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

Dataset:

Num of genes in input gene set: 55
Total number of genes: 20834
Prediction LLR threshold: 0

The CLIME PDF output two sections:

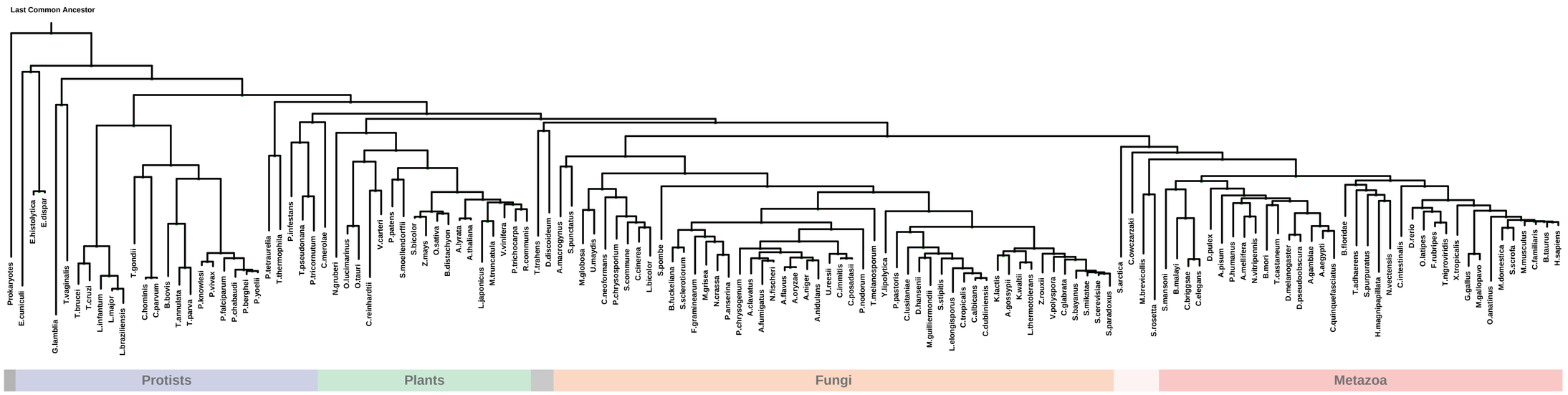
1) Overview of Evolutionarily Conserved Modules (ECMs)

- 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.

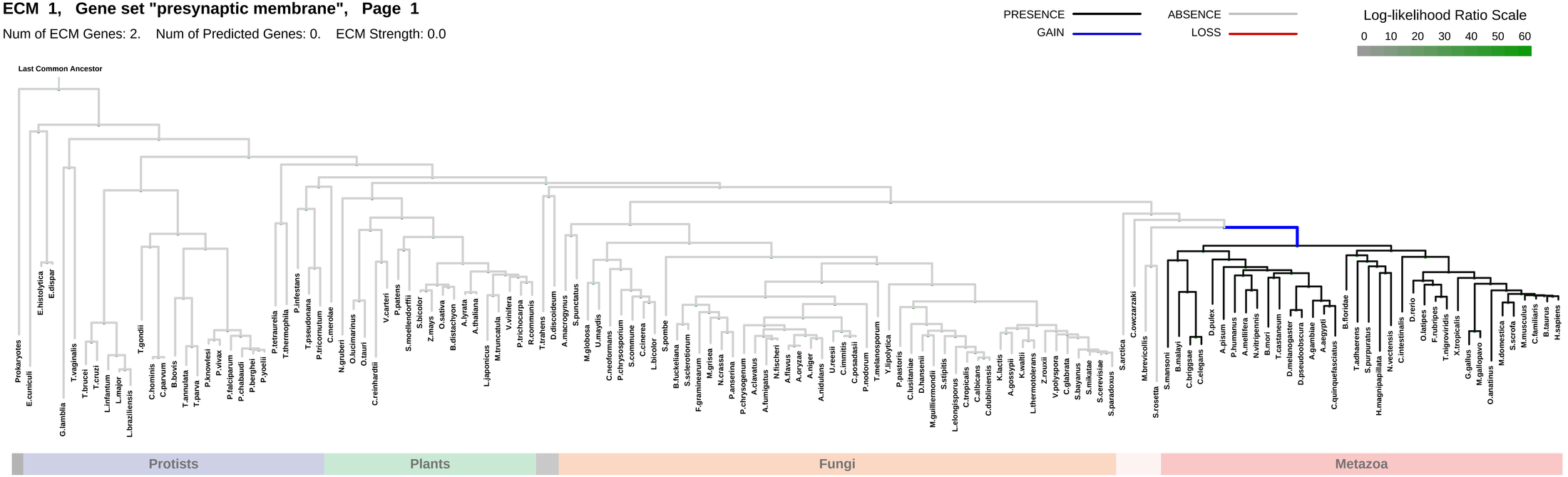
Overview of Evolutionarily Conserved Modules (ECMs)





ECM 1, Gene set "presynaptic membrane", Page 1

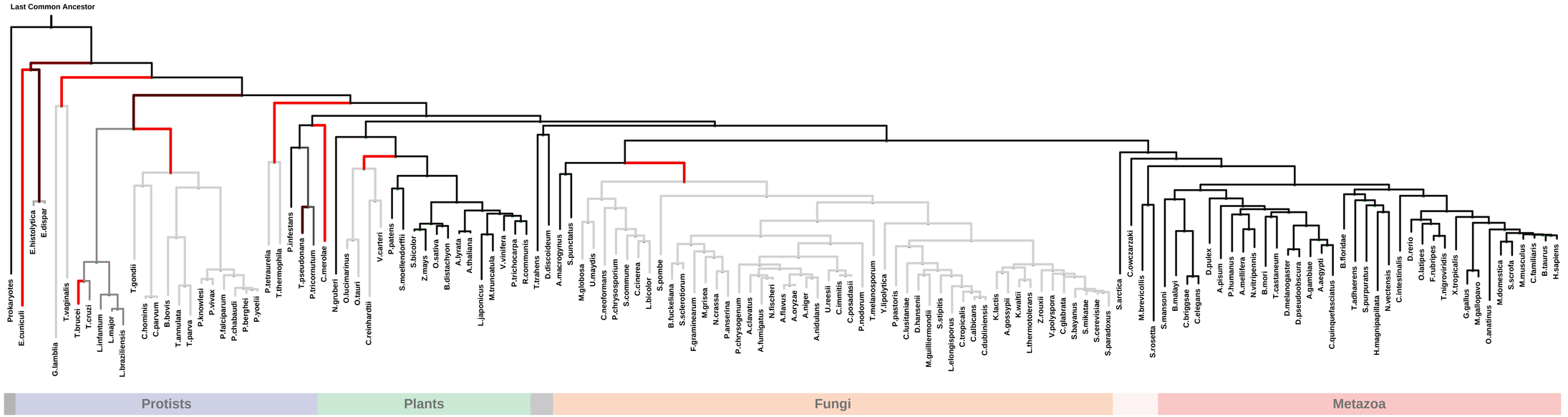
Num of ECM Genes: 2. Num of Predicted Genes: 0. ECM Strength: 0.0

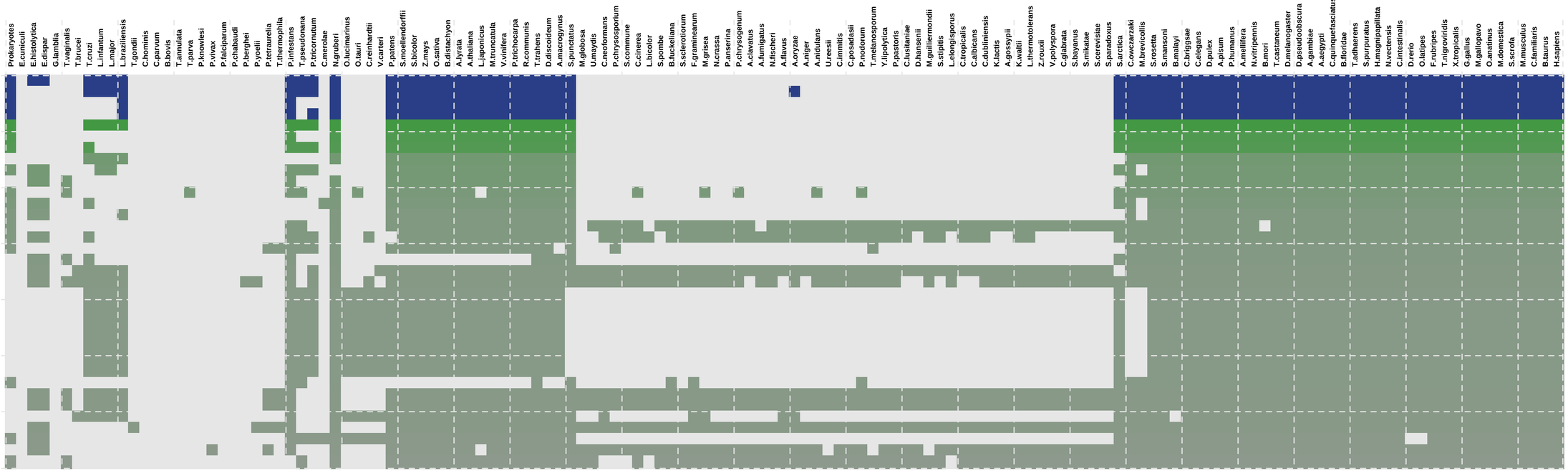


| PG | Protein | Prokaryotes | E.cuniculi | E.histolytica | E.dispar | G.lamblia | T.vaginalis | T.brucei | T.cruzi | L.infantum | L.major | L.braziliensis | T.gondii | C.hominis | C.parvum | B.bovis | T.annulata | T.parva | P.knowlesi | P.vivax | P.falciparum | P.chabaudi | P.berghei | P.yoelii | P.tetraurelia | 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 2, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 4. Num of Predicted Genes: 71. ECM Strength: 5.6

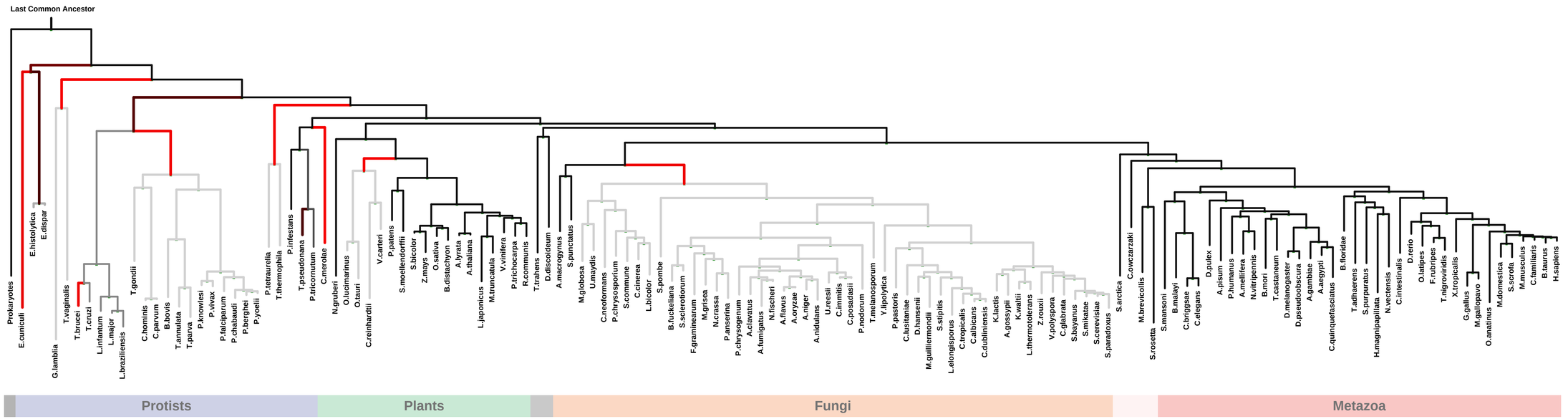


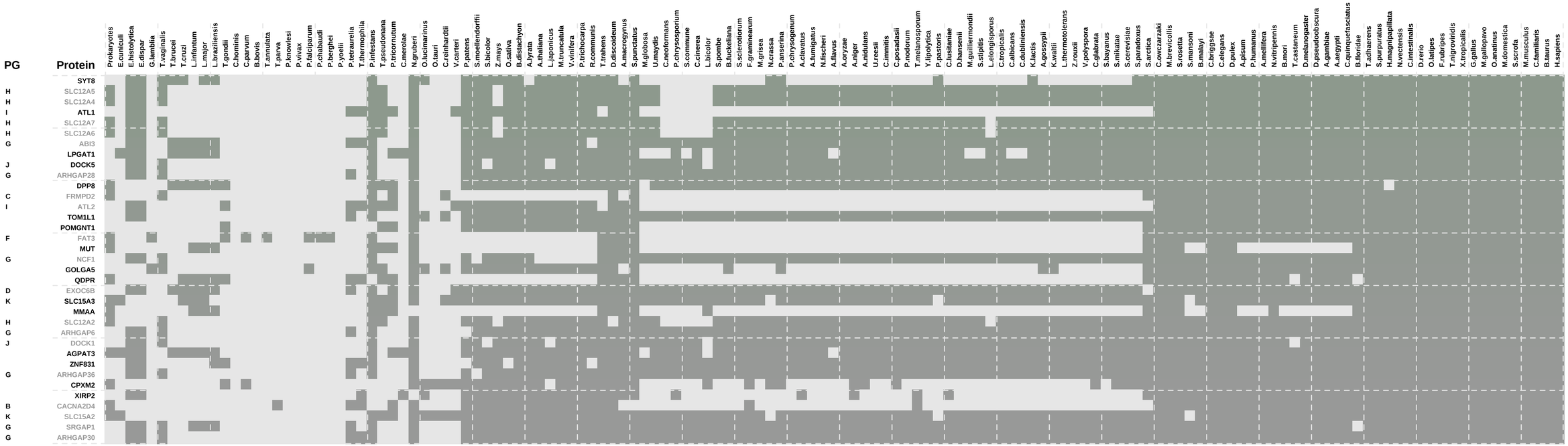


1: axon || 2: postsynaptic density || 3: presynaptic membrane || 4: asymmetric synapse || 5: cell cortex || 6: dendrite || 7: dendritic shaft || 8: postsynaptic membrane || 9: presynaptic active zone || 10: neuron projection ||
11: cytoplasmic vesicle || 12: synapse || 13: extrinsic to membrane || 14: focal adhesion || 15: ruffle membrane || 16: exocyst || 17: Golgi cisterna membrane || 18: cell periphery || 19: lamellipodium || 20: phagocytic vesicle ||
21: vesicle membrane || 22: acrosomal vesicle || 23: cortical cytoskeleton || 24: F-actin capping protein complex

ECM 2, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 4. Num of Predicted Genes: 71. ECM Strength: 5.6

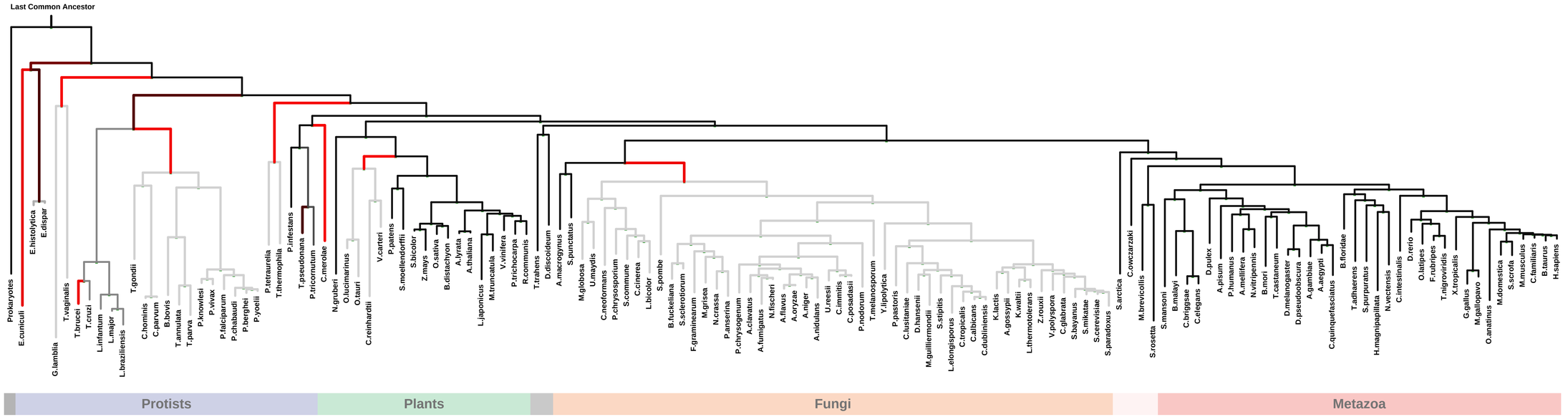




1: acrosomal vesicle || 2: synaptic vesicle || 3: dendrite membrane || 4: perikaryon || 5: axon || 6: Golgi cis cisterna || 7: basolateral plasma membrane || 8: lamellipodium || 9: tight junction || 10: endosome || 11: endosome membrane ||
12: Golgi stack || 13: lysosome || 14: NADPH oxidase complex || 15: phagolysosome || 16: cis-Golgi network || 17: COPI-coated vesicle membrane || 18: Golgi cisterna || 19: Golgi medial cisterna || 20: Golgi trans cisterna ||
21: exocyst || 22: lysosomal membrane || 23: actin cytoskeleton || 24: actin filament || 25: extracellular matrix || 26: cytoplasmic membrane-bounded vesicle

ECM 2, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 4. Num of Predicted Genes: 71. ECM Strength: 5.6

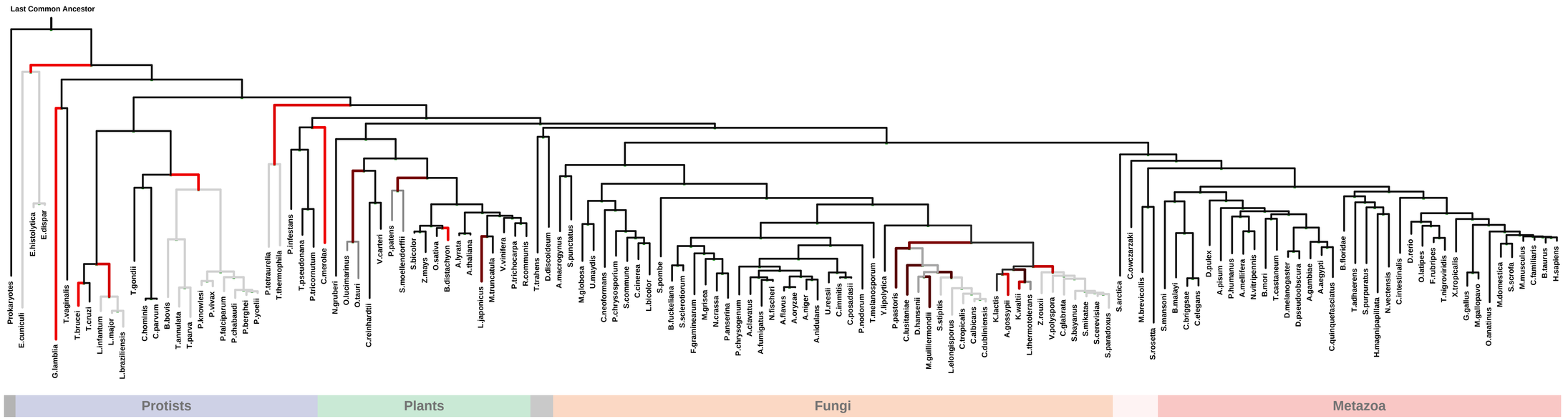


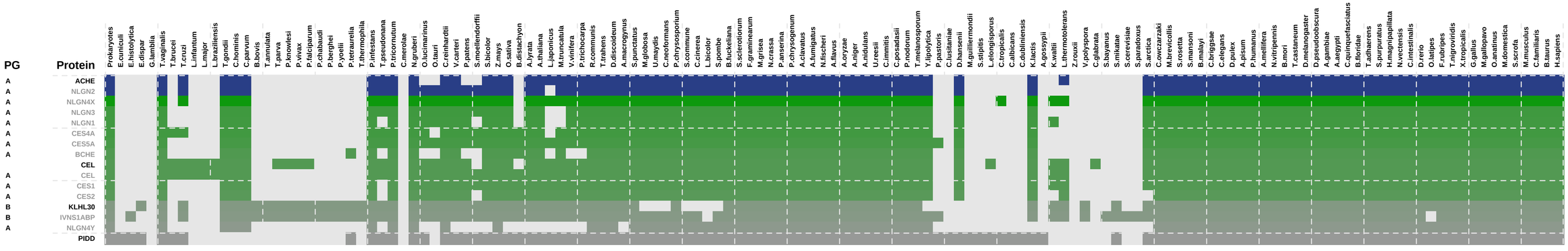
PG	Protein	LLR	Notes
G	ARHGAP33	0.3	
J	DOCK4	0.3	1 / 2 / 3
G	RALBP1	0.0	
K	SLC15A1	0.0	
	RASA2	**0.0**	**4**

1: endomembrane system || 2: stereocilium || 3: stereocilium bundle || 4: intrinsic to internal side of plasma membrane

ECM 3, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 14. ECM Strength: 4.7

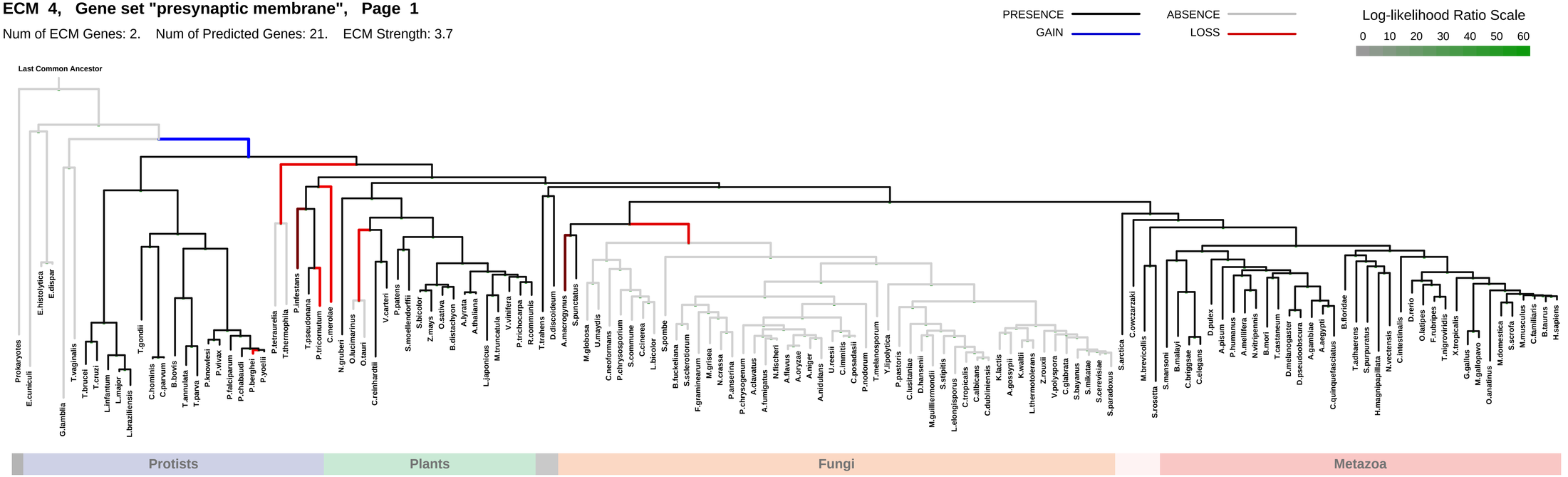


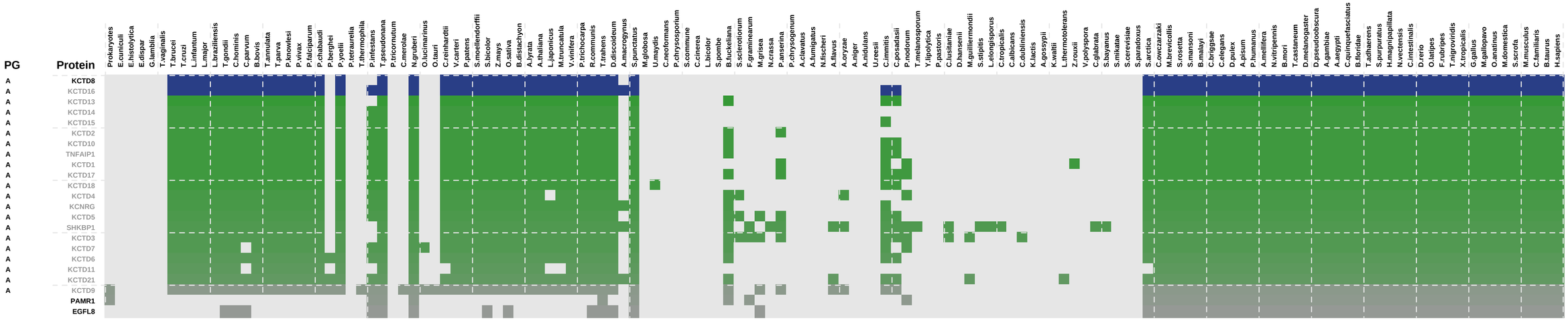


1: anchored to membrane || 2: axon || 3: basal lamina || 4: dendrite || 5: endoplasmic reticulum lumen || 6: neuromuscular junction || 7: postsynaptic membrane || 8: presynaptic membrane || 9: synapse || 10: synaptic cleft ||
11: inhibitory synapse || 12: excitatory synapse || 13: postsynaptic density || 14: endocytic vesicle || 15: nuclear envelope lumen || 16: spliceosomal complex

ECM 4, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 21. ECM Strength: 3.7

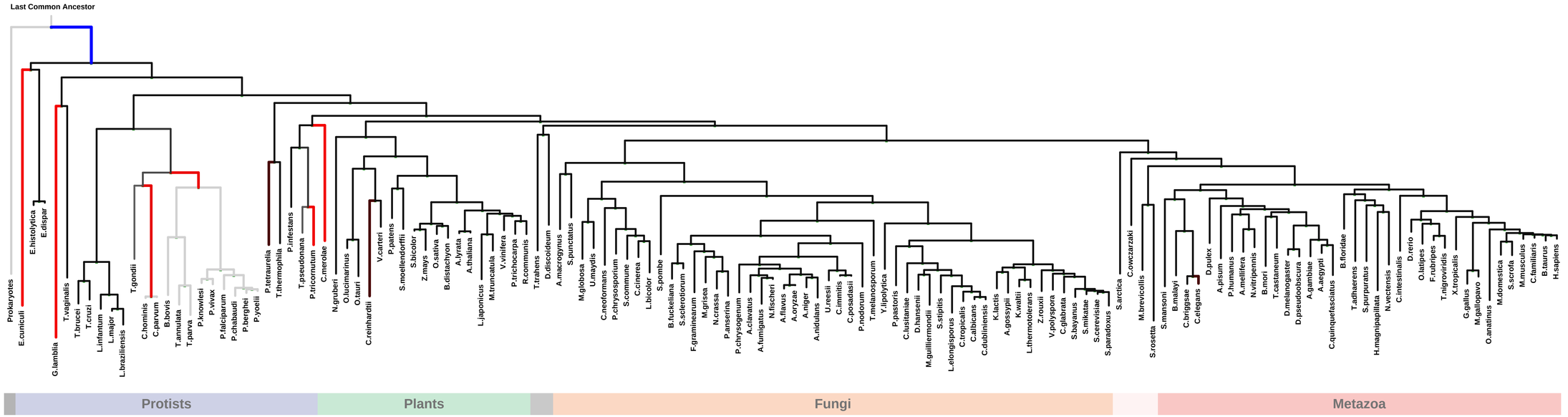


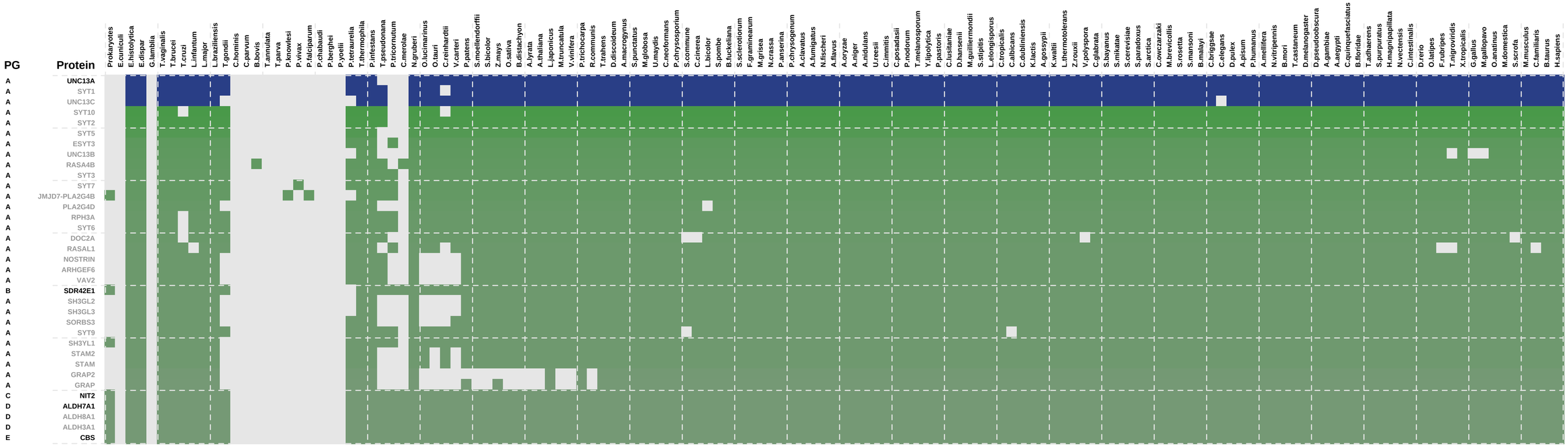


1: postsynaptic membrane || 2: presynaptic membrane || 3: receptor complex || 4: Cul3-RING ubiquitin ligase complex || 5: endosome

ECM 5, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

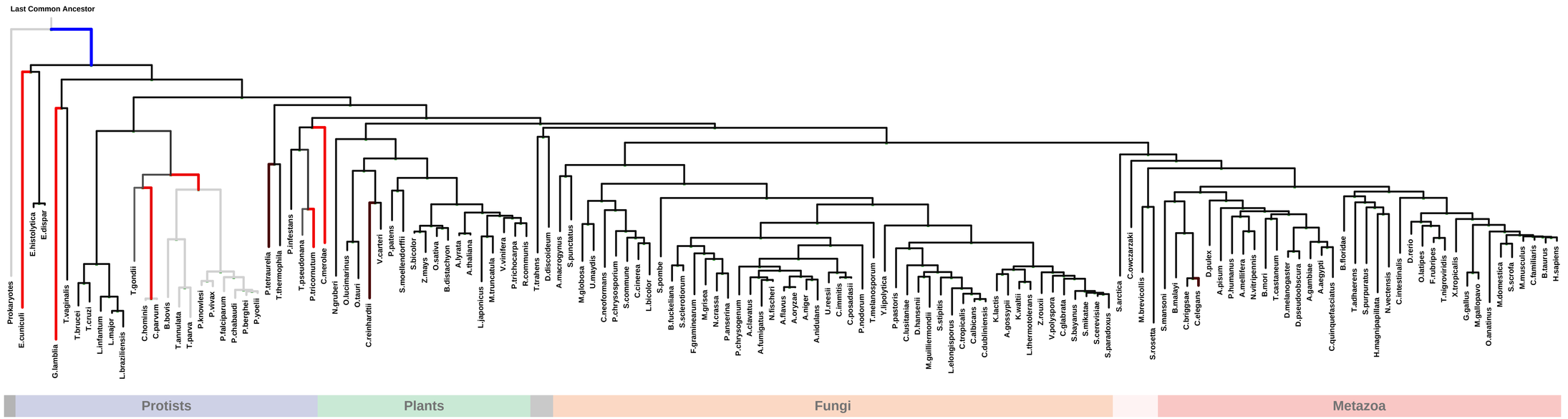




1: presynaptic membrane || 2: chromaffin granule membrane || 3: clathrin-sculpted acetylcholine transport vesicle membrane || 4: clathrin-sculpted gamma-aminobutyric acid transport vesicle membrane || 5: clathrin-sculpted glutamate transport vesicle membrane ||
6: clathrin-sculpted monoamine transport vesicle membrane || 7: dense core granule || 8: endocytic vesicle membrane || 9: neuron projection || 10: synaptic vesicle || 11: synaptic vesicle membrane || 12: recycling endosome membrane ||
13: synapse || 14: endosome || 15: lysosome || 16: cytoplasmic vesicle membrane || 17: extrinsic to membrane || 18: secretory granule || 19: perinuclear endoplasmic reticulum || 20: intrinsic to internal side of plasma membrane ||

ECM 5, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

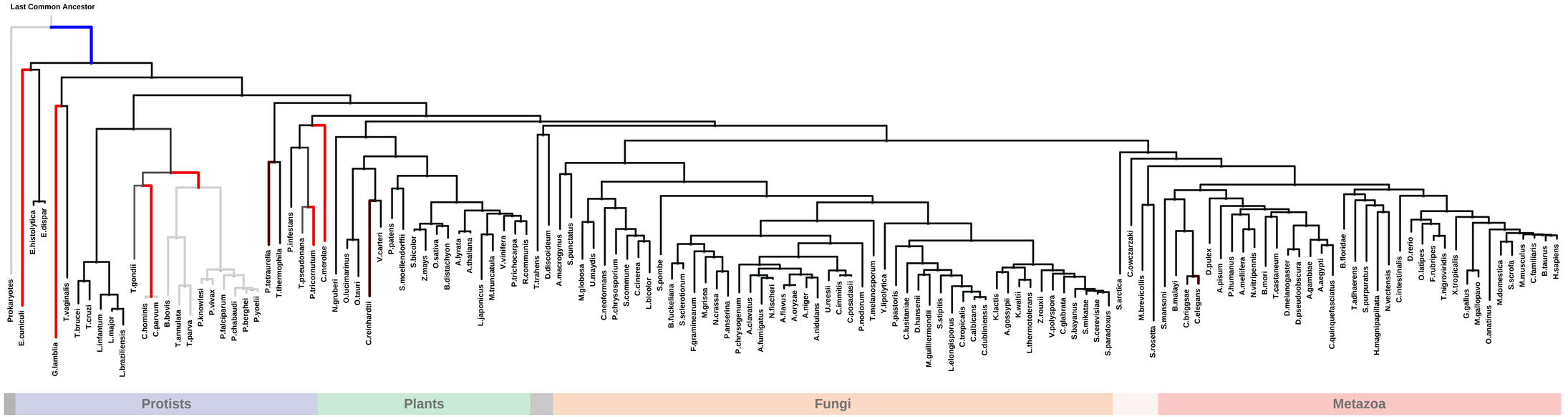


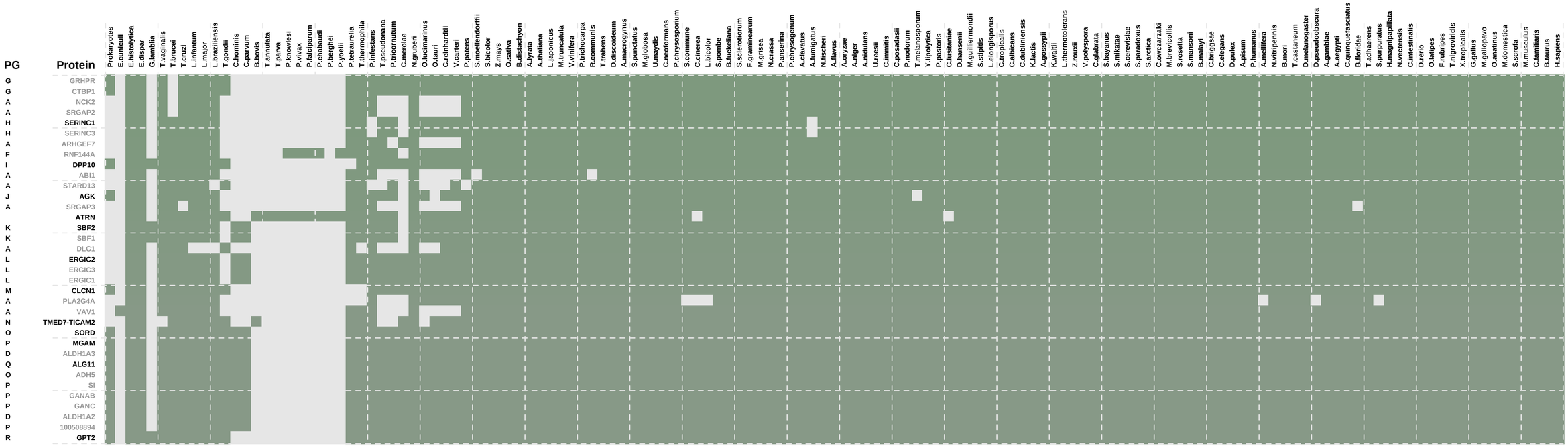
PG	Protein	LLR	Notes
	CTH	**15.3**	
D	ALDH3A2	15.3	1
D	ALDH3B2	15.3	
D	ALDH4A1	15.3	
D	ALDH5A1	15.3	
D	ALDH6A1	15.3	
A	NCK1	15.3	2
A	NCF2	15.3	3 / 4 / 5
A	SH3KBP1	15.3	6 / 7 / 8 / 9
A	SH3D19	15.3	
	SLC30A6	**15.3**	
A	SORBS2	15.3	10 / 11
D	ALDH1L1	15.3	
A	SH3GL1	15.3	12
F	**RNF144B**	**14.4**	13 / 14
A	GRB2	14.3	2 / 15 / 16 / 17
A	ABI2	13.7	18 / 19 / 20 / 21
	ARPC2	**13.6**	7 / 10 / 22 / 23 / 24
A	RASA4	13.5	25
A	MCTP2	13.4	
	PLEKHA7	**13.4**	
A	FCHSD2	13.3	
A	PLA2G4E	13.0	26
A	DOC2B	12.9	27 / 28 / 29
A	PCLO	12.7	9 / 29
A	STAC3	12.6	
C	NIT1	12.4	
A	NCF4	12.3	4 / 5
A	ESYT2	12.1	
A	MCTP1	11.7	
F	CUL9	11.7	30
F	ARIH2	11.7	
F	RNF217	11.7	
G	**PHGDH**	**11.6**	
G	CTBP2	11.6	9 / 31

1: peroxisome || 2: vesicle membrane || 3: acrosomal vesicle || 4: NADPH oxidase complex || 5: phagolysosome || 6: cytoplasmic vesicle membrane || 7: focal adhesion || 8: neuron projection || 9: synapse || 10: actin cytoskeleton ||
11: Z disc || 12: early endosome membrane || 13: mitochondrial membrane || 14: ubiquitin ligase complex || 15: endosome || 16: Grb2-EGFR complex || 17: signalosome || 18: cell-cell adherens junction || 19: dendrite ||
20: filopodium || 21: lamellipodium || 22: Arp2/3 protein complex || 23: cell leading edge || 24: cell projection || 25: intrinsic to internal side of plasma membrane || 26: lysosomal membrane || 27: microtubule cytoskeleton ||

ECM 5, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

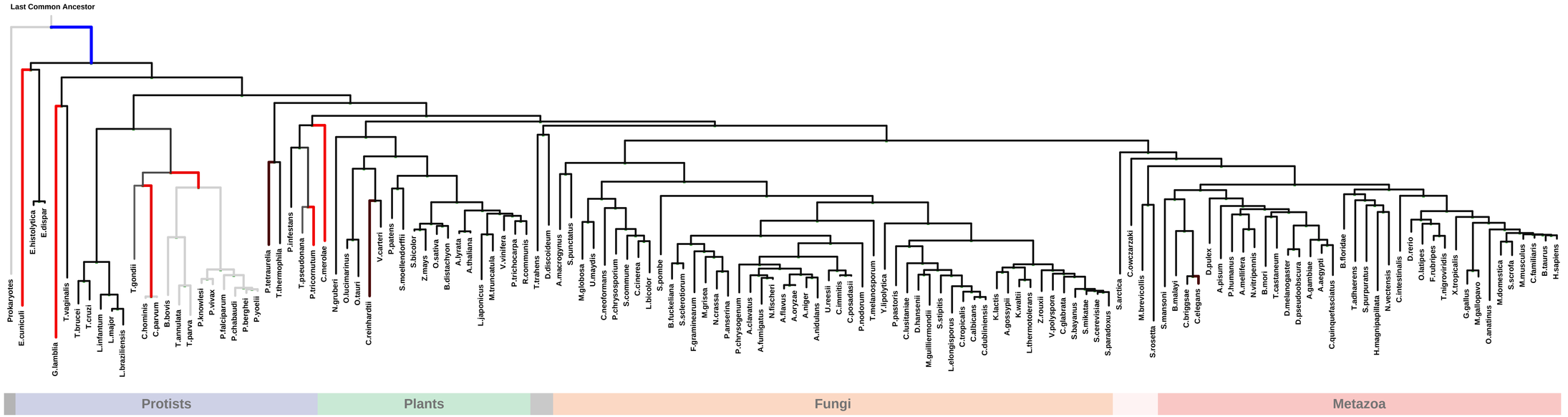




1: peroxisomal matrix || 2: transcriptional repressor complex || 3: vesicle membrane || 4: lamellipodium || 5: phagocytic vesicle || 6: postsynaptic density || 7: postsynaptic membrane || 8: cell cortex || 9: focal adhesion ||
10: neuron projection || 11: ruffle || 12: filopodium || 13: growth cone || 14: synapse || 15: lipid particle || 16: mitochondrial membrane || 17: vacuolar membrane || 18: actin filament || 19: caveola || 20: stress fiber ||
21: endoplasmic reticulum-Golgi intermediate compartment membrane || 22: endoplasmic reticulum-Golgi intermediate compartment || 23: chloride channel complex || 24: sarcolemma || 25: zymogen granule || 26: cilium || 27: flagellum ||

ECM 5, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

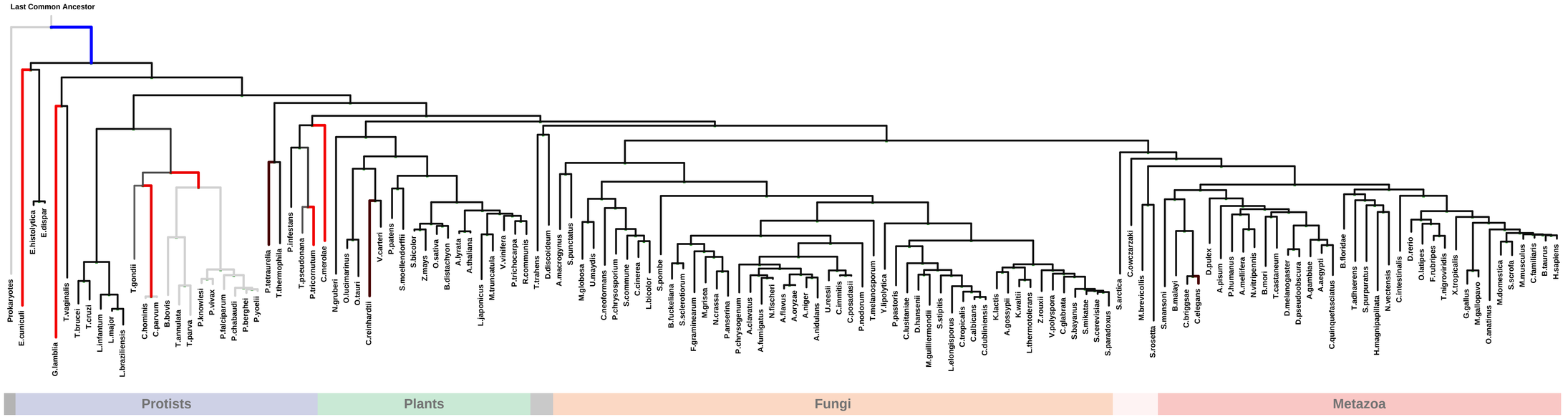


PG	Protein	LLR	Notes
R	CCBL1	7.6	
R	CCBL2	7.6	
R	ACCSL	7.6	
R	TAT	7.6	
R	ACCS	7.6	
D	ALDH3B1	7.6	
I	DPP4	7.6	1 / 2 / 3 / 4 / 5 / 6
D	ALDH2	7.6	
R	GPT	7.6	
A	RAPGEF1	7.6	7
A	ARHGAP35	7.6	8
	ZCCHC13	7.5	
S	LRRC10B	7.5	
T	GNAL	7.3	9 / 10
U	PEX5	7.3	11 / 12 / 13
	ARPC3	7.2	4 / 8 / 14
A	SGSM1	7.2	
	STXBP5L	7.2	
A	HCLS1	7.2	
	ARPC4-TTLL3	7.2	
	MIPEP	7.2	
V	PDCD6IP	7.2	15 / 16
	GAPVD1	7.1	7
W	CAPN3	7.1	17 / 18 / 19
X	SNX1	6.9	20 / 21
A	PLA2G4B	6.9	20
	RANBP10	6.9	22
	SUCLG1	6.9	
P	KIAA1161	6.9	23
A	ARHGAP31	6.8	4 / 24
A	ARHGAP4	6.7	24
Q	ALG2	6.7	
D	ALDH16A1	6.6	
I	FAP	6.5	3 / 4 / 5
A	FAM13B	6.5	

1: endocytic vesicle || 2: intercellular canaliculus || 3: invadopodium membrane || 4: lamellipodium || 5: lamellipodium membrane || 6: membrane raft || 7: endosome || 8: actin cytoskeleton || 9: extrinsic to internal side of plasma membrane ||
10: heterotrimeric G-protein complex || 11: peroxisomal matrix || 12: peroxisomal membrane || 13: peroxisome || 14: Arp2/3 protein complex || 15: melanosome || 16: microtubule organizing center || 17: myofibril || 18: T-tubule ||
19: Z disc || 20: early endosome membrane || 21: endosome membrane || 22: cytoplasmic microtubule || 23: nuclear membrane || 24: focal adhesion

ECM 5, Gene set "presynaptic membrane", Page 5

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

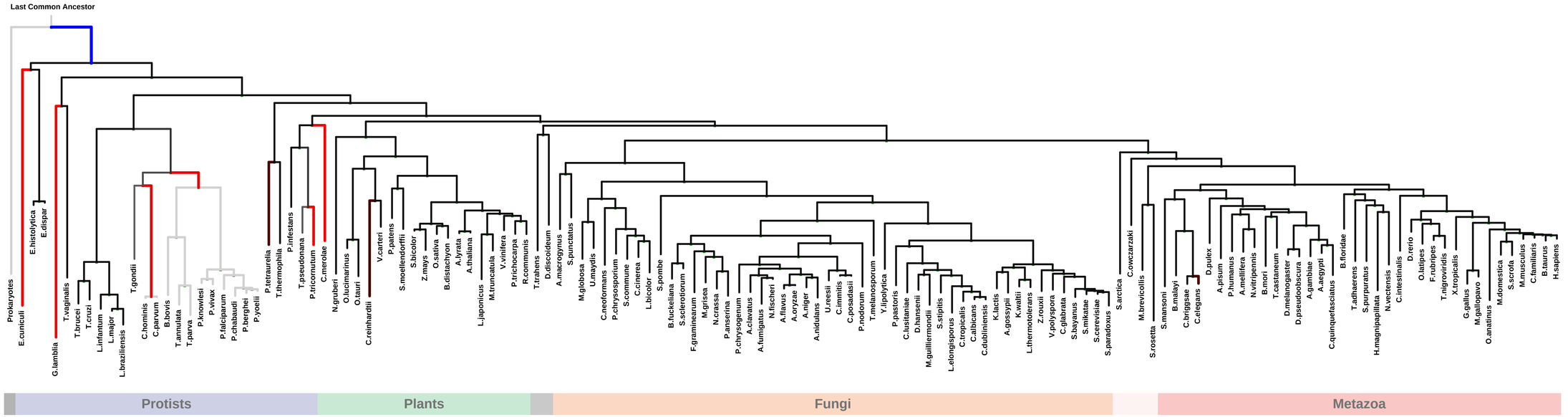


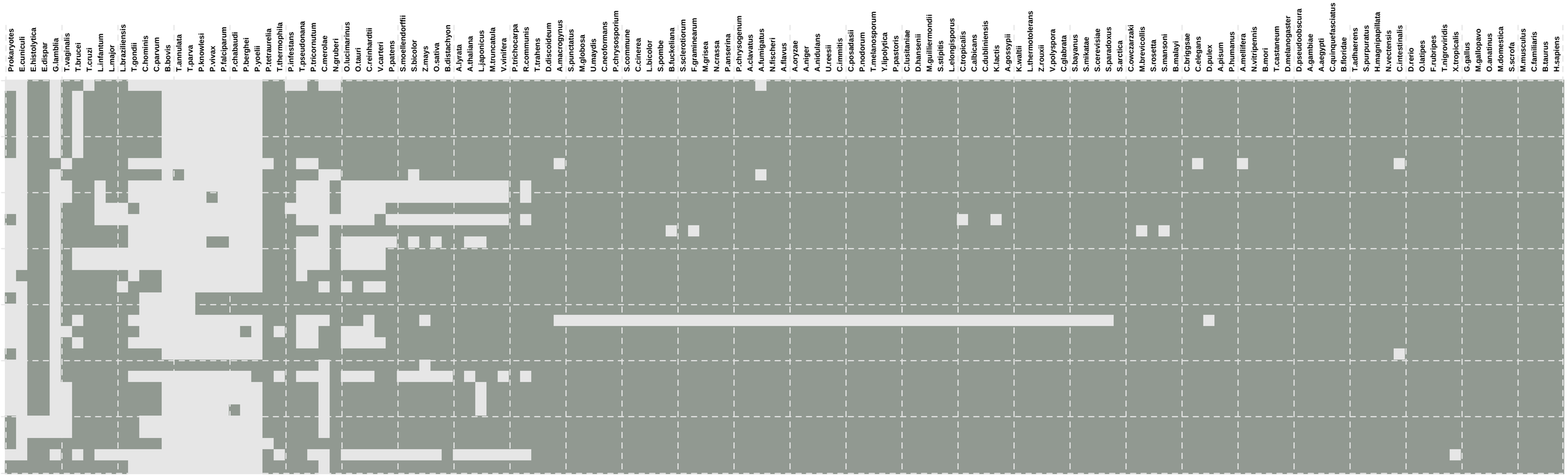
PG	Protein	LLR	Notes
A	VAV3	6.4	
A	HGS	6.4	1 / 2 / 3 / 4 / 5
	IMPA1	**6.3**	6
Y	**CCNT2**	**6.2**	
	CCNF	**6.2**	7 / 8
	RICTOR	**6.2**	9
U	PEX5L	6.1	10 / 11 / 12 / 13
M	CLCN2	6.0	11 / 14 / 15
H	SERINC2	6.0	
Z	**ADAT1**	**5.9**	
	ARPC1A	**5.9**	16
a	**IP6K1**	**5.8**	
a	IP6K2	5.8	17
	IDH3A	**5.8**	
F	RNF19A	5.8	
I	DPP6	5.7	
	CNDP1	**5.6**	
T	GNAZ	5.6	18 / 19 / 20
	WDR45B	**5.5**	
A	SYT11	5.4	21
A	PLCD1	5.4	
A	PLCD4	5.4	
A	PLCG1	5.4	22 / 23 / 24 / 25
A	PLCG2	5.4	
F	RNF14	5.2	
A	ARHGAP23	5.2	
	PRKCSH	**5.1**	26
A	ABI3	5.0	22
	ANKRD36	**4.9**	
	TLE6	**4.6**	27
F	RNF19B	4.6	
S	LRRC2	4.6	
S	LRRC27	4.5	
A	ARHGEF37	4.4	
A	STAC	4.2	

1: early endosome || 2: early endosome membrane || 3: endosome || 4: multivesicular body membrane || 5: secretory granule || 6: axon || 7: centriole || 8: SCF ubiquitin ligase complex || 9: TORC2 complex || 10: cell tip ||
11: dendrite || 12: intracellular cyclic nucleotide activated cation channel complex || 13: peroxisomal membrane || 14: chloride channel complex || 15: perikaryon || 16: actin cytoskeleton || 17: intermediate filament cytoskeleton ||
18: extrinsic to internal side of plasma membrane || 19: heterotrimeric G-protein complex || 20: nuclear envelope || 21: synaptic vesicle membrane || 22: lamellipodium || 23: neuron projection || 24: ruffle || 25: signalosome ||

ECM 5, Gene set "presynaptic membrane", Page 6

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7



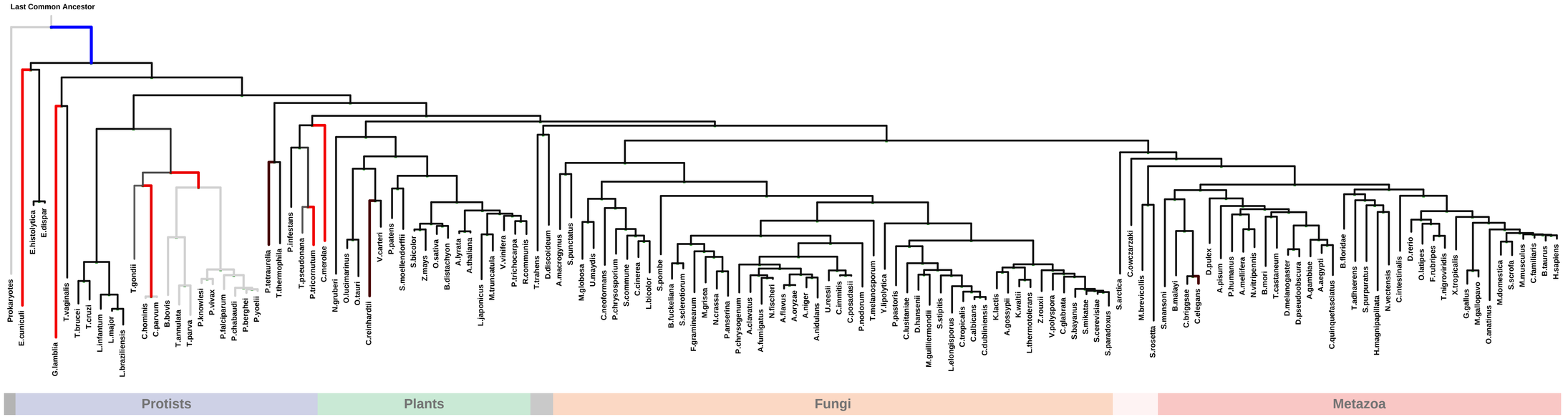


PG	Protein	LLR	Notes
H	SERINC5	4.1	1
	PGM1	**4.0**	**2**
O	ADH1B	4.0	
O	ADH1C	4.0	
O	ADH4	4.0	3
O	ADH1A	4.0	
O	ADH7	4.0	
	N4BP2	**4.0**	
b	**ATG4D**	**4.0**	
A	PACSIN2	3.9	4
A	PACSIN1	3.9	5 / 6
A	STARD8	3.9	7
A	NOXA1	3.9	8
Z	ADARB1	3.8	
A	SH3D21	3.8	
A	ARHGAP30	3.8	4
A	ARHGAP33	3.8	
	LARP6	**3.8**	**9**
A	RASA3	3.7	10
	DECR1	**3.7**	
F	ARIH1	3.7	11
	PIEZO2	**3.7**	
N	TMED3	3.7	12 / 13 / 14 / 15
A	ARHGEF26	3.7	16
P	GAA	3.7	17 / 18
	CWC22	**3.5**	**19 / 20**
A	SH3RF3	3.5	
X	SNX12	3.5	
X	SNX3	3.5	21 / 22
X	SNX4	3.5	23 / 24
c	**SVOPL**	**3.3**	
c	SLC22A4	3.3	
B	NSDHL	3.2	25
A	SKAP2	3.1	
S	LRRC59	2.9	26

1: myelin sheath || 2: actin cytoskeleton || 3: microtubule cytoskeleton || 4: cytoplasmic membrane-bounded vesicle || 5: COPI-coated vesicle || 6: synapse || 7: focal adhesion || 8: NADPH oxidase complex || 9: ribonucleoprotein complex || 10: intrinsic to internal side of plasma membrane || 11: ubiquitin ligase complex || 12: COPI vesicle coat || 13: endoplasmic reticulum-Golgi intermediate compartment || 14: endoplasmic reticulum-Golgi intermediate compartment membrane || 15: Golgi cisterna membrane || 16: ruffle || 17: lysosomal membrane || 18: lysosome || 19: catalytic step 2 spliceosome || 20: spliceosomal complex || 21: early endosome || 22: endosome membrane || 23: cytoplasmic dynein complex ||

ECM 5, Gene set "presynaptic membrane", Page 7

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

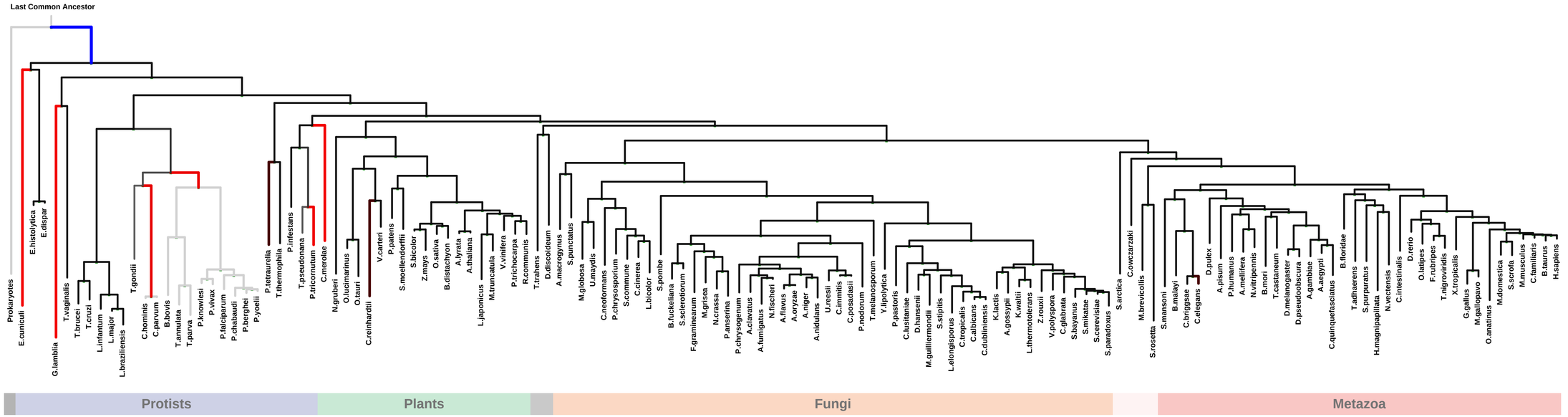


PG	Protein	LLR	Notes
d	MON1B	2.9	
A	CD2AP	2.7	1 / 2 / 3
	LENG8	2.6	
A	ITSN1	2.6	4 / 5 / 6 / 7 / 8
e	NSFL1C	2.6	9 / 10
f	LMAN1	2.6	11 / 12 / 13 / 14
A	ARHGAP12	2.6	
A	SRGAP1	2.6	
S	LRCH2	2.6	
A	PLCE1	2.5	
	TWF2	2.4	6 / 15 / 16 / 17 / 18
E	SRR	2.4	19
T	GNAT2	2.4	20 / 21 / 22 / 23 / 24
	PRPF39	2.4	
b	ATG4C	2.3	
A	ZFYVE21	2.2	25 / 26
J	SPHK1	2.2	
g	LPXN	2.2	26 / 27 / 28
h	SMPDL3B	2.1	
T	GNAS	2.1	3 / 20 / 21 / 29 / 30 / 31
B	HSD3B1	1.9	32 / 33
	RNF4	1.9	34 / 35
	PRPF40A	1.8	36 / 37
S	LRR1	1.8	
	CHMP5	1.8	38
a	IPMK	1.7	
A	ARHGAP15	1.7	
h	SMPD1	1.7	39 / 40
W	CAPN1	1.7	
	ADIPOR2	1.7	
A	CHN2	1.6	
g	ABLIM1	1.5	1
A	ARHGAP21	1.4	41
	POMT2	1.4	
J	SPHK2	1.4	42

1: actin cytoskeleton || 2: filamentous actin || 3: ruffle || 4: coated pit || 5: endocytic vesicle || 6: lamellipodium || 7: neuron projection || 8: synapse || 9: chromosome || 10: Golgi stack || 11: endoplasmic reticulum-Golgi intermediate compartment ||
12: endoplasmic reticulum-Golgi intermediate compartment membrane || 13: ER to Golgi transport vesicle membrane || 14: sarcomere || 15: filopodium || 16: growth cone || 17: myofibril || 18: stereocilium || 19: apical part of cell ||
20: extrinsic to internal side of plasma membrane || 21: heterotrimeric G-protein complex || 22: photoreceptor inner segment || 23: photoreceptor outer segment || 24: photoreceptor outer segment membrane || 25: cytoplasmic membrane-bounded vesicle ||

ECM 5, Gene set "presynaptic membrane", Page 8

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7

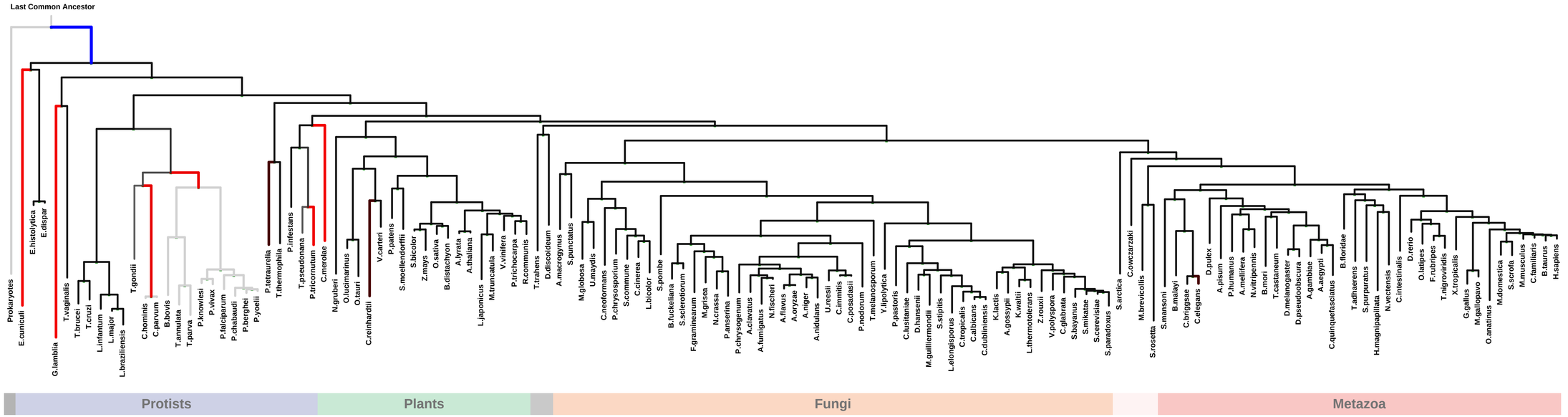


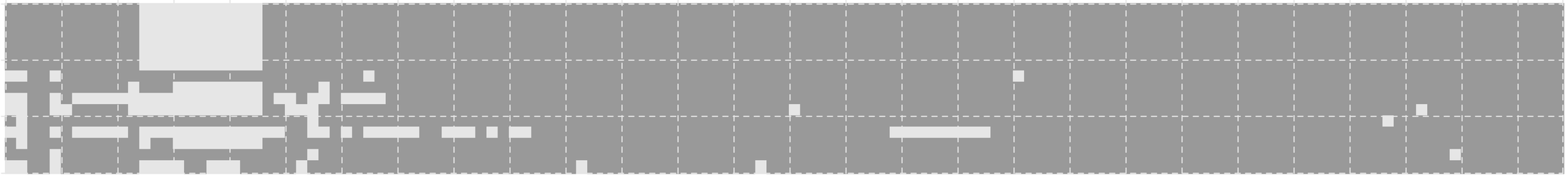
PG	Protein	LLR	Notes
A	SYT4	1.3	1 / 2
V	PTPN23	1.3	3 / 4 / 5 / 6
A	DBNL	1.3	7 / 8 / 9 / 10
	NOC3L	1.2	11
A	CRKL	1.2	
A	PLEKHG4B	1.1	
A	ARHGAP18	1.1	
S	LRRC69	1.1	
f	LMAN2L	1.1	12
	STX7	1.0	13 / 14 / 15 / 16
X	SNX8	0.9	13 / 17
	SLC27A2	0.8	18 / 19 / 20 / 21
d	MON1A	0.8	
A	EEA1	0.7	13 / 22 / 23
A	PACSIN3	0.7	
	IKZF5	0.7	
Z	ADARB2	0.7	
A	ARHGAP1	0.7	10
A	ARHGAP28	0.6	
V	RHPN1	0.5	
A	ARHGAP5	0.5	
A	PLEKHF2	0.5	24
A	FYCO1	0.5	25 / 26 / 27 / 28
A	ZFYVE1	0.5	29
A	RUFY1	0.5	13
A	ZFYVE26	0.5	30
A	ZFYVE28	0.5	13
A	PLEKHF1	0.5	5 / 15 / 28 / 31
	SLC38A4	0.5	
S	LRRC55	0.4	
	UGGT2	0.3	18 / 32
Y	CCNL1	0.3	11
A	RASGRP2	0.2	1 / 33 / 34
	RFT1	0.2	
A	ESYT1	0.2	

1: neuron projection || 2: synaptic vesicle membrane || 3: cilium || 4: cytoplasmic membrane-bounded vesicle || 5: endosome || 6: microtubule basal body || 7: cell cortex || 8: lamellipodium || 9: postsynaptic density ||
10: ruffle || 11: nuclear speck || 12: ER to Golgi transport vesicle || 13: early endosome membrane || 14: late endosome membrane || 15: lysosomal membrane || 16: SNARE complex || 17: retromer complex || 18: endoplasmic reticulum lumen ||
19: integral to endoplasmic reticulum membrane || 20: integral to peroxisomal membrane || 21: peroxisomal membrane || 22: early endosome || 23: extrinsic to plasma membrane || 24: transport vesicle || 25: autophagic vacuole ||

ECM 5, Gene set "presynaptic membrane", Page 9

Num of ECM Genes: 3. Num of Predicted Genes: 292. ECM Strength: 3.7



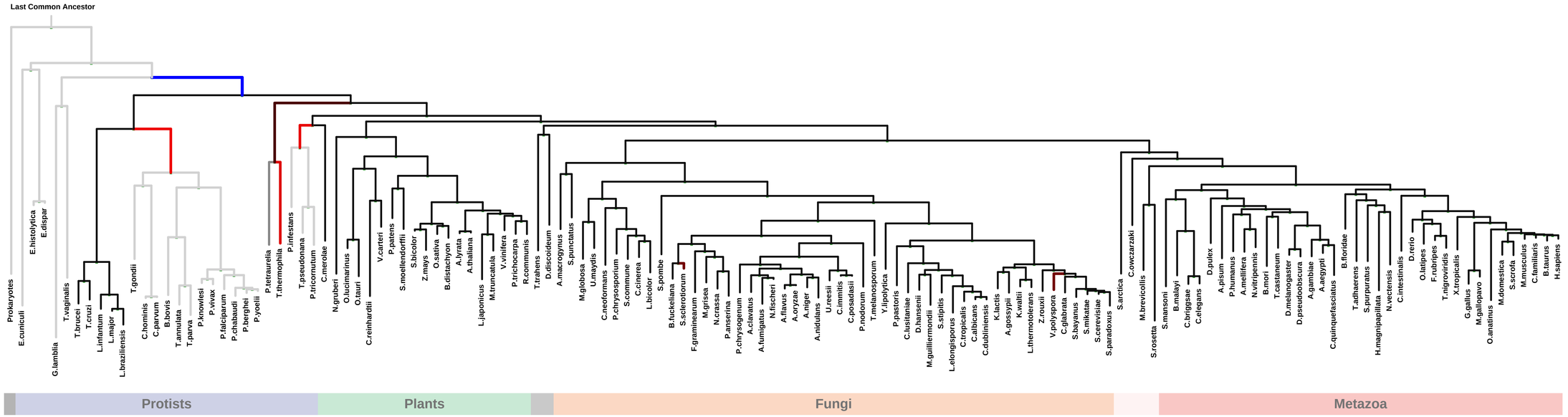


PG	Protein	LLR	Notes
i	AKR1C2	0.1	
i	AKR1C3	0.1	
i	AKR1C4	0.1	
i	AKR1D1	0.1	
i	AKR1B1	0.1	
	AKR1C2	0.1	
e	UBXN2B	0.1	
S	LRRC30	0.1	
A	ARHGAP40	0.0	
	NFX1	0.0	
	LDHAL6A	0.0	
A	CNKSR2	0.0	1 / 2
	POLH	0.0	
	RBM41	0.0	
W	GCA	0.0	

1: neuron projection || 2: postsynaptic membrane

ECM 6, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 2. Num of Predicted Genes: 53. ECM Strength: 3.4

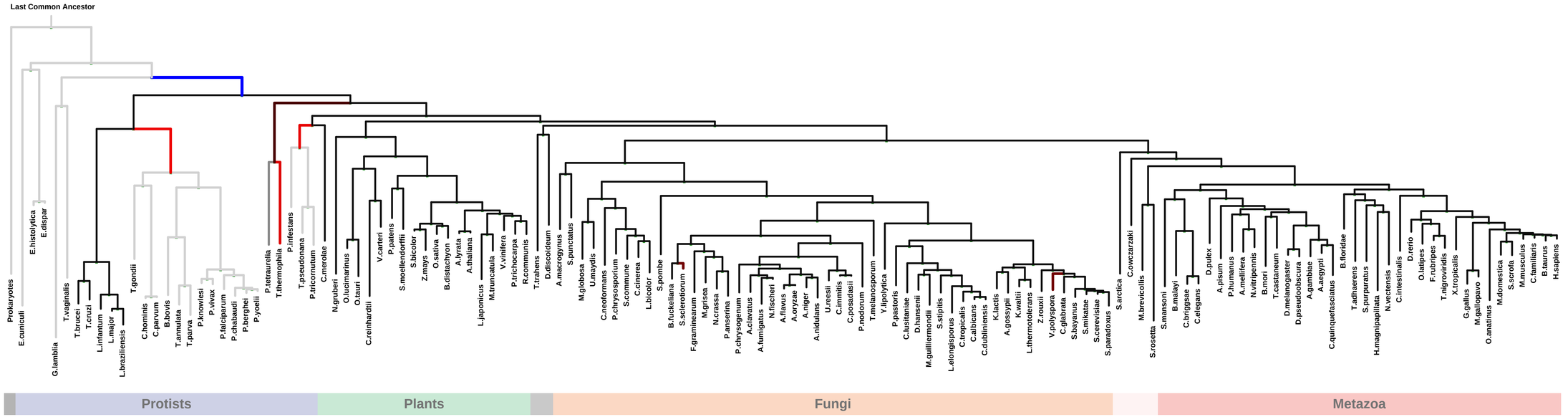


PG	Protein	LLR	Notes
A	PICALM		1 / 2 / 3 / 4 / 5
A	SNAP91		3 / 4 / 5 / 6 / 7 / 8
B	COX18	16.8	9
C	CYP1A2	7.5	
D	ADIPOR1	7.1	
D	PAQR3	7.1	
D	PAQR5	7.1	
E	PDK1	6.8	10
C	CYP8B1	5.5	
	VPS28	5.2	11 / 12 / 13
D	PAQR4	4.6	
F	NENF	4.6	
F	CYB5D2	4.6	
E	PDK4	3.9	
E	PDK2	3.9	10
	LEO1	3.5	14
C	CYP2E1	3.0	15
C	CYP39A1	3.0	
C	CYP7A1	3.0	
C	CYP7B1	3.0	
G	AGPS	3.0	16 / 17 / 18
G	D2HGDH	3.0	
G	LDHD	3.0	
C	PTGIS	3.0	19
C	CYP20A1	3.0	
	CYB5RL	2.1	
C	CYP2J2	2.1	
C	CYP2R1	2.1	
C	CYP2W1	2.1	
C	CYP1A1	2.1	
C	CYP2A13	2.1	
C	CYP2A7	2.1	
C	CYP2C18	2.1	
F	PGRMC1	2.1	
F	PGRMC2	2.1	

1: AP-2 adaptor complex || 2: clathrin coat of coated pit || 3: coated pit || 4: postsynaptic membrane || 5: presynaptic membrane || 6: clathrin coat || 7: postsynaptic density || 8: synaptic vesicle || 9: integral to mitochondrial inner membrane ||
10: pyruvate dehydrogenase complex || 11: endosome || 12: endosome membrane || 13: late endosome membrane || 14: Cdc73/Paf1 complex || 15: intrinsic to endoplasmic reticulum membrane || 16: peroxisomal matrix || 17: peroxisomal membrane ||
18: peroxisome || 19: caveola

ECM 6, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 2. Num of Predicted Genes: 53. ECM Strength: 3.4

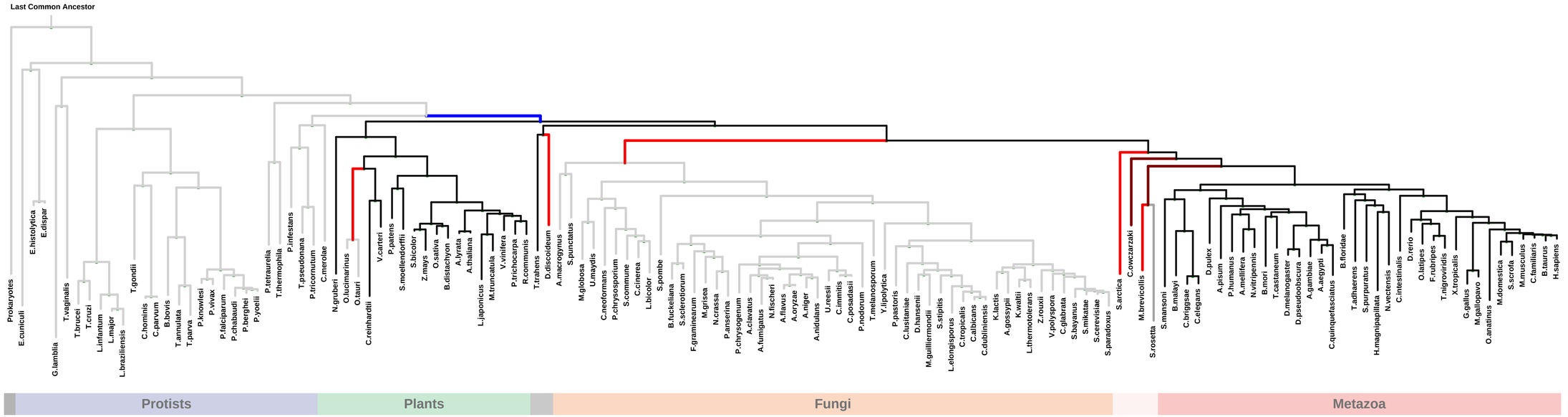


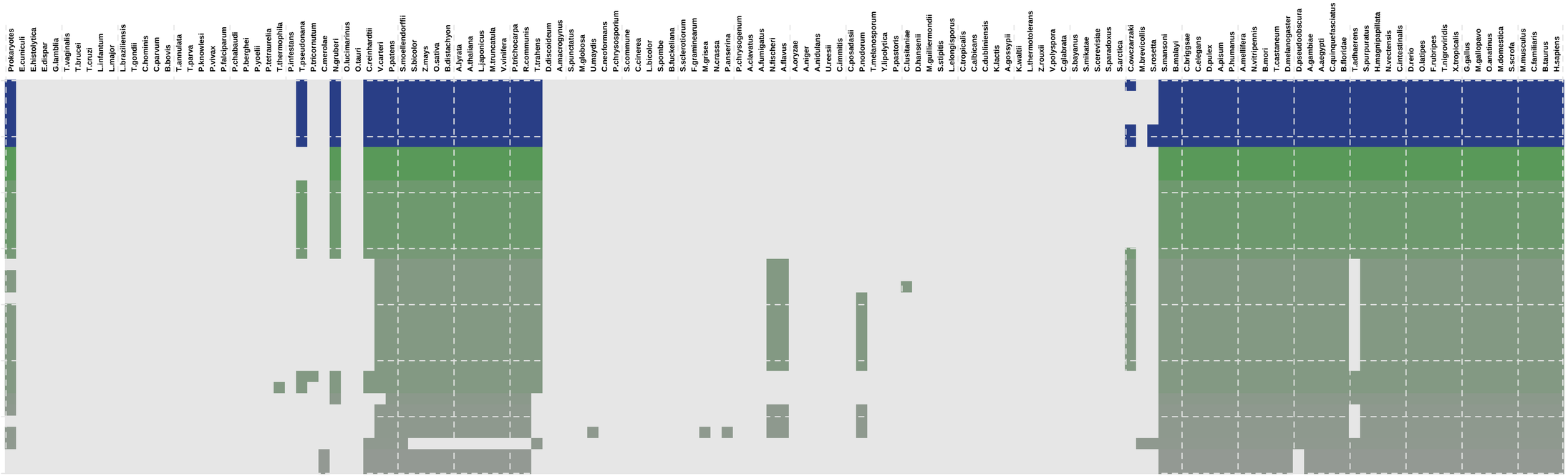
PG	Protein	LLR	Notes
C	CYP2C19	2.1	
C	TBXAS1	2.1	
C	CYP2C9	2.1	
E	BCKDK	1.5	1
	FAAH2	**1.4**	
H	**FMO4**	**1.2**	2
H	FMO5	1.2	2
H	FMO1	1.2	2 / 3
H	FMO2	1.2	
B	OXA1L	1.2	4 / 5 / 6
	EWSR1	**1.0**	
	ALG9	**0.7**	2
I	**FAHD2A**	**0.5**	
I	FAHD2B	0.5	
I	FAHD1	0.5	
	SLC22A2	**0.5**	
J	**NOX3**	**0.3**	7
J	CYBB	0.3	7 / 8
	MTHFD1L	**0.1**	
E	PDK3	0.0	

1: mitochondrial alpha-ketoglutarate dehydrogenase complex || 2: intrinsic to endoplasmic reticulum membrane || 3: endoplasmic reticulum lumen || 4: integral to mitochondrial membrane || 5: mitochondrial membrane || 6: mitochondrial respiratory chain ||
7: NADPH oxidase complex || 8: phagocytic vesicle membrane

ECM 7, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 6. Num of Predicted Genes: 39. ECM Strength: 8.0

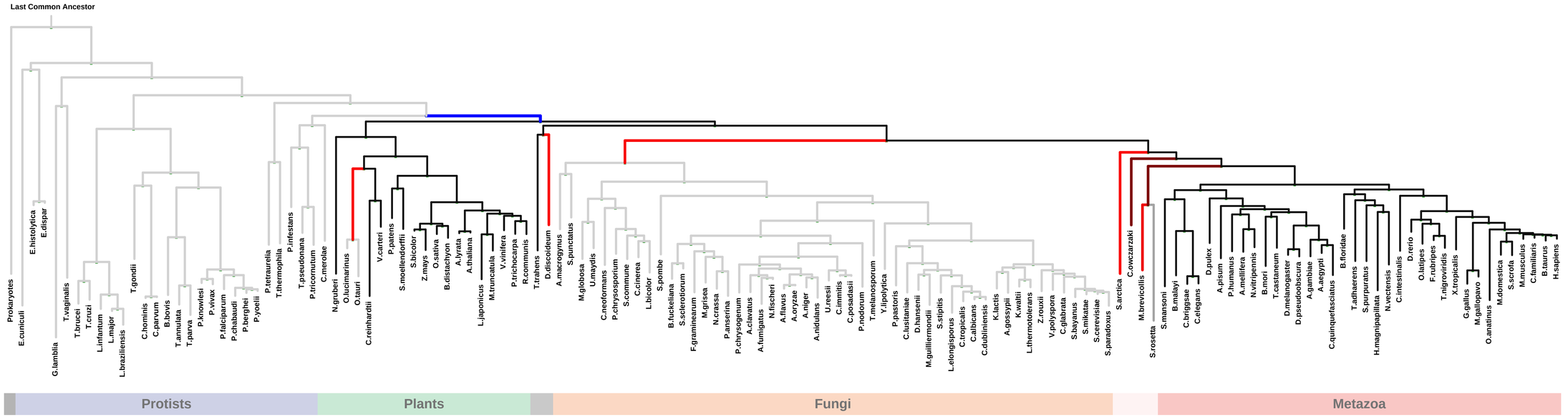


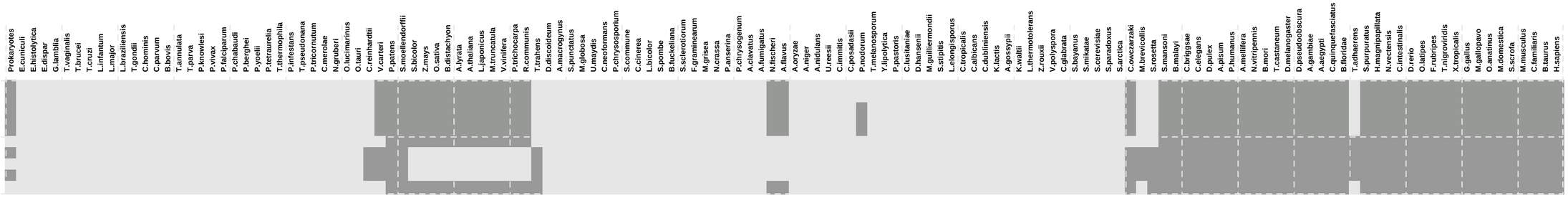


1: dendrite || 2: kainate selective glutamate receptor complex || 3: perikaryon || 4: postsynaptic membrane || 5: presynaptic membrane || 6: terminal button || 7: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 8: asymmetric synapse || 9: dendrite cytoplasm || 10: dendritic shaft || 11: endocytic vesicle membrane || 12: growth cone || 13: postsynaptic density || 14: synaptic vesicle membrane || 15: N-methyl-D-aspartate selective glutamate receptor complex || 16: outer membrane-bounded periplasmic space || 17: neuron projection || 18: synaptic cleft || 19: synaptic vesicle || 20: Z disc || 21: dendritic spine || 22: ionotropic glutamate receptor complex || 23: synapse || 24: dendrite membrane ||

ECM 7, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 6. Num of Predicted Genes: 39. ECM Strength: 8.0

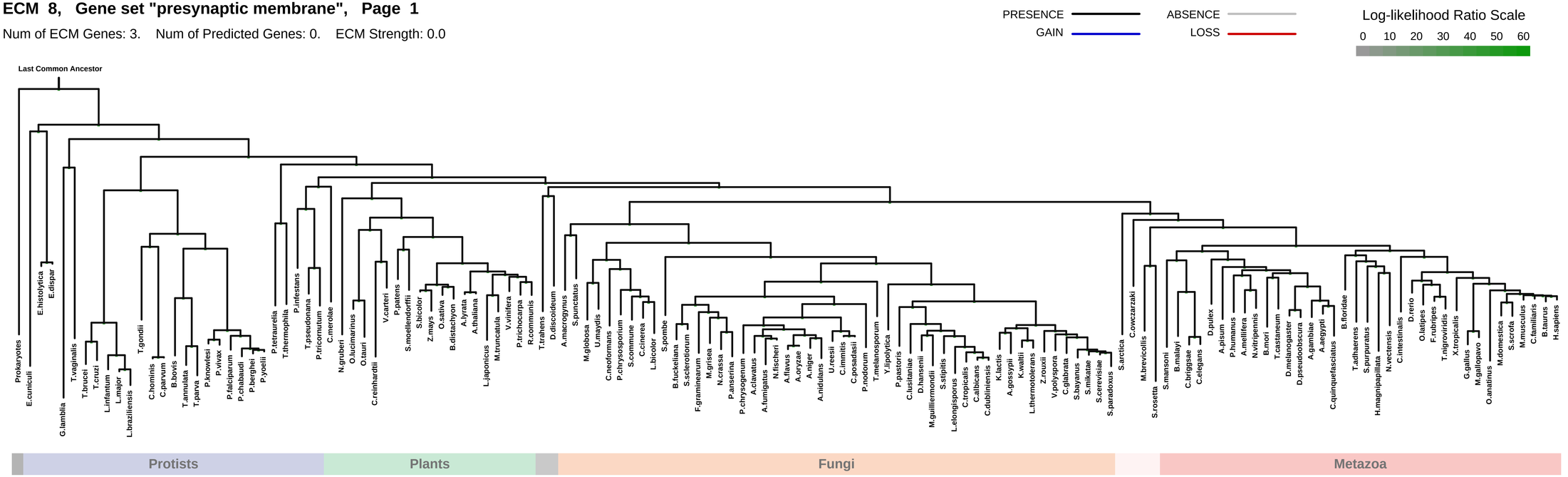




1: Golgi lumen || 2: proteinaceous extracellular matrix || 3: anchored to membrane || 4: axon || 5: growth cone || 6: sarcomere

ECM 8, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 3. Num of Predicted Genes: 0. ECM Strength: 0.0

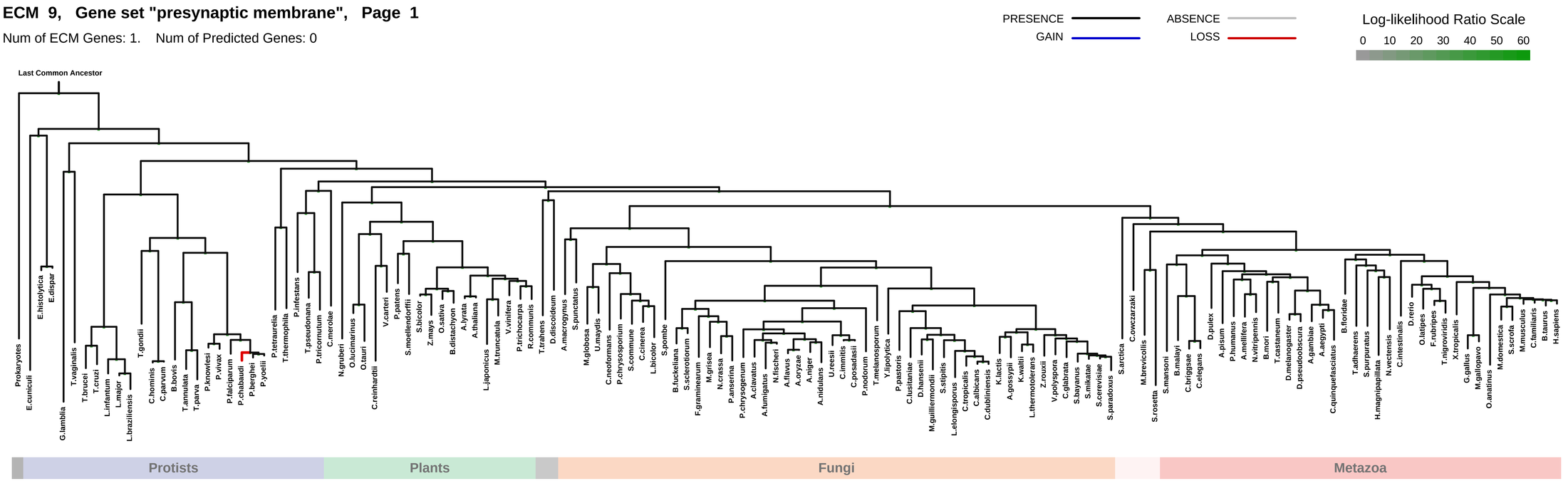


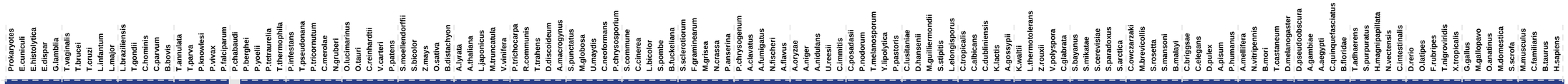
PG	Protein	LLR	Notes
A	CAMK2A		1 / 2
A	CASK		2 / 3 / 4 / 5 / 6 / 7 / 8 / 9
A	MPP4		2

1: endocytic vesicle membrane || 2: presynaptic membrane || 3: actin cytoskeleton || 4: basement membrane || 5: basolateral plasma membrane || 6: cell-cell junction || 7: cilium membrane || 8: nuclear lamina || 9: nuclear matrix

ECM 9, Gene set "presynaptic membrane", Page 1

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

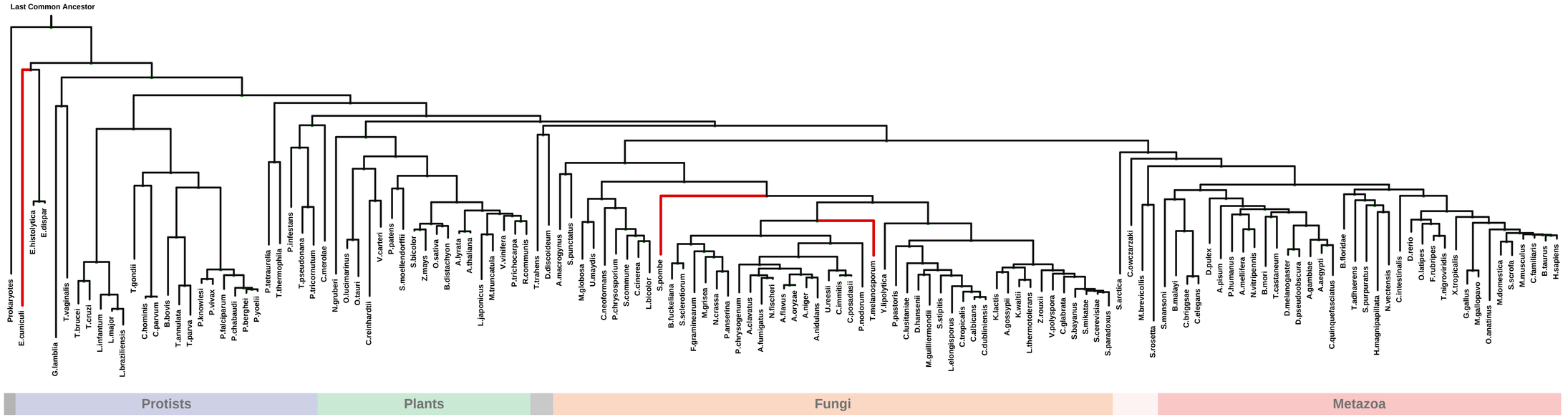


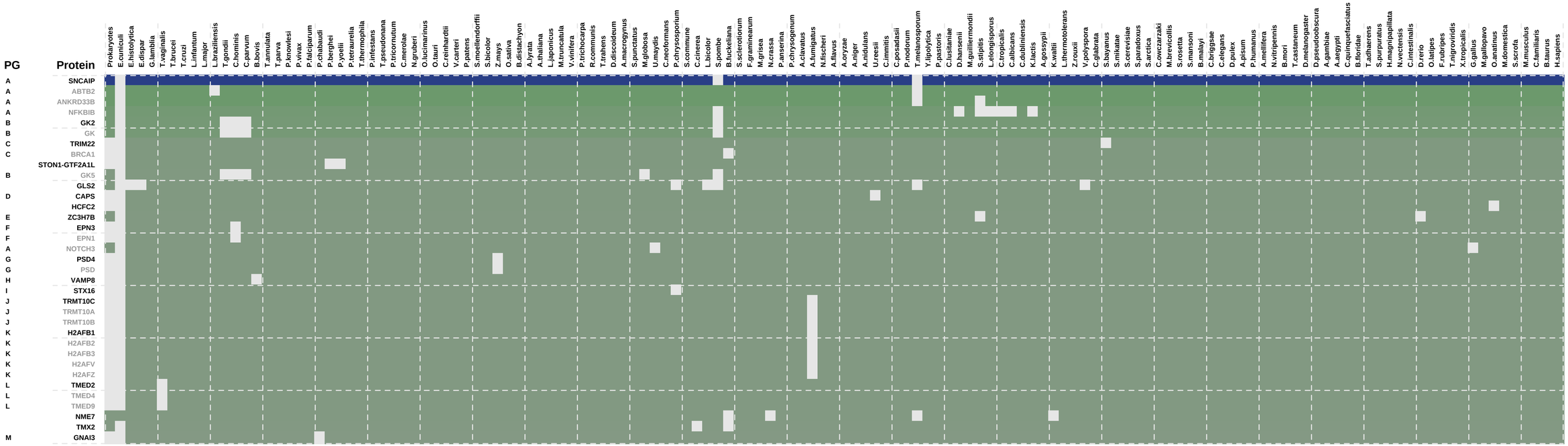


1: basolateral plasma membrane || 2: cell leading edge || 3: cell-cell adherens junction || 4: cell-cell junction || 5: myelin sheath abaxonal region || 6: postsynaptic membrane || 7: presynaptic membrane || 8: Scrib-APC-beta-catenin complex

ECM 10, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 467

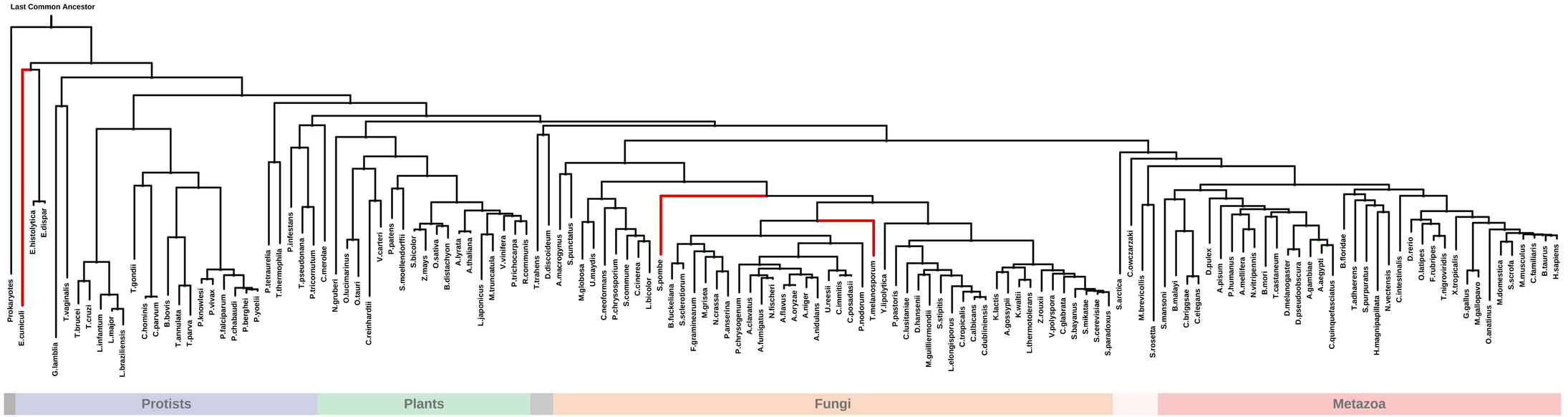


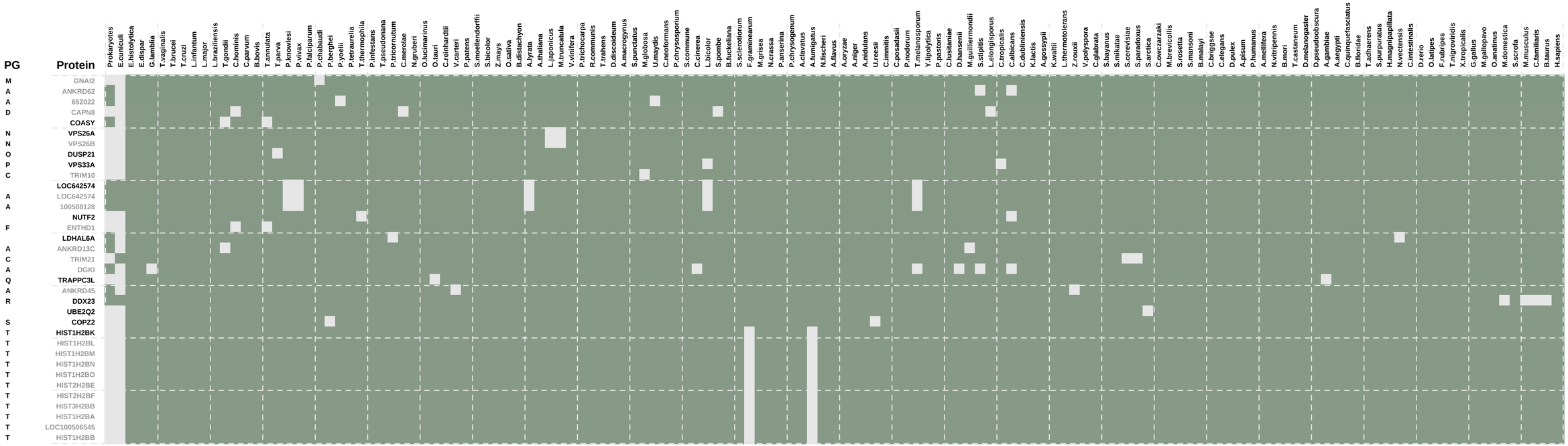


1: presynaptic membrane || 2: mitochondrial outer membrane || 3: Cajal body || 4: nuclear speck || 5: BRCA1-A complex || 6: BRCA1-BARD1 complex || 7: chromosome || 8: filamentous actin || 9: focal adhesion || 10: gamma-tubulin ring complex || 11: ribonucleoprotein complex || 12: ruffle || 13: ubiquitin ligase complex || 14: clathrin-coated vesicle || 15: coated pit || 16: trans-Golgi network || 17: early endosome || 18: late endosome membrane || 19: lysosomal membrane || 20: recycling endosome || 21: secretory granule membrane || 22: SNARE complex || 23: nuclear nucleosome || 24: transcriptionally active chromatin || 25: nucleosome || 26: Barr body || 27: COPI-coated vesicle || 28: COPI-coated vesicle membrane ||

ECM 10, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 467

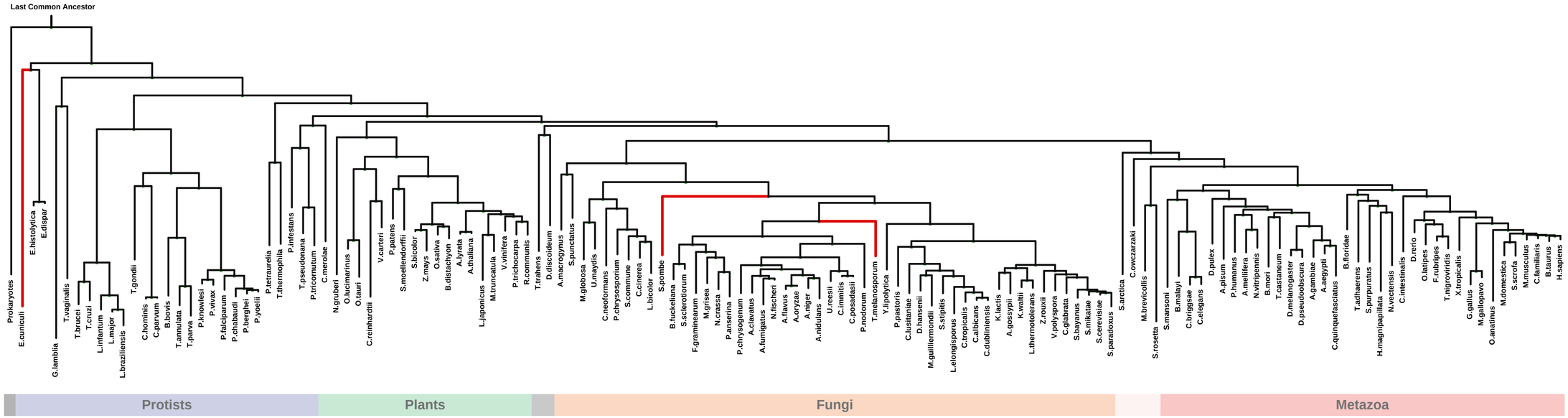


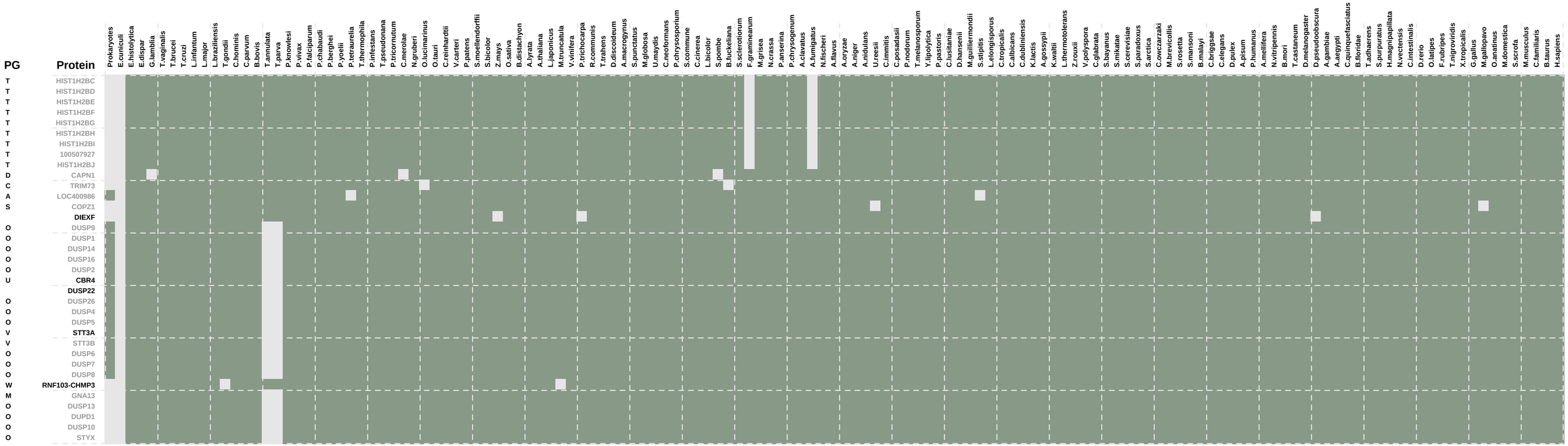


1: extrinsic to internal side of plasma membrane || 2: heterotrimeric G-protein complex || 3: membrane raft || 4: midbody || 5: mitochondrial outer membrane || 6: endosome || 7: endosome membrane || 8: retromer complex ||
9: vesicle || 10: early endosome || 11: HOPS complex || 12: late endosome || 13: late endosome membrane || 14: lysosomal membrane || 15: microtubule cytoskeleton || 16: nuclear pore || 17: cytoplasmic mRNA processing body ||
18: ribonucleoprotein complex || 19: SCF ubiquitin ligase complex || 20: guanyl-nucleotide exchange factor complex || 21: catalytic step 2 spliceosome || 22: U5 snRNP || 23: cis-Golgi network || 24: COPI vesicle coat || 25: nucleosome ||

ECM 10, Gene set "presynaptic membrane", Page 3

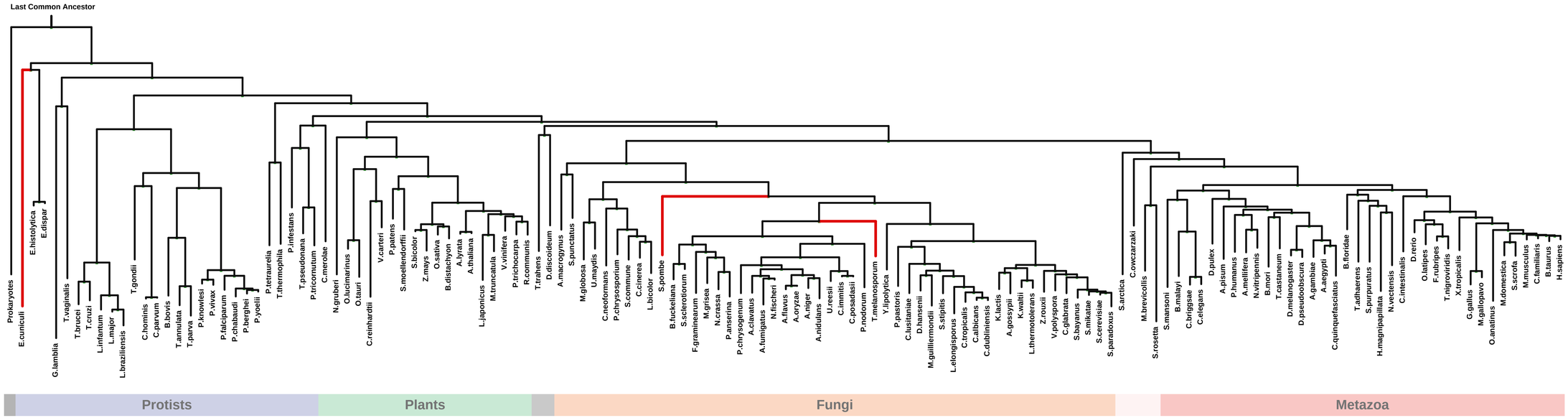
Num of ECM Genes: 1. Num of Predicted Genes: 467

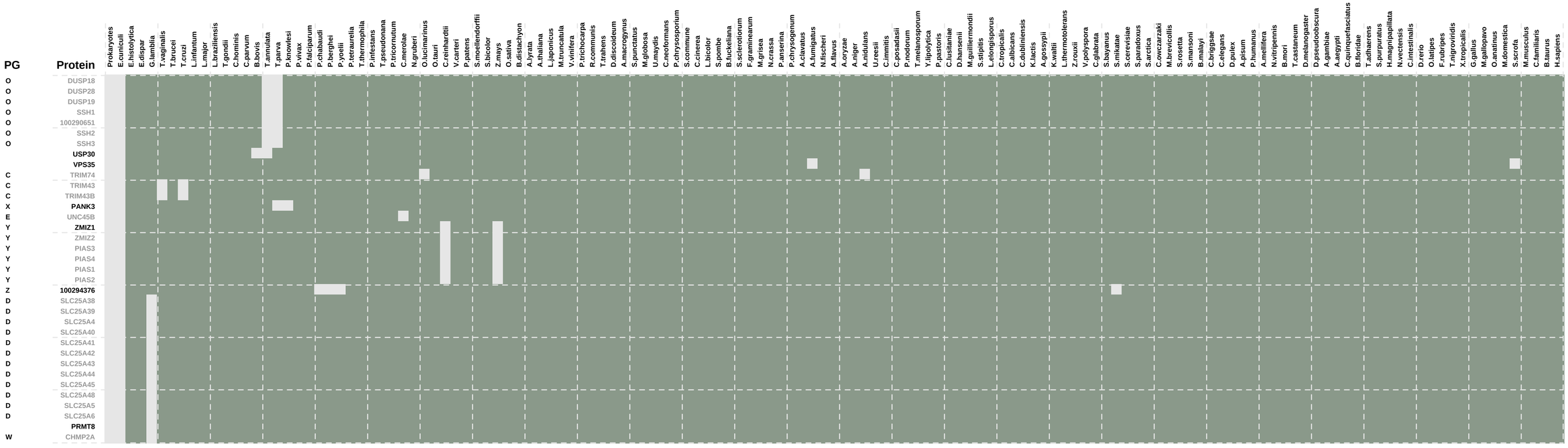




ECM 10, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 467

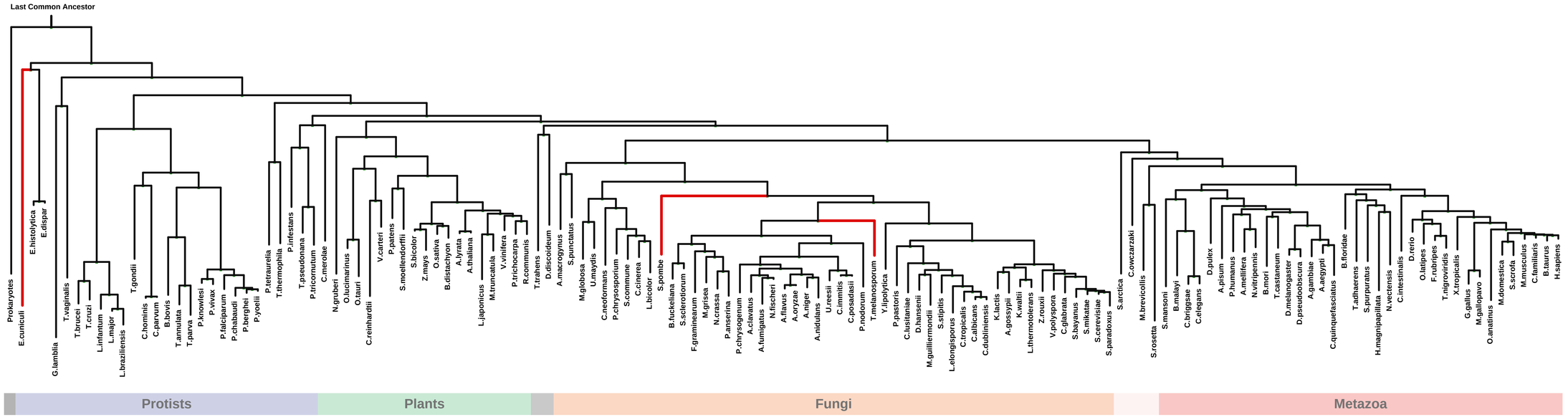




1: cleavage furrow || 2: lamellipodium || 3: midbody || 4: mitochondrial outer membrane || 5: endosome || 6: nuclear speck || 7: nuclear replication fork || 8: dendrite || 9: synapse || 10: nuclear matrix || 11: PML body ||
12: mitochondrial nucleoid || 13: MMXD complex || 14: mitochondrial inner membrane presequence translocase complex || 15: late endosome membrane

ECM 10, Gene set "presynaptic membrane", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 467

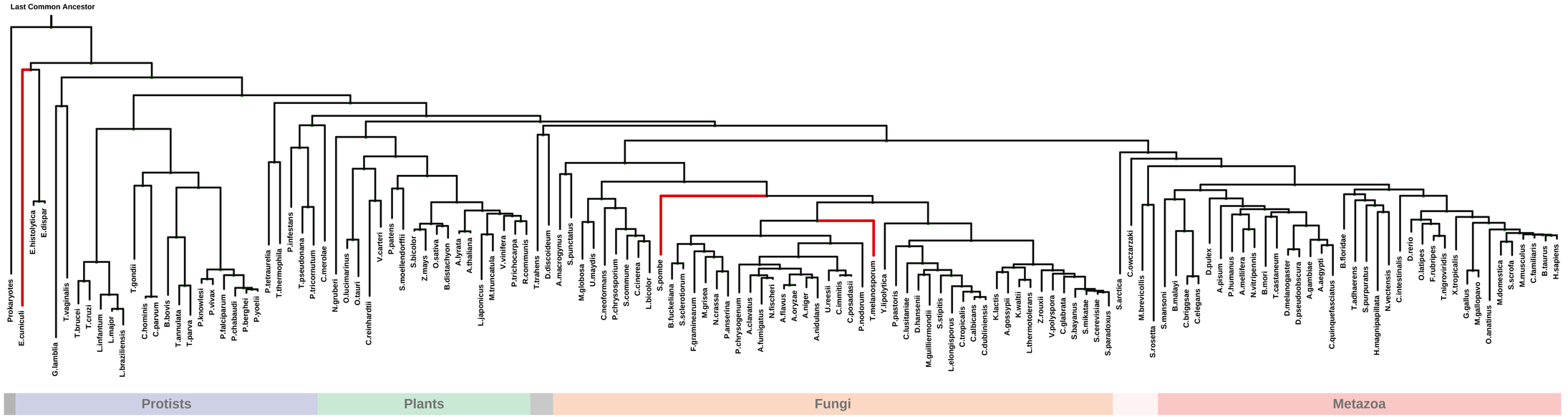


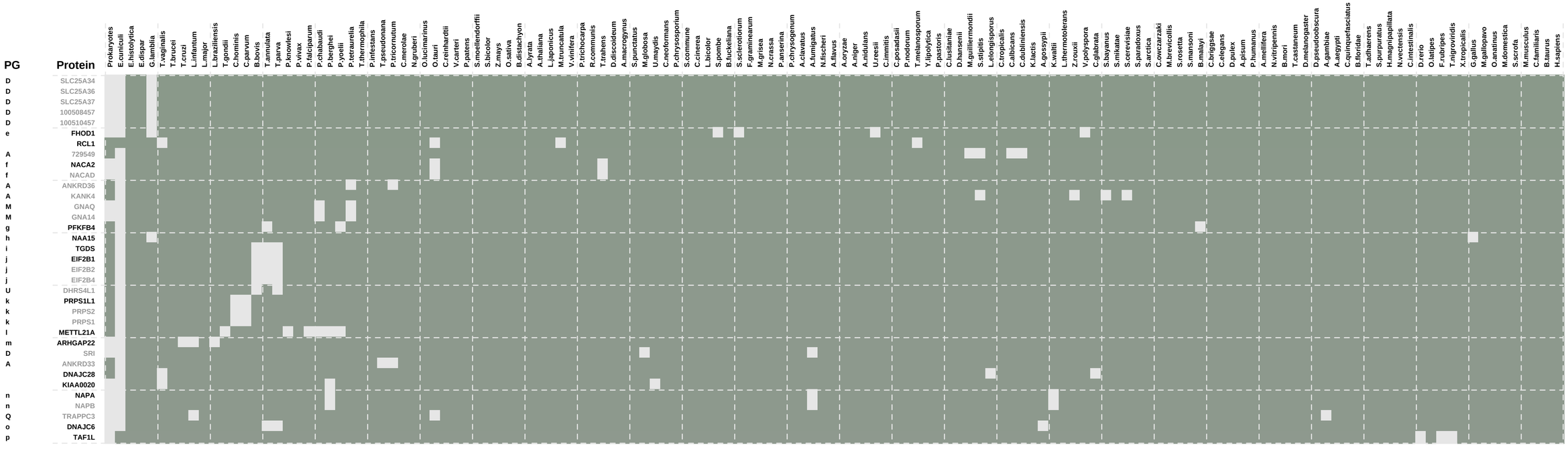
PG	Protein	LLR	Notes
U	DECR2	6.5	1
	RBM15B	6.5	
a	EIF2A	6.5	2
b	ITSN2	6.5	
a	EIF3B	6.5	3
	CHKA	6.5	
c	SF3B3	6.5	4 / 5 / 6 / 7
D	SLC25A1	6.5	
D	SLC25A10	6.5	
D	SLC25A11	6.5	
d	TNPO1	6.5	8
d	TNPO2	6.5	8
D	SLC25A12	6.5	
D	SLC25A13	6.5	
D	SLC25A14	6.5	
D	SLC25A15	6.5	
D	SLC25A16	6.5	
D	SLC25A17	6.5	1 / 9 / 10
D	SLC25A18	6.5	
D	SLC25A19	6.5	
D	UCP1	6.5	
D	UCP2	6.5	
D	UCP3	6.5	
D	SLC25A2	6.5	
D	SLC25A20	6.5	
D	SLC25A21	6.5	
D	SLC25A22	6.5	
D	SLC25A26	6.5	
D	SLC25A28	6.5	
D	SLC25A29	6.5	
D	SLC25A3	6.5	
D	SLC25A30	6.5	
D	SLC25A31	6.5	11 / 12
D	SLC25A32	6.5	
D	SLC25A33	6.5	

1: peroxisome || 2: eukaryotic translation initiation factor 2 complex || 3: eukaryotic translation initiation factor 3 complex || 4: catalytic step 2 spliceosome || 5: small nuclear ribonucleoprotein complex || 6: spliceosomal complex || 7: U12-type spliceosomal complex ||
8: nuclear pore || 9: integral to peroxisomal membrane || 10: peroxisomal membrane || 11: cilium || 12: flagellum

ECM 10, Gene set "presynaptic membrane", Page 6

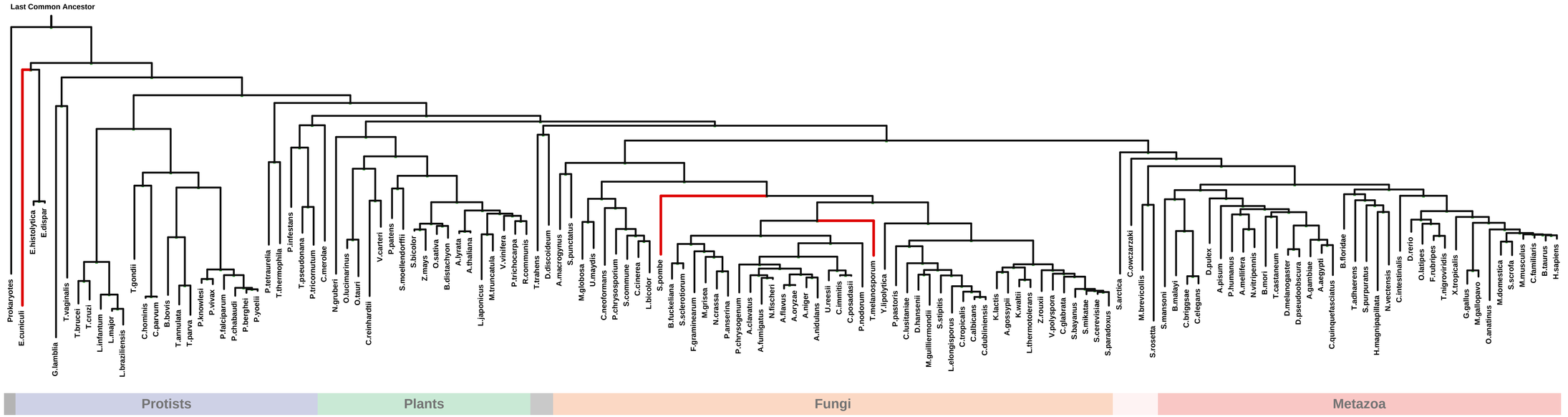
Num of ECM Genes: 1. Num of Predicted Genes: 467

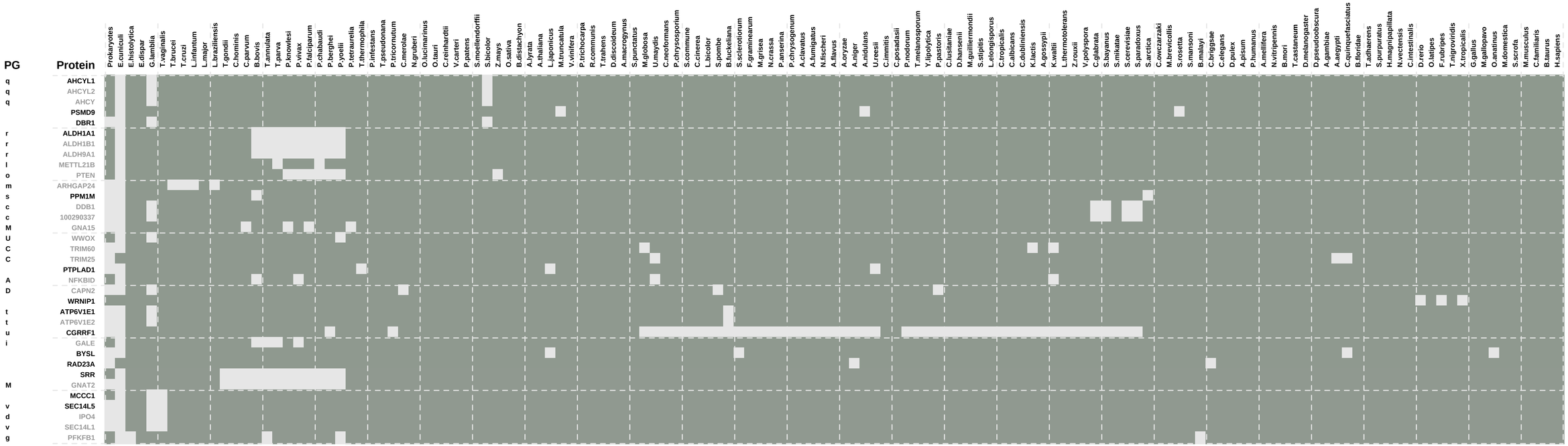




ECM 10, Gene set "presynaptic membrane", Page 7

Num of ECM Genes: 1. Num of Predicted Genes: 467

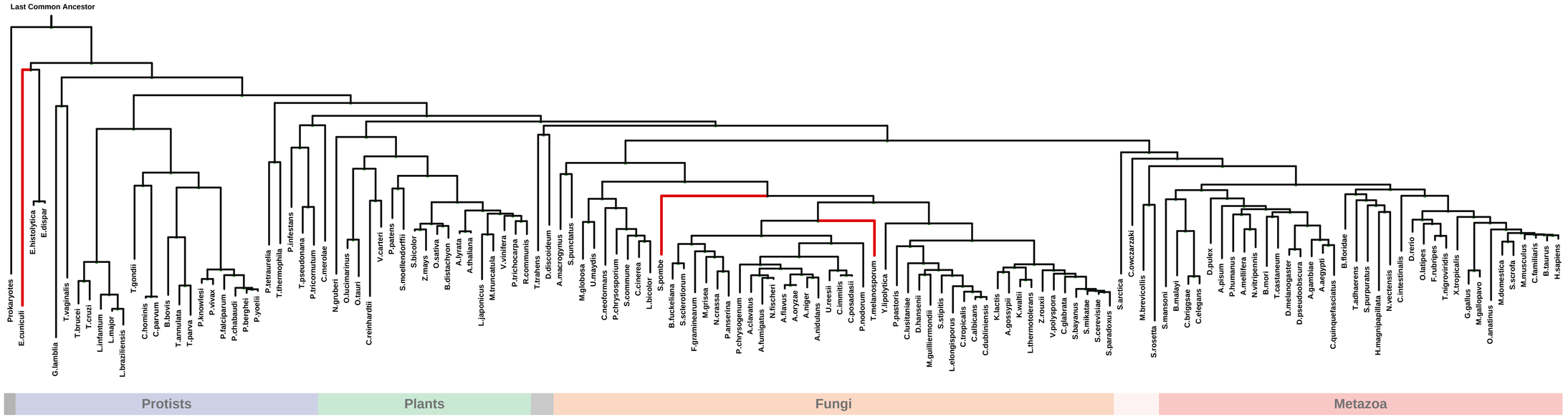


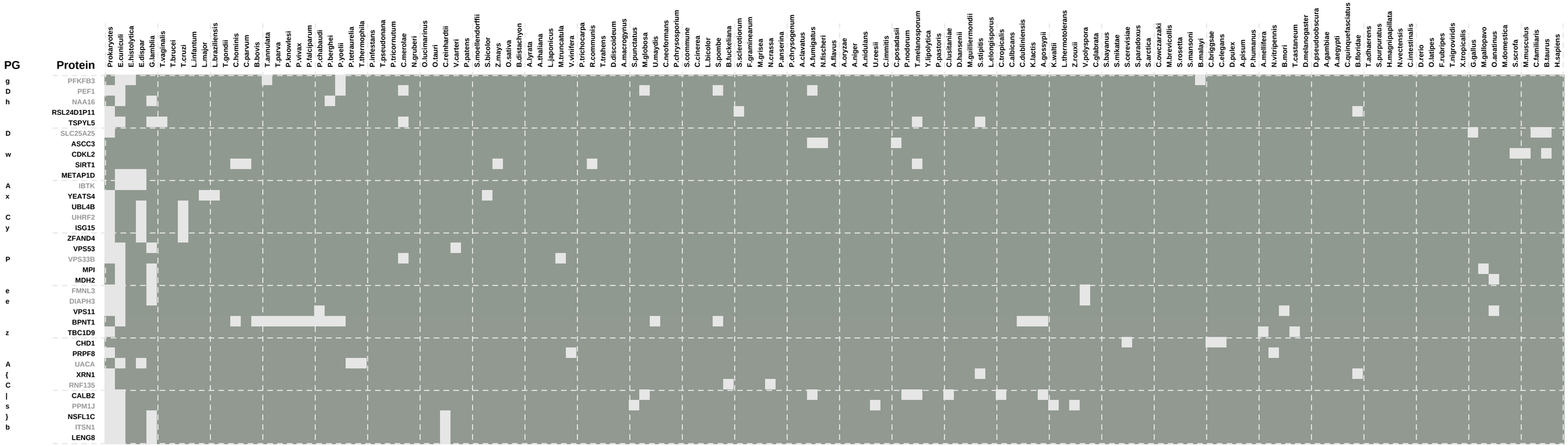


1: melanosome || 2: proteasome regulatory particle || 3: proteasome regulatory particle, base subcomplex || 4: cell projection || 5: internal side of plasma membrane || 6: myelin sheath adaxonal region || 7: neuron projection || 8: PML body ||
9: Schmidt-Lanterman incisure || 10: focal adhesion || 11: Cul4A-RING ubiquitin ligase complex || 12: Cul4B-RING ubiquitin ligase complex || 13: Cul4-RING ubiquitin ligase complex || 14: extrinsic to internal side of plasma membrane ||
15: heterotrimeric G-protein complex || 16: microvillus || 17: chromatin || 18: endosome || 19: proton-transporting two-sector ATPase complex || 20: proton-transporting two-sector ATPase complex, catalytic domain || 21: acrosomal vesicle ||

ECM 10, Gene set "presynaptic membrane", Page 8

Num of ECM Genes: 1. Num of Predicted Genes: 467

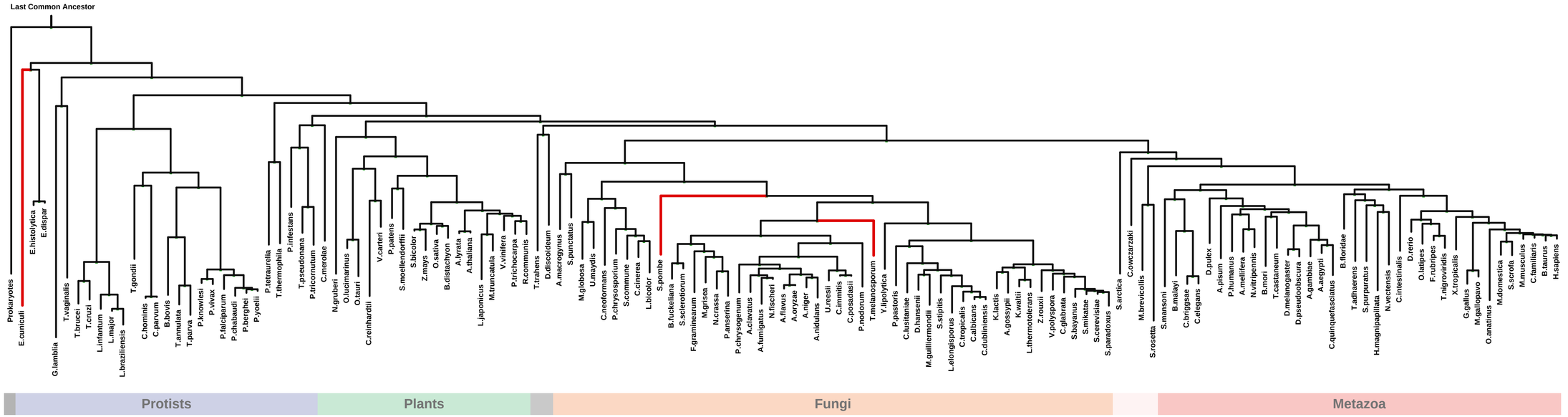


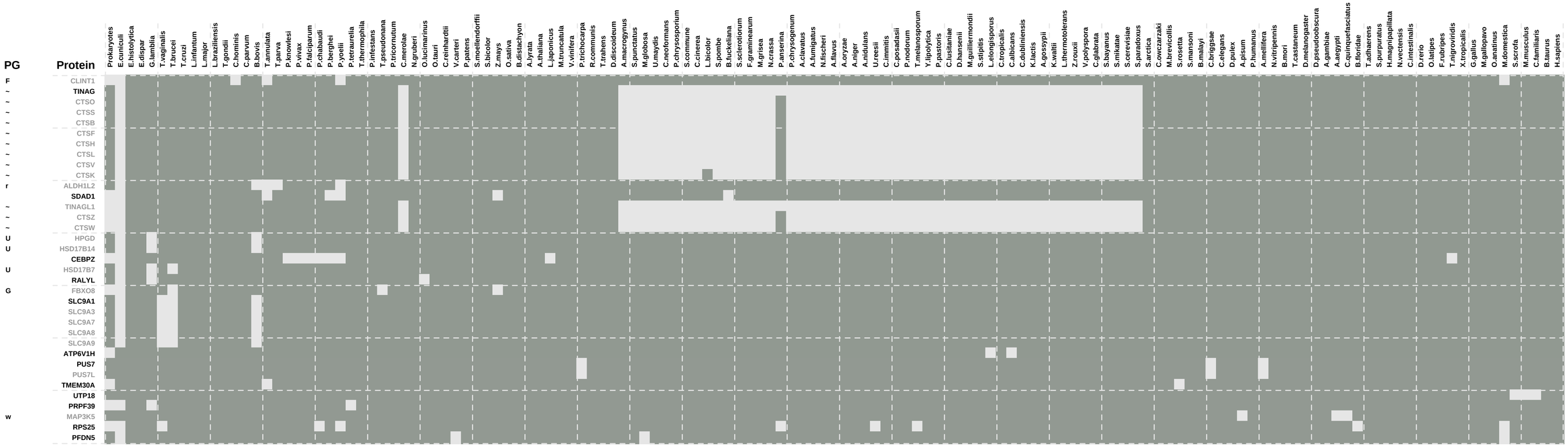


1: chromatin silencing complex || 2: ESC/E(Z) complex || 3: nuclear chromatin || 4: nuclear envelope || 5: nuclear euchromatin || 6: nuclear heterochromatin || 7: nuclear inner membrane || 8: PML body || 9: rDNA heterochromatin ||
10: NuA4 histone acetyltransferase complex || 11: nuclear matrix || 12: endosome membrane || 13: GARP complex || 14: HOPS complex || 15: late endosome || 16: late endosome membrane || 17: lysosomal membrane || 18: lysosome ||
19: platelet alpha granule || 20: endocytic vesicle || 21: endosome || 22: catalytic step 2 spliceosome || 23: nuclear speck || 24: U5 snRNP || 25: apoptosome || 26: intermediate filament cytoskeleton || 27: gap junction ||

ECM 10, Gene set "presynaptic membrane", Page 9

Num of ECM Genes: 1. Num of Predicted Genes: 467

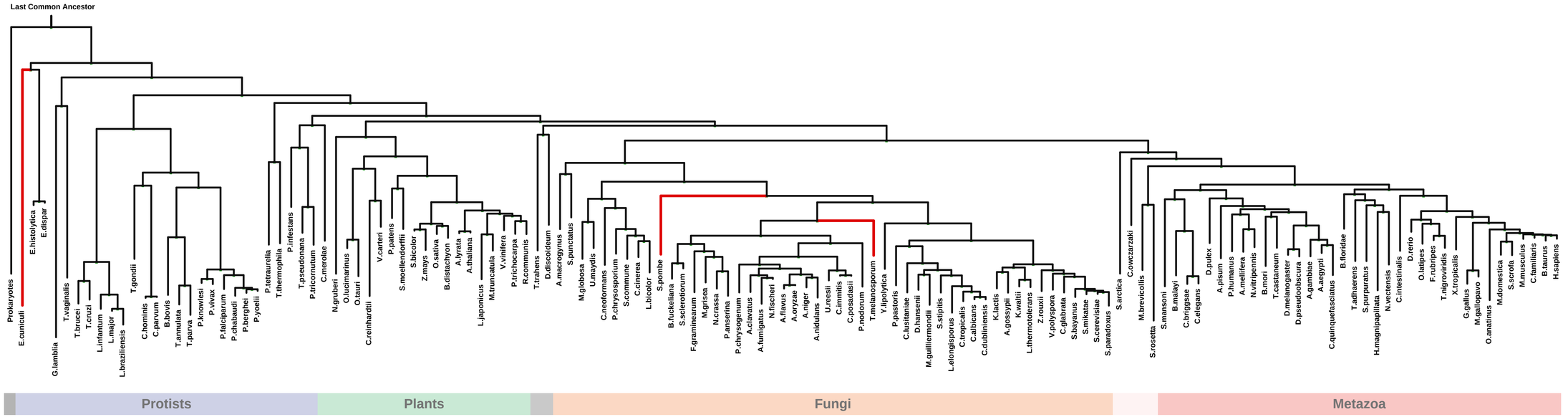


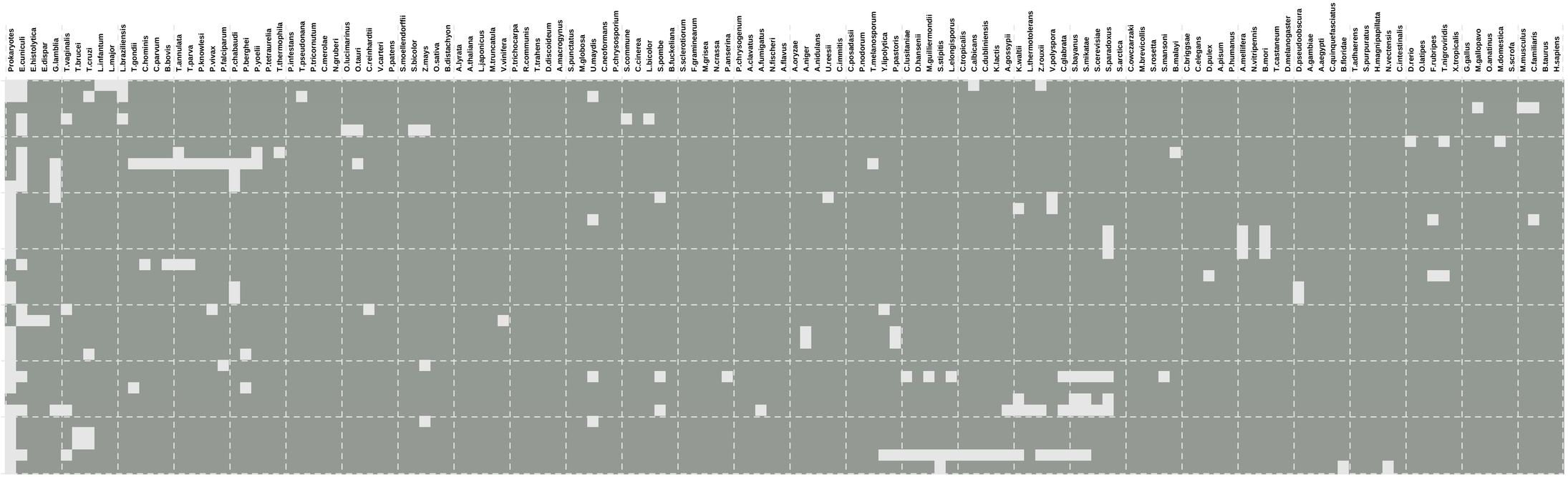


1: clathrin-coated vesicle || 2: basement membrane || 3: lysosome || 4: endolysosome lumen || 5: lysosomal lumen || 6: caveola || 7: external side of plasma membrane || 8: melanosome || 9: sarcolemma || 10: alveolar lamellar body || 11: apical part of cell || 12: microvillus || 13: neuron projection || 14: perikaryon || 15: secretory granule || 16: extracellular matrix || 17: trans-Golgi network || 18: ubiquitin ligase complex || 19: basolateral plasma membrane || 20: membrane raft || 21: brush border || 22: brush border membrane || 23: recycling endosome membrane || 24: late endosome membrane || 25: recycling endosome || 26: vacuolar proton-transporting V-type ATPase, V1 domain ||

ECM 10, Gene set "presynaptic membrane", Page 10

Num of ECM Genes: 1. Num of Predicted Genes: 467

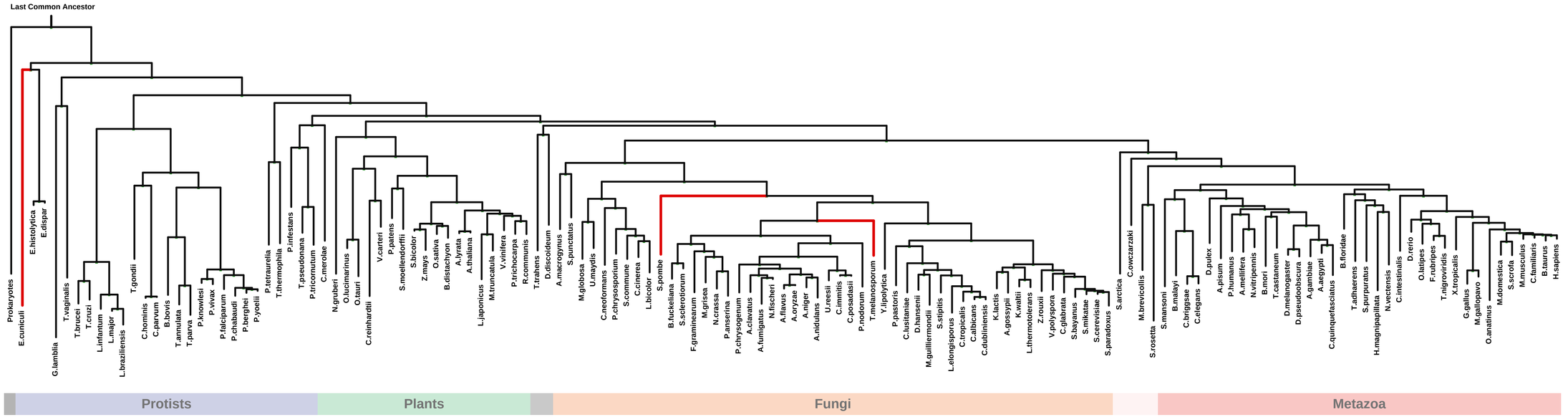


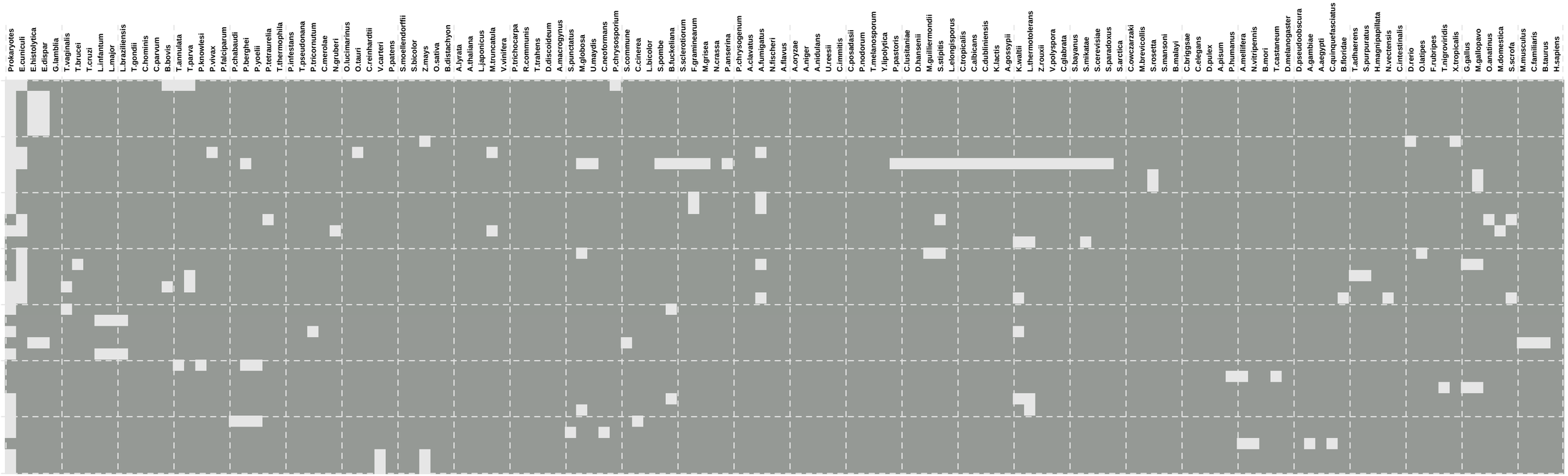


1: endoplasmic reticulum-Golgi intermediate compartment || 2: endoplasmic reticulum-Golgi intermediate compartment membrane || 3: melanosome || 4: tRNA (m1A) methyltransferase complex || 5: early endosome || 6: internal side of plasma membrane || 7: spindle || 8: nuclear cyclin-dependent protein kinase holoenzyme complex || 9: nuclear speck || 10: basal plasma membrane || 11: integral to endoplasmic reticulum membrane || 12: Cajal body || 13: U7 snRNP || 14: cilium || 15: cis-Golgi network || 16: peroxisomal membrane || 17: peroxisome || 18: neuron projection || 19: ruffle || 20: ruffle membrane || 21: trans-Golgi network || 22: cilium axoneme || 23: Golgi cisterna membrane || 24: CCR4-NOT complex ||

ECM 10, Gene set "presynaptic membrane", Page 11

Num of ECM Genes: 1. Num of Predicted Genes: 467

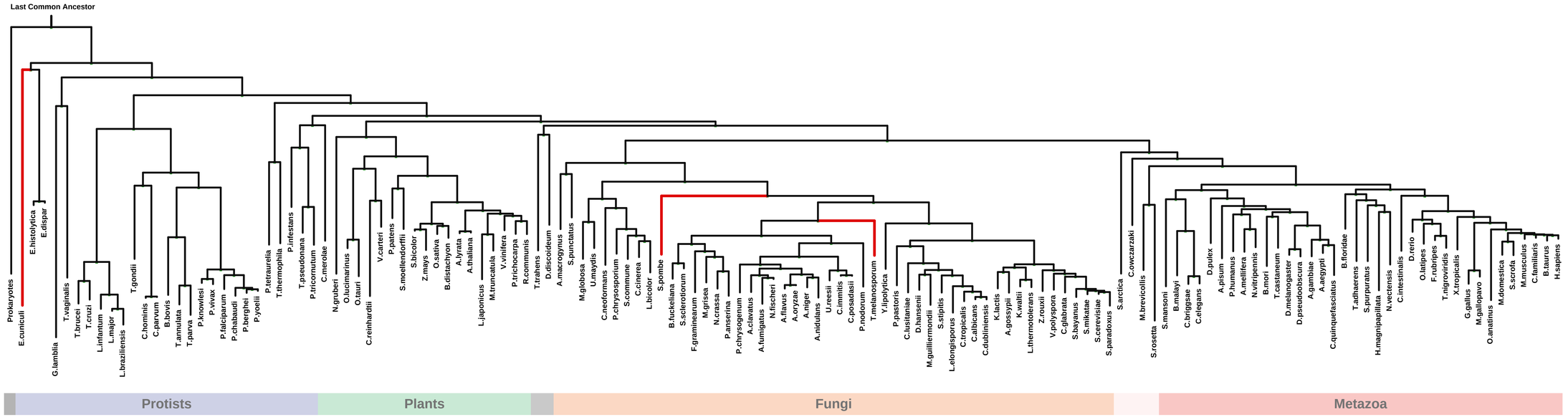


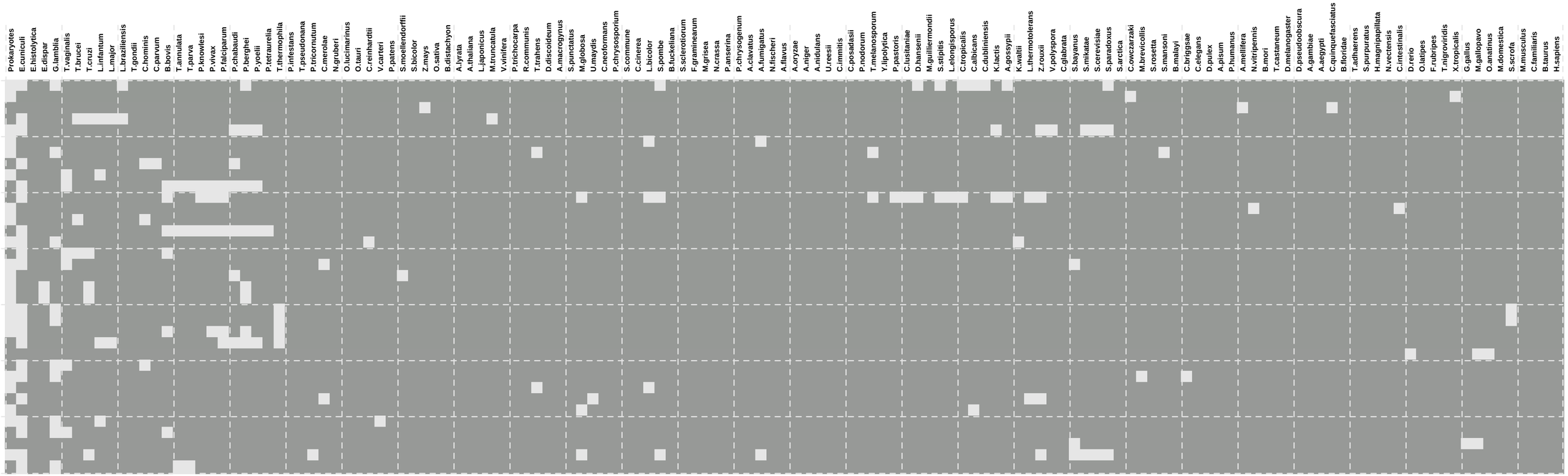


1: BLOC-1 complex || 2: endosome membrane || 3: membrane raft || 4: phagocytic vesicle || 5: SNARE complex || 6: axoneme || 7: cilium || 8: flagellum || 9: microtubule cytoskeleton || 10: postsynaptic density ||
11: postsynaptic membrane || 12: trans-Golgi network || 13: cytosolic large ribosomal subunit || 14: chromatin || 15: chromatin remodeling complex || 16: nucleosome || 17: nuclear membrane || 18: acrosomal vesicle || 19: MAML1-RBP-Jkappa- ICN1 complex ||
20: MCM complex || 21: lamellipodium || 22: 90S preribosome || 23: cytosolic small ribosomal subunit || 24: microtubule organizing center || 25: ribonucleoprotein complex || 26: ribosome || 27: small-subunit processome ||

ECM 10, Gene set "presynaptic membrane", Page 12

Num of ECM Genes: 1. Num of Predicted Genes: 467



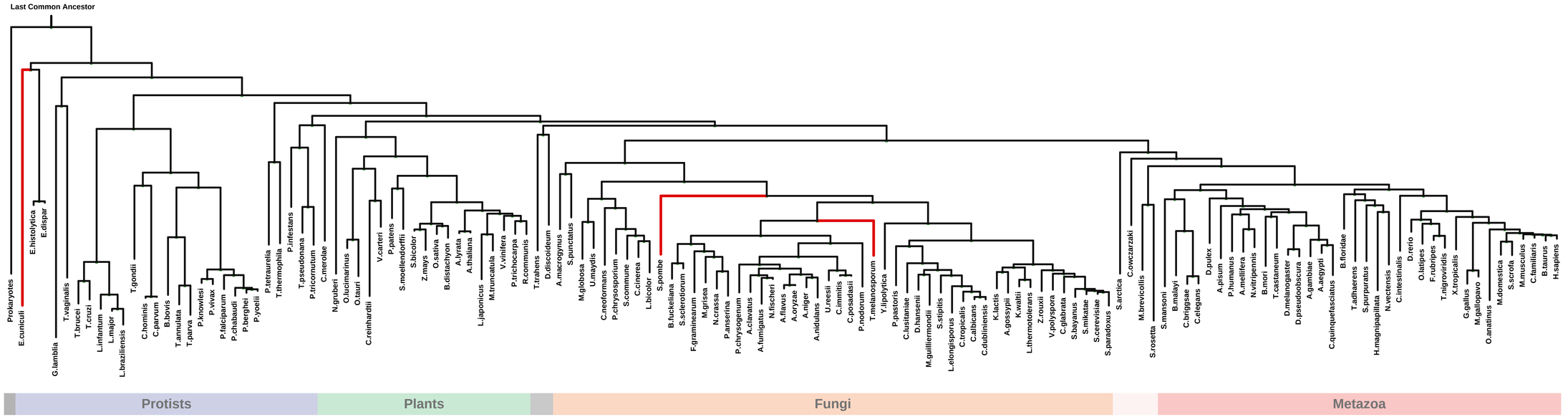


PG	Protein	LLR	Notes
z	TBC1D24	1.5	
	PIK3C2B	1.5	1
	KRR1	1.5	2
	ORC4	1.5	3 / 4
Z	SRD5A1	1.5	5 / 6
	PSMD4	1.5	7 / 8
	LOC100129492	1.4	
	WIPI1	1.4	9 / 10 / 11 / 12 / 13 / 14
	ZC3H4	1.4	
	UCKL1	1.4	
A	ANKRD13D	1.4	
	ATP6V1C1	1.3	15 / 16 / 17 / 18
	AKTIP	1.3	19 / 20
i	NSDHL	1.3	21
}	UBXN2B	1.3	
	SLC9A2	1.2	
	SMYD2	1.2	
	POLR3F	1.2	22
	UBTD2	1.1	
	UBTD1	1.1	
I	STX5	1.1	23 / 24
I	100510546	1.1	
H	VAMP3	1.1	10 / 24 / 25 / 26 / 27 / 28
	MOCOS	1.1	
	DUS3L	1.1	
	SV2C	1.1	29
	PDCD2L	1.1	
	SF3A3	1.0	30 / 31 / 32
A	KLHL9	1.0	33 / 34
C	TRIM11	1.0	
	XAB2	0.9	30
U	HSD17B4	0.8	35 / 36 / 37
	RPS9	0.8	2 / 38 / 39
D	CAPNS2	0.8	
U	HSD17B8	0.8	40

1: endocytic vesicle || 2: ribonucleoprotein complex || 3: nuclear origin of replication recognition complex || 4: origin recognition complex || 5: cell body fiber || 6: myelin sheath || 7: proteasome accessory complex || 8: proteasome complex ||
9: autophagic vacuole membrane || 10: clathrin-coated vesicle || 11: endosome membrane || 12: pre-autophagosomal structure || 13: pre-autophagosomal structure membrane || 14: trans-Golgi network || 15: apical part of cell ||
16: cytoplasmic vesicle || 17: proton-transporting two-sector ATPase complex || 18: proton-transporting V-type ATPase, V1 domain || 19: FHF complex || 20: HOPS complex || 21: lipid particle || 22: DNA-directed RNA polymerase III complex ||

ECM 10, Gene set "presynaptic membrane", Page 13

Num of ECM Genes: 1. Num of Predicted Genes: 467

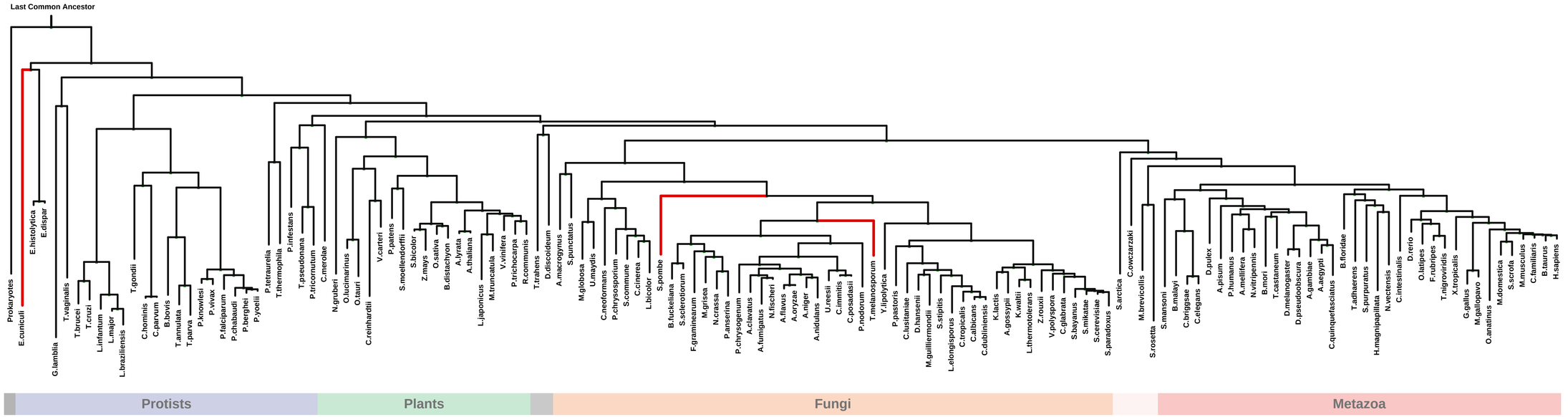


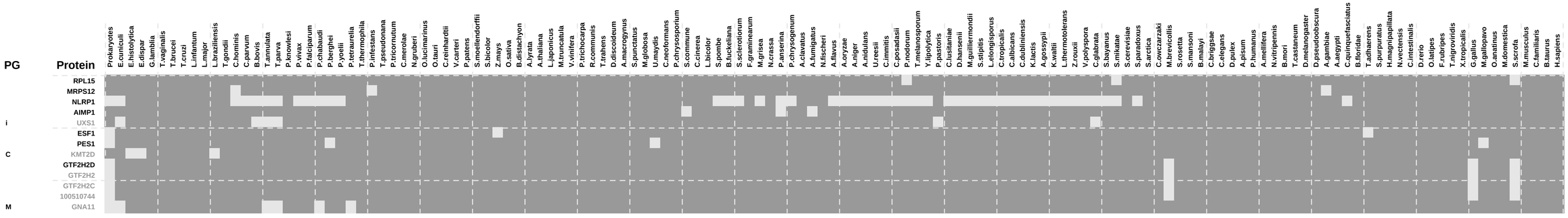
PG	Protein	LLR	Notes
	UCHL3	0.8	
	GSPT2	0.8	
	C21orf2	0.7	
C	KMT2A	0.7	1 / 2
C	TRIM35	0.7	
	NOL10	0.7	
	MRE11A	0.7	3 / 4 / 5 / 6
	PCNA	0.7	7 / 8 / 9 / 10
	COPA	0.6	11
	MYO18A	0.6	12 / 13 / 14
f	NACA	0.6	
	POLH	0.6	
	TOP3A	0.6	15 / 16
I	METTL21C	0.6	
	RABL6	0.5	
	SF3A2	0.5	17 / 18 / 19
R	DDX3Y	0.5	
M	GNAZ	0.5	20 / 21 / 22
C	TRIM72	0.5	23 / 24
w	MAP3K12	0.4	
X	PANK2	0.4	25
	PAPOLG	0.4	
	PAPOLA	0.4	
	PAPOLB	0.4	
A	ZBTB17	0.4	
	NOS3	0.3	26 / 27 / 28
	BTF3	0.3	
x	MLLT1	0.3	
	GPI	0.3	
D	CAPN3	0.3	29 / 30 / 31
	GAPVD1	0.3	32
	SUPT16H	0.2	15
k	PRPSAP1	0.2	
k	PRPSAP2	0.2	
	LSM3	0.1	17

1: histone methyltransferase complex || 2: MLL1 complex || 3: chromosome, telomeric region || 4: condensed nuclear chromosome || 5: Mre11 complex || 6: nuclear chromatin || 7: DNA replication factor C complex || 8: microtubule cytoskeleton ||
9: nuclear replication fork || 10: PCNA-p21 complex || 11: COPI vesicle coat || 12: actomyosin || 13: endoplasmic reticulum-Golgi intermediate compartment || 14: myosin complex || 15: chromosome || 16: PML body || 17: catalytic step 2 spliceosome ||
18: small nuclear ribonucleoprotein complex || 19: spliceosomal complex || 20: extrinsic to internal side of plasma membrane || 21: heterotrimeric G-protein complex || 22: nuclear envelope || 23: cytoplasmic vesicle membrane || 24: sarcolemma ||

ECM 10, Gene set "presynaptic membrane", Page 14

Num of ECM Genes: 1. Num of Predicted Genes: 467

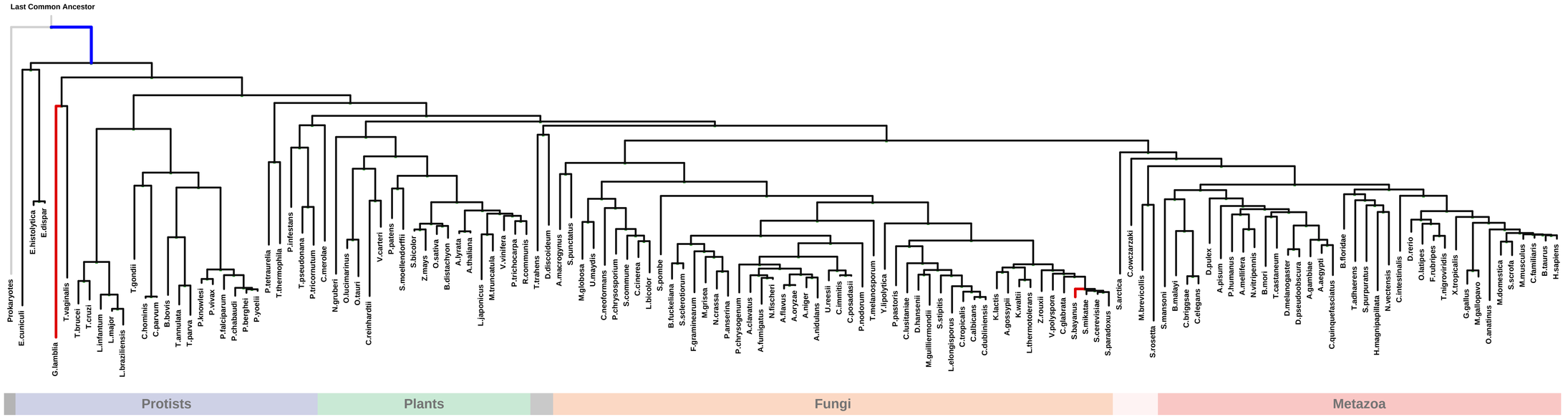


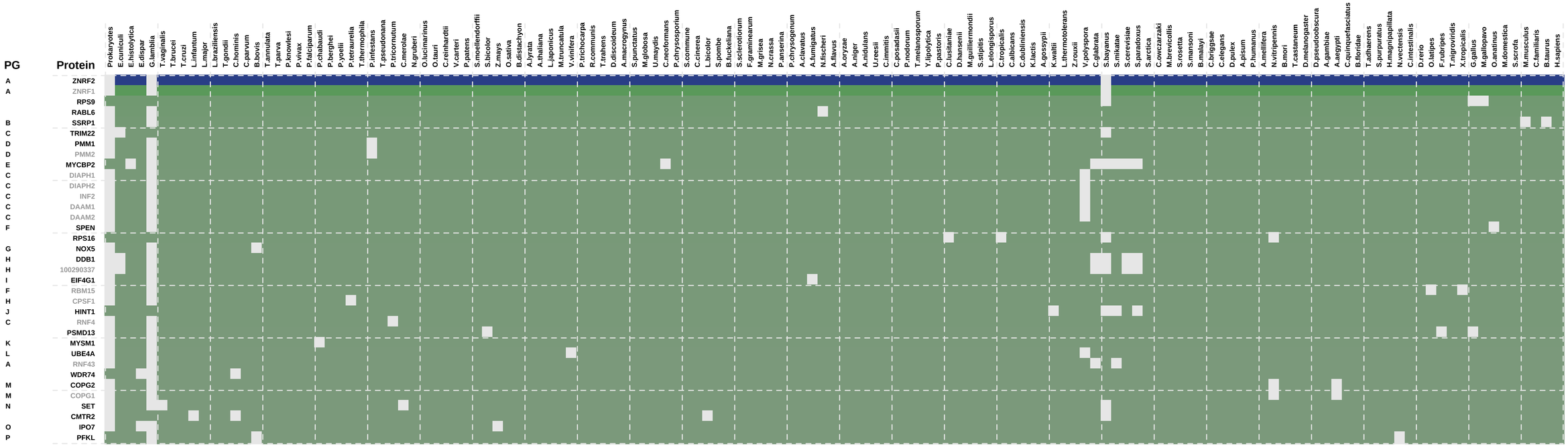


1: cytosolic large ribosomal subunit || 2: ribosome || 3: mitochondrial ribosome || 4: small ribosomal subunit || 5: NLRP1 inflammasome complex || 6: aminoacyl-tRNA synthetase multienzyme complex || 7: transport vesicle || 8: Golgi cisterna membrane ||
9: condensed chromosome || 10: PeBoW complex || 11: preribosome, large subunit precursor || 12: histone methyltransferase complex || 13: holo TFIIH complex || 14: extrinsic to internal side of plasma membrane || 15: heterotrimeric G-protein complex

ECM 11, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 500

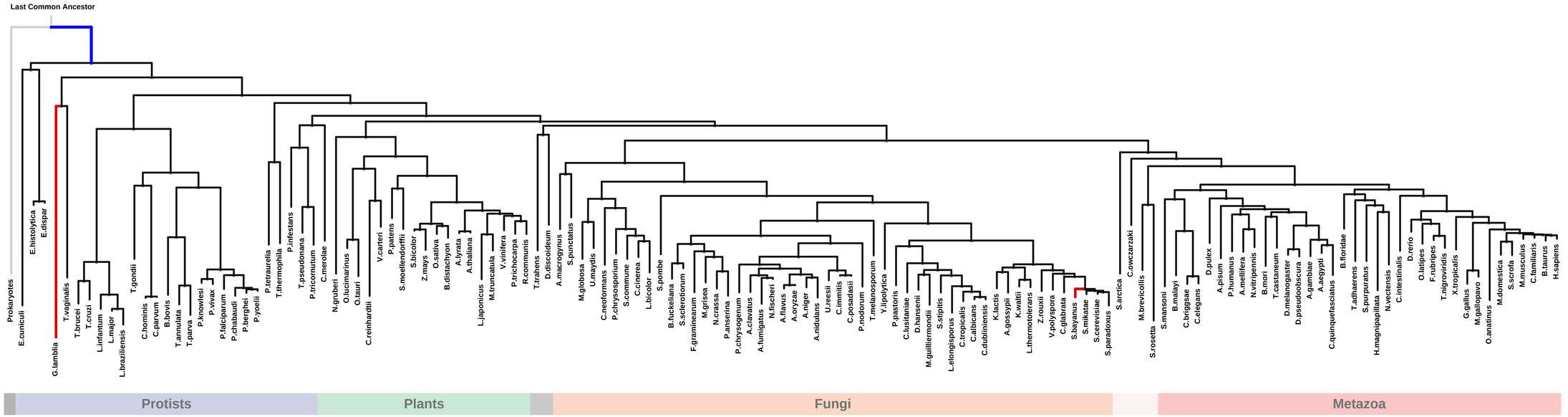




1: endosome membrane || 2: lysosomal membrane || 3: presynaptic membrane || 4: endosome || 5: lysosome || 6: synaptic vesicle membrane || 7: cytosolic small ribosomal subunit || 8: ribonucleoprotein complex || 9: ribosome ||
10: chromosome || 11: Cajal body || 12: nuclear speck || 13: axon || 14: microtubule cytoskeleton || 15: mitotic spindle || 16: ruffle membrane || 17: early endosome || 18: stress fiber || 19: transcriptional repressor complex ||
20: small ribosomal subunit || 21: Cul4A-RING ubiquitin ligase complex || 22: Cul4B-RING ubiquitin ligase complex || 23: Cul4-RING ubiquitin ligase complex || 24: eukaryotic translation initiation factor 4F complex || 25: mRNA cleavage and polyadenylation specificity factor complex ||

ECM 11, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 500

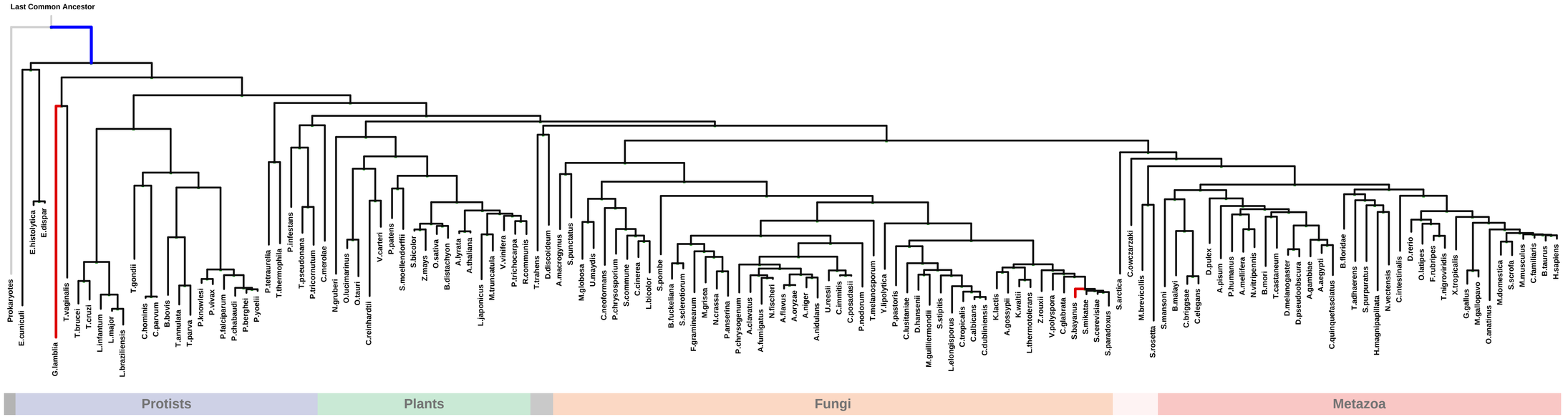


PG	Protein	LLR	Notes
Q	NUDCD3	12.6	
Q	NUDC	12.6	
G	DGKA	12.5	
R	CUL4A	12.5	1 / 2
R	CUL2	12.5	3
C	LNX2	12.5	
S	NARF	12.4	4 / 5 / 6
S	NARFL	12.4	7
	SREK1	12.4	8
C	PDZRN4	12.3	
	RPL6	12.2	9
	RBM41	12.0	
C	TRIM21	11.9	10 / 11 / 12
	UNG	11.8	
	FBXW9	11.8	
	ARCN1	11.8	13 / 14
T	DDX23	11.6	15 / 16
U	CNOT6	11.6	
O	CSE1L	11.4	17
V	ZBTB11	11.4	
	DAZ2	11.2	
	ERCC4	11.2	18 / 19 / 20
	LSM1	11.1	11
J	HINT2	11.0	
W	RBM14-RBM4	10.9	
X	TRRAP	10.9	21 / 22 / 23 / 24
Y	SF1	10.9	8 / 25
Z	ATP6V1C2	10.9	26
B	HMGB1	10.9	27 / 28 / 29
a	MYO10	10.9	28 / 30 / 31 / 32 / 33 / 34 /
a	MYO7B	10.9	34
	RAVER2	10.7	
	RPL34	10.7	9
	RQCD1	10.7	10
	CLP1	10.6	36

1: Cul4A-RING ubiquitin ligase complex || 2: Cul4-RING ubiquitin ligase complex || 3: Cul2-RING ubiquitin ligase complex || 4: lamin filament || 5: nuclear lamina || 6: nuclear lumen || 7: CIA complex || 8: spliceosomal complex ||
9: cytosolic large ribosomal subunit || 10: cytoplasmic mRNA processing body || 11: ribonucleoprotein complex || 12: SCF ubiquitin ligase complex || 13: clathrin adaptor complex || 14: COPI vesicle coat || 15: catalytic step 2 spliceosome ||
16: U5 snRNP || 17: nuclear pore || 18: chromosome, telomeric region || 19: nuclear chromosome, telomeric region || 20: nucleotide-excision repair complex || 21: NuA4 histone acetyltransferase complex || 22: PCAF complex ||

ECM 11, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 500

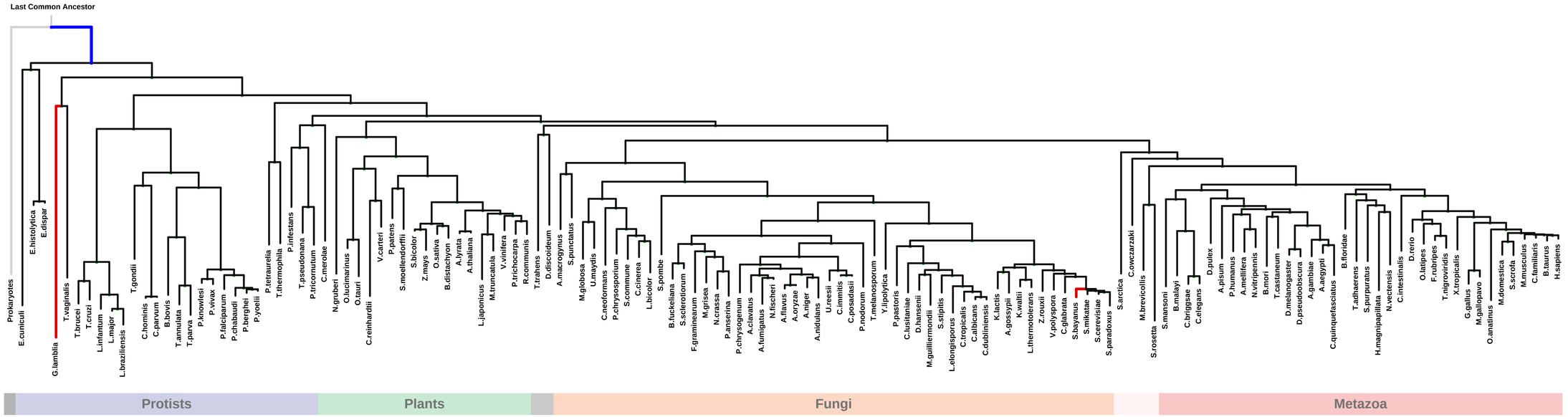


PG	Protein	LLR	Notes
U	CCRN4L	10.4	
U	PDE12	10.4	
U	ANGEL2	10.4	
U	ANGEL1	10.4	
b	**SLC25A12**	**10.4**	
b	SLC25A13	10.4	
b	SLC25A14	10.4	
b	SLC25A15	10.4	
b	SLC25A16	10.4	
b	SLC25A17	10.4	1 / 2 / 3
b	SLC25A18	10.4	
b	SLC25A19	10.4	
b	SLC25A2	10.4	
b	SLC25A20	10.4	
b	SLC25A21	10.4	
b	SLC25A22	10.4	
b	SLC25A26	10.4	
b	SLC25A28	10.4	
b	SLC25A29	10.4	
b	SLC25A3	10.4	
b	SLC25A30	10.4	
b	SLC25A31	10.4	4 / 5
b	SLC25A32	10.4	
b	SLC25A33	10.4	
b	SLC25A34	10.4	
b	SLC25A36	10.4	
b	SLC25A37	10.4	
b	SLC25A38	10.4	
b	SLC25A39	10.4	
b	SLC25A4	10.4	6
b	SLC25A40	10.4	
b	SLC25A41	10.4	
b	SLC25A42	10.4	
b	SLC25A43	10.4	
b	SLC25A44	10.4	

1: integral to peroxisomal membrane || 2: peroxisomal membrane || 3: peroxisome || 4: cilium || 5: flagellum || 6: mitochondrial outer membrane

ECM 11, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 500

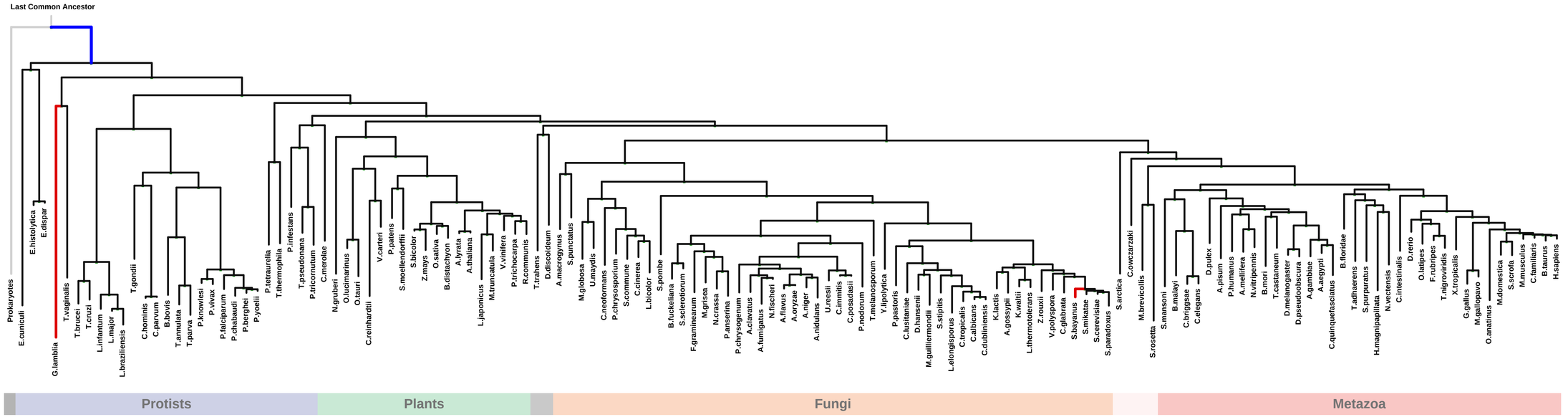


PG	Protein	LLR	Notes
b	SLC25A45	10.4	
b	SLC25A48	10.4	
b	SLC25A5	10.4	1 / 2
b	SLC25A6	10.4	3
	PRMT8	**10.4**	
c	**EIF2A**	**10.4**	4
d	**ITSN2**	**10.4**	
e	**TNPO1**	**10.4**	5
e	TNPO2	10.4	5
c	EIF3B	10.4	6
	CHMP2A	**10.4**	7
F	RBM15B	10.4	
	CHKA	**10.4**	
b	UCP1	10.4	
b	UCP2	10.4	
b	UCP3	10.4	
f	**DECR2**	**10.4**	8
H	SF3B3	10.4	9 / 10 / 11 / 12
b	SLC25A1	10.4	
b	SLC25A10	10.4	
b	SLC25A11	10.4	
b	100508457	10.4	
b	100510457	10.4	
	RBM5	**10.4**	11
	RPS24	**10.1**	13 / 14
g	**KANK4**	**9.9**	
l	EIF4G3	9.9	15
h	**ZC3H6**	**9.8**	
C	FHOD3	9.8	
	SEL1L2	**9.8**	
	PCID2	**9.8**	
C	GRID2IP	9.7	16
i	**TLDC2**	**9.6**	
f	SDR16C5	9.5	
	PPAT	**9.4**	

1: mitochondrial nucleoid || 2: MMXD complex || 3: mitochondrial inner membrane presequence translocase complex || 4: eukaryotic translation initiation factor 2 complex || 5: nuclear pore || 6: eukaryotic translation initiation factor 3 complex || 7: late endosome membrane || 8: peroxisome || 9: catalytic step 2 spliceosome || 10: small nuclear ribonucleoprotein complex || 11: spliceosomal complex || 12: U12-type spliceosomal complex || 13: cytosolic small ribosomal subunit || 14: small ribosomal subunit || 15: eukaryotic translation initiation factor 4F complex || 16: postsynaptic membrane

ECM 11, Gene set "presynaptic membrane", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 500

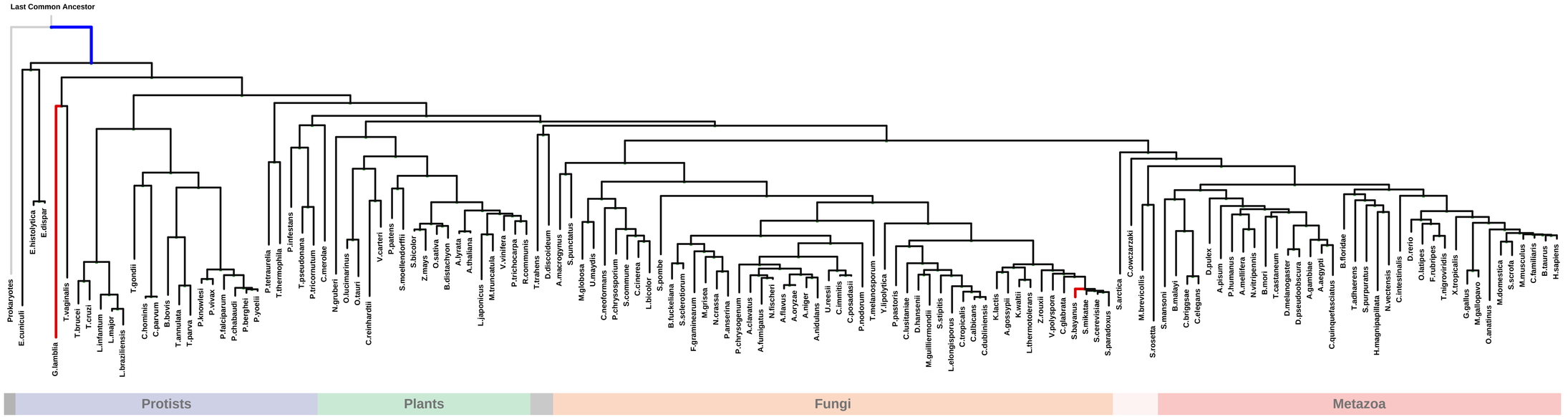


PG	Protein	LLR	Notes
j	NAA15	9.4	
	CCNK	9.4	
k	KIAA1161	9.1	1
l	TAF1L	8.8	2
d	ESYT1	8.8	
	DBR1	8.7	
m	AHCY	8.7	3
m	AHCYL1	8.7	
m	AHCYL2	8.7	
C	FHDC1	8.3	
f	WWOX	8.3	4
Y	QKI	8.2	
C	TRIM25	8.2	
U	LRCH2	8.1	
n	UQCRC2	8.1	5
	COQ5	8.1	
n	PMPCA	8.1	
	TBPL1	8.1	6
o	ATP6V1E1	8.1	4 / 7 / 8 / 9
o	ATP6V1E2	8.1	9 / 10
	WRNIP1	8.1	
	PSMD3	8.1	11 / 12
	RAD23A	8.0	12
p	CERS6	8.0	1
q	CEPT1	8.0	1
q	EPT1	8.0	
	RSL24D1P11	7.8	
j	NAA16	7.8	
b	SLC25A25	7.7	
	ASCC3	7.7	
r	CDKL2	7.7	
	VPS53	7.6	13 / 14
s	YEATS4	7.6	15 / 16
	ZFAND4	7.6	
	UBL4B	7.6	

1: nuclear membrane || 2: transcription factor TFIID complex || 3: melanosome || 4: microvillus || 5: mitochondrial respiratory chain complex III || 6: transcription factor TFIIA complex || 7: endosome || 8: proton-transporting two-sector ATPase complex || 9: proton-transporting two-sector ATPase complex, catalytic domain || 10: acrosomal vesicle || 11: proteasome accessory complex || 12: proteasome complex || 13: endosome membrane || 14: GARP complex || 15: NuA4 histone acetyltransferase complex || 16: nuclear matrix

ECM 11, Gene set "presynaptic membrane", Page 6

Num of ECM Genes: 1. Num of Predicted Genes: 500

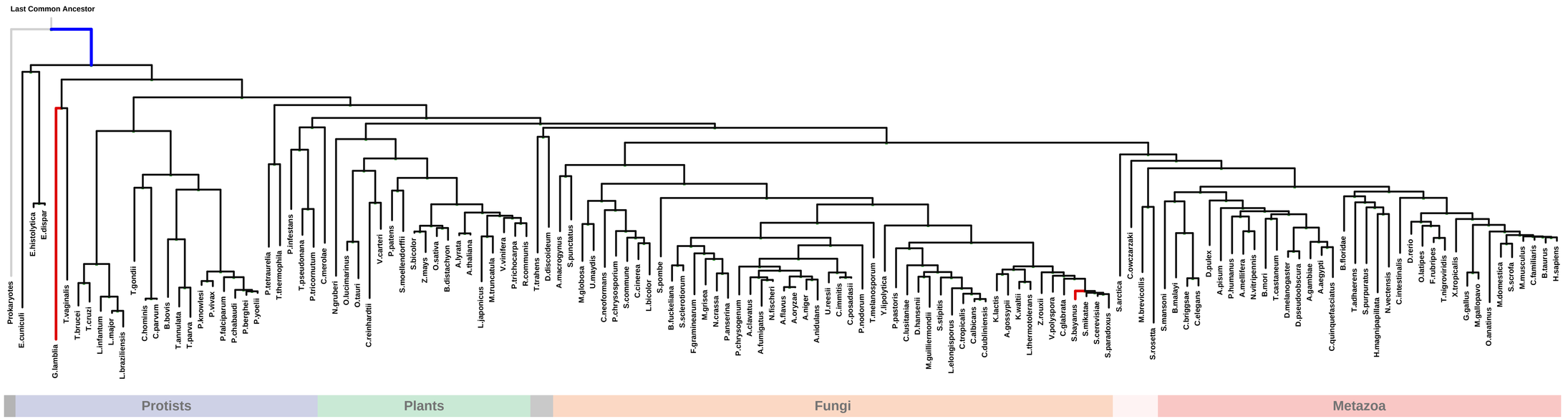


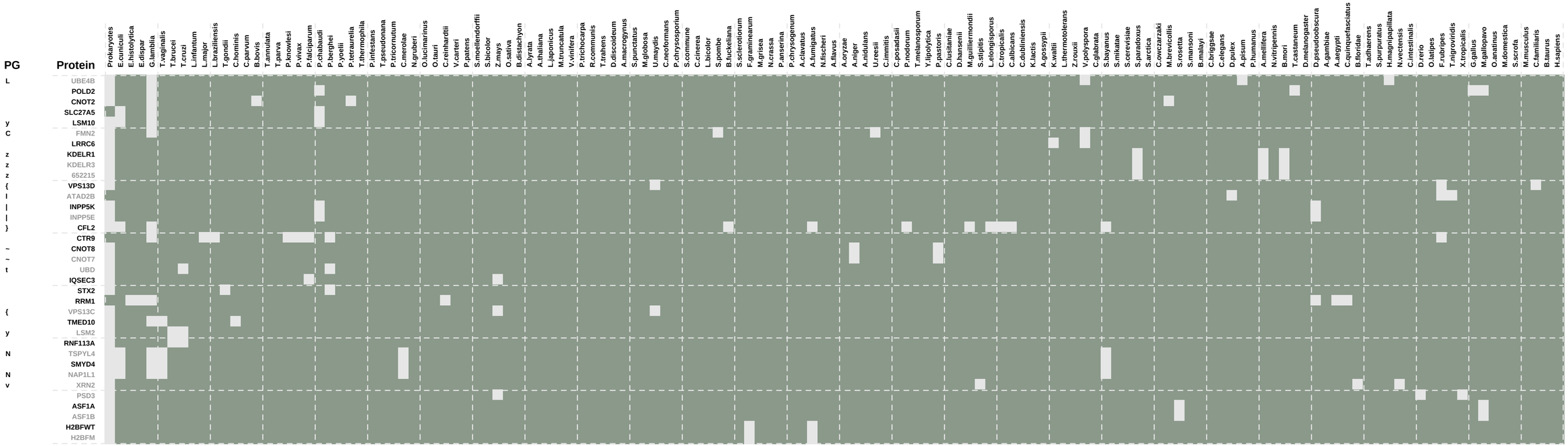
PG	Protein	LLR	Notes
C	UHRF2	7.6	1
t	ISG15	7.6	
C	FMNL3	7.6	
C	DIAPH3	7.6	
	EXOSC10	7.5	2 / 3 / 4
u	MDH2	7.5	
	MPI	7.5	
	TBC1D9	7.5	
U	LRRC10	7.5	5
	PRPF8	7.5	6 / 7 / 8
P	PFKM	7.5	9
	CHD1	7.4	
v	XRN1	7.4	10
C	RNF135	7.3	
d	ITSN1	7.3	11 / 12 / 13 / 14 / 15
w	NSFL1C	7.3	16 / 17
	LENG8	7.3	
	G3BP1	7.3	
f	HSD17B14	7.2	
f	HPGD	7.2	
W	RALYL	7.1	
f	HSD17B7	7.1	
	RPL19	7.1	18
	ATP6V1H	7.1	19
a	MYO7A	7.0	15 / 20 / 21 / 22 / 23 / 24
	TMEM30A	7.0	
	PRPF39	7.0	
x	PUS7L	7.0	
x	PUS7	7.0	
	UTP18	7.0	
r	MAP3K5	6.9	
	KCNAB1	6.8	
	NCAPD2	6.8	28 / 29 / 30 / 31
C	LONRF2	6.6	
r	CDK13	6.6	7 / 32

1: nuclear heterochromatin || 2: exosome (RNase complex) || 3: nuclear exosome (RNase complex) || 4: transcriptionally active chromatin || 5: myofibril || 6: catalytic step 2 spliceosome || 7: nuclear speck || 8: U5 snRNP ||
9: 6-phosphofructokinase complex || 10: intermediate filament cytoskeleton || 11: coated pit || 12: endocytic vesicle || 13: lamellipodium || 14: neuron projection || 15: synapse || 16: chromosome || 17: Golgi stack ||
18: cytosolic large ribosomal subunit || 19: vacuolar proton-transporting V-type ATPase, V1 domain || 20: cell cortex || 21: lysosomal membrane || 22: melanosome || 23: myosin complex || 24: photoreceptor connecting cilium ||

ECM 11, Gene set "presynaptic membrane", Page 7

Num of ECM Genes: 1. Num of Predicted Genes: 500

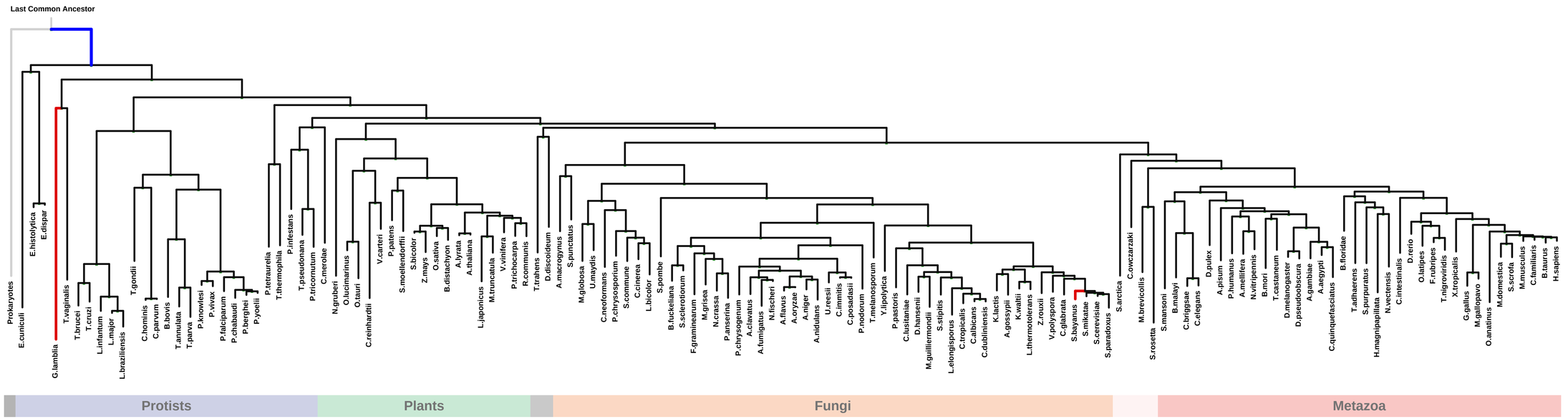




1: ubiquitin ligase complex || 2: basal plasma membrane || 3: integral to endoplasmic reticulum membrane || 4: Cajal body || 5: U7 snRNP || 6: cilium || 7: cis-Golgi network || 8: endoplasmic reticulum-Golgi intermediate compartment ||
9: neuron projection || 10: ruffle || 11: ruffle membrane || 12: trans-Golgi network || 13: cilium axoneme || 14: Golgi cisterna membrane || 15: nuclear matrix || 16: Cdc73/Paf1 complex || 17: nuclear speck || 18: transcriptionally active chromatin ||
19: CCR4-NOT complex || 20: cytoplasmic mRNA processing body || 21: aggresome || 22: inhibitory synapse || 23: postsynaptic membrane || 24: basolateral plasma membrane || 25: cell-cell junction || 26: membrane raft ||

ECM 11, Gene set "presynaptic membrane", Page 8

Num of ECM Genes: 1. Num of Predicted Genes: 500

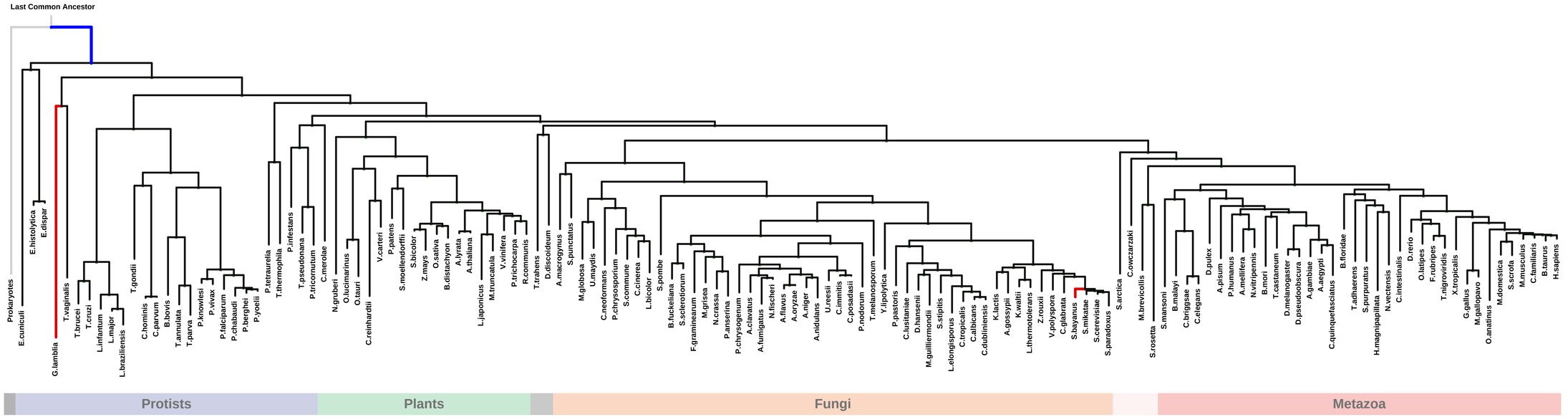


PG	Protein	LLR	Notes
	ISG20L2	6.0	
	SPAG6	6.0	1 / 2 / 3 / 4
	WDR34	6.0	
	LOC81691	6.0	
	MCM6	5.9	5
	CCDC94	5.9	
C	RFPL4B	5.9	
B	HMGB3	5.8	6
V	ZBTB8A	5.8	
	SUPT5H	5.7	7
B	HMG20A	5.7	
C	TRIM5	5.7	8
	ELAC1	5.7	
	SENP3	5.7	9
	NAA50	5.7	
	EML4	5.6	
C	TRIM62	5.6	
	RPS5	5.6	10 / 11
	HCN2	5.6	12 / 13 / 14 / 15
C	TRIM4	5.6	
C	PCGF1	5.6	16
G	DGKG	5.6	
A	ZSWIM2	5.6	
X	ATR	5.5	6 / 17 / 18
	HIPK2	5.5	
	ARFGEF1	5.5	19 / 20 / 21
	ARFGEF2	5.5	21 / 22 / 23 / 24 / 25 / 26 /
d	PIK3C2B	5.4	30
	PSMD4	5.4	31 / 32
	KRR1	5.4	11
h	ZC3H4	5.3	
y	LOC100129492	5.3	
	GMPS	5.3	
Z	ATP6V1C1	5.2	25 / 33 / 34 / 35
	AKTIP	5.2	36 / 37

1: axoneme || 2: cilium || 3: flagellum || 4: microtubule cytoskeleton || 5: MCM complex || 6: chromosome || 7: DSIF complex || 8: cytoplasmic mRNA processing body || 9: MLL1 complex || 10: cytosolic small ribosomal subunit ||
11: ribonucleoprotein complex || 12: axon || 13: dendritic shaft || 14: synapse || 15: voltage-gated potassium channel complex || 16: PcG protein complex || 17: PML body || 18: XY body || 19: nuclear matrix || 20: small nuclear ribonucleoprotein complex ||
21: trans-Golgi network || 22: asymmetric synapse || 23: axonemal microtubule || 24: cytoplasmic membrane-bounded vesicle || 25: cytoplasmic vesicle || 26: dendritic spine || 27: microtubule organizing center || 28: recycling endosome ||

ECM 11, Gene set "presynaptic membrane", Page 9

Num of ECM Genes: 1. Num of Predicted Genes: 500

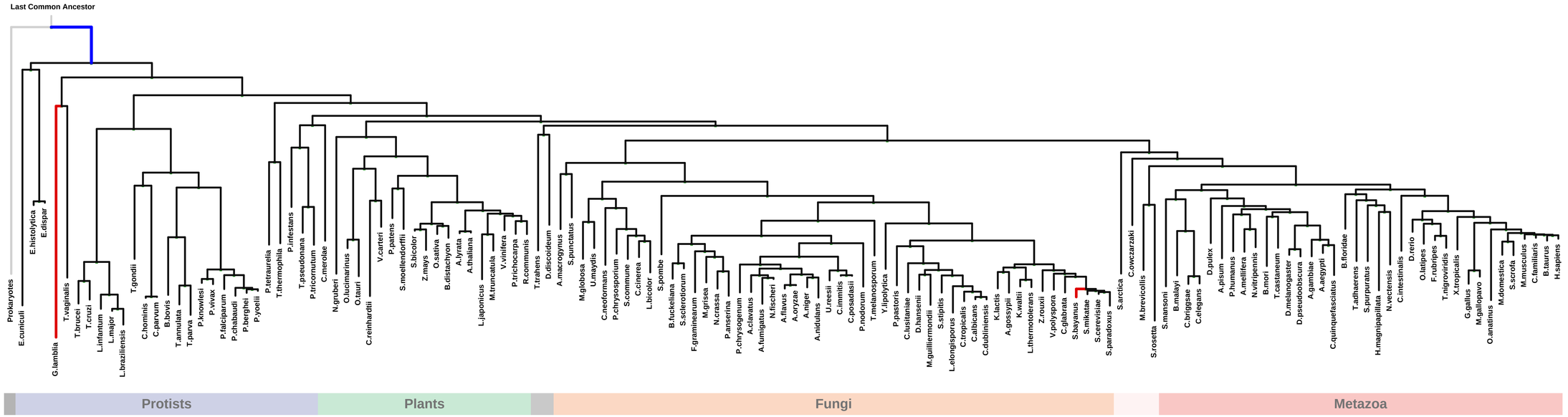


PG	Protein	LLR	Notes
w	SMYD2	5.2	
	UBXN2B	5.2	
	SLC35B2	5.1	
	POLR3F	5.1	1
	STX5	5.0	2 / 3
	100510546	5.0	
	UBTD2	5.0	
	UBTD1	5.0	
	PDCD2L	5.0	
	SF3A3	5.0	4 / 5 / 6
	DUS3L	4.9	
	SHMT1	4.9	
C	SHMT2	4.9	7 / 8 / 9
	TRIM11	4.9	
	COPS4	4.9	10
	XAB2	4.8	4
	UCHL3	4.7	
f	HSD17B8	4.7	11
C	TRIM35	4.7	
	GSPT2	4.6	
	NOL10	4.6	
	MRE11A	4.6	12 / 13 / 14 / 15
a	MYO18A	4.6	16 / 17 / 18
	ARPC1B	4.6	19 / 20
	PCNA	4.6	7 / 21 / 22 / 23
	NACA	4.5	
	COPA	4.5	24
C	KMT2A	4.5	25 / 26
	TOP3A	4.5	27 / 28
	SF3A2	4.4	4 / 6 / 29
T	DDX3Y	4.4	
	PANK2	4.3	8
r	MAP3K12	4.3	
	PAPOLB	4.3	
	PAPOLG	4.3	

1: DNA-directed RNA polymerase III complex || 2: endoplasmic reticulum-Golgi intermediate compartment membrane || 3: SNARE complex || 4: catalytic step 2 spliceosome || 5: nuclear speck || 6: spliceosomal complex || 7: microtubule cytoskeleton ||
8: mitochondrial intermembrane space || 9: mitochondrial nucleoid || 10: signalosome || 11: mitochondrial envelope || 12: chromosome, telomeric region || 13: condensed nuclear chromosome || 14: Mre11 complex || 15: nuclear chromatin ||
16: actomyosin || 17: endoplasmic reticulum-Golgi intermediate compartment || 18: myosin complex || 19: actin cytoskeleton || 20: Arp2/3 protein complex || 21: DNA replication factor C complex || 22: nuclear replication fork || 23: PCNA-p21 complex ||

ECM 11, Gene set "presynaptic membrane", Page 10

Num of ECM Genes: 1. Num of Predicted Genes: 500

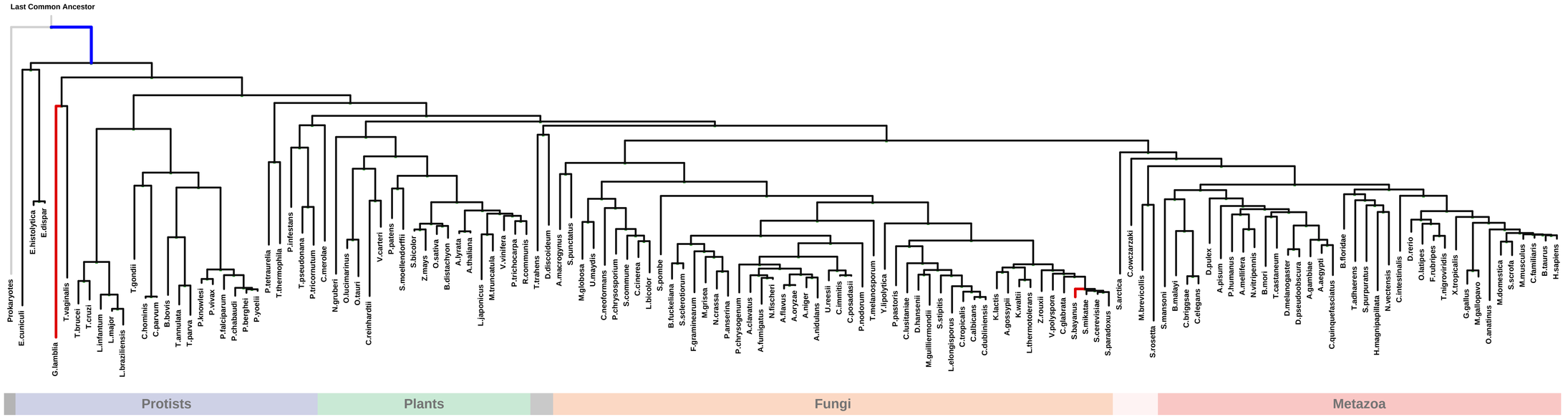


PG	Protein	LLR	Notes
	PAPOLA	4.3	
V	ZBTB17	4.3	
	BTF3	4.3	
s	MLLT1	4.2	
	GPI	4.2	
	CAPN3	4.2	1 / 2 / 3
	GAPVD1	4.2	4
	SUPT16H	4.1	5
C	NOS3	4.1	6 / 7 / 8
	BIRC2	4.1	9 / 10
	BIRC3	4.1	
	LSM3	4.0	11
	MRPS12	4.0	12 / 13
	RPL15	4.0	14 / 15
	AIMP1	4.0	16 / 17
	ESF1	4.0	
	POLR2I	3.9	18
	PES1	3.9	19 / 20 / 21
p	CERS3	3.9	22
	GTF2H2C	3.9	
	GTF2H2D	3.9	
	GTF2H2	3.9	23
	100510744	3.9	
	HAGHL	3.9	
V	ZBTB8B	3.9	
f	HSDL1	3.9	
	RPTOR	3.9	24 / 25 / 26
	BUD31	3.9	
	ITPA	3.8	
C	KMT2D	3.8	27
	RPS18	3.8	13 / 15 / 28
d	EPS15L1	3.8	29
	TUBGCP2	3.7	30 / 31 / 32
	FBL	3.7	33 / 34 / 35
	PLCH2	3.7	

1: myofibril || 2: T-tubule || 3: Z disc || 4: endosome || 5: chromosome || 6: apical part of cell || 7: caveola || 8: endocytic vesicle membrane || 9: CD40 receptor complex || 10: internal side of plasma membrane ||
11: catalytic step 2 spliceosome || 12: mitochondrial ribosome || 13: small ribosomal subunit || 14: cytosolic large ribosomal subunit || 15: ribosome || 16: aminoacyl-tRNA synthetase multienzyme complex || 17: transport vesicle ||
18: DNA-directed RNA polymerase II, core complex || 19: condensed chromosome || 20: PeBoW complex || 21: preribosome, large subunit precursor || 22: nuclear membrane || 23: holo TFIIH complex || 24: dendrite || 25: lysosome ||

ECM 11, Gene set "presynaptic membrane", Page 11

Num of ECM Genes: 1. Num of Predicted Genes: 500

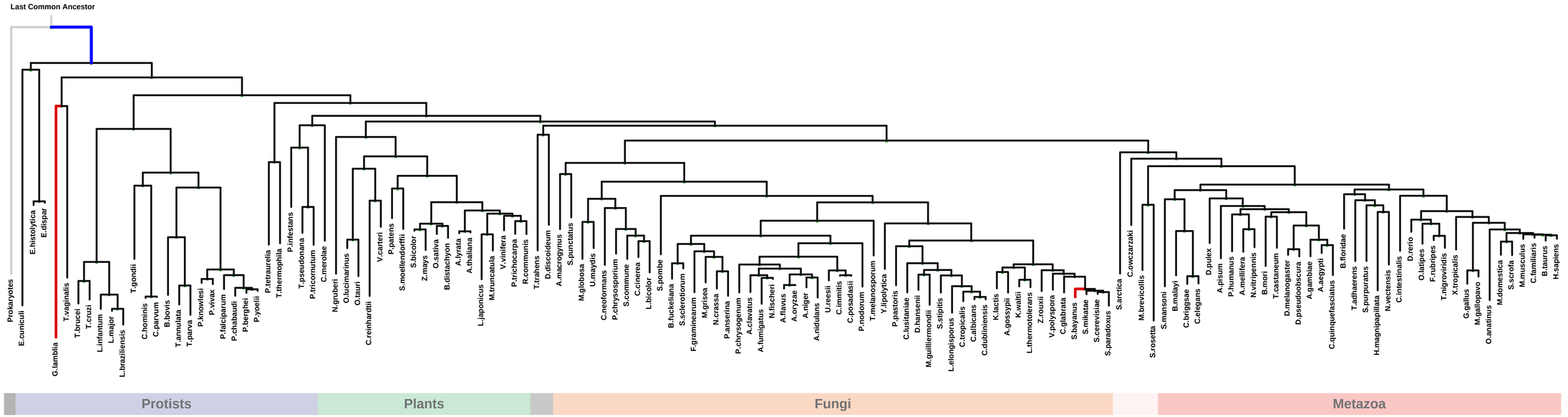


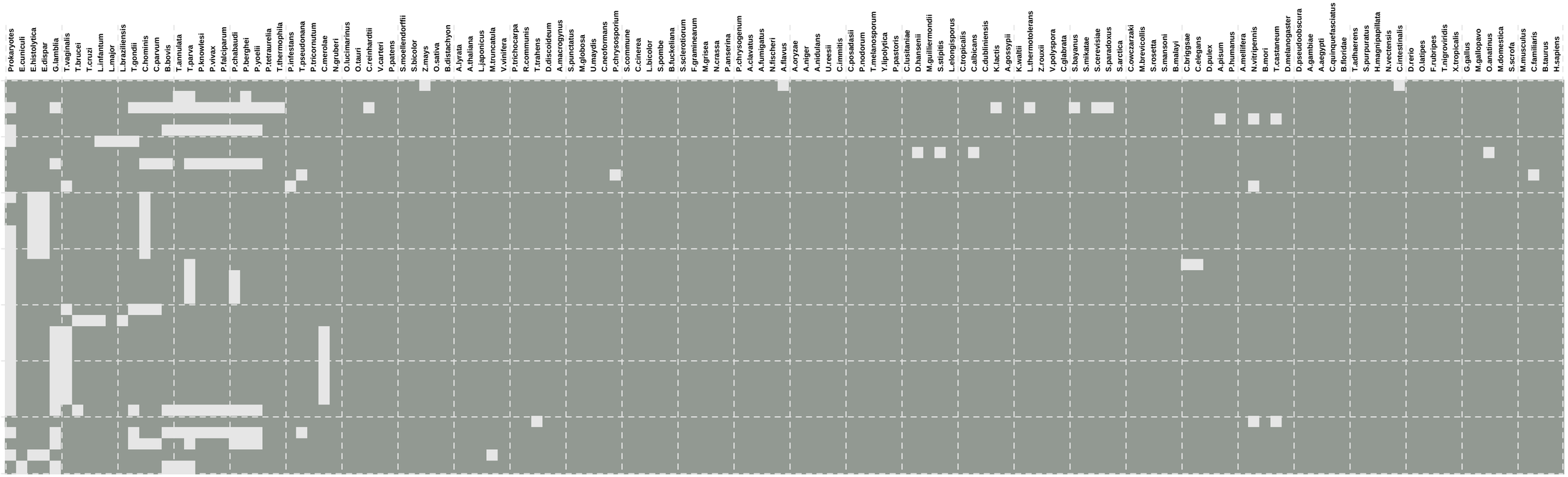
PG	Protein	LLR	Notes
	653881	3.7	
	NME5	3.7	
	PUM1	3.7	
	PUM2	3.7	1
C	TRIM3	3.6	2
U	NRROS	3.6	
	CCNG1	3.6	3
	NOC3L	3.6	4
	FMN1	3.6	
I	INPP5J	3.5	5 / 6 / 7
	U2AF1L4	3.5	4 / 8
	ZRSR2	3.5	9
I	EP300	3.5	10 / 11 / 12
	HCN1	3.5	3 / 13
	IARS	3.5	
}	CFL1	3.5	14 / 15 / 16 / 17
	RPL13A	3.4	18 / 19 / 20
i	NCOA7	3.4	
{	VPS13A	3.3	
u	LDHB	3.3	
C	SETD1A	3.3	4 / 21 / 22 / 23
B	HMGB2	3.3	24
B	HMGB3P27	3.3	21
B	100508670	3.3	
	PPAN-P2RY11	3.3	
	ABHD17A	3.3	
	RFWD3	3.3	25
U	LRG1	3.3	
	SLC35B1	3.3	
	U2AF1	3.2	4 / 8 / 26 / 27
	LOC441722	3.2	
g	FEM1C	3.2	
	PSMC2	3.2	28 / 29
U	LINGO1	3.2	
	UBA1	3.2	

1: cytoplasmic stress granule || 2: early endosome || 3: dendrite || 4: nuclear speck || 5: dendritic shaft || 6: growth cone || 7: ruffle || 8: spliceosomal complex || 9: U12-type spliceosomal complex || 10: chromatin ||
11: histone acetyltransferase complex || 12: protein-DNA complex || 13: axon || 14: cortical actin cytoskeleton || 15: lamellipodium membrane || 16: nuclear matrix || 17: ruffle membrane || 18: cytosolic large ribosomal subunit ||
19: large ribosomal subunit || 20: ribonucleoprotein complex || 21: chromosome || 22: histone methyltransferase complex || 23: Set1C/COMPASS complex || 24: condensed chromosome || 25: PML body || 26: Cajal body ||

ECM 11, Gene set "presynaptic membrane", Page 12

Num of ECM Genes: 1. Num of Predicted Genes: 500

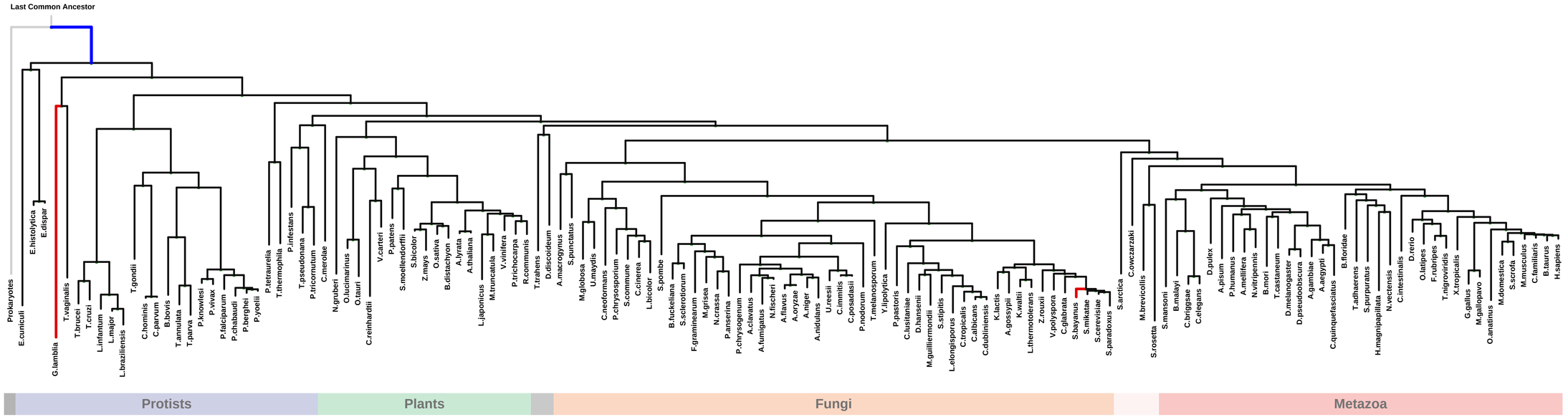


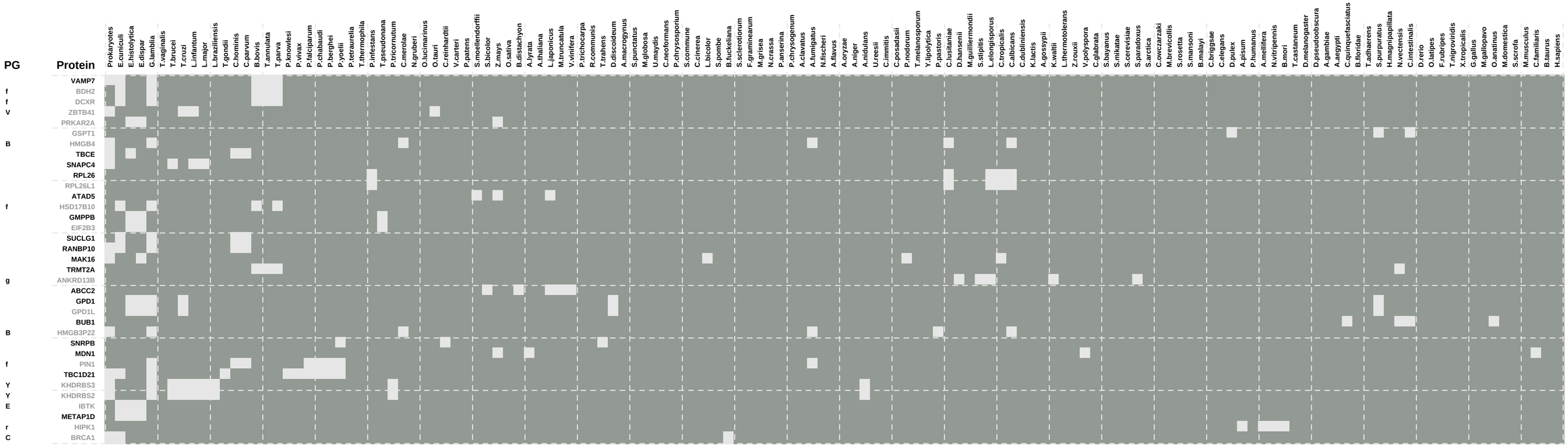


1: chromosome || 2: zeta DNA polymerase complex || 3: condensed nuclear chromosome || 4: male germ cell nucleus || 5: microtubule organizing center || 6: PML body || 7: spindle pole || 8: microtubule associated complex ||
9: glycosylphosphatidylinositol-N-acetylglucosaminyltransferase (GPI-GnT) complex || 10: cytoplasmic vesicle membrane || 11: synaptic vesicle || 12: centriole || 13: polar microtubule || 14: spindle || 15: cytoplasmic mRNA processing body ||
16: cytoplasmic stress granule || 17: eukaryotic translation initiation factor 4F complex || 18: mRNA cap binding complex || 19: RNA-induced silencing complex || 20: chromatin accessibility complex || 21: epsilon DNA polymerase complex ||

ECM 11, Gene set "presynaptic membrane", Page 13

Num of ECM Genes: 1. Num of Predicted Genes: 500

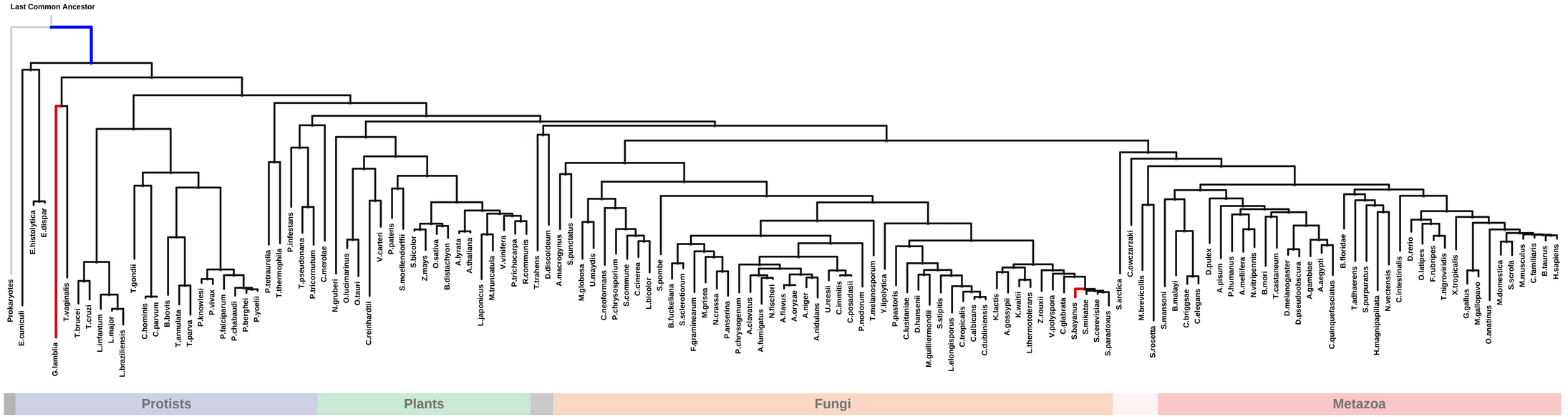




1: apical part of cell || 2: late endosome membrane || 3: lysosomal membrane || 4: neuron projection || 5: phagocytic vesicle || 6: phagocytic vesicle membrane || 7: SNARE complex || 8: synapse || 9: transport vesicle membrane ||
10: brush border || 11: microvillus || 12: cAMP-dependent protein kinase complex || 13: T-tubule || 14: chromosome || 15: cytosolic large ribosomal subunit || 16: large ribosomal subunit || 17: eukaryotic translation initiation factor 2B complex ||
18: cytoplasmic microtubule || 19: intercellular canaliculus || 20: glycerol-3-phosphate dehydrogenase complex || 21: condensed chromosome kinetochore || 22: condensed nuclear chromosome, centromeric region || 23: kinetochore ||

ECM 11, Gene set "presynaptic membrane", Page 14

Num of ECM Genes: 1. Num of Predicted Genes: 500

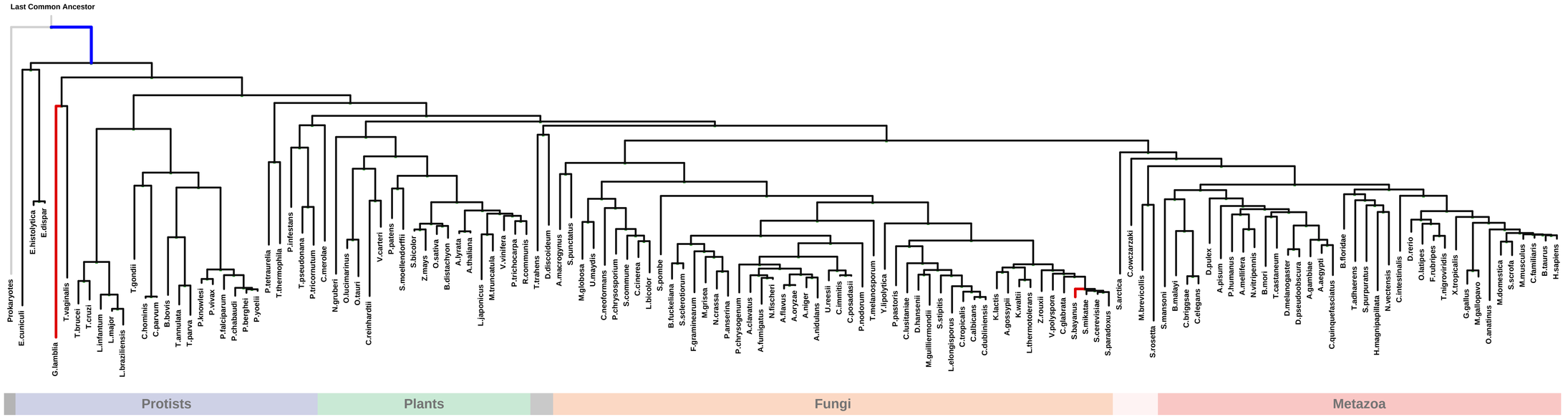


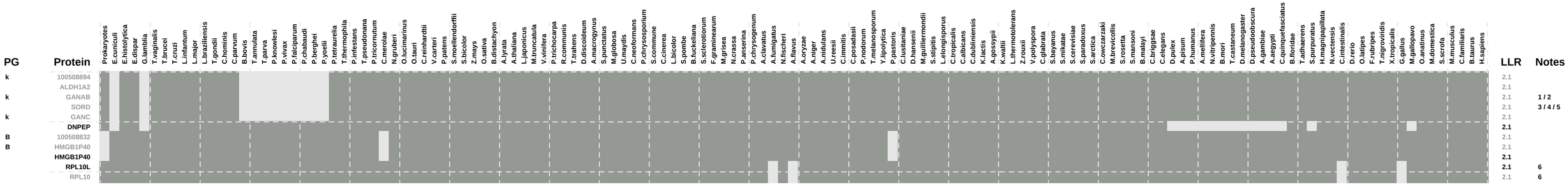
PG	Protein	LLR	Notes
	GPS1	2.4	1
	YIPF7	2.4	
	MCCC1	2.4	
e	IPO4	2.4	2
	SEC14L1	2.4	
	SEC14L5	2.4	
U	SLIT2	2.4	
	TRMT1	2.4	
	653889	2.4	
r	ABL1	2.4	3 / 4
	STON1-GTF2A1L	2.4	
K	SMARCC2	2.4	5 / 6 / 7 / 8
G	DGKQ	2.4	9
U	IGFALS	2.4	
	SENP7	2.3	
	POLA2	2.3	10
	NMT2	2.3	
	NMT1	2.3	3
q	CHPT1	2.3	
	SLC2A9	2.3	11
	TMTC1	2.3	
	SF3B2	2.2	12 / 13 / 14
	DERL2	2.2	15 / 16 / 17
	PANK1	2.2	18
	EIF3CL	2.2	
	EIF3C	2.2	19
	SUPT6H	2.2	
	GGPS1	2.1	
	100510614	2.1	
C	NOS1	2.1	20 / 21 / 22 / 23
	ALDH1A3	2.1	
	ALG11	2.1	
k	SI	2.1	24 / 25
k	MGAM	2.1	
	ADH5	2.1	

1: signalosome || 2: nuclear pore || 3: actin cytoskeleton || 4: nuclear membrane || 5: nBAF complex || 6: npBAF complex || 7: SWI/SNF complex || 8: transcriptional repressor complex || 9: nuclear speck || 10: alpha DNA polymerase:primase complex || 11: nuclear envelope || 12: catalytic step 2 spliceosome || 13: spliceosomal complex || 14: U12-type spliceosomal complex || 15: early endosome || 16: integral to endoplasmic reticulum membrane || 17: late endosome || 18: cell periphery || 19: eukaryotic translation initiation factor 3 complex || 20: dendritic spine || 21: photoreceptor inner segment || 22: sarcolemma || 23: sarcoplasmic reticulum || 24: brush border || 25: membrane raft

ECM 11, Gene set "presynaptic membrane", Page 15

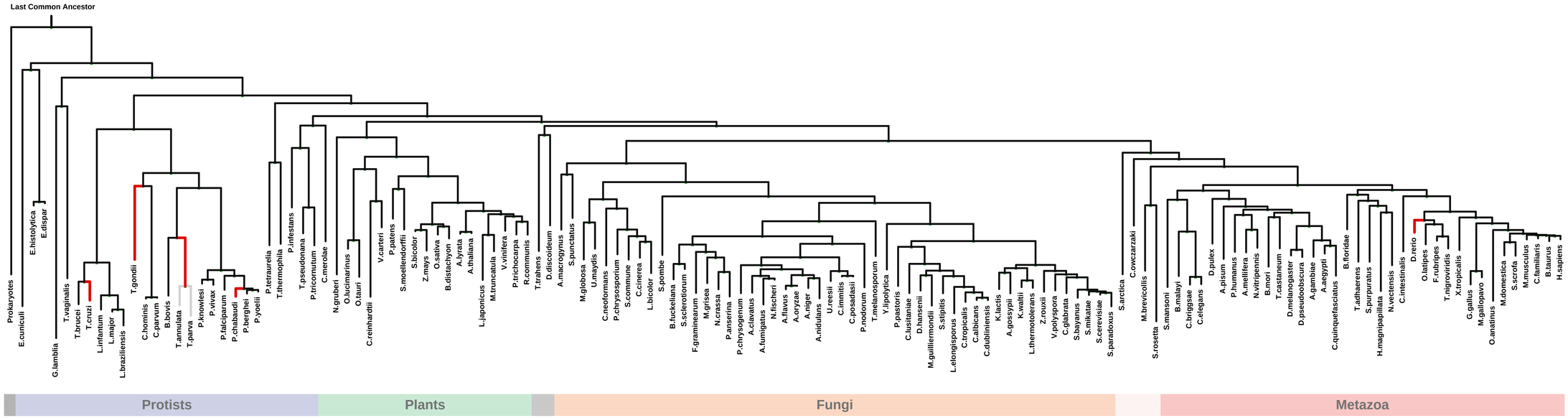
Num of ECM Genes: 1. Num of Predicted Genes: 500

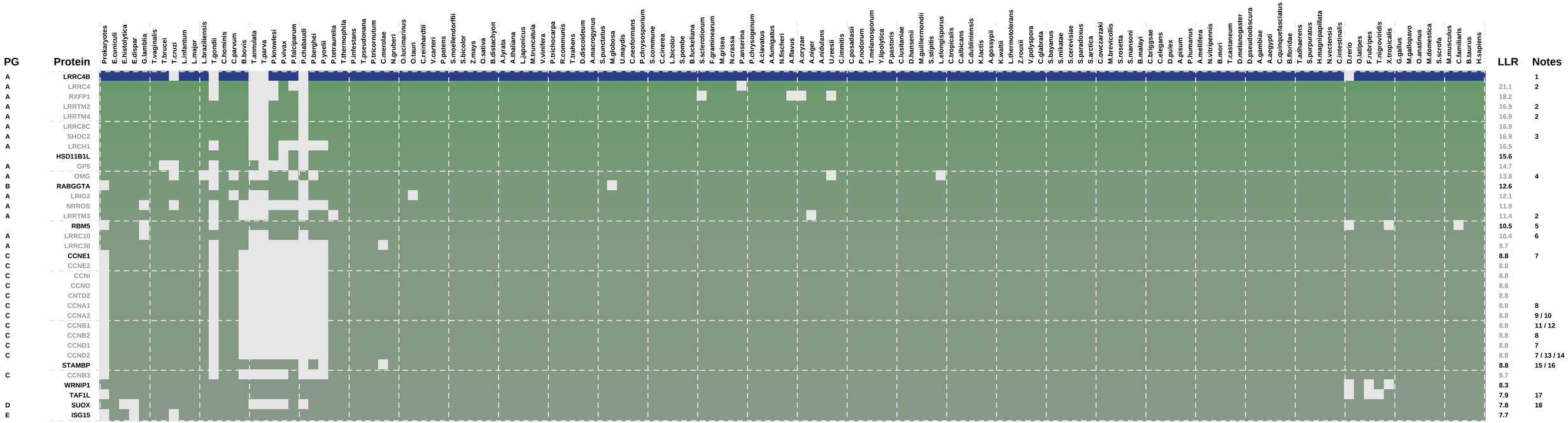




ECM 12, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 141

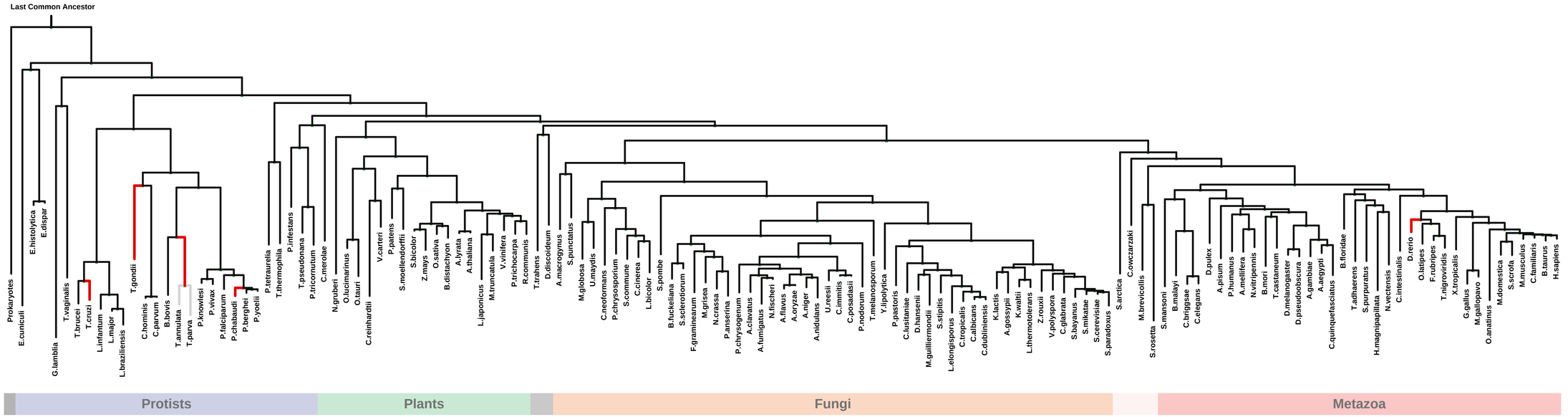


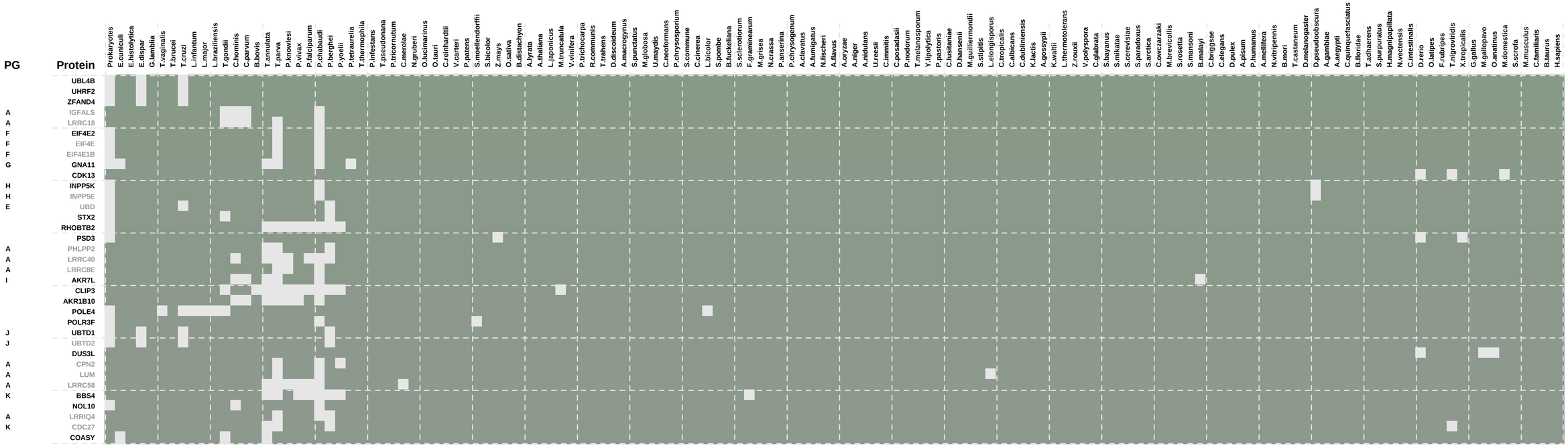


1: presynaptic membrane || 2: postsynaptic membrane || 3: protein phosphatase type 1 complex || 4: anchored to membrane || 5: spliceosomal complex || 6: myofibril || 7: cyclin-dependent protein kinase holoenzyme complex ||
8: microtubule cytoskeleton || 9: female pronucleus || 10: male pronucleus || 11: condensed nuclear chromosome outer kinetochore || 12: spindle pole || 13: chromatin || 14: nuclear membrane || 15: cleavage furrow || 16: early endosome ||
17: transcription factor TFIID complex || 18: mitochondrial intermembrane space

ECM 12, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 141

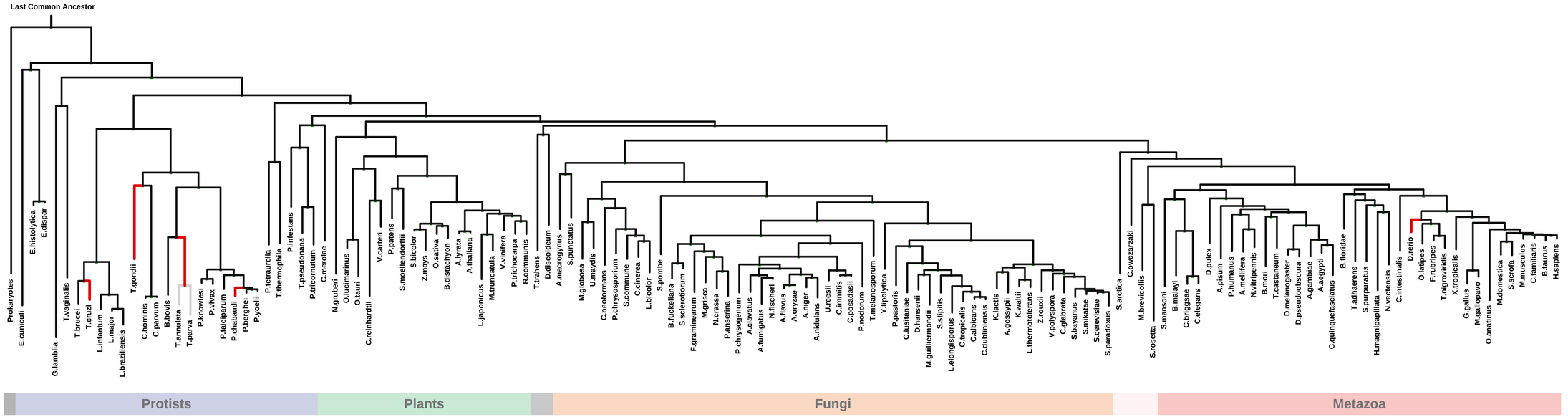


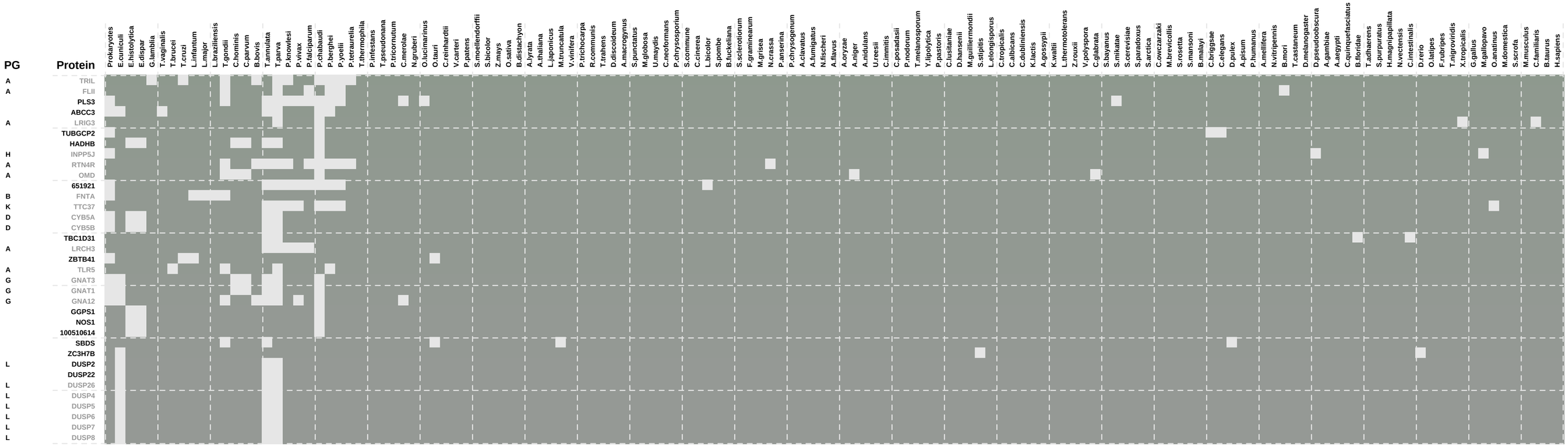


1: nuclear heterochromatin || 2: mRNA cap binding complex || 3: cytoplasmic mRNA processing body || 4: cytoplasmic stress granule || 5: eukaryotic translation initiation factor 4F complex || 6: RNA-induced silencing complex || 7: extrinsic to internal side of plasma membrane ||
8: heterotrimeric G-protein complex || 9: nuclear cyclin-dependent protein kinase holoenzyme complex || 10: nuclear speck || 11: neuron projection || 12: ruffle || 13: ruffle membrane || 14: trans-Golgi network || 15: cilium axoneme ||
16: Golgi cisterna membrane || 17: aggresome || 18: basolateral plasma membrane || 19: cell-cell junction || 20: membrane raft || 21: midbody || 22: transport vesicle || 23: postsynaptic density || 24: postsynaptic membrane ||

ECM 12, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 141

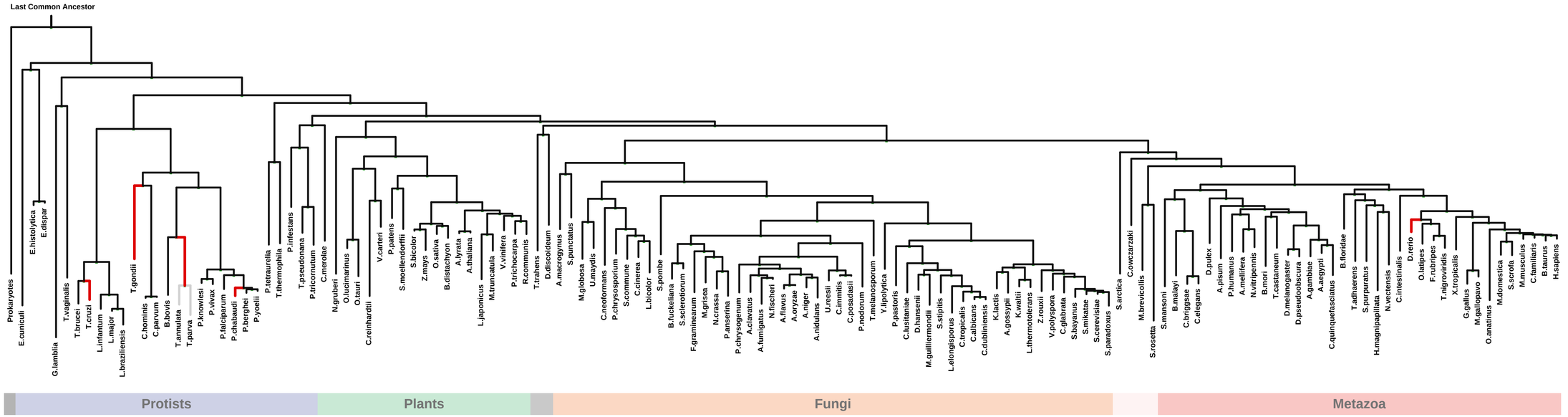




1: lipopolysaccharide receptor complex || 2: cytoplasmic microtubule || 3: microtubule organizing center || 4: spindle pole || 5: mitochondrial envelope || 6: mitochondrial fatty acid beta-oxidation multienzyme complex || 7: mitochondrial nucleoid ||
8: mitochondrial outer membrane || 9: dendritic shaft || 10: growth cone || 11: ruffle || 12: anchored to membrane || 13: Golgi lumen || 14: lysosomal lumen || 15: proteinaceous extracellular matrix || 16: microtubule associated complex ||
17: Ski complex || 18: transcriptionally active chromatin || 19: extrinsic to internal side of plasma membrane || 20: heterotrimeric G-protein complex || 21: photoreceptor inner segment || 22: photoreceptor outer segment || 23: photoreceptor connecting cilium ||

ECM 12, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 141

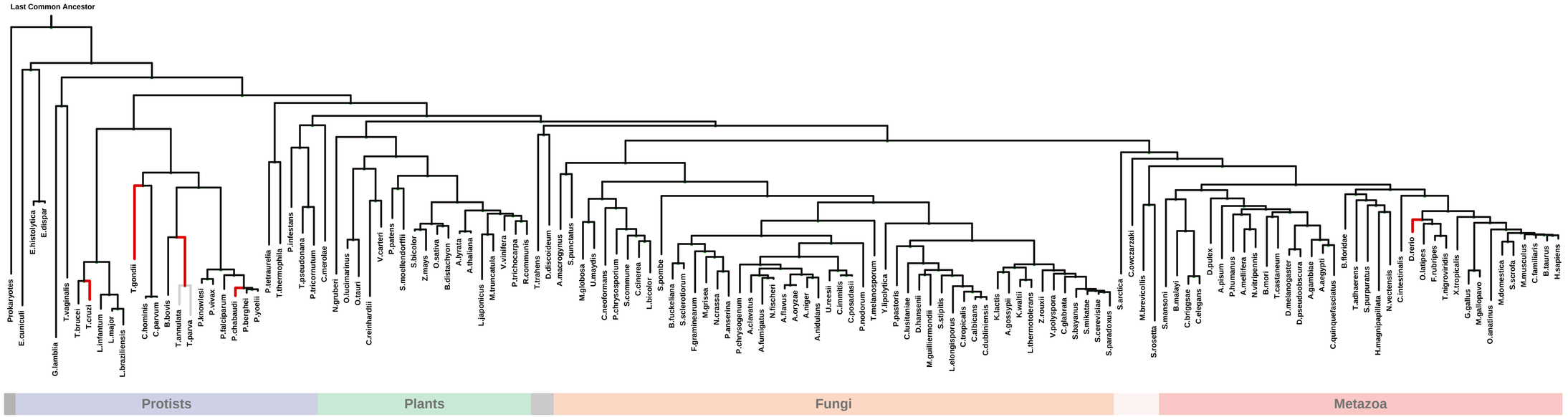


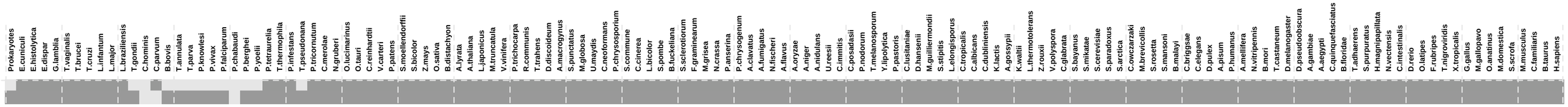
PG	Protein	LLR	Notes
L	DUSP9	1.9	
	CBR4	1.9	
M	STT3A	1.9	1
M	STT3B	1.9	1
L	DUSP1	1.9	
L	DUSP14	1.9	
L	DUSP16	1.9	2
L	DUSP10	1.9	
L	DUSP28	1.9	
L	DUSP18	1.9	
L	DUSP19	1.9	
L	STYX	1.9	
G	GNA13	1.9	3 / 4 / 5 / 6
L	DUSP13	1.9	
L	DUPD1	1.9	
L	SSH1	1.9	7 / 8 / 9
L	SSH2	1.9	
L	100290651	1.9	
L	SSH3	1.9	
	RNGTT	1.5	
	SETD2	1.4	10
I	KCNAB2	1.4	11
A	LRCH4	1.3	12
	MYSM1	1.2	13
	UFD1L	1.1	
N	METTL21A	1.0	
G	GNAI3	1.0	4 / 5 / 9 / 14 / 15
G	GNAI2	1.0	4 / 5 / 9 / 14
	CKAP5	1.0	16 / 17 / 18 / 19
	UCHL1	1.0	
	RPL27A	1.0	20
	PUSL1	0.8	
	RNF113A	0.8	
	LSM2	0.8	21
N	METTL21B	0.7	

1: oligosaccharyltransferase complex || 2: cytoplasmic membrane-bounded vesicle || 3: brush border membrane || 4: extrinsic to internal side of plasma membrane || 5: heterotrimeric G-protein complex || 6: melanosome || 7: cleavage furrow || 8: lamellipodium || 9: midbody || 10: chromosome || 11: juxtaparanode region of axon || 12: PML body || 13: chromatin remodeling complex || 14: membrane raft || 15: zymogen granule || 16: gamma-tubulin complex || 17: microtubule cytoskeleton || 18: microtubule plus end || 19: spindle pole || 20: cytosolic large ribosomal subunit || 21: catalytic step 2 spliceosome

ECM 12, Gene set "presynaptic membrane", Page 5

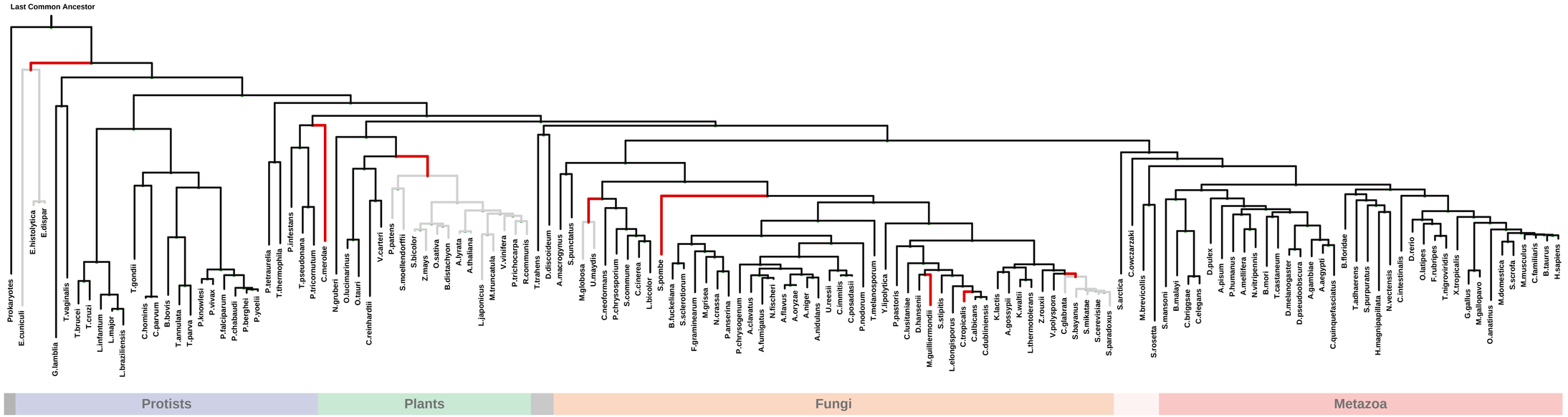
Num of ECM Genes: 1. Num of Predicted Genes: 141





ECM 13, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 43

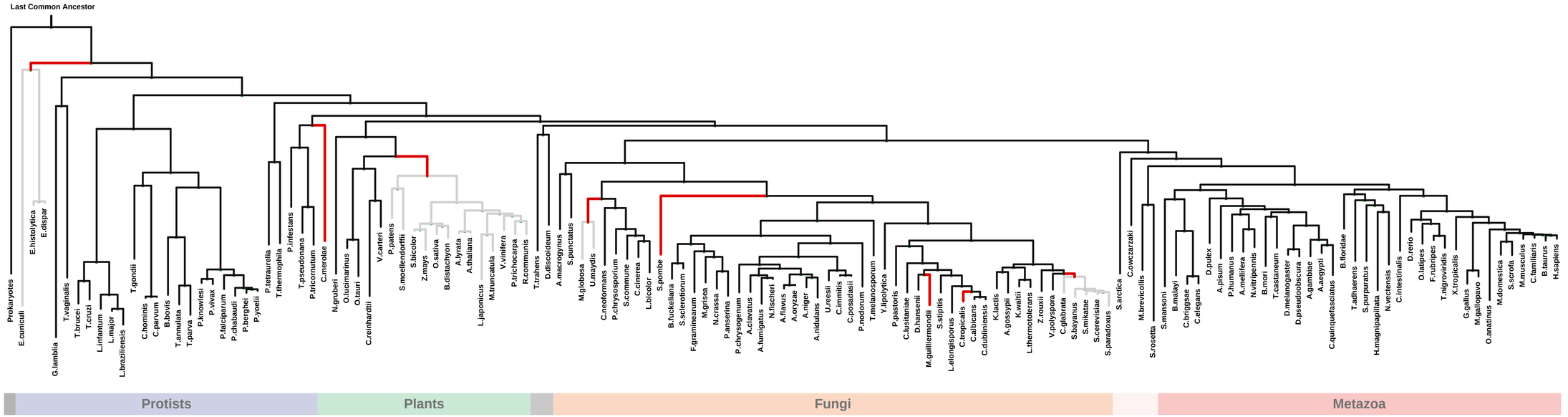


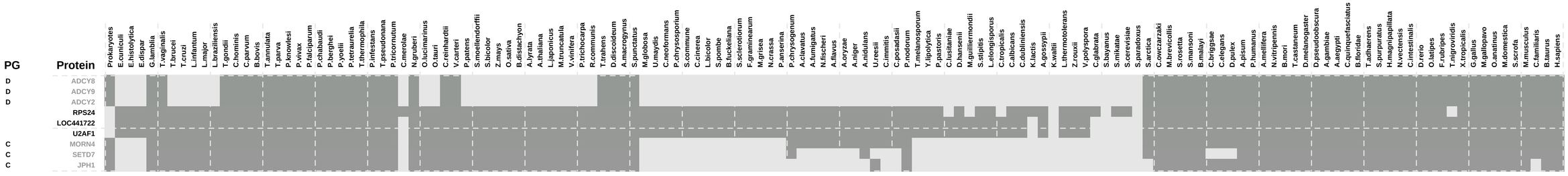
PG	Protein	LLR	Notes
A	PDE2A		1 / 2
A	PDE10A	23.6	
A	PDE6A	23.6	
A	PDE6B	23.6	
A	PDE1C	20.2	
A	PDE1A	20.2	
A	PDE1B	20.2	
A	PDE3B	20.2	3
A	PDE3A	19.9	
A	PDE5A	19.2	
A	PDE6C	18.8	
A	PDE4A	18.0	4
A	PDE4B	18.0	
A	PDE4C	18.0	5
A	PDE4D	18.0	6
A	PDE7A	18.0	
A	PDE7B	18.0	
A	PDE8B	18.0	
A	PDE11A	16.6	7
A	PDE9A	16.6	4
A	PDE8A	13.6	
B	CNGA2	10.8	8
B	CNGA3	4.5	9
	MGRN1	3.4	10
	CAPN11	2.8	11
C	JPH4	2.1	12
C	JPH2	2.1	12 / 13 / 14
C	JPH3	2.1	12 / 13
	DERL3	2.1	15
D	GUCY1A3	1.8	16
D	ADCY7	1.6	
D	ADCY4	1.5	17
D	ADCY5	1.5	1 / 5 / 18 / 19
D	ADCY6	1.5	1 / 18 / 19 / 20 / 21
D	ADCY1	1.5	

1: membrane raft || 2: presynaptic membrane || 3: guanyl-nucleotide exchange factor complex || 4: ruffle membrane || 5: primary cilium || 6: microtubule organizing center || 7: perikaryon || 8: intracellular cyclic nucleotide activated cation channel complex || 9: photoreceptor outer segment || 10: early endosome || 11: acrosomal vesicle || 12: junctional sarcoplasmic reticulum membrane || 13: junctional membrane complex || 14: Z disc || 15: integral to endoplasmic reticulum membrane || 16: guanylate cyclase complex, soluble || 17: dendrite || 18: endosome || 19: sarcolemma || 20: cilium || 21: microvillus membrane

ECM 13, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 43

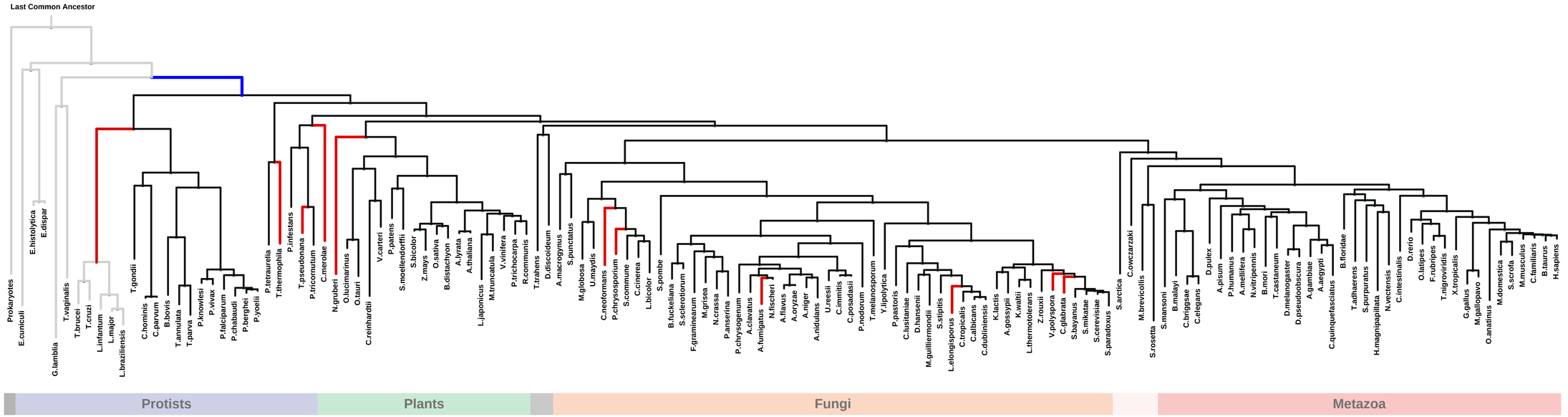




1: dendrite || 2: membrane raft || 3: cytosolic small ribosomal subunit || 4: small ribosomal subunit || 5: Cajal body || 6: catalytic step 2 spliceosome || 7: nuclear speck || 8: spliceosomal complex || 9: chromosome ||
10: junctional membrane complex || 11: junctional sarcoplasmic reticulum membrane || 12: Z disc

ECM 14, Gene set "presynaptic membrane", Page 1

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



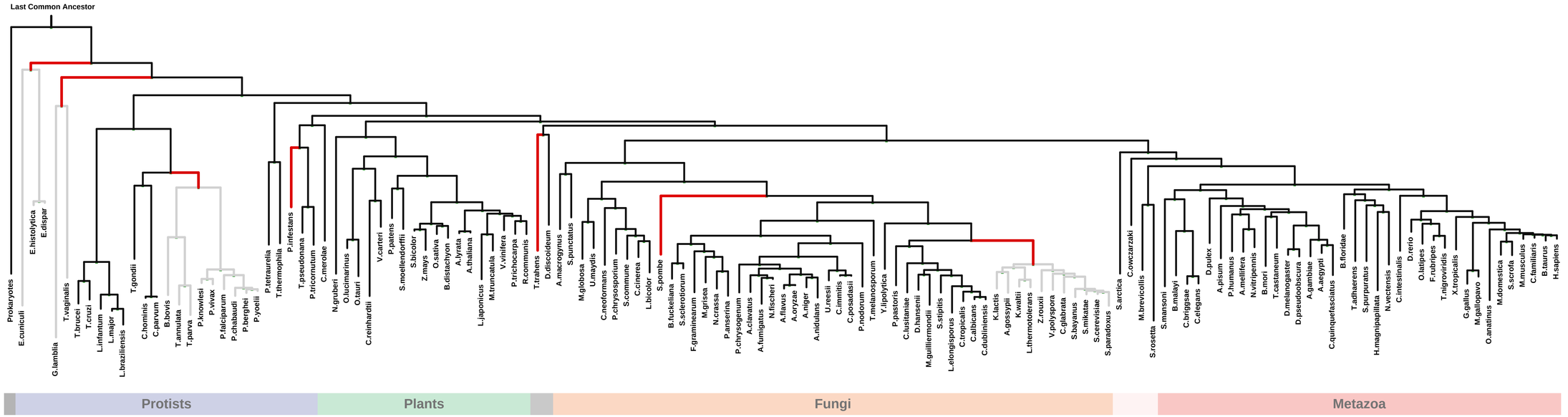
PG	Protein	LLR	Notes
A	PI4K2A		
A	PI4K2B	42.3	

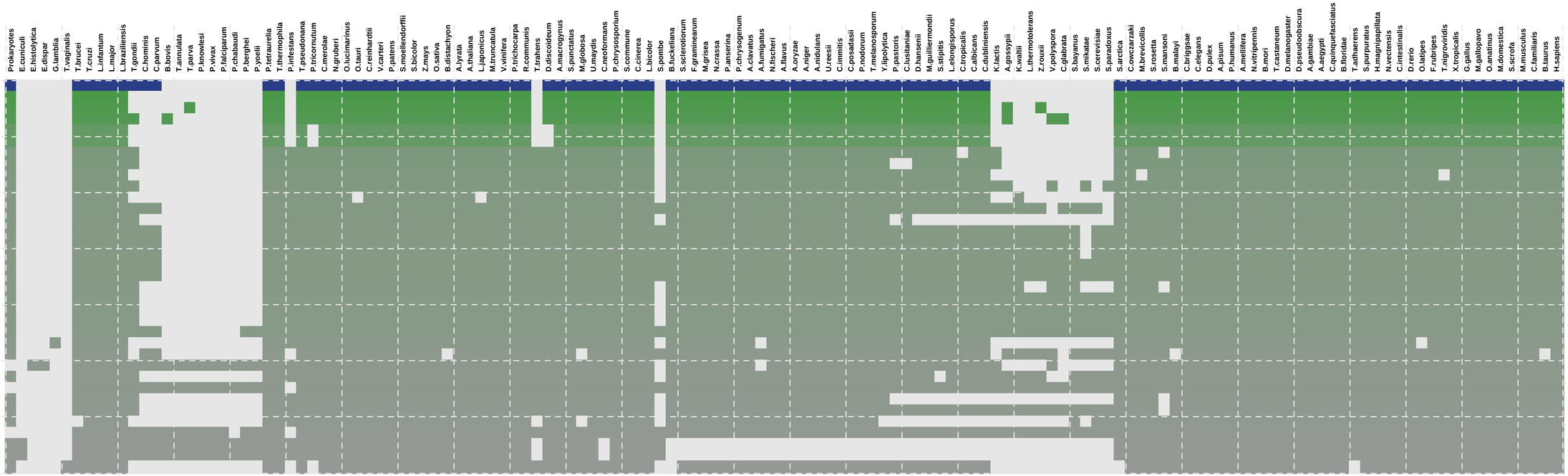
1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9

1: BLOC-1 complex || 2: cytoplasmic vesicle || 3: dendrite || 4: early endosome membrane || 5: endosome || 6: exocytic vesicle || 7: membrane raft || 8: neuron projection || 9: perikaryon || 10: presynaptic membrane ||
11: synaptic vesicle membrane

ECM 15, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 65

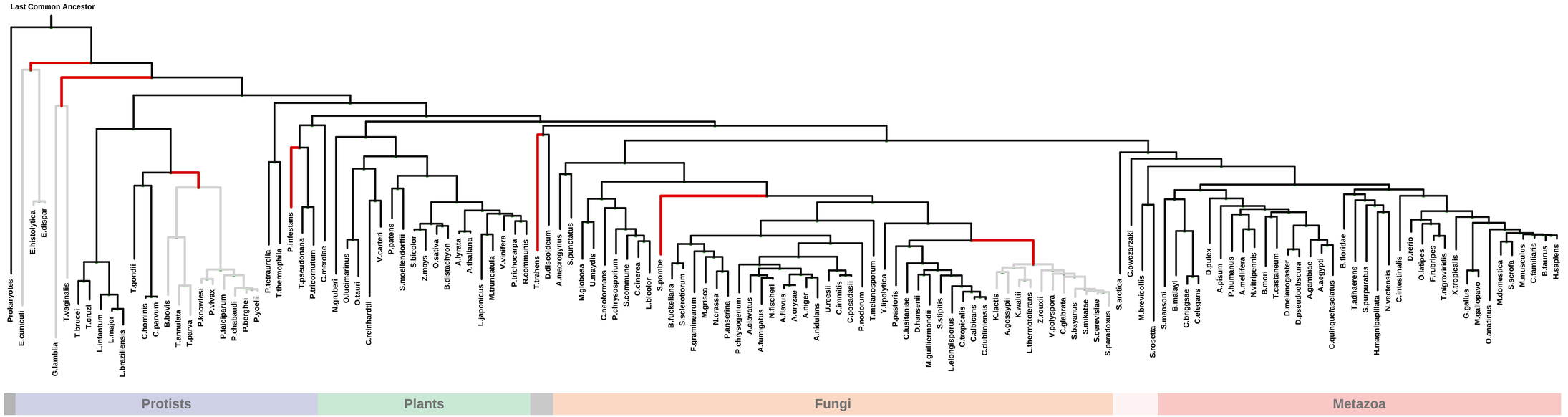


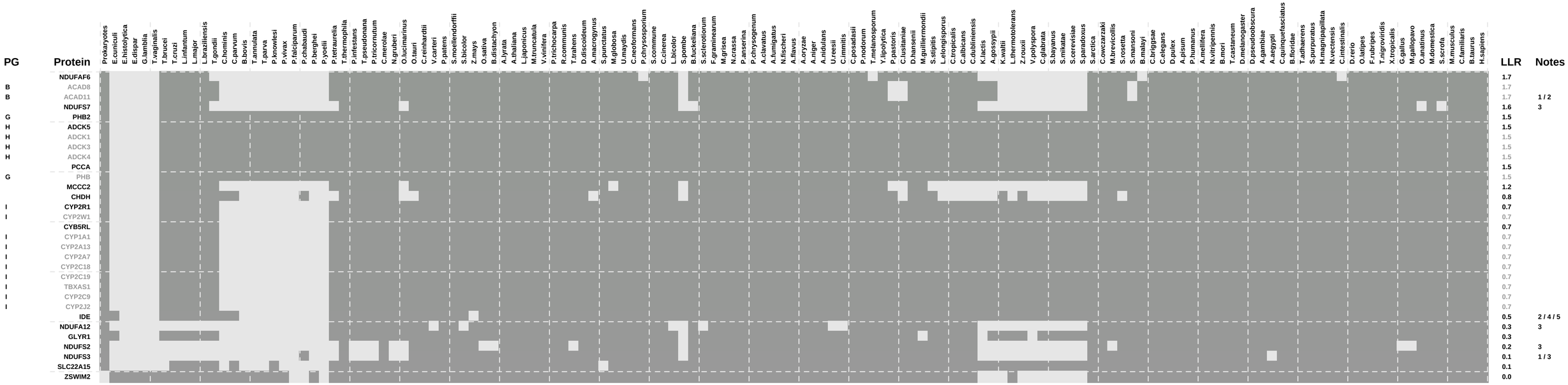


1: anchored to membrane || 2: axon || 3: clathrin-sculpted gamma-aminobutyric acid transport vesicle membrane || 4: presynaptic membrane || 5: synaptic vesicle membrane || 6: vesicle membrane || 7: synaptic vesicle || 8: dendrite || 9: mitochondrial membrane || 10: mitochondrial nucleoid || 11: mitochondrial respiratory chain complex I || 12: mitochondrial outer membrane || 13: extrinsic to mitochondrial inner membrane || 14: transport vesicle membrane || 15: peroxisome || 16: nuclear membrane || 17: mitochondrial intermembrane space

ECM 15, Gene set "presynaptic membrane", Page 2

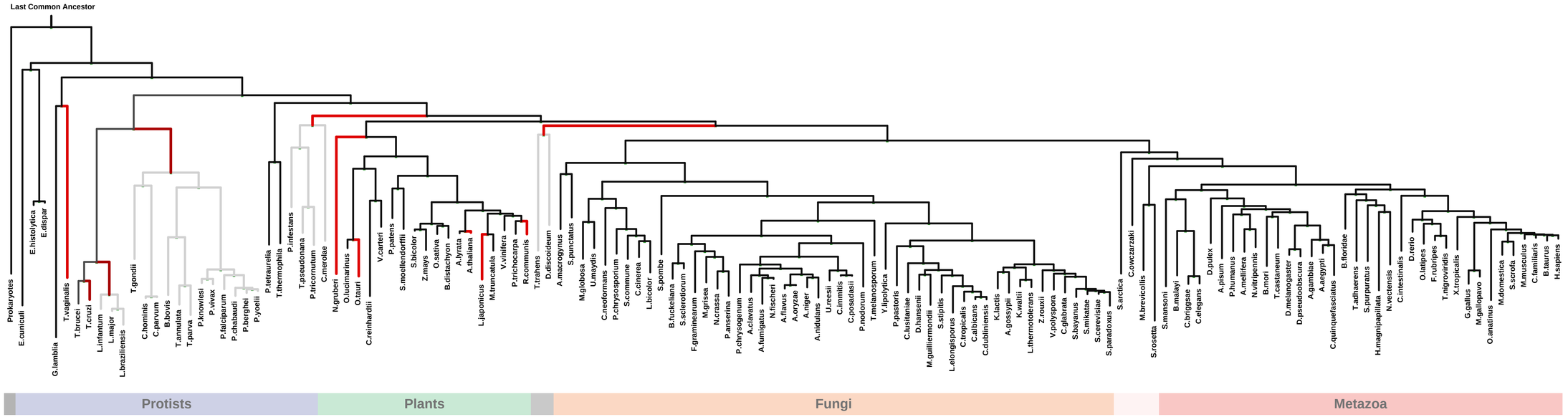
Num of ECM Genes: 1. Num of Predicted Genes: 65

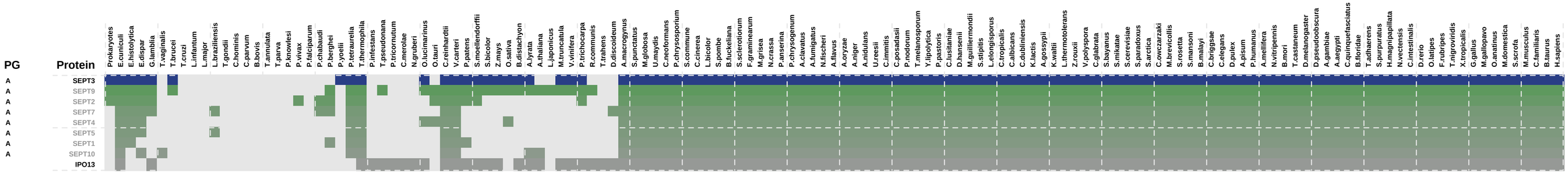




ECM 16, Gene set "presynaptic membrane", Page 1

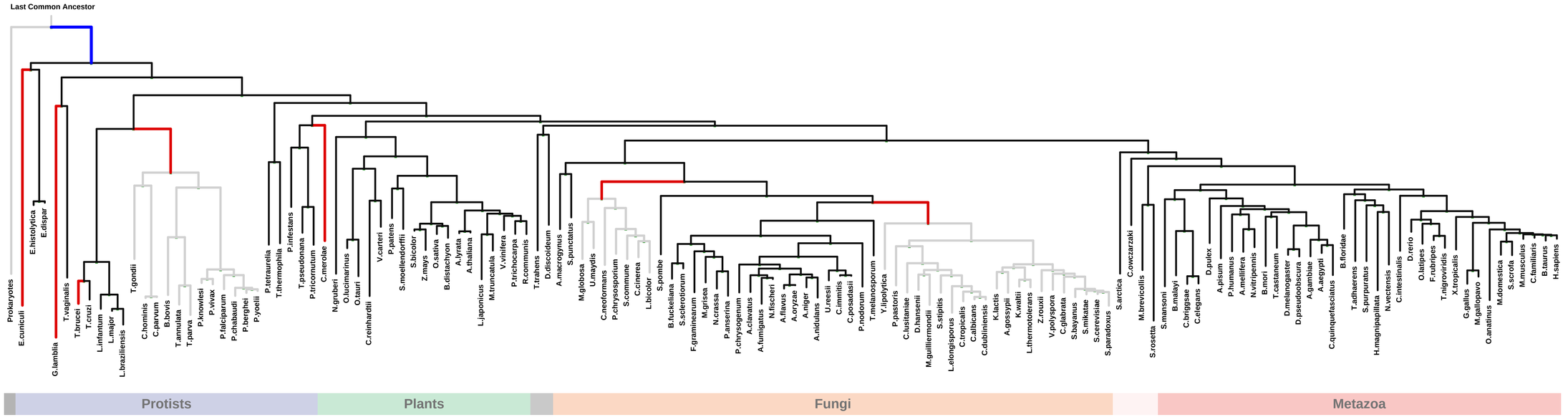
Num of ECM Genes: 1. Num of Predicted Genes: 8





ECM 17, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 125

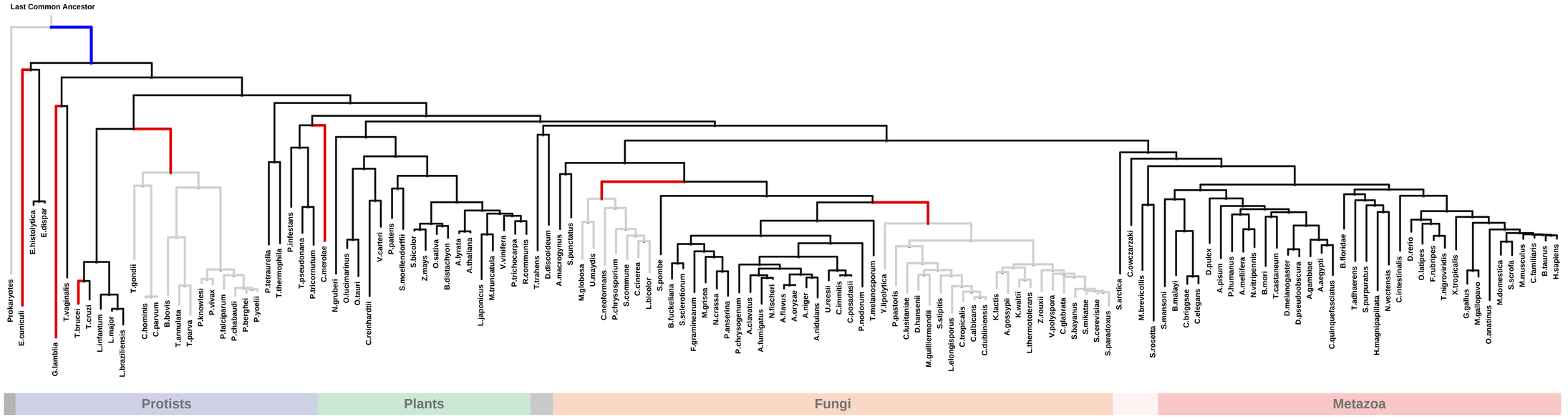


PG	Protein	LLR	Notes
A	DENND1A		1 / 2 / 3 / 4
A	DENND1B	39.1	1
A	DENND5A	37.0	
A	DENND5B	37.0	
A	DENND1C	36.0	1
A	MADD	33.3	
A	DENND2A	33.2	5 / 6
A	DENND4A	33.1	
A	DENND2C	30.2	
A	DENND2D	30.2	
A	ST5	30.2	
A	DENND4B	24.6	
A	DENND3	15.1	
B	KLHL30	13.8	
	VPS36	13.8	7 / 8 / 9
C	SH3YL1	12.0	10
C	CPNE2	11.6	
B	IPP	10.0	6
D	PHGDH	9.5	
D	CTBP1	9.5	11
D	CTBP2	9.5	11 / 12
D	GRHPR	9.5	13
E	TLR6	8.2	14 / 15
F	CCNG1	8.2	3
	HSD17B7	7.8	
C	DOC2B	7.4	16 / 17 / 18
C	PLA2G4E	7.4	19
C	CPNE1	7.2	
C	SYT9	6.7	20 / 21 / 22
C	SYT3	6.6	7 / 22
C	SYT7	6.5	9 / 22
G	SERINC3	6.2	
G	SERINC1	6.2	
A	DENND4C	6.2	23 / 24
F	CCNG2	5.9	

1: clathrin-coated vesicle || 2: clathrin-coated vesicle membrane || 3: dendrite || 4: presynaptic membrane || 5: actin cortical patch || 6: actin cytoskeleton || 7: endosome || 8: late endosome || 9: lysosome || 10: ruffle membrane ||
11: transcriptional repressor complex || 12: synapse || 13: peroxisomal matrix || 14: phagocytic vesicle membrane || 15: Toll-like receptor 2-Toll-like receptor 6 protein complex || 16: microtubule cytoskeleton || 17: SNARE complex ||
18: synaptic vesicle || 19: lysosomal membrane || 20: dense core granule || 21: secretory granule membrane || 22: synaptic vesicle membrane || 23: cytoplasmic vesicle membrane || 24: insulin-responsive compartment

ECM 17, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 125

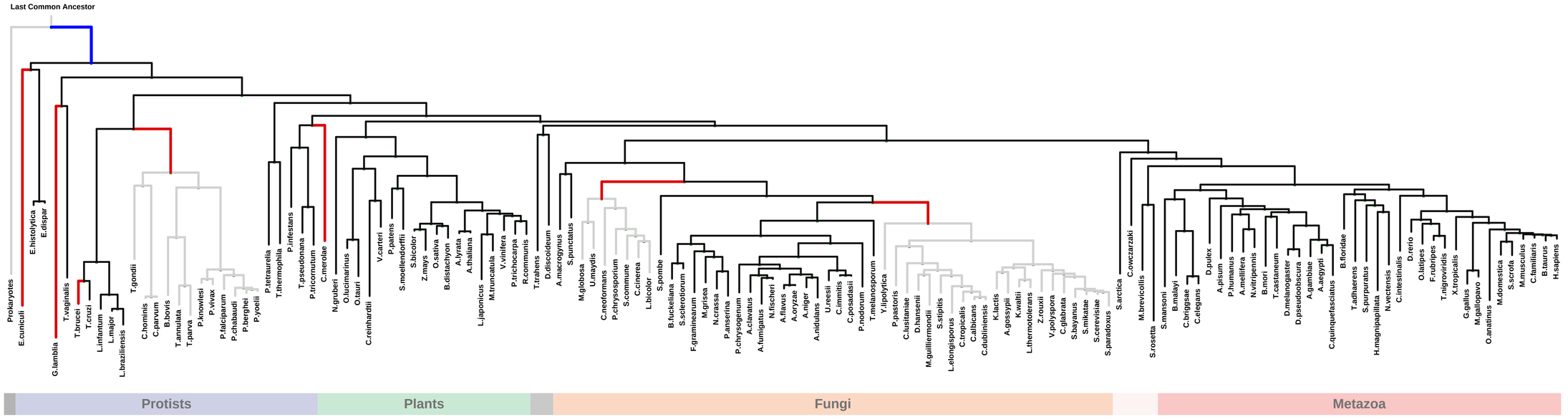


PG	Protein	LLR	Notes
	IPO9	5.4	1
H	PGM5	5.4	2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 1
C	NCK2	5.2	11
C	SRGAP2	5.2	12 / 13 / 14 / 15
	PRMT5	5.0	
	AGK	4.9	16
	GAPVD1	4.9	17
I	CAPN3	4.9	10 / 18 / 19
J	SOX7	4.8	
K	ADH1B	4.6	
K	ADH1C	4.6	
H	PGM1	4.6	20
K	ADH4	4.6	21
K	ADH7	4.6	
K	ADH1A	4.6	
E	LRRC27	4.4	
C	UNC13C	4.3	22
L	GABARAPL1	4.2	23 / 24 / 25 / 26 / 27
L	MAP1LC3C	4.2	23 / 28 / 29 / 30 / 31
L	GABARAPL2	4.2	23 / 28 / 29
L	GABARAP	4.2	20 / 23 / 28 / 29 / 32 / 33 /
M	IDH3B	4.2	
M	IDH3G	4.2	
C	SYT6	4.1	35 / 36 / 37
C	RPH3A	4.1	35 / 37 / 38
B	IVNS1ABP	3.9	39
C	PLA2G4D	3.4	25
L	MAP1LC3B	3.4	23 / 28 / 29 / 30 / 31 / 33 /
L	MAP1LC3B2	3.4	28 / 29 / 30
L	MAP1LC3A	3.4	23 / 28 / 29 / 30 / 31 / 42
C	ESYT3	3.3	
C	PLCG2	3.2	
C	PLCD1	3.2	
C	PLCD4	3.2	
C	PLCG1	3.2	12 / 43 / 44 / 45

1: nuclear pore || 2: cell-cell adherens junction || 3: costamere || 4: dystrophin-associated glycoprotein complex || 5: focal adhesion || 6: intercalated disc || 7: internal side of plasma membrane || 8: sarcolemma || 9: stress fiber ||
10: Z disc || 11: vesicle membrane || 12: lamellipodium || 13: phagocytic vesicle || 14: postsynaptic density || 15: postsynaptic membrane || 16: mitochondrial membrane || 17: endosome || 18: myofibril || 19: T-tubule ||
20: actin cytoskeleton || 21: microtubule cytoskeleton || 22: presynaptic membrane || 23: autophagic vacuole || 24: cell body || 25: cytoplasmic vesicle membrane || 26: dendrite cytoplasm || 27: dendrite membrane || 28: autophagic vacuole membrane ||

ECM 17, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 125

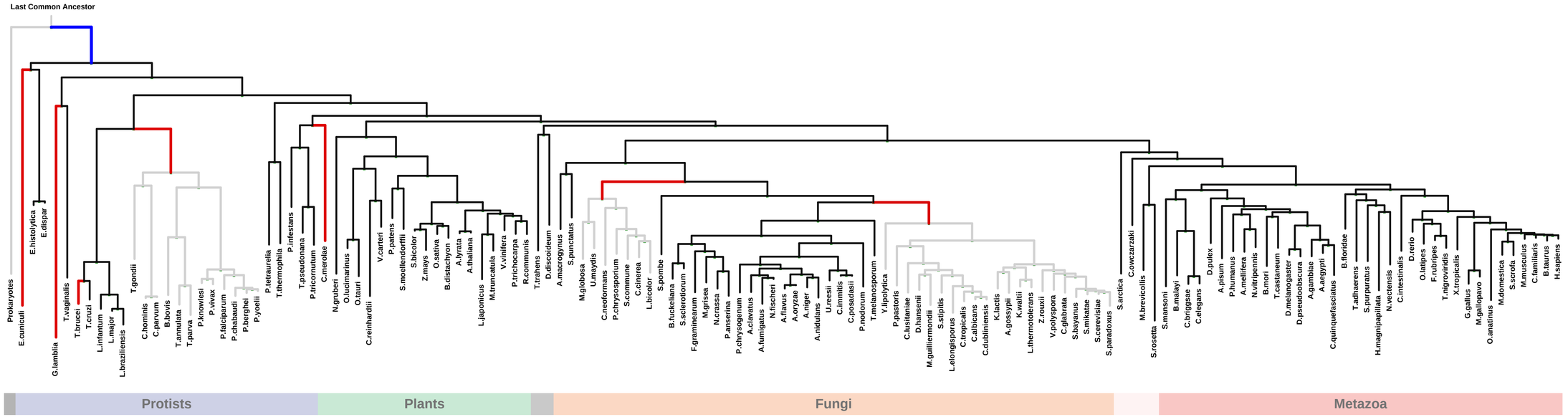


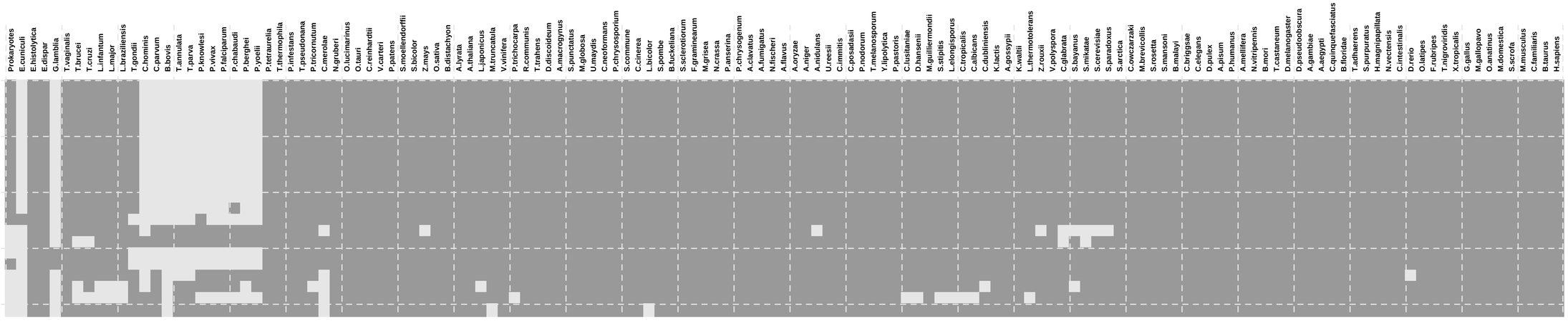
PG	Protein	LLR	Notes
C	PIEZO2	3.1	
C	SYT2	3.0	1 / 2 / 3
C	NPHP1	3.0	4 / 5 / 6 / 7 / 8 / 9
E	LRRC66	2.6	
N	GNAL	2.6	10 / 11
	CCNF	2.5	12 / 13
C	SYT11	2.5	3
B	KLHL33	2.5	
C	ESYT2	2.3	
C	CPNE8	2.2	
	EMC2	2.1	14
C	CPNE4	1.8	
	CWC22	1.7	15 / 16
O	DDB1	1.7	17 / 18 / 19
O	100290337	1.7	
	LNX1	1.6	
	SNW1	1.5	15 / 16 / 20 / 21
	ATRN	1.3	
P	RNF217	1.2	
G	SERINC2	1.1	
Q	CLPTM1	0.9	22
Q	CLPTM1L	0.9	
P	RNF19A	0.9	
E	TLR3	0.9	23 / 24
E	LRRC59	0.8	25
I	CAPN11	0.8	26
	IMPAD1	0.7	
I	CAPN9	0.7	
C	PLCE1	0.7	
	ASPM	0.6	27 / 28
C	OTOF	0.6	3 / 29
P	RNF144A	0.6	
C	VAV2	0.6	
C	ARHGEF6	0.6	30
C	NOSTRIN	0.6	2

1: chromaffin granule membrane || 2: endocytic vesicle membrane || 3: synaptic vesicle membrane || 4: adherens junction || 5: cell-cell junction || 6: cilium axoneme || 7: motile cilium || 8: photoreceptor connecting cilium ||
9: tight junction || 10: extrinsic to internal side of plasma membrane || 11: heterotrimeric G-protein complex || 12: centriole || 13: SCF ubiquitin ligase complex || 14: ER membrane protein complex || 15: catalytic step 2 spliceosome ||
16: spliceosomal complex || 17: Cul4A-RING ubiquitin ligase complex || 18: Cul4B-RING ubiquitin ligase complex || 19: Cul4-RING ubiquitin ligase complex || 20: chromatin || 21: nuclear part || 22: external side of plasma membrane ||

ECM 17, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 125

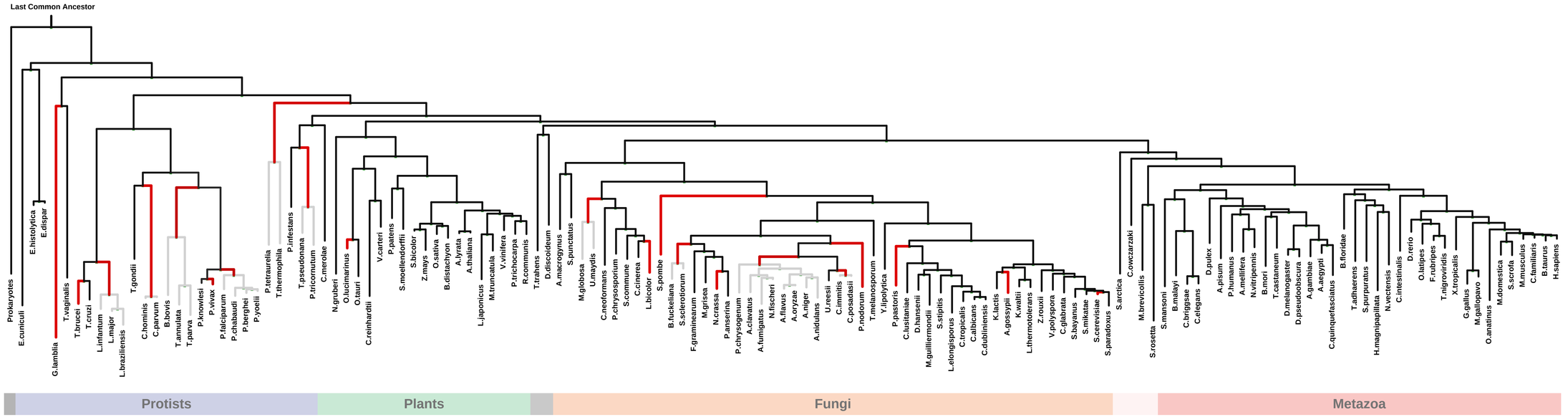


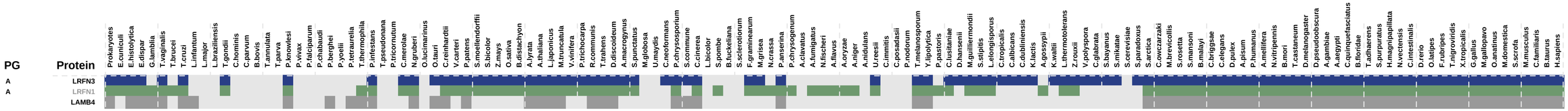


1: peroxisome || 2: PcG protein complex || 3: extrinsic to internal side of plasma membrane || 4: heterotrimeric G-protein complex || 5: photoreceptor inner segment || 6: photoreceptor outer segment || 7: photoreceptor outer segment membrane || 8: apical part of cell || 9: retromer complex

ECM 18, Gene set "presynaptic membrane", Page 1

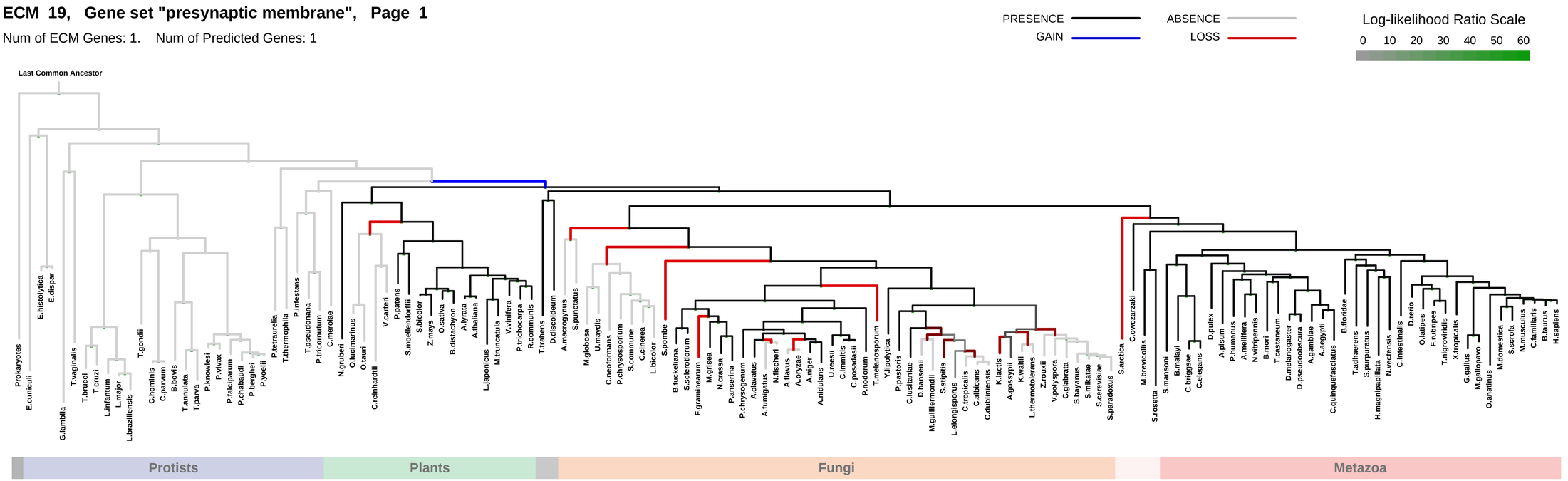
Num of ECM Genes: 1. Num of Predicted Genes: 2





ECM 19, Gene set "presynaptic membrane", Page 1

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

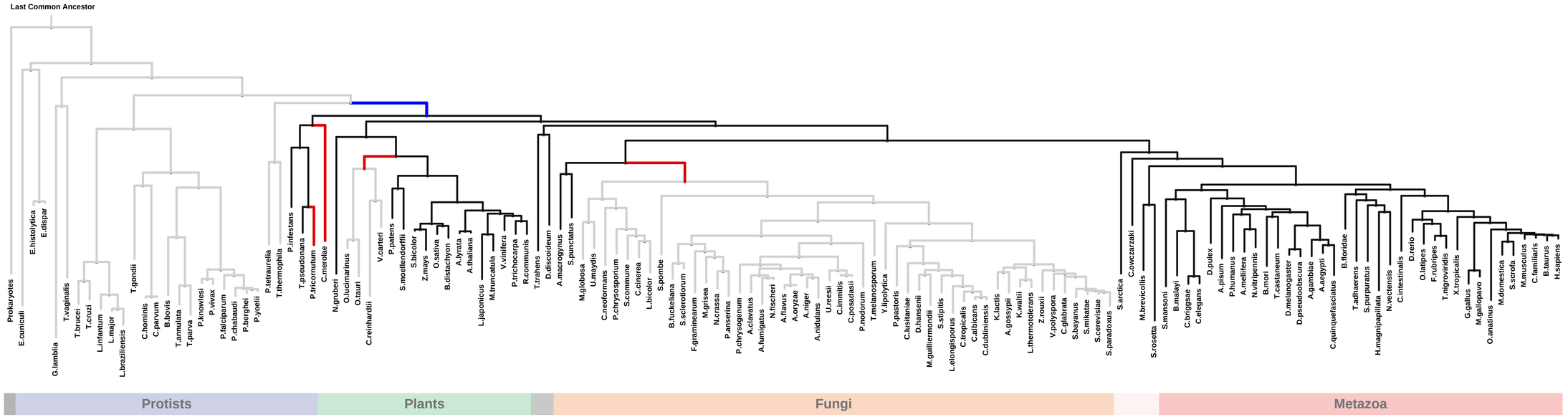


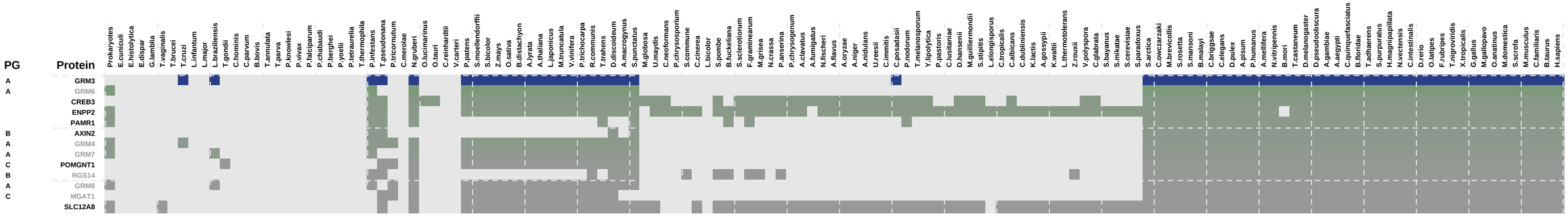
PG	Protein	LLR	Notes
	RIMS1		1
	LDB1	3.4	2 / 3

1: presynaptic membrane || 2: cell-cell junction || 3: nuclear chromatin

ECM 20, Gene set "presynaptic membrane", Page 1

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

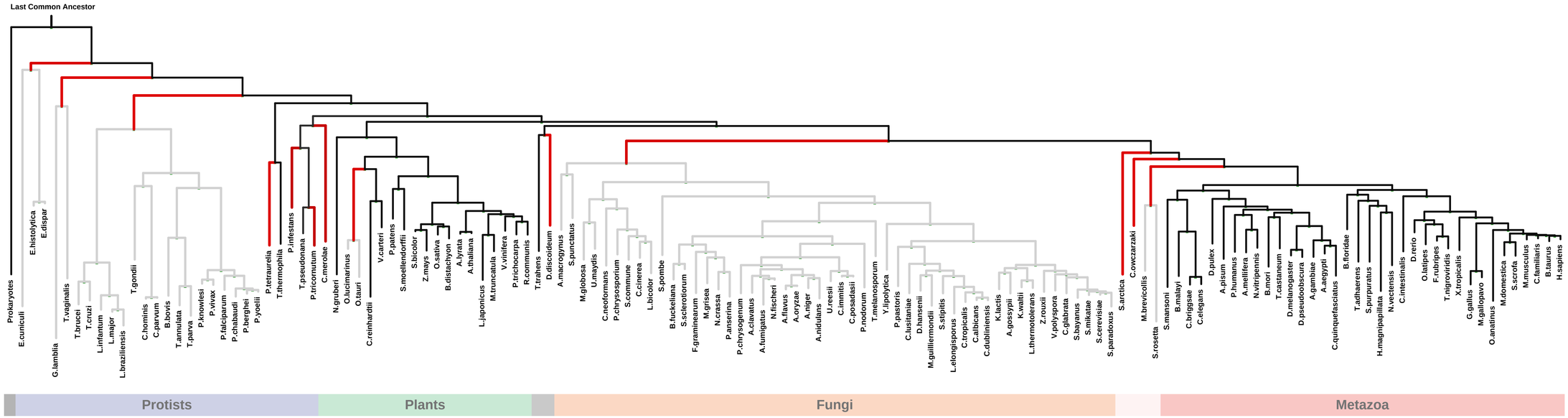


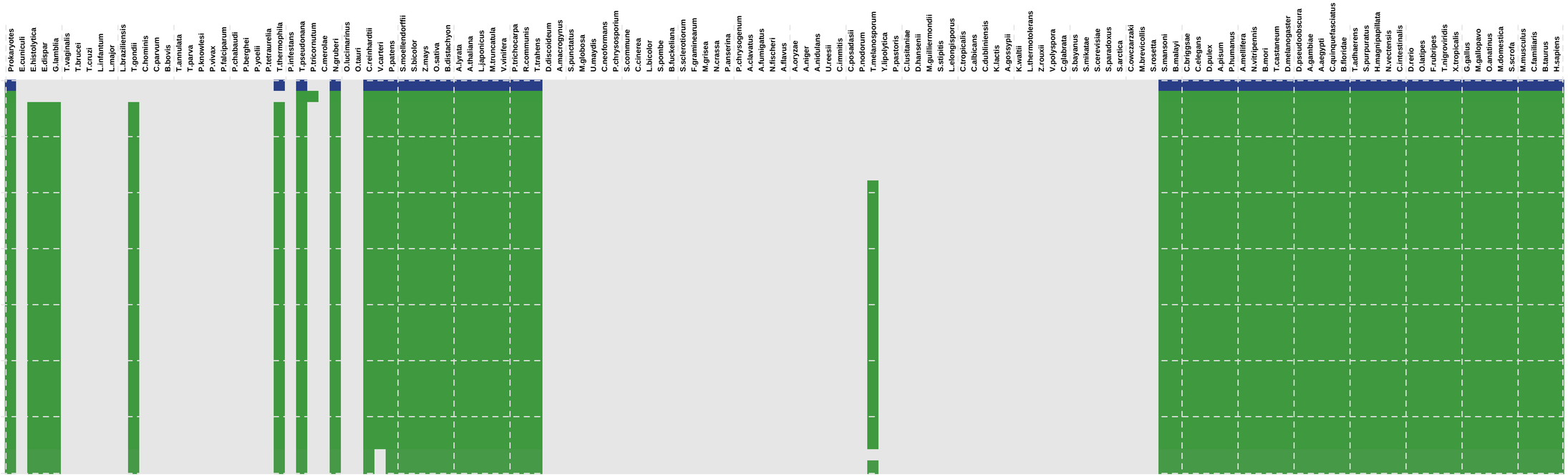


1: axon || 2: postsynaptic density || 3: postsynaptic membrane || 4: presynaptic membrane || 5: integral to endoplasmic reticulum membrane || 6: nuclear body || 7: beta-catenin destruction complex || 8: cell cortex || 9: cytoplasmic membrane-bounded vesicle || 10: cytoplasmic microtubule || 11: cytoplasmic vesicle || 12: asymmetric synapse || 13: dendrite || 14: dendritic shaft || 15: presynaptic active zone || 16: dendritic spine || 17: intermediate filament cytoskeleton || 18: PML body || 19: spindle || 20: spindle pole || 21: neuron projection

ECM 21, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 186

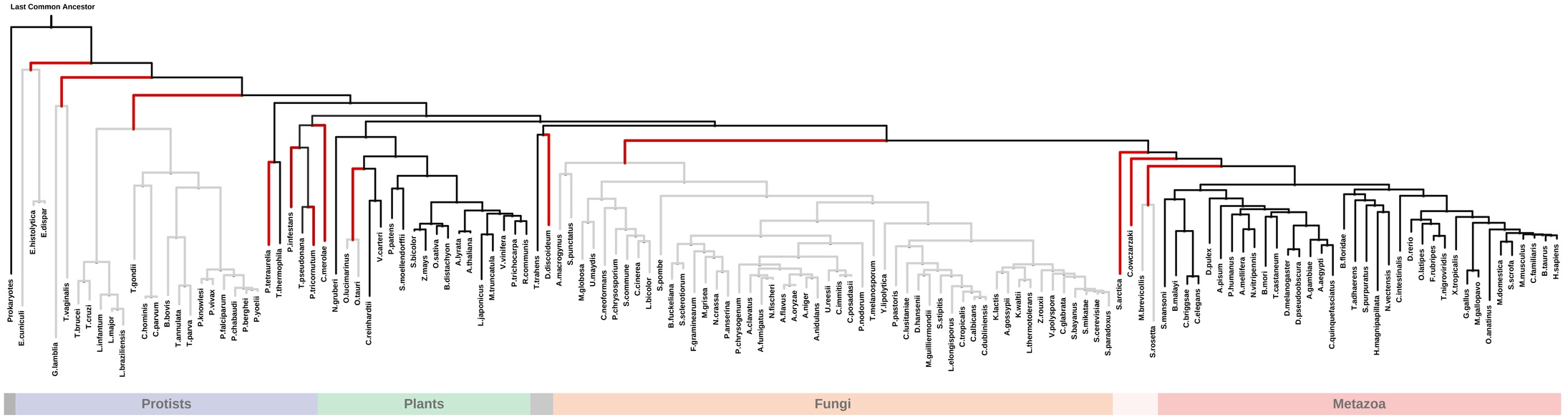




1: dendrite || 2: kainate selective glutamate receptor complex || 3: perikaryon || 4: postsynaptic membrane || 5: presynaptic membrane || 6: terminal button || 7: axon || 8: dendrite cytoplasm || 9: platelet alpha granule lumen ||
10: proteinaceous extracellular matrix || 11: acrosomal membrane || 12: external side of plasma membrane || 13: platelet alpha granule || 14: platelet dense tubular network || 15: extracellular matrix || 16: extrinsic to external side of plasma membrane ||
17: neuromuscular junction || 18: melanosome || 19: fibrinogen complex || 20: endoplasmic reticulum lumen || 21: endoplasmic reticulum-Golgi intermediate compartment

ECM 21, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 186

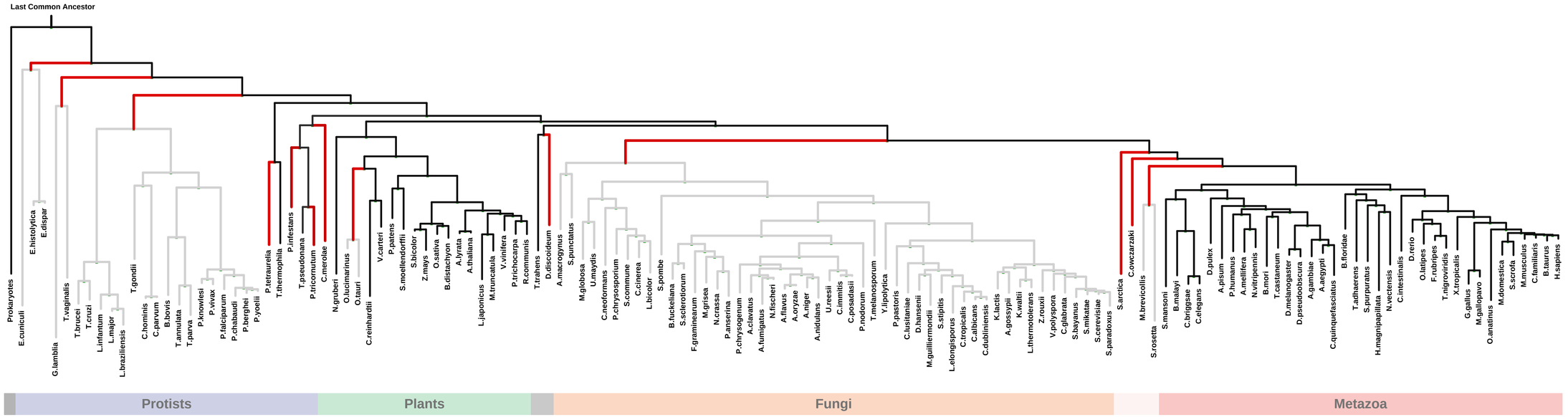


PG	Protein	LLR	Notes
B	SERPING1	35.3	1
B	SERPINB13	30.9	
	SELENBP1	**24.4**	
C	**CACNA2D1**	**23.0**	2 / 3 / 4
D	**MYOM3**	**20.7**	5
	CATSPER3	**17.6**	6 / 7 / 8 / 9
D	COL14A1	17.4	10 / 11 / 12 / 13
A	GRIA3	16.8	14 / 15 / 16 / 17 / 18 / 19 /
A	GRIA4	16.8	14 / 17 / 19 / 20 / 22 / 23
A	GRID1	16.8	20 / 24
A	GRIK1	16.8	20 / 22 / 23 / 25 / 26
A	GRIK2	16.8	18 / 20 / 22 / 23 / 26 / 27
A	GRIA1	16.8	14 / 17 / 19 / 20 / 25 / 28 /
A	GRIN2D	16.8	20 / 24 / 31
A	GRIN3A	16.8	19 / 20 / 24 / 31 / 32 / 33
A	GRIA2	16.8	14 / 15 / 16 / 17 / 18 / 19 /
D	CNTN1	16.7	36
D	COL12A1	16.4	11 / 12
	MTERFD1	**15.4**	
A	GRIN3B	14.6	20 / 24 / 31
A	GRID2	14.6	19 / 20 / 24 / 29 / 33 / 37
	GRIN3B	**14.6**	
D	MYBPC3	13.1	38 / 39 / 40
D	FNDC3A	13.1	6 / 41
D	ITGAX	13.0	42 / 43
E	**SLC10A2**	**12.9**	44
E	SLC10A4	12.9	
E	SLC10A5	12.9	
E	SLC10A6	12.9	
E	SLC10A1	12.9	45
D	PRTG	12.3	
D	CDON	12.3	12
D	IGSF22	12.3	
	DCTPP1	**11.4**	
	TTC24	**11.2**	

1: platelet alpha granule lumen || 2: sarcoplasmic reticulum || 3: T-tubule || 4: voltage-gated calcium channel complex || 5: M band || 6: acrosomal vesicle || 7: CatSper complex || 8: cilium || 9: flagellar membrane || 10: collagen ||
11: endoplasmic reticulum lumen || 12: extracellular matrix || 13: proteinaceous extracellular matrix || 14: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 15: asymmetric synapse || 16: dendritic shaft ||
17: endocytic vesicle membrane || 18: perikaryon || 19: postsynaptic density || 20: postsynaptic membrane || 21: synaptic cleft || 22: terminal button || 23: kainate selective glutamate receptor complex || 24: outer membrane-bounded periplasmic space ||

ECM 21, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 186

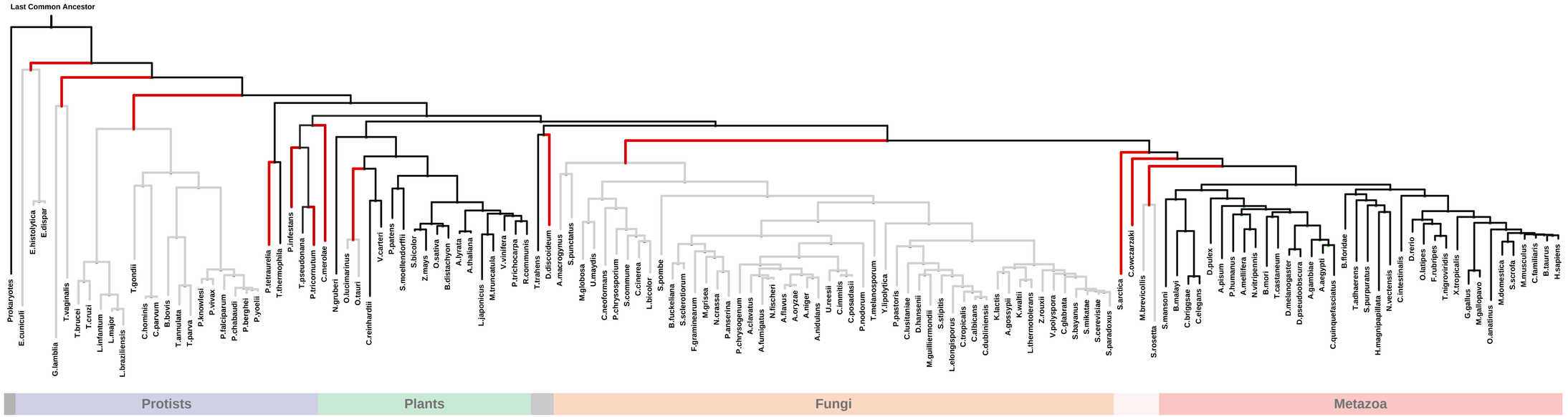




1: collagen || 2: extracellular matrix || 3: dendrite || 4: kainate selective glutamate receptor complex || 5: perikaryon || 6: postsynaptic membrane || 7: presynaptic membrane || 8: terminal button || 9: N-methyl-D-aspartate selective glutamate receptor complex || 10: outer membrane-bounded periplasmic space || 11: postsynaptic density || 12: voltage-gated calcium channel complex || 13: myosin filament || 14: semaphorin receptor complex || 15: basement membrane || 16: interstitial matrix || 17: synapse || 18: heterochromatin || 19: NuRD complex || 20: cytoplasmic mRNA processing body || 21: cytoplasmic stress granule || 22: Golgi lumen || 23: CatSper complex || 24: cilium || 25: flagellar membrane ||

ECM 21, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 186

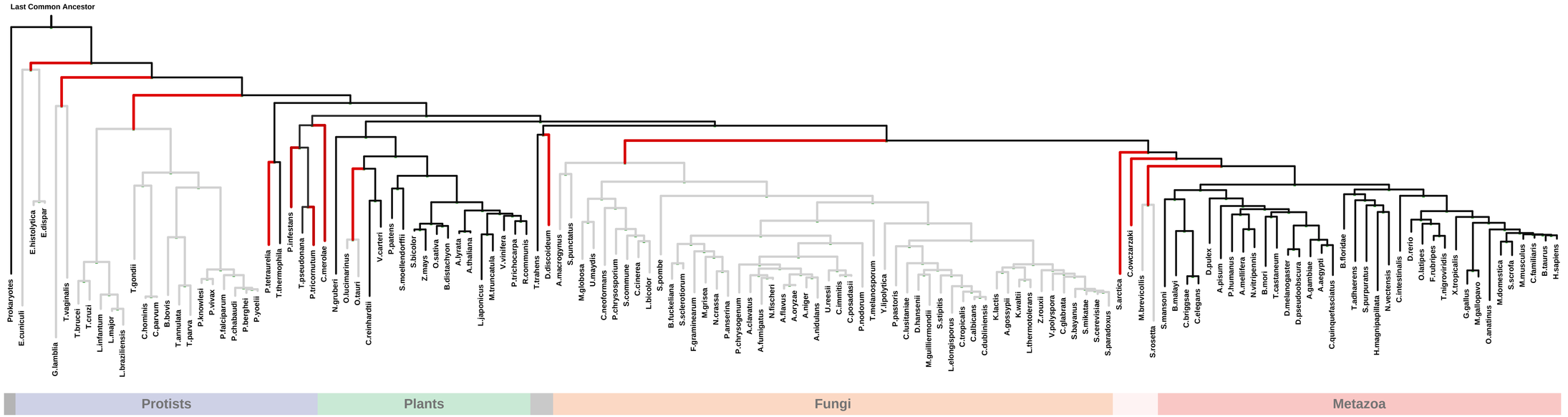


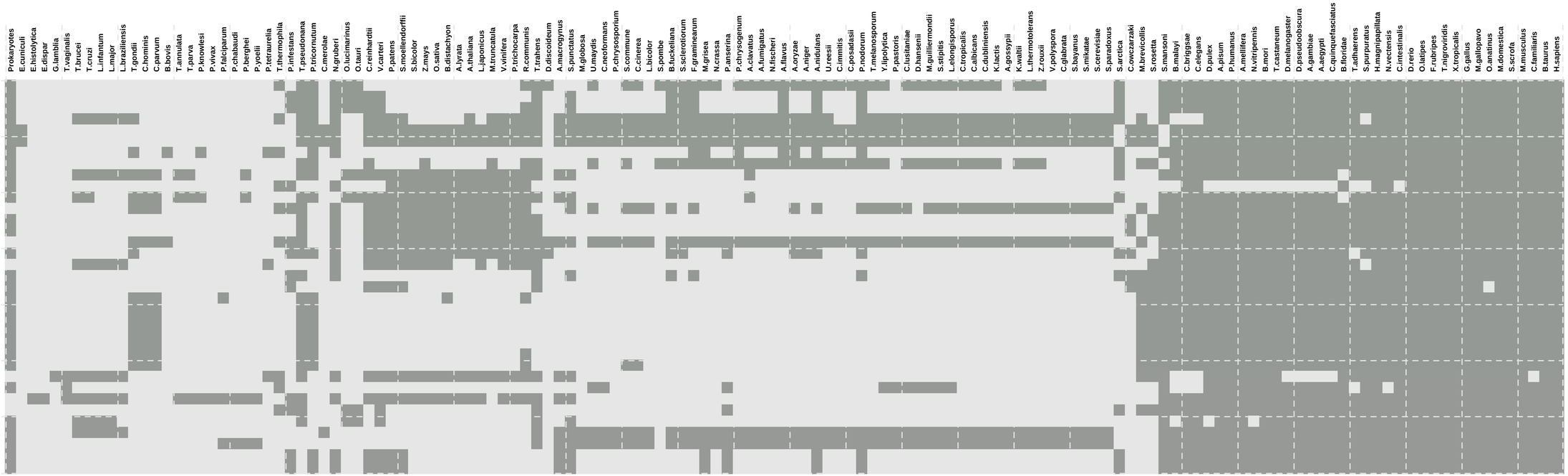


1: axon || 2: clathrin-sculpted monoamine transport vesicle membrane || 3: dense core granule || 4: synaptic vesicle membrane || 5: terminal button || 6: cytoplasmic exosome (RNase complex) || 7: cytoplasmic mRNA processing body || 8: P granule || 9: dendrite || 10: DNA replication factor A complex || 11: nuclear chromosome, telomeric region || 12: heterochromatin || 13: histone deacetylase complex || 14: endoplasmic reticulum lumen

ECM 21, Gene set "presynaptic membrane", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 186

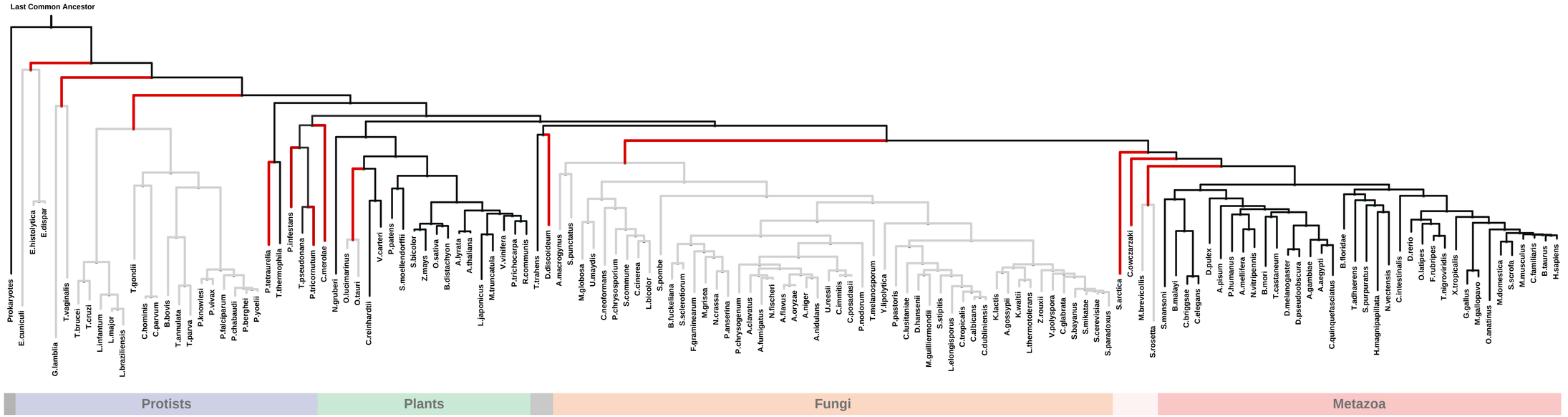


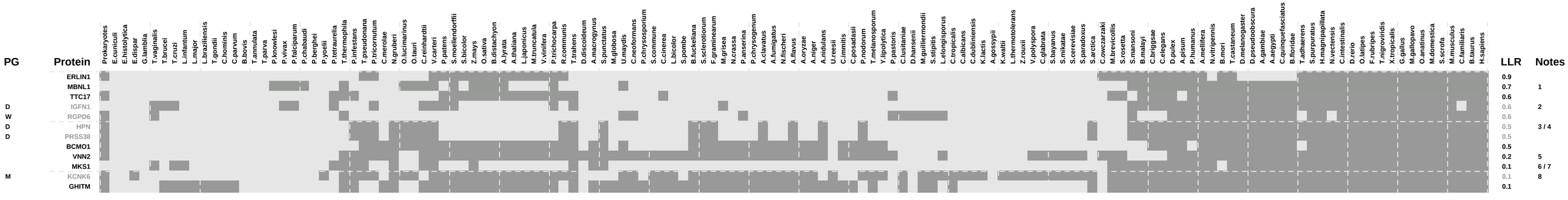


1: cell cortex || 2: cell-cell junction || 3: condensed nuclear chromosome || 4: proteinaceous extracellular matrix || 5: anchored to external side of plasma membrane || 6: endoplasmic reticulum lumen || 7: lysosomal lumen || 8: lysosome ||
9: polysome || 10: CRD-mediated mRNA stability complex || 11: cytoplasmic stress granule || 12: histone pre-mRNA 3'end processing complex || 13: ribonucleoprotein complex || 14: U12-type spliceosomal complex || 15: N-methyl-D-aspartate selective glutamate receptor complex ||
16: outer membrane-bounded periplasmic space || 17: postsynaptic density || 18: postsynaptic membrane || 19: presynaptic membrane || 20: terminal button || 21: neuron projection || 22: synaptic cleft || 23: synaptic vesicle ||

ECM 21, Gene set "presynaptic membrane", Page 6

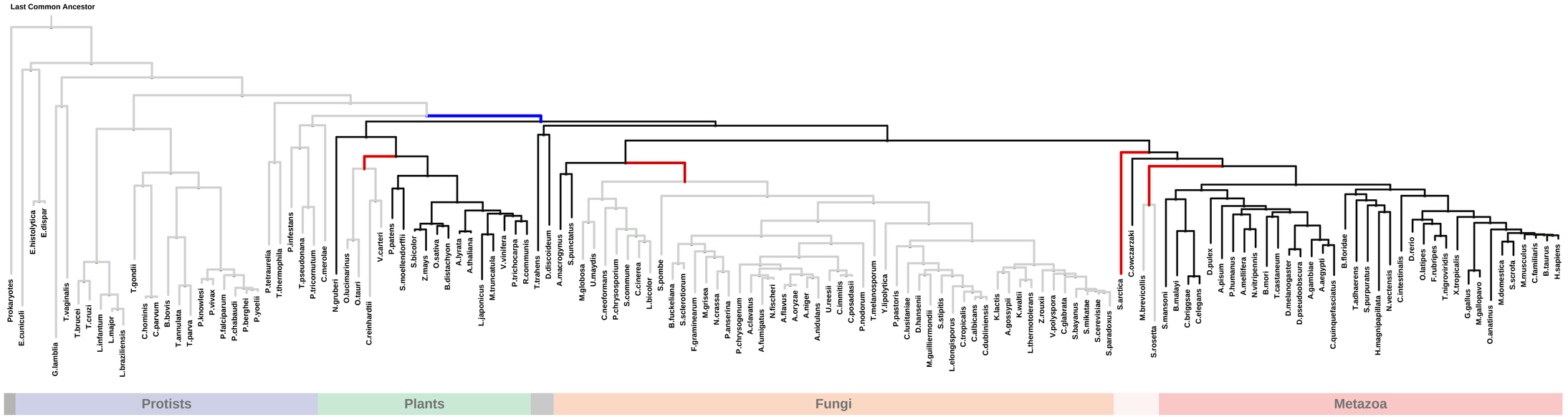
Num of ECM Genes: 1. Num of Predicted Genes: 186

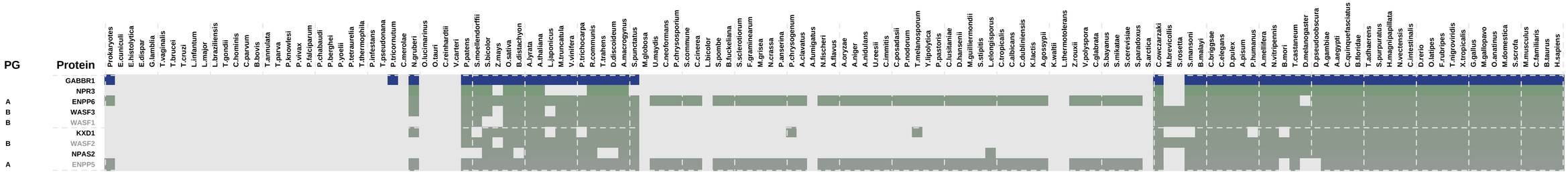




ECM 22, Gene set "presynaptic membrane", Page 1

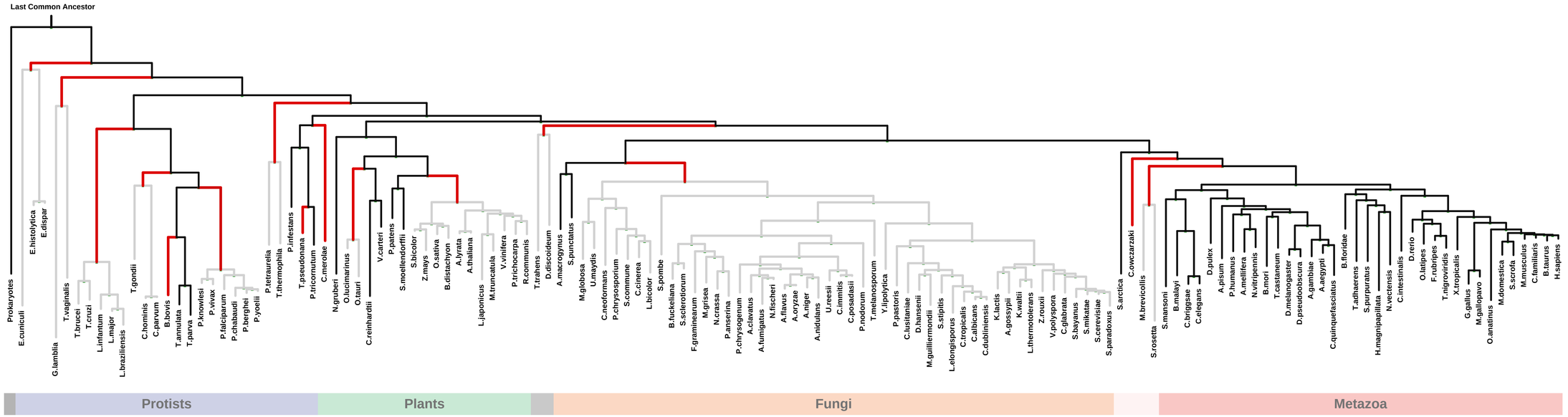
Num of ECM Genes: 1. Num of Predicted Genes: 8

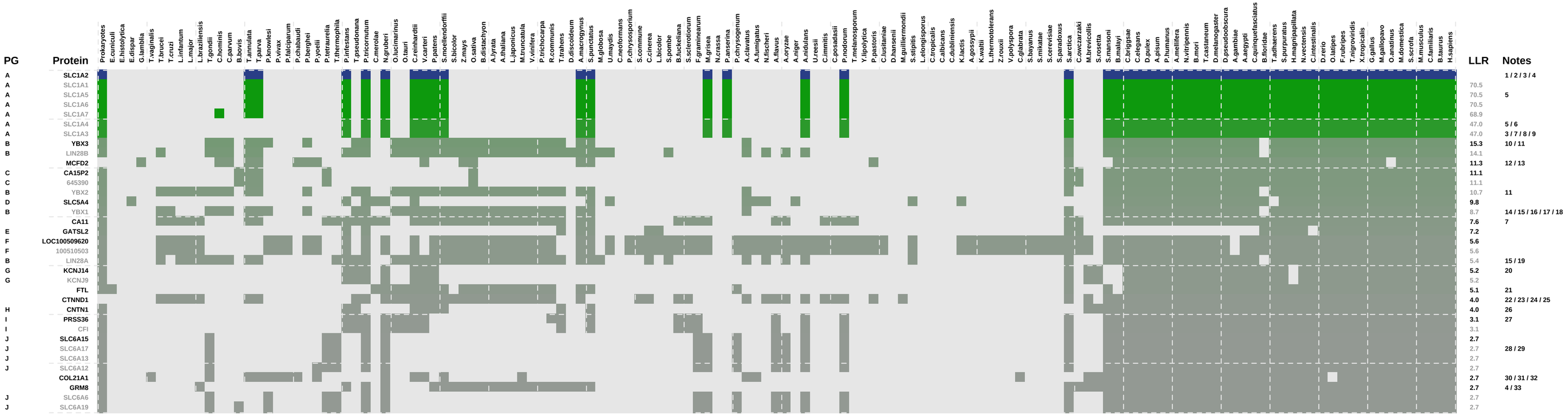




ECM 23, Gene set "presynaptic membrane", Page 1

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

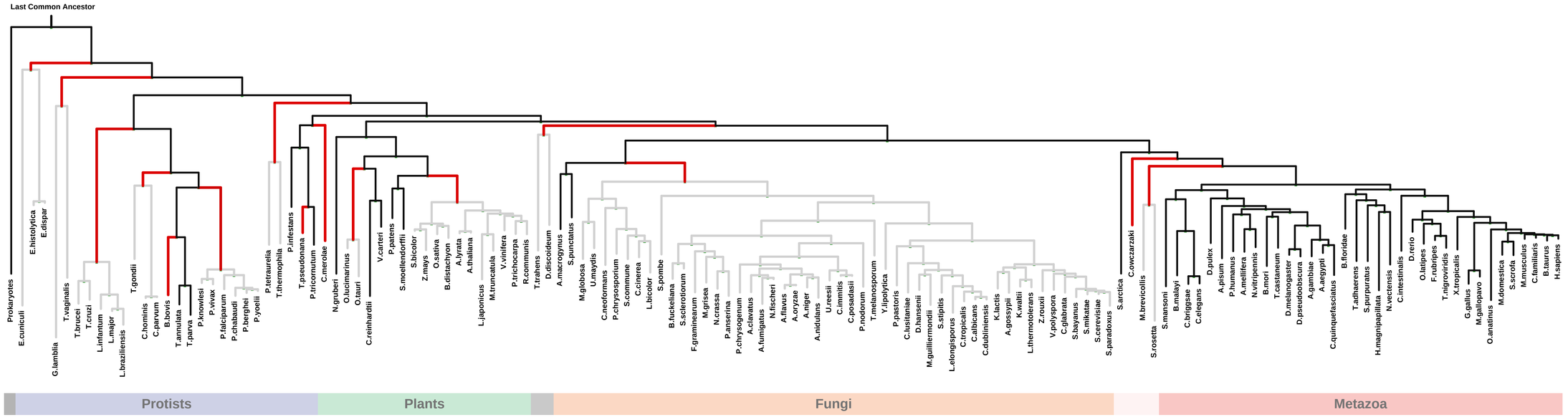


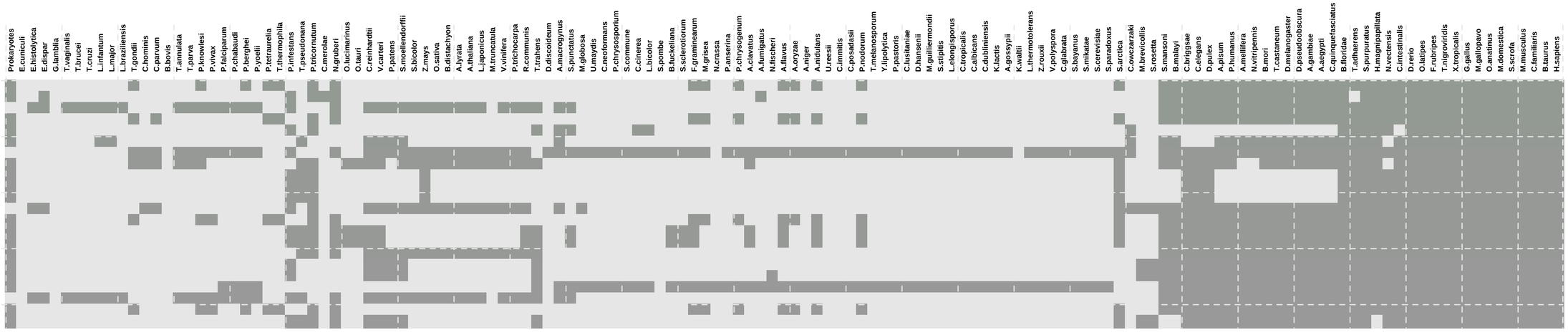


1: axolemma || 2: dendritic shaft || 3: dendritic spine || 4: presynaptic membrane || 5: melanosome || 6: intermediate filament || 7: basolateral plasma membrane || 8: fibril || 9: synapse || 10: gap junction || 11: polysome ||
12: endoplasmic reticulum-Golgi intermediate compartment || 13: ER to Golgi transport vesicle membrane || 14: CRD-mediated mRNA stability complex || 15: cytoplasmic stress granule || 16: histone pre-mRNA 3'end processing complex || 17: ribonucleoprotein complex ||
18: U12-type spliceosomal complex || 19: cytoplasmic mRNA processing body || 20: voltage-gated potassium channel complex || 21: intracellular ferritin complex || 22: cell-cell adherens junction || 23: cell-cell junction || 24: lamellipodium ||

ECM 23, Gene set "presynaptic membrane", Page 2

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

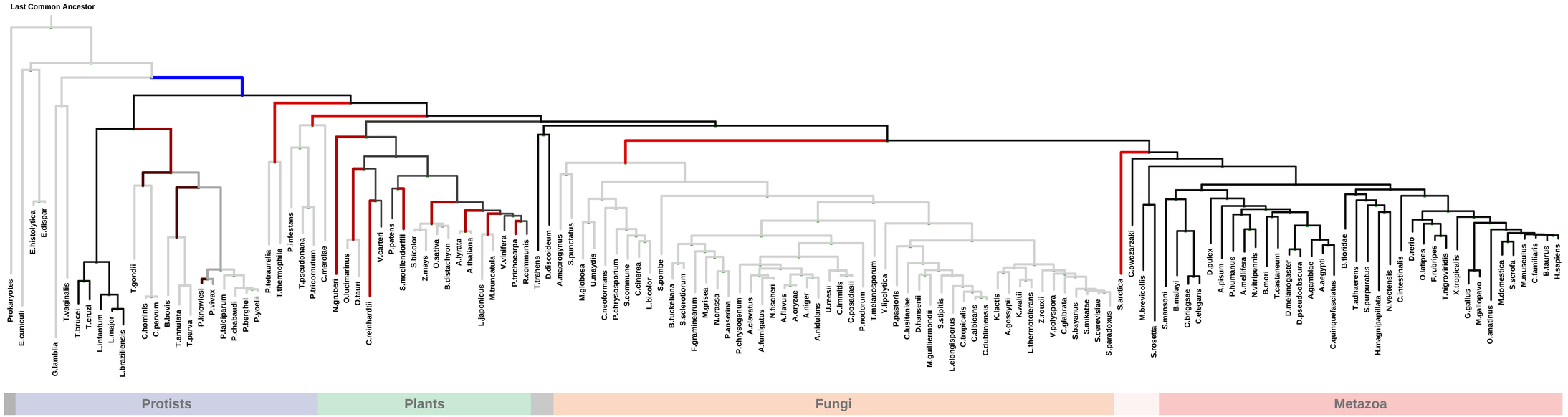


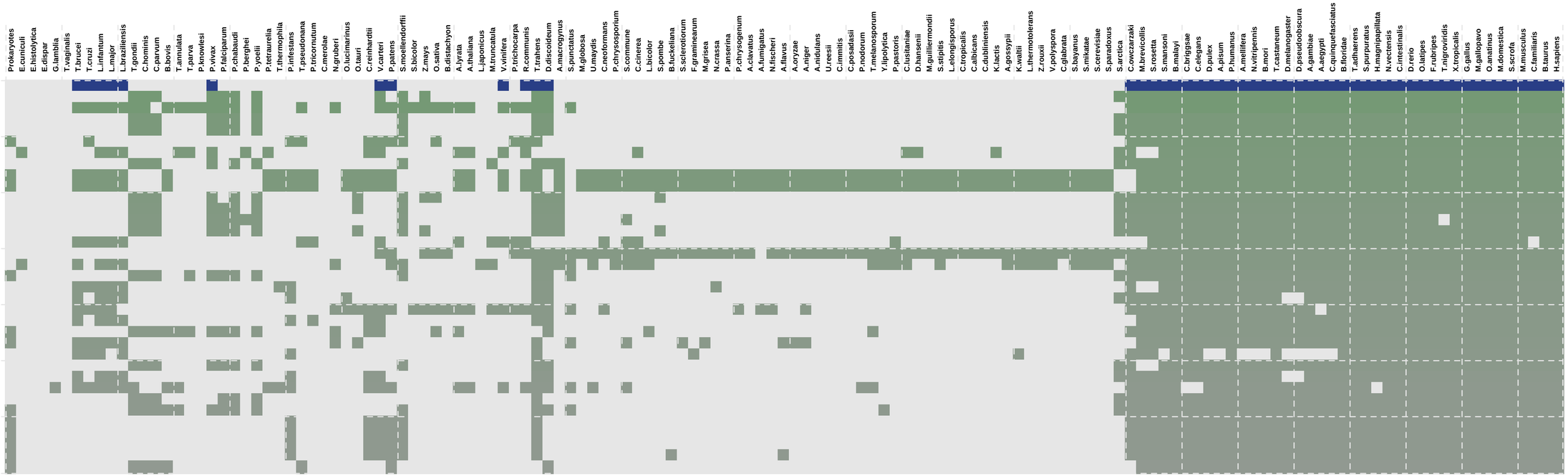


1: axon || 2: Golgi trans cisterna || 3: integral to Golgi membrane || 4: BAT3 complex || 5: brush border membrane || 6: cytoplasmic vesicle || 7: basolateral plasma membrane || 8: cell-cell junction || 9: nuclear membrane ||
10: dendrite || 11: dendrite cytoplasm || 12: perikaryon || 13: postsynaptic membrane || 14: terminal button || 15: extracellular matrix || 16: external side of plasma membrane || 17: T-tubule || 18: voltage-gated potassium channel complex

ECM 24, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 64

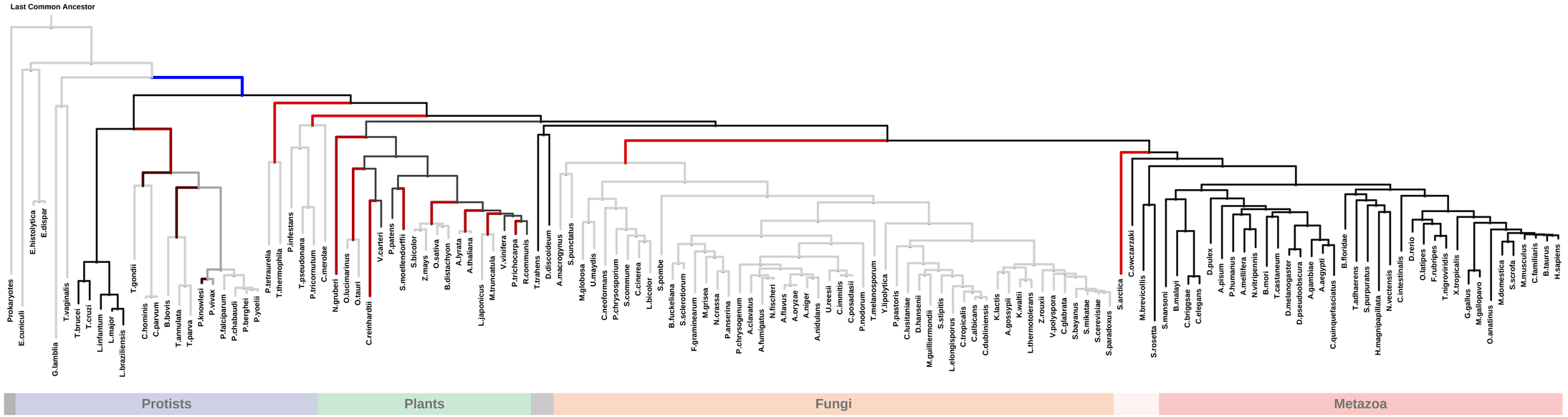




1: postsynaptic membrane || 2: presynaptic membrane || 3: receptor complex || 4: basement membrane || 5: proteinaceous extracellular matrix || 6: microfibril || 7: caveola || 8: intercalated disc || 9: sarcolemma || 10: T-tubule ||
11: voltage-gated sodium channel complex || 12: extracellular matrix || 13: axonal growth cone || 14: beta-catenin destruction complex || 15: cell-cell adherens junction || 16: cytoplasmic microtubule || 17: kinetochore || 18: lamellipodium ||
19: lateral plasma membrane || 20: microtubule plus end || 21: ruffle membrane || 22: synapse || 23: tight junction || 24: actin filament || 25: external side of plasma membrane || 26: fibrinogen complex || 27: platelet alpha granule ||

ECM 24, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 64

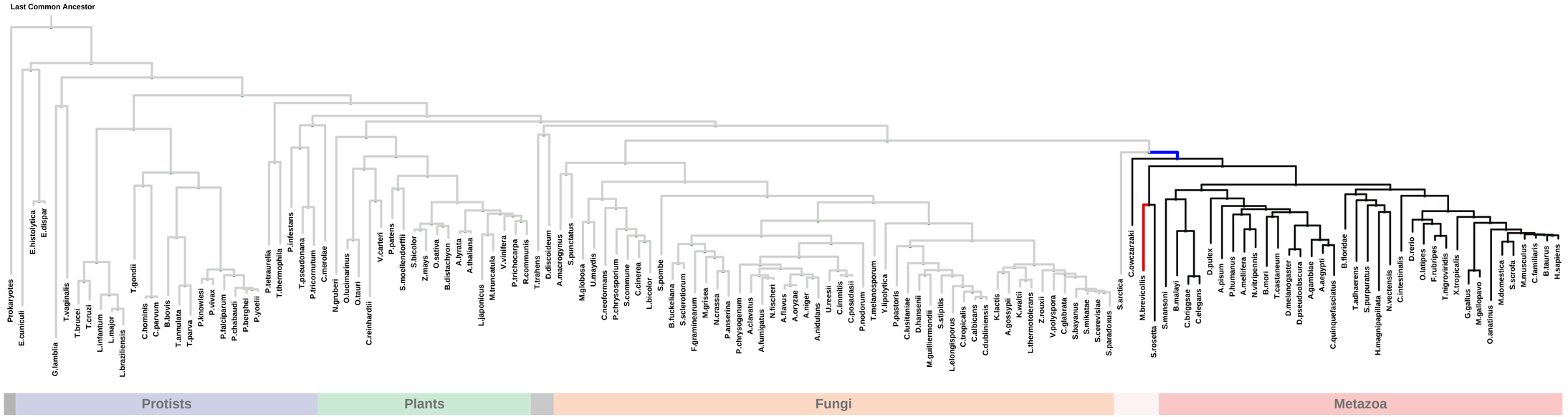


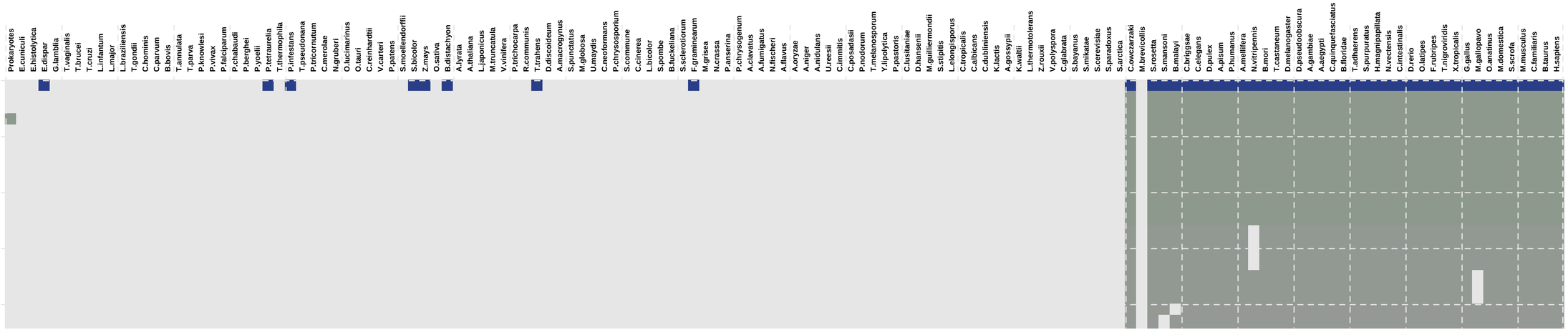
PG	Protein	LLR	Notes
G	MCOLN1	3.3	1 / 2 / 3
E	ITGA10	3.1	4
B	SDK1	3.0	
E	VWCE	2.8	
G	MCOLN3	2.8	
	ADAMTSL2	2.8	
E	ITGA1	2.8	4 / 5 / 6 / 7 / 8 / 9 / 10
B	ADAMTS16	2.7	11
B	ADAMTS2	2.7	11
B	ADAMTS9	2.6	11 / 12
B	THSD7B	2.3	
	HS3ST1	2.1	13
	STXBP4	2.0	14
B	ADAMTS19	2.0	11
	PCBD2	2.0	
	SCAPER	1.9	
E	ITGAD	1.9	4
B	ADAMTSL4	1.7	15
E	CCBE1	1.6	16
	QPCT	1.6	
B	BOC	1.3	17 / 18
	SPSB4	1.3	
	DDAH1	1.1	
B	SEMA5B	0.9	
B	BAI3	0.8	
B	GPR98	0.6	19
B	THSD7A	0.5	
	DMBT1	0.5	11 / 20 / 21 / 22
B	FNDC3A	0.1	5 / 23
F	GALNTL5	0.1	

1: endosome membrane || 2: late endosome membrane || 3: lysosomal membrane || 4: integrin complex || 5: acrosomal vesicle || 6: basal part of cell || 7: external side of plasma membrane || 8: membrane raft || 9: neuron projection ||
10: perikaryon || 11: proteinaceous extracellular matrix || 12: extracellular matrix || 13: Golgi lumen || 14: intermediate filament cytoskeleton || 15: interstitial matrix || 16: collagen || 17: axon || 18: growth cone || 19: stereocilia ankle link complex ||
20: extrinsic to membrane || 21: phagocytic vesicle membrane || 22: zymogen granule membrane || 23: vesicle membrane

ECM 25, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 21



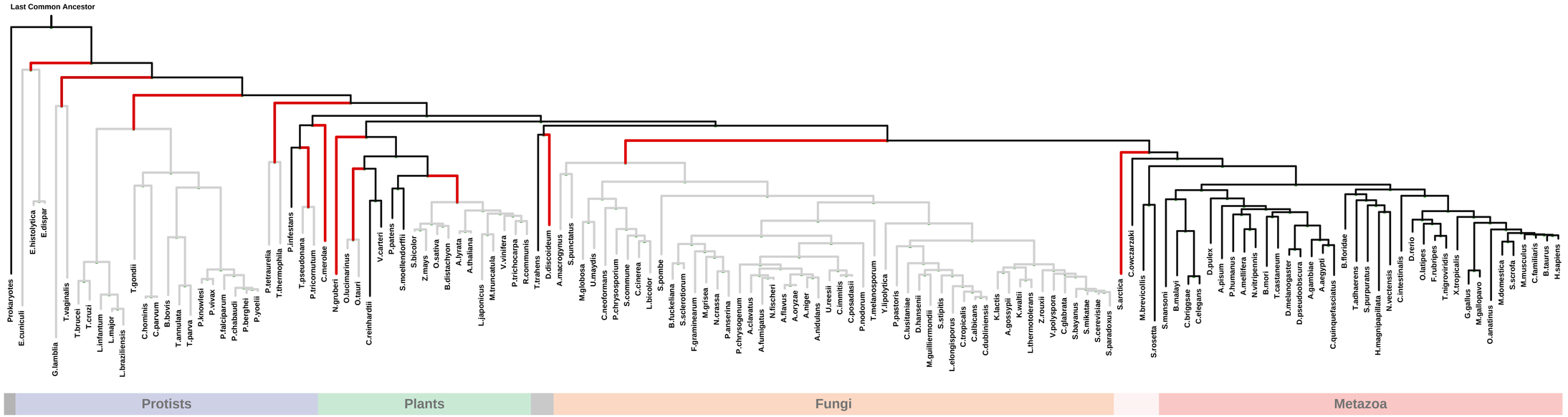


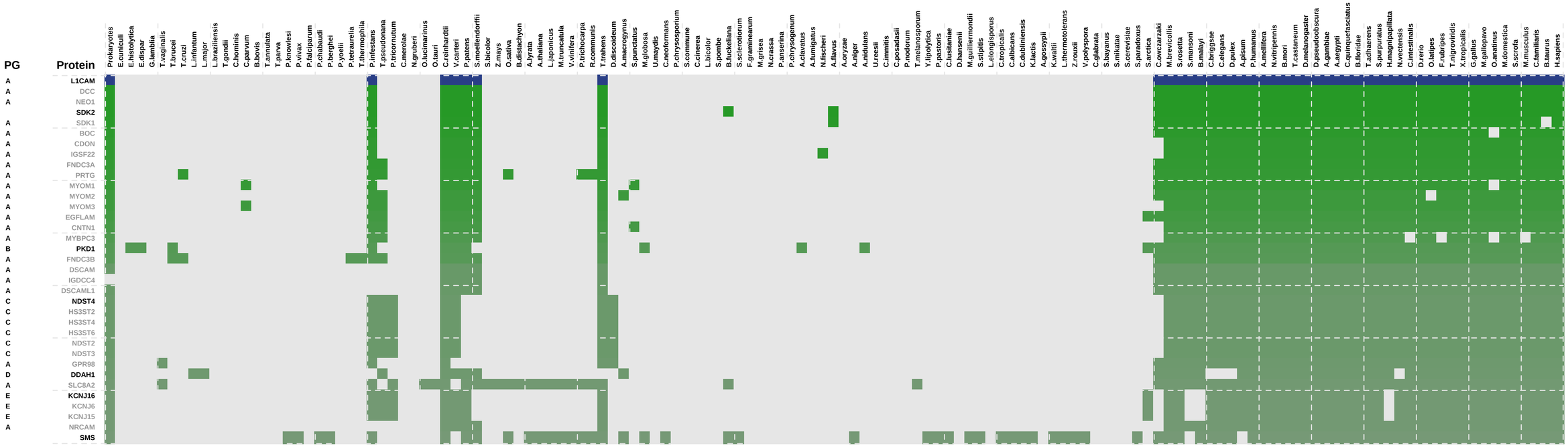
PG	Protein	LLR	Notes
	FBXO45		1 / 2 / 3
A	CALCRL	5.8	4 / 5
	CRHR2	5.8	
	FREM1	5.8	6
A	GHRHR	5.8	7 / 8 / 9 / 10
A	GIPR	5.8	
A	GLP1R	5.8	11
A	GLP2R	5.8	
A	PTH1R	5.8	12 / 13 / 14
A	SCTR	5.8	
	TPM3	5.8	15 / 16 / 17
A	VIPR1	5.8	
A	VIPR2	5.8	
B	DLGAP3	3.1	1 / 2
B	DLGAP4	3.1	18 / 19
B	DLGAP1	3.1	1 / 2
B	DLGAP2	3.1	1 / 2 / 20
C	BANF1P3	2.9	
C	BANF1	2.9	21
C	645870	2.9	
	PROM1	2.3	22 / 23 / 24 / 25 / 26
A	GCGR	1.6	4

1: postsynaptic density || 2: postsynaptic membrane || 3: presynaptic membrane || 4: endosome || 5: lysosome || 6: basement membrane || 7: nuclear inner membrane || 8: nuclear matrix || 9: nuclear outer membrane ||
10: secretory granule || 11: clathrin-coated endocytic vesicle || 12: basolateral plasma membrane || 13: brush border membrane || 14: receptor complex || 15: actin cytoskeleton || 16: muscle thin filament tropomyosin || 17: stress fiber ||
18: dendrite || 19: synapse || 20: neurofilament || 21: chromosome || 22: brush border || 23: microvillus membrane || 24: photoreceptor outer segment || 25: photoreceptor outer segment membrane || 26: stereocilium

ECM 26, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 174

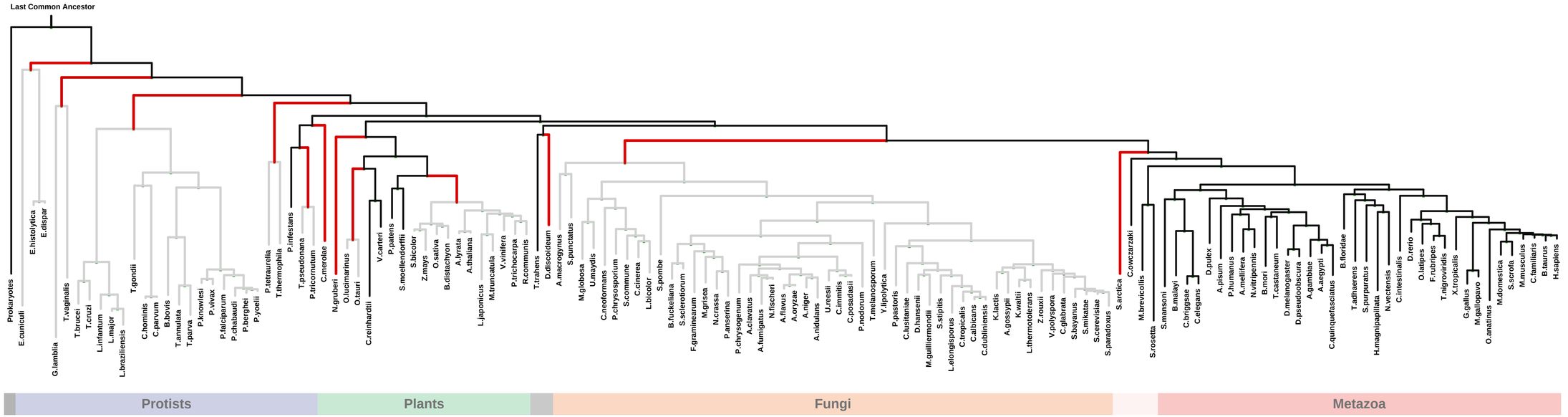


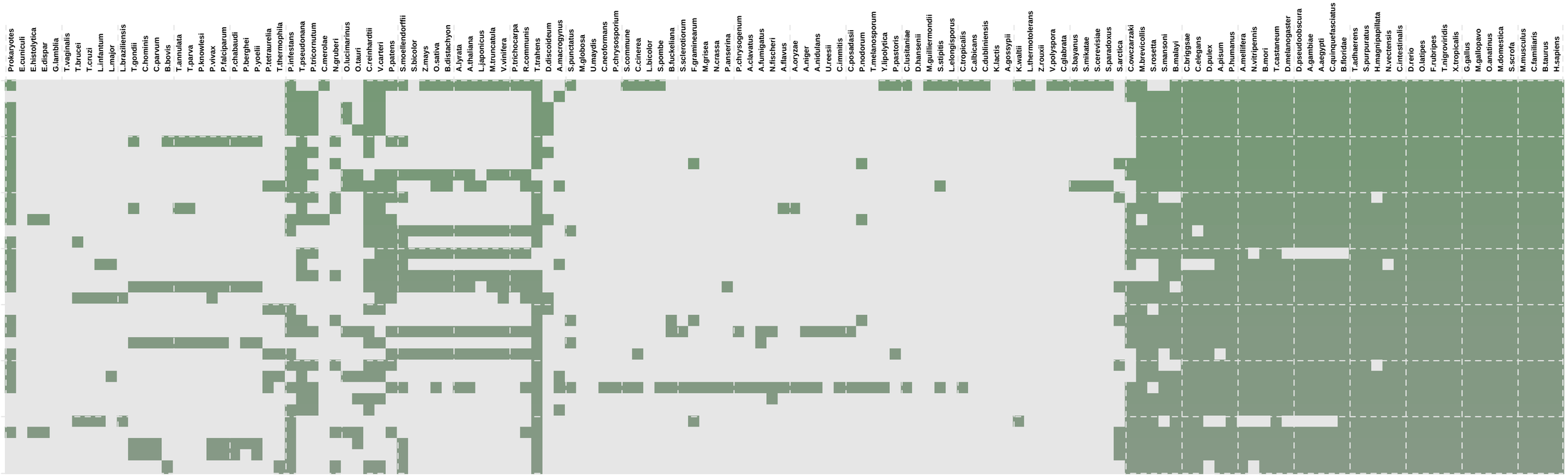


1: external side of plasma membrane || 2: presynaptic membrane || 3: terminal button || 4: axon || 5: growth cone membrane || 6: membrane raft || 7: growth cone || 8: extracellular matrix || 9: acrosomal vesicle || 10: vesicle membrane ||
11: M band || 12: striated muscle myosin thick filament || 13: myosin filament || 14: basement membrane || 15: interstitial matrix || 16: synapse || 17: anchored to membrane || 18: A band || 19: sarcomere || 20: basolateral plasma membrane ||
21: cilium || 22: motile primary cilium || 23: polycystin complex || 24: stereocilia ankle link complex || 25: dendritic spine || 26: voltage-gated potassium channel complex || 27: dendrite || 28: neuronal cell body membrane ||

ECM 26, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 174

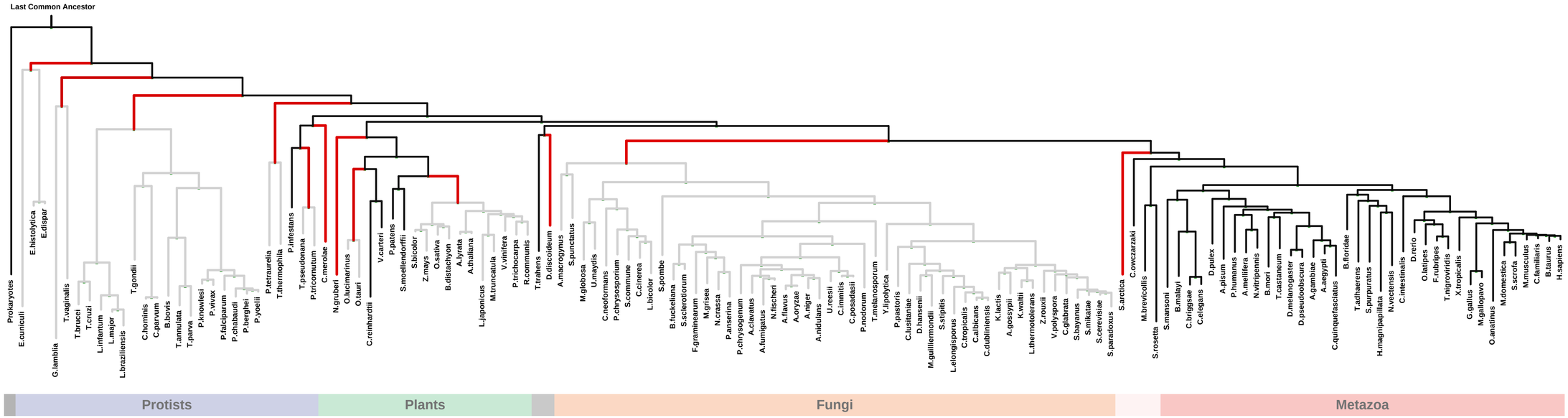


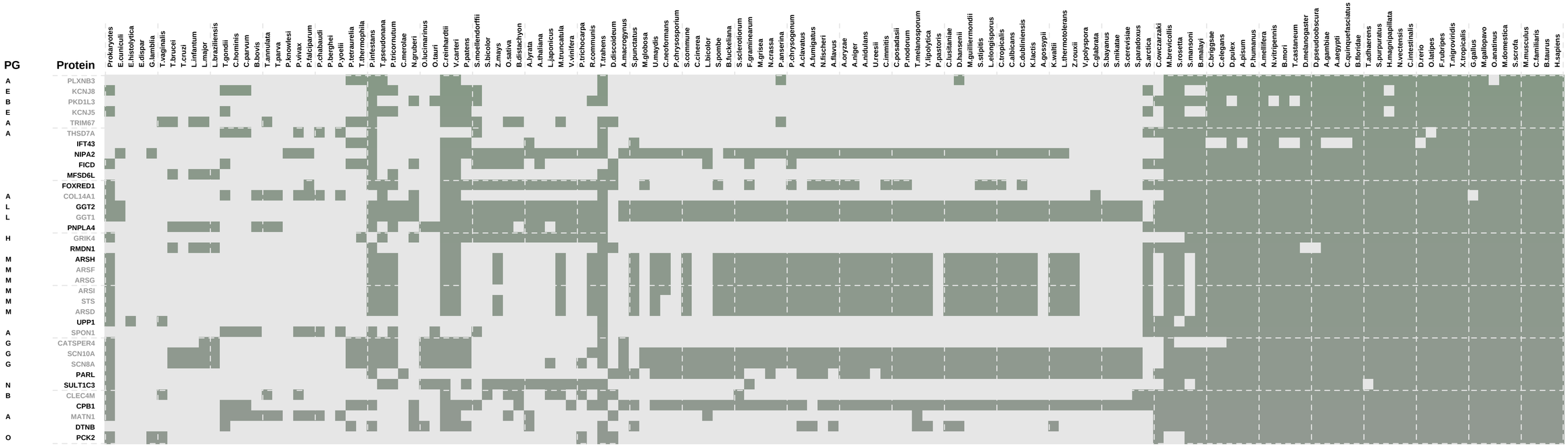


1: endoplasmic reticulum lumen || 2: extracellular matrix || 3: Golgi lumen || 4: CatSper complex || 5: cilium || 6: flagellar membrane || 7: external side of plasma membrane || 8: T-tubule || 9: voltage-gated potassium channel complex ||
10: integrin complex || 11: THO complex || 12: THO complex part of transcription export complex || 13: transcription export complex || 14: basement membrane || 15: endoplasmic reticulum-Golgi intermediate compartment || 16: fibrinogen complex ||
17: platelet alpha granule lumen || 18: proteinaceous extracellular matrix || 19: axon || 20: dendrite || 21: dendrite cytoplasm || 22: perikaryon || 23: postsynaptic membrane || 24: terminal button || 25: presynaptic membrane ||

ECM 26, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 174

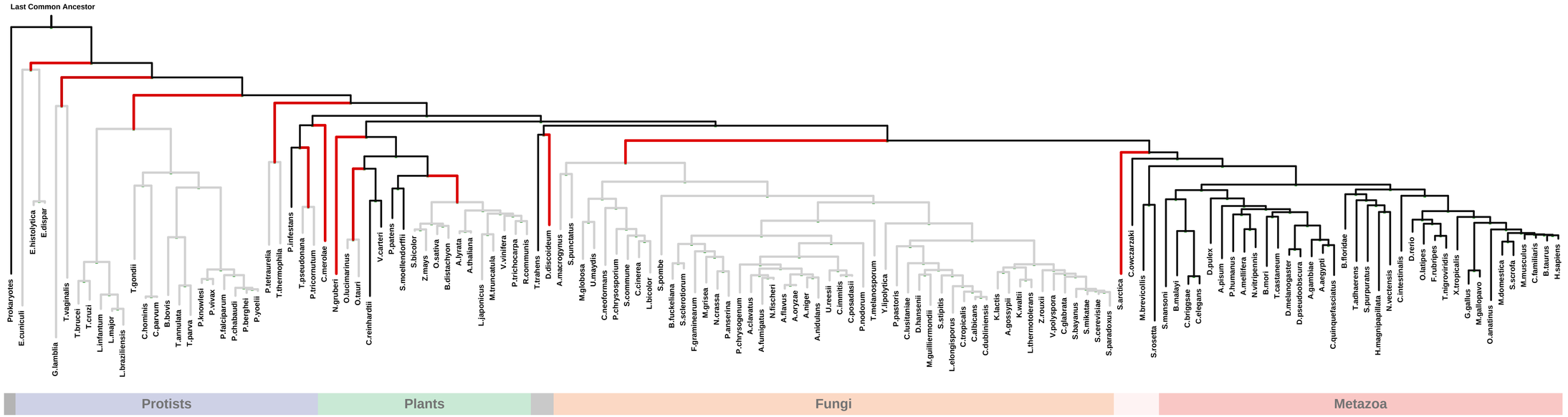


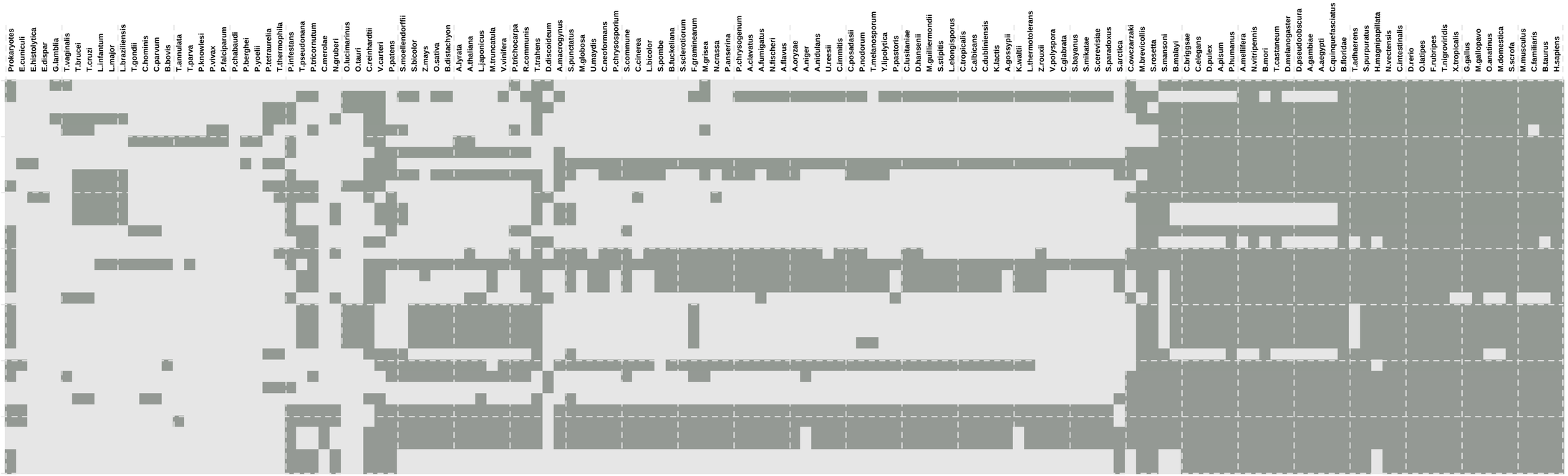


1: ATP-sensitive potassium channel complex || 2: myofibril || 3: sarcolemma || 4: voltage-gated potassium channel complex || 5: external side of plasma membrane || 6: T-tubule || 7: early endosome || 8: collagen || 9: endoplasmic reticulum lumen ||
10: extracellular matrix || 11: proteinaceous extracellular matrix || 12: anchored to external side of plasma membrane || 13: dendrite || 14: kainate selective glutamate receptor complex || 15: perikaryon || 16: postsynaptic membrane ||
17: presynaptic membrane || 18: terminal button || 19: spindle pole || 20: lysosome || 21: endosome || 22: nuclear envelope || 23: acrosomal vesicle || 24: CatSper complex || 25: cilium || 26: flagellar membrane ||

ECM 26, Gene set "presynaptic membrane", Page 4

Num of ECM Genes: 1. Num of Predicted Genes: 174

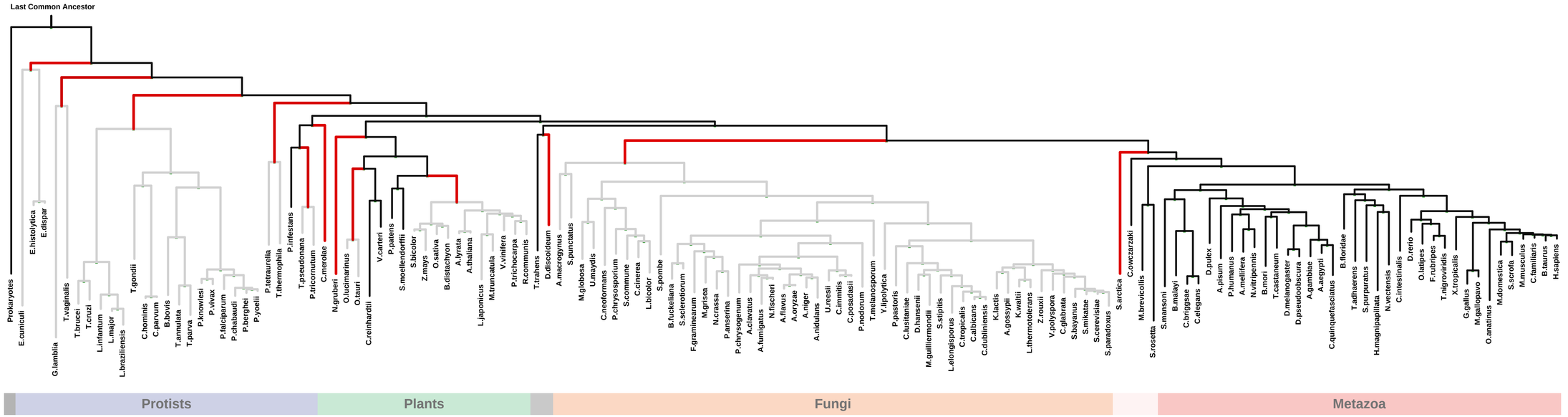




1: caveola || 2: microvillus membrane || 3: BBSome || 4: cilium membrane || 5: microtubule basal body || 6: Z disc || 7: extracellular matrix || 8: proteinaceous extracellular matrix || 9: Golgi cisterna membrane || 10: Golgi medial cisterna || 11: microtubule organizing center || 12: septin complex || 13: mitochondrial outer membrane || 14: CatSper complex || 15: cilium || 16: flagellar membrane || 17: apical part of cell || 18: Golgi stack || 19: integral to Golgi membrane || 20: clathrin-sculpted monoamine transport vesicle membrane || 21: dense core granule || 22: synaptic vesicle membrane || 23: terminal button || 24: lysosomal lumen || 25: endoplasmic reticulum lumen || 26: flagellar axoneme ||

ECM 26, Gene set "presynaptic membrane", Page 5

Num of ECM Genes: 1. Num of Predicted Genes: 174

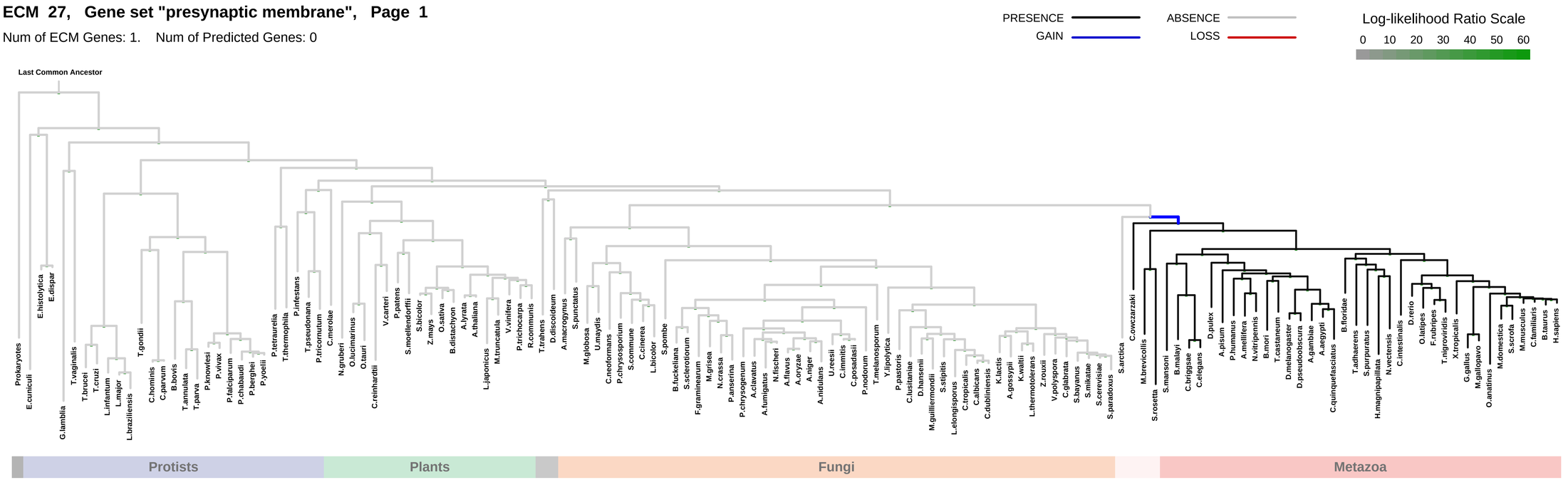


PG	Protein	LLR	Notes
U	CACNA2D2	1.9	1
	KCNJ12	1.8	
E	KCNJ18	1.8	
E	KCNJ12	1.8	
E	KCNJ4	1.8	2 / 3 / 4 / 5
E	100290070	1.8	
M	ARSE	1.8	6 / 7
K	FKRP	1.7	8 / 9 / 10
	TEX30	1.6	
	TM2D2	1.5	
	GATSL1	1.5	
U	CACNA2D1	1.3	1 / 11 / 12
V	SLC1A3	1.1	2 / 13 / 14 / 15
V	SLC1A4	1.1	16 / 17
B	LRTM2	1.1	
	KIFAP3	1.0	18 / 19 / 20
A	ITGAD	0.9	21
	TMEM65	0.9	
	MFSD12	0.7	
	STARD7	0.6	
A	THSD7B	0.6	
	C4orf29	0.5	
S	SLC26A1	0.5	
	COLGALT2	0.5	6
P	B3GNT3	0.5	
	VWA3A	0.4	
	GAS7	0.3	22 / 23
M	ARSK	0.3	6
Q	MTX1	0.3	24
	IFT140	0.3	25 / 26 / 27
A	ADAMTSL3	0.3	28
	MTX1P1	0.2	
A	PAPLN	0.2	29
	ZC2HC1B	0.2	
	TDO2	0.1	

1: voltage-gated calcium channel complex || 2: basolateral plasma membrane || 3: cytoplasmic vesicle membrane || 4: dendrite || 5: voltage-gated potassium channel complex || 6: endoplasmic reticulum lumen || 7: Golgi stack ||
8: dystrophin-associated glycoprotein complex || 9: rough endoplasmic reticulum || 10: sarcolemma || 11: sarcoplasmic reticulum || 12: T-tubule || 13: dendritic spine || 14: fibril || 15: synapse || 16: intermediate filament ||
17: melanosome || 18: condensed nuclear chromosome || 19: kinesin II complex || 20: spindle microtubule || 21: integrin complex || 22: actin filament || 23: ruffle || 24: mitochondrial outer membrane || 25: cilium axoneme ||

ECM 27, Gene set "presynaptic membrane", Page 1

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

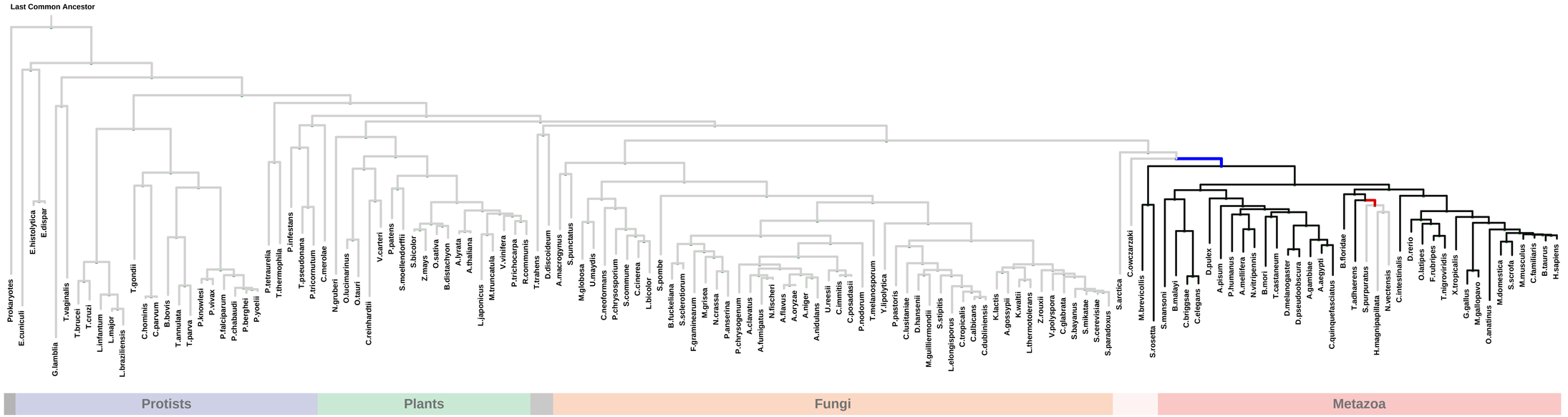


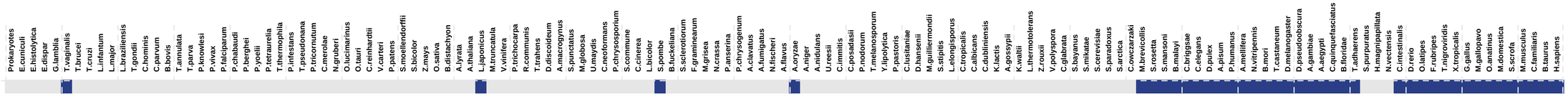
PG	Protein	LLR	Notes
	RIMS2		1

1: presynaptic membrane

ECM 28, Gene set "presynaptic membrane", Page 1

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

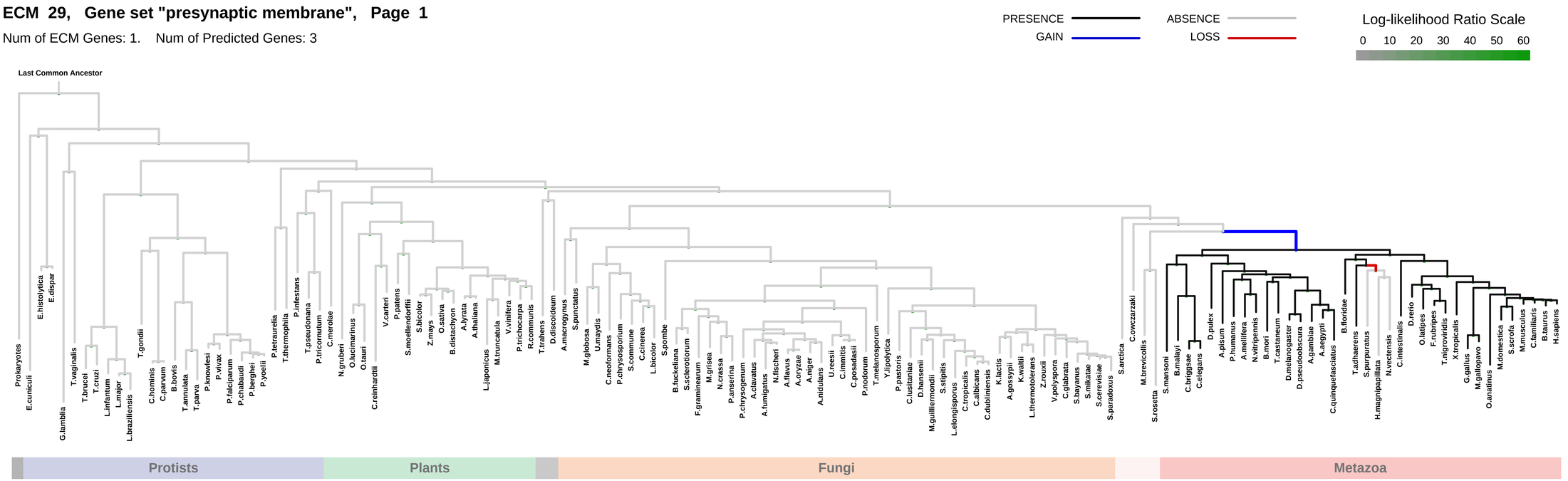




1: IkappaB kinase complex || 2: presynaptic membrane

ECM 29, Gene set "presynaptic membrane", Page 1

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

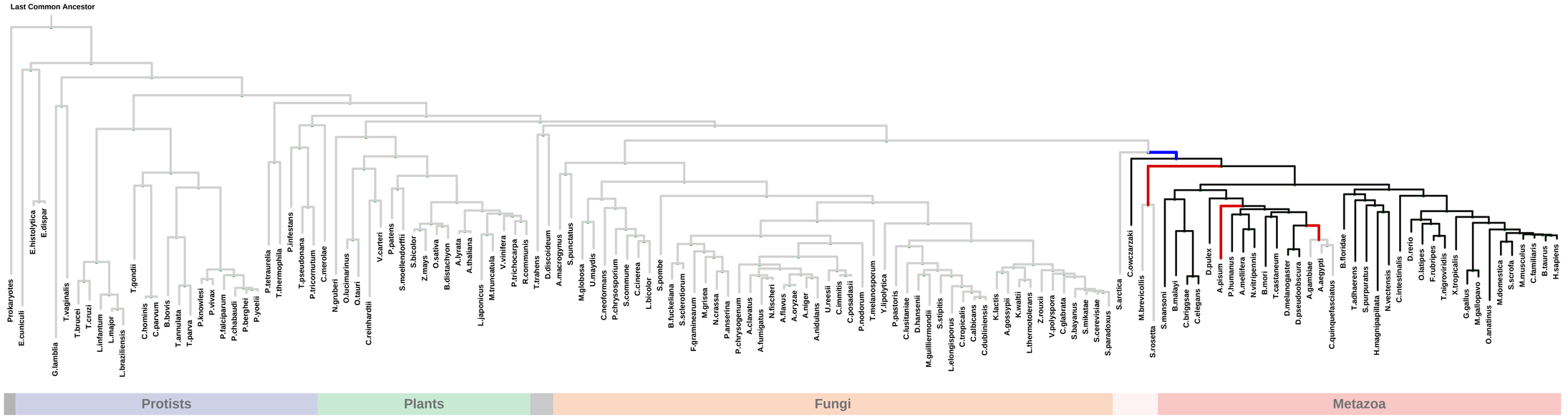


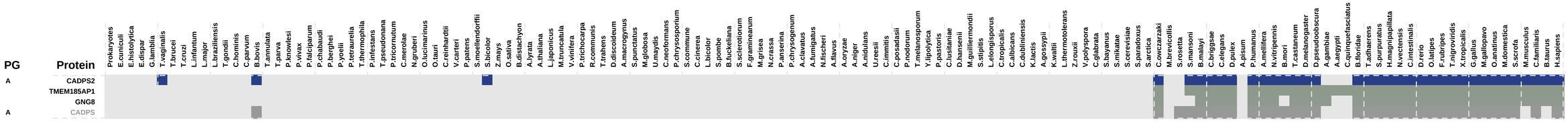
PG	Protein	LLR	Notes
	ERC2		1 / 2
	MRPL42	2.6	3
	CD200	2.0	
	SKIDA1	0.5	

1: growth cone || 2: presynaptic membrane || 3: mitochondrial small ribosomal subunit

ECM 30, Gene set "presynaptic membrane", Page 1

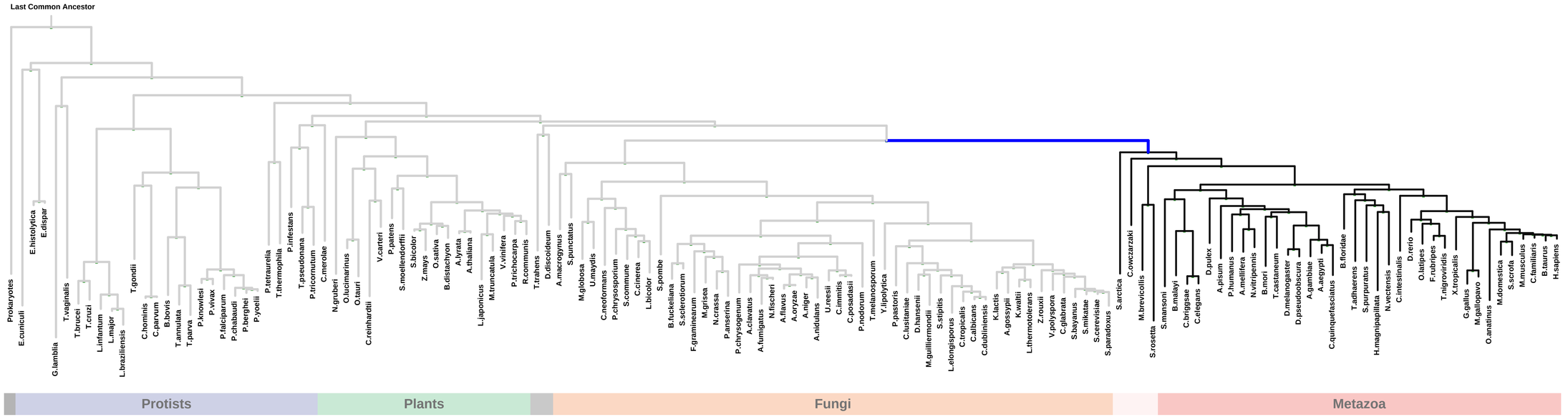
Num of ECM Genes: 1. Num of Predicted Genes: 3





ECM 31, Gene set "presynaptic membrane", Page 1

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

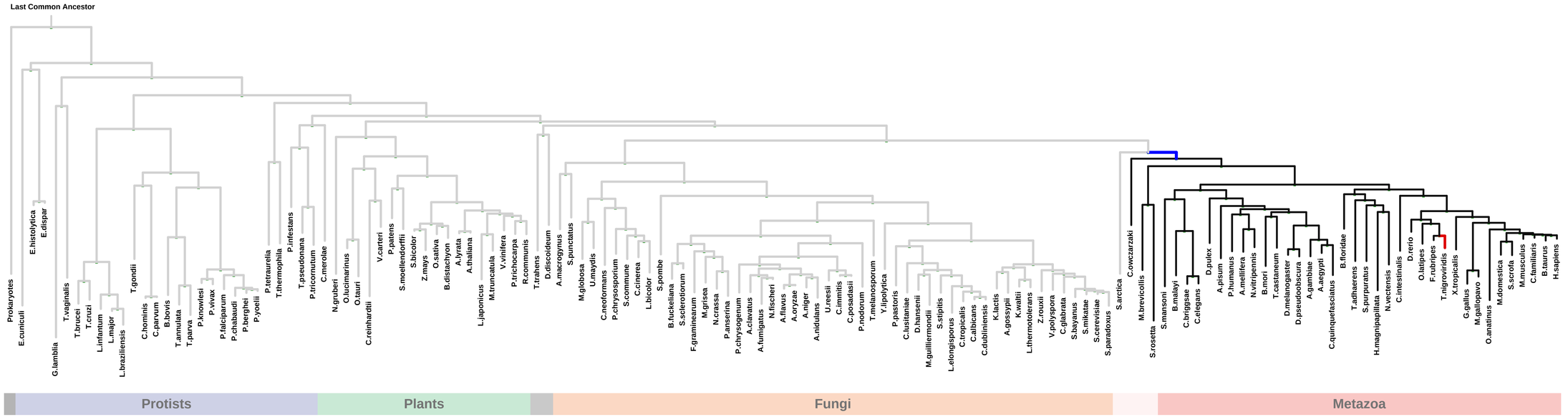


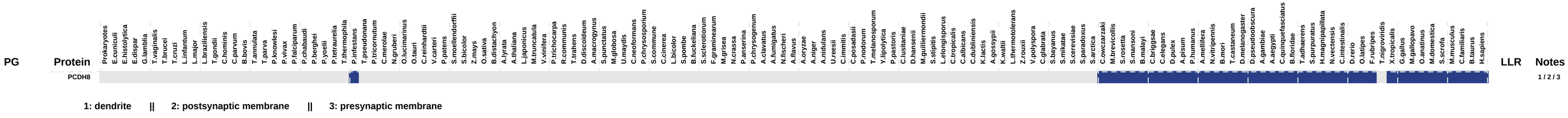
PG	Protein	LLR	Notes
	PICK1		1 / 2 / 3 / 4

1: endocytic vesicle membrane || 2: postsynaptic density || 3: presynaptic membrane || 4: synapse

ECM 32, Gene set "presynaptic membrane", Page 1

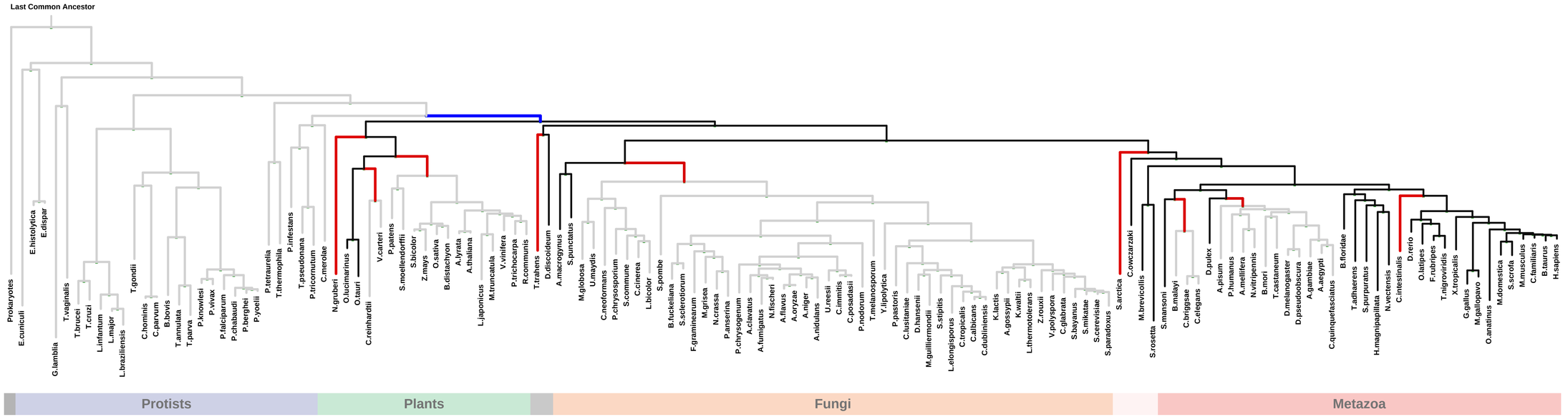
Num of ECM Genes: 1. Num of Predicted Genes: 0

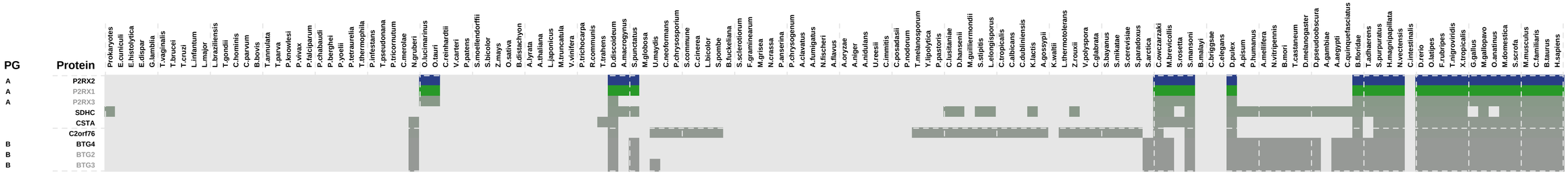




ECM 33, Gene set "presynaptic membrane", Page 1

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

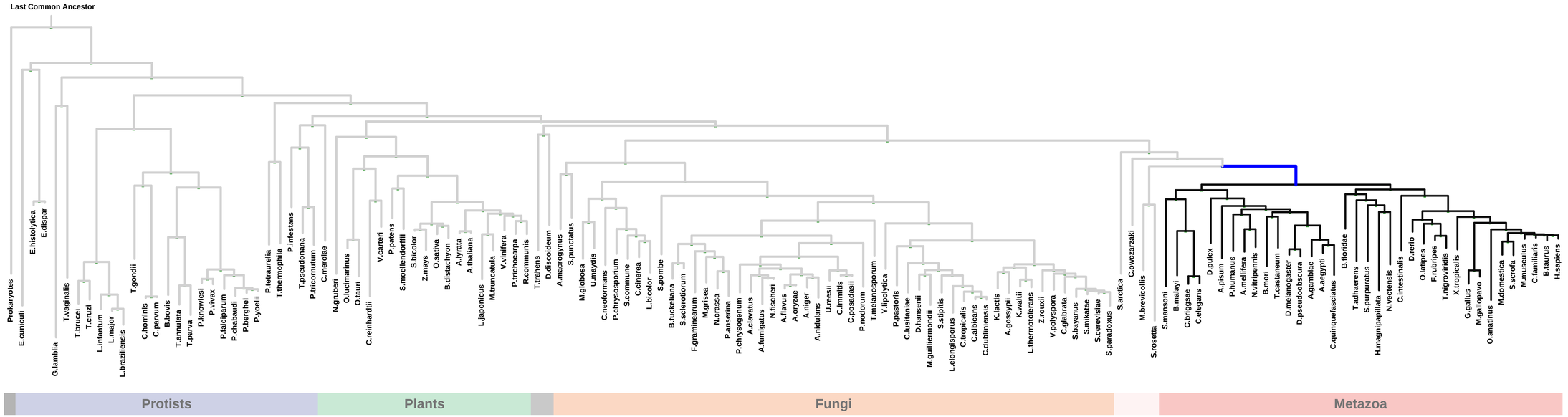




1: postsynaptic density || 2: presynaptic membrane || 3: terminal button || 4: membrane raft || 5: postsynaptic membrane || 6: dendritic spine || 7: rough endoplasmic reticulum || 8: mitochondrial respiratory chain complex II ||
9: cornified envelope

ECM 34, Gene set "presynaptic membrane", Page 1

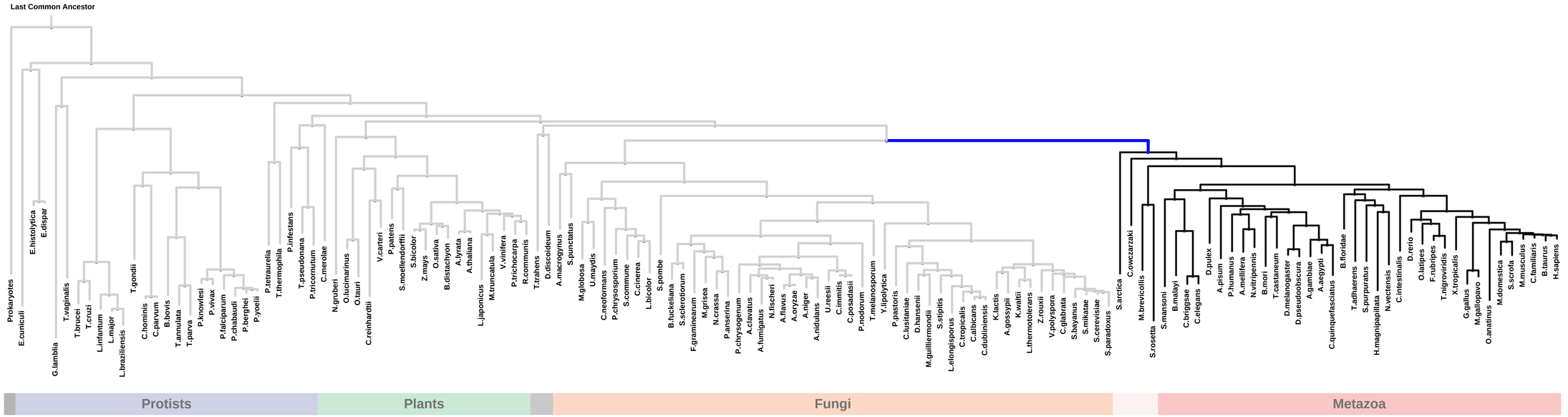
Num of ECM Genes: 1. Num of Predicted Genes: 0





ECM 35, Gene set "presynaptic membrane", Page 1

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

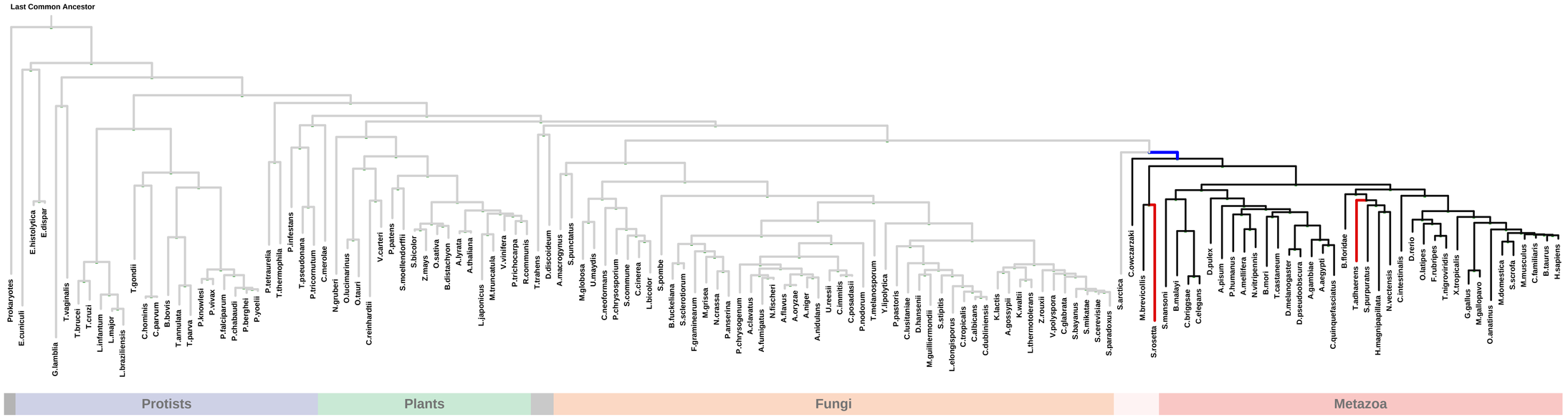


PG	Protein	LLR	Notes
	NRXN1		1 / 2 / 3 / 4

1: axonal growth cone || 2: endocytic vesicle || 3: presynaptic membrane || 4: synapse

ECM 36, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 46

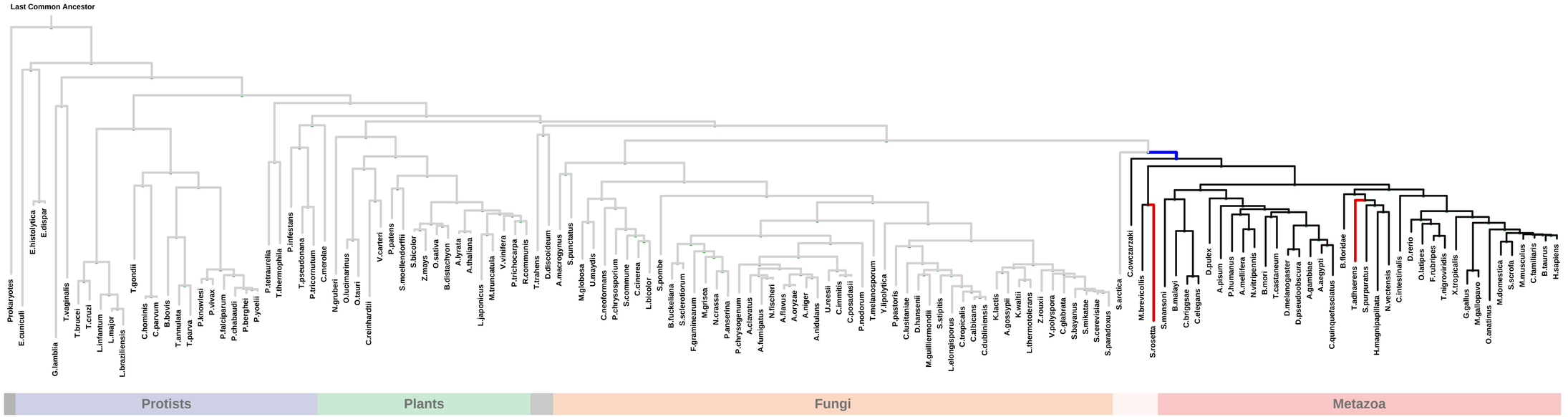


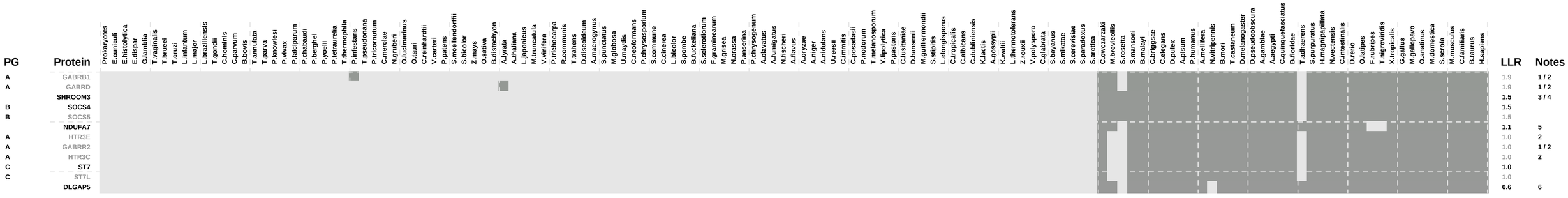


1: chloride channel complex || 2: dendrite || 3: neuronal cell body membrane || 4: postsynaptic membrane || 5: presynaptic membrane || 6: receptor complex || 7: synaptic cleft || 8: acetylcholine-gated channel complex || 9: axon ||
10: integral to synaptic vesicle membrane || 11: dendrite membrane || 12: microtubule cytoskeleton || 13: calcium channel complex || 14: synapse || 15: neuromuscular junction || 16: postsynaptic density || 17: external side of plasma membrane

ECM 36, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 46

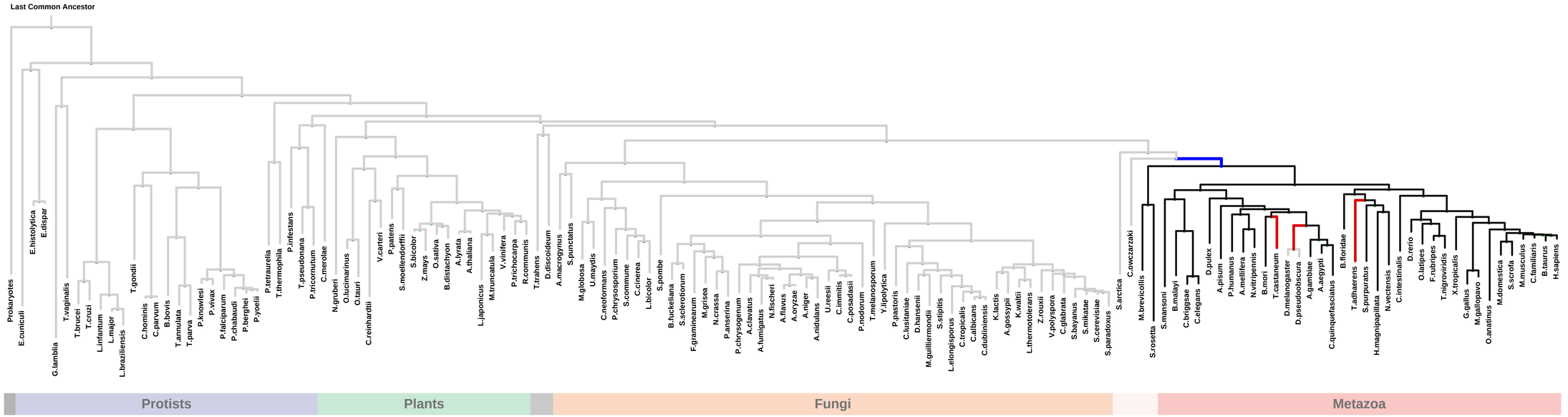




1: chloride channel complex || 2: postsynaptic membrane || 3: adherens junction || 4: apical junction complex || 5: mitochondrial respiratory chain complex I || 6: spindle pole centrosome

ECM 37, Gene set "presynaptic membrane", Page 1

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

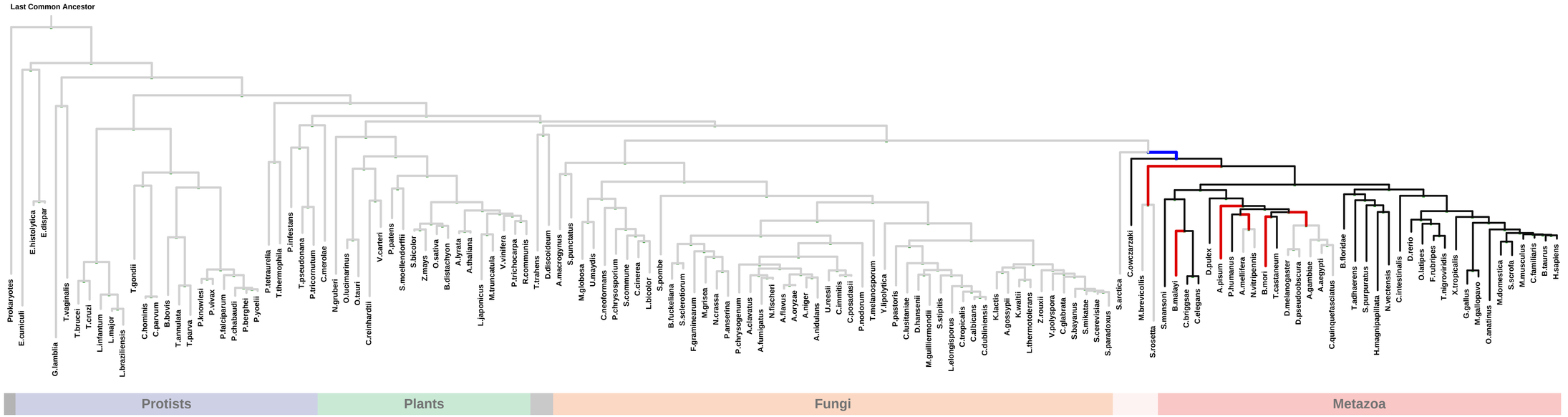


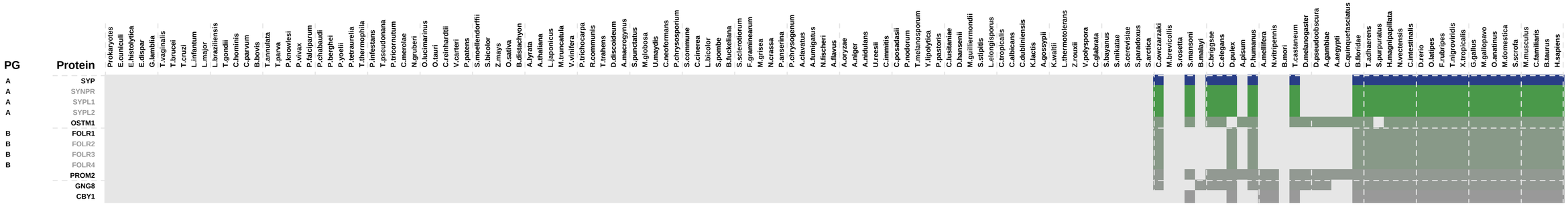


1: dendritic spine || 2: growth cone || 3: lamellipodium || 4: nuclear speck || 5: postsynaptic membrane || 6: presynaptic membrane || 7: synapse

ECM 38, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 11

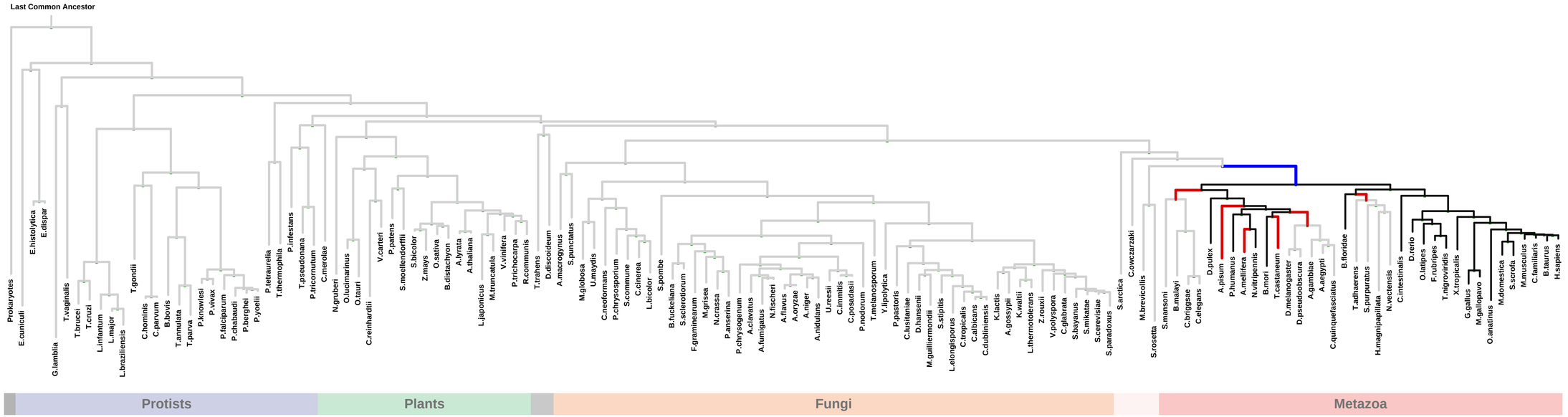




1: integral to synaptic vesicle membrane || 2: neuron projection terminus || 3: presynaptic active zone || 4: presynaptic membrane || 5: neuron projection || 6: synaptic vesicle membrane || 7: cytoplasmic vesicle membrane || 8: melanosome ||
9: secretory granule || 10: synaptic vesicle || 11: lysosomal membrane || 12: anchored to membrane || 13: extrinsic to membrane || 14: basolateral plasma membrane || 15: cilium membrane || 16: microvillus membrane || 17: heterotrimeric G-protein complex ||
18: microtubule basal body || 19: nuclear speck || 20: trans-Golgi network

ECM 39, Gene set "presynaptic membrane", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 83

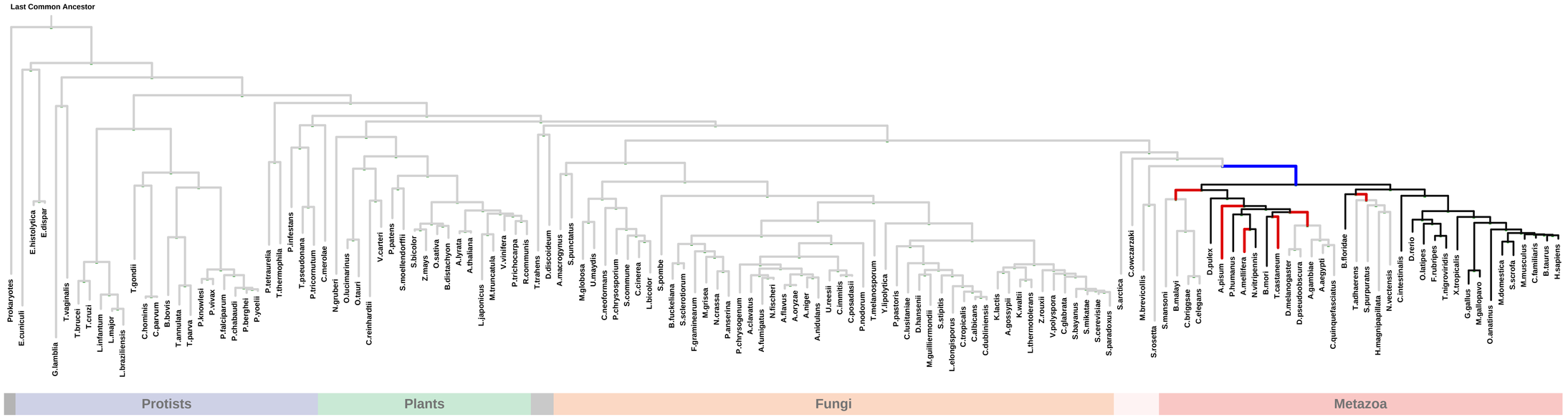


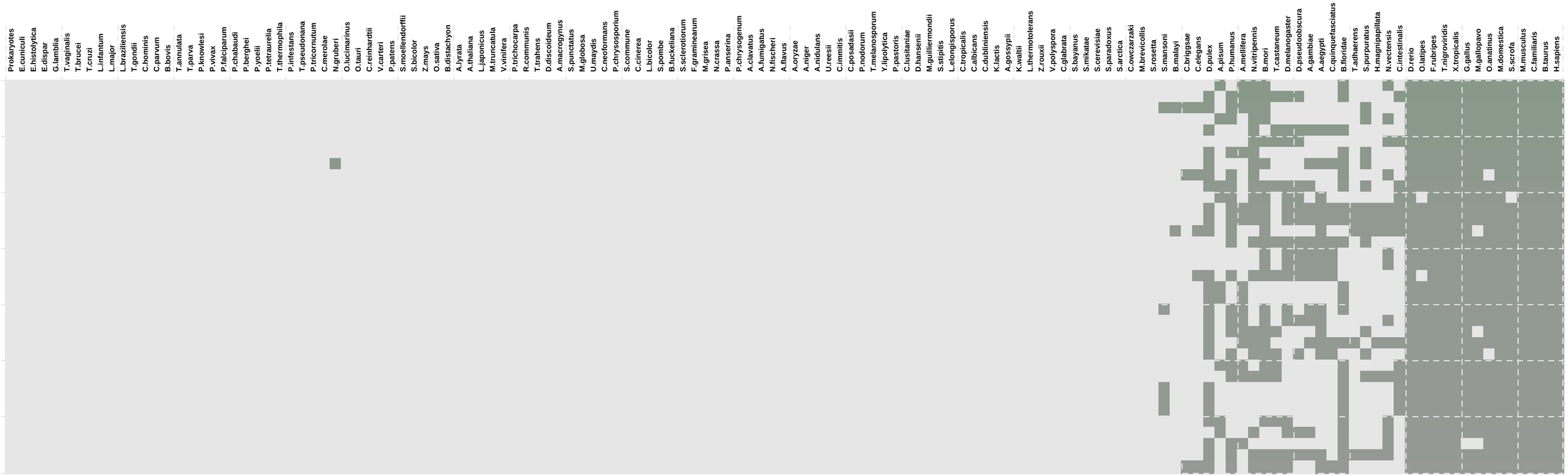


1: presynaptic membrane || 2: compact myelin || 3: membrane raft || 4: insulin-like growth factor binding protein complex || 5: platelet alpha granule lumen || 6: histone methyltransferase complex || 7: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 8: endocytic vesicle membrane || 9: voltage-gated calcium channel complex || 10: focal adhesion || 11: protein phosphatase type 1 complex || 12: sarcomere || 13: external side of plasma membrane

ECM 39, Gene set "presynaptic membrane", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 83



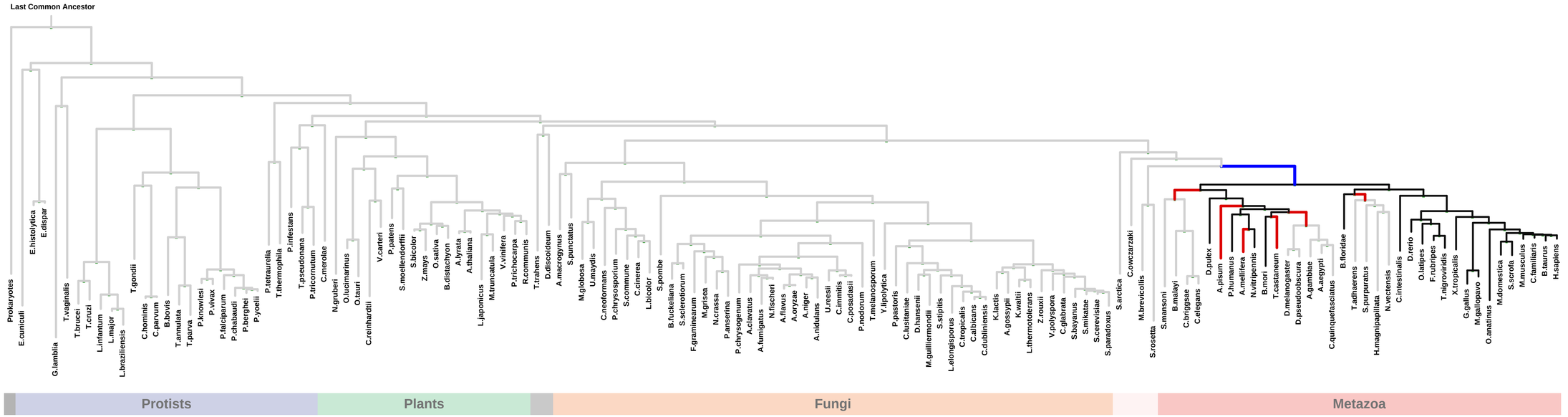


PG	Protein	LLR	Notes
	OR5AP2	6.9	
	CDC42EP4	6.8	1 / 2 / 3
	LGALS3	6.5	4 / 5 / 6
	CDKN2AIP	6.4	7
	SPATA2L	6.3	
	RILP	6.0	8 / 9 / 10 / 11 / 12
	CDCA4	5.7	
	RBP4	5.5	
	CNRIP1	5.5	
	EVPLL	4.1	
	SUSD3	3.9	
H	TET3	3.5	13
H	TET2	3.5	
B	POLR3G	3.5	14
	COX7A1	3.2	15
I	GADD45A	3.1	
I	GADD45B	3.1	
	SDC3	2.9	16 / 17 / 18
J	LYPD6B	2.7	19
J	LYPD6	2.7	
	EPGN	2.6	
	BCL9	2.6	
	C9orf16	2.5	
C	FAM117B	2.5	
	MID1IP1	2.4	3
	CRLF1	2.4	20
	GAREML	2.2	
K	C1QB	2.2	21 / 22
K	EMILIN1	2.2	4 / 21
K	MMRN2	2.2	23
G	TNFSF13B	2.1	
	MRGPRX3	1.9	
	CNPY1	1.7	
	EPCAM	1.6	24 / 25 / 26
L	TPBGL	1.4	

1: actin cytoskeleton || 2: endomembrane system || 3: microtubule cytoskeleton || 4: extracellular matrix || 5: proteinaceous extracellular matrix || 6: spliceosomal complex || 7: granular component || 8: late endosome || 9: late endosome membrane ||
10: lysosomal membrane || 11: lysosome || 12: phagocytic vesicle membrane || 13: male pronucleus || 14: DNA-directed RNA polymerase III complex || 15: mitochondrial respiratory chain || 16: axon || 17: Golgi lumen || 18: lysosomal lumen ||
19: anchored to membrane || 20: CRLF-CLCF1 complex || 21: collagen || 22: complement component C1 complex || 23: basement membrane || 24: basolateral plasma membrane || 25: lateral plasma membrane || 26: tight junction

ECM 39, Gene set "presynaptic membrane", Page 3

Num of ECM Genes: 1. Num of Predicted Genes: 83



PG	Protein	LLR	Notes
	IGFBP4	1.1	
	CLEC1B	1.0	
E	CACNG7	0.8	1 / 2
D	BTNL3	0.7	
	GKAP1	0.7	
	MED9	0.6	3
K	CBLN1	0.6	4
	LALBA	0.6	
	IL17D	0.6	
L	LOC100507050	0.4	
	KATNBL1	0.3	
	TOR1AIP1	0.3	5
	C18orf32	0.3	
	CCR10	0.2	

1: alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid selective glutamate receptor complex || 2: voltage-gated calcium channel complex || 3: mediator complex || 4: synapse || 5: nuclear inner membrane