Full wwPDB EM Validation Report (i)

Mar 19, 2024 – 05:50 PM JST

PDB ID	:	6AH0
EMDB ID	:	EMD-9621
Title	:	The Cryo-EM Structure of the Precusor of Human Pre-catalytic Spliceosome (pre-B complex)
Authors	:	Zhan, X.; Yan, C.; Zhang, X.; Shi, Y.
Deposited on	:	2018-08-15
Resolution	:	5.70 Å(reported)

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

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

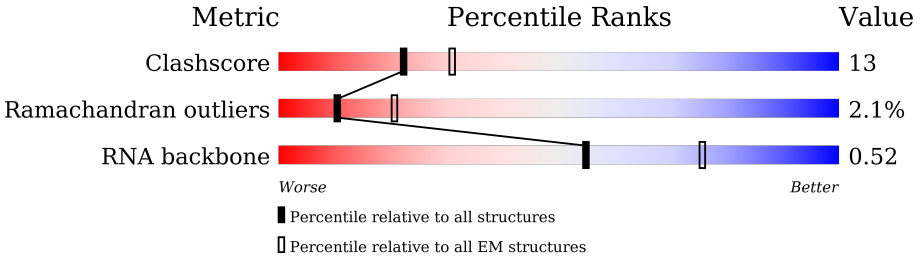
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 5.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
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	B	117	38% 44% 16%
2	D	2136	86% 12%
3	E	357	18% 81% 16%
4	P	118	61% 37%
4	a	118	66% 34%
4	k	118	72% 71% 28%
5	Q	86	6% 81% 17%
5	b	86	10% 85% 15%

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Mol	Chain	Length	Quality of chain
5	m	86	86% / 86% / 14%
6	R	92	7% / 85% / 15%
6	c	92	5% / 85% / 15%
6	l	92	86% / 86% / 14%
7	S	76	7% / 93%
7	d	76	9% / 91% / 9%
7	n	76	89% / 89% / 11%
8	T	126	5% / 56% / 44%
8	e	126	62% / 38%
8	h	126	63% / 63% / 37%
9	U	231	26% / 72%
9	f	231	28% / 72%
9	i	231	32% / 32% / 68%
10	V	119	64% / 5% / 31%
10	g	119	5% / 78% / 22%
10	j	119	69% / 69% / 31%
11	F	107	12% / 39% / 21% / 36%
12	q	95	95% / 91% / 5%
13	r	102	74% / 72% / 26%
14	s	139	53% / 53% / 47%
15	t	91	82% / 79% / 18%
16	x	80	88% / 86% / 12%
17	y	103	63% / 63% / 37%
18	z	96	64% / 63% / 36%
19	G	274	15% / 5% / 8% / 85%

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Mol	Chain	Length	Quality of chain
20	H	188	54% 20% 21% 15% 42%
21	o	255	64% 63% 36%
22	p	225	42% 42% 58%
23	u	793	16% 15% 84%
24	v	464	21% 19% 79%
25	w	501	88% 87% 12%
26	1	1304	77% 56% 22% 21%
27	2	895	20% 19% 79%
28	3	1217	96% 87% 10%
29	4	424	18% 17% 82%
30	5	125	86% 75% 11% 14%
31	6	110	81% 72% 8% 19%
32	7	86	77% 59% 16% 23%
33	J	683	23% 76%
34	K	522	58% 7% 34%
35	N	941	53% 9% 38%
36	L	499	45% 55%
37	M	128	93% 5%
38	O	142	95%
39	W	565	5% 61% 17% 18%
40	I	144	38% 31% 13% 19%
41	X	820	50% 50%
42	A	2335	86% 9% 5%
43	C	972	77% 7% 16%

2 Entry composition (i)

There are 46 unique types of molecules in this entry. The entry contains 63369 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 U5snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	B	115	2419	1084	402	818	115	0	0

- Molecule 2 is a protein called U5 small nuclear ribonucleoprotein 200 kDa helicase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	D	1874	7496	3748	1874	1874	0	0

- Molecule 3 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	E	299	1196	598	299	299	0	0

- Molecule 4 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	a	78	318	162	78	78	0	0
4	k	85	340	170	85	85	0	0
4	P	74	300	152	74	74	0	0

- Molecule 5 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	b	73	300	154	73	73	0	0
5	m	74	296	148	74	74	0	0

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Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	Q	71	292	150	71	71	0	0

- Molecule 6 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	c	78	314	158	78	78	0	0
6	l	79	316	158	79	79	0	0
6	R	78	314	158	78	78	0	0

- Molecule 7 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	d	69	282	144	69	69	0	0
7	n	68	272	136	68	68	0	0
7	S	73	298	152	73	73	0	0

- Molecule 8 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	e	78	318	162	78	78	0	0
8	h	80	320	160	80	80	0	0
8	T	71	288	146	71	71	0	0

- Molecule 9 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	f	64	260	132	64	64	0	0
9	i	73	292	146	73	73	0	0
9	U	64	256	128	64	64	0	0

- Molecule 10 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	g	93	380	194	93	93	0	0
10	j	82	328	164	82	82	0	0
10	V	82	334	170	82	82	0	0

- Molecule 11 is a RNA chain called U6snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
11	F	69	1470	656	259	486	69	0	0

- Molecule 12 is a protein called U6 snRNA-associated Sm-like protein LSm2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	q	90	360	180	90	90	0	0

- Molecule 13 is a protein called U6 snRNA-associated Sm-like protein LSm3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	r	75	300	150	75	75	0	0

- Molecule 14 is a protein called U6 snRNA-associated Sm-like protein LSm4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
14	s	74	296	148	74	74	0	0

- Molecule 15 is a protein called U6 snRNA-associated Sm-like protein LSm5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
15	t	75	300	150	75	75	0	0

- Molecule 16 is a protein called U6 snRNA-associated Sm-like protein LSm6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
16	x	70	280	140	70	70	0	0

- Molecule 17 is a protein called U6 snRNA-associated Sm-like protein LSm7.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
17	y	65	260	130	65	65	0	0

- Molecule 18 is a protein called U6 snRNA-associated Sm-like protein LSm8.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
18	z	61	244	122	61	61	0	0

- Molecule 19 is a RNA chain called pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
19	G	42	862	387	122	311	42	0	0

- Molecule 20 is a RNA chain called U2snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
20	H	109	2311	1032	396	774	109	0	0

- Molecule 21 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
21	o	162	648	324	162	162	0	0

- Molecule 22 is a protein called U2 small nuclear ribonucleoprotein B".

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
22	p	94	376	188	94	94	0	0

- Molecule 23 is a protein called Splicing factor 3A subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
23	u	124	496	248	124	124	0	0

- Molecule 24 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	v	99	396	198	99	99	0	0

- Molecule 25 is a protein called Splicing factor 3A subunit 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
25	w	443	1773	887	443	443	0	0

- Molecule 26 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
26	1	1030	4120	2060	1030	1030	0	0

- Molecule 27 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
27	2	186	744	372	186	186	0	0

- Molecule 28 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
28	3	1174	4696	2348	1174	1174	0	0

- Molecule 29 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
29	4	78	312	156	78	78	0	0

- Molecule 30 is a protein called Splicing factor 3B subunit 6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	5	108	432	216	108	108	0	0

- Molecule 31 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	6	89	356	178	89	89	0	0

- Molecule 32 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	7	66	264	132	66	66	0	0

- Molecule 33 is a protein called U4/U6 small nuclear ribonucleoprotein Prp3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
33	J	167	668	334	167	167	0	0

- Molecule 34 is a protein called U4/U6 small nuclear ribonucleoprotein Prp4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
34	K	343	1371	686	343	342	0	0

- Molecule 35 is a protein called Pre-mRNA-processing factor 6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
35	N	579	2316	1158	579	579	0	0

- Molecule 36 is a protein called U4/U6 small nuclear ribonucleoprotein Prp31.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
36	L	226	904	452	226	226	0	0

- Molecule 37 is a protein called NHP2-like protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
37	M	125	500	250	125	125	0	0

- Molecule 38 is a protein called Thioredoxin-like protein 4A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
38	O	139	556	278	139	139	0	0

- Molecule 39 is a protein called U4/U6.U5 tri-snRNP-associated protein 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
39	W	463	1852	926	463	463	0	0

- Molecule 40 is a RNA chain called U4snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
40	I	117	2491	1112	439	823	117	0	0

- Molecule 41 is a protein called Probable ATP-dependent RNA helicase DDX23.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
41	X	414	1661	833	414	414	0	0

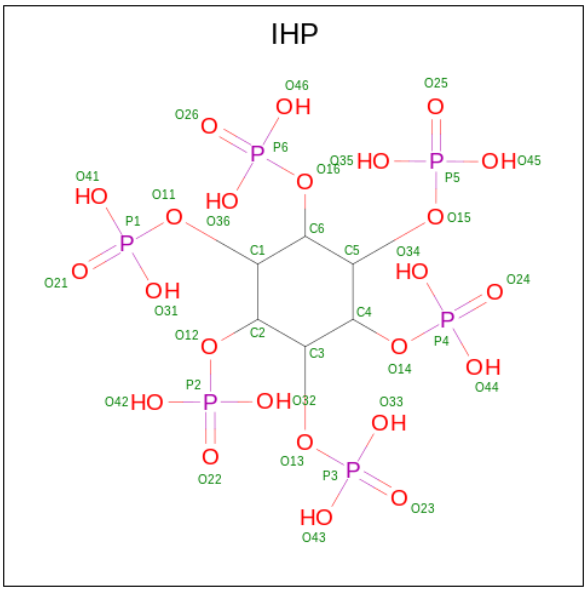
- Molecule 42 is a protein called Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
42	A	2221	8884	4442	2221	2221	0	0

- Molecule 43 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

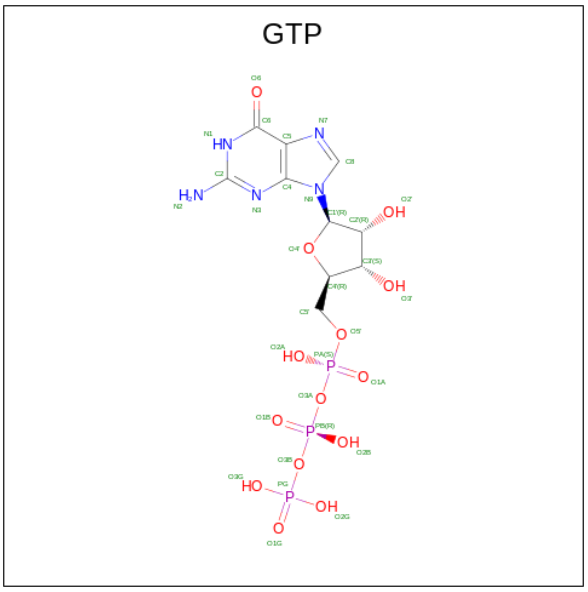
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
43	C	818	3272	1636	818	818	0	0

- Molecule 44 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: $C_6H_{18}O_{24}P_6$).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	O	P	
44	A	1	36	6	24	6	0

- Molecule 45 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
45	C	1	32	10	5	14	3	0

- Molecule 46 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

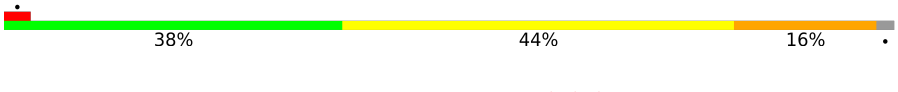
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
46	C	1	1	1	0

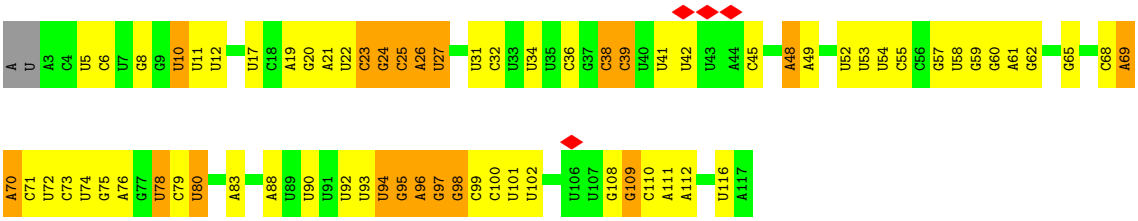
3 Residue-property plots (i)

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: U5snRNA

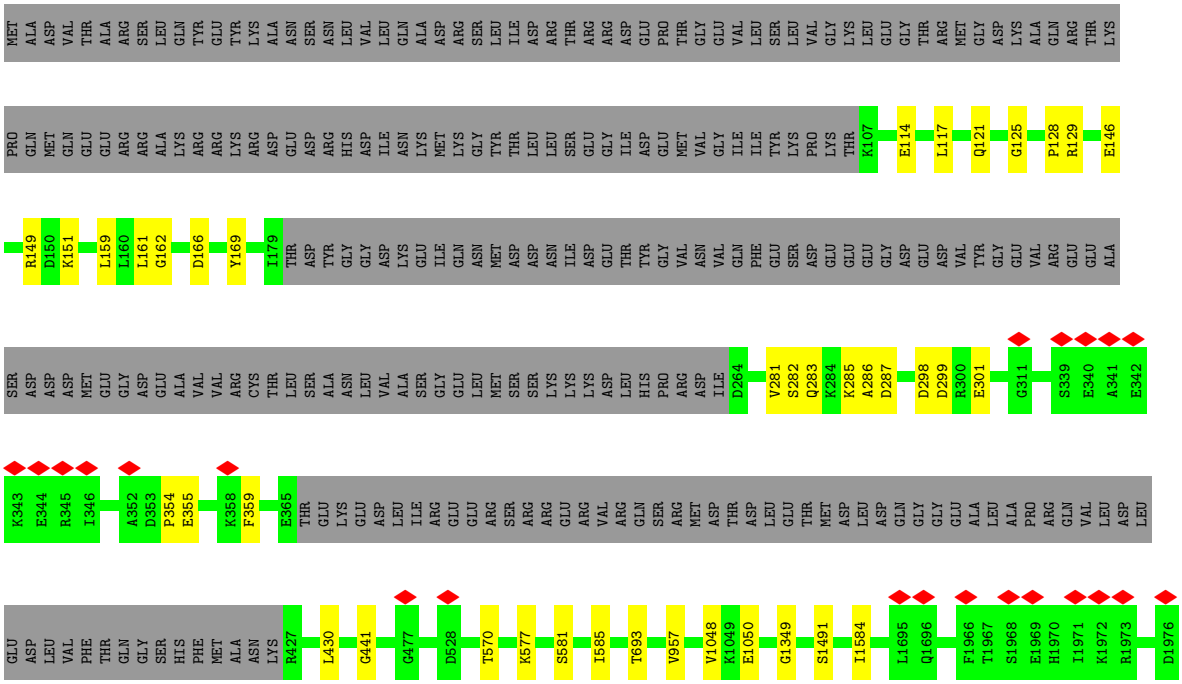
Chain B:

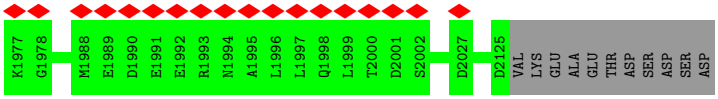




- Molecule 2: U5 small nuclear ribonucleoprotein 200 kDa helicase

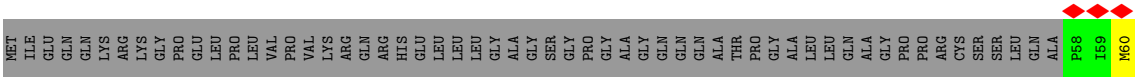
Chain D:

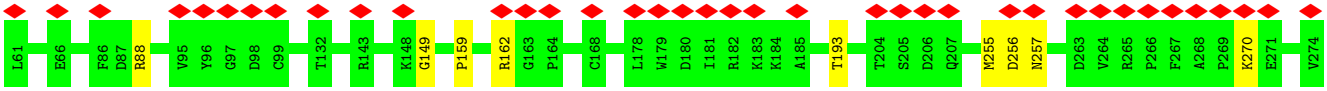


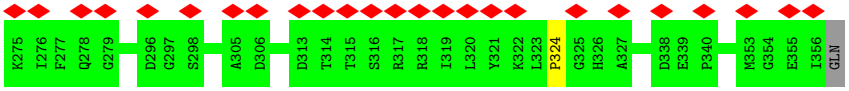


• Molecule 3: U5 small nuclear ribonucleoprotein 40 kDa protein

Chain E:

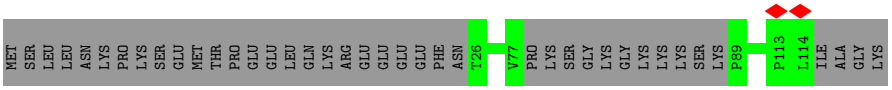






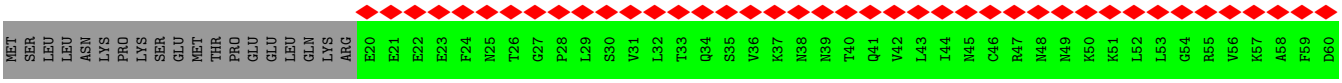
• Molecule 4: Small nuclear ribonucleoprotein Sm D2

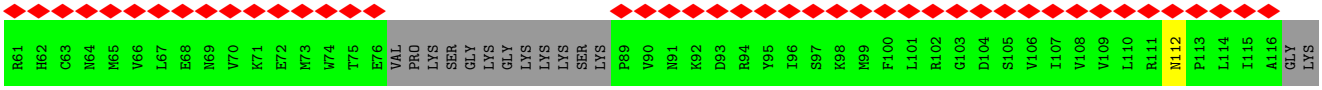
Chain a:



• Molecule 4: Small nuclear ribonucleoprotein Sm D2

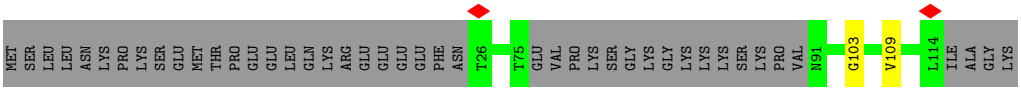
Chain k:





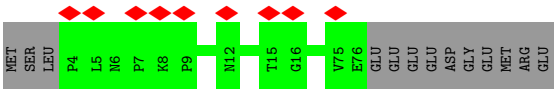
• Molecule 4: Small nuclear ribonucleoprotein Sm D2

Chain P:



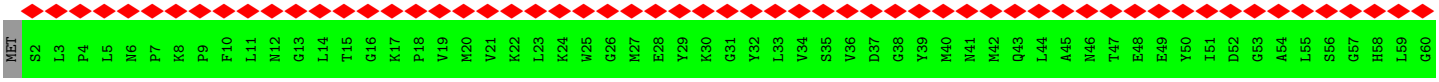
• Molecule 5: Small nuclear ribonucleoprotein F

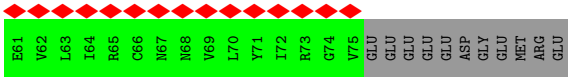
Chain b:



• Molecule 5: Small nuclear ribonucleoprotein F

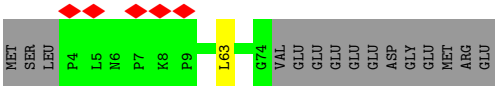
Chain m:





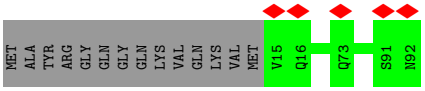
• Molecule 5: Small nuclear ribonucleoprotein F

Chain Q:



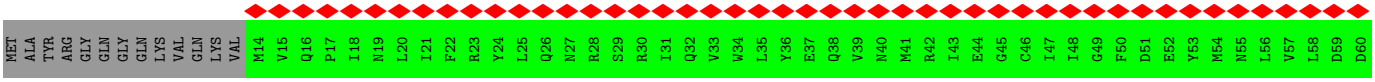
• Molecule 6: Small nuclear ribonucleoprotein E

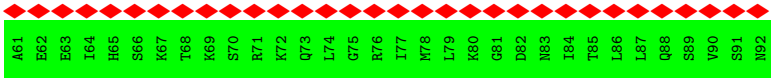
Chain c:



• Molecule 6: Small nuclear ribonucleoprotein E

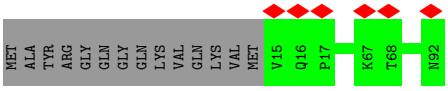
Chain l:





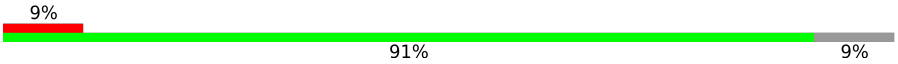
• Molecule 6: Small nuclear ribonucleoprotein E

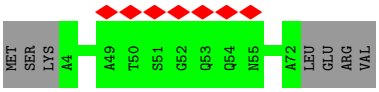
Chain R:



• Molecule 7: Small nuclear ribonucleoprotein G

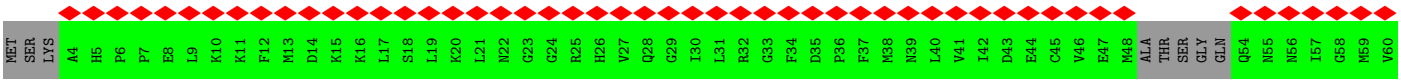
Chain d:

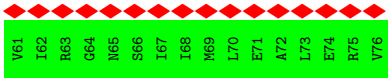




• Molecule 7: Small nuclear ribonucleoprotein G

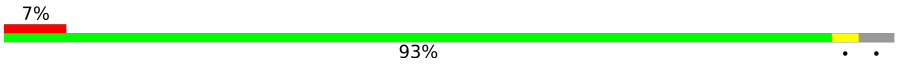
Chain n:

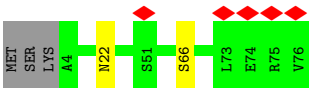




• Molecule 7: Small nuclear ribonucleoprotein G

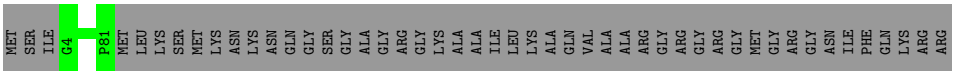
Chain S:





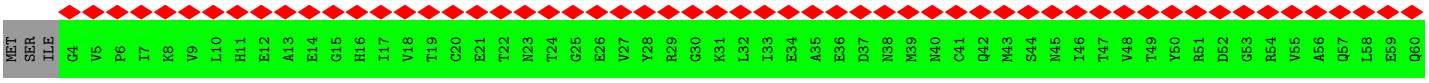
• Molecule 8: Small nuclear ribonucleoprotein Sm D3

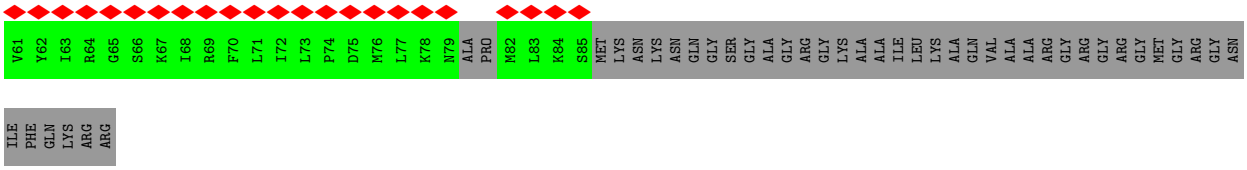
Chain e:



• Molecule 8: Small nuclear ribonucleoprotein Sm D3

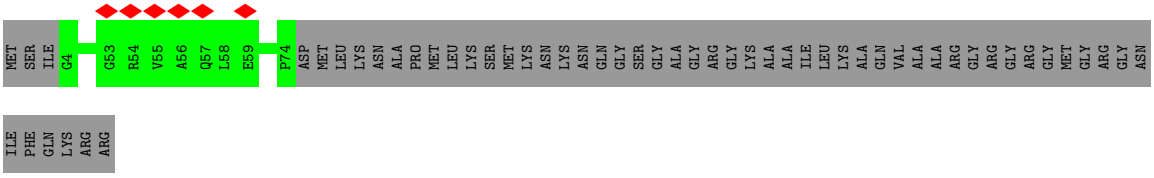
Chain h:





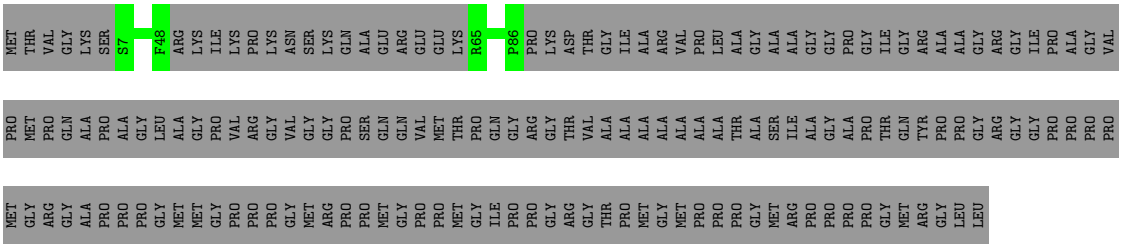
• Molecule 8: Small nuclear ribonucleoprotein Sm D3

Chain T:



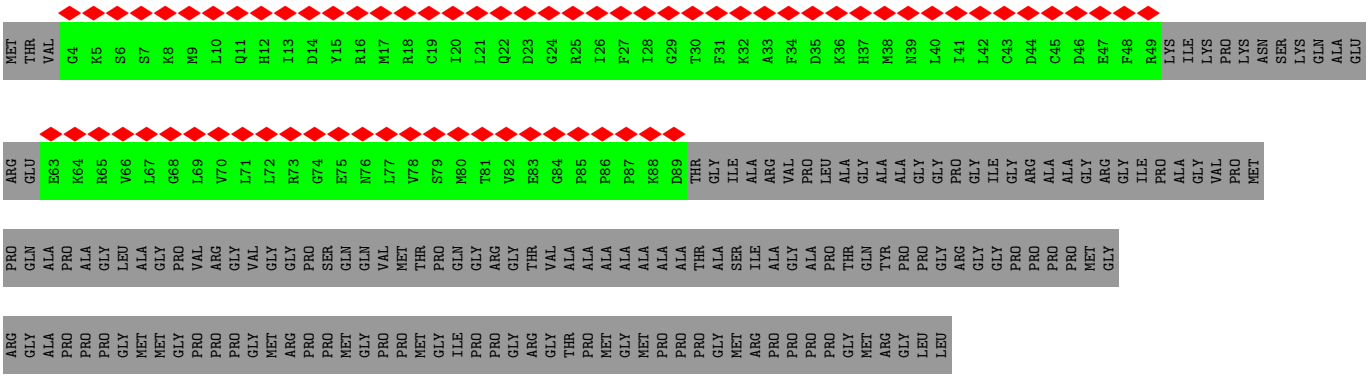
• Molecule 9: Small nuclear ribonucleoprotein-associated proteins B and B'

Chain f:



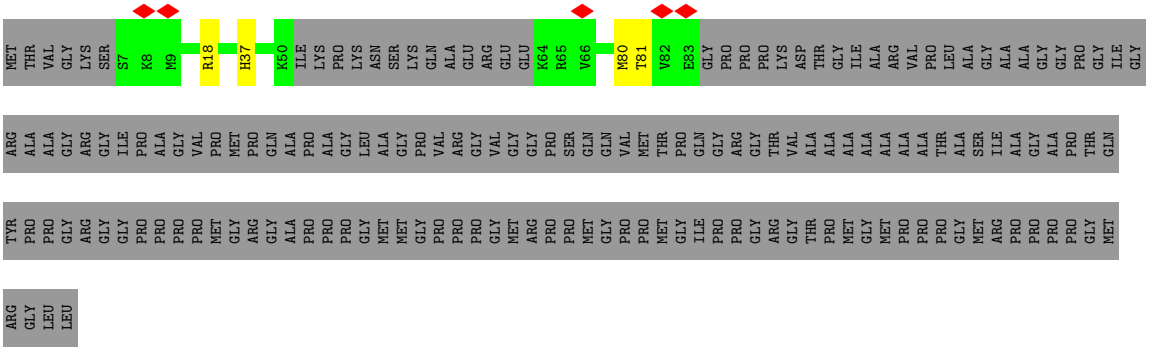
• Molecule 9: Small nuclear ribonucleoprotein-associated proteins B and B'

Chain i:



• Molecule 9: Small nuclear ribonucleoprotein-associated proteins B and B'

Chain U:



• Molecule 10: Small nuclear ribonucleoprotein Sm D1

Chain g: 5% 78% 22%

MET K2 S35 MET N37 V83 V87 K91 R92 E93 A94 V95 ALA GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY PRO ARG ARG

• Molecule 10: Small nuclear ribonucleoprotein Sm D1

Chain j: 69% 69% 31%

M1 K2 L3 V4 R5 F6 L7 M8 K9 L10 S11 H12 E13 T14 V15 T16 I17 E18 L19 K20 N21 G22 T23 Q24 V25 H26 G27 T28 I29 T30 G31 V32 D33 V34 S35 M36 N37 T38 H39 L40 K41 A42 V43 K44 M45 T46 L47 K48 N49 R50 E51 P52 V53 Q54 L55 E56 T57 L58 S59 I60

R61 G62 N63 N64 I65 R66 Y67 F68 I69 L70 P71 D72 S73 L74 P75 L76 D77 T78 L79 L80 V81 D82 VAL GLU PRO LYS VAL LYS SER LYS LYS ARG GLU ALA VAL ALA GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY GLY PRO ARG ARG

• Molecule 10: Small nuclear ribonucleoprotein Sm D1

Chain V: 64% 5% 31%

MET K2 K20 N21 S59 N63 N64 I65 D77 T78 V83 GLU PRO LYS VAL LYS SER LYS LYS ARG GLU ALA VAL ALA GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY ARG GLY GLY PRO ARG ARG

• Molecule 11: U6snRNA

Chain F: 12% 39% 21% 36%

G1 C6 G7 C8 U9 C19 A U A U A C U A A A A U U G G A A C G A U A C A G A45 G46 A47 A48 G49 A50 U51 U52 A53 G59 C66 G67 A70 G71 G72 A73 A76 C A C G C A

A A U85 U86 U89 G90 A91 A92 G93 C94 G95 U96 U C C A U A102 U103 U104 U105 U106 U107

• Molecule 12: U6 snRNA-associated Sm-like protein LSm2

Chain q: 95% 91% 5%

M1 L2 F3 Y4 S5 F6 F7 K8 S9 L10 V11 G12 K13 D14 V15 V16 V17 E18 L19 K20 N21 D22 L23 S24 I25 C26 G27 T28 L29 H30 S31 V32 D33 Q34 Y35 L36 N37 I38 K39 L40 T41 D42 I43 S44 V45 T46 D47 P48 E49 K50 Y51 P52 H53 M54 L55 S56 V57 K58 N59 C60

F61 I62 R63 G64 S65 V66 V67 R68 Y69 V70 Q71 L72 P73 A74 D75 E76 V77 D78 T79 Q80 L81 L82 Q83 D84 A85 A86 R87 K88 E89 A90 LEU GLN GLN LYS GLN

• Molecule 13: U6 snRNA-associated Sm-like protein LSm3

Chain r: 74% 72% 26%

MET ALA ASP ASP VAL ASP GLN GLN GLN THR THR ASN THR VAL GLU E16 P17 L18 D19 L20 I21 R22 L23 S24 L25 D26 E27 R28 I29 Y30 V31 K32 M33 R34 N35 D36 R37 E38 L39 R40 G41 R42 L43 H44 A45 Y46 D47 Q48 H49 L50 N51 M52 I53 L54 G55 D56 V57 E58 E59 T60

V61 T62 T63 I64 GLU ILE ASP GLU GLU THR TYR GLU E73 I74 Y75 K76 S77 T78 K79 R80 N81 I82 P83 M84 L85 F86 V87 R88 G89 D90 G91 V92 V93 L94 V95 A96 P97 P98 LEU ARG VAL GLY

- Molecule 14: U6 snRNA-associated Sm-like protein LSm4

Chain s: 53% 53% 47%

M1 L2 P3 L4 S5 L6 L7 K8 T9 A10 Q11 N12 H13 P14 M15 L16 V17 E18 L19 K20 N21 G22 E23 T24 Y25 N26 G27 H28 L29 V30 S31 C32 D33 M34 W35 M36 M37 I38 M39 L40 R41 E42 V43 I44 C45 T46 S47 ARG ASP GLY ASP LYS PHE W54 R55 M56 P57 E58 C59 Y60

I61 R62 G63 S64 T65 I66 K67 Y68 L69 R70 I71 P72 D73 E74 I75 I76 D77 M78 V79 K80 GLU GLU VAL VAL ALA LYS GLY ARG GLY ARG GLY GLY LEU GLN GLN GLN LYS GLN GLN LYS GLY ARG GLY MET GLY GLY ALA GLY ARG GLY VAL PHE GLY GLY ARG GLY ARG GLY GLY ILE

PRO GLY THR GLY ARG GLY GLN PRO GLU LYS LYS PRO GLY ARG GLN ALA GLY LYS GLN

- Molecule 15: U6 snRNA-associated Sm-like protein LSm5

Chain t: 82% 79% 18%

MET ALA ALA ASN ALA THR THR ASN PRO S10 Q11 L12 L13 P14 L15 E16 L17 V18 D19 K20 C21 I22 G23 S24 R25 I26 H27 I28 V29 M30 K31 S32 D33 K34 E35 I36 V37 G38 T39 L40 L41 G42 F43 D44 D45 F46 V47 N48 M49 V50 L51 E52 D53 V54 T55 E56 F57 E58 I59 T60

P61 E62 GLY R64 R65 I66 T67 K68 L69 D70 Q71 I72 L73 L74 N75 G76 N77 N78 I79 T80 M81 L82 V83 P84 G85 GLY GLU GLY PRO GLU VAL

- Molecule 16: U6 snRNA-associated Sm-like protein LSm6

Chain x: 88% 86% 12%

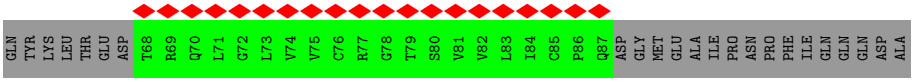
MET SER LEU ARG LYS GLN T7 P8 S9 D10 F11 L12 K13 Q14 I15 I16 G17 R18 P19 V20 V21 V22 K23 L24 N25 S26 G27 V28 D29 Y30 R31 G32 V33 L34 A35 C36 L37 D38 G39 Y40 M41 N42 I43 A44 L45 E46 Q47 T48 E49 E50 Y51 V52 N53 G54 Q55 L56 K57 N58 K59 Y60

G61 D62 A63 F64 I65 R66 G67 N68 N69 V70 L71 Y72 I73 S74 T75 Q76 LYS ARG ARG MET

- Molecule 17: U6 snRNA-associated Sm-like protein LSm7

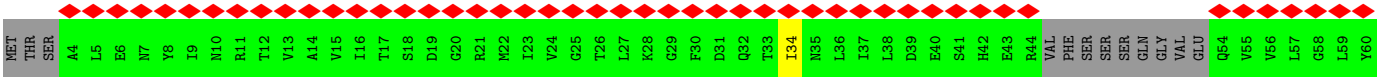
Chain y: 63% 63% 37%

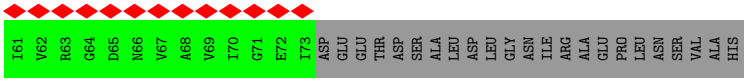
MET ALA ASP LYS GLU LYS LYS LYS LYS GLU S11 I12 L13 D14 L15 S16 K17 Y18 I19 D20 K21 T22 I23 R24 V25 K26 F27 Q28 G29 G30 R31 E32 A33 S34 G35 I36 L37 K38 G39 F40 D41 P42 L43 L44 M45 L46 V47 L48 D49 G50 T51 I52 E53 Y54 M55 ARG ASP PRO ASP ASP



• Molecule 18: U6 snRNA-associated Sm-like protein LSm8

Chain z:



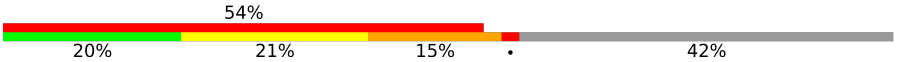


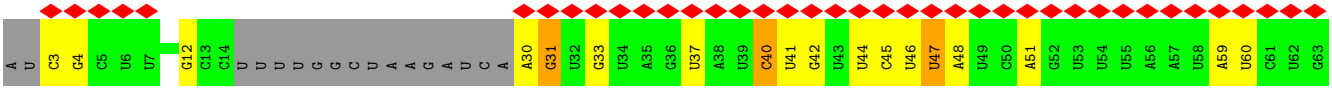
• Molecule 19: pre-mRNA

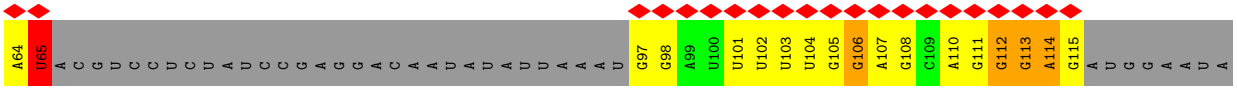
Chain G:

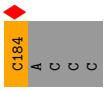
• Molecule 20: U2snRNA

Chain H:









• Molecule 21: U2 small nuclear ribonucleoprotein A'

Chain o: 64% 63% • 36%

MET V2 K3 L4 T5 A6 E7 L8 I9 E10 Q11 A12 A13 Q14 Y15 T16 N17 A18 V19 R20 D21 R22 E23 L24 D25 L26 R27 G28 Y29 K30 I31 P32 V33 I34 E35 N36 L37 G38 A39 T40 L41 D42 Q43 F44 D45 A46 I47 D48 F49 S50 D51 N52 E53 I54 R55 K56 L57 D58 G59 F60

P61 L62 L63 R64 R65 L66 K67 T68 L69 L70 V71 N72 N73 N74 R75 I76 C77 R78 I79 G80 E81 G82 L83 D84 Q85 A86 L87 P88 C89 L90 T91 E92 L93 I94 L95 T96 N97 N98 S99 L100 V101 E102 L103 G104 D105 L106 D107 P108 L109 A110 S111 L112 K113 S114 L115 T116 Y117 L118 S119 I120

L121 R122 N123 P124 V125 T126 N127 K128 K129 H130 Y131 R132 L133 Y134 V135 I136 Y137 K138 V139 P140 Q141 V142 R143 V144 L145 D146 F147 Q148 K149 V150 K151 L152 K153 E154 R155 Q156 E157 A158 E159 K160 M161 F162 K163 GLY LYS ARG GLY ALA GLN LEU ALA LYS ASP ILE ALA ARG ARG SER LYS THR

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

ASP GLY GLU GLU GLU MET GLU GLU ASP THR VAL THR ASN GLY SER

- Molecule 22: U2 small nuclear ribonucleoprotein B”

Chain p: 42% 42% 58%

MET ASP I3 R4 P5 N6 H7 T8 I9 Y10 I11 N12 N13 M14 N15 D16 K17 I18 K19 K20 E21 E22 L23 K24 R25 S26 L27 Y28 A29 L30 F31 S32 Q33 F34 G35 H36 V37 V38 D39 I40 V41 A42 L43 K44 T45 M46 K47 M48 R49 G50 Q51 A52 F53 V54 I55 F56 K57 E58 L59 G60

S61 S62 T63 N64 A65 L66 R67 Q68 L69 Q70 G71 F72 F73 F74 Y75 G76 K77 F78 M79 R80 I81 Q82 Y83 A84 K85 T86 D87 S88 D89 I90 I91 S92 K93 N94 R95 G96 THR PHE ALA ASP LYS GLU LYS LYS LYS GLU LYS LYS LYS ALA LYS THR VAL GLU GLN THR ALA THR THR THR

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

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

- Molecule 23: Splicing factor 3A subunit 1

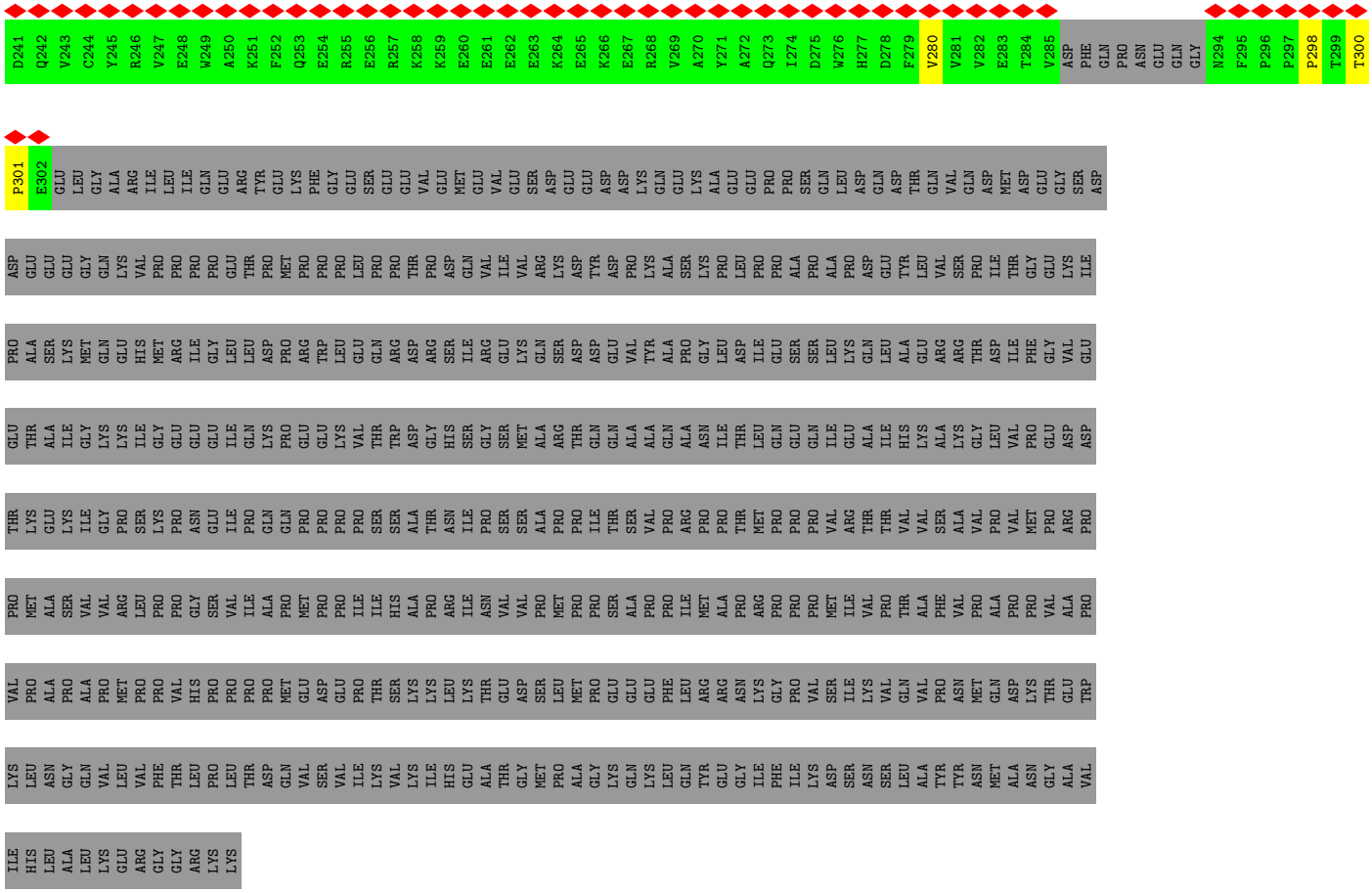
Chain u: 16% 15% • 84%

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

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

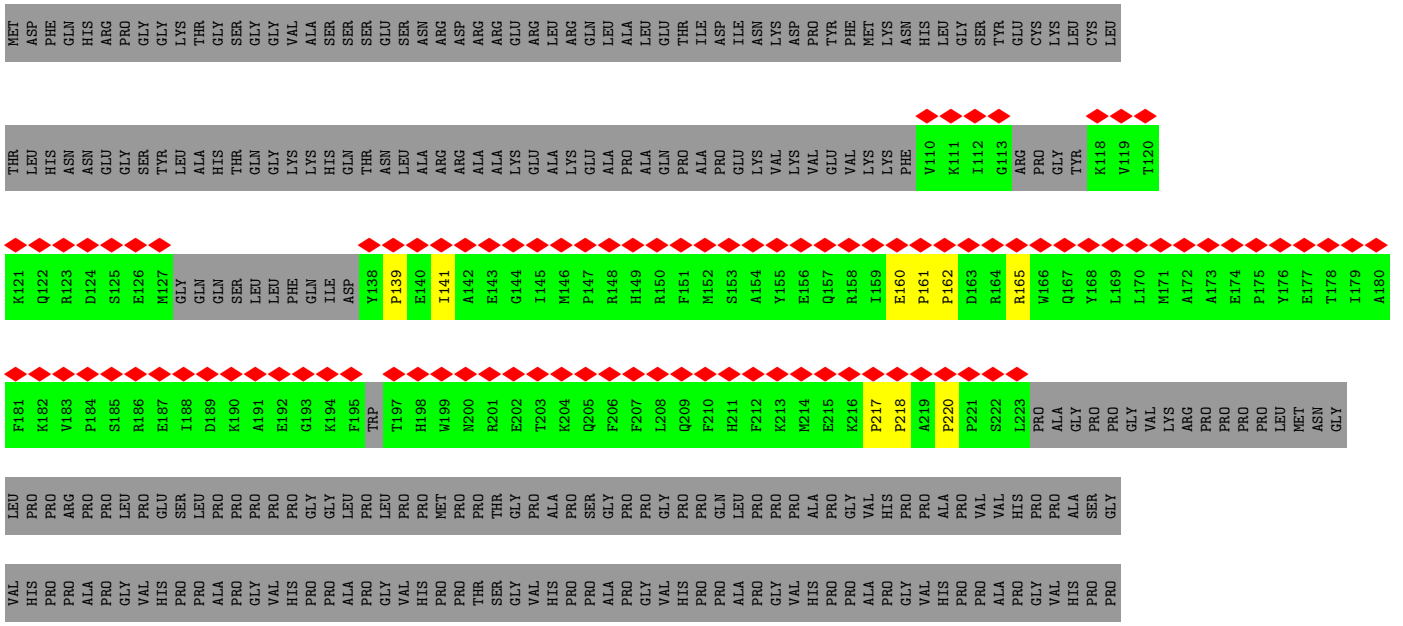
GLN GLN THR THR GLN GLN GLN LEU PRO GLN LYS VAL GLN ALA GLN VAL ILE GLN GLU THR ILE VAL PRO LYS GLU PRO PRO PRO GLU PHE GLU PHE ILE ALA ASP PRO PRO SER ILE S160 A161 F162 D163 L164 D165 V166 V167 K168 L169 T170 A171 Q172 F173 V174 A175 R176 N177 G178 R179 Q180

F181 L182 T183 Q184 L185 M186 Q187 K188 E189 Q190 R191 N192 Y193 Q194 F195 D196 F197 L198 R199 P200 Q201 H202 S203 L204 F205 N206 Y207 F208 T209 K210 L211 V212 E213 Q214 Y215 T216 K217 I218 L219 I220 P221 P222 K223 G224 L225 F226 S227 K228 LEU LYS LYS GLU ALA GLU ASN PRO ARG GLU VAL L240



• Molecule 24: Splicing factor 3A subunit 2

Chain v: 21% 19% 79%



ALA PRO GLY VAL HIS PRO PRO PRO SER ALA GLY VAL HIS PRO GLN ALA PRO GLY VAL HIS PRO ALA ALA PRO ALA VAL HIS PRO GLN ALA PRO GLY VAL HIS PRO PRO ALA PRO GLY MET HIS PRO GLN ALA PRO GLY VAL HIS PRO GLN PRO PRO GLY VAL HIS PRO SER ALA PRO GLY

VAL HIS PRO GLN PRO PRO GLY VAL HIS PRO SER ASN PRO GLY VAL HIS PRO PRO THR PRO MET PRO PRO MET LEU ARG PRO PRO LEU PRO SER GLU GLY PRO GLY ASN ILE PRO PRO PRO PRO PRO THR ASN

- Molecule 25: Splicing factor 3A subunit 3

Chain w: 88% 87% 12%

M1 E2 T3 I4 L5 E6 Q7 Q8 R9 R10 Y11 H12 E13 E14 K15 E16 R17 L18 M19 D20 V21 M22 A23 K24 E25 M26 L27 T28 K29 K30 S31 T32 L33 R34 D35 Q36 I37 N38 S39 D40 H41 R42 T43 R44 A45 M46 Q47 D48 R49 Y50 M51 E52 V53 S54 G55 N56 L57 R58 D59 L60

Y61 D62 D63 K64 D65 G66 L67 R68 K69 E70 E71 L72 N73 A74 I75 S76 G77 P78 N79 E80 F81 A82 E83 F84 Y85 N86 R87 L88 K89 Q90 I91 K92 E93 F94 H95 R96 K97 H98 PRO ASN GLU ILE CYS VAL PRO MET SER VAL GLU F110 E111 E112 L113 L114 K115 A116 R117 E118 N119 P120

S121 E122 E123 A124 Q125 N126 L127 V128 E129 F130 T131 D132 E133 E134 G135 Y136 G137 R138 Y139 L140 D141 L142 H143 ASP CYS TYR LEU LYS Y149 I150 N151 L152 K153 A154 S155 E156 K157 L158 D159 Y160 I161 T162 Y163 L164 S165 I166 F167 D168 Q169 L170 F171 D172 I173 P174 K175 E176 R177 K178 N179 A180

E181 Y182 K183 R184 Y185 L186 E187 M188 L189 L190 E191 Y192 L193 Q194 D195 Y196 T197 D198 R199 V200 K201 P202 L203 Q204 D205 Q206 N207 E208 L209 F210 GLY LYS ILE GLN ALA GLU PHE E218 K219 K220 W221 E222 N223 G224 T225 F226 P227 G228 W229 P230 K231 E232 T233 S234 S235 A236 L237 T238 H239 A240

G241 A242 H243 L244 D245 L246 S247 A248 F249 S250 S251 W252 E253 E254 L255 A256 S257 L258 G259 L260 D261 R262 L263 K264 S265 A266 L267 L268 A269 L270 G271 L272 K273 C274 G275 G276 T277 L278 E279 E280 R281 A282 Q283 R284 L285 F286 S287 T288 K289 G290 K291 S292 L293 E294 S295 L296 D297 T298 S299 L300

F301 A302 K303 N304 P305 K306 S307 K308 G309 T310 K311 R312 D313 T314 E315 R316 N317 K318 D319 I320 A321 F322 L323 E324 A325 Q326 I327 Y328 E329 Y330 V331 E332 I333 L334 G335 E336 Q337 R338 H339 L340 T341 H342 E343 N344 V345 Q346 R347 K348 Q349 A350 R351 T352 G353 E354 E355 R356 E357 E358 E359 E360

E361 E362 Q363 I364 S365 E366 S367 E368 S369 E370 D371 E372 E373 N374 GLU ILE ILE TYR ASN PRO LYS ASN LEU PRO LEU GLY TRP ASP GLY LYS PRO I392 P393 Y394 W395 L396 Y397 K398 L399 H400 G401 L402 N403 I404 N405 Y406 N407 C408 E409 I410 C411 G412 N413 Y414 T415 Y416 R417 G418 P419 K420

A421 F422 Q423 R424 H425 F426 A427 E428 W429 R430 H431 A432 H433 G434 M435 R436 C437 L438 G439 I440 P441 N442 T443 A444 H445 F446 A447 N448 V449 T450 Q451 I452 E453 D454 A455 V456 S457 L458 W459 A460 K461 L462 K463 LEU GLN LYS ALA SER GLU ARG TRP GLN PRO ASP THR GLU GLU GLU TYR E480

D481 S482 S483 G484 N485 V486 V487 N488 K489 K490 T491 Y492 E493 D494 L495 K496 R497 Q498 G499 LEU LEU

- Molecule 26: Splicing factor 3B subunit 1

Chain 1: 77% 56% 22% 21%

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

THR GLU LEU GLU ASP ASP ASP ASP ASP TYR SER SER SER THR SER LEU LEU GLY GLN LYS LYS PRO GLY TYR HIS ALA PRO VAL ALA LEU LEU ASN ASP ILE PRO GLN SER THR GLU GLN TYR D102 P103 F104 A105 E106 H107 R108 P109 P110 K111 I112 A113 D114 R115 E116 D117 E118 Y119 K120

K121 H122 R123 R124 T125 M126 I127 I128 S129 PRO GLU ARG LEU ASP PRO PHE ALA ASP GLY GLY LYS THR PRO ASP PRO LYS MET ASN ALA ARG THR TYR MET ASP VAL MET ARG GLU GLN HIS LEU THR LYS GLU GLU ARG GLU ILE ARG GLN GLN LEU A173 E174 K175 A176 K177 A178 G179 E180

L181 K182 V183 V184 N185 G186 A187 A188 A189 S190 GLN PRO PRO SER LYS ARG LYS ARG ARG TRP ASP GLN THR ALA D205 Q206 T207 P208 G209 A210 T211 P212 K213 K214 L215 S216 S217 W218 D219 Q220 A221 E222 T223 P224 G225 H226 T227 P228 S229 L230 R231 W232 D233 E234 T235 P236 G237 R238 A239 K240

G241 S242 E243 T244 P245 G246 A247 T248 P249 G250 S251 K252 I253 W254 D255 P256 T257 P258 S259 HIS THR PRO ALA GLY ALA ALA THR PRO GLY ARG GLY ASP THR PRO GLY HIS ALA THR PRO GLY HIS GLY GLY GLY ALA THR SER SER ALA ARG LYS ASN ARG TRP ASP GLU THR PRO LYS THR E300

R301 D302 T303 P304 G305 H306 G307 S308 G309 W310 A311 E312 T313 P314 R315 T316 D317 R318 G319 G320 D321 S322 I323 G324 E325 T326 P327 T328 PRO GLY ALA SER LYS ARG LYS SER ARG TRP ASP GLU THR PRO ALA SER GLN MET GLY GLY SER THR PRO VAL LEU THR PRO GLY LYS THR PRO ILE

GLY THR PRO ALA MET ASN MET ALA THR PRO THR PRO GLY HIS ILE MET SER MET THR PRO GLU GLN LEU GLN ALA TRP ARG TRP GLU ARG GLU ILE ASP E394 R395 N396 R397 P398 L399 S400 D401 E402 E403 L404 D405 A406 M407 F408 P409 E410 G411 Y412 K413 V414 L415 P416 P417 P418 A419 G420

Y421 V422 P423 I424 R425 T426 P427 A428 R429 K430 L431 T432 A433 T434 P435 T436 P437 L438 G439 G440 M441 T442 G443 F444 H445 M446 Q447 THR GLU ASP ARG THR MET K454 S455 V456 N457 D458 Q459 P460 S461 G462 ASN L464 P465 F466 L467 K468 P469 D470 D471 I472 Q473 Y474 F475 D476 K477 L478 L479 V480

D481 V482 D483 E484 S485 THR LEU SER PRO E490 E491 Q492 K493 E494 R495 K496 I497 M498 K499 L500 L501 L502 K503 I504 K505 N506 G507 T508 P509 P510 M511 R512 K513 A514 A515 L516 R517 Q518 I519 T520 D521 K522 A523 R524 E525 F526 G527 A528 G529 P530 L531 F532 N533 Q534 I535 L536 P537 L538 L539 N540

S541 P542 T543 L544 E545 D546 Q547 E548 R549 H550 L551 L552 V553 K554 V555 I556 D557 R558 I559 L560 Y561 K562 L563 D564 D565 L566 V567 R568 P569 Y570 V571 H572 K573 I574 L575 V576 V577 I578 E579 P580 L581 L582 I583 D584 E585 D586 Y587 Y588 A589 R590 V591 E592 G593 R594 E595 I596 I597 S598 N599 L600

A601 K602 A603 A604 G605 L606 A607 T608 M609 I610 S611 T612 M613 R614 P615 D616 I617 D618 N619 M620 D621 E622 Y623 V624 R625 N626 T627 T628 A629 R630 A631 F632 A633 V634 V635 A636 S637 A638 L639 G640 I641 P642 S643 L644 L645 P646 F647 L648 K649 A650 V651 C652 K653 S654 K655 K656 S657 W658 Q659 A660

R661 H662 T663 G664 I665 K666 I667 V668 Q669 Q670 I671 A672 I673 L674 M675 G676 C677 A678 I679 L680 P681 H682 L683 R684 S685 L686 V687 E688 I689 I690 E691 H692 G693 L694 V695 D696 E697 Q698 Q699 K700 V701 R702 T703 I704 S705 A706 L707 A708 I709 A710 A711 L712 A713 E714 A715 A716 T717 P718 Y719 G720

I721 E722 S723 F724 D725 S726 V727 L728 K729 P730 L731 W732 K733 G734 I735 R736 Q737 H738 R739 G740 K741 G742 L743 A744 A745 F746 L747 K748 A749 I750 G751 Y752 L753 I754 P755 L756 M757 D758 A759 E760 Y761 A762 N763 Y764 Y765 T766 R767 E768 V769 M770 L771 I772 L773 I774 R775 E776 F777 Q778 S779 P780

D781 E782 E783 N784 K785 K786 I787 V788 L789 K790 V791 V792 K793 Q794 C795 C796 G797 T798 D799 G800 V801 E802 A803 N804 Y805 I806 K807 T808 E809 I810 L811 P812 P813 F814 F815 K816 H817 F818 W819 Q820 H821 R822 M823 A824 L825 D826 R827 R828 N829 Y830 R831 Q832 L833 V834 D835 T836 T837 V838 E839 L840

A841 N842 K843 V844 G845 A846 A847 E848 I849 I850 S851 R852 I853 V854 D855 D856 L857 K858 D859 E860 A861 E862 Q863 Y864 R865 K866 M867 V868 M869 E870 T871 I872 E873 K874 I875 M876 G877 N878 L879 G880 A881 A882 D883 I884 D885 H886 K887 L888 E889 E890 Q891 L892 I893 D894 G895 I896 L897 Y898 A899 F900

Q901 E902 Q903 T904 T905 E906 D907 S908 V909 M910 L911 N912 G913 F914 G915 T916 V917 V918 N919 A920 L921 G922 K923 R924 V925 K926 P927 Y928 L929 P930 Q931 I932 C933 G934 T935 V936 L937 W938 R939 L940 N941 N942 K943 S944 A945 K946 V947 R948 Q949 Q950 A951 A952 D953 L954 I955 S956 R957 T958 A959 V960

V961 M962 K963 T964 C965 Q966 E967 E968 K969 L970 M971 G972 H973 L974 G975 V976 V977 L978 Y979 E980 Y981 L982 G983 E984 E985 Y986 P987 E988 V989 L990 G991 S992 I993 L994 G995 A996 L997 K998 A999 I1000 V1001 N1002 V1003 I1004 G1005 M1006 H1007 K1008 M1009 T1010 P1011 P1012 I1013 K1014 D1015 L1016 L1017 P1018 R1019 L1020

T1021 P1022 I1023 L1024 K1025 N1026 R1027 H1028 E1029 K1030 V1031 Q1032 E1033 N1034 C1035 I1036 D1037 L1038 V1039 G1040 R1041 I1042 A1043 G1046 A1047 E1048 Y1049 E1054 W1055 I1058 C1059 F1060 E1061 L1062 L1063 E1064 L1065 L1066 K1067 A1068 H1069 K1070 K1071 A1072 I1073 R1074 R1075 A1076 T1077 V1078 N1079 T1080 F1081 G1082 Y1083 I1084 A1085

K1086 A1087 I1088 G1089 P1090 H1091 D1092 V1093 L1094 A1095 T1096 L1097 L1098 N1099 N1100 L1101 K1102 V1103 Q1104 E1105 R1106 Q1107 N1108 R1109 V1110 C1111 T1112 T1113 V1114 A1115 I1116 A1117 I1118 V1119 A1120 E1121 T1122 C1123 S1124 P1125 F1126 T1127 V1128 L1129 P1130 A1131 L1132 M1133 N1134 E1135 Y1136 R1137 V1138 P1139 E1140 L1141 N1142 V1143 Q1144 N1145

G1146 V1147 L1148 K1149 S1150 L1151 S1152 F1153 L1154 F1155 E1156 Y1157 I1158 G1159 E1160 M1161 G1162 K1163 D1164 Y1165 I1166 Y1167 A1168 V1169 T1170 P1171 L1172 L1173 E1174 D1175 A1176 L1177 M1178 D1179 R1180 D1181 L1182 V1183 H1184 R1185 Q1186 T1187 A1188 S1189 A1190 V1191 V1192 Q1193 H1194 M1195 S1196 L1197 G1198 V1199 Y1200 G1201 F1202 G1203 C1204 E1205

D1206 S1207 L1208 N1209 H1210 L1211 L1212 N1213 Y1214 V1215 W1216 P1217 N1218 V1219 F1220 E1221 T1222 S1223 P1224 H1225 V1226 I1227 Q1228 A1229 V1230 M1231 G1232 A1233 L1234 E1235 G1236 L1237 R1238 V1239 A1240 I1241 G1242 P1243 C1244 R1245 M1246 L1247 Q1248 Y1249 C1250 L1251 Q1252 G1253 L1254 F1255 H1256 P1257 A1258 R1259 K1260 V1261 R1262 D1263 V1264 Y1265

W1266 K1267 I1268 Y1269 N1270 S1271 I1272 Y1273 I1274 G1275 S1276 Q1277 D1278 A1279 L1280 I1281 A1282 H1283 Y1284 P1285 R1286 I1287 Y1288 N1289 D1290 D1291 K1292 N1293 T1294 Y1295 I1296 R1297 Y1298 E1299 L1300 D1301 Y1302 I1303 L1304

- Molecule 27: Splicing factor 3B subunit 2

Chain 2: 20% 19% 79%

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

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

MET ALA HIS PRO PRO ASN LEU GLY PRO PRO PRO LEU ARG VAL GLY GLU PRO VAL ALA LEU SER GLU GLU GLU GLU ARG LEU LYS LEU ALA GLN GLN GLN ALA ALA LEU LEU MET GLN GLN GLU GLU GLU ARG ALA LYS GLN GLN GLY ASP HIS SER LEU LYS GLU HIS GLU LEU LEU GLU GLN

GLN LYS ARG ALA ALA VAL LEU LEU GLU GLN GLU ARG GLN GLN GLU ILE ALA LYS MET GLY THR PRO VAL PRO ARG PRO PRO GLN ASP MET GLY GLN ILE GLY VAL ARG THR PRO LEU GLY PRO ARG VAL ALA ALA PRO VAL GLY PRO VAL GLY PRO THR PRO THR VAL LEU PRO MET GLY

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

ARG SER SER LEU GLY GLN SER ALA SER GLU THR GLU GLU ASP THR VAL SER VAL SER LYS LYS LYS GLU LYS ASN ARG LYS ARG ARG ASN ARG LYS LYS LYS LYS LYS LYS PRO GLN ARG VAL ARG GLY VAL SER SER GLU SER SER GLY ASP ARG GLU LYS ASP SER THR ARG SER ARG GLY SER

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

LYS LYS GLY PHE GLU GLU GLU HIS LYS ASP SER ASP ASP ASP SER SER ASP ASP GLU GLN GLU LYS LYS PRO GLU ALA PRO LYS LEU SER LYS LYS LYS LEU ARG ARG MET ASN ARG PHE T461 V462 A463 E464 L465 K466 Q467 L468 V469 A470 R471 P472 D473 V474 V475 E476 M477 H478 D479 V480

T481 A482 Q483 D484 P485 K486 L487 L488 V489 H490 L491 K492 A493 T494 R495 N496 S497 V498 P499 V500 P501 R502 H503 W504 C505 F506 K507 R508 K509 Y510 L511 Q512 G513 K514 R515 G516 I517 E518 K519 P520 P521 F522 E523 L524 P525 D526 F527 I528 K529 R530 T531 G532 I533 Q534 E535 M536 R537 E538 ALA LEU

GLN GLU LYS GLU GLU Q546 K547 T548 M549 K550 S551 K552 M553 R554 R558 P559 K560 M561 G562 K563 I564 D565 I566 D567 Y568 Q569 K570 L571 H572 D573 A574 F575 F576 K577 W578 Q579 T580 LYS PRO LYS LEU T585 T586 H587 G588 D589 L590 Y591 Y592 E593 G594 K595 E596 F597 E598 T599 R600 LEU LYS

GLU K604 K605 P606 G607 D608 L609 S610 D611 E612 L613 R614 I615 S616 L617 G618 M619 P620 V621 G622 PRO ASN ALA HIS LYS VAL PRO P630 P631 W632 L633 I634 A635 M636 Q637 R638 Y639 G640 P641 P642 P643 S644 Y645 P646 N647 L648 K649 I650 P651 G652 L653 N654 S655 P656 ILE PRO GLU SER CYS SER

PHE GLY TYR HIS ALA GLY GLY TRP GLY LYS PRO PRO PRO VAL ASP GLU THR GLY LYS PRO L682 Y683 G684 D685 V686 F687 G688 T689 N690 A691 A692 GLU PHE GLN THR LYS THR GLU GLU GLU GLU ILE ASP ARG THR PRO TRP GLY GLU LEU GLU PRO SER ASP GLU GLU SER SER GLU GLU GLU

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

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

LYS TYR GLU GLU HIS VAL ARG GLU GLN GLN ALA GLN VAL GLU LYS GLU ASP PHE SER ASP MET VAL ALA GLU HIS ALA ALA LYS GLN LYS GLN LYS LYS ARG LYS ALA GLN PRO GLN ASP SER ARG GLY GLY SER LYS LYS TYR LYS GLU PHE LYS PHE

- Molecule 28: Splicing factor 3B subunit 3

Chain 3: 96% 87% 10%

M1 F2 L3 Y4 N5 L6 T7 L8 Q9 R10 A11 T12 G13 I14 S15 F16 A17 I18 H19 V79 G20 N21 F22 S23 G24 T25 K26 Q27 Q28 E29 I30 V31 V32 S33 R34 G35 K36 I37 L38 E39 L40 L41 R42 P43 D44 P45 N46 T47 G48 K49 V50 H51 T52 L53 L54 T55 V56 E57 V58 F59 G60

V61 I62 R63 S64 L65 M66 A67 F68 R69 L70 T71 G72 G73 T74 K75 D76 Y77 I78 V79 V80 G81 S82 D83 S84 G85 R86 I87 V88 I89 L90 E91 Y92 Q93 P94 S95 K96 N97 M98 F99 E100 K101 I102 H103 Q104 E105 T106 F107 G108 K109 S110 G111 C112 R113 R114 I115 V116 P117 G118 Q119 F120

L121 A122 V123 D124 P125 K126 G127 R128 A129 V130 M131 I132 S133 A134 I135 E136 K137 Q138 K139 L140 V141 Y142 I143 L144 N145 R146 D147 A148 A149 A150 R151 L152 T153 I154 S155 S156 P157 L158 E159 A160 H161 K162 A163 N164 T165 L166 V167 Y168 H169 V170 V171 G172 V173 D174 V175 G176 F177 E178 N179 P180

M181 F182 A183 C184 L185 E186 M187 D188 Y189 E190 E191 A192 D193 N194 D195 P196 T197 G198 E199 A200 A201 A202 N203 T204 Q205 Q206 T207 L208 T209 F210 Y211 E212 L213 D214 L215 G216 L217 N218 H219 V220 V221 R222 K223 Y224 S225 E226 P227 L228 E229 E230 H231 G232 N233 F234 L235 I236 T237 V238 P239 G240

G241 S242 D243 G244 P245 S246 G247 V248 L249 I250 C251 S252 E253 N254 Y255 I256 T257 Y258 K259 N260 F261 G262 D263 Q264 P265 D266 I267 R268 C269 P270 I271 P272 R273 R274 R275 N276 D277 L278 D279 D280 P281 E282 R283 G284 M285 I286 F287 V288 C289 S290 A291 T292 H293 K294 T295 K296 S297 M298 F299 F300

F301 L302 A303 Q304 T305 E306 Q307 G308 D309 I310 F311 K312 I313 T314 L315 E316 T317 D318 E319 D320 M321 V322 T323 E324 I325 R326 L327 K328 Y329 F330 D331 T332 V333 P334 V335 A336 A337 A338 M339 C340 V341 L342 K343 T344 G345 F346 L347 F348 V349 A350 S351 E352 F353 G354 N355 H356 Y357 L358 Y359 Q360

I361 A362 H363 L364 G365 D366 D367 D368 E369 E370 P371 E372 F373 S374 S375 A376 M377 P378 L379 E380 GLU GLY D383 T384 F385 F386 F387 Q388 P389 R390 P391 L392 K393 N394 L395 V396 L397 V398 D399 E400 L401 D402 S403 L404 S405 P406 I407 L408 F409 C410 Q411 I412 A413 D414 L415 A416 N417 E418 D419 T420

P421 Q422 L423 Y424 V425 A426 C427 G428 R429 G430 P431 R432 S433 S434 L435 R436 V437 L438 R439 HIS G441 L442 E443 V444 S445 E446 M447 A448 V449 S450 E451 L452 P453 G454 N455 P456 N457 A458 V459 W460 T461 V462 R463 R464 H465 I466 E467 D468 E469 F470 D471 A472 Y473 I474 I475 V476 S477 F478 V479 N480

A481 T482 L483 V484 L485 S486 I487 G488 E489 T490 V491 E492 E493 V494 T495 D496 S497 G498 F499 L500 G501 T502 T503 P504 T505 L506 S507 C508 S509 L510 L511 G512 D513 D514 A515 L516 V517 Q518 V519 Y520 P521 D522 G523 I524 R525 H526 I527 R528 A529 D530 K531 R532 V533 N534 E535 W536 K537 T538 P539 G540

K541 K542 T543 I544 V545 K546 C547 A548 V549 N550 Q551 R552 Q553 V554 V555 I556 A557 L558 T559 G560 G561 E562 L563 V564 Y565 F566 E567 M568 D569 P570 S571 G572 Q573 L574 N575 E576 Y577 T578 E579 R580 K581 E582 M583 S584 A585 D586 V587 V588 C589 M590 S591 L592 A593 N594 V595 P596 P597 G598 E599 Q600

R601 S602 R603 F604 L605 A606 V607 G608 L609 V610 D611 N612 T613 V614 R615 I616 I617 S618 L619 D620 P621 S622 D623 G624 L625 Q626 P627 L628 S629 M630 Q631 A632 L633 P634 A635 Q636 P637 E638 S639 L640 C641 I642 V643 E644 M645 GLY GLY THR GLU LYS GLN ASP GLU LEU GLY GLU ARG GLY SER ILE

GLY F662 L663 Y664 L665 N666 I667 G668 L669 Q670 N671 G672 V673 L674 L675 R676 T677 V678 L679 D680 P681 V682 T683 G684 D685 L686 S687 D688 T689 R690 T691 ARG TYR LEU G695 S696 R697 P698 V699 K700 L701 F702 R703 V704 R705 M706 Q707 G708 Q709 E710 A711 V712 L713 A714 M715 S716 S717 R718 S719 W720

L721 S722 Y723 S724 Y725 Q726 S727 R728 F729 H730 L731 T732 P733 L734 S735 Y736 E737 T738 L739 E740 F741 A742 S743 G744 F745 A746 S747 E748 Q749 C750 P751 E752 G753 I754 V755 A756 I757 S758 T759 N760 T761 L762 R763 I764 L765 A766 L767 E768 K769 L770 G771 A772 V773 F774 N775 Q776 V777 A778 F779 P780

L781 Q782 Y783 T784 P785 R786 K787 F788 V789 I790 H791 F792 E793 S794 N795 N796 L797 T798 I799 I800 E801 T802 D803 H804 N805 A806 Y807 T808 E809 A810 T811 K812 A813 Q814 R815 K816 Q817 Q818 M819 A820 E821 E822 M823 V824 E825 A826 A827 GLY GLU ASP GLU ARG GLU L834 A835 A836 E837 M838 A839 A840

A841 F842 L843 N844 E845 N846 L847 P848 E849 S850 I851 F852 G853 A854 P855 K856 A857 C858 N859 G860 Q861 W862 A863 S864 V865 I866 R867 V868 M869 N870 P871 I872 Q873 G874 N875 T876 L877 D878 L879 V880 Q881 L882 E883 Q884 N885 E886 A887 A888 F889 S890 V891 A892 V893 C894 R895 F896 S897 N898 T899 G900

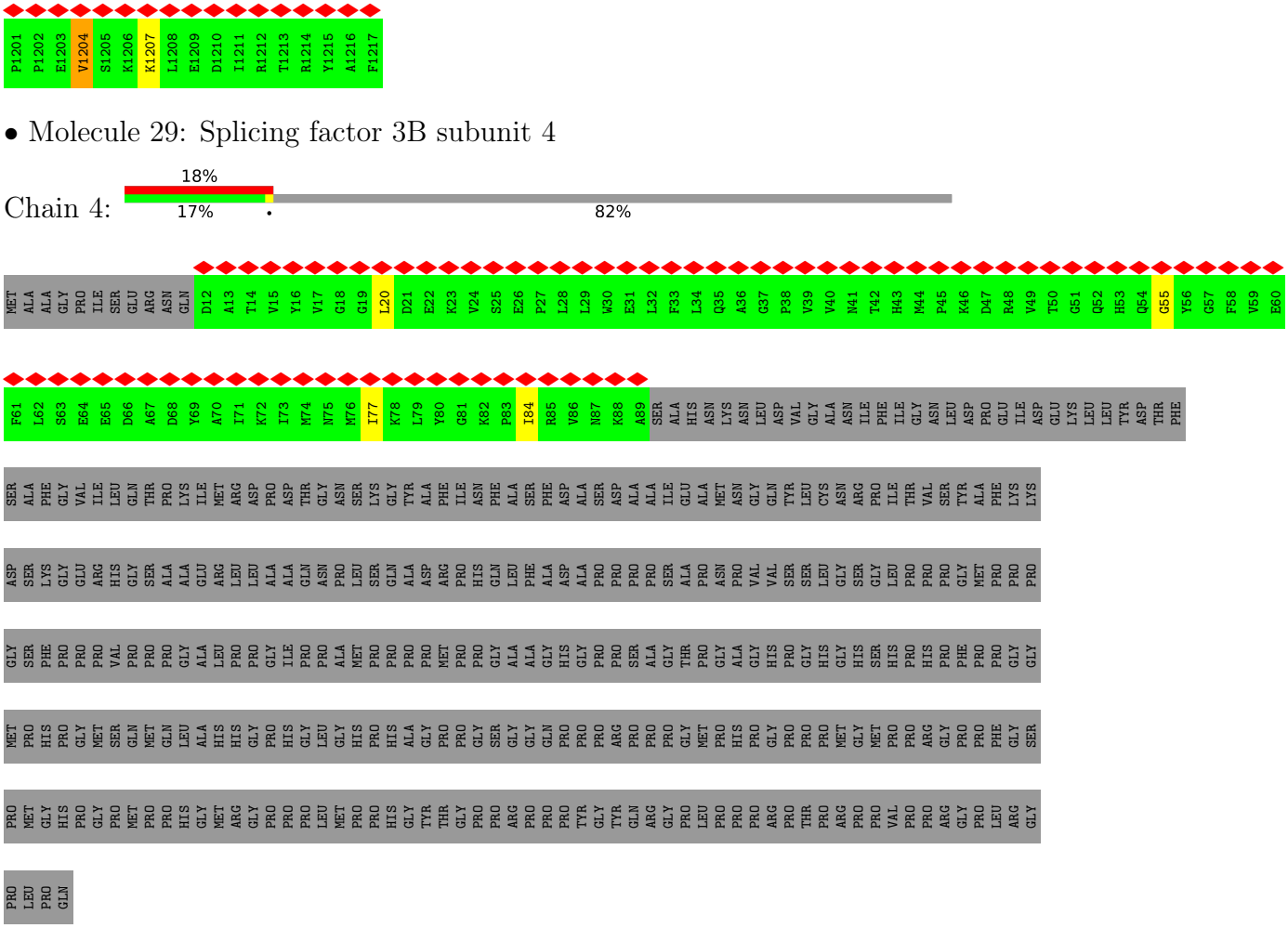
E901 D902 W903 Y904 V905 L906 V907 G908 V909 A910 K911 D912 L913 I914 L915 N916 P917 R918 S919 V920 A921 G922 G923 F924 V925 Y926 T927 Y928 K929 L930 V931 N932 N933 G934 E935 K936 L937 E938 F939 L940 H941 K942 T943 P944 V945 E946 E947 V948 P949 A950 A951 I952 A953 P954 F955 Q956 G957 R958 V959 L960

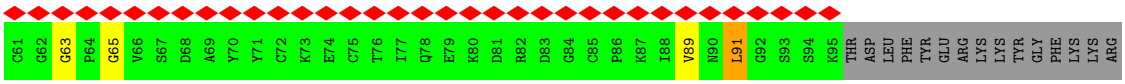
I961 G962 V963 G964 K965 L966 L967 R968 V969 Y970 D971 L972 G973 K974 K975 K976 L977 L978 R979 K980 C981 E982 N983 K984 H985 I986 A987 N988 Y989 I990 S991 G992 I993 Q994 T995 I996 G997 H998 R999 V1000 I1001 V1002 S1003 D1004 V1005 Q1006 E1007 S1008 F1009 I1010 W1011 V1012 R1013 Y1014 K1015 R1016 N1017 E1018 N1019 Q1020

L1021 I1022 I1023 F1024 A1025 D1026 D1027 T1028 Y1029 P1030 R1031 W1032 V1033 T1034 T1035 A1036 S1037 L1038 L1039 D1040 Y1041 D1042 T1043 V1044 A1045 G1046 A1047 D1048 K1049 F1050 G1051 N1052 I1053 C1054 V1055 V1056 R1057 L1058 P1059 P1060 N1061 T1062 N1063 D1064 E1065 V1066 D1067 GLU ASP PRO THR GLY ASN LYS ALA LEU TRP ASP ARG GLY

LEU LEU N1083 G1084 A1085 S1086 Q1087 K1088 A1089 E1090 V1091 I1092 M1093 N1094 Y1095 H1096 V1097 G1098 E1099 T1100 V1101 L1102 S1103 L1104 Q1105 K1106 T1107 T1108 L1109 I1110 P1111 G1112 G1113 S1114 E1115 S1116 L1117 V1118 Y1119 T1120 T1121 L1122 S1123 G1124 G1125 I1126 G1127 I1128 L1129 V1130 P1131 F1132 T1133 S1134 H1135 E1136 D1137 H1138 D1139 F1140

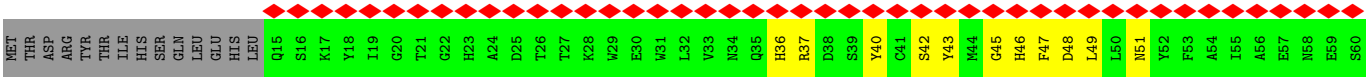
F1141 Q1142 H1143 V1144 E1145 M1146 H1147 L1148 R1149 S1150 E1151 H1152 P1153 P1154 L1155 C1156 G1157 R1158 D1159 H1160 L1161 S1162 F1163 R1164 S1165 Y1166 Y1167 F1168 P1169 V1170 K1171 N1172 V1173 I1174 D1175 G1176 D1177 L1178 C1179 E1180 Q1181 F1182 N1183 S1184 M1185 E1186 P1187 N1188 K1189 Q1190 K1191 N1192 V1193 S1194 E1195 E1196 L1197 D1198 R1199 T1200

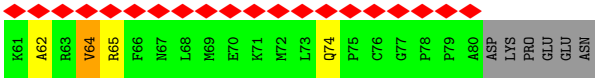

P1201 P1202 E1203 V1204 S1205 K1206 K1207 L1208 E1209 D1210 I1211 R1212 T1213 R1214 Y1215 A1216 F1217
• Molecule 29: Splicing factor 3B subunit 4
Chain 4:
18%
17%
82%
MET ALA ALA GLY PRO ILE SER GLU ARG ASN GLN D12 A13 T14 V15 Y16 V17 G18 G19 L20 D21 E22 K23 V24 S25 E26 P27 L28 L29 W30 E31 L32 F33 L34 Q35 A36 G37 P38 V39 V40 N41 T42 H43 M44 P45 K46 D47 R48 V49 T50 G51 Q52 H53 Q54 G55 Y56 G57 F58 V59 E60
F61 L62 S63 E64 E65 D66 A67 D68 Y69 A70 I71 K72 I73 M74 N75 M76 I77 K78 L79 Y80 G81 K82 P83 I84 R85 V86 N87 K88 A89 SER ALA HIS ASN LYS ASN LEU ASP VAL GLY ALA ASN ILE PHE ILE GLY ASN LEU ASP PRO GLU ILE ASP GLU LYS LEU LEU TYR ASP THR PHE
SER ALA PHE GLY VAL ILE LEU GLN THR PRO LYS ILE MET ARG ASP PRO ASP THR GLY ASN SER LYS GLY TYR ALA PHE ILE ASN PHE ALA SER PHE ASP ALA SER ASP ALA ALA ILE GLU ALA MET ASN GLY GLN TYR LEU CYS ASN ARG PRO ILE THR VAL SER TYR ALA PHE LYS LYS
ASP SER LYS GLY GLU ARG HIS GLY SER ALA ALA GLU ARG LEU LEU ALA ALA GLN ASN PRO LEU SER GLN ALA ASP ARG PRO HIS GLN LEU PHE ALA ASP ALA PRO PRO PRO SER ALA PRO ASN PRO VAL VAL SER SER LEU GLY SER GLY LEU PRO PRO GLY MET PRO PRO PRO
GLY SER PHE PRO PRO PRO VAL PRO PRO PRO GLY ALA LEU PRO PRO GLY ILE PRO PRO ALA MET PRO PRO PRO PRO MET PRO PRO GLY ALA ALA GLY HIS GLY PRO PRO SER ALA GLY THR PRO GLY ALA GLY HIS PRO GLY HIS GLY HIS SER HIS PRO HIS PRO PHE PRO PRO GLY GLY
MET PRO HIS PRO GLY MET SER GLN MET GLN LEU ALA HIS HIS GLY PRO HIS GLY LEU GLY HIS PRO HIS ALA GLY PRO PRO GLY SER GLY GLY GLN PRO PRO PRO ARG PRO PRO PRO GLY MET PRO HIS PRO GLY PRO PRO PRO MET GLY MET PRO PRO ARG GLY PRO PRO PHE GLY SER
PRO MET GLY HIS PRO GLY PRO MET PRO PRO HIS GLY MET ARG GLY PRO PRO PRO LEU MET PRO PRO HIS GLY TYR THR GLY PRO PRO ARG PRO PRO PRO TYR GLY TYR GLN ARG GLY PRO LEU PRO PRO PRO ARG PRO THR PRO ARG PRO PRO VAL PRO PRO ARG GLY PRO LEU ARG GLY
PRO LEU PRO GLN
• Molecule 30: Splicing factor 3B subunit 6
Chain 5:
86%
75%
11%
14%
MET ALA MET GLN ALA ALA LYS ARG ALA ASN ILE R12 L13 P14 P15 E16 V17 N18 R19 I20 L21 Y22 I23 R24 N25 L26 P27 Y28 K29 I30 T31 A32 E33 E34 M35 Y36 D37 I38 F39 G40 K41 Y42 G43 P44 I45 R46 Q47 I48 R49 V50 G51 N52 T53 P54 E55 T56 R57 G58 T59 A60
Y61 V62 V63 Y64 E65 D66 I67 F68 D69 A70 K71 N72 A73 C74 D75 H76 L77 S78 G79 F80 N81 V82 C83 N84 R85 Y86 L87 V88 V89 L90 Y91 Y92 N93 A94 N95 R96 A97 F98 Q99 K100 M101 D102 T103 K104 K105 K106 E107 E108 Q109 L110 K111 L112 L113 K114 E115 K116 Y117 G118 I119 ASN
THR ASP PRO PRO LYS
• Molecule 31: PHD finger-like domain-containing protein 5A
Chain 6:
81%
72%
8%
19%
MET ALA LYS HIS HIS PRO D7 L8 I9 F10 C11 R12 K13 Q14 A15 G16 V17 A18 I19 G20 R21 L22 C23 E24 K25 C26 D27 G28 K29 C30 V31 I32 C33 D34 S35 Y36 V37 R38 P39 C40 T41 L42 V43 R44 I45 C46 D47 E48 C49 N50 Y51 G52 S53 Y54 Q55 G56 R57 C58 V59 I60



• Molecule 32: Splicing factor 3B subunit 5

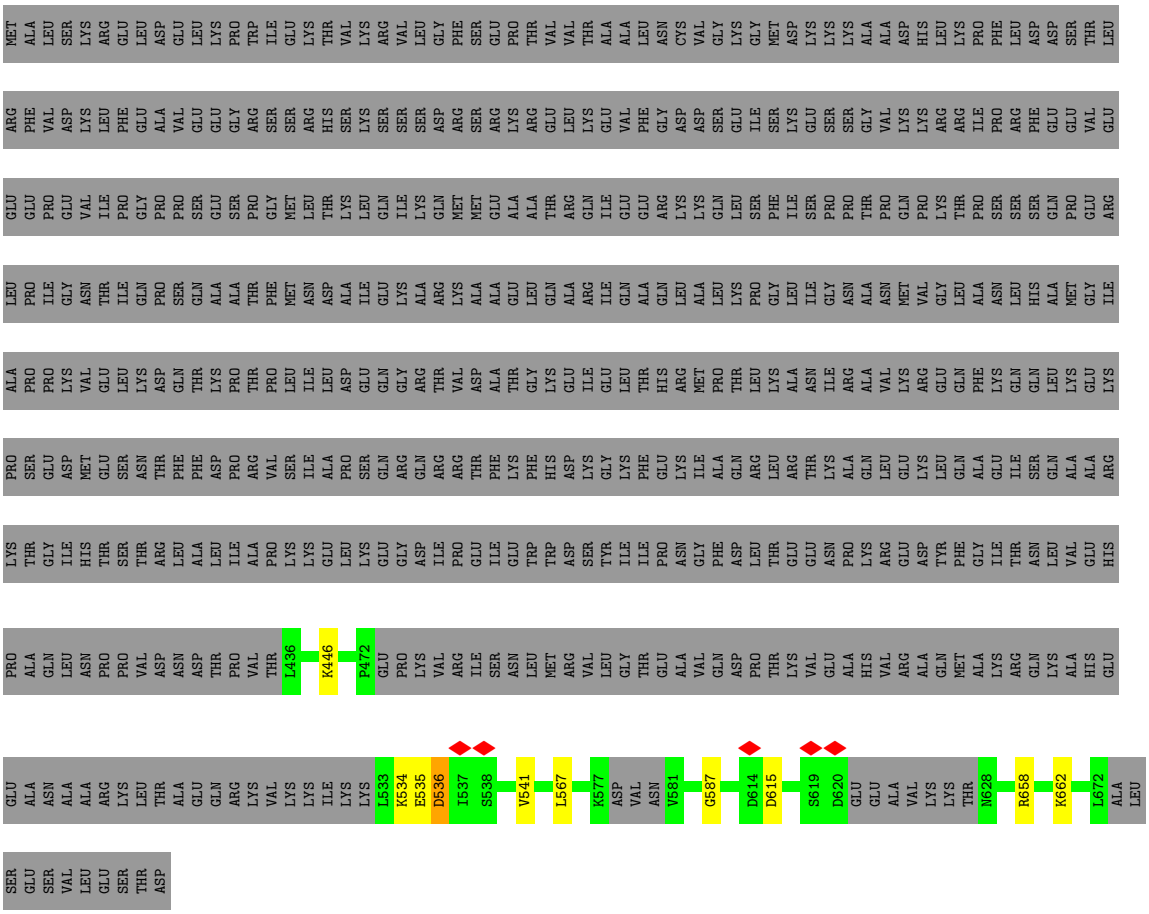
Chain 7:





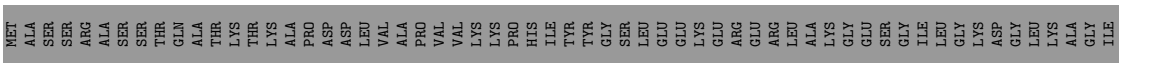
• Molecule 33: U4/U6 small nuclear ribonucleoprotein Prp3

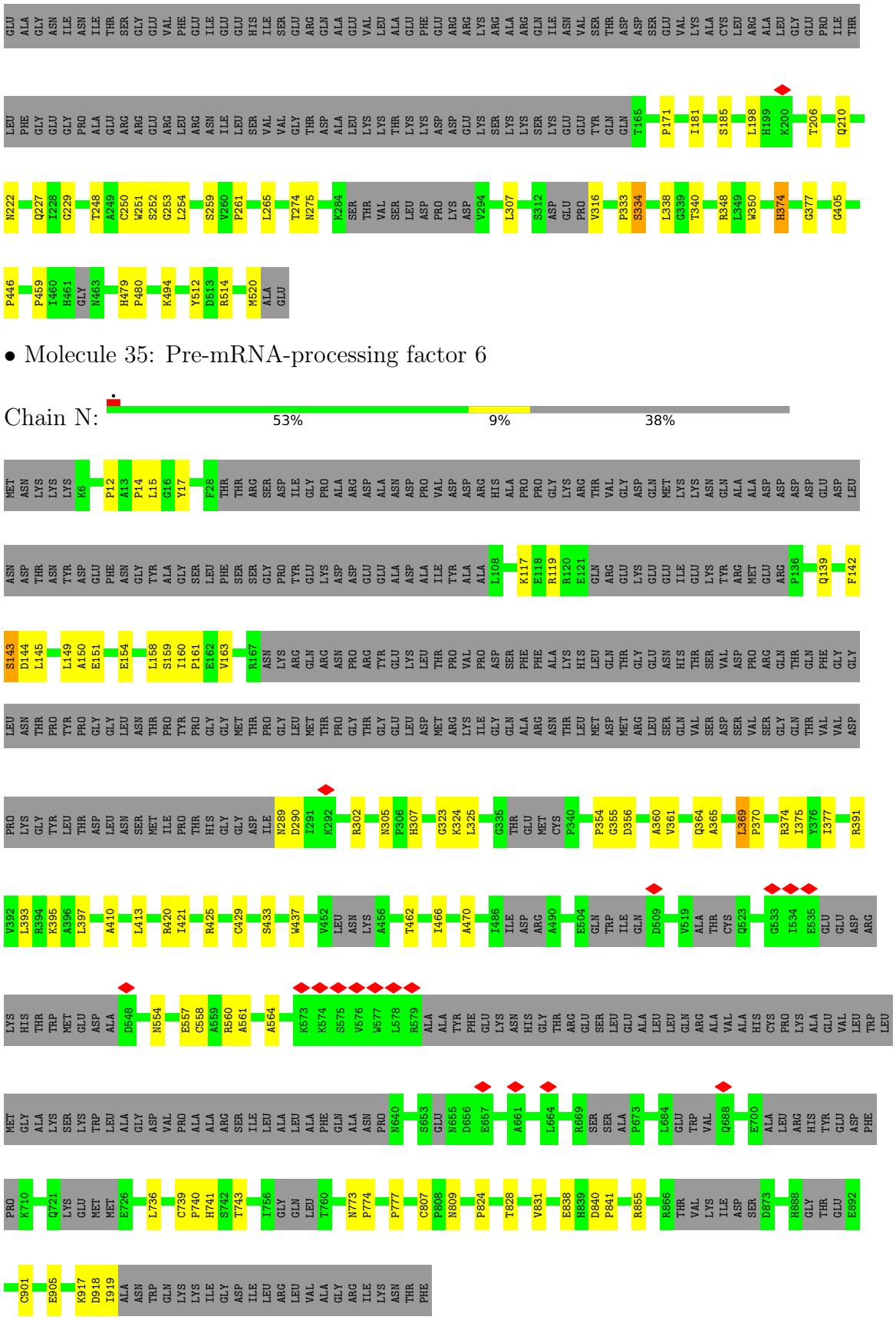
Chain J:



• Molecule 34: U4/U6 small nuclear ribonucleoprotein Prp4

Chain K:



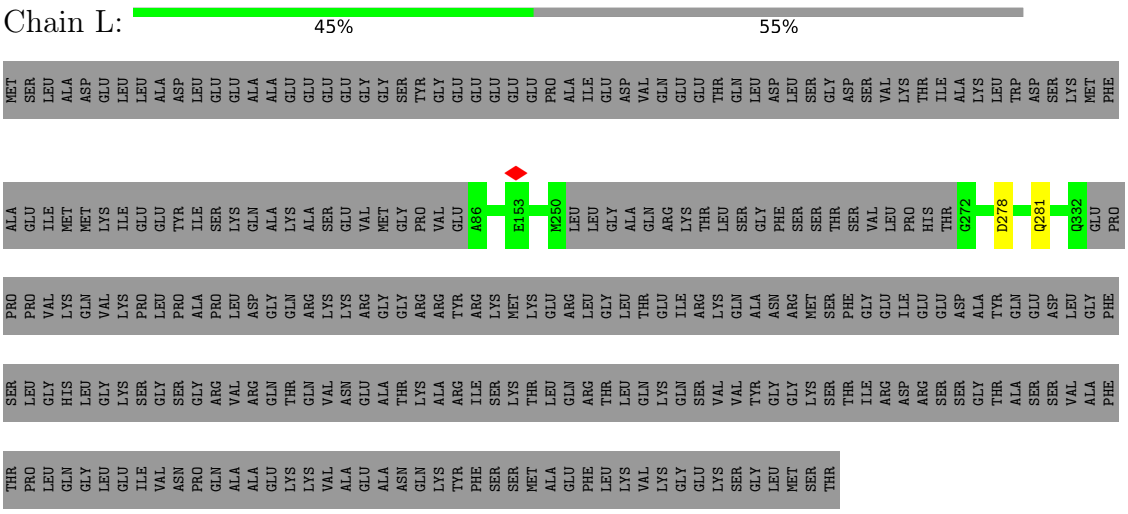


- Molecule 35: Pre-mRNA-processing factor 6

Chain N: 53% 9% 38%

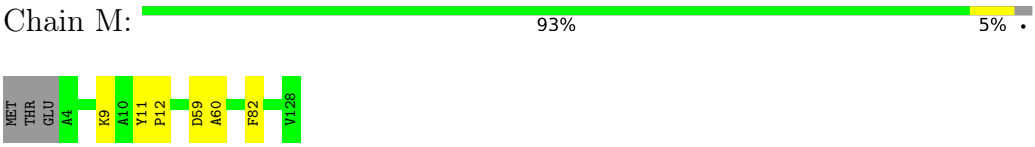
- Molecule 36: U4/U6 small nuclear ribonucleoprotein Prp31

Chain L:



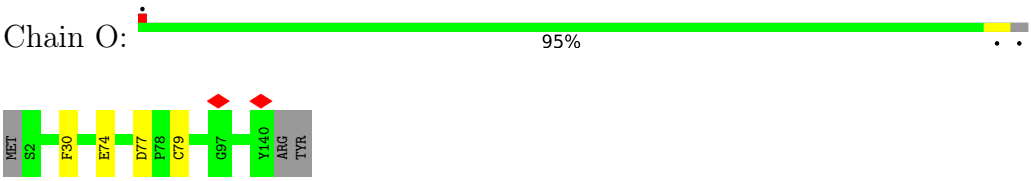
- Molecule 37: NHP2-like protein 1

Chain M:



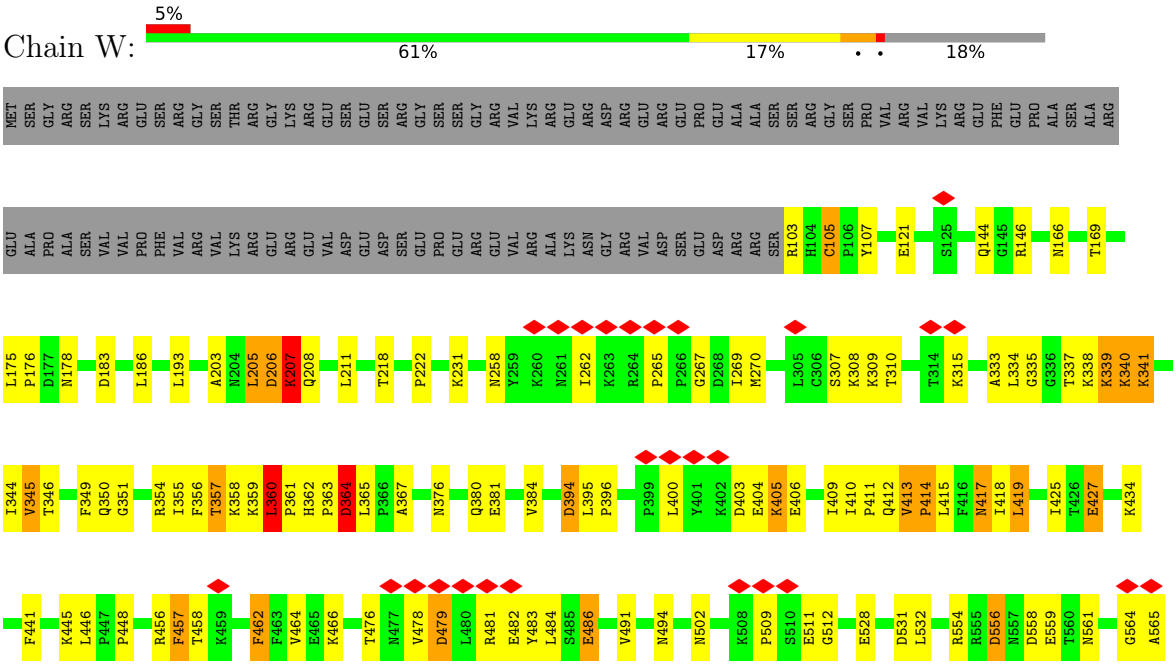
- Molecule 38: Thioredoxin-like protein 4A

Chain O:



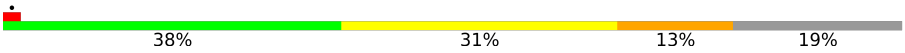
- Molecule 39: U4/U6.U5 tri-snRNP-associated protein 2

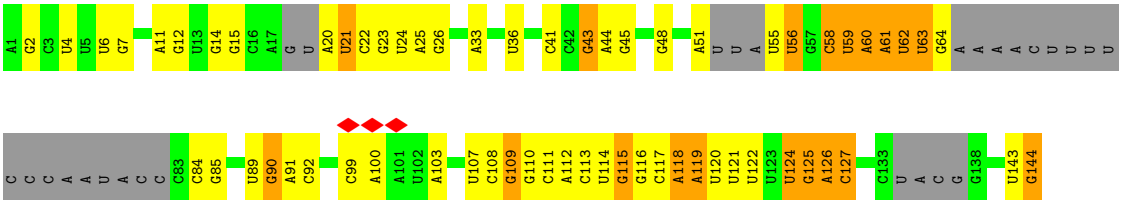
Chain W:



- Molecule 40: U4snRNA

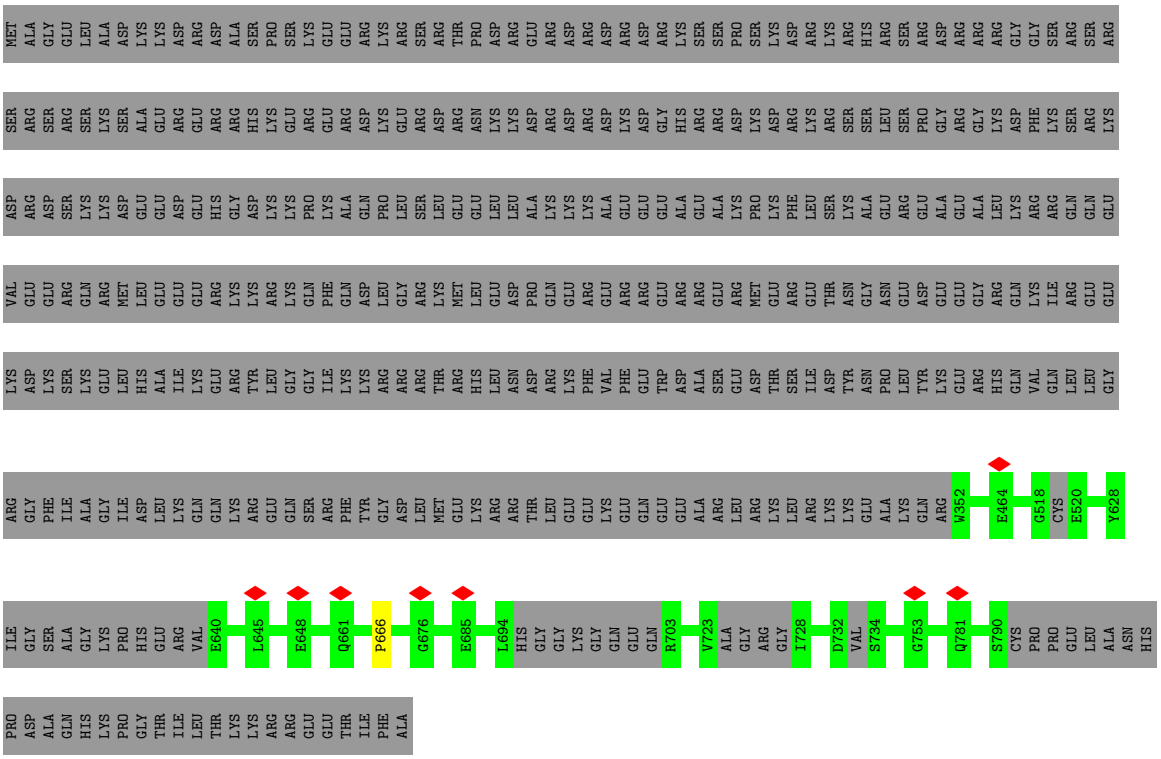
Chain I:





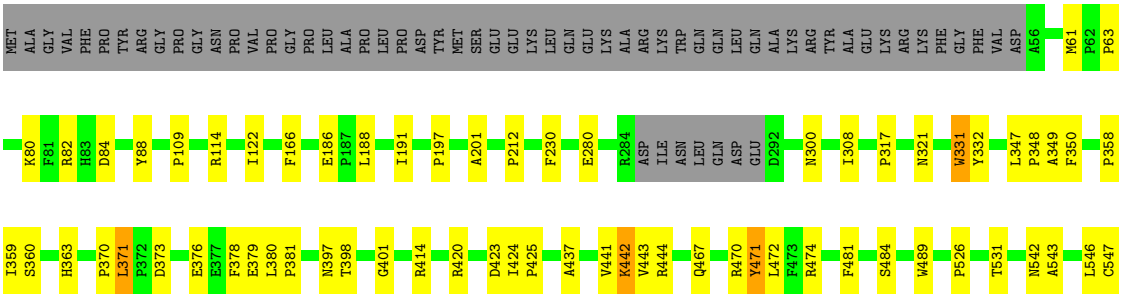
- Molecule 41: Probable ATP-dependent RNA helicase DDX23

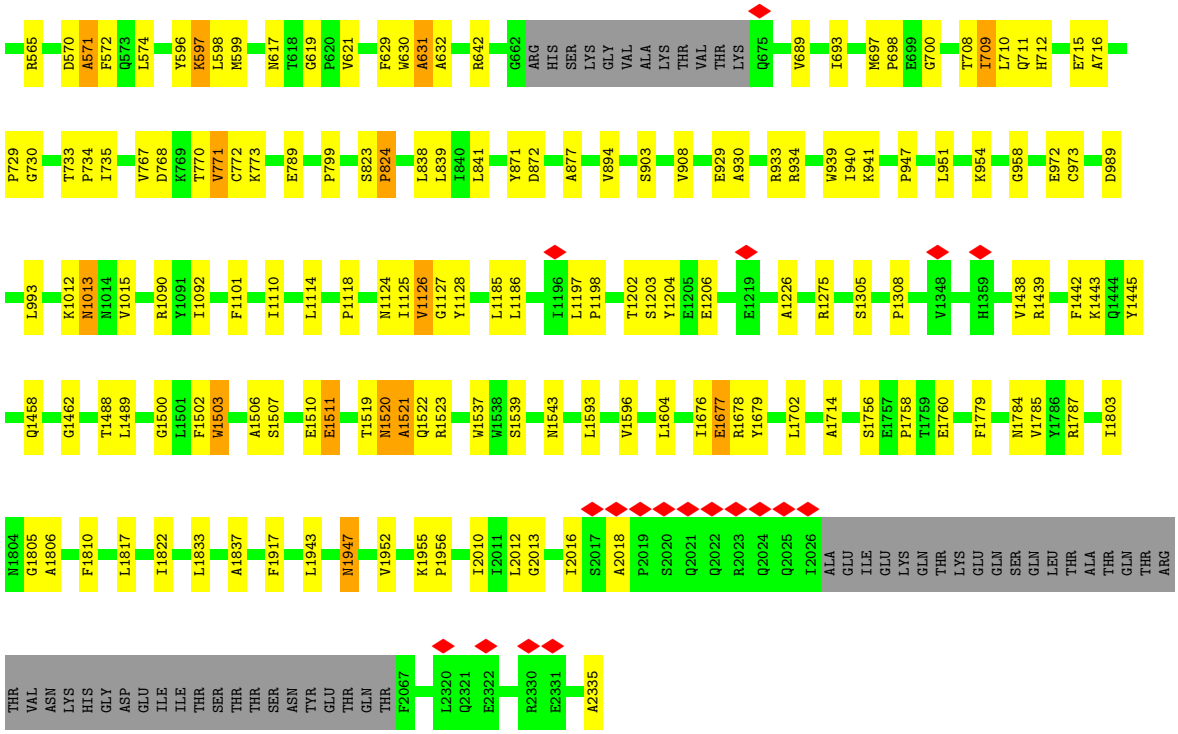
Chain X:



- Molecule 42: Pre-mRNA-processing-splicing factor 8

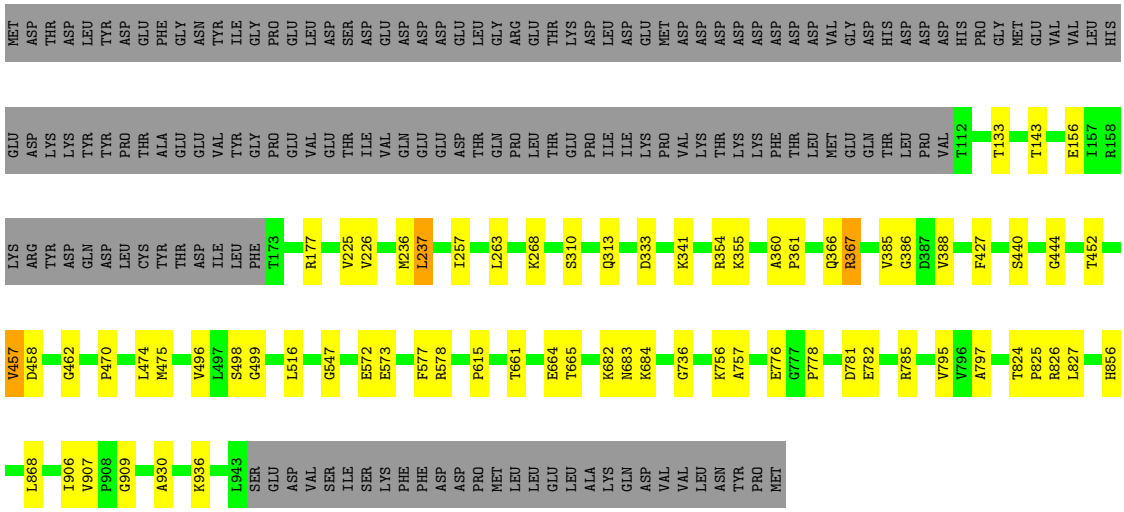
Chain A:





- Molecule 43: 116 kDa U5 small nuclear ribonucleoprotein component

Chain C:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	186162	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 ($e^-/Å^2$)	45	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.116	Depositor
Minimum map value	-0.035	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	535.2, 535.2, 535.2	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.338, 1.338, 1.338	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: GTP, IHP, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
1	B	0.18	0/2697	0.76	0/4193
2	D	0.32	0/7493	0.57	0/9361
3	E	0.67	0/1195	0.71	0/1492
4	P	0.23	0/298	0.48	0/370
4	a	0.23	0/316	0.48	0/392
4	k	0.70	0/338	0.73	0/419
5	Q	0.24	0/291	0.49	0/363
5	b	0.24	0/299	0.49	0/373
5	m	0.78	0/295	0.76	0/367
6	R	0.22	0/313	0.49	0/390
6	c	0.22	0/313	0.49	0/390
6	l	0.63	0/315	0.75	0/392
7	S	0.24	0/297	0.51	0/371
7	d	0.24	0/281	0.52	0/351
7	n	0.55	0/270	0.63	0/334
8	T	0.23	0/287	0.49	0/358
8	e	0.23	0/317	0.52	0/396
8	h	0.47	0/318	0.56	0/394
9	U	0.22	0/254	0.48	0/314
9	f	0.23	0/258	0.48	0/320
9	i	0.47	0/290	0.65	0/359
10	V	0.22	0/333	0.47	0/416
10	g	0.22	0/378	0.46	0/471
10	j	0.56	0/327	0.68	0/407
11	F	0.26	0/1639	0.72	0/2545
12	q	0.42	0/359	0.67	0/447
13	r	0.46	0/298	0.77	0/369
14	s	0.34	0/294	0.61	0/364
15	t	0.42	0/298	0.57	0/369
16	x	0.43	0/279	0.66	0/347
17	y	0.38	0/258	0.61	0/319
18	z	0.42	0/242	0.65	0/299

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
19	G	0.62	2/954 (0.2%)	0.87	0/1477
20	H	0.77	11/2576 (0.4%)	1.24	32/4003 (0.8%)
21	o	0.63	0/647	1.42	0/807
22	p	0.62	0/375	1.20	0/467
23	u	0.22	0/493	0.42	0/611
24	v	0.23	0/392	0.55	0/483
25	w	0.24	0/1767	0.46	0/2199
26	1	1.03	4/4112 (0.1%)	0.81	0/5126
27	2	0.72	0/738	0.72	0/912
28	3	0.85	0/4689	0.76	0/5849
29	4	0.66	0/311	0.70	0/387
30	5	0.77	0/431	0.77	0/537
31	6	0.75	0/355	0.70	0/442
32	7	1.01	0/263	0.77	0/327
33	J	0.68	0/664	0.66	0/823
34	K	0.73	0/1367	0.79	0/1702
35	N	0.55	0/2297	0.68	1/2838 (0.0%)
36	L	0.34	0/902	0.51	0/1124
37	M	0.38	0/499	0.62	0/622
38	O	0.74	0/555	0.73	0/692
39	W	0.50	0/1851	1.16	7/2312 (0.3%)
40	I	0.23	1/2779 (0.0%)	0.70	0/4319
41	X	0.43	0/1655	0.56	0/2062
42	A	0.62	2/8880 (0.0%)	0.72	2/11093 (0.0%)
43	C	0.65	1/3270 (0.0%)	0.73	0/4084
All	All	0.59	21/64262 (0.0%)	0.75	42/83350 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	D	0	1
4	k	0	1
16	x	0	1
25	w	0	1
26	1	0	15
27	2	0	2
28	3	0	13
30	5	0	1
31	6	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
32	7	0	1
34	K	0	1
35	N	0	6
39	W	0	62
43	C	0	1
All	All	0	108

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
42	A	597	LYS	C-N	10.75	1.58	1.34
20	H	142	C	C1'-N1	7.31	1.59	1.48
26	1	1243	PRO	N-CA	-7.12	1.35	1.47
42	A	877	ALA	C-N	7.10	1.50	1.34
20	H	182	U	C1'-N1	6.93	1.59	1.48
20	H	150	U	C1'-N1	6.69	1.58	1.48
20	H	151	C	C1'-N1	6.50	1.58	1.48
20	H	141	C	C1'-N1	6.43	1.58	1.48
20	H	148	C	C1'-N1	6.40	1.58	1.48
20	H	97	G	C1'-N9	-6.38	1.38	1.46
20	H	184	C	C1'-N1	6.38	1.58	1.48
26	1	719	TYR	C-O	-6.29	1.11	1.23
26	1	944	SER	N-CA	-5.69	1.34	1.46
40	I	63	U	C1'-N1	5.68	1.57	1.48
26	1	718	PRO	CA-C	-5.58	1.41	1.52
20	H	48	A	C1'-N9	-5.49	1.39	1.46
19	G	131	U	C1'-N1	5.47	1.56	1.48
20	H	65	U	C1'-N1	5.45	1.56	1.48
43	C	661	THR	C-N	-5.12	1.22	1.34
19	G	122	U	C1'-N1	5.09	1.56	1.48
20	H	110	A	C1'-N9	-5.06	1.39	1.46

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
20	H	162	U	N3-C2-O2	-9.04	115.88	122.20
20	H	169	C	P-O3'-C3'	8.24	129.58	119.70
35	N	369	LEU	C-N-CA	-8.00	88.41	122.00
42	A	877	ALA	O-C-N	7.84	135.24	122.70
20	H	114	A	OP2-P-O3'	7.27	121.19	105.20
20	H	149	A	OP2-P-O3'	7.26	121.18	105.20
20	H	183	G	OP2-P-O3'	7.24	121.12	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
20	H	181	G	OP2-P-O3'	7.23	121.10	105.20
20	H	141	C	OP2-P-O3'	7.22	121.08	105.20
20	H	113	G	OP2-P-O3'	7.21	121.07	105.20
20	H	182	U	OP2-P-O3'	7.19	121.02	105.20
20	H	148	C	OP2-P-O3'	7.18	121.00	105.20
20	H	150	U	OP2-P-O3'	7.18	121.00	105.20
20	H	149	A	O3'-P-O5'	-6.86	90.97	104.00
20	H	155	C	P-O3'-C3'	6.84	127.91	119.70
20	H	183	G	O3'-P-O5'	-6.82	91.05	104.00
20	H	182	U	O3'-P-O5'	-6.80	91.08	104.00
20	H	141	C	O3'-P-O5'	-6.79	91.09	104.00
20	H	148	C	O3'-P-O5'	-6.79	91.11	104.00
20	H	113	G	O3'-P-O5'	-6.75	91.18	104.00
20	H	181	G	O3'-P-O5'	-6.75	91.18	104.00
20	H	114	A	O3'-P-O5'	-6.74	91.20	104.00
20	H	150	U	O3'-P-O5'	-6.72	91.23	104.00
39	W	354	ARG	O-C-N	6.56	133.19	122.70
39	W	427	GLU	N-CA-C	6.51	128.57	111.00
20	H	162	U	N1-C2-O2	6.20	127.14	122.80
42	A	877	ALA	CA-C-N	-5.99	104.01	117.20
20	H	172	C	P-O3'-C3'	5.80	126.66	119.70
39	W	457	PHE	N-CA-C	5.78	126.61	111.00
20	H	156	U	P-O3'-C3'	-5.78	112.77	119.70
39	W	457	PHE	C-N-CA	5.55	135.59	121.70
20	H	157	G	O4'-C1'-N9	-5.38	103.90	108.20
39	W	364	ASP	N-CA-C	5.33	125.40	111.00
20	H	156	U	OP2-P-O3'	5.28	116.83	105.20
20	H	160	A	P-O5'-C5'	-5.27	112.47	120.90
20	H	170	C	N3-C4-C5	-5.18	119.83	121.90
39	W	394	ASP	C-N-CA	5.17	134.63	121.70
20	H	170	C	O4'-C1'-C2'	-5.16	100.64	105.80
20	H	162	U	C2-N3-C4	-5.13	123.92	127.00
20	H	157	G	P-O5'-C5'	-5.10	112.75	120.90
39	W	427	GLU	C-N-CA	-5.09	108.98	121.70
20	H	156	U	C4'-C3'-C2'	5.01	107.61	102.60

There are no chirality outliers.

All (108) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
26	1	1025	LYS	Peptide
26	1	110	PRO	Peptide

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Mol	Chain	Res	Type	Group
26	1	1122	THR	Peptide
26	1	1127	THR	Peptide
26	1	1179	ASP	Peptide
26	1	1199	VAL	Peptide
26	1	220	GLN	Peptide
26	1	257	THR	Peptide
26	1	415	LEU	Peptide,Mainchain
26	1	545	GLU	Peptide
26	1	689	ILE	Peptide
26	1	717	THR	Peptide
26	1	941	ASN	Peptide
26	1	944	SER	Peptide
27	2	553	MET	Peptide
27	2	558	ARG	Peptide
28	3	261	PHE	Peptide
28	3	366	ASP	Peptide
28	3	468	ASP	Peptide
28	3	530	ASP	Peptide
28	3	534	ASN	Peptide
28	3	552	ARG	Peptide
28	3	670	GLN	Peptide
28	3	678	VAL	Peptide
28	3	74	THR	Peptide
28	3	885	ASN	Peptide
28	3	916	ASN	Peptide
28	3	980	LYS	Peptide
28	3	986	ILE	Peptide
30	5	29	LYS	Peptide
31	6	89	VAL	Peptide
31	6	91	LEU	Peptide
32	7	74	GLN	Peptide
43	C	736	GLY	Peptide
2	D	430	LEU	Peptide
34	K	374	HIS	Peptide
35	N	14	PRO	Peptide
35	N	773	ASN	Peptide,Mainchain
35	N	807	CYS	Peptide,Mainchain
35	N	838	GLU	Peptide
39	W	103	ARG	Peptide,Mainchain
39	W	105	CYS	Peptide
39	W	121	GLU	Peptide
39	W	144	GLN	Peptide

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Mol	Chain	Res	Type	Group
39	W	175	LEU	Peptide
39	W	193	LEU	Peptide
39	W	203	ALA	Peptide
39	W	205	LEU	Peptide
39	W	206	ASP	Peptide
39	W	207	LYS	Peptide
39	W	218	THR	Peptide
39	W	258	ASN	Peptide
39	W	267	GLY	Peptide
39	W	269	ILE	Peptide
39	W	270	MET	Peptide
39	W	308	LYS	Peptide
39	W	309	LYS	Peptide
39	W	310	THR	Peptide
39	W	315	LYS	Peptide
39	W	333	ALA	Peptide
39	W	346	THR	Peptide
39	W	356	PHE	Peptide
39	W	357	THR	Peptide
39	W	360	LEU	Peptide
39	W	362	HIS	Peptide
39	W	363	PRO	Peptide
39	W	364	ASP	Peptide
39	W	381	GLU	Peptide
39	W	384	VAL	Peptide
39	W	396	PRO	Peptide
39	W	403	ASP	Peptide
39	W	404	GLU	Peptide
39	W	405	LYS	Peptide
39	W	409	ILE	Peptide
39	W	412	GLN	Peptide
39	W	413	VAL	Peptide
39	W	414	PRO	Peptide
39	W	417	ASN	Peptide
39	W	419	LEU	Peptide
39	W	445	LYS	Peptide
39	W	446	LEU	Peptide
39	W	448	PRO	Peptide
39	W	456	ARG	Peptide
39	W	462	PHE	Peptide
39	W	464	VAL	Peptide
39	W	476	THR	Peptide

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Mol	Chain	Res	Type	Group
39	W	478	VAL	Peptide
39	W	479	ASP	Peptide
39	W	481	ARG	Peptide
39	W	482	GLU	Peptide
39	W	483	TYR	Peptide
39	W	486	GLU	Peptide
39	W	494	ASN	Peptide
39	W	511	GLU	Peptide
39	W	512	GLY	Peptide
39	W	528	GLU	Peptide
39	W	554	ARG	Peptide
39	W	556	ASP	Peptide
39	W	558	ASP	Peptide
39	W	559	GLU	Peptide
39	W	561	ASN	Peptide
4	k	112	ASN	Peptide
25	w	443	THR	Peptide
16	x	51	TYR	Peptide

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	B	2419	0	1224	60	0
2	D	7496	0	1961	18	0
3	E	1196	0	337	2	0
4	P	300	0	80	9	0
4	a	318	0	86	0	0
4	k	340	0	87	0	0
5	Q	292	0	93	1	0
5	b	300	0	95	0	0
5	m	296	0	87	0	0
6	R	314	0	86	0	0
6	c	314	0	86	0	0
6	l	316	0	85	0	0
7	S	298	0	89	1	0
7	d	282	0	85	0	0
7	n	272	0	75	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	T	288	0	84	0	0
8	e	318	0	92	0	0
8	h	320	0	88	0	0
9	U	256	0	70	3	0
9	f	260	0	74	0	0
9	i	292	0	80	0	0
10	V	334	0	92	16	0
10	g	380	0	103	0	0
10	j	328	0	89	0	0
11	F	1470	0	745	49	0
12	q	360	0	95	0	0
13	r	300	0	77	0	0
14	s	296	0	77	0	0
15	t	300	0	80	0	0
16	x	280	0	81	0	0
17	y	260	0	75	0	0
18	z	244	0	71	0	0
19	G	862	0	441	136	0
20	H	2311	0	1170	139	0
21	o	648	0	167	0	0
22	p	376	0	102	0	0
23	u	496	0	118	0	0
24	v	396	0	91	0	0
25	w	1773	0	477	0	0
26	1	4120	0	1091	171	0
27	2	744	0	189	5	0
28	3	4696	0	1266	59	0
29	4	312	0	87	2	0
30	5	432	0	114	7	0
31	6	356	0	105	5	0
32	7	264	0	70	9	0
33	J	668	0	179	8	0
34	K	1371	0	384	17	0
35	N	2316	0	581	45	0
36	L	904	0	235	1	0
37	M	500	0	128	4	0
38	O	556	0	147	1	0
39	W	1852	0	477	30	0
40	I	2491	0	1262	118	0
41	X	1661	0	440	0	0
42	A	8884	0	2283	148	0
43	C	3272	0	874	50	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	A	36	0	6	0	0
45	C	32	0	12	4	0
46	C	1	0	0	0	0
All	All	63369	0	19125	1003	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 13.

All (1003) 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)
19:G:145:U:C2'	19:G:146:C:H5"	1.54	1.37
33:J:536:ASP:CA	33:J:587:GLY:CA	2.11	1.28
43:C:470:PRO:CA	43:C:499:GLY:HA2	1.64	1.27
40:I:63:U:H2'	40:I:64:G:C8	1.69	1.26
33:J:536:ASP:CA	33:J:587:GLY:HA3	1.64	1.25
39:W:341:LYS:CA	39:W:359:LYS:H	1.51	1.24
19:G:135:G:N2	20:H:42:G:C4	2.07	1.21
19:G:153:C:H4'	19:G:154:U:OP1	1.42	1.18
19:G:145:U:C4	19:G:146:C:C5	2.32	1.18
19:G:137:C:O2'	19:G:138:A:H5'	1.45	1.15
19:G:149:G:C8	19:G:150:U:C5	2.34	1.15
33:J:536:ASP:CA	33:J:587:GLY:N	2.10	1.15
19:G:145:U:H2'	19:G:146:C:C5'	1.78	1.14
40:I:51:A:O2'	40:I:56:U:H5"	1.46	1.14
42:A:398:THR:CA	43:C:386:GLY:HA2	1.79	1.11
42:A:1458:GLN:O	42:A:1462:GLY:CA	1.99	1.11
20:H:156:U:H6	20:H:156:U:H5"	1.10	1.09
43:C:665:THR:O	43:C:826:ARG:CA	2.00	1.08
42:A:1833:LEU:O	42:A:1837:ALA:N	1.86	1.07
19:G:145:U:C3'	19:G:146:C:H5"	1.84	1.07
40:I:119:A:N3	4:P:103:GLY:O	1.87	1.06
19:G:145:U:O4	19:G:146:C:C4	2.09	1.06
34:K:250:CYS:N	34:K:253:GLY:O	1.88	1.06
42:A:1458:GLN:O	42:A:1462:GLY:N	1.88	1.05
40:I:126:A:N1	10:V:65:ILE:O	1.91	1.04
11:F:59:G:H1'	40:I:21:U:H4'	1.41	1.03
19:G:155:U:H4'	19:G:156:U:H5'	1.38	1.03
39:W:344:ILE:C	39:W:360:LEU:CA	2.26	1.03
19:G:149:G:C8	19:G:150:U:C4	2.47	1.02
11:F:59:G:H5'	40:I:22:C:H5"	1.36	1.02

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:G:145:U:H2'	19:G:146:C:H5"	1.03	1.01
19:G:135:G:N2	20:H:42:G:N3	2.06	1.01
33:J:536:ASP:CA	33:J:587:GLY:H	1.72	1.01
26:1:102:ASP:O	26:1:105:ALA:N	1.94	1.00
40:I:119:A:N3	4:P:103:GLY:C	2.14	1.00
19:G:145:U:C3'	19:G:146:C:C5'	2.39	0.99
40:I:60:A:H2'	40:I:61:A:H1'	1.40	0.99
35:N:901:CYS:O	35:N:905:GLU:CA	2.09	0.99
40:I:127:C:H1'	10:V:21:ASN:CA	1.91	0.99
40:I:58:C:O2'	40:I:59:U:C5'	2.10	0.99
40:I:91:A:H2	40:I:110:G:N2	1.61	0.99
19:G:146:C:C2	20:H:33:G:N1	2.32	0.97
19:G:135:G:N3	20:H:42:G:C2	2.33	0.97
42:A:1519:THR:O	42:A:1521:ALA:N	1.96	0.97
26:1:501:LEU:O	26:1:504:ILE:N	1.98	0.97
40:I:58:C:H2'	40:I:59:U:O5'	1.65	0.96
19:G:143:U:H6	19:G:143:U:H5'	1.30	0.96
42:A:1458:GLN:O	42:A:1462:GLY:HA2	1.64	0.96
19:G:146:C:C2	20:H:33:G:C6	2.53	0.96
34:K:251:TRP:O	34:K:275:ASN:CA	2.14	0.95
19:G:145:U:C2'	19:G:146:C:C5'	2.38	0.95
42:A:378:PHE:O	43:C:355:LYS:CA	2.14	0.95
39:W:345:VAL:N	39:W:360:LEU:N	2.15	0.95
43:C:776:GLU:O	43:C:781:ASP:C	2.06	0.94
35:N:901:CYS:O	35:N:905:GLU:N	2.01	0.94
11:F:71:G:H1	40:I:4:U:H3	0.98	0.94
34:K:494:LYS:O	34:K:512:TYR:N	2.01	0.94
20:H:156:U:H5"	20:H:156:U:C6	2.02	0.94
19:G:146:C:O2	20:H:33:G:C6	2.20	0.94
35:N:560:ARG:O	35:N:564:ALA:C	2.06	0.93
11:F:52:U:H5"	11:F:52:U:H6	1.34	0.93
19:G:135:G:C2	20:H:42:G:C2	2.57	0.93
35:N:354:PRO:O	35:N:356:ASP:N	2.02	0.92
40:I:51:A:HO2'	40:I:56:U:H5"	1.29	0.92
1:B:94:U:H1'	1:B:95:G:OP1	1.70	0.92
40:I:63:U:H2'	40:I:64:G:H8	1.13	0.91
1:B:12:U:H3	1:B:65:G:H1	1.12	0.91
42:A:1785:VAL:CA	42:A:1806:ALA:O	2.18	0.91
42:A:1676:ILE:O	42:A:1679:TYR:N	2.03	0.91
35:N:560:ARG:O	35:N:564:ALA:N	2.04	0.91
35:N:375:ILE:O	35:N:377:ILE:N	2.03	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:I:58:C:C2'	40:I:59:U:O5'	2.15	0.90
19:G:143:U:H5'	19:G:143:U:C6	2.06	0.90
39:W:341:LYS:CA	39:W:359:LYS:N	2.34	0.90
40:I:119:A:N3	4:P:103:GLY:CA	2.35	0.90
42:A:398:THR:CA	43:C:386:GLY:CA	2.49	0.89
19:G:149:G:N7	19:G:150:U:C4	2.40	0.89
26:1:793:LYS:O	26:1:797:GLY:HA3	1.72	0.89
42:A:711:GLN:O	42:A:715:GLU:N	2.05	0.89
19:G:155:U:O2'	19:G:156:U:OP2	1.89	0.89
42:A:379:GLU:O	43:C:355:LYS:N	2.07	0.88
42:A:109:PRO:O	42:A:191:ILE:N	2.06	0.88
42:A:1784:ASN:C	42:A:1806:ALA:O	2.12	0.88
19:G:145:U:H3'	19:G:146:C:C5'	2.04	0.88
42:A:941:LYS:N	42:A:1090:ARG:O	2.07	0.88
35:N:560:ARG:O	35:N:564:ALA:CA	2.23	0.86
40:I:58:C:O2'	40:I:59:U:H5'	1.73	0.86
20:H:154:C:O2	20:H:176:G:N2	2.07	0.86
11:F:59:G:H5'	40:I:22:C:C5'	2.05	0.86
42:A:1520:ASN:O	42:A:1523:ARG:N	2.08	0.86
35:N:160:ILE:CA	42:A:730:GLY:O	2.24	0.86
19:G:153:C:OP1	19:G:154:U:P	2.34	0.86
20:H:40:C:H5"	20:H:40:C:H6	1.39	0.86
40:I:63:U:C2'	40:I:64:G:H8	1.89	0.85
40:I:21:U:O2'	40:I:22:C:H5'	1.75	0.85
42:A:197:PRO:O	42:A:201:ALA:CA	2.24	0.85
20:H:156:U:H6	20:H:156:U:C5'	1.88	0.85
34:K:494:LYS:O	34:K:512:TYR:CA	2.25	0.85
26:1:728:LEU:O	26:1:731:LEU:N	2.10	0.84
42:A:733:THR:C	42:A:735:ILE:H	1.78	0.84
40:I:59:U:O2'	40:I:60:A:O5'	1.95	0.84
42:A:973:CYS:N	42:A:1101:PHE:O	2.11	0.83
19:G:137:C:HO2'	19:G:138:A:H5'	1.37	0.83
19:G:151:C:H1'	19:G:152:C:OP1	1.78	0.83
40:I:58:C:C2'	40:I:59:U:C5'	2.57	0.83
19:G:151:C:H4'	19:G:152:C:H5	1.44	0.83
42:A:1785:VAL:N	42:A:1806:ALA:O	2.11	0.82
40:I:62:U:H2'	40:I:63:U:H6	1.44	0.82
20:H:152:G:N2	20:H:153:A:N7	2.27	0.82
19:G:145:U:C5	19:G:146:C:C5	2.66	0.82
19:G:146:C:O2	20:H:33:G:N1	2.13	0.82
26:1:406:ALA:O	30:5:98:PHE:CA	2.28	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:H:152:G:H5"	20:H:153:A:OP2	1.80	0.82
19:G:135:G:C2	20:H:42:G:C4	2.68	0.81
26:1:648:LEU:O	26:1:651:VAL:N	2.13	0.81
40:I:59:U:HO2'	40:I:60:A:P	2.02	0.81
43:C:470:PRO:CA	43:C:499:GLY:CA	2.54	0.81
19:G:145:U:C4	19:G:146:C:C4	2.63	0.81
40:I:108:C:O2'	40:I:109:G:H5'	1.81	0.81
29:4:77:ILE:O	29:4:84:ILE:N	2.14	0.81
35:N:142:PHE:O	35:N:145:LEU:N	2.14	0.81
31:6:56:GLY:O	31:6:65:GLY:N	2.12	0.81
42:A:929:GLU:O	42:A:933:ARG:N	2.13	0.81
19:G:149:G:C2	19:G:150:U:H2'	2.16	0.80
20:H:165:A:O2'	20:H:166:G:H5'	1.81	0.80
19:G:149:G:N9	19:G:150:U:C5	2.49	0.80
43:C:827:LEU:O	43:C:906:ILE:CA	2.30	0.80
42:A:712:HIS:O	42:A:716:ALA:N	2.13	0.80
40:I:119:A:C2	4:P:103:GLY:O	2.34	0.80
2:D:570:THR:CA	42:A:2335:ALA:O	2.29	0.80
39:W:334:LEU:C	39:W:340:LYS:CA	2.50	0.80
28:3:523:GLY:HA3	28:3:536:TRP:O	1.83	0.79
39:W:345:VAL:N	39:W:360:LEU:H	1.81	0.79
42:A:973:CYS:O	42:A:1101:PHE:N	2.13	0.79
1:B:17:U:H3	1:B:60:G:H1	0.83	0.79
11:F:52:U:H5"	11:F:52:U:C6	2.17	0.79
19:G:147:C:O2	20:H:31:G:N1	2.11	0.79
20:H:177:A:H5"	20:H:178:A:OP1	1.84	0.78
26:1:669:GLN:O	26:1:672:ALA:N	2.16	0.78
11:F:59:G:H4'	40:I:22:C:OP1	1.84	0.78
19:G:149:G:H2'	19:G:150:U:C6	2.19	0.77
26:1:428:ALA:O	26:1:432:THR:N	2.17	0.77
19:G:146:C:H1'	20:H:33:G:N2	1.99	0.77
20:H:101:U:H5"	20:H:102:U:H5'	1.64	0.77
19:G:151:C:H4'	19:G:152:C:C5	2.18	0.77
11:F:59:G:C1'	40:I:21:U:H4'	2.14	0.77
28:3:839:ALA:O	28:3:843:LEU:N	2.13	0.77
19:G:146:C:O2	20:H:33:G:C2	2.37	0.77
19:G:145:U:H3	20:H:33:G:H1	1.33	0.77
19:G:155:U:H4'	19:G:156:U:C5'	2.13	0.77
42:A:908:VAL:CA	42:A:1445:TYR:O	2.33	0.77
19:G:146:C:H1'	20:H:33:G:C2	2.20	0.76
19:G:135:G:C2	20:H:42:G:N3	2.52	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:I:58:C:H2'	40:I:59:U:C5'	2.14	0.76
42:A:1125:ILE:O	42:A:1126:VAL:C	2.24	0.76
11:F:52:U:H6	11:F:52:U:C5'	1.97	0.76
26:1:102:ASP:O	26:1:105:ALA:CA	2.34	0.76
19:G:132:G:H1	20:H:44:U:H3	1.33	0.76
20:H:143:A:H3'	20:H:143:A:N3	2.01	0.76
20:H:153:A:H2'	20:H:154:C:H5'	1.65	0.76
40:I:62:U:H2'	40:I:63:U:C6	2.21	0.76
11:F:102:A:H2'	11:F:103:U:H5'	1.68	0.76
43:C:683:ASN:CA	43:C:795:VAL:O	2.34	0.76
42:A:630:TRP:O	42:A:632:ALA:N	2.18	0.76
19:G:149:G:H3'	19:G:150:U:H5"	1.67	0.76
26:1:1016:LEU:O	26:1:1019:ARG:N	2.19	0.76
39:W:340:LYS:O	39:W:358:LYS:CA	2.34	0.75
42:A:708:THR:O	42:A:711:GLN:N	2.19	0.75
11:F:59:G:C5'	40:I:22:C:H5"	2.15	0.75
2:D:282:SER:O	2:D:286:ALA:N	2.18	0.75
40:I:91:A:H2	40:I:110:G:H22	0.83	0.75
42:A:1702:LEU:O	42:A:1714:ALA:CA	2.34	0.75
19:G:149:G:H2'	19:G:150:U:H6	1.52	0.75
40:I:126:A:H2	10:V:64:ASN:O	1.70	0.75
26:1:1246:MET:O	26:1:1249:TYR:N	2.18	0.74
42:A:1833:LEU:O	42:A:1837:ALA:CA	2.36	0.74
26:1:874:LYS:O	26:1:877:GLY:N	2.20	0.74
1:B:48:A:P	42:A:280:GLU:H	2.11	0.74
1:B:95:G:H5'	1:B:96:A:OP2	1.87	0.74
19:G:153:C:OP1	19:G:154:U:OP1	2.05	0.74
20:H:153:A:C2'	20:H:154:C:H5'	2.17	0.74
42:A:84:ASP:O	42:A:88:TYR:N	2.20	0.74
42:A:317:PRO:O	42:A:321:ASN:O	2.05	0.74
28:3:442:LEU:O	28:3:735:SER:N	2.19	0.74
40:I:119:A:C4	4:P:103:GLY:HA3	2.22	0.74
43:C:143:THR:CA	45:C:1500:GTP:O1B	2.36	0.74
1:B:26:A:C5	42:A:423:ASP:CA	2.71	0.74
1:B:26:A:H5"	1:B:26:A:N3	2.02	0.74
28:3:304:GLN:CA	28:3:309:ASP:O	2.36	0.73
28:3:753:GLY:HA3	28:3:765:LEU:O	1.88	0.73
42:A:80:LYS:C	42:A:82:ARG:H	1.92	0.73
42:A:1500:GLY:O	42:A:1756:SER:CA	2.37	0.73
26:1:1270:ASN:O	26:1:1273:TYR:N	2.21	0.73
42:A:441:VAL:O	42:A:444:ARG:N	2.21	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:H:153:A:H2'	20:H:154:C:C5'	2.19	0.73
40:I:126:A:H2	10:V:64:ASN:C	1.93	0.73
19:G:136:U:H1'	19:G:137:C:OP1	1.89	0.72
19:G:146:C:O2	20:H:33:G:C5	2.41	0.72
26:1:994:LEU:O	26:1:997:LEU:N	2.22	0.72
42:A:733:THR:O	42:A:735:ILE:N	2.21	0.72
26:1:660:ALA:O	26:1:663:THR:N	2.22	0.72
28:3:380:GLU:O	28:3:383:ASP:N	2.22	0.72
40:I:127:C:H1'	10:V:21:ASN:C	2.08	0.72
40:I:127:C:O2	10:V:21:ASN:O	2.08	0.72
39:W:344:ILE:C	39:W:360:LEU:N	2.40	0.72
40:I:58:C:C2'	40:I:59:U:H5'	2.20	0.72
26:1:531:LEU:O	26:1:534:GLN:N	2.18	0.72
42:A:186:GLU:O	42:A:565:ARG:O	2.08	0.72
19:G:145:U:C4	19:G:146:C:C6	2.77	0.72
26:1:1055:TRP:O	26:1:1058:ILE:N	2.22	0.71
26:1:535:ILE:O	26:1:538:LEU:N	2.23	0.71
42:A:470:ARG:O	42:A:472:LEU:N	2.23	0.71
26:1:122:HIS:O	26:1:125:THR:N	2.22	0.71
1:B:26:A:N3	1:B:26:A:H3'	2.05	0.71
42:A:471:TYR:O	42:A:474:ARG:N	2.24	0.71
26:1:700:LYS:O	26:1:703:THR:N	2.24	0.71
19:G:153:C:OP1	19:G:154:U:OP2	2.09	0.70
26:1:791:VAL:O	26:1:794:GLN:N	2.23	0.70
11:F:102:A:C2'	11:F:103:U:H5'	2.21	0.70
42:A:1520:ASN:O	42:A:1522:GLN:N	2.24	0.70
19:G:134:U:H3	20:H:42:G:H1	1.37	0.70
20:H:154:C:H2'	20:H:155:C:C6	2.27	0.70
42:A:114:ARG:O	42:A:489:TRP:N	2.25	0.70
43:C:909:GLY:HA3	43:C:930:ALA:H	1.56	0.70
40:I:21:U:H2'	40:I:22:C:H6	1.57	0.70
42:A:939:TRP:O	42:A:1090:ARG:N	2.17	0.70
20:H:153:A:N6	20:H:177:A:C2	2.60	0.69
20:H:168:A:C8	20:H:168:A:H5"	2.27	0.69
43:C:776:GLU:O	43:C:781:ASP:CA	2.40	0.69
11:F:86:U:H3	20:H:12:G:H1	1.39	0.69
20:H:30:A:N3	20:H:30:A:H2'	2.06	0.69
42:A:331:TRP:O	43:C:177:ARG:O	2.10	0.69
42:A:930:ALA:O	42:A:934:ARG:O	2.10	0.69
27:2:479:ASP:O	27:2:482:ALA:N	2.25	0.69
42:A:930:ALA:O	42:A:934:ARG:N	2.25	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:159:LEU:O	2:D:162:GLY:N	2.24	0.69
20:H:150:U:H3	20:H:181:G:H1	1.41	0.69
28:3:545:VAL:N	28:3:557:ALA:O	2.25	0.69
35:N:361:VAL:O	35:N:365:ALA:N	2.26	0.69
42:A:61:MET:N	42:A:484:SER:O	2.26	0.69
20:H:40:C:H6	20:H:40:C:C5'	2.05	0.69
20:H:180:G:H2'	20:H:181:G:H8	1.57	0.69
40:I:119:A:C2	4:P:103:GLY:CA	2.76	0.69
35:N:154:GLU:O	42:A:700:GLY:HA3	1.94	0.68
39:W:166:ASN:O	39:W:169:THR:O	2.11	0.68
40:I:63:U:C2'	40:I:64:G:C8	2.61	0.68
42:A:1125:ILE:O	42:A:1128:TYR:N	2.21	0.68
39:W:335:GLY:N	39:W:340:LYS:CA	2.56	0.68
42:A:80:LYS:O	42:A:82:ARG:N	2.25	0.68
11:F:49:G:H1	40:I:63:U:H3	1.41	0.68
28:3:558:LEU:O	28:3:561:GLY:N	2.24	0.68
40:I:127:C:H1'	10:V:21:ASN:O	1.93	0.68
11:F:73:A:N1	40:I:2:G:O6	2.27	0.68
20:H:143:A:H2'	20:H:144:C:H6	1.59	0.68
20:H:152:G:O3'	20:H:153:A:O4'	2.11	0.68
42:A:570:ASP:O	42:A:572:PHE:N	2.26	0.67
19:G:146:C:H6	19:G:146:C:H5'	1.58	0.67
19:G:151:C:C4'	19:G:152:C:H5	2.07	0.67
40:I:24:U:H3	40:I:48:G:H1	1.42	0.67
40:I:21:U:H2'	40:I:22:C:C6	2.29	0.67
40:I:60:A:H2'	40:I:61:A:C1'	2.20	0.67
40:I:55:U:H5'	40:I:56:U:OP2	1.93	0.67
43:C:474:LEU:CA	43:C:498:SER:O	2.42	0.67
20:H:106:G:H21	20:H:107:A:N6	1.92	0.67
27:2:487:LEU:O	27:2:490:HIS:N	2.28	0.67
42:A:1519:THR:O	42:A:1520:ASN:C	2.31	0.67
20:H:151:C:H2'	20:H:152:G:H8	1.60	0.67
20:H:151:C:O2	20:H:152:G:C8	2.48	0.66
42:A:733:THR:C	42:A:735:ILE:N	2.49	0.66
2:D:166:ASP:O	2:D:169:TYR:N	2.26	0.66
40:I:20:A:H2'	40:I:21:U:C6	2.31	0.66
19:G:147:C:OP2	19:G:147:C:H3'	1.96	0.66
40:I:119:A:N3	4:P:103:GLY:HA3	2.09	0.66
20:H:151:C:C2	20:H:152:G:C8	2.83	0.66
20:H:153:A:C3'	20:H:154:C:H5'	2.25	0.66
28:3:753:GLY:CA	28:3:765:LEU:O	2.44	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
42:A:1539:SER:O	42:A:1543:ASN:N	2.17	0.66
34:K:251:TRP:O	34:K:274:THR:O	2.13	0.66
19:G:128:U:H6	19:G:128:U:O5'	1.78	0.65
11:F:59:G:H4'	40:I:22:C:P	2.37	0.65
19:G:127:U:O2'	19:G:128:U:O4'	2.13	0.65
26:1:1243:PRO:O	26:1:1246:MET:N	2.29	0.65
27:2:491:LEU:O	27:2:494:THR:N	2.30	0.65
40:I:6:U:H2'	40:I:7:G:H8	1.62	0.65
42:A:1110:ILE:O	42:A:1114:LEU:N	2.29	0.65
35:N:161:PRO:N	42:A:730:GLY:O	2.29	0.65
1:B:58:U:H2'	1:B:59:G:H8	1.62	0.65
19:G:137:C:H6	19:G:137:C:O5'	1.78	0.65
26:1:886:HIS:O	26:1:889:GLU:N	2.30	0.65
40:I:111:C:H6	40:I:111:C:O5'	1.78	0.65
19:G:151:C:H1'	19:G:152:C:P	2.36	0.65
42:A:543:ALA:O	42:A:547:CYS:N	2.17	0.65
19:G:151:C:C4'	19:G:152:C:C5	2.79	0.65
42:A:441:VAL:O	42:A:442:LYS:C	2.36	0.65
20:H:153:A:H3'	20:H:154:C:H5'	1.79	0.65
28:3:1148:LEU:O	28:3:1152:HIS:N	2.27	0.65
42:A:441:VAL:O	42:A:443:VAL:N	2.30	0.65
1:B:78:U:O2'	1:B:80:U:OP1	2.13	0.64
39:W:344:ILE:O	39:W:360:LEU:CA	2.44	0.64
1:B:97:G:H1	1:B:116:U:H3	1.44	0.64
40:I:117:C:H6	40:I:117:C:O5'	1.80	0.64
26:1:758:ASP:O	26:1:762:ALA:N	2.28	0.64
28:3:868:VAL:O	28:3:877:LEU:N	2.30	0.64
42:A:1676:ILE:O	42:A:1677:GLU:C	2.33	0.64
19:G:146:C:N3	20:H:33:G:C6	2.66	0.64
26:1:1280:LEU:O	26:1:1283:HIS:N	2.22	0.64
19:G:153:C:C4'	19:G:154:U:OP1	2.35	0.64
26:1:749:ALA:O	26:1:752:TYR:N	2.31	0.64
40:I:51:A:O2'	40:I:56:U:C5'	2.35	0.64
26:1:1018:PRO:O	26:1:1021:THR:N	2.30	0.64
42:A:1438:VAL:O	42:A:1442:PHE:N	2.31	0.64
26:1:658:TRP:O	26:1:661:ARG:N	2.30	0.63
32:7:40:TYR:O	32:7:43:TYR:N	2.31	0.63
42:A:397:ASN:C	43:C:386:GLY:O	2.37	0.63
19:G:145:U:O4	19:G:146:C:N4	2.31	0.63
19:G:150:U:OP1	31:6:63:GLY:HA3	1.98	0.63
33:J:658:ARG:O	33:J:662:LYS:N	2.31	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:K:248:THR:O	34:K:254:LEU:CA	2.46	0.63
34:K:338:LEU:O	34:K:350:TRP:N	2.29	0.63
42:A:1784:ASN:O	42:A:1806:ALA:N	2.30	0.63
20:H:152:G:C2	20:H:153:A:C5	2.87	0.63
28:3:931:VAL:O	28:3:936:LYS:N	2.31	0.63
20:H:147:G:H2'	20:H:148:C:H6	1.63	0.63
26:1:1264:VAL:O	26:1:1267:LYS:N	2.32	0.63
19:G:135:G:H5'	19:G:136:U:OP2	1.99	0.63
20:H:114:A:H61	20:H:142:C:H42	1.44	0.63
28:3:325:ILE:O	28:3:375:SER:N	2.30	0.63
40:I:89:U:C2'	40:I:90:G:H5'	2.29	0.63
40:I:126:A:C2	10:V:20:LYS:CA	2.82	0.63
42:A:1784:ASN:O	42:A:1806:ALA:O	2.16	0.63
19:G:137:C:C2'	19:G:138:A:H5'	2.28	0.63
40:I:89:U:O2'	40:I:90:G:H5'	1.99	0.63
42:A:1125:ILE:O	42:A:1127:GLY:N	2.31	0.62
20:H:106:G:H4'	20:H:107:A:O4'	1.99	0.62
1:B:98:G:H2'	1:B:99:C:C6	2.34	0.62
19:G:127:U:OP2	19:G:127:U:H2'	1.99	0.62
19:G:146:C:C2	19:G:147:C:C5	2.87	0.62
26:1:914:PHE:O	26:1:917:VAL:N	2.32	0.62
40:I:91:A:O5'	40:I:91:A:H8	1.82	0.62
26:1:179:GLY:O	26:1:182:LYS:N	2.33	0.62
35:N:410:ALA:O	35:N:413:LEU:N	2.33	0.62
42:A:542:ASN:O	42:A:546:LEU:N	2.30	0.62
20:H:154:C:H2'	20:H:155:C:H6	1.63	0.62
35:N:828:THR:O	35:N:831:VAL:N	2.31	0.62
40:I:126:A:N1	10:V:65:ILE:C	2.53	0.62
42:A:371:LEU:CA	43:C:341:LYS:O	2.47	0.62
20:H:157:G:H8	20:H:157:G:H5"	1.65	0.62
28:3:973:GLY:HA3	28:3:976:LYS:O	2.00	0.62
19:G:146:C:O2'	19:G:147:C:H5'	2.00	0.62
28:3:1191:LYS:O	28:3:1194:SER:N	2.32	0.62
42:A:1519:THR:C	42:A:1521:ALA:N	2.53	0.62
1:B:98:G:H2'	1:B:99:C:H6	1.65	0.62
42:A:471:TYR:O	42:A:472:LEU:C	2.38	0.62
11:F:49:G:H2'	11:F:50:A:H8	1.64	0.61
19:G:150:U:H4'	19:G:151:C:OP2	1.98	0.61
40:I:119:A:C2	4:P:103:GLY:HA2	2.35	0.61
19:G:146:C:C2'	19:G:147:C:H5'	2.30	0.61
20:H:143:A:H2'	20:H:144:C:C6	2.35	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
40:I:108:C:H2'	40:I:109:G:H8	1.63	0.61
19:G:155:U:H5"	19:G:156:U:H5"	1.83	0.61
26:1:895:GLY:O	26:1:898:TYR:N	2.34	0.61
19:G:146:C:H2'	19:G:147:C:C6	2.36	0.61
20:H:112:G:H2'	20:H:113:G:H8	1.65	0.61
28:3:586:ASP:O	28:3:610:VAL:N	2.32	0.61
40:I:127:C:C1'	10:V:21:ASN:CA	2.74	0.61
26:1:551:LEU:O	26:1:554:LYS:N	2.34	0.61
26:1:862:GLU:O	26:1:865:ARG:N	2.33	0.61
1:B:12:U:O4	1:B:65:G:O6	2.19	0.61
20:H:153:A:N6	20:H:177:A:H2	1.98	0.61
20:H:156:U:C6	20:H:156:U:C5'	2.72	0.61
34:K:252:SER:CA	34:K:274:THR:O	2.49	0.61
20:H:142:C:C2'	20:H:143:A:H5'	2.30	0.61
26:1:953:ASP:O	26:1:956:SER:N	2.34	0.61
19:G:136:U:H1'	19:G:137:C:P	2.41	0.60
28:3:638:GLU:N	28:3:668:GLY:O	2.32	0.60
42:A:768:ASP:O	42:A:772:CYS:N	2.34	0.60
26:1:491:GLU:O	26:1:494:GLU:N	2.32	0.60
39:W:345:VAL:N	39:W:360:LEU:CA	2.62	0.60
26:1:897:LEU:O	26:1:900:PHE:N	2.34	0.60
40:I:33:A:H62	40:I:43:G:H21	1.49	0.60
42:A:1489:LEU:N	42:A:1537:TRP:O	2.33	0.60
28:3:563:LEU:N	28:3:581:LYS:O	2.27	0.60
39:W:344:ILE:C	39:W:360:LEU:H	2.03	0.60
43:C:143:THR:N	45:C:1500:GTP:O1B	2.34	0.60
26:1:784:MET:O	26:1:787:ILE:N	2.34	0.60
26:1:929:LEU:O	26:1:932:ILE:N	2.34	0.60
26:1:1094:LEU:O	26:1:1098:LEU:N	2.32	0.60
40:I:59:U:C2	40:I:60:A:C8	2.90	0.60
19:G:146:C:H2'	19:G:147:C:H6	1.65	0.60
26:1:610:ILE:O	26:1:613:MET:N	2.34	0.60
39:W:341:LYS:C	39:W:359:LYS:H	2.04	0.60
43:C:313:GLN:N	45:C:1500:GTP:O6	2.24	0.60
37:M:12:PRO:O	37:M:82:PHE:CA	2.50	0.59
1:B:94:U:C1'	1:B:95:G:OP1	2.47	0.59
26:1:1182:LEU:O	26:1:1185:ARG:N	2.35	0.59
39:W:338:LYS:O	39:W:339:LYS:C	2.37	0.59
2:D:281:VAL:O	2:D:285:LYS:N	2.30	0.59
28:3:550:ASN:N	28:3:553:GLN:O	2.27	0.59
34:K:181:ILE:O	34:K:185:SER:N	2.31	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
35:N:917:LYS:O	35:N:919:ILE:N	2.36	0.59
42:A:300:ASN:O	43:C:936:LYS:CA	2.50	0.59
42:A:1676:ILE:O	42:A:1678:ARG:N	2.35	0.59
42:A:1779:PHE:N	42:A:1810:PHE:O	2.29	0.59
28:3:664:TYR:CA	28:3:677:THR:O	2.50	0.59
33:J:536:ASP:N	33:J:587:GLY:HA3	2.17	0.59
39:W:344:ILE:CA	39:W:360:LEU:H	2.16	0.59
26:1:1125:PRO:O	26:1:1128:VAL:N	2.35	0.59
35:N:466:ILE:O	35:N:470:ALA:N	2.35	0.59
39:W:427:GLU:N	39:W:441:PHE:H	2.01	0.59
19:G:145:U:H3'	19:G:146:C:H5'	1.82	0.59
26:1:308:SER:O	26:1:311:ALA:N	2.35	0.59
28:3:645:MET:N	28:3:662:PHE:O	2.28	0.59
40:I:62:U:C2	40:I:63:U:C5	2.91	0.59
30:5:67:ILE:O	30:5:70:ALA:N	2.36	0.59
42:A:770:THR:O	42:A:773:LYS:N	2.32	0.58
11:F:59:G:H4'	40:I:21:U:O3'	2.04	0.58
19:G:135:G:N3	20:H:42:G:N2	2.50	0.58
19:G:146:C:O2	20:H:33:G:C4	2.55	0.58
37:M:12:PRO:O	37:M:82:PHE:N	2.36	0.58
1:B:96:A:H3'	1:B:96:A:OP1	2.03	0.58
42:A:80:LYS:C	42:A:82:ARG:N	2.54	0.58
42:A:2010:ILE:O	42:A:2013:GLY:O	2.21	0.58
43:C:496:VAL:O	43:C:547:GLY:N	2.30	0.58
26:1:745:ALA:O	26:1:748:LYS:N	2.36	0.58
26:1:1149:LYS:O	26:1:1152:SER:N	2.36	0.58
26:1:811:LEU:O	26:1:814:PHE:N	2.36	0.58
20:H:154:C:O2'	20:H:155:C:H5'	2.04	0.58
1:B:96:A:H3'	1:B:96:A:P	2.43	0.58
19:G:145:U:N3	19:G:146:C:C6	2.71	0.58
40:I:59:U:C2	40:I:60:A:N7	2.71	0.58
42:A:1506:ALA:O	42:A:1510:GLU:N	2.34	0.58
42:A:689:VAL:O	42:A:693:ILE:N	2.32	0.58
35:N:361:VAL:O	35:N:365:ALA:CA	2.52	0.58
1:B:95:G:H3'	1:B:95:G:N3	2.19	0.58
19:G:149:G:N9	19:G:150:U:C6	2.72	0.58
19:G:151:C:C5'	19:G:152:C:H5	2.17	0.58
28:3:1204:VAL:O	28:3:1207:LYS:N	2.37	0.58
40:I:108:C:C2'	40:I:109:G:H5'	2.34	0.58
26:1:424:ILE:O	26:1:428:ALA:N	2.36	0.57
32:7:48:ASP:O	32:7:51:ASN:N	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:G:125:C:O2'	19:G:126:C:P	2.62	0.57
40:I:113:C:H6	40:I:113:C:O5'	1.88	0.57
19:G:149:G:C4	19:G:150:U:C6	2.93	0.57
42:A:122:ILE:N	42:A:481:PHE:O	2.25	0.57
19:G:150:U:O2	19:G:150:U:O2'	2.22	0.57
20:H:152:G:N2	20:H:153:A:C5	2.73	0.57
39:W:335:GLY:HA2	39:W:340:LYS:O	2.05	0.57
42:A:379:GLU:C	43:C:355:LYS:CA	2.73	0.57
26:1:892:LEU:O	26:1:895:GLY:N	2.37	0.57
35:N:139:GLN:O	35:N:143:SER:N	2.35	0.57
20:H:165:A:C6	20:H:166:G:O6	2.57	0.57
40:I:110:G:O5'	40:I:110:G:H8	1.86	0.57
11:F:50:A:H2'	11:F:51:U:H6	1.69	0.57
26:1:578:ILE:O	26:1:581:LEU:N	2.37	0.57
26:1:937:LEU:O	26:1:940:LEU:N	2.38	0.57
40:I:111:C:H2'	40:I:112:A:H8	1.69	0.56
1:B:110:C:H2'	1:B:111:A:H8	1.70	0.56
19:G:146:C:N4	19:G:147:C:H41	2.03	0.56
28:3:287:PHE:CA	28:3:304:GLN:O	2.53	0.56
42:A:630:TRP:O	42:A:631:ALA:C	2.43	0.56
43:C:682:LYS:O	43:C:797:ALA:N	2.38	0.56
26:1:849:ILE:O	26:1:852:ARG:N	2.38	0.56
28:3:1160:HIS:O	28:3:1163:PHE:N	2.37	0.56
39:W:341:LYS:CA	39:W:358:LYS:CA	2.83	0.56
40:I:20:A:H2'	40:I:21:U:C5	2.40	0.56
42:A:1012:LYS:O	42:A:1013:ASN:O	2.23	0.56
11:F:59:G:C4'	40:I:21:U:O3'	2.53	0.56
19:G:149:G:C2'	19:G:150:U:C6	2.89	0.56
28:3:15:SER:N	28:3:33:SER:O	2.35	0.56
20:H:141:C:H2'	20:H:142:C:H6	1.71	0.56
42:A:940:ILE:CA	42:A:1090:ARG:O	2.54	0.56
19:G:136:U:C1'	19:G:137:C:P	2.94	0.56
20:H:141:C:C2	20:H:142:C:C5	2.93	0.56
42:A:930:ALA:O	42:A:934:ARG:CA	2.54	0.56
1:B:69:A:O2'	1:B:70:A:N3	2.39	0.56
20:H:149:A:H2'	20:H:150:U:H6	1.70	0.56
20:H:152:G:N2	20:H:153:A:C8	2.73	0.56
26:1:716:ALA:O	26:1:719:TYR:N	2.39	0.56
40:I:108:C:H2'	40:I:109:G:C8	2.41	0.56
42:A:371:LEU:CA	43:C:341:LYS:C	2.74	0.56
19:G:151:C:C1'	19:G:152:C:P	2.94	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:H:150:U:H2'	20:H:151:C:H6	1.71	0.56
42:A:331:TRP:O	43:C:177:ARG:CA	2.54	0.56
42:A:1787:ARG:O	42:A:1803:ILE:O	2.24	0.56
1:B:61:A:H2'	1:B:62:G:H8	1.69	0.55
26:1:968:GLU:O	26:1:971:MET:N	2.39	0.55
11:F:50:A:C4	11:F:51:U:C5	2.94	0.55
19:G:149:G:C3'	19:G:150:U:H5"	2.35	0.55
20:H:147:G:C4	20:H:148:C:C5	2.94	0.55
28:3:523:GLY:CA	28:3:536:TRP:O	2.51	0.55
20:H:150:U:C2	20:H:151:C:C5	2.94	0.55
26:1:874:LYS:O	26:1:877:GLY:CA	2.54	0.55
26:1:1124:SER:O	26:1:1127:THR:N	2.34	0.55
28:3:931:VAL:O	28:3:935:GLU:N	2.39	0.55
19:G:135:G:N2	20:H:42:G:N9	2.53	0.55
20:H:181:G:H2'	20:H:182:U:H6	1.71	0.55
40:I:125:G:H1'	10:V:63:ASN:C	2.27	0.55
26:1:173:ALA:C	26:1:176:ALA:H	2.09	0.55
28:3:303:ALA:O	28:3:310:ILE:CA	2.55	0.55
30:5:98:PHE:O	30:5:100:LYS:N	2.39	0.55
28:3:1194:SER:O	28:3:1199:ARG:N	2.36	0.55
2:D:128:PRO:O	2:D:129:ARG:C	2.45	0.55
2:D:146:GLU:O	2:D:149:ARG:N	2.40	0.55
19:G:137:C:O2'	19:G:138:A:C5'	2.37	0.55
20:H:183:G:C4	20:H:184:C:C5	2.94	0.55
20:H:183:G:H2'	20:H:184:C:H6	1.71	0.55
30:5:109:GLN:O	30:5:112:LEU:N	2.39	0.55
40:I:21:U:C2'	40:I:22:C:H5'	2.37	0.55
40:I:59:U:H1'	40:I:60:A:H5'	1.89	0.55
11:F:51:U:H2'	11:F:51:U:O2	2.06	0.55
20:H:181:G:C4	20:H:182:U:C5	2.95	0.55
19:G:151:C:O2'	19:G:151:C:O2	2.24	0.54
42:A:359:ILE:O	42:A:360:SER:C	2.44	0.54
2:D:283:GLN:O	2:D:287:ASP:N	2.33	0.54
20:H:149:A:C4	20:H:150:U:C5	2.95	0.54
26:1:517:ARG:O	26:1:520:THR:N	2.41	0.54
26:1:557:ASP:O	26:1:560:LEU:N	2.40	0.54
40:I:55:U:H3'	40:I:56:U:C6	2.42	0.54
40:I:55:U:H2'	40:I:55:U:O2	2.07	0.54
40:I:124:U:H1'	9:U:37:HIS:O	2.06	0.54
43:C:664:GLU:O	43:C:785:ARG:N	2.27	0.54
1:B:17:U:O2	1:B:60:G:N2	2.28	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:108:G:H3'	1:B:109:G:H8	1.73	0.54
2:D:1048:VAL:O	2:D:1050:GLU:N	2.40	0.54
11:F:52:U:C6	11:F:52:U:C5'	2.85	0.54
19:G:146:C:C2	20:H:33:G:C2	2.95	0.54
20:H:153:A:C3'	20:H:154:C:C5'	2.86	0.54
35:N:142:PHE:O	35:N:143:SER:C	2.45	0.54
43:C:776:GLU:O	43:C:782:GLU:N	2.41	0.54
1:B:26:A:H2	1:B:27:U:C5	2.26	0.54
19:G:146:C:N3	20:H:33:G:O6	2.40	0.54
1:B:110:C:H2'	1:B:111:A:C8	2.41	0.54
19:G:146:C:C1'	20:H:33:G:N2	2.68	0.54
19:G:151:C:O2'	19:G:152:C:OP1	2.24	0.54
1:B:99:C:H2'	1:B:100:C:C6	2.43	0.54
20:H:147:G:H2'	20:H:148:C:C6	2.43	0.54
26:1:1026:ASN:O	26:1:1028:HIS:N	2.41	0.54
26:1:1205:GLU:O	26:1:1208:LEU:N	2.41	0.54
31:6:7:ASP:O	31:6:91:LEU:N	2.39	0.54
19:G:151:C:C5'	19:G:152:C:C5	2.91	0.54
26:1:641:ILE:O	26:1:644:LEU:N	2.40	0.54
37:M:9:LYS:O	37:M:11:TYR:N	2.40	0.54
26:1:981:TYR:O	26:1:984:GLU:N	2.20	0.53
28:3:785:PRO:CA	28:3:800:ILE:O	2.56	0.53
11:F:47:A:H2'	11:F:48:A:H8	1.72	0.53
26:1:1132:LEU:O	26:1:1135:GLU:N	2.41	0.53
42:A:1817:LEU:N	42:A:1917:PHE:O	2.40	0.53
19:G:153:C:H2'	19:G:153:C:O2	2.08	0.53
20:H:153:A:H3'	20:H:154:C:C5'	2.38	0.53
34:K:222:ASN:O	34:K:520:MET:N	2.39	0.53
35:N:159:SER:O	42:A:730:GLY:HA3	2.08	0.53
35:N:142:PHE:O	35:N:144:ASP:N	2.41	0.53
40:I:58:C:H2'	40:I:59:U:H5'	1.85	0.53
40:I:61:A:H2'	40:I:62:U:C6	2.44	0.53
26:1:841:ALA:O	26:1:843:LYS:N	2.42	0.53
43:C:457:VAL:CA	43:C:462:GLY:HA3	2.39	0.53
28:3:1195:GLU:O	28:3:1198:ASP:N	2.41	0.53
35:N:290:ASP:H	42:A:872:ASP:CA	2.21	0.53
40:I:55:U:H3'	40:I:56:U:C5	2.44	0.53
40:I:126:A:C2	10:V:64:ASN:C	2.79	0.53
42:A:570:ASP:C	42:A:572:PHE:N	2.61	0.53
11:F:73:A:C2	40:I:2:G:N1	2.75	0.53
19:G:137:C:C2'	19:G:138:A:C5'	2.87	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:1:963:LYS:O	26:1:966:GLN:N	2.30	0.52
35:N:117:LYS:C	35:N:119:ARG:H	2.12	0.52
2:D:298:ASP:O	2:D:301:GLU:N	2.41	0.52
26:1:244:THR:O	26:1:247:ALA:N	2.42	0.52
33:J:534:LYS:O	33:J:567:LEU:O	2.26	0.52
34:K:206:THR:O	34:K:210:GLN:N	2.37	0.52
42:A:823:SER:O	42:A:824:PRO:C	2.47	0.52
26:1:929:LEU:O	26:1:930:PRO:C	2.45	0.52
26:1:1280:LEU:O	26:1:1282:ALA:N	2.42	0.52
35:N:302:ARG:O	35:N:305:ASN:O	2.28	0.52
26:1:747:LEU:O	26:1:748:LYS:C	2.48	0.52
27:2:596:GLU:O	27:2:598:GLU:N	2.43	0.52
40:I:21:U:HO2'	40:I:22:C:H5'	1.73	0.52
26:1:663:THR:O	26:1:666:LYS:N	2.42	0.52
35:N:425:ARG:O	35:N:429:CYS:N	2.38	0.52
42:A:347:LEU:O	42:A:348:PRO:C	2.47	0.52
28:3:430:GLY:O	28:3:433:SER:N	2.31	0.52
28:3:546:LYS:O	28:3:556:ILE:CA	2.58	0.52
40:I:118:A:H8	40:I:118:A:OP2	1.92	0.52
42:A:1943:LEU:O	42:A:1947:ASN:CA	2.58	0.52
1:B:19:A:H62	42:A:467:GLN:CA	2.22	0.52
1:B:48:A:O5'	42:A:280:GLU:N	2.42	0.52
28:3:589:CYS:O	28:3:608:GLY:N	2.30	0.52
42:A:708:THR:O	42:A:709:ILE:C	2.48	0.52
42:A:1439:ARG:O	42:A:1443:LYS:N	2.43	0.52
19:G:146:C:H2'	19:G:147:C:H5'	1.91	0.51
26:1:699:GLN:O	26:1:700:LYS:C	2.48	0.51
20:H:30:A:N3	20:H:30:A:C2'	2.73	0.51
20:H:107:A:C6	20:H:108:G:C5	2.99	0.51
26:1:771:LEU:O	26:1:774:ILE:N	2.44	0.51
26:1:793:LYS:O	26:1:797:GLY:CA	2.54	0.51
26:1:1110:VAL:O	26:1:1113:THR:N	2.43	0.51
32:7:37:ARG:O	32:7:40:TYR:N	2.44	0.51
34:K:340:THR:O	34:K:348:ARG:N	2.40	0.51
35:N:393:LEU:O	35:N:397:LEU:N	2.39	0.51
42:A:617:ASN:CA	42:A:621:VAL:O	2.59	0.51
11:F:52:U:O4	11:F:53:A:N6	2.43	0.51
19:G:152:C:H6	19:G:152:C:H3'	1.76	0.51
28:3:673:VAL:CA	28:3:691:THR:H	2.24	0.51
35:N:375:ILE:C	35:N:377:ILE:N	2.63	0.51
11:F:46:G:H2'	11:F:47:A:C8	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
28:3:699:VAL:CA	28:3:715:MET:O	2.59	0.51
28:3:973:GLY:HA3	28:3:976:LYS:C	2.31	0.51
39:W:344:ILE:CA	39:W:360:LEU:CA	2.89	0.51
26:1:423:PRO:O	26:1:427:PRO:N	2.43	0.51
1:B:95:G:N3	1:B:95:G:C2'	2.73	0.51
26:1:1025:LYS:O	26:1:1027:ARG:N	2.42	0.51
42:A:838:LEU:O	42:A:841:LEU:N	2.44	0.51
19:G:156:U:H2'	19:G:156:U:O2	2.08	0.51
28:3:488:GLY:C	28:3:490:THR:H	2.14	0.51
30:5:46:ARG:N	30:5:63:VAL:O	2.44	0.51
42:A:1520:ASN:C	42:A:1522:GLN:N	2.63	0.51
19:G:126:C:H2'	19:G:126:C:O2	2.09	0.51
40:I:111:C:H2'	40:I:112:A:C8	2.46	0.51
42:A:398:THR:CA	43:C:386:GLY:HA3	2.38	0.51
26:1:1035:CYS:O	26:1:1038:LEU:N	2.44	0.51
2:D:114:GLU:O	2:D:117:LEU:N	2.44	0.51
20:H:111:G:O3'	20:H:112:G:O4'	2.29	0.51
26:1:1080:THR:O	26:1:1083:TYR:N	2.44	0.51
26:1:1188:ALA:O	26:1:1191:VAL:N	2.44	0.51
26:1:1207:SER:O	26:1:1210:HIS:N	2.43	0.51
28:3:147:ASP:N	28:3:151:ARG:O	2.42	0.51
28:3:318:ASP:N	28:3:321:MET:O	2.27	0.51
26:1:804:ASN:O	26:1:807:LYS:N	2.44	0.50
40:I:143:U:H2'	40:I:144:G:H5"	1.92	0.50
26:1:1129:LEU:O	26:1:1132:LEU:N	2.44	0.50
26:1:629:ALA:O	26:1:632:PHE:N	2.45	0.50
42:A:1488:THR:C	42:A:1537:TRP:O	2.49	0.50
19:G:143:U:C6	19:G:143:U:C5'	2.89	0.50
9:U:18:ARG:N	9:U:81:THR:O	2.40	0.50
1:B:26:A:N3	1:B:26:A:C3'	2.73	0.50
19:G:149:G:H21	19:G:150:U:H5'	1.77	0.50
20:H:143:A:N3	20:H:143:A:C3'	2.73	0.50
40:I:20:A:O2'	40:I:21:U:H5'	2.12	0.50
42:A:332:TYR:CA	43:C:177:ARG:O	2.60	0.50
19:G:146:C:C4	19:G:147:C:N4	2.73	0.50
40:I:58:C:O2'	40:I:59:U:H5"	2.09	0.50
42:A:972:GLU:CA	42:A:1101:PHE:O	2.60	0.50
43:C:452:THR:O	43:C:577:PHE:CA	2.60	0.50
26:1:1268:ILE:O	26:1:1271:SER:N	2.44	0.50
28:3:1195:GLU:C	28:3:1198:ASP:H	2.14	0.50
42:A:823:SER:O	42:A:824:PRO:O	2.30	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
35:N:360:ALA:O	35:N:364:GLN:N	2.38	0.50
1:B:100:C:H2'	1:B:101:U:C6	2.46	0.50
34:K:250:CYS:O	34:K:251:TRP:C	2.50	0.50
1:B:58:U:H2'	1:B:59:G:C8	2.46	0.49
39:W:564:GLY:O	39:W:565:ALA:O	2.29	0.49
26:1:528:ALA:O	26:1:531:LEU:N	2.44	0.49
39:W:349:PHE:N	39:W:364:ASP:H	2.10	0.49
42:A:401:GLY:HA3	43:C:385:VAL:O	2.12	0.49
42:A:929:GLU:O	42:A:933:ARG:CA	2.59	0.49
11:F:102:A:O2'	11:F:103:U:C5'	2.60	0.49
26:1:587:TYR:O	26:1:590:ARG:N	2.45	0.49
11:F:47:A:H2'	11:F:48:A:C8	2.47	0.49
26:1:237:GLY:O	26:1:239:ALA:N	2.45	0.49
33:J:446:LYS:CA	40:I:23:G:OP1	2.61	0.49
39:W:334:LEU:CA	39:W:340:LYS:CA	2.90	0.49
43:C:470:PRO:C	43:C:499:GLY:HA2	2.29	0.49
1:B:48:A:O5'	42:A:280:GLU:CA	2.60	0.49
20:H:106:G:N2	20:H:107:A:C6	2.72	0.49
20:H:46:U:H5"	20:H:47:U:H2'	1.93	0.49
26:1:1227:ILE:O	26:1:1230:VAL:N	2.46	0.49
28:3:596:PRO:O	28:3:598:GLY:N	2.45	0.49
42:A:597:LYS:C	42:A:599:MET:H	2.16	0.49
1:B:48:A:H2'	1:B:49:A:H8	1.76	0.49
19:G:149:G:H3'	19:G:149:G:N3	2.28	0.49
35:N:158:LEU:O	35:N:160:ILE:N	2.44	0.49
42:A:596:TYR:O	42:A:597:LYS:C	2.50	0.49
11:F:102:A:O2'	11:F:103:U:H5"	2.12	0.49
19:G:146:C:C2	19:G:147:C:H5	2.30	0.49
20:H:40:C:C5'	20:H:40:C:C6	2.92	0.49
26:1:553:VAL:O	26:1:556:ILE:N	2.46	0.49
39:W:341:LYS:O	39:W:359:LYS:CA	2.61	0.49
19:G:151:C:C1'	19:G:152:C:OP1	2.55	0.48
20:H:107:A:C2	20:H:108:G:C4	3.01	0.48
42:A:708:THR:O	42:A:710:LEU:N	2.46	0.48
26:1:625:ARG:O	26:1:628:THR:N	2.46	0.48
26:1:631:ALA:O	26:1:634:VAL:N	2.47	0.48
43:C:133:THR:O	43:C:225:VAL:CA	2.62	0.48
19:G:135:G:H1	20:H:41:U:H3	1.60	0.48
42:A:1197:LEU:O	42:A:1226:ALA:CA	2.62	0.48
19:G:135:G:C2	20:H:42:G:C5	3.02	0.48
26:1:177:LYS:O	26:1:180:GLU:N	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
28:3:672:GLY:O	28:3:695:GLY:N	2.46	0.48
35:N:160:ILE:CA	42:A:730:GLY:C	2.82	0.48
42:A:947:PRO:O	42:A:951:LEU:N	2.41	0.48
1:B:72:U:H2'	1:B:73:C:H6	1.78	0.48
27:2:491:LEU:O	27:2:493:ALA:N	2.46	0.48
26:1:939:ARG:O	26:1:940:LEU:C	2.51	0.48
11:F:73:A:H2	40:I:2:G:H1	1.56	0.48
19:G:152:C:O2'	19:G:153:C:O5'	2.30	0.48
26:1:408:PHE:O	26:1:409:PRO:C	2.50	0.48
43:C:263:LEU:O	43:C:268:LYS:N	2.47	0.48
1:B:17:U:O4	1:B:60:G:O6	2.31	0.47
1:B:25:C:H42	42:A:420:ARG:H	1.62	0.47
1:B:95:G:N3	1:B:95:G:H2'	2.28	0.47
11:F:49:G:H2'	11:F:50:A:C8	2.48	0.47
19:G:125:C:HO2'	19:G:126:C:P	2.36	0.47
20:H:151:C:C2	20:H:152:G:N7	2.82	0.47
1:B:23:C:H3'	1:B:24:G:H4'	1.96	0.47
19:G:149:G:C2'	19:G:150:U:H6	2.23	0.47
26:1:944:SER:O	26:1:946:LYS:N	2.38	0.47
26:1:978:LEU:O	26:1:979:TYR:C	2.51	0.47
28:3:923:GLY:HA3	28:3:947:GLU:O	2.14	0.47
40:I:110:G:H2'	40:I:111:C:C6	2.49	0.47
43:C:143:THR:H	45:C:1500:GTP:PB	2.37	0.47
43:C:366:GLN:O	43:C:367:ARG:C	2.51	0.47
26:1:102:ASP:O	26:1:106:GLU:N	2.47	0.47
11:F:73:A:N1	40:I:2:G:C6	2.82	0.47
19:G:135:G:O6	20:H:41:U:O4	2.32	0.47
28:3:558:LEU:O	28:3:561:GLY:CA	2.63	0.47
40:I:109:G:H2'	40:I:110:G:C8	2.49	0.47
20:H:153:A:C2'	20:H:154:C:C5'	2.86	0.47
26:1:226:HIS:O	26:1:229:SER:N	2.47	0.47
26:1:660:ALA:O	26:1:661:ARG:C	2.53	0.47
39:W:351:GLY:HA2	39:W:367:ALA:C	2.35	0.47
26:1:103:PRO:C	26:1:106:GLU:H	2.18	0.47
28:3:42:ARG:N	28:3:51:HIS:O	2.32	0.47
35:N:433:SER:O	35:N:437:TRP:N	2.47	0.47
43:C:452:THR:O	43:C:578:ARG:N	2.46	0.47
28:3:44:ASP:O	28:3:48:GLY:HA2	2.15	0.47
34:K:333:PRO:O	34:K:334:SER:O	2.33	0.47
35:N:410:ALA:O	35:N:413:LEU:CA	2.62	0.47
20:H:153:A:C8	20:H:154:C:H5'	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:H:183:G:H2'	20:H:184:C:C6	2.50	0.47
35:N:15:LEU:O	35:N:17:TYR:N	2.48	0.47
42:A:230:PHE:N	42:A:414:ARG:O	2.45	0.47
2:D:355:GLU:O	2:D:359:PHE:N	2.40	0.47
26:1:210:ALA:O	26:1:213:LYS:N	2.48	0.47
26:1:693:GLY:O	26:1:695:VAL:N	2.48	0.47
32:7:36:HIS:O	32:7:37:ARG:C	2.53	0.47
34:K:307:LEU:O	34:K:316:VAL:N	2.48	0.47
1:B:111:A:H2'	1:B:112:A:C8	2.49	0.46
11:F:50:A:H2'	11:F:51:U:C6	2.50	0.46
19:G:122:U:H4'	19:G:123:U:OP1	2.14	0.46
26:1:667:ILE:O	26:1:668:VAL:C	2.53	0.46
11:F:66:C:H2'	11:F:67:G:C8	2.50	0.46
32:7:42:SER:O	32:7:45:GLY:N	2.48	0.46
40:I:61:A:H2'	40:I:62:U:H6	1.80	0.46
20:H:107:A:C6	20:H:108:G:C6	3.04	0.46
26:1:705:SER:O	26:1:706:ALA:C	2.54	0.46
19:G:153:C:H4'	19:G:153:C:OP1	2.14	0.46
35:N:557:GLU:O	35:N:561:ALA:N	2.48	0.46
40:I:51:A:C2	40:I:55:U:O2'	2.64	0.46
40:I:126:A:C2	10:V:64:ASN:O	2.60	0.46
26:1:974:LEU:O	26:1:975:GLY:C	2.54	0.46
37:M:59:ASP:O	37:M:60:ALA:C	2.53	0.46
40:I:11:A:H2'	40:I:12:G:C8	2.50	0.46
26:1:1280:LEU:O	26:1:1281:ILE:C	2.51	0.46
35:N:391:ARG:O	35:N:395:LYS:N	2.37	0.46
20:H:141:C:H2'	20:H:142:C:C6	2.50	0.46
20:H:150:U:H2'	20:H:151:C:C6	2.50	0.46
20:H:168:A:H3'	20:H:169:C:H6	1.80	0.46
31:6:46:CYS:O	31:6:50:ASN:N	2.43	0.46
43:C:827:LEU:C	43:C:907:VAL:H	2.18	0.46
20:H:149:A:H2'	20:H:150:U:C6	2.50	0.46
26:1:257:THR:O	26:1:259:SER:N	2.49	0.46
32:7:48:ASP:O	32:7:49:LEU:C	2.54	0.46
1:B:26:A:H2	1:B:27:U:C6	2.34	0.46
1:B:99:C:H2'	1:B:100:C:H6	1.79	0.46
20:H:3:C:H2'	20:H:4:G:C8	2.51	0.46
20:H:181:G:H2'	20:H:182:U:C6	2.50	0.46
26:1:708:ALA:O	26:1:711:ALA:N	2.49	0.46
35:N:429:CYS:O	35:N:433:SER:N	2.38	0.46
42:A:1520:ASN:C	42:A:1522:GLN:H	2.19	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:H:180:G:H2'	20:H:181:G:C8	2.44	0.45
28:3:890:SER:O	28:3:908:GLY:N	2.41	0.45
20:H:59:A:H2'	20:H:60:U:O4'	2.17	0.45
42:A:570:ASP:O	42:A:571:ALA:C	2.54	0.45
2:D:159:LEU:C	2:D:161:LEU:N	2.68	0.45
20:H:113:G:H2'	20:H:114:A:H8	1.82	0.45
28:3:1141:PHE:O	28:3:1144:VAL:N	2.49	0.45
32:7:62:ALA:O	32:7:65:ARG:N	2.50	0.45
20:H:112:G:H2'	20:H:113:G:C8	2.50	0.45
26:1:687:VAL:O	26:1:690:ILE:N	2.50	0.45
35:N:554:ASN:O	35:N:558:CYS:N	2.43	0.45
20:H:148:C:H2'	20:H:149:A:H8	1.82	0.45
40:I:125:G:H1'	10:V:63:ASN:O	2.17	0.45
42:A:770:THR:O	42:A:771:VAL:C	2.51	0.45
2:D:1349:GLY:HA2	2:D:1491:SER:O	2.16	0.45
9:U:80:MET:O	10:V:59:SER:N	2.44	0.45
11:F:52:U:C5	11:F:52:U:OP2	2.70	0.45
19:G:149:G:N3	19:G:150:U:H5"	2.31	0.45
28:3:672:GLY:O	28:3:691:THR:N	2.49	0.45
40:I:115:G:H2'	40:I:116:G:C8	2.52	0.45
20:H:142:C:H2'	20:H:143:A:H5'	1.98	0.45
26:1:862:GLU:O	26:1:863:GLN:C	2.55	0.45
1:B:74:U:H2'	1:B:75:G:C8	2.52	0.45
28:3:215:LEU:O	28:3:218:ASN:N	2.50	0.45
43:C:133:THR:O	43:C:226:VAL:N	2.46	0.45
26:1:1119:VAL:O	26:1:1122:THR:N	2.49	0.45
28:3:663:LEU:O	28:3:678:VAL:CA	2.65	0.45
26:1:849:ILE:O	26:1:850:ILE:C	2.54	0.44
26:1:1243:PRO:O	26:1:1244:CYS:C	2.55	0.44
40:I:118:A:OP2	40:I:118:A:C8	2.71	0.44
42:A:350:PHE:O	43:C:268:LYS:O	2.35	0.44
1:B:98:G:OP2	1:B:98:G:C8	2.70	0.44
19:G:127:U:O2'	19:G:127:U:O2	2.31	0.44
19:G:147:C:N3	20:H:31:G:O6	2.50	0.44
19:G:150:U:O2'	19:G:151:C:C5	2.71	0.44
35:N:289:ASN:N	42:A:871:TYR:C	2.71	0.44
42:A:989:ASP:O	42:A:993:LEU:N	2.41	0.44
11:F:102:A:C2'	11:F:103:U:C5'	2.93	0.44
20:H:114:A:H2'	20:H:115:G:H8	1.81	0.44
20:H:152:G:O2'	20:H:153:A:H1'	2.16	0.44
35:N:149:LEU:O	35:N:151:GLU:N	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:1:606:LEU:O	26:1:609:MET:N	2.51	0.44
40:I:91:A:H2'	40:I:92:C:C6	2.53	0.44
4:P:109:VAL:N	5:Q:63:LEU:O	2.42	0.44
34:K:374:HIS:O	34:K:377:GLY:N	2.46	0.44
42:A:1520:ASN:O	42:A:1521:ALA:C	2.56	0.44
1:B:10:U:H2'	1:B:11:U:C6	2.52	0.44
19:G:148:U:O3'	19:G:149:G:O4'	2.35	0.44
20:H:178:A:C5'	20:H:179:C:OP2	2.66	0.44
20:H:182:U:H2'	20:H:183:G:H8	1.81	0.44
26:1:693:GLY:O	26:1:694:LEU:C	2.55	0.44
26:1:708:ALA:O	26:1:709:ILE:C	2.54	0.44
26:1:892:LEU:O	26:1:893:ILE:C	2.54	0.44
42:A:570:ASP:O	42:A:574:LEU:N	2.38	0.44
2:D:121:GLN:O	2:D:125:GLY:N	2.40	0.44
11:F:52:U:C6	11:F:52:U:OP2	2.71	0.44
11:F:90:G:H2'	11:F:91:A:H8	1.82	0.44
11:F:91:A:H2'	11:F:92:A:C8	2.53	0.44
19:G:149:G:C5	19:G:150:U:C4	3.05	0.44
28:3:676:ARG:O	28:3:686:LEU:CA	2.65	0.44
28:3:930:LEU:C	28:3:934:GLY:HA2	2.38	0.44
39:W:334:LEU:O	39:W:340:LYS:O	2.35	0.44
40:I:59:U:O2	40:I:60:A:C8	2.70	0.44
7:S:22:ASN:N	7:S:66:SER:O	2.49	0.44
1:B:61:A:H2'	1:B:62:G:C8	2.50	0.44
19:G:126:C:C2	19:G:126:C:OP2	2.70	0.44
20:H:142:C:O2'	20:H:143:A:H5'	2.18	0.44
20:H:143:A:OP2	20:H:143:A:C2	2.71	0.44
26:1:663:THR:O	26:1:664:GLY:C	2.56	0.44
26:1:953:ASP:O	26:1:954:LEU:C	2.56	0.44
43:C:257:ILE:O	43:C:310:SER:O	2.36	0.44
35:N:560:ARG:C	35:N:564:ALA:H	2.21	0.44
26:1:889:GLU:O	26:1:892:LEU:N	2.51	0.43
26:1:1078:VAL:O	26:1:1081:PHE:N	2.50	0.43
28:3:1148:LEU:O	28:3:1151:GLU:N	2.51	0.43
40:I:59:U:HO2'	40:I:60:A:C5'	2.19	0.43
26:1:665:ILE:O	26:1:666:LYS:C	2.55	0.43
40:I:21:U:C5	40:I:21:U:OP2	2.70	0.43
42:A:770:THR:O	42:A:772:CYS:N	2.51	0.43
26:1:865:ARG:O	26:1:866:LYS:C	2.56	0.43
26:1:955:ILE:O	26:1:956:SER:C	2.57	0.43
26:1:1264:VAL:O	26:1:1265:TYR:C	2.56	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:95:G:N3	1:B:95:G:C3'	2.81	0.43
26:1:629:ALA:O	26:1:630:ARG:C	2.56	0.43
26:1:1230:VAL:O	26:1:1233:ALA:N	2.52	0.43
40:I:110:G:O5'	40:I:110:G:C8	2.70	0.43
1:B:31:U:H2'	1:B:32:C:C6	2.54	0.43
1:B:72:U:H2'	1:B:73:C:C6	2.53	0.43
20:H:98:G:H5'	20:H:104:U:OP2	2.19	0.43
26:1:994:LEU:O	26:1:995:GLY:C	2.56	0.43
20:H:154:C:O2'	20:H:155:C:C5'	2.66	0.43
26:1:803:ALA:O	26:1:804:ASN:C	2.54	0.43
26:1:1029:GLU:O	26:1:1032:GLN:N	2.51	0.43
26:1:1110:VAL:O	26:1:1111:CYS:C	2.57	0.43
28:3:5:ASN:O	28:3:1176:GLY:HA3	2.19	0.43
35:N:560:ARG:O	35:N:564:ALA:O	2.33	0.43
2:D:298:ASP:O	2:D:299:ASP:C	2.56	0.43
20:H:64:A:H2'	20:H:65:U:C6	2.54	0.43
20:H:157:G:H2'	20:H:158:G:O4'	2.19	0.43
26:1:720:GLY:O	26:1:721:ILE:C	2.54	0.43
26:1:872:ILE:O	26:1:873:GLU:C	2.57	0.43
42:A:84:ASP:O	42:A:88:TYR:CA	2.66	0.43
42:A:379:GLU:O	43:C:355:LYS:CA	2.67	0.43
43:C:474:LEU:CA	43:C:498:SER:C	2.86	0.43
30:5:98:PHE:C	30:5:100:LYS:N	2.72	0.43
42:A:1502:PHE:O	42:A:1503:TRP:O	2.36	0.43
26:1:998:LYS:O	26:1:1001:VAL:N	2.51	0.43
3:E:255:MET:C	3:E:257:ASN:H	2.22	0.43
11:F:48:A:H2'	11:F:49:G:H8	1.84	0.43
11:F:91:A:H2'	11:F:92:A:H8	1.82	0.43
26:1:501:LEU:O	26:1:502:LEU:C	2.55	0.43
26:1:993:ILE:O	26:1:994:LEU:C	2.57	0.43
42:A:597:LYS:C	42:A:599:MET:N	2.72	0.43
11:F:89:U:H2'	11:F:90:G:C8	2.53	0.42
20:H:3:C:H2'	20:H:4:G:H8	1.84	0.42
26:1:665:ILE:O	26:1:668:VAL:N	2.52	0.42
26:1:833:LEU:O	26:1:834:VAL:C	2.56	0.42
42:A:838:LEU:O	42:A:839:LEU:C	2.57	0.42
42:A:1805:GLY:O	42:A:1822:ILE:N	2.45	0.42
19:G:128:U:H2'	19:G:129:G:H8	1.84	0.42
19:G:149:G:C8	19:G:150:U:O4	2.70	0.42
19:G:152:C:C2'	19:G:153:C:O5'	2.67	0.42
26:1:627:THR:O	26:1:630:ARG:N	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:G:137:C:H2'	19:G:138:A:C5'	2.49	0.42
26:1:981:TYR:O	26:1:983:GLY:N	2.52	0.42
40:I:21:U:OP2	40:I:21:U:H5	2.03	0.42
42:A:597:LYS:O	42:A:599:MET:N	2.51	0.42
11:F:92:A:H2'	11:F:93:G:C8	2.54	0.42
20:H:179:C:H2'	20:H:180:G:H8	1.83	0.42
26:1:889:GLU:O	26:1:890:GLU:C	2.57	0.42
40:I:90:G:H2'	40:I:91:A:C8	2.55	0.42
19:G:152:C:O2'	19:G:153:C:O4'	2.38	0.42
20:H:178:A:N3	20:H:178:A:H2'	2.34	0.42
26:1:429:ARG:O	26:1:432:THR:N	2.46	0.42
26:1:935:THR:O	26:1:936:VAL:C	2.58	0.42
1:B:31:U:H2'	1:B:32:C:H6	1.84	0.42
11:F:92:A:H2'	11:F:93:G:H8	1.83	0.42
30:5:51:GLY:HA3	30:5:56:THR:O	2.20	0.42
1:B:59:G:C2	1:B:60:G:C8	3.08	0.42
11:F:71:G:N2	40:I:4:U:O2	2.33	0.42
11:F:89:U:H2'	11:F:90:G:H8	1.84	0.42
20:H:107:A:N1	20:H:108:G:C5	2.88	0.42
26:1:854:VAL:O	26:1:856:ASP:N	2.52	0.42
40:I:125:G:N3	10:V:63:ASN:O	2.53	0.42
1:B:98:G:OP2	1:B:98:G:H8	2.03	0.42
19:G:155:U:O4'	19:G:156:U:C5	2.73	0.42
26:1:831:ARG:O	26:1:832:GLN:C	2.58	0.42
26:1:867:MET:O	26:1:868:VAL:C	2.57	0.42
34:K:333:PRO:O	34:K:334:SER:C	2.58	0.42
35:N:462:THR:O	35:N:466:ILE:N	2.38	0.42
40:I:14:G:H2'	40:I:15:G:C8	2.55	0.42
1:B:55:C:O2'	42:A:642:ARG:O	2.23	0.42
2:D:441:GLY:O	2:D:693:THR:N	2.36	0.42
19:G:135:G:C2	20:H:42:G:N1	2.87	0.42
26:1:578:ILE:O	26:1:579:GLU:C	2.57	0.42
42:A:1507:SER:O	42:A:1511:GLU:N	2.48	0.42
43:C:909:GLY:HA3	43:C:930:ALA:N	2.29	0.42
20:H:168:A:H3'	20:H:169:C:C6	2.54	0.42
26:1:631:ALA:O	26:1:632:PHE:C	2.58	0.42
39:W:344:ILE:CA	39:W:360:LEU:N	2.81	0.42
20:H:155:C:H2'	20:H:156:U:H5"	2.02	0.41
36:L:278:ASP:O	36:L:281:GLN:N	2.53	0.41
39:W:205:LEU:C	39:W:207:LYS:H	2.23	0.41
39:W:405:LYS:CA	42:A:789:GLU:CA	2.98	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:1:952:ALA:O	26:1:953:ASP:C	2.57	0.41
42:A:1593:LEU:O	42:A:1596:VAL:N	2.53	0.41
1:B:38:C:N4	1:B:39:C:N3	2.68	0.41
11:F:66:C:H2'	11:F:67:G:H8	1.85	0.41
20:H:153:A:H62	20:H:177:A:H2	1.67	0.41
26:1:318:ARG:O	26:1:321:ASP:N	2.52	0.41
26:1:1046:GLY:O	26:1:1048:GLU:N	2.52	0.41
39:W:338:LYS:O	39:W:339:LYS:O	2.38	0.41
19:G:125:C:OP2	19:G:125:C:C2	2.73	0.41
20:H:112:G:H8	20:H:112:G:O5'	2.04	0.41
26:1:1256:HIS:O	26:1:1257:PRO:C	2.58	0.41
1:B:26:A:N7	42:A:423:ASP:CA	2.83	0.41
20:H:152:G:H2'	20:H:153:A:C1'	2.51	0.41
26:1:758:ASP:O	26:1:761:TYR:N	2.54	0.41
28:3:437:VAL:O	28:3:776:GLN:CA	2.69	0.41
35:N:117:LYS:C	35:N:119:ARG:N	2.74	0.41
26:1:600:LEU:O	26:1:604:ALA:N	2.35	0.41
43:C:236:MET:O	43:C:237:LEU:C	2.59	0.41
20:H:153:A:H2'	20:H:154:C:H5"	1.99	0.41
26:1:841:ALA:C	26:1:843:LYS:N	2.73	0.41
26:1:1105:GLU:O	26:1:1106:ARG:C	2.59	0.41
32:7:64:VAL:O	32:7:65:ARG:C	2.59	0.41
1:B:26:A:N3	1:B:26:A:C5'	2.80	0.41
20:H:103:U:C3'	20:H:104:U:H5'	2.50	0.41
20:H:183:G:C6	20:H:184:C:N4	2.89	0.41
26:1:301:ARG:O	26:1:304:PRO:N	2.53	0.41
26:1:745:ALA:O	26:1:746:PHE:C	2.59	0.41
1:B:5:U:H2'	1:B:6:C:C6	2.56	0.41
1:B:75:G:H2'	1:B:76:A:C8	2.55	0.41
2:D:577:LYS:O	2:D:581:SER:N	2.54	0.41
3:E:255:MET:O	3:E:257:ASN:N	2.54	0.41
19:G:145:U:C3'	19:G:146:C:H5'	2.42	0.41
19:G:146:C:N3	19:G:147:C:N4	2.69	0.41
20:H:171:U:H2'	20:H:172:C:O4'	2.21	0.41
26:1:645:LEU:O	26:1:646:PRO:C	2.56	0.41
26:1:750:ILE:O	26:1:753:LEU:N	2.54	0.41
26:1:830:TYR:O	26:1:831:ARG:C	2.57	0.41
26:1:1169:VAL:O	26:1:1172:LEU:N	2.54	0.41
28:3:1148:LEU:O	28:3:1149:ARG:C	2.58	0.41
42:A:331:TRP:O	43:C:177:ARG:C	2.59	0.41
42:A:1952:VAL:O	42:A:1956:PRO:N	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
26:1:547:GLN:O	26:1:548:GLU:C	2.58	0.41
26:1:862:GLU:O	26:1:864:TYR:N	2.53	0.41
26:1:914:PHE:O	26:1:915:GLY:C	2.58	0.41
26:1:1129:LEU:O	26:1:1130:PRO:C	2.59	0.41
32:7:46:HIS:O	32:7:47:PHE:C	2.59	0.41
40:I:107:U:H2'	40:I:108:C:H6	1.85	0.41
43:C:756:LYS:O	43:C:757:ALA:C	2.58	0.41
1:B:101:U:H2'	1:B:102:U:C6	2.56	0.40
26:1:1128:VAL:O	26:1:1129:LEU:C	2.60	0.40
26:1:1223:SER:O	26:1:1224:PRO:C	2.60	0.40
43:C:684:LYS:O	43:C:795:VAL:N	2.45	0.40
28:3:1193:VAL:O	28:3:1196:GLU:N	2.54	0.40
35:N:736:LEU:O	35:N:740:PRO:N	2.54	0.40
38:O:30:PHE:O	38:O:79:CYS:CA	2.69	0.40
40:I:60:A:P	40:I:61:A:OP1	2.79	0.40
29:4:20:LEU:O	29:4:55:GLY:HA2	2.21	0.40
31:6:30:CYS:N	31:6:35:SER:O	2.38	0.40
42:A:570:ASP:C	42:A:572:PHE:H	2.22	0.40
43:C:684:LYS:N	43:C:795:VAL:O	2.55	0.40
1:B:71:C:H2'	1:B:72:U:C6	2.55	0.40
11:F:90:G:H2'	11:F:91:A:C8	2.57	0.40
26:1:1013:ILE:O	26:1:1014:LYS:C	2.60	0.40
35:N:289:ASN:N	42:A:871:TYR:O	2.54	0.40
42:A:954:LYS:O	42:A:958:GLY:N	2.46	0.40
42:A:1519:THR:C	42:A:1521:ALA:H	2.22	0.40
19:G:149:G:C4	19:G:150:U:C5	3.09	0.40
20:H:152:G:H2'	20:H:152:G:N3	2.36	0.40
20:H:166:G:N3	20:H:166:G:H2'	2.37	0.40
26:1:874:LYS:O	26:1:877:GLY:HA3	2.21	0.40
40:I:14:G:H2'	40:I:15:G:H8	1.87	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	D	1868/2136 (88%)	1770 (95%)	93 (5%)	5 (0%)	41	76
3	E	297/357 (83%)	272 (92%)	16 (5%)	9 (3%)	4	28
4	P	70/118 (59%)	68 (97%)	2 (3%)	0	100	100
4	a	74/118 (63%)	71 (96%)	3 (4%)	0	100	100
4	k	81/118 (69%)	78 (96%)	3 (4%)	0	100	100
5	Q	69/86 (80%)	67 (97%)	2 (3%)	0	100	100
5	b	71/86 (83%)	70 (99%)	1 (1%)	0	100	100
5	m	72/86 (84%)	68 (94%)	4 (6%)	0	100	100
6	R	76/92 (83%)	70 (92%)	6 (8%)	0	100	100
6	c	76/92 (83%)	70 (92%)	6 (8%)	0	100	100
6	l	77/92 (84%)	76 (99%)	1 (1%)	0	100	100
7	S	71/76 (93%)	67 (94%)	4 (6%)	0	100	100
7	d	67/76 (88%)	63 (94%)	4 (6%)	0	100	100
7	n	64/76 (84%)	62 (97%)	2 (3%)	0	100	100
8	T	69/126 (55%)	69 (100%)	0	0	100	100
8	e	76/126 (60%)	73 (96%)	3 (4%)	0	100	100
8	h	76/126 (60%)	75 (99%)	1 (1%)	0	100	100
9	U	60/231 (26%)	57 (95%)	3 (5%)	0	100	100
9	f	60/231 (26%)	57 (95%)	3 (5%)	0	100	100
9	i	69/231 (30%)	68 (99%)	1 (1%)	0	100	100
10	V	80/119 (67%)	76 (95%)	4 (5%)	0	100	100
10	g	89/119 (75%)	84 (94%)	5 (6%)	0	100	100
10	j	80/119 (67%)	77 (96%)	3 (4%)	0	100	100
12	q	88/95 (93%)	77 (88%)	7 (8%)	4 (4%)	2	22
13	r	71/102 (70%)	66 (93%)	3 (4%)	2 (3%)	5	30
14	s	70/139 (50%)	64 (91%)	5 (7%)	1 (1%)	11	46
15	t	71/91 (78%)	64 (90%)	4 (6%)	3 (4%)	3	22
16	x	68/80 (85%)	66 (97%)	2 (3%)	0	100	100
17	y	61/103 (59%)	56 (92%)	5 (8%)	0	100	100
18	z	57/96 (59%)	52 (91%)	4 (7%)	1 (2%)	8	40

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
21	o	160/255 (63%)	146 (91%)	12 (8%)	2 (1%)	12	48
22	p	92/225 (41%)	90 (98%)	2 (2%)	0	100	100
23	u	118/793 (15%)	106 (90%)	6 (5%)	6 (5%)	2	19
24	v	91/464 (20%)	66 (72%)	16 (18%)	9 (10%)	0	9
25	w	431/501 (86%)	385 (89%)	41 (10%)	5 (1%)	13	49
26	1	1014/1304 (78%)	821 (81%)	171 (17%)	22 (2%)	6	35
27	2	174/895 (19%)	155 (89%)	14 (8%)	5 (3%)	4	29
28	3	1160/1217 (95%)	1062 (92%)	90 (8%)	8 (1%)	22	62
29	4	76/424 (18%)	74 (97%)	2 (3%)	0	100	100
30	5	106/125 (85%)	83 (78%)	20 (19%)	3 (3%)	5	30
31	6	87/110 (79%)	76 (87%)	11 (13%)	0	100	100
32	7	64/86 (74%)	55 (86%)	8 (12%)	1 (2%)	9	43
33	J	159/683 (23%)	148 (93%)	7 (4%)	4 (2%)	5	32
34	K	335/522 (64%)	295 (88%)	26 (8%)	14 (4%)	3	22
35	N	541/941 (58%)	475 (88%)	41 (8%)	25 (5%)	2	21
36	L	222/499 (44%)	214 (96%)	8 (4%)	0	100	100
37	M	123/128 (96%)	117 (95%)	6 (5%)	0	100	100
38	O	137/142 (96%)	126 (92%)	9 (7%)	2 (2%)	10	45
39	W	461/565 (82%)	327 (71%)	77 (17%)	57 (12%)	0	5
41	X	402/820 (49%)	393 (98%)	8 (2%)	1 (0%)	47	81
42	A	2213/2335 (95%)	2046 (92%)	100 (4%)	67 (3%)	4	28
43	C	814/972 (84%)	751 (92%)	40 (5%)	23 (3%)	5	30
All	All	13158/19749 (67%)	11964 (91%)	915 (7%)	279 (2%)	10	36

All (279) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	354	PRO
2	D	957	VAL
2	D	1584	ILE
3	E	193	THR
12	q	55	LEU
15	t	60	THR
15	t	61	PRO

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Mol	Chain	Res	Type
15	t	70	ASP
23	u	301	PRO
24	v	139	PRO
24	v	160	GLU
24	v	161	PRO
24	v	162	PRO
24	v	165	ARG
24	v	218	PRO
25	w	284	ARG
26	1	113	ALA
26	1	208	PRO
26	1	416	PRO
26	1	418	PRO
26	1	456	VAL
26	1	941	ASN
26	1	1105	GLU
26	1	1110	VAL
27	2	597	PHE
28	3	406	PRO
30	5	99	GLN
33	J	541	VAL
34	K	171	PRO
34	K	227	GLN
34	K	334	SER
34	K	480	PRO
34	K	514	ARG
35	N	12	PRO
35	N	163	VAL
35	N	355	GLY
35	N	370	PRO
35	N	420	ARG
35	N	741	HIS
35	N	841	PRO
35	N	918	ASP
39	W	146	ARG
39	W	178	ASN
39	W	183	ASP
39	W	206	ASP
39	W	207	LYS
39	W	208	GLN
39	W	231	LYS
39	W	265	PRO

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Mol	Chain	Res	Type
39	W	307	SER
39	W	340	LYS
39	W	345	VAL
39	W	350	GLN
39	W	355	ILE
39	W	360	LEU
39	W	361	PRO
39	W	364	ASP
39	W	394	ASP
39	W	406	GLU
39	W	411	PRO
39	W	414	PRO
39	W	415	LEU
39	W	419	LEU
39	W	458	THR
39	W	479	ASP
39	W	484	LEU
39	W	486	GLU
39	W	532	LEU
39	W	556	ASP
42	A	63	PRO
42	A	166	PHE
42	A	308	ILE
42	A	331	TRP
42	A	363	HIS
42	A	371	LEU
42	A	373	ASP
42	A	424	ILE
42	A	425	PRO
42	A	442	LYS
42	A	471	TYR
42	A	571	ALA
42	A	598	LEU
42	A	629	PHE
42	A	631	ALA
42	A	697	MET
42	A	698	PRO
42	A	799	PRO
42	A	1013	ASN
42	A	1124	ASN
42	A	1186	LEU
42	A	1202	THR

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Mol	Chain	Res	Type
42	A	1511	GLU
42	A	1520	ASN
42	A	1521	ALA
42	A	1604	LEU
42	A	1760	GLU
42	A	2016	ILE
42	A	2018	ALA
43	C	333	ASP
43	C	388	VAL
43	C	427	PHE
43	C	444	GLY
43	C	457	VAL
43	C	458	ASP
43	C	475	MET
43	C	516	LEU
43	C	572	GLU
43	C	825	PRO
2	D	151	LYS
12	q	74	ALA
13	r	97	PRO
14	s	12	ASN
21	o	160	LYS
23	u	223	LYS
23	u	280	VAL
25	w	277	THR
28	3	772	ALA
30	5	104	LYS
34	K	198	LEU
34	K	265	LEU
35	N	150	ALA
35	N	824	PRO
35	N	840	ASP
39	W	105	CYS
39	W	107	TYR
39	W	186	LEU
39	W	211	LEU
39	W	339	LYS
39	W	341	LYS
39	W	365	LEU
39	W	380	GLN
39	W	395	LEU
39	W	457	PHE

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Mol	Chain	Res	Type
39	W	462	PHE
39	W	502	ASN
39	W	531	ASP
41	X	666	PRO
42	A	531	THR
42	A	729	PRO
42	A	767	VAL
42	A	1015	VAL
42	A	1092	ILE
42	A	1126	VAL
42	A	1185	LEU
42	A	1308	PRO
43	C	156	GLU
43	C	354	ARG
43	C	367	ARG
43	C	440	SER
43	C	824	THR
43	C	868	LEU
3	E	60	MET
3	E	88	ARG
3	E	256	ASP
25	w	177	ARG
25	w	393	PRO
26	1	437	PRO
27	2	510	TYR
34	K	261	PRO
35	N	143	SER
35	N	774	PRO
38	O	74	GLU
39	W	400	LEU
39	W	410	ILE
39	W	417	ASN
39	W	466	LYS
39	W	509	PRO
42	A	212	PRO
42	A	376	GLU
42	A	381	PRO
42	A	709	ILE
42	A	734	PRO
42	A	824	PRO
42	A	1203	SER
42	A	1204	TYR

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Mol	Chain	Res	Type
42	A	1503	TRP
42	A	1677	GLU
42	A	1758	PRO
42	A	1947	ASN
43	C	237	LEU
43	C	615	PRO
3	E	162	ARG
13	r	96	ALA
21	o	32	PRO
23	u	300	THR
26	1	112	ILE
26	1	523	ALA
26	1	909	VAL
26	1	1006	MET
27	2	463	ALA
27	2	599	THR
28	3	529	ALA
28	3	578	THR
30	5	75	ASP
33	J	535	GLU
33	J	536	ASP
33	J	615	ASP
34	K	229	GLY
34	K	259	SER
34	K	405	GLY
35	N	324	LYS
35	N	374	ARG
35	N	777	PRO
35	N	809	ASN
35	N	855	ARG
39	W	176	PRO
39	W	376	ASN
39	W	418	ILE
39	W	425	ILE
39	W	491	VAL
42	A	188	LEU
42	A	380	LEU
42	A	526	PRO
42	A	903	SER
42	A	1305	SER
43	C	856	HIS
3	E	159	PRO

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Mol	Chain	Res	Type
12	q	73	PRO
24	v	141	ILE
24	v	217	PRO
26	1	1075	ARG
26	1	1186	GLN
28	3	95	SER
28	3	229	GLU
35	N	421	ILE
39	W	337	THR
39	W	434	LYS
42	A	349	ALA
42	A	437	ALA
42	A	1206	GLU
43	C	360	ALA
43	C	573	GLU
3	E	270	LYS
18	z	34	ILE
24	v	220	PRO
26	1	326	THR
26	1	932	ILE
26	1	1047	ALA
28	3	407	ILE
35	N	307	HIS
35	N	325	LEU
38	O	77	ASP
39	W	357	THR
39	W	413	VAL
42	A	370	PRO
42	A	619	GLY
42	A	1198	PRO
42	A	1275	ARG
42	A	1955	LYS
42	A	2012	LEU
43	C	361	PRO
3	E	149	GLY
26	1	417	PRO
34	K	459	PRO
34	K	479	HIS
35	N	739	CYS
39	W	222	PRO
39	W	262	ILE
42	A	771	VAL

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Mol	Chain	Res	Type
23	u	221	PRO
26	1	223	THR
42	A	358	PRO
42	A	1118	PRO
25	w	229	TRP
26	1	409	PRO
27	2	586	ILE
28	3	1204	VAL
34	K	446	PRO
35	N	323	GLY
35	N	369	LEU
2	D	585	ILE
3	E	324	PRO
23	u	298	PRO
26	1	1031	VAL
32	7	64	VAL
42	A	894	VAL
12	q	52	PRO
35	N	743	THR
43	C	778	PRO

5.3.2 Protein sidechains (i)

There are no protein residues with a non-rotameric sidechain to report in this entry.

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	B	114/117 (97%)	38 (33%)	2 (1%)
11	F	65/107 (60%)	10 (15%)	2 (3%)
19	G	41/274 (14%)	28 (68%)	9 (21%)
20	H	105/188 (55%)	25 (23%)	2 (1%)
40	I	112/144 (77%)	31 (27%)	4 (3%)
All	All	437/830 (52%)	132 (30%)	19 (4%)

All (132) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	B	8	G
1	B	10	U
1	B	20	G

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Mol	Chain	Res	Type
1	B	21	A
1	B	22	U
1	B	23	C
1	B	24	G
1	B	25	C
1	B	26	A
1	B	27	U
1	B	34	U
1	B	36	C
1	B	38	C
1	B	39	C
1	B	41	U
1	B	42	U
1	B	45	C
1	B	48	A
1	B	52	U
1	B	53	U
1	B	54	U
1	B	57	G
1	B	68	C
1	B	69	A
1	B	70	A
1	B	79	C
1	B	80	U
1	B	83	A
1	B	88	A
1	B	90	U
1	B	92	U
1	B	93	U
1	B	94	U
1	B	95	G
1	B	96	A
1	B	97	G
1	B	98	G
1	B	109	G
11	F	6	C
11	F	7	G
11	F	9	U
11	F	51	U
11	F	52	U
11	F	53	A
11	F	70	A

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Mol	Chain	Res	Type
11	F	103	U
11	F	104	U
11	F	106	U
19	G	123	U
19	G	124	U
19	G	125	C
19	G	126	C
19	G	127	U
19	G	128	U
19	G	129	G
19	G	130	A
19	G	135	G
19	G	136	U
19	G	137	C
19	G	140	A
19	G	144	A
19	G	145	U
19	G	146	C
19	G	147	C
19	G	148	U
19	G	149	G
19	G	150	U
19	G	151	C
19	G	152	C
19	G	154	U
19	G	156	U
19	G	157	U
19	G	159	U
19	G	161	U
19	G	162	C
19	G	163	C
20	H	31	G
20	H	37	U
20	H	40	C
20	H	45	C
20	H	47	U
20	H	51	A
20	H	65	U
20	H	105	G
20	H	106	G
20	H	112	G
20	H	143	A

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Mol	Chain	Res	Type
20	H	147	G
20	H	152	G
20	H	153	A
20	H	154	C
20	H	156	U
20	H	157	G
20	H	164	C
20	H	166	G
20	H	167	U
20	H	168	A
20	H	169	C
20	H	177	A
20	H	178	A
20	H	179	C
40	I	21	U
40	I	25	A
40	I	26	G
40	I	36	U
40	I	41	C
40	I	44	A
40	I	45	G
40	I	56	U
40	I	58	C
40	I	59	U
40	I	60	A
40	I	61	A
40	I	62	U
40	I	84	C
40	I	85	G
40	I	90	G
40	I	100	A
40	I	103	A
40	I	109	G
40	I	114	U
40	I	115	G
40	I	118	A
40	I	119	A
40	I	120	U
40	I	121	U
40	I	122	U
40	I	124	U
40	I	125	G

Continued on next page...

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Mol	Chain	Res	Type
40	I	126	A
40	I	127	C
40	I	144	G

All (19) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	B	78	U
1	B	94	U
11	F	51	U
11	F	52	U
19	G	123	U
19	G	136	U
19	G	143	U
19	G	148	U
19	G	150	U
19	G	151	C
19	G	153	C
19	G	155	U
19	G	156	U
20	H	156	U
20	H	168	A
40	I	43	G
40	I	58	C
40	I	99	C
40	I	114	U

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 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 for Mogul analysis.

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
45	GTP	C	1500	46	26,34,34	1.27	1 (3%)	32,54,54	1.62	3 (9%)
44	IHP	A	3000	-	36,36,36	0.82	0	54,60,60	1.20	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
45	GTP	C	1500	46	-	3/18/38/38	0/3/3/3
44	IHP	A	3000	-	-	6/30/54/54	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	C	1500	GTP	C6-N1	-3.66	1.32	1.37

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	C	1500	GTP	PB-O3B-PG	-5.86	112.72	132.83
44	A	3000	IHP	C6-C5-C4	3.80	118.73	110.41
45	C	1500	GTP	PA-O3A-PB	-3.76	119.91	132.83
44	A	3000	IHP	C5-C4-C3	2.46	115.80	110.41
45	C	1500	GTP	C5-C6-N1	2.40	118.19	113.95

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
44	A	3000	IHP	C2-O12-P2-O42
44	A	3000	IHP	C3-O13-P3-O23
45	C	1500	GTP	C5'-O5'-PA-O3A
44	A	3000	IHP	C6-O16-P6-O46
44	A	3000	IHP	C5-O15-P5-O25

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Mol	Chain	Res	Type	Atoms
44	A	3000	IHP	C1-O11-P1-O31
44	A	3000	IHP	C4-O14-P4-O34
45	C	1500	GTP	PG-O3B-PB-O2B
45	C	1500	GTP	C5'-O5'-PA-O1A

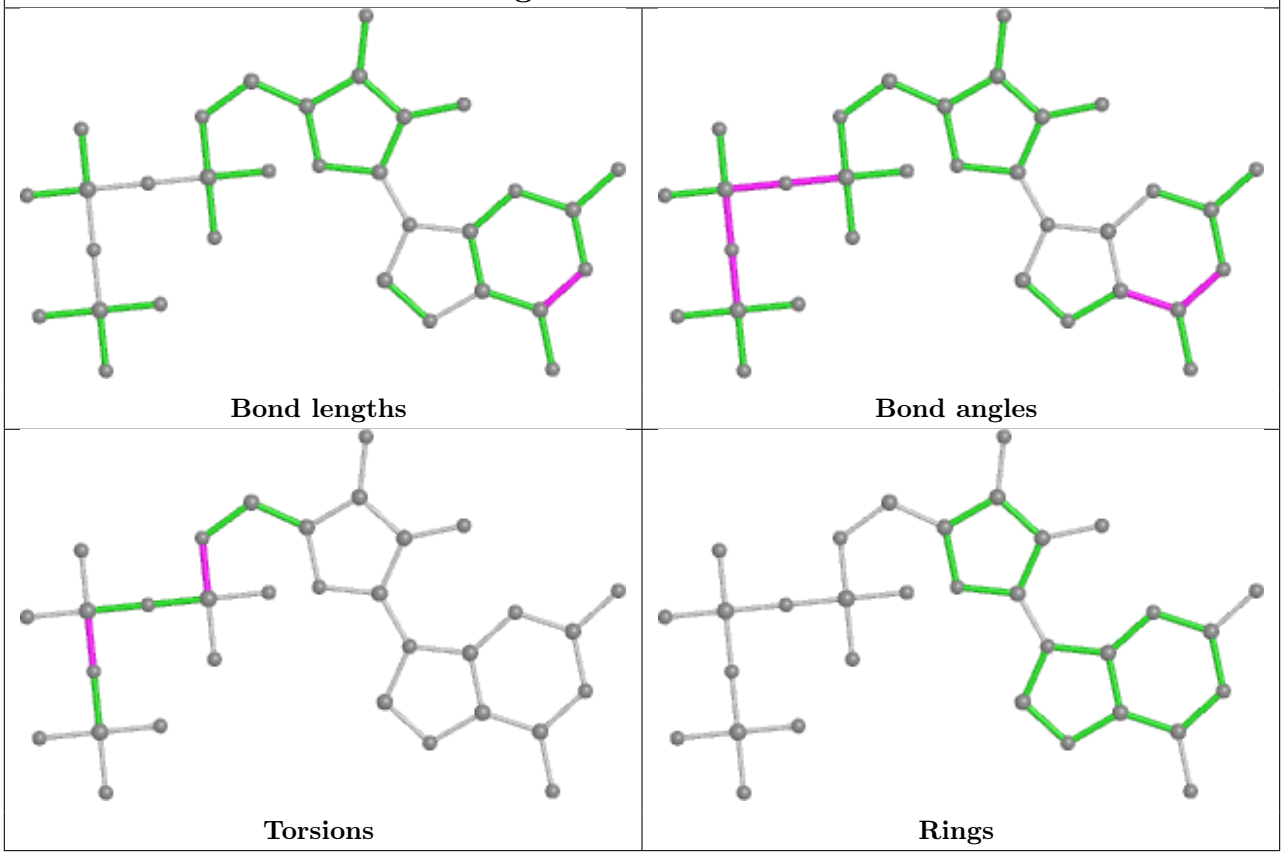
There are no ring outliers.

1 monomer is involved in 4 short contacts:

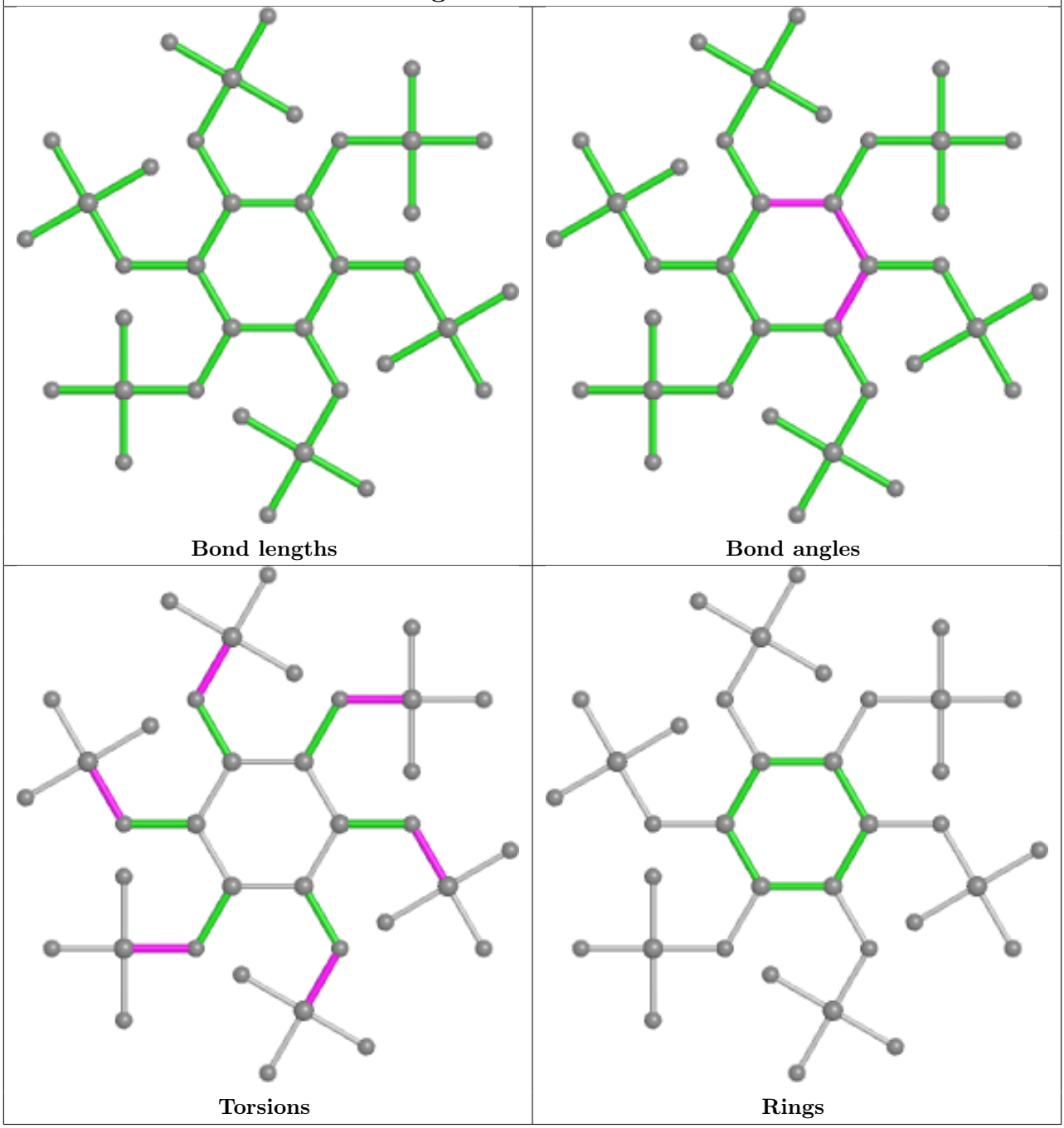
Mol	Chain	Res	Type	Clashes	Symm-Clashes
45	C	1500	GTP	4	0

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 GTP C 1500



Ligand IHP A 3000



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

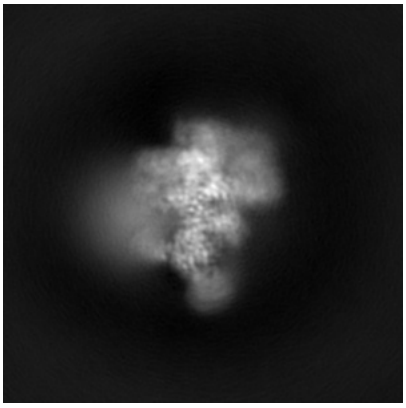
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-9621. These allow visual inspection of the internal detail of the map and identification of artifacts.

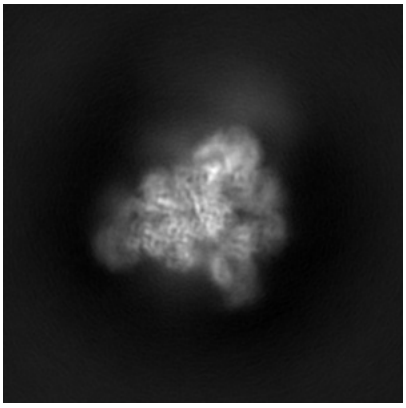
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

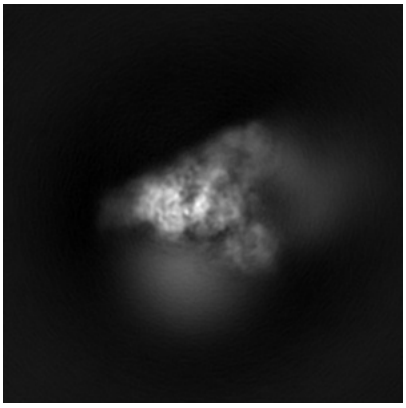
6.1.1 Primary map



X



Y

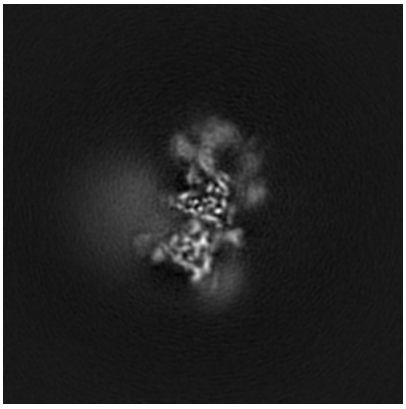


Z

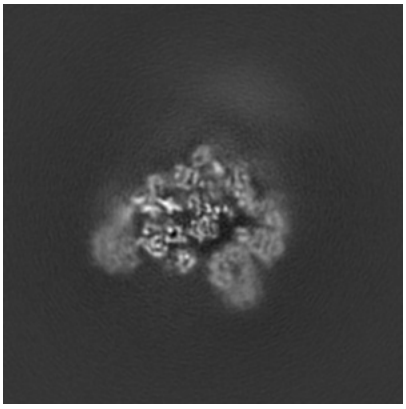
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

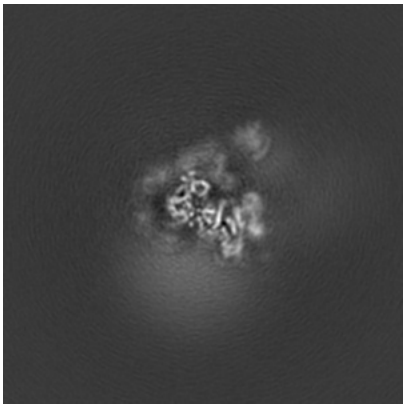
6.2.1 Primary map



X Index: 200



Y Index: 200

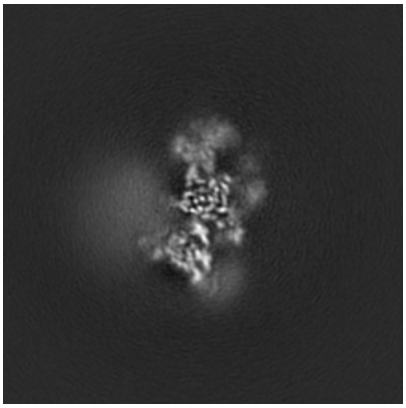


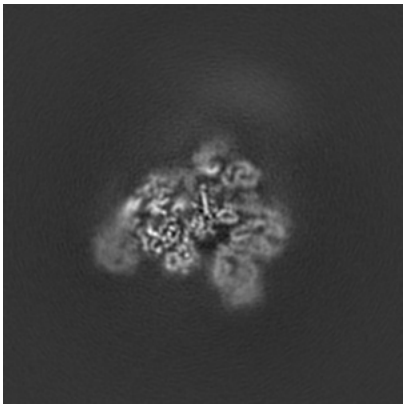
Z Index: 200

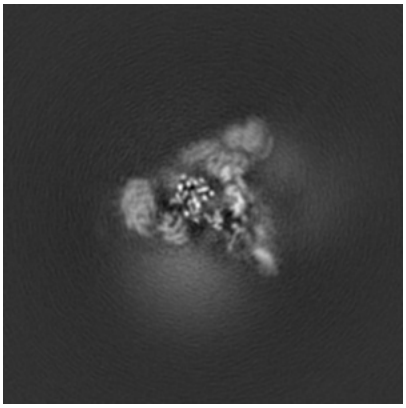
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map


X Index: 197

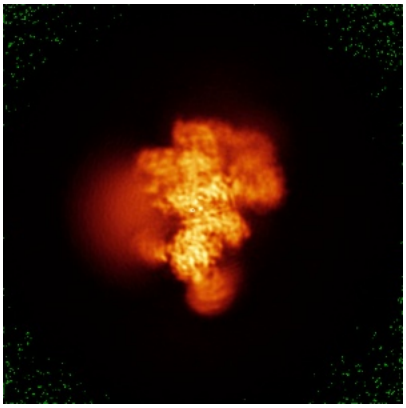

Y Index: 193

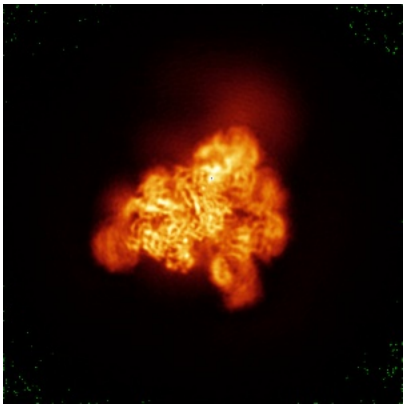

Z Index: 213

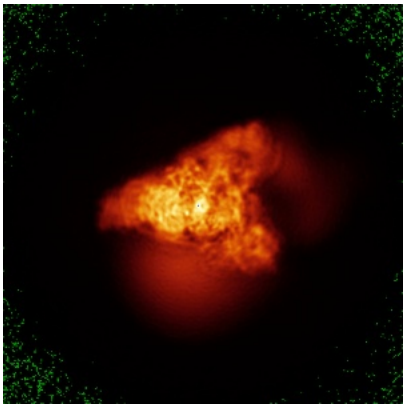
The images above show the largest variance slices of the map in three orthogonal directions.

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

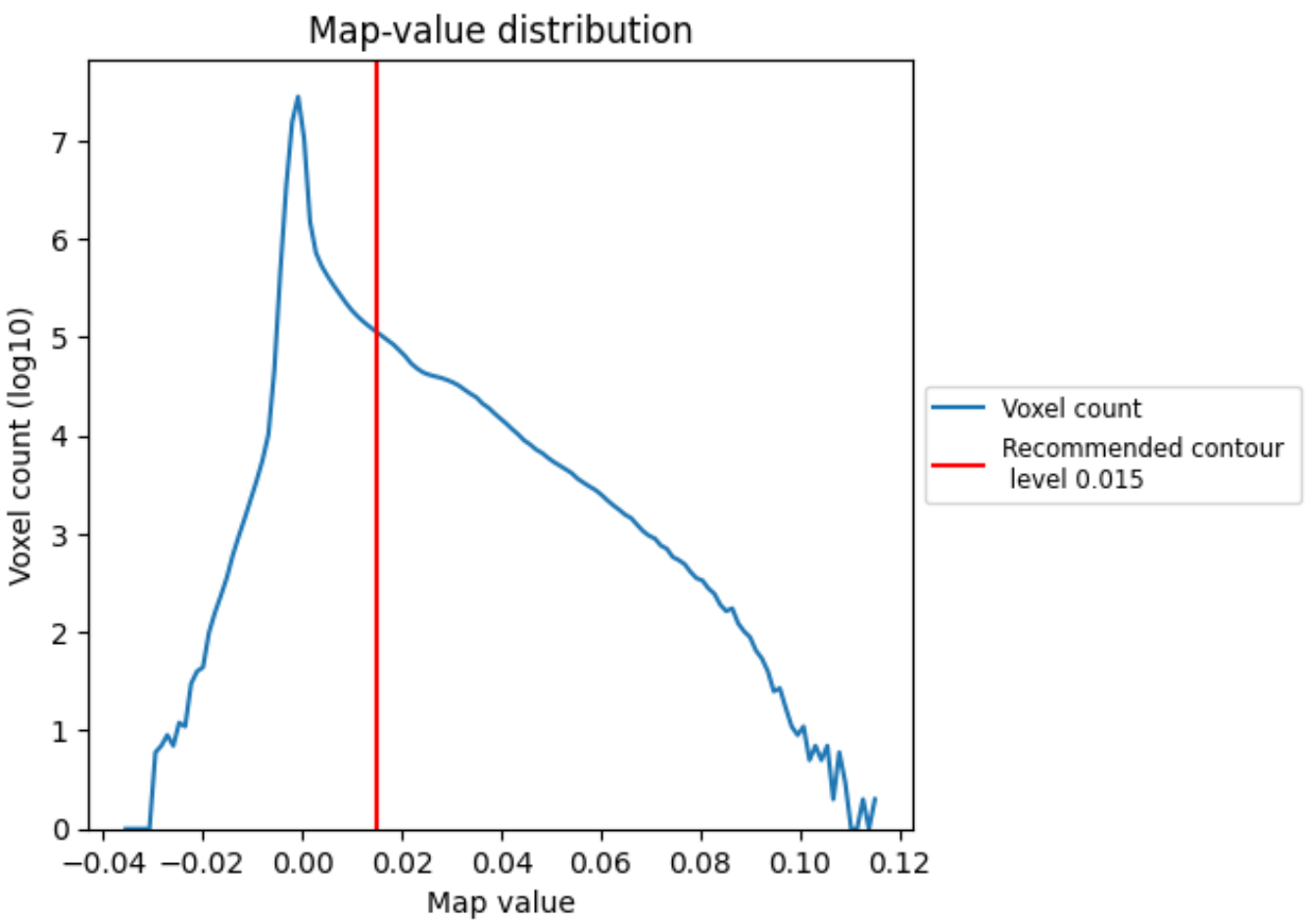
6.6 Mask visualisation (i)

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

7 Map analysis (i)

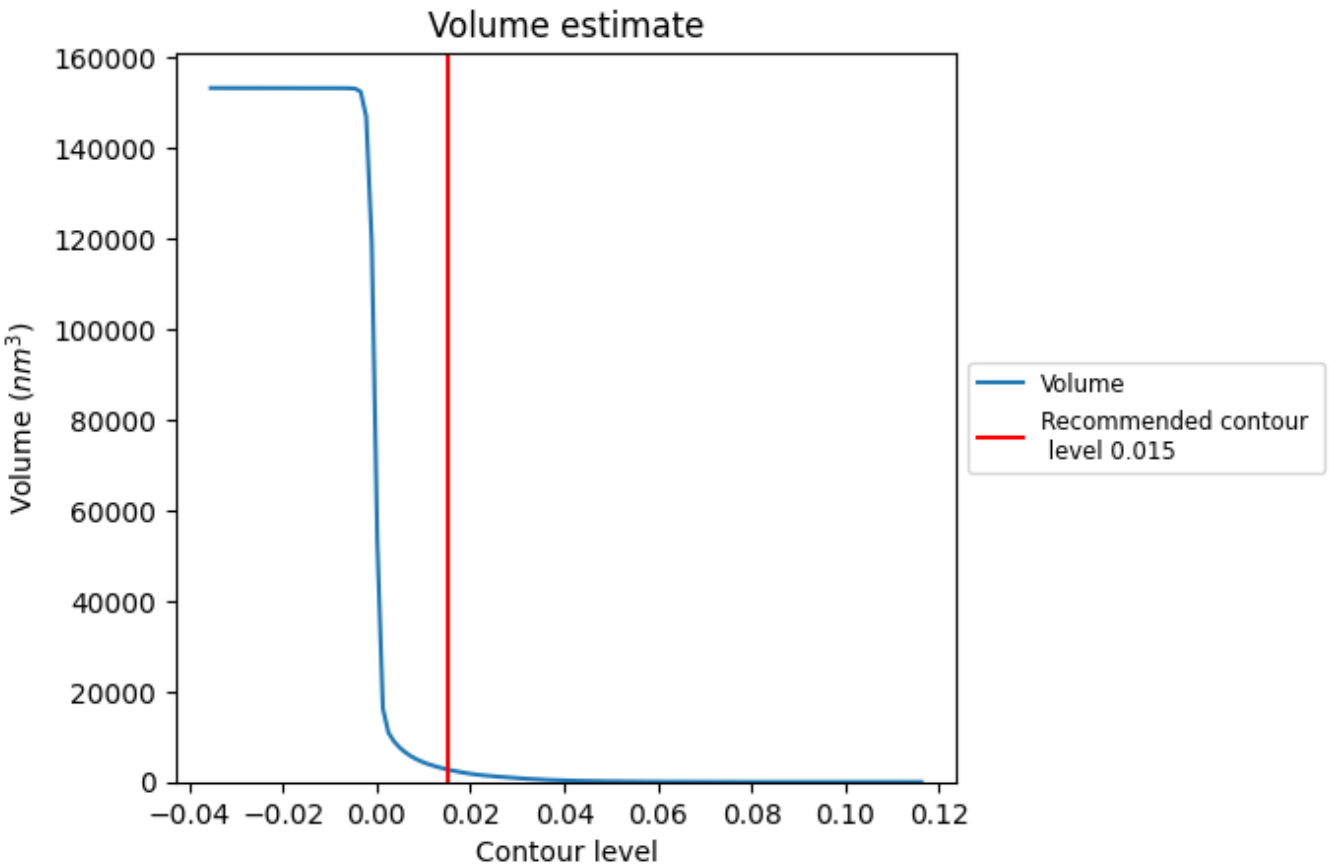
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



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

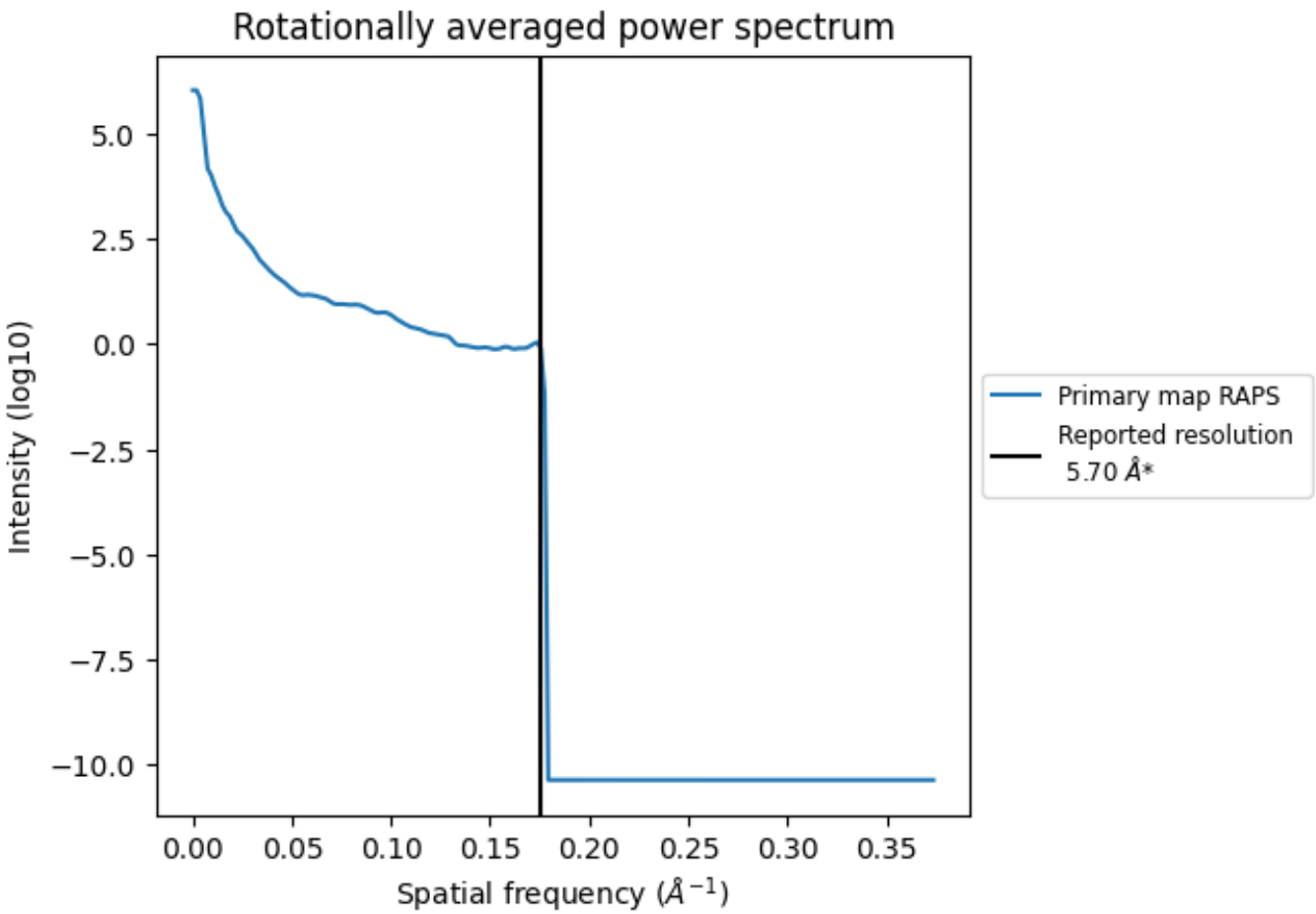
7.2 Volume estimate (i)



The volume at the recommended contour level is 2784 nm^3; this corresponds to an approximate mass of 2515 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 0.175 Å^{-1}

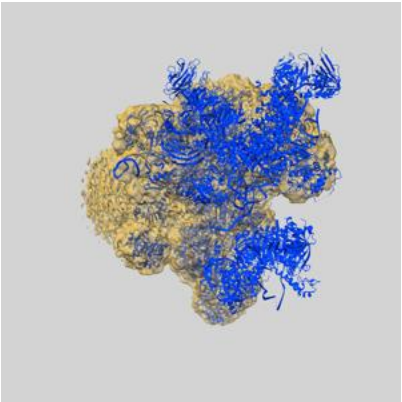
8 Fourier-Shell correlation (i)

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

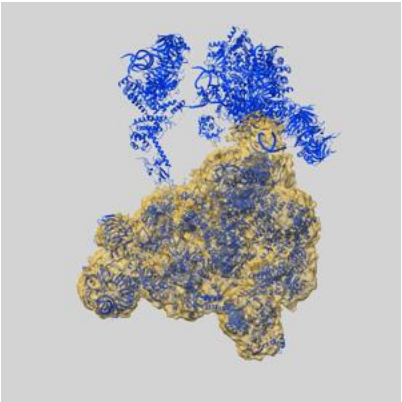
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-9621 and PDB model 6AH0. Per-residue inclusion information can be found in section 3 on page 14.

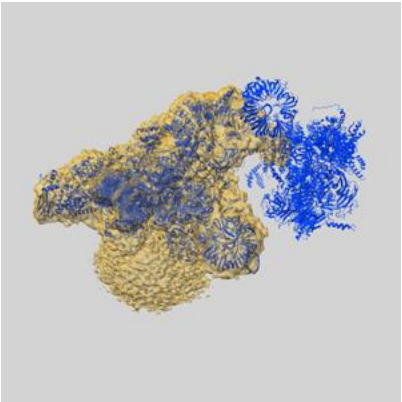
9.1 Map-model overlay (i)



X



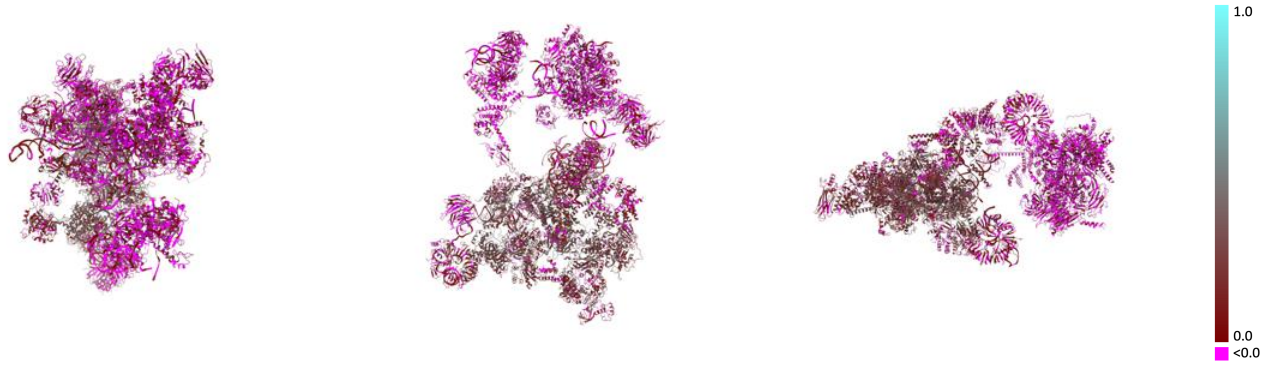
Y



Z

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

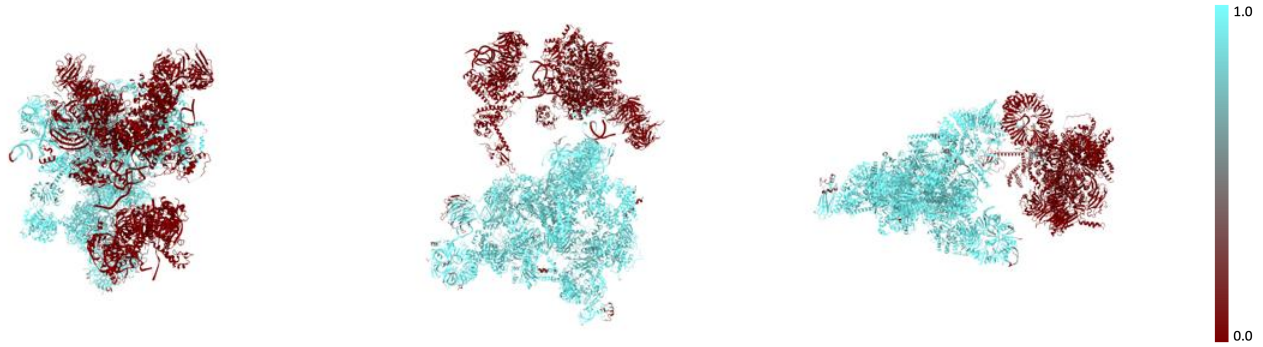
9.2 Q-score mapped to coordinate model (i)



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.

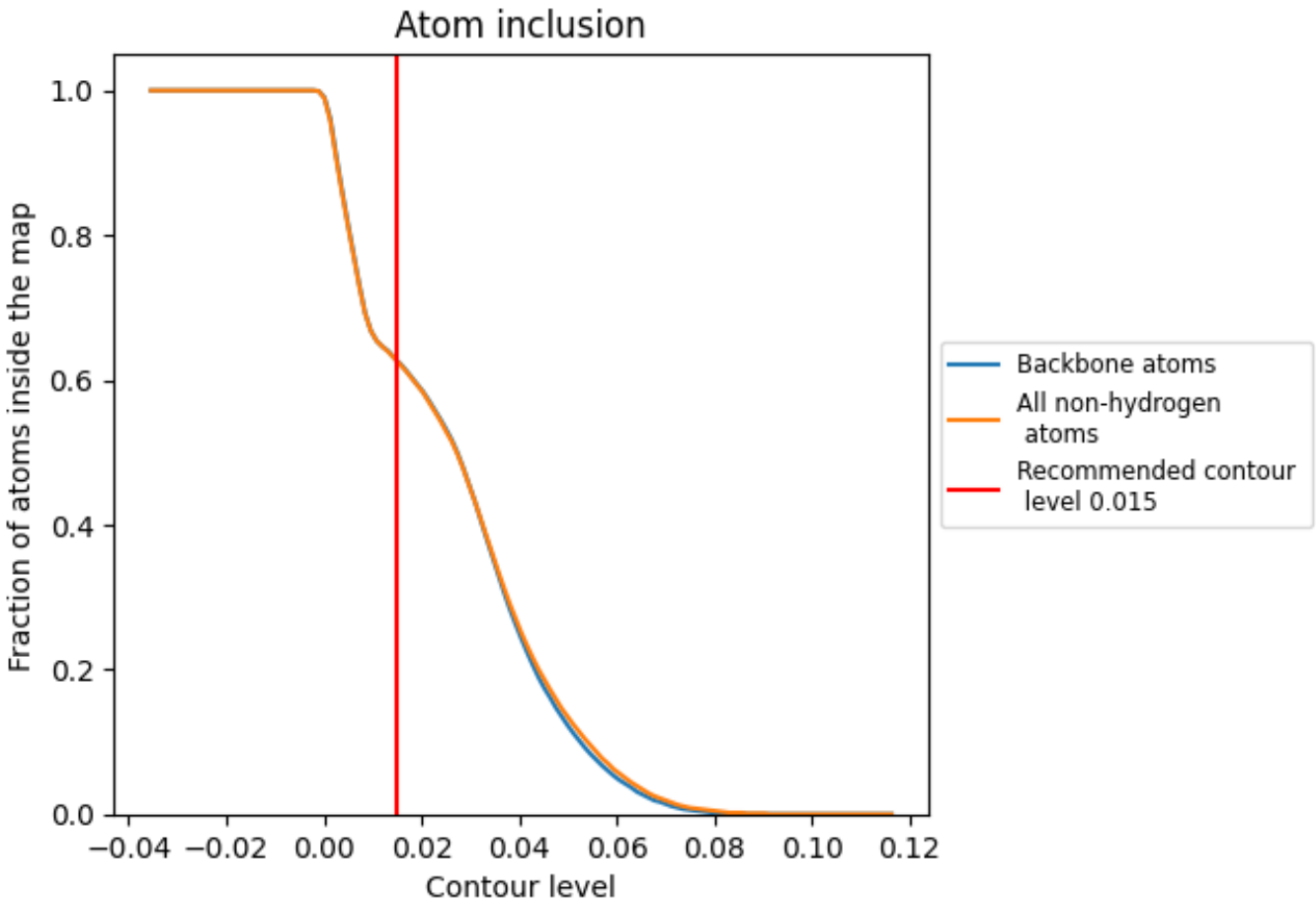
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.015).

9.4 Atom inclusion (i)



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

9.5 Map-model fit summary (i)

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

Chain	Atom inclusion	Q-score
All	0.6260	0.1190
1	0.0190	0.0020
2	0.0360	0.0050
3	0.0000	-0.0030
4	0.0000	-0.0090
5	0.0000	-0.0110
6	0.0000	-0.0050
7	0.0000	0.0920
A	0.9900	0.2830
B	0.9360	0.1220
C	1.0000	0.2810
D	0.9740	0.1980
E	0.7270	-0.0190
F	0.7860	0.1010
G	0.0000	0.0150
H	0.0530	-0.0000
I	0.9330	0.1200
J	0.9580	0.0740
K	0.9940	0.0920
L	0.9870	0.1530
M	0.9900	0.2130
N	0.9580	0.1260
O	0.9750	0.2170
P	0.9570	0.1190
Q	0.9210	0.0870
R	0.8920	0.0800
S	0.9230	0.1050
T	0.9060	0.0760
U	0.9100	0.0820
V	0.9550	0.1500
W	0.9250	0.1840
X	0.9610	0.1200
a	0.9650	0.1010
b	0.8400	0.0480
c	0.9040	0.0990

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Chain	Atom inclusion	Q-score
d	0.8760	0.1480
e	1.0000	0.2090
f	1.0000	0.1490
g	0.9290	0.1560
h	0.0000	0.0120
i	0.0000	-0.0140
j	0.0000	-0.0180
k	0.0000	0.0390
l	0.0000	0.0120
m	0.0000	0.0380
n	0.0000	0.0170
o	0.0000	-0.0050
p	0.0000	0.0060
q	0.0000	0.0370
r	0.0000	0.0420
s	0.0000	-0.0520
t	0.0000	-0.0050
u	0.0000	0.0100
v	0.0000	0.0170
w	0.0000	-0.0140
x	0.0000	0.0050
y	0.0000	0.0190
z	0.0000	-0.0140