



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 311364 Report

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

Pham number 311364 has 128 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Caterpie\_8, JohnLord\_9, Mao1\_8, Mask\_9, Sejanus\_9
- Track 2 : Dori\_9
- Track 3 : StAugustine\_16
- Track 4 : Causa\_18
- Track 5 : LilMcDreamy\_12
- Track 6 : Tres\_14, LilSmirk\_14, Brownie5\_14, Boyle\_14, Arbiter\_14, LizLemon\_14, Kheth\_14, Kolhan\_14, Rhinoforte\_14, Opia\_14, Ares\_14, Rosebush\_14, Eaglehorse\_14, PrinceCharming\_14, Glass\_14, Godines\_14, ItsyBitsy1\_14, Allegro\_14, Laurie\_14, Faze9\_14, MasterPo\_14, Lephleur\_14, FrenchFry\_14, Bananafish\_14, Vic9\_00014, TA17A\_14, Calamitous\_14, West99\_14, Tinciduntolum\_15, Blocker23\_14, Lars\_14, Hedgerow\_14, Holeinone\_14, Kaleb\_14, Phantasmagoria\_14, Sabella\_14, Coffee\_14
- Track 7 : Akoma\_13, OrangeOswald\_13, HarveySr\_13, Jackstina\_12, Neos5\_13, Yinz\_13, Tydolla\_13, SynergyX\_13, LestyG\_13, Briakila\_13, Corofin\_13, TinyTerror\_13, Olivio\_12, Glubnar\_13, Baloo\_13, SwainyDoc\_13, Gadget\_14, Athena\_14, Kronus\_12, Devonte\_13, Deenasa\_13, Audrey\_13, SlippinJimmy\_13, Mortcellus\_12, Halfpint\_12, MmasiCarm\_13, Phayeta\_13, Phaedrus\_12, Casbah\_12, Kamiyu\_13, Shenandoah\_13, Nozo\_13, RagingRooster\_13, ChaChing\_13
- Track 8 : Philly\_12
- Track 9 : Ben11\_12, Abinghost\_13
- Track 10 : Mulaychimus\_13, Pipefish\_13
- Track 11 : Phlyer\_13, Bernardo\_13, Heathcliff\_13, GlenHope\_14
- Track 12 : Thonko\_9
- Track 13 : Ligma\_10, Shatter\_10, Fresco\_10, Axumite\_10
- Track 14 : BiggityBass\_9
- Track 15 : Evaa\_11
- Track 16 : Wooper\_12, MakoManhole\_12, CloverMinnie\_12, CaiB\_12, AnarQue\_12
- Track 17 : Mariokart\_10
- Track 18 : BobRoss2024\_9
- Track 19 : NHagos\_10
- Track 20 : AksarBAT\_10
- Track 21 : LittleMunchkin\_11
- Track 22 : Yeshua\_12
- Track 23 : Sisko\_9, Yago84\_9, AnClar\_9
- Track 24 : Sour\_13
- Track 25 : FelixTres\_12, TraderJ\_12, MossRose\_12, Blackpen\_12
- Track 26 : JellyBelly\_10

- Track 27 : CharlottesWeb\_10
- Track 28 : Coldpizza\_12
- Track 29 : Taptic\_8, PR\_08, Argie\_9, D12\_08, Megabear\_8, Cepens\_8, GodPhather\_9, Jeon\_8
- Track 30 : TPA2\_19
- Track 31 : Pine5\_13

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

The start number called the most often in the published annotations is 19, it was called in 79 of the 113 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abinghost\_13, Akoma\_13, Allegro\_14, Arbiter\_14, Ares\_14, Athena\_14, Audrey\_13, Baloo\_13, Bananafish\_14, Ben11\_12, Bernardo\_13, Blocker23\_14, Boyle\_14, Briakila\_13, Brownie5\_14, Calamitous\_14, Casbah\_12, Caterpie\_8, ChaChing\_13, Coffee\_14, Corofin\_13, Deenasa\_13, Devonte\_13, Eaglehorse\_14, Faze9\_14, FrenchFry\_14, Gadget\_14, Glass\_14, GlenHope\_14, Glubnar\_13, Godines\_14, Halfpint\_12, HarveySr\_13, Heathcliff\_13, Hedgerow\_14, Holeinone\_14, ItsyBitsy1\_14, Jackstina\_12, JohnLord\_9, Kaleb\_14, Kamiyu\_13, Kheth\_14, Kolhan\_14, Kronus\_12, Lars\_14, Laurie\_14, Lephleur\_14, LestyG\_13, LilMcDreamy\_12, LilSmirk\_14, LizLemon\_14, Mao1\_8, Mask\_9, MasterPo\_14, MmasiCarm\_13, Mortcellus\_12, Mulaychimus\_13, Neos5\_13, Nozo\_13, Olivio\_12, Opia\_14, OrangeOswald\_13, Phaedrus\_12, Phantasmagoria\_14, Phayeta\_13, Philly\_12, Phlyer\_13, Pipefish\_13, PrinceCharming\_14, RagingRooster\_13, Rhinoforte\_14, Rosebush\_14, Sabella\_14, Sejanus\_9, Shenandoah\_13, SlippinJimmy\_13, SwainyDoc\_13, SynergyX\_13, TA17A\_14, Tinciduntolum\_15, TinyTerror\_13, Tres\_14, Tydolla\_13, Vic9\_00014, West99\_14, Yinz\_13,

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

- Dori\_9,

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

- AksarBAT\_10, AnClar\_9, AnarQue\_12, Argie\_9, Axumite\_10, BiggityBass\_9, Blackpen\_12, BobRoss2024\_9, CaiB\_12, Causa\_18, Cepens\_8, CharlottesWeb\_10, CloverMinnie\_12, Coldpizza\_12, D12\_08, Evaa\_11, FelixTres\_12, Fresco\_10, GodPhather\_9, JellyBelly\_10, Jeon\_8, Ligma\_10, LittleMunchkin\_11, MakoManhole\_12, Mariokart\_10, Megabear\_8, MossRose\_12, NHagos\_10, PR\_08, Pine5\_13, Shatter\_10, Sisko\_9, Sour\_13, StAugustine\_16, TPA2\_19, Taptic\_8, Thonko\_9, TraderJ\_12, Wooper\_12, Yago84\_9, Yeshua\_12,

**Summary by start number:**

Start 15:

- Found in 1 of 128 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 113
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Thonko\_9 (B8),

Start 18:

- Found in 6 of 128 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 1 of 113
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Dori\_9 (AD),

#### Start 19:

- Found in 87 of 128 ( 68.0% ) of genes in pham
- Manual Annotations of this start: 79 of 113
- Called 98.9% of time when present
- Phage (with cluster) where this start called: Abinghost\_13 (B3), Akoma\_13 (B3), Allegro\_14 (B2), Arbiter\_14 (B2), Ares\_14 (B2), Athena\_14 (B3), Audrey\_13 (B3), Baloo\_13 (B3), Bananafish\_14 (B2), Ben11\_12 (B3), Bernardo\_13 (B3), Blocker23\_14 (B2), Boyle\_14 (B2), Briakila\_13 (B3), Brownie5\_14 (B2), Calamitous\_14 (B2), Casbah\_12 (B3), Caterpie\_8 (AD), ChaChing\_13 (B3), Coffee\_14 (B2), Corofin\_13 (B3), Deenasa\_13 (B3), Devonte\_13 (B3), Eaglehorse\_14 (B2), Faze9\_14 (B2), FrenchFry\_14 (B2), Gadget\_14 (B3), Glass\_14 (B2), GlenHope\_14 (B3), Glubnar\_13 (B3), Godines\_14 (B2), Halfpint\_12 (B3), HarveySr\_13 (B3), Heathcliff\_13 (B3), Hedgerow\_14 (B2), Holeinone\_14 (B2), ItsyBitsy1\_14 (B2), Jackstina\_12 (B3), JohnLord\_9 (AD), Kaleb\_14 (B2), Kamiyu\_13 (B3), Kheth\_14 (B2), Kolhan\_14 (B2), Kronus\_12 (B3), Lars\_14 (B2), Laurie\_14 (B2), Lephleur\_14 (B2), LestyG\_13 (B3), LilMcDreamy\_12 (B12), LilSmirk\_14 (B2), LizLemon\_14 (B2), Mao1\_8 (AD), Mask\_9 (AD), MasterPo\_14 (B2), MmasiCarm\_13 (B3), Mortcellus\_12 (B3), Mulaychimus\_13 (B3), Neos5\_13 (B3), Nozo\_13 (B3), Olivio\_12 (B3), Opia\_14 (B2), OrangeOswald\_13 (B3), Phaedrus\_12 (B3), Phantasmagoria\_14 (B2), Phayeta\_13 (B3), Philly\_12 (B3), Phlyer\_13 (B3), Pipefish\_13 (B3), PrinceCharming\_14 (B2), RagingRooster\_13 (B3), Rhinoforte\_14 (B2), Rosebush\_14 (B2), Sabella\_14 (B2), Sejanus\_9 (AD), Shenandoah\_13 (B3), SlippinJimmy\_13 (B3), SwainyDoc\_13 (B3), SynergyX\_13 (B3), TA17A\_14 (B2), Tinciduntolum\_15 (B2), TinyTerror\_13 (B3), Tres\_14 (B2), Tydolla\_13 (B3), Vic9\_00014 (B2), West99\_14 (B2), Yinz\_13 (B3),

#### Start 20:

- Found in 9 of 128 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 7 of 113
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Axumite\_10 (DR), CharlottesWeb\_10 (DR), Coldpizza\_12 (DR), Evaa\_11 (DR), Fresco\_10 (DR), JellyBelly\_10 (DR), Ligma\_10 (DR), Mariokart\_10 (DR), Shatter\_10 (DR),

#### Start 21:

- Found in 29 of 128 ( 22.7% ) of genes in pham
- Manual Annotations of this start: 23 of 113
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AksarBAT\_10 (DR), AnClar\_9 (DR), AnarQue\_12 (DR), Argie\_9 (W), BiggityBass\_9 (DR), Blackpen\_12 (DR), BobRoss2024\_9 (DR), CaiB\_12 (DR), Cepens\_8 (W), CloverMinnie\_12 (DR), D12\_08 (W), FelixTres\_12 (DR), GodPhather\_9 (W), Jeon\_8 (W), LittleMunchkin\_11 (DR), MakoManhole\_12 (DR), Megabear\_8 (W), MossRose\_12 (DR), NHagos\_10 (DR), PR\_08 (W), Pine5\_13 (singleton), Sisko\_9 (DR), Sour\_13 (DR), TPA2\_19 (singleton), Taptic\_8 (W), TraderJ\_12 (DR), Wooper\_12 (DR), Yago84\_9 (DR), Yeshua\_12 (DR),

#### Start 22:

- Found in 2 of 128 ( 1.6% ) of genes in pham

- Manual Annotations of this start: 2 of 113
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Causa\_18 (AI), StAugustine\_16 (AI),

### **Summary by clusters:**

There are 9 clusters represented in this pham: singleton, B2, AI, B8, B12, W, B3, DR, AD,

Info for manual annotations of cluster AD:

- Start number 18 was manually annotated 1 time for cluster AD.
- Start number 19 was manually annotated 3 times for cluster AD.

Info for manual annotations of cluster AI:

- Start number 22 was manually annotated 2 times for cluster AI.

Info for manual annotations of cluster B12:

- Start number 19 was manually annotated 1 time for cluster B12.

Info for manual annotations of cluster B2:

- Start number 19 was manually annotated 36 times for cluster B2.

Info for manual annotations of cluster B3:

- Start number 19 was manually annotated 39 times for cluster B3.

Info for manual annotations of cluster B8:

- Start number 15 was manually annotated 1 time for cluster B8.

Info for manual annotations of cluster DR:

- Start number 20 was manually annotated 7 times for cluster DR.
- Start number 21 was manually annotated 15 times for cluster DR.

Info for manual annotations of cluster W:

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

### **Gene Information:**

Gene: Abinghost\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for Abinghost\_13:

(4, 10166), (6, 10232), (Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: Akoma\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for Akoma\_13:

(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: AksarBAT\_10 Start: 9511, Stop: 9714, Start Num: 21

Candidate Starts for AksarBAT\_10:

(Start: 21 @9511 has 23 MA's), (25, 9541), (45, 9682),

Gene: Allegro\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Allegro\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: AnClar\_9 Start: 9843, Stop: 10046, Start Num: 21

Candidate Starts for AnClar\_9:

(17, 9834), (Start: 21 @9843 has 23 MA's), (28, 9906), (40, 9978), (45, 10014),

Gene: AnarQue\_12 Start: 11030, Stop: 11233, Start Num: 21

Candidate Starts for AnarQue\_12:

(Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Arbiter\_14 Start: 12154, Stop: 12327, Start Num: 19

Candidate Starts for Arbiter\_14:

(Start: 19 @12154 has 79 MA's), (29, 12220), (35, 12253),

Gene: Ares\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Ares\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Argie\_9 Start: 10545, Stop: 10733, Start Num: 21

Candidate Starts for Argie\_9:

(Start: 21 @10545 has 23 MA's), (31, 10638), (33, 10656), (41, 10695), (44, 10725),

Gene: Athena\_14 Start: 11403, Stop: 11609, Start Num: 19

Candidate Starts for Athena\_14:

(Start: 19 @11403 has 79 MA's), (28, 11478), (39, 11553),

Gene: Audrey\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for Audrey\_13:

(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: Axumite\_10 Start: 9533, Stop: 9739, Start Num: 20

Candidate Starts for Axumite\_10:

(1, 8870), (2, 8882), (5, 9125), (7, 9203), (Start: 20 @9533 has 7 MA's), (28, 9596),

Gene: Baloo\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for Baloo\_13:

(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: Bananafish\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Bananafish\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Ben11\_12 Start: 10488, Stop: 10694, Start Num: 19

Candidate Starts for Ben11\_12:

(4, 10014), (6, 10080), (Start: 19 @10488 has 79 MA's), (28, 10563), (39, 10638),

Gene: Bernardo\_13 Start: 10662, Stop: 10868, Start Num: 19

Candidate Starts for Bernardo\_13:

(1, 9978), (2, 9990), (3, 10014), (4, 10188), (6, 10254), (Start: 19 @10662 has 79 MA's), (28, 10737), (39, 10812),

Gene: BiggityBass\_9 Start: 9351, Stop: 9554, Start Num: 21

Candidate Starts for BiggityBass\_9:

(8, 9090), (17, 9342), (Start: 21 @9351 has 23 MA's), (28, 9414), (36, 9465),

Gene: Blackpen\_12 Start: 10522, Stop: 10725, Start Num: 21

Candidate Starts for Blackpen\_12:

(16, 10501), (Start: 21 @10522 has 23 MA's), (25, 10552), (38, 10651),

Gene: Blocker23\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for Blocker23\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: BobRoss2024\_9 Start: 9382, Stop: 9585, Start Num: 21

Candidate Starts for BobRoss2024\_9:

(12, 9268), (17, 9373), (Start: 21 @9382 has 23 MA's), (35, 9490), (37, 9499),

Gene: Boyle\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for Boyle\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Briakila\_13 Start: 11429, Stop: 11635, Start Num: 19

Candidate Starts for Briakila\_13:

(Start: 19 @11429 has 79 MA's), (28, 11504), (39, 11579),

Gene: Brownie5\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for Brownie5\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: CaiB\_12 Start: 11030, Stop: 11233, Start Num: 21

Candidate Starts for CaiB\_12:

(Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Calamitous\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Calamitous\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Casbah\_12 Start: 10492, Stop: 10698, Start Num: 19

Candidate Starts for Casbah\_12:

(Start: 19 @10492 has 79 MA's), (28, 10567), (39, 10642),

Gene: Caterpie\_8 Start: 8334, Stop: 8522, Start Num: 19

Candidate Starts for Caterpie\_8:

(Start: 18 @8331 has 1 MA's), (Start: 19 @8334 has 79 MA's),

Gene: Causa\_18 Start: 12947, Stop: 13141, Start Num: 22

Candidate Starts for Causa\_18:

(9, 12701), (Start: 22 @12947 has 2 MA's), (26, 12998), (32, 13046),

Gene: Cepens\_8 Start: 10284, Stop: 10472, Start Num: 21

Candidate Starts for Cepens\_8:

(Start: 21 @10284 has 23 MA's), (31, 10377), (33, 10395), (41, 10434), (44, 10464),

Gene: ChaChing\_13 Start: 10655, Stop: 10861, Start Num: 19

Candidate Starts for ChaChing\_13:

(Start: 19 @10655 has 79 MA's), (28, 10730), (39, 10805),

Gene: CharlottesWeb\_10 Start: 9585, Stop: 9791, Start Num: 20  
Candidate Starts for CharlottesWeb\_10:  
(2, 8934), (3, 8958), (4, 9135), (6, 9201), (7, 9255), (Start: 20 @9585 has 7 MA's), (35, 9693), (36, 9699),

Gene: CloverMinnie\_12 Start: 11030, Stop: 11233, Start Num: 21  
Candidate Starts for CloverMinnie\_12:  
(Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Coffee\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Coffee\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Coldpizza\_12 Start: 11468, Stop: 11665, Start Num: 20  
Candidate Starts for Coldpizza\_12:  
(Start: 20 @11468 has 7 MA's), (36, 11582),

Gene: Corofin\_13 Start: 10665, Stop: 10871, Start Num: 19  
Candidate Starts for Corofin\_13:  
(Start: 19 @10665 has 79 MA's), (28, 10740), (39, 10815),

Gene: D12\_08 Start: 10239, Stop: 10427, Start Num: 21  
Candidate Starts for D12\_08:  
(Start: 21 @10239 has 23 MA's), (31, 10332), (33, 10350), (41, 10389), (44, 10419),

Gene: Deenasa\_13 Start: 11403, Stop: 11609, Start Num: 19  
Candidate Starts for Deenasa\_13:  
(Start: 19 @11403 has 79 MA's), (28, 11478), (39, 11553),

Gene: Devonte\_13 Start: 10640, Stop: 10846, Start Num: 19  
Candidate Starts for Devonte\_13:  
(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: Dori\_9 Start: 8150, Stop: 8341, Start Num: 18  
Candidate Starts for Dori\_9:  
(Start: 18 @8150 has 1 MA's), (Start: 19 @8153 has 79 MA's),

Gene: Eaglehorse\_14 Start: 12082, Stop: 12255, Start Num: 19  
Candidate Starts for Eaglehorse\_14:  
(Start: 19 @12082 has 79 MA's), (29, 12148), (35, 12181),

Gene: Evaa\_11 Start: 10856, Stop: 11044, Start Num: 20  
Candidate Starts for Evaa\_11:  
(1, 10193), (2, 10205), (3, 10229), (4, 10403), (5, 10445), (6, 10469), (Start: 20 @10856 has 7 MA's),  
(25, 10886), (36, 10970),

Gene: Faze9\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Faze9\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: FelixTres\_12 Start: 11030, Stop: 11233, Start Num: 21  
Candidate Starts for FelixTres\_12:

(16, 11009), (Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: FrenchFry\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for FrenchFry\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Fresco\_10 Start: 9533, Stop: 9739, Start Num: 20

Candidate Starts for Fresco\_10:

(1, 8870), (2, 8882), (5, 9125), (7, 9203), (Start: 20 @9533 has 7 MA's), (28, 9596),

Gene: Gadget\_14 Start: 10644, Stop: 10850, Start Num: 19

Candidate Starts for Gadget\_14:

(Start: 19 @10644 has 79 MA's), (28, 10719), (39, 10794),

Gene: Glass\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for Glass\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: GlenHope\_14 Start: 10654, Stop: 10860, Start Num: 19

Candidate Starts for GlenHope\_14:

(1, 9970), (2, 9982), (3, 10006), (4, 10180), (6, 10246), (Start: 19 @10654 has 79 MA's), (28, 10729), (39, 10804),

Gene: Glubnar\_13 Start: 10644, Stop: 10850, Start Num: 19

Candidate Starts for Glubnar\_13:

(Start: 19 @10644 has 79 MA's), (28, 10719), (39, 10794),

Gene: GodPhather\_9 Start: 10542, Stop: 10730, Start Num: 21

Candidate Starts for GodPhather\_9:

(Start: 21 @10542 has 23 MA's), (31, 10635), (33, 10653), (41, 10692), (44, 10722),

Gene: Godines\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Godines\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Halfpint\_12 Start: 10489, Stop: 10695, Start Num: 19

Candidate Starts for Halfpint\_12:

(Start: 19 @10489 has 79 MA's), (28, 10564), (39, 10639),

Gene: HarveySr\_13 Start: 10641, Stop: 10847, Start Num: 19

Candidate Starts for HarveySr\_13:

(Start: 19 @10641 has 79 MA's), (28, 10716), (39, 10791),

Gene: Heathcliff\_13 Start: 10626, Stop: 10832, Start Num: 19

Candidate Starts for Heathcliff\_13:

(1, 9942), (2, 9954), (3, 9978), (4, 10152), (6, 10218), (Start: 19 @10626 has 79 MA's), (28, 10701), (39, 10776),

Gene: Hedgerow\_14 Start: 12163, Stop: 12336, Start Num: 19

Candidate Starts for Hedgerow\_14:

(Start: 19 @12163 has 79 MA's), (29, 12229), (35, 12262),

Gene: Holeinone\_14 Start: 12063, Stop: 12236, Start Num: 19

Candidate Starts for Holeinone\_14:  
(Start: 19 @12063 has 79 MA's), (29, 12129), (35, 12162),

Gene: ItsyBitsy1\_14 Start: 12055, Stop: 12228, Start Num: 19  
Candidate Starts for ItsyBitsy1\_14:  
(Start: 19 @12055 has 79 MA's), (29, 12121), (35, 12154),

Gene: Jackstina\_12 Start: 10557, Stop: 10763, Start Num: 19  
Candidate Starts for Jackstina\_12:  
(Start: 19 @10557 has 79 MA's), (28, 10632), (39, 10707),

Gene: JellyBelly\_10 Start: 9585, Stop: 9791, Start Num: 20  
Candidate Starts for JellyBelly\_10:  
(2, 8934), (3, 8958), (4, 9135), (6, 9201), (Start: 20 @9585 has 7 MA's), (35, 9693), (36, 9699),

Gene: Jeon\_8 Start: 10272, Stop: 10460, Start Num: 21  
Candidate Starts for Jeon\_8:  
(Start: 21 @10272 has 23 MA's), (31, 10365), (33, 10383), (41, 10422), (44, 10452),

Gene: JohnLord\_9 Start: 7856, Stop: 8044, Start Num: 19  
Candidate Starts for JohnLord\_9:  
(Start: 18 @7853 has 1 MA's), (Start: 19 @7856 has 79 MA's),

Gene: Kaleb\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Kaleb\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Kamiyu\_13 Start: 10635, Stop: 10841, Start Num: 19  
Candidate Starts for Kamiyu\_13:  
(Start: 19 @10635 has 79 MA's), (28, 10710), (39, 10785),

Gene: Kheth\_14 Start: 12064, Stop: 12237, Start Num: 19  
Candidate Starts for Kheth\_14:  
(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Kolhan\_14 Start: 12064, Stop: 12237, Start Num: 19  
Candidate Starts for Kolhan\_14:  
(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Kronus\_12 Start: 11247, Stop: 11453, Start Num: 19  
Candidate Starts for Kronus\_12:  
(Start: 19 @11247 has 79 MA's), (28, 11322), (39, 11397),

Gene: Lars\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Lars\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Laurie\_14 Start: 12065, Stop: 12238, Start Num: 19  
Candidate Starts for Laurie\_14:  
(Start: 19 @12065 has 79 MA's), (29, 12131), (35, 12164),

Gene: Lephleur\_14 Start: 12064, Stop: 12237, Start Num: 19  
Candidate Starts for Lephleur\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: LestyG\_13 Start: 10644, Stop: 10850, Start Num: 19

Candidate Starts for LestyG\_13:

(Start: 19 @10644 has 79 MA's), (28, 10719), (39, 10794),

Gene: Ligma\_10 Start: 9533, Stop: 9739, Start Num: 20

Candidate Starts for Ligma\_10:

(1, 8870), (2, 8882), (5, 9125), (7, 9203), (Start: 20 @9533 has 7 MA's), (28, 9596),

Gene: LilMcDreamy\_12 Start: 11806, Stop: 12027, Start Num: 19

Candidate Starts for LilMcDreamy\_12:

(1, 11131), (2, 11143), (3, 11167), (4, 11341), (Start: 19 @11806 has 79 MA's), (40, 11950), (42, 11983),

Gene: LilSmirk\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for LilSmirk\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: LittleMunchkin\_11 Start: 10824, Stop: 11030, Start Num: 21

Candidate Starts for LittleMunchkin\_11:

(11, 10707), (13, 10728), (14, 10767), (17, 10815), (Start: 21 @10824 has 23 MA's), (28, 10887),

Gene: LizLemon\_14 Start: 12181, Stop: 12354, Start Num: 19

Candidate Starts for LizLemon\_14:

(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: MakoManhole\_12 Start: 11030, Stop: 11233, Start Num: 21

Candidate Starts for MakoManhole\_12:

(Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Mao1\_8 Start: 8549, Stop: 8737, Start Num: 19

Candidate Starts for Mao1\_8:

(Start: 18 @8546 has 1 MA's), (Start: 19 @8549 has 79 MA's),

Gene: Mariokart\_10 Start: 9585, Stop: 9791, Start Num: 20

Candidate Starts for Mariokart\_10:

(Start: 20 @9585 has 7 MA's), (35, 9693), (36, 9699),

Gene: Mask\_9 Start: 8550, Stop: 8738, Start Num: 19

Candidate Starts for Mask\_9:

(Start: 18 @8547 has 1 MA's), (Start: 19 @8550 has 79 MA's),

Gene: MasterPo\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for MasterPo\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Megabear\_8 Start: 10239, Stop: 10427, Start Num: 21

Candidate Starts for Megabear\_8:

(Start: 21 @10239 has 23 MA's), (31, 10332), (33, 10350), (41, 10389), (44, 10419),

Gene: MmasiCarm\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for MmasiCarm\_13:

(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: Mortcellus\_12 Start: 11278, Stop: 11484, Start Num: 19

Candidate Starts for Mortcellus\_12:

(Start: 19 @11278 has 79 MA's), (28, 11353), (39, 11428),

Gene: MossRose\_12 Start: 11030, Stop: 11233, Start Num: 21

Candidate Starts for MossRose\_12:

(16, 11009), (Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Mulaychimus\_13 Start: 10641, Stop: 10847, Start Num: 19

Candidate Starts for Mulaychimus\_13:

(Start: 19 @10641 has 79 MA's), (28, 10716), (39, 10791),

Gene: NHagos\_10 Start: 9514, Stop: 9717, Start Num: 21

Candidate Starts for NHagos\_10:

(Start: 21 @9514 has 23 MA's), (25, 9544), (45, 9685),

Gene: Neos5\_13 Start: 11430, Stop: 11636, Start Num: 19

Candidate Starts for Neos5\_13:

(Start: 19 @11430 has 79 MA's), (28, 11505), (39, 11580),

Gene: Nozo\_13 Start: 11405, Stop: 11611, Start Num: 19

Candidate Starts for Nozo\_13:

(Start: 19 @11405 has 79 MA's), (28, 11480), (39, 11555),

Gene: Olivio\_12 Start: 10489, Stop: 10695, Start Num: 19

Candidate Starts for Olivio\_12:

(Start: 19 @10489 has 79 MA's), (28, 10564), (39, 10639),

Gene: Opia\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Opia\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: OrangeOswald\_13 Start: 10640, Stop: 10846, Start Num: 19

Candidate Starts for OrangeOswald\_13:

(Start: 19 @10640 has 79 MA's), (28, 10715), (39, 10790),

Gene: PR\_08 Start: 10239, Stop: 10427, Start Num: 21

Candidate Starts for PR\_08:

(Start: 21 @10239 has 23 MA's), (31, 10332), (33, 10350), (41, 10389), (44, 10419),

Gene: Phaedrus\_12 Start: 10557, Stop: 10763, Start Num: 19

Candidate Starts for Phaedrus\_12:

(Start: 19 @10557 has 79 MA's), (28, 10632), (39, 10707),

Gene: Phantasmagoria\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Phantasmagoria\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Phayeta\_13 Start: 10516, Stop: 10722, Start Num: 19

Candidate Starts for Phayeta\_13:

(Start: 19 @10516 has 79 MA's), (28, 10591), (39, 10666),

Gene: Philly\_12 Start: 10530, Stop: 10736, Start Num: 19  
Candidate Starts for Philly\_12:  
(1, 9846), (2, 9858), (3, 9882), (4, 10056), (6, 10122), (Start: 19 @10530 has 79 MA's), (28, 10605),  
(39, 10680),

Gene: Phlyer\_13 Start: 11397, Stop: 11603, Start Num: 19  
Candidate Starts for Phlyer\_13:  
(1, 10713), (2, 10725), (3, 10749), (4, 10923), (6, 10989), (Start: 19 @11397 has 79 MA's), (28, 11472),  
(39, 11547),

Gene: Pine5\_13 Start: 10872, Stop: 11096, Start Num: 21  
Candidate Starts for Pine5\_13:  
(Start: 21 @10872 has 23 MA's), (24, 10899), (33, 10980), (34, 10983),

Gene: Pipefish\_13 Start: 11526, Stop: 11732, Start Num: 19  
Candidate Starts for Pipefish\_13:  
(Start: 19 @11526 has 79 MA's), (28, 11601), (39, 11676),

Gene: PrinceCharming\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for PrinceCharming\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: RagingRooster\_13 Start: 10641, Stop: 10847, Start Num: 19  
Candidate Starts for RagingRooster\_13:  
(Start: 19 @10641 has 79 MA's), (28, 10716), (39, 10791),

Gene: Rhinoforte\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Rhinoforte\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Rosebush\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for Rosebush\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Sabella\_14 Start: 12064, Stop: 12237, Start Num: 19  
Candidate Starts for Sabella\_14:  
(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Sejanus\_9 Start: 9366, Stop: 9554, Start Num: 19  
Candidate Starts for Sejanus\_9:  
(Start: 18 @9363 has 1 MA's), (Start: 19 @9366 has 79 MA's),

Gene: Shatter\_10 Start: 9533, Stop: 9739, Start Num: 20  
Candidate Starts for Shatter\_10:  
(1, 8870), (2, 8882), (5, 9125), (7, 9203), (Start: 20 @9533 has 7 MA's), (28, 9596),

Gene: Shenandoah\_13 Start: 10643, Stop: 10849, Start Num: 19  
Candidate Starts for Shenandoah\_13:  
(Start: 19 @10643 has 79 MA's), (28, 10718), (39, 10793),

Gene: Sisko\_9 Start: 9345, Stop: 9548, Start Num: 21  
Candidate Starts for Sisko\_9:

(17, 9336), (Start: 21 @9345 has 23 MA's), (28, 9408), (40, 9480), (45, 9516),

Gene: SlippinJimmy\_13 Start: 11402, Stop: 11608, Start Num: 19

Candidate Starts for SlippinJimmy\_13:

(Start: 19 @11402 has 79 MA's), (28, 11477), (39, 11552),

Gene: Sour\_13 Start: 11191, Stop: 11394, Start Num: 21

Candidate Starts for Sour\_13:

(Start: 21 @11191 has 23 MA's), (35, 11299),

Gene: StAugustine\_16 Start: 12941, Stop: 13135, Start Num: 22

Candidate Starts for StAugustine\_16:

(Start: 22 @12941 has 2 MA's), (26, 12992), (32, 13040),

Gene: SwainyDoc\_13 Start: 10638, Stop: 10844, Start Num: 19

Candidate Starts for SwainyDoc\_13:

(Start: 19 @10638 has 79 MA's), (28, 10713), (39, 10788),

Gene: SynergyX\_13 Start: 10641, Stop: 10847, Start Num: 19

Candidate Starts for SynergyX\_13:

(Start: 19 @10641 has 79 MA's), (28, 10716), (39, 10791),

Gene: TA17A\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for TA17A\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: TPA2\_19 Start: 12170, Stop: 12361, Start Num: 21

Candidate Starts for TPA2\_19:

(Start: 21 @12170 has 23 MA's), (28, 12233), (39, 12302), (43, 12338), (45, 12341),

Gene: Taptic\_8 Start: 10239, Stop: 10427, Start Num: 21

Candidate Starts for Taptic\_8:

(Start: 21 @10239 has 23 MA's), (31, 10332), (33, 10350), (41, 10389), (44, 10419),

Gene: Thonko\_9 Start: 8053, Stop: 8286, Start Num: 15

Candidate Starts for Thonko\_9:

(Start: 15 @8053 has 1 MA's), (23, 8101), (28, 8155), (30, 8164), (35, 8203), (39, 8227), (40, 8230),

Gene: Tinciduntolum\_15 Start: 12180, Stop: 12353, Start Num: 19

Candidate Starts for Tinciduntolum\_15:

(Start: 19 @12180 has 79 MA's), (29, 12246), (35, 12279),

Gene: TinyTerror\_13 Start: 10643, Stop: 10849, Start Num: 19

Candidate Starts for TinyTerror\_13:

(Start: 19 @10643 has 79 MA's), (28, 10718), (39, 10793),

Gene: TraderJ\_12 Start: 11027, Stop: 11230, Start Num: 21

Candidate Starts for TraderJ\_12:

(16, 11006), (Start: 21 @11027 has 23 MA's), (25, 11057), (38, 11156),

Gene: Tres\_14 Start: 12064, Stop: 12237, Start Num: 19

Candidate Starts for Tres\_14:

(Start: 19 @12064 has 79 MA's), (29, 12130), (35, 12163),

Gene: Tydolla\_13 Start: 11402, Stop: 11608, Start Num: 19  
Candidate Starts for Tydolla\_13:  
(Start: 19 @11402 has 79 MA's), (28, 11477), (39, 11552),

Gene: Vic9\_00014 Start: 12507, Stop: 12680, Start Num: 19  
Candidate Starts for Vic9\_00014:  
(Start: 19 @12507 has 79 MA's), (29, 12573), (35, 12606),

Gene: West99\_14 Start: 12181, Stop: 12354, Start Num: 19  
Candidate Starts for West99\_14:  
(Start: 19 @12181 has 79 MA's), (29, 12247), (35, 12280),

Gene: Wooper\_12 Start: 11030, Stop: 11233, Start Num: 21  
Candidate Starts for Wooper\_12:  
(Start: 21 @11030 has 23 MA's), (25, 11060), (38, 11159),

Gene: Yago84\_9 Start: 9354, Stop: 9557, Start Num: 21  
Candidate Starts for Yago84\_9:  
(17, 9345), (Start: 21 @9354 has 23 MA's), (28, 9417), (40, 9489), (45, 9525),

Gene: Yeshua\_12 Start: 11034, Stop: 11237, Start Num: 21  
Candidate Starts for Yeshua\_12:  
(8, 10770), (10, 10863), (Start: 21 @11034 has 23 MA's), (25, 11064), (27, 11085), (38, 11163),

Gene: Yinz\_13 Start: 10670, Stop: 10876, Start Num: 19  
Candidate Starts for Yinz\_13:  
(Start: 19 @10670 has 79 MA's), (28, 10745), (39, 10820),