SUPPLEMENTARY TABLES

Table S1. Additional conserved protein domains identified on sirtuin proteins in our dataset.

Domain	**Found in species**	**Sirtuin Clade**	**gene ID (short)**	**Position to SIR2 domain**
CAP_C	*Acropora millepora*	SIR8	XP_029214425.1	Upstream
CAP_C	*Actinia tenebrosa*	SIR8	XP_031565139.1	Upstream
CAP_C	*Amphimedon queenslandica*	SIR8	XP_011406188.1	Upstream
CAP_C	*Orbicella faveolata*	SIR8	XP_020631316.1	Upstream
CAP_C	*Pocillopora damicornis*	SIR8	XP_027046210.1	Upstream
CAP_C	*Stylophora pistillata*	SIR8	XP_022790004.1	Upstream
DUF592	*Puccinia graminis*	SIR1	KAA1082764.1	Upstream
DUF592	*Rhizophagus irregularis*	SIR1	PKC08513.1	Upstream
DUF592	*Saccharomyces cerevisiae*	SIR1	4IAO	Upstream
DUF592	*Saccharomyces cerevisiae*	SIR1	NP_014573.1	Upstream
DUF592	*Schizosaccharomyces pombe*	SIR1	NP_001018840.1	Upstream
Img2	*Dendronephthya gigantea*	SIR2	XP_028398492.1	Upstream
Mob_synth_C	*Pleurobrachia bachei*	SIR7	sb|2669295	Downstream
Oxysterol_BP	*Mnemiopsis leidyi*	SIR3	ML002624a	Upstream
Radical_SAM	*Pleurobrachia bachei*	SIR7	sb|2669295	Downstream

Table S2: Probable contaminating sequences / horizontal gene transfer events in our dataset. See Figure S6 for the relevant gene tree.

Scientific name	**gene ID (short)**	**Species with most similar protein**
Aurelia coerulea	TCONS_00008113_Seg122.19.p1	*Aquifex aeolicus*
Capitella teleta	ELT91158.1	*Methanopyrus kandleri*
Clytia hemisphaerica	TCONS_00049926	*Thermus thermophilus*
Leucosolenia complicata	lcpid67440_lcgid21395	*Aquifex aeolicus*
Salpingoeca rosetta	XP_004993987.1	*Pyrobaculum aerophilum*
Strongylocentrotus purpuratus	XP_030829218.1	*Caldanaerobacter subterraneus*
Stylissa carteri	scaffold70346-gene-0.28	*Thermococcus kodakarensis*
Sycon ciliatum	scpid89809_scgid18507	*Saccharolobus solfataricus*

SUPPLEMENTARY FIGURE LEGENDS

Figure S1: A cartoon demonstrating the difference between orthologs and paralogs, and why the distinction shifts at different levels of evolutionary analysis. (A) A hypothetical gene tree of "family 3" sirtuins, based on the results of Opazo et al. (2020) Note that the fish and frog have two copies of the gene, which are distinguished as "Sir3" and "Sir 3-like". From the vantage of vertebrates, Sir3 and Sir3-like are paralogs of each other, as signified by the colored boxes. A scientist who assumes that, for example, "Frog Sir3-like" and "Mouse Sir3" play similar roles in their respective organisms is likely to generate a flawed hypothesis. However, from the vantage of all animals (including invertebrates like sea urchins and jellyfish), vertebrate Sir3 and Sir3-like are both orthologs of their invertebrate counterpart. (B) The gene tree described in (A) reconciled with the species tree. In this scenario, the two genes in fish and frogs originate from a single gene duplication event that occurred early in vertebrate history. The mouse lost one of these two paralogs over the course of evolution. It is worth noting that other scenarios of gene duplication and loss could explain the gene tree seen in (A).

Figure S2. The full phylogeny used to design Figure 2. Clades are colored based on their assignment in Figure 2. See GitHub file "9b_Domain_NOTUNG_Final.tree" for the relevant tree file.

Figure S3. Partial alignment of SIR6 and SIR8 sequences. A conserved nine amino acid motif is identified at the top of the figure, although additional differences between SIR6 and SIR8 exist. See GitHub file "9_SIR2_Domains.vetted.mafft.fasta" for the full data. Image made in Geneious v.9.1.8.

Figure S4. A partial protein alignment showing a unique SIR9 motif and its distribution across animals. Additional SIR9 proteins from animals that were not queried in the original analysis are shown at the bottom of the alignment. Image made in Geneious v.9.1.8.

Figure S5. The full phylogeny used to design Figure 5. See GitHub file "4_NOTUNG-SpongeFirst-Final_Tree.tree" for the relevant tree file.

Figure S6. Initial phylogeny of sirtuin protein domains in our study. Likely contaminants / possible horizontal gene transfers are colored red and were excluded from further analysis. See GitHub file “8_SIR2_Domains.mafft.fasta.contree.tree” for the relevant tree file.

Figure S7. The full phylogeny used to inform Figure 6. Probable losses of PNC1 and NAMPT are labeled on the tree.

Figure S1

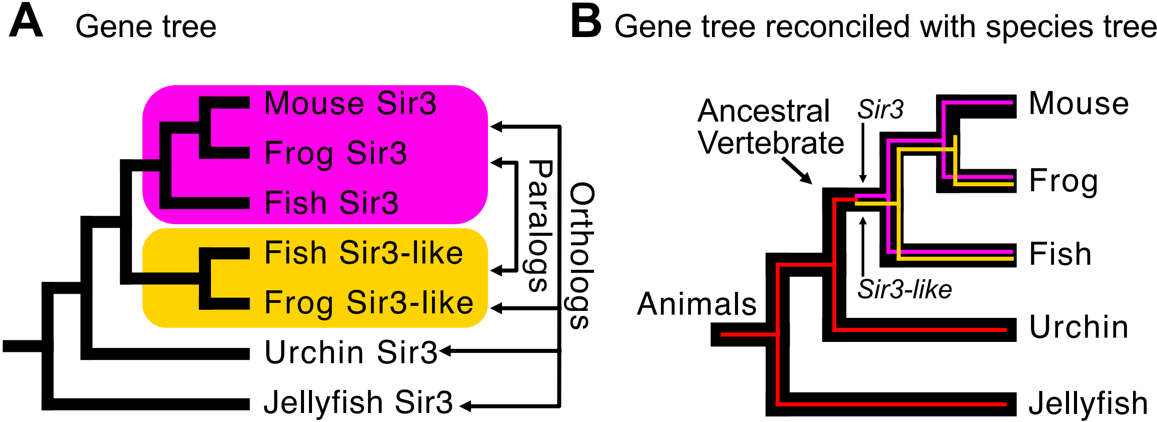
A
Gene tree
Mouse Sir3
Frog Sir3
Fish Sir3
Fish Sir3-like
Frog Sir3-like
Urchin Sir3
Jellyfish Sir3
Paralogs
Orthologs
B
Gene tree reconciled with species tree
Ancestral Vertebrate
Sir3
Sir3-like
Animals
Mouse
Frog
Fish
Urchin
Jellyfish

Figure S2


Schmidtea_mediterranea_augustus_masked-scaffold19448-processed-gene-0.0-mRNA-1_SIR5A_XENLA
Chara_braunii_A0A388LX92_CHABU_SIR5_CANLF
Rhizophagus_irregularis_A0A2I1H174_9GLOM_SIR5_CHICK
Galerina_marginata_A0A067TWG2_GALM3_SIR5_COPC7
Galerina_marginata_A0A067TTX9_GALM3_SIR5_COPC7
Galerina_marginata_A0A067SC53_GALM3_SIR5_COPC7
Trichoplax_sp._H2_RDD44172.1_SIR5_CANLF
Trichoplax_adhaerens_XP_002111996.1_SIR5_MOUSE
Oscarella_carmela_m.102278g.102278_comp37162_c0_seq1_SIR5_CANLF
Haliclona_amboinensis_c48062_g1_i4_mm.2497_SIR5_CANLF
Amphimedon_queenslandica_XP_003382458.1_SIR5_CANLF
Haliclona_tubifera_c27515_g1_i1_m.3231_SIR5_XENTR
Stylissa_carteri_maker-SC_scaffold3240-augustus-gene-0.61-mRNA-1_SIR5_CANLF
Ephydatia_muelleri_m.42840_g.42840_SIR5_CANLF
Exaiptasia_diaphana_XP_020897758.1_SIR5_CHICK
Actinia_tenebrosa_XP_031565089.1_SIR5_CANLF
Nematostella_vectensis_XP_048576900.1_SIR5_CANLF
Xenia_sp._Carnegie-2017_XP_046842162.1_SIR5_CANLF
Dendronephthya_gigantea_XP_028392003.1_SIR5_CANLF
Acropora_millepora_XP_029191153.1_SIR5_CANLF
Acropora_digitifera_XP_015764941.1_SIR5_CANLF
Stylophora_pistillata_XP_022791312.1_SIR5_CANLF
Pocillopora_damicornis_XP_027051970.1_SIR5_CANLF
Orbicella_faveolata_XP_020603299.1_SIR5_CANLF
Strongylocentrotus_purpuratus_A0A7M7NUX7_STRPU_SIR5A_XENLA
Mus_musculus_SIR5_MOUSE_SIR5_MOUSE
Homo_sapiens_SIR5_HUMAN_SIR5_HUMAN
Xenopus_laevis_SIR5A_XENLA_SIR5A_XENLA
Chiloscyllium_punctatum_A0A401SZL3_CHIPU_SIR5_CHICK
Latimeria_chalumnae_H3AF98_LATCH_SIR5_XENTR
Octopus_bimaculoides_A0A0L8FJ96_OCTBM_SIR5_DANRE
Capitella_teleta_R7TYG4_CAPTE_SIR5_CANLF
Daphnia_magna_A0A164XVS9_9CRUS_SIR5_DAPPU
Ciona_intestinalis_H2XWF2_CIOIN_SIR5_MOUSE
Fistulifera_solaris_A0A1Z5JZ96_FISSO_SIR2E_DICDI
Ectocarpus_siliculosus_D8LHN5_ECTSI_SIR2E_DICDI
Sphaeroforma_arctica_JP610_XP_014153224.1_SIR2A_PLAF7
Sphaeroforma_arctica_JP610_XP_014152407.1_NPD2_PYRAE
Sphaeroforma_arctica_JP610_XP_014157535.1_SIR2_DANRE
Fistulifera_solaris_A0A1Z5K5D8_FISSO_SIR2_MACFA
Pleurobrachia_bachei_sb_2658796_SIR3_MOUSE
Mnemiopsis_leidyi_ML145823a-PA_SIR3_MOUSE
Sycon_coactum_31281.p1_SIR3_HUMAN
Leucosolenia_complicata_lcpid16602_lcgid57329_SIR3_MOUSE
Oscarella_carmela_m.66298g.66298_comp35380_c0_seq4_SIR3_MOUSE
Haliclona_amboinensis_c47378_g1_i1_m.22237_SIR3_HUMAN
Amphimedon_queenslandica_XP_019851125.1_SIR3_HUMAN
Haliclona_tubifera_c47108_g1_i2_m.19397_SIR3_MOUSE
Ephydatia_muelleri_m.56358_g.56358_SIR3_MOUSE
Trichoplax_sp._H2_RDD42035.1_SIR3_MOUSE
Trichoplax_adhaerens_XP_002108771.1_SIR3_MOUSE
Nematostella_vectensis_EDO47672.1_SIR3_HUMAN
Actinia_tenebrosa_XP_031557593.1_SIR3_HUMAN
Stylophora_pistillata_XP_022778949.1_SIR3_HUMAN
Pocillopora_damicornis_XP_027036956.1_SIR3_HUMAN
Acropora_millepora_XP_029189899.1_SIR3_HUMAN
Acropora_digitifera_XP_015769634.1_SIR3_HUMAN
Orbicella_faveolata_XP_020605701.1_SIR3_HUMAN
Exaiptasia_diaphana_KXJ12134.1_SIR3_HUMAN
Aurelia_coerulea_XLOC_005945_TCONS_00008273_Seg12214.1.p1_SIR3_HUMAN
Ciona_intestinalis_H2XW94_CIOIN_SIR3_HUMAN
Capitella_teleta_R7T6P1_CAPTE_SIR3_HUMAN
Octopus_bimaculoides_A0A0L8FVJ2_OCTBM_SIR3_MOUSE
Mus_musculus_SIR3_MOUSE_SIR3_MOUSE
Homo_sapiens_SIR3_HUMAN_SIR3_HUMAN
Xenopus_laevis_A0A8J1KJA7_XENLA_SIR3_MOUSE
Latimeria_chalumnae_H3AAK4_LATCH_SIR3_HUMAN
Chiloscyllium_punctatum_A0A401T636_CHIPU_SIR3_HUMAN
Xenopus_laevis_A0A1L8GWP9_XENLA_SIR3_HUMAN
Latimeria_chalumnae_H3BDU0_LATCH_SIR3_HUMAN
Strongylocentrotus_purpuratus_A0A7M7P4N3_STRPU_SIR3_HUMAN
Saccharomyces_cerevisiae_SIR2_YEAST_SIR2_YEAST
Saccharomyces_cerevisiae_HST1_YEAST_HST1_YEAST
Schizosaccharomyces_pombe_SIR2_SCHPO_SIR2_SCHPO
Galerina_marginata_A0A067SMM4_GALM3_HST1_EMENI
Spizellomyces_punctatus_A0A0L0H9S1_SPIPD_SIR1_HUMAN
Rhizophagus_irregularis_A0A2I1GLM2_9GLOM_SIR1_RAT
Amoeboaphelidium_occidentale_KAI3659977.1_SIR1_HUMAN
Salpingoeca_rosetta_XP_004994060.1_SIRT1_DROME
Monosiga_brevicollis_MX1_XP_001742130.1_SIR1_RAT
Leucosolenia_complicata_lcpid102077_lcgid36957_SIRT1_DROME
Pleurobrachia_bachei_sb_2653035_SIR1_RAT
Mnemiopsis_leidyi_ML07823a-PA_SIR1_HUMAN
Acropora_millepora_XP_029212880.2_SIR1_MOUSE
Acropora_digitifera_XP_015779435.1_SIR1_RAT
Orbicella_faveolata_XP_020629309.1_SIR1_HUMAN
Stylophora_pistillata_XP_022798495.1_SIR1_HUMAN
Pocillopora_damicornis_XP_027050465.1_SIR1_HUMAN
Exaiptasia_diaphana_XP_020892771.1_SIR1_HUMAN
Actinia_tenebrosa_XP_031549158.1_SIR1_HUMAN
Nematostella_vectensis_EDO31684.1_SIR1_RAT
Xenia_sp._Carnegie-2017_XP_046844853.1_SIR1_HUMAN
Dendronephthya_gigantea_XP_028408359.1_SIR1_HUMAN
Strongylocentrotus_purpuratus_A0A7M7NDM7_STRPU_SIR1_HUMAN
Aurelia_coerulea_XLOC_021578_TCONS_00030503_Seg1865.9.p1_SIR1_HUMAN
Oscarella_carmela_m.310769g.310769_comp54758_c0_seq1_SIR1_HUMAN
Hydra_vulgaris_XP_047125773.1_SIR1_RAT
Clytia_hemisphaerica_TCONS_00023571-protein_SIR1_HUMAN
Ciona_intestinalis_F6SLD6_CIOIN_SIR1_HUMAN
Mus_musculus_SIR1_MOUSE_SIR1_MOUSE
Homo_sapiens_SIR1_HUMAN_SIR1_HUMAN
Xenopus_laevis_A0A1L8FEV8_XENLA_SIR1_MOUSE
Latimeria_chalumnae_H3AHF8_LATCH_SIR1_HUMAN
Chiloscyllium_punctatum_A0A401SYB6_CHIPU_SIR1_MOUSE
Octopus_bimaculoides_A0A0L8FRB6_OCTBM_SIR1_MOUSE
Capitella_teleta_R7VG12_CAPTE_SIR1_MOUSE
Drosophila_melanogaster_SIRT1_DROME_SIRT1_DROME
Haliclona_amboinensis_c50309_g1_i11_mm.3444_SIR1_MOUSE
Amphimedon_queenslandica_XP_011404349.2_SIR1_MOUSE
Haliclona_tubifera_c40894_g1_i1_m.10778_SIR1_HUMAN
Ephydatia_muelleri_m.68701_g.68701_SIR1_HUMAN
Schmidtea_mediterranea_maker-scaffold9062-augustus-gene-0.7-mRNA-1_SIR1_RAT
Daphnia_magna_A0A162Q0V9_9CRUS_SIR1_HUMAN
Caenorhabditis_elegans_SIR2_CAEEL_SIR2_CAEEL
Capsaspora_owczarzaki_ATCC_30864_XP_004346801.2_SIR1_MOUSE
Rozella_allomycis_A0A075AU49_ROZAC_SIR1_HUMAN
Fistulifera_solaris_A0A1Z5K794_FISSO_HST1_EMENI
Ectocarpus_siliculosus_D8LES8_ECTSI_SIR1_RAT
Volvox_carteri_D8TL05_VOLCA_HST3_YEAST
Amoeboaphelidium_protococcarum_KAI3629610.1_HST3_CANAL
Amoeboaphelidium_occidentale_KAI3659897.1_HST3_CANAL
Spizellomyces_punctatus_A0A0L0HTT9_SPIPD_HST3_CANAL
Rhizophagus_irregularis_A0A2I1GBB3_9GLOM_HST3_CANAL
Puccinia_graminis_E3JQ55_PUCGT_HST4_SCHPO
Galerina_marginata_A0A067T782_GALM3_HST4_EMENI
Schizosaccharomyces_pombe_HST4_SCHPO_HST4_SCHPO
Saccharomyces_cerevisiae_HST4_YEAST_HST4_YEAST
Galerina_marginata_A0A067TQF3_GALM3_HST3_CANAL
Saccharomyces_cerevisiae_HST3_YEAST_HST3_YEAST
Rozella_allomycis_A0A075AV36_ROZAC_HST3_CANAL
Fonticula_alba_XP_009494611.1_HST3_YEAST
Fonticula_alba_XP_009493409.1_SIR1_RAT
Fistulifera_solaris_A0A1Z5JC26_FISSO_HST2_SCHPO
Amoeboaphelidium_protococcarum_KAI3633495.1_SIR2_DANRE
Amoeboaphelidium_occidentale_KAI3658166.1_SIR2_DANRE
Spizellomyces_punctatus_A0A0L0HPN6_SPIPD_SIR2_DANRE
Puccinia_graminis_E3KY50_PUCGT_SIR2_DANRE
Galerina_marginata_A0A067TI91_GALM3_HST21_EMENI
Schizosaccharomyces_pombe_HST2_SCHPO_HST2_SCHPO
Spizellomyces_punctatus_A0A0L0HKL8_SPIPD_HST4_YEAST
Rhizophagus_irregularis_A0A2I1G7C6_9GLOM_SIR2_DANRE
Saccharomyces_cerevisiae_HST2_YEAST_HST2_YEAST
Fonticula_alba_XP_009494998.1_SIR2_RAT
Monosiga_brevicollis_MX1_XP_001749314.1_SIRT2_DROME
Salpingoeca_rosetta_XP_004991122.1_SIRT2_DROME
Pleurobrachia_bachei_sb_2643951_SIR2_DANRE
Mnemiopsis_leidyi_ML20759a-PA_SIR2_DANRE
Acropora_millepora_XP_044163473.1_SIR2_MACFA
Acropora_digitifera_XP_015779163.1_SIR2_PONAB
Stylophora_pistillata_XP_022806417.1_SIR2_MACFA
Pocillopora_damicornis_RMX45954.1_SIR2_MACFA
Orbicella_faveolata_XP_020605893.1_SIR2_DANRE
Nematostella_vectensis_EDO46813.1_SIR2_DANRE
Leucosolenia_complicata_lcpid103158_lcgid58614_SIR2_DANRE
Exaiptasia_diaphana_XP_020915333.1_SIR2_DANRE
Actinia_tenebrosa_XP_031571475.1_SIR2_DANRE
Ciona_intestinalis_Q1RL34_CIOIN_SIR2_DANRE
Stylissa_carteri_snap_masked-SC_scaffold12141-processed-gene-0.2-mRNA-1_SIR2_RAT
Ephydatia_muelleri_m.97546_g.97546_SIR2_DANRE
Haliclona_amboinensis_c45780_g1_i1_m.19520_SIR2_DANRE
Amphimedon_queenslandica_XP_019851847.1_SIR2_DANRE
Amphimedon_queenslandica_XP_019864326.1_SIR2_DANRE-Domain2
Amphimedon_queenslandica_XP_019864326.1_SIR2_DANRE
Amphimedon_queenslandica_XP_019861130.1_SIR2_DANRE
Haliclona_tubifera_c42791_g1_i4_mm.1297_SIR2_DANRE
Pleurobrachia_bachei_sb_2650883_SIR2_RAT
Mnemiopsis_leidyi_ML074235a-PA_SIR2_MOUSE
Myxobolus_squamalis_KAF1743723.1_SIR2_MOUSE
Henneguya_salminicola_KAF0992715.1_SIR2_DANRE
Thelohanellus_kitauei_KII66353.1_SIR2_MOUSE
Trichoplax_sp._H2_RDD40343.1_SIR2_DANRE
Trichoplax_adhaerens_XP_002113435.1_SIR2_DANRE
Trichoplax_sp._H2_RDD44322.1_SIR2_DANRE
Trichoplax_adhaerens_XP_002113608.1_SIR2_DANRE
Strongylocentrotus_purpuratus_A0A7M7PQD5_STRPU_SIR2_DANRE
Nematostella_vectensis_EDO48459.1_SIR2_DANRE
Clytia_hemisphaerica_TCONS_00029362-protein_SIR2_DANRE
Aurelia_coerulea_XLOC_021960_TCONS_00031013_Seg1882.3.p1_SIR2_DANRE
Octopus_bimaculoides_A0A0L8IAL6_OCTBM_SIR2_DANRE
Capitella_teleta_R7TK56_CAPTE_SIR2_DANRE
Pleurobrachia_bachei_sb_2664049_SIRT2_DROME
Mnemiopsis_leidyi_ML002624a-PA_OSB10_HUMAN
Oscarella_carmela_m.20604g.20604_comp28043_c0_seq1_SIR2_DANRE
Trichoplax_sp._H2_RDD42036.1_SIR3_HUMAN
Trichoplax_adhaerens_XP_002108772.1_SIR3_MOUSE
Xenia_sp._Carnegie-2017_XP_046848641.1_SIR2_DANRE
Dendronephthya_gigantea_XP_028398492.1_SIR2_DANRE
Aurelia_coerulea_XLOC_057165_TCONS_00080094_Seg5705.2.p1_SIR3_MOUSE
Capitella_teleta_R7T8F1_CAPTE_SIR3_HUMAN
Schmidtea_mediterranea_augustus_masked-scaffold272-processed-gene-3.2-mRNA-1_HST21_EMENI
Drosophila_melanogaster_SIRT2_DROME_SIRT2_DROME
Daphnia_magna_A0A0P5CJZ6_9CRUS_SIR2_DANRE
Mus_musculus_SIR2_MOUSE_SIR2_MOUSE
Homo_sapiens_SIR2_HUMAN_SIR2_HUMAN
Xenopus_laevis_A0A8J0UAR6_XENLA_SIR2_DANRE
Chiloscyllium_punctatum_A0A401SWK8_CHIPU_SIR2_DANRE
Capsaspora_owczarzaki_ATCC_30864_XP_004348413.1_SIR2_DANRE
Sphaeroforma_arctica_JP610_XP_014152202.1_SIR2_DANRE
Sphaeroforma_arctica_JP610_XP_014151708.1_SIR2_DANRE
Fistulifera_solaris_A0A1Z5K280_FISSO_NPD2_BRADU
Ectocarpus_siliculosus_D8LJJ1_ECTSI_SIR4_ARATH
Volvox_carteri_D8U497_VOLCA_SIR4_ARATH
Mnemiopsis_leidyi_ML41824a-PA_SIR4_MOUSE
Haliclona_tubifera_c17806_g1_i1_m.1263_SIR4_BOVIN
Haliclona_amboinensis_c33180_g1_i1_m.7512_SIR4_MOUSE
Amphimedon_queenslandica_XP_011403504.2_SIR4_BOVIN
Ephydatia_muelleri_m.26778_g.26778_SIR4_MOUSE
Hydra_vulgaris_XP_002163018.1_SIR4_MOUSE
Clytia_hemisphaerica_TCONS_00017752-protein_SIR4_MOUSE
Aurelia_coerulea_XLOC_073218_TCONS_00101516_Seg992.8.p1_SIR4_BOVIN
Sycon_coactum_7951.p1_SIR4_BOVIN
Leucosolenia_complicata_lcpid57906_lcgid55101_SIR4_BOVIN
Oscarella_carmela_m.10296g.10296_comp22152_c0_seq1_SIR4_MOUSE
Trichoplax_sp._H2_RDD40986.1_SIR4_MOUSE
Trichoplax_adhaerens_XP_002114969.1_SIR4_MOUSE
Acropora_millepora_XP_029213217.2_SIR4_BOVIN
Acropora_digitifera_XP_015779547.1_SIR4_BOVIN
Stylophora_pistillata_XP_022787591.1_SIR4_HUMAN
Pocillopora_damicornis_RMX57446.1_SIR4_BOVIN
Orbicella_faveolata_XP_020602659.1_SIR4_BOVIN
Nematostella_vectensis_EDO35866.1_SIR4_MOUSE
Exaiptasia_diaphana_XP_020893572.1_SIR4_BOVIN
Actinia_tenebrosa_XP_031549214.1_SIR4_BOVIN
Xenia_sp._Carnegie-2017_XP_046840840.1_SIR4_HUMAN
Dendronephthya_gigantea_XP_028400421.1_SIR4_MOUSE
Capitella_teleta_R7VC11_CAPTE_SIR4_MOUSE
Mus_musculus_SIR4_MOUSE_SIR4_MOUSE
Homo_sapiens_SIR4_HUMAN_SIR4_HUMAN
Xenopus_laevis_A0A1L8I0D6_XENLA_SIR4_BOVIN
Latimeria_chalumnae_H3BG66_LATCH_SIR4_MOUSE
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Caenorhabditis_elegans_SIR42_CAEEL_SIR42_CAEEL
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Monosiga_brevicollis_MX1_XP_001744705.1_SIR4_MONBE
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Figure S3

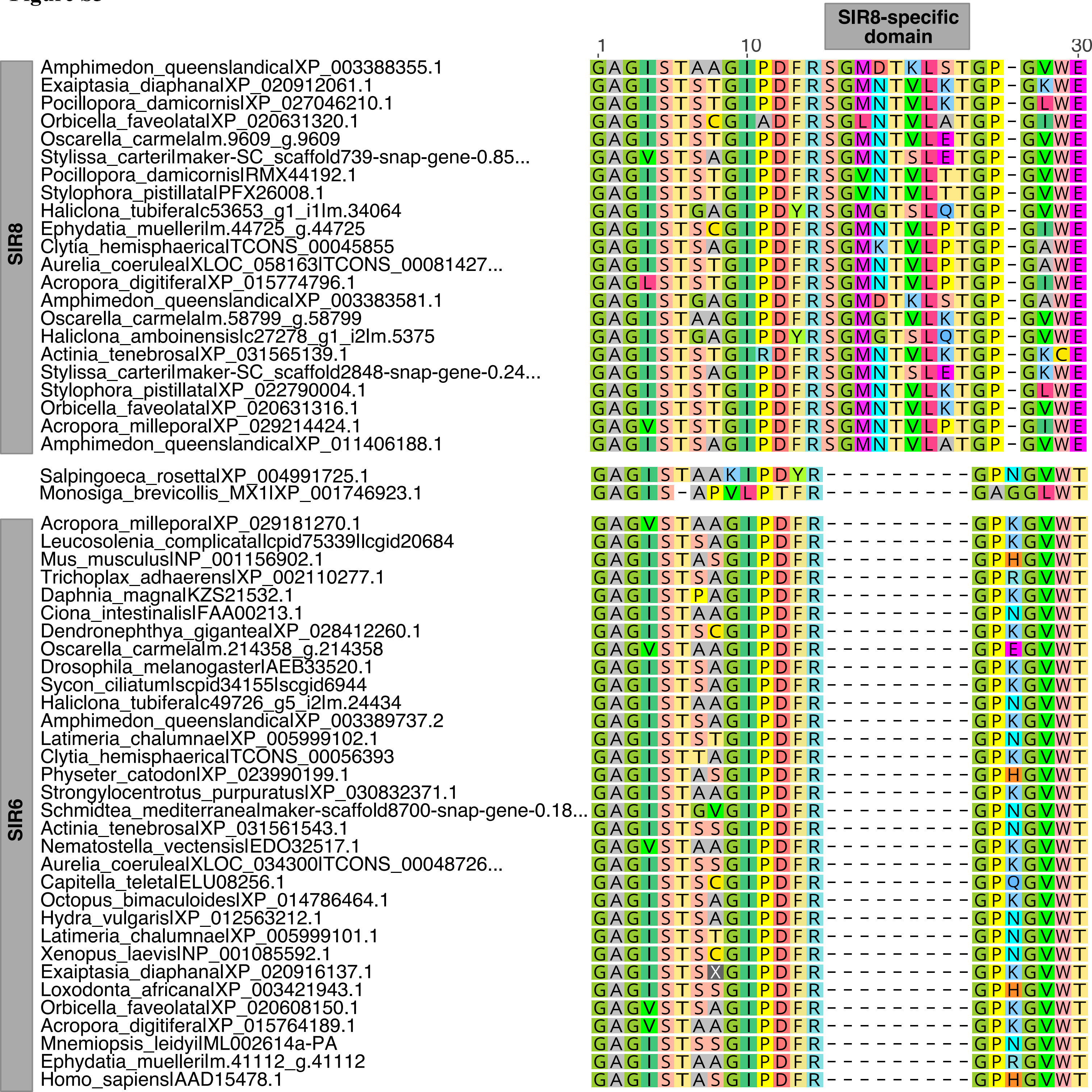

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Figure S4

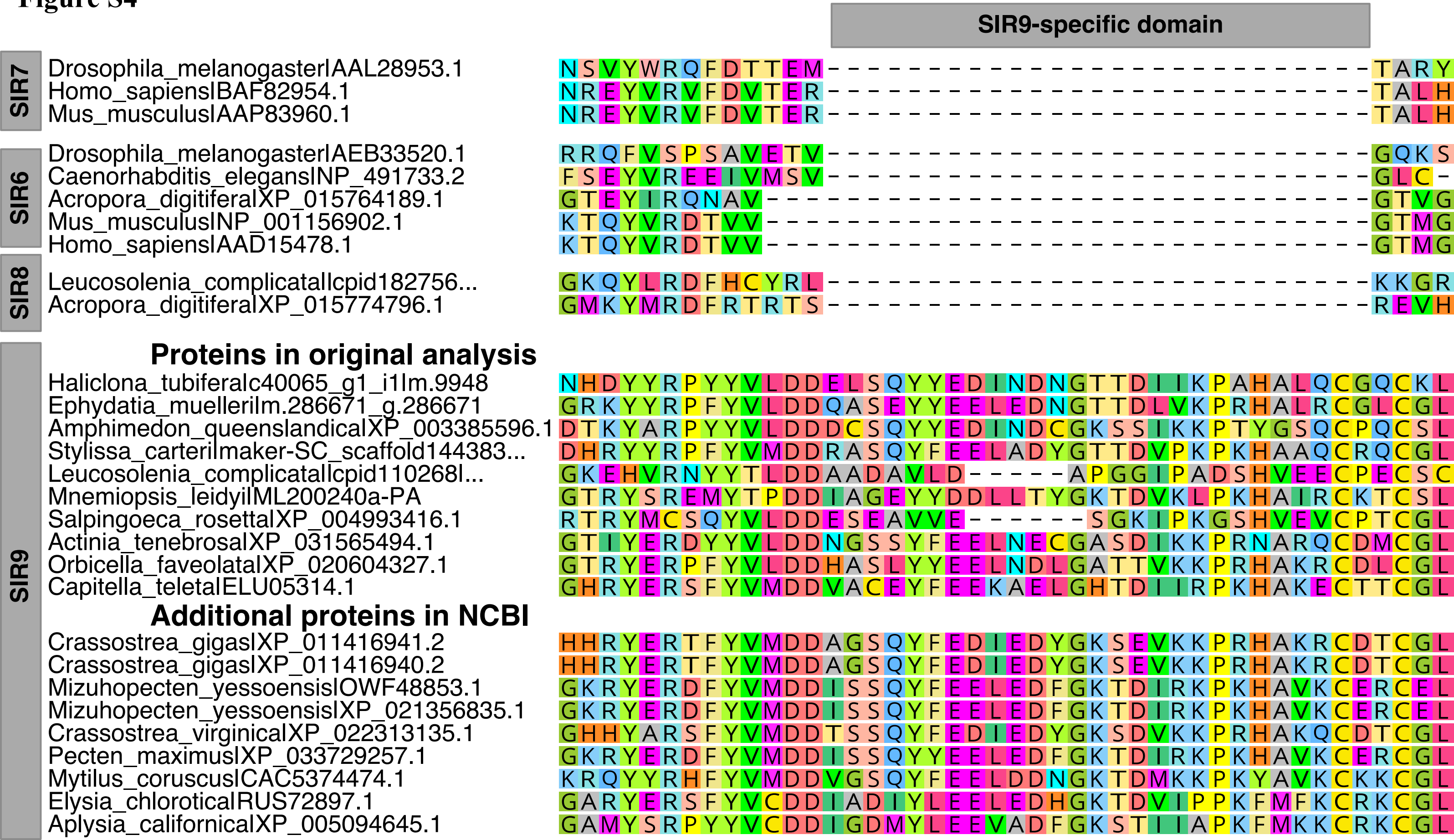
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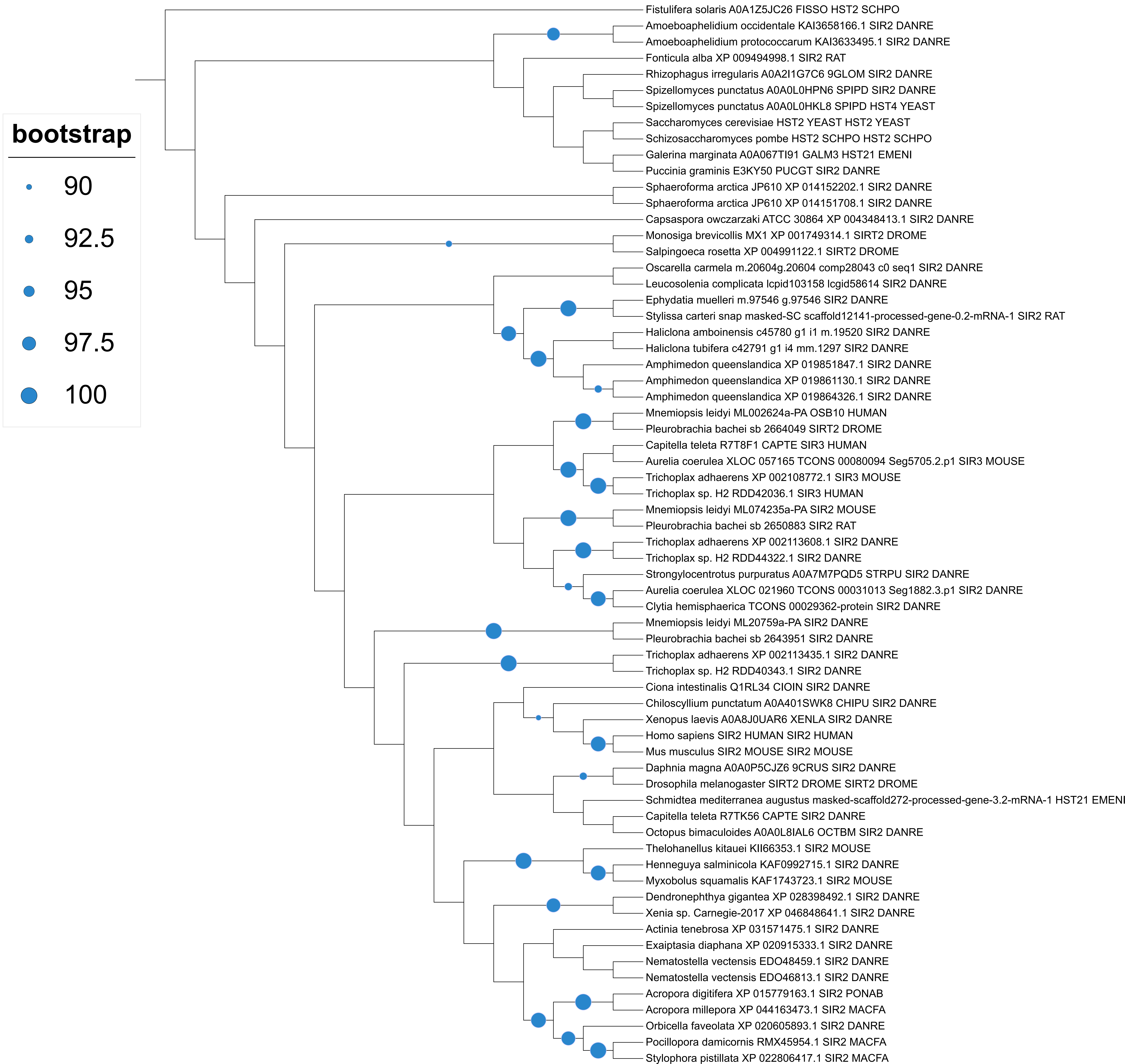
Figure S5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Drosophila melanogaster SIRT2 DROME SIRT2 DROME
Schmidtea mediterranea augustus masked-scaffold272-processed-gene-3.2-mRNA-1 HST21 EMENI
Capitella teleta R7TK56 CAPTE SIR2 DANRE
Octopus bimaculoides A0A0L8IAL6 OCTBM SIR2 DANRE
Thelohanellus kitauei KII66353.1 SIR2 MOUSE
Henneguya salminicola KAF0992715.1 SIR2 DANRE
Myxobolus squamalis KAF1743723.1 SIR2 MOUSE
Dendronephthya gigantea XP 028398492.1 SIR2 DANRE
Xenia sp. Carnegie-2017 XP 046848641.1 SIR2 DANRE
Actinia tenebrosa XP 031571475.1 SIR2 DANRE
Exaiptasia diaphana XP 020915333.1 SIR2 DANRE
Nematostella vectensis EDO48459.1 SIR2 DANRE
Nematostella vectensis EDO46813.1 SIR2 DANRE
Acropora digitifera XP 015779163.1 SIR2 PONAB
Acropora millepora XP 044163473.1 SIR2 MACFA
Orbicella faveolata XP 020605893.1 SIR2 DANRE
Pocillopora damicornis RMX45954.1 SIR2 MACFA
Stylophora pistillata XP 022806417.1 SIR2 MACFA

Figure S6


Aurelia_coerulea_XLOC_005839_TCONS_00008113_Seg122.19.p1_NPD_AQUAE
Clytia_hemisphaerica_TCONS_00049926-protein_NPD_THET8
Leucosolenia_complicata_lcpid67440_lcgid21395_NPD_AQUAE
Sycon_coactum_29914.p1_NPD1_ARCFU
Capitella_teleta_R7TBQ3_CAPTE_NPD_METKA
Strongylocentrotus_purpuratus_A0A7M7N1G3_STRPU_NPD2_CALS4
Salpingoeca_rosetta_XP_004993987.1_NPD2_PYRAE
Acropora_digitifera_XP_015769634.1_SIR3_HUMAN
Acropora_millepora_XP_029189899.1_SIR3_HUMAN
Orbicella_faveolata_XP_020605701.1_SIR3_HUMAN
Pocillopora_damicornis_XP_027036956.1_SIR3_HUMAN
Stylophora_pistillata_XP_022778949.1_SIR3_HUMAN
Actinia_tenebrosa_XP_031557593.1_SIR3_HUMAN
Nematostella_vectensis_EDO47672.1_SIR3_HUMAN
Exaiptasia_diaphana_KXJ12134.1_SIR3_HUMAN
Amphimedon_queenslandica_XP_019851125.1_SIR3_HUMAN
Haliclona_amboinensis_c47378_g1_i1_m.22237_SIR3_HUMAN
Haliclona_tubifera_c47108_g1_i2_m.19397_SIR3_MOUSE
Ephydatia_muelleri_m.56358_g.56358_SIR3_MOUSE
Oscarella_carmela_m.66298g.66298_comp35380_c0_seq4_SIR3_MOUSE
Capitella_teleta_R7T6P1_CAPTE_SIR3_HUMAN
Ciona_intestinalis_H2XW94_CIOIN_SIR3_HUMAN
Aurelia_coerulea_XLOC_005945_TCONS_00008273_Seg12214.1.p1_SIR3_HUMAN
Leucosolenia_complicata_lcpid16602_lcgid57329_SIR3_MOUSE
Sycon_coactum_31281.p1_SIR3_HUMAN
Mnemiopsis_leidyi_ML145823a-PA_SIR3_MOUSE
Pleurobrachia_bachei_sb_2658796_SIR3_MOUSE
Trichoplax_adhaerens_XP_002108771.1_SIR3_MOUSE
Trichoplax_sp._H2_RDD42035.1_SIR3_MOUSE
Chiloscyllium_punctatum_A0A401T636_CHIPU_SIR3_HUMAN
Homo_sapiens_SIR3_HUMAN_SIR3_HUMAN
Mus_musculus_SIR3_MOUSE_SIR3_MOUSE
Xenopus_laevis_A0A8J1KJA7_XENLA_SIR3_MOUSE
Latimeria_chalumnae_H3AAK4_LATCH_SIR3_HUMAN
Latimeria_chalumnae_H3BDU0_LATCH_SIR3_HUMAN
Xenopus_laevis_A0A1L8GWP9_XENLA_SIR3_HUMAN
Strongylocentrotus_purpuratus_A0A7M7P4N3_STRPU_SIR3_HUMAN
Octopus_bimaculoides_A0A0L8FVJ2_OCTBM_SIR3_MOUSE
Aurelia_coerulea_XLOC_057165_TCONS_00080094_Seg5705.2.p1_SIR3_MOUSE
Trichoplax_adhaerens_XP_002108772.1_SIR3_MOUSE
Trichoplax_sp._H2_RDD42036.1_SIR3_HUMAN
Capitella_teleta_R7T8F1_CAPTE_SIR3_HUMAN
Acropora_digitifera_XP_015779163.1_SIR2_PONAB
Acropora_millepora_XP_044163473.1_SIR2_MACFA
Orbicella_faveolata_XP_020605893.1_SIR2_DANRE
Pocillopora_damicornis_RMX45954.1_SIR2_MACFA
Stylophora_pistillata_XP_022806417.1_SIR2_MACFA
Mnemiopsis_leidyi_ML074235a-PA_SIR2_MOUSE
Pleurobrachia_bachei_sb_2650883_SIR2_RAT
Nematostella_vectensis_EDO46813.1_SIR2_DANRE
Dendronephthya_gigantea_XP_028398492.1_SIR2_DANRE
Xenia_sp._Carnegie-2017_XP_046848641.1_SIR2_DANRE
Sphaeroforma_arctica_JP610_XP_014152202.1_SIR2_DANRE
Actinia_tenebrosa_XP_031571475.1_SIR2_DANRE
Ciona_intestinalis_Q1RL34_CIOIN_SIR2_DANRE
Exaiptasia_diaphana_XP_020915333.1_SIR2_DANRE
Daphnia_magna_A0A0P5CJZ6_9CRUS_SIR2_DANRE
Henneguya_salminicola_KAF0992715.1_SIR2_DANRE
Myxobolus_squamalis_KAF1743723.1_SIR2_MOUSE
Thelohanellus_kitauei_KII66353.1_SIR2_MOUSE
Trichoplax_adhaerens_XP_002113435.1_SIR2_DANRE
Trichoplax_sp._H2_RDD40343.1_SIR2_DANRE
Amphimedon_queenslandica_XP_019851847.1_SIR2_DANRE
Haliclona_amboinensis_c45780_g1_i1_m.19520_SIR2_DANRE
Amphimedon_queenslandica_XP_019861130.1_SIR2_DANRE
Amphimedon_queenslandica_XP_019864326.1_SIR2_DANRE
Amphimedon_queenslandica_XP_019864326.1_SIR2_DANRE-Domain2
Ephydatia_muelleri_m.97546_g.97546_SIR2_DANRE
Stylissa_carteri_snap_masked-SC_scaffold12141-processed-gene-0.2-mRNA-1_SIR2_RAT
Haliclona_tubifera_c42791_g1_i4_mm.1297_SIR2_DANRE
Nematostella_vectensis_EDO48459.1_SIR2_DANRE
Capsaspora_owczarzaki_ATCC_30864_XP_004348413.1_SIR2_DANRE
Oscarella_carmela_m.20604g.20604_comp28043_c0_seq1_SIR2_DANRE
Aurelia_coerulea_XLOC_021960_TCONS_00031013_Seg1882.3.p1_SIR2_DANRE
Clytia_hemisphaerica_TCONS_00029362-protein_SIR2_DANRE
Octopus_bimaculoides_A0A0L8IAL6_OCTBM_SIR2_DANRE
Strongylocentrotus_purpuratus_A0A7M7PQD5_STRPU_SIR2_DANRE
Chiloscyllium_punctatum_A0A401SWK8_CHIPU_SIR2_DANRE
Homo_sapiens_SIR2_HUMAN_SIR2_HUMAN
Mus_musculus_SIR2_MOUSE_SIR2_MOUSE
Xenopus_laevis_A0A8J0UAR6_XENLA_SIR2_DANRE
Puccinia_graminis_E3KY50_PUCGT_SIR2_DANRE
Sphaeroforma_arctica_JP610_XP_014151708.1_SIR2_DANRE
Rhizophagus_irregularis_A0A2I1G7C6_9GLOM_SIR2_DANRE
Drosophila_melanogaster_SIRT2_DROME_SIRT2_DROME
Capitella_teleta_R7TK56_CAPTE_SIR2_DANRE
Amoeboaphelidium_occidentale_KAI3658166.1_SIR2_DANRE
Amoeboaphelidium_protococcarum_KAI3633495.1_SIR2_DANRE
Monosiga_brevicollis_MX1_XP_001749314.1_SIRT2_DROME
Spizellomyces_punctatus_A0A0L0HPN6_SPIPD_SIR2_DANRE
Leucosolenia_complicata_lcpid103158_lcgid58614_SIR2_DANRE
Mnemiopsis_leidyi_ML20759a-PA_SIR2_DANRE
Pleurobrachia_bachei_sb_2643951_SIR2_DANRE
Saccharomyces_cerevisiae_HST2_YEAST_HST2_YEAST
Salpingoeca_rosetta_XP_004991122.1_SIRT2_DROME
Trichoplax_adhaerens_XP_002113608.1_SIR2_DANRE
Trichoplax_sp._H2_RDD44322.1_SIR2_DANRE
Galerina_marginata_A0A067TI91_GALM3_HST21_EMENI
Schizosaccharomyces_pombe_HST2_SCHPO_HST2_SCHPO
Acropora_digitifera_XP_015779435.1_SIR1_RAT
Acropora_millepora_XP_029212880.2_SIR1_MOUSE
Orbicella_faveolata_XP_020629309.1_SIR1_HUMAN
Pocillopora_damicornis_XP_027050465.1_SIR1_HUMAN
Stylophora_pistillata_XP_022798495.1_SIR1_HUMAN
Actinia_tenebrosa_XP_031549158.1_SIR1_HUMAN
Exaiptasia_diaphana_XP_020892771.1_SIR1_HUMAN
Nematostella_vectensis_EDO31684.1_SIR1_RAT
Dendronephthya_gigantea_XP_028408359.1_SIR1_HUMAN
Xenia_sp._Carnegie-2017_XP_046844853.1_SIR1_HUMAN
Strongylocentrotus_purpuratus_A0A7M7NDM7_STRPU_SIR1_HUMAN
Aurelia_coerulea_XLOC_021578_TCONS_00030503_Seg1865.9.p1_SIR1_HUMAN
Oscarella_carmela_m.310769g.310769_comp54758_c0_seq1_SIR1_HUMAN
Chiloscyllium_punctatum_A0A401SYB6_CHIPU_SIR1_MOUSE
Xenopus_laevis_A0A1L8FEV8_XENLA_SIR1_MOUSE
Homo_sapiens_SIR1_HUMAN_SIR1_HUMAN
Mus_musculus_SIR1_MOUSE_SIR1_MOUSE
Latimeria_chalumnae_H3AHF8_LATCH_SIR1_HUMAN
Ciona_intestinalis_F6SLD6_CIOIN_SIR1_HUMAN
Clytia_hemisphaerica_TCONS_00023571-protein_SIR1_HUMAN
Hydra_vulgaris_XP_047125773.1_SIR1_RAT
Capitella_teleta_R7VG12_CAPTE_SIR1_MOUSE
Monosiga_brevicollis_MX1_XP_001742130.1_SIR1_RAT
Salpingoeca_rosetta_XP_004994060.1_SIRT1_DROME
Octopus_bimaculoides_A0A0L8FRB6_OCTBM_SIR1_MOUSE
Drosophila_melanogaster_SIRT1_DROME_SIRT1_DROME
Daphnia_magna_A0A162Q0V9_9CRUS_SIR1_HUMAN
Schmidtea_mediterranea_maker-scaffold9062-augustus-gene-0.7-mRNA-1_SIR1_RAT
Amphimedon_queenslandica_XP_011404349.2_SIR1_MOUSE
Haliclona_amboinensis_c50309_g1_i11_mm.3444_SIR1_MOUSE
Haliclona_tubifera_c40894_g1_i1_m.10778_SIR1_HUMAN
Ephydatia_muelleri_m.68701_g.68701_SIR1_HUMAN
Caenorhabditis_elegans_SIR2_CAEEL_SIR2_CAEEL
Leucosolenia_complicata_lcpid102077_lcgid36957_SIRT1_DROME
Capsaspora_owczarzaki_ATCC_30864_XP_004346801.2_SIR1_MOUSE
Mnemiopsis_leidyi_ML07823a-PA_SIR1_HUMAN
Pleurobrachia_bachei_sb_2653035_SIR1_RAT
Amoeboaphelidium_occidentale_KAI3659977.1_SIR1_HUMAN
Ectocarpus_siliculosus_D8LES8_ECTSI_SIR1_RAT
Fistulifera_solaris_A0A1Z5K794_FISSO_HST1_EMENI
Saccharomyces_cerevisiae_HST1_YEAST_HST1_YEAST
Saccharomyces_cerevisiae_SIR2_YEAST_SIR2_YEAST
Schizosaccharomyces_pombe_SIR2_SCHPO_SIR2_SCHPO
Galerina_marginata_A0A067SMM4_GALM3_HST1_EMENI
Rhizophagus_irregularis_A0A2I1GLM2_9GLOM_SIR1_RAT
Spizellomyces_punctatus_A0A0L0H9S1_SPIPD_SIR1_HUMAN
Rozella_allomycis_A0A075AU49_ROZAC_SIR1_HUMAN
Fonticula_alba_XP_009493409.1_SIR1_RAT
Fistulifera_solaris_A0A1Z5JC26_FISSO_HST2_SCHPO
Schmidtea_mediterranea_augustus_masked-scaffold272-processed-gene-3.2-mRNA-1_HST21_EMENI
Fistulifera_solaris_A0A1Z5K5D8_FISSO_SIR2_MACFA
Sphaeroforma_arctica_JP610_XP_014157535.1_SIR2_DANRE
Mnemiopsis_leidyi_ML002624a-PA_OSB10_HUMAN
Pleurobrachia_bachei_sb_2664049_SIRT2_DROME
Fonticula_alba_XP_009494998.1_SIR2_RAT
Amoeboaphelidium_occidentale_KAI3659897.1_HST3_CANAL
Amoeboaphelidium_protococcarum_KAI3629610.1_HST3_CANAL
Spizellomyces_punctatus_A0A0L0HTT9_SPIPD_HST3_CANAL
Galerina_marginata_A0A067TQF3_GALM3_HST3_CANAL
Saccharomyces_cerevisiae_HST3_YEAST_HST3_YEAST
Rhizophagus_irregularis_A0A2I1GBB3_9GLOM_HST3_CANAL
Galerina_marginata_A0A067T782_GALM3_HST4_EMENI
Saccharomyces_cerevisiae_HST4_YEAST_HST4_YEAST
Schizosaccharomyces_pombe_HST4_SCHPO_HST4_SCHPO
Puccinia_graminis_E3JQ55_PUCGT_HST4_SCHPO
Rozella_allomycis_A0A075AV36_ROZAC_HST3_CANAL
Fonticula_alba_XP_009494611.1_HST3_YEAST
Volvox_carteri_D8TL05_VOLCA_HST3_YEAST
Spizellomyces_punctatus_A0A0L0HKL8_SPIPD_HST4_YEAST
Acropora_digitifera_XP_015779547.1_SIR4_BOVIN
Acropora_millepora_XP_029213217.2_SIR4_BOVIN
Orbicella_faveolata_XP_020602659.1_SIR4_BOVIN
Pocillopora_damicornis_RMX57446.1_SIR4_BOVIN
Stylophora_pistillata_XP_022787591.1_SIR4_HUMAN
Actinia_tenebrosa_XP_031549214.1_SIR4_BOVIN
Nematostella_vectensis_EDO35866.1_SIR4_MOUSE
Exaiptasia_diaphana_XP_020893572.1_SIR4_BOVIN
Dendronephthya_gigantea_XP_028400421.1_SIR4_MOUSE
Xenia_sp._Carnegie-2017_XP_046840840.1_SIR4_HUMAN
Capitella_teleta_R7VC11_CAPTE_SIR4_MOUSE
Xenopus_laevis_A0A1L8I0D6_XENLA_SIR4_BOVIN
Chiloscyllium_punctatum_A0A401RMI2_CHIPU_SIR4_HUMAN
Latimeria_chalumnae_H3BG66_LATCH_SIR4_MOUSE
Homo_sapiens_SIR4_HUMAN_SIR4_HUMAN
Mus_musculus_SIR4_MOUSE_SIR4_MOUSE
Ciona_intestinalis_F6TVS6_CIOIN_SIR4_MOUSE
Strongylocentrotus_purpuratus_A0A7M7RE10_STRPU_SIR4_HUMAN
Amphimedon_queenslandica_XP_011403504.2_SIR4_BOVIN
Haliclona_amboinensis_c33180_g1_i1_m.7512_SIR4_MOUSE
Haliclona_tubifera_c17806_g1_i1_m.1263_SIR4_BOVIN
Ephydatia_muelleri_m.26778_g.26778_SIR4_MOUSE
Aurelia_coerulea_XLOC_073218_TCONS_00101516_Seg992.8.p1_SIR4_BOVIN
Clytia_hemisphaerica_TCONS_00017752-protein_SIR4_MOUSE
Hydra_vulgaris_XP_002163018.1_SIR4_MOUSE
Leucosolenia_complicata_lcpid57906_lcgid55101_SIR4_BOVIN
Sycon_coactum_7951.p1_SIR4_BOVIN
Trichoplax_adhaerens_XP_002114969.1_SIR4_MOUSE
Trichoplax_sp._H2_RDD40986.1_SIR4_MOUSE
Oscarella_carmela_m.10296g.10296_comp22152_c0_seq1_SIR4_MOUSE
Octopus_bimaculoides_A0A0L8HM37_OCTBM_SIR4_BOVIN
Schmidtea_mediterranea_augustus_masked-scaffold20463-processed-gene-0.0-mRNA-1_SIR4_MOUSE
Caenorhabditis_elegans_SIR41_CAEEL_SIR41_CAEEL
Caenorhabditis_elegans_SIR42_CAEEL_SIR42_CAEEL
Drosophila_melanogaster_SIR4_DROME_SIR4_DROME
Mnemiopsis_leidyi_ML41824a-PA_SIR4_MOUSE
Capsaspora_owczarzaki_ATCC_30864_KJE90862.1_SIR4_MOUSE
Ectocarpus_siliculosus_D8LJJ1_ECTSI_SIR4_ARATH
Fistulifera_solaris_A0A1Z5K280_FISSO_NPD2_BRADU
Volvox_carteri_D8U497_VOLCA_SIR4_ARATH
Monosiga_brevicollis_MX1_XP_001744705.1_SIR4_MONBE
Salpingoeca_rosetta_XP_004989159.1_SIR4_MONBE
Amoeboaphelidium_occidentale_KAI3661634.1_SIR4_BATDJ
Amoeboaphelidium_protococcarum_KAI3633096.1_SIR4_BATDJ
Galerina_marginata_A0A067TC06_GALM3_SIR4_BATDJ
Puccinia_graminis_E3KJ55_PUCGT_SIR4_BATDJ
Rhizophagus_irregularis_A0A2I1HDR7_9GLOM_SIR4_BATDJ
Spizellomyces_punctatus_A0A0L0H4V4_SPIPD_SIR4_BATDJ
Capsaspora_owczarzaki_ATCC_30864_XP_004343843.2_SIR6_MACFA
Mnemiopsis_leidyi_ML23958a-PA_SIR1_ORYSI
Pleurobrachia_bachei_sb_2669295_CNX2_ARATH
Monosiga_brevicollis_MX1_XP_001746923.1_SIR1_ARATH
Salpingoeca_rosetta_XP_004991725.1_SIR6_CASCN
Acropora_digitifera_XP_015764189.1_SIR6_CASCN
Orbicella_faveolata_XP_020608148.1_SIR6_CASCN
Pocillopora_damicornis_XP_027050255.1_SIR6_CASCN
Stylophora_pistillata_XP_022784120.1_SIR6_CASCN
Actinia_tenebrosa_XP_031561543.1_SIR6_MACFA
Nematostella_vectensis_EDO32517.1_SIR6_CASCN
Exaiptasia_diaphana_XP_020916137.1_SIR6_CASCN
Mnemiopsis_leidyi_ML002614a-PA_SIR6_CASCN
Pleurobrachia_bachei_sb_2657812_SIR6_MOUSE
Aurelia_coerulea_XLOC_034300_TCONS_00048726_Seg2682.3.p1_SIR6_CASCN
Clytia_hemisphaerica_TCONS_00056393-protein_SIR6_CASCN
Hydra_vulgaris_XP_047139351.1_SIR6_CASCN
Capitella_teleta_R7UXV9_CAPTE_SIR6_MOUSE
Homo_sapiens_SIR6_HUMAN_SIR6_HUMAN
Mus_musculus_SIR6_MOUSE_SIR6_MOUSE
Latimeria_chalumnae_H3AGQ1_LATCH_SIR6_MOUSE
Xenopus_laevis_Q6GPW5_XENLA_SIR6_MACFA
Octopus_bimaculoides_A0A0L8FVN7_OCTBM_SIR6_CASCN
Schmidtea_mediterranea_maker-scaffold8700-snap-gene-0.18-mRNA-1_SIR6_CASCN
Strongylocentrotus_purpuratus_A0A7M7N7D4_STRPU_SIR6_CASCN
Dendronephthya_gigantea_XP_028412260.1_SIR6_MACFA
Xenia_sp._Carnegie-2017_XP_046857358.1_SIR6_MACFA
Oscarella_carmela_m.214358g.214358_comp39808_c0_seq29_SIR6_CASCN
Trichoplax_adhaerens_XP_002110277.1_SIR6_MACFA
Amphimedon_queenslandica_XP_003389737.2_SIR6_MACFA
Haliclona_tubifera_c49726_g5_i2_m.24434_SIR6_MACFA
Ephydatia_muelleri_m.41112_g.41112_SIR6_MACFA
Stylissa_carteri_maker-SC_scaffold2306-augustus-gene-0.139-mRNA-1_SIR6_CASCN
Leucosolenia_complicata_lcpid75339_lcgid20684_SIR6_CASCN
Daphnia_magna_A0A162SQA7_9CRUS_SIR6_DROME
Drosophila_melanogaster_SIR6_DROME_SIR6_DROME
Caenorhabditis_elegans_SIR24_CAEEL_SIR24_CAEEL
Chara_braunii_A0A388K2V7_CHABU_TF29_SCHPO
Volvox_carteri_D8TU91_VOLCA_SIR1_ARATH
Ectocarpus_siliculosus_D7G3Z0_ECTSI_SIR1_ARATH
Fistulifera_solaris_A0A1Z5JKY8_FISSO_SIR6_CASCN
Acropora_digitifera_XP_015774796.1_SIR1_ARATH
Acropora_millepora_XP_029214425.2_SIR1_ARATH
Orbicella_faveolata_XP_020631320.1_SIR1_ARATH
Pocillopora_damicornis_RMX44192.1_SIR1_ORYSI
Stylophora_pistillata_PFX26008.1_SIR1_ARATH
Aurelia_coerulea_XLOC_058163_TCONS_00081427_Seg589.7.p1_SIR1_ARATH
Chara_braunii_A0A388M0E5_CHABU_SIR1_ARATH
Actinia_tenebrosa_XP_031565139.1_SIR1_ARATH
Exaiptasia_diaphana_XP_020912061.1_SIR1_ARATH
Orbicella_faveolata_XP_020631316.1_SIR1_ARATH
Pocillopora_damicornis_XP_027046210.1_SIR1_ARATH
Stylophora_pistillata_XP_022790004.1_SIR1_ARATH
Amphimedon_queenslandica_XP_011406188.1_SIR1_ARATH
Ephydatia_muelleri_m.44725_g.44725_SIR1_ARATH
Oscarella_carmela_m.9609g.9609_comp21492_c0_seq1_SIR1_ARATH
Amphimedon_queenslandica_XP_003383581.1_SIR1_ARATH
Haliclona_amboinensis_c27278_g1_i2_m.5375_SIR1_ARATH
Haliclona_tubifera_c53653_g1_i1_m.34064_SIR1_ARATH
Amphimedon_queenslandica_XP_003388355.1_SIR1_ORYSI
Oscarella_carmela_m.58799g.58799_comp34829_c0_seq1_SIR1_ARATH
Stylissa_carteri_maker-SC_scaffold2848-snap-gene-0.24-mRNA-1_SIR1_ORYSI
Stylissa_carteri_maker-SC_scaffold739-snap-gene-0.85-mRNA-1_SIR6_MACFA
Clytia_hemisphaerica_TCONS_00045855-protein_SIR6_CASCN
Chara_braunii_A0A388K9Y1_CHABU_SIR6_DROME
Leucosolenia_complicata_lcpid182756_lcgid10070_SIR1_ARATH
Actinia_tenebrosa_XP_031565494.1_SIR1_ARATH
Orbicella_faveolata_XP_020604327.1_SIR1_ARATH
Amphimedon_queenslandica_XP_003385596.1_SIR6_CASCN
Leucosolenia_complicata_lcpid110268_lcgid61006_SIR1_ARATH
Salpingoeca_rosetta_XP_004993416.1_SIR6_CASCN
Ephydatia_muelleri_m.286671_g.286671_SIR1_ARATH
Haliclona_tubifera_c40065_g1_i1_m.9948_SIR1_ARATH
Stylissa_carteri_maker-SC_scaffold144383-augustus-gene-0.30-mRNA-1_SIR1_ARATH-Domain2
Mnemiopsis_leidyi_ML200240a-PA_SIR1_ARATH
Capitella_teleta_R7UFJ9_CAPTE_SIR1_ORYSI
Capitella_teleta_R7TRL9_CAPTE_SIR6_MACFA
Capitella_teleta_R7UG42_CAPTE_SIR7_HUMAN
Octopus_bimaculoides_A0A0L8HEZ4_OCTBM_SIR7_BOVIN
Trichoplax_adhaerens_XP_002109473.1_SIR7_BOVIN
Trichoplax_sp._H2_RDD45328.1_SIR7_BOVIN
Chiloscyllium_punctatum_A0A401S4C4_CHIPU_SIR7_HUMAN
Latimeria_chalumnae_H3AKL9_LATCH_SIR7_BOVIN
Homo_sapiens_SIR7_HUMAN_SIR7_HUMAN
Mus_musculus_SIR7_MOUSE_SIR7_MOUSE
Xenopus_laevis_Q5XG15_XENLA_SIR7_HUMAN
Oscarella_carmela_m.16056g.16056_comp26712_c0_seq2_SIR7_MOUSE
Capsaspora_owczarzaki_ATCC_30864_XP_004344427.2_SIR7_HUMAN
Ciona_intestinalis_F7AUS4_CIOIN_SIR7_RAT
Drosophila_melanogaster_SIR7_DROME_SIR7_DROME
Leucosolenia_complicata_lcpid135799_lcgid5960_SIR7_BOVIN
Sycon_coactum_12062.p1_SIR7_HUMAN
Salpingoeca_rosetta_XP_004991027.1_SIR7_HUMAN
Monosiga_brevicollis_MX1_XP_001749356.1_SIR7_BOVIN
Strongylocentrotus_purpuratus_A0A7M7NU88_STRPU_SIR7_HUMAN
Dendronephthya_gigantea_XP_028415928.1_SIR7_BOVIN
Xenia_sp._Carnegie-2017_XP_046855444.1_SIR7_BOVIN
Actinia_tenebrosa_XP_031555893.1_SIR7_BOVIN
Exaiptasia_diaphana_KXJ28567.1_SIR7_BOVIN
Nematostella_vectensis_EDO29747.1_SIR7_BOVIN
Aurelia_coerulea_XLOC_058355_TCONS_00081668_Seg5923.2.p1_SIR7_BOVIN
Orbicella_faveolata_XP_020607353.1_SIR7_BOVIN
Pocillopora_damicornis_XP_027058842.1_SIR7_BOVIN
Stylophora_pistillata_PFX22126.1_SIR7_BOVIN
Acropora_digitifera_XP_015751984.1_SIR7_BOVIN
Acropora_millepora_XP_029180011.2_SIR7_BOVIN
Acropora_digitifera_XP_015764941.1_SIR5_CANLF
Acropora_millepora_XP_029191153.1_SIR5_CANLF
Orbicella_faveolata_XP_020603299.1_SIR5_CANLF
Pocillopora_damicornis_XP_027051970.1_SIR5_CANLF
Stylophora_pistillata_XP_022791312.1_SIR5_CANLF
Actinia_tenebrosa_XP_031565089.1_SIR5_CANLF
Exaiptasia_diaphana_XP_020897758.1_SIR5_CHICK
Nematostella_vectensis_XP_048576900.1_SIR5_CANLF
Dendronephthya_gigantea_XP_028392003.1_SIR5_CANLF
Xenia_sp._Carnegie-2017_XP_046842162.1_SIR5_CANLF
Amphimedon_queenslandica_XP_003382458.1_SIR5_CANLF
Haliclona_amboinensis_c48062_g1_i4_mm.2497_SIR5_CANLF
Haliclona_tubifera_c27515_g1_i1_m.3231_SIR5_XENTR
Ephydatia_muelleri_m.42840_g.42840_SIR5_CANLF
Stylissa_carteri_maker-SC_scaffold3240-augustus-gene-0.61-mRNA-1_SIR5_CANLF
Oscarella_carmela_m.102278g.102278_comp37162_c0_seq1_SIR5_CANLF
Trichoplax_adhaerens_XP_002111996.1_SIR5_MOUSE
Trichoplax_sp._H2_RDD44172.1_SIR5_CANLF
Strongylocentrotus_purpuratus_A0A7M7NUX7_STRPU_SIR5A_XENLA
Capitella_teleta_R7TYG4_CAPTE_SIR5_CANLF
Chiloscyllium_punctatum_A0A401SZL3_CHIPU_SIR5_CHICK
Homo_sapiens_SIR5_HUMAN_SIR5_HUMAN
Mus_musculus_SIR5_MOUSE_SIR5_MOUSE
Xenopus_laevis_SIR5A_XENLA_SIR5A_XENLA
Latimeria_chalumnae_H3AF98_LATCH_SIR5_XENTR
Octopus_bimaculoides_A0A0L8FJ96_OCTBM_SIR5_DANRE
Ciona_intestinalis_H2XWF2_CIOIN_SIR5_MOUSE
Daphnia_magna_A0A164XVS9_9CRUS_SIR5_DAPPU
Galerina_marginata_A0A067TTX9_GALM3_SIR5_COPC7
Galerina_marginata_A0A067TWG2_GALM3_SIR5_COPC7
Rhizophagus_irregularis_A0A2I1H174_9GLOM_SIR5_CHICK
Schmidtea_mediterranea_augustus_masked-scaffold19448-processed-gene-0.0-mRNA-1_SIR5A_XENLA
Chara_braunii_A0A388LX92_CHABU_SIR5_CANLF
Galerina_marginata_A0A067SC53_GALM3_SIR5_COPC7
Sphaeroforma_arctica_JP610_XP_014152407.1_NPD2_PYRAE
Sphaeroforma_arctica_JP610_XP_014153224.1_SIR2A_PLAF7
Stylissa_carteri_augustus_masked-SC_scaffold70346-processed-gene-0.28-mRNA-1_NPD_THEKO
Ectocarpus_siliculosus_D8LHN5_ECTSI_SIR2E_DICDI
Fistulifera_solaris_A0A1Z5JZ96_FISSO_SIR2E_DICDI
0.7

Figure S7


PNC1
NAMPT
Metazoa
Ctenophora
Placozoa
-PNC1
Anthozoa
Scleractinia
Cnidaria
Actiniaria
Myxobolidae
Medusozoa
-NAMPT
Hydrozoa
Chordata
Ascidiacea
-NAMPT
Echinodermata
Echinoidea
Valvatida
Asteroidea
Trichinellida
-PNC1
Strongylidae
Nematoda
-PNC1
Strongylida
-PNC1
Haemonchid
Chromadorea
-PNC1
Rhabditida
-NAMPT
Onchocercidae
-PNC1
Rhabditidae
-NAMPT
Cyprididae
Podocopida
Entomobryomorpha
-NAMPT
Ephemeroptera
Thripidae
Blattodea
Megachilidae
Halictidae
Braconidae
Cotesia
Hymenoptera
Formicidae
Insecta
-NAMPT
Apidae
Bombus
Apis
Vespidae
Pteromalidae
Chironomidae
Lucilia
Muscidae
Diptera
Drosophilidae
Drosophila
Tephritidae
Arthropoda
Culicidae
Nymphalidae
Lepidoptera
Papilionidae
Pieris
Pieridae
Noctuidae
Scarabaeidae
Coleoptera
Chrysomelidae
Tenebrionidae
Lampyridae
Curculionidae
Hemiptera
Delphacidae
Aphididae
Araneae
Araneidae
-NAMPT
Mesostigmata
Arachnida
Trombidiformes
Oppiidae
Sarcoptiformes
-NAMPT
Ixodidae
Hexanauplia
-NAMPT
Caligidae
Amphipoda
-NAMPT
Malacostraca
Decapoda
-NAMPT
-NAMPT
Parachela
Diphyllobothriidae
Cestoda
-PNC1
Cyclophyllidea
Platyhelminthes
Taeniidae
Opisthorchiidae
Plagiorchiida
Trematoda
Fasciolidae
Schistosomatidae
-PNC1
Rotaria
Eurotatoria
-NAMPT
Polychaeta
Annelida
Cephalopoda
Pectinidae
Bivalvia
Mollusca
Gastropoda
Leucosolenida
Porifera
Haplosclerida
Demospongiae
-PNC1
Suberitida
Pleurobrachia_bachei
Mnemiopsis_leidyi
Trichoplax_sp._H2
Trichoplax_adhaerens
Dendronephthya_gigantea
Orbicella_faveolata
Stylophora_pistillata
Pocillopora_damicornis
Acropora_digitifera
Acropora_millepora
Exaiptasia_diaphana
Nematostella_vectensis
Actinia_tenebrosa
Thelohanellus_kitauei
Henneguya_salminicola
Aurelia_coerulea
Clytia_hemisphaerica
Hydra_vulgaris
Oikopleura_dioica
Branchiostoma_belcheri
Branchiostoma_floridae
Phallusia_mammillata
Styela_clava
Saccoglossus_kowalevskii
Anneissia_japonica
Apostichopus_japonicus
Strongylocentrotus_purpuratus
Lytechinus_variegatus
Acanthaster_planci
Patiria_miniata
Asterias_rubens
Trichuris_suis
Trichuris_trichiura
Trichinella_patagoniensis
Trichinella_zimbabwensis
Trichinella_papuae
Trichinella_sp._T9
Trichinella_murrelli
Trichinella_britovi
Trichinella_pseudospiralis
Trichinella_nelsoni
Trichinella_nativa
Trichinella_spiralis
Oesophagostomum_dentatum
Cylicostephanus_goldi
Strongylus_vulgaris
Dictyocaulus_viviparus
Necator_americanus
Ancylostoma_ceylanicum
Ancylostoma_duodenale
Ancylostoma_caninum
Nippostrongylus_brasiliensis
Heligmosomoides_polygyrus
Angiostrongylus_costaricensis
Angiostrongylus_cantonensis
Teladorsagia_circumcincta
Haemonchus_placei
Haemonchus_contortus
Halicephalobus_sp._NKZ332
Gongylonema_pulchrum
Dracunculus_medinensis
Thelazia_callipaeda
Pristionchus_pacificus
Enterobius_vermicularis
Steinernema_carpocapsae
Strongyloides_ratti
Bursaphelenchus_okinawaensis
Bursaphelenchus_xylophilus
Onchocerca_flexuosa
Onchocerca_ochengi
Litomosoides_sigmodontis
Loa_loa
Wuchereria_bancrofti
Brugia_timori
Brugia_pahangi
Brugia_malayi
Acanthocheilonema_viteae
Anisakis_simplex
Toxocara_canis
Diploscapter_pachys
Caenorhabditis_bovis
Caenorhabditis_nigoni
Caenorhabditis_brenneri
Caenorhabditis_remanei
Caenorhabditis_elegans
Caenorhabditis_briggsae
Nymphon_striatum
Notodromas_monacha
Cyprideis_torosa
Darwinula_stevensoni
Folsomia_candida
Orchesella_cincta
Ephemera_danica
Cloeon_dipterum
Thrips_palmi
Frankliniella_occidentalis
Pediculus_humanus_corporis
Timema_shepardi
Timema_californicum
Zootermopsis_nevadensis
Cryptotermes_secundus
Coptotermes_formosanus
Ctenocephalides_felis
Belonochema_treatae
Ampulex_compressa
Neodiprion_lecontei
Ceratosolen_solmsi_marchali
Orussus_abietinus
Cephus_cinctus
Osmia_bicornis_bicornis
Osmia_lignaria
Megachile_rotundata
Nomia_melanderi
Dufourea_novaeangliae
Megalopta_genalis
Aphidius_gifuensis
Chelonus_insularis
Diachasma_alloeum
Microplitis_demolitor
Fopius_arisanus
Cotesia_chilonis
Cotesia_congregata
Athalia_rosae
Copidosoma_floridanum
Ooceraea_biroi
Pseudoatta_argentina
Nylanderia_fulva
Harpegnathos_saltator
Dinoponera_quadriceps
Odontomachus_brunneus
Cyphomyrmex_costatus
Vollenhovia_emeryi
Monomorium_pharaonis
Temnothorax_longispinosus
Temnothorax_curvispinosus
Pseudomyrmex_gracilis
Pogonomyrmex_barbatus
Camponotus_floridanus
Acromyrmex_charruanus
Acromyrmex_insinuator
Acromyrmex_heyeri
Acromyrmex_echinatior
Linepithema_humile
Formica_exsecta
Lasius_niger
Wasmannia_auropunctata
Trachymyrmex_cornetzi
Trachymyrmex_zeteki
Trachymyrmex_septentrionalis
Solenopsis_invicta
Atta_colombica
Atta_cephalotes
Trichogramma_brassicae
Trichogramma_pretiosum
Habropoda_laboriosa
Frieseomelitta_varia
Eufriesea_mexicana
Melipona_quadrifasciata
Ceratina_calcarata
Bombus_vancouverensis
Bombus_vosnesenskii
Bombus_impatiens
Bombus_bifarius
Bombus_terrestris
Apis_florea
Apis_dorsata
Apis_cerana_cerana
Apis_mellifera_caucasica
Polistes_dominula
Polistes_canadensis
Vespula_pensylvanica
Vespula_germanica
Vespula_vulgaris
Vespa_mandarinia
Trichomalopsis_sarcophagae
Nasonia_vitripennis
Hermetia_illucens
Clunio_marinus
Polypedilum_vanderplanki
Contarinia_nasturtii
Teleopsis_dalmanni
Bradysia_odoriphaga
Bradysia_coprophila
Glossina_fuscipes
Sarcophaga_bullata
Lucilia_sericata
Lucilia_cuprina
Stomoxys_calcitrans
Musca_domestica
Scaptodrosophila_lebanonensis
Drosophila_subpulchrella
Drosophila_rhopaloa
Drosophila_innubila
Drosophila_biarmipes
Drosophila_novamexicana
Drosophila_bipectinata
Drosophila_kikkawai
Drosophila_ficusphila
Drosophila_elegans
Drosophila_busckii
Drosophila_takahashii
Drosophila_eugracilis
Drosophila_suzukii
Drosophila_albomicans
Drosophila_obscura
Drosophila_guanche
Drosophila_arizonae
Drosophila_willistoni
Drosophila_yakuba
Drosophila_virilis
Drosophila_subobscura
Drosophila_simulans
Drosophila_sechellia
Drosophila_persimilis
Drosophila_navojoa
Drosophila_mojavensis
Drosophila_miranda
Drosophila_melanogaster
Drosophila_hydei
Drosophila_grimshawi
Drosophila_erecta
Drosophila_ananassae
Rhagoletis_zephyria
Zeugodacus_cucurbitae
Bactrocera_oleae
Bactrocera_tryoni
Bactrocera_dorsalis
Ceratitis_capitata
Culex_pipiens_pallens
Culex_quinquefasciatus
Anopheles_coluzzii
Anopheles_sinensis
Anopheles_darlingi
Anopheles_stephensi
Anopheles_arabiensis
Anopheles_albimanus
Aedes_albopictus
Aedes_aegypti
Hyposmocoma_kahamanoa
Arctia_plantaginis
Amyelois_transitella
Eumeta_japonica
Maniola_hyperantus
Vanessa_tameamea
Danaus_plexippus_plexippus
Pararge_aegeria
Bicyclus_anynana
Operophtera_brumata
Ostrinia_furnacalis
Aricia_agestis
Parnassius_apollo
Papilio_polytes
Papilio_machaon
Papilio_xuthus
Plutella_xylostella
Pieris_macdunnoughi
Pieris_rapae
Zerene_cesonia
Manduca_sexta
Helicoverpa_armigera
Trichoplusia_ni
Spodoptera_litura
Spodoptera_frugiperda
Spodoptera_exigua
Heliothis_virescens
Bombyx_mori
Ignelater_luminosus
Agrilus_planipennis
Anoplophora_glabripennis
Oryctes_borbonicus
Onthophagus_taurus
Aethina_tumida
Nicrophorus_vespilloides
Callosobruchus_maculatus
Gonioctena_quinquepunctata
Diabrotica_virgifera_virgifera
Leptinotarsa_decemlineata
Asbolus_verrucosus
Tribolium_castaneum
Abscondita_terminalis
Photinus_pyralis
Rhynchophorus_ferrugineus
Dendroctonus_ponderosae
Sitophilus_oryzae
Halyomorpha_halys
Apolygus_lucorum
Diaphorina_citri
Laodelphax_striatellus
Nilaparvata_lugens
Cimex_lectularius
Bemisia_tabaci
Melanaphis_sacchari
Cinara_cedri
Sipha_flava
Diuraphis_noxia
Aphis_craccivora
Aphis_glycines
Aphis_gossypii
Rhopalosiphum_maidis
Myzus_persicae
Acyrthosiphon_pisum
Centruroides_sculpturatus
Stegodyphus_mimosarum
Stegodyphus_dumicola
Parasteatoda_tepidariorum
Araneus_ventricosus
Argiope_bruennichi
Tropilaelaps_mercedesae
Varroa_destructor
Galendromus_occidentalis
Dinothrombium_tinctorium
Leptotrombidium_deliense
Tetranychus_urticae
Medioppia_subpectinata
Oppiella_nova
Sarcoptes_scabiei
Euroglyphus_maynei
Dermatophagoides_pteronyssinus
Dermacentor_silvarum
Ixodes_persulcatus
Ixodes_scapularis
Rhipicephalus_sanguineus
Rhipicephalus_microplus
Limulus_polyphemus
Amphibalanus_amphitrite
Eurytemora_affinis
Caligus_clemensi
Caligus_rogercresseyi
Lepeophtheirus_salmonis
Pollicipes_pollicipes
Tigriopus_californicus
Trinorchestia_longiramus
Hyalella_azteca
Armadillidium_nasatum
Armadillidium_vulgare
Portunus_trituberculatus
Chionoecetes_opilio
Homarus_americanus
Penaeus_vannamei
Penaeus_monodon
Daphnia_magna
Daphnia_pulex
Ramazzottius_varieornatus
Hypsibius_dujardini
Priapulus_caudatus
Intoshia_linei
Macrostomum_lignano
Spirometra_erinaceieuropaei
Schistocephalus_solidus
Sparganum_proliferum
Dibothriocephalus_latus
Mesocestoides_corti
Hymenolepis_microstoma
Hymenolepis_diminuta
Taenia_asiatica
Echinococcus_multilocularis
Echinococcus_granulosus
Hydatigera_taeniaeformis
Clonorchis_sinensis
Opisthorchis_felineus
Opisthorchis_viverrini
Paragonimus_kellicotti
Paragonimus_heterotremus
Paragonimus_miyazakii
Paragonimus_westermani
Echinostoma_caproni
Fasciolopsis_buski
Fasciola_gigantica
Fasciola_hepatica
Trichobilharzia_regenti
Schistosoma_margrebowiei
Schistosoma_mattheei
Schistosoma_curassoni
Schistosoma_haematobium
Schistosoma_bovis
Schistosoma_mansoni
Schistosoma_japonicum
Didymodactylos_carnosus
Rotaria_sp._Silwood2
Rotaria_sp._Silwood1
Rotaria_sordida
Rotaria_socialis
Rotaria_magnacalcarata
Adineta_steineri
Adineta_ricciae
Brachionus_calyciflorus
Brachionus_plicatilis
Bugula_neritina
Lingula_anatina
Dimorphilus_gyrociliatus
Capitella_teleta
Helobdella_robusta
Sepia_pharaonis
Octopus_sinensis
Octopus_bimaculoides
Pecten_maximus
Mizuhopecten_yessoensis
Crassostrea_gigas
Crassostrea_virginica
Mytilus_coruscus
Mytilus_galloprovincialis
Mytilus_edulis
Gigantopelta_aegis
Pomacea_canaliculata
Batillaria_attramentaria
Lottia_gigantea
Plakobranchus_ocellatus
Elysia_marginata
Elysia_chlorotica
Candidula_unifasciata
Biomphalaria_glabrata
Aplysia_californica
Oscarella_carmela
Leucosolenia_complicata
Sycon_ciliatum
Halisarca_dujardinii
Haliclona_amboinensis
Haliclona_tubifera
Amphimedon_queenslandica
Xestospongia_testudinaria
Suberites_domuncula
Halichondria_panicea
Ephydatia_muelleri