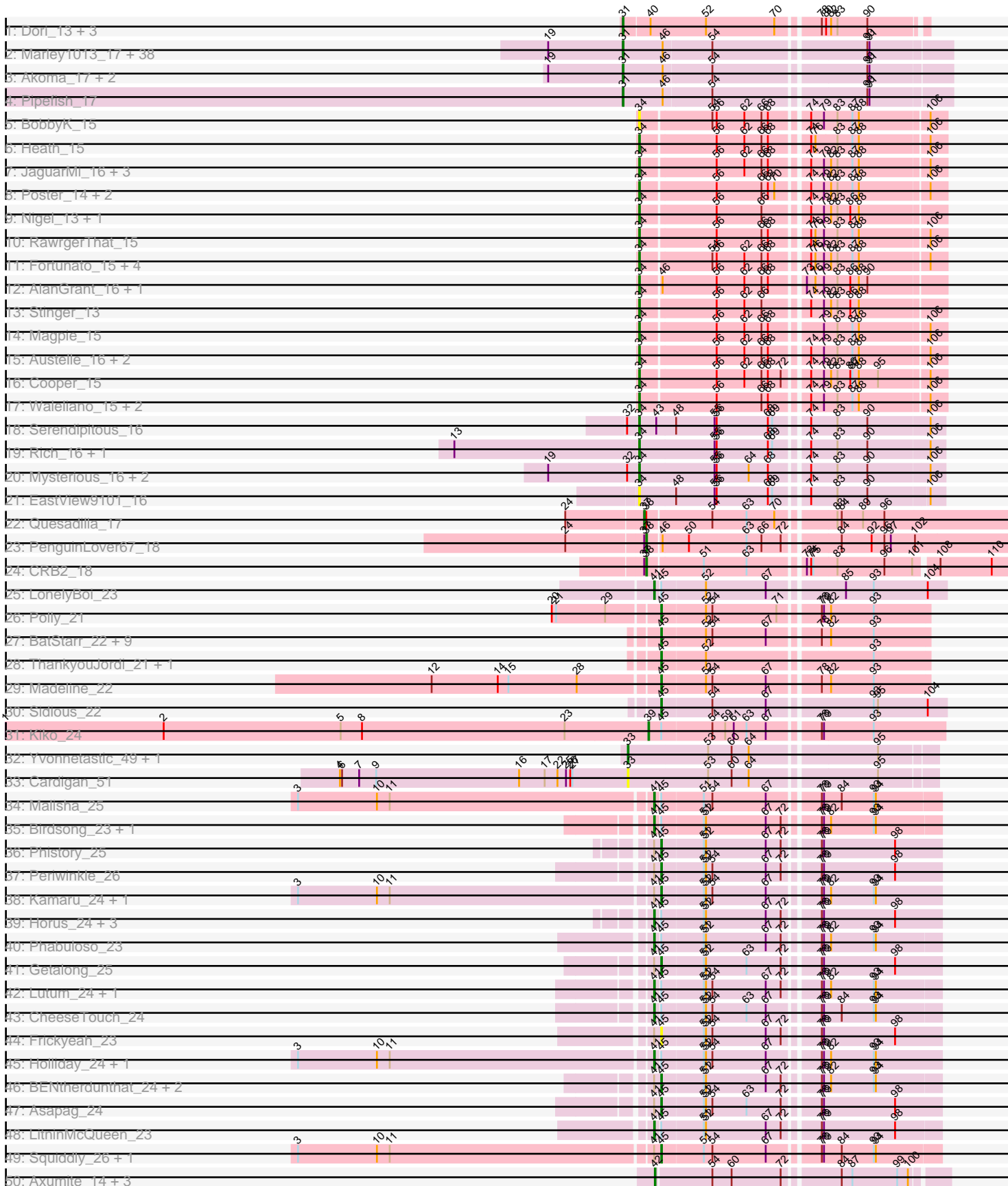
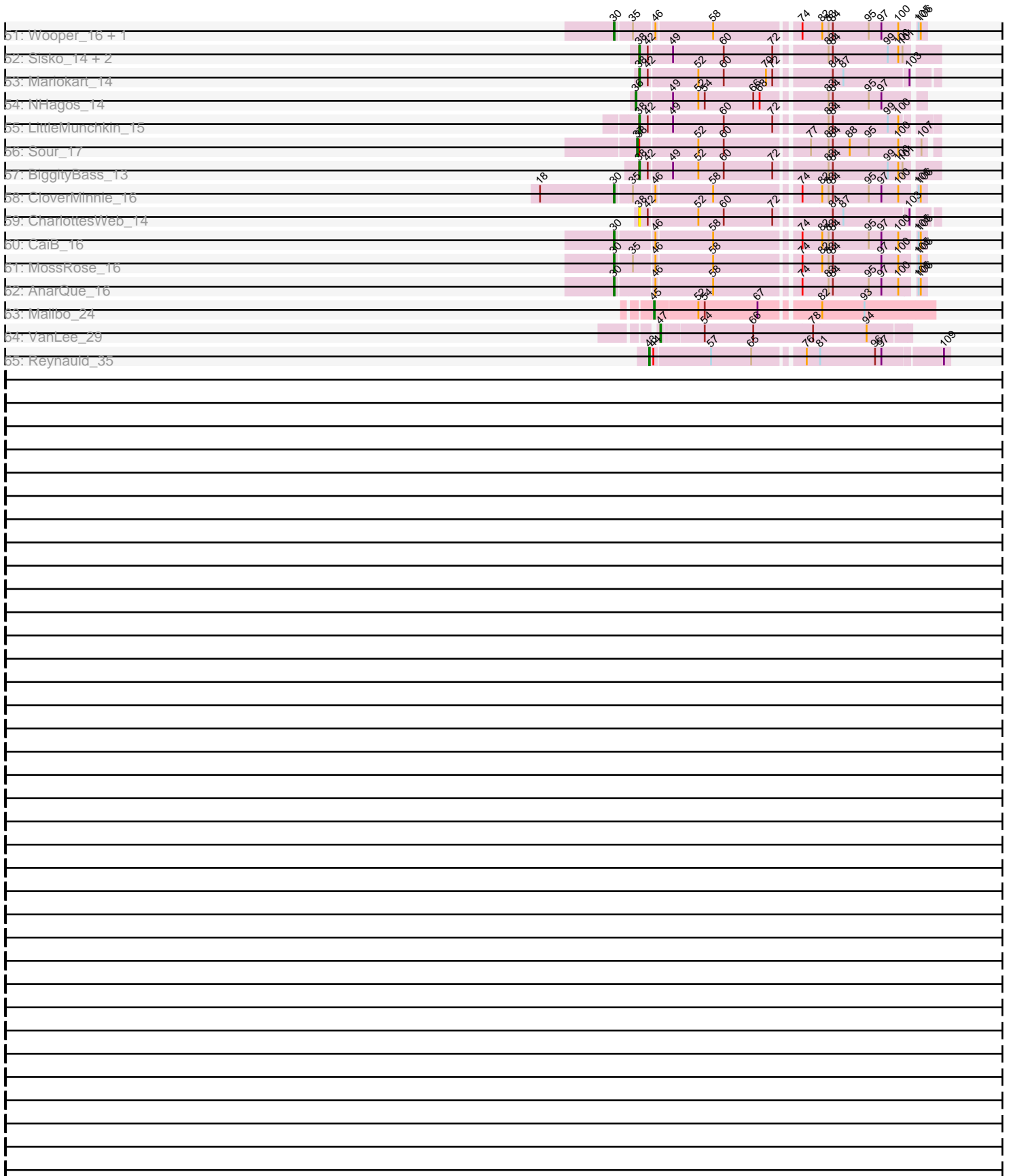


Pham 163398



Pham 163398



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 163398 Report

This analysis was run 04/28/24 on database version 559.

Pham number 163398 has 153 members, 19 are drafts.

Phages represented in each track:

- Track 1 : Dori\_13, Mask\_13, Sejanus\_13, Mao1\_12
- Track 2 : Marley1013\_17, OrangeOswald\_17, Gervas\_17, Philly\_16, Jackstina\_16, Neos5\_17, Phlyer\_17, Yinz\_17, Nozo\_17, SynergyX\_17, LestyG\_17, Corofin\_17, Briakila\_17, Compostia\_18, Heathcliff\_17, Rita1961\_17, GlenHope\_18, Chandler\_17, RagingRooster\_17, Baloo\_17, Abinghost\_17, Gadget\_18, Devonte\_17, Morty007\_17, Kamiyu\_17, Deenasa\_17, Audrey\_17, Kronus\_16, Mortcellus\_16, Halfpint\_16, Obutu\_17, Phayeta\_17, Daisy\_17, Athena\_18, Casbah\_16, RomaT\_17, MmasiCarm\_17, Tydolla\_17, ChaChing\_17
- Track 3 : Akoma\_17, Bernardo\_17, Yahalom\_17
- Track 4 : Pipefish\_17
- Track 5 : BobbyK\_15
- Track 6 : Heath\_15
- Track 7 : JaguarMi\_16, Mithril\_15, Lolalove\_15, BrownCNA\_16
- Track 8 : Poster\_14, ChrisnMich\_14, Nanao\_14
- Track 9 : Nigel\_13, JAMaL\_15
- Track 10 : RawrgerThat\_15
- Track 11 : Fortunato\_15, Apex\_15, Prince\_16, Mudslide\_15, Frederick\_15
- Track 12 : AlanGrant\_16, Vincenzo\_16
- Track 13 : Stinger\_13
- Track 14 : Magpie\_15
- Track 15 : Austelle\_16, Hydro\_15, Hangman\_15
- Track 16 : Cooper\_15
- Track 17 : Waleliano\_15, Zemanar\_16, VioletZ\_15
- Track 18 : Serendipitous\_16
- Track 19 : Rich\_16, Bae\_16
- Track 20 : Mysterious\_16, Phelemich\_16, Reprobate\_16
- Track 21 : EastView9101\_16
- Track 22 : Quesadilla\_17
- Track 23 : PenguinLover67\_18
- Track 24 : CRB2\_18
- Track 25 : LonelyBoi\_23
- Track 26 : Polly\_21
- Track 27 : BatStarr\_22, Bialota\_22, Nymphadora\_22, Hugley\_22, TimTam\_22, Bosnia\_22, Zirinka\_22, Herod\_22, Ohgeesy\_22, Eviarto\_22
- Track 28 : ThankyouJordi\_21, WelcomeAyanna\_21
- Track 29 : Madeline\_22
- Track 30 : Sidious\_22

- Track 31 : Kiko\_24
- Track 32 : Yvonnetastic\_49, JonJames\_51
- Track 33 : Cardigan\_51
- Track 34 : Malisha\_25
- Track 35 : Birdsong\_23, BearBQ\_23
- Track 36 : Phistory\_25
- Track 37 : Periwinkle\_26
- Track 38 : Kamaru\_24, Whitney\_25
- Track 39 : Horus\_24, Crater\_22, Apricot\_23, Leroy\_24
- Track 40 : Phabuloso\_23
- Track 41 : Getalong\_25
- Track 42 : Lutum\_24, Kenna\_23
- Track 43 : CheeseTouch\_24
- Track 44 : Frickyeah\_23
- Track 45 : Holliday\_24, Budski\_24
- Track 46 : BENtherdunthat\_24, Kuwabara\_23, MortyNRick\_23
- Track 47 : Asapag\_24
- Track 48 : LitninMcQueen\_23
- Track 49 : Squiddly\_26, Spooky\_24
- Track 50 : Axumite\_14, Ligma\_14, Shatter\_14, Fresco\_14
- Track 51 : Wooper\_16, MakoManhole\_16
- Track 52 : Sisko\_14, Yago84\_14, AnClar\_14
- Track 53 : Mariokart\_14
- Track 54 : NHagos\_14
- Track 55 : LittleMunchkin\_15
- Track 56 : Sour\_17
- Track 57 : BiggityBass\_13
- Track 58 : CloverMinnie\_16
- Track 59 : CharlottesWeb\_14
- Track 60 : CaiB\_16
- Track 61 : MossRose\_16
- Track 62 : AnarQue\_16
- Track 63 : Malibo\_24
- Track 64 : VanLee\_29
- Track 65 : Reynauld\_35

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

The start number called the most often in the published annotations is 31, it was called in 45 of the 134 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abinghost\_17, Akoma\_17, Athena\_18, Audrey\_17, Baloo\_17, Bernardo\_17, Briakila\_17, Casbah\_16, ChaChing\_17, Chandler\_17, Compostia\_18, Corofin\_17, Daisy\_17, Deenasa\_17, Devonte\_17, Dori\_13, Gadget\_18, Gervas\_17, GlenHope\_18, Halfpint\_16, Heathcliff\_17, Jackstina\_16, Kamiyu\_17, Kronus\_16, LestyG\_17, Mao1\_12, Marley1013\_17, Mask\_13, MmasiCarm\_17, Mortcellus\_16, Morty007\_17, Neos5\_17, Nozo\_17, Obutu\_17, OrangeOswald\_17, Phayeta\_17, Philly\_16, Phlyer\_17, Pipefish\_17, RagingRooster\_17, Rita1961\_17, RomaT\_17, Sejanus\_13, SynergyX\_17, Tydolla\_17, Yahalom\_17, Yinz\_17,

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

- 

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

- AlanGrant\_16, AnClar\_14, AnarQue\_16, Apex\_15, Apricot\_23, Asapag\_24, Austelle\_16, Axumite\_14, BENtherdunthat\_24, Bae\_16, BatStarr\_22, BearBQ\_23, Bialota\_22, BiggityBass\_13, Birdsong\_23, BobbyK\_15, Bosnia\_22, BrownCNA\_16, Budski\_24, CRB2\_18, CaiB\_16, Cardigan\_51, CharlottesWeb\_14, CheeseTouch\_24, ChrisnMich\_14, CloverMinnie\_16, Cooper\_15, Crater\_22, EastView9101\_16, Eviarto\_22, Fortunato\_15, Frederick\_15, Fresco\_14, Frickyeah\_23, Getalong\_25, Hangman\_15, Heath\_15, Herod\_22, Holliday\_24, Horus\_24, Hugley\_22, Hydro\_15, JAMaL\_15, JaguarMi\_16, JonJames\_51, Kamaru\_24, Kenna\_23, Kiko\_24, Kuwabara\_23, Leroy\_24, Ligma\_14, LitninMcQueen\_23, LittleMunchkin\_15, Lolalove\_15, LonelyBoi\_23, Lutum\_24, Madeline\_22, Magpie\_15, MakoManhole\_16, Malibo\_24, Malisha\_25, Mariokart\_14, Mithril\_15, MortyNRick\_23, MossRose\_16, Mudslide\_15, Mysterious\_16, NHagos\_14, Nanao\_14, Nigel\_13, Nymphadora\_22, Ohgeesy\_22, PenguinLover67\_18, Periwinkle\_26, Phabuloso\_23, Phelemich\_16, Phistory\_25, Polly\_21, Poster\_14, Prince\_16, Quesadilla\_17, RawrgerThat\_15, Reprobate\_16, Reynauld\_35, Rich\_16, Serendipitous\_16, Shatter\_14, Sidious\_22, Sisko\_14, Sour\_17, Spooky\_24, Squiddly\_26, Stinger\_13, ThankyouJordi\_21, TimTam\_22, VanLee\_29, Vincenzo\_16, VioletZ\_15, Waleliano\_15, WelcomeAyanna\_21, Whitney\_25, Wooper\_16, Yago84\_14, Yvonnestic\_49, Zemanar\_16, Zirinka\_22,

### Summary by start number:

Start 30:

- Found in 6 of 153 ( 3.9% ) of genes in pham
- Manual Annotations of this start: 5 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnarQue\_16 (DR), CaiB\_16 (DR), CloverMinnie\_16 (DR), MakoManhole\_16 (DR), MossRose\_16 (DR), Wooper\_16 (DR),

Start 31:

- Found in 47 of 153 ( 30.7% ) of genes in pham
- Manual Annotations of this start: 45 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Abinghost\_17 (B3), Akoma\_17 (B3), Athena\_18 (B3), Audrey\_17 (B3), Baloo\_17 (B3), Bernardo\_17 (B3), Briakila\_17 (B3), Casbah\_16 (B3), ChaChing\_17 (B3), Chandler\_17 (B3), Compostia\_18 (B3), Corofin\_17 (B3), Daisy\_17 (B3), Deenasa\_17 (B3), Devonte\_17 (B3), Dori\_13 (AD), Gadget\_18 (B3), Gervas\_17 (B3), GlenHope\_18 (B3), Halfpint\_16 (B3), Heathcliff\_17 (B3), Jackstina\_16 (B3), Kamiyu\_17 (B3), Kronus\_16 (B3), LestyG\_17 (B3), Mao1\_12 (AD), Marley1013\_17 (B3), Mask\_13 (AD), MmasiCarm\_17 (B3), Mortcellus\_16 (B3), Morty007\_17 (B3), Neos5\_17 (B3), Nozo\_17 (B3), Obutu\_17 (B3), OrangeOswald\_17 (B3), Phayeta\_17 (B3), Philly\_16 (B3), Phlyer\_17 (B3), Pipefish\_17 (B3), RagingRooster\_17 (B3), Rita1961\_17 (B3), RomaT\_17 (B3), Sejanus\_13 (AD), SynergyX\_17 (B3), Tydolla\_17 (B3), Yahalom\_17 (B3), Yinz\_17 (B3),

Start 33:

- Found in 3 of 153 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cardigan\_51 (DD), JonJames\_51 (DD), Yvonnestic\_49 (DD),

#### Start 34:

- Found in 35 of 153 ( 22.9% ) of genes in pham
- Manual Annotations of this start: 27 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AlanGrant\_16 (B4), Apex\_15 (B4), Austelle\_16 (B4), Bae\_16 (B5), BobbyK\_15 (B4), BrownCNA\_16 (B4), ChrisnMich\_14 (B4), Cooper\_15 (B4), EastView9101\_16 (B5), Fortunato\_15 (B4), Frederick\_15 (B4), Hangman\_15 (B4), Heath\_15 (B4), Hydro\_15 (B4), JAMaL\_15 (B4), JaguarMi\_16 (B4), Lolalove\_15 (B4), Magpie\_15 (B4), Mithril\_15 (B4), Mudslide\_15 (B4), Mysterious\_16 (B5), Nanao\_14 (B4), Nigel\_13 (B4), Phelemich\_16 (B5), Poster\_14 (B4), Prince\_16 (B4), RawrgerThat\_15 (B4), Reprobate\_16 (B5), Rich\_16 (B5), Serendipitous\_16 (B5), Stinger\_13 (B4), Vincenzo\_16 (B4), VioletZ\_15 (B4), Waleliano\_15 (B4), Zemanar\_16 (B4),

#### Start 36:

- Found in 1 of 153 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NHagos\_14 (DR),

#### Start 37:

- Found in 4 of 153 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 2 of 134
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Quesadilla\_17 (B9), Sour\_17 (DR),

#### Start 38:

- Found in 11 of 153 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 8 of 134
- Called 81.8% of time when present
- Phage (with cluster) where this start called: AnClar\_14 (DR), BiggityBass\_13 (DR), CRB2\_18 (B9), CharlottesWeb\_14 (DR), LittleMunchkin\_15 (DR), Mariokart\_14 (DR), PenguinLover67\_18 (B9), Sisko\_14 (DR), Yago84\_14 (DR),

#### Start 39:

- Found in 1 of 153 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Kiko\_24 (DB),

#### Start 41:

- Found in 27 of 153 ( 17.6% ) of genes in pham
- Manual Annotations of this start: 15 of 134
- Called 55.6% of time when present
- Phage (with cluster) where this start called: Apricot\_23 (DN3), BearBQ\_23 (DN), Birdsong\_23 (DN), Budski\_24 (DN), CheeseTouch\_24 (DN1), Crater\_22 (DN3), Holliday\_24 (DN1), Horus\_24 (DN1), Kenna\_23 (DN1), Leroy\_24 (DN1),

LitninMcQueen\_23 (DN1), LonelyBoi\_23 (CY), Lutum\_24 (DN1), Malisha\_25 (DN), Phabuloso\_23 (DN1),

Start 42:

- Found in 11 of 153 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 2 of 134
- Called 36.4% of time when present
- Phage (with cluster) where this start called: Axumite\_14 (DR), Fresco\_14 (DR), Ligma\_14 (DR), Shatter\_14 (DR),

Start 43:

- Found in 2 of 153 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 134
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Reynauld\_35 (singleton),

Start 45:

- Found in 44 of 153 ( 28.8% ) of genes in pham
- Manual Annotations of this start: 24 of 134
- Called 63.6% of time when present
- Phage (with cluster) where this start called: Asapag\_24 (DN1), BENtherdunthat\_24 (DN1), BatStarr\_22 (CZ1), Bialota\_22 (CZ1), Bosnia\_22 (CZ1), Eviarto\_22 (CZ1), Frickyeah\_23 (DN1), Getalong\_25 (DN1), Herod\_22 (CZ1), Hugley\_22 (CZ1), Kamaru\_24 (DN1), Kuwabara\_23 (DN4), Madeline\_22 (CZ1), Malibo\_24 (DW), MortyNRick\_23 (DN), Nymphadora\_22 (CZ1), Ohgeesy\_22 (CZ), Periwinkle\_26 (DN1), Phistory\_25 (DN1), Polly\_21 (CZ1), Sidious\_22 (CZ7), Spooky\_24 (DN2), Squiddly\_26 (DN2), ThankyouJordi\_21 (CZ1), TimTam\_22 (CZ1), WelcomeAyanna\_21 (CZ1), Whitney\_25 (DN1), Zirinka\_22 (CZ1),

Start 47:

- Found in 1 of 153 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: VanLee\_29 (singleton),

### **Summary by clusters:**

There are 19 clusters represented in this pham: DN, singleton, DN4, AD, CZ, DD, CZ1, DB, CZ7, DN2, B4, B5, CY, DN1, DN3, B3, DW, DR, B9,

Info for manual annotations of cluster AD:

- Start number 31 was manually annotated 3 times for cluster AD.

Info for manual annotations of cluster B3:

- Start number 31 was manually annotated 42 times for cluster B3.

Info for manual annotations of cluster B4:

- Start number 34 was manually annotated 22 times for cluster B4.

Info for manual annotations of cluster B5:

- Start number 34 was manually annotated 5 times for cluster B5.

Info for manual annotations of cluster B9:

- Start number 37 was manually annotated 1 time for cluster B9.
- Start number 38 was manually annotated 2 times for cluster B9.

Info for manual annotations of cluster CY:

- Start number 41 was manually annotated 1 time for cluster CY.

Info for manual annotations of cluster CZ:

- Start number 45 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ1:

- Start number 45 was manually annotated 12 times for cluster CZ1.

Info for manual annotations of cluster CZ7:

- Start number 45 was manually annotated 1 time for cluster CZ7.

Info for manual annotations of cluster DB:

- Start number 39 was manually annotated 1 time for cluster DB.

Info for manual annotations of cluster DD:

- Start number 33 was manually annotated 2 times for cluster DD.

Info for manual annotations of cluster DN:

- Start number 41 was manually annotated 4 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 41 was manually annotated 8 times for cluster DN1.
- Start number 45 was manually annotated 6 times for cluster DN1.

Info for manual annotations of cluster DN2:

- Start number 45 was manually annotated 2 times for cluster DN2.

Info for manual annotations of cluster DN3:

- Start number 41 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster DN4:

- Start number 45 was manually annotated 1 time for cluster DN4.

Info for manual annotations of cluster DR:

- Start number 30 was manually annotated 5 times for cluster DR.
- Start number 36 was manually annotated 1 time for cluster DR.
- Start number 37 was manually annotated 1 time for cluster DR.
- Start number 38 was manually annotated 6 times for cluster DR.
- Start number 42 was manually annotated 2 times for cluster DR.

Info for manual annotations of cluster DW:

- Start number 45 was manually annotated 1 time for cluster DW.

### ***Gene Information:***

Gene: Abinghost\_17 Start: 14566, Stop: 15000, Start Num: 31

Candidate Starts for Abinghost\_17:



(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: Akoma\_17 Start: 14566, Stop: 15000, Start Num: 31

Candidate Starts for Akoma\_17:

(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: AlanGrant\_16 Start: 15755, Stop: 16156, Start Num: 34

Candidate Starts for AlanGrant\_16:

(Start: 34 @15755 has 27 MA's), (46, 15782), (56, 15857), (62, 15896), (66, 15920), (68, 15929), (73, 15968), (76, 15980), (79, 15992), (83, 16010), (86, 16028), (88, 16040), (90, 16052),

Gene: AnClar\_14 Start: 13769, Stop: 14164, Start Num: 38

Candidate Starts for AnClar\_14:

(Start: 38 @13769 has 8 MA's), (Start: 42 @13781 has 2 MA's), (49, 13811), (60, 13883), (72, 13952), (83, 14015), (84, 14021), (99, 14099), (100, 14114), (101, 14120),

Gene: AnarQue\_16 Start: 14378, Stop: 14779, Start Num: 30

Candidate Starts for AnarQue\_16:

(Start: 30 @14378 has 5 MA's), (46, 14426), (58, 14504), (74, 14615), (83, 14651), (84, 14657), (95, 14708), (97, 14726), (100, 14750), (105, 14768), (106, 14771),

Gene: Apex\_15 Start: 15157, Stop: 15558, Start Num: 34

Candidate Starts for Apex\_15:

(Start: 34 @15157 has 27 MA's), (54, 15253), (56, 15259), (62, 15298), (66, 15322), (68, 15331), (74, 15376), (76, 15382), (79, 15394), (82, 15403), (83, 15412), (87, 15433), (88, 15442), (106, 15535),

Gene: Apricot\_23 Start: 19749, Stop: 20129, Start Num: 41

Candidate Starts for Apricot\_23:

(Start: 41 @19749 has 15 MA's), (Start: 45 @19755 has 24 MA's), (51, 19812), (52, 19815), (67, 19899), (72, 19920), (78, 19962), (79, 19965), (98, 20064),

Gene: Asapag\_24 Start: 20197, Stop: 20571, Start Num: 45

Candidate Starts for Asapag\_24:

(Start: 41 @20191 has 15 MA's), (Start: 45 @20197 has 24 MA's), (51, 20254), (52, 20257), (54, 20266), (63, 20314), (72, 20362), (78, 20404), (79, 20407), (98, 20506),

Gene: Athena\_18 Start: 15329, Stop: 15763, Start Num: 31

Candidate Starts for Athena\_18:

(19, 15224), (Start: 31 @15329 has 45 MA's), (46, 15383), (54, 15449), (90, 15650), (91, 15653),

Gene: Audrey\_17 Start: 14566, Stop: 15000, Start Num: 31

Candidate Starts for Audrey\_17:

(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: Austelle\_16 Start: 15613, Stop: 16014, Start Num: 34

Candidate Starts for Austelle\_16:

(Start: 34 @15613 has 27 MA's), (56, 15715), (62, 15754), (66, 15778), (68, 15787), (74, 15832), (79, 15850), (83, 15868), (87, 15889), (88, 15898), (106, 15991),

Gene: Axumite\_14 Start: 12949, Stop: 13329, Start Num: 42

Candidate Starts for Axumite\_14:

(Start: 42 @12949 has 2 MA's), (54, 13024), (60, 13051), (72, 13120), (84, 13189), (87, 13204), (99, 13267), (100, 13282),

Gene: BENtherdunthat\_24 Start: 20197, Stop: 20568, Start Num: 45

Candidate Starts for BENtherdunthat\_24:

(Start: 41 @20191 has 15 MA's), (Start: 45 @20197 has 24 MA's), (51, 20254), (52, 20257), (67, 20341), (72, 20362), (78, 20404), (79, 20407), (82, 20416), (93, 20476), (94, 20479),

Gene: Bae\_16 Start: 14990, Stop: 15397, Start Num: 34

Candidate Starts for Bae\_16:

(13, 14732), (Start: 34 @14990 has 27 MA's), (55, 15095), (56, 15098), (68, 15170), (69, 15176), (74, 15215), (83, 15251), (90, 15293), (106, 15377),

Gene: Baloo\_17 Start: 14566, Stop: 14997, Start Num: 31

Candidate Starts for Baloo\_17:

(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: BatStarr\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for BatStarr\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: BearBQ\_23 Start: 21031, Stop: 21408, Start Num: 41

Candidate Starts for BearBQ\_23:

(Start: 41 @21031 has 15 MA's), (Start: 45 @21037 has 24 MA's), (51, 21094), (52, 21097), (67, 21181), (72, 21202), (78, 21244), (79, 21247), (82, 21256), (93, 21316), (94, 21319),

Gene: Bernardo\_17 Start: 14565, Stop: 14999, Start Num: 31

Candidate Starts for Bernardo\_17:

(19, 14460), (Start: 31 @14565 has 45 MA's), (46, 14619), (54, 14685), (90, 14886), (91, 14889),

Gene: Bialota\_22 Start: 21086, Stop: 21442, Start Num: 45

Candidate Starts for Bialota\_22:

(Start: 45 @21086 has 24 MA's), (52, 21146), (54, 21155), (67, 21230), (78, 21293), (82, 21305), (93, 21365),

Gene: BiggityBass\_13 Start: 12863, Stop: 13258, Start Num: 38

Candidate Starts for BiggityBass\_13:

(Start: 38 @12863 has 8 MA's), (Start: 42 @12875 has 2 MA's), (49, 12905), (52, 12941), (60, 12977), (72, 13046), (83, 13109), (84, 13115), (99, 13193), (100, 13208), (101, 13214),

Gene: Birdsong\_23 Start: 19924, Stop: 20301, Start Num: 41

Candidate Starts for Birdsong\_23:

(Start: 41 @19924 has 15 MA's), (Start: 45 @19930 has 24 MA's), (51, 19987), (52, 19990), (67, 20074), (72, 20095), (78, 20137), (79, 20140), (82, 20149), (93, 20209), (94, 20212),

Gene: BobbyK\_15 Start: 14976, Stop: 15377, Start Num: 34

Candidate Starts for BobbyK\_15:

(Start: 34 @14976 has 27 MA's), (54, 15072), (56, 15078), (62, 15117), (66, 15141), (68, 15150), (74, 15195), (79, 15213), (83, 15231), (87, 15252), (88, 15261), (106, 15354),

Gene: Bosnia\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for Bosnia\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Briakila\_17 Start: 15331, Stop: 15765, Start Num: 31

Candidate Starts for Briakila\_17:

(19, 15226), (Start: 31 @15331 has 45 MA's), (46, 15385), (54, 15451), (90, 15652), (91, 15655),

Gene: BrownCNA\_16 Start: 15230, Stop: 15631, Start Num: 34

Candidate Starts for BrownCNA\_16:

(Start: 34 @15230 has 27 MA's), (56, 15332), (62, 15371), (66, 15395), (68, 15404), (74, 15449), (79, 15467), (82, 15476), (83, 15485), (87, 15506), (88, 15515), (106, 15608),

Gene: Budski\_24 Start: 20296, Stop: 20676, Start Num: 41

Candidate Starts for Budski\_24:

(3, 19807), (10, 19918), (11, 19936), (Start: 41 @20296 has 15 MA's), (Start: 45 @20302 has 24 MA's), (51, 20359), (52, 20362), (54, 20371), (67, 20446), (78, 20509), (79, 20512), (82, 20521), (93, 20581), (94, 20584),

Gene: CRB2\_18 Start: 16038, Stop: 16547, Start Num: 38

Candidate Starts for CRB2\_18:

(Start: 37 @16035 has 2 MA's), (Start: 38 @16038 has 8 MA's), (51, 16113), (63, 16173), (73, 16242), (74, 16248), (75, 16251), (83, 16284), (96, 16350), (101, 16389), (108, 16416), (110, 16488),

Gene: CaiB\_16 Start: 14363, Stop: 14764, Start Num: 30

Candidate Starts for CaiB\_16:

(Start: 30 @14363 has 5 MA's), (46, 14411), (58, 14489), (74, 14600), (82, 14627), (83, 14636), (84, 14642), (95, 14693), (97, 14711), (100, 14735), (105, 14753), (106, 14756),

Gene: Cardigan\_51 Start: 36197, Stop: 36607, Start Num: 33

Candidate Starts for Cardigan\_51:

(4, 35792), (6, 35795), (7, 35819), (9, 35843), (16, 36044), (17, 36080), (22, 36098), (25, 36110), (26, 36116), (27, 36119), (Start: 33 @36197 has 2 MA's), (53, 36308), (60, 36341), (64, 36365), (95, 36530),

Gene: Casbah\_16 Start: 14418, Stop: 14852, Start Num: 31

Candidate Starts for Casbah\_16:

(19, 14313), (Start: 31 @14418 has 45 MA's), (46, 14472), (54, 14538), (90, 14739), (91, 14742),

Gene: ChaChing\_17 Start: 14581, Stop: 14964, Start Num: 31

Candidate Starts for ChaChing\_17:

(19, 14476), (Start: 31 @14581 has 45 MA's), (46, 14635), (54, 14701), (90, 14902), (91, 14905),

Gene: Chandler\_17 Start: 15340, Stop: 15774, Start Num: 31

Candidate Starts for Chandler\_17:

(19, 15235), (Start: 31 @15340 has 45 MA's), (46, 15394), (54, 15460), (90, 15661), (91, 15664),

Gene: CharlottesWeb\_14 Start: 12853, Stop: 13239, Start Num: 38

Candidate Starts for CharlottesWeb\_14:

(Start: 38 @12853 has 8 MA's), (Start: 42 @12865 has 2 MA's), (52, 12931), (60, 12967), (72, 13036), (84, 13105), (87, 13120), (103, 13210),

Gene: CheeseTouch\_24 Start: 20185, Stop: 20562, Start Num: 41

Candidate Starts for CheeseTouch\_24:

(Start: 41 @20185 has 15 MA's), (Start: 45 @20191 has 24 MA's), (51, 20248), (52, 20251), (54, 20260), (63, 20308), (67, 20335), (78, 20398), (79, 20401), (84, 20425), (93, 20470), (94, 20473),

Gene: ChrisnMich\_14 Start: 13912, Stop: 14313, Start Num: 34

Candidate Starts for ChrisnMich\_14:

(Start: 34 @13912 has 27 MA's), (56, 14014), (66, 14077), (68, 14086), (70, 14095), (74, 14131), (79, 14149), (82, 14158), (83, 14167), (87, 14188), (88, 14197), (106, 14290),

Gene: CloverMinnie\_16 Start: 14303, Stop: 14704, Start Num: 30

Candidate Starts for CloverMinnie\_16:

(18, 14198), (Start: 30 @14303 has 5 MA's), (35, 14324), (46, 14351), (58, 14429), (74, 14540), (82, 14567), (83, 14576), (84, 14582), (95, 14633), (97, 14651), (100, 14675), (105, 14693), (106, 14696),

Gene: Compostia\_18 Start: 14999, Stop: 15433, Start Num: 31

Candidate Starts for Compostia\_18:

(19, 14894), (Start: 31 @14999 has 45 MA's), (46, 15053), (54, 15119), (90, 15320), (91, 15323),

Gene: Cooper\_15 Start: 14020, Stop: 14421, Start Num: 34

Candidate Starts for Cooper\_15:

(Start: 34 @14020 has 27 MA's), (56, 14122), (62, 14161), (66, 14185), (68, 14194), (72, 14212), (74, 14239), (79, 14257), (82, 14266), (83, 14275), (86, 14293), (87, 14296), (88, 14305), (95, 14332), (106, 14398),

Gene: Corofin\_17 Start: 14591, Stop: 15025, Start Num: 31

Candidate Starts for Corofin\_17:

(19, 14486), (Start: 31 @14591 has 45 MA's), (46, 14645), (54, 14711), (90, 14912), (91, 14915),

Gene: Crater\_22 Start: 19749, Stop: 20129, Start Num: 41

Candidate Starts for Crater\_22:

(Start: 41 @19749 has 15 MA's), (Start: 45 @19755 has 24 MA's), (51, 19812), (52, 19815), (67, 19899), (72, 19920), (78, 19962), (79, 19965), (98, 20064),

Gene: Daisy\_17 Start: 14587, Stop: 15021, Start Num: 31

Candidate Starts for Daisy\_17:

(19, 14482), (Start: 31 @14587 has 45 MA's), (46, 14641), (54, 14707), (90, 14908), (91, 14911),

Gene: Deenasa\_17 Start: 15329, Stop: 15763, Start Num: 31

Candidate Starts for Deenasa\_17:

(19, 15224), (Start: 31 @15329 has 45 MA's), (46, 15383), (54, 15449), (90, 15650), (91, 15653),

Gene: Devonte\_17 Start: 14566, Stop: 15000, Start Num: 31

Candidate Starts for Devonte\_17:

(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: Dori\_13 Start: 11588, Stop: 11983, Start Num: 31

Candidate Starts for Dori\_13:

(Start: 31 @11588 has 45 MA's), (40, 11621), (52, 11699), (70, 11795), (78, 11846), (80, 11852), (82, 11858), (83, 11867), (90, 11909),

Gene: EastView9101\_16 Start: 14852, Stop: 15256, Start Num: 34

Candidate Starts for EastView9101\_16:

(Start: 34 @14852 has 27 MA's), (48, 14903), (55, 14957), (56, 14960), (68, 15032), (69, 15038), (74, 15077), (83, 15113), (90, 15155), (106, 15236),

Gene: Eviarto\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for Eviarto\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Fortunato\_15 Start: 14970, Stop: 15371, Start Num: 34

Candidate Starts for Fortunato\_15:

(Start: 34 @14970 has 27 MA's), (54, 15066), (56, 15072), (62, 15111), (66, 15135), (68, 15144), (74, 15189), (76, 15195), (79, 15207), (82, 15216), (83, 15225), (87, 15246), (88, 15255), (106, 15348),

Gene: Frederick\_15 Start: 14979, Stop: 15380, Start Num: 34

Candidate Starts for Frederick\_15:

(Start: 34 @14979 has 27 MA's), (54, 15075), (56, 15081), (62, 15120), (66, 15144), (68, 15153), (74, 15198), (76, 15204), (79, 15216), (82, 15225), (83, 15234), (87, 15255), (88, 15264), (106, 15357),

Gene: Fresco\_14 Start: 12949, Stop: 13329, Start Num: 42

Candidate Starts for Fresco\_14:

(Start: 42 @12949 has 2 MA's), (54, 13024), (60, 13051), (72, 13120), (84, 13189), (87, 13204), (99, 13267), (100, 13282),

Gene: Frickyeah\_23 Start: 19960, Stop: 20334, Start Num: 45

Candidate Starts for Frickyeah\_23:

(Start: 41 @19954 has 15 MA's), (Start: 45 @19960 has 24 MA's), (51, 20017), (52, 20020), (54, 20029), (67, 20104), (72, 20125), (78, 20167), (79, 20170), (98, 20269),

Gene: Gadget\_18 Start: 14570, Stop: 15004, Start Num: 31

Candidate Starts for Gadget\_18:

(19, 14465), (Start: 31 @14570 has 45 MA's), (46, 14624), (54, 14690), (90, 14891), (91, 14894),

Gene: Gervas\_17 Start: 14549, Stop: 14983, Start Num: 31

Candidate Starts for Gervas\_17:

(19, 14444), (Start: 31 @14549 has 45 MA's), (46, 14603), (54, 14669), (90, 14870), (91, 14873),

Gene: Getalong\_25 Start: 20997, Stop: 21371, Start Num: 45

Candidate Starts for Getalong\_25:

(Start: 41 @20991 has 15 MA's), (Start: 45 @20997 has 24 MA's), (51, 21054), (52, 21057), (63, 21114), (72, 21162), (78, 21204), (79, 21207), (98, 21306),

Gene: GlenHope\_18 Start: 14556, Stop: 14990, Start Num: 31

Candidate Starts for GlenHope\_18:

(19, 14451), (Start: 31 @14556 has 45 MA's), (46, 14610), (54, 14676), (90, 14877), (91, 14880),

Gene: Halfpint\_16 Start: 14391, Stop: 14825, Start Num: 31

Candidate Starts for Halfpint\_16:

(19, 14286), (Start: 31 @14391 has 45 MA's), (46, 14445), (54, 14511), (90, 14712), (91, 14715),

Gene: Hangman\_15 Start: 14979, Stop: 15380, Start Num: 34

Candidate Starts for Hangman\_15:

(Start: 34 @14979 has 27 MA's), (56, 15081), (62, 15120), (66, 15144), (68, 15153), (74, 15198), (79, 15216), (83, 15234), (87, 15255), (88, 15264), (106, 15357),

Gene: Heath\_15 Start: 14976, Stop: 15377, Start Num: 34

Candidate Starts for Heath\_15:

(Start: 34 @14976 has 27 MA's), (56, 15078), (62, 15117), (66, 15141), (68, 15150), (74, 15195), (76, 15201), (83, 15231), (87, 15252), (88, 15261), (106, 15354),

Gene: Heathcliff\_17 Start: 14528, Stop: 14962, Start Num: 31

Candidate Starts for Heathcliff\_17:

(19, 14423), (Start: 31 @14528 has 45 MA's), (46, 14582), (54, 14648), (90, 14849), (91, 14852),

Gene: Herod\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for Herod\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Holliday\_24 Start: 20296, Stop: 20676, Start Num: 41

Candidate Starts for Holliday\_24:

(3, 19807), (10, 19918), (11, 19936), (Start: 41 @20296 has 15 MA's), (Start: 45 @20302 has 24 MA's), (51, 20359), (52, 20362), (54, 20371), (67, 20446), (78, 20509), (79, 20512), (82, 20521), (93, 20581), (94, 20584),

Gene: Horus\_24 Start: 20213, Stop: 20593, Start Num: 41

Candidate Starts for Horus\_24:

(Start: 41 @20213 has 15 MA's), (Start: 45 @20219 has 24 MA's), (51, 20276), (52, 20279), (67, 20363), (72, 20384), (78, 20426), (79, 20429), (98, 20528),

Gene: Hugley\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for Hugley\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Hydro\_15 Start: 14976, Stop: 15377, Start Num: 34

Candidate Starts for Hydro\_15:

(Start: 34 @14976 has 27 MA's), (56, 15078), (62, 15117), (66, 15141), (68, 15150), (74, 15195), (79, 15213), (83, 15231), (87, 15252), (88, 15261), (106, 15354),

Gene: JAMaL\_15 Start: 15160, Stop: 15561, Start Num: 34

Candidate Starts for JAMaL\_15:

(Start: 34 @15160 has 27 MA's), (56, 15262), (66, 15325), (74, 15379), (79, 15397), (82, 15406), (83, 15415), (86, 15433), (88, 15445),

Gene: Jackstina\_16 Start: 14492, Stop: 14926, Start Num: 31

Candidate Starts for Jackstina\_16:

(19, 14387), (Start: 31 @14492 has 45 MA's), (46, 14546), (54, 14612), (90, 14813), (91, 14816),

Gene: JaguarMi\_16 Start: 14806, Stop: 15207, Start Num: 34

Candidate Starts for JaguarMi\_16:

(Start: 34 @14806 has 27 MA's), (56, 14908), (62, 14947), (66, 14971), (68, 14980), (74, 15025), (79, 15043), (82, 15052), (83, 15061), (87, 15082), (88, 15091), (106, 15184),

Gene: JonJames\_51 Start: 37099, Stop: 37509, Start Num: 33

Candidate Starts for JonJames\_51:

(Start: 33 @37099 has 2 MA's), (53, 37210), (60, 37243), (64, 37267), (95, 37432),

Gene: Kamaru\_24 Start: 20302, Stop: 20676, Start Num: 45

Candidate Starts for Kamaru\_24:

(3, 19807), (10, 19918), (11, 19936), (Start: 41 @20296 has 15 MA's), (Start: 45 @20302 has 24 MA's), (51, 20359), (52, 20362), (54, 20371), (67, 20446), (78, 20509), (79, 20512), (82, 20521), (93, 20581), (94, 20584),

Gene: Kamiyu\_17 Start: 14537, Stop: 14971, Start Num: 31

Candidate Starts for Kamiyu\_17:

(19, 14432), (Start: 31 @14537 has 45 MA's), (46, 14591), (54, 14657), (90, 14858), (91, 14861),

Gene: Kenna\_23 Start: 20192, Stop: 20569, Start Num: 41

Candidate Starts for Kenna\_23:

(Start: 41 @20192 has 15 MA's), (Start: 45 @20198 has 24 MA's), (51, 20255), (52, 20258), (54, 20267), (67, 20342), (72, 20363), (78, 20405), (79, 20408), (82, 20417), (93, 20477), (94, 20480),

Gene: Kiko\_24 Start: 20229, Stop: 20624, Start Num: 39

Candidate Starts for Kiko\_24:

(1, 19326), (2, 19548), (5, 19797), (8, 19827), (23, 20112), (Start: 39 @20229 has 1 MA's), (Start: 45 @20247 has 24 MA's), (54, 20316), (59, 20334), (61, 20346), (63, 20364), (67, 20391), (78, 20454), (79, 20457), (93, 20526),

Gene: Kronus\_16 Start: 15149, Stop: 15583, Start Num: 31

Candidate Starts for Kronus\_16:

(19, 15044), (Start: 31 @15149 has 45 MA's), (46, 15203), (54, 15269), (90, 15470), (91, 15473),

Gene: Kuwabara\_23 Start: 19624, Stop: 19995, Start Num: 45

Candidate Starts for Kuwabara\_23:

(Start: 41 @19618 has 15 MA's), (Start: 45 @19624 has 24 MA's), (51, 19681), (52, 19684), (67, 19768), (72, 19789), (78, 19831), (79, 19834), (82, 19843), (93, 19903), (94, 19906),

Gene: Leroy\_24 Start: 20214, Stop: 20594, Start Num: 41

Candidate Starts for Leroy\_24:

(Start: 41 @20214 has 15 MA's), (Start: 45 @20220 has 24 MA's), (51, 20277), (52, 20280), (67, 20364), (72, 20385), (78, 20427), (79, 20430), (98, 20529),

Gene: LestyG\_17 Start: 14570, Stop: 15004, Start Num: 31

Candidate Starts for LestyG\_17:

(19, 14465), (Start: 31 @14570 has 45 MA's), (46, 14624), (54, 14690), (90, 14891), (91, 14894),

Gene: Ligma\_14 Start: 12949, Stop: 13329, Start Num: 42

Candidate Starts for Ligma\_14:

(Start: 42 @12949 has 2 MA's), (54, 13024), (60, 13051), (72, 13120), (84, 13189), (87, 13204), (99, 13267), (100, 13282),

Gene: LitninMcQueen\_23 Start: 19948, Stop: 20325, Start Num: 41

Candidate Starts for LitninMcQueen\_23:

(Start: 41 @19948 has 15 MA's), (Start: 45 @19954 has 24 MA's), (51, 20011), (52, 20014), (67, 20098), (72, 20119), (78, 20161), (79, 20164), (98, 20263),

Gene: LittleMunchkin\_15 Start: 14381, Stop: 14770, Start Num: 38

Candidate Starts for LittleMunchkin\_15:

(Start: 38 @14381 has 8 MA's), (Start: 42 @14393 has 2 MA's), (49, 14423), (60, 14495), (72, 14564), (83, 14627), (84, 14633), (99, 14711), (100, 14726),

Gene: Lolalove\_15 Start: 14976, Stop: 15377, Start Num: 34

Candidate Starts for Lolalove\_15:

(Start: 34 @14976 has 27 MA's), (56, 15078), (62, 15117), (66, 15141), (68, 15150), (74, 15195), (79, 15213), (82, 15222), (83, 15231), (87, 15252), (88, 15261), (106, 15354),

Gene: LonelyBoi\_23 Start: 20872, Stop: 21258, Start Num: 41

Candidate Starts for LonelyBoi\_23:

(Start: 41 @20872 has 15 MA's), (Start: 45 @20878 has 24 MA's), (52, 20938), (67, 21022), (85, 21118), (93, 21157), (104, 21232),

Gene: Lutum\_24 Start: 20192, Stop: 20569, Start Num: 41

Candidate Starts for Lutum\_24:

(Start: 41 @20192 has 15 MA's), (Start: 45 @20198 has 24 MA's), (51, 20255), (52, 20258), (54, 20267), (67, 20342), (72, 20363), (78, 20405), (79, 20408), (82, 20417), (93, 20477), (94, 20480),

Gene: Madeline\_22 Start: 21372, Stop: 21728, Start Num: 45

Candidate Starts for Madeline\_22:

(12, 21066), (14, 21159), (15, 21174), (28, 21270), (Start: 45 @21372 has 24 MA's), (52, 21432), (54, 21441), (67, 21516), (78, 21579), (82, 21591), (93, 21651),

Gene: Magpie\_15 Start: 15161, Stop: 15562, Start Num: 34

Candidate Starts for Magpie\_15:

(Start: 34 @15161 has 27 MA's), (56, 15263), (62, 15302), (66, 15326), (68, 15335), (79, 15398), (83, 15416), (87, 15437), (88, 15446), (106, 15539),

Gene: MakoManhole\_16 Start: 14381, Stop: 14782, Start Num: 30

Candidate Starts for MakoManhole\_16:

(Start: 30 @14381 has 5 MA's), (35, 14402), (46, 14429), (58, 14507), (74, 14618), (82, 14645), (83, 14654), (84, 14660), (95, 14711), (97, 14729), (100, 14753), (105, 14771), (106, 14774),

Gene: Malibo\_24 Start: 20256, Stop: 20633, Start Num: 45

Candidate Starts for Malibo\_24:

(Start: 45 @20256 has 24 MA's), (52, 20316), (54, 20325), (67, 20400), (82, 20475), (93, 20535),

Gene: Malisha\_25 Start: 22077, Stop: 22454, Start Num: 41

Candidate Starts for Malisha\_25:

(3, 21588), (10, 21699), (11, 21717), (Start: 41 @22077 has 15 MA's), (Start: 45 @22083 has 24 MA's), (51, 22140), (54, 22152), (67, 22227), (78, 22290), (79, 22293), (84, 22317), (93, 22362), (94, 22365),

Gene: Mao1\_12 Start: 11984, Stop: 12379, Start Num: 31

Candidate Starts for Mao1\_12:

(Start: 31 @11984 has 45 MA's), (40, 12017), (52, 12095), (70, 12191), (78, 12242), (80, 12248), (82, 12254), (83, 12263), (90, 12305),

Gene: Mariokart\_14 Start: 12852, Stop: 13238, Start Num: 38

Candidate Starts for Mariokart\_14:

(Start: 38 @12852 has 8 MA's), (Start: 42 @12864 has 2 MA's), (52, 12930), (60, 12966), (70, 13026), (72, 13035), (84, 13104), (87, 13119), (103, 13209),

Gene: Marley1013\_17 Start: 15350, Stop: 15784, Start Num: 31

Candidate Starts for Marley1013\_17:

(19, 15245), (Start: 31 @15350 has 45 MA's), (46, 15404), (54, 15470), (90, 15671), (91, 15674),



Gene: Mask\_13 Start: 11985, Stop: 12380, Start Num: 31

Candidate Starts for Mask\_13:

(Start: 31 @11985 has 45 MA's), (40, 12018), (52, 12096), (70, 12192), (78, 12243), (80, 12249), (82, 12255), (83, 12264), (90, 12306),

Gene: Mithril\_15 Start: 14979, Stop: 15380, Start Num: 34

Candidate Starts for Mithril\_15:

(Start: 34 @14979 has 27 MA's), (56, 15081), (62, 15120), (66, 15144), (68, 15153), (74, 15198), (79, 15216), (82, 15225), (83, 15234), (87, 15255), (88, 15264), (106, 15357),

Gene: MmasiCarm\_17 Start: 14563, Stop: 14997, Start Num: 31

Candidate Starts for MmasiCarm\_17:

(19, 14458), (Start: 31 @14563 has 45 MA's), (46, 14617), (54, 14683), (90, 14884), (91, 14887),

Gene: Mortcellus\_16 Start: 15204, Stop: 15638, Start Num: 31

Candidate Starts for Mortcellus\_16:

(19, 15099), (Start: 31 @15204 has 45 MA's), (46, 15258), (54, 15324), (90, 15525), (91, 15528),

Gene: Morty007\_17 Start: 15350, Stop: 15784, Start Num: 31

Candidate Starts for Morty007\_17:

(19, 15245), (Start: 31 @15350 has 45 MA's), (46, 15404), (54, 15470), (90, 15671), (91, 15674),

Gene: MortyNRick\_23 Start: 19930, Stop: 20301, Start Num: 45

Candidate Starts for MortyNRick\_23:

(Start: 41 @19924 has 15 MA's), (Start: 45 @19930 has 24 MA's), (51, 19987), (52, 19990), (67, 20074), (72, 20095), (78, 20137), (79, 20140), (82, 20149), (93, 20209), (94, 20212),

Gene: MossRose\_16 Start: 14360, Stop: 14761, Start Num: 30

Candidate Starts for MossRose\_16:

(Start: 30 @14360 has 5 MA's), (35, 14381), (46, 14408), (58, 14486), (74, 14597), (82, 14624), (83, 14633), (84, 14639), (97, 14708), (100, 14732), (105, 14750), (106, 14753),

Gene: Mudslide\_15 Start: 15224, Stop: 15625, Start Num: 34

Candidate Starts for Mudslide\_15:

(Start: 34 @15224 has 27 MA's), (54, 15320), (56, 15326), (62, 15365), (66, 15389), (68, 15398), (74, 15443), (76, 15449), (79, 15461), (82, 15470), (83, 15479), (87, 15500), (88, 15509), (106, 15602),

Gene: Mysterious\_16 Start: 15087, Stop: 15494, Start Num: 34

Candidate Starts for Mysterious\_16:

(19, 14964), (32, 15072), (Start: 34 @15087 has 27 MA's), (55, 15192), (56, 15195), (64, 15240), (68, 15267), (74, 15312), (83, 15348), (90, 15390), (106, 15474),

Gene: NHagos\_14 Start: 12851, Stop: 13228, Start Num: 36

Candidate Starts for NHagos\_14:

(Start: 36 @12851 has 1 MA's), (49, 12896), (52, 12932), (54, 12941), (66, 13010), (68, 13019), (83, 13100), (84, 13106), (95, 13157), (97, 13175),

Gene: Nanao\_14 Start: 13912, Stop: 14313, Start Num: 34

Candidate Starts for Nanao\_14:

(Start: 34 @13912 has 27 MA's), (56, 14014), (66, 14077), (68, 14086), (70, 14095), (74, 14131), (79, 14149), (82, 14158), (83, 14167), (87, 14188), (88, 14197), (106, 14290),

Gene: Neos5\_17 Start: 15356, Stop: 15790, Start Num: 31

Candidate Starts for Neos5\_17:

(19, 15251), (Start: 31 @15356 has 45 MA's), (46, 15410), (54, 15476), (90, 15677), (91, 15680),

Gene: Nigel\_13 Start: 13828, Stop: 14229, Start Num: 34

Candidate Starts for Nigel\_13:

(Start: 34 @13828 has 27 MA's), (56, 13930), (66, 13993), (74, 14047), (79, 14065), (82, 14074), (83, 14083), (86, 14101), (88, 14113),

Gene: Nozo\_17 Start: 15331, Stop: 15762, Start Num: 31

Candidate Starts for Nozo\_17:

(19, 15226), (Start: 31 @15331 has 45 MA's), (46, 15385), (54, 15451), (90, 15652), (91, 15655),

Gene: Nymphadora\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for Nymphadora\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Obutu\_17 Start: 14561, Stop: 14995, Start Num: 31

Candidate Starts for Obutu\_17:

(19, 14456), (Start: 31 @14561 has 45 MA's), (46, 14615), (54, 14681), (90, 14882), (91, 14885),

Gene: Ohgeesy\_22 Start: 20697, Stop: 21053, Start Num: 45

Candidate Starts for Ohgeesy\_22:

(Start: 45 @20697 has 24 MA's), (52, 20757), (54, 20766), (67, 20841), (78, 20904), (82, 20916), (93, 20976),

Gene: OrangeOswald\_17 Start: 14566, Stop: 15000, Start Num: 31

Candidate Starts for OrangeOswald\_17:

(19, 14461), (Start: 31 @14566 has 45 MA's), (46, 14620), (54, 14686), (90, 14887), (91, 14890),

Gene: PenguinLover67\_18 Start: 16012, Stop: 16536, Start Num: 38

Candidate Starts for PenguinLover67\_18:

(24, 15904), (Start: 37 @16009 has 2 MA's), (Start: 38 @16012 has 8 MA's), (46, 16030), (50, 16066), (63, 16147), (66, 16168), (72, 16195), (84, 16264), (92, 16306), (96, 16324), (97, 16333), (102, 16366),

Gene: Periwinkle\_26 Start: 20664, Stop: 21038, Start Num: 45

Candidate Starts for Periwinkle\_26:

(Start: 41 @20658 has 15 MA's), (Start: 45 @20664 has 24 MA's), (51, 20721), (52, 20724), (54, 20733), (67, 20808), (72, 20829), (78, 20871), (79, 20874), (98, 20973),

Gene: Phabuloso\_23 Start: 19948, Stop: 20325, Start Num: 41

Candidate Starts for Phabuloso\_23:

(Start: 41 @19948 has 15 MA's), (Start: 45 @19954 has 24 MA's), (51, 20011), (52, 20014), (67, 20098), (72, 20119), (78, 20161), (79, 20164), (82, 20173), (93, 20233), (94, 20236),

Gene: Phayeta\_17 Start: 14442, Stop: 14876, Start Num: 31

Candidate Starts for Phayeta\_17:

(19, 14337), (Start: 31 @14442 has 45 MA's), (46, 14496), (54, 14562), (90, 14763), (91, 14766),

Gene: Phelemich\_16 Start: 15091, Stop: 15498, Start Num: 34

Candidate Starts for Phelemich\_16:

(19, 14968), (32, 15076), (Start: 34 @15091 has 27 MA's), (55, 15196), (56, 15199), (64, 15244), (68, 15271), (74, 15316), (83, 15352), (90, 15394), (106, 15478),

Gene: Philly\_16 Start: 14432, Stop: 14866, Start Num: 31

Candidate Starts for Philly\_16:

(19, 14327), (Start: 31 @14432 has 45 MA's), (46, 14486), (54, 14552), (90, 14753), (91, 14756),

Gene: Phistory\_25 Start: 20985, Stop: 21359, Start Num: 45

Candidate Starts for Phistory\_25:

(Start: 41 @20979 has 15 MA's), (Start: 45 @20985 has 24 MA's), (51, 21042), (52, 21045), (67, 21129), (72, 21150), (78, 21192), (79, 21195), (98, 21294),

Gene: Phlyer\_17 Start: 15300, Stop: 15734, Start Num: 31

Candidate Starts for Phlyer\_17:

(19, 15195), (Start: 31 @15300 has 45 MA's), (46, 15354), (54, 15420), (90, 15621), (91, 15624),

Gene: Pipefish\_17 Start: 15450, Stop: 15884, Start Num: 31

Candidate Starts for Pipefish\_17:

(Start: 31 @15450 has 45 MA's), (46, 15504), (54, 15570), (90, 15771), (91, 15774),

Gene: Polly\_21 Start: 20514, Stop: 20870, Start Num: 45

Candidate Starts for Polly\_21:

(20, 20373), (21, 20379), (29, 20448), (Start: 45 @20514 has 24 MA's), (52, 20574), (54, 20583), (71, 20673), (78, 20721), (79, 20724), (82, 20733), (93, 20793),

Gene: Poster\_14 Start: 13912, Stop: 14313, Start Num: 34

Candidate Starts for Poster\_14:

(Start: 34 @13912 has 27 MA's), (56, 14014), (66, 14077), (68, 14086), (70, 14095), (74, 14131), (79, 14149), (82, 14158), (83, 14167), (87, 14188), (88, 14197), (106, 14290),

Gene: Prince\_16 Start: 15136, Stop: 15537, Start Num: 34

Candidate Starts for Prince\_16:

(Start: 34 @15136 has 27 MA's), (54, 15232), (56, 15238), (62, 15277), (66, 15301), (68, 15310), (74, 15355), (76, 15361), (79, 15373), (82, 15382), (83, 15391), (87, 15412), (88, 15421), (106, 15514),

Gene: Quesadilla\_17 Start: 15843, Stop: 16370, Start Num: 37

Candidate Starts for Quesadilla\_17:

(24, 15738), (Start: 37 @15843 has 2 MA's), (Start: 38 @15846 has 8 MA's), (54, 15933), (63, 15981), (70, 16020), (83, 16092), (84, 16098), (89, 16128), (96, 16158),

Gene: RagingRooster\_17 Start: 14567, Stop: 15001, Start Num: 31

Candidate Starts for RagingRooster\_17:

(19, 14462), (Start: 31 @14567 has 45 MA's), (46, 14621), (54, 14687), (90, 14888), (91, 14891),

Gene: RawrgerThat\_15 Start: 14973, Stop: 15374, Start Num: 34

Candidate Starts for RawrgerThat\_15:

(Start: 34 @14973 has 27 MA's), (56, 15075), (66, 15138), (68, 15147), (74, 15192), (76, 15198), (79, 15210), (83, 15228), (87, 15249), (88, 15258), (106, 15351),

Gene: Reprobate\_16 Start: 15088, Stop: 15495, Start Num: 34

Candidate Starts for Reprobate\_16:

(19, 14965), (32, 15073), (Start: 34 @15088 has 27 MA's), (55, 15193), (56, 15196), (64, 15241), (68, 15268), (74, 15313), (83, 15349), (90, 15391), (106, 15475),

Gene: Reynauld\_35 Start: 36999, Stop: 37397, Start Num: 43

Candidate Starts for Reynauld\_35:

(Start: 43 @36999 has 1 MA's), (44, 37005), (57, 37083), (65, 37140), (76, 37203), (81, 37221), (96, 37299), (97, 37308), (109, 37389),

Gene: Rich\_16 Start: 14987, Stop: 15394, Start Num: 34

Candidate Starts for Rich\_16:

(13, 14729), (Start: 34 @14987 has 27 MA's), (55, 15092), (56, 15095), (68, 15167), (69, 15173), (74, 15212), (83, 15248), (90, 15290), (106, 15374),

Gene: Rita1961\_17 Start: 14562, Stop: 14996, Start Num: 31

Candidate Starts for Rita1961\_17:

(19, 14457), (Start: 31 @14562 has 45 MA's), (46, 14616), (54, 14682), (90, 14883), (91, 14886),

Gene: RomaT\_17 Start: 15347, Stop: 15781, Start Num: 31

Candidate Starts for RomaT\_17:

(19, 15242), (Start: 31 @15347 has 45 MA's), (46, 15401), (54, 15467), (90, 15668), (91, 15671),

Gene: Sejanus\_13 Start: 12918, Stop: 13313, Start Num: 31

Candidate Starts for Sejanus\_13:

(Start: 31 @12918 has 45 MA's), (40, 12951), (52, 13029), (70, 13125), (78, 13176), (80, 13182), (82, 13188), (83, 13197), (90, 13239),

Gene: Serendipitous\_16 Start: 15034, Stop: 15441, Start Num: 34

Candidate Starts for Serendipitous\_16:

(32, 15019), (Start: 34 @15034 has 27 MA's), (Start: 43 @15058 has 1 MA's), (48, 15085), (55, 15139), (56, 15142), (68, 15214), (69, 15220), (74, 15259), (83, 15295), (90, 15337), (106, 15421),

Gene: Shatter\_14 Start: 12949, Stop: 13329, Start Num: 42

Candidate Starts for Shatter\_14:

(Start: 42 @12949 has 2 MA's), (54, 13024), (60, 13051), (72, 13120), (84, 13189), (87, 13204), (99, 13267), (100, 13282),

Gene: Sidious\_22 Start: 20529, Stop: 20909, Start Num: 45

Candidate Starts for Sidious\_22:

(Start: 45 @20529 has 24 MA's), (54, 20598), (67, 20673), (93, 20808), (95, 20814), (104, 20883),

Gene: Sisko\_14 Start: 13277, Stop: 13672, Start Num: 38

Candidate Starts for Sisko\_14:

(Start: 38 @13277 has 8 MA's), (Start: 42 @13289 has 2 MA's), (49, 13319), (60, 13391), (72, 13460), (83, 13523), (84, 13529), (99, 13607), (100, 13622), (101, 13628),

Gene: Sour\_17 Start: 14711, Stop: 15097, Start Num: 37

Candidate Starts for Sour\_17:

(Start: 37 @14711 has 2 MA's), (Start: 38 @14714 has 8 MA's), (52, 14792), (60, 14828), (77, 14936), (83, 14960), (84, 14966), (88, 14990), (95, 15017), (100, 15059), (107, 15080),

Gene: Spooky\_24 Start: 20292, Stop: 20663, Start Num: 45

Candidate Starts for Spooky\_24:

(3, 19797), (10, 19908), (11, 19926), (Start: 41 @20286 has 15 MA's), (Start: 45 @20292 has 24 MA's), (51, 20349), (54, 20361), (67, 20436), (78, 20499), (79, 20502), (84, 20526), (93, 20571), (94, 20574),

Gene: Squiddly\_26 Start: 21704, Stop: 22075, Start Num: 45

Candidate Starts for Squiddly\_26:

(3, 21209), (10, 21320), (11, 21338), (Start: 41 @21698 has 15 MA's), (Start: 45 @21704 has 24 MA's), (51, 21761), (54, 21773), (67, 21848), (78, 21911), (79, 21914), (84, 21938), (93, 21983), (94, 21986),

Gene: Stinger\_13 Start: 13475, Stop: 13876, Start Num: 34

Candidate Starts for Stinger\_13:

(Start: 34 @13475 has 27 MA's), (56, 13577), (62, 13616), (66, 13640), (74, 13694), (79, 13712), (82, 13721), (83, 13730), (86, 13748), (88, 13760),

Gene: SynergyX\_17 Start: 14567, Stop: 15001, Start Num: 31

Candidate Starts for SynergyX\_17:

(19, 14462), (Start: 31 @14567 has 45 MA's), (46, 14621), (54, 14687), (90, 14888), (91, 14891),

Gene: ThankyouJordi\_21 Start: 21049, Stop: 21405, Start Num: 45

Candidate Starts for ThankyouJordi\_21:

(Start: 45 @21049 has 24 MA's), (52, 21109), (93, 21328),

Gene: TimTam\_22 Start: 21074, Stop: 21430, Start Num: 45

Candidate Starts for TimTam\_22:

(Start: 45 @21074 has 24 MA's), (52, 21134), (54, 21143), (67, 21218), (78, 21281), (82, 21293), (93, 21353),

Gene: Tydolla\_17 Start: 15304, Stop: 15738, Start Num: 31

Candidate Starts for Tydolla\_17:

(19, 15199), (Start: 31 @15304 has 45 MA's), (46, 15358), (54, 15424), (90, 15625), (91, 15628),

Gene: VanLee\_29 Start: 25243, Stop: 25584, Start Num: 47

Candidate Starts for VanLee\_29:

(Start: 47 @25243 has 1 MA's), (54, 25297), (66, 25366), (78, 25450), (94, 25525),

Gene: Vincenzo\_16 Start: 15755, Stop: 16156, Start Num: 34

Candidate Starts for Vincenzo\_16:

(Start: 34 @15755 has 27 MA's), (46, 15782), (56, 15857), (62, 15896), (66, 15920), (68, 15929), (73, 15968), (76, 15980), (79, 15992), (83, 16010), (86, 16028), (88, 16040), (90, 16052),

Gene: VioletZ\_15 Start: 15009, Stop: 15410, Start Num: 34

Candidate Starts for VioletZ\_15:

(Start: 34 @15009 has 27 MA's), (56, 15111), (66, 15174), (68, 15183), (74, 15228), (79, 15246), (83, 15264), (87, 15285), (88, 15294), (106, 15387),

Gene: Waleliano\_15 Start: 14979, Stop: 15380, Start Num: 34

Candidate Starts for Waleliano\_15:

(Start: 34 @14979 has 27 MA's), (56, 15081), (66, 15144), (68, 15153), (74, 15198), (79, 15216), (83, 15234), (87, 15255), (88, 15264), (106, 15357),

Gene: WelcomeAyanna\_21 Start: 21049, Stop: 21405, Start Num: 45

Candidate Starts for WelcomeAyanna\_21:

(Start: 45 @21049 has 24 MA's), (52, 21109), (93, 21328),

Gene: Whitney\_25 Start: 21106, Stop: 21480, Start Num: 45

Candidate Starts for Whitney\_25:

(3, 20611), (10, 20722), (11, 20740), (Start: 41 @21100 has 15 MA's), (Start: 45 @21106 has 24 MA's), (51, 21163), (52, 21166), (54, 21175), (67, 21250), (78, 21313), (79, 21316), (82, 21325), (93, 21385), (94, 21388),

Gene: Wooper\_16 Start: 14369, Stop: 14770, Start Num: 30

Candidate Starts for Wooper\_16:

(Start: 30 @14369 has 5 MA's), (35, 14390), (46, 14417), (58, 14495), (74, 14606), (82, 14633), (83, 14642), (84, 14648), (95, 14699), (97, 14717), (100, 14741), (105, 14759), (106, 14762),

Gene: Yago84\_14 Start: 13286, Stop: 13681, Start Num: 38

Candidate Starts for Yago84\_14:

(Start: 38 @13286 has 8 MA's), (Start: 42 @13298 has 2 MA's), (49, 13328), (60, 13400), (72, 13469), (83, 13532), (84, 13538), (99, 13616), (100, 13631), (101, 13637),

Gene: Yahalom\_17 Start: 14578, Stop: 15012, Start Num: 31

Candidate Starts for Yahalom\_17:

(19, 14473), (Start: 31 @14578 has 45 MA's), (46, 14632), (54, 14698), (90, 14899), (91, 14902),

Gene: Yinz\_17 Start: 14605, Stop: 15039, Start Num: 31

Candidate Starts for Yinz\_17:

(19, 14500), (Start: 31 @14605 has 45 MA's), (46, 14659), (54, 14725), (90, 14926), (91, 14929),

Gene: Yvonnetastic\_49 Start: 34634, Stop: 35044, Start Num: 33

Candidate Starts for Yvonnetastic\_49:

(Start: 33 @34634 has 2 MA's), (53, 34745), (60, 34778), (64, 34802), (95, 34967),

Gene: Zemanar\_16 Start: 14979, Stop: 15380, Start Num: 34

Candidate Starts for Zemanar\_16:

(Start: 34 @14979 has 27 MA's), (56, 15081), (66, 15144), (68, 15153), (74, 15198), (79, 15216), (83, 15234), (87, 15255), (88, 15264), (106, 15357),

Gene: Zirinka\_22 Start: 21086, Stop: 21442, Start Num: 45

Candidate Starts for Zirinka\_22:

(Start: 45 @21086 has 24 MA's), (52, 21146), (54, 21155), (67, 21230), (78, 21293), (82, 21305), (93, 21365),