

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

Dataset:

Num of genes in input gene set: 16
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.

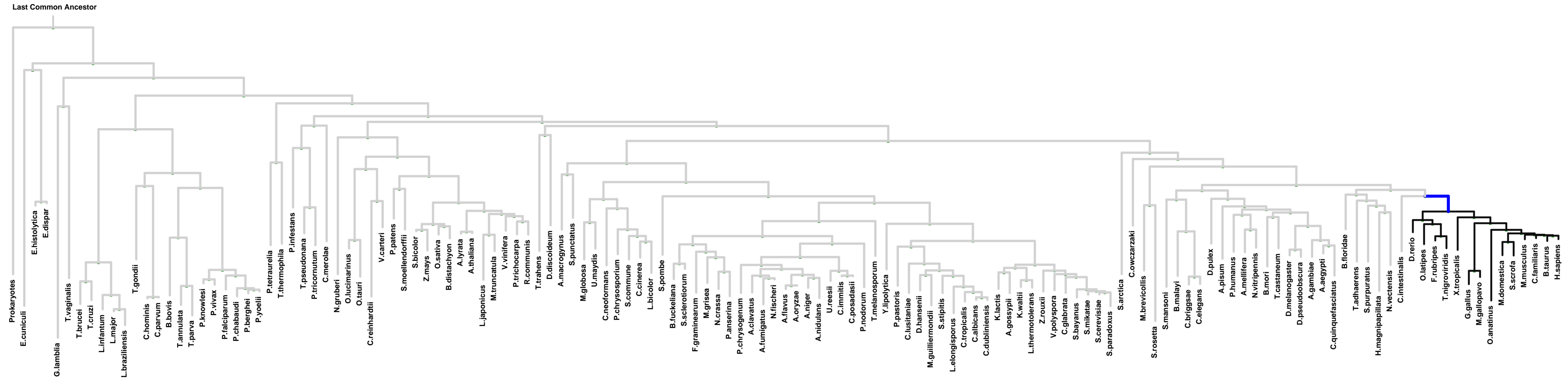
ECM 1, Gene set "MHC class II protein complex", Page 1

Num of ECM Genes: 9. Num of Predicted Genes: 0. ECM Strength: 0.0

PRESENCE ——— ABSENCE ———
GAIN ——— LOSS ———

Log-likelihood Ratio Scale

0 10 20 30 40 50 60



PG
A
A
A
A
A
A
A
A
A

Protein
HLA-DMA
HLA-DPA1
HLA-DQB1
HLA-DQB2
HLA-DRA
HLA-DRB1
HLA-DRB3
HLA-DRB4
HLA-DRB5

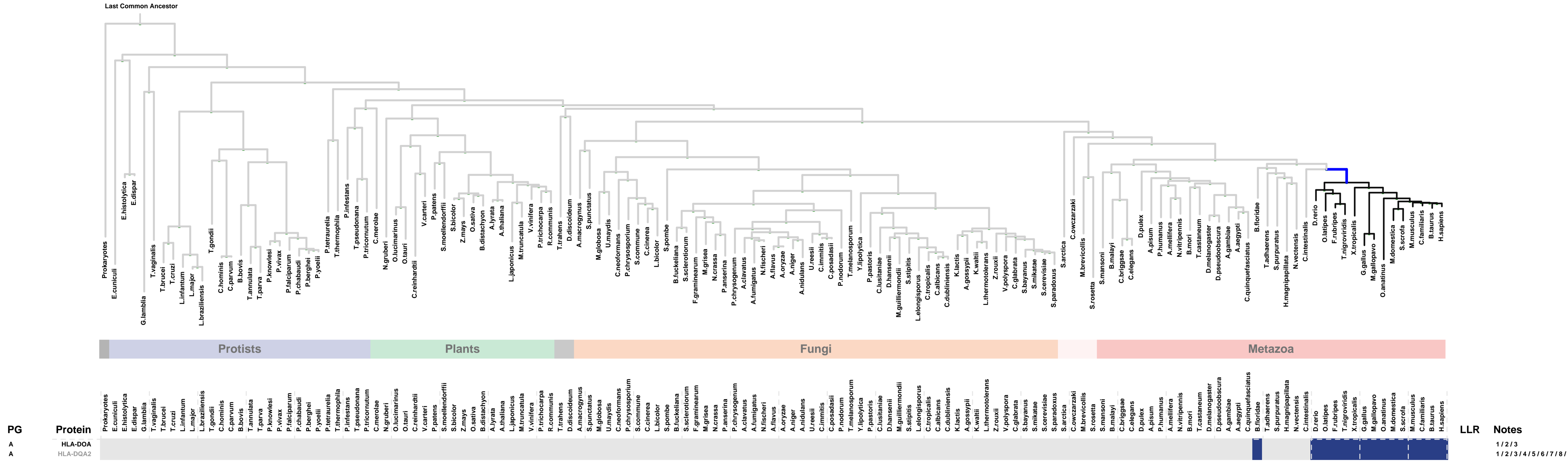
Prokaryotes	Prokaryotes	
E.cuniculi	E.cuniculi	
E.histolytica	E.histolytica	
E.dispar	E.dispar	
G.lambli	G.lambli	
T.vaginalis	T.vaginalis	
T.brucel	T.brucel	
T.cruzi	T.cruzi	
L.infantum	L.infantum	
L.major	L.major	
L.brazilienis	L.brazilienis	
T.gondii	T.gondii	
C.hominis	C.hominis	
C.parvum	C.parvum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

LLR Notes
1/2/3/4
2/3/5/6/7/8/9/10/11
2/3/5/6/7/8/9/10/11
2/3/5/6/7/8/9/10/11
1/2/3/5/6/8/9/10/11
1/2/3/5/6/8/9/10/11
1/2/3/5/6/8/9/10/11
1/2/3/5/6/8/9/10/11

1: late endosome membrane || 2: lysosomal membrane || 3: MHC class II protein complex || 4: multivesicular body || 5: clathrin-coated endocytic vesicle membrane || 6: endocytic vesicle membrane || 7: endosome membrane || 8: ER to Golgi transport vesicle membrane || 9: integral to luminal side of endoplasmic reticulum membrane || 10: trans-Golgi network membrane || 11: transport vesicle membrane || 12: lysosome || 13: external side of plasma membrane

ECM 2, Gene set "MHC class II protein complex", Page 1

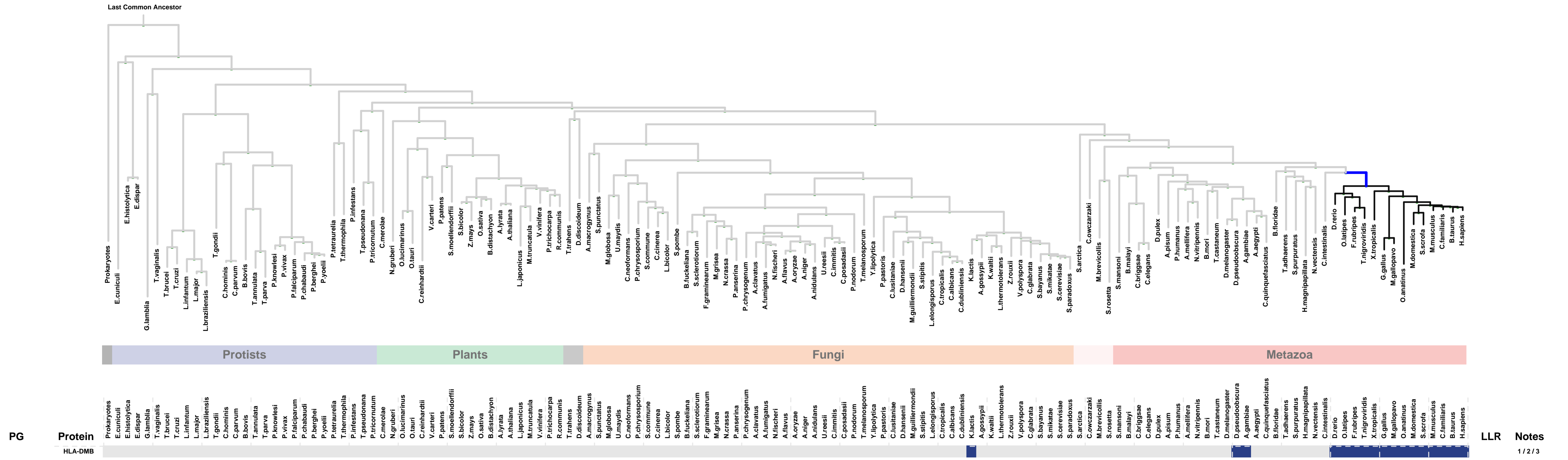
Num of ECM Genes: 2. Num of Predicted Genes: 0. ECM Strength: 0.0



1: endosome membrane || 2: lysosomal membrane || 3: MHC class II protein complex || 4: clathrin-coated endocytic vesicle membrane || 5: endocytic vesicle membrane || 6: ER to Golgi transport vesicle membrane || 7: integral to luminal side of endoplasmic reticulum membrane || 8: trans-Golgi network membrane || 9: transport vesicle membrane

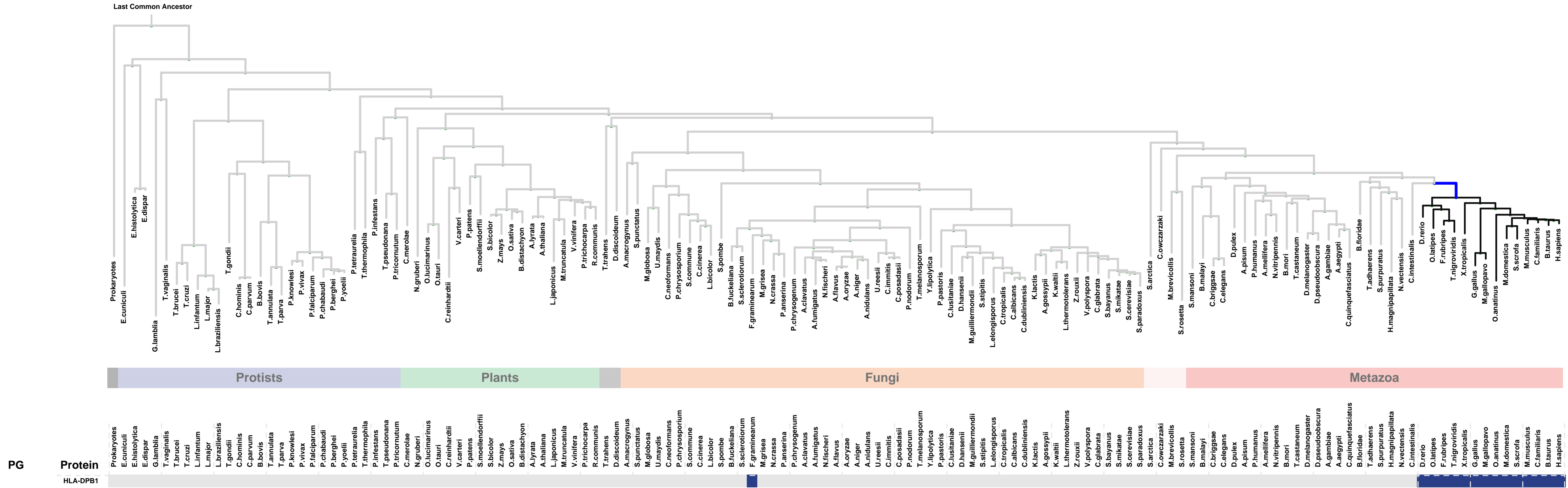
ECM 3, Gene set "MHC class II protein complex", Page 1

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



ECM 4, Gene set "MHC class II protein complex", Page 1

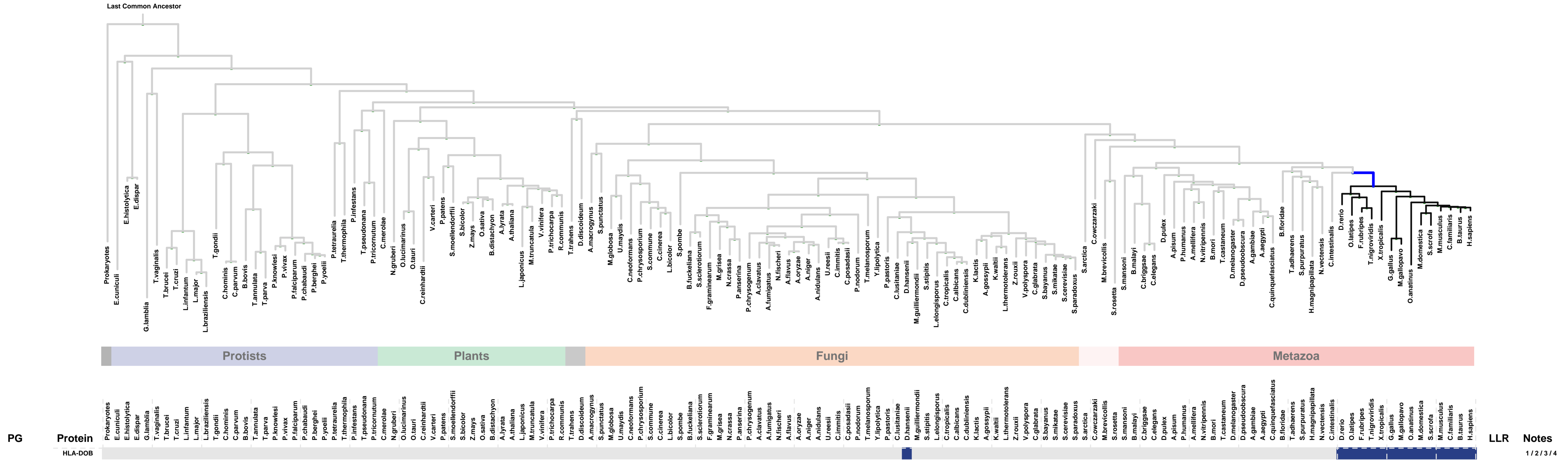
Num of ECM Genes: 1. Num of Predicted Genes: 0



1: clathrin-coated endocytic vesicle membrane || 2: endocytic vesicle membrane || 3: endosome membrane || 4: ER to Golgi transport vesicle membrane || 5: integral to luminal side of endoplasmic reticulum membrane || 6: lysosomal membrane || 7: MHC class II protein complex || 8: trans-Golgi network membrane || 9: transport vesicle membrane

ECM 5, Gene set "MHC class II protein complex", Page 1

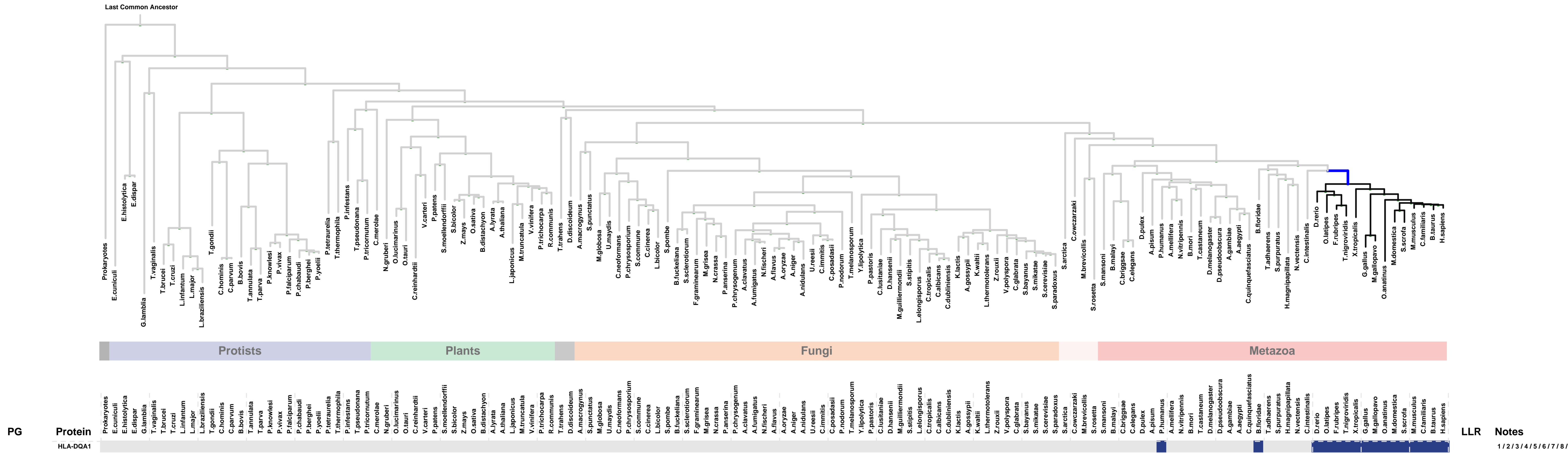
Num of ECM Genes: 1. Num of Predicted Genes: 0



LLR Notes
1/2/3/4

ECM 6, Gene set "MHC class II protein complex", Page 1

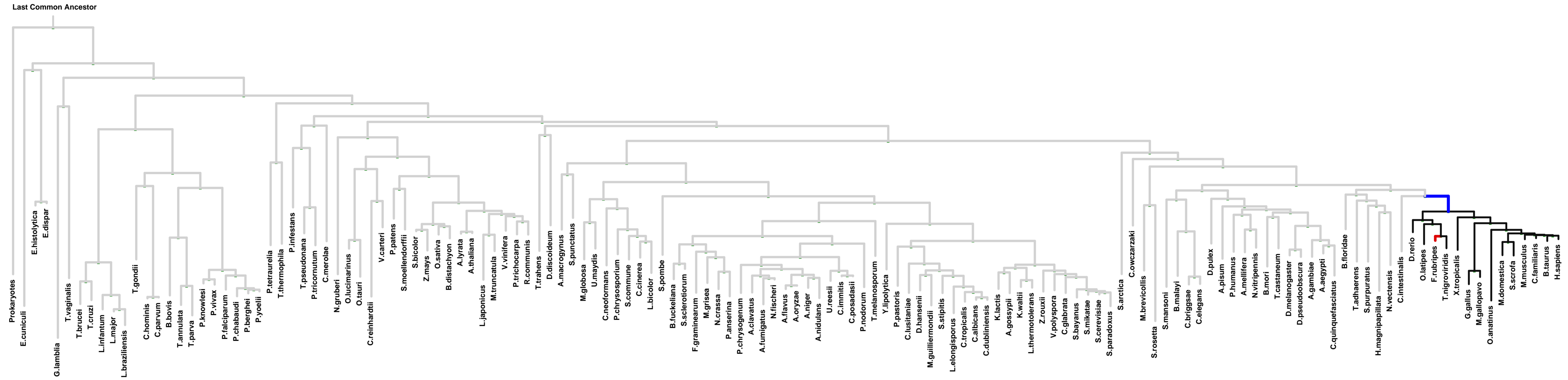
Num of ECM Genes: 1. Num of Predicted Genes: 0



1: clathrin-coated endocytic vesicle membrane || 2: endocytic vesicle membrane || 3: endosome membrane || 4: ER to Golgi transport vesicle membrane || 5: integral to luminal side of endoplasmic reticulum membrane || 6: lysosomal membrane || 7: MHC class II protein complex || 8: trans-Golgi network membrane || 9: transport vesicle membrane

ECM 7, Gene set "MHC class II protein complex", Page 1

Num of ECM Genes: 1. Num of Predicted Genes: 36

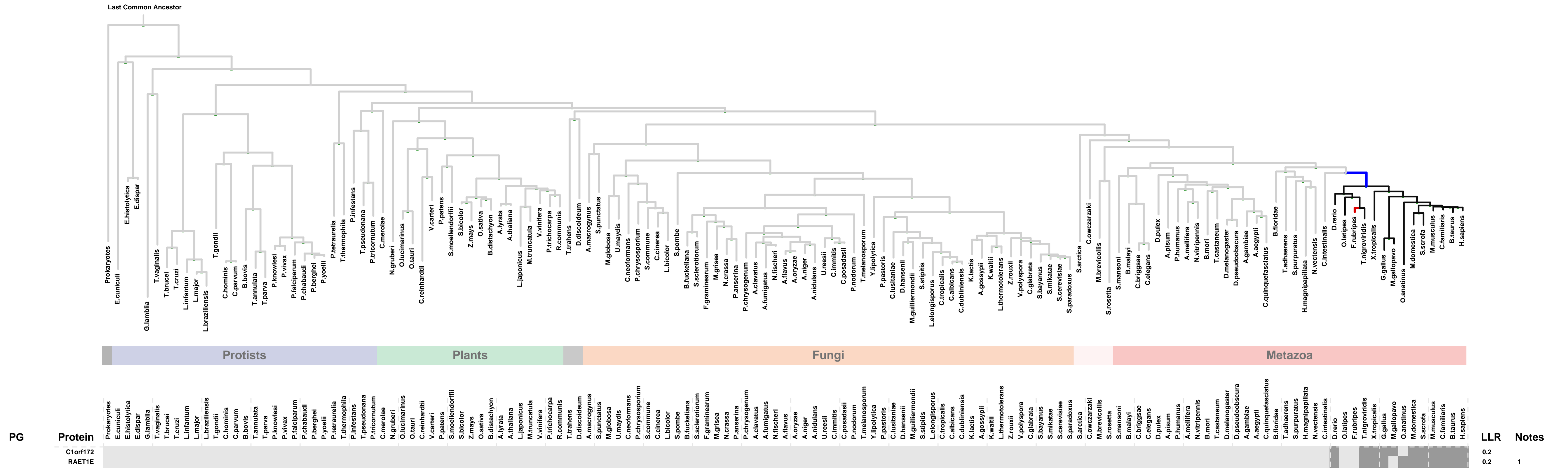


PG	Protein	LLR	Notes
	CD74		
	LOC646543	6.3	1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17
	C9orf91	5.3	
A	FXYD2	5.3	13
A	FXYD3	5.3	14
A	FXYD6	5.3	
	HLA-DPB2	5.3	
	KIAA1671	5.3	
	LCN1	5.3	
	PROSER2	5.3	
	LSP1	5.3	
B	MFAP2	5.3	15
	MUSTN1	5.3	16
	AHDC1	5.3	
	GMNC	4.5	
	FNDC9	4.2	
	C11orf24	4.2	
	GNRH2	3.4	
C	LILRA1	3.3	
C	LILRB2	3.0	
	RIPPLY3	3.0	
	FCER1G	3.0	
	CEP68	3.0	4/17
A	FXYD1	3.0	
D	TMSB15A	3.0	14
D	TMSB15B	3.0	
	100287712	3.0	
	100510144	3.0	
C	100510200	3.0	
	FAM180B	2.9	
	CYYR1	2.6	
B	MFAP5	2.4	16
	CAST	2.4	
	PNRC1	2.4	
	KRCC1	1.2	
		0.8	

1: clathrin-coated endocytic vesicle membrane || 2: endocytic vesicle membrane || 3: ER to Golgi transport vesicle membrane || 4: external side of plasma membrane || 5: integral to luminal side of endoplasmic reticulum membrane || 6: lysosomal lumen || 7: lysosomal membrane || 8: MHC class II protein complex || 9: multivesicular body || 10: trans-Golgi network membrane || 11: transport vesicle membrane || 12: vacuole || 13: sodium:potassium-exchanging ATPase complex || 14: chloride channel complex || 15: actin cytoskeleton || 16: microfilament || 17: Fc-epsilon receptor I complex

ECM 7, Gene set "MHC class II protein complex", Page 2

Num of ECM Genes: 1. Num of Predicted Genes: 36



PG

Protein	LLR	Notes
C1orf172	0.2	
RAET1E	0.2	1

1: MHC class I protein complex