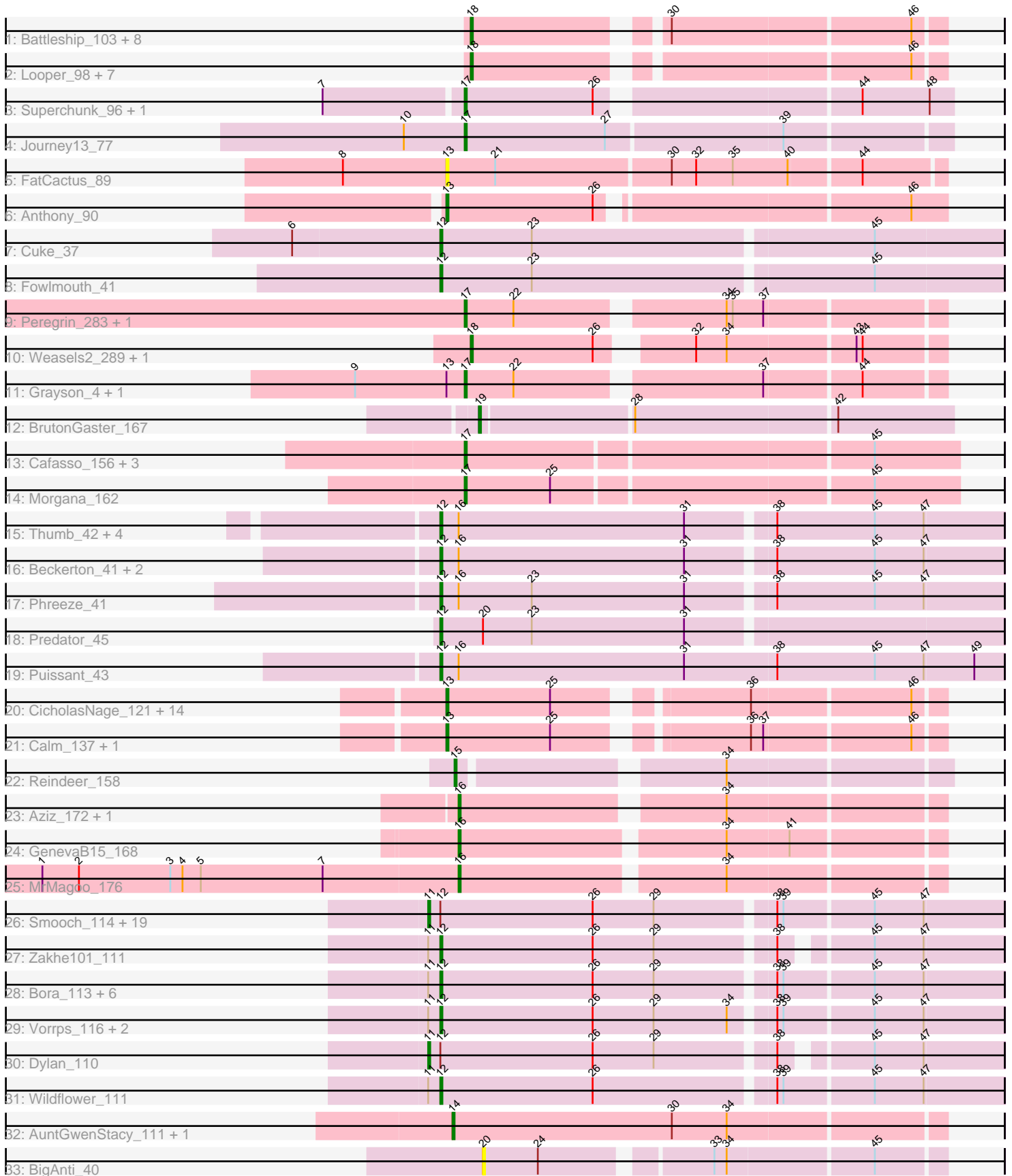


Pham 311414



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 311414 Report

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

Pham number 311414 has 105 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Battleship\_103, Rosalind\_101, KatherineG\_100, DekHockey33\_103, Elle\_96, Waits\_100, MinecraftSteve\_101, Switzerland\_99, ShayRa\_99
- Track 2 : Looper\_98, ReMo\_99, Nebulosus\_98, LastResort\_99, JSwag\_102, Boohoo\_100, Soups\_101, Anaysia\_101
- Track 3 : Superchunk\_96, Caraxes\_97
- Track 4 : Journey13\_77
- Track 5 : FatCactus\_89
- Track 6 : Anthony\_90
- Track 7 : Cuke\_37
- Track 8 : Fowlmouth\_41
- Track 9 : Peregrin\_283, Peregrin\_4
- Track 10 : Weasels2\_289, Weasels2\_3
- Track 11 : Grayson\_4, Grayson\_287
- Track 12 : BrutonGaster\_167
- Track 13 : Cafasso\_156, Aleemily\_154, ModicumRichard\_156, ObLaDi\_156
- Track 14 : Morgana\_162
- Track 15 : Thumb\_42, Oaker\_41, BobtimousPrime\_43, Nish23\_44, Cborch11\_43
- Track 16 : Beckerton\_41, Megatron06\_43, Damien\_42
- Track 17 : Phreeze\_41
- Track 18 : Predator\_45
- Track 19 : Puissant\_43
- Track 20 : CicholasNage\_121, Wamburggrxpress\_134, Halena\_130, Wyatt2\_130, OhShagHennessy\_123, Appletree2\_131, AvadaKedavra\_131, Tyson\_132, JoeDirt\_132, Rose5\_131, MAckerman\_131, Acquire49\_130, UPIE\_129, LeBron\_130, Poochiewood\_123
- Track 21 : Calm\_137, Zaria\_135
- Track 22 : Reindeer\_158
- Track 23 : Aziz\_172, Estes\_172
- Track 24 : GenevaB15\_168
- Track 25 : MrMagoo\_176
- Track 26 : Smooch\_114, Schuy\_116, MadKillah\_119, Imara\_111, Shida\_115, Corndog\_112, Firecracker\_116, Wogge42\_111, Idergollasper\_120, KingPhillip3\_114, Blessica\_115, NiebruSaylor\_116, YoyoKar\_112, Murai\_116, FoulBall\_115, SchoolBus\_117, JangDynasty\_114, Vagabond\_115, Winget\_116, Familton\_118
- Track 27 : Zakhe101\_111
- Track 28 : Bora\_113, TelAviv\_112, Zebo\_115, Alkhayr\_116, Ryadel\_121, Krili\_118, Ashwin\_111

- Track 29 : Vorrps\_116, Mori\_116, Catdawg\_117
- Track 30 : Dylan\_110
- Track 31 : Wildflower\_111
- Track 32 : AuntGwenStacy\_111, Typha\_110
- Track 33 : BigAnti\_40

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

The start number called the most often in the published annotations is 12, it was called in 24 of the 96 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alkhayr\_116, Ashwin\_111, Beckerton\_41, BobtimousPrime\_43, Bora\_113, Catdawg\_117, Cborch11\_43, Cuke\_37, Damien\_42, Fowlmouth\_41, Krili\_118, Megatron06\_43, Mori\_116, Nish23\_44, Oaker\_41, Phreeze\_41, Predator\_45, Puissant\_43, Ryadel\_121, TelAviv\_112, Thumb\_42, Vorrps\_116, Wildflower\_111, Zakhe101\_111, Zebo\_115,

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

- Blessica\_115, Corndog\_112, Dylan\_110, Familton\_118, Firecracker\_116, FoulBall\_115, Idergollasper\_120, Imara\_111, JangDynasty\_114, KingPhillip3\_114, MadKillah\_119, Murai\_116, NiebruSaylor\_116, SchoolBus\_117, Schuy\_116, Shida\_115, Smooch\_114, Vagabond\_115, Winget\_116, Wogge42\_111, YoyoKar\_112,

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

- Acquire49\_130, Aleemily\_154, Anaysia\_101, Anthony\_90, Appletree2\_131, AuntGwenStacy\_111, AvadaKedavra\_131, Aziz\_172, Battleship\_103, BigAnti\_40, Boohoo\_100, BrutonGaster\_167, Cafasso\_156, Calm\_137, Caraxes\_97, CicholasNage\_121, DekHockey33\_103, Elle\_96, Estes\_172, FatCactus\_89, GenevaB15\_168, Grayson\_287, Grayson\_4, Halena\_130, JSwag\_102, JoeDirt\_132, Journey13\_77, KatherineG\_100, LastResort\_99, LeBron\_130, Looper\_98, MAckerman\_131, MinecraftSteve\_101, ModicumRichard\_156, Morgana\_162, MrMagoo\_176, Nebulosus\_98, ObLaDi\_156, OhShagHennessy\_123, Peregrin\_283, Peregrin\_4, Pochiewood\_123, ReMo\_99, Reindeer\_158, Rosalind\_101, Rose5\_131, ShayRa\_99, Soups\_101, Superchunk\_96, Switzerland\_99, Typha\_110, Tyson\_132, UPIE\_129, Waits\_100, Wamburggrxpress\_134, Weasels2\_289, Weasels2\_3, Wyatt2\_130, Zaria\_135,

### **Summary by start number:**

Start 11:

- Found in 33 of 105 ( 31.4% ) of genes in pham
- Manual Annotations of this start: 18 of 96
- Called 63.6% of time when present
- Phage (with cluster) where this start called: Blessica\_115 (O), Corndog\_112 (O), Dylan\_110 (O), Familton\_118 (O), Firecracker\_116 (O), FoulBall\_115 (O), Idergollasper\_120 (O), Imara\_111 (O), JangDynasty\_114 (O), KingPhillip3\_114 (O), MadKillah\_119 (O), Murai\_116 (O), NiebruSaylor\_116 (O), SchoolBus\_117 (O), Schuy\_116 (O), Shida\_115 (O), Smooch\_114 (O), Vagabond\_115 (O), Winget\_116

(O), Wogge42\_111 (O), YoyoKar\_112 (O),

Start 12:

- Found in 46 of 105 ( 43.8% ) of genes in pham
- Manual Annotations of this start: 24 of 96
- Called 54.3% of time when present
- Phage (with cluster) where this start called: Alkhayr\_116 (O), Ashwin\_111 (O), Beckerton\_41 (H1), BobtimousPrime\_43 (H1), Bora\_113 (O), Catdawg\_117 (O), Cborch11\_43 (H1), Cuke\_37 (AC), Damien\_42 (H1), Fowlmouth\_41 (AC), Krili\_118 (O), Megatron06\_43 (H1), Mori\_116 (O), Nish23\_44 (H1), Oaker\_41 (H1), Phreeze\_41 (H1), Predator\_45 (H1), Puissant\_43 (H1), Ryadel\_121 (O), TelAviv\_112 (O), Thumb\_42 (H1), Vorrps\_116 (O), Wildflower\_111 (O), Zakhe101\_111 (O), Zebo\_115 (O),

Start 13:

- Found in 21 of 105 ( 20.0% ) of genes in pham
- Manual Annotations of this start: 17 of 96
- Called 90.5% of time when present
- Phage (with cluster) where this start called: Acquire49\_130 (L1), Anthony\_90 (A20), Appletree2\_131 (L1), AvadaKedavra\_131 (L1), Calm\_137 (L1), CicholasNage\_121 (L1), FatCactus\_89 (A20), Halena\_130 (L1), JoeDirt\_132 (L1), LeBron\_130 (L1), MAckerman\_131 (L1), OhShagHennessy\_123 (L1), Poochiewood\_123 (L1), Rose5\_131 (L1), Tyson\_132 (L1), UPIE\_129 (L1), Wamburgrxpress\_134 (L1), Wyatt2\_130 (L1), Zaria\_135 (L1),

Start 14:

- Found in 2 of 105 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AuntGwenStacy\_111 (Y), Typha\_110 (Y),

Start 15:

- Found in 1 of 105 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Reindeer\_158 (M1),

Start 16:

- Found in 14 of 105 ( 13.3% ) of genes in pham
- Manual Annotations of this start: 4 of 96
- Called 28.6% of time when present
- Phage (with cluster) where this start called: Aziz\_172 (M2), Estes\_172 (M2), GenevaB15\_168 (M2), MrMagoo\_176 (M2),

Start 17:

- Found in 12 of 105 ( 11.4% ) of genes in pham
- Manual Annotations of this start: 11 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aleemily\_154 (DZ), Cafasso\_156 (DZ), Caraxes\_97 (A2), Grayson\_287 (CB), Grayson\_4 (CB), Journey13\_77 (A2), ModicumRichard\_156 (DZ), Morgana\_162 (DZ), ObLaDi\_156 (DZ), Peregrin\_283 (CB), Peregrin\_4 (CB), Superchunk\_96 (A2),

Start 18:

- Found in 19 of 105 ( 18.1% ) of genes in pham
- Manual Annotations of this start: 18 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Anaysia\_101 (A15), Battleship\_103 (A15), Boohoo\_100 (A15), DekHockey33\_103 (A15), Elle\_96 (A15), JSwag\_102 (A15), KatherineG\_100 (A15), LastResort\_99 (A15), Looper\_98 (A15), MinecraftSteve\_101 (A15), Nebulosus\_98 (A15), ReMo\_99 (A15), Rosalind\_101 (A15), ShayRa\_99 (A15), Soups\_101 (A15), Switzerland\_99 (A15), Waits\_100 (A15), Weasels2\_289 (CB), Weasels2\_3 (CB),

Start 19:

- Found in 1 of 105 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BrutonGaster\_167 (CQ2),

Start 20:

- Found in 2 of 105 ( 1.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: BigAnti\_40 (singleton),

**Summary by clusters:**

There are 14 clusters represented in this pham: A15, A20, AC, CQ2, CB, H1, singleton, O, A2, DZ, L1, Y, M1, M2,

Info for manual annotations of cluster A15:

- Start number 18 was manually annotated 16 times for cluster A15.

Info for manual annotations of cluster A2:

- Start number 17 was manually annotated 2 times for cluster A2.

Info for manual annotations of cluster A20:

- Start number 13 was manually annotated 1 time for cluster A20.

Info for manual annotations of cluster AC:

- Start number 12 was manually annotated 2 times for cluster AC.

Info for manual annotations of cluster CB:

- Start number 17 was manually annotated 4 times for cluster CB.
- Start number 18 was manually annotated 2 times for cluster CB.

Info for manual annotations of cluster CQ2:

- Start number 19 was manually annotated 1 time for cluster CQ2.

Info for manual annotations of cluster DZ:

- Start number 17 was manually annotated 5 times for cluster DZ.

Info for manual annotations of cluster H1:

- Start number 12 was manually annotated 10 times for cluster H1.

Info for manual annotations of cluster L1:

- Start number 13 was manually annotated 16 times for cluster L1.

Info for manual annotations of cluster M1:

- Start number 15 was manually annotated 1 time for cluster M1.

Info for manual annotations of cluster M2:

- Start number 16 was manually annotated 4 times for cluster M2.

Info for manual annotations of cluster O:

- Start number 11 was manually annotated 18 times for cluster O.
- Start number 12 was manually annotated 12 times for cluster O.

Info for manual annotations of cluster Y:

- Start number 14 was manually annotated 2 times for cluster Y.

### **Gene Information:**

Gene: Acquire49\_130 Start: 72231, Stop: 72010, Start Num: 13

Candidate Starts for Acquire49\_130:

(Start: 13 @72231 has 17 MA's), (25, 72180), (36, 72099), (46, 72024),

Gene: Aleemily\_154 Start: 81911, Stop: 82144, Start Num: 17

Candidate Starts for Aleemily\_154:

(Start: 17 @81911 has 11 MA's), (45, 82103),

Gene: Alkhayr\_116 Start: 66773, Stop: 66507, Start Num: 12

Candidate Starts for Alkhayr\_116:

(Start: 11 @66779 has 18 MA's), (Start: 12 @66773 has 24 MA's), (26, 66698), (29, 66668), (38, 66614), (39, 66611), (45, 66569), (47, 66545),

Gene: Anaysia\_101 Start: 51081, Stop: 50872, Start Num: 18

Candidate Starts for Anaysia\_101:

(Start: 18 @51081 has 18 MA's), (46, 50886),

Gene: Anthony\_90 Start: 50703, Stop: 50473, Start Num: 13

Candidate Starts for Anthony\_90:

(Start: 13 @50703 has 17 MA's), (26, 50631), (46, 50490),

Gene: Appletree2\_131 Start: 72409, Stop: 72188, Start Num: 13

Candidate Starts for Appletree2\_131:

(Start: 13 @72409 has 17 MA's), (25, 72358), (36, 72277), (46, 72202),

Gene: Ashwin\_111 Start: 65671, Stop: 65414, Start Num: 12

Candidate Starts for Ashwin\_111:

(Start: 11 @65677 has 18 MA's), (Start: 12 @65671 has 24 MA's), (26, 65596), (29, 65566), (38, 65512), (39, 65509), (45, 65476), (47, 65452),

Gene: AuntGwenStacy\_111 Start: 67266, Stop: 67502, Start Num: 14

Candidate Starts for AuntGwenStacy\_111:

(Start: 14 @67266 has 2 MA's), (30, 67374), (34, 67401),

Gene: AvadaKedavra\_131 Start: 72274, Stop: 72053, Start Num: 13

Candidate Starts for AvadaKedavra\_131:

(Start: 13 @72274 has 17 MA's), (25, 72223), (36, 72142), (46, 72067),

Gene: Aziz\_172 Start: 81638, Stop: 81417, Start Num: 16

Candidate Starts for Aziz\_172:

(Start: 16 @81638 has 4 MA's), (34, 81518),

Gene: Battleship\_103 Start: 50973, Stop: 50764, Start Num: 18

Candidate Starts for Battleship\_103:

(Start: 18 @50973 has 18 MA's), (30, 50892), (46, 50778),

Gene: Beckerton\_41 Start: 38294, Stop: 38563, Start Num: 12

Candidate Starts for Beckerton\_41:

(Start: 12 @38294 has 24 MA's), (Start: 16 @38303 has 4 MA's), (31, 38414), (38, 38453), (45, 38501), (47, 38525),

Gene: BigAnti\_40 Start: 40903, Stop: 41112, Start Num: 20

Candidate Starts for BigAnti\_40:

(20, 40903), (24, 40930), (33, 41005), (34, 41011), (45, 41080),

Gene: Blessica\_115 Start: 67445, Stop: 67173, Start Num: 11

Candidate Starts for Blessica\_115:

(Start: 11 @67445 has 18 MA's), (Start: 12 @67439 has 24 MA's), (26, 67364), (29, 67334), (38, 67280), (39, 67277), (45, 67235), (47, 67211),

Gene: BobtimousPrime\_43 Start: 38207, Stop: 38476, Start Num: 12

Candidate Starts for BobtimousPrime\_43:

(Start: 12 @38207 has 24 MA's), (Start: 16 @38216 has 4 MA's), (31, 38327), (38, 38366), (45, 38414), (47, 38438),

Gene: Boohoo\_100 Start: 50398, Stop: 50189, Start Num: 18

Candidate Starts for Boohoo\_100:

(Start: 18 @50398 has 18 MA's), (46, 50203),

Gene: Bora\_113 Start: 67457, Stop: 67191, Start Num: 12

Candidate Starts for Bora\_113:

(Start: 11 @67463 has 18 MA's), (Start: 12 @67457 has 24 MA's), (26, 67382), (29, 67352), (38, 67298), (39, 67295), (45, 67253), (47, 67229),

Gene: BrutonGaster\_167 Start: 88890, Stop: 88666, Start Num: 19

Candidate Starts for BrutonGaster\_167:

(Start: 19 @88890 has 1 MA's), (28, 88818), (42, 88722),

Gene: Cafasso\_156 Start: 82337, Stop: 82570, Start Num: 17

Candidate Starts for Cafasso\_156:

(Start: 17 @82337 has 11 MA's), (45, 82529),

Gene: Calm\_137 Start: 73492, Stop: 73271, Start Num: 13

Candidate Starts for Calm\_137:

(Start: 13 @73492 has 17 MA's), (25, 73441), (36, 73360), (37, 73354), (46, 73285),

Gene: Caraxes\_97 Start: 50973, Stop: 50749, Start Num: 17

Candidate Starts for Caraxes\_97:

(7, 51039), (Start: 17 @50973 has 11 MA's), (26, 50910), (44, 50793), (48, 50760),

Gene: Catdawg\_117 Start: 68093, Stop: 67827, Start Num: 12

Candidate Starts for Catdawg\_117:

(Start: 11 @68099 has 18 MA's), (Start: 12 @68093 has 24 MA's), (26, 68018), (29, 67988), (34, 67952), (38, 67934), (39, 67931), (45, 67889), (47, 67865),

Gene: Cborch11\_43 Start: 37756, Stop: 38025, Start Num: 12

Candidate Starts for Cborch11\_43:

(Start: 12 @37756 has 24 MA's), (Start: 16 @37765 has 4 MA's), (31, 37876), (38, 37915), (45, 37963), (47, 37987),

Gene: CicholasNage\_121 Start: 69588, Stop: 69367, Start Num: 13

Candidate Starts for CicholasNage\_121:

(Start: 13 @69588 has 17 MA's), (25, 69537), (36, 69456), (46, 69381),

Gene: Corndog\_112 Start: 65734, Stop: 65462, Start Num: 11

Candidate Starts for Corndog\_112:

(Start: 11 @65734 has 18 MA's), (Start: 12 @65728 has 24 MA's), (26, 65653), (29, 65623), (38, 65569), (39, 65566), (45, 65524), (47, 65500),

Gene: Cuke\_37 Start: 30414, Stop: 30683, Start Num: 12

Candidate Starts for Cuke\_37:

(6, 30342), (Start: 12 @30414 has 24 MA's), (23, 30459), (45, 30621),

Gene: Damien\_42 Start: 37764, Stop: 38033, Start Num: 12

Candidate Starts for Damien\_42:

(Start: 12 @37764 has 24 MA's), (Start: 16 @37773 has 4 MA's), (31, 37884), (38, 37923), (45, 37971), (47, 37995),

Gene: DekHockey33\_103 Start: 51186, Stop: 50977, Start Num: 18

Candidate Starts for DekHockey33\_103:

(Start: 18 @51186 has 18 MA's), (30, 51105), (46, 50991),

Gene: Dylan\_110 Start: 65781, Stop: 65518, Start Num: 11

Candidate Starts for Dylan\_110:

(Start: 11 @65781 has 18 MA's), (Start: 12 @65775 has 24 MA's), (26, 65700), (29, 65670), (38, 65616), (45, 65580), (47, 65556),

Gene: Elle\_96 Start: 50181, Stop: 49969, Start Num: 18

Candidate Starts for Elle\_96:

(Start: 18 @50181 has 18 MA's), (30, 50100), (46, 49986),

Gene: Estes\_172 Start: 81845, Stop: 81621, Start Num: 16

Candidate Starts for Estes\_172:

(Start: 16 @81845 has 4 MA's), (34, 81722),

Gene: Familton\_118 Start: 67806, Stop: 67534, Start Num: 11

Candidate Starts for Familton\_118:

(Start: 11 @67806 has 18 MA's), (Start: 12 @67800 has 24 MA's), (26, 67725), (29, 67695), (38, 67641), (39, 67638), (45, 67596), (47, 67572),

Gene: FatCactus\_89 Start: 50312, Stop: 50076, Start Num: 13

Candidate Starts for FatCactus\_89:

(8, 50363), (Start: 13 @50312 has 17 MA's), (21, 50288), (30, 50204), (32, 50192), (35, 50174), (40, 50147), (44, 50114),

Gene: Firecracker\_116 Start: 67314, Stop: 67042, Start Num: 11

Candidate Starts for Firecracker\_116:

(Start: 11 @67314 has 18 MA's), (Start: 12 @67308 has 24 MA's), (26, 67233), (29, 67203), (38, 67149), (39, 67146), (45, 67104), (47, 67080),

Gene: FoulBall\_115 Start: 67062, Stop: 66790, Start Num: 11

Candidate Starts for FoulBall\_115:

(Start: 11 @67062 has 18 MA's), (Start: 12 @67056 has 24 MA's), (26, 66981), (29, 66951), (38, 66897), (39, 66894), (45, 66852), (47, 66828),

Gene: Fowlmouth\_41 Start: 34176, Stop: 34445, Start Num: 12

Candidate Starts for Fowlmouth\_41:

(Start: 12 @34176 has 24 MA's), (23, 34221), (45, 34383),

Gene: GenevaB15\_168 Start: 78350, Stop: 78126, Start Num: 16

Candidate Starts for GenevaB15\_168:

(Start: 16 @78350 has 4 MA's), (34, 78227), (41, 78197),

Gene: Grayson\_4 Start: 1447, Stop: 1229, Start Num: 17

Candidate Starts for Grayson\_4:

(9, 1501), (Start: 13 @1456 has 17 MA's), (Start: 17 @1447 has 11 MA's), (22, 1423), (37, 1312), (44, 1267),

Gene: Grayson\_287 Start: 130348, Stop: 130130, Start Num: 17

Candidate Starts for Grayson\_287:

(9, 130402), (Start: 13 @130357 has 17 MA's), (Start: 17 @130348 has 11 MA's), (22, 130324), (37, 130213), (44, 130168),

Gene: Halena\_130 Start: 72429, Stop: 72208, Start Num: 13

Candidate Starts for Halena\_130:

(Start: 13 @72429 has 17 MA's), (25, 72378), (36, 72297), (46, 72222),

Gene: Idergollasper\_120 Start: 68517, Stop: 68245, Start Num: 11

Candidate Starts for Idergollasper\_120:

(Start: 11 @68517 has 18 MA's), (Start: 12 @68511 has 24 MA's), (26, 68436), (29, 68406), (38, 68352), (39, 68349), (45, 68307), (47, 68283),

Gene: Imara\_111 Start: 66800, Stop: 66528, Start Num: 11

Candidate Starts for Imara\_111:

(Start: 11 @66800 has 18 MA's), (Start: 12 @66794 has 24 MA's), (26, 66719), (29, 66689), (38, 66635), (39, 66632), (45, 66590), (47, 66566),

Gene: JSwag\_102 Start: 50605, Stop: 50396, Start Num: 18

Candidate Starts for JSwag\_102:

(Start: 18 @50605 has 18 MA's), (46, 50410),

Gene: JangDynasty\_114 Start: 66867, Stop: 66595, Start Num: 11  
Candidate Starts for JangDynasty\_114:  
(Start: 11 @66867 has 18 MA's), (Start: 12 @66861 has 24 MA's), (26, 66786), (29, 66756), (38, 66702), (39, 66699), (45, 66657), (47, 66633),

Gene: JoeDirt\_132 Start: 73472, Stop: 73251, Start Num: 13  
Candidate Starts for JoeDirt\_132:  
(Start: 13 @73472 has 17 MA's), (25, 73421), (36, 73340), (46, 73265),

Gene: Journey13\_77 Start: 46254, Stop: 46024, Start Num: 17  
Candidate Starts for Journey13\_77:  
(10, 46284), (Start: 17 @46254 has 11 MA's), (27, 46185), (39, 46101),

Gene: KatherineG\_100 Start: 50906, Stop: 50697, Start Num: 18  
Candidate Starts for KatherineG\_100:  
(Start: 18 @50906 has 18 MA's), (30, 50825), (46, 50711),

Gene: KingPhillip3\_114 Start: 67373, Stop: 67101, Start Num: 11  
Candidate Starts for KingPhillip3\_114:  
(Start: 11 @67373 has 18 MA's), (Start: 12 @67367 has 24 MA's), (26, 67292), (29, 67262), (38, 67208), (39, 67205), (45, 67163), (47, 67139),

Gene: Krili\_118 Start: 67650, Stop: 67384, Start Num: 12  
Candidate Starts for Krili\_118:  
(Start: 11 @67656 has 18 MA's), (Start: 12 @67650 has 24 MA's), (26, 67575), (29, 67545), (38, 67491), (39, 67488), (45, 67446), (47, 67422),

Gene: LastResort\_99 Start: 50839, Stop: 50630, Start Num: 18  
Candidate Starts for LastResort\_99:  
(Start: 18 @50839 has 18 MA's), (46, 50644),

Gene: LeBron\_130 Start: 71994, Stop: 71773, Start Num: 13  
Candidate Starts for LeBron\_130:  
(Start: 13 @71994 has 17 MA's), (25, 71943), (36, 71862), (46, 71787),

Gene: Looper\_98 Start: 49688, Stop: 49479, Start Num: 18  
Candidate Starts for Looper\_98:  
(Start: 18 @49688 has 18 MA's), (46, 49493),

Gene: MAckerman\_131 Start: 72432, Stop: 72211, Start Num: 13  
Candidate Starts for MAckerman\_131:  
(Start: 13 @72432 has 17 MA's), (25, 72381), (36, 72300), (46, 72225),

Gene: MadKillah\_119 Start: 67132, Stop: 66860, Start Num: 11  
Candidate Starts for MadKillah\_119:  
(Start: 11 @67132 has 18 MA's), (Start: 12 @67126 has 24 MA's), (26, 67051), (29, 67021), (38, 66967), (39, 66964), (45, 66922), (47, 66898),

Gene: Megatron06\_43 Start: 38293, Stop: 38562, Start Num: 12  
Candidate Starts for Megatron06\_43:  
(Start: 12 @38293 has 24 MA's), (Start: 16 @38302 has 4 MA's), (31, 38413), (38, 38452), (45, 38500), (47, 38524),

Gene: MinecraftSteve\_101 Start: 50769, Stop: 50560, Start Num: 18

Candidate Starts for MinecraftSteve\_101:

(Start: 18 @50769 has 18 MA's), (30, 50688), (46, 50574),

Gene: ModicumRichard\_156 Start: 82598, Stop: 82831, Start Num: 17

Candidate Starts for ModicumRichard\_156:

(Start: 17 @82598 has 11 MA's), (45, 82790),

Gene: Morgana\_162 Start: 82939, Stop: 83172, Start Num: 17

Candidate Starts for Morgana\_162:

(Start: 17 @82939 has 11 MA's), (25, 82981), (45, 83131),

Gene: Mori\_116 Start: 67676, Stop: 67410, Start Num: 12

Candidate Starts for Mori\_116:

(Start: 11 @67682 has 18 MA's), (Start: 12 @67676 has 24 MA's), (26, 67601), (29, 67571), (34, 67535), (38, 67517), (39, 67514), (45, 67472), (47, 67448),

Gene: MrMagoo\_176 Start: 82529, Stop: 82305, Start Num: 16

Candidate Starts for MrMagoo\_176:

(1, 82733), (2, 82715), (3, 82670), (4, 82664), (5, 82655), (7, 82595), (Start: 16 @82529 has 4 MA's), (34, 82406),

Gene: Murai\_116 Start: 67500, Stop: 67228, Start Num: 11

Candidate Starts for Murai\_116:

(Start: 11 @67500 has 18 MA's), (Start: 12 @67494 has 24 MA's), (26, 67419), (29, 67389), (38, 67335), (39, 67332), (45, 67290), (47, 67266),

Gene: Nebulosus\_98 Start: 50396, Stop: 50187, Start Num: 18

Candidate Starts for Nebulosus\_98:

(Start: 18 @50396 has 18 MA's), (46, 50201),

Gene: NiebruSaylor\_116 Start: 66796, Stop: 66524, Start Num: 11

Candidate Starts for NiebruSaylor\_116:

(Start: 11 @66796 has 18 MA's), (Start: 12 @66790 has 24 MA's), (26, 66715), (29, 66685), (38, 66631), (39, 66628), (45, 66586), (47, 66562),

Gene: Nish23\_44 Start: 37756, Stop: 38025, Start Num: 12

Candidate Starts for Nish23\_44:

(Start: 12 @37756 has 24 MA's), (Start: 16 @37765 has 4 MA's), (31, 37876), (38, 37915), (45, 37963), (47, 37987),

Gene: Oaker\_41 Start: 38011, Stop: 38280, Start Num: 12

Candidate Starts for Oaker\_41:

(Start: 12 @38011 has 24 MA's), (Start: 16 @38020 has 4 MA's), (31, 38131), (38, 38170), (45, 38218), (47, 38242),

Gene: ObLaDi\_156 Start: 82597, Stop: 82830, Start Num: 17

Candidate Starts for ObLaDi\_156:

(Start: 17 @82597 has 11 MA's), (45, 82789),

Gene: OhShagHennessy\_123 Start: 71193, Stop: 70972, Start Num: 13

Candidate Starts for OhShagHennessy\_123:

(Start: 13 @71193 has 17 MA's), (25, 71142), (36, 71061), (46, 70986),

Gene: Peregrin\_283 Start: 131539, Stop: 131321, Start Num: 17

Candidate Starts for Peregrin\_283:

(Start: 17 @131539 has 11 MA's), (22, 131515), (34, 131422), (35, 131419), (37, 131404),

Gene: Peregrin\_4 Start: 1470, Stop: 1252, Start Num: 17

Candidate Starts for Peregrin\_4:

(Start: 17 @1470 has 11 MA's), (22, 1446), (34, 1353), (35, 1350), (37, 1335),

Gene: Phreeze\_41 Start: 37819, Stop: 38088, Start Num: 12

Candidate Starts for Phreeze\_41:

(Start: 12 @37819 has 24 MA's), (Start: 16 @37828 has 4 MA's), (23, 37864), (31, 37939), (38, 37978), (45, 38026), (47, 38050),

Gene: Poochiewood\_123 Start: 70018, Stop: 69797, Start Num: 13

Candidate Starts for Poochiewood\_123:

(Start: 13 @70018 has 17 MA's), (25, 69967), (36, 69886), (46, 69811),

Gene: Predator\_45 Start: 37593, Stop: 37862, Start Num: 12

Candidate Starts for Predator\_45:

(Start: 12 @37593 has 24 MA's), (20, 37614), (23, 37638), (31, 37713),

Gene: Puissant\_43 Start: 38658, Stop: 38933, Start Num: 12

Candidate Starts for Puissant\_43:

(Start: 12 @38658 has 24 MA's), (Start: 16 @38667 has 4 MA's), (31, 38778), (38, 38823), (45, 38871), (47, 38895), (49, 38919),

Gene: ReMo\_99 Start: 50822, Stop: 50613, Start Num: 18

Candidate Starts for ReMo\_99:

(Start: 18 @50822 has 18 MA's), (46, 50627),

Gene: Reindeer\_158 Start: 80568, Stop: 80347, Start Num: 15

Candidate Starts for Reindeer\_158:

(Start: 15 @80568 has 1 MA's), (34, 80451),

Gene: Rosalind\_101 Start: 50902, Stop: 50693, Start Num: 18

Candidate Starts for Rosalind\_101:

(Start: 18 @50902 has 18 MA's), (30, 50821), (46, 50707),

Gene: Rose5\_131 Start: 72502, Stop: 72281, Start Num: 13

Candidate Starts for Rose5\_131:

(Start: 13 @72502 has 17 MA's), (25, 72451), (36, 72370), (46, 72295),

Gene: Ryadel\_121 Start: 68642, Stop: 68376, Start Num: 12

Candidate Starts for Ryadel\_121:

(Start: 11 @68648 has 18 MA's), (Start: 12 @68642 has 24 MA's), (26, 68567), (29, 68537), (38, 68483), (39, 68480), (45, 68438), (47, 68414),

Gene: SchoolBus\_117 Start: 67682, Stop: 67410, Start Num: 11

Candidate Starts for SchoolBus\_117:

(Start: 11 @67682 has 18 MA's), (Start: 12 @67676 has 24 MA's), (26, 67601), (29, 67571), (38, 67517), (39, 67514), (45, 67472), (47, 67448),

Gene: Schuy\_116 Start: 66841, Stop: 66569, Start Num: 11

Candidate Starts for Schuy\_116:

(Start: 11 @66841 has 18 MA's), (Start: 12 @66835 has 24 MA's), (26, 66760), (29, 66730), (38, 66676), (39, 66673), (45, 66631), (47, 66607),

Gene: ShayRa\_99 Start: 49454, Stop: 49245, Start Num: 18

Candidate Starts for ShayRa\_99:

(Start: 18 @49454 has 18 MA's), (30, 49373), (46, 49259),

Gene: Shida\_115 Start: 67343, Stop: 67071, Start Num: 11

Candidate Starts for Shida\_115:

(Start: 11 @67343 has 18 MA's), (Start: 12 @67337 has 24 MA's), (26, 67262), (29, 67232), (38, 67178), (39, 67175), (45, 67133), (47, 67109),

Gene: Smooch\_114 Start: 67380, Stop: 67108, Start Num: 11

Candidate Starts for Smooch\_114:

(Start: 11 @67380 has 18 MA's), (Start: 12 @67374 has 24 MA's), (26, 67299), (29, 67269), (38, 67215), (39, 67212), (45, 67170), (47, 67146),

Gene: Soups\_101 Start: 51147, Stop: 50938, Start Num: 18

Candidate Starts for Soups\_101:

(Start: 18 @51147 has 18 MA's), (46, 50952),

Gene: Superchunk\_96 Start: 50973, Stop: 50749, Start Num: 17

Candidate Starts for Superchunk\_96:

(7, 51039), (Start: 17 @50973 has 11 MA's), (26, 50910), (44, 50793), (48, 50760),

Gene: Switzerland\_99 Start: 50423, Stop: 50214, Start Num: 18

Candidate Starts for Switzerland\_99:

(Start: 18 @50423 has 18 MA's), (30, 50342), (46, 50228),

Gene: TelAviv\_112 Start: 67409, Stop: 67143, Start Num: 12

Candidate Starts for TelAviv\_112:

(Start: 11 @67415 has 18 MA's), (Start: 12 @67409 has 24 MA's), (26, 67334), (29, 67304), (38, 67250), (39, 67247), (45, 67205), (47, 67181),

Gene: Thumb\_42 Start: 37751, Stop: 38020, Start Num: 12

Candidate Starts for Thumb\_42:

(Start: 12 @37751 has 24 MA's), (Start: 16 @37760 has 4 MA's), (31, 37871), (38, 37910), (45, 37958), (47, 37982),

Gene: Typha\_110 Start: 67267, Stop: 67503, Start Num: 14

Candidate Starts for Typha\_110:

(Start: 14 @67267 has 2 MA's), (30, 67375), (34, 67402),

Gene: Tyson\_132 Start: 72982, Stop: 72761, Start Num: 13

Candidate Starts for Tyson\_132:

(Start: 13 @72982 has 17 MA's), (25, 72931), (36, 72850), (46, 72775),

Gene: UPIE\_129 Start: 72301, Stop: 72080, Start Num: 13

Candidate Starts for UPIE\_129:

(Start: 13 @72301 has 17 MA's), (25, 72250), (36, 72169), (46, 72094),

Gene: Vagabond\_115 Start: 66830, Stop: 66558, Start Num: 11

Candidate Starts for Vagabond\_115:

(Start: 11 @66830 has 18 MA's), (Start: 12 @66824 has 24 MA's), (26, 66749), (29, 66719), (38, 66665), (39, 66662), (45, 66620), (47, 66596),

Gene: Vorrps\_116 Start: 67677, Stop: 67411, Start Num: 12

Candidate Starts for Vorrps\_116:

(Start: 11 @67683 has 18 MA's), (Start: 12 @67677 has 24 MA's), (26, 67602), (29, 67572), (34, 67536), (38, 67518), (39, 67515), (45, 67473), (47, 67449),

Gene: Waits\_100 Start: 51076, Stop: 50867, Start Num: 18

Candidate Starts for Waits\_100:

(Start: 18 @51076 has 18 MA's), (30, 50995), (46, 50881),

Gene: Wamburgrxpress\_134 Start: 72959, Stop: 72738, Start Num: 13

Candidate Starts for Wamburgrxpress\_134:

(Start: 13 @72959 has 17 MA's), (25, 72908), (36, 72827), (46, 72752),

Gene: Weasels2\_289 Start: 133162, Stop: 132950, Start Num: 18

Candidate Starts for Weasels2\_289:

(Start: 18 @133162 has 18 MA's), (26, 133102), (32, 133066), (34, 133051), (43, 132991), (44, 132988),

Gene: Weasels2\_3 Start: 1457, Stop: 1245, Start Num: 18

Candidate Starts for Weasels2\_3:

(Start: 18 @1457 has 18 MA's), (26, 1397), (32, 1361), (34, 1346), (43, 1286), (44, 1283),

Gene: Wildflower\_111 Start: 65312, Stop: 65046, Start Num: 12

Candidate Starts for Wildflower\_111:

(Start: 11 @65318 has 18 MA's), (Start: 12 @65312 has 24 MA's), (26, 65237), (38, 65153), (39, 65150), (45, 65108), (47, 65084),

Gene: Winget\_116 Start: 67532, Stop: 67260, Start Num: 11

Candidate Starts for Winget\_116:

(Start: 11 @67532 has 18 MA's), (Start: 12 @67526 has 24 MA's), (26, 67451), (29, 67421), (38, 67367), (39, 67364), (45, 67322), (47, 67298),

Gene: Wogge42\_111 Start: 66865, Stop: 66593, Start Num: 11

Candidate Starts for Wogge42\_111:

(Start: 11 @66865 has 18 MA's), (Start: 12 @66859 has 24 MA's), (26, 66784), (29, 66754), (38, 66700), (39, 66697), (45, 66655), (47, 66631),

Gene: Wyatt2\_130 Start: 72608, Stop: 72387, Start Num: 13

Candidate Starts for Wyatt2\_130:

(Start: 13 @72608 has 17 MA's), (25, 72557), (36, 72476), (46, 72401),

Gene: YoyoKar\_112 Start: 66890, Stop: 66618, Start Num: 11

Candidate Starts for YoyoKar\_112:

(Start: 11 @66890 has 18 MA's), (Start: 12 @66884 has 24 MA's), (26, 66809), (29, 66779), (38, 66725), (39, 66722), (45, 66680), (47, 66656),

Gene: Zakhe101\_111 Start: 65614, Stop: 65357, Start Num: 12

Candidate Starts for Zakhe101\_111:

(Start: 11 @65620 has 18 MA's), (Start: 12 @65614 has 24 MA's), (26, 65539), (29, 65509), (38, 65455), (45, 65419), (47, 65395),

Gene: Zaria\_135 Start: 72957, Stop: 72736, Start Num: 13

Candidate Starts for Zaria\_135:

(Start: 13 @72957 has 17 MA's), (25, 72906), (36, 72825), (37, 72819), (46, 72750),

Gene: Zebo\_115 Start: 67172, Stop: 66906, Start Num: 12

Candidate Starts for Zebo\_115:

(Start: 11 @67178 has 18 MA's), (Start: 12 @67172 has 24 MA's), (26, 67097), (29, 67067), (38, 67013), (39, 67010), (45, 66968), (47, 66944),