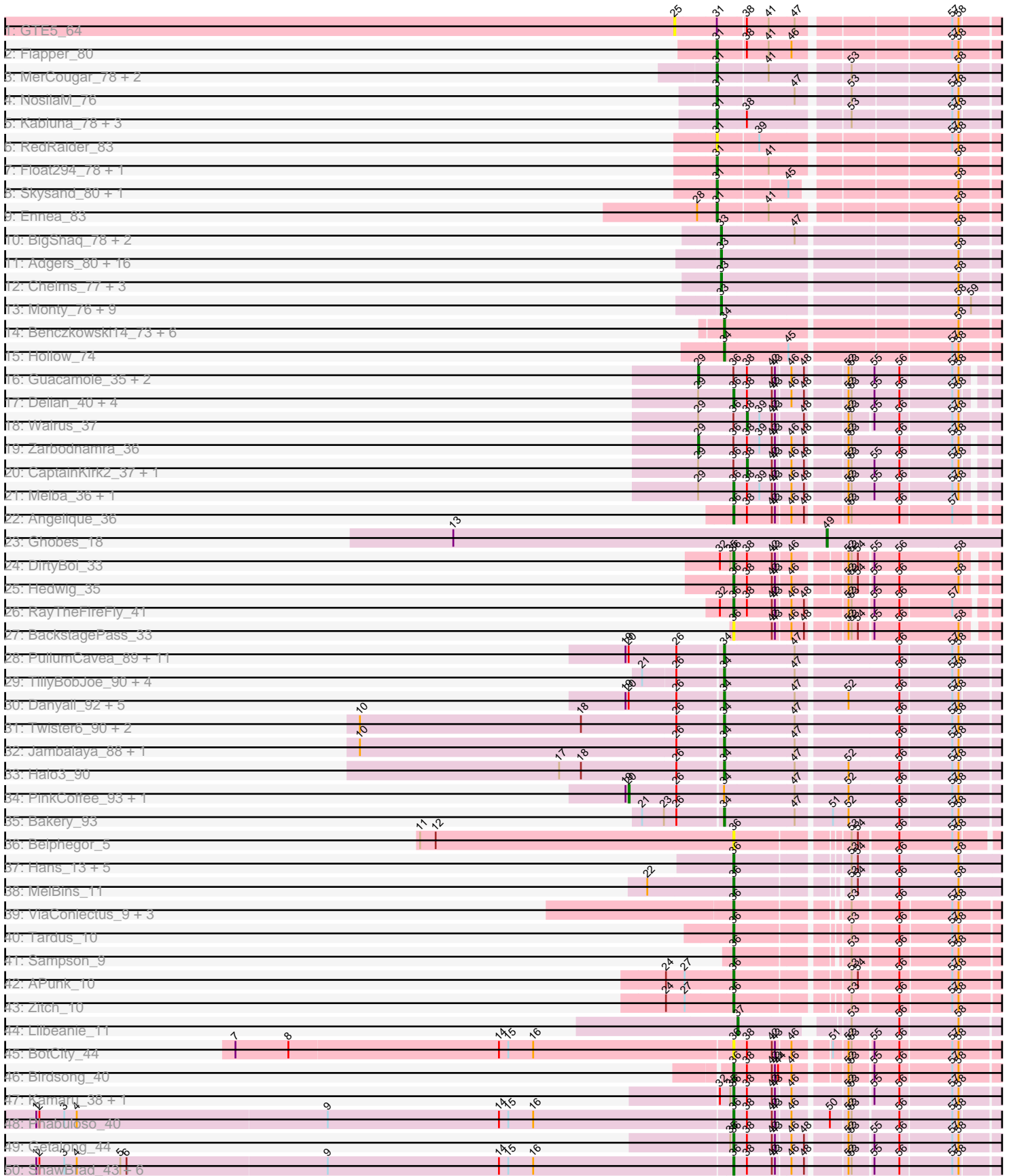
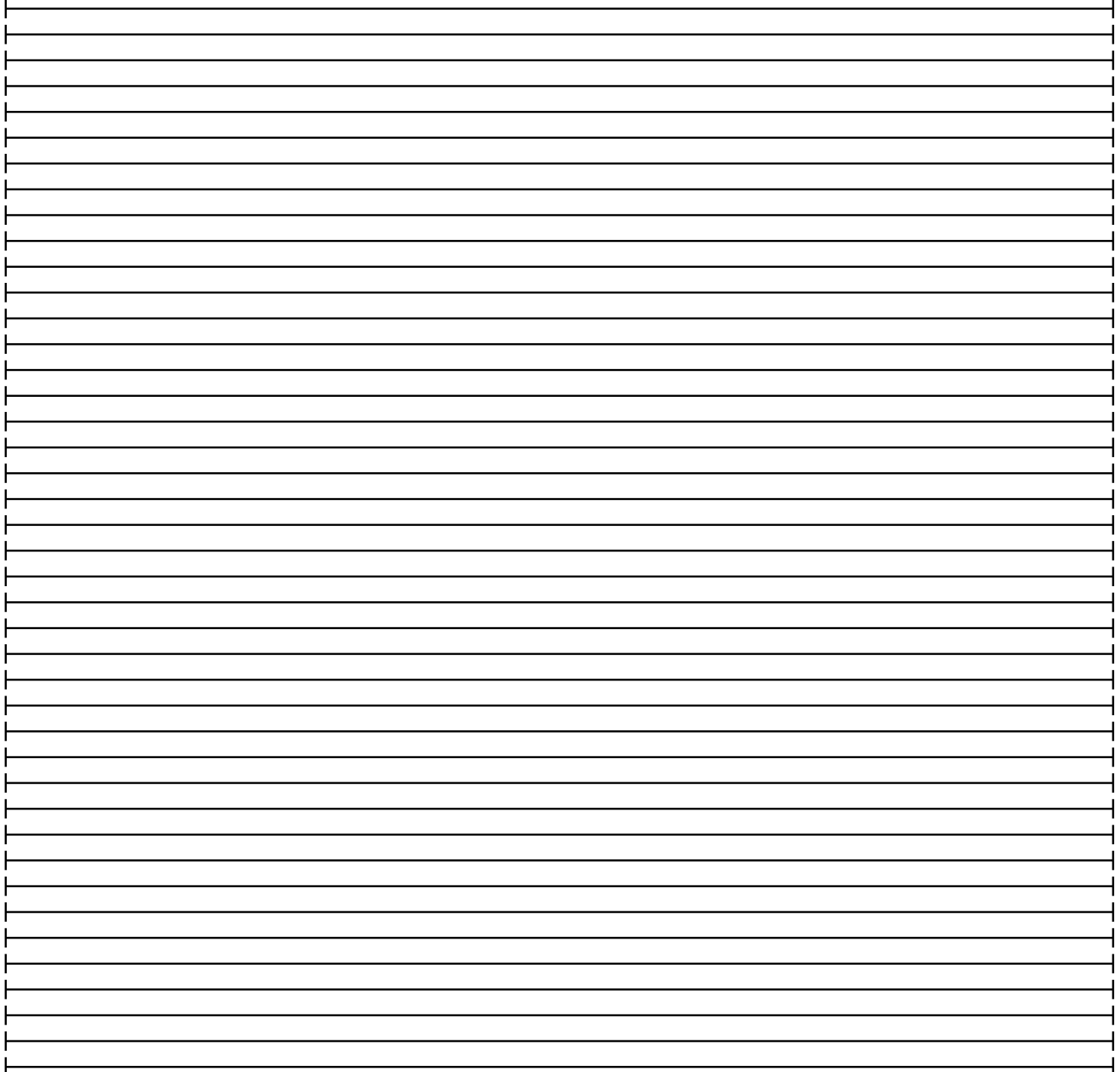
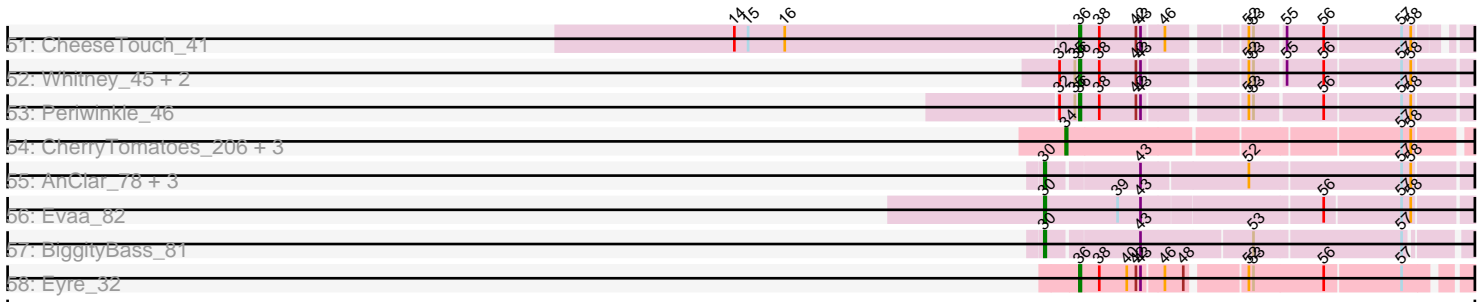


Pham 215902



# Pham 215902



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 215902 Report

This analysis was run 02/22/25 on database version 588.

Pham number 215902 has 156 members, 22 are drafts.

Phages represented in each track:

- Track 1 : GTE5\_64
- Track 2 : Flapper\_80
- Track 3 : MerCougar\_78, Outis\_76, StarStruck\_76
- Track 4 : NosilaM\_76
- Track 5 : Kabluna\_78, SuperSulley\_77, Buggaboo\_77, Bonum\_79
- Track 6 : RedRaider\_83
- Track 7 : Float294\_78, Lollipop1437\_79
- Track 8 : Skysand\_80, Patio\_78
- Track 9 : Ennea\_83
- Track 10 : BigShaq\_78, BenoitCattle\_77, Crete\_77
- Track 11 : Adgers\_80, Sombrero\_78, BirksAndSocks\_81, Sam12\_76, Exiguo\_76, Gorko\_76, Butterball\_79, Poland\_81, Beaver\_80, Jellybones\_78, FelixAlejandro\_81, Msay19\_81, Worcestershire\_76, Squibbles\_76, Boneham\_80, CinnamonToast\_81, RemRem\_78
- Track 12 : Chelms\_77, Linetti\_77, Dakiti\_78, PierreThree\_76
- Track 13 : Monty\_76, CathyBurgh\_76, Barbochs\_76, Hotorobo\_77, Breezic\_77, John316\_80, Flakey\_76, Ekhein\_77, Lizzo\_77, GourdThymes\_77
- Track 14 : Benczkowski14\_73, Niagara\_73, Kvothe\_72, Katyusha\_72, Tredge\_73, Teech\_71, Teatealatte\_74
- Track 15 : Hollow\_74
- Track 16 : Guacamole\_35, Hitter\_38, MintFen\_37
- Track 17 : Delian\_40, Mellie\_34, JasperJr\_35, Obliviate\_33, PhrostedPhlake\_40
- Track 18 : Walrus\_37
- Track 19 : Zarbodnamra\_36
- Track 20 : CaptainKirk2\_37, UmaThurman\_32
- Track 21 : Melba\_36, BlingBling\_34
- Track 22 : Angelique\_36
- Track 23 : Ghobes\_18
- Track 24 : DirtyBoi\_33
- Track 25 : Hedwig\_35
- Track 26 : RayTheFireFly\_41
- Track 27 : BackstagePass\_33
- Track 28 : PullumCavea\_89, Wizard\_86, Fireball\_94, Arri\_91, Gezellig\_90, Phlop\_88, CherryCola\_91, KimmyK\_89, Valary\_92, Portcullis\_91, Shinji\_90, Egi03\_90
- Track 29 : TillyBobJoe\_90, SmokingBunny\_92, Salvador\_91, Evamon\_91, Togo\_91
- Track 30 : Danyall\_92, YungMoney\_91, CoveyB\_93, Nubi\_94, Mutzi\_91, Barb\_95

- Track 31 : Twister6\_90, VanDeWege\_93, RogerDodger\_94
- Track 32 : Jambalaya\_88, Savbucketdawg\_86
- Track 33 : Halo3\_90
- Track 34 : PinkCoffee\_93, ClamChowder\_94
- Track 35 : Bakery\_93
- Track 36 : Belphegor\_5
- Track 37 : Hans\_13, Phauci\_4, Ali17\_9, Phinally\_11, Leonard\_11, Inspectinfecti\_12
- Track 38 : MelBins\_11
- Track 39 : ViaConlectus\_9, Scioto\_9, Natkenzie\_9, Abblin\_9
- Track 40 : Tardus\_10
- Track 41 : Sampson\_9
- Track 42 : APunk\_10
- Track 43 : Zitch\_10
- Track 44 : Lilbeanie\_11
- Track 45 : BotCity\_44
- Track 46 : Birdsong\_40
- Track 47 : Kamaru\_38, LitninMcQueen\_37
- Track 48 : Phabuloso\_40
- Track 49 : Getalong\_44
- Track 50 : ShawBrad\_43, Frickyeah\_43, Holliday\_42, Phistory\_43, Lutum\_43, Kenna\_42, Crater\_40
- Track 51 : CheeseTouch\_41
- Track 52 : Whitney\_45, Budski\_42, BENtherdunthat\_42
- Track 53 : Periwinkle\_46
- Track 54 : CherryTomatoes\_206, Pupper\_204, SCentae\_203, Skog\_33
- Track 55 : AnClar\_78, Sisko\_81, LittleMunchkin\_81, Yago84\_80
- Track 56 : Evaa\_82
- Track 57 : BiggityBass\_81
- Track 58 : Eyre\_32

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

The start number called the most often in the published annotations is 36, it was called in 39 of the 134 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• APunk\_10, Abblin\_9, Ali17\_9, Angelique\_36, BENtherdunthat\_42, BackstagePass\_33, Belphegor\_5, Birdsong\_40, BlingBling\_34, BotCity\_44, Budski\_42, CheeseTouch\_41, Crater\_40, Delian\_40, DirtyBoi\_33, Eyre\_32, Frickyeah\_43, Getalong\_44, Hans\_13, Hedwig\_35, Holliday\_42, Inspectinfecti\_12, JasperJr\_35, Kamaru\_38, Kenna\_42, Leonard\_11, LitninMcQueen\_37, Lutum\_43, MelBins\_11, Melba\_36, Mellie\_34, Natkenzie\_9, Obliviate\_33, Periwinkle\_46, Phabuloso\_40, Phauci\_4, Phinally\_11, Phistory\_43, PhrostedPhlake\_40, RayTheFireFly\_41, Sampson\_9, Scioto\_9, ShawBrad\_43, Tardus\_10, ViaConlectus\_9, Whitney\_45, Zitch\_10,

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

• CaptainKirk2\_37, Guacamole\_35, Hitter\_38, MintFen\_37, UmaThurman\_32, Walrus\_37, Zarbodnamra\_36,

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

- Adgers\_80, AnClar\_78, Arri\_91, Bakery\_93, Barb\_95, Barbochs\_76, Beaver\_80, Benczkowski14\_73, BenoitCattle\_77, BigShaq\_78, BiggityBass\_81, BirksAndSocks\_81, Boneham\_80, Bonum\_79, Breezic\_77, Buggaboo\_77, Butterball\_79, CathyBurgh\_76, Chelms\_77, CherryCola\_91, CherryTomatoes\_206, CinnamonToast\_81, ClamChowder\_94, CoveyB\_93, Crete\_77, Dakiti\_78, Danyall\_92, Egi03\_90, Ekhein\_77, Ennea\_83, Evaa\_82, Evamon\_91, Exiguo\_76, FelixAlejandro\_81, Fireball\_94, Flakey\_76, Flapper\_80, Float294\_78, GTE5\_64, Gezellig\_90, Ghobes\_18, Gorko\_76, GourdThymes\_77, Halo3\_90, Hollow\_74, Hotorobo\_77, Jambalaya\_88, Jellybones\_78, John316\_80, Kabluna\_78, Katyusha\_72, KimmyK\_89, Kvothe\_72, Lilbeanie\_11, Linetti\_77, LittleMunchkin\_81, Lizzo\_77, Lollipop1437\_79, MerCougar\_78, Monty\_76, Msay19\_81, Mutzi\_91, Niagara\_73, NosilaM\_76, Nubi\_94, Outis\_76, Patio\_78, Phlop\_88, PierreThree\_76, PinkCoffee\_93, Poland\_81, Portcullis\_91, PullumCavea\_89, Pupper\_204, RedRaider\_83, RemRem\_78, RogerDodger\_94, SCentae\_203, Salvador\_91, Sam12\_76, Savbucketdawg\_86, Shinji\_90, Sisko\_81, Skog\_33, Skysand\_80, SmokingBunny\_92, Sombrero\_78, Squibbles\_76, StarStruck\_76, SuperSulley\_77, Teatealatte\_74, Teech\_71, TillyBobJoe\_90, Togo\_91, Tredge\_73, Twister6\_90, Valary\_92, VanDeWege\_93, Wizard\_86, Worcestershire\_76, Yago84\_80, YungMoney\_91,

### Summary by start number:

Start 20:

- Found in 20 of 156 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 2 of 134
- Called 10.0% of time when present
- Phage (with cluster) where this start called: ClamChowder\_94 (DC1), PinkCoffee\_93 (DC1),

Start 25:

- Found in 1 of 156 ( 0.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: GTE5\_64 (CR1),

Start 29:

- Found in 14 of 156 ( 9.0% ) of genes in pham
- Manual Annotations of this start: 4 of 134
- Called 28.6% of time when present
- Phage (with cluster) where this start called: Guacamole\_35 (CV), Hitter\_38 (CV), MintFen\_37 (CV), Zarbodnamra\_36 (CV),

Start 30:

- Found in 6 of 156 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 6 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnClar\_78 (DR), BiggityBass\_81 (DR), Evaa\_82 (DR), LittleMunchkin\_81 (DR), Sisko\_81 (DR), Yago84\_80 (DR),

Start 31:

- Found in 16 of 156 ( 10.3% ) of genes in pham
- Manual Annotations of this start: 14 of 134

- Called 93.8% of time when present
- Phage (with cluster) where this start called: Bonum\_79 (CR2), Buggaboo\_77 (CR2), Ennea\_83 (CR3), Flapper\_80 (CR1), Float294\_78 (CR3), Kabluna\_78 (CR2), Lollipop1437\_79 (CR3), MerCougar\_78 (CR2), NosilaM\_76 (CR2), Outis\_76 (CR2), Patio\_78 (CR3), RedRaider\_83 (CR3), Skysand\_80 (CR3), StarStruck\_76 (CR2), SuperSulley\_77 (CR2),

#### Start 33:

- Found in 34 of 156 ( 21.8% ) of genes in pham
- Manual Annotations of this start: 28 of 134
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adgers\_80 (CS2), Barbochs\_76 (CS2), Beaver\_80 (CS2), BenoitCattle\_77 (CS2), BigShaq\_78 (CS2), BirksAndSocks\_81 (CS2), Boneham\_80 (CS2), Breezic\_77 (CS2), Butterball\_79 (CS2), CathyBurgh\_76 (CS2), Chelms\_77 (CS2), CinnamonToast\_81 (CS2), Crete\_77 (CS2), Dakiti\_78 (CS2), Ekhein\_77 (CS2), Exiguo\_76 (CS2), FelixAlejandro\_81 (CS2), Flakey\_76 (CS2), Gorko\_76 (CS2), GourdThymes\_77 (CS2), Hotorobo\_77 (CS2), Jellybones\_78 (CS2), John316\_80 (CS2), Linetti\_77 (CS2), Lizzo\_77 (CS2), Monty\_76 (CS2), Msay19\_81 (CS2), PierreThree\_76 (CS2), Poland\_81 (CS2), RemRem\_78 (CS2), Sam12\_76 (CS2), Sombrero\_78 (CS2), Squibbles\_76 (CS2), Worcestershire\_76 (CS2),

#### Start 34:

- Found in 44 of 156 ( 28.2% ) of genes in pham
- Manual Annotations of this start: 36 of 134
- Called 95.5% of time when present
- Phage (with cluster) where this start called: Arri\_91 (DC1), Bakery\_93 (DC1), Barb\_95 (DC1), Benczkowski14\_73 (CS4), CherryCola\_91 (DC1), CherryTomatoes\_206 (DO), CoveyB\_93 (DC1), Danyall\_92 (DC1), Egi03\_90 (DC1), Evamon\_91 (DC1), Fireball\_94 (DC1), Gezellig\_90 (DC1), Halo3\_90 (DC1), Hollow\_74 (CS4), Jambalaya\_88 (DC1), Katyusha\_72 (CS4), KimmyK\_89 (DC1), Kvothe\_72 (CS4), Mutzi\_91 (DC1), Niagara\_73 (CS4), Nubi\_94 (DC1), Phlop\_88 (DC1), Portcullis\_91 (DC1), PullumCavea\_89 (DC1), Pupper\_204 (DO), RogerDodger\_94 (DC1), SCentae\_203 (DO), Salvador\_91 (DC1), Savbucketdawg\_86 (DC1), Shinji\_90 (DC1), Skog\_33 (DO), SmokingBunny\_92 (DC1), Teatealatte\_74 (CS4), Teech\_71 (CS4), TillyBobJoe\_90 (DC1), Togo\_91 (DC1), Tredge\_73 (CS4), Twister6\_90 (DC1), Valary\_92 (DC1), VanDeWege\_93 (DC1), Wizard\_86 (DC1), YungMoney\_91 (DC1),

#### Start 36:

- Found in 54 of 156 ( 34.6% ) of genes in pham
- Manual Annotations of this start: 39 of 134
- Called 87.0% of time when present
- Phage (with cluster) where this start called: APunk\_10 (DE4), Abblin\_9 (DE4), Ali17\_9 (DE2), Angelique\_36 (CY1), BENtherdunthat\_42 (DN1), BackstagePass\_33 (DB), Belphegor\_5 (DE), Birdsong\_40 (DN), BlingBling\_34 (CV), BotCity\_44 (DN), Budski\_42 (DN), CheeseTouch\_41 (DN1), Crater\_40 (DN3), Delian\_40 (CV), DirtyBoi\_33 (DB), Eyre\_32 (singleton), Frickyeah\_43 (DN1), Getalong\_44 (DN1), Hans\_13 (DE2), Hedwig\_35 (DB), Holliday\_42 (DN1), Inspectinfecti\_12 (DE2), JasperJr\_35 (CV), Kamaru\_38 (DN1), Kenna\_42 (DN1), Leonard\_11 (DE2), LitninMcQueen\_37 (DN1), Lutum\_43 (DN1), MelBins\_11 (DE2), Melba\_36 (CV), Mellie\_34 (CV), Natkenzie\_9 (DE4), Obliviate\_33 (CV), Periwinkle\_46 (DN1), Phabuloso\_40 (DN1), Phauci\_4 (DE2), Phinally\_11 (DE2), Phistory\_43 (DN1),

PhrostedPhlake\_40 (CV), RayTheFireFly\_41 (DB), Sampson\_9 (DE4), Scioto\_9 (DE4), ShawBrad\_43 (DN1), Tardus\_10 (DE4), ViaConlectus\_9 (DE4), Whitney\_45 (DN1), Zitch\_10 (DE4),

Start 37:

- Found in 1 of 156 ( 0.6% ) 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: Lilbeanie\_11 (DE5),

Start 38:

- Found in 43 of 156 ( 27.6% ) of genes in pham
- Manual Annotations of this start: 3 of 134
- Called 7.0% of time when present
- Phage (with cluster) where this start called: CaptainKirk2\_37 (CV), UmaThurman\_32 (CV), Walrus\_37 (CV),

Start 49:

- Found in 1 of 156 ( 0.6% ) 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: Ghobes\_18 (DA),

### **Summary by clusters:**

There are 20 clusters represented in this pham: CR2, CR3, singleton, CR1, DN, DO, DB, DE2, DE, DE4, CY1, DA, DN1, DE5, DN3, CS4, CS2, DR, CV, DC1,

Info for manual annotations of cluster CR1:

- Start number 31 was manually annotated 1 time for cluster CR1.

Info for manual annotations of cluster CR2:

- Start number 31 was manually annotated 8 times for cluster CR2.

Info for manual annotations of cluster CR3:

- Start number 31 was manually annotated 5 times for cluster CR3.

Info for manual annotations of cluster CS2:

- Start number 33 was manually annotated 28 times for cluster CS2.

Info for manual annotations of cluster CS4:

- Start number 34 was manually annotated 7 times for cluster CS4.

Info for manual annotations of cluster CV:

- Start number 29 was manually annotated 4 times for cluster CV.
- Start number 36 was manually annotated 7 times for cluster CV.
- Start number 38 was manually annotated 3 times for cluster CV.

Info for manual annotations of cluster CY1:

- Start number 36 was manually annotated 1 time for cluster CY1.

Info for manual annotations of cluster DA:

- Start number 49 was manually annotated 1 time for cluster DA.

Info for manual annotations of cluster DB:

- Start number 36 was manually annotated 3 times for cluster DB.

Info for manual annotations of cluster DC1:

- Start number 20 was manually annotated 2 times for cluster DC1.
- Start number 34 was manually annotated 25 times for cluster DC1.

Info for manual annotations of cluster DE2:

- Start number 36 was manually annotated 7 times for cluster DE2.

Info for manual annotations of cluster DE4:

- Start number 36 was manually annotated 5 times for cluster DE4.

Info for manual annotations of cluster DE5:

- Start number 37 was manually annotated 1 time for cluster DE5.

Info for manual annotations of cluster DN:

- Start number 36 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 36 was manually annotated 12 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 36 was manually annotated 1 time for cluster DN3.

Info for manual annotations of cluster DO:

- Start number 34 was manually annotated 4 times for cluster DO.

Info for manual annotations of cluster DR:

- Start number 30 was manually annotated 6 times for cluster DR.

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

Gene: APunk\_10 Start: 5832, Stop: 6140, Start Num: 36

Candidate Starts for APunk\_10:

(24, 5769), (27, 5787), (Start: 36 @5832 has 39 MA's), (53, 5928), (54, 5934), (56, 5970), (57, 6018), (58, 6024),

Gene: Abblin\_9 Start: 5353, Stop: 5655, Start Num: 36

Candidate Starts for Abblin\_9:

(Start: 36 @5353 has 39 MA's), (53, 5443), (56, 5485), (57, 5533), (58, 5539),

Gene: Adgers\_80 Start: 60593, Stop: 60273, Start Num: 33

Candidate Starts for Adgers\_80:

(Start: 33 @60593 has 28 MA's), (58, 60380),

Gene: Ali17\_9 Start: 5663, Stop: 5983, Start Num: 36

Candidate Starts for Ali17\_9:

(Start: 36 @5663 has 39 MA's), (53, 5753), (54, 5759), (56, 5795), (58, 5852),



Gene: AnClar\_78 Start: 60612, Stop: 60265, Start Num: 30

Candidate Starts for AnClar\_78:

(Start: 30 @60612 has 6 MA's), (43, 60555), (52, 60489), (57, 60393), (58, 60387),

Gene: Angelique\_36 Start: 29622, Stop: 29323, Start Num: 36

Candidate Starts for Angelique\_36:

(Start: 36 @29622 has 39 MA's), (Start: 38 @29610 has 3 MA's), (42, 29586), (43, 29583), (46, 29571), (48, 29559), (52, 29526), (53, 29523), (56, 29478), (57, 29430),

Gene: Arri\_91 Start: 57646, Stop: 57308, Start Num: 34

Candidate Starts for Arri\_91:

(19, 57736), (Start: 20 @57733 has 2 MA's), (26, 57688), (Start: 34 @57646 has 36 MA's), (47, 57580), (56, 57487), (57, 57439), (58, 57433),

Gene: BENtherdunthat\_42 Start: 29776, Stop: 29441, Start Num: 36

Candidate Starts for BENtherdunthat\_42:

(32, 29788), (35, 29779), (Start: 36 @29776 has 39 MA's), (Start: 38 @29764 has 3 MA's), (42, 29740), (43, 29737), (52, 29680), (53, 29677), (55, 29659), (56, 29635), (57, 29587), (58, 29581),

Gene: BackstagePass\_33 Start: 28562, Stop: 28269, Start Num: 36

Candidate Starts for BackstagePass\_33:

(Start: 36 @28562 has 39 MA's), (42, 28526), (43, 28523), (46, 28511), (48, 28499), (52, 28469), (53, 28466), (54, 28460), (55, 28448), (56, 28424), (58, 28367),

Gene: Bakery\_93 Start: 59467, Stop: 59129, Start Num: 34

Candidate Starts for Bakery\_93:

(21, 59542), (23, 59521), (26, 59509), (Start: 34 @59467 has 36 MA's), (47, 59401), (51, 59371), (52, 59356), (56, 59308), (57, 59260), (58, 59254),

Gene: Barb\_95 Start: 58510, Stop: 58172, Start Num: 34

Candidate Starts for Barb\_95:

(19, 58600), (Start: 20 @58597 has 2 MA's), (26, 58552), (Start: 34 @58510 has 36 MA's), (47, 58444), (52, 58399), (56, 58351), (57, 58303), (58, 58297),

Gene: Barbochs\_76 Start: 59970, Stop: 59629, Start Num: 33

Candidate Starts for Barbochs\_76:

(Start: 33 @59970 has 28 MA's), (58, 59757), (59, 59748),

Gene: Beaver\_80 Start: 61914, Stop: 61585, Start Num: 33

Candidate Starts for Beaver\_80:

(Start: 33 @61914 has 28 MA's), (58, 61701),

Gene: Belphegor\_5 Start: 2778, Stop: 3092, Start Num: 36

Candidate Starts for Belphegor\_5:

(11, 2478), (12, 2493), (Start: 36 @2778 has 39 MA's), (53, 2871), (54, 2877), (56, 2913), (57, 2964), (58, 2970),

Gene: Benczkowski14\_73 Start: 60661, Stop: 60341, Start Num: 34

Candidate Starts for Benczkowski14\_73:

(Start: 34 @60661 has 36 MA's), (58, 60451),

Gene: BenoitCattle\_77 Start: 60565, Stop: 60242, Start Num: 33

Candidate Starts for BenoitCattle\_77:  
(Start: 33 @60565 has 28 MA's), (47, 60496), (58, 60346),

Gene: BigShaq\_78 Start: 60737, Stop: 60411, Start Num: 33  
Candidate Starts for BigShaq\_78:  
(Start: 33 @60737 has 28 MA's), (47, 60668), (58, 60524),

Gene: BiggityBass\_81 Start: 62080, Stop: 61751, Start Num: 30  
Candidate Starts for BiggityBass\_81:  
(Start: 30 @62080 has 6 MA's), (43, 62023), (53, 61954), (57, 61861),

Gene: Birdsong\_40 Start: 30587, Stop: 30261, Start Num: 36  
Candidate Starts for Birdsong\_40:  
(Start: 36 @30587 has 39 MA's), (Start: 38 @30575 has 3 MA's), (42, 30551), (43, 30548), (44, 30545),  
(46, 30533), (52, 30491), (53, 30488), (55, 30470), (56, 30446), (57, 30398), (58, 30392),

Gene: BirksAndSocks\_81 Start: 62036, Stop: 61731, Start Num: 33  
Candidate Starts for BirksAndSocks\_81:  
(Start: 33 @62036 has 28 MA's), (58, 61823),

Gene: BlingBling\_34 Start: 30550, Stop: 30248, Start Num: 36  
Candidate Starts for BlingBling\_34:  
(Start: 29 @30583 has 4 MA's), (Start: 36 @30550 has 39 MA's), (Start: 38 @30538 has 3 MA's), (39,  
30526), (42, 30514), (43, 30511), (46, 30499), (48, 30487), (52, 30454), (53, 30451), (55, 30430), (56,  
30406), (57, 30358), (58, 30352),

Gene: Boneham\_80 Start: 61961, Stop: 61656, Start Num: 33  
Candidate Starts for Boneham\_80:  
(Start: 33 @61961 has 28 MA's), (58, 61748),

Gene: Bonum\_79 Start: 57724, Stop: 57392, Start Num: 31  
Candidate Starts for Bonum\_79:  
(Start: 31 @57724 has 14 MA's), (Start: 38 @57697 has 3 MA's), (53, 57610), (57, 57520), (58, 57514),

Gene: BotCity\_44 Start: 30361, Stop: 30053, Start Num: 36  
Candidate Starts for BotCity\_44:  
(7, 30835), (8, 30784), (14, 30583), (15, 30574), (16, 30550), (Start: 36 @30361 has 39 MA's), (Start:  
38 @30349 has 3 MA's), (42, 30325), (43, 30322), (46, 30310), (51, 30280), (52, 30268), (53, 30265),  
(55, 30247), (56, 30223), (57, 30175), (58, 30169),

Gene: Breezic\_77 Start: 60181, Stop: 59828, Start Num: 33  
Candidate Starts for Breezic\_77:  
(Start: 33 @60181 has 28 MA's), (58, 59968), (59, 59959),

Gene: Budski\_42 Start: 31521, Stop: 31192, Start Num: 36  
Candidate Starts for Budski\_42:  
(32, 31533), (35, 31524), (Start: 36 @31521 has 39 MA's), (Start: 38 @31509 has 3 MA's), (42, 31485),  
(43, 31482), (52, 31425), (53, 31422), (55, 31404), (56, 31380), (57, 31332), (58, 31326),

Gene: Buggaboo\_77 Start: 58290, Stop: 57958, Start Num: 31  
Candidate Starts for Buggaboo\_77:  
(Start: 31 @58290 has 14 MA's), (Start: 38 @58263 has 3 MA's), (53, 58176), (57, 58086), (58, 58080),

Gene: Butterball\_79 Start: 61966, Stop: 61661, Start Num: 33  
Candidate Starts for Butterball\_79:  
(Start: 33 @61966 has 28 MA's), (58, 61753),

Gene: CaptainKirk2\_37 Start: 29823, Stop: 29527, Start Num: 38  
Candidate Starts for CaptainKirk2\_37:  
(Start: 29 @29868 has 4 MA's), (Start: 36 @29835 has 39 MA's), (Start: 38 @29823 has 3 MA's), (42, 29799), (43, 29796), (46, 29784), (48, 29772), (52, 29739), (53, 29736), (55, 29715), (56, 29691), (57, 29643), (58, 29637),

Gene: CathyBurgh\_76 Start: 60701, Stop: 60336, Start Num: 33  
Candidate Starts for CathyBurgh\_76:  
(Start: 33 @60701 has 28 MA's), (58, 60488), (59, 60479),

Gene: CheeseTouch\_41 Start: 28097, Stop: 27792, Start Num: 36  
Candidate Starts for CheeseTouch\_41:  
(14, 28319), (15, 28310), (16, 28286), (Start: 36 @28097 has 39 MA's), (Start: 38 @28085 has 3 MA's), (42, 28061), (43, 28058), (46, 28046), (52, 28004), (53, 28001), (55, 27983), (56, 27959), (57, 27911), (58, 27905),

Gene: Chelms\_77 Start: 60667, Stop: 60350, Start Num: 33  
Candidate Starts for Chelms\_77:  
(Start: 33 @60667 has 28 MA's), (58, 60454),

Gene: CherryCola\_91 Start: 58059, Stop: 57721, Start Num: 34  
Candidate Starts for CherryCola\_91:  
(19, 58149), (Start: 20 @58146 has 2 MA's), (26, 58101), (Start: 34 @58059 has 36 MA's), (47, 57993), (56, 57900), (57, 57852), (58, 57846),

Gene: CherryTomatoes\_206 Start: 140218, Stop: 140541, Start Num: 34  
Candidate Starts for CherryTomatoes\_206:  
(Start: 34 @140218 has 36 MA's), (57, 140422), (58, 140428),

Gene: CinnamonToast\_81 Start: 62041, Stop: 61709, Start Num: 33  
Candidate Starts for CinnamonToast\_81:  
(Start: 33 @62041 has 28 MA's), (58, 61828),

Gene: ClamChowder\_94 Start: 58597, Stop: 58172, Start Num: 20  
Candidate Starts for ClamChowder\_94:  
(19, 58600), (Start: 20 @58597 has 2 MA's), (26, 58552), (Start: 34 @58510 has 36 MA's), (47, 58444), (52, 58399), (56, 58351), (57, 58303), (58, 58297),

Gene: CoveyB\_93 Start: 57997, Stop: 57659, Start Num: 34  
Candidate Starts for CoveyB\_93:  
(19, 58087), (Start: 20 @58084 has 2 MA's), (26, 58039), (Start: 34 @57997 has 36 MA's), (47, 57931), (52, 57886), (56, 57838), (57, 57790), (58, 57784),

Gene: Crater\_40 Start: 29695, Stop: 29378, Start Num: 36  
Candidate Starts for Crater\_40:  
(1, 30361), (2, 30358), (3, 30334), (4, 30322), (5, 30280), (6, 30274), (9, 30082), (14, 29917), (15, 29908), (16, 29884), (Start: 36 @29695 has 39 MA's), (Start: 38 @29683 has 3 MA's), (42, 29659), (43, 29656), (46, 29644), (48, 29632), (52, 29599), (53, 29596), (55, 29578), (56, 29554), (57, 29506), (58, 29500),

Gene: Crete\_77 Start: 60795, Stop: 60469, Start Num: 33  
Candidate Starts for Crete\_77:  
(Start: 33 @60795 has 28 MA's), (47, 60726), (58, 60582),

Gene: Dakiti\_78 Start: 61535, Stop: 61218, Start Num: 33  
Candidate Starts for Dakiti\_78:  
(Start: 33 @61535 has 28 MA's), (58, 61322),

Gene: Danyall\_92 Start: 57691, Stop: 57353, Start Num: 34  
Candidate Starts for Danyall\_92:  
(19, 57781), (Start: 20 @57778 has 2 MA's), (26, 57733), (Start: 34 @57691 has 36 MA's), (47, 57625),  
(52, 57580), (56, 57532), (57, 57484), (58, 57478),

Gene: Delian\_40 Start: 29833, Stop: 29525, Start Num: 36  
Candidate Starts for Delian\_40:  
(Start: 29 @29866 has 4 MA's), (Start: 36 @29833 has 39 MA's), (Start: 38 @29821 has 3 MA's), (42, 29797), (43, 29794), (46, 29782), (48, 29770), (52, 29737), (53, 29734), (55, 29713), (56, 29689), (57, 29641), (58, 29635),

Gene: DirtyBoi\_33 Start: 28465, Stop: 28172, Start Num: 36  
Candidate Starts for DirtyBoi\_33:  
(32, 28477), (35, 28468), (Start: 36 @28465 has 39 MA's), (Start: 38 @28453 has 3 MA's), (42, 28429),  
(43, 28426), (46, 28414), (52, 28372), (53, 28369), (54, 28363), (55, 28351), (56, 28327), (58, 28270),

Gene: Egi03\_90 Start: 57081, Stop: 56743, Start Num: 34  
Candidate Starts for Egi03\_90:  
(19, 57171), (Start: 20 @57168 has 2 MA's), (26, 57123), (Start: 34 @57081 has 36 MA's), (47, 57015),  
(56, 56922), (57, 56874), (58, 56868),

Gene: Ekhein\_77 Start: 59871, Stop: 59527, Start Num: 33  
Candidate Starts for Ekhein\_77:  
(Start: 33 @59871 has 28 MA's), (58, 59658), (59, 59649),

Gene: Ennea\_83 Start: 59022, Stop: 58708, Start Num: 31  
Candidate Starts for Ennea\_83:  
(28, 59040), (Start: 31 @59022 has 14 MA's), (41, 58977), (58, 58815),

Gene: Evaa\_82 Start: 60219, Stop: 59869, Start Num: 30  
Candidate Starts for Evaa\_82:  
(Start: 30 @60219 has 6 MA's), (39, 60171), (43, 60156), (56, 60045), (57, 59997), (58, 59991),

Gene: Evamon\_91 Start: 57458, Stop: 57120, Start Num: 34  
Candidate Starts for Evamon\_91:  
(21, 57530), (26, 57500), (Start: 34 @57458 has 36 MA's), (47, 57392), (56, 57299), (57, 57251), (58, 57245),

Gene: Exiguo\_76 Start: 59877, Stop: 59545, Start Num: 33  
Candidate Starts for Exiguo\_76:  
(Start: 33 @59877 has 28 MA's), (58, 59664),

Gene: Eyre\_32 Start: 25507, Stop: 25208, Start Num: 36  
Candidate Starts for Eyre\_32:

(Start: 36 @25507 has 39 MA's), (Start: 38 @25495 has 3 MA's), (40, 25477), (42, 25471), (43, 25468), (46, 25456), (48, 25444), (52, 25411), (53, 25408), (56, 25363), (57, 25315),

Gene: FelixAlejandro\_81 Start: 62391, Stop: 62059, Start Num: 33  
Candidate Starts for FelixAlejandro\_81:  
(Start: 33 @62391 has 28 MA's), (58, 62178),

Gene: Fireball\_94 Start: 57920, Stop: 57582, Start Num: 34  
Candidate Starts for Fireball\_94:  
(19, 58010), (Start: 20 @58007 has 2 MA's), (26, 57962), (Start: 34 @57920 has 36 MA's), (47, 57854), (56, 57761), (57, 57713), (58, 57707),

Gene: Flakey\_76 Start: 60687, Stop: 60322, Start Num: 33  
Candidate Starts for Flakey\_76:  
(Start: 33 @60687 has 28 MA's), (58, 60474), (59, 60465),

Gene: Flapper\_80 Start: 58306, Stop: 57980, Start Num: 31  
Candidate Starts for Flapper\_80:  
(Start: 31 @58306 has 14 MA's), (Start: 38 @58282 has 3 MA's), (41, 58261), (46, 58240), (57, 58105), (58, 58099),

Gene: Float294\_78 Start: 58928, Stop: 58614, Start Num: 31  
Candidate Starts for Float294\_78:  
(Start: 31 @58928 has 14 MA's), (41, 58883), (58, 58721),

Gene: Frickyeah\_43 Start: 29647, Stop: 29330, Start Num: 36  
Candidate Starts for Frickyeah\_43:  
(1, 30313), (2, 30310), (3, 30286), (4, 30274), (5, 30232), (6, 30226), (9, 30034), (14, 29869), (15, 29860), (16, 29836), (Start: 36 @29647 has 39 MA's), (Start: 38 @29635 has 3 MA's), (42, 29611), (43, 29608), (46, 29596), (48, 29584), (52, 29551), (53, 29548), (55, 29530), (56, 29506), (57, 29458), (58, 29452),

Gene: GTE5\_64 Start: 50838, Stop: 50473, Start Num: 25  
Candidate Starts for GTE5\_64:  
(25, 50838), (Start: 31 @50799 has 14 MA's), (Start: 38 @50775 has 3 MA's), (41, 50754), (47, 50730), (57, 50598), (58, 50592),

Gene: Getalong\_44 Start: 32367, Stop: 32050, Start Num: 36  
Candidate Starts for Getalong\_44:  
(35, 32370), (Start: 36 @32367 has 39 MA's), (Start: 38 @32355 has 3 MA's), (42, 32331), (43, 32328), (46, 32316), (48, 32304), (52, 32271), (53, 32268), (55, 32250), (56, 32226), (57, 32178), (58, 32172),

Gene: Gezellig\_90 Start: 57304, Stop: 56966, Start Num: 34  
Candidate Starts for Gezellig\_90:  
(19, 57394), (Start: 20 @57391 has 2 MA's), (26, 57346), (Start: 34 @57304 has 36 MA's), (47, 57238), (56, 57145), (57, 57097), (58, 57091),

Gene: Ghobes\_18 Start: 16697, Stop: 16407, Start Num: 49  
Candidate Starts for Ghobes\_18:  
(13, 17057), (Start: 49 @16697 has 1 MA's),

Gene: Gorko\_76 Start: 59788, Stop: 59468, Start Num: 33  
Candidate Starts for Gorko\_76:

(Start: 33 @59788 has 28 MA's), (58, 59575),

Gene: GourdThymes\_77 Start: 60728, Stop: 60423, Start Num: 33

Candidate Starts for GourdThymes\_77:

(Start: 33 @60728 has 28 MA's), (58, 60515), (59, 60506),

Gene: Guacamole\_35 Start: 30431, Stop: 30090, Start Num: 29

Candidate Starts for Guacamole\_35:

(Start: 29 @30431 has 4 MA's), (Start: 36 @30398 has 39 MA's), (Start: 38 @30386 has 3 MA's), (42, 30362), (43, 30359), (46, 30347), (48, 30335), (52, 30302), (53, 30299), (55, 30278), (56, 30254), (57, 30206), (58, 30200),

Gene: Halo3\_90 Start: 58179, Stop: 57841, Start Num: 34

Candidate Starts for Halo3\_90:

(17, 58332), (18, 58311), (26, 58221), (Start: 34 @58179 has 36 MA's), (47, 58113), (52, 58068), (56, 58020), (57, 57972), (58, 57966),

Gene: Hans\_13 Start: 6198, Stop: 6524, Start Num: 36

Candidate Starts for Hans\_13:

(Start: 36 @6198 has 39 MA's), (53, 6291), (54, 6297), (56, 6333), (58, 6390),

Gene: Hedwig\_35 Start: 28932, Stop: 28639, Start Num: 36

Candidate Starts for Hedwig\_35:

(Start: 36 @28932 has 39 MA's), (Start: 38 @28920 has 3 MA's), (42, 28896), (43, 28893), (46, 28881), (52, 28839), (53, 28836), (54, 28830), (55, 28818), (56, 28794), (58, 28737),

Gene: Hitter\_38 Start: 30165, Stop: 29812, Start Num: 29

Candidate Starts for Hitter\_38:

(Start: 29 @30165 has 4 MA's), (Start: 36 @30132 has 39 MA's), (Start: 38 @30120 has 3 MA's), (42, 30096), (43, 30093), (46, 30081), (48, 30069), (52, 30036), (53, 30033), (55, 30012), (56, 29988), (57, 29940), (58, 29934),

Gene: Holliday\_42 Start: 30222, Stop: 29905, Start Num: 36

Candidate Starts for Holliday\_42:

(1, 30888), (2, 30885), (3, 30861), (4, 30849), (5, 30807), (6, 30801), (9, 30609), (14, 30444), (15, 30435), (16, 30411), (Start: 36 @30222 has 39 MA's), (Start: 38 @30210 has 3 MA's), (42, 30186), (43, 30183), (46, 30171), (48, 30159), (52, 30126), (53, 30123), (55, 30105), (56, 30081), (57, 30033), (58, 30027),

Gene: Hollow\_74 Start: 60832, Stop: 60512, Start Num: 34

Candidate Starts for Hollow\_74:

(Start: 34 @60832 has 36 MA's), (45, 60772), (57, 60628), (58, 60622),

Gene: Hotorobo\_77 Start: 60751, Stop: 60410, Start Num: 33

Candidate Starts for Hotorobo\_77:

(Start: 33 @60751 has 28 MA's), (58, 60538), (59, 60529),

Gene: Inspectinfecti\_12 Start: 6720, Stop: 7040, Start Num: 36

Candidate Starts for Inspectinfecti\_12:

(Start: 36 @6720 has 39 MA's), (53, 6810), (54, 6816), (56, 6852), (58, 6909),

Gene: Jambalaya\_88 Start: 56761, Stop: 56423, Start Num: 34

Candidate Starts for Jambalaya\_88:

(10, 57106), (26, 56803), (Start: 34 @56761 has 36 MA's), (47, 56695), (56, 56602), (57, 56554), (58, 56548),

Gene: JasperJr\_35 Start: 30398, Stop: 30090, Start Num: 36

Candidate Starts for JasperJr\_35:

(Start: 29 @30431 has 4 MA's), (Start: 36 @30398 has 39 MA's), (Start: 38 @30386 has 3 MA's), (42, 30362), (43, 30359), (46, 30347), (48, 30335), (52, 30302), (53, 30299), (55, 30278), (56, 30254), (57, 30206), (58, 30200),

Gene: Jellybones\_78 Start: 61675, Stop: 61343, Start Num: 33

Candidate Starts for Jellybones\_78:

(Start: 33 @61675 has 28 MA's), (58, 61462),

Gene: John316\_80 Start: 61839, Stop: 61486, Start Num: 33

Candidate Starts for John316\_80:

(Start: 33 @61839 has 28 MA's), (58, 61626), (59, 61617),

Gene: Kabluna\_78 Start: 57062, Stop: 56721, Start Num: 31

Candidate Starts for Kabluna\_78:

(Start: 31 @57062 has 14 MA's), (Start: 38 @57035 has 3 MA's), (53, 56948), (57, 56858), (58, 56852),

Gene: Kamaru\_38 Start: 29300, Stop: 28986, Start Num: 36

Candidate Starts for Kamaru\_38:

(32, 29312), (35, 29303), (Start: 36 @29300 has 39 MA's), (Start: 38 @29288 has 3 MA's), (42, 29264), (43, 29261), (46, 29249), (52, 29204), (53, 29201), (55, 29183), (56, 29159), (57, 29111), (58, 29105),

Gene: Katyusha\_72 Start: 60661, Stop: 60341, Start Num: 34

Candidate Starts for Katyusha\_72:

(Start: 34 @60661 has 36 MA's), (58, 60451),

Gene: Kenna\_42 Start: 30558, Stop: 30241, Start Num: 36

Candidate Starts for Kenna\_42:

(1, 31224), (2, 31221), (3, 31197), (4, 31185), (5, 31143), (6, 31137), (9, 30945), (14, 30780), (15, 30771), (16, 30747), (Start: 36 @30558 has 39 MA's), (Start: 38 @30546 has 3 MA's), (42, 30522), (43, 30519), (46, 30507), (48, 30495), (52, 30462), (53, 30459), (55, 30441), (56, 30417), (57, 30369), (58, 30363),

Gene: KimmyK\_89 Start: 57751, Stop: 57413, Start Num: 34

Candidate Starts for KimmyK\_89:

(19, 57841), (Start: 20 @57838 has 2 MA's), (26, 57793), (Start: 34 @57751 has 36 MA's), (47, 57685), (56, 57592), (57, 57544), (58, 57538),

Gene: Kvothe\_72 Start: 60503, Stop: 60183, Start Num: 34

Candidate Starts for Kvothe\_72:

(Start: 34 @60503 has 36 MA's), (58, 60293),

Gene: Leonard\_11 Start: 6315, Stop: 6635, Start Num: 36

Candidate Starts for Leonard\_11:

(Start: 36 @6315 has 39 MA's), (53, 6405), (54, 6411), (56, 6447), (58, 6504),

Gene: Lilbeanie\_11 Start: 4525, Stop: 4851, Start Num: 37

Candidate Starts for Lilbeanie\_11:

(Start: 37 @4525 has 1 MA's), (53, 4612), (56, 4657), (58, 4711),

Gene: Linetti\_77 Start: 61689, Stop: 61372, Start Num: 33

Candidate Starts for Linetti\_77:

(Start: 33 @61689 has 28 MA's), (58, 61476),

Gene: LitninMcQueen\_37 Start: 29049, Stop: 28729, Start Num: 36

Candidate Starts for LitninMcQueen\_37:

(32, 29061), (35, 29052), (Start: 36 @29049 has 39 MA's), (Start: 38 @29037 has 3 MA's), (42, 29013), (43, 29010), (46, 28998), (52, 28953), (53, 28950), (55, 28932), (56, 28908), (57, 28860), (58, 28854),

Gene: LittleMunchkin\_81 Start: 61979, Stop: 61644, Start Num: 30

Candidate Starts for LittleMunchkin\_81:

(Start: 30 @61979 has 6 MA's), (43, 61922), (52, 61856), (57, 61760), (58, 61754),

Gene: Lizzo\_77 Start: 60701, Stop: 60336, Start Num: 33

Candidate Starts for Lizzo\_77:

(Start: 33 @60701 has 28 MA's), (58, 60488), (59, 60479),

Gene: Lollipop1437\_79 Start: 58702, Stop: 58388, Start Num: 31

Candidate Starts for Lollipop1437\_79:

(Start: 31 @58702 has 14 MA's), (41, 58657), (58, 58495),

Gene: Lutum\_43 Start: 30558, Stop: 30241, Start Num: 36

Candidate Starts for Lutum\_43:

(1, 31224), (2, 31221), (3, 31197), (4, 31185), (5, 31143), (6, 31137), (9, 30945), (14, 30780), (15, 30771), (16, 30747), (Start: 36 @30558 has 39 MA's), (Start: 38 @30546 has 3 MA's), (42, 30522), (43, 30519), (46, 30507), (48, 30495), (52, 30462), (53, 30459), (55, 30441), (56, 30417), (57, 30369), (58, 30363),

Gene: MelBins\_11 Start: 6093, Stop: 6413, Start Num: 36

Candidate Starts for MelBins\_11:

(22, 6012), (Start: 36 @6093 has 39 MA's), (53, 6183), (54, 6189), (56, 6225), (58, 6282),

Gene: Melba\_36 Start: 30375, Stop: 30085, Start Num: 36

Candidate Starts for Melba\_36:

(Start: 29 @30408 has 4 MA's), (Start: 36 @30375 has 39 MA's), (Start: 38 @30363 has 3 MA's), (39, 30351), (42, 30339), (43, 30336), (46, 30324), (48, 30312), (52, 30279), (53, 30276), (55, 30255), (56, 30231), (57, 30183), (58, 30177),

Gene: Mellie\_34 Start: 28646, Stop: 28332, Start Num: 36

Candidate Starts for Mellie\_34:

(Start: 29 @28679 has 4 MA's), (Start: 36 @28646 has 39 MA's), (Start: 38 @28634 has 3 MA's), (42, 28610), (43, 28607), (46, 28595), (48, 28583), (52, 28550), (53, 28547), (55, 28529), (56, 28505), (57, 28457), (58, 28451),

Gene: MerCougar\_78 Start: 58752, Stop: 58420, Start Num: 31

Candidate Starts for MerCougar\_78:

(Start: 31 @58752 has 14 MA's), (41, 58707), (53, 58641), (58, 58545),

Gene: MintFen\_37 Start: 30482, Stop: 30147, Start Num: 29

Candidate Starts for MintFen\_37:

(Start: 29 @30482 has 4 MA's), (Start: 36 @30449 has 39 MA's), (Start: 38 @30437 has 3 MA's), (42, 30413), (43, 30410), (46, 30398), (48, 30386), (52, 30353), (53, 30350), (55, 30329), (56, 30305), (57,



30257), (58, 30251),

Gene: Monty\_76 Start: 59914, Stop: 59549, Start Num: 33

Candidate Starts for Monty\_76:

(Start: 33 @59914 has 28 MA's), (58, 59701), (59, 59692),

Gene: Msay19\_81 Start: 62277, Stop: 61945, Start Num: 33

Candidate Starts for Msay19\_81:

(Start: 33 @62277 has 28 MA's), (58, 62064),

Gene: Mutzi\_91 Start: 58651, Stop: 58313, Start Num: 34

Candidate Starts for Mutzi\_91:

(19, 58741), (Start: 20 @58738 has 2 MA's), (26, 58693), (Start: 34 @58651 has 36 MA's), (47, 58585), (52, 58540), (56, 58492), (57, 58444), (58, 58438),

Gene: Natkenzie\_9 Start: 5353, Stop: 5655, Start Num: 36

Candidate Starts for Natkenzie\_9:

(Start: 36 @5353 has 39 MA's), (53, 5443), (56, 5485), (57, 5533), (58, 5539),

Gene: Niagara\_73 Start: 60594, Stop: 60274, Start Num: 34

Candidate Starts for Niagara\_73:

(Start: 34 @60594 has 36 MA's), (58, 60384),

Gene: NosilaM\_76 Start: 57364, Stop: 57035, Start Num: 31

Candidate Starts for NosilaM\_76:

(Start: 31 @57364 has 14 MA's), (47, 57295), (53, 57253), (57, 57163), (58, 57157),

Gene: Nubi\_94 Start: 57714, Stop: 57376, Start Num: 34

Candidate Starts for Nubi\_94:

(19, 57804), (Start: 20 @57801 has 2 MA's), (26, 57756), (Start: 34 @57714 has 36 MA's), (47, 57648), (52, 57603), (56, 57555), (57, 57507), (58, 57501),

Gene: Obliviate\_33 Start: 28822, Stop: 28514, Start Num: 36

Candidate Starts for Obliviate\_33:

(Start: 29 @28855 has 4 MA's), (Start: 36 @28822 has 39 MA's), (Start: 38 @28810 has 3 MA's), (42, 28786), (43, 28783), (46, 28771), (48, 28759), (52, 28726), (53, 28723), (55, 28702), (56, 28678), (57, 28630), (58, 28624),

Gene: Outis\_76 Start: 57844, Stop: 57512, Start Num: 31

Candidate Starts for Outis\_76:

(Start: 31 @57844 has 14 MA's), (41, 57799), (53, 57733), (58, 57637),

Gene: Patio\_78 Start: 57925, Stop: 57620, Start Num: 31

Candidate Starts for Patio\_78:

(Start: 31 @57925 has 14 MA's), (45, 57865), (58, 57727),

Gene: Periwinkle\_46 Start: 32013, Stop: 31696, Start Num: 36

Candidate Starts for Periwinkle\_46:

(32, 32025), (35, 32016), (Start: 36 @32013 has 39 MA's), (Start: 38 @32001 has 3 MA's), (42, 31977), (43, 31974), (52, 31917), (53, 31914), (56, 31872), (57, 31824), (58, 31818),

Gene: Phabuloso\_40 Start: 30274, Stop: 29954, Start Num: 36

Candidate Starts for Phabuloso\_40:

(1, 30940), (2, 30937), (3, 30913), (4, 30901), (9, 30661), (14, 30496), (15, 30487), (16, 30463), (Start: 36 @30274 has 39 MA's), (Start: 38 @30262 has 3 MA's), (42, 30238), (43, 30235), (46, 30223), (50, 30193), (52, 30178), (53, 30175), (56, 30133), (57, 30085), (58, 30079),

Gene: Phauci\_4 Start: 2839, Stop: 3165, Start Num: 36

Candidate Starts for Phauci\_4:

(Start: 36 @2839 has 39 MA's), (53, 2932), (54, 2938), (56, 2974), (58, 3031),

Gene: Phinally\_11 Start: 6312, Stop: 6632, Start Num: 36

Candidate Starts for Phinally\_11:

(Start: 36 @6312 has 39 MA's), (53, 6402), (54, 6408), (56, 6444), (58, 6501),

Gene: Phistory\_43 Start: 30909, Stop: 30592, Start Num: 36

Candidate Starts for Phistory\_43:

(1, 31575), (2, 31572), (3, 31548), (4, 31536), (5, 31494), (6, 31488), (9, 31296), (14, 31131), (15, 31122), (16, 31098), (Start: 36 @30909 has 39 MA's), (Start: 38 @30897 has 3 MA's), (42, 30873), (43, 30870), (46, 30858), (48, 30846), (52, 30813), (53, 30810), (55, 30792), (56, 30768), (57, 30720), (58, 30714),

Gene: Phlop\_88 Start: 57354, Stop: 57016, Start Num: 34

Candidate Starts for Phlop\_88:

(19, 57444), (Start: 20 @57441 has 2 MA's), (26, 57396), (Start: 34 @57354 has 36 MA's), (47, 57288), (56, 57195), (57, 57147), (58, 57141),

Gene: PhrostedPhlake\_40 Start: 30630, Stop: 30334, Start Num: 36

Candidate Starts for PhrostedPhlake\_40:

(Start: 29 @30663 has 4 MA's), (Start: 36 @30630 has 39 MA's), (Start: 38 @30618 has 3 MA's), (42, 30594), (43, 30591), (46, 30579), (48, 30567), (52, 30534), (53, 30531), (55, 30510), (56, 30486), (57, 30438), (58, 30432),

Gene: PierreThree\_76 Start: 61166, Stop: 60849, Start Num: 33

Candidate Starts for PierreThree\_76:

(Start: 33 @61166 has 28 MA's), (58, 60953),

Gene: PinkCoffee\_93 Start: 57642, Stop: 57217, Start Num: 20

Candidate Starts for PinkCoffee\_93:

(19, 57645), (Start: 20 @57642 has 2 MA's), (26, 57597), (Start: 34 @57555 has 36 MA's), (47, 57489), (52, 57444), (56, 57396), (57, 57348), (58, 57342),

Gene: Poland\_81 Start: 62256, Stop: 61924, Start Num: 33

Candidate Starts for Poland\_81:

(Start: 33 @62256 has 28 MA's), (58, 62043),

Gene: Portcullis\_91 Start: 57360, Stop: 57022, Start Num: 34

Candidate Starts for Portcullis\_91:

(19, 57450), (Start: 20 @57447 has 2 MA's), (26, 57402), (Start: 34 @57360 has 36 MA's), (47, 57294), (56, 57201), (57, 57153), (58, 57147),

Gene: PullumCavea\_89 Start: 57531, Stop: 57193, Start Num: 34

Candidate Starts for PullumCavea\_89:

(19, 57621), (Start: 20 @57618 has 2 MA's), (26, 57573), (Start: 34 @57531 has 36 MA's), (47, 57465), (56, 57372), (57, 57324), (58, 57318),

Gene: Pupper\_204 Start: 140080, Stop: 140403, Start Num: 34  
Candidate Starts for Pupper\_204:  
(Start: 34 @140080 has 36 MA's), (57, 140284), (58, 140290),

Gene: RayTheFireFly\_41 Start: 30859, Stop: 30572, Start Num: 36  
Candidate Starts for RayTheFireFly\_41:  
(32, 30871), (Start: 36 @30859 has 39 MA's), (Start: 38 @30847 has 3 MA's), (42, 30823), (43, 30820),  
(46, 30808), (48, 30796), (52, 30763), (53, 30760), (55, 30742), (56, 30718), (57, 30670),

Gene: RedRaider\_83 Start: 60073, Stop: 59747, Start Num: 31  
Candidate Starts for RedRaider\_83:  
(Start: 31 @60073 has 14 MA's), (39, 60037), (57, 59872), (58, 59866),

Gene: RemRem\_78 Start: 59853, Stop: 59521, Start Num: 33  
Candidate Starts for RemRem\_78:  
(Start: 33 @59853 has 28 MA's), (58, 59640),

Gene: RogerDodger\_94 Start: 58119, Stop: 57781, Start Num: 34  
Candidate Starts for RogerDodger\_94:  
(10, 58464), (18, 58251), (26, 58161), (Start: 34 @58119 has 36 MA's), (47, 58053), (56, 57960), (57,  
57912), (58, 57906),

Gene: SCentae\_203 Start: 140271, Stop: 140594, Start Num: 34  
Candidate Starts for SCentae\_203:  
(Start: 34 @140271 has 36 MA's), (57, 140475), (58, 140481),

Gene: Salvador\_91 Start: 57456, Stop: 57118, Start Num: 34  
Candidate Starts for Salvador\_91:  
(21, 57528), (26, 57498), (Start: 34 @57456 has 36 MA's), (47, 57390), (56, 57297), (57, 57249), (58,  
57243),

Gene: Sam12\_76 Start: 59877, Stop: 59545, Start Num: 33  
Candidate Starts for Sam12\_76:  
(Start: 33 @59877 has 28 MA's), (58, 59664),

Gene: Sampson\_9 Start: 5298, Stop: 5600, Start Num: 36  
Candidate Starts for Sampson\_9:  
(Start: 36 @5298 has 39 MA's), (53, 5388), (56, 5430), (57, 5478), (58, 5484),

Gene: Savbucketdawg\_86 Start: 56798, Stop: 56460, Start Num: 34  
Candidate Starts for Savbucketdawg\_86:  
(10, 57143), (26, 56840), (Start: 34 @56798 has 36 MA's), (47, 56732), (56, 56639), (57, 56591), (58,  
56585),

Gene: Scioto\_9 Start: 5353, Stop: 5655, Start Num: 36  
Candidate Starts for Scioto\_9:  
(Start: 36 @5353 has 39 MA's), (53, 5443), (56, 5485), (57, 5533), (58, 5539),

Gene: ShawBrad\_43 Start: 30132, Stop: 29815, Start Num: 36  
Candidate Starts for ShawBrad\_43:  
(1, 30798), (2, 30795), (3, 30771), (4, 30759), (5, 30717), (6, 30711), (9, 30519), (14, 30354), (15,  
30345), (16, 30321), (Start: 36 @30132 has 39 MA's), (Start: 38 @30120 has 3 MA's), (42, 30096),  
(43, 30093), (46, 30081), (48, 30069), (52, 30036), (53, 30033), (55, 30015), (56, 29991), (57, 29943),

(58, 29937),

Gene: Shinji\_90 Start: 57537, Stop: 57199, Start Num: 34

Candidate Starts for Shinji\_90:

(19, 57627), (Start: 20 @57624 has 2 MA's), (26, 57579), (Start: 34 @57537 has 36 MA's), (47, 57471), (56, 57378), (57, 57330), (58, 57324),

Gene: Sisko\_81 Start: 60938, Stop: 60591, Start Num: 30

Candidate Starts for Sisko\_81:

(Start: 30 @60938 has 6 MA's), (43, 60881), (52, 60815), (57, 60719), (58, 60713),

Gene: Skog\_33 Start: 15580, Stop: 15906, Start Num: 34

Candidate Starts for Skog\_33:

(Start: 34 @15580 has 36 MA's), (57, 15784), (58, 15790),

Gene: Skysand\_80 Start: 58588, Stop: 58283, Start Num: 31

Candidate Starts for Skysand\_80:

(Start: 31 @58588 has 14 MA's), (45, 58528), (58, 58390),

Gene: SmokingBunny\_92 Start: 58452, Stop: 58114, Start Num: 34

Candidate Starts for SmokingBunny\_92:

(21, 58524), (26, 58494), (Start: 34 @58452 has 36 MA's), (47, 58386), (56, 58293), (57, 58245), (58, 58239),

Gene: Sombrero\_78 Start: 60468, Stop: 60136, Start Num: 33

Candidate Starts for Sombrero\_78:

(Start: 33 @60468 has 28 MA's), (58, 60255),

Gene: Squibbles\_76 Start: 60731, Stop: 60402, Start Num: 33

Candidate Starts for Squibbles\_76:

(Start: 33 @60731 has 28 MA's), (58, 60518),

Gene: StarStruck\_76 Start: 57844, Stop: 57512, Start Num: 31

Candidate Starts for StarStruck\_76:

(Start: 31 @57844 has 14 MA's), (41, 57799), (53, 57733), (58, 57637),

Gene: SuperSulley\_77 Start: 58290, Stop: 57958, Start Num: 31

Candidate Starts for SuperSulley\_77:

(Start: 31 @58290 has 14 MA's), (Start: 38 @58263 has 3 MA's), (53, 58176), (57, 58086), (58, 58080),

Gene: Tardus\_10 Start: 4552, Stop: 4857, Start Num: 36

Candidate Starts for Tardus\_10:

(Start: 36 @4552 has 39 MA's), (53, 4645), (56, 4687), (57, 4735), (58, 4741),

Gene: Teatealatte\_74 Start: 60491, Stop: 60171, Start Num: 34

Candidate Starts for Teatealatte\_74:

(Start: 34 @60491 has 36 MA's), (58, 60281),

Gene: Teech\_71 Start: 60307, Stop: 59987, Start Num: 34

Candidate Starts for Teech\_71:

(Start: 34 @60307 has 36 MA's), (58, 60097),

Gene: TillyBobJoe\_90 Start: 57675, Stop: 57337, Start Num: 34

Candidate Starts for TillyBobJoe\_90:

(21, 57747), (26, 57717), (Start: 34 @57675 has 36 MA's), (47, 57609), (56, 57516), (57, 57468), (58, 57462),

Gene: Togo\_91 Start: 58452, Stop: 58114, Start Num: 34

Candidate Starts for Togo\_91:

(21, 58524), (26, 58494), (Start: 34 @58452 has 36 MA's), (47, 58386), (56, 58293), (57, 58245), (58, 58239),

Gene: Tredge\_73 Start: 60491, Stop: 60171, Start Num: 34

Candidate Starts for Tredge\_73:

(Start: 34 @60491 has 36 MA's), (58, 60281),

Gene: Twister6\_90 Start: 56801, Stop: 56463, Start Num: 34

Candidate Starts for Twister6\_90:

(10, 57146), (18, 56933), (26, 56843), (Start: 34 @56801 has 36 MA's), (47, 56735), (56, 56642), (57, 56594), (58, 56588),

Gene: UmaThurman\_32 Start: 29419, Stop: 29123, Start Num: 38

Candidate Starts for UmaThurman\_32:

(Start: 29 @29464 has 4 MA's), (Start: 36 @29431 has 39 MA's), (Start: 38 @29419 has 3 MA's), (42, 29395), (43, 29392), (46, 29380), (48, 29368), (52, 29335), (53, 29332), (55, 29311), (56, 29287), (57, 29239), (58, 29233),

Gene: Valary\_92 Start: 58444, Stop: 58106, Start Num: 34

Candidate Starts for Valary\_92:

(19, 58534), (Start: 20 @58531 has 2 MA's), (26, 58486), (Start: 34 @58444 has 36 MA's), (47, 58378), (56, 58285), (57, 58237), (58, 58231),

Gene: VanDeWege\_93 Start: 57969, Stop: 57631, Start Num: 34

Candidate Starts for VanDeWege\_93:

(10, 58314), (18, 58101), (26, 58011), (Start: 34 @57969 has 36 MA's), (47, 57903), (56, 57810), (57, 57762), (58, 57756),

Gene: ViaConlectus\_9 Start: 5353, Stop: 5655, Start Num: 36

Candidate Starts for ViaConlectus\_9:

(Start: 36 @5353 has 39 MA's), (53, 5443), (56, 5485), (57, 5533), (58, 5539),

Gene: Walrus\_37 Start: 30012, Stop: 29710, Start Num: 38

Candidate Starts for Walrus\_37:

(Start: 29 @30057 has 4 MA's), (Start: 36 @30024 has 39 MA's), (Start: 38 @30012 has 3 MA's), (39, 30000), (42, 29988), (43, 29985), (48, 29961), (52, 29928), (53, 29925), (55, 29907), (56, 29883), (57, 29835), (58, 29829),

Gene: Whitney\_45 Start: 33551, Stop: 33234, Start Num: 36

Candidate Starts for Whitney\_45:

(32, 33563), (35, 33554), (Start: 36 @33551 has 39 MA's), (Start: 38 @33539 has 3 MA's), (42, 33515), (43, 33512), (52, 33455), (53, 33452), (55, 33434), (56, 33410), (57, 33362), (58, 33356),

Gene: Wizard\_86 Start: 57304, Stop: 56966, Start Num: 34

Candidate Starts for Wizard\_86:

(19, 57394), (Start: 20 @57391 has 2 MA's), (26, 57346), (Start: 34 @57304 has 36 MA's), (47, 57238), (56, 57145), (57, 57097), (58, 57091),

Gene: Worcestershire\_76 Start: 59861, Stop: 59529, Start Num: 33

Candidate Starts for Worcestershire\_76:

(Start: 33 @59861 has 28 MA's), (58, 59648),

Gene: Yago84\_80 Start: 60646, Stop: 60299, Start Num: 30

Candidate Starts for Yago84\_80:

(Start: 30 @60646 has 6 MA's), (43, 60589), (52, 60523), (57, 60427), (58, 60421),

Gene: YungMoney\_91 Start: 59491, Stop: 59153, Start Num: 34

Candidate Starts for YungMoney\_91:

(19, 59581), (Start: 20 @59578 has 2 MA's), (26, 59533), (Start: 34 @59491 has 36 MA's), (47, 59425), (52, 59380), (56, 59332), (57, 59284), (58, 59278),

Gene: Zarbodnamra\_36 Start: 29888, Stop: 29547, Start Num: 29

Candidate Starts for Zarbodnamra\_36:

(Start: 29 @29888 has 4 MA's), (Start: 36 @29855 has 39 MA's), (Start: 38 @29843 has 3 MA's), (39, 29831), (42, 29819), (43, 29816), (46, 29804), (48, 29792), (52, 29759), (53, 29756), (56, 29711), (57, 29663), (58, 29657),

Gene: Zitch\_10 Start: 5089, Stop: 5394, Start Num: 36

Candidate Starts for Zitch\_10:

(24, 5026), (27, 5044), (Start: 36 @5089 has 39 MA's), (53, 5182), (56, 5224), (57, 5272), (58, 5278),