

Pham 290947



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 290947 Report

This analysis was run 03/28/26 on database version 641.

Pham number 290947 has 135 members, 10 are drafts.

Phages represented in each track:

- Track 1 : Severus\_53, KittenMittens\_52, Drake94\_53, Goose\_55, OKCentral2016\_54, WalterMcMickey\_53, Chartreuse\_58, PeaceMeal1\_53, DaVinci\_58, Trike\_53, Rebeuca\_55, Twister\_53
- Track 2 : 20ES\_61, First\_0060
- Track 3 : Changeling\_57
- Track 4 : JoshKayV\_60
- Track 5 : Jaan\_58, Landor\_58
- Track 6 : Kalpine\_56
- Track 7 : AnnaL29\_60, RedRock\_60, Loser\_60
- Track 8 : WideWale\_59, MiculUcigas\_58, HarryHoudini\_59, Updawg\_59, Centaur\_59, Piro94\_58, NaSiaTalie\_58, Sknot\_58, Drake55\_60, ArcherNM\_53, Flare16\_58, Equemioh13\_59, Baehexic\_57
- Track 9 : BiancaTri92\_58
- Track 10 : CRB1\_62
- Track 11 : Trixie\_56
- Track 12 : Leogania\_58
- Track 13 : Chargerpower\_56
- Track 14 : Phoxy\_61, Bigflo\_61, Farber\_61, Hercules11\_61, Aglet\_62, SoilDragon\_61, ACFishhook\_60, Spike509\_61, Fernando\_61, OlanP\_60, P28Green\_62, Calvinny\_61, Sabia\_61, Grum1\_61, AgronaGT15\_60, Beauxregard13\_61, Zetzy\_60, StepMih\_61, Reba\_61, Dieselweasel\_62, LugYA\_64, Marius\_62, SoYo\_61, Watson\_61, Taurus\_62, MadMarie\_61, Gemma\_60, Snickers\_61, Soshari\_63, Groupthink\_62, LBerry\_62, DaHudson\_61, TinyPebbles\_60, Pawn\_61, Heliosoles\_60, Grub\_61, BreSam8\_61, GtownJaz\_61, MoneyMay\_61, KADY\_61, Penny1\_62, PGHhamlin\_63, Phranny\_62, Manu\_61, Grif\_61, Croquant\_62, HashRod\_62, HaveUMetTed\_62, MuchMore\_64, Colbster\_61, PhishRPhriends\_59, Anubis\_64, Malinsilva\_63, Rummer\_60, Stagni\_61, Louie6\_60, Wooldri\_63, PurpleHaze\_61, Gwennie\_60, EpicPhail\_62, ClownCar\_61, PotatoSplit\_63, LarryKay\_61, JenCasNa\_62, AugsMagnumOpus\_64, Sabinator\_60, Misomonster\_62, Kalb97\_62, Kalnoky\_62, Mainiac\_61, JeppNRM\_62, MarQuardt\_61, Montavir\_60, Lowa\_61, Phoebe\_62, Daishi\_60, GingkoMaracino\_61, Ollie\_61, Pembroke\_61, Cullens\_61
- Track 15 : Isiphiwo\_57, Polyphemus\_61, SmellyB\_59, SuperAwesome\_59, McFly\_59, Priamo\_61, Cookiedough\_59, Kipper29\_59, Kazan\_60, JewelBug\_60, Neeharika16\_58, Newrala\_59, VohminGhazi\_59, Hoot\_54
- Track 16 : Dorothea\_59

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

The start number called the most often in the published annotations is 4, it was called in 122 of the 125 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- 20ES\_61, ACFishhook\_60, Aglet\_62, AgronaGT15\_60, Anubis\_64, ArcherNM\_53, AugsMagnumOpus\_64, Baehexic\_57, Beauxregard13\_61, BiancaTri92\_58, Bigflo\_61, BreSam8\_61, CRB1\_62, Calvinny\_61, Centaur\_59, Changeling\_57, Chargerpower\_56, Chartreuse\_58, ClownCar\_61, Colbster\_61, Cookiedough\_59, Croquant\_62, Cullens\_61, DaHudson\_61, DaVinci\_58, Daishi\_60, Dieselweasel\_62, Dorothea\_59, Drake55\_60, Drake94\_53, EpicPhail\_62, Equemioh13\_59, Farber\_61, Fernando\_61, First\_0060, Flare16\_58, Gemma\_60, GingkoMaracino\_61, Goose\_55, Grif\_61, Groupthink\_62, Grub\_61, Grum1\_61, GtownJaz\_61, Gwennie\_60, HarryHoudini\_59, HashRod\_62, HaveUMetTed\_62, Heliosoles\_60, Hercules11\_61, Hoot\_54, Isiphiwo\_57, Jaan\_58, JenCasNa\_62, JeppNRM\_62, JewelBug\_60, JoshKayV\_60, KADY\_61, Kalb97\_62, Kalnoky\_62, Kalpine\_56, Kazan\_60, Kipper29\_59, KittenMittens\_52, LBerry\_62, Landor\_58, LarryKay\_61, Leogania\_58, Louie6\_60, Lowa\_61, LugYA\_64, MadMarie\_61, Mainiac\_61, Malinsilva\_63, Manu\_61, MarQuardt\_61, Marius\_62, McFly\_59, MiculUcigas\_58, Misomonster\_62, MoneyMay\_61, Montavir\_60, MuchMore\_64, NaSiaTalie\_58, Neeharika16\_58, Newrala\_59, OKCentral2016\_54, OlanP\_60, Ollie\_61, P28Green\_62, PGHhamlin\_63, Pawn\_61, PeaceMeal1\_53, Pembroke\_61, Penny1\_62, PhishRPhriends\_59, Phoebe\_62, Phoxy\_61, Phranny\_62, Piro94\_58, Polyphemus\_61, PotatoSplit\_63, Priamo\_61, PurpleHaze\_61, Reba\_61, Rebeuca\_55, Rummer\_60, Sabia\_61, Sabinator\_60, Severus\_53, Sknot\_58, SmellyB\_59, Snickers\_61, SoYo\_61, SoilDragon\_61, Soshari\_63, Spike509\_61, Stagni\_61, StepMih\_61, SuperAwesome\_59, Taurus\_62, TinyPebbles\_60, Trike\_53, Trixie\_56, Twister\_53, Updawg\_59, VohminGhazi\_59, WalterMcMickey\_53, Watson\_61, WideWale\_59, Wooldri\_63, Zetzy\_60,

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

- 

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

- AnnaL29\_60, Loser\_60, RedRock\_60,

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

Start 4:

- Found in 132 of 135 ( 97.8% ) of genes in pham
- Manual Annotations of this start: 122 of 125
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 20ES\_61 (A2), ACFishhook\_60 (A3), Aglet\_62 (A3), AgronaGT15\_60 (A3), Anubis\_64 (A3), ArcherNM\_53 (A2), AugsMagnumOpus\_64 (A3), Baehexic\_57 (A2), Beauxregard13\_61 (A3), BiancaTri92\_58 (A2), Bigflo\_61 (A3), BreSam8\_61 (A3), CRB1\_62 (A2), Calvinny\_61 (A3), Centaur\_59 (A2), Changeling\_57 (A2), Chargerpower\_56 (A22), Chartreuse\_58 (A6), ClownCar\_61 (A3), Colbster\_61 (A3), Cookiedough\_59 (A6), Croquant\_62 (A3), Cullens\_61 (A3), DaHudson\_61 (A3), DaVinci\_58 (A6), Daishi\_60 (A3),

Dieselweasel\_62 (A3), Dorothea\_59 (A6), Drake55\_60 (A2), Drake94\_53 (A10), EpicPhail\_62 (A3), Equemioh13\_59 (A2), Farber\_61 (A3), Fernando\_61 (A3), First\_0060 (A2), Flare16\_58 (A2), Gemma\_60 (A3), GingkoMaracino\_61 (A3), Goose\_55 (A10), Grif\_61 (A3), Groupthink\_62 (A3), Grub\_61 (A3), Grum1\_61 (A3), GtownJaz\_61 (A3), Gwennie\_60 (A3), HarryHoudini\_59 (A2), HashRod\_62 (A3), HaveUMetTed\_62 (A3), Heliosoles\_60 (A3), Hercules11\_61 (A3), Hoot\_54 (A6), Isiphiwo\_57 (A6), Jaan\_58 (A2), JenCasNa\_62 (A3), JeppNRM\_62 (A3), JewelBug\_60 (A6), JoshKayV\_60 (A2), KADY\_61 (A3), Kalb97\_62 (A3), Kalnoky\_62 (A3), Kalpine\_56 (A2), Kazan\_60 (A6), Kipper29\_59 (A6), KittenMittens\_52 (A10), LBerry\_62 (A3), Landor\_58 (A2), LarryKay\_61 (A3), Leogania\_58 (A2), Louie6\_60 (A3), Iowa\_61 (A3), LugYA\_64 (A3), MadMarie\_61 (A3), Mainiac\_61 (A3), Malinsilva\_63 (A3), Manu\_61 (A3), MarQuardt\_61 (A3), Marius\_62 (A3), McFly\_59 (A6), MiculUcigas\_58 (A2), Misomonster\_62 (A3), MoneyMay\_61 (A3), Montavir\_60 (A3), MuchMore\_64 (A3), NaSiaTalie\_58 (A2), Neeharika16\_58 (A6), Newrala\_59 (A6), OKCentral2016\_54 (A10), OlanP\_60 (A3), Ollie\_61 (A3), P28Green\_62 (A3), PGHhamlin\_63 (A3), Pawn\_61 (A3), PeaceMeal1\_53 (A10), Pembroke\_61 (A3), Penny1\_62 (A3), PhishRPhriends\_59 (A3), Phoebe\_62 (A3), Phoxy\_61 (A3), Phranny\_62 (A3), Piro94\_58 (A2), Polyphemus\_61 (A6), PotatoSplit\_63 (A3), Priamo\_61 (A6), PurpleHaze\_61 (A3), Reba\_61 (A3), Rebeuca\_55 (A10), Rummer\_60 (A3), Sabia\_61 (A3), Sabinator\_60 (A3), Severus\_53 (A10), Sknot\_58 (A2), SmellyB\_59 (A6), Snickers\_61 (A3), SoYo\_61 (A3), SoilDragon\_61 (A3), Soshari\_63 (A3), Spike509\_61 (A3), Stagni\_61 (A3), StepMih\_61 (A3), SuperAwesome\_59 (A6), Taurus\_62 (A3), TinyPebbles\_60 (A3), Trike\_53 (A10), Trixie\_56 (A2), Twister\_53 (A10), Updawg\_59 (A2), VohminGhazi\_59 (A6), WalterMcMickey\_53 (A10), Watson\_61 (A3), WideWale\_59 (A2), Wooldri\_63 (A3), Zetzy\_60 (A3),

Start 5:

- Found in 3 of 135 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 3 of 125
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnnaL29\_60 (A2), Loser\_60 (A2), RedRock\_60 (A2),

### Summary by clusters:

There are 5 clusters represented in this pham: A3, A2, A22, A10, A6,

Info for manual annotations of cluster A10:

- Start number 4 was manually annotated 10 times for cluster A10.

Info for manual annotations of cluster A2:

- Start number 4 was manually annotated 21 times for cluster A2.
- Start number 5 was manually annotated 3 times for cluster A2.

Info for manual annotations of cluster A22:

- Start number 4 was manually annotated 1 time for cluster A22.

Info for manual annotations of cluster A3:

- Start number 4 was manually annotated 73 times for cluster A3.

Info for manual annotations of cluster A6:

- Start number 4 was manually annotated 17 times for cluster A6.

**Gene Information:**

Gene: 20ES\_61 Start: 38721, Stop: 38644, Start Num: 4

Candidate Starts for 20ES\_61:

(Start: 4 @38721 has 122 MA's), (6, 38706), (7, 38700),

Gene: ACFishhook\_60 Start: 38200, Stop: 38108, Start Num: 4

Candidate Starts for ACFishhook\_60:

(2, 38440), (3, 38401), (Start: 4 @38200 has 122 MA's),

Gene: Aglet\_62 Start: 38243, Stop: 38151, Start Num: 4

Candidate Starts for Aglet\_62:

(2, 38483), (3, 38444), (Start: 4 @38243 has 122 MA's),

Gene: AgronaGT15\_60 Start: 38091, Stop: 37999, Start Num: 4

Candidate Starts for AgronaGT15\_60:

(2, 38331), (3, 38292), (Start: 4 @38091 has 122 MA's),

Gene: AnnaL29\_60 Start: 39131, Stop: 39054, Start Num: 5

Candidate Starts for AnnaL29\_60:

(Start: 5 @39131 has 3 MA's), (6, 39116),

Gene: Anubis\_64 Start: 38129, Stop: 38037, Start Num: 4

Candidate Starts for Anubis\_64:

(2, 38369), (3, 38330), (Start: 4 @38129 has 122 MA's),

Gene: ArcherNM\_53 Start: 38135, Stop: 38058, Start Num: 4

Candidate Starts for ArcherNM\_53:

(Start: 4 @38135 has 122 MA's), (6, 38120),

Gene: AugsMagnumOpus\_64 Start: 38234, Stop: 38142, Start Num: 4

Candidate Starts for AugsMagnumOpus\_64:

(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: Baehexic\_57 Start: 38247, Stop: 38170, Start Num: 4

Candidate Starts for Baehexic\_57:

(Start: 4 @38247 has 122 MA's), (6, 38232),

Gene: Beauxregard13\_61 Start: 38246, Stop: 38154, Start Num: 4

Candidate Starts for Beauxregard13\_61:

(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: BiancaTri92\_58 Start: 38840, Stop: 38763, Start Num: 4

Candidate Starts for BiancaTri92\_58:

(Start: 4 @38840 has 122 MA's), (6, 38825), (7, 38819),

Gene: Bigflo\_61 Start: 38242, Stop: 38150, Start Num: 4

Candidate Starts for Bigflo\_61:

(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: BreSam8\_61 Start: 38236, Stop: 38144, Start Num: 4  
Candidate Starts for BreSam8\_61:  
(2, 38476), (3, 38437), (Start: 4 @38236 has 122 MA's),

Gene: CRB1\_62 Start: 39238, Stop: 39161, Start Num: 4  
Candidate Starts for CRB1\_62:  
(Start: 4 @39238 has 122 MA's), (6, 39223), (7, 39217),

Gene: Calvinny\_61 Start: 38128, Stop: 38036, Start Num: 4  
Candidate Starts for Calvinny\_61:  
(2, 38368), (3, 38329), (Start: 4 @38128 has 122 MA's),

Gene: Centaur\_59 Start: 38461, Stop: 38384, Start Num: 4  
Candidate Starts for Centaur\_59:  
(Start: 4 @38461 has 122 MA's), (6, 38446),

Gene: Changeling\_57 Start: 38877, Stop: 38800, Start Num: 4  
Candidate Starts for Changeling\_57:  
(1, 39300), (2, 39117), (3, 39078), (Start: 4 @38877 has 122 MA's), (6, 38862),

Gene: Chargerpower\_56 Start: 36935, Stop: 36858, Start Num: 4  
Candidate Starts for Chargerpower\_56:  
(Start: 4 @36935 has 122 MA's),

Gene: Chartreuse\_58 Start: 36473, Stop: 36393, Start Num: 4  
Candidate Starts for Chartreuse\_58:  
(Start: 4 @36473 has 122 MA's),

Gene: ClownCar\_61 Start: 38121, Stop: 38029, Start Num: 4  
Candidate Starts for ClownCar\_61:  
(2, 38361), (3, 38322), (Start: 4 @38121 has 122 MA's),

Gene: Colbster\_61 Start: 38246, Stop: 38154, Start Num: 4  
Candidate Starts for Colbster\_61:  
(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: Cookiedough\_59 Start: 37101, Stop: 37021, Start Num: 4  
Candidate Starts for Cookiedough\_59:  
(Start: 4 @37101 has 122 MA's), (9, 37050),

Gene: Croquant\_62 Start: 38241, Stop: 38149, Start Num: 4  
Candidate Starts for Croquant\_62:  
(2, 38481), (3, 38442), (Start: 4 @38241 has 122 MA's),

Gene: Cullens\_61 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for Cullens\_61:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: DaHudson\_61 Start: 38235, Stop: 38143, Start Num: 4  
Candidate Starts for DaHudson\_61:  
(2, 38475), (3, 38436), (Start: 4 @38235 has 122 MA's),

Gene: DaVinci\_58 Start: 36527, Stop: 36447, Start Num: 4

Candidate Starts for DaVinci\_58:  
(Start: 4 @36527 has 122 MA's),

Gene: Daishi\_60 Start: 37111, Stop: 37019, Start Num: 4  
Candidate Starts for Daishi\_60:  
(2, 37351), (3, 37312), (Start: 4 @37111 has 122 MA's),

Gene: Dieselweasel\_62 Start: 38245, Stop: 38153, Start Num: 4  
Candidate Starts for Dieselweasel\_62:  
(2, 38485), (3, 38446), (Start: 4 @38245 has 122 MA's),

Gene: Dorothea\_59 Start: 37096, Stop: 37016, Start Num: 4  
Candidate Starts for Dorothea\_59:  
(Start: 4 @37096 has 122 MA's), (6, 37081), (9, 37045),

Gene: Drake55\_60 Start: 38543, Stop: 38466, Start Num: 4  
Candidate Starts for Drake55\_60:  
(Start: 4 @38543 has 122 MA's), (6, 38528),

Gene: Drake94\_53 Start: 36610, Stop: 36524, Start Num: 4  
Candidate Starts for Drake94\_53:  
(Start: 4 @36610 has 122 MA's),

Gene: EpicPhail\_62 Start: 38246, Stop: 38154, Start Num: 4  
Candidate Starts for EpicPhail\_62:  
(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: Equemioh13\_59 Start: 38366, Stop: 38289, Start Num: 4  
Candidate Starts for Equemioh13\_59:  
(Start: 4 @38366 has 122 MA's), (6, 38351),

Gene: Farber\_61 Start: 38232, Stop: 38140, Start Num: 4  
Candidate Starts for Farber\_61:  
(2, 38472), (3, 38433), (Start: 4 @38232 has 122 MA's),

Gene: Fernando\_61 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for Fernando\_61:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: First\_0060 Start: 38621, Stop: 38544, Start Num: 4  
Candidate Starts for First\_0060:  
(Start: 4 @38621 has 122 MA's), (6, 38606), (7, 38600),

Gene: Flare16\_58 Start: 38122, Stop: 38045, Start Num: 4  
Candidate Starts for Flare16\_58:  
(Start: 4 @38122 has 122 MA's), (6, 38107),

Gene: Gemma\_60 Start: 38124, Stop: 38032, Start Num: 4  
Candidate Starts for Gemma\_60:  
(2, 38364), (3, 38325), (Start: 4 @38124 has 122 MA's),

Gene: GingkoMaracino\_61 Start: 38128, Stop: 38036, Start Num: 4  
Candidate Starts for GingkoMaracino\_61:

(2, 38368), (3, 38329), (Start: 4 @38128 has 122 MA's),

Gene: Goose\_55 Start: 37188, Stop: 37105, Start Num: 4  
Candidate Starts for Goose\_55:  
(Start: 4 @37188 has 122 MA's),

Gene: Grif\_61 Start: 38317, Stop: 38225, Start Num: 4  
Candidate Starts for Grif\_61:  
(2, 38557), (3, 38518), (Start: 4 @38317 has 122 MA's),

Gene: Groupthink\_62 Start: 38128, Stop: 38036, Start Num: 4  
Candidate Starts for Groupthink\_62:  
(2, 38368), (3, 38329), (Start: 4 @38128 has 122 MA's),

Gene: Grub\_61 Start: 38234, Stop: 38142, Start Num: 4  
Candidate Starts for Grub\_61:  
(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: Grum1\_61 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for Grum1\_61:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: GtownJaz\_61 Start: 38244, Stop: 38152, Start Num: 4  
Candidate Starts for GtownJaz\_61:  
(2, 38484), (3, 38445), (Start: 4 @38244 has 122 MA's),

Gene: Gwennie\_60 Start: 38246, Stop: 38154, Start Num: 4  
Candidate Starts for Gwennie\_60:  
(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: HarryHoudini\_59 Start: 38552, Stop: 38475, Start Num: 4  
Candidate Starts for HarryHoudini\_59:  
(Start: 4 @38552 has 122 MA's), (6, 38537),

Gene: HashRod\_62 Start: 38270, Stop: 38178, Start Num: 4  
Candidate Starts for HashRod\_62:  
(2, 38510), (3, 38471), (Start: 4 @38270 has 122 MA's),

Gene: HaveUMetTed\_62 Start: 38113, Stop: 38021, Start Num: 4  
Candidate Starts for HaveUMetTed\_62:  
(2, 38353), (3, 38314), (Start: 4 @38113 has 122 MA's),

Gene: Heliosoles\_60 Start: 38131, Stop: 38039, Start Num: 4  
Candidate Starts for Heliosoles\_60:  
(2, 38371), (3, 38332), (Start: 4 @38131 has 122 MA's),

Gene: Hercules11\_61 Start: 38251, Stop: 38159, Start Num: 4  
Candidate Starts for Hercules11\_61:  
(2, 38491), (3, 38452), (Start: 4 @38251 has 122 MA's),

Gene: Hoot\_54 Start: 34937, Stop: 34857, Start Num: 4  
Candidate Starts for Hoot\_54:  
(Start: 4 @34937 has 122 MA's), (9, 34886),

Gene: Isiphiwo\_57 Start: 36653, Stop: 36573, Start Num: 4  
Candidate Starts for Isiphiwo\_57:  
(Start: 4 @36653 has 122 MA's), (9, 36602),

Gene: Jaan\_58 Start: 39427, Stop: 39350, Start Num: 4  
Candidate Starts for Jaan\_58:  
(2, 39667), (3, 39628), (Start: 4 @39427 has 122 MA's), (6, 39412),

Gene: JenCasNa\_62 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for JenCasNa\_62:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: JeppNRM\_62 Start: 38129, Stop: 38037, Start Num: 4  
Candidate Starts for JeppNRM\_62:  
(2, 38369), (3, 38330), (Start: 4 @38129 has 122 MA's),

Gene: JewelBug\_60 Start: 37292, Stop: 37212, Start Num: 4  
Candidate Starts for JewelBug\_60:  
(Start: 4 @37292 has 122 MA's), (9, 37241),

Gene: JoshKayV\_60 Start: 38905, Stop: 38825, Start Num: 4  
Candidate Starts for JoshKayV\_60:  
(Start: 4 @38905 has 122 MA's), (6, 38890),

Gene: KADY\_61 Start: 38270, Stop: 38178, Start Num: 4  
Candidate Starts for KADY\_61:  
(2, 38510), (3, 38471), (Start: 4 @38270 has 122 MA's),

Gene: Kalb97\_62 Start: 38127, Stop: 38035, Start Num: 4  
Candidate Starts for Kalb97\_62:  
(2, 38367), (3, 38328), (Start: 4 @38127 has 122 MA's),

Gene: Kalnoky\_62 Start: 38125, Stop: 38033, Start Num: 4  
Candidate Starts for Kalnoky\_62:  
(2, 38365), (3, 38326), (Start: 4 @38125 has 122 MA's),

Gene: Kalpine\_56 Start: 38466, Stop: 38380, Start Num: 4  
Candidate Starts for Kalpine\_56:  
(Start: 4 @38466 has 122 MA's), (6, 38451), (8, 38421),

Gene: Kazan\_60 Start: 37092, Stop: 37012, Start Num: 4  
Candidate Starts for Kazan\_60:  
(Start: 4 @37092 has 122 MA's), (9, 37041),

Gene: Kipper29\_59 Start: 37105, Stop: 37025, Start Num: 4  
Candidate Starts for Kipper29\_59:  
(Start: 4 @37105 has 122 MA's), (9, 37054),

Gene: KittenMittens\_52 Start: 36618, Stop: 36532, Start Num: 4  
Candidate Starts for KittenMittens\_52:  
(Start: 4 @36618 has 122 MA's),

Gene: LBerry\_62 Start: 38246, Stop: 38154, Start Num: 4  
Candidate Starts for LBerry\_62:  
(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: Landor\_58 Start: 39345, Stop: 39268, Start Num: 4  
Candidate Starts for Landor\_58:  
(2, 39585), (3, 39546), (Start: 4 @39345 has 122 MA's), (6, 39330),

Gene: LarryKay\_61 Start: 38272, Stop: 38180, Start Num: 4  
Candidate Starts for LarryKay\_61:  
(2, 38512), (3, 38473), (Start: 4 @38272 has 122 MA's),

Gene: Leogania\_58 Start: 39218, Stop: 39141, Start Num: 4  
Candidate Starts for Leogania\_58:  
(Start: 4 @39218 has 122 MA's), (6, 39203),

Gene: Loser\_60 Start: 39078, Stop: 39001, Start Num: 5  
Candidate Starts for Loser\_60:  
(Start: 5 @39078 has 3 MA's), (6, 39063),

Gene: Louie6\_60 Start: 38271, Stop: 38179, Start Num: 4  
Candidate Starts for Louie6\_60:  
(2, 38511), (3, 38472), (Start: 4 @38271 has 122 MA's),

Gene: Lowa\_61 Start: 38234, Stop: 38142, Start Num: 4  
Candidate Starts for Lowa\_61:  
(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: LugYA\_64 Start: 38243, Stop: 38151, Start Num: 4  
Candidate Starts for LugYA\_64:  
(2, 38483), (3, 38444), (Start: 4 @38243 has 122 MA's),

Gene: MadMarie\_61 Start: 38244, Stop: 38152, Start Num: 4  
Candidate Starts for MadMarie\_61:  
(2, 38484), (3, 38445), (Start: 4 @38244 has 122 MA's),

Gene: Mainiac\_61 Start: 38236, Stop: 38144, Start Num: 4  
Candidate Starts for Mainiac\_61:  
(2, 38476), (3, 38437), (Start: 4 @38236 has 122 MA's),

Gene: Malinsilva\_63 Start: 38234, Stop: 38142, Start Num: 4  
Candidate Starts for Malinsilva\_63:  
(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: Manu\_61 Start: 38128, Stop: 38036, Start Num: 4  
Candidate Starts for Manu\_61:  
(2, 38368), (3, 38329), (Start: 4 @38128 has 122 MA's),

Gene: MarQuardt\_61 Start: 38244, Stop: 38152, Start Num: 4  
Candidate Starts for MarQuardt\_61:  
(2, 38484), (3, 38445), (Start: 4 @38244 has 122 MA's),

Gene: Marius\_62 Start: 38125, Stop: 38033, Start Num: 4

Candidate Starts for Marius\_62:  
(2, 38365), (3, 38326), (Start: 4 @38125 has 122 MA's),

Gene: McFly\_59 Start: 37086, Stop: 37006, Start Num: 4  
Candidate Starts for McFly\_59:  
(Start: 4 @37086 has 122 MA's), (9, 37035),

Gene: MiculUcigas\_58 Start: 38025, Stop: 37948, Start Num: 4  
Candidate Starts for MiculUcigas\_58:  
(Start: 4 @38025 has 122 MA's), (6, 38010),

Gene: Misomonster\_62 Start: 38269, Stop: 38177, Start Num: 4  
Candidate Starts for Misomonster\_62:  
(2, 38509), (3, 38470), (Start: 4 @38269 has 122 MA's),

Gene: MoneyMay\_61 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for MoneyMay\_61:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: Montavir\_60 Start: 38243, Stop: 38151, Start Num: 4  
Candidate Starts for Montavir\_60:  
(2, 38483), (3, 38444), (Start: 4 @38243 has 122 MA's),

Gene: MuchMore\_64 Start: 38234, Stop: 38142, Start Num: 4  
Candidate Starts for MuchMore\_64:  
(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: NaSiaTalie\_58 Start: 38119, Stop: 38042, Start Num: 4  
Candidate Starts for NaSiaTalie\_58:  
(Start: 4 @38119 has 122 MA's), (6, 38104),

Gene: Neeharika16\_58 Start: 36546, Stop: 36466, Start Num: 4  
Candidate Starts for Neeharika16\_58:  
(Start: 4 @36546 has 122 MA's), (9, 36495),

Gene: Newrala\_59 Start: 37088, Stop: 37008, Start Num: 4  
Candidate Starts for Newrala\_59:  
(Start: 4 @37088 has 122 MA's), (9, 37037),

Gene: OKCentral2016\_54 Start: 37091, Stop: 37008, Start Num: 4  
Candidate Starts for OKCentral2016\_54:  
(Start: 4 @37091 has 122 MA's),

Gene: OlanP\_60 Start: 38301, Stop: 38209, Start Num: 4  
Candidate Starts for OlanP\_60:  
(2, 38541), (3, 38502), (Start: 4 @38301 has 122 MA's),

Gene: Ollie\_61 Start: 38113, Stop: 38021, Start Num: 4  
Candidate Starts for Ollie\_61:  
(2, 38353), (3, 38314), (Start: 4 @38113 has 122 MA's),

Gene: P28Green\_62 Start: 38245, Stop: 38153, Start Num: 4  
Candidate Starts for P28Green\_62:

(2, 38485), (3, 38446), (Start: 4 @38245 has 122 MA's),

Gene: PGHhamlin\_63 Start: 38234, Stop: 38142, Start Num: 4

Candidate Starts for PGHhamlin\_63:

(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: Pawn\_61 Start: 38132, Stop: 38040, Start Num: 4

Candidate Starts for Pawn\_61:

(2, 38372), (3, 38333), (Start: 4 @38132 has 122 MA's),

Gene: PeaceMeal1\_53 Start: 36619, Stop: 36533, Start Num: 4

Candidate Starts for PeaceMeal1\_53:

(Start: 4 @36619 has 122 MA's),

Gene: Pembroke\_61 Start: 38243, Stop: 38151, Start Num: 4

Candidate Starts for Pembroke\_61:

(2, 38483), (3, 38444), (Start: 4 @38243 has 122 MA's),

Gene: Penny1\_62 Start: 38246, Stop: 38154, Start Num: 4

Candidate Starts for Penny1\_62:

(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: PhishRPhriends\_59 Start: 37309, Stop: 37217, Start Num: 4

Candidate Starts for PhishRPhriends\_59:

(2, 37549), (3, 37510), (Start: 4 @37309 has 122 MA's),

Gene: Phoebe\_62 Start: 38235, Stop: 38143, Start Num: 4

Candidate Starts for Phoebe\_62:

(2, 38475), (3, 38436), (Start: 4 @38235 has 122 MA's),

Gene: Phoxy\_61 Start: 38267, Stop: 38175, Start Num: 4

Candidate Starts for Phoxy\_61:

(2, 38507), (3, 38468), (Start: 4 @38267 has 122 MA's),

Gene: Phranny\_62 Start: 38114, Stop: 38022, Start Num: 4

Candidate Starts for Phranny\_62:

(2, 38354), (3, 38315), (Start: 4 @38114 has 122 MA's),

Gene: Piro94\_58 Start: 38469, Stop: 38392, Start Num: 4

Candidate Starts for Piro94\_58:

(Start: 4 @38469 has 122 MA's), (6, 38454),

Gene: Polyphemus\_61 Start: 37471, Stop: 37391, Start Num: 4

Candidate Starts for Polyphemus\_61:

(Start: 4 @37471 has 122 MA's), (9, 37420),

Gene: PotatoSplit\_63 Start: 38246, Stop: 38154, Start Num: 4

Candidate Starts for PotatoSplit\_63:

(2, 38486), (3, 38447), (Start: 4 @38246 has 122 MA's),

Gene: Priamo\_61 Start: 36839, Stop: 36759, Start Num: 4

Candidate Starts for Priamo\_61:

(Start: 4 @36839 has 122 MA's), (9, 36788),

Gene: PurpleHaze\_61 Start: 38127, Stop: 38035, Start Num: 4  
Candidate Starts for PurpleHaze\_61:  
(2, 38367), (3, 38328), (Start: 4 @38127 has 122 MA's),

Gene: Reba\_61 Start: 37787, Stop: 37695, Start Num: 4  
Candidate Starts for Reba\_61:  
(2, 38027), (3, 37988), (Start: 4 @37787 has 122 MA's),

Gene: Rebeuca\_55 Start: 37764, Stop: 37681, Start Num: 4  
Candidate Starts for Rebeuca\_55:  
(Start: 4 @37764 has 122 MA's),

Gene: RedRock\_60 Start: 39311, Stop: 39234, Start Num: 5  
Candidate Starts for RedRock\_60:  
(Start: 5 @39311 has 3 MA's), (6, 39296),

Gene: Rummer\_60 Start: 38270, Stop: 38178, Start Num: 4  
Candidate Starts for Rummer\_60:  
(2, 38510), (3, 38471), (Start: 4 @38270 has 122 MA's),

Gene: Sabia\_61 Start: 38251, Stop: 38159, Start Num: 4  
Candidate Starts for Sabia\_61:  
(2, 38491), (3, 38452), (Start: 4 @38251 has 122 MA's),

Gene: Sabinator\_60 Start: 38241, Stop: 38149, Start Num: 4  
Candidate Starts for Sabinator\_60:  
(2, 38481), (3, 38442), (Start: 4 @38241 has 122 MA's),

Gene: Severus\_53 Start: 36617, Stop: 36531, Start Num: 4  
Candidate Starts for Severus\_53:  
(Start: 4 @36617 has 122 MA's),

Gene: Sknot\_58 Start: 38122, Stop: 38045, Start Num: 4  
Candidate Starts for Sknot\_58:  
(Start: 4 @38122 has 122 MA's), (6, 38107),

Gene: SmellyB\_59 Start: 37086, Stop: 37006, Start Num: 4  
Candidate Starts for SmellyB\_59:  
(Start: 4 @37086 has 122 MA's), (9, 37035),

Gene: Snickers\_61 Start: 38216, Stop: 38124, Start Num: 4  
Candidate Starts for Snickers\_61:  
(2, 38456), (3, 38417), (Start: 4 @38216 has 122 MA's),

Gene: SoYo\_61 Start: 38154, Stop: 38062, Start Num: 4  
Candidate Starts for SoYo\_61:  
(2, 38394), (3, 38355), (Start: 4 @38154 has 122 MA's),

Gene: SoilDragon\_61 Start: 37690, Stop: 37598, Start Num: 4  
Candidate Starts for SoilDragon\_61:  
(2, 37930), (3, 37891), (Start: 4 @37690 has 122 MA's),

Gene: Soshari\_63 Start: 38266, Stop: 38174, Start Num: 4  
Candidate Starts for Soshari\_63:  
(2, 38506), (3, 38467), (Start: 4 @38266 has 122 MA's),

Gene: Spike509\_61 Start: 38267, Stop: 38175, Start Num: 4  
Candidate Starts for Spike509\_61:  
(2, 38507), (3, 38468), (Start: 4 @38267 has 122 MA's),

Gene: Stagni\_61 Start: 38245, Stop: 38153, Start Num: 4  
Candidate Starts for Stagni\_61:  
(2, 38485), (3, 38446), (Start: 4 @38245 has 122 MA's),

Gene: StepMih\_61 Start: 38236, Stop: 38144, Start Num: 4  
Candidate Starts for StepMih\_61:  
(2, 38476), (3, 38437), (Start: 4 @38236 has 122 MA's),

Gene: SuperAwesome\_59 Start: 37091, Stop: 37011, Start Num: 4  
Candidate Starts for SuperAwesome\_59:  
(Start: 4 @37091 has 122 MA's), (9, 37040),

Gene: Taurus\_62 Start: 38242, Stop: 38150, Start Num: 4  
Candidate Starts for Taurus\_62:  
(2, 38482), (3, 38443), (Start: 4 @38242 has 122 MA's),

Gene: TinyPebbles\_60 Start: 38272, Stop: 38180, Start Num: 4  
Candidate Starts for TinyPebbles\_60:  
(2, 38512), (3, 38473), (Start: 4 @38272 has 122 MA's),

Gene: Trike\_53 Start: 36623, Stop: 36540, Start Num: 4  
Candidate Starts for Trike\_53:  
(Start: 4 @36623 has 122 MA's),

Gene: Trixie\_56 Start: 38334, Stop: 38248, Start Num: 4  
Candidate Starts for Trixie\_56:  
(Start: 4 @38334 has 122 MA's), (8, 38289),

Gene: Twister\_53 Start: 37325, Stop: 37242, Start Num: 4  
Candidate Starts for Twister\_53:  
(Start: 4 @37325 has 122 MA's),

Gene: Updawg\_59 Start: 38366, Stop: 38289, Start Num: 4  
Candidate Starts for Updawg\_59:  
(Start: 4 @38366 has 122 MA's), (6, 38351),

Gene: VohminGhazi\_59 Start: 37087, Stop: 37007, Start Num: 4  
Candidate Starts for VohminGhazi\_59:  
(Start: 4 @37087 has 122 MA's), (9, 37036),

Gene: WalterMcMickey\_53 Start: 37325, Stop: 37242, Start Num: 4  
Candidate Starts for WalterMcMickey\_53:  
(Start: 4 @37325 has 122 MA's),

Gene: Watson\_61 Start: 38234, Stop: 38142, Start Num: 4

Candidate Starts for Watson\_61:  
(2, 38474), (3, 38435), (Start: 4 @38234 has 122 MA's),

Gene: WideWale\_59 Start: 38366, Stop: 38289, Start Num: 4  
Candidate Starts for WideWale\_59:  
(Start: 4 @38366 has 122 MA's), (6, 38351),

Gene: Wooldri\_63 Start: 38154, Stop: 38062, Start Num: 4  
Candidate Starts for Wooldri\_63:  
(2, 38394), (3, 38355), (Start: 4 @38154 has 122 MA's),

Gene: Zetzy\_60 Start: 37805, Stop: 37713, Start Num: 4  
Candidate Starts for Zetzy\_60:  
(2, 38045), (3, 38006), (Start: 4 @37805 has 122 MA's),