

Pham 311824

1: Issmi_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
2: Amethyst_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
3: Superstar_21	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
4: Tefunt_18 + 1	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
5: Nishikigoi_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
6: Omar_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
7: Diane_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
8: Caelum_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
9: Sudan_18 + 2	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
10: phiCAM_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
11: Speedwell_23	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
12: Pavo_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
13: Conan_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
14: Provolone_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
15: Verabelle_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
16: Jhitchelle_17	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
17: Saftant_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
18: Yosif_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
19: ZamZam_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
20: SunkenRoot_20	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
21: Verse_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
22: Celery_21	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
23: Vanseggelen_23	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
24: Dexers_17	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
25: ElGato_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
26: Amela_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
27: phiHau3_20	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
28: BroPleas_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
29: Rockaby_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
30: Chilliann_18	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366
31: SJRbid_19	26	40	54	68	82	96	102	112	126	138	155	169	184	206	228	242	256	270	288	306	318	328	333	347	355	362	366

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 311824 Report

This analysis was run 06/27/26 on database version 652.

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 311824 has 34 members, 8 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 : Sudan_18, Kaine_18, Alsaber_19
- Track 10 : phiCAM_19
- Track 11 : Speedwell_23
- Track 12 : Pavo_19
- Track 13 : Conan_19
- Track 14 : Provolone_19
- Track 15 : Verabelle_19
- Track 16 : Jhitchelle_17
- Track 17 : Saftant_18
- Track 18 : Yosif_19
- Track 19 : ZamZam_18
- Track 20 : SunkenRoot_20
- Track 21 : Verse_18
- Track 22 : Celery_21
- Track 23 : Vanseggelen_23
- Track 24 : Dexers_17
- Track 25 : ElGato_19
- Track 26 : Amela_18
- Track 27 : phiHau3_20
- Track 28 : BroPlease_19
- Track 29 : Rockabye_92
- Track 30 : Chilliams_87
- Track 31 : SJReid_93

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

The start number called the most often in the published annotations is 19, it was called in 10 of the 26 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alsaber_19, Amela_18, Celery_21, Conan_19, Dexers_17, ElGato_19, Jhitchelle_17, Kaine_18, Pavo_19, Sudan_18, SunkenRoot_20, Vanseggelen_23, Verabelle_19, Verse_18,

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

- Provolone_19, phiCAM_19,

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

- Amethyst_18, BroPlease_19, Caelum_19, Chilliamps_87, Diane_18, Haizum_18, Issmi_19, Nishikigoi_18, Omar_19, Rockabye_92, SJReid_93, Saftant_18, Speedwell_23, Superstar_21, Tefunt_18, Yosif_19, ZamZam_18, phiHau3_20,

Summary by start number:

Start 1:

- Found in 2 of 34 (5.9%) of genes in pham
- Manual Annotations of this start: 2 of 26
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BroPlease_19 (BD4), phiHau3_20 (BD4),

Start 3:

- Found in 3 of 34 (8.8%) of genes in pham
- Manual Annotations of this start: 1 of 26
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chilliamps_87 (FC), Rockabye_92 (FC), SJReid_93 (FC),

Start 4:

- Found in 3 of 34 (8.8%) of genes in pham
- Manual Annotations of this start: 3 of 26
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Saftant_18 (BD3), Speedwell_23 (BD3), ZamZam_18 (BD3),

Start 19:

- Found in 16 of 34 (47.1%) of genes in pham
- Manual Annotations of this start: 10 of 26
- Called 87.5% 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), Jhitchelle_17 (BD3), Kaine_18 (BD3), Pavo_19 (BD3), Sudan_18 (BD3), SunkenRoot_20 (BD3), Vanseggelen_23 (BD3), Verabelle_19 (BD3), Verse_18 (BD3),

Start 21:

- Found in 10 of 34 (29.4%) of genes in pham
- Manual Annotations of this start: 9 of 26
- Called 100.0% 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 24:

- Found in 19 of 34 (55.9%) of genes in pham
- Manual Annotations of this start: 1 of 26
- Called 5.3% of time when present
- Phage (with cluster) where this start called: Provolone_19 (BD3),

Start 40:

- Found in 26 of 34 (76.5%) of genes in pham
- No Manual Annotations of this start.
- Called 3.8% of time when present
- Phage (with cluster) where this start called: phiCAM_19 (BD3),

Summary by clusters:

There are 4 clusters represented in this pham: BD4, FC, BD3, BD2,

Info for manual annotations of cluster BD2:

- Start number 21 was manually annotated 8 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 4 was manually annotated 3 times for cluster BD3.
- Start number 19 was manually annotated 10 times for cluster BD3.
- Start number 21 was manually annotated 1 time for cluster BD3.
- Start number 24 was manually annotated 1 time for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 1 was manually annotated 2 times for cluster BD4.

Info for manual annotations of cluster FC:

- Start number 3 was manually annotated 1 time for cluster FC.

Gene Information:

Gene: Alsaber_19 Start: 11562, Stop: 15674, Start Num: 19

Candidate Starts for Alsaber_19:

(Start: 19 @11562 has 10 MA's), (Start: 24 @11586 has 1 MA's), (40, 11706), (42, 11739), (54, 11817), (55, 11820), (80, 12060), (82, 12081), (89, 12123), (92, 12159), (95, 12171), (108, 12297), (119, 12393), (121, 12423), (123, 12444), (128, 12516), (132, 12615), (133, 12624), (149, 12930), (151, 12966), (155, 13026), (165, 13137), (169, 13173), (172, 13194), (179, 13239), (182, 13272), (186, 13290), (188, 13323), (203, 13443), (204, 13446), (210, 13512), (211, 13521), (218, 13605), (221, 13614), (223, 13629), (234, 13704), (239, 13740), (242, 13779), (256, 13893), (259, 13905), (260, 13911), (263, 13950), (267, 13977), (273, 14031), (276, 14085), (287, 14214), (289, 14259), (302, 14346), (326, 14544), (328, 14574), (329, 14616), (339, 14775), (340, 14787), (343, 14850), (347, 14964), (352, 15003), (354, 15075), (356, 15114), (357, 15156), (361, 15231), (362, 15252), (364,

15309), (365, 15330), (368, 15378), (369, 15381), (370, 15396), (374, 15459), (375, 15468), (379, 15510), (386, 15660), (387, 15663),

Gene: Amela_18 Start: 11854, Stop: 15966, Start Num: 19

Candidate Starts for Amela_18:

(Start: 19 @11854 has 10 MA's), (Start: 24 @11878 has 1 MA's), (40, 11998), (42, 12031), (47, 12061), (54, 12109), (55, 12112), (75, 12328), (84, 12388), (95, 12463), (100, 12526), (108, 12589), (116, 12664), (123, 12736), (132, 12907), (133, 12916), (149, 13222), (151, 13258), (155, 13318), (159, 13351), (165, 13429), (169, 13465), (172, 13486), (175, 13504), (179, 13531), (182, 13564), (186, 13582), (188, 13615), (193, 13672), (200, 13717), (203, 13735), (210, 13804), (221, 13906), (225, 13933), (234, 13996), (242, 14071), (251, 14149), (256, 14185), (259, 14197), (260, 14203), (263, 14242), (266, 14260), (276, 14377), (283, 14476), (284, 14482), (286, 14503), (287, 14506), (302, 14638), (312, 14716), (328, 14866), (329, 14908), (347, 15256), (352, 15295), (354, 15367), (356, 15406), (361, 15523), (362, 15544), (364, 15601), (365, 15622), (368, 15670), (369, 15673), (374, 15751), (375, 15760), (379, 15802), (386, 15952), (387, 15955),

Gene: Amethyst_18 Start: 11541, Stop: 15449, Start Num: 21

Candidate Starts for Amethyst_18:

(Start: 21 @11541 has 9 MA's), (40, 11676), (54, 11787), (59, 11850), (68, 11919), (87, 12081), (89, 12090), (92, 12126), (102, 12213), (132, 12582), (133, 12591), (155, 12990), (159, 13023), (169, 13137), (179, 13203), (182, 13236), (186, 13254), (187, 13278), (192, 13329), (216, 13428), (217, 13431), (218, 13437), (231, 13482), (242, 13569), (248, 13626), (256, 13683), (266, 13758), (274, 13830), (298, 14124), (314, 14223), (321, 14256), (328, 14364), (333, 14469), (347, 14754), (356, 14904), (357, 14946), (361, 15021), (362, 15042), (364, 15099), (365, 15120), (366, 15123),

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

Candidate Starts for BroPlease_19:

(Start: 1 @11860 has 2 MA's), (10, 12196), (15, 12241), (18, 12334), (22, 12358), (23, 12367), (39, 12493), (50, 12577), (55, 12616), (63, 12703), (68, 12760), (77, 12853), (79, 12862), (82, 12889), (85, 12907), (90, 12940), (92, 12967), (98, 13024), (99, 13033), (116, 13180), (117, 13186), (118, 13189), (130, 13408), (131, 13423), (133, 13435), (139, 13516), (145, 13654), (149, 13738), (155, 13834), (156, 13843), (168, 13978), (169, 13981), (171, 13993), (182, 14080), (183, 14083), (185, 14089), (204, 14254), (208, 14281), (236, 14440), (238, 14449), (242, 14500), (243, 14503), (246, 14524), (250, 14572), (254, 14599), (256, 14614), (257, 14620), (266, 14689), (272, 14740), (299, 15058), (310, 15112), (311, 15142), (328, 15295), (331, 15376), (334, 15403), (348, 15670),

Gene: Caelum_19 Start: 11485, Stop: 15480, Start Num: 21

Candidate Starts for Caelum_19:

(Start: 21 @11485 has 9 MA's), (38, 11611), (40, 11620), (41, 11641), (51, 11698), (54, 11731), (68, 11863), (87, 12025), (92, 12070), (105, 12175), (119, 12304), (126, 12412), (133, 12535), (155, 12934), (169, 13081), (172, 13102), (176, 13126), (179, 13147), (182, 13180), (186, 13198), (187, 13222), (201, 13339), (223, 13450), (224, 13453), (228, 13474), (237, 13546), (242, 13600), (248, 13657), (256, 13714), (259, 13726), (260, 13732), (266, 13789), (274, 13861), (279, 13951), (318, 14278), (325, 14344), (328, 14395), (333, 14500), (335, 14548), (340, 14608), (344, 14719), (347, 14785), (353, 14857), (354, 14896), (356, 14935), (359, 14995), (360, 15049), (361, 15052), (362, 15073), (363, 15085), (364, 15130), (365, 15151), (368, 15199), (371, 15247), (386, 15469),

Gene: Celery_21 Start: 11512, Stop: 15627, Start Num: 19

Candidate Starts for Celery_21:

(14, 11401), (Start: 19 @11512 has 10 MA's), (Start: 24 @11536 has 1 MA's), (40, 11656), (42, 11689), (47, 11719), (54, 11767), (55, 11770), (82, 12031), (92, 12109), (93, 12112), (95, 12121), (100, 12184), (105, 12214), (107, 12238), (108, 12247), (113, 12298), (116, 12322), (123, 12394), (132, 12565), (133, 12574), (149, 12880), (152, 12943), (155, 12976), (161, 13051), (165, 13087), (169, 13123),

(179, 13189), (182, 13222), (186, 13240), (188, 13273), (192, 13315), (193, 13330), (198, 13363), (199, 13369), (202, 13387), (205, 13402), (210, 13462), (211, 13471), (212, 13480), (215, 13510), (221, 13564), (223, 13579), (234, 13654), (242, 13729), (255, 13831), (256, 13843), (259, 13855), (260, 13861), (263, 13900), (266, 13918), (276, 14035), (286, 14161), (289, 14209), (301, 14293), (302, 14296), (328, 14524), (329, 14566), (347, 14914), (352, 14953), (354, 15025), (356, 15064), (357, 15106), (360, 15178), (361, 15181), (362, 15202), (364, 15259), (365, 15280), (368, 15328), (369, 15331), (370, 15346), (374, 15409), (375, 15418), (379, 15460), (386, 15613), (387, 15616),

Gene: Chilliams_87 Start: 56444, Stop: 61222, Start Num: 3

Candidate Starts for Chilliams_87:

(Start: 3 @56444 has 1 MA's), (11, 56747), (12, 56750), (13, 56759), (17, 56864), (Start: 24 @56909 has 1 MA's), (26, 56924), (27, 56927), (30, 56948), (34, 56981), (36, 57008), (46, 57092), (49, 57116), (50, 57119), (53, 57152), (65, 57269), (69, 57314), (74, 57383), (76, 57395), (97, 57560), (106, 57626), (110, 57677), (115, 57716), (120, 57764), (124, 57806), (125, 57830), (135, 58016), (136, 58028), (141, 58079), (146, 58232), (147, 58265), (156, 58403), (158, 58424), (160, 58466), (173, 58583), (174, 58586), (177, 58607), (181, 58640), (196, 58781), (197, 58784), (203, 58826), (220, 58994), (243, 59168), (244, 59177), (249, 59234), (258, 59288), (262, 59333), (267, 59375), (278, 59507), (281, 59555), (286, 59609), (305, 59780), (319, 59948), (322, 59981), (338, 60266), (347, 60455), (349, 60464), (350, 60479), (355, 60581), (357, 60650), (361, 60725), (369, 60875), (370, 60893), (372, 60935), (376, 60968), (385, 61157),

Gene: Conan_19 Start: 11284, Stop: 15396, Start Num: 19

Candidate Starts for Conan_19:

(Start: 19 @11284 has 10 MA's), (Start: 24 @11308 has 1 MA's), (40, 11428), (42, 11461), (47, 11491), (54, 11539), (82, 11803), (89, 11845), (95, 11893), (108, 12019), (119, 12115), (121, 12145), (123, 12166), (126, 12223), (128, 12238), (132, 12337), (133, 12346), (149, 12652), (151, 12688), (155, 12748), (166, 12868), (169, 12895), (170, 12898), (176, 12940), (179, 12961), (199, 13141), (210, 13234), (211, 13243), (214, 13267), (217, 13321), (218, 13327), (221, 13336), (223, 13351), (226, 13366), (229, 13384), (234, 13426), (242, 13501), (256, 13615), (259, 13627), (260, 13633), (266, 13690), (269, 13723), (272, 13741), (275, 13780), (276, 13807), (287, 13936), (289, 13981), (302, 14068), (312, 14146), (326, 14266), (328, 14296), (329, 14338), (339, 14497), (340, 14509), (341, 14542), (345, 14662), (347, 14686), (351, 14719), (352, 14725), (353, 14758), (354, 14797), (356, 14836), (358, 14887), (361, 14953), (362, 14974), (364, 15031), (365, 15052), (368, 15100), (369, 15103), (370, 15118), (374, 15181), (375, 15190), (379, 15232), (380, 15247), (386, 15382), (387, 15385),

Gene: Dexers_17 Start: 11265, Stop: 15377, Start Num: 19

Candidate Starts for Dexers_17:

(Start: 19 @11265 has 10 MA's), (Start: 24 @11289 has 1 MA's), (40, 11409), (42, 11442), (54, 11520), (55, 11523), (80, 11763), (82, 11784), (89, 11826), (95, 11874), (108, 12000), (119, 12096), (121, 12126), (123, 12147), (128, 12219), (132, 12318), (133, 12327), (134, 12339), (149, 12633), (151, 12669), (155, 12729), (165, 12840), (169, 12876), (172, 12897), (179, 12942), (182, 12975), (186, 12993), (188, 13026), (203, 13146), (204, 13149), (210, 13215), (211, 13224), (218, 13308), (221, 13317), (223, 13332), (234, 13407), (239, 13443), (242, 13482), (256, 13596), (259, 13608), (260, 13614), (263, 13653), (267, 13680), (273, 13734), (276, 13788), (287, 13917), (289, 13962), (302, 14049), (326, 14247), (328, 14277), (329, 14319), (339, 14478), (340, 14490), (343, 14553), (347, 14667), (352, 14706), (354, 14778), (356, 14817), (357, 14859), (361, 14934), (362, 14955), (364, 15012), (365, 15033), (368, 15081), (369, 15084), (370, 15099), (374, 15162), (375, 15171), (379, 15213), (386, 15363), (387, 15366),

Gene: Diane_18 Start: 11534, Stop: 15442, Start Num: 21

Candidate Starts for Diane_18:

(Start: 21 @11534 has 9 MA's), (40, 11669), (54, 11780), (59, 11843), (65, 11876), (68, 11912), (89, 12083), (91, 12113), (92, 12119), (102, 12206), (126, 12461), (127, 12464), (133, 12584), (155, 12983), (159, 13016), (169, 13130), (171, 13142), (179, 13196), (182, 13229), (186, 13247), (193, 13337), (216, 13421), (218, 13430), (242, 13562), (244, 13574), (248, 13619), (256, 13676), (266, 13751), (274, 13823), (298, 14117), (314, 14216), (321, 14249), (328, 14357), (340, 14570), (347, 14747), (356, 14897), (357, 14939), (361, 15014), (362, 15035), (364, 15092), (365, 15113), (366, 15116), (368, 15161), (376, 15254),

Gene: ElGato_19 Start: 11287, Stop: 15399, Start Num: 19

Candidate Starts for ElGato_19:

(Start: 19 @11287 has 10 MA's), (Start: 24 @11311 has 1 MA's), (40, 11431), (42, 11464), (47, 11494), (54, 11542), (82, 11806), (89, 11848), (95, 11896), (108, 12022), (119, 12118), (121, 12148), (123, 12169), (128, 12241), (132, 12340), (133, 12349), (149, 12655), (151, 12691), (155, 12751), (166, 12871), (169, 12898), (170, 12901), (176, 12943), (179, 12964), (199, 13144), (209, 13222), (210, 13237), (211, 13246), (214, 13270), (217, 13324), (218, 13330), (221, 13339), (223, 13354), (226, 13369), (229, 13387), (234, 13429), (242, 13504), (256, 13618), (259, 13630), (260, 13636), (263, 13675), (265, 13684), (266, 13693), (287, 13939), (289, 13984), (302, 14071), (312, 14149), (326, 14269), (328, 14299), (329, 14341), (339, 14500), (340, 14512), (341, 14545), (345, 14665), (347, 14689), (352, 14728), (353, 14761), (354, 14800), (356, 14839), (358, 14890), (361, 14956), (362, 14977), (364, 15034), (365, 15055), (368, 15103), (369, 15106), (370, 15121), (374, 15184), (375, 15193), (379, 15235), (380, 15250), (386, 15385), (387, 15388),

Gene: Haizum_18 Start: 11570, Stop: 15475, Start Num: 21

Candidate Starts for Haizum_18:

(Start: 21 @11570 has 9 MA's), (40, 11705), (54, 11816), (59, 11879), (65, 11912), (68, 11948), (87, 12110), (89, 12119), (92, 12155), (102, 12242), (132, 12611), (133, 12620), (155, 13019), (159, 13052), (169, 13166), (179, 13232), (182, 13265), (186, 13283), (187, 13307), (189, 13319), (193, 13373), (216, 13457), (218, 13466), (231, 13511), (242, 13598), (248, 13655), (256, 13712), (266, 13787), (274, 13859), (298, 14153), (314, 14252), (321, 14285), (328, 14393), (330, 14438), (333, 14498), (340, 14606), (356, 14933), (357, 14975), (361, 15050), (362, 15071), (364, 15128), (365, 15149), (366, 15152), (368, 15197), (386, 15464),

Gene: Issmi_19 Start: 11823, Stop: 15905, Start Num: 21

Candidate Starts for Issmi_19:

(Start: 21 @11823 has 9 MA's), (26, 11850), (40, 11958), (41, 11979), (54, 12069), (68, 12201), (82, 12330), (92, 12408), (96, 12441), (98, 12465), (126, 12750), (132, 12864), (133, 12873), (155, 13272), (169, 13419), (176, 13464), (180, 13494), (184, 13524), (206, 13701), (223, 13788), (224, 13791), (228, 13812), (241, 13932), (242, 13938), (255, 14040), (256, 14052), (266, 14127), (271, 14169), (279, 14277), (296, 14454), (299, 14484), (307, 14580), (308, 14601), (318, 14703), (328, 14820), (333, 14925), (347, 15210), (352, 15249), (353, 15282), (354, 15321), (356, 15360), (360, 15474), (361, 15477), (362, 15498), (364, 15555), (365, 15576), (366, 15579), (367, 15600), (368, 15624), (382, 15768), (386, 15894),

Gene: Jhitchelle_17 Start: 11193, Stop: 15305, Start Num: 19

Candidate Starts for Jhitchelle_17:

(Start: 19 @11193 has 10 MA's), (Start: 24 @11217 has 1 MA's), (39, 11331), (40, 11337), (42, 11370), (47, 11400), (52, 11430), (54, 11448), (56, 11472), (66, 11553), (80, 11691), (89, 11754), (92, 11790), (95, 11802), (98, 11847), (102, 11877), (108, 11928), (113, 11979), (123, 12075), (126, 12132), (129, 12168), (132, 12246), (133, 12255), (149, 12561), (153, 12627), (154, 12633), (155, 12657), (161, 12732), (169, 12804), (179, 12870), (180, 12879), (190, 12960), (194, 13014), (199, 13050), (210, 13143), (211, 13152), (212, 13161), (214, 13176), (225, 13272), (234, 13335), (240, 13380), (242, 13410), (248, 13467), (251, 13488), (256, 13524), (263, 13581), (266, 13599), (267, 13608), (293, 13908), (302, 13977), (303, 13995), (313, 14064), (321, 14097), (323, 14139), (324, 14148), (328,

14205), (331, 14286), (333, 14310), (337, 14388), (347, 14595), (352, 14634), (354, 14706), (356, 14745), (361, 14862), (362, 14883), (364, 14940), (365, 14961), (368, 15009), (369, 15012), (370, 15027), (374, 15090), (375, 15099), (379, 15141), (386, 15291), (387, 15294),

Gene: Kaine_18 Start: 11265, Stop: 15377, Start Num: 19

Candidate Starts for Kaine_18:

(Start: 19 @11265 has 10 MA's), (Start: 24 @11289 has 1 MA's), (40, 11409), (42, 11442), (54, 11520), (55, 11523), (80, 11763), (82, 11784), (89, 11826), (92, 11862), (95, 11874), (108, 12000), (119, 12096), (121, 12126), (123, 12147), (128, 12219), (132, 12318), (133, 12327), (149, 12633), (151, 12669), (155, 12729), (165, 12840), (169, 12876), (172, 12897), (179, 12942), (182, 12975), (186, 12993), (188, 13026), (203, 13146), (204, 13149), (210, 13215), (211, 13224), (218, 13308), (221, 13317), (223, 13332), (234, 13407), (239, 13443), (242, 13482), (256, 13596), (259, 13608), (260, 13614), (263, 13653), (267, 13680), (273, 13734), (276, 13788), (287, 13917), (289, 13962), (302, 14049), (326, 14247), (328, 14277), (329, 14319), (339, 14478), (340, 14490), (343, 14553), (347, 14667), (352, 14706), (354, 14778), (356, 14817), (357, 14859), (361, 14934), (362, 14955), (364, 15012), (365, 15033), (368, 15081), (369, 15084), (370, 15099), (374, 15162), (375, 15171), (379, 15213), (386, 15363), (387, 15366),

Gene: Nishikigoi_18 Start: 11570, Stop: 15475, Start Num: 21

Candidate Starts for Nishikigoi_18:

(Start: 21 @11570 has 9 MA's), (40, 11705), (54, 11816), (59, 11879), (65, 11912), (68, 11948), (87, 12110), (89, 12119), (92, 12155), (102, 12242), (132, 12611), (133, 12620), (155, 13019), (159, 13052), (169, 13166), (179, 13232), (182, 13265), (186, 13283), (187, 13307), (189, 13319), (193, 13373), (216, 13457), (218, 13466), (242, 13598), (248, 13655), (256, 13712), (266, 13787), (274, 13859), (298, 14153), (314, 14252), (321, 14285), (328, 14393), (330, 14438), (333, 14498), (340, 14606), (356, 14933), (357, 14975), (361, 15050), (362, 15071), (364, 15128), (365, 15149), (366, 15152), (368, 15197), (386, 15464),

Gene: Omar_19 Start: 11800, Stop: 15807, Start Num: 21

Candidate Starts for Omar_19:

(Start: 21 @11800 has 9 MA's), (38, 11926), (40, 11935), (54, 12046), (59, 12109), (68, 12178), (80, 12286), (89, 12349), (92, 12385), (101, 12466), (111, 12556), (126, 12727), (127, 12730), (133, 12850), (138, 12922), (155, 13249), (164, 13354), (169, 13396), (171, 13408), (172, 13417), (176, 13441), (179, 13462), (182, 13495), (186, 13513), (195, 13609), (217, 13690), (218, 13696), (234, 13753), (245, 13843), (247, 13873), (249, 13897), (253, 13921), (256, 13942), (266, 14017), (270, 14053), (274, 14089), (298, 14383), (321, 14614), (327, 14701), (328, 14722), (335, 14875), (339, 14923), (347, 15112), (356, 15262), (357, 15304), (361, 15379), (362, 15400), (364, 15457), (365, 15478), (368, 15526), (384, 15721),

Gene: Pavo_19 Start: 11557, Stop: 15669, Start Num: 19

Candidate Starts for Pavo_19:

(Start: 19 @11557 has 10 MA's), (Start: 24 @11581 has 1 MA's), (40, 11701), (42, 11734), (47, 11764), (54, 11812), (80, 12055), (82, 12076), (89, 12118), (95, 12166), (108, 12292), (119, 12388), (121, 12418), (123, 12439), (128, 12511), (132, 12610), (133, 12619), (149, 12925), (151, 12961), (155, 13021), (162, 13099), (165, 13132), (169, 13168), (172, 13189), (179, 13234), (182, 13267), (186, 13285), (188, 13318), (192, 13360), (199, 13414), (202, 13432), (203, 13438), (204, 13441), (210, 13507), (211, 13516), (215, 13555), (221, 13609), (223, 13624), (230, 13675), (234, 13699), (242, 13774), (256, 13888), (259, 13900), (260, 13906), (266, 13963), (269, 13996), (272, 14014), (275, 14053), (276, 14080), (287, 14209), (289, 14254), (302, 14341), (312, 14419), (326, 14539), (328, 14569), (329, 14611), (339, 14770), (340, 14782), (341, 14815), (345, 14935), (347, 14959), (352, 14998), (353, 15031), (354, 15070), (356, 15109), (358, 15160), (361, 15226), (362, 15247), (364, 15304), (365, 15325), (368, 15373), (369, 15376), (370, 15391), (374, 15454), (375, 15463), (379, 15505), (380, 15520), (386, 15655), (387, 15658),

Gene: Provolone_19 Start: 11311, Stop: 15399, Start Num: 24

Candidate Starts for Provolone_19:

(Start: 19 @11287 has 10 MA's), (Start: 24 @11311 has 1 MA's), (40, 11431), (42, 11464), (47, 11494), (54, 11542), (82, 11806), (89, 11848), (95, 11896), (108, 12022), (119, 12118), (121, 12148), (123, 12169), (128, 12241), (132, 12340), (133, 12349), (149, 12655), (151, 12691), (155, 12751), (166, 12871), (169, 12898), (170, 12901), (176, 12943), (179, 12964), (199, 13144), (210, 13237), (211, 13246), (214, 13270), (217, 13324), (218, 13330), (221, 13339), (223, 13354), (226, 13369), (229, 13387), (234, 13429), (242, 13504), (256, 13618), (259, 13630), (260, 13636), (266, 13693), (269, 13726), (272, 13744), (275, 13783), (276, 13810), (287, 13939), (289, 13984), (302, 14071), (312, 14149), (326, 14269), (328, 14299), (329, 14341), (339, 14500), (340, 14512), (341, 14545), (345, 14665), (347, 14689), (352, 14728), (353, 14761), (354, 14800), (356, 14839), (358, 14890), (361, 14956), (362, 14977), (364, 15034), (365, 15055), (368, 15103), (369, 15106), (370, 15121), (374, 15184), (375, 15193), (379, 15235), (380, 15250), (386, 15385), (387, 15388),

Gene: Rockabye_92 Start: 56803, Stop: 61581, Start Num: 3

Candidate Starts for Rockabye_92:

(Start: 3 @56803 has 1 MA's), (11, 57106), (12, 57109), (13, 57118), (15, 57139), (16, 57193), (17, 57223), (Start: 24 @57268 has 1 MA's), (26, 57283), (30, 57307), (36, 57367), (46, 57451), (49, 57475), (50, 57478), (53, 57511), (65, 57628), (71, 57706), (76, 57754), (88, 57829), (97, 57919), (104, 57967), (110, 58036), (120, 58123), (135, 58375), (136, 58387), (146, 58591), (156, 58762), (160, 58825), (165, 58873), (173, 58942), (174, 58945), (177, 58966), (181, 58999), (196, 59140), (197, 59143), (203, 59185), (219, 59350), (220, 59353), (243, 59527), (244, 59536), (278, 59866), (285, 59965), (286, 59968), (291, 60022), (295, 60055), (306, 60166), (319, 60307), (347, 60814), (349, 60823), (350, 60838), (355, 60940), (361, 61084), (369, 61234), (370, 61252), (372, 61294), (381, 61399), (385, 61516),

Gene: SJReid_93 Start: 55855, Stop: 60636, Start Num: 3

Candidate Starts for SJReid_93:

(Start: 3 @55855 has 1 MA's), (6, 56032), (11, 56158), (13, 56170), (16, 56245), (30, 56359), (33, 56389), (35, 56410), (36, 56419), (41, 56473), (46, 56503), (53, 56563), (57, 56602), (65, 56680), (70, 56737), (74, 56794), (76, 56806), (85, 56863), (94, 56929), (110, 57088), (115, 57127), (120, 57175), (128, 57286), (130, 57373), (135, 57427), (136, 57439), (143, 57580), (146, 57643), (147, 57676), (148, 57700), (156, 57814), (160, 57877), (165, 57925), (178, 58021), (181, 58051), (196, 58192), (197, 58195), (203, 58237), (219, 58402), (220, 58405), (243, 58579), (244, 58588), (262, 58744), (267, 58786), (278, 58918), (306, 59218), (319, 59359), (347, 59866), (349, 59875), (350, 59890), (361, 60136), (369, 60286), (370, 60304), (372, 60346), (376, 60379), (378, 60391), (385, 60571),

Gene: Saftant_18 Start: 11565, Stop: 15947, Start Num: 4

Candidate Starts for Saftant_18:

(2, 11433), (Start: 4 @11565 has 3 MA's), (8, 11694), (20, 11901), (25, 11931), (28, 11952), (31, 11967), (32, 11976), (36, 12018), (37, 12033), (47, 12111), (48, 12117), (62, 12249), (64, 12270), (67, 12288), (81, 12423), (83, 12450), (86, 12465), (92, 12519), (95, 12531), (100, 12594), (102, 12606), (107, 12648), (108, 12657), (123, 12804), (133, 12984), (137, 13038), (149, 13290), (155, 13386), (157, 13404), (166, 13506), (169, 13533), (171, 13545), (179, 13599), (186, 13650), (191, 13719), (202, 13797), (206, 13815), (207, 13824), (215, 13845), (222, 13893), (228, 13926), (239, 14013), (242, 14052), (245, 14067), (252, 14139), (254, 14151), (256, 14166), (261, 14199), (264, 14229), (266, 14241), (268, 14262), (270, 14277), (277, 14349), (315, 14697), (316, 14706), (320, 14724), (328, 14835), (329, 14877), (336, 14997), (342, 15090), (343, 15111), (345, 15201), (347, 15225), (350, 15249), (352, 15264), (353, 15297), (354, 15336), (356, 15375), (360, 15489), (361, 15492), (362, 15513), (364, 15570), (365, 15591), (368, 15639), (369, 15642), (371, 15687), (379, 15771), (383, 15846), (386, 15933), (387, 15936),

Gene: Speedwell_23 Start: 13301, Stop: 17692, Start Num: 4

Candidate Starts for Speedwell_23:

(Start: 4 @13301 has 3 MA's), (5, 13346), (7, 13376), (28, 13688), (31, 13703), (32, 13712), (36, 13754), (43, 13820), (44, 13826), (45, 13829), (58, 13949), (61, 13982), (67, 14024), (78, 14141), (86, 14201), (95, 14267), (108, 14393), (122, 14531), (123, 14540), (133, 14720), (137, 14774), (140, 14804), (149, 15026), (151, 15062), (155, 15122), (166, 15242), (169, 15269), (179, 15335), (186, 15386), (191, 15455), (202, 15533), (206, 15551), (207, 15560), (215, 15581), (225, 15650), (243, 15791), (254, 15887), (256, 15902), (261, 15935), (266, 15977), (272, 16028), (274, 16049), (275, 16067), (280, 16160), (290, 16271), (292, 16283), (294, 16295), (302, 16355), (317, 16463), (328, 16583), (329, 16625), (350, 16997), (352, 17012), (353, 17045), (354, 17084), (356, 17123), (357, 17165), (361, 17240), (362, 17261), (364, 17318), (365, 17339), (368, 17387), (369, 17390), (379, 17519), (383, 17591), (386, 17678), (387, 17681),

Gene: Sudan_18 Start: 11552, Stop: 15664, Start Num: 19

Candidate Starts for Sudan_18:

(Start: 19 @11552 has 10 MA's), (Start: 24 @11576 has 1 MA's), (40, 11696), (42, 11729), (54, 11807), (55, 11810), (80, 12050), (82, 12071), (89, 12113), (92, 12149), (95, 12161), (108, 12287), (119, 12383), (121, 12413), (123, 12434), (128, 12506), (132, 12605), (133, 12614), (149, 12920), (151, 12956), (155, 13016), (165, 13127), (169, 13163), (172, 13184), (179, 13229), (182, 13262), (186, 13280), (188, 13313), (203, 13433), (204, 13436), (210, 13502), (211, 13511), (218, 13595), (221, 13604), (223, 13619), (234, 13694), (239, 13730), (242, 13769), (256, 13883), (259, 13895), (260, 13901), (263, 13940), (267, 13967), (273, 14021), (276, 14075), (287, 14204), (289, 14249), (302, 14336), (326, 14534), (328, 14564), (329, 14606), (339, 14765), (340, 14777), (343, 14840), (347, 14954), (352, 14993), (354, 15065), (356, 15104), (357, 15146), (361, 15221), (362, 15242), (364, 15299), (365, 15320), (368, 15368), (369, 15371), (370, 15386), (374, 15449), (375, 15458), (379, 15500), (386, 15650), (387, 15653),

Gene: SunkenRoot_20 Start: 11847, Stop: 15959, Start Num: 19

Candidate Starts for SunkenRoot_20:

(Start: 19 @11847 has 10 MA's), (Start: 24 @11871 has 1 MA's), (40, 11991), (42, 12024), (47, 12054), (54, 12102), (55, 12105), (75, 12321), (80, 12345), (82, 12366), (89, 12408), (92, 12444), (93, 12447), (95, 12456), (100, 12519), (105, 12549), (107, 12573), (108, 12582), (109, 12594), (113, 12633), (116, 12657), (123, 12729), (132, 12900), (133, 12909), (149, 13215), (152, 13278), (155, 13311), (165, 13422), (169, 13458), (172, 13479), (179, 13524), (182, 13557), (186, 13575), (188, 13608), (192, 13650), (193, 13665), (198, 13698), (199, 13704), (202, 13722), (205, 13737), (210, 13797), (211, 13806), (212, 13815), (214, 13830), (215, 13845), (218, 13890), (221, 13899), (225, 13926), (233, 13986), (242, 14064), (251, 14142), (256, 14178), (259, 14190), (260, 14196), (263, 14235), (266, 14253), (267, 14262), (276, 14370), (283, 14469), (284, 14475), (286, 14496), (287, 14499), (302, 14631), (312, 14709), (328, 14859), (329, 14901), (347, 15249), (352, 15288), (354, 15360), (356, 15399), (361, 15516), (362, 15537), (364, 15594), (365, 15615), (368, 15663), (369, 15666), (374, 15744), (375, 15753), (379, 15795), (386, 15945), (387, 15948),

Gene: Superstar_21 Start: 12671, Stop: 16678, Start Num: 21

Candidate Starts for Superstar_21:

(Start: 21 @12671 has 9 MA's), (38, 12797), (40, 12806), (51, 12884), (54, 12917), (68, 13049), (73, 13115), (82, 13178), (89, 13220), (92, 13256), (98, 13313), (102, 13343), (112, 13436), (114, 13448), (126, 13598), (132, 13712), (133, 13721), (155, 14120), (165, 14231), (172, 14288), (176, 14312), (179, 14333), (182, 14366), (186, 14384), (193, 14474), (216, 14558), (217, 14561), (218, 14567), (231, 14612), (232, 14615), (242, 14699), (248, 14756), (256, 14813), (259, 14825), (260, 14831), (266, 14888), (274, 14960), (298, 15254), (299, 15257), (302, 15266), (328, 15593), (333, 15698), (335, 15746), (340, 15806), (347, 15983), (353, 16055), (354, 16094), (356, 16133), (360, 16247), (361, 16250), (362, 16271), (364, 16328), (365, 16349), (366, 16352), (371, 16445), (373, 16469), (377, 16493), (386, 16667),

Gene: Tefunt_18 Start: 11570, Stop: 15475, Start Num: 21

Candidate Starts for Tefunt_18:

(Start: 21 @11570 has 9 MA's), (40, 11705), (54, 11816), (59, 11879), (65, 11912), (68, 11948), (87, 12110), (89, 12119), (92, 12155), (102, 12242), (132, 12611), (133, 12620), (155, 13019), (159, 13052), (169, 13166), (179, 13232), (182, 13265), (186, 13283), (187, 13307), (189, 13319), (193, 13373), (216, 13457), (218, 13466), (231, 13511), (242, 13598), (248, 13655), (256, 13712), (266, 13787), (274, 13859), (298, 14153), (314, 14252), (321, 14285), (328, 14393), (330, 14438), (333, 14498), (340, 14606), (356, 14933), (357, 14975), (361, 15050), (362, 15071), (364, 15128), (365, 15149), (366, 15152), (368, 15197), (386, 15464),

Gene: Vanseggelen_23 Start: 11218, Stop: 15330, Start Num: 19

Candidate Starts for Vanseggelen_23:

(Start: 19 @11218 has 10 MA's), (Start: 24 @11242 has 1 MA's), (29, 11269), (40, 11362), (42, 11395), (47, 11425), (54, 11473), (60, 11545), (80, 11716), (82, 11737), (89, 11779), (95, 11827), (100, 11890), (108, 11953), (119, 12049), (121, 12079), (123, 12100), (128, 12172), (132, 12271), (133, 12280), (149, 12586), (155, 12682), (159, 12715), (165, 12793), (169, 12829), (179, 12895), (196, 13054), (199, 13075), (210, 13168), (211, 13177), (212, 13186), (226, 13300), (234, 13360), (240, 13405), (242, 13435), (248, 13492), (251, 13513), (256, 13549), (263, 13606), (266, 13624), (267, 13633), (302, 14002), (313, 14089), (321, 14122), (323, 14164), (328, 14230), (331, 14311), (333, 14335), (339, 14431), (340, 14443), (345, 14596), (347, 14620), (352, 14659), (354, 14731), (356, 14770), (357, 14812), (361, 14887), (362, 14908), (364, 14965), (365, 14986), (368, 15034), (369, 15037), (370, 15052), (374, 15115), (375, 15124), (379, 15166), (380, 15181), (386, 15316), (387, 15319),

Gene: Verabelle_19 Start: 11549, Stop: 15661, Start Num: 19

Candidate Starts for Verabelle_19:

(Start: 19 @11549 has 10 MA's), (Start: 24 @11573 has 1 MA's), (29, 11600), (39, 11687), (40, 11693), (42, 11726), (47, 11756), (54, 11804), (72, 11987), (73, 12005), (82, 12068), (89, 12110), (92, 12146), (95, 12158), (98, 12203), (102, 12233), (108, 12284), (113, 12335), (121, 12410), (123, 12431), (126, 12488), (129, 12524), (132, 12602), (133, 12611), (144, 12824), (149, 12917), (153, 12983), (154, 12989), (155, 13013), (163, 13100), (179, 13226), (180, 13235), (185, 13268), (186, 13277), (188, 13310), (192, 13352), (195, 13373), (199, 13406), (201, 13418), (202, 13424), (205, 13439), (210, 13499), (211, 13508), (212, 13517), (213, 13529), (214, 13532), (225, 13628), (227, 13637), (234, 13691), (240, 13736), (242, 13766), (248, 13823), (251, 13844), (256, 13880), (263, 13937), (266, 13955), (267, 13964), (276, 14072), (288, 14240), (302, 14333), (313, 14420), (321, 14453), (323, 14495), (328, 14561), (331, 14642), (333, 14666), (337, 14744), (345, 14927), (347, 14951), (352, 14990), (353, 15023), (354, 15062), (356, 15101), (361, 15218), (362, 15239), (364, 15296), (365, 15317), (369, 15368), (374, 15446), (375, 15455), (379, 15497), (386, 15647), (387, 15650),

Gene: Verse_18 Start: 11848, Stop: 15960, Start Num: 19

Candidate Starts for Verse_18:

(Start: 19 @11848 has 10 MA's), (Start: 24 @11872 has 1 MA's), (40, 11992), (42, 12025), (47, 12055), (54, 12103), (55, 12106), (75, 12322), (84, 12382), (95, 12457), (100, 12520), (108, 12583), (116, 12658), (123, 12730), (132, 12901), (133, 12910), (149, 13216), (151, 13252), (155, 13312), (159, 13345), (165, 13423), (167, 13444), (169, 13459), (172, 13480), (175, 13498), (179, 13525), (182, 13558), (186, 13576), (188, 13609), (193, 13666), (200, 13711), (203, 13729), (210, 13798), (221, 13900), (225, 13927), (234, 13990), (242, 14065), (251, 14143), (254, 14164), (256, 14179), (259, 14191), (260, 14197), (263, 14236), (266, 14254), (276, 14371), (283, 14470), (284, 14476), (286, 14497), (287, 14500), (302, 14632), (312, 14710), (328, 14860), (329, 14902), (347, 15250), (352, 15289), (354, 15361), (356, 15400), (361, 15517), (362, 15538), (364, 15595), (365, 15616), (368, 15664), (369, 15667), (374, 15745), (375, 15754), (379, 15796), (386, 15946), (387, 15949),

Gene: Yosif_19 Start: 11936, Stop: 15949, Start Num: 21

Candidate Starts for Yosif_19:

(Start: 21 @11936 has 9 MA's), (Start: 24 @11951 has 1 MA's), (40, 12071), (44, 12113), (47, 12134), (54, 12182), (65, 12281), (80, 12425), (83, 12455), (95, 12536), (103, 12614), (133, 12992), (140, 13076), (142, 13115), (149, 13295), (150, 13328), (155, 13391), (169, 13538), (179, 13604), (182, 13637), (184, 13643), (186, 13655), (201, 13796), (202, 13802), (207, 13829), (222, 13898), (234, 13982), (235, 13985), (236, 13997), (242, 14057), (256, 14171), (259, 14183), (267, 14255), (283, 14450), (286, 14477), (300, 14609), (302, 14612), (304, 14633), (309, 14654), (328, 14840), (346, 15218), (347, 15227), (352, 15266), (353, 15299), (356, 15377), (357, 15419), (358, 15428), (360, 15491), (361, 15494), (362, 15515), (364, 15572), (365, 15593), (368, 15641), (369, 15644), (370, 15659), (374, 15722), (375, 15731), (379, 15773), (380, 15794), (382, 15806), (383, 15848), (386, 15935), (387, 15938),

Gene: ZamZam_18 Start: 11560, Stop: 15954, Start Num: 4

Candidate Starts for ZamZam_18:

(2, 11434), (Start: 4 @11560 has 3 MA's), (8, 11689), (9, 11710), (20, 11896), (25, 11926), (28, 11947), (31, 11962), (32, 11971), (36, 12013), (37, 12028), (43, 12079), (62, 12244), (63, 12250), (67, 12283), (81, 12418), (83, 12445), (86, 12460), (92, 12514), (95, 12526), (100, 12589), (102, 12601), (107, 12643), (108, 12652), (123, 12799), (133, 12979), (137, 13033), (149, 13285), (153, 13351), (155, 13381), (166, 13501), (169, 13528), (171, 13540), (179, 13594), (186, 13645), (188, 13678), (191, 13714), (202, 13792), (206, 13810), (207, 13819), (215, 13840), (222, 13888), (228, 13921), (242, 14047), (245, 14062), (252, 14134), (254, 14146), (256, 14161), (261, 14194), (264, 14224), (266, 14236), (274, 14308), (279, 14398), (282, 14440), (320, 14731), (328, 14842), (331, 14923), (333, 14947), (347, 15232), (352, 15271), (354, 15343), (356, 15382), (357, 15424), (361, 15499), (362, 15520), (364, 15577), (365, 15598), (368, 15646), (369, 15649), (371, 15694), (379, 15778), (380, 15805), (383, 15853), (386, 15940), (387, 15943),

Gene: phiCAM_19 Start: 13655, Stop: 17626, Start Num: 40

Candidate Starts for phiCAM_19:

(Start: 19 @13511 has 10 MA's), (Start: 24 @13535 has 1 MA's), (40, 13655), (42, 13688), (47, 13718), (54, 13766), (55, 13769), (75, 13985), (82, 14030), (92, 14108), (93, 14111), (95, 14120), (100, 14183), (105, 14213), (107, 14237), (108, 14246), (113, 14297), (116, 14321), (123, 14393), (132, 14564), (133, 14573), (149, 14879), (152, 14942), (155, 14975), (165, 15086), (169, 15122), (172, 15143), (179, 15188), (182, 15221), (186, 15239), (188, 15272), (192, 15314), (193, 15329), (198, 15362), (199, 15368), (202, 15386), (203, 15392), (204, 15395), (210, 15461), (211, 15470), (212, 15479), (214, 15494), (221, 15563), (223, 15578), (234, 15653), (242, 15728), (254, 15827), (256, 15842), (259, 15854), (260, 15860), (263, 15899), (266, 15917), (275, 16007), (276, 16034), (286, 16160), (297, 16262), (302, 16295), (328, 16523), (329, 16565), (339, 16724), (340, 16736), (347, 16913), (352, 16952), (354, 17024), (356, 17063), (361, 17180), (362, 17201), (364, 17258), (365, 17279), (368, 17327), (369, 17330), (370, 17345), (374, 17408), (375, 17417), (379, 17459), (386, 17612), (387, 17615),

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

Candidate Starts for phiHau3_20:

(Start: 1 @11837 has 2 MA's), (10, 12173), (15, 12218), (18, 12311), (22, 12335), (23, 12344), (39, 12470), (50, 12554), (55, 12593), (63, 12680), (68, 12737), (77, 12830), (79, 12839), (82, 12866), (85, 12884), (90, 12917), (92, 12944), (98, 13001), (99, 13010), (116, 13157), (117, 13163), (118, 13166), (130, 13385), (133, 13412), (139, 13493), (145, 13631), (149, 13715), (155, 13811), (156, 13820), (168, 13955), (169, 13958), (171, 13970), (182, 14057), (183, 14060), (185, 14066), (204, 14231), (208, 14258), (236, 14417), (238, 14426), (242, 14477), (246, 14501), (250, 14549), (254, 14576), (256, 14591), (266, 14666), (272, 14717), (299, 15035), (310, 15089), (311, 15119), (328, 15272), (331, 15353), (332, 15362), (334, 15380), (348, 15647),