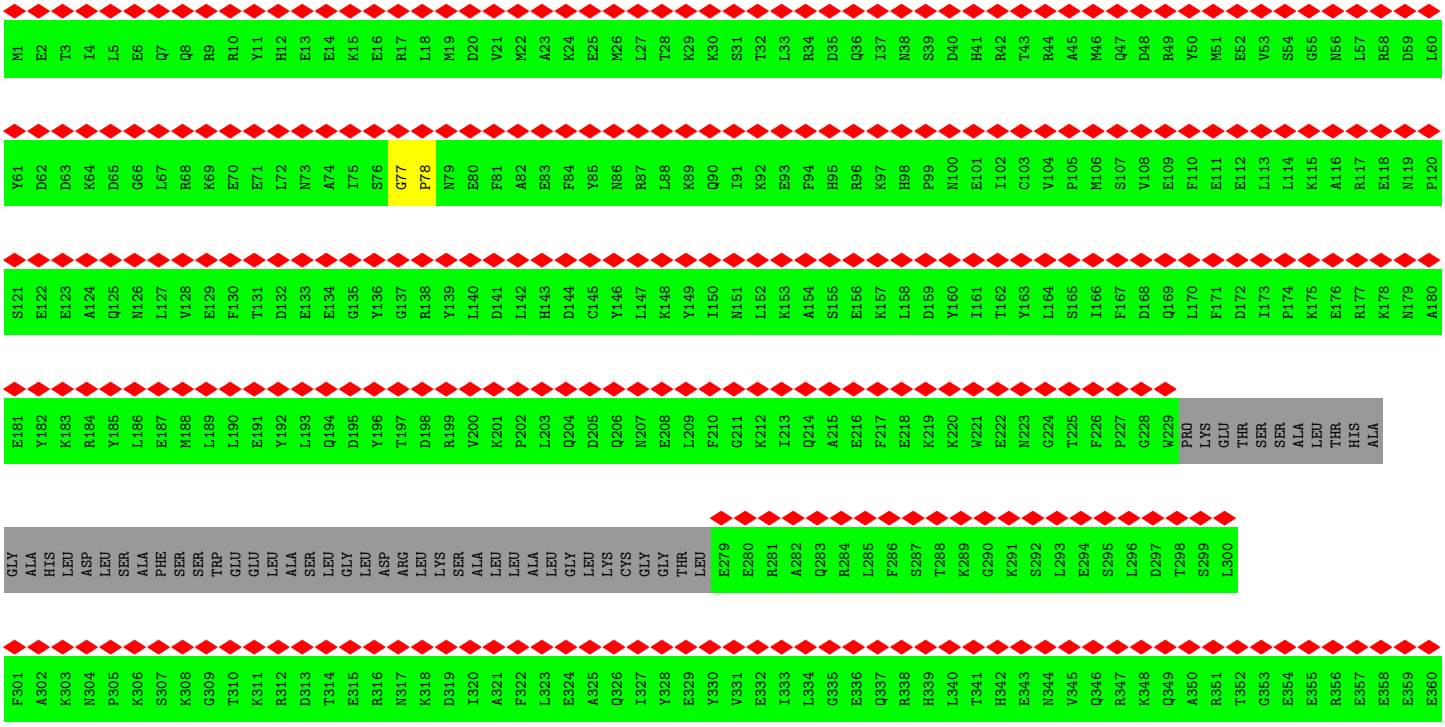
Chain B:

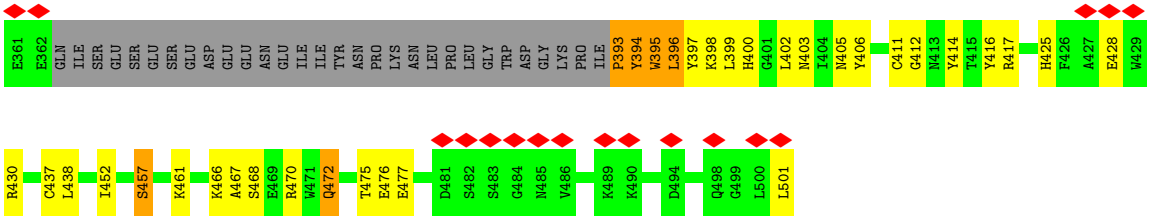


• Molecule 10: Splicing factor 3A subunit 3

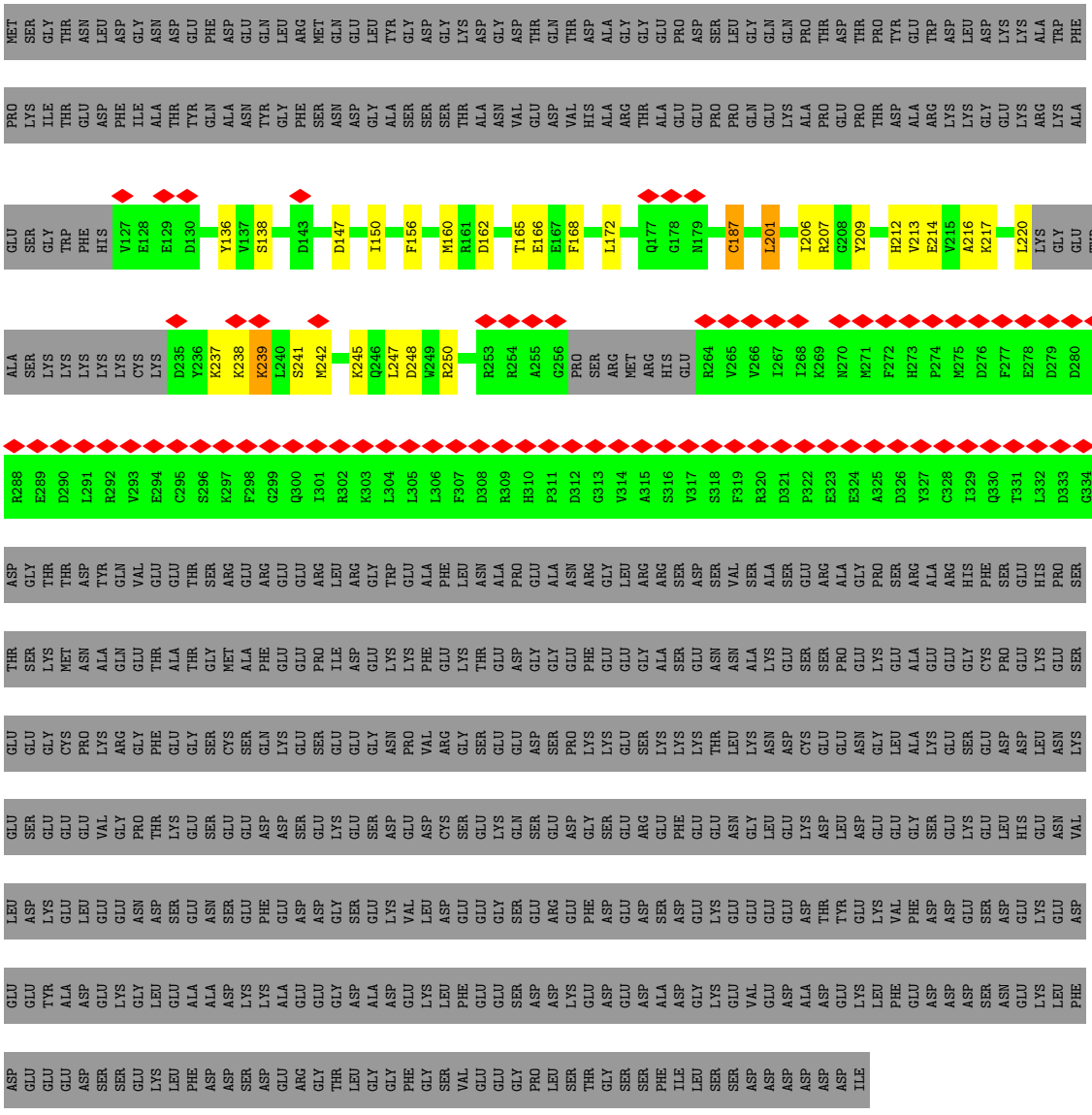
Chain C:



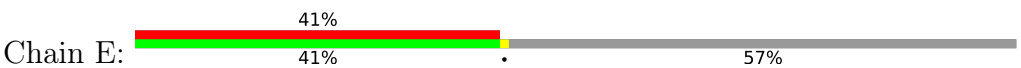


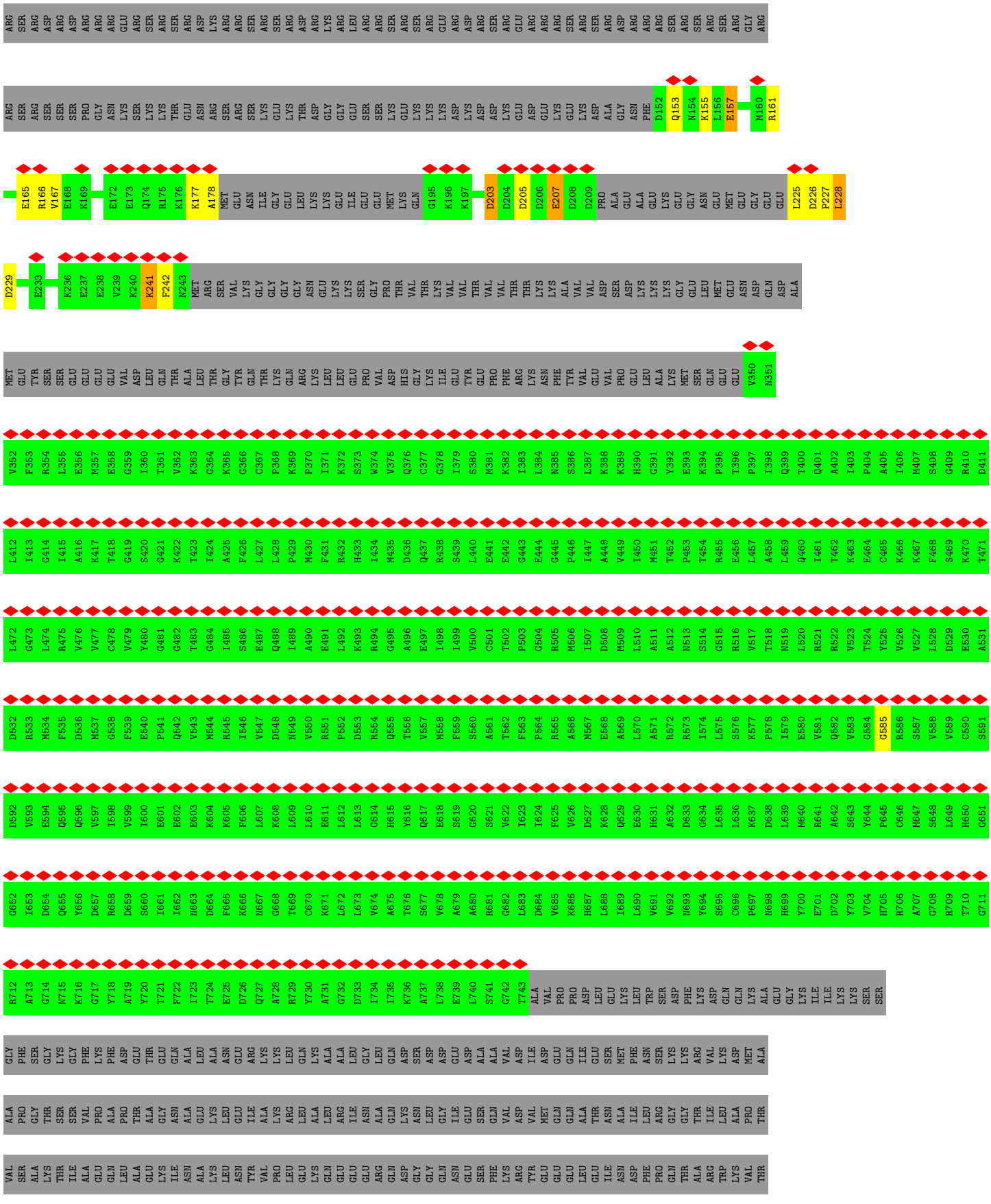


• Molecule 11: HIV Tat-specific factor 1

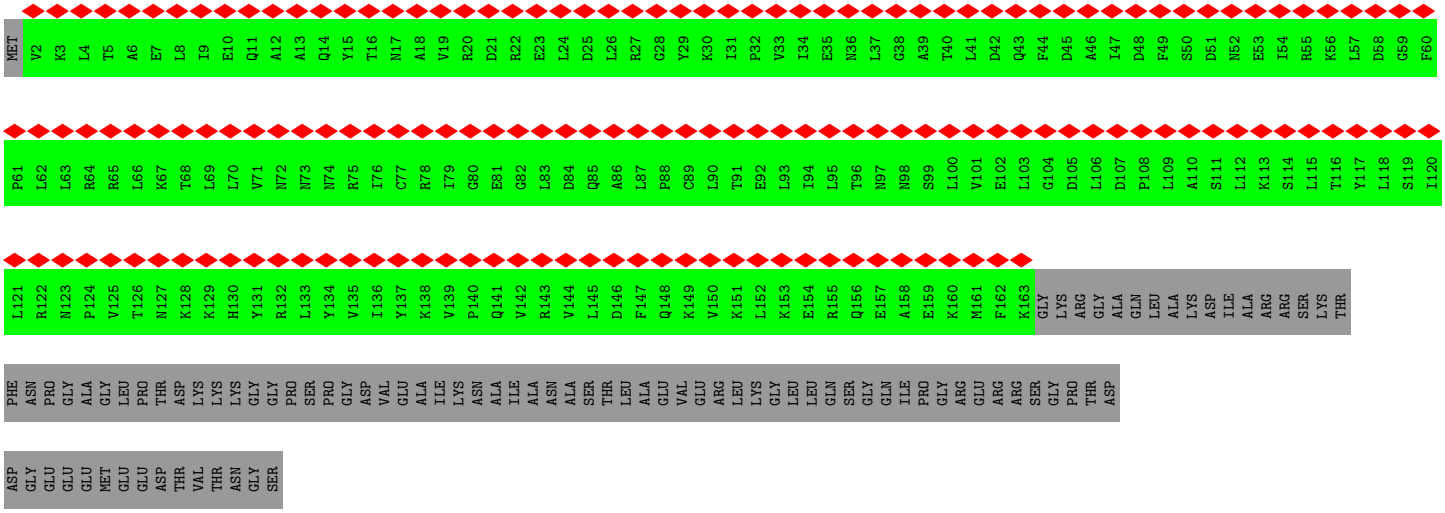


• Molecule 12: RNA helicase

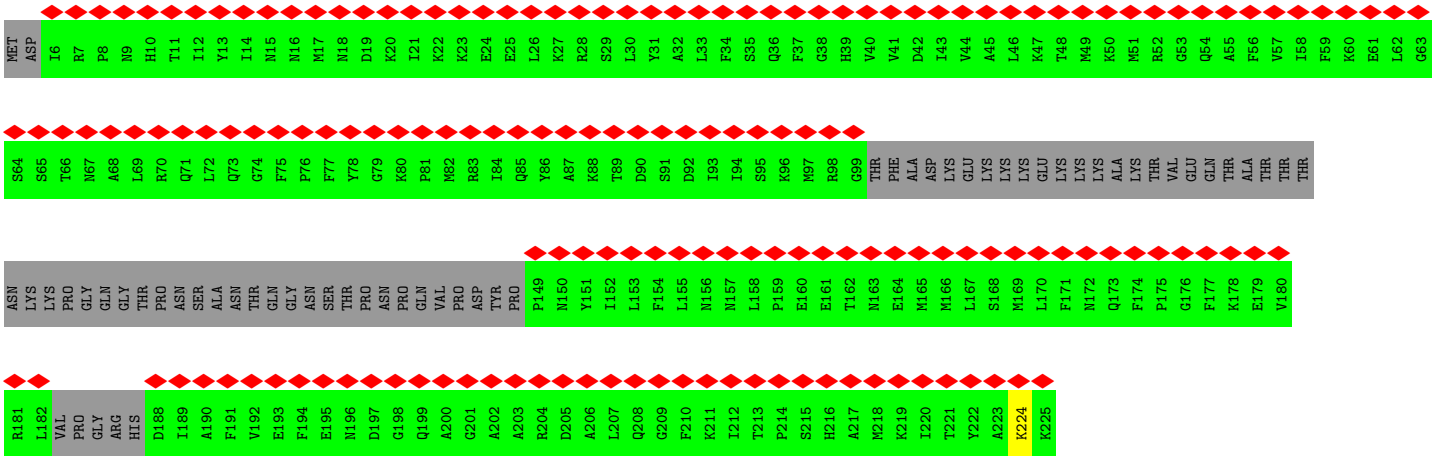



ARG SER ARG ASP ARG ASP ARG ARG ARG GLU ARG SER ARG SER ARG ASP LYS ARG ARG SER ARG SER ARG ASP ARG LYS ARG LEU ARG ARG SER ARG SER ARG GLU ARG ASP ARG SER ARG SER ARG ASP ARG ARG ARG SER ARG SER ARG GLY ARG
ARG SER ARG SER SER PRO GLY ASN LYS SER LYS LYS THR GLU ASN ARG SER ARG SER LYS GLU LYS THR ASP GLY GLY GLU GLU SER SER LYS GLU LYS LYS LYS ASP LYS ASP LYS GLU ASP GLU LYS GLU LYS ASP ALA GLY ASN PHE D152 Q153 N154 K155 L156 E157 M160 R161
E165 R166 V167 E168 K169 E172 E173 Q174 R175 K176 K177 A178 MET GLU ASN ILE GLY GLU LEU LYS LYS GLU ILE GLU GLU MET LYS GLN G195 K196 K197 D203 D204 D205 D206 E207 D208 D209 PRO ALA GLU ALA GLU LYS GLU GLY ASN GLU MET GLU GLY GLU L225 D226 P227 L228
D229 E233 K236 E237 E238 V239 K240 K241 F242 N243 MET ARG SER VAL LYS GLY GLY GLY GLY ASN GLU LYS LYS SER GLY PRO THR VAL THR LYS VAL VAL THR THR LYS LYS ALA VAL VAL ASP SER ASP LYS LYS LYS GLY GLU LEU MET GLU ASN ASP GLN ASP ALA
MET GLU TYR SER SER GLU GLU GLU GLU VAL ASP LEU GLN THR ALA LEU THR GLY TYR GLN THR LYS GLN ARG LYS LEU LEU GLU PRO VAL ASP HIS GLY LYS ILE GLU TYR GLU PRO PHE ARG LYS ASN PHE TYR VAL GLU VAL PRO GLU LEU ALA LYS MET SER GLN GLU GLU V350 N351
V352 F353 R354 L355 E356 M357 E358 G359 I360 T361 V362 K363 G364 K365 G366 C367 P368 K369 P370 I371 K372 S373 W374 V375 Q376 C377 G378 I379 S380 M381 K382 I383 L384 N385 S386 L387 K388 K389 H390 G391 Y392 E393 K394 P395 T396 P397 I398 Q399 T400 Q401 A402 I403 P404 A405 I406 M407 S408 G409 R410 D411
L412 I413 G414 I415 A416 K417 T418 G419 S420 G421 K422 T423 I424 A425 F426 L427 L428 P429 M430 F431 R432 H433 I434 M435 D436 Q437 R438 S439 L440 E441 E442 G443 E444 G445 P446 I447 A448 V449 I450 M451 T452 P453 T454 R455 E456 L457 A458 L459 Q460 I461 T462 K463 E464 C465 K466 K467 F468 S469 K470 T471
L472 G473 L474 R475 V476 V477 C478 V479 Y480 G481 G482 T483 G484 I485 S486 E487 Q488 I489 A490 E491 L492 K493 R494 G495 A496 E497 I498 I499 V500 C501 T502 P503 G504 R505 M506 I507 D508 M509 L510 A511 A512 N513 S514 G515 R516 V517 T518 N519 L520 R521 R522 V523 T524 Y525 V526 V527 L528 D529 E530 A531
D532 R533 M534 F535 D536 M537 G538 F539 E540 P541 Q542 V543 M544 R545 I546 V547 D548 N549 V550 R551 P552 D553 R554 Q555 T556 V557 M558 F559 S560 A561 T562 F563 P564 R565 A566 M567 E568 A569 L570 A571 R572 R573 I574 L575 S576 K577 P578 I579 E580 V581 Q582 V583 G584 G585 R586 S587 V588 V589 C590 S591
D592 V593 E594 Q595 Q596 V597 I598 V599 I600 E601 E602 E603 K604 K605 F606 L607 K608 L609 L610 E611 L612 L613 G614 H615 Y616 Q617 E618 S619 G620 S621 V622 I623 I624 F625 V626 D627 K628 Q629 E630 H631 A632 D633 G634 L635 L636 K637 D638 L639 M640 R641 A642 S643 Y644 P645 C646 M647 S648 L649 H650 G651
G652 I653 D654 Q655 Y656 D657 R658 D659 S660 I661 I662 N663 D664 F665 K666 N667 G668 T669 C670 K671 L672 L673 V674 A675 T676 S677 V678 A679 A680 R681 G682 L683 D684 V685 K686 H687 L688 I689 L690 V691 V692 N693 Y694 S695 C696 P697 N698 H699 Y700 E701 D702 Y703 V704 H705 R706 A707 G708 R709 T710 G711
R712 A713 G714 N715 K716 G717 Y718 A719 Y720 T721 F722 I723 T724 E725 D726 Q727 A728 R729 Y730 A731 G732 D733 I734 T735 K736 A737 L738 E739 L740 S741 G742 T743 ALA VAL PRO PRO ASP LEU GLU LYS LEU TRP SER ASP PHE LYS ASP GLN GLN LYS ALA GLU GLY LYS ILE ILE LYS LYS SER SER
GLY PHE SER GLY LYS GLY PHE LYS PHE ASP GLU THR GLU GLN ALA LEU ALA ASN GLU ARG LYS LYS LEU GLN LYS ALA ALA LEU GLY LEU GLN ASP SER ASP ASP GLU ASP ALA ALA VAL ASP ILE ASP GLU GLN ILE GLU SER MET PHE ASN SER LYS LYS ARG VAL LYS ASP MET ALA
ALA PRO GLY THR SER SER VAL PRO ALA PRO THR ALA GLY ASN ALA GLU LYS LEU GLU ILE GLU ILE ALA LYS ARG LEU ALA LEU ARG ILE ASN ALA GLN LYS ASN LEU GLY LYS ILE GLU SER GLN VAL ASP VAL MET GLN GLN ALA THR ASN ALA ILE LEU ARG GLY GLY THR ILE LEU ALA PRO THR
VAL SER ALA LYS THR ILE ALA GLU LYS ILE ASN ALA LYS LEU ASN TYR VAL PRO LEU GLU LYS GLN GLU GLU ARG GLN ASP GLY GLY GLN ASN GLU SER PHE LYS ARG TYR GLU GLU GLU LEU GLU ILE ASN ASP PHE PRO GLN THR ALA ARG TRP LYS VAL THR

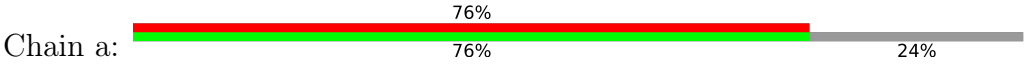
• Molecule 13: U2 small nuclear ribonucleoprotein A'

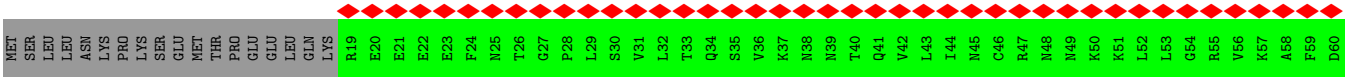


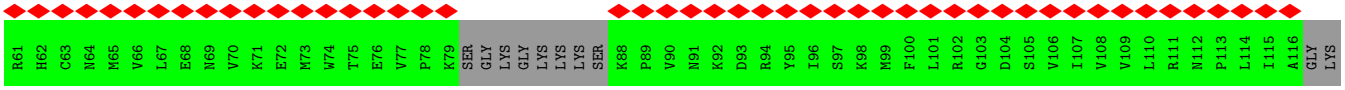
• Molecule 14: U2 small nuclear ribonucleoprotein B"



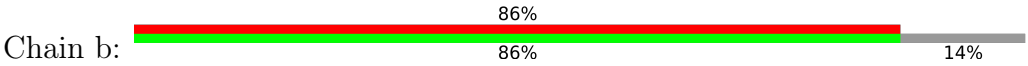
• Molecule 15: Small nuclear ribonucleoprotein Sm D2



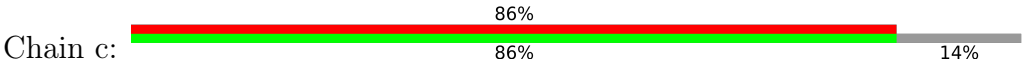


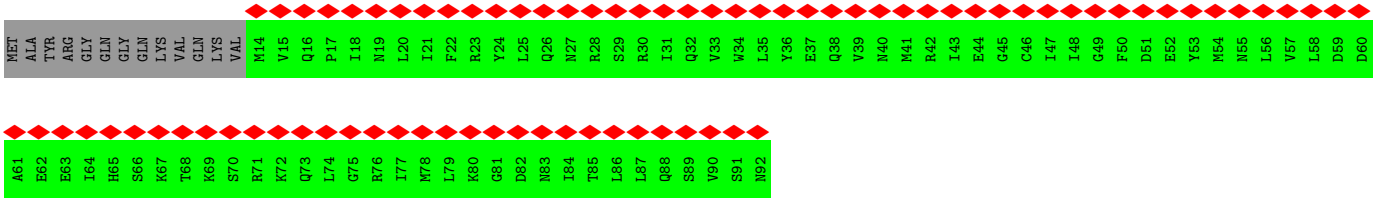


• Molecule 16: Small nuclear ribonucleoprotein F



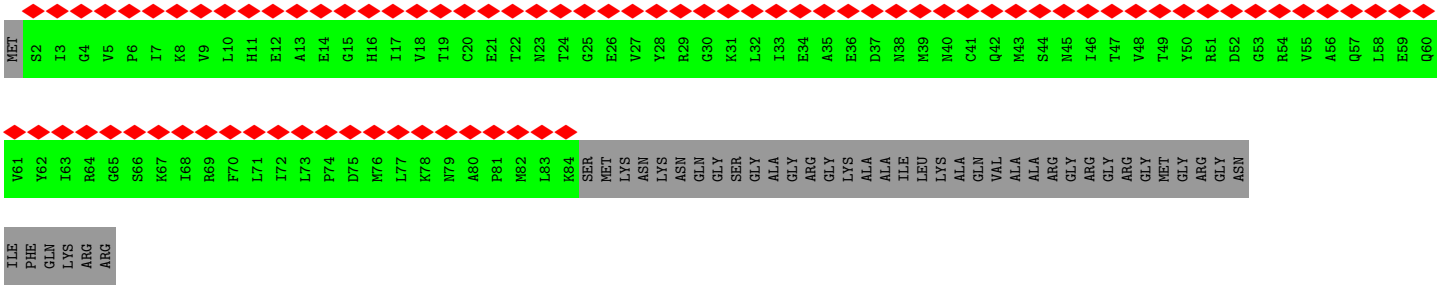
• Molecule 17: Small nuclear ribonucleoprotein E





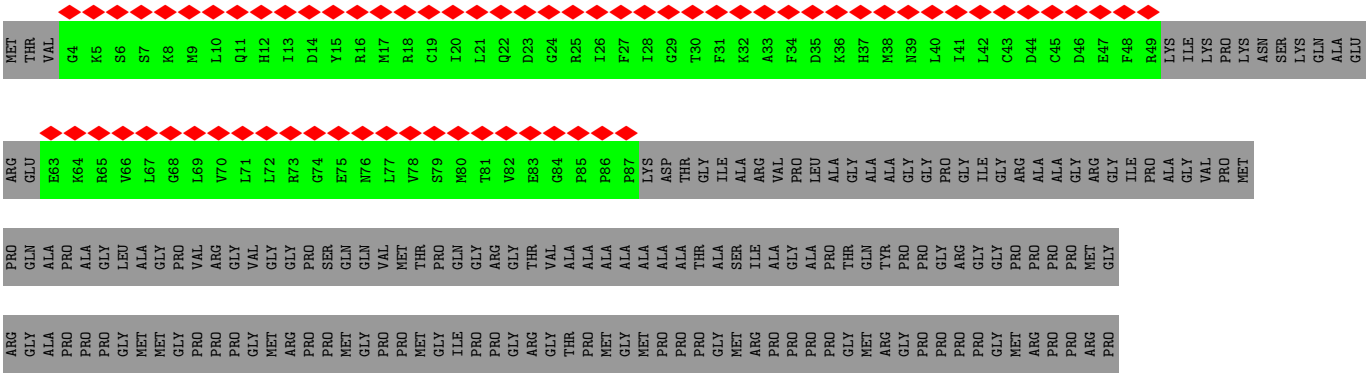
• Molecule 18: Small nuclear ribonucleoprotein G

• Molecule 19: Small nuclear ribonucleoprotein Sm D3



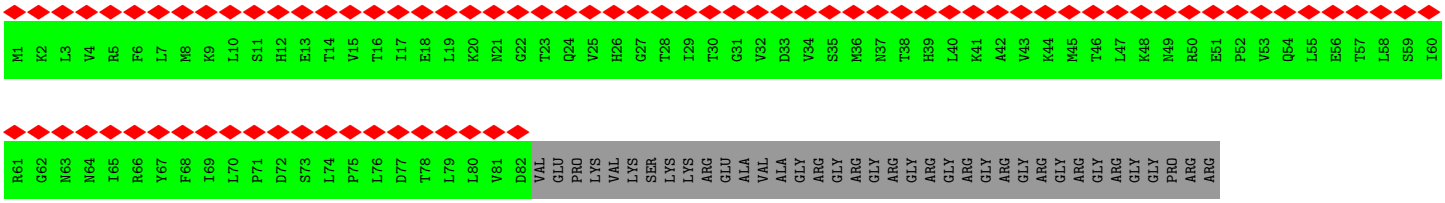
• Molecule 20: Small nuclear ribonucleoprotein-associated proteins B and B'

Chain f:



• Molecule 21: Small nuclear ribonucleoprotein Sm D1

Chain g:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	485418	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.257	Depositor
Minimum map value	-0.135	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	347.84, 347.84, 347.84	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.087, 1.087, 1.087	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 9B0

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	H	0.41	2/3507 (0.1%)	0.95	17/5454 (0.3%)
2	1	0.27	0/6609	0.45	1/8946 (0.0%)
3	2	0.25	0/1248	0.45	0/1672
4	3	0.27	0/9435	0.49	1/12802 (0.0%)
5	4	0.24	0/670	0.45	0/850
6	5	0.48	1/555 (0.2%)	0.52	0/750
7	6	0.25	0/653	0.45	0/877
8	A	0.24	0/507	0.41	0/640
9	B	0.24	0/426	0.50	0/543
10	C	0.25	0/2133	0.45	0/2773
11	D	0.28	0/1325	0.47	0/1749
12	E	0.41	1/2171 (0.0%)	0.52	0/2779
13	F	0.24	0/671	0.49	0/849
14	G	0.23	0/689	0.46	0/869
15	a	0.24	0/374	0.50	0/472
16	b	0.25	0/311	0.51	0/395
17	c	0.24	0/319	0.49	0/399
18	d	0.25	0/307	0.51	0/388
19	e	0.25	0/343	0.51	0/433
20	f	0.24	0/294	0.49	0/370
21	g	0.23	0/339	0.51	0/428
All	All	0.30	4/32886 (0.0%)	0.56	19/44438 (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
1	H	0	1
10	C	0	1

Continued on next page...

Continued from previous page...

Mol	Chain	#Chirality outliers	#Planarity outliers
All	All	0	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	5	78	PRO	C-N	8.67	1.50	1.34
1	H	45	C	O3'-P	-7.13	1.52	1.61
1	H	55	U	P-OP2	5.57	1.58	1.49
12	E	178	ALA	C-O	5.12	1.33	1.23

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	H	28	C	N1-C1'-C2'	-11.54	98.99	114.00
1	H	120	A	C6-N1-C2	-8.05	113.77	118.60
1	H	42	G	C4'-C3'-O3'	7.34	127.69	113.00
1	H	27	U	C3'-C2'-C1'	7.02	107.11	101.50
1	H	55	U	OP1-P-OP2	6.85	129.88	119.60
1	H	28	C	C1'-C2'-O2'	-6.80	90.20	110.60
1	H	55	U	O5'-P-OP2	-6.72	99.65	105.70
4	3	625	LEU	CA-CB-CG	6.71	130.72	115.30
1	H	120	A	N1-C2-N3	6.31	132.46	129.30
1	H	19	G	O5'-P-OP1	-6.23	100.09	105.70
1	H	136	G	C2-N3-C4	6.08	114.94	111.90
1	H	129	U	N1-C2-O2	5.71	126.80	122.80
1	H	129	U	N3-C2-O2	-5.48	118.37	122.20
1	H	136	G	N3-C4-C5	-5.33	125.93	128.60
2	1	563	LEU	CA-CB-CG	5.33	127.57	115.30
1	H	168	A	C4-N9-C1'	5.25	135.75	126.30
1	H	28	C	C3'-C2'-C1'	5.21	105.67	101.50
1	H	121	A	C2-N3-C4	5.06	113.13	110.60
1	H	137	U	C6-N1-C2	-5.03	117.98	121.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
10	C	393	PRO	Mainchain
1	H	43	U	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	H	3142	0	1594	60	0
2	1	6487	0	6700	136	0
3	2	1210	0	1010	27	0
4	3	9247	0	9179	161	0
5	4	664	0	230	0	0
6	5	539	0	505	10	0
7	6	645	0	626	9	0
8	A	504	0	150	0	0
9	B	421	0	148	0	0
10	C	2103	0	1108	47	0
11	D	1308	0	1061	25	0
12	E	2153	0	1054	27	0
13	F	666	0	209	0	0
14	G	685	0	226	7	0
15	a	372	0	118	0	0
16	b	308	0	115	0	0
17	c	319	0	92	0	0
18	d	305	0	105	0	0
19	e	341	0	112	0	0
20	f	293	0	99	0	0
21	g	337	0	110	0	0
22	1	51	0	0	9	0
23	6	3	0	0	0	0
23	C	1	0	0	0	0
All	All	32104	0	24551	454	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 8.

All (454) 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)
1:H:25:G:H1'	10:C:399:LEU:CD2	1.33	1.55
12:E:226:ASP:OD1	12:E:227:PRO:HD2	1.18	1.31
10:C:396:LEU:HD12	10:C:400:HIS:HD2	0.98	1.13

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:25:G:C1'	10:C:399:LEU:CD2	2.25	1.12
10:C:396:LEU:HD12	10:C:400:HIS:CD2	1.88	1.08
1:H:25:G:C1'	10:C:399:LEU:HD22	1.82	1.07
12:E:226:ASP:OD1	12:E:227:PRO:CD	2.04	1.05
10:C:398:LYS:HG2	10:C:403:ASN:ND2	1.72	1.04
1:H:25:G:H1'	10:C:399:LEU:HD21	1.37	1.03
22:1:1500:9B0:C39	7:6:38:ARG:HD2	1.89	1.01
2:1:900:PHE:CD1	2:1:914:PHE:HD2	1.83	0.95
2:1:900:PHE:HD1	2:1:914:PHE:HD2	1.09	0.95
1:H:25:G:C1'	10:C:399:LEU:HD21	1.98	0.90
2:1:900:PHE:CD1	2:1:914:PHE:CD2	2.62	0.87
1:H:25:G:H1'	10:C:399:LEU:HD22	0.88	0.87
4:3:264:GLN:HE22	4:3:322:VAL:H	1.24	0.84
2:1:900:PHE:HD1	2:1:914:PHE:CD2	1.97	0.83
10:C:501:LEU:C	14:G:224:LYS:H	1.84	0.81
1:H:45:C:C2	10:C:395:TRP:CD1	2.70	0.80
4:3:579:GLU:HB3	4:3:625:LEU:HD11	1.65	0.78
10:C:402:LEU:O	10:C:403:ASN:ND2	2.17	0.77
1:H:150:U:H3	1:H:181:G:H1	1.31	0.76
12:E:177:LYS:HB2	12:E:177:LYS:NZ	2.01	0.75
12:E:241:LYS:HA	12:E:241:LYS:HE3	1.69	0.74
1:H:43:U:H4'	1:H:43:U:OP1	1.85	0.74
4:3:463:ARG:HB3	4:3:471:ASP:HA	1.70	0.73
2:1:614:ARG:HH21	12:E:228:LEU:HD13	1.53	0.73
4:3:583:MET:SD	4:3:615:ARG:NH1	2.62	0.72
12:E:166:ARG:NH1	12:E:166:ARG:HB3	2.04	0.72
10:C:501:LEU:HA	14:G:224:LYS:O	1.90	0.72
4:3:1121:THR:HG22	4:3:1125:GLY:H	1.55	0.72
1:H:47:U:H3'	1:H:48:A:H5'	1.71	0.71
4:3:698:PRO:O	4:3:700:LYS:NZ	2.24	0.70
2:1:925:VAL:HG23	2:1:928:TYR:HB2	1.74	0.70
2:1:945:ALA:HA	2:1:948:ARG:HB2	1.74	0.70
4:3:805:ASN:ND2	4:3:858:GLY:O	2.25	0.69
4:3:703:ARG:NH1	4:3:711:ALA:O	2.23	0.69
4:3:1121:THR:HG23	4:3:1123:SER:H	1.54	0.69
1:H:56:A:C2	3:2:478:HIS:CE1	2.81	0.69
2:1:900:PHE:CE1	2:1:954:LEU:HD22	2.27	0.69
4:3:547:CYS:SG	4:3:548:ALA:N	2.65	0.69
7:6:21:ARG:NH2	7:6:68:ASP:OD1	2.26	0.68
12:E:166:ARG:HB3	12:E:166:ARG:HH11	1.58	0.68
10:C:398:LYS:CG	10:C:403:ASN:ND2	2.55	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:186:GLU:OE1	4:3:222:ARG:NH2	2.27	0.68
4:3:499:PHE:HD2	4:3:518:GLN:HE21	1.41	0.67
4:3:672:GLY:HA3	4:3:695:GLY:HA3	1.76	0.67
4:3:893:VAL:HG22	4:3:905:VAL:HG22	1.77	0.66
4:3:707:GLN:HG3	4:3:709:GLN:HE22	1.60	0.66
10:C:397:TYR:O	10:C:402:LEU:HB2	1.96	0.66
4:3:673:VAL:HG12	4:3:690:ARG:HA	1.77	0.66
4:3:511:LEU:HB2	4:3:517:VAL:HG23	1.78	0.65
4:3:511:LEU:HD21	4:3:568:MET:HG3	1.78	0.65
4:3:101:LYS:HD3	4:3:104:GLN:HG3	1.77	0.65
2:1:926:LYS:HG2	2:1:927:PRO:HD3	1.79	0.65
1:H:45:C:N3	10:C:395:TRP:CD1	2.65	0.64
2:1:699:GLN:O	2:1:699:GLN:HG3	1.95	0.64
3:2:591:TYR:HA	3:2:595:LYS:HD3	1.77	0.64
1:H:42:G:C5	1:H:43:U:C6	2.85	0.64
10:C:398:LYS:HG2	10:C:403:ASN:HD22	1.60	0.64
2:1:866:LYS:HG3	2:1:909:VAL:HG11	1.79	0.64
4:3:828:GLY:O	4:3:834:LEU:N	2.31	0.64
2:1:731:LEU:HB3	2:1:750:ILE:HD11	1.80	0.63
1:H:56:A:H2	3:2:478:HIS:CE1	2.16	0.63
11:D:201:LEU:HB3	11:D:213:VAL:HG21	1.81	0.63
11:D:248:ASP:OD2	11:D:250:ARG:NH1	2.30	0.63
4:3:707:GLN:O	4:3:709:GLN:NE2	2.32	0.63
4:3:899:THR:HG22	4:3:900:GLY:H	1.64	0.62
2:1:1137:ARG:HH12	3:2:524:LEU:H	1.47	0.62
4:3:864:SER:HB3	4:3:882:LEU:HD12	1.82	0.62
10:C:501:LEU:C	14:G:224:LYS:N	2.52	0.62
2:1:1142:ASN:ND2	11:D:247:LEU:O	2.32	0.62
11:D:138:SER:HB3	11:D:212:HIS:HB3	1.81	0.62
4:3:798:ILE:HD13	4:3:893:VAL:HG21	1.81	0.62
4:3:958:ARG:NH2	4:3:1014:TYR:OH	2.33	0.62
4:3:614:VAL:HG23	4:3:633:LEU:HD21	1.82	0.62
6:5:51:ASN:OD1	6:5:61:LYS:NZ	2.30	0.62
2:1:850:ILE:O	2:1:854:VAL:HB	1.99	0.61
11:D:165:THR:OG1	11:D:166:GLU:N	2.32	0.61
2:1:900:PHE:HE1	2:1:954:LEU:HD22	1.65	0.60
4:3:93:GLN:NE2	4:3:100:GLU:OE1	2.35	0.60
4:3:412:ILE:HG12	4:3:423:LEU:HG	1.83	0.60
12:E:177:LYS:HB2	12:E:177:LYS:HZ3	1.67	0.60
1:H:36:G:N1	11:D:250:ARG:HD2	2.15	0.60
4:3:343:LYS:O	4:3:344:THR:OG1	2.18	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:56:A:C5	3:2:504:TRP:CZ3	2.89	0.60
10:C:467:ALA:HA	10:C:470:ARG:HD2	1.84	0.59
22:1:1500:9B0:C39	7:6:38:ARG:CD	2.75	0.59
11:D:206:ILE:HD12	11:D:209:TYR:H	1.68	0.59
1:H:54:U:H2'	1:H:55:U:C6	2.38	0.59
10:C:501:LEU:CA	14:G:224:LYS:O	2.51	0.59
4:3:718:ARG:NH1	4:3:734:LEU:O	2.35	0.59
4:3:294:LYS:HD2	4:3:299:PHE:HB3	1.84	0.58
1:H:20:G:H2'	1:H:21:C:C6	2.38	0.58
2:1:553:VAL:HG22	2:1:596:ILE:HD11	1.85	0.58
4:3:1183:ASN:OD1	4:3:1205:SER:OG	2.22	0.58
1:H:22:U:O2	10:C:395:TRP:CH2	2.56	0.58
1:H:45:C:C2	10:C:395:TRP:HD1	2.20	0.58
1:H:56:A:C5	3:2:504:TRP:HZ3	2.22	0.57
1:H:43:U:H2'	1:H:44:U:C6	2.39	0.57
12:E:207:GLU:OE1	12:E:207:GLU:HA	2.03	0.57
2:1:976:VAL:O	2:1:980:GLU:HG2	2.05	0.57
2:1:1287:ILE:HD13	6:5:32:LEU:HD21	1.85	0.57
4:3:118:GLY:HA2	4:3:132:ILE:HD11	1.87	0.57
4:3:755:VAL:HG13	4:3:764:ILE:HG12	1.87	0.57
4:3:786:ARG:NH1	4:3:802:THR:O	2.38	0.57
4:3:1001:ILE:HG13	4:3:1038:LEU:HD11	1.86	0.57
2:1:823:MET:HG2	2:1:833:LEU:HD22	1.87	0.56
2:1:490:GLU:HB3	2:1:493:LYS:HB2	1.86	0.56
4:3:555:VAL:HG23	4:3:592:LEU:HD11	1.87	0.56
4:3:1008:SER:HB3	4:3:1031:ARG:HB2	1.87	0.56
4:3:675:LEU:HD13	4:3:688:ASP:HB3	1.86	0.56
2:1:1137:ARG:NH1	3:2:522:PHE:O	2.38	0.56
2:1:1000:ILE:O	2:1:1004:ILE:HG22	2.06	0.56
11:D:206:ILE:HD11	11:D:209:TYR:HB2	1.88	0.56
7:6:58:CYS:HB3	7:6:62:GLY:H	1.71	0.56
4:3:507:SER:HB3	4:3:519:VAL:HB	1.88	0.55
4:3:856:LYS:NZ	6:5:58:ASN:O	2.36	0.55
2:1:945:ALA:HB2	2:1:948:ARG:HH11	1.71	0.55
4:3:120:PHE:HB2	4:3:133:SER:HB3	1.87	0.55
7:6:27:ASP:OD1	7:6:67:SER:OG	2.20	0.55
1:H:45:C:H5"	1:H:46:U:H5'	1.89	0.55
12:E:241:LYS:HE3	12:E:241:LYS:CA	2.37	0.55
2:1:494:GLU:HA	2:1:497:ILE:HG22	1.89	0.55
2:1:614:ARG:NH2	12:E:228:LEU:HD13	2.21	0.55
2:1:914:PHE:HZ	2:1:932:ILE:HG12	1.70	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:1118:VAL:HG22	4:3:1128:ILE:HG22	1.89	0.55
1:H:42:G:C6	1:H:43:U:C6	2.94	0.54
2:1:954:LEU:O	2:1:958:THR:OG1	2.23	0.54
2:1:1157:TYR:CE1	22:1:1500:9B0:C30	2.91	0.54
10:C:406:TYR:O	10:C:416:TYR:N	2.36	0.54
2:1:1299:GLU:OE2	6:5:71:LYS:NZ	2.39	0.54
4:3:436:ARG:HH11	4:3:776:GLN:HE22	1.55	0.54
4:3:804:HIS:NE2	4:3:859:ASN:O	2.39	0.54
4:3:407:ILE:HG23	4:3:425:VAL:HG13	1.90	0.54
4:3:804:HIS:O	6:5:58:ASN:ND2	2.32	0.54
2:1:658:TRP:CH2	2:1:700:LYS:HE2	2.43	0.54
2:1:963:LYS:HG2	2:1:1003:VAL:HG13	1.89	0.54
2:1:991:GLY:HA3	2:1:1030:LYS:HG2	1.90	0.54
2:1:608:THR:O	2:1:612:THR:HG23	2.09	0.53
2:1:1256:HIS:HD2	2:1:1258:ALA:H	1.55	0.53
1:H:24:A:C6	10:C:396:LEU:HD13	2.44	0.53
4:3:612:ASN:O	4:3:633:LEU:N	2.42	0.53
2:1:1137:ARG:HH12	3:2:524:LEU:N	2.05	0.53
4:3:1159:ASP:HB3	4:3:1162:SER:HB3	1.91	0.53
1:H:151:C:H2'	1:H:152:G:H8	1.74	0.52
2:1:701:VAL:O	2:1:705:SER:OG	2.24	0.52
4:3:476:VAL:HG13	4:3:483:LEU:HG	1.92	0.52
2:1:568:ARG:NH1	12:E:242:PHE:CE1	2.78	0.52
2:1:578:ILE:HD13	2:1:596:ILE:HG21	1.91	0.52
4:3:534:ASN:OD1	4:3:534:ASN:N	2.43	0.52
1:H:46:U:O5'	1:H:47:U:H4'	2.10	0.52
22:1:1500:9B0:C7	22:1:1500:9B0:C29	2.87	0.52
2:1:830:TYR:O	2:1:834:VAL:HG23	2.09	0.52
4:3:463:ARG:HA	4:3:472:ALA:N	2.24	0.52
4:3:506:LEU:HD23	4:3:545:VAL:O	2.10	0.52
2:1:960:VAL:HA	2:1:1003:VAL:HG21	1.92	0.52
4:3:947:GLU:HG2	4:3:964:GLY:HA3	1.91	0.51
1:H:120:A:N1	1:H:137:U:O4	2.43	0.51
2:1:732:TRP:HA	2:1:735:ILE:HG12	1.93	0.51
4:3:797:LEU:HG	4:3:871:PRO:HG3	1.93	0.51
1:H:27:U:H2'	1:H:28:C:C6	2.46	0.51
1:H:42:G:C6	1:H:43:U:C5	2.99	0.51
2:1:763:ASN:HB2	2:1:800:GLY:O	2.11	0.51
4:3:462:VAL:HG23	4:3:510:LEU:HB2	1.92	0.51
10:C:398:LYS:HG2	10:C:403:ASN:HD21	1.66	0.51
2:1:556:ILE:O	2:1:560:LEU:HB2	2.11	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:1:729:LYS:HB3	2:1:730:PRO:HD3	1.93	0.51
4:3:128:ARG:NH2	4:3:178:GLU:O	2.43	0.51
22:1:1500:9B0:C10	22:1:1500:9B0:C5	2.88	0.50
4:3:528:ARG:HH22	4:3:573:GLN:NE2	2.08	0.50
4:3:1133:THR:HG21	4:3:1214:ARG:HH22	1.75	0.50
1:H:36:G:N1	11:D:250:ARG:CD	2.73	0.50
1:H:56:A:N7	3:2:504:TRP:HZ3	2.09	0.50
2:1:851:SER:HA	2:1:854:VAL:HG12	1.92	0.50
2:1:1036:ILE:HD11	2:1:1065:LEU:HD13	1.94	0.50
4:3:747:SER:H	4:3:751:PRO:HA	1.76	0.50
2:1:494:GLU:O	2:1:498:MET:HG3	2.12	0.50
1:H:60:U:H2'	1:H:61:C:C6	2.47	0.50
4:3:236:ILE:HB	4:3:249:LEU:HB2	1.93	0.50
4:3:478:PHE:N	4:3:481:ALA:O	2.42	0.50
1:H:36:G:H1	11:D:250:ARG:HD3	1.77	0.50
2:1:495:ARG:HD2	2:1:534:GLN:NE2	2.27	0.50
2:1:1187:THR:O	2:1:1191:VAL:HG23	2.12	0.50
4:3:739:LEU:HD13	4:3:756:ALA:HB1	1.93	0.50
4:3:663:LEU:HB3	4:3:679:LEU:HB3	1.94	0.50
10:C:438:LEU:HD21	10:C:452:ILE:HG23	1.94	0.50
1:H:22:U:O2	10:C:393:PRO:HB3	2.12	0.49
4:3:34:ARG:NH1	4:3:39:GLU:OE1	2.45	0.49
12:E:177:LYS:NZ	12:E:177:LYS:CB	2.74	0.49
4:3:274:ARG:HD2	4:3:389:PRO:HG3	1.94	0.49
2:1:495:ARG:HD2	2:1:534:GLN:HE21	1.77	0.49
11:D:241:SER:O	11:D:245:LYS:HG3	2.13	0.49
2:1:1125:PRO:HG2	2:1:1165:TYR:CE2	2.48	0.49
4:3:463:ARG:H	4:3:463:ARG:HD2	1.78	0.49
4:3:565:TYR:HD2	4:3:577:TYR:HB2	1.77	0.49
2:1:575:LEU:O	2:1:579:GLU:N	2.46	0.49
2:1:821:HIS:O	2:1:825:LEU:HD23	2.12	0.49
6:5:29:TRP:O	6:5:33:VAL:HG13	2.12	0.49
10:C:501:LEU:CB	14:G:224:LYS:N	2.76	0.49
11:D:136:TYR:HB2	11:D:216:ALA:HA	1.93	0.49
4:3:353:PHE:HB3	4:3:406:PRO:HD3	1.94	0.49
4:3:604:PHE:HB3	4:3:616:ILE:HD11	1.95	0.49
12:E:241:LYS:HA	12:E:241:LYS:CE	2.42	0.49
1:H:42:G:H2'	1:H:43:U:O4'	2.12	0.49
2:1:932:ILE:O	2:1:936:VAL:HG22	2.13	0.49
3:2:473:ASP:N	3:2:473:ASP:OD1	2.46	0.49
4:3:539:PRO:O	4:3:542:LYS:HE2	2.13	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:E:166:ARG:NH1	12:E:166:ARG:CB	2.75	0.49
1:H:24:A:C5	10:C:396:LEU:HD13	2.48	0.49
3:2:569:GLN:HA	3:2:572:HIS:HB3	1.95	0.49
12:E:161:ARG:HD2	12:E:165:GLU:OE2	2.13	0.49
4:3:742:ALA:HA	4:3:755:VAL:O	2.13	0.48
10:C:411:CYS:SG	10:C:430:ARG:HD3	2.53	0.48
12:E:177:LYS:HB2	12:E:177:LYS:HZ2	1.78	0.48
1:H:46:U:H3	10:C:398:LYS:HE2	1.79	0.48
10:C:501:LEU:C	14:G:224:LYS:CA	2.81	0.48
1:H:54:U:H2'	1:H:55:U:H6	1.78	0.48
10:C:396:LEU:O	10:C:396:LEU:HG	2.11	0.48
4:3:96:LYS:HB3	4:3:98:MET:HG2	1.94	0.48
4:3:318:ASP:N	4:3:321:MET:O	2.43	0.48
4:3:589:CYS:SG	4:3:637:PRO:HB2	2.54	0.48
2:1:551:LEU:O	2:1:555:VAL:HG23	2.13	0.48
2:1:1005:GLY:HA2	2:1:1045:ARG:NH1	2.28	0.48
12:E:241:LYS:HE3	12:E:241:LYS:O	2.12	0.48
4:3:35:GLY:HA3	6:5:47:PHE:CZ	2.49	0.48
2:1:509:PRO:HA	2:1:512:ARG:HB2	1.96	0.48
2:1:959:ALA:HA	2:1:962:MET:HB2	1.96	0.48
2:1:1106:ARG:HD2	2:1:1106:ARG:HA	1.74	0.48
4:3:546:LYS:HD2	4:3:587:VAL:O	2.14	0.48
11:D:238:LYS:O	11:D:242:MET:HG2	2.14	0.47
4:3:473:TYR:HA	4:3:485:LEU:O	2.13	0.47
4:3:532:ARG:HD3	4:3:533:VAL:H	1.79	0.47
4:3:699:VAL:HA	4:3:715:MET:O	2.14	0.47
3:2:467:GLN:HA	10:C:461:LYS:HE2	1.96	0.47
4:3:671:ASN:HB2	4:3:673:VAL:HG22	1.96	0.47
1:H:120:A:N1	1:H:137:U:C4	2.82	0.47
3:2:495:ARG:HG2	4:3:1083:ASN:O	2.14	0.47
1:H:124:G:H2'	1:H:125:G:C8	2.49	0.47
2:1:925:VAL:CG2	2:1:928:TYR:HB2	2.44	0.47
2:1:1174:GLU:CD	2:1:1210:HIS:HE2	2.17	0.47
2:1:1180:ARG:HH22	3:2:513:GLY:HA2	1.79	0.47
4:3:520:TYR:HE1	4:3:525:ARG:HG2	1.80	0.47
11:D:239:LYS:HA	11:D:242:MET:HG2	1.95	0.47
2:1:914:PHE:CZ	2:1:932:ILE:HG12	2.49	0.47
2:1:1118:ILE:O	2:1:1122:THR:HG23	2.14	0.47
2:1:661:ARG:NH1	2:1:696:ASP:OD2	2.47	0.47
4:3:404:LEU:HD21	4:3:438:LEU:HD11	1.97	0.47
4:3:475:ILE:HG23	4:3:484:VAL:HB	1.97	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:D:136:TYR:HB3	11:D:214:GLU:HG3	1.97	0.47
10:C:394:TYR:O	10:C:397:TYR:HB3	2.14	0.47
22:1:1500:9B0:C18	22:1:1500:9B0:C23	2.92	0.47
4:3:317:THR:HG22	4:3:318:ASP:O	2.14	0.47
4:3:996:ILE:O	4:3:998:HIS:N	2.47	0.47
7:6:54:TYR:HB3	7:6:57:ARG:HH11	1.80	0.47
1:H:47:U:H3'	1:H:48:A:C5'	2.43	0.47
2:1:746:PHE:O	2:1:750:ILE:HG12	2.15	0.47
3:2:467:GLN:NE2	10:C:457:SER:OG	2.49	0.46
4:3:187:MET:CE	6:5:73:LEU:HD22	2.44	0.46
4:3:451:GLU:HG2	4:3:761:THR:HA	1.97	0.46
4:3:877:LEU:HD23	4:3:935:GLU:HG2	1.96	0.46
4:3:343:LYS:HB3	4:3:343:LYS:HE3	1.66	0.46
4:3:1082:LEU:HD12	4:3:1088:LYS:HE3	1.96	0.46
2:1:492:GLN:OE1	2:1:496:LYS:HD3	2.15	0.46
2:1:505:LYS:NZ	2:1:548:GLU:OE1	2.48	0.46
2:1:945:ALA:HB1	2:1:989:VAL:HG11	1.96	0.46
11:D:147:ASP:HA	11:D:150:ILE:HG13	1.97	0.46
2:1:580:PRO:O	2:1:581:LEU:HB2	2.15	0.46
2:1:850:ILE:HD13	2:1:872:ILE:HG12	1.97	0.46
22:1:1500:9B0:C23	22:1:1500:9B0:C17	2.93	0.46
1:H:30:A:H61	1:H:40:C:H42	1.64	0.46
1:H:36:G:H1	11:D:250:ARG:CD	2.28	0.46
4:3:947:GLU:HG3	4:3:948:VAL:H	1.80	0.46
2:1:830:TYR:OH	2:1:870:GLU:OE1	2.33	0.46
4:3:702:PHE:HE2	4:3:715:MET:HE2	1.80	0.46
4:3:501:GLY:HA2	4:3:525:ARG:HH22	1.80	0.46
7:6:25:LYS:HB3	7:6:25:LYS:HE2	1.84	0.46
1:H:53:U:H2'	1:H:54:U:O4'	2.16	0.46
2:1:1256:HIS:CD2	2:1:1258:ALA:H	2.33	0.46
10:C:393:PRO:HA	10:C:395:TRP:CE2	2.51	0.46
4:3:521:PRO:O	4:3:543:THR:HG23	2.16	0.46
4:3:705:ARG:NH1	4:3:710:GLU:OE1	2.49	0.46
2:1:535:ILE:HG21	2:1:556:ILE:HD11	1.97	0.46
10:C:466:LYS:O	10:C:470:ARG:HG3	2.16	0.46
4:3:230:GLU:OE1	4:3:268:ARG:NH2	2.49	0.45
4:3:330:PHE:O	4:3:390:ARG:NH2	2.49	0.45
4:3:444:VAL:HG11	4:3:736:TYR:HB2	1.98	0.45
4:3:573:GLN:CD	4:3:574:LEU:H	2.20	0.45
12:E:177:LYS:HZ3	12:E:177:LYS:CB	2.28	0.45
1:H:43:U:H2'	1:H:44:U:H6	1.81	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:C:425:HIS:HA	10:C:428:GLU:HG2	1.97	0.45
4:3:463:ARG:NH1	4:3:468:ASP:O	2.49	0.45
1:H:120:A:C6	1:H:137:U:O4	2.69	0.45
2:1:722:GLU:H	2:1:722:GLU:CD	2.19	0.45
4:3:88:VAL:HG12	4:3:104:GLN:HG2	1.98	0.45
7:6:46:CYS:SG	7:6:48:GLU:HG3	2.57	0.45
2:1:822:ARG:H	2:1:822:ARG:HD2	1.82	0.45
2:1:912:ASN:O	2:1:916:THR:HG23	2.16	0.45
2:1:500:LEU:O	2:1:503:LYS:HB3	2.16	0.45
12:E:203:ASP:OD1	12:E:203:ASP:N	2.49	0.45
2:1:668:VAL:HG13	2:1:686:LEU:HD22	1.98	0.45
2:1:696:ASP:OD1	2:1:697:GLU:N	2.50	0.45
2:1:849:ILE:O	2:1:853:ILE:HG12	2.17	0.45
3:2:681:PRO:HB2	3:2:682:LEU:H	1.64	0.45
4:3:294:LYS:HE3	4:3:295:THR:O	2.17	0.45
1:H:166:G:N2	1:H:166:G:OP2	2.50	0.45
2:1:519:ILE:HA	2:1:522:LYS:HB2	1.99	0.45
2:1:522:LYS:HB3	2:1:526:PHE:CE2	2.52	0.45
4:3:1027:ASP:OD2	4:3:1031:ARG:NH1	2.50	0.44
4:3:13:GLY:O	4:3:34:ARG:HG3	2.16	0.44
4:3:200:ALA:O	4:3:204:THR:OG1	2.35	0.44
2:1:766:THR:O	2:1:770:MET:HB2	2.17	0.44
2:1:943:LYS:HB2	2:1:943:LYS:HE2	1.68	0.44
3:2:707:PRO:HA	4:3:1040:ASP:OD2	2.17	0.44
4:3:80:VAL:HB	4:3:88:VAL:HG23	1.98	0.44
10:C:411:CYS:O	10:C:414:TYR:N	2.33	0.44
2:1:812:PRO:HB2	2:1:813:PRO:HD3	2.00	0.44
4:3:449:VAL:HG22	4:3:763:ARG:HG2	1.99	0.44
2:1:503:LYS:HE3	2:1:511:MET:HB2	1.99	0.44
2:1:504:ILE:HD13	2:1:516:LEU:HG	1.98	0.44
11:D:156:PHE:CE2	11:D:201:LEU:HG	2.53	0.44
4:3:1114:SER:HB2	4:3:1215:TYR:CE1	2.53	0.44
6:5:49:LEU:HD12	6:5:49:LEU:HA	1.87	0.44
1:H:25:G:O4'	10:C:399:LEU:HD21	2.16	0.44
3:2:583:LYS:HD2	3:2:583:LYS:HA	1.79	0.44
3:2:592:TYR:CE1	3:2:595:LYS:HD2	2.53	0.44
4:3:552:ARG:HG3	4:3:595:VAL:HG11	2.00	0.44
1:H:26:A:H2'	1:H:27:U:O4'	2.17	0.44
2:1:531:LEU:O	2:1:535:ILE:HG13	2.17	0.44
2:1:614:ARG:N	2:1:615:PRO:HD2	2.33	0.44
2:1:767:ARG:O	2:1:771:LEU:HD23	2.18	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:1:1182:LEU:HD22	2:1:1226:VAL:HG21	2.00	0.44
4:3:899:THR:HG22	4:3:900:GLY:N	2.32	0.44
2:1:553:VAL:HG21	2:1:592:GLU:HG2	2.00	0.43
2:1:714:GLU:O	2:1:717:THR:HG22	2.18	0.43
2:1:945:ALA:HB2	2:1:948:ARG:NH1	2.33	0.43
2:1:982:LEU:HD23	2:1:982:LEU:HA	1.86	0.43
4:3:464:ARG:N	4:3:472:ALA:HB2	2.33	0.43
4:3:534:ASN:HD21	4:3:573:GLN:NE2	2.16	0.43
4:3:716:SER:OG	4:3:717:SER:N	2.51	0.43
4:3:1116:SER:HB3	4:3:1130:VAL:HG12	1.99	0.43
2:1:758:ASP:O	2:1:762:ALA:CB	2.66	0.43
2:1:848:GLU:H	2:1:848:GLU:CD	2.21	0.43
2:1:900:PHE:CE1	2:1:954:LEU:CD2	2.99	0.43
3:2:592:TYR:CZ	3:2:595:LYS:HB3	2.53	0.43
4:3:125:PRO:HG2	4:3:174:ASP:HA	1.99	0.43
1:H:25:G:C2	10:C:395:TRP:HB2	2.53	0.43
1:H:46:U:H3'	1:H:47:U:O3'	2.18	0.43
1:H:151:C:H2'	1:H:152:G:C8	2.53	0.43
2:1:573:LYS:O	2:1:576:VAL:HG12	2.18	0.43
2:1:1193:GLN:HB2	2:1:1233:ALA:HA	1.99	0.43
12:E:166:ARG:CB	12:E:166:ARG:CZ	2.96	0.43
1:H:144:C:H2'	1:H:145:A:H2'	2.00	0.43
2:1:549:ARG:NE	2:1:592:GLU:OE1	2.51	0.43
2:1:684:ARG:O	2:1:688:GLU:HG3	2.18	0.43
4:3:625:LEU:HD12	4:3:625:LEU:O	2.18	0.43
4:3:588:VAL:HG23	4:3:589:CYS:SG	2.59	0.43
4:3:706:MET:HG3	4:3:721:LEU:HD11	2.00	0.43
4:3:875:ASN:OD1	4:3:875:ASN:N	2.51	0.43
1:H:35:A:N6	11:D:250:ARG:HE	2.17	0.43
2:1:1248:GLN:O	3:2:497:SER:HA	2.18	0.43
4:3:704:VAL:HG21	4:3:713:LEU:HB2	2.01	0.43
2:1:1056:MET:HB3	2:1:1056:MET:HE2	1.84	0.43
4:3:83:ASP:O	4:3:111:GLY:N	2.48	0.43
2:1:1021:THR:HG23	2:1:1022:PRO:HD3	2.01	0.43
6:5:53:PHE:O	6:5:57:GLU:HG2	2.19	0.43
10:C:77:GLY:HA3	10:C:78:PRO:HD3	1.84	0.43
10:C:501:LEU:CB	14:G:224:LYS:H	2.31	0.43
1:H:49:U:H2'	1:H:50:C:C6	2.54	0.43
2:1:587:TYR:O	2:1:591:VAL:HG23	2.19	0.43
2:1:864:TYR:O	2:1:868:VAL:HG23	2.19	0.43
2:1:926:LYS:O	2:1:929:LEU:HB2	2.19	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:1141:PHE:HE1	4:3:1208:LEU:HD23	1.84	0.42
2:1:998:LYS:O	2:1:1002:ASN:HB2	2.19	0.42
4:3:635:ALA:HB3	4:3:669:LEU:HD13	2.01	0.42
4:3:773:VAL:HG13	4:3:774:PHE:CD2	2.54	0.42
4:3:866:ILE:HD13	4:3:907:VAL:HG21	2.00	0.42
4:3:1061:ASN:OD1	4:3:1061:ASN:N	2.52	0.42
1:H:13:C:H2'	1:H:14:C:C6	2.54	0.42
2:1:495:ARG:HA	2:1:498:MET:HG3	2.01	0.42
2:1:898:TYR:CZ	12:E:167:VAL:HG11	2.54	0.42
4:3:532:ARG:HE	4:3:532:ARG:HA	1.83	0.42
4:3:565:TYR:OH	4:3:601:ARG:NH1	2.53	0.42
2:1:735:ILE:HG22	2:1:746:PHE:HB3	2.02	0.42
2:1:1103:VAL:HG23	2:1:1103:VAL:O	2.18	0.42
4:3:49:LYS:HD3	4:3:49:LYS:HA	1.70	0.42
4:3:478:PHE:CE2	4:3:483:LEU:HD23	2.52	0.42
4:3:473:TYR:CZ	4:3:497:SER:HA	2.54	0.42
2:1:578:ILE:HG22	2:1:578:ILE:O	2.19	0.42
2:1:1021:THR:N	2:1:1022:PRO:HD2	2.34	0.42
2:1:1067:LYS:HG2	2:1:1111:CYS:SG	2.59	0.42
4:3:279:ASP:HA	4:3:857:ALA:HB2	2.01	0.42
12:E:153:GLN:OE1	12:E:153:GLN:HA	2.20	0.42
2:1:584:ASP:O	2:1:590:ARG:NH2	2.50	0.42
4:3:315:LEU:HD12	4:3:315:LEU:HA	1.92	0.42
4:3:515:ALA:HB1	4:3:526:HIS:NE2	2.34	0.42
4:3:807:TYR:HB2	4:3:812:LYS:HE3	2.00	0.42
10:C:393:PRO:C	10:C:395:TRP:N	2.72	0.42
4:3:700:LYS:HB3	4:3:702:PHE:CZ	2.54	0.42
11:D:172:LEU:HD23	11:D:172:LEU:HA	1.87	0.42
1:H:56:A:C6	3:2:504:TRP:CZ3	3.08	0.42
2:1:498:MET:C	2:1:500:LEU:N	2.74	0.41
2:1:700:LYS:CD	12:E:205:ASP:HB2	2.50	0.41
2:1:893:ILE:HG21	2:1:928:TYR:CG	2.55	0.41
4:3:1165:SER:OG	4:3:1170:VAL:HG23	2.20	0.41
11:D:245:LYS:HB3	11:D:245:LYS:HE2	1.66	0.41
2:1:664:GLY:O	2:1:668:VAL:HG23	2.20	0.41
7:6:29:LYS:HG3	7:6:36:TYR:CZ	2.55	0.41
4:3:511:LEU:HD11	4:3:568:MET:HG3	2.02	0.41
4:3:724:SER:HA	4:3:729:PHE:HA	2.02	0.41
12:E:155:LYS:N	12:E:155:LYS:HD2	2.35	0.41
4:3:473:TYR:HB3	4:3:484:VAL:HG23	2.02	0.41
4:3:594:ASN:H	4:3:594:ASN:ND2	2.18	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:616:ILE:O	4:3:617:ILE:HD13	2.20	0.41
4:3:702:PHE:CE2	4:3:741:PHE:HA	2.55	0.41
4:3:818:GLN:O	4:3:822:GLU:HG3	2.21	0.41
11:D:201:LEU:HD23	11:D:201:LEU:HA	1.91	0.41
2:1:840:LEU:O	2:1:844:VAL:HG12	2.21	0.41
4:3:703:ARG:NH1	4:3:703:ARG:HA	2.35	0.41
2:1:856:ASP:HB3	2:1:864:TYR:HE2	1.86	0.41
4:3:48:GLY:HA3	4:3:398:VAL:HG11	2.02	0.41
4:3:1128:ILE:HD13	4:3:1216:ALA:HB2	2.01	0.41
12:E:157:GLU:OE2	12:E:157:GLU:N	2.53	0.41
1:H:56:A:C2	3:2:478:HIS:ND1	2.89	0.41
2:1:865:ARG:NH2	2:1:902:GLU:HG2	2.36	0.41
2:1:893:ILE:O	2:1:896:ILE:HG13	2.21	0.41
3:2:459:ARG:NH1	3:2:481:THR:HG22	2.36	0.41
4:3:691:THR:HB	4:3:720:TRP:CH2	2.55	0.41
1:H:35:A:H61	11:D:250:ARG:HD2	1.86	0.41
2:1:926:LYS:HG2	2:1:927:PRO:CD	2.48	0.41
4:3:317:THR:HG22	4:3:318:ASP:N	2.35	0.41
4:3:1020:GLN:HB3	4:3:1022:ILE:HD11	2.03	0.41
2:1:560:LEU:HD12	2:1:560:LEU:HA	1.87	0.40
2:1:892:LEU:HD23	2:1:892:LEU:HA	1.93	0.40
2:1:1074:ARG:HE	22:1:1500:9B0:C1	2.33	0.40
4:3:749:GLN:H	4:3:749:GLN:HG3	1.71	0.40
4:3:515:ALA:HB1	4:3:526:HIS:CE1	2.56	0.40
4:3:569:ASP:O	4:3:571:SER:N	2.55	0.40
2:1:941:ASN:O	2:1:981:TYR:OH	2.36	0.40
2:1:1067:LYS:HD2	2:1:1107:GLN:NE2	2.36	0.40
3:2:496:ASN:O	3:2:497:SER:OG	2.40	0.40
4:3:463:ARG:HA	4:3:472:ALA:H	1.86	0.40
2:1:858:LYS:HD3	12:E:167:VAL:HG22	2.04	0.40
2:1:1074:ARG:NE	22:1:1500:9B0:O2	2.50	0.40
4:3:1095:TYR:HB2	4:3:1173:VAL:HG21	2.03	0.40
11:D:220:LEU:HD23	11:D:220:LEU:HA	1.90	0.40
2:1:1257:PRO:HG3	3:2:482:ALA:HB2	2.02	0.40
3:2:469:VAL:HG11	3:2:489:VAL:HG11	2.02	0.40
4:3:404:LEU:HD23	4:3:407:ILE:HD11	2.04	0.40
4:3:464:ARG:HG3	4:3:514:ASP:OD2	2.22	0.40
4:3:756:ALA:O	4:3:757:ILE:HD13	2.22	0.40
10:C:394:TYR:CE1	10:C:397:TYR:CD2	3.10	0.40
10:C:472:GLN:O	10:C:476:GLU:HB2	2.22	0.40
11:D:160:MET:HB3	11:D:187:CYS:SG	2.62	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	
2	1	813/1304 (62%)	782 (96%)	31 (4%)	0	100	100
3	2	172/895 (19%)	156 (91%)	15 (9%)	1 (1%)	25	43
4	3	1168/1217 (96%)	1121 (96%)	46 (4%)	1 (0%)	51	73
5	4	156/424 (37%)	153 (98%)	3 (2%)	0	100	100
6	5	64/86 (74%)	63 (98%)	1 (2%)	0	100	100
7	6	83/110 (76%)	79 (95%)	4 (5%)	0	100	100
8	A	121/793 (15%)	121 (100%)	0	0	100	100
9	B	96/464 (21%)	94 (98%)	2 (2%)	0	100	100
10	C	416/501 (83%)	398 (96%)	17 (4%)	1 (0%)	47	68
11	D	198/755 (26%)	182 (92%)	16 (8%)	0	100	100
12	E	447/1052 (42%)	431 (96%)	15 (3%)	1 (0%)	47	68
13	F	160/255 (63%)	160 (100%)	0	0	100	100
14	G	160/225 (71%)	158 (99%)	2 (1%)	0	100	100
15	a	86/118 (73%)	84 (98%)	2 (2%)	0	100	100
16	b	72/86 (84%)	71 (99%)	1 (1%)	0	100	100
17	c	77/92 (84%)	77 (100%)	0	0	100	100
18	d	72/76 (95%)	72 (100%)	0	0	100	100
19	e	81/126 (64%)	79 (98%)	2 (2%)	0	100	100
20	f	67/240 (28%)	67 (100%)	0	0	100	100
21	g	80/119 (67%)	79 (99%)	1 (1%)	0	100	100
All	All	4589/8938 (51%)	4427 (96%)	158 (3%)	4 (0%)	54	73

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	C	412	GLY
3	2	496	ASN
12	E	585	GLY
4	3	997	GLY

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	1	701/1104 (64%)	666 (95%)	35 (5%)	24 46
3	2	104/776 (13%)	98 (94%)	6 (6%)	20 38
4	3	1022/1051 (97%)	963 (94%)	59 (6%)	20 38
5	4	8/336 (2%)	8 (100%)	0	100 100
6	5	57/77 (74%)	56 (98%)	1 (2%)	59 81
7	6	73/95 (77%)	72 (99%)	1 (1%)	67 86
8	A	4/709 (1%)	4 (100%)	0	100 100
9	B	7/382 (2%)	7 (100%)	0	100 100
10	C	80/446 (18%)	69 (86%)	11 (14%)	3 6
11	D	108/661 (16%)	100 (93%)	8 (7%)	13 27
12	E	73/909 (8%)	66 (90%)	7 (10%)	8 16
13	F	6/218 (3%)	6 (100%)	0	100 100
14	G	7/195 (4%)	7 (100%)	0	100 100
15	a	4/110 (4%)	4 (100%)	0	100 100
16	b	4/74 (5%)	4 (100%)	0	100 100
17	c	1/84 (1%)	1 (100%)	0	100 100
18	d	3/66 (4%)	3 (100%)	0	100 100
19	e	3/101 (3%)	3 (100%)	0	100 100
20	f	3/177 (2%)	3 (100%)	0	100 100
21	g	3/101 (3%)	3 (100%)	0	100 100
All	All	2271/7672 (30%)	2143 (94%)	128 (6%)	25 40

All (128) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	1	518	GLN
2	1	546	ASP
2	1	562	LYS
2	1	565	ASP
2	1	576	VAL
2	1	585	GLU
2	1	614	ARG
2	1	637	SER
2	1	683	LEU
2	1	700	LYS
2	1	768	GLU
2	1	771	LEU
2	1	778	GLN
2	1	798	THR
2	1	823	MET
2	1	825	LEU
2	1	892	LEU
2	1	914	PHE
2	1	926	LYS
2	1	941	ASN
2	1	946	LYS
2	1	956	SER
2	1	963	LYS
2	1	967	GLU
2	1	1009	MET
2	1	1014	LYS
2	1	1017	LEU
2	1	1027	ARG
2	1	1053	ARG
2	1	1070	LYS
2	1	1105	GLU
2	1	1126	PHE
2	1	1209	ASN
2	1	1271	SER
2	1	1277	GLN
3	2	502	ARG
3	2	508	ARG
3	2	569	GLN
3	2	572	HIS
3	2	577	LYS
3	2	598	GLU
4	3	55	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	3	223	LYS
4	3	230	GLU
4	3	235	LEU
4	3	243	ASP
4	3	246	SER
4	3	298	MET
4	3	316	GLU
4	3	318	ASP
4	3	320	ASP
4	3	369	GLU
4	3	390	ARG
4	3	415	LEU
4	3	429	ARG
4	3	461	THR
4	3	463	ARG
4	3	468	ASP
4	3	480	ASN
4	3	497	SER
4	3	509	SER
4	3	513	ASP
4	3	531	LYS
4	3	546	LYS
4	3	549	VAL
4	3	558	LEU
4	3	573	GLN
4	3	577	TYR
4	3	589	CYS
4	3	590	MET
4	3	591	SER
4	3	629	SER
4	3	633	LEU
4	3	639	SER
4	3	641	CYS
4	3	643	VAL
4	3	645	MET
4	3	670	GLN
4	3	688	ASP
4	3	690	ARG
4	3	697	ARG
4	3	704	VAL
4	3	719	SER
4	3	725	TYR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	3	728	ARG
4	3	738	THR
4	3	809	GLU
4	3	845	GLU
4	3	864	SER
4	3	916	ASN
4	3	919	SER
4	3	959	VAL
4	3	1043	THR
4	3	1048	ASP
4	3	1061	ASN
4	3	1120	THR
4	3	1121	THR
4	3	1166	TYR
4	3	1207	LYS
4	3	1217	PHE
6	5	48	ASP
7	6	73	LYS
10	C	394	TYR
10	C	395	TRP
10	C	396	LEU
10	C	405	ASN
10	C	417	ARG
10	C	437	CYS
10	C	457	SER
10	C	468	SER
10	C	472	GLN
10	C	475	THR
10	C	477	GLU
11	D	162	ASP
11	D	168	PHE
11	D	187	CYS
11	D	201	LEU
11	D	207	ARG
11	D	217	LYS
11	D	237	LYS
11	D	239	LYS
12	E	157	GLU
12	E	203	ASP
12	E	207	GLU
12	E	225	LEU
12	E	228	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
12	E	229	ASP
12	E	241	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
2	1	506	ASN
2	1	534	GLN
2	1	737	GLN
2	1	903	GLN
2	1	941	ASN
2	1	1007	HIS
2	1	1032	GLN
2	1	1107	GLN
2	1	1144	GLN
2	1	1184	HIS
2	1	1194	HIS
2	1	1252	GLN
2	1	1256	HIS
2	1	1293	ASN
3	2	458	ASN
3	2	467	GLN
3	2	490	HIS
4	3	46	ASN
4	3	93	GLN
4	3	194	ASN
4	3	264	GLN
4	3	363	HIS
4	3	480	ASN
4	3	573	GLN
4	3	594	ASN
4	3	612	ASN
4	3	709	GLN
4	3	776	GLN
4	3	805	ASN
4	3	870	ASN
4	3	916	ASN
4	3	941	HIS
4	3	983	ASN
4	3	1017	ASN
4	3	1052	ASN
10	C	400	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
10	C	403	ASN
11	D	179	ASN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	H	143/188 (76%)	27 (18%)	0

All (27) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	H	22	U
1	H	23	A
1	H	24	A
1	H	43	U
1	H	47	U
1	H	48	A
1	H	101	U
1	H	102	U
1	H	103	U
1	H	111	G
1	H	116	A
1	H	117	U
1	H	121	A
1	H	122	U
1	H	123	A
1	H	124	G
1	H	128	C
1	H	129	U
1	H	130	U
1	H	131	G
1	H	136	G
1	H	138	C
1	H	146	C
1	H	147	G
1	H	157	G
1	H	164	C
1	H	177	A

There are no RNA pucker outliers to report.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
22	9B0	1	1500	-	52,54,54	0.73	1 (1%)	61,77,77	0.80	2 (3%)

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
22	9B0	1	1500	-	-	25/67/91/91	0/3/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
22	1	1500	9B0	C17-C16	-3.63	1.32	1.43

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
22	1	1500	9B0	C17-C16-C14	2.91	131.59	127.32
22	1	1500	9B0	O9-C26-C27	-2.47	104.86	109.35

There are no chirality outliers.

All (25) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
22	1	1500	9B0	O5-C29-N1-C33
22	1	1500	9B0	O5-C29-N1-C30
22	1	1500	9B0	N1-C29-O5-C8
22	1	1500	9B0	O5-C8-C9-C10
22	1	1500	9B0	C6-C8-C9-C10
22	1	1500	9B0	O3-C3-C4-C5
22	1	1500	9B0	C2-C3-C4-C5
22	1	1500	9B0	C1-C2-C3-C4
22	1	1500	9B0	C1-C2-C3-O3
22	1	1500	9B0	O8-C23-C24-C26
22	1	1500	9B0	C14-C16-C17-C18
22	1	1500	9B0	O6-C29-N1-C30
22	1	1500	9B0	O6-C29-N1-C33
22	1	1500	9B0	O6-C29-O5-C8
22	1	1500	9B0	C4-C5-C6-C7
22	1	1500	9B0	C4-C5-C6-C8
22	1	1500	9B0	C4-C5-C6-O4
22	1	1500	9B0	C9-C10-C11-C12
22	1	1500	9B0	C35-C34-N2-C31
22	1	1500	9B0	O8-C23-C24-C25
22	1	1500	9B0	C9-C8-O5-C29
22	1	1500	9B0	C6-C8-O5-C29
22	1	1500	9B0	C17-C18-C19-C20
22	1	1500	9B0	C17-C18-C19-O7
22	1	1500	9B0	C17-C18-C19-C21

There are no ring outliers.

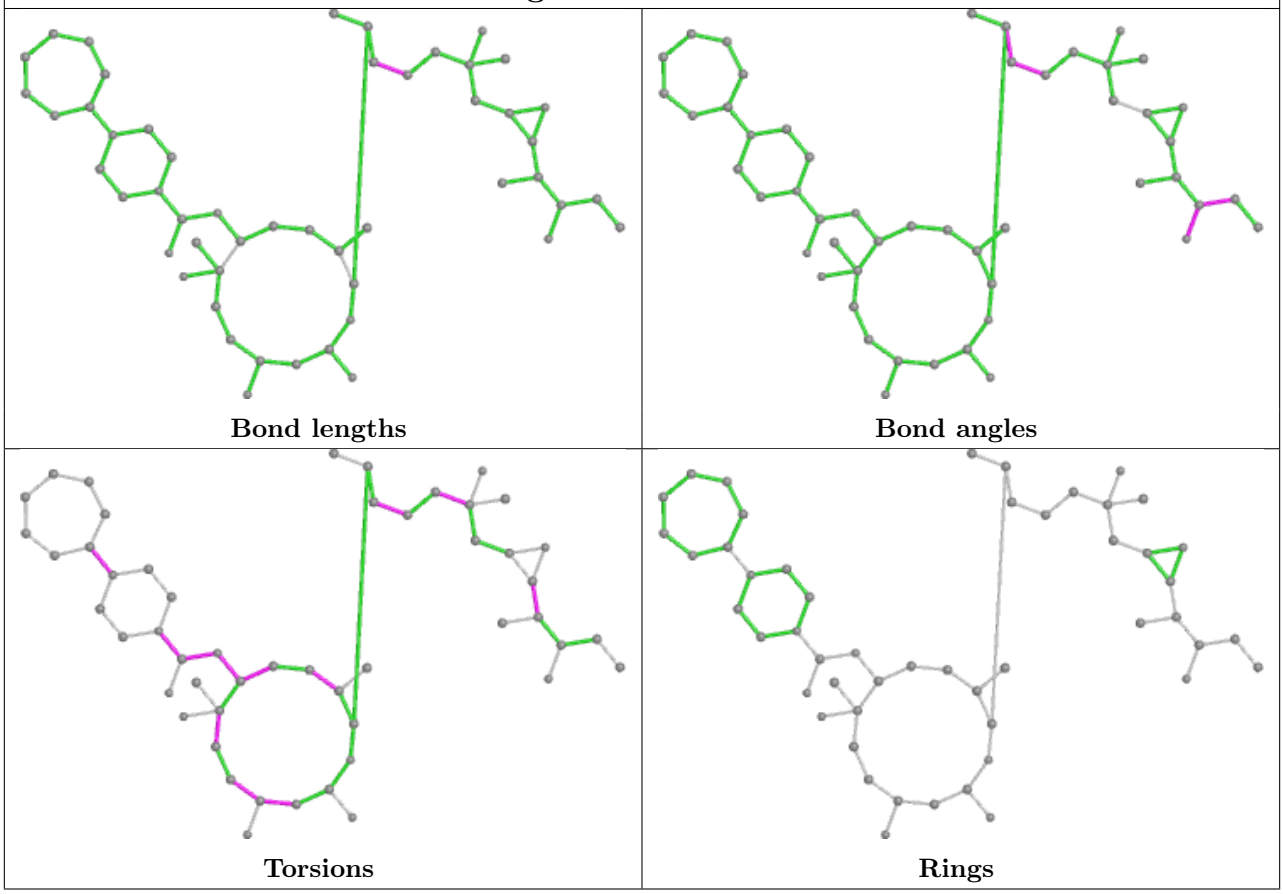
1 monomer is involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
22	1	1500	9B0	9	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand 9B0 1 1500



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

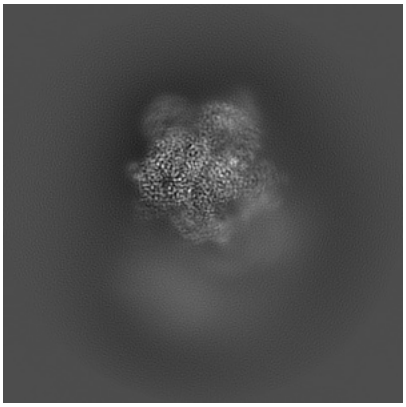
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-31334. These allow visual inspection of the internal detail of the map and identification of artifacts.

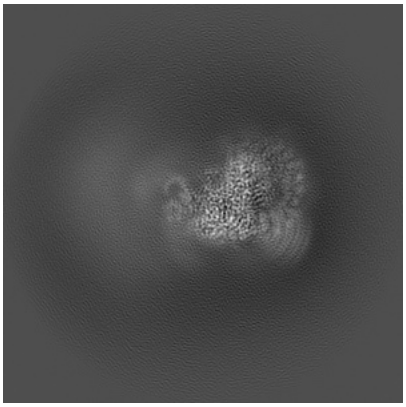
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

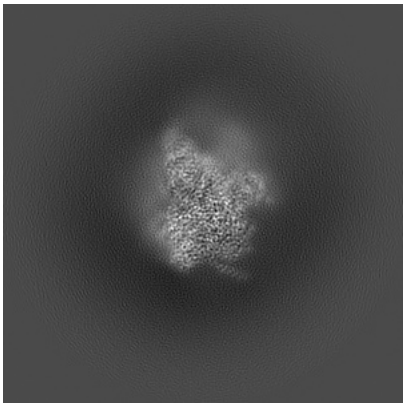
6.1.1 Primary map



X



Y

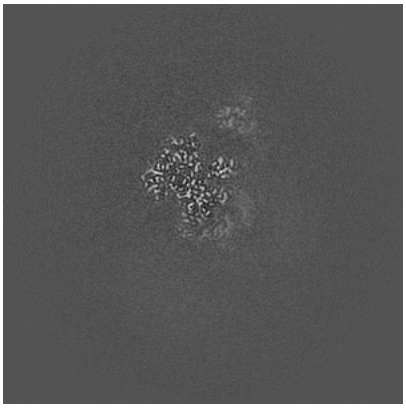


Z

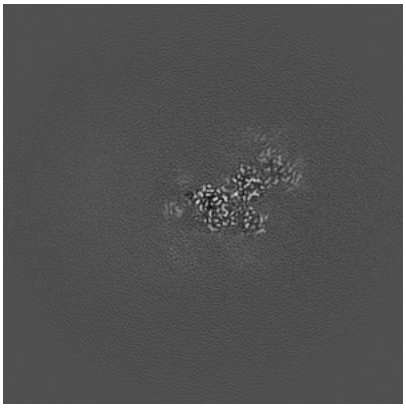
The images above show the map projected in three orthogonal directions.

6.2 Central slices

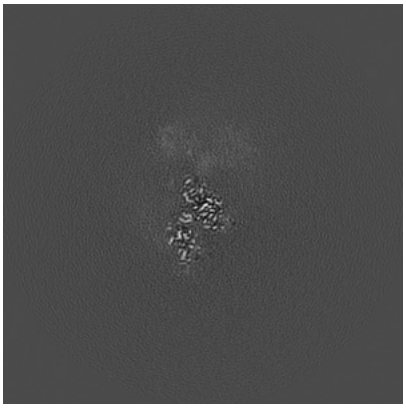
6.2.1 Primary map



X Index: 160



Y Index: 160

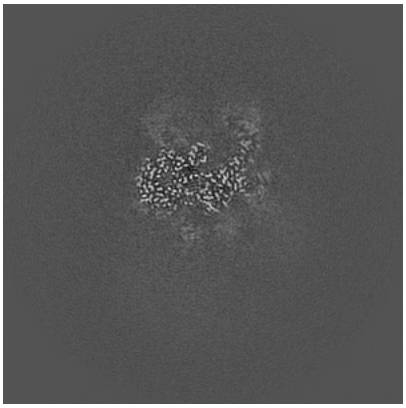


Z Index: 160

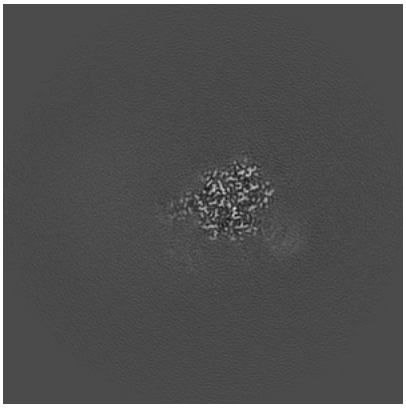
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

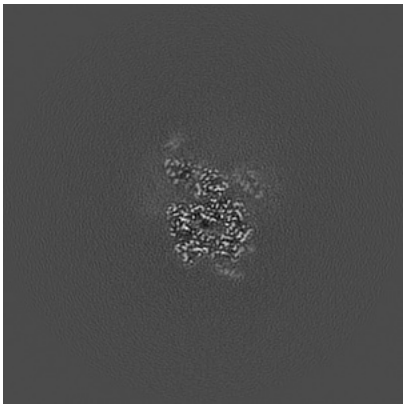
6.3.1 Primary map



X Index: 147



Y Index: 148

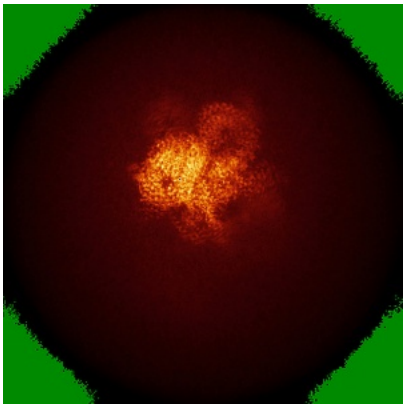


Z Index: 191

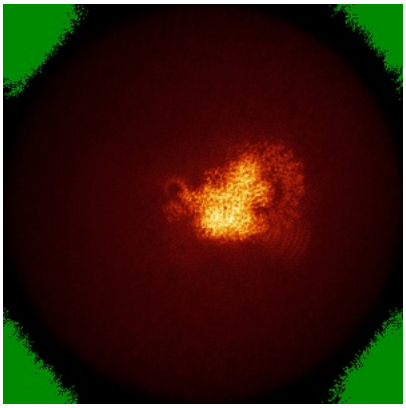
The images above show the largest variance slices of the map in three orthogonal directions.

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

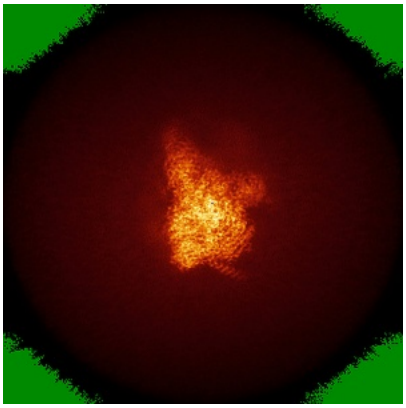
6.4.1 Primary map



X



Y



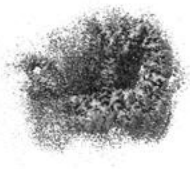
Z

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 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

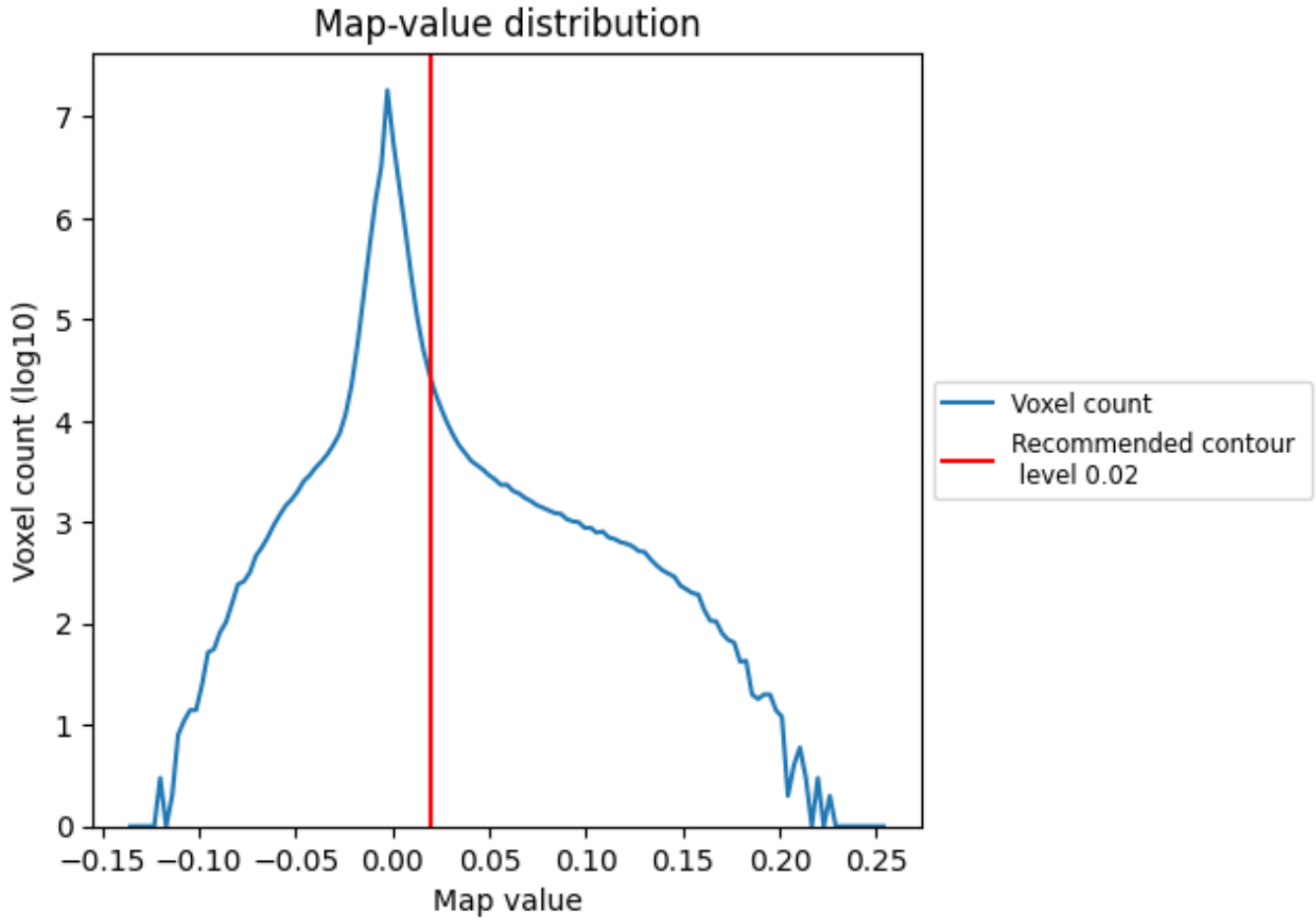
6.6 Mask visualisation (i)

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

7 Map analysis

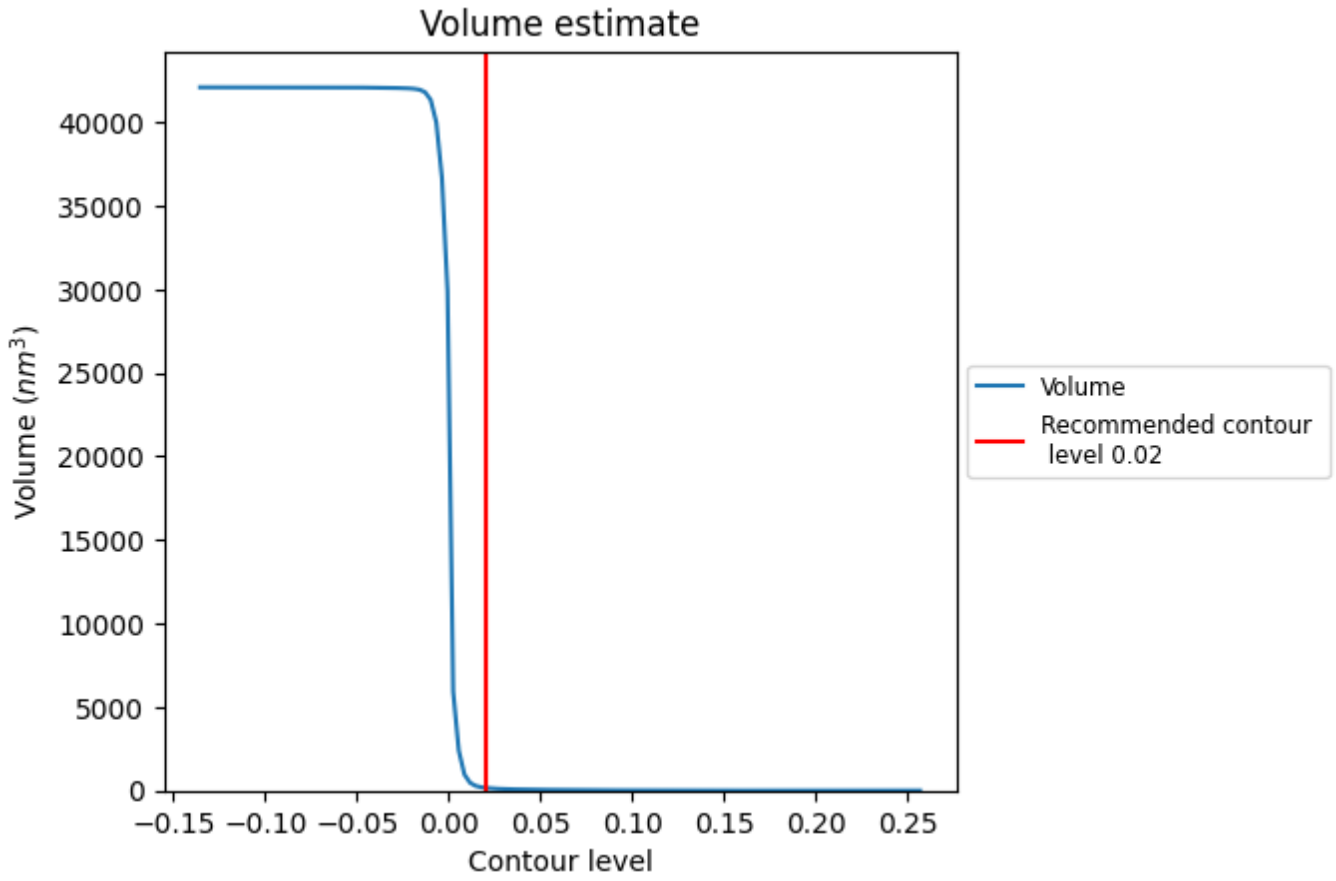
This section contains the results of statistical analysis of the map.

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.

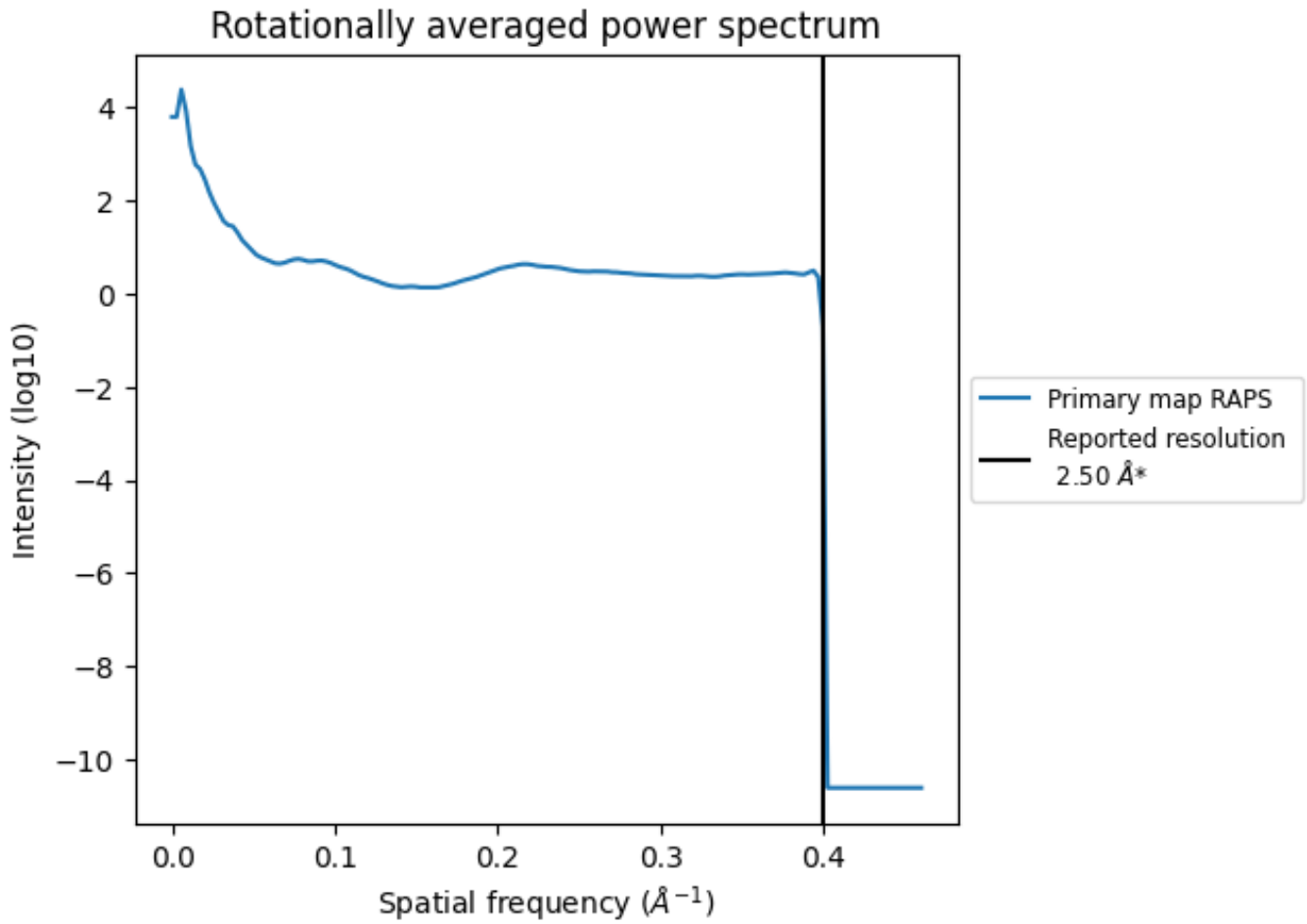
7.2 Volume estimate



The volume at the recommended contour level is 166 nm^3; this corresponds to an approximate mass of 150 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 0.400 Å^{-1}

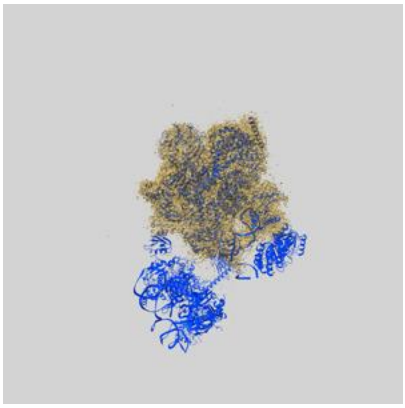
8 Fourier-Shell correlation

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

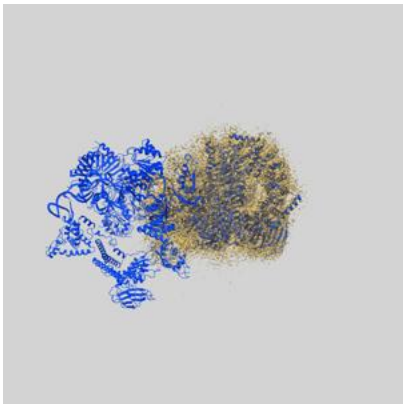
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-31334 and PDB model 7EVO. Per-residue inclusion information can be found in section 3 on page 9.

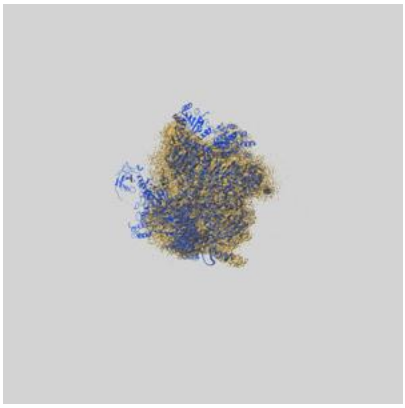
9.1 Map-model overlay



X



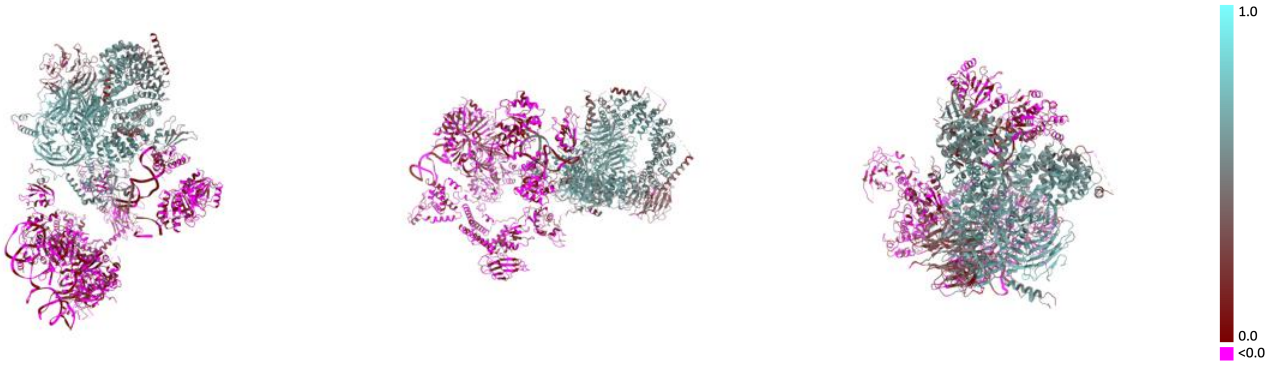
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

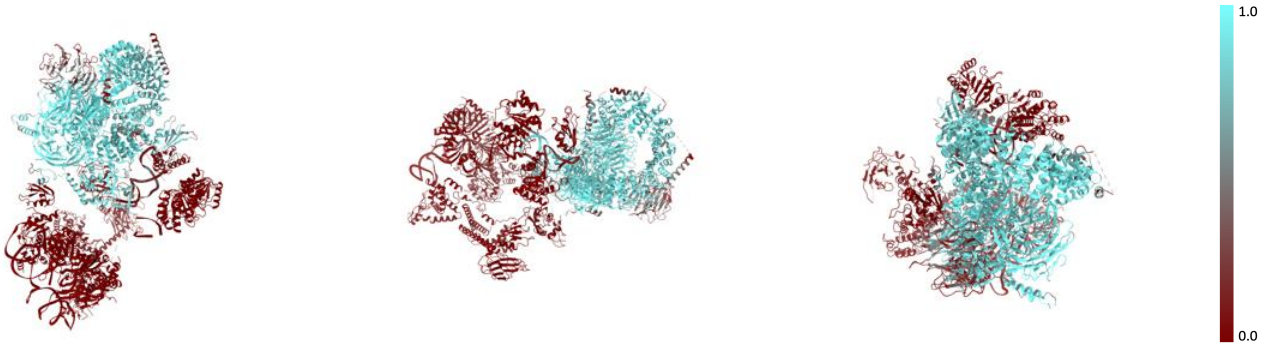
9.2 Q-score mapped to coordinate model



X Y Z

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

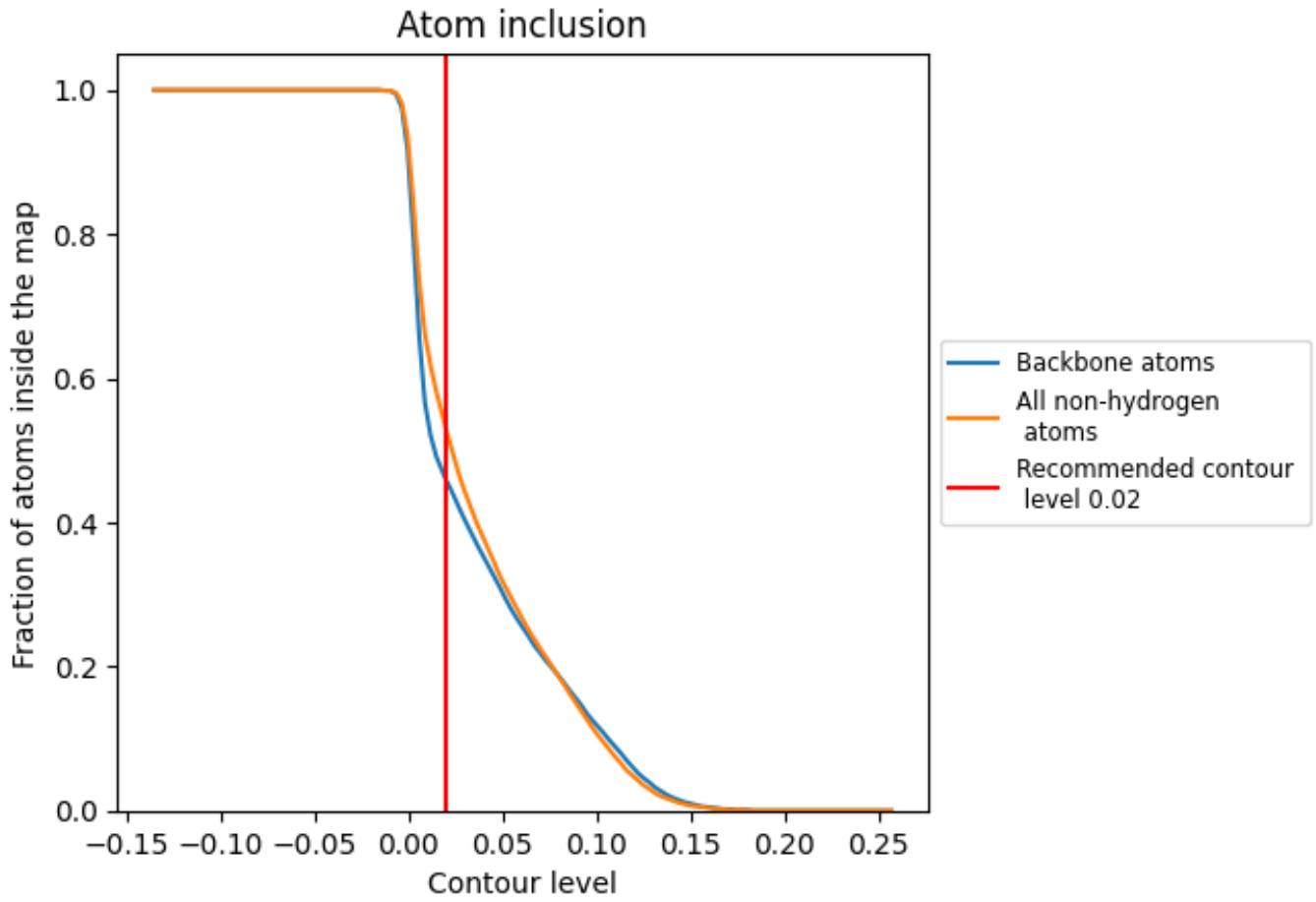
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.02).

9.4 Atom inclusion (i)



At the recommended contour level, 46% of all backbone atoms, 53% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5280	0.3670
1	0.8730	0.5840
2	0.6220	0.4210
3	0.8050	0.5730
4	0.0040	0.0160
5	0.9830	0.6830
6	0.9250	0.6450
A	0.0000	0.0030
B	0.0000	-0.0050
C	0.3010	0.2070
D	0.5410	0.3660
E	0.0920	0.0680
F	0.0000	0.0180
G	0.0000	-0.0010
H	0.1450	0.0740
a	0.0000	0.0310
b	0.0000	0.0080
c	0.0000	0.0310
d	0.0000	-0.0240
e	0.0000	0.0410
f	0.0000	0.0290
g	0.0000	0.0440