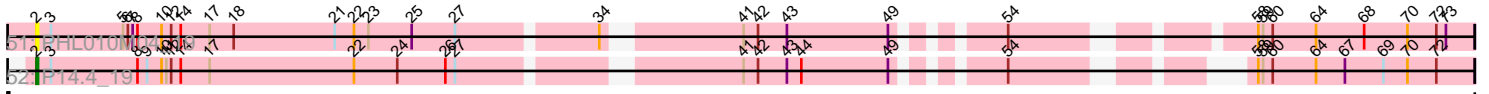




# Pham 194040



Track	Label	Value
51	PHLOTUM	1
51	PHLOTUM	2
51	PHLOTUM	3
51	PHLOTUM	4
51	PHLOTUM	5
51	PHLOTUM	6
51	PHLOTUM	7
51	PHLOTUM	8
51	PHLOTUM	9
51	PHLOTUM	10
51	PHLOTUM	11
51	PHLOTUM	12
51	PHLOTUM	13
51	PHLOTUM	14
51	PHLOTUM	15
51	PHLOTUM	16
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51	PHLOTUM	42
51	PHLOTUM	43
51	PHLOTUM	44
51	PHLOTUM	45
51	PHLOTUM	46
51	PHLOTUM	47
51	PHLOTUM	48
51	PHLOTUM	49
51	PHLOTUM	50
51	PHLOTUM	51
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51	PHLOTUM	95
51	PHLOTUM	96
51	PHLOTUM	97
51	PHLOTUM	98
51	PHLOTUM	99
51	PHLOTUM	100
52	P14.4_19	1
52	P14.4_19	2
52	P14.4_19	3
52	P14.4_19	4
52	P14.4_19	5
52	P14.4_19	6
52	P14.4_19	7
52	P14.4_19	8
52	P14.4_19	9
52	P14.4_19	10
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52	P14.4_19	12
52	P14.4_19	13
52	P14.4_19	14
52	P14.4_19	15
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52	P14.4_19	20
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52	P14.4_19	94
52	P14.4_19	95
52	P14.4_19	96
52	P14.4_19	97
52	P14.4_19	98
52	P14.4_19	99
52	P14.4_19	100

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 194040 Report

This analysis was run 11/02/24 on database version 579.

Pham number 194040 has 57 members, 14 are drafts.

Phages represented in each track:

- Track 1 : P106L\_19, P106M\_19, P106C\_19
- Track 2 : P100D\_19
- Track 3 : PHL071N05\_19
- Track 4 : Lauchelly\_19
- Track 5 : Attacne\_19
- Track 6 : Kubed\_19
- Track 7 : Leviosa\_19
- Track 8 : Procrass1\_19
- Track 9 : Keiki\_19, Pirate\_19
- Track 10 : P107A\_19
- Track 11 : PHL114L00\_19
- Track 12 : Moyashi\_19
- Track 13 : PAS50\_19
- Track 14 : MrAK\_19
- Track 15 : P108C\_19
- Track 16 : P1.1\_19
- Track 17 : P105\_19, PHL113M01\_19
- Track 18 : P101A\_19
- Track 19 : P9.1\_19
- Track 20 : LilBandit\_19
- Track 21 : ATCC29399BT\_19, ATCC29399BC\_19
- Track 22 : P104A\_19
- Track 23 : P106I\_19
- Track 24 : Stormborn\_19
- Track 25 : P107C\_19
- Track 26 : MEAK\_19
- Track 27 : PAD20\_19
- Track 28 : P100A\_19
- Track 29 : Cota\_19
- Track 30 : SKKY\_19
- Track 31 : Solid\_19
- Track 32 : Supernova\_19
- Track 33 : PHL067M10\_19
- Track 34 : Rileysaurus\_19
- Track 35 : P100.1\_19
- Track 36 : Enoki\_19
- Track 37 : Ouroboros\_19

- Track 38 : Aquarius\_19
- Track 39 : Enochoraptor\_20
- Track 40 : QueenBey\_19
- Track 41 : PHL037M02\_19
- Track 42 : PHL060L00\_19
- Track 43 : BruceLethal\_19
- Track 44 : P106A\_19
- Track 45 : P104B\_19
- Track 46 : DrParker\_19
- Track 47 : PHL111M01\_19
- Track 48 : PA6\_19
- Track 49 : Wizzo\_19
- Track 50 : PHL112N00\_19
- Track 51 : PHL010M04\_19
- Track 52 : P14.4\_19

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

The start number called the most often in the published annotations is 2, it was called in 41 of the 43 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- ATCC29399BC\_19, ATCC29399BT\_19, Aquarius\_19, Attacne\_19, BruceLethal\_19, Cota\_19, DrParker\_19, Enochoraptor\_20, Enoki\_19, Keiki\_19, Kubed\_19, Lauchelly\_19, Leviosa\_19, LilBandit\_19, MEAK\_19, Moyashi\_19, MrAK\_19, Ouroboros\_19, P1.1\_19, P100.1\_19, P100A\_19, P100D\_19, P101A\_19, P104A\_19, P104B\_19, P105\_19, P106A\_19, P106C\_19, P106I\_19, P106L\_19, P106M\_19, P108C\_19, P14.4\_19, P9.1\_19, PHL010M04\_19, PHL060L00\_19, PHL067M10\_19, PHL071N05\_19, PHL111M01\_19, PHL112N00\_19, PHL113M01\_19, PHL114L00\_19, Pirate\_19, Procrass1\_19, QueenBey\_19, Rileysaurus\_19, SKKY\_19, Solid\_19, Stormborn\_19, Supernova\_19, Wizzo\_19,

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

- P107A\_19, P107C\_19, PA6\_19, PAD20\_19, PAS50\_19, PHL037M02\_19,

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

- 

**Summary by start number:**

Start 1:

- Found in 15 of 57 ( 26.3% ) of genes in pham
- Manual Annotations of this start: 1 of 43
- Called 13.3% of time when present
- Phage (with cluster) where this start called: P107C\_19 (BU), PHL037M02\_19 (BU),

Start 2:

- Found in 57 of 57 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 41 of 43
- Called 89.5% of time when present

- Phage (with cluster) where this start called: ATCC29399BC\_19 (BU), ATCC29399BT\_19 (BU), Aquarius\_19 (BU), Attacne\_19 (BU), BruceLethal\_19 (BU), Cota\_19 (BU), DrParker\_19 (BU), Enochoraptor\_20 (BU), Enoki\_19 (BU), Keiki\_19 (BU), Kubed\_19 (BU), Lauchelly\_19 (BU), Leviosa\_19 (BU), LilBandit\_19 (BU), MEAK\_19 (BU), Moyashi\_19 (BU), MrAK\_19 (BU), Ouroboros\_19 (BU), P1.1\_19 (BU), P100.1\_19 (BU), P100A\_19 (BU), P100D\_19 (BU), P101A\_19 (BU), P104A\_19 (BU), P104B\_19 (BU), P105\_19 (BU), P106A\_19 (BU), P106C\_19 (BU), P106I\_19 (BU), P106L\_19 (BU), P106M\_19 (BU), P108C\_19 (BU), P14.4\_19 (BU), P9.1\_19 (BU), PHL010M04\_19 (BU), PHL060L00\_19 (BU), PHL067M10\_19 (BU), PHL071N05\_19 (BU), PHL111M01\_19 (BU), PHL112N00\_19 (BU), PHL113M01\_19 (BU), PHL114L00\_19 (BU), Pirate\_19 (BU), Procrass1\_19 (BU), QueenBey\_19 (BU), Rileysaurus\_19 (BU), SKKY\_19 (BU), Solid\_19 (BU), Stormborn\_19 (BU), Supernova\_19 (BU), Wizzo\_19 (BU),

Start 3:

- Found in 57 of 57 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 1 of 43
- Called 1.8% of time when present
- Phage (with cluster) where this start called: P107A\_19 (BU),

Start 6:

- Found in 32 of 57 ( 56.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 9.4% of time when present
- Phage (with cluster) where this start called: PA6\_19 (BU), PAD20\_19 (BU), PAS50\_19 (BU),

### Summary by clusters:

There is one cluster represented in this pham: BU

Info for manual annotations of cluster BU:

- Start number 1 was manually annotated 1 time for cluster BU.
- Start number 2 was manually annotated 41 times for cluster BU.
- Start number 3 was manually annotated 1 time for cluster BU.

### Gene Information:

Gene: ATCC29399BC\_19 Start: 14535, Stop: 15341, Start Num: 2

Candidate Starts for ATCC29399BC\_19:

(Start: 1 @14532 has 1 MA's), (Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (5, 14589), (6, 14592), (7, 14595), (9, 14604), (12, 14619), (13, 14622), (14, 14625), (17, 14643), (18, 14658), (21, 14721), (23, 14742), (25, 14769), (26, 14790), (27, 14796), (28, 14805), (30, 14832), (37, 14895), (41, 14949), (42, 14958), (43, 14976), (49, 15039), (54, 15096), (58, 15207), (59, 15210), (60, 15216), (64, 15243), (67, 15261), (69, 15285), (70, 15300), (72, 15318),

Gene: ATCC29399BT\_19 Start: 14535, Stop: 15341, Start Num: 2

Candidate Starts for ATCC29399BT\_19:

(Start: 1 @14532 has 1 MA's), (Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (5, 14589), (6, 14592), (7, 14595), (9, 14604), (12, 14619), (13, 14622), (14, 14625), (17, 14643), (18, 14658), (21, 14721), (23, 14742), (25, 14769), (26, 14790), (27, 14796), (28, 14805), (30, 14832), (37,

14895), (41, 14949), (42, 14958), (43, 14976), (49, 15039), (54, 15096), (58, 15207), (59, 15210), (60, 15216), (64, 15243), (67, 15261), (69, 15285), (70, 15300), (72, 15318),

Gene: Aquarius\_19 Start: 14558, Stop: 15319, Start Num: 2

Candidate Starts for Aquarius\_19:

(Start: 2 @14558 has 41 MA's), (Start: 3 @14567 has 1 MA's), (5, 14612), (6, 14615), (7, 14618), (8, 14621), (9, 14627), (10, 14636), (11, 14639), (12, 14642), (14, 14648), (17, 14666), (18, 14681), (21, 14744), (22, 14756), (24, 14783), (26, 14813), (27, 14819), (28, 14828), (29, 14846), (30, 14855), (33, 14873), (40, 14963), (42, 14981), (49, 15026), (54, 15074), (58, 15185), (59, 15188), (60, 15194), (64, 15221), (67, 15239), (69, 15263), (70, 15278), (72, 15296),

Gene: Attacne\_19 Start: 14541, Stop: 15347, Start Num: 2

Candidate Starts for Attacne\_19:

(Start: 2 @14541 has 41 MA's), (Start: 3 @14550 has 1 MA's), (8, 14604), (9, 14610), (10, 14619), (12, 14625), (14, 14631), (17, 14649), (18, 14664), (21, 14727), (22, 14739), (24, 14766), (26, 14796), (27, 14802), (28, 14811), (29, 14829), (30, 14838), (41, 14955), (42, 14964), (43, 14982), (49, 15045), (54, 15102), (59, 15216), (60, 15222), (63, 15246), (64, 15249), (67, 15267), (69, 15291), (70, 15306), (72, 15324),

Gene: BruceLethal\_19 Start: 14542, Stop: 15321, Start Num: 2

Candidate Starts for BruceLethal\_19:

(Start: 1 @14539 has 1 MA's), (Start: 2 @14542 has 41 MA's), (Start: 3 @14551 has 1 MA's), (5, 14596), (6, 14599), (7, 14602), (8, 14605), (9, 14611), (10, 14620), (11, 14623), (14, 14632), (17, 14650), (21, 14728), (22, 14740), (24, 14767), (25, 14776), (26, 14797), (27, 14803), (28, 14812), (41, 14956), (49, 15028), (54, 15085), (57, 15145), (58, 15187), (59, 15190), (60, 15196), (64, 15223), (67, 15241), (68, 15253), (70, 15280), (72, 15298),

Gene: Cota\_19 Start: 14559, Stop: 15365, Start Num: 2

Candidate Starts for Cota\_19:

(Start: 2 @14559 has 41 MA's), (Start: 3 @14568 has 1 MA's), (6, 14616), (7, 14619), (8, 14622), (9, 14628), (10, 14637), (11, 14640), (12, 14643), (14, 14649), (17, 14667), (18, 14682), (21, 14745), (22, 14757), (25, 14793), (26, 14814), (27, 14820), (28, 14829), (30, 14856), (41, 14973), (42, 14982), (49, 15063), (54, 15120), (59, 15234), (60, 15240), (64, 15267), (67, 15285), (68, 15297), (70, 15324), (71, 15339), (73, 15348),

Gene: DrParker\_19 Start: 14592, Stop: 15398, Start Num: 2

Candidate Starts for DrParker\_19:

(Start: 2 @14592 has 41 MA's), (Start: 3 @14601 has 1 MA's), (7, 14652), (8, 14655), (9, 14661), (10, 14670), (11, 14673), (12, 14676), (14, 14682), (17, 14700), (18, 14715), (21, 14778), (22, 14790), (23, 14799), (25, 14826), (26, 14847), (27, 14853), (29, 14880), (30, 14889), (41, 15006), (42, 15015), (48, 15078), (49, 15087), (54, 15144), (57, 15213), (58, 15264), (59, 15267), (60, 15273), (64, 15300), (68, 15330), (70, 15357), (71, 15372),

Gene: Enochoraptor\_20 Start: 14537, Stop: 15343, Start Num: 2

Candidate Starts for Enochoraptor\_20:

(Start: 1 @14534 has 1 MA's), (Start: 2 @14537 has 41 MA's), (Start: 3 @14546 has 1 MA's), (6, 14594), (7, 14597), (10, 14615), (11, 14618), (12, 14621), (13, 14624), (17, 14645), (18, 14660), (21, 14723), (22, 14735), (23, 14744), (25, 14771), (26, 14792), (27, 14798), (29, 14825), (30, 14834), (33, 14852), (41, 14951), (42, 14960), (43, 14978), (54, 15089), (57, 15158), (58, 15209), (59, 15212), (60, 15218), (64, 15245), (67, 15263), (69, 15287), (70, 15302), (71, 15317), (73, 15326),

Gene: Enoki\_19 Start: 14535, Stop: 15341, Start Num: 2

Candidate Starts for Enoki\_19:

(Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (7, 14595), (8, 14598), (9, 14604), (10, 14613), (12, 14619), (14, 14625), (22, 14733), (24, 14760), (25, 14769), (26, 14790), (27, 14796), (28, 14805), (29, 14823), (30, 14832), (33, 14850), (41, 14949), (42, 14958), (46, 15012), (52, 15039), (58, 15207), (59, 15210), (60, 15216), (64, 15243), (70, 15300), (71, 15315),

Gene: Keiki\_19 Start: 14555, Stop: 15289, Start Num: 2

Candidate Starts for Keiki\_19:

(Start: 2 @14555 has 41 MA's), (Start: 3 @14564 has 1 MA's), (6, 14612), (7, 14615), (9, 14624), (10, 14633), (11, 14636), (12, 14639), (14, 14645), (22, 14753), (23, 14762), (24, 14780), (25, 14789), (26, 14810), (27, 14816), (29, 14843), (30, 14852), (33, 14870), (41, 14969), (42, 14978), (43, 14996), (54, 15035), (57, 15104), (58, 15155), (59, 15158), (60, 15164), (64, 15191), (67, 15209), (69, 15233), (70, 15248), (71, 15263),

Gene: Kubed\_19 Start: 14536, Stop: 15333, Start Num: 2

Candidate Starts for Kubed\_19:

(Start: 2 @14536 has 41 MA's), (Start: 3 @14545 has 1 MA's), (5, 14590), (6, 14593), (7, 14596), (8, 14599), (9, 14605), (10, 14614), (14, 14626), (17, 14644), (18, 14659), (22, 14734), (23, 14743), (25, 14770), (26, 14791), (27, 14797), (29, 14824), (30, 14833), (32, 14851), (35, 14896), (36, 14905), (37, 14923), (42, 14986), (43, 15004), (45, 15040), (58, 15199), (59, 15202), (60, 15208), (61, 15229), (64, 15235), (69, 15277), (70, 15292), (72, 15310), (73, 15316),

Gene: Lauchelly\_19 Start: 14562, Stop: 15368, Start Num: 2

Candidate Starts for Lauchelly\_19:

(Start: 2 @14562 has 41 MA's), (Start: 3 @14571 has 1 MA's), (6, 14619), (7, 14622), (9, 14631), (14, 14652), (17, 14670), (22, 14760), (23, 14769), (24, 14787), (25, 14796), (26, 14817), (27, 14823), (28, 14832), (29, 14850), (30, 14859), (41, 14976), (42, 14985), (43, 15003), (49, 15066), (54, 15123), (57, 15192), (58, 15234), (59, 15237), (60, 15243), (64, 15270), (67, 15288), (69, 15312), (70, 15327), (71, 15342),

Gene: Leviosa\_19 Start: 14567, Stop: 15382, Start Num: 2

Candidate Starts for Leviosa\_19:

(Start: 2 @14567 has 41 MA's), (Start: 3 @14576 has 1 MA's), (6, 14624), (7, 14627), (14, 14657), (22, 14765), (23, 14774), (25, 14801), (26, 14822), (27, 14828), (28, 14837), (29, 14855), (30, 14864), (41, 14981), (42, 14990), (43, 15008), (49, 15071), (54, 15137), (58, 15248), (59, 15251), (60, 15257), (64, 15284), (67, 15302), (69, 15326), (70, 15341), (72, 15359),

Gene: LilBandit\_19 Start: 14554, Stop: 15135, Start Num: 2

Candidate Starts for LilBandit\_19:

(Start: 2 @14554 has 41 MA's), (Start: 3 @14563 has 1 MA's), (7, 14614), (8, 14617), (9, 14623), (14, 14644), (22, 14752), (23, 14761), (24, 14779), (26, 14809), (27, 14815), (30, 14851), (33, 14869), (58, 15001), (59, 15004), (60, 15010), (64, 15037), (67, 15055), (69, 15079), (70, 15094), (71, 15109), (73, 15118),

Gene: MEAK\_19 Start: 14535, Stop: 15323, Start Num: 2

Candidate Starts for MEAK\_19:

(Start: 1 @14532 has 1 MA's), (Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (8, 14598), (9, 14604), (12, 14619), (14, 14625), (17, 14643), (20, 14697), (22, 14733), (23, 14742), (24, 14760), (25, 14769), (26, 14790), (27, 14796), (28, 14805), (29, 14823), (30, 14832), (41, 14931), (42, 14940), (49, 15021), (54, 15069), (58, 15189), (59, 15192), (60, 15198), (64, 15225), (69, 15267), (70, 15282), (72, 15300),

Gene: Moyashi\_19 Start: 14593, Stop: 15417, Start Num: 2

Candidate Starts for Moyashi\_19:

(Start: 2 @14593 has 41 MA's), (Start: 3 @14602 has 1 MA's), (6, 14650), (7, 14653), (8, 14656), (10, 14671), (12, 14677), (14, 14683), (17, 14701), (18, 14716), (21, 14779), (23, 14800), (25, 14827), (26, 14848), (27, 14854), (28, 14863), (29, 14881), (30, 14890), (41, 15007), (42, 15016), (48, 15088), (49, 15097), (54, 15154), (57, 15223), (58, 15283), (60, 15292), (64, 15319), (68, 15349), (69, 15361), (70, 15376), (71, 15391),

Gene: MrAK\_19 Start: 14604, Stop: 15419, Start Num: 2

Candidate Starts for MrAK\_19:

(Start: 2 @14604 has 41 MA's), (Start: 3 @14613 has 1 MA's), (8, 14667), (14, 14694), (17, 14712), (18, 14727), (21, 14790), (22, 14802), (23, 14811), (25, 14838), (26, 14859), (27, 14865), (29, 14892), (30, 14901), (41, 15018), (42, 15027), (52, 15117), (55, 15210), (58, 15285), (60, 15294), (64, 15321), (69, 15363), (70, 15378), (71, 15393),

Gene: Ouroboros\_19 Start: 14536, Stop: 15342, Start Num: 2

Candidate Starts for Ouroboros\_19:

(Start: 1 @14533 has 1 MA's), (Start: 2 @14536 has 41 MA's), (Start: 3 @14545 has 1 MA's), (7, 14596), (8, 14599), (10, 14614), (11, 14617), (12, 14620), (13, 14623), (14, 14626), (17, 14644), (22, 14734), (23, 14743), (25, 14770), (26, 14791), (27, 14797), (28, 14806), (29, 14824), (30, 14833), (41, 14950), (42, 14959), (43, 14977), (49, 15040), (54, 15097), (58, 15208), (59, 15211), (60, 15217), (64, 15244), (67, 15262), (69, 15286), (70, 15301), (72, 15319),

Gene: P1.1\_19 Start: 14561, Stop: 15376, Start Num: 2

Candidate Starts for P1.1\_19:

(Start: 2 @14561 has 41 MA's), (Start: 3 @14570 has 1 MA's), (7, 14621), (8, 14624), (10, 14639), (12, 14645), (13, 14648), (15, 14654), (17, 14669), (18, 14684), (21, 14747), (22, 14759), (25, 14795), (26, 14816), (27, 14822), (29, 14849), (30, 14858), (33, 14876), (38, 14933), (41, 14966), (42, 14975), (49, 15056), (54, 15113), (58, 15242), (59, 15245), (60, 15251), (64, 15278), (69, 15320), (70, 15335), (72, 15353),

Gene: P100.1\_19 Start: 14565, Stop: 15389, Start Num: 2

Candidate Starts for P100.1\_19:

(Start: 2 @14565 has 41 MA's), (Start: 3 @14574 has 1 MA's), (7, 14625), (8, 14628), (9, 14634), (10, 14643), (11, 14646), (12, 14649), (14, 14655), (22, 14763), (23, 14772), (24, 14790), (26, 14820), (27, 14826), (29, 14853), (41, 14979), (42, 14988), (43, 15006), (48, 15060), (49, 15069), (54, 15126), (57, 15195), (58, 15255), (60, 15264), (64, 15291), (68, 15321), (69, 15333), (70, 15348), (71, 15363),

Gene: P100A\_19 Start: 14565, Stop: 15362, Start Num: 2

Candidate Starts for P100A\_19:

(Start: 2 @14565 has 41 MA's), (Start: 3 @14574 has 1 MA's), (7, 14625), (8, 14628), (10, 14643), (11, 14646), (12, 14649), (14, 14655), (17, 14673), (18, 14688), (23, 14772), (25, 14799), (26, 14820), (27, 14826), (28, 14835), (30, 14862), (41, 14979), (42, 14988), (43, 15006), (54, 15117), (58, 15228), (59, 15231), (60, 15237), (64, 15264), (69, 15306), (70, 15321), (71, 15336),

Gene: P100D\_19 Start: 14551, Stop: 15339, Start Num: 2

Candidate Starts for P100D\_19:

(Start: 2 @14551 has 41 MA's), (Start: 3 @14560 has 1 MA's), (6, 14608), (7, 14611), (9, 14620), (10, 14629), (12, 14635), (14, 14641), (19, 14704), (21, 14737), (22, 14749), (23, 14758), (24, 14776), (25, 14785), (26, 14806), (27, 14812), (28, 14821), (29, 14839), (30, 14848), (41, 14965), (42, 14974), (43, 14992), (49, 15055), (54, 15103), (56, 15163), (58, 15205), (59, 15208), (60, 15214), (64, 15241), (67, 15259), (70, 15298), (71, 15313), (72, 15316),

Gene: P101A\_19 Start: 14557, Stop: 15363, Start Num: 2

Candidate Starts for P101A\_19:



(Start: 2 @14557 has 41 MA's), (Start: 3 @14566 has 1 MA's), (6, 14614), (7, 14617), (9, 14626), (10, 14635), (14, 14647), (22, 14755), (23, 14764), (25, 14791), (26, 14812), (27, 14818), (29, 14845), (30, 14854), (41, 14971), (42, 14980), (43, 14998), (49, 15061), (54, 15118), (58, 15229), (59, 15232), (60, 15238), (64, 15265), (69, 15307), (70, 15322), (71, 15337),

Gene: P104A\_19 Start: 14538, Stop: 15128, Start Num: 2

Candidate Starts for P104A\_19:

(Start: 2 @14538 has 41 MA's), (Start: 3 @14547 has 1 MA's), (8, 14601), (9, 14607), (10, 14616), (11, 14619), (12, 14622), (14, 14628), (18, 14661), (22, 14736), (24, 14763), (26, 14793), (27, 14799), (28, 14808), (29, 14826), (41, 14916), (42, 14925), (43, 14943), (58, 14994), (59, 14997), (60, 15003), (64, 15030), (67, 15048), (69, 15072), (70, 15087), (71, 15102), (73, 15111),

Gene: P104B\_19 Start: 14554, Stop: 15360, Start Num: 2

Candidate Starts for P104B\_19:

(Start: 2 @14554 has 41 MA's), (Start: 3 @14563 has 1 MA's), (6, 14611), (7, 14614), (8, 14617), (9, 14623), (10, 14632), (11, 14635), (12, 14638), (14, 14644), (17, 14662), (18, 14677), (22, 14752), (23, 14761), (25, 14788), (27, 14815), (28, 14824), (29, 14842), (30, 14851), (41, 14968), (42, 14977), (49, 15058), (54, 15106), (58, 15226), (59, 15229), (60, 15235), (64, 15262), (67, 15280), (69, 15304), (70, 15319),

Gene: P105\_19 Start: 14475, Stop: 15299, Start Num: 2

Candidate Starts for P105\_19:

(Start: 2 @14475 has 41 MA's), (Start: 3 @14484 has 1 MA's), (8, 14538), (10, 14553), (12, 14559), (14, 14565), (18, 14598), (21, 14661), (22, 14673), (23, 14682), (25, 14709), (26, 14730), (27, 14736), (29, 14763), (30, 14772), (33, 14790), (41, 14889), (42, 14898), (46, 14952), (52, 14979), (58, 15165), (59, 15168), (60, 15174), (64, 15201), (69, 15243), (70, 15258), (71, 15273),

Gene: P106A\_19 Start: 14582, Stop: 15406, Start Num: 2

Candidate Starts for P106A\_19:

(Start: 2 @14582 has 41 MA's), (Start: 3 @14591 has 1 MA's), (7, 14642), (8, 14645), (9, 14651), (10, 14660), (11, 14663), (12, 14666), (14, 14672), (22, 14780), (23, 14789), (24, 14807), (26, 14837), (27, 14843), (29, 14870), (30, 14879), (33, 14897), (41, 14996), (42, 15005), (43, 15023), (54, 15116), (55, 15170), (58, 15272), (60, 15281), (64, 15308), (68, 15338), (70, 15365), (71, 15380),

Gene: P106C\_19 Start: 14576, Stop: 15382, Start Num: 2

Candidate Starts for P106C\_19:

(Start: 1 @14573 has 1 MA's), (Start: 2 @14576 has 41 MA's), (Start: 3 @14585 has 1 MA's), (6, 14633), (8, 14639), (9, 14645), (10, 14654), (11, 14657), (12, 14660), (14, 14666), (17, 14684), (18, 14699), (21, 14762), (22, 14774), (24, 14801), (26, 14831), (27, 14837), (28, 14846), (29, 14864), (30, 14873), (31, 14882), (41, 14999), (42, 15008), (43, 15026), (44, 15035), (49, 15089), (54, 15137), (58, 15248), (59, 15251), (60, 15257), (64, 15284), (67, 15302), (69, 15326), (70, 15341), (72, 15359),

Gene: P106I\_19 Start: 14576, Stop: 15211, Start Num: 2

Candidate Starts for P106I\_19:

(Start: 1 @14573 has 1 MA's), (Start: 2 @14576 has 41 MA's), (Start: 3 @14585 has 1 MA's), (6, 14633), (8, 14639), (9, 14645), (10, 14654), (11, 14657), (12, 14660), (14, 14666), (17, 14684), (18, 14699), (21, 14762), (22, 14774), (24, 14801), (26, 14831), (27, 14837), (28, 14846), (29, 14864), (30, 14873), (31, 14882), (41, 14999), (42, 15008), (43, 15026), (58, 15077), (59, 15080), (60, 15086), (64, 15113), (67, 15131), (69, 15155), (70, 15170), (72, 15188),

Gene: P106L\_19 Start: 14576, Stop: 15382, Start Num: 2

Candidate Starts for P106L\_19:

(Start: 1 @14573 has 1 MA's), (Start: 2 @14576 has 41 MA's), (Start: 3 @14585 has 1 MA's), (6, 14633), (8, 14639), (9, 14645), (10, 14654), (11, 14657), (12, 14660), (14, 14666), (17, 14684), (18, 14699), (21, 14762), (22, 14774), (24, 14801), (26, 14831), (27, 14837), (28, 14846), (29, 14864), (30, 14873), (31, 14882), (41, 14999), (42, 15008), (43, 15026), (44, 15035), (49, 15089), (54, 15137), (58, 15248), (59, 15251), (60, 15257), (64, 15284), (67, 15302), (69, 15326), (70, 15341), (72, 15359),

Gene: P106M\_19 Start: 14576, Stop: 15382, Start Num: 2

Candidate Starts for P106M\_19:

(Start: 1 @14573 has 1 MA's), (Start: 2 @14576 has 41 MA's), (Start: 3 @14585 has 1 MA's), (6, 14633), (8, 14639), (9, 14645), (10, 14654), (11, 14657), (12, 14660), (14, 14666), (17, 14684), (18, 14699), (21, 14762), (22, 14774), (24, 14801), (26, 14831), (27, 14837), (28, 14846), (29, 14864), (30, 14873), (31, 14882), (41, 14999), (42, 15008), (43, 15026), (44, 15035), (49, 15089), (54, 15137), (58, 15248), (59, 15251), (60, 15257), (64, 15284), (67, 15302), (69, 15326), (70, 15341), (72, 15359),

Gene: P107A\_19 Start: 14571, Stop: 15377, Start Num: 3

Candidate Starts for P107A\_19:

(Start: 2 @14562 has 41 MA's), (Start: 3 @14571 has 1 MA's), (6, 14619), (7, 14622), (8, 14625), (9, 14631), (10, 14640), (14, 14652), (17, 14670), (18, 14685), (22, 14760), (23, 14769), (25, 14796), (26, 14817), (27, 14823), (28, 14832), (29, 14850), (30, 14859), (41, 14976), (42, 14985), (54, 15132), (56, 15192), (58, 15243), (59, 15246), (60, 15252), (64, 15279), (67, 15297), (69, 15321), (70, 15336), (72, 15354),

Gene: P107C\_19 Start: 14532, Stop: 15341, Start Num: 1

Candidate Starts for P107C\_19:

(Start: 1 @14532 has 1 MA's), (Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (5, 14589), (6, 14592), (7, 14595), (9, 14604), (12, 14619), (13, 14622), (14, 14625), (17, 14643), (18, 14658), (21, 14721), (23, 14742), (25, 14769), (26, 14790), (27, 14796), (28, 14805), (30, 14832), (37, 14895), (41, 14949), (42, 14958), (43, 14976), (49, 15039), (54, 15096), (58, 15207), (59, 15210), (60, 15216), (64, 15243), (67, 15261), (69, 15285), (70, 15300), (72, 15318),

Gene: P108C\_19 Start: 14559, Stop: 15365, Start Num: 2

Candidate Starts for P108C\_19:

(Start: 2 @14559 has 41 MA's), (Start: 3 @14568 has 1 MA's), (6, 14616), (7, 14619), (8, 14622), (9, 14628), (10, 14637), (12, 14643), (14, 14649), (17, 14667), (22, 14757), (23, 14766), (25, 14793), (26, 14814), (27, 14820), (29, 14847), (34, 14901), (41, 14973), (42, 14982), (48, 15054), (49, 15063), (54, 15120), (58, 15231), (59, 15234), (60, 15240), (64, 15267), (67, 15285), (69, 15309), (70, 15324), (72, 15342),

Gene: P14.4\_19 Start: 14550, Stop: 15338, Start Num: 2

Candidate Starts for P14.4\_19:

(Start: 2 @14550 has 41 MA's), (Start: 3 @14559 has 1 MA's), (8, 14613), (9, 14619), (10, 14628), (11, 14631), (12, 14634), (14, 14640), (17, 14658), (22, 14748), (24, 14775), (26, 14805), (27, 14811), (41, 14964), (42, 14973), (43, 14991), (44, 15000), (49, 15054), (54, 15102), (58, 15204), (59, 15207), (60, 15213), (64, 15240), (67, 15258), (69, 15282), (70, 15297), (72, 15315),

Gene: P9.1\_19 Start: 14545, Stop: 15351, Start Num: 2

Candidate Starts for P9.1\_19:

(Start: 2 @14545 has 41 MA's), (Start: 3 @14554 has 1 MA's), (8, 14608), (9, 14614), (10, 14623), (12, 14629), (13, 14632), (15, 14638), (17, 14653), (18, 14668), (21, 14731), (22, 14743), (24, 14770), (26, 14800), (27, 14806), (29, 14833), (30, 14842), (33, 14860), (34, 14887), (41, 14959), (42, 14968), (43, 14986), (44, 14995), (49, 15049), (54, 15115), (57, 15175), (58, 15217), (59, 15220), (60, 15226), (64, 15253), (67, 15271), (70, 15310), (71, 15325), (73, 15334),

Gene: PA6\_19 Start: 14630, Stop: 15319, Start Num: 6

Candidate Starts for PA6\_19:

(Start: 2 @14573 has 41 MA's), (Start: 3 @14582 has 1 MA's), (6, 14630), (7, 14633), (9, 14642), (10, 14651), (12, 14657), (14, 14663), (17, 14681), (22, 14771), (23, 14780), (25, 14807), (26, 14828), (27, 14834), (29, 14861), (30, 14870), (34, 14915), (39, 14963), (41, 14987), (42, 14996), (43, 15014), (45, 15050), (49, 15059), (54, 15116), (65, 15248), (66, 15254),

Gene: PAD20\_19 Start: 14599, Stop: 15339, Start Num: 6

Candidate Starts for PAD20\_19:

(Start: 2 @14542 has 41 MA's), (Start: 3 @14551 has 1 MA's), (6, 14599), (8, 14605), (9, 14611), (10, 14620), (11, 14623), (12, 14626), (14, 14632), (16, 14641), (17, 14650), (18, 14665), (21, 14728), (22, 14740), (25, 14776), (26, 14797), (27, 14803), (29, 14830), (30, 14839), (41, 14956), (42, 14965), (43, 14983), (44, 14992), (47, 15031), (51, 15052), (53, 15091), (57, 15163), (58, 15205), (60, 15214), (64, 15241), (67, 15259), (69, 15283), (70, 15298), (71, 15313), (73, 15322),

Gene: PAS50\_19 Start: 14607, Stop: 15269, Start Num: 6

Candidate Starts for PAS50\_19:

(Start: 2 @14550 has 41 MA's), (Start: 3 @14559 has 1 MA's), (4, 14589), (6, 14607), (8, 14613), (10, 14628), (12, 14634), (14, 14640), (18, 14673), (21, 14736), (22, 14748), (23, 14757), (25, 14784), (26, 14805), (27, 14811), (29, 14838), (30, 14847), (41, 14937), (42, 14946), (43, 14964), (49, 15027), (62, 15195), (65, 15198), (66, 15204),

Gene: PHL010M04\_19 Start: 14541, Stop: 15347, Start Num: 2

Candidate Starts for PHL010M04\_19:

(Start: 2 @14541 has 41 MA's), (Start: 3 @14550 has 1 MA's), (5, 14595), (6, 14598), (7, 14601), (8, 14604), (10, 14619), (12, 14625), (14, 14631), (17, 14649), (18, 14664), (21, 14727), (22, 14739), (23, 14748), (25, 14775), (27, 14802), (34, 14883), (41, 14955), (42, 14964), (43, 14982), (49, 15045), (54, 15093), (58, 15213), (59, 15216), (60, 15222), (64, 15249), (68, 15279), (70, 15306), (72, 15324), (73, 15330),

Gene: PHL037M02\_19 Start: 14540, Stop: 15331, Start Num: 1

Candidate Starts for PHL037M02\_19:

(Start: 1 @14540 has 1 MA's), (Start: 2 @14543 has 41 MA's), (Start: 3 @14552 has 1 MA's), (7, 14603), (8, 14606), (9, 14612), (10, 14621), (12, 14627), (14, 14633), (17, 14651), (22, 14741), (23, 14750), (24, 14768), (26, 14798), (27, 14804), (28, 14813), (30, 14840), (41, 14957), (42, 14966), (43, 14984), (54, 15086), (58, 15197), (59, 15200), (60, 15206), (64, 15233), (67, 15251), (69, 15275), (70, 15290), (71, 15305), (72, 15308),

Gene: PHL060L00\_19 Start: 14561, Stop: 15151, Start Num: 2

Candidate Starts for PHL060L00\_19:

(Start: 2 @14561 has 41 MA's), (Start: 3 @14570 has 1 MA's), (7, 14621), (8, 14624), (9, 14630), (10, 14639), (11, 14642), (12, 14645), (14, 14651), (22, 14759), (23, 14768), (24, 14786), (26, 14816), (27, 14822), (29, 14849), (54, 14888), (57, 14957), (58, 15017), (60, 15026), (64, 15053), (68, 15083), (69, 15095), (70, 15110), (71, 15125),

Gene: PHL067M10\_19 Start: 14524, Stop: 15339, Start Num: 2

Candidate Starts for PHL067M10\_19:

(Start: 2 @14524 has 41 MA's), (Start: 3 @14533 has 1 MA's), (6, 14581), (7, 14584), (8, 14587), (9, 14593), (10, 14602), (12, 14608), (14, 14614), (17, 14632), (18, 14647), (21, 14710), (22, 14722), (23, 14731), (25, 14758), (26, 14779), (27, 14785), (29, 14812), (30, 14821), (33, 14839), (41, 14938), (42, 14947), (43, 14965), (48, 15019), (49, 15028), (54, 15094), (58, 15205), (59, 15208), (60, 15214), (64, 15241), (67, 15259), (70, 15298), (71, 15313), (73, 15322),

Gene: PHL071N05\_19 Start: 14549, Stop: 15355, Start Num: 2

Candidate Starts for PHL071N05\_19:

(Start: 2 @14549 has 41 MA's), (Start: 3 @14558 has 1 MA's), (6, 14606), (7, 14609), (10, 14627), (12, 14633), (14, 14639), (17, 14657), (22, 14747), (23, 14756), (25, 14783), (26, 14804), (27, 14810), (28, 14819), (29, 14837), (30, 14846), (33, 14864), (41, 14963), (42, 14972), (43, 14990), (54, 15110), (58, 15221), (59, 15224), (60, 15230), (64, 15257), (67, 15275), (69, 15299), (70, 15314), (72, 15332),

Gene: PHL111M01\_19 Start: 14544, Stop: 15341, Start Num: 2

Candidate Starts for PHL111M01\_19:

(Start: 2 @14544 has 41 MA's), (Start: 3 @14553 has 1 MA's), (8, 14607), (10, 14622), (12, 14628), (14, 14634), (18, 14667), (21, 14730), (22, 14742), (23, 14751), (25, 14778), (26, 14799), (27, 14805), (29, 14832), (30, 14841), (41, 14958), (42, 14967), (46, 15030), (55, 15123), (59, 15210), (60, 15216), (64, 15243), (69, 15285), (70, 15300), (72, 15318),

Gene: PHL112N00\_19 Start: 14546, Stop: 15361, Start Num: 2

Candidate Starts for PHL112N00\_19:

(Start: 2 @14546 has 41 MA's), (Start: 3 @14555 has 1 MA's), (14, 14636), (17, 14654), (18, 14669), (21, 14732), (22, 14744), (23, 14753), (25, 14780), (26, 14801), (27, 14807), (29, 14834), (30, 14843), (41, 14960), (42, 14969), (43, 14987), (49, 15050), (54, 15107), (57, 15176), (58, 15227), (59, 15230), (60, 15236), (64, 15263), (68, 15293), (69, 15305), (70, 15320), (71, 15335), (73, 15344),

Gene: PHL113M01\_19 Start: 14579, Stop: 15385, Start Num: 2

Candidate Starts for PHL113M01\_19:

(Start: 2 @14579 has 41 MA's), (Start: 3 @14588 has 1 MA's), (8, 14642), (10, 14657), (12, 14663), (14, 14669), (18, 14702), (21, 14765), (22, 14777), (23, 14786), (25, 14813), (26, 14834), (27, 14840), (29, 14867), (30, 14876), (33, 14894), (41, 14993), (42, 15002), (46, 15056), (52, 15083), (58, 15251), (59, 15254), (60, 15260), (64, 15287), (69, 15329), (70, 15344), (71, 15359),

Gene: PHL114L00\_19 Start: 14540, Stop: 15355, Start Num: 2

Candidate Starts for PHL114L00\_19:

(Start: 1 @14537 has 1 MA's), (Start: 2 @14540 has 41 MA's), (Start: 3 @14549 has 1 MA's), (7, 14600), (8, 14603), (14, 14630), (17, 14648), (18, 14663), (23, 14747), (24, 14765), (26, 14795), (27, 14801), (30, 14837), (34, 14882), (41, 14954), (42, 14963), (43, 14981), (50, 15053), (57, 15170), (58, 15221), (59, 15224), (60, 15230), (64, 15257), (67, 15275), (69, 15299), (70, 15314), (71, 15329), (73, 15338),

Gene: Pirate\_19 Start: 14540, Stop: 15274, Start Num: 2

Candidate Starts for Pirate\_19:

(Start: 2 @14540 has 41 MA's), (Start: 3 @14549 has 1 MA's), (6, 14597), (7, 14600), (9, 14609), (10, 14618), (11, 14621), (12, 14624), (14, 14630), (22, 14738), (23, 14747), (24, 14765), (25, 14774), (26, 14795), (27, 14801), (29, 14828), (30, 14837), (33, 14855), (41, 14954), (42, 14963), (43, 14981), (54, 15020), (57, 15089), (58, 15140), (59, 15143), (60, 15149), (64, 15176), (67, 15194), (69, 15218), (70, 15233), (71, 15248),

Gene: Procrass1\_19 Start: 14547, Stop: 15344, Start Num: 2

Candidate Starts for Procrass1\_19:

(Start: 2 @14547 has 41 MA's), (Start: 3 @14556 has 1 MA's), (6, 14604), (7, 14607), (9, 14616), (10, 14625), (14, 14637), (17, 14655), (21, 14733), (22, 14745), (25, 14781), (26, 14802), (27, 14808), (29, 14835), (30, 14844), (33, 14862), (39, 14937), (41, 14961), (42, 14970), (43, 14988), (49, 15051), (54, 15099), (57, 15168), (58, 15210), (59, 15213), (60, 15219), (64, 15246), (69, 15288), (70, 15303), (72, 15321),

Gene: QueenBey\_19 Start: 14541, Stop: 15347, Start Num: 2

Candidate Starts for QueenBey\_19:

(Start: 1 @14538 has 1 MA's), (Start: 2 @14541 has 41 MA's), (Start: 3 @14550 has 1 MA's), (8, 14604), (9, 14610), (10, 14619), (12, 14625), (15, 14634), (17, 14649), (18, 14664), (22, 14739), (23, 14748), (25, 14775), (26, 14796), (27, 14802), (29, 14829), (30, 14838), (41, 14955), (42, 14964), (43, 14982), (49, 15045), (54, 15102), (58, 15213), (59, 15216), (60, 15222), (64, 15249), (67, 15267), (69, 15291), (70, 15306), (71, 15321), (73, 15330),

Gene: Rileysaurus\_19 Start: 14544, Stop: 15359, Start Num: 2

Candidate Starts for Rileysaurus\_19:

(Start: 2 @14544 has 41 MA's), (Start: 3 @14553 has 1 MA's), (7, 14604), (8, 14607), (9, 14613), (14, 14634), (17, 14652), (22, 14742), (23, 14751), (24, 14769), (26, 14799), (27, 14805), (28, 14814), (29, 14832), (30, 14841), (41, 14958), (42, 14967), (43, 14985), (54, 15114), (58, 15225), (59, 15228), (60, 15234), (64, 15261), (67, 15279), (69, 15303), (70, 15318), (72, 15336),

Gene: SKKY\_19 Start: 14598, Stop: 15227, Start Num: 2

Candidate Starts for SKKY\_19:

(Start: 2 @14598 has 41 MA's), (Start: 3 @14607 has 1 MA's), (5, 14652), (6, 14655), (7, 14658), (8, 14661), (10, 14676), (12, 14682), (14, 14688), (17, 14706), (21, 14784), (22, 14796), (23, 14805), (26, 14853), (27, 14859), (28, 14868), (30, 14895), (41, 15012), (42, 15021), (43, 15039), (54, 15150),

Gene: Solid\_19 Start: 14535, Stop: 15341, Start Num: 2

Candidate Starts for Solid\_19:

(Start: 2 @14535 has 41 MA's), (Start: 3 @14544 has 1 MA's), (6, 14592), (7, 14595), (8, 14598), (9, 14604), (10, 14613), (11, 14616), (12, 14619), (14, 14625), (17, 14643), (21, 14721), (22, 14733), (26, 14790), (27, 14796), (29, 14823), (30, 14832), (41, 14949), (42, 14958), (43, 14976), (44, 14985), (49, 15039), (54, 15096), (58, 15207), (59, 15210), (60, 15216), (64, 15243), (67, 15261), (69, 15285), (70, 15300),

Gene: Stormborn\_19 Start: 14562, Stop: 15086, Start Num: 2

Candidate Starts for Stormborn\_19:

(Start: 1 @14559 has 1 MA's), (Start: 2 @14562 has 41 MA's), (Start: 3 @14571 has 1 MA's), (6, 14619), (7, 14622), (8, 14625), (10, 14640), (12, 14646), (14, 14652), (17, 14670), (18, 14685), (22, 14760), (23, 14769), (24, 14787), (26, 14817), (27, 14823), (28, 14832), (29, 14850), (42, 14985), (43, 15003),

Gene: Supernova\_19 Start: 14570, Stop: 15376, Start Num: 2

Candidate Starts for Supernova\_19:

(Start: 2 @14570 has 41 MA's), (Start: 3 @14579 has 1 MA's), (8, 14633), (10, 14648), (12, 14654), (14, 14660), (18, 14693), (21, 14756), (22, 14768), (23, 14777), (25, 14804), (26, 14825), (27, 14831), (29, 14858), (30, 14867), (41, 14984), (42, 14993), (46, 15047), (52, 15074), (58, 15242), (59, 15245), (60, 15251), (64, 15278), (69, 15320), (70, 15335), (71, 15350),

Gene: Wizzo\_19 Start: 14571, Stop: 15386, Start Num: 2

Candidate Starts for Wizzo\_19:

(Start: 2 @14571 has 41 MA's), (Start: 3 @14580 has 1 MA's), (7, 14631), (8, 14634), (9, 14640), (10, 14649), (11, 14652), (12, 14655), (14, 14661), (17, 14679), (18, 14694), (21, 14757), (22, 14769), (25, 14805), (26, 14826), (27, 14832), (29, 14859), (30, 14868), (41, 14976), (42, 14985), (43, 15003), (49, 15066), (54, 15114), (58, 15252), (59, 15255), (60, 15261), (64, 15288), (68, 15318), (69, 15330), (70, 15345), (72, 15363),