

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 163726 Report

This analysis was run 04/28/24 on database version 559.

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 163726 has 40 members, 7 are drafts.

Phages represented in each track:

- Track 1 : phiBT1_43
- Track 2 : Samora_12
- Track 3 : Lilbooboo_12
- Track 4 : Vash_12
- Track 5 : Shawty_12
- Track 6 : RemusLoopin_12
- Track 7 : Sebastisaurus_12
- Track 8 : SoJo_16
- Track 9 : SV1_16
- Track 10 : Raleigh_16
- Track 11 : PapayaSalad_16
- Track 12 : Ididsumtinwong_16, Bioscum_16
- Track 13 : Austintatious_16
- Track 14 : Keanu_21
- Track 15 : Hiyaa_21
- Track 16 : Spocter_21
- Track 17 : Galactica_19
- Track 18 : Typher_21
- Track 19 : TurboVicky_19
- Track 20 : Goodman_20, Johann_20
- Track 21 : Cicada_21
- Track 22 : PermaG_20
- Track 23 : Jera_20
- Track 24 : Zanella_19
- Track 25 : SBlackberry_19
- Track 26 : Antuna_22, MenE_25
- Track 27 : Dropshot_21, Appa_21
- Track 28 : Phonegingi_21
- Track 29 : Blett_22
- Track 30 : Bush_23
- Track 31 : Warren_22
- Track 32 : Pickles13_21
- Track 33 : Teng_22

- Track 34 : DelaGarza_20
- Track 35 : Lesiram_20
- Track 36 : Gingerbug_18

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

The start number called the most often in the published annotations is 2, it was called in 10 of the 33 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Austintatious_16, Bioscum_16, Galactica_19, Hiyaa_21, Ididsumtinwong_16, Keanu_21, PapayaSalad_16, Raleigh_16, SV1_16, SoJo_16, Spocter_21,

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

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

- Antuna_22, Appa_21, Blett_22, Bush_23, Cicada_21, DelaGarza_20, Dropshot_21, Gingerbug_18, Goodman_20, Jera_20, Johann_20, Lesiram_20, Lilbooboo_12, MenE_25, PermaG_20, Phonegingi_21, Pickles13_21, RemusLoopin_12, SBlackberry_19, Samora_12, Sebastisaurus_12, Shawty_12, Teng_22, TurboVicky_19, Typher_21, Vash_12, Warren_22, Zanella_19, phiBT1_43,

Summary by start number:

Start 2:

- Found in 11 of 40 (27.5%) of genes in pham
- Manual Annotations of this start: 10 of 33
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Austintatious_16 (BC3), Bioscum_16 (BC3), Galactica_19 (BQ), Hiyaa_21 (BQ), Ididsumtinwong_16 (BC3), Keanu_21 (BQ), PapayaSalad_16 (BC3), Raleigh_16 (BC2), SV1_16 (BC1), SoJo_16 (BC1), Spocter_21 (BQ),

Start 8:

- Found in 7 of 40 (17.5%) of genes in pham
- Manual Annotations of this start: 5 of 33
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lilbooboo_12 (BB1), RemusLoopin_12 (BB2), Samora_12 (BB1), Sebastisaurus_12 (BB2), Shawty_12 (BB1), Vash_12 (BB1), phiBT1_43 (BB1),

Start 11:

- Found in 15 of 40 (37.5%) of genes in pham
- Manual Annotations of this start: 9 of 33
- Called 86.7% of time when present
- Phage (with cluster) where this start called: Antuna_22 (GA), Appa_21 (GA), Blett_22 (GA), Bush_23 (GA), DelaGarza_20 (GF), Dropshot_21 (GA), Gingerbug_18 (GF), Lesiram_20 (GF), MenE_25 (GA), Phonegingi_21 (GA), Pickles13_21 (GA), Teng_22 (GF), Warren_22 (GA),

Start 35:

- Found in 19 of 40 (47.5%) of genes in pham
- Manual Annotations of this start: 9 of 33
- Called 47.4% of time when present
- Phage (with cluster) where this start called: Cicada_21 (EJ), Goodman_20 (EJ), Jera_20 (EJ), Johann_20 (EJ), PermaG_20 (EJ), SBlackberry_19 (EJ), TurboVicky_19 (EJ), Typher_21 (EJ), Zanella_19 (EJ),

Summary by clusters:

There are 9 clusters represented in this pham: BB1, EJ, BC1, GF, BQ, GA, BB2, BC2, BC3,

Info for manual annotations of cluster BB1:

- Start number 8 was manually annotated 3 times for cluster BB1.

Info for manual annotations of cluster BB2:

- Start number 8 was manually annotated 2 times for cluster BB2.

Info for manual annotations of cluster BC1:

- Start number 2 was manually annotated 2 times for cluster BC1.

Info for manual annotations of cluster BC2:

- Start number 2 was manually annotated 1 time for cluster BC2.

Info for manual annotations of cluster BC3:

- Start number 2 was manually annotated 4 times for cluster BC3.

Info for manual annotations of cluster BQ:

- Start number 2 was manually annotated 3 times for cluster BQ.

Info for manual annotations of cluster EJ:

- Start number 35 was manually annotated 9 times for cluster EJ.

Info for manual annotations of cluster GA:

- Start number 11 was manually annotated 7 times for cluster GA.

Info for manual annotations of cluster GF:

- Start number 11 was manually annotated 2 times for cluster GF.

Gene Information:

Gene: Antuna_22 Start: 11505, Stop: 13703, Start Num: 11

Candidate Starts for Antuna_22:

(Start: 11 @11505 has 9 MA's), (16, 11580), (21, 11631), (25, 11658), (Start: 35 @11751 has 9 MA's), (39, 11808), (44, 11850), (47, 11883), (49, 11895), (58, 11946), (59, 11949), (61, 11958), (62, 11961), (64, 11997), (65, 12003), (66, 12006), (68, 12018), (70, 12027), (72, 12051), (82, 12150), (89, 12210), (93, 12249), (94, 12264), (98, 12321), (108, 12459), (110, 12489), (112, 12501), (114, 12525), (117, 12534), (122, 12555), (123, 12558), (126, 12570), (130, 12588), (138, 12630), (142, 12660), (166, 12801), (175, 12858), (188, 12924), (197, 12984), (198, 12993), (212, 13056), (221, 13122), (291,

13473), (293, 13497), (303, 13536), (308, 13557),

Gene: Appa_21 Start: 11367, Stop: 13565, Start Num: 11

Candidate Starts for Appa_21:

(Start: 11 @11367 has 9 MA's), (16, 11442), (21, 11493), (25, 11520), (Start: 35 @11613 has 9 MA's), (39, 11670), (44, 11712), (47, 11745), (49, 11757), (58, 11808), (59, 11811), (61, 11820), (62, 11823), (64, 11859), (65, 11865), (66, 11868), (68, 11880), (70, 11889), (72, 11913), (82, 12012), (89, 12072), (93, 12111), (94, 12126), (98, 12183), (108, 12321), (110, 12351), (112, 12363), (114, 12387), (117, 12396), (122, 12417), (123, 12420), (126, 12432), (130, 12450), (138, 12492), (142, 12522), (166, 12663), (175, 12720), (188, 12786), (197, 12846), (198, 12855), (212, 12918), (221, 12984), (236, 13017), (291, 13335), (293, 13359), (303, 13398), (308, 13419),

Gene: Austintatious_16 Start: 9780, Stop: 12197, Start Num: 2

Candidate Starts for Austintatious_16:

(Start: 2 @9780 has 10 MA's), (4, 9792), (5, 9846), (6, 9867), (26, 10041), (29, 10062), (34, 10119), (36, 10152), (46, 10254), (53, 10296), (61, 10338), (62, 10341), (63, 10353), (73, 10431), (77, 10494), (85, 10557), (87, 10575), (89, 10587), (94, 10641), (95, 10650), (97, 10695), (98, 10698), (104, 10779), (111, 10866), (112, 10869), (120, 10917), (125, 10935), (129, 10953), (131, 10965), (149, 11076), (157, 11133), (164, 11169), (168, 11190), (173, 11223), (174, 11229), (180, 11262), (184, 11283), (190, 11316), (194, 11340), (221, 11538), (262, 11796), (266, 11817), (268, 11841), (271, 11862), (282, 11916), (295, 11982), (301, 11994), (310, 12039),

Gene: Bioscum_16 Start: 9816, Stop: 12233, Start Num: 2

Candidate Starts for Bioscum_16:

(Start: 2 @9816 has 10 MA's), (4, 9828), (5, 9882), (6, 9903), (26, 10077), (29, 10098), (34, 10155), (36, 10188), (46, 10290), (53, 10332), (61, 10374), (62, 10377), (63, 10389), (73, 10467), (77, 10530), (85, 10593), (87, 10611), (89, 10623), (94, 10677), (95, 10686), (97, 10731), (98, 10734), (104, 10815), (111, 10902), (112, 10905), (120, 10953), (125, 10971), (129, 10989), (131, 11001), (149, 11112), (157, 11169), (164, 11205), (168, 11226), (173, 11259), (174, 11265), (184, 11319), (190, 11352), (194, 11376), (221, 11574), (262, 11832), (266, 11853), (268, 11877), (271, 11898), (282, 11952), (295, 12018), (301, 12030), (310, 12075),

Gene: Blett_22 Start: 11520, Stop: 13718, Start Num: 11

Candidate Starts for Blett_22:

(Start: 11 @11520 has 9 MA's), (16, 11595), (21, 11646), (25, 11673), (Start: 35 @11766 has 9 MA's), (39, 11823), (44, 11865), (47, 11898), (49, 11910), (58, 11961), (59, 11964), (61, 11973), (62, 11976), (64, 12012), (65, 12018), (66, 12021), (68, 12033), (70, 12042), (72, 12066), (82, 12165), (89, 12225), (93, 12264), (94, 12279), (98, 12336), (108, 12474), (110, 12504), (112, 12516), (114, 12540), (117, 12549), (122, 12570), (123, 12573), (126, 12585), (130, 12603), (138, 12645), (142, 12675), (163, 12804), (175, 12873), (188, 12939), (197, 12999), (198, 13008), (212, 13071), (221, 13137), (236, 13170), (291, 13488), (293, 13512), (303, 13551), (308, 13572),

Gene: Bush_23 Start: 11501, Stop: 13699, Start Num: 11

Candidate Starts for Bush_23:

(Start: 11 @11501 has 9 MA's), (16, 11576), (21, 11627), (25, 11654), (Start: 35 @11747 has 9 MA's), (39, 11804), (44, 11846), (47, 11879), (49, 11891), (58, 11942), (59, 11945), (61, 11954), (62, 11957), (64, 11993), (65, 11999), (66, 12002), (68, 12014), (70, 12023), (72, 12047), (82, 12146), (89, 12206), (93, 12245), (94, 12260), (104, 12398), (105, 12404), (108, 12455), (110, 12485), (112, 12497), (114, 12521), (117, 12530), (122, 12551), (123, 12554), (126, 12566), (130, 12584), (138, 12626), (142, 12656), (166, 12797), (175, 12854), (188, 12920), (197, 12980), (198, 12989), (212, 13052), (221, 13118), (236, 13151), (291, 13469), (293, 13493), (303, 13532), (308, 13553),

Gene: Cicada_21 Start: 13577, Stop: 15565, Start Num: 35

Candidate Starts for Cicada_21:

(Start: 35 @13577 has 9 MA's), (37, 13616), (51, 13727), (54, 13742), (56, 13754), (80, 13946), (83, 13970), (90, 14012), (98, 14102), (102, 14153), (107, 14219), (115, 14300), (118, 14315), (125, 14339), (139, 14402), (142, 14426), (159, 14528), (163, 14552), (175, 14621), (181, 14654), (212, 14852), (216, 14879), (218, 14897), (223, 14951), (231, 14999), (233, 15011), (235, 15017), (244, 15083), (246, 15095), (270, 15272), (278, 15308), (284, 15338), (296, 15398), (317, 15539),

Gene: DelaGarza_20 Start: 12031, Stop: 14265, Start Num: 11

Candidate Starts for DelaGarza_20:

(Start: 11 @12031 has 9 MA's), (13, 12037), (17, 12118), (19, 12130), (21, 12148), (22, 12157), (29, 12199), (30, 12205), (44, 12367), (45, 12382), (48, 12403), (49, 12412), (61, 12475), (71, 12556), (72, 12568), (76, 12616), (77, 12634), (82, 12667), (89, 12727), (94, 12781), (98, 12838), (108, 12976), (110, 13006), (112, 13018), (119, 13063), (135, 13132), (142, 13171), (146, 13195), (153, 13216), (165, 13282), (183, 13372), (185, 13381), (186, 13384), (195, 13435), (216, 13579), (226, 13675), (233, 13711), (238, 13732), (244, 13783), (247, 13798), (269, 13963), (270, 13972), (278, 14008), (291, 14065), (294, 14083), (300, 14098), (302, 14107),

Gene: Dropshot_21 Start: 11367, Stop: 13565, Start Num: 11

Candidate Starts for Dropshot_21:

(Start: 11 @11367 has 9 MA's), (16, 11442), (21, 11493), (25, 11520), (Start: 35 @11613 has 9 MA's), (39, 11670), (44, 11712), (47, 11745), (49, 11757), (58, 11808), (59, 11811), (61, 11820), (62, 11823), (64, 11859), (65, 11865), (66, 11868), (68, 11880), (70, 11889), (72, 11913), (82, 12012), (89, 12072), (93, 12111), (94, 12126), (98, 12183), (108, 12321), (110, 12351), (112, 12363), (114, 12387), (117, 12396), (122, 12417), (123, 12420), (126, 12432), (130, 12450), (138, 12492), (142, 12522), (166, 12663), (175, 12720), (188, 12786), (197, 12846), (198, 12855), (212, 12918), (221, 12984), (236, 13017), (291, 13335), (293, 13359), (303, 13398), (308, 13419),

Gene: Galactica_19 Start: 14849, Stop: 17671, Start Num: 2

Candidate Starts for Galactica_19:

(Start: 2 @14849 has 10 MA's), (6, 14936), (7, 14957), (20, 15179), (26, 15212), (28, 15221), (42, 15383), (49, 15446), (62, 15512), (64, 15548), (69, 15575), (70, 15578), (75, 15641), (78, 15674), (94, 15812), (99, 15878), (104, 15950), (108, 15998), (110, 16028), (116, 16070), (124, 16100), (126, 16109), (128, 16121), (131, 16136), (136, 16163), (147, 16235), (150, 16250), (164, 16340), (168, 16361), (171, 16376), (180, 16433), (184, 16454), (187, 16469), (190, 16487), (194, 16511), (207, 16598), (212, 16637), (233, 16787), (248, 16862), (249, 16883), (253, 16916), (259, 16961), (262, 16982), (267, 17015), (271, 17048), (276, 17063), (287, 17117), (289, 17138), (292, 17159), (299, 17183), (305, 17207), (312, 17258), (314, 17270), (316, 17291), (319, 17453), (320, 17498), (321, 17555), (322, 17579),

Gene: Gingerbug_18 Start: 11192, Stop: 13474, Start Num: 11

Candidate Starts for Gingerbug_18:

(Start: 11 @11192 has 9 MA's), (17, 11273), (19, 11285), (33, 11393), (38, 11471), (39, 11480), (41, 11501), (44, 11522), (45, 11537), (48, 11558), (61, 11630), (63, 11645), (71, 11711), (73, 11726), (74, 11735), (76, 11771), (77, 11789), (82, 11822), (89, 11882), (94, 11936), (97, 11990), (101, 12023), (105, 12080), (109, 12140), (110, 12161), (112, 12173), (113, 12185), (121, 12224), (123, 12230), (127, 12251), (130, 12260), (138, 12302), (140, 12314), (142, 12332), (156, 12428), (161, 12449), (166, 12473), (167, 12476), (170, 12497), (176, 12533), (188, 12596), (191, 12620), (211, 12752), (212, 12761), (226, 12884), (233, 12920), (242, 12983), (249, 13034), (251, 13046), (255, 13091), (272, 13190), (278, 13217), (300, 13307), (312, 13376),

Gene: Goodman_20 Start: 13490, Stop: 15478, Start Num: 35

Candidate Starts for Goodman_20:

(24, 13391), (Start: 35 @13490 has 9 MA's), (51, 13640), (54, 13655), (56, 13667), (80, 13859), (83, 13883), (90, 13925), (98, 14015), (102, 14066), (107, 14132), (115, 14213), (118, 14228), (125, 14252), (142, 14339), (159, 14441), (163, 14465), (175, 14534), (181, 14567), (212, 14765), (216, 14792), (218, 14810), (223, 14864), (231, 14912), (233, 14924), (235, 14930), (244, 14996), (246, 15008), (247, 15011), (270, 15185), (278, 15221), (284, 15251), (296, 15311), (317, 15452),

Gene: Hiyaa_21 Start: 15882, Stop: 18707, Start Num: 2

Candidate Starts for Hiyaa_21:

(1, 15810), (Start: 2 @15882 has 10 MA's), (6, 15969), (7, 15990), (20, 16212), (26, 16245), (36, 16356), (42, 16416), (62, 16545), (64, 16581), (65, 16587), (68, 16602), (70, 16611), (75, 16674), (78, 16707), (86, 16773), (94, 16845), (104, 16983), (110, 17061), (116, 17103), (120, 17121), (125, 17139), (126, 17142), (131, 17169), (132, 17175), (136, 17196), (143, 17247), (147, 17268), (153, 17304), (164, 17373), (169, 17400), (180, 17466), (184, 17487), (187, 17502), (190, 17520), (192, 17535), (194, 17544), (198, 17574), (209, 17649), (216, 17697), (219, 17718), (224, 17775), (225, 17778), (233, 17820), (234, 17823), (245, 17883), (248, 17895), (249, 17916), (255, 17973), (259, 17994), (263, 18027), (272, 18084), (283, 18138), (289, 18171), (304, 18237), (312, 18291), (315, 18315), (322, 18615), (323, 18696),

Gene: Ididsumtinwong_16 Start: 9816, Stop: 12233, Start Num: 2

Candidate Starts for Ididsumtinwong_16:

(Start: 2 @9816 has 10 MA's), (4, 9828), (5, 9882), (6, 9903), (26, 10077), (29, 10098), (34, 10155), (36, 10188), (46, 10290), (53, 10332), (61, 10374), (62, 10377), (63, 10389), (73, 10467), (77, 10530), (85, 10593), (87, 10611), (89, 10623), (94, 10677), (95, 10686), (97, 10731), (98, 10734), (104, 10815), (111, 10902), (112, 10905), (120, 10953), (125, 10971), (129, 10989), (131, 11001), (149, 11112), (157, 11169), (164, 11205), (168, 11226), (173, 11259), (174, 11265), (184, 11319), (190, 11352), (194, 11376), (221, 11574), (262, 11832), (266, 11853), (268, 11877), (271, 11898), (282, 11952), (295, 12018), (301, 12030), (310, 12075),

Gene: Jera_20 Start: 12587, Stop: 14575, Start Num: 35

Candidate Starts for Jera_20:

(Start: 35 @12587 has 9 MA's), (37, 12626), (51, 12737), (54, 12752), (56, 12764), (80, 12956), (83, 12980), (102, 13163), (107, 13229), (118, 13325), (125, 13349), (142, 13436), (159, 13538), (163, 13562), (175, 13631), (181, 13664), (188, 13697), (208, 13829), (216, 13889), (221, 13940), (231, 14009), (233, 14021), (235, 14027), (270, 14282), (284, 14348), (296, 14408), (317, 14549),

Gene: Johann_20 Start: 13490, Stop: 15478, Start Num: 35

Candidate Starts for Johann_20:

(24, 13391), (Start: 35 @13490 has 9 MA's), (51, 13640), (54, 13655), (56, 13667), (80, 13859), (83, 13883), (90, 13925), (98, 14015), (102, 14066), (107, 14132), (115, 14213), (118, 14228), (125, 14252), (142, 14339), (159, 14441), (163, 14465), (175, 14534), (181, 14567), (212, 14765), (216, 14792), (218, 14810), (223, 14864), (231, 14912), (233, 14924), (235, 14930), (244, 14996), (246, 15008), (247, 15011), (270, 15185), (278, 15221), (284, 15251), (296, 15311), (317, 15452),

Gene: Keanu_21 Start: 15925, Stop: 18747, Start Num: 2

Candidate Starts for Keanu_21:

(1, 15853), (Start: 2 @15925 has 10 MA's), (6, 16012), (7, 16033), (15, 16168), (20, 16255), (26, 16288), (28, 16297), (36, 16399), (42, 16459), (62, 16588), (64, 16624), (65, 16630), (66, 16633), (69, 16651), (70, 16654), (75, 16717), (78, 16750), (94, 16888), (97, 16942), (102, 16996), (104, 17026), (106, 17038), (110, 17104), (119, 17161), (120, 17164), (126, 17185), (131, 17212), (140, 17260), (151, 17338), (153, 17347), (169, 17443), (177, 17491), (180, 17509), (182, 17524), (183, 17527), (184, 17530), (187, 17545), (190, 17563), (194, 17587), (198, 17617), (209, 17692), (213, 17725), (216, 17740), (225, 17821), (228, 17839), (234, 17866), (240, 17893), (248, 17938), (251, 17971), (258, 18025), (259, 18037), (262, 18058), (263, 18070), (272, 18127), (287, 18193), (289, 18214),

(304, 18280), (312, 18334), (314, 18346), (315, 18358),

Gene: Lesiram_20 Start: 12001, Stop: 14235, Start Num: 11

Candidate Starts for Lesiram_20:

(Start: 11 @12001 has 9 MA's), (13, 12007), (17, 12088), (19, 12100), (21, 12118), (22, 12127), (29, 12169), (30, 12175), (44, 12337), (45, 12352), (48, 12373), (49, 12382), (61, 12445), (71, 12526), (72, 12538), (76, 12586), (77, 12604), (82, 12637), (89, 12697), (94, 12751), (98, 12808), (108, 12946), (110, 12976), (112, 12988), (119, 13033), (135, 13102), (142, 13141), (146, 13165), (153, 13186), (165, 13252), (183, 13342), (186, 13354), (195, 13405), (201, 13438), (226, 13645), (233, 13681), (238, 13702), (244, 13753), (247, 13768), (269, 13933), (270, 13942), (278, 13978), (291, 14035), (294, 14053), (300, 14068), (302, 14077),

Gene: Lilbooboo_12 Start: 8195, Stop: 10384, Start Num: 8

Candidate Starts for Lilbooboo_12:

(Start: 8 @8195 has 5 MA's), (10, 8222), (Start: 11 @8240 has 9 MA's), (29, 8363), (33, 8402), (36, 8453), (43, 8528), (46, 8555), (50, 8579), (51, 8585), (60, 8636), (61, 8639), (63, 8654), (73, 8732), (77, 8795), (84, 8846), (88, 8879), (91, 8900), (92, 8921), (94, 8942), (104, 9080), (112, 9170), (123, 9227), (128, 9251), (130, 9260), (139, 9305), (141, 9326), (157, 9434), (164, 9470), (168, 9491), (183, 9581), (184, 9584), (190, 9617), (194, 9641), (200, 9680), (202, 9686), (219, 9815), (224, 9872), (231, 9905), (232, 9908), (237, 9926), (241, 9959), (259, 10091), (274, 10187), (286, 10241), (309, 10352),

Gene: MenE_25 Start: 11635, Stop: 13833, Start Num: 11

Candidate Starts for MenE_25:

(Start: 11 @11635 has 9 MA's), (16, 11710), (21, 11761), (25, 11788), (Start: 35 @11881 has 9 MA's), (39, 11938), (44, 11980), (47, 12013), (49, 12025), (58, 12076), (59, 12079), (61, 12088), (62, 12091), (64, 12127), (65, 12133), (66, 12136), (68, 12148), (70, 12157), (72, 12181), (82, 12280), (89, 12340), (93, 12379), (94, 12394), (98, 12451), (108, 12589), (110, 12619), (112, 12631), (114, 12655), (117, 12664), (122, 12685), (123, 12688), (126, 12700), (130, 12718), (138, 12760), (142, 12790), (166, 12931), (175, 12988), (188, 13054), (197, 13114), (198, 13123), (212, 13186), (221, 13252), (291, 13603), (293, 13627), (303, 13666), (308, 13687),

Gene: PapayaSalad_16 Start: 9786, Stop: 12203, Start Num: 2

Candidate Starts for PapayaSalad_16:

(Start: 2 @9786 has 10 MA's), (4, 9798), (5, 9852), (6, 9873), (26, 10047), (29, 10068), (34, 10125), (46, 10260), (53, 10302), (61, 10344), (62, 10347), (63, 10359), (73, 10437), (77, 10500), (85, 10563), (87, 10581), (89, 10593), (94, 10647), (95, 10656), (97, 10701), (98, 10704), (104, 10785), (111, 10872), (112, 10875), (120, 10923), (125, 10941), (129, 10959), (131, 10971), (149, 11082), (157, 11139), (164, 11175), (168, 11196), (173, 11229), (174, 11235), (180, 11268), (184, 11289), (190, 11322), (194, 11346), (205, 11421), (266, 11823), (268, 11847), (271, 11868), (282, 11922), (294, 11985), (301, 12000), (310, 12045),

Gene: PermaG_20 Start: 13551, Stop: 15539, Start Num: 35

Candidate Starts for PermaG_20:

(Start: 35 @13551 has 9 MA's), (37, 13590), (51, 13701), (54, 13716), (56, 13728), (80, 13920), (83, 13944), (90, 13986), (98, 14076), (99, 14085), (102, 14127), (107, 14193), (115, 14274), (118, 14289), (125, 14313), (140, 14385), (142, 14400), (159, 14502), (163, 14526), (175, 14595), (181, 14628), (193, 14694), (212, 14826), (216, 14853), (223, 14925), (228, 14958), (233, 14985), (235, 14991), (239, 15024), (270, 15246), (278, 15282), (284, 15312), (296, 15372), (317, 15513),

Gene: Phonegingi_21 Start: 11365, Stop: 13626, Start Num: 11

Candidate Starts for Phonegingi_21:

(Start: 11 @11365 has 9 MA's), (16, 11440), (21, 11491), (25, 11518), (Start: 35 @11611 has 9 MA's), (40, 11680), (44, 11710), (47, 11743), (49, 11755), (58, 11806), (59, 11809), (61, 11818), (62, 11821),

(64, 11857), (65, 11863), (66, 11866), (68, 11878), (70, 11887), (82, 12010), (89, 12070), (93, 12109), (94, 12124), (98, 12181), (105, 12268), (108, 12319), (110, 12349), (112, 12361), (114, 12385), (117, 12394), (119, 12406), (122, 12415), (123, 12418), (126, 12430), (137, 12487), (138, 12490), (142, 12520), (163, 12649), (175, 12718), (181, 12751), (188, 12784), (189, 12799), (197, 12844), (198, 12853), (216, 12943), (236, 13015), (247, 13063), (250, 13096), (255, 13147), (261, 13180), (263, 13213), (264, 13216), (272, 13291), (291, 13396), (293, 13420), (303, 13459),

Gene: Pickles13_21 Start: 11528, Stop: 13990, Start Num: 11

Candidate Starts for Pickles13_21:

(Start: 11 @11528 has 9 MA's), (16, 11603), (18, 11633), (23, 11666), (25, 11681), (33, 11744), (Start: 35 @11774 has 9 MA's), (36, 11795), (39, 11831), (44, 11873), (47, 11906), (49, 11918), (58, 11969), (59, 11972), (62, 11984), (64, 12020), (65, 12026), (66, 12029), (68, 12041), (70, 12050), (72, 12074), (79, 12152), (89, 12233), (93, 12272), (94, 12287), (96, 12299), (98, 12344), (100, 12362), (104, 12425), (105, 12431), (108, 12482), (110, 12512), (112, 12524), (114, 12548), (117, 12557), (122, 12578), (123, 12581), (126, 12593), (130, 12611), (132, 12623), (138, 12653), (144, 12701), (148, 12719), (161, 12800), (162, 12809), (167, 12827), (196, 13043), (199, 13076), (206, 13151), (217, 13253), (220, 13271), (221, 13322), (222, 13337), (229, 13385), (243, 13469), (256, 13577), (291, 13760), (293, 13784), (303, 13823), (307, 13838), (313, 13886), (318, 13964),

Gene: Raleigh_16 Start: 10247, Stop: 12655, Start Num: 2

Candidate Starts for Raleigh_16:

(Start: 2 @10247 has 10 MA's), (5, 10313), (6, 10334), (7, 10355), (9, 10412), (26, 10508), (31, 10544), (34, 10586), (47, 10730), (52, 10760), (53, 10763), (55, 10775), (57, 10784), (61, 10805), (64, 10844), (72, 10895), (77, 10961), (78, 10970), (81, 10982), (89, 11054), (94, 11108), (112, 11336), (120, 11384), (126, 11405), (172, 11675), (180, 11729), (181, 11732), (184, 11750), (187, 11765), (190, 11783), (194, 11807), (195, 11816), (198, 11837), (205, 11882), (212, 11933), (225, 12041), (251, 12176), (258, 12230), (260, 12251), (266, 12284), (271, 12329), (282, 12383), (301, 12464), (306, 12491), (311, 12515),

Gene: RemusLoopin_12 Start: 8193, Stop: 10382, Start Num: 8

Candidate Starts for RemusLoopin_12:

(Start: 8 @8193 has 5 MA's), (27, 8343), (29, 8361), (33, 8400), (36, 8451), (38, 8478), (46, 8553), (50, 8577), (61, 8637), (63, 8652), (72, 8727), (77, 8793), (84, 8844), (94, 8940), (102, 9048), (104, 9078), (112, 9168), (154, 9405), (157, 9432), (168, 9489), (178, 9546), (179, 9558), (184, 9582), (190, 9615), (194, 9639), (219, 9813), (233, 9915), (259, 10089), (274, 10185), (279, 10206), (301, 10311),

Gene: SBlackberry_19 Start: 13346, Stop: 15334, Start Num: 35

Candidate Starts for SBlackberry_19:

(Start: 35 @13346 has 9 MA's), (37, 13385), (51, 13496), (54, 13511), (56, 13523), (80, 13715), (83, 13739), (102, 13922), (107, 13988), (118, 14084), (125, 14108), (142, 14195), (159, 14297), (163, 14321), (175, 14390), (181, 14423), (208, 14588), (212, 14621), (216, 14648), (218, 14666), (231, 14768), (233, 14780), (235, 14786), (247, 14867), (270, 15041), (284, 15107), (296, 15167), (300, 15176), (317, 15308),

Gene: SV1_16 Start: 10022, Stop: 12439, Start Num: 2

Candidate Starts for SV1_16:

(Start: 2 @10022 has 10 MA's), (4, 10034), (5, 10088), (6, 10109), (26, 10283), (29, 10304), (33, 10343), (36, 10394), (46, 10496), (53, 10538), (60, 10577), (61, 10580), (62, 10583), (73, 10673), (77, 10736), (85, 10799), (87, 10817), (89, 10829), (94, 10883), (98, 10940), (104, 11021), (111, 11108), (112, 11111), (120, 11159), (125, 11177), (131, 11207), (168, 11432), (174, 11471), (177, 11486), (184, 11525), (190, 11558), (194, 11582), (212, 11708), (221, 11780), (257, 12002), (262, 12038), (266, 12059), (268, 12083), (271, 12104), (277, 12131), (281, 12155), (282, 12158), (294, 12221), (295, 12224), (301, 12236), (310, 12281),

Gene: Samora_12 Start: 8227, Stop: 10419, Start Num: 8

Candidate Starts for Samora_12:

(Start: 8 @8227 has 5 MA's), (10, 8254), (Start: 11 @8272 has 9 MA's), (36, 8485), (38, 8512), (43, 8560), (46, 8587), (50, 8611), (61, 8671), (62, 8674), (63, 8686), (73, 8764), (77, 8827), (84, 8878), (91, 8932), (92, 8953), (94, 8974), (102, 9082), (104, 9112), (112, 9202), (164, 9502), (184, 9616), (190, 9649), (194, 9673), (200, 9712), (202, 9718), (219, 9847), (224, 9904), (231, 9937), (259, 10123), (274, 10219), (286, 10273), (289, 10297),

Gene: Sebastisaurus_12 Start: 8219, Stop: 10408, Start Num: 8

Candidate Starts for Sebastisaurus_12:

(Start: 8 @8219 has 5 MA's), (27, 8369), (29, 8387), (33, 8426), (Start: 35 @8456 has 9 MA's), (36, 8477), (38, 8504), (46, 8579), (50, 8603), (61, 8663), (63, 8678), (72, 8753), (77, 8819), (94, 8966), (102, 9074), (104, 9104), (109, 9161), (112, 9194), (154, 9431), (157, 9458), (168, 9515), (178, 9572), (179, 9584), (184, 9608), (190, 9641), (194, 9665), (219, 9839), (231, 9929), (233, 9941), (251, 10049), (254, 10082), (259, 10115), (265, 10151), (274, 10211), (280, 10235), (297, 10328), (301, 10337),

Gene: Shawty_12 Start: 8222, Stop: 10411, Start Num: 8

Candidate Starts for Shawty_12:

(Start: 8 @8222 has 5 MA's), (10, 8249), (32, 8414), (33, 8429), (36, 8480), (38, 8507), (46, 8582), (50, 8606), (61, 8666), (63, 8681), (67, 8717), (72, 8756), (77, 8822), (84, 8873), (92, 8948), (94, 8969), (99, 9035), (103, 9083), (104, 9107), (109, 9164), (112, 9197), (139, 9332), (158, 9464), (160, 9476), (164, 9497), (182, 9605), (184, 9611), (187, 9626), (190, 9644), (194, 9668), (201, 9710), (204, 9722), (215, 9815), (219, 9842), (231, 9932), (254, 10085), (259, 10118), (274, 10214),

Gene: SoJo_16 Start: 10050, Stop: 12278, Start Num: 2

Candidate Starts for SoJo_16:

(Start: 2 @10050 has 10 MA's), (3, 10056), (4, 10062), (12, 10239), (14, 10260), (26, 10377), (36, 10488), (42, 10548), (61, 10674), (70, 10743), (78, 10839), (88, 10914), (94, 10977), (99, 11043), (104, 11115), (110, 11193), (120, 11253), (136, 11319), (145, 11373), (147, 11382), (155, 11427), (157, 11445), (159, 11451), (193, 11586), (210, 11685), (218, 11742), (227, 11808), (230, 11820), (249, 11928), (252, 11952), (262, 12027), (275, 12108), (285, 12159), (290, 12189),

Gene: Spocter_21 Start: 15870, Stop: 18695, Start Num: 2

Candidate Starts for Spocter_21:

(1, 15798), (Start: 2 @15870 has 10 MA's), (6, 15957), (7, 15978), (20, 16200), (26, 16233), (36, 16344), (42, 16404), (62, 16533), (64, 16569), (65, 16575), (68, 16590), (70, 16599), (75, 16662), (78, 16695), (86, 16761), (94, 16833), (104, 16971), (110, 17049), (116, 17091), (120, 17109), (125, 17127), (126, 17130), (131, 17157), (132, 17163), (136, 17184), (143, 17235), (147, 17256), (150, 17271), (151, 17283), (153, 17292), (164, 17361), (169, 17388), (180, 17454), (184, 17475), (187, 17490), (190, 17508), (192, 17523), (194, 17532), (198, 17562), (203, 17580), (209, 17637), (216, 17685), (219, 17706), (224, 17763), (225, 17766), (233, 17808), (234, 17811), (241, 17850), (245, 17871), (248, 17883), (249, 17904), (255, 17961), (259, 17982), (263, 18015), (272, 18072), (283, 18126), (289, 18159), (312, 18279), (315, 18303), (322, 18603), (323, 18684),

Gene: Teng_22 Start: 12028, Stop: 14262, Start Num: 11

Candidate Starts for Teng_22:

(Start: 11 @12028 has 9 MA's), (13, 12034), (17, 12115), (19, 12127), (21, 12145), (22, 12154), (29, 12196), (30, 12202), (44, 12364), (45, 12379), (48, 12400), (49, 12409), (61, 12472), (71, 12553), (72, 12565), (76, 12613), (77, 12631), (82, 12664), (89, 12724), (94, 12778), (98, 12835), (108, 12973), (110, 13003), (112, 13015), (135, 13129), (142, 13168), (146, 13192), (153, 13213), (165, 13279), (183, 13369), (186, 13381), (195, 13432), (233, 13708), (238, 13729), (244, 13780), (247, 13795),

(269, 13960), (270, 13969), (278, 14005), (291, 14062), (294, 14080), (300, 14095), (302, 14104),

Gene: TurboVicky_19 Start: 13340, Stop: 15328, Start Num: 35

Candidate Starts for TurboVicky_19:

(Start: 35 @13340 has 9 MA's), (37, 13379), (51, 13490), (54, 13505), (56, 13517), (80, 13709), (83, 13733), (90, 13775), (102, 13916), (107, 13982), (118, 14078), (142, 14189), (159, 14291), (163, 14315), (175, 14384), (181, 14417), (208, 14582), (214, 14630), (216, 14642), (218, 14660), (231, 14762), (233, 14774), (235, 14780), (270, 15035), (284, 15101), (296, 15161), (317, 15302),

Gene: Typher_21 Start: 13470, Stop: 15458, Start Num: 35

Candidate Starts for Typher_21:

(Start: 35 @13470 has 9 MA's), (37, 13509), (51, 13620), (54, 13635), (56, 13647), (80, 13839), (83, 13863), (90, 13905), (102, 14046), (107, 14112), (118, 14208), (142, 14319), (159, 14421), (163, 14445), (175, 14514), (181, 14547), (208, 14712), (212, 14745), (214, 14760), (216, 14772), (218, 14790), (233, 14904), (235, 14910), (270, 15165), (284, 15231), (296, 15291), (317, 15432),

Gene: Vash_12 Start: 8200, Stop: 10392, Start Num: 8

Candidate Starts for Vash_12:

(Start: 8 @8200 has 5 MA's), (10, 8227), (29, 8368), (33, 8407), (36, 8458), (43, 8533), (46, 8560), (50, 8584), (51, 8590), (60, 8641), (61, 8644), (63, 8659), (73, 8737), (77, 8800), (84, 8851), (88, 8884), (92, 8926), (94, 8947), (99, 9013), (104, 9085), (112, 9175), (123, 9232), (130, 9265), (134, 9289), (139, 9310), (141, 9331), (157, 9439), (164, 9475), (179, 9565), (181, 9571), (183, 9586), (184, 9589), (190, 9622), (194, 9646), (200, 9685), (219, 9820), (224, 9877), (231, 9910), (233, 9922), (259, 10096), (274, 10192), (286, 10246), (289, 10270), (296, 10309), (298, 10315), (309, 10360),

Gene: Warren_22 Start: 11565, Stop: 13763, Start Num: 11

Candidate Starts for Warren_22:

(Start: 11 @11565 has 9 MA's), (16, 11640), (21, 11691), (25, 11718), (Start: 35 @11811 has 9 MA's), (44, 11910), (47, 11943), (49, 11955), (58, 12006), (59, 12009), (61, 12018), (62, 12021), (64, 12057), (65, 12063), (66, 12066), (68, 12078), (70, 12087), (72, 12111), (82, 12210), (89, 12270), (93, 12309), (94, 12324), (98, 12381), (108, 12519), (110, 12549), (112, 12561), (114, 12585), (117, 12594), (122, 12615), (123, 12618), (126, 12630), (130, 12648), (138, 12690), (142, 12720), (145, 12744), (163, 12849), (175, 12918), (181, 12951), (188, 12984), (197, 13044), (198, 13053), (212, 13116), (221, 13182), (236, 13215), (273, 13452), (291, 13533), (293, 13557), (303, 13596), (308, 13617),

Gene: Zanella_19 Start: 13343, Stop: 15331, Start Num: 35

Candidate Starts for Zanella_19:

(Start: 35 @13343 has 9 MA's), (37, 13382), (51, 13493), (54, 13508), (56, 13520), (80, 13712), (83, 13736), (102, 13919), (107, 13985), (118, 14081), (125, 14105), (142, 14192), (159, 14294), (163, 14318), (175, 14387), (181, 14420), (208, 14585), (214, 14633), (216, 14645), (218, 14663), (231, 14765), (233, 14777), (235, 14783), (270, 15038), (284, 15104), (296, 15164), (317, 15305),

Gene: phiBT1_43 Start: 8225, Stop: 10414, Start Num: 8

Candidate Starts for phiBT1_43:

(Start: 8 @8225 has 5 MA's), (10, 8252), (33, 8432), (36, 8483), (38, 8510), (43, 8558), (46, 8585), (50, 8609), (61, 8669), (63, 8684), (73, 8762), (77, 8825), (78, 8834), (84, 8876), (91, 8930), (92, 8951), (94, 8972), (102, 9080), (104, 9110), (112, 9200), (128, 9281), (133, 9311), (139, 9335), (141, 9356), (152, 9425), (154, 9437), (158, 9467), (160, 9479), (165, 9503), (180, 9593), (182, 9608), (184, 9614), (190, 9647), (192, 9662), (194, 9671), (200, 9710), (202, 9716), (204, 9725), (215, 9818), (224, 9902), (232, 9938), (233, 9947), (254, 10088), (259, 10121), (265, 10157), (274, 10217), (286, 10271), (288, 10277), (301, 10343),