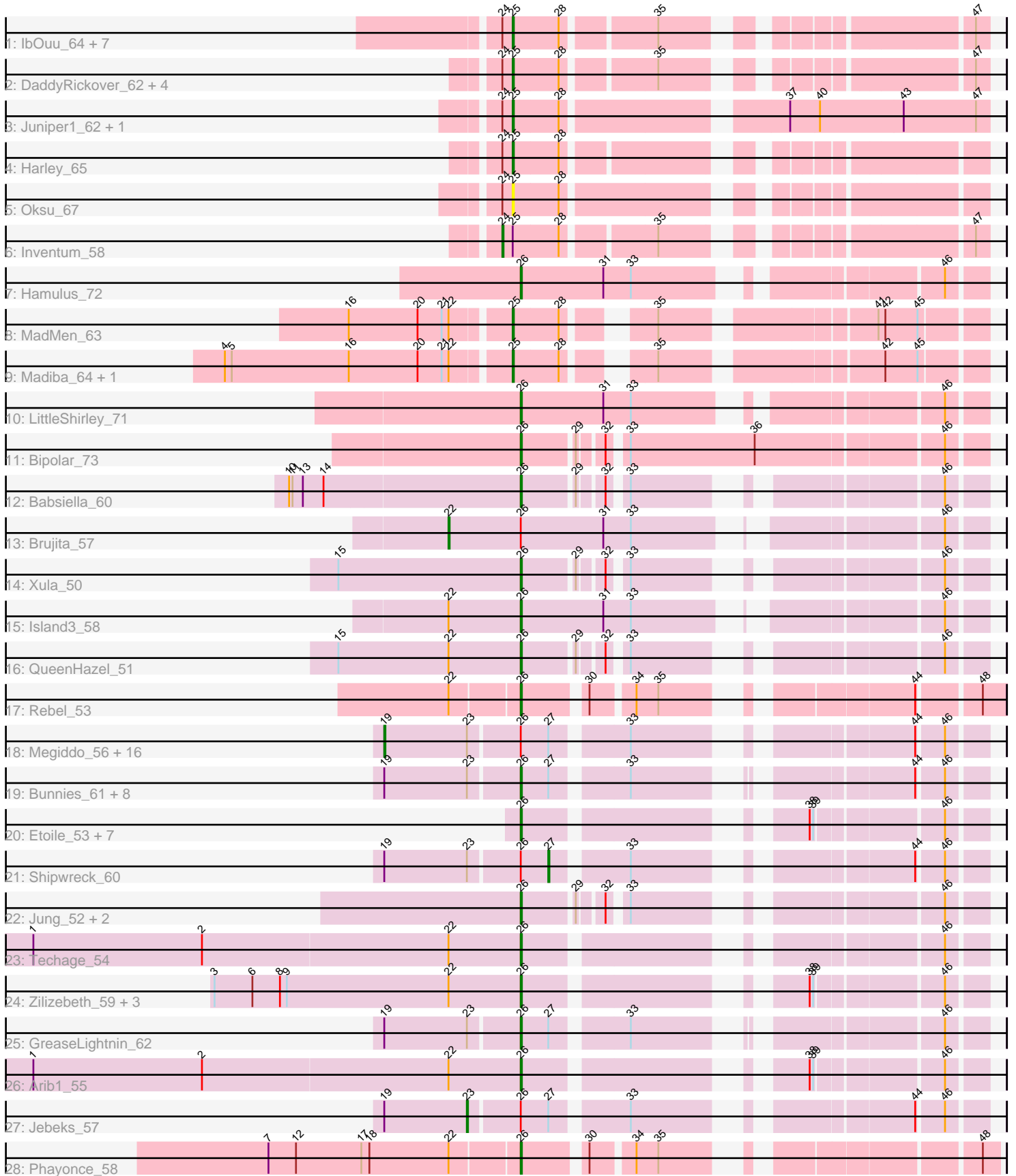


# Pham 224529



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 224529 Report

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

Pham number 224529 has 77 members, 9 are drafts.

Phages represented in each track:

- Track 1 : IbOuu\_64, Cerasum\_59, Coco12\_62, BigPhil\_59, Velveteen\_58, Brookers\_60, Kingsley\_60, Sarma624\_61
- Track 2 : DaddyRickover\_62, Dorothy\_61, Sassafras\_61, RedBird\_61, Aubs\_63
- Track 3 : Juniper1\_62, Estave1\_66
- Track 4 : Harley\_65
- Track 5 : Oksu\_67
- Track 6 : Inventum\_58
- Track 7 : Hamulus\_72
- Track 8 : MadMen\_63
- Track 9 : Madiba\_64, Mova\_67
- Track 10 : LittleShirley\_71
- Track 11 : Bipolar\_73
- Track 12 : Babsiella\_60
- Track 13 : Brujita\_57
- Track 14 : Xula\_50
- Track 15 : Island3\_58
- Track 16 : QueenHazel\_51
- Track 17 : Rebel\_53
- Track 18 : Megiddo\_56, Brusacoram\_58, Necropolis\_55, Dynamo\_56, Sonah\_57, KilKor\_56, Glaske\_55, Bobi\_76, Atcoo\_58, Gavriela\_56, Phalm\_56, StressBall\_56, Malithi\_57, Bogie\_60, HUHilltop\_59, StevieRay\_61, Willsammy\_56
- Track 19 : Bunnies\_61, Thespiis\_58, CactusJack\_56, Bhagsy\_62, Phineas\_58, Vidya\_55, Camster\_58, Ksqared\_59, Pygmy\_61
- Track 20 : Etoile\_53, Fishburne\_53, Langerak\_54, Polkaroo\_56, Kari\_53, Bartholomew\_53, FirstPlacePfu\_55, Venti\_54
- Track 21 : Shipwreck\_60
- Track 22 : Jung\_52, Xeno\_56, HC\_52
- Track 23 : Techage\_54
- Track 24 : Zilizebeth\_59, Majeke\_59, Mangethe\_59, Phegasus\_59
- Track 25 : GreaseLightnin\_62
- Track 26 : Arib1\_55
- Track 27 : Jebeks\_57
- Track 28 : Phayonce\_58

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

The start number called the most often in the published annotations is 26, it was called in 31 of the 68 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arib1\_55, Babsiella\_60, Bartholomew\_53, Bhagsy\_62, Bipolar\_73, Bunnies\_61, CactusJack\_56, Camster\_58, Etoile\_53, FirstPlacePfu\_55, Fishburne\_53, GreaseLightnin\_62, HC\_52, Hamulus\_72, Island3\_58, Jung\_52, Kari\_53, Ksquared\_59, Langerak\_54, LittleShirley\_71, Majeke\_59, Mangethe\_59, Phayonce\_58, Phegasus\_59, Phineas\_58, Polkaroo\_56, Pygmy\_61, QueenHazel\_51, Rebel\_53, Techage\_54, Thespis\_58, Venti\_54, Vidya\_55, Xeno\_56, Xula\_50, Zilizebeth\_59,

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

- Atcoo\_58, Bobi\_76, Bogie\_60, Brujita\_57, Brusacoram\_58, Dynamo\_56, Gavriela\_56, Glaske\_55, HUHilltop\_59, Jebeks\_57, KilKor\_56, Malithi\_57, Megiddo\_56, Necropolis\_55, Phalm\_56, Shipwreck\_60, Sonah\_57, StevieRay\_61, StressBall\_56, Willsammy\_56,

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

- Aubs\_63, BigPhil\_59, Brookers\_60, Cerasum\_59, Coco12\_62, DaddyRickover\_62, Dorothy\_61, Estave1\_66, Harley\_65, IbOuu\_64, Inventum\_58, Juniper1\_62, Kingsley\_60, MadMen\_63, Madiba\_64, Mova\_67, Oksu\_67, RedBird\_61, Sarma624\_61, Sassafras\_61, Velveteen\_58,

### Summary by start number:

Start 19:

- Found in 29 of 77 ( 37.7% ) of genes in pham
- Manual Annotations of this start: 17 of 68
- Called 58.6% of time when present
- Phage (with cluster) where this start called: Atcoo\_58 (P1), Bobi\_76 (F1), Bogie\_60 (P1), Brusacoram\_58 (P1), Dynamo\_56 (P1), Gavriela\_56 (P1), Glaske\_55 (P1), HUHilltop\_59 (P1), KilKor\_56 (P1), Malithi\_57 (P1), Megiddo\_56 (P1), Necropolis\_55 (P1), Phalm\_56 (P1), Sonah\_57 (P1), StevieRay\_61 (P1), StressBall\_56 (P1), Willsammy\_56 (P1),

Start 22:

- Found in 14 of 77 ( 18.2% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 7.1% of time when present
- Phage (with cluster) where this start called: Brujita\_57 (I1),

Start 23:

- Found in 29 of 77 ( 37.7% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 3.4% of time when present
- Phage (with cluster) where this start called: Jebeks\_57 (P1),

Start 24:

- Found in 18 of 77 ( 23.4% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 5.6% of time when present

- Phage (with cluster) where this start called: Inventum\_58 (F1),

#### Start 25:

- Found in 21 of 77 ( 27.3% ) of genes in pham
- Manual Annotations of this start: 16 of 68
- Called 95.2% of time when present
- Phage (with cluster) where this start called: Aubs\_63 (F1), BigPhil\_59 (F1), Brookers\_60 (F1), Cerasum\_59 (F1), Coco12\_62 (F1), DaddyRickover\_62 (F1), Dorothy\_61 (F1), Estave1\_66 (F1), Harley\_65 (F1), IbOuu\_64 (F1), Juniper1\_62 (F1), Kingsley\_60 (F1), MadMen\_63 (F1), Madiba\_64 (F1), Mova\_67 (F1), Oksu\_67 (F1), RedBird\_61 (F1), Sarma624\_61 (F1), Sassafras\_61 (F1), Velveteen\_58 (F1),

#### Start 26:

- Found in 56 of 77 ( 72.7% ) of genes in pham
- Manual Annotations of this start: 31 of 68
- Called 64.3% of time when present
- Phage (with cluster) where this start called: Arib1\_55 (P1), Babsiella\_60 (I1), Bartholomew\_53 (P1), Bhagsy\_62 (P1), Bipolar\_73 (F1), Bunnies\_61 (P1), CactusJack\_56 (P1), Camster\_58 (P1), Etoile\_53 (P1), FirstPlacePfu\_55 (P1), Fishburne\_53 (P1), GreaseLightnin\_62 (P1), HC\_52 (I1), Hamulus\_72 (F1), Island3\_58 (I1), Jung\_52 (P1), Kari\_53 (P1), Ksquared\_59 (P1), Langerak\_54 (P1), LittleShirley\_71 (F1), Majeke\_59 (P1), Mangethe\_59 (P1), Phayonce\_58 (P5), Phegasus\_59 (P1), Phineas\_58 (P1), Polkaroo\_56 (P1), Pygmy\_61 (P1), QueenHazel\_51 (I1), Rebel\_53 (N), Techage\_54 (P1), Thespis\_58 (P1), Venti\_54 (P1), Vidya\_55 (P1), Xeno\_56 (N), Xula\_50 (I1), Zilizebeth\_59 (P1),

#### Start 27:

- Found in 29 of 77 ( 37.7% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 3.4% of time when present
- Phage (with cluster) where this start called: Shipwreck\_60 (P1),

### Summary by clusters:

There are 5 clusters represented in this pham: I1, F1, P1, P5, N,

#### Info for manual annotations of cluster F1:

- Start number 19 was manually annotated 1 time for cluster F1.
- Start number 24 was manually annotated 1 time for cluster F1.
- Start number 25 was manually annotated 16 times for cluster F1.
- Start number 26 was manually annotated 3 times for cluster F1.

#### Info for manual annotations of cluster I1:

- Start number 22 was manually annotated 1 time for cluster I1.
- Start number 26 was manually annotated 5 times for cluster I1.

#### Info for manual annotations of cluster N:

- Start number 26 was manually annotated 2 times for cluster N.

#### Info for manual annotations of cluster P1:

- Start number 19 was manually annotated 16 times for cluster P1.
- Start number 23 was manually annotated 1 time for cluster P1.
- Start number 26 was manually annotated 20 times for cluster P1.

- Start number 27 was manually annotated 1 time for cluster P1.

Info for manual annotations of cluster P5:

- Start number 26 was manually annotated 1 time for cluster P5.

### **Gene Information:**

Gene: Arib1\_55 Start: 36318, Stop: 36641, Start Num: 26

Candidate Starts for Arib1\_55:

(1, 35895), (2, 36042), (Start: 22 @36255 has 1 MA's), (Start: 26 @36318 has 31 MA's), (38, 36507), (39, 36510), (46, 36609),

Gene: Atcoo\_58 Start: 40217, Stop: 40654, Start Num: 19

Candidate Starts for Atcoo\_58:

(Start: 19 @40217 has 17 MA's), (Start: 23 @40289 has 1 MA's), (Start: 26 @40331 has 31 MA's), (Start: 27 @40355 has 1 MA's), (33, 40412), (44, 40601), (46, 40622),

Gene: Aubs\_63 Start: 41384, Stop: 41719, Start Num: 25

Candidate Starts for Aubs\_63:

(Start: 24 @41375 has 1 MA's), (Start: 25 @41384 has 16 MA's), (28, 41423), (35, 41495), (47, 41708),

Gene: Babsiella\_60 Start: 39552, Stop: 39869, Start Num: 26

Candidate Starts for Babsiella\_60:

(10, 39354), (11, 39357), (13, 39366), (14, 39384), (Start: 26 @39552 has 31 MA's), (29, 39594), (32, 39612), (33, 39624), (46, 39837),

Gene: Bartholomew\_53 Start: 36260, Stop: 36583, Start Num: 26

Candidate Starts for Bartholomew\_53:

(Start: 26 @36260 has 31 MA's), (38, 36449), (39, 36452), (46, 36551),

Gene: Bhagsy\_62 Start: 40139, Stop: 40462, Start Num: 26

Candidate Starts for Bhagsy\_62:

(Start: 19 @40025 has 17 MA's), (Start: 23 @40097 has 1 MA's), (Start: 26 @40139 has 31 MA's), (Start: 27 @40163 has 1 MA's), (33, 40220), (44, 40409), (46, 40430),

Gene: BigPhil\_59 Start: 37375, Stop: 37716, Start Num: 25

Candidate Starts for BigPhil\_59:

(Start: 24 @37366 has 1 MA's), (Start: 25 @37375 has 16 MA's), (28, 37414), (35, 37492), (47, 37705),

Gene: Bipolar\_73 Start: 45463, Stop: 45828, Start Num: 26

Candidate Starts for Bipolar\_73:

(Start: 26 @45463 has 31 MA's), (29, 45505), (32, 45523), (33, 45535), (36, 45643), (46, 45796),

Gene: Bobi\_76 Start: 47153, Stop: 47593, Start Num: 19

Candidate Starts for Bobi\_76:

(Start: 19 @47153 has 17 MA's), (Start: 23 @47225 has 1 MA's), (Start: 26 @47267 has 31 MA's), (Start: 27 @47291 has 1 MA's), (33, 47348), (44, 47540), (46, 47561),

Gene: Bogie\_60 Start: 39977, Stop: 40417, Start Num: 19

Candidate Starts for Bogie\_60:

(Start: 19 @39977 has 17 MA's), (Start: 23 @40049 has 1 MA's), (Start: 26 @40091 has 31 MA's),  
(Start: 27 @40115 has 1 MA's), (33, 40172), (44, 40364), (46, 40385),

Gene: Brookers\_60 Start: 40326, Stop: 40667, Start Num: 25

Candidate Starts for Brookers\_60:

(Start: 24 @40317 has 1 MA's), (Start: 25 @40326 has 16 MA's), (28, 40365), (35, 40443), (47, 40656),

Gene: Brujita\_57 Start: 38345, Stop: 38749, Start Num: 22

Candidate Starts for Brujita\_57:

(Start: 22 @38345 has 1 MA's), (Start: 26 @38408 has 31 MA's), (31, 38480), (33, 38504), (46, 38717),

Gene: Brusacoram\_58 Start: 38760, Stop: 39197, Start Num: 19

Candidate Starts for Brusacoram\_58:

(Start: 19 @38760 has 17 MA's), (Start: 23 @38832 has 1 MA's), (Start: 26 @38874 has 31 MA's),  
(Start: 27 @38898 has 1 MA's), (33, 38955), (44, 39144), (46, 39165),

Gene: Bunnies\_61 Start: 40221, Stop: 40544, Start Num: 26

Candidate Starts for Bunnies\_61:

(Start: 19 @40107 has 17 MA's), (Start: 23 @40179 has 1 MA's), (Start: 26 @40221 has 31 MA's),  
(Start: 27 @40245 has 1 MA's), (33, 40302), (44, 40491), (46, 40512),

Gene: CactusJack\_56 Start: 39089, Stop: 39412, Start Num: 26

Candidate Starts for CactusJack\_56:

(Start: 19 @38975 has 17 MA's), (Start: 23 @39047 has 1 MA's), (Start: 26 @39089 has 31 MA's),  
(Start: 27 @39113 has 1 MA's), (33, 39170), (44, 39359), (46, 39380),

Gene: Camster\_58 Start: 38552, Stop: 38878, Start Num: 26

Candidate Starts for Camster\_58:

(Start: 19 @38438 has 17 MA's), (Start: 23 @38510 has 1 MA's), (Start: 26 @38552 has 31 MA's),  
(Start: 27 @38576 has 1 MA's), (33, 38633), (44, 38825), (46, 38846),

Gene: Cerasum\_59 Start: 37393, Stop: 37734, Start Num: 25

Candidate Starts for Cerasum\_59:

(Start: 24 @37384 has 1 MA's), (Start: 25 @37393 has 16 MA's), (28, 37432), (35, 37510), (47, 37723),

Gene: Coco12\_62 Start: 41450, Stop: 41791, Start Num: 25

Candidate Starts for Coco12\_62:

(Start: 24 @41441 has 1 MA's), (Start: 25 @41450 has 16 MA's), (28, 41489), (35, 41567), (47, 41780),

Gene: DaddyRickover\_62 Start: 41176, Stop: 41511, Start Num: 25

Candidate Starts for DaddyRickover\_62:

(Start: 24 @41167 has 1 MA's), (Start: 25 @41176 has 16 MA's), (28, 41215), (35, 41287), (47, 41500),

Gene: Dorothy\_61 Start: 40350, Stop: 40685, Start Num: 25

Candidate Starts for Dorothy\_61:

(Start: 24 @40341 has 1 MA's), (Start: 25 @40350 has 16 MA's), (28, 40389), (35, 40461), (47, 40674),

Gene: Dynamo\_56 Start: 38011, Stop: 38451, Start Num: 19

Candidate Starts for Dynamo\_56:

(Start: 19 @38011 has 17 MA's), (Start: 23 @38083 has 1 MA's), (Start: 26 @38125 has 31 MA's),  
(Start: 27 @38149 has 1 MA's), (33, 38206), (44, 38398), (46, 38419),

Gene: Estave1\_66 Start: 42262, Stop: 42642, Start Num: 25

Candidate Starts for Estave1\_66:

(Start: 24 @42253 has 1 MA's), (Start: 25 @42262 has 16 MA's), (28, 42301), (37, 42472), (40, 42496), (43, 42568), (47, 42631),

Gene: Etoile\_53 Start: 36260, Stop: 36583, Start Num: 26

Candidate Starts for Etoile\_53:

(Start: 26 @36260 has 31 MA's), (38, 36449), (39, 36452), (46, 36551),

Gene: FirstPlacePfu\_55 Start: 36292, Stop: 36615, Start Num: 26

Candidate Starts for FirstPlacePfu\_55:

(Start: 26 @36292 has 31 MA's), (38, 36481), (39, 36484), (46, 36583),

Gene: Fishburne\_53 Start: 36260, Stop: 36583, Start Num: 26

Candidate Starts for Fishburne\_53:

(Start: 26 @36260 has 31 MA's), (38, 36449), (39, 36452), (46, 36551),

Gene: Gavriela\_56 Start: 38975, Stop: 39412, Start Num: 19

Candidate Starts for Gavriela\_56:

(Start: 19 @38975 has 17 MA's), (Start: 23 @39047 has 1 MA's), (Start: 26 @39089 has 31 MA's), (Start: 27 @39113 has 1 MA's), (33, 39170), (44, 39359), (46, 39380),

Gene: Glaske\_55 Start: 38975, Stop: 39412, Start Num: 19

Candidate Starts for Glaske\_55:

(Start: 19 @38975 has 17 MA's), (Start: 23 @39047 has 1 MA's), (Start: 26 @39089 has 31 MA's), (Start: 27 @39113 has 1 MA's), (33, 39170), (44, 39359), (46, 39380),

Gene: GreaseLightnin\_62 Start: 40455, Stop: 40778, Start Num: 26

Candidate Starts for GreaseLightnin\_62:

(Start: 19 @40341 has 17 MA's), (Start: 23 @40413 has 1 MA's), (Start: 26 @40455 has 31 MA's), (Start: 27 @40479 has 1 MA's), (33, 40536), (46, 40746),

Gene: HC\_52 Start: 35682, Stop: 35999, Start Num: 26

Candidate Starts for HC\_52:

(Start: 26 @35682 has 31 MA's), (29, 35724), (32, 35742), (33, 35754), (46, 35967),

Gene: HUHilltop\_59 Start: 38234, Stop: 38674, Start Num: 19

Candidate Starts for HUHilltop\_59:

(Start: 19 @38234 has 17 MA's), (Start: 23 @38306 has 1 MA's), (Start: 26 @38348 has 31 MA's), (Start: 27 @38372 has 1 MA's), (33, 38429), (44, 38621), (46, 38642),

Gene: Hamulus\_72 Start: 45640, Stop: 45987, Start Num: 26

Candidate Starts for Hamulus\_72:

(Start: 26 @45640 has 31 MA's), (31, 45712), (33, 45736), (46, 45955),

Gene: Harley\_65 Start: 42034, Stop: 42369, Start Num: 25

Candidate Starts for Harley\_65:

(Start: 24 @42025 has 1 MA's), (Start: 25 @42034 has 16 MA's), (28, 42073),

Gene: lbOuu\_64 Start: 41437, Stop: 41772, Start Num: 25

Candidate Starts for lbOuu\_64:

(Start: 24 @41428 has 1 MA's), (Start: 25 @41437 has 16 MA's), (28, 41476), (35, 41548), (47, 41761),

Gene: Inventum\_58 Start: 40539, Stop: 40883, Start Num: 24

Candidate Starts for Inventum\_58:

(Start: 24 @40539 has 1 MA's), (Start: 25 @40548 has 16 MA's), (28, 40587), (35, 40659), (47, 40872),

Gene: Island3\_58 Start: 38408, Stop: 38749, Start Num: 26

Candidate Starts for Island3\_58:

(Start: 22 @38345 has 1 MA's), (Start: 26 @38408 has 31 MA's), (31, 38480), (33, 38504), (46, 38717),

Gene: Jebeks\_57 Start: 37603, Stop: 37971, Start Num: 23

Candidate Starts for Jebeks\_57:

(Start: 19 @37531 has 17 MA's), (Start: 23 @37603 has 1 MA's), (Start: 26 @37645 has 31 MA's),  
(Start: 27 @37669 has 1 MA's), (33, 37726), (44, 37918), (46, 37939),

Gene: Jung\_52 Start: 35997, Stop: 36314, Start Num: 26

Candidate Starts for Jung\_52:

(Start: 26 @35997 has 31 MA's), (29, 36039), (32, 36057), (33, 36069), (46, 36282),

Gene: Juniper1\_62 Start: 41298, Stop: 41678, Start Num: 25

Candidate Starts for Juniper1\_62:

(Start: 24 @41289 has 1 MA's), (Start: 25 @41298 has 16 MA's), (28, 41337), (37, 41508), (40, 41532),  
(43, 41604), (47, 41667),

Gene: Kari\_53 Start: 36257, Stop: 36580, Start Num: 26

Candidate Starts for Kari\_53:

(Start: 26 @36257 has 31 MA's), (38, 36446), (39, 36449), (46, 36548),

Gene: KilKor\_56 Start: 39668, Stop: 40105, Start Num: 19

Candidate Starts for KilKor\_56:

(Start: 19 @39668 has 17 MA's), (Start: 23 @39740 has 1 MA's), (Start: 26 @39782 has 31 MA's),  
(Start: 27 @39806 has 1 MA's), (33, 39863), (44, 40052), (46, 40073),

Gene: Kingsley\_60 Start: 40183, Stop: 40524, Start Num: 25

Candidate Starts for Kingsley\_60:

(Start: 24 @40174 has 1 MA's), (Start: 25 @40183 has 16 MA's), (28, 40222), (35, 40300), (47, 40513),

Gene: Ksquared\_59 Start: 40221, Stop: 40544, Start Num: 26

Candidate Starts for Ksquared\_59:

(Start: 19 @40107 has 17 MA's), (Start: 23 @40179 has 1 MA's), (Start: 26 @40221 has 31 MA's),  
(Start: 27 @40245 has 1 MA's), (33, 40302), (44, 40491), (46, 40512),

Gene: Langerak\_54 Start: 36276, Stop: 36599, Start Num: 26

Candidate Starts for Langerak\_54:

(Start: 26 @36276 has 31 MA's), (38, 36465), (39, 36468), (46, 36567),

Gene: LittleShirley\_71 Start: 44686, Stop: 45033, Start Num: 26

Candidate Starts for LittleShirley\_71:

(Start: 26 @44686 has 31 MA's), (31, 44758), (33, 44782), (46, 45001),

Gene: MadMen\_63 Start: 41307, Stop: 41648, Start Num: 25

Candidate Starts for MadMen\_63:

(16, 41175), (20, 41235), (21, 41256), (Start: 22 @41262 has 1 MA's), (Start: 25 @41307 has 16 MA's),  
(28, 41346), (35, 41400), (41, 41562), (42, 41568), (45, 41595),

Gene: Madiba\_64 Start: 40812, Stop: 41153, Start Num: 25



Candidate Starts for Madiba\_64:

(4, 40572), (5, 40578), (16, 40680), (20, 40740), (21, 40761), (Start: 22 @40767 has 1 MA's), (Start: 25 @40812 has 16 MA's), (28, 40851), (35, 40905), (42, 41073), (45, 41100),

Gene: Majeke\_59 Start: 37835, Stop: 38158, Start Num: 26

Candidate Starts for Majeke\_59:

(3, 37568), (6, 37601), (8, 37625), (9, 37631), (Start: 22 @37772 has 1 MA's), (Start: 26 @37835 has 31 MA's), (38, 38024), (39, 38027), (46, 38126),

Gene: Malithi\_57 Start: 38149, Stop: 38589, Start Num: 19

Candidate Starts for Malithi\_57:

(Start: 19 @38149 has 17 MA's), (Start: 23 @38221 has 1 MA's), (Start: 26 @38263 has 31 MA's), (Start: 27 @38287 has 1 MA's), (33, 38344), (44, 38536), (46, 38557),

Gene: Mangethe\_59 Start: 37835, Stop: 38158, Start Num: 26

Candidate Starts for Mangethe\_59:

(3, 37568), (6, 37601), (8, 37625), (9, 37631), (Start: 22 @37772 has 1 MA's), (Start: 26 @37835 has 31 MA's), (38, 38024), (39, 38027), (46, 38126),

Gene: Megiddo\_56 Start: 38999, Stop: 39439, Start Num: 19

Candidate Starts for Megiddo\_56:

(Start: 19 @38999 has 17 MA's), (Start: 23 @39071 has 1 MA's), (Start: 26 @39113 has 31 MA's), (Start: 27 @39137 has 1 MA's), (33, 39194), (44, 39386), (46, 39407),

Gene: Mova\_67 Start: 41316, Stop: 41657, Start Num: 25

Candidate Starts for Mova\_67:

(4, 41076), (5, 41082), (16, 41184), (20, 41244), (21, 41265), (Start: 22 @41271 has 1 MA's), (Start: 25 @41316 has 16 MA's), (28, 41355), (35, 41409), (42, 41577), (45, 41604),

Gene: Necropolis\_55 Start: 37600, Stop: 38040, Start Num: 19

Candidate Starts for Necropolis\_55:

(Start: 19 @37600 has 17 MA's), (Start: 23 @37672 has 1 MA's), (Start: 26 @37714 has 31 MA's), (Start: 27 @37738 has 1 MA's), (33, 37795), (44, 37987), (46, 38008),

Gene: Oksu\_67 Start: 43933, Stop: 44274, Start Num: 25

Candidate Starts for Oksu\_67:

(Start: 24 @43924 has 1 MA's), (Start: 25 @43933 has 16 MA's), (28, 43972),

Gene: Phalm\_56 Start: 38975, Stop: 39412, Start Num: 19

Candidate Starts for Phalm\_56:

(Start: 19 @38975 has 17 MA's), (Start: 23 @39047 has 1 MA's), (Start: 26 @39089 has 31 MA's), (Start: 27 @39113 has 1 MA's), (33, 39170), (44, 39359), (46, 39380),

Gene: Phayonce\_58 Start: 40466, Stop: 40795, Start Num: 26

Candidate Starts for Phayonce\_58:

(7, 40253), (12, 40277), (17, 40334), (18, 40340), (Start: 22 @40409 has 1 MA's), (Start: 26 @40466 has 31 MA's), (30, 40514), (34, 40547), (35, 40565), (48, 40781),

Gene: Phegasus\_59 Start: 37802, Stop: 38125, Start Num: 26

Candidate Starts for Phegasus\_59:

(3, 37535), (6, 37568), (8, 37592), (9, 37598), (Start: 22 @37739 has 1 MA's), (Start: 26 @37802 has 31 MA's), (38, 37991), (39, 37994), (46, 38093),

Gene: Phineas\_58 Start: 38683, Stop: 39009, Start Num: 26

Candidate Starts for Phineas\_58:

(Start: 19 @38569 has 17 MA's), (Start: 23 @38641 has 1 MA's), (Start: 26 @38683 has 31 MA's),  
(Start: 27 @38707 has 1 MA's), (33, 38764), (44, 38956), (46, 38977),

Gene: Polkaroo\_56 Start: 37599, Stop: 37922, Start Num: 26

Candidate Starts for Polkaroo\_56:

(Start: 26 @37599 has 31 MA's), (38, 37788), (39, 37791), (46, 37890),

Gene: Pygmy\_61 Start: 40147, Stop: 40473, Start Num: 26

Candidate Starts for Pygmy\_61:

(Start: 19 @40033 has 17 MA's), (Start: 23 @40105 has 1 MA's), (Start: 26 @40147 has 31 MA's),  
(Start: 27 @40171 has 1 MA's), (33, 40228), (44, 40420), (46, 40441),

Gene: QueenHazel\_51 Start: 36206, Stop: 36523, Start Num: 26

Candidate Starts for QueenHazel\_51:

(15, 36047), (Start: 22 @36143 has 1 MA's), (Start: 26 @36206 has 31 MA's), (29, 36248), (32, 36266),  
(33, 36278), (46, 36491),

Gene: Rebel\_53 Start: 34876, Stop: 35211, Start Num: 26

Candidate Starts for Rebel\_53:

(Start: 22 @34819 has 1 MA's), (Start: 26 @34876 has 31 MA's), (30, 34924), (34, 34957), (35, 34975),  
(44, 35143), (48, 35191),

Gene: RedBird\_61 Start: 40229, Stop: 40564, Start Num: 25

Candidate Starts for RedBird\_61:

(Start: 24 @40220 has 1 MA's), (Start: 25 @40229 has 16 MA's), (28, 40268), (35, 40340), (47, 40553),

Gene: Sarma624\_61 Start: 37375, Stop: 37716, Start Num: 25

Candidate Starts for Sarma624\_61:

(Start: 24 @37366 has 1 MA's), (Start: 25 @37375 has 16 MA's), (28, 37414), (35, 37492), (47, 37705),

Gene: Sassafras\_61 Start: 40547, Stop: 40882, Start Num: 25

Candidate Starts for Sassafras\_61:

(Start: 24 @40538 has 1 MA's), (Start: 25 @40547 has 16 MA's), (28, 40586), (35, 40658), (47, 40871),

Gene: Shipwreck\_60 Start: 40146, Stop: 40448, Start Num: 27

Candidate Starts for Shipwreck\_60:

(Start: 19 @40008 has 17 MA's), (Start: 23 @40080 has 1 MA's), (Start: 26 @40122 has 31 MA's),  
(Start: 27 @40146 has 1 MA's), (33, 40203), (44, 40395), (46, 40416),

Gene: Sonah\_57 Start: 37705, Stop: 38145, Start Num: 19

Candidate Starts for Sonah\_57:

(Start: 19 @37705 has 17 MA's), (Start: 23 @37777 has 1 MA's), (Start: 26 @37819 has 31 MA's),  
(Start: 27 @37843 has 1 MA's), (33, 37900), (44, 38092), (46, 38113),

Gene: StevieRay\_61 Start: 40026, Stop: 40466, Start Num: 19

Candidate Starts for StevieRay\_61:

(Start: 19 @40026 has 17 MA's), (Start: 23 @40098 has 1 MA's), (Start: 26 @40140 has 31 MA's),  
(Start: 27 @40164 has 1 MA's), (33, 40221), (44, 40413), (46, 40434),

Gene: StressBall\_56 Start: 38975, Stop: 39412, Start Num: 19

Candidate Starts for StressBall\_56:

(Start: 19 @38975 has 17 MA's), (Start: 23 @39047 has 1 MA's), (Start: 26 @39089 has 31 MA's),  
(Start: 27 @39113 has 1 MA's), (33, 39170), (44, 39359), (46, 39380),

Gene: Techage\_54 Start: 36368, Stop: 36694, Start Num: 26

Candidate Starts for Techage\_54:

(1, 35945), (2, 36092), (Start: 22 @36305 has 1 MA's), (Start: 26 @36368 has 31 MA's), (46, 36662),

Gene: Thespis\_58 Start: 38874, Stop: 39197, Start Num: 26

Candidate Starts for Thespis\_58:

(Start: 19 @38760 has 17 MA's), (Start: 23 @38832 has 1 MA's), (Start: 26 @38874 has 31 MA's),  
(Start: 27 @38898 has 1 MA's), (33, 38955), (44, 39144), (46, 39165),

Gene: Velveteen\_58 Start: 37375, Stop: 37716, Start Num: 25

Candidate Starts for Velveteen\_58:

(Start: 24 @37366 has 1 MA's), (Start: 25 @37375 has 16 MA's), (28, 37414), (35, 37492), (47, 37705),

Gene: Venti\_54 Start: 36260, Stop: 36583, Start Num: 26

Candidate Starts for Venti\_54:

(Start: 26 @36260 has 31 MA's), (38, 36449), (39, 36452), (46, 36551),

Gene: Vidya\_55 Start: 37618, Stop: 37944, Start Num: 26

Candidate Starts for Vidya\_55:

(Start: 19 @37504 has 17 MA's), (Start: 23 @37576 has 1 MA's), (Start: 26 @37618 has 31 MA's),  
(Start: 27 @37642 has 1 MA's), (33, 37699), (44, 37891), (46, 37912),

Gene: Willsammy\_56 Start: 39151, Stop: 39588, Start Num: 19

Candidate Starts for Willsammy\_56:

(Start: 19 @39151 has 17 MA's), (Start: 23 @39223 has 1 MA's), (Start: 26 @39265 has 31 MA's),  
(Start: 27 @39289 has 1 MA's), (33, 39346), (44, 39535), (46, 39556),

Gene: Xeno\_56 Start: 35652, Stop: 35969, Start Num: 26

Candidate Starts for Xeno\_56:

(Start: 26 @35652 has 31 MA's), (29, 35694), (32, 35712), (33, 35724), (46, 35937),

Gene: Xula\_50 Start: 35808, Stop: 36125, Start Num: 26

Candidate Starts for Xula\_50:

(15, 35649), (Start: 26 @35808 has 31 MA's), (29, 35850), (32, 35868), (33, 35880), (46, 36093),

Gene: Zilizebeth\_59 Start: 37826, Stop: 38149, Start Num: 26

Candidate Starts for Zilizebeth\_59:

(3, 37559), (6, 37592), (8, 37616), (9, 37622), (Start: 22 @37763 has 1 MA's), (Start: 26 @37826 has  
31 MA's), (38, 38015), (39, 38018), (46, 38117),