



wwPDB EM Validation Summary Report ⓘ

Oct 28, 2024 – 04:39 AM JST

PDB ID : 8I0T
EMDB ID : EMD-35109
Title : The cryo-EM structure of human Bact-III complex
Authors : Zhan, X.; Lu, Y.; Shi, Y.
Deposited on : 2023-01-11
Resolution : 3.00 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 ⓘ 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.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

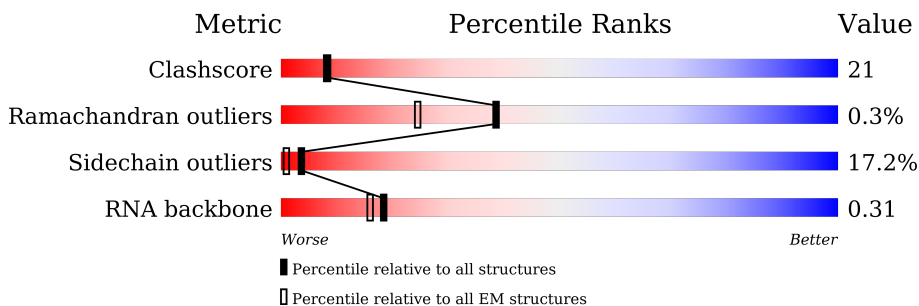
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.00 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 $\leq 5\%$. 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	
2	B	117	
3	C	972	
4	D	2136	
5	E	357	
6	F	107	
7	G	220	




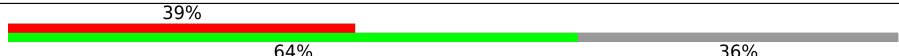
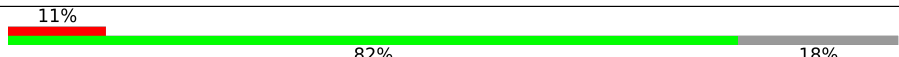
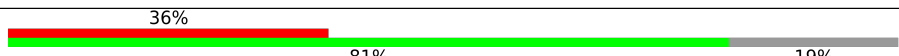
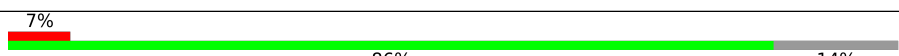
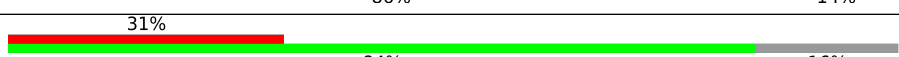

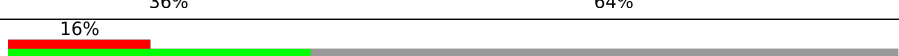
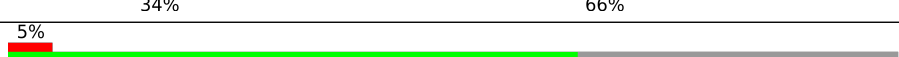

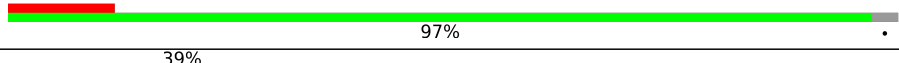
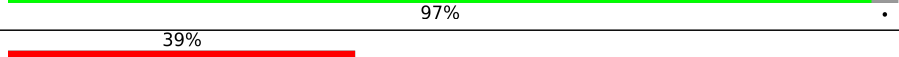
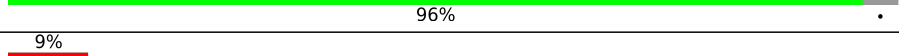









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Mol	Chain	Length	Quality of chain
8	H	188	
9	I	855	
10	J	848	
11	K	343	
12	L	802	
13	N	144	
14	O	420	
15	P	229	
16	Q	1485	
17	R	536	
18	S	166	
19	T	514	
20	U	2752	
21	V	908	
22	W	579	
23	X	1041	
24	Y	492	
25	Z	225	
26	1	1304	
27	3	1217	
28	p	225	
29	w	501	
30	2	895	
31	4	424	
32	7	110	

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Mol	Chain	Length	Quality of chain
33	5	86	
34	y	301	
35	v	464	
36	o	255	
37	c	118	
37	h	118	
38	d	86	
38	i	86	
39	a	240	
39	m	240	
40	g	126	
40	l	126	
41	f	76	
41	k	76	
42	e	92	
42	j	92	
43	b	119	
43	n	119	
44	u	793	
45	q	504	
45	r	504	
45	s	504	
45	t	504	
46	9	520	

2 Entry composition

There are 50 unique types of molecules in this entry. The entry contains 120623 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	2242	18543	11943	3241	3280	79	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 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 RNA chain called U6 snRNA.

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

- Molecule 7 is a RNA chain called Pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	72	Total	C	N	O	P	0	0
			1503	673	248	510	72		

- Molecule 8 is a RNA chain called U2 snRNA.

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

- Molecule 9 is a protein called Pre-mRNA-splicing factor SYF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	I	571	Total	C	N	O	0	0
			2880	1738	571	571		

- Molecule 10 is a protein called Crooked neck-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	249	Total	C	N	O	S	0	0
			2116	1355	380	375	6		

- Molecule 11 is a protein called RING finger protein 113A.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	49	Total	C	N	O	S	0	0
			411	258	70	80	3		

- Molecule 12 is a protein called Cell division cycle 5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	328	Total	C	N	O	S	0	0
			2192	1361	421	406	4		

- 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	C	N	O	0	0
			1447	862	292	293		

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

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

- Molecule 16 is a protein called RNA helicase aquarius.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	Q	1329	Total	C	N	O	0	0
			6730	4072	1329	1329		

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

Mol	Chain	Residues	Atoms					AltConf	Trace	
17	R	361	Total	C	N	O	P	S	0	0
			2760	1694	524	529	1	12		

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

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

- Molecule 19 is a protein called Pleiotropic regulator 1.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	1	816	6486	4163	1119	1165	39	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	3	1177	9220	5854	1566	1755	45	0	0

- Molecule 28 is a protein called U2 small nuclear ribonucleoprotein B''.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
29	w	434	Total	C	N	O	S	0	0
			2275	1287	491	493	4		

- Molecule 30 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	2	250	Total	C	N	O	S	0	0
			1807	1134	340	326	7		

- Molecule 31 is a protein called Splicing factor 3B subunit 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	4	161	Total	C	N	O	0	0
			792	470	161	161		

- Molecule 32 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	7	81	Total	C	N	O	S	0	0
			613	376	109	115	13		

- Molecule 33 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	5	77	Total	C	N	O	S	0	0
			635	403	110	117	5		

- Molecule 34 is a protein called Peptidyl-prolyl cis-trans isomerase E.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	y	79	Total	C	N	O	0	0
			390	232	79	79		

- Molecule 35 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	v	173	1041	602	219	217	3	0	0

- Molecule 36 is a protein called U2 small nuclear ribonucleoprotein A'.

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

- Molecule 37 is a protein called Small nuclear ribonucleoprotein Sm D2.

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

- Molecule 38 is a protein called Small nuclear ribonucleoprotein F.

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

- Molecule 39 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

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

- Molecule 40 is a protein called Small nuclear ribonucleoprotein Sm D3.

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

- Molecule 41 is a protein called Small nuclear ribonucleoprotein G.

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

- Molecule 42 is a protein called Small nuclear ribonucleoprotein E.

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

- Molecule 43 is a protein called Small nuclear ribonucleoprotein Sm D1.

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

- Molecule 44 is a protein called Splicing factor 3A subunit 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	u	187	Total	C	N	O	0	0
			834	460	187	187		

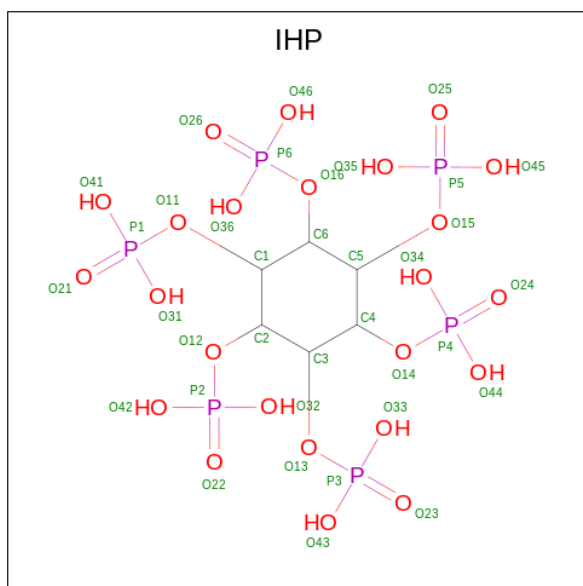
- Molecule 45 is a protein called Pre-mRNA-processing factor 19.

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

- Molecule 46 is a protein called RING-type E3 ubiquitin-protein ligase PPIL2.

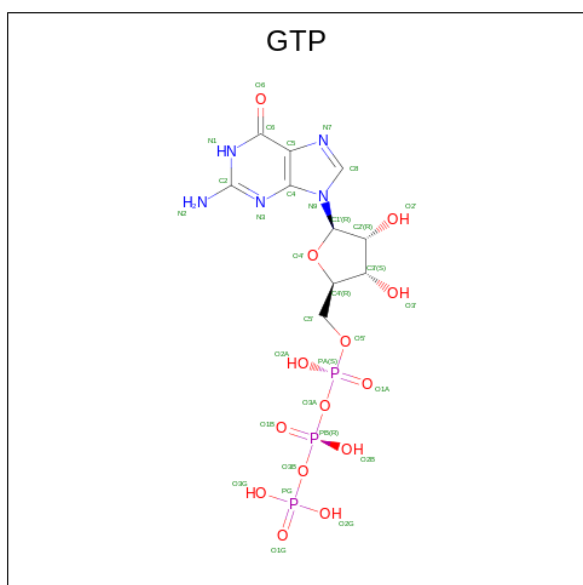
Mol	Chain	Residues	Atoms				AltConf	Trace	
			Total	C	N	O			S
46	9	338	2307	1429	420	450	8	0	0

- Molecule 47 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: $C_6H_{18}O_{24}P_6$).



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

- Molecule 48 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	
48	C	1	32	10	5	14	3	0

- Molecule 49 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
49	C	1	1	1	0
49	F	6	6	6	0

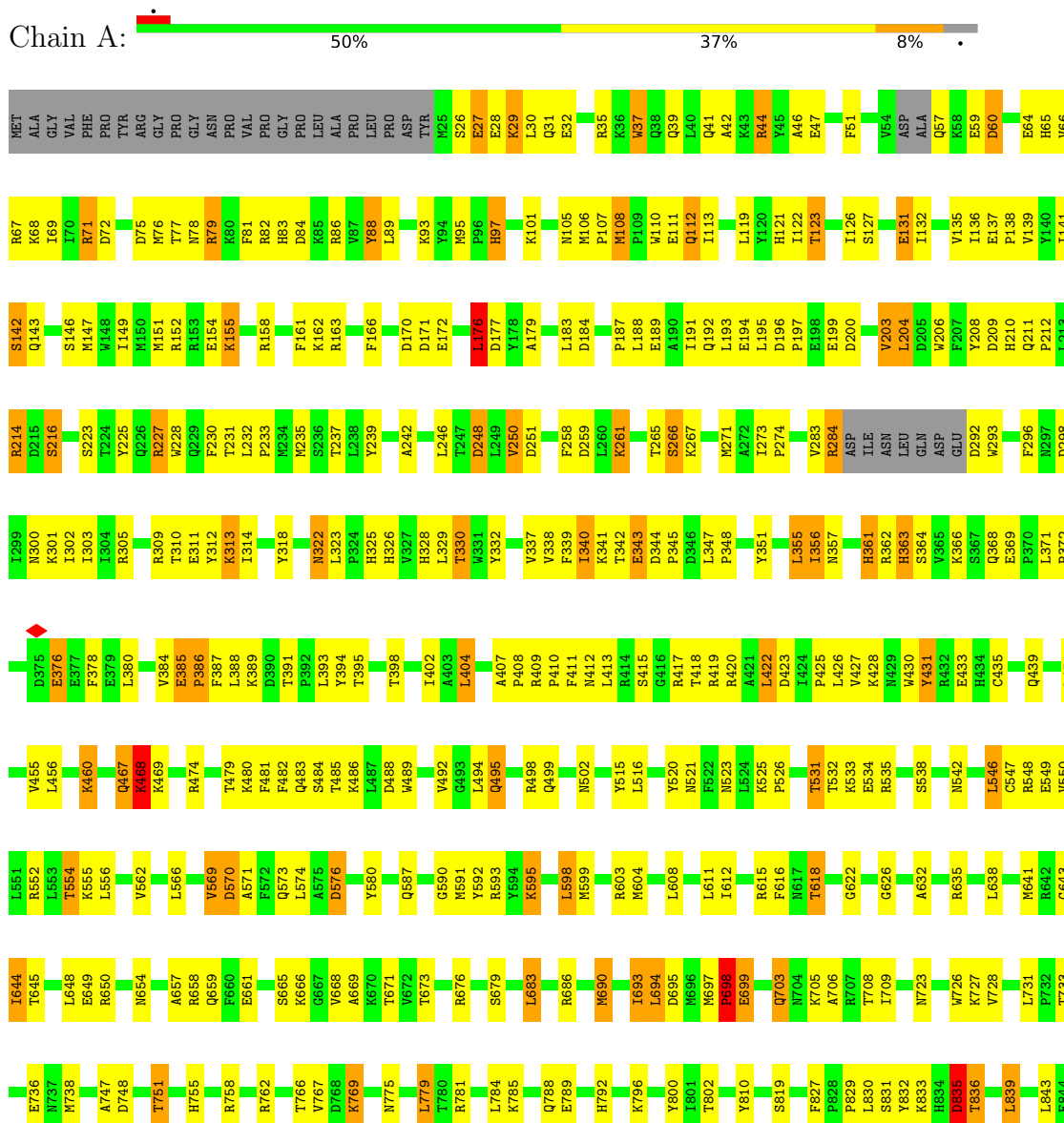
- Molecule 50 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
50	K	1	1	1	0
50	N	3	3	3	0
50	7	3	3	3	0

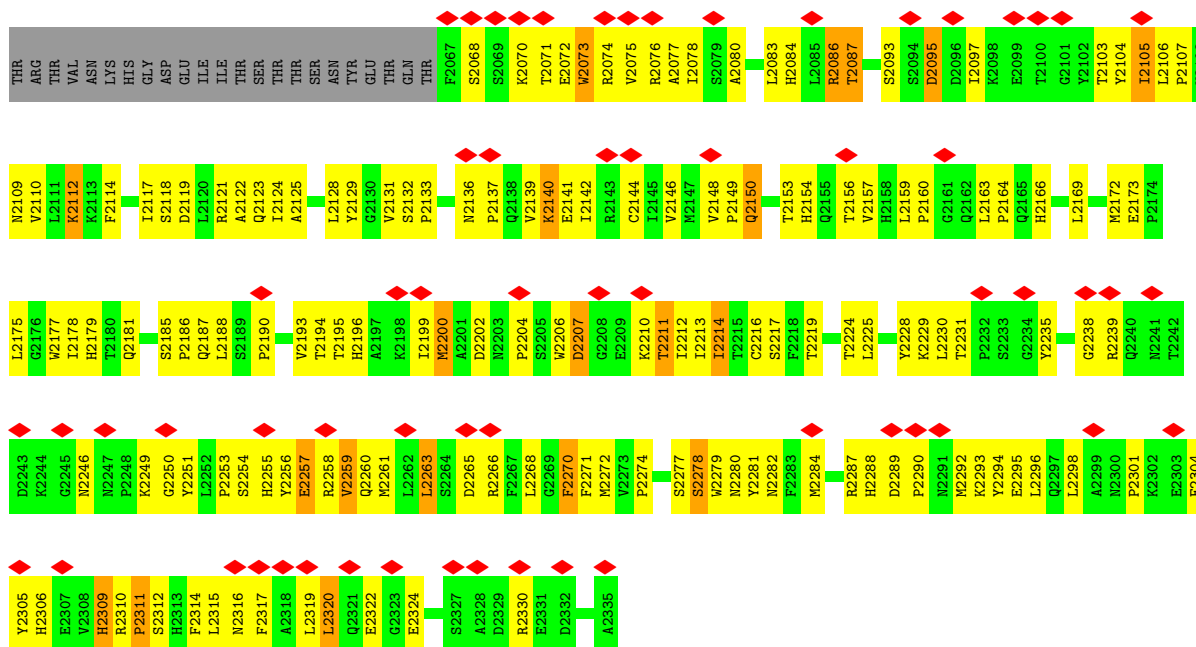
3 Residue-property plots

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.

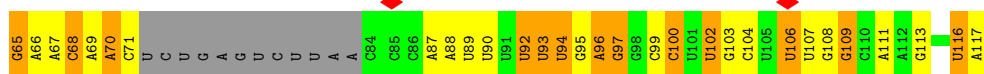
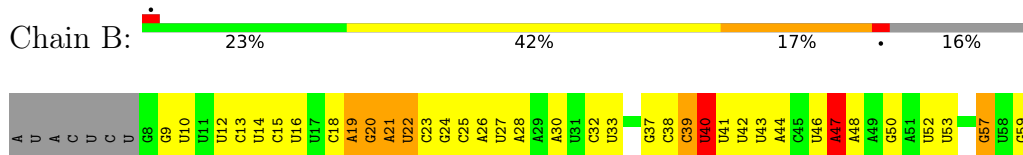
• Molecule 1: Pre-mRNA-processing-splicing factor 8



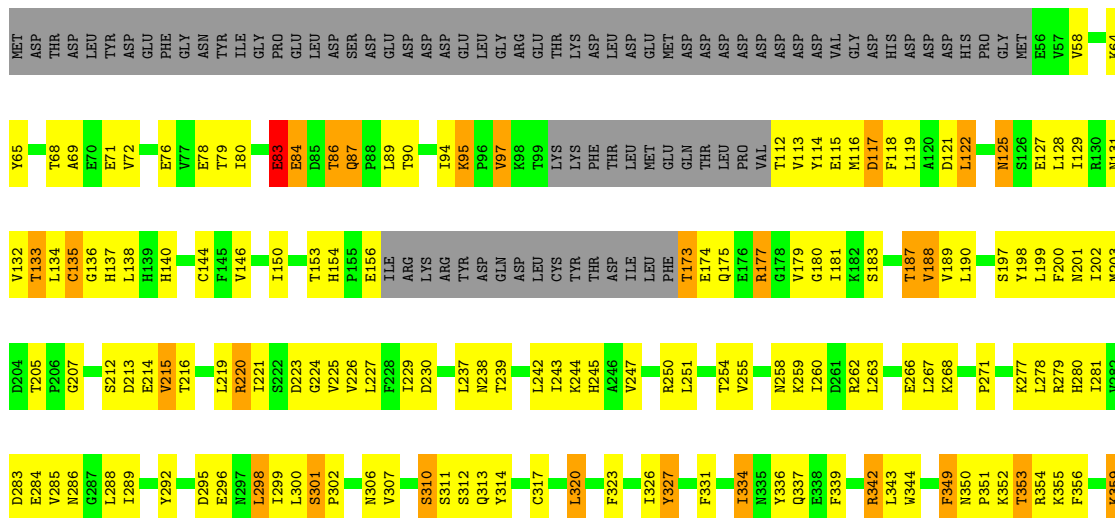
V1981	V1982	L1983	K1984	D1985	N1986	L1987	L1988	A1989	V1990	L1991	G1992	K1993	V1997	N1998	V1999	A2000	S2001	L2002	T2003	Q2004	S2005	E2006	T2007	R2008	D2009	L2010	L2011	L2012	E2015	ILE	SER	ALA	PRO	SER	SER	GLN	GLN	ARG	GLN	GLN	ILE	ALA	GLU	ILE	GLU	LYS	GLN	THR	LYS	THR	GLU	SER	GLN	GLN	LEU	THR	ALA	THR	GLN
E1844	V1845	A1846	A1847	L1848	L1849	R1850	S1851	L1852	P1853	V1854	E1855	Q1856	Q1857	P1858	K1859	Q1860	I1861	V1862	V1863	R1864	R1865	K1866	G1867	M1868	L1869	D1870	L1871	L1872	V1873	L1874	H1875	L1876	L1877	D1878	P1879	M1880	I1881	V1882	V1883	K1884	G1885	G1886	S1887	E1888	L1889	Q1890	L1891	P1892	L1893	L1894	L1895	C1896	L1897	F1902	G1903	I1906	L1907		
M1914	L1915	L1916	F1917	N1918	L1919	L1920	V1921	L1922	S1923	V1924	K1925	T1926	V1927	V1928	V1929	V1930	T1931	F1932	F1933	R1934	R1935	L1936	L1937	L1938	L1939	R1940	R1941	L1942	L1943	H1944	V1945	N1946	N1947	N1948	R1949	A1950	K1951	L1952	D1957	K1958	L1959	T1962	H1965	H1966	I1967	W1968	L1971	T1972	D1973	L1974	E1975	W1976	L1977	K1978	L1979	E1980			
W1778	F1779	D1780	D1781	T1782	T1783	N1784	R1787	V1788	T1789	I1790	H1791	K1792	T1793	F1794	E1795	L1798	T1799	T1800	N1804	A1805	L1806	F1808	L1809	F1810	N1811	P1812	R1813	L1814	G1815	Q1816	L1817	F1818	K1819	I1820	I1821	T1824	S1825	A1826	Q1829	K1830	K1831	R1832	L1833	G1834	Q1835	L1836	A1837	K1838	W1839	K1840	A1842	E1843							
D1690	M1691	S1697	P1698	T1699	G1700	V1701	L1702	D1706	M1710	L1711	H1712	S1713	A1714	G1716	M1717	F1719	P1720	G1721	S1722	K1723	P1724	L1725	I1726	Q1727	M1730	M1734	K1735	E1745	R1746	L1751	S1756	P1761	Y1762	L1763	S1764	S1765	Q1766	N1767	Y1768	G1769	E1770	L1771	F1772	S1773	M1774	Q1775	I1776	I1777											
M1623	S1624	C1625	A1626	D1627	L1628	L1629	L1630	L1631	S1634	Y1635	Y1636	K1636	M1637	V1638	M1639	S1640	R1641	P1642	S1643	L1644	G1645	A1646	T1647	S1648	K1649	M1652	D1653	S1654	T1655	T1656	H1657	K1658	R1659	Y1660	M1661	I1662	D1663	I1664	R1667	L1670	Y1671	D1672	D1675	I1676	E1677	R1678	R1681	F1684	L1685	D1686	L1687	T1688	T1689						
L1526	M1527	R1532	R1533	L1536	S1539	M1543	R1544	Y1548	V1553	Q1554	L1555	T1558	G1559	T1568	L1569	S1572	Q1575	H1580	L1581	W1582	Q1583	K1584	I1585	I1589	V1590	L1593	E1600	L1601	L1604	E1605	I1606	E1607	T1608	Y1609	Q1610	I1614	H1615	W1616	R1617	K1618	M1622																		
D1441	Y1445	K1449	Q1450	W1455	T1456	H1457	Q1458	R1459	H1460	D1461	G1462	L1467	M1468	W1469	Y1470	D1473	E1482	L1484	L1485	E1486	L1489	F1490	K1491	G1492	T1493	F1494	F1495	D1496	T1497	W1498	E1499	F1502	W1503	E1504	K1505	ALA	SER	GLY	PHE	GLU	SER	LYS	MET	W1515	K1516	R1517	V1518	R1523											
H1359	E1360	E1361	D1362	Q1363	M1367	L1368	Y1369	R1370	Y1371	I1372	Q1373	F1374	W1375	E1376	S1377	E1378	S1382	Q1383	R1384	L1391	Q1394	I1397	A1398	Q1399	N1400	R1401	L1402	L1403	F1406	D1407	L1408	E1409	S1411	D1413	W1414	R1414	G1415	I1416	P1417	R1418	I1419	M1420	Q1424	R1427	W1436	R1437	V1438	R1439	L1440										
K1262	I1268	T1272	Y1273	F1274	R1275	E1276	L1288	V1289	M1293	R1298	I1301	G1302	L1303	K1306	F1311	F1315	F1316	Y1317	T1318	P1319	K1320	E1321	G1324	L1325	L1328	H1332	V1333	L1334	I1335	P1336	Q1337	S1338	D1339	T1346	D1347	V1348	G1349	I1350	H1352																				
S1173	F1174	S1179	K1180	D1181	M1182	F1183	M1184	L1185	L1186	M1189	C1190	E1193	G1194	R1195	P1198	K1199	C1200	R1201	S1203	Y1204	E1205	E1206	F1207	L1208	H1209	K1210	D1211	G1212	K1213	K1131	K1132	R1136	M1218	E1219	V1220	T1221	K1222	E1223	R1224	E1235	R1243	Q1246	S1251	G1252	W1258	I1259	N1261												
D1070	D1076	T1079	C1089	R1090	Y1091	Q1092	Q1095	Q1097	Y0961	E972	F1098	F1099	R1100	H1096	I1097	F1098	F1099	R1100	N1122	N1123	N1124	N1125	N1126	G1127	I1000	Y1001	D1002	T1010	A1011	K1012	M1013	M1014	M1018	Y1019	K1020	D1021	M1022	S1027	Y1028	G1029	I1030	A990	R1032	K932	R933	F1039	I1040	W939	I940	K941	P942								
R845	Y850	S854	R855	L856	M857	Q858	S859	Q860	R861	E862	E863	L864	G865	L866	Y871	D872	R873	H874	H875	E876	S879	R883	H884	L885	L886	T887	Q888	R889	E893	Y902	L905	Y909	P813	L914	E915	K916	D923	E929	A990	D931	R932	R933	F1039	I1040	W939	I940	K941	P942											

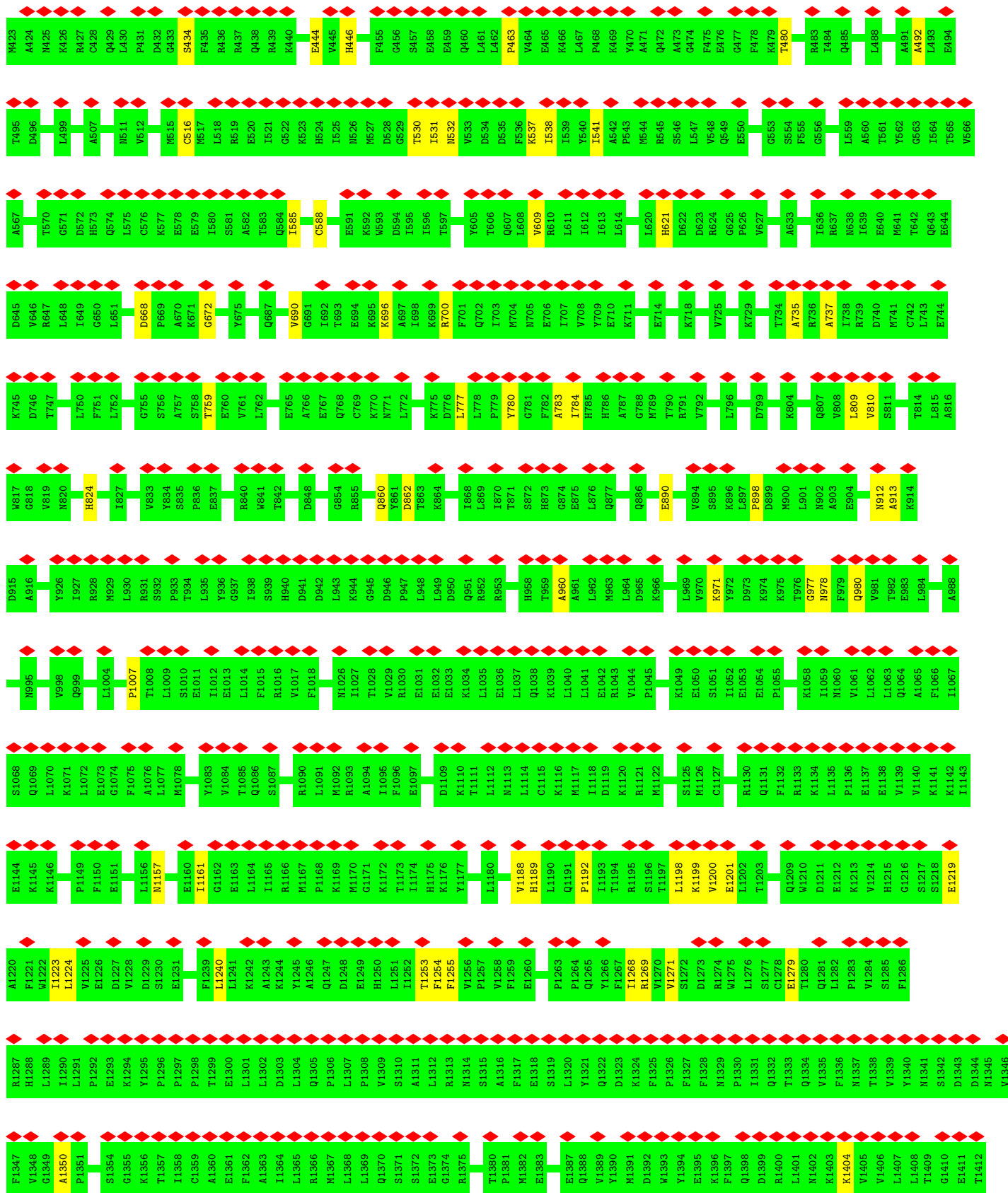


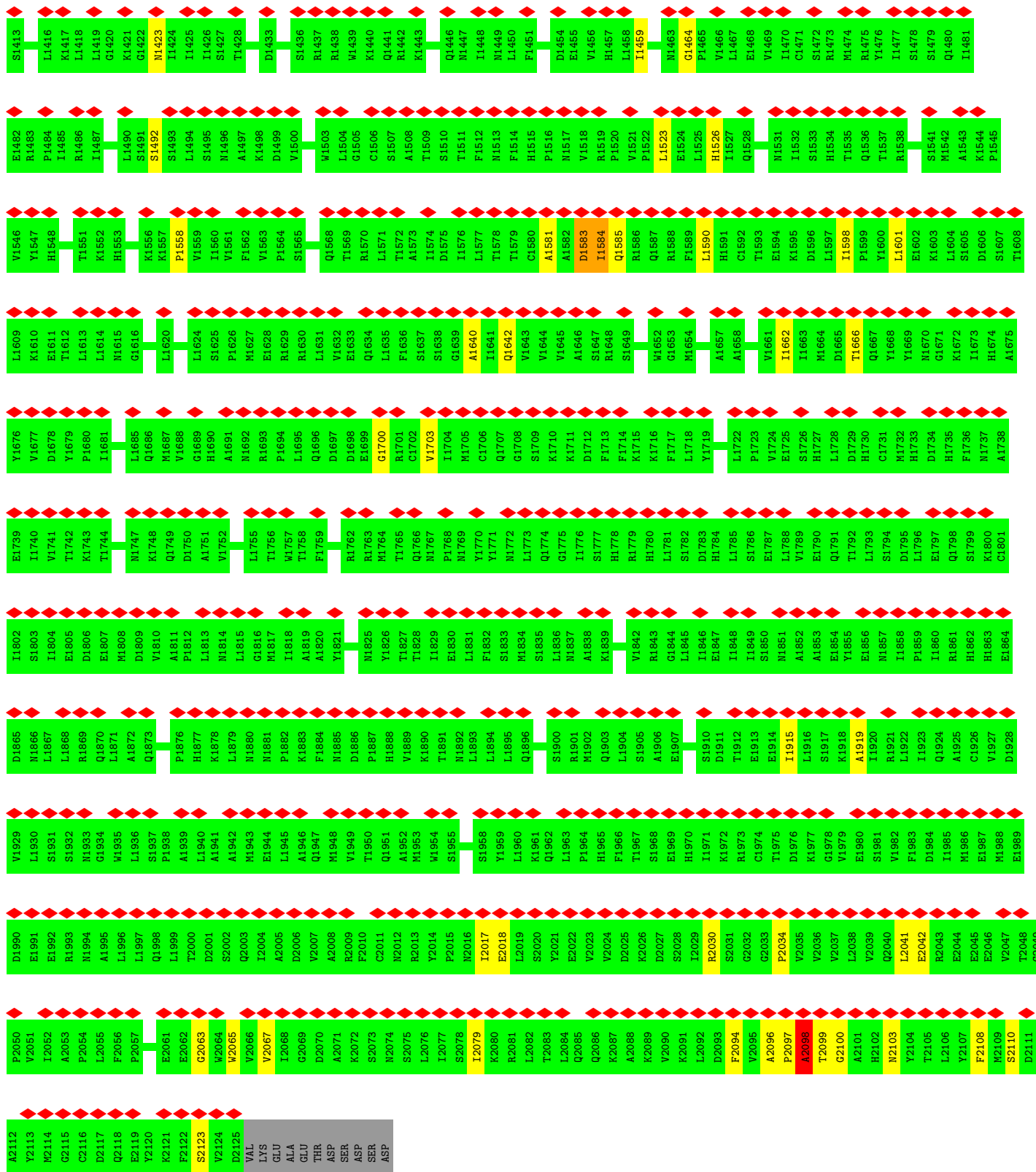
● Molecule 2: U5 snRNA



● Molecule 3: 116 kDa U5 small nuclear ribonucleoprotein component

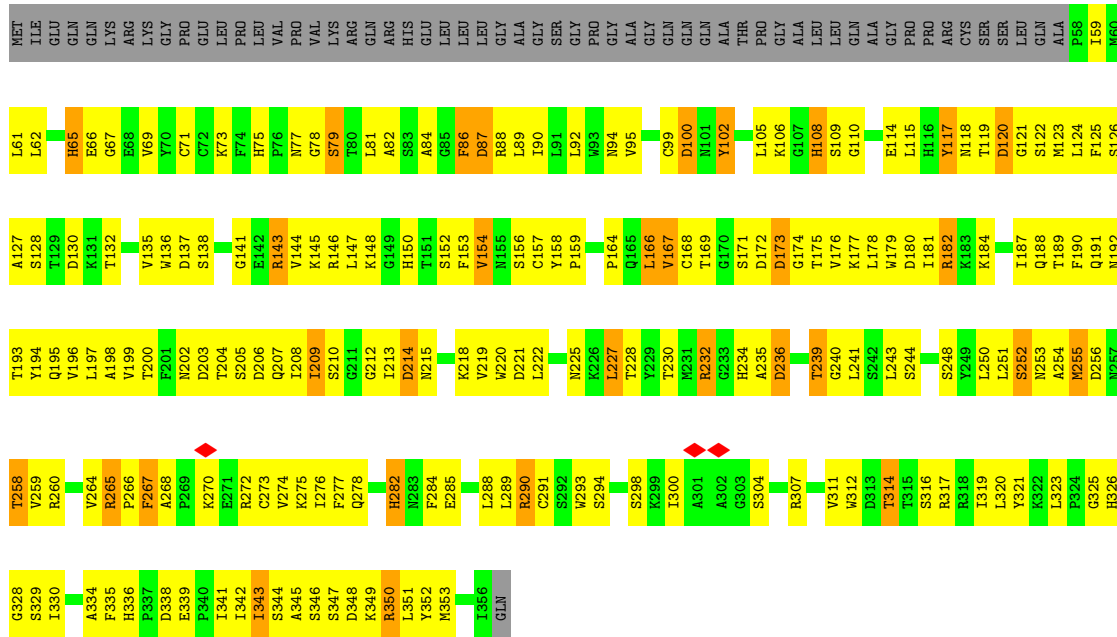




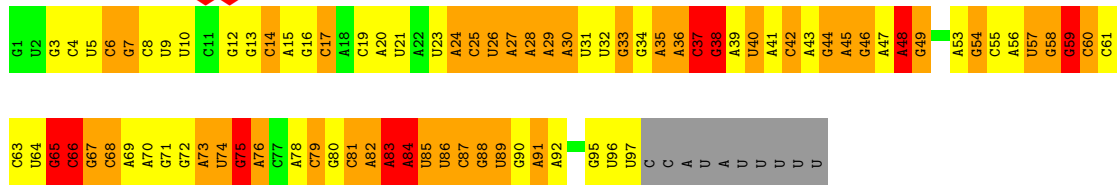


• Molecule 5: U5 small nuclear ribonucleoprotein 40 kDa protein

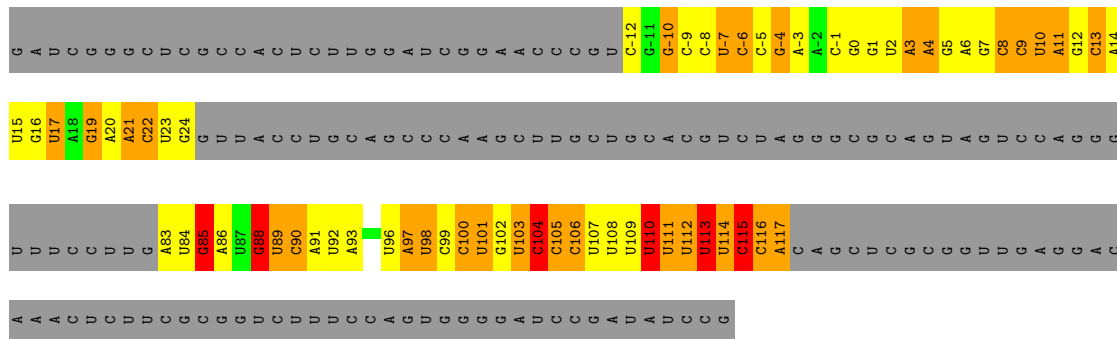




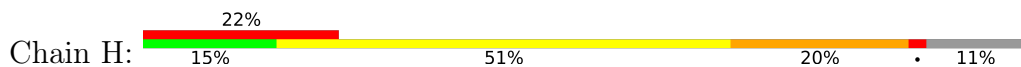
• Molecule 6: U6 snRNA

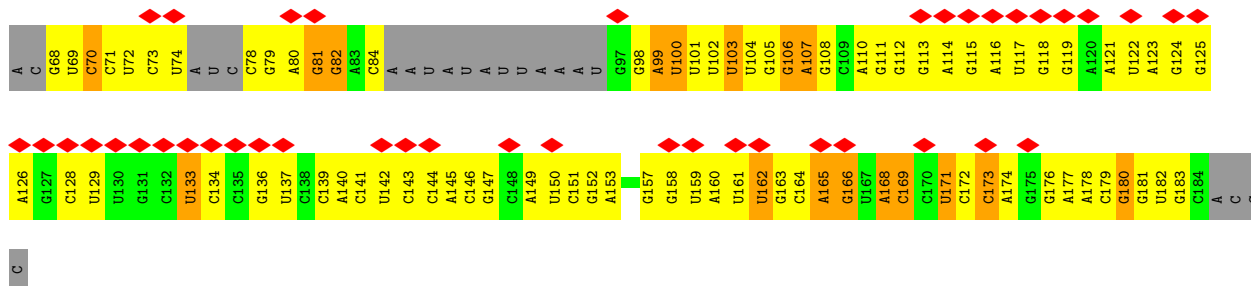


• Molecule 7: Pre-mRNA

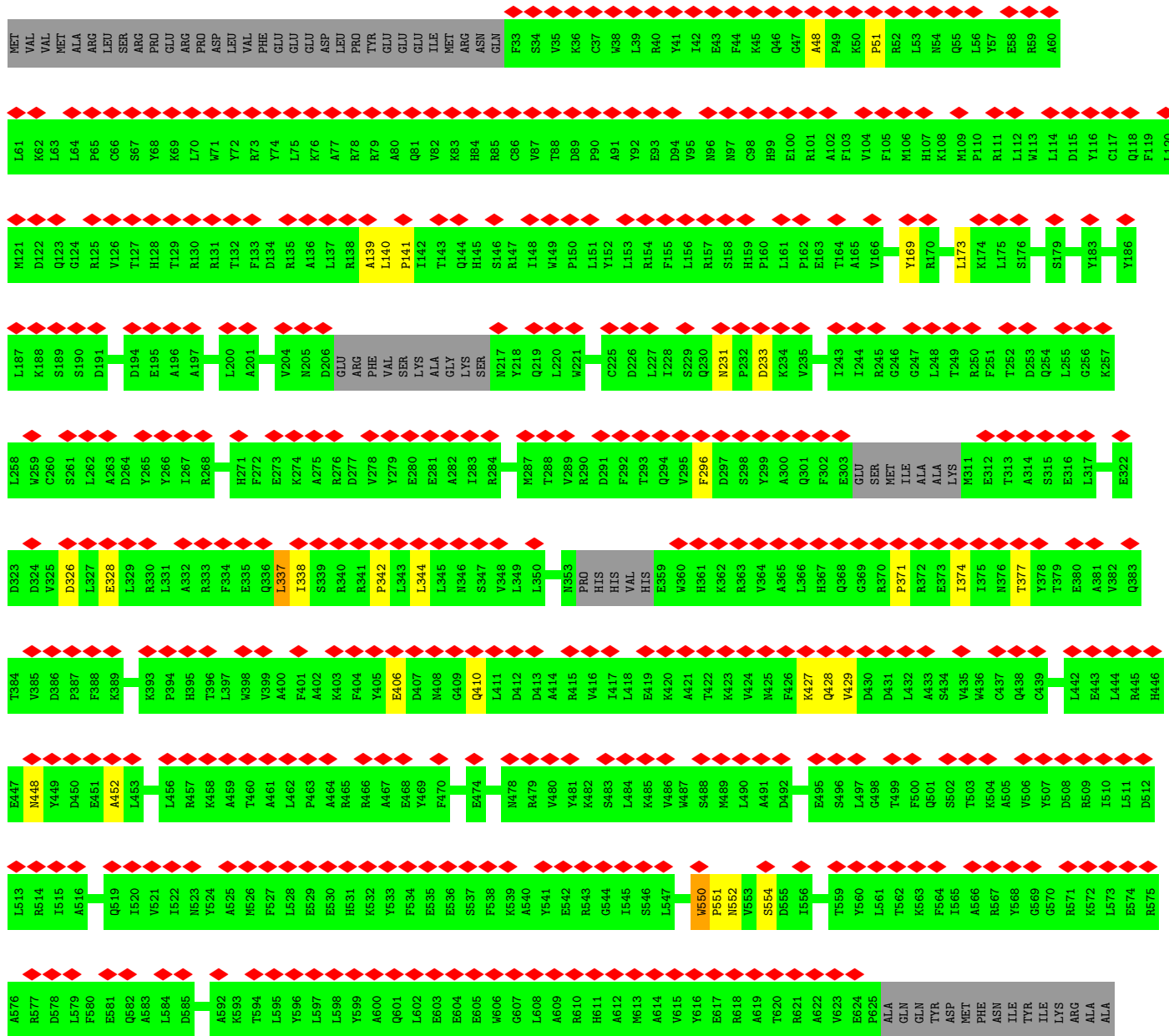


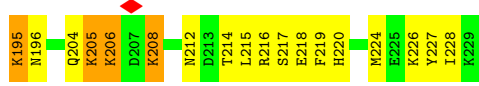
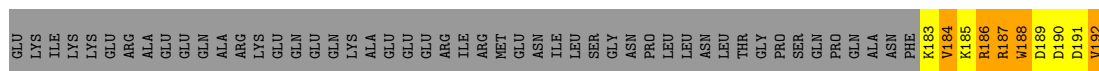
• Molecule 8: U2 snRNA



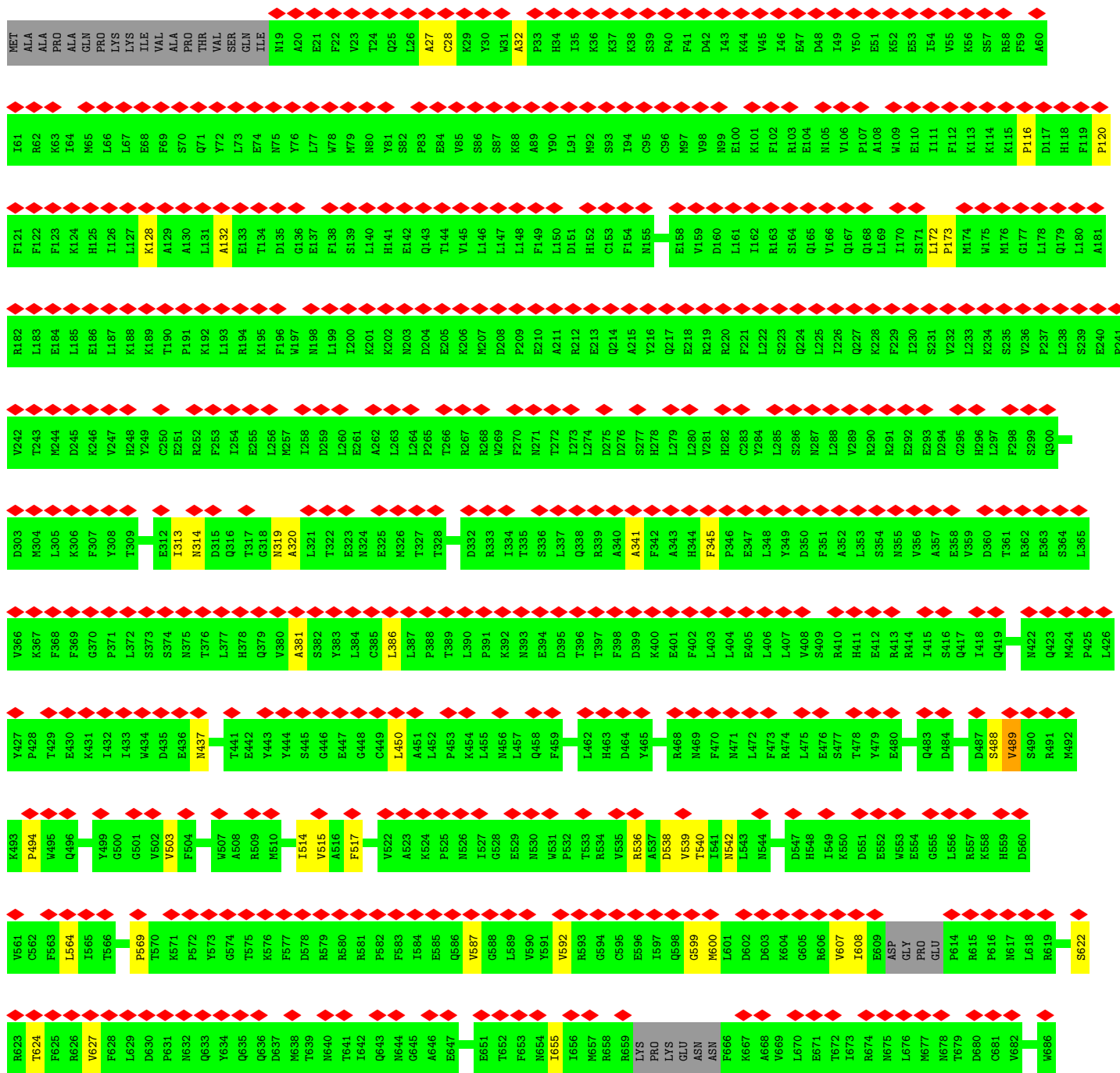
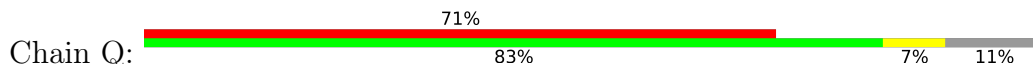


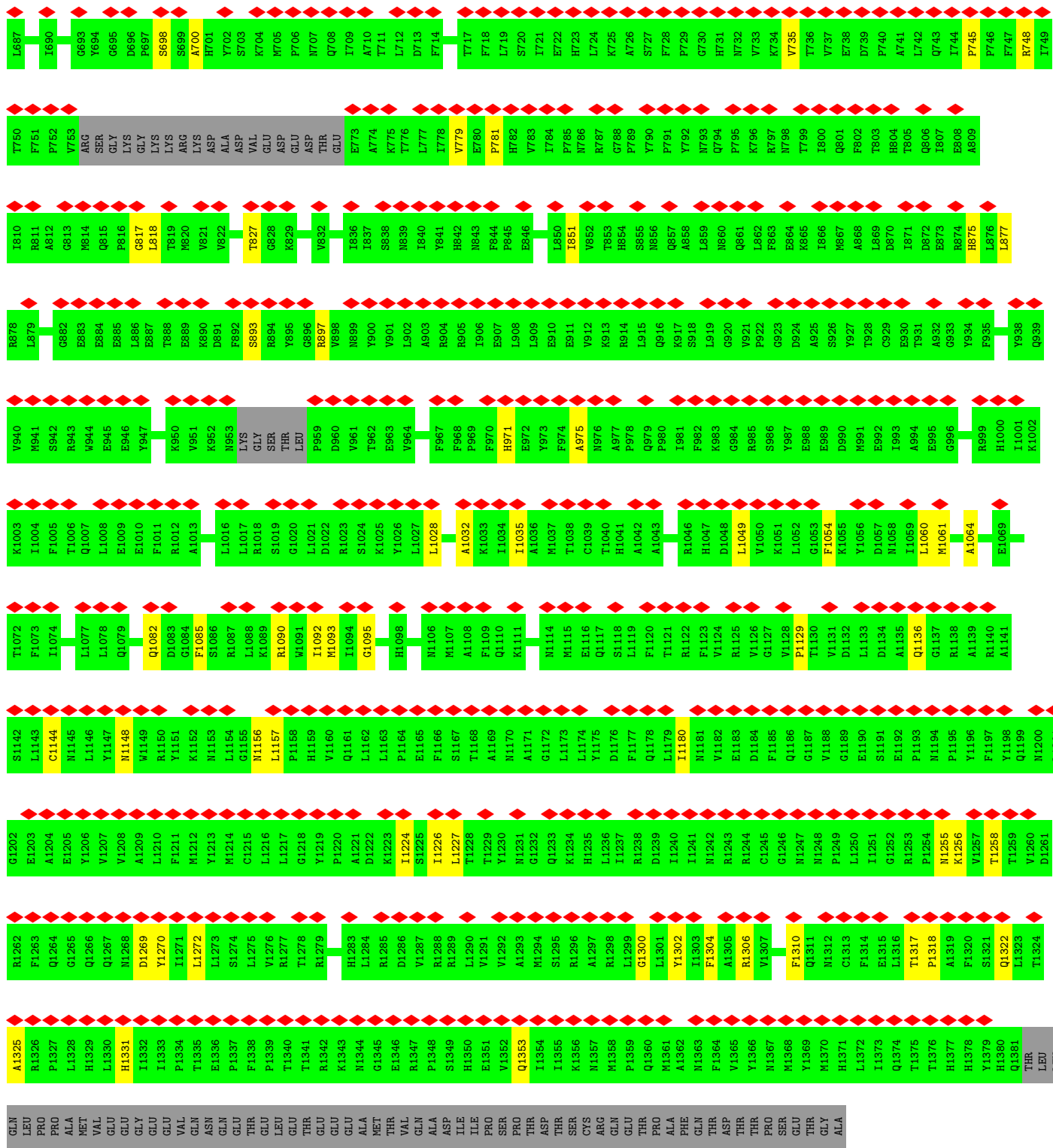
• Molecule 9: Pre-mRNA-splicing factor SYF1





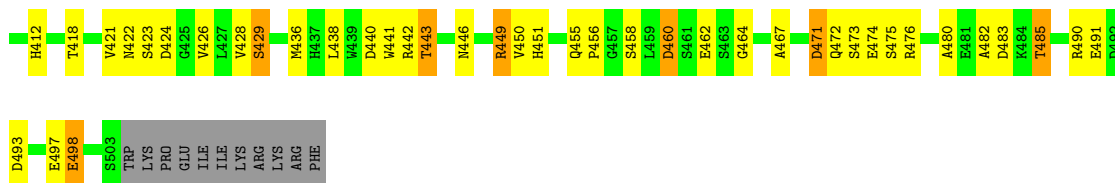
• Molecule 16: RNA helicase aquarius



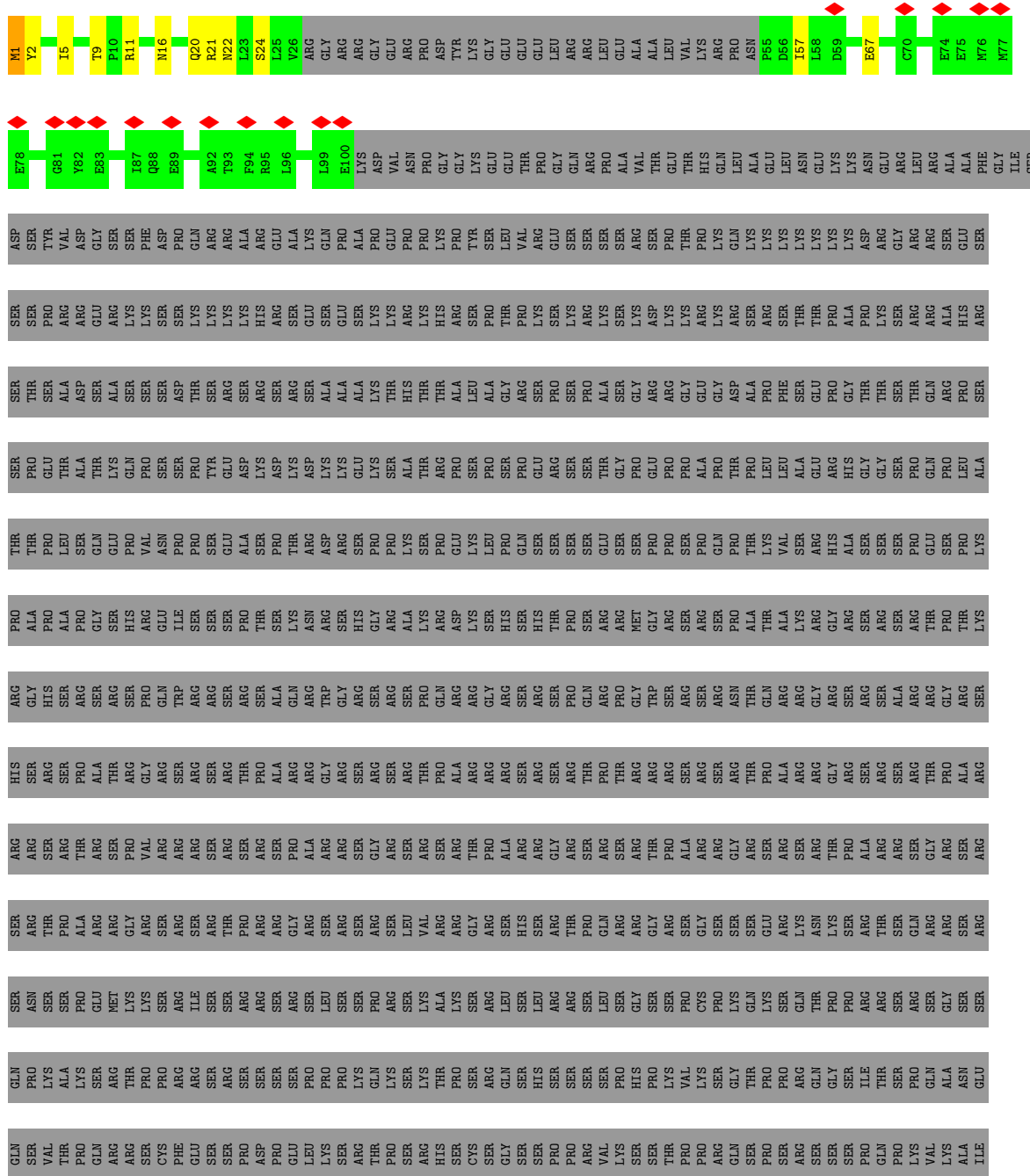


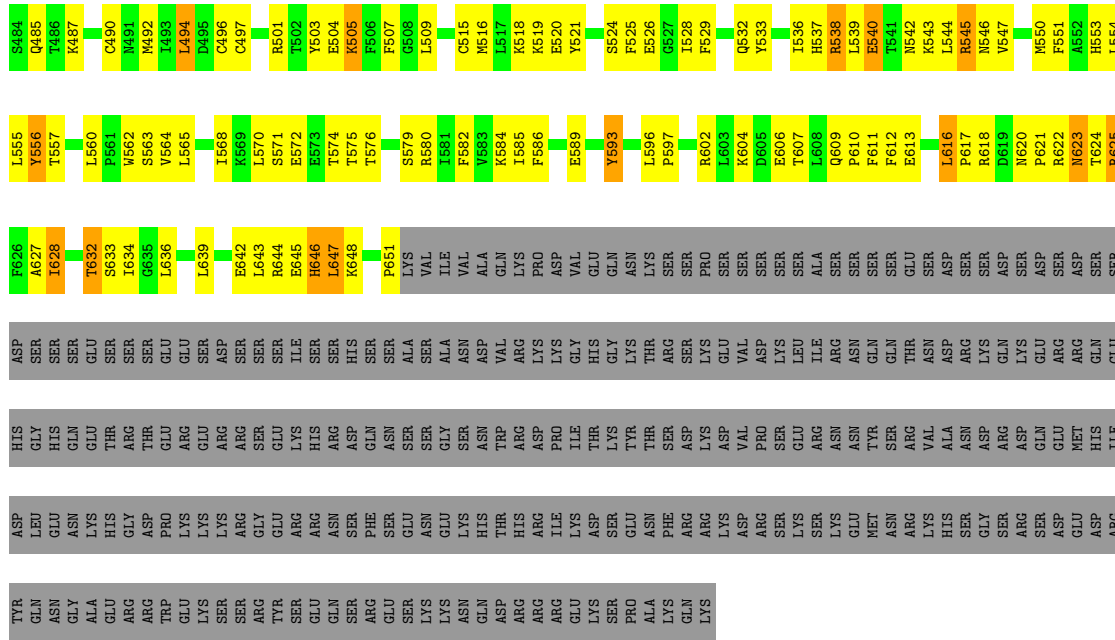
• Molecule 17: SNW domain-containing protein 1



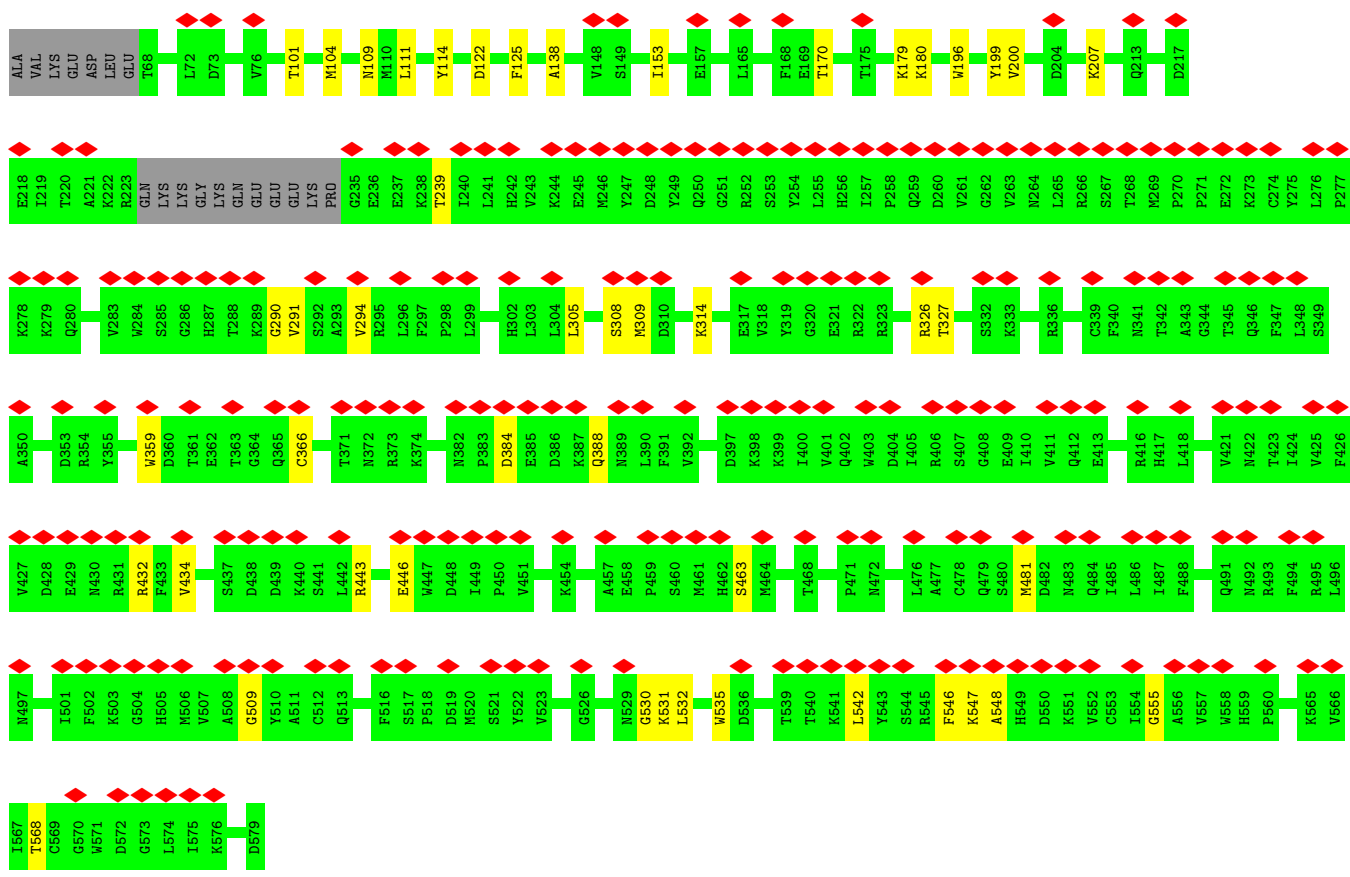
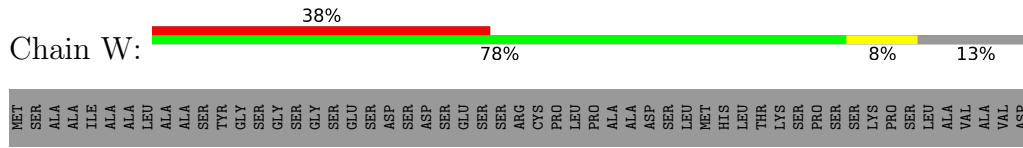


• Molecule 20: Serine/arginine repetitive matrix protein 2

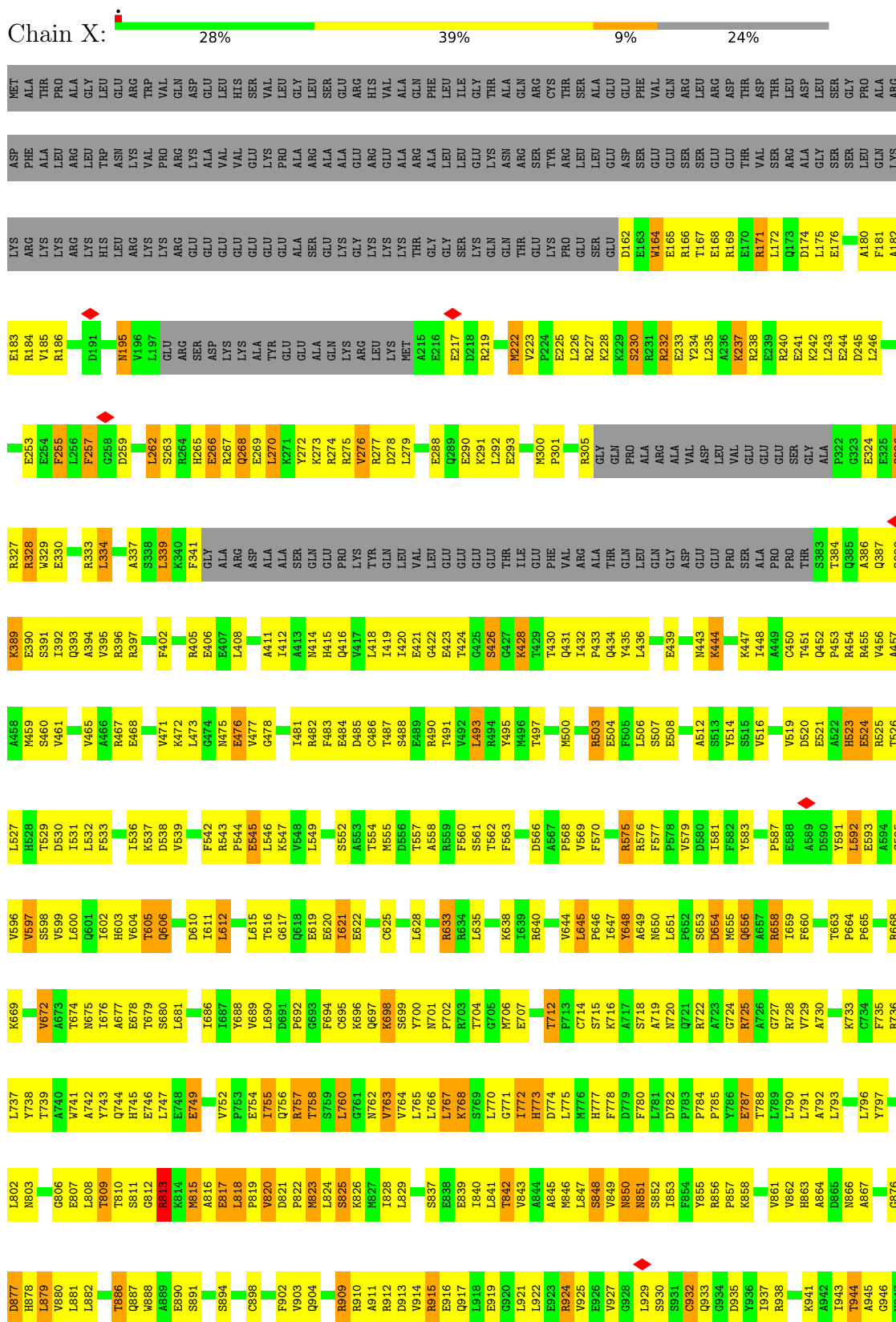


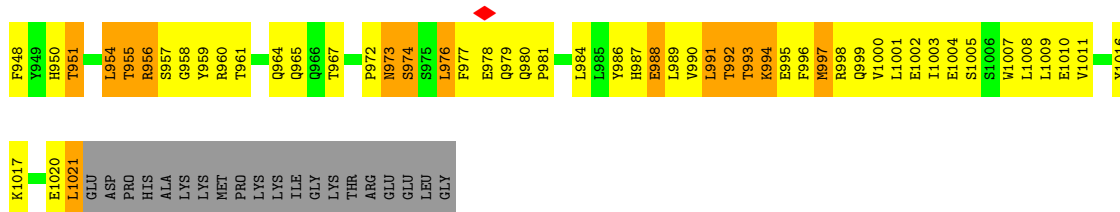


● Molecule 22: Pre-mRNA-processing factor 17

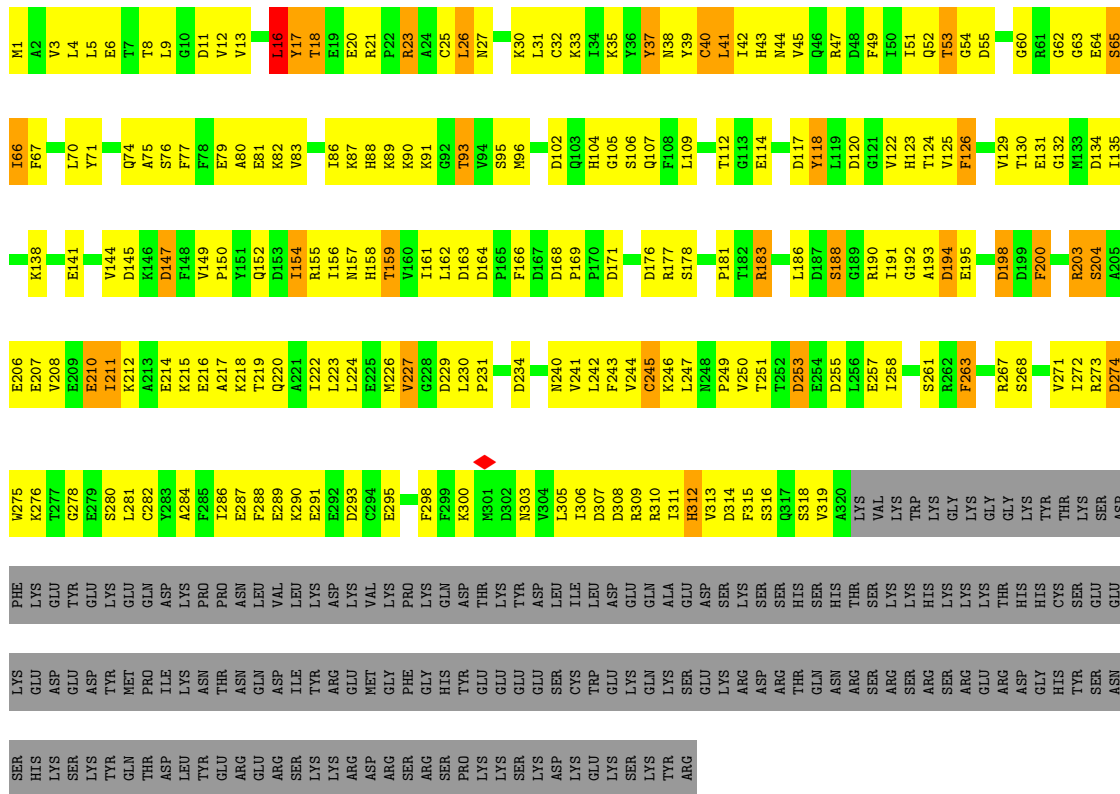
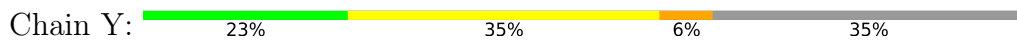


• Molecule 23: Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16

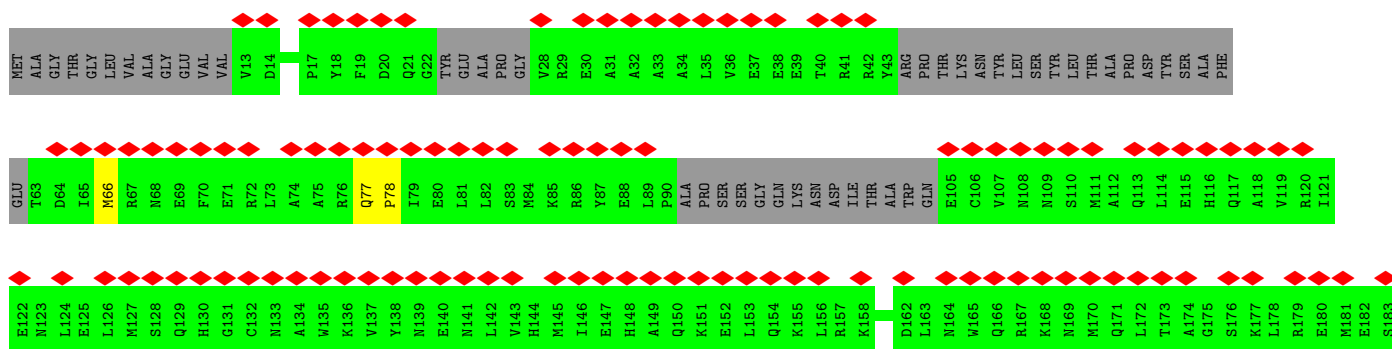


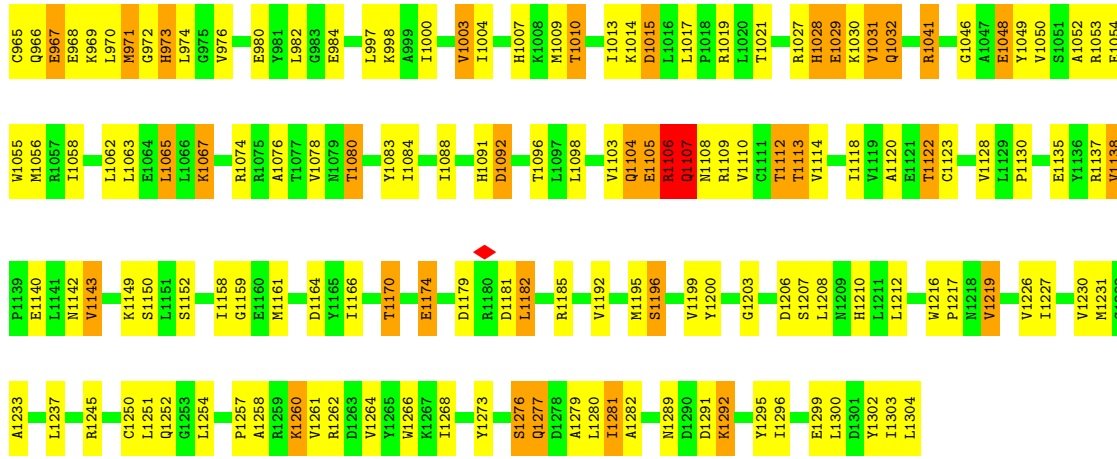


● Molecule 24: Peptidyl-prolyl cis-trans isomerase-like 4

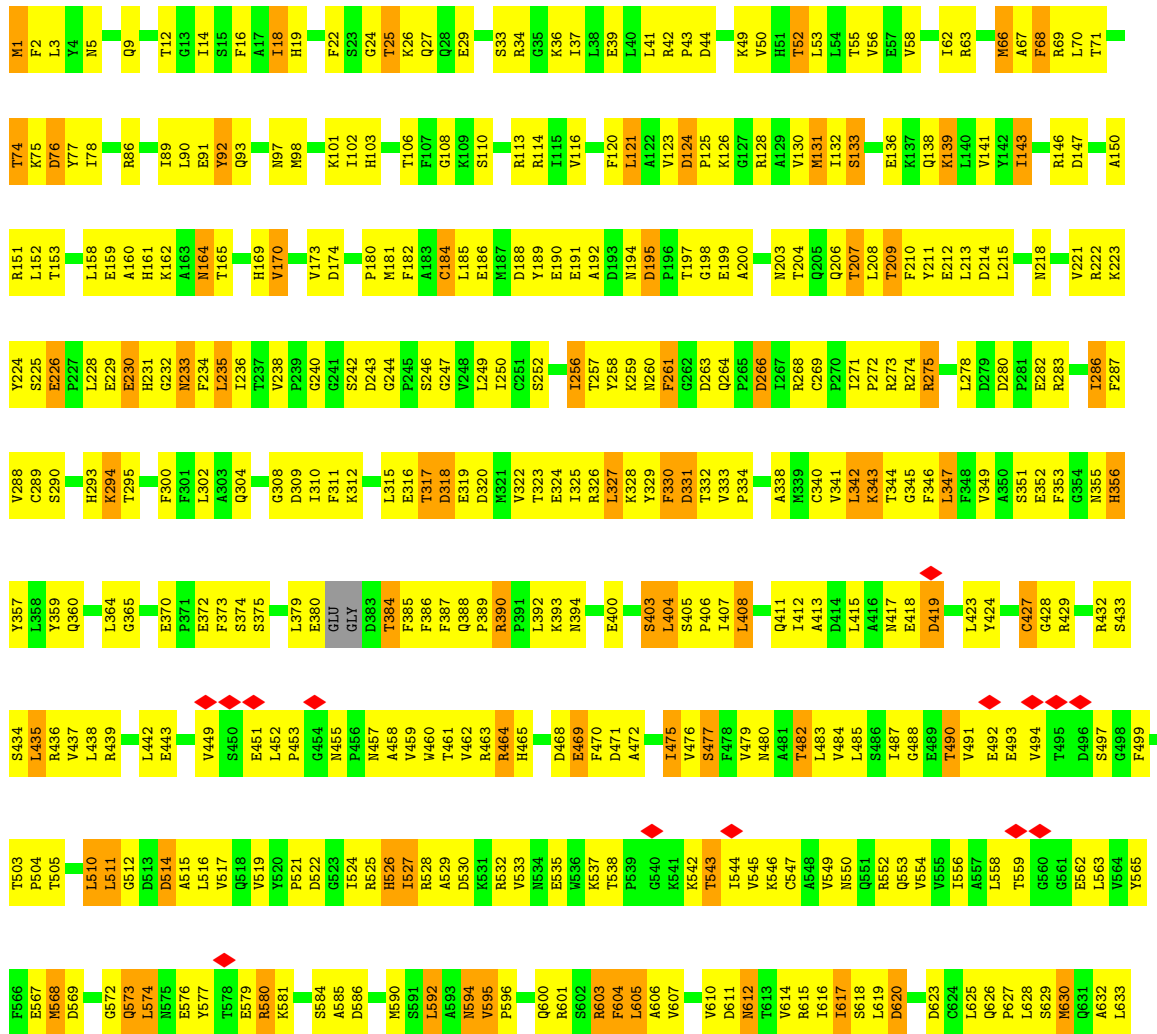


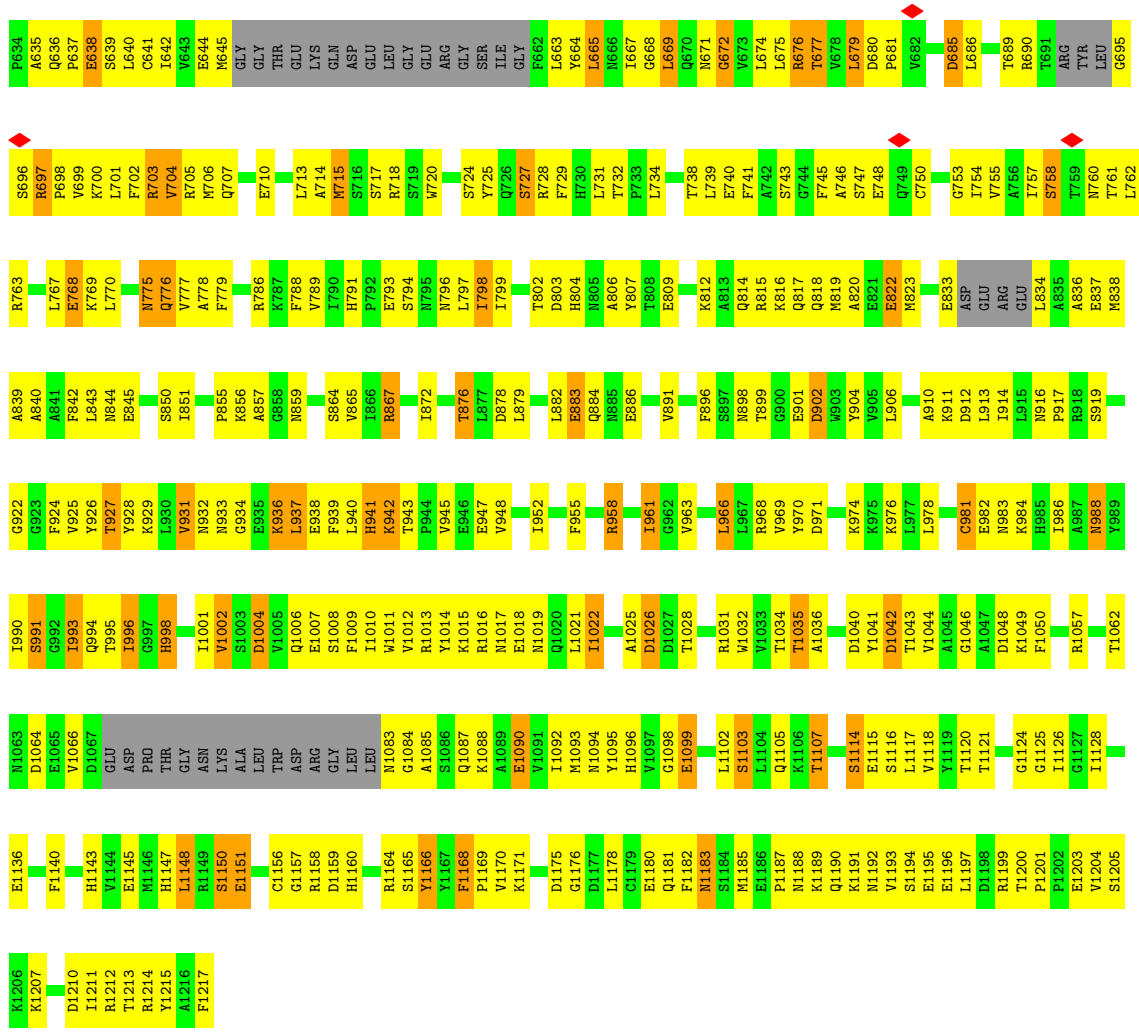
● Molecule 25: Pre-mRNA-splicing factor SPF27



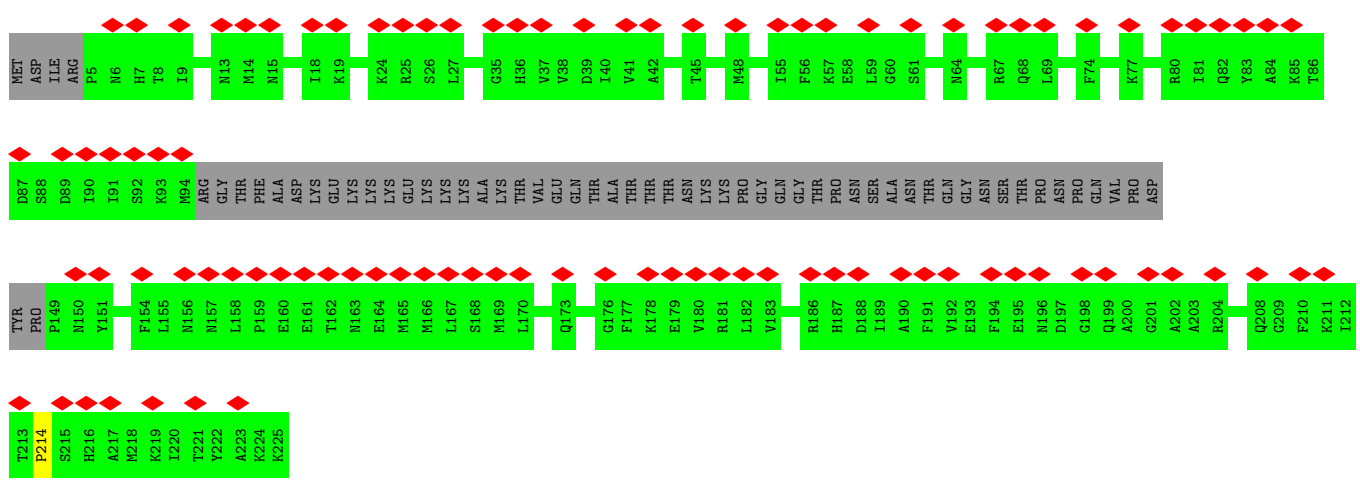
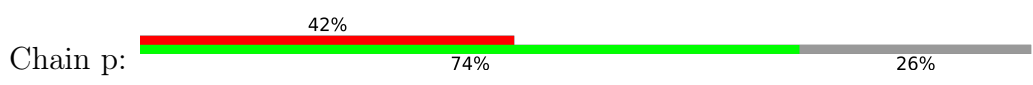


• Molecule 27: Splicing factor 3B subunit 3

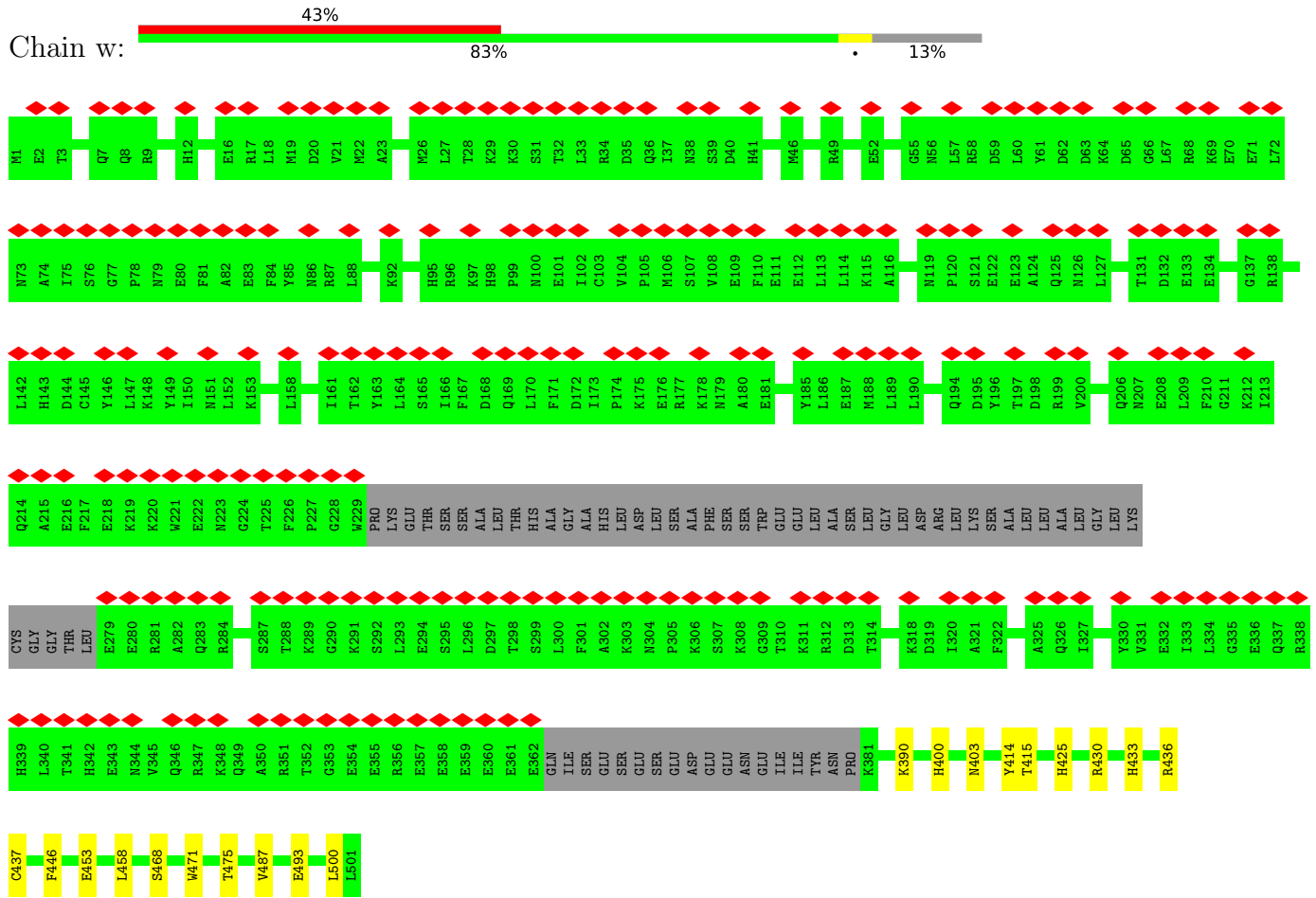




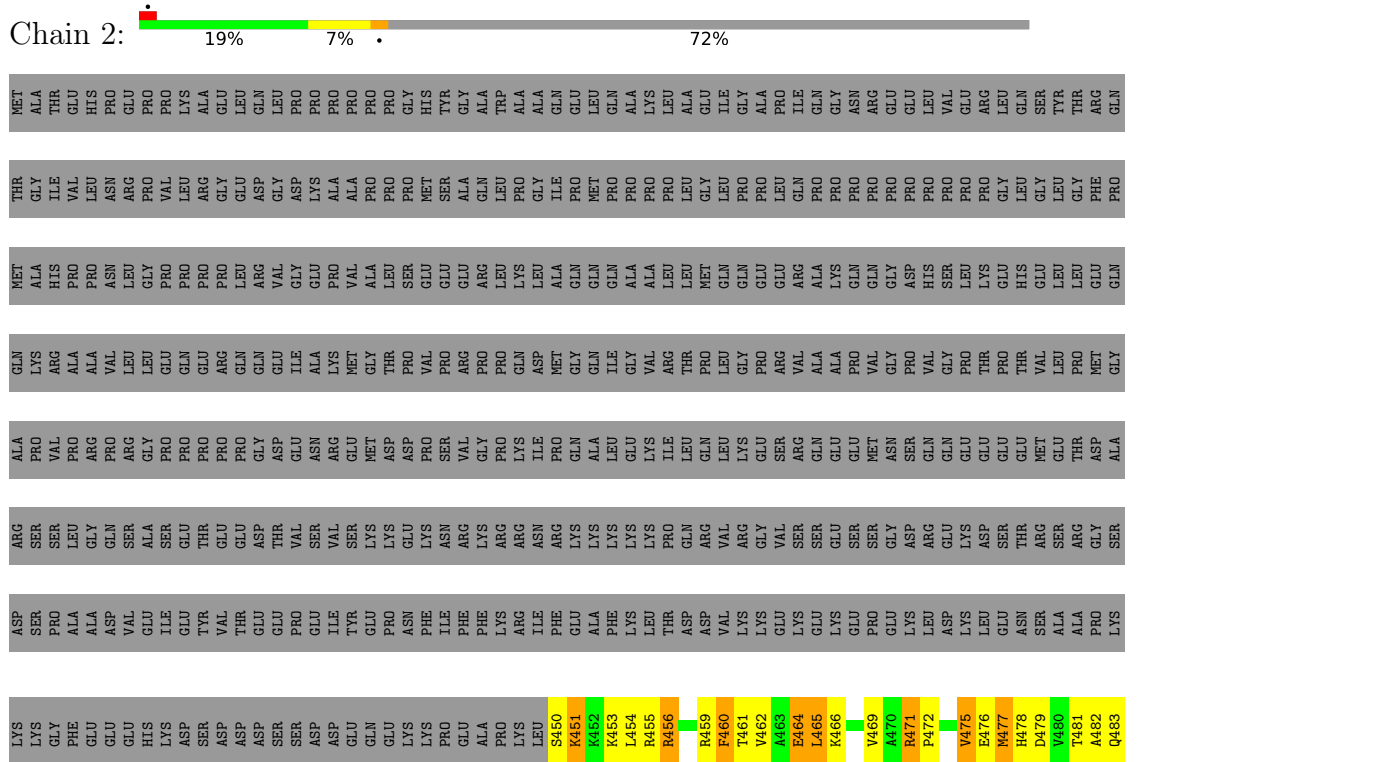
● Molecule 28: U2 small nuclear ribonucleoprotein B”

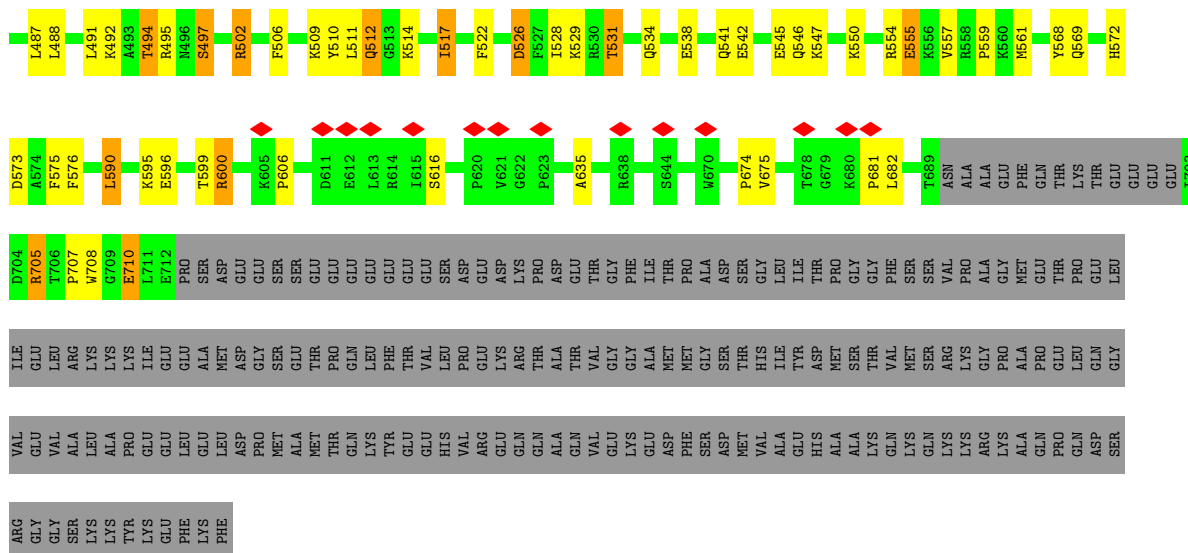


● Molecule 29: Splicing factor 3A subunit 3

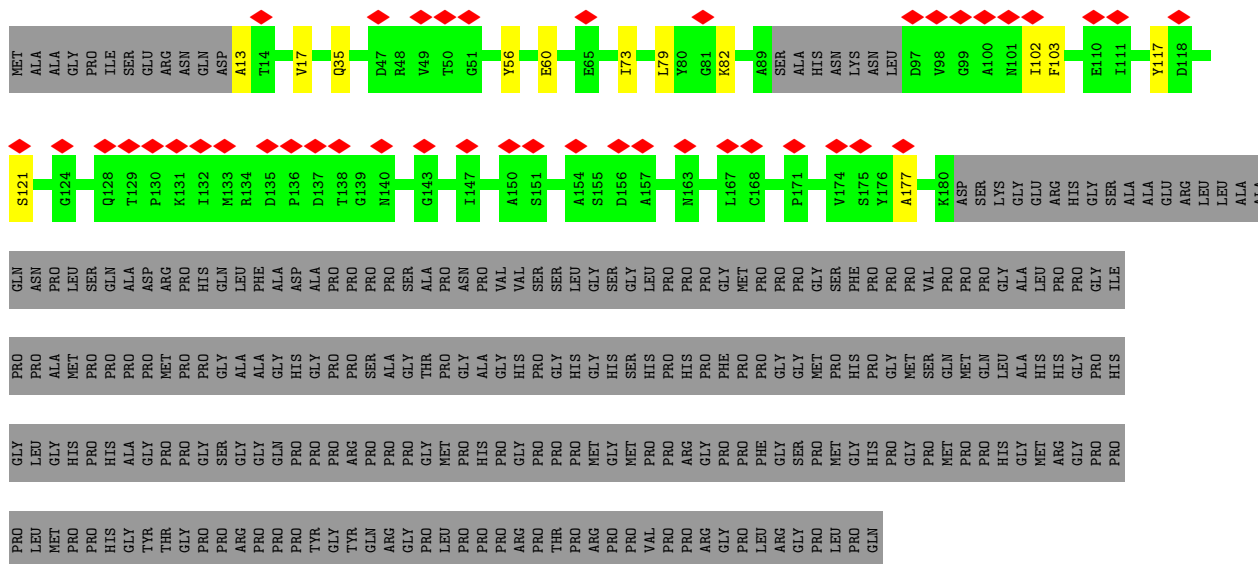


• Molecule 30: Splicing factor 3B subunit 2

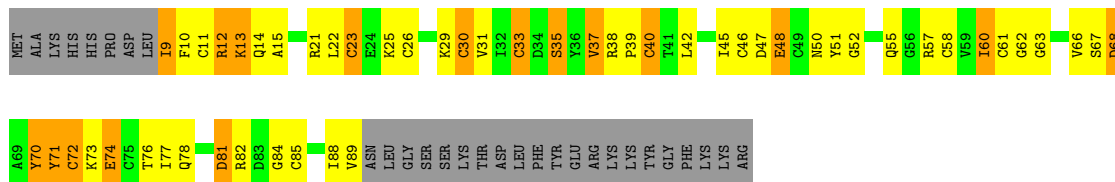
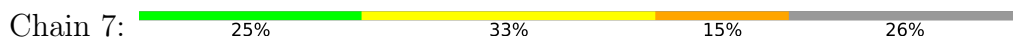




• Molecule 31: Splicing factor 3B subunit 4



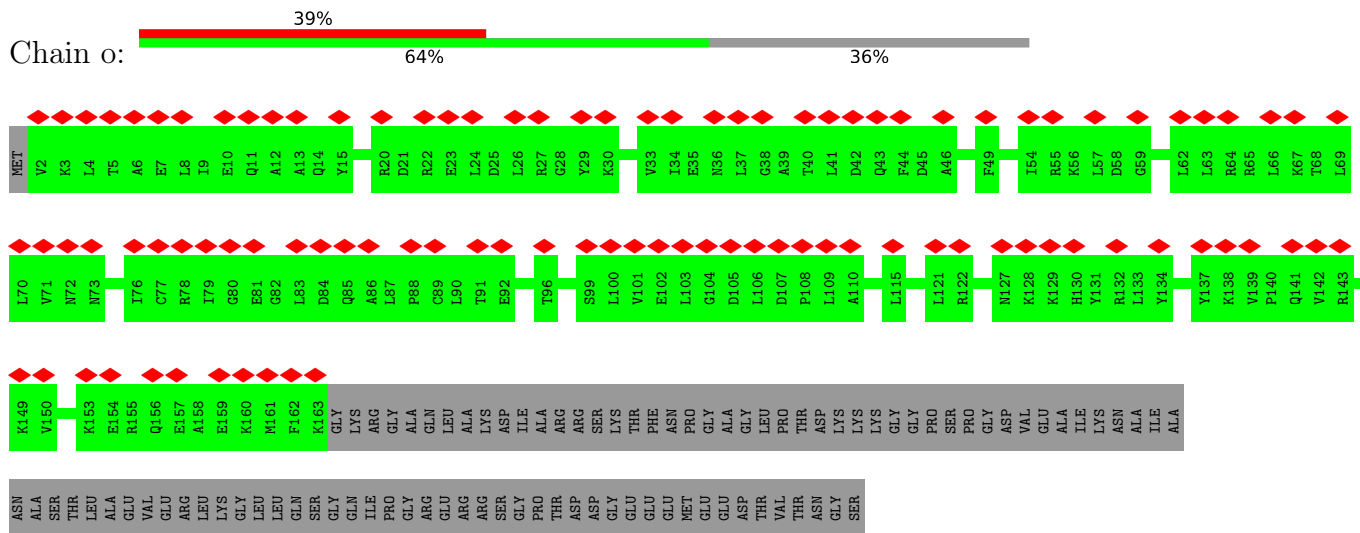
• Molecule 32: PHD finger-like domain-containing protein 5A



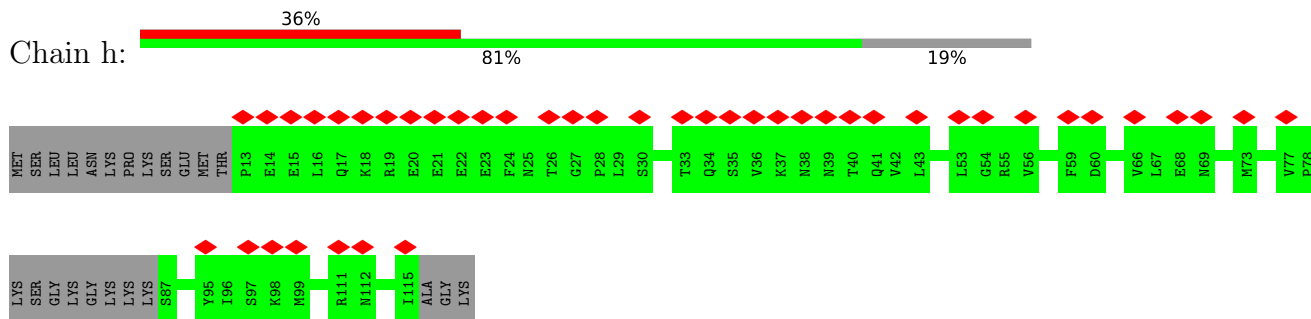
• Molecule 33: Splicing factor 3B subunit 5

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

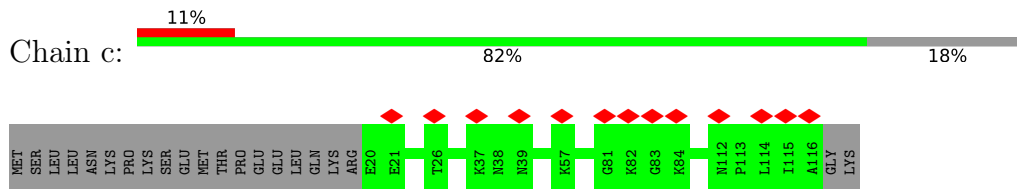
• Molecule 36: U2 small nuclear ribonucleoprotein A'



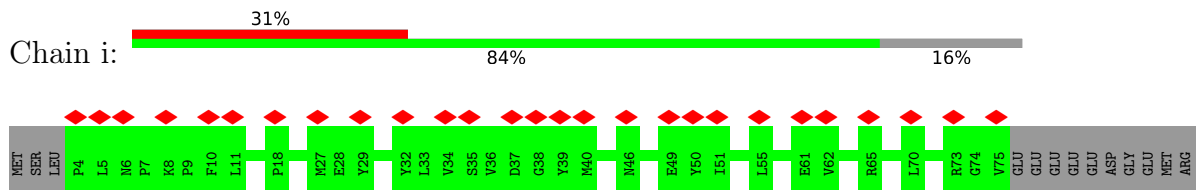
• Molecule 37: Small nuclear ribonucleoprotein Sm D2



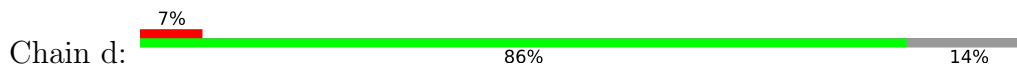
• Molecule 37: Small nuclear ribonucleoprotein Sm D2



• Molecule 38: Small nuclear ribonucleoprotein F

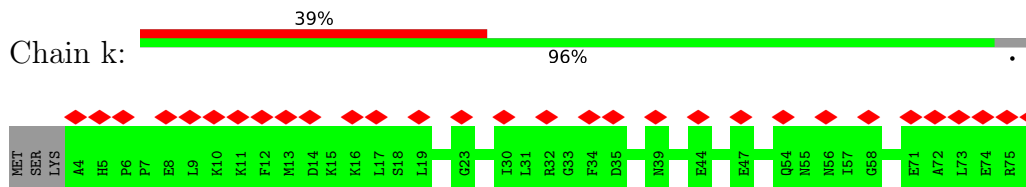


• Molecule 38: Small nuclear ribonucleoprotein F

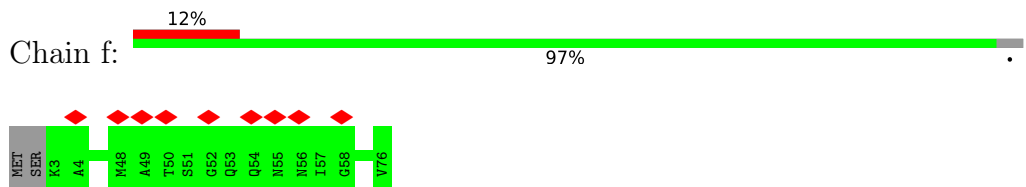


LYS
ARG
ARG

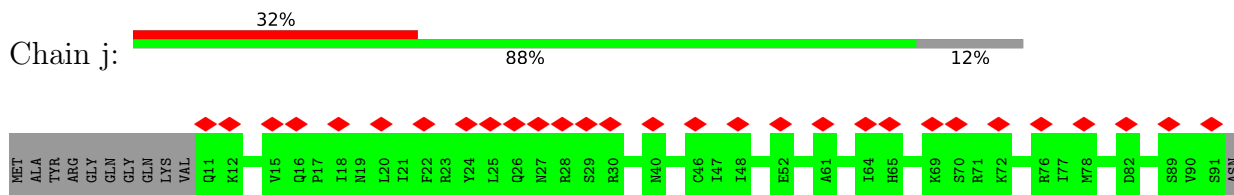
- Molecule 41: Small nuclear ribonucleoprotein G



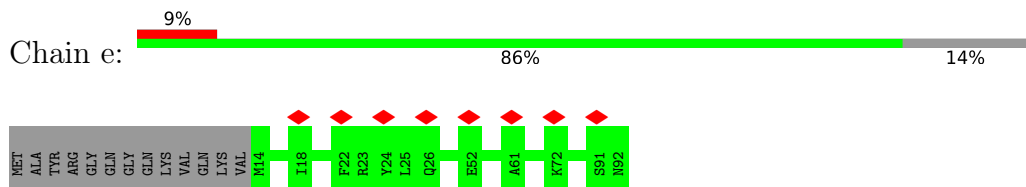
- Molecule 41: Small nuclear ribonucleoprotein G



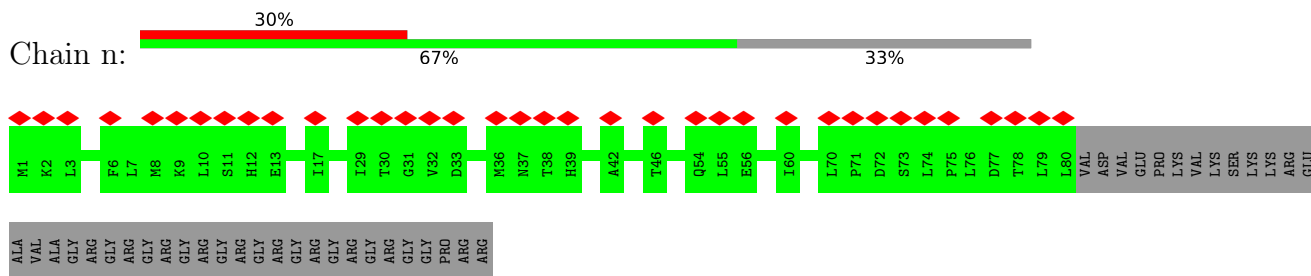
- Molecule 42: Small nuclear ribonucleoprotein E



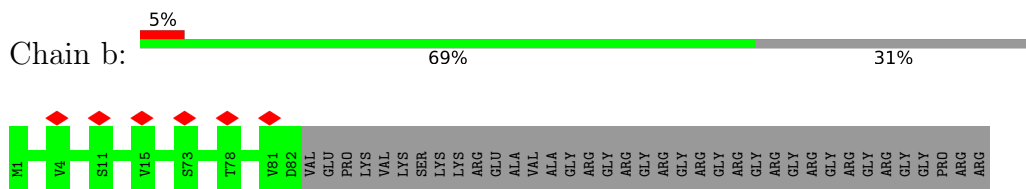
- Molecule 42: Small nuclear ribonucleoprotein E



- Molecule 43: Small nuclear ribonucleoprotein Sm D1



- Molecule 43: Small nuclear ribonucleoprotein Sm D1



GLY HIS HIS HIS ALA LYS LYS PHE PHE ILE ILE ALA SER SER THR THR MET MET ASP ASP ARG ARG SER SER LYS LYS LYS PHE PHE TVR TVR SER SER LEU

Molecule 45: Pre-mRNA-processing factor 19



MET SER L3 I4 C5 S6 I7 S8 S9 E10 V11 P12 E13 H14 P15 C16 V17 S18 P19 V20 S21 N22 H23 Y24 V25 E26 R27 R28 L29 I30 E31 K32 Y33 I34 A35 E36 N37 G38 T39 D40 P41 L42 N43 M44 Q45 P46 L47 S48 E49 E50 O51 L52 L53 D54 I55 K56 W57 A58 H59 P60

P63 K64 P65 P66 S67 A68 T69 S70 I71 P72 A73 I74 L75 K76 A77 L78 Q79 D80 E81 W82 D83 A84 V85 M86 L87 H88 S89 F90 T91 L92 R93 Q94 Q95 L96 Q97 T98 T99 R100 Q101 E102 L103 S104 H105 A106 L107 D111 A112 A113 C114 R115 V116 I117 A118 R119 L120 T121 K122 E123

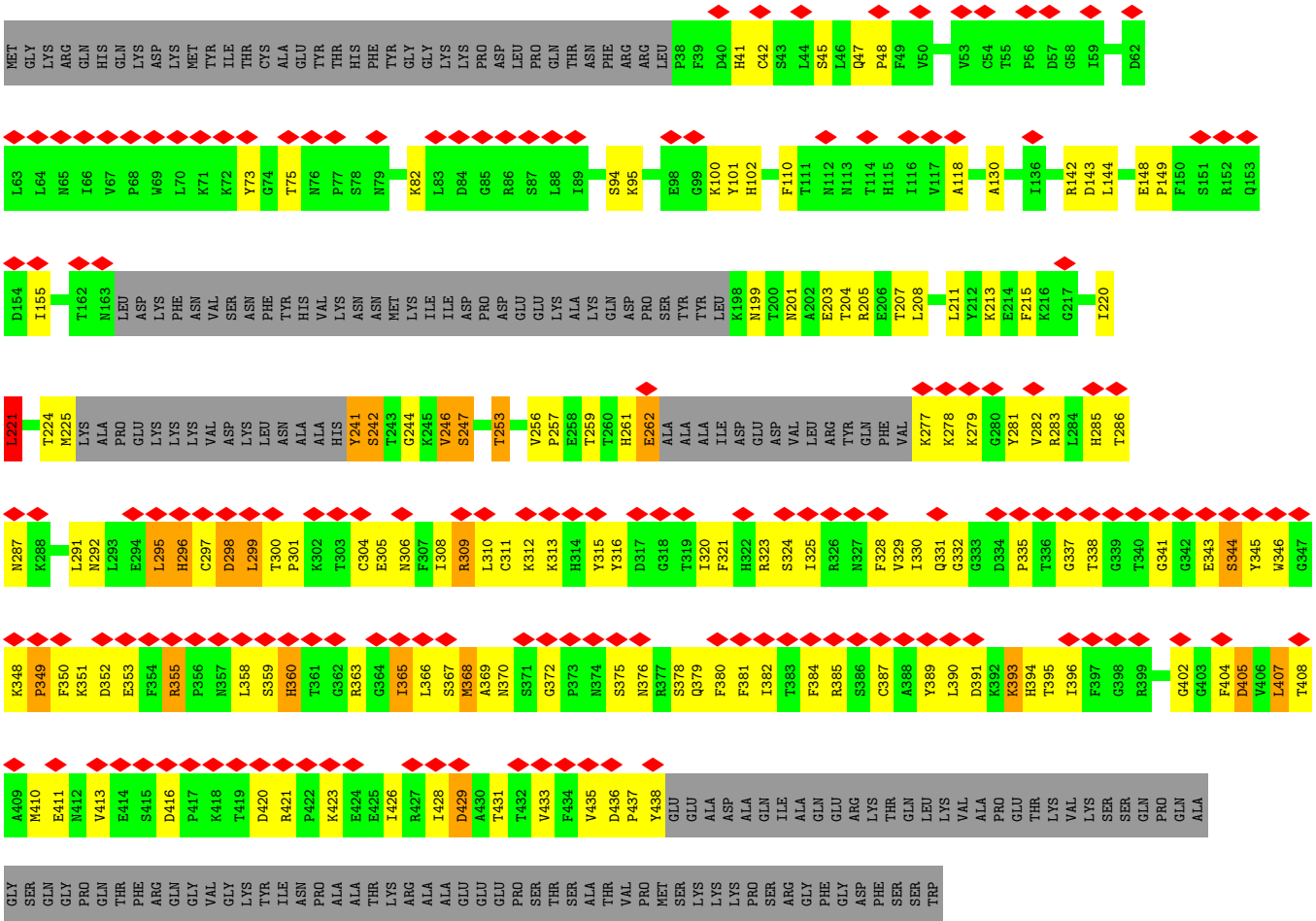
Molecule 45: Pre-mRNA-processing factor 19



MET SER L3 I4 C5 S6 I7 S8 S9 E10 V11 P12 E13 H14 P15 C16 V17 S18 P19 V20 S21 N22 H23 Y24 V25 E26 R27 R28 L29 I30 E31 K32 Y33 I34 A35 E36 N37 G38 T39 D40 P41 L42 N43 M44 Q45 P46 L47 S48 E49 E50 O51 L52 L53 D54 I55 K56 W57 A58 H59 P60

GLU SER ALA THR MET GLY LEU SER LEU HIS PHE MET ASP THR PHE GLY ASP TYR LEU GLU ARG THR SER ASN SER SER ASP ALA ASN GLY PHE THR PRO GLY HIS SER LEU GLY ASP ILE ALA ARG SER SER LEU VAL GLN THR	GLY THR GLY THR MET GLY LEU SER LEU HIS PHE MET ASP THR PHE GLY ASP TYR LEU GLU ARG THR SER ASN SER SER ASP ALA ASN GLY PHE THR PRO GLY HIS SER LEU GLY ASP ILE ALA ARG SER SER LEU VAL GLN THR	ASN PHE LYS THR LEU GLN LEU ASP ASN ASN PHE MET ASP THR VAL SER LYS SER SER PHE ILE ARG THR PHE ASP GLN SER SER ASP ALA ASN GLY PHE THR PRO GLY HIS SER LEU GLY ASP ILE ALA ARG SER SER LEU VAL GLN THR	HIS ALA LYS PHE ILE ALA SER THR GLY MET ASP ARG SER LEU LYS PHE TYR SER SER LEU
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Molecule 46: RING-type E3 ubiquitin-protein ligase PPIL2



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	111205	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 ($e^-/\text{\AA}^2$)	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	3.975	Depositor
Minimum map value	-2.446	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.082	Depositor
Recommended contour level	0.22	Depositor
Map size (\AA)	516.96, 516.96, 516.96	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	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: ZN, MG, SEP, GTP, IHP

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	0.91	22/19056 (0.1%)	0.70	12/25857 (0.0%)
2	B	1.14	7/2303 (0.3%)	1.16	8/3579 (0.2%)
3	C	0.39	0/6873	0.59	2/9346 (0.0%)
4	D	0.25	0/8527	0.45	0/11887
5	E	0.32	0/2392	0.60	1/3242 (0.0%)
6	F	1.51	38/2323 (1.6%)	1.32	20/3619 (0.6%)
7	G	1.00	4/1673 (0.2%)	1.29	17/2597 (0.7%)
8	H	0.79	14/3947 (0.4%)	1.08	7/6138 (0.1%)
9	I	0.25	0/2898	0.44	0/4057
10	J	0.44	0/2171	0.55	0/2929
11	K	0.59	0/423	0.60	0/568
12	L	0.48	1/2216 (0.0%)	0.54	0/3007
13	N	0.39	0/1210	0.57	0/1622
14	O	0.27	0/1447	0.49	0/2013
15	P	0.81	3/888 (0.3%)	0.72	1/1177 (0.1%)
16	Q	0.25	0/6796	0.45	0/9527
17	R	0.52	0/2789	0.57	0/3747
18	S	0.27	0/769	0.52	0/1063
19	T	0.86	0/2574	0.71	2/3511 (0.1%)
20	U	0.55	0/424	0.49	0/582
21	V	0.42	0/2993	0.55	1/4088 (0.0%)
22	W	0.26	0/2471	0.48	0/3437
23	X	0.43	1/6479 (0.0%)	0.64	2/8747 (0.0%)
24	Y	0.38	0/2605	0.60	2/3522 (0.1%)
25	Z	0.27	0/768	0.41	0/1067
26	1	0.63	0/6609	0.65	4/8947 (0.0%)
27	3	0.53	0/9408	0.66	1/12767 (0.0%)
28	p	0.25	0/847	0.47	0/1181
29	w	0.31	0/2311	0.49	0/3008
30	2	0.49	0/1837	0.60	0/2473
31	4	0.27	0/790	0.48	0/1095
32	7	0.56	0/621	0.61	0/833

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	5	0.72	0/654	0.64	0/885
34	y	0.26	0/389	0.49	0/540
35	v	0.38	0/1054	0.57	0/1385
36	o	0.24	0/821	0.48	0/1149
37	c	0.25	0/387	0.54	0/482
37	h	0.24	0/485	0.48	0/677
38	d	0.25	0/295	0.55	0/367
38	i	0.27	0/362	0.53	0/502
39	a	0.26	0/343	0.57	0/427
39	m	0.26	0/416	0.54	0/581
40	g	0.24	0/322	0.56	0/399
40	l	0.26	0/417	0.51	0/581
41	f	0.25	0/295	0.57	0/367
41	k	0.26	0/366	0.53	0/509
42	e	0.23	0/315	0.52	0/392
42	j	0.25	0/403	0.46	0/561
43	b	0.24	0/327	0.53	0/407
43	n	0.24	0/404	0.50	0/564
44	u	0.24	0/842	0.42	0/1110
45	q	0.25	0/658	0.40	0/919
45	r	0.26	0/653	0.41	0/912
45	s	0.27	0/658	0.44	0/919
45	t	0.26	0/653	0.40	0/912
46	9	0.32	0/2342	0.55	1/3182 (0.0%)
All	All	0.61	90/123299 (0.1%)	0.67	81/169962 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	16
3	C	0	6
4	D	0	2
9	I	0	3
10	J	0	3
11	K	0	1
12	L	0	2
13	N	0	2
15	P	0	2
16	Q	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
17	R	0	1
18	S	0	1
23	X	0	1
24	Y	0	3
25	Z	0	1
26	1	0	4
27	3	0	5
30	2	0	1
32	7	0	1
33	5	0	1
46	9	0	2
All	All	0	60

The worst 5 of 90 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	109	U	O3'-P	9.45	1.72	1.61
6	F	67	G	C5-C4	-7.50	1.33	1.38
8	H	22	U	N1-C2	-7.49	1.31	1.38
8	H	25	G	C5-C4	-7.15	1.33	1.38
6	F	65	G	C5-C4	-7.11	1.33	1.38

The worst 5 of 81 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	G	104	C	N1-C2-O2	9.23	124.44	118.90
19	T	186	PRO	C-N-CA	-8.88	99.51	121.70
1	A	1771	LEU	CA-CB-CG	8.78	135.50	115.30
7	G	110	U	C4'-C3'-O3'	-8.39	91.77	109.40
7	G	109	U	P-O3'-C3'	8.38	129.75	119.70

There are no chirality outliers.

5 of 60 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	108	MET	Peptide
1	A	187	PRO	Peptide
1	A	203	VAL	Peptide
1	A	376	GLU	Peptide
1	A	386	PRO	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	18543	0	18403	835	0
2	B	2066	0	1047	58	0
3	C	6724	0	6696	430	0
4	D	8528	0	3745	58	0
5	E	2338	0	2275	170	0
6	F	2075	0	1048	124	0
7	G	1503	0	766	137	0
8	H	3539	0	1791	134	0
9	I	2880	0	1411	16	0
10	J	2116	0	1977	109	0
11	K	411	0	362	19	0
12	L	2192	0	1775	83	0
13	N	1184	0	1190	59	0
14	O	1447	0	638	26	0
15	P	876	0	875	59	0
16	Q	6730	0	3268	56	0
17	R	2760	0	2639	129	0
18	S	770	0	356	8	0
19	T	2507	0	2451	114	0
20	U	422	0	291	11	0
21	V	2959	0	2237	106	0
22	W	2473	0	1096	30	0
23	X	6357	0	6349	480	0
24	Y	2556	0	2492	181	0
25	Z	772	0	342	0	0
26	1	6486	0	6690	382	0
27	3	9220	0	9139	604	0
28	p	841	0	420	0	0
29	w	2275	0	1347	0	0
30	2	1807	0	1622	65	0
31	4	792	0	367	9	0
32	7	613	0	597	43	0
33	5	635	0	595	37	0
34	y	390	0	190	0	0
35	v	1041	0	800	0	0
36	o	816	0	386	0	0
37	c	388	0	102	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
37	h	482	0	220	0	0
38	d	296	0	87	0	0
38	i	359	0	179	0	0
39	a	344	0	93	0	0
39	m	413	0	194	0	0
40	g	324	0	89	0	0
40	l	415	0	198	0	0
41	f	296	0	84	0	0
41	k	364	0	176	0	0
42	e	316	0	85	0	0
42	j	403	0	173	0	0
43	b	328	0	89	0	0
43	n	402	0	184	0	0
44	u	834	0	325	0	0
45	q	659	0	296	0	0
45	r	654	0	294	0	0
45	s	659	0	296	0	0
45	t	654	0	294	0	0
46	9	2307	0	1898	126	0
47	A	36	0	6	2	0
48	C	32	0	12	2	0
49	C	1	0	0	0	0
49	F	6	0	0	0	0
50	7	3	0	0	0	0
50	K	1	0	0	0	0
50	N	3	0	0	0	0
All	All	120623	0	93047	4334	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 21.

The worst 5 of 4334 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)
23:X:819:PRO:HD3	23:X:921:LEU:CD1	1.48	1.39
15:P:184:VAL:HG22	24:Y:123:HIS:CE1	1.61	1.33
23:X:819:PRO:CD	23:X:921:LEU:CD1	2.11	1.28
15:P:184:VAL:CG2	24:Y:123:HIS:HE1	1.46	1.26
23:X:819:PRO:CD	23:X:921:LEU:HD12	1.66	1.24

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	2232/2335 (96%)	1971 (88%)	250 (11%)	11 (0%)	25	61
3	C	854/972 (88%)	737 (86%)	110 (13%)	7 (1%)	16	51
4	D	1720/2136 (80%)	1589 (92%)	124 (7%)	7 (0%)	30	66
5	E	297/357 (83%)	271 (91%)	26 (9%)	0	100	100
9	I	563/855 (66%)	481 (85%)	80 (14%)	2 (0%)	30	66
10	J	245/848 (29%)	215 (88%)	27 (11%)	3 (1%)	11	41
11	K	47/343 (14%)	41 (87%)	6 (13%)	0	100	100
12	L	318/802 (40%)	294 (92%)	24 (8%)	0	100	100
13	N	141/144 (98%)	119 (84%)	21 (15%)	1 (1%)	19	54
14	O	288/420 (69%)	242 (84%)	46 (16%)	0	100	100
15	P	97/229 (42%)	85 (88%)	11 (11%)	1 (1%)	13	46
16	Q	1319/1485 (89%)	1207 (92%)	112 (8%)	0	100	100
17	R	352/536 (66%)	314 (89%)	36 (10%)	2 (1%)	22	57
18	S	156/166 (94%)	147 (94%)	9 (6%)	0	100	100
19	T	318/514 (62%)	289 (91%)	29 (9%)	0	100	100
20	U	68/2752 (2%)	62 (91%)	6 (9%)	0	100	100
21	V	458/908 (50%)	430 (94%)	28 (6%)	0	100	100
22	W	497/579 (86%)	442 (89%)	55 (11%)	0	100	100
23	X	778/1041 (75%)	691 (89%)	82 (10%)	5 (1%)	22	57
24	Y	318/492 (65%)	277 (87%)	41 (13%)	0	100	100
25	Z	147/225 (65%)	132 (90%)	13 (9%)	2 (1%)	9	37
26	1	814/1304 (62%)	705 (87%)	105 (13%)	4 (0%)	25	61
27	3	1165/1217 (96%)	991 (85%)	173 (15%)	1 (0%)	48	81
28	p	163/225 (72%)	147 (90%)	15 (9%)	1 (1%)	22	57
29	w	428/501 (85%)	380 (89%)	48 (11%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
30	2	246/895 (28%)	212 (86%)	33 (13%)	1 (0%)	30	66
31	4	157/424 (37%)	138 (88%)	19 (12%)	0	100	100
32	7	79/110 (72%)	65 (82%)	14 (18%)	0	100	100
33	5	75/86 (87%)	64 (85%)	11 (15%)	0	100	100
34	y	77/301 (26%)	64 (83%)	13 (17%)	0	100	100
35	v	165/464 (36%)	149 (90%)	16 (10%)	0	100	100
36	o	160/255 (63%)	136 (85%)	24 (15%)	0	100	100
37	c	95/118 (80%)	85 (90%)	10 (10%)	0	100	100
37	h	91/118 (77%)	82 (90%)	9 (10%)	0	100	100
38	d	72/86 (84%)	63 (88%)	9 (12%)	0	100	100
38	i	70/86 (81%)	64 (91%)	6 (9%)	0	100	100
39	a	84/240 (35%)	71 (84%)	13 (16%)	0	100	100
39	m	80/240 (33%)	72 (90%)	8 (10%)	0	100	100
40	g	77/126 (61%)	69 (90%)	8 (10%)	0	100	100
40	l	81/126 (64%)	70 (86%)	11 (14%)	0	100	100
41	f	72/76 (95%)	61 (85%)	11 (15%)	0	100	100
41	k	71/76 (93%)	63 (89%)	8 (11%)	0	100	100
42	e	77/92 (84%)	71 (92%)	6 (8%)	0	100	100
42	j	79/92 (86%)	73 (92%)	6 (8%)	0	100	100
43	b	80/119 (67%)	65 (81%)	15 (19%)	0	100	100
43	n	78/119 (66%)	67 (86%)	11 (14%)	0	100	100
44	u	183/793 (23%)	170 (93%)	13 (7%)	0	100	100
45	q	130/504 (26%)	116 (89%)	14 (11%)	0	100	100
45	r	129/504 (26%)	119 (92%)	10 (8%)	0	100	100
45	s	130/504 (26%)	107 (82%)	20 (15%)	3 (2%)	5	26
45	t	129/504 (26%)	120 (93%)	9 (7%)	0	100	100
46	9	330/520 (64%)	292 (88%)	38 (12%)	0	100	100
All	All	16880/28964 (58%)	14987 (89%)	1842 (11%)	51 (0%)	38	70

5 of 51 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
17	R	164	PRO

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Mol	Chain	Res	Type
17	R	223	PRO
23	X	820	VAL
1	A	699	GLU
1	A	1417	PRO

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	2012/2108 (95%)	1683 (84%)	329 (16%)	2	9
3	C	747/866 (86%)	612 (82%)	135 (18%)	1	7
5	E	256/300 (85%)	209 (82%)	47 (18%)	1	7
9	I	22/749 (3%)	22 (100%)	0	100	100
10	J	205/751 (27%)	175 (85%)	30 (15%)	2	12
11	K	43/294 (15%)	37 (86%)	6 (14%)	3	13
12	L	141/709 (20%)	119 (84%)	22 (16%)	2	11
13	N	130/130 (100%)	111 (85%)	19 (15%)	2	12
14	O	3/361 (1%)	3 (100%)	0	100	100
15	P	95/203 (47%)	73 (77%)	22 (23%)	0	3
16	Q	71/1336 (5%)	71 (100%)	0	100	100
17	R	268/458 (58%)	214 (80%)	54 (20%)	1	5
19	T	273/441 (62%)	224 (82%)	49 (18%)	1	8
20	U	21/2432 (1%)	17 (81%)	4 (19%)	1	7
21	V	188/838 (22%)	159 (85%)	29 (15%)	2	11
23	X	682/897 (76%)	560 (82%)	122 (18%)	1	8
24	Y	286/451 (63%)	243 (85%)	43 (15%)	2	12
26	1	700/1104 (63%)	598 (85%)	102 (15%)	2	12
27	3	1018/1051 (97%)	809 (80%)	209 (20%)	1	5
28	p	8/195 (4%)	8 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
29	w	112/446 (25%)	93 (83%)	19 (17%)	1	9
30	2	152/776 (20%)	126 (83%)	26 (17%)	1	8
32	7	69/95 (73%)	47 (68%)	22 (32%)	0	1
33	5	68/77 (88%)	53 (78%)	15 (22%)	1	4
35	v	78/382 (20%)	67 (86%)	11 (14%)	3	13
36	o	6/218 (3%)	6 (100%)	0	100	100
37	h	5/110 (4%)	5 (100%)	0	100	100
38	i	4/74 (5%)	4 (100%)	0	100	100
39	m	4/177 (2%)	4 (100%)	0	100	100
40	l	3/101 (3%)	3 (100%)	0	100	100
41	k	3/66 (4%)	3 (100%)	0	100	100
42	j	1/84 (1%)	1 (100%)	0	100	100
43	n	3/101 (3%)	3 (100%)	0	100	100
44	u	10/709 (1%)	10 (100%)	0	100	100
46	9	185/456 (41%)	147 (80%)	38 (20%)	1	5
All	All	7872/19546 (40%)	6519 (83%)	1353 (17%)	4	8

5 of 1353 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
26	1	582	LEU
27	3	704	VAL
26	1	890	GLU
26	1	581	LEU
27	3	139	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 171 such sidechains are listed below:

Mol	Chain	Res	Type
24	Y	312	HIS
27	3	411	GLN
26	1	682	HIS
26	1	1277	GLN
27	3	730	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	B	96/117 (82%)	33 (34%)	1 (1%)
6	F	96/107 (89%)	48 (50%)	4 (4%)
7	G	70/220 (31%)	46 (65%)	9 (12%)
8	H	163/188 (86%)	73 (44%)	6 (3%)
All	All	425/632 (67%)	200 (47%)	20 (4%)

5 of 200 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 20 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
8	H	13	C
8	H	45	C
8	H	165	A
8	H	47	U
7	G	84	U

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

1 non-standard protein/DNA/RNA residue is 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	224	17	8,9,10	1.42	1 (12%)	8,12,14	2.10	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	224	17	-	0/5/8/10	-

All (1) bond length outliers are listed below:

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

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	R	224	SEP	P-OG-CB	-4.46	106.02	118.30
17	R	224	SEP	OG-CB-CA	3.47	111.52	108.14

There are no chirality outliers.

There are no torsion outliers.

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
48	GTP	C	1500	49	26,34,34	1.14	1 (3%)	32,54,54	1.91	7 (21%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
47	IHP	A	3000	-	36,36,36	1.44	6 (16%)	54,60,60	1.91	18 (33%)

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
48	GTP	C	1500	49	-	4/18/38/38	0/3/3/3
47	IHP	A	3000	-	-	8/30/54/54	0/1/1/1

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
48	C	1500	GTP	C5-C6	-4.13	1.39	1.47
47	A	3000	IHP	P6-O16	4.02	1.66	1.59
47	A	3000	IHP	P5-O15	2.73	1.64	1.59
47	A	3000	IHP	C5-C4	2.41	1.57	1.52
47	A	3000	IHP	C6-C5	2.31	1.57	1.52

The worst 5 of 25 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
48	C	1500	GTP	PA-O3A-PB	-5.10	115.31	132.83
48	C	1500	GTP	PB-O3B-PG	-5.09	115.36	132.83
47	A	3000	IHP	O46-P6-O26	-4.04	94.87	110.68
47	A	3000	IHP	O14-C4-C5	3.70	117.41	108.69
48	C	1500	GTP	C5-C6-N1	3.42	119.98	113.95

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

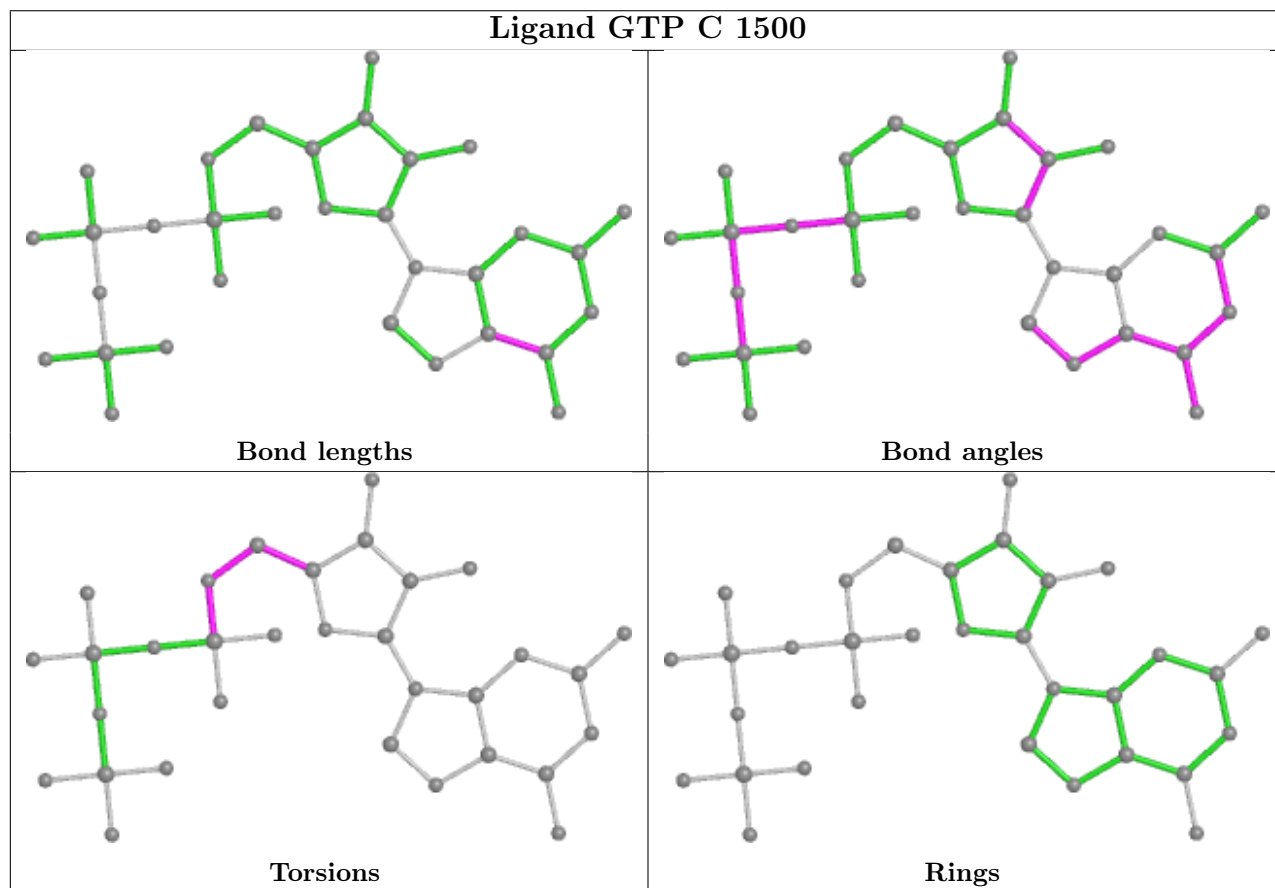
Mol	Chain	Res	Type	Atoms
47	A	3000	IHP	C1-C6-O16-P6
47	A	3000	IHP	C5-C6-O16-P6
48	C	1500	GTP	C4'-C5'-O5'-PA
48	C	1500	GTP	C3'-C4'-C5'-O5'
48	C	1500	GTP	O4'-C4'-C5'-O5'

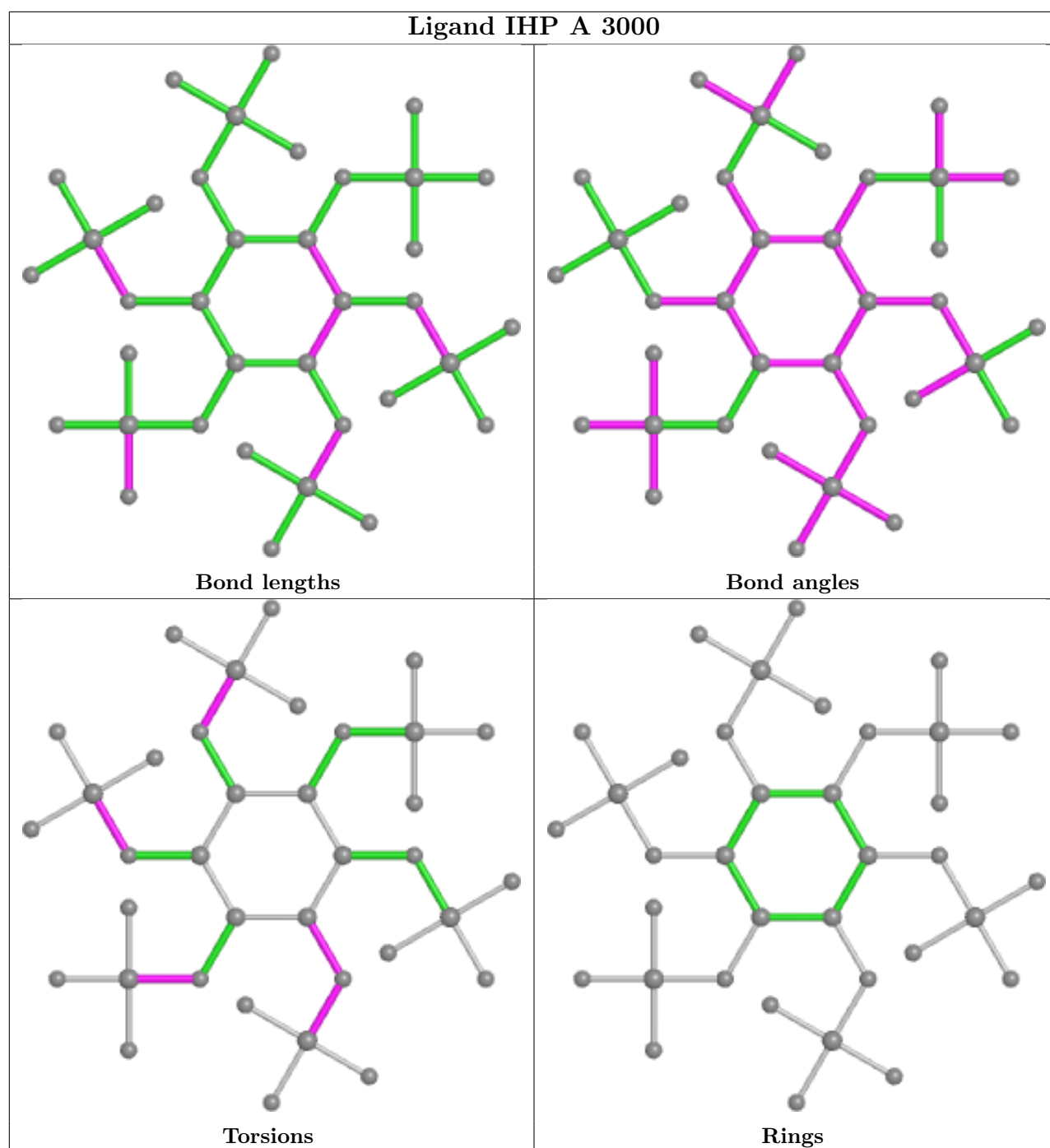
There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
48	C	1500	GTP	2	0
47	A	3000	IHP	2	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.

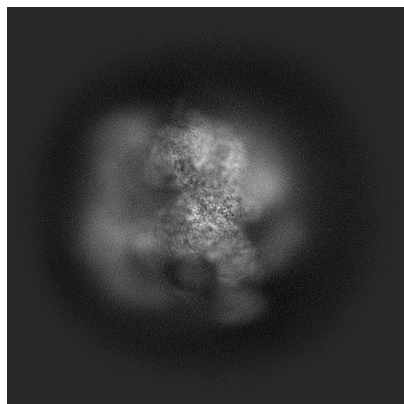
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35109. These allow visual inspection of the internal detail of the map and identification of artifacts.

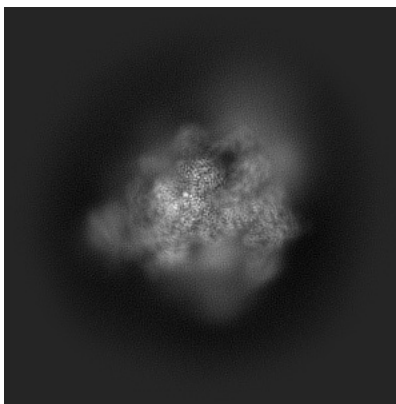
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

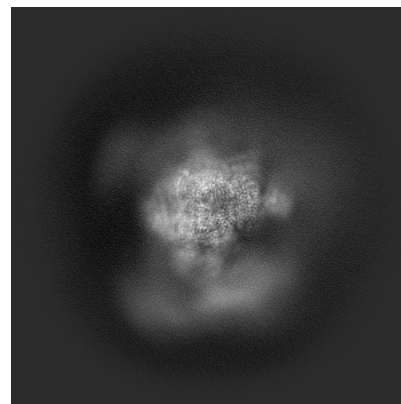
6.1.1 Primary map



X

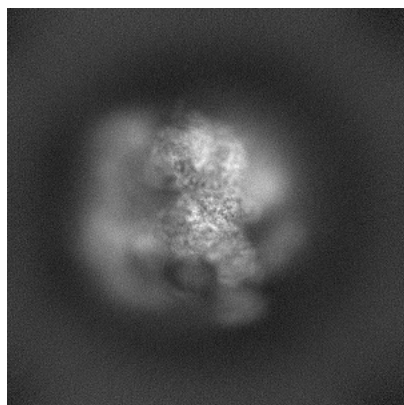


Y

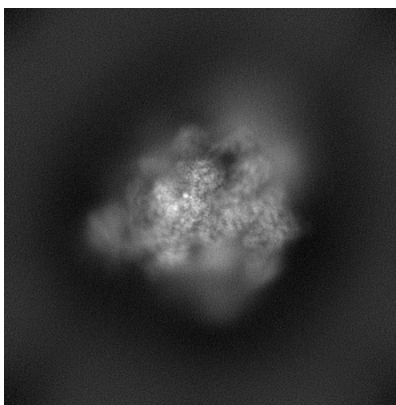


Z

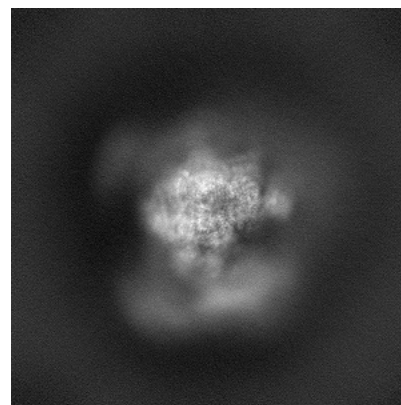
6.1.2 Raw map



X



Y

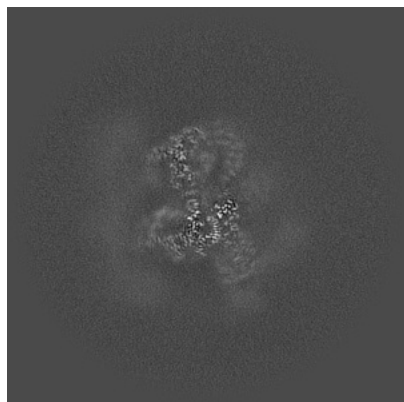


Z

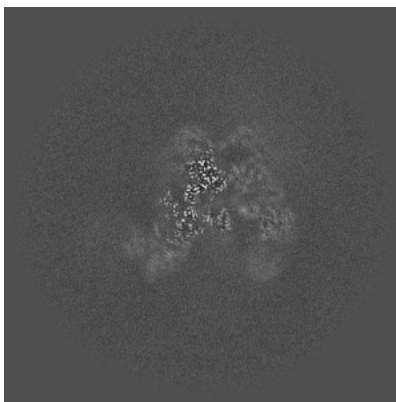
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

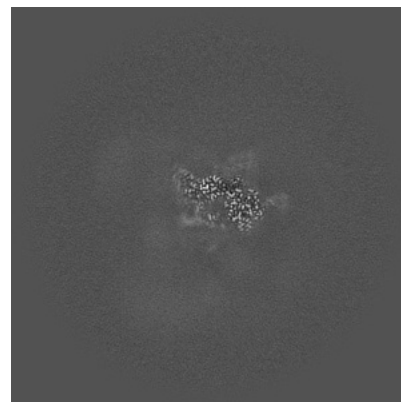
6.2.1 Primary map



X Index: 240

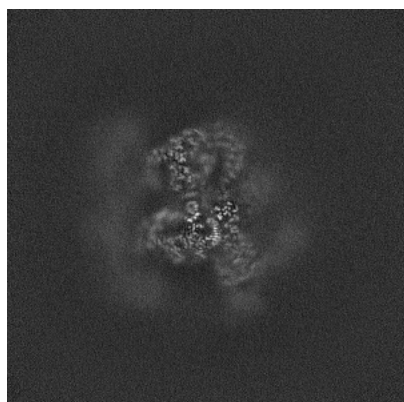


Y Index: 240

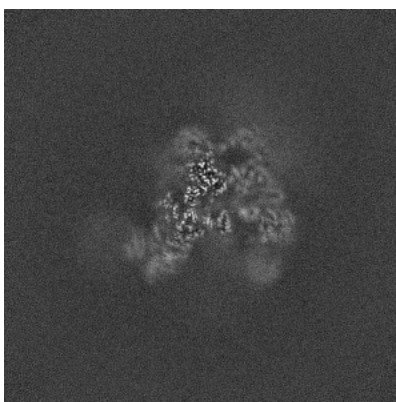


Z Index: 240

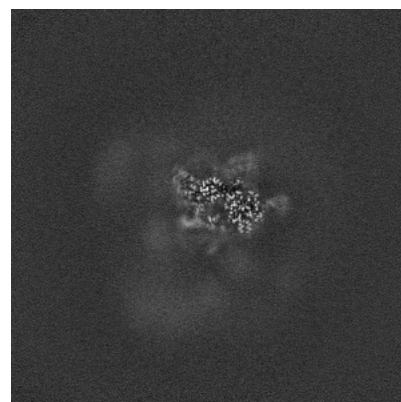
6.2.2 Raw map



X Index: 240



Y Index: 240

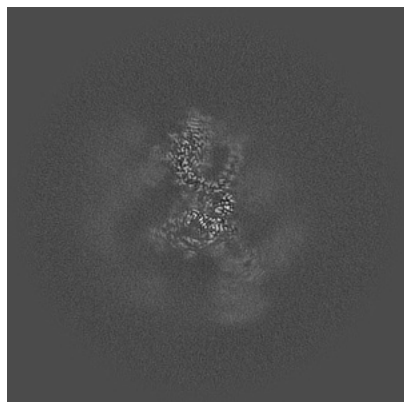


Z Index: 240

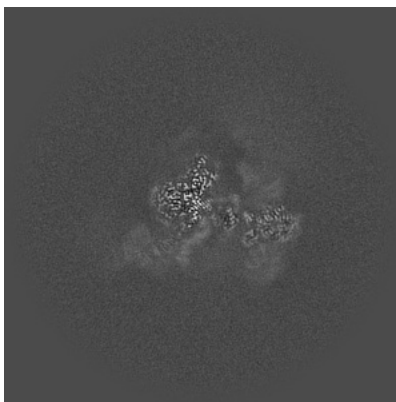
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

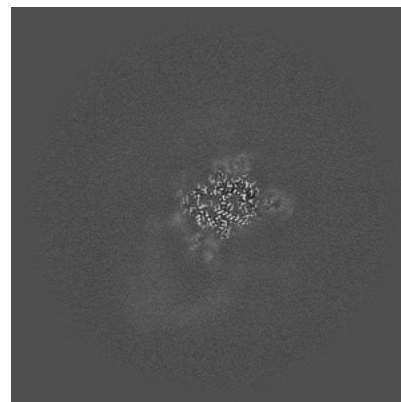
6.3.1 Primary map



X Index: 227

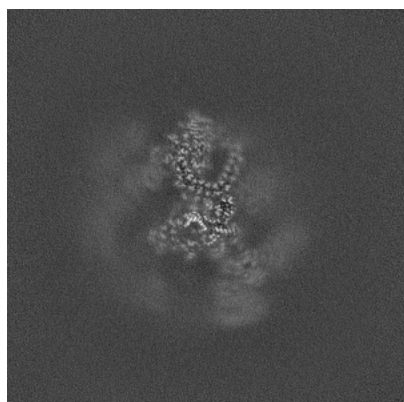


Y Index: 226

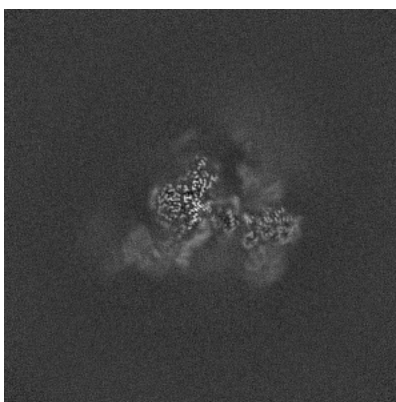


Z Index: 227

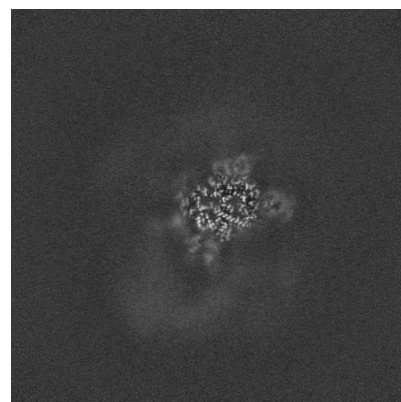
6.3.2 Raw map



X Index: 226



Y Index: 226

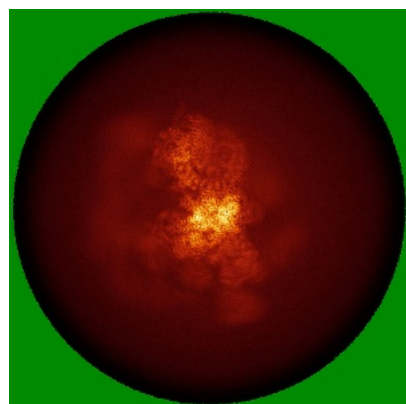


Z Index: 227

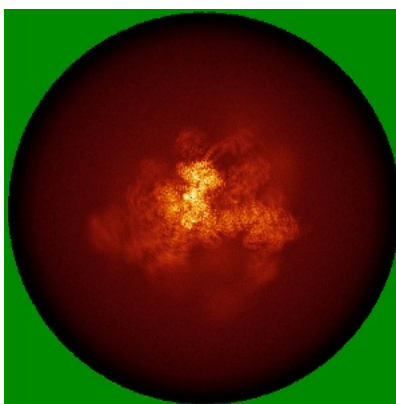
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

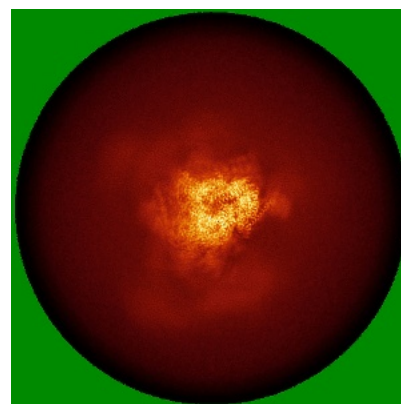
6.4.1 Primary map



X

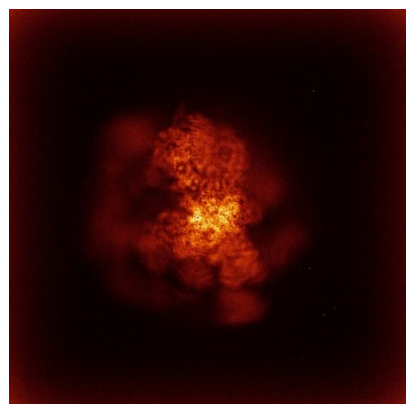


Y

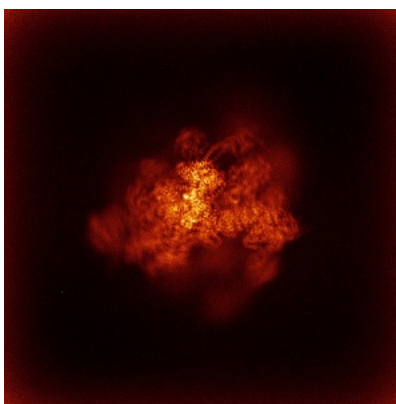


Z

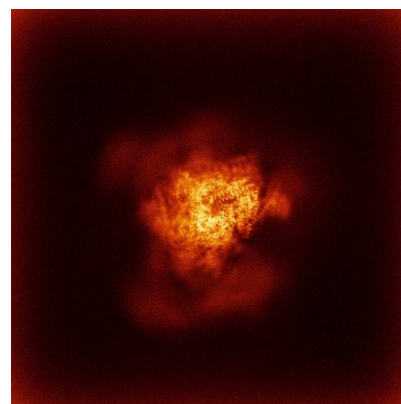
6.4.2 Raw map



X



Y

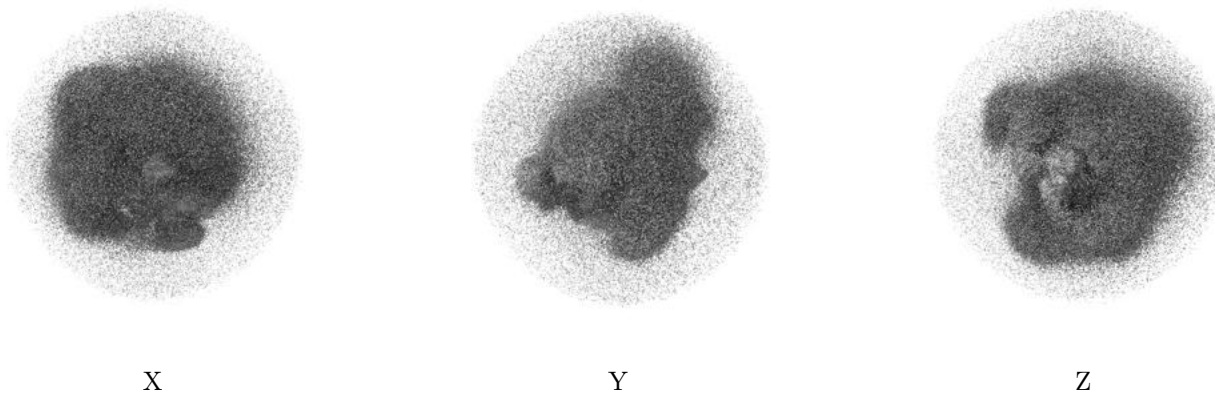


Z

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.

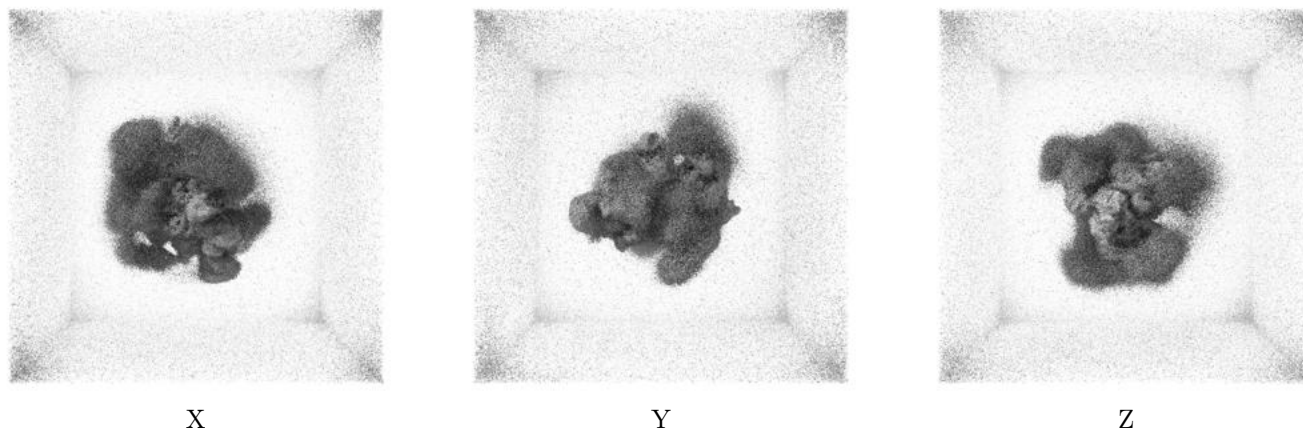
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.22. 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



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.

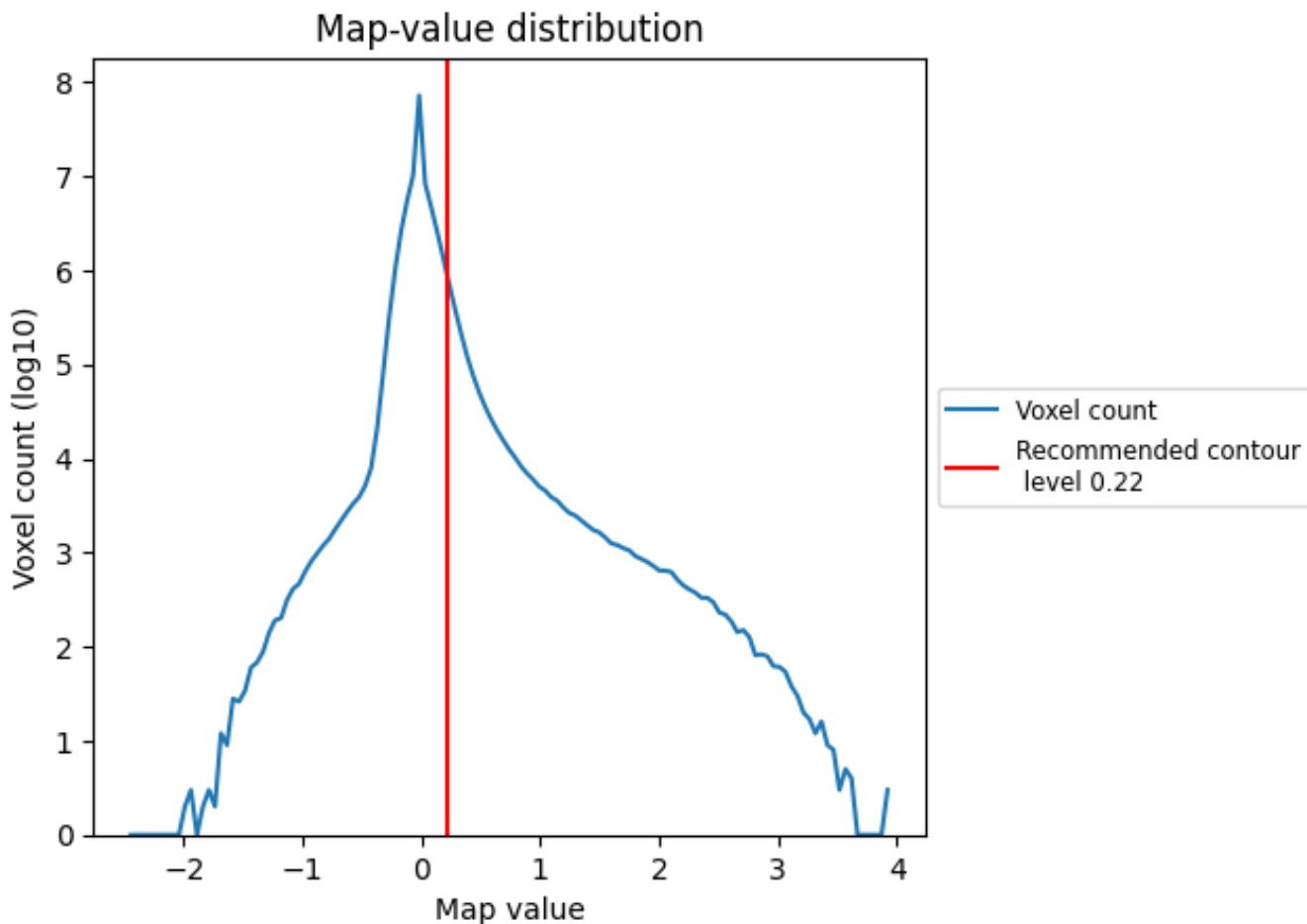
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

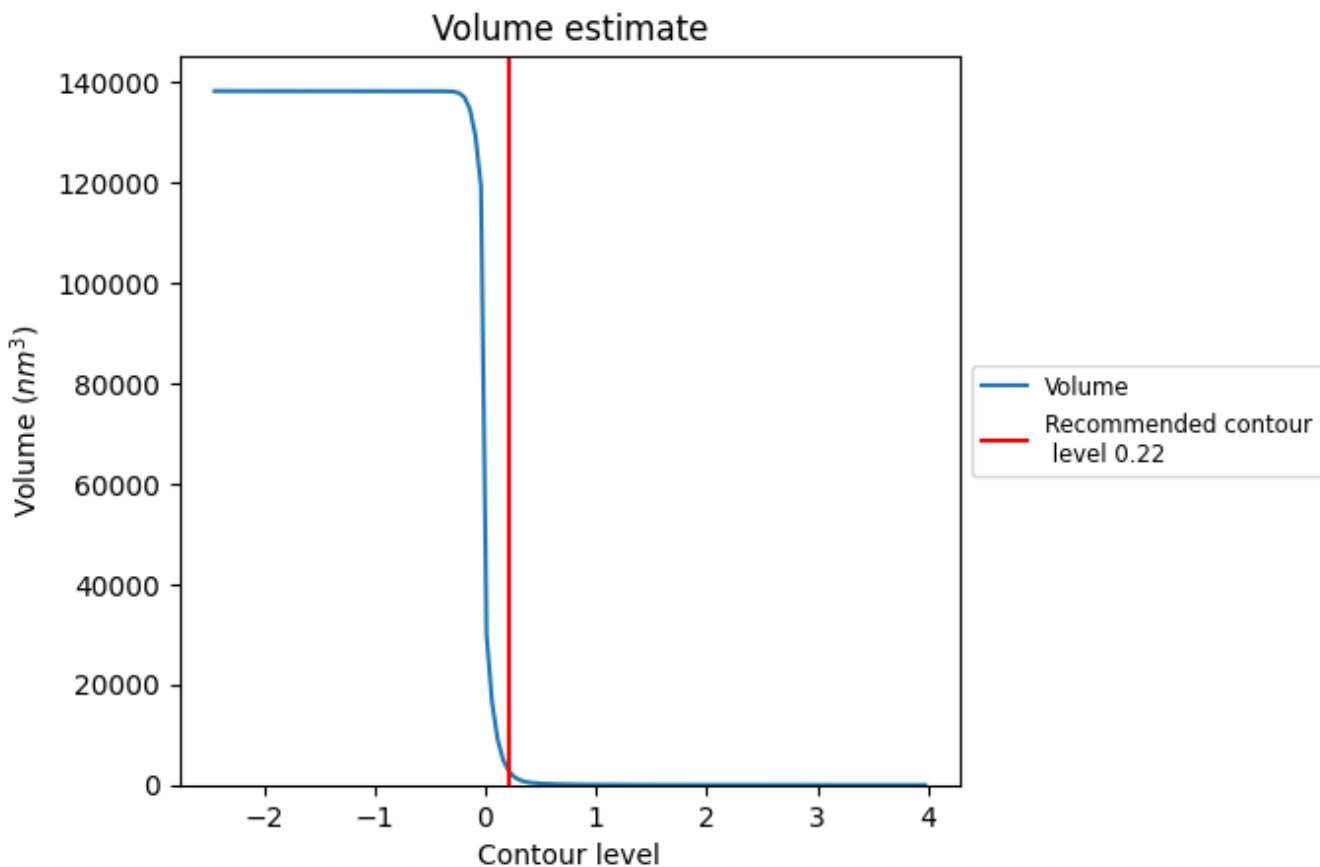
This section contains the results of statistical analysis of the map.

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.

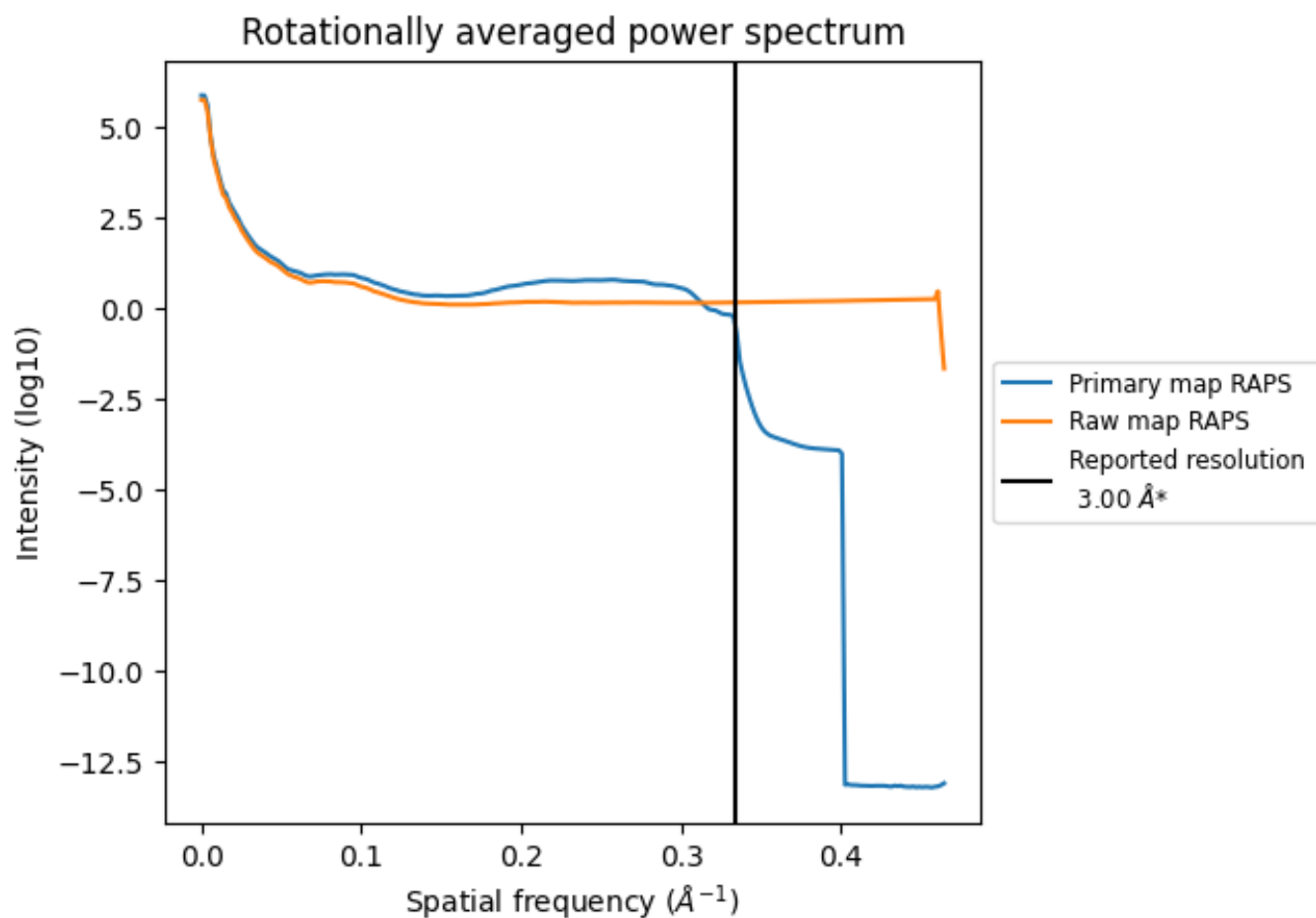
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2586 nm^3 ; this corresponds to an approximate mass of 2336 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](#)

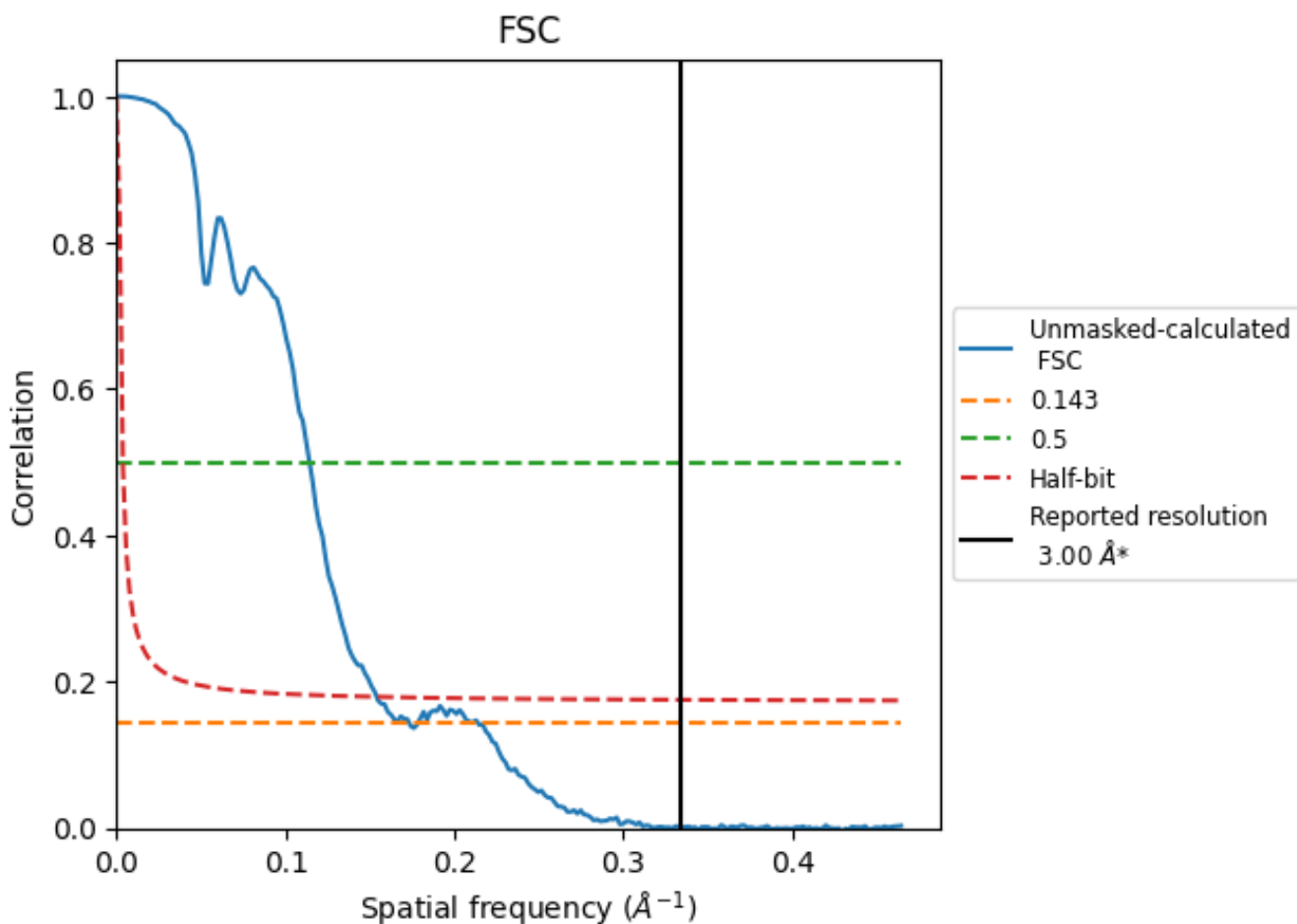


*Reported resolution corresponds to spatial frequency of 0.333 Å⁻¹

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.333 Å⁻¹

8.2 Resolution estimates [i](#)

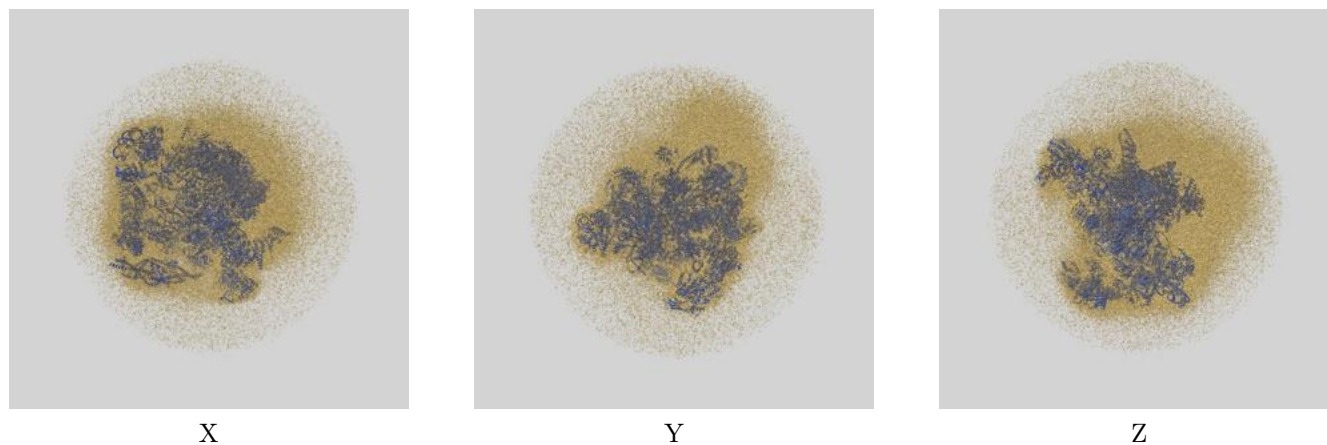
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.00	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.77	8.75	6.49

*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 5.77 differs from the reported value 3.0 by more than 10 %

9 Map-model fit [i](#)

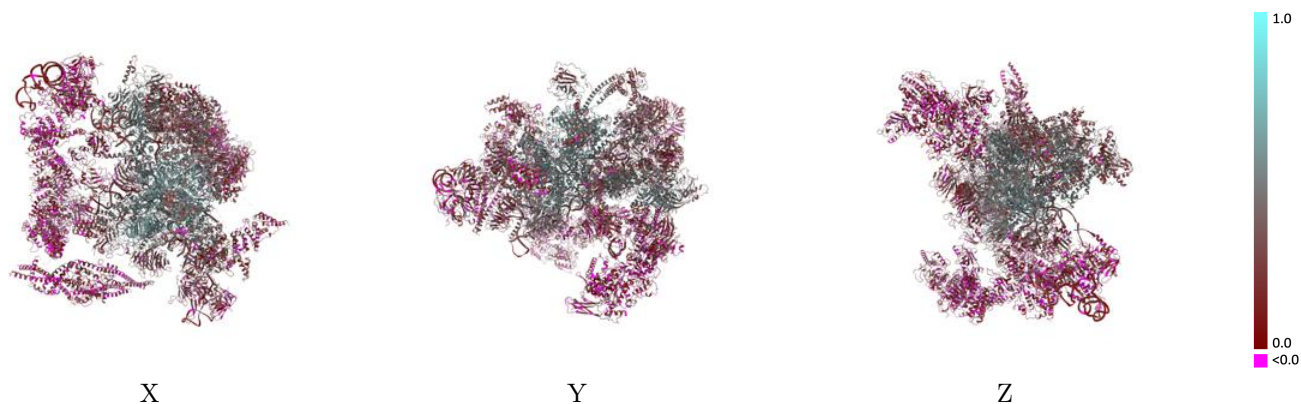
This section contains information regarding the fit between EMDB map EMD-35109 and PDB model 8I0T. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



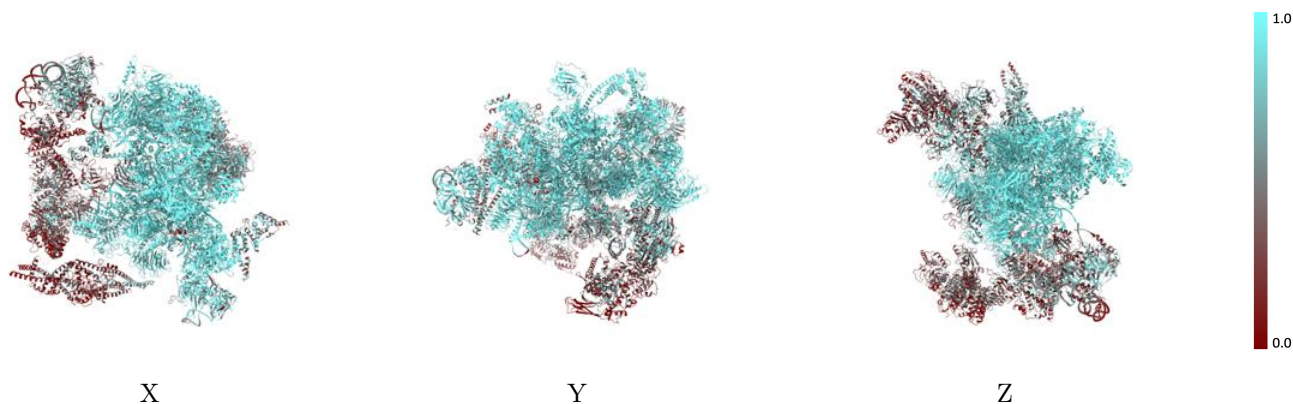
The images above show the 3D surface view of the map at the recommended contour level 0.22 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



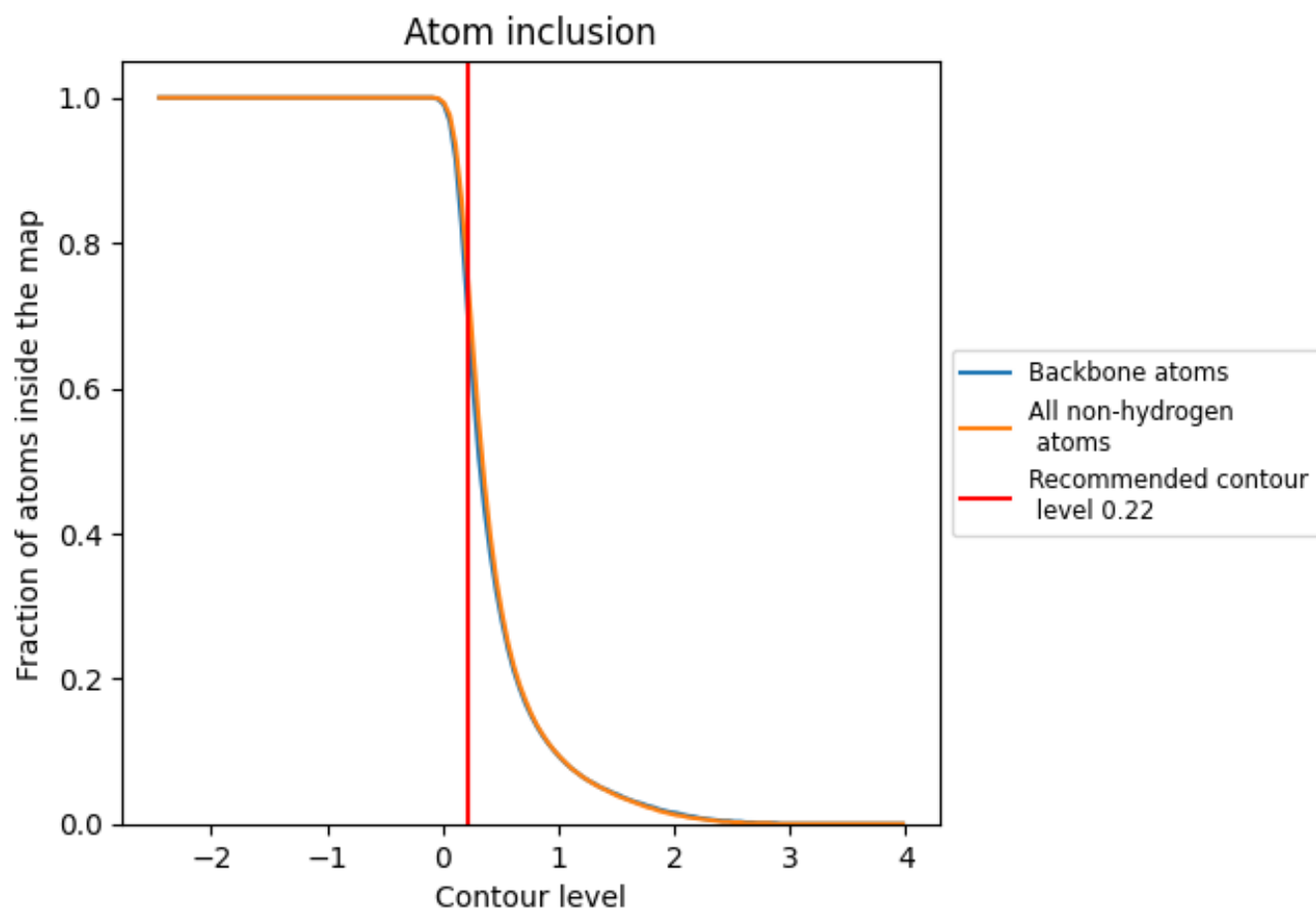
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.22).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 75% 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 (0.22) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7470	 0.3400
1	 0.9470	 0.4170
2	 0.9040	 0.4390
3	 0.9370	 0.4190
4	 0.6830	 0.2090
5	 0.9520	 0.5020
7	 0.9570	 0.4140
9	 0.4520	 0.2830
A	 0.8920	 0.4820
B	 0.9000	 0.3660
C	 0.9540	 0.3650
D	 0.3940	 0.1750
E	 0.9150	 0.3000
F	 0.9420	 0.3810
G	 0.9570	 0.3900
H	 0.6440	 0.2330
I	 0.3090	 0.1700
J	 0.9390	 0.3760
K	 0.8850	 0.4640
L	 0.6680	 0.3730
N	 0.9700	 0.4350
O	 0.8640	 0.3330
P	 0.9430	 0.5100
Q	 0.2830	 0.1700
R	 0.9220	 0.4390
S	 0.8830	 0.2600
T	 0.9940	 0.5820
U	 0.7840	 0.4100
V	 0.7860	 0.2850
W	 0.5610	 0.2430
X	 0.9240	 0.3760
Y	 0.9390	 0.3500
Z	 0.3080	 0.1640
a	 0.7850	 0.2140
b	 0.8480	 0.2330



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
c	 0.7780	 0.2450
d	 0.7900	 0.2360
e	 0.7660	 0.1910
f	 0.7130	 0.2310
g	 0.8240	 0.2150
h	 0.5620	 0.1710
i	 0.5820	 0.1510
j	 0.5860	 0.1740
k	 0.5490	 0.1770
l	 0.4940	 0.1640
m	 0.5280	 0.1770
n	 0.5020	 0.1600
o	 0.4150	 0.1780
p	 0.4570	 0.2020
q	 0.1870	 0.1670
r	 0.2950	 0.1550
s	 0.1850	 0.1630
t	 0.1960	 0.1830
u	 0.3570	 0.1770
v	 0.7080	 0.3850
w	 0.5410	 0.2370
y	 0.3260	 0.1650