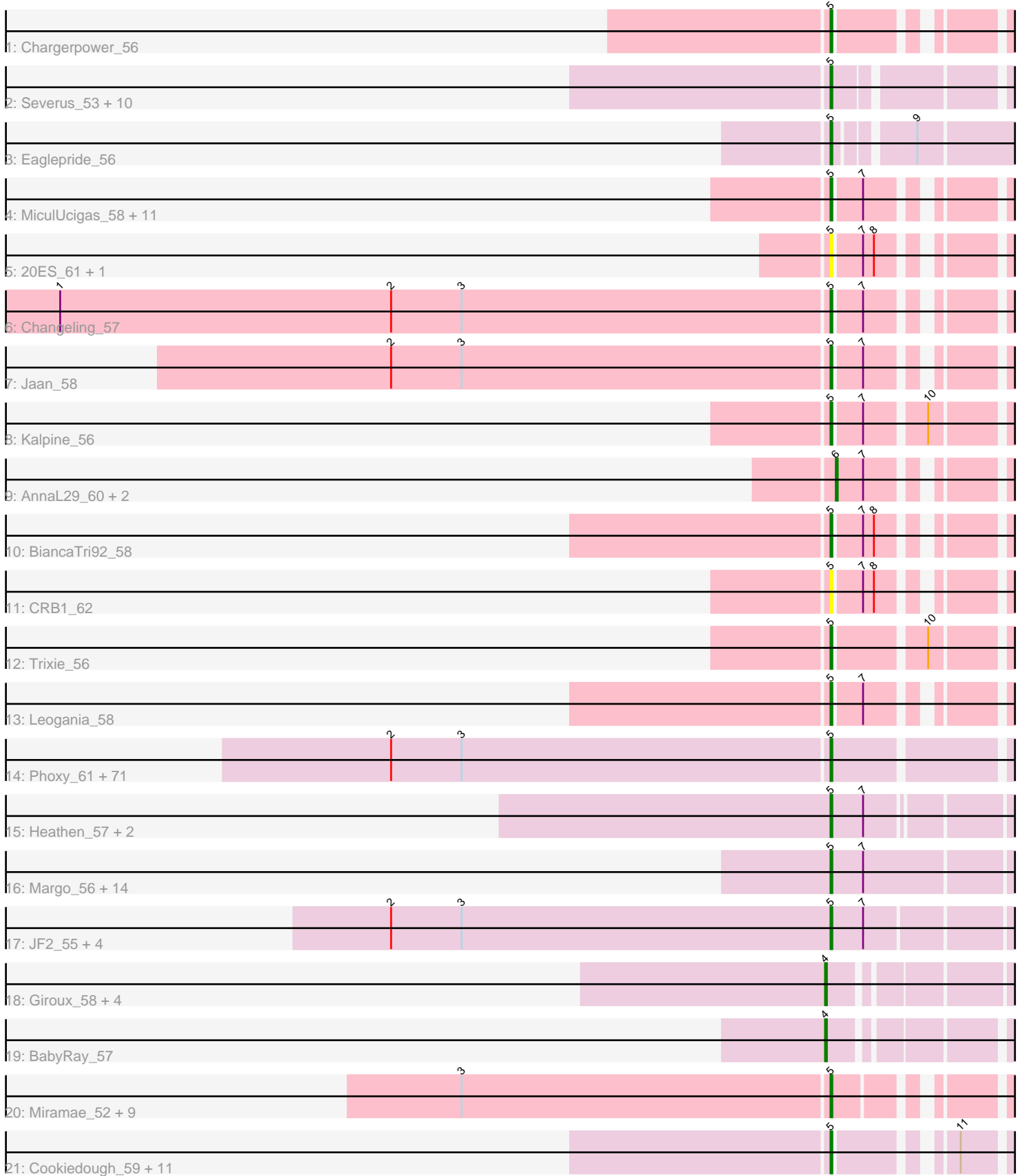


Pham 163393



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 163393 Report

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

Pham number 163393 has 160 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Chargerpower\_56
- Track 2 : Severus\_53, KittenMittens\_52, Drake94\_53, Goose\_55, OKCentral2016\_54, Rebeuca\_55, WalterMcMickey\_53, PeaceMeal1\_53, DaVinci\_58, Trike\_53, Twister\_53
- Track 3 : Eaglepride\_56
- Track 4 : MiculUcigas\_58, WideWale\_59, HarryHoudini\_59, Updawg\_59, Centaur\_59, Piro94\_58, NaSiaTalie\_58, Drake55\_60, ArcherNM\_53, Flare16\_58, Equemioh13\_59, Baehexic\_57
- Track 5 : 20ES\_61, First\_0060
- Track 6 : Changeling\_57
- Track 7 : Jaan\_58
- Track 8 : Kalpine\_56
- Track 9 : AnnaL29\_60, RedRock\_60, Loser\_60
- Track 10 : BiancaTri92\_58
- Track 11 : CRB1\_62
- Track 12 : Trixie\_56
- Track 13 : Leogania\_58
- Track 14 : Phoxy\_61, Farber\_61, Hercules11\_61, Aglet\_62, ACFishhook\_60, Spike509\_61, Phoebe\_62, Fernando\_61, OlanP\_60, P28Green\_62, Sabia\_61, GingkoMaracino\_61, Grum1\_61, AgronaGT15\_60, Zetzy\_60, Gemma\_60, Reba\_61, Snickers\_61, Dieselweasel\_62, LugYA\_64, Marius\_62, SoYo\_61, Watson\_61, Taurus\_62, MadMarie\_61, Soshari\_63, Groupthink\_62, LBerry\_62, DaHudson\_61, Pawn\_61, Heliosoles\_60, Grub\_61, StepMih\_61, BreSam8\_61, GtownJaz\_61, MoneyMay\_61, KADY\_61, Penny1\_62, PGHhamlin\_63, Beauxregard13\_61, Phranny\_62, Manu\_61, Grif\_61, HashRod\_62, HaveUMetTed\_62, MuchMore\_64, Colbster\_61, PhishRPhriends\_59, Anubis\_64, EpicPhail\_62, Malinsilva\_63, Rummer\_60, SoilDragon\_61, Stagni\_61, Louie6\_60, Wooldri\_63, PurpleHaze\_61, PotatoSplit\_63, JenCasNa\_62, AugsMagnumOpus\_64, Sabinator\_60, Misomonster\_62, Kalb97\_62, Kalnoky\_62, Mainiac\_61, JeppNRM\_62, MarQuardt\_61, LarryKay\_61, Daishi\_60, Ollie\_61, Pembroke\_61, Cullens\_61
- Track 15 : Heathen\_57, Scout\_57, HelDan\_57
- Track 16 : Margo\_56, Panamaxus\_54, MA5\_57, Lambert1\_56, QuinnKiro\_55, Texage\_55, Caviar\_56, Pocahontas\_56, Norbert\_55, Popcicle\_56, Hookmount\_56, Veracruz\_55, Todacoro\_56, Noella\_56, ResDef\_57
- Track 17 : JF2\_55, JF4\_55, MK4\_57, Phantastic\_58, Isca\_56
- Track 18 : Giroux\_58, Bugatti\_58, TNguyen7\_58, SaturnRing\_58, BlueBird\_59
- Track 19 : BabyRay\_57

- Track 20 : Miramae\_52, Cerulean\_55, AvatarAhPeg\_52, LHTSCC\_56, Obama12\_55, Arturo\_53, Happiness\_53, Mundrea\_53, Kratak\_54, ChampagnePapi\_56
- Track 21 : Cookiedough\_59, Isiphiwo\_57, SmellyB\_59, SuperAwesome\_59, McFly\_59, Priamo\_61, Kipper29\_59, Kazan\_60, Hoot\_54, JewelBug\_60, Newrala\_59, VohminGhazi\_59

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

The start number called the most often in the published annotations is 5, it was called in 145 of the 151 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, Arturo\_53, AugsMagnumOpus\_64, AvatarAhPeg\_52, Baehexic\_57, Beauxregard13\_61, BiancaTri92\_58, BreSam8\_61, CRB1\_62, Caviar\_56, Centaur\_59, Cerulean\_55, ChampagnePapi\_56, Changeling\_57, Chargerpower\_56, Colbster\_61, Cookiedough\_59, Cullens\_61, DaHudson\_61, DaVinci\_58, Daishi\_60, Dieselweasel\_62, Drake55\_60, Drake94\_53, Eaglepride\_56, 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, Happiness\_53, HarryHoudini\_59, HashRod\_62, HaveUMetTed\_62, Heathen\_57, HelDan\_57, Heliosoles\_60, Hercules11\_61, Hookmount\_56, Hoot\_54, Isca\_56, Isiphiwo\_57, JF2\_55, JF4\_55, Jaan\_58, JenCasNa\_62, JeppNRM\_62, JewelBug\_60, KADY\_61, Kalb97\_62, Kalnoky\_62, Kalpine\_56, Kazan\_60, Kipper29\_59, KittenMittens\_52, Kratak\_54, LBerry\_62, LHTSCC\_56, Lambert1\_56, LarryKay\_61, Leogania\_58, Louie6\_60, LugYA\_64, MA5\_57, MK4\_57, MadMarie\_61, Mainiac\_61, Malinsilva\_63, Manu\_61, MarQuardt\_61, Margo\_56, Marius\_62, McFly\_59, MiculUcigas\_58, Miramae\_52, Misomonster\_62, MoneyMay\_61, MuchMore\_64, Mundrea\_53, NaSiaTalie\_58, Newrala\_59, Noella\_56, Norbert\_55, OKCentral2016\_54, Obama12\_55, OlanP\_60, Ollie\_61, P28Green\_62, PGHhamlin\_63, Panamaxus\_54, Pawn\_61, PeaceMeal1\_53, Pembroke\_61, Penny1\_62, Phantastic\_58, PhishRPhriends\_59, Phoebe\_62, Phoxy\_61, Phranny\_62, Piro94\_58, Pocahontas\_56, Popcicle\_56, PotatoSplit\_63, Priamo\_61, PurpleHaze\_61, QuinnKiro\_55, Reba\_61, Rebeuca\_55, ResDef\_57, Rummer\_60, Sabia\_61, Sabinator\_60, Scout\_57, Severus\_53, SmellyB\_59, Snickers\_61, SoYo\_61, SoilDragon\_61, Soshari\_63, Spike509\_61, Stagni\_61, StepMih\_61, SuperAwesome\_59, Taurus\_62, Texage\_55, Todacoro\_56, Trike\_53, Trixie\_56, Twister\_53, Updawg\_59, Veracruz\_55, 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, BabyRay\_57, BlueBird\_59, Bugatti\_58, Giroux\_58, Loser\_60, RedRock\_60, SaturnRing\_58, TNguyen7\_58,

**Summary by start number:**

#### Start 4:

- Found in 6 of 160 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 3 of 151
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BabyRay\_57 (A3), BlueBird\_59 (A3), Bugatti\_58 (A3), Giroux\_58 (A3), SaturnRing\_58 (A3), TNguyen7\_58 (A3),

#### Start 5:

- Found in 151 of 160 ( 94.4% ) of genes in pham
- Manual Annotations of this start: 145 of 151
- 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), Arturo\_53 (A4), AugsMagnumOpus\_64 (A3), AvatarAhPeg\_52 (A4), Baehexic\_57 (A2), Beauxregard13\_61 (A3), BiancaTri92\_58 (A2), BreSam8\_61 (A3), CRB1\_62 (A2), Caviar\_56 (A3), Centaur\_59 (A2), Cerulean\_55 (A4), ChampagnePapi\_56 (A4), Changeling\_57 (A2), Chargerpower\_56 (A), Colbster\_61 (A3), Cookiedough\_59 (A6), Cullens\_61 (A3), DaHudson\_61 (A3), DaVinci\_58 (A6), Daishi\_60 (A3), Dieselweasel\_62 (A3), Drake55\_60 (A2), Drake94\_53 (A10), Eaglepride\_56 (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), Happiness\_53 (A4), HarryHoudini\_59 (A2), HashRod\_62 (A3), HaveUMetTed\_62 (A3), Heathen\_57 (A3), HelDan\_57 (A3), Heliosoles\_60 (A3), Hercules11\_61 (A3), Hookmount\_56 (A3), Hoot\_54 (A6), Isca\_56 (A3), Isiphiwo\_57 (A6), JF2\_55 (A3), JF4\_55 (A3), Jaan\_58 (A2), JenCasNa\_62 (A3), JeppNRM\_62 (A3), JewelBug\_60 (A6), KADY\_61 (A3), Kalb97\_62 (A3), Kalnoky\_62 (A3), Kalpine\_56 (A2), Kazan\_60 (A6), Kipper29\_59 (A6), KittenMittens\_52 (A10), Kratark\_54 (A4), LBerry\_62 (A3), LHTSCC\_56 (A4), Lambert1\_56 (A3), LarryKay\_61 (A3), Leogania\_58 (A2), Louie6\_60 (A3), LugYA\_64 (A3), MA5\_57 (A3), MK4\_57 (A3), MadMarie\_61 (A3), Mainiac\_61 (A3), Malinsilva\_63 (A3), Manu\_61 (A3), MarQuardt\_61 (A3), Margo\_56 (A3), Marius\_62 (A3), McFly\_59 (A6), MiculUcigas\_58 (A2), Miramae\_52 (A4), Misomonster\_62 (A3), MoneyMay\_61 (A3), MuchMore\_64 (A3), Mundrea\_53 (A4), NaSiaTalie\_58 (A2), Newrala\_59 (A6), Noella\_56 (A3), Norbert\_55 (A3), OKCentral2016\_54 (A10), Obama12\_55 (A4), OlanP\_60 (A3), Ollie\_61 (A3), P28Green\_62 (A3), PGHhamlin\_63 (A3), Panamaxus\_54 (A3), Pawn\_61 (A3), PeaceMeal1\_53 (A10), Pembroke\_61 (A3), Penny1\_62 (A3), Phantastic\_58 (A3), PhishRPhriends\_59 (A3), Phoebe\_62 (A3), Phoxy\_61 (A3), Phranny\_62 (A3), Piro94\_58 (A2), Pocahontas\_56 (A3), Popcicle\_56 (A3), PotatoSplit\_63 (A3), Priamo\_61 (A6), PurpleHaze\_61 (A3), QuinnKiro\_55 (A3), Reba\_61 (A3), Rebeuca\_55 (A10), ResDef\_57 (A3), Rummer\_60 (A3), Sabia\_61 (A3), Sabinator\_60 (A3), Scout\_57 (A3), Severus\_53 (A10), 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), Texage\_55 (A3), Todacoro\_56 (A3), Trike\_53 (A10), Trixie\_56 (A2), Twister\_53 (A10), Updawg\_59 (A2), Veracruz\_55 (A3), VohminGhazi\_59 (A6), WalterMcMickey\_53 (A10), Watson\_61 (A3), WideWale\_59 (A2), Wooldri\_63 (A3), Zetzy\_60 (A3),

#### Start 6:

- Found in 3 of 160 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 3 of 151
- 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 6 clusters represented in this pham: A, A10, A3, A2, A4, A6,

Info for manual annotations of cluster A:

- Start number 5 was manually annotated 1 time for cluster A.

Info for manual annotations of cluster A10:

- Start number 5 was manually annotated 11 times for cluster A10.

Info for manual annotations of cluster A2:

- Start number 5 was manually annotated 18 times for cluster A2.
- Start number 6 was manually annotated 3 times for cluster A2.

Info for manual annotations of cluster A3:

- Start number 4 was manually annotated 3 times for cluster A3.
- Start number 5 was manually annotated 92 times for cluster A3.

Info for manual annotations of cluster A4:

- Start number 5 was manually annotated 10 times for cluster A4.

Info for manual annotations of cluster A6:

- Start number 5 was manually annotated 13 times for cluster A6.

### **Gene Information:**

Gene: 20ES\_61 Start: 38721, Stop: 38644, Start Num: 5

Candidate Starts for 20ES\_61:

(Start: 5 @38721 has 145 MA's), (7, 38706), (8, 38700),

Gene: ACFishhook\_60 Start: 38200, Stop: 38108, Start Num: 5

Candidate Starts for ACFishhook\_60:

(2, 38440), (3, 38401), (Start: 5 @38200 has 145 MA's),

Gene: Aglet\_62 Start: 38243, Stop: 38151, Start Num: 5

Candidate Starts for Aglet\_62:

(2, 38483), (3, 38444), (Start: 5 @38243 has 145 MA's),

Gene: AgronaGT15\_60 Start: 38091, Stop: 37999, Start Num: 5

Candidate Starts for AgronaGT15\_60:

(2, 38331), (3, 38292), (Start: 5 @38091 has 145 MA's),

Gene: AnnaL29\_60 Start: 39131, Stop: 39054, Start Num: 6

Candidate Starts for AnnaL29\_60:

(Start: 6 @39131 has 3 MA's), (7, 39116),

Gene: Anubis\_64 Start: 38129, Stop: 38037, Start Num: 5

Candidate Starts for Anubis\_64:

(2, 38369), (3, 38330), (Start: 5 @38129 has 145 MA's),

Gene: ArcherNM\_53 Start: 38135, Stop: 38058, Start Num: 5

Candidate Starts for ArcherNM\_53:

(Start: 5 @38135 has 145 MA's), (7, 38120),

Gene: Arturo\_53 Start: 37722, Stop: 37645, Start Num: 5

Candidate Starts for Arturo\_53:

(3, 37923), (Start: 5 @37722 has 145 MA's),

Gene: AugsMagnumOpus\_64 Start: 38234, Stop: 38142, Start Num: 5

Candidate Starts for AugsMagnumOpus\_64:

(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: AvatarAhPeg\_52 Start: 37235, Stop: 37158, Start Num: 5

Candidate Starts for AvatarAhPeg\_52:

(3, 37436), (Start: 5 @37235 has 145 MA's),

Gene: BabyRay\_57 Start: 37849, Stop: 37763, Start Num: 4

Candidate Starts for BabyRay\_57:

(Start: 4 @37849 has 3 MA's),

Gene: Baehexic\_57 Start: 38247, Stop: 38170, Start Num: 5

Candidate Starts for Baehexic\_57:

(Start: 5 @38247 has 145 MA's), (7, 38232),

Gene: Beauxregard13\_61 Start: 38246, Stop: 38154, Start Num: 5

Candidate Starts for Beauxregard13\_61:

(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: BiancaTri92\_58 Start: 38840, Stop: 38763, Start Num: 5

Candidate Starts for BiancaTri92\_58:

(Start: 5 @38840 has 145 MA's), (7, 38825), (8, 38819),

Gene: BlueBird\_59 Start: 37893, Stop: 37804, Start Num: 4

Candidate Starts for BlueBird\_59:

(Start: 4 @37893 has 3 MA's),

Gene: BreSam8\_61 Start: 38236, Stop: 38144, Start Num: 5

Candidate Starts for BreSam8\_61:

(2, 38476), (3, 38437), (Start: 5 @38236 has 145 MA's),

Gene: Bugatti\_58 Start: 37893, Stop: 37804, Start Num: 4

Candidate Starts for Bugatti\_58:

(Start: 4 @37893 has 3 MA's),

Gene: CRB1\_62 Start: 39238, Stop: 39161, Start Num: 5

Candidate Starts for CRB1\_62:

(Start: 5 @39238 has 145 MA's), (7, 39223), (8, 39217),

Gene: Caviar\_56 Start: 37855, Stop: 37757, Start Num: 5

Candidate Starts for Caviar\_56:

(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: Centaur\_59 Start: 38461, Stop: 38384, Start Num: 5

Candidate Starts for Centaur\_59:

(Start: 5 @38461 has 145 MA's), (7, 38446),

Gene: Cerulean\_55 Start: 37887, Stop: 37810, Start Num: 5

Candidate Starts for Cerulean\_55:

(3, 38088), (Start: 5 @37887 has 145 MA's),

Gene: ChampagnePapi\_56 Start: 37886, Stop: 37809, Start Num: 5

Candidate Starts for ChampagnePapi\_56:

(3, 38087), (Start: 5 @37886 has 145 MA's),

Gene: Changeling\_57 Start: 38877, Stop: 38800, Start Num: 5

Candidate Starts for Changeling\_57:

(1, 39300), (2, 39117), (3, 39078), (Start: 5 @38877 has 145 MA's), (7, 38862),

Gene: Chargerpower\_56 Start: 36935, Stop: 36858, Start Num: 5

Candidate Starts for Chargerpower\_56:

(Start: 5 @36935 has 145 MA's),

Gene: Colbster\_61 Start: 38246, Stop: 38154, Start Num: 5

Candidate Starts for Colbster\_61:

(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: Cookiedough\_59 Start: 37101, Stop: 37021, Start Num: 5

Candidate Starts for Cookiedough\_59:

(Start: 5 @37101 has 145 MA's), (11, 37050),

Gene: Cullens\_61 Start: 38242, Stop: 38150, Start Num: 5

Candidate Starts for Cullens\_61:

(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: DaHudson\_61 Start: 38235, Stop: 38143, Start Num: 5

Candidate Starts for DaHudson\_61:

(2, 38475), (3, 38436), (Start: 5 @38235 has 145 MA's),

Gene: DaVinci\_58 Start: 36527, Stop: 36447, Start Num: 5

Candidate Starts for DaVinci\_58:

(Start: 5 @36527 has 145 MA's),

Gene: Daishi\_60 Start: 37111, Stop: 37019, Start Num: 5

Candidate Starts for Daishi\_60:

(2, 37351), (3, 37312), (Start: 5 @37111 has 145 MA's),

Gene: Dieselweasel\_62 Start: 38245, Stop: 38153, Start Num: 5

Candidate Starts for Dieselweasel\_62:

(2, 38485), (3, 38446), (Start: 5 @38245 has 145 MA's),

Gene: Drake55\_60 Start: 38543, Stop: 38466, Start Num: 5

Candidate Starts for Drake55\_60:

(Start: 5 @38543 has 145 MA's), (7, 38528),

Gene: Drake94\_53 Start: 36610, Stop: 36524, Start Num: 5  
Candidate Starts for Drake94\_53:  
(Start: 5 @36610 has 145 MA's),

Gene: Eaglepride\_56 Start: 37562, Stop: 37473, Start Num: 5  
Candidate Starts for Eaglepride\_56:  
(Start: 5 @37562 has 145 MA's), (9, 37526),

Gene: EpicPhail\_62 Start: 38246, Stop: 38154, Start Num: 5  
Candidate Starts for EpicPhail\_62:  
(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: Equemioh13\_59 Start: 38366, Stop: 38289, Start Num: 5  
Candidate Starts for Equemioh13\_59:  
(Start: 5 @38366 has 145 MA's), (7, 38351),

Gene: Farber\_61 Start: 38232, Stop: 38140, Start Num: 5  
Candidate Starts for Farber\_61:  
(2, 38472), (3, 38433), (Start: 5 @38232 has 145 MA's),

Gene: Fernando\_61 Start: 38242, Stop: 38150, Start Num: 5  
Candidate Starts for Fernando\_61:  
(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: First\_0060 Start: 38621, Stop: 38544, Start Num: 5  
Candidate Starts for First\_0060:  
(Start: 5 @38621 has 145 MA's), (7, 38606), (8, 38600),

Gene: Flare16\_58 Start: 38122, Stop: 38045, Start Num: 5  
Candidate Starts for Flare16\_58:  
(Start: 5 @38122 has 145 MA's), (7, 38107),

Gene: Gemma\_60 Start: 38124, Stop: 38032, Start Num: 5  
Candidate Starts for Gemma\_60:  
(2, 38364), (3, 38325), (Start: 5 @38124 has 145 MA's),

Gene: GingkoMaracino\_61 Start: 38128, Stop: 38036, Start Num: 5  
Candidate Starts for GingkoMaracino\_61:  
(2, 38368), (3, 38329), (Start: 5 @38128 has 145 MA's),

Gene: Giroux\_58 Start: 37892, Stop: 37803, Start Num: 4  
Candidate Starts for Giroux\_58:  
(Start: 4 @37892 has 3 MA's),

Gene: Goose\_55 Start: 37188, Stop: 37105, Start Num: 5  
Candidate Starts for Goose\_55:  
(Start: 5 @37188 has 145 MA's),

Gene: Grif\_61 Start: 38317, Stop: 38225, Start Num: 5  
Candidate Starts for Grif\_61:  
(2, 38557), (3, 38518), (Start: 5 @38317 has 145 MA's),

Gene: Groupthink\_62 Start: 38128, Stop: 38036, Start Num: 5



Candidate Starts for Groupthink\_62:  
(2, 38368), (3, 38329), (Start: 5 @38128 has 145 MA's),

Gene: Grub\_61 Start: 38234, Stop: 38142, Start Num: 5  
Candidate Starts for Grub\_61:  
(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: Grum1\_61 Start: 38242, Stop: 38150, Start Num: 5  
Candidate Starts for Grum1\_61:  
(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: GtownJaz\_61 Start: 38244, Stop: 38152, Start Num: 5  
Candidate Starts for GtownJaz\_61:  
(2, 38484), (3, 38445), (Start: 5 @38244 has 145 MA's),

Gene: Happiness\_53 Start: 37469, Stop: 37392, Start Num: 5  
Candidate Starts for Happiness\_53:  
(3, 37670), (Start: 5 @37469 has 145 MA's),

Gene: HarryHoudini\_59 Start: 38552, Stop: 38475, Start Num: 5  
Candidate Starts for HarryHoudini\_59:  
(Start: 5 @38552 has 145 MA's), (7, 38537),

Gene: HashRod\_62 Start: 38270, Stop: 38178, Start Num: 5  
Candidate Starts for HashRod\_62:  
(2, 38510), (3, 38471), (Start: 5 @38270 has 145 MA's),

Gene: HaveUMetTed\_62 Start: 38113, Stop: 38021, Start Num: 5  
Candidate Starts for HaveUMetTed\_62:  
(2, 38353), (3, 38314), (Start: 5 @38113 has 145 MA's),

Gene: Heathen\_57 Start: 37581, Stop: 37489, Start Num: 5  
Candidate Starts for Heathen\_57:  
(Start: 5 @37581 has 145 MA's), (7, 37563),

Gene: HelDan\_57 Start: 37797, Stop: 37705, Start Num: 5  
Candidate Starts for HelDan\_57:  
(Start: 5 @37797 has 145 MA's), (7, 37779),

Gene: Heliosoles\_60 Start: 38131, Stop: 38039, Start Num: 5  
Candidate Starts for Heliosoles\_60:  
(2, 38371), (3, 38332), (Start: 5 @38131 has 145 MA's),

Gene: Hercules11\_61 Start: 38251, Stop: 38159, Start Num: 5  
Candidate Starts for Hercules11\_61:  
(2, 38491), (3, 38452), (Start: 5 @38251 has 145 MA's),

Gene: Hookmount\_56 Start: 37856, Stop: 37758, Start Num: 5  
Candidate Starts for Hookmount\_56:  
(Start: 5 @37856 has 145 MA's), (7, 37838),

Gene: Hoot\_54 Start: 34937, Stop: 34857, Start Num: 5  
Candidate Starts for Hoot\_54:

(Start: 5 @34937 has 145 MA's), (11, 34886),

Gene: Isca\_56 Start: 37366, Stop: 37271, Start Num: 5

Candidate Starts for Isca\_56:

(2, 37609), (3, 37570), (Start: 5 @37366 has 145 MA's), (7, 37348),

Gene: Isiphiwo\_57 Start: 36653, Stop: 36573, Start Num: 5

Candidate Starts for Isiphiwo\_57:

(Start: 5 @36653 has 145 MA's), (11, 36602),

Gene: JF2\_55 Start: 36067, Stop: 35972, Start Num: 5

Candidate Starts for JF2\_55:

(2, 36310), (3, 36271), (Start: 5 @36067 has 145 MA's), (7, 36049),

Gene: JF4\_55 Start: 36067, Stop: 35972, Start Num: 5

Candidate Starts for JF4\_55:

(2, 36310), (3, 36271), (Start: 5 @36067 has 145 MA's), (7, 36049),

Gene: Jaan\_58 Start: 39427, Stop: 39350, Start Num: 5

Candidate Starts for Jaan\_58:

(2, 39667), (3, 39628), (Start: 5 @39427 has 145 MA's), (7, 39412),

Gene: JenCasNa\_62 Start: 38242, Stop: 38150, Start Num: 5

Candidate Starts for JenCasNa\_62:

(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: JeppNRM\_62 Start: 38129, Stop: 38037, Start Num: 5

Candidate Starts for JeppNRM\_62:

(2, 38369), (3, 38330), (Start: 5 @38129 has 145 MA's),

Gene: JewelBug\_60 Start: 37292, Stop: 37212, Start Num: 5

Candidate Starts for JewelBug\_60:

(Start: 5 @37292 has 145 MA's), (11, 37241),

Gene: KADY\_61 Start: 38270, Stop: 38178, Start Num: 5

Candidate Starts for KADY\_61:

(2, 38510), (3, 38471), (Start: 5 @38270 has 145 MA's),

Gene: Kalb97\_62 Start: 38127, Stop: 38035, Start Num: 5

Candidate Starts for Kalb97\_62:

(2, 38367), (3, 38328), (Start: 5 @38127 has 145 MA's),

Gene: Kalnoky\_62 Start: 38125, Stop: 38033, Start Num: 5

Candidate Starts for Kalnoky\_62:

(2, 38365), (3, 38326), (Start: 5 @38125 has 145 MA's),

Gene: Kalpine\_56 Start: 38466, Stop: 38380, Start Num: 5

Candidate Starts for Kalpine\_56:

(Start: 5 @38466 has 145 MA's), (7, 38451), (10, 38421),

Gene: Kazan\_60 Start: 37092, Stop: 37012, Start Num: 5

Candidate Starts for Kazan\_60:

(Start: 5 @37092 has 145 MA's), (11, 37041),

Gene: Kipper29\_59 Start: 37105, Stop: 37025, Start Num: 5  
Candidate Starts for Kipper29\_59:  
(Start: 5 @37105 has 145 MA's), (11, 37054),

Gene: KittenMittens\_52 Start: 36618, Stop: 36532, Start Num: 5  
Candidate Starts for KittenMittens\_52:  
(Start: 5 @36618 has 145 MA's),

Gene: Kratark\_54 Start: 37605, Stop: 37528, Start Num: 5  
Candidate Starts for Kratark\_54:  
(3, 37806), (Start: 5 @37605 has 145 MA's),

Gene: LBerry\_62 Start: 38246, Stop: 38154, Start Num: 5  
Candidate Starts for LBerry\_62:  
(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: LHTSCC\_56 Start: 37886, Stop: 37809, Start Num: 5  
Candidate Starts for LHTSCC\_56:  
(3, 38087), (Start: 5 @37886 has 145 MA's),

Gene: Lambert1\_56 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for Lambert1\_56:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: LarryKay\_61 Start: 38272, Stop: 38180, Start Num: 5  
Candidate Starts for LarryKay\_61:  
(2, 38512), (3, 38473), (Start: 5 @38272 has 145 MA's),

Gene: Leogania\_58 Start: 39218, Stop: 39141, Start Num: 5  
Candidate Starts for Leogania\_58:  
(Start: 5 @39218 has 145 MA's), (7, 39203),

Gene: Loser\_60 Start: 39078, Stop: 39001, Start Num: 6  
Candidate Starts for Loser\_60:  
(Start: 6 @39078 has 3 MA's), (7, 39063),

Gene: Louie6\_60 Start: 38271, Stop: 38179, Start Num: 5  
Candidate Starts for Louie6\_60:  
(2, 38511), (3, 38472), (Start: 5 @38271 has 145 MA's),

Gene: LugYA\_64 Start: 38243, Stop: 38151, Start Num: 5  
Candidate Starts for LugYA\_64:  
(2, 38483), (3, 38444), (Start: 5 @38243 has 145 MA's),

Gene: MA5\_57 Start: 37267, Stop: 37175, Start Num: 5  
Candidate Starts for MA5\_57:  
(Start: 5 @37267 has 145 MA's), (7, 37249),

Gene: MK4\_57 Start: 37351, Stop: 37256, Start Num: 5  
Candidate Starts for MK4\_57:  
(2, 37594), (3, 37555), (Start: 5 @37351 has 145 MA's), (7, 37333),

Gene: MadMarie\_61 Start: 38244, Stop: 38152, Start Num: 5  
Candidate Starts for MadMarie\_61:  
(2, 38484), (3, 38445), (Start: 5 @38244 has 145 MA's),

Gene: Mainiac\_61 Start: 38236, Stop: 38144, Start Num: 5  
Candidate Starts for Mainiac\_61:  
(2, 38476), (3, 38437), (Start: 5 @38236 has 145 MA's),

Gene: Malinsilva\_63 Start: 38234, Stop: 38142, Start Num: 5  
Candidate Starts for Malinsilva\_63:  
(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: Manu\_61 Start: 38128, Stop: 38036, Start Num: 5  
Candidate Starts for Manu\_61:  
(2, 38368), (3, 38329), (Start: 5 @38128 has 145 MA's),

Gene: MarQuardt\_61 Start: 38244, Stop: 38152, Start Num: 5  
Candidate Starts for MarQuardt\_61:  
(2, 38484), (3, 38445), (Start: 5 @38244 has 145 MA's),

Gene: Margo\_56 Start: 37881, Stop: 37783, Start Num: 5  
Candidate Starts for Margo\_56:  
(Start: 5 @37881 has 145 MA's), (7, 37863),

Gene: Marius\_62 Start: 38125, Stop: 38033, Start Num: 5  
Candidate Starts for Marius\_62:  
(2, 38365), (3, 38326), (Start: 5 @38125 has 145 MA's),

Gene: McFly\_59 Start: 37086, Stop: 37006, Start Num: 5  
Candidate Starts for McFly\_59:  
(Start: 5 @37086 has 145 MA's), (11, 37035),

Gene: MiculUcigas\_58 Start: 38025, Stop: 37948, Start Num: 5  
Candidate Starts for MiculUcigas\_58:  
(Start: 5 @38025 has 145 MA's), (7, 38010),

Gene: Miramae\_52 Start: 36897, Stop: 36820, Start Num: 5  
Candidate Starts for Miramae\_52:  
(3, 37098), (Start: 5 @36897 has 145 MA's),

Gene: Misomonster\_62 Start: 38269, Stop: 38177, Start Num: 5  
Candidate Starts for Misomonster\_62:  
(2, 38509), (3, 38470), (Start: 5 @38269 has 145 MA's),

Gene: MoneyMay\_61 Start: 38242, Stop: 38150, Start Num: 5  
Candidate Starts for MoneyMay\_61:  
(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: MuchMore\_64 Start: 38234, Stop: 38142, Start Num: 5  
Candidate Starts for MuchMore\_64:  
(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: Mundrea\_53 Start: 37449, Stop: 37372, Start Num: 5

Candidate Starts for Mundrea\_53:  
(3, 37650), (Start: 5 @37449 has 145 MA's),

Gene: NaSiaTalie\_58 Start: 38119, Stop: 38042, Start Num: 5  
Candidate Starts for NaSiaTalie\_58:  
(Start: 5 @38119 has 145 MA's), (7, 38104),

Gene: Newrala\_59 Start: 37088, Stop: 37008, Start Num: 5  
Candidate Starts for Newrala\_59:  
(Start: 5 @37088 has 145 MA's), (11, 37037),

Gene: Noella\_56 Start: 37856, Stop: 37758, Start Num: 5  
Candidate Starts for Noella\_56:  
(Start: 5 @37856 has 145 MA's), (7, 37838),

Gene: Norbert\_55 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for Norbert\_55:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: OKCentral2016\_54 Start: 37091, Stop: 37008, Start Num: 5  
Candidate Starts for OKCentral2016\_54:  
(Start: 5 @37091 has 145 MA's),

Gene: Obama12\_55 Start: 37870, Stop: 37793, Start Num: 5  
Candidate Starts for Obama12\_55:  
(3, 38071), (Start: 5 @37870 has 145 MA's),

Gene: OlanP\_60 Start: 38301, Stop: 38209, Start Num: 5  
Candidate Starts for OlanP\_60:  
(2, 38541), (3, 38502), (Start: 5 @38301 has 145 MA's),

Gene: Ollie\_61 Start: 38113, Stop: 38021, Start Num: 5  
Candidate Starts for Ollie\_61:  
(2, 38353), (3, 38314), (Start: 5 @38113 has 145 MA's),

Gene: P28Green\_62 Start: 38245, Stop: 38153, Start Num: 5  
Candidate Starts for P28Green\_62:  
(2, 38485), (3, 38446), (Start: 5 @38245 has 145 MA's),

Gene: PGHhamlin\_63 Start: 38234, Stop: 38142, Start Num: 5  
Candidate Starts for PGHhamlin\_63:  
(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: Panamaxus\_54 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for Panamaxus\_54:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: Pawn\_61 Start: 38132, Stop: 38040, Start Num: 5  
Candidate Starts for Pawn\_61:  
(2, 38372), (3, 38333), (Start: 5 @38132 has 145 MA's),

Gene: PeaceMeal1\_53 Start: 36619, Stop: 36533, Start Num: 5  
Candidate Starts for PeaceMeal1\_53:

(Start: 5 @36619 has 145 MA's),

Gene: Pembroke\_61 Start: 38243, Stop: 38151, Start Num: 5

Candidate Starts for Pembroke\_61:

(2, 38483), (3, 38444), (Start: 5 @38243 has 145 MA's),

Gene: Penny1\_62 Start: 38246, Stop: 38154, Start Num: 5

Candidate Starts for Penny1\_62:

(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: Phantastic\_58 Start: 37528, Stop: 37433, Start Num: 5

Candidate Starts for Phantastic\_58:

(2, 37771), (3, 37732), (Start: 5 @37528 has 145 MA's), (7, 37510),

Gene: PhishRPhriends\_59 Start: 37309, Stop: 37217, Start Num: 5

Candidate Starts for PhishRPhriends\_59:

(2, 37549), (3, 37510), (Start: 5 @37309 has 145 MA's),

Gene: Phoebe\_62 Start: 38235, Stop: 38143, Start Num: 5

Candidate Starts for Phoebe\_62:

(2, 38475), (3, 38436), (Start: 5 @38235 has 145 MA's),

Gene: Phoxy\_61 Start: 38267, Stop: 38175, Start Num: 5

Candidate Starts for Phoxy\_61:

(2, 38507), (3, 38468), (Start: 5 @38267 has 145 MA's),

Gene: Phranny\_62 Start: 38114, Stop: 38022, Start Num: 5

Candidate Starts for Phranny\_62:

(2, 38354), (3, 38315), (Start: 5 @38114 has 145 MA's),

Gene: Piro94\_58 Start: 38469, Stop: 38392, Start Num: 5

Candidate Starts for Piro94\_58:

(Start: 5 @38469 has 145 MA's), (7, 38454),

Gene: Pocahontas\_56 Start: 37852, Stop: 37754, Start Num: 5

Candidate Starts for Pocahontas\_56:

(Start: 5 @37852 has 145 MA's), (7, 37834),

Gene: Popcicle\_56 Start: 37852, Stop: 37754, Start Num: 5

Candidate Starts for Popcicle\_56:

(Start: 5 @37852 has 145 MA's), (7, 37834),

Gene: PotatoSplit\_63 Start: 38246, Stop: 38154, Start Num: 5

Candidate Starts for PotatoSplit\_63:

(2, 38486), (3, 38447), (Start: 5 @38246 has 145 MA's),

Gene: Priamo\_61 Start: 36839, Stop: 36759, Start Num: 5

Candidate Starts for Priamo\_61:

(Start: 5 @36839 has 145 MA's), (11, 36788),

Gene: PurpleHaze\_61 Start: 38127, Stop: 38035, Start Num: 5

Candidate Starts for PurpleHaze\_61:

(2, 38367), (3, 38328), (Start: 5 @38127 has 145 MA's),

Gene: QuinnKiro\_55 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for QuinnKiro\_55:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: Reba\_61 Start: 37787, Stop: 37695, Start Num: 5  
Candidate Starts for Reba\_61:  
(2, 38027), (3, 37988), (Start: 5 @37787 has 145 MA's),

Gene: Rebeuca\_55 Start: 37764, Stop: 37681, Start Num: 5  
Candidate Starts for Rebeuca\_55:  
(Start: 5 @37764 has 145 MA's),

Gene: RedRock\_60 Start: 39311, Stop: 39234, Start Num: 6  
Candidate Starts for RedRock\_60:  
(Start: 6 @39311 has 3 MA's), (7, 39296),

Gene: ResDef\_57 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for ResDef\_57:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: Rummer\_60 Start: 38270, Stop: 38178, Start Num: 5  
Candidate Starts for Rummer\_60:  
(2, 38510), (3, 38471), (Start: 5 @38270 has 145 MA's),

Gene: Sabia\_61 Start: 38251, Stop: 38159, Start Num: 5  
Candidate Starts for Sabia\_61:  
(2, 38491), (3, 38452), (Start: 5 @38251 has 145 MA's),

Gene: Sabinator\_60 Start: 38241, Stop: 38149, Start Num: 5  
Candidate Starts for Sabinator\_60:  
(2, 38481), (3, 38442), (Start: 5 @38241 has 145 MA's),

Gene: SaturnRing\_58 Start: 37893, Stop: 37804, Start Num: 4  
Candidate Starts for SaturnRing\_58:  
(Start: 4 @37893 has 3 MA's),

Gene: Scout\_57 Start: 37044, Stop: 36952, Start Num: 5  
Candidate Starts for Scout\_57:  
(Start: 5 @37044 has 145 MA's), (7, 37026),

Gene: Severus\_53 Start: 36617, Stop: 36531, Start Num: 5  
Candidate Starts for Severus\_53:  
(Start: 5 @36617 has 145 MA's),

Gene: SmellyB\_59 Start: 37086, Stop: 37006, Start Num: 5  
Candidate Starts for SmellyB\_59:  
(Start: 5 @37086 has 145 MA's), (11, 37035),

Gene: Snickers\_61 Start: 38216, Stop: 38124, Start Num: 5  
Candidate Starts for Snickers\_61:  
(2, 38456), (3, 38417), (Start: 5 @38216 has 145 MA's),

Gene: SoYo\_61 Start: 38154, Stop: 38062, Start Num: 5  
Candidate Starts for SoYo\_61:  
(2, 38394), (3, 38355), (Start: 5 @38154 has 145 MA's),

Gene: SoilDragon\_61 Start: 37690, Stop: 37598, Start Num: 5  
Candidate Starts for SoilDragon\_61:  
(2, 37930), (3, 37891), (Start: 5 @37690 has 145 MA's),

Gene: Soshari\_63 Start: 38266, Stop: 38174, Start Num: 5  
Candidate Starts for Soshari\_63:  
(2, 38506), (3, 38467), (Start: 5 @38266 has 145 MA's),

Gene: Spike509\_61 Start: 38267, Stop: 38175, Start Num: 5  
Candidate Starts for Spike509\_61:  
(2, 38507), (3, 38468), (Start: 5 @38267 has 145 MA's),

Gene: Stagni\_61 Start: 38245, Stop: 38153, Start Num: 5  
Candidate Starts for Stagni\_61:  
(2, 38485), (3, 38446), (Start: 5 @38245 has 145 MA's),

Gene: StepMih\_61 Start: 38236, Stop: 38144, Start Num: 5  
Candidate Starts for StepMih\_61:  
(2, 38476), (3, 38437), (Start: 5 @38236 has 145 MA's),

Gene: SuperAwesome\_59 Start: 37091, Stop: 37011, Start Num: 5  
Candidate Starts for SuperAwesome\_59:  
(Start: 5 @37091 has 145 MA's), (11, 37040),

Gene: TNguyen7\_58 Start: 37859, Stop: 37770, Start Num: 4  
Candidate Starts for TNguyen7\_58:  
(Start: 4 @37859 has 3 MA's),

Gene: Taurus\_62 Start: 38242, Stop: 38150, Start Num: 5  
Candidate Starts for Taurus\_62:  
(2, 38482), (3, 38443), (Start: 5 @38242 has 145 MA's),

Gene: Texage\_55 Start: 37856, Stop: 37758, Start Num: 5  
Candidate Starts for Texage\_55:  
(Start: 5 @37856 has 145 MA's), (7, 37838),

Gene: Todacoro\_56 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for Todacoro\_56:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: Trike\_53 Start: 36623, Stop: 36540, Start Num: 5  
Candidate Starts for Trike\_53:  
(Start: 5 @36623 has 145 MA's),

Gene: Trixie\_56 Start: 38334, Stop: 38248, Start Num: 5  
Candidate Starts for Trixie\_56:  
(Start: 5 @38334 has 145 MA's), (10, 38289),

Gene: Twister\_53 Start: 37325, Stop: 37242, Start Num: 5



Candidate Starts for Twister\_53:  
(Start: 5 @37325 has 145 MA's),

Gene: Updawg\_59 Start: 38366, Stop: 38289, Start Num: 5  
Candidate Starts for Updawg\_59:  
(Start: 5 @38366 has 145 MA's), (7, 38351),

Gene: Veracruz\_55 Start: 37855, Stop: 37757, Start Num: 5  
Candidate Starts for Veracruz\_55:  
(Start: 5 @37855 has 145 MA's), (7, 37837),

Gene: VohminGhazi\_59 Start: 37087, Stop: 37007, Start Num: 5  
Candidate Starts for VohminGhazi\_59:  
(Start: 5 @37087 has 145 MA's), (11, 37036),

Gene: WalterMcMickey\_53 Start: 37325, Stop: 37242, Start Num: 5  
Candidate Starts for WalterMcMickey\_53:  
(Start: 5 @37325 has 145 MA's),

Gene: Watson\_61 Start: 38234, Stop: 38142, Start Num: 5  
Candidate Starts for Watson\_61:  
(2, 38474), (3, 38435), (Start: 5 @38234 has 145 MA's),

Gene: WideWale\_59 Start: 38366, Stop: 38289, Start Num: 5  
Candidate Starts for WideWale\_59:  
(Start: 5 @38366 has 145 MA's), (7, 38351),

Gene: Wooldri\_63 Start: 38154, Stop: 38062, Start Num: 5  
Candidate Starts for Wooldri\_63:  
(2, 38394), (3, 38355), (Start: 5 @38154 has 145 MA's),

Gene: Zetzy\_60 Start: 37805, Stop: 37713, Start Num: 5  
Candidate Starts for Zetzy\_60:  
(2, 38045), (3, 38006), (Start: 5 @37805 has 145 MA's),