

Pham 284059



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 284059 Report

This analysis was run 02/23/26 on database version 636.

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 284059 has 29 members, 16 are drafts.

Phages represented in each track:

- Track 1 : Alok\_i\_22, Chidiebere\_23, Mikronejon\_22, EmoNemo\_22, Hanem\_23, Pakusa\_22, Kabocha\_24, Twin\_22
- Track 2 : DalanDe\_18
- Track 3 : FlyingTortilla\_22
- Track 4 : Gray\_23
- Track 5 : Farrylious\_21, Argena\_22
- Track 6 : Toneprano\_22, Amoonguss\_22, MintFritos\_22
- Track 7 : Beted\_22, Lenoshki\_22
- Track 8 : Schomber\_22
- Track 9 : Thales\_18
- Track 10 : ChisanaKitsune\_19
- Track 11 : ScarletRaider\_22
- Track 12 : GMA6\_11
- Track 13 : UBSmoodge\_24
- Track 14 : FruityLoops\_21
- Track 15 : Oogie\_22
- Track 16 : Cantare\_7
- Track 17 : Gilgamesh\_46
- Track 18 : OnionKnight\_3

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

The start number called the most often in the published annotations is 3, it was called in 9 of the 13 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alok\_i\_22, Amoonguss\_22, Argena\_22, Beted\_22, Chidiebere\_23, ChisanaKitsune\_19, DalanDe\_18, EmoNemo\_22, Farrylious\_21, FlyingTortilla\_22, FruityLoops\_21, GMA6\_11, Hanem\_23, Kabocha\_24, Lenoshki\_22, Mikronejon\_22, MintFritos\_22, Oogie\_22, Pakusa\_22, ScarletRaider\_22, Schomber\_22, Thales\_18,

Toneprano\_22, Twin\_22, UBSmoodge\_24,

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

- Gray\_23,

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

- Cantare\_7, Gilgamesh\_46, OnionKnight\_3,

### Summary by start number:

Start 1:

- Found in 1 of 29 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 13
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gilgamesh\_46 (singleton),

Start 2:

- Found in 23 of 29 ( 79.3% ) of genes in pham
- Manual Annotations of this start: 1 of 13
- Called 4.3% of time when present
- Phage (with cluster) where this start called: Gray\_23 (DQ),

Start 3:

- Found in 26 of 29 ( 89.7% ) of genes in pham
- Manual Annotations of this start: 9 of 13
- Called 96.2% of time when present
- Phage (with cluster) where this start called: Alok\_i\_22 (DQ), Amoonguss\_22 (DQ), Argena\_22 (DQ), Beted\_22 (DQ), Chidiebere\_23 (DQ), ChisanaKitsune\_19 (DQ), DalanDe\_18 (DQ), EmoNemo\_22 (DQ), Farrylious\_21 (DQ), FlyingTortilla\_22 (DQ), FruityLoops\_21 (DQ), GMA6\_11 (DQ), Hanem\_23 (DQ), Kabocha\_24 (DQ), Lenoshki\_22 (DQ), Mikronejon\_22 (DQ), MintFritos\_22 (DQ), Oogie\_22 (DQ), Pakusa\_22 (DQ), ScarletRaider\_22 (DQ), Schomber\_22 (DQ), Thales\_18 (DQ), Toneprano\_22 (DQ), Twin\_22 (DQ), UBSmoodge\_24 (DQ),

Start 4:

- Found in 1 of 29 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 13
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cantare\_7 (singleton),

Start 31:

- Found in 1 of 29 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 13
- Called 100.0% of time when present
- Phage (with cluster) where this start called: OnionKnight\_3 (singleton),

### Summary by clusters:

There are 2 clusters represented in this pham: singleton, DQ,

Info for manual annotations of cluster DQ:

- Start number 2 was manually annotated 1 time for cluster DQ.
- Start number 3 was manually annotated 9 times for cluster DQ.

### **Gene Information:**

Gene: Alok\_i\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Alok\_i\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Amoonguss\_22 Start: 9184, Stop: 11844, Start Num: 3

Candidate Starts for Amoonguss\_22:

(Start: 2 @9169 has 1 MA's), (Start: 3 @9184 has 9 MA's), (12, 9289), (13, 9307), (17, 9376), (25, 9466), (26, 9481), (27, 9490), (36, 9589), (37, 9592), (45, 9634), (46, 9646), (49, 9676), (55, 9709), (56, 9721), (57, 9736), (61, 9751), (65, 9784), (66, 9796), (67, 9814), (72, 9880), (79, 9952), (81, 9958), (84, 9976), (93, 10045), (99, 10099), (100, 10102), (104, 10171), (110, 10240), (115, 10318), (126, 10456), (129, 10471), (134, 10537), (143, 10636), (144, 10645), (145, 10663), (157, 10825), (158, 10849), (163, 10879), (164, 10882), (167, 10894), (168, 10903), (171, 10960), (173, 11011), (178, 11038), (179, 11044), (181, 11059), (186, 11101), (189, 11119), (193, 11137), (198, 11182), (201, 11212), (202, 11221), (204, 11233), (205, 11245), (209, 11287), (215, 11347), (216, 11350), (221, 11398), (222, 11401), (223, 11410), (228, 11443), (229, 11464), (232, 11506), (233, 11515), (236, 11575), (239, 11608), (240, 11638), (244, 11734), (247, 11773), (250, 11830),

Gene: Argena\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Argena\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (144, 10642), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Beted\_22 Start: 8807, Stop: 11467, Start Num: 3

Candidate Starts for Beted\_22:

(Start: 2 @8792 has 1 MA's), (Start: 3 @8807 has 9 MA's), (12, 8912), (13, 8930), (17, 8999), (25, 9089), (26, 9104), (27, 9113), (36, 9212), (37, 9215), (45, 9257), (46, 9269), (49, 9299), (55, 9332), (56, 9344), (57, 9359), (61, 9374), (65, 9407), (66, 9419), (67, 9437), (72, 9503), (79, 9575), (81, 9581), (84, 9599), (93, 9668), (99, 9722), (100, 9725), (104, 9794), (110, 9863), (115, 9941), (126, 10079), (129, 10094), (143, 10259), (145, 10286), (157, 10448), (158, 10472), (163, 10502), (164, 10505), (167, 10517), (168, 10526), (171, 10583), (173, 10634), (178, 10661), (179, 10667), (181, 10682), (186, 10724), (189, 10742), (193, 10760), (198, 10805), (201, 10835), (202, 10844), (204, 10856), (205,

10868), (209, 10910), (210, 10916), (215, 10970), (216, 10973), (221, 11021), (222, 11024), (223, 11033), (228, 11066), (229, 11087), (232, 11129), (233, 11138), (236, 11198), (239, 11231), (240, 11261), (242, 11321), (244, 11357), (245, 11360), (247, 11396), (250, 11453),

Gene: Cantare\_7 Start: 3960, Stop: 6341, Start Num: 4

Candidate Starts for Cantare\_7:

(Start: 4 @3960 has 1 MA's), (5, 3969), (6, 3978), (8, 4023), (10, 4032), (13, 4083), (15, 4131), (18, 4182), (40, 4380), (42, 4386), (48, 4431), (52, 4455), (59, 4509), (64, 4536), (72, 4644), (86, 4752), (87, 4758), (96, 4830), (97, 4833), (99, 4857), (100, 4860), (102, 4911), (103, 4920), (104, 4929), (107, 4962), (109, 4983), (112, 5028), (113, 5040), (118, 5160), (125, 5211), (129, 5226), (130, 5244), (131, 5247), (135, 5280), (136, 5301), (138, 5310), (149, 5445), (155, 5493), (160, 5580), (162, 5601), (169, 5640), (170, 5655), (172, 5682), (175, 5742), (177, 5748), (180, 5772), (183, 5802), (185, 5829), (189, 5850), (195, 5901), (206, 6006), (217, 6102), (219, 6117), (220, 6120), (223, 6162),

Gene: Chidiebere\_23 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Chidiebere\_23:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: ChisanaKitsune\_19 Start: 7882, Stop: 10536, Start Num: 3

Candidate Starts for ChisanaKitsune\_19:

(Start: 2 @7867 has 1 MA's), (Start: 3 @7882 has 9 MA's), (12, 7987), (13, 8005), (17, 8074), (25, 8164), (26, 8179), (36, 8287), (37, 8290), (45, 8332), (46, 8344), (49, 8374), (55, 8407), (56, 8419), (57, 8434), (61, 8449), (65, 8482), (66, 8494), (67, 8512), (72, 8578), (79, 8650), (81, 8656), (84, 8674), (93, 8743), (99, 8797), (100, 8800), (104, 8869), (110, 8938), (115, 9016), (126, 9154), (129, 9169), (143, 9334), (145, 9361), (157, 9517), (158, 9541), (163, 9571), (164, 9574), (167, 9586), (168, 9595), (171, 9652), (173, 9703), (179, 9736), (181, 9751), (186, 9793), (189, 9811), (193, 9829), (198, 9874), (201, 9904), (202, 9913), (204, 9925), (205, 9937), (209, 9979), (210, 9985), (215, 10039), (216, 10042), (221, 10090), (222, 10093), (223, 10102), (228, 10135), (229, 10156), (232, 10198), (233, 10207), (236, 10267), (239, 10300), (240, 10330), (244, 10426), (245, 10429), (247, 10465), (250, 10522),

Gene: DalanDe\_18 Start: 8687, Stop: 11458, Start Num: 3

Candidate Starts for DalanDe\_18:

(Start: 3 @8687 has 9 MA's), (6, 8711), (12, 8789), (14, 8822), (15, 8855), (16, 8861), (19, 8912), (21, 8921), (22, 8927), (33, 9056), (35, 9080), (46, 9140), (49, 9170), (53, 9188), (58, 9233), (62, 9260), (65, 9278), (66, 9290), (67, 9308), (68, 9332), (70, 9350), (71, 9353), (72, 9374), (73, 9377), (75, 9386), (84, 9470), (87, 9494), (89, 9503), (90, 9524), (93, 9539), (94, 9542), (98, 9581), (100, 9596), (104, 9665), (105, 9668), (108, 9707), (110, 9734), (111, 9758), (113, 9776), (116, 9833), (120, 9911), (122, 9944), (124, 9950), (128, 9965), (129, 9968), (131, 9989), (133, 10025), (139, 10085), (140, 10091), (141, 10106), (142, 10112), (147, 10184), (154, 10259), (156, 10334), (161, 10391), (163, 10406), (164, 10409), (168, 10430), (179, 10559), (181, 10574), (187, 10646), (190, 10688), (197, 10760), (204, 10826), (205, 10838), (208, 10871), (210, 10886), (211, 10904), (212, 10910), (221, 10991), (223, 11003), (227, 11027), (228, 11036), (230, 11078), (237, 11186), (238, 11189), (241, 11249), (244, 11324), (249, 11417), (250, 11420),

Gene: EmoNemo\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for EmoNemo\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Farrylious\_21 Start: 8934, Stop: 11594, Start Num: 3

Candidate Starts for Farrylious\_21:

(Start: 2 @8919 has 1 MA's), (Start: 3 @8934 has 9 MA's), (12, 9039), (13, 9057), (17, 9126), (25, 9216), (26, 9231), (27, 9240), (36, 9339), (37, 9342), (45, 9384), (46, 9396), (49, 9426), (55, 9459), (56, 9471), (57, 9486), (61, 9501), (65, 9534), (66, 9546), (67, 9564), (72, 9630), (79, 9702), (81, 9708), (84, 9726), (93, 9795), (99, 9849), (100, 9852), (104, 9921), (110, 9990), (115, 10068), (126, 10206), (129, 10221), (134, 10287), (143, 10386), (144, 10395), (145, 10413), (156, 10557), (157, 10575), (158, 10599), (163, 10629), (164, 10632), (167, 10644), (168, 10653), (171, 10710), (173, 10761), (178, 10788), (179, 10794), (181, 10809), (186, 10851), (189, 10869), (193, 10887), (198, 10932), (201, 10962), (202, 10971), (204, 10983), (205, 10995), (209, 11037), (215, 11097), (216, 11100), (221, 11148), (222, 11151), (223, 11160), (228, 11193), (229, 11214), (232, 11256), (233, 11265), (236, 11325), (239, 11358), (240, 11388), (244, 11484), (247, 11523), (250, 11580),

Gene: FlyingTortilla\_22 Start: 10228, Stop: 12855, Start Num: 3

Candidate Starts for FlyingTortilla\_22:

(Start: 2 @10213 has 1 MA's), (Start: 3 @10228 has 9 MA's), (11, 10315), (12, 10330), (14, 10363), (17, 10417), (19, 10453), (23, 10489), (26, 10522), (27, 10531), (35, 10624), (36, 10630), (44, 10672), (45, 10675), (49, 10717), (55, 10750), (65, 10825), (66, 10837), (67, 10855), (72, 10921), (75, 10933), (81, 10999), (84, 11017), (100, 11143), (104, 11212), (110, 11281), (111, 11305), (115, 11359), (124, 11494), (126, 11497), (129, 11512), (145, 11704), (156, 11824), (157, 11842), (163, 11896), (168, 11920), (173, 12022), (174, 12025), (176, 12037), (181, 12070), (198, 12193), (200, 12220), (202, 12232), (204, 12244), (205, 12256), (209, 12298), (216, 12361), (221, 12409), (222, 12412), (223, 12421), (224, 12427), (228, 12454), (233, 12526), (238, 12607), (240, 12649), (242, 12709), (244, 12745), (245, 12748), (247, 12784), (250, 12841),

Gene: FruityLoops\_21 Start: 10233, Stop: 12860, Start Num: 3

Candidate Starts for FruityLoops\_21:

(Start: 2 @10218 has 1 MA's), (Start: 3 @10233 has 9 MA's), (11, 10320), (12, 10335), (14, 10368), (17, 10422), (19, 10458), (23, 10494), (26, 10527), (27, 10536), (36, 10635), (44, 10677), (45, 10680), (49, 10722), (55, 10755), (65, 10830), (66, 10842), (67, 10860), (72, 10926), (73, 10929), (75, 10938), (81, 11004), (84, 11022), (100, 11148), (104, 11217), (110, 11286), (111, 11310), (115, 11364), (124, 11499), (126, 11502), (129, 11517), (145, 11709), (156, 11829), (157, 11847), (163, 11901), (168, 11925), (173, 12027), (174, 12030), (176, 12042), (181, 12075), (198, 12198), (200, 12225), (202, 12237), (204, 12249), (205, 12261), (209, 12303), (216, 12366), (221, 12414), (222, 12417), (223, 12426), (224, 12432), (228, 12459), (233, 12531), (238, 12612), (240, 12654), (242, 12714), (244, 12750), (245, 12753), (247, 12789), (250, 12846),

Gene: GMA6\_11 Start: 5324, Stop: 7891, Start Num: 3

Candidate Starts for GMA6\_11:

(Start: 3 @5324 has 9 MA's), (12, 5423), (14, 5456), (15, 5489), (16, 5495), (17, 5510), (19, 5546), (22, 5561), (25, 5597), (27, 5621), (30, 5663), (33, 5690), (36, 5720), (37, 5723), (39, 5744), (43, 5759), (46, 5777), (47, 5780), (49, 5807), (53, 5825), (55, 5840), (56, 5852), (57, 5867), (66, 5927), (72, 6011), (74, 6017), (76, 6035), (84, 6107), (89, 6140), (99, 6230), (100, 6233), (106, 6329), (117, 6527), (126, 6587), (132, 6626), (141, 6743), (150, 6824), (156, 6839), (157, 6857), (159, 6884), (168, 6935), (191, 7169), (196, 7199), (204, 7277), (205, 7289), (207, 7310), (211, 7355), (214, 7382), (222, 7445), (229, 7508), (233, 7559), (236, 7619), (240, 7682), (241, 7703), (244, 7778), (246, 7796), (250, 7874),

Gene: Gilgamesh\_46 Start: 29138, Stop: 31591, Start Num: 1

Candidate Starts for Gilgamesh\_46:

(Start: 1 @29138 has 1 MA's), (9, 29252), (17, 29366), (21, 29402), (28, 29495), (32, 29537), (34, 29558), (50, 29663), (88, 29996), (90, 30023), (92, 30035), (98, 30080), (110, 30224), (155, 30728), (165, 30851), (194, 31127), (198, 31166), (199, 31184), (218, 31337),

Gene: Gray\_23 Start: 9166, Stop: 11841, Start Num: 2

Candidate Starts for Gray\_23:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Hanem\_23 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Hanem\_23:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Kabocha\_24 Start: 9994, Stop: 12654, Start Num: 3

Candidate Starts for Kabocha\_24:

(Start: 2 @9979 has 1 MA's), (Start: 3 @9994 has 9 MA's), (12, 10099), (13, 10117), (17, 10186), (25, 10276), (26, 10291), (27, 10300), (36, 10399), (37, 10402), (45, 10444), (46, 10456), (49, 10486), (55, 10519), (56, 10531), (57, 10546), (61, 10561), (65, 10594), (66, 10606), (67, 10624), (72, 10690), (79, 10762), (81, 10768), (84, 10786), (93, 10855), (99, 10909), (100, 10912), (104, 10981), (110, 11050), (115, 11128), (126, 11266), (129, 11281), (134, 11347), (143, 11446), (145, 11473), (156, 11617), (157, 11635), (158, 11659), (163, 11689), (164, 11692), (167, 11704), (168, 11713), (171, 11770), (173, 11821), (178, 11848), (179, 11854), (181, 11869), (186, 11911), (189, 11929), (193, 11947), (198, 11992), (201, 12022), (202, 12031), (204, 12043), (205, 12055), (209, 12097), (215, 12157), (216, 12160), (221, 12208), (222, 12211), (223, 12220), (228, 12253), (229, 12274), (232, 12316), (233, 12325), (236, 12385), (239, 12418), (240, 12448), (244, 12544), (247, 12583), (250, 12640),

Gene: Lenoshki\_22 Start: 8807, Stop: 11467, Start Num: 3

Candidate Starts for Lenoshki\_22:

(Start: 2 @8792 has 1 MA's), (Start: 3 @8807 has 9 MA's), (12, 8912), (13, 8930), (17, 8999), (25, 9089), (26, 9104), (27, 9113), (36, 9212), (37, 9215), (45, 9257), (46, 9269), (49, 9299), (55, 9332), (56, 9344), (57, 9359), (61, 9374), (65, 9407), (66, 9419), (67, 9437), (72, 9503), (79, 9575), (81, 9581), (84, 9599), (93, 9668), (99, 9722), (100, 9725), (104, 9794), (110, 9863), (115, 9941), (126, 10079), (129, 10094), (143, 10259), (145, 10286), (157, 10448), (158, 10472), (163, 10502), (164, 10505), (167, 10517), (168, 10526), (171, 10583), (173, 10634), (178, 10661), (179, 10667), (181, 10682), (186, 10724), (189, 10742), (193, 10760), (198, 10805), (201, 10835), (202, 10844), (204, 10856), (205, 10868), (209, 10910), (210, 10916), (215, 10970), (216, 10973), (221, 11021), (222, 11024), (223, 11033), (228, 11066), (229, 11087), (232, 11129), (233, 11138), (236, 11198), (239, 11231), (240, 11261), (242, 11321), (244, 11357), (245, 11360), (247, 11396), (250, 11453),

Gene: Mikronejon\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Mikronejon\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: MintFritos\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for MintFritos\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (144, 10642), (145, 10660), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: OnionKnight\_3 Start: 1799, Stop: 4105, Start Num: 31

Candidate Starts for OnionKnight\_3:

(7, 1499), (20, 1664), (24, 1709), (29, 1775), (Start: 31 @1799 has 1 MA's), (36, 1838), (38, 1853), (41, 1865), (51, 1940), (54, 1955), (57, 1985), (60, 1997), (63, 2018), (69, 2099), (71, 2105), (77, 2180), (78, 2186), (80, 2207), (82, 2210), (83, 2213), (85, 2243), (87, 2252), (88, 2255), (91, 2285), (95, 2312), (101, 2393), (110, 2474), (114, 2522), (119, 2639), (121, 2660), (122, 2678), (123, 2681), (127, 2696), (137, 2792), (143, 2864), (146, 2894), (147, 2918), (148, 2939), (151, 2966), (153, 2987), (162, 3122), (166, 3134), (182, 3302), (184, 3335), (188, 3359), (192, 3398), (202, 3491), (203, 3497), (212, 3587), (213, 3608), (221, 3665), (225, 3689), (226, 3698), (231, 3761), (234, 3800), (235, 3842), (243, 3992), (248, 4079),

Gene: Oogie\_22 Start: 8833, Stop: 11493, Start Num: 3

Candidate Starts for Oogie\_22:

(Start: 2 @8818 has 1 MA's), (Start: 3 @8833 has 9 MA's), (12, 8938), (17, 9025), (25, 9115), (26, 9130), (27, 9139), (36, 9238), (37, 9241), (45, 9283), (46, 9295), (49, 9325), (55, 9358), (56, 9370), (57, 9385), (61, 9400), (65, 9433), (66, 9445), (67, 9463), (72, 9529), (79, 9601), (81, 9607), (84, 9625), (93, 9694), (99, 9748), (100, 9751), (104, 9820), (110, 9889), (115, 9967), (126, 10105), (129, 10120), (143, 10285), (145, 10312), (157, 10474), (158, 10498), (163, 10528), (164, 10531), (167, 10543), (168, 10552), (171, 10609), (173, 10660), (178, 10687), (179, 10693), (181, 10708), (186, 10750), (189, 10768), (193, 10786), (198, 10831), (201, 10861), (202, 10870), (204, 10882), (205, 10894), (209, 10936), (210, 10942), (215, 10996), (216, 10999), (221, 11047), (222, 11050), (223, 11059), (228, 11092), (229, 11113), (232, 11155), (233, 11164), (236, 11224), (239, 11257), (240, 11287), (242, 11347), (244, 11383), (245, 11386), (247, 11422), (250, 11479),

Gene: Pakusa\_22 Start: 8923, Stop: 11583, Start Num: 3

Candidate Starts for Pakusa\_22:

(Start: 2 @8908 has 1 MA's), (Start: 3 @8923 has 9 MA's), (12, 9028), (13, 9046), (17, 9115), (25, 9205), (26, 9220), (27, 9229), (36, 9328), (37, 9331), (45, 9373), (46, 9385), (49, 9415), (55, 9448), (56, 9460), (57, 9475), (61, 9490), (65, 9523), (66, 9535), (67, 9553), (72, 9619), (79, 9691), (81, 9697), (84, 9715), (93, 9784), (99, 9838), (100, 9841), (104, 9910), (110, 9979), (115, 10057), (126, 10195), (129, 10210), (134, 10276), (143, 10375), (145, 10402), (156, 10546), (157, 10564), (158, 10588), (163, 10618), (164, 10621), (167, 10633), (168, 10642), (171, 10699), (173, 10750), (178, 10777), (179, 10783), (181, 10798), (186, 10840), (189, 10858), (193, 10876), (198, 10921), (201, 10951), (202, 10960), (204, 10972), (205, 10984), (209, 11026), (215, 11086), (216, 11089), (221, 11137), (222, 11140), (223, 11149), (228, 11182), (229, 11203), (232, 11245), (233, 11254), (236, 11314), (239, 11347), (240, 11377), (244, 11473), (247, 11512), (250, 11569),

Gene: ScarletRaider\_22 Start: 10255, Stop: 12882, Start Num: 3

Candidate Starts for ScarletRaider\_22:

(Start: 2 @10240 has 1 MA's), (Start: 3 @10255 has 9 MA's), (11, 10342), (12, 10357), (14, 10390), (17, 10444), (19, 10480), (23, 10516), (26, 10549), (27, 10558), (35, 10651), (36, 10657), (44, 10699), (45, 10702), (49, 10744), (55, 10777), (65, 10852), (66, 10864), (67, 10882), (72, 10948), (75, 10960), (81, 11026), (84, 11044), (100, 11170), (104, 11239), (110, 11308), (111, 11332), (115, 11386), (124, 11521), (126, 11524), (129, 11539), (145, 11731), (152, 11809), (156, 11851), (157, 11869), (163, 11923), (168, 11947), (173, 12049), (174, 12052), (176, 12064), (181, 12097), (193, 12175), (198, 12220), (200, 12247), (202, 12259), (204, 12271), (205, 12283), (209, 12325), (216, 12388), (221, 12436), (222, 12439), (223, 12448), (224, 12454), (228, 12481), (233, 12553), (238, 12634), (240, 12676), (244, 12772), (245, 12775), (247, 12811), (250, 12868),

Gene: Schomber\_22 Start: 8931, Stop: 11591, Start Num: 3

Candidate Starts for Schomber\_22:

(Start: 2 @8916 has 1 MA's), (Start: 3 @8931 has 9 MA's), (12, 9036), (13, 9054), (17, 9123), (25, 9213), (26, 9228), (27, 9237), (36, 9336), (37, 9339), (45, 9381), (46, 9393), (49, 9423), (55, 9456), (56, 9468), (57, 9483), (61, 9498), (65, 9531), (66, 9543), (67, 9561), (72, 9627), (79, 9699), (81, 9705), (84, 9723), (93, 9792), (99, 9846), (100, 9849), (104, 9918), (110, 9987), (115, 10065), (126, 10203), (129, 10218), (134, 10284), (143, 10383), (144, 10392), (145, 10410), (156, 10554), (157, 10572), (158, 10596), (163, 10626), (164, 10629), (167, 10641), (168, 10650), (171, 10707), (173, 10758), (178, 10785), (179, 10791), (181, 10806), (186, 10848), (189, 10866), (193, 10884), (198, 10929), (201, 10959), (202, 10968), (204, 10980), (205, 10992), (209, 11034), (215, 11094), (216, 11097), (221, 11145), (222, 11148), (223, 11157), (228, 11190), (229, 11211), (232, 11253), (233, 11262), (236, 11322), (239, 11355), (240, 11385), (242, 11445), (244, 11481), (247, 11520), (250, 11577),

Gene: Thales\_18 Start: 8025, Stop: 10796, Start Num: 3

Candidate Starts for Thales\_18:

(Start: 3 @8025 has 9 MA's), (6, 8049), (12, 8127), (14, 8160), (15, 8193), (16, 8199), (19, 8250), (21, 8259), (22, 8265), (27, 8325), (33, 8394), (35, 8418), (46, 8478), (49, 8508), (53, 8526), (57, 8568), (58,

8571), (62, 8598), (65, 8616), (66, 8628), (67, 8646), (68, 8670), (71, 8691), (72, 8712), (73, 8715), (77, 8760), (84, 8808), (87, 8832), (89, 8841), (90, 8862), (93, 8877), (94, 8880), (100, 8934), (104, 9003), (105, 9006), (108, 9045), (111, 9096), (113, 9114), (116, 9171), (120, 9249), (128, 9303), (129, 9306), (131, 9327), (133, 9363), (139, 9423), (140, 9429), (141, 9444), (142, 9450), (147, 9522), (154, 9597), (156, 9672), (161, 9729), (163, 9744), (164, 9747), (168, 9768), (179, 9897), (181, 9912), (187, 9984), (190, 10026), (197, 10098), (204, 10164), (205, 10176), (208, 10209), (210, 10224), (211, 10242), (212, 10248), (221, 10329), (223, 10341), (227, 10365), (228, 10374), (230, 10416), (237, 10524), (238, 10527), (241, 10587), (244, 10662), (249, 10755), (250, 10758),

Gene: Toneprano\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Toneprano\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (144, 10642), (145, 10660), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: Twin\_22 Start: 9181, Stop: 11841, Start Num: 3

Candidate Starts for Twin\_22:

(Start: 2 @9166 has 1 MA's), (Start: 3 @9181 has 9 MA's), (12, 9286), (13, 9304), (17, 9373), (25, 9463), (26, 9478), (27, 9487), (36, 9586), (37, 9589), (45, 9631), (46, 9643), (49, 9673), (55, 9706), (56, 9718), (57, 9733), (61, 9748), (65, 9781), (66, 9793), (67, 9811), (72, 9877), (79, 9949), (81, 9955), (84, 9973), (93, 10042), (99, 10096), (100, 10099), (104, 10168), (110, 10237), (115, 10315), (126, 10453), (129, 10468), (134, 10534), (143, 10633), (145, 10660), (156, 10804), (157, 10822), (158, 10846), (163, 10876), (164, 10879), (167, 10891), (168, 10900), (171, 10957), (173, 11008), (178, 11035), (179, 11041), (181, 11056), (186, 11098), (189, 11116), (193, 11134), (198, 11179), (201, 11209), (202, 11218), (204, 11230), (205, 11242), (209, 11284), (215, 11344), (216, 11347), (221, 11395), (222, 11398), (223, 11407), (228, 11440), (229, 11461), (232, 11503), (233, 11512), (236, 11572), (239, 11605), (240, 11635), (244, 11731), (247, 11770), (250, 11827),

Gene: UBSmoodge\_24 Start: 10724, Stop: 13351, Start Num: 3

Candidate Starts for UBSmoodge\_24:

(Start: 2 @10709 has 1 MA's), (Start: 3 @10724 has 9 MA's), (11, 10811), (12, 10826), (14, 10859), (17, 10913), (19, 10949), (23, 10985), (26, 11018), (27, 11027), (35, 11120), (36, 11126), (44, 11168), (45, 11171), (49, 11213), (55, 11246), (65, 11321), (66, 11333), (67, 11351), (72, 11417), (73, 11420), (75, 11429), (81, 11495), (84, 11513), (100, 11639), (104, 11708), (110, 11777), (111, 11801), (115, 11855), (124, 11990), (126, 11993), (129, 12008), (145, 12200), (156, 12320), (157, 12338), (163, 12392), (168, 12416), (173, 12518), (174, 12521), (176, 12533), (181, 12566), (193, 12644), (198, 12689), (200, 12716), (202, 12728), (204, 12740), (205, 12752), (209, 12794), (216, 12857), (221, 12905), (222, 12908), (223, 12917), (224, 12923), (228, 12950), (229, 12971), (233, 13022), (238, 13103), (240, 13145), (244, 13241), (247, 13280), (250, 13337),