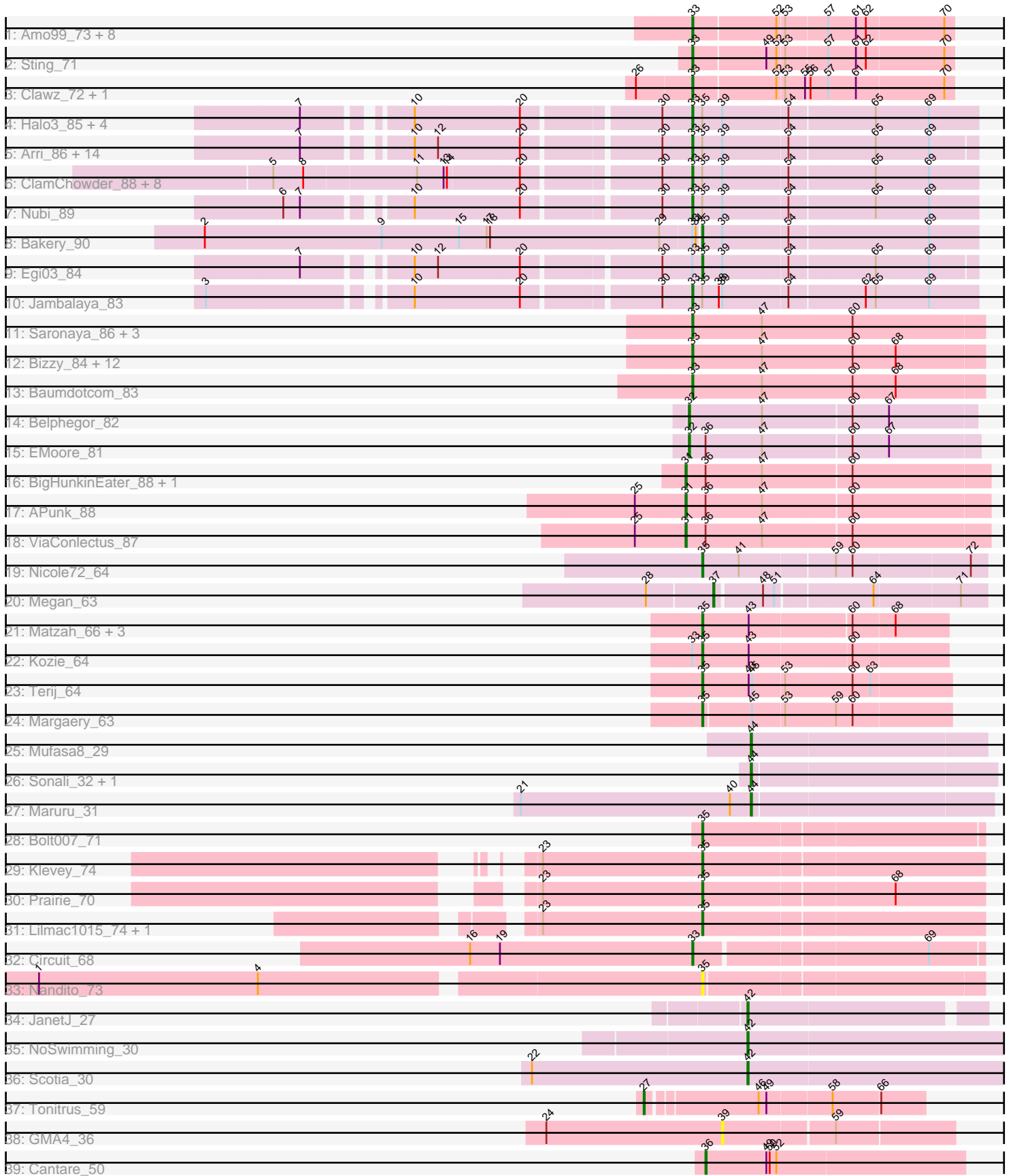


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Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. 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 294608 Report

This analysis was run 04/18/26 on database version 643.

Pham number 294608 has 95 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Amo99\_73, Purplicious\_71, Stillion\_72, KingstonB\_73, Grumio\_72, DonTron\_72, Jollymon\_72, ColdSoup\_73, Soos\_68
- Track 2 : Sting\_71
- Track 3 : Clawz\_72, Makar\_73
- Track 4 : Halo3\_85, SmokingBunny\_87, Salvador\_86, Evamon\_86, Togo\_86
- Track 5 : Arri\_86, PullumCavea\_84, Twister6\_85, Wizard\_81, VanDeWege\_88, Fireball\_89, Gezellig\_82, CherryCola\_85, RogerDodger\_89, Savbucketdawg\_81, KimmyK\_84, Valary\_87, Phlop\_83, Portcullis\_86, Shinji\_85
- Track 6 : ClamChowder\_88, Barb\_89, Danyall\_86, TillyBobJoe\_84, YungMoney\_85, Fugax\_89, PinkCoffee\_87, CoveyB\_87, Mutzi\_85
- Track 7 : Nubi\_89
- Track 8 : Bakery\_90
- Track 9 : Egi03\_84
- Track 10 : Jambalaya\_83
- Track 11 : Saronaya\_86, StorminNorm\_85, Gustavo\_86, Gaea\_85
- Track 12 : Bizzy\_84, Kroos\_84, YorkOnyx\_83, Derg\_77, Ribeye\_84, Tycho\_84, Tangerine\_84, Ashertheman\_84, Flatwoods\_84, LilHam\_78, SchottB\_83, JKSyngboy\_81, Kwobi\_86
- Track 13 : Baumdotcom\_83
- Track 14 : Belphegor\_82
- Track 15 : EMoore\_81
- Track 16 : BigHunkinEater\_88, Zitch\_90
- Track 17 : APunk\_88
- Track 18 : ViaConlectus\_87
- Track 19 : Nicole72\_64
- Track 20 : Megan\_63
- Track 21 : Matzah\_66, MementoMori\_65, Cressida\_67, Cinna\_64
- Track 22 : Kozie\_64
- Track 23 : Terij\_64
- Track 24 : Margaery\_63
- Track 25 : Mufasa8\_29
- Track 26 : Sonali\_32, Sunshine23\_32
- Track 27 : Maruru\_31
- Track 28 : Bolt007\_71
- Track 29 : Klevey\_74
- Track 30 : Prairie\_70
- Track 31 : Lilmac1015\_74, CalWood4100\_74

- Track 32 : Circuit\_68
- Track 33 : Nandito\_73
- Track 34 : JanetJ\_27
- Track 35 : NoSwimming\_30
- Track 36 : Scotia\_30
- Track 37 : Tonitrus\_59
- Track 38 : GMA4\_36
- Track 39 : Cantare\_50

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

The start number called the most often in the published annotations is 33, it was called in 54 of the 82 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amo99\_73, Arri\_86, Ashertheman\_84, Barb\_89, Baumdotcom\_83, Bizzy\_84, CherryCola\_85, Circuit\_68, ClamChowder\_88, Clawz\_72, ColdSoup\_73, CoveyB\_87, Danyall\_86, Derg\_77, DonTron\_72, Evamon\_86, Fireball\_89, Flatwoods\_84, Fugax\_89, Gaea\_85, Gezellig\_82, Grumio\_72, Gustavo\_86, Halo3\_85, JKSyngboy\_81, Jambalaya\_83, Jollymon\_72, KimmyK\_84, KingstonB\_73, Kroos\_84, Kwobi\_86, LilHam\_78, Makar\_73, Mutzi\_85, Nubi\_89, Phlop\_83, PinkCoffee\_87, Portcullis\_86, PullumCavea\_84, Purplicious\_71, Ribeye\_84, RogerDodger\_89, Salvador\_86, Saronaya\_86, Savbucketdawg\_81, SchottB\_83, Shinji\_85, SmokingBunny\_87, Soos\_68, Stillion\_72, Sting\_71, StorminNorm\_85, Tangerine\_84, TillyBobJoe\_84, Togo\_86, Twister6\_85, Tycho\_84, Valary\_87, VanDeWege\_88, Wizard\_81, YorkOnyx\_83, YungMoney\_85,

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

- Bakery\_90, Egi03\_84, Kozi\_64,

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

- APunk\_88, Belphegor\_82, BigHunkinEater\_88, Bolt007\_71, CalWood4100\_74, Cantare\_50, Cinna\_64, Cressida\_67, EMOore\_81, GMA4\_36, JanetJ\_27, Klevey\_74, Lilmac1015\_74, Margaery\_63, Maruru\_31, Matzah\_66, Megan\_63, MementoMori\_65, Mufasa8\_29, Nandito\_73, Nicole72\_64, NoSwimming\_30, Prairie\_70, Scotia\_30, Sonali\_32, Sunshine23\_32, Terij\_64, Tonitrus\_59, ViaConlectus\_87, Zitch\_90,

**Summary by start number:**

Start 27:

- Found in 1 of 95 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Tonitrus\_59 (singleton),

Start 31:

- Found in 4 of 95 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 82
- Called 100.0% of time when present

- Phage (with cluster) where this start called: APunk\_88 (DE4), BigHunkinEater\_88 (DE4), ViaConlectus\_87 (DE4), Zitch\_90 (DE4),

#### Start 32:

- Found in 2 of 95 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 2 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Belphegor\_82 (DE2), EMOore\_81 (DE2),

#### Start 33:

- Found in 65 of 95 ( 68.4% ) of genes in pham
- Manual Annotations of this start: 54 of 82
- Called 95.4% of time when present
- Phage (with cluster) where this start called: Amo99\_73 (CP), Arri\_86 (DC1), Ashertheman\_84 (DE1), Barb\_89 (DC1), Baumdotcom\_83 (DE1), Bizzy\_84 (DE1), CherryCola\_85 (DC1), Circuit\_68 (FH), ClamChowder\_88 (DC1), Clawz\_72 (CP), ColdSoup\_73 (CP), CoveyB\_87 (DC1), Danyall\_86 (DC1), Derg\_77 (DE1), DonTron\_72 (CP), Evamon\_86 (DC1), Fireball\_89 (DC1), Flatwoods\_84 (DE1), Fugax\_89 (DC1), Gaea\_85 (DE1), Gezellig\_82 (DC1), Grumio\_72 (CP), Gustavo\_86 (DE1), Halo3\_85 (DC1), JKSyngboy\_81 (DE1), Jambalaya\_83 (DC1), Jollymon\_72 (CP), KimmyK\_84 (DC1), KingstonB\_73 (CP), Kroos\_84 (DE1), Kwobi\_86 (DE1), LilHam\_78 (DE1), Makar\_73 (CP), Mutzi\_85 (DC1), Nubi\_89 (DC1), Phlop\_83 (DC1), PinkCoffee\_87 (DC1), Portcullis\_86 (DC1), PullumCavea\_84 (DC1), Purplicious\_71 (CP), Ribeye\_84 (DE1), RogerDodger\_89 (DC1), Salvador\_86 (DC1), Saronaya\_86 (DE1), Savbucketdawg\_81 (DC1), SchottB\_83 (DE1), Shinji\_85 (DC1), SmokingBunny\_87 (DC1), Soos\_68 (CP), Stillion\_72 (CP), Sting\_71 (CP), StorminNorm\_85 (DE1), Tangerine\_84 (DE1), TillyBobJoe\_84 (DC1), Togo\_86 (DC1), Twister6\_85 (DC1), Tycho\_84 (DE1), Valary\_87 (DC1), VanDeWege\_88 (DC1), Wizard\_81 (DC1), YorkOnyx\_83 (DE1), YungMoney\_85 (DC1),

#### Start 35:

- Found in 47 of 95 ( 49.5% ) of genes in pham
- Manual Annotations of this start: 14 of 82
- Called 34.0% of time when present
- Phage (with cluster) where this start called: Bakery\_90 (DC1), Bolt007\_71 (FH), CalWood4100\_74 (FH), Cinna\_64 (EI), Cressida\_67 (EI), Egi03\_84 (DC1), Klevey\_74 (FH), Kozie\_64 (EI), Lilmac1015\_74 (FH), Margaery\_63 (EI), Matzah\_66 (EI), MementoMori\_65 (EI), Nandito\_73 (FH), Nicole72\_64 (EC), Prairie\_70 (FH), Terij\_64 (EI),

#### Start 36:

- Found in 6 of 95 ( 6.3% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Cantare\_50 (singleton),

#### Start 37:

- Found in 1 of 95 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Megan\_63 (EC),

#### Start 39:

- Found in 34 of 95 ( 35.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 2.9% of time when present
- Phage (with cluster) where this start called: GMA4\_36 (singleton),

Start 42:

- Found in 3 of 95 ( 3.2% ) of genes in pham
- Manual Annotations of this start: 3 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: JanetJ\_27 (FO), NoSwimming\_30 (FO), Scotia\_30 (FO),

Start 44:

- Found in 4 of 95 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Maruru\_31 (FG), Mufasa8\_29 (FG), Sonali\_32 (FG), Sunshine23\_32 (FG),

### **Summary by clusters:**

There are 11 clusters represented in this pham: singleton, EI, DE1, DC1, DE4, EC, FG, FH, CP, DE2, FO,

Info for manual annotations of cluster CP:

- Start number 33 was manually annotated 5 times for cluster CP.

Info for manual annotations of cluster DC1:

- Start number 33 was manually annotated 30 times for cluster DC1.
- Start number 35 was manually annotated 2 times for cluster DC1.

Info for manual annotations of cluster DE1:

- Start number 33 was manually annotated 18 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 32 was manually annotated 2 times for cluster DE2.

Info for manual annotations of cluster DE4:

- Start number 31 was manually annotated 3 times for cluster DE4.

Info for manual annotations of cluster EC:

- Start number 35 was manually annotated 1 time for cluster EC.
- Start number 37 was manually annotated 1 time for cluster EC.

Info for manual annotations of cluster EI:

- Start number 35 was manually annotated 7 times for cluster EI.

Info for manual annotations of cluster FG:

- Start number 44 was manually annotated 3 times for cluster FG.

Info for manual annotations of cluster FH:

- Start number 33 was manually annotated 1 time for cluster FH.
- Start number 35 was manually annotated 4 times for cluster FH.

Info for manual annotations of cluster FO:

•Start number 42 was manually annotated 3 times for cluster FO.

**Gene Information:**

Gene: APunk\_88 Start: 58714, Stop: 58983, Start Num: 31

Candidate Starts for APunk\_88:

(25, 58669), (Start: 31 @58714 has 3 MA's), (Start: 36 @58732 has 1 MA's), (47, 58783), (60, 58861),

Gene: Amo99\_73 Start: 48277, Stop: 48501, Start Num: 33

Candidate Starts for Amo99\_73:

(Start: 33 @48277 has 54 MA's), (52, 48349), (53, 48355), (57, 48391), (61, 48415), (62, 48424), (70, 48493),

Gene: Arri\_86 Start: 56263, Stop: 56015, Start Num: 33

Candidate Starts for Arri\_86:

(7, 56575), (10, 56497), (12, 56476), (20, 56404), (30, 56290), (Start: 33 @56263 has 54 MA's), (Start: 35 @56254 has 14 MA's), (39, 56236), (54, 56179), (65, 56104), (69, 56056),

Gene: Ashertheman\_84 Start: 56563, Stop: 56823, Start Num: 33

Candidate Starts for Ashertheman\_84:

(Start: 33 @56563 has 54 MA's), (47, 56626), (60, 56707), (68, 56746),

Gene: Bakery\_90 Start: 58633, Stop: 58391, Start Num: 35

Candidate Starts for Bakery\_90:

(2, 59074), (9, 58915), (15, 58846), (17, 58822), (18, 58819), (29, 58666), (Start: 33 @58639 has 54 MA's), (34, 58636), (Start: 35 @58633 has 14 MA's), (39, 58615), (54, 58558), (69, 58435),

Gene: Barb\_89 Start: 56790, Stop: 56539, Start Num: 33

Candidate Starts for Barb\_89:

(5, 57147), (8, 57120), (11, 57021), (13, 56997), (14, 56994), (20, 56931), (30, 56817), (Start: 33 @56790 has 54 MA's), (Start: 35 @56781 has 14 MA's), (39, 56763), (54, 56706), (65, 56631), (69, 56583),

Gene: Baumdotcom\_83 Start: 56963, Stop: 57223, Start Num: 33

Candidate Starts for Baumdotcom\_83:

(Start: 33 @56963 has 54 MA's), (47, 57026), (60, 57107), (68, 57146),

Gene: Belphegor\_82 Start: 58991, Stop: 59245, Start Num: 32

Candidate Starts for Belphegor\_82:

(Start: 32 @58991 has 2 MA's), (47, 59057), (60, 59135), (67, 59168),

Gene: BigHunkinEater\_88 Start: 58349, Stop: 58618, Start Num: 31

Candidate Starts for BigHunkinEater\_88:

(Start: 31 @58349 has 3 MA's), (Start: 36 @58367 has 1 MA's), (47, 58418), (60, 58496),

Gene: Bizzy\_84 Start: 56320, Stop: 56580, Start Num: 33

Candidate Starts for Bizzy\_84:

(Start: 33 @56320 has 54 MA's), (47, 56383), (60, 56464), (68, 56503),

Gene: Bolt007\_71 Start: 45075, Stop: 44833, Start Num: 35  
Candidate Starts for Bolt007\_71:  
(Start: 35 @45075 has 14 MA's),

Gene: CalWood4100\_74 Start: 45377, Stop: 45132, Start Num: 35  
Candidate Starts for CalWood4100\_74:  
(23, 45521), (Start: 35 @45377 has 14 MA's),

Gene: Cantare\_50 Start: 45879, Stop: 46109, Start Num: 36  
Candidate Starts for Cantare\_50:  
(Start: 36 @45879 has 1 MA's), (49, 45933), (50, 45936), (52, 45942),

Gene: CherryCola\_85 Start: 56676, Stop: 56428, Start Num: 33  
Candidate Starts for CherryCola\_85:  
(7, 56988), (10, 56910), (12, 56889), (20, 56817), (30, 56703), (Start: 33 @56676 has 54 MA's), (Start: 35 @56667 has 14 MA's), (39, 56649), (54, 56592), (65, 56517), (69, 56469),

Gene: Cinna\_64 Start: 43061, Stop: 43273, Start Num: 35  
Candidate Starts for Cinna\_64:  
(Start: 35 @43061 has 14 MA's), (43, 43103), (60, 43190), (68, 43226),

Gene: Circuit\_68 Start: 44623, Stop: 44378, Start Num: 33  
Candidate Starts for Circuit\_68:  
(16, 44824), (19, 44797), (Start: 33 @44623 has 54 MA's), (69, 44425),

Gene: ClamChowder\_88 Start: 56790, Stop: 56539, Start Num: 33  
Candidate Starts for ClamChowder\_88:  
(5, 57147), (8, 57120), (11, 57021), (13, 56997), (14, 56994), (20, 56931), (30, 56817), (Start: 33 @56790 has 54 MA's), (Start: 35 @56781 has 14 MA's), (39, 56763), (54, 56706), (65, 56631), (69, 56583),

Gene: Clawz\_72 Start: 48155, Stop: 48379, Start Num: 33  
Candidate Starts for Clawz\_72:  
(26, 48107), (Start: 33 @48155 has 54 MA's), (52, 48227), (53, 48233), (55, 48251), (56, 48254), (57, 48269), (61, 48293), (70, 48371),

Gene: ColdSoup\_73 Start: 48358, Stop: 48582, Start Num: 33  
Candidate Starts for ColdSoup\_73:  
(Start: 33 @48358 has 54 MA's), (52, 48430), (53, 48436), (57, 48472), (61, 48496), (62, 48505), (70, 48574),

Gene: CoveyB\_87 Start: 56277, Stop: 56026, Start Num: 33  
Candidate Starts for CoveyB\_87:  
(5, 56634), (8, 56607), (11, 56508), (13, 56484), (14, 56481), (20, 56418), (30, 56304), (Start: 33 @56277 has 54 MA's), (Start: 35 @56268 has 14 MA's), (39, 56250), (54, 56193), (65, 56118), (69, 56070),

Gene: Cressida\_67 Start: 42667, Stop: 42879, Start Num: 35  
Candidate Starts for Cressida\_67:  
(Start: 35 @42667 has 14 MA's), (43, 42709), (60, 42796), (68, 42832),

Gene: Danyall\_86 Start: 55971, Stop: 55720, Start Num: 33  
Candidate Starts for Danyall\_86:

(5, 56328), (8, 56301), (11, 56202), (13, 56178), (14, 56175), (20, 56112), (30, 55998), (Start: 33 @55971 has 54 MA's), (Start: 35 @55962 has 14 MA's), (39, 55944), (54, 55887), (65, 55812), (69, 55764),

Gene: Derg\_77 Start: 55217, Stop: 55477, Start Num: 33  
Candidate Starts for Derg\_77:  
(Start: 33 @55217 has 54 MA's), (47, 55280), (60, 55361), (68, 55400),

Gene: DonTron\_72 Start: 48395, Stop: 48619, Start Num: 33  
Candidate Starts for DonTron\_72:  
(Start: 33 @48395 has 54 MA's), (52, 48467), (53, 48473), (57, 48509), (61, 48533), (62, 48542), (70, 48611),

Gene: EMoore\_81 Start: 58164, Stop: 58421, Start Num: 32  
Candidate Starts for EMoore\_81:  
(Start: 32 @58164 has 2 MA's), (Start: 36 @58179 has 1 MA's), (47, 58230), (60, 58308), (67, 58341),

Gene: Egi03\_84 Start: 55689, Stop: 55450, Start Num: 35  
Candidate Starts for Egi03\_84:  
(7, 56010), (10, 55932), (12, 55911), (20, 55839), (30, 55725), (Start: 33 @55698 has 54 MA's), (Start: 35 @55689 has 14 MA's), (39, 55671), (54, 55614), (65, 55539), (69, 55491),

Gene: Evamon\_86 Start: 56075, Stop: 55827, Start Num: 33  
Candidate Starts for Evamon\_86:  
(7, 56387), (10, 56309), (20, 56216), (30, 56102), (Start: 33 @56075 has 54 MA's), (Start: 35 @56066 has 14 MA's), (39, 56048), (54, 55991), (65, 55916), (69, 55868),

Gene: Fireball\_89 Start: 56537, Stop: 56289, Start Num: 33  
Candidate Starts for Fireball\_89:  
(7, 56849), (10, 56771), (12, 56750), (20, 56678), (30, 56564), (Start: 33 @56537 has 54 MA's), (Start: 35 @56528 has 14 MA's), (39, 56510), (54, 56453), (65, 56378), (69, 56330),

Gene: Flatwoods\_84 Start: 56131, Stop: 56391, Start Num: 33  
Candidate Starts for Flatwoods\_84:  
(Start: 33 @56131 has 54 MA's), (47, 56194), (60, 56275), (68, 56314),

Gene: Fugax\_89 Start: 56782, Stop: 56531, Start Num: 33  
Candidate Starts for Fugax\_89:  
(5, 57139), (8, 57112), (11, 57013), (13, 56989), (14, 56986), (20, 56923), (30, 56809), (Start: 33 @56782 has 54 MA's), (Start: 35 @56773 has 14 MA's), (39, 56755), (54, 56698), (65, 56623), (69, 56575),

Gene: GMA4\_36 Start: 29103, Stop: 29303, Start Num: 39  
Candidate Starts for GMA4\_36:  
(24, 28944), (39, 29103), (59, 29199),

Gene: Gaea\_85 Start: 56481, Stop: 56741, Start Num: 33  
Candidate Starts for Gaea\_85:  
(Start: 33 @56481 has 54 MA's), (47, 56544), (60, 56625),

Gene: Gezellig\_82 Start: 55921, Stop: 55673, Start Num: 33  
Candidate Starts for Gezellig\_82:

(7, 56233), (10, 56155), (12, 56134), (20, 56062), (30, 55948), (Start: 33 @55921 has 54 MA's), (Start: 35 @55912 has 14 MA's), (39, 55894), (54, 55837), (65, 55762), (69, 55714),

Gene: Grumio\_72 Start: 47836, Stop: 48060, Start Num: 33

Candidate Starts for Grumio\_72:

(Start: 33 @47836 has 54 MA's), (52, 47908), (53, 47914), (57, 47950), (61, 47974), (62, 47983), (70, 48052),

Gene: Gustavo\_86 Start: 57313, Stop: 57573, Start Num: 33

Candidate Starts for Gustavo\_86:

(Start: 33 @57313 has 54 MA's), (47, 57376), (60, 57457),

Gene: Halo3\_85 Start: 56796, Stop: 56545, Start Num: 33

Candidate Starts for Halo3\_85:

(7, 57108), (10, 57030), (20, 56937), (30, 56823), (Start: 33 @56796 has 54 MA's), (Start: 35 @56787 has 14 MA's), (39, 56769), (54, 56712), (65, 56637), (69, 56589),

Gene: JKSyngboy\_81 Start: 56985, Stop: 57245, Start Num: 33

Candidate Starts for JKSyngboy\_81:

(Start: 33 @56985 has 54 MA's), (47, 57048), (60, 57129), (68, 57168),

Gene: Jambalaya\_83 Start: 55378, Stop: 55127, Start Num: 33

Candidate Starts for Jambalaya\_83:

(3, 55774), (10, 55612), (20, 55519), (30, 55405), (Start: 33 @55378 has 54 MA's), (Start: 35 @55369 has 14 MA's), (38, 55354), (39, 55351), (54, 55294), (62, 55228), (65, 55219), (69, 55171),

Gene: JanetJ\_27 Start: 24007, Stop: 23804, Start Num: 42

Candidate Starts for JanetJ\_27:

(Start: 42 @24007 has 3 MA's),

Gene: Jollymon\_72 Start: 48358, Stop: 48582, Start Num: 33

Candidate Starts for Jollymon\_72:

(Start: 33 @48358 has 54 MA's), (52, 48430), (53, 48436), (57, 48472), (61, 48496), (62, 48505), (70, 48574),

Gene: KimmyK\_84 Start: 56368, Stop: 56120, Start Num: 33

Candidate Starts for KimmyK\_84:

(7, 56680), (10, 56602), (12, 56581), (20, 56509), (30, 56395), (Start: 33 @56368 has 54 MA's), (Start: 35 @56359 has 14 MA's), (39, 56341), (54, 56284), (65, 56209), (69, 56161),

Gene: KingstonB\_73 Start: 47833, Stop: 48057, Start Num: 33

Candidate Starts for KingstonB\_73:

(Start: 33 @47833 has 54 MA's), (52, 47905), (53, 47911), (57, 47947), (61, 47971), (62, 47980), (70, 48049),

Gene: Klevey\_74 Start: 45284, Stop: 45039, Start Num: 35

Candidate Starts for Klevey\_74:

(23, 45428), (Start: 35 @45284 has 14 MA's),

Gene: Kozie\_64 Start: 42302, Stop: 42514, Start Num: 35

Candidate Starts for Kozie\_64:

(Start: 33 @42293 has 54 MA's), (Start: 35 @42302 has 14 MA's), (43, 42344), (60, 42431),

Gene: Kroos\_84 Start: 56981, Stop: 57241, Start Num: 33  
Candidate Starts for Kroos\_84:  
(Start: 33 @56981 has 54 MA's), (47, 57044), (60, 57125), (68, 57164),

Gene: Kwobi\_86 Start: 57490, Stop: 57750, Start Num: 33  
Candidate Starts for Kwobi\_86:  
(Start: 33 @57490 has 54 MA's), (47, 57553), (60, 57634), (68, 57673),

Gene: LilHam\_78 Start: 54602, Stop: 54862, Start Num: 33  
Candidate Starts for LilHam\_78:  
(Start: 33 @54602 has 54 MA's), (47, 54665), (60, 54746), (68, 54785),

Gene: Lilmac1015\_74 Start: 45377, Stop: 45132, Start Num: 35  
Candidate Starts for Lilmac1015\_74:  
(23, 45521), (Start: 35 @45377 has 14 MA's),

Gene: Makar\_73 Start: 48182, Stop: 48406, Start Num: 33  
Candidate Starts for Makar\_73:  
(26, 48134), (Start: 33 @48182 has 54 MA's), (52, 48254), (53, 48260), (55, 48278), (56, 48281), (57, 48296), (61, 48320), (70, 48398),

Gene: Margaery\_63 Start: 42267, Stop: 42482, Start Num: 35  
Candidate Starts for Margaery\_63:  
(Start: 35 @42267 has 14 MA's), (45, 42309), (53, 42336), (59, 42381), (60, 42396),

Gene: Maruru\_31 Start: 29698, Stop: 29486, Start Num: 44  
Candidate Starts for Maruru\_31:  
(21, 29905), (40, 29716), (Start: 44 @29698 has 3 MA's),

Gene: Matzah\_66 Start: 43128, Stop: 43340, Start Num: 35  
Candidate Starts for Matzah\_66:  
(Start: 35 @43128 has 14 MA's), (43, 43170), (60, 43257), (68, 43293),

Gene: Megan\_63 Start: 45613, Stop: 45837, Start Num: 37  
Candidate Starts for Megan\_63:  
(28, 45556), (Start: 37 @45613 has 1 MA's), (48, 45652), (51, 45661), (64, 45739), (71, 45814),

Gene: MementoMori\_65 Start: 42723, Stop: 42935, Start Num: 35  
Candidate Starts for MementoMori\_65:  
(Start: 35 @42723 has 14 MA's), (43, 42765), (60, 42852), (68, 42888),

Gene: Mufasa8\_29 Start: 27032, Stop: 26823, Start Num: 44  
Candidate Starts for Mufasa8\_29:  
(Start: 44 @27032 has 3 MA's),

Gene: Mutzi\_85 Start: 56931, Stop: 56680, Start Num: 33  
Candidate Starts for Mutzi\_85:  
(5, 57288), (8, 57261), (11, 57162), (13, 57138), (14, 57135), (20, 57072), (30, 56958), (Start: 33 @56931 has 54 MA's), (Start: 35 @56922 has 14 MA's), (39, 56904), (54, 56847), (65, 56772), (69, 56724),

Gene: Nandito\_73 Start: 45609, Stop: 45370, Start Num: 35  
Candidate Starts for Nandito\_73:

(1, 46188), (4, 45990), (Start: 35 @45609 has 14 MA's),

Gene: Nicole72\_64 Start: 46099, Stop: 46344, Start Num: 35

Candidate Starts for Nicole72\_64:

(Start: 35 @46099 has 14 MA's), (41, 46132), (59, 46213), (60, 46228), (72, 46330),

Gene: NoSwimming\_30 Start: 25642, Stop: 25406, Start Num: 42

Candidate Starts for NoSwimming\_30:

(Start: 42 @25642 has 3 MA's),

Gene: Nubi\_89 Start: 56334, Stop: 56083, Start Num: 33

Candidate Starts for Nubi\_89:

(6, 56661), (7, 56646), (10, 56568), (20, 56475), (30, 56361), (Start: 33 @56334 has 54 MA's), (Start: 35 @56325 has 14 MA's), (39, 56307), (54, 56250), (65, 56175), (69, 56127),

Gene: Phlop\_83 Start: 55971, Stop: 55723, Start Num: 33

Candidate Starts for Phlop\_83:

(7, 56283), (10, 56205), (12, 56184), (20, 56112), (30, 55998), (Start: 33 @55971 has 54 MA's), (Start: 35 @55962 has 14 MA's), (39, 55944), (54, 55887), (65, 55812), (69, 55764),

Gene: PinkCoffee\_87 Start: 55835, Stop: 55587, Start Num: 33

Candidate Starts for PinkCoffee\_87:

(5, 56192), (8, 56165), (11, 56066), (13, 56042), (14, 56039), (20, 55976), (30, 55862), (Start: 33 @55835 has 54 MA's), (Start: 35 @55826 has 14 MA's), (39, 55808), (54, 55751), (65, 55676), (69, 55628),

Gene: Portcullis\_86 Start: 55977, Stop: 55729, Start Num: 33

Candidate Starts for Portcullis\_86:

(7, 56289), (10, 56211), (12, 56190), (20, 56118), (30, 56004), (Start: 33 @55977 has 54 MA's), (Start: 35 @55968 has 14 MA's), (39, 55950), (54, 55893), (65, 55818), (69, 55770),

Gene: Prairie\_70 Start: 44683, Stop: 44438, Start Num: 35

Candidate Starts for Prairie\_70:

(23, 44827), (Start: 35 @44683 has 14 MA's), (68, 44518),

Gene: PullumCavea\_84 Start: 56148, Stop: 55900, Start Num: 33

Candidate Starts for PullumCavea\_84:

(7, 56460), (10, 56382), (12, 56361), (20, 56289), (30, 56175), (Start: 33 @56148 has 54 MA's), (Start: 35 @56139 has 14 MA's), (39, 56121), (54, 56064), (65, 55989), (69, 55941),

Gene: Purplicious\_71 Start: 47601, Stop: 47825, Start Num: 33

Candidate Starts for Purplicious\_71:

(Start: 33 @47601 has 54 MA's), (52, 47673), (53, 47679), (57, 47715), (61, 47739), (62, 47748), (70, 47817),

Gene: Ribeye\_84 Start: 56456, Stop: 56716, Start Num: 33

Candidate Starts for Ribeye\_84:

(Start: 33 @56456 has 54 MA's), (47, 56519), (60, 56600), (68, 56639),

Gene: RogerDodger\_89 Start: 56736, Stop: 56488, Start Num: 33

Candidate Starts for RogerDodger\_89:

(7, 57048), (10, 56970), (12, 56949), (20, 56877), (30, 56763), (Start: 33 @56736 has 54 MA's), (Start: 35 @56727 has 14 MA's), (39, 56709), (54, 56652), (65, 56577), (69, 56529),

Gene: Salvador\_86 Start: 56073, Stop: 55825, Start Num: 33

Candidate Starts for Salvador\_86:

(7, 56385), (10, 56307), (20, 56214), (30, 56100), (Start: 33 @56073 has 54 MA's), (Start: 35 @56064 has 14 MA's), (39, 56046), (54, 55989), (65, 55914), (69, 55866),

Gene: Saronaya\_86 Start: 57313, Stop: 57573, Start Num: 33

Candidate Starts for Saronaya\_86:

(Start: 33 @57313 has 54 MA's), (47, 57376), (60, 57457),

Gene: Savbucketdawg\_81 Start: 55415, Stop: 55167, Start Num: 33

Candidate Starts for Savbucketdawg\_81:

(7, 55727), (10, 55649), (12, 55628), (20, 55556), (30, 55442), (Start: 33 @55415 has 54 MA's), (Start: 35 @55406 has 14 MA's), (39, 55388), (54, 55331), (65, 55256), (69, 55208),

Gene: SchottB\_83 Start: 57376, Stop: 57636, Start Num: 33

Candidate Starts for SchottB\_83:

(Start: 33 @57376 has 54 MA's), (47, 57439), (60, 57520), (68, 57559),

Gene: Scotia\_30 Start: 25627, Stop: 25391, Start Num: 42

Candidate Starts for Scotia\_30:

(22, 25822), (Start: 42 @25627 has 3 MA's),

Gene: Shinji\_85 Start: 56154, Stop: 55906, Start Num: 33

Candidate Starts for Shinji\_85:

(7, 56466), (10, 56388), (12, 56367), (20, 56295), (30, 56181), (Start: 33 @56154 has 54 MA's), (Start: 35 @56145 has 14 MA's), (39, 56127), (54, 56070), (65, 55995), (69, 55947),

Gene: SmokingBunny\_87 Start: 57069, Stop: 56821, Start Num: 33

Candidate Starts for SmokingBunny\_87:

(7, 57381), (10, 57303), (20, 57210), (30, 57096), (Start: 33 @57069 has 54 MA's), (Start: 35 @57060 has 14 MA's), (39, 57042), (54, 56985), (65, 56910), (69, 56862),

Gene: Sonali\_32 Start: 30335, Stop: 30120, Start Num: 44

Candidate Starts for Sonali\_32:

(Start: 44 @30335 has 3 MA's),

Gene: Soos\_68 Start: 47562, Stop: 47786, Start Num: 33

Candidate Starts for Soos\_68:

(Start: 33 @47562 has 54 MA's), (52, 47634), (53, 47640), (57, 47676), (61, 47700), (62, 47709), (70, 47778),

Gene: Stillion\_72 Start: 48159, Stop: 48383, Start Num: 33

Candidate Starts for Stillion\_72:

(Start: 33 @48159 has 54 MA's), (52, 48231), (53, 48237), (57, 48273), (61, 48297), (62, 48306), (70, 48375),

Gene: Sting\_71 Start: 48001, Stop: 48225, Start Num: 33

Candidate Starts for Sting\_71:

(Start: 33 @48001 has 54 MA's), (49, 48064), (52, 48073), (53, 48079), (57, 48115), (61, 48139), (62, 48148), (70, 48217),

Gene: StorminNorm\_85 Start: 57257, Stop: 57517, Start Num: 33

Candidate Starts for StorminNorm\_85:  
(Start: 33 @57257 has 54 MA's), (47, 57320), (60, 57401),

Gene: Sunshine23\_32 Start: 29942, Stop: 29730, Start Num: 44  
Candidate Starts for Sunshine23\_32:  
(Start: 44 @29942 has 3 MA's),

Gene: Tangerine\_84 Start: 56314, Stop: 56574, Start Num: 33  
Candidate Starts for Tangerine\_84:  
(Start: 33 @56314 has 54 MA's), (47, 56377), (60, 56458), (68, 56497),

Gene: Terij\_64 Start: 41499, Stop: 41717, Start Num: 35  
Candidate Starts for Terij\_64:  
(Start: 35 @41499 has 14 MA's), (43, 41541), (45, 41544), (53, 41571), (60, 41631), (63, 41646),

Gene: TillyBobJoe\_84 Start: 55955, Stop: 55707, Start Num: 33  
Candidate Starts for TillyBobJoe\_84:  
(5, 56312), (8, 56285), (11, 56186), (13, 56162), (14, 56159), (20, 56096), (30, 55982), (Start: 33 @55955 has 54 MA's), (Start: 35 @55946 has 14 MA's), (39, 55928), (54, 55871), (65, 55796), (69, 55748),

Gene: Togo\_86 Start: 57069, Stop: 56821, Start Num: 33  
Candidate Starts for Togo\_86:  
(7, 57381), (10, 57303), (20, 57210), (30, 57096), (Start: 33 @57069 has 54 MA's), (Start: 35 @57060 has 14 MA's), (39, 57042), (54, 56985), (65, 56910), (69, 56862),

Gene: Tonitrus\_59 Start: 44270, Stop: 44503, Start Num: 27  
Candidate Starts for Tonitrus\_59:  
(Start: 27 @44270 has 1 MA's), (46, 44363), (49, 44369), (58, 44423), (66, 44465),

Gene: Twister6\_85 Start: 55418, Stop: 55170, Start Num: 33  
Candidate Starts for Twister6\_85:  
(7, 55730), (10, 55652), (12, 55631), (20, 55559), (30, 55445), (Start: 33 @55418 has 54 MA's), (Start: 35 @55409 has 14 MA's), (39, 55391), (54, 55334), (65, 55259), (69, 55211),

Gene: Tycho\_84 Start: 56791, Stop: 57051, Start Num: 33  
Candidate Starts for Tycho\_84:  
(Start: 33 @56791 has 54 MA's), (47, 56854), (60, 56935), (68, 56974),

Gene: Valary\_87 Start: 57061, Stop: 56813, Start Num: 33  
Candidate Starts for Valary\_87:  
(7, 57373), (10, 57295), (12, 57274), (20, 57202), (30, 57088), (Start: 33 @57061 has 54 MA's), (Start: 35 @57052 has 14 MA's), (39, 57034), (54, 56977), (65, 56902), (69, 56854),

Gene: VanDeWege\_88 Start: 56586, Stop: 56338, Start Num: 33  
Candidate Starts for VanDeWege\_88:  
(7, 56898), (10, 56820), (12, 56799), (20, 56727), (30, 56613), (Start: 33 @56586 has 54 MA's), (Start: 35 @56577 has 14 MA's), (39, 56559), (54, 56502), (65, 56427), (69, 56379),

Gene: ViaConlectus\_87 Start: 57801, Stop: 58070, Start Num: 31  
Candidate Starts for ViaConlectus\_87:  
(25, 57756), (Start: 31 @57801 has 3 MA's), (Start: 36 @57819 has 1 MA's), (47, 57870), (60, 57948),

Gene: Wizard\_81 Start: 55921, Stop: 55673, Start Num: 33

Candidate Starts for Wizard\_81:

(7, 56233), (10, 56155), (12, 56134), (20, 56062), (30, 55948), (Start: 33 @55921 has 54 MA's), (Start: 35 @55912 has 14 MA's), (39, 55894), (54, 55837), (65, 55762), (69, 55714),

Gene: YorkOnyx\_83 Start: 56426, Stop: 56686, Start Num: 33

Candidate Starts for YorkOnyx\_83:

(Start: 33 @56426 has 54 MA's), (47, 56489), (60, 56570), (68, 56609),

Gene: YungMoney\_85 Start: 57771, Stop: 57520, Start Num: 33

Candidate Starts for YungMoney\_85:

(5, 58128), (8, 58101), (11, 58002), (13, 57978), (14, 57975), (20, 57912), (30, 57798), (Start: 33 @57771 has 54 MA's), (Start: 35 @57762 has 14 MA's), (39, 57744), (54, 57687), (65, 57612), (69, 57564),

Gene: Zitch\_90 Start: 58345, Stop: 58614, Start Num: 31

Candidate Starts for Zitch\_90:

(Start: 31 @58345 has 3 MA's), (Start: 36 @58363 has 1 MA's), (47, 58414), (60, 58492),