



wwPDB EM Validation Summary Report ⓘ

Nov 8, 2022 – 09:18 AM JST

PDB ID : 5Z57
EMDB ID : EMD-6890
Title : Cryo-EM structure of the human activated spliceosome (late Bact) at 6.5 angstrom
Authors : Zhang, X.; Yan, C.; Zhan, X.; Li, L.; Lei, J.; Shi, Y.
Deposited on : 2018-01-17
Resolution : 6.50 Å(reported)

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

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A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

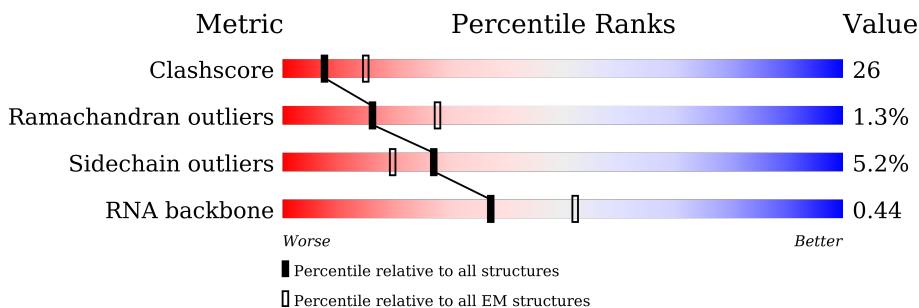
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

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 6.50 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	A	2335	<div style="display: flex; justify-content: space-between;"> 18% 48% 33% • 15% </div>
2	B	117	<div style="display: flex; justify-content: space-between;"> 13% 29% 26% 14% • 28% </div>
3	C	972	<div style="display: flex; justify-content: space-between;"> 8% 49% 31% 7% • 12% </div>
4	D	2136	<div style="display: flex; justify-content: space-between;"> 78% 79% • 19% </div>
5	E	357	<div style="display: flex; justify-content: space-between;"> 22% 58% 22% • 16% </div>
6	a	126	<div style="display: flex; justify-content: space-between;"> 57% 64% 36% </div>
6	h	126	<div style="display: flex; justify-content: space-between;"> 60% 63% 37% </div>

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Mol	Chain	Length	Quality of chain
7	b	231	27% 35% 65%
7	i	231	35% 37% 63%
8	c	119	48% 69% 31%
8	j	119	65% 69% 31%
9	d	118	57% 81% 18%
9	k	118	67% 71% 28%
10	f	86	64% 86% 14%
10	m	86	77% 86% 14%
11	e	92	54% 86% 14%
11	l	92	80% 86% 14%
12	g	76	70% 97%
12	n	76	84% 89% 11%
13	F	107	7% 26% 30% 31% 13%
14	G	274	14% 12% 72%
15	H	188	39% 13% 40% 17% 28%
16	o	255	62% 62% 36%
17	p	225	68% 66% 7% 27%
18	w	501	72% 84% 13%
19	u	793	13% 12% 87%
20	v	464	22% 32% 64%
21	1	1304	8% 51% 28% 20%
22	2	895	6% 14% 6% 80%
23	3	1217	11% 50% 47%
24	4	424	12% 9% 8% 82%
25	5	125	8% 58% 29% 14%

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Mol	Chain	Length	Quality of chain
26	6	110	11% 55% 26% 19%
27	7	86	7% 43% 33% 23%
28	J	848	41% 54% 7% 38%
29	L	802	27% 35% 7% 57%
30	q	504	26% 25% 74%
30	r	504	25% 25% 74%
30	s	504	12% 13% 87%
30	t	504	13% 13% 87%
31	K	225	60% 54% 12% 32%
32	I	855	64% 60% 6% 34%
33	Q	1485	87% 89% 11%
34	N	144	6% 58% 36% 5%
35	O	420	28% 33% 31% 32%
36	P	229	25% 18% 18% 5% 58%
37	R	540	20% 25% 18% 9% 47%
38	S	166	40% 59% 30% 6%
39	T	514	36% 20% 39%
40	U	2752	99%
41	V	908	28% 44% 5% 50%
42	W	579	66% 64% 17% 17%
43	X	396	11% 31% 9% 60%
44	Y	322	16% 17% 67%
45	Z	619	8% 9% 7% 82%
46	x	1041	56% 55% 44%
47	y	301	68% 77% 23%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
48	IHP	A	2401	-	-	X	-
50	GTP	C	1500	-	-	X	-
52	ZN	O	502	-	-	X	-

2 Entry composition

There are 52 unique types of molecules in this entry. The entry contains 113433 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1978	16399	10552	2875	2897	75	0	0

- Molecule 2 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	84	1768	792	295	597	84	0	0

- Molecule 3 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	860	6716	4294	1120	1270	32	0	0

- Molecule 4 is a protein called U5 small nuclear ribonucleoprotein 200 kDa helicase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	1722	8528	5084	1722	1722	0	0

- Molecule 5 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	299	2338	1470	410	445	13	0	0

- Molecule 6 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	a	81	399	237	81	81	0	0

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Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	h	80	393	233	80	80	0	0

- Molecule 7 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
7	b	82	405	241	82	82	0	0
7	i	86	422	250	86	86	0	0

- Molecule 8 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	c	82	406	242	82	82	0	0
8	j	82	406	242	82	82	0	0

- Molecule 9 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	d	97	480	286	97	97	0	0
9	k	85	422	252	85	85	0	0

- Molecule 10 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	f	74	361	213	74	74	0	0
10	m	74	361	213	74	74	0	0

- Molecule 11 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	e	79	391	233	79	79	0	0
11	l	79	391	233	79	79	0	0

- Molecule 12 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms				AltConf	Trace
12	g	74	Total	C	N	O	0	0
			363	215	74	74		
12	n	68	Total	C	N	O	0	0
			334	198	68	68		

- Molecule 13 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	F	93	Total	C	N	O	P	0	0
			1988	889	363	643	93		

- Molecule 14 is a RNA chain called pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	G	77	Total	C	N	O	P	0	0
			1545	689	240	539	77		

- Molecule 15 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	H	136	Total	C	N	O	P	0	0
			2886	1289	499	962	136		

- Molecule 16 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	o	162	Total	C	N	O	0	0
			804	480	162	162		

- Molecule 17 is a protein called U2 small nuclear ribonucleoprotein B'.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	p	165	Total	C	N	O	0	0
			813	483	165	165		

- Molecule 18 is a protein called Splicing factor 3A subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	w	438	Total	C	N	O	S	0	0
			2373	1450	461	459	3		

- Molecule 19 is a protein called Splicing factor 3A subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
19	u	104	520	312	104	104	0	0

- Molecule 20 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	v	165	936	565	191	178	2	0	0

- Molecule 21 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	1	1038	7702	4900	1347	1415	40	0	0

- Molecule 22 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	2	183	1252	809	213	226	4	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	3	1177	9195	5834	1561	1755	45	0	0

- Molecule 24 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	4	78	527	345	83	99	0	0

- Molecule 25 is a protein called Splicing factor 3B subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	5	108	807	512	142	150	3	0	0

- Molecule 26 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	6	89	670	410	119	128	13	0	0

- Molecule 27 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	7	66	540	343	94	98	5	0	0

- Molecule 28 is a protein called Crooked neck-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	J	522	3463	2156	653	648	6	0	0

- Molecule 29 is a protein called Cell division cycle 5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	L	342	2260	1430	406	420	4	0	0

- Molecule 30 is a protein called Pre-mRNA-processing factor 19.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	q	132	659	395	132	132	0	0
30	r	131	654	392	131	131	0	0
30	s	67	335	201	67	67	0	0
30	t	67	335	201	67	67	0	0

- Molecule 31 is a protein called Pre-mRNA-splicing factor SPF27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	K	152	979	611	177	189	2	0	0

- Molecule 32 is a protein called Pre-mRNA-splicing factor SYF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	I	564	Total	C	N	O	0	0
			2778	1650	564	564		

- Molecule 33 is a protein called Intron-binding protein aquarius.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	Q	1317	Total	C	N	O	0	0
			6528	3894	1317	1317		

- Molecule 34 is a protein called Protein BUD31 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	N	143	Total	C	N	O	S	0	0
			1184	746	217	209	12		

- Molecule 35 is a protein called Pre-mRNA-splicing factor RBM22.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	O	285	Total	C	N	O	S	0	0
			2273	1428	401	424	20		

- Molecule 36 is a protein called Spliceosome-associated protein CWC15 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	P	96	Total	C	N	O	S	0	0
			829	508	162	157	2		

- Molecule 37 is a protein called Skip.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	R	288	Total	C	N	O	S	0	0
			2188	1375	392	409	12		

- Molecule 38 is a protein called Peptidyl-prolyl cis-trans isomerase-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	S	159	Total	C	N	O	S	0	0
			1236	787	215	227	7		

- Molecule 39 is a protein called Pleiotropic regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	T	313	Total	C	N	O	S	0	0
			2457	1552	447	450	8		

- Molecule 40 is a protein called Serine/arginine repetitive matrix protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	U	26	Total	C	N	O	S	0	0
			193	120	36	36	1		

- Molecule 41 is a protein called Pre-mRNA-splicing factor CWC22 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	V	452	Total	C	N	O		0	0
			2243	1339	452	452			

- Molecule 42 is a protein called Pre-mRNA-processing factor 17.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	W	483	Total	C	N	O		0	0
			2384	1418	483	483			

- Molecule 43 is a protein called Smad nuclear-interacting protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	X	158	Total	C	N	O	S	0	0
			1012	645	172	194	1		

- Molecule 44 is a protein called RNA-binding motif protein, X-linked 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Y	105	Total	C	N	O	S	0	0
			743	470	127	144	2		

- Molecule 45 is a protein called BUD13 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Z	113	Total	C	N	O		0	0
			755	474	147	134			

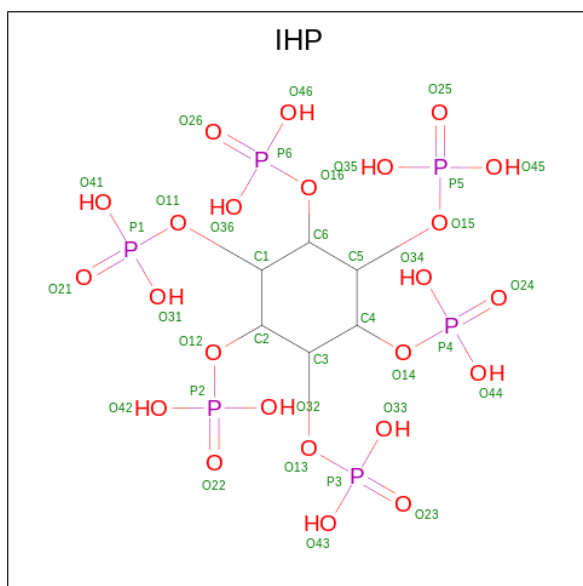
- Molecule 46 is a protein called Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
46	x	583	2882	1715	583	584	0	0

- Molecule 47 is a protein called Peptidyl-prolyl cis-trans isomerase E.

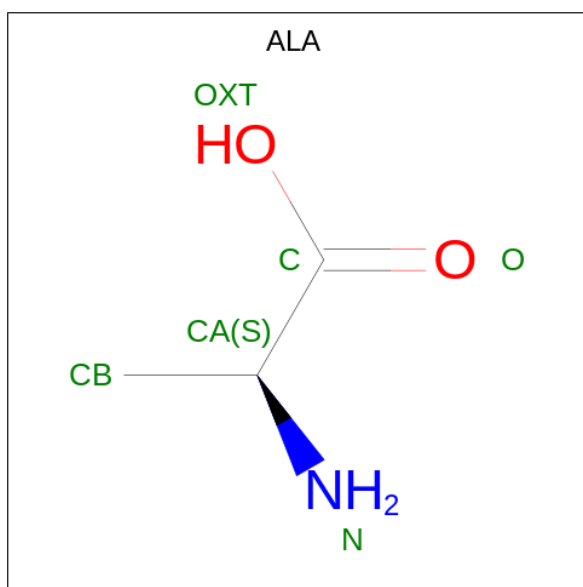
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
47	y	232	1133	669	232	232	0	0

- Molecule 48 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: $C_6H_{18}O_{24}P_6$).



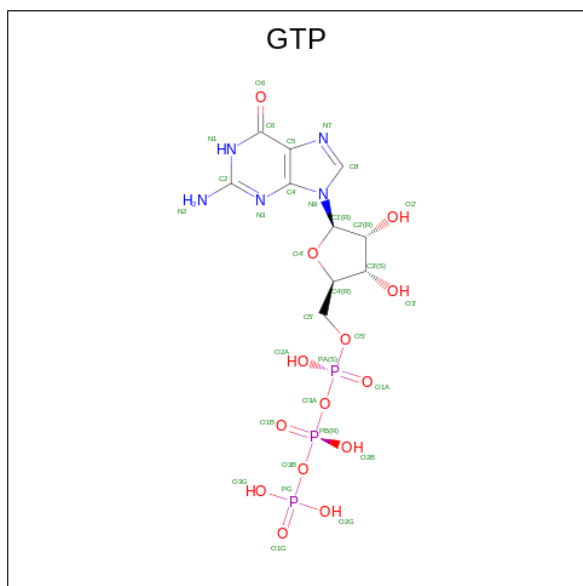
Mol	Chain	Residues	Atoms				AltConf
			Total	C	O	P	
48	A	1	36	6	24	6	0

- Molecule 49 is ALANINE (three-letter code: ALA) (formula: $C_3H_7NO_2$).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
49	A	1	5	3	1	1	0

- Molecule 50 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	
50	C	1	32	10	5	14	3	0

- Molecule 51 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
51	C	1	Total 1	Mg 1	0
51	F	5	Total 5	Mg 5	0

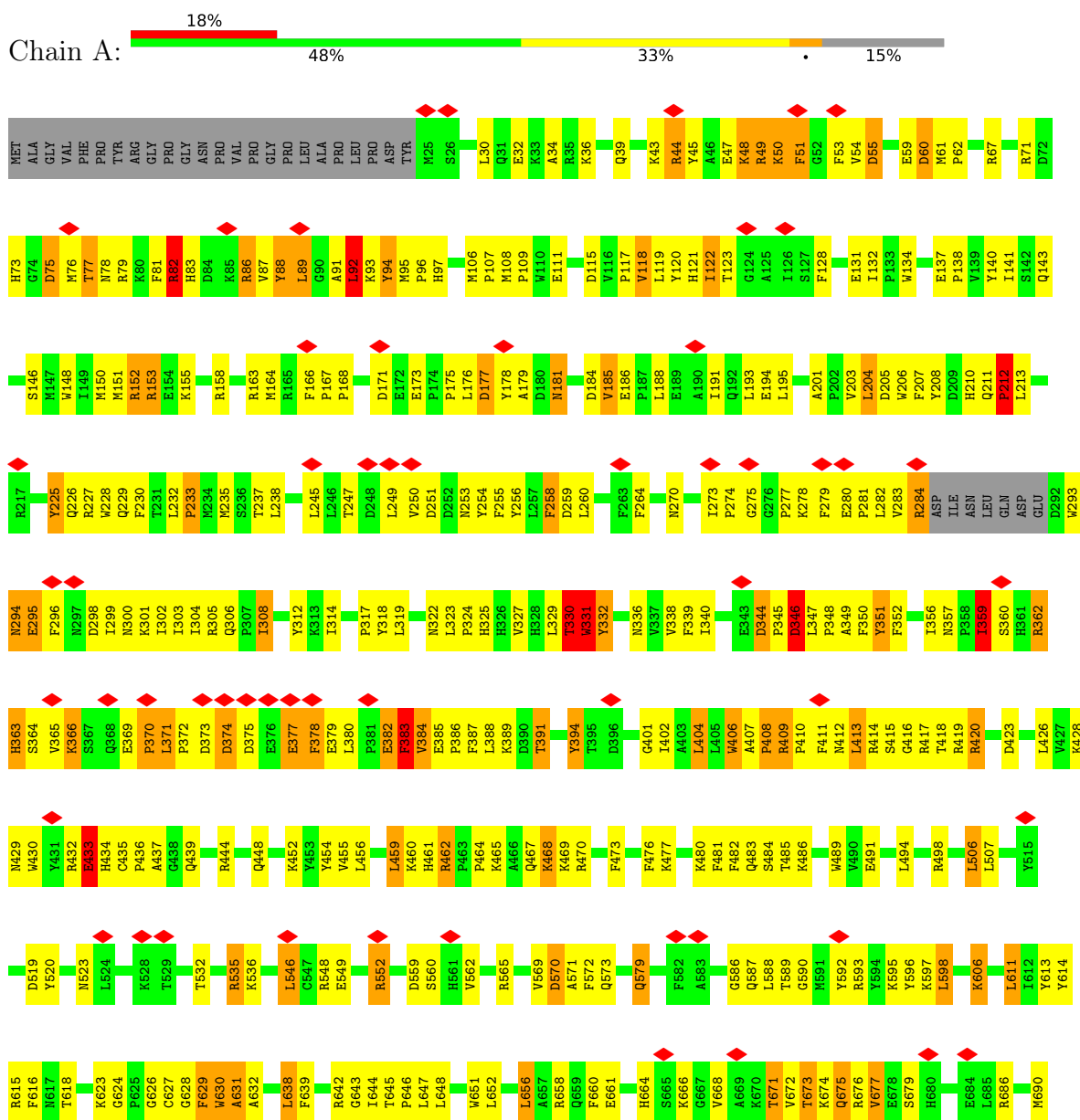
- Molecule 52 is ZINC ION (three-letter code: ZN) (formula: Zn).

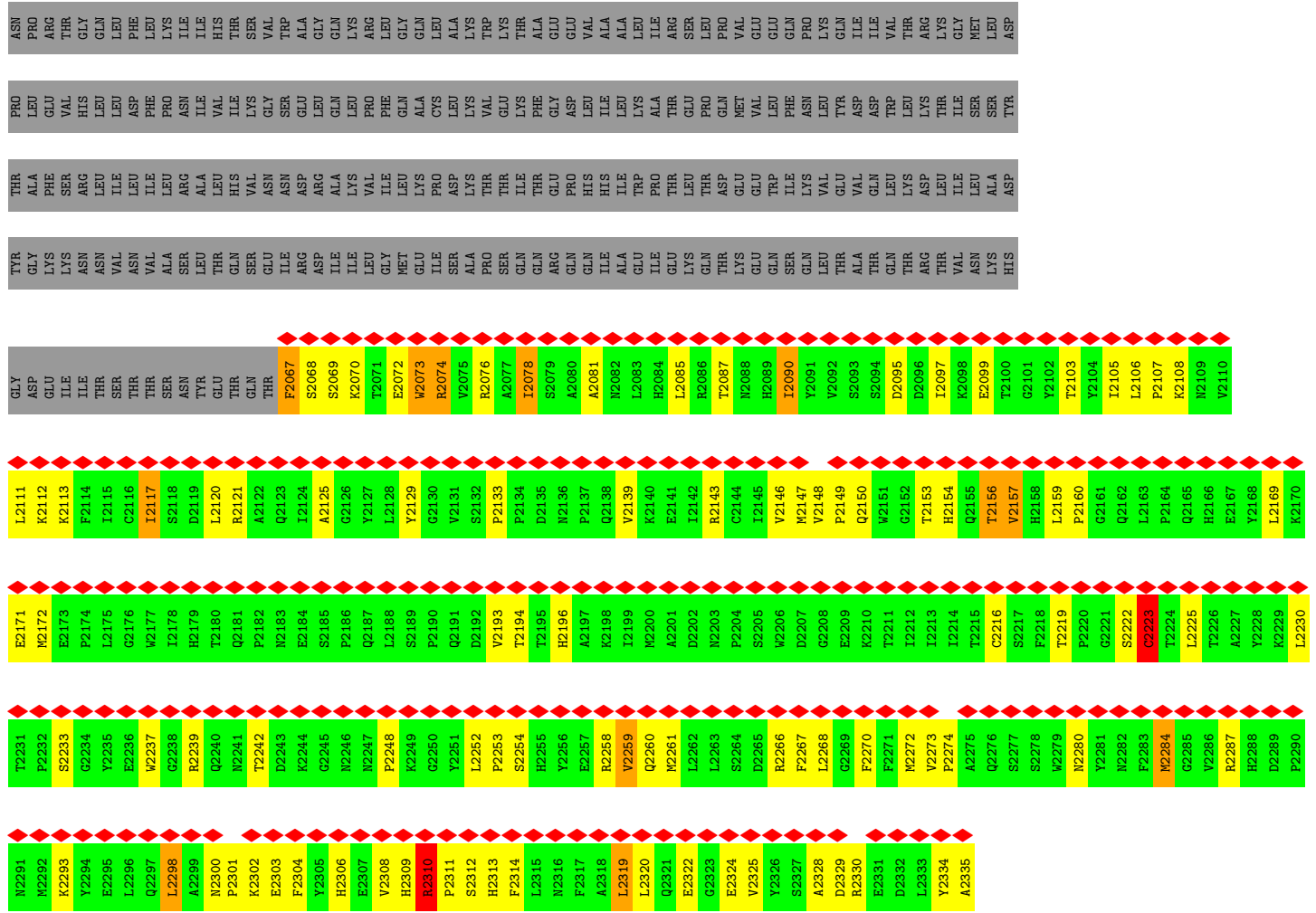
Mol	Chain	Residues	Atoms		AltConf
52	v	1	Total 1	Zn 1	0
52	6	3	Total 3	Zn 3	0
52	N	3	Total 3	Zn 3	0
52	O	3	Total 3	Zn 3	0

3 Residue-property plots [i](#)

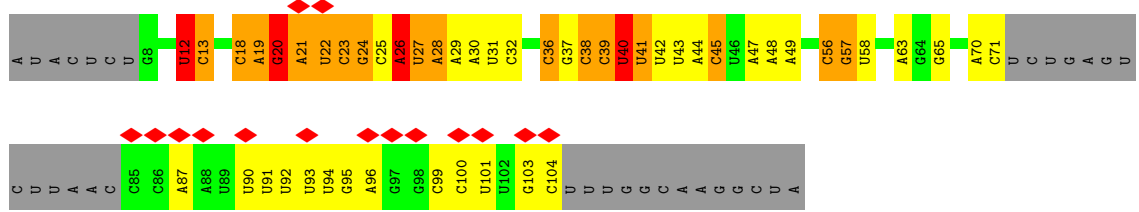
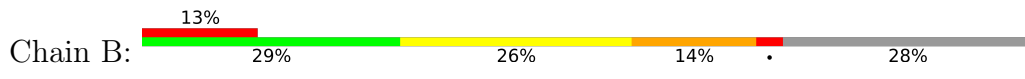
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Pre-mRNA-processing-splicing factor 8

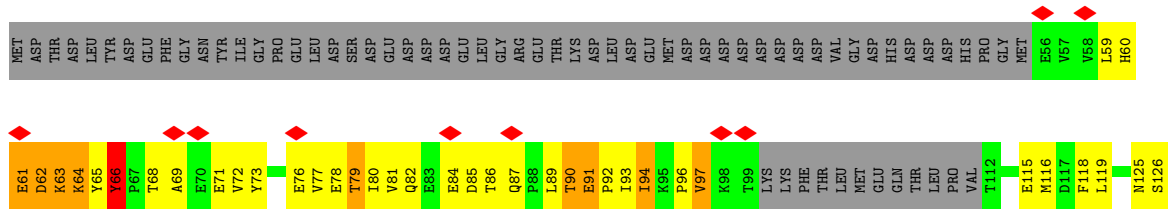




• Molecule 2: U5 snRNA



• Molecule 3: 116 kDa U5 small nuclear ribonucleoprotein component

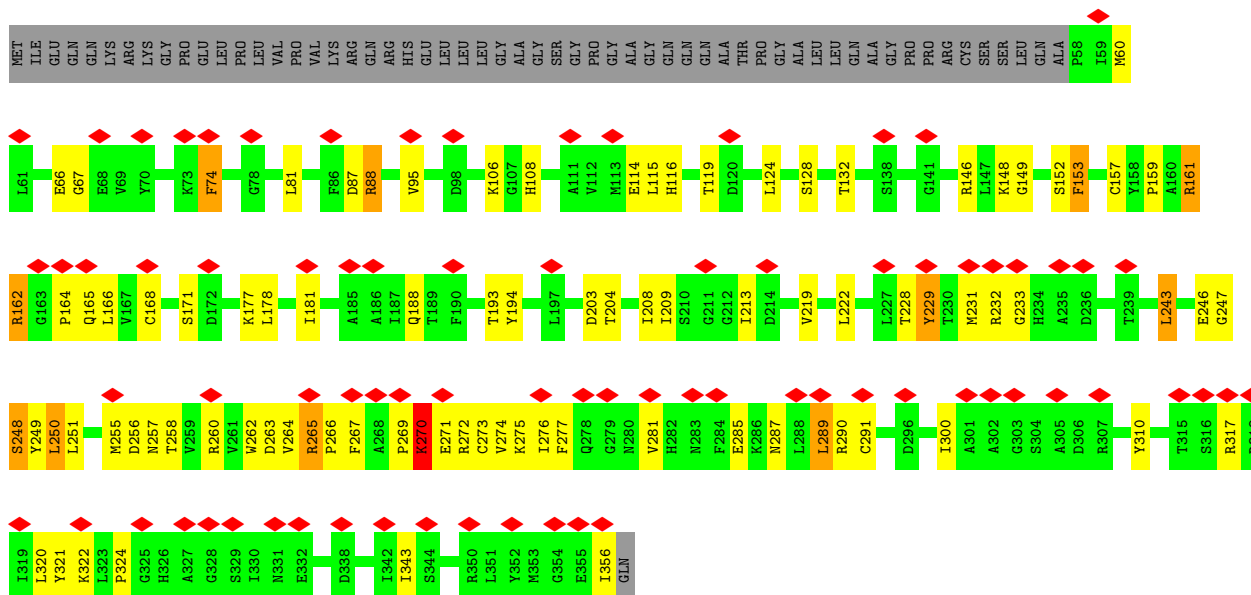


SER	GLU	TYR	H421	L481	I541	G601	V661	W721	F782	A846	Y906	K966	M1026
ALA	CYS	GLN	F422	M482	A642	E602	A662	L722	A783	L847	L907	N967	I1027
ASN	GLU	LEU	M423	R483	P643	R603	T663	V723	I784	D848	G908	N968	T1028
VAL	GLN	HIS	A424	I484	M544	T604	F664	F724	H785	I849	N909	L969	V1029
ALA	LEU	THR	K485	T485	R545	T805	L665	V725	A786	L850	Y910	V970	R1030
SER	VAL	GLU	M426	S486	S546	T806	R666	H726	A787	Q851	Q911	K971	E1031
GLY	LEU	GLY	R427	K487	L547	Q607	V667	S727	G788	M852	N912	Y972	E1032
LEU	LEU	ASP	C428	L488	V548	L608	D668	R728	F789	L853	A913	D973	E1033
MET	LEU	ASP	Q429	L489	Q649	V609	P669	K729	R791	G854	K914	K974	K1034
SER	GLY	ILE	L430	R490	E550	R610	A670	E730	V792	R855	D915	K975	L1035
SER	ASN	ARG	P431	A491	M551	L611	K671	T731	F793	A856	A916	T976	E1036
LYS	THR	GLU	G433	A492	G553	I612	G672	G732	R794	R858	V917	G977	L1037
LYS	PHE	ARG	G433	L493	S554	L613	L673	K733	T795	P859	N918	N978	Q1038
ASP	ASP	SER	S434	E494	F555	L614	F674	T734	L796	Q980	W919	F979	K1039
ASP	ILE	ARG	F435	T495	F556	D615	Y675	A735	V797	Q860	L920	Q980	L1040
HIS	LEU	ARG	R436	D496	G556	E616	F676	R736	E798	Y861	G921	V981	L1041
PRO	VAL	GLU	R437	T497	K557	I617	D677	A737	D799	D862	Y922	E983	E1042
LEU	LEU	ARG	Q438	M498	R558	H618	M678	I738	F801	T863	A923	E983	R1043
ASP	ARG	VAL	R439	L499	L559	L619	S679	R739	F802	K864	Y924	L984	V1044
ASP	HIS	GLN	K440	L500	T561	L620	F680	D740	A802	G865	L925	G985	P1045
ALA	ARG	SER	G441	L501	Y562	H621	R681	M741	D803	E866	Y926	R986	I1046
ALA	ARG	GLN	Y442	C502	G563	D622	P682	C742	K804	G867	I927	I987	P1047
PHE	LEU	THR	E443	A503	G563	L743	V683	L743	H805	I868	R928	A988	V1048
THR	CYS	LEU	E444	P504	E444	R624	P684	E744	I806	L869	M929	S989	K1049
LEU	GLN	GLU	V445	T505	T565	K745	L885	K745	Q807	I870	L930	H990	E1050
LEU	LEU	THR	H446	G506	V566	P825	E686	D746	V808	T871	R931	Y991	S1051
LEU	LEU	THR	V447	A507	A567	P827	Q887	T747	L809	S872	S932	Y992	I1052
ARG	ALA	ASP	W448	G508	E568	L628	Q888	L748	H873	G874	T934	T994	E1053
ASP	ALA	ASP	A449	K509	L569	E629	Y889	G749	V810	G874	L935	N995	E1054
ALA	GLN	GLN	L450	T510	T570	A630	V690	L750	L815	E875	L936	D996	P1055
LEU	GLY	GLY	K451	M511	G571	L631	G691	F751	A816	L876	Y936	D996	S1056
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LEU	ARG	LEU	P454	L514	Q574	R634	E694	E754	N820	N820	S939	Q999	I1059
ARG	ARG	P405	F455	M515	L575	A635	K695	G755	L821	L821	H940	T1000	L1062
ILE	ASP	R406	R455	C516	C576	A635	K696	S756	P822	S881	D941	Y1001	L1063
GLY	GLY	Q407	S457	M517	K577	I636	K697	S756	A823	L882	D942	N1002	L1063
VAL	VAL	V408	E458	M518	E578	R637	I698	S758	H824	L883	L943	Q1003	Q1064
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GLU	GLU	L410	Q460	E520	I580	I639	K699	T759	V826	Q885	G945	L1006	F1066
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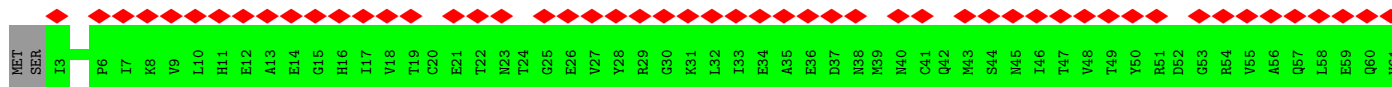
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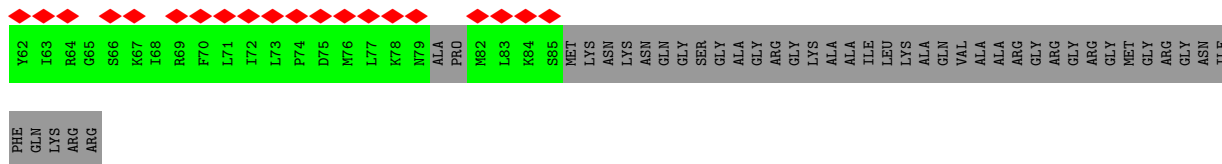


• Molecule 5: U5 small nuclear ribonucleoprotein 40 kDa protein

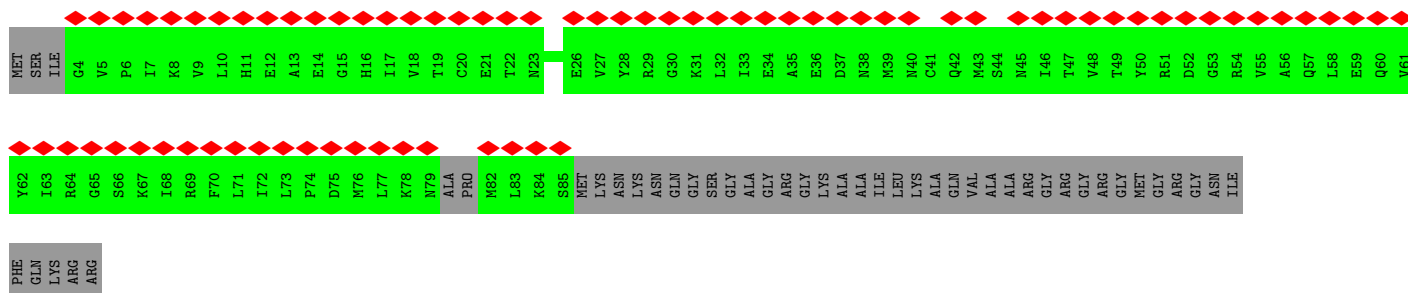


• Molecule 6: Small nuclear ribonucleoprotein Sm D3

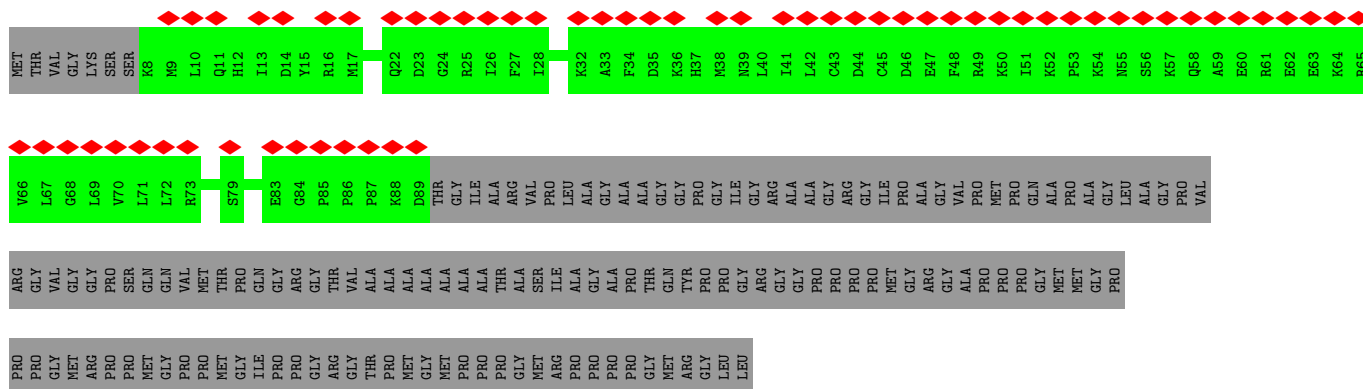




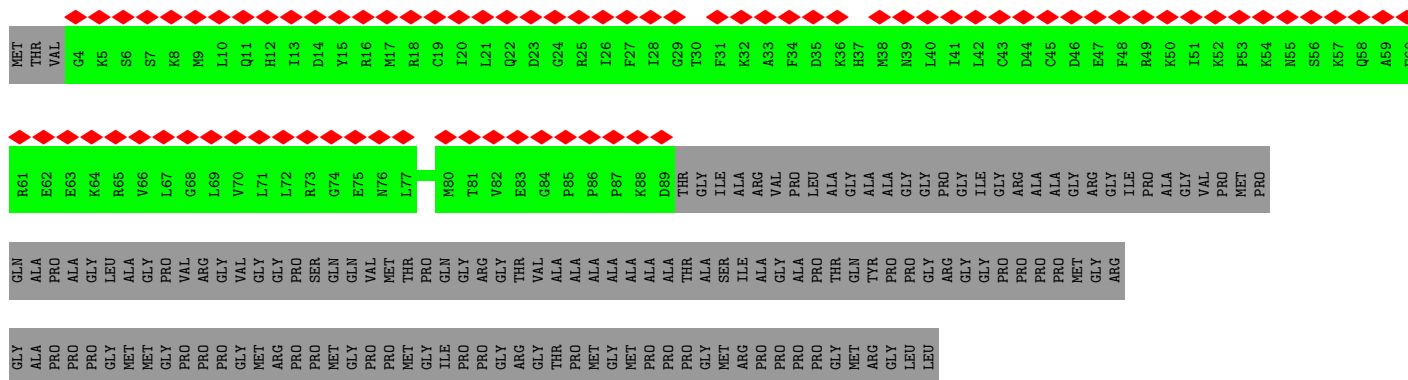
• Molecule 6: Small nuclear ribonucleoprotein Sm D3



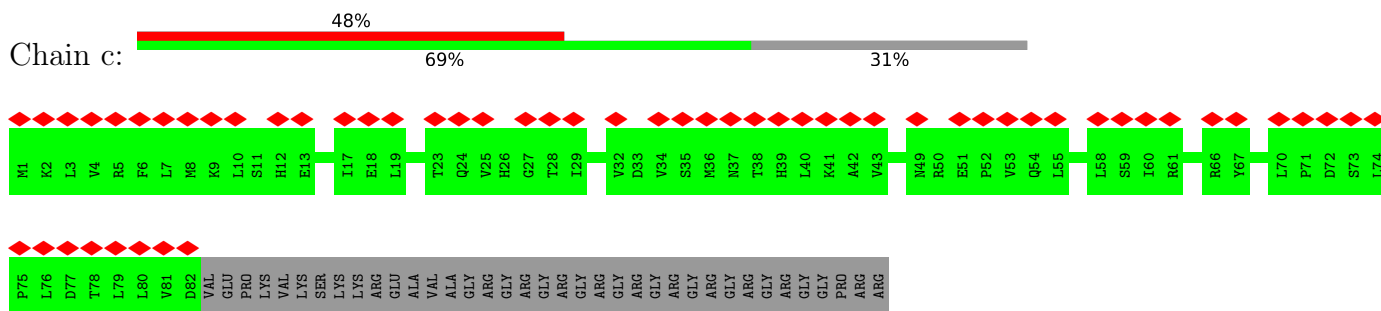
• Molecule 7: Small nuclear ribonucleoprotein-associated proteins B and B'



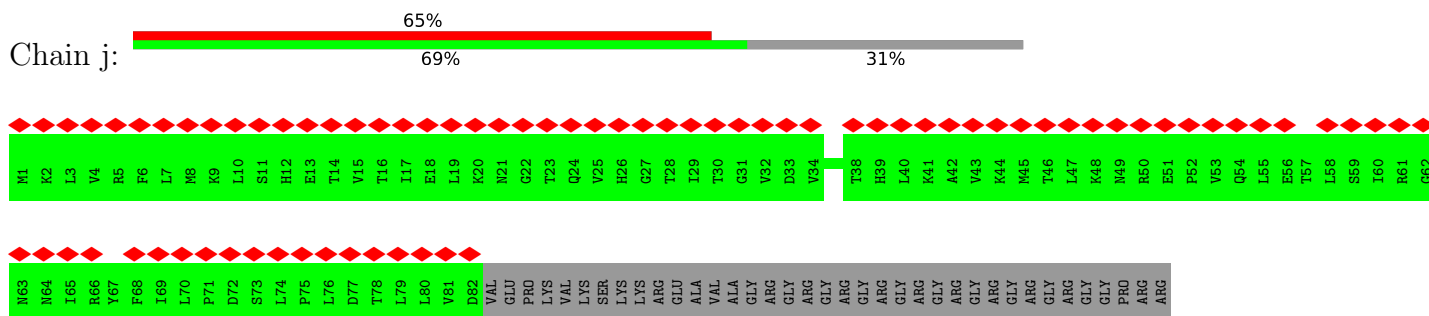
• Molecule 7: Small nuclear ribonucleoprotein-associated proteins B and B'



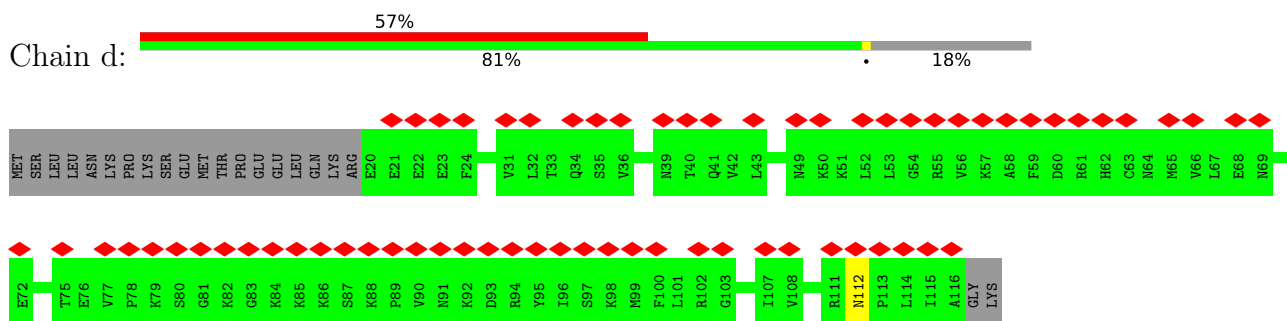
• Molecule 8: Small nuclear ribonucleoprotein Sm D1



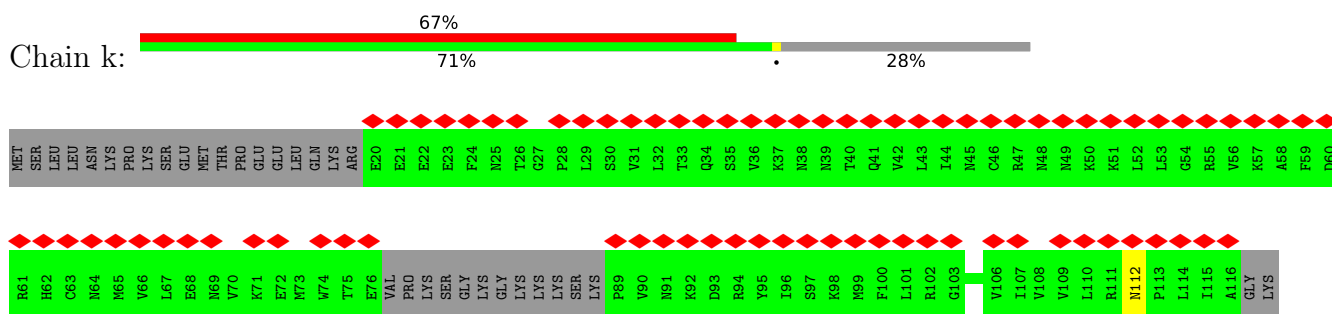
• Molecule 8: Small nuclear ribonucleoprotein Sm D1



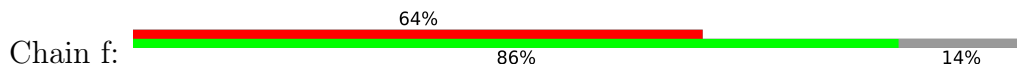
• Molecule 9: Small nuclear ribonucleoprotein Sm D2

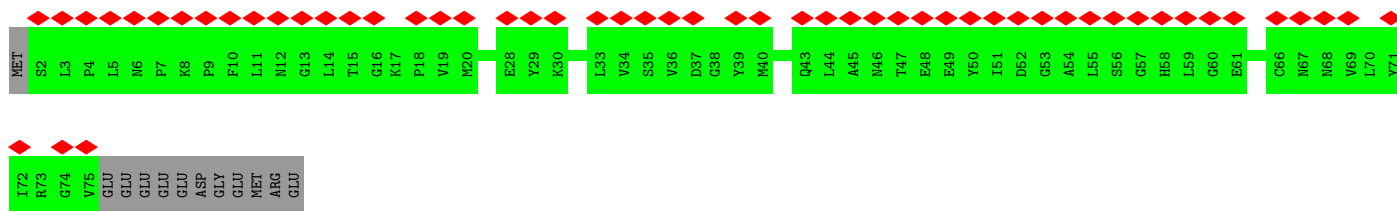


• Molecule 9: Small nuclear ribonucleoprotein Sm D2

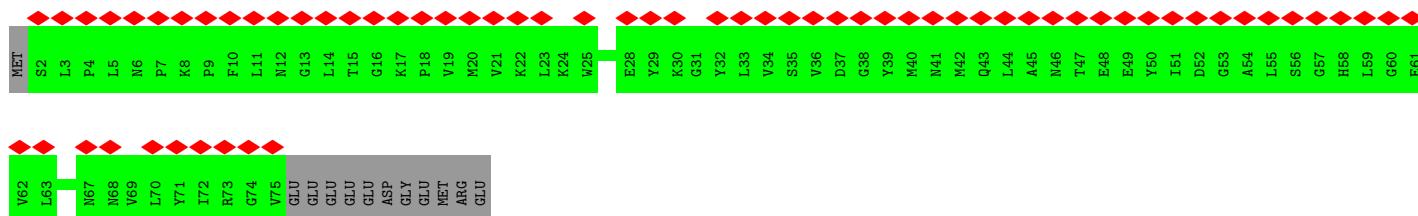
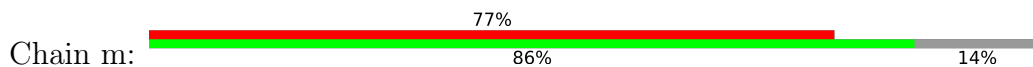


• Molecule 10: Small nuclear ribonucleoprotein F

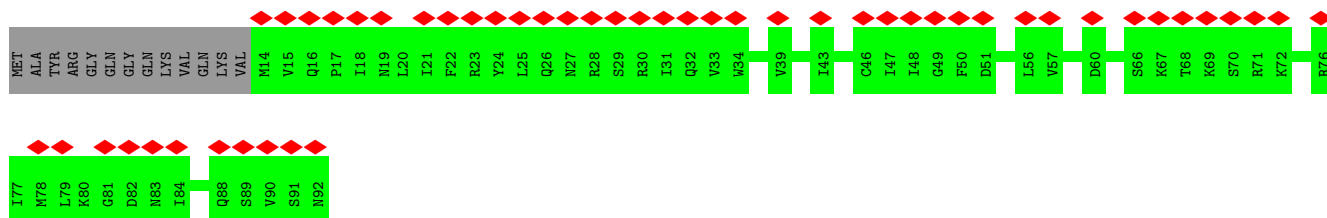
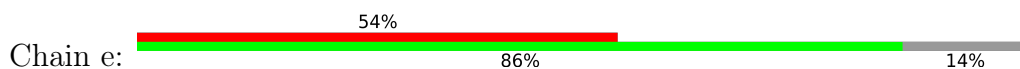




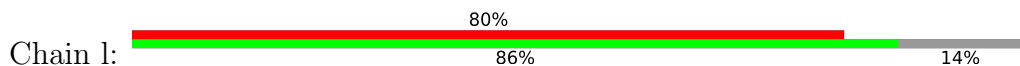
• Molecule 10: Small nuclear ribonucleoprotein F



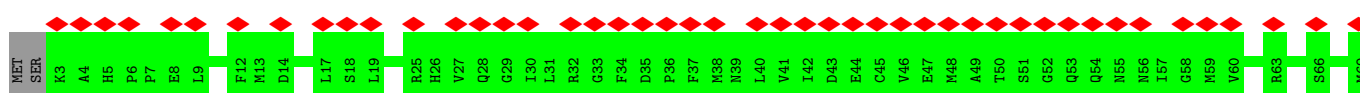
• Molecule 11: Small nuclear ribonucleoprotein E

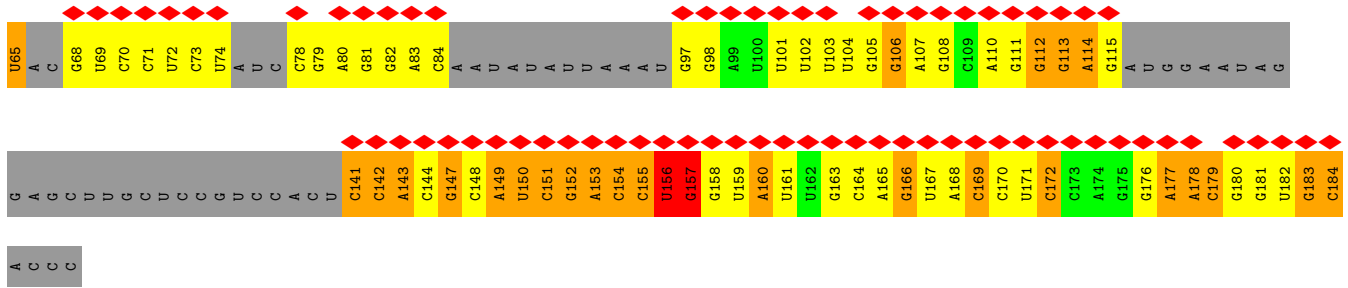


• Molecule 11: Small nuclear ribonucleoprotein E

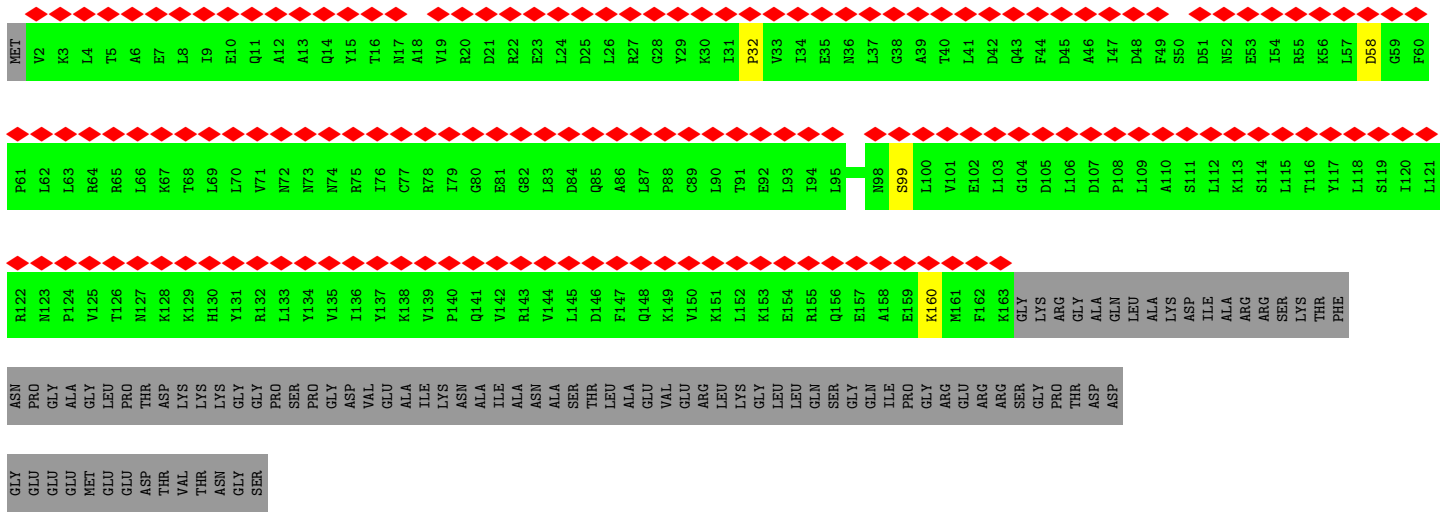


• Molecule 12: Small nuclear ribonucleoprotein G

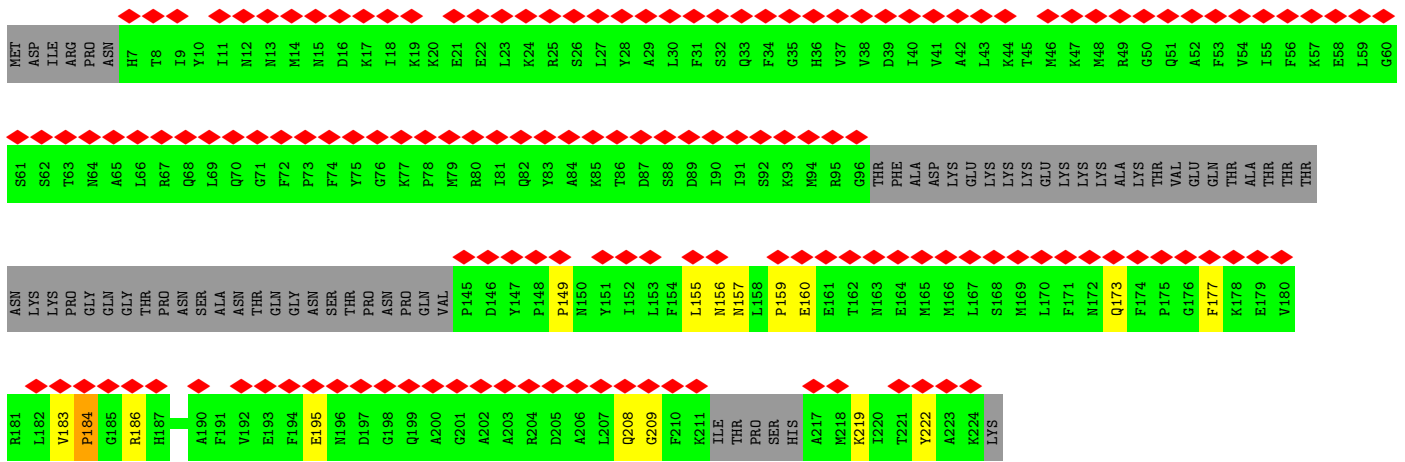




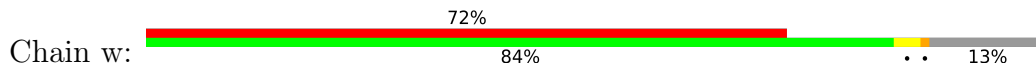
• Molecule 16: U2 small nuclear ribonucleoprotein A'

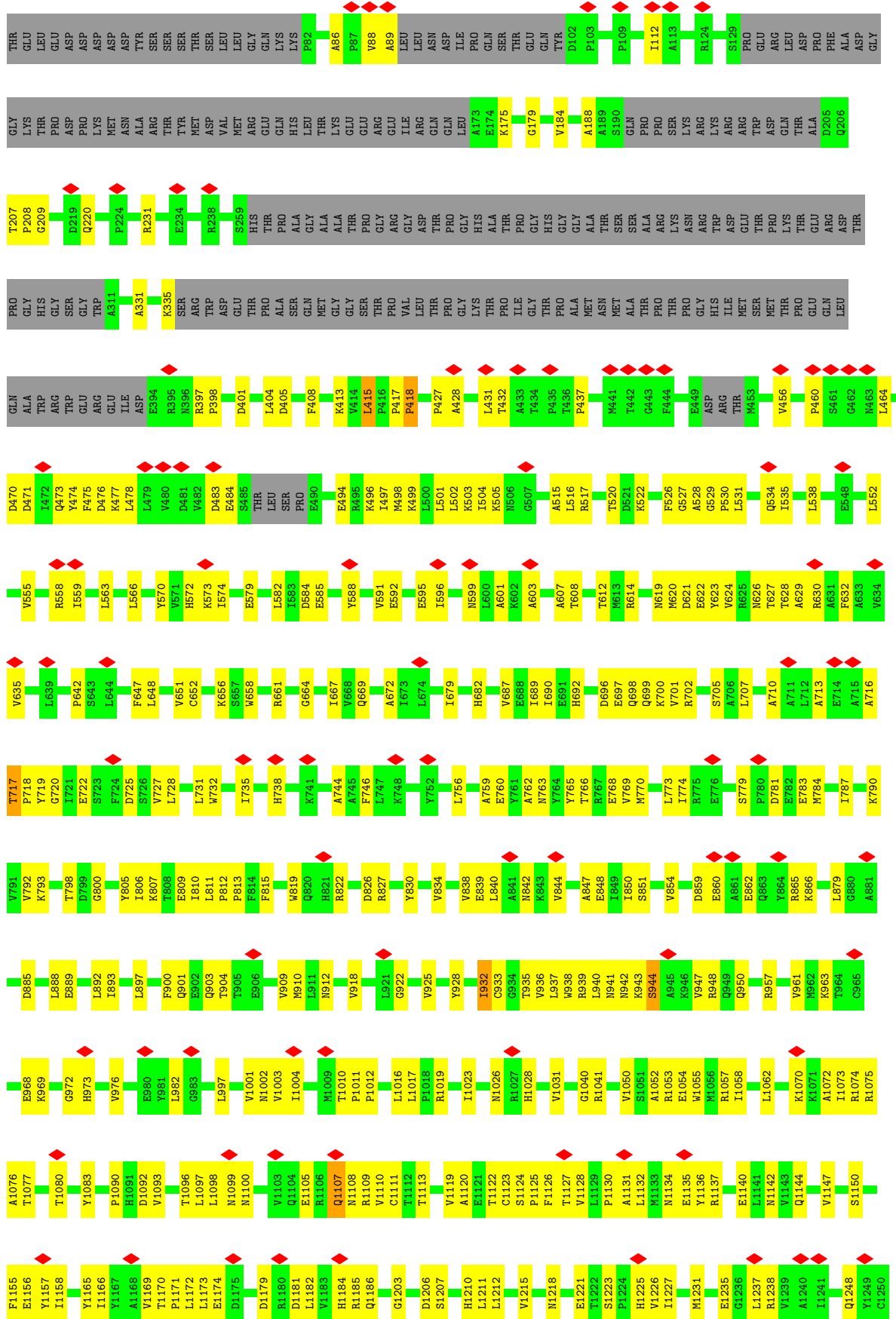


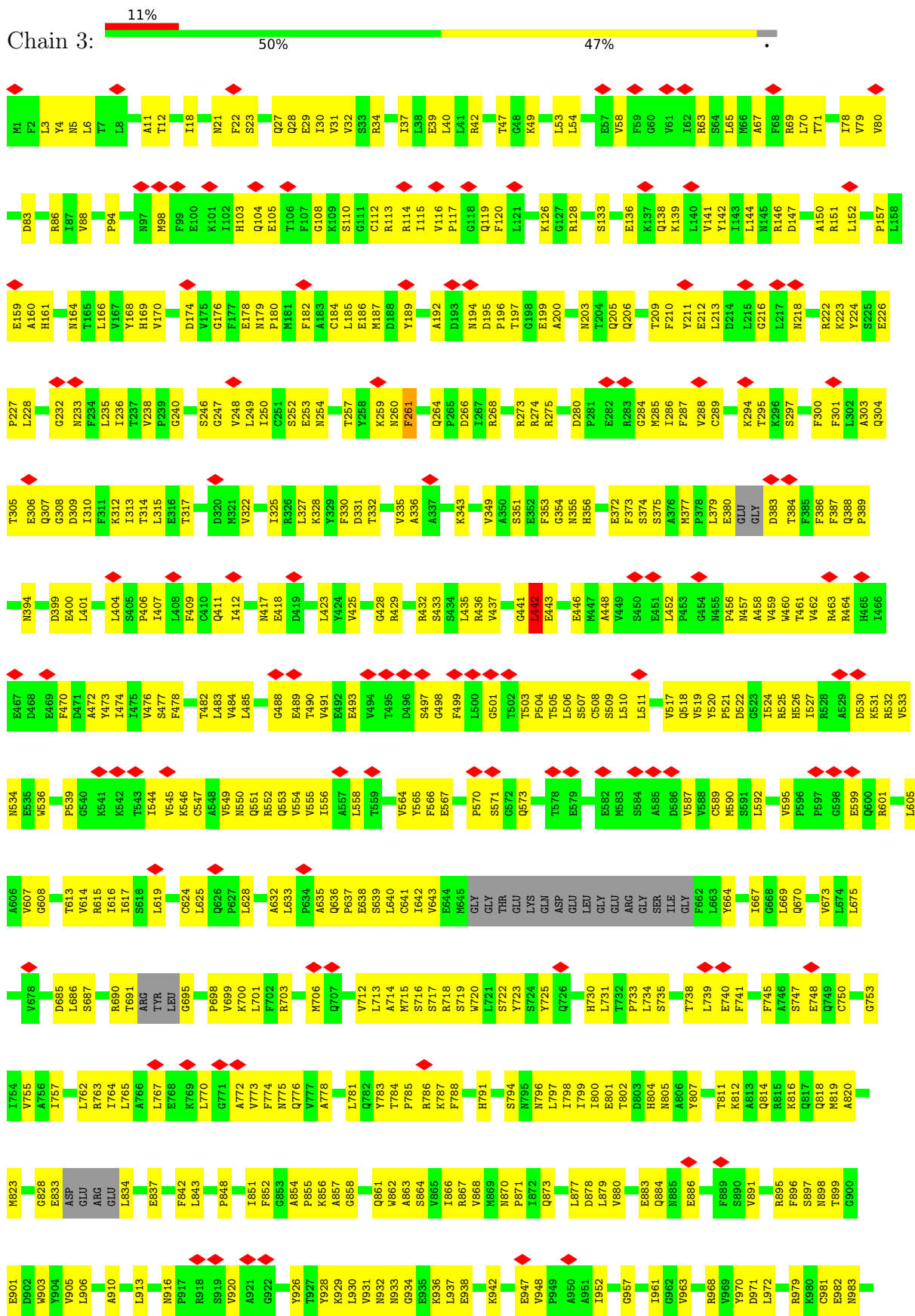
• Molecule 17: U2 small nuclear ribonucleoprotein B''

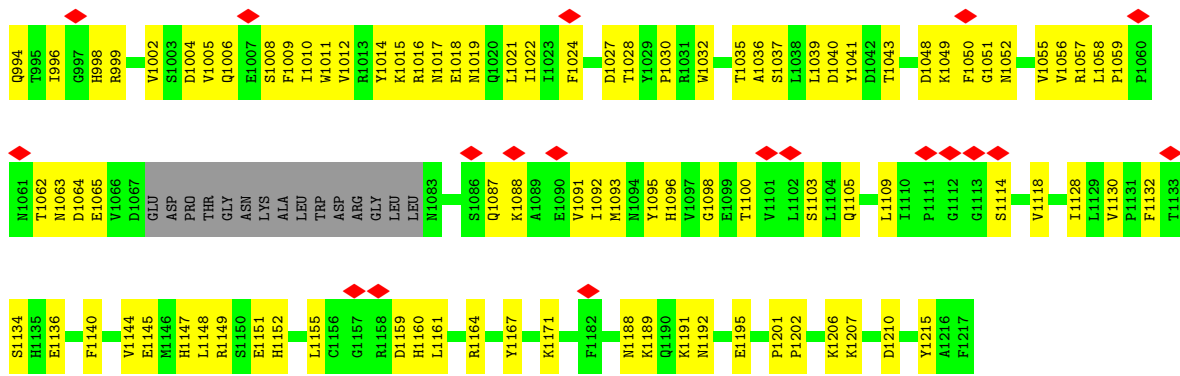


• Molecule 18: Splicing factor 3A subunit 3

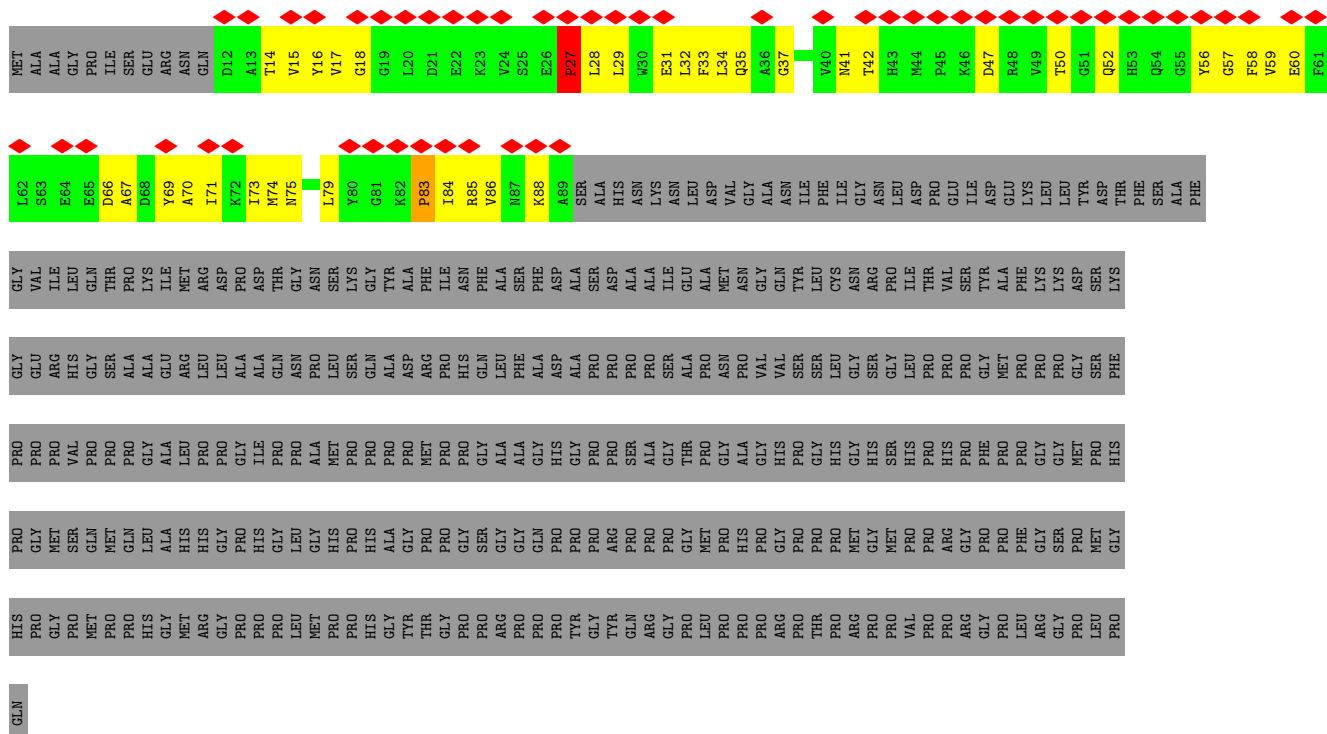




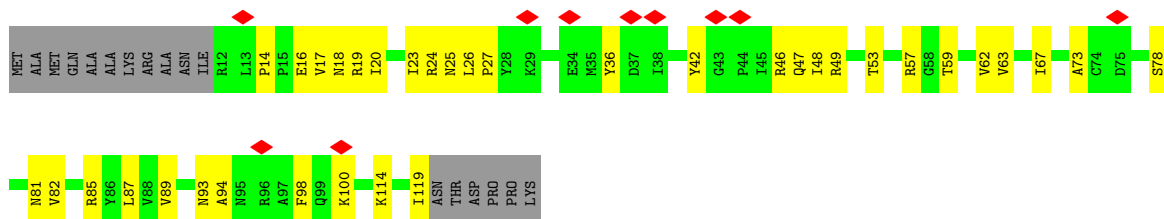




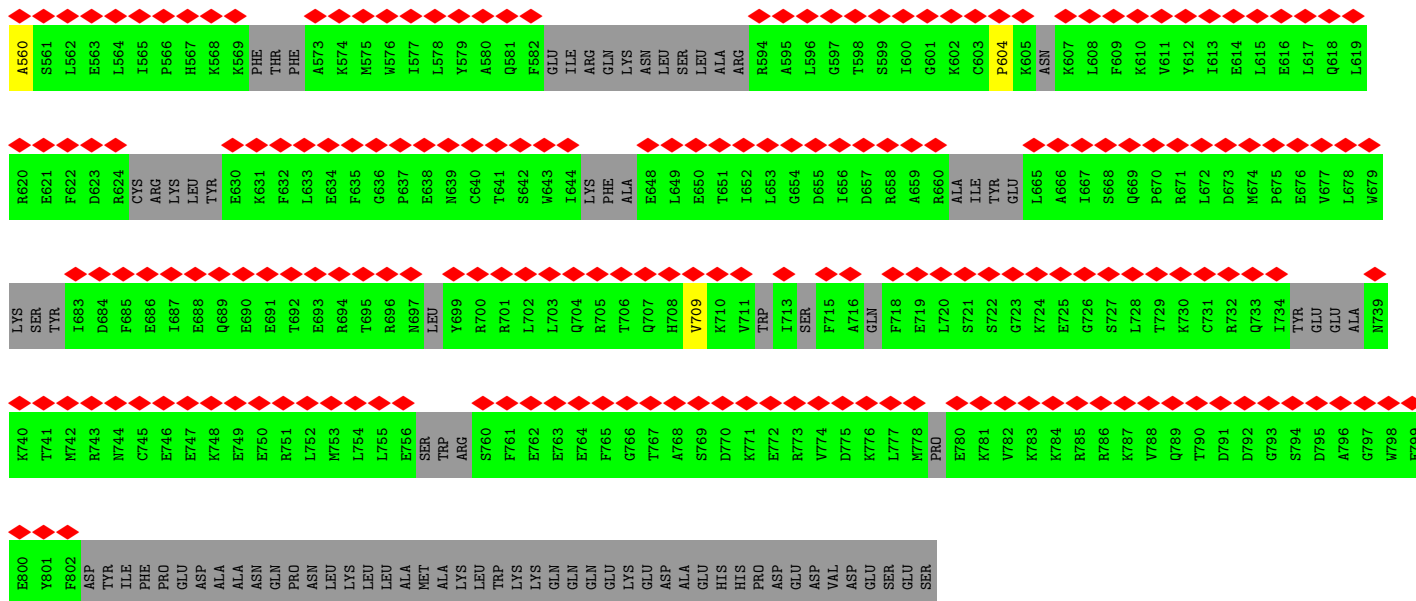
• Molecule 24: Splicing factor 3B subunit 4



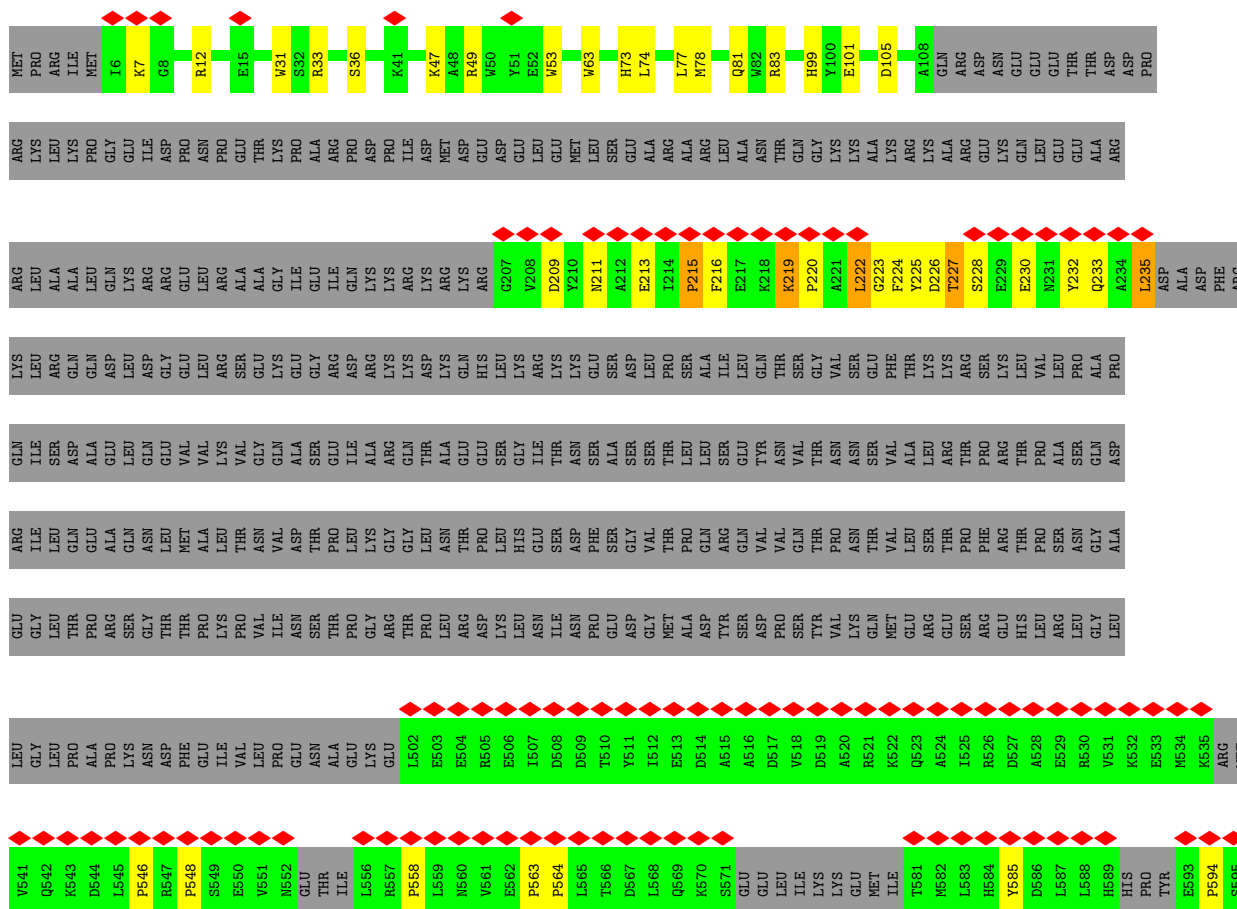
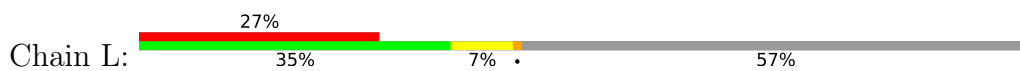
• Molecule 25: Splicing factor 3B subunit 6

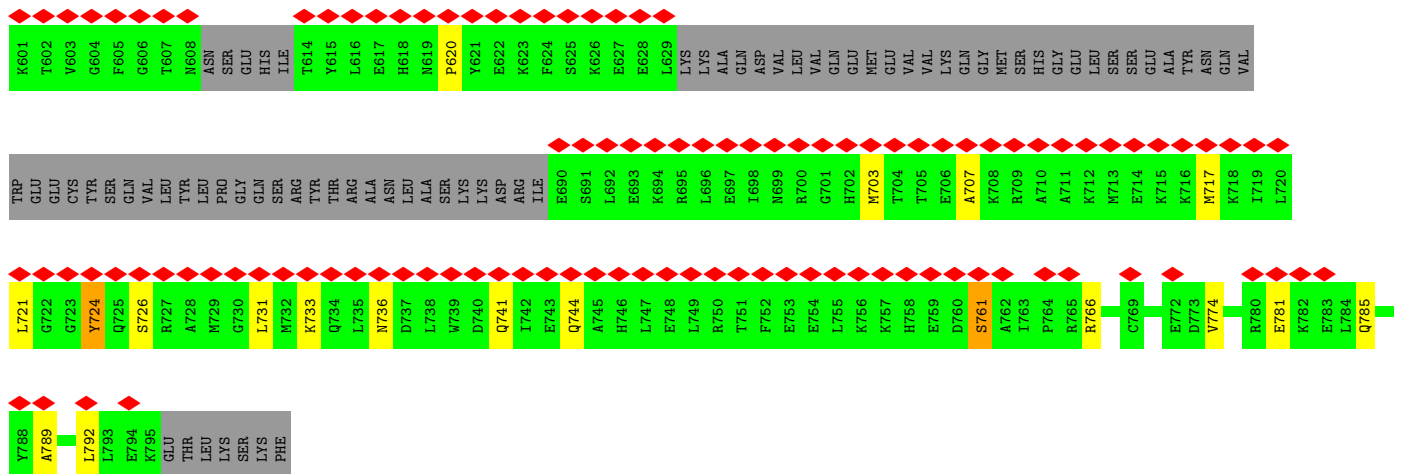


• Molecule 26: PHD finger-like domain-containing protein 5A

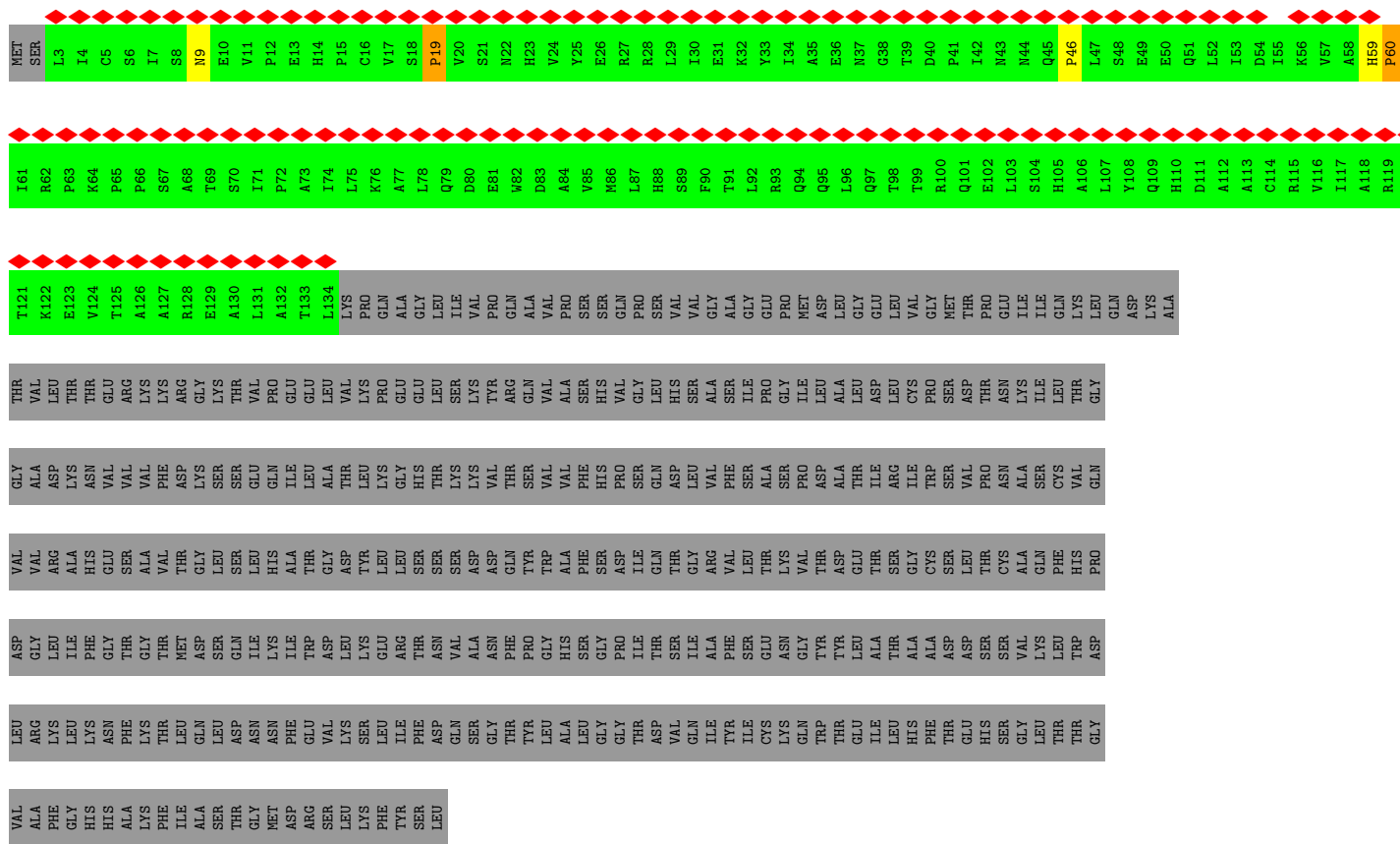


● Molecule 29: Cell division cycle 5-like protein

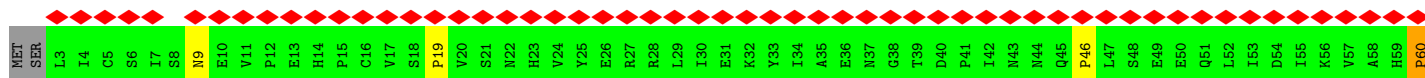




• Molecule 30: Pre-mRNA-processing factor 19



• Molecule 30: Pre-mRNA-processing factor 19



I61 R62 P63 K64 P65 P66 S67 A68 T69 S70 I71 P72 A73 I74 L76 K76 A77 L78 Q79 D80 E81 W82 D83 A84 V86 M86 L87 H88 S89 F90 T91 L92 Q93 Q94 Q95 L96 Q97 T98 T99 R100 Q101 E102 L103 S104 H105 L107 Y108 Q109 H110 D111 A112 C113 C114 R115 V116 I117 A118 R119 L120

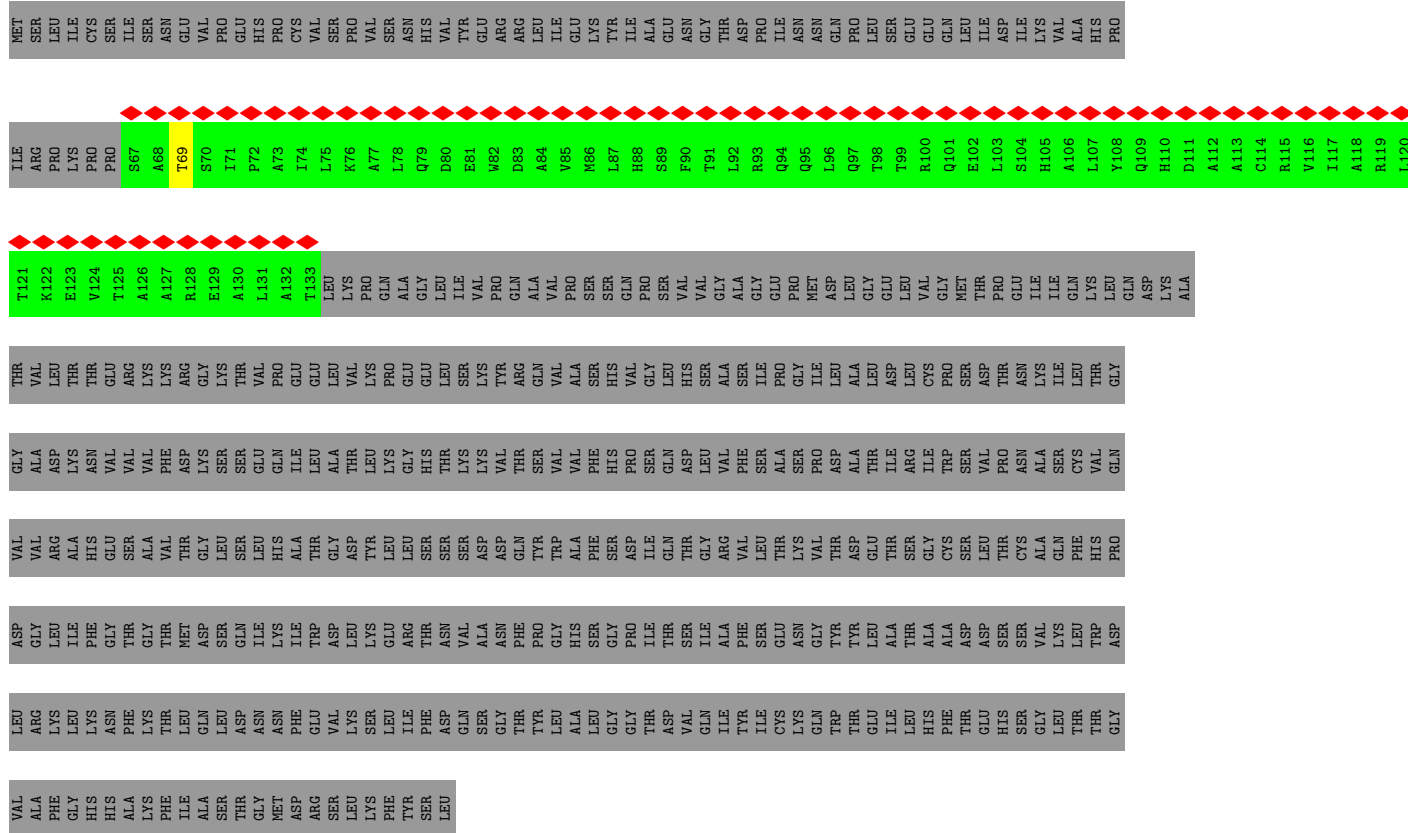
Table of amino acid residues for chain s, including labels like T121, K122, E123, V124, T125, A126, A127, R128, E129, A130, L131, A132, T133, L134 and their corresponding amino acid types.

Molecule 30: Pre-mRNA-processing factor 19

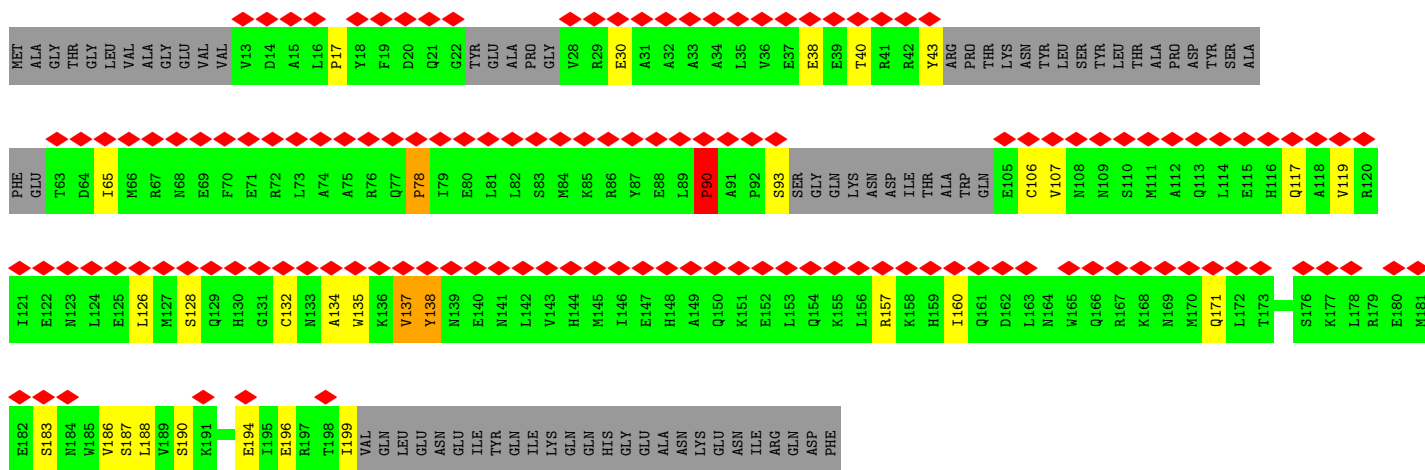


Detailed table of amino acid residues for chain s, with columns for residue labels (MET, SER, LEU, etc.) and their amino acid types (GLY, VAL, ARG, etc.).

• Molecule 30: Pre-mRNA-processing factor 19



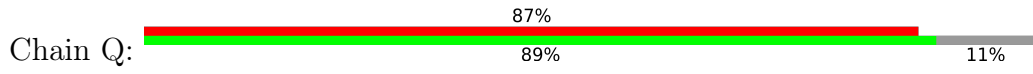
• Molecule 31: Pre-mRNA-splicing factor SPF27



• Molecule 32: Pre-mRNA-splicing factor SYF1



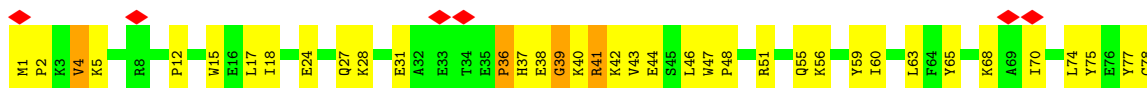
• Molecule 33: Intron-binding protein aquarius

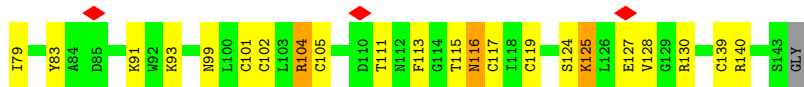


MET	ALA	ALA	PRO	ALA	ALA	GLN	PRO	LYS	LYS	ILE	VAL	ALA	ALA	THR	SER	VAL	GLN	ASN	ALA	E21	F22	V23	T24	Q25	L26	A27	C28	K29	Y30	W31	A32	P33	H34	I35	K36	K37	K38	S39	P40	F41	D42	I43	K44	V45	I46	E47	D48	I49	Y50	E51	K52	E53	I54	V55	K56	R58	F59	A60		
I61	R62	K63	I64	M65	L66	L67	E68	F69	S70	Q71	Y72	L73	E74	M75	Y76	L77	M78	N80	Y81	S82	P83	E84	V85	S86	S87	K88	A89	Y90	L91	M92	S93	C95	C96	M97	N98	N99	E100	K101	F102	R103	E104	I105	V106	P107	A108	W109	E110	I111	F112	K113	K114	K115	P116	D117	H118	F119	P120			
F121	F122	F123	K124	H125	I126	L127	K128	A129	A130	L131	A132	E133	T134	D135	G136	F137	F138	S139	L140	H141	E142	Q143	T144	V145	L146	L147	L148	F149	L150	D151	H152	C153	F154	N155	S156	L157	E158	V159	D160	L161	F162	R163	S164	Q165	V166	Q167	Q168	L169	W170	S171	F172	P173	M174	W175	G176	L177	L178	Q179	L180	
A181	R182	L183	E184	L185	E186	L187	K188	K189	T190	P191	K192	L193	R194	K195	F196	W197	N198	L199	I200	K201	K202	M203	D204	E205	K206	M207	D208	P209	E210	A211	R212	E213	Q214	A215	Y216	Q217	E218	R219	R220	F221	L222	S223	Q224	L225	I226	Q227	K228	F229	I230	S231	V232	L233	K234	S235	V236	P237	L238	S239	E240	
P241	V242	T243	W244	D245	K246	V247	H248	G249	C250	E251	R252	F253	L254	E255	L256	M257	L258	D259	L260	E261	A262	L263	L264	P265	T266	R267	R268	W269	F270	M271	T272	L273	D275	D276	S277	H278	R279	K400	A341	L280	V281	H282	C283	Y284	L285	S286	M287	L288	V289	R290	R291	E292	E293	D294	G295	H296	L297	F298	S299	R300
L301	L302	D303	M304	L305	K306	F307	Y308	T309	G310	F311	E312	I313	N314	D315	Q316	T317	N319	A320	L321	T322	E323	N324	E325	M326	T327	T328	I329	H330	Y331	D332	T335	S336	L337	Q338	R339	A340	A341	L280	V281	H282	C283	Y284	L285	S286	M287	L288	V289	R290	R291	E292	E293	D294	G295	H296	L297	F298	S299	R300		
R362	E363	S364	L365	V366	K367	F368	F369	G370	A371	L372	S373	S374	D435	N375	T376	L377	H378	Q379	V380	A381	S382	Y383	C385	L386	L387	P388	T389	L390	H391	K392	N393	D394	T396	T397	F398	D399	K400	E401	L460	L462	L403	D464	Y465	E405	L406	L407	W408	S409	R410	H411	E412	R413	R414	I415	S416	O417	I418	Q420	L421	
M422	Q423	M424	P425	L426	Y427	P428	T429	E430	K431	I432	L433	W434	D435	E436	N437	I438	V439	P440	T441	E442	Y444	S445	G446	E447	G448	C449	L450	A451	L452	P453	K454	L455	M456	L457	Q458	F459	L460	T461	L462	H463	D464	Y465	L466	L467	R468	M469	F470	M471	L472	F473	R474	L475	E476	S477	T478	Y479	E480	I481		
R482	I485	E486	D487	S488	V489	S490	R491	M492	K493	P494	W495	Q496	S497	GLU	TYR	G500	G501	V502	V503	F504	G505	G506	W507	A508	R509	M510	A511	Q512	P513	I514	V515	A516	F517	T518	V519	V520	E521	V522	A523	K524	P525	E526	I527	G528	E529	N530	W531	P532	T533	R534	V535	R536	A537	D538	V539	T540	I541	M542		
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D603	K604	G605	R606	V607	I608	GLU	ASP	GLY	PRO	GLU	P614	R615	P616	N617	L618	R619	G620	E621	S622	R623	T624	F625	R626	V627	F628	L629	D630	P631	M632	Q633	Y634	Q635	Q636	D637	M638	T639	M640	T641	I642	Q643	M644	G645	A646	E647	D648	V649	Y650	E651	T652	F653	M654	I655	L656	M657	R658	R659	K660	P661	L662	
E663	N664	N665	F666	K667	A668	V669	L670	E671	T672	L673	R674	M675	L676	M677	N678	T679	D680	C681	V682	V683	P684	D685	V686	L687	H688	D689	I690	L691	L692	G693	Y694	G695	D696	P697	L698	S699	M640	T641	I642	Q643	M644	G645	A646	E647	D648	V649	Y650	E651	T652	F653	M654	I655	L656	M657	R658	R659	K660	P661	L662	
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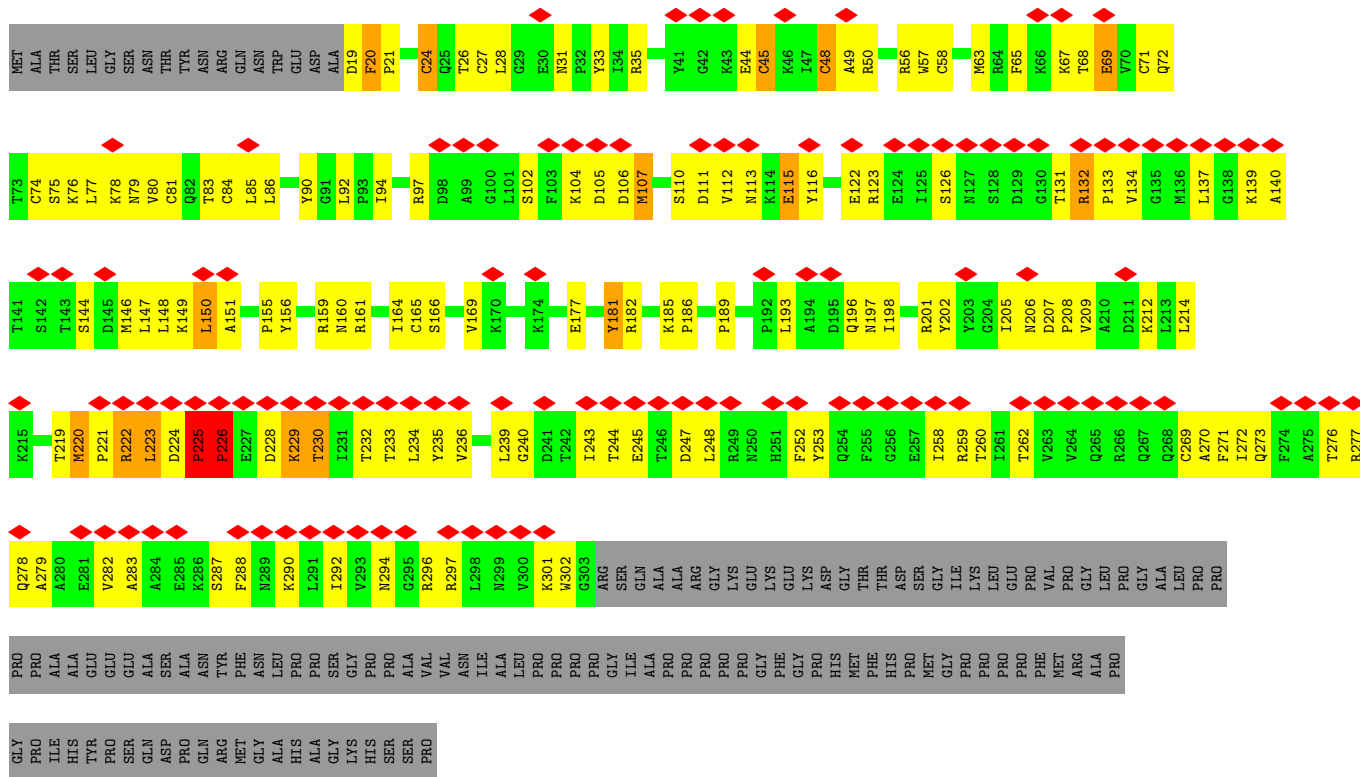
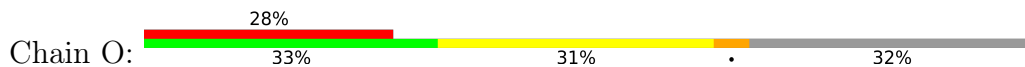
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A903	R904	I906	L908	L909	E910	V912	K913	R914	L915	M916	K917	S918	L919	G920	V921	P922	G923	D924	A925	S926	Y927	E928	C929	E930	T931	D932	G933	Y934	F935	F936	L937	Y938	Q939	V940	M941	S942	R943	W944	E945	E946	T947	I948	S949	K950	V951	K952	N953	LYS	GLY	SER	THR	LEU	P959	D960	Y961	T962				
E963	V964	S965	T966	F967	F968	P969	F970	H971	E972	Y973	F974	A975	N976	A977	PRO	GLN	PRD	F981	F982	K983	G984	A985	S986	Y987	E988	E989	D990	M991	E992	F993	A994	E995	G996	C997	F998	A999	I1000	I1001	K1002	K1003	I1004	F1005	E945	T1006	Q1007	L1008	E1009	E1010	F1011	A1012	A1013	S1014	E1015	L1016	L1017	R1018	S1019	G1020	L1021	D1022
R1023	S1024	K1025	Y1026	L1027	L1028	V1029	K1030	E1031	A1032	Y973	I1034	I1035	A1036	M1037	T1038	C1039	T1040	H1041	A1042	A1043	L1044	K1045	R1046	H1047	D1048	L1049	V1050	K1051	L1052	F1053	A1054	K1055	Y1056	D1057	N1058	I1059	L1060	M1061	E1062	E1063	A1064	A1065	Q1066	I1067	L1068	E1069	I1070	E1071	T1072	F1073	I1074	P1075	L1076	L1077	L1078	Q1079	M1080	F1081	Q1082	
D1083	G1084	F1085	S1086	L1087	L1088	K1089	R1090	W1091	A1092	M1093	I1094	G1095	D1096	H1097	H1098	Q1099	L1100	P1101	P1102	I1103	L1104	K1105	M1106	M1107	A1108	F1109	Q1110	K1111	L1112	S1113	M1114	E1115	M1116	Q1117	S1118	L1119	F1120	T1121	R1122	F1123	V1124	R1125	V1126	G1127	L1128	P1129	T1130	V1131	D1132	L1133	D1134	A1135	Q1136	G1137	R1138	A1139	L1140	A1141	S1142	
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E1203	A1204	E1205	Y1206	V1207	V1208	A1209	L1210	F1211	M1212	Y1213	M1214	C1215	L1216	L1217	T1218	Y1219	P1220	A1221	V1222	K1223	I1224	S1225	I1226	L1227	T1228	T1229	Y1230	M1231	G1232	Q1233	K1234	H1235	L1236	I1237	R1238	D1239	I1240	I1241	N1242	R1243	R1244	C1245	G1246	M1247	N1248	P1249	L1250	I1251	G1252	R1253	P1254	M1255	K1256	V1257	T1258	T1259	V1260	D1261	R1262	
F1263	Q1264	G1265	Q1266	Q1267	M1268	D1269	Y1270	I1271	L1272	L1273	S1274	V1275	V1276	R1277	T1278	A1279	A1280	V1281	G1282	H1283	I1284	R1285	D1286	V1287	R1288	A1289	L1290	V1291	A1292	M1293	M1294	S1295	R1296	A1297	R1298	L1299	G1300	L1301	Y1302	I1303	F1304	A1305	R1306	V1307	S1308	L1309	F1310	Q1311	M1312	C1313	F1314	E1315	L1316	T1317	P1318	A1319	F1320	S1321	Q1322	
L1323	T1324	A1325	R1326	P1327	L1328	H1329	L1330	H1331	I1332	L1333	P1334	T1335	E1336	PRO	PHE	PRO	T1340	T1341	R1342	K1343	M1344	G1345	E1346	R1347	P1348	S1349	H1350	E1351	V1352	Q1353	L1354	I1355	K1356	M1357	M1358	P1359	Q1360	M1361	A1362	N1363	F1364	Y1365	V1366	M1367	M1368	Y1369	H1371	L1372	L1373	Q1374	T1375	T1376	H1377	H1378	Y1379	L1380	Q1381	THR		
LEU	LEU	GLN	SER	THR	PRO	PRO	ALA	ALA	MET	VAL	ILE	PRO	GLU	GLY	LEU	GLU	THR	VAL	GLN	ASN	GLN	THR	VAL	GLY	GLU	ALA	ASP	ASP	ILE	LEU	PRO	SER	PRO	SER	THR	THR	THR	ARG	ARG	GLN	GLU	THR	THR	ALA	ALA	PHE	GLN	THR	THR	PRO	SER	GLU	THR							
GLY	ALA	THR	SER	THR	PRO	PRO	ALA	ALA	MET	VAL	ILE	PRO	GLU	GLY	LEU	GLU	THR	VAL	GLN	ASN	GLN	THR	VAL	GLY	GLU	ALA	ASP	ASP	ILE	LEU	PRO	SER	PRO	SER	THR	THR	ARG	ARG	GLN	GLU	THR	THR	ALA	ALA	PHE	GLN	THR	THR	PRO	SER	GLU	THR								

• Molecule 34: Protein BUD31 homolog

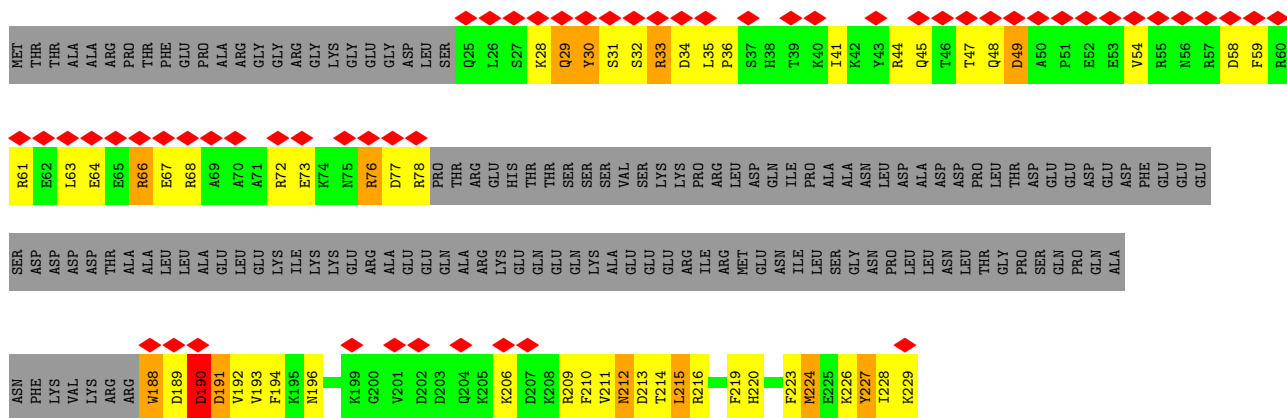
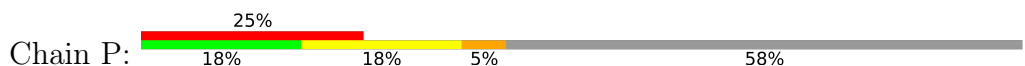




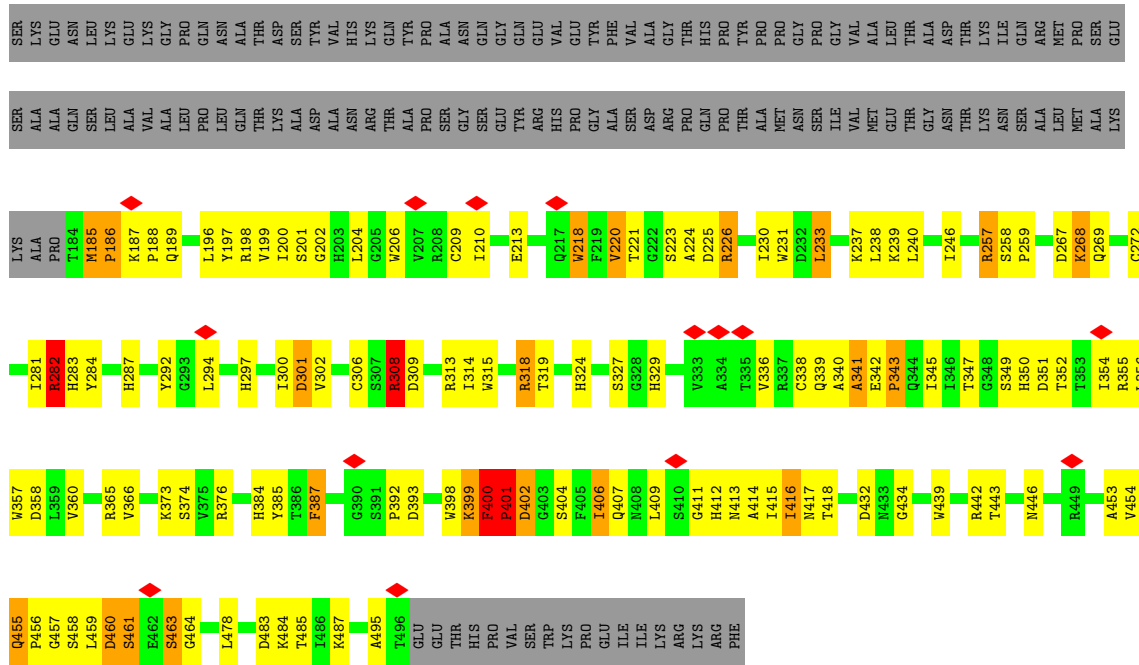
• Molecule 35: Pre-mRNA-splicing factor RBM22



• Molecule 36: Spliceosome-associated protein CWC15 homolog

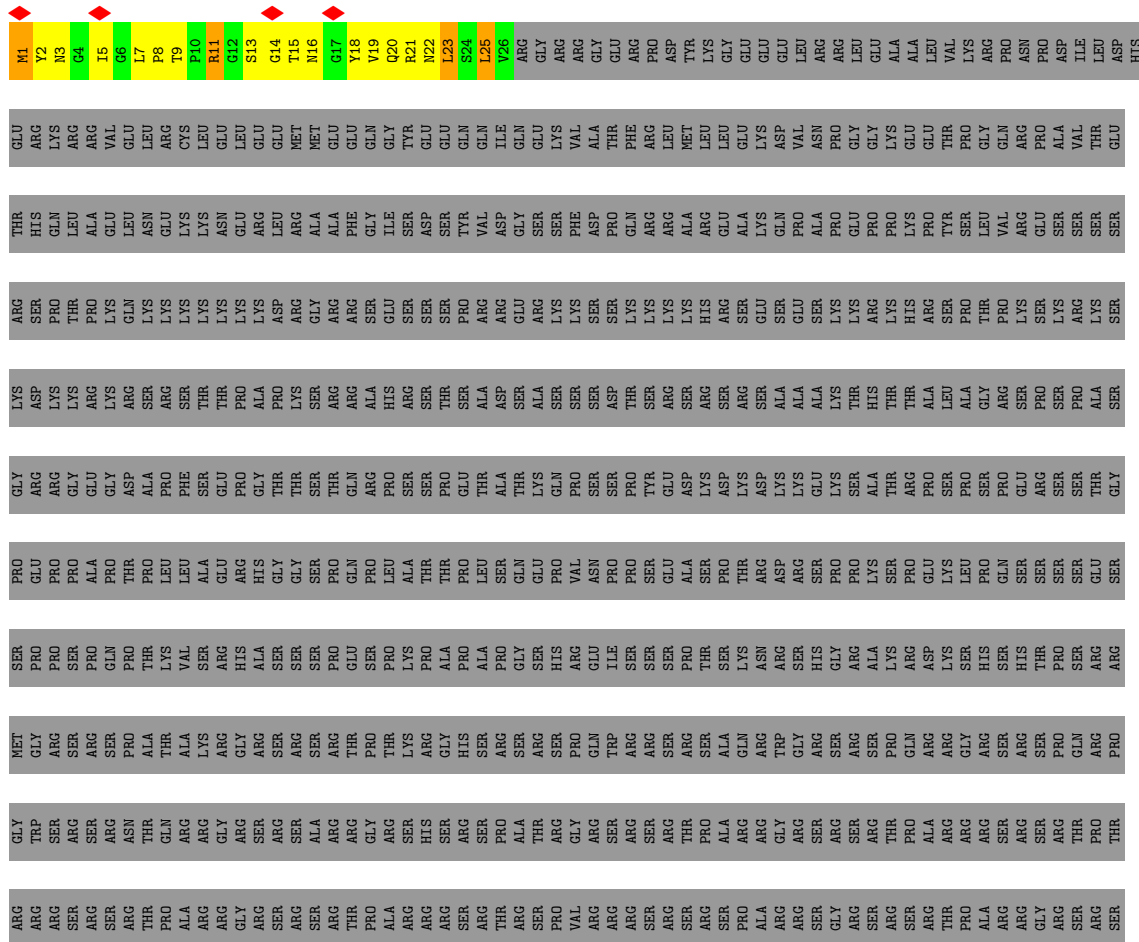


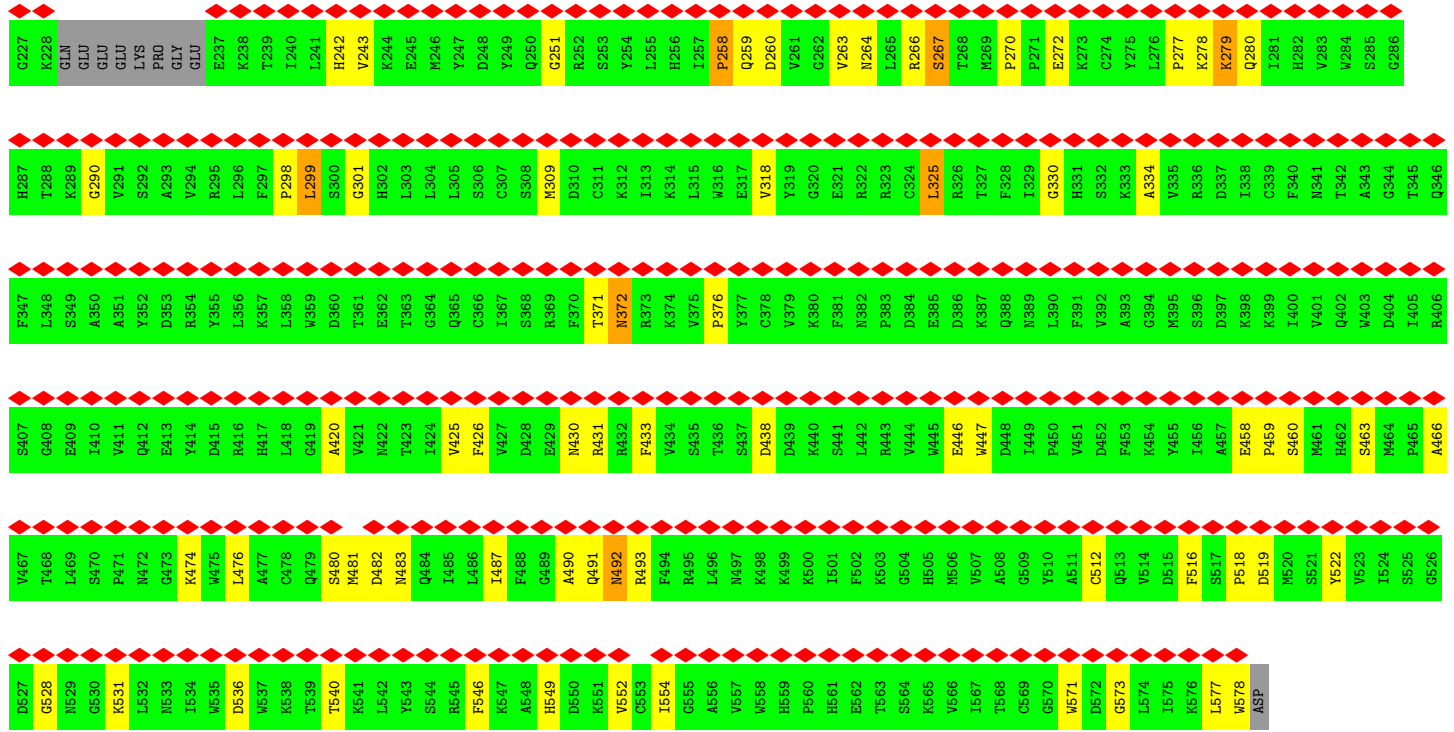
• Molecule 37: Skip



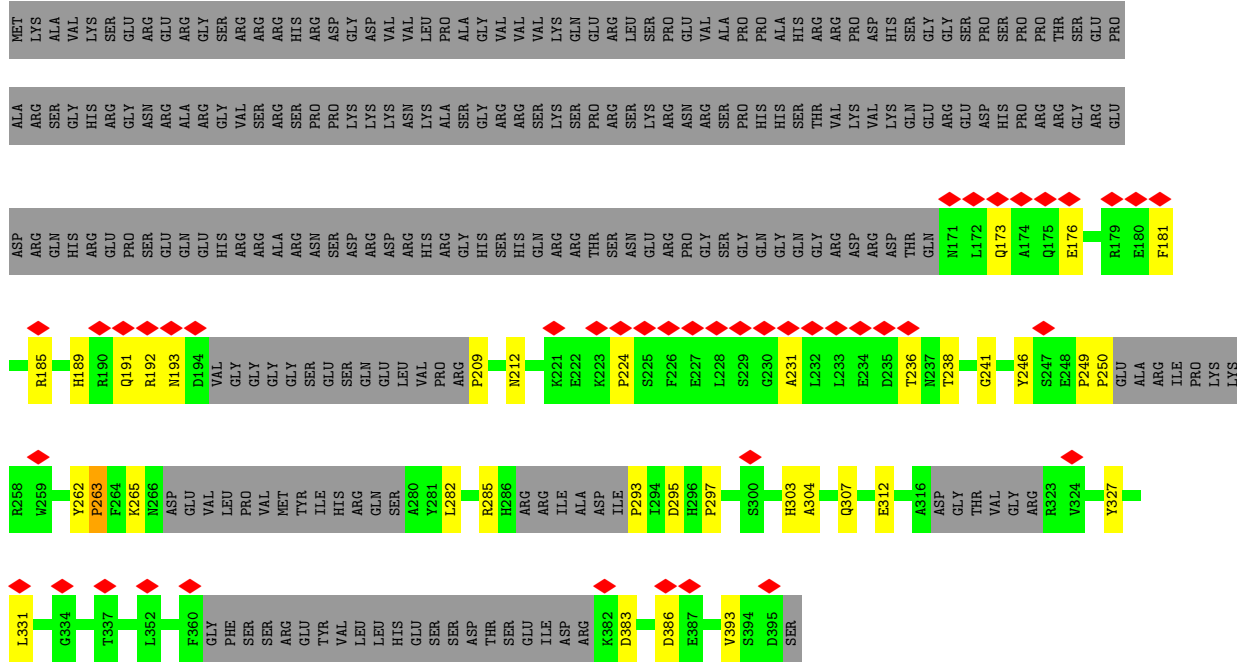
● Molecule 40: Serine/arginine repetitive matrix protein 2

Chain U: 99%



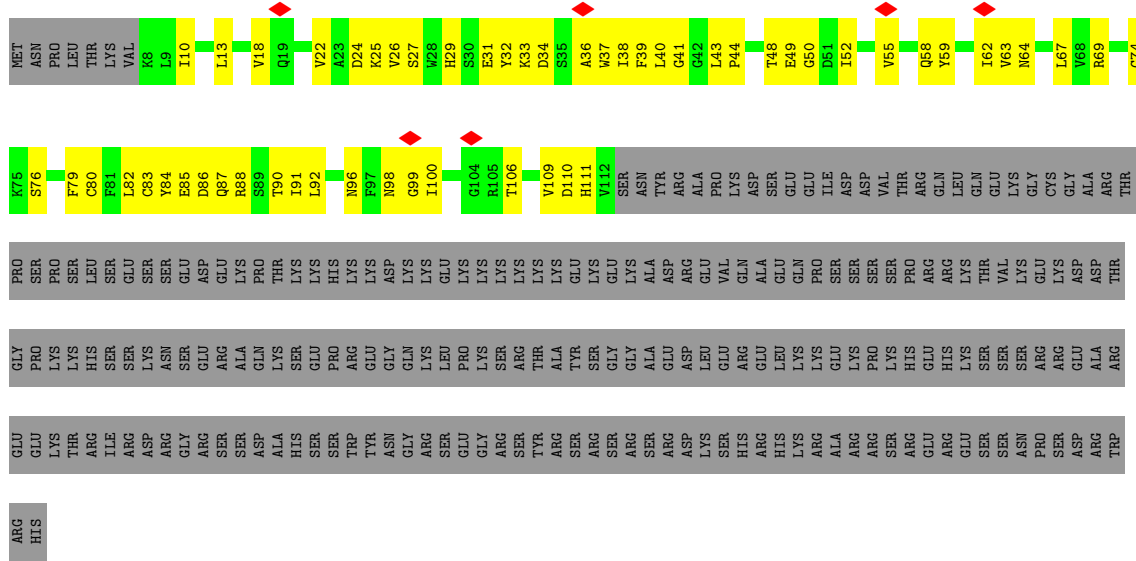


• Molecule 43: Smad nuclear-interacting protein 1

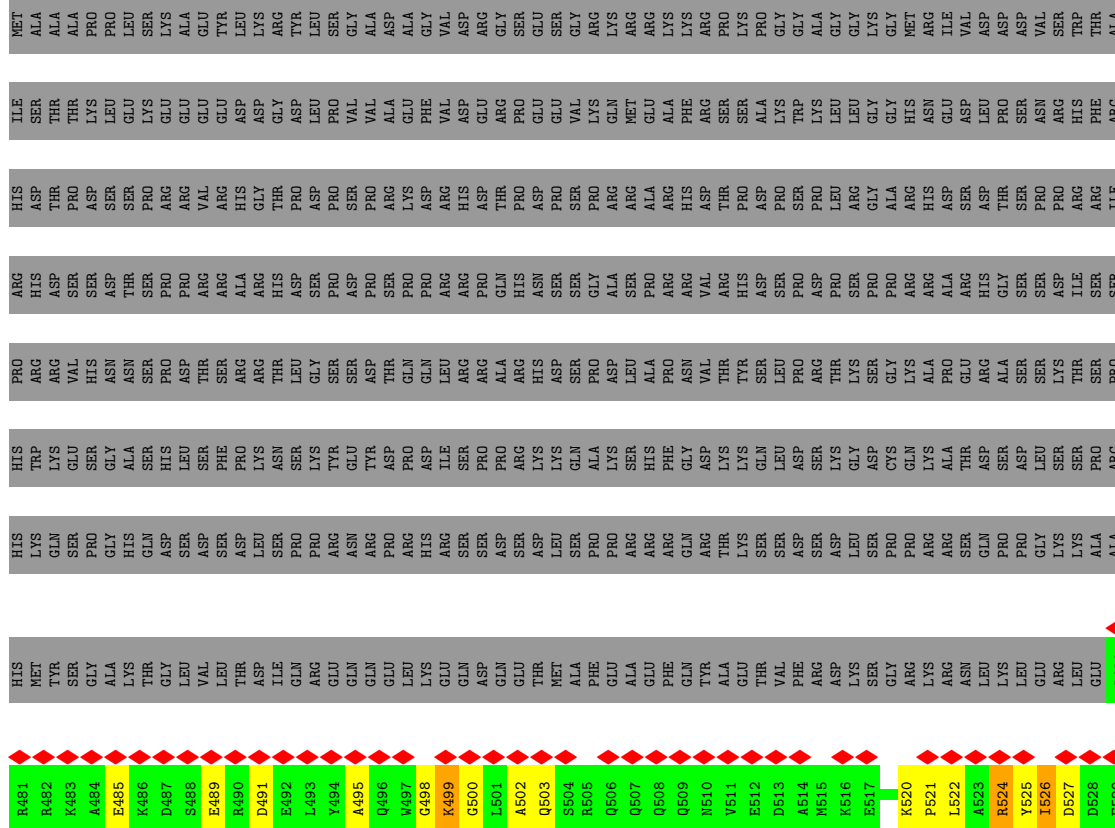


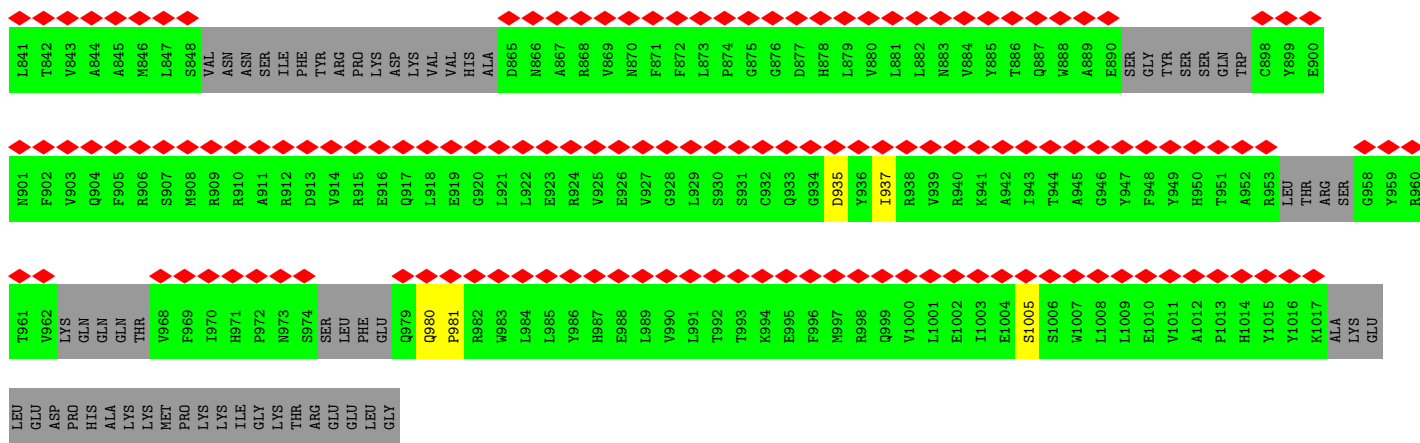
• Molecule 44: RNA-binding motif protein, X-linked 2



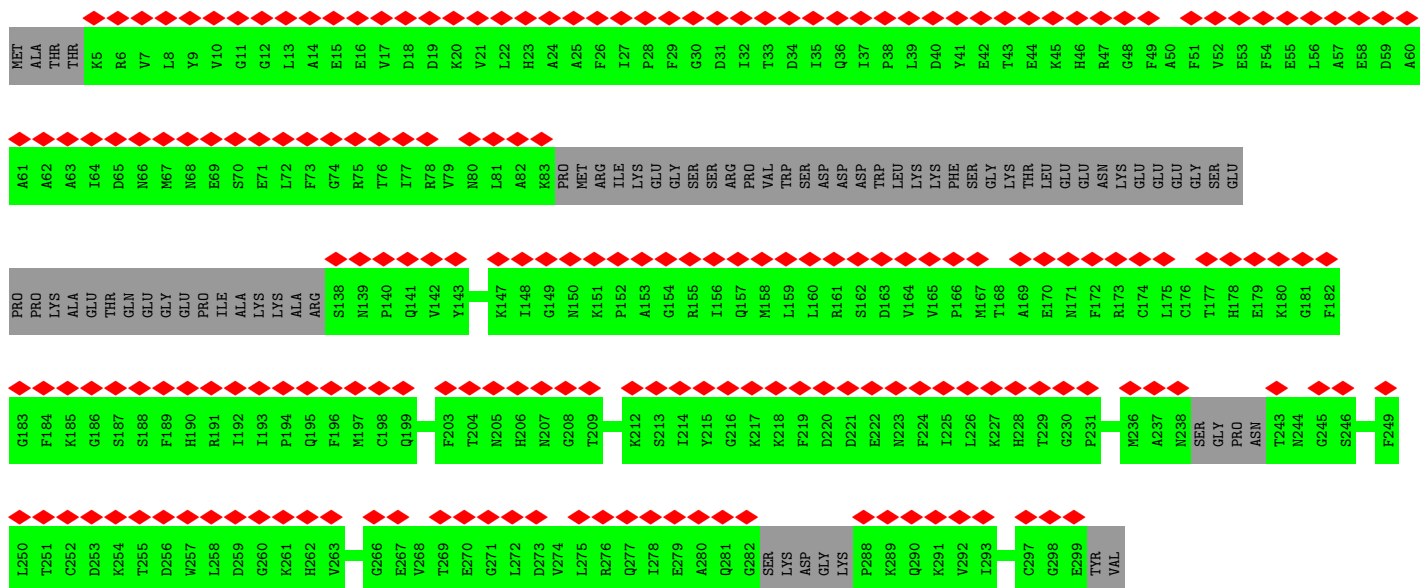
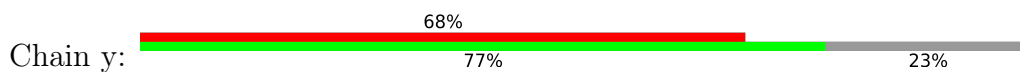


● Molecule 45: BUD13 homolog





• Molecule 47: Peptidyl-prolyl cis-trans isomerase E



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	14316	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 ($e^-/\text{\AA}^2$)	48	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	0.142	Depositor
Minimum map value	-0.067	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.0323	Depositor
Map size (\AA)	535.2, 535.2, 535.2	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	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: IHP, MG, ZN, GTP

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.72	9/16867 (0.1%)	0.80	25/22888 (0.1%)
2	B	0.75	2/1970 (0.1%)	0.91	7/3060 (0.2%)
3	C	0.79	1/6864 (0.0%)	0.96	10/9334 (0.1%)
4	D	0.33	0/8527	0.59	0/11887
5	E	0.64	0/2392	0.79	0/3242
6	a	0.47	0/397	0.61	0/549
6	h	0.46	0/391	0.61	0/540
7	b	0.49	0/404	0.72	0/561
7	i	0.50	0/421	0.73	0/583
8	c	0.57	0/405	0.73	0/563
8	j	0.57	0/405	0.73	0/563
9	d	0.68	0/479	0.84	0/666
9	k	0.70	0/420	0.85	0/583
10	f	0.75	0/360	0.81	0/497
10	m	0.75	0/360	0.81	0/497
11	e	0.65	0/390	0.80	0/542
11	l	0.64	0/390	0.80	0/542
12	g	0.54	0/362	0.71	0/501
12	n	0.54	0/332	0.72	0/458
13	F	0.39	0/2224	0.86	0/3462
14	G	0.35	0/1717	0.95	1/2664 (0.0%)
15	H	0.59	7/3217 (0.2%)	1.06	18/4997 (0.4%)
16	o	0.61	0/803	1.41	2/1119 (0.2%)
17	p	1.01	1/810 (0.1%)	1.46	4/1122 (0.4%)
18	w	0.53	5/2380 (0.2%)	0.67	13/3274 (0.4%)
19	u	0.23	0/514	0.63	4/710 (0.6%)
20	v	0.73	4/935 (0.4%)	0.81	9/1266 (0.7%)
21	1	0.33	0/7826	0.51	0/10617
22	2	0.52	3/1277 (0.2%)	0.73	7/1724 (0.4%)
23	3	0.32	0/9381	0.52	0/12732
24	4	0.83	2/535 (0.4%)	0.98	4/724 (0.6%)
25	5	0.29	0/823	0.48	0/1123

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
26	6	0.29	0/678	0.51	0/909
27	7	0.31	0/556	0.45	0/751
28	J	0.62	0/3500	0.73	0/4750
29	L	0.52	3/2283 (0.1%)	0.58	8/3088 (0.3%)
30	q	0.35	0/658	0.58	3/919 (0.3%)
30	r	0.32	0/653	0.59	3/912 (0.3%)
30	s	0.26	0/334	0.37	0/466
30	t	0.30	0/334	0.38	0/466
31	K	1.28	14/981 (1.4%)	0.69	5/1317 (0.4%)
32	I	0.39	0/2745	0.56	17/3765 (0.5%)
33	Q	0.21	0/6518	0.42	0/9075
34	N	0.88	1/1210 (0.1%)	1.00	3/1622 (0.2%)
35	O	0.80	3/2321 (0.1%)	0.94	6/3135 (0.2%)
36	P	0.83	1/841 (0.1%)	1.01	2/1117 (0.2%)
37	R	0.68	5/2224 (0.2%)	0.88	7/2992 (0.2%)
38	S	0.59	0/1268	0.80	1/1714 (0.1%)
39	T	1.05	1/2522 (0.0%)	1.11	4/3438 (0.1%)
40	U	1.03	0/196	1.09	1/265 (0.4%)
41	V	0.54	0/2239	0.67	1/3118 (0.0%)
42	W	0.55	0/2381	0.76	4/3310 (0.1%)
43	X	0.27	0/1012	0.48	0/1351
44	Y	0.31	0/753	0.48	0/1014
45	Z	0.57	2/772 (0.3%)	0.79	7/1056 (0.7%)
46	x	0.35	0/2871	0.53	3/3981 (0.1%)
47	y	0.35	0/1129	0.61	0/1558
All	All	0.58	64/115557 (0.1%)	0.75	179/159679 (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
1	A	0	6
3	C	0	3
4	D	0	1
9	d	0	1
9	k	0	1
21	1	0	9
22	2	0	1
23	3	0	4
27	7	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
34	N	0	1
37	R	0	1
39	T	0	2
43	X	0	1
All	All	0	32

The worst 5 of 64 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
31	K	106	CYS	CB-SG	-23.13	1.43	1.82
31	K	132	CYS	CB-SG	-17.48	1.52	1.82
29	L	761	SER	CB-OG	8.91	1.53	1.42
31	K	128	SER	CB-OG	8.42	1.53	1.42
31	K	183	SER	CB-OG	8.28	1.53	1.42

The worst 5 of 179 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
24	4	83	PRO	CA-CB-CG	10.19	124.17	104.80
22	2	636	MET	CG-SD-CE	9.28	115.05	100.20
31	K	90	PRO	CA-CB-CG	8.66	121.26	104.80
45	Z	569	PRO	CA-N-CD	-8.56	99.52	111.50
45	Z	573	PRO	CA-N-CD	-8.45	99.67	111.50

There are no chirality outliers.

5 of 32 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	166	PHE	Peptide
1	A	346	ASP	Peptide
1	A	408	PRO	Peptide
1	A	433	GLU	Peptide
1	A	697	MET	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	16399	0	16176	1407	0
2	B	1768	0	897	120	0
3	C	6716	0	6691	892	0
4	D	8528	0	3745	78	0
5	E	2338	0	2272	153	0
6	a	399	0	173	0	0
6	h	393	0	170	0	0
7	b	405	0	170	0	0
7	i	422	0	177	0	0
8	c	406	0	170	0	0
8	j	406	0	170	0	0
9	d	480	0	200	0	0
9	k	422	0	175	0	0
10	f	361	0	158	0	0
10	m	361	0	158	0	0
11	e	391	0	163	0	0
11	l	391	0	163	0	0
12	g	363	0	160	0	0
12	n	334	0	143	0	0
13	F	1988	0	1005	186	0
14	G	1545	0	786	197	0
15	H	2886	0	1463	239	0
16	o	804	0	350	0	0
17	p	813	0	365	0	0
18	w	2373	0	1301	0	0
19	u	520	0	214	0	0
20	v	936	0	591	0	0
21	1	7702	0	7389	309	0
22	2	1252	0	1040	57	0
23	3	9195	0	9091	465	0
24	4	527	0	438	40	0
25	5	807	0	729	26	0
26	6	670	0	654	21	0
27	7	540	0	509	25	0
28	J	3463	0	2544	107	0
29	L	2260	0	1776	92	0
30	q	659	0	296	0	0
30	r	654	0	294	0	0
30	s	335	0	168	0	0
30	t	335	0	168	0	0
31	K	979	0	739	11	0
32	I	2778	0	1238	21	0
33	Q	6528	0	2814	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
34	N	1184	0	1190	75	0
35	O	2273	0	2244	244	0
36	P	829	0	814	192	0
37	R	2188	0	2102	400	0
38	S	1236	0	1210	135	0
39	T	2457	0	2416	251	0
40	U	193	0	196	40	0
41	V	2243	0	971	48	0
42	W	2384	0	1055	126	0
43	X	1012	0	733	17	0
44	Y	743	0	613	67	0
45	Z	755	0	591	113	0
46	x	2882	0	1308	0	0
47	y	1133	0	519	0	0
48	A	36	0	6	10	0
49	A	5	0	4	2	0
50	C	32	0	12	11	0
51	C	1	0	0	0	0
51	F	5	0	0	0	0
52	6	3	0	0	0	0
52	N	3	0	0	0	0
52	O	3	0	0	3	0
52	v	1	0	0	0	0
All	All	113433	0	84077	4900	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 26.

The worst 5 of 4900 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)
44:Y:37:TRP:CH2	45:Z:498:GLY:HA2	1.23	1.65
1:A:1758:PRO:HA	21:1:938:TRP:CD1	1.28	1.59
1:A:2270:PHE:HB3	4:D:1264:PRO:CB	1.34	1.56
3:C:149:LEU:HD13	3:C:427:PHE:CD2	1.38	1.54
1:A:2270:PHE:CG	4:D:1264:PRO:CB	1.89	1.54

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1970/2335 (84%)	1835 (93%)	108 (6%)	27 (1%)	11	46
3	C	854/972 (88%)	777 (91%)	57 (7%)	20 (2%)	6	34
4	D	1720/2136 (80%)	1632 (95%)	85 (5%)	3 (0%)	47	81
5	E	297/357 (83%)	272 (92%)	16 (5%)	9 (3%)	4	28
6	a	77/126 (61%)	76 (99%)	1 (1%)	0	100	100
6	h	76/126 (60%)	75 (99%)	1 (1%)	0	100	100
7	b	80/231 (35%)	78 (98%)	2 (2%)	0	100	100
7	i	84/231 (36%)	82 (98%)	2 (2%)	0	100	100
8	c	80/119 (67%)	77 (96%)	3 (4%)	0	100	100
8	j	80/119 (67%)	77 (96%)	3 (4%)	0	100	100
9	d	95/118 (80%)	91 (96%)	4 (4%)	0	100	100
9	k	81/118 (69%)	78 (96%)	3 (4%)	0	100	100
10	f	72/86 (84%)	69 (96%)	3 (4%)	0	100	100
10	m	72/86 (84%)	68 (94%)	4 (6%)	0	100	100
11	e	77/92 (84%)	76 (99%)	1 (1%)	0	100	100
11	l	77/92 (84%)	76 (99%)	1 (1%)	0	100	100
12	g	72/76 (95%)	70 (97%)	2 (3%)	0	100	100
12	n	64/76 (84%)	62 (97%)	2 (3%)	0	100	100
16	o	160/255 (63%)	146 (91%)	12 (8%)	2 (1%)	12	48
17	p	159/225 (71%)	138 (87%)	9 (6%)	12 (8%)	1	13
18	w	420/501 (84%)	380 (90%)	37 (9%)	3 (1%)	22	63
19	u	92/793 (12%)	86 (94%)	4 (4%)	2 (2%)	6	35
20	v	153/464 (33%)	124 (81%)	22 (14%)	7 (5%)	2	21
21	1	1022/1304 (78%)	897 (88%)	119 (12%)	6 (1%)	25	66
22	2	171/895 (19%)	154 (90%)	17 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	3	1165/1217 (96%)	1081 (93%)	80 (7%)	4 (0%)	41	76
24	4	76/424 (18%)	69 (91%)	6 (8%)	1 (1%)	12	48
25	5	106/125 (85%)	90 (85%)	16 (15%)	0	100	100
26	6	87/110 (79%)	80 (92%)	7 (8%)	0	100	100
27	7	64/86 (74%)	55 (86%)	9 (14%)	0	100	100
28	J	483/848 (57%)	452 (94%)	24 (5%)	7 (1%)	11	46
29	L	324/802 (40%)	304 (94%)	18 (6%)	2 (1%)	25	66
30	q	130/504 (26%)	119 (92%)	7 (5%)	4 (3%)	4	27
30	r	129/504 (26%)	118 (92%)	9 (7%)	2 (2%)	9	44
30	s	65/504 (13%)	62 (95%)	2 (3%)	1 (2%)	10	46
30	t	65/504 (13%)	64 (98%)	0	1 (2%)	10	46
31	K	144/225 (64%)	134 (93%)	6 (4%)	4 (3%)	5	30
32	I	498/855 (58%)	479 (96%)	11 (2%)	8 (2%)	9	44
33	Q	1297/1485 (87%)	1271 (98%)	26 (2%)	0	100	100
34	N	141/144 (98%)	126 (89%)	12 (8%)	3 (2%)	7	36
35	O	283/420 (67%)	247 (87%)	26 (9%)	10 (4%)	3	25
36	P	92/229 (40%)	82 (89%)	8 (9%)	2 (2%)	6	35
37	R	274/540 (51%)	234 (85%)	25 (9%)	15 (6%)	2	19
38	S	157/166 (95%)	144 (92%)	10 (6%)	3 (2%)	8	38
39	T	311/514 (60%)	282 (91%)	17 (6%)	12 (4%)	3	23
40	U	24/2752 (1%)	20 (83%)	3 (12%)	1 (4%)	3	22
41	V	444/908 (49%)	412 (93%)	27 (6%)	5 (1%)	14	52
42	W	477/579 (82%)	421 (88%)	32 (7%)	24 (5%)	2	20
43	X	144/396 (36%)	134 (93%)	10 (7%)	0	100	100
44	Y	103/322 (32%)	92 (89%)	11 (11%)	0	100	100
45	Z	109/619 (18%)	93 (85%)	10 (9%)	6 (6%)	2	19
46	x	561/1041 (54%)	536 (96%)	20 (4%)	5 (1%)	17	57
47	y	224/301 (74%)	217 (97%)	7 (3%)	0	100	100
All	All	16082/29057 (55%)	14914 (93%)	957 (6%)	211 (1%)	16	48

5 of 211 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	82	ARG
1	A	92	LEU
1	A	167	PRO
1	A	188	LEU
1	A	331	TRP

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1773/2108 (84%)	1675 (94%)	98 (6%)	21	47
3	C	745/866 (86%)	677 (91%)	68 (9%)	9	30
5	E	256/300 (85%)	244 (95%)	12 (5%)	26	51
18	w	49/446 (11%)	47 (96%)	2 (4%)	30	55
20	v	30/382 (8%)	28 (93%)	2 (7%)	16	41
21	1	735/1104 (67%)	735 (100%)	0	100	100
22	2	94/776 (12%)	90 (96%)	4 (4%)	29	53
23	3	1012/1051 (96%)	1011 (100%)	1 (0%)	93	97
24	4	39/336 (12%)	37 (95%)	2 (5%)	24	49
25	5	74/109 (68%)	74 (100%)	0	100	100
26	6	76/95 (80%)	76 (100%)	0	100	100
27	7	57/77 (74%)	57 (100%)	0	100	100
28	J	205/751 (27%)	194 (95%)	11 (5%)	22	47
29	L	131/709 (18%)	122 (93%)	9 (7%)	15	40
31	K	54/196 (28%)	49 (91%)	5 (9%)	9	29
34	N	130/130 (100%)	125 (96%)	5 (4%)	33	57
35	O	250/361 (69%)	239 (96%)	11 (4%)	28	53
36	P	90/203 (44%)	77 (86%)	13 (14%)	3	16
37	R	215/463 (46%)	165 (77%)	50 (23%)	1	4
38	S	129/134 (96%)	119 (92%)	10 (8%)	12	36

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
39	T	268/441 (61%)	251 (94%)	17 (6%)	18	43
40	U	21/2432 (1%)	16 (76%)	5 (24%)	0	4
43	X	51/349 (15%)	44 (86%)	7 (14%)	3	17
44	Y	57/291 (20%)	56 (98%)	1 (2%)	59	77
45	Z	47/545 (9%)	39 (83%)	8 (17%)	2	12
46	x	1/897 (0%)	1 (100%)	0	100	100
All	All	6589/15552 (42%)	6248 (95%)	341 (5%)	27	48

5 of 341 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
36	P	29	GLN
37	R	415	LEU
36	P	188	TRP
37	R	125	MET
38	S	129	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 106 such sidechains are listed below:

Mol	Chain	Res	Type
23	3	97	ASN
28	J	351	ASN
39	T	413	ASN
23	3	254	ASN
23	3	775	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
13	F	91/107 (85%)	37 (40%)	12 (13%)
14	G	76/274 (27%)	48 (63%)	9 (11%)
15	H	130/188 (69%)	33 (25%)	4 (3%)
2	B	82/117 (70%)	19 (23%)	10 (12%)
All	All	379/686 (55%)	137 (36%)	35 (9%)

5 of 137 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	12	U
2	B	13	C
2	B	19	A
2	B	20	G
2	B	21	A

5 of 35 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
14	G	151	C
14	G	153	C
15	H	46	U
13	F	25	C
13	F	7	G

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 19 ligands modelled in this entry, 16 are monoatomic - leaving 3 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	$\# Z > 2$
49	ALA	A	2402	-	3,4,5	0.65	0	2,4,6	0.83	0
50	GTP	C	1500	51	26,34,34	1.18	1 (3%)	32,54,54	1.81	8 (25%)
48	IHP	A	2401	-	36,36,36	1.01	2 (5%)	54,60,60	1.62	12 (22%)

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
49	ALA	A	2402	-	-	0/0/2/4	-
50	GTP	C	1500	51	-	7/18/38/38	0/3/3/3
48	IHP	A	2401	-	-	6/30/54/54	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
50	C	1500	GTP	C6-N1	-3.52	1.32	1.37
48	A	2401	IHP	P5-O45	-2.86	1.43	1.54
48	A	2401	IHP	P2-O12	2.65	1.64	1.59

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
48	A	2401	IHP	O45-P5-O35	4.10	123.30	107.64
48	A	2401	IHP	O35-P5-O15	-3.97	88.19	105.99
50	C	1500	GTP	C5-C6-N1	3.79	120.64	113.95
50	C	1500	GTP	PA-O3A-PB	-3.79	119.84	132.83
50	C	1500	GTP	O6-C6-C5	-3.73	117.08	124.37

There are no chirality outliers.

5 of 13 torsion outliers are listed below:

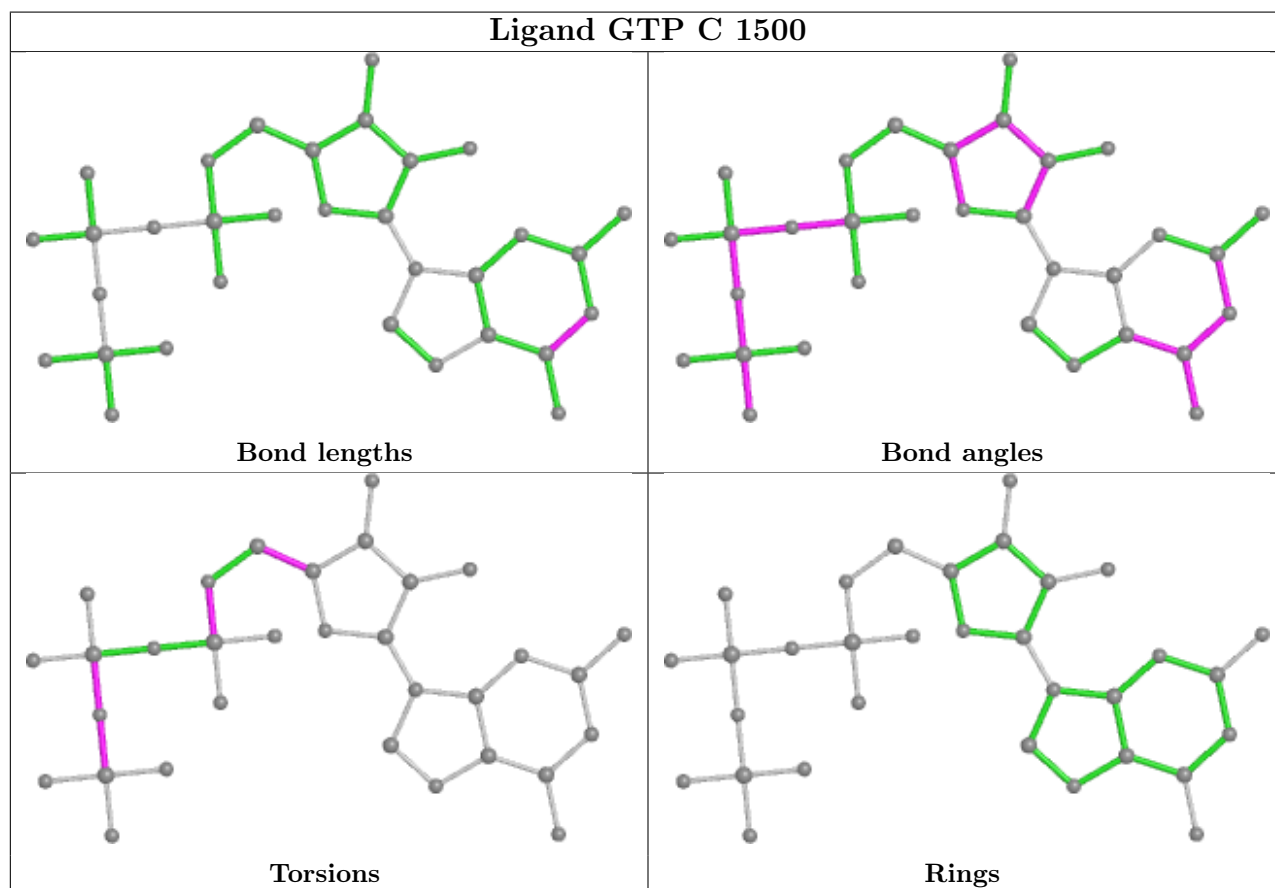
Mol	Chain	Res	Type	Atoms
48	A	2401	IHP	C4-C5-O15-P5
48	A	2401	IHP	C6-C5-O15-P5
50	C	1500	GTP	PB-O3B-PG-O3G
50	C	1500	GTP	C5'-O5'-PA-O3A
50	C	1500	GTP	C5'-O5'-PA-O1A

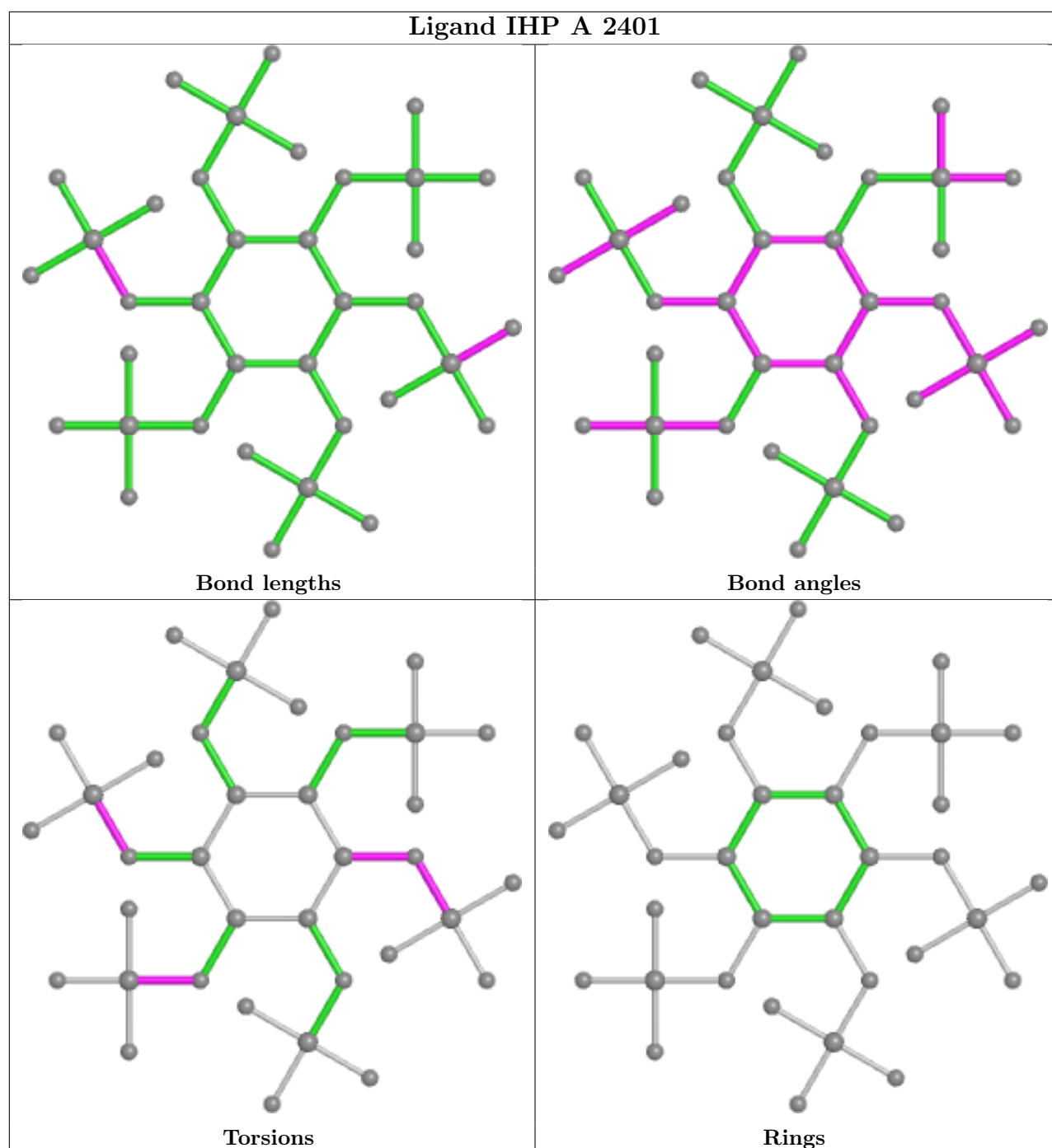
There are no ring outliers.

3 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
49	A	2402	ALA	2	0
50	C	1500	GTP	11	0
48	A	2401	IHP	10	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 than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

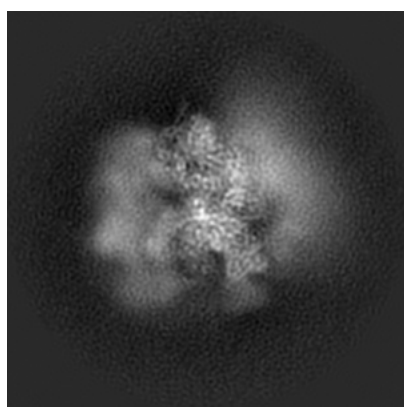
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6890. These allow visual inspection of the internal detail of the map and identification of artifacts.

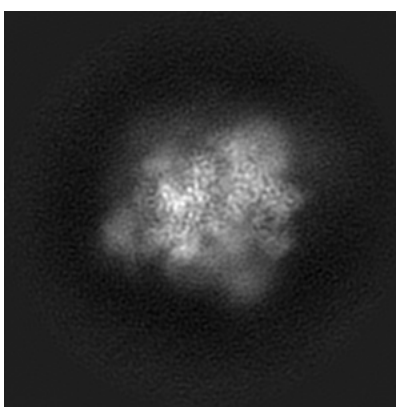
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

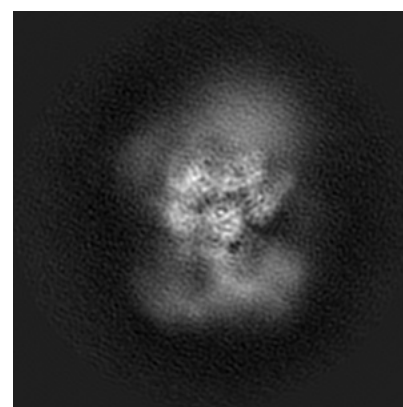
6.1.1 Primary map



X



Y

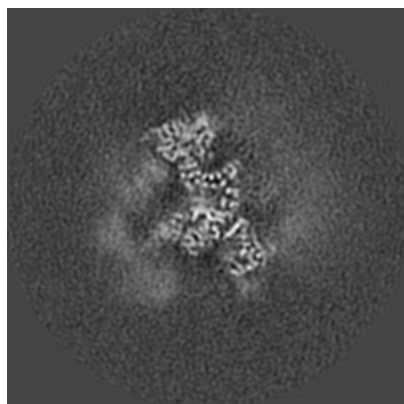


Z

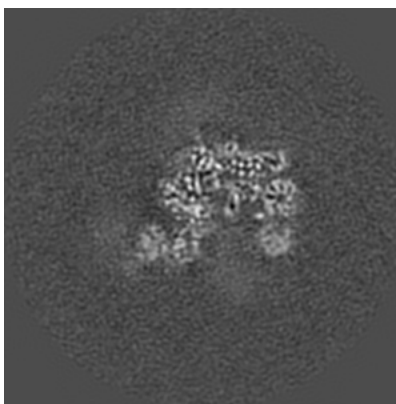
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

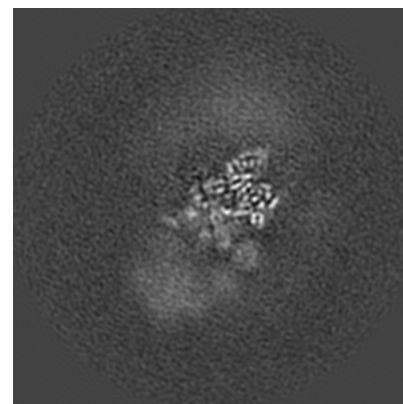
6.2.1 Primary map



X Index: 200



Y Index: 200

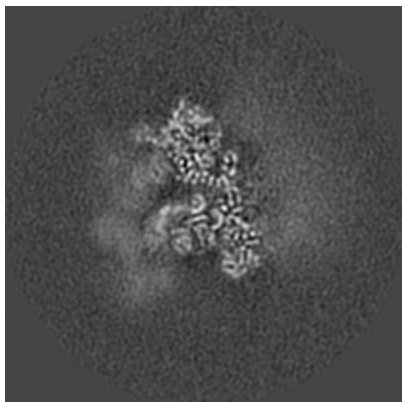


Z Index: 200

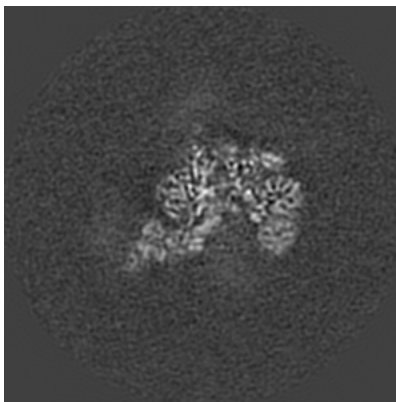
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

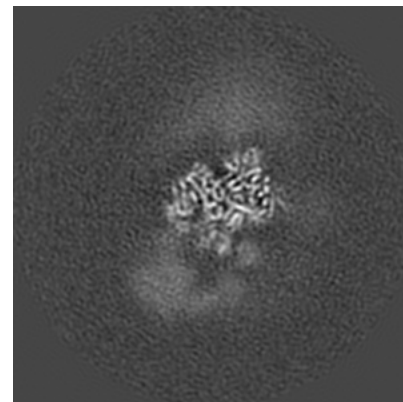
6.3.1 Primary map



X Index: 210



Y Index: 195



Z Index: 192

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0323. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

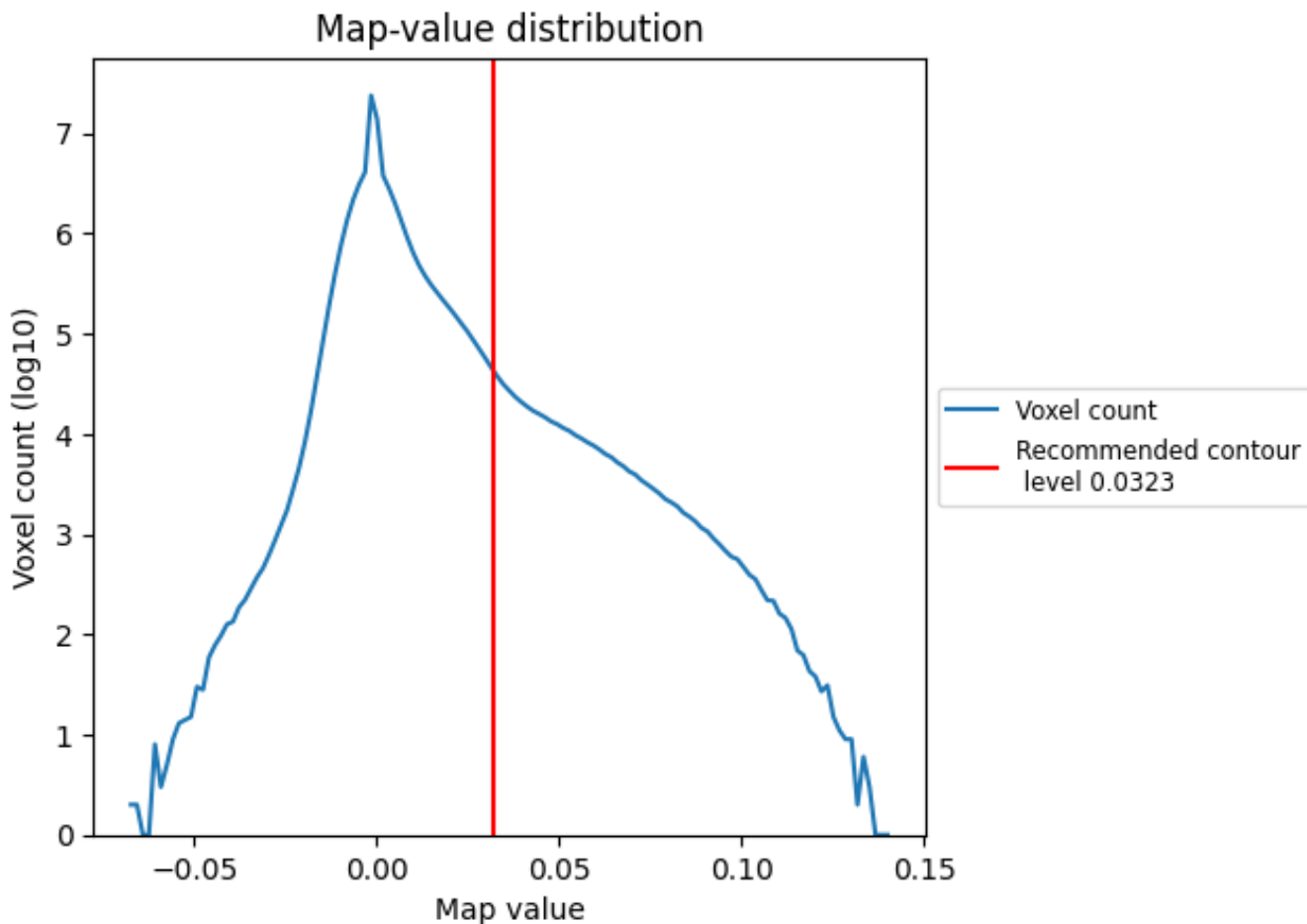
6.5 Mask visualisation

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

7 Map analysis [i](#)

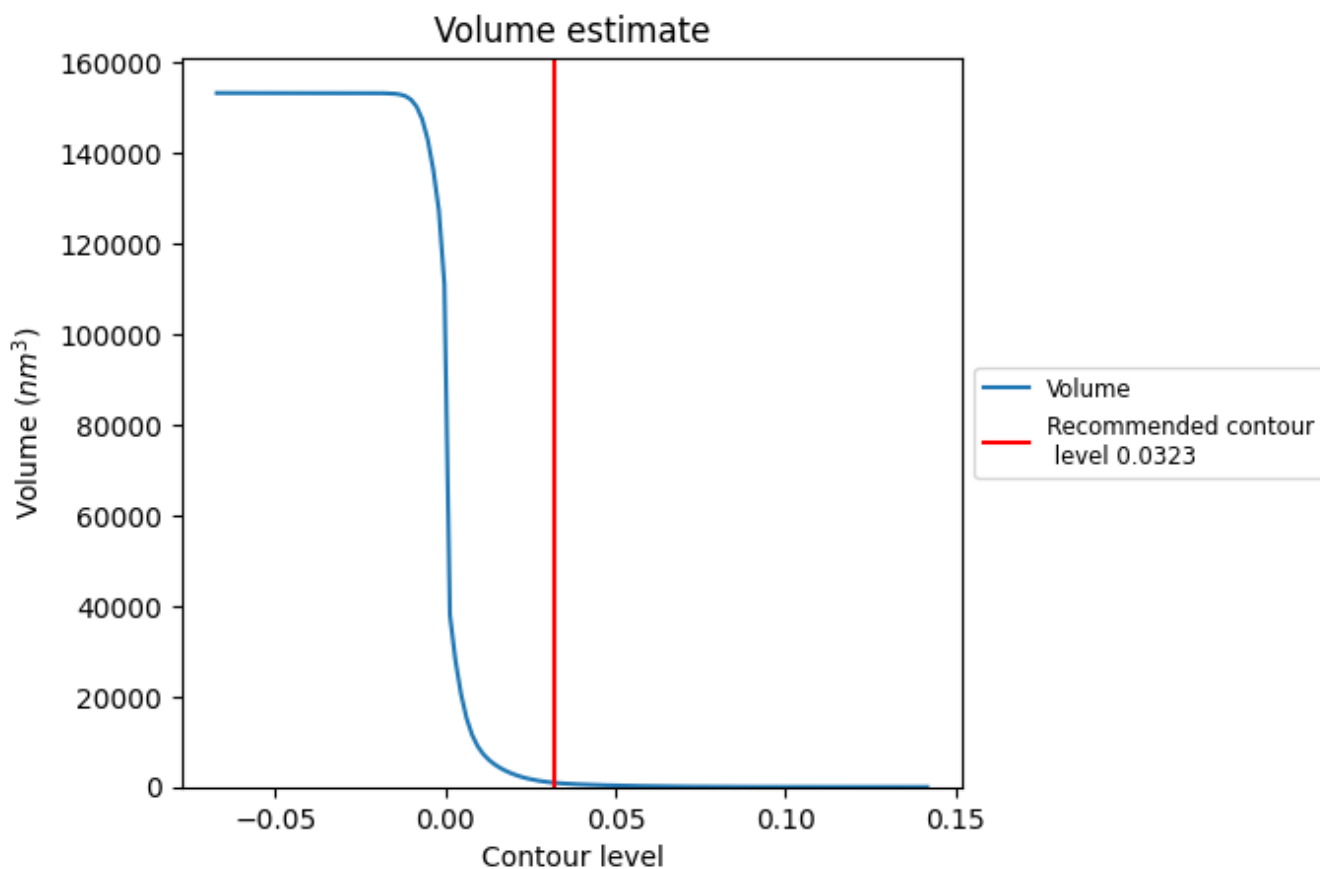
This section contains the results of statistical analysis of the map.

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.

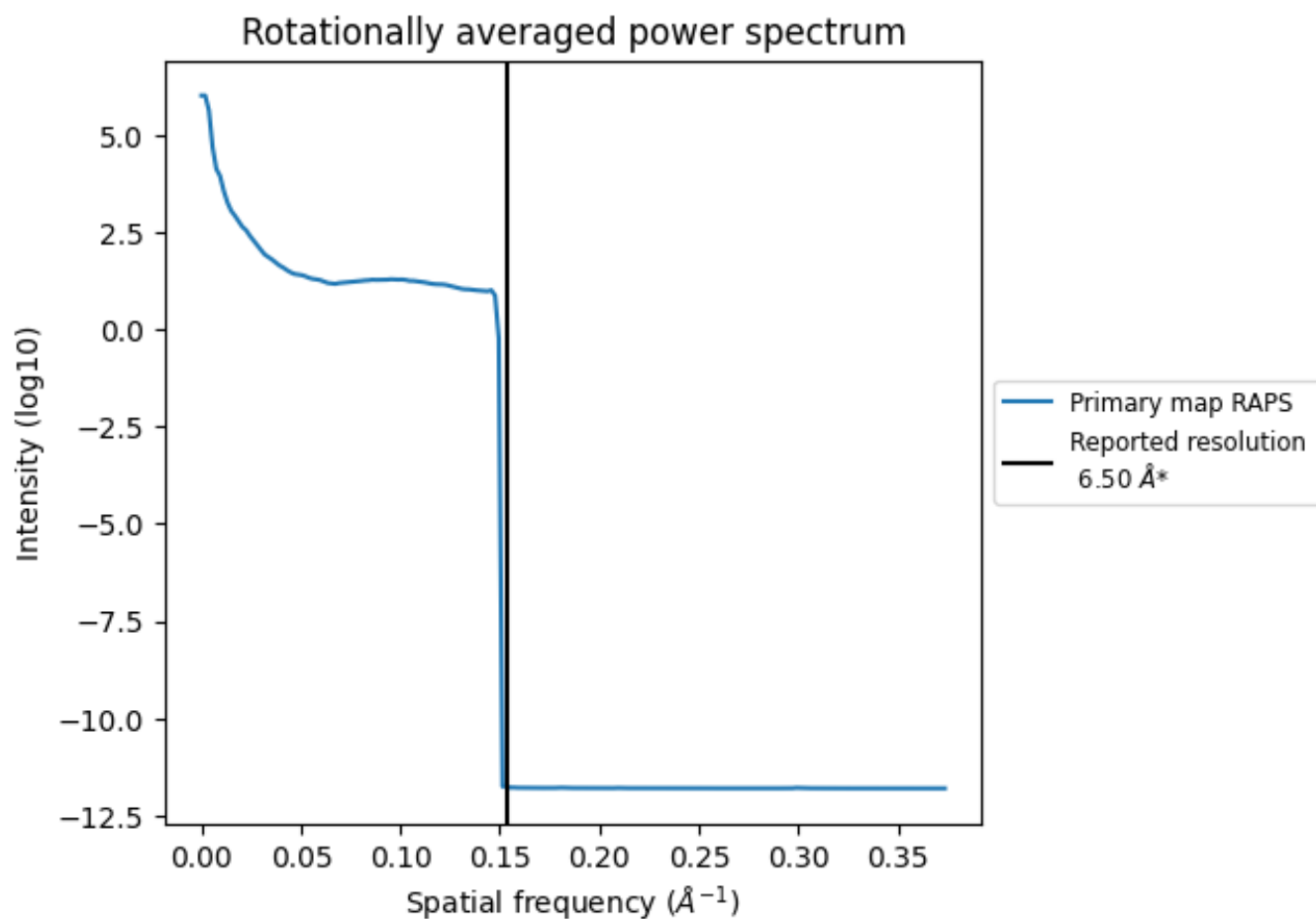
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 909 nm^3 ; this corresponds to an approximate mass of 821 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 0.154 Å⁻¹

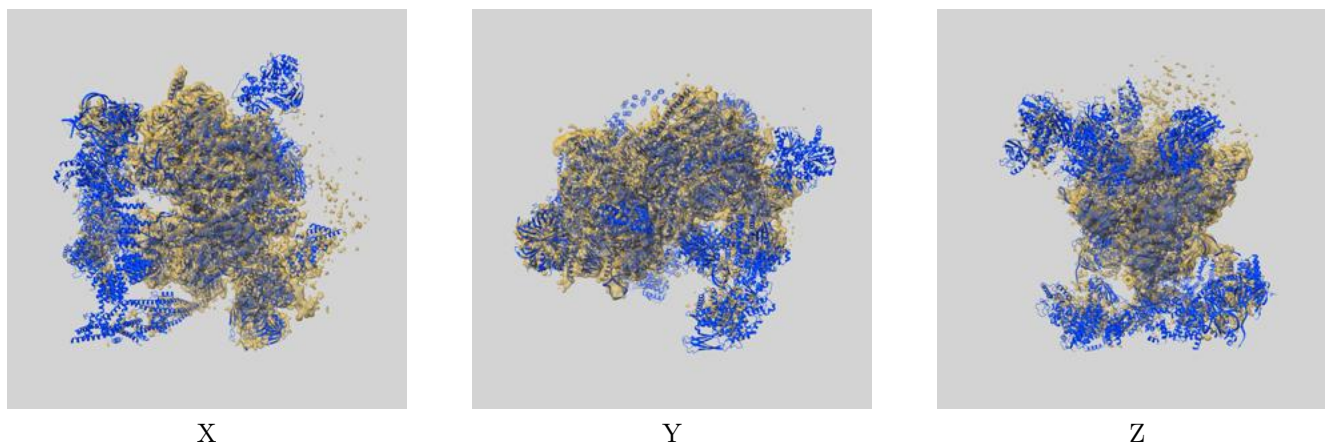
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

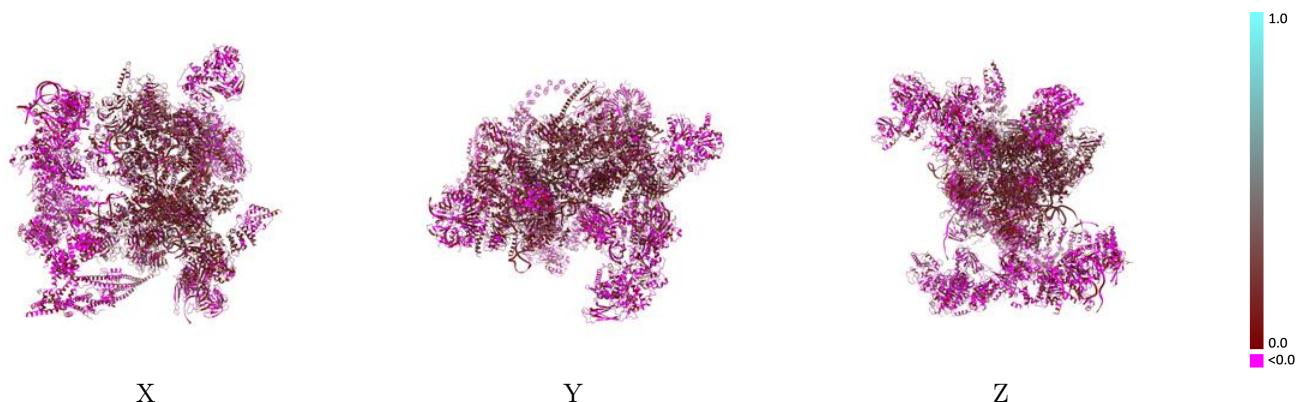
This section contains information regarding the fit between EMDB map EMD-6890 and PDB model 5Z57. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



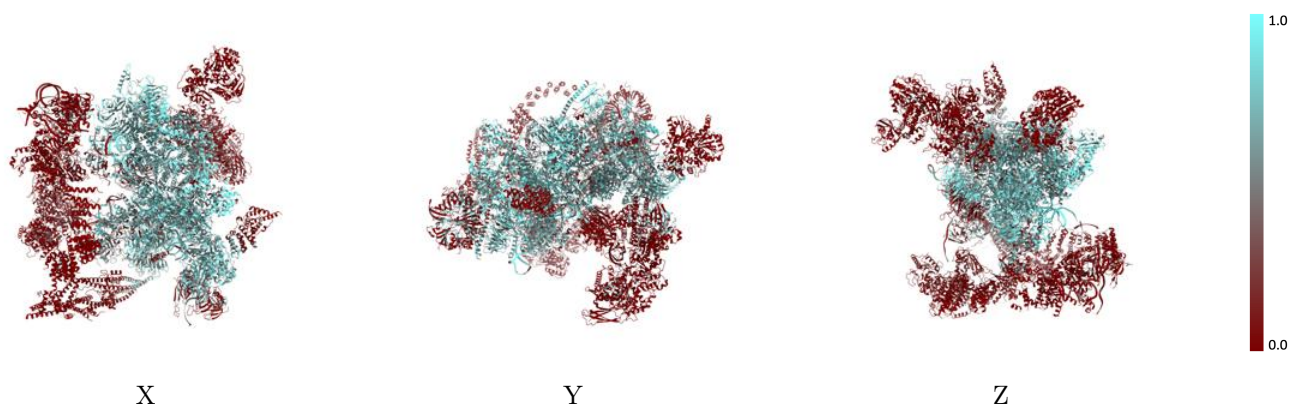
The images above show the 3D surface view of the map at the recommended contour level 0.0323 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



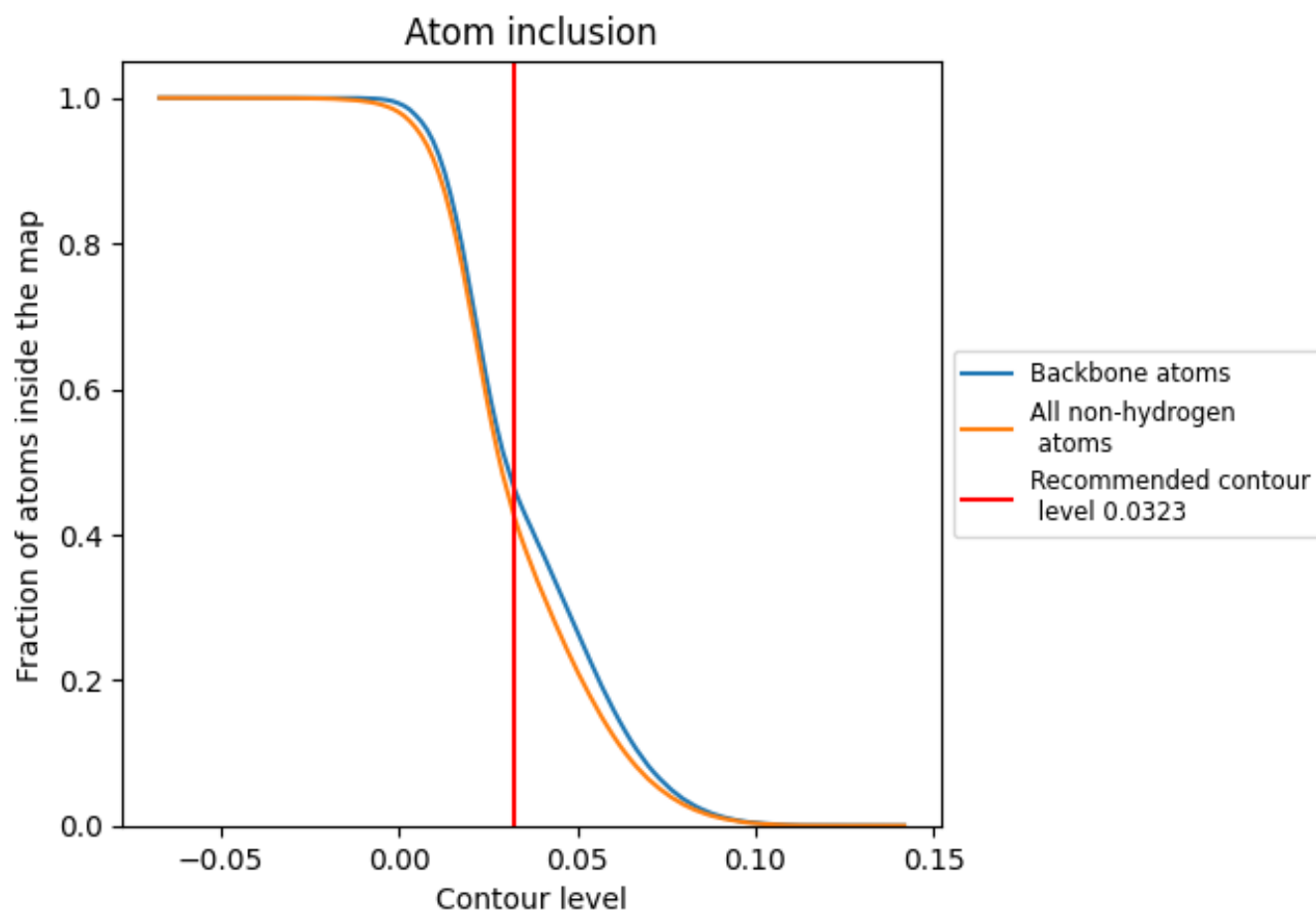
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0323).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 46% of all backbone atoms, 42% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary















































The table lists the average atom inclusion at the recommended contour level (0.0323) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4240	 0.0970
1	 0.6633	 0.1660
2	 0.6029	 0.1390
3	 0.6993	 0.1390
4	 0.3289	 0.0210
5	 0.7032	 0.1570
6	 0.6662	 0.1340
7	 0.6705	 0.1450
A	 0.5702	 0.1360
B	 0.7771	 0.1670
C	 0.6934	 0.1510
D	 0.0485	 0.0190
E	 0.6062	 0.1060
F	 0.8093	 0.1690
G	 0.7566	 0.1610
H	 0.4217	 0.0840
I	 0.0378	 0.0050
J	 0.3452	 0.0650
K	 0.1220	 0.0430
L	 0.3254	 0.0880
N	 0.6693	 0.1380
O	 0.4912	 0.1160
P	 0.3292	 0.1440
Q	 0.0244	 0.0100
R	 0.4886	 0.1440
S	 0.4905	 0.1130
T	 0.7377	 0.1470
U	 0.6684	 0.1850
V	 0.4084	 0.1230
W	 0.1942	 0.0690
X	 0.6451	 0.1400
Y	 0.7104	 0.1780
Z	 0.4447	 0.1540
a	 0.1404	 0.0070
b	 0.2864	 0.0520



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Chain	Atom inclusion	Q-score
c	 0.3202	 0.0290
d	 0.3125	 0.0350
e	 0.3478	 0.0300
f	 0.2798	 0.0180
g	 0.2810	 0.0330
h	 0.0585	 -0.0130
i	 0.0687	 0.0440
j	 0.0911	 0.0080
k	 0.0640	 0.0180
l	 0.0793	 -0.0210
m	 0.1191	 -0.0100
n	 0.0868	 0.0230
o	 0.0311	 0.0290
p	 0.1009	 0.0230
q	 0.0212	 -0.0080
r	 0.0459	 0.0430
s	 0.1104	 0.0360
t	 0.0000	 0.0240
u	 0.0135	 0.0250
v	 0.3534	 0.0880
w	 0.2144	 0.0530
x	 0.0000	 0.0020
y	 0.1289	 0.0030