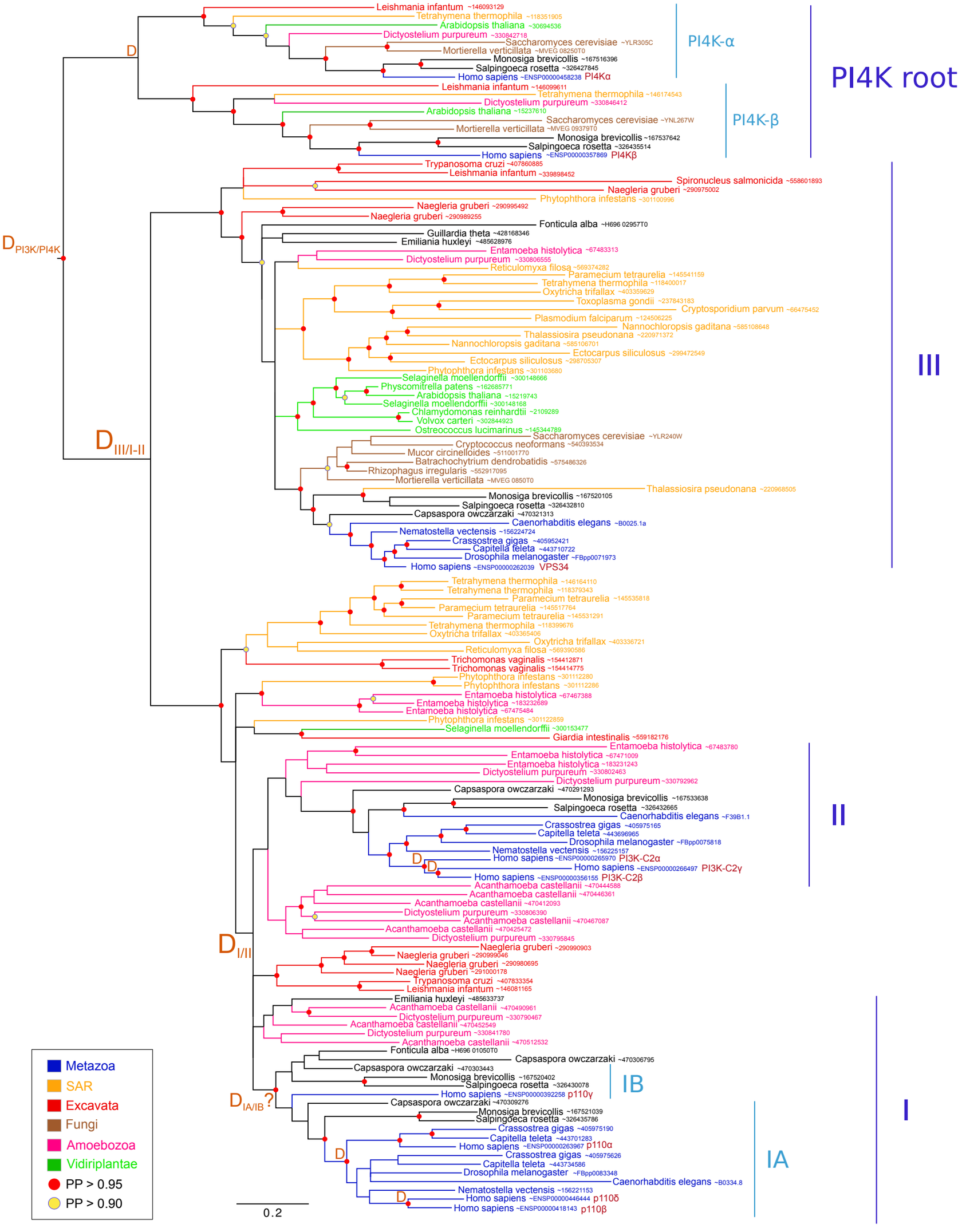
PI4K root
PI4K-α
PI4K-β
III
II
I
IA
IB
D
D PI3K/PI4K
D III/I-II
D I/II
D IA/IB ?
Leishmania infantum ~146093129
Tetrahymena thermophila ~118351905
Arabidopsis thaliana ~30694536
Dictyostelium purpureum ~330842718
Saccharomyces cerevisiae ~YLR305C
Mortierella verticillata ~MVEG 08250T0
Monosiga brevicollis ~167516396
Salpingoeca rosetta ~326427845
Homo sapiens ~ENSP00000458238 PI4Kα
Leishmania infantum ~146099611
Tetrahymena thermophila ~146174543
Dictyostelium purpureum ~330846412
Arabidopsis thaliana ~15237610
Saccharomyces cerevisiae ~YNL267W
Mortierella verticillata ~MVEG 09379T0
Monosiga brevicollis ~167537642
Salpingoeca rosetta ~326435514
Homo sapiens ~ENSP00000357869 PI4Kβ
Trypanosoma cruzi ~407860885
Leishmania infantum ~339898452
Spironucleus salmonicida ~558601893
Naegleria gruberi ~290975002
Phytophthora infestans ~301100996
Naegleria gruberi ~290995492
Naegleria gruberi ~290989255
Fonticula alba ~H696 02957T0
Guillardia theta ~428168346
Emiliania huxleyi ~485628976
Entamoeba histolytica ~67483313
Dictyostelium purpureum ~330806555
Reticulomyxa filosa ~569374282
Paramecium tetraurelia ~145541159
Tetrahymena thermophila ~118400017
Oxytricha trifallax ~403359629
Toxoplasma gondii ~237843183
Cryptosporidium parvum ~66475452
Plasmodium falciparum ~124506225
Nannochloropsis gaditana ~585108648
Thalassiosira pseudonana ~220971372
Nannochloropsis gaditana ~585106701
Ectocarpus siliculosus ~299472549
Ectocarpus siliculosus ~298705307
Phytophthora infestans ~301103680
Selaginella moellendorffii ~300148666
Physcomitrella patens ~162685771
Arabidopsis thaliana ~15219743
Selaginella moellendorffii ~300148168
Chlamydomonas reinhardtii ~2109289
Volvox carteri ~302844923
Ostreococcus lucimarinus ~145344789
Saccharomyces cerevisiae ~YLR240W
Cryptococcus neoformans ~540393534
Mucor circinelloides ~511001770
Batrachochytrium dendrobatidis ~575486326
Rhizophagus irregularis ~552917095
Mortierella verticillata ~MVEG 0850T0
Thalassiosira pseudonana ~220968505
Monosiga brevicollis ~167520105
Salpingoeca rosetta ~326432810
Capsaspora owczarzaki ~470321313
Caenorhabditis elegans ~B0025.1a
Nematostella vectensis ~156224724
Crassostrea gigas ~405952421
Capitella teleta ~443710722
Drosophila melanogaster ~FBpp0071973
Homo sapiens ~ENSP00000262039 VPS34
Tetrahymena thermophila ~146164110
Tetrahymena thermophila ~118379343
Paramecium tetraurelia ~145535818
Paramecium tetraurelia ~145517764
Paramecium tetraurelia ~145531291
Tetrahymena thermophila ~118399676
Oxytricha trifallax ~403365406
Oxytricha trifallax ~403336721
Reticulomyxa filosa ~569390586
Trichomonas vaginalis ~154412871
Trichomonas vaginalis ~154414775
Phytophthora infestans ~301112280
Phytophthora infestans ~301112286
Entamoeba histolytica ~67467388
Entamoeba histolytica ~183232689
Entamoeba histolytica ~67475484
Phytophthora infestans ~301122859
Selaginella moellendorffii ~300153477
Giardia intestinalis ~559182176
Entamoeba histolytica ~67483780
Entamoeba histolytica ~67471009
Entamoeba histolytica ~183231243
Dictyostelium purpureum ~330802463
Dictyostelium purpureum ~330792962
Capsaspora owczarzaki ~470291293
Monosiga brevicollis ~167533638
Salpingoeca rosetta ~326432665
Caenorhabditis elegans ~F39B1.1
Crassostrea gigas ~405975165
Capitella teleta ~443696965
Drosophila melanogaster ~FBpp0075818
Nematostella vectensis ~156225157
Homo sapiens ~ENSP00000265970 PI3K-C2α
Homo sapiens ~ENSP00000266497 PI3K-C2γ
Homo sapiens ~ENSP00000356155 PI3K-C2β
Acanthamoeba castellanii ~470444588
Acanthamoeba castellanii ~470446361
Acanthamoeba castellanii ~470412093
Dictyostelium purpureum ~330806390
Acanthamoeba castellanii ~470467087
Acanthamoeba castellanii ~470425472
Dictyostelium purpureum ~330795845
Naegleria gruberi ~290990903
Naegleria gruberi ~290999046
Naegleria gruberi ~290980695
Naegleria gruberi ~291000178
Trypanosoma cruzi ~407833354
Leishmania infantum ~146081165
Emiliania huxleyi ~485633737
Acanthamoeba castellanii ~470490961
Dictyostelium purpureum ~330790467
Acanthamoeba castellanii ~470452549
Dictyostelium purpureum ~330841780
Acanthamoeba castellanii ~470512532
Fonticula alba ~H696 01050T0
Capsaspora owczarzaki ~470306795
Capsaspora owczarzaki ~470303443
Monosiga brevicollis ~167520402
Salpingoeca rosetta ~326430078
Homo sapiens ~ENSP00000392258 p110γ
Capsaspora owczarzaki ~470309276
Monosiga brevicollis ~167521039
Salpingoeca rosetta ~326435786
Crassostrea gigas ~405975190
Capitella teleta ~443701283
Homo sapiens ~ENSP00000263967 p110α
Crassostrea gigas ~405975626
Capitella teleta ~443734586
Drosophila melanogaster ~FBpp0083348
Caenorhabditis elegans ~B0334.8
Nematostella vectensis ~156221153
Homo sapiens ~ENSP00000446444 p110δ
Homo sapiens ~ENSP00000418143 p110β
0.2
Metazoa
SAR
Excavata
Fungi
Amoebozoa
Vidiriplantae
PP > 0.95
PP > 0.90