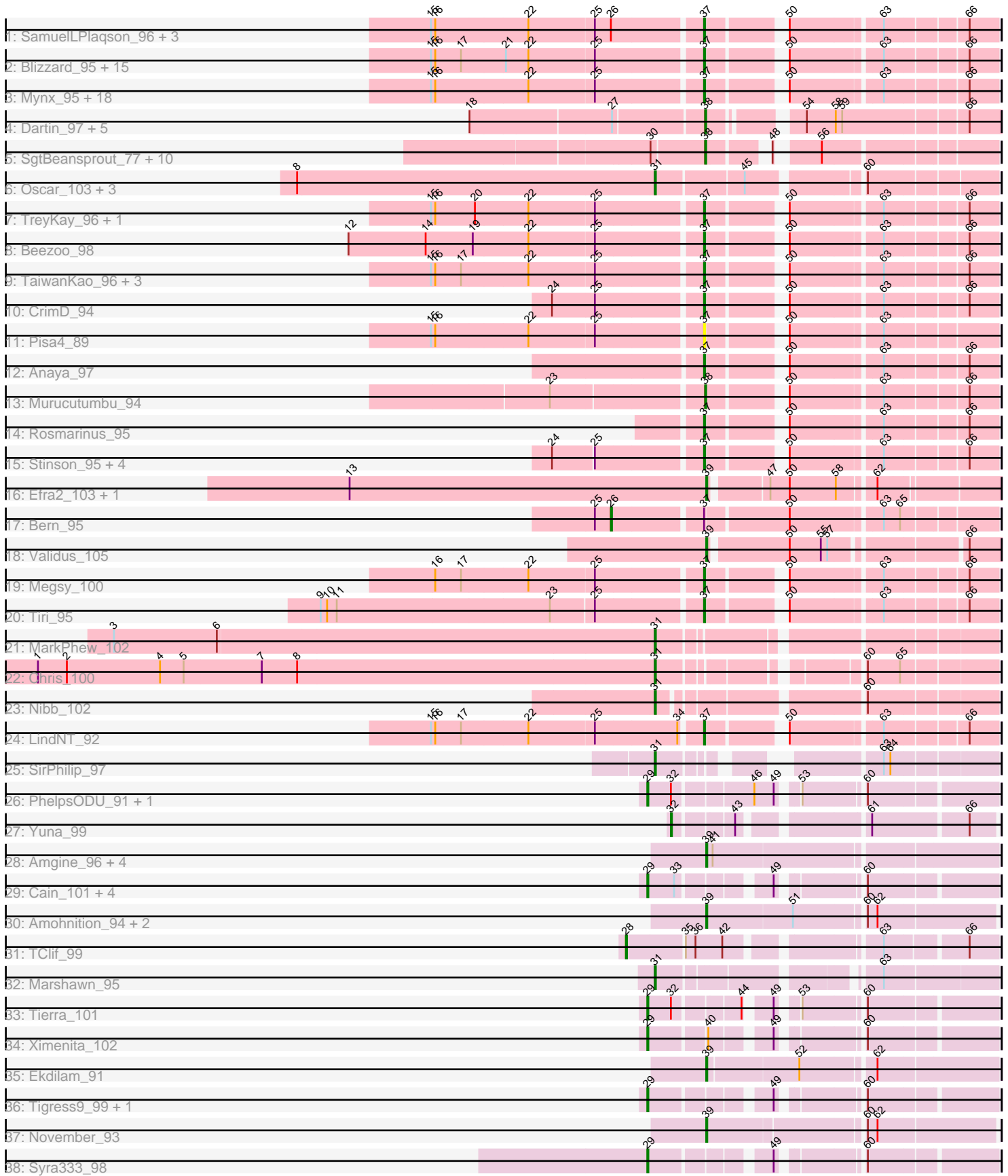


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Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 304857 Report

This analysis was run 06/08/26 on database version 649.

Pham number 304857 has 113 members, 8 are drafts.

Phages represented in each track:

- Track 1 : SamuelLPlaqson\_96, DrHayes\_96, Anma\_97, Urkel\_96
- Track 2 : Blizzard\_95, Belladonna\_95, Capricorn\_95, Emerson\_99, ShiaSurprise\_97, Homura\_93, Durfee\_95, Geraldini\_95, CaseJules\_98, Twitch\_95, CREW\_93, Dalmuri\_95, Boiiii\_95, Asayake\_95, BEEST\_94, Jeckyll\_95
- Track 3 : Mynx\_95, Adonis\_94, Veliki\_95, Ganymede\_94, Adephagia\_93, JAWS\_93, Tachez\_95, QuincyRose\_92, Ramen\_95, Sulley\_93, Jayhawk\_98, BarrelRoll\_94, Rapunzel97\_97, BGlluviae\_94, AlishaPH\_87, Atiba\_95, Pokerus\_94, Zavala\_96, Slimphazie\_97
- Track 4 : Dartin\_97, Shaobing\_95, McMater\_97, Niklas\_97, Richo\_97, Peanam\_98
- Track 5 : SgtBeansprout\_77, Nikao\_79, Torres\_79, LilPharaoh\_77, Teejan\_78, Trice\_76, Enkosi\_78, Mdavu\_77, Amelie\_76, Binglebops\_76, Nutello\_76
- Track 6 : Oscar\_103, Scarlett\_102, LeMond\_102, KiSi\_103
- Track 7 : TreyKay\_96, Prithvi\_96
- Track 8 : Beezoo\_98
- Track 9 : TaiwanKao\_96, Angelica\_93, Deby\_94, BaghaKamala\_94
- Track 10 : CrimD\_94
- Track 11 : Pisa4\_89
- Track 12 : Anaya\_97
- Track 13 : Murucutumbu\_94
- Track 14 : Rosmarinus\_95
- Track 15 : Stinson\_95, Devera\_101, Illumine\_98, LaterM\_94, Dole\_97
- Track 16 : Efra2\_103, Guanica15\_102
- Track 17 : Bern\_95
- Track 18 : Validus\_105
- Track 19 : Megsy\_100
- Track 20 : Tiri\_95
- Track 21 : MarkPhew\_102
- Track 22 : Chris\_100
- Track 23 : Nibb\_102
- Track 24 : LindNT\_92
- Track 25 : SirPhilip\_97
- Track 26 : PhelpsODU\_91, Unicorn\_101
- Track 27 : Yuna\_99
- Track 28 : Amgine\_96, Applecrisp\_94, Lavahound\_95, Fefferhead\_97, Ellie\_95
- Track 29 : Cain\_101, Bryler\_93, Shadow1\_99, Sunflower1121\_99, Phrank\_102
- Track 30 : Amohnition\_94, DarthP\_94, Hammy\_94
- Track 31 : TClif\_99

- Track 32 : Marshawn\_95
- Track 33 : Tierra\_101
- Track 34 : Ximenita\_102
- Track 35 : Ekdilam\_91
- Track 36 : Tigress9\_99, Krueger\_100
- Track 37 : November\_93
- Track 38 : Syra333\_98

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

The start number called the most often in the published annotations is 37, it was called in 55 of the 105 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adephagia\_93, Adonis\_94, AlishaPH\_87, Anaya\_97, Angelica\_93, Anma\_97, Asayake\_95, Atiba\_95, BEEST\_94, BGlluviae\_94, BaghaKamala\_94, BarrelRoll\_94, Beezoo\_98, Belladonna\_95, Blizzard\_95, Boiiii\_95, CREW\_93, Capricorn\_95, CaseJules\_98, CrimD\_94, Dalmuri\_95, Deby\_94, Devera\_101, Dole\_97, DrHayes\_96, Durfee\_95, Emerson\_99, Ganymede\_94, Geraldini\_95, Homura\_93, Illumine\_98, JAWS\_93, Jayhawk\_98, Jeckyll\_95, LaterM\_94, LindNT\_92, Megsy\_100, Mynx\_95, Pisa4\_89, Pokerus\_94, Prithvi\_96, QuincyRose\_92, Ramen\_95, Rapunzel97\_97, Rosmarinus\_95, SamuelLPlaqson\_96, ShiaSurprise\_97, Slimphazie\_97, Stinson\_95, Sulley\_93, Tachez\_95, TaiwanKao\_96, Tiri\_95, TreyKay\_96, Twitch\_95, Urkel\_96, Veliki\_95, Zavala\_96,

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

- Bern\_95,

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

- Amelie\_76, Amgine\_96, Amohnition\_94, Applecrisp\_94, Biglebops\_76, Bryler\_93, Cain\_101, Chris\_100, DarthP\_94, Dartin\_97, Efra2\_103, Ekdilam\_91, Ellie\_95, Enkosi\_78, Fefferhead\_97, Guanica15\_102, Hammy\_94, KiSi\_103, Krueger\_100, Lavahound\_95, LeMond\_102, LilPharaoh\_77, MarkPhew\_102, Marshawn\_95, McMater\_97, Mdavu\_77, Murucutumbu\_94, Nibb\_102, Nikao\_79, Niklas\_97, November\_93, Nutello\_76, Oscar\_103, Peanam\_98, PhelpsODU\_91, Phrank\_102, Richo\_97, Scarlett\_102, SgtBeansprout\_77, Shadow1\_99, Shaobing\_95, SirPhilip\_97, Sunflower1121\_99, Syra333\_98, TClif\_99, Teejan\_78, Tierra\_101, Tigress9\_99, Torres\_79, Trice\_76, Unicorn\_101, Validus\_105, Ximenita\_102, Yuna\_99,

**Summary by start number:**

Start 26:

- Found in 5 of 113 ( 4.4% ) of genes in pham
- Manual Annotations of this start: 1 of 105
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Bern\_95 (K1),

Start 28:

- Found in 1 of 113 ( 0.9% ) of genes in pham

- Manual Annotations of this start: 1 of 105
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TClif\_99 (K6),

#### Start 29:

- Found in 12 of 113 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 12 of 105
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bryler\_93 (K6), Cain\_101 (K6), Krueger\_100 (K6), PhelpsODU\_91 (K6), Phrank\_102 (K6), Shadow1\_99 (K6), Sunflower1121\_99 (K6), Syra333\_98 (K6), Tierra\_101 (K6), Tigress9\_99 (K6), Unicorn\_101 (K6), Ximenita\_102 (K6),

#### Start 31:

- Found in 9 of 113 ( 8.0% ) of genes in pham
- Manual Annotations of this start: 9 of 105
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chris\_100 (K1), KiSi\_103 (K1), LeMond\_102 (K1), MarkPhew\_102 (K1), Marshawn\_95 (K6), Nibb\_102 (K1), Oscar\_103 (K1), Scarlett\_102 (K1), SirPhilip\_97 (K6),

#### Start 32:

- Found in 4 of 113 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 1 of 105
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Yuna\_99 (K6),

#### Start 37:

- Found in 59 of 113 ( 52.2% ) of genes in pham
- Manual Annotations of this start: 55 of 105
- Called 98.3% of time when present
- Phage (with cluster) where this start called: Adephagia\_93 (K1), Adonis\_94 (K1), AlishaPH\_87 (K1), Anaya\_97 (K1), Angelica\_93 (K1), Anma\_97 (K1), Asayake\_95 (K1), Atiba\_95 (K1), BEEST\_94 (K1), BGlluviae\_94 (K1), BaghaKamala\_94 (K1), BarrelRoll\_94 (K1), Beezoo\_98 (K1), Belladonna\_95 (K1), Blizzard\_95 (K1), Boiiii\_95 (K1), CREW\_93 (K1), Capricorn\_95 (K1), CaseJules\_98 (K1), CrimD\_94 (K1), Dalmuri\_95 (K1), Deby\_94 (K1), Devera\_101 (K1), Dole\_97 (K1), DrHayes\_96 (K1), Durfee\_95 (K1), Emerson\_99 (K1), Ganymede\_94 (K1), Geraldini\_95 (K1), Homura\_93 (K1), Illumine\_98 (K1), JAWS\_93 (K1), Jayhawk\_98 (K1), Jeckyll\_95 (K1), LaterM\_94 (K1), LindNT\_92 (K1), Megsy\_100 (K1), Mynx\_95 (K1), Pisa4\_89 (K1), Pokerus\_94 (K1), Prithvi\_96 (K1), QuincyRose\_92 (K1), Ramen\_95 (K1), Rapunzel97\_97 (K1), Rosmarinus\_95 (K1), SamuelLPlaqson\_96 (K1), ShiaSurprise\_97 (K1), Slimphazie\_97 (K1), Stinson\_95 (K1), Sulley\_93 (K1), Tachez\_95 (K1), TaiwanKao\_96 (K1), Tiri\_95 (K1), TreyKay\_96 (K1), Twitch\_95 (K1), Urkel\_96 (K1), Veliki\_95 (K1), Zavala\_96 (K1),

#### Start 38:

- Found in 18 of 113 ( 15.9% ) of genes in pham
- Manual Annotations of this start: 13 of 105
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amelie\_76 (K1), Binglebops\_76 (K1), Dartin\_97 (K1), Enkosi\_78 (K1), LilPharaoh\_77 (K1), McMater\_97 (K1), Mdavu\_77 (K1), Murucutumbu\_94 (K1), Nikao\_79 (K1), Niklas\_97 (K1), Nutello\_76 (K1),

Peanam\_98 (K1), Richo\_97 (K1), SgtBeansprout\_77 (K1), Shaobing\_95 (K1), Teejan\_78 (K1), Torres\_79 (K1), Trice\_76 (K1),

Start 39:

- Found in 13 of 113 ( 11.5% ) of genes in pham
- Manual Annotations of this start: 13 of 105
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amgine\_96 (K6), Amohnition\_94 (K6), Applecrisp\_94 (K6), DarthP\_94 (K6), Efra2\_103 (K1), Ekdilam\_91 (K6), Ellie\_95 (K6), Fefferhead\_97 (K6), Guanica15\_102 (K1), Hammy\_94 (K6), Lavahound\_95 (K6), November\_93 (K6), Validus\_105 (K1),

### **Summary by clusters:**

There are 2 clusters represented in this pham: K1, K6,

Info for manual annotations of cluster K1:

- Start number 26 was manually annotated 1 time for cluster K1.
- Start number 31 was manually annotated 7 times for cluster K1.
- Start number 37 was manually annotated 55 times for cluster K1.
- Start number 38 was manually annotated 13 times for cluster K1.
- Start number 39 was manually annotated 3 times for cluster K1.

Info for manual annotations of cluster K6:

- Start number 28 was manually annotated 1 time for cluster K6.
- Start number 29 was manually annotated 12 times for cluster K6.
- Start number 31 was manually annotated 2 times for cluster K6.
- Start number 32 was manually annotated 1 time for cluster K6.
- Start number 39 was manually annotated 10 times for cluster K6.

### **Gene Information:**

Gene: Adephagia\_93 Start: 58879, Stop: 59109, Start Num: 37

Candidate Starts for Adephagia\_93:

(15, 58639), (16, 58642), (22, 58726), (25, 58786), (Start: 37 @58879 has 55 MA's), (50, 58936), (63, 59014), (66, 59083),

Gene: Adonis\_94 Start: 59264, Stop: 59494, Start Num: 37

Candidate Starts for Adonis\_94:

(15, 59024), (16, 59027), (22, 59111), (25, 59171), (Start: 37 @59264 has 55 MA's), (50, 59321), (63, 59399), (66, 59468),

Gene: AlishaPH\_87 Start: 56267, Stop: 56497, Start Num: 37

Candidate Starts for AlishaPH\_87:

(15, 56027), (16, 56030), (22, 56114), (25, 56174), (Start: 37 @56267 has 55 MA's), (50, 56324), (63, 56402), (66, 56471),

Gene: Amelie\_76 Start: 55854, Stop: 56072, Start Num: 38

Candidate Starts for Amelie\_76:

(30, 55806), (Start: 38 @55854 has 13 MA's), (48, 55896), (56, 55926),

Gene: Amgine\_96 Start: 61635, Stop: 61889, Start Num: 39

Candidate Starts for Amgine\_96:

(Start: 39 @61635 has 13 MA's), (41, 61641),

Gene: Amohnition\_94 Start: 61150, Stop: 61401, Start Num: 39

Candidate Starts for Amohnition\_94:

(Start: 39 @61150 has 13 MA's), (51, 61228), (60, 61288), (62, 61297),

Gene: Anaya\_97 Start: 60067, Stop: 60297, Start Num: 37

Candidate Starts for Anaya\_97:

(Start: 37 @60067 has 55 MA's), (50, 60124), (63, 60202), (66, 60271),

Gene: Angelica\_93 Start: 58831, Stop: 59061, Start Num: 37

Candidate Starts for Angelica\_93:

(15, 58591), (16, 58594), (17, 58618), (22, 58678), (25, 58738), (Start: 37 @58831 has 55 MA's), (50, 58888), (63, 58966), (66, 59035),

Gene: Anma\_97 Start: 59765, Stop: 59995, Start Num: 37

Candidate Starts for Anma\_97:

(15, 59525), (16, 59528), (22, 59612), (25, 59672), (Start: 26 @59687 has 1 MA's), (Start: 37 @59765 has 55 MA's), (50, 59822), (63, 59900), (66, 59969),

Gene: Applecrisp\_94 Start: 61353, Stop: 61607, Start Num: 39

Candidate Starts for Applecrisp\_94:

(Start: 39 @61353 has 13 MA's), (41, 61359),

Gene: Asayake\_95 Start: 59138, Stop: 59368, Start Num: 37

Candidate Starts for Asayake\_95:

(15, 58898), (16, 58901), (17, 58925), (21, 58964), (22, 58985), (25, 59045), (Start: 37 @59138 has 55 MA's), (50, 59195), (63, 59273), (66, 59342),

Gene: Atiba\_95 Start: 58789, Stop: 59019, Start Num: 37

Candidate Starts for Atiba\_95:

(15, 58549), (16, 58552), (22, 58636), (25, 58696), (Start: 37 @58789 has 55 MA's), (50, 58846), (63, 58924), (66, 58993),

Gene: BEEST\_94 Start: 59139, Stop: 59369, Start Num: 37

Candidate Starts for BEEST\_94:

(15, 58899), (16, 58902), (17, 58926), (21, 58965), (22, 58986), (25, 59046), (Start: 37 @59139 has 55 MA's), (50, 59196), (63, 59274), (66, 59343),

Gene: BGlluviae\_94 Start: 58541, Stop: 58771, Start Num: 37

Candidate Starts for BGlluviae\_94:

(15, 58301), (16, 58304), (22, 58388), (25, 58448), (Start: 37 @58541 has 55 MA's), (50, 58598), (63, 58676), (66, 58745),

Gene: BaghaKamala\_94 Start: 58365, Stop: 58595, Start Num: 37

Candidate Starts for BaghaKamala\_94:

(15, 58125), (16, 58128), (17, 58152), (22, 58212), (25, 58272), (Start: 37 @58365 has 55 MA's), (50, 58422), (63, 58500), (66, 58569),

Gene: BarrelRoll\_94 Start: 58905, Stop: 59135, Start Num: 37

Candidate Starts for BarrelRoll\_94:

(15, 58665), (16, 58668), (22, 58752), (25, 58812), (Start: 37 @58905 has 55 MA's), (50, 58962), (63, 59040), (66, 59109),

Gene: Beezoo\_98 Start: 59727, Stop: 59957, Start Num: 37

Candidate Starts for Beezoo\_98:

(12, 59409), (14, 59481), (19, 59523), (22, 59574), (25, 59634), (Start: 37 @59727 has 55 MA's), (50, 59784), (63, 59862), (66, 59931),

Gene: Belladonna\_95 Start: 58941, Stop: 59171, Start Num: 37

Candidate Starts for Belladonna\_95:

(15, 58701), (16, 58704), (17, 58728), (21, 58767), (22, 58788), (25, 58848), (Start: 37 @58941 has 55 MA's), (50, 58998), (63, 59076), (66, 59145),

Gene: Bern\_95 Start: 57508, Stop: 57831, Start Num: 26

Candidate Starts for Bern\_95:

(25, 57493), (Start: 26 @57508 has 1 MA's), (Start: 37 @57586 has 55 MA's), (50, 57658), (63, 57736), (65, 57751),

Gene: Biglebops\_76 Start: 55869, Stop: 56087, Start Num: 38

Candidate Starts for Biglebops\_76:

(30, 55821), (Start: 38 @55869 has 13 MA's), (48, 55911), (56, 55941),

Gene: Blizzard\_95 Start: 59138, Stop: 59368, Start Num: 37

Candidate Starts for Blizzard\_95:

(15, 58898), (16, 58901), (17, 58925), (21, 58964), (22, 58985), (25, 59045), (Start: 37 @59138 has 55 MA's), (50, 59195), (63, 59273), (66, 59342),

Gene: Boiiii\_95 Start: 59140, Stop: 59370, Start Num: 37

Candidate Starts for Boiiii\_95:

(15, 58900), (16, 58903), (17, 58927), (21, 58966), (22, 58987), (25, 59047), (Start: 37 @59140 has 55 MA's), (50, 59197), (63, 59275), (66, 59344),

Gene: Bryler\_93 Start: 57045, Stop: 57311, Start Num: 29

Candidate Starts for Bryler\_93:

(Start: 29 @57045 has 12 MA's), (33, 57069), (49, 57138), (60, 57201),

Gene: CREW\_93 Start: 58940, Stop: 59170, Start Num: 37

Candidate Starts for CREW\_93:

(15, 58700), (16, 58703), (17, 58727), (21, 58766), (22, 58787), (25, 58847), (Start: 37 @58940 has 55 MA's), (50, 58997), (63, 59075), (66, 59144),

Gene: Cain\_101 Start: 60192, Stop: 60458, Start Num: 29

Candidate Starts for Cain\_101:

(Start: 29 @60192 has 12 MA's), (33, 60216), (49, 60285), (60, 60348),

Gene: Capricorn\_95 Start: 58941, Stop: 59171, Start Num: 37

Candidate Starts for Capricorn\_95:

(15, 58701), (16, 58704), (17, 58728), (21, 58767), (22, 58788), (25, 58848), (Start: 37 @58941 has 55 MA's), (50, 58998), (63, 59076), (66, 59145),

Gene: CaseJules\_98 Start: 59138, Stop: 59368, Start Num: 37

Candidate Starts for CaseJules\_98:

(15, 58898), (16, 58901), (17, 58925), (21, 58964), (22, 58985), (25, 59045), (Start: 37 @59138 has 55 MA's), (50, 59195), (63, 59273), (66, 59342),

Gene: Chris\_100 Start: 61462, Stop: 61725, Start Num: 31

Candidate Starts for Chris\_100:

(1, 60892), (2, 60919), (4, 61006), (5, 61027), (7, 61099), (8, 61132), (Start: 31 @61462 has 9 MA's), (60, 61615), (65, 61645),

Gene: CrimD\_94 Start: 59033, Stop: 59263, Start Num: 37

Candidate Starts for CrimD\_94:

(24, 58901), (25, 58940), (Start: 37 @59033 has 55 MA's), (50, 59090), (63, 59168), (66, 59237),

Gene: Dalmuri\_95 Start: 58941, Stop: 59171, Start Num: 37

Candidate Starts for Dalmuri\_95:

(15, 58701), (16, 58704), (17, 58728), (21, 58767), (22, 58788), (25, 58848), (Start: 37 @58941 has 55 MA's), (50, 58998), (63, 59076), (66, 59145),

Gene: DarthP\_94 Start: 60983, Stop: 61234, Start Num: 39

Candidate Starts for DarthP\_94:

(Start: 39 @60983 has 13 MA's), (51, 61061), (60, 61121), (62, 61130),

Gene: Dartin\_97 Start: 60821, Stop: 61057, Start Num: 38

Candidate Starts for Dartin\_97:

(18, 60617), (27, 60743), (Start: 38 @60821 has 13 MA's), (54, 60887), (58, 60914), (59, 60920), (66, 61028),

Gene: Deby\_94 Start: 59696, Stop: 59926, Start Num: 37

Candidate Starts for Deby\_94:

(15, 59456), (16, 59459), (17, 59483), (22, 59543), (25, 59603), (Start: 37 @59696 has 55 MA's), (50, 59753), (63, 59831), (66, 59900),

Gene: Devera\_101 Start: 59853, Stop: 60083, Start Num: 37

Candidate Starts for Devera\_101:

(24, 59724), (25, 59760), (Start: 37 @59853 has 55 MA's), (50, 59910), (63, 59988), (66, 60057),

Gene: Dole\_97 Start: 59856, Stop: 60086, Start Num: 37

Candidate Starts for Dole\_97:

(24, 59727), (25, 59763), (Start: 37 @59856 has 55 MA's), (50, 59913), (63, 59991), (66, 60060),

Gene: DrHayes\_96 Start: 59765, Stop: 59995, Start Num: 37

Candidate Starts for DrHayes\_96:

(15, 59525), (16, 59528), (22, 59612), (25, 59672), (Start: 26 @59687 has 1 MA's), (Start: 37 @59765 has 55 MA's), (50, 59822), (63, 59900), (66, 59969),

Gene: Durfee\_95 Start: 59138, Stop: 59368, Start Num: 37

Candidate Starts for Durfee\_95:

(15, 58898), (16, 58901), (17, 58925), (21, 58964), (22, 58985), (25, 59045), (Start: 37 @59138 has 55 MA's), (50, 59195), (63, 59273), (66, 59342),

Gene: Efra2\_103 Start: 60683, Stop: 60925, Start Num: 39

Candidate Starts for Efra2\_103:

(13, 60350), (Start: 39 @60683 has 13 MA's), (47, 60731), (50, 60749), (58, 60791), (62, 60821),

Gene: Ekdilam\_91 Start: 61162, Stop: 61413, Start Num: 39

Candidate Starts for Ekdilam\_91:

(Start: 39 @61162 has 13 MA's), (52, 61243), (62, 61306),

Gene: Ellie\_95 Start: 61344, Stop: 61598, Start Num: 39

Candidate Starts for Ellie\_95:

(Start: 39 @61344 has 13 MA's), (41, 61350),

Gene: Emerson\_99 Start: 59543, Stop: 59773, Start Num: 37

Candidate Starts for Emerson\_99:

(15, 59303), (16, 59306), (17, 59330), (21, 59369), (22, 59390), (25, 59450), (Start: 37 @59543 has 55 MA's), (50, 59600), (63, 59678), (66, 59747),

Gene: Enkosi\_78 Start: 58467, Stop: 58685, Start Num: 38

Candidate Starts for Enkosi\_78:

(30, 58419), (Start: 38 @58467 has 13 MA's), (48, 58509), (56, 58539),

Gene: Fefferhead\_97 Start: 60765, Stop: 61019, Start Num: 39

Candidate Starts for Fefferhead\_97:

(Start: 39 @60765 has 13 MA's), (41, 60771),

Gene: Ganymede\_94 Start: 58952, Stop: 59182, Start Num: 37

Candidate Starts for Ganymede\_94:

(15, 58712), (16, 58715), (22, 58799), (25, 58859), (Start: 37 @58952 has 55 MA's), (50, 59009), (63, 59087), (66, 59156),

Gene: Geraldini\_95 Start: 59051, Stop: 59281, Start Num: 37

Candidate Starts for Geraldini\_95:

(15, 58811), (16, 58814), (17, 58838), (21, 58877), (22, 58898), (25, 58958), (Start: 37 @59051 has 55 MA's), (50, 59108), (63, 59186), (66, 59255),

Gene: Guanica15\_102 Start: 60372, Stop: 60614, Start Num: 39

Candidate Starts for Guanica15\_102:

(13, 60039), (Start: 39 @60372 has 13 MA's), (47, 60420), (50, 60438), (58, 60480), (62, 60510),

Gene: Hammy\_94 Start: 61201, Stop: 61452, Start Num: 39

Candidate Starts for Hammy\_94:

(Start: 39 @61201 has 13 MA's), (51, 61279), (60, 61339), (62, 61348),

Gene: Homura\_93 Start: 58941, Stop: 59171, Start Num: 37

Candidate Starts for Homura\_93:

(15, 58701), (16, 58704), (17, 58728), (21, 58767), (22, 58788), (25, 58848), (Start: 37 @58941 has 55 MA's), (50, 58998), (63, 59076), (66, 59145),

Gene: Illumine\_98 Start: 59855, Stop: 60085, Start Num: 37

Candidate Starts for Illumine\_98:

(24, 59726), (25, 59762), (Start: 37 @59855 has 55 MA's), (50, 59912), (63, 59990), (66, 60059),

Gene: JAWS\_93 Start: 58982, Stop: 59212, Start Num: 37

Candidate Starts for JAWS\_93:

(15, 58742), (16, 58745), (22, 58829), (25, 58889), (Start: 37 @58982 has 55 MA's), (50, 59039), (63, 59117), (66, 59186),

Gene: Jayhawk\_98 Start: 58965, Stop: 59195, Start Num: 37

Candidate Starts for Jayhawk\_98:

(15, 58725), (16, 58728), (22, 58812), (25, 58872), (Start: 37 @58965 has 55 MA's), (50, 59022), (63, 59100), (66, 59169),

Gene: Jeckyll\_95 Start: 58941, Stop: 59171, Start Num: 37

Candidate Starts for Jeckyll\_95:

(15, 58701), (16, 58704), (17, 58728), (21, 58767), (22, 58788), (25, 58848), (Start: 37 @58941 has 55 MA's), (50, 58998), (63, 59076), (66, 59145),

Gene: KiSi\_103 Start: 61933, Stop: 62211, Start Num: 31

Candidate Starts for KiSi\_103:

(8, 61603), (Start: 31 @61933 has 9 MA's), (45, 62008), (60, 62101),

Gene: Krueger\_100 Start: 59699, Stop: 59965, Start Num: 29

Candidate Starts for Krueger\_100:

(Start: 29 @59699 has 12 MA's), (49, 59792), (60, 59855),

Gene: LaterM\_94 Start: 59378, Stop: 59608, Start Num: 37

Candidate Starts for LaterM\_94:

(24, 59249), (25, 59285), (Start: 37 @59378 has 55 MA's), (50, 59435), (63, 59513), (66, 59582),

Gene: Lavahound\_95 Start: 61766, Stop: 62020, Start Num: 39

Candidate Starts for Lavahound\_95:

(Start: 39 @61766 has 13 MA's), (41, 61772),

Gene: LeMond\_102 Start: 61890, Stop: 62168, Start Num: 31

Candidate Starts for LeMond\_102:

(8, 61560), (Start: 31 @61890 has 9 MA's), (45, 61965), (60, 62058),

Gene: LilPharaoh\_77 Start: 55582, Stop: 55800, Start Num: 38

Candidate Starts for LilPharaoh\_77:

(30, 55534), (Start: 38 @55582 has 13 MA's), (48, 55624), (56, 55654),

Gene: LindNT\_92 Start: 59288, Stop: 59518, Start Num: 37

Candidate Starts for LindNT\_92:

(15, 59048), (16, 59051), (17, 59075), (22, 59135), (25, 59195), (34, 59270), (Start: 37 @59288 has 55 MA's), (50, 59345), (63, 59423), (66, 59492),

Gene: MarkPhew\_102 Start: 61533, Stop: 61808, Start Num: 31

Candidate Starts for MarkPhew\_102:

(3, 61035), (6, 61131), (Start: 31 @61533 has 9 MA's),

Gene: Marshawn\_95 Start: 60831, Stop: 61100, Start Num: 31

Candidate Starts for Marshawn\_95:

(Start: 31 @60831 has 9 MA's), (63, 61002),

Gene: McMater\_97 Start: 60821, Stop: 61057, Start Num: 38

Candidate Starts for McMater\_97:

(18, 60617), (27, 60743), (Start: 38 @60821 has 13 MA's), (54, 60887), (58, 60914), (59, 60920), (66, 61028),

Gene: Mdavu\_77 Start: 55858, Stop: 56076, Start Num: 38

Candidate Starts for Mdavu\_77:

(30, 55810), (Start: 38 @55858 has 13 MA's), (48, 55900), (56, 55930),

Gene: Megsy\_100 Start: 59426, Stop: 59656, Start Num: 37

Candidate Starts for Megsy\_100:

(16, 59189), (17, 59213), (22, 59273), (25, 59333), (Start: 37 @59426 has 55 MA's), (50, 59483), (63, 59561), (66, 59630),

Gene: Murucutumbu\_94 Start: 59843, Stop: 60073, Start Num: 38

Candidate Starts for Murucutumbu\_94:

(23, 59711), (Start: 38 @59843 has 13 MA's), (50, 59900), (63, 59978), (66, 60047),

Gene: Mynx\_95 Start: 59288, Stop: 59518, Start Num: 37

Candidate Starts for Mynx\_95:

(15, 59048), (16, 59051), (22, 59135), (25, 59195), (Start: 37 @59288 has 55 MA's), (50, 59345), (63, 59423), (66, 59492),

Gene: Nibb\_102 Start: 61676, Stop: 61948, Start Num: 31

Candidate Starts for Nibb\_102:

(Start: 31 @61676 has 9 MA's), (60, 61838),

Gene: Nikao\_79 Start: 58467, Stop: 58685, Start Num: 38

Candidate Starts for Nikao\_79:

(30, 58419), (Start: 38 @58467 has 13 MA's), (48, 58509), (56, 58539),

Gene: Niklas\_97 Start: 60422, Stop: 60658, Start Num: 38

Candidate Starts for Niklas\_97:

(18, 60218), (27, 60344), (Start: 38 @60422 has 13 MA's), (54, 60488), (58, 60515), (59, 60521), (66, 60629),

Gene: November\_93 Start: 60907, Stop: 61155, Start Num: 39

Candidate Starts for November\_93:

(Start: 39 @60907 has 13 MA's), (60, 61042), (62, 61051),

Gene: Nutello\_76 Start: 55854, Stop: 56072, Start Num: 38

Candidate Starts for Nutello\_76:

(30, 55806), (Start: 38 @55854 has 13 MA's), (48, 55896), (56, 55926),

Gene: Oscar\_103 Start: 61812, Stop: 62090, Start Num: 31

Candidate Starts for Oscar\_103:

(8, 61482), (Start: 31 @61812 has 9 MA's), (45, 61887), (60, 61980),

Gene: Peanam\_98 Start: 60489, Stop: 60710, Start Num: 38

Candidate Starts for Peanam\_98:

(18, 60285), (27, 60411), (Start: 38 @60489 has 13 MA's), (54, 60540), (58, 60567), (59, 60573), (66, 60681),

Gene: PhelpsODU\_91 Start: 55946, Stop: 56224, Start Num: 29

Candidate Starts for PhelpsODU\_91:

(Start: 29 @55946 has 12 MA's), (Start: 32 @55967 has 1 MA's), (46, 56033), (49, 56051), (53, 56063), (60, 56114),

Gene: Phrank\_102 Start: 60490, Stop: 60756, Start Num: 29

Candidate Starts for Phrank\_102:

(Start: 29 @60490 has 12 MA's), (33, 60514), (49, 60583), (60, 60646),

Gene: Pisa4\_89 Start: 55047, Stop: 55277, Start Num: 37

Candidate Starts for Pisa4\_89:

(15, 54807), (16, 54810), (22, 54894), (25, 54954), (Start: 37 @55047 has 55 MA's), (50, 55104), (63, 55182),

Gene: Pokerus\_94 Start: 59008, Stop: 59238, Start Num: 37

Candidate Starts for Pokerus\_94:

(15, 58768), (16, 58771), (22, 58855), (25, 58915), (Start: 37 @59008 has 55 MA's), (50, 59065), (63, 59143), (66, 59212),

Gene: Prithvi\_96 Start: 59546, Stop: 59776, Start Num: 37

Candidate Starts for Prithvi\_96:

(15, 59306), (16, 59309), (20, 59345), (22, 59393), (25, 59453), (Start: 37 @59546 has 55 MA's), (50, 59603), (63, 59681), (66, 59750),

Gene: QuincyRose\_92 Start: 58952, Stop: 59182, Start Num: 37

Candidate Starts for QuincyRose\_92:

(15, 58712), (16, 58715), (22, 58799), (25, 58859), (Start: 37 @58952 has 55 MA's), (50, 59009), (63, 59087), (66, 59156),

Gene: Ramen\_95 Start: 58695, Stop: 58925, Start Num: 37

Candidate Starts for Ramen\_95:

(15, 58455), (16, 58458), (22, 58542), (25, 58602), (Start: 37 @58695 has 55 MA's), (50, 58752), (63, 58830), (66, 58899),

Gene: Rapunzel97\_97 Start: 58920, Stop: 59150, Start Num: 37

Candidate Starts for Rapunzel97\_97:

(15, 58680), (16, 58683), (22, 58767), (25, 58827), (Start: 37 @58920 has 55 MA's), (50, 58977), (63, 59055), (66, 59124),

Gene: Richo\_97 Start: 60821, Stop: 61057, Start Num: 38

Candidate Starts for Richo\_97:

(18, 60617), (27, 60743), (Start: 38 @60821 has 13 MA's), (54, 60887), (58, 60914), (59, 60920), (66, 61028),

Gene: Rosmarinus\_95 Start: 58929, Stop: 59159, Start Num: 37

Candidate Starts for Rosmarinus\_95:

(Start: 37 @58929 has 55 MA's), (50, 58986), (63, 59064), (66, 59133),

Gene: SamuelLPlaqson\_96 Start: 59765, Stop: 59995, Start Num: 37

Candidate Starts for SamuelLPlaqson\_96:

(15, 59525), (16, 59528), (22, 59612), (25, 59672), (Start: 26 @59687 has 1 MA's), (Start: 37 @59765 has 55 MA's), (50, 59822), (63, 59900), (66, 59969),

Gene: Scarlett\_102 Start: 61681, Stop: 61959, Start Num: 31

Candidate Starts for Scarlett\_102:

(8, 61351), (Start: 31 @61681 has 9 MA's), (45, 61756), (60, 61849),

Gene: SgtBeansprout\_77 Start: 55854, Stop: 56072, Start Num: 38

Candidate Starts for SgtBeansprout\_77:

(30, 55806), (Start: 38 @55854 has 13 MA's), (48, 55896), (56, 55926),

Gene: Shadow1\_99 Start: 59836, Stop: 60102, Start Num: 29

Candidate Starts for Shadow1\_99:

(Start: 29 @59836 has 12 MA's), (33, 59860), (49, 59929), (60, 59992),

Gene: Shaobing\_95 Start: 60463, Stop: 60699, Start Num: 38

Candidate Starts for Shaobing\_95:

(18, 60259), (27, 60385), (Start: 38 @60463 has 13 MA's), (54, 60529), (58, 60556), (59, 60562), (66, 60670),

Gene: ShiaSurprise\_97 Start: 59138, Stop: 59368, Start Num: 37

Candidate Starts for ShiaSurprise\_97:

(15, 58898), (16, 58901), (17, 58925), (21, 58964), (22, 58985), (25, 59045), (Start: 37 @59138 has 55 MA's), (50, 59195), (63, 59273), (66, 59342),

Gene: SirPhilip\_97 Start: 61295, Stop: 61543, Start Num: 31

Candidate Starts for SirPhilip\_97:

(Start: 31 @61295 has 9 MA's), (63, 61448), (64, 61454),

Gene: Slimphazie\_97 Start: 59376, Stop: 59606, Start Num: 37

Candidate Starts for Slimphazie\_97:

(15, 59136), (16, 59139), (22, 59223), (25, 59283), (Start: 37 @59376 has 55 MA's), (50, 59433), (63, 59511), (66, 59580),

Gene: Stinson\_95 Start: 59153, Stop: 59383, Start Num: 37

Candidate Starts for Stinson\_95:

(24, 59024), (25, 59060), (Start: 37 @59153 has 55 MA's), (50, 59210), (63, 59288), (66, 59357),

Gene: Sulley\_93 Start: 59106, Stop: 59336, Start Num: 37

Candidate Starts for Sulley\_93:

(15, 58866), (16, 58869), (22, 58953), (25, 59013), (Start: 37 @59106 has 55 MA's), (50, 59163), (63, 59241), (66, 59310),

Gene: Sunflower1121\_99 Start: 59594, Stop: 59860, Start Num: 29

Candidate Starts for Sunflower1121\_99:

(Start: 29 @59594 has 12 MA's), (33, 59618), (49, 59687), (60, 59750),

Gene: Syra333\_98 Start: 59676, Stop: 59942, Start Num: 29

Candidate Starts for Syra333\_98:

(Start: 29 @59676 has 12 MA's), (49, 59769), (60, 59832),

Gene: TClif\_99 Start: 60813, Stop: 61112, Start Num: 28

Candidate Starts for TClif\_99:

(Start: 28 @60813 has 1 MA's), (35, 60864), (36, 60873), (42, 60897), (63, 61017), (66, 61086),

Gene: Tachez\_95 Start: 58789, Stop: 59019, Start Num: 37

Candidate Starts for Tachez\_95:

(15, 58549), (16, 58552), (22, 58636), (25, 58696), (Start: 37 @58789 has 55 MA's), (50, 58846), (63, 58924), (66, 58993),

Gene: TaiwanKao\_96 Start: 59201, Stop: 59431, Start Num: 37

Candidate Starts for TaiwanKao\_96:

(15, 58961), (16, 58964), (17, 58988), (22, 59048), (25, 59108), (Start: 37 @59201 has 55 MA's), (50, 59258), (63, 59336), (66, 59405),

Gene: Teejan\_78 Start: 58467, Stop: 58685, Start Num: 38

Candidate Starts for Teejan\_78:

(30, 58419), (Start: 38 @58467 has 13 MA's), (48, 58509), (56, 58539),

Gene: Tierra\_101 Start: 60797, Stop: 61063, Start Num: 29

Candidate Starts for Tierra\_101:

(Start: 29 @60797 has 12 MA's), (Start: 32 @60818 has 1 MA's), (44, 60872), (49, 60890), (53, 60902), (60, 60953),

Gene: Tigress9\_99 Start: 60027, Stop: 60293, Start Num: 29

Candidate Starts for Tigress9\_99:

(Start: 29 @60027 has 12 MA's), (49, 60120), (60, 60183),

Gene: Tiri\_95 Start: 58682, Stop: 58912, Start Num: 37

Candidate Starts for Tiri\_95:

(9, 58340), (10, 58346), (11, 58355), (23, 58550), (25, 58589), (Start: 37 @58682 has 55 MA's), (50, 58739), (63, 58817), (66, 58886),

Gene: Torres\_79 Start: 58468, Stop: 58686, Start Num: 38

Candidate Starts for Torres\_79:

(30, 58420), (Start: 38 @58468 has 13 MA's), (48, 58510), (56, 58540),

Gene: TreyKay\_96 Start: 59546, Stop: 59776, Start Num: 37

Candidate Starts for TreyKay\_96:

(15, 59306), (16, 59309), (20, 59345), (22, 59393), (25, 59453), (Start: 37 @59546 has 55 MA's), (50, 59603), (63, 59681), (66, 59750),

Gene: Trice\_76 Start: 55855, Stop: 56073, Start Num: 38

Candidate Starts for Trice\_76:

(30, 55807), (Start: 38 @55855 has 13 MA's), (48, 55897), (56, 55927),

Gene: Twitch\_95 Start: 58944, Stop: 59174, Start Num: 37

Candidate Starts for Twitch\_95:

(15, 58704), (16, 58707), (17, 58731), (21, 58770), (22, 58791), (25, 58851), (Start: 37 @58944 has 55 MA's), (50, 59001), (63, 59079), (66, 59148),

Gene: Unicorn\_101 Start: 60574, Stop: 60852, Start Num: 29

Candidate Starts for Unicorn\_101:

(Start: 29 @60574 has 12 MA's), (Start: 32 @60595 has 1 MA's), (46, 60661), (49, 60679), (53, 60691), (60, 60742),

Gene: Urkel\_96 Start: 59765, Stop: 59995, Start Num: 37

Candidate Starts for Urkel\_96:

(15, 59525), (16, 59528), (22, 59612), (25, 59672), (Start: 26 @59687 has 1 MA's), (Start: 37 @59765 has 55 MA's), (50, 59822), (63, 59900), (66, 59969),

Gene: Validus\_105 Start: 61894, Stop: 62133, Start Num: 39

Candidate Starts for Validus\_105:

(Start: 39 @61894 has 13 MA's), (50, 61963), (55, 61990), (57, 61996), (66, 62104),

Gene: Veliki\_95 Start: 58967, Stop: 59197, Start Num: 37

Candidate Starts for Veliki\_95:

(15, 58727), (16, 58730), (22, 58814), (25, 58874), (Start: 37 @58967 has 55 MA's), (50, 59024), (63, 59102), (66, 59171),

Gene: Ximenita\_102 Start: 60409, Stop: 60675, Start Num: 29

Candidate Starts for Ximenita\_102:

(Start: 29 @60409 has 12 MA's), (40, 60457), (49, 60502), (60, 60565),

Gene: Yuna\_99 Start: 61586, Stop: 61840, Start Num: 32

Candidate Starts for Yuna\_99:

(Start: 32 @61586 has 1 MA's), (43, 61634), (61, 61733), (66, 61817),

Gene: Zavala\_96 Start: 59202, Stop: 59432, Start Num: 37

Candidate Starts for Zavala\_96:

(15, 58962), (16, 58965), (22, 59049), (25, 59109), (Start: 37 @59202 has 55 MA's), (50, 59259), (63, 59337), (66, 59406),