wwPDB EM Validation Summary Report (i)

Sep 28, 2024 – 05:52 pm BST

PDB ID	:	6TLJ
EMDB ID	:	EMD-10516
Title	:	Cryo-EM structure of the Anaphase-promoting complex/Cyclosome, in complex with the Mitotic checkpoint complex (APC/C-MCC) at 3.8 angstrom resolution
Authors	:	Alfieri, C.; Barford, D.
Deposited on	:	2019-12-02
Resolution	:	3.80 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

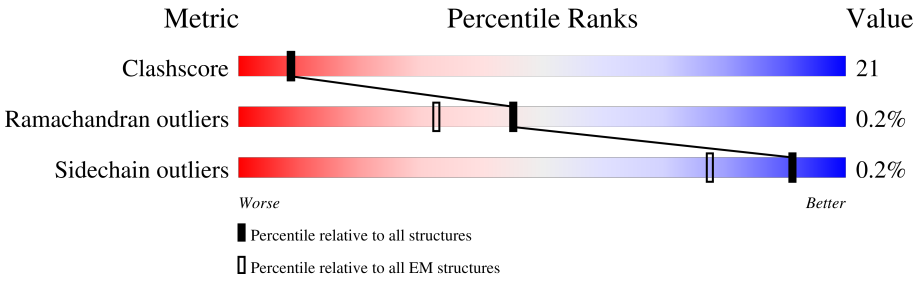
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	: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

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.80 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

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	1944	19% 44% 30% 26%
2	B	84	92% 43% 48% • 6%
3	C	597	21% 53% 34% 12%
3	P	597	17% 46% 36% 18%
4	D	121	5% 11% • 85%
5	E	110	5% 36% 15% 49%
6	F	824	8% 41% 18% 41%
6	H	824	• 37% 21% 41%

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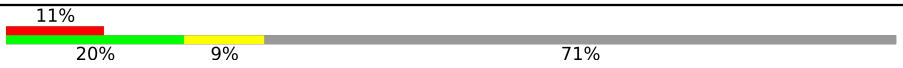
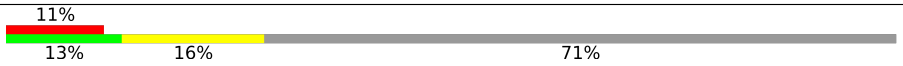
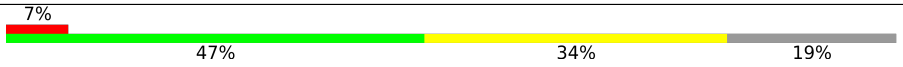
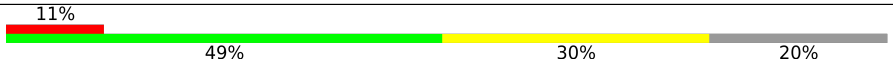
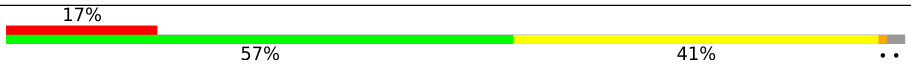
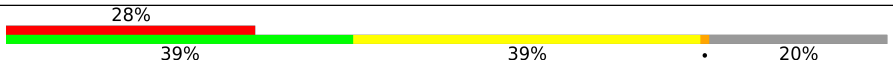
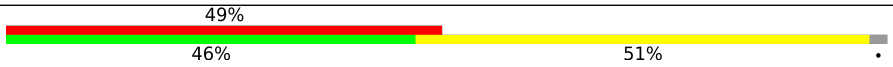
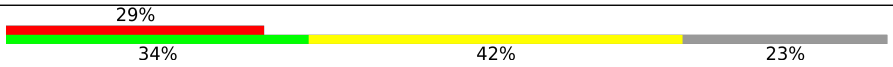
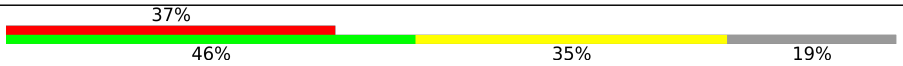
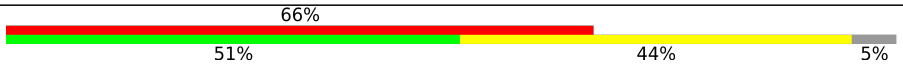
Mol	Chain	Length	Quality of chain
7	G	85	
7	W	85	
8	I	808	
9	J	620	
9	K	620	
10	L	185	
11	M	74	
12	N	822	
13	O	755	
14	Q	374	
15	R	499	
16	S	1050	
17	X	599	
17	Y	599	
18	Z	205	

2 Entry composition (i)

There are 18 unique types of molecules in this entry. The entry contains 72305 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 Anaphase-promoting complex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1441	10949	7039	1853	1983	74	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	356	PHE	PRO	conflict	UNP Q9H1A4

- Molecule 2 is a protein called Anaphase-promoting complex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	79	643	411	116	100	16	0	0

- Molecule 3 is a protein called Cell division cycle protein 23 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	524	4306	2774	727	781	24	0	0
3	P	491	Total	C	N	O	S	0	0
			4043	2611	679	729	24		

- Molecule 4 is a protein called Anaphase-promoting complex subunit 15.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	D	18	153	104	23	26	0	0

- Molecule 5 is a protein called Anaphase-promoting complex subunit 16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	56	450	290	74	85	1	0	0

- Molecule 6 is a protein called Cell division cycle protein 27 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	483	Total	C	N	O	S	0	0
			3849	2470	649	704	26		
6	H	483	Total	C	N	O	S	0	0
			3853	2473	650	704	26		

- Molecule 7 is a protein called Anaphase-promoting complex subunit CDC26.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	25	Total	C	N	O	S	0	0
			213	133	40	39	1		
7	W	25	Total	C	N	O	S	0	0
			213	133	40	39	1		

- Molecule 8 is a protein called Anaphase-promoting complex subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	733	Total	C	N	O	S	0	0
			5728	3675	953	1067	33		

- Molecule 9 is a protein called Cell division cycle protein 16 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	504	Total	C	N	O	S	0	0
			4047	2601	684	737	25		
9	K	493	Total	C	N	O	S	0	0
			3988	2563	672	729	24		

- Molecule 10 is a protein called Anaphase-promoting complex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	182	Total	C	N	O	S	0	0
			1435	898	263	268	6		

- Molecule 11 is a protein called Anaphase-promoting complex subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	M	59	Total	C	N	O	S	0	0
			493	310	79	102	2		

- Molecule 12 is a protein called Anaphase-promoting complex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	N	703	Total	C	N	O	S	0	0
			5403	3436	971	971	25		

- Molecule 13 is a protein called Anaphase-promoting complex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	O	685	Total	C	N	O	S	0	0
			5402	3446	940	988	28		

- Molecule 14 is a protein called Cell division cycle protein 20 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	Q	365	Total	C	N	O	S	0	0
			2739	1720	503	505	11		

- Molecule 15 is a protein called Cell division cycle protein 20 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	R	383	Total	C	N	O	S	0	0
			2953	1855	538	548	12		

- Molecule 16 is a protein called Mitotic checkpoint serine/threonine-protein kinase BUB1 beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	S	293	Total	C	N	O	S	0	0
			2227	1397	405	420	5		

- Molecule 17 is a protein called Anaphase-promoting complex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	X	484	Total	C	N	O	S	0	0
			3773	2393	652	704	24		
17	Y	496	Total	C	N	O	S	0	0
			3868	2449	669	724	26		

- Molecule 18 is a protein called Mitotic spindle assembly checkpoint protein MAD2A.

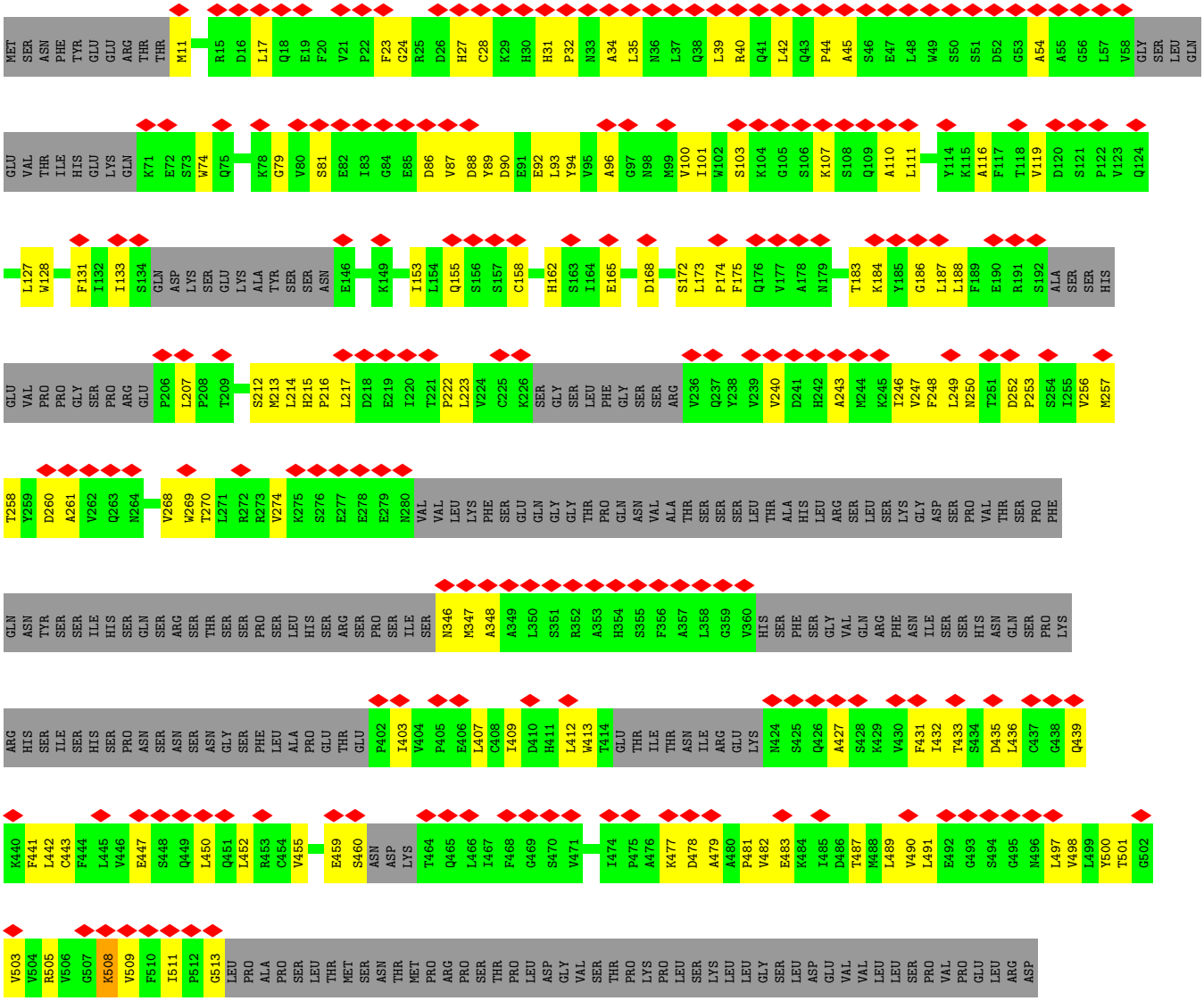
Mol	Chain	Residues	Atoms					AltConf	Trace
18	Z	195	Total	C	N	O	S	0	0
			1577	1012	256	305	4		

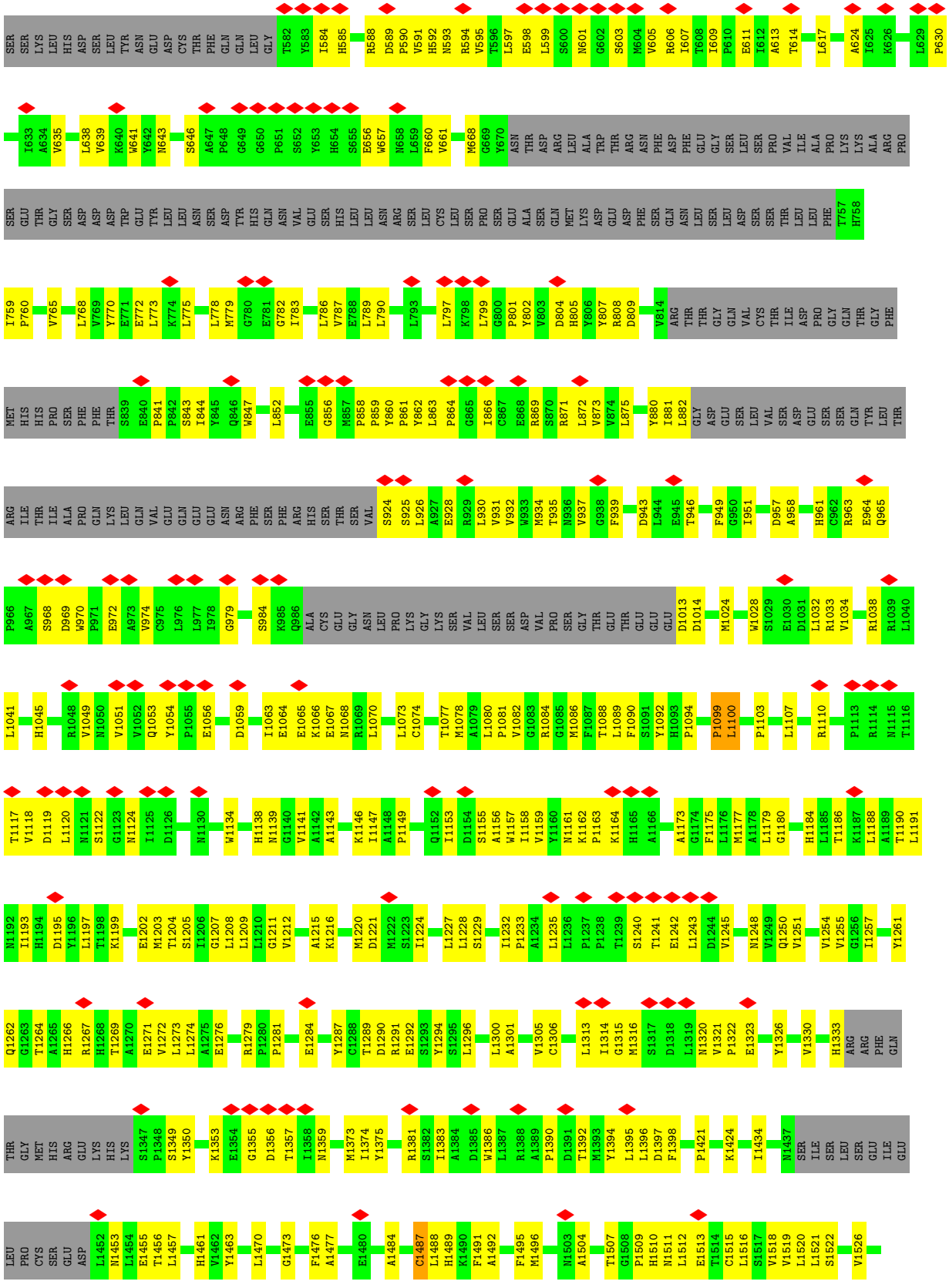
3 Residue-property plots (i)

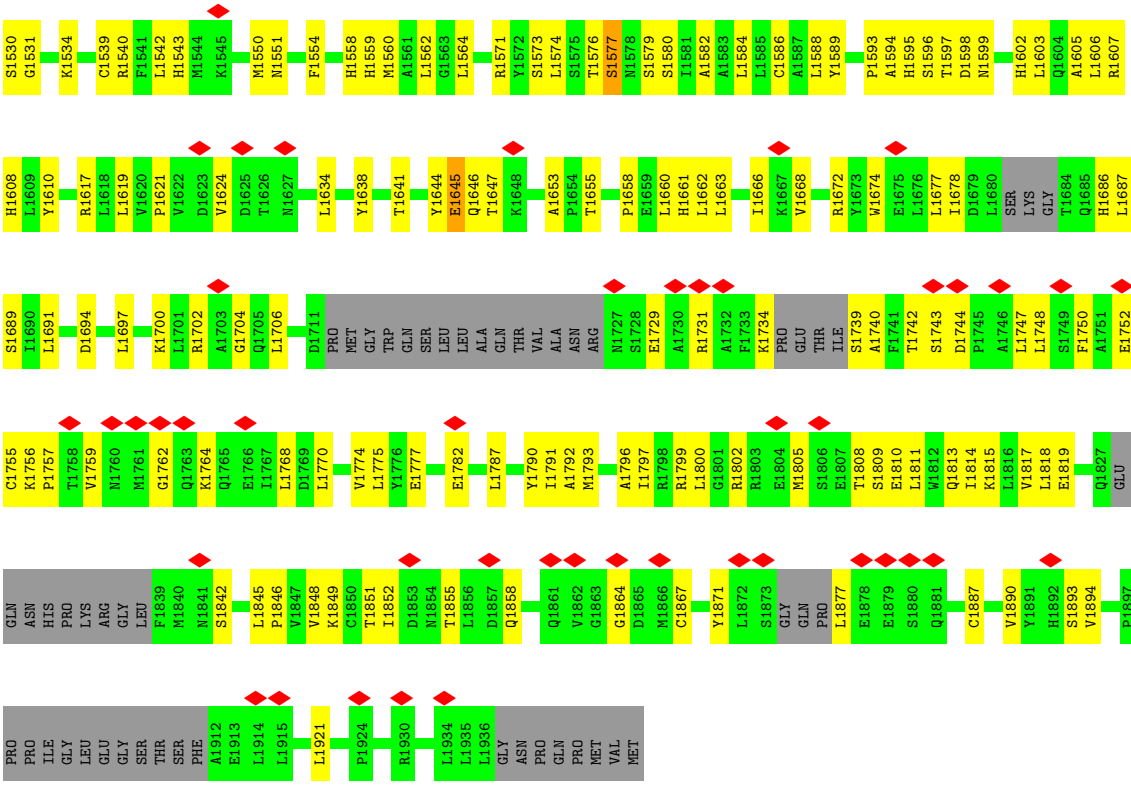
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Anaphase-promoting complex subunit 1

Chain A:

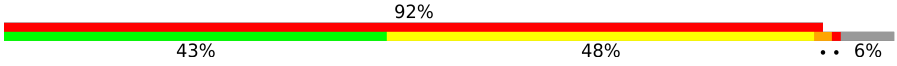


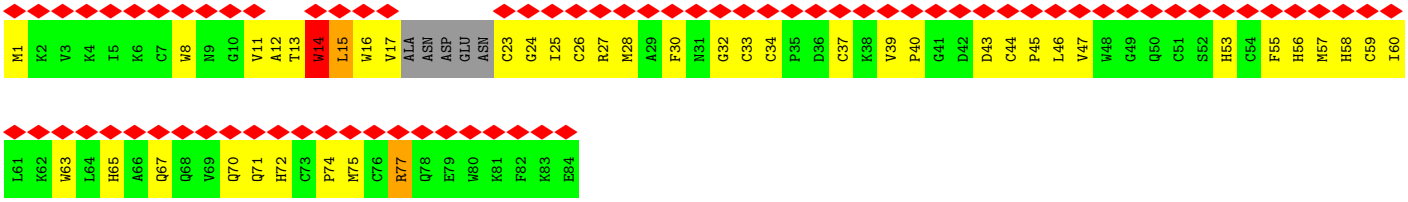

SER SER LYS LEU HIS ASP SER LEU TYR ASN GLU ASP CYS THR PHE GLN GLN LEU GLY T582 Y583 I584 H585 R588 D589 P590 V591 H592 N593 R594 V595 T596 L597 E598 L599 S600 N601 G602 S603 M604 V605 R606 I607 I608 I609 P610 E611 I612 A613 T614 L617 A624 I625 K626 L629 P630
T633 A634 V635 L638 V639 K640 W641 Y642 N643 S646 A647 P648 G649 G650 P651 S652 Y653 H654 S655 E656 W657 N658 L659 F660 V661 W668 G669 Y670 ASN THR ASP ARG LEU ALA TRP THR ARG ASN PHE ASP PHE GLU GLY SER LEU SER PRO VAL ILE ALA PRO LYS LYS ALA ARG PRO
SER GLU THR GLY SER ASP ASP ASP TRP GLU TYR LEU LEU ASN SER ASP TYR HIS GLN ASN VAL GLU SER HIS LEU LEU LEU ASN ARG SER LEU CYS LEU SER PRO SER GLU ALA SER GLN MET LYS ASP GLU ASP PHE SER GLN ASN LEU SER LEU ASP SER SER THR LEU LEU LEU PHE T757 H758
I759 P760 V765 L768 V769 Y770 E771 E772 L773 K774 L775 L778 M779 G780 E781 G782 I783 L786 V787 E788 L789 L790 L793 L797 K798 L799 G800 P801 Y802 V803 D804 H805 Y806 Y807 R808 D809 V814 ARG THR THR GLY GLN VAL CYS THR ILE ASP PRO GLY GLN THR GLY PHE
MET HIS HIS PRO SER PHE PHE THR S839 E840 P841 P842 S843 I844 Y845 Q846 W847 L852 E855 G856 M857 P858 P859 Y860 P861 Y862 L863 P864 G865 I866 C867 E868 R869 S870 R871 L872 V873 V874 L875 Y880 I881 L882 GLY ASP GLU SER LEU VAL SER ASP GLU SER SER GLN TYR LEU THR
ARG ILE THR ILE ALA PRO GLN LYS LEU GLN VAL GLU GLN GLU GLU GLU ASN ARG PHE SER PHE ARG HIS SER THR SER VAL S924 S925 L926 A927 E928 R929 L930 V931 V932 W933 M934 T935 N936 V937 G938 F939 D943 L944 E945 T946 F949 G950 I951 D957 A958 H961 C962 R963 E964 Q965
P966 A967 S968 D969 W970 P971 E972 A973 V974 C975 L976 L977 I978 G979 S984 K985 Q986 ALA CYS GLU GLY ASN LEU PRO LYS GLY LYS SER VAL LEU SER SER ASP VAL PRO SER GLY THR GLU THR GLU GLU GLU D1013 D1014 M1024 W1028 S1029 E1030 D1031 L1032 R1033 V1034 R1038 R1039 L1040
L1041 H1045 R1048 V1049 N1050 V1051 Y1052 Q1053 Y1054 P1055 E1056 D1059 I1063 E1064 E1065 K1066 E1067 N1068 R1069 L1070 L1073 C1074 T1077 M1078 A1079 L1080 P1081 V1082 G1083 R1084 G1085 M1086 F1087 T1088 L1089 F1090 S1091 Y1092 H1093 P1094 P1099 L1100 P1103 L1107 R1110 P1113 R1114 N1115 T1116
T1117 V1118 D1119 L1120 N1121 S1122 G1123 N1124 I1125 D1126 N1130 W1134 H1138 N1139 G1140 V1141 A1142 A1143 K1146 I1147 A1148 P1149 Q1152 I1153 D1154 S1155 A1156 W1157 I1158 V1159 Y1160 N1161 K1162 P1163 K1164 H1165 A1166 A1173 G1174 F1175 L1176 M1177 A1178 L1179 G1180 H1184 L1185 T1186 K1187 L1188 A1189 T1190 L1191
N1192 I1193 H1194 D1195 Y1196 L1197 T1198 K1199 E1202 M1203 T1204 S1205 I1206 G1207 L1208 L1209 L1210 G1211 V1212 A1215 K1216 M1220 D1221 M1222 S1223 I1224 L1227 L1228 S1229 I1232 P1233 A1234 L1235 L1236 P1237 P1238 T1239 S1240 T1241 E1242 L1243 D1244 V1245 N1248 V1249 Q1250 V1251 V1254 V1255 G1256 I1257 Y1261
Q1262 G1263 T1264 A1265 H1266 R1267 H1268 T1269 A1270 E1271 V1272 L1273 L1274 A1275 E1276 R1279 P1280 P1281 E1284 Y1287 C1288 T1289 D1290 R1291 E1292 S1293 Y1294 S1295 L1296 L1300 A1301 V1305 C1306 L1313 I1314 G1315 M1316 S1317 D1318 L1319 N1320 V1321 P1322 E1323 Y1326 V1330 H1333 ARG ARG PHE GLN
THR GLY MET HIS ARG GLU LYS HIS LYS S1347 P1348 S1349 Y1350 K1353 E1354 G1355 D1356 T1357 I1358 N1359 M1373 I1374 Y1375 R1381 S1382 I1383 A1384 D1385 W1386 L1387 R1388 A1389 P1390 D1391 T1392 M1393 Y1394 L1395 L1396 D1397 F1398 P1421 K1424 I1434 N1437 SER ILE SER LEU SER GLU ILE GLU
LEU PRO CYS SER GLU ASP L1452 N1453 L1454 E1455 T1456 L1457 H1461 V1462 Y1463 L1470 G1473 F1476 A1477 E1480 A1484 C1487 L1488 H1489 K1490 F1491 A1492 F1495 M1496 N1503 A1504 T1507 G1508 P1509 H1510 N1511 L1512 E1513 T1514 C1515 L1516 S1517 V1518 V1519 L1520 L1521 S1522 V1526



• Molecule 2: Anaphase-promoting complex subunit 11

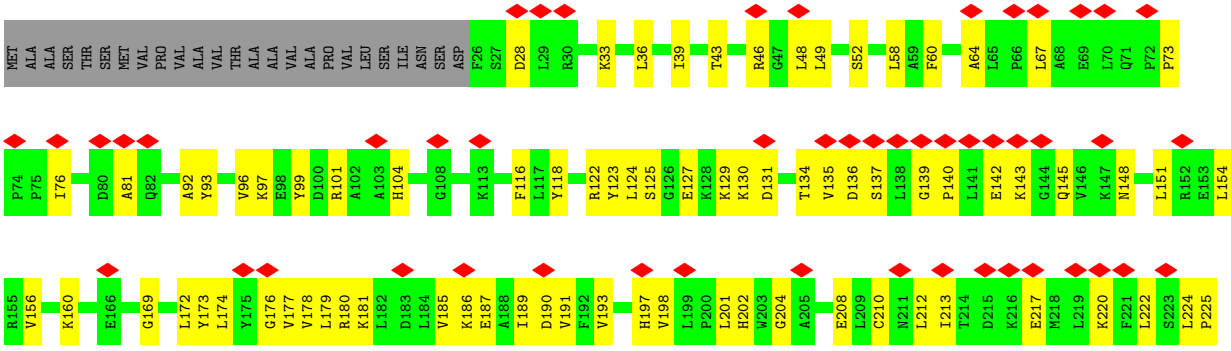
Chain B:

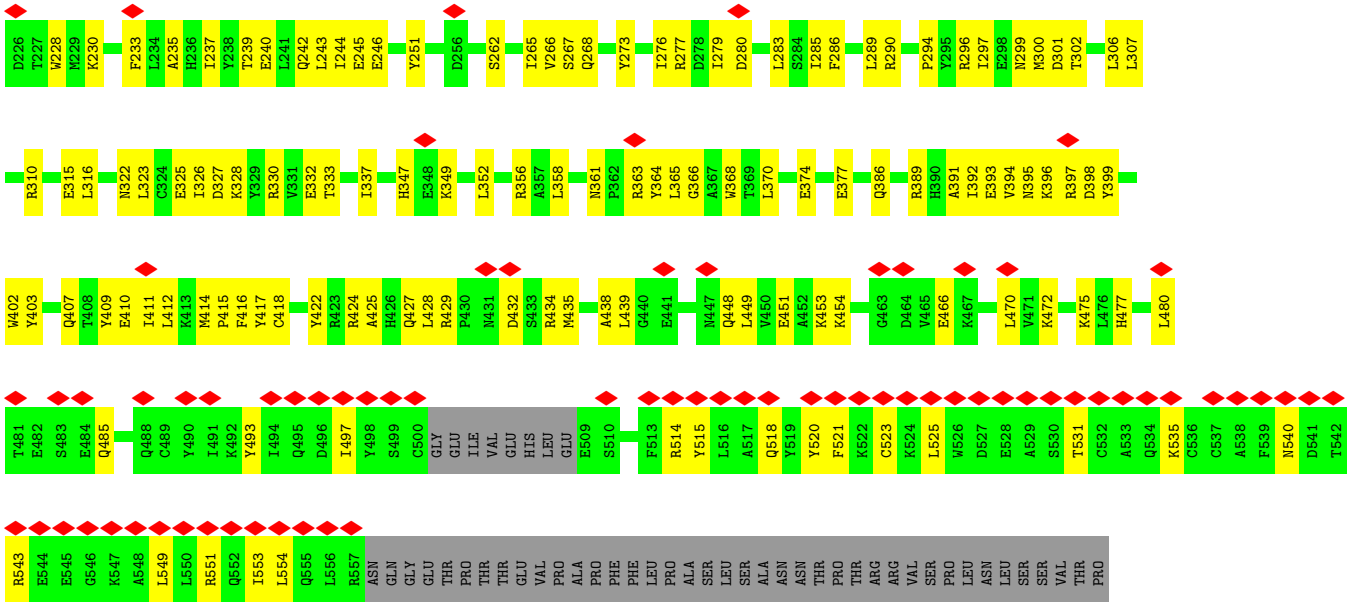




• Molecule 3: Cell division cycle protein 23 homolog

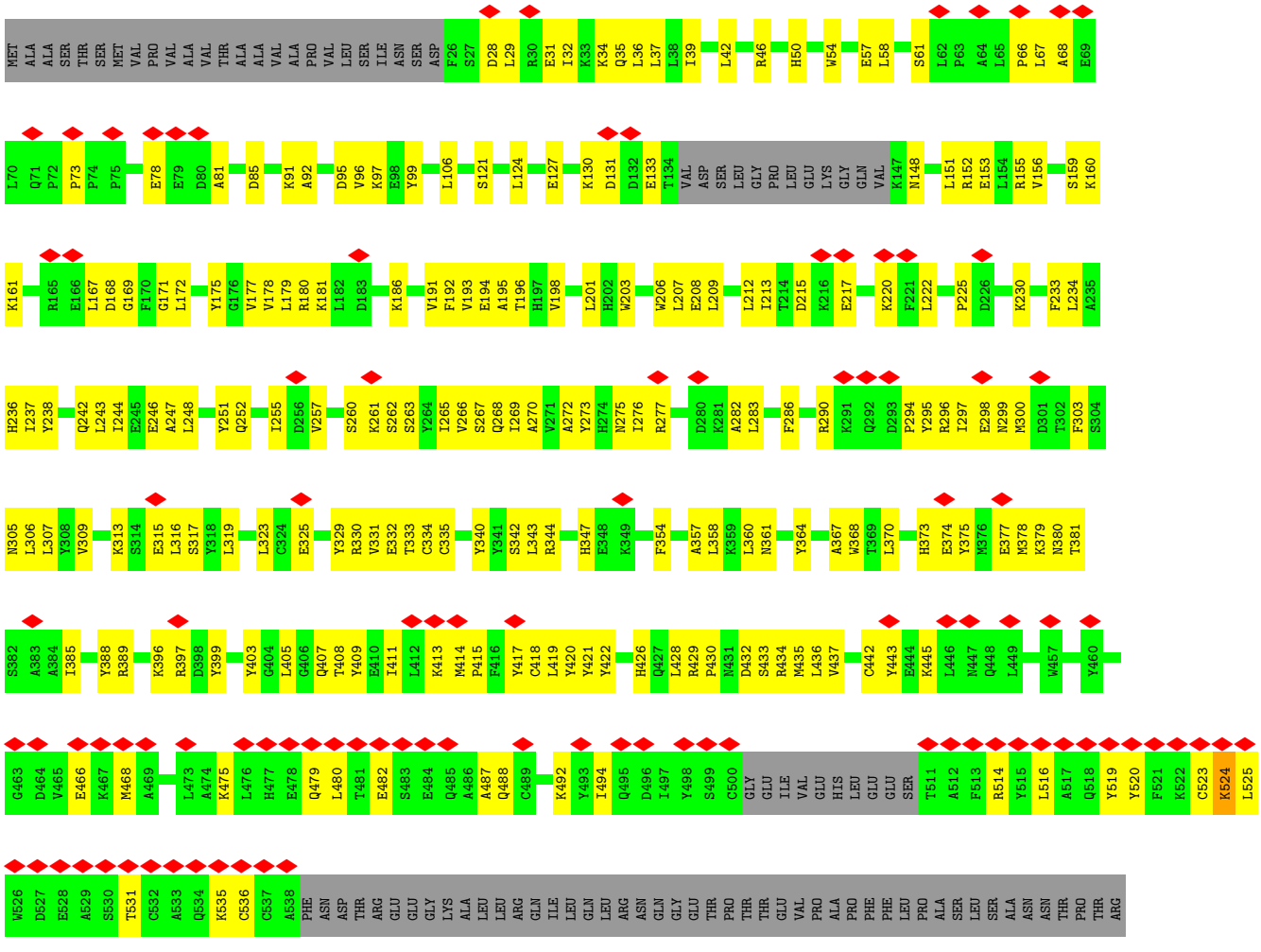
Chain C:





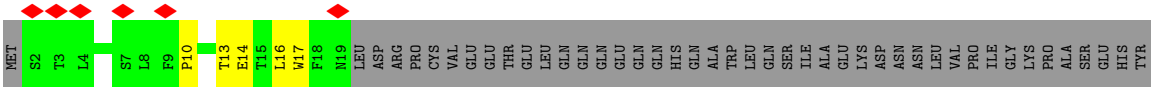
• Molecule 3: Cell division cycle protein 23 homolog

Chain P:



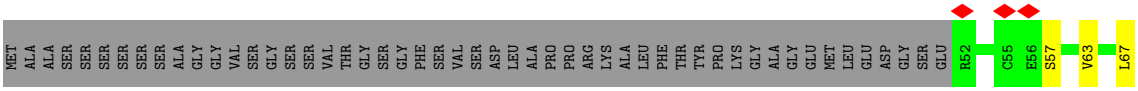
• Molecule 4: Anaphase-promoting complex subunit 15

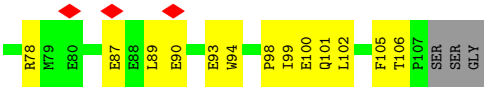
Chain D:



• Molecule 5: Anaphase-promoting complex subunit 16

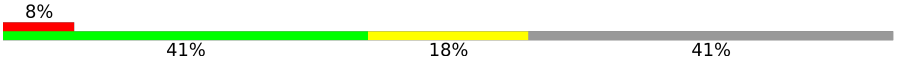
Chain E:

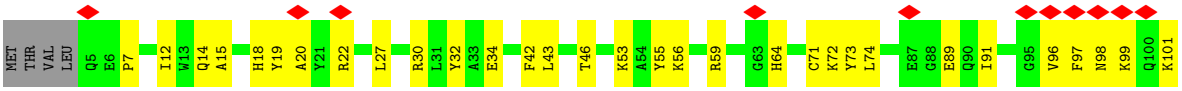


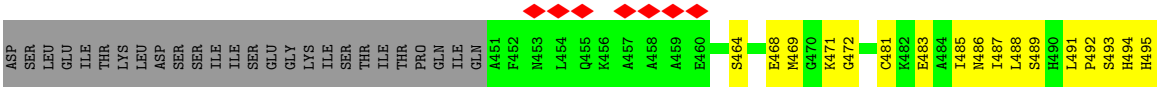


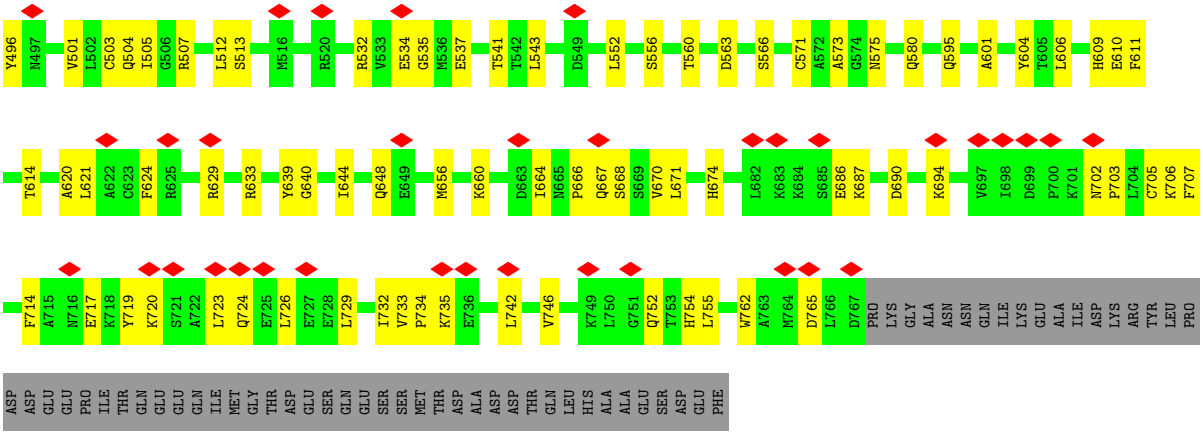
• Molecule 6: Cell division cycle protein 27 homolog

Chain F:



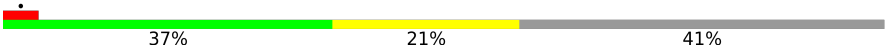


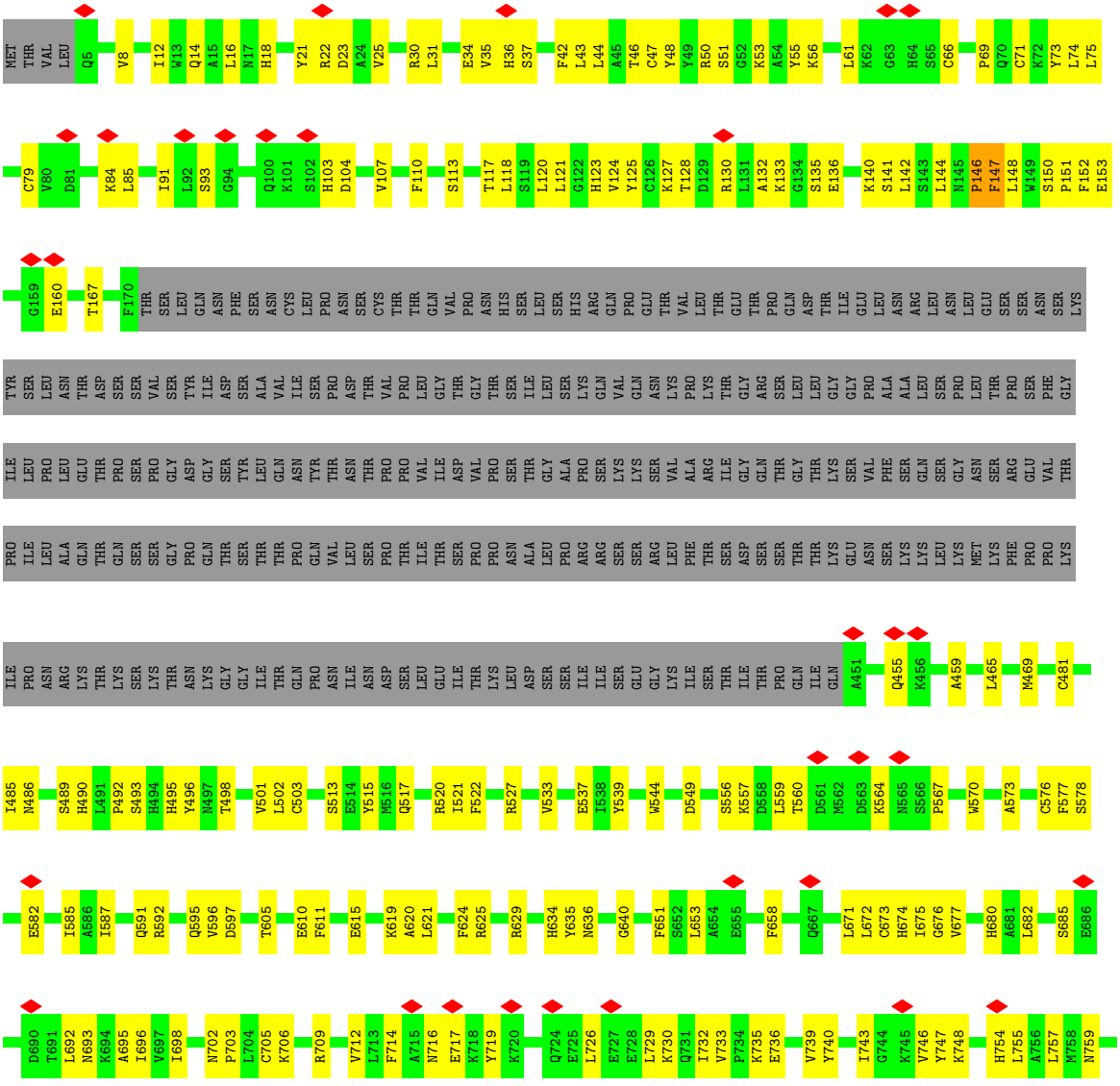




• Molecule 6: Cell division cycle protein 27 homolog

Chain H:



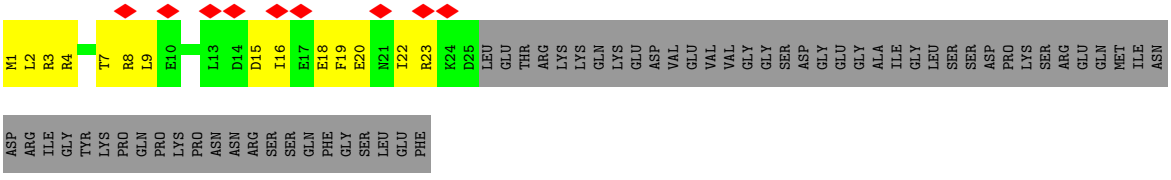


• Molecule 7: Anaphase-promoting complex subunit CDC26

Chain G:

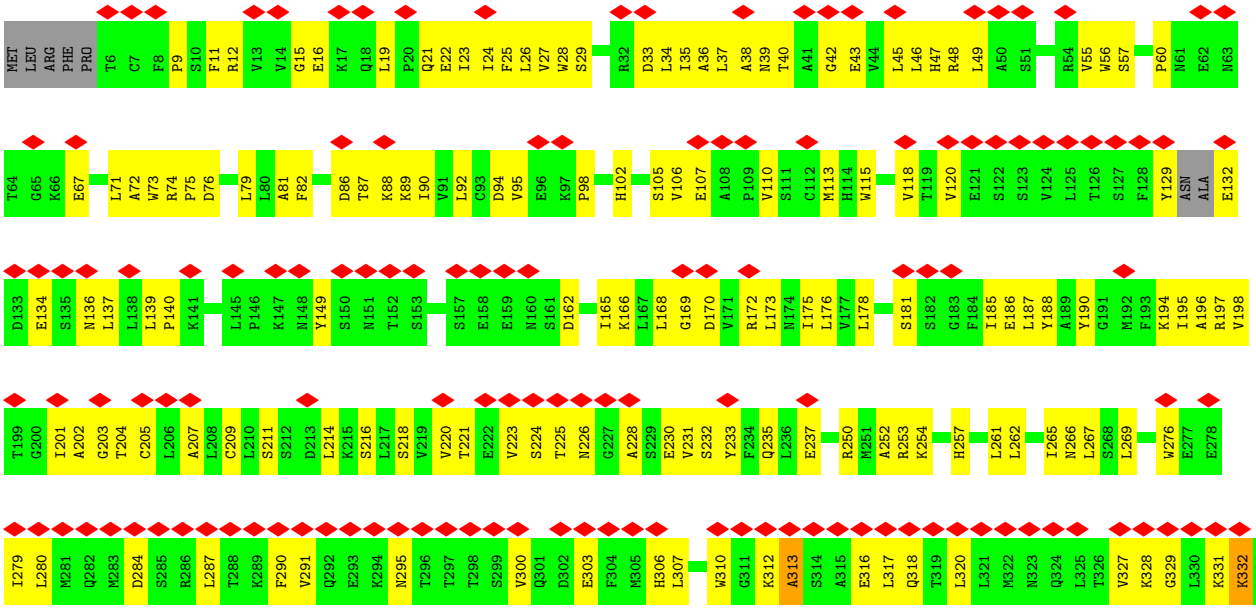
• Molecule 7: Anaphase-promoting complex subunit CDC26

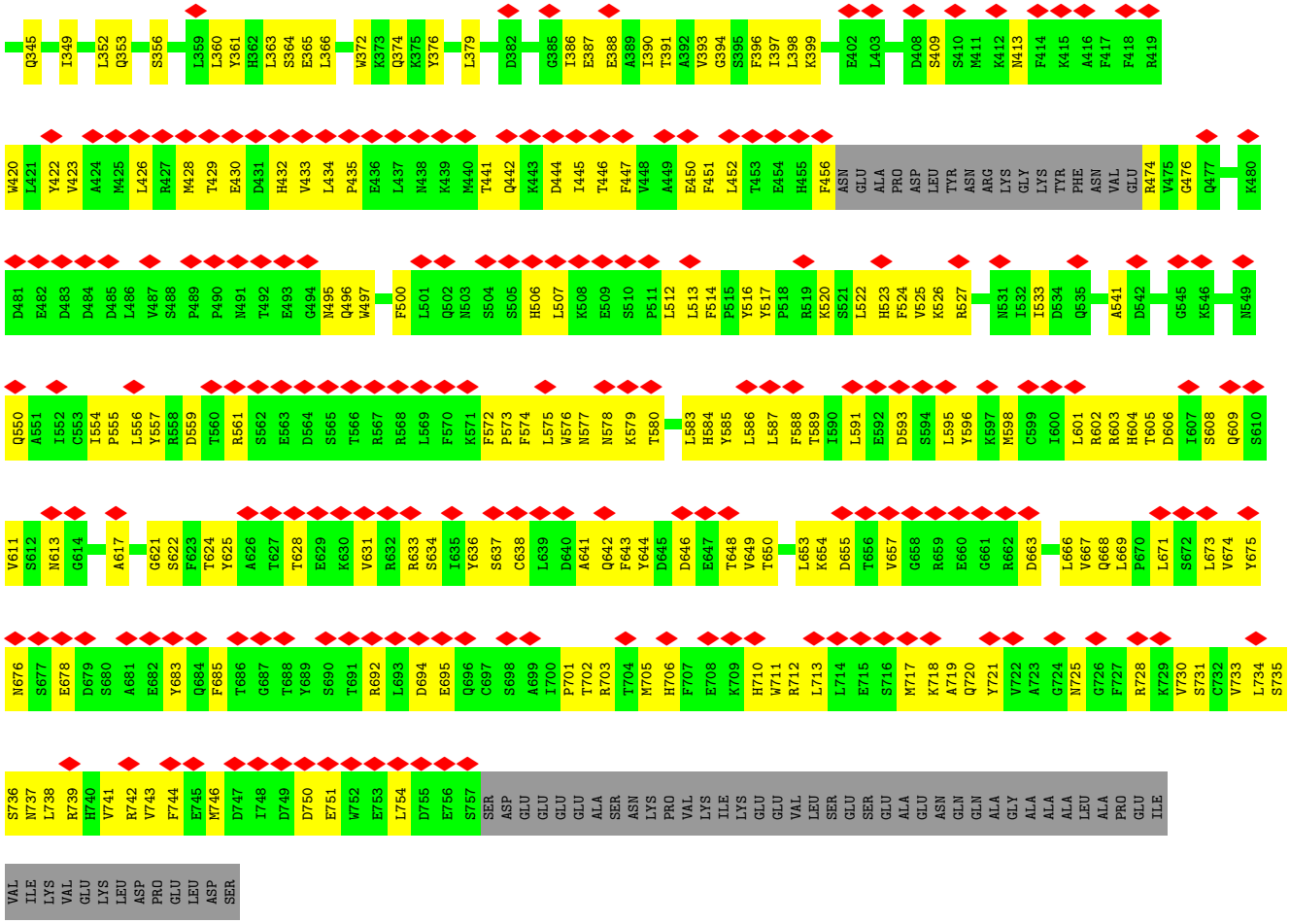
Chain W:



• Molecule 8: Anaphase-promoting complex subunit 4

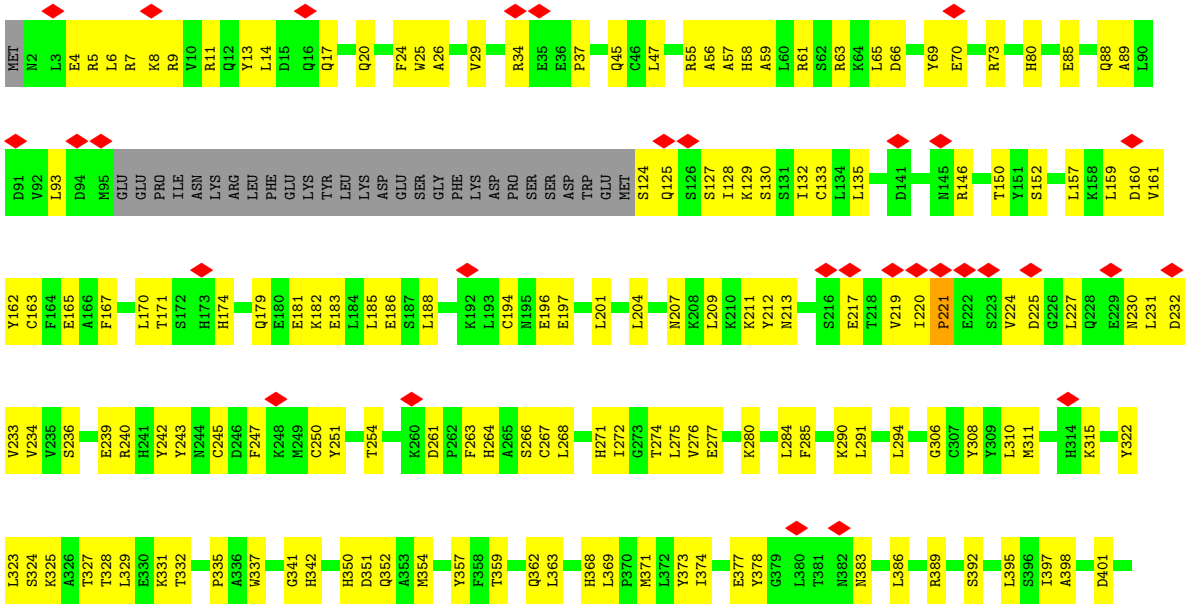
Chain I:

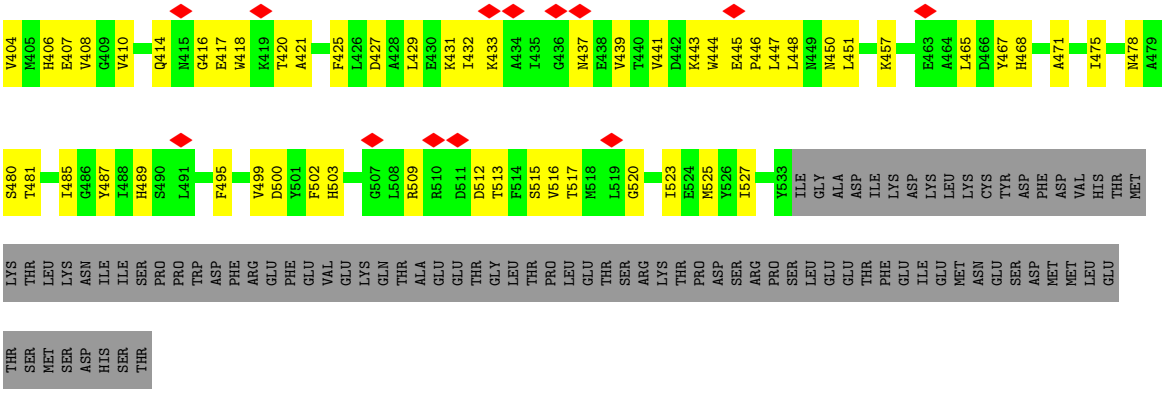




• Molecule 9: Cell division cycle protein 16 homolog

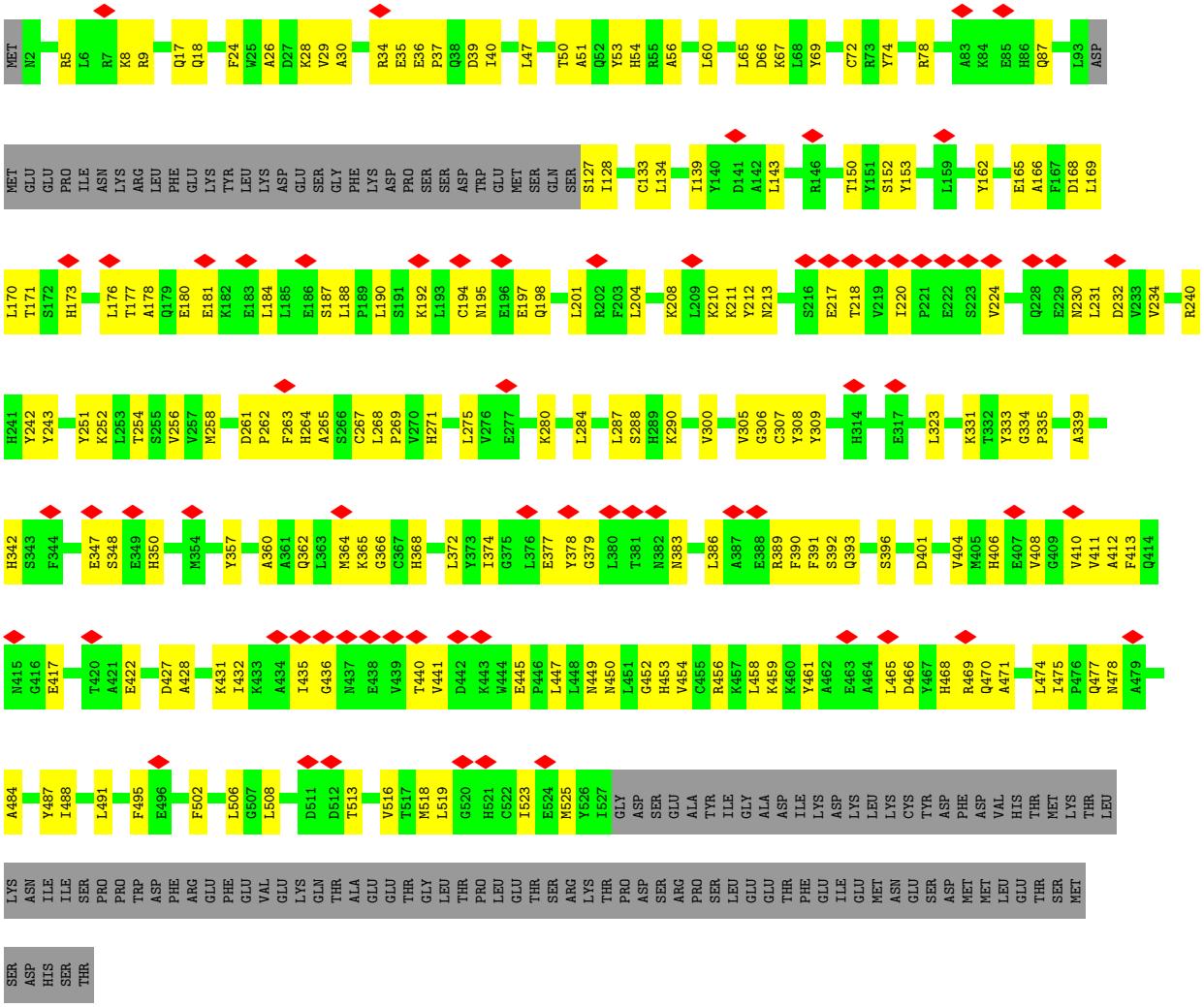
Chain J:





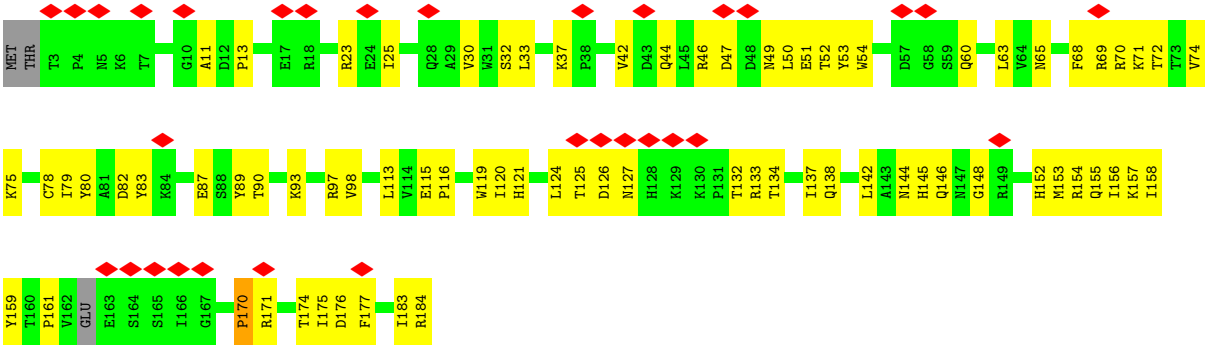
• Molecule 9: Cell division cycle protein 16 homolog

Chain K:



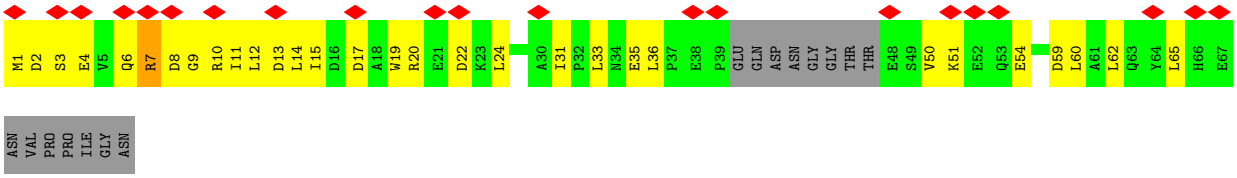
• Molecule 10: Anaphase-promoting complex subunit 10

Chain L:



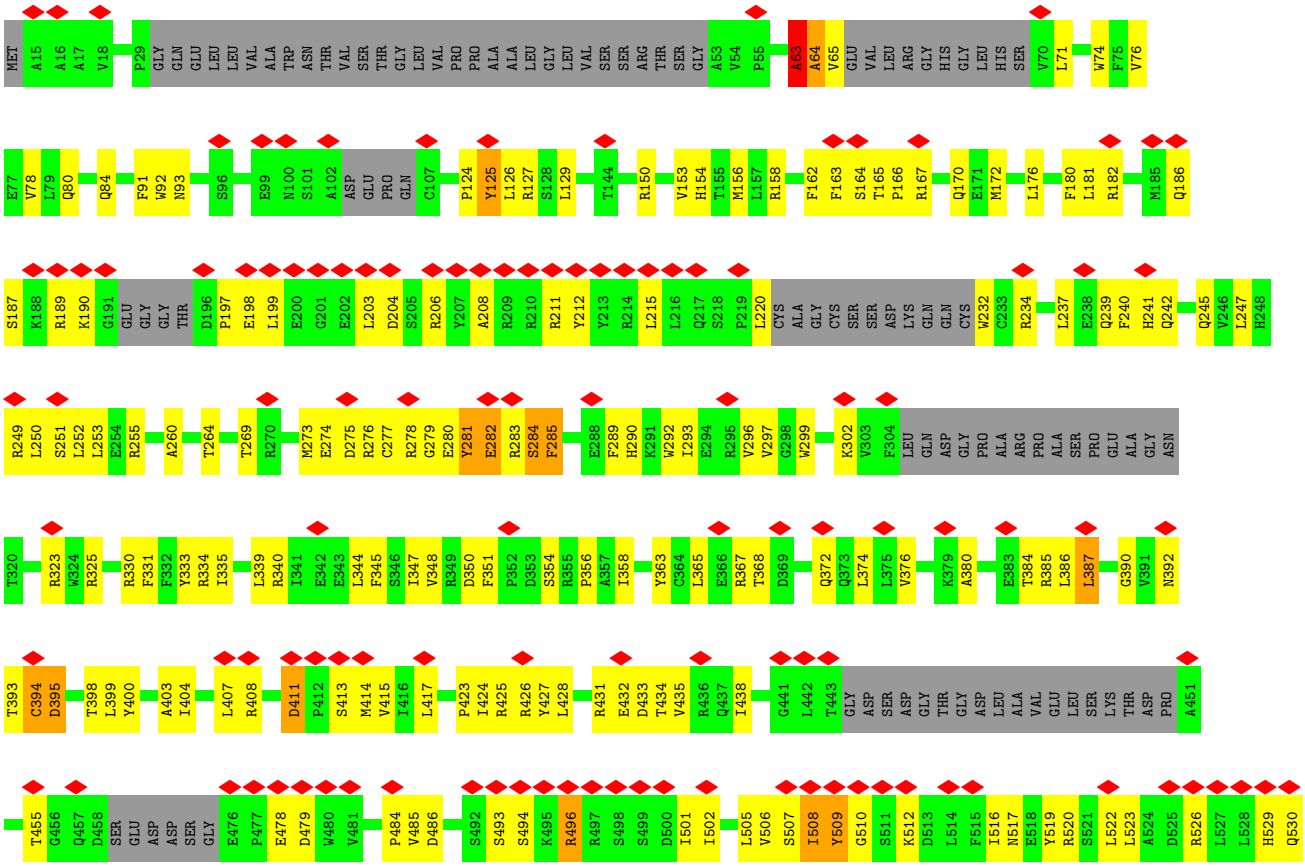
• Molecule 11: Anaphase-promoting complex subunit 13

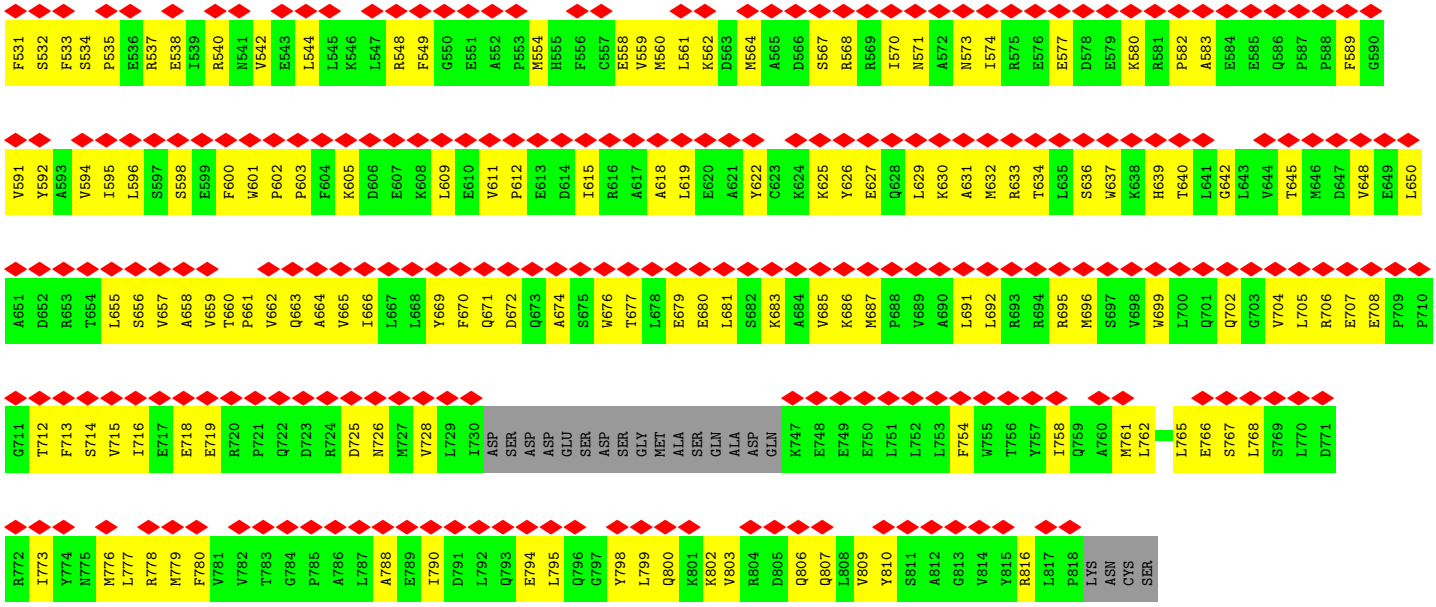
Chain M:



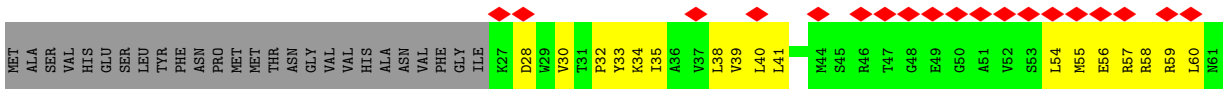
• Molecule 12: Anaphase-promoting complex subunit 2

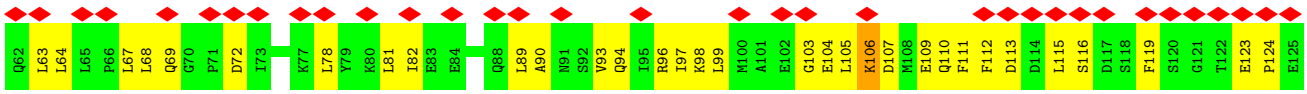
Chain N:

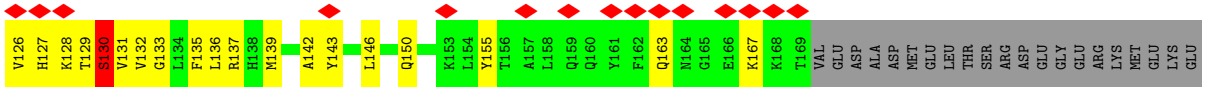


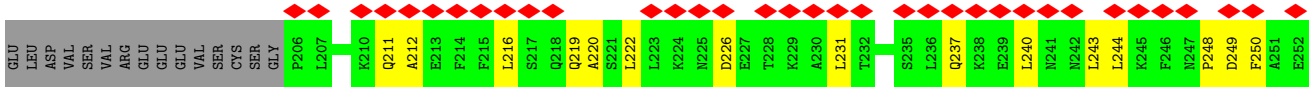


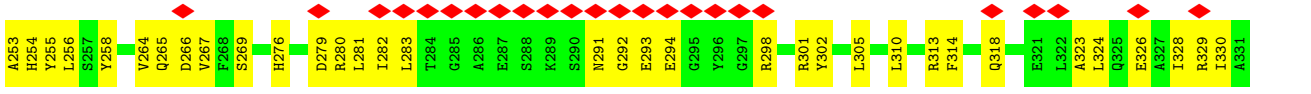
• Molecule 13: Anaphase-promoting complex subunit 5

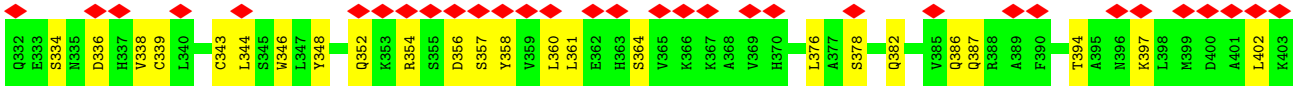


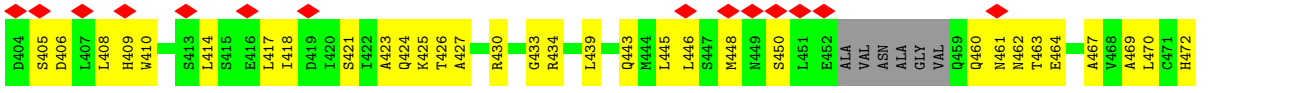


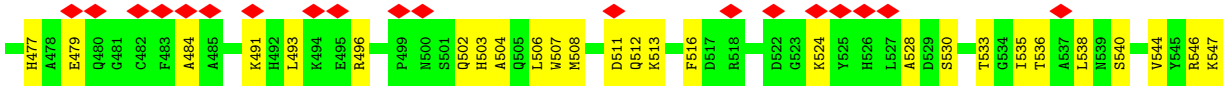


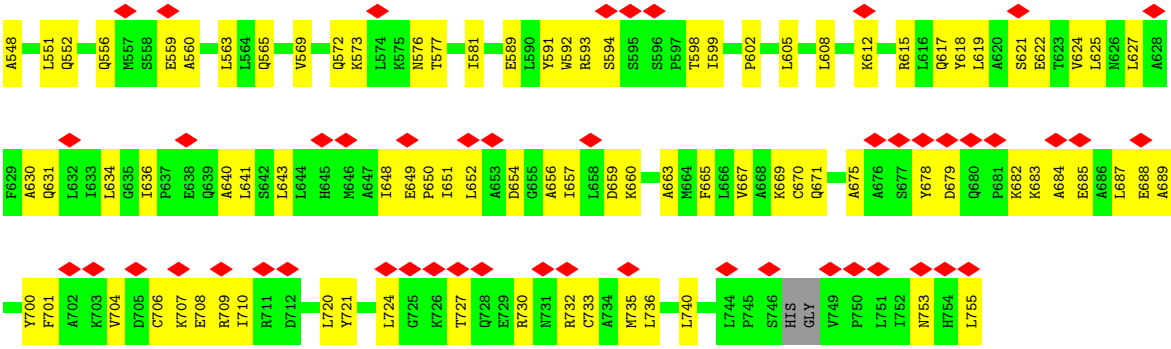






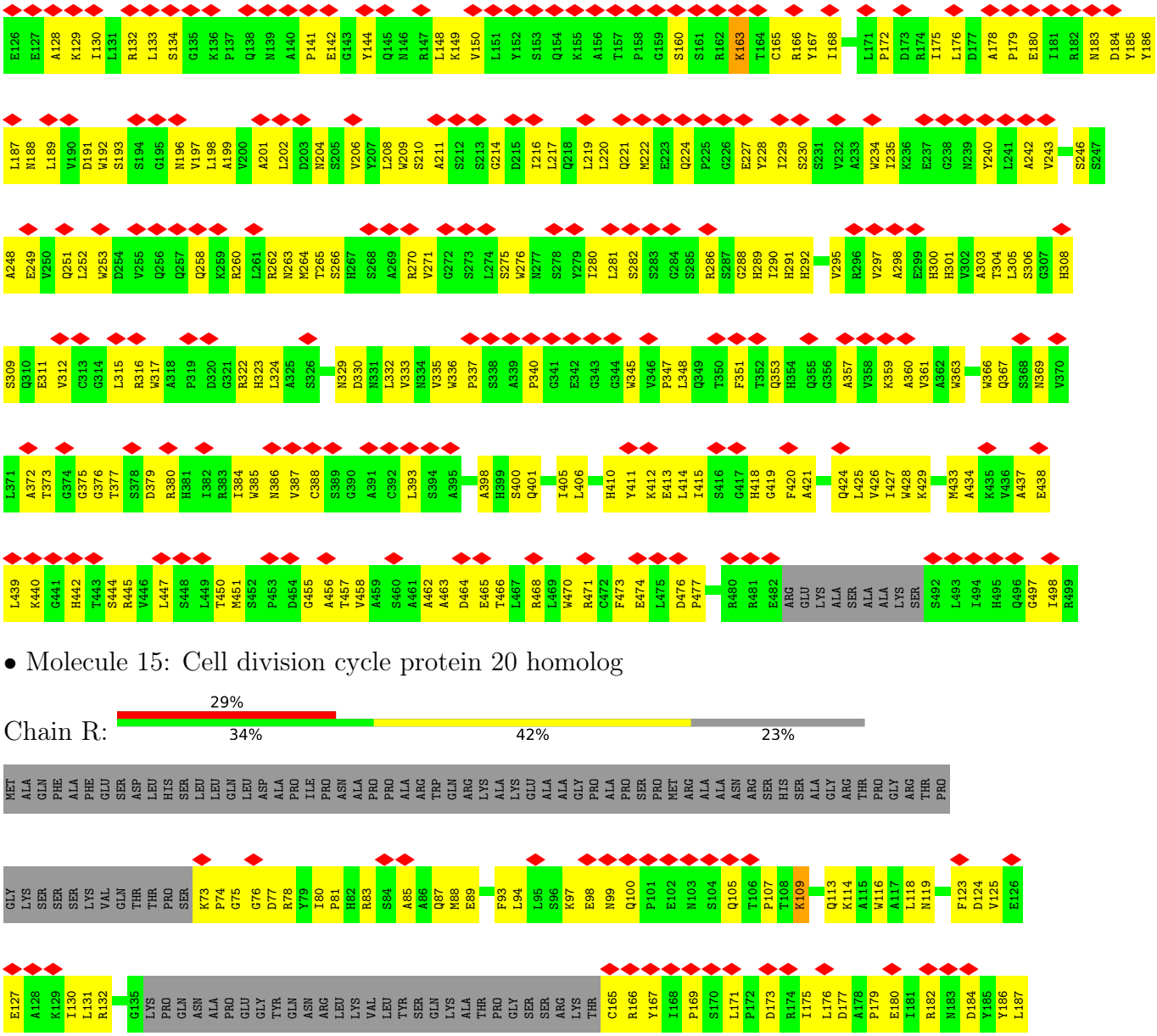






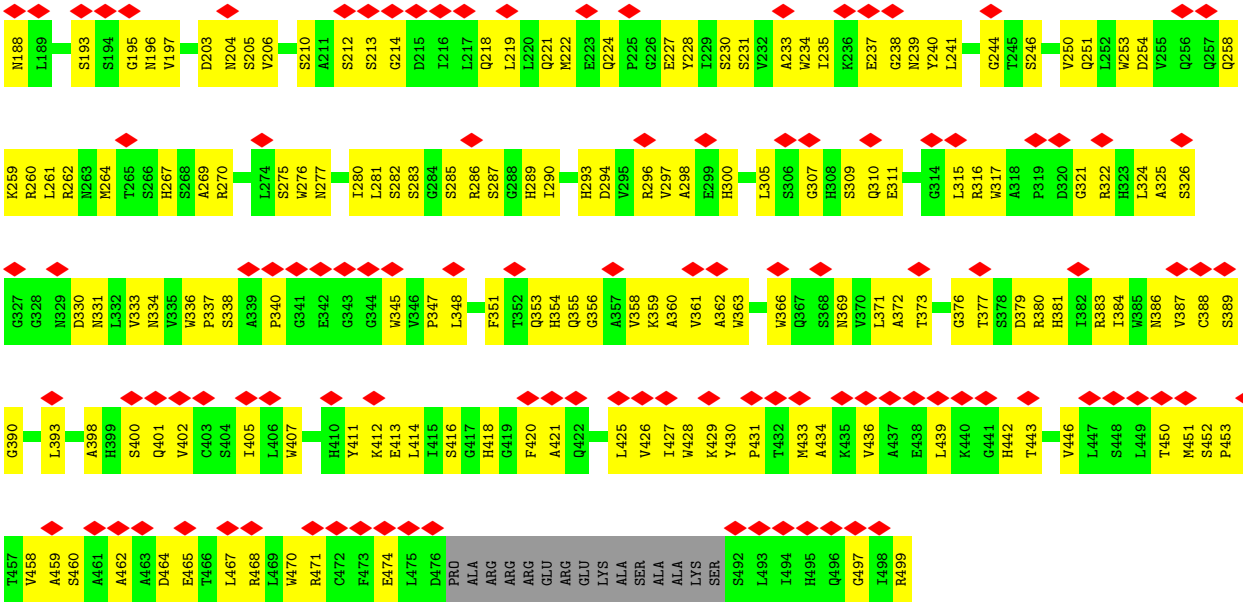
• Molecule 14: Cell division cycle protein 20 homolog

Chain Q:



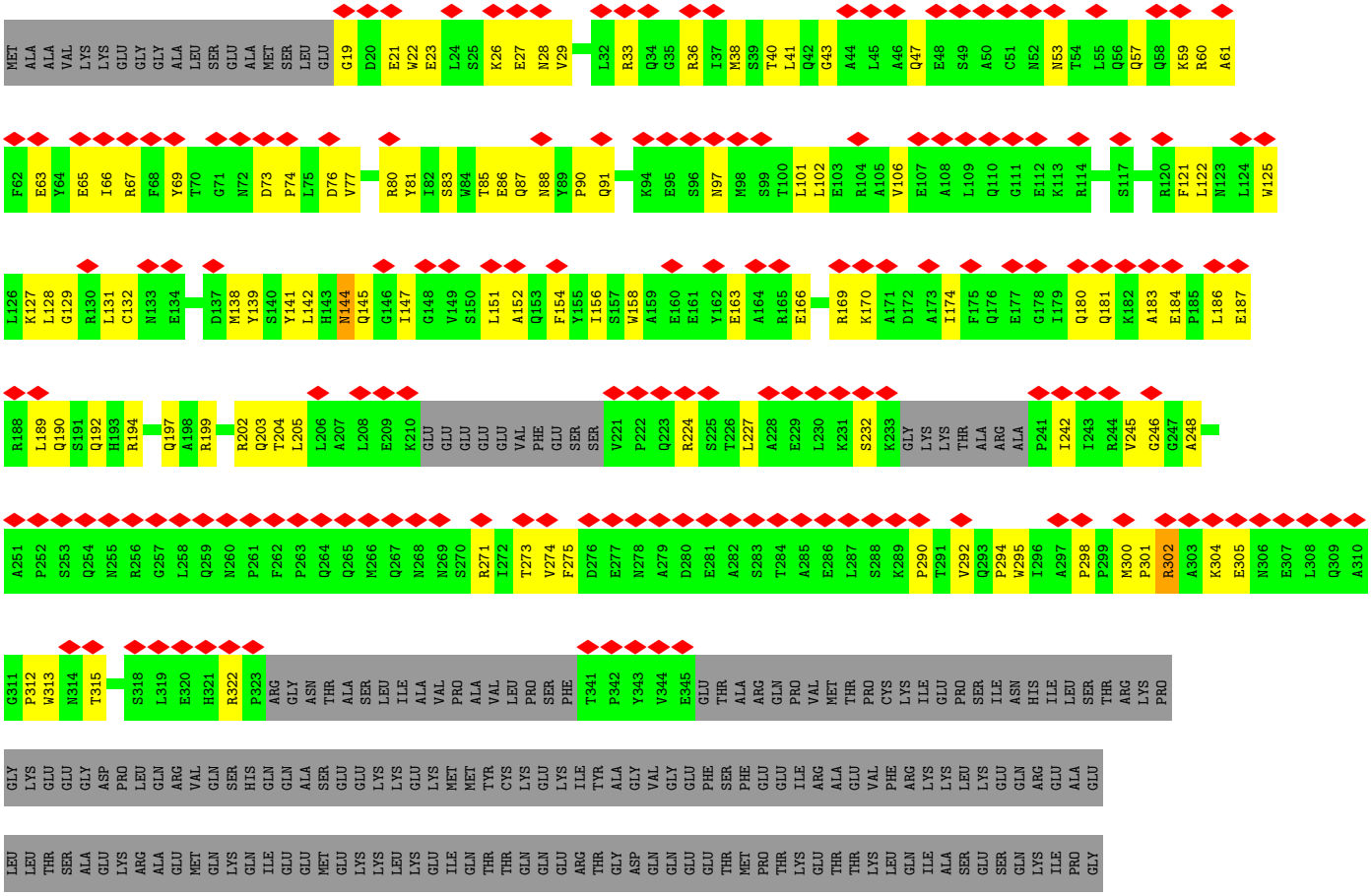
• Molecule 15: Cell division cycle protein 20 homolog

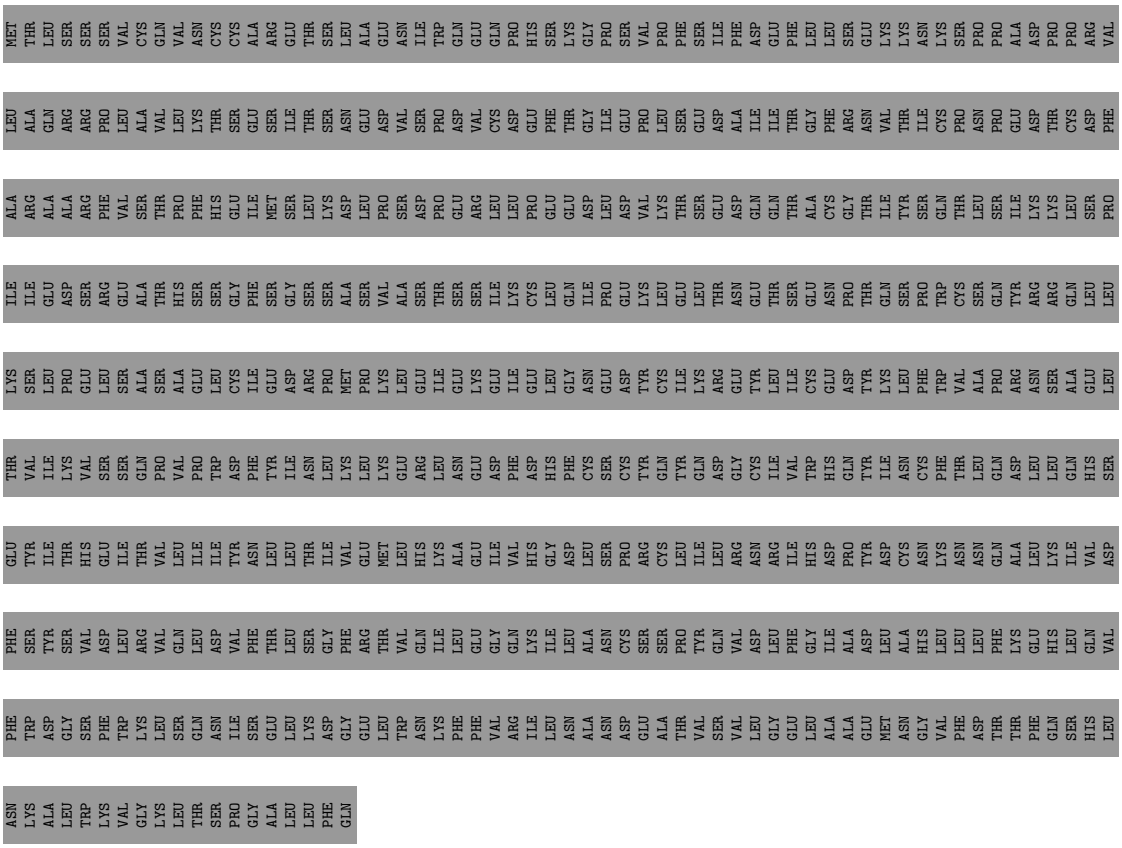
Chain R:



• Molecule 16: Mitotic checkpoint serine/threonine-protein kinase BUB1 beta

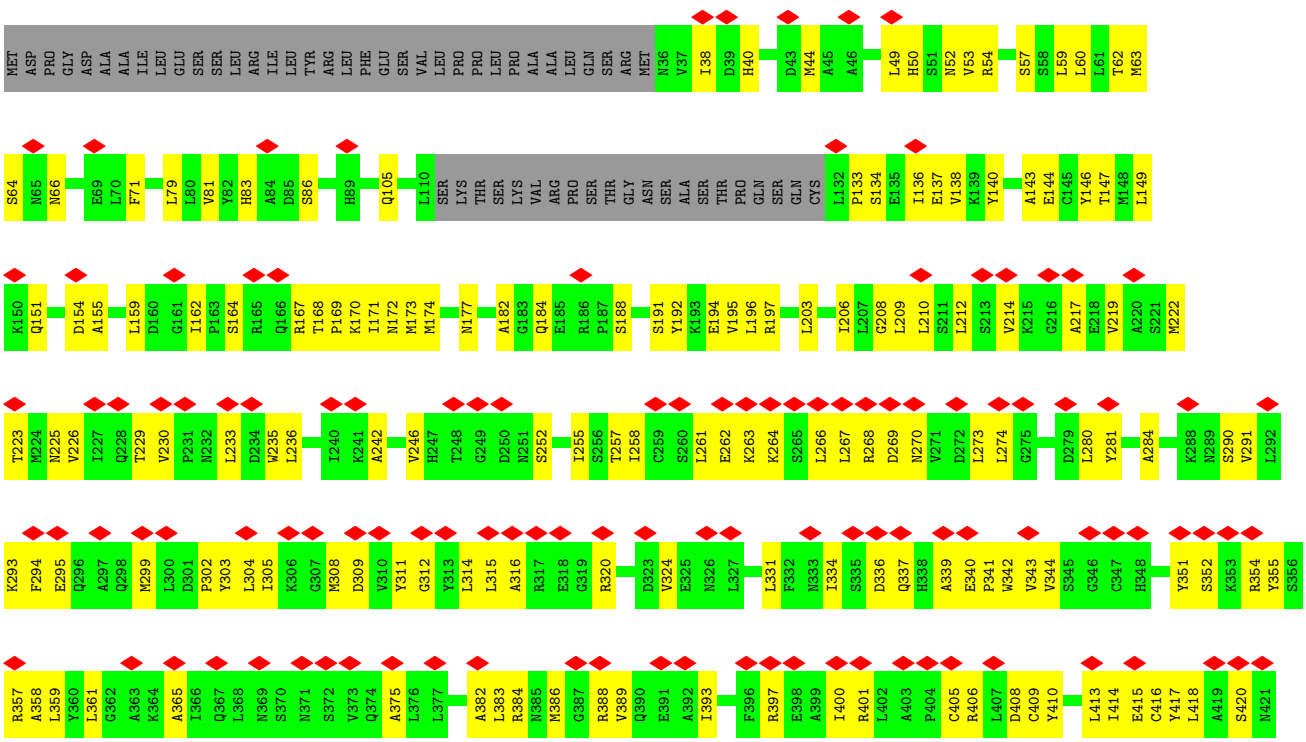
Chain S:

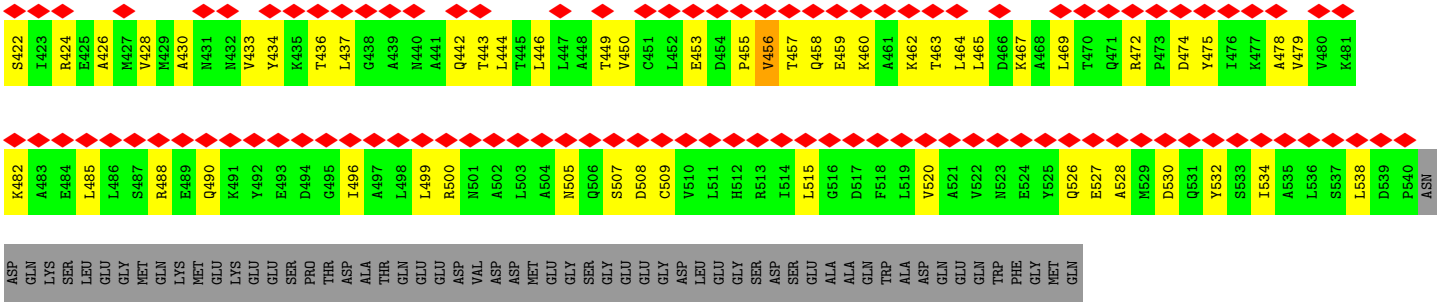




• Molecule 17: Anaphase-promoting complex subunit 7

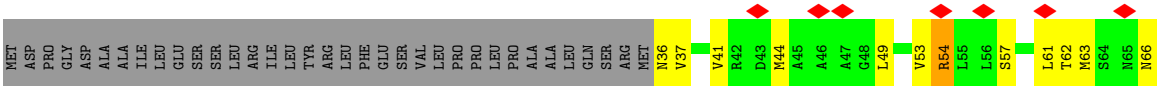
Chain X:

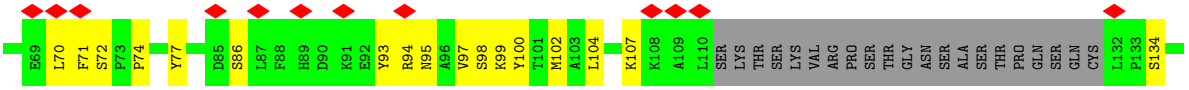


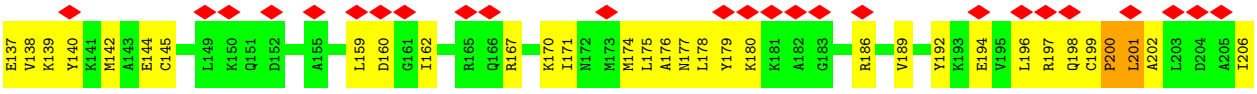


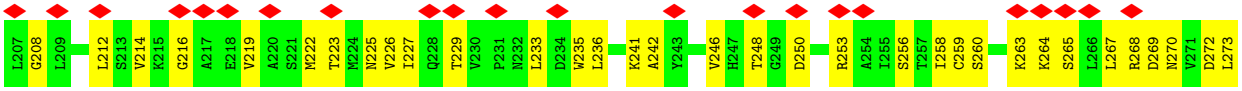
• Molecule 17: Anaphase-promoting complex subunit 7

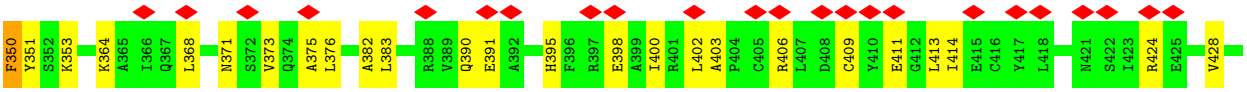
Chain Y:

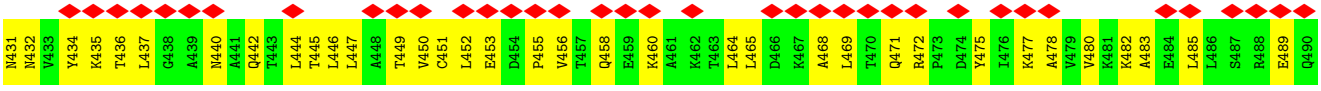


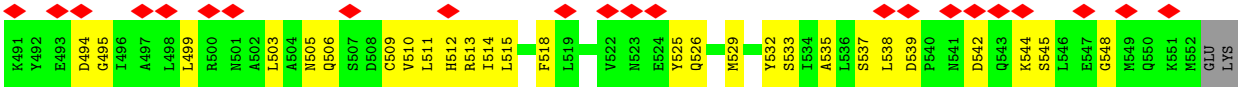


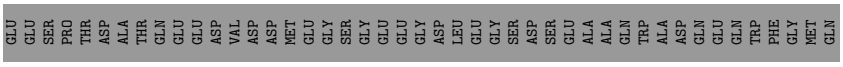












• Molecule 18: Mitotic spindle assembly checkpoint protein MAD2A

Chain Z:


MET ALA LEU GLN LEU SER ARG E8 Q9 G10 I11 T12 L13 R14 G15 S16 A17 E18 I19 V20 A21 E22 F23 F24 S25 F26 G27 I28 N29 S30 I31 R35 G36 I37 E41 T42 F43 T44 R45 V46 Q47 K48 Y49 G50 L51 T52 L53 L54 V55 T56 T57 D58 L61 I62 K63 Y64 L65
N66 N67 V68 V69 E70 Q71 L72 K73 D74 W75 L76 Y77 K78 C79 S80 V81 Q82 K83 L84 V85 V86 V87 I88 S89 N90 I91 E92 S93 G94 E95 V96 L97 E98 R99 W100 Q101 F102 D103 I104 E105 C106 D107 K108 T109 A110 K111 D112 D113 S114 A115 P116 R117 E118 K119 S120 Q121 K122 A123 I124 Q125
D126 E127 I128 R129 S130 V131 I132 R133 Q134 I135 T136 A137 T138 F141 L144 L145 E146 V147 S148 C149 S150 F151 D152 L153 L154 I155 Y156 T157 D158 K159 D160 L161 V162 V163 P164 E165 E168 E169 S170 G171 P172 Q173 F174 I175 T176 N177 S178 E179 E180 V181 R182 L183 R184 S185 F186 T187 T188
T189 I190 H191 K192 V193 N194 S195 M196 V197 A198 Y199 K200 I201 P202 VAL ASN ASP

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	343551	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	27	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.206	Depositor
Minimum map value	-0.097	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.009	Depositor
Recommended contour level	0.06	Depositor
Map size (Å)	359.04, 359.04, 359.04	wwPDB
Map dimensions	264, 264, 264	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.36, 1.36, 1.36	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	0.35	0/11191	0.50	0/15239
2	B	0.26	0/665	0.50	0/896
3	C	0.37	0/4404	0.47	0/5945
3	P	0.35	0/4138	0.46	0/5587
4	D	0.32	0/159	0.51	0/218
5	E	0.35	0/459	0.45	0/619
6	F	0.38	0/3939	0.44	0/5325
6	H	0.40	0/3943	0.46	0/5329
7	G	0.31	0/214	0.46	0/284
7	W	0.31	0/214	0.51	0/284
8	I	0.30	0/5849	0.48	0/7932
9	J	0.39	0/4146	0.48	0/5616
9	K	0.37	0/4086	0.46	0/5534
10	L	0.36	0/1468	0.49	0/1993
11	M	0.36	0/502	0.54	0/680
12	N	0.30	0/5496	0.53	3/7444 (0.0%)
13	O	0.32	0/5501	0.48	0/7432
14	Q	0.29	0/2807	0.49	0/3830
15	R	0.31	0/3029	0.49	0/4124
16	S	0.28	0/2272	0.44	0/3088
17	X	0.30	0/3833	0.46	0/5187
17	Y	0.30	0/3928	0.45	0/5311
18	Z	0.27	0/1605	0.45	0/2176
All	All	0.34	0/73848	0.48	3/100073 (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	4
2	B	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
8	I	0	2
9	J	0	2
9	K	0	3
12	N	0	9
13	O	0	1
14	Q	0	1
16	S	0	1
All	All	0	25

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	N	125	TYR	C-N-CA	7.50	140.45	121.70
12	N	63	ALA	N-CA-C	6.49	128.51	111.00
12	N	508	ILE	C-N-CA	-5.17	108.78	121.70

There are no chirality outliers.

5 of 25 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1356	ASP	Peptide
1	A	274	VAL	Peptide
1	A	856	GLY	Peptide
1	A	859	PRO	Peptide
2	B	14	TRP	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	10949	0	10691	464	0
2	B	643	0	617	58	0
3	C	4306	0	4275	183	0
3	P	4043	0	4000	171	0
4	D	153	0	148	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	E	450	0	435	18	0
6	F	3849	0	3783	121	0
6	H	3853	0	3794	157	0
7	G	213	0	220	13	0
7	W	213	0	220	20	0
8	I	5728	0	5615	280	0
9	J	4047	0	3949	184	0
9	K	3988	0	3908	158	0
10	L	1435	0	1382	69	0
11	M	493	0	469	30	0
12	N	5403	0	5104	251	0
13	O	5402	0	5436	247	0
14	Q	2739	0	2582	184	0
15	R	2953	0	2839	185	0
16	S	2227	0	2028	107	0
17	X	3773	0	3831	170	0
17	Y	3868	0	3926	178	0
18	Z	1577	0	1593	73	0
All	All	72305	0	70845	2997	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 2997 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)
16:S:290:PRO:HB2	16:S:292:VAL:HG23	1.37	1.01
14:Q:141:PRO:HB2	16:S:202:ARG:HE	1.26	0.95
9:J:264:HIS:HE2	9:J:266:SER:HG	1.11	0.93
1:A:1134:TRP:HD1	1:A:1597:THR:HA	1.36	0.90
2:B:11:VAL:HG22	12:N:642:GLY:HA2	1.54	0.89

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	1399/1944 (72%)	1246 (89%)	147 (10%)	6 (0%)	30 63
2	B	75/84 (89%)	64 (85%)	11 (15%)	0	100 100
3	C	520/597 (87%)	490 (94%)	30 (6%)	0	100 100
3	P	485/597 (81%)	455 (94%)	30 (6%)	0	100 100
4	D	16/121 (13%)	13 (81%)	3 (19%)	0	100 100
5	E	54/110 (49%)	52 (96%)	2 (4%)	0	100 100
6	F	479/824 (58%)	448 (94%)	31 (6%)	0	100 100
6	H	479/824 (58%)	443 (92%)	34 (7%)	2 (0%)	30 63
7	G	23/85 (27%)	23 (100%)	0	0	100 100
7	W	23/85 (27%)	23 (100%)	0	0	100 100
8	I	727/808 (90%)	674 (93%)	53 (7%)	0	100 100
9	J	500/620 (81%)	454 (91%)	45 (9%)	1 (0%)	44 74
9	K	489/620 (79%)	445 (91%)	44 (9%)	0	100 100
10	L	180/185 (97%)	159 (88%)	19 (11%)	2 (1%)	12 42
11	M	55/74 (74%)	43 (78%)	12 (22%)	0	100 100
12	N	681/822 (83%)	575 (84%)	104 (15%)	2 (0%)	37 69
13	O	677/755 (90%)	639 (94%)	37 (6%)	1 (0%)	48 79
14	Q	361/374 (96%)	327 (91%)	32 (9%)	2 (1%)	22 55
15	R	377/499 (76%)	338 (90%)	39 (10%)	0	100 100
16	S	285/1050 (27%)	240 (84%)	45 (16%)	0	100 100
17	X	480/599 (80%)	456 (95%)	23 (5%)	1 (0%)	44 74
17	Y	492/599 (82%)	464 (94%)	26 (5%)	2 (0%)	30 63
18	Z	193/205 (94%)	187 (97%)	6 (3%)	0	100 100
All	All	9050/12481 (72%)	8258 (91%)	773 (8%)	19 (0%)	45 74

5 of 19 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1099	PRO
6	H	147	PHE
10	L	175	ILE
13	O	130	SER

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Mol	Chain	Res	Type
17	X	456	VAL

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	1151/1720 (67%)	1149 (100%)	2 (0%)	92 94
2	B	71/75 (95%)	69 (97%)	2 (3%)	38 59
3	C	452/520 (87%)	451 (100%)	1 (0%)	92 94
3	P	422/520 (81%)	420 (100%)	2 (0%)	86 90
4	D	18/115 (16%)	18 (100%)	0	100 100
5	E	47/89 (53%)	47 (100%)	0	100 100
6	F	407/727 (56%)	407 (100%)	0	100 100
6	H	408/727 (56%)	408 (100%)	0	100 100
7	G	23/77 (30%)	23 (100%)	0	100 100
7	W	23/77 (30%)	23 (100%)	0	100 100
8	I	621/730 (85%)	620 (100%)	1 (0%)	92 94
9	J	424/548 (77%)	423 (100%)	1 (0%)	92 94
9	K	423/548 (77%)	423 (100%)	0	100 100
10	L	155/170 (91%)	155 (100%)	0	100 100
11	M	55/67 (82%)	54 (98%)	1 (2%)	54 71
12	N	518/724 (72%)	516 (100%)	2 (0%)	89 91
13	O	577/650 (89%)	576 (100%)	1 (0%)	92 94
14	Q	275/310 (89%)	275 (100%)	0	100 100
15	R	311/411 (76%)	310 (100%)	1 (0%)	91 92
16	S	208/938 (22%)	206 (99%)	2 (1%)	73 80
17	X	407/513 (79%)	407 (100%)	0	100 100
17	Y	418/513 (82%)	416 (100%)	2 (0%)	86 90
18	Z	181/190 (95%)	181 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	7595/10959 (69%)	7577 (100%)	18 (0%)	91 94

5 of 18 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
16	S	144	ASN
17	Y	350	PHE
17	Y	54	ARG
12	N	285	PHE
15	R	109	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 175 such sidechains are listed below:

Mol	Chain	Res	Type
13	O	671	GLN
15	R	369	ASN
3	P	162	HIS
3	P	427	GLN
16	S	293	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
12	N	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	N	92:TRP	C	93:ASN	N	2.97

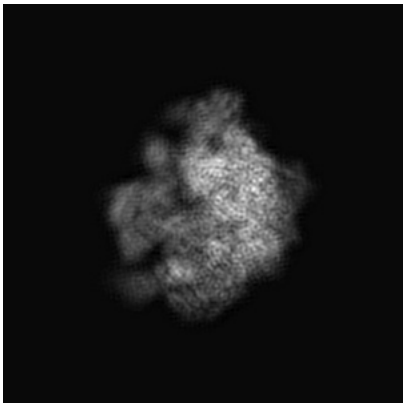
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-10516. These allow visual inspection of the internal detail of the map and identification of artifacts.

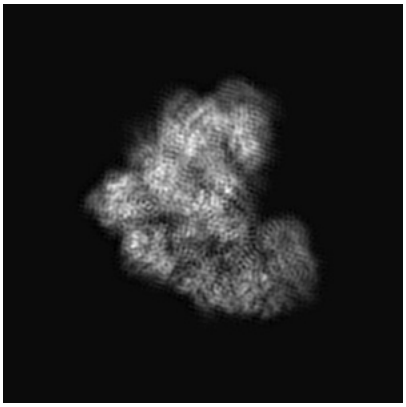
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

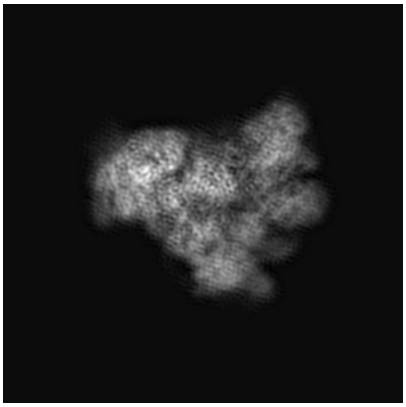
6.1.1 Primary map



X



Y

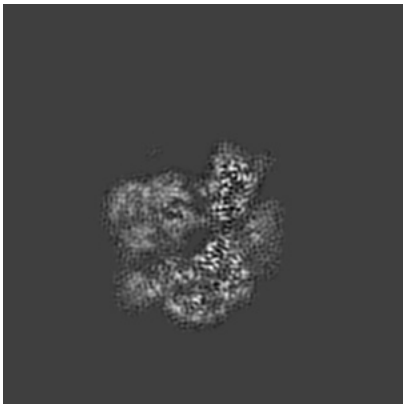


Z

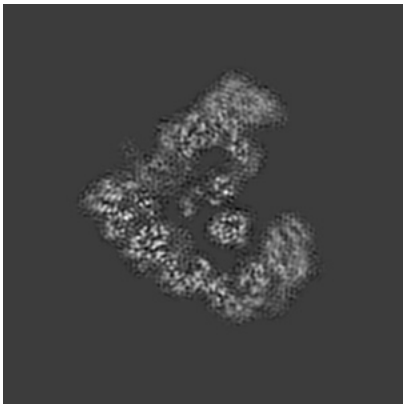
The images above show the map projected in three orthogonal directions.

6.2 Central slices

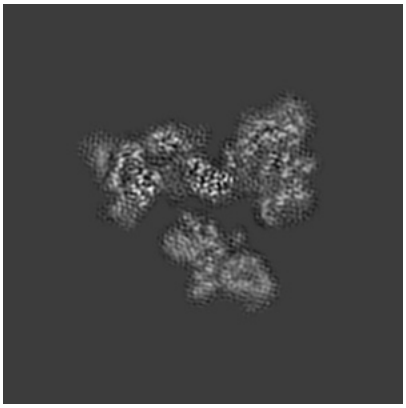
6.2.1 Primary map



X Index: 132



Y Index: 132

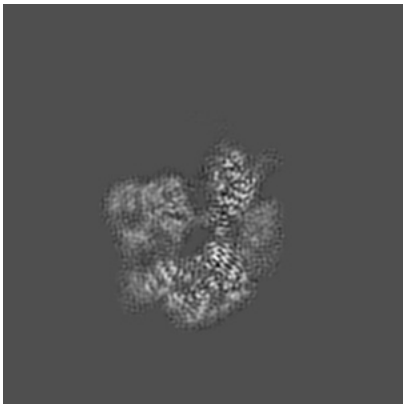


Z Index: 132

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

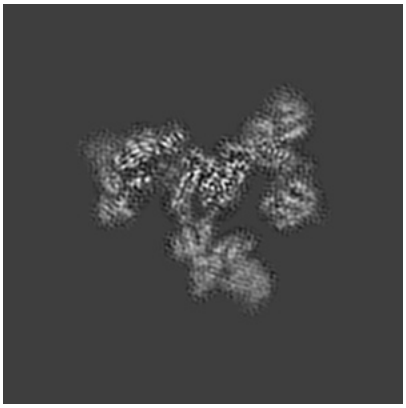
6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 129

Y Index: 147

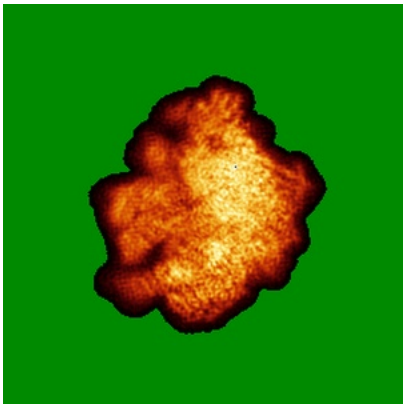


Z Index: 139

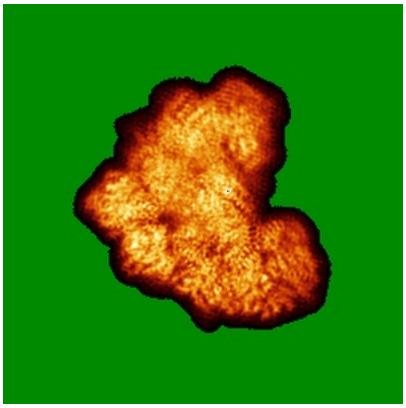
The images above show the largest variance slices of the map in three orthogonal directions.

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

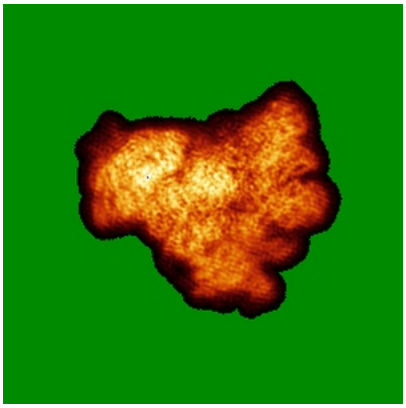
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.06. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

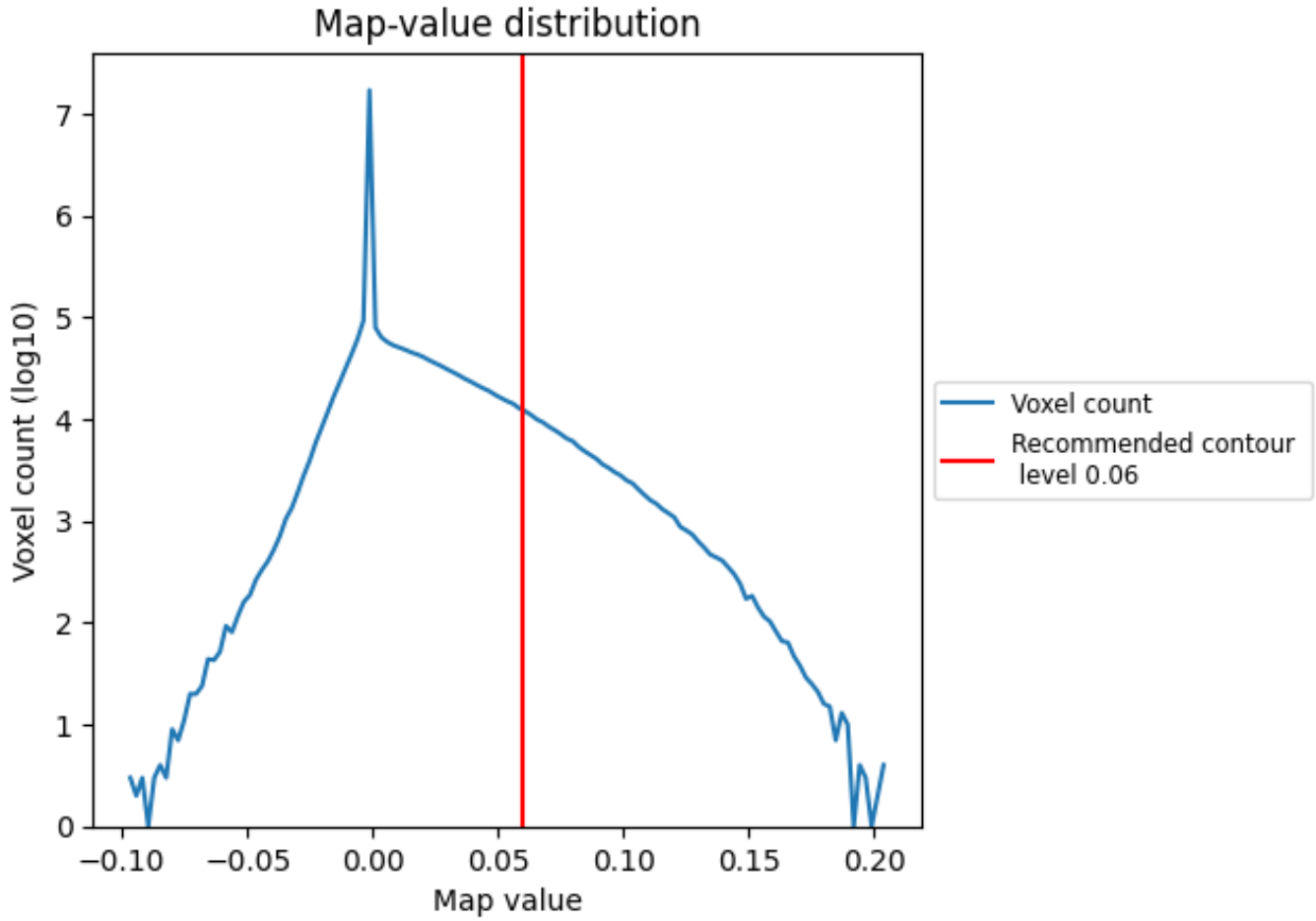
6.6 Mask visualisation (i)

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

7 Map analysis

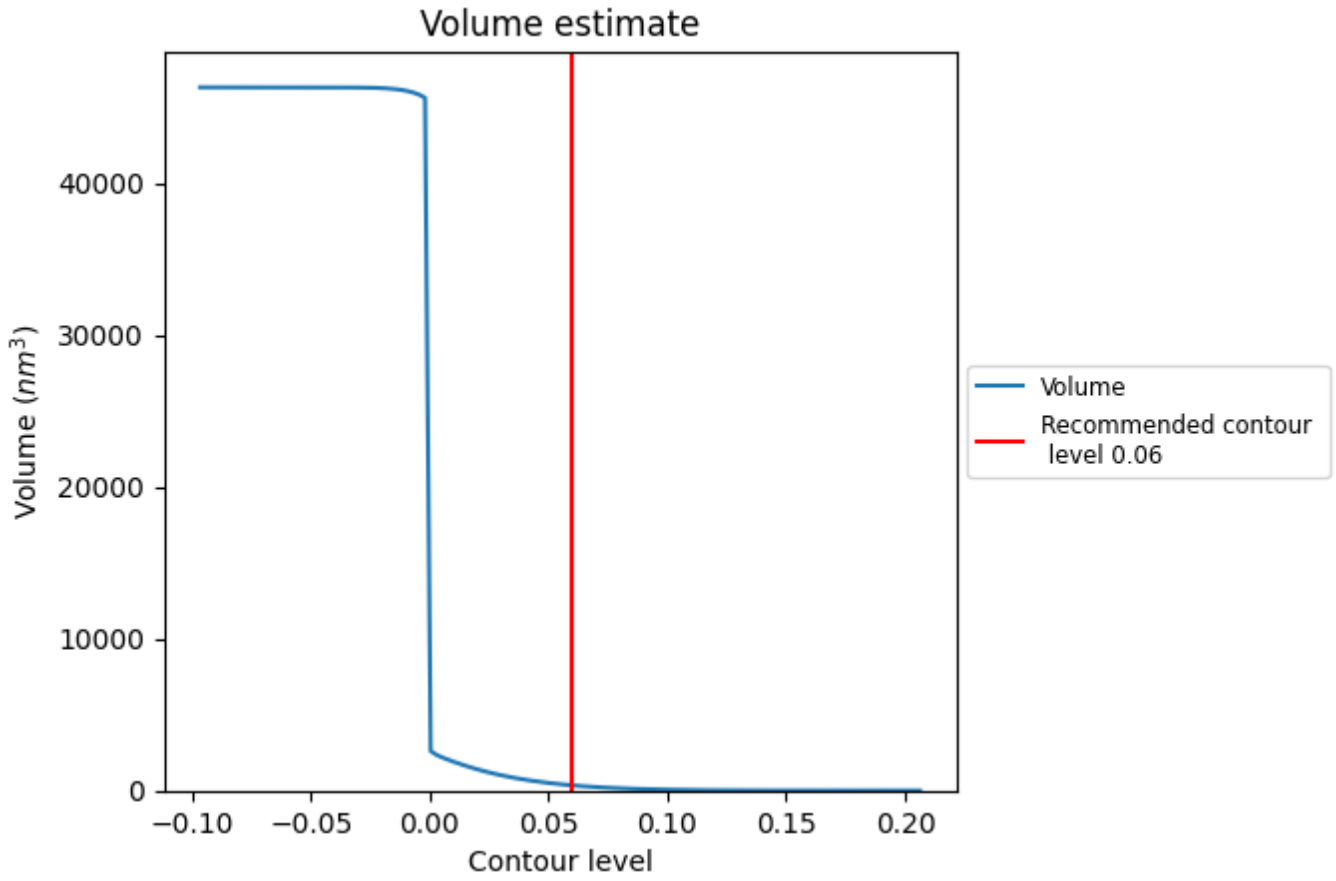
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

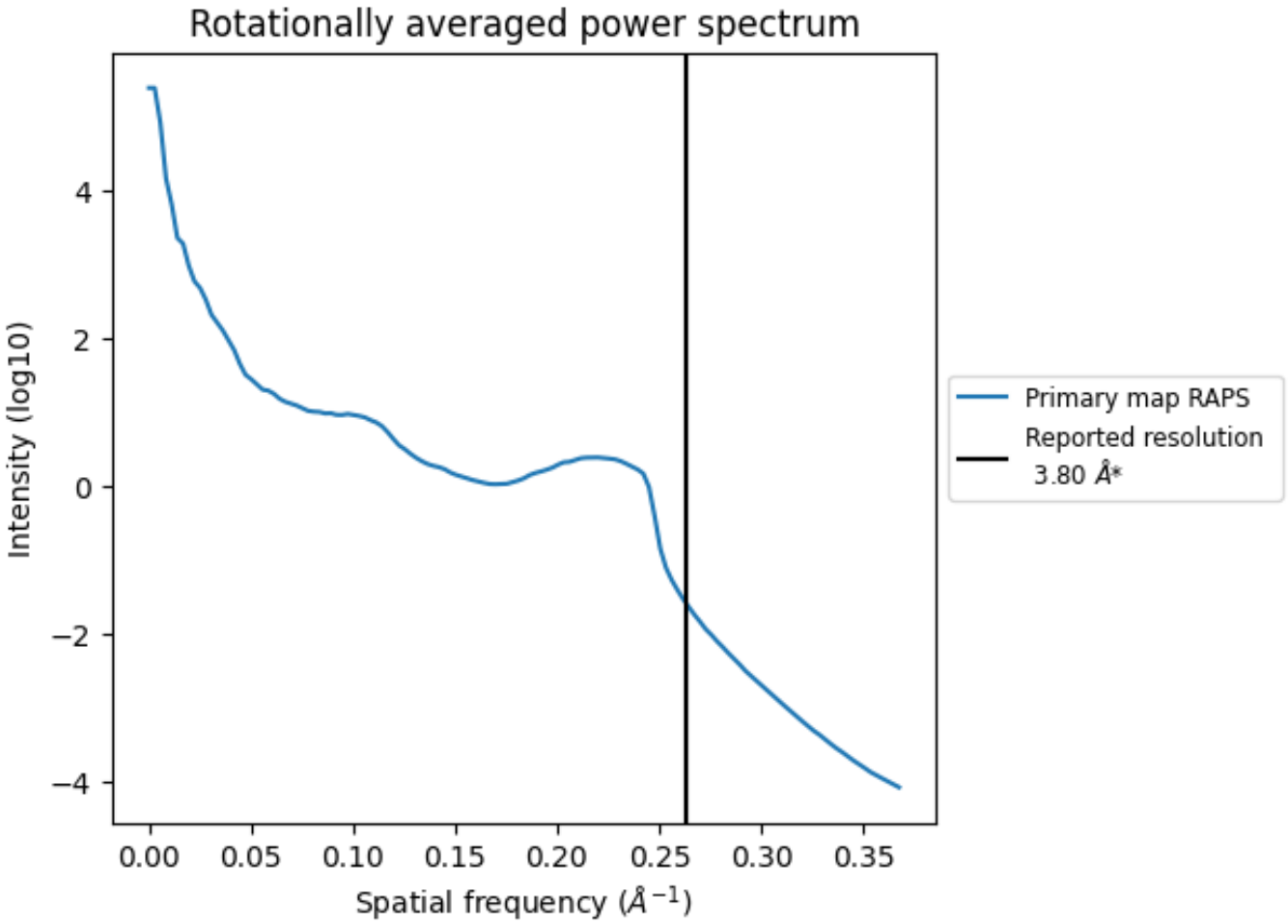
7.2 Volume estimate (i)



The volume at the recommended contour level is 343 nm^3; this corresponds to an approximate mass of 310 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 0.263 Å^{-1}

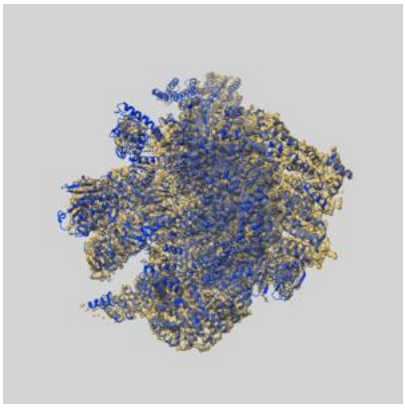
8 Fourier-Shell correlation (i)

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

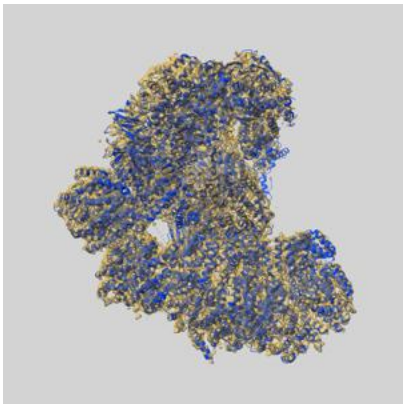
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-10516 and PDB model 6TLJ. Per-residue inclusion information can be found in section 3 on page 7.

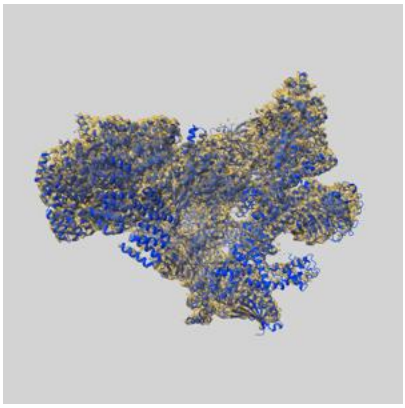
9.1 Map-model overlay



X



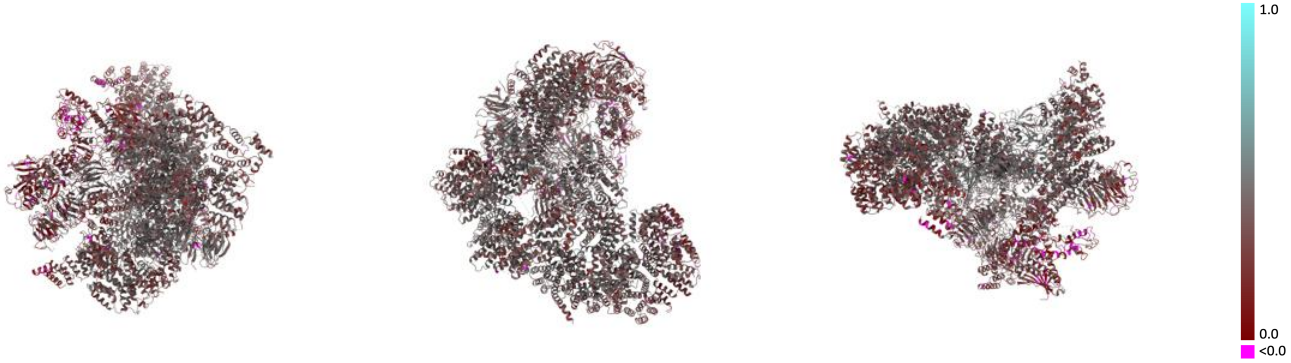
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.06 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.

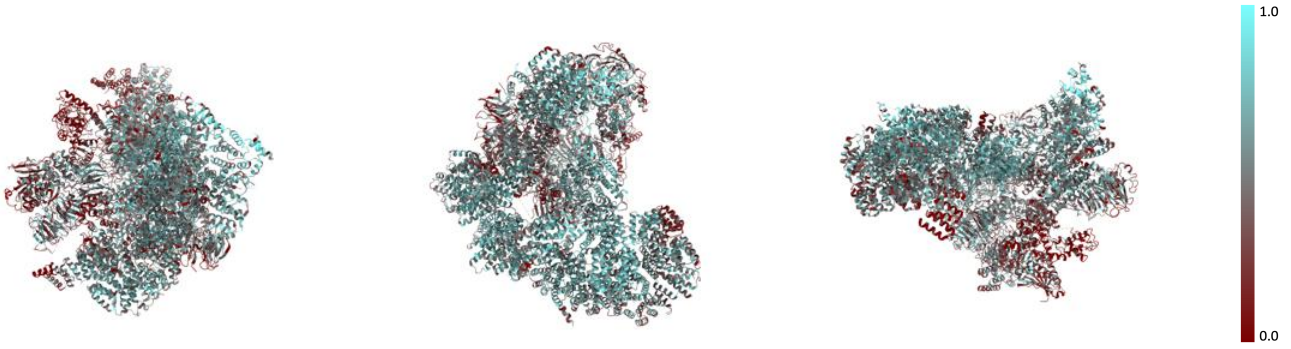
9.2 Q-score mapped to coordinate model



X Y Z

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

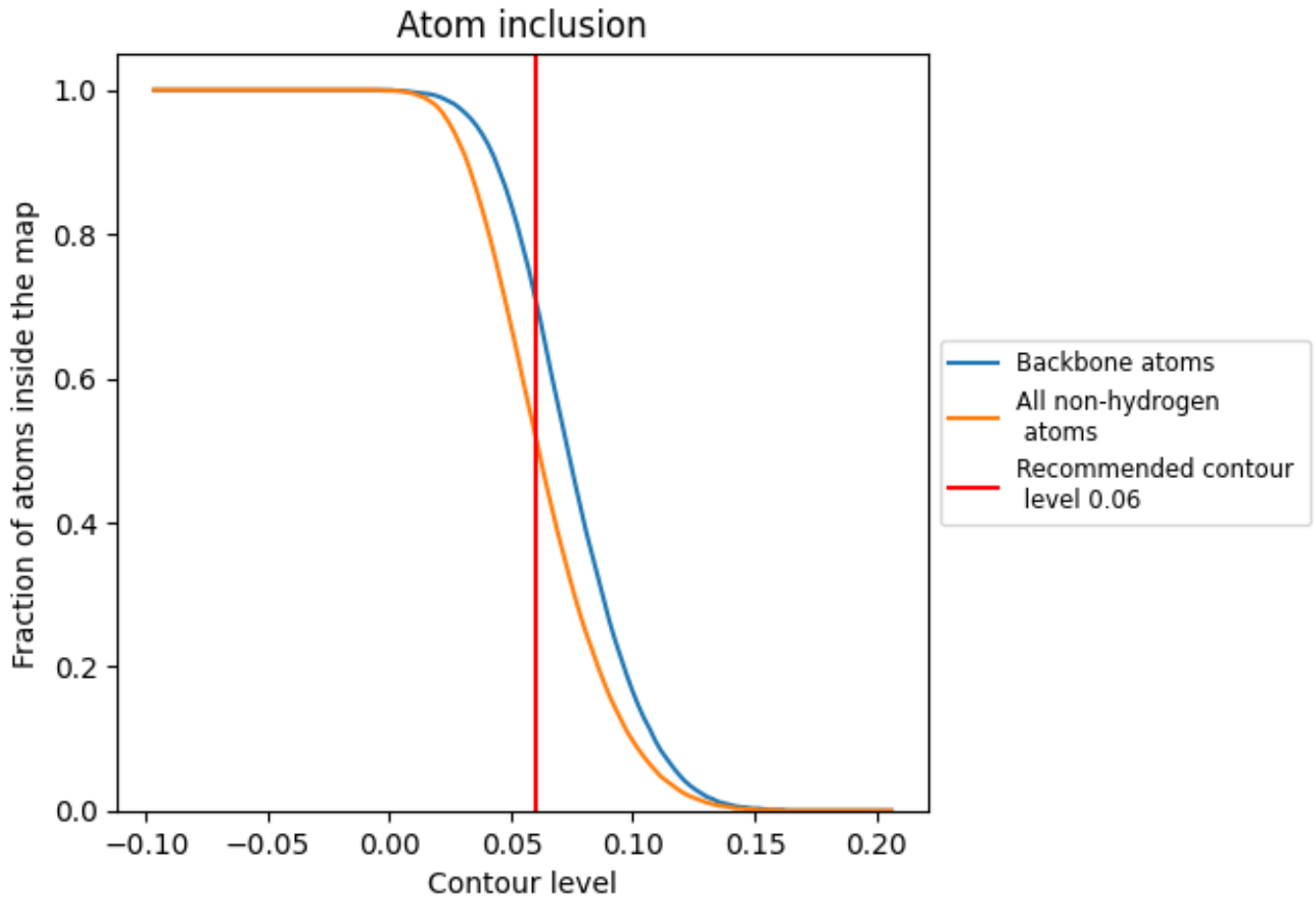
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.06).

9.4 Atom inclusion (i)



At the recommended contour level, 71% of all backbone atoms, 52% 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 (0.06) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5200	0.3570
A	0.5550	0.4080
B	0.0250	0.1810
C	0.5580	0.3750
D	0.4600	0.4830
E	0.6330	0.4370
F	0.6350	0.4030
G	0.5270	0.4060
H	0.6880	0.4100
I	0.4270	0.3240
J	0.6720	0.4070
K	0.6300	0.3790
L	0.6040	0.4320
M	0.5030	0.4120
N	0.3890	0.2730
O	0.4950	0.3820
P	0.5830	0.3540
Q	0.4320	0.2950
R	0.4840	0.3450
S	0.3730	0.2790
W	0.5410	0.4030
X	0.4380	0.3000
Y	0.4940	0.3270
Z	0.2870	0.2380