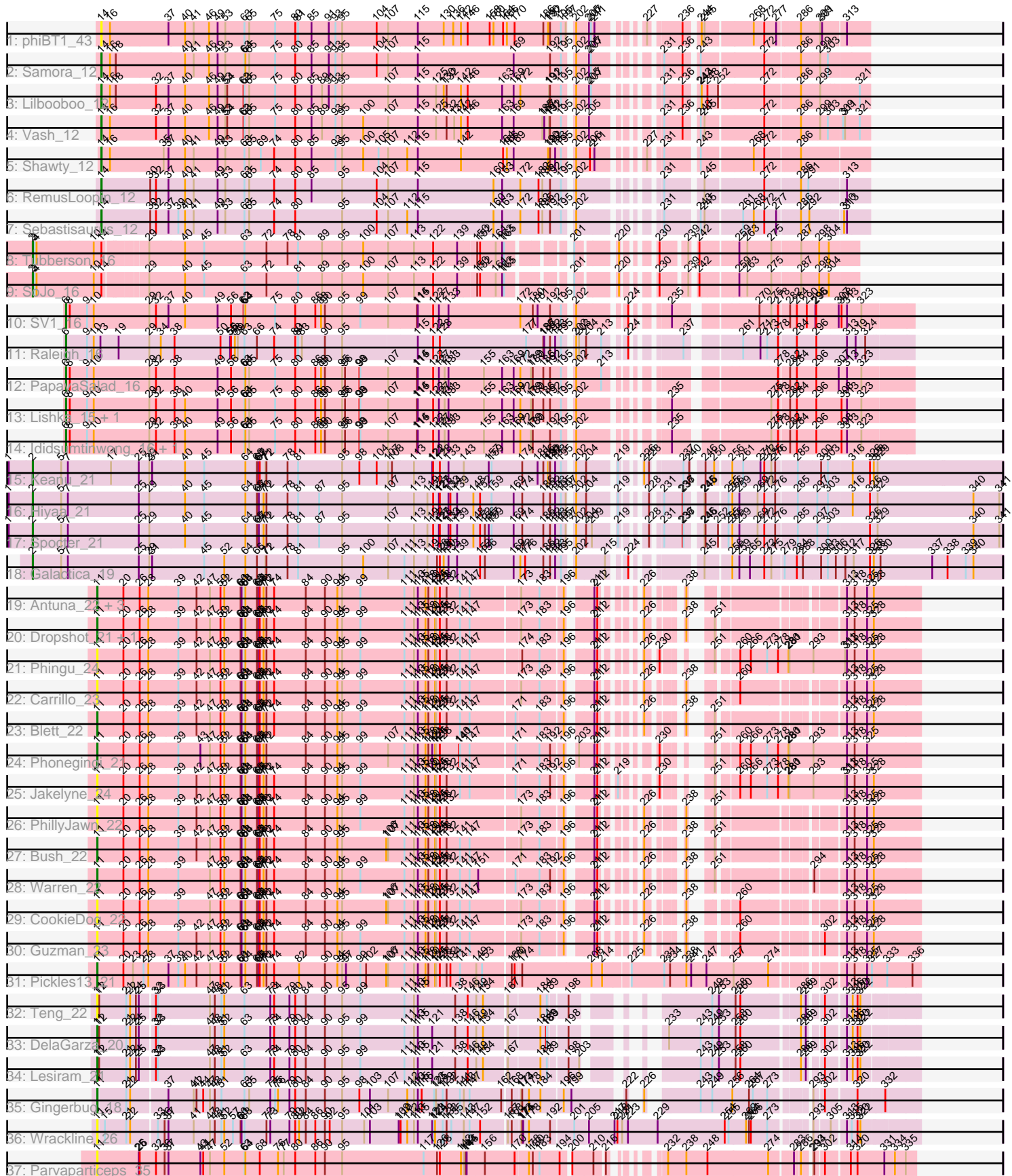


Pham 224686



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 224686 Report

This analysis was run 03/28/25 on database version 593.

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 224686 has 43 members, 13 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 : Tubberson_16
- Track 9 : SoJo_16
- Track 10 : SV1_16
- Track 11 : Raleigh_16
- Track 12 : PapayaSalad_16
- Track 13 : Lishka_15, Austintatious_16
- Track 14 : Ididsumtinwong_16, Bioscum_16
- Track 15 : Keanu_21
- Track 16 : Hiyaa_21
- Track 17 : Spocter_21
- Track 18 : Galactica_19
- Track 19 : Antuna_22, Violeta_23, Losacky_24, MenE_22
- Track 20 : Dropshot_21, Appa_21
- Track 21 : Phingu_24
- Track 22 : Carrillo_23
- Track 23 : Blett_22
- Track 24 : Phonegingi_21
- Track 25 : Jakelyne_24
- Track 26 : PhillyJawn_22
- Track 27 : Bush_22
- Track 28 : Warren_22
- Track 29 : CookieDog_22
- Track 30 : Guzman_23
- Track 31 : Pickles13_21
- Track 32 : Teng_22
- Track 33 : DelaGarza_20

- Track 34 : Lesiram_21
- Track 35 : Gingerbug_18
- Track 36 : Wrackline_26
- Track 37 : Parvaparticeps_35

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

The start number called the most often in the published annotations is 11, it was called in 12 of the 30 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antuna_22, Appa_21, Blett_22, Bush_22, Carrillo_23, CookieDog_22, DelaGarza_20, Dropshot_21, Gingerbug_18, Guzman_23, Jakelyne_24, Lesiram_21, Losacky_24, MenE_22, Parvaparticeps_35, PhillyJawn_22, Phingu_24, Phoningji_21, Pickles13_21, Teng_22, Violeta_23, Warren_22, Wrackline_26,

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

-

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

- Austintatious_16, Bioscum_16, Galactica_19, Hiyaa_21, Ididsumtinwong_16, Keanu_21, Lilbooboo_12, Lishka_15, PapayaSalad_16, Raleigh_16, RemusLoopin_12, SV1_16, Samora_12, Sebastisaurus_12, Shawty_12, SoJo_16, Spocter_21, Tubberson_16, Vash_12, phiBT1_43,

Summary by start number:

Start 2:

- Found in 6 of 43 (14.0%) of genes in pham
- Manual Annotations of this start: 6 of 30
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Galactica_19 (BQ), Hiyaa_21 (BQ), Keanu_21 (BQ), SoJo_16 (BC1), Spocter_21 (BQ), Tubberson_16 (BC1),

Start 6:

- Found in 7 of 43 (16.3%) of genes in pham
- Manual Annotations of this start: 6 of 30
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Austintatious_16 (BC3), Bioscum_16 (BC3), Ididsumtinwong_16 (BC3), Lishka_15 (BC3), PapayaSalad_16 (BC3), Raleigh_16 (BC2), SV1_16 (BC1),

Start 11:

- Found in 23 of 43 (53.5%) of genes in pham
- Manual Annotations of this start: 12 of 30
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Antuna_22 (GA), Appa_21 (GA), Blett_22 (GA), Bush_22 (GA), Carrillo_23 (GA), CookieDog_22 (GA), DelaGarza_20 (GF), Dropshot_21 (GA), Gingerbug_18 (GF), Guzman_23 (GA), Jakelyne_24 (GA), Lesiram_21 (GF), Losacky_24 (GA), MenE_22 (GA), Parvaparticeps_35 (UNK),

PhillyJawn_22 (GA), Phingu_24 (GA), Phonegingi_21 (GA), Pickles13_21 (GA), Teng_22 (GF), Violeta_23 (GA), Warren_22 (GA), Wrackline_26 (GF),

Start 14:

- Found in 9 of 43 (20.9%) of genes in pham
- Manual Annotations of this start: 6 of 30
- Called 77.8% 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),

Summary by clusters:

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

Info for manual annotations of cluster BB1:

- Start number 14 was manually annotated 4 times for cluster BB1.

Info for manual annotations of cluster BB2:

- Start number 14 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.
- Start number 6 was manually annotated 1 time for cluster BC1.

Info for manual annotations of cluster BC2:

- Start number 6 was manually annotated 1 time for cluster BC2.

Info for manual annotations of cluster BC3:

- Start number 6 was manually annotated 4 times for cluster BC3.

Info for manual annotations of cluster BQ:

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

Info for manual annotations of cluster GA:

- Start number 11 was manually annotated 9 times for cluster GA.

Info for manual annotations of cluster GF:

- Start number 11 was manually annotated 3 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 12 MA's), (20, 11580), (26, 11631), (28, 11658), (39, 11751), (42, 11808), (47, 11850), (50, 11883), (52, 11895), (60, 11946), (61, 11949), (63, 11958), (64, 11961), (66, 11997), (67, 12003), (68, 12006), (70, 12018), (72, 12027), (74, 12051), (84, 12150), (90, 12210), (94, 12249), (95, 12264), (99, 12321), (111, 12459), (113, 12489), (115, 12501), (118, 12525), (120, 12534), (124, 12555), (125, 12558), (128, 12570), (132, 12588), (141, 12630), (147, 12660), (173, 12801), (183,

12858), (196, 12924), (211, 12984), (212, 12993), (226, 13056), (238, 13122), (313, 13473), (318, 13497), (325, 13536), (328, 13557),

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

Candidate Starts for Appa_21:

(Start: 11 @11367 has 12 MA's), (20, 11442), (26, 11493), (28, 11520), (39, 11613), (42, 11670), (47, 11712), (50, 11745), (52, 11757), (60, 11808), (61, 11811), (63, 11820), (64, 11823), (66, 11859), (67, 11865), (68, 11868), (70, 11880), (72, 11889), (74, 11913), (84, 12012), (90, 12072), (94, 12111), (95, 12126), (99, 12183), (111, 12321), (113, 12351), (115, 12363), (118, 12387), (120, 12396), (124, 12417), (125, 12420), (128, 12432), (132, 12450), (141, 12492), (147, 12522), (173, 12663), (183, 12720), (196, 12786), (211, 12846), (212, 12855), (226, 12918), (238, 12984), (251, 13017), (313, 13335), (318, 13359), (325, 13398), (328, 13419),

Gene: Austintatious_16 Start: 9780, Stop: 12197, Start Num: 6

Candidate Starts for Austintatious_16:

(Start: 6 @9780 has 6 MA's), (8, 9792), (9, 9846), (10, 9867), (29, 10041), (32, 10062), (38, 10119), (40, 10152), (49, 10254), (56, 10296), (63, 10338), (64, 10341), (65, 10353), (75, 10431), (80, 10494), (86, 10557), (88, 10575), (90, 10587), (95, 10641), (96, 10650), (98, 10695), (99, 10698), (107, 10779), (114, 10866), (115, 10869), (122, 10917), (127, 10935), (131, 10953), (133, 10965), (155, 11076), (163, 11133), (169, 11169), (172, 11190), (179, 11223), (180, 11229), (186, 11262), (192, 11283), (195, 11316), (202, 11340), (235, 11538), (275, 11796), (278, 11817), (282, 11841), (284, 11862), (296, 11916), (308, 11982), (313, 11994), (323, 12039),

Gene: Bioscum_16 Start: 9816, Stop: 12233, Start Num: 6

Candidate Starts for Bioscum_16:

(Start: 6 @9816 has 6 MA's), (8, 9828), (9, 9882), (10, 9903), (29, 10077), (32, 10098), (38, 10155), (40, 10188), (49, 10290), (56, 10332), (63, 10374), (64, 10377), (65, 10389), (75, 10467), (80, 10530), (86, 10593), (88, 10611), (90, 10623), (95, 10677), (96, 10686), (98, 10731), (99, 10734), (107, 10815), (114, 10902), (115, 10905), (122, 10953), (127, 10971), (131, 10989), (133, 11001), (155, 11112), (163, 11169), (169, 11205), (172, 11226), (179, 11259), (180, 11265), (192, 11319), (195, 11352), (202, 11376), (235, 11574), (275, 11832), (278, 11853), (282, 11877), (284, 11898), (296, 11952), (308, 12018), (313, 12030), (323, 12075),

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

Candidate Starts for Blett_22:

(Start: 11 @11520 has 12 MA's), (20, 11595), (26, 11646), (28, 11673), (39, 11766), (42, 11823), (47, 11865), (50, 11898), (52, 11910), (60, 11961), (61, 11964), (63, 11973), (64, 11976), (66, 12012), (67, 12018), (68, 12021), (70, 12033), (72, 12042), (74, 12066), (84, 12165), (90, 12225), (94, 12264), (95, 12279), (99, 12336), (111, 12474), (113, 12504), (115, 12516), (118, 12540), (120, 12549), (124, 12570), (125, 12573), (128, 12585), (132, 12603), (141, 12645), (147, 12675), (171, 12804), (183, 12873), (196, 12939), (211, 12999), (212, 13008), (226, 13071), (238, 13137), (251, 13170), (313, 13488), (318, 13512), (325, 13551), (328, 13572),

Gene: Bush_22 Start: 11501, Stop: 13699, Start Num: 11

Candidate Starts for Bush_22:

(Start: 11 @11501 has 12 MA's), (20, 11576), (26, 11627), (28, 11654), (39, 11747), (42, 11804), (47, 11846), (50, 11879), (52, 11891), (60, 11942), (61, 11945), (63, 11954), (64, 11957), (66, 11993), (67, 11999), (68, 12002), (70, 12014), (72, 12023), (74, 12047), (84, 12146), (90, 12206), (94, 12245), (95, 12260), (106, 12398), (107, 12404), (111, 12455), (113, 12485), (115, 12497), (118, 12521), (120, 12530), (124, 12551), (125, 12554), (128, 12566), (132, 12584), (141, 12626), (147, 12656), (173, 12797), (183, 12854), (196, 12920), (211, 12980), (212, 12989), (226, 13052), (238, 13118), (251, 13151), (313, 13469), (318, 13493), (325, 13532), (328, 13553),

Gene: Carrillo_23 Start: 11474, Stop: 13672, Start Num: 11

Candidate Starts for Carrillo_23:

(Start: 11 @11474 has 12 MA's), (20, 11549), (26, 11600), (28, 11627), (39, 11720), (42, 11777), (47, 11819), (50, 11852), (52, 11864), (60, 11915), (61, 11918), (63, 11927), (64, 11930), (66, 11966), (67, 11972), (68, 11975), (70, 11987), (72, 11996), (74, 12020), (84, 12119), (90, 12179), (94, 12218), (95, 12233), (99, 12290), (111, 12428), (113, 12458), (115, 12470), (118, 12494), (120, 12503), (124, 12524), (125, 12527), (128, 12539), (132, 12557), (141, 12599), (147, 12629), (173, 12770), (183, 12827), (196, 12893), (211, 12953), (212, 12962), (226, 13025), (238, 13091), (260, 13172), (313, 13442), (318, 13466), (325, 13505), (328, 13526),

Gene: CookieDog_22 Start: 11501, Stop: 13699, Start Num: 11

Candidate Starts for CookieDog_22:

(Start: 11 @11501 has 12 MA's), (20, 11576), (26, 11627), (28, 11654), (39, 11747), (47, 11846), (50, 11879), (52, 11891), (60, 11942), (61, 11945), (63, 11954), (64, 11957), (66, 11993), (67, 11999), (68, 12002), (70, 12014), (72, 12023), (74, 12047), (84, 12146), (90, 12206), (94, 12245), (95, 12260), (106, 12398), (107, 12404), (111, 12455), (113, 12485), (115, 12497), (118, 12521), (120, 12530), (124, 12551), (125, 12554), (128, 12566), (132, 12584), (141, 12626), (147, 12656), (173, 12797), (183, 12854), (196, 12920), (211, 12980), (212, 12989), (226, 13052), (238, 13118), (260, 13199), (313, 13469), (318, 13493), (325, 13532), (328, 13553),

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

Candidate Starts for DelaGarza_20:

(Start: 11 @12031 has 12 MA's), (12, 12037), (21, 12118), (22, 12130), (24, 12148), (25, 12157), (32, 12199), (33, 12205), (47, 12367), (48, 12382), (51, 12403), (52, 12412), (63, 12475), (73, 12556), (74, 12568), (79, 12616), (80, 12634), (84, 12667), (90, 12727), (95, 12781), (99, 12838), (111, 12976), (113, 13006), (115, 13018), (121, 13063), (138, 13132), (146, 13171), (149, 13195), (154, 13216), (167, 13282), (184, 13372), (188, 13381), (189, 13384), (198, 13435), (233, 13579), (243, 13675), (249, 13711), (253, 13732), (258, 13783), (260, 13798), (286, 13963), (289, 13972), (302, 14008), (313, 14065), (316, 14083), (320, 14098), (322, 14107),

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

Candidate Starts for Dropshot_21:

(Start: 11 @11367 has 12 MA's), (20, 11442), (26, 11493), (28, 11520), (39, 11613), (42, 11670), (47, 11712), (50, 11745), (52, 11757), (60, 11808), (61, 11811), (63, 11820), (64, 11823), (66, 11859), (67, 11865), (68, 11868), (70, 11880), (72, 11889), (74, 11913), (84, 12012), (90, 12072), (94, 12111), (95, 12126), (99, 12183), (111, 12321), (113, 12351), (115, 12363), (118, 12387), (120, 12396), (124, 12417), (125, 12420), (128, 12432), (132, 12450), (141, 12492), (147, 12522), (173, 12663), (183, 12720), (196, 12786), (211, 12846), (212, 12855), (226, 12918), (238, 12984), (251, 13017), (313, 13335), (318, 13359), (325, 13398), (328, 13419),

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

Candidate Starts for Galactica_19:

(Start: 2 @14849 has 6 MA's), (5, 14936), (7, 14957), (25, 15179), (29, 15212), (31, 15221), (45, 15383), (52, 15446), (64, 15512), (66, 15548), (71, 15575), (72, 15578), (78, 15641), (81, 15674), (95, 15812), (100, 15878), (107, 15950), (111, 15998), (113, 16028), (119, 16070), (126, 16100), (128, 16109), (130, 16121), (133, 16136), (139, 16163), (152, 16235), (156, 16250), (169, 16340), (172, 16361), (176, 16376), (186, 16433), (192, 16454), (193, 16469), (195, 16487), (202, 16511), (215, 16598), (224, 16637), (245, 16787), (256, 16862), (259, 16883), (265, 16916), (272, 16961), (275, 16982), (279, 17015), (284, 17048), (288, 17063), (300, 17117), (303, 17138), (306, 17159), (312, 17183), (317, 17207), (326, 17258), (328, 17270), (330, 17291), (337, 17453), (338, 17498), (339, 17555), (340, 17579),

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

Candidate Starts for Gingerbug_18:

(Start: 11 @11192 has 12 MA's), (21, 11273), (22, 11285), (37, 11393), (41, 11471), (42, 11480), (44, 11501), (47, 11522), (48, 11537), (51, 11558), (63, 11630), (65, 11645), (73, 11711), (75, 11726), (76, 11735), (79, 11771), (80, 11789), (84, 11822), (90, 11882), (95, 11936), (98, 11990), (103, 12023), (107, 12080), (112, 12140), (113, 12161), (115, 12173), (116, 12185), (123, 12224), (125, 12230), (129, 12251), (132, 12260), (141, 12302), (143, 12314), (147, 12332), (162, 12428), (168, 12449), (173, 12473), (174, 12476), (178, 12497), (184, 12533), (196, 12596), (199, 12620), (222, 12752), (226, 12761), (243, 12884), (249, 12920), (256, 12983), (264, 13034), (267, 13046), (273, 13091), (293, 13190), (302, 13217), (320, 13307), (332, 13376),

Gene: Guzman_23 Start: 11782, Stop: 13980, Start Num: 11

Candidate Starts for Guzman_23:

(Start: 11 @11782 has 12 MA's), (20, 11857), (26, 11908), (28, 11935), (39, 12028), (42, 12085), (47, 12127), (50, 12160), (52, 12172), (60, 12223), (61, 12226), (63, 12235), (64, 12238), (66, 12274), (67, 12280), (68, 12283), (70, 12295), (72, 12304), (74, 12328), (84, 12427), (90, 12487), (94, 12526), (95, 12541), (99, 12598), (111, 12736), (113, 12766), (115, 12778), (118, 12802), (120, 12811), (124, 12832), (125, 12835), (128, 12847), (132, 12865), (141, 12907), (147, 12937), (173, 13078), (183, 13135), (196, 13201), (211, 13261), (212, 13270), (226, 13333), (238, 13399), (260, 13480), (302, 13693), (313, 13750), (318, 13774), (325, 13813), (328, 13834),

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

Candidate Starts for Hiyaa_21:

(1, 15810), (Start: 2 @15882 has 6 MA's), (5, 15969), (7, 15990), (25, 16212), (29, 16245), (40, 16356), (45, 16416), (64, 16545), (66, 16581), (67, 16587), (70, 16602), (72, 16611), (78, 16674), (81, 16707), (87, 16773), (95, 16845), (107, 16983), (113, 17061), (119, 17103), (122, 17121), (127, 17139), (128, 17142), (133, 17169), (134, 17175), (139, 17196), (148, 17247), (152, 17268), (159, 17304), (169, 17373), (174, 17400), (186, 17466), (192, 17487), (193, 17502), (195, 17520), (197, 17535), (202, 17544), (204, 17574), (219, 17649), (228, 17697), (231, 17718), (236, 17775), (237, 17778), (245, 17820), (246, 17823), (255, 17883), (256, 17895), (259, 17916), (269, 17973), (272, 17994), (276, 18027), (285, 18084), (297, 18138), (303, 18171), (316, 18237), (326, 18291), (329, 18315), (340, 18615), (341, 18696),

Gene: Ididsumtinwong_16 Start: 9816, Stop: 12233, Start Num: 6

Candidate Starts for Ididsumtinwong_16:

(Start: 6 @9816 has 6 MA's), (8, 9828), (9, 9882), (10, 9903), (29, 10077), (32, 10098), (38, 10155), (40, 10188), (49, 10290), (56, 10332), (63, 10374), (64, 10377), (65, 10389), (75, 10467), (80, 10530), (86, 10593), (88, 10611), (90, 10623), (95, 10677), (96, 10686), (98, 10731), (99, 10734), (107, 10815), (114, 10902), (115, 10905), (122, 10953), (127, 10971), (131, 10989), (133, 11001), (155, 11112), (163, 11169), (169, 11205), (172, 11226), (179, 11259), (180, 11265), (192, 11319), (195, 11352), (202, 11376), (235, 11574), (275, 11832), (278, 11853), (282, 11877), (284, 11898), (296, 11952), (308, 12018), (313, 12030), (323, 12075),

Gene: Jakelyne_24 Start: 11520, Stop: 13781, Start Num: 11

Candidate Starts for Jakelyne_24:

(Start: 11 @11520 has 12 MA's), (20, 11595), (26, 11646), (28, 11673), (39, 11766), (42, 11823), (47, 11865), (50, 11898), (52, 11910), (60, 11961), (61, 11964), (63, 11973), (64, 11976), (66, 12012), (67, 12018), (68, 12021), (70, 12033), (72, 12042), (74, 12066), (84, 12165), (90, 12225), (94, 12264), (95, 12279), (99, 12336), (111, 12474), (113, 12504), (115, 12516), (118, 12540), (120, 12549), (124, 12570), (125, 12573), (128, 12585), (132, 12603), (141, 12645), (147, 12675), (171, 12804), (183, 12873), (192, 12906), (196, 12939), (211, 12999), (212, 13008), (219, 13038), (230, 13098), (251, 13170), (260, 13218), (266, 13251), (273, 13302), (278, 13335), (280, 13368), (281, 13371), (293, 13446), (311, 13545), (313, 13551), (318, 13575), (325, 13614), (328, 13635),

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

Candidate Starts for Keanu_21:

(1, 15853), (Start: 2 @15925 has 6 MA's), (5, 16012), (7, 16033), (17, 16168), (25, 16255), (29, 16288), (31, 16297), (40, 16399), (45, 16459), (64, 16588), (66, 16624), (67, 16630), (68, 16633), (71, 16651), (72, 16654), (78, 16717), (81, 16750), (95, 16888), (98, 16942), (104, 16996), (107, 17026), (108, 17038), (113, 17104), (121, 17161), (122, 17164), (128, 17185), (133, 17212), (143, 17260), (157, 17338), (159, 17347), (174, 17443), (181, 17491), (186, 17509), (190, 17524), (191, 17527), (192, 17530), (193, 17545), (195, 17563), (202, 17587), (204, 17617), (219, 17692), (226, 17725), (228, 17740), (237, 17821), (240, 17839), (246, 17866), (250, 17893), (256, 17938), (261, 17971), (271, 18025), (272, 18037), (275, 18058), (276, 18070), (285, 18127), (300, 18193), (303, 18214), (316, 18280), (326, 18334), (328, 18346), (329, 18358),

Gene: Lesiram_21 Start: 12001, Stop: 14235, Start Num: 11

Candidate Starts for Lesiram_21:

(Start: 11 @12001 has 12 MA's), (12, 12007), (21, 12088), (22, 12100), (24, 12118), (25, 12127), (32, 12169), (33, 12175), (47, 12337), (48, 12352), (51, 12373), (52, 12382), (63, 12445), (73, 12526), (74, 12538), (79, 12586), (80, 12604), (84, 12637), (90, 12697), (95, 12751), (99, 12808), (111, 12946), (113, 12976), (115, 12988), (121, 13033), (138, 13102), (146, 13141), (149, 13165), (154, 13186), (167, 13252), (184, 13342), (189, 13354), (198, 13405), (203, 13438), (243, 13645), (249, 13681), (253, 13702), (258, 13753), (260, 13768), (286, 13933), (289, 13942), (302, 13978), (313, 14035), (316, 14053), (320, 14068), (322, 14077),

Gene: Lilbooboo_12 Start: 8195, Stop: 10384, Start Num: 14

Candidate Starts for Lilbooboo_12:

(Start: 14 @8195 has 6 MA's), (16, 8222), (18, 8240), (32, 8363), (37, 8402), (40, 8453), (46, 8528), (49, 8555), (53, 8579), (54, 8585), (62, 8636), (63, 8639), (65, 8654), (75, 8732), (80, 8795), (85, 8846), (89, 8879), (91, 8900), (93, 8921), (95, 8942), (107, 9080), (115, 9170), (125, 9227), (130, 9251), (132, 9260), (142, 9305), (146, 9326), (163, 9434), (169, 9470), (172, 9491), (191, 9581), (192, 9584), (195, 9617), (202, 9641), (205, 9680), (207, 9686), (231, 9815), (236, 9872), (243, 9905), (244, 9908), (248, 9926), (252, 9959), (272, 10091), (286, 10187), (299, 10241), (321, 10352),

Gene: Lishka_15 Start: 9780, Stop: 12197, Start Num: 6

Candidate Starts for Lishka_15:

(Start: 6 @9780 has 6 MA's), (8, 9792), (9, 9846), (10, 9867), (29, 10041), (32, 10062), (38, 10119), (40, 10152), (49, 10254), (56, 10296), (63, 10338), (64, 10341), (65, 10353), (75, 10431), (80, 10494), (86, 10557), (88, 10575), (90, 10587), (95, 10641), (96, 10650), (98, 10695), (99, 10698), (107, 10779), (114, 10866), (115, 10869), (122, 10917), (127, 10935), (131, 10953), (133, 10965), (155, 11076), (163, 11133), (169, 11169), (172, 11190), (179, 11223), (180, 11229), (186, 11262), (192, 11283), (195, 11316), (202, 11340), (235, 11538), (275, 11796), (278, 11817), (282, 11841), (284, 11862), (296, 11916), (308, 11982), (313, 11994), (323, 12039),

Gene: Losacky_24 Start: 11647, Stop: 13845, Start Num: 11

Candidate Starts for Losacky_24:

(Start: 11 @11647 has 12 MA's), (20, 11722), (26, 11773), (28, 11800), (39, 11893), (42, 11950), (47, 11992), (50, 12025), (52, 12037), (60, 12088), (61, 12091), (63, 12100), (64, 12103), (66, 12139), (67, 12145), (68, 12148), (70, 12160), (72, 12169), (74, 12193), (84, 12292), (90, 12352), (94, 12391), (95, 12406), (99, 12463), (111, 12601), (113, 12631), (115, 12643), (118, 12667), (120, 12676), (124, 12697), (125, 12700), (128, 12712), (132, 12730), (141, 12772), (147, 12802), (173, 12943), (183, 13000), (196, 13066), (211, 13126), (212, 13135), (226, 13198), (238, 13264), (313, 13615), (318, 13639), (325, 13678), (328, 13699),

Gene: MenE_22 Start: 11635, Stop: 13833, Start Num: 11

Candidate Starts for MenE_22:

(Start: 11 @11635 has 12 MA's), (20, 11710), (26, 11761), (28, 11788), (39, 11881), (42, 11938), (47, 11980), (50, 12013), (52, 12025), (60, 12076), (61, 12079), (63, 12088), (64, 12091), (66, 12127), (67, 12133), (68, 12136), (70, 12148), (72, 12157), (74, 12181), (84, 12280), (90, 12340), (94, 12379), (95, 12394), (99, 12451), (111, 12589), (113, 12619), (115, 12631), (118, 12655), (120, 12664), (124, 12685), (125, 12688), (128, 12700), (132, 12718), (141, 12760), (147, 12790), (173, 12931), (183, 12988), (196, 13054), (211, 13114), (212, 13123), (226, 13186), (238, 13252), (313, 13603), (318, 13627), (325, 13666), (328, 13687),

Gene: PapayaSalad_16 Start: 9786, Stop: 12203, Start Num: 6

Candidate Starts for PapayaSalad_16:

(Start: 6 @9786 has 6 MA's), (8, 9798), (9, 9852), (10, 9873), (29, 10047), (32, 10068), (38, 10125), (49, 10260), (56, 10302), (63, 10344), (64, 10347), (65, 10359), (75, 10437), (80, 10500), (86, 10563), (88, 10581), (90, 10593), (95, 10647), (96, 10656), (98, 10701), (99, 10704), (107, 10785), (114, 10872), (115, 10875), (122, 10923), (127, 10941), (131, 10959), (133, 10971), (155, 11082), (163, 11139), (169, 11175), (172, 11196), (179, 11229), (180, 11235), (186, 11268), (192, 11289), (195, 11322), (202, 11346), (213, 11421), (278, 11823), (282, 11847), (284, 11868), (296, 11922), (307, 11985), (313, 12000), (323, 12045),

Gene: Parvaparticeps_35 Start: 26694, Stop: 24370, Start Num: 11

Candidate Starts for Parvaparticeps_35:

(Start: 11 @26694 has 12 MA's), (25, 26571), (26, 26568), (32, 26517), (36, 26490), (37, 26478), (43, 26379), (44, 26370), (47, 26349), (52, 26304), (63, 26241), (64, 26238), (68, 26193), (76, 26136), (77, 26118), (80, 26082), (86, 26019), (90, 25989), (95, 25935), (117, 25680), (126, 25638), (128, 25629), (142, 25566), (143, 25557), (144, 25551), (145, 25548), (156, 25494), (170, 25401), (178, 25362), (180, 25350), (183, 25329), (194, 25269), (200, 25248), (210, 25185), (216, 25158), (232, 25074), (238, 25020), (248, 24954), (274, 24765), (283, 24702), (286, 24687), (293, 24669), (294, 24666), (302, 24642), (314, 24573), (320, 24552), (331, 24468), (334, 24435), (335, 24402),

Gene: PhillyJawn_22 Start: 11367, Stop: 13565, Start Num: 11

Candidate Starts for PhillyJawn_22:

(Start: 11 @11367 has 12 MA's), (20, 11442), (26, 11493), (28, 11520), (39, 11613), (42, 11670), (47, 11712), (50, 11745), (52, 11757), (60, 11808), (61, 11811), (63, 11820), (64, 11823), (66, 11859), (67, 11865), (68, 11868), (70, 11880), (72, 11889), (74, 11913), (84, 12012), (90, 12072), (94, 12111), (95, 12126), (99, 12183), (111, 12321), (113, 12351), (115, 12363), (118, 12387), (120, 12396), (124, 12417), (125, 12420), (128, 12432), (132, 12450), (173, 12663), (183, 12720), (196, 12786), (211, 12846), (212, 12855), (226, 12918), (238, 12984), (251, 13017), (313, 13335), (318, 13359), (325, 13398), (328, 13419),

Gene: Phingu_24 Start: 11523, Stop: 13784, Start Num: 11

Candidate Starts for Phingu_24:

(Start: 11 @11523 has 12 MA's), (20, 11598), (26, 11649), (28, 11676), (39, 11769), (42, 11826), (47, 11868), (50, 11901), (52, 11913), (60, 11964), (61, 11967), (63, 11976), (64, 11979), (66, 12015), (67, 12021), (68, 12024), (70, 12036), (72, 12045), (74, 12069), (84, 12168), (90, 12228), (94, 12267), (95, 12282), (99, 12339), (111, 12477), (113, 12507), (115, 12519), (118, 12543), (120, 12552), (124, 12573), (125, 12576), (128, 12588), (132, 12606), (141, 12648), (147, 12678), (174, 12822), (183, 12876), (196, 12942), (211, 13002), (212, 13011), (226, 13074), (230, 13101), (251, 13173), (260, 13221), (266, 13254), (273, 13305), (278, 13338), (280, 13371), (281, 13374), (293, 13449), (311, 13548), (313, 13554), (318, 13578), (325, 13617), (328, 13638),

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

Candidate Starts for Phonegingi_21:

(Start: 11 @11365 has 12 MA's), (20, 11440), (26, 11491), (28, 11518), (39, 11611), (43, 11680), (47, 11710), (50, 11743), (52, 11755), (60, 11806), (61, 11809), (63, 11818), (64, 11821), (66, 11857), (67,

11863), (68, 11866), (70, 11878), (72, 11887), (84, 12010), (90, 12070), (94, 12109), (95, 12124), (99, 12181), (107, 12268), (111, 12319), (113, 12349), (115, 12361), (118, 12385), (120, 12394), (121, 12406), (124, 12415), (125, 12418), (128, 12430), (140, 12487), (141, 12490), (147, 12520), (171, 12649), (183, 12718), (192, 12751), (196, 12784), (203, 12799), (211, 12844), (212, 12853), (230, 12943), (251, 13015), (260, 13063), (266, 13096), (273, 13147), (278, 13180), (280, 13213), (281, 13216), (293, 13291), (313, 13396), (318, 13420), (325, 13459),

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

Candidate Starts for Pickles13_21:

(Start: 11 @11528 has 12 MA's), (20, 11603), (23, 11633), (27, 11666), (28, 11681), (37, 11744), (39, 11774), (40, 11795), (42, 11831), (47, 11873), (50, 11906), (52, 11918), (60, 11969), (61, 11972), (64, 11984), (66, 12020), (67, 12026), (68, 12029), (70, 12041), (72, 12050), (74, 12074), (82, 12152), (90, 12233), (94, 12272), (95, 12287), (97, 12299), (99, 12344), (102, 12362), (106, 12425), (107, 12431), (111, 12482), (113, 12512), (115, 12524), (118, 12548), (120, 12557), (124, 12578), (125, 12581), (128, 12593), (132, 12611), (134, 12623), (141, 12653), (149, 12701), (153, 12719), (168, 12800), (170, 12809), (174, 12827), (208, 13043), (214, 13076), (225, 13151), (231, 13253), (234, 13271), (238, 13322), (241, 13337), (247, 13385), (257, 13469), (274, 13577), (313, 13760), (318, 13784), (325, 13823), (327, 13838), (333, 13886), (336, 13964),

Gene: Raleigh_16 Start: 10247, Stop: 12655, Start Num: 6

Candidate Starts for Raleigh_16:

(Start: 6 @10247 has 6 MA's), (9, 10313), (10, 10334), (13, 10355), (19, 10412), (29, 10508), (34, 10544), (38, 10586), (50, 10730), (55, 10760), (56, 10763), (58, 10775), (59, 10784), (63, 10805), (66, 10844), (74, 10895), (80, 10961), (81, 10970), (83, 10982), (90, 11054), (95, 11108), (115, 11336), (122, 11384), (128, 11405), (177, 11675), (186, 11729), (187, 11732), (192, 11750), (193, 11765), (195, 11783), (202, 11807), (203, 11816), (204, 11837), (213, 11882), (224, 11933), (237, 12041), (261, 12176), (271, 12230), (273, 12251), (278, 12284), (284, 12329), (296, 12383), (313, 12464), (319, 12491), (324, 12515),

Gene: RemusLoopin_12 Start: 8193, Stop: 10382, Start Num: 14

Candidate Starts for RemusLoopin_12:

(Start: 14 @8193 has 6 MA's), (30, 8343), (32, 8361), (37, 8400), (40, 8451), (41, 8478), (49, 8553), (53, 8577), (63, 8637), (65, 8652), (74, 8727), (80, 8793), (85, 8844), (95, 8940), (104, 9048), (107, 9078), (115, 9168), (160, 9405), (163, 9432), (172, 9489), (182, 9546), (185, 9558), (192, 9582), (195, 9615), (202, 9639), (231, 9813), (245, 9915), (272, 10089), (286, 10185), (291, 10206), (313, 10311),

Gene: SV1_16 Start: 10022, Stop: 12439, Start Num: 6

Candidate Starts for SV1_16:

(Start: 6 @10022 has 6 MA's), (8, 10034), (9, 10088), (10, 10109), (29, 10283), (32, 10304), (37, 10343), (40, 10394), (49, 10496), (56, 10538), (62, 10577), (63, 10580), (64, 10583), (75, 10673), (80, 10736), (86, 10799), (88, 10817), (90, 10829), (95, 10883), (99, 10940), (107, 11021), (114, 11108), (115, 11111), (122, 11159), (127, 11177), (133, 11207), (172, 11432), (180, 11471), (181, 11486), (192, 11525), (195, 11558), (202, 11582), (224, 11708), (235, 11780), (270, 12002), (275, 12038), (278, 12059), (282, 12083), (284, 12104), (290, 12131), (295, 12155), (296, 12158), (307, 12221), (308, 12224), (313, 12236), (323, 12281),

Gene: Samora_12 Start: 8227, Stop: 10419, Start Num: 14

Candidate Starts for Samora_12:

(Start: 14 @8227 has 6 MA's), (16, 8254), (18, 8272), (40, 8485), (41, 8512), (46, 8560), (49, 8587), (53, 8611), (63, 8671), (64, 8674), (65, 8686), (75, 8764), (80, 8827), (85, 8878), (91, 8932), (93, 8953), (95, 8974), (104, 9082), (107, 9112), (115, 9202), (169, 9502), (192, 9616), (195, 9649), (202, 9673), (205, 9712), (207, 9718), (231, 9847), (236, 9904), (243, 9937), (272, 10123), (286, 10219), (299, 10273), (303, 10297),

Gene: Sebastisaurus_12 Start: 8219, Stop: 10408, Start Num: 14

Candidate Starts for Sebastisaurus_12:

(Start: 14 @8219 has 6 MA's), (30, 8369), (32, 8387), (37, 8426), (39, 8456), (40, 8477), (41, 8504), (49, 8579), (53, 8603), (63, 8663), (65, 8678), (74, 8753), (80, 8819), (95, 8966), (104, 9074), (107, 9104), (112, 9161), (115, 9194), (160, 9431), (163, 9458), (172, 9515), (182, 9572), (185, 9584), (192, 9608), (195, 9641), (202, 9665), (231, 9839), (243, 9929), (245, 9941), (261, 10049), (268, 10082), (272, 10115), (277, 10151), (286, 10211), (292, 10235), (310, 10328), (313, 10337),

Gene: Shawty_12 Start: 8222, Stop: 10411, Start Num: 14

Candidate Starts for Shawty_12:

(Start: 14 @8222 has 6 MA's), (16, 8249), (35, 8414), (37, 8429), (40, 8480), (41, 8507), (49, 8582), (53, 8606), (63, 8666), (65, 8681), (69, 8717), (74, 8756), (80, 8822), (85, 8873), (93, 8948), (95, 8969), (100, 9035), (105, 9083), (107, 9107), (112, 9164), (115, 9197), (142, 9332), (164, 9464), (166, 9476), (169, 9497), (190, 9605), (192, 9611), (193, 9626), (195, 9644), (202, 9668), (206, 9710), (211, 9722), (227, 9815), (231, 9842), (243, 9932), (268, 10085), (272, 10118), (286, 10214),

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

Candidate Starts for SoJo_16:

(Start: 2 @10050 has 6 MA's), (3, 10056), (4, 10062), (10, 10239), (Start: 14 @10260 has 6 MA's), (29, 10377), (40, 10488), (45, 10548), (63, 10674), (72, 10743), (81, 10839), (89, 10914), (95, 10977), (100, 11043), (107, 11115), (113, 11193), (122, 11253), (139, 11319), (150, 11373), (152, 11382), (161, 11427), (163, 11445), (165, 11451), (201, 11586), (220, 11685), (230, 11742), (239, 11808), (242, 11820), (259, 11928), (263, 11952), (275, 12027), (287, 12108), (298, 12159), (304, 12189),

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

Candidate Starts for Spocter_21:

(1, 15798), (Start: 2 @15870 has 6 MA's), (5, 15957), (7, 15978), (25, 16200), (29, 16233), (40, 16344), (45, 16404), (64, 16533), (66, 16569), (67, 16575), (70, 16590), (72, 16599), (78, 16662), (81, 16695), (87, 16761), (95, 16833), (107, 16971), (113, 17049), (119, 17091), (122, 17109), (127, 17127), (128, 17130), (133, 17157), (134, 17163), (139, 17184), (148, 17235), (152, 17256), (156, 17271), (157, 17283), (159, 17292), (169, 17361), (174, 17388), (186, 17454), (192, 17475), (193, 17490), (195, 17508), (197, 17523), (202, 17532), (204, 17562), (209, 17580), (219, 17637), (228, 17685), (231, 17706), (236, 17763), (237, 17766), (245, 17808), (246, 17811), (252, 17850), (255, 17871), (256, 17883), (259, 17904), (269, 17961), (272, 17982), (276, 18015), (285, 18072), (297, 18126), (303, 18159), (326, 18279), (329, 18303), (340, 18603), (341, 18684),

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

Candidate Starts for Teng_22:

(Start: 11 @12028 has 12 MA's), (12, 12034), (21, 12115), (22, 12127), (24, 12145), (25, 12154), (32, 12196), (33, 12202), (47, 12364), (48, 12379), (51, 12400), (52, 12409), (63, 12472), (73, 12553), (74, 12565), (79, 12613), (80, 12631), (84, 12664), (90, 12724), (95, 12778), (99, 12835), (111, 12973), (113, 13003), (115, 13015), (138, 13129), (146, 13168), (149, 13192), (154, 13213), (167, 13279), (184, 13369), (189, 13381), (198, 13432), (249, 13708), (253, 13729), (258, 13780), (260, 13795), (286, 13960), (289, 13969), (302, 14005), (313, 14062), (316, 14080), (320, 14095), (322, 14104),

Gene: Tubberson_16 Start: 10050, Stop: 12278, Start Num: 2

Candidate Starts for Tubberson_16:

(Start: 2 @10050 has 6 MA's), (3, 10056), (4, 10062), (10, 10239), (Start: 14 @10260 has 6 MA's), (29, 10377), (40, 10488), (45, 10548), (63, 10674), (72, 10743), (78, 10806), (81, 10839), (89, 10914), (95, 10977), (100, 11043), (107, 11115), (113, 11193), (122, 11253), (139, 11319), (150, 11373), (152, 11382), (161, 11427), (163, 11445), (165, 11451), (201, 11586), (220, 11685), (230, 11742), (239, 11808), (242, 11820), (259, 11928), (263, 11952), (275, 12027), (287, 12108), (298, 12159), (304,

12189),

Gene: Vash_12 Start: 8200, Stop: 10392, Start Num: 14

Candidate Starts for Vash_12:

(Start: 14 @8200 has 6 MA's), (16, 8227), (32, 8368), (37, 8407), (40, 8458), (46, 8533), (49, 8560), (53, 8584), (54, 8590), (62, 8641), (63, 8644), (65, 8659), (75, 8737), (80, 8800), (85, 8851), (89, 8884), (93, 8926), (95, 8947), (100, 9013), (107, 9085), (115, 9175), (125, 9232), (132, 9265), (137, 9289), (142, 9310), (146, 9331), (163, 9439), (169, 9475), (185, 9565), (187, 9571), (191, 9586), (192, 9589), (195, 9622), (202, 9646), (205, 9685), (231, 9820), (236, 9877), (243, 9910), (245, 9922), (272, 10096), (286, 10192), (299, 10246), (303, 10270), (309, 10309), (311, 10315), (321, 10360),

Gene: Violeta_23 Start: 11465, Stop: 13663, Start Num: 11

Candidate Starts for Violeta_23:

(Start: 11 @11465 has 12 MA's), (20, 11540), (26, 11591), (28, 11618), (39, 11711), (42, 11768), (47, 11810), (50, 11843), (52, 11855), (60, 11906), (61, 11909), (63, 11918), (64, 11921), (66, 11957), (67, 11963), (68, 11966), (70, 11978), (72, 11987), (74, 12011), (84, 12110), (90, 12170), (94, 12209), (95, 12224), (99, 12281), (111, 12419), (113, 12449), (115, 12461), (118, 12485), (120, 12494), (124, 12515), (125, 12518), (128, 12530), (132, 12548), (141, 12590), (147, 12620), (173, 12761), (183, 12818), (196, 12884), (211, 12944), (212, 12953), (226, 13016), (238, 13082), (313, 13433), (318, 13457), (325, 13496), (328, 13517),

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

Candidate Starts for Warren_22:

(Start: 11 @11565 has 12 MA's), (20, 11640), (26, 11691), (28, 11718), (39, 11811), (47, 11910), (50, 11943), (52, 11955), (60, 12006), (61, 12009), (63, 12018), (64, 12021), (66, 12057), (67, 12063), (68, 12066), (70, 12078), (72, 12087), (74, 12111), (84, 12210), (90, 12270), (94, 12309), (95, 12324), (99, 12381), (111, 12519), (113, 12549), (115, 12561), (118, 12585), (120, 12594), (124, 12615), (125, 12618), (128, 12630), (132, 12648), (141, 12690), (147, 12720), (151, 12744), (171, 12849), (183, 12918), (192, 12951), (196, 12984), (211, 13044), (212, 13053), (226, 13116), (238, 13182), (251, 13215), (294, 13452), (313, 13533), (318, 13557), (325, 13596), (328, 13617),

Gene: Wrackline_26 Start: 12677, Stop: 15094, Start Num: 11

Candidate Starts for Wrackline_26:

(Start: 11 @12677 has 12 MA's), (15, 12695), (21, 12758), (22, 12770), (33, 12845), (36, 12866), (37, 12878), (41, 12956), (47, 13007), (48, 13022), (51, 13043), (52, 13052), (57, 13079), (60, 13103), (61, 13106), (63, 13115), (72, 13184), (73, 13196), (79, 13256), (80, 13274), (82, 13286), (84, 13307), (86, 13337), (90, 13367), (92, 13382), (95, 13421), (101, 13490), (103, 13508), (109, 13598), (110, 13604), (112, 13625), (113, 13646), (115, 13658), (121, 13703), (123, 13709), (124, 13712), (129, 13736), (132, 13745), (135, 13760), (143, 13799), (147, 13817), (152, 13847), (167, 13922), (168, 13934), (173, 13958), (174, 13961), (175, 13964), (178, 13982), (192, 14048), (201, 14114), (205, 14159), (217, 14237), (218, 14246), (221, 14261), (223, 14279), (229, 14372), (254, 14576), (255, 14588), (262, 14642), (264, 14651), (266, 14657), (273, 14708), (293, 14807), (305, 14852), (313, 14891), (315, 14906), (320, 14924), (322, 14933),

Gene: phiBT1_43 Start: 8225, Stop: 10414, Start Num: 14

Candidate Starts for phiBT1_43:

(Start: 14 @8225 has 6 MA's), (16, 8252), (37, 8432), (40, 8483), (41, 8510), (46, 8558), (49, 8585), (53, 8609), (63, 8669), (65, 8684), (75, 8762), (80, 8825), (81, 8834), (85, 8876), (91, 8930), (93, 8951), (95, 8972), (104, 9080), (107, 9110), (115, 9200), (130, 9281), (136, 9311), (142, 9335), (146, 9356), (158, 9425), (160, 9437), (164, 9467), (166, 9479), (170, 9503), (186, 9593), (190, 9608), (192, 9614), (195, 9647), (197, 9662), (202, 9671), (205, 9710), (207, 9716), (211, 9725), (227, 9818), (236, 9902), (244, 9938), (245, 9947), (268, 10088), (272, 10121), (277, 10157), (286, 10217), (299, 10271), (301, 10277), (313, 10343),

