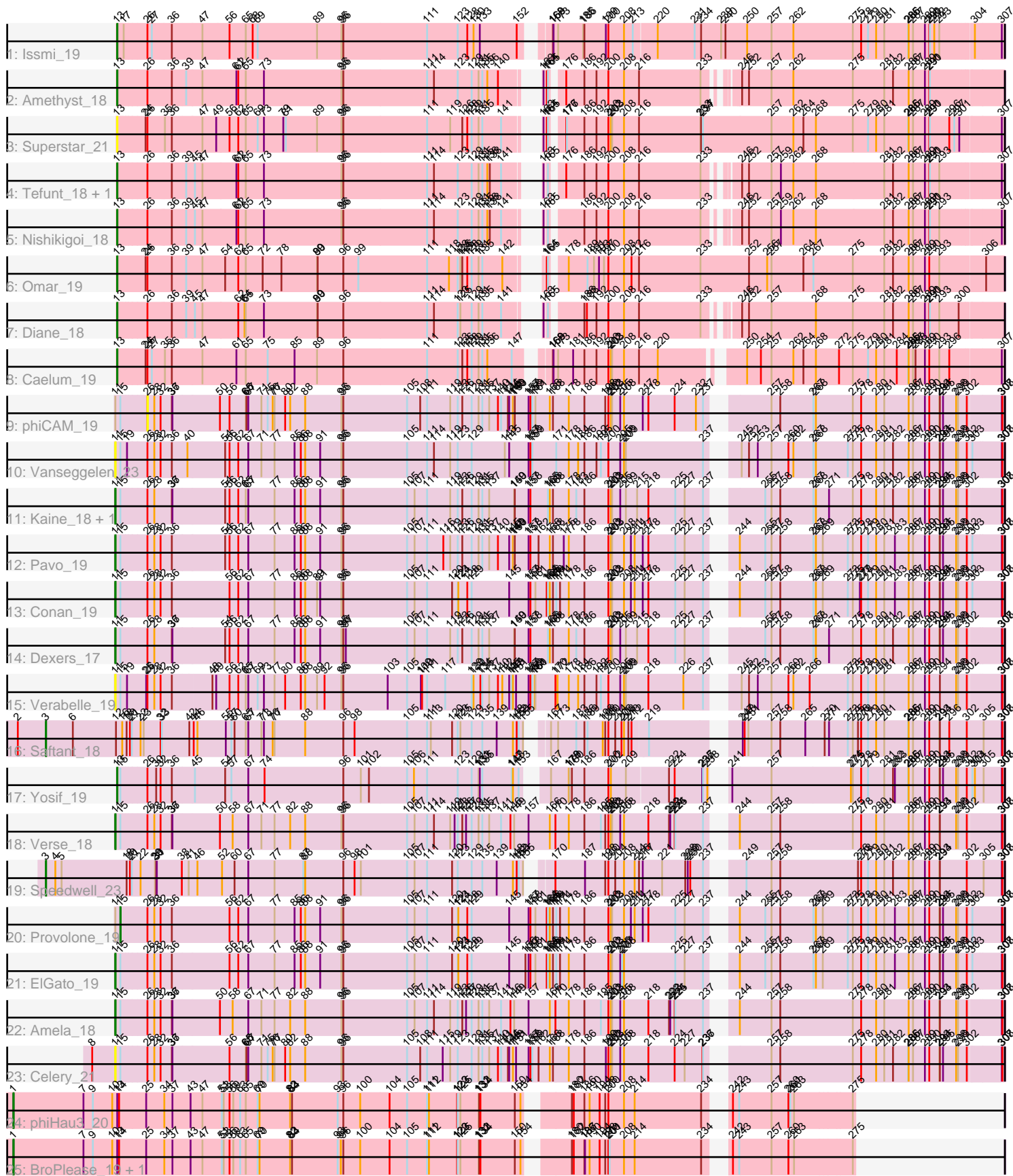


Pham 195726



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

Pham 195726 Report

This analysis was run 12/09/24 on database version 580.

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 195726 has 28 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Issmi_19
- Track 2 : Amethyst_18
- Track 3 : Superstar_21
- Track 4 : Tefunt_18, Haizum_18
- Track 5 : Nishikigoj_18
- Track 6 : Omar_19
- Track 7 : Diane_18
- Track 8 : Caelum_19
- Track 9 : phiCAM_19
- Track 10 : Vanseggelen_23
- Track 11 : Kaine_18, Alsaber_19
- Track 12 : Pavo_19
- Track 13 : Conan_19
- Track 14 : Dexers_17
- Track 15 : Verabelle_19
- Track 16 : Saftant_18
- Track 17 : Yosif_19
- Track 18 : Verse_18
- Track 19 : Speedwell_23
- Track 20 : Provolone_19
- Track 21 : ElGato_19
- Track 22 : Amela_18
- Track 23 : Celery_21
- Track 24 : phiHau3_20
- Track 25 : BroPlease_19, GreenWeasel_20

Summary of Final Annotations (See graph section above for start numbers):

The start number called the most often in the published annotations is 13, it was called in 9 of the 23 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amethyst_18, Caelum_19, Diane_18, Haizum_18, Issmi_19, Nishikigoi_18, Omar_19, Superstar_21, Tefunt_18, Yosif_19,

Genes that have the "Most Annotated" start but do not call it:

- BroPlease_19, GreenWeasel_20, phiHau3_20,

Genes that do not have the "Most Annotated" start:

- Alsaber_19, Amela_18, Celery_21, Conan_19, Dexers_17, ElGato_19, Kaine_18, Pavo_19, Provolone_19, Saftant_18, Speedwell_23, Vanseggelen_23, Verabelle_19, Verse_18, phiCAM_19,

Summary by start number:

Start 1:

- Found in 3 of 28 (10.7%) of genes in pham
- Manual Annotations of this start: 3 of 23
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BroPlease_19 (BD4), GreenWeasel_20 (BD4), phiHau3_20 (BD4),

Start 3:

- Found in 2 of 28 (7.1%) of genes in pham
- Manual Annotations of this start: 2 of 23
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Saftant_18 (BD3), Speedwell_23 (BD3),

Start 11:

- Found in 13 of 28 (46.4%) of genes in pham
- Manual Annotations of this start: 8 of 23
- Called 84.6% of time when present
- Phage (with cluster) where this start called: Alsaber_19 (BD3), Amela_18 (BD3), Celery_21 (BD3), Conan_19 (BD3), Dexers_17 (BD3), ElGato_19 (BD3), Kaine_18 (BD3), Pavo_19 (BD3), Vanseggelen_23 (BD3), Verabelle_19 (BD3), Verse_18 (BD3),

Start 13:

- Found in 13 of 28 (46.4%) of genes in pham
- Manual Annotations of this start: 9 of 23
- Called 76.9% of time when present
- Phage (with cluster) where this start called: Amethyst_18 (BD2), Caelum_19 (BD2), Diane_18 (BD2), Haizum_18 (BD2), Issmi_19 (BD2), Nishikigoi_18 (BD2), Omar_19 (BD2), Superstar_21 (BD2), Tefunt_18 (BD2), Yosif_19 (BD3),

Start 15:

- Found in 14 of 28 (50.0%) of genes in pham
- Manual Annotations of this start: 1 of 23
- Called 7.1% of time when present
- Phage (with cluster) where this start called: Provolone_19 (BD3),

Start 26:

- Found in 23 of 28 (82.1%) of genes in pham

- No Manual Annotations of this start.
- Called 4.3% of time when present
- Phage (with cluster) where this start called: phiCAM_19 (BD3),

Summary by clusters:

There are 3 clusters represented in this pham: BD4, BD3, BD2,

Info for manual annotations of cluster BD2:

- Start number 13 was manually annotated 8 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 3 was manually annotated 2 times for cluster BD3.
- Start number 11 was manually annotated 8 times for cluster BD3.
- Start number 13 was manually annotated 1 time for cluster BD3.
- Start number 15 was manually annotated 1 time for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 1 was manually annotated 3 times for cluster BD4.

Gene Information:

Gene: Alsaber_19 Start: 11562, Stop: 15674, Start Num: 11

Candidate Starts for Alsaber_19:

(Start: 11 @11562 has 8 MA's), (Start: 15 @11586 has 1 MA's), (26, 11706), (28, 11739), (36, 11817), (37, 11820), (54, 12060), (56, 12081), (62, 12123), (65, 12159), (67, 12171), (77, 12297), (85, 12393), (86, 12423), (88, 12444), (91, 12516), (95, 12615), (96, 12624), (105, 12930), (107, 12966), (111, 13026), (119, 13137), (123, 13173), (126, 13194), (129, 13239), (131, 13272), (135, 13290), (137, 13323), (149, 13443), (150, 13446), (157, 13512), (158, 13521), (165, 13605), (166, 13614), (168, 13629), (178, 13704), (183, 13740), (186, 13779), (200, 13893), (202, 13905), (203, 13911), (205, 13950), (209, 13977), (215, 14031), (218, 14085), (225, 14214), (227, 14259), (237, 14346), (255, 14544), (257, 14574), (258, 14616), (267, 14775), (268, 14787), (271, 14850), (275, 14964), (278, 15003), (280, 15075), (281, 15114), (282, 15156), (286, 15231), (287, 15252), (289, 15309), (290, 15330), (293, 15378), (294, 15381), (295, 15396), (298, 15459), (299, 15468), (302, 15510), (307, 15660), (308, 15663),

Gene: Amela_18 Start: 11854, Stop: 15966, Start Num: 11

Candidate Starts for Amela_18:

(Start: 11 @11854 has 8 MA's), (Start: 15 @11878 has 1 MA's), (26, 11998), (28, 12031), (32, 12061), (36, 12109), (37, 12112), (50, 12328), (58, 12388), (67, 12463), (71, 12526), (77, 12589), (82, 12664), (88, 12736), (95, 12907), (96, 12916), (105, 13222), (107, 13258), (111, 13318), (114, 13351), (119, 13429), (123, 13465), (126, 13486), (127, 13504), (129, 13531), (131, 13564), (135, 13582), (137, 13615), (141, 13672), (146, 13717), (149, 13735), (157, 13804), (166, 13906), (170, 13933), (178, 13996), (186, 14071), (195, 14149), (200, 14185), (202, 14197), (203, 14203), (205, 14242), (208, 14260), (218, 14377), (222, 14476), (223, 14482), (224, 14503), (225, 14506), (237, 14638), (244, 14716), (257, 14866), (258, 14908), (275, 15256), (278, 15295), (280, 15367), (281, 15406), (286, 15523), (287, 15544), (289, 15601), (290, 15622), (293, 15670), (294, 15673), (298, 15751), (299, 15760), (302, 15802), (307, 15952), (308, 15955),

Gene: Amethyst_18 Start: 11541, Stop: 15449, Start Num: 13

Candidate Starts for Amethyst_18:

(Start: 13 @11541 has 9 MA's), (26, 11676), (36, 11787), (39, 11850), (47, 11919), (61, 12081), (62, 12090), (65, 12126), (73, 12213), (95, 12582), (96, 12591), (111, 12990), (114, 13023), (123, 13137), (129, 13203), (131, 13236), (135, 13254), (136, 13278), (140, 13329), (163, 13428), (164, 13431), (165, 13437), (176, 13482), (186, 13569), (192, 13626), (200, 13683), (208, 13758), (216, 13830), (233, 14124), (246, 14223), (252, 14256), (257, 14364), (262, 14469), (275, 14754), (281, 14904), (282, 14946), (286, 15021), (287, 15042), (289, 15099), (290, 15120), (291, 15123),

Gene: BroPlease_19 Start: 11860, Stop: 15681, Start Num: 1

Candidate Starts for BroPlease_19:

(Start: 1 @11860 has 3 MA's), (7, 12196), (9, 12241), (10, 12334), (Start: 13 @12358 has 9 MA's), (14, 12367), (25, 12493), (34, 12577), (37, 12616), (43, 12703), (47, 12760), (51, 12853), (53, 12862), (56, 12889), (59, 12907), (63, 12940), (65, 12967), (69, 13024), (70, 13033), (82, 13180), (83, 13186), (84, 13189), (93, 13408), (94, 13423), (96, 13435), (100, 13516), (104, 13654), (105, 13738), (111, 13834), (112, 13843), (122, 13978), (123, 13981), (125, 13993), (131, 14080), (132, 14083), (134, 14089), (150, 14254), (154, 14281), (180, 14440), (182, 14449), (186, 14500), (187, 14503), (190, 14524), (194, 14572), (198, 14599), (200, 14614), (201, 14620), (208, 14689), (214, 14740), (234, 15058), (242, 15112), (243, 15142), (257, 15295), (260, 15376), (263, 15403), (275, 15670),

Gene: Caelum_19 Start: 11485, Stop: 15480, Start Num: 13

Candidate Starts for Caelum_19:

(Start: 13 @11485 has 9 MA's), (24, 11611), (26, 11620), (27, 11641), (35, 11698), (36, 11731), (47, 11863), (61, 12025), (65, 12070), (75, 12175), (85, 12304), (89, 12412), (96, 12535), (111, 12934), (123, 13081), (126, 13102), (128, 13126), (129, 13147), (131, 13180), (135, 13198), (136, 13222), (147, 13339), (168, 13450), (169, 13453), (173, 13474), (181, 13546), (186, 13600), (192, 13657), (200, 13714), (202, 13726), (203, 13732), (208, 13789), (216, 13861), (220, 13951), (250, 14278), (254, 14344), (257, 14395), (262, 14500), (264, 14548), (268, 14608), (272, 14719), (275, 14785), (279, 14857), (280, 14896), (281, 14935), (284, 14995), (285, 15049), (286, 15052), (287, 15073), (288, 15085), (289, 15130), (290, 15151), (293, 15199), (296, 15247), (307, 15469),

Gene: Celery_21 Start: 11512, Stop: 15627, Start Num: 11

Candidate Starts for Celery_21:

(8, 11401), (Start: 11 @11512 has 8 MA's), (Start: 15 @11536 has 1 MA's), (26, 11656), (28, 11689), (32, 11719), (36, 11767), (37, 11770), (56, 12031), (65, 12109), (66, 12112), (67, 12121), (71, 12184), (75, 12214), (76, 12238), (77, 12247), (80, 12298), (82, 12322), (88, 12394), (95, 12565), (96, 12574), (105, 12880), (108, 12943), (111, 12976), (115, 13051), (119, 13087), (123, 13123), (129, 13189), (131, 13222), (135, 13240), (137, 13273), (140, 13315), (141, 13330), (144, 13363), (145, 13369), (148, 13387), (151, 13402), (157, 13462), (158, 13471), (159, 13480), (162, 13510), (166, 13564), (168, 13579), (178, 13654), (186, 13729), (199, 13831), (200, 13843), (202, 13855), (203, 13861), (205, 13900), (208, 13918), (218, 14035), (224, 14161), (227, 14209), (236, 14293), (237, 14296), (257, 14524), (258, 14566), (275, 14914), (278, 14953), (280, 15025), (281, 15064), (282, 15106), (285, 15178), (286, 15181), (287, 15202), (289, 15259), (290, 15280), (293, 15328), (294, 15331), (295, 15346), (298, 15409), (299, 15418), (302, 15460), (307, 15613), (308, 15616),

Gene: Conan_19 Start: 11284, Stop: 15396, Start Num: 11

Candidate Starts for Conan_19:

(Start: 11 @11284 has 8 MA's), (Start: 15 @11308 has 1 MA's), (26, 11428), (28, 11461), (32, 11491), (36, 11539), (56, 11803), (62, 11845), (67, 11893), (77, 12019), (85, 12115), (86, 12145), (88, 12166), (89, 12223), (91, 12238), (95, 12337), (96, 12346), (105, 12652), (107, 12688), (111, 12748), (120, 12868), (123, 12895), (124, 12898), (128, 12940), (129, 12961), (145, 13141), (157, 13234), (158, 13243), (161, 13267), (164, 13321), (165, 13327), (166, 13336), (168, 13351), (171, 13366), (174, 13384), (178, 13426), (186, 13501), (200, 13615), (202, 13627), (203, 13633), (208, 13690), (211, 13723), (214, 13741), (217, 13780), (218, 13807), (225, 13936), (227, 13981), (237, 14068), (244, 14146), (255, 14266), (257, 14296), (258, 14338), (267, 14497), (268, 14509), (269, 14542), (273,

14662), (275, 14686), (277, 14719), (278, 14725), (279, 14758), (280, 14797), (281, 14836), (283, 14887), (286, 14953), (287, 14974), (289, 15031), (290, 15052), (293, 15100), (294, 15103), (295, 15118), (298, 15181), (299, 15190), (302, 15232), (303, 15247), (307, 15382), (308, 15385),

Gene: Dexers_17 Start: 11265, Stop: 15377, Start Num: 11

Candidate Starts for Dexers_17:

(Start: 11 @11265 has 8 MA's), (Start: 15 @11289 has 1 MA's), (26, 11409), (28, 11442), (36, 11520), (37, 11523), (54, 11763), (56, 11784), (62, 11826), (67, 11874), (77, 12000), (85, 12096), (86, 12126), (88, 12147), (91, 12219), (95, 12318), (96, 12327), (97, 12339), (105, 12633), (107, 12669), (111, 12729), (119, 12840), (123, 12876), (126, 12897), (129, 12942), (131, 12975), (135, 12993), (137, 13026), (149, 13146), (150, 13149), (157, 13215), (158, 13224), (165, 13308), (166, 13317), (168, 13332), (178, 13407), (183, 13443), (186, 13482), (200, 13596), (202, 13608), (203, 13614), (205, 13653), (209, 13680), (215, 13734), (218, 13788), (225, 13917), (227, 13962), (237, 14049), (255, 14247), (257, 14277), (258, 14319), (267, 14478), (268, 14490), (271, 14553), (275, 14667), (278, 14706), (280, 14778), (281, 14817), (282, 14859), (286, 14934), (287, 14955), (289, 15012), (290, 15033), (293, 15081), (294, 15084), (295, 15099), (298, 15162), (299, 15171), (302, 15213), (307, 15363), (308, 15366),

Gene: Diane_18 Start: 11534, Stop: 15442, Start Num: 13

Candidate Starts for Diane_18:

(Start: 13 @11534 has 9 MA's), (26, 11669), (36, 11780), (39, 11843), (45, 11876), (47, 11912), (62, 12083), (64, 12113), (65, 12119), (73, 12206), (89, 12461), (90, 12464), (96, 12584), (111, 12983), (114, 13016), (123, 13130), (125, 13142), (129, 13196), (131, 13229), (135, 13247), (141, 13337), (163, 13421), (165, 13430), (186, 13562), (188, 13574), (192, 13619), (200, 13676), (208, 13751), (216, 13823), (233, 14117), (246, 14216), (252, 14249), (257, 14357), (268, 14570), (275, 14747), (281, 14897), (282, 14939), (286, 15014), (287, 15035), (289, 15092), (290, 15113), (291, 15116), (293, 15161), (300, 15254),

Gene: ElGato_19 Start: 11287, Stop: 15399, Start Num: 11

Candidate Starts for ElGato_19:

(Start: 11 @11287 has 8 MA's), (Start: 15 @11311 has 1 MA's), (26, 11431), (28, 11464), (32, 11494), (36, 11542), (56, 11806), (62, 11848), (67, 11896), (77, 12022), (85, 12118), (86, 12148), (88, 12169), (91, 12241), (95, 12340), (96, 12349), (105, 12655), (107, 12691), (111, 12751), (120, 12871), (123, 12898), (124, 12901), (128, 12943), (129, 12964), (145, 13144), (156, 13222), (157, 13237), (158, 13246), (161, 13270), (164, 13324), (165, 13330), (166, 13339), (168, 13354), (171, 13369), (174, 13387), (178, 13429), (186, 13504), (200, 13618), (202, 13630), (203, 13636), (205, 13675), (207, 13684), (208, 13693), (225, 13939), (227, 13984), (237, 14071), (244, 14149), (255, 14269), (257, 14299), (258, 14341), (267, 14500), (268, 14512), (269, 14545), (273, 14665), (275, 14689), (278, 14728), (279, 14761), (280, 14800), (281, 14839), (283, 14890), (286, 14956), (287, 14977), (289, 15034), (290, 15055), (293, 15103), (294, 15106), (295, 15121), (298, 15184), (299, 15193), (302, 15235), (303, 15250), (307, 15385), (308, 15388),

Gene: GreenWeasel_20 Start: 11869, Stop: 15690, Start Num: 1

Candidate Starts for GreenWeasel_20:

(Start: 1 @11869 has 3 MA's), (7, 12205), (9, 12250), (10, 12343), (Start: 13 @12367 has 9 MA's), (14, 12376), (25, 12502), (34, 12586), (37, 12625), (43, 12712), (47, 12769), (51, 12862), (53, 12871), (56, 12898), (59, 12916), (63, 12949), (65, 12976), (69, 13033), (70, 13042), (82, 13189), (83, 13195), (84, 13198), (93, 13417), (94, 13432), (96, 13444), (100, 13525), (104, 13663), (105, 13747), (111, 13843), (112, 13852), (122, 13987), (123, 13990), (125, 14002), (131, 14089), (132, 14092), (134, 14098), (150, 14263), (154, 14290), (180, 14449), (182, 14458), (186, 14509), (187, 14512), (190, 14533), (194, 14581), (198, 14608), (200, 14623), (201, 14629), (208, 14698), (214, 14749), (234, 15067), (242, 15121), (243, 15151), (257, 15304), (260, 15385), (263, 15412), (275, 15679),

Gene: Haizum_18 Start: 11570, Stop: 15475, Start Num: 13

Candidate Starts for Haizum_18:

(Start: 13 @11570 has 9 MA's), (26, 11705), (36, 11816), (39, 11879), (45, 11912), (47, 11948), (61, 12110), (62, 12119), (65, 12155), (73, 12242), (95, 12611), (96, 12620), (111, 13019), (114, 13052), (123, 13166), (129, 13232), (131, 13265), (135, 13283), (136, 13307), (138, 13319), (141, 13373), (163, 13457), (165, 13466), (176, 13511), (186, 13598), (192, 13655), (200, 13712), (208, 13787), (216, 13859), (233, 14153), (246, 14252), (252, 14285), (257, 14393), (259, 14438), (262, 14498), (268, 14606), (281, 14933), (282, 14975), (286, 15050), (287, 15071), (289, 15128), (290, 15149), (291, 15152), (293, 15197), (307, 15464),

Gene: Issmi_19 Start: 11823, Stop: 15905, Start Num: 13

Candidate Starts for Issmi_19:

(Start: 13 @11823 has 9 MA's), (17, 11850), (26, 11958), (27, 11979), (36, 12069), (47, 12201), (56, 12330), (65, 12408), (68, 12441), (69, 12465), (89, 12750), (95, 12864), (96, 12873), (111, 13272), (123, 13419), (128, 13464), (130, 13494), (133, 13524), (152, 13701), (168, 13788), (169, 13791), (173, 13812), (185, 13932), (186, 13938), (199, 14040), (200, 14052), (208, 14127), (213, 14169), (220, 14277), (231, 14454), (234, 14484), (239, 14580), (240, 14601), (250, 14703), (257, 14820), (262, 14925), (275, 15210), (278, 15249), (279, 15282), (280, 15321), (281, 15360), (285, 15474), (286, 15477), (287, 15498), (289, 15555), (290, 15576), (291, 15579), (292, 15600), (293, 15624), (304, 15768), (307, 15894),

Gene: Kaine_18 Start: 11265, Stop: 15377, Start Num: 11

Candidate Starts for Kaine_18:

(Start: 11 @11265 has 8 MA's), (Start: 15 @11289 has 1 MA's), (26, 11409), (28, 11442), (36, 11520), (37, 11523), (54, 11763), (56, 11784), (62, 11826), (65, 11862), (67, 11874), (77, 12000), (85, 12096), (86, 12126), (88, 12147), (91, 12219), (95, 12318), (96, 12327), (105, 12633), (107, 12669), (111, 12729), (119, 12840), (123, 12876), (126, 12897), (129, 12942), (131, 12975), (135, 12993), (137, 13026), (149, 13146), (150, 13149), (157, 13215), (158, 13224), (165, 13308), (166, 13317), (168, 13332), (178, 13407), (183, 13443), (186, 13482), (200, 13596), (202, 13608), (203, 13614), (205, 13653), (209, 13680), (215, 13734), (218, 13788), (225, 13917), (227, 13962), (237, 14049), (255, 14247), (257, 14277), (258, 14319), (267, 14478), (268, 14490), (271, 14553), (275, 14667), (278, 14706), (280, 14778), (281, 14817), (282, 14859), (286, 14934), (287, 14955), (289, 15012), (290, 15033), (293, 15081), (294, 15084), (295, 15099), (298, 15162), (299, 15171), (302, 15213), (307, 15363), (308, 15366),

Gene: Nishikigoi_18 Start: 11570, Stop: 15475, Start Num: 13

Candidate Starts for Nishikigoi_18:

(Start: 13 @11570 has 9 MA's), (26, 11705), (36, 11816), (39, 11879), (45, 11912), (47, 11948), (61, 12110), (62, 12119), (65, 12155), (73, 12242), (95, 12611), (96, 12620), (111, 13019), (114, 13052), (123, 13166), (129, 13232), (131, 13265), (135, 13283), (136, 13307), (138, 13319), (141, 13373), (163, 13457), (165, 13466), (186, 13598), (192, 13655), (200, 13712), (208, 13787), (216, 13859), (233, 14153), (246, 14252), (252, 14285), (257, 14393), (259, 14438), (262, 14498), (268, 14606), (281, 14933), (282, 14975), (286, 15050), (287, 15071), (289, 15128), (290, 15149), (291, 15152), (293, 15197), (307, 15464),

Gene: Omar_19 Start: 11800, Stop: 15807, Start Num: 13

Candidate Starts for Omar_19:

(Start: 13 @11800 has 9 MA's), (24, 11926), (26, 11935), (36, 12046), (39, 12109), (47, 12178), (54, 12286), (62, 12349), (65, 12385), (72, 12466), (78, 12556), (89, 12727), (90, 12730), (96, 12850), (99, 12922), (111, 13249), (118, 13354), (123, 13396), (125, 13408), (126, 13417), (128, 13441), (129, 13462), (131, 13495), (135, 13513), (142, 13609), (164, 13690), (165, 13696), (178, 13753), (189, 13843), (191, 13873), (193, 13897), (197, 13921), (200, 13942), (208, 14017), (212, 14053), (216, 14089), (233, 14383), (252, 14614), (256, 14701), (257, 14722), (264, 14875), (267, 14923), (275,

15112), (281, 15262), (282, 15304), (286, 15379), (287, 15400), (289, 15457), (290, 15478), (293, 15526), (306, 15721),

Gene: Pavo_19 Start: 11557, Stop: 15669, Start Num: 11

Candidate Starts for Pavo_19:

(Start: 11 @11557 has 8 MA's), (Start: 15 @11581 has 1 MA's), (26, 11701), (28, 11734), (32, 11764), (36, 11812), (54, 12055), (56, 12076), (62, 12118), (67, 12166), (77, 12292), (85, 12388), (86, 12418), (88, 12439), (91, 12511), (95, 12610), (96, 12619), (105, 12925), (107, 12961), (111, 13021), (116, 13099), (119, 13132), (123, 13168), (126, 13189), (129, 13234), (131, 13267), (135, 13285), (137, 13318), (140, 13360), (145, 13414), (148, 13432), (149, 13438), (150, 13441), (157, 13507), (158, 13516), (162, 13555), (166, 13609), (168, 13624), (175, 13675), (178, 13699), (186, 13774), (200, 13888), (202, 13900), (203, 13906), (208, 13963), (211, 13996), (214, 14014), (217, 14053), (218, 14080), (225, 14209), (227, 14254), (237, 14341), (244, 14419), (255, 14539), (257, 14569), (258, 14611), (267, 14770), (268, 14782), (269, 14815), (273, 14935), (275, 14959), (278, 14998), (279, 15031), (280, 15070), (281, 15109), (283, 15160), (286, 15226), (287, 15247), (289, 15304), (290, 15325), (293, 15373), (294, 15376), (295, 15391), (298, 15454), (299, 15463), (302, 15505), (303, 15520), (307, 15655), (308, 15658),

Gene: Provolone_19 Start: 11311, Stop: 15399, Start Num: 15

Candidate Starts for Provolone_19:

(Start: 11 @11287 has 8 MA's), (Start: 15 @11311 has 1 MA's), (26, 11431), (28, 11464), (32, 11494), (36, 11542), (56, 11806), (62, 11848), (67, 11896), (77, 12022), (85, 12118), (86, 12148), (88, 12169), (91, 12241), (95, 12340), (96, 12349), (105, 12655), (107, 12691), (111, 12751), (120, 12871), (123, 12898), (124, 12901), (128, 12943), (129, 12964), (145, 13144), (157, 13237), (158, 13246), (161, 13270), (164, 13324), (165, 13330), (166, 13339), (168, 13354), (171, 13369), (174, 13387), (178, 13429), (186, 13504), (200, 13618), (202, 13630), (203, 13636), (208, 13693), (211, 13726), (214, 13744), (217, 13783), (218, 13810), (225, 13939), (227, 13984), (237, 14071), (244, 14149), (255, 14269), (257, 14299), (258, 14341), (267, 14500), (268, 14512), (269, 14545), (273, 14665), (275, 14689), (278, 14728), (279, 14761), (280, 14800), (281, 14839), (283, 14890), (286, 14956), (287, 14977), (289, 15034), (290, 15055), (293, 15103), (294, 15106), (295, 15121), (298, 15184), (299, 15193), (302, 15235), (303, 15250), (307, 15385), (308, 15388),

Gene: Saftant_18 Start: 11565, Stop: 15947, Start Num: 3

Candidate Starts for Saftant_18:

(2, 11433), (Start: 3 @11565 has 2 MA's), (6, 11694), (12, 11901), (16, 11931), (18, 11952), (20, 11967), (21, 11976), (22, 12018), (23, 12033), (32, 12111), (33, 12117), (42, 12249), (44, 12270), (46, 12288), (55, 12423), (57, 12450), (60, 12465), (65, 12519), (67, 12531), (71, 12594), (73, 12606), (76, 12648), (77, 12657), (88, 12804), (96, 12984), (98, 13038), (105, 13290), (111, 13386), (113, 13404), (120, 13506), (123, 13533), (125, 13545), (129, 13599), (135, 13650), (139, 13719), (148, 13797), (152, 13815), (153, 13824), (155, 13845), (167, 13893), (173, 13926), (183, 14013), (186, 14052), (189, 14067), (196, 14139), (198, 14151), (200, 14166), (204, 14199), (206, 14229), (208, 14241), (210, 14262), (212, 14277), (219, 14349), (247, 14697), (248, 14706), (251, 14724), (257, 14835), (258, 14877), (265, 14997), (270, 15090), (271, 15111), (273, 15201), (275, 15225), (276, 15249), (278, 15264), (279, 15297), (280, 15336), (281, 15375), (285, 15489), (286, 15492), (287, 15513), (289, 15570), (290, 15591), (293, 15639), (294, 15642), (296, 15687), (302, 15771), (305, 15846), (307, 15933), (308, 15936),

Gene: Speedwell_23 Start: 13301, Stop: 17692, Start Num: 3

Candidate Starts for Speedwell_23:

(Start: 3 @13301 has 2 MA's), (4, 13346), (5, 13376), (18, 13688), (20, 13703), (21, 13712), (22, 13754), (29, 13820), (30, 13826), (31, 13829), (38, 13949), (41, 13982), (46, 14024), (52, 14141), (60, 14201), (67, 14267), (77, 14393), (87, 14531), (88, 14540), (96, 14720), (98, 14774), (101, 14804), (105, 15026), (107, 15062), (111, 15122), (120, 15242), (123, 15269), (129, 15335), (135, 15386),

(139, 15455), (148, 15533), (152, 15551), (153, 15560), (155, 15581), (170, 15650), (187, 15791), (198, 15887), (200, 15902), (204, 15935), (208, 15977), (214, 16028), (216, 16049), (217, 16067), (221, 16160), (228, 16271), (229, 16283), (230, 16295), (237, 16355), (249, 16463), (257, 16583), (258, 16625), (276, 16997), (278, 17012), (279, 17045), (280, 17084), (281, 17123), (282, 17165), (286, 17240), (287, 17261), (289, 17318), (290, 17339), (293, 17387), (294, 17390), (302, 17519), (305, 17591), (307, 17678), (308, 17681),

Gene: Superstar_21 Start: 12671, Stop: 16678, Start Num: 13

Candidate Starts for Superstar_21:

(Start: 13 @12671 has 9 MA's), (24, 12797), (26, 12806), (35, 12884), (36, 12917), (47, 13049), (49, 13115), (56, 13178), (62, 13220), (65, 13256), (69, 13313), (73, 13343), (79, 13436), (81, 13448), (89, 13598), (95, 13712), (96, 13721), (111, 14120), (119, 14231), (126, 14288), (128, 14312), (129, 14333), (131, 14366), (135, 14384), (141, 14474), (163, 14558), (164, 14561), (165, 14567), (176, 14612), (177, 14615), (186, 14699), (192, 14756), (200, 14813), (202, 14825), (203, 14831), (208, 14888), (216, 14960), (233, 15254), (234, 15257), (237, 15266), (257, 15593), (262, 15698), (264, 15746), (268, 15806), (275, 15983), (279, 16055), (280, 16094), (281, 16133), (285, 16247), (286, 16250), (287, 16271), (289, 16328), (290, 16349), (291, 16352), (296, 16445), (297, 16469), (301, 16493), (307, 16667),

Gene: Tefunt_18 Start: 11570, Stop: 15475, Start Num: 13

Candidate Starts for Tefunt_18:

(Start: 13 @11570 has 9 MA's), (26, 11705), (36, 11816), (39, 11879), (45, 11912), (47, 11948), (61, 12110), (62, 12119), (65, 12155), (73, 12242), (95, 12611), (96, 12620), (111, 13019), (114, 13052), (123, 13166), (129, 13232), (131, 13265), (135, 13283), (136, 13307), (138, 13319), (141, 13373), (163, 13457), (165, 13466), (176, 13511), (186, 13598), (192, 13655), (200, 13712), (208, 13787), (216, 13859), (233, 14153), (246, 14252), (252, 14285), (257, 14393), (259, 14438), (262, 14498), (268, 14606), (281, 14933), (282, 14975), (286, 15050), (287, 15071), (289, 15128), (290, 15149), (291, 15152), (293, 15197), (307, 15464),

Gene: Vanseggelen_23 Start: 11218, Stop: 15330, Start Num: 11

Candidate Starts for Vanseggelen_23:

(Start: 11 @11218 has 8 MA's), (Start: 15 @11242 has 1 MA's), (19, 11269), (26, 11362), (28, 11395), (32, 11425), (36, 11473), (40, 11545), (54, 11716), (56, 11737), (62, 11779), (67, 11827), (71, 11890), (77, 11953), (85, 12049), (86, 12079), (88, 12100), (91, 12172), (95, 12271), (96, 12280), (105, 12586), (111, 12682), (114, 12715), (119, 12793), (123, 12829), (129, 12895), (143, 13054), (145, 13075), (157, 13168), (158, 13177), (159, 13186), (171, 13300), (178, 13360), (184, 13405), (186, 13435), (192, 13492), (195, 13513), (200, 13549), (205, 13606), (208, 13624), (209, 13633), (237, 14002), (245, 14089), (252, 14122), (253, 14164), (257, 14230), (260, 14311), (262, 14335), (267, 14431), (268, 14443), (273, 14596), (275, 14620), (278, 14659), (280, 14731), (281, 14770), (282, 14812), (286, 14887), (287, 14908), (289, 14965), (290, 14986), (293, 15034), (294, 15037), (295, 15052), (298, 15115), (299, 15124), (302, 15166), (303, 15181), (307, 15316), (308, 15319),

Gene: Verabelle_19 Start: 11549, Stop: 15661, Start Num: 11

Candidate Starts for Verabelle_19:

(Start: 11 @11549 has 8 MA's), (Start: 15 @11573 has 1 MA's), (19, 11600), (25, 11687), (26, 11693), (28, 11726), (32, 11756), (36, 11804), (48, 11987), (49, 12005), (56, 12068), (62, 12110), (65, 12146), (67, 12158), (69, 12203), (73, 12233), (77, 12284), (80, 12335), (86, 12410), (88, 12431), (89, 12488), (92, 12524), (95, 12602), (96, 12611), (103, 12824), (105, 12917), (109, 12983), (110, 12989), (111, 13013), (117, 13100), (129, 13226), (130, 13235), (134, 13268), (135, 13277), (137, 13310), (140, 13352), (142, 13373), (145, 13406), (147, 13418), (148, 13424), (151, 13439), (157, 13499), (158, 13508), (159, 13517), (160, 13529), (161, 13532), (170, 13628), (172, 13637), (178, 13691), (184, 13736), (186, 13766), (192, 13823), (195, 13844), (200, 13880), (205, 13937), (208, 13955), (209, 13964), (218, 14072), (226, 14240), (237, 14333), (245, 14420), (252, 14453), (253, 14495), (257,

14561), (260, 14642), (262, 14666), (266, 14744), (273, 14927), (275, 14951), (278, 14990), (279, 15023), (280, 15062), (281, 15101), (286, 15218), (287, 15239), (289, 15296), (290, 15317), (294, 15368), (298, 15446), (299, 15455), (302, 15497), (307, 15647), (308, 15650),

Gene: Verse_18 Start: 11848, Stop: 15960, Start Num: 11

Candidate Starts for Verse_18:

(Start: 11 @11848 has 8 MA's), (Start: 15 @11872 has 1 MA's), (26, 11992), (28, 12025), (32, 12055), (36, 12103), (37, 12106), (50, 12322), (58, 12382), (67, 12457), (71, 12520), (77, 12583), (82, 12658), (88, 12730), (95, 12901), (96, 12910), (105, 13216), (107, 13252), (111, 13312), (114, 13345), (119, 13423), (121, 13444), (123, 13459), (126, 13480), (127, 13498), (129, 13525), (131, 13558), (135, 13576), (137, 13609), (141, 13666), (146, 13711), (149, 13729), (157, 13798), (166, 13900), (170, 13927), (178, 13990), (186, 14065), (195, 14143), (198, 14164), (200, 14179), (202, 14191), (203, 14197), (205, 14236), (208, 14254), (218, 14371), (222, 14470), (223, 14476), (224, 14497), (225, 14500), (237, 14632), (244, 14710), (257, 14860), (258, 14902), (275, 15250), (278, 15289), (280, 15361), (281, 15400), (286, 15517), (287, 15538), (289, 15595), (290, 15616), (293, 15664), (294, 15667), (298, 15745), (299, 15754), (302, 15796), (307, 15946), (308, 15949),

Gene: Yosif_19 Start: 11936, Stop: 15949, Start Num: 13

Candidate Starts for Yosif_19:

(Start: 13 @11936 has 9 MA's), (Start: 15 @11951 has 1 MA's), (26, 12071), (30, 12113), (32, 12134), (36, 12182), (45, 12281), (54, 12425), (57, 12455), (67, 12536), (74, 12614), (96, 12992), (101, 13076), (102, 13115), (105, 13295), (106, 13328), (111, 13391), (123, 13538), (129, 13604), (131, 13637), (133, 13643), (135, 13655), (147, 13796), (148, 13802), (153, 13829), (167, 13898), (178, 13982), (179, 13985), (180, 13997), (186, 14057), (200, 14171), (202, 14183), (209, 14255), (222, 14450), (224, 14477), (235, 14609), (237, 14612), (238, 14633), (241, 14654), (257, 14840), (274, 15218), (275, 15227), (278, 15266), (279, 15299), (281, 15377), (282, 15419), (283, 15428), (285, 15491), (286, 15494), (287, 15515), (289, 15572), (290, 15593), (293, 15641), (294, 15644), (295, 15659), (298, 15722), (299, 15731), (302, 15773), (303, 15794), (304, 15806), (305, 15848), (307, 15935), (308, 15938),

Gene: phiCAM_19 Start: 13655, Stop: 17626, Start Num: 26

Candidate Starts for phiCAM_19:

(Start: 11 @13511 has 8 MA's), (Start: 15 @13535 has 1 MA's), (26, 13655), (28, 13688), (32, 13718), (36, 13766), (37, 13769), (50, 13985), (56, 14030), (65, 14108), (66, 14111), (67, 14120), (71, 14183), (75, 14213), (76, 14237), (77, 14246), (80, 14297), (82, 14321), (88, 14393), (95, 14564), (96, 14573), (105, 14879), (108, 14942), (111, 14975), (119, 15086), (123, 15122), (126, 15143), (129, 15188), (131, 15221), (135, 15239), (137, 15272), (140, 15314), (141, 15329), (144, 15362), (145, 15368), (148, 15386), (149, 15392), (150, 15395), (157, 15461), (158, 15470), (159, 15479), (161, 15494), (166, 15563), (168, 15578), (178, 15653), (186, 15728), (198, 15827), (200, 15842), (202, 15854), (203, 15860), (205, 15899), (208, 15917), (217, 16007), (218, 16034), (224, 16160), (232, 16262), (237, 16295), (257, 16523), (258, 16565), (267, 16724), (268, 16736), (275, 16913), (278, 16952), (280, 17024), (281, 17063), (286, 17180), (287, 17201), (289, 17258), (290, 17279), (293, 17327), (294, 17330), (295, 17345), (298, 17408), (299, 17417), (302, 17459), (307, 17612), (308, 17615),

Gene: phiHau3_20 Start: 11837, Stop: 15658, Start Num: 1

Candidate Starts for phiHau3_20:

(Start: 1 @11837 has 3 MA's), (7, 12173), (9, 12218), (10, 12311), (Start: 13 @12335 has 9 MA's), (14, 12344), (25, 12470), (34, 12554), (37, 12593), (43, 12680), (47, 12737), (51, 12830), (53, 12839), (56, 12866), (59, 12884), (63, 12917), (65, 12944), (69, 13001), (70, 13010), (82, 13157), (83, 13163), (84, 13166), (93, 13385), (96, 13412), (100, 13493), (104, 13631), (105, 13715), (111, 13811), (112, 13820), (122, 13955), (123, 13958), (125, 13970), (131, 14057), (132, 14060), (134, 14066), (150, 14231), (154, 14258), (180, 14417), (182, 14426), (186, 14477), (190, 14501), (194, 14549), (198, 14576), (200, 14591), (208, 14666), (214, 14717), (234, 15035), (242, 15089), (243, 15119), (257,

15272), (260, 15353), (261, 15362), (263, 15380), (275, 15647),