wwPDB EM Validation Summary Report (i)

Oct 15, 2024 – 09:54 AM JST

PDB ID	:	8I0U
EMDB ID	:	EMD-35110
Title	:	The cryo-EM structure of human Bact-IV complex
Authors	:	Zhan, X.; Lu, Y.; Shi, Y.
Deposited on	:	2023-01-11
Resolution	:	3.30 Å(reported)

This is a wwPDB EM Validation Summary 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 (i)) were used in the production of this report:

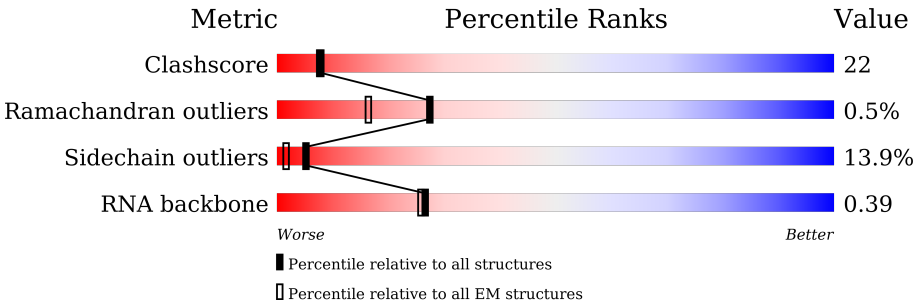
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance

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

The reported resolution of this entry is 3.30 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	A	2335	10% 53% 26% 5% 16%
2	B	117	6% 32% 34% 15% • 16%
3	C	972	45% 38% 5% 12%
4	E	357	33% 44% 7% 16%
5	F	107	• 23% 37% 25% 5% 9%
6	G	220	8% 5% 18% 10% • 64%
7	H	188	69% 20% 50% 16% • 11%

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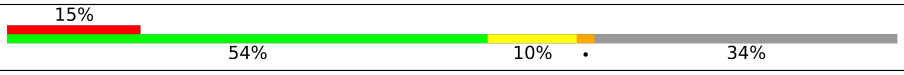
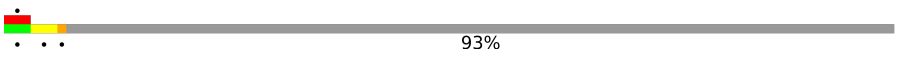
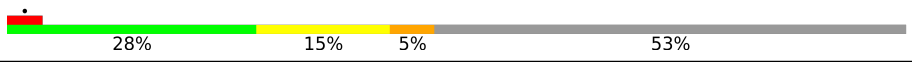
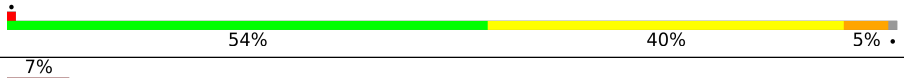
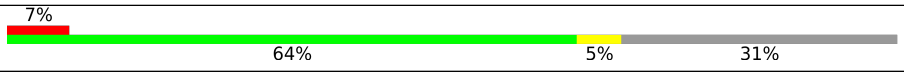
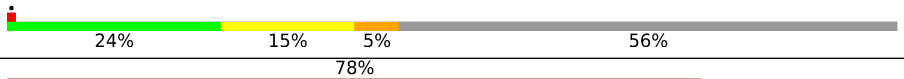
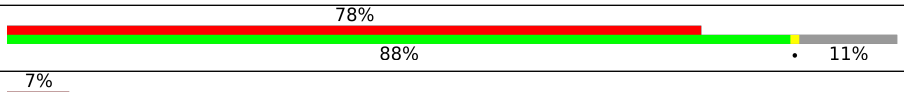
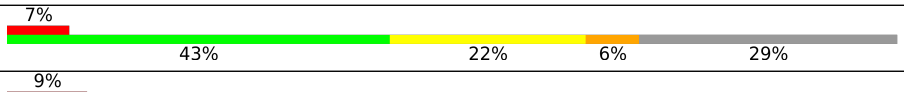
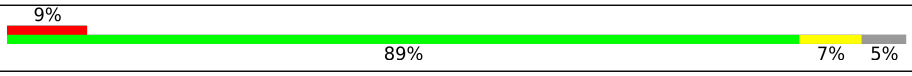
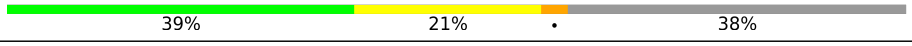
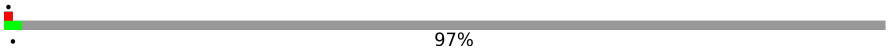
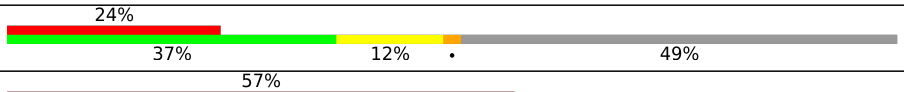
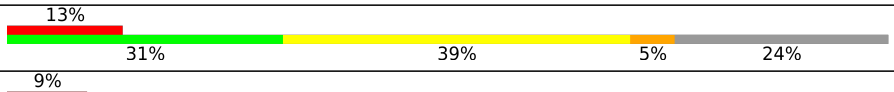
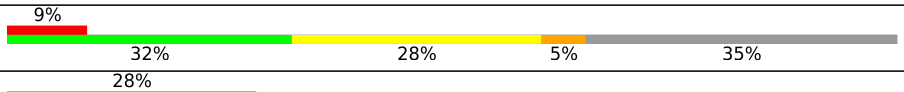
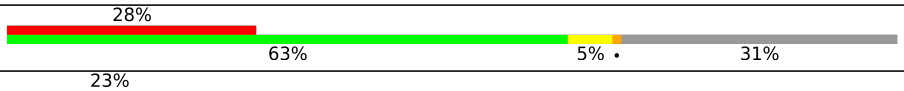
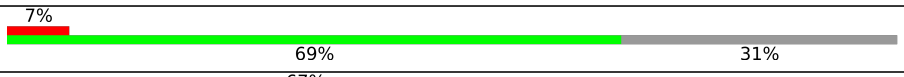
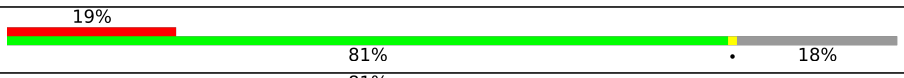
Mol	Chain	Length	Quality of chain
8	I	855	
9	J	848	
10	K	343	
11	L	802	
12	M	243	
13	N	144	
14	O	420	
15	P	229	
16	Q	1485	
17	R	536	
18	S	166	
19	T	514	
20	U	2752	
21	V	908	
22	W	579	
23	X	1041	
24	Y	492	
25	Z	225	
26	y	301	
27	a	240	
27	m	240	
28	b	119	
28	n	119	
29	c	118	
29	h	118	

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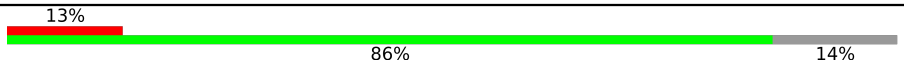
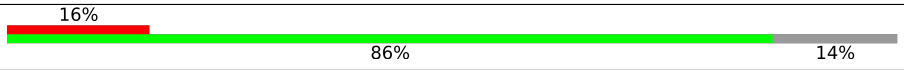
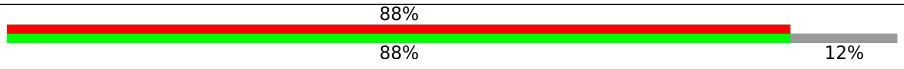
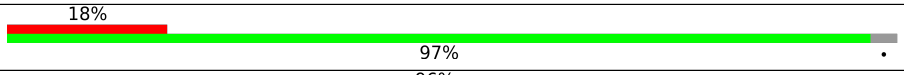
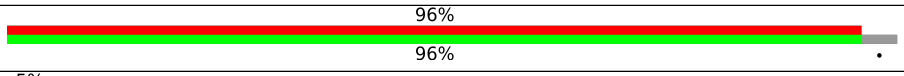
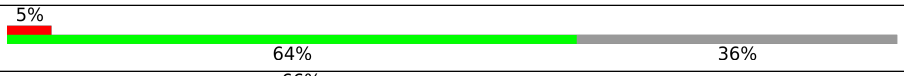
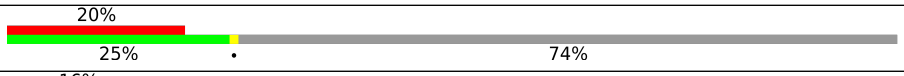
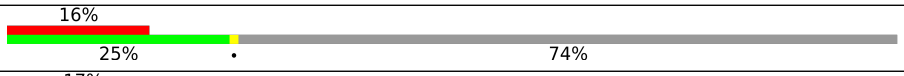
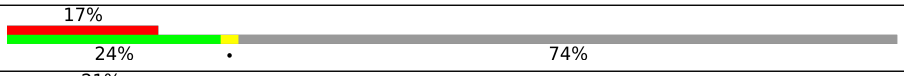
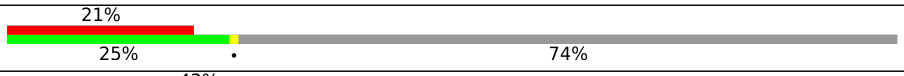
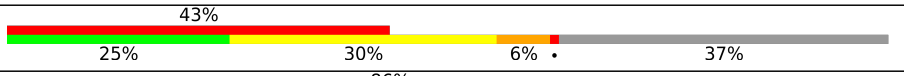
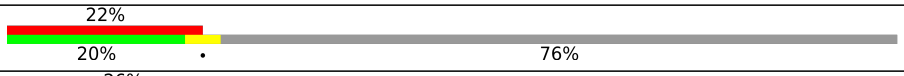
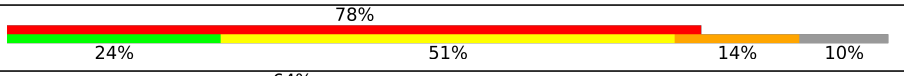
Mol	Chain	Length	Quality of chain
30	d	86	
30	i	86	
31	e	92	
31	j	92	
32	f	76	
32	k	76	
33	g	126	
33	l	126	
34	q	504	
34	r	504	
34	s	504	
34	t	504	
35	1	1304	
36	3	1217	
37	p	225	
38	w	501	
39	2	895	
40	4	424	
41	7	110	
42	5	86	
43	o	255	

2 Entry composition (i)

There are 47 unique types of molecules in this entry. The entry contains 106396 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	1969	16331	10528	2863	2872	68	0	0

- Molecule 2 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	98	2066	925	347	696	98	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	6724	4298	1122	1272	32	0	0

- Molecule 4 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

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

- Molecule 5 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	F	97	2075	928	381	669	97	0	0

- Molecule 6 is a RNA chain called Pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	G	79	1587	708	248	552	79	0	0

- Molecule 7 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	167	Total	C	N	O	P	0	0
			3539	1581	607	1184	167		

- Molecule 8 is a protein called Pre-mRNA-splicing factor SYF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	I	672	Total	C	N	O	0	0
			3387	2043	672	672		

- Molecule 9 is a protein called Crooked neck-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	561	Total	C	N	O	S	0	0
			3773	2350	709	708	6		

- Molecule 10 is a protein called RING finger protein 113A.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	K	24	Total	C	N	O	S	0	0
			185	114	32	36	3		

- Molecule 11 is a protein called Cell division cycle 5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L	387	Total	C	N	O	S	0	0
			2584	1596	494	489	5		

- Molecule 12 is a protein called Pre-mRNA-splicing factor SYF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M	114	Total	C	N	O	S	0	0
			971	605	181	183	2		

- Molecule 13 is a protein called Protein BUD31 homolog.

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

- Molecule 14 is a protein called Pre-mRNA-splicing factor RBM22.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	O	290	Total 1447	C 862	N 292	O 293	0	0

- Molecule 15 is a protein called Spliceosome-associated protein CWC15 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	101	Total 876	C 537	N 175	O 162	S 2	0	0

- Molecule 16 is a protein called RNA helicase aquarius.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	Q	1322	Total 5288	C 2644	N 1322	O 1322	0	0

- Molecule 17 is a protein called SNW domain-containing protein 1.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	R	380	Total 2915	C 1791	N 552	O 558	P 2	S 12	0	0

- Molecule 18 is a protein called Peptidyl-prolyl cis-trans isomerase-like 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	S	158	Total 770	C 454	N 158	O 158	0	0

- Molecule 19 is a protein called Pleiotropic regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	T	320	Total 2507	C 1582	N 456	O 462	S 7	0	0

- Molecule 20 is a protein called Serine/arginine repetitive matrix protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	U	72	Total 422	C 257	N 82	O 82	S 1	0	0

- Molecule 21 is a protein called Pre-mRNA-splicing factor CWC22 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V	462	Total 2959	C 1842	N 537	O 567	S 13	0	0

- Molecule 22 is a protein called Pre-mRNA-processing factor 17.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	W	501	Total 2473	C 1471	N 501	O 501	0	0

- Molecule 23 is a protein called Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X	786	Total 6357	C 4010	N 1133	O 1184	S 30	0	0

- Molecule 24 is a protein called Peptidyl-prolyl cis-trans isomerase-like 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	320	Total 2556	C 1616	N 420	O 508	S 12	0	0

- Molecule 25 is a protein called Pre-mRNA-splicing factor SPF27.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	Z	155	Total 772	C 462	N 155	O 155	0	0

- Molecule 26 is a protein called Peptidyl-prolyl cis-trans isomerase E.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	y	79	Total 316	C 158	N 79	O 79	0	0

- Molecule 27 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	a	86	Total 344	C 172	N 86	O 86	0	0
27	m	82	Total 413	C 249	N 82	O 82	0	0

- Molecule 28 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	b	82	Total 328	C 164	N 82	O 82	0	0
28	n	80	Total 402	C 242	N 80	O 80	0	0

- Molecule 29 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	c	97	Total 388	C 194	N 97	O 97	0	0
29	h	95	Total 482	C 292	N 95	O 95	0	0

- Molecule 30 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	d	74	Total 296	C 148	N 74	O 74	0	0
30	i	72	Total 359	C 215	N 72	O 72	0	0

- Molecule 31 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	e	79	Total 316	C 158	N 79	O 79	0	0
31	j	81	Total 403	C 241	N 81	O 81	0	0

- Molecule 32 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	f	74	Total 296	C 148	N 74	O 74	0	0
32	k	73	Total 364	C 218	N 73	O 73	0	0

- Molecule 33 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	g	81	Total 324	C 162	N 81	O 81	0	0
33	l	83	Total 415	C 249	N 83	O 83	0	0

- Molecule 34 is a protein called Pre-mRNA-processing factor 19.

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

- Molecule 35 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	1	816	Total 6486	C 4163	N 1119	O 1165	S 39	0	0

- Molecule 36 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	3	1177	Total 9220	C 5854	N 1566	O 1755	S 45	0	0

- Molecule 37 is a protein called U2 small nuclear ribonucleoprotein B".

Mol	Chain	Residues	Atoms				AltConf	Trace
37	p	167	Total 841	C 507	N 167	O 167	0	0

- Molecule 38 is a protein called Splicing factor 3A subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	w	121	Total 999	C 637	N 178	O 180	S 4	0	0

- Molecule 39 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	2	250	Total	C	N	O	S	0	0
			1803	1131	339	326	7		

- Molecule 40 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	4	151	Total	C	N	O	0	0
			743	441	151	151		

- Molecule 41 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	7	81	Total	C	N	O	S	0	0
			613	376	109	115	13		

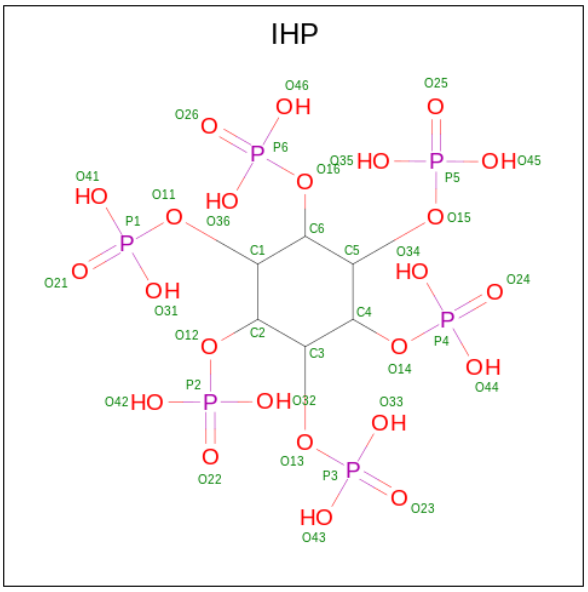
- Molecule 42 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	5	77	Total	C	N	O	S	0	0
			635	403	110	117	5		

- Molecule 43 is a protein called U2 small nuclear ribonucleoprotein A'.

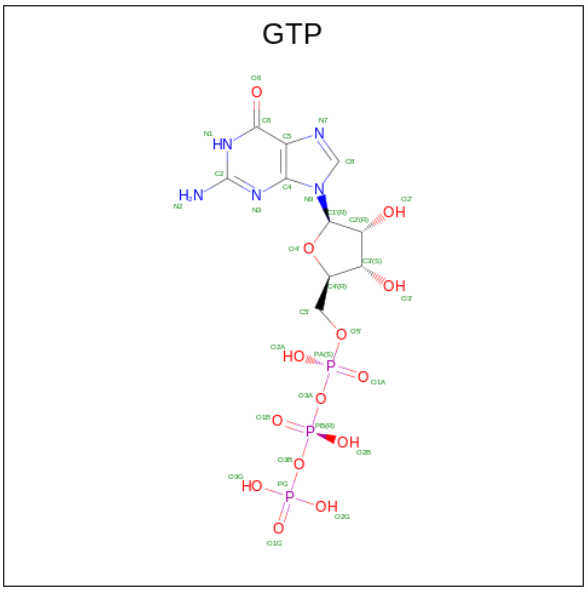
Mol	Chain	Residues	Atoms				AltConf	Trace
43	o	162	Total	C	N	O	0	0
			816	492	162	162		

- 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
46	C	1	Total Mg 1 1	0
46	F	6	Total Mg 6 6	0

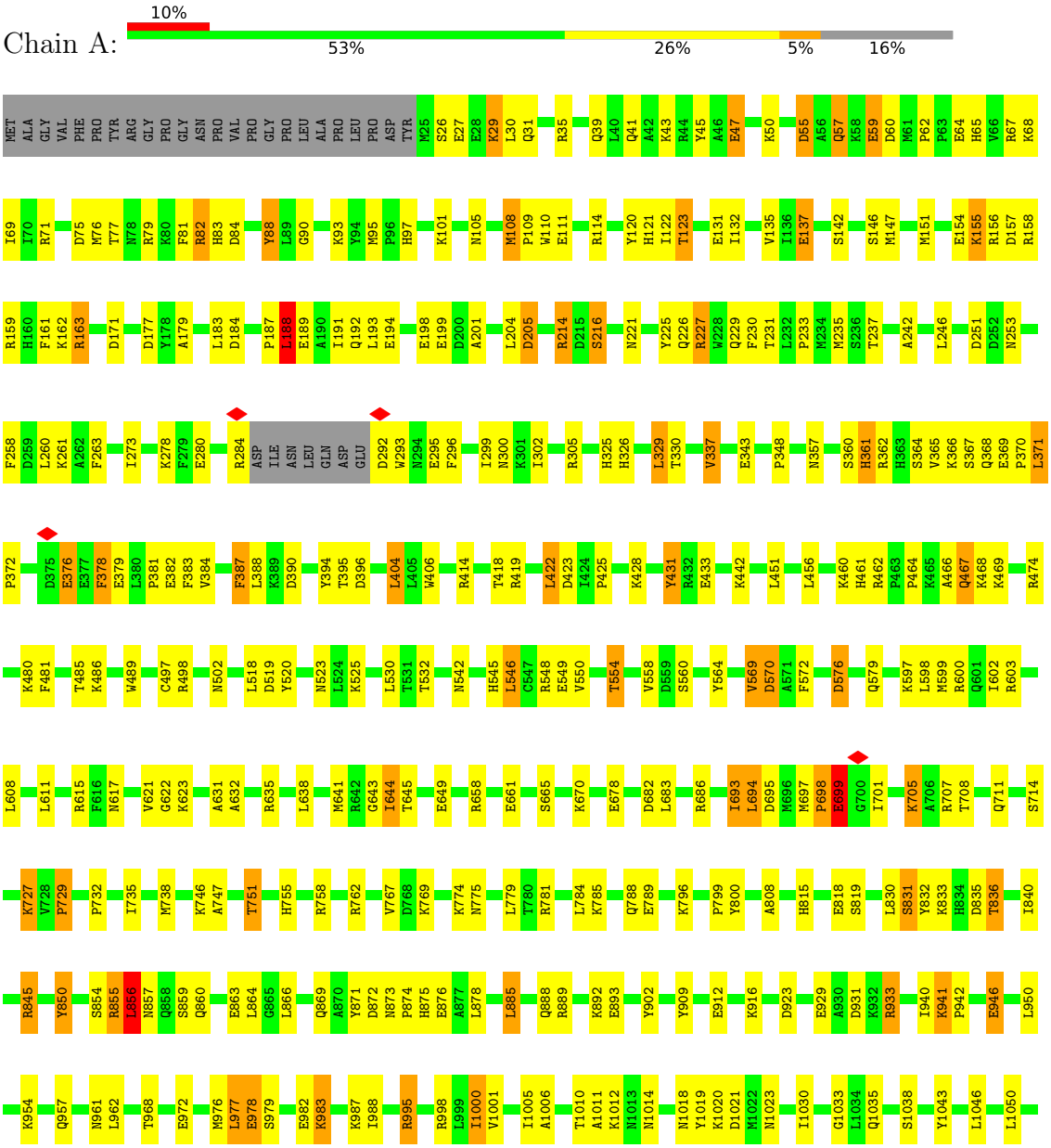
- Molecule 47 is ZINC ION (three-letter code: ZN) (formula: Zn).

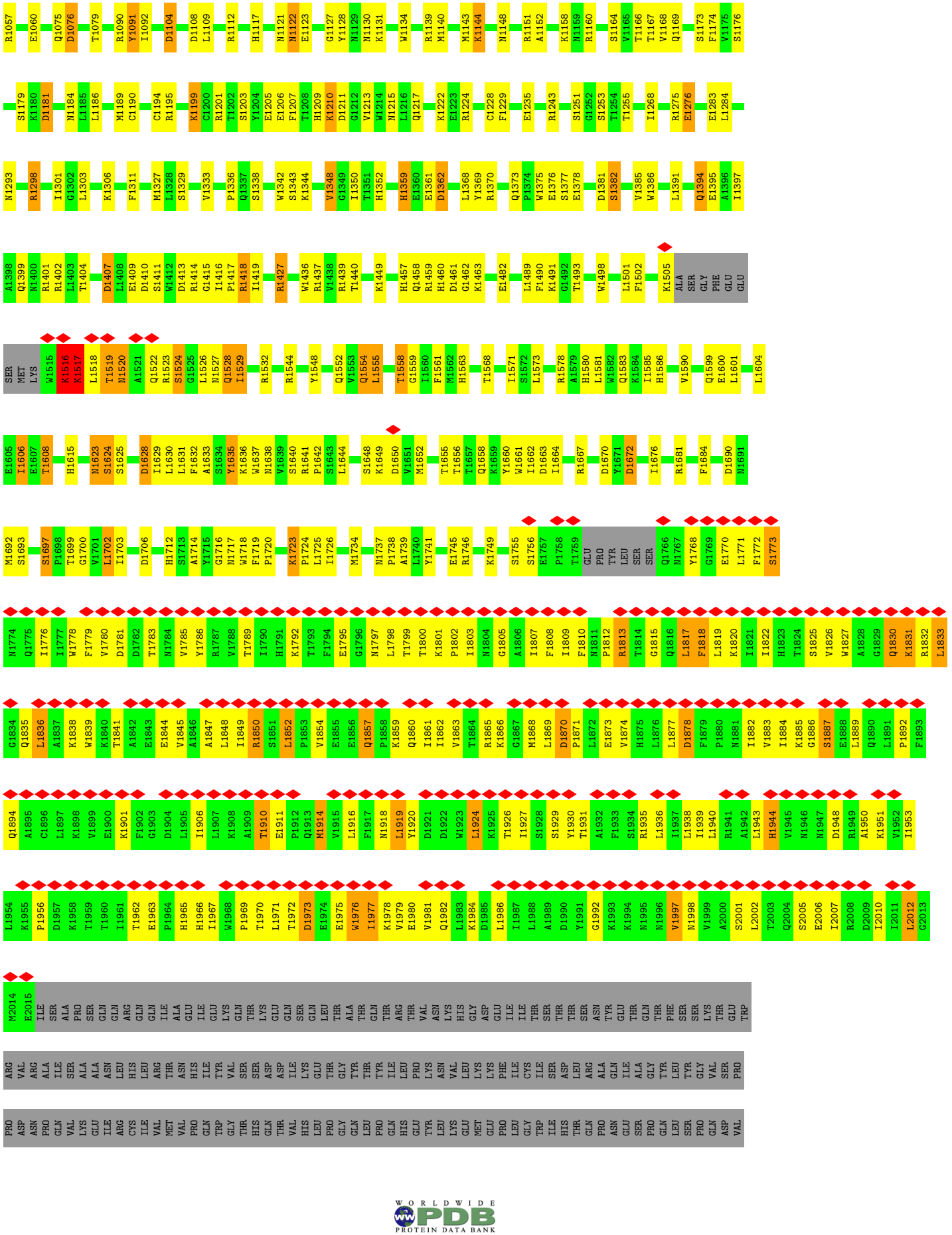
Mol	Chain	Residues	Atoms	AltConf
47	K	1	Total Zn 1 1	0
47	N	3	Total Zn 3 3	0
47	7	3	Total Zn 3 3	0

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

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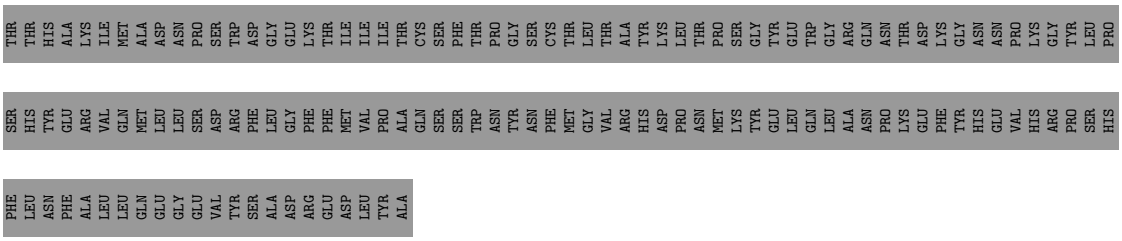
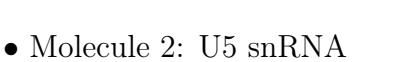
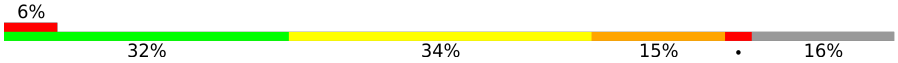
S1179 K1180 D1181 N1184 L1185 L1186 M1189 C1190 C1194 R1195 K1199 C1200 R1201 T1202 S1203 Y1204 E1205 E1206 F1207 T1208 H1209 K1210 D1211 G1212 V1213 W1214 N1215 L1216 Q1217 K1222 E1223 R1224 C1228 F1229 E1235 R1243 S1251 G1252 S1253 T1254 T1255 I1268 R1275 E1276 E1283 L1284
N1293 R1298 I1301 G1302 L1303 K1306 F1311 M1327 L1328 S1329 V1333 P1336 Q1337 S1338 W1342 S1343 K1344 V1348 G1349 I1350 T1351 H1352 H1359 E1360 E1361 D1362 L1368 Y1369 R1370 Q1373 P1374 W1375 E1376 S1377 E1378 D1381 S1382 V1385 W1386 L1391 Q1394 E1395 A1396 I1397
A1398 Q1399 N1400 R1401 R1402 L1403 T1404 D1407 L1408 E1409 D1410 S1411 W1412 D1413 R1414 G1415 I1416 P1417 R1418 I1419 R1427 W1436 R1437 V1438 R1439 T1440 K1449 H1457 Q1458 R1459 H1460 D1461 G1462 K1463 E1482 L1489 F1490 K1491 G1492 T1493 W1498 L1501 F1502 K1505 ALA SER GLY PHE GLU GLU
SER MET LYS W1515 K1516 K1517 L1518 T1519 N1520 A1521 Q1522 R1523 S1524 G1525 L1526 N1527 Q1528 I1529 R1532 R1544 Y1548 Q1552 V1553 Q1554 L1555 T1558 G1559 I1560 F1561 M1562 H1563 T1568 I1571 S1572 L1573 R1578 A1579 H1580 L1581 W1582 Q1583 K1584 I1585 H1586 V1590 Q1599 E1600 L1601 L1604
E1605 I1606 E1607 T1608 H1615 N1623 S1624 S1625 D1628 I1629 L1630 L1631 F1632 A1633 S1634 Y1635 K1636 W1637 N1638 V1639 S1640 R1641 P1642 S1643 L1644 S1648 K1649 D1650 V1651 M1652 T1655 T1656 T1657 Q1658 K1659 Y1660 W1661 I1662 D1663 I1664 R1667 D1670 Y1671 D1672 I1676 R1681 F1684 D1690 N1691
M1692 S1693 S1697 P1698 T1699 G1700 V1701 L1702 I1703 D1706 H1712 S1713 A1714 Y1715 G1716 N1717 W1718 F1719 P1720 K1723 P1724 L1725 I1726 M1734 N1737 P1738 A1739 L1740 Y1741 E1745 R1746 K1749 S1755 S1756 E1757 P1758 T1759 GLU PRO TYR LEU SER SER Q1766 N1767 Y1768 G1769 E1770 L1771 F1772 S1773
N1774 Q1775 I1776 I1777 W1778 F1779 V1780 D1781 D1782 T1783 N1784 V1785 Y1786 R1787 V1788 T1789 I1790 H1791 K1792 T1793 F1794 E1795 G1796 N1797 L1798 T1799 T1800 K1801 P1802 I1803 N1804 G1805 A1806 I1807 F1808 I1809 F1810 N1811 P1812 R1813 T1814 G1815 Q1816 L1817 F1818 L1819 K1820 I1821 I1822 H1823 T1824 S1825 V1826 W1827 A1828 G1829 Q1830 K1831 R1832 L1833
G1834 Q1835 L1836 A1837 K1838 W1839 K1840 T1841 A1842 E1843 E1844 V1845 A1846 A1847 L1848 I1849 R1850 S1851 L1852 P1853 V1854 E1855 E1856 Q1857 P1858 K1859 Q1860 I1861 I1862 V1863 T1864 R1865 K1866 G1867 M1868 L1869 D1870 P1871 L1872 E1873 V1874 H1875 L1876 L1877 D1878 F1879 P1880 N1881 I1882 V1883 I1884 K1885 G1886 S1887 E1888 L1889 Q1890 L1891 P1892 F1893
Q1894 A1895 C1896 L1897 K1898 V1899 E1900 K1901 F1902 G1903 D1904 L1905 I1906 L1907 K1908 A1909 T1910 E1911 P1912 Q1913 M1914 V1915 L1916 F1917 N1918 L1919 Y1920 D1921 D1922 W1923 L1924 K1925 T1926 I1927 S1928 S1929 Y1930 T1931 A1932 F1933 S1934 R1935 L1936 I1937 L1938 I1939 L1940 R1941 A1942 L1943 H1944 V1945 N1946 N1947 D1948 R1949 A1950 K1951 V1952 I1953
L1954 K1955 P1956 D1957 K1958 T1959 T1960 I1961 T1962 E1963 P1964 H1965 H1966 I1967 W1968 P1969 T1970 L1971 T1972 D1973 E1974 E1975 W1976 I1977 K1978 V1979 E1980 V1981 Q1982 L1983 K1984 D1985 L1986 I1987 L1988 A1989 D1990 Y1991 G1992 K1993 K1994 N1995 N1996 V1997 N1998 V1999 A2000 S2001 L2002 T2003 Q2004 S2005 E2006 I2007 R2008 D2009 I2010 I2011 L2012 G2013
M2014 E2015 ILE SER ALA PRO SER GLN GLN ARG GLN GLN ILE ALA GLU ILE GLU LYS GLN THR LYS GLU GLN SER GLN LEU THR ALA THR GLN THR ARG THR VAL ASN LYS HIS GLY ASP GLU ILE ILE THR SER THR THR THR SER ASN TYR GLU THR GLN THR PHE SER SER LYS THR GLU TRP
ARG VAL ARG ALA ILE SER ALA ALA ASN LEU HIS LEU ARG THR ASN HIS ILE TYR VAL SER SER ASP ASP ILE LYS GLU THR THR VAL HIS LEU PRO GLN HIS GLU TYR LEU LYS GLU MET GLU PRO LEU GLY TRP ILE HIS THR GLN PRO ASN GLU SER PRO GLN LEU SER PRO GLN ASP VAL
PRO ASP ASN PRO GLN VAL LYS GLU ILE ARG CYS ILE VAL MET VAL PRO GLN TRP GLY THR HIS GLN THR VAL HIS LEU PRO GLY GLN LEU PRO GLN HIS GLU TYR LEU LYS LYS GLU MET GLU PRO LEU GLY TRP ILE HIS THR GLN PRO ASN GLU SER PRO GLN LEU SER PRO GLN ASP VAL

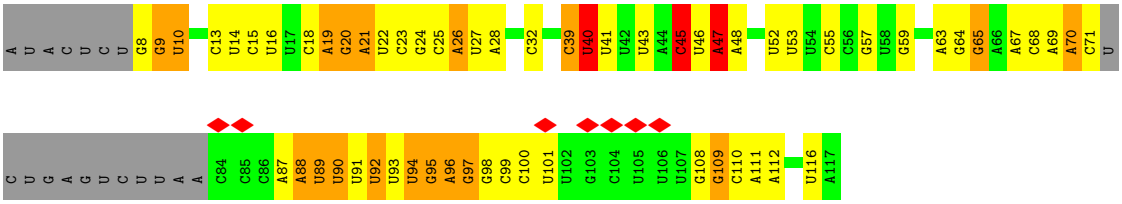




• Molecule 2: U5 snRNA

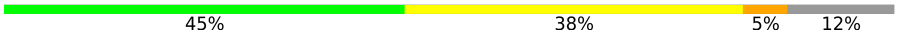
Chain B:

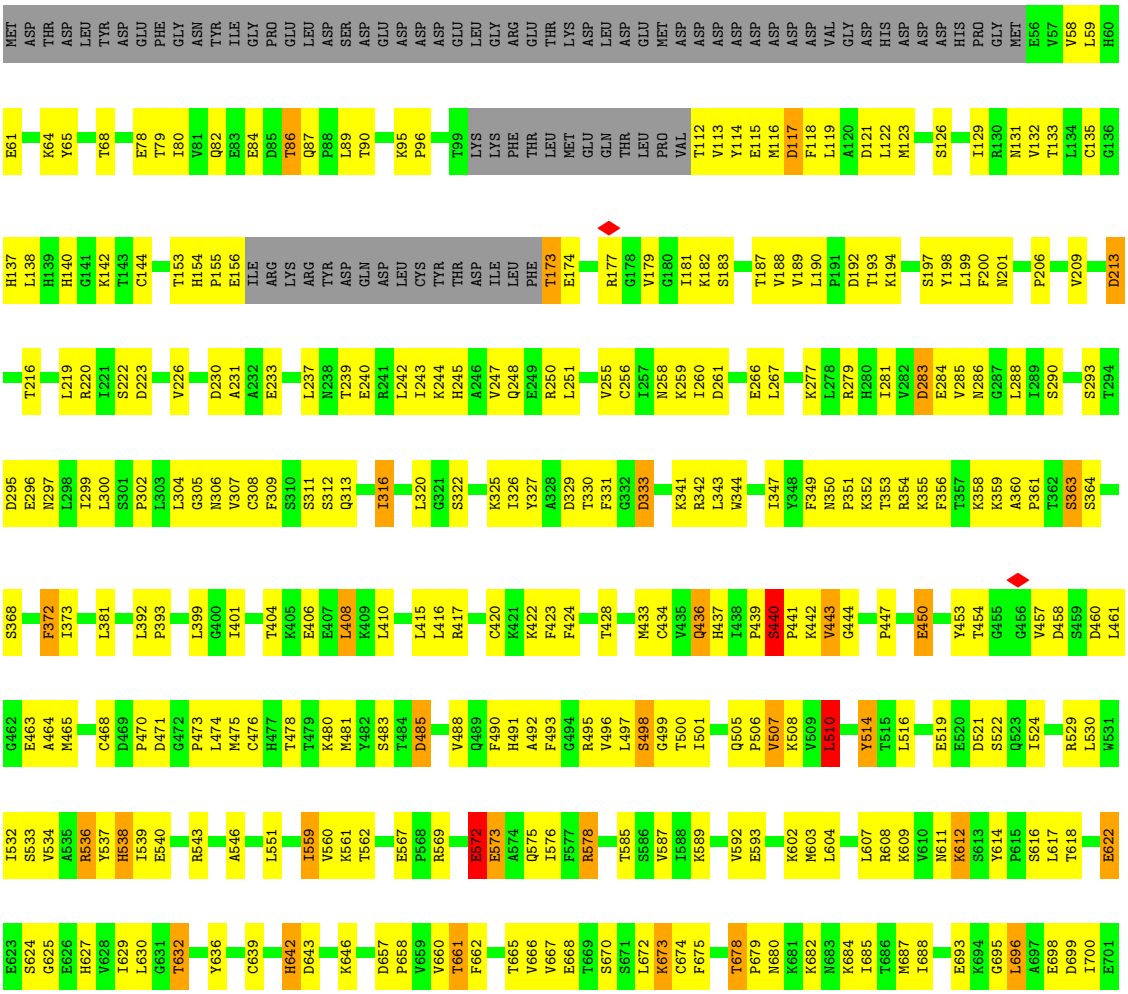


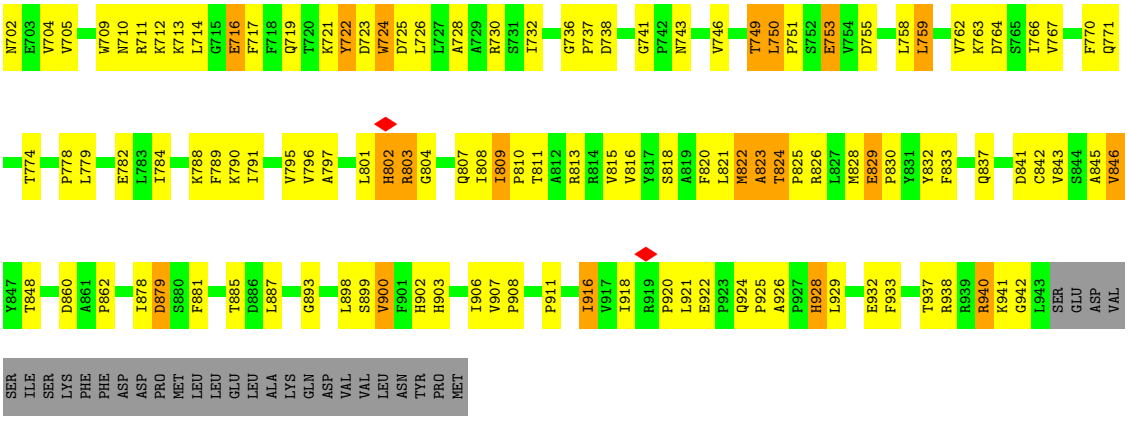


• Molecule 3: 116 kDa U5 small nuclear ribonucleoprotein component

Chain C:

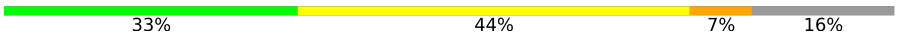


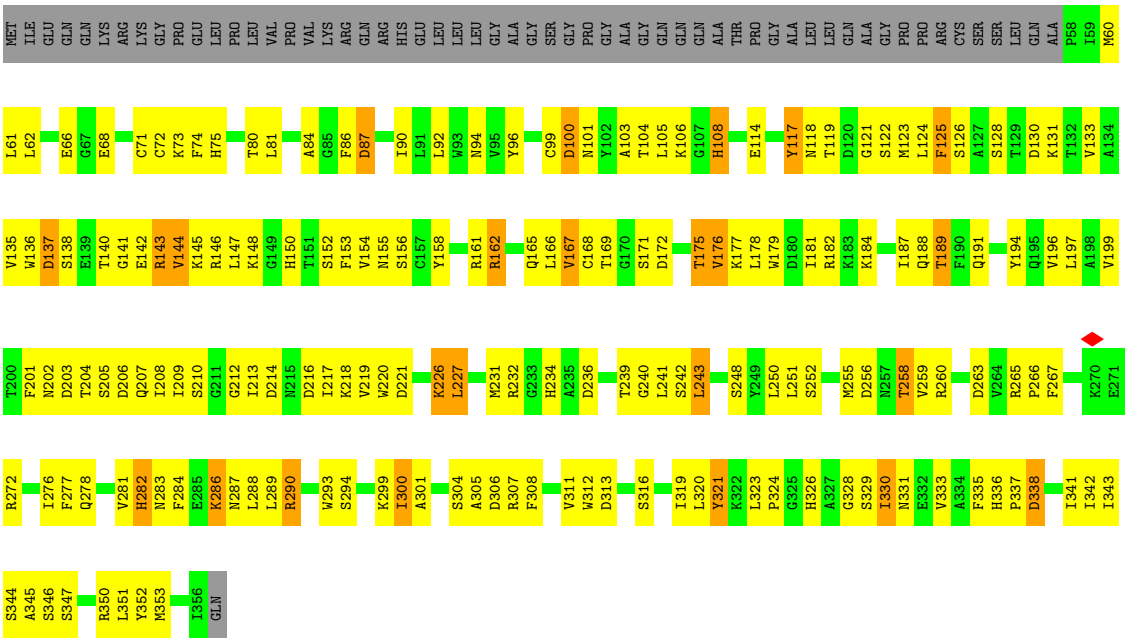




• Molecule 4: U5 small nuclear ribonucleoprotein 40 kDa protein

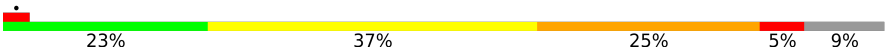
Chain E:

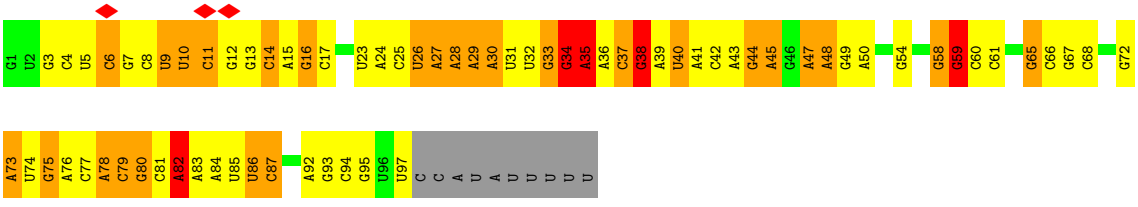




• Molecule 5: U6 snRNA

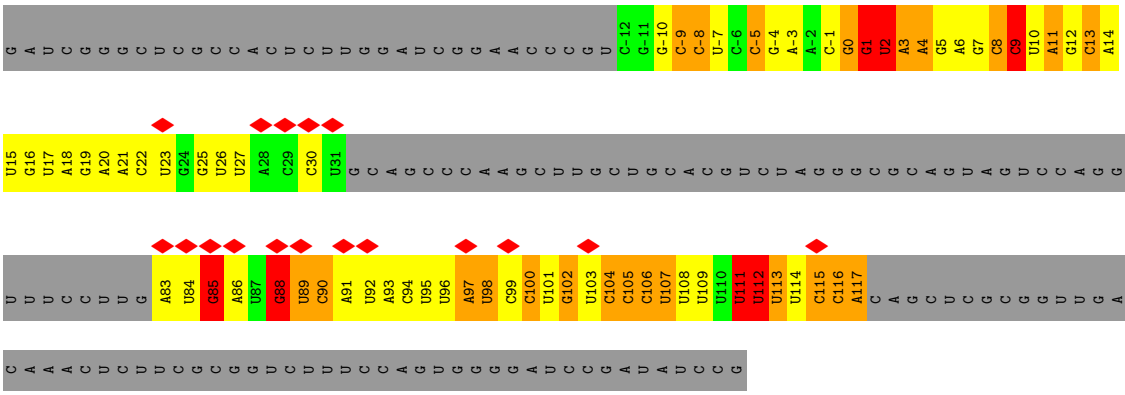
Chain F:





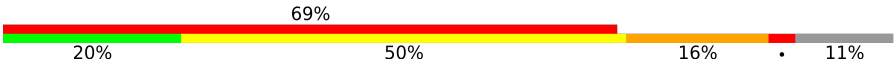
• Molecule 6: Pre-mRNA

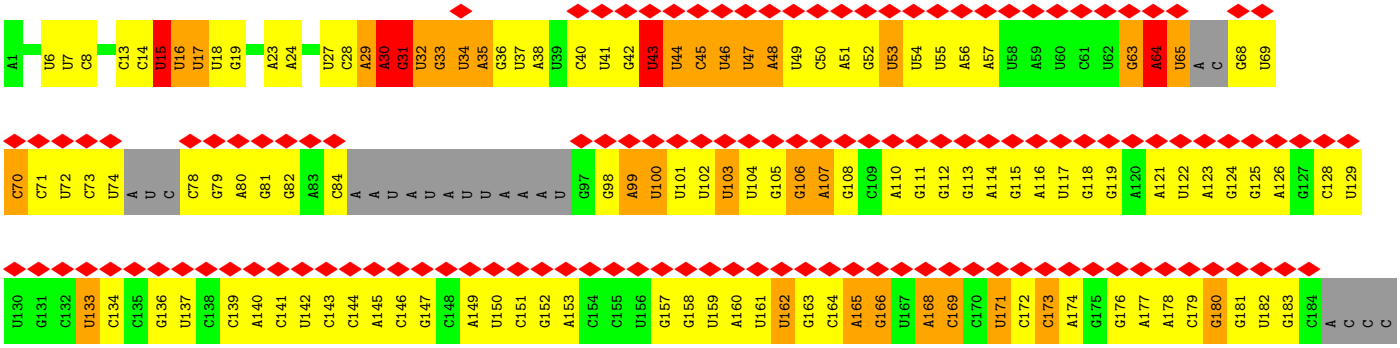
Chain G:



• Molecule 7: U2 snRNA

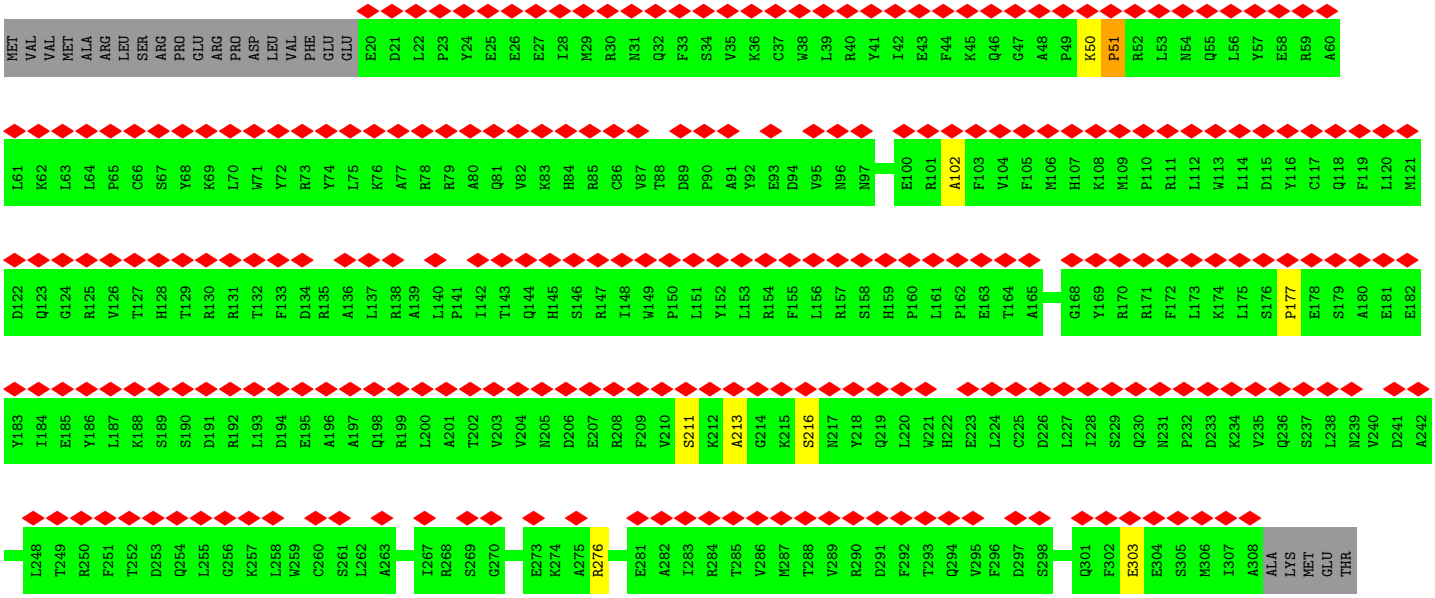
Chain H:

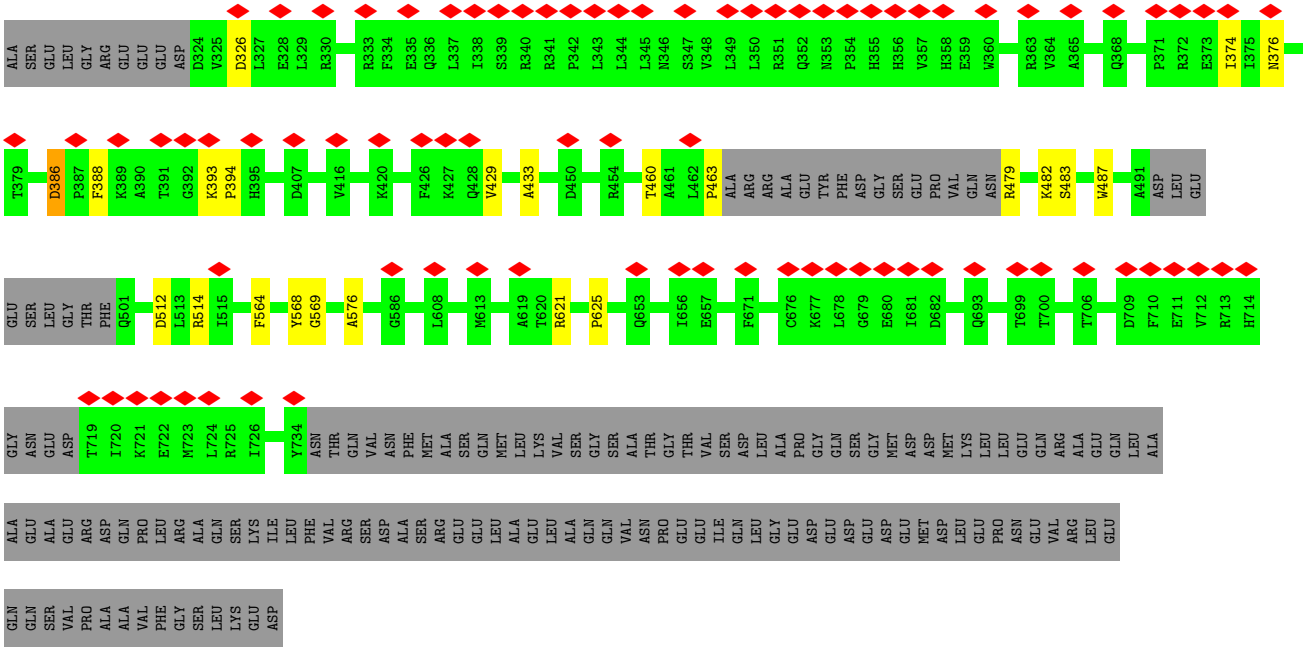




• Molecule 8: Pre-mRNA-splicing factor SYF1

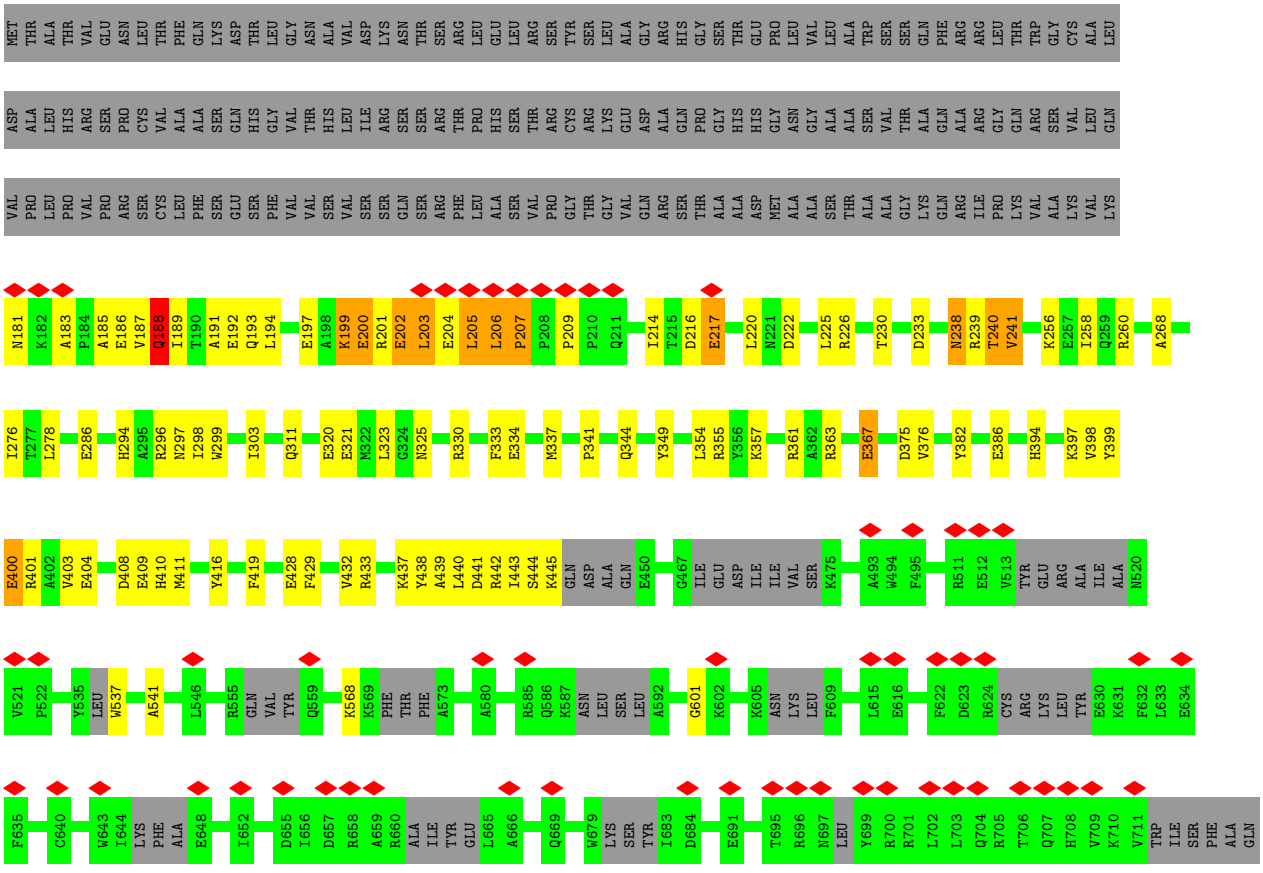
Chain I:

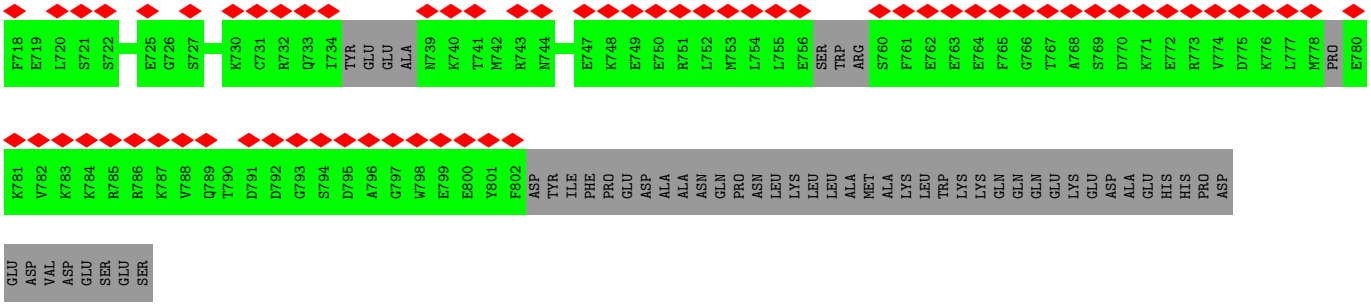




• Molecule 9: Crooked neck-like protein 1

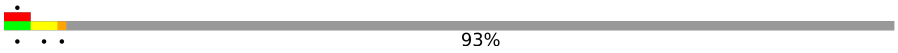
Chain J:

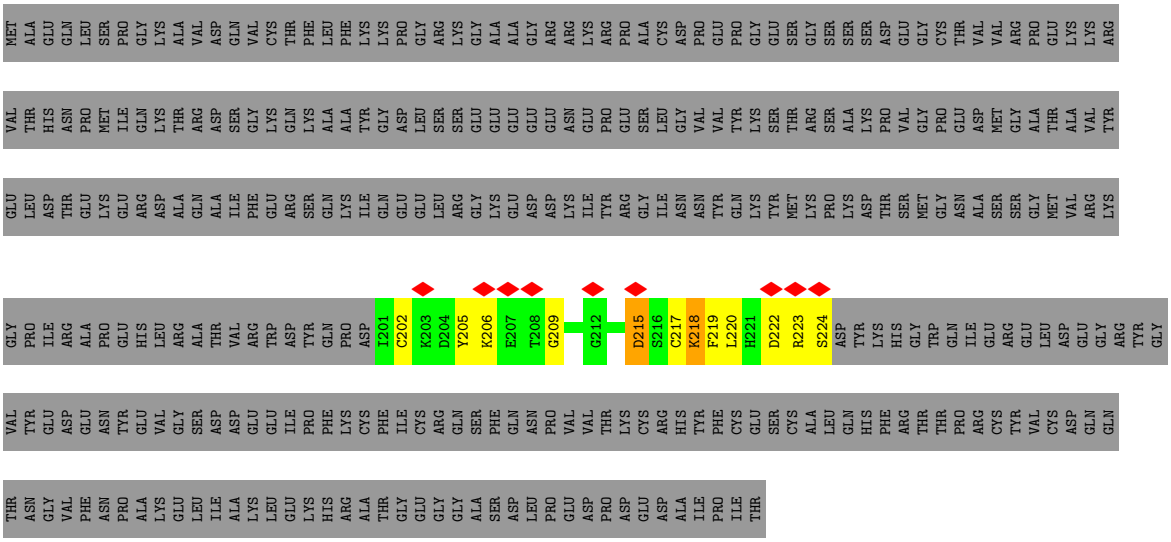




• Molecule 10: RING finger protein 113A

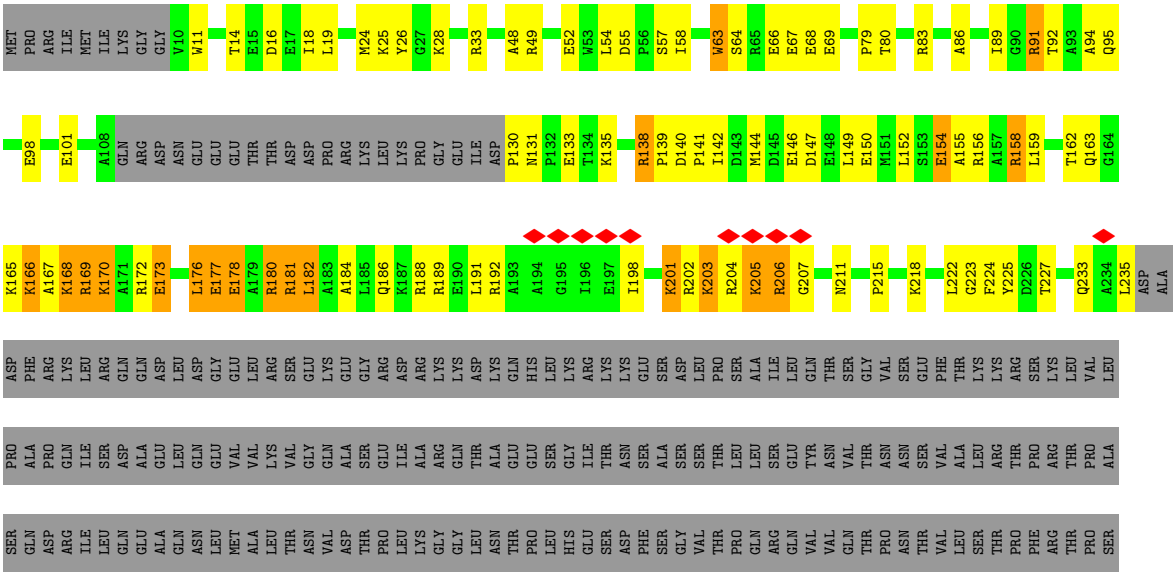
Chain K:

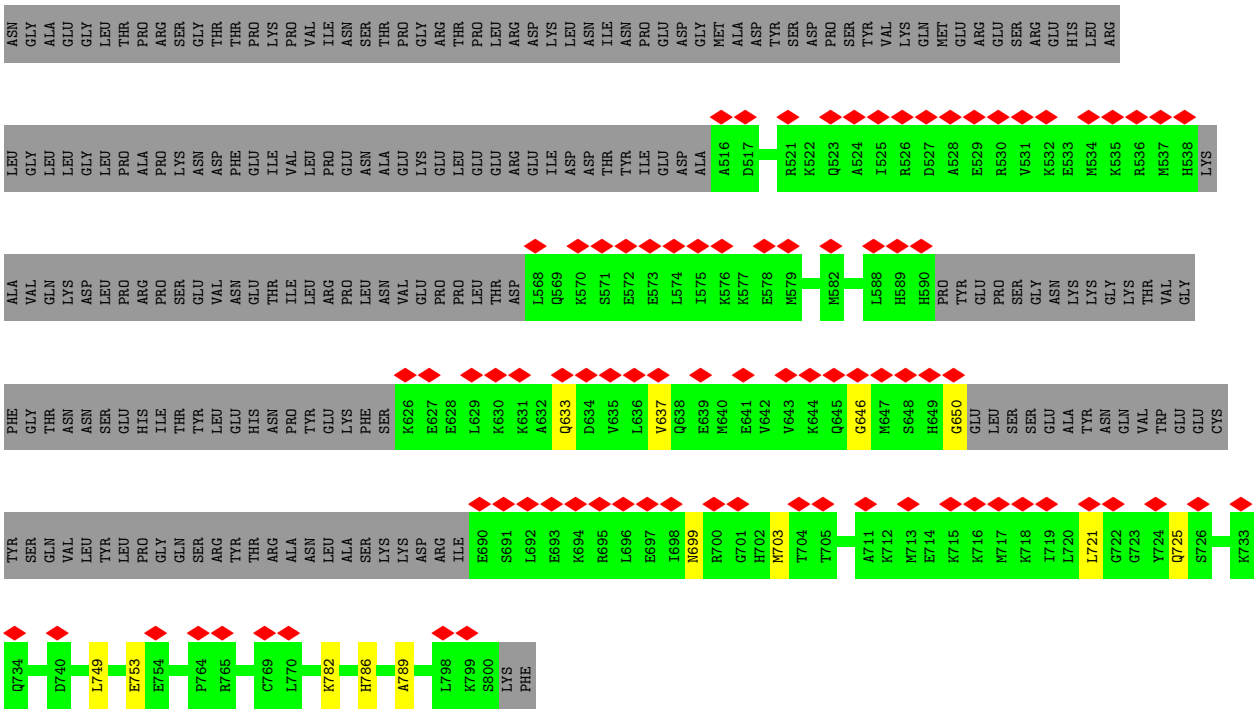




• Molecule 11: Cell division cycle 5-like protein

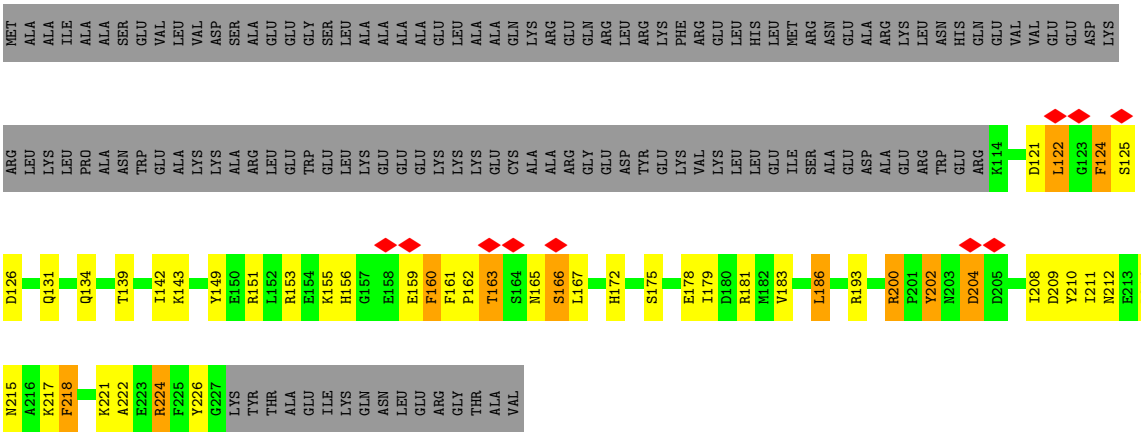
Chain L:





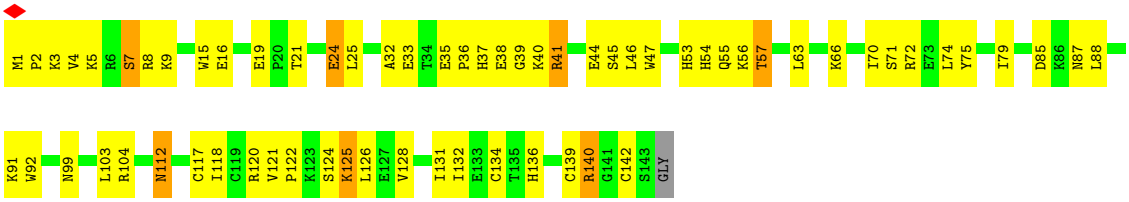
• Molecule 12: Pre-mRNA-splicing factor SYF2

Chain M:



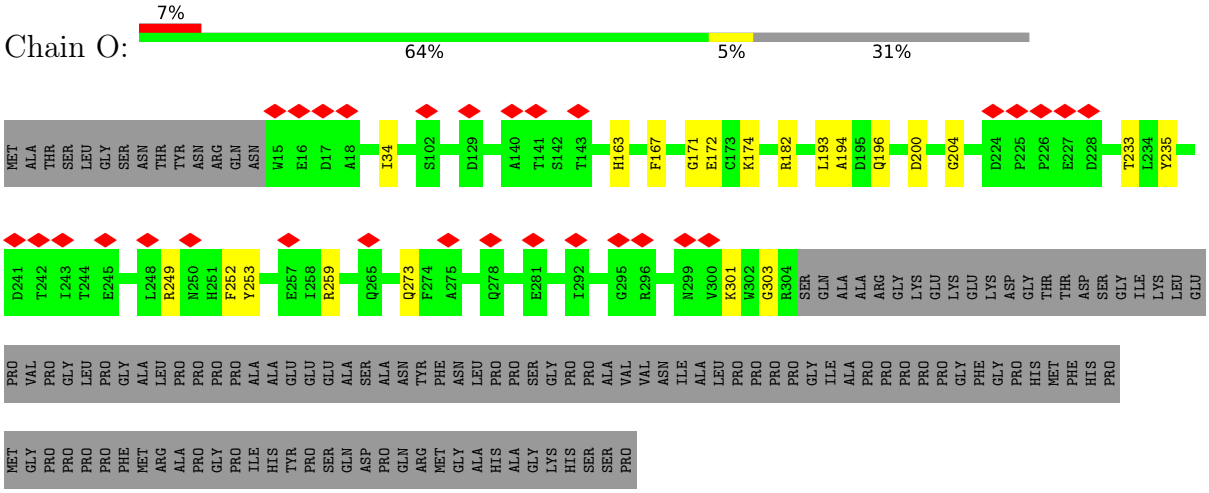
• Molecule 13: Protein BUD31 homolog

Chain N:



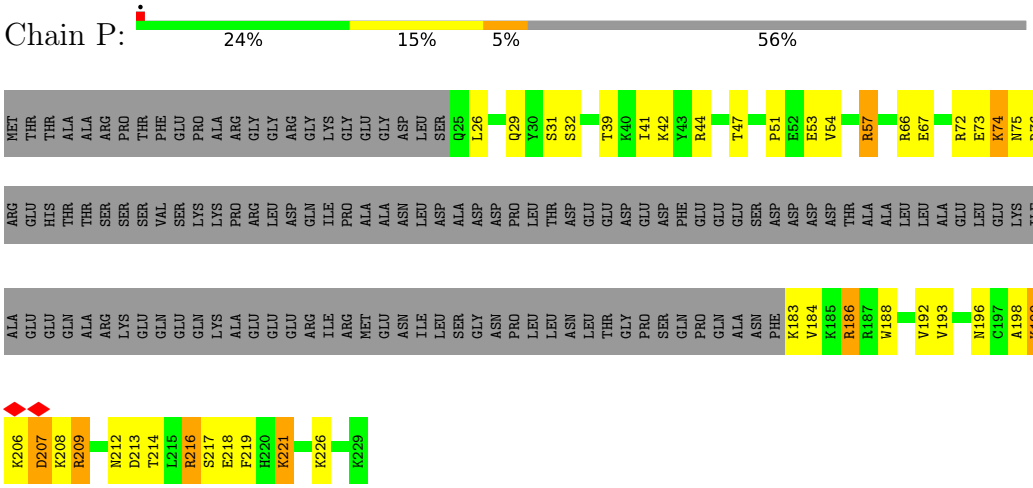
• Molecule 14: Pre-mRNA-splicing factor RBM22

Chain O:



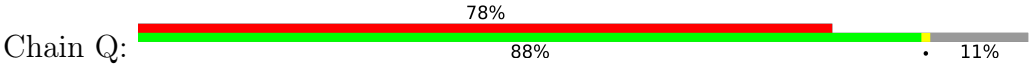
• Molecule 15: Spliceosome-associated protein CWC15 homolog

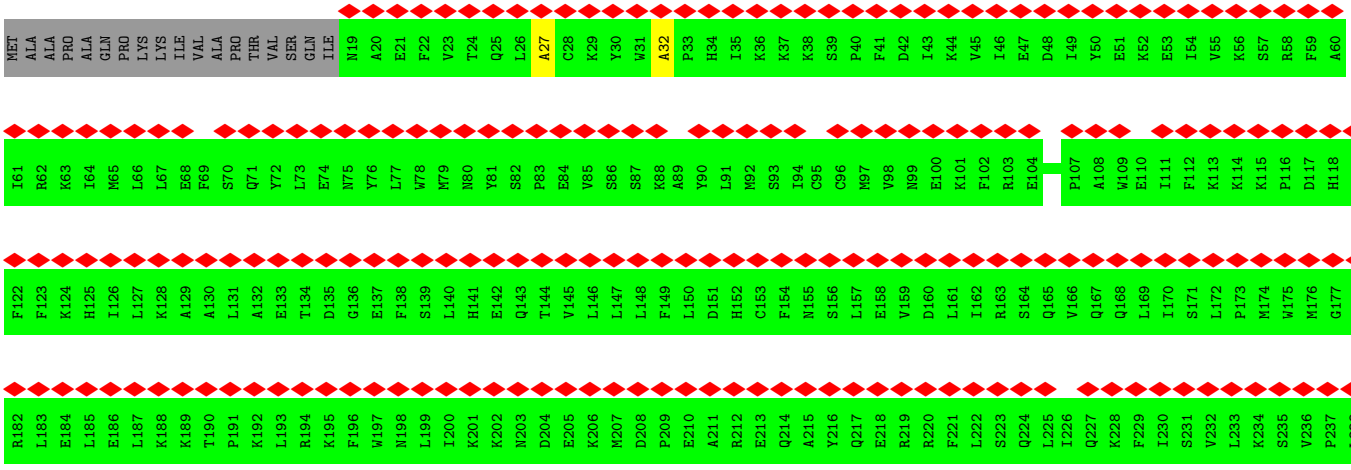
Chain P:

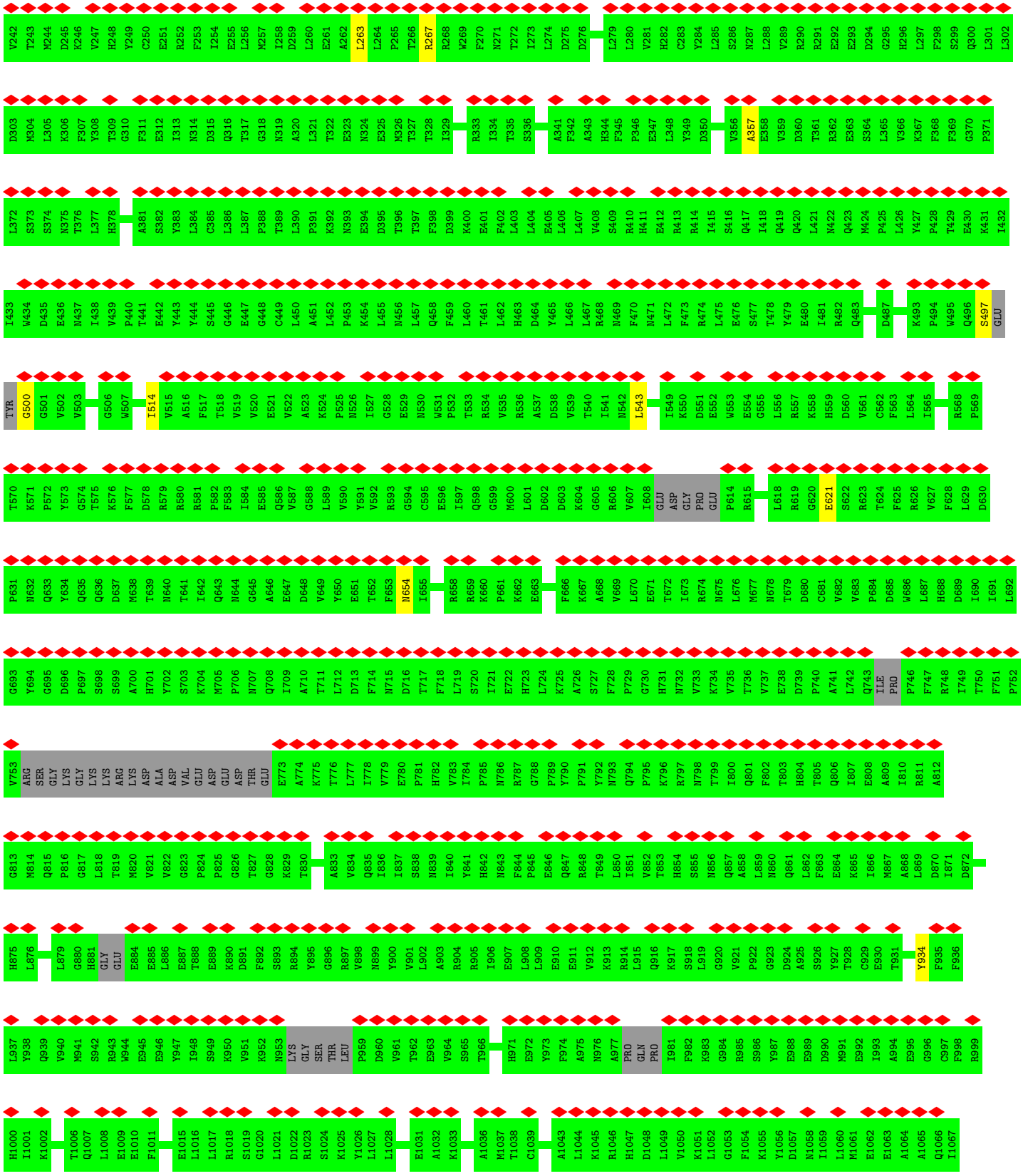


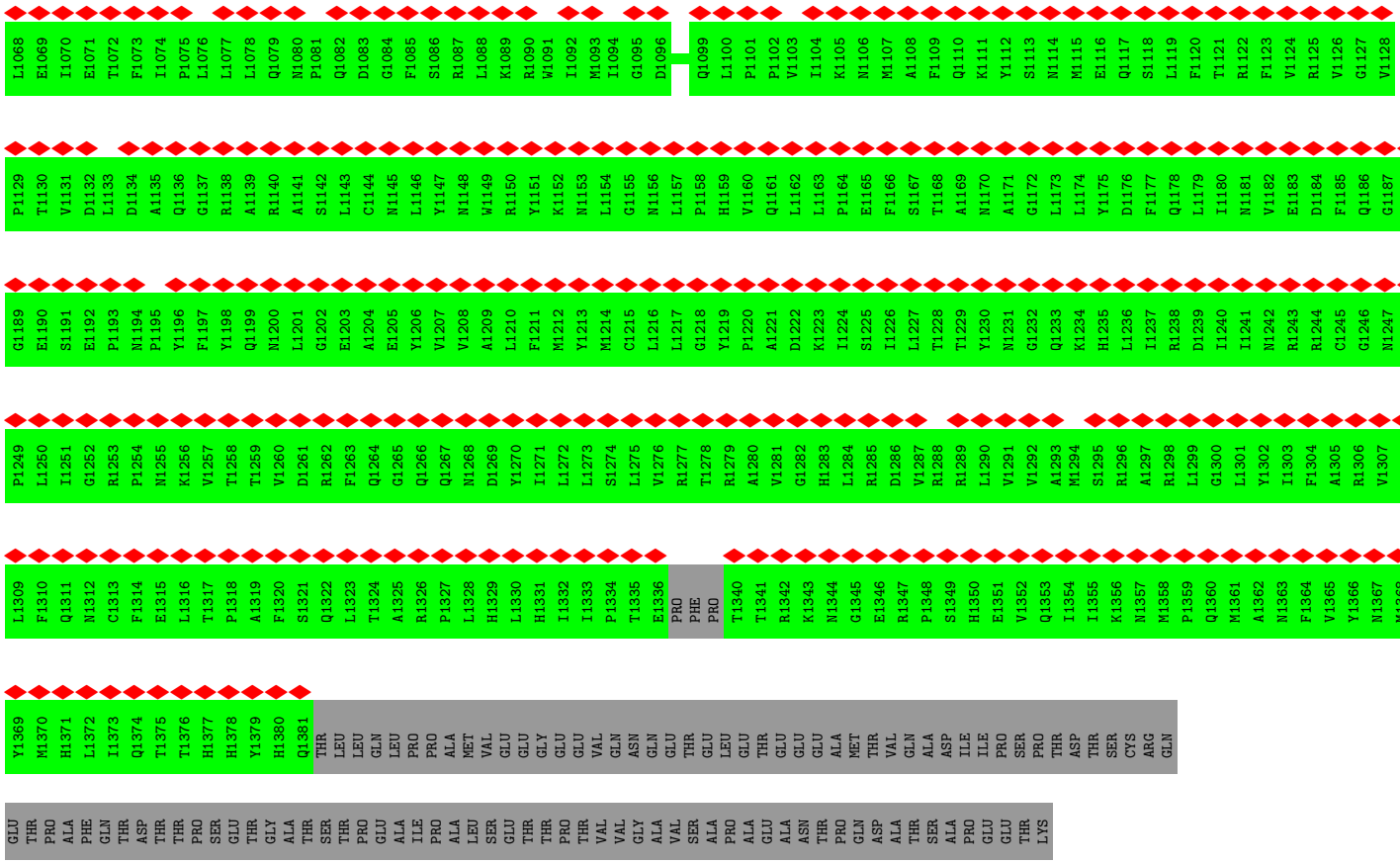
• Molecule 16: RNA helicase aquarius

Chain Q:



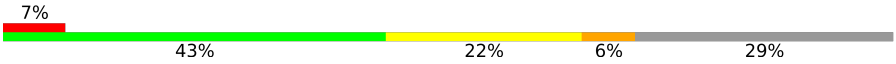


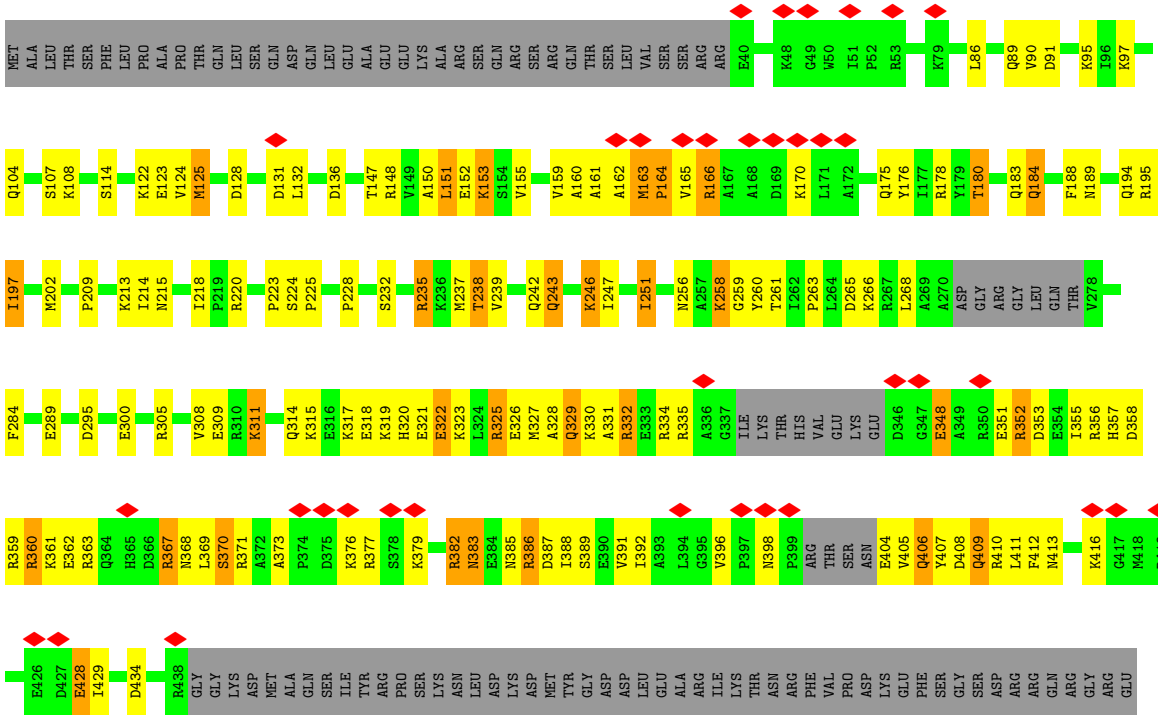

V242 T243 M244 D245 K246 V247 H248 Y249 C250 E251 R252 F253 I254 E255 L256 M257 I258 D259 L260 E261 A262 L263 L264 P265 T266 R267 R268 W269 F270 N271 T272 I273 L274 D275 D276 L279 L280 V281 H282 C283 Y284 L285 S286 N287 L288 V289 R290 R291 E292 E293 D294 G295 H296 L297 F298 S299 Q300 L301 L302
D303 M304 L305 K306 F307 Y308 T309 G310 F311 E312 I313 N314 D315 Q316 T317 G318 N319 A320 L321 T322 E323 N324 E325 M326 T327 T328 I329 R333 I334 T335 S336 A341 F342 A343 H344 F345 P346 E347 L348 Y349 D350 V356 A357 E358 V359 D360 T361 R362 E363 S364 L365 V366 K367 F368 F369 G370 P371
L372 S373 S374 N375 T376 L377 H378 A381 S382 Y383 L384 C385 L386 L387 P388 T389 L390 P391 K392 N393 E394 D395 T396 T397 F398 D399 K400 E401 F402 L403 L404 E405 L406 L407 V408 S409 R410 H411 E412 R413 R414 I415 S416 Q417 I418 Q419 Q420 L421 N422 Q423 M424 P425 L426 Y427 P428 T429 E430 K431 I432
I433 W434 D435 E436 N437 I438 V439 P440 T441 E442 Y443 Y444 S445 G446 E447 G448 C449 L450 A451 L452 P453 K454 L455 N456 L457 Q458 F459 L460 T461 L462 H463 D464 Y465 L466 L467 R468 N469 F470 N471 L472 F473 R474 L475 E476 S477 T478 Y479 E480 I481 R482 Q483 D487 K493 P494 W495 Q496 S497 GLU
TYR G500 G501 V502 V503 G506 W507 I514 V515 A516 F517 T518 V519 V520 E521 V522 A523 K524 P525 N526 I527 G528 E529 N530 W531 P532 T533 R534 V535 R536 A537 D538 V539 T540 I541 N542 L543 I549 K550 D551 E552 W553 E554 G555 L556 R557 K558 H559 D560 V561 C562 F563 L564 I565 R568 P569
T570 K571 P572 Y573 G574 T575 K576 F577 D578 R579 R580 R581 P582 F583 I584 E585 Q586 V587 G588 L589 V590 Y591 V592 R593 G594 C595 E596 I597 Q598 G599 M600 L601 D602 D603 K604 G605 R606 V607 I608 GLU ASP GLY PRO GLU P614 R615 L618 R619 G620 E621 S622 R623 T624 F625 R626 V627 F628 L629 D630
P631 N632 Q633 Y634 Q635 Q636 D637 M638 T639 N640 T641 I642 Q643 N644 G645 A646 E647 D648 V649 Y650 E651 T652 F653 N654 I655 R658 R659 K660 P661 K662 E663 F666 K667 A668 V669 L670 E671 T672 I673 R674 N675 L676 M677 N678 T679 D680 C681 V682 V683 P684 D685 W686 L687 H688 D689 I690 I691 L692
G693 Y694 G695 D696 P697 S698 S699 A700 H701 Y702 S703 K704 M705 P706 N707 Q708 I709 A710 T711 L712 D713 F714 N715 D716 T717 F718 L719 S720 I721 E722 H723 L724 K725 A726 S727 F728 P729 G730 H731 N732 V733 K734 V735 T736 V737 E738 D739 P740 A741 L742 Q743 ILE PRO P746 F747 R748 I749 T750 F751 P752
V753 ARG SER GLY LYS GLY LYS LYS ARG LYS ASP ALA ASP VAL GLU ASP GLU ASP THR GLU E773 A774 K775 T776 L777 I778 V779 E780 P781 H782 V783 I784 P785 N786 R787 G788 P789 Y790 P791 Y792 N793 Q794 P795 K796 R797 N798 T799 I800 Q801 F802 T803 H804 T805 Q806 I807 E808 A809 I810 R811 A812
G813 M814 Q815 P816 G817 L818 T819 M820 V821 V822 G823 P824 P825 G826 T827 G828 K829 T830 A833 V834 Q835 I836 I837 S838 N839 I840 Y841 H842 N843 F844 P845 E846 Q847 R848 T849 L850 I851 V852 T853 H854 S855 N856 Q857 A858 L859 N860 Q861 L862 F863 E864 K865 I866 M867 A868 L869 D870 I871 D872
H875 L876 L879 G880 H881 GLY GLU E884 E885 L886 E887 T888 E889 K890 D891 F892 S893 R894 Y895 G896 R897 V898 N899 Y900 V901 L902 A903 R904 R905 I906 E907 L908 L909 E910 E911 V912 K913 R914 L915 Q916 K917 S918 L919 G920 V921 P922 G923 D924 A925 S926 Y927 T928 G929 E930 T931 Y934 F935 F936
L937 Y938 Q939 V940 M941 S942 R943 W944 E945 E946 Y947 I948 S949 K950 V951 K952 N953 LYS GLY SER THR LEU P959 D960 V961 T962 E963 V964 S965 T966 H971 E972 Y973 F974 A975 N976 A977 PRO GLN PRO I981 F982 K983 G984 R985 S986 Y987 E988 E989 D990 M991 E992 I993 A994 E995 G996 C997 F998 R999
H1000 I1001 K1002 T1006 Q1007 L1008 E1009 E1010 F1011 E1015 L1016 L1017 R1018 S1019 G1020 L1021 D1022 R1023 S1024 K1025 Y1026 L1027 L1028 E1031 A1032 K1033 A1036 M1037 T1038 C1039 A1043 L1044 K1045 R1046 H1047 D1048 L1049 V1050 K1051 L1052 G1053 F1054 K1055 Y1056 D1057 N1058 I1059 L1060 M1061 E1062 E1063 A1064 A1065 Q1066 I1067

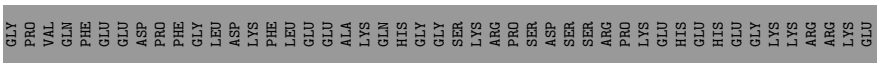


• Molecule 17: SNW domain-containing protein 1

Chain R:





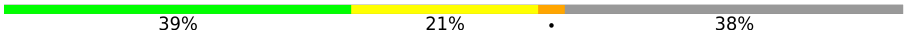


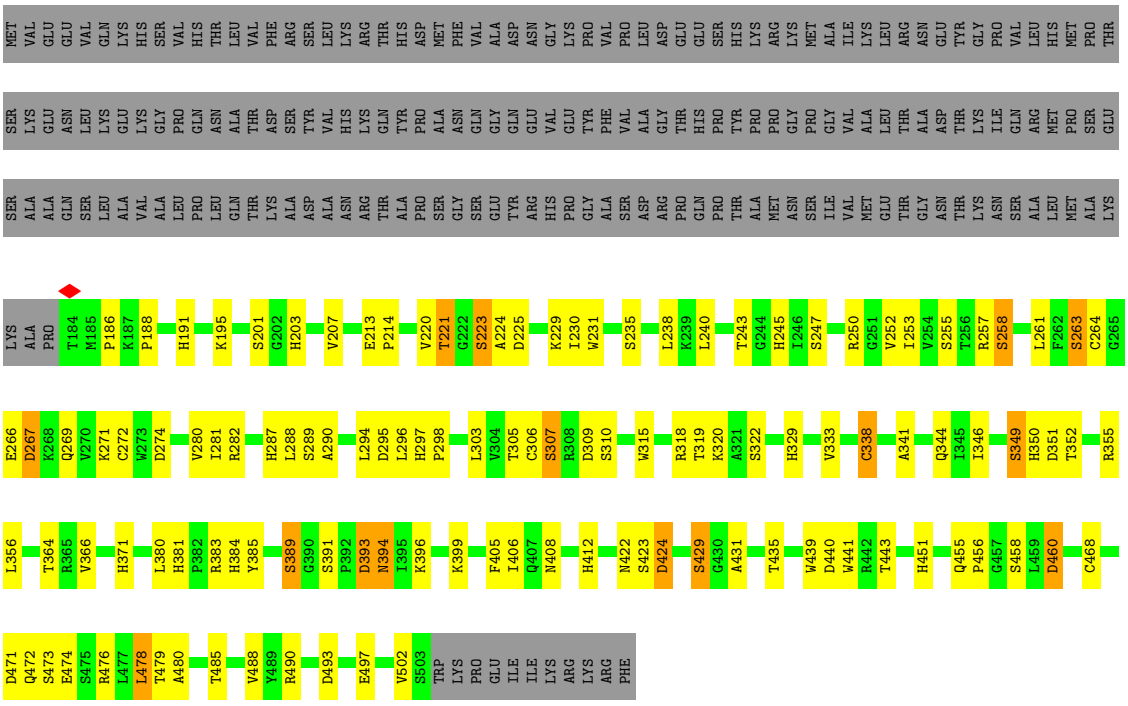
• Molecule 18: Peptidyl-prolyl cis-trans isomerase-like 1

Chain S:

• Molecule 19: Pleiotropic regulator 1

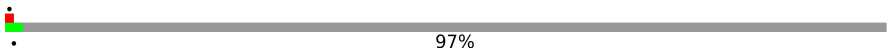
Chain T:

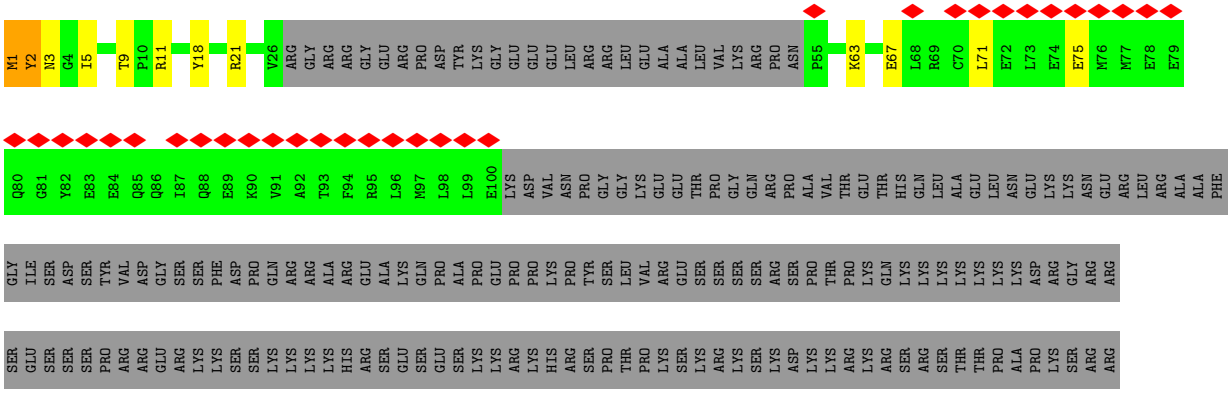


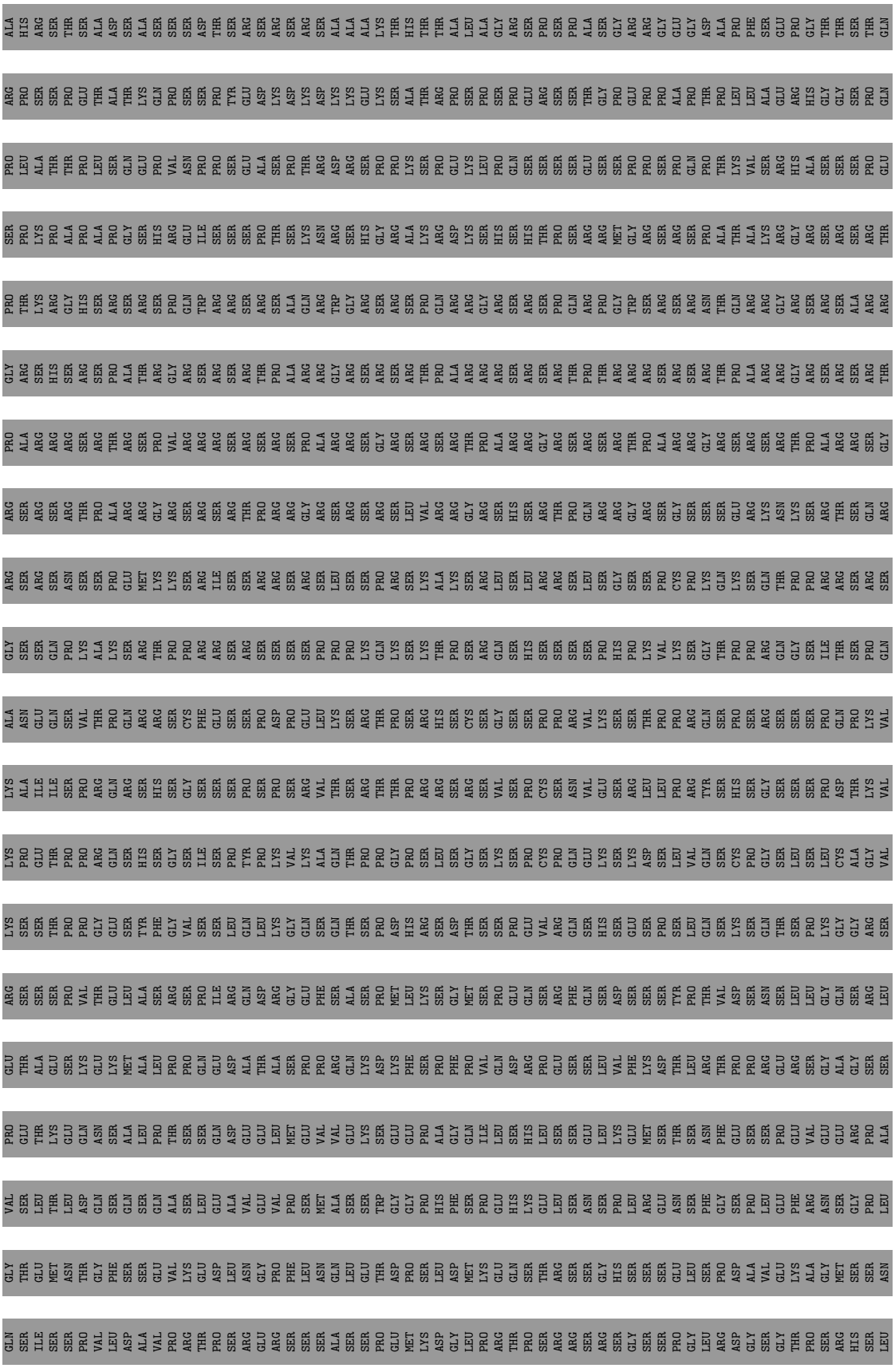


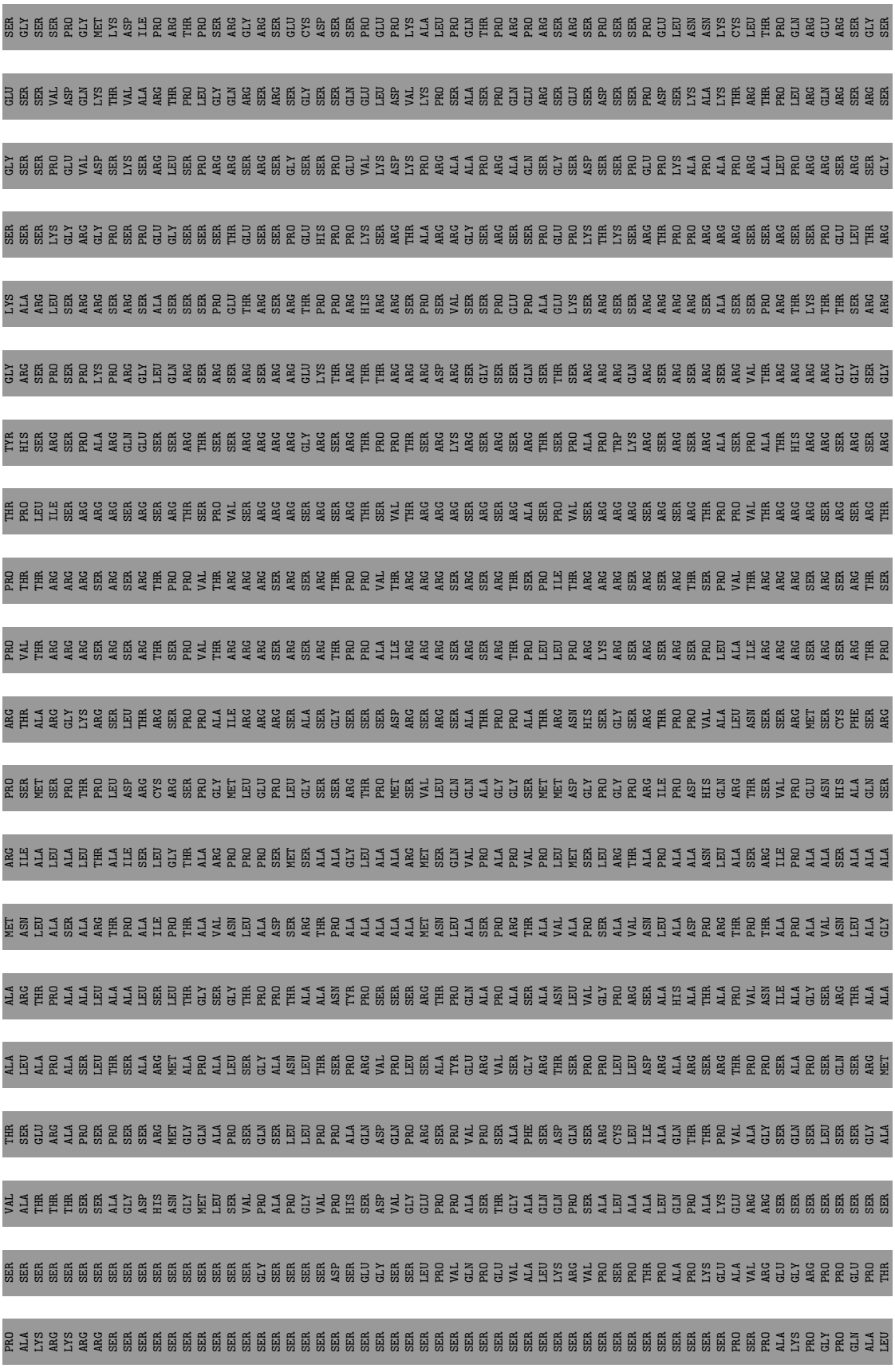
• Molecule 20: Serine/arginine repetitive matrix protein 2

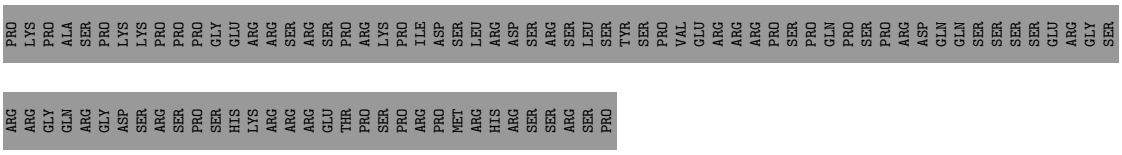
Chain U:



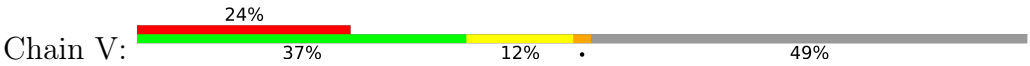


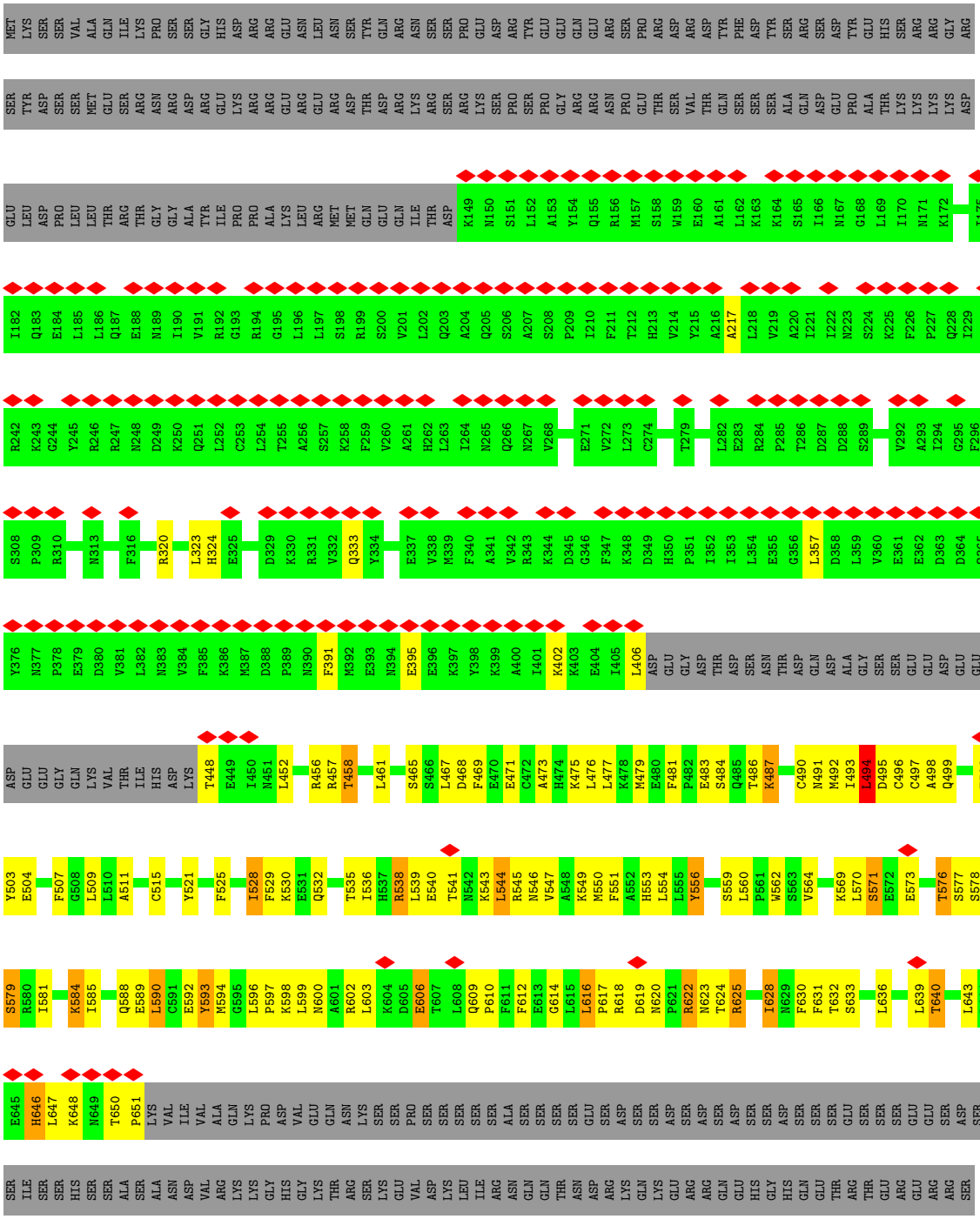


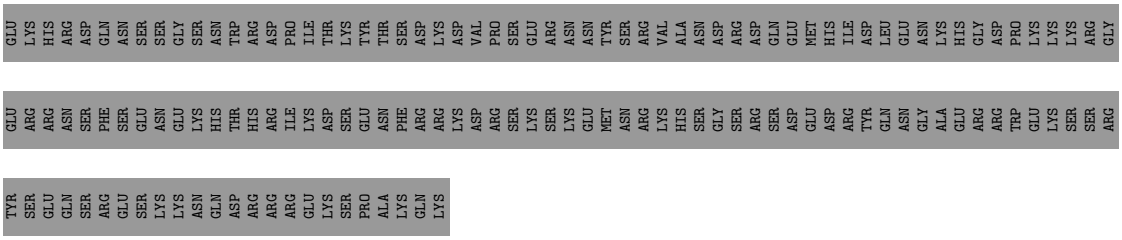




• Molecule 21: Pre-mRNA-splicing factor CWC22 homolog

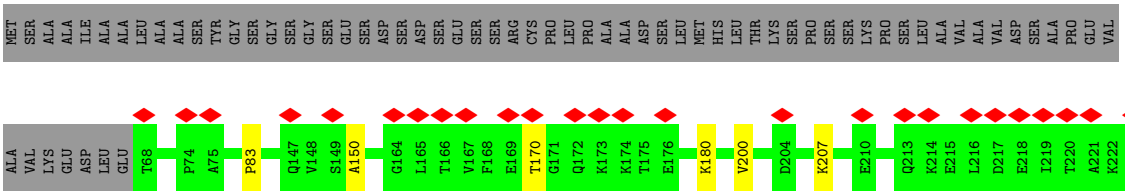






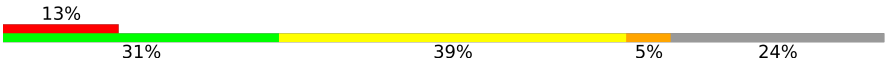
• Molecule 22: Pre-mRNA-processing factor 17

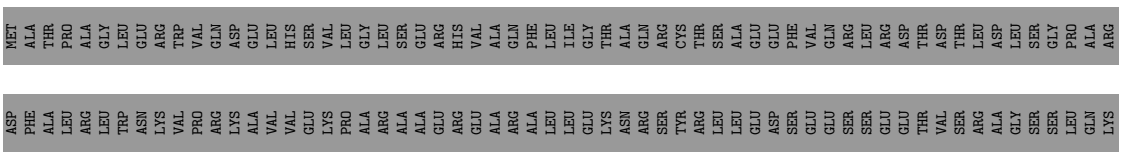
Chain W:

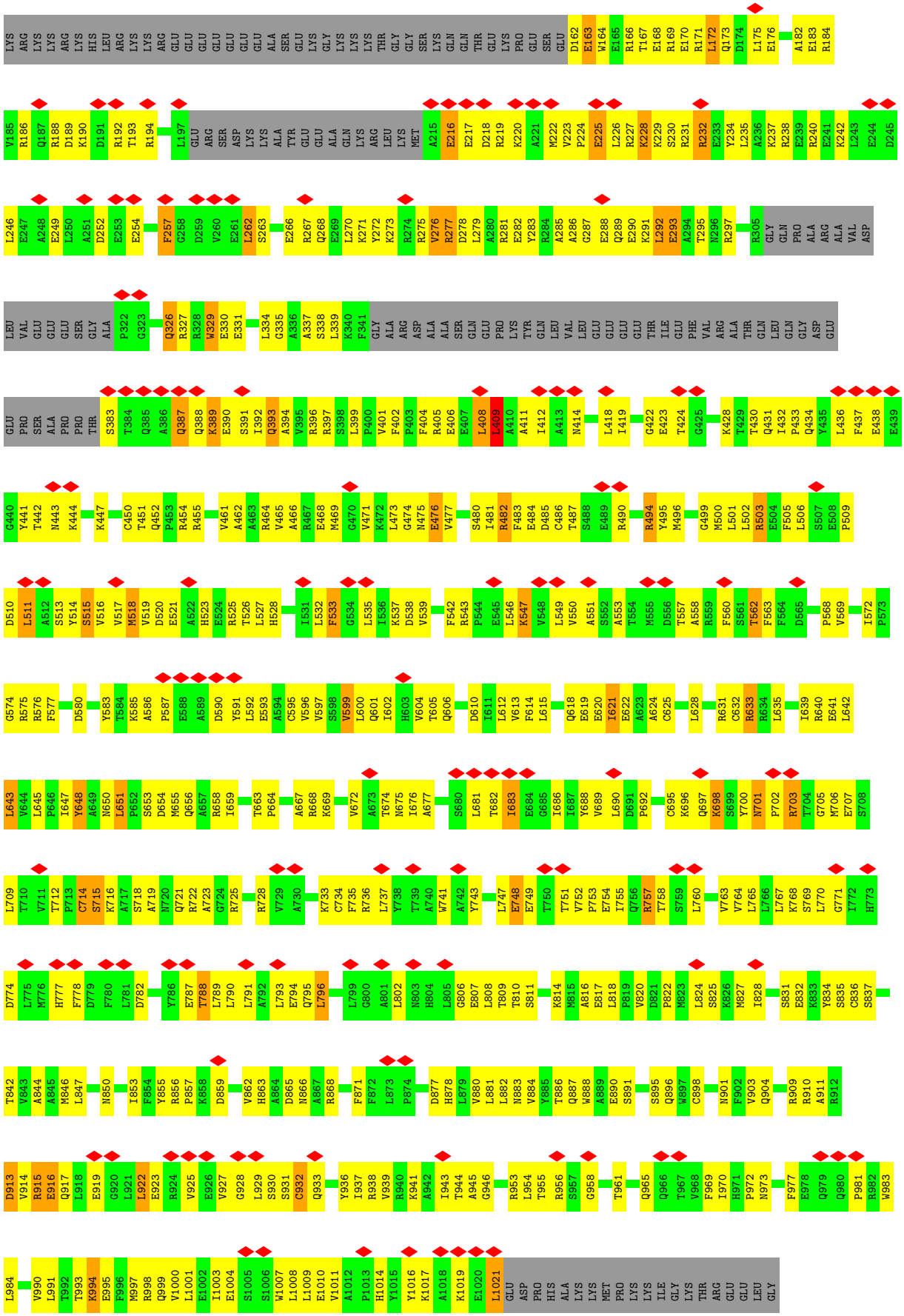


• Molecule 23: Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16

Chain X:

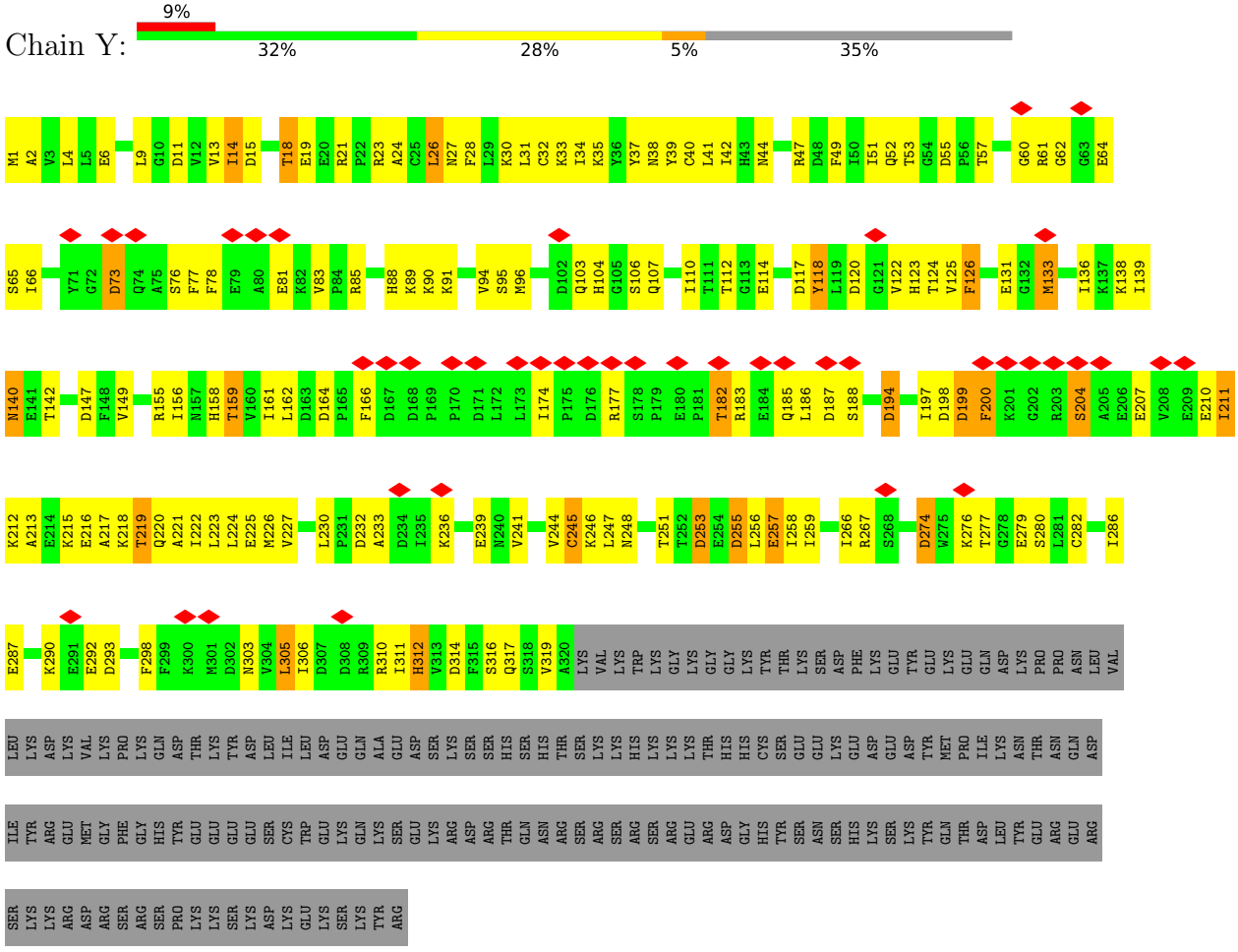






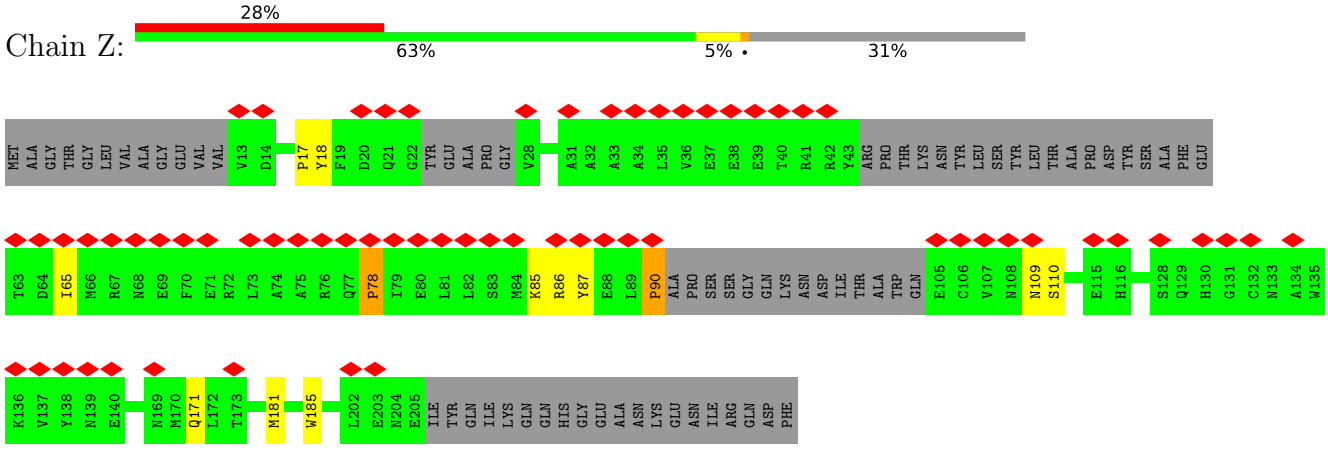
• Molecule 24: Peptidyl-prolyl cis-trans isomerase-like 4

Chain Y:



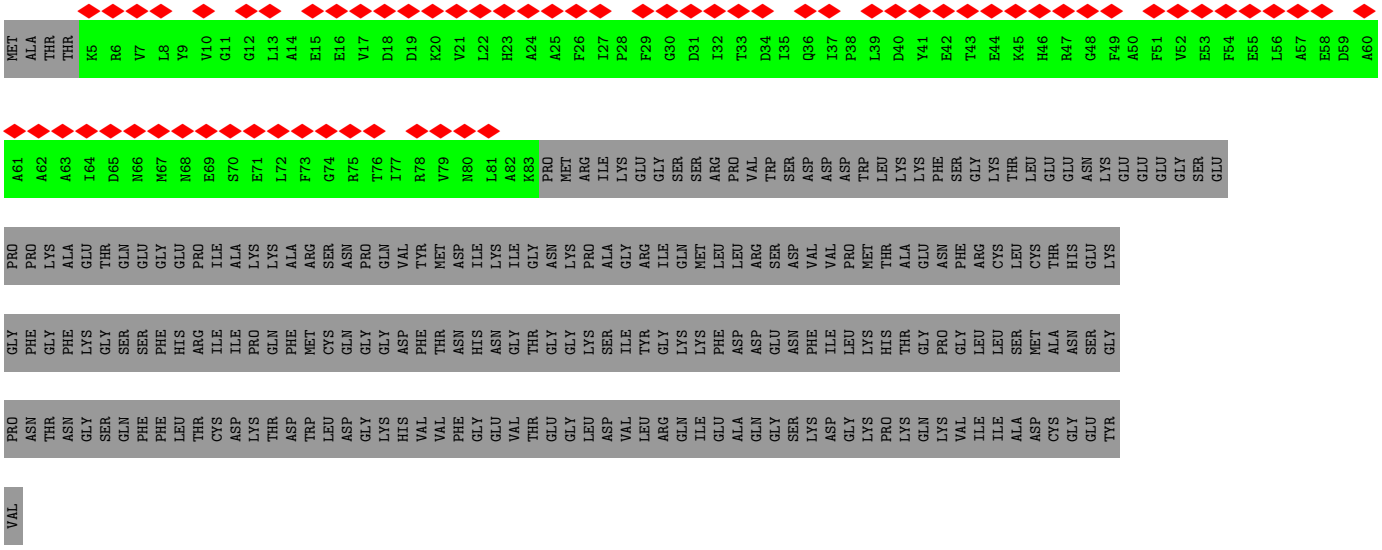
• Molecule 25: Pre-mRNA-splicing factor SPF27

Chain Z:

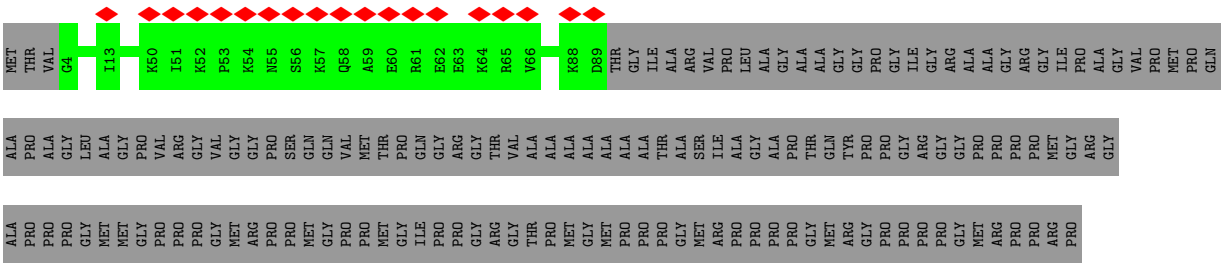


• Molecule 26: Peptidyl-prolyl cis-trans isomerase E

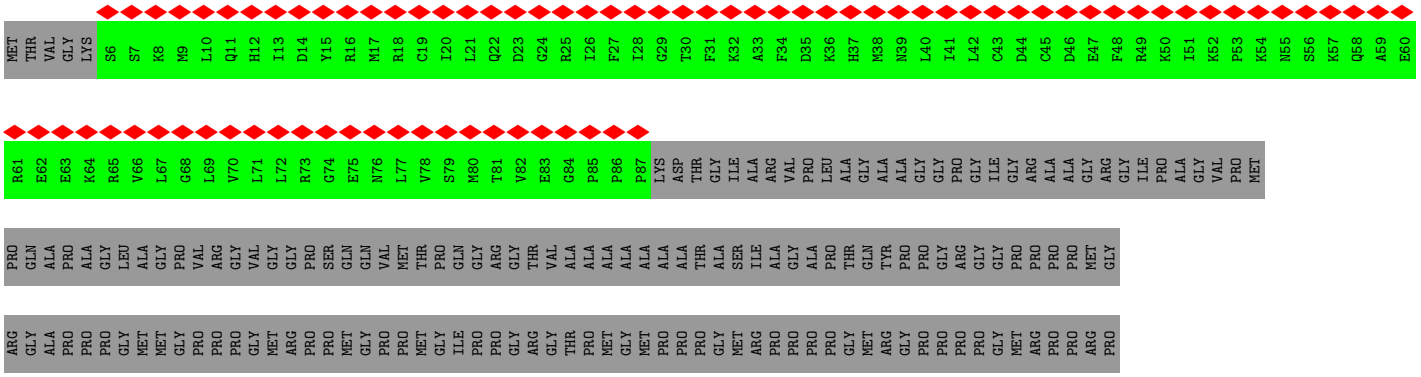
Chain y:



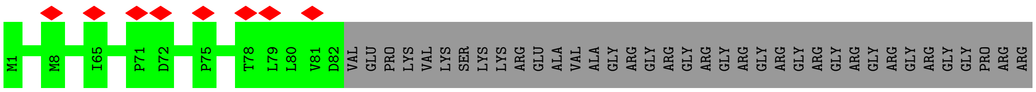
• Molecule 27: Small nuclear ribonucleoprotein-associated proteins B and B'



• Molecule 27: Small nuclear ribonucleoprotein-associated proteins B and B'

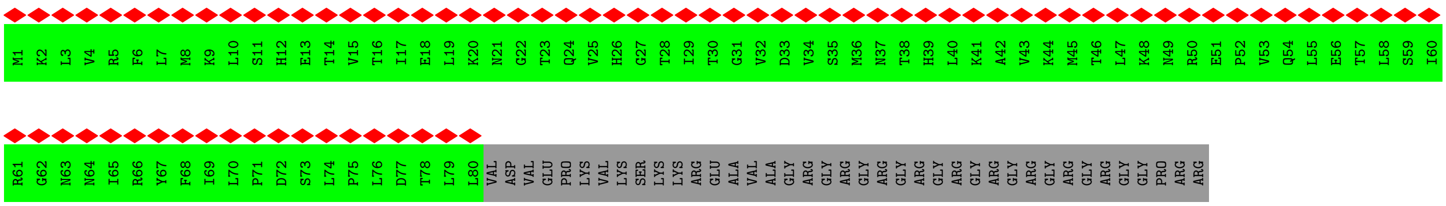


• Molecule 28: Small nuclear ribonucleoprotein Sm D1



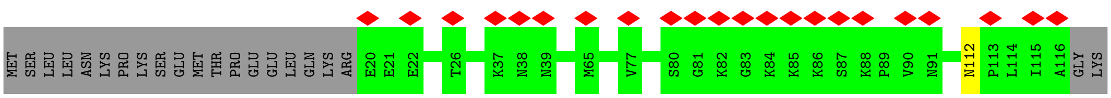
• Molecule 28: Small nuclear ribonucleoprotein Sm D1

Chain n:



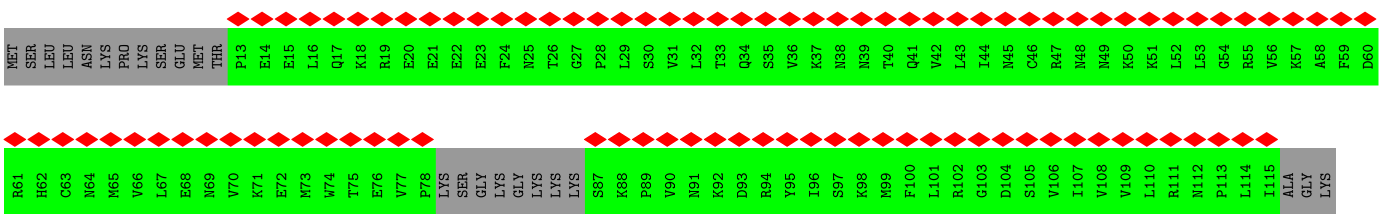
• Molecule 29: Small nuclear ribonucleoprotein Sm D2

Chain c:



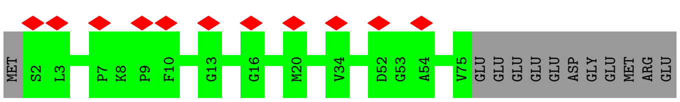
• Molecule 29: Small nuclear ribonucleoprotein Sm D2

Chain h:



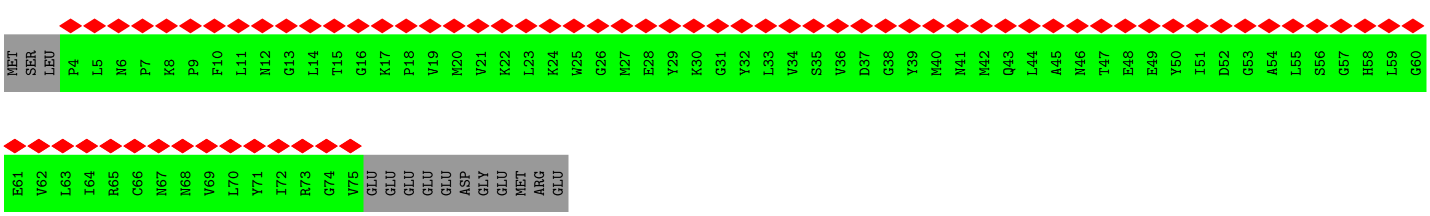
• Molecule 30: Small nuclear ribonucleoprotein F

Chain d:



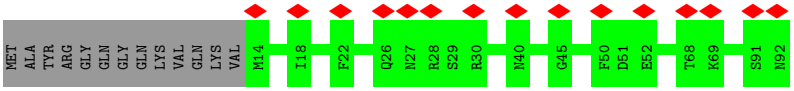
• Molecule 30: Small nuclear ribonucleoprotein F

Chain i:



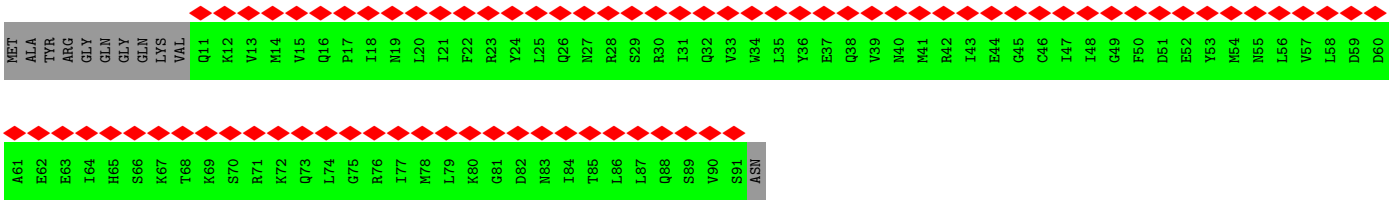
• Molecule 31: Small nuclear ribonucleoprotein E

Chain e:



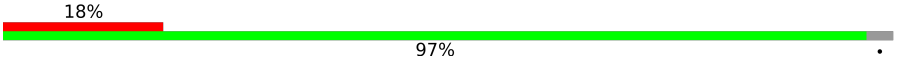
• Molecule 31: Small nuclear ribonucleoprotein E

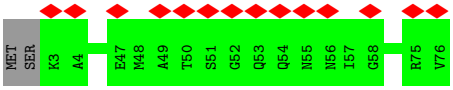
Chain j:



• Molecule 32: Small nuclear ribonucleoprotein G

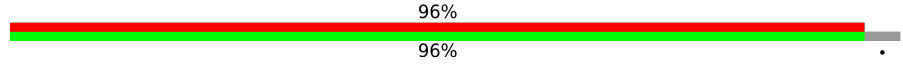
Chain f:





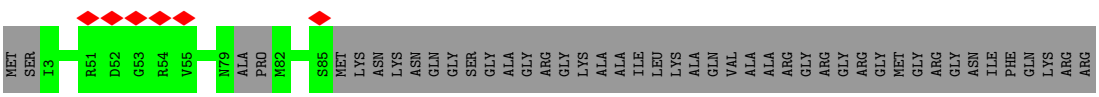
• Molecule 32: Small nuclear ribonucleoprotein G

Chain k:



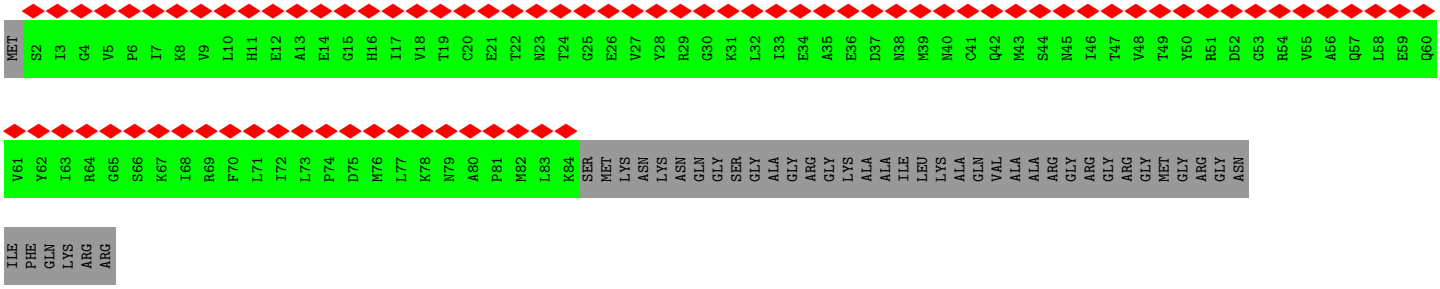
• Molecule 33: Small nuclear ribonucleoprotein Sm D3

Chain g:



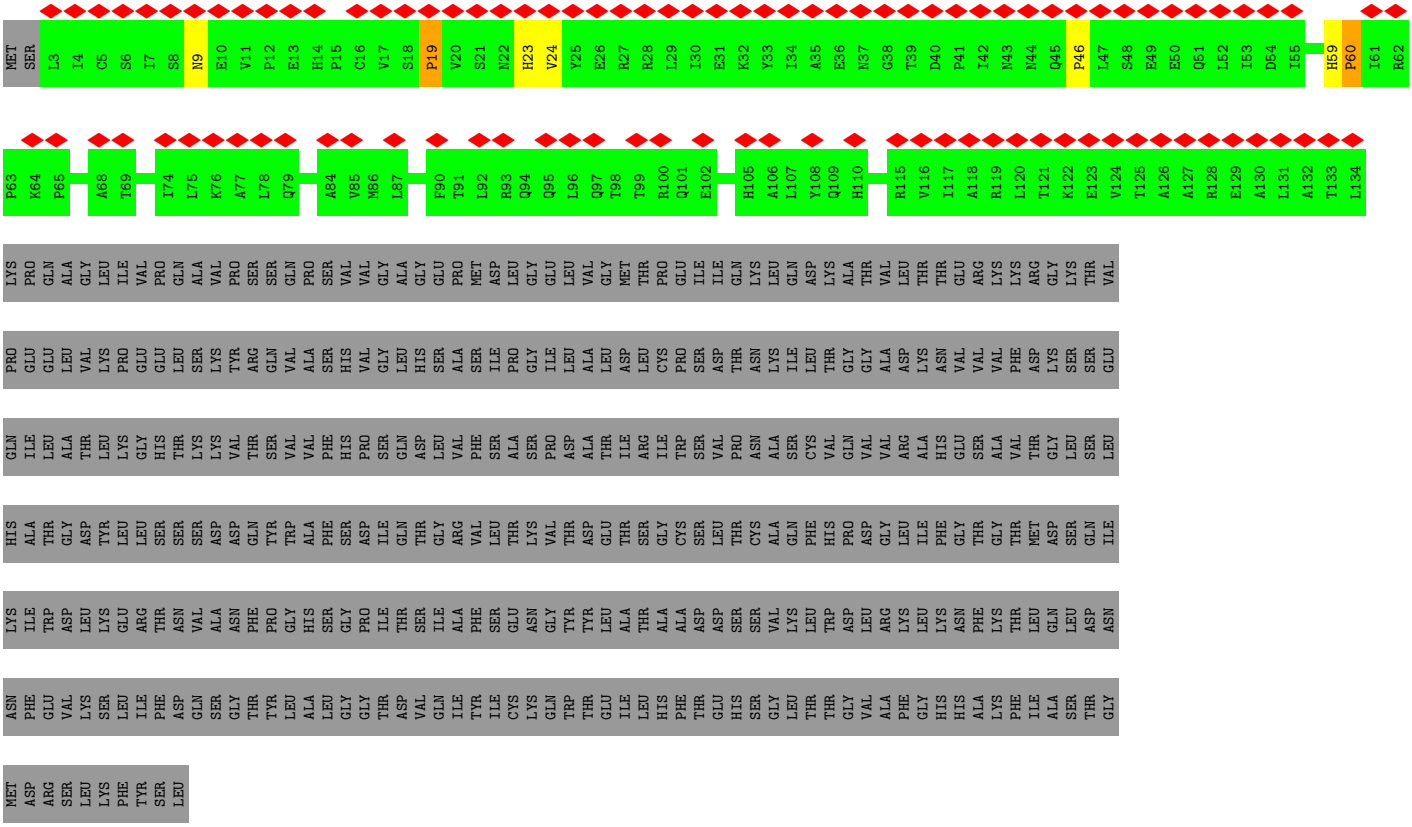
• Molecule 33: Small nuclear ribonucleoprotein Sm D3

Chain l:



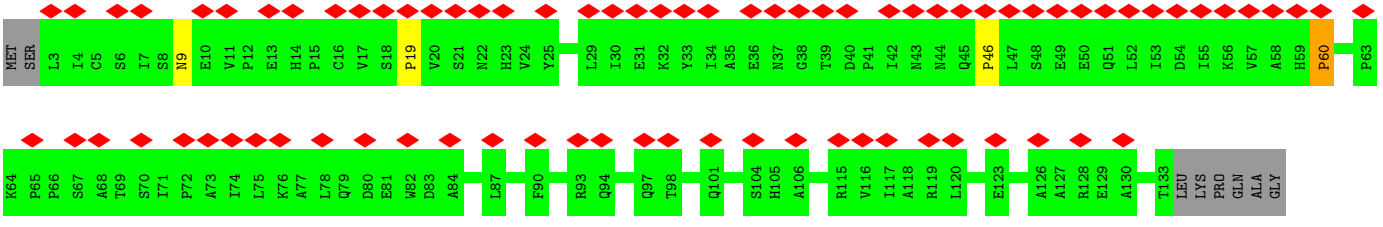
• Molecule 34: Pre-mRNA-processing factor 19

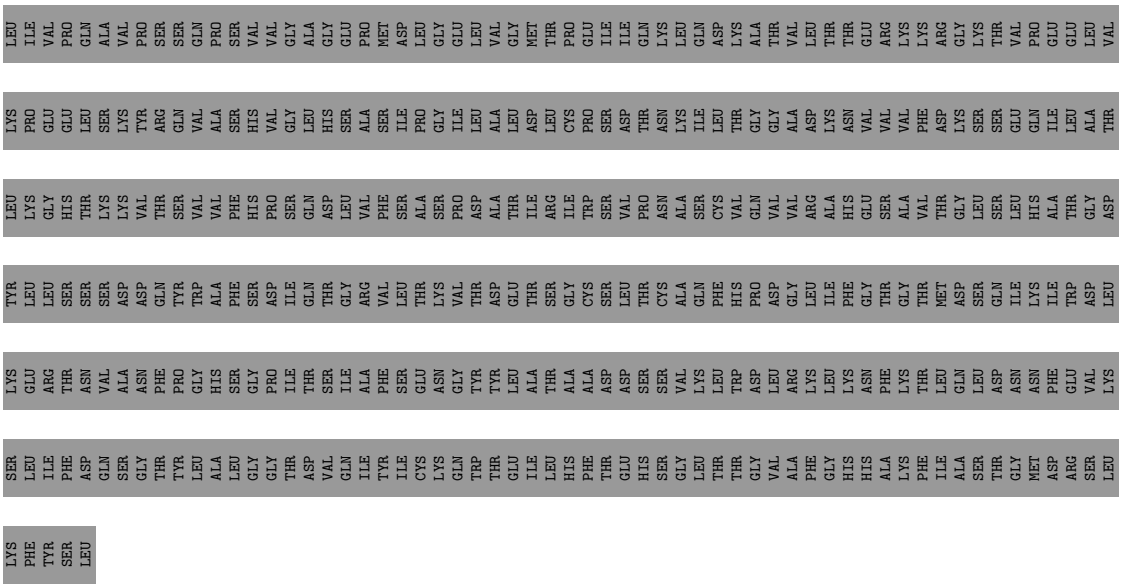
Chain q:



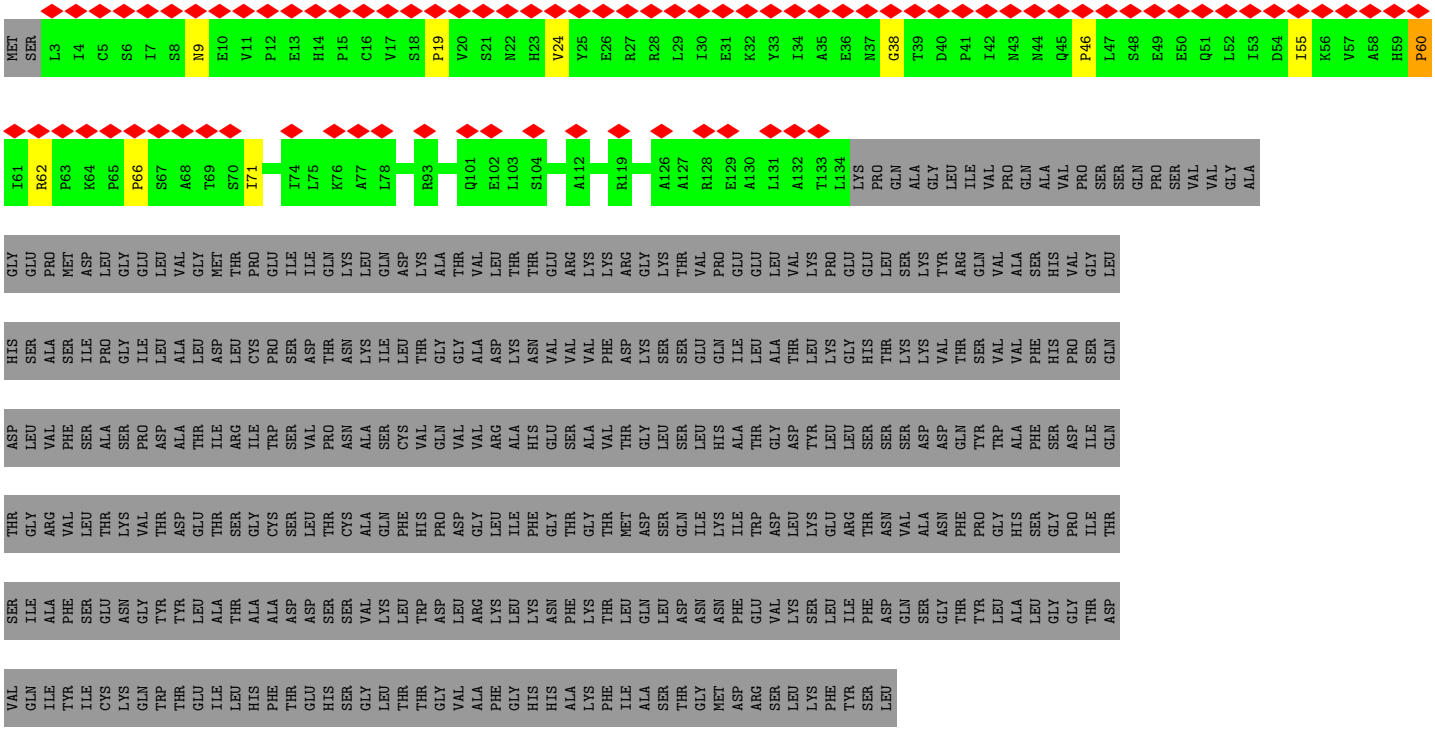
• Molecule 34: Pre-mRNA-processing factor 19

Chain r:

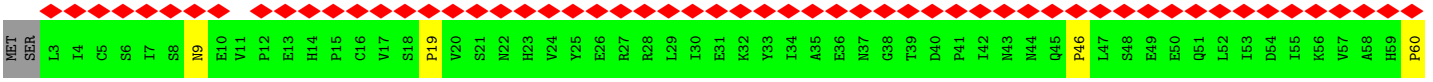


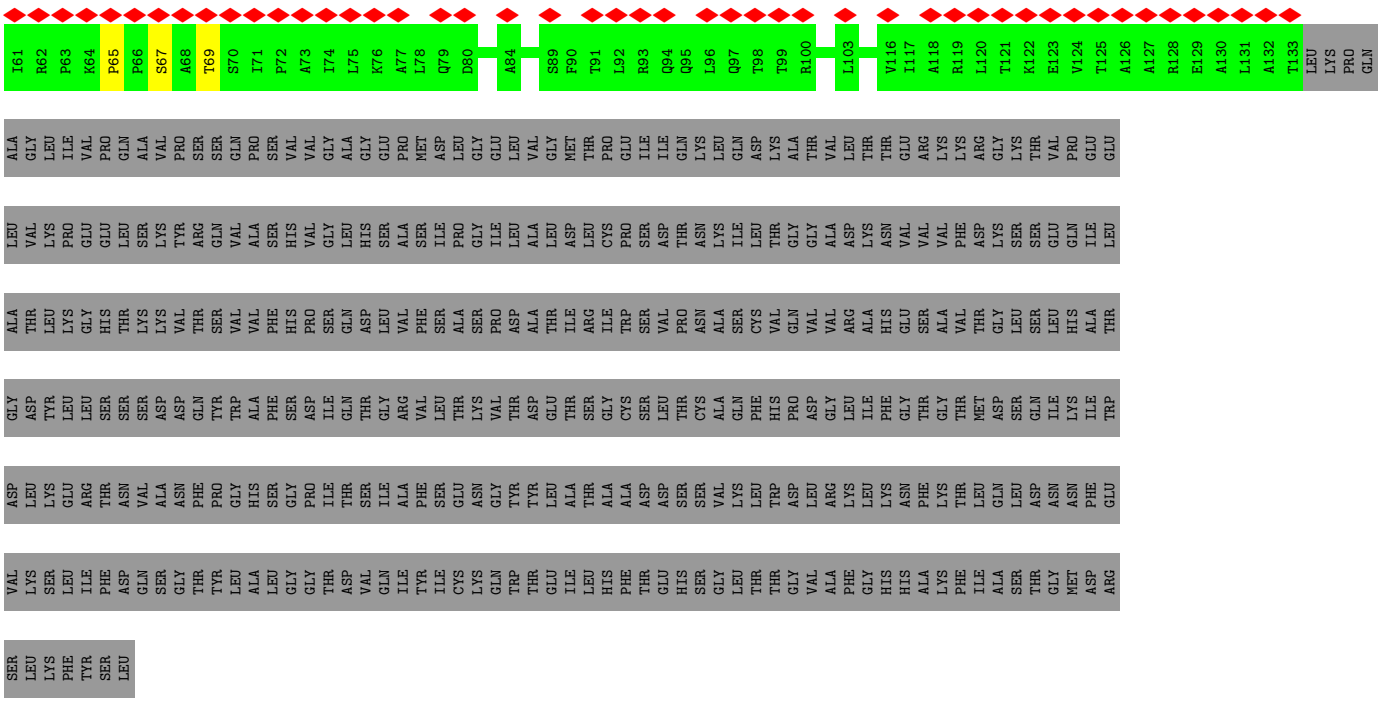


• Molecule 34: Pre-mRNA-processing factor 19



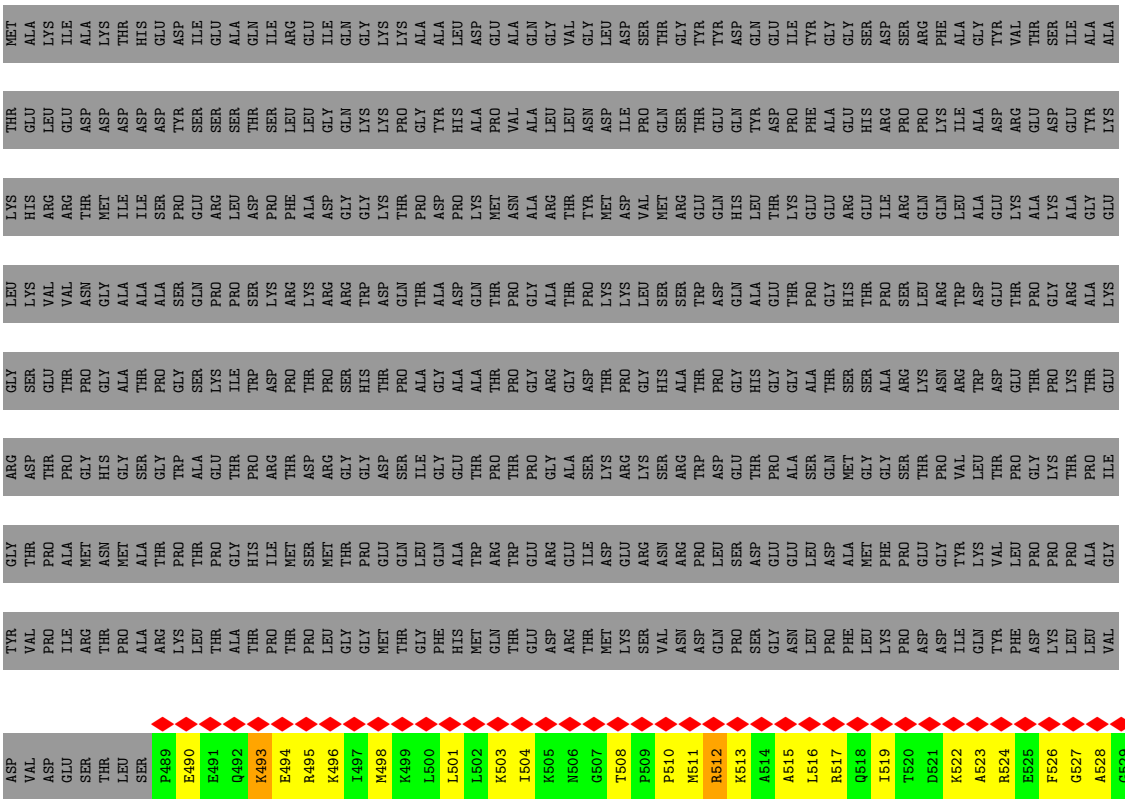
• Molecule 34: Pre-mRNA-processing factor 19

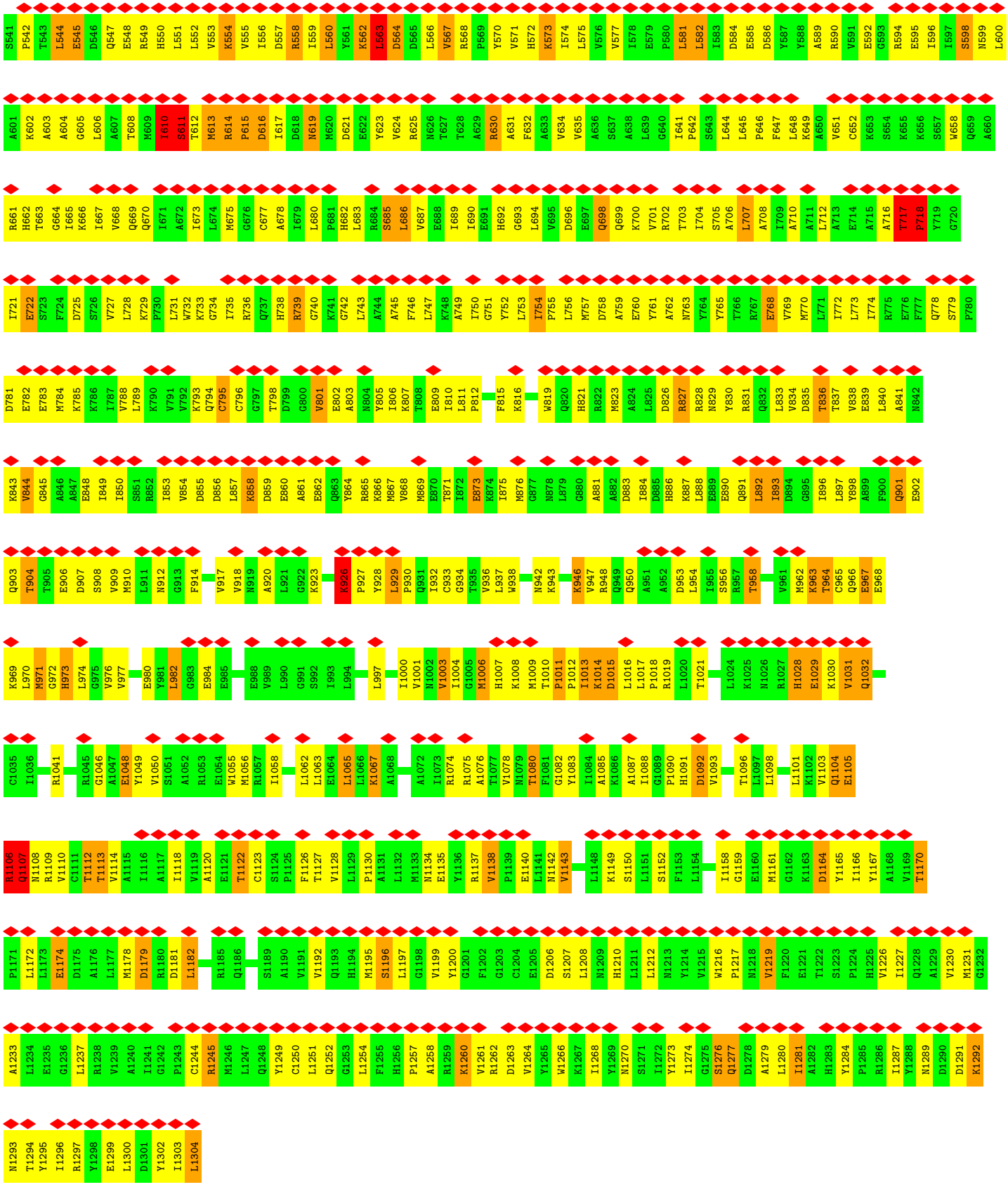




• Molecule 35: Splicing factor 3B subunit 1

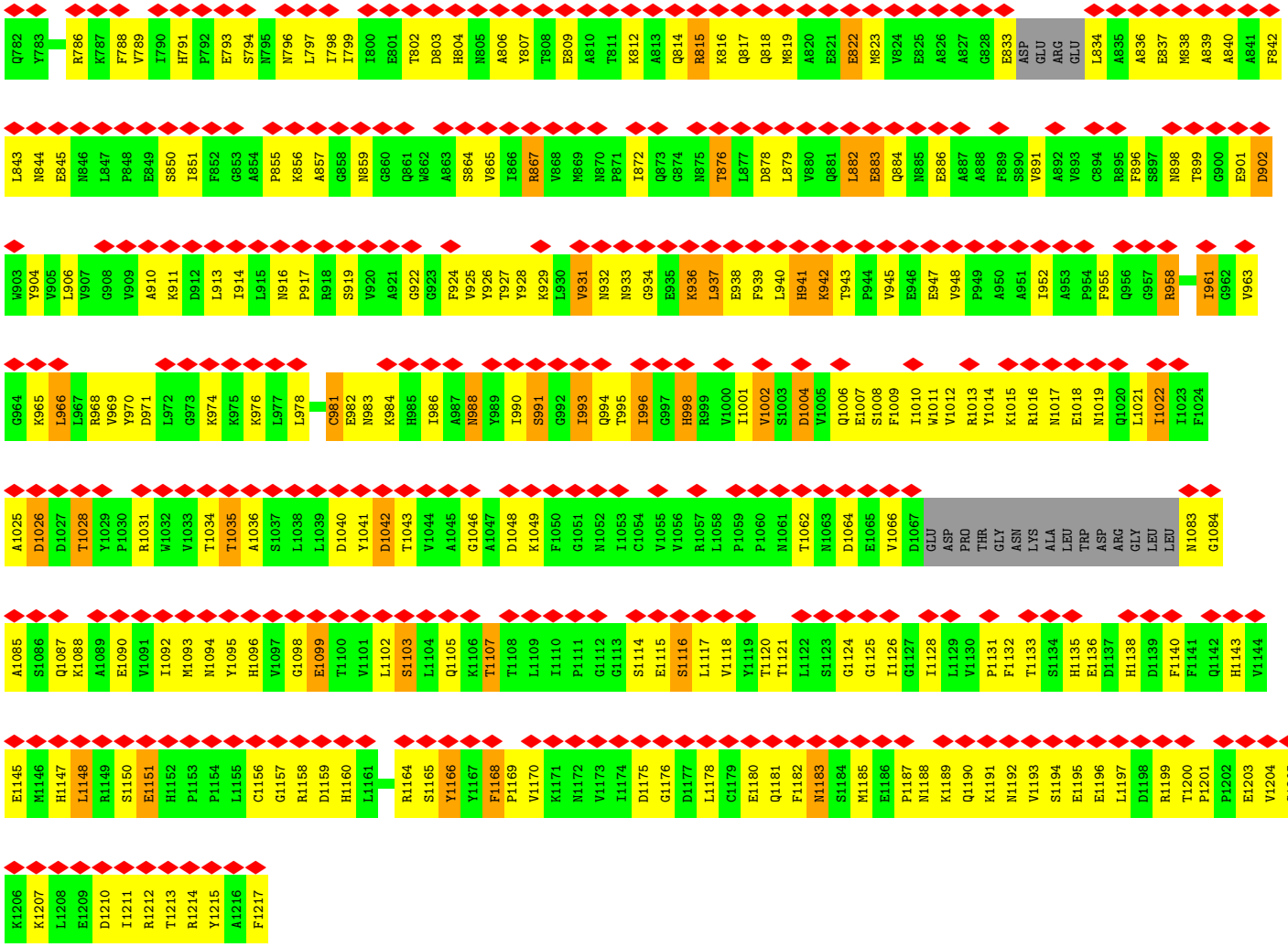
Chain 1:





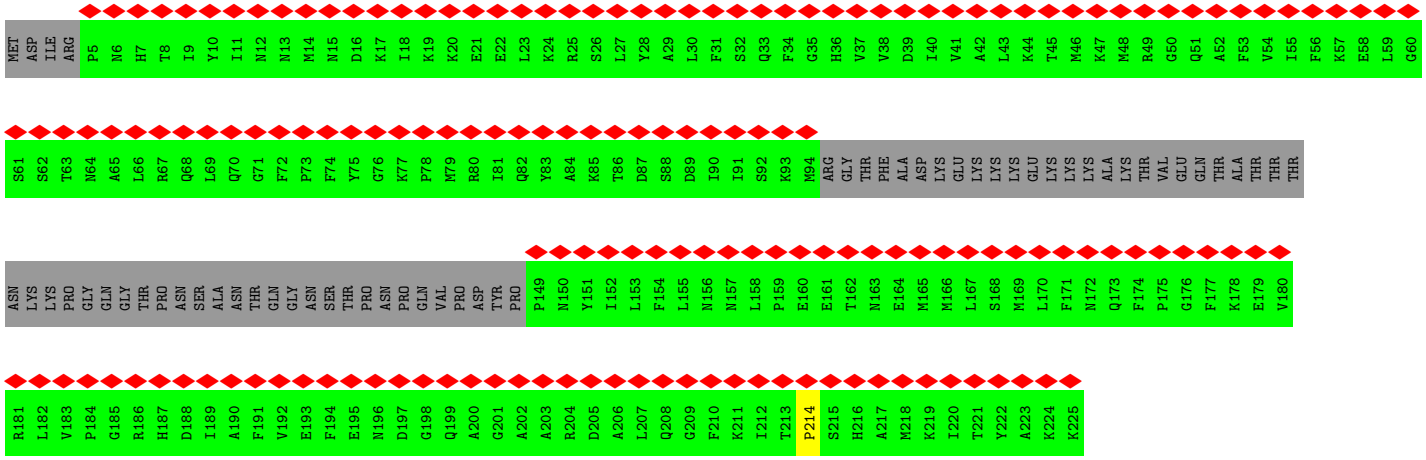
• Molecule 36: Splicing factor 3B subunit 3

Chain 3:



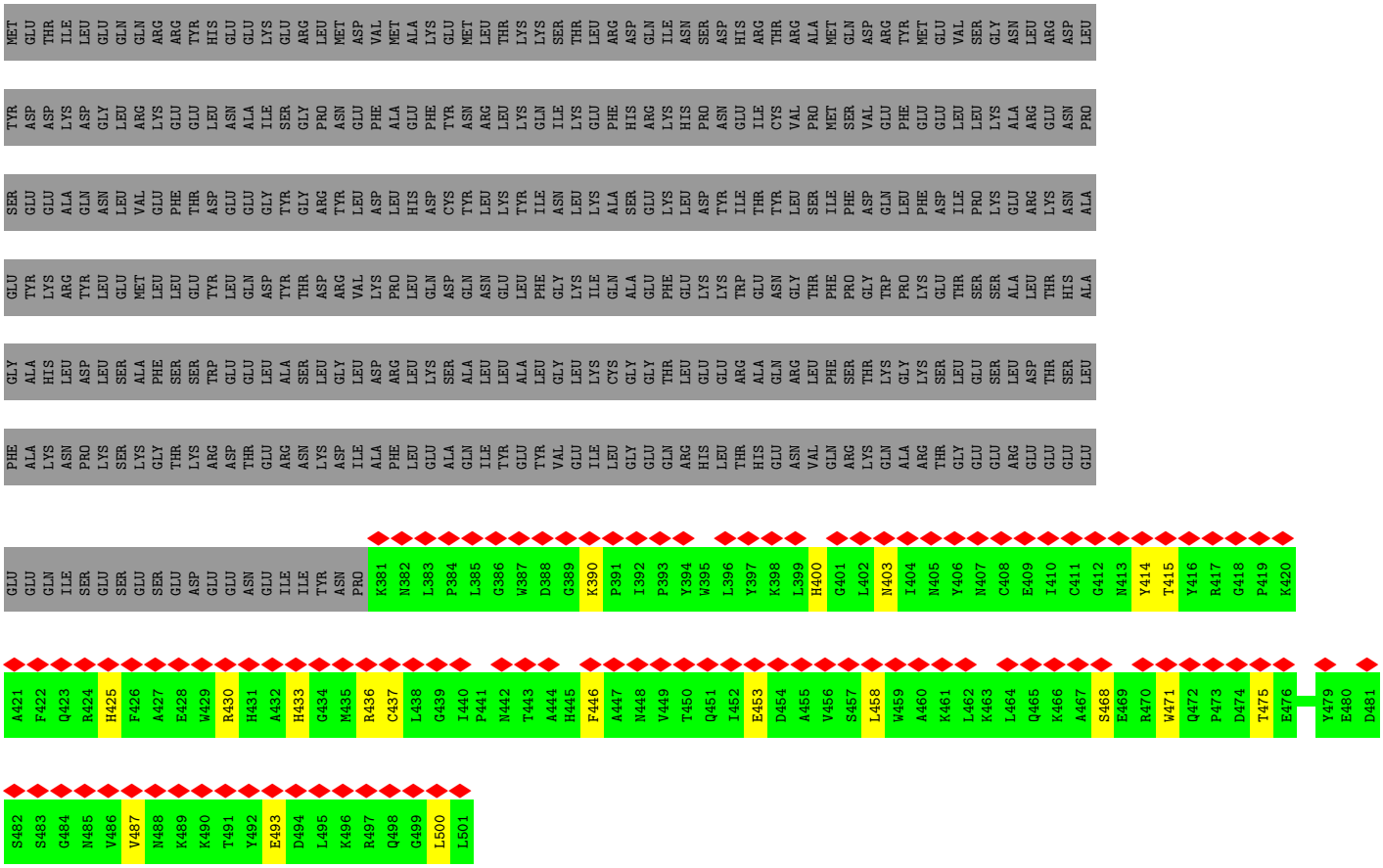
• Molecule 37: U2 small nuclear ribonucleoprotein B"

Chain p:



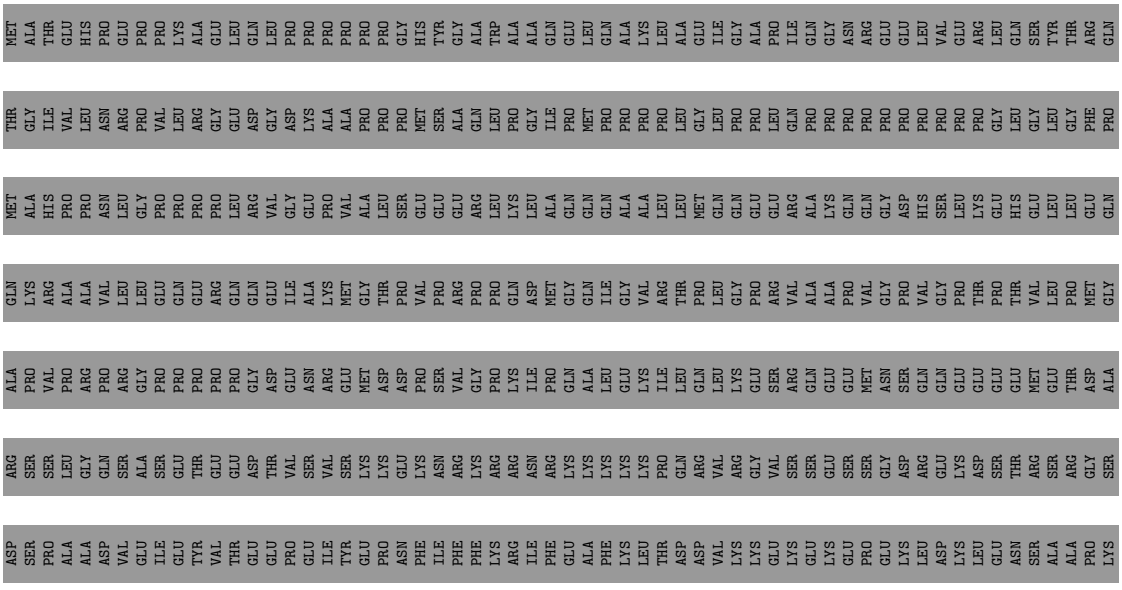
• Molecule 38: Splicing factor 3A subunit 3

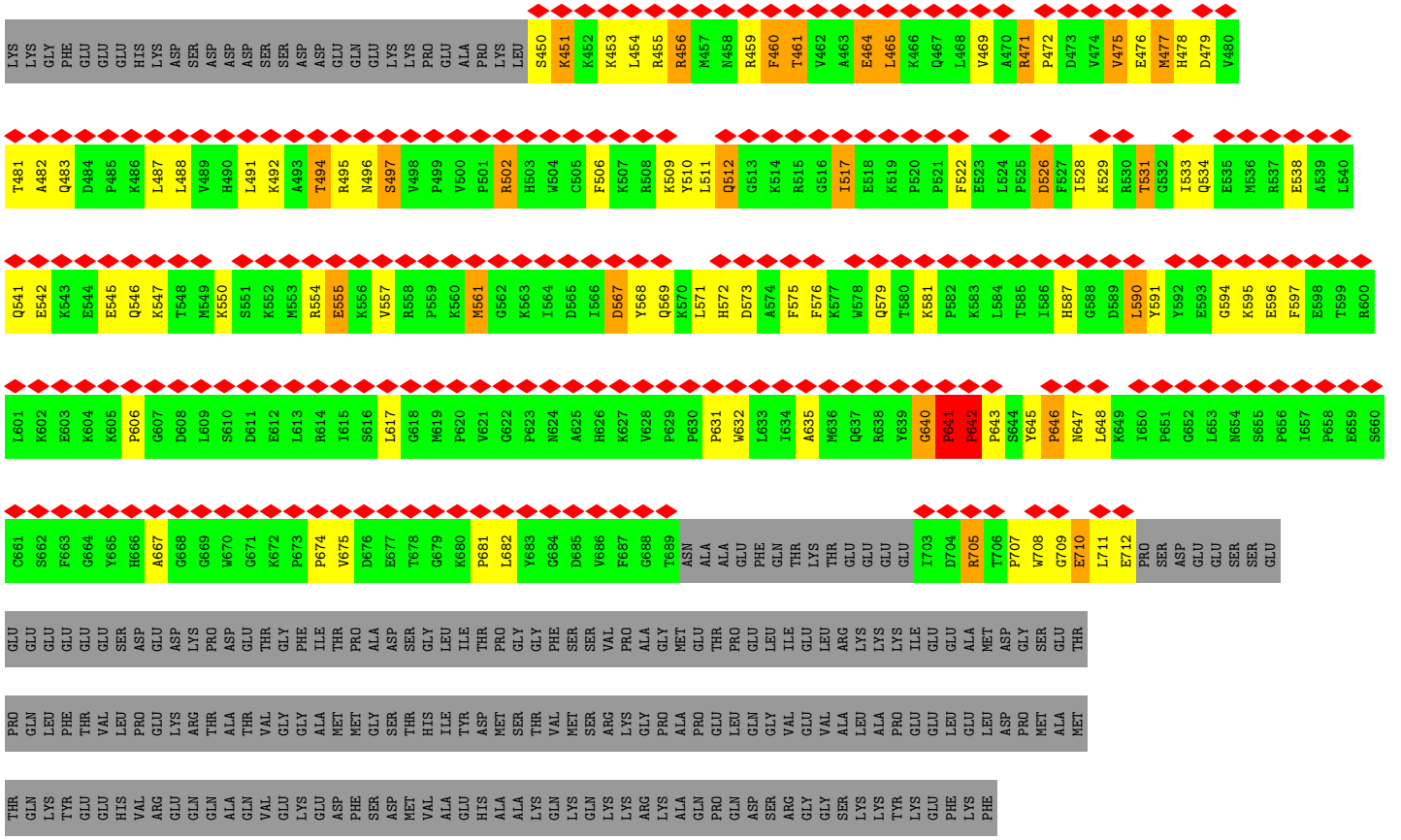
Chain w:



• Molecule 39: Splicing factor 3B subunit 2

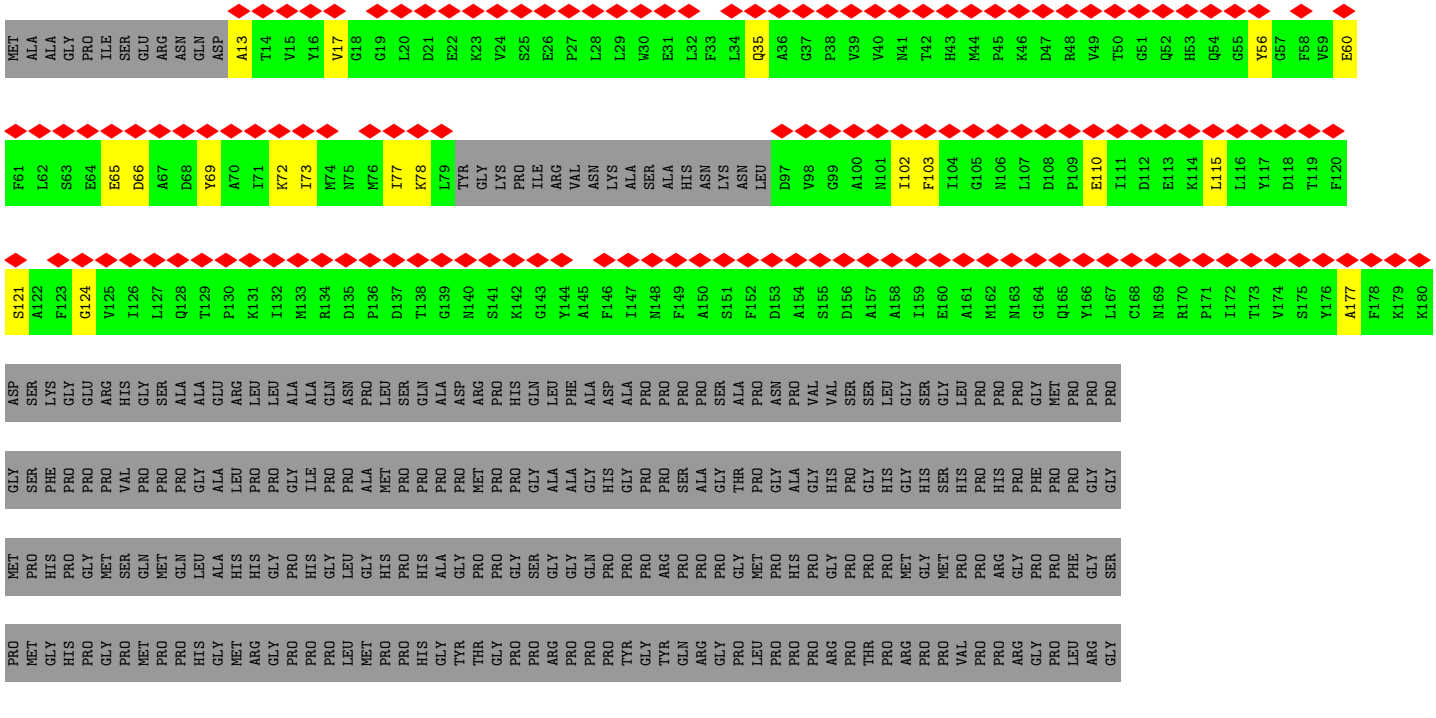
Chain 2:





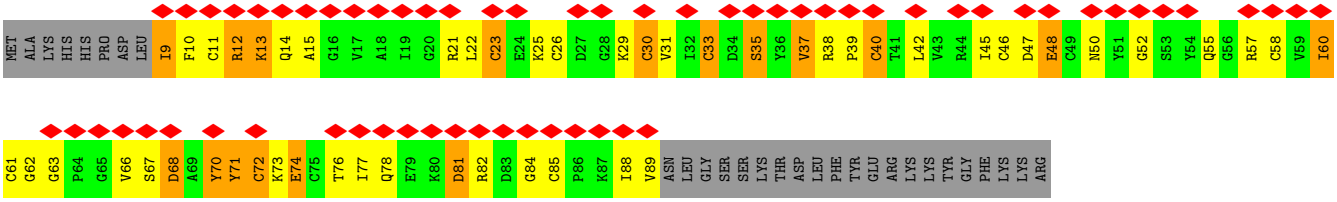
• Molecule 40: Splicing factor 3B subunit 4

Chain 4:



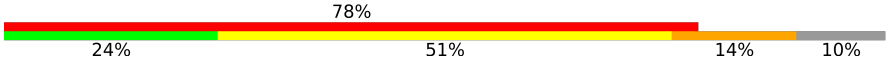
• Molecule 41: PHD finger-like domain-containing protein 5A

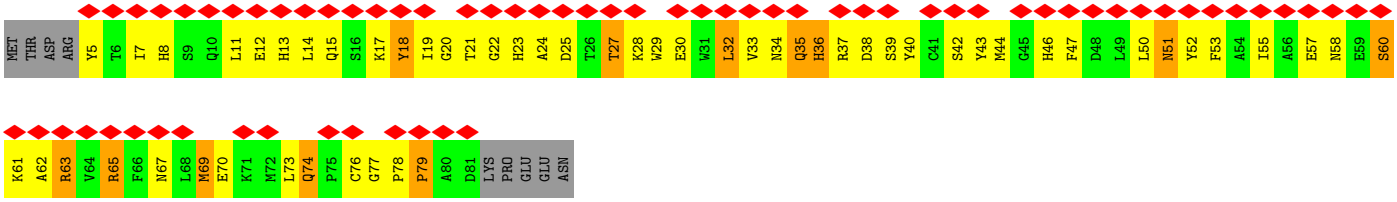
Chain 7:



• Molecule 42: Splicing factor 3B subunit 5

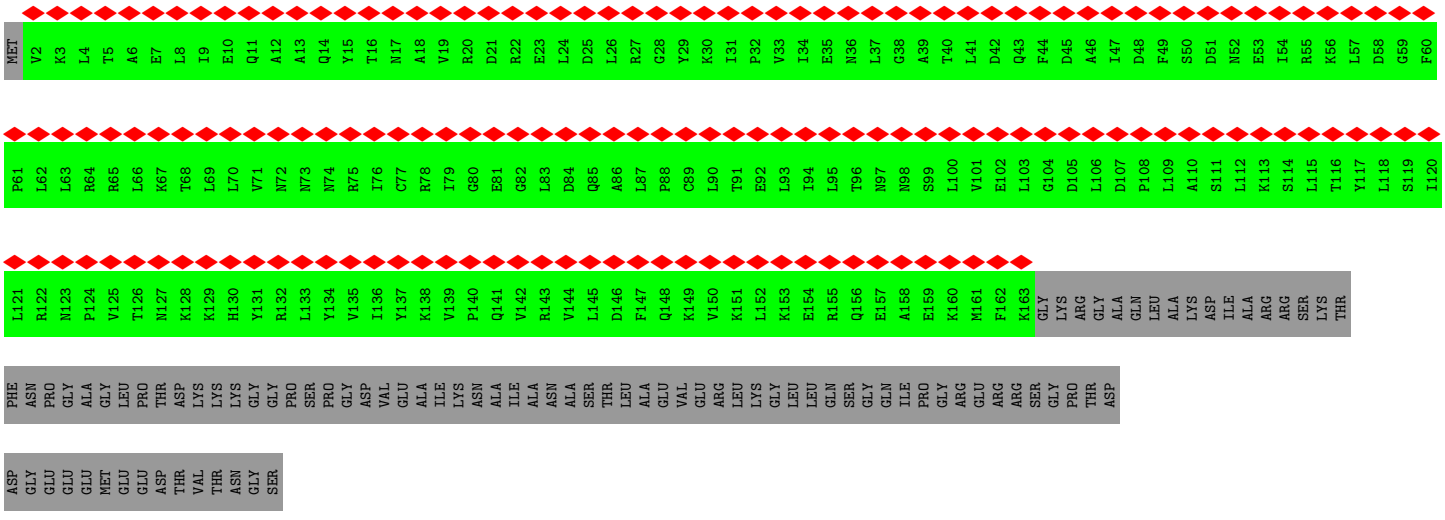
Chain 5:





• Molecule 43: U2 small nuclear ribonucleoprotein A'

Chain o:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	47352	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.422	Depositor
Minimum map value	-1.073	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.058	Depositor
Recommended contour level	0.24	Depositor
Map size (Å)	516.96, 516.96, 516.96	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.077, 1.077, 1.077	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: SEP, ZN, 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	A	0.78	1/16774 (0.0%)	0.67	5/22749 (0.0%)
2	B	1.08	2/2303 (0.1%)	1.01	6/3579 (0.2%)
3	C	0.55	0/6873	0.62	2/9346 (0.0%)
4	E	0.42	0/2392	0.63	1/3242 (0.0%)
5	F	1.21	3/2323 (0.1%)	1.17	11/3619 (0.3%)
6	G	0.81	5/1764 (0.3%)	1.34	25/2737 (0.9%)
7	H	0.70	4/3947 (0.1%)	1.11	17/6138 (0.3%)
8	I	0.26	0/3406	0.43	0/4767
9	J	0.60	1/3817 (0.0%)	0.54	0/5184
10	K	0.72	0/188	0.60	0/248
11	L	0.50	0/2612	0.57	0/3548
12	M	0.48	0/991	0.75	0/1325
13	N	0.64	0/1210	0.60	0/1622
14	O	0.34	0/1447	0.48	0/2013
15	P	0.73	0/888	0.79	1/1177 (0.1%)
16	Q	0.24	0/5279	0.45	0/6583
17	R	0.53	0/2937	0.62	0/3945
18	S	0.27	0/769	0.50	0/1063
19	T	1.01	0/2574	0.72	2/3511 (0.1%)
20	U	0.43	0/424	0.48	0/582
21	V	0.32	0/2993	0.50	1/4088 (0.0%)
22	W	0.34	0/2471	0.71	0/3437
23	X	0.36	1/6479 (0.0%)	0.60	4/8747 (0.0%)
24	Y	0.33	0/2605	0.58	0/3522
25	Z	0.39	0/768	0.52	2/1067 (0.2%)
26	y	0.26	0/315	0.51	0/392
27	a	0.51	0/343	0.69	0/427
27	m	0.26	0/416	0.54	0/581
28	b	0.57	0/327	0.67	0/407
28	n	0.24	0/404	0.50	0/564
29	c	0.69	0/387	0.72	0/482
29	h	0.24	0/485	0.48	0/677

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
30	d	0.77	0/295	0.76	0/367
30	i	0.27	0/362	0.53	0/502
31	e	0.65	0/315	0.75	0/392
31	j	0.25	0/403	0.46	0/561
32	f	0.55	0/295	0.61	0/367
32	k	0.26	0/366	0.53	0/509
33	g	0.47	0/322	0.55	0/399
33	l	0.26	0/417	0.51	0/581
34	q	0.35	0/658	0.63	3/919 (0.3%)
34	r	0.32	0/653	0.59	3/912 (0.3%)
34	s	0.34	0/658	0.66	3/919 (0.3%)
34	t	0.35	0/653	0.59	3/912 (0.3%)
35	1	0.69	4/6609 (0.1%)	0.71	9/8947 (0.1%)
36	3	0.53	0/9408	0.66	1/12767 (0.0%)
37	p	0.26	0/847	0.48	0/1181
38	w	0.38	0/1029	0.54	0/1393
39	2	0.72	5/1833 (0.3%)	0.70	3/2469 (0.1%)
40	4	0.33	0/741	0.51	0/1027
41	7	0.56	0/621	0.61	0/833
42	5	0.72	0/654	0.64	0/885
43	o	0.24	0/821	0.48	0/1149
All	All	0.61	26/108871 (0.0%)	0.69	102/149360 (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	11
3	C	0	4
4	E	0	1
6	G	0	1
8	I	0	1
9	J	0	2
12	M	0	1
13	N	0	1
15	P	0	1
17	R	0	1
23	X	0	1
24	Y	0	1
29	c	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
35	1	0	5
36	3	0	5
39	2	0	1
41	7	0	1
42	5	0	1
All	All	0	40

The worst 5 of 26 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
39	2	642	PRO	N-CA	13.71	1.70	1.47
35	1	718	PRO	N-CA	13.30	1.69	1.47
39	2	641	PRO	N-CA	13.02	1.69	1.47
23	X	701	ASN	C-N	9.25	1.51	1.34
35	1	926	LYS	C-N	8.50	1.50	1.34

The worst 5 of 102 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	G	2	U	C4'-C3'-O3'	14.57	142.14	113.00
39	2	567	ASP	CB-CA-C	12.96	136.32	110.40
7	H	15	U	N3-C4-O4	-12.80	110.44	119.40
35	1	615	PRO	CA-N-CD	-11.72	95.08	111.50
6	G	0	G	N9-C1'-C2'	-11.71	98.77	114.00

There are no chirality outliers.

5 of 40 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	187	PRO	Peptide
1	A	365	VAL	Peptide
1	A	433	GLU	Peptide
1	A	699	GLU	Peptide
1	A	855	ARG	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	A	16331	0	16276	625	0
2	B	2066	0	1047	61	0
3	C	6724	0	6696	318	0
4	E	2338	0	2275	153	0
5	F	2075	0	1048	85	0
6	G	1587	0	808	127	0
7	H	3539	0	1791	118	0
8	I	3387	0	1651	22	0
9	J	3773	0	2869	90	0
10	K	185	0	165	21	0
11	L	2584	0	2096	103	0
12	M	971	0	950	70	0
13	N	1184	0	1190	45	0
14	O	1447	0	638	31	0
15	P	876	0	875	52	0
16	Q	5288	0	1361	7	0
17	R	2915	0	2794	192	0
18	S	770	0	356	6	0
19	T	2507	0	2451	83	0
20	U	422	0	291	13	0
21	V	2959	0	2237	106	0
22	W	2473	0	1096	8	0
23	X	6357	0	6349	417	0
24	Y	2556	0	2492	145	0
25	Z	772	0	342	8	0
26	y	316	0	86	0	0
27	a	344	0	93	0	0
27	m	413	0	194	0	0
28	b	328	0	89	0	0
28	n	402	0	184	0	0
29	c	388	0	102	0	0
29	h	482	0	220	0	0
30	d	296	0	87	0	0
30	i	359	0	179	0	0
31	e	316	0	85	0	0
31	j	403	0	173	0	0
32	f	296	0	84	0	0
32	k	364	0	176	0	0
33	g	324	0	89	0	0
33	l	415	0	198	0	0
34	q	659	0	296	0	0
34	r	654	0	294	0	0
34	s	659	0	296	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
34	t	654	0	294	0	0
35	1	6486	0	6690	660	0
36	3	9220	0	9139	672	0
37	p	841	0	420	0	0
38	w	999	0	961	0	0
39	2	1803	0	1611	189	0
40	4	743	0	344	31	0
41	7	613	0	597	46	0
42	5	635	0	595	103	0
43	o	816	0	386	0	0
44	A	36	0	6	5	0
45	C	32	0	12	0	0
46	C	1	0	0	0	0
46	F	6	0	0	0	0
47	7	3	0	0	0	0
47	K	1	0	0	0	0
47	N	3	0	0	0	0
All	All	106396	0	84124	3982	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 22.

The worst 5 of 3982 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)
39:2:594:GLY:HA2	39:2:597:PHE:CE2	1.21	1.65
35:1:1056:MET:HG2	39:2:561:MET:SD	1.37	1.64
39:2:635:ALA:CB	40:4:73:ILE:HA	1.32	1.59
39:2:635:ALA:HB3	40:4:73:ILE:CA	1.10	1.55
39:2:641:PRO:N	39:2:641:PRO:CA	1.69	1.55

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	1961/2335 (84%)	1760 (90%)	186 (10%)	15 (1%)	16 46
3	C	854/972 (88%)	751 (88%)	100 (12%)	3 (0%)	30 61
4	E	297/357 (83%)	270 (91%)	27 (9%)	0	100 100
8	I	662/855 (77%)	575 (87%)	86 (13%)	1 (0%)	44 71
9	J	525/848 (62%)	487 (93%)	33 (6%)	5 (1%)	13 42
10	K	22/343 (6%)	18 (82%)	4 (18%)	0	100 100
11	L	375/802 (47%)	358 (96%)	16 (4%)	1 (0%)	37 66
12	M	112/243 (46%)	105 (94%)	5 (4%)	2 (2%)	7 30
13	N	141/144 (98%)	125 (89%)	16 (11%)	0	100 100
14	O	288/420 (69%)	262 (91%)	26 (9%)	0	100 100
15	P	97/229 (42%)	89 (92%)	7 (7%)	1 (1%)	13 42
16	Q	1304/1485 (88%)	1279 (98%)	25 (2%)	0	100 100
17	R	370/536 (69%)	336 (91%)	31 (8%)	3 (1%)	16 46
18	S	156/166 (94%)	144 (92%)	12 (8%)	0	100 100
19	T	318/514 (62%)	300 (94%)	18 (6%)	0	100 100
20	U	68/2752 (2%)	63 (93%)	4 (6%)	1 (2%)	8 33
21	V	458/908 (50%)	433 (94%)	25 (6%)	0	100 100
22	W	497/579 (86%)	473 (95%)	24 (5%)	0	100 100
23	X	778/1041 (75%)	728 (94%)	49 (6%)	1 (0%)	48 76
24	Y	318/492 (65%)	296 (93%)	22 (7%)	0	100 100
25	Z	147/225 (65%)	138 (94%)	5 (3%)	4 (3%)	4 22
26	y	77/301 (26%)	76 (99%)	1 (1%)	0	100 100
27	a	84/240 (35%)	82 (98%)	2 (2%)	0	100 100
27	m	80/240 (33%)	72 (90%)	8 (10%)	0	100 100
28	b	80/119 (67%)	77 (96%)	3 (4%)	0	100 100
28	n	78/119 (66%)	67 (86%)	11 (14%)	0	100 100
29	c	95/118 (80%)	91 (96%)	4 (4%)	0	100 100
29	h	91/118 (77%)	82 (90%)	9 (10%)	0	100 100
30	d	72/86 (84%)	69 (96%)	3 (4%)	0	100 100
30	i	70/86 (81%)	64 (91%)	6 (9%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
31	e	77/92 (84%)	76 (99%)	1 (1%)	0	100 100
31	j	79/92 (86%)	73 (92%)	6 (8%)	0	100 100
32	f	72/76 (95%)	70 (97%)	2 (3%)	0	100 100
32	k	71/76 (93%)	63 (89%)	8 (11%)	0	100 100
33	g	77/126 (61%)	76 (99%)	1 (1%)	0	100 100
33	l	81/126 (64%)	70 (86%)	11 (14%)	0	100 100
34	q	130/504 (26%)	117 (90%)	7 (5%)	6 (5%)	2 13
34	r	129/504 (26%)	118 (92%)	9 (7%)	2 (2%)	8 32
34	s	130/504 (26%)	114 (88%)	8 (6%)	8 (6%)	1 9
34	t	129/504 (26%)	116 (90%)	9 (7%)	4 (3%)	3 21
35	1	814/1304 (62%)	703 (86%)	101 (12%)	10 (1%)	11 38
36	3	1165/1217 (96%)	992 (85%)	172 (15%)	1 (0%)	48 76
37	p	163/225 (72%)	147 (90%)	15 (9%)	1 (1%)	22 53
38	w	119/501 (24%)	107 (90%)	12 (10%)	0	100 100
39	2	246/895 (28%)	208 (85%)	34 (14%)	4 (2%)	8 32
40	4	147/424 (35%)	129 (88%)	18 (12%)	0	100 100
41	7	79/110 (72%)	65 (82%)	14 (18%)	0	100 100
42	5	75/86 (87%)	64 (85%)	11 (15%)	0	100 100
43	o	160/255 (63%)	136 (85%)	24 (15%)	0	100 100
All	All	14418/25294 (57%)	13114 (91%)	1231 (8%)	73 (0%)	27 56

5 of 73 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1417	PRO
9	J	202	GLU
17	R	164	PRO
25	Z	78	PRO
25	Z	86	ARG

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	1768/2108 (84%)	1579 (89%)	189 (11%)	5 21
3	C	747/866 (86%)	654 (88%)	93 (12%)	4 16
4	E	256/300 (85%)	213 (83%)	43 (17%)	1 8
8	I	24/749 (3%)	24 (100%)	0	100 100
9	J	239/751 (32%)	222 (93%)	17 (7%)	12 37
10	K	20/294 (7%)	16 (80%)	4 (20%)	1 5
11	L	171/709 (24%)	143 (84%)	28 (16%)	2 9
12	M	104/209 (50%)	91 (88%)	13 (12%)	3 16
13	N	130/130 (100%)	116 (89%)	14 (11%)	5 20
14	O	3/361 (1%)	3 (100%)	0	100 100
15	P	95/203 (47%)	80 (84%)	15 (16%)	2 10
17	R	282/457 (62%)	235 (83%)	47 (17%)	2 8
19	T	273/441 (62%)	248 (91%)	25 (9%)	7 26
20	U	21/2432 (1%)	19 (90%)	2 (10%)	7 25
21	V	188/838 (22%)	156 (83%)	32 (17%)	1 8
23	X	682/897 (76%)	600 (88%)	82 (12%)	4 17
24	Y	286/451 (63%)	246 (86%)	40 (14%)	3 13
27	m	4/177 (2%)	4 (100%)	0	100 100
28	n	3/101 (3%)	3 (100%)	0	100 100
29	h	5/110 (4%)	5 (100%)	0	100 100
30	i	4/74 (5%)	4 (100%)	0	100 100
31	j	1/84 (1%)	1 (100%)	0	100 100
32	k	3/66 (4%)	3 (100%)	0	100 100
33	l	3/101 (3%)	3 (100%)	0	100 100
35	1	700/1104 (63%)	601 (86%)	99 (14%)	3 13
36	3	1018/1051 (97%)	810 (80%)	208 (20%)	1 4
37	p	8/195 (4%)	8 (100%)	0	100 100
38	w	104/446 (23%)	85 (82%)	19 (18%)	1 6
39	2	151/776 (20%)	125 (83%)	26 (17%)	1 8
41	7	69/95 (73%)	47 (68%)	22 (32%)	0 1

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
42	5	68/77 (88%)	53 (78%)	15 (22%)	1 3
43	o	6/218 (3%)	6 (100%)	0	100 100
All	All	7436/16871 (44%)	6403 (86%)	1033 (14%)	5 13

5 of 1033 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
36	3	1022	ILE
38	w	403	ASN
36	3	1012	VAL
13	N	5	LYS
12	M	163	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 153 such sidechains are listed below:

Mol	Chain	Res	Type
35	1	1134	ASN
36	3	933	ASN
36	3	46	ASN
36	3	480	ASN
39	2	546	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	B	96/117 (82%)	28 (29%)	3 (3%)
5	F	96/107 (89%)	42 (43%)	6 (6%)
6	G	77/220 (35%)	44 (57%)	12 (15%)
7	H	163/188 (86%)	69 (42%)	9 (5%)
All	All	432/632 (68%)	183 (42%)	30 (6%)

5 of 183 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	9	G
2	B	10	U
2	B	20	G
2	B	21	A
2	B	22	U

5 of 30 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	G	100	C
7	H	45	C
6	G	103	U
7	H	165	A
7	H	30	A

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
17	SEP	R	232	17	8,9,10	1.51	1 (12%)	8,12,14	1.31	1 (12%)
17	SEP	R	224	17	8,9,10	1.42	1 (12%)	8,12,14	1.63	2 (25%)

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
17	SEP	R	232	17	-	2/5/8/10	-
17	SEP	R	224	17	-	1/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	R	232	SEP	P-O1P	3.21	1.60	1.50
17	R	224	SEP	P-O1P	3.12	1.60	1.50

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	R	224	SEP	P-OG-CB	-3.28	109.27	118.30
17	R	224	SEP	OG-CB-CA	2.44	110.52	108.14
17	R	232	SEP	P-OG-CB	-2.25	112.09	118.30

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
17	R	224	SEP	N-CA-CB-OG
17	R	232	SEP	CB-OG-P-O2P
17	R	232	SEP	CB-OG-P-O3P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 16 ligands modelled in this entry, 14 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
44	IHP	A	3000	-	36,36,36	1.00	1 (2%)	54,60,60	1.84	12 (22%)
45	GTP	C	1500	46	26,34,34	1.59	4 (15%)	32,54,54	2.02	9 (28%)

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
44	IHP	A	3000	-	-	5/30/54/54	0/1/1/1
45	GTP	C	1500	46	-	4/18/38/38	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
45	C	1500	GTP	C5-C6	-5.09	1.37	1.47
45	C	1500	GTP	C2'-C1'	-2.95	1.49	1.53
45	C	1500	GTP	C5-C4	-2.34	1.37	1.43
44	A	3000	IHP	P5-O15	2.13	1.63	1.59
45	C	1500	GTP	O4'-C4'	-2.00	1.40	1.45

The worst 5 of 21 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
45	C	1500	GTP	PB-O3B-PG	-5.18	115.04	132.83
44	A	3000	IHP	O41-P1-O31	4.71	125.65	107.64
44	A	3000	IHP	C5-C4-C3	4.59	120.46	110.41
44	A	3000	IHP	C5-C6-C1	4.39	120.02	110.41
44	A	3000	IHP	O15-C5-C4	4.29	118.81	108.69

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
44	A	3000	IHP	C3-C4-O14-P4
44	A	3000	IHP	C3-O13-P3-O23
44	A	3000	IHP	C5-O15-P5-O25
45	C	1500	GTP	C4'-C5'-O5'-PA
45	C	1500	GTP	C3'-C4'-C5'-O5'

There are no ring outliers.

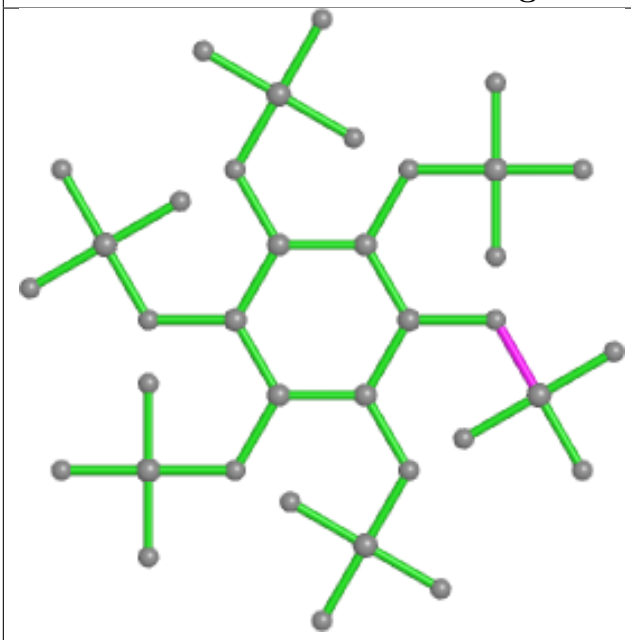
1 monomer is involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
44	A	3000	IHP	5	0

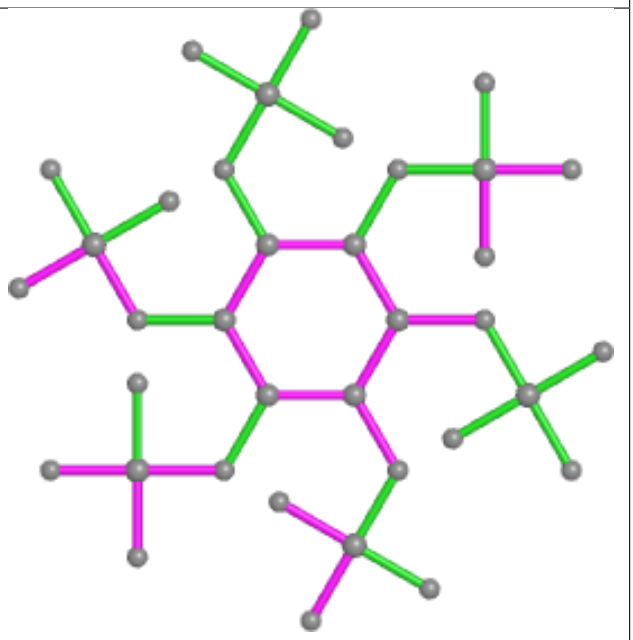
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

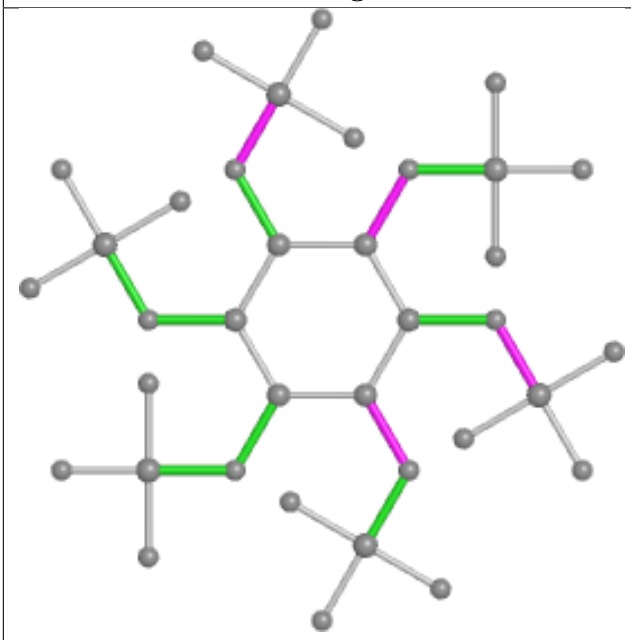
Ligand IHP A 3000



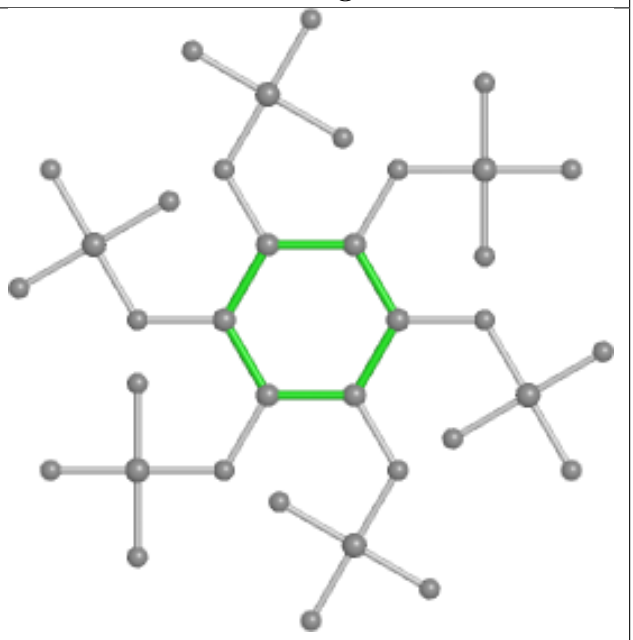
Bond lengths



Bond angles

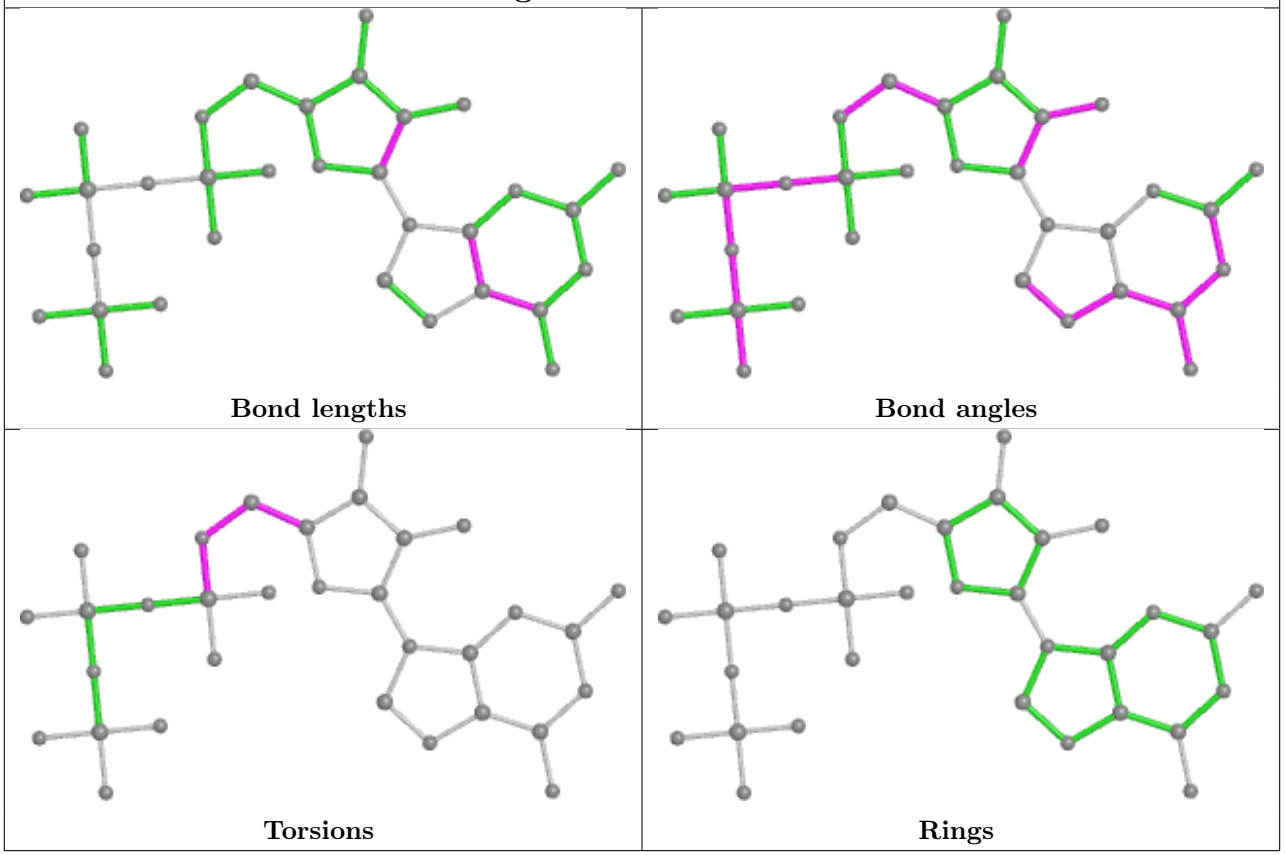


Torsions



Rings

Ligand GTP C 1500



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

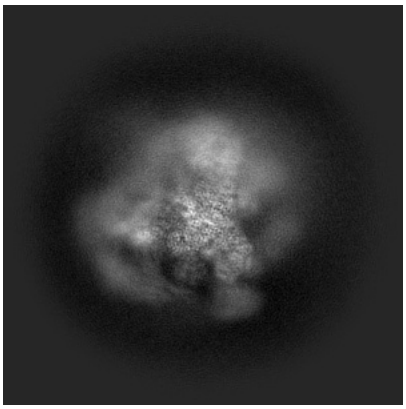
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-35110. These allow visual inspection of the internal detail of the map and identification of artifacts.

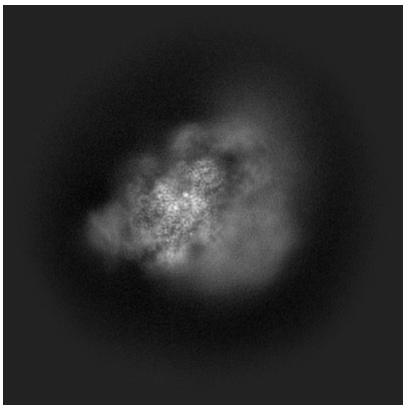
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

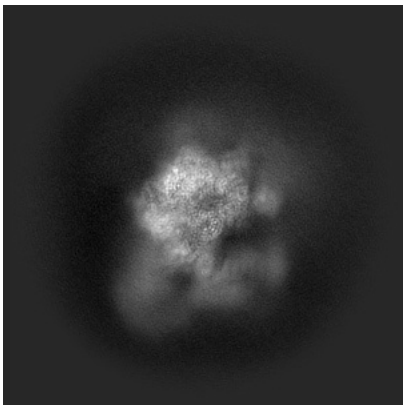
6.1.1 Primary map



X

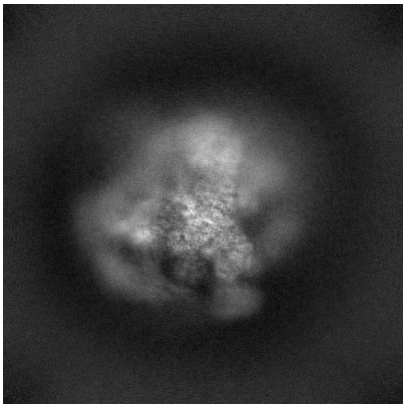


Y

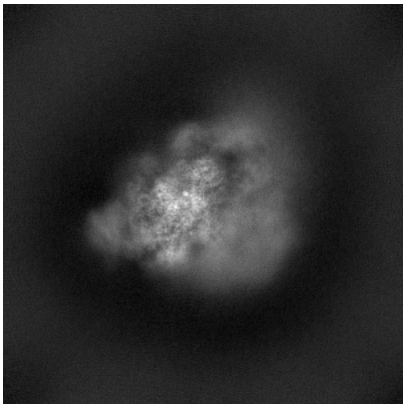


Z

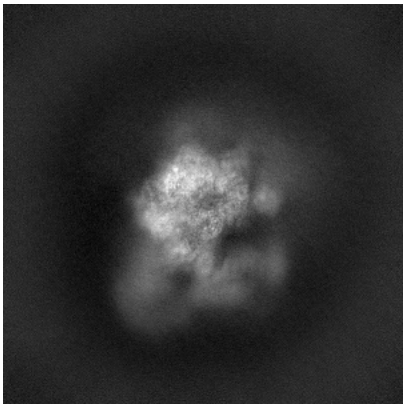
6.1.2 Raw map



X



Y

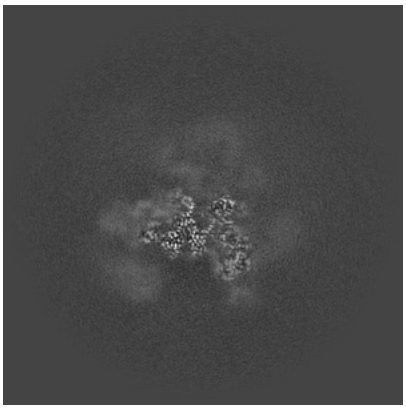


Z

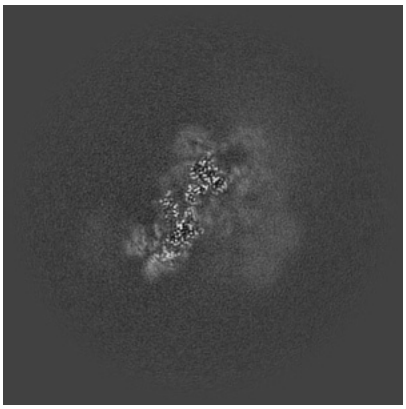
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

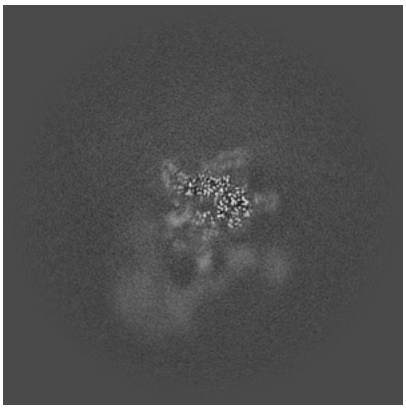
6.2.1 Primary map



X Index: 240

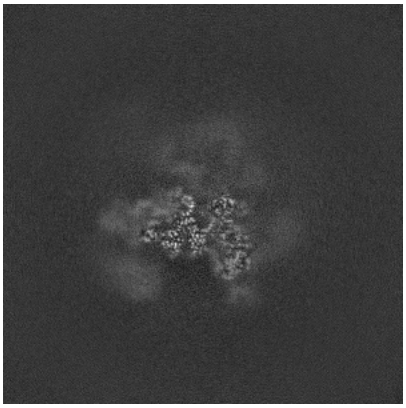


Y Index: 240

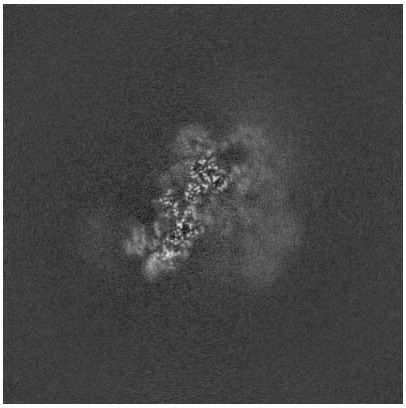


Z Index: 240

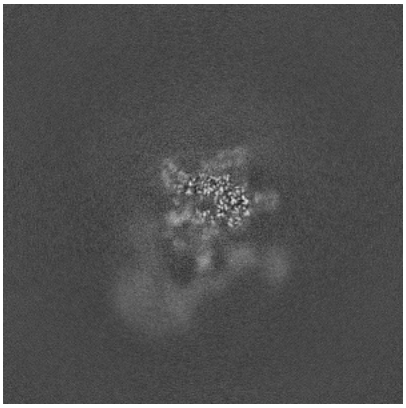
6.2.2 Raw map



X Index: 240



Y Index: 240

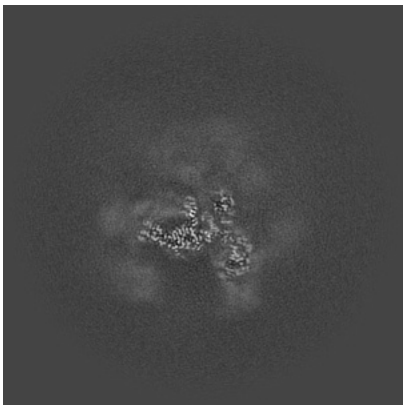


Z Index: 240

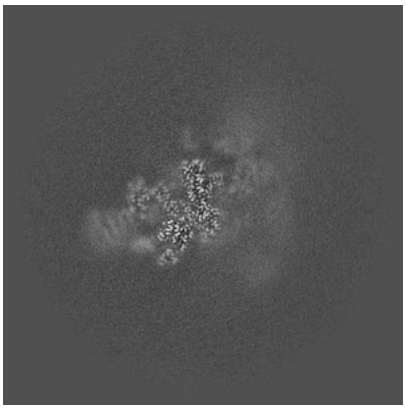
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

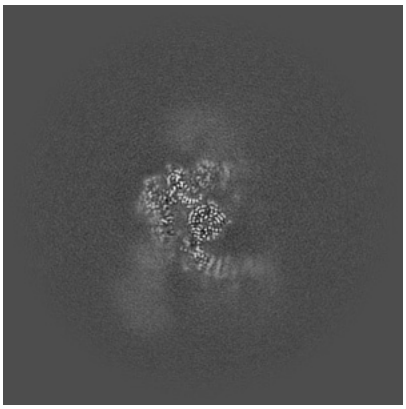
6.3.1 Primary map



X Index: 235

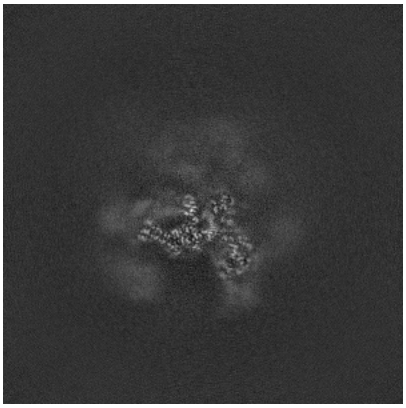


Y Index: 262

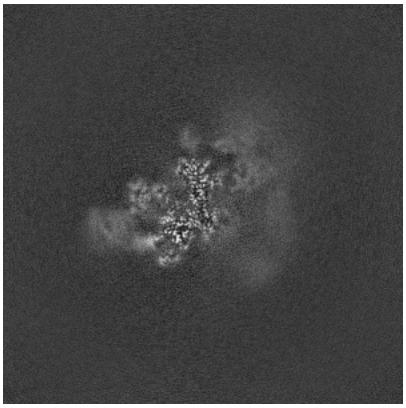


Z Index: 200

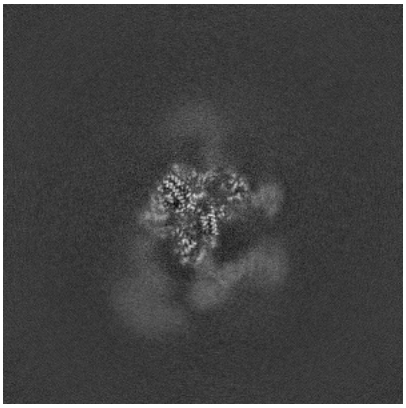
6.3.2 Raw map



X Index: 236



Y Index: 259

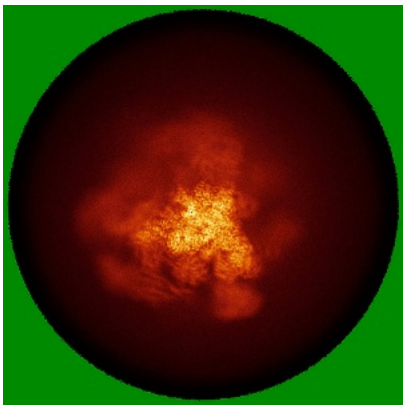


Z Index: 218

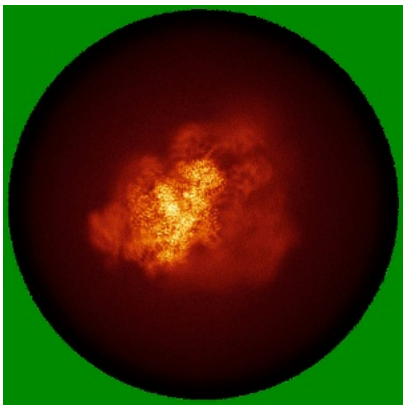
The images above show the largest variance slices of the map in three orthogonal directions.

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

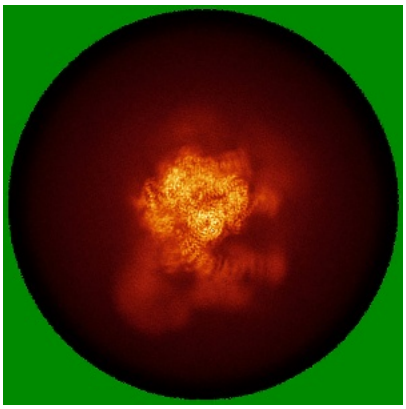
6.4.1 Primary map



X

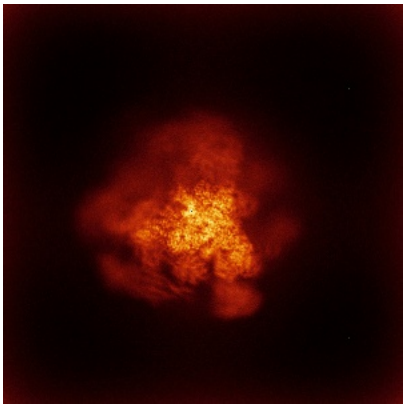


Y

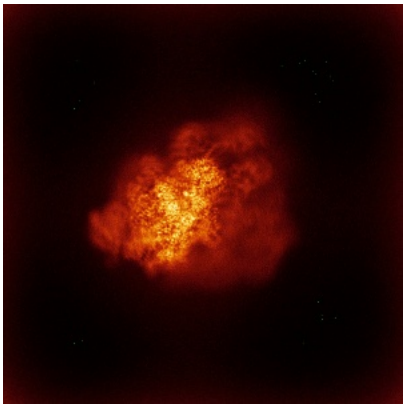


Z

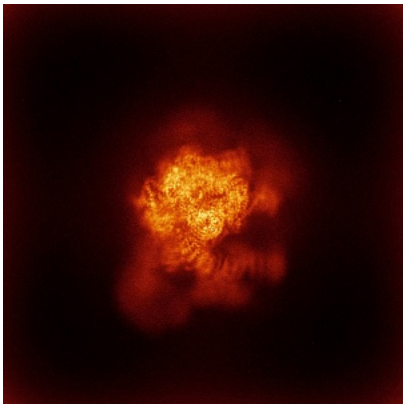
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

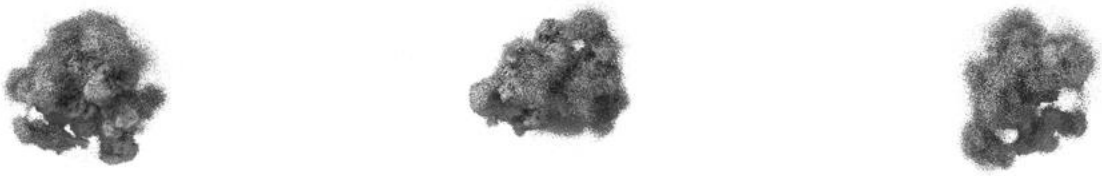
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.24. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

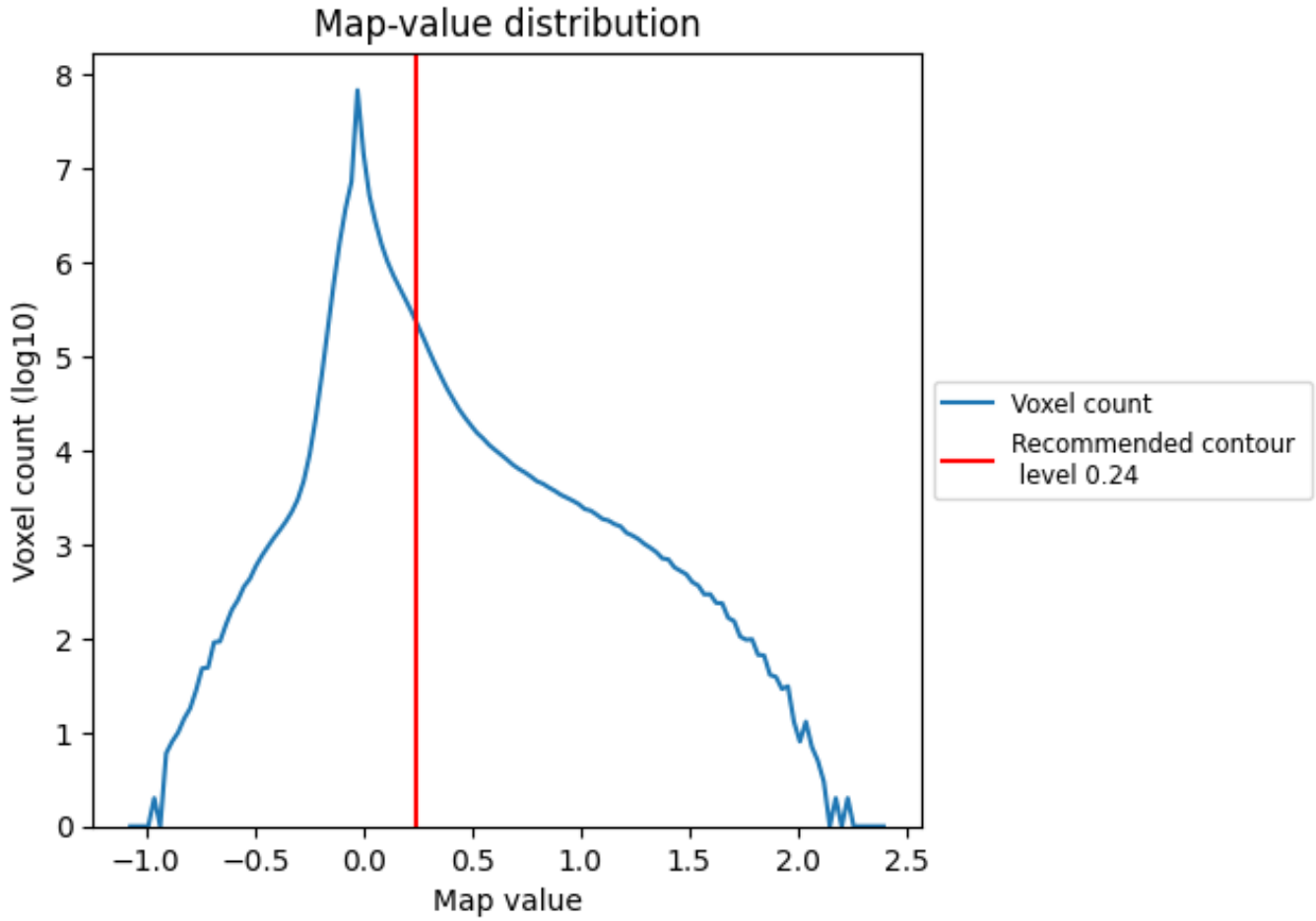
6.6 Mask visualisation (i)

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

7 Map analysis

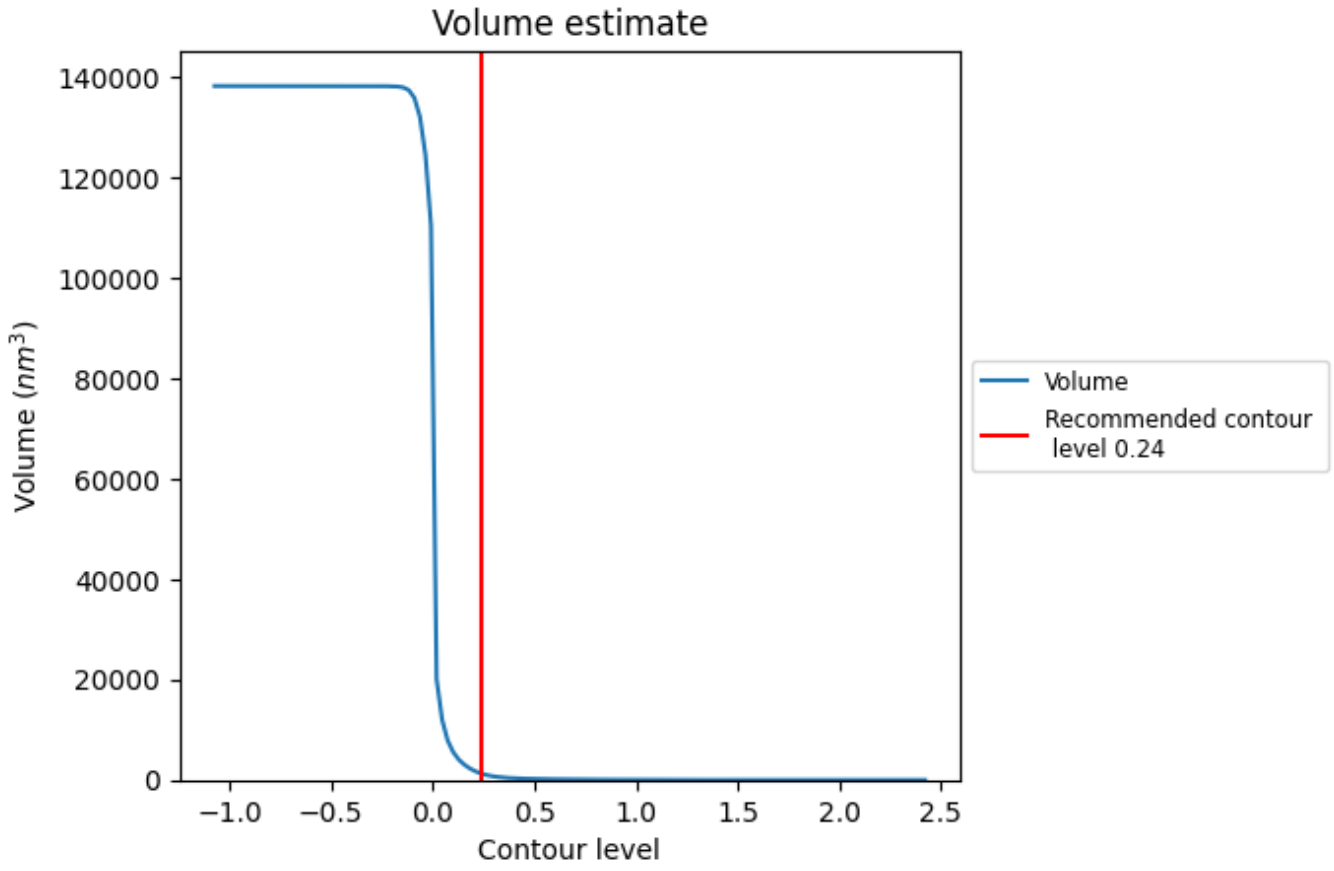
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

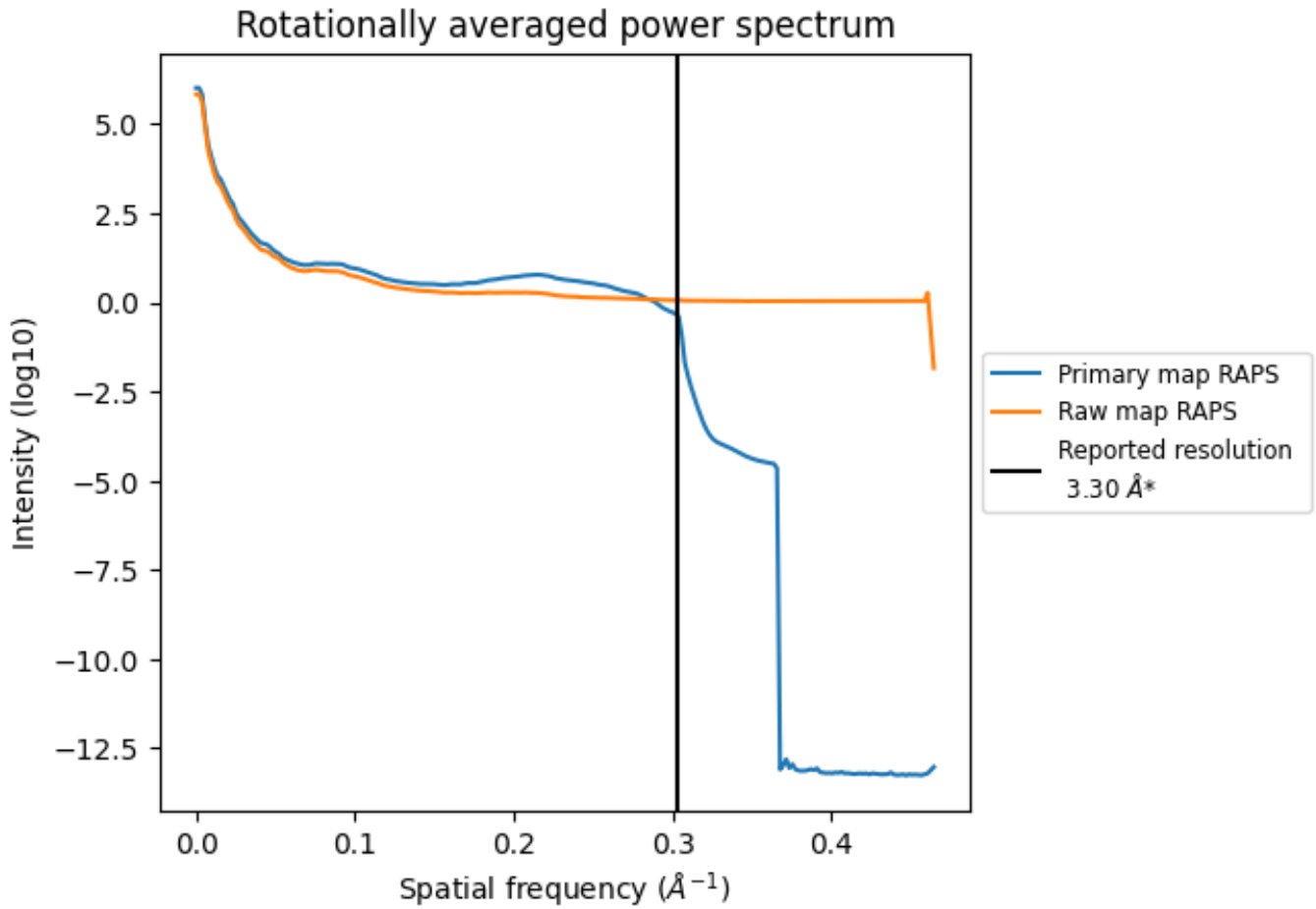
7.2 Volume estimate (i)



The volume at the recommended contour level is 1270 nm^3; this corresponds to an approximate mass of 1147 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)

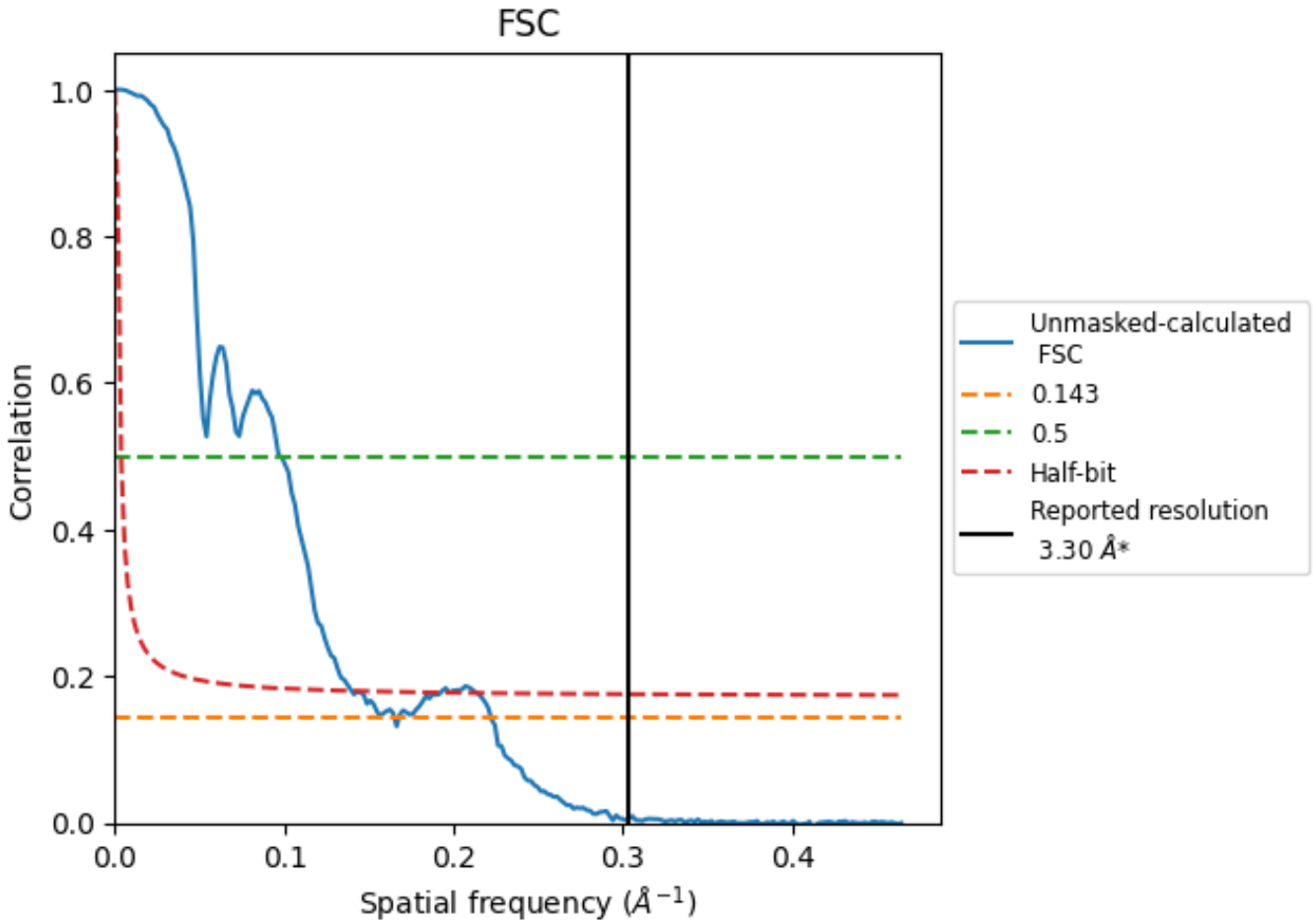


*Reported resolution corresponds to spatial frequency of 0.303 $Å^{-1}$

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.303 Å^{-1}

8.2 Resolution estimates (i)

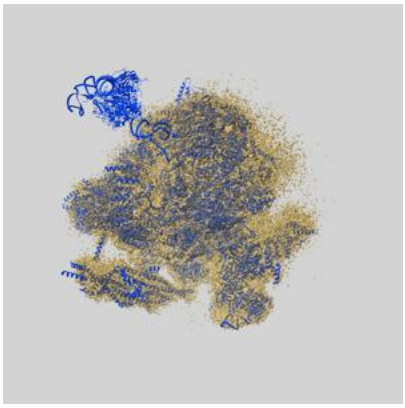
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.06	10.25	7.15

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.06 differs from the reported value 3.3 by more than 10 %

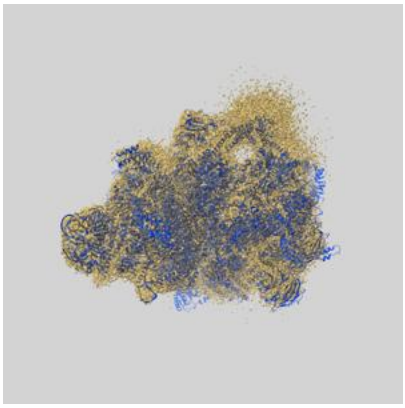
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-35110 and PDB model 8I0U. Per-residue inclusion information can be found in section 3 on page 14.

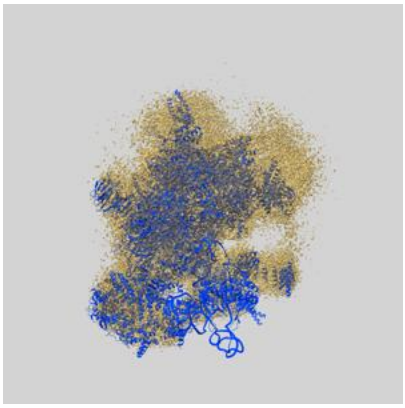
9.1 Map-model overlay



X



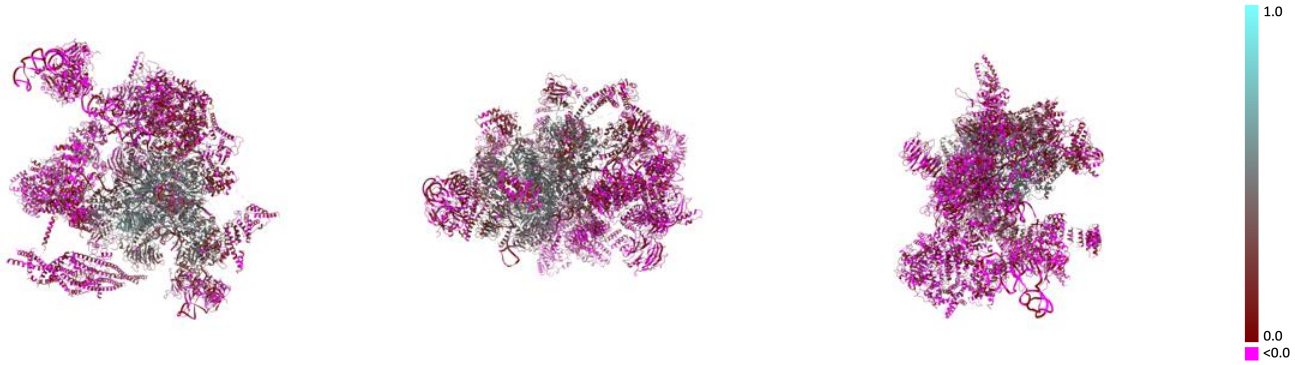
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.24 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.

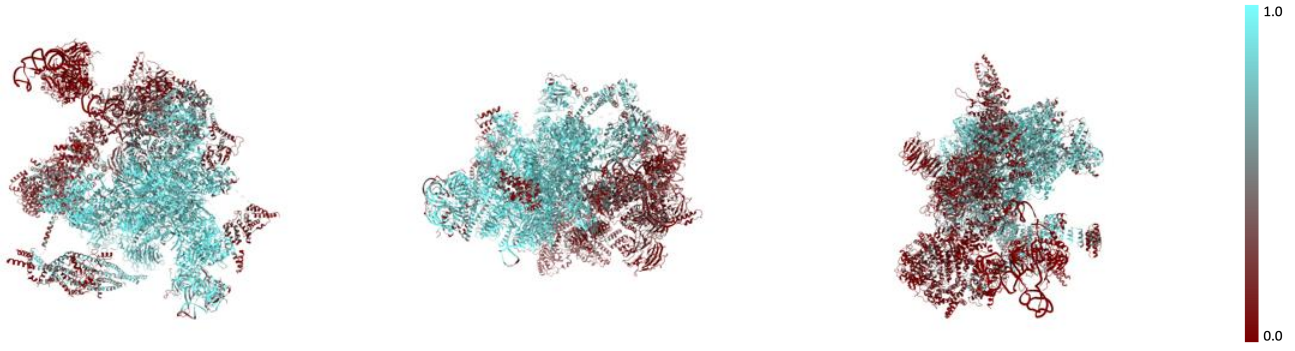
9.2 Q-score mapped to coordinate model (i)



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.

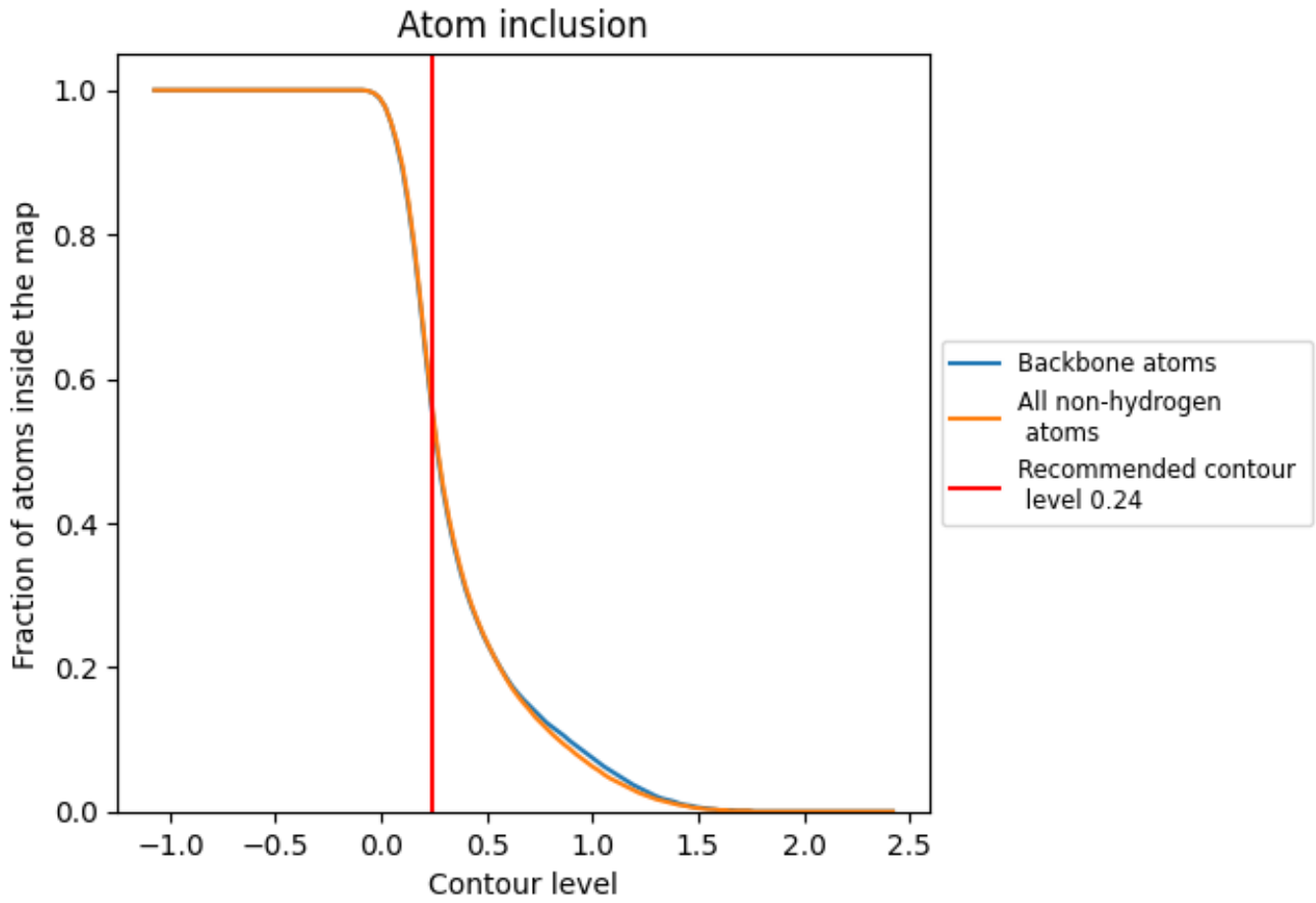
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.24).

9.4 Atom inclusion (i)



At the recommended contour level, 56% of all backbone atoms, 56% 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 (0.24) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5640	0.1950
1	0.3010	0.0610
2	0.1370	0.0270
3	0.1540	0.0140
4	0.0820	0.0730
5	0.1900	0.0420
7	0.2500	0.0280
A	0.8410	0.4130
B	0.8840	0.2950
C	0.9260	0.3690
E	0.9220	0.3010
F	0.8990	0.3120
G	0.7160	0.1670
H	0.2260	0.0480
I	0.4770	0.0620
J	0.7680	0.2640
K	0.5190	0.1250
L	0.7490	0.2670
M	0.7880	0.2730
N	0.9310	0.4230
O	0.8600	0.3210
P	0.8790	0.4120
Q	0.1160	0.0130
R	0.8110	0.3270
S	0.8680	0.1710
T	0.9810	0.5470
U	0.6150	0.2860
V	0.5210	0.1380
W	0.3650	0.0840
X	0.6580	0.1520
Y	0.7070	0.1480
Z	0.5870	0.0830
a	0.7410	0.1220
b	0.8170	0.0700
c	0.6830	0.0420

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Chain	Atom inclusion	Q-score
d	0.7370	0.0720
e	0.7220	0.0200
f	0.7030	0.0640
g	0.8890	0.1830
h	0.0000	-0.0280
i	0.0000	0.0130
j	0.0000	0.0080
k	0.0000	-0.0330
l	0.0020	0.0010
m	0.0000	0.0040
n	0.0000	0.0480
o	0.0000	-0.0050
p	0.0020	0.0130
q	0.2560	0.0050
r	0.4110	0.0430
s	0.3380	0.0280
t	0.2160	0.0160
w	0.1590	0.0060
y	0.1270	0.0130