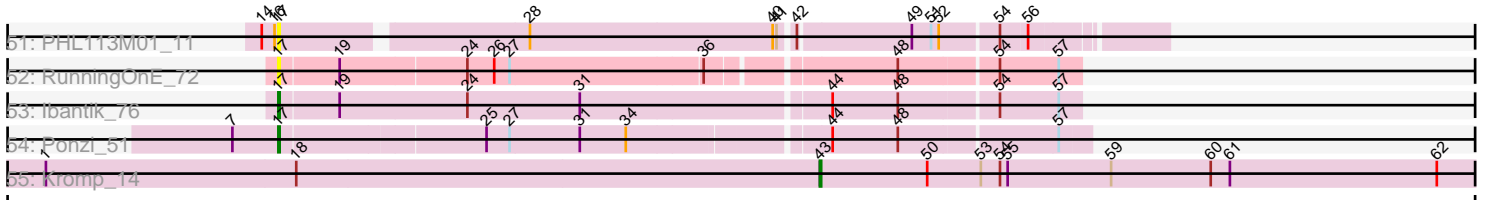


Pham 296569



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 296569 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296569 has 64 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Success\_58
- Track 2 : Bimmel\_56
- Track 3 : Spooks\_57
- Track 4 : Kubed\_11
- Track 5 : Procrass1\_11
- Track 6 : Keiki\_11
- Track 7 : PA6\_11, Wizzo\_11
- Track 8 : P107A\_11
- Track 9 : P106L\_11, P106M\_11, P106C\_11, P106A\_11, P106I\_11
- Track 10 : Lauchelly\_11
- Track 11 : Attacne\_11
- Track 12 : PAS50\_11
- Track 13 : PHL071N05\_11
- Track 14 : PHL114L00\_11
- Track 15 : Enochoraptor\_11, P108C\_11, Pirate\_11
- Track 16 : Moyashi\_11
- Track 17 : Ouroboros\_11
- Track 18 : P100.1\_11
- Track 19 : P101A\_11
- Track 20 : P100D\_11
- Track 21 : P1.1\_11
- Track 22 : Stormborn\_11
- Track 23 : P107C\_11, Solid\_11
- Track 24 : MEAK\_11
- Track 25 : ATCC29399BC\_11
- Track 26 : LilBandit\_11
- Track 27 : ATCC29399BT\_11
- Track 28 : P104A\_11
- Track 29 : PAD20\_11
- Track 30 : Supernova\_11
- Track 31 : PHL067M10\_11
- Track 32 : QueenBey\_11
- Track 33 : P100A\_11
- Track 34 : Rileysaurus\_11
- Track 35 : P9.1\_11
- Track 36 : PHL037M02\_11
- Track 37 : P105\_11

- Track 38 : PHL010M04\_11
- Track 39 : Aquarius\_11
- Track 40 : PHL060L00\_11
- Track 41 : Leviosa\_11
- Track 42 : Enoki\_11
- Track 43 : P104B\_11
- Track 44 : PHL112N00\_11
- Track 45 : BruceLethal\_11
- Track 46 : Cota\_11, MrAK\_11
- Track 47 : P14.4\_11
- Track 48 : SKKY\_11
- Track 49 : DrParker\_11
- Track 50 : PHL111M01\_11
- Track 51 : PHL113M01\_11
- Track 52 : RunningOnE\_72
- Track 53 : Ibantik\_76
- Track 54 : Ponzi\_51
- Track 55 : Kromp\_14

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

The start number called the most often in the published annotations is 17, it was called in 34 of the 51 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aquarius\_11, Attacne\_11, Bimmel\_56, BruceLethal\_11, Cota\_11, DrParker\_11, Enochoraptor\_11, Enoki\_11, Ibantik\_76, Keiki\_11, Kubed\_11, Lauchelly\_11, Leviosa\_11, LilBandit\_11, MEAK\_11, Moyashi\_11, MrAK\_11, Ouroboros\_11, P104B\_11, P107A\_11, P107C\_11, P108C\_11, PA6\_11, PAD20\_11, PAS50\_11, PHL010M04\_11, PHL037M02\_11, PHL060L00\_11, PHL067M10\_11, PHL071N05\_11, PHL111M01\_11, PHL112N00\_11, PHL113M01\_11, PHL114L00\_11, Pirate\_11, Ponzi\_51, Procrass1\_11, QueenBey\_11, Rileysaurus\_11, RunningOnE\_72, SKKY\_11, Solid\_11, Spooks\_57, Stormborn\_11, Success\_58, Supernova\_11, Wizzo\_11,

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

- ATCC29399BC\_11, ATCC29399BT\_11, P1.1\_11, P100.1\_11, P100A\_11, P100D\_11, P101A\_11, P104A\_11, P105\_11, P106A\_11, P106C\_11, P106I\_11, P106L\_11, P106M\_11, P14.4\_11, P9.1\_11,

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

- Kromp\_14,

**Summary by start number:**

Start 4:

- Found in 5 of 64 ( 7.8% ) of genes in pham
- Manual Annotations of this start: 1 of 51
- Called 20.0% of time when present
- Phage (with cluster) where this start called: P14.4\_11 (BU),

Start 13:

- Found in 20 of 64 ( 31.2% ) of genes in pham
- Manual Annotations of this start: 4 of 51
- Called 20.0% of time when present
- Phage (with cluster) where this start called: ATCC29399BT\_11 (BU), P100.1\_11 (BU), P100A\_11 (BU), P105\_11 (BU),

Start 14:

- Found in 36 of 64 ( 56.2% ) of genes in pham
- Manual Annotations of this start: 11 of 51
- Called 30.6% of time when present
- Phage (with cluster) where this start called: ATCC29399BC\_11 (BU), P1.1\_11 (BU), P100D\_11 (BU), P101A\_11 (BU), P104A\_11 (BU), P106A\_11 (BU), P106C\_11 (BU), P106I\_11 (BU), P106L\_11 (BU), P106M\_11 (BU), P9.1\_11 (BU),

Start 17:

- Found in 63 of 64 ( 98.4% ) of genes in pham
- Manual Annotations of this start: 34 of 51
- Called 74.6% of time when present
- Phage (with cluster) where this start called: Aquarius\_11 (BU), Attacne\_11 (BU), Bimmel\_56 (BT), BruceLethal\_11 (BU), Cota\_11 (BU), DrParker\_11 (BU), Enochoraptor\_11 (BU), Enoki\_11 (BU), Ibantik\_76 (singleton), Keiki\_11 (BU), Kubed\_11 (BU), Lauchelly\_11 (BU), Leviosa\_11 (BU), LilBandit\_11 (BU), MEAK\_11 (BU), Moyashi\_11 (BU), MrAK\_11 (BU), Ouroboros\_11 (BU), P104B\_11 (BU), P107A\_11 (BU), P107C\_11 (BU), P108C\_11 (BU), PA6\_11 (BU), PAD20\_11 (BU), PAS50\_11 (BU), PHL010M04\_11 (BU), PHL037M02\_11 (BU), PHL060L00\_11 (BU), PHL067M10\_11 (BU), PHL071N05\_11 (BU), PHL111M01\_11 (BU), PHL112N00\_11 (BU), PHL113M01\_11 (BU), PHL114L00\_11 (BU), Pirate\_11 (BU), Ponzi\_51 (singleton), Procrass1\_11 (BU), QueenBey\_11 (BU), Rileysaurus\_11 (BU), RunningOnE\_72 (UNK), SKKY\_11 (BU), Solid\_11 (BU), Spooks\_57 (BT), Stormborn\_11 (BU), Success\_58 (BT), Supernova\_11 (BU), Wizzo\_11 (BU),

Start 43:

- Found in 1 of 64 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 51
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Kromp\_14 (singleton),

**Summary by clusters:**

There are 4 clusters represented in this pham: BT, BU, singleton, UNK,

Info for manual annotations of cluster BT:

- Start number 17 was manually annotated 3 times for cluster BT.

Info for manual annotations of cluster BU:

- Start number 4 was manually annotated 1 time for cluster BU.
- Start number 13 was manually annotated 4 times for cluster BU.
- Start number 14 was manually annotated 11 times for cluster BU.
- Start number 17 was manually annotated 29 times for cluster BU.

**Gene Information:**

Gene: ATCC29399BC\_11 Start: 7150, Stop: 7785, Start Num: 14

Candidate Starts for ATCC29399BC\_11:

(Start: 14 @7150 has 11 MA's), (16, 7159), (Start: 17 @7162 has 34 MA's), (21, 7255), (28, 7342), (40, 7531), (41, 7534), (42, 7543), (49, 7627), (51, 7642), (52, 7648), (54, 7690), (56, 7708),

Gene: ATCC29399BT\_11 Start: 7147, Stop: 7782, Start Num: 13

Candidate Starts for ATCC29399BT\_11:

(12, 7141), (Start: 13 @7147 has 4 MA's), (16, 7156), (Start: 17 @7159 has 34 MA's), (24, 7291), (28, 7339), (29, 7363), (40, 7528), (41, 7531), (49, 7624), (51, 7639), (52, 7645), (54, 7687), (56, 7705),

Gene: Aquarius\_11 Start: 7160, Stop: 7801, Start Num: 17

Candidate Starts for Aquarius\_11:

(2, 7076), (3, 7106), (8, 7130), (15, 7148), (16, 7157), (Start: 17 @7160 has 34 MA's), (21, 7253), (28, 7340), (30, 7376), (33, 7412), (39, 7526), (40, 7529), (41, 7532), (49, 7625), (51, 7640), (52, 7646), (54, 7688), (56, 7706),

Gene: Attacne\_11 Start: 7163, Stop: 7786, Start Num: 17

Candidate Starts for Attacne\_11:

(Start: 14 @7151 has 11 MA's), (16, 7160), (Start: 17 @7163 has 34 MA's), (21, 7256), (28, 7343), (30, 7379), (40, 7532), (41, 7535), (49, 7628), (51, 7643), (52, 7649), (54, 7691), (56, 7709),

Gene: Bimmel\_56 Start: 31804, Stop: 32394, Start Num: 17

Candidate Starts for Bimmel\_56:

(11, 31786), (Start: 17 @31804 has 34 MA's), (24, 31942), (31, 32029), (32, 32050), (36, 32122), (44, 32209), (46, 32242), (47, 32245), (48, 32260),

Gene: BruceLethal\_11 Start: 7160, Stop: 7792, Start Num: 17

Candidate Starts for BruceLethal\_11:

(Start: 14 @7148 has 11 MA's), (16, 7157), (Start: 17 @7160 has 34 MA's), (21, 7253), (28, 7340), (30, 7376), (40, 7529), (41, 7532), (49, 7625), (51, 7640), (52, 7646), (54, 7688), (56, 7706),

Gene: Cota\_11 Start: 7170, Stop: 7796, Start Num: 17

Candidate Starts for Cota\_11:

(Start: 14 @7158 has 11 MA's), (16, 7167), (Start: 17 @7170 has 34 MA's), (21, 7263), (28, 7350), (30, 7386), (40, 7539), (41, 7542), (45, 7596), (49, 7635), (51, 7650), (52, 7656), (54, 7698), (56, 7716),

Gene: DrParker\_11 Start: 7185, Stop: 7826, Start Num: 17

Candidate Starts for DrParker\_11:

(Start: 14 @7173 has 11 MA's), (16, 7182), (Start: 17 @7185 has 34 MA's), (21, 7278), (28, 7365), (30, 7401), (38, 7542), (41, 7557), (45, 7611), (49, 7650), (51, 7665), (52, 7671), (54, 7713), (56, 7731),

Gene: Enochoraptor\_11 Start: 7174, Stop: 7800, Start Num: 17

Candidate Starts for Enochoraptor\_11:

(Start: 14 @7162 has 11 MA's), (16, 7171), (Start: 17 @7174 has 34 MA's), (21, 7267), (28, 7354), (38, 7531), (41, 7546), (49, 7639), (51, 7654), (52, 7660), (54, 7702), (56, 7720),

Gene: Enoki\_11 Start: 7161, Stop: 7781, Start Num: 17

Candidate Starts for Enoki\_11:

(Start: 14 @7149 has 11 MA's), (16, 7158), (Start: 17 @7161 has 34 MA's), (21, 7254), (28, 7341), (30, 7377), (33, 7413), (38, 7518), (39, 7527), (40, 7530), (41, 7533), (49, 7626), (51, 7641), (52, 7647), (54, 7689), (56, 7707),

Gene: lbantik\_76 Start: 35791, Stop: 36390, Start Num: 17

Candidate Starts for lbantik\_76:

(Start: 17 @35791 has 34 MA's), (19, 35836), (24, 35935), (31, 36022), (44, 36205), (48, 36256), (54, 36328), (57, 36373),

Gene: Keiki\_11 Start: 7170, Stop: 7796, Start Num: 17

Candidate Starts for Keiki\_11:

(Start: 14 @7158 has 11 MA's), (16, 7167), (Start: 17 @7170 has 34 MA's), (21, 7263), (28, 7350), (30, 7386), (40, 7539), (41, 7542), (45, 7596), (49, 7635), (52, 7656), (54, 7698), (56, 7716),

Gene: Kromp\_14 Start: 9809, Stop: 10375, Start Num: 43

Candidate Starts for Kromp\_14:

(1, 9206), (18, 9401), (Start: 43 @9809 has 1 MA's), (50, 9893), (53, 9935), (54, 9950), (55, 9956), (59, 10037), (60, 10115), (61, 10130), (62, 10292),

Gene: Kubed\_11 Start: 7161, Stop: 7790, Start Num: 17

Candidate Starts for Kubed\_11:

(Start: 13 @7149 has 4 MA's), (16, 7158), (Start: 17 @7161 has 34 MA's), (23, 7284), (28, 7341), (40, 7530), (41, 7533), (49, 7626), (51, 7641), (52, 7647), (54, 7689), (56, 7707),

Gene: Lauchelly\_11 Start: 7156, Stop: 7794, Start Num: 17

Candidate Starts for Lauchelly\_11:

(Start: 13 @7144 has 4 MA's), (16, 7153), (Start: 17 @7156 has 34 MA's), (28, 7336), (30, 7372), (40, 7525), (41, 7528), (42, 7537), (51, 7636), (52, 7642), (54, 7684), (56, 7702),

Gene: Leviosa\_11 Start: 7181, Stop: 7813, Start Num: 17

Candidate Starts for Leviosa\_11:

(Start: 14 @7169 has 11 MA's), (16, 7178), (Start: 17 @7181 has 34 MA's), (28, 7361), (40, 7550), (41, 7553), (42, 7562), (49, 7646), (51, 7661), (52, 7667), (54, 7709), (56, 7727),

Gene: LilBandit\_11 Start: 7167, Stop: 7796, Start Num: 17

Candidate Starts for LilBandit\_11:

(Start: 4 @7119 has 1 MA's), (5, 7125), (6, 7128), (9, 7143), (12, 7149), (Start: 13 @7155 has 4 MA's), (16, 7164), (Start: 17 @7167 has 34 MA's), (21, 7260), (28, 7347), (40, 7536), (41, 7539), (42, 7548), (49, 7632), (51, 7647), (52, 7653), (54, 7695), (56, 7713),

Gene: MEAK\_11 Start: 7162, Stop: 7782, Start Num: 17

Candidate Starts for MEAK\_11:

(Start: 14 @7150 has 11 MA's), (16, 7159), (Start: 17 @7162 has 34 MA's), (21, 7255), (28, 7342), (33, 7414), (38, 7519), (41, 7534), (49, 7627), (51, 7642), (52, 7648), (54, 7690), (56, 7708),

Gene: Moyashi\_11 Start: 7180, Stop: 7824, Start Num: 17

Candidate Starts for Moyashi\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: MrAK\_11 Start: 7192, Stop: 7836, Start Num: 17

Candidate Starts for MrAK\_11:

(Start: 14 @7180 has 11 MA's), (16, 7189), (Start: 17 @7192 has 34 MA's), (21, 7285), (28, 7372), (30, 7408), (40, 7561), (41, 7564), (45, 7618), (49, 7657), (51, 7672), (52, 7678), (54, 7720), (56, 7738),

Gene: Ouroboros\_11 Start: 7164, Stop: 7787, Start Num: 17

Candidate Starts for Ouroboros\_11:

(12, 7146), (Start: 13 @7152 has 4 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (23, 7287), (24, 7296), (28, 7344), (40, 7533), (41, 7536), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: P1.1\_11 Start: 7152, Stop: 7793, Start Num: 14

Candidate Starts for P1.1\_11:

(Start: 14 @7152 has 11 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (21, 7257), (28, 7344), (30, 7380), (39, 7530), (40, 7533), (41, 7536), (45, 7590), (49, 7629), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: P100.1\_11 Start: 7148, Stop: 7801, Start Num: 13

Candidate Starts for P100.1\_11:

(12, 7142), (Start: 13 @7148 has 4 MA's), (16, 7157), (Start: 17 @7160 has 34 MA's), (21, 7253), (28, 7340), (30, 7376), (38, 7517), (41, 7532), (45, 7586), (49, 7625), (51, 7640), (52, 7646), (54, 7688), (56, 7706),

Gene: P100A\_11 Start: 7160, Stop: 7795, Start Num: 13

Candidate Starts for P100A\_11:

(12, 7154), (Start: 13 @7160 has 4 MA's), (16, 7169), (Start: 17 @7172 has 34 MA's), (21, 7265), (24, 7304), (28, 7352), (30, 7388), (41, 7544), (42, 7553), (51, 7652), (52, 7658), (54, 7700), (56, 7718),

Gene: P100D\_11 Start: 7145, Stop: 7798, Start Num: 14

Candidate Starts for P100D\_11:

(Start: 14 @7145 has 11 MA's), (16, 7154), (Start: 17 @7157 has 34 MA's), (21, 7250), (28, 7337), (38, 7514), (39, 7523), (40, 7526), (41, 7529), (45, 7583), (49, 7622), (51, 7637), (52, 7643), (54, 7685), (56, 7703),

Gene: P101A\_11 Start: 7152, Stop: 7808, Start Num: 14

Candidate Starts for P101A\_11:

(Start: 14 @7152 has 11 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (21, 7257), (28, 7344), (30, 7380), (38, 7521), (41, 7536), (45, 7590), (49, 7629), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: P104A\_11 Start: 7149, Stop: 7781, Start Num: 14

Candidate Starts for P104A\_11:

(Start: 14 @7149 has 11 MA's), (16, 7158), (Start: 17 @7161 has 34 MA's), (21, 7254), (28, 7341), (38, 7518), (41, 7533), (45, 7587), (49, 7626), (51, 7641), (52, 7647), (54, 7689), (56, 7707),

Gene: P104B\_11 Start: 7169, Stop: 7798, Start Num: 17

Candidate Starts for P104B\_11:

(Start: 4 @7121 has 1 MA's), (5, 7127), (6, 7130), (9, 7145), (12, 7151), (Start: 13 @7157 has 4 MA's), (16, 7166), (Start: 17 @7169 has 34 MA's), (21, 7262), (22, 7283), (28, 7349), (40, 7538), (41, 7541), (45, 7595), (49, 7634), (51, 7649), (52, 7655), (54, 7697), (56, 7715),

Gene: P105\_11 Start: 7140, Stop: 7781, Start Num: 13

Candidate Starts for P105\_11:

(Start: 13 @7140 has 4 MA's), (16, 7149), (Start: 17 @7152 has 34 MA's), (21, 7245), (28, 7332), (30, 7368), (40, 7521), (41, 7524), (49, 7617), (51, 7632), (52, 7638), (54, 7680), (56, 7698),

Gene: P106A\_11 Start: 7168, Stop: 7824, Start Num: 14

Candidate Starts for P106A\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (40, 7549), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: P106C\_11 Start: 7168, Stop: 7824, Start Num: 14

Candidate Starts for P106C\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (40, 7549), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: P106I\_11 Start: 7168, Stop: 7824, Start Num: 14

Candidate Starts for P106I\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (40, 7549), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: P106L\_11 Start: 7168, Stop: 7824, Start Num: 14

Candidate Starts for P106L\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (40, 7549), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: P106M\_11 Start: 7168, Stop: 7824, Start Num: 14

Candidate Starts for P106M\_11:

(Start: 14 @7168 has 11 MA's), (16, 7177), (Start: 17 @7180 has 34 MA's), (21, 7273), (28, 7360), (30, 7396), (38, 7537), (40, 7549), (41, 7552), (45, 7606), (49, 7645), (51, 7660), (52, 7666), (54, 7708), (56, 7726),

Gene: P107A\_11 Start: 7168, Stop: 7800, Start Num: 17

Candidate Starts for P107A\_11:

(Start: 13 @7156 has 4 MA's), (16, 7165), (Start: 17 @7168 has 34 MA's), (28, 7348), (30, 7384), (38, 7525), (39, 7534), (40, 7537), (41, 7540), (42, 7549), (49, 7633), (51, 7648), (52, 7654), (54, 7696), (56, 7714),

Gene: P107C\_11 Start: 7162, Stop: 7785, Start Num: 17

Candidate Starts for P107C\_11:

(Start: 14 @7150 has 11 MA's), (16, 7159), (Start: 17 @7162 has 34 MA's), (21, 7255), (28, 7342), (40, 7531), (41, 7534), (42, 7543), (49, 7627), (51, 7642), (52, 7648), (54, 7690), (56, 7708),

Gene: P108C\_11 Start: 7167, Stop: 7793, Start Num: 17

Candidate Starts for P108C\_11:

(Start: 14 @7155 has 11 MA's), (16, 7164), (Start: 17 @7167 has 34 MA's), (21, 7260), (28, 7347), (38, 7524), (41, 7539), (49, 7632), (51, 7647), (52, 7653), (54, 7695), (56, 7713),

Gene: P14.4\_11 Start: 7116, Stop: 7793, Start Num: 4

Candidate Starts for P14.4\_11:

(Start: 4 @7116 has 1 MA's), (5, 7122), (6, 7125), (9, 7140), (12, 7146), (Start: 13 @7152 has 4 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (21, 7257), (22, 7278), (28, 7344), (30, 7380), (38, 7521), (39, 7530), (40, 7533), (41, 7536), (49, 7629), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: P9.1\_11 Start: 7144, Stop: 7788, Start Num: 14

Candidate Starts for P9.1\_11:

(Start: 14 @7144 has 11 MA's), (16, 7153), (Start: 17 @7156 has 34 MA's), (21, 7249), (28, 7336), (30, 7372), (38, 7513), (41, 7528), (49, 7621), (51, 7636), (52, 7642), (54, 7684), (56, 7702), (58, 7732),

Gene: PA6\_11 Start: 7172, Stop: 7813, Start Num: 17

Candidate Starts for PA6\_11:

(Start: 4 @7124 has 1 MA's), (5, 7130), (6, 7133), (9, 7148), (12, 7154), (Start: 13 @7160 has 4 MA's), (16, 7169), (Start: 17 @7172 has 34 MA's), (21, 7265), (28, 7352), (30, 7388), (40, 7541), (41, 7544), (45, 7598), (49, 7637), (51, 7652), (52, 7658), (54, 7700), (56, 7718),

Gene: PAD20\_11 Start: 7164, Stop: 7793, Start Num: 17

Candidate Starts for PAD20\_11:

(Start: 14 @7152 has 11 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (21, 7257), (28, 7344), (40, 7533), (41, 7536), (42, 7545), (45, 7590), (49, 7629), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: PAS50\_11 Start: 7161, Stop: 7799, Start Num: 17

Candidate Starts for PAS50\_11:

(Start: 14 @7149 has 11 MA's), (16, 7158), (Start: 17 @7161 has 34 MA's), (21, 7254), (23, 7284), (28, 7341), (30, 7377), (38, 7518), (40, 7530), (41, 7533), (45, 7587), (49, 7626), (51, 7641), (52, 7647), (54, 7689), (56, 7707),

Gene: PHL010M04\_11 Start: 7155, Stop: 7787, Start Num: 17

Candidate Starts for PHL010M04\_11:

(Start: 13 @7143 has 4 MA's), (16, 7152), (Start: 17 @7155 has 34 MA's), (28, 7335), (30, 7371), (40, 7524), (41, 7527), (49, 7620), (54, 7683), (56, 7701),

Gene: PHL037M02\_11 Start: 7161, Stop: 7802, Start Num: 17

Candidate Starts for PHL037M02\_11:

(Start: 13 @7149 has 4 MA's), (16, 7158), (Start: 17 @7161 has 34 MA's), (21, 7254), (28, 7341), (30, 7377), (40, 7530), (41, 7533), (45, 7587), (49, 7626), (51, 7641), (52, 7647), (54, 7689), (56, 7707),

Gene: PHL060L00\_11 Start: 7151, Stop: 7804, Start Num: 17

Candidate Starts for PHL060L00\_11:

(Start: 14 @7139 has 11 MA's), (16, 7148), (Start: 17 @7151 has 34 MA's), (21, 7244), (28, 7331), (30, 7367), (40, 7520), (41, 7523), (42, 7532), (49, 7616), (51, 7631), (52, 7637), (54, 7679), (56, 7697),

Gene: PHL067M10\_11 Start: 7157, Stop: 7771, Start Num: 17

Candidate Starts for PHL067M10\_11:

(Start: 14 @7145 has 11 MA's), (16, 7154), (Start: 17 @7157 has 34 MA's), (21, 7250), (24, 7289), (28, 7337), (38, 7514), (39, 7523), (40, 7526), (41, 7529), (49, 7622), (51, 7637), (52, 7643), (54, 7685), (56, 7703),

Gene: PHL071N05\_11 Start: 7159, Stop: 7797, Start Num: 17

Candidate Starts for PHL071N05\_11:

(Start: 14 @7147 has 11 MA's), (16, 7156), (Start: 17 @7159 has 34 MA's), (21, 7252), (28, 7339), (40, 7528), (41, 7531), (49, 7624), (51, 7639), (52, 7645), (54, 7687), (56, 7705),

Gene: PHL111M01\_11 Start: 7168, Stop: 7788, Start Num: 17

Candidate Starts for PHL111M01\_11:

(Start: 14 @7156 has 11 MA's), (16, 7165), (Start: 17 @7168 has 34 MA's), (21, 7261), (28, 7348), (30, 7384), (38, 7525), (40, 7537), (41, 7540), (45, 7594), (49, 7633), (51, 7648), (52, 7654), (54, 7696), (56, 7714),

Gene: PHL112N00\_11 Start: 7164, Stop: 7784, Start Num: 17

Candidate Starts for PHL112N00\_11:

(Start: 14 @7152 has 11 MA's), (16, 7161), (Start: 17 @7164 has 34 MA's), (21, 7257), (22, 7278), (28, 7344), (30, 7380), (40, 7533), (41, 7536), (49, 7629), (51, 7644), (52, 7650), (54, 7692), (56, 7710),

Gene: PHL113M01\_11 Start: 7172, Stop: 7813, Start Num: 17

Candidate Starts for PHL113M01\_11:

(Start: 14 @7160 has 11 MA's), (16, 7169), (Start: 17 @7172 has 34 MA's), (28, 7352), (40, 7541), (41, 7544), (42, 7553), (49, 7637), (51, 7652), (52, 7658), (54, 7700), (56, 7718),

Gene: PHL114L00\_11 Start: 7168, Stop: 7791, Start Num: 17

Candidate Starts for PHL114L00\_11:

(9, 7144), (12, 7150), (Start: 13 @7156 has 4 MA's), (16, 7165), (Start: 17 @7168 has 34 MA's), (28, 7348), (41, 7540), (51, 7648), (52, 7654), (54, 7696), (56, 7714),

Gene: Pirate\_11 Start: 7156, Stop: 7782, Start Num: 17

Candidate Starts for Pirate\_11:

(Start: 14 @7144 has 11 MA's), (16, 7153), (Start: 17 @7156 has 34 MA's), (21, 7249), (28, 7336), (38, 7513), (41, 7528), (49, 7621), (51, 7636), (52, 7642), (54, 7684), (56, 7702),

Gene: Ponzi\_51 Start: 29147, Stop: 29737, Start Num: 17

Candidate Starts for Ponzi\_51:

(7, 29111), (Start: 17 @29147 has 34 MA's), (25, 29300), (27, 29318), (31, 29372), (34, 29408), (44, 29546), (48, 29597), (57, 29714),

Gene: Procrass1\_11 Start: 7169, Stop: 7795, Start Num: 17

Candidate Starts for Procrass1\_11:

(Start: 14 @7157 has 11 MA's), (16, 7166), (Start: 17 @7169 has 34 MA's), (21, 7262), (28, 7349), (38, 7526), (41, 7541), (49, 7634), (51, 7649), (52, 7655), (54, 7697), (56, 7715),

Gene: QueenBey\_11 Start: 7157, Stop: 7789, Start Num: 17

Candidate Starts for QueenBey\_11:

(Start: 13 @7145 has 4 MA's), (16, 7154), (Start: 17 @7157 has 34 MA's), (28, 7337), (30, 7373), (33, 7409), (40, 7526), (41, 7529), (51, 7637), (52, 7643), (54, 7685), (56, 7703),

Gene: Rileysaurus\_11 Start: 7153, Stop: 7785, Start Num: 17

Candidate Starts for Rileysaurus\_11:

(Start: 13 @7141 has 4 MA's), (16, 7150), (Start: 17 @7153 has 34 MA's), (21, 7246), (23, 7276), (28, 7333), (41, 7525), (42, 7534), (49, 7618), (54, 7681), (56, 7699),

Gene: RunningOnE\_72 Start: 34517, Stop: 35101, Start Num: 17

Candidate Starts for RunningOnE\_72:

(Start: 17 @34517 has 34 MA's), (19, 34562), (24, 34658), (26, 34679), (27, 34691), (36, 34835), (48, 34967), (54, 35039), (57, 35084),

Gene: SKKY\_11 Start: 7186, Stop: 7830, Start Num: 17

Candidate Starts for SKKY\_11:

(10, 7165), (Start: 13 @7174 has 4 MA's), (16, 7183), (Start: 17 @7186 has 34 MA's), (21, 7279), (28, 7366), (30, 7402), (38, 7543), (40, 7555), (41, 7558), (45, 7612), (49, 7651), (51, 7666), (52, 7672), (54, 7714), (56, 7732),

Gene: Solid\_11 Start: 7163, Stop: 7783, Start Num: 17

Candidate Starts for Solid\_11:

(Start: 14 @7151 has 11 MA's), (16, 7160), (Start: 17 @7163 has 34 MA's), (21, 7256), (28, 7343), (40, 7532), (41, 7535), (42, 7544), (49, 7628), (51, 7643), (52, 7649), (54, 7691), (56, 7709),

Gene: Spooks\_57 Start: 33105, Stop: 33695, Start Num: 17

Candidate Starts for Spooks\_57:

(11, 33087), (Start: 17 @33105 has 34 MA's), (20, 33183), (28, 33291), (31, 33330), (32, 33351), (35, 33381), (36, 33423), (44, 33510), (46, 33543), (47, 33546), (48, 33561),

Gene: Stormborn\_11 Start: 7159, Stop: 7797, Start Num: 17

Candidate Starts for Stormborn\_11:

(Start: 13 @7147 has 4 MA's), (16, 7156), (Start: 17 @7159 has 34 MA's), (28, 7339), (40, 7528), (41, 7531), (45, 7585), (49, 7624), (51, 7639), (52, 7645), (54, 7687), (56, 7705),

Gene: Success\_58 Start: 32224, Stop: 32814, Start Num: 17

Candidate Starts for Success\_58:

(11, 32206), (Start: 17 @32224 has 34 MA's), (24, 32362), (31, 32449), (32, 32470), (36, 32542), (37, 32563), (44, 32629), (46, 32662), (47, 32665), (48, 32680),

Gene: Supernova\_11 Start: 7163, Stop: 7804, Start Num: 17

Candidate Starts for Supernova\_11:

(Start: 14 @7151 has 11 MA's), (16, 7160), (Start: 17 @7163 has 34 MA's), (21, 7256), (23, 7286), (28, 7343), (30, 7379), (40, 7532), (41, 7535), (45, 7589), (49, 7628), (51, 7643), (52, 7649), (54, 7691), (56, 7709),

Gene: Wizzo\_11 Start: 7174, Stop: 7815, Start Num: 17

Candidate Starts for Wizzo\_11:

(Start: 4 @7126 has 1 MA's), (5, 7132), (6, 7135), (9, 7150), (12, 7156), (Start: 13 @7162 has 4 MA's), (16, 7171), (Start: 17 @7174 has 34 MA's), (21, 7267), (28, 7354), (30, 7390), (40, 7543), (41, 7546), (45, 7600), (49, 7639), (51, 7654), (52, 7660), (54, 7702), (56, 7720),