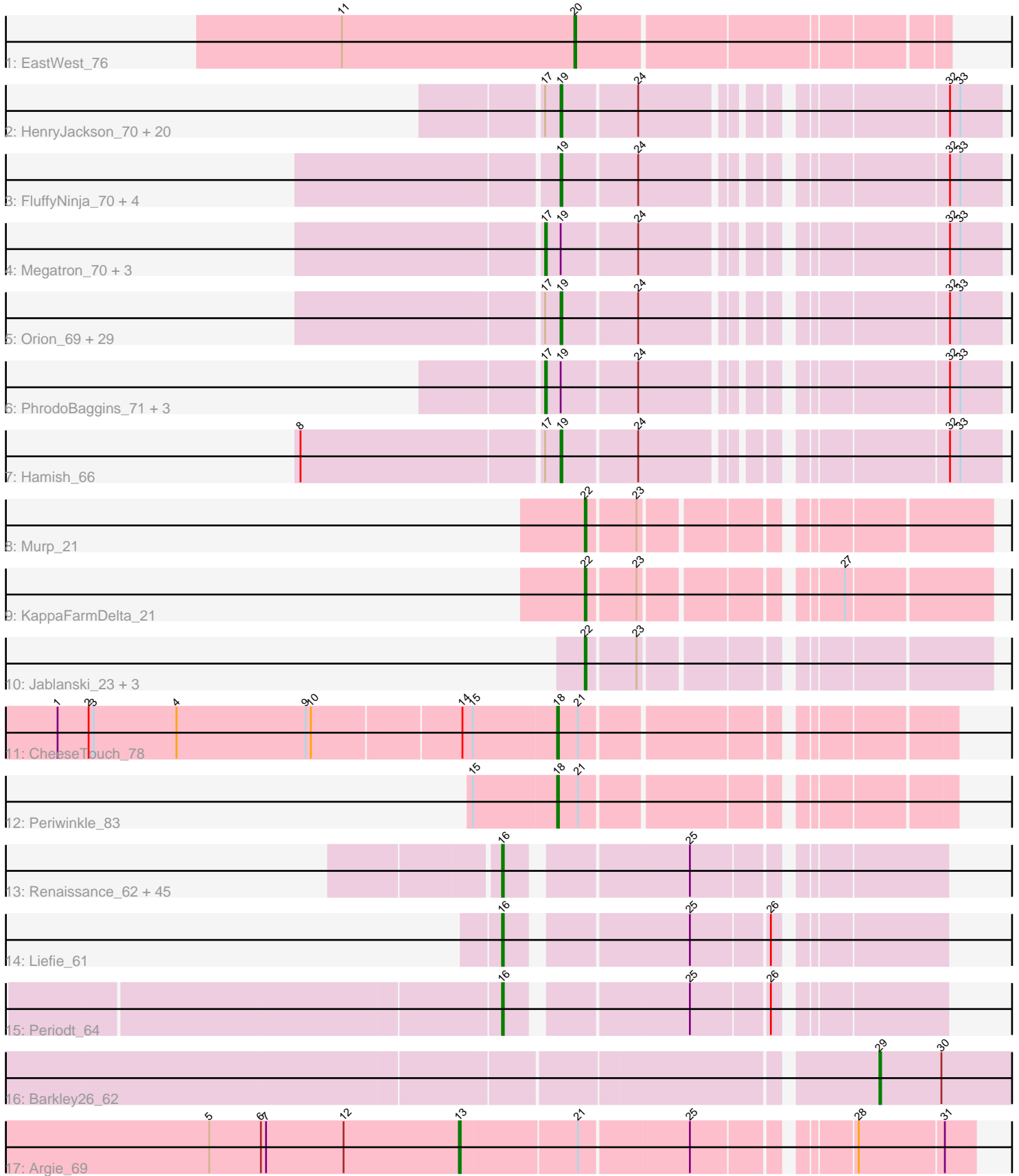


Pham 163448



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 163448 Report

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

Pham number 163448 has 124 members, 3 are drafts.

Phages represented in each track:

- Track 1 : EastWest\_76
- Track 2 : HenryJackson\_70, Kahve\_70, DaddyDaniels\_72, Ashraf\_70, Vista\_68, Zonia\_70, Thora\_68, Keitherie\_72, Mosaic\_67, Cosmolli16\_71, TallGrassMM\_68, ImtiyazSitla\_70, Childish\_69, MRabcd\_69, Chorkpop\_70, Daffy\_68, Mana\_68, Maskar\_70, MitKao\_69, Wallhey\_70, Lego3393\_67
- Track 3 : FluffyNinja\_70, Yoshand\_70, Swish\_70, BlackStallion\_70, Pherdinand\_70
- Track 4 : Megatron\_70, PhatCats2014\_70, Piglet\_0070, Matalotodo\_69
- Track 5 : Orion\_69, IsaacEli\_71, Mutante\_70, Altwerkus\_68, Xavier\_69, Katniss\_71, Serendipity\_69, PG1\_69, Serpentine\_0070, Anderson\_71, Kikipoo\_71, Badfish\_70, Skippy\_71, Chah\_71, Waterdiva\_70, Hertubise\_69, Mesh1\_70, Hetaeria\_69, Cannibal\_70, ThreeOh3D2\_71, Oosterbaan\_69, Frankicide\_68, UAch1\_70, Maru\_69, Phipps\_69, Eugenia\_70, OliverWalter\_69, Olak\_69, Scoot17C\_70, Jillium\_70
- Track 6 : PhrodoBaggins\_71, GeneCoco\_70, Kwksand96\_70, Pinkman\_69
- Track 7 : Hamish\_66
- Track 8 : Murp\_21
- Track 9 : KappaFarmDelta\_21
- Track 10 : Jablanski\_23, Posh\_23, Pytheas\_23, Wrigley\_23
- Track 11 : CheeseTouch\_78
- Track 12 : Periwinkle\_83
- Track 13 : Renaissance\_62, Camri\_63, LouisV14\_65, Gideon\_63, Aroostook\_63, Hope\_63, Jonghyun\_61, DNAlll\_0060, Marmie\_63, PinkYoshi\_63, Gomashi\_62, Sizemore\_64, Grizzly\_62, Kasen3\_64, JorRay\_64, Angel\_61, Phish\_62, Phreak\_63, Hotshotbaby7\_63, Mowgli\_63, CassieYates\_63, Remy19\_63, CLED96\_62, Coleslaw\_62, Avrafan\_62, Schiebel\_61, Plagueis\_63, Cedasite\_63, Jolene\_63, Kareem\_64, Crespo\_62, Darionha\_63, BruceB\_63, Sweets\_63, Olga\_64, GoldenAsh\_61, ShaboiShabazz\_62, OctaviousRex\_62, Cherrybomb426\_62, Zombie\_63, Peeb\_62, Annihilator\_62, BPs\_63, Frosty24\_63, TomBrady\_63, Chance64\_63
- Track 14 : Liefie\_61
- Track 15 : Periodt\_64
- Track 16 : Barkley26\_62
- Track 17 : Argie\_69

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

The start number called the most often in the published annotations is 19, it was called in 55 of the 121 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Altwerkus\_68, Anderson\_71, Ashraf\_70, Badfish\_70, BlackStallion\_70, Cannibal\_70, Chah\_71, Childish\_69, Chorkpop\_70, Cosmolli16\_71, DaddyDaniels\_72, Daffy\_68, Eugenia\_70, FluffyNinja\_70, Frankicide\_68, Hamish\_66, HenryJackson\_70, Hertubise\_69, Hetaeria\_69, ImtiyazSitla\_70, IsaacEli\_71, Jillium\_70, Kahve\_70, Katniss\_71, Keitherie\_72, Kikipoo\_71, Lego3393\_67, MRabcd\_69, Mana\_68, Maru\_69, Maskar\_70, Mesh1\_70, MitKao\_69, Mosaic\_67, Mutante\_70, Olak\_69, OliverWalter\_69, Oosterbaan\_69, Orion\_69, PG1\_69, Pherdinand\_70, Phipps\_69, Scoot17C\_70, Serendipity\_69, Serpentine\_0070, Skippy\_71, Swish\_70, TallGrassMM\_68, Thora\_68, ThreeOh3D2\_71, UAch1\_70, Vista\_68, Wallhey\_70, Waterdiva\_70, Xavier\_69, Yoshand\_70, Zonia\_70,

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

- GeneCoco\_70, Kwksand96\_70, Matalotodo\_69, Megatron\_70, PhatCats2014\_70, PhrodoBaggins\_71, Piglet\_0070, Pinkman\_69,

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

- Angel\_61, Annihilator\_62, Argie\_69, Aroostook\_63, Avrafan\_62, BPs\_63, Barkley26\_62, BruceB\_63, CLED96\_62, Camri\_63, CassieYates\_63, Cedasite\_63, Chance64\_63, CheeseTouch\_78, Cherrybomb426\_62, Coleslaw\_62, Crespo\_62, DNAIII\_0060, Darionha\_63, EastWest\_76, Frosty24\_63, Gideon\_63, GoldenAsh\_61, Gomashi\_62, Grizzly\_62, Hope\_63, Hotshotbaby7\_63, Jablanski\_23, Jolene\_63, Jonghyun\_61, JorRay\_64, KappaFarmDelta\_21, Kareem\_64, Kasen3\_64, Liefie\_61, LouisV14\_65, Marmie\_63, Mowgli\_63, Murp\_21, OctaviousRex\_62, Olga\_64, Peeb\_62, Periodt\_64, Periwinkle\_83, Phish\_62, Phreak\_63, PinkYoshi\_63, Plagueis\_63, Posh\_23, Pytheas\_23, Remy19\_63, Renaissance\_62, Schiebel\_61, ShaboiShabazz\_62, Sizemore\_64, Sweets\_63, TomBrady\_63, Wrigley\_23, Zombie\_63,

### Summary by start number:

Start 13:

- Found in 1 of 124 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Argie\_69 (W),

Start 16:

- Found in 48 of 124 ( 38.7% ) of genes in pham
- Manual Annotations of this start: 48 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Angel\_61 (G1), Annihilator\_62 (G1), Aroostook\_63 (G1), Avrafan\_62 (G1), BPs\_63 (G1), BruceB\_63 (G1), CLED96\_62 (G1), Camri\_63 (G1), CassieYates\_63 (G1), Cedasite\_63 (G1), Chance64\_63 (G1), Cherrybomb426\_62 (G1), Coleslaw\_62 (G1), Crespo\_62 (G1), DNAIII\_0060 (G1), Darionha\_63 (G1), Frosty24\_63 (G1), Gideon\_63 (G1), GoldenAsh\_61 (G1), Gomashi\_62 (G1), Grizzly\_62 (G1), Hope\_63 (G1), Hotshotbaby7\_63 (G1), Jolene\_63 (G1), Jonghyun\_61 (G1), JorRay\_64 (G1), Kareem\_64 (G1), Kasen3\_64

(G1), Liefie\_61 (G1), LouisV14\_65 (G1), Marmie\_63 (G1), Mowgli\_63 (G1), OctaviousRex\_62 (G1), Olga\_64 (G1), Peeb\_62 (G1), Periodt\_64 (G1), Phish\_62 (G1), Phreak\_63 (G1), PinkYoshi\_63 (G1), Plagueis\_63 (G1), Remy19\_63 (G1), Renaissance\_62 (G1), Schiebel\_61 (G1), ShaboiShabazz\_62 (G1), Sizemore\_64 (G1), Sweets\_63 (G1), TomBrady\_63 (G1), Zombie\_63 (G1),

Start 17:

- Found in 60 of 124 ( 48.4% ) of genes in pham
- Manual Annotations of this start: 7 of 121
- Called 13.3% of time when present
- Phage (with cluster) where this start called: GeneCoco\_70 (B1), Kwksand96\_70 (B1), Matalotodo\_69 (B1), Megatron\_70 (B1), PhatCats2014\_70 (B1), PhrodoBaggins\_71 (B1), Piglet\_0070 (B1), Pinkman\_69 (B1),

Start 18:

- Found in 2 of 124 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 2 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: CheeseTouch\_78 (DN1), Periwinkle\_83 (DN1),

Start 19:

- Found in 65 of 124 ( 52.4% ) of genes in pham
- Manual Annotations of this start: 55 of 121
- Called 87.7% of time when present
- Phage (with cluster) where this start called: Altwerkus\_68 (B1), Anderson\_71 (B1), Ashraf\_70 (B1), Badfish\_70 (B1), BlackStallion\_70 (B1), Cannibal\_70 (B1), Chah\_71 (B1), Childish\_69 (B1), Chorkpop\_70 (B1), Cosmolli16\_71 (B1), DaddyDaniels\_72 (B1), Daffy\_68 (B1), Eugenia\_70 (B1), FluffyNinja\_70 (B1), Frankicide\_68 (B1), Hamish\_66 (B1), HenryJackson\_70 (B1), Hertubise\_69 (B1), Hetaeria\_69 (B1), ImtiyazSitla\_70 (B1), IsaacEli\_71 (B1), Jillium\_70 (B1), Kahve\_70 (B1), Katniss\_71 (B1), Keitherie\_72 (B1), Kikipoo\_71 (B1), Lego3393\_67 (B1), MRabcd\_69 (B1), Mana\_68 (B1), Maru\_69 (B1), Maskar\_70 (B1), Mesh1\_70 (B1), MitKao\_69 (B1), Mosaic\_67 (B1), Mutante\_70 (B1), Olak\_69 (B1), OliverWalter\_69 (B1), Oosterbaan\_69 (B1), Orion\_69 (B1), PG1\_69 (B1), Pherdinand\_70 (B1), Phipps\_69 (B1), Scoot17C\_70 (B1), Serendipity\_69 (B1), Serpentine\_0070 (B1), Skippy\_71 (B1), Swish\_70 (B1), TallGrassMM\_68 (B1), Thora\_68 (B1), ThreeOh3D2\_71 (B1), UAch1\_70 (B1), Vista\_68 (B1), Wallhey\_70 (B1), Waterdiva\_70 (B1), Xavier\_69 (B1), Yoshand\_70 (B1), Zonia\_70 (B1),

Start 20:

- Found in 1 of 124 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EastWest\_76 (AO),

Start 22:

- Found in 6 of 124 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 6 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jablanski\_23 (CY), KappaFarmDelta\_21 (CV), Murp\_21 (CV), Posh\_23 (CY), Pytheas\_23 (CY), Wrigley\_23 (CY),

Start 29:

- Found in 1 of 124 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 121
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Barkley26\_62 (G1),

### **Summary by clusters:**

There are 7 clusters represented in this pham: G1, AO, CY, DN1, B1, W, CV,

Info for manual annotations of cluster AO:

- Start number 20 was manually annotated 1 time for cluster AO.

Info for manual annotations of cluster B1:

- Start number 17 was manually annotated 7 times for cluster B1.
- Start number 19 was manually annotated 55 times for cluster B1.

Info for manual annotations of cluster CV:

- Start number 22 was manually annotated 2 times for cluster CV.

Info for manual annotations of cluster CY:

- Start number 22 was manually annotated 4 times for cluster CY.

Info for manual annotations of cluster DN1:

- Start number 18 was manually annotated 2 times for cluster DN1.

Info for manual annotations of cluster G1:

- Start number 16 was manually annotated 48 times for cluster G1.
- Start number 29 was manually annotated 1 time for cluster G1.

Info for manual annotations of cluster W:

- Start number 13 was manually annotated 1 time for cluster W.

### **Gene Information:**

Gene: Altwerkus\_68 Start: 56943, Stop: 57158, Start Num: 19

Candidate Starts for Altwerkus\_68:

(Start: 17 @56934 has 7 MA's), (Start: 19 @56943 has 55 MA's), (24, 56982), (32, 57129), (33, 57135),

Gene: Anderson\_71 Start: 57515, Stop: 57730, Start Num: 19

Candidate Starts for Anderson\_71:

(Start: 17 @57506 has 7 MA's), (Start: 19 @57515 has 55 MA's), (24, 57554), (32, 57701), (33, 57707),

Gene: Angel\_61 Start: 41085, Stop: 41306, Start Num: 16

Candidate Starts for Angel\_61:

(Start: 16 @41085 has 48 MA's), (25, 41178),

Gene: Annihilator\_62 Start: 41537, Stop: 41758, Start Num: 16

Candidate Starts for Annihilator\_62:

(Start: 16 @41537 has 48 MA's), (25, 41630),

Gene: Argie\_69 Start: 50693, Stop: 50962, Start Num: 13

Candidate Starts for Argie\_69:

(5, 50549), (6, 50579), (7, 50582), (12, 50627), (Start: 13 @50693 has 1 MA's), (21, 50759), (25, 50819), (28, 50897), (31, 50945),

Gene: Aroostook\_63 Start: 41547, Stop: 41768, Start Num: 16

Candidate Starts for Aroostook\_63:

(Start: 16 @41547 has 48 MA's), (25, 41640),

Gene: Ashraf\_70 Start: 57497, Stop: 57712, Start Num: 19

Candidate Starts for Ashraf\_70:

(Start: 17 @57488 has 7 MA's), (Start: 19 @57497 has 55 MA's), (24, 57536), (32, 57683), (33, 57689),

Gene: Avrafan\_62 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Avrafan\_62:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: BPs\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for BPs\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Badfish\_70 Start: 57801, Stop: 58016, Start Num: 19

Candidate Starts for Badfish\_70:

(Start: 17 @57792 has 7 MA's), (Start: 19 @57801 has 55 MA's), (24, 57840), (32, 57987), (33, 57993),

Gene: Barkley26\_62 Start: 41400, Stop: 41621, Start Num: 29

Candidate Starts for Barkley26\_62:

(Start: 29 @41400 has 1 MA's), (30, 41436),

Gene: BlackStallion\_70 Start: 57544, Stop: 57759, Start Num: 19

Candidate Starts for BlackStallion\_70:

(Start: 19 @57544 has 55 MA's), (24, 57583), (32, 57730), (33, 57736),

Gene: BruceB\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for BruceB\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: CLED96\_62 Start: 41100, Stop: 41321, Start Num: 16

Candidate Starts for CLED96\_62:

(Start: 16 @41100 has 48 MA's), (25, 41193),

Gene: Camri\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Camri\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Cannibal\_70 Start: 57539, Stop: 57754, Start Num: 19

Candidate Starts for Cannibal\_70:

(Start: 17 @57530 has 7 MA's), (Start: 19 @57539 has 55 MA's), (24, 57578), (32, 57725), (33, 57731),

Gene: CassieYates\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for CassieYates\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Cedasite\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Cedasite\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Chah\_71 Start: 57242, Stop: 57457, Start Num: 19

Candidate Starts for Chah\_71:

(Start: 17 @57233 has 7 MA's), (Start: 19 @57242 has 55 MA's), (24, 57281), (32, 57428), (33, 57434),

Gene: Chance64\_63 Start: 41547, Stop: 41768, Start Num: 16

Candidate Starts for Chance64\_63:

(Start: 16 @41547 has 48 MA's), (25, 41640),

Gene: CheeseTouch\_78 Start: 40545, Stop: 40745, Start Num: 18

Candidate Starts for CheeseTouch\_78:

(1, 40263), (2, 40281), (3, 40284), (4, 40332), (9, 40407), (10, 40410), (14, 40494), (15, 40500), (Start: 18 @40545 has 2 MA's), (21, 40557),

Gene: Cherrybomb426\_62 Start: 41100, Stop: 41321, Start Num: 16

Candidate Starts for Cherrybomb426\_62:

(Start: 16 @41100 has 48 MA's), (25, 41193),

Gene: Childish\_69 Start: 57818, Stop: 58033, Start Num: 19

Candidate Starts for Childish\_69:

(Start: 17 @57809 has 7 MA's), (Start: 19 @57818 has 55 MA's), (24, 57857), (32, 58004), (33, 58010),

Gene: Chorkpop\_70 Start: 57281, Stop: 57496, Start Num: 19

Candidate Starts for Chorkpop\_70:

(Start: 17 @57272 has 7 MA's), (Start: 19 @57281 has 55 MA's), (24, 57320), (32, 57467), (33, 57473),

Gene: Coleslaw\_62 Start: 41537, Stop: 41758, Start Num: 16

Candidate Starts for Coleslaw\_62:

(Start: 16 @41537 has 48 MA's), (25, 41630),

Gene: Cosmolli16\_71 Start: 57999, Stop: 58214, Start Num: 19

Candidate Starts for Cosmolli16\_71:

(Start: 17 @57990 has 7 MA's), (Start: 19 @57999 has 55 MA's), (24, 58038), (32, 58185), (33, 58191),

Gene: Crespo\_62 Start: 41546, Stop: 41767, Start Num: 16

Candidate Starts for Crespo\_62:

(Start: 16 @41546 has 48 MA's), (25, 41639),

Gene: DNAlll\_0060 Start: 39174, Stop: 39395, Start Num: 16

Candidate Starts for DNAlll\_0060:

(Start: 16 @39174 has 48 MA's), (25, 39267),

Gene: DaddyDaniels\_72 Start: 57775, Stop: 57990, Start Num: 19  
Candidate Starts for DaddyDaniels\_72:  
(Start: 17 @57766 has 7 MA's), (Start: 19 @57775 has 55 MA's), (24, 57814), (32, 57961), (33, 57967),

Gene: Daffy\_68 Start: 57266, Stop: 57481, Start Num: 19  
Candidate Starts for Daffy\_68:  
(Start: 17 @57257 has 7 MA's), (Start: 19 @57266 has 55 MA's), (24, 57305), (32, 57452), (33, 57458),

Gene: Darionha\_63 Start: 41545, Stop: 41766, Start Num: 16  
Candidate Starts for Darionha\_63:  
(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: EastWest\_76 Start: 45392, Stop: 45592, Start Num: 20  
Candidate Starts for EastWest\_76:  
(11, 45257), (Start: 20 @45392 has 1 MA's),

Gene: Eugenia\_70 Start: 57936, Stop: 58151, Start Num: 19  
Candidate Starts for Eugenia\_70:  
(Start: 17 @57927 has 7 MA's), (Start: 19 @57936 has 55 MA's), (24, 57975), (32, 58122), (33, 58128),

Gene: FluffyNinja\_70 Start: 57545, Stop: 57760, Start Num: 19  
Candidate Starts for FluffyNinja\_70:  
(Start: 19 @57545 has 55 MA's), (24, 57584), (32, 57731), (33, 57737),

Gene: Frankicide\_68 Start: 57327, Stop: 57542, Start Num: 19  
Candidate Starts for Frankicide\_68:  
(Start: 17 @57318 has 7 MA's), (Start: 19 @57327 has 55 MA's), (24, 57366), (32, 57513), (33, 57519),

Gene: Frosty24\_63 Start: 41545, Stop: 41766, Start Num: 16  
Candidate Starts for Frosty24\_63:  
(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: GeneCoco\_70 Start: 57804, Stop: 58028, Start Num: 17  
Candidate Starts for GeneCoco\_70:  
(Start: 17 @57804 has 7 MA's), (Start: 19 @57813 has 55 MA's), (24, 57852), (32, 57999), (33, 58005),

Gene: Gideon\_63 Start: 41547, Stop: 41768, Start Num: 16  
Candidate Starts for Gideon\_63:  
(Start: 16 @41547 has 48 MA's), (25, 41640),

Gene: GoldenAsh\_61 Start: 41085, Stop: 41306, Start Num: 16  
Candidate Starts for GoldenAsh\_61:  
(Start: 16 @41085 has 48 MA's), (25, 41178),

Gene: Gomashi\_62 Start: 41547, Stop: 41768, Start Num: 16  
Candidate Starts for Gomashi\_62:  
(Start: 16 @41547 has 48 MA's), (25, 41640),



Gene: Grizzly\_62 Start: 41396, Stop: 41617, Start Num: 16

Candidate Starts for Grizzly\_62:

(Start: 16 @41396 has 48 MA's), (25, 41489),

Gene: Hamish\_66 Start: 57196, Stop: 57411, Start Num: 19

Candidate Starts for Hamish\_66:

(8, 57052), (Start: 17 @57187 has 7 MA's), (Start: 19 @57196 has 55 MA's), (24, 57235), (32, 57382), (33, 57388),

Gene: HenryJackson\_70 Start: 57807, Stop: 58022, Start Num: 19

Candidate Starts for HenryJackson\_70:

(Start: 17 @57798 has 7 MA's), (Start: 19 @57807 has 55 MA's), (24, 57846), (32, 57993), (33, 57999),

Gene: Hertubise\_69 Start: 57573, Stop: 57788, Start Num: 19

Candidate Starts for Hertubise\_69:

(Start: 17 @57564 has 7 MA's), (Start: 19 @57573 has 55 MA's), (24, 57612), (32, 57759), (33, 57765),

Gene: Hetaeria\_69 Start: 57513, Stop: 57728, Start Num: 19

Candidate Starts for Hetaeria\_69:

(Start: 17 @57504 has 7 MA's), (Start: 19 @57513 has 55 MA's), (24, 57552), (32, 57699), (33, 57705),

Gene: Hope\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Hope\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Hotshotbaby7\_63 Start: 41547, Stop: 41768, Start Num: 16

Candidate Starts for Hotshotbaby7\_63:

(Start: 16 @41547 has 48 MA's), (25, 41640),

Gene: ImtiyazSitla\_70 Start: 57497, Stop: 57712, Start Num: 19

Candidate Starts for ImtiyazSitla\_70:

(Start: 17 @57488 has 7 MA's), (Start: 19 @57497 has 55 MA's), (24, 57536), (32, 57683), (33, 57689),

Gene: IsaacEli\_71 Start: 57796, Stop: 58011, Start Num: 19

Candidate Starts for IsaacEli\_71:

(Start: 17 @57787 has 7 MA's), (Start: 19 @57796 has 55 MA's), (24, 57835), (32, 57982), (33, 57988),

Gene: Jablanski\_23 Start: 20497, Stop: 20700, Start Num: 22

Candidate Starts for Jablanski\_23:

(Start: 22 @20497 has 6 MA's), (23, 20524),

Gene: Jillium\_70 Start: 57802, Stop: 58017, Start Num: 19

Candidate Starts for Jillium\_70:

(Start: 17 @57793 has 7 MA's), (Start: 19 @57802 has 55 MA's), (24, 57841), (32, 57988), (33, 57994),

Gene: Jolene\_63 Start: 41949, Stop: 42170, Start Num: 16

Candidate Starts for Jolene\_63:  
(Start: 16 @41949 has 48 MA's), (25, 42042),

Gene: Jonghyun\_61 Start: 41548, Stop: 41769, Start Num: 16  
Candidate Starts for Jonghyun\_61:  
(Start: 16 @41548 has 48 MA's), (25, 41641),

Gene: JorRay\_64 Start: 41545, Stop: 41766, Start Num: 16  
Candidate Starts for JorRay\_64:  
(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Kahve\_70 Start: 57804, Stop: 58019, Start Num: 19  
Candidate Starts for Kahve\_70:  
(Start: 17 @57795 has 7 MA's), (Start: 19 @57804 has 55 MA's), (24, 57843), (32, 57990), (33, 57996),

Gene: KappaFarmDelta\_21 Start: 19185, Stop: 19388, Start Num: 22  
Candidate Starts for KappaFarmDelta\_21:  
(Start: 22 @19185 has 6 MA's), (23, 19212), (27, 19308),

Gene: Kareem\_64 Start: 41545, Stop: 41766, Start Num: 16  
Candidate Starts for Kareem\_64:  
(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Kasen3\_64 Start: 41534, Stop: 41755, Start Num: 16  
Candidate Starts for Kasen3\_64:  
(Start: 16 @41534 has 48 MA's), (25, 41627),

Gene: Katniss\_71 Start: 57244, Stop: 57459, Start Num: 19  
Candidate Starts for Katniss\_71:  
(Start: 17 @57235 has 7 MA's), (Start: 19 @57244 has 55 MA's), (24, 57283), (32, 57430), (33, 57436),

Gene: Keitherie\_72 Start: 57866, Stop: 58081, Start Num: 19  
Candidate Starts for Keitherie\_72:  
(Start: 17 @57857 has 7 MA's), (Start: 19 @57866 has 55 MA's), (24, 57905), (32, 58052), (33, 58058),

Gene: Kikipoo\_71 Start: 57796, Stop: 58011, Start Num: 19  
Candidate Starts for Kikipoo\_71:  
(Start: 17 @57787 has 7 MA's), (Start: 19 @57796 has 55 MA's), (24, 57835), (32, 57982), (33, 57988),

Gene: Kwksand96\_70 Start: 57369, Stop: 57593, Start Num: 17  
Candidate Starts for Kwksand96\_70:  
(Start: 17 @57369 has 7 MA's), (Start: 19 @57378 has 55 MA's), (24, 57417), (32, 57564), (33, 57570),

Gene: Lego3393\_67 Start: 57823, Stop: 58038, Start Num: 19  
Candidate Starts for Lego3393\_67:  
(Start: 17 @57814 has 7 MA's), (Start: 19 @57823 has 55 MA's), (24, 57862), (32, 58009), (33, 58015),

Gene: Liefie\_61 Start: 41294, Stop: 41515, Start Num: 16  
Candidate Starts for Liefie\_61:  
(Start: 16 @41294 has 48 MA's), (25, 41387), (26, 41429),

Gene: LouisV14\_65 Start: 43789, Stop: 44010, Start Num: 16  
Candidate Starts for LouisV14\_65:  
(Start: 16 @43789 has 48 MA's), (25, 43882),

Gene: MRabcd\_69 Start: 57584, Stop: 57799, Start Num: 19  
Candidate Starts for MRabcd\_69:  
(Start: 17 @57575 has 7 MA's), (Start: 19 @57584 has 55 MA's), (24, 57623), (32, 57770), (33, 57776),

Gene: Mana\_68 Start: 57257, Stop: 57472, Start Num: 19  
Candidate Starts for Mana\_68:  
(Start: 17 @57248 has 7 MA's), (Start: 19 @57257 has 55 MA's), (24, 57296), (32, 57443), (33, 57449),

Gene: Marmie\_63 Start: 41546, Stop: 41767, Start Num: 16  
Candidate Starts for Marmie\_63:  
(Start: 16 @41546 has 48 MA's), (25, 41639),

Gene: Maru\_69 Start: 57696, Stop: 57911, Start Num: 19  
Candidate Starts for Maru\_69:  
(Start: 17 @57687 has 7 MA's), (Start: 19 @57696 has 55 MA's), (24, 57735), (32, 57882), (33, 57888),

Gene: Maskar\_70 Start: 57497, Stop: 57712, Start Num: 19  
Candidate Starts for Maskar\_70:  
(Start: 17 @57488 has 7 MA's), (Start: 19 @57497 has 55 MA's), (24, 57536), (32, 57683), (33, 57689),

Gene: Matalotodo\_69 Start: 58087, Stop: 58311, Start Num: 17  
Candidate Starts for Matalotodo\_69:  
(Start: 17 @58087 has 7 MA's), (Start: 19 @58096 has 55 MA's), (24, 58135), (32, 58282), (33, 58288),

Gene: Megatron\_70 Start: 57774, Stop: 57998, Start Num: 17  
Candidate Starts for Megatron\_70:  
(Start: 17 @57774 has 7 MA's), (Start: 19 @57783 has 55 MA's), (24, 57822), (32, 57969), (33, 57975),

Gene: Mesh1\_70 Start: 57832, Stop: 58047, Start Num: 19  
Candidate Starts for Mesh1\_70:  
(Start: 17 @57823 has 7 MA's), (Start: 19 @57832 has 55 MA's), (24, 57871), (32, 58018), (33, 58024),

Gene: MitKao\_69 Start: 57266, Stop: 57481, Start Num: 19  
Candidate Starts for MitKao\_69:  
(Start: 17 @57257 has 7 MA's), (Start: 19 @57266 has 55 MA's), (24, 57305), (32, 57452), (33, 57458),

Gene: Mosaic\_67 Start: 57261, Stop: 57476, Start Num: 19

Candidate Starts for Mosaic\_67:

(Start: 17 @57252 has 7 MA's), (Start: 19 @57261 has 55 MA's), (24, 57300), (32, 57447), (33, 57453),

Gene: Mowgli\_63 Start: 41546, Stop: 41767, Start Num: 16

Candidate Starts for Mowgli\_63:

(Start: 16 @41546 has 48 MA's), (25, 41639),

Gene: Murp\_21 Start: 19085, Stop: 19288, Start Num: 22

Candidate Starts for Murp\_21:

(Start: 22 @19085 has 6 MA's), (23, 19112),

Gene: Mutante\_70 Start: 57280, Stop: 57495, Start Num: 19

Candidate Starts for Mutante\_70:

(Start: 17 @57271 has 7 MA's), (Start: 19 @57280 has 55 MA's), (24, 57319), (32, 57466), (33, 57472),

Gene: OctaviousRex\_62 Start: 41524, Stop: 41745, Start Num: 16

Candidate Starts for OctaviousRex\_62:

(Start: 16 @41524 has 48 MA's), (25, 41617),

Gene: Olak\_69 Start: 57284, Stop: 57499, Start Num: 19

Candidate Starts for Olak\_69:

(Start: 17 @57275 has 7 MA's), (Start: 19 @57284 has 55 MA's), (24, 57323), (32, 57470), (33, 57476),

Gene: Olga\_64 Start: 41546, Stop: 41767, Start Num: 16

Candidate Starts for Olga\_64:

(Start: 16 @41546 has 48 MA's), (25, 41639),

Gene: OliverWalter\_69 Start: 57603, Stop: 57818, Start Num: 19

Candidate Starts for OliverWalter\_69:

(Start: 17 @57594 has 7 MA's), (Start: 19 @57603 has 55 MA's), (24, 57642), (32, 57789), (33, 57795),

Gene: Oosterbaan\_69 Start: 57560, Stop: 57775, Start Num: 19

Candidate Starts for Oosterbaan\_69:

(Start: 17 @57551 has 7 MA's), (Start: 19 @57560 has 55 MA's), (24, 57599), (32, 57746), (33, 57752),

Gene: Orion\_69 Start: 57222, Stop: 57437, Start Num: 19

Candidate Starts for Orion\_69:

(Start: 17 @57213 has 7 MA's), (Start: 19 @57222 has 55 MA's), (24, 57261), (32, 57408), (33, 57414),

Gene: PG1\_69 Start: 57793, Stop: 58008, Start Num: 19

Candidate Starts for PG1\_69:

(Start: 17 @57784 has 7 MA's), (Start: 19 @57793 has 55 MA's), (24, 57832), (32, 57979), (33, 57985),

Gene: Peeb\_62 Start: 41520, Stop: 41741, Start Num: 16

Candidate Starts for Peeb\_62:

(Start: 16 @41520 has 48 MA's), (25, 41613),

Gene: Periodt\_64 Start: 42142, Stop: 42363, Start Num: 16

Candidate Starts for Periodt\_64:

(Start: 16 @42142 has 48 MA's), (25, 42235), (26, 42277),

Gene: Periwinkle\_83 Start: 46446, Stop: 46646, Start Num: 18

Candidate Starts for Periwinkle\_83:

(15, 46401), (Start: 18 @46446 has 2 MA's), (21, 46458),

Gene: PhatCats2014\_70 Start: 57789, Stop: 58013, Start Num: 17

Candidate Starts for PhatCats2014\_70:

(Start: 17 @57789 has 7 MA's), (Start: 19 @57798 has 55 MA's), (24, 57837), (32, 57984), (33, 57990),

Gene: Pherdinand\_70 Start: 57547, Stop: 57762, Start Num: 19

Candidate Starts for Pherdinand\_70:

(Start: 19 @57547 has 55 MA's), (24, 57586), (32, 57733), (33, 57739),

Gene: Phipps\_69 Start: 57345, Stop: 57560, Start Num: 19

Candidate Starts for Phipps\_69:

(Start: 17 @57336 has 7 MA's), (Start: 19 @57345 has 55 MA's), (24, 57384), (32, 57531), (33, 57537),

Gene: Phish\_62 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Phish\_62:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Phreak\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Phreak\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: PhrodoBaggins\_71 Start: 57642, Stop: 57866, Start Num: 17

Candidate Starts for PhrodoBaggins\_71:

(Start: 17 @57642 has 7 MA's), (Start: 19 @57651 has 55 MA's), (24, 57690), (32, 57837), (33, 57843),

Gene: Piglet\_0070 Start: 57761, Stop: 57985, Start Num: 17

Candidate Starts for Piglet\_0070:

(Start: 17 @57761 has 7 MA's), (Start: 19 @57770 has 55 MA's), (24, 57809), (32, 57956), (33, 57962),

Gene: PinkYoshi\_63 Start: 41537, Stop: 41758, Start Num: 16

Candidate Starts for PinkYoshi\_63:

(Start: 16 @41537 has 48 MA's), (25, 41630),

Gene: Pinkman\_69 Start: 57360, Stop: 57584, Start Num: 17

Candidate Starts for Pinkman\_69:

(Start: 17 @57360 has 7 MA's), (Start: 19 @57369 has 55 MA's), (24, 57408), (32, 57555), (33, 57561),

Gene: Plagueis\_63 Start: 41366, Stop: 41587, Start Num: 16

Candidate Starts for Plagueis\_63:

(Start: 16 @41366 has 48 MA's), (25, 41459),

Gene: Posh\_23 Start: 20350, Stop: 20553, Start Num: 22

Candidate Starts for Posh\_23:

(Start: 22 @20350 has 6 MA's), (23, 20377),

Gene: Pytheas\_23 Start: 20496, Stop: 20699, Start Num: 22

Candidate Starts for Pytheas\_23:

(Start: 22 @20496 has 6 MA's), (23, 20523),

Gene: Remy19\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Remy19\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Renaissance\_62 Start: 41523, Stop: 41744, Start Num: 16

Candidate Starts for Renaissance\_62:

(Start: 16 @41523 has 48 MA's), (25, 41616),

Gene: Schiebel\_61 Start: 41085, Stop: 41306, Start Num: 16

Candidate Starts for Schiebel\_61:

(Start: 16 @41085 has 48 MA's), (25, 41178),

Gene: Scoot17C\_70 Start: 57224, Stop: 57439, Start Num: 19

Candidate Starts for Scoot17C\_70:

(Start: 17 @57215 has 7 MA's), (Start: 19 @57224 has 55 MA's), (24, 57263), (32, 57410), (33, 57416),

Gene: Serendipity\_69 Start: 57579, Stop: 57794, Start Num: 19

Candidate Starts for Serendipity\_69:

(Start: 17 @57570 has 7 MA's), (Start: 19 @57579 has 55 MA's), (24, 57618), (32, 57765), (33, 57771),

Gene: Serpentine\_0070 Start: 57662, Stop: 57877, Start Num: 19

Candidate Starts for Serpentine\_0070:

(Start: 17 @57653 has 7 MA's), (Start: 19 @57662 has 55 MA's), (24, 57701), (32, 57848), (33, 57854),

Gene: ShaboiShabazz\_62 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for ShaboiShabazz\_62:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Sizemore\_64 Start: 41534, Stop: 41755, Start Num: 16

Candidate Starts for Sizemore\_64:

(Start: 16 @41534 has 48 MA's), (25, 41627),

Gene: Skippy\_71 Start: 57515, Stop: 57730, Start Num: 19

Candidate Starts for Skippy\_71:

(Start: 17 @57506 has 7 MA's), (Start: 19 @57515 has 55 MA's), (24, 57554), (32, 57701), (33, 57707),

Gene: Sweets\_63 Start: 41540, Stop: 41761, Start Num: 16

Candidate Starts for Sweets\_63:

(Start: 16 @41540 has 48 MA's), (25, 41633),

Gene: Swish\_70 Start: 57532, Stop: 57747, Start Num: 19  
Candidate Starts for Swish\_70:  
(Start: 19 @57532 has 55 MA's), (24, 57571), (32, 57718), (33, 57724),

Gene: TallGrassMM\_68 Start: 57172, Stop: 57387, Start Num: 19  
Candidate Starts for TallGrassMM\_68:  
(Start: 17 @57163 has 7 MA's), (Start: 19 @57172 has 55 MA's), (24, 57211), (32, 57358), (33, 57364),

Gene: Thora\_68 Start: 57612, Stop: 57827, Start Num: 19  
Candidate Starts for Thora\_68:  
(Start: 17 @57603 has 7 MA's), (Start: 19 @57612 has 55 MA's), (24, 57651), (32, 57798), (33, 57804),

Gene: ThreeOh3D2\_71 Start: 57789, Stop: 58004, Start Num: 19  
Candidate Starts for ThreeOh3D2\_71:  
(Start: 17 @57780 has 7 MA's), (Start: 19 @57789 has 55 MA's), (24, 57828), (32, 57975), (33, 57981),

Gene: TomBrady\_63 Start: 41546, Stop: 41767, Start Num: 16  
Candidate Starts for TomBrady\_63:  
(Start: 16 @41546 has 48 MA's), (25, 41639),

Gene: UAch1\_70 Start: 57513, Stop: 57728, Start Num: 19  
Candidate Starts for UAch1\_70:  
(Start: 17 @57504 has 7 MA's), (Start: 19 @57513 has 55 MA's), (24, 57552), (32, 57699), (33, 57705),

Gene: Vista\_68 Start: 57268, Stop: 57483, Start Num: 19  
Candidate Starts for Vista\_68:  
(Start: 17 @57259 has 7 MA's), (Start: 19 @57268 has 55 MA's), (24, 57307), (32, 57454), (33, 57460),

Gene: Wallhey\_70 Start: 57375, Stop: 57590, Start Num: 19  
Candidate Starts for Wallhey\_70:  
(Start: 17 @57366 has 7 MA's), (Start: 19 @57375 has 55 MA's), (24, 57414), (32, 57561), (33, 57567),

Gene: Waterdiva\_70 Start: 57645, Stop: 57860, Start Num: 19  
Candidate Starts for Waterdiva\_70:  
(Start: 17 @57636 has 7 MA's), (Start: 19 @57645 has 55 MA's), (24, 57684), (32, 57831), (33, 57837),

Gene: Wrigley\_23 Start: 20247, Stop: 20450, Start Num: 22  
Candidate Starts for Wrigley\_23:  
(Start: 22 @20247 has 6 MA's), (23, 20274),

Gene: Xavier\_69 Start: 57273, Stop: 57488, Start Num: 19  
Candidate Starts for Xavier\_69:  
(Start: 17 @57264 has 7 MA's), (Start: 19 @57273 has 55 MA's), (24, 57312), (32, 57459), (33, 57465),

Gene: Yoshand\_70 Start: 57545, Stop: 57760, Start Num: 19

Candidate Starts for Yoshand\_70:

(Start: 19 @57545 has 55 MA's), (24, 57584), (32, 57731), (33, 57737),

Gene: Zombie\_63 Start: 41545, Stop: 41766, Start Num: 16

Candidate Starts for Zombie\_63:

(Start: 16 @41545 has 48 MA's), (25, 41638),

Gene: Zonia\_70 Start: 57826, Stop: 58041, Start Num: 19

Candidate Starts for Zonia\_70:

(Start: 17 @57817 has 7 MA's), (Start: 19 @57826 has 55 MA's), (24, 57865), (32, 58012), (33, 58018),