wwPDB EM Validation Summary Report ⓘ

May 28, 2026 – 04:40 PM JST

PDB ID	:	9VM8 / pdb_00009vm8
EMDB ID	:	EMD-65180
Title	:	Structure of DOCK6 octamer
Authors	:	Kukimoto-Niino, M.; Katsura, K.; Ishizuka-Katsura, Y.; Yonemochi, M.; Hanada, K.; Shirouzu, M.
Deposited on	:	2025-06-27
Resolution	:	7.53 Å(reported)

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

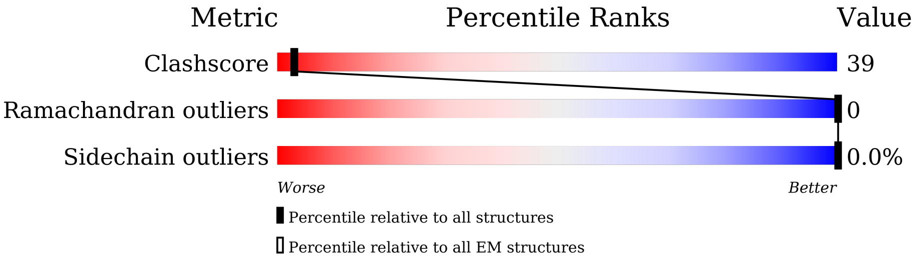
EMDB validation analysis	:	0.0.1.dev132
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

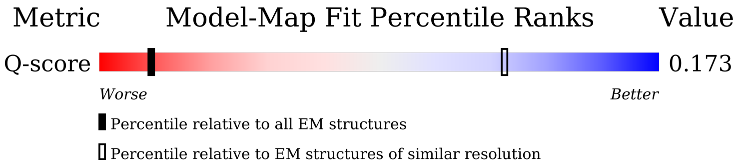
1 Overall quality at a glance

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

The reported resolution of this entry is 7.53 Å.

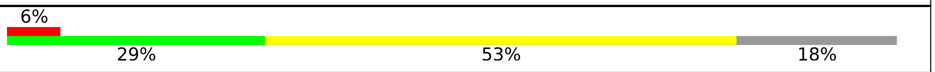
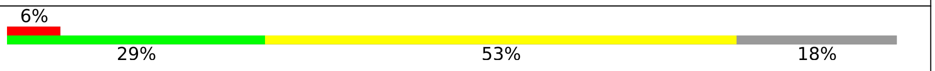
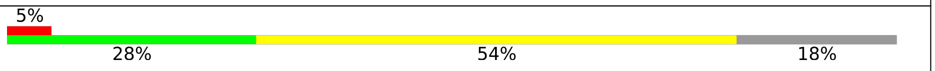
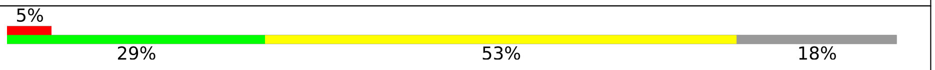
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.





Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	374 (7.04 - 8.01)

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	2053	
1	B	2053	
1	C	2053	
1	D	2053	

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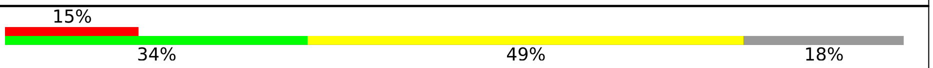
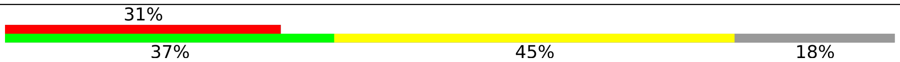
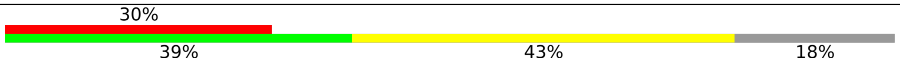
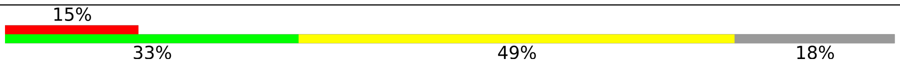
Mol	Chain	Length	Quality of chain
1	E	2053	
1	F	2053	
1	G	2053	
1	H	2053	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 107608 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 Dedicator of cytokinesis protein 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1683	Total 13425	C 8576	N 2321	O 2469	S 59	0	0
1	C	1689	Total 13477	C 8609	N 2332	O 2477	S 59	0	0
1	D	1689	Total 13477	C 8609	N 2332	O 2477	S 59	0	0
1	B	1683	Total 13425	C 8576	N 2321	O 2469	S 59	0	0
1	E	1689	Total 13477	C 8609	N 2332	O 2477	S 59	0	0
1	F	1683	Total 13425	C 8576	N 2321	O 2469	S 59	0	0
1	G	1683	Total 13425	C 8576	N 2321	O 2469	S 59	0	0
1	H	1689	Total 13477	C 8609	N 2332	O 2477	S 59	0	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	GLY	-	expression tag	UNP Q96HP0
A	-4	GLY	-	expression tag	UNP Q96HP0
A	-3	SER	-	expression tag	UNP Q96HP0
A	-2	GLY	-	expression tag	UNP Q96HP0
A	-1	GLY	-	expression tag	UNP Q96HP0
A	0	SER	-	expression tag	UNP Q96HP0
C	-5	GLY	-	expression tag	UNP Q96HP0
C	-4	GLY	-	expression tag	UNP Q96HP0
C	-3	SER	-	expression tag	UNP Q96HP0
C	-2	GLY	-	expression tag	UNP Q96HP0
C	-1	GLY	-	expression tag	UNP Q96HP0
C	0	SER	-	expression tag	UNP Q96HP0
D	-5	GLY	-	expression tag	UNP Q96HP0
D	-4	GLY	-	expression tag	UNP Q96HP0

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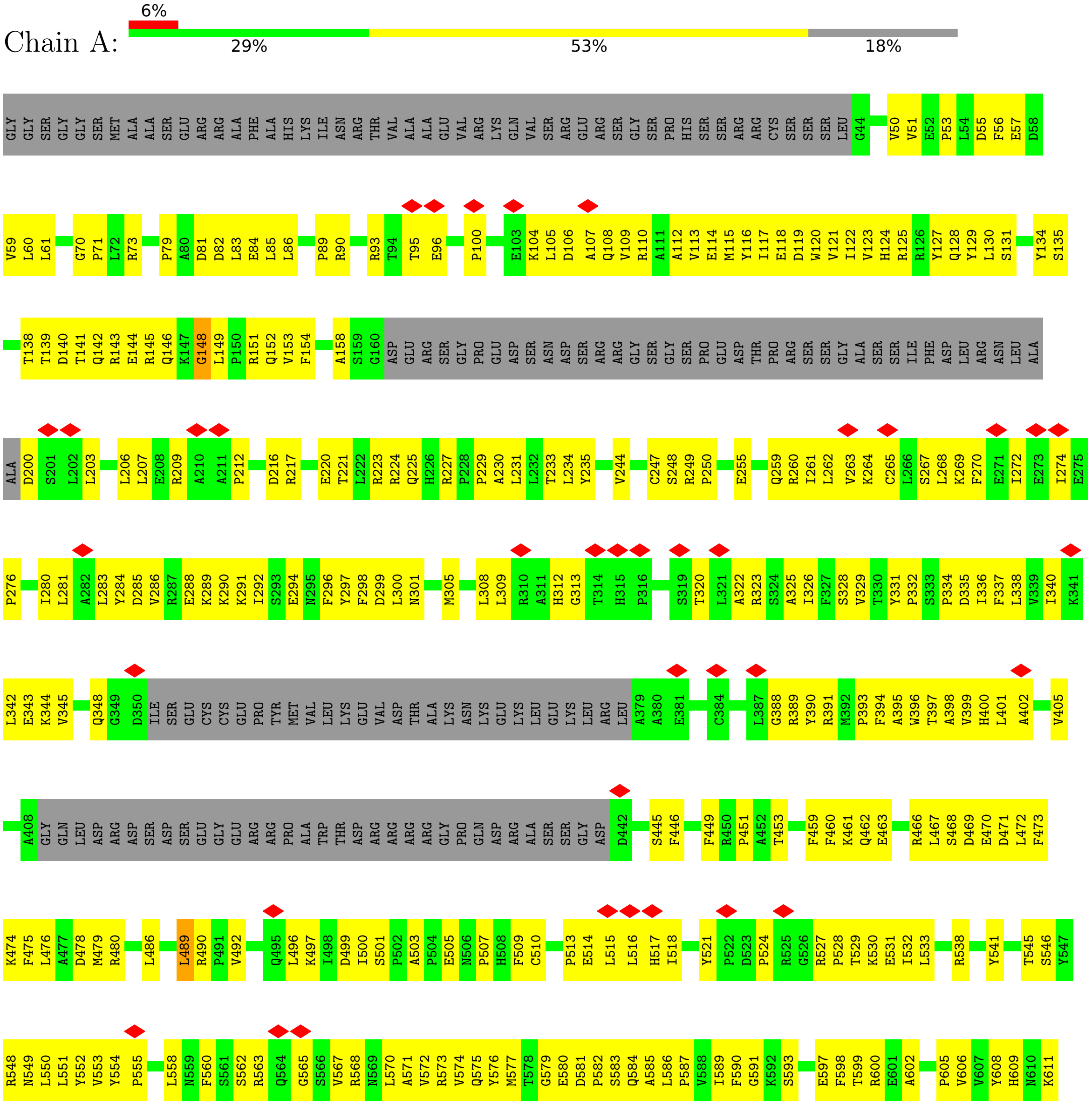
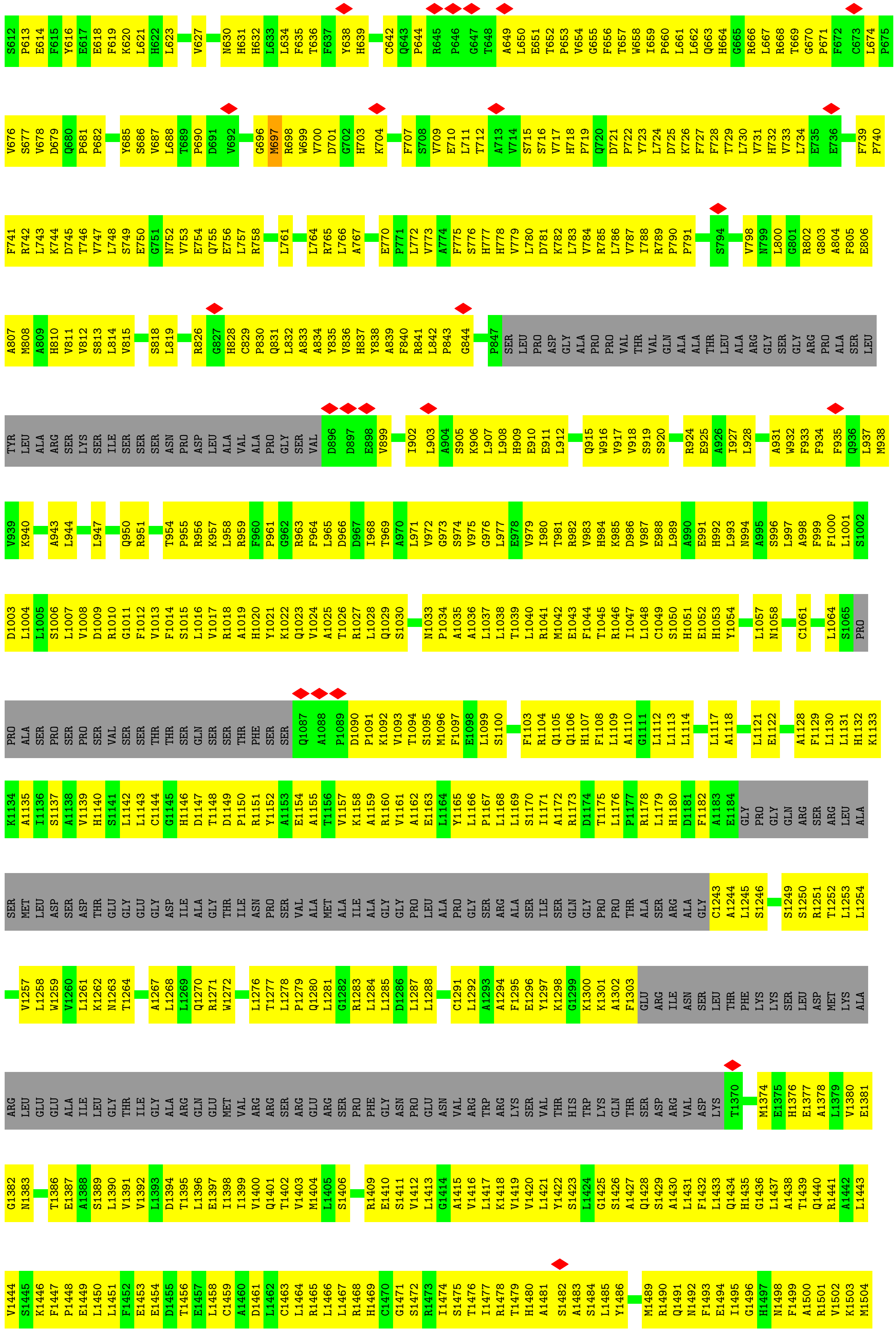
Chain	Residue	Modelled	Actual	Comment	Reference
D	-3	SER	-	expression tag	UNP Q96HP0
D	-2	GLY	-	expression tag	UNP Q96HP0
D	-1	GLY	-	expression tag	UNP Q96HP0
D	0	SER	-	expression tag	UNP Q96HP0
B	-5	GLY	-	expression tag	UNP Q96HP0
B	-4	GLY	-	expression tag	UNP Q96HP0
B	-3	SER	-	expression tag	UNP Q96HP0
B	-2	GLY	-	expression tag	UNP Q96HP0
B	-1	GLY	-	expression tag	UNP Q96HP0
B	0	SER	-	expression tag	UNP Q96HP0
E	-5	GLY	-	expression tag	UNP Q96HP0
E	-4	GLY	-	expression tag	UNP Q96HP0
E	-3	SER	-	expression tag	UNP Q96HP0
E	-2	GLY	-	expression tag	UNP Q96HP0
E	-1	GLY	-	expression tag	UNP Q96HP0
E	0	SER	-	expression tag	UNP Q96HP0
F	-5	GLY	-	expression tag	UNP Q96HP0
F	-4	GLY	-	expression tag	UNP Q96HP0
F	-3	SER	-	expression tag	UNP Q96HP0
F	-2	GLY	-	expression tag	UNP Q96HP0
F	-1	GLY	-	expression tag	UNP Q96HP0
F	0	SER	-	expression tag	UNP Q96HP0
G	-5	GLY	-	expression tag	UNP Q96HP0
G	-4	GLY	-	expression tag	UNP Q96HP0
G	-3	SER	-	expression tag	UNP Q96HP0
G	-2	GLY	-	expression tag	UNP Q96HP0
G	-1	GLY	-	expression tag	UNP Q96HP0
G	0	SER	-	expression tag	UNP Q96HP0
H	-5	GLY	-	expression tag	UNP Q96HP0
H	-4	GLY	-	expression tag	UNP Q96HP0
H	-3	SER	-	expression tag	UNP Q96HP0
H	-2	GLY	-	expression tag	UNP Q96HP0
H	-1	GLY	-	expression tag	UNP Q96HP0
H	0	SER	-	expression tag	UNP Q96HP0

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: Dedicator of cytokinesis protein 6

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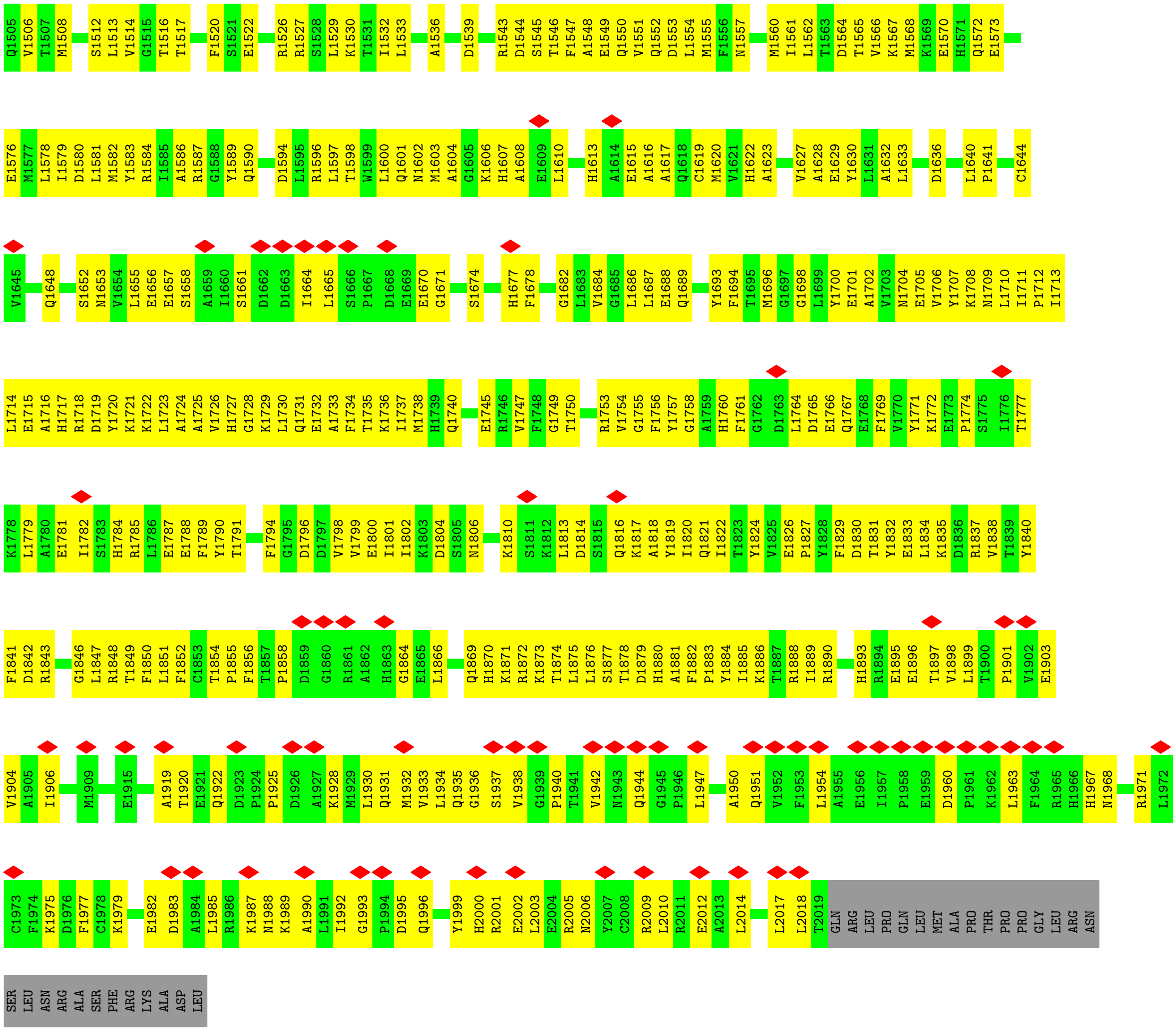
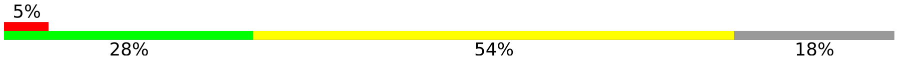
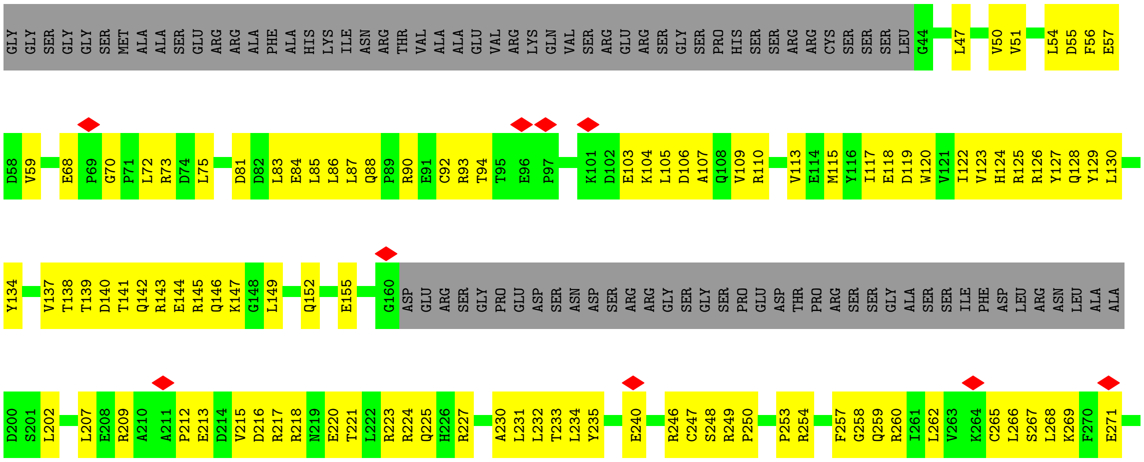
V676 S677 V678 D679 Q680 P681 P682 Y685 S686 V687 L688 T689 P690 D691 V692 G696 M697 R698 W699 V700 D701 G702 H703 K704 F707 S708 V709 E710 L711 T712 A713 V714 S715 S716 V717 H718 P719 Q720 D721 P722 Y723 L724 D725 K726 F727 F728 T729 L730 V731 H732 V733 L734 E735 E736 F739 P740
F741 R742 L743 K744 D745 T746 V747 L748 S749 E750 G751 N752 V753 E754 Q755 E756 L757 R758 L761 L764 R765 L766 A767 E770 P771 L772 V773 A774 F775 S776 H777 H778 V779 L780 D781 K782 L783 V784 R785 L786 V787 I788 R789 P790 P791 S794 V798 N799 L800 G801 R802 G803 A804 F805 E806
A807 M808 A809 H810 V811 V812 S813 L814 V815 S818 L819 R826 G827 H828 C829 P830 Q831 L832 A833 A834 Y835 V836 H837 Y838 A839 F840 R841 L842 P843 G844 P847 SER LEU PRO ASP GLY ALA PRO PRO VAL THR VAL GLN ALA ALA THR LEU ALA ARG GLY SER GLY ARG PRO ALA SER LEU
TYR LEU ALA ARG SER LYS SER ILE SER SER SER ASN PRO ASP LEU ALA VAL ALA PRO GLY SER VAL D896 D897 E898 V899 I902 L903 A904 S905 K906 L907 L908 H909 E910 E911 L912 Q915 W916 V917 V918 S919 S920 R924 E925 A926 I927 L928 A931 W932 F933 F934 F935 Q936 L937 M938
V939 K940 A943 L944 L947 Q950 R951 T954 P955 R956 K957 L958 R959 F960 P961 G962 R963 F964 L965 D966 D967 I968 T969 A970 L971 V972 G973 S974 V975 G976 L977 E978 V979 I980 T981 R982 V983 H984 K985 D986 V987 E988 L989 A990 E991 H992 L993 N994 A995 S996 L997 A998 F999 F1000 L1001 S1002
D1003 L1004 L1005 S1006 L1007 V1008 D1009 R1010 G1011 F1012 V1013 F1014 S1015 L1016 V1017 R1018 A1019 H1020 Y1021 K1022 Q1023 V1024 A1025 T1026 R1027 L1028 Q1029 S1030 N1033 P1034 A1035 A1036 L1037 L1038 T1039 L1040 R1041 M1042 E1043 F1044 T1045 R1046 I1047 L1048 C1049 S1050 H1051 E1052 H1053 Y1054 L1057 N1058 C1061 L1064 S1065 PRO
PRO ALA SER PRO SER PRO SER VAL SER SER THR THR SER GLN SER SER THR PHE SER SER Q1087 A1088 P1089 D1090 P1091 K1092 V1093 T1094 S1095 M1096 F1097 E1098 L1099 S1100 F1103 R1104 Q1105 Q1106 H1107 F1108 L1109 A1110 G1111 L1112 L1113 L1114 L1117 A1118 L1121 E1122 A1128 F1129 L1130 L1131 H1132 K1133
K1134 A1135 I1136 S1137 A1138 V1139 H1140 S1141 L1142 L1143 C1144 G1145 H1146 D1147 T1148 D1149 P1150 R1151 Y1152 A1153 E1154 A1155 T1156 V1157 K1158 A1159 R1160 V1161 A1162 E1163 L1164 Y1165 L1166 P1167 L1168 L1169 S1170 I1171 A1172 R1173 D1174 T1175 L1176 P1177 R1178 L1179 H1180 D1181 F1182 A1183 E1184 GLY PRO GLY GLN ARG SER ARG LEU ALA
SER MET LEU ASP SER ASP THR GLU GLY GLU ASP ILE ALA GLY THR ILE ASN PRO SER VAL ALA MET ALA ILE ALA GLY GLY PRO LEU ALA PRO GLY SER ARG ALA SER ILE SER GLN GLY PRO PRO THR ALA SER ARG ALA GLY C1243 A1244 L1245 S1246 S1249 S1250 R1251 T1252 L1253 L1254
V1257 L1258 W1259 V1260 L1261 K1262 N1263 T1264 A1267 L1268 L1269 Q1270 R1271 W1272 L1276 T1277 L1278 P1279 Q1280 L1281 G1282 R1283 L1284 L1285 D1286 L1287 L1288 C1291 L1292 A1293 A1294 F1295 E1296 Y1297 K1298 G1299 K1300 K1301 A1302 F1303 GLU ARG ILE ASN SER LEU THR PHE LYS LYS SER LEU ASP MET LYS ALA
ARG LEU GLU GLU ALA ILE LEU GLY THR ILE GLY ALA ARG GLN GLU MET VAL ARG ARG SER ARG GLU ARG SER PRO PHE GLY ASN PRO GLU ASN VAL ARG TRP ARG LYS SER VAL THR HIS TRP LYS GLN THR SER ASP ARG VAL ASP LYS T1370 M1374 E1375 H1376 E1377 A1378 L1379 V1380 E1381
G1382 N1383 T1386 E1387 A1388 S1389 L1390 V1391 V1392 L1393 D1394 T1395 L1396 E1397 I1398 I1399 V1400 Q1401 T1402 V1403 M1404 L1405 S1406 R1409 E1410 S1411 V1412 L1413 G1414 A1415 V1416 L1417 K1418 V1419 V1420 L1421 Y1422 S1423 L1424 G1425 S1426 A1427 Q1428 S1429 A1430 L1431 F1432 L1433 Q1434 H1435 G1436 L1437 A1438 T1439 Q1440 R1441 A1442 L1443
V1444 S1445 K1446 F1447 P1448 E1449 L1450 L1451 F1452 E1453 E1454 D1455 T1456 E1457 L1458 C1459 A1460 D1461 L1462 C1463 L1464 R1465 L1466 L1467 R1468 H1469 C1470 G1471 S1472 R1473 I1474 S1475 T1476 I1477 R1478 T1479 H1480 A1481 S1482 A1483 S1484 L1485 Y1486 M1489 R1490 Q1491 N1492 F1493 E1494 I1495 G1496 H1497 N1498 F1499 A1500 R1501 V1502 K1503 M1504

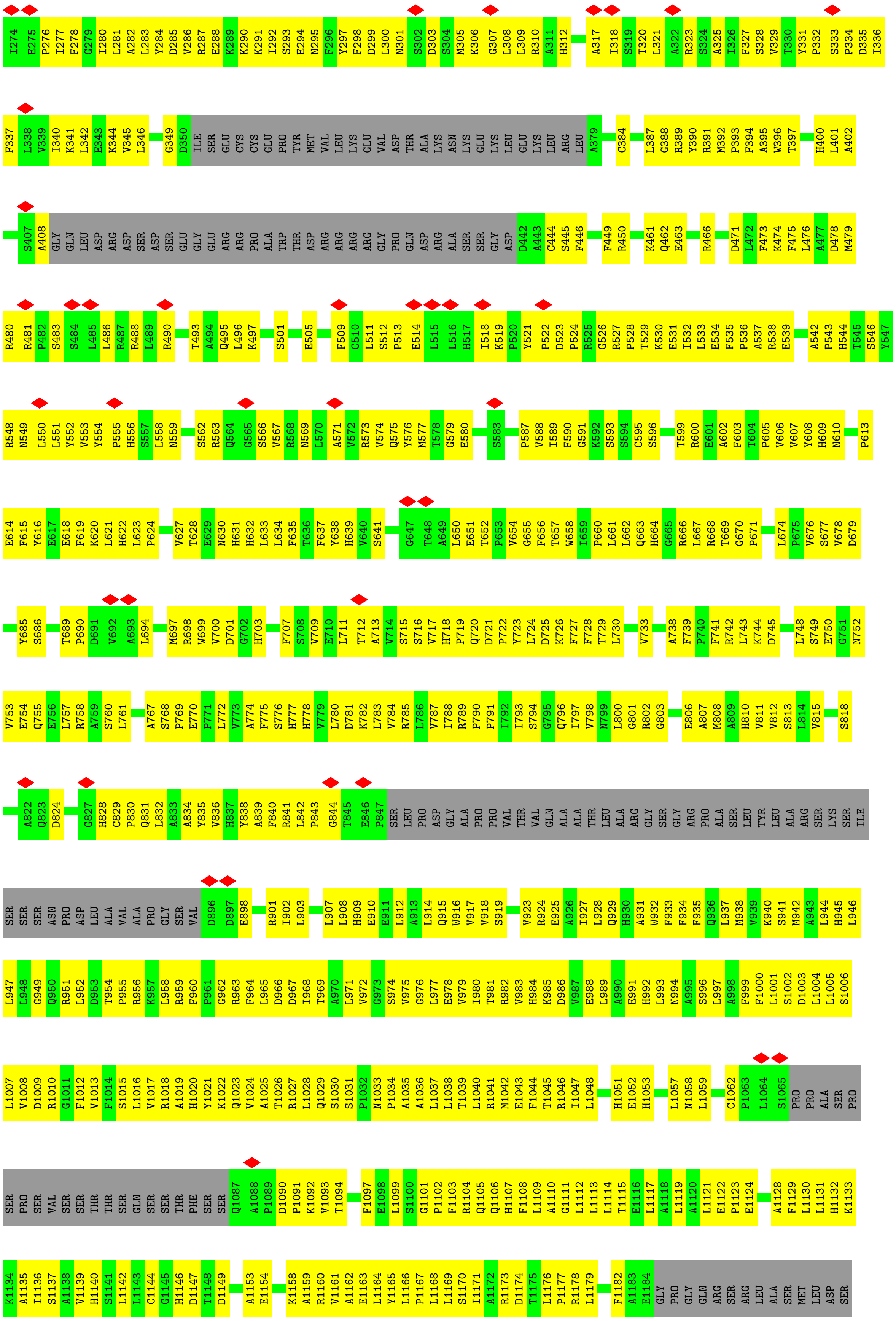


- Molecule 1: Dedicator of cytokinesis protein 6

Chain C:



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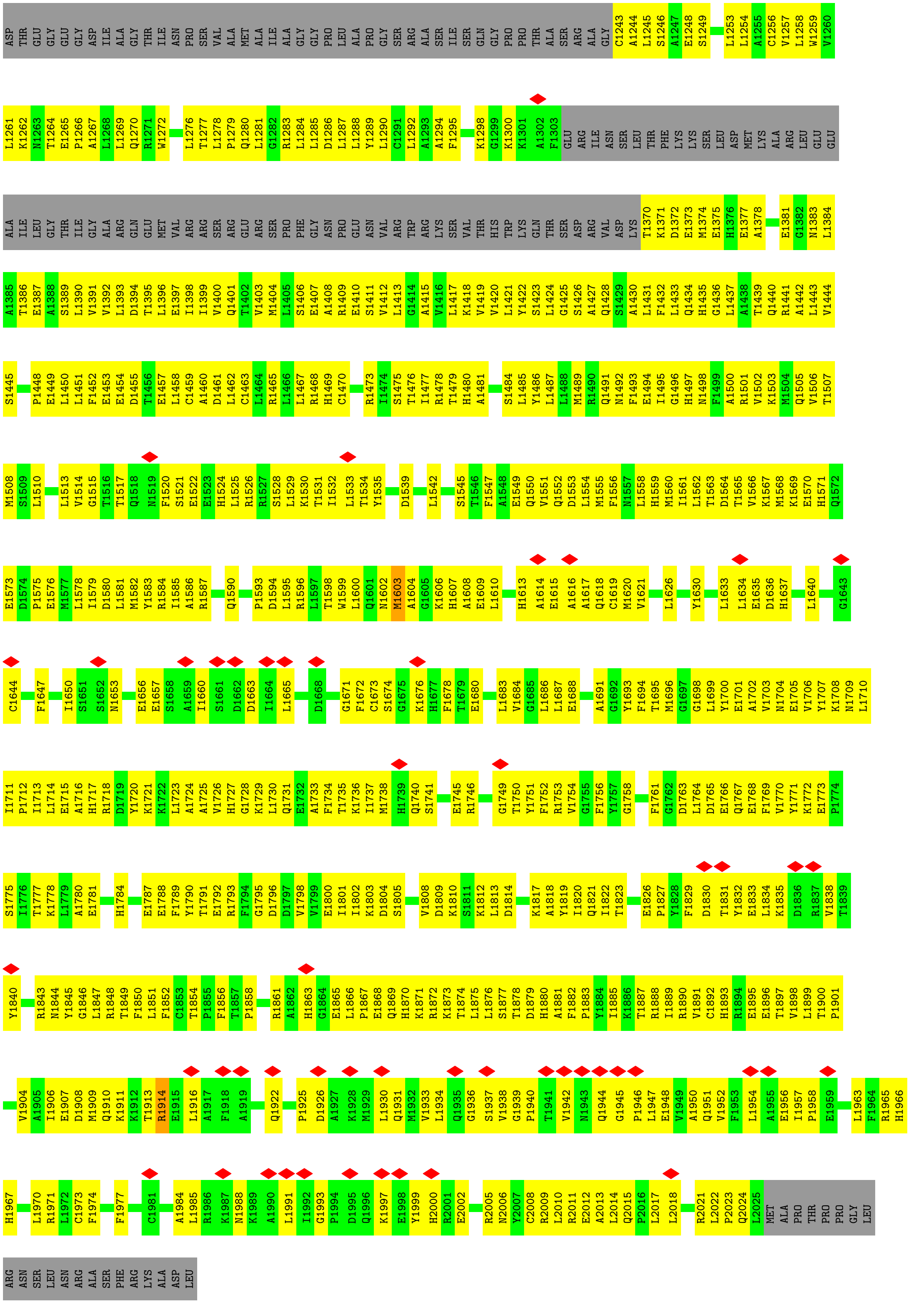
F337 L338 V339 I340 K341 L342 E343 K344 V345 L346 G349 D350 ILE SER GLU CYS CYS GLU PRO TYR MET VAL LEU LYS GLU VAL ASP THR ALA LYS ASN LYS GLU LYS LEU GLU LYS LEU ARG LEU A379 C384 L387 G388 R389 Y390 R391 M392 P393 F394 A395 W396 T397 H400 L401 A402
S407 A408 GLY GLN LEU ASP ARG ASP SER ASP SER GLU GLY GLU ARG ARG PRO ALA TRP THR THR ASP ARG ARG ARG ARG GLY PRO GLN ASP ARG ALA ALA SER SER GLY ASP D442 A443 C444 S445 F446 F449 R450 K461 Q462 E463 R466 D471 L472 F473 K474 F475 L476 A477 D478 M479
R480 R481 P482 S483 S484 L485 L486 R487 R488 L489 R490 T493 A494 Q495 L496 K497 S501 E505 F509 C510 L511 S512 P513 E514 L515 L516 H517 I518 K519 P520 Y521 P522 D523 P524 R525 G526 R527 P528 T529 K530 E531 I532 L533 E534 F535 P536 A537 R538 E539 A542 P543 H544 T545 S546 Y547
R548 N549 L550 L551 Y552 V553 Y554 P555 H556 S557 L558 N559 S562 R563 Q564 G565 S566 V567 R568 N569 L570 A571 V572 R573 V574 Q575 Y576 M577 T578 G579 E580 S583 P587 V588 I589 F590 G591 K592 S593 S594 C595 S596 T599 R600 E601 A602 F603 T604 P605 V606 V607 Y608 H609 N610 P613
E614 F615 Y616 E617 E618 F619 K620 L621 H622 L623 P624 V627 T628 E629 N630 H631 H632 L633 L634 F635 T636 F637 Y638 H639 V640 S641 G647 T648 A649 L650 E651 T652 P653 V654 G655 F656 T657 W658 I659 P660 L661 L662 Q663 H664 G665 R666 L667 R668 T669 G670 P671 L674 P675 V676 S677 V678 D679
Y685 S686 T689 P690 D691 V692 A693 L694 M697 R698 W699 V700 D701 G702 H703 F707 S708 V709 E710 L711 T712 A713 V714 S715 S716 V717 H718 P719 Q720 D721 P722 Y723 L724 D725 K726 F727 F728 T729 L730 V733 A738 F739 P740 F741 R742 L743 K744 D745 L748 S749 E750 G751 N752
V753 E754 Q755 E756 L757 R758 A759 S760 L761 A767 S768 P769 E770 P771 L772 V773 A774 F775 S776 H777 H778 V779 L780 D781 K782 L783 V784 R785 L786 V787 I788 R789 P790 P791 I792 I793 S794 G795 Q796 I797 V798 N799 L800 G801 R802 G803 E806 A807 M808 A809 H810 V811 V812 S813 L814 V815 S818
A822 Q823 D824 G827 H828 C829 P830 Q831 L832 A833 A834 Y835 V836 H837 Y838 A839 F840 R841 L842 P843 G844 T845 E846 P847 SER LEU PRO ASP GLY ALA PRO PRO VAL THR VAL GLN ALA ALA THR LEU ALA ARG GLY SER GLY ARG PRO ALA SER LEU TYR LEU ALA ARG SER LYS SER ILE
SER SER SER ASN PRO ASP LEU ALA VAL ALA PRO GLY SER VAL D896 D897 E898 R901 I902 L903 L907 L908 H909 E910 E911 L912 A913 L914 Q915 W916 V917 V918 S919 V923 R924 E925 A926 I927 L928 Q929 H930 A931 W932 F933 F934 F935 Q936 L937 M938 V939 K940 S941 M942 A943 L944 H945 L946
L947 L948 G949 Q950 R951 L952 D953 T954 P955 R956 K957 L958 R959 F960 P961 G962 R963 F964 L965 D966 D967 I968 T969 A970 L971 V972 G973 S974 V975 G976 L977 E978 V979 I980 T981 R982 V983 H984 K985 D986 V987 E988 L989 A990 E991 H992 L993 N994 A995 S996 L997 A998 F999 F1000 L1001 S1002 D1003 L1004 L1005 S1006
L1007 V1008 D1009 R1010 G1011 F1012 V1013 F1014 S1015 L1016 V1017 R1018 A1019 H1020 Y1021 K1022 Q1023 V1024 A1025 T1026 R1027 L1028 Q1029 S1030 S1031 P1032 N1033 P1034 A1035 A1036 L1037 L1038 T1039 L1040 R1041 M1042 E1043 F1044 T1045 R1046 I1047 L1048 H1051 E1052 H1053 L1057 N1058 L1059 C1062 P1063 L1064 S1065 PRO PRO ALA SER PRO
SER PRO SER VAL SER SER THR THR SER GLN SER SER THR PHE SER SER Q1087 A1088 P1089 D1090 P1091 K1092 V1093 T1094 F1097 E1098 L1099 S1100 G1101 P1102 F1103 R1104 Q1105 Q1106 H1107 F1108 L1109 A1110 G1111 L1112 L1113 L1114 T1115 E1116 L1117 A1118 L1119 A1120 L1121 E1122 P1123 E1124 A1128 F1129 L1130 L1131 H1132 K1133
K1134 A1135 I1136 S1137 A1138 V1139 H1140 S1141 L1142 L1143 C1144 G1145 H1146 D1147 T1148 D1149 A1153 E1154 K1158 A1159 R1160 V1161 A1162 E1163 L1164 Y1165 L1166 P1167 L1168 L1169 S1170 I1171 A1172 R1173 D1174 T1175 L1176 P1177 R1178 L1179 F1182 A1183 E1184 GLY PRO GLY GLN ARG SER ARG LEU ALA SER MET LEU ASP SER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L1261 K1262 N1263 T1264 E1265 P1266 A1267 L1268 L1269 Q1270 R1271 W1272 L1276 T1277 L1278 P1279 Q1280 L1281 G1282 R1283 L1284 L1285 D1286 L1287 L1288 Y1289 L1290 C1291 L1292 A1293 A1294 F1295 K1298 G1299 K1300 K1301 A1302 F1303 GLU ARG ILE ASN SER LEU THR PHE LYS LYS SER LEU ASP MET LYS ALA ARG LEU GLU GLU
ALA ILE LEU GLY THR ILE GLY ALA ARG GLN GLU MET VAL ARG ARG SER ARG GLU ARG SER PRO PHE GLY ASN PRO GLU ASN VAL ARG TRP ARG LYS SER VAL THR HIS TRP LYS GLN THR SER ASP ARG VAL ASP LYS T1370 K1371 D1372 E1373 M1374 E1375 H1376 E1377 A1378 E1381 G1382 N1383 L1384
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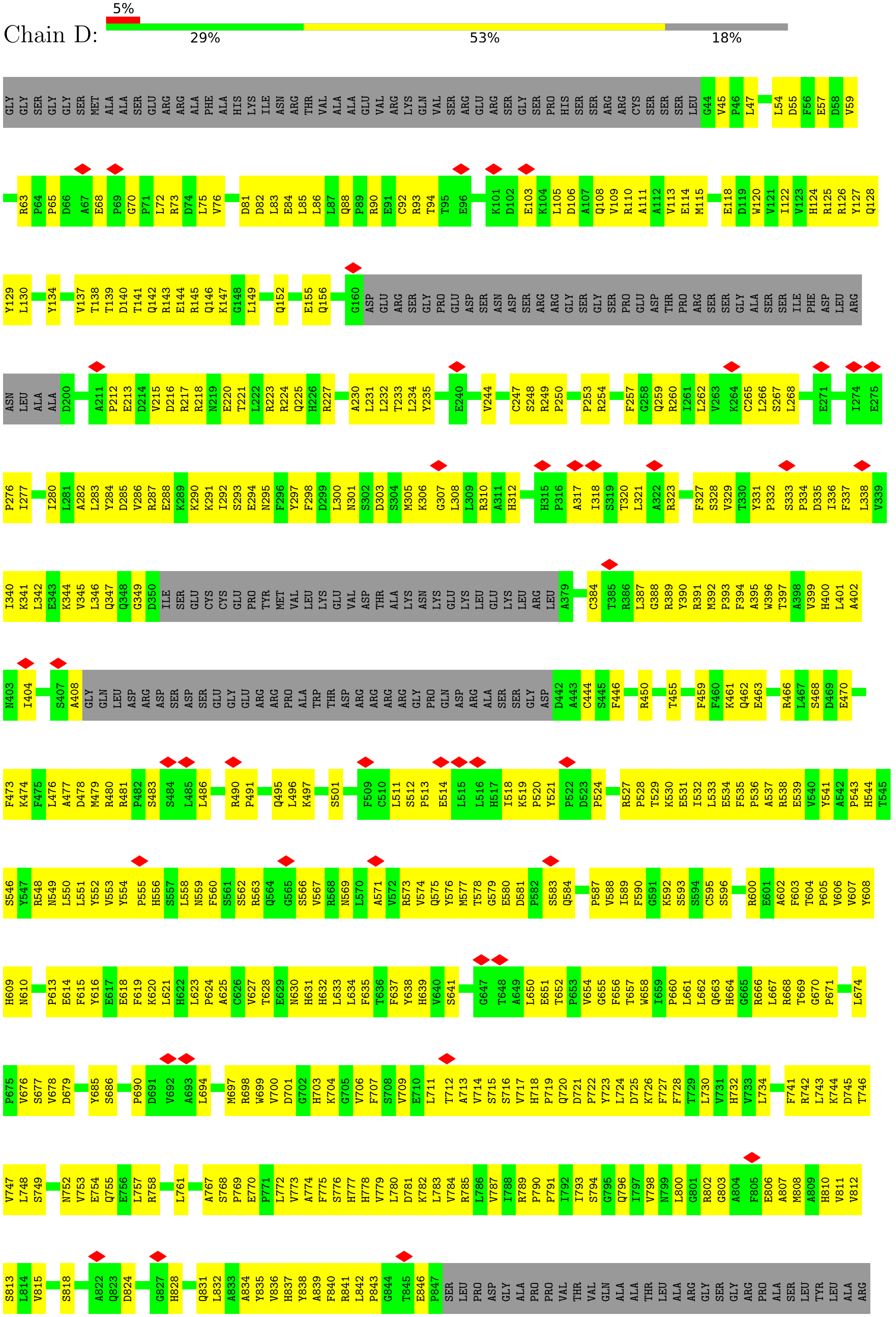
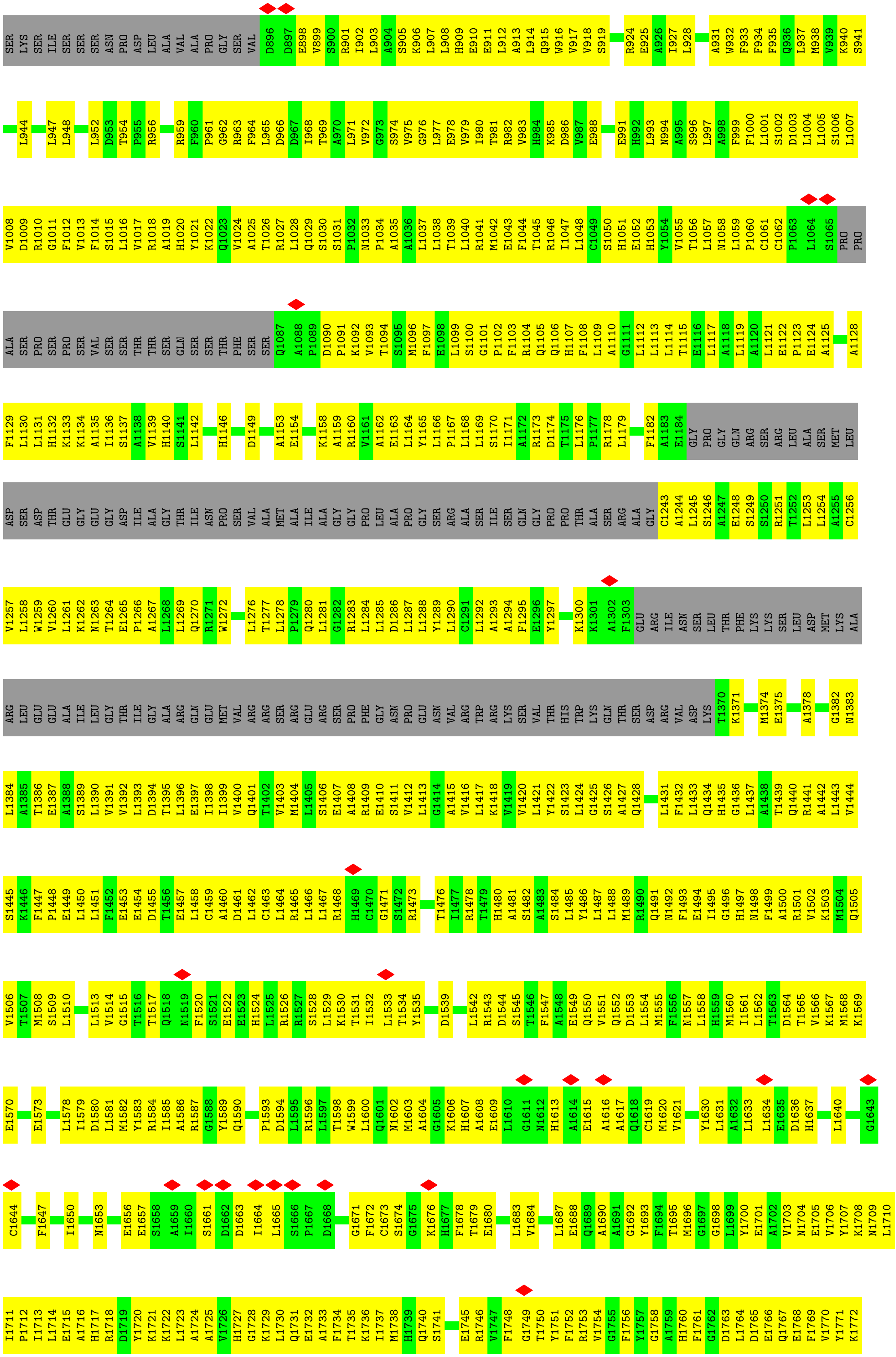
- Molecule 1: Dedicator of cytokinesis protein 6

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V1008 D1009 R1010 G1011 F1012 V1013 F1014 S1015 L1016 V1017 R1018 A1019 H1020 Y1021 K1022 Q1023 V1024 A1025 T1026 R1027 L1028 Q1029 S1030 S1031 P1032 N1033 P1034 A1035 A1036 L1037 L1038 T1039 L1040 R1041 M1042 E1043 F1044 T1045 R1046 I1047 L1048 C1049 S1050 H1051 E1052 H1053 Y1054 V1055 T1056 L1057 N1058 L1059 P1060 C1061 C1062 P1063 L1064 S1065 PRO PRO
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ASP SER ASP THR GLU GLY GLU GLY ASP ILE ALA GLY THR ILE ASN PRO SER VAL ALA MET ALA ILE ALA GLY GLY PRO LEU ALA PRO GLY SER ARG ALA SER ILE SER GLN GLY PRO PRO THR ALA SER ARG ALA GLY C1243 A1244 L1245 S1246 A1247 E1248 S1249 S1250 R1251 T1252 L1253 L1254 A1255 C1256
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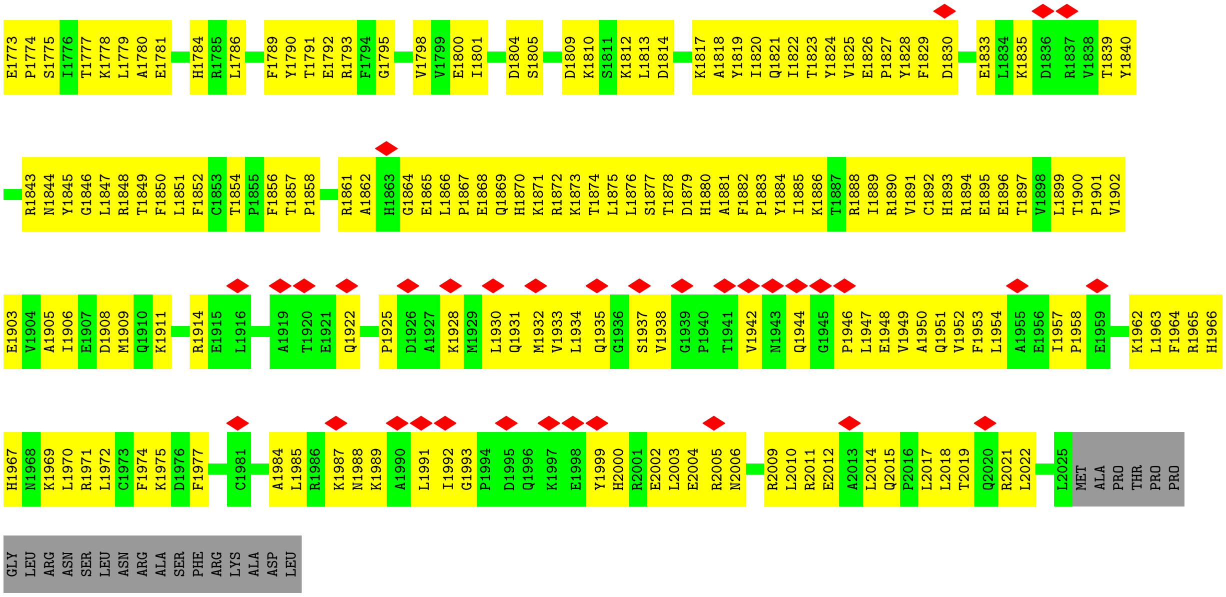

- Molecule 1: Dedicator of cytokinesis protein 6

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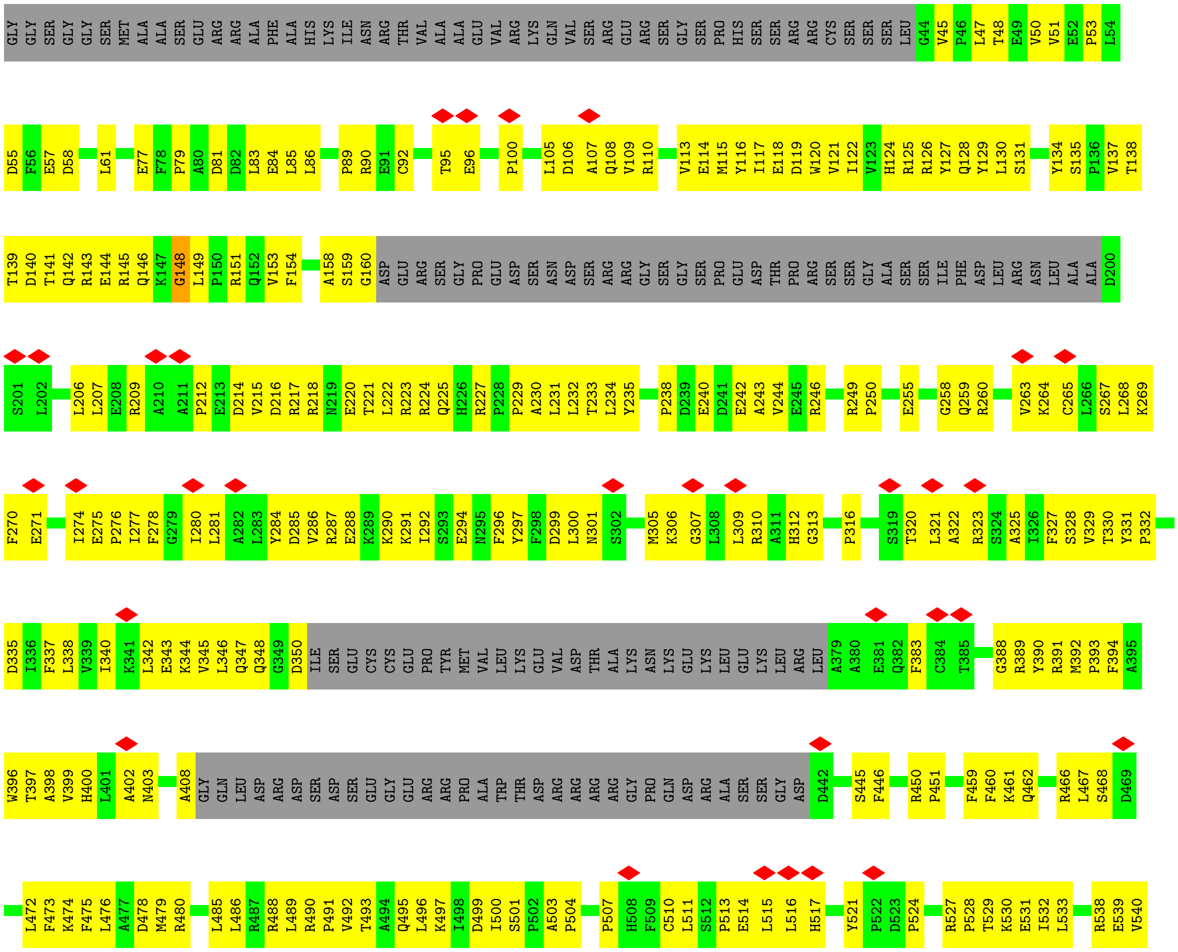

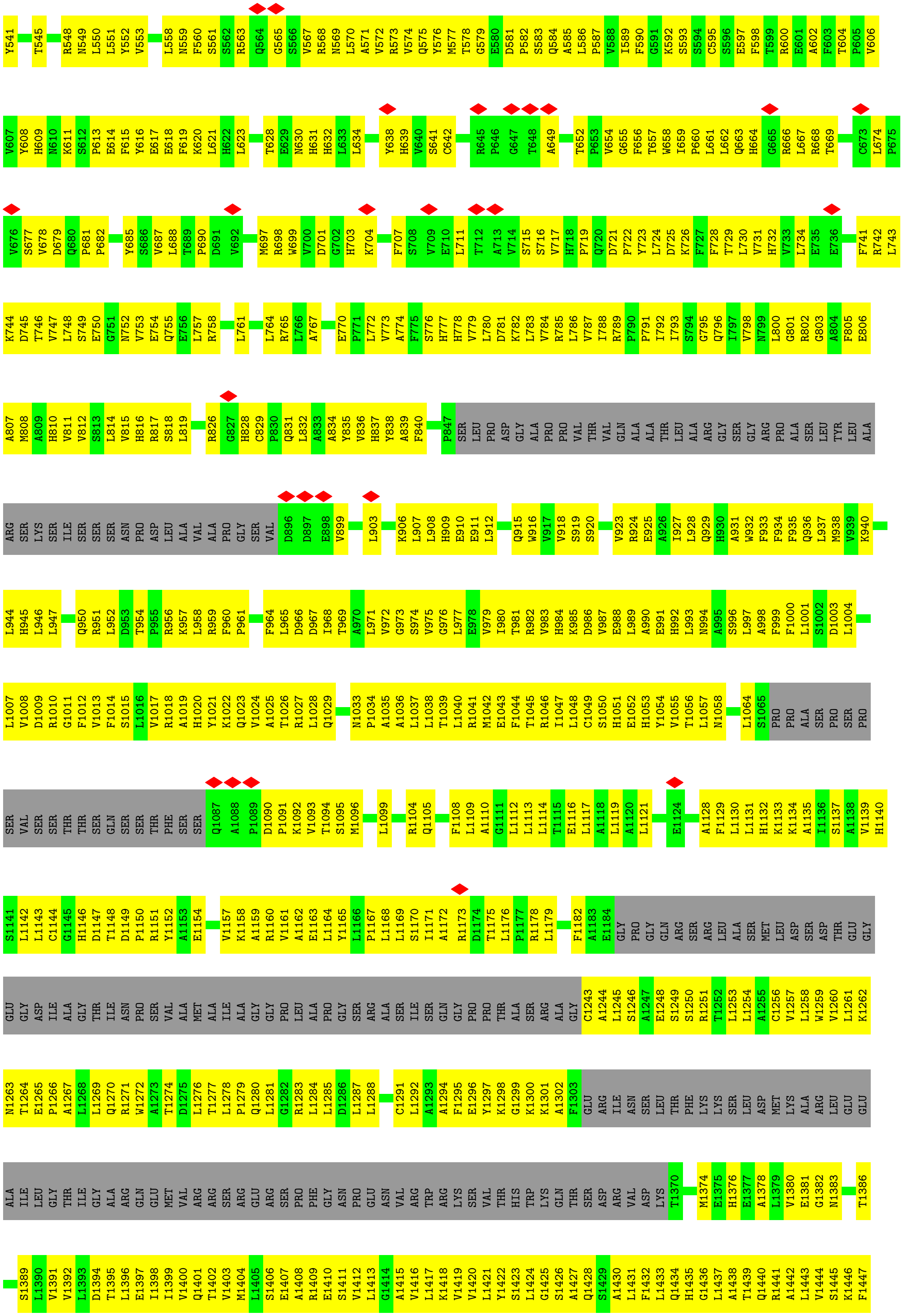
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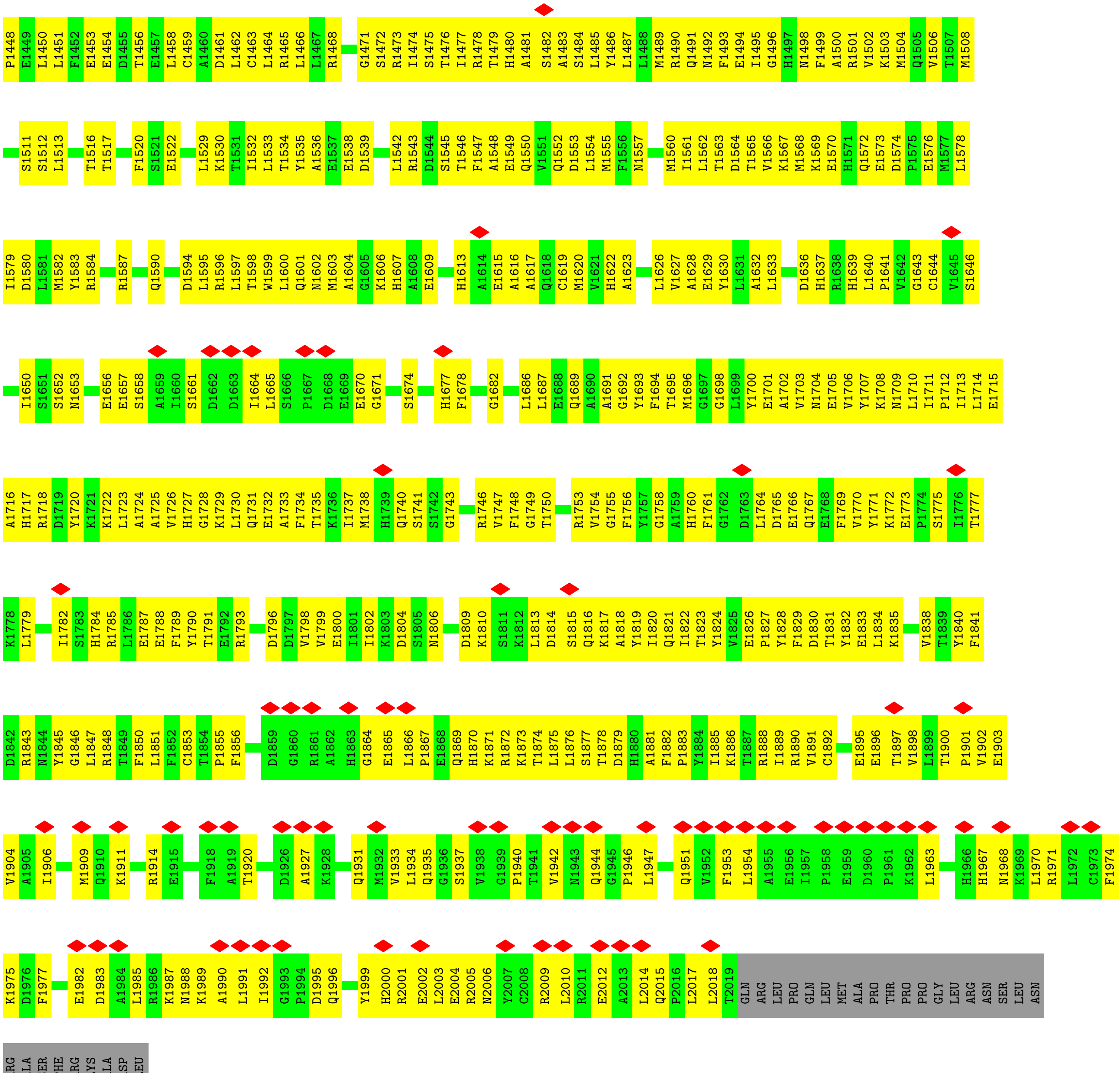

- Molecule 1: Dedicator of cytokinesis protein 6

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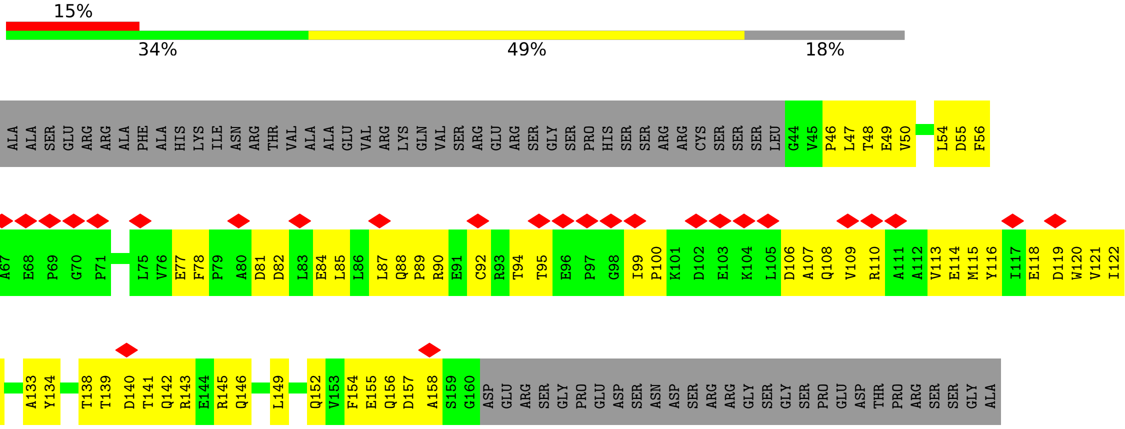

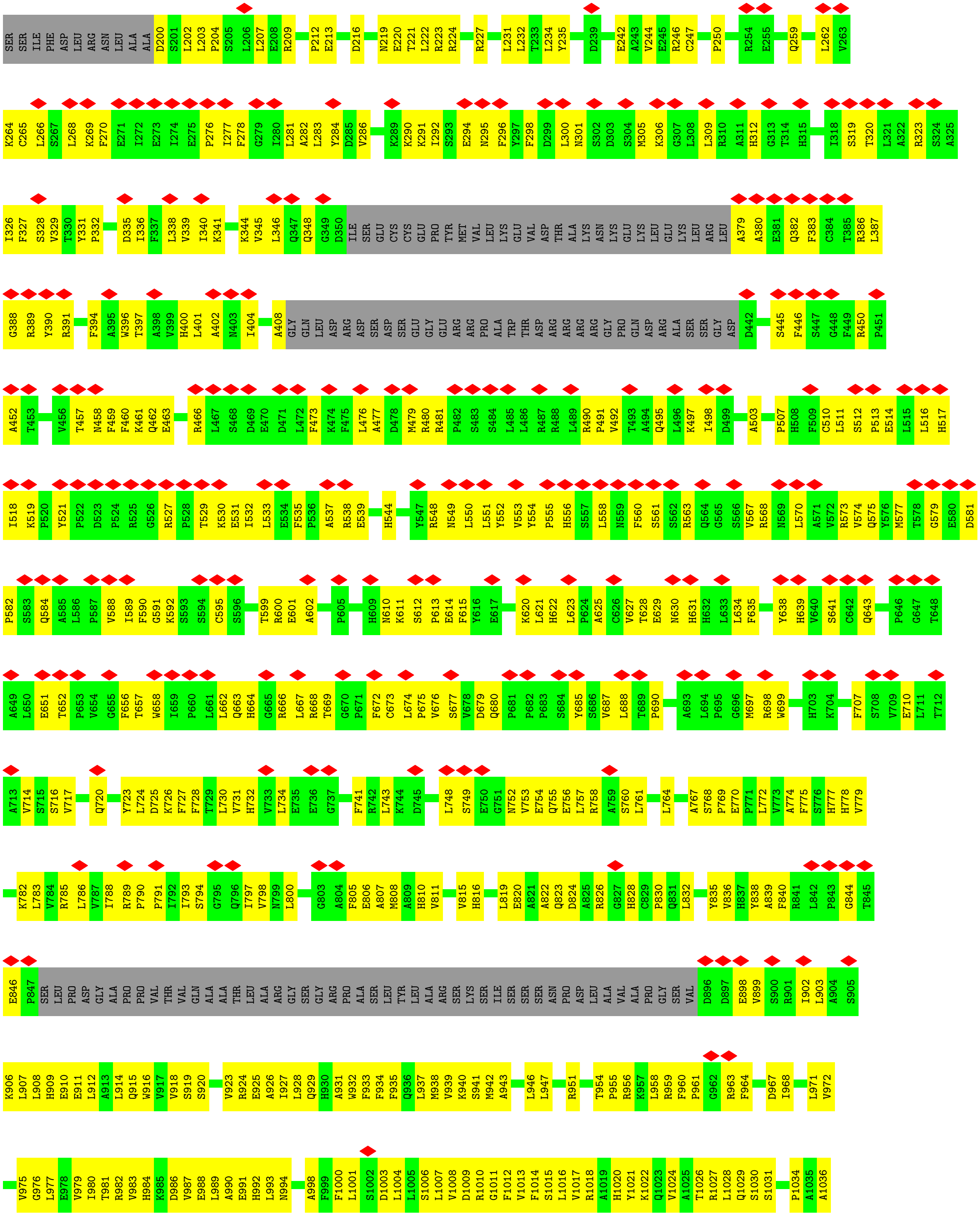
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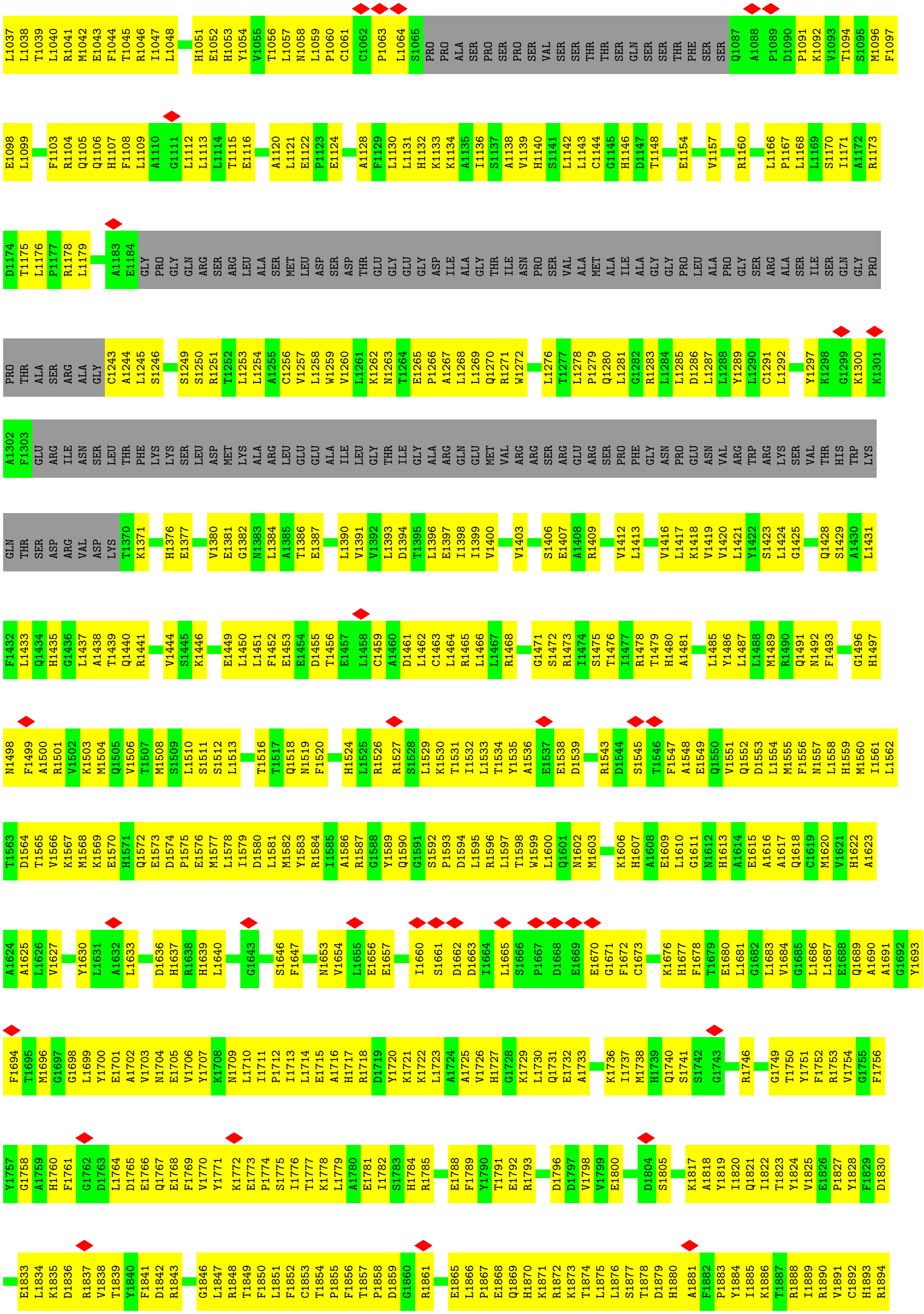
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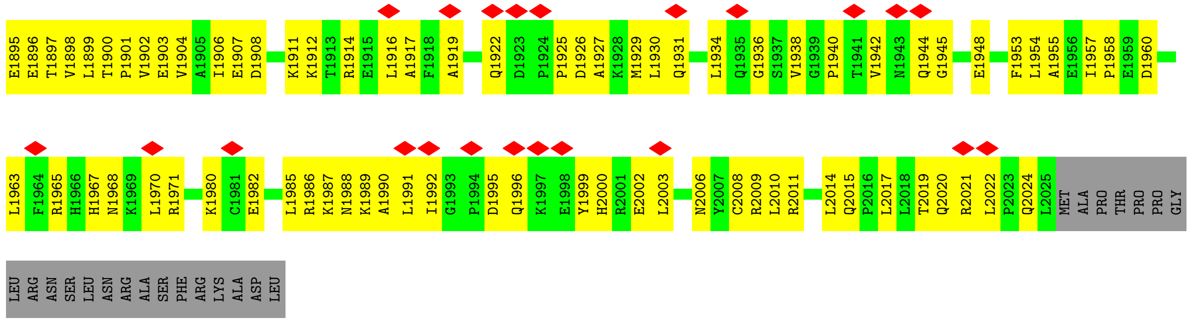

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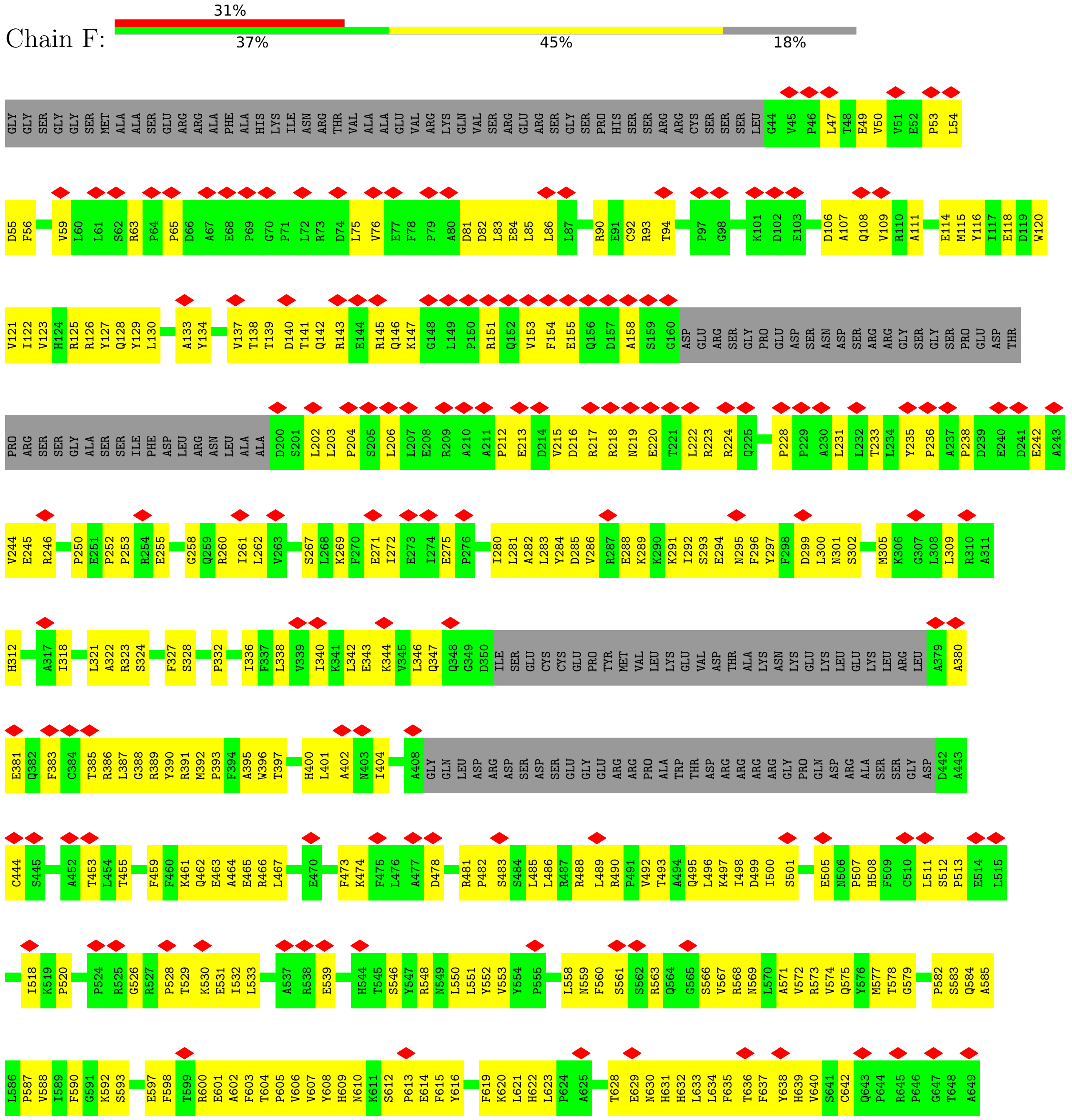

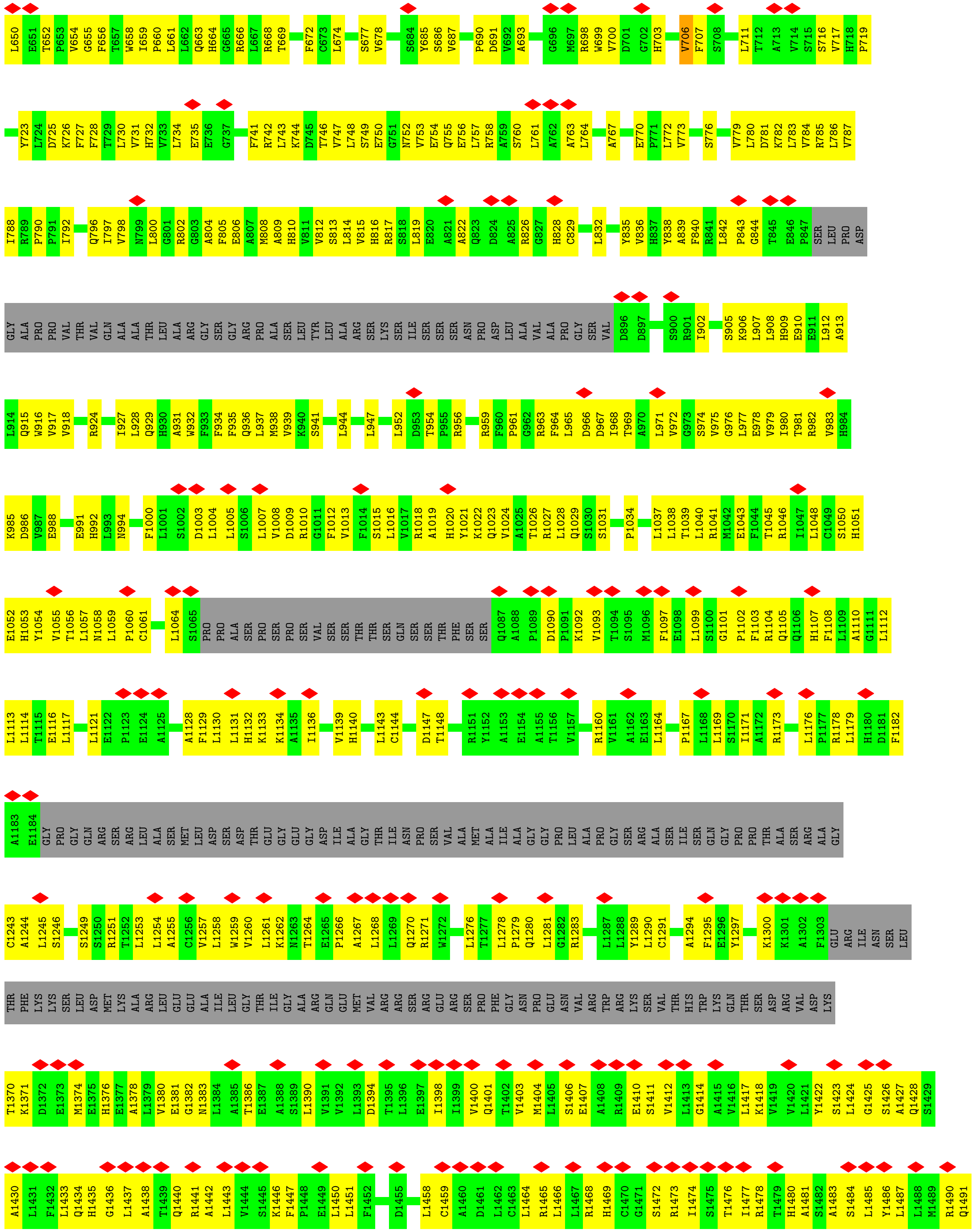
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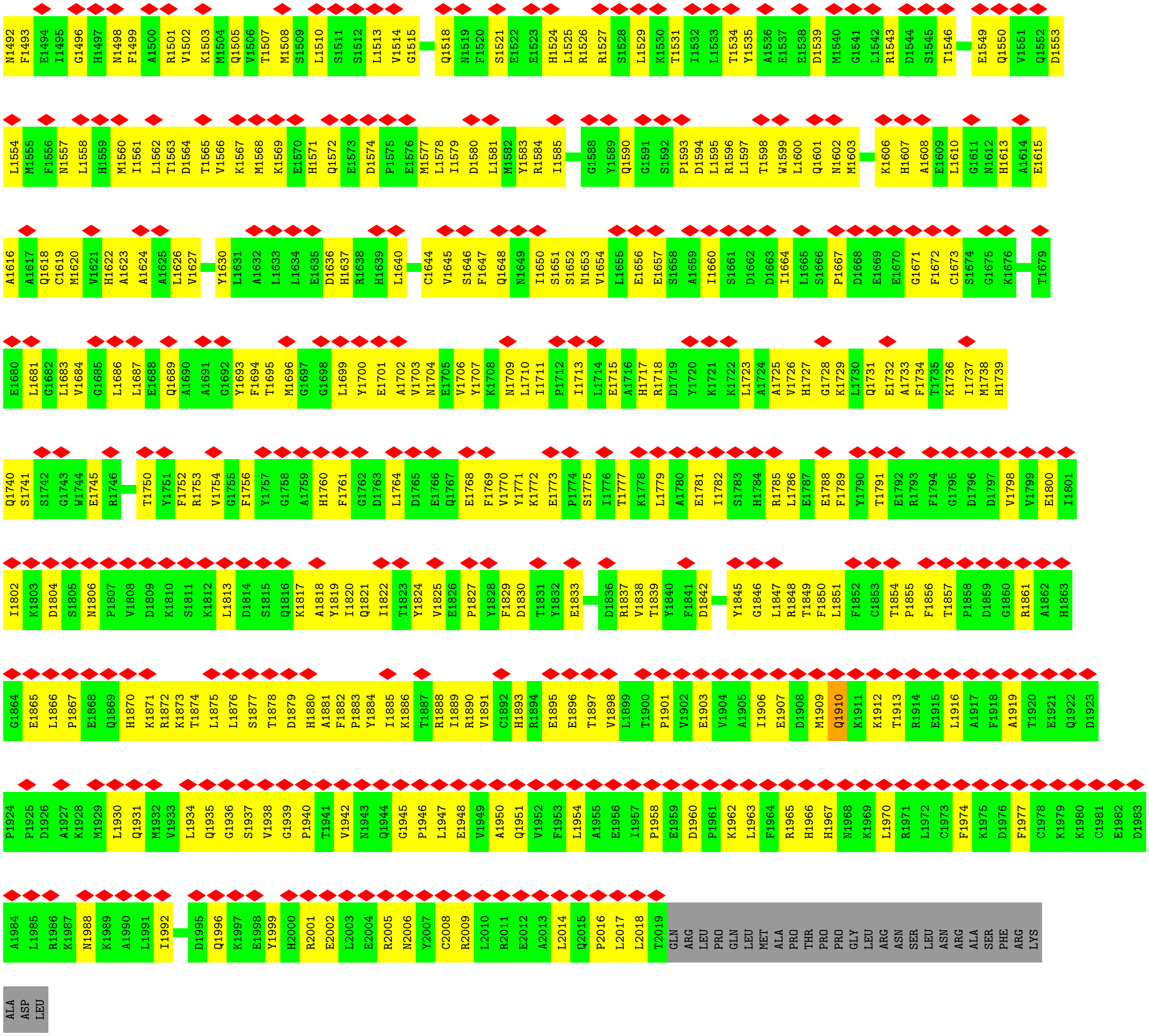

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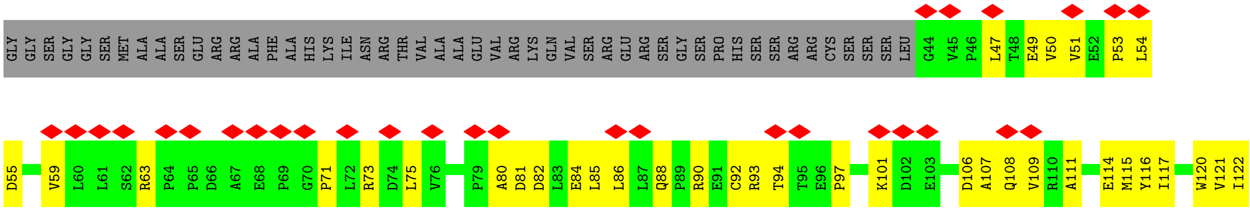

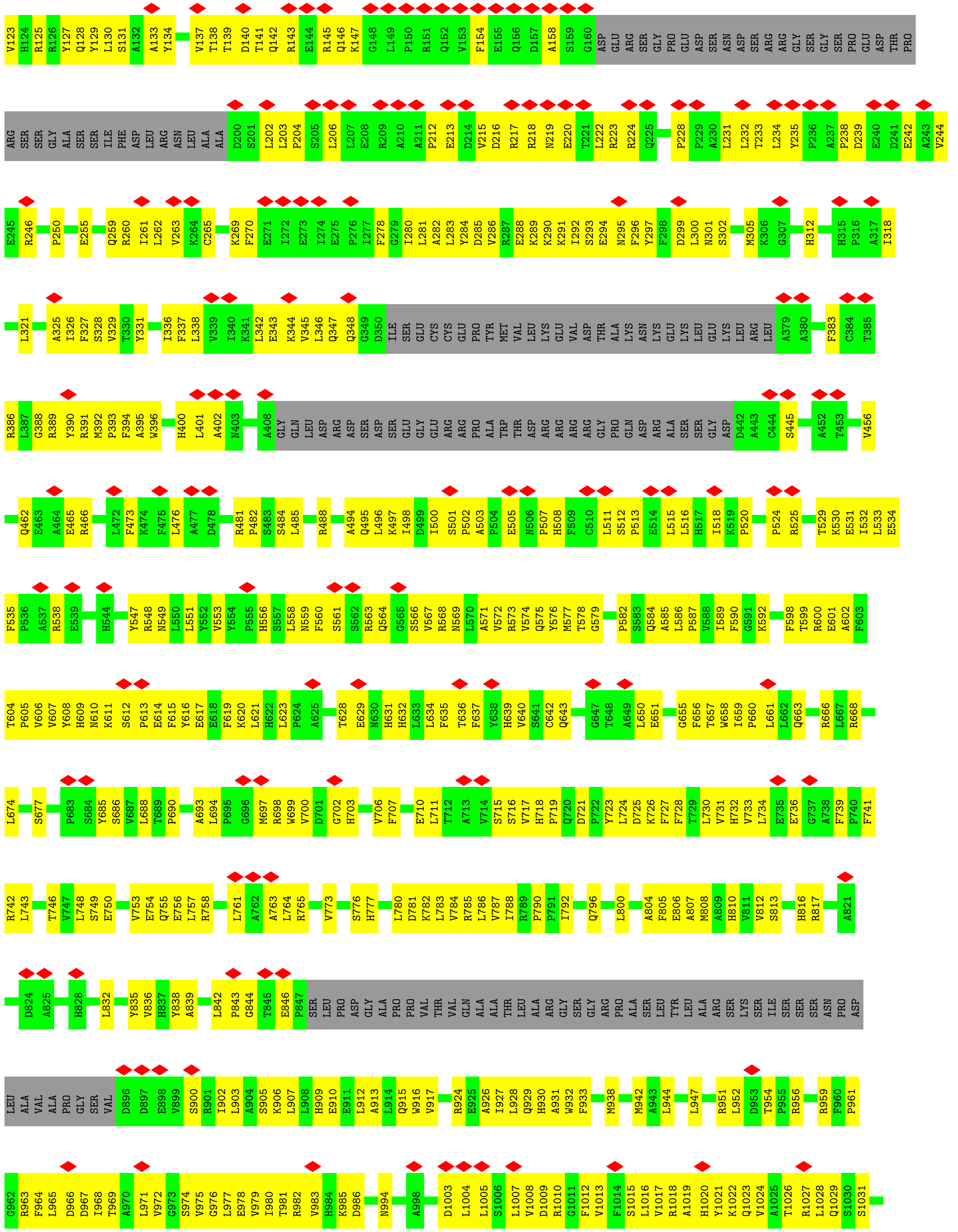
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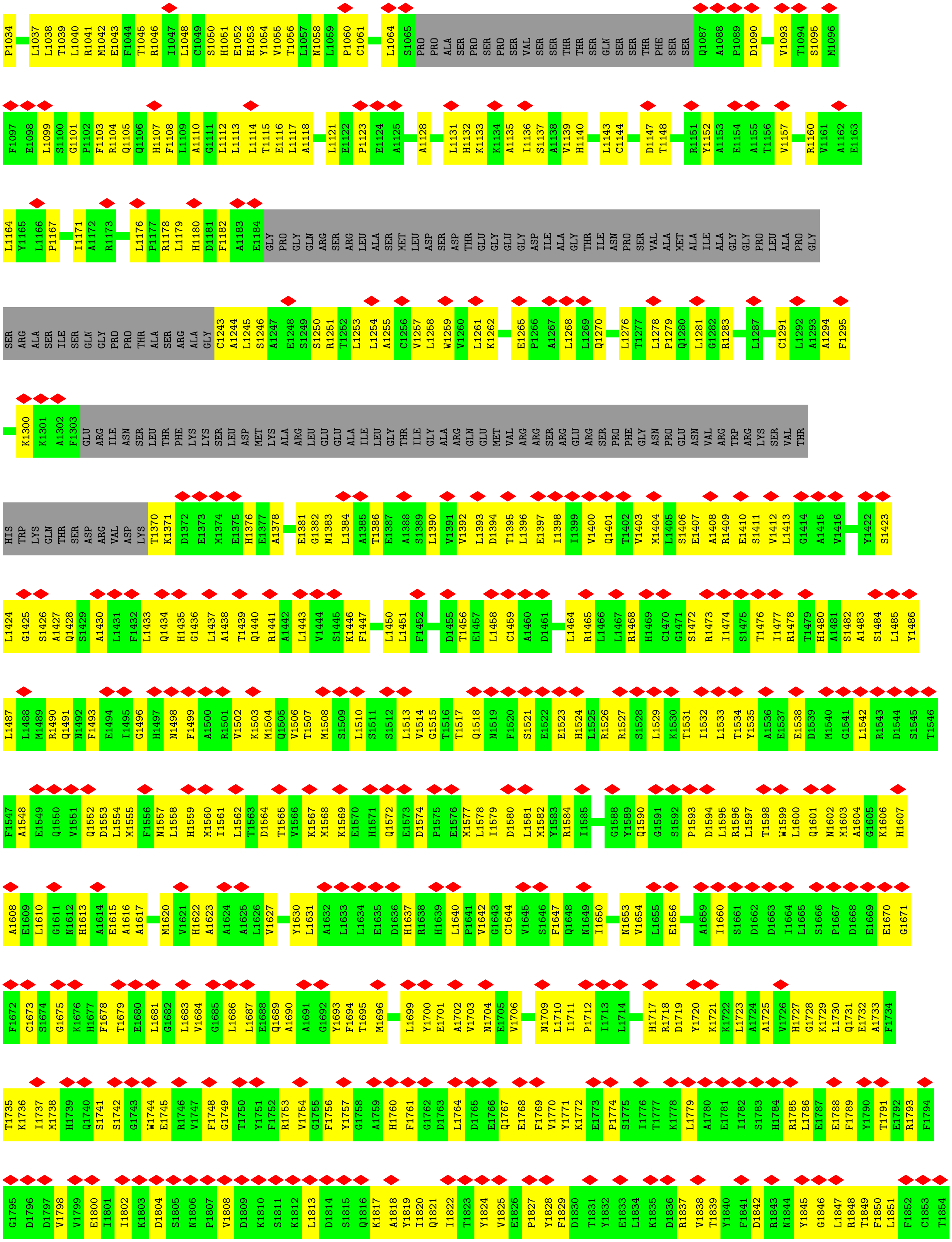
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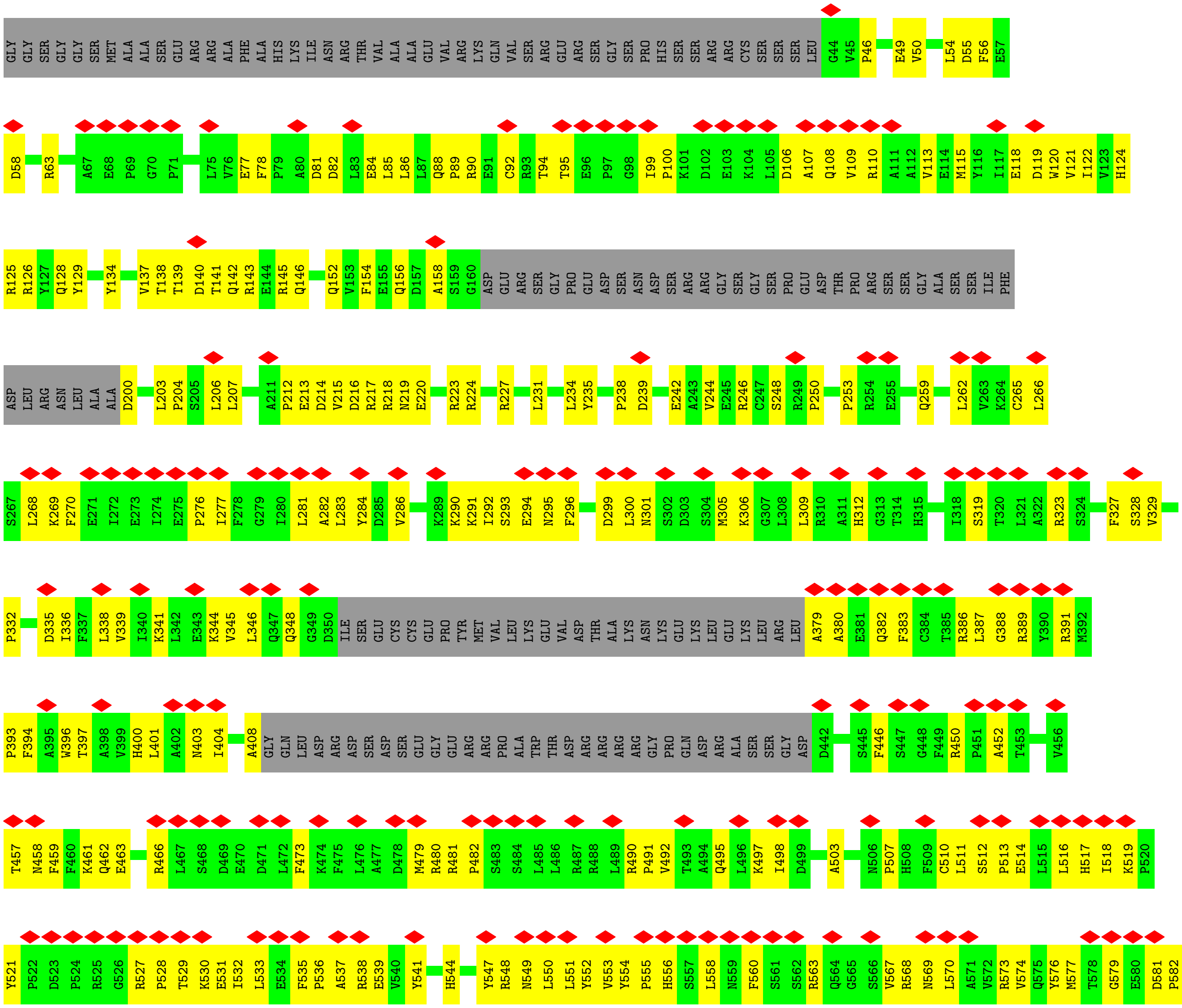
F1672 C1673 S1674 G1675 K1676 H1677 F1678 T1679 E1680 L1681 G1682 L1683 V1684 G1685 L1686 L1687 E1688 Q1689 A1690 A1691 G1692 Y1693 F1694 T1695 M1696 L1699 Y1700 E1701 A1702 V1703 N1704 E1705 V1706 N1709 L1710 I1711 P1712 I1713 L1714 H1717 R1718 D1719 Y1720 K1721 K1722 L1723 A1724 A1725 V1726 H1727 G1728 K1729 L1730 Q1731 E1732 A1733 F1734
T1735 K1736 I1737 M1738 H1739 Q1740 S1741 S1742 G1743 W1744 E1745 R1746 V1747 F1748 G1749 T1750 Y1751 F1752 R1753 V1754 G1755 F1756 Y1757 G1758 A1759 H1760 F1761 G1762 D1763 L1764 D1765 E1766 Q1767 E1768 F1769 V1770 Y1771 K1772 E1773 P1774 S1775 I1776 T1777 K1778 L1779 A1780 E1781 I1782 S1783 H1784 R1785 L1786 E1787 E1788 F1789 Y1790 T1791 E1792 R1793 F1794
G1795 D1796 D1797 V1798 V1799 E1800 I1801 I1802 K1803 D1804 S1805 N1806 P1807 V1808 D1809 K1810 S1811 K1812 L1813 D1814 S1815 Q1816 K1817 A1818 Y1819 I1820 Q1821 I1822 T1823 Y1824 V1825 E1826 P1827 Y1828 F1829 D1830 T1831 Y1832 E1833 L1834 K1835 D1836 R1837 V1838 T1839 Y1840 F1841 D1842 R1843 N1844 Y1845 G1846 L1847 R1848 T1849 F1850 L1851 F1852 C1853 T1854

• Molecule 1: Dedicator of cytokinesis protein 6

Chain H:

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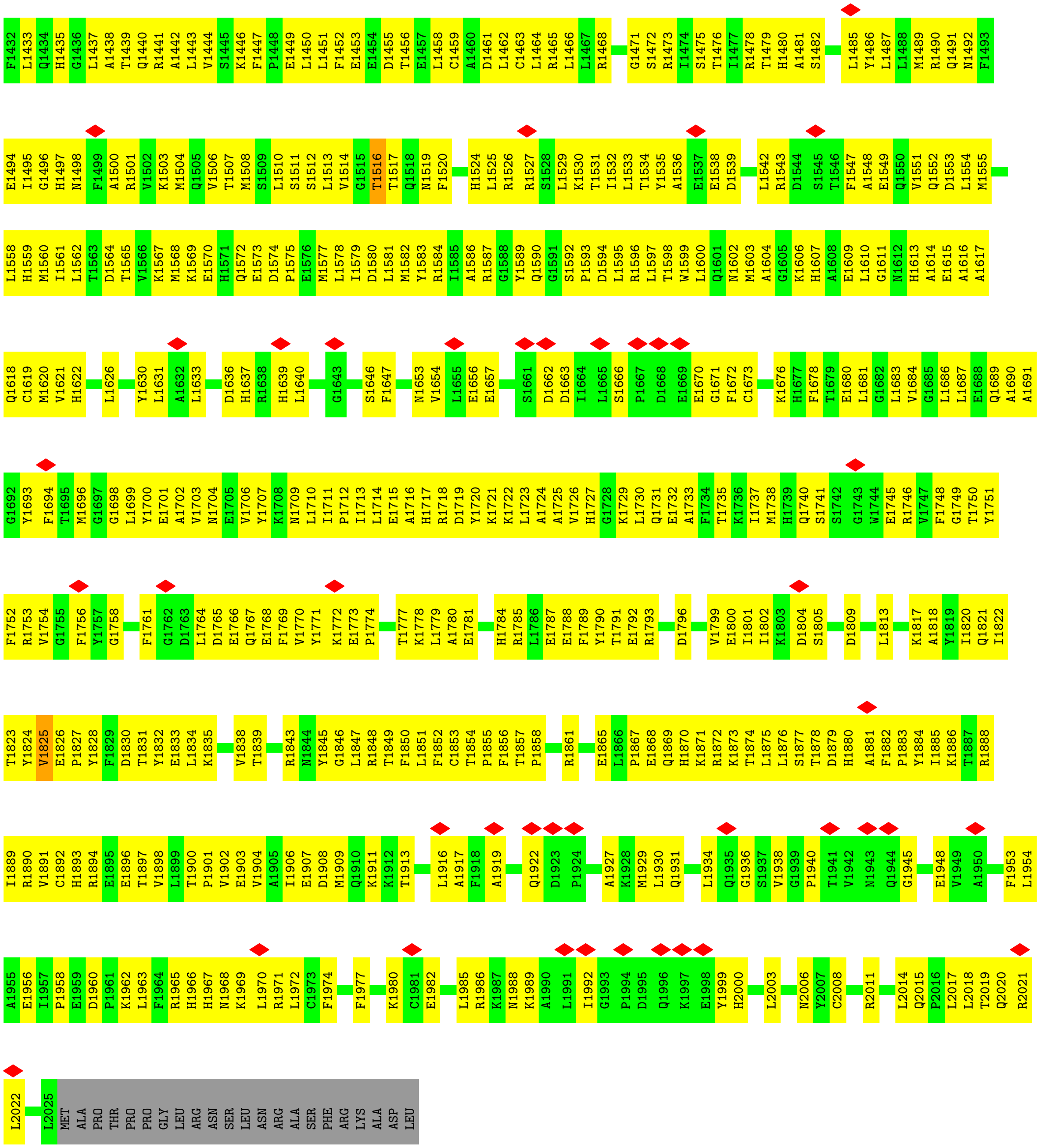
T648 A649 L650 E651 T652 P653 V654 G655 F656 T657 W658 I659 P660 L661 L662 Q663 H664 G665 R666 L667 R668 T669 G670 P671 F672 C673 L674 P675 V676 S677 V678 D679 Q680 R681 P682 P683 S684 Y685 S686 V687 L688 T689 P690 A693 L694 P695 G696 M697 R698 W699 V700 D701 G702 H703 K704 F707 S708 V709
E710 L711 T712 A713 V717 H718 P719 Q720 Y723 L724 D725 K726 F727 F728 T729 L730 V731 H732 V733 L734 E735 E736 G737 A738 F739 D745 T746 V747 L748 S749 E750 G751 N752 V753 E754 Q755 E756 L757 R758 A759 S760 L761 L764 R765 L766 A767 S768 P769 E770 P771 L772 V773 A774 F775 S776 H777
H778 V779 K782 L783 V784 R785 L786 V787 I788 R789 P790 P791 I792 I793 S794 G795 Q796 I797 V798 N799 L800 G803 A804 F805 E806 A807 M808 A809 H810 V811 V812 V815 H816 R817 S818 L819 E820 A821 A822 Q823 D824 A825 R826 G827 H828 C829 P830 Q831 L832 A833 A834 Y835 V836 H837 Y838 A839 F840
R841 L842 P843 G844 T845 E846 P847 SER LEU PRO ASP GLY ALA PRO PRO VAL THR VAL GLN ALA ALA THR LEU ALA ARG GLY SER GLY ARG PRO ALA SER LEU TYR LEU ALA ARG SER LYS SER ILE SER SER SER ASN PRO ASP LEU ALA VAL ALA PRO GLY SER VAL D896 D897 E898 V899 S900
R901 I902 L903 A904 S905 K906 L907 L908 H909 E910 E911 L912 A913 L914 Q915 W916 V917 V918 S919 S920 V923 R924 E925 A926 I927 L928 Q929 H930 A931 W932 F933 F934 F935 Q936 L937 M938 V939 K940 S941 M942 A943 L946 L947 R951 T954 P955 R956 K957 L958 R959 F960 P961 G962 R963 F964
D967 I968 T969 A970 L971 V972 V975 G976 L977 E978 V979 I980 T981 R982 V983 H984 K985 D986 V987 E988 L989 A990 E991 H992 L993 N994 A998 F999 F1000 L1001 S1002 D1003 S1006 L1007 V1008 D1009 R1010 G1011 F1012 V1013 F1014 S1015 L1016 V1017 R1018 A1019 H1020 Y1021 K1022 Q1023 V1024 A1025 T1026 R1027 L1028 Q1029 S1030
S1031 P1034 L1037 L1038 T1039 L1040 R1041 M1042 E1043 F1044 T1045 R1046 I1047 L1048 H1051 E1052 H1053 Y1054 V1055 T1056 L1057 N1058 P1063 L1064 S1065 PRO PRO ALA SER PRO SER PRO SER VAL SER SER THR THR SER GLN SER SER THR PHE SER SER Q1087 A1088 P1089 D1090 P1091 K1092 V1093 T1094 S1095 M1096
F1097 E1098 L1099 F1103 R1104 Q1105 Q1106 H1107 F1108 L1109 A1110 G1111 L1112 L1113 L1114 T1115 E1116 L1119 A1120 L1121 E1122 A1128 F1129 L1130 L1131 H1132 K1133 K1134 A1135 I1136 V1139 H1140 S1141 L1142 L1143 H1146 D1147 E1154 V1157 R1160 L1166 P1167 L1168 L1169 S1170 I1171 A1172 R1173 D1174 T1175 L1176
P1177 R1178 L1179 A1183 E1184 GLY PRO GLY GLN ARG SER ARG LEU ALA SER MET LEU ASP SER ASP THR GLU GLY GLU GLY ASP ILE ALA GLY THR ILE ASN PRO SER VAL ALA MET ALA ILE ALA GLY GLY PRO LEU ALA PRO GLY SER ARG ALA SER ILE SER GLN GLY PRO PRO THR ALA
SER ARG ALA GLY C1243 A1244 L1245 S1246 A1247 E1248 S1249 S1250 R1251 T1252 L1253 L1254 A1255 C1256 V1257 L1258 W1259 V1260 L1261 K1262 N1263 T1264 E1265 P1266 A1267 L1268 L1269 Q1270 R1271 W1272 L1276 T1277 L1278 P1279 Q1280 L1281 G1282 R1283 L1284 L1285 D1286 L1287 L1288 Y1289 L1290 C1291 L1292 A1293 A1294 F1295 E1296 Y1297 K1298 G1299 K1300
F1303 GLU ARG ILE ASN SER LEU THR PHE LYS LYS SER LEU ASP MET LYS ALA ARG LEU GLU GLU ALA ILE LEU GLY THR ILE GLY ALA ARG GLN GLU MET VAL ARG ARG SER ARG GLU ARG SER PRO PHE GLY ASN PRO GLU ASN VAL ARG TRP ARG LYS SER VAL THR HIS TRP LYS
GLN THR SER ASP ARG VAL ASP LYS T1370 K1371 M1374 E1377 A1378 E1381 G1382 N1383 L1384 A1385 T1386 L1390 V1391 V1392 D1394 T1395 L1396 E1397 I1398 I1399 V1400 V1403 S1406 E1407 A1408 R1409 V1412 L1413 V1416 L1417 K1418 V1419 V1420 L1421 Y1422 S1423 L1424 G1425 Q1428 S1429 A1430 L1431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E1494 I1495 G1496 H1497 N1498 F1499 A1500 R1501 V1502 K1503 M1504 Q1505 V1506 T1507 M1508 S1509 L1510 S1511 S1512 L1513 V1514 G1515 T1516 T1517 Q1518 N1519 F1520 H1524 L1525 R1526 R1527 S1528 L1529 K1530 T1531 I1532 L1533 T1534 Y1535 A1536 E1537 E1538 D1539 L1542 R1543 D1544 S1545 T1546 F1547 A1548 E1549 Q1550 V1551 Q1552 D1553 L1554 M1555
L1558 H1559 M1560 I1561 L1562 T1563 D1564 T1565 V1566 K1567 M1568 K1569 E1570 H1571 Q1572 E1573 D1574 P1575 E1576 M1577 L1578 I1579 D1580 L1581 M1582 Y1583 R1584 I1585 A1586 R1587 G1588 Y1589 Q1590 G1591 S1592 P1593 D1594 L1595 R1596 L1597 T1598 W1599 L1600 Q1601 N1602 M1603 A1604 G1605 K1606 H1607 A1608 E1609 L1610 G1611 N1612 H1613 A1614 E1615 A1616 A1617
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T1823 Y1824 V1825 E1826 P1827 Y1828 F1829 D1830 T1831 Y1832 E1833 L1834 K1835 V1838 T1839 R1843 N1844 Y1845 G1846 L1847 R1848 T1849 F1850 L1851 F1852 C1853 T1854 P1855 F1856 T1857 P1858 R1861 E1865 L1866 P1867 E1868 Q1869 H1870 K1871 R1872 K1873 T1874 L1875 L1876 S1877 T1878 D1879 H1880 A1881 F1882 P1883 Y1884 I1885 K1886 T1887 R1888
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A1955 E1956 I1957 P1958 E1959 D1960 P1961 K1962 L1963 F1964 R1965 H1966 H1967 N1968 K1969 L1970 R1971 L1972 C1973 F1974 F1977 K1980 C1981 E1982 L1985 R1986 K1987 N1988 K1989 A1990 L1991 I1992 G1993 P1994 D1995 Q1996 K1997 E1998 Y1999 H2000 L2003 N2006 Y2007 C2008 R2011 L2014 Q2015 P2016 L2017 L2018 T2019 Q2020 R2021
L2022 L2025 MET ALA PRO THR PRO PRO GLY LEU ARG ASN SER LEU ASN ARG ALA SER PHE ARG LYS ALA ASP LEU

4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	102384	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	50.1	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	64000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.075	Depositor
Minimum map value	-0.038	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.008	Depositor
Map size (Å)	452.2, 452.2, 452.2	wwPDB
Map dimensions	340, 340, 340	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.33, 1.33, 1.33	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.29	0/13741	0.61	5/18646 (0.0%)
1	B	0.29	0/13741	0.58	2/18646 (0.0%)
1	C	0.30	0/13794	0.61	3/18718 (0.0%)
1	D	0.29	0/13794	0.59	0/18718
1	E	0.23	0/13794	0.55	0/18718
1	F	0.21	0/13741	0.56	4/18646 (0.0%)
1	G	0.21	0/13741	0.53	0/18646
1	H	0.23	0/13794	0.55	2/18718 (0.0%)
All	All	0.26	0/110140	0.57	16/149456 (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	C	0	1
1	D	0	1
1	H	0	1
All	All	0	3

There are no bond length outliers.

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	489	LEU	CA-C-N	16.87	144.44	120.49
1	F	489	LEU	C-N-CA	16.87	144.44	120.49
1	A	489	LEU	CA-C-N	13.31	142.59	121.83
1	A	489	LEU	C-N-CA	13.31	142.59	121.83
1	C	1914	ARG	CB-CG-CD	7.93	129.53	111.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	1277	THR	Peptide
1	D	1277	THR	Peptide
1	H	1516	THR	Peptide

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	13425	0	13390	1202	0
1	B	13425	0	13390	1220	0
1	C	13477	0	13448	1206	0
1	D	13477	0	13448	1173	0
1	E	13477	0	13448	996	0
1	F	13425	0	13390	845	0
1	G	13425	0	13390	835	0
1	H	13477	0	13448	983	0
All	All	107608	0	107352	8321	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 39.

The worst 5 of 8321 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:674:LEU:O	1:G:707:PHE:HB3	1.37	1.20
1:F:674:LEU:O	1:F:707:PHE:HB3	1.47	1.15
1:B:674:LEU:O	1:B:707:PHE:HB3	1.48	1.12
1:A:674:LEU:O	1:A:707:PHE:HB3	1.51	1.10
1:A:772:LEU:O	1:A:776:SER:HB3	1.50	1.10

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	1667/2053 (81%)	1506 (90%)	161 (10%)	0	100	100
1	B	1667/2053 (81%)	1501 (90%)	166 (10%)	0	100	100
1	C	1673/2053 (82%)	1490 (89%)	183 (11%)	0	100	100
1	D	1673/2053 (82%)	1506 (90%)	167 (10%)	0	100	100
1	E	1673/2053 (82%)	1552 (93%)	121 (7%)	0	100	100
1	F	1667/2053 (81%)	1566 (94%)	101 (6%)	0	100	100
1	G	1667/2053 (81%)	1570 (94%)	97 (6%)	0	100	100
1	H	1673/2053 (82%)	1546 (92%)	127 (8%)	0	100	100
All	All	13360/16424 (81%)	12237 (92%)	1123 (8%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	1470/1773 (83%)	1470 (100%)	0	100	100
1	B	1470/1773 (83%)	1470 (100%)	0	100	100
1	C	1476/1773 (83%)	1476 (100%)	0	100	100
1	D	1476/1773 (83%)	1476 (100%)	0	100	100
1	E	1476/1773 (83%)	1476 (100%)	0	100	100
1	F	1470/1773 (83%)	1469 (100%)	1 (0%)	88	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	1470/1773 (83%)	1470 (100%)	0	100	100
1	H	1476/1773 (83%)	1476 (100%)	0	100	100
All	All	11784/14184 (83%)	11783 (100%)	1 (0%)	100	100

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	1910	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 156 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	1689	GLN
1	H	994	ASN
1	G	301	ASN
1	G	1767	GLN
1	H	1731	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

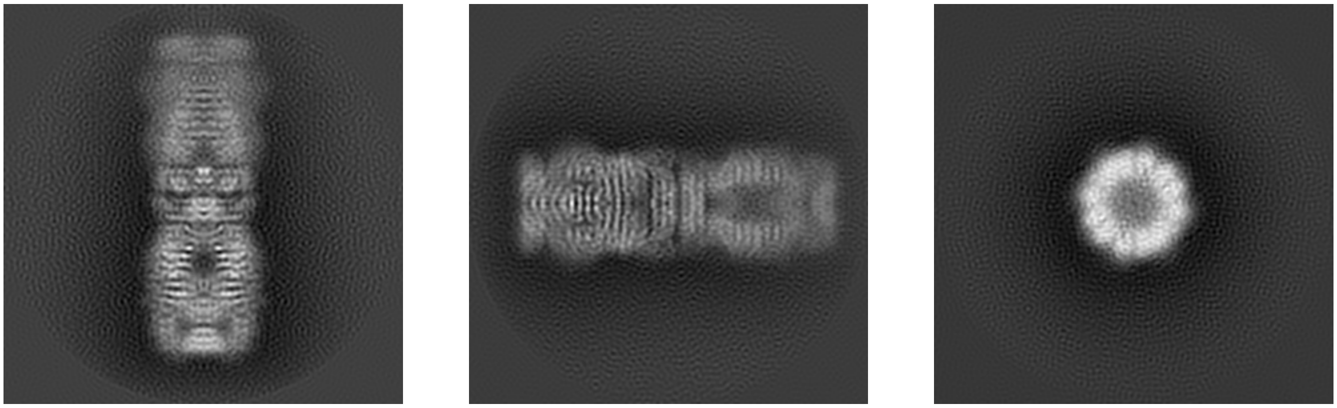
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-65180. 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.

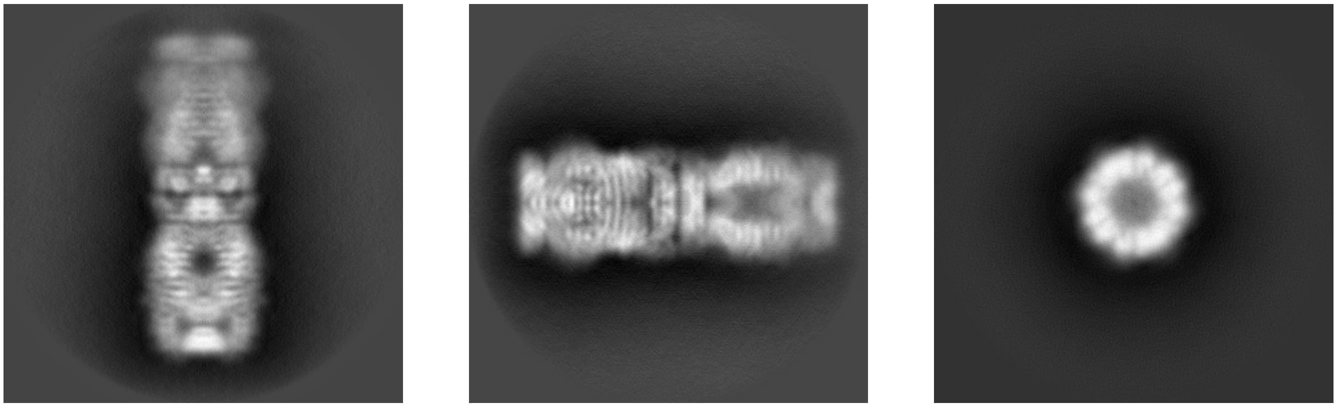
6.1 Orthogonal projections ⓘ

6.1.1 Primary map



X Y Z

6.1.2 Raw map

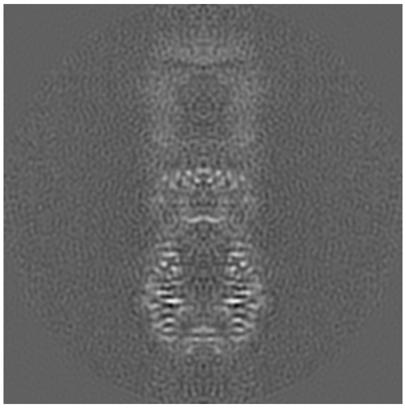


X Y Z

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

6.2 Central slices (i)

6.2.1 Primary map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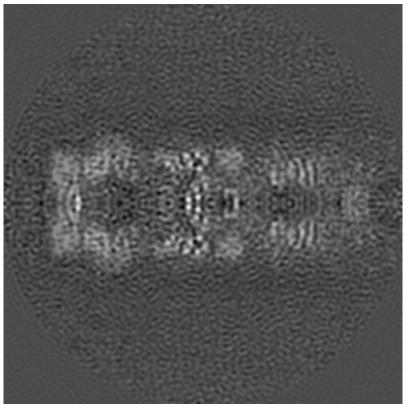
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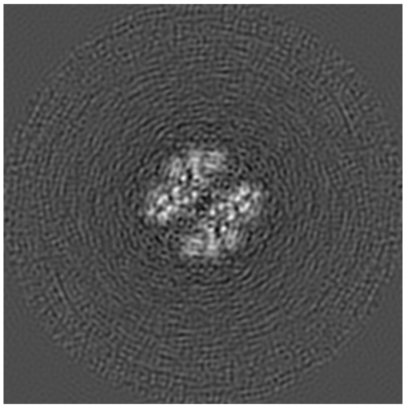
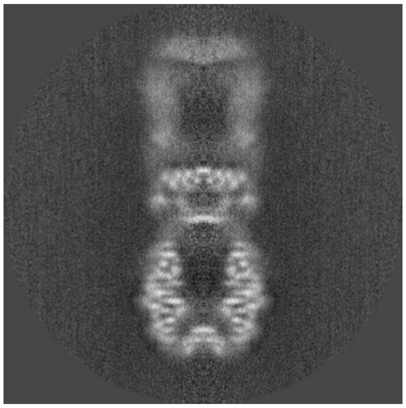
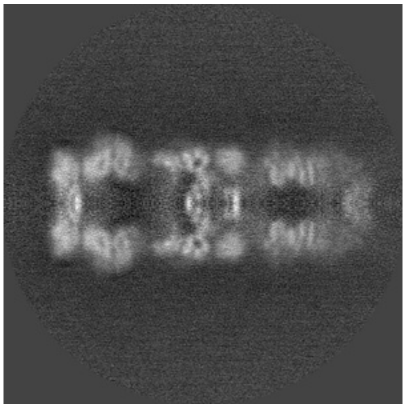
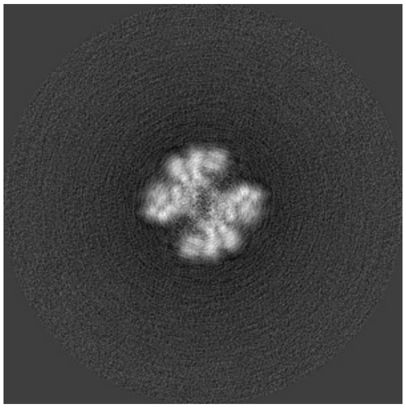

Z Index: 170

6.2.2 Raw map


X Index: 170


Y Index: 170

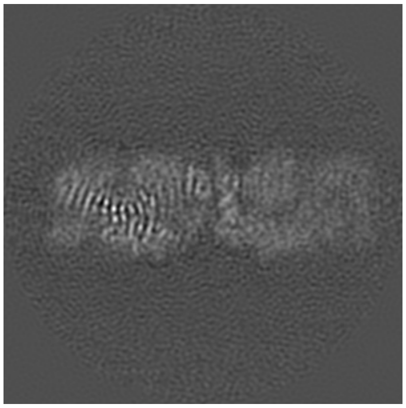

Z Index: 170

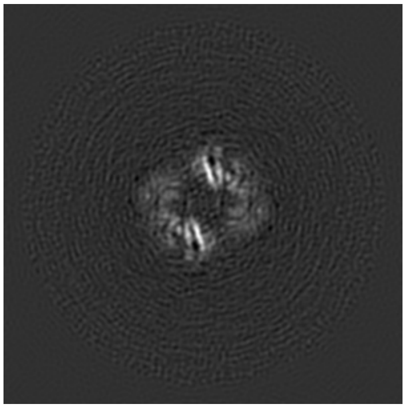
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

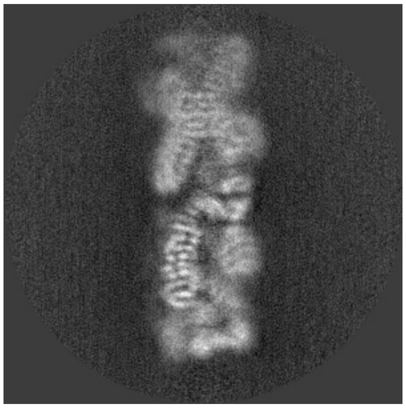
6.3.1 Primary map

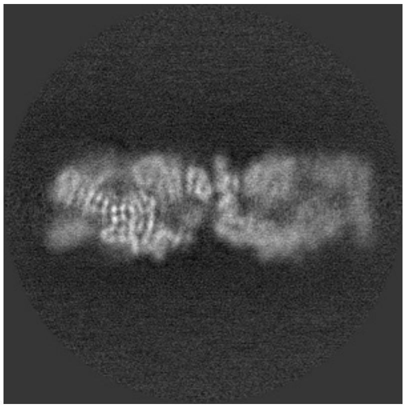

X Index: 166

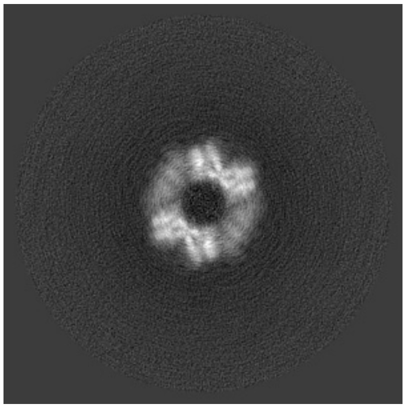

Y Index: 143


Z Index: 94

6.3.2 Raw map


X Index: 146

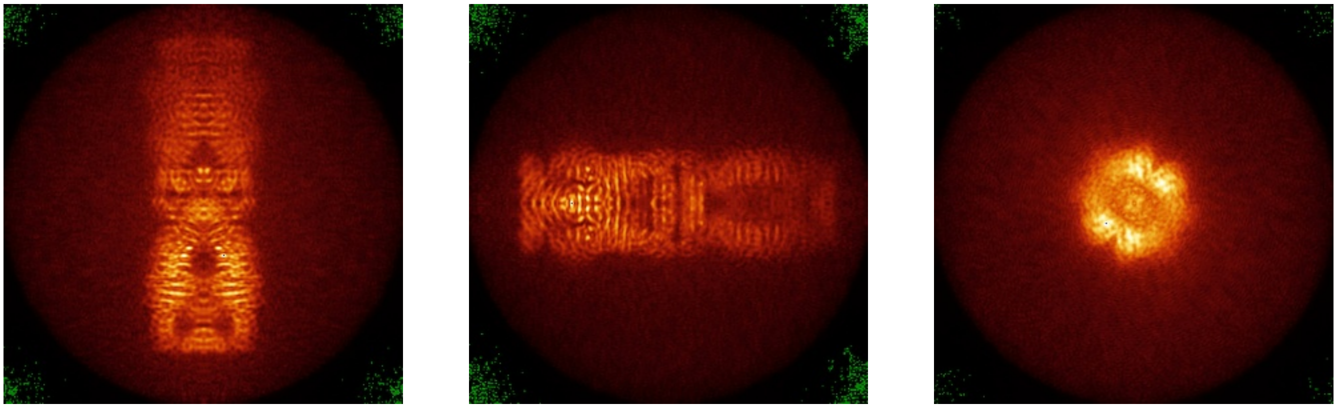

Y Index: 144


Z Index: 110

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

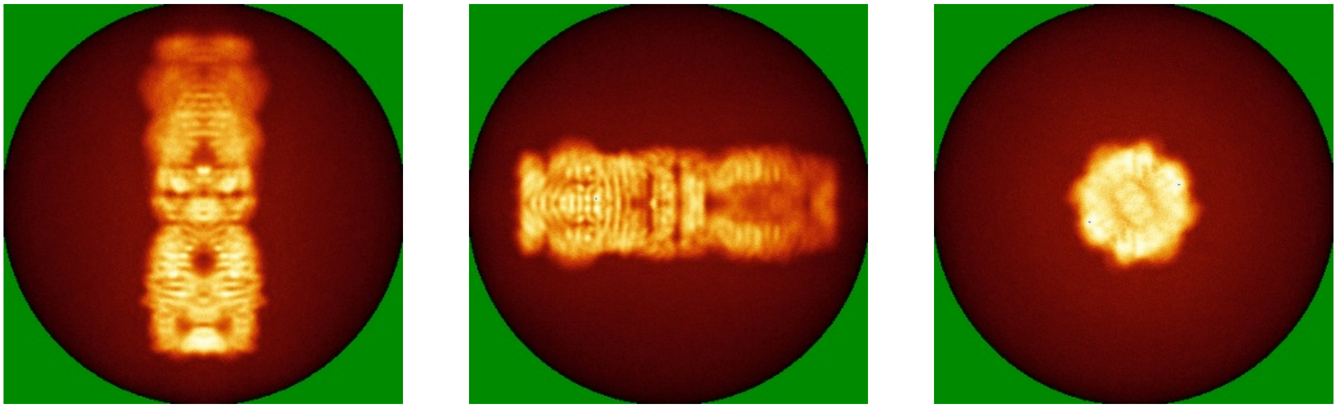
6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map



X Y Z

6.4.2 Raw map

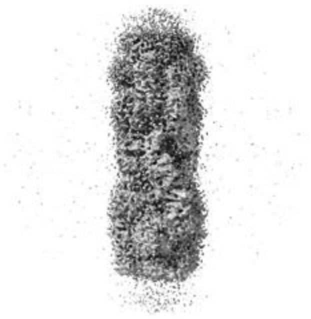


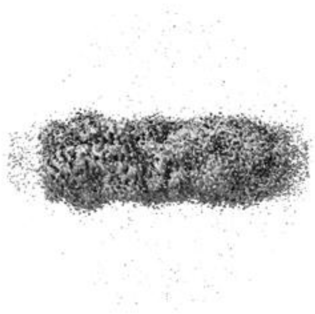
X Y Z

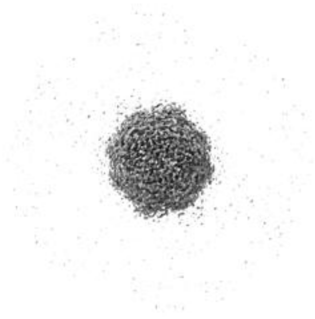
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map


X

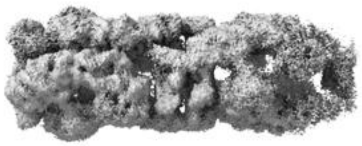

Y

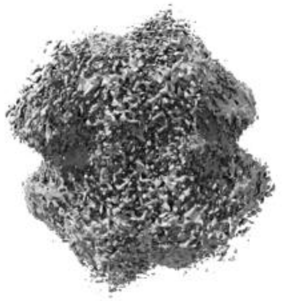

Z

The images above show the 3D surface view of the map at the recommended contour level 0.008. 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.

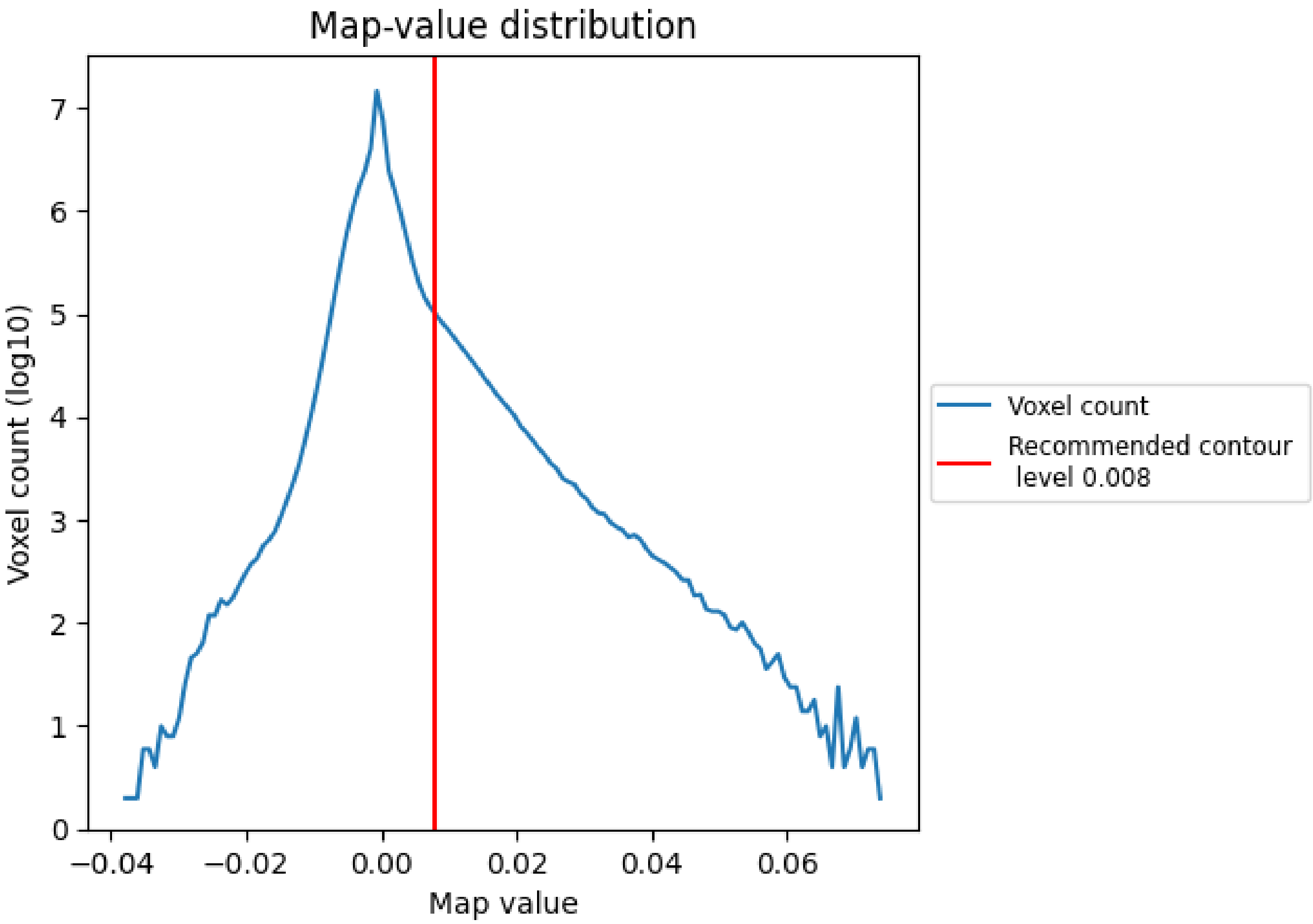
6.6 Mask visualisation (i)

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

7 Map analysis (i)

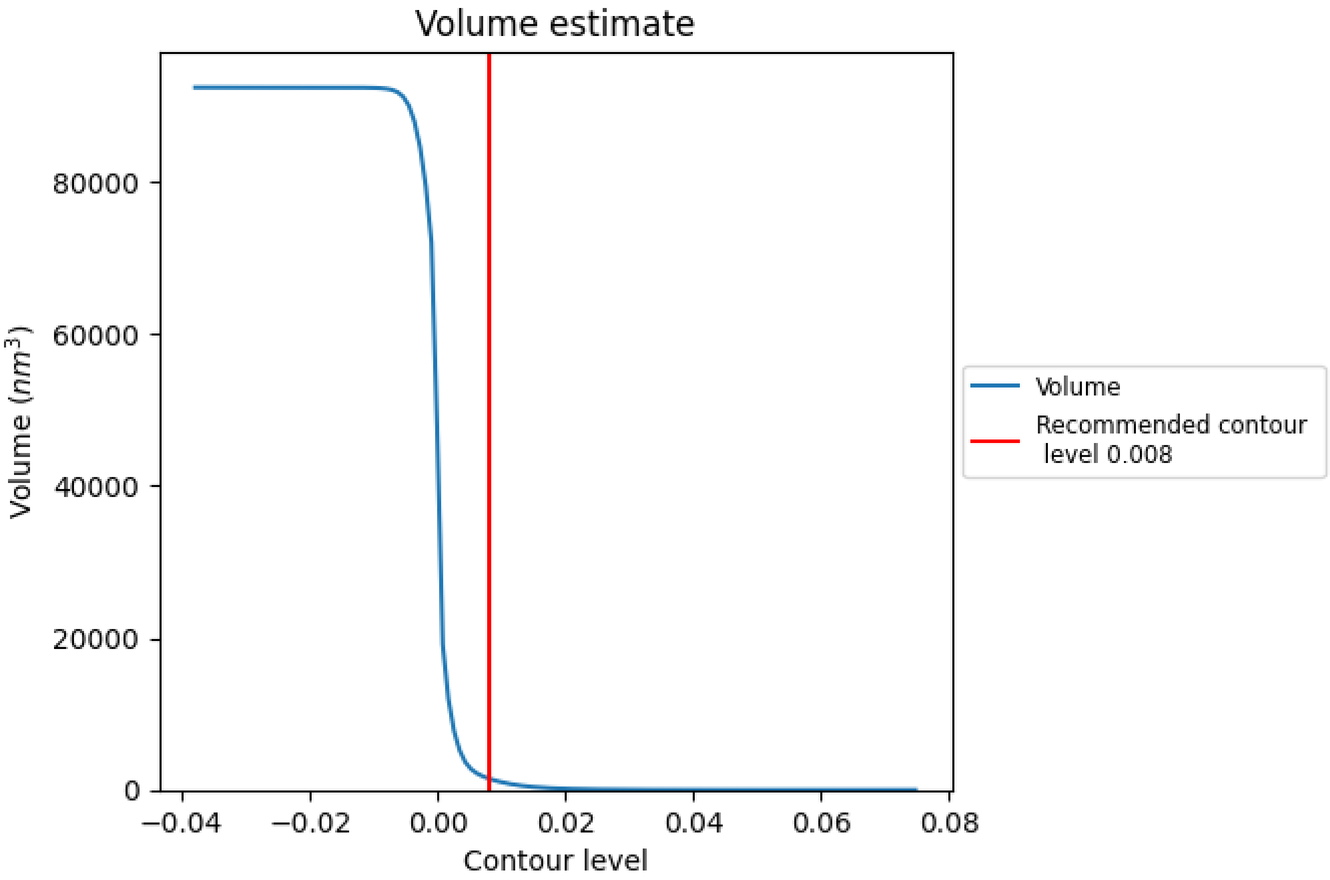
This section contains the results of statistical analysis of the map.

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.

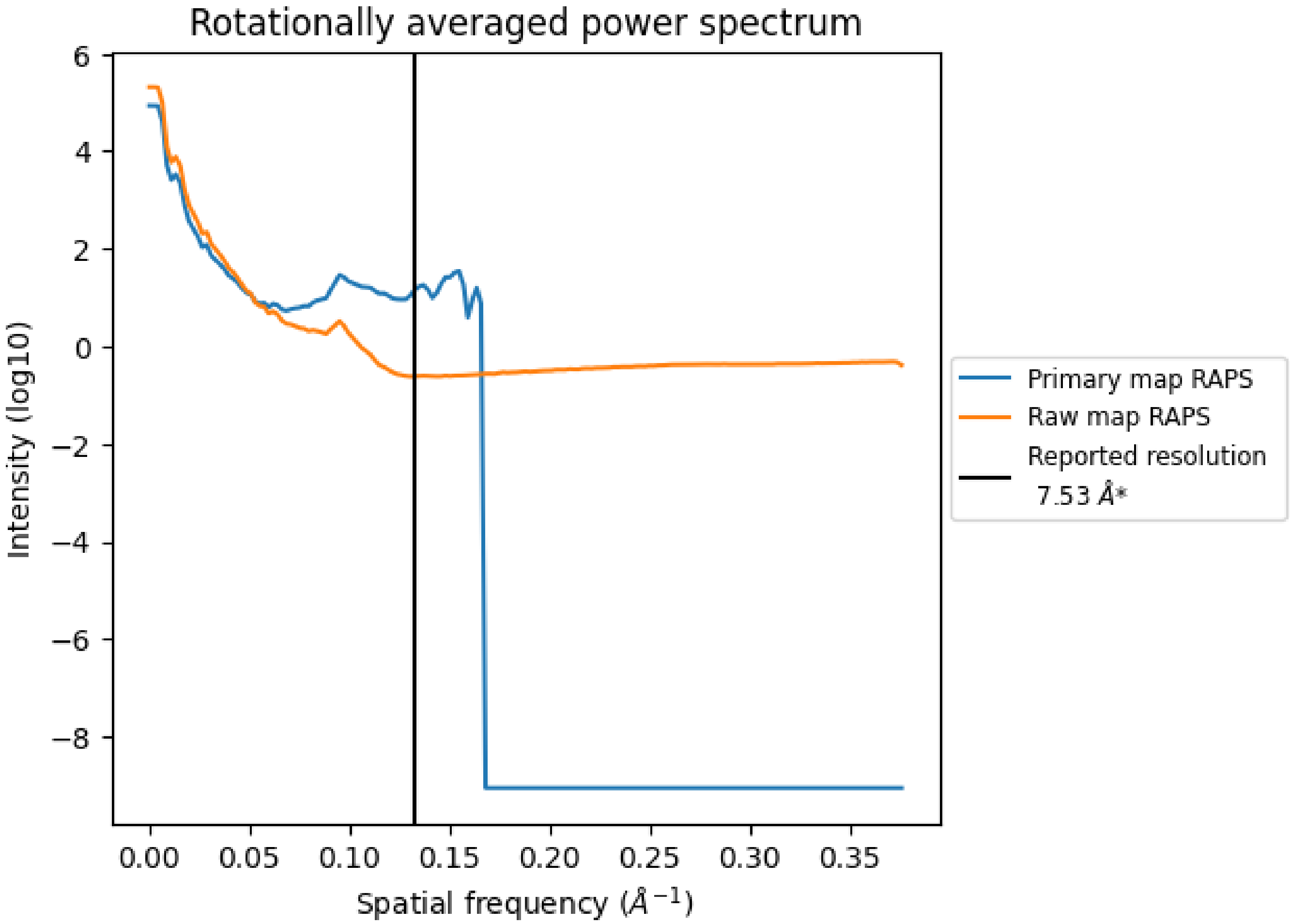
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 1498 nm^3; this corresponds to an approximate mass of 1353 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 ⓘ

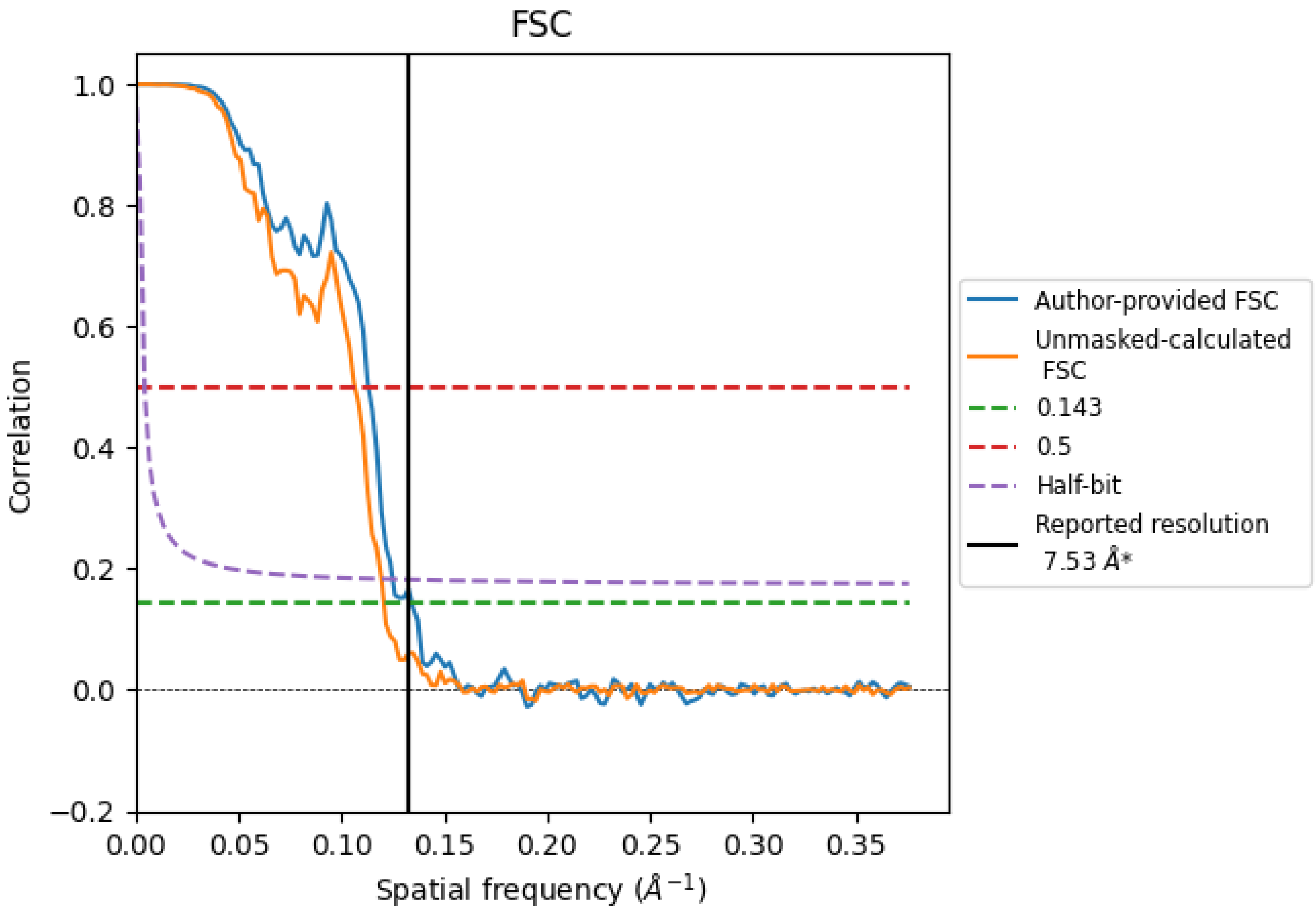


*Reported resolution corresponds to spatial frequency of 0.133 $Å^{-1}$

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 0.133 Å^{-1}

8.2 Resolution estimates (i)

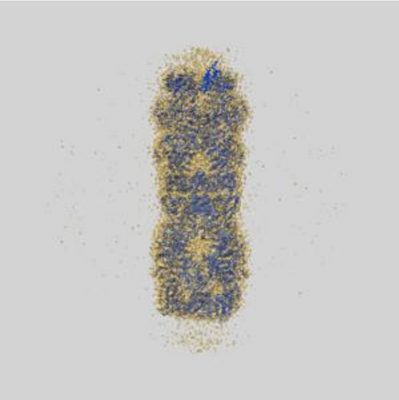
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	7.53	-	-
Author-provided FSC curve	7.44	8.84	8.00
Unmasked-calculated*	8.29	9.38	8.38

*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 8.29 differs from the reported value 7.53 by more than 10 %

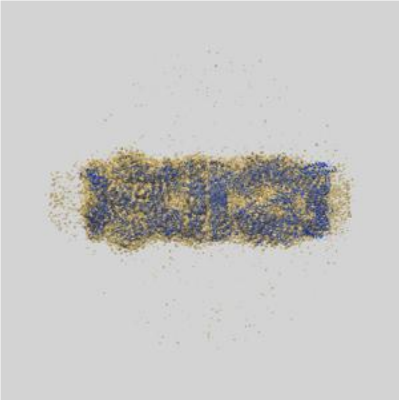
9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-65180 and PDB model 9VM8. Per-residue inclusion information can be found in section 3 on page 6.

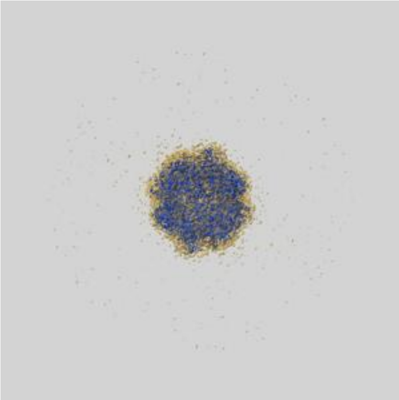
9.1 Map-model overlay ⓘ



X



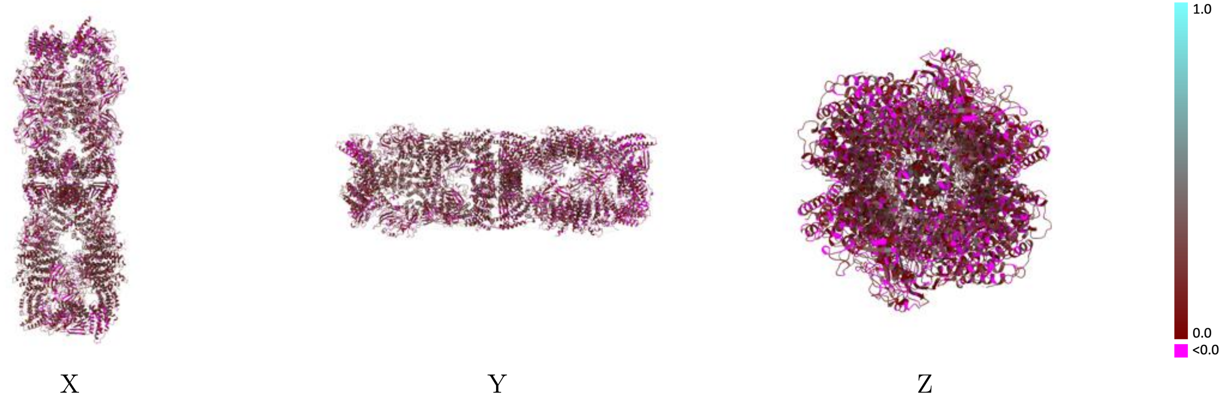
Y



Z

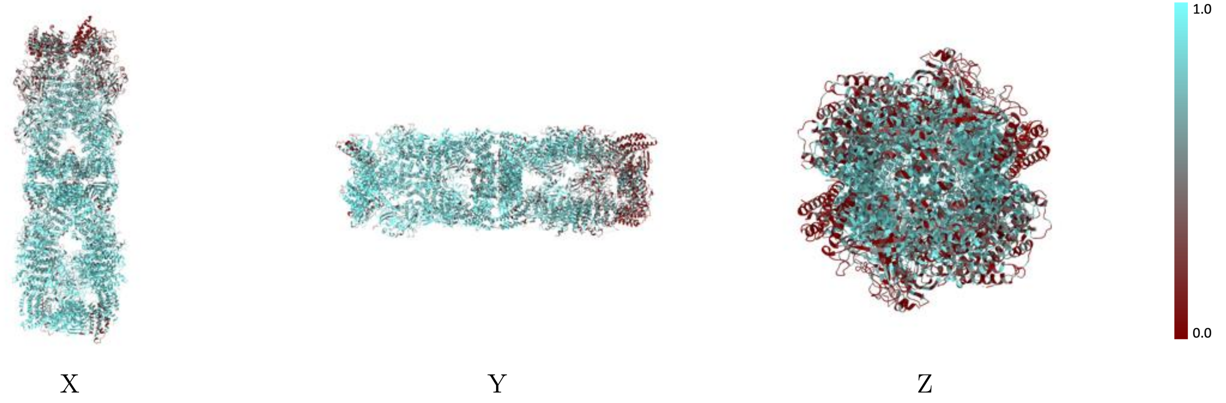
The images above show the 3D surface view of the map at the recommended contour level 0.008 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model



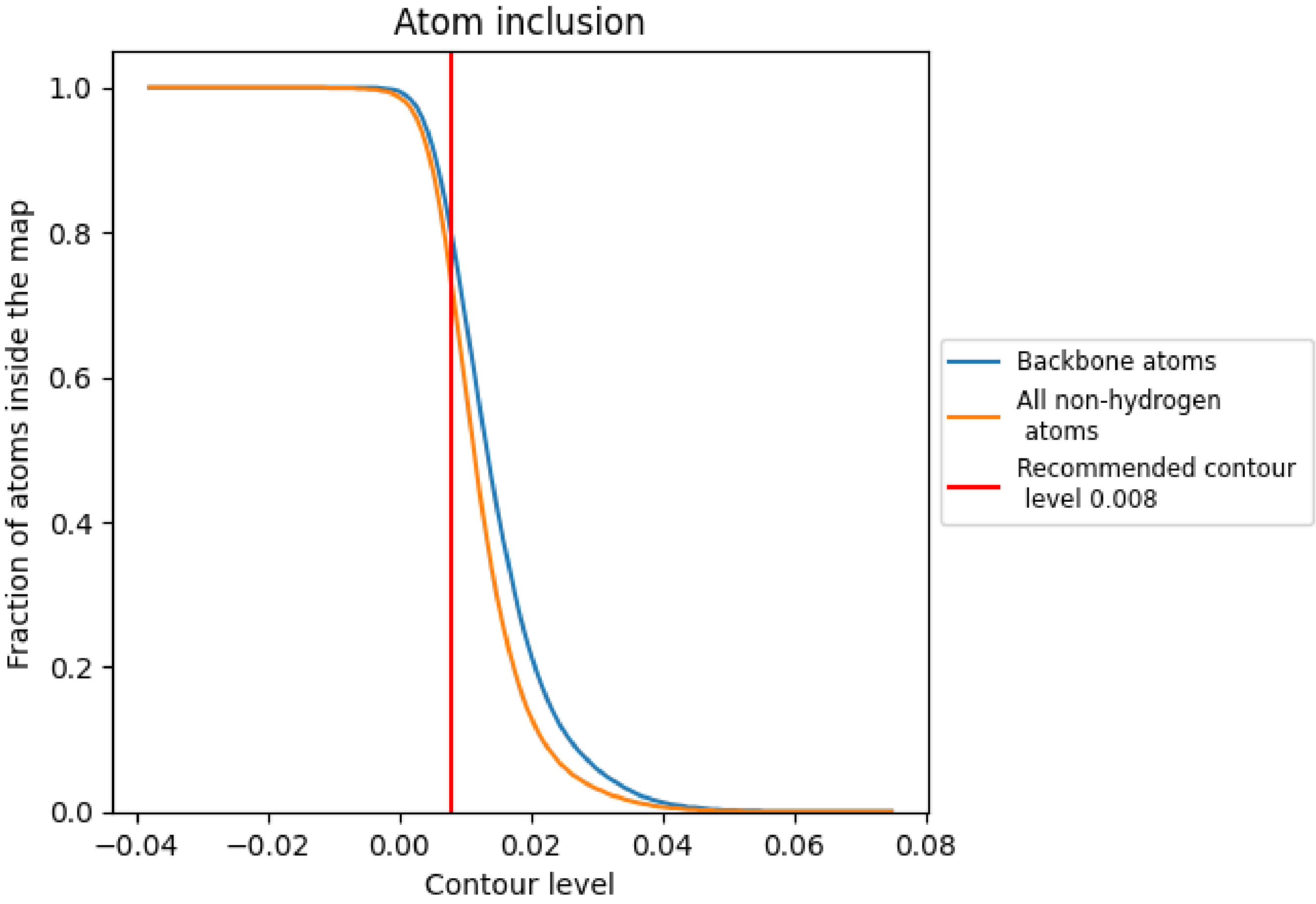
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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



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 (0.008).

9.4 Atom inclusion ⓘ



At the recommended contour level, 79% of all backbone atoms, 72% 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 (0.008) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	▬ 0.7230	▬ 0.1730
A	▬ 0.8230	▬ 0.1890
B	▬ 0.8210	▬ 0.1870
C	▬ 0.8300	▬ 0.1980
D	▬ 0.8290	▬ 0.1970
E	▬ 0.7050	▬ 0.1670
F	▬ 0.5370	▬ 0.1400
G	▬ 0.5370	▬ 0.1410
H	▬ 0.7040	▬ 0.1680