Output results of CLIME (CLustering by Inferred Models of Evolution)

Dataset:

Num of genes in input gene set: 82
Total number of genes: 20834
Prediction LLR threshold: 0

The CLIME PDF output two sections:

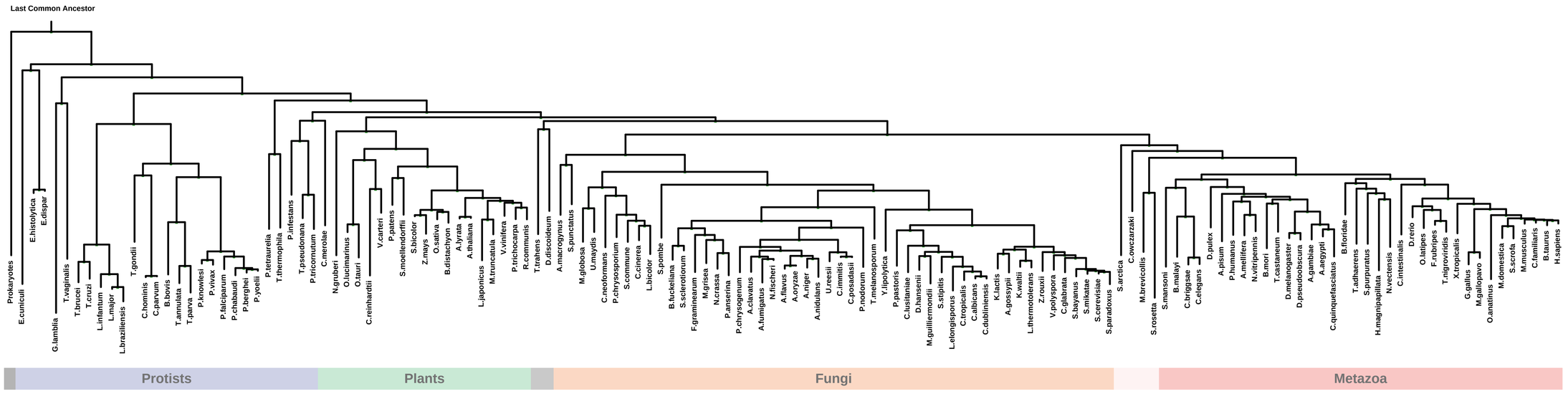
1) Overview of Evolutionarily Conserved Modules (ECMs)

- Top panel shows the predefined species tree.
- Bottom panel shows the partition of input genes into Evolutionary Conserved Modules (ECMs), ordered by ECM strength (shown at right), and separated by horizontal lines.
- Each row show one gene, where the phylogenetic profile indicates presence (blue) or absence (gray) of homologs in each species (column).
- Gene symbols are shown at left. Gray color indicates that the gene is a paralog to a higher scoring gene within the same ECM (based on BLASTP E < 1e-3).

2) Details of each ECM and its expansion ECM+

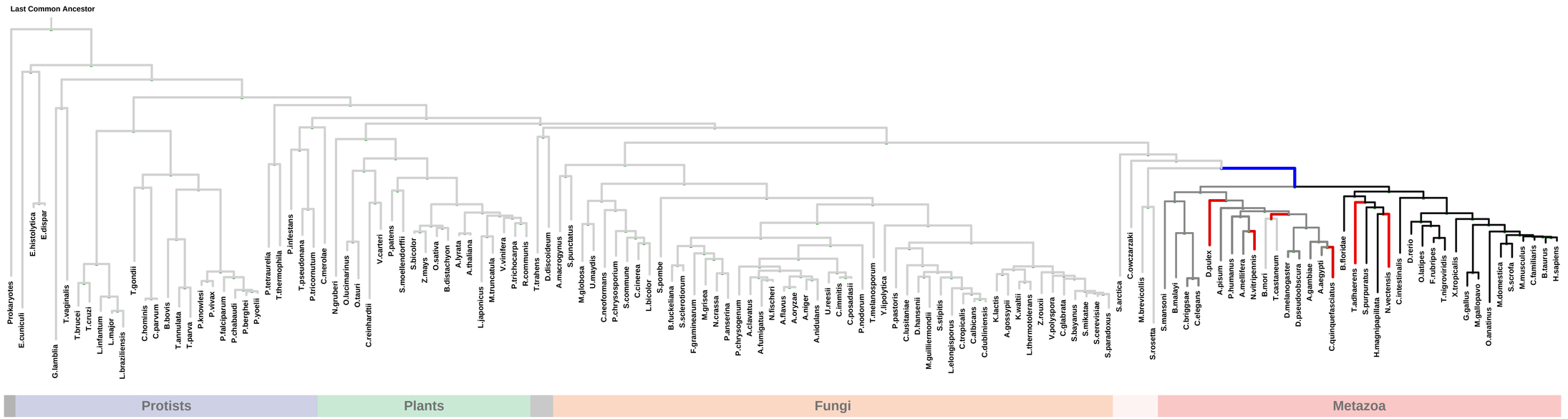
- Top panel shows the inferred evolutionary history on the predefined species tree. Branch color shows the gain event (blue) and loss events (red color, with brighter color indicating higher confidence in loss). Branches before the gain or after a loss are shown in gray.
- Bottom panel shows the input genes that are within the ECM (blue/white rows) as well as all genes in the expanded ECM+ (green/gray rows). The ECM+ includes genes likely to have arisen under the inferred model of evolution relative to a background model, and scored using a log likelihood ratio (LLR).
- PG indicates "paralog group" and are labeled alphabetically (i.e., A, B). The first gene within each paralog group is shown in black color. All other genes sharing sequence similarity (BLAST E < 1e-3) are assigned to the same PG label and displayed in gray.

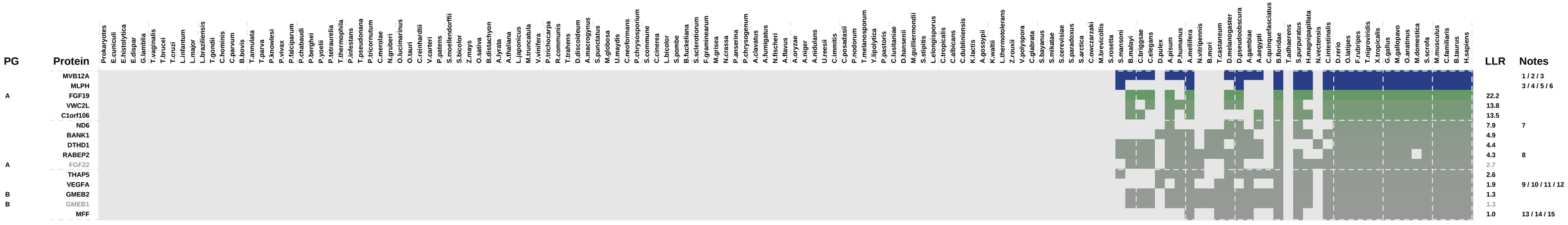
Overview of Evolutionarily Conserved Modules (ECMs)



ECM 1, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 13. ECM Strength: 2.5

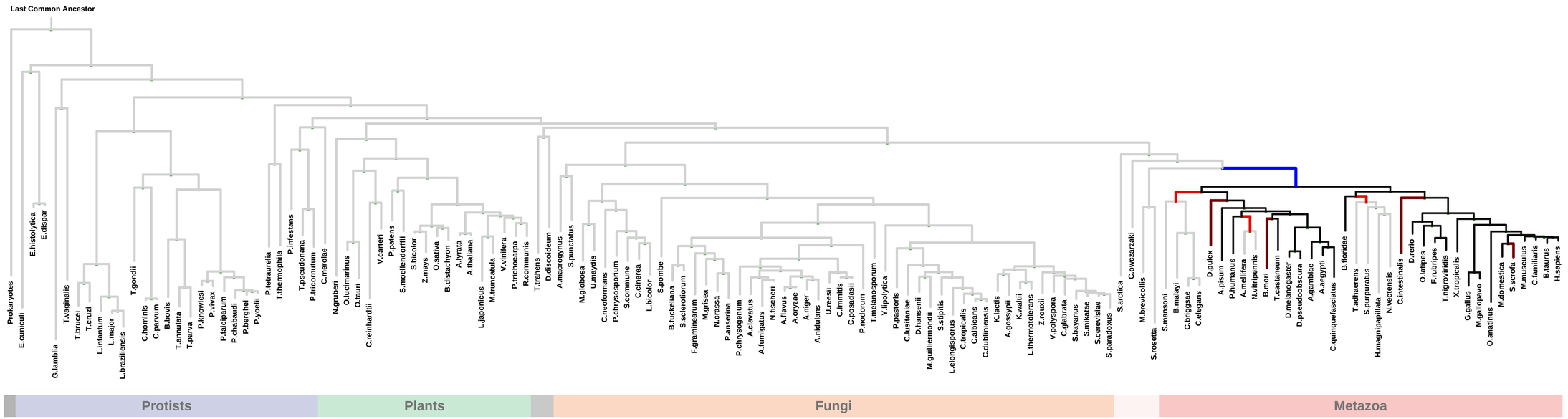




1: aggresome || 2: late endosome membrane || 3: microtubule organizing center || 4: cortical actin cytoskeleton || 5: microtubule plus end || 6: stress fiber || 7: mitochondrial respiratory chain complex I || 8: early endosome ||
9: basement membrane || 10: platelet alpha granule lumen || 11: proteinaceous extracellular matrix || 12: secretory granule || 13: integral to mitochondrial membrane || 14: mitochondrial outer membrane || 15: peroxisome

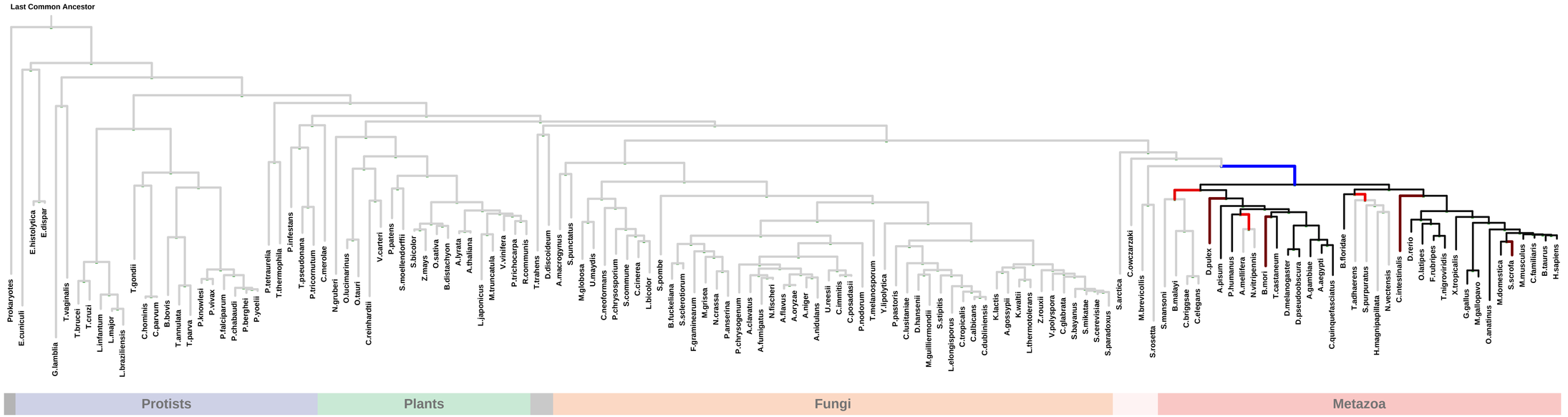
ECM 2, Gene set "microtubule organizing center", Page 1

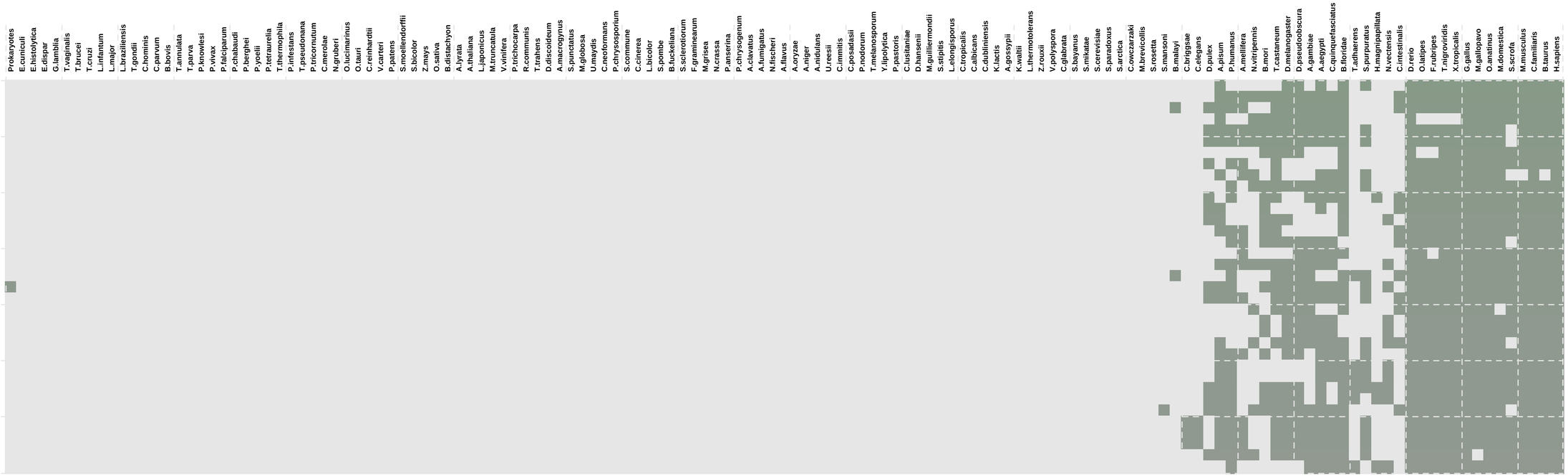
Num of ECM Genes: 2. Num of Predicted Genes: 117. ECM Strength: 2.1



ECM 2, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 2. Num of Predicted Genes: 117. ECM Strength: 2.1



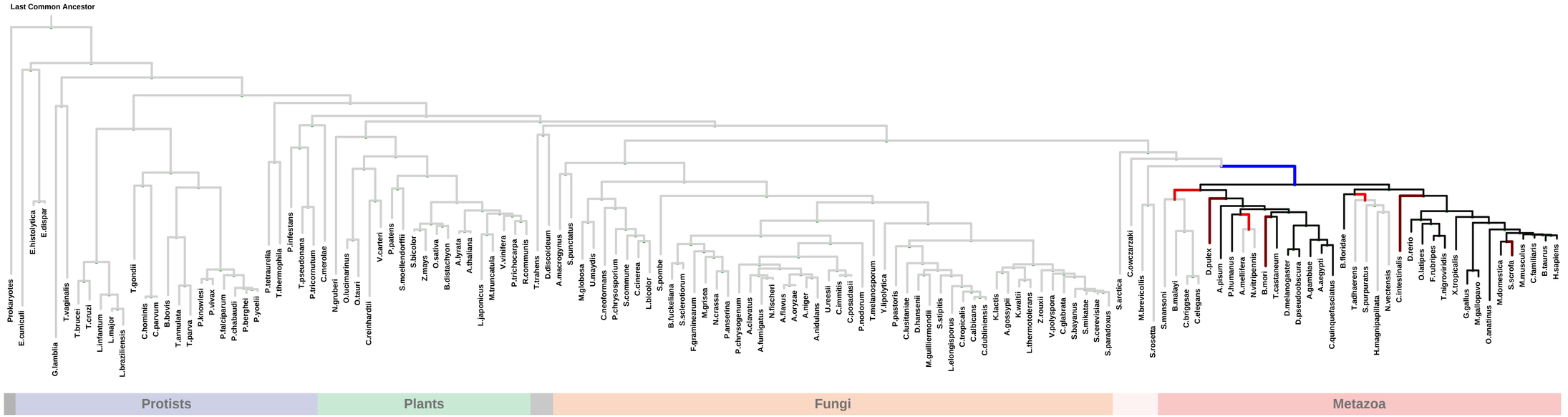


PG	Protein	LLR	Notes
	ND6	7.6	1
	FAM107A	7.1	
	FAM122A	6.9	
	RBFA	6.9	
J	NINJ2	6.9	
J	NINJ1	6.9	
K	CD164L2	6.5	
B	TAPBPL	6.4	
F	GFRA2	6.4	2 / 3
	COX7A1	6.3	4
	GORAB	6.3	
	IGF1	6.1	5 / 6
L	TNFSF13B	5.7	
M	CRLF1	5.6	7
	PLEKHN1	5.1	
	NDUFA1	5.1	1 / 8
	CIDEB	4.9	
M	EBI3	4.9	
	NANS	4.8	
	VEGFB	4.8	6
	ARGLU1	4.7	
N	GADD45A	4.4	
N	GADD45B	4.4	
	C19orf12	4.4	8
	VSTM2L	4.3	
C	OR6B3	4.1	
C	OR6B2	4.1	
O	LAPTM4A	4.0	9
O	LAPTM4B	3.9	9
	TSHZ3	3.7	10
P	ITM2C	3.7	11 / 12
P	ITM2A	3.7	
P	ITM2B	3.7	13 / 14 / 15
	C2orf42	3.6	
	FBXO5	3.6	16

1: mitochondrial respiratory chain complex I || 2: anchored to membrane || 3: extrinsic to membrane || 4: mitochondrial respiratory chain || 5: insulin-like growth factor binding protein complex || 6: platelet alpha granule lumen || 7: CRLF-CLCF1 complex || 8: mitochondrial membrane || 9: endomembrane system || 10: growth cone || 11: lysosomal membrane || 12: lysosome || 13: endosome membrane || 14: Golgi-associated vesicle membrane || 15: integral to organelle membrane || 16: spindle

ECM 2, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 2. Num of Predicted Genes: 117. ECM Strength: 2.1

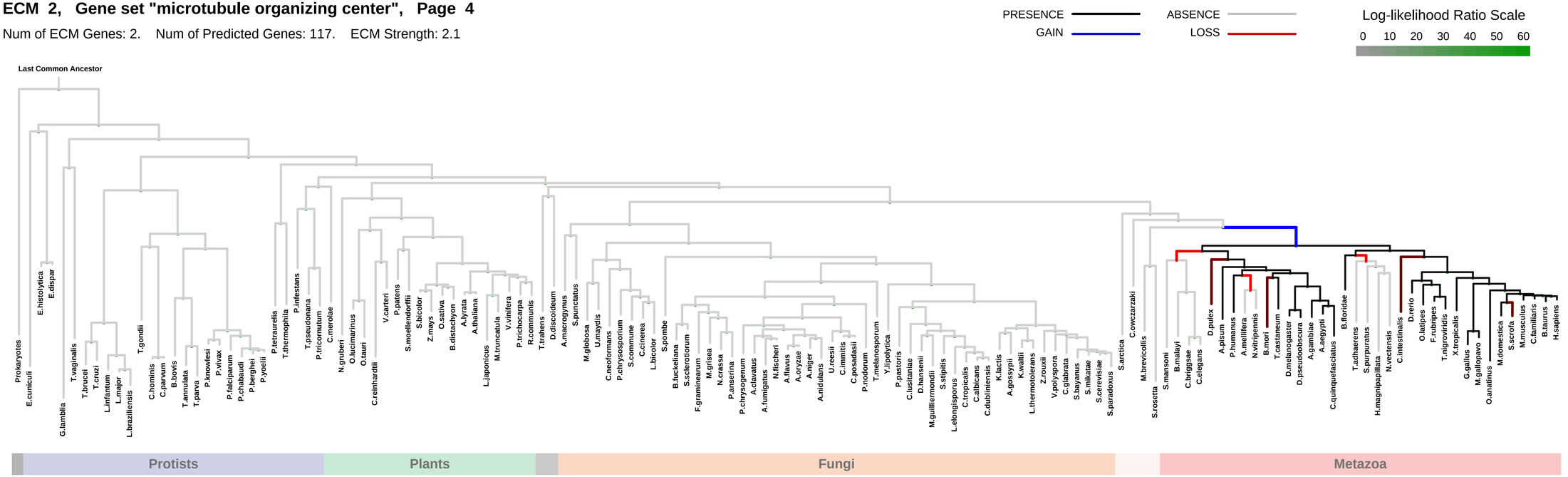


PG	Protein	LLR	Notes
	TMEM211	3.4	
	COX16	3.3	1
Q	COBLL1	3.3	
Q	COBL	3.3	2 / 3 / 4 / 5 / 6 / 7 / 8
D	CYR61	3.2	
	OPTN	3.1	9 / 10
	PLP2	3.1	
	TDRD12	3.0	
	NKPD1	3.0	
R	CACNG4	2.9	11 / 12 / 13
	MSANTD3	2.7	
F	GFRA3	2.7	14 / 15 / 16
F	GFRA1	2.7	14 / 16
	LALBA	2.6	
	YAF2	2.6	
	TFPT	2.6	17
C	OR5AP2	2.5	
	QSER1	2.5	
	ATF4	2.5	18
	LYSMD2	2.4	
	TMIE	2.4	
	SAMSN1	2.3	8
	FAM195A	2.2	
	PIK3AP1	1.9	
	MFF	1.7	19 / 20 / 21
L	TNFSF12-TNFSF13	1.7	
L	TNFSF13	1.7	15
	CRB3	1.5	22
	SUSD3	1.4	
	NDNF	1.4	23
S	MBD6	1.4	24
S	MBD5	1.4	24
R	CACNG5	1.2	11 / 25 / 26
	TMEM200A	1.2	
	FJX1	1.0	

1: mitochondrial membrane || 2: actin filament || 3: axon || 4: axonal growth cone || 5: cell cortex || 6: dendrite || 7: dendritic growth cone || 8: ruffle || 9: cytoplasmic membrane-bounded vesicle || 10: trans-Golgi network ||
11: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 12: endocytic vesicle membrane || 13: voltage-gated calcium channel complex || 14: anchored to membrane || 15: external side of plasma membrane ||
16: extrinsic to membrane || 17: Ino80 complex || 18: microtubule organizing center || 19: integral to mitochondrial membrane || 20: mitochondrial outer membrane || 21: peroxisome || 22: tight junction || 23: extracellular matrix ||

ECM 2, Gene set "microtubule organizing center", Page 4

Num of ECM Genes: 2. Num of Predicted Genes: 117. ECM Strength: 2.1

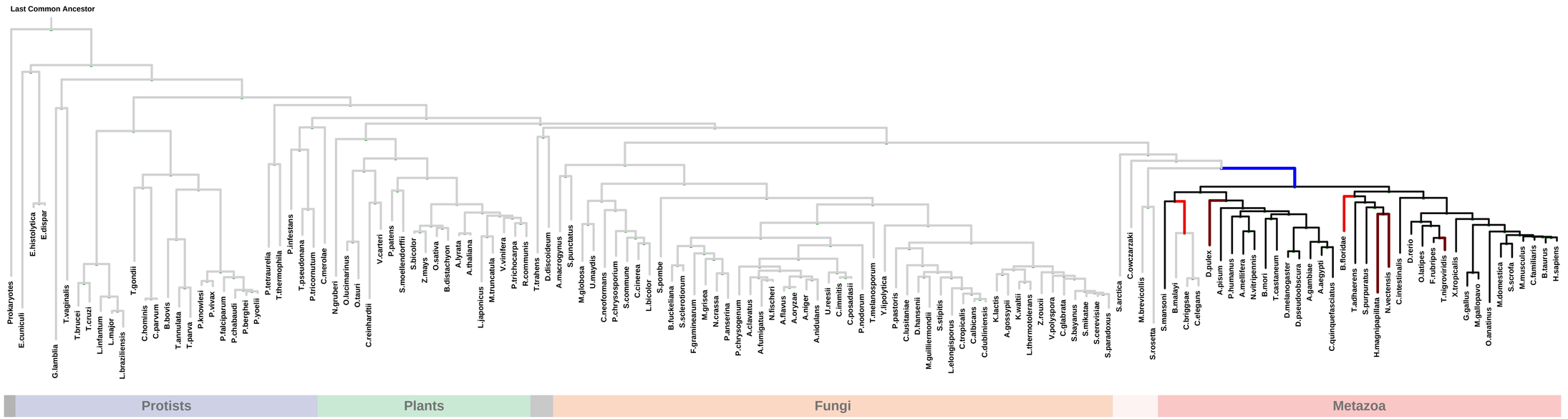


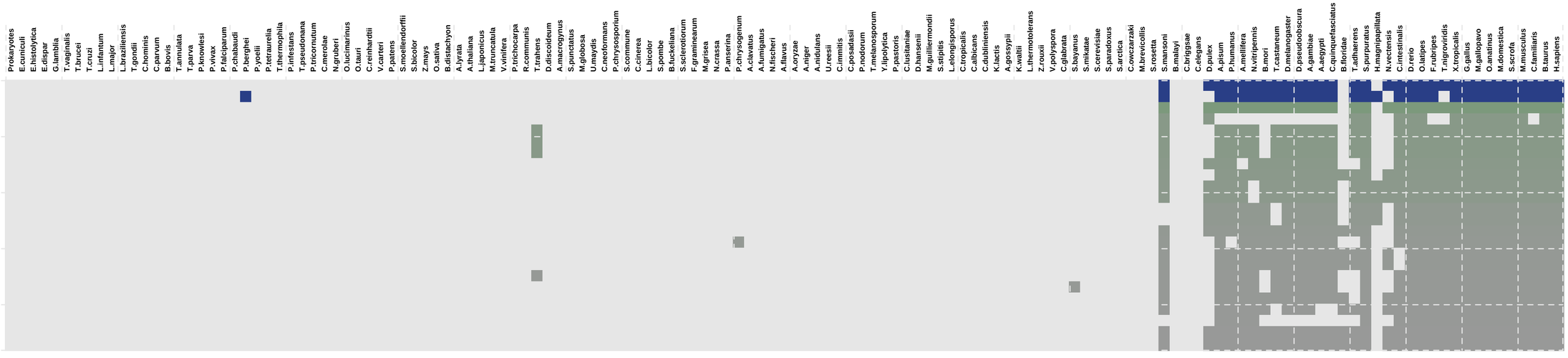
PG	Protein	LLR	Notes
	FASTKD2	0.9	
G	SPATA2	0.7	
	C16orf45	0.6	
	C2orf47	0.6	
K	CD164	0.5	1 / 2 / 3 / 4
	LOC728715	0.4	
	100510334	0.4	
R	CACNG7	0.4	5 / 6
	CDC42EP2	0.4	7 / 8
B	BTN2A2	0.3	
	DTHD1	0.2	
	TMEM179	0.1	
T	PHYHIP	0.1	
T	PHYHIPL	0.1	

1: endosome || 2: endosome membrane || 3: lysosomal membrane || 4: lysosome || 5: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 6: voltage-gated calcium channel complex || 7: endomembrane system || 8: microtubule cytoskeleton

ECM 3, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 22. ECM Strength: 0.7

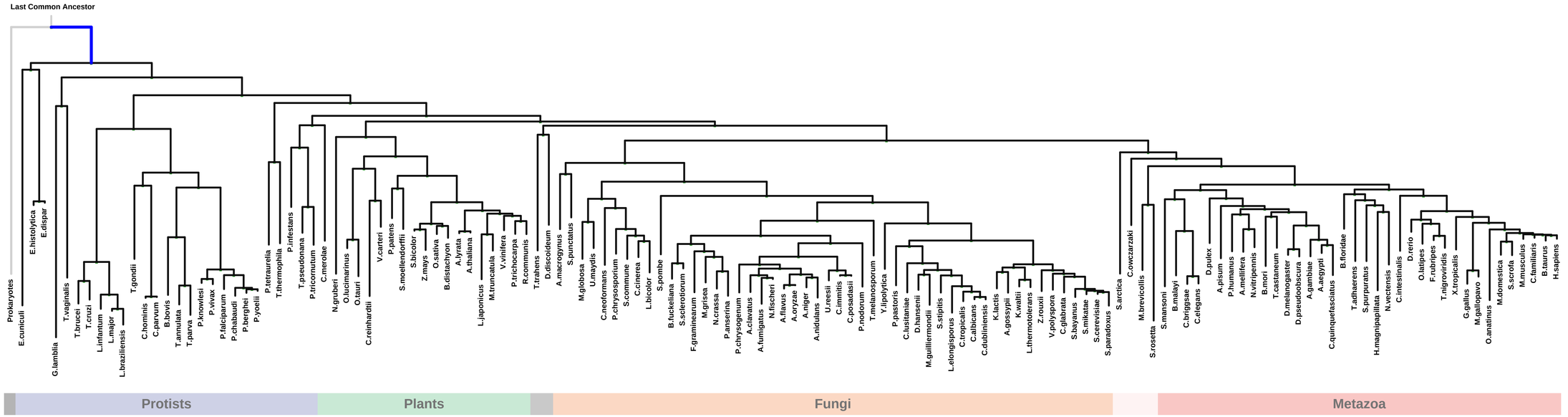




1: condensed chromosome kinetochore || 2: microtubule organizing center || 3: centriole || 4: cilium || 5: microtubule basal body || 6: cytoplasmic membrane-bounded vesicle || 7: cytoplasmic vesicle || 8: mitochondrial respiratory chain complex I ||
9: PML body

ECM 4, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 7. Num of Predicted Genes: 0. ECM Strength: 0.0

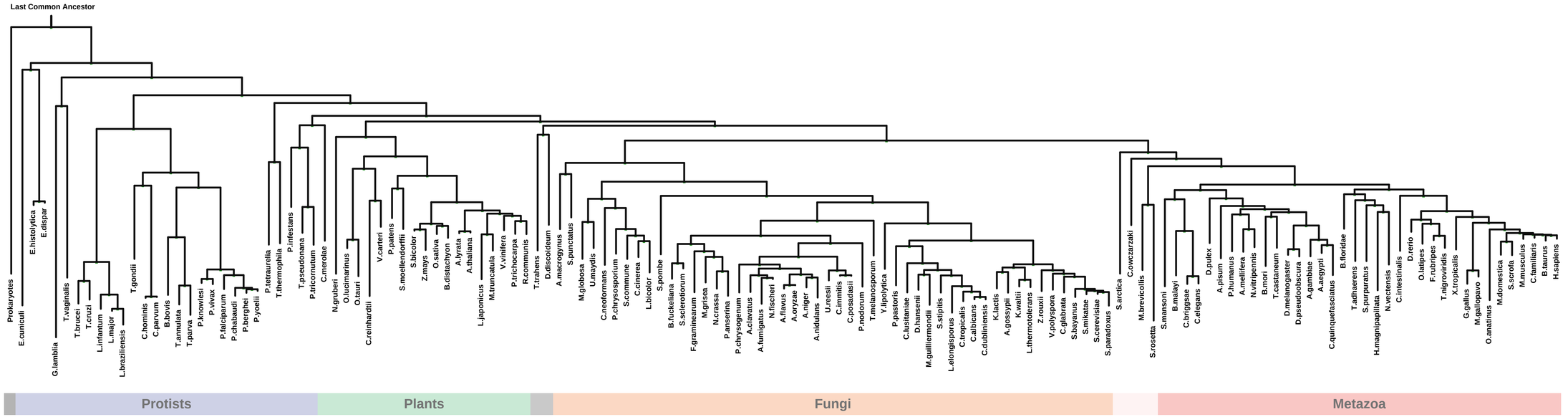


PG	Protein	LLR	Notes
	BIRC6		1 / 2 / 3 / 4 / 5
	CDC42		2 / 3 / 6 / 7 / 8 / 9 / 10 / 11
	EVI5		2 / 12
A	KIF18A		2 / 13 / 14 / 15 / 16 / 17
A	KIF2B		2 / 12 / 15 / 16 / 18
A	KIFC1		2 / 12 / 15 / 19
	SCYL1		2 / 20 / 21 / 22

1: endosome || 2: microtubule organizing center || 3: midbody || 4: spindle pole || 5: trans-Golgi network || 6: apical part of cell || 7: filopodium || 8: mitotic spindle || 9: neuron projection || 10: secretory granule ||
11: spindle midzone || 12: spindle || 13: caveola || 14: kinetochore microtubule || 15: microtubule associated complex || 16: microtubule cytoskeleton || 17: ruffle || 18: condensed chromosome kinetochore || 19: early endosome ||
20: cis-Golgi network || 21: COPI vesicle coat || 22: endoplasmic reticulum-Golgi intermediate compartment

ECM 5, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 14. Num of Predicted Genes: 0. ECM Strength: 0.0

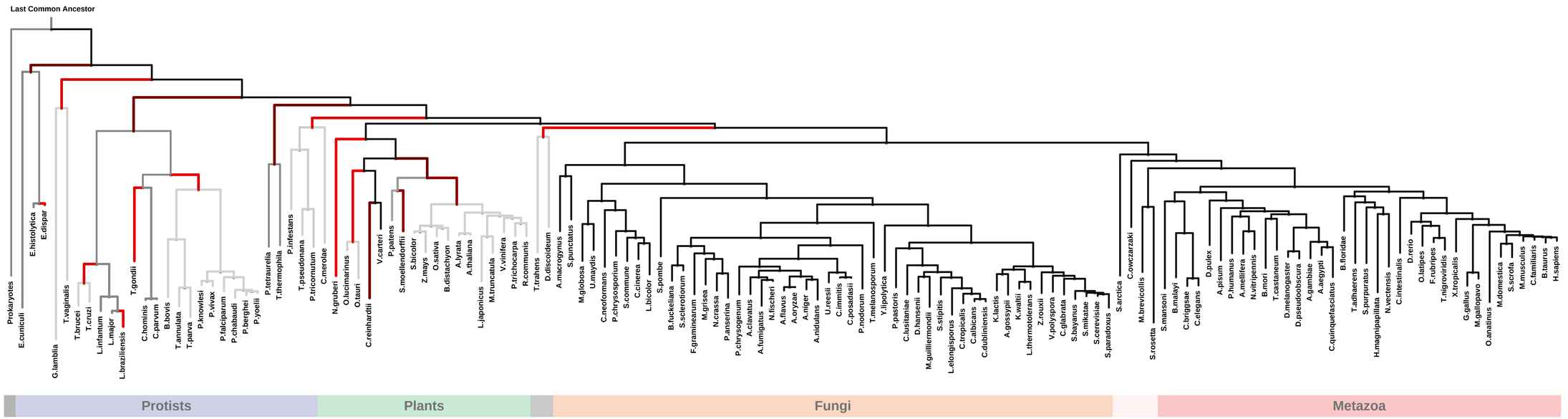


PG	Protein	LLR	Notes
	ABCA2		1 / 2 / 3 / 4 / 5 / 6 / 7
	ERCC6L2		7
A	CAMK2B		7 / 8 / 9 / 10
A	CDK1		7 / 11 / 12
A	DAPK3		7 / 13 / 14
A	MAPK1		7 / 15 / 16 / 17 / 18 / 19 / 2
A	MARK4		7 / 21 / 24
A	NEK6		7 / 25 / 26
A	NEK7		7 / 26
	NUBP2		7
A	PSKH1		7 / 25
	RUVBL1		7 / 27 / 28 / 29 / 30
	SPAST		3 / 7 / 11 / 21 / 31 / 32
A	YES1		7

1: ATP-binding cassette (ABC) transporter complex || 2: cytoplasmic membrane-bounded vesicle || 3: endosome || 4: endosome membrane || 5: lysosomal membrane || 6: lysosome || 7: microtubule organizing center || 8: endocytic vesicle membrane ||
9: sarcoplasmic reticulum membrane || 10: spindle midzone || 11: midbody || 12: spindle microtubule || 13: chromosome, centromeric region || 14: PML body || 15: axon part || 16: caveola || 17: dendrite cytoplasm ||
18: early endosome || 19: focal adhesion || 20: late endosome || 21: microtubule cytoskeleton || 22: perikaryon || 23: pseudopodium || 24: neuron projection || 25: nuclear speck || 26: spindle pole || 27: Ino80 complex ||
28: MLL1 complex || 29: NuA4 histone acetyltransferase complex || 30: nuclear matrix || 31: cytoplasmic vesicle || 32: spindle

ECM 6, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 49. ECM Strength: 0.0

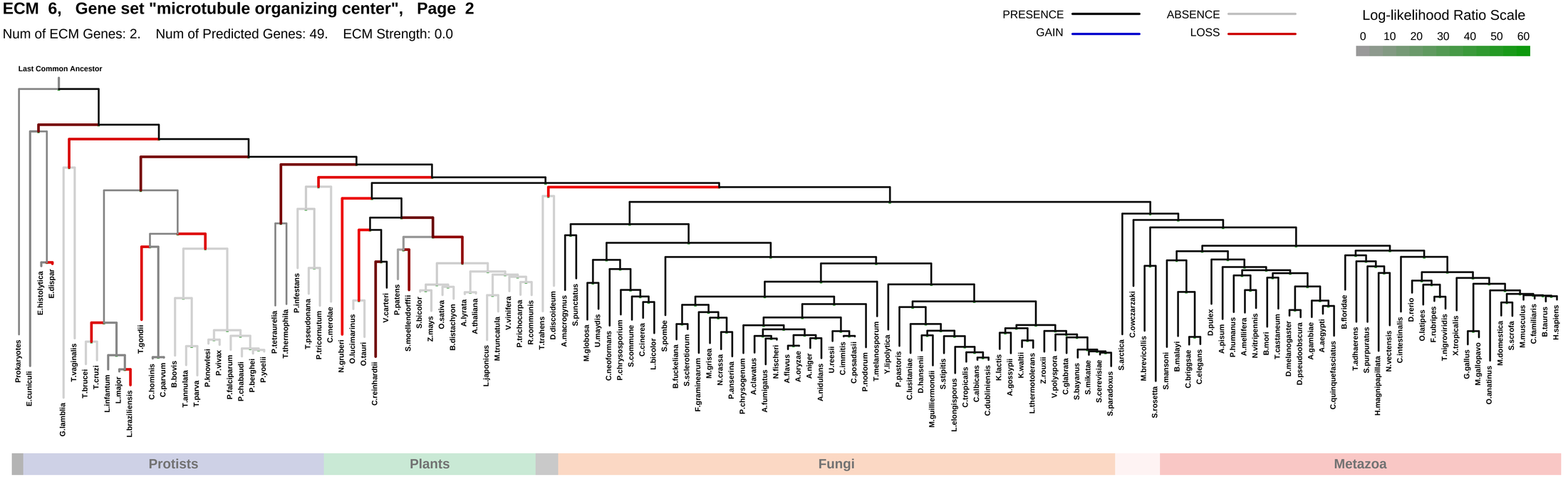


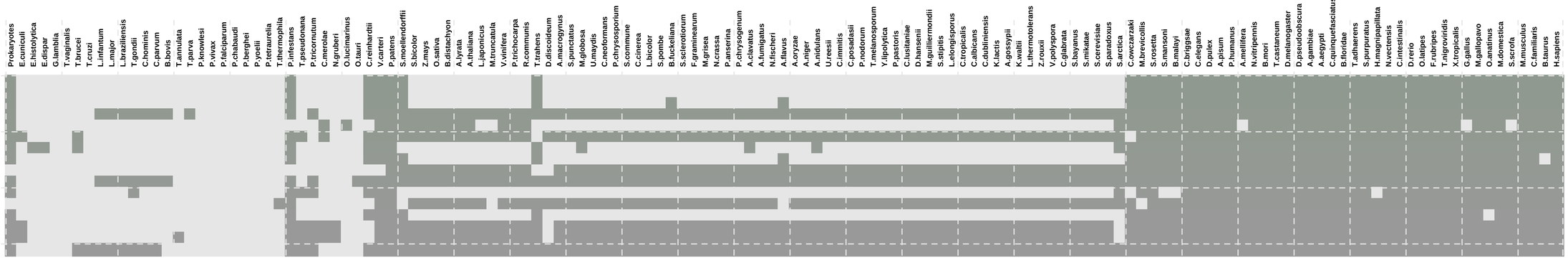
PG	Protein	LLR	Notes
	SEPT1		1 / 2
A	SLMAP		1 / 3 / 4 / 5
A	SEPT5	31.8	2 / 6 / 7
A	SEPT10	24.6	2
A	SEPT4	23.2	8
A	SEPT7	19.6	2 / 9 / 10 / 11 / 12 / 13 / 14
A	SEPT8	19.4	2
A	SEPT6	19.4	2 / 6 / 11 / 12 / 14 / 15 / 17
A	SEPT14	19.4	2
A	SEPT2	19.3	2 / 9 / 11 / 12 / 14 / 15 / 18
B	FURIN	18.8	21 / 22 / 23 / 24 / 25
C	GPR125	17.6	26
A	SEPT12	16.9	2 / 11 / 13 / 14 / 15 / 16 / 2
A	SEPT3	12.7	2 / 28
	FBXO16	12.4	
D	DDAH1	12.3	
E	SLC26A4	10.2	
E	SLC26A8	10.2	
B	PCSK7	10.1	29
A	SEPT11	10.1	2 / 16 / 30 / 31 / 32
E	SLC26A3	9.6	
E	SLC26A5	9.5	33 / 34
	MRPS2	9.1	35
E	SLC26A1	8.4	
A	SEPT9	8.0	9 / 16
	CSMD3	7.7	
	OVGP1	6.4	36
C	CLEC4M	5.8	
	MLX	5.4	
F	EGFLAM	5.3	32 / 37 / 38
G	GYS2	4.3	18 / 39
G	GYS1	4.3	40
D	DDAH2	4.0	
	THBS3	3.7	
F	NEO1	3.7	

1: microtubule organizing center || 2: septin complex || 3: prefoldin complex || 4: sarcolemma || 5: smooth endoplasmic reticulum || 6: synaptic vesicle || 7: terminal button || 8: microtubule-based flagellum || 9: actin cytoskeleton ||
10: cilium axoneme || 11: cleavage furrow || 12: condensed chromosome kinetochore || 13: microtubule cytoskeleton || 14: midbody || 15: spindle || 16: stress fiber || 17: axon terminus || 18: cell cortex || 19: cilium membrane ||
20: exocyst || 21: Golgi cisterna || 22: Golgi lumen || 23: membrane raft || 24: trans-Golgi network || 25: trans-Golgi network transport vesicle || 26: external side of plasma membrane || 27: cilium || 28: presynaptic membrane ||

ECM 6, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 2. Num of Predicted Genes: 49. ECM Strength: 0.0

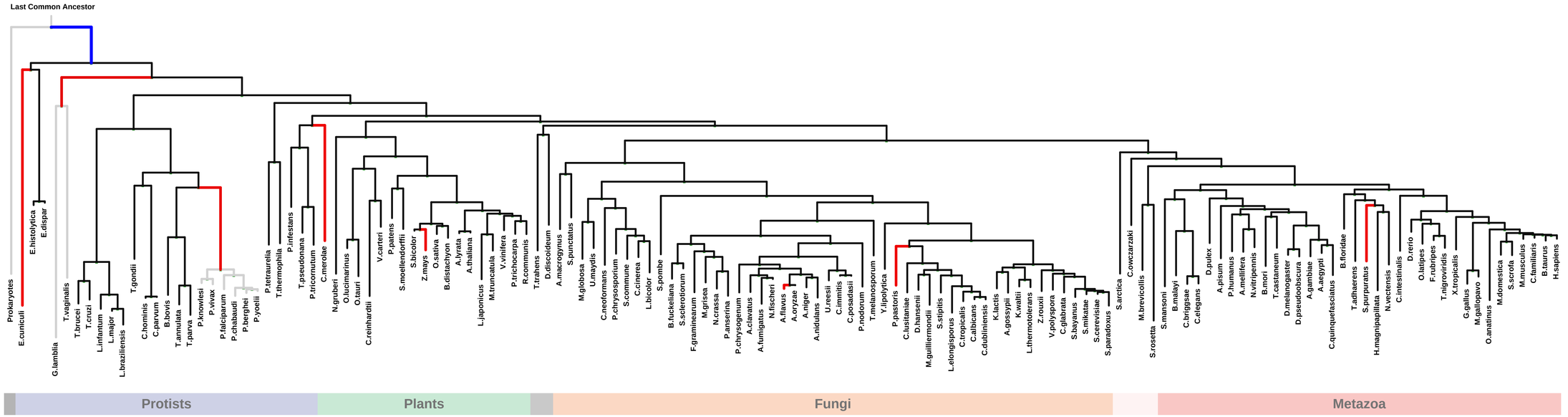


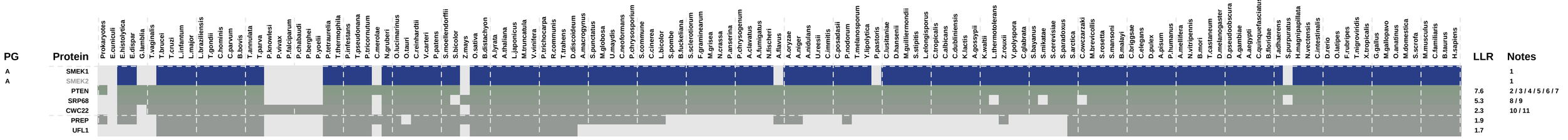


1: axon || 2: growth cone membrane || 3: membrane raft || 4: external side of plasma membrane || 5: presynaptic membrane || 6: terminal button || 7: mitochondrial nucleoid || 8: basolateral plasma membrane || 9: cilium ||
10: motile primary cilium || 11: polycystin complex || 12: T-tubule || 13: voltage-gated potassium channel complex || 14: oligosaccharyltransferase complex || 15: growth cone || 16: anchored to external side of plasma membrane ||
17: endosome || 18: recycling endosome membrane

ECM 7, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 5. ECM Strength: 9.8

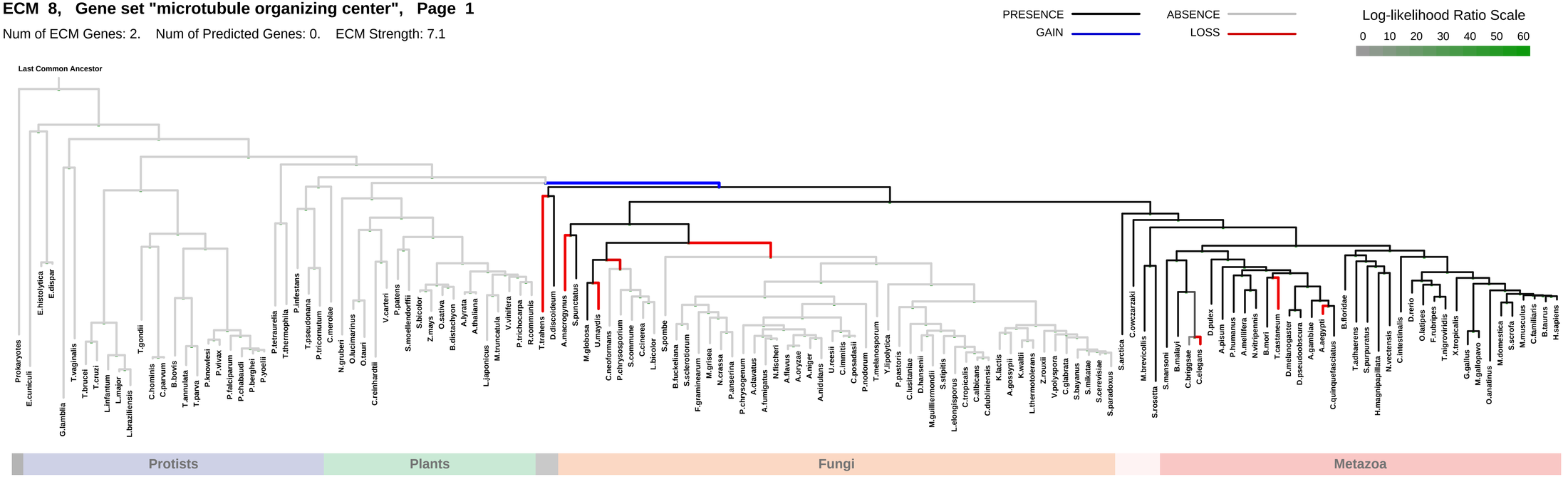




1: microtubule organizing center || 2: cell projection || 3: internal side of plasma membrane || 4: myelin sheath adaxonal region || 5: neuron projection || 6: PML body || 7: Schmidt-Lanterman incisure || 8: ribosome || 9: signal recognition particle, endoplasmic reticulum targeting || 10: catalytic step 2 spliceosome || 11: spliceosomal complex

ECM 8, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 0. ECM Strength: 7.1

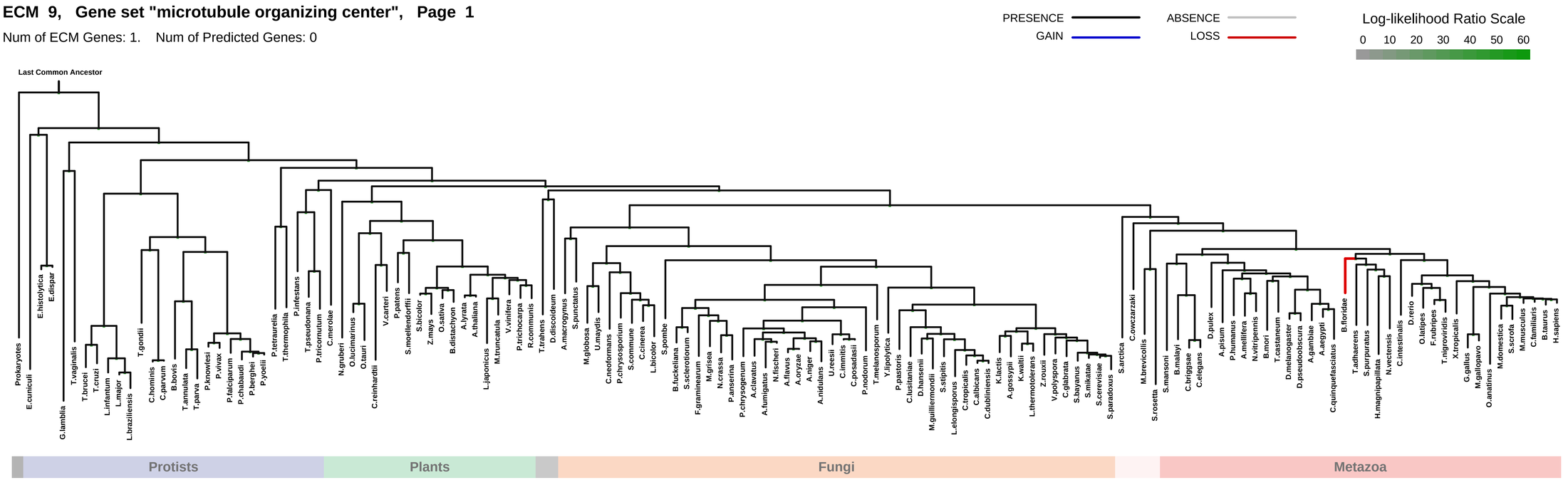


PG	Protein	LLR	Notes
A	TACC1		1 / 2 / 3
A	TACC2		3

1: intermediate filament cytoskeleton || 2: microtubule cytoskeleton || 3: microtubule organizing center

ECM 9, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

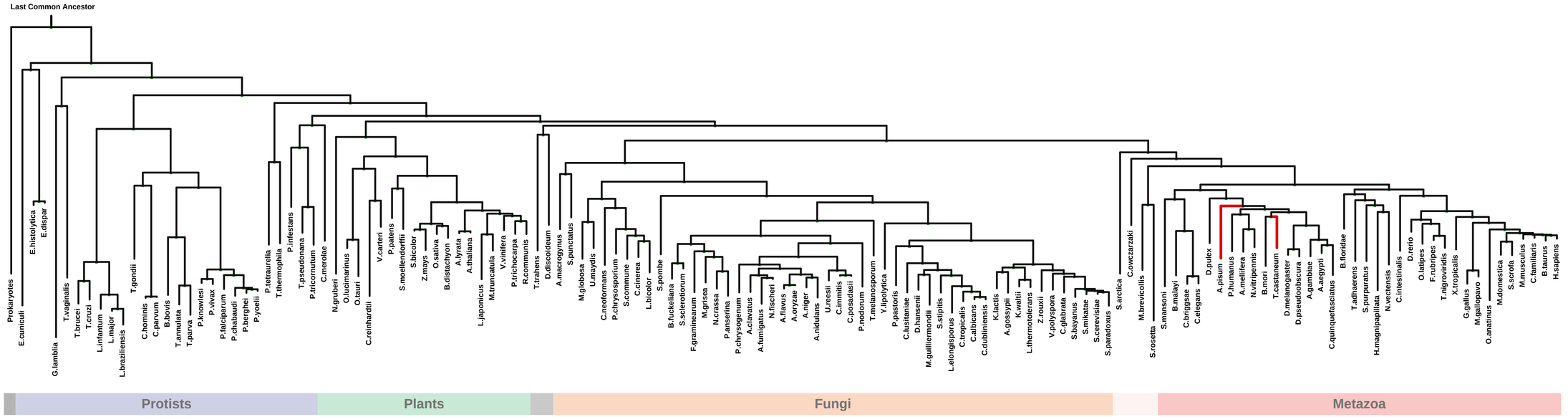


PG	Protein	LLR	Notes
	PTK2		1 / 2 / 3 / 4

1: cell cortex || 2: focal adhesion || 3: lamellipodium || 4: microtubule organizing center

ECM 10, Gene set "microtubule organizing center", Page 1

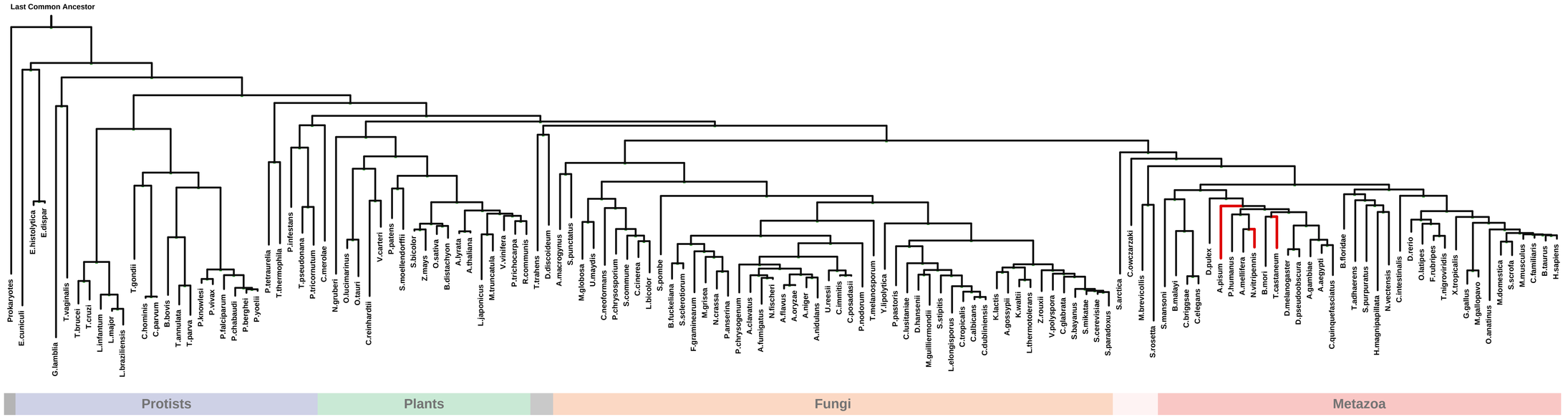
Num of ECM Genes: 1. Num of Predicted Genes: 0

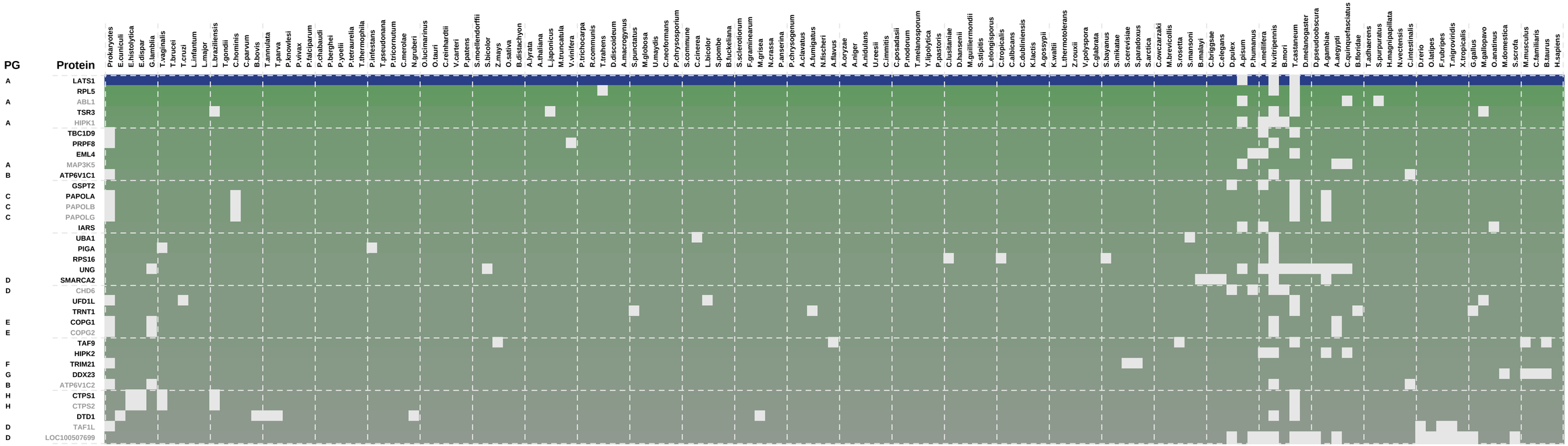


| PG | Protein | Prokaryotes | E.cuniculi | E.histolytica | E.dispar | G.lamblia | T.vaginalis | T.brucei | T.cruzi | L.infantum | L.major | L.braziliensis | T.gondii | C.hominis | C.parvum | B.bovis | T.annulata | T.parva | P.knowlesi | P.vivax | P.falciparum | P.chabaudi | P.berghei | P.yoelii | P.tetraurelia | T.thermophila | P.infestans | T.pseudonana | P.tricornutum | C.merolae | N.gruberi | O.lucimarinus | O.tauri | C.reinhardtii | V.carteri | P.patens | S.moellendorffii | S.bicolor | Z.mays | O.sativa | B.distachyon | A.lyrata | A.thaliana | L.japonicus | M.truncatula | V.vinifera | P.trichocarpa | R.communis | T.trahens | D.discoideum | A.macrogynus | S.punctatus | M.globosa | U.maydis | C.neoformans | P.chrysosporium | S.commune | C.cinerea | L.bicolor | S.pombe | B.fuckeliana | S.sclerotiorum | F.graminearum | M.grisea | N.crassa | P.anserina | P.chrysogenum | A.clavatus | A.fumigatus | N.fischeri | A.flavus | A.oryzae | A.niger | A.nidulans | U.reesii | C.immitis | C.posadasii | P.nodorum | T.melanosporum | Y.lipolytica | P.pastoris | C.lusitaniae | D.hansenii | M.guilliermondii | S.stipitis | L.elongisporus | C.tropicalis | C.albicans | C.dubliniensis | K.lactis | A.gossypii | K.waltii | L.thermotolerans | Z.rouxii | V.polyspora | C.glabrata | S.bayanus | S.mikatae | S.cerevisiae | S.paradoxus | S.arctica | C.owczarzaki | M.brevicollis | S.rosetta | S.mansoni | B.malayi | C.briggsae | C.elegans | D.pulex | A.pisum | P.humanus | A.mellifera | N.vitripennis | B.mori | T.castaneum | D.melanogaster | D.pseudoobscura | A.gambiae | A.aegypti | C.quinquefasciatus | B.floridae | T.adhaerens | S.purpuratus | H.magnipapillata | N.vectensis | C.intestinalis | D.rerio | O.latipes | F.rubripes | T.nigroviridis | X.tropicalis | G.gallus | M.gallopavo | O.anatinus | M.domestica | S.scrofa | M.musculus | C.familiaris | B.taurus | H.sapiens | LLR | Notes |
|---|---|---

ECM 11, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 137

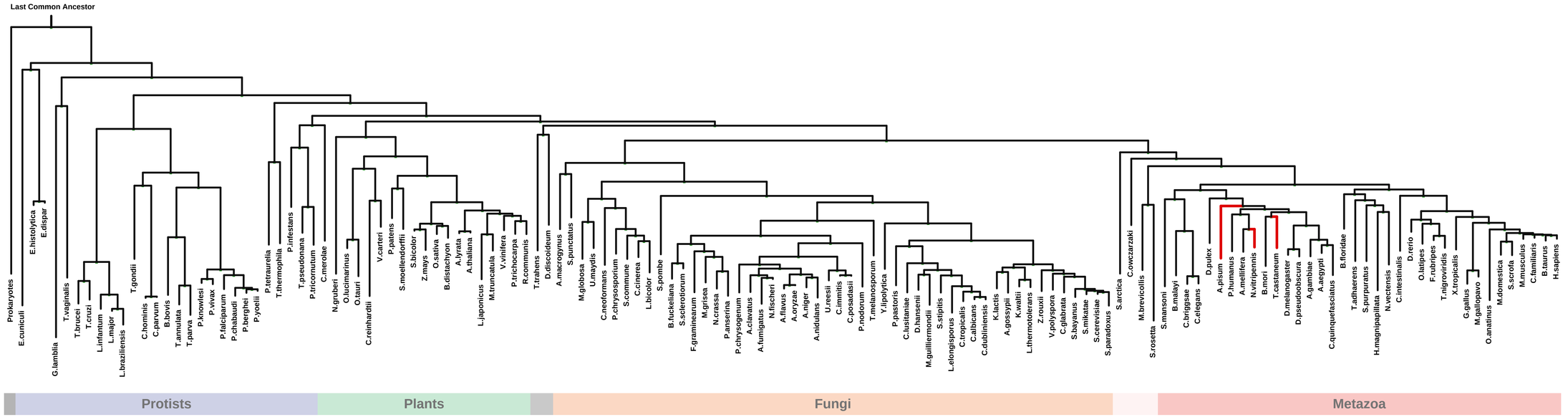


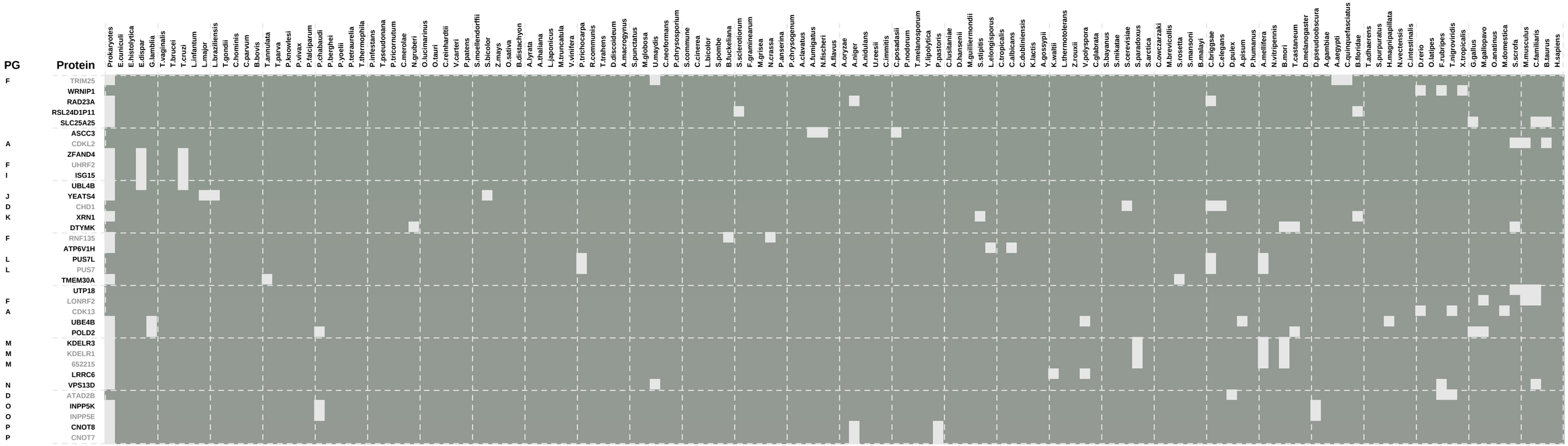


1: microtubule organizing center || 2: spindle pole || 3: cytosolic large ribosomal subunit || 4: ribonucleoprotein complex || 5: actin cytoskeleton || 6: nuclear membrane || 7: nuclear speck || 8: PML body || 9: catalytic step 2 spliceosome ||
10: U5 snRNP || 11: apical part of cell || 12: cytoplasmic vesicle || 13: proton-transporting two-sector ATPase complex || 14: proton-transporting V-type ATPase, V1 domain || 15: glycosylphosphatidylinositol-N-acetylglucosaminyltransferase (GPI-GnT) complex ||
16: cytosolic small ribosomal subunit || 17: small ribosomal subunit || 18: intermediate filament cytoskeleton || 19: nBAF complex || 20: npBAF complex || 21: nuclear chromatin || 22: SWI/SNF complex || 23: WINAC complex ||

ECM 11, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 137

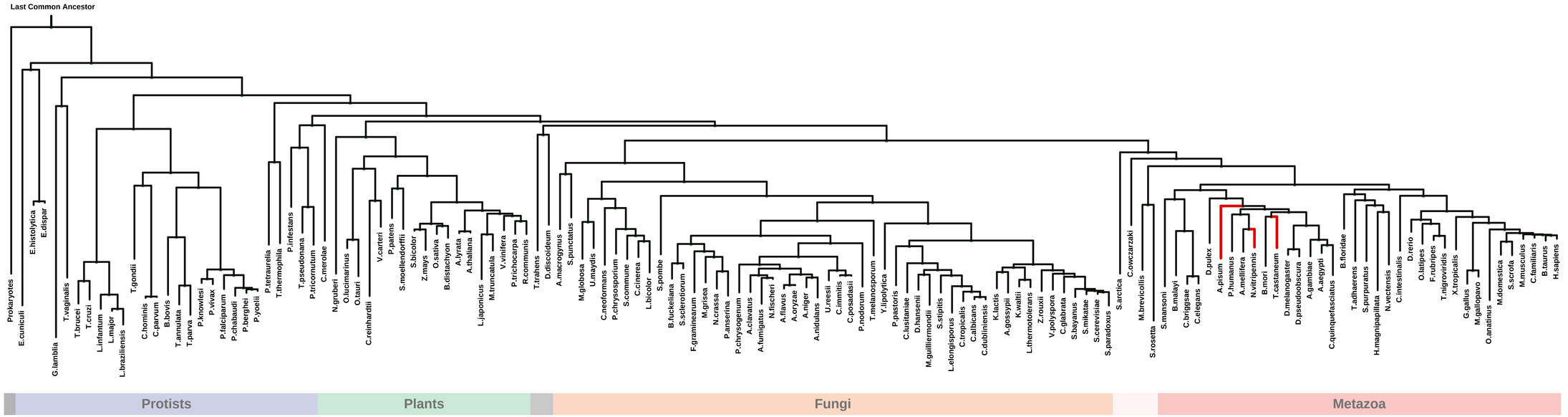


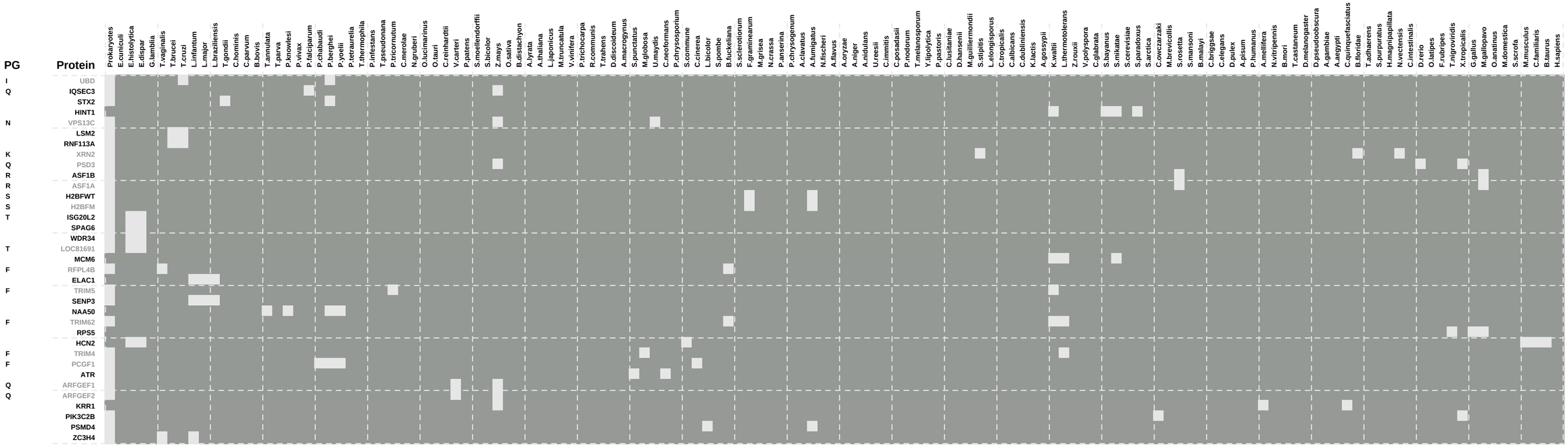


1: proteasome complex || 2: nuclear heterochromatin || 3: NuA4 histone acetyltransferase complex || 4: nuclear matrix || 5: intermediate filament cytoskeleton || 6: vacuolar proton-transporting V-type ATPase, V1 domain || 7: nuclear cyclin-dependent protein kinase holoenzyme complex || 8: nuclear speck || 9: ubiquitin ligase complex || 10: cis-Golgi network || 11: endoplasmic reticulum-Golgi intermediate compartment || 12: cilium || 13: neuron projection || 14: ruffle || 15: ruffle membrane || 16: trans-Golgi network || 17: cilium axoneme || 18: Golgi cisterna membrane || 19: CCR4-NOT complex || 20: cytoplasmic mRNA processing body

ECM 11, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 137

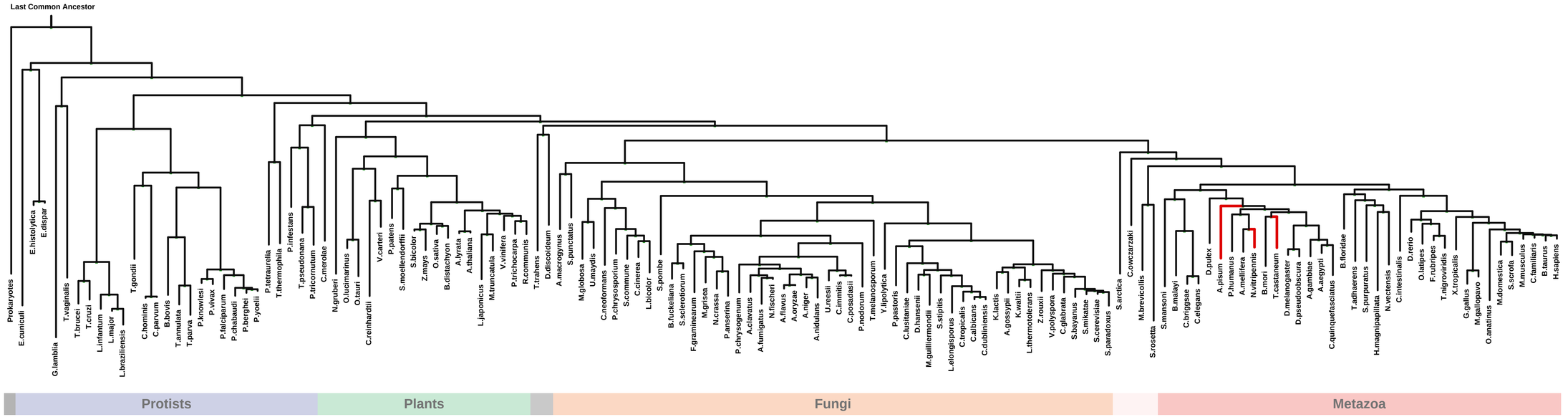


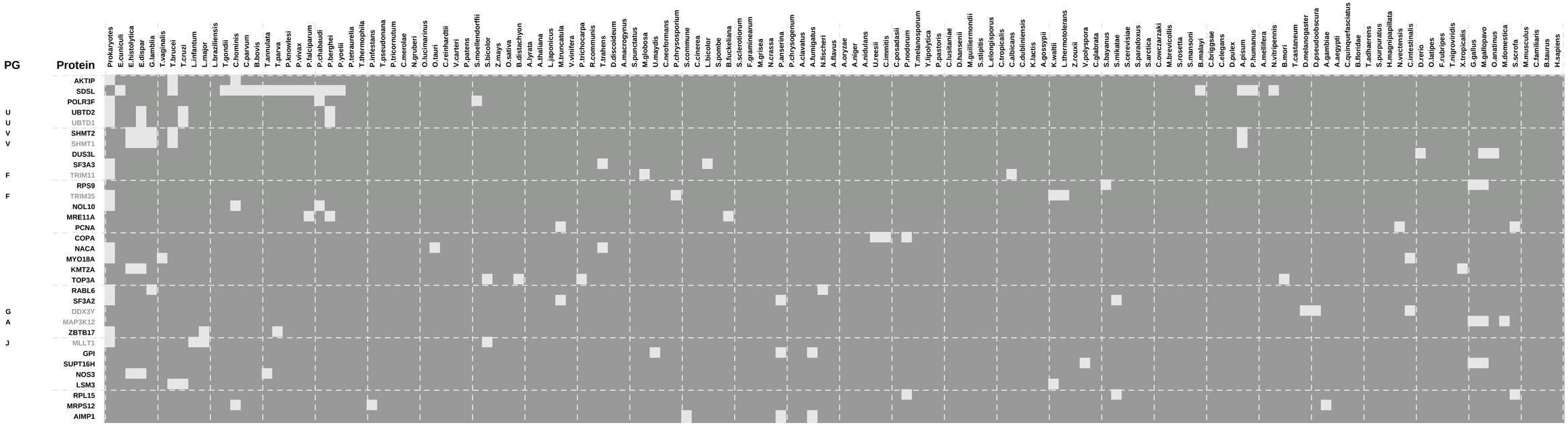


1: aggresome || 2: inhibitory synapse || 3: postsynaptic membrane || 4: trans-Golgi network || 5: basolateral plasma membrane || 6: cell-cell junction || 7: membrane raft || 8: midbody || 9: transport vesicle || 10: catalytic step 2 spliceosome ||
11: postsynaptic density || 12: chromatin || 13: chromatin remodeling complex || 14: nuclear membrane || 15: nucleosome || 16: axoneme || 17: cilium || 18: flagellum || 19: microtubule cytoskeleton || 20: MCM complex ||
21: cytoplasmic mRNA processing body || 22: MLL1 complex || 23: cytosolic small ribosomal subunit || 24: ribonucleoprotein complex || 25: axon || 26: dendritic shaft || 27: synapse || 28: voltage-gated potassium channel complex ||

ECM 11, Gene set "microtubule organizing center", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 137

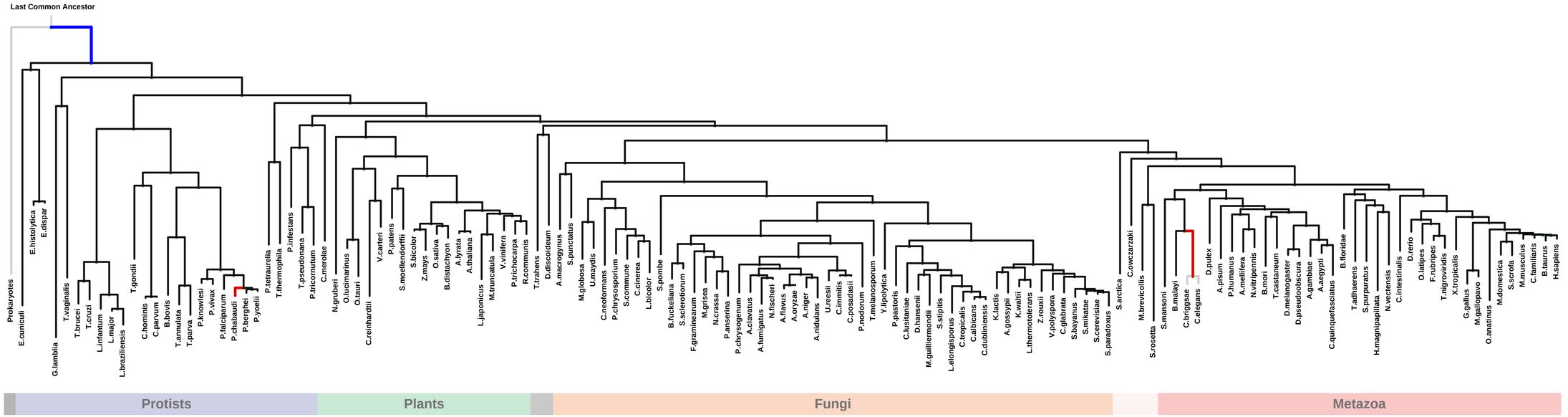


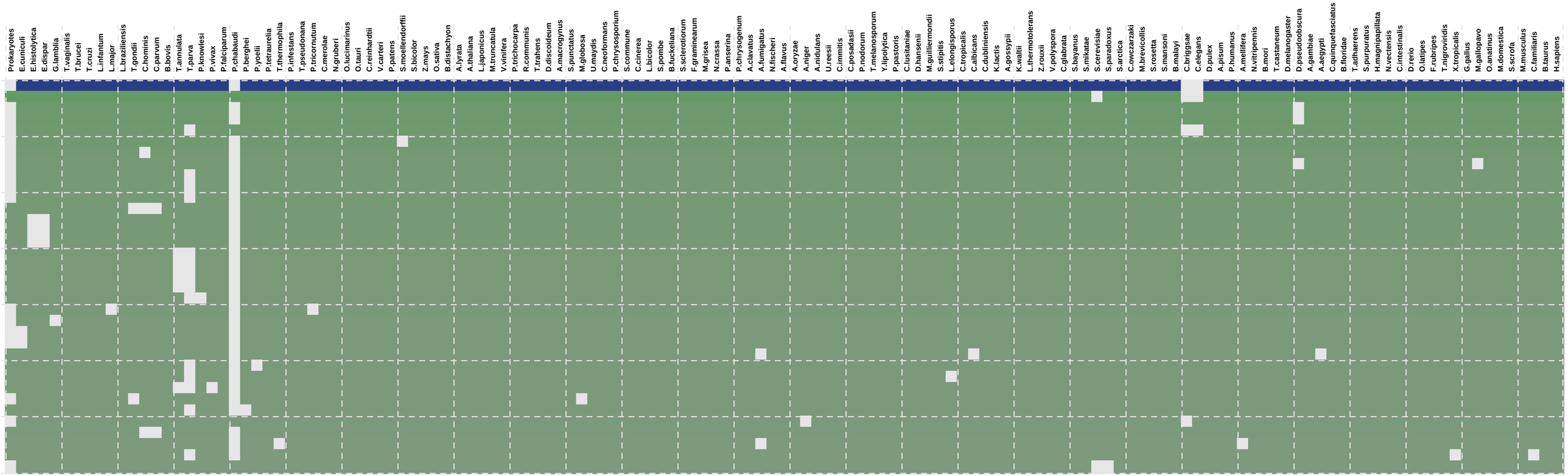


1: FHF complex || 2: HOPS complex || 3: DNA-directed RNA polymerase III complex || 4: microtubule cytoskeleton || 5: mitochondrial intermembrane space || 6: mitochondrial nucleoid || 7: catalytic step 2 spliceosome || 8: nuclear speck || 9: spliceosomal complex || 10: cytosolic small ribosomal subunit || 11: ribonucleoprotein complex || 12: ribosome || 13: chromosome, telomeric region || 14: condensed nuclear chromosome || 15: Mre11 complex || 16: nuclear chromatin || 17: DNA replication factor C complex || 18: nuclear replication fork || 19: PCNA-p21 complex || 20: COPI vesicle coat || 21: actomyosin || 22: endoplasmic reticulum-Golgi intermediate compartment || 23: myosin complex || 24: histone methyltransferase complex || 25: MLL1 complex || 26: chromosome || 27: PML body || 28: small nuclear ribonucleoprotein complex || 29: apical part of cell || 30: caveola || 31: endocytic vesicle membrane || 32: cytosolic large ribosomal subunit || 33: mitochondrial ribosome || 34: small ribosomal subunit || 35: aminoacyl-tRNA synthetase multienzyme complex || 36: transport vesicle

ECM 12, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 455

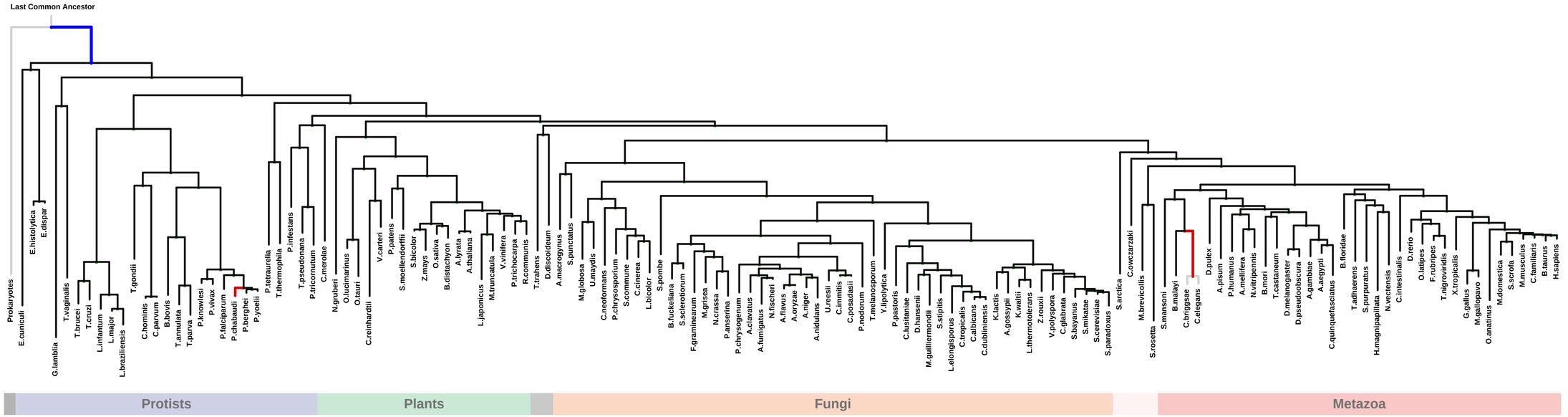




1: cytoplasmic microtubule || 2: microtubule organizing center || 3: spindle pole || 4: cilium axoneme || 5: Golgi cisterna membrane || 6: neuron projection || 7: ruffle || 8: ruffle membrane || 9: trans-Golgi network || 10: centriole ||
11: polar microtubule || 12: spindle || 13: DNA-directed RNA polymerase III complex || 14: dendritic shaft || 15: growth cone || 16: cytoplasmic mRNA processing body || 17: cytoplasmic stress granule || 18: eukaryotic translation initiation factor 4F complex ||
19: mRNA cap binding complex || 20: RNA-induced silencing complex || 21: dendritic spine || 22: photoreceptor inner segment || 23: sarcolemma || 24: sarcoplasmic reticulum || 25: postsynaptic membrane || 26: protein phosphatase type 1 complex ||

ECM 12, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 455

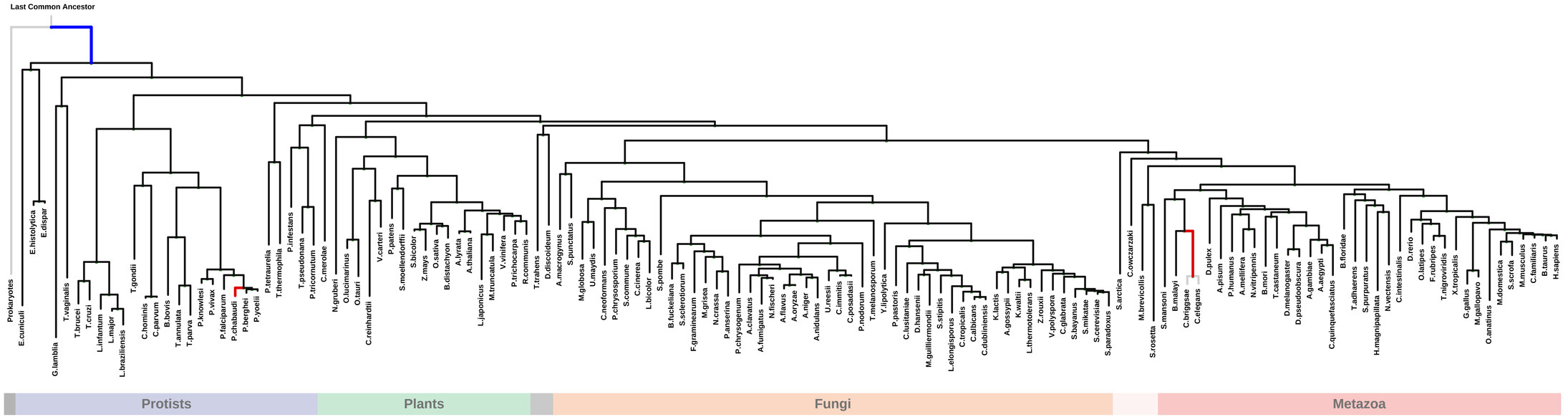


PG	Protein	LLR	Notes
H	DDX23	11.4	1 / 2
I	PUS7L	11.0	
I	PUS7	11.0	
B	PCGF1	10.5	3
E	OMD	10.2	4 / 5 / 6
J	PPP2R1B	10.1	
E	LRRC18	9.8	
	RER1	9.6	7
K	MYO7A	9.5	8 / 9 / 10 / 11 / 12 / 13 / 14
F	GNAQ	9.4	17 / 18 / 19
F	GNA14	9.4	17 / 18
L	TMTC1	9.2	
E	LRIG2	9.0	
J	PPP2R1A	8.9	20 / 21 / 22
B	TAF1L	8.6	23
M	ZSWIM2	8.5	
	STAMBP	8.4	24 / 25
B	RNF41	8.4	
N	METTL21B	8.3	
O	PPAN-P2RY11	8.2	
B	SMARCA2	8.2	26 / 27 / 28 / 29 / 30 / 31
B	TRIM25	8.0	
	WRNIP1	7.9	
E	LRRC4B	7.9	32
	RSL24D1P11	7.6	
P	SLC25A25	7.5	
	ASCC3	7.5	
E	CDKL2	7.4	
Q	YEATS4	7.4	33 / 34
	ZFAND4	7.4	
R	ISG15	7.4	
	UBL4B	7.4	
B	UHRF2	7.4	35
E	SLIT2	7.4	
S	VPS11	7.4	9 / 36 / 37 / 38 / 39

1: catalytic step 2 spliceosome || 2: U5 snRNP || 3: PcG protein complex || 4: Golgi lumen || 5: lysosomal lumen || 6: proteinaceous extracellular matrix || 7: integral to Golgi membrane || 8: cell cortex || 9: lysosomal membrane ||
10: melanosome || 11: myosin complex || 12: photoreceptor connecting cilium || 13: photoreceptor inner segment || 14: photoreceptor outer segment || 15: stereocilium || 16: synapse || 17: extrinsic to internal side of plasma membrane ||
18: heterotrimeric G-protein complex || 19: nuclear membrane || 20: chromosome, centromeric region || 21: microtubule cytoskeleton || 22: protein phosphatase type 2A complex || 23: transcription factor TFIID complex || 24: cleavage furrow ||

ECM 12, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 455

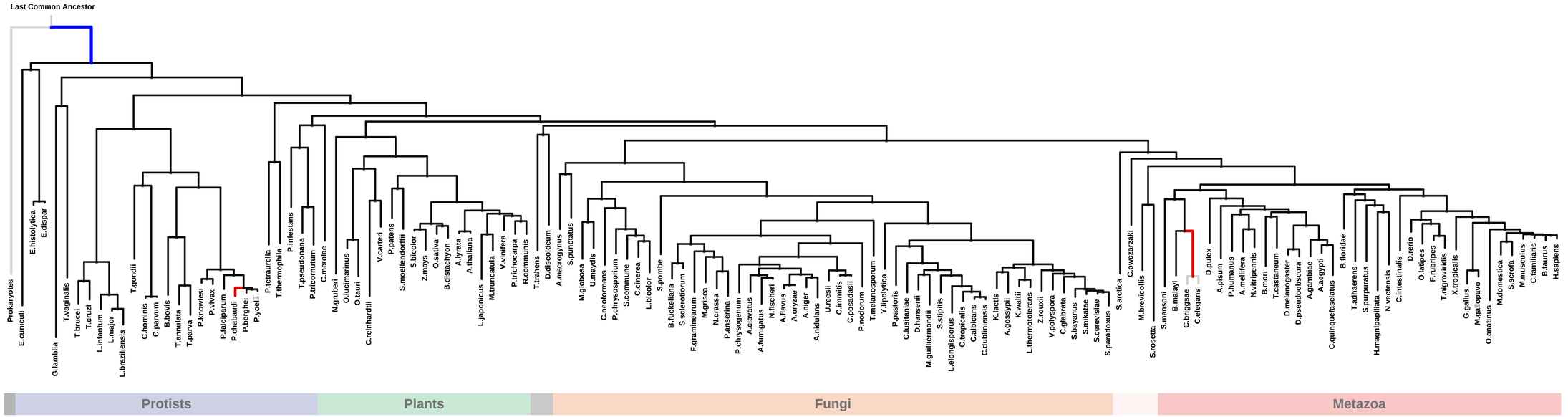


PG	Protein	LLR	Notes
	TBC1D9	7.3	
E	LRRC10	7.3	1
	PRPF8	7.3	2 / 3 / 4
T	AKR1A1	7.2	
U	DERL1	7.2	5 / 6 / 7
V	XRN1	7.2	8
B	RNF135	7.1	
	ZNF598	7.1	
	ATP6V1H	6.9	9
W	SLC36A4	6.8	
	TMEM30A	6.8	
X	UTP18	6.8	
E	MAP3K5	6.7	
B	LONRF2	6.4	
E	CDK13	6.4	3 / 10
	POLD2	6.3	
Y	LSM10	6.3	11 / 12
	SLC27A5	6.3	6 / 13
	LRRC6	6.3	14
Z	KDELR3	6.2	
Z	652215	6.2	
Z	KDELR1	6.2	15 / 16
a	VPS13D	6.2	
B	ATAD2B	6.2	
b	CNOT7	6.1	17 / 18
b	CNOT8	6.1	
E	SLIT1	6.1	
R	UBD	6.1	19
c	IQSEC3	6.1	20 / 21 / 22
	STX2	6.0	23 / 24 / 25 / 26 / 27
d	HINT1	6.0	
a	VPS13C	6.0	
Y	LSM2	6.0	2
	RNF113A	6.0	
V	XRN2	5.9	19

1: myofibril || 2: catalytic step 2 spliceosome || 3: nuclear speck || 4: U5 snRNP || 5: early endosome || 6: integral to endoplasmic reticulum membrane || 7: late endosome || 8: intermediate filament cytoskeleton || 9: vacuolar proton-transporting V-type ATPase, V1 domain ||
10: nuclear cyclin-dependent protein kinase holoenzyme complex || 11: Cajal body || 12: U7 snRNP || 13: basal plasma membrane || 14: cilium || 15: cis-Golgi network || 16: endoplasmic reticulum-Golgi intermediate compartment ||
17: CCR4-NOT complex || 18: cytoplasmic mRNA processing body || 19: aggresome || 20: inhibitory synapse || 21: postsynaptic membrane || 22: trans-Golgi network || 23: basolateral plasma membrane || 24: cell-cell junction ||

ECM 12, Gene set "microtubule organizing center", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 455

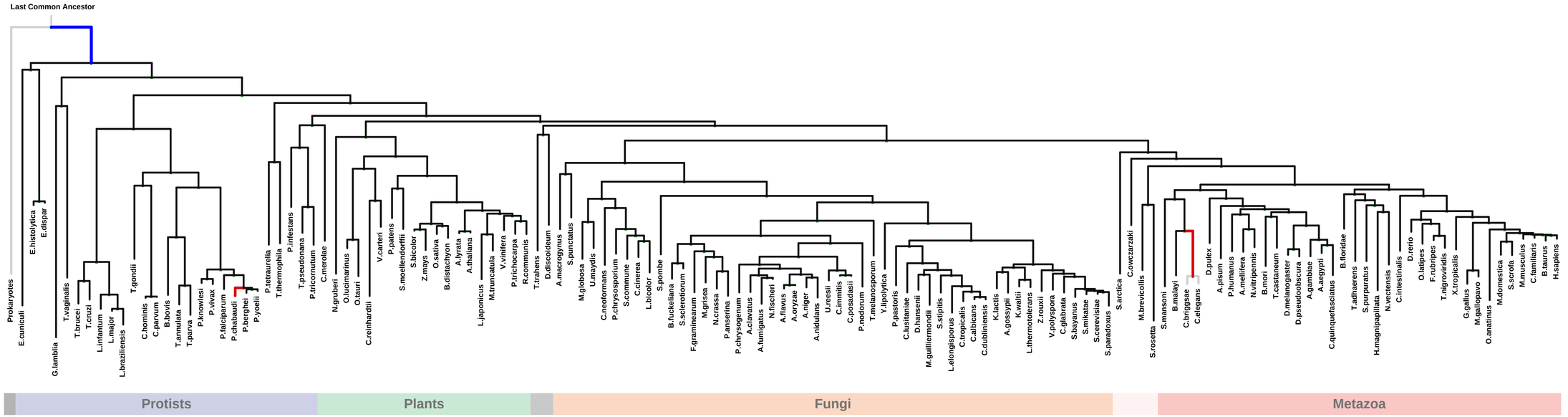


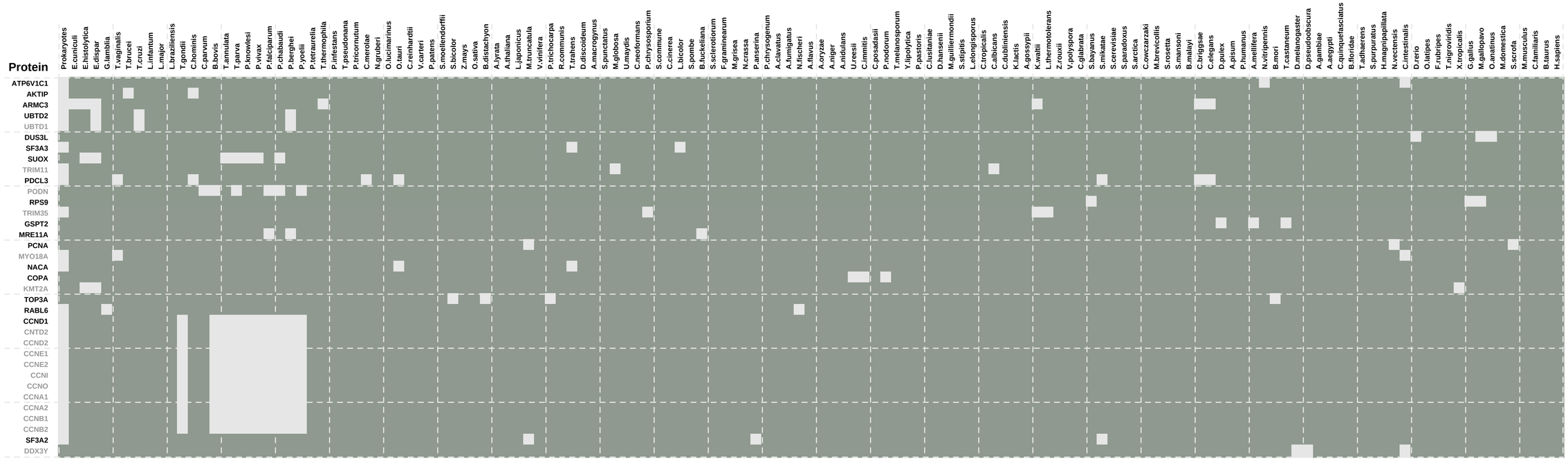
PG	Protein	LLR	Notes
	PIGK	5.9	1 / 2
K	MYO1B	5.8	3 / 4 / 5 / 6
c	PSD3	5.8	7 / 8 / 9
e	ASF1A	5.8	10
e	ASF1B	5.8	11
f	H2BFWT	5.8	12 / 13
f	H2BFM	5.8	13
E	LRRC4	5.8	8
	SPAG6	5.8	14 / 15 / 16 / 17
g	LOC81691	5.8	
g	ISG20L2	5.8	
	WDR34	5.8	
	RPL36	5.7	18
	MCM6	5.7	19
	RHOBTB2	5.7	
B	RFPL4B	5.6	
h	WDR45	5.6	
	NAA50	5.6	
B	TRIM5	5.5	20
	ELAC1	5.5	
	SENP3	5.5	21
	EML4	5.4	
B	TRIM62	5.4	
	RPS5	5.4	22 / 23
i	HCN2	5.4	24 / 25 / 26 / 27
B	TRIM4	5.4	
j	ATR	5.3	28 / 29 / 30
c	ARFGEF2	5.3	9 / 31 / 32 / 33 / 34 / 35 / 3
c	ARFGEF1	5.3	9 / 39 / 40
	HIPK2	5.3	
k	PIK3C2B	5.2	41
	KRR1	5.2	23
	PSMD4	5.2	42 / 43
	ZC3H4	5.1	
h	WIPI1	5.1	9 / 44 / 45 / 46 / 47 / 48

1: GPI-anchor transamidase complex || 2: integral to endoplasmic reticulum membrane || 3: brush border || 4: cell periphery || 5: filopodium || 6: myosin complex || 7: postsynaptic density || 8: postsynaptic membrane || 9: trans-Golgi network ||
10: chromatin remodeling complex || 11: chromatin || 12: nuclear membrane || 13: nucleosome || 14: axoneme || 15: cilium || 16: flagellum || 17: microtubule cytoskeleton || 18: cytosolic large ribosomal subunit || 19: MCM complex ||
20: cytoplasmic mRNA processing body || 21: MLL1 complex || 22: cytosolic small ribosomal subunit || 23: ribonucleoprotein complex || 24: axon || 25: dendritic shaft || 26: synapse || 27: voltage-gated potassium channel complex ||

ECM 12, Gene set "microtubule organizing center", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 455

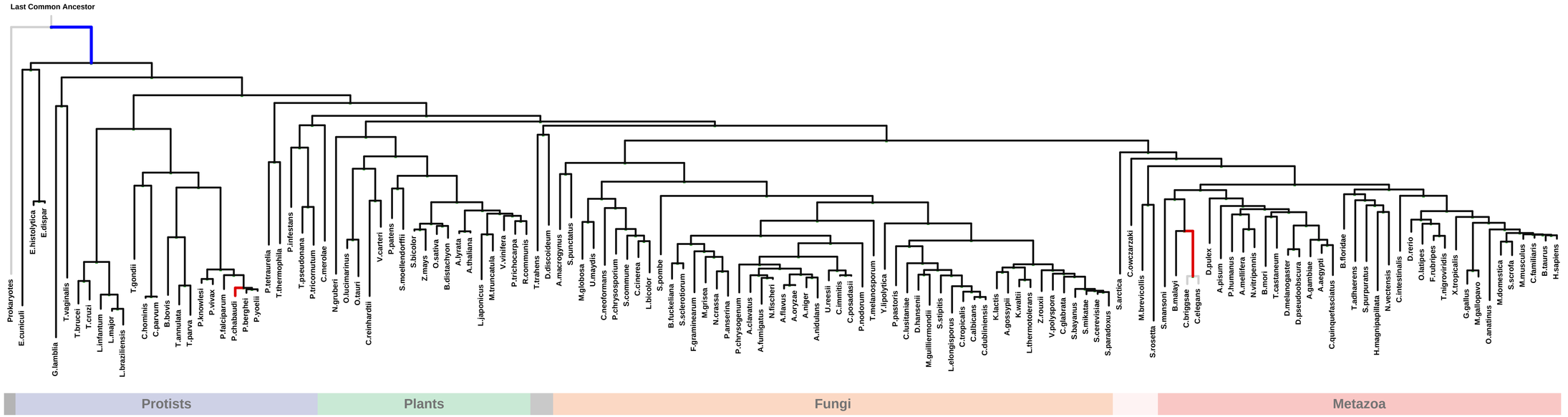


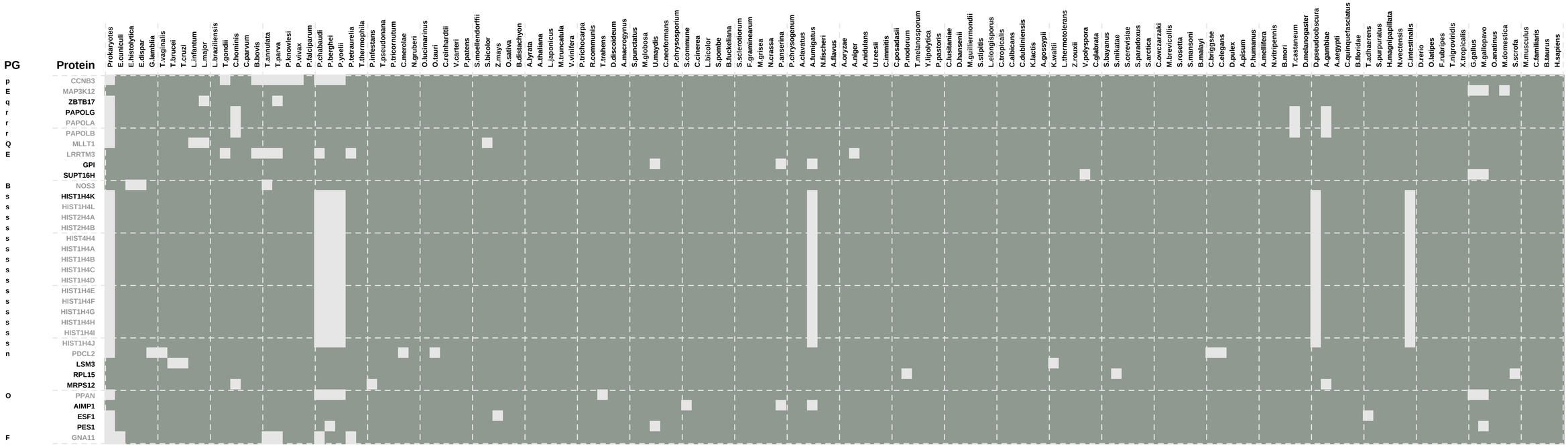


1: apical part of cell || 2: cytoplasmic vesicle || 3: proton-transporting two-sector ATPase complex || 4: proton-transporting V-type ATPase, V1 domain || 5: FHF complex || 6: HOPS complex || 7: catalytic step 2 spliceosome || 8: nuclear speck || 9: spliceosomal complex || 10: mitochondrial intermembrane space || 11: proteinaceous extracellular matrix || 12: cytosolic small ribosomal subunit || 13: ribonucleoprotein complex || 14: ribosome || 15: chromosome, telomeric region || 16: condensed nuclear chromosome || 17: Mre11 complex || 18: nuclear chromatin || 19: DNA replication factor C complex || 20: microtubule cytoskeleton || 21: nuclear replication fork || 22: PCNA-p21 complex || 23: actomyosin ||

ECM 12, Gene set "microtubule organizing center", Page 6

Num of ECM Genes: 1. Num of Predicted Genes: 455

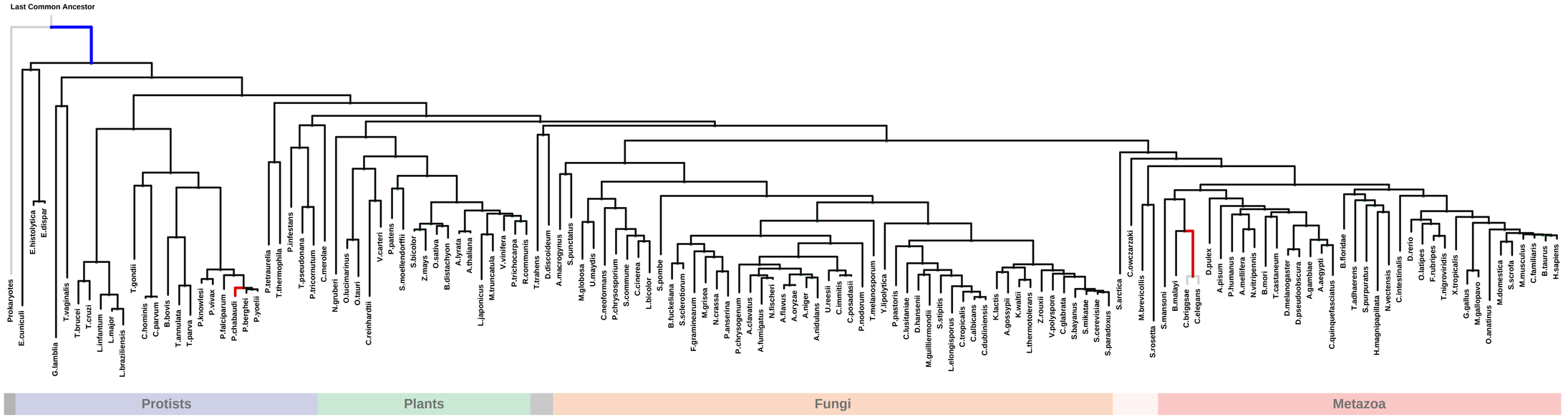


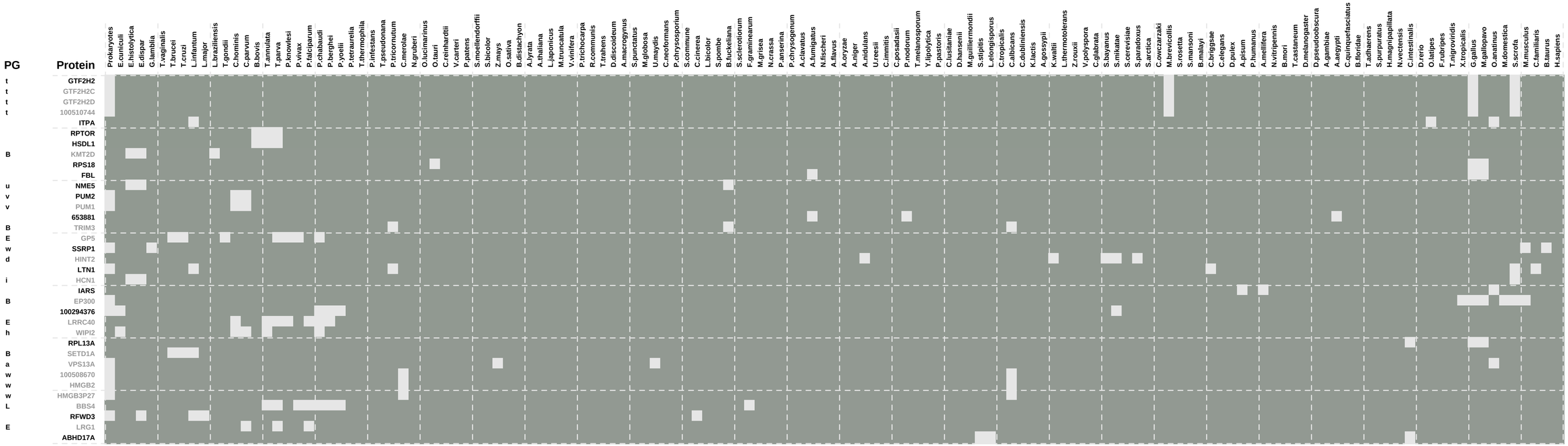


1: postsynaptic membrane || 2: chromosome || 3: apical part of cell || 4: caveola || 5: endocytic vesicle membrane || 6: actin cytoskeleton || 7: nucleosome || 8: catalytic step 2 spliceosome || 9: cytosolic large ribosomal subunit ||
10: ribosome || 11: mitochondrial ribosome || 12: small ribosomal subunit || 13: aminoacyl-tRNA synthetase multienzyme complex || 14: transport vesicle || 15: condensed chromosome || 16: PeBoW complex || 17: preribosome, large subunit precursor ||
18: extrinsic to internal side of plasma membrane || 19: heterotrimeric G-protein complex

ECM 12, Gene set "microtubule organizing center", Page 7

Num of ECM Genes: 1. Num of Predicted Genes: 455

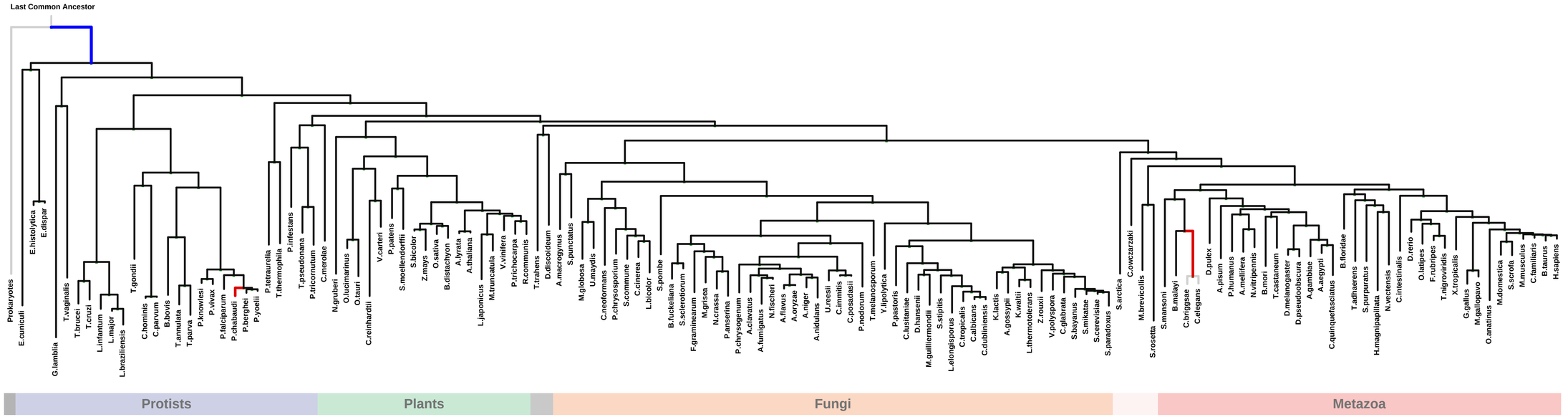


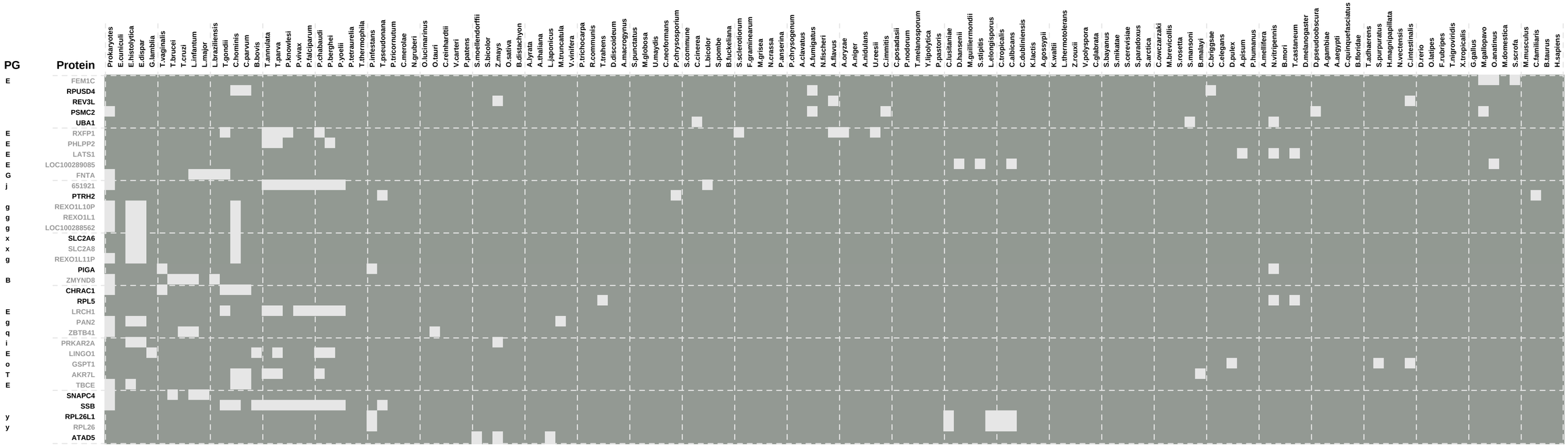


1: holo TFIIH complex || 2: dendrite || 3: lysosome || 4: TORC1 complex || 5: histone methyltransferase complex || 6: cytosolic small ribosomal subunit || 7: ribosome || 8: small ribosomal subunit || 9: box C/D snoRNP complex ||
10: Cajal body || 11: granular component || 12: cytoplasmic stress granule || 13: early endosome || 14: chromosome || 15: axon || 16: chromatin || 17: histone acetyltransferase complex || 18: protein-DNA complex ||
19: autophagic vacuole || 20: autophagic vacuole membrane || 21: pre-autophagosomal structure membrane || 22: cytosolic large ribosomal subunit || 23: large ribosomal subunit || 24: ribonucleoprotein complex || 25: nuclear speck ||

ECM 12, Gene set "microtubule organizing center", Page 8

Num of ECM Genes: 1. Num of Predicted Genes: 455

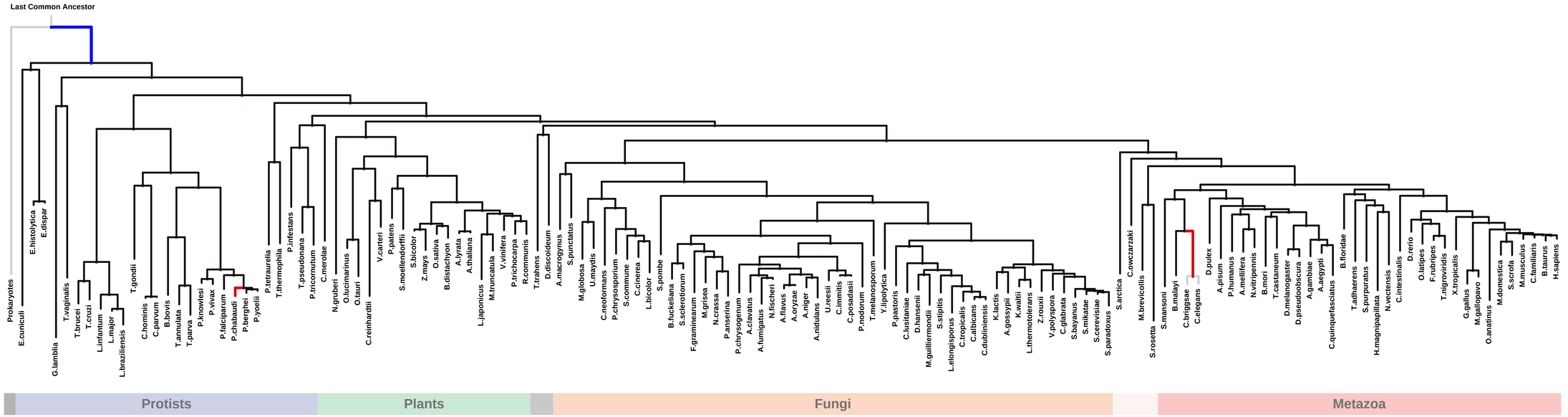




1: chromosome || 2: zeta DNA polymerase complex || 3: proteasome accessory complex || 4: proteasome complex || 5: microtubule organizing center || 6: spindle pole || 7: microtubule associated complex || 8: cytoplasmic vesicle membrane || 9: synaptic vesicle || 10: glycosylphosphatidylinositol-N-acetylglucosaminyltransferase (GPI-GnT) complex || 11: chromatin accessibility complex || 12: epsilon DNA polymerase complex || 13: cytosolic large ribosomal subunit || 14: ribonucleoprotein complex || 15: cAMP-dependent protein kinase complex || 16: T-tubule || 17: large ribosomal subunit

ECM 12, Gene set "microtubule organizing center", Page 9

Num of ECM Genes: 1. Num of Predicted Genes: 455

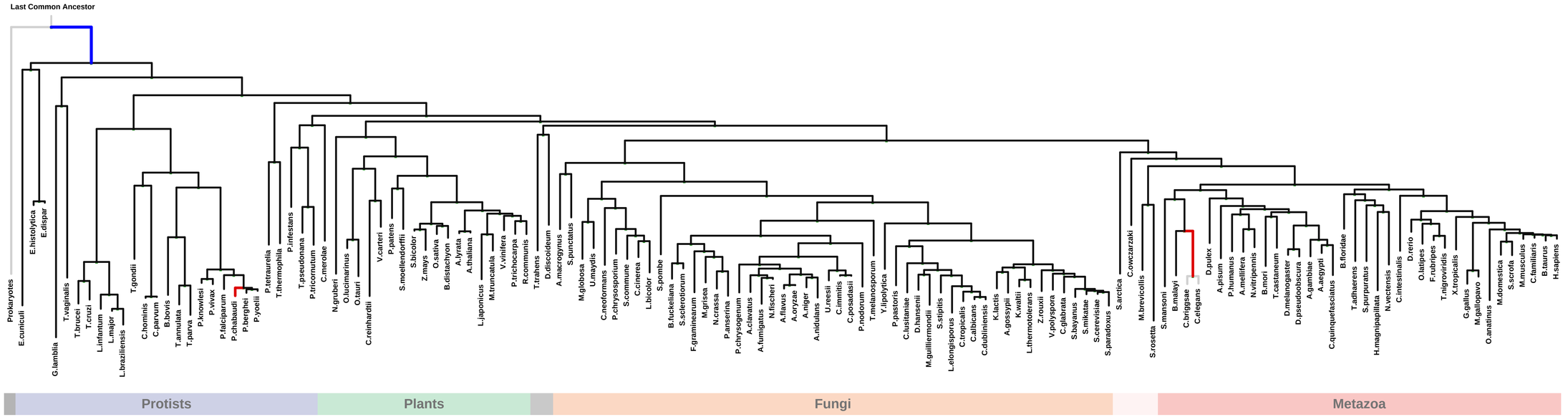


PG	Protein	LLR	Notes
M	ZNRF1	2.5	1 / 2 / 3
M	ZNRF2	2.5	4 / 5 / 6
z	EIF2B3	2.4	7
z	GMPPB	2.4	
	MAK16	2.4	
T	AKR1B10	2.4	2
	TRMT2A	2.4	
	METTL1	2.4	
E	ANKRD13B	2.4	
{	ABCC2	2.4	8
	BUB1	2.4	9 / 10 / 11
	MDN1	2.3	
	SNRPB	2.3	12 / 13 / 14 / 15 / 16 / 17
	FBXW9	2.3	
	STON1-GTF2A1L	2.3	
B	TRIM22	2.3	18 / 19
E	HIPK1	2.3	19 / 20
	METAP1D	2.3	
	IBTK	2.3	
B	BRCA1	2.2	21 / 22 / 23 / 24 / 25 / 26 /
|	PMM1	2.2	
|	PMM2	2.2	
E	ABL1	2.2	30 / 31
}	TRMT1	2.2	
	DPAGT1	2.1	32
~	NMT1	2.1	30
~	NMT2	2.1	
	CHPT1	2.1	
x	SLC2A9	2.1	33
	SF3B2	2.1	12 / 15 / 16
U	DERL2	2.0	32 / 34 / 35
	SUPT6H	2.0	
	DAAM2	1.9	
	DIAPH1	1.9	36 / 37
	INF2	1.9	

1: endosome || 2: lysosome || 3: synaptic vesicle membrane || 4: endosome membrane || 5: lysosomal membrane || 6: presynaptic membrane || 7: eukaryotic translation initiation factor 2B complex || 8: intercellular canaliculus ||
9: condensed chromosome kinetochore || 10: condensed nuclear chromosome, centromeric region || 11: kinetochore || 12: catalytic step 2 spliceosome || 13: histone pre-mRNA 3'end processing complex || 14: small nuclear ribonucleoprotein complex ||
15: spliceosomal complex || 16: U12-type spliceosomal complex || 17: U7 snRNP || 18: Cajal body || 19: nuclear speck || 20: PML body || 21: BRCA1-A complex || 22: BRCA1-BARD1 complex || 23: chromosome || 24: filamentous actin ||

ECM 12, Gene set "microtubule organizing center", Page 10

Num of ECM Genes: 1. Num of Predicted Genes: 455

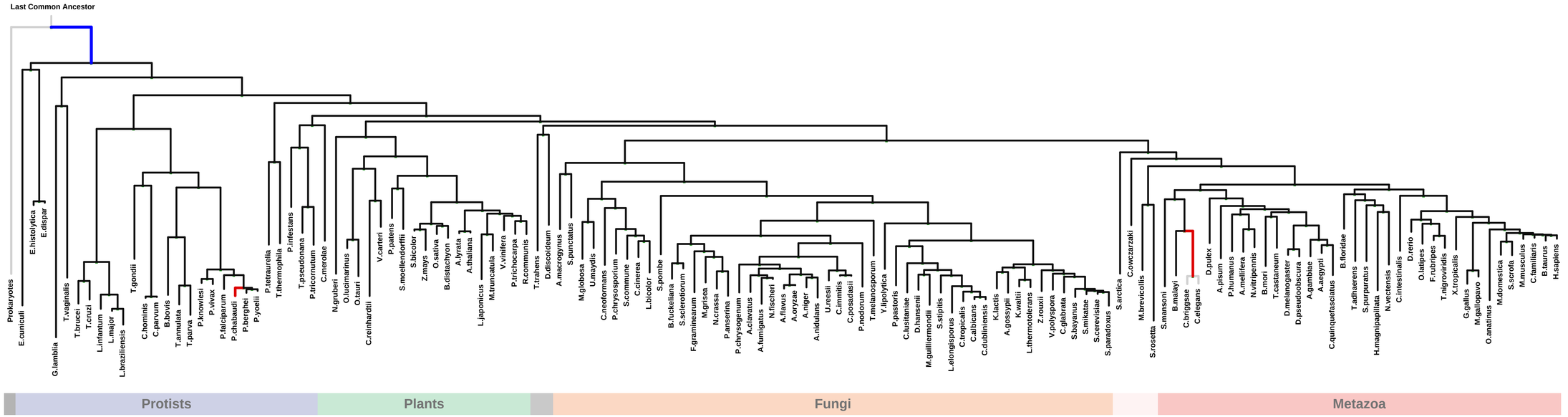


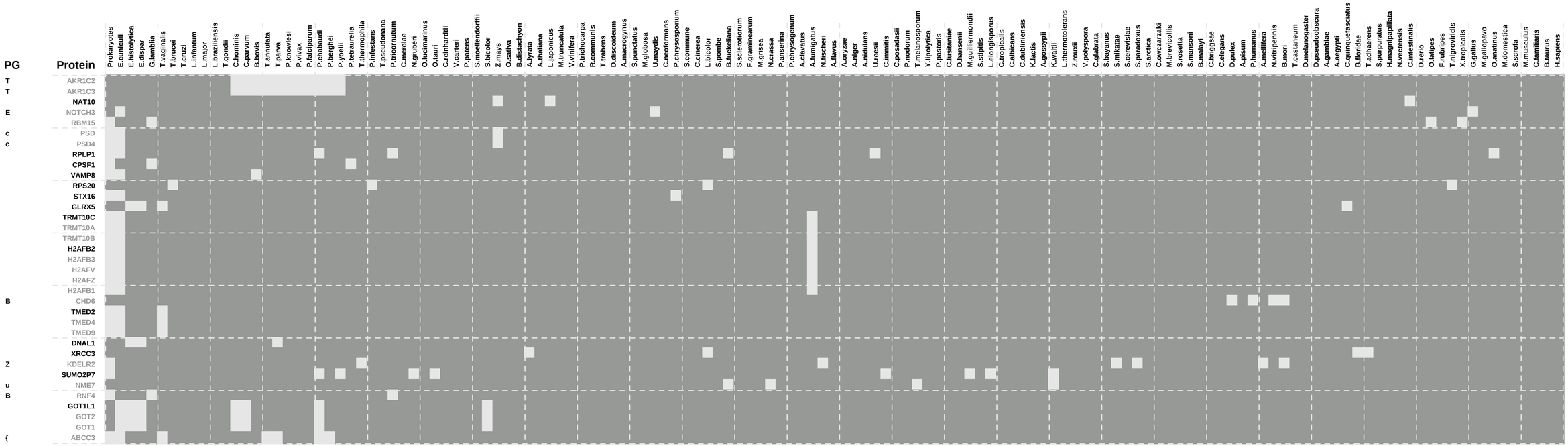
PG	Protein	LLR	Notes
	DIAPH2	1.9	1
	DAAM1	1.9	2
w	100508832	1.9	
	HMGB1P40	**1.9**	
w	HMGB1P40	1.9	
	SPEN	**1.9**	**3**
E	LRRC58	1.8	
	RPL10L	**1.8**	**4**
	RPL10	1.8	4
	CDIPT	**1.8**	
L	TTC37	1.8	5 / 6
P	CAPS	1.8	
	YIPF5	**1.7**	**7 / 8 / 9**
B	WHSC1	1.7	10 / 11
	HCFC2	**1.7**	
B	RNF2	1.6	12 / 13 / 14 / 15 / 16 / 17
	POLR2G	**1.6**	**18**
	TOP2A	**1.6**	**19 / 20 / 21 / 22**
E	ECM2	1.6	23 / 24
	ZC3H7B	**1.6**	
	EPN1	**1.6**	**25**
	EPN3	1.6	26
L	CDC27	1.6	27 / 28 / 29
	RPS16	**1.5**	**30 / 31**
	EFTUD1	**1.5**	
	NOX5	**1.5**	
B	TRIML1	1.5	
E	RTN4RL2	1.5	32 / 33 / 34
	EIF4G1	**1.5**	**35**
	TXNL4A	**1.4**	**36**
	TXNL4B	1.4	36
T	AKR1C4	1.4	
T	AKR1D1	1.4	
T	AKR1B1	1.4	
	AKR1C2	**1.4**	

1: early endosome || 2: stress fiber || 3: transcriptional repressor complex || 4: cytosolic large ribosomal subunit || 5: Ski complex || 6: transcriptionally active chromatin || 7: endoplasmic reticulum exit site || 8: ER to Golgi transport vesicle || 9: Golgi cisterna membrane || 10: chromosome || 11: nuclear membrane || 12: MLL1 complex || 13: nuclear body || 14: PcG protein complex || 15: PRC1 complex || 16: sex chromatin || 17: ubiquitin ligase complex || 18: DNA-directed RNA polymerase II, core complex || 19: centriole || 20: nuclear chromosome || 21: nucleoid || 22: synaptonemal complex || 23: interstitial matrix || 24: proteinaceous extracellular matrix || 25: coated pit ||

ECM 12, Gene set "microtubule organizing center", Page 11

Num of ECM Genes: 1. Num of Predicted Genes: 455

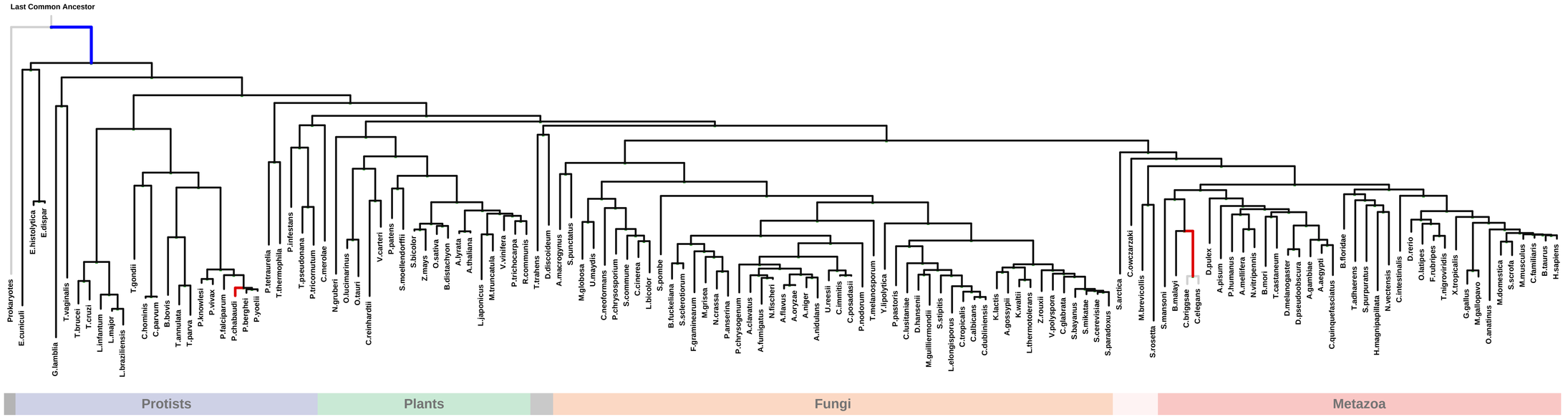




1: ruffle || 2: trans-Golgi network || 3: cytosolic large ribosomal subunit || 4: mRNA cleavage and polyadenylation specificity factor complex || 5: early endosome || 6: late endosome membrane || 7: lysosomal membrane || 8: recycling endosome || 9: secretory granule membrane || 10: SNARE complex || 11: cytosolic small ribosomal subunit || 12: nuclear nucleosome || 13: transcriptionally active chromatin || 14: nucleosome || 15: Barr body || 16: COPI-coated vesicle || 17: COPI-coated vesicle membrane || 18: endoplasmic reticulum-Golgi intermediate compartment || 19: endoplasmic reticulum-Golgi intermediate compartment membrane || 20: Golgi cisterna membrane || 21: zymogen granule membrane ||

ECM 12, Gene set "microtubule organizing center", Page 12

Num of ECM Genes: 1. Num of Predicted Genes: 455

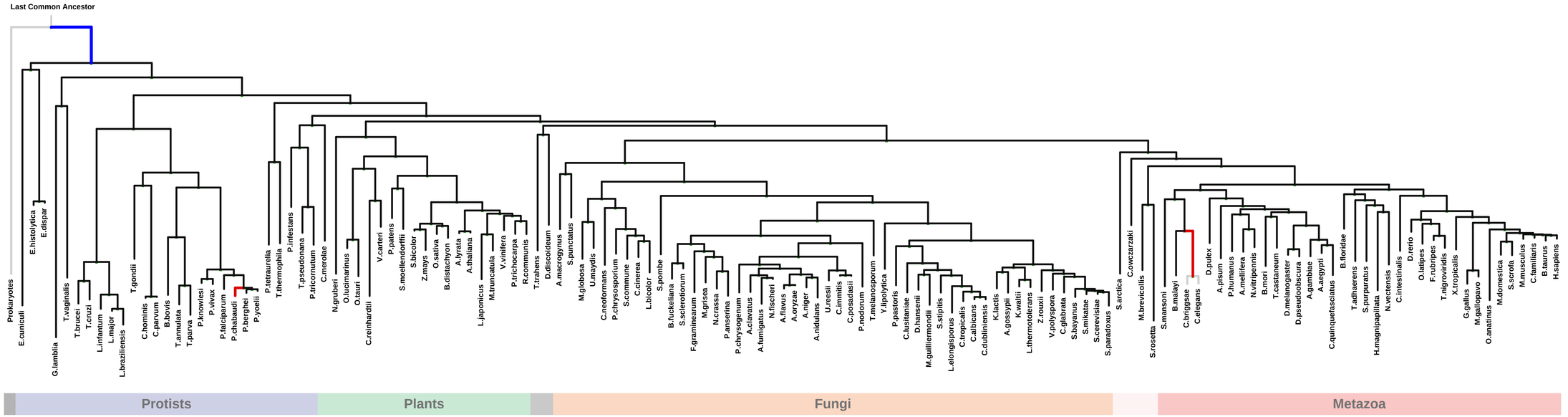


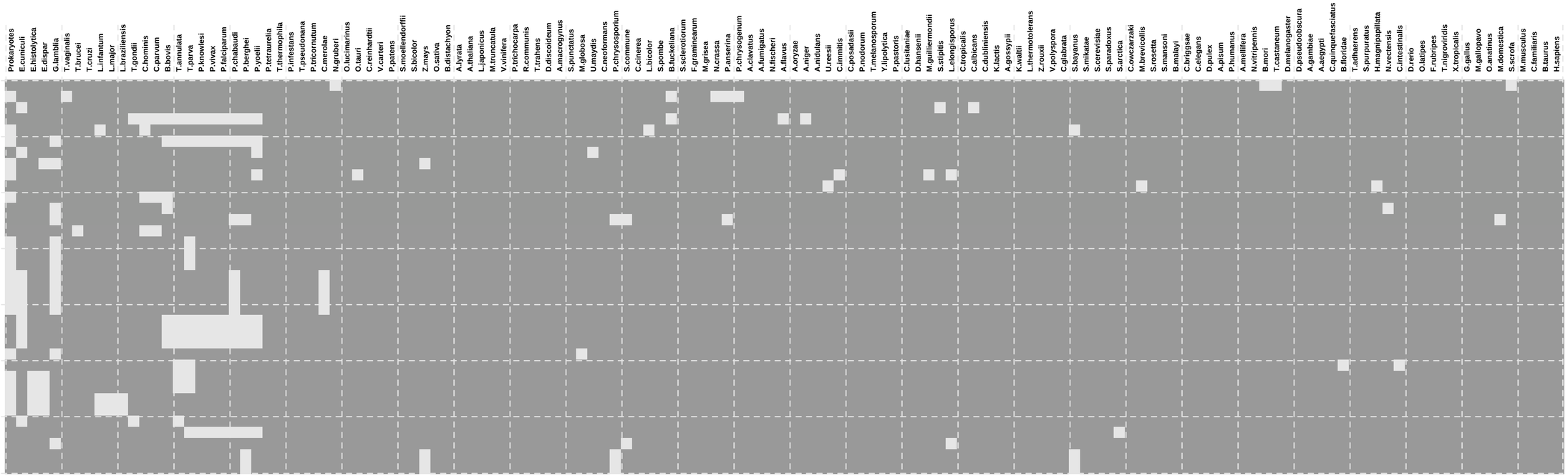
PG	Protein	LLR	Notes
E	CLIP3	1.1	1 / 2 / 3 / 4 / 5 / 6
T	AKR1C1	1.1	
	PGLS	1.1	
	TPI1	1.1	
S	VPS18	1.0	7 / 8 / 9 / 10 / 11
B	SETD2	1.0	12
i	HCN3	1.0	
	EXOSC2	1.0	13
E	TRIO	1.0	
	COQ3	0.9	
B	NSD1	0.9	12
	RBM25	0.9	14
	PRIM1	0.9	15
T	KCNAB2	0.9	16
	PSMD13	0.9	17 / 18 / 19
	TMX2	0.8	
}	TRMT1L	0.8	
	UFD1L	0.8	
	RNASEH2A	0.8	20
	DHPS	0.8	
B	PDZRN3	0.7	21
	HSPE1-MOB4	0.7	
E	LRSAM1	0.7	22
N	METTL21A	0.6	
	HADHB	0.6	23 / 24 / 25 / 26
B	SH3RF2	0.6	
W	SLC38A4	0.6	
	RPS13	0.6	27 / 28
	TRNT1	0.6	
	UBE4A	0.6	29
M	RNF43	0.5	30
	WDR74	0.5	
	TAF9	0.5	31 / 32 / 33 / 34 / 35 / 36 /
	COPG2	0.5	38
	COPG1	0.5	38

1: early endosome membrane || 2: Golgi stack || 3: membrane raft || 4: recycling endosome membrane || 5: trans-Golgi network || 6: trans-Golgi network membrane || 7: actin filament || 8: early endosome || 9: HOPS complex ||
10: late endosome membrane || 11: lysosomal membrane || 12: chromosome || 13: exosome (RNase complex) || 14: nuclear speck || 15: alpha DNA polymerase:primase complex || 16: juxtaparanode region of axon || 17: proteasome accessory complex ||
18: proteasome complex || 19: proteasome regulatory particle || 20: ribonuclease H2 complex || 21: neuromuscular junction || 22: membrane part || 23: mitochondrial envelope || 24: mitochondrial fatty acid beta-oxidation multienzyme complex ||

ECM 12, Gene set "microtubule organizing center", Page 13

Num of ECM Genes: 1. Num of Predicted Genes: 455

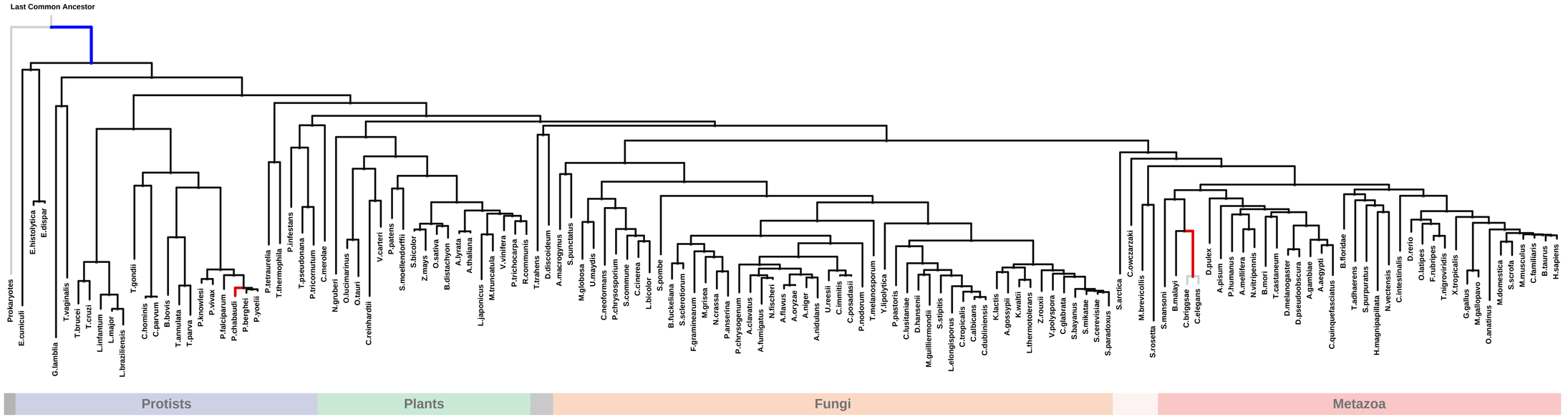




1: basolateral plasma membrane || 2: early phagosome || 3: endolysosome membrane || 4: endosome || 5: endosome membrane || 6: lysosome || 7: nuclear pore || 8: kinetochore || 9: DNA-directed RNA polymerase II, core complex ||
10: nuclear membrane || 11: 6-phosphofructokinase complex || 12: Cul4A-RING ubiquitin ligase complex || 13: Cul4-RING ubiquitin ligase complex || 14: Cul2-RING ubiquitin ligase complex || 15: lamellipodium || 16: neuron projection ||
17: ruffle || 18: signalosome || 19: mitochondrial outer membrane || 20: microtubule cytoskeleton || 21: cytoplasmic microtubule || 22: midbody || 23: histone methyltransferase complex || 24: spliceosomal complex || 25: lamin filament ||

ECM 12, Gene set "microtubule organizing center", Page 14

Num of ECM Genes: 1. Num of Predicted Genes: 455

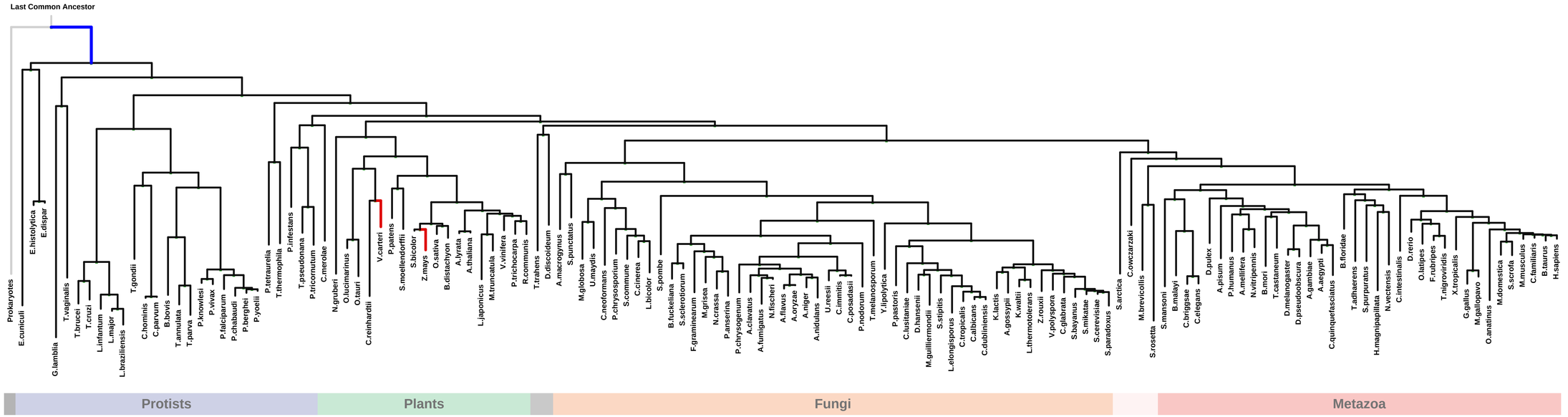


PG	Protein	LLR	Notes
VBP1		0.0	1

1: prefoldin complex

ECM 13, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 405

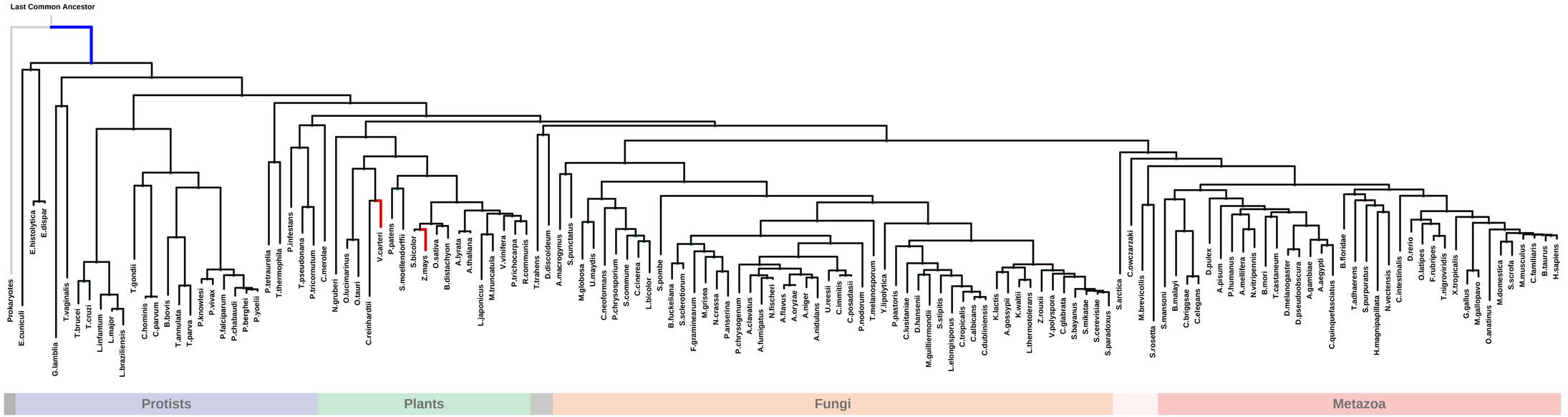


PG	Protein	LLR	Notes
A	ARFGEF2		1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9
A	ARFGEF1	29.9	9 / 10 / 11
A	IQSEC3	18.5	9 / 12 / 13
B	VPS13C	18.4	
A	PSD3	18.2	9 / 13 / 14
	XPOT	17.8	15
	KRR1	17.6	16
	ESF1	16.1	
B	VPS13A	15.5	
	REV3L	15.4	17 / 18
C	PRKAR2A	15.0	19 / 20
	ATAD5	14.9	
	MDN1	14.7	
	NAT10	13.8	
A	PSD	13.8	9 / 21
A	PSD4	13.8	9
	TAF9	12.9	22 / 23 / 24 / 25 / 26 / 27 /
D	IPO7	12.7	15
E	NARF	12.4	29 / 30 / 31
E	NARFL	12.4	32
F	TATDN2	12.3	
G	TRIM21	11.9	16 / 33 / 34
C	PRKAR2B	11.7	19 / 35
H	ANKRD45	11.7	
	ERCC3	11.7	36 / 37
I	DDX23	11.6	38 / 39
D	CSE1L	11.4	15
	DIEXF	11.3	
J	PIAS1	10.7	40
J	PIAS2	10.7	40 / 41
J	PIAS3	10.7	42 / 43
J	PIAS4	10.7	10 / 41
J	ZMIZ1	10.7	40
J	ZMIZ2	10.7	44
	SEL1L2	9.8	

1: asymmetric synapse || 2: axonemal microtubule || 3: cytoplasmic membrane-bounded vesicle || 4: cytoplasmic vesicle || 5: dendritic spine || 6: microtubule organizing center || 7: recycling endosome || 8: symmetric synapse ||
9: trans-Golgi network || 10: nuclear matrix || 11: small nuclear ribonucleoprotein complex || 12: inhibitory synapse || 13: postsynaptic membrane || 14: postsynaptic density || 15: nuclear pore || 16: ribonucleoprotein complex ||
17: chromosome || 18: zeta DNA polymerase complex || 19: cAMP-dependent protein kinase complex || 20: T-tubule || 21: ruffle || 22: Cajal body || 23: MLL1 complex || 24: PCAF complex || 25: pre-snoRNP complex ||

ECM 13, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 405

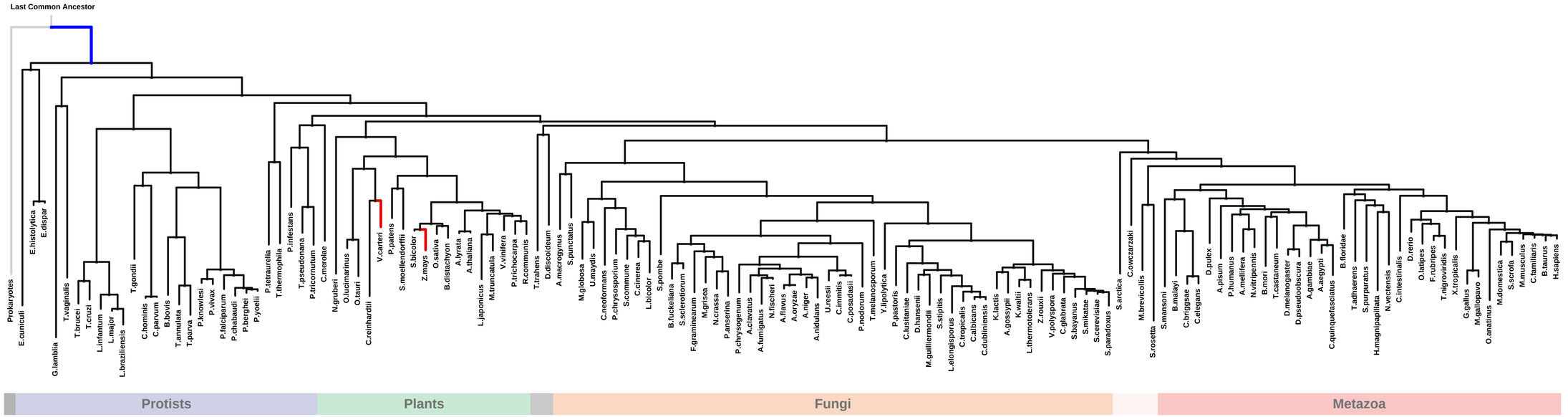


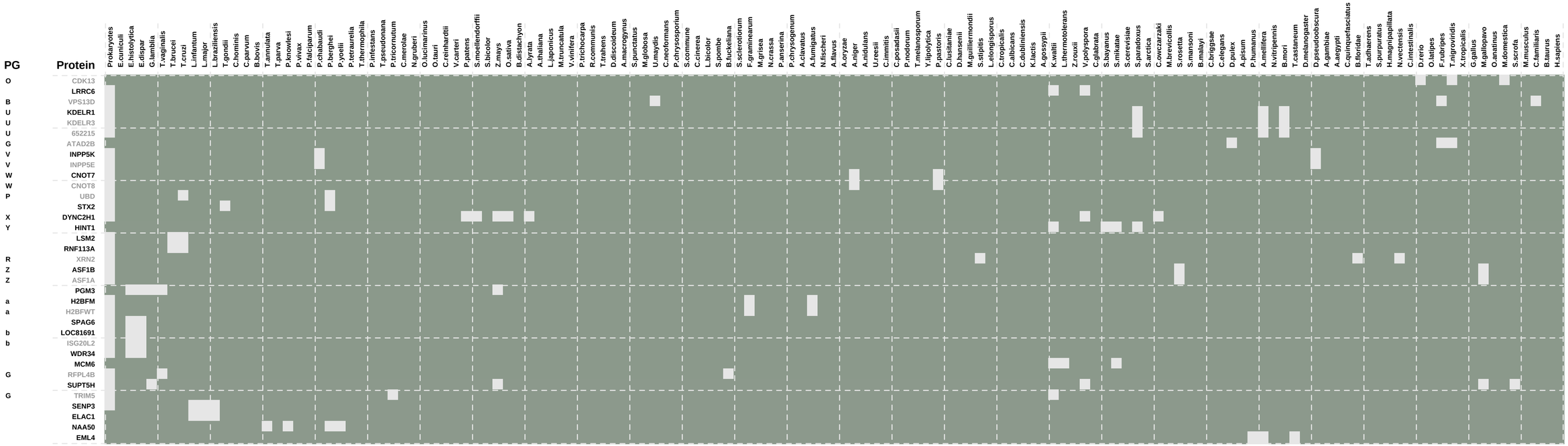
PG	Protein	LLR	Notes
	ISCU	9.2	
G	TAF1L	8.8	1
K	PTEN	8.5	2 / 3 / 4 / 5 / 6 / 7
G	TRIM25	8.2	
F	TATDN3	8.2	
L	PIGO	8.1	
	WRNIP1	8.1	
	RAD23A	8.0	8
	RSL24D1P11	7.8	
M	SLC25A25	7.7	
N	YEATS4	7.7	9 / 10
O	CDKL2	7.7	
	ASCC3	7.7	
	VPS53	7.7	11 / 12
	SIRT1	7.6	6 / 13 / 14 / 15 / 16 / 17 / 1
	ZFAND4	7.6	
P	ISG15	7.6	
	UBL4B	7.6	
G	UHRF2	7.6	18
	TBC1D9	7.5	
Q	GZF1	7.5	
	PRPF8	7.5	21 / 22 / 23
G	CHD1	7.4	
R	XRN1	7.4	24
G	RNF135	7.3	
	SDAD1	7.2	
A	FBXO8	7.2	25 / 26
	ATP6V1H	7.1	27
	TMEM30A	7.0	
S	UTP18	7.0	
T	PUS7	7.0	
T	PUS7L	7.0	
O	MAP3K5	6.9	
	PFDN5	6.9	28
G	LONRF2	6.6	

1: transcription factor TFIID complex || 2: cell projection || 3: internal side of plasma membrane || 4: myelin sheath adaxonal region || 5: neuron projection || 6: PML body || 7: Schmidt-Lanterman incisure || 8: proteasome complex ||
9: NuA4 histone acetyltransferase complex || 10: nuclear matrix || 11: endosome membrane || 12: GARP complex || 13: chromatin silencing complex || 14: ESC/E(Z) complex || 15: nuclear chromatin || 16: nuclear envelope ||
17: nuclear euchromatin || 18: nuclear heterochromatin || 19: nuclear inner membrane || 20: rDNA heterochromatin || 21: catalytic step 2 spliceosome || 22: nuclear speck || 23: U5 snRNP || 24: intermediate filament cytoskeleton ||

ECM 13, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 405

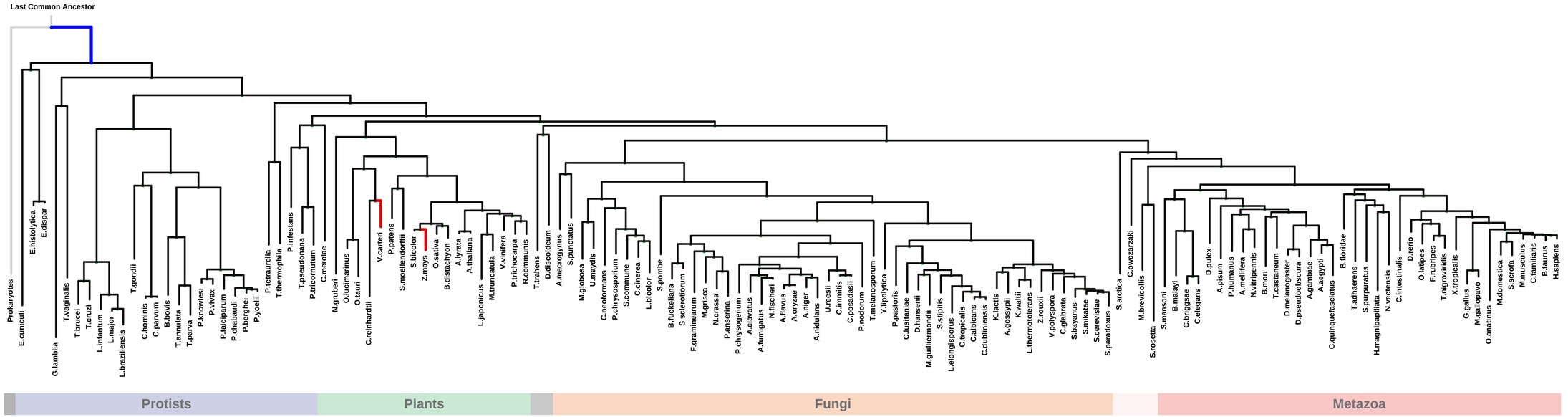




1: nuclear cyclin-dependent protein kinase holoenzyme complex || 2: nuclear speck || 3: cilium || 4: cis-Golgi network || 5: endoplasmic reticulum-Golgi intermediate compartment || 6: neuron projection || 7: ruffle || 8: ruffle membrane || 9: trans-Golgi network || 10: cilium axoneme || 11: Golgi cisterna membrane || 12: CCR4-NOT complex || 13: cytoplasmic mRNA processing body || 14: aggresome || 15: basolateral plasma membrane || 16: cell-cell junction || 17: membrane raft || 18: midbody || 19: transport vesicle || 20: apical part of cell || 21: dynein complex || 22: motile primary cilium || 23: catalytic step 2 spliceosome || 24: chromatin || 25: chromatin remodeling complex ||

ECM 13, Gene set "microtubule organizing center", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 405

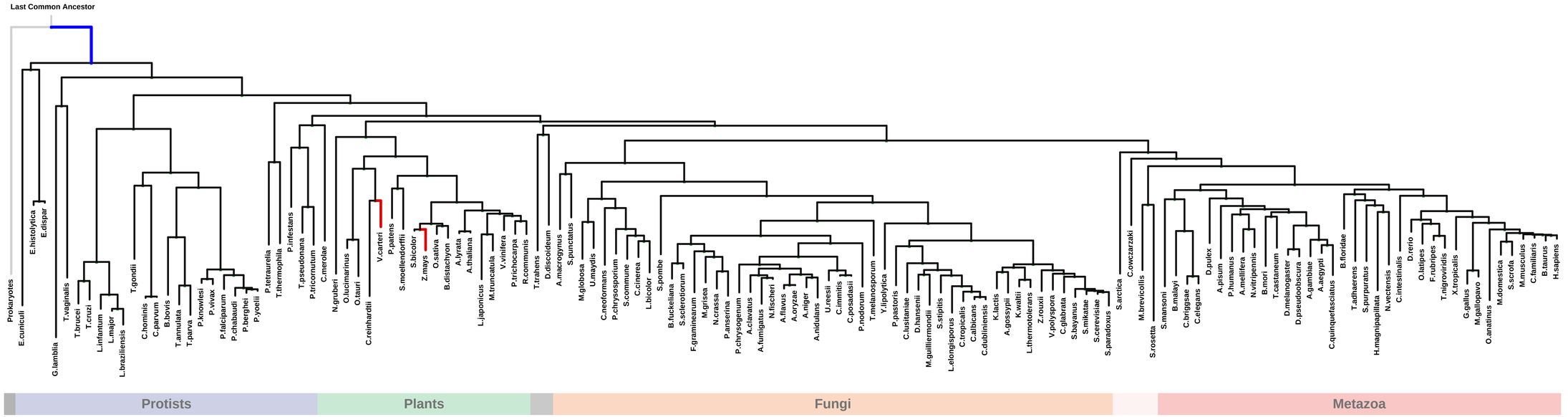


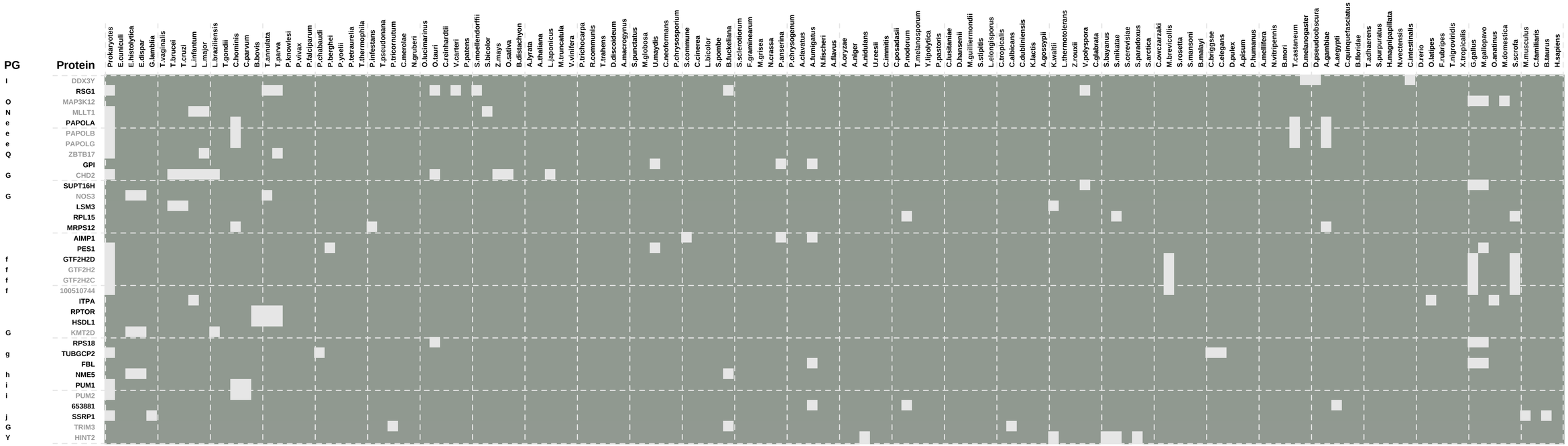
PG	Protein	LLR	Notes
G	TRIM62	5.6	
C	HCN2	5.6	1 / 2 / 3 / 4
	RPS5	5.6	5 / 6
L	PIGG	5.6	
G	TRIM4	5.6	
G	PCGF1	5.6	7
	ATR	5.5	8 / 9 / 10
	HIPK2	5.5	
	PIK3C2B	5.4	11
	PSMD4	5.4	12 / 13
	ZC3H4	5.3	
B	VPS13B	5.3	
	ATP6V1C1	5.2	14 / 15 / 16 / 17
	AKTIP	5.2	18 / 19
	POLR3F	5.1	20
c	UBTD2	5.0	
c	UBTD1	5.0	
	DUS3L	5.0	
	SF3A3	4.9	21 / 22 / 23
G	TRIM11	4.9	
	XAB2	4.8	21
	RPS9	4.7	5 / 6 / 24
G	TRIM35	4.7	
d	GSPT2	4.6	
	PELO	4.6	
	NOL10	4.6	
	MRE11A	4.6	25 / 26 / 27 / 28
	PCNA	4.6	29 / 30 / 31 / 32
	MYO18A	4.5	33 / 34 / 35
	TOP3A	4.5	8 / 9
	NACA	4.5	
	COPA	4.5	36
G	KMT2A	4.5	37 / 38
	RABL6	4.4	
	SF3A2	4.4	21 / 23 / 39

1: axon || 2: dendritic shaft || 3: synapse || 4: voltage-gated potassium channel complex || 5: cytosolic small ribosomal subunit || 6: ribonucleoprotein complex || 7: PcG protein complex || 8: chromosome || 9: PML body ||
10: XY body || 11: endocytic vesicle || 12: proteasome accessory complex || 13: proteasome complex || 14: apical part of cell || 15: cytoplasmic vesicle || 16: proton-transporting two-sector ATPase complex || 17: proton-transporting V-type ATPase, V1 domain ||
18: FHF complex || 19: HOPS complex || 20: DNA-directed RNA polymerase III complex || 21: catalytic step 2 spliceosome || 22: nuclear speck || 23: spliceosomal complex || 24: ribosome || 25: chromosome, telomeric region ||

ECM 13, Gene set "microtubule organizing center", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 405

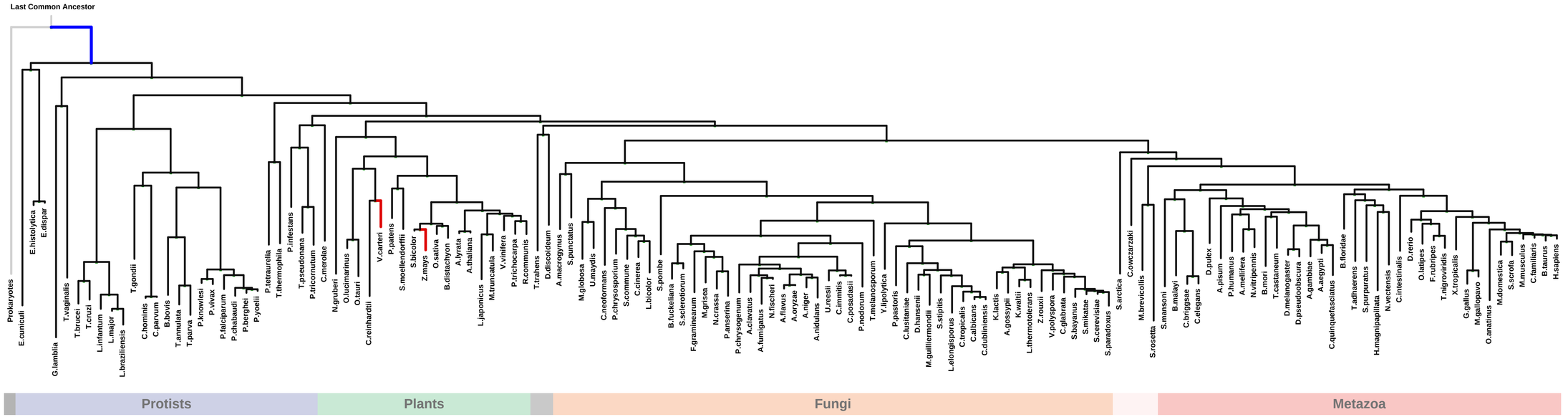




1: cilium || 2: microtubule basal body || 3: chromosome || 4: apical part of cell || 5: caveola || 6: endocytic vesicle membrane || 7: catalytic step 2 spliceosome || 8: cytosolic large ribosomal subunit || 9: ribosome || 10: mitochondrial ribosome ||
11: small ribosomal subunit || 12: aminoacyl-tRNA synthetase multienzyme complex || 13: transport vesicle || 14: condensed chromosome || 15: PeBoW complex || 16: preribosome, large subunit precursor || 17: holo TFIIH complex ||
18: dendrite || 19: lysosome || 20: TORC1 complex || 21: histone methyltransferase complex || 22: cytosolic small ribosomal subunit || 23: cytoplasmic microtubule || 24: microtubule organizing center || 25: spindle pole ||

ECM 13, Gene set "microtubule organizing center", Page 6

Num of ECM Genes: 1. Num of Predicted Genes: 405

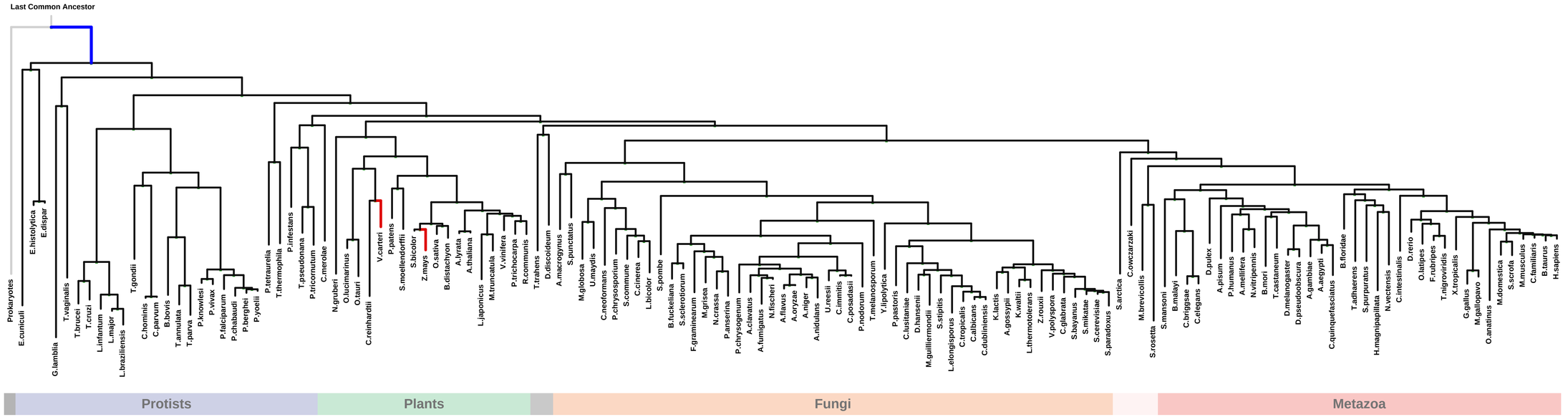


PG	Protein	LLR	Notes
V	INPP5J	3.5	1 / 2 / 3
C	HCN1	3.5	4 / 5
G	EP300	3.5	6 / 7 / 8
	IARS	**3.5**	
	RPL13A	**3.4**	9 / 10 / 11
G	SETD1A	3.3	12 / 13 / 14 / 15
j	HMGB3P27	3.3	12
j	100508670	3.3	
j	HMGB2	3.3	16
	RFWD3	**3.3**	17
	PPAN-P2RY11	**3.3**	
	ABHD17A	**3.3**	
H	LRG1	3.3	
H	FEM1C	3.2	
	PSMC2	**3.2**	18 / 19
	UBA1	**3.2**	
H	PHLPP2	3.2	
O	LATS1	3.1	20 / 21
	SLC36A4	**3.1**	
k	**FNTA**	**3.1**	22
H	LOC100289085	3.0	
	PTRH2	**3.0**	
I	**EIF4E1B**	**3.0**	23
I	EIF4E2	3.0	23
I	EIF4E	3.0	23 / 24 / 25 / 26 / 27
g	TUBGCP3	3.0	28 / 29 / 30
b	LOC100288562	3.0	
b	REXO1L1	3.0	
m	**SLC2A6**	**3.0**	
m	SLC2A8	3.0	31 / 32
b	REXO1L11P	3.0	
b	REXO1L10P	3.0	
	PIGA	**3.0**	33
G	ZMYND8	2.9	
	CHRAC1	**2.9**	34 / 35

1: dendritic shaft || 2: growth cone || 3: ruffle || 4: axon || 5: dendrite || 6: chromatin || 7: histone acetyltransferase complex || 8: protein-DNA complex || 9: cytosolic large ribosomal subunit || 10: large ribosomal subunit || 11: ribonucleoprotein complex || 12: chromosome || 13: histone methyltransferase complex || 14: nuclear speck || 15: Set1C/COMPASS complex || 16: condensed chromosome || 17: PML body || 18: proteasome accessory complex || 19: proteasome complex || 20: microtubule organizing center || 21: spindle pole || 22: microtubule associated complex || 23: mRNA cap binding complex || 24: cytoplasmic mRNA processing body || 25: cytoplasmic stress granule ||

ECM 13, Gene set "microtubule organizing center", Page 7

Num of ECM Genes: 1. Num of Predicted Genes: 405

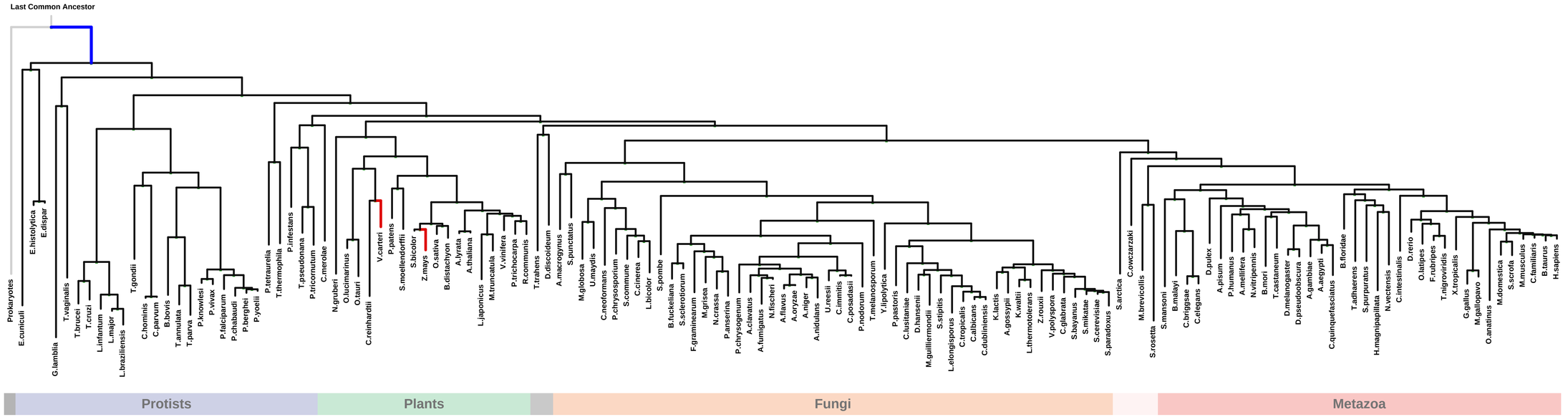


PG	Protein	LLR	Notes
b	RPL5	2.9	1 / 2
	PAN2	2.9	
Q	ZBTB41	2.8	
d	GSPT1	2.8	
	TBCE	2.7	
	AGAP3	2.7	3
	SNAPC4	2.7	
n	RPL26L1	2.7	4
n	RPL26	2.7	1
o	ZNRF1	2.7	5 / 6 / 7
o	ZNRF2	2.7	8 / 9 / 10
p	EIF2B3	2.6	11
p	GMPPB	2.6	
	MAK16	2.6	
	TRMT2A	2.6	
	ABCC2	2.6	12
	SNRPB	2.6	13 / 14 / 15 / 16 / 17 / 18
H	ANKRD13B	2.6	
	BUB1	2.6	19 / 20 / 21
G	TRIM22	2.5	22 / 23
O	HIPK1	2.5	23 / 24
	IBTK	2.5	
	METAP1D	2.5	
G	BRCA1	2.4	2 / 25 / 26 / 27 / 28 / 29 / 3
q	PMM2	2.4	
q	PMM1	2.4	
O	ABL1	2.4	33 / 34
H	SLIT2	2.4	
	TRMT1	2.4	
H	IGFALS	2.4	
	STON1-GTF2A1L	2.4	
r	NMT2	2.3	
r	NMT1	2.3	33
	CHPT1	2.3	
s	TMTC1	2.3	

1: cytosolic large ribosomal subunit || 2: ribonucleoprotein complex || 3: cell periphery || 4: large ribosomal subunit || 5: endosome || 6: lysosome || 7: synaptic vesicle membrane || 8: endosome membrane || 9: lysosomal membrane ||
10: presynaptic membrane || 11: eukaryotic translation initiation factor 2B complex || 12: intercellular canaliculus || 13: catalytic step 2 spliceosome || 14: histone pre-mRNA 3'end processing complex || 15: small nuclear ribonucleoprotein complex ||
16: spliceosomal complex || 17: U12-type spliceosomal complex || 18: U7 snRNP || 19: condensed chromosome kinetochore || 20: condensed nuclear chromosome, centromeric region || 21: kinetochore || 22: Cajal body || 23: nuclear speck ||

ECM 13, Gene set "microtubule organizing center", Page 8

Num of ECM Genes: 1. Num of Predicted Genes: 405

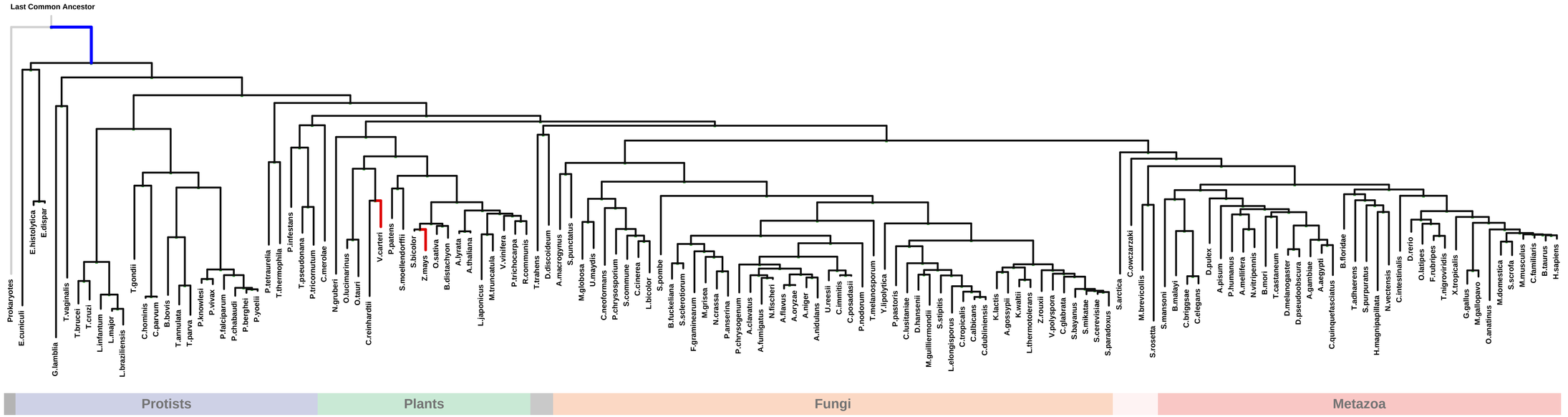


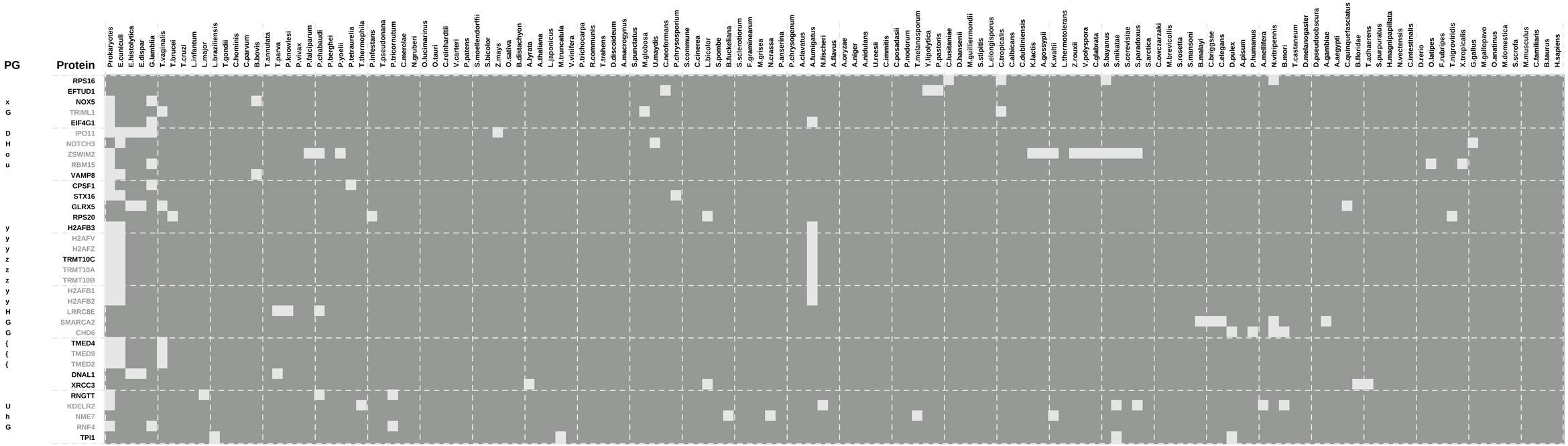
PG	Protein	LLR	Notes
m	SLC2A9	2.3	1
	SF3B2	2.2	2 / 3 / 4
	DERL2	2.2	5 / 6 / 7
	SUPT6H	2.2	
	GGPS1	2.1	
	100510614	2.1	
G	NOS1	2.1	8 / 9 / 10 / 11
t	DIAPH2	2.1	5
t	INF2	2.1	
t	DAAM2	2.1	
t	DAAM1	2.1	12
t	DIAPH1	2.1	13 / 14
j	100508832	2.1	
j	HMGB1P40	2.1	
	HMGB1P40	2.1	
u	SPEN	2.1	15
v	RPL10	2.0	16
v	RPL10L	2.0	16
	CDIPT	2.0	
M	CAPS	2.0	
	RHOBTB2	2.0	
	HCFC2	1.9	
G	WHSC1	1.9	17 / 18
C	RAPGEF3	1.9	19 / 20
H	LRRTM4	1.9	21
H	LRRC8C	1.9	
H	SHOC2	1.9	22
H	LRRTM2	1.9	21
	POLR2G	1.8	23
G	RNF2	1.8	24 / 25 / 26 / 27 / 28 / 29
	TOP2A	1.8	30 / 31 / 32 / 33
	ZC3H7B	1.8	
s	CDC27	1.8	34 / 35 / 36
w	EPN3	1.8	37
w	EPN1	1.8	38

1: nuclear envelope || 2: catalytic step 2 spliceosome || 3: spliceosomal complex || 4: U12-type spliceosomal complex || 5: early endosome || 6: integral to endoplasmic reticulum membrane || 7: late endosome || 8: dendritic spine ||
9: photoreceptor inner segment || 10: sarcolemma || 11: sarcoplasmic reticulum || 12: stress fiber || 13: mitotic spindle || 14: ruffle membrane || 15: transcriptional repressor complex || 16: cytosolic large ribosomal subunit ||
17: chromosome || 18: nuclear membrane || 19: cAMP-dependent protein kinase complex || 20: endomembrane system || 21: postsynaptic membrane || 22: protein phosphatase type 1 complex || 23: DNA-directed RNA polymerase II, core complex ||

ECM 13, Gene set "microtubule organizing center", Page 9

Num of ECM Genes: 1. Num of Predicted Genes: 405

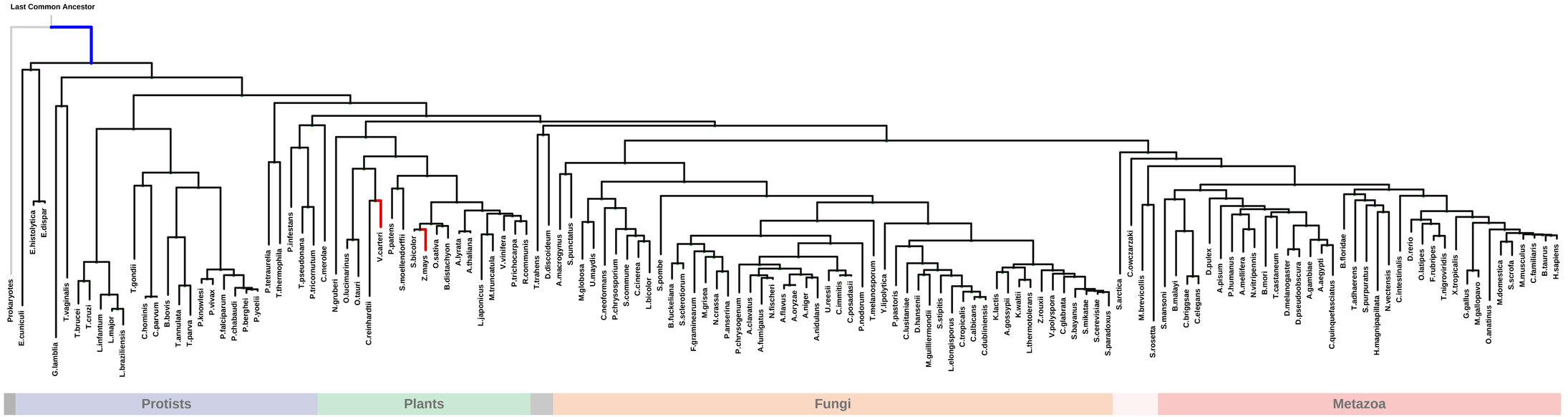


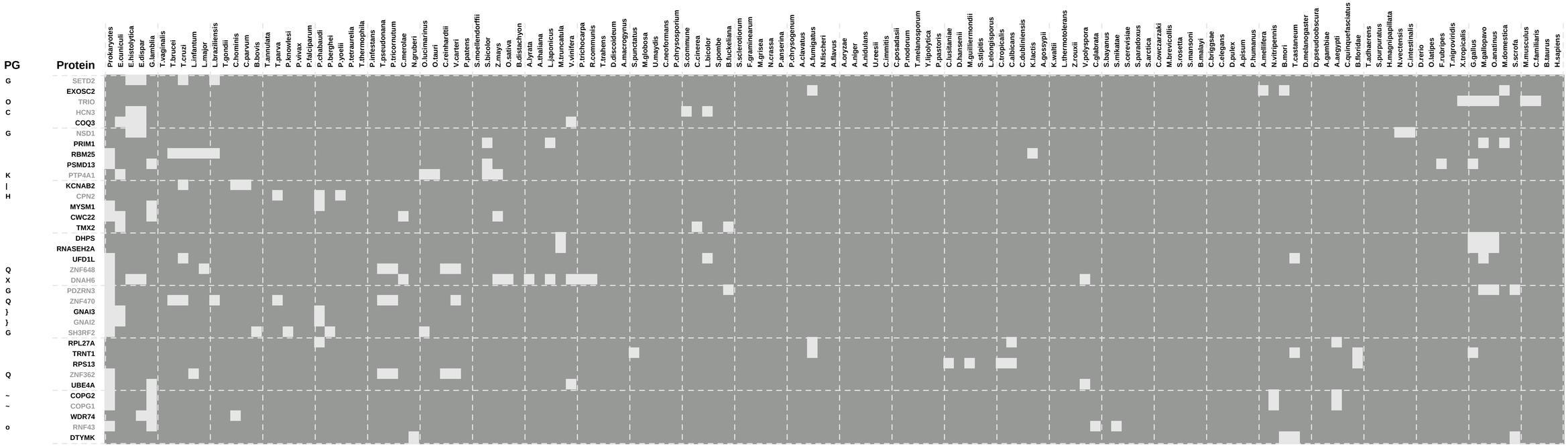


1: cytosolic small ribosomal subunit || 2: small ribosomal subunit || 3: eukaryotic translation initiation factor 4F complex || 4: nuclear pore || 5: early endosome || 6: late endosome membrane || 7: lysosomal membrane || 8: recycling endosome ||
9: secretory granule membrane || 10: SNARE complex || 11: mRNA cleavage and polyadenylation specificity factor complex || 12: nucleosome || 13: Barr body || 14: nuclear nucleosome || 15: transcriptionally active chromatin ||
16: intermediate filament cytoskeleton || 17: nBAF complex || 18: npBAF complex || 19: nuclear chromatin || 20: SWI/SNF complex || 21: WINAC complex || 22: endoplasmic reticulum-Golgi intermediate compartment || 23: endoplasmic reticulum-Golgi intermediate compartment membrane ||

ECM 13, Gene set "microtubule organizing center", Page 10

Num of ECM Genes: 1. Num of Predicted Genes: 405

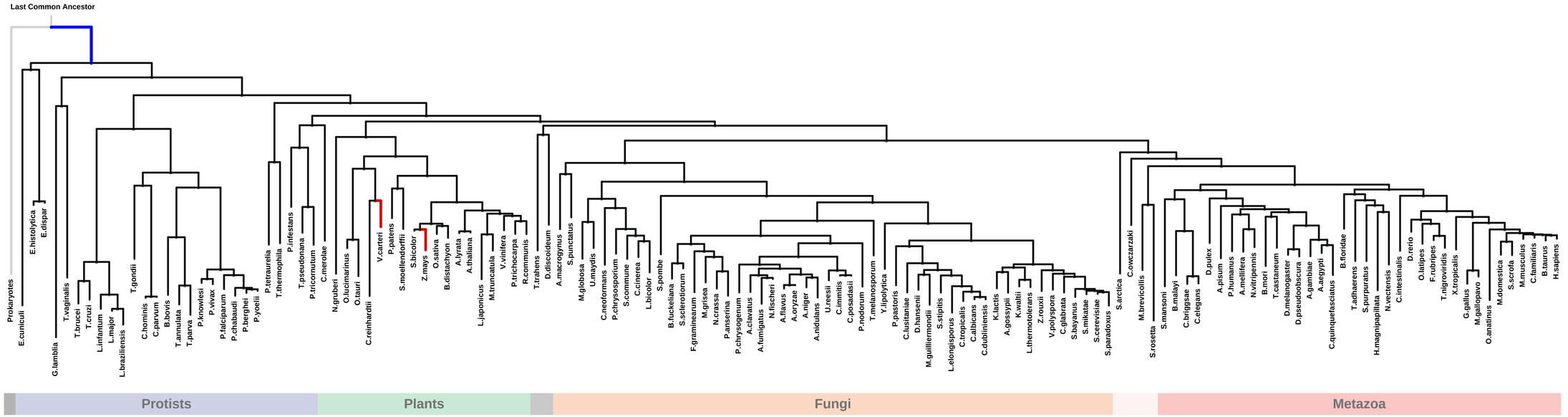


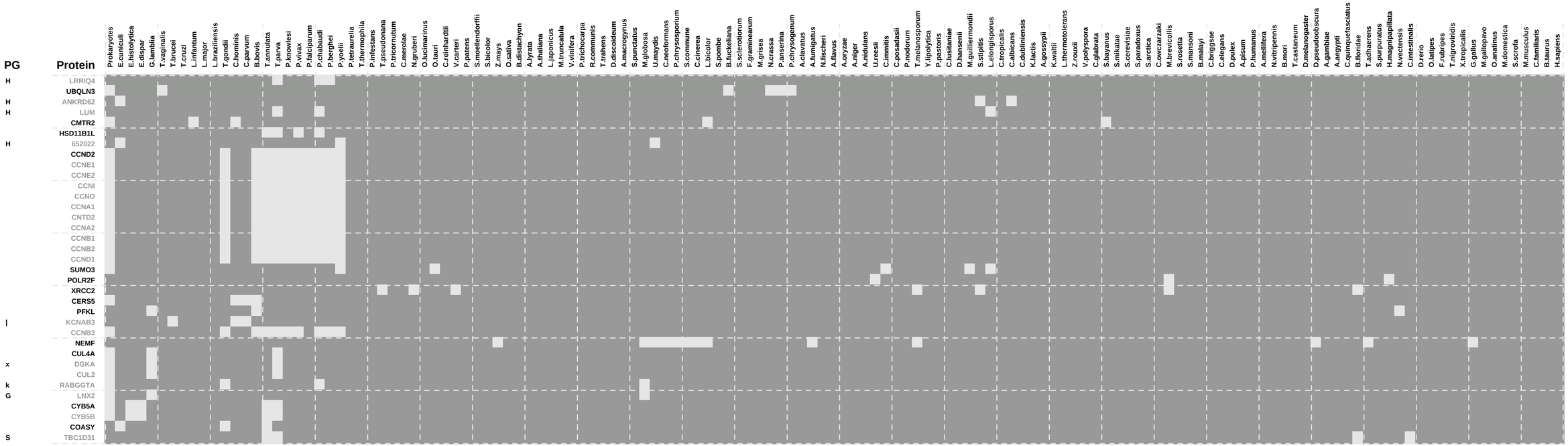


1: chromosome || 2: exosome (RNase complex) || 3: alpha DNA polymerase:primase complex || 4: nuclear speck || 5: proteasome accessory complex || 6: proteasome complex || 7: proteasome regulatory particle || 8: early endosome ||
9: internal side of plasma membrane || 10: spindle || 11: juxtaparanode region of axon || 12: chromatin remodeling complex || 13: catalytic step 2 spliceosome || 14: spliceosomal complex || 15: ribonuclease H2 complex || 16: axonemal dynein complex ||
17: cilium axoneme || 18: neuromuscular junction || 19: extrinsic to internal side of plasma membrane || 20: heterotrimeric G-protein complex || 21: membrane raft || 22: midbody || 23: zymogen granule || 24: cytosolic large ribosomal subunit ||

ECM 13, Gene set "microtubule organizing center", Page 11

Num of ECM Genes: 1. Num of Predicted Genes: 405

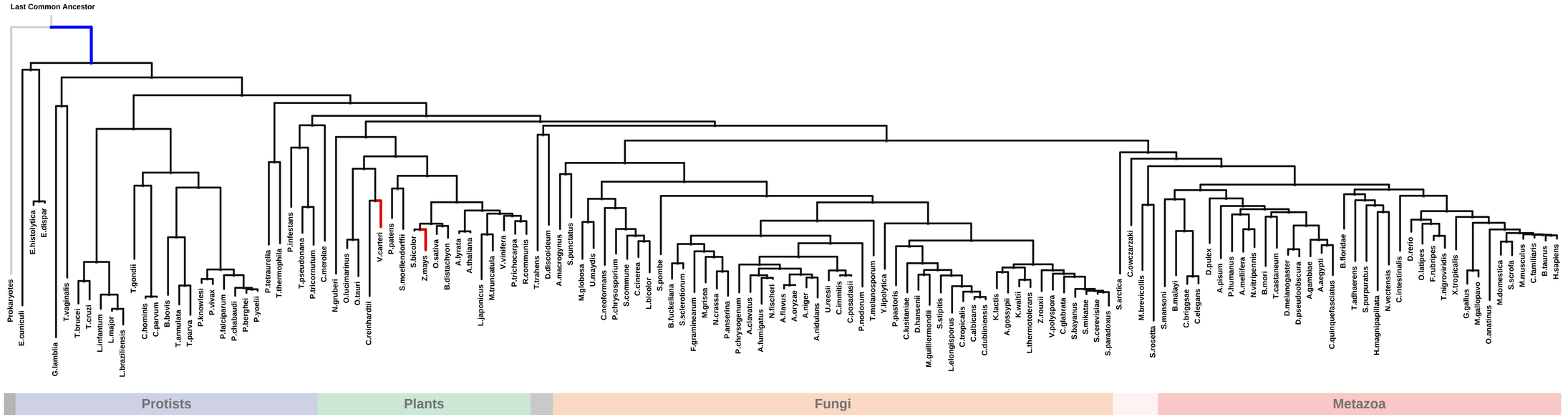


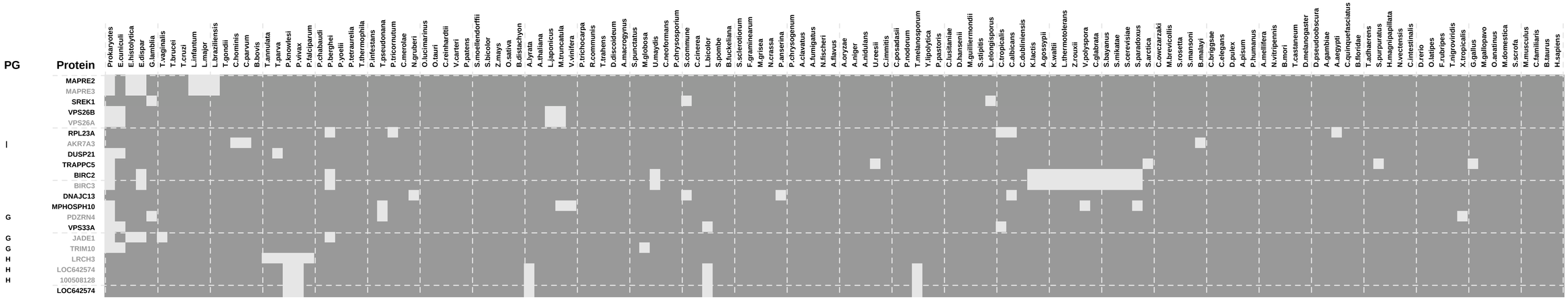


1: extracellular matrix || 2: fibrillar collagen || 3: Golgi lumen || 4: lysosomal lumen || 5: proteinaceous extracellular matrix || 6: chromatin || 7: cyclin-dependent protein kinase holoenzyme complex || 8: nuclear membrane ||
9: microtubule cytoskeleton || 10: female pronucleus || 11: male pronucleus || 12: condensed nuclear chromosome outer kinetochore || 13: spindle pole || 14: kinetochore || 15: DNA-directed RNA polymerase II, core complex || 16: 6-phosphofructokinase complex ||
17: Cul4A-RING ubiquitin ligase complex || 18: Cul4-RING ubiquitin ligase complex || 19: Cul2-RING ubiquitin ligase complex || 20: mitochondrial outer membrane

ECM 13, Gene set "microtubule organizing center", Page 12

Num of ECM Genes: 1. Num of Predicted Genes: 405

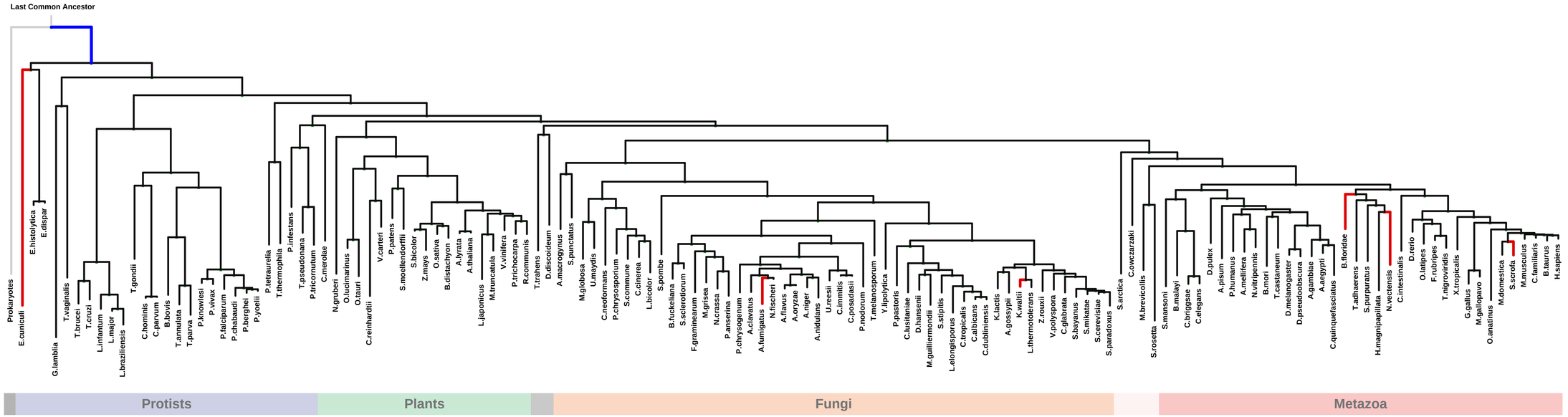


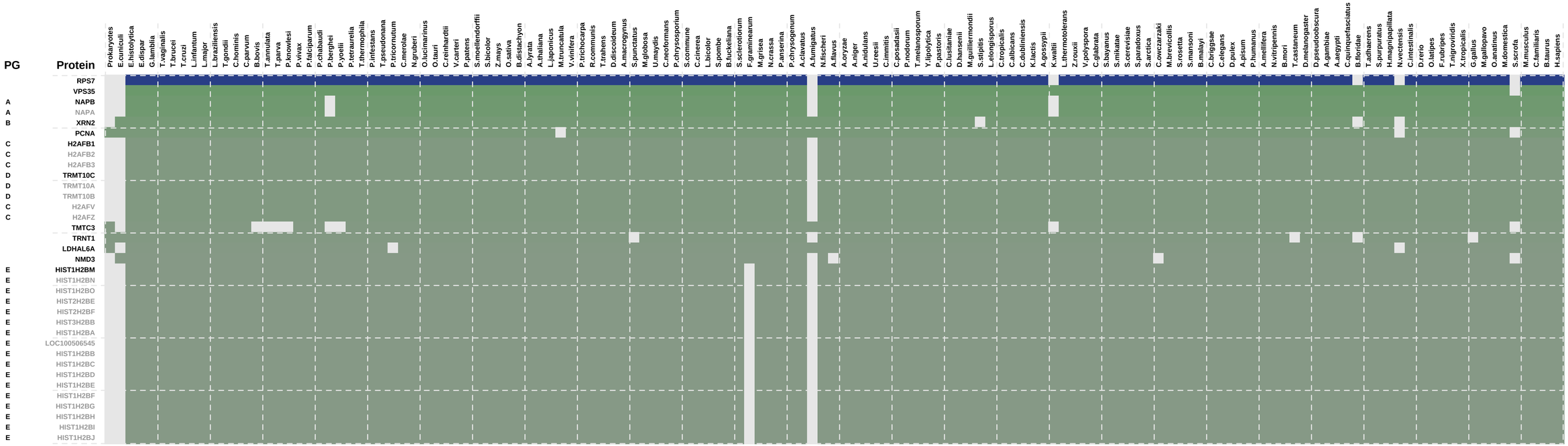


1: microtubule cytoskeleton || 2: cytoplasmic microtubule || 3: midbody || 4: spliceosomal complex || 5: retromer complex || 6: endosome || 7: endosome membrane || 8: vesicle || 9: cytosolic large ribosomal subunit ||
10: TORC2 complex || 11: TRAPP complex || 12: CD40 receptor complex || 13: internal side of plasma membrane || 14: chromosome || 15: small nucleolar ribonucleoprotein complex || 16: early endosome || 17: HOPS complex ||
18: late endosome || 19: late endosome membrane || 20: lysosomal membrane || 21: histone acetyltransferase complex

ECM 14, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 79

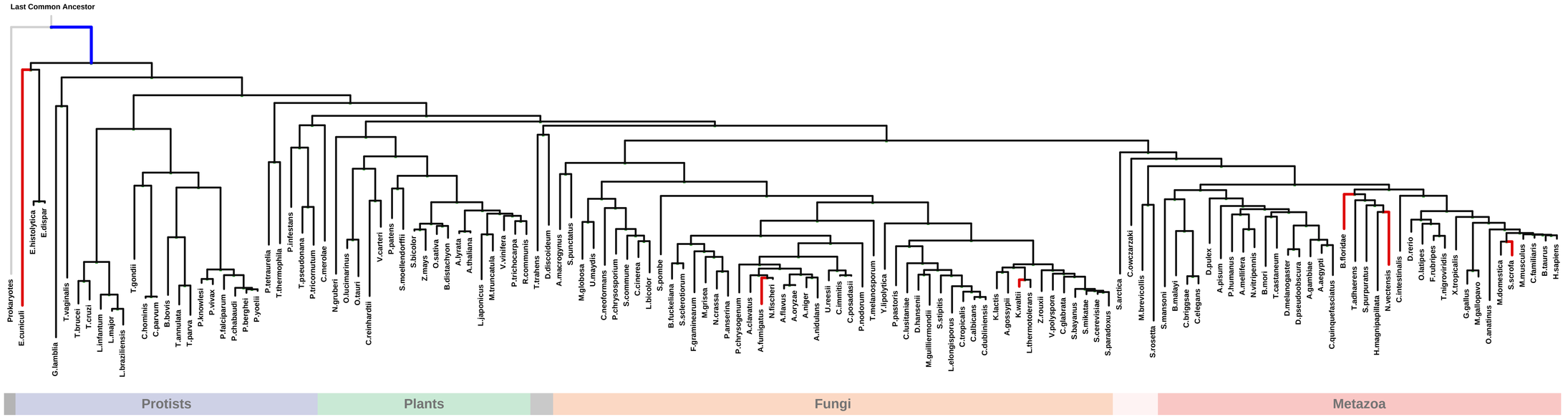




1: 90S preribosome || 2: cytosolic small ribosomal subunit || 3: microtubule organizing center || 4: ribonucleoprotein complex || 5: ribosome || 6: small-subunit processome || 7: endosome || 8: synaptobrevin 2-SNAP-25-syntaxin-1a complex ||
9: aggresome || 10: DNA replication factor C complex || 11: microtubule cytoskeleton || 12: nuclear replication fork || 13: PCNA-p21 complex || 14: nuclear nucleosome || 15: transcriptionally active chromatin || 16: nucleosome ||
17: Barr body || 18: extrinsic to plasma membrane

ECM 14, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 79

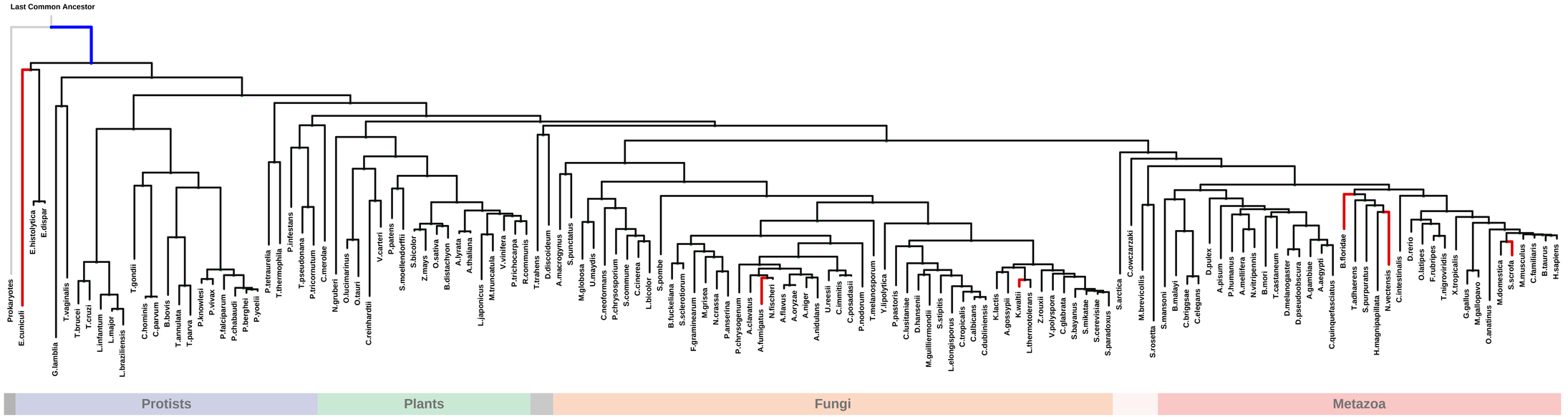


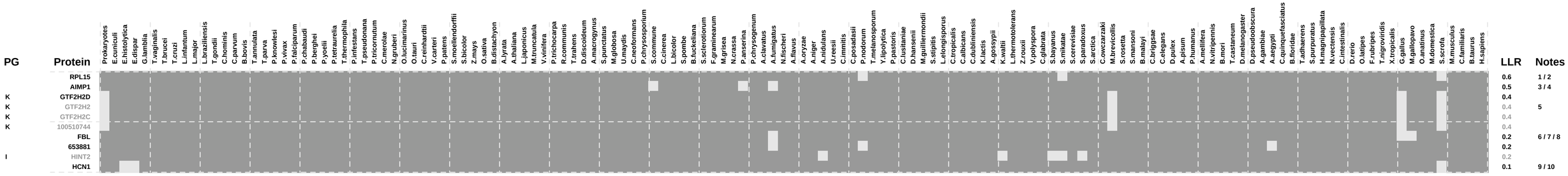
PG	Protein	LLR	Notes
E	HIST1H2BK	8.0	1
E	HIST1H2BL	8.0	1
E	100507927	8.0	
	RPL13	7.6	2 / 3
	EMG1	7.2	
	RER1	6.3	4
F	SRI	5.6	5 / 6 / 7
	RPS14	5.5	8
	IFT80	5.3	9 / 10
	NIP7	5.2	
G	TRIM60	4.9	
H	NFKBID	4.8	
	RSL24D1P11	4.4	
	CDKL2	4.2	
B	XRN1	3.9	11
	PPM1J	3.9	
	UTP18	3.5	
	RPL18	3.1	2
F	CAPNS1	3.0	
	PHF5A	3.0	12 / 13 / 14 / 15
	LRRC6	3.0	16
I	HINT1	2.8	
	RPLP2	2.6	2
E	H2BFWT	2.5	1 / 17
E	H2BFM	2.5	1
H	NOTCH1	2.5	18 / 19
	ASNA1	2.5	
G	TRIM5	2.3	20
	PSMD4	1.9	21 / 22
	UBXN2B	1.8	
J	STX5	1.6	23 / 24
J	100510546	1.6	
	RPL35A	1.4	2
	GPI	0.7	
	LSM3	0.6	25

1: nucleosome || 2: cytosolic large ribosomal subunit || 3: cytosolic ribosome || 4: integral to Golgi membrane || 5: sarcoplasmic reticulum membrane || 6: vesicle || 7: Z disc || 8: cytosolic small ribosomal subunit || 9: cilium axoneme ||
10: microtubule basal body || 11: intermediate filament cytoskeleton || 12: nuclear matrix || 13: nuclear speck || 14: U12-type spliceosomal complex || 15: U2 snRNP || 16: cilium || 17: nuclear membrane || 18: acrosomal vesicle ||
19: MAML1-RBP-Jkappa- ICN1 complex || 20: cytoplasmic mRNA processing body || 21: proteasome accessory complex || 22: proteasome complex || 23: endoplasmic reticulum-Golgi intermediate compartment membrane || 24: SNARE complex ||

ECM 14, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 79

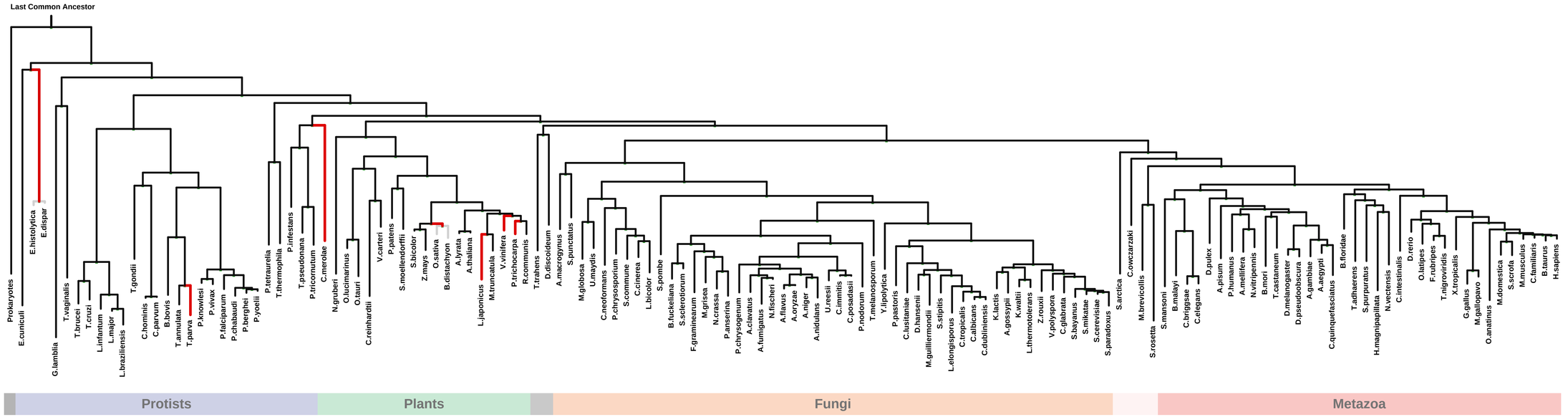


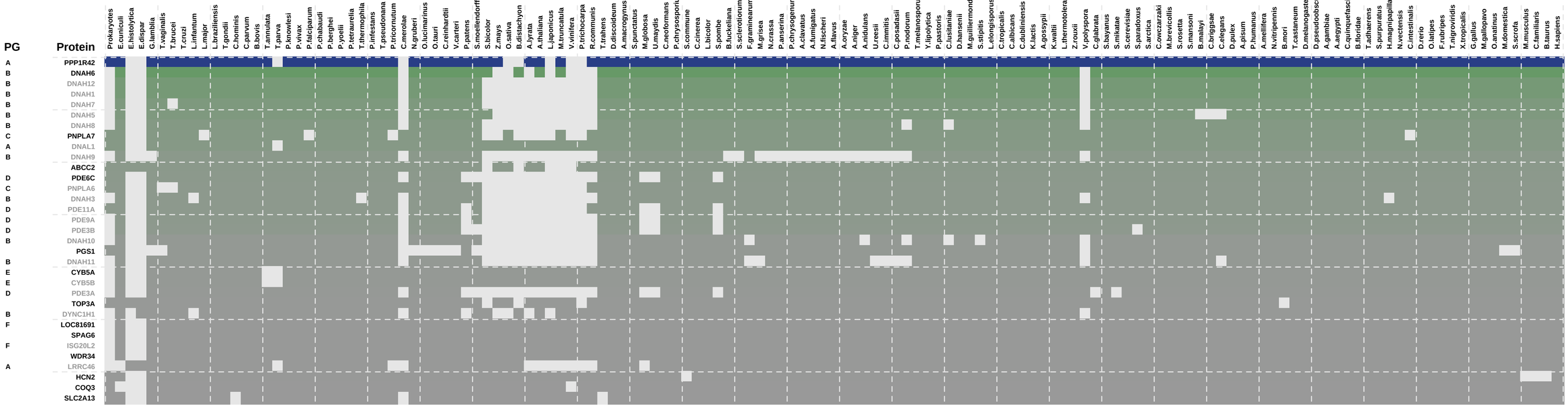


1: cytosolic large ribosomal subunit || 2: ribosome || 3: aminoacyl-tRNA synthetase multienzyme complex || 4: transport vesicle || 5: holo TFIIH complex || 6: box C/D snoRNP complex || 7: Cajal body || 8: granular component || 9: axon || 10: dendrite

ECM 15, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 32

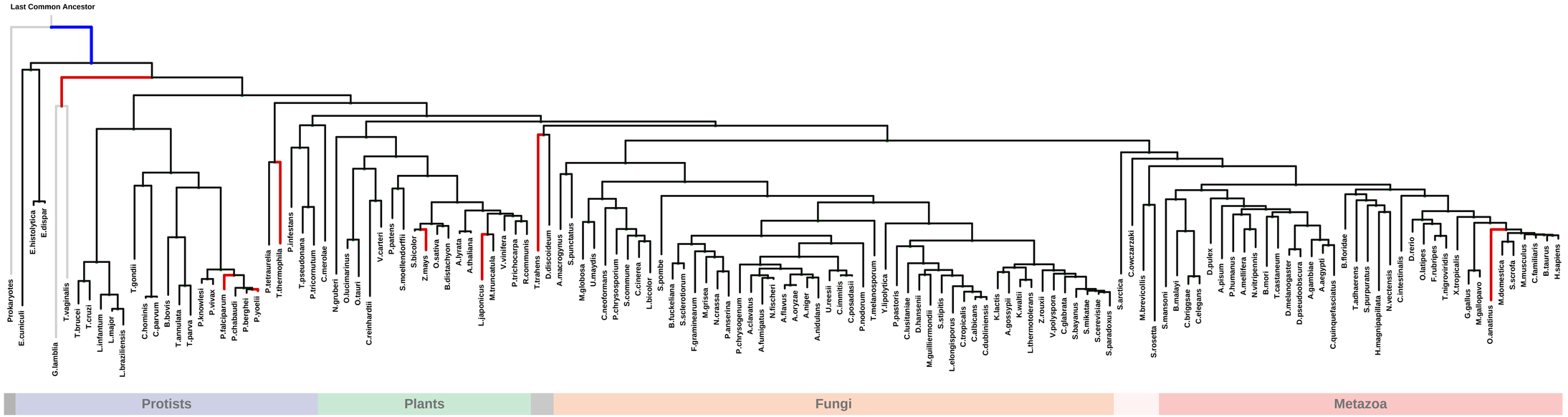


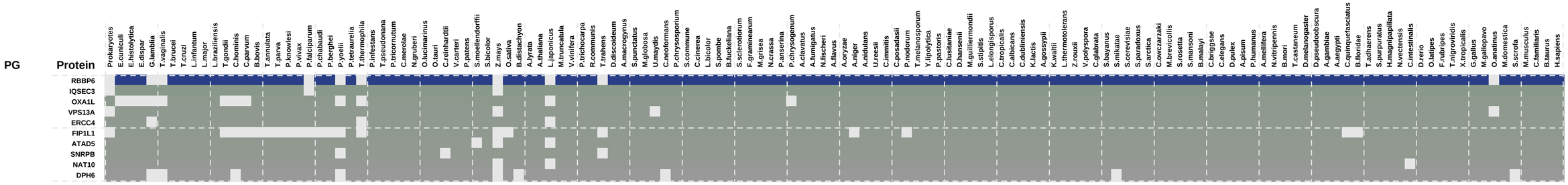


1: manchette || 2: microtubule cytoskeleton || 3: microtubule organizing center || 4: axonemal dynein complex || 5: cilium axoneme || 6: dynein complex || 7: cilium || 8: microtubule-based flagellum || 9: lysosomal membrane || 10: mitochondrial membrane || 11: nuclear membrane || 12: intercellular canaliculus || 13: perikaryon || 14: ruffle membrane || 15: guanyl-nucleotide exchange factor complex || 16: mitochondrial outer membrane || 17: chromosome || 18: PML body || 19: cytoplasmic dynein complex || 20: axoneme || 21: flagellum || 22: axon || 23: dendritic shaft || 24: synapse || 25: voltage-gated potassium channel complex

ECM 16, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 9

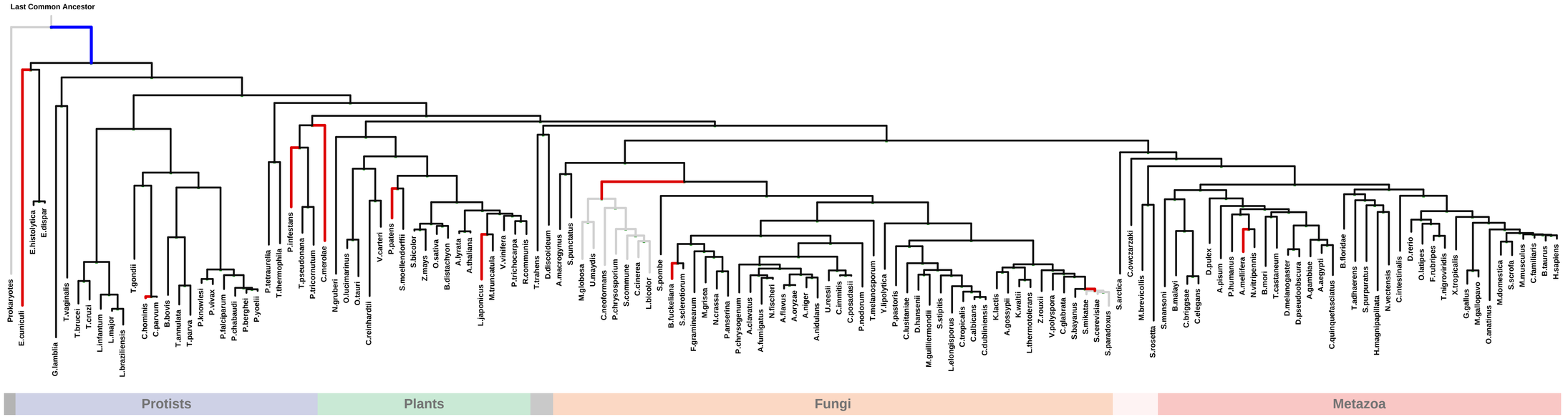




1: chromosome || 2: microtubule organizing center || 3: inhibitory synapse || 4: postsynaptic membrane || 5: trans-Golgi network || 6: integral to mitochondrial membrane || 7: mitochondrial membrane || 8: mitochondrial respiratory chain ||
9: chromosome, telomeric region || 10: nuclear chromosome, telomeric region || 11: nucleotide-excision repair complex || 12: mRNA cleavage and polyadenylation specificity factor complex || 13: catalytic step 2 spliceosome || 14: histone pre-mRNA 3'end processing complex ||
15: small nuclear ribonucleoprotein complex || 16: spliceosomal complex || 17: U12-type spliceosomal complex || 18: U7 snRNP

ECM 17, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 2

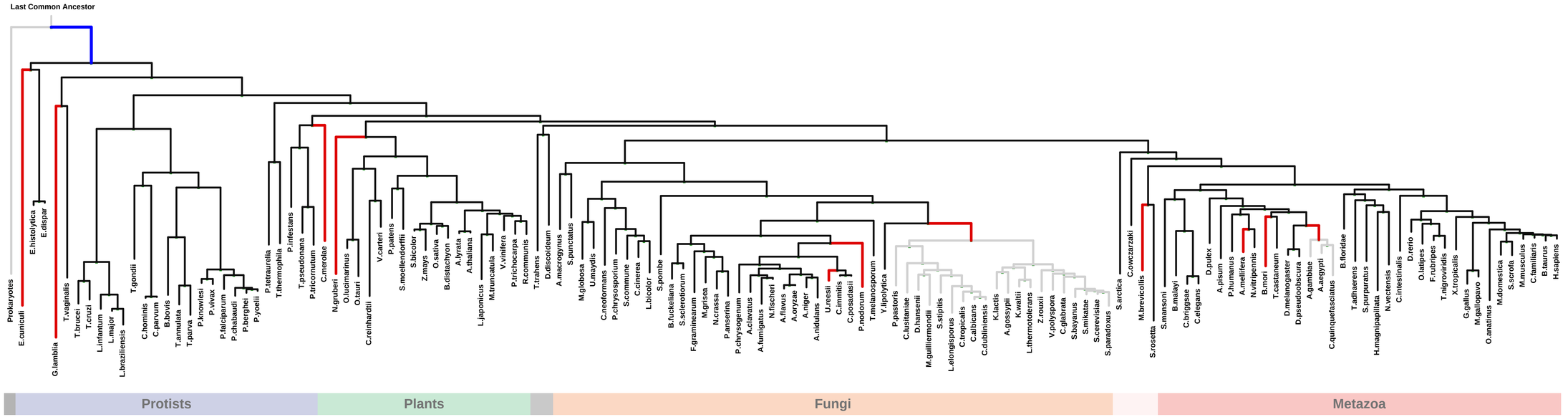


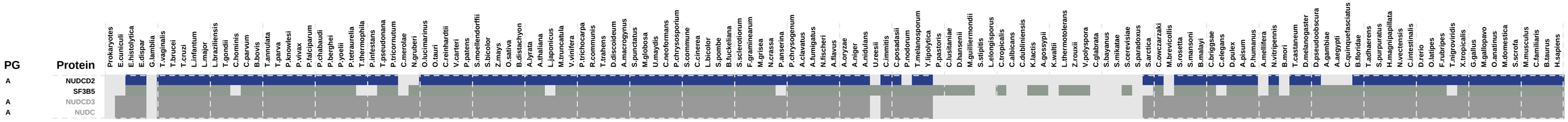
PG	Protein	LLR	Notes
	TRIP4		1
	SF3B5	2.1	2
	TRIM72	1.5	3 / 4

1: microtubule organizing center || 2: U12-type spliceosomal complex || 3: cytoplasmic vesicle membrane || 4: sarcolemma

ECM 18, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 3

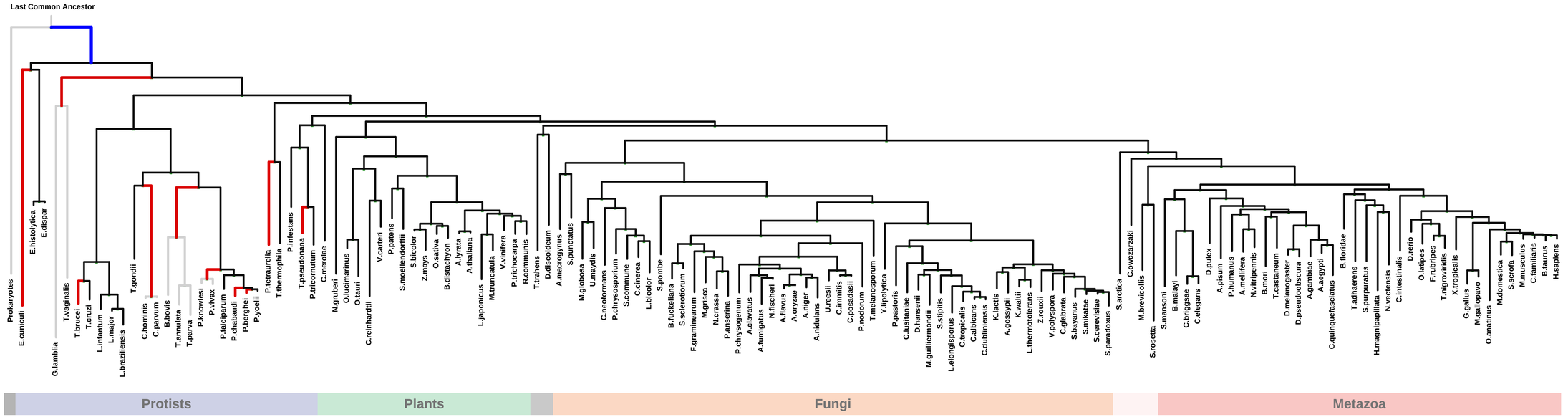




1: condensed chromosome kinetochore || 2: microtubule organizing center || 3: spindle pole || 4: U12-type spliceosomal complex

ECM 19, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 95



PG	Protein	LLR	Notes
A	PDCD6IP		1 / 2
	IPO9	18.3	3
B	FAP	16.8	4 / 5 / 6
B	DPP9	14.2	
A	PTPN23	11.0	7 / 8 / 9 / 10
B	DPP10	10.4	
C	SNX30	9.9	
D	GNAS	9.4	11 / 12 / 13 / 14 / 15 / 16
	SLC27A2	9.3	17 / 18 / 19 / 20
E	ADH6	9.2	
	JMJD7-PLA2G4B	8.9	
F	TMED7	8.8	21 / 22 / 23 / 24
G	GRHPR	8.6	25
G	CTBP1	8.6	26
G	CTBP2	8.6	26 / 27
G	PHGDH	8.6	
H	PGM5	8.5	28 / 29 / 30 / 31 / 32 / 33 /
I	SDR42E1	8.4	
	PPME1	8.1	
	AKR1B10	7.2	37
J	ALDH16A1	7.2	
	WDR52	6.9	
	EBNA1BP2	6.7	
	REV1	6.7	
	LARP4	6.6	
K	CLCN3	6.3	38 / 39 / 40 / 41 / 42 / 43
K	CLCN4	6.3	39 / 41
K	CLCN5	6.3	44 / 45
K	CLCN6	6.3	45
K	CLCN7	6.3	46 / 47
K	CLCNKA	6.3	48
K	CLCNKB	6.3	48
	ALG2	6.0	
	GCA	5.9	
	LNX1	5.7	

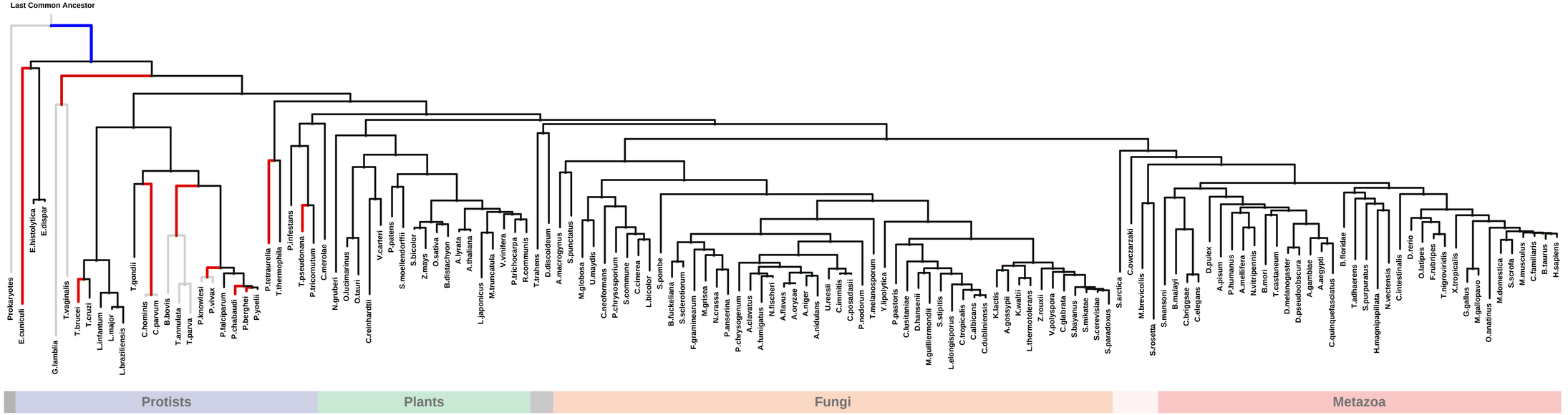
1: melanosome || 2: microtubule organizing center || 3: nuclear pore || 4: invadopodium membrane || 5: lamellipodium || 6: lamellipodium membrane || 7: cilium || 8: cytoplasmic membrane-bounded vesicle || 9: endosome ||
10: microtubule basal body || 11: extrinsic to internal side of plasma membrane || 12: heterotrimeric G-protein complex || 13: intrinsic to membrane || 14: ruffle || 15: trans-Golgi network membrane || 16: transport vesicle || 17: endoplasmic reticulum lumen ||
18: integral to endoplasmic reticulum membrane || 19: integral to peroxisomal membrane || 20: peroxisomal membrane || 21: COPI vesicle coat || 22: COPII vesicle coat || 23: endoplasmic reticulum-Golgi intermediate compartment || 24: endoplasmic reticulum-Golgi intermediate compartment membrane

ECM 19, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 95

PRESENCE ABSENCE
GAIN LOSS

Log-likelihood Ratio Scale
0 10 20 30 40 50 60

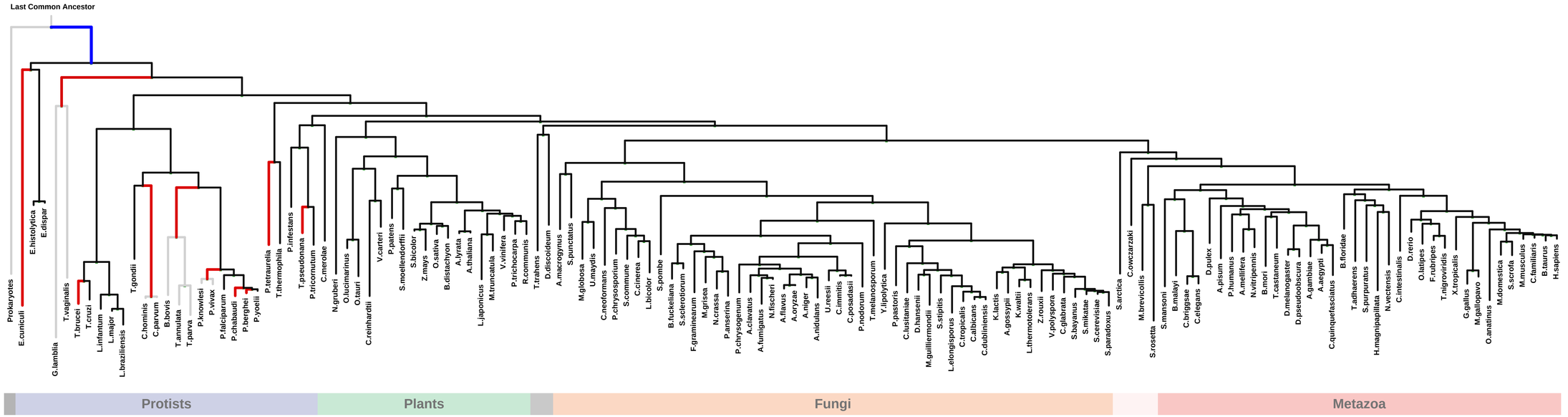


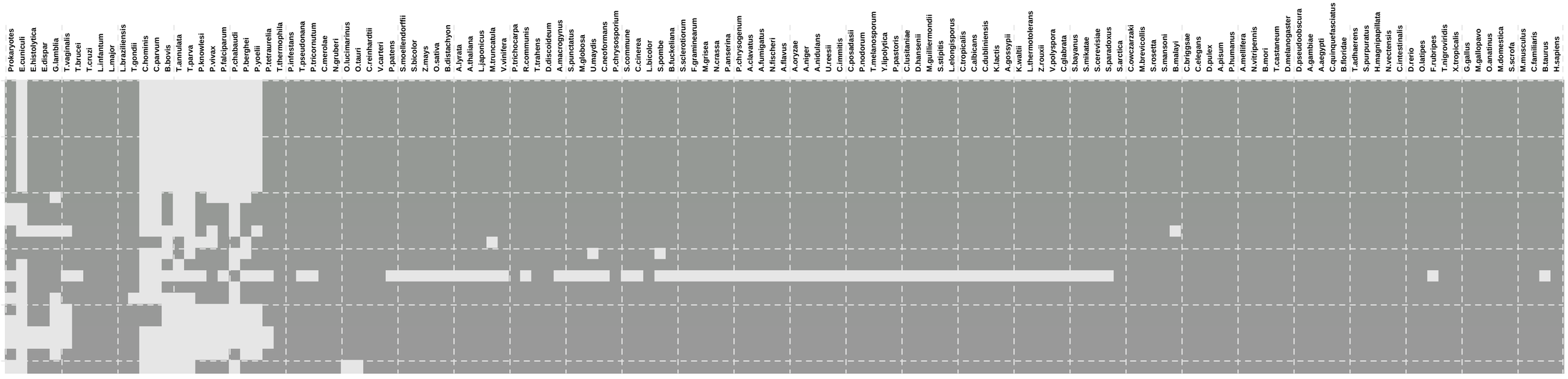
PG	Protein	LLR	Notes
	SCAF8	5.6	1 / 2
	ABCC3	5.1	
D	GNAZ	5.0	3 / 4 / 5
	CYP1B1	4.9	
L	SV2A	4.4	6 / 7 / 8 / 9
E	VAT1L	4.2	
H	LOC729468	3.9	
H	100287382	3.9	
	GCH1	3.7	10 / 11
I	NSDHL	3.5	12
M	LRRC66	3.2	
L	SVOP	3.1	9 / 13
D	GNA11	3.1	3 / 4
	RBM28	2.9	2
N	FBXL15	2.9	14
O	ESYT2	2.9	
M	LRSAM1	2.8	15
	CYP21A1P	2.6	
N	KDM2B	2.4	16
	SLC9A6	2.4	17 / 18
	PDK3	2.4	
O	ESYT3	2.3	
D	GNA14	2.0	3 / 4
D	GNAQ	2.0	3 / 4 / 11
	SPHK2	1.9	19
	UCHL1	1.9	
A	RHPN2	1.7	
F	TMED7-TICAM2	1.7	
	CAND2	1.7	
E	ADH1A	1.7	
E	ADH7	1.7	
H	PGM1	1.7	20
E	ADH1B	1.7	
E	ADH1C	1.7	
E	ADH4	1.7	21

1: nuclear matrix || 2: spliceosomal complex || 3: extrinsic to internal side of plasma membrane || 4: heterotrimeric G-protein complex || 5: nuclear envelope || 6: cell-cell junction || 7: neuromuscular junction || 8: presynaptic active zone ||
9: synaptic vesicle membrane || 10: cytoplasmic vesicle || 11: nuclear membrane || 12: lipid particle || 13: synaptic vesicle || 14: SCF ubiquitin ligase complex || 15: membrane part || 16: PcG protein complex || 17: early endosome membrane ||
18: recycling endosome membrane || 19: lysosomal membrane || 20: actin cytoskeleton || 21: microtubule cytoskeleton

ECM 19, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 95

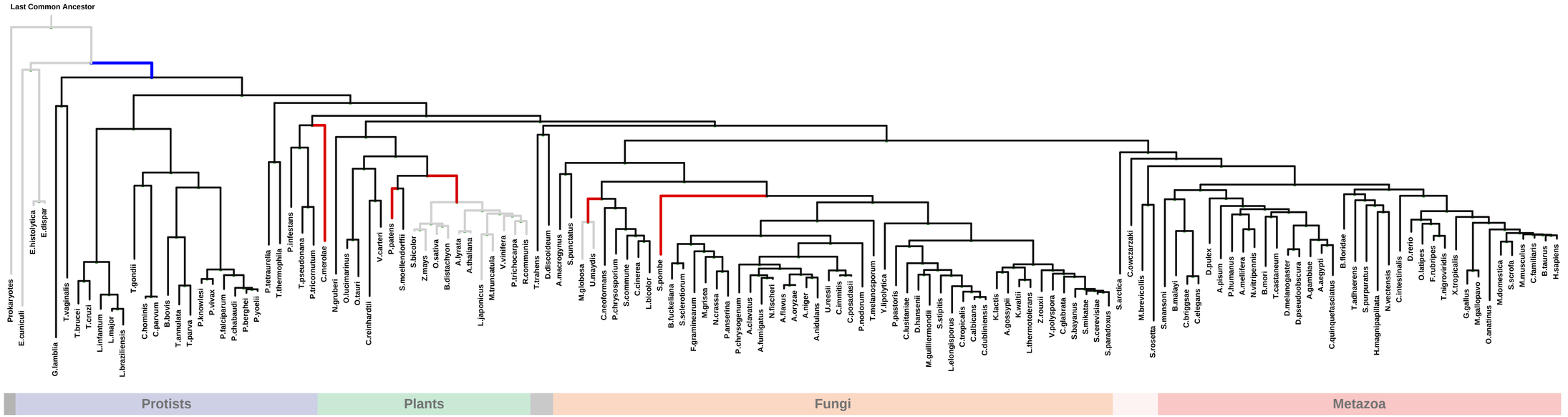




1: endocytic vesicle || 2: intercellular canaliculus || 3: invadopodium membrane || 4: lamellipodium || 5: lamellipodium membrane || 6: membrane raft || 7: extrinsic to internal side of plasma membrane || 8: heterotrimeric G-protein complex ||
9: photoreceptor connecting cilium || 10: photoreceptor inner segment || 11: photoreceptor outer segment || 12: photoreceptor outer segment membrane || 13: extracellular matrix || 14: Golgi lumen || 15: lysosomal lumen || 16: proteinaceous extracellular matrix ||
17: autophagic vacuole || 18: autophagic vacuole membrane || 19: pre-autophagosomal structure membrane || 20: basement membrane || 21: laminin-1 complex || 22: laminin-5 complex || 23: clathrin-coated vesicle || 24: endosome membrane ||
25: pre-autophagosomal structure || 26: trans-Golgi network || 27: peroxisome || 28: cytoplasmic vesicle membrane || 29: cytoplasmic vesicle || 30: early endosome membrane || 31: late endosome membrane || 32: vesicle membrane

ECM 20, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 29

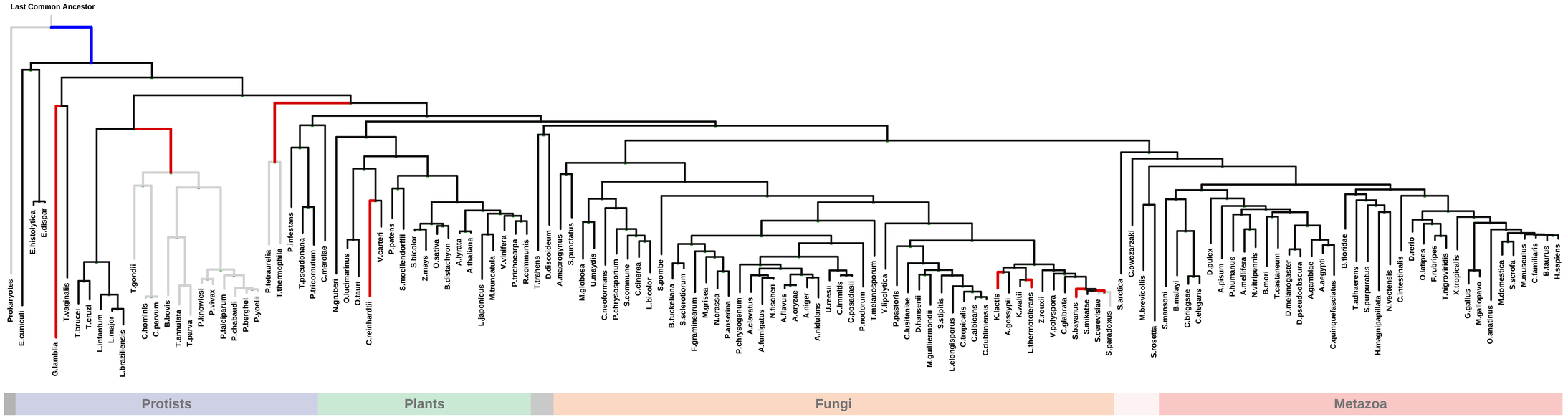


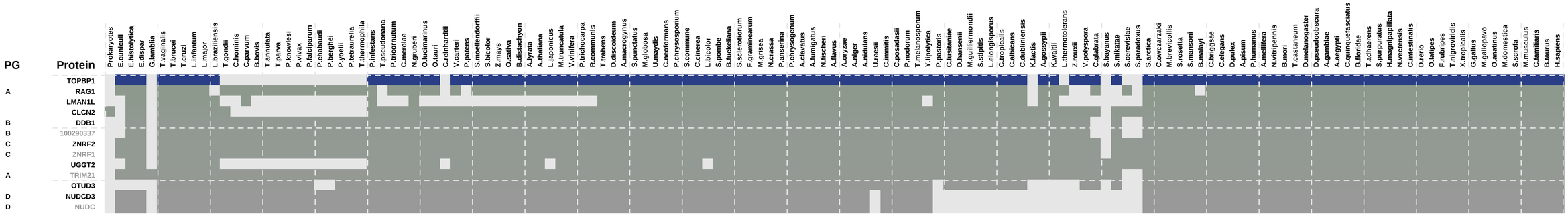
PG	Protein	LLR	Notes
A	PDE4D		1
A	PDE4A	39.2	2
A	PDE4B	39.2	
A	PDE4C	39.2	3
A	PDE7A	39.2	
A	PDE7B	39.2	
A	PDE8B	39.2	
A	PDE9A	30.0	2
A	PDE11A	30.0	4
A	PDE8A	29.3	
A	PDE6B	26.6	
A	PDE1C	26.6	
A	PDE10A	26.6	
A	PDE1A	26.6	
A	PDE1B	26.6	
A	PDE6A	26.6	
A	PDE2A	20.5	5 / 6
A	PDE5A	19.6	
A	PDE6C	17.4	
A	PDE3B	16.7	7
A	PDE3A	13.2	
B	100508571	4.4	
B	100510540	4.4	
C	RABEPK	3.9	8 / 9
B	DNAH12	2.5	10 / 11
B	DNAH1	2.5	10 / 11 / 12
C	KLHDC2	1.4	
	SLC2A12	1.3	13
	CNGA2	0.3	14
	VPS18	0.0	15 / 16 / 17 / 18 / 19

1: microtubule organizing center || 2: ruffle membrane || 3: primary cilium || 4: perikaryon || 5: membrane raft || 6: presynaptic membrane || 7: guanyl-nucleotide exchange factor complex || 8: endosome || 9: endosome membrane ||
10: cilium axoneme || 11: dynein complex || 12: axonemal dynein complex || 13: endomembrane system || 14: intracellular cyclic nucleotide activated cation channel complex || 15: actin filament || 16: early endosome || 17: HOPS complex ||
18: late endosome membrane || 19: lysosomal membrane

ECM 21, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 12

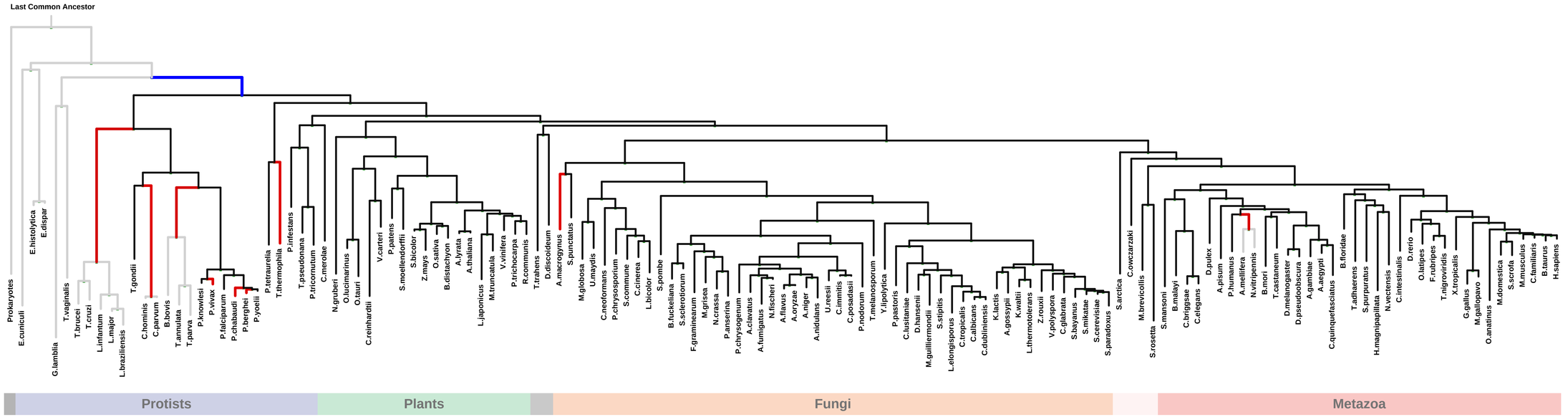


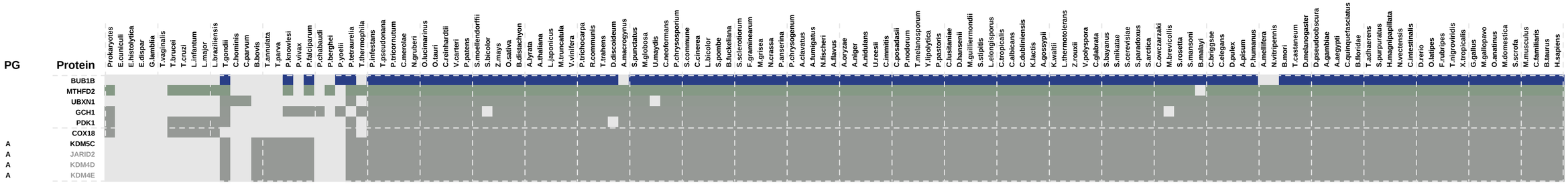


1: chromosome || 2: condensed nuclear chromosome || 3: male germ cell nucleus || 4: microtubule organizing center || 5: PML body || 6: spindle pole || 7: endoplasmic reticulum-Golgi intermediate compartment membrane || 8: chloride channel complex || 9: dendrite || 10: perikaryon || 11: Cul4A-RING ubiquitin ligase complex || 12: Cul4B-RING ubiquitin ligase complex || 13: Cul4-RING ubiquitin ligase complex || 14: endosome membrane || 15: lysosomal membrane || 16: presynaptic membrane || 17: endosome || 18: lysosome || 19: synaptic vesicle membrane || 20: endoplasmic reticulum lumen || 21: endoplasmic reticulum-Golgi intermediate compartment || 22: cytoplasmic mRNA processing body || 23: ribonucleoprotein complex || 24: SCF ubiquitin ligase complex

ECM 22, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 9

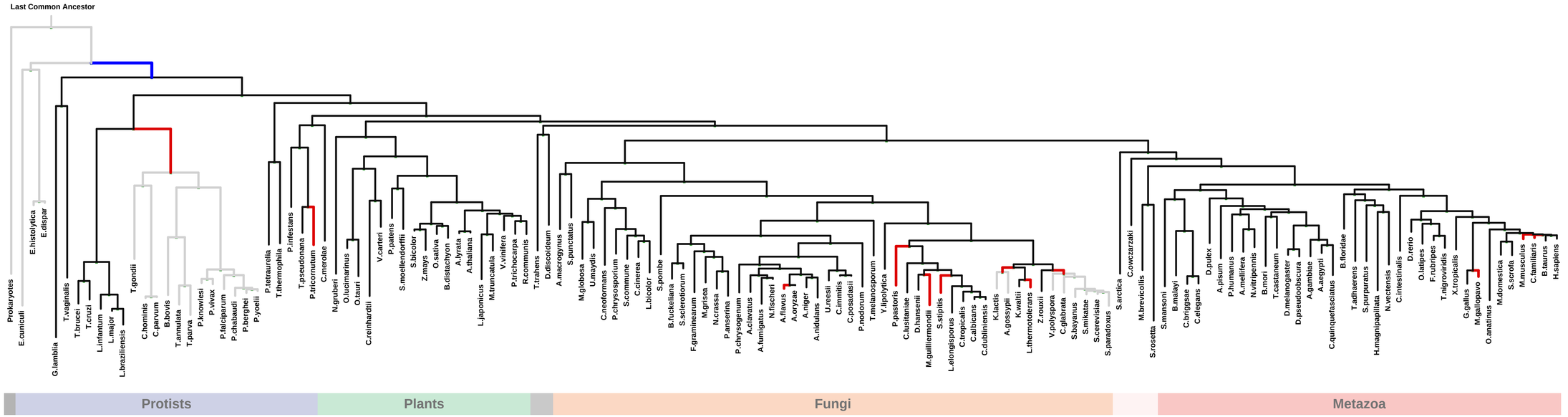


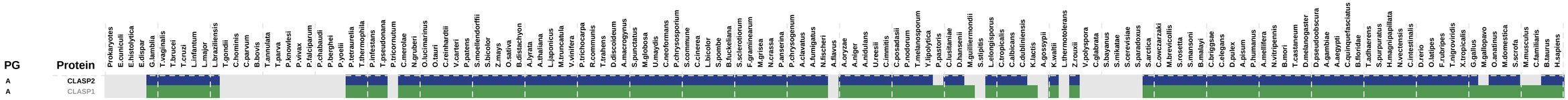


1: anaphase-promoting complex || 2: condensed chromosome kinetochore || 3: condensed chromosome outer kinetochore || 4: kinetochore || 5: microtubule organizing center || 6: spindle midzone || 7: Cdc48p-Npl4p-Ufd1p AAA ATPase complex ||
8: dendrite || 9: proteasome complex || 10: cytoplasmic vesicle || 11: nuclear membrane || 12: pyruvate dehydrogenase complex || 13: integral to mitochondrial inner membrane || 14: ESC/E(Z) complex || 15: histone methyltransferase complex

ECM 23, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 1

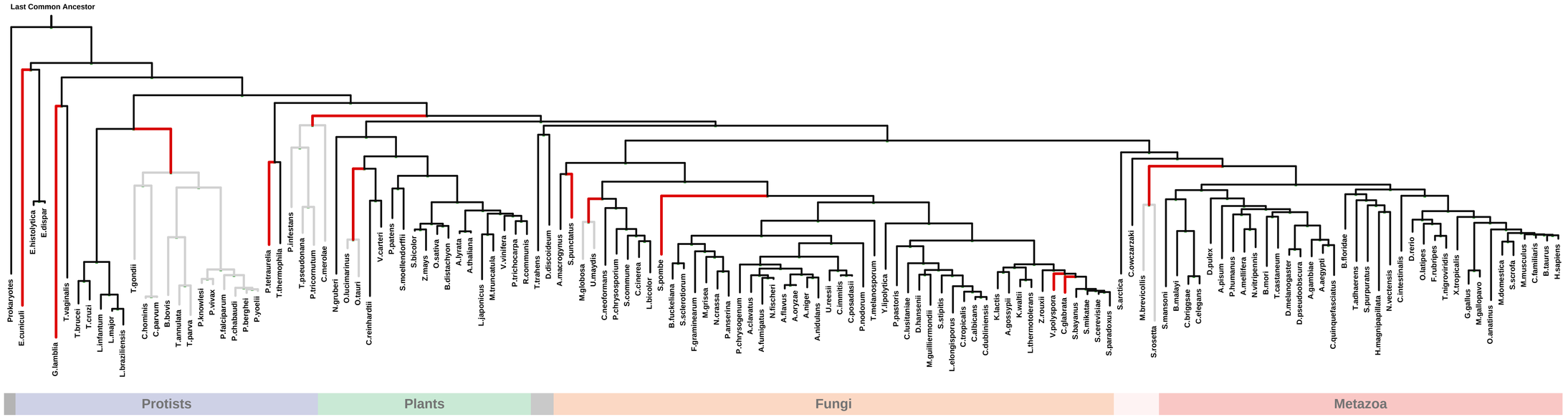


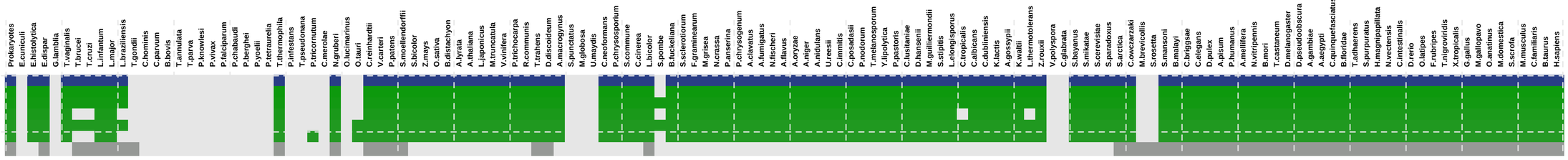


1: cell cortex || 2: condensed chromosome kinetochore || 3: cytoplasmic microtubule || 4: kinetochore microtubule || 5: microtubule organizing center || 6: ruffle membrane || 7: trans-Golgi network || 8: cortical microtubule cytoskeleton || 9: kinetochore || 10: spindle microtubule

ECM 24, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 6

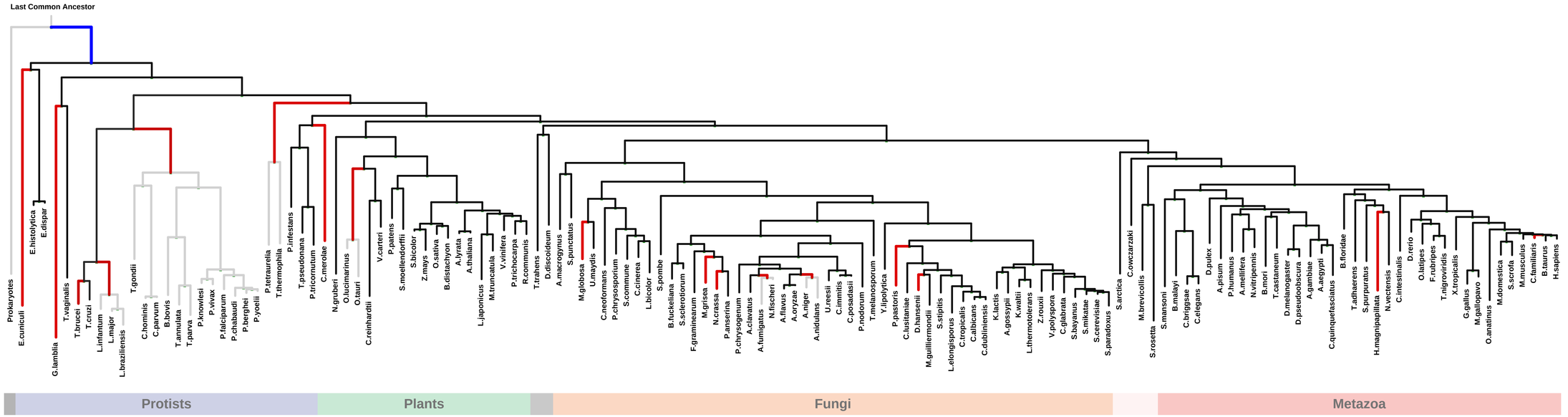


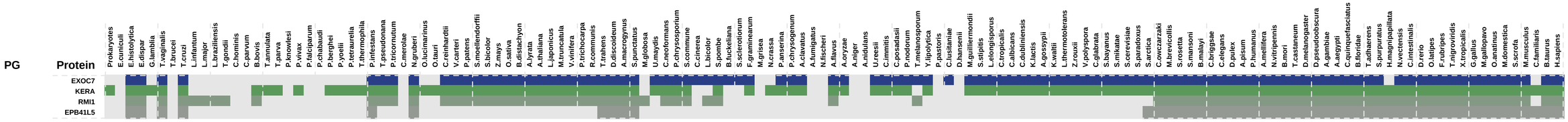


1: dendrite || 2: microtubule organizing center || 3: spindle || 4: growth cone || 5: terminal button || 6: cell body || 7: exocytic vesicle || 8: filamentous actin || 9: lamellipodium || 10: basement membrane || 11: stereocilia ankle link complex || 12: stereocilium bundle || 13: stereocilium membrane

ECM 25, Gene set "microtubule organizing center", Page 1

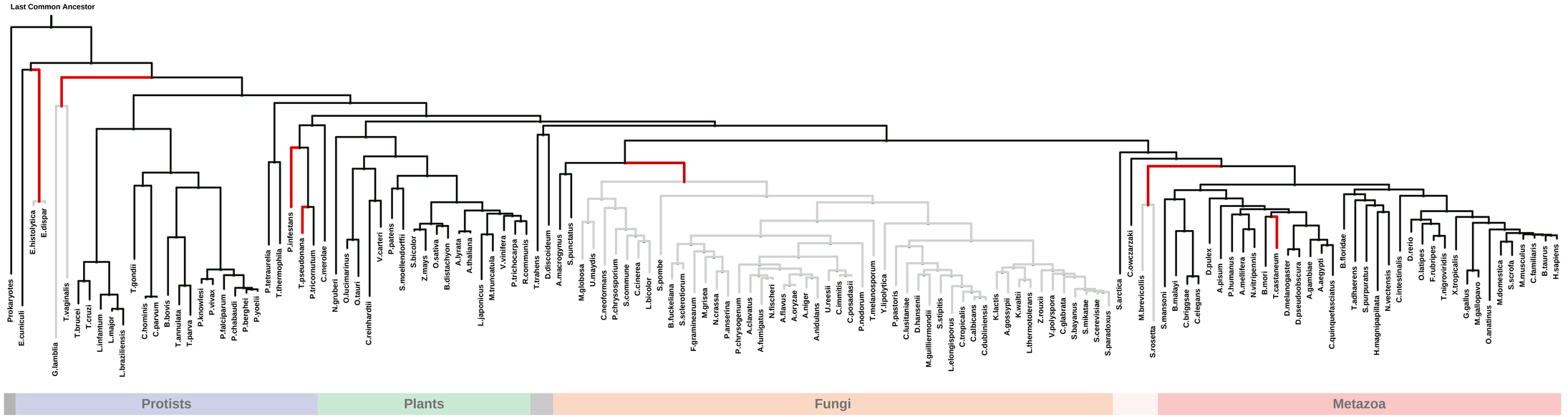
Num of ECM Genes: 1. Num of Predicted Genes: 3

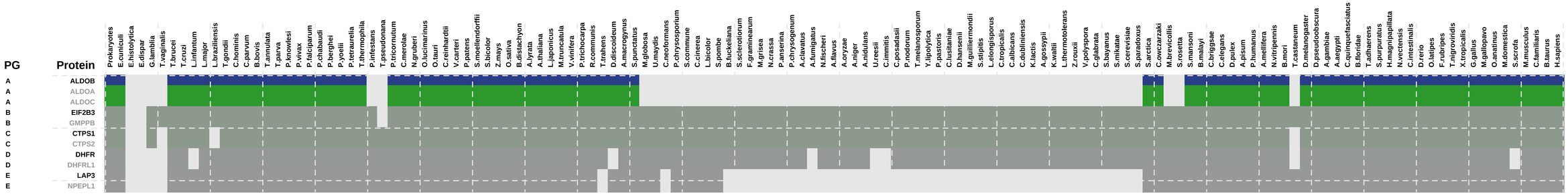




ECM 26, Gene set "microtubule organizing center", Page 1

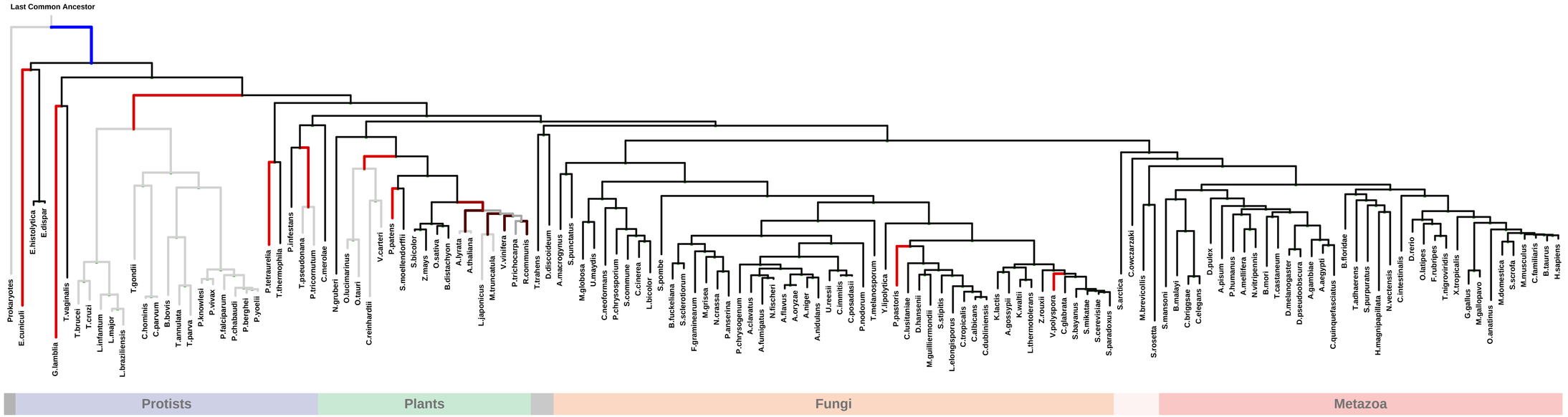
Num of ECM Genes: 1. Num of Predicted Genes: 10

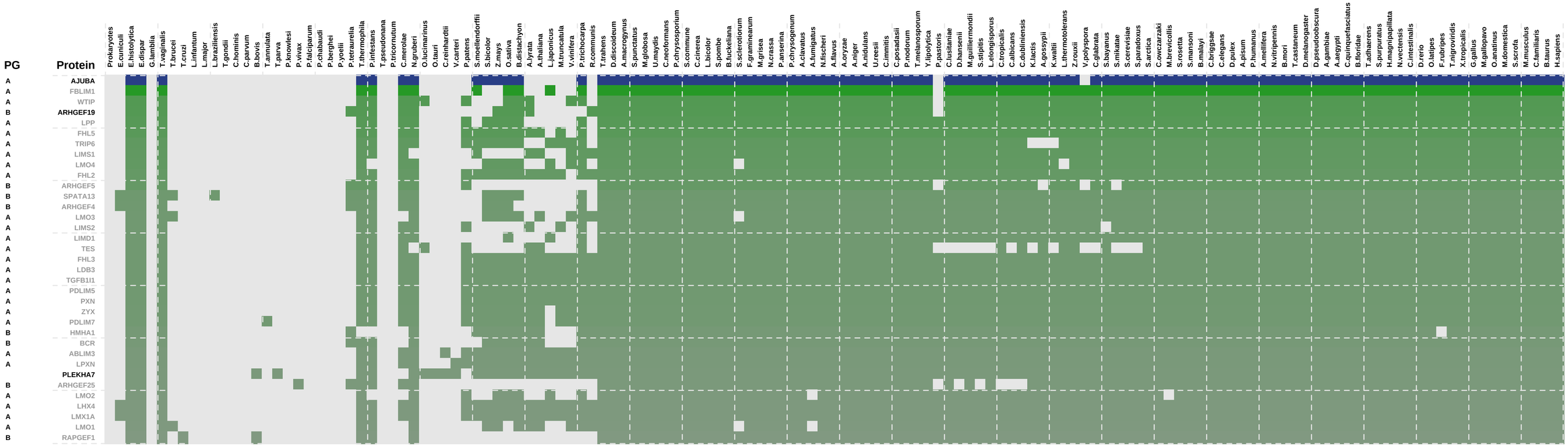




ECM 27, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 124

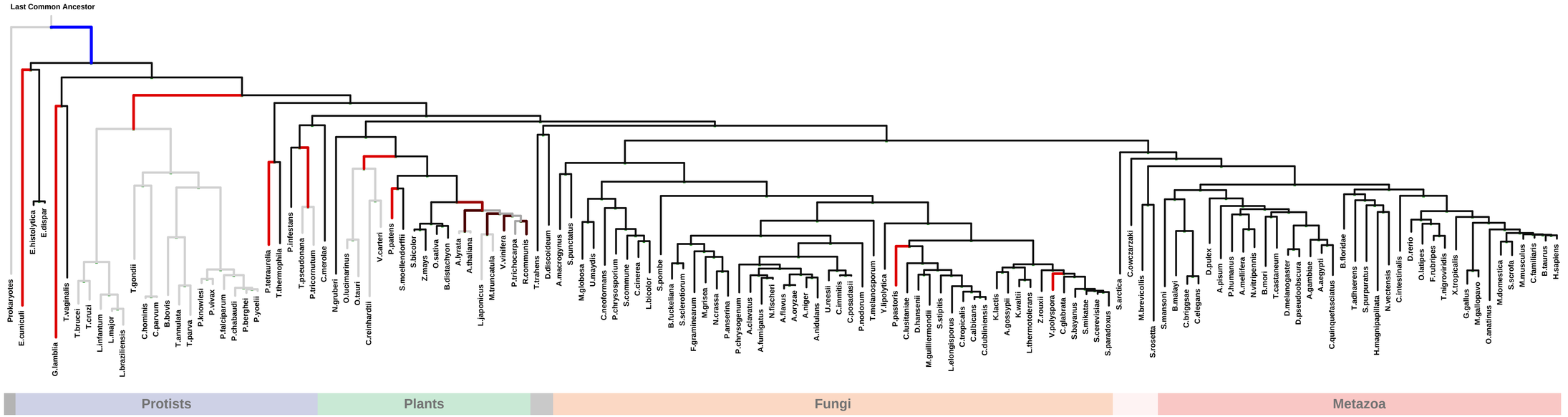




1: cell-cell junction || 2: cytoplasmic mRNA processing body || 3: focal adhesion || 4: lamellipodium || 5: microtubule organizing center || 6: cell cortex || 7: stress fiber || 8: adherens junction || 9: interleukin-1 receptor complex || 10: actin cytoskeleton || 11: M band || 12: Z disc || 13: filopodium || 14: ruffle membrane || 15: RNA-induced silencing complex || 16: pseudopodium || 17: extracellular matrix || 18: nuclear matrix || 19: postsynaptic density || 20: postsynaptic membrane || 21: microtubule associated complex || 22: cell-cell adherens junction || 23: ruffle || 24: cell projection || 25: podosome || 26: myofibril || 27: sarcomere || 28: endosome

ECM 27, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 124

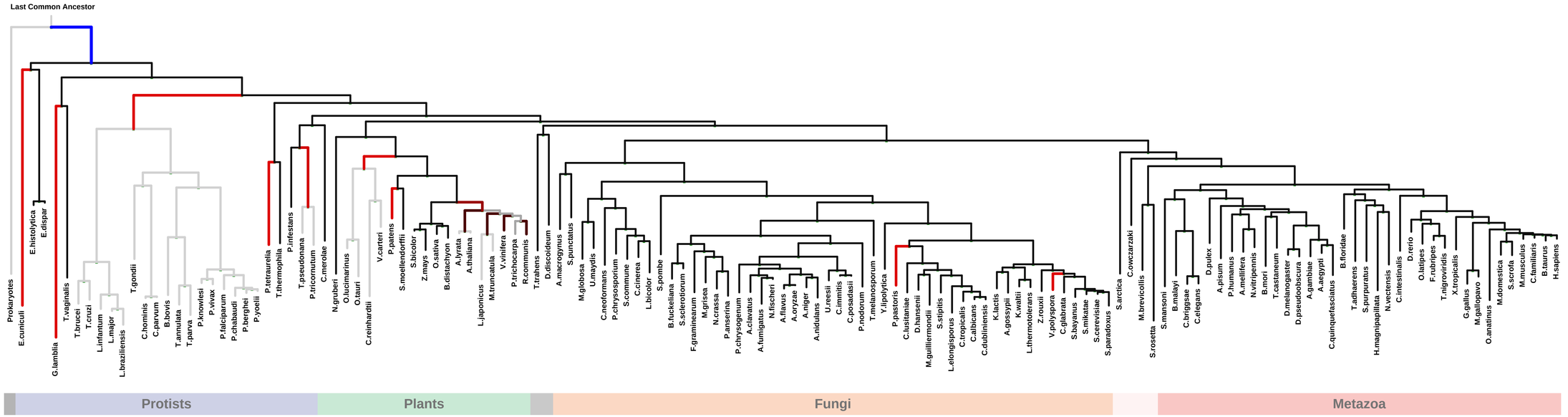


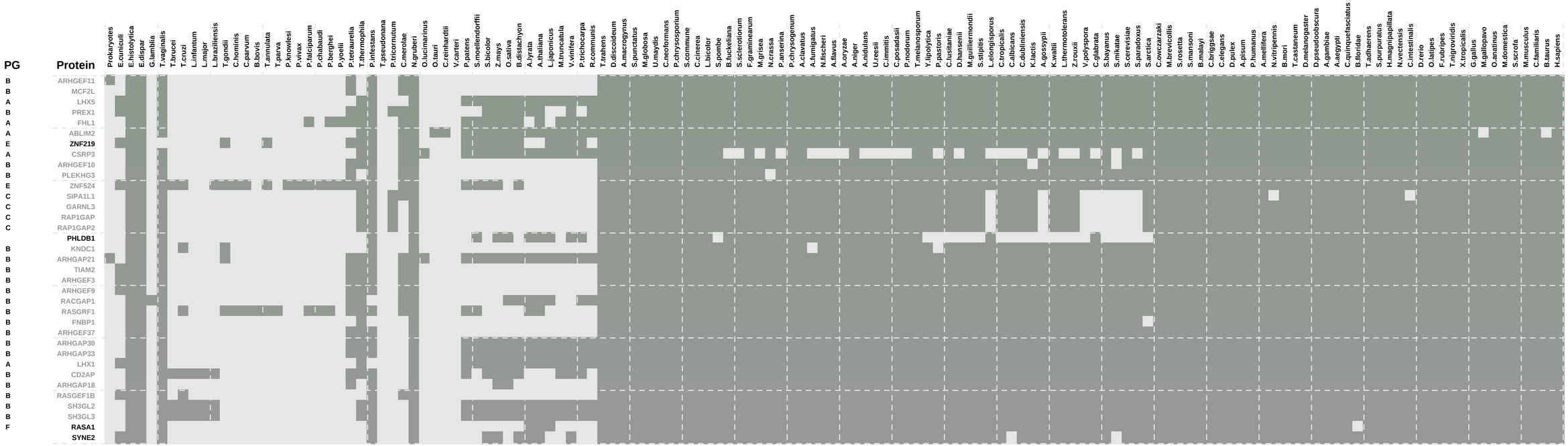
PG	Protein	LLR	Notes
B	NCF1	9.9	1 / 2
B	GMIP	9.8	
B	ARHGAP29	9.8	
B	SKAP1	9.6	
C	**SIPA1L2**	**9.5**	
C	RALGAPA2	9.5	
C	TSC2	9.5	3 / 4 / 5 / 6 / 7
C	RALGAPA1	9.5	
C	SIPA1	9.5	8
A	CRIP2	9.5	9 / 10
A	LMX1B	9.4	
B	ARHGAP6	9.2	11 / 12
A	PDLIM3	9.1	11 / 13
A	ABLIM1	8.7	11
A	PRICKLE1	8.6	14
D	**ZFPM1**	**8.3**	15
A	PRICKLE3	8.3	
B	NET1	8.1	
B	PLEKHG1	8.1	
B	TIAM1	8.1	16
B	ARHGEF16	8.1	
B	ARHGAP17	8.1	17
B	ARHGAP32	8.1	9 / 11 / 18 / 19 / 20
B	PREX2	7.6	
	HUS1	**7.2**	21
	AMIGO1	**6.8**	22
B	PLEKHG6	6.8	23 / 24
B	DNMBP	6.6	25 / 26
C	SIPA1L3	6.3	
A	LHX3	6.2	
A	LHX6	6.2	
A	LHX8	6.2	
A	PRICKLE2	6.0	14 / 27 / 28
D	ZNF831	5.9	
B	ARHGEF17	5.8	

1: NADPH oxidase complex || 2: phagolysosome || 3: caveola || 4: cytoskeletal part || 5: dendrite || 6: growth cone || 7: TSC1-TSC2 complex || 8: endomembrane system || 9: cell cortex || 10: extracellular matrix ||
11: actin cytoskeleton || 12: actin filament || 13: Z disc || 14: nuclear membrane || 15: transcriptional repressor complex || 16: cell-cell junction || 17: tight junction || 18: endosome membrane || 19: postsynaptic density ||
20: postsynaptic membrane || 21: checkpoint clamp complex || 22: axon || 23: cleavage furrow || 24: spindle pole || 25: Golgi stack || 26: synapse || 27: apicolateral plasma membrane || 28: lateral plasma membrane

ECM 27, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 124

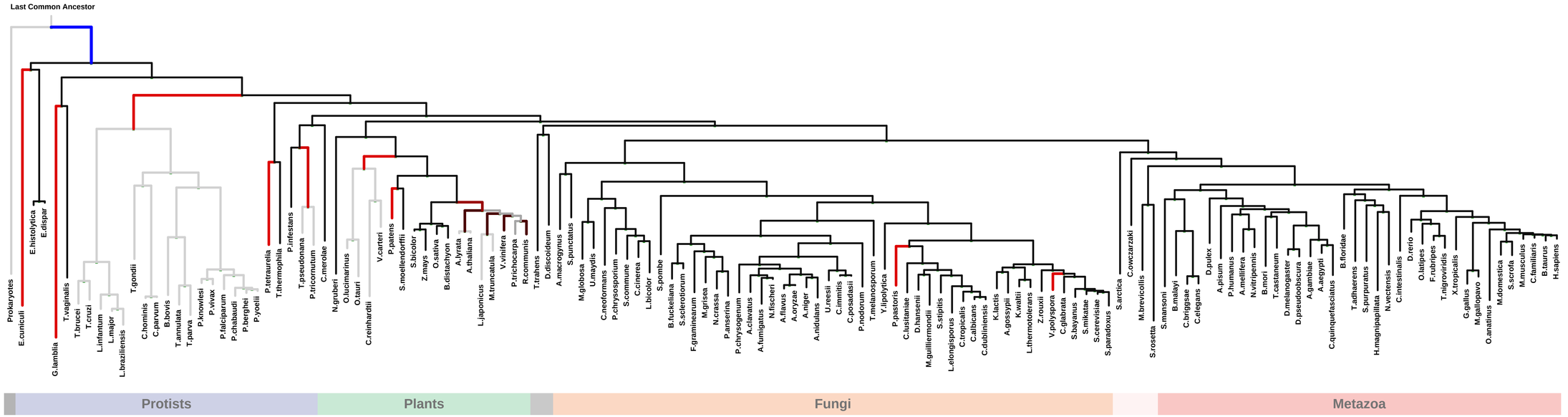




1: lamellipodium || 2: actin cytoskeleton || 3: intermediate filament cytoskeleton || 4: Z disc || 5: dendritic spine || 6: postsynaptic density || 7: postsynaptic membrane || 8: dendrite || 9: guanyl-nucleotide exchange factor complex ||
10: cytoplasmic vesicle membrane || 11: filopodium || 12: growth cone || 13: acrosomal vesicle || 14: centralspindlin complex || 15: cleavage furrow || 16: midbody || 17: mitotic spindle || 18: spindle midzone || 19: neuron projection ||
20: cell cortex || 21: coated pit || 22: cytoplasmic membrane-bounded vesicle || 23: lysosome || 24: filamentous actin || 25: ruffle || 26: early endosome || 27: late endosome || 28: clathrin-coated endocytic vesicle membrane ||

ECM 27, Gene set "microtubule organizing center", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 124

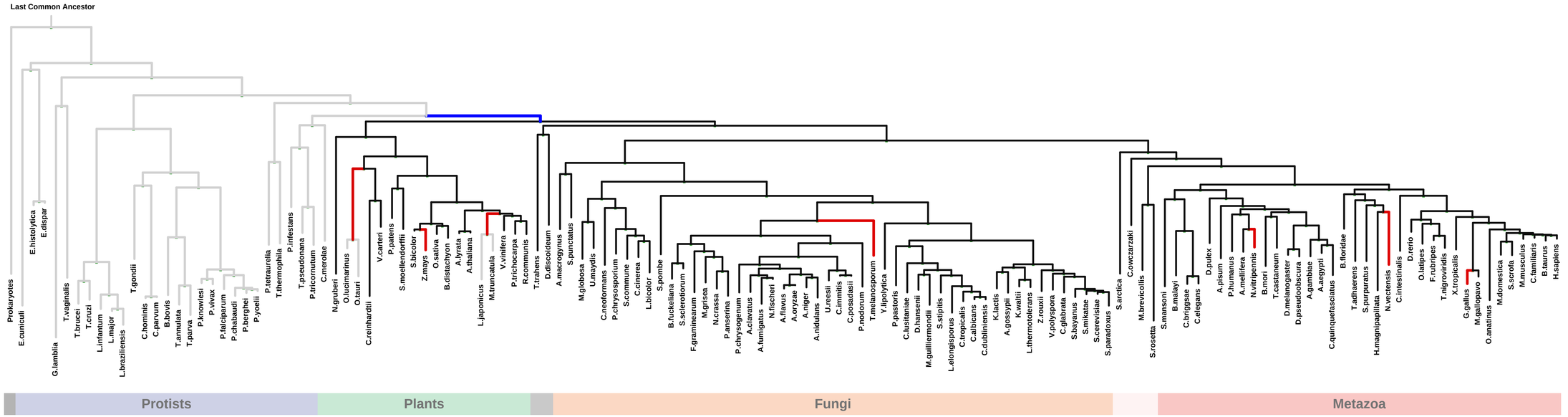


PG	Protein	LLR	Notes
B	RAPGEF5	0.9	
B	RGL2	0.9	
B	RGL4	0.9	1
B	FNBP1L	0.9	1 / 2
B	RASGEF1A	0.9	
F	NF1	0.9	3 / 4 / 5
E	ZNF217	0.8	6
B	SH3D21	0.8	
B	ARHGAP23	0.7	
B	ARHGEF1	0.5	
B	SYDE2	0.5	
B	RGL1	0.5	
B	RALGPS1	0.5	
B	RGL3	0.5	
B	RALGPS2	0.5	
B	RALGDS	0.5	
B	RASGEF1C	0.5	
B	RAPGEFL1	0.5	
	TMED1	**0.2**	**7 / 8**
A	LMCD1	0.2	9

1: cytoplasmic membrane-bounded vesicle || 2: cell cortex || 3: axon || 4: dendrite || 5: intrinsic to internal side of plasma membrane || 6: histone deacetylase complex || 7: endoplasmic reticulum-Golgi intermediate compartment || 8: endoplasmic reticulum-Golgi intermediate compartment membrane || 9: extracellular matrix

ECM 28, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 1

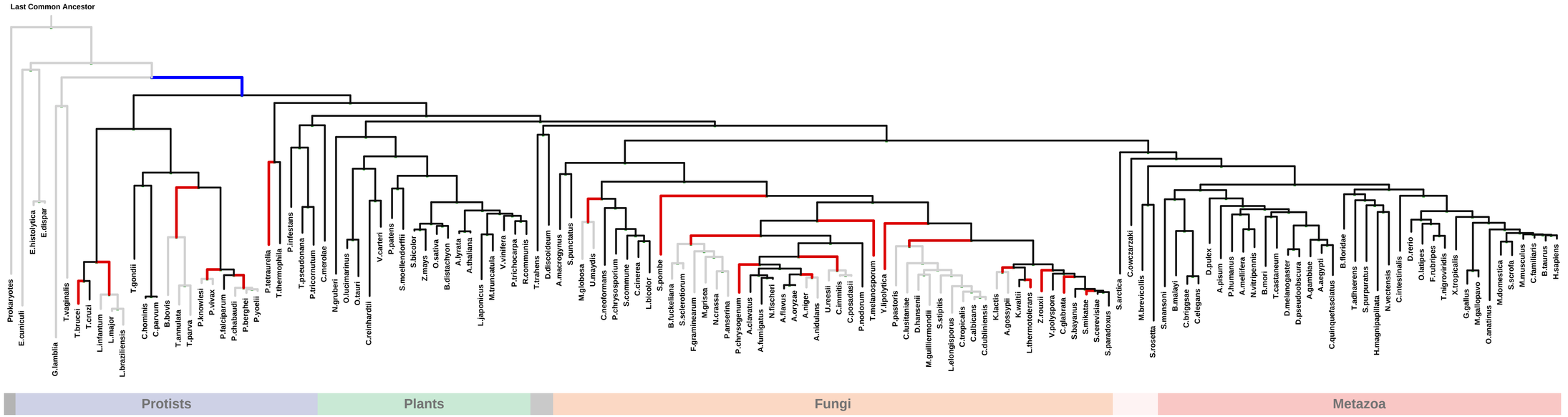


PG	Protein	LLR	Notes
A	FRY		1 / 2
A	FRYL	49.7	

1: microtubule organizing center || 2: spindle pole

ECM 29, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 4

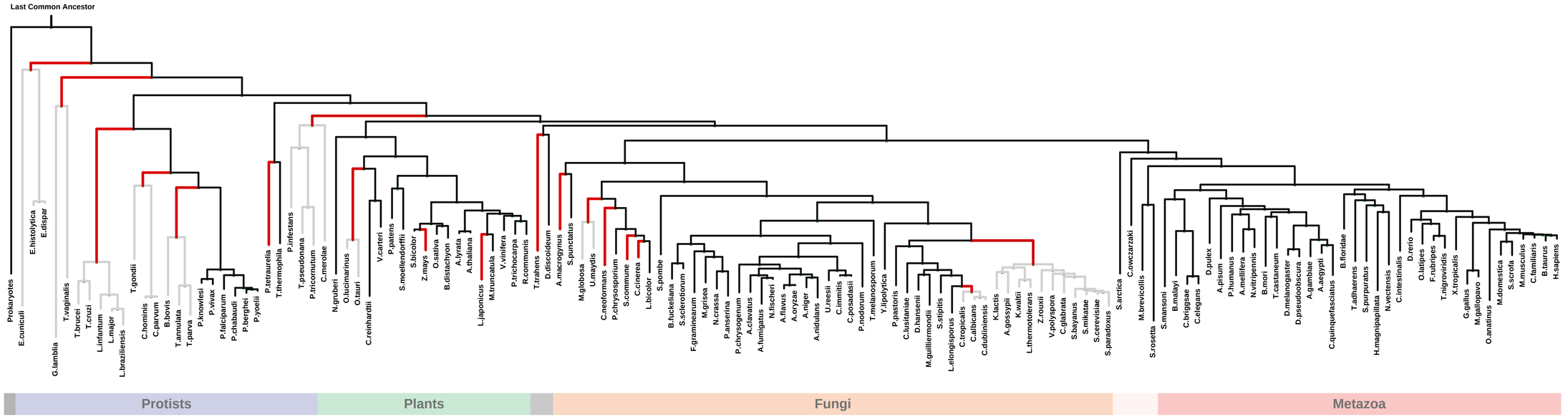


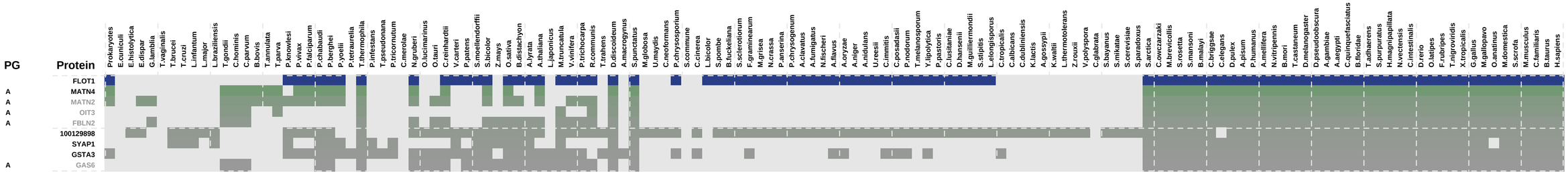
PG	Protein	LLR	Notes
	UBXN6		1
	GSTA4	7.2	
	SLC35C1	4.6	
	KCNQ1	2.3	2 / 3 / 4 / 5 / 6 / 7 / 8
	SCAF11	2.3	

1: microtubule organizing center || 2: basolateral plasma membrane || 3: early endosome || 4: late endosome || 5: lysosome || 6: sarcolemma || 7: voltage-gated potassium channel complex || 8: zymogen granule membrane

ECM 30, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 8

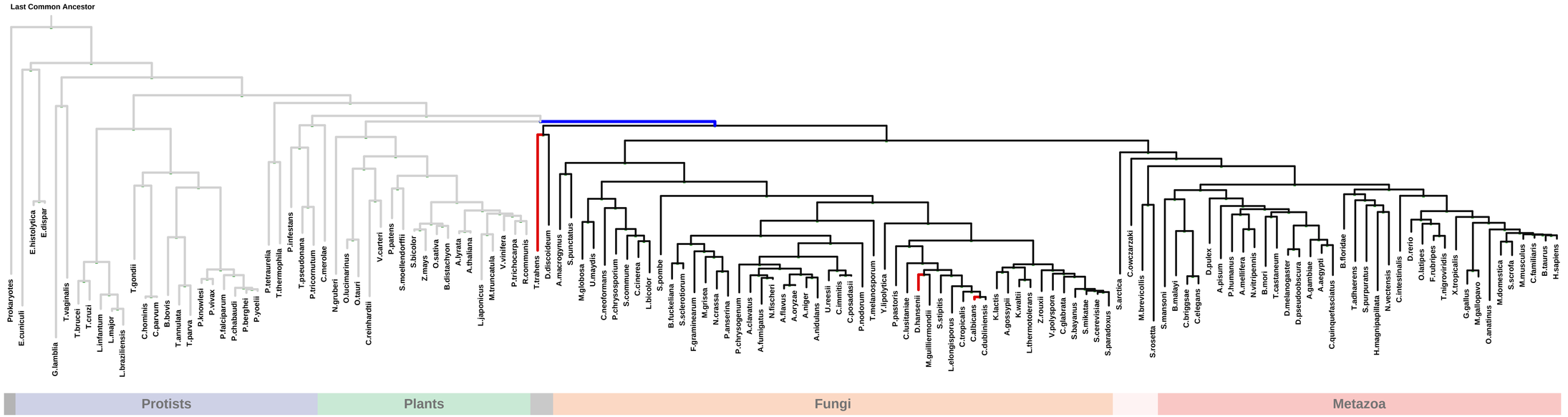




1: caveola || 2: centriolar satellite || 3: endosome || 4: flotillin complex || 5: melanosome || 6: membrane raft || 7: microtubule organizing center || 8: sarcolemma || 9: signalosome || 10: basement membrane ||
11: extracellular matrix || 12: proteinaceous extracellular matrix || 13: nuclear envelope || 14: endoplasmic reticulum lumen || 15: Golgi lumen || 16: platelet alpha granule lumen

ECM 31, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 1

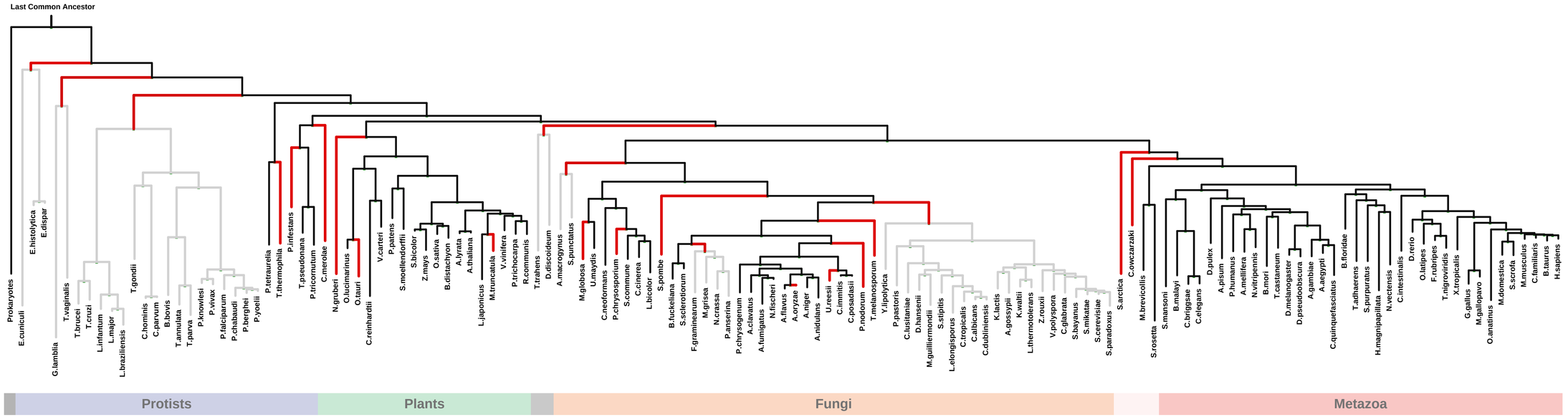


PG	Protein	LLR	Notes
A	RASSF1		1 / 2 / 3
A	PDZD8	0.2	

1: microtubule cytoskeleton || 2: microtubule organizing center || 3: spindle pole

ECM 32, Gene set "microtubule organizing center", Page 1

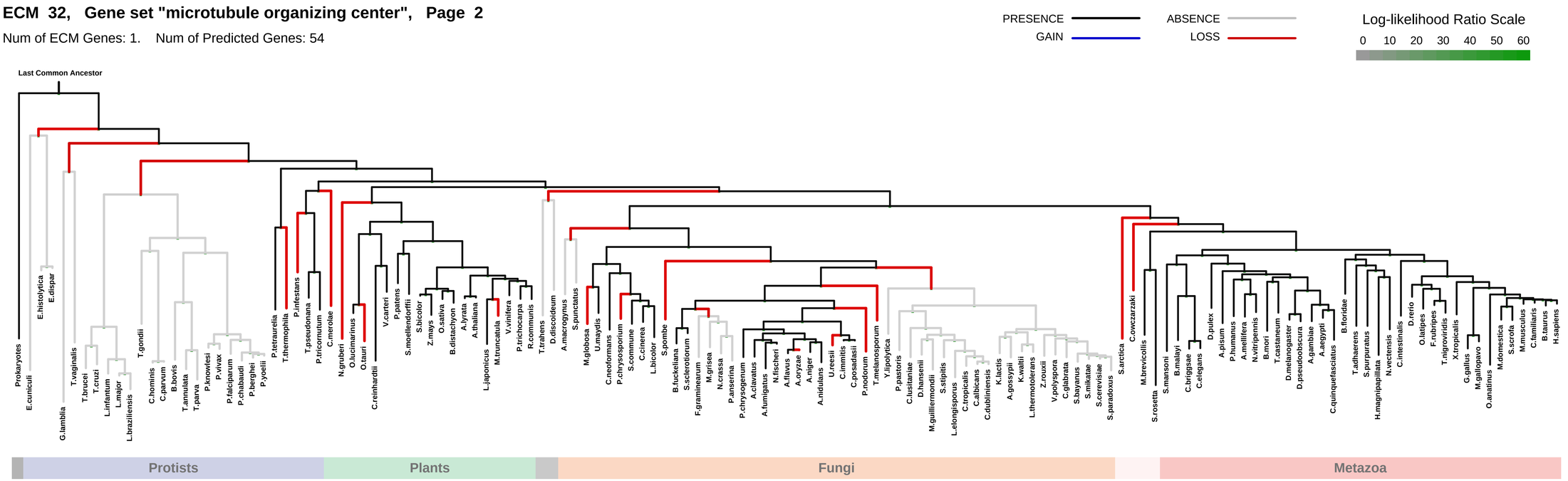
Num of ECM Genes: 1. Num of Predicted Genes: 54

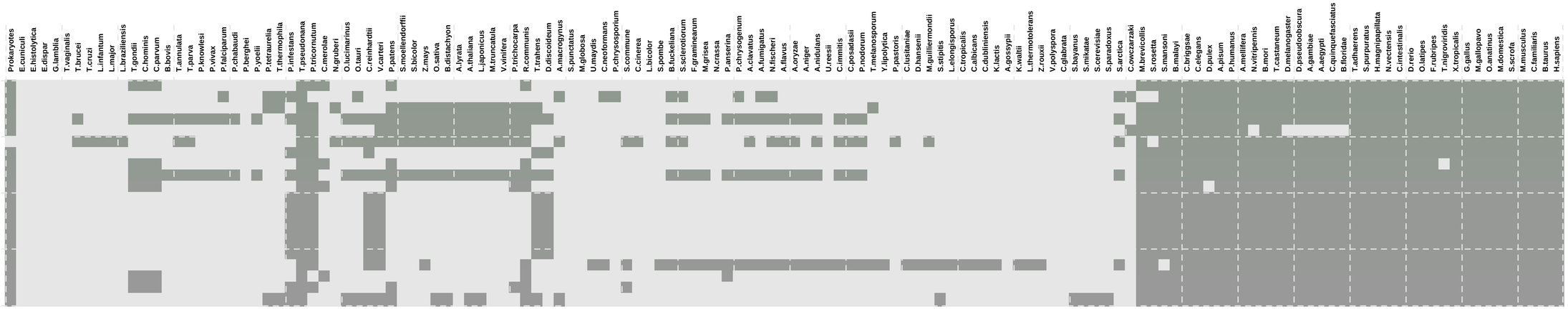


1: actin cytoskeleton || 2: cell cortex || 3: chloride channel complex || 4: microtubule organizing center || 5: stereocilium || 6: apical part of cell || 7: cell-cell junction || 8: cytoplasmic vesicle membrane || 9: microtubule cytoskeleton ||
10: microvillus || 11: midbody || 12: nuclear matrix || 13: brush border || 14: nuclear envelope || 15: nuclear membrane || 16: dendritic spine || 17: sarcolemma || 18: intercalated disc || 19: T-tubule || 20: Z disc ||
21: transport vesicle || 22: mitochondrial respiratory chain complex I || 23: voltage-gated calcium channel complex || 24: collagen || 25: extracellular matrix || 26: acrosomal vesicle || 27: CatSper complex || 28: cilium || 29: flagellar membrane ||

ECM 32, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 54

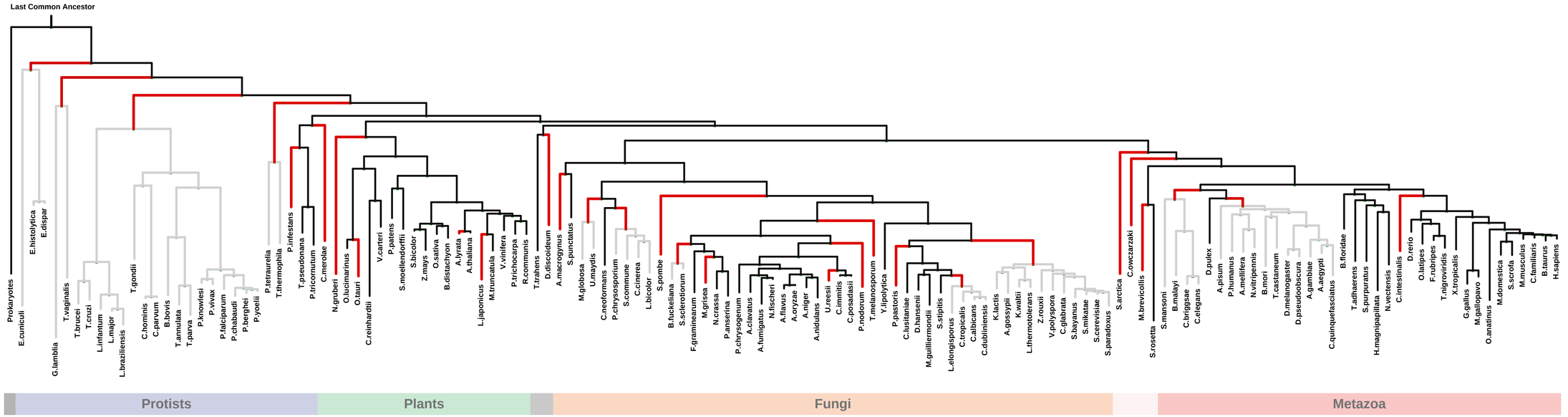


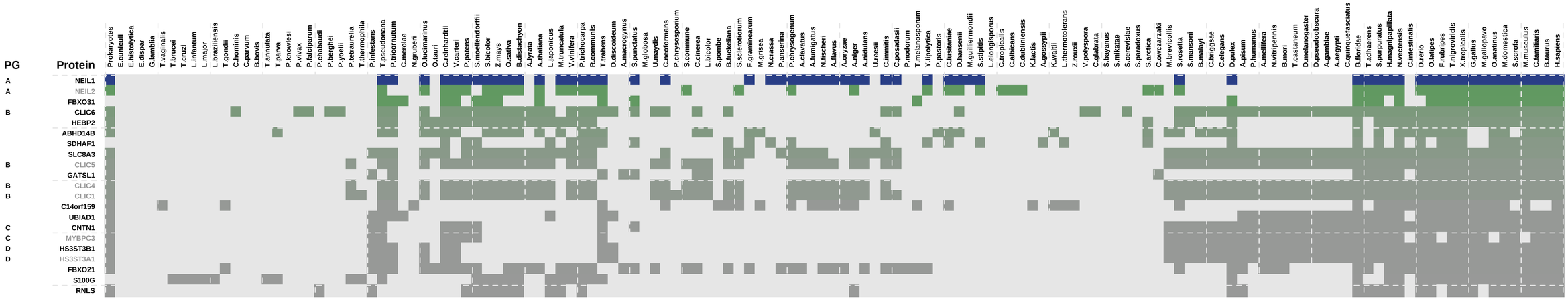


1: sarcoplasmic reticulum || 2: T-tubule || 3: voltage-gated calcium channel complex || 4: endoplasmic reticulum lumen || 5: cell-cell adherens junction || 6: cell-cell junction || 7: lamellipodium || 8: midbody || 9: Golgi lumen ||
10: Golgi cisterna membrane || 11: lysosomal lumen || 12: Golgi stack || 13: integral to Golgi membrane || 14: CatSper complex || 15: cilium || 16: flagellar membrane

ECM 33, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 20

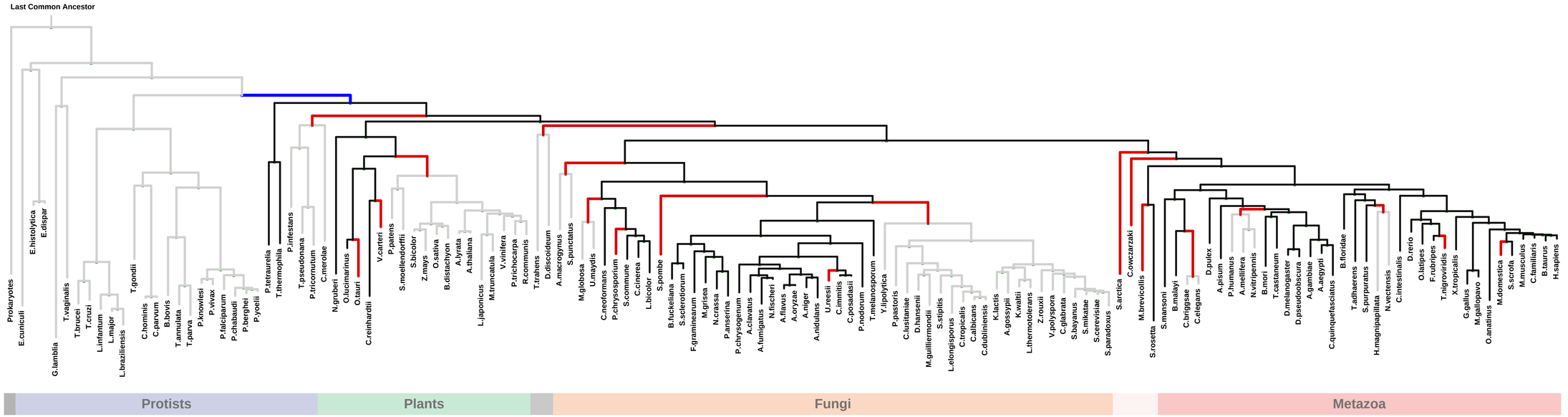




1: chromosome || 2: microtubule organizing center || 3: spindle microtubule || 4: SCF ubiquitin ligase complex || 5: chloride channel complex || 6: dendritic spine || 7: sarcolemma || 8: actin cytoskeleton || 9: cell cortex ||
10: stereocilium || 11: apical part of cell || 12: cell-cell junction || 13: cytoplasmic vesicle membrane || 14: microtubule cytoskeleton || 15: microvillus || 16: midbody || 17: nuclear matrix || 18: brush border || 19: nuclear envelope ||
20: nuclear membrane || 21: anchored to membrane || 22: A band || 23: sarcomere || 24: striated muscle myosin thick filament || 25: ubiquitin ligase complex || 26: basolateral plasma membrane

ECM 34, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

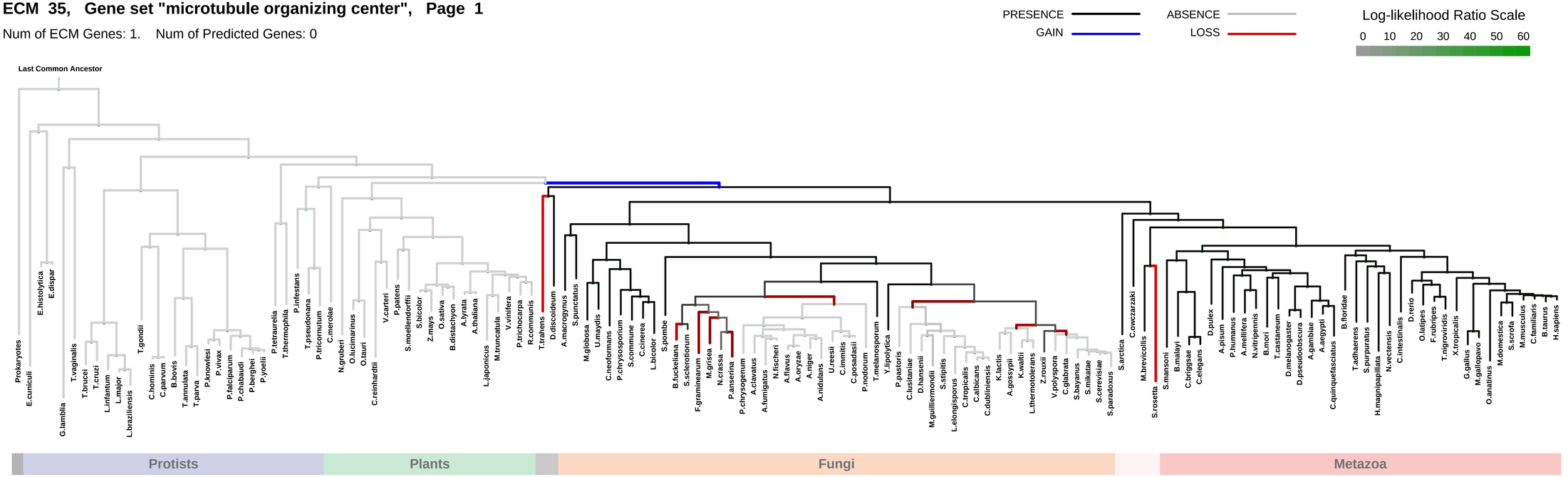


PG	Protein	LLR	Notes
	MCPH1		1

1: microtubule organizing center

ECM 35, Gene set "microtubule organizing center", Page 1

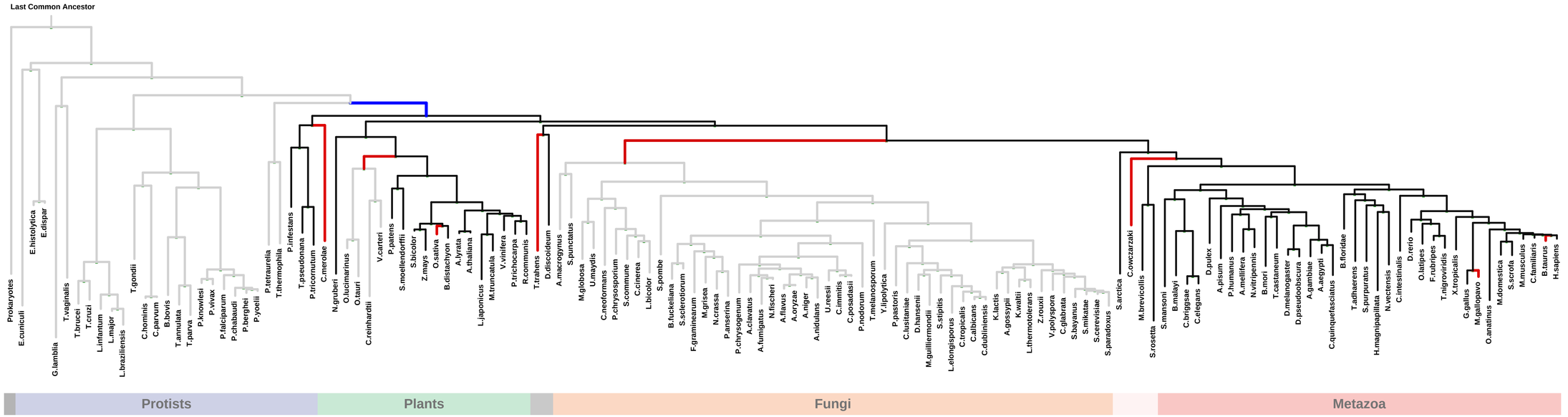
Num of ECM Genes: 1. Num of Predicted Genes: 0



1: microtubule organizing center

ECM 36, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

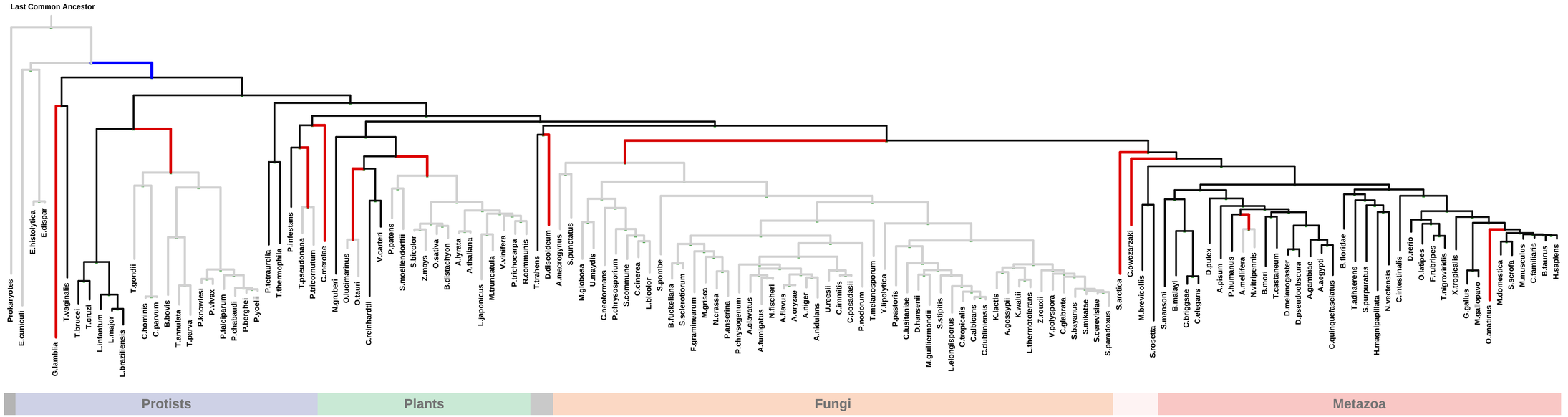


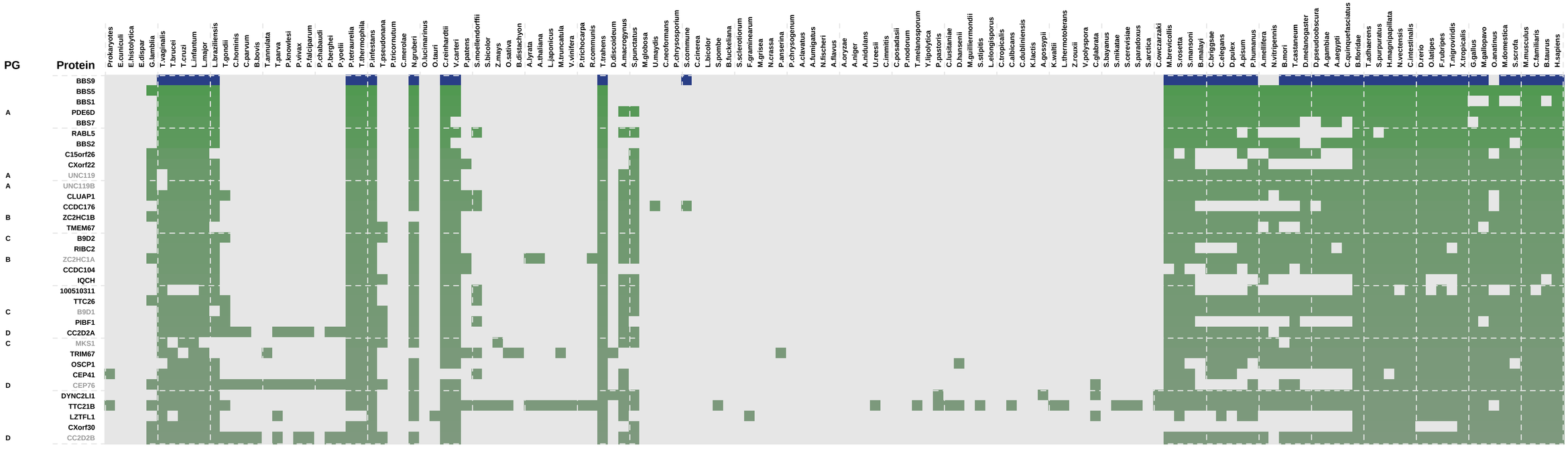
PG	Protein	LLR	Notes
CIR1			1 / 2 / 3

1: histone deacetylase complex || 2: microtubule organizing center || 3: nuclear speck

ECM 37, Gene set "microtubule organizing center", Page 1

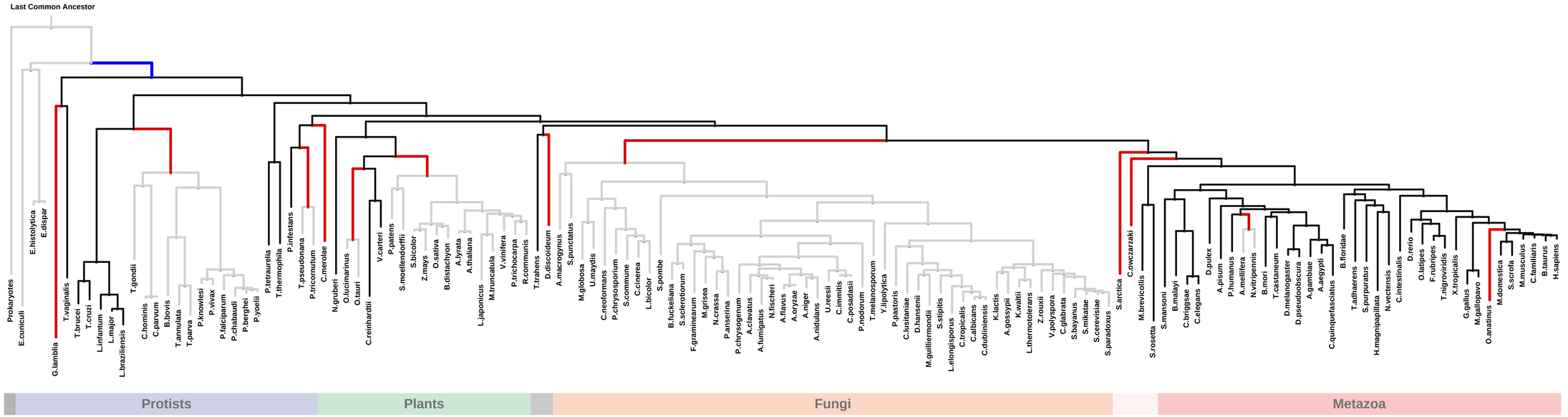
Num of ECM Genes: 1. Num of Predicted Genes: 71





ECM 37, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 71

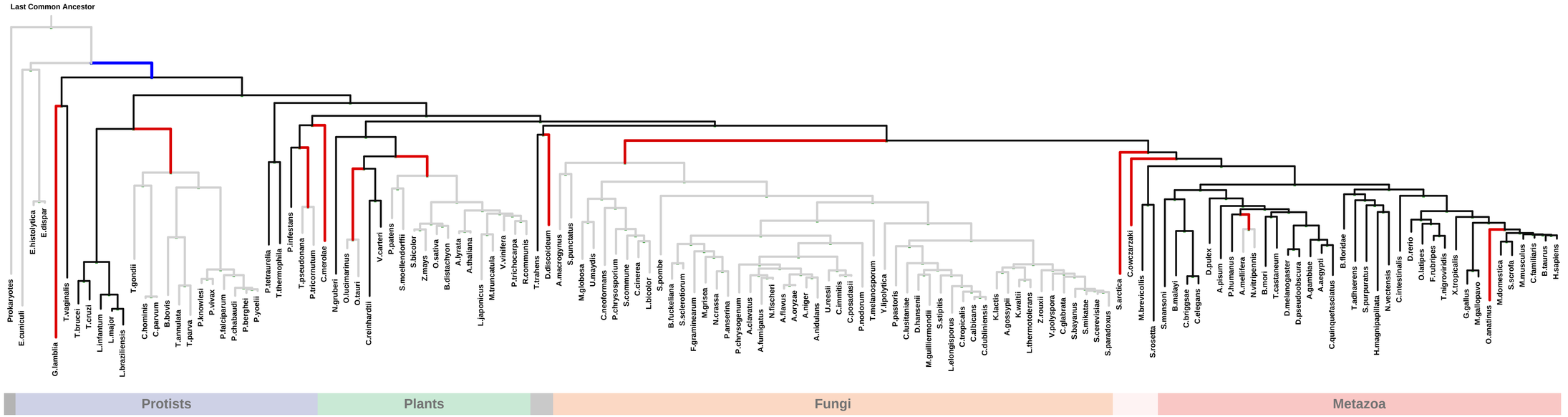


PG	Protein	LLR	Notes
	KIAA1279	9.9	
	TRAF3IP1	9.8	
	TECPR2	9.4	
	KIAA0556	9.3	
	CCDC81	8.7	
	PLXNB3	8.4	
	SPAG16	8.3	1 / 2
	IFT46	8.2	3 / 4 / 5
	IFT140	8.2	1 / 6 / 7
E	FAM221B	8.1	
E	FAM221A	8.1	
	ACAN	7.3	8 / 9 / 10 / 11
	CATSPER1	7.0	12 / 13 / 14
F	AGBL3	6.7	
F	AGBL5	6.7	
F	AGBL1	6.7	
F	AGBL4	6.5	
F	AGBL2	5.7	
	KIAA1751	5.3	
	IFT57	5.0	3 / 7 / 15
	C20orf26	4.2	
	COL7A1	4.0	8 / 16 / 17
	LRRC56	3.8	
	C8orf37	3.5	
	KIAA1841	3.5	
	AXDND1	3.1	
	MCOLN3	2.9	
	ZMYND12	2.8	
F	AGTPBP1	2.7	
	RTDR1	2.6	
G	TTC30A	2.5	13
G	TTC30B	2.5	13
	TTC29	1.7	
	CCDC40	1.6	13
	C16orf93	1.6	

1: cilium axoneme || 2: flagellar axoneme || 3: microtubule basal body || 4: microtubule-based flagellum || 5: motile primary cilium || 6: cilium basal body || 7: photoreceptor connecting cilium || 8: extracellular matrix || 9: Golgi lumen ||
10: lysosomal lumen || 11: proteinaceous extracellular matrix || 12: CatSper complex || 13: cilium || 14: flagellar membrane || 15: dendrite terminus || 16: basement membrane || 17: endoplasmic reticulum lumen

ECM 37, Gene set "microtubule organizing center", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 71

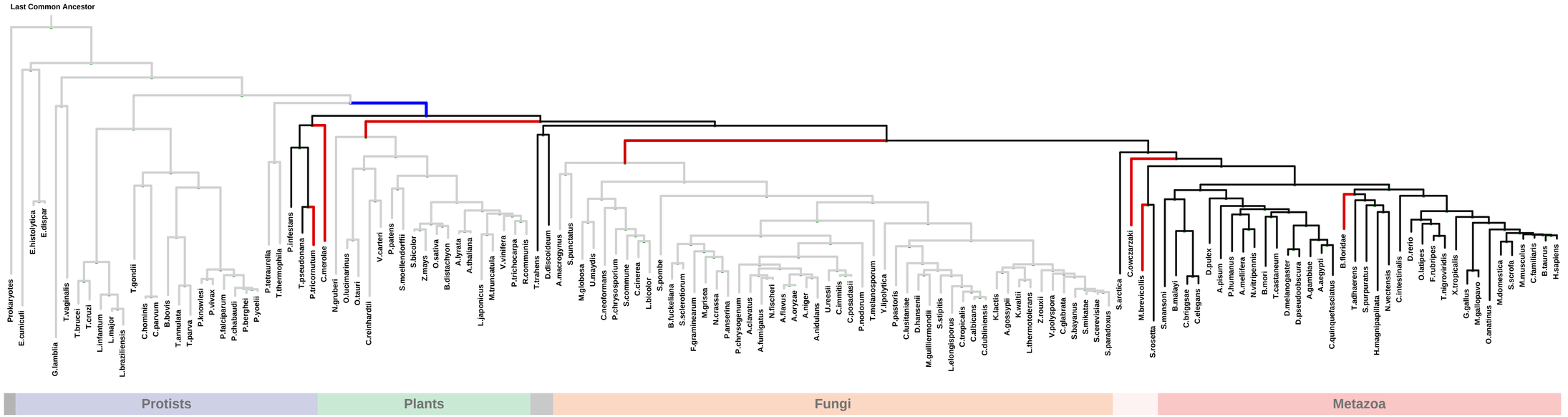


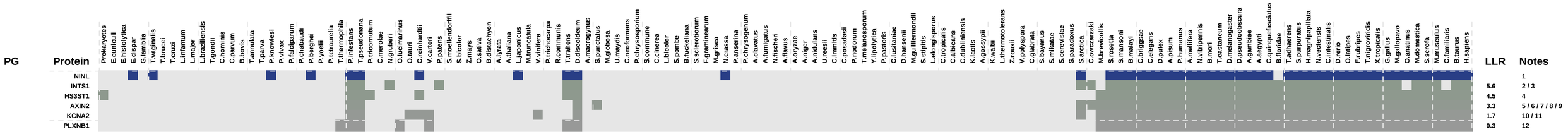
PG	Protein	LLR	Notes
	CEP95	1.0	1
	KIFAP3	1.0	2 / 3 / 4

1: spindle pole || 2: condensed nuclear chromosome || 3: kinesin II complex || 4: spindle microtubule

ECM 38, Gene set "microtubule organizing center", Page 1

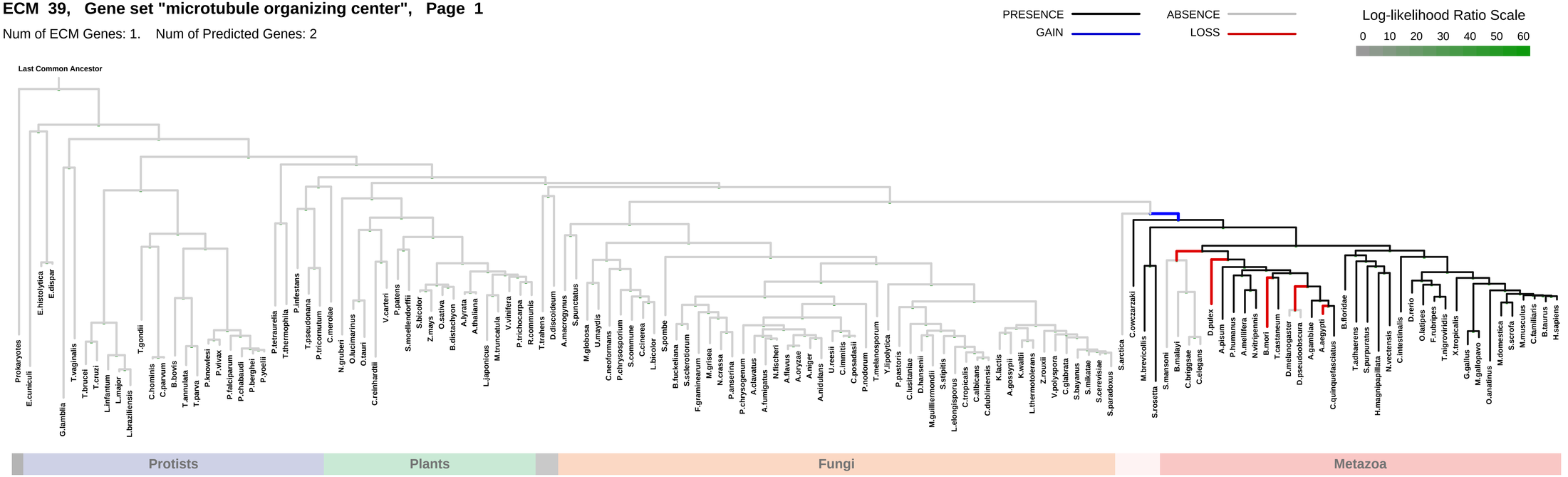
Num of ECM Genes: 1. Num of Predicted Genes: 5





ECM 39, Gene set "microtubule organizing center", Page 1

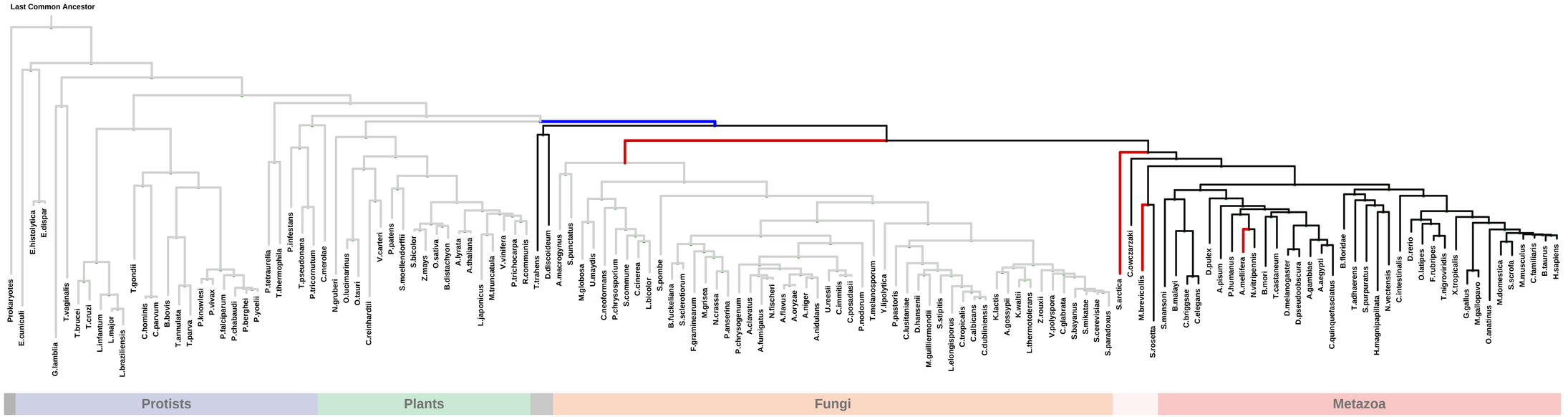
Num of ECM Genes: 1. Num of Predicted Genes: 2

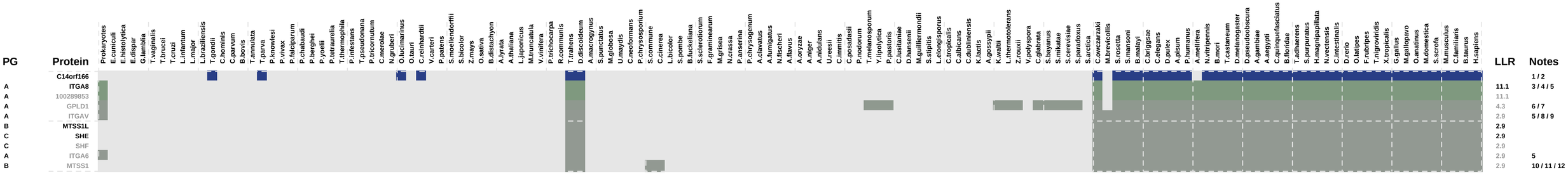


1: microtubule organizing center || 2: spindle

ECM 40, Gene set "microtubule organizing center", Page 1

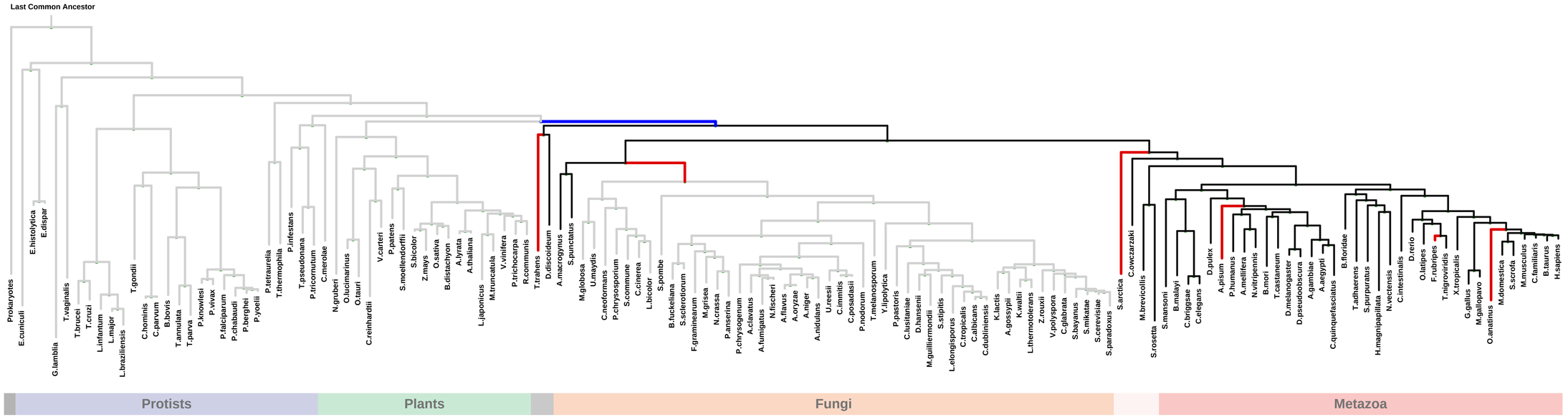
Num of ECM Genes: 1. Num of Predicted Genes: 9

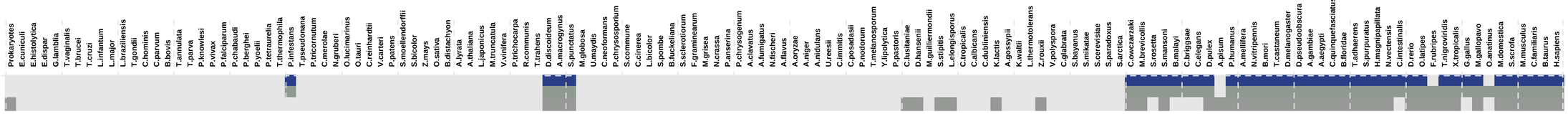




ECM 41, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 2

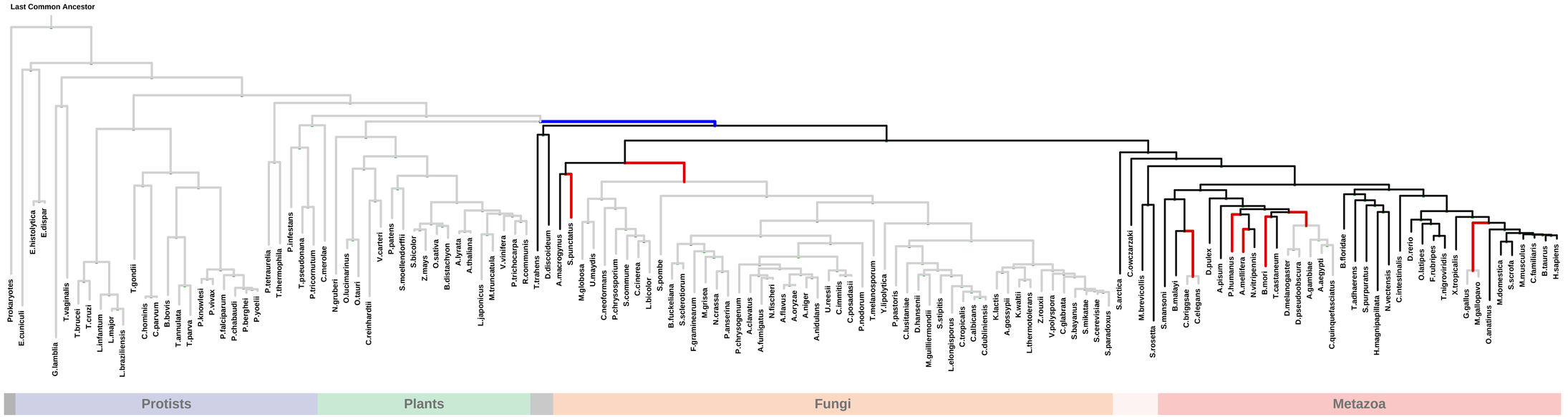


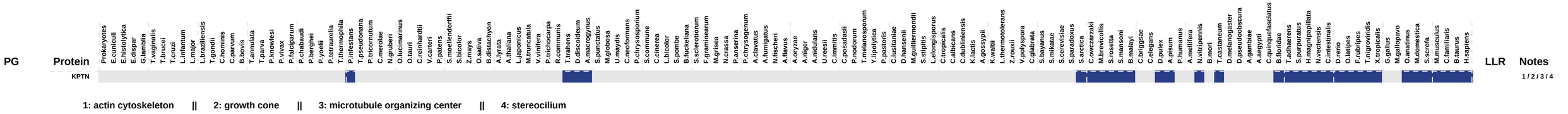


1: microtubule organizing center || 2: mitochondrial respiratory chain complex II

ECM 42, Gene set "microtubule organizing center", Page 1

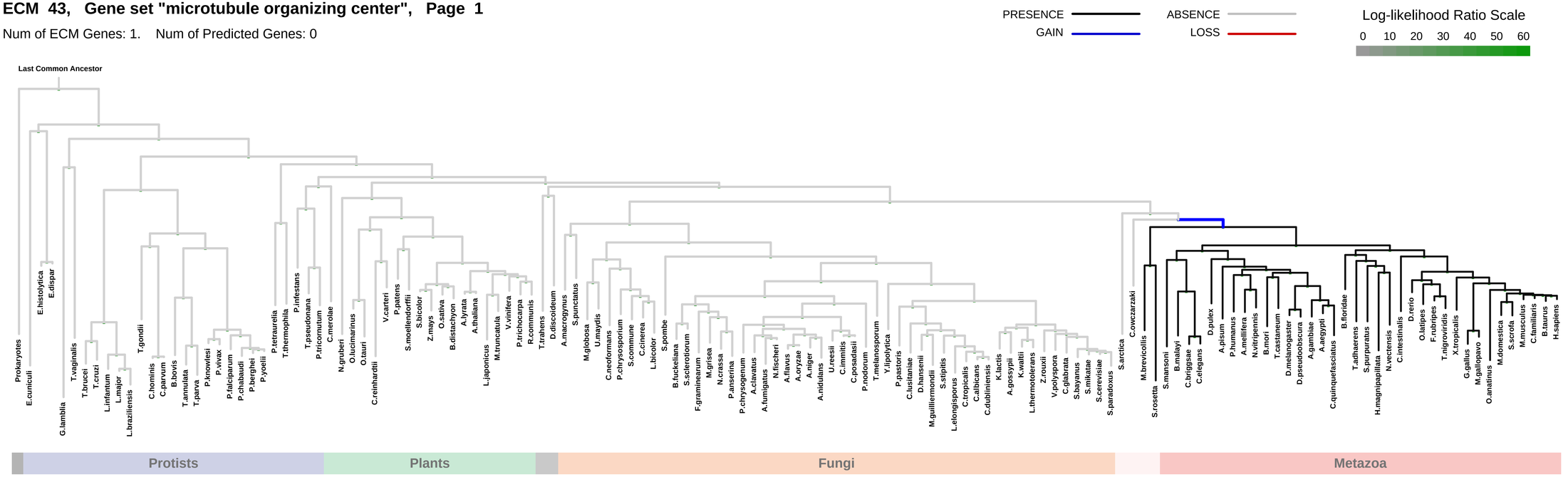
Num of ECM Genes: 1. Num of Predicted Genes: 0





ECM 43, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

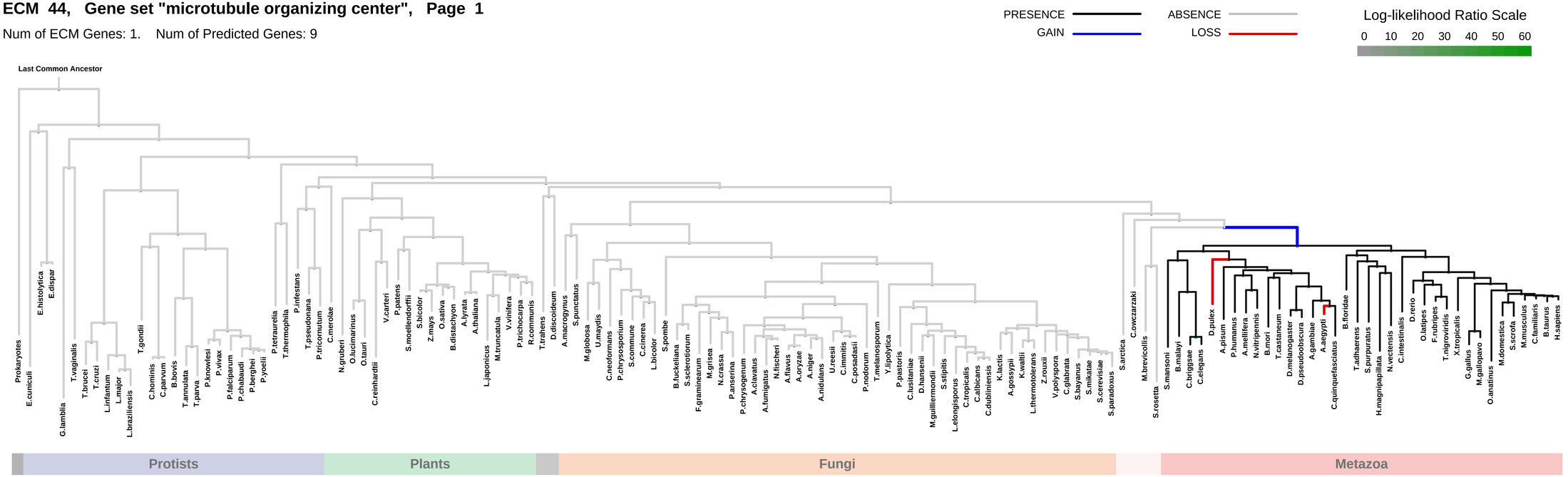


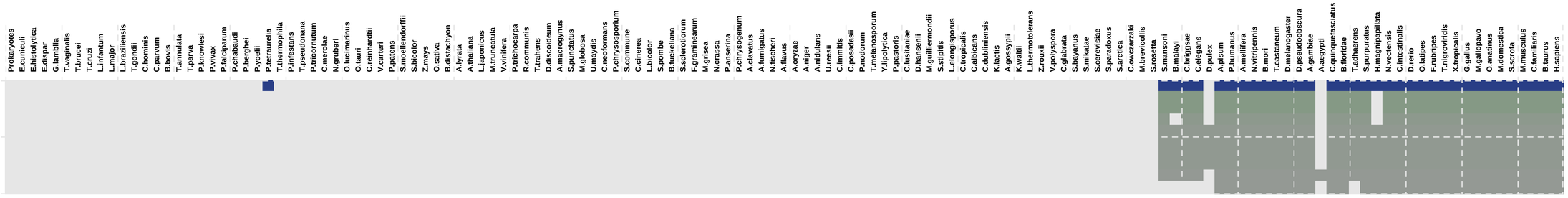
PG	Protein	LLR	Notes
	KRT18		1 / 2 / 3 / 4

1: centriolar satellite || 2: intermediate filament || 3: keratin filament || 4: microtubule organizing center

ECM 44, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 9

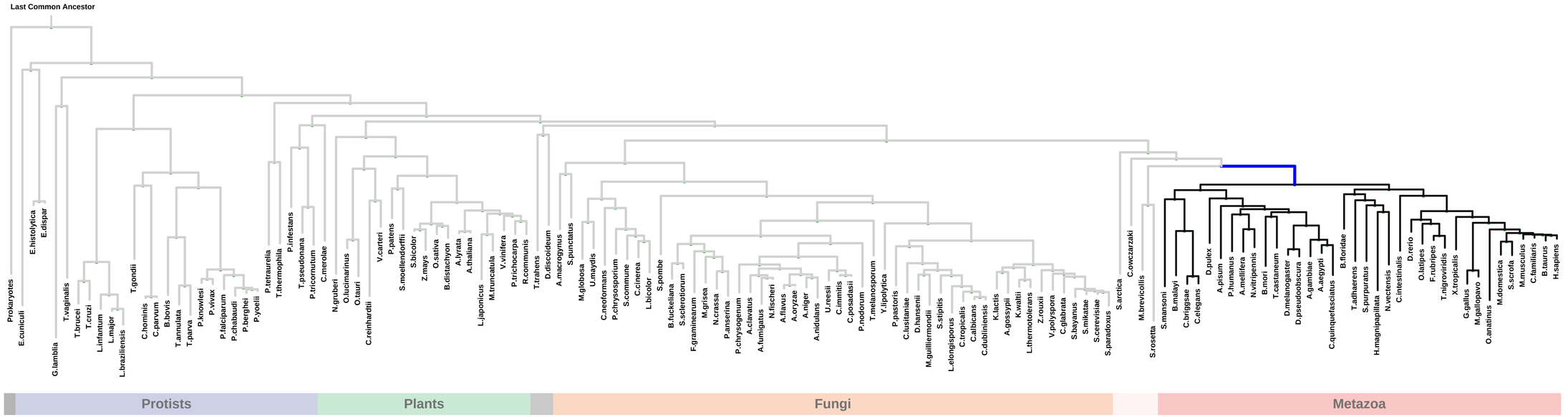




1: cleavage furrow || 2: microtubule organizing center || 3: nuclear speck || 4: NuRD complex || 5: basal lamina || 6: collagen type IV || 7: endoplasmic reticulum lumen || 8: neuromuscular junction || 9: nuclear euchromatin ||
10: external side of plasma membrane

ECM 45, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

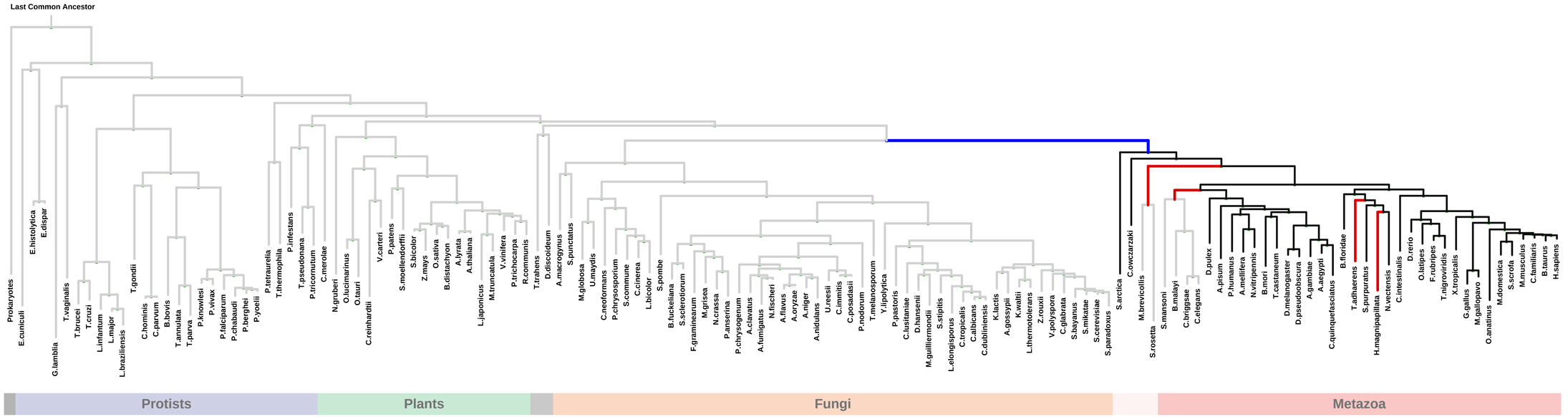


PG	Protein	LLR	Notes
	PAX2		1 / 2 / 3

1: centriolar satellite || 2: microtubule organizing center || 3: protein-DNA complex

ECM 46, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 4

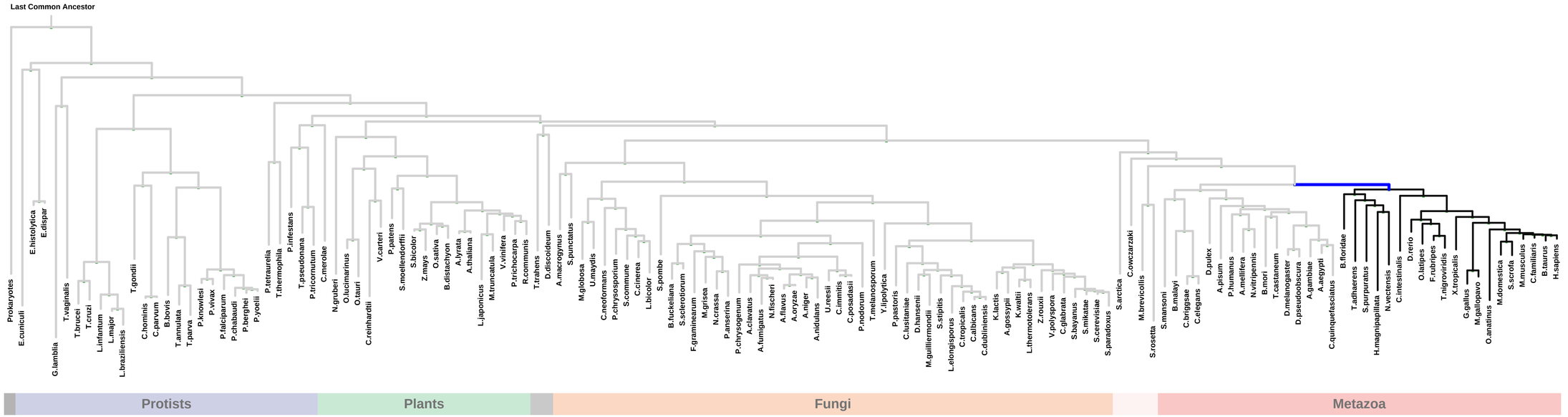


PG	Protein	LLR	Notes
A	RELB		1
A	RELA	17.7	
	NOL11	6.3	
A	NFATC1	3.4	2
	GREB1	3.0	

1: microtubule organizing center || 2: nuclear chromatin

ECM 47, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

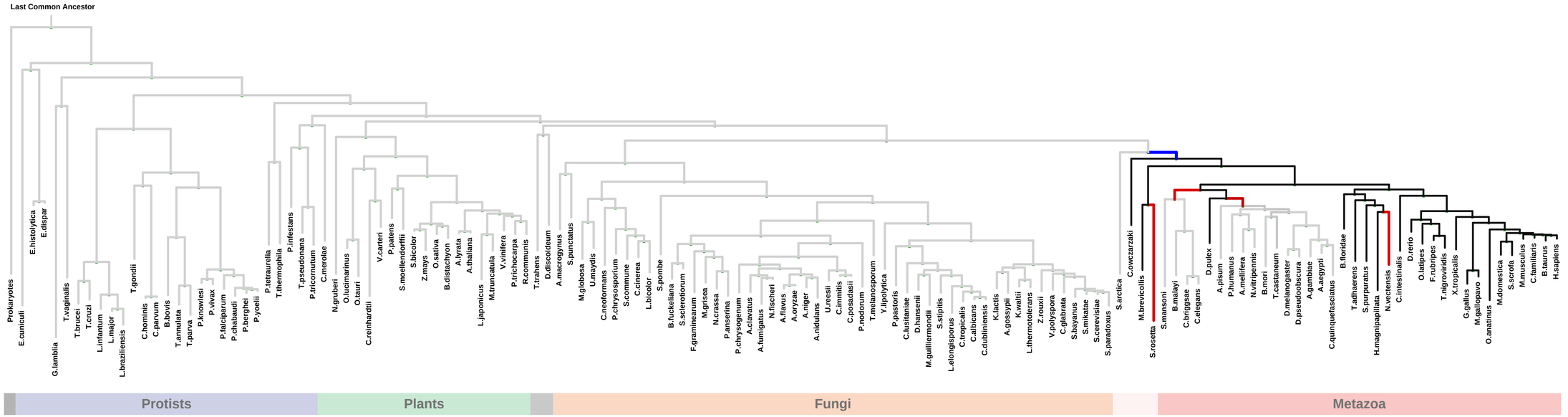


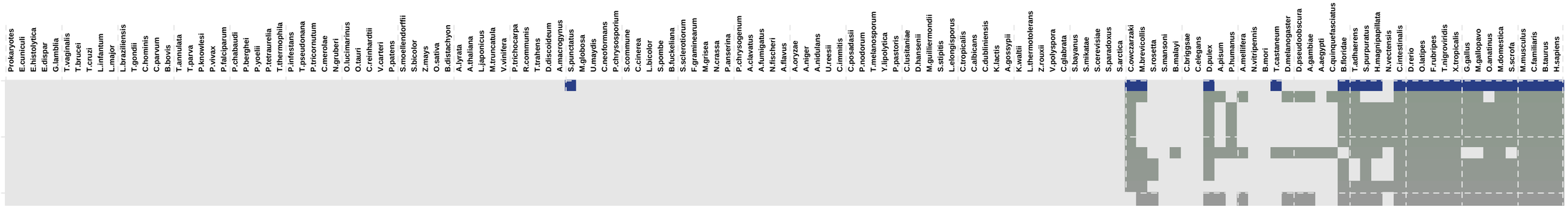
PG	Protein	Prokaryotes E.cuniculi E.histolytica E.dispar G.lamblia T.vaginalis T.brucei T.cruzi L.infantum L.major L.braziliensis T.gondii C.hominis C.parvum B.bovis T.annulata T.parva P.knowlesi P.vivax P.falciparum P.chabaudi P.berghei P.yoelii P.tetraurelia T.thermophila P.infestans T.pseudonana P.tricornutum C.merolae N.gruberi O.lucimarinus O.tauri C.reinhardtii V.carteri P.patens S.moellendorffii S.bicolor Z.mays O.sativa B.distachyon A.lyrata A.thaliana L.japonicus M.truncatula V.vinifera P.trichocarpa R.communis T.trahens D.discoideum A.macrogynus S.punctatus M.globosa U.maydis C.neoformans P.chrysosporium S.commune C.cinerea L.bicolor S.pombe B.fuckeliana S.sclerotiorum F.graminearum M.grisea N.crassa P.anserina P.chrysogenum A.clavatus A.fumigatus N.fischeri A.flavus A.oryzae A.niger A.nidulans U.reesii C.immitis C.posadasii P.nodorum T.melanosporum Y.lipolytica P.pastoris C.lusitaniae D.hansenii M.guilliermondii S.stipitis L.elongisporus C.tropicalis C.albicans C.dubliniensis K.lactis A.gossypii K.waltii L.thermotolerans Z.rouxii V.polyspora C.glabrata S.bayanus S.mikatae S.cerevisiae S.paradoxus S.arctica C.owczarzaki M.brevicollis S.rosetta S.mansoni B.malayi C.briggsae C.elegans D.pulex A.pisum P.humanus A.mellifera N.vitripennis B.mori T.castaneum D.melanogaster D.pseudoobscura A.gambiae A.aegypti C.quinquefasciatus B.floridae T.adhaerens S.purpuratus H.magnipapillata N.vectensis C.intestinalis D.rerio O.latipes F.rubripes T.nigroviridis X.tropicalis G.gallus M.gallopavo O.anatinus M.domestica S.scrofa M.musculus C.familiaris B.taurus H.sapiens	LLR	Notes
	CEP57L1			1

1: microtubule organizing center

ECM 48, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 10

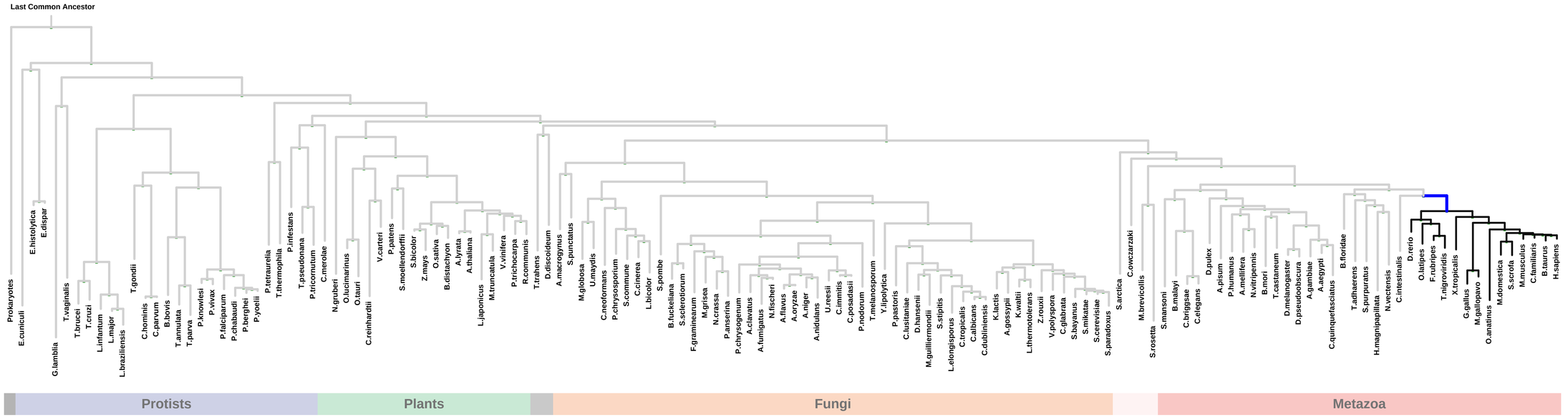




1: condensed chromosome outer kinetochore || 2: microtubule organizing center || 3: spindle pole || 4: cytoplasmic vesicle membrane || 5: anchored to membrane || 6: extrinsic to membrane || 7: Ino80 complex

ECM 49, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

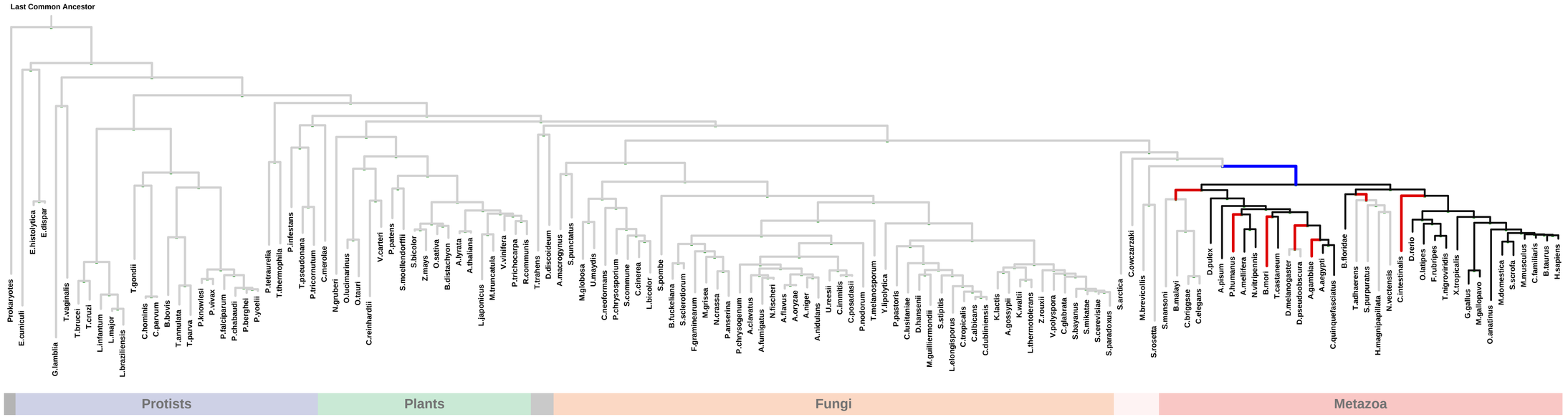


PG	Protein	Prokaryotes E.cuniculi E.histolytica E.dispar G.lamblia T.vaginalis T.brucei T.cruzi L.infantum L.major L.braziliensis T.gondii C.hominis C.parvum B.bovis T.annulata T.parva P.knowlesi P.vivax P.falciparum P.chabaudi P.berghei P.yoelii P.tetraurelia T.thermophila P.infestans T.pseudonana P.tricornutum C.merolae N.gruberi O.lucimarinus O.tauri C.reinhardtii V.carteri P.patens S.moellendorffii S.bicolor Z.mays O.sativa B.distachyon A.lyrata A.thaliana L.japonicus M.truncatula V.vinifera P.trichocarpa R.communis T.trahens D.discoideum A.macrogynus S.punctatus M.globosa U.maydis C.neoformans P.chrysosporium S.commune C.cinerea L.bicolor S.pombe B.fuckeliana S.sclerotiorum F.graminearum M.grisea N.crassa P.anserina P.chrysogenum A.clavatus A.fumigatus A.flavus A.oryzae A.niger A.nidulans U.reesii C.immitis C.posadasii P.nodorum T.melanosporum Y.lipolytica P.pastoris C.lusitaniae D.hansenii M.guilliermondii S.stipitis L.elongisporus C.tropicalis C.albicans C.dubliniensis K.lactis A.gossypii K.waltii L.thermotolerans Z.rouxii V.polyspora C.glabrata S.bayanus S.mikatae S.cerevisiae S.paradoxus S.arctica C.owczarzaki M.brevicollis S.rosetta S.mansoni B.malayi C.briggsae C.elegans D.pulex A.pisum P.humanus A.mellifera N.vitripennis B.mori T.castaneum D.melanogaster D.pseudoobscura A.gambiae A.aegypti C.quinquefasciatus B.floridae T.adhaerens S.purpuratus H.magnipapillata N.vectensis C.intestinalis D.rerio O.latipes F.rubripes T.nigroviridis X.tropicalis G.gallus M.gallopavo O.anatinus M.domestica S.scrofa M.musculus C.familiaris B.taurus H.sapiens	LLR	Notes
	AKAP11			1

1: microtubule organizing center

ECM 50, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 117

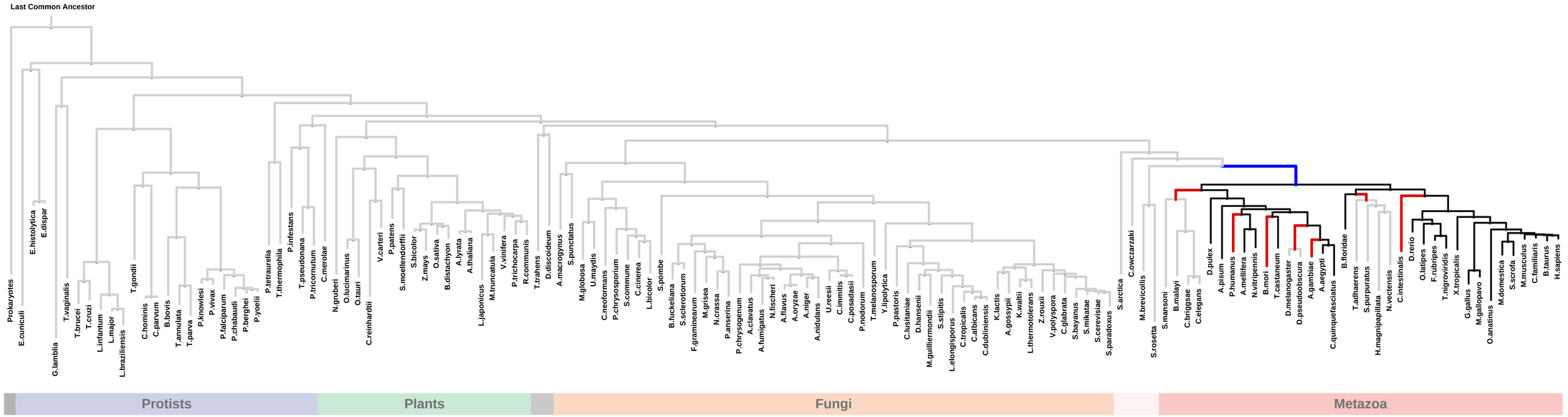


PG	Protein	LLR	Notes
	ATF4		1
A	GFRA1	33.5	2 / 3
A	GFRA3	33.5	2 / 3 / 4
A	GFRA2	29.8	2 / 3
	C2CD2L	26.3	
	UQCR11	21.5	5
	DOK7	17.1	6
B	LYPD6B	16.4	2
B	LYPD6	16.4	
	CD79A	15.8	4 / 7 / 8 / 9
	SPATA2L	14.6	
C	WISP3	14.6	
	C16orf87	13.9	
	TMEM211	13.8	
D	AUTS2	13.8	
E	CACNG4	13.6	10 / 11 / 12
	GLYATL2	12.6	
F	OR5AP2	12.5	
	TICAM2	12.4	13
A	GFRAL	12.1	
	CRB3	12.0	14
	HAVCR2	11.9	
G	CT45A1	11.6	
G	CT45A2	11.6	
G	CT45A3	11.6	
G	CT45A4	11.6	
	CT45A6	11.6	
	TAPBPL	10.8	
	MED9	10.1	15
	AKAP6	10.1	16 / 17 / 18 / 19
	FABP6	9.0	
	LYSMD2	9.0	
	N4BP3	8.8	20
	COX16	8.7	21
D	FBRSL1	8.6	

1: microtubule organizing center || 2: anchored to membrane || 3: extrinsic to membrane || 4: external side of plasma membrane || 5: respiratory chain || 6: neuromuscular junction || 7: B cell receptor complex || 8: membrane raft ||
9: multivesicular body || 10: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 11: endocytic vesicle membrane || 12: voltage-gated calcium channel complex || 13: endosome membrane || 14: tight junction ||
15: mediator complex || 16: calcium channel complex || 17: nuclear envelope || 18: nuclear outer membrane || 19: sarcoplasmic reticulum || 20: cytoplasmic vesicle membrane || 21: mitochondrial membrane

ECM 50, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 117

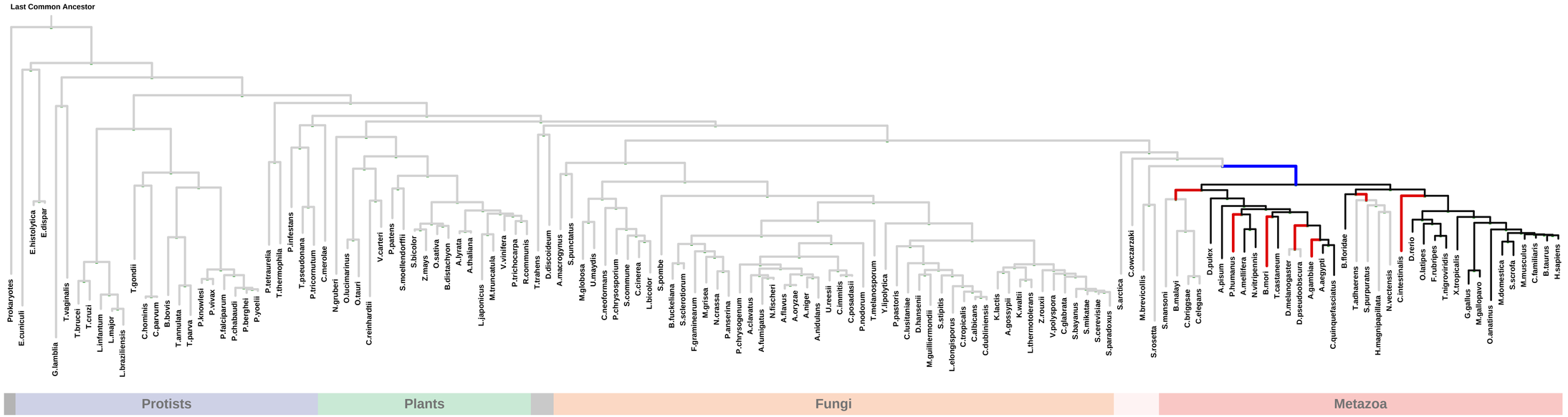


PG	Protein	LLR	Notes
F	OR51D1	8.4	
	MYEOV2	7.7	
E	CACNG5	7.6	1 / 2 / 3
	NDUFA1	7.4	4 / 5
	ND6	7.3	5
H	TNFSF13B	7.3	
	IGF1	7.2	6 / 7
E	CACNG7	7.0	1 / 8
	CD164	6.8	9 / 10 / 11 / 12
F	OR6B3	6.5	
F	OR6B2	6.5	
	MRGPRX3	6.4	
	ANAPC15	6.3	13
	PTGFRN	6.0	
G	100509058	5.8	
	SMIM4	5.8	
	HSF2BP	5.1	
F	OR6K6	4.9	
	TMEM130	4.8	
C	WISP2	4.7	
	FADD	4.6	14 / 15 / 16 / 17 / 18
	ITFG3	4.5	
	MMS22L	4.4	19 / 20 / 21
E	CACNG2	4.3	1 / 8 / 22
	GOLIM4	4.3	10 / 23 / 24 / 25 / 26
	NCCRP1	4.1	
F	OR5I1	3.9	
	SOST	3.7	27
F	OR5AS1	3.6	
	PERP	3.5	28
I	PHYHIP	3.2	
I	PHYHIPL	3.2	
	KTN1	3.2	
J	TCN2	3.1	
K	METRN	3.1	

1: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 2: postsynaptic density || 3: postsynaptic membrane || 4: mitochondrial membrane || 5: mitochondrial respiratory chain complex I || 6: insulin-like growth factor binding protein complex || 7: platelet alpha granule lumen || 8: voltage-gated calcium channel complex || 9: endosome || 10: endosome membrane || 11: lysosomal membrane || 12: lysosome || 13: anaphase-promoting complex || 14: CD95 death-inducing signaling complex || 15: cell body || 16: death-inducing signaling complex || 17: membrane raft || 18: neuron projection || 19: FACT complex || 20: MCM complex || 21: nuclear replication fork || 22: endocytic vesicle membrane || 23: cis-Golgi network ||

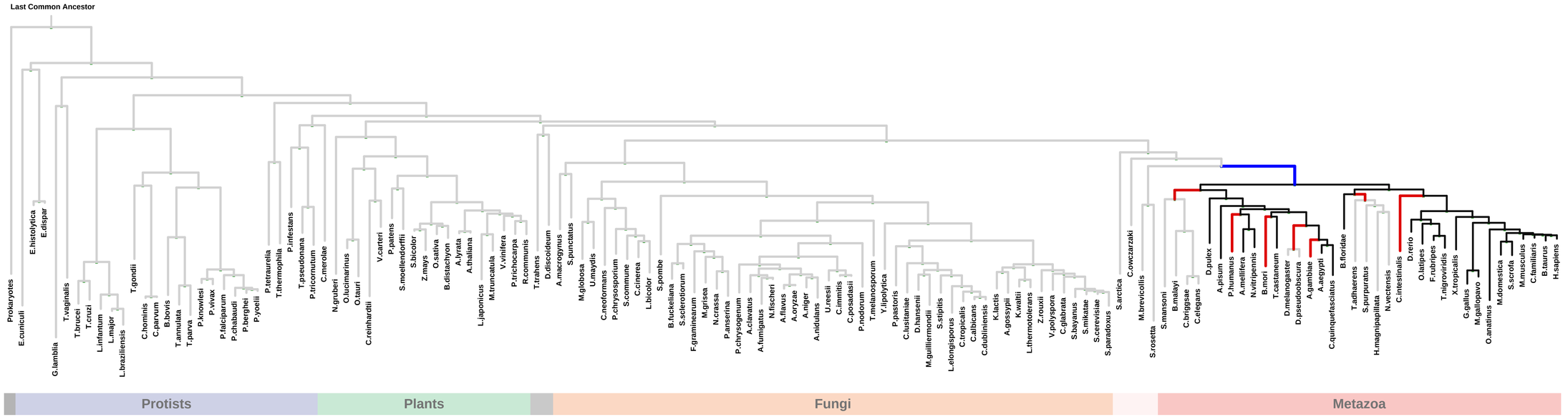
ECM 50, Gene set "microtubule organizing center", Page 3

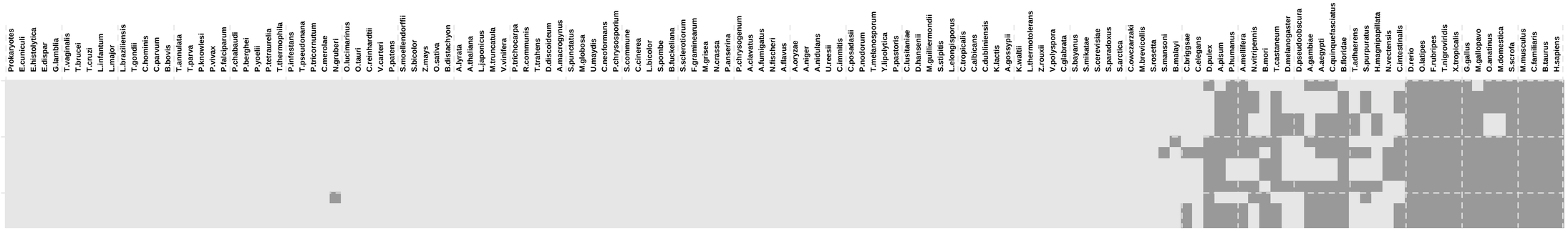
Num of ECM Genes: 1. Num of Predicted Genes: 117



ECM 50, Gene set "microtubule organizing center", Page 4

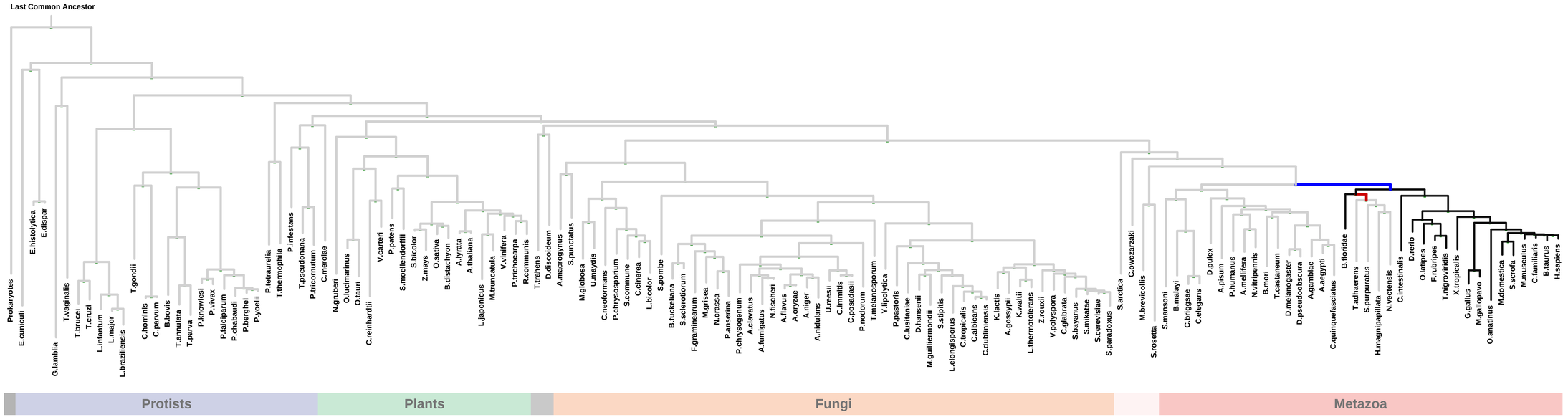
Num of ECM Genes: 1. Num of Predicted Genes: 117





ECM 51, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 56

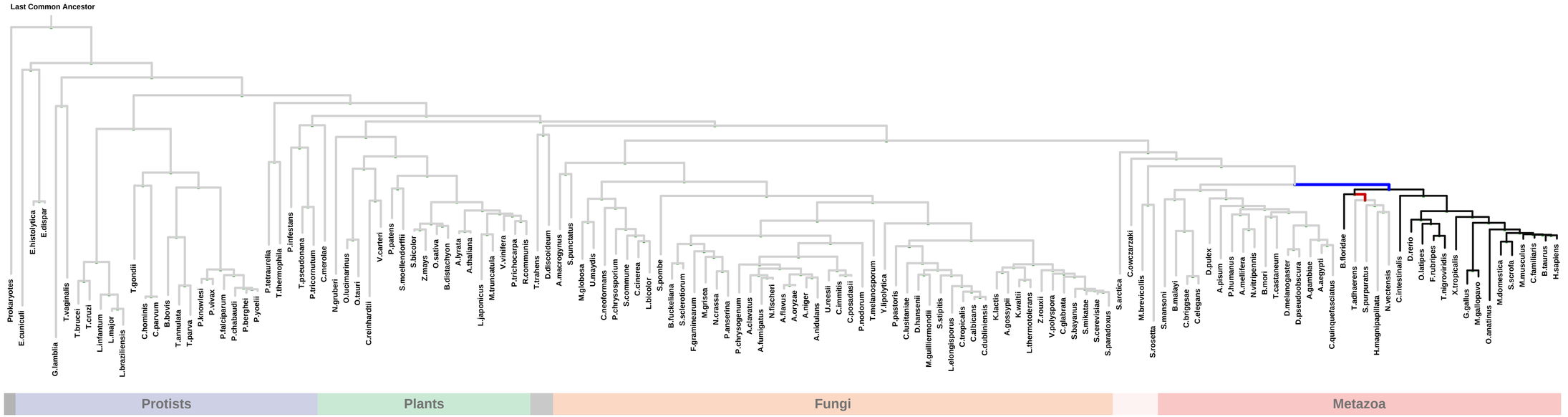


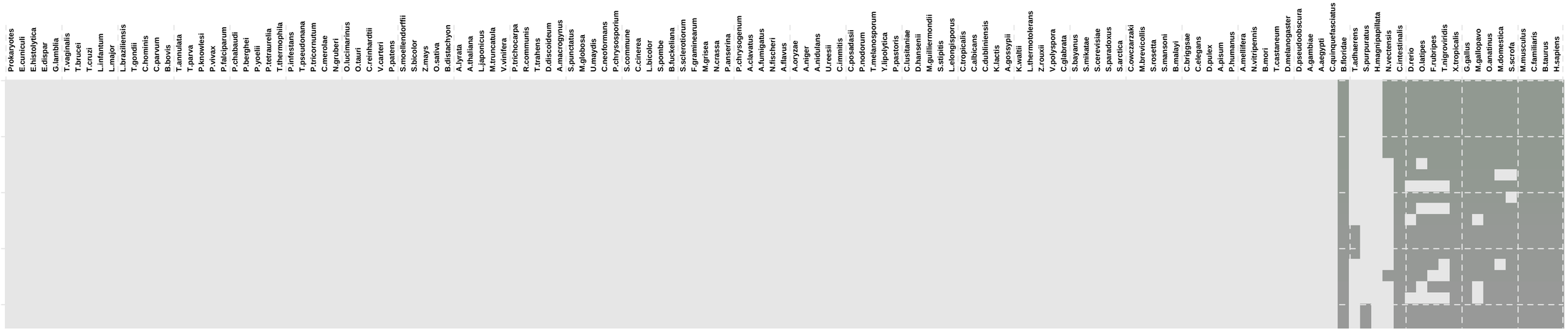
PG	Protein	LLR	Notes
	FAM110B		1
A	BTN3A1	5.2	
	CLDN7	5.2	2 / 3
B	CRYBA2	5.2	
B	CRYBA4	5.2	
B	CRYBB2	5.2	
B	CRYBB3	5.2	
	EDAR	5.2	4
C	EMID1	5.2	5
C	COL26A1	5.2	5 / 6
	HOMEZ	5.2	
	IFFO2	5.2	
	IGFBP6	5.2	
	IL17F	5.2	
D	IL17RA	5.2	
D	IL17RD	5.2	
E	KCNMB1	5.2	7
E	KCNMB3	5.2	7
	KIAA1549	5.2	
	LECT1	5.2	8
F	PRRG1	5.2	
F	PRRG2	5.2	
F	PRRG3	5.2	
	PTGER1	5.2	
G	STC1	5.2	
G	STC2	5.2	
	TMEM178A	5.2	
A	TRIM14	5.2	
A	TRIM16L	5.2	
A	TRIM69	5.2	9
	WISP1	5.2	
	ZNF365	5.2	1
	PRR14L	4.1	
	TMEM102	3.3	
E	KCNMB4	3.3	7

1: microtubule organizing center || 2: lateral plasma membrane || 3: tight junction || 4: apical part of cell || 5: collagen || 6: endoplasmic reticulum lumen || 7: voltage-gated potassium channel complex || 8: endomembrane system || 9: nuclear speck

ECM 51, Gene set "microtubule organizing center", Page 2

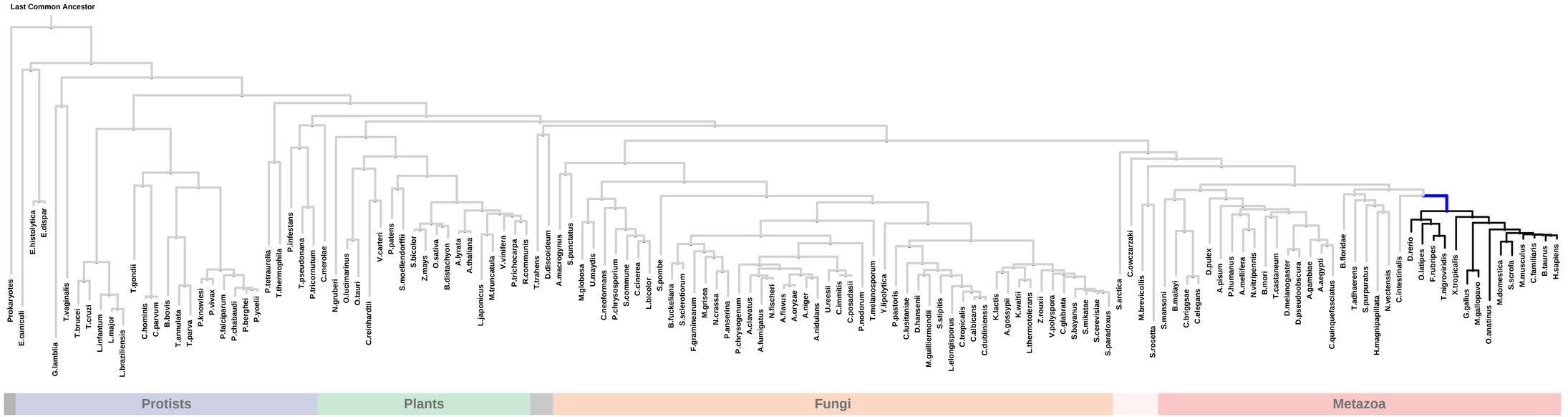
Num of ECM Genes: 1. Num of Predicted Genes: 56

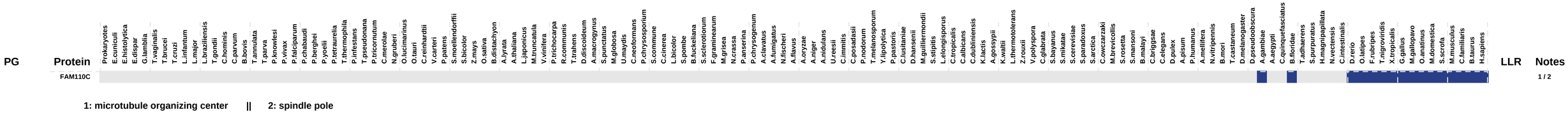




ECM 52, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

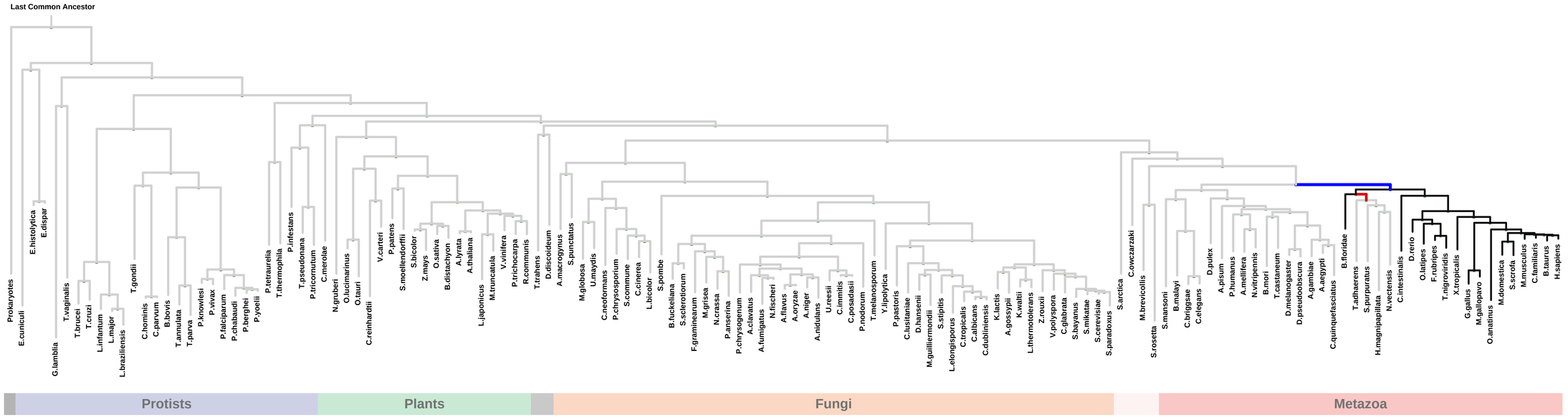




1: microtubule organizing center || 2: spindle pole

ECM 53, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 55

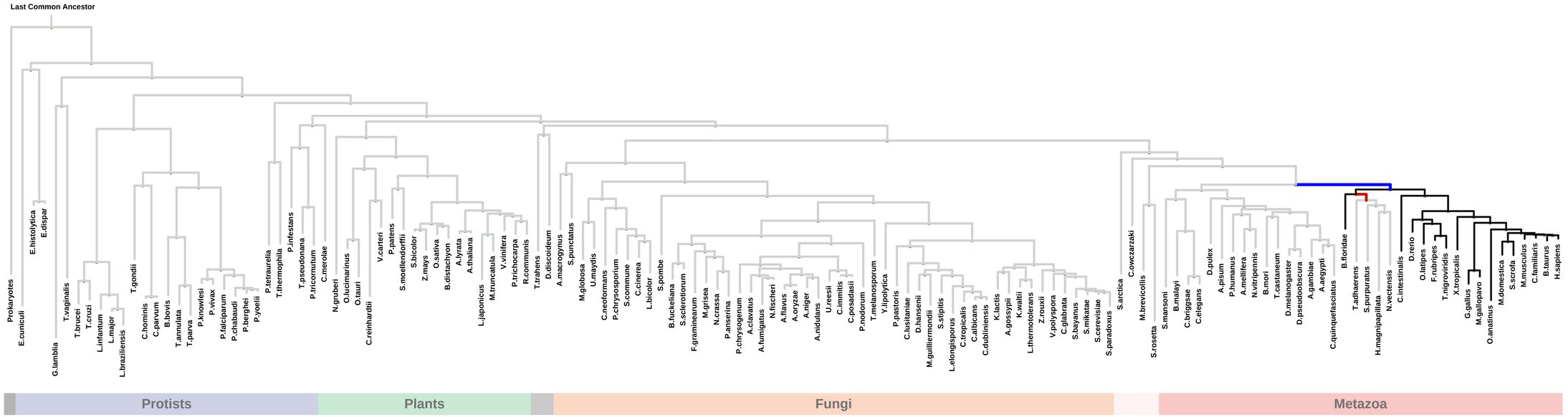


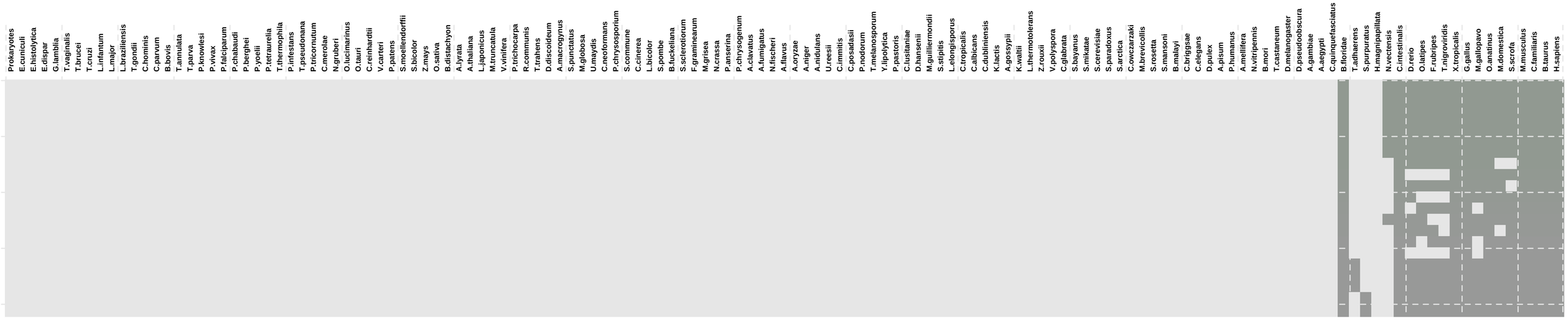
PG	Protein	LLR	Notes
	ZNF365		1
A	BTN3A1	5.3	
	CLDN7	5.3	2 / 3
B	CRYBA2	5.3	
B	CRYBA4	5.3	
B	CRYBB2	5.3	
B	CRYBB3	5.3	
	EDAR	5.3	4
C	EMID1	5.3	5
C	COL26A1	5.3	5 / 6
	HOMEZ	5.3	
	IFFO2	5.3	
	IGFBP6	5.3	
	IL17F	5.3	
D	IL17RA	5.3	
D	IL17RD	5.3	
E	KCNMB1	5.3	7
E	KCNMB3	5.3	7
	KIAA1549	5.3	
	LECT1	5.3	8
F	PRRG1	5.3	
F	PRRG2	5.3	
F	PRRG3	5.3	
	PTGER1	5.3	
G	STC1	5.3	
G	STC2	5.3	
	TMEM178A	5.3	
A	TRIM14	5.3	
A	TRIM16L	5.3	
A	TRIM69	5.3	9
	WISP1	5.3	
	PRR14L	4.2	
	NDP	3.4	10
E	KCNMB4	3.4	7
	TMEM102	3.4	

1: microtubule organizing center || 2: lateral plasma membrane || 3: tight junction || 4: apical part of cell || 5: collagen || 6: endoplasmic reticulum lumen || 7: voltage-gated potassium channel complex || 8: endomembrane system || 9: nuclear speck || 10: extracellular matrix

ECM 53, Gene set "microtubule organizing center", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 55



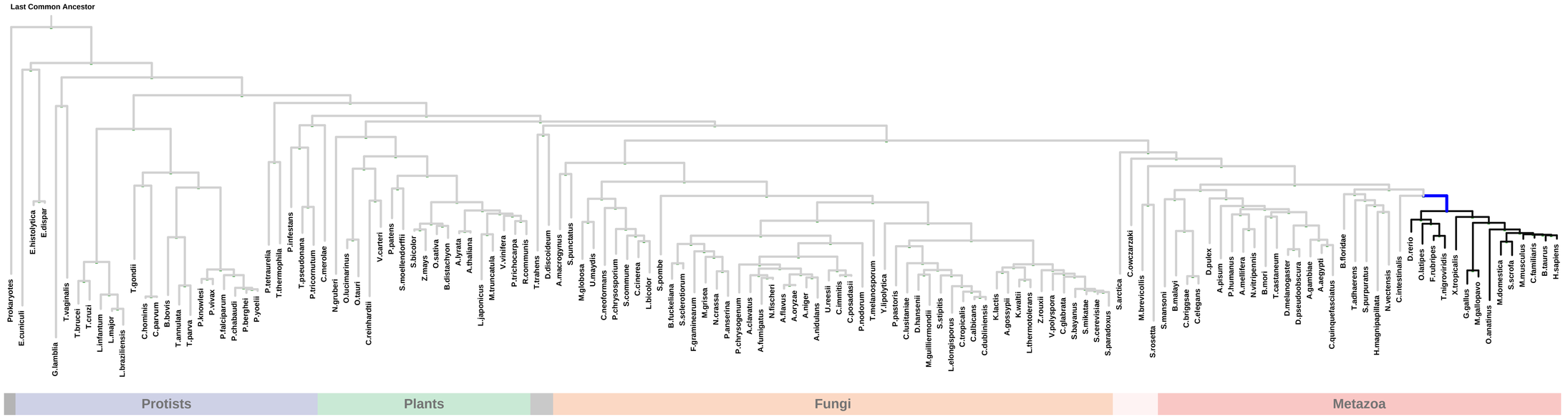


PG	Protein	LLR	Notes
	FAM134B	3.4	1
H	TNF	3.4	2 / 3 / 4 / 5
	TRAF3IP2	3.4	
I	CKAP2	3.4	6 / 7 / 8
H	LTA	3.4	
	LYVE1	3.4	
I	CKAP2L	3.4	
	SLC48A1	3.3	9 / 10
	CLPS	3.2	
	MACC1	2.8	
	MSMP	2.3	
	FAM187B	1.6	
	KIAA0753	1.2	
	FBXO46	1.2	
	MS4A4A	0.5	
	ODF1	0.4	11
J	LYG1	0.3	
J	LYG2	0.3	
	ENDOD1	0.3	
	SLAIN1	0.3	
	NXPE1	0.3	

1: cis-Golgi network || 2: external side of plasma membrane || 3: membrane raft || 4: phagocytic cup || 5: recycling endosome || 6: cytoplasmic microtubule || 7: microtubule cytoskeleton || 8: spindle pole || 9: endosome membrane ||
10: lysosomal membrane || 11: outer dense fiber

ECM 54, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

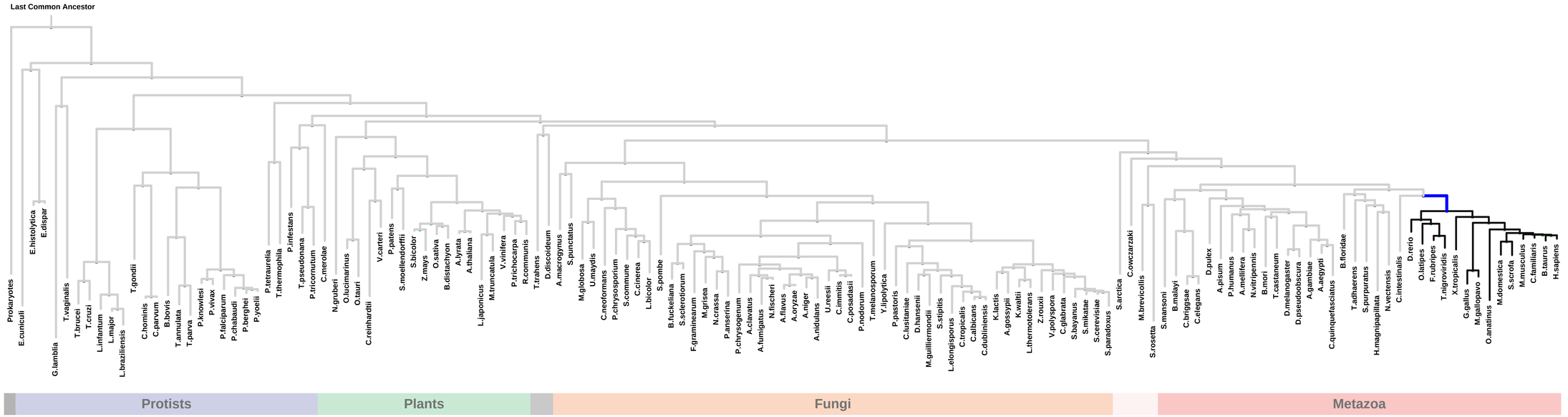


PG	Protein	Prokaryotes E.cuniculi E.histolytica E.dispar G.lamblia T.vaginalis T.brucei T.cruzi L.infantum L.major L.braziliensis T.gondii C.hominis C.parvum B.bovis T.annulata T.parva P.knowlesi P.vivax P.falciparum P.chabaudi P.berghei P.yoelii P.tetraurelia T.thermophila P.infestans T.pseudonana P.tricornutum C.merolae N.gruberi O.lucimarinus O.tauri C.reinhardtii V.carteri P.patens S.moellendorffii S.bicolor Z.mays O.sativa B.distachyon A.lyrata A.thaliana L.japonicus M.truncatula V.vinifera P.trichocarpa R.communis T.trahens D.discoideum A.macrogynus S.punctatus M.globosa U.maydis C.neoformans P.chrysosporium S.commune C.cinerea L.bicolor S.pombe B.fuckeliana S.sclerotiorum F.graminearum M.grisea N.crassa P.anserina P.chrysogenum A.clavatus A.fumigatus N.fischeri A.flavus A.oryzae A.niger A.nidulans U.reesii C.immitis C.posadasii P.nodorum T.melanosporum Y.lipolytica P.pastoris C.lusitaniae D.hansenii M.guilliermondii S.stipitis L.elongisporus C.tropicalis C.albicans C.dubliniensis K.lactis A.gossypii K.waltii L.thermotolerans Z.rouxii V.polyspora C.glabrata S.bayanus S.mikatae S.cerevisiae S.paradoxus S.arctica C.owczarzaki M.brevicollis S.rosetta S.mansoni B.malayi C.briggsae C.elegans D.pulex A.pisum P.humanus A.mellifera N.vitripennis B.mori T.castaneum D.melanogaster D.pseudoobscura A.gambiae A.aegypti C.quinquefasciatus B.floridae T.adhaerens S.purpuratus H.magnipapillata N.vectensis C.intestinalis D.rerio O.latipes F.rubripes T.nigroviridis X.tropicalis G.gallus M.gallopavo O.anatinus M.domestica S.scrofa M.musculus C.familiaris B.taurus H.sapiens	LLR	Notes
	FAM110A			1 / 2

1: microtubule organizing center || 2: spindle pole

ECM 55, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0

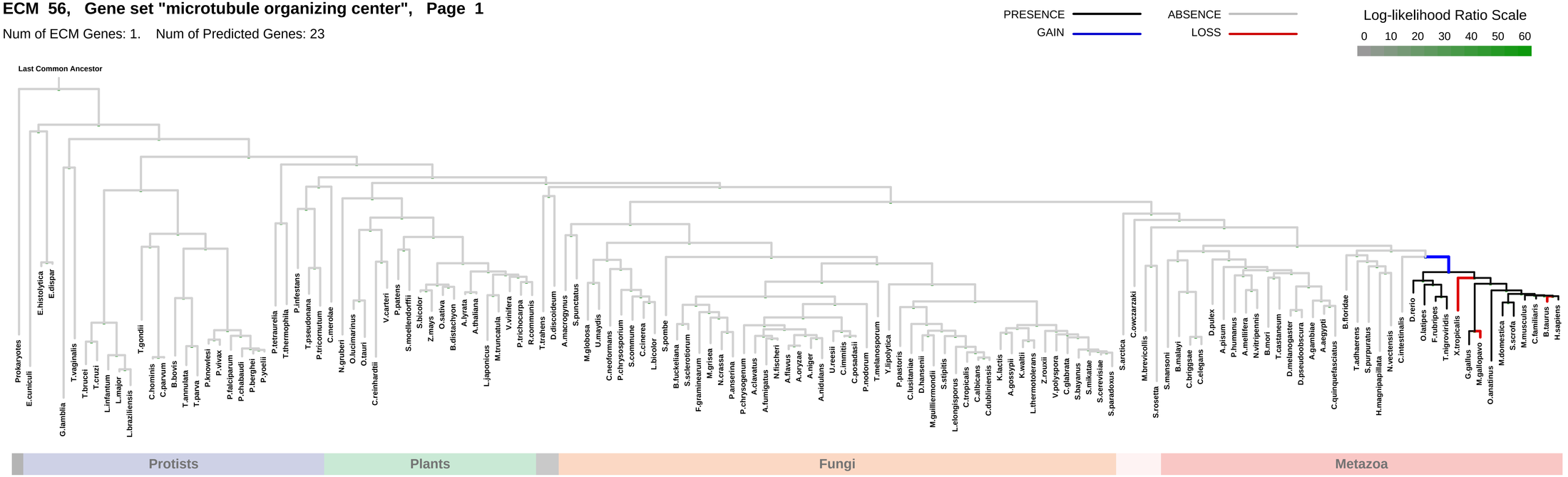


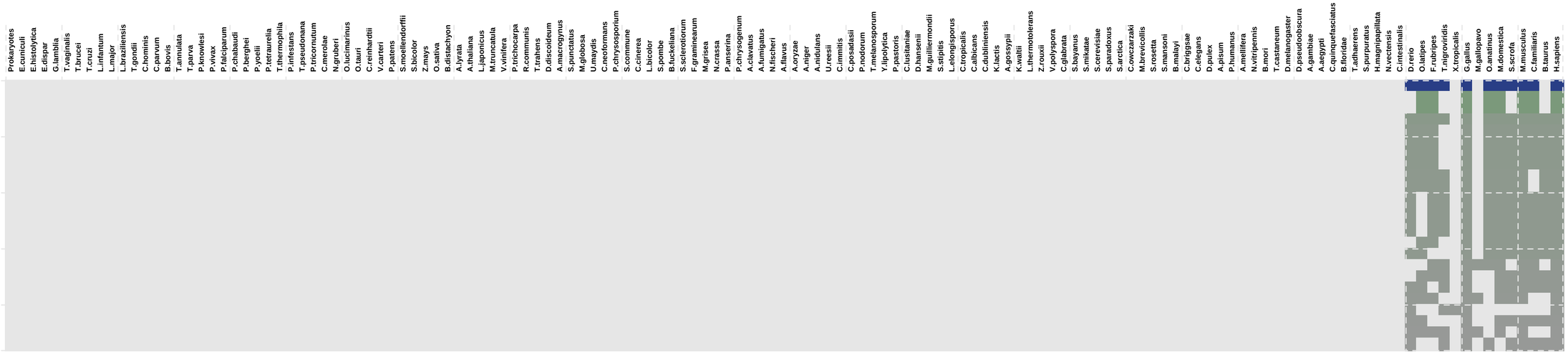
PG	Protein	LLR	Notes
	SNCG		1 / 2 / 3

1: axon terminus || 2: microtubule organizing center || 3: spindle

ECM 56, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 23



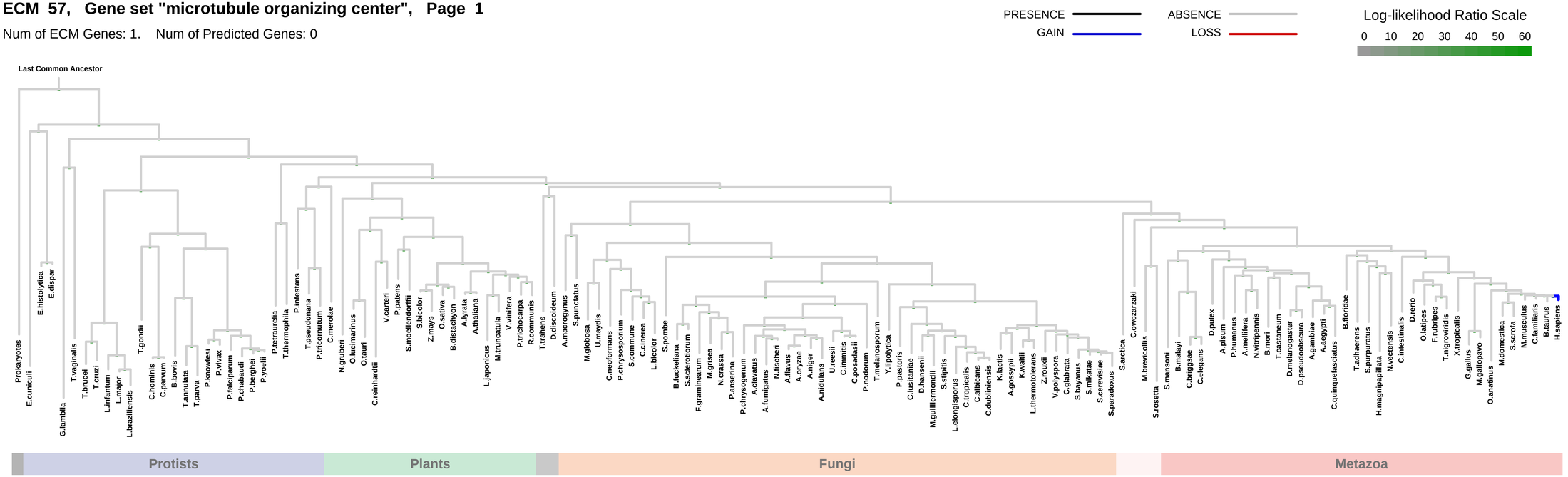


PG	Protein	LLR	Notes
	PTPN20A		1
A	TCP10	12.7	
A	TCP10L2	12.7	
	PTTG1	6.4	
B	IL24	5.0	
	IFNB1	5.0	
	IL12A	5.0	2
B	IL19	5.0	
C	FAM196B	4.5	
C	FAM196A	4.5	
	MS4A18	4.5	
	BRICD5	4.5	
	FOXP1	4.5	
	MS4A18	4.5	
	BCL2L15	4.2	
	RNASE7	4.2	
	C17orf58	2.9	
	KIAA0101	2.7	
	BAALC	2.4	
	LOC100288814	2.0	
	LOC646543	1.7	
	MARCKSL1	1.4	
	LOC100506514	0.9	
	SRGN	0.7	3 / 4 / 5

1: microtubule organizing center || 2: interleukin-12 complex || 3: mast cell granule || 4: platelet alpha granule lumen || 5: zymogen granule

ECM 57, Gene set "microtubule organizing center", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 0



PG	Protein	Prokaryotes E.cuniculi E.histolytica E.dispar G.lamblia T.vaginalis T.brucei T.cruzi L.infantum L.major L.braziliensis T.gondii C.hominis C.parvum B.bovis T.annulata T.parva P.knowlesi P.vivax P.falciparum P.chabaudi P.berghei P.yoelii P.tetraurelia T.thermophila P.infestans T.pseudonana P.tricornutum C.merolae N.gruberi O.lucimarinus O.tauri C.reinhardtii V.carteri P.patens S.moellendorffii S.bicolor Z.mays O.sativa B.distachyon A.lyrata A.thaliana L.japonicus M.truncatula V.vinifera P.trichocarpa R.communis T.trahens D.discoideum A.macrogynus S.punctatus M.globosa U.maydis C.neoformans P.chrysosporium S.commune C.cinerea L.bicolor S.pombe B.fuckeliana S.sclerotiorum F.graminearum M.grisea N.crassa P.anserina P.chrysogenum A.clavatus A.fumigatus N.fischeri A.flavus A.oryzae A.niger A.nidulans U.reesii C.immitis C.posadasii P.nodorum T.melanosporum Y.lipolytica P.pastoris C.lusitaniae D.hansenii M.guilliermondii S.stipitis L.elongisporus C.tropicalis C.albicans C.dubliniensis K.lactis A.gossypii K.waltii L.thermotolerans Z.rouxii V.polyspora C.glabrata S.bayanus S.mikatae S.cerevisiae S.paradoxus S.arctica C.owczarzaki M.brevicollis S.rosetta S.mansoni B.malayi C.briggsae C.elegans D.pulex A.pisum P.humanus A.mellifera N.vitripennis B.mori T.castaneum D.melanogaster D.pseudoobscura A.gambiae A.aegypti C.quinquefasciatus B.floridae T.adhaerens S.purpuratus H.magnipapillata N.vectensis C.intestinalis D.rerio O.latipes F.rubripes T.nigroviridis X.tropicalis G.gallus M.gallopavo O.anatinus M.domestica S.scrofa M.musculus C.familiaris B.taurus H.sapiens	LLR	Notes
CHMP1A				1 / 2 / 3 / 4 / 5 / 6

1: condensed nuclear chromosome || 2: early endosome || 3: endomembrane system || 4: endosome membrane || 5: microtubule organizing center || 6: nuclear matrix