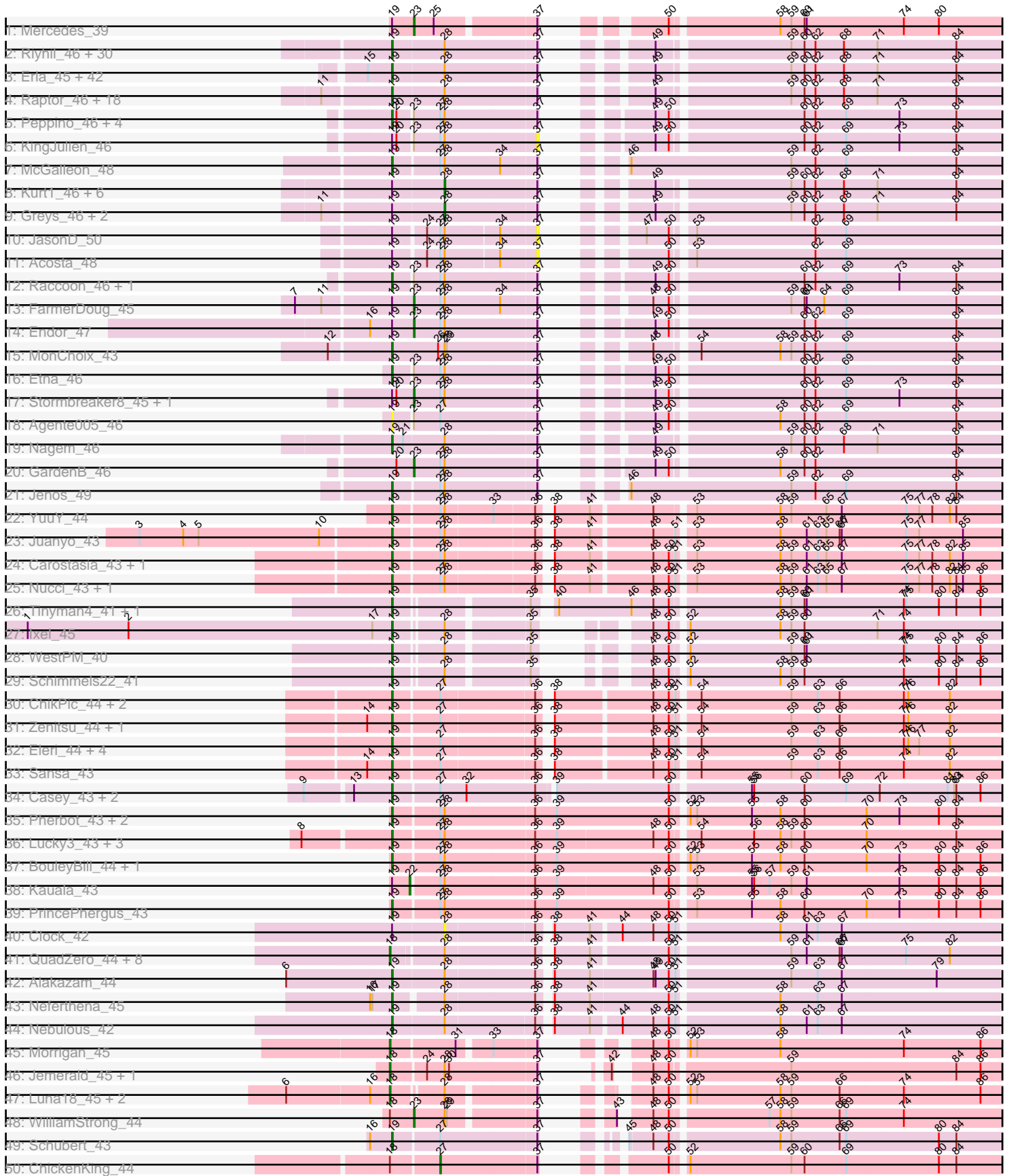


Pham 166492





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 166492 Report

This analysis was run 07/09/24 on database version 566.

Pham number 166492 has 185 members, 18 are drafts.

Phages represented in each track:

- Track 1 : Mercedes\_39
- Track 2 : Rihhil\_46, Dothraki\_46, Martin\_47, Bandik\_46, Renzie\_46, TatarkaPM\_46, SJay\_46, Ioannes\_46, BeautPeep30\_46, Peep\_46, Inventa\_46, Dave\_46, Rapph\_46, ParleG\_46, Alyxandracam\_46, OldNelly\_47, Stanktossa\_46, Superfresh\_46, MillyPhilly\_46, Phireproof\_46, Figueroism\_46, Phiderman\_46, MrWorldwide\_46, Antoinette\_46, AlexAdler\_46, Phriends\_46, Pherferi\_46, Shee\_46, PhredFlintston\_46, TinSulphur\_47, MaeLinda\_46
- Track 3 : Erla\_45, Aubergine\_45, TeddyBear\_45, HankSprout\_46, Garey24\_46, Kale\_45, Jerbirus\_47, ManRay\_45, StirfryIV\_47, Winzigespinne\_45, Papafritta\_45, Benjalauen\_46, Duocatuli\_45, Espinosa\_45, Baines\_45, Pocket\_45, Bonino\_45, Chamuel\_45, Rog141\_45, Asta\_45, SonOfLevi\_46, Nattles\_45, Ilzat\_45, Gershwin\_45, KannH\_45, JeriBeth\_47, Clancy\_45, HungryHenry\_45, Calix\_45, Sedgewig\_45, Christoph\_45, Etta\_45, Gelo\_45, AranulaLuti\_45, Janus167\_45, StingRay\_45, Oats\_45, Tenda\_45, HanSolo\_45, Klimt\_46, Chako\_45, JasperRussell\_45, Gubbabump\_45
- Track 4 : Raptor\_46, BonesMcCoy\_46, Ludgate\_46, Thorongil\_46, Strathdee\_46, Thompsone\_46, Oxtober96\_47, Convict\_46, BigRedClifford\_46, WildNOut\_46, Blage\_46, Knox\_46, AxiPup\_46, Teagan\_46, Den3\_46, Gargoyle\_46, PuppyEggo\_46, Lovelyunicorn\_46, Velene\_46
- Track 5 : Peppino\_46, Redfield\_46, Hamlet\_46, Balsa\_45, Schnapsidee\_46
- Track 6 : KingJulien\_46
- Track 7 : McGalleon\_48
- Track 8 : Kurt1\_46, NickSell\_48, SoilGremlin\_47, Robinson\_46, Delphidian\_48, Zada\_47, Byron23\_47
- Track 9 : Greys\_46, Vispistious\_47, ShaiHulud\_47
- Track 10 : JasonD\_50
- Track 11 : Acosta\_48
- Track 12 : Raccoon\_46, Leafus\_46
- Track 13 : FarmerDoug\_45
- Track 14 : Endor\_47
- Track 15 : MonChoix\_43
- Track 16 : Etna\_46
- Track 17 : Stormbreaker8\_45, BeeBee8\_47
- Track 18 : Agente005\_46
- Track 19 : Nagem\_46
- Track 20 : GardenB\_46
- Track 21 : Jenos\_49

- Track 22 : YuuY\_44
- Track 23 : Juanyo\_43
- Track 24 : Carostasia\_43, Quartz\_44
- Track 25 : Nucci\_43, Mandalorian\_43
- Track 26 : Tinyman4\_41, HerculesXL\_42
- Track 27 : Ixel\_45
- Track 28 : WestPM\_40
- Track 29 : Schimmels22\_41
- Track 30 : ChikPic\_44, Shamu\_45, Finny\_45
- Track 31 : Zenitsu\_44, MCubed\_44
- Track 32 : Eleri\_44, ColaCorta\_44, Andromedas\_44, Glamour\_44, Saratos\_44
- Track 33 : Sansa\_43
- Track 34 : Casey\_43, Pikmin\_43, Pajaza\_43
- Track 35 : Pherbot\_43, Bustleton\_43, Sinatra\_44
- Track 36 : Lucky3\_43, Golden\_43, Guetzie\_44, SirVictor\_44
- Track 37 : BouleyBill\_44, Koji\_43
- Track 38 : Kauala\_43
- Track 39 : PrincePhergus\_43
- Track 40 : Clock\_42
- Track 41 : QuadZero\_44, Fulton\_44, LilTerminator\_44, Hasitha\_44, CaptainRex\_44, Greenlvy\_43, Zayuliv\_44, Librie\_44, Zepp\_44
- Track 42 : Alakazam\_44
- Track 43 : Neferthena\_45
- Track 44 : Nebulous\_42
- Track 45 : Morigan\_45
- Track 46 : Jemerald\_45, Juicer\_45
- Track 47 : Luna18\_45, KatChan\_45, Chepli\_45
- Track 48 : WilliamStrong\_44
- Track 49 : Schubert\_43
- Track 50 : ChickenKing\_44
- Track 51 : GaeCeo\_46
- Track 52 : Cheeto1\_46

***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 139 of the 167 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agente005\_46, Alakazam\_44, AlexAdler\_46, Alyxandracam\_46, Andromedas\_44, Antoinette\_46, AranulaLuti\_45, Asta\_45, Aubergine\_45, AxiPup\_46, Baines\_45, Balsa\_45, Bandik\_46, BeautPeep30\_46, Benjalauren\_46, BigRedClifford\_46, Blage\_46, BonesMcCoy\_46, Bonino\_45, BouleyBill\_44, Bustleton\_43, Calix\_45, Carostasia\_43, Casey\_43, Chako\_45, Chamuel\_45, ChikPic\_44, Christoph\_45, Clancy\_45, ColaCorta\_44, Convict\_46, Dave\_46, Den3\_46, Dothraki\_46, Duocatuli\_45, Eleri\_44, Erla\_45, Espinosa\_45, Etna\_46, Etta\_45, Figueroism\_46, Finny\_45, Garey24\_46, Gargoyle\_46, Gelo\_45, Gershwin\_45, Glamour\_44, Golden\_43, Gubbabump\_45, Guetzie\_44, Hamlet\_46, HanSolo\_45, HankSprout\_46, HerculesXL\_42, HungryHenry\_45, Ilzat\_45, Inventa\_46, Ioannes\_46, Ixel\_45, Janus167\_45, JasperRussell\_45, Jenos\_49, Jerbirus\_47, JeriBeth\_47, Juanyo\_43,

Kale\_45, KannH\_45, Klimt\_46, Knox\_46, Koji\_43, Leafus\_46, Lovelyunicorn\_46, Lucky3\_43, Ludgate\_46, MCubed\_44, MaeLinda\_46, ManRay\_45, Mandalorian\_43, Martin\_47, McGalleon\_48, MillyPhilly\_46, MonChoix\_43, MrWorldwide\_46, Nagem\_46, Nattles\_45, Nebulous\_42, Neferthena\_45, Nucci\_43, Oats\_45, OldNelly\_47, Oxtober96\_47, Pajaza\_43, Papafritta\_45, ParleG\_46, Peep\_46, Peppino\_46, Pherbot\_43, Pherferi\_46, Phiderman\_46, Phireproof\_46, PhredFlintston\_46, Phriends\_46, Pikmin\_43, Pocket\_45, PrincePhergus\_43, PuppyEggo\_46, Quartz\_44, Raccoon\_46, Rappheph\_46, Raptor\_46, Redfield\_46, Renzie\_46, Rihhil\_46, Rog141\_45, SJay\_46, Sansa\_43, Saratos\_44, Schimmels22\_41, Schnapsidee\_46, Schubert\_43, Sedgewig\_45, Shamu\_45, Shee\_46, Sinatra\_44, SirVictor\_44, SonOfLevi\_46, Stanktossa\_46, StingRay\_45, StirfryIV\_47, Strathdee\_46, Superfresh\_46, TatarkaPM\_46, Teagan\_46, TeddyBear\_45, Tenda\_45, Thompsone\_46, Thorongil\_46, TinSulphur\_47, Tinyman4\_41, Velene\_46, WestPM\_40, WildNOut\_46, Winzigespinne\_45, YuuY\_44, Zenitsu\_44,

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

- Acosta\_48, BeeBee8\_47, Byron23\_47, Clock\_42, Delphidian\_48, Endor\_47, FarmerDoug\_45, Greys\_46, JasonD\_50, Kauala\_43, KingJulien\_46, Kurt1\_46, Mercedes\_39, NickSell\_48, Robinson\_46, ShaiHulud\_47, SoilGremlin\_47, Stormbreaker8\_45, Vispistious\_47, Zada\_47,

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

- CaptainRex\_44, Cheeto1\_46, Chepli\_45, ChickenKing\_44, Fulton\_44, GaeCeo\_46, GardenB\_46, Greenlvy\_43, Hasitha\_44, Jemerald\_45, Juicer\_45, KatChan\_45, Librie\_44, LilTerminator\_44, Luna18\_45, Morigan\_45, QuadZero\_44, WilliamStrong\_44, Zayuliv\_44, Zepp\_44,

### Summary by start number:

Start 18:

- Found in 19 of 185 ( 10.3% ) of genes in pham
- Manual Annotations of this start: 14 of 167
- Called 84.2% of time when present
- Phage (with cluster) where this start called: CaptainRex\_44 (EA5), Chepli\_45 (EA6), Fulton\_44 (EA5), GaeCeo\_46 (EA9), Greenlvy\_43 (EA5), Hasitha\_44 (EA5), Jemerald\_45 (EA6), Juicer\_45 (EA6), KatChan\_45 (EA6), Librie\_44 (EA5), LilTerminator\_44 (EA5), Luna18\_45 (EA6), Morigan\_45 (EA6), QuadZero\_44 (EA5), Zayuliv\_44 (EA5), Zepp\_44 (EA5),

Start 19:

- Found in 165 of 185 ( 89.2% ) of genes in pham
- Manual Annotations of this start: 139 of 167
- Called 87.9% of time when present
- Phage (with cluster) where this start called: Agente005\_46 (EA1), Alakazam\_44 (EA5), AlexAdler\_46 (EA1), Alyxandracam\_46 (EA1), Andromedas\_44 (EA2), Antoinette\_46 (EA1), AranulaLuti\_45 (EA1), Asta\_45 (EA1), Aubergine\_45 (EA1), AxiPup\_46 (EA1), Baines\_45 (EA1), Balsa\_45 (EA1), Bandik\_46 (EA1), BeautPeep30\_46 (EA1), Benjalauren\_46 (EA1), BigRedClifford\_46 (EA1), Blage\_46 (EA1), BonesMcCoy\_46 (EA1), Bonino\_45 (EA1), BouleyBill\_44 (EA4), Bustleton\_43 (EA4), Calix\_45 (EA1), Carostasia\_43 (EA10), Casey\_43 (EA3), Chako\_45 (EA1), Chamuel\_45 (EA1), ChikPic\_44 (EA2), Christoph\_45 (EA1), Clancy\_45 (EA1), ColaCorta\_44 (EA2), Convict\_46 (EA1), Dave\_46 (EA1), Den3\_46 (EA1),

Dothraki\_46 (EA1), Duocatuli\_45 (EA1), Eleri\_44 (EA2), Erla\_45 (EA1), Espinosa\_45 (EA1), Etna\_46 (EA1), Etta\_45 (EA1), Figueroism\_46 (EA1), Finny\_45 (EA2), Garey24\_46 (EA1), Gargoyle\_46 (EA1), Gelo\_45 (EA1), Gershwin\_45 (EA1), Glamour\_44 (EA2), Golden\_43 (EA4), Gubbabump\_45 (EA1), Guetzie\_44 (EA4), Hamlet\_46 (EA1), HanSolo\_45 (EA1), HankSprout\_46 (EA1), HerculesXL\_42 (EA11), HungryHenry\_45 (EA1), Ilzat\_45 (EA1), Inventa\_46 (EA1), Ioannes\_46 (EA1), Ixel\_45 (EA11), Janus167\_45 (EA1), JasperRussell\_45 (EA1), Jenos\_49 (EA1), Jerbirus\_47 (EA1), JeriBeth\_47 (EA1), Juanyo\_43 (EA10), Kale\_45 (EA1), KannH\_45 (EA1), Klimt\_46 (EA1), Knox\_46 (EA1), Koji\_43 (EA4), Leafus\_46 (EA1), Lovelyunicorn\_46 (EA1), Lucky3\_43 (EA4), Ludgate\_46 (EA1), MCubed\_44 (EA2), MaeLinda\_46 (EA1), ManRay\_45 (EA1), Mandalorian\_43 (EA10), Martin\_47 (EA1), McGalleon\_48 (EA1), MillyPhilly\_46 (EA1), MonChoix\_43 (EA1), MrWorldwide\_46 (EA1), Nagem\_46 (EA1), Nattles\_45 (EA1), Nebulous\_42 (EA5), Neferthena\_45 (EA5), Nucci\_43 (EA10), Oats\_45 (EA1), OldNelly\_47 (EA1), Oxtober96\_47 (EA1), Pajaza\_43 (EA3), Papafritta\_45 (EA1), ParleG\_46 (EA1), Peep\_46 (EA1), Peppino\_46 (EA1), Pherbot\_43 (EA4), Pherferi\_46 (EA1), Phiderman\_46 (EA1), Phireproof\_46 (EA1), PhredFlintston\_46 (EA1), Phriends\_46 (EA1), Pikmin\_43 (EA3), Pocket\_45 (EA1), PrincePhergus\_43 (EA4), PuppyEggo\_46 (EA1), Quartz\_44 (EA10), Raccoon\_46 (EA1), Rapheph\_46 (EA1), Raptor\_46 (EA1), Redfield\_46 (EA1), Renzie\_46 (EA1), Riyhil\_46 (EA1), Rog141\_45 (EA1), SJay\_46 (EA1), Sansa\_43 (EA2), Saratos\_44 (EA2), Schimmels22\_41 (EA11), Schnapsidee\_46 (EA1), Schubert\_43 (EA8), Sedgewig\_45 (EA1), Shamu\_45 (EA2), Shee\_46 (EA1), Sinatra\_44 (EA4), SirVictor\_44 (EA4), SonOfLevi\_46 (EA1), Stanktossa\_46 (EA1), StingRay\_45 (EA1), StirfryIV\_47 (EA1), Strathdee\_46 (EA1), Superfresh\_46 (EA1), TatarkaPM\_46 (EA1), Teagan\_46 (EA1), TeddyBear\_45 (EA1), Tenda\_45 (EA1), Thompsone\_46 (EA1), Thorongil\_46 (EA1), TinSulphur\_47 (EA1), Tinyman4\_41 (EA11), Velene\_46 (EA1), WestPM\_40 (EA11), WildNOut\_46 (EA1), Winzigespinne\_45 (EA1), YuuY\_44 (EA10), Zenitsu\_44 (EA2),

#### Start 22:

- Found in 1 of 185 ( 0.5% ) of genes in pham
- Manual Annotations of this start: 1 of 167
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Kauala\_43 (EA4),

#### Start 23:

- Found in 17 of 185 ( 9.2% ) of genes in pham
- Manual Annotations of this start: 7 of 167
- Called 41.2% of time when present
- Phage (with cluster) where this start called: BeeBee8\_47 (EA1), Endor\_47 (EA1), FarmerDoug\_45 (EA1), GardenB\_46 (EA1), Mercedes\_39 (EA), Stormbreaker8\_45 (EA1), WilliamStrong\_44 (EA6),

#### Start 27:

- Found in 54 of 185 ( 29.2% ) of genes in pham
- Manual Annotations of this start: 2 of 167
- Called 3.7% of time when present
- Phage (with cluster) where this start called: Cheeto1\_46 (EA9), ChickenKing\_44 (EA9),

#### Start 28:

- Found in 162 of 185 ( 87.6% ) of genes in pham
- Manual Annotations of this start: 4 of 167

- Called 6.8% of time when present
- Phage (with cluster) where this start called: Byron23\_47 (EA1), Clock\_42 (EA5), Delphidian\_48 (EA1), Greys\_46 (EA1), Kurt1\_46 (EA1), NickSell\_48 (EA1), Robinson\_46 (EA1), ShaiHulud\_47 (EA1), SoilGremlin\_47 (EA1), Vispistious\_47 (EA1), Zada\_47 (EA1),

Start 37:

- Found in 136 of 185 ( 73.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 2.2% of time when present
- Phage (with cluster) where this start called: Acosta\_48 (EA1), JasonD\_50 (EA1), KingJulien\_46 (EA1),

### **Summary by clusters:**

There are 11 clusters represented in this pham: EA11, EA10, EA, EA9, EA8, EA1, EA3, EA2, EA5, EA4, EA6,

Info for manual annotations of cluster EA:

- Start number 23 was manually annotated 1 time for cluster EA.

Info for manual annotations of cluster EA1:

- Start number 19 was manually annotated 102 times for cluster EA1.
- Start number 23 was manually annotated 5 times for cluster EA1.
- Start number 28 was manually annotated 4 times for cluster EA1.

Info for manual annotations of cluster EA10:

- Start number 19 was manually annotated 5 times for cluster EA10.

Info for manual annotations of cluster EA11:

- Start number 19 was manually annotated 5 times for cluster EA11.

Info for manual annotations of cluster EA2:

- Start number 19 was manually annotated 11 times for cluster EA2.

Info for manual annotations of cluster EA3:

- Start number 19 was manually annotated 3 times for cluster EA3.

Info for manual annotations of cluster EA4:

- Start number 19 was manually annotated 9 times for cluster EA4.
- Start number 22 was manually annotated 1 time for cluster EA4.

Info for manual annotations of cluster EA5:

- Start number 18 was manually annotated 7 times for cluster EA5.
- Start number 19 was manually annotated 3 times for cluster EA5.

Info for manual annotations of cluster EA6:

- Start number 18 was manually annotated 6 times for cluster EA6.
- Start number 23 was manually annotated 1 time for cluster EA6.

Info for manual annotations of cluster EA8:

- Start number 19 was manually annotated 1 time for cluster EA8.

Info for manual annotations of cluster EA9:

- Start number 18 was manually annotated 1 time for cluster EA9.
- Start number 27 was manually annotated 2 times for cluster EA9.

**Gene Information:**

Gene: Acosta\_48 Start: 33795, Stop: 33262, Start Num: 37

Candidate Starts for Acosta\_48:

(Start: 19 @33975 has 139 MA's), (24, 33936), (Start: 27 @33918 has 2 MA's), (Start: 28 @33912 has 4 MA's), (34, 33843), (37, 33795), (50, 33702), (53, 33681), (62, 33519), (69, 33477),

Gene: Agente005\_46 Start: 33776, Stop: 33048, Start Num: 19

Candidate Starts for Agente005\_46:

(Start: 19 @33776 has 139 MA's), (Start: 23 @33752 has 7 MA's), (Start: 27 @33716 has 2 MA's), (37, 33587), (49, 33506), (50, 33488), (58, 33353), (60, 33320), (62, 33305), (69, 33263), (84, 33113),

Gene: Alakazam\_44 Start: 33194, Stop: 32403, Start Num: 19

Candidate Starts for Alakazam\_44:

(6, 33338), (Start: 19 @33194 has 139 MA's), (Start: 28 @33125 has 4 MA's), (36, 33005), (38, 32993), (41, 32945), (48, 32861), (49, 32858), (50, 32840), (51, 32834), (59, 32687), (63, 32651), (67, 32618), (79, 32489),

Gene: AlexAdler\_46 Start: 33801, Stop: 33076, Start Num: 19

Candidate Starts for AlexAdler\_46:

(Start: 19 @33801 has 139 MA's), (Start: 28 @33732 has 4 MA's), (37, 33609), (49, 33534), (59, 33366), (60, 33348), (62, 33333), (68, 33294), (71, 33249), (84, 33141),

Gene: Alyxandracam\_46 Start: 33811, Stop: 33086, Start Num: 19

Candidate Starts for Alyxandracam\_46:

(Start: 19 @33811 has 139 MA's), (Start: 28 @33742 has 4 MA's), (37, 33619), (49, 33544), (59, 33376), (60, 33358), (62, 33343), (68, 33304), (71, 33259), (84, 33151),

Gene: Andromedas\_44 Start: 32738, Stop: 31959, Start Num: 19

Candidate Starts for Andromedas\_44:

(Start: 19 @32738 has 139 MA's), (Start: 27 @32678 has 2 MA's), (36, 32555), (38, 32546), (48, 32420), (50, 32399), (51, 32393), (54, 32369), (59, 32246), (63, 32210), (66, 32180), (74, 32093), (76, 32087), (77, 32072), (82, 32030),

Gene: Antoinette\_46 Start: 33801, Stop: 33076, Start Num: 19

Candidate Starts for Antoinette\_46:

(Start: 19 @33801 has 139 MA's), (Start: 28 @33732 has 4 MA's), (37, 33609), (49, 33534), (59, 33366), (60, 33348), (62, 33333), (68, 33294), (71, 33249), (84, 33141),

Gene: AranulaLuti\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for AranulaLuti\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: Asta\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for Asta\_45:



(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: Aubergine\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for Aubergine\_45:

(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: AxiPup\_46 Start: 33780, Stop: 33055, Start Num: 19

Candidate Starts for AxiPup\_46:

(11, 33867), (Start: 19 @33780 has 139 MA's), (Start: 28 @33711 has 4 MA's), (37, 33588), (49, 33513), (59, 33345), (60, 33327), (62, 33312), (68, 33273), (71, 33228), (84, 33120),

Gene: Baines\_45 Start: 33501, Stop: 32776, Start Num: 19

Candidate Starts for Baines\_45:

(15, 33534), (Start: 19 @33501 has 139 MA's), (Start: 28 @33432 has 4 MA's), (37, 33309), (49, 33234), (59, 33066), (60, 33048), (62, 33033), (68, 32994), (71, 32949), (84, 32841),

Gene: Balsa\_45 Start: 33763, Stop: 33035, Start Num: 19

Candidate Starts for Balsa\_45:

(Start: 19 @33763 has 139 MA's), (20, 33757), (Start: 23 @33739 has 7 MA's), (Start: 27 @33703 has 2 MA's), (Start: 28 @33697 has 4 MA's), (37, 33574), (49, 33493), (50, 33475), (60, 33307), (62, 33292), (69, 33250), (73, 33178), (84, 33100),

Gene: Bandik\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Bandik\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: BeautPeep30\_46 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for BeautPeep30\_46:

(Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),

Gene: BeeBee8\_47 Start: 33910, Stop: 33206, Start Num: 23

Candidate Starts for BeeBee8\_47:

(Start: 19 @33934 has 139 MA's), (20, 33928), (Start: 23 @33910 has 7 MA's), (Start: 27 @33874 has 2 MA's), (Start: 28 @33868 has 4 MA's), (37, 33745), (49, 33664), (50, 33646), (60, 33478), (62, 33463), (69, 33421), (73, 33349), (84, 33271),

Gene: Benjalauren\_46 Start: 33514, Stop: 32789, Start Num: 19

Candidate Starts for Benjalauren\_46:

(15, 33547), (Start: 19 @33514 has 139 MA's), (Start: 28 @33445 has 4 MA's), (37, 33322), (49, 33247), (59, 33079), (60, 33061), (62, 33046), (68, 33007), (71, 32962), (84, 32854),

Gene: BigRedClifford\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for BigRedClifford\_46:

(11, 33897), (Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: Blage\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for Blage\_46:

(11, 33897), (Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: BonesMcCoy\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for BonesMcCoy\_46:

(11, 33897), (Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: Bonino\_45 Start: 33487, Stop: 32762, Start Num: 19

Candidate Starts for Bonino\_45:

(15, 33520), (Start: 19 @33487 has 139 MA's), (Start: 28 @33418 has 4 MA's), (37, 33295), (49, 33220), (59, 33052), (60, 33034), (62, 33019), (68, 32980), (71, 32935), (84, 32827),

Gene: BouleyBill\_44 Start: 32763, Stop: 31951, Start Num: 19

Candidate Starts for BouleyBill\_44:

(Start: 19 @32763 has 139 MA's), (Start: 27 @32703 has 2 MA's), (Start: 28 @32697 has 4 MA's), (36, 32577), (39, 32547), (50, 32394), (52, 32379), (53, 32370), (55, 32295), (58, 32256), (60, 32223), (70, 32139), (73, 32094), (80, 32040), (84, 32016), (86, 31983),

Gene: Bustleton\_43 Start: 32557, Stop: 31745, Start Num: 19

Candidate Starts for Bustleton\_43:

(Start: 19 @32557 has 139 MA's), (Start: 27 @32497 has 2 MA's), (Start: 28 @32491 has 4 MA's), (36, 32371), (39, 32341), (50, 32188), (52, 32173), (53, 32164), (55, 32089), (58, 32050), (60, 32017), (70, 31933), (73, 31888), (80, 31834), (84, 31810),

Gene: Byron23\_47 Start: 33740, Stop: 33084, Start Num: 28

Candidate Starts for Byron23\_47:

(Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: Calix\_45 Start: 33494, Stop: 32769, Start Num: 19

Candidate Starts for Calix\_45:

(15, 33527), (Start: 19 @33494 has 139 MA's), (Start: 28 @33425 has 4 MA's), (37, 33302), (49, 33227), (59, 33059), (60, 33041), (62, 33026), (68, 32987), (71, 32942), (84, 32834),

Gene: CaptainRex\_44 Start: 31206, Stop: 30424, Start Num: 18

Candidate Starts for CaptainRex\_44:

(Start: 18 @31206 has 14 MA's), (Start: 28 @31140 has 4 MA's), (36, 31020), (38, 31011), (41, 30963), (50, 30864), (51, 30858), (59, 30711), (61, 30690), (66, 30645), (67, 30642), (75, 30555), (82, 30495),

Gene: Carostasia\_43 Start: 32271, Stop: 31492, Start Num: 19

Candidate Starts for Carostasia\_43:

(Start: 19 @32271 has 139 MA's), (Start: 27 @32211 has 2 MA's), (Start: 28 @32205 has 4 MA's), (36, 32088), (38, 32079), (41, 32031), (48, 31953), (50, 31932), (51, 31926), (53, 31908), (58, 31794), (59, 31779), (61, 31758), (63, 31743), (65, 31731), (67, 31710), (75, 31623), (77, 31605), (78, 31587), (82, 31563), (85, 31545),

Gene: Casey\_43 Start: 32217, Stop: 31417, Start Num: 19

Candidate Starts for Casey\_43:

(9, 32328), (13, 32268), (Start: 19 @32217 has 139 MA's), (Start: 27 @32157 has 2 MA's), (32, 32121), (36, 32028), (39, 32010), (50, 31860), (55, 31761), (56, 31758), (60, 31689), (69, 31632), (72, 31587), (81, 31494), (83, 31485), (84, 31482), (86, 31449),

Gene: Chako\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for Chako\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: Chamuel\_45 Start: 33520, Stop: 32795, Start Num: 19

Candidate Starts for Chamuel\_45:

(15, 33553), (Start: 19 @33520 has 139 MA's), (Start: 28 @33451 has 4 MA's), (37, 33328), (49, 33253), (59, 33085), (60, 33067), (62, 33052), (68, 33013), (71, 32968), (84, 32860),

Gene: Cheeto1\_46 Start: 33211, Stop: 32546, Start Num: 27

Candidate Starts for Cheeto1\_46:

(Start: 18 @33274 has 14 MA's), (Start: 27 @33211 has 2 MA's), (37, 33082), (50, 32989), (52, 32974), (59, 32836), (60, 32818), (65, 32788), (69, 32761), (80, 32635), (84, 32611),

Gene: Chepli\_45 Start: 32099, Stop: 31398, Start Num: 18

Candidate Starts for Chepli\_45:

(6, 32237), (16, 32126), (Start: 18 @32099 has 14 MA's), (Start: 28 @32036 has 4 MA's), (37, 31925), (48, 31862), (50, 31841), (52, 31826), (53, 31817), (58, 31703), (59, 31688), (66, 31622), (74, 31535), (86, 31430),

Gene: ChickenKing\_44 Start: 33104, Stop: 32439, Start Num: 27

Candidate Starts for ChickenKing\_44:

(Start: 18 @33167 has 14 MA's), (Start: 27 @33104 has 2 MA's), (37, 32975), (50, 32882), (52, 32867), (59, 32729), (60, 32711), (69, 32654), (80, 32528), (84, 32504),

Gene: ChikPic\_44 Start: 32592, Stop: 31813, Start Num: 19

Candidate Starts for ChikPic\_44:

(Start: 19 @32592 has 139 MA's), (Start: 27 @32532 has 2 MA's), (36, 32409), (38, 32400), (48, 32274), (50, 32253), (51, 32247), (54, 32223), (59, 32100), (63, 32064), (66, 32034), (74, 31947), (76, 31941), (82, 31884),

Gene: Christoph\_45 Start: 33507, Stop: 32782, Start Num: 19

Candidate Starts for Christoph\_45:

(15, 33540), (Start: 19 @33507 has 139 MA's), (Start: 28 @33438 has 4 MA's), (37, 33315), (49, 33240), (59, 33072), (60, 33054), (62, 33039), (68, 33000), (71, 32955), (84, 32847),

Gene: Clancy\_45 Start: 33543, Stop: 32818, Start Num: 19

Candidate Starts for Clancy\_45:

(15, 33576), (Start: 19 @33543 has 139 MA's), (Start: 28 @33474 has 4 MA's), (37, 33351), (49, 33276), (59, 33108), (60, 33090), (62, 33075), (68, 33036), (71, 32991), (84, 32883),

Gene: Clock\_42 Start: 33864, Stop: 33151, Start Num: 28

Candidate Starts for Clock\_42:

(Start: 19 @33933 has 139 MA's), (Start: 28 @33864 has 4 MA's), (36, 33747), (38, 33735), (41, 33687), (44, 33651), (48, 33609), (50, 33588), (51, 33582), (58, 33450), (61, 33414), (63, 33399), (67, 33366),

Gene: ColaCorta\_44 Start: 32738, Stop: 31959, Start Num: 19

Candidate Starts for ColaCorta\_44:

(Start: 19 @32738 has 139 MA's), (Start: 27 @32678 has 2 MA's), (36, 32555), (38, 32546), (48, 32420), (50, 32399), (51, 32393), (54, 32369), (59, 32246), (63, 32210), (66, 32180), (74, 32093), (76,

32087), (77, 32072), (82, 32030),

Gene: Convict\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for Convict\_46:

(11, 33897), (Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: Dave\_46 Start: 33801, Stop: 33076, Start Num: 19

Candidate Starts for Dave\_46:

(Start: 19 @33801 has 139 MA's), (Start: 28 @33732 has 4 MA's), (37, 33609), (49, 33534), (59, 33366), (60, 33348), (62, 33333), (68, 33294), (71, 33249), (84, 33141),

Gene: Delphidian\_48 Start: 33740, Stop: 33084, Start Num: 28

Candidate Starts for Delphidian\_48:

(Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: Den3\_46 Start: 33815, Stop: 33090, Start Num: 19

Candidate Starts for Den3\_46:

(11, 33902), (Start: 19 @33815 has 139 MA's), (Start: 28 @33746 has 4 MA's), (37, 33623), (49, 33548), (59, 33380), (60, 33362), (62, 33347), (68, 33308), (71, 33263), (84, 33155),

Gene: Dothraki\_46 Start: 33809, Stop: 33084, Start Num: 19

Candidate Starts for Dothraki\_46:

(Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: Duocatuli\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for Duocatuli\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: Eleri\_44 Start: 32582, Stop: 31803, Start Num: 19

Candidate Starts for Eleri\_44:

(Start: 19 @32582 has 139 MA's), (Start: 27 @32522 has 2 MA's), (36, 32399), (38, 32390), (48, 32264), (50, 32243), (51, 32237), (54, 32213), (59, 32090), (63, 32054), (66, 32024), (74, 31937), (76, 31931), (77, 31916), (82, 31874),

Gene: Endor\_47 Start: 33982, Stop: 33278, Start Num: 23

Candidate Starts for Endor\_47:

(16, 34036), (Start: 19 @34006 has 139 MA's), (Start: 23 @33982 has 7 MA's), (Start: 27 @33946 has 2 MA's), (Start: 28 @33940 has 4 MA's), (37, 33817), (49, 33736), (50, 33718), (60, 33550), (62, 33535), (69, 33493), (84, 33343),

Gene: Erla\_45 Start: 33491, Stop: 32766, Start Num: 19

Candidate Starts for Erla\_45:

(15, 33524), (Start: 19 @33491 has 139 MA's), (Start: 28 @33422 has 4 MA's), (37, 33299), (49, 33224), (59, 33056), (60, 33038), (62, 33023), (68, 32984), (71, 32939), (84, 32831),

Gene: Espinosa\_45 Start: 33506, Stop: 32781, Start Num: 19

Candidate Starts for Espinosa\_45:

(15, 33539), (Start: 19 @33506 has 139 MA's), (Start: 28 @33437 has 4 MA's), (37, 33314), (49, 33239), (59, 33071), (60, 33053), (62, 33038), (68, 32999), (71, 32954), (84, 32846),

Gene: Etna\_46 Start: 33810, Stop: 33082, Start Num: 19

Candidate Starts for Etna\_46:

(Start: 19 @33810 has 139 MA's), (Start: 23 @33786 has 7 MA's), (Start: 27 @33750 has 2 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33540), (50, 33522), (60, 33354), (62, 33339), (69, 33297), (84, 33147),

Gene: Etta\_45 Start: 33495, Stop: 32770, Start Num: 19

Candidate Starts for Etta\_45:

(15, 33528), (Start: 19 @33495 has 139 MA's), (Start: 28 @33426 has 4 MA's), (37, 33303), (49, 33228), (59, 33060), (60, 33042), (62, 33027), (68, 32988), (71, 32943), (84, 32835),

Gene: FarmerDoug\_45 Start: 33486, Stop: 32788, Start Num: 23

Candidate Starts for FarmerDoug\_45:

(7, 33633), (11, 33597), (Start: 19 @33510 has 139 MA's), (Start: 23 @33486 has 7 MA's), (Start: 27 @33450 has 2 MA's), (Start: 28 @33444 has 4 MA's), (34, 33369), (37, 33321), (48, 33249), (50, 33228), (59, 33078), (60, 33060), (61, 33057), (64, 33033), (69, 33003), (84, 32853),

Gene: Figueroism\_46 Start: 33800, Stop: 33075, Start Num: 19

Candidate Starts for Figueroism\_46:

(Start: 19 @33800 has 139 MA's), (Start: 28 @33731 has 4 MA's), (37, 33608), (49, 33533), (59, 33365), (60, 33347), (62, 33332), (68, 33293), (71, 33248), (84, 33140),

Gene: Finny\_45 Start: 32576, Stop: 31797, Start Num: 19

Candidate Starts for Finny\_45:

(Start: 19 @32576 has 139 MA's), (Start: 27 @32516 has 2 MA's), (36, 32393), (38, 32384), (48, 32258), (50, 32237), (51, 32231), (54, 32207), (59, 32084), (63, 32048), (66, 32018), (74, 31931), (76, 31925), (82, 31868),

Gene: Fulton\_44 Start: 31207, Stop: 30425, Start Num: 18

Candidate Starts for Fulton\_44:

(Start: 18 @31207 has 14 MA's), (Start: 28 @31141 has 4 MA's), (36, 31021), (38, 31012), (41, 30964), (50, 30865), (51, 30859), (59, 30712), (61, 30691), (66, 30646), (67, 30643), (75, 30556), (82, 30496),

Gene: GaeCeo\_46 Start: 33400, Stop: 32672, Start Num: 18

Candidate Starts for GaeCeo\_46:

(Start: 18 @33400 has 14 MA's), (Start: 27 @33337 has 2 MA's), (37, 33208), (50, 33115), (52, 33100), (59, 32962), (60, 32944), (69, 32887), (80, 32761), (84, 32737),

Gene: GardenB\_46 Start: 33727, Stop: 33023, Start Num: 23

Candidate Starts for GardenB\_46:

(20, 33745), (Start: 23 @33727 has 7 MA's), (Start: 27 @33691 has 2 MA's), (Start: 28 @33685 has 4 MA's), (37, 33562), (49, 33481), (50, 33463), (58, 33328), (60, 33295), (62, 33280), (84, 33088),

Gene: Garey24\_46 Start: 33474, Stop: 32749, Start Num: 19

Candidate Starts for Garey24\_46:

(15, 33507), (Start: 19 @33474 has 139 MA's), (Start: 28 @33405 has 4 MA's), (37, 33282), (49, 33207), (59, 33039), (60, 33021), (62, 33006), (68, 32967), (71, 32922), (84, 32814),

Gene: Gargoyle\_46 Start: 33815, Stop: 33090, Start Num: 19

Candidate Starts for Gargoyle\_46:

(11, 33902), (Start: 19 @33815 has 139 MA's), (Start: 28 @33746 has 4 MA's), (37, 33623), (49, 33548), (59, 33380), (60, 33362), (62, 33347), (68, 33308), (71, 33263), (84, 33155),

Gene: Gelo\_45 Start: 33501, Stop: 32776, Start Num: 19

Candidate Starts for Gelo\_45:

(15, 33534), (Start: 19 @33501 has 139 MA's), (Start: 28 @33432 has 4 MA's), (37, 33309), (49, 33234), (59, 33066), (60, 33048), (62, 33033), (68, 32994), (71, 32949), (84, 32841),

Gene: Gershwin\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for Gershwin\_45:

(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: Glamour\_44 Start: 32730, Stop: 31951, Start Num: 19

Candidate Starts for Glamour\_44:

(Start: 19 @32730 has 139 MA's), (Start: 27 @32670 has 2 MA's), (36, 32547), (38, 32538), (48, 32412), (50, 32391), (51, 32385), (54, 32361), (59, 32238), (63, 32202), (66, 32172), (74, 32085), (76, 32079), (77, 32064), (82, 32022),

Gene: Golden\_43 Start: 32643, Stop: 31837, Start Num: 19

Candidate Starts for Golden\_43:

(8, 32757), (Start: 19 @32643 has 139 MA's), (Start: 27 @32583 has 2 MA's), (Start: 28 @32577 has 4 MA's), (36, 32457), (39, 32430), (48, 32301), (50, 32280), (54, 32250), (56, 32178), (58, 32142), (59, 32127), (60, 32109), (70, 32025), (84, 31902),

Gene: Greenlvy\_43 Start: 31562, Stop: 30780, Start Num: 18

Candidate Starts for Greenlvy\_43:

(Start: 18 @31562 has 14 MA's), (Start: 28 @31496 has 4 MA's), (36, 31376), (38, 31367), (41, 31319), (50, 31220), (51, 31214), (59, 31067), (61, 31046), (66, 31001), (67, 30998), (75, 30911), (82, 30851),

Gene: Greys\_46 Start: 33739, Stop: 33083, Start Num: 28

Candidate Starts for Greys\_46:

(11, 33895), (Start: 19 @33808 has 139 MA's), (Start: 28 @33739 has 4 MA's), (37, 33616), (49, 33541), (59, 33373), (60, 33355), (62, 33340), (68, 33301), (71, 33256), (84, 33148),

Gene: Gubbabump\_45 Start: 33488, Stop: 32763, Start Num: 19

Candidate Starts for Gubbabump\_45:

(15, 33521), (Start: 19 @33488 has 139 MA's), (Start: 28 @33419 has 4 MA's), (37, 33296), (49, 33221), (59, 33053), (60, 33035), (62, 33020), (68, 32981), (71, 32936), (84, 32828),

Gene: Guetzie\_44 Start: 32628, Stop: 31822, Start Num: 19

Candidate Starts for Guetzie\_44:

(8, 32742), (Start: 19 @32628 has 139 MA's), (Start: 27 @32568 has 2 MA's), (Start: 28 @32562 has 4 MA's), (36, 32442), (39, 32415), (48, 32286), (50, 32265), (54, 32235), (56, 32163), (58, 32127), (59, 32112), (60, 32094), (70, 32010), (84, 31887),

Gene: Hamlet\_46 Start: 33755, Stop: 33027, Start Num: 19

Candidate Starts for Hamlet\_46:

(Start: 19 @33755 has 139 MA's), (20, 33749), (Start: 23 @33731 has 7 MA's), (Start: 27 @33695 has 2 MA's), (Start: 28 @33689 has 4 MA's), (37, 33566), (49, 33485), (50, 33467), (60, 33299), (62, 33284), (69, 33242), (73, 33170), (84, 33092),

Gene: HanSolo\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for HanSolo\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: HankSprout\_46 Start: 33375, Stop: 32650, Start Num: 19

Candidate Starts for HankSprout\_46:

(15, 33408), (Start: 19 @33375 has 139 MA's), (Start: 28 @33306 has 4 MA's), (37, 33183), (49, 33108), (59, 32940), (60, 32922), (62, 32907), (68, 32868), (71, 32823), (84, 32715),

Gene: Hasitha\_44 Start: 31219, Stop: 30437, Start Num: 18

Candidate Starts for Hasitha\_44:

(Start: 18 @31219 has 14 MA's), (Start: 28 @31153 has 4 MA's), (36, 31033), (38, 31024), (41, 30976), (50, 30877), (51, 30871), (59, 30724), (61, 30703), (66, 30658), (67, 30655), (75, 30568), (82, 30508),

Gene: HerculesXL\_42 Start: 31320, Stop: 30547, Start Num: 19

Candidate Starts for HerculesXL\_42:

(Start: 19 @31320 has 139 MA's), (35, 31158), (40, 31140), (46, 31041), (48, 31011), (50, 30990), (58, 30852), (59, 30837), (60, 30819), (61, 30816), (74, 30684), (75, 30681), (80, 30636), (84, 30612), (86, 30579),

Gene: HungryHenry\_45 Start: 33503, Stop: 32778, Start Num: 19

Candidate Starts for HungryHenry\_45:

(15, 33536), (Start: 19 @33503 has 139 MA's), (Start: 28 @33434 has 4 MA's), (37, 33311), (49, 33236), (59, 33068), (60, 33050), (62, 33035), (68, 32996), (71, 32951), (84, 32843),

Gene: Ilzat\_45 Start: 33514, Stop: 32789, Start Num: 19

Candidate Starts for Ilzat\_45:

(15, 33547), (Start: 19 @33514 has 139 MA's), (Start: 28 @33445 has 4 MA's), (37, 33322), (49, 33247), (59, 33079), (60, 33061), (62, 33046), (68, 33007), (71, 32962), (84, 32854),

Gene: Inventa\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Inventa\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Ioannes\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for Ioannes\_46:

(Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: Ixel\_45 Start: 32997, Stop: 32293, Start Num: 19

Candidate Starts for Ixel\_45:

(1, 33495), (2, 33357), (17, 33024), (Start: 19 @32997 has 139 MA's), (Start: 28 @32937 has 4 MA's), (35, 32835), (48, 32757), (50, 32736), (52, 32721), (58, 32598), (59, 32583), (60, 32565), (71, 32466), (74, 32430),

Gene: Janus167\_45 Start: 33495, Stop: 32770, Start Num: 19

Candidate Starts for Janus167\_45:

(15, 33528), (Start: 19 @33495 has 139 MA's), (Start: 28 @33426 has 4 MA's), (37, 33303), (49, 33228), (59, 33060), (60, 33042), (62, 33027), (68, 32988), (71, 32943), (84, 32835),

Gene: JasonD\_50 Start: 33723, Stop: 33190, Start Num: 37

Candidate Starts for JasonD\_50:

(Start: 19 @33903 has 139 MA's), (24, 33864), (Start: 27 @33846 has 2 MA's), (Start: 28 @33840 has 4 MA's), (34, 33771), (37, 33723), (47, 33660), (50, 33630), (53, 33609), (62, 33447), (69, 33405),

Gene: JasperRussell\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for JasperRussell\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: Jemerald\_45 Start: 33166, Stop: 32465, Start Num: 18

Candidate Starts for Jemerald\_45:

(Start: 18 @33166 has 14 MA's), (24, 33121), (Start: 28 @33097 has 4 MA's), (30, 33091), (37, 32974), (42, 32959), (48, 32929), (50, 32908), (59, 32755), (84, 32530), (86, 32497),

Gene: Jenos\_49 Start: 34633, Stop: 33893, Start Num: 19

Candidate Starts for Jenos\_49:

(Start: 19 @34633 has 139 MA's), (Start: 27 @34573 has 2 MA's), (Start: 28 @34567 has 4 MA's), (37, 34444), (46, 34402), (59, 34183), (62, 34150), (69, 34108), (84, 33958),

Gene: Jerbirus\_47 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for Jerbirus\_47:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: JeriBeth\_47 Start: 33361, Stop: 32636, Start Num: 19

Candidate Starts for JeriBeth\_47:

(15, 33394), (Start: 19 @33361 has 139 MA's), (Start: 28 @33292 has 4 MA's), (37, 33169), (49, 33094), (59, 32926), (60, 32908), (62, 32893), (68, 32854), (71, 32809), (84, 32701),

Gene: Juanyo\_43 Start: 32202, Stop: 31423, Start Num: 19

Candidate Starts for Juanyo\_43:

(3, 32538), (4, 32478), (5, 32457), (10, 32292), (Start: 19 @32202 has 139 MA's), (Start: 27 @32142 has 2 MA's), (Start: 28 @32136 has 4 MA's), (36, 32019), (38, 32010), (41, 31962), (48, 31884), (51, 31857), (53, 31839), (58, 31725), (61, 31689), (63, 31674), (65, 31662), (66, 31644), (67, 31641), (75, 31554), (77, 31536), (85, 31476),

Gene: Juicer\_45 Start: 33166, Stop: 32465, Start Num: 18

Candidate Starts for Juicer\_45:

(Start: 18 @33166 has 14 MA's), (24, 33121), (Start: 28 @33097 has 4 MA's), (30, 33091), (37, 32974), (42, 32959), (48, 32929), (50, 32908), (59, 32755), (84, 32530), (86, 32497),

Gene: Kale\_45 Start: 33510, Stop: 32785, Start Num: 19

Candidate Starts for Kale\_45:

(15, 33543), (Start: 19 @33510 has 139 MA's), (Start: 28 @33441 has 4 MA's), (37, 33318), (49, 33243), (59, 33075), (60, 33057), (62, 33042), (68, 33003), (71, 32958), (84, 32850),

Gene: KannH\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for KannH\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: KatChan\_45 Start: 32111, Stop: 31410, Start Num: 18



Candidate Starts for KatChan\_45:

(6, 32249), (16, 32138), (Start: 18 @32111 has 14 MA's), (Start: 28 @32048 has 4 MA's), (37, 31937), (48, 31874), (50, 31853), (52, 31838), (53, 31829), (58, 31715), (59, 31700), (66, 31634), (74, 31547), (86, 31442),

Gene: Kauala\_43 Start: 32902, Stop: 32117, Start Num: 22

Candidate Starts for Kauala\_43:

(Start: 19 @32926 has 139 MA's), (Start: 22 @32902 has 1 MA's), (Start: 27 @32866 has 2 MA's), (Start: 28 @32860 has 4 MA's), (36, 32740), (39, 32710), (48, 32581), (50, 32560), (53, 32536), (55, 32461), (56, 32458), (57, 32437), (59, 32407), (61, 32386), (73, 32260), (80, 32206), (84, 32182), (86, 32149),

Gene: KingJulien\_46 Start: 33457, Stop: 32918, Start Num: 37

Candidate Starts for KingJulien\_46:

(Start: 19 @33646 has 139 MA's), (20, 33640), (Start: 23 @33622 has 7 MA's), (Start: 27 @33586 has 2 MA's), (Start: 28 @33580 has 4 MA's), (37, 33457), (49, 33376), (50, 33358), (60, 33190), (62, 33175), (69, 33133), (73, 33061), (84, 32983),

Gene: Klimt\_46 Start: 33526, Stop: 32801, Start Num: 19

Candidate Starts for Klimt\_46:

(15, 33559), (Start: 19 @33526 has 139 MA's), (Start: 28 @33457 has 4 MA's), (37, 33334), (49, 33259), (59, 33091), (60, 33073), (62, 33058), (68, 33019), (71, 32974), (84, 32866),

Gene: Knox\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for Knox\_46:

(11, 33897), (Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: Koji\_43 Start: 32928, Stop: 32116, Start Num: 19

Candidate Starts for Koji\_43:

(Start: 19 @32928 has 139 MA's), (Start: 27 @32868 has 2 MA's), (Start: 28 @32862 has 4 MA's), (36, 32742), (39, 32712), (50, 32559), (52, 32544), (53, 32535), (55, 32460), (58, 32421), (60, 32388), (70, 32304), (73, 32259), (80, 32205), (84, 32181), (86, 32148),

Gene: Kurt1\_46 Start: 33737, Stop: 33081, Start Num: 28

Candidate Starts for Kurt1\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Leafus\_46 Start: 33909, Stop: 33181, Start Num: 19

Candidate Starts for Leafus\_46:

(Start: 19 @33909 has 139 MA's), (Start: 23 @33885 has 7 MA's), (Start: 27 @33849 has 2 MA's), (Start: 28 @33843 has 4 MA's), (37, 33720), (49, 33639), (50, 33621), (60, 33453), (62, 33438), (69, 33396), (73, 33324), (84, 33246),

Gene: Librie\_44 Start: 31206, Stop: 30424, Start Num: 18

Candidate Starts for Librie\_44:

(Start: 18 @31206 has 14 MA's), (Start: 28 @31140 has 4 MA's), (36, 31020), (38, 31011), (41, 30963), (50, 30864), (51, 30858), (59, 30711), (61, 30690), (66, 30645), (67, 30642), (75, 30555), (82, 30495),

Gene: LilTerminator\_44 Start: 31228, Stop: 30446, Start Num: 18

Candidate Starts for LilTerminator\_44:

(Start: 18 @31228 has 14 MA's), (Start: 28 @31162 has 4 MA's), (36, 31042), (38, 31033), (41, 30985), (50, 30886), (51, 30880), (59, 30733), (61, 30712), (66, 30667), (67, 30664), (75, 30577), (82, 30517),

Gene: Lovelyunicorn\_46 Start: 33811, Stop: 33086, Start Num: 19

Candidate Starts for Lovelyunicorn\_46:

(11, 33898), (Start: 19 @33811 has 139 MA's), (Start: 28 @33742 has 4 MA's), (37, 33619), (49, 33544), (59, 33376), (60, 33358), (62, 33343), (68, 33304), (71, 33259), (84, 33151),

Gene: Lucky3\_43 Start: 32643, Stop: 31837, Start Num: 19

Candidate Starts for Lucky3\_43:

(8, 32757), (Start: 19 @32643 has 139 MA's), (Start: 27 @32583 has 2 MA's), (Start: 28 @32577 has 4 MA's), (36, 32457), (39, 32430), (48, 32301), (50, 32280), (54, 32250), (56, 32178), (58, 32142), (59, 32127), (60, 32109), (70, 32025), (84, 31902),

Gene: Ludgate\_46 Start: 33809, Stop: 33084, Start Num: 19

Candidate Starts for Ludgate\_46:

(11, 33896), (Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: Luna18\_45 Start: 32111, Stop: 31410, Start Num: 18

Candidate Starts for Luna18\_45:

(6, 32249), (16, 32138), (Start: 18 @32111 has 14 MA's), (Start: 28 @32048 has 4 MA's), (37, 31937), (48, 31874), (50, 31853), (52, 31838), (53, 31829), (58, 31715), (59, 31700), (66, 31634), (74, 31547), (86, 31442),

Gene: MCubed\_44 Start: 32607, Stop: 31828, Start Num: 19

Candidate Starts for MCubed\_44:

(14, 32640), (Start: 19 @32607 has 139 MA's), (Start: 27 @32547 has 2 MA's), (36, 32424), (38, 32415), (48, 32289), (50, 32268), (51, 32262), (54, 32238), (59, 32115), (63, 32079), (66, 32049), (74, 31962), (76, 31956), (82, 31899),

Gene: MaeLinda\_46 Start: 33810, Stop: 33085, Start Num: 19

Candidate Starts for MaeLinda\_46:

(Start: 19 @33810 has 139 MA's), (Start: 28 @33741 has 4 MA's), (37, 33618), (49, 33543), (59, 33375), (60, 33357), (62, 33342), (68, 33303), (71, 33258), (84, 33150),

Gene: ManRay\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for ManRay\_45:

(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: Mandalorian\_43 Start: 32281, Stop: 31502, Start Num: 19

Candidate Starts for Mandalorian\_43:

(Start: 19 @32281 has 139 MA's), (Start: 27 @32221 has 2 MA's), (Start: 28 @32215 has 4 MA's), (36, 32098), (38, 32089), (41, 32041), (48, 31963), (50, 31942), (51, 31936), (53, 31918), (58, 31804), (59, 31789), (61, 31768), (63, 31753), (65, 31741), (67, 31720), (75, 31633), (77, 31615), (78, 31597), (82, 31573), (84, 31564), (85, 31555), (86, 31531),

Gene: Martin\_47 Start: 33815, Stop: 33090, Start Num: 19

Candidate Starts for Martin\_47:

(Start: 19 @33815 has 139 MA's), (Start: 28 @33746 has 4 MA's), (37, 33623), (49, 33548), (59, 33380), (60, 33362), (62, 33347), (68, 33308), (71, 33263), (84, 33155),

Gene: McGalleon\_48 Start: 34793, Stop: 34053, Start Num: 19

Candidate Starts for McGalleon\_48:

(Start: 19 @34793 has 139 MA's), (Start: 27 @34733 has 2 MA's), (Start: 28 @34727 has 4 MA's), (34, 34652), (37, 34604), (46, 34562), (59, 34343), (62, 34310), (69, 34268), (84, 34118),

Gene: Mercedes\_39 Start: 31146, Stop: 30457, Start Num: 23

Candidate Starts for Mercedes\_39:

(Start: 19 @31176 has 139 MA's), (Start: 23 @31146 has 7 MA's), (25, 31119), (37, 30993), (50, 30900), (58, 30762), (59, 30747), (60, 30729), (61, 30726), (74, 30594), (80, 30546),

Gene: MillyPhilly\_46 Start: 33803, Stop: 33078, Start Num: 19

Candidate Starts for MillyPhilly\_46:

(Start: 19 @33803 has 139 MA's), (Start: 28 @33734 has 4 MA's), (37, 33611), (49, 33536), (59, 33368), (60, 33350), (62, 33335), (68, 33296), (71, 33251), (84, 33143),

Gene: MonChoix\_43 Start: 33358, Stop: 32630, Start Num: 19

Candidate Starts for MonChoix\_43:

(12, 33436), (Start: 19 @33358 has 139 MA's), (26, 33295), (Start: 28 @33286 has 4 MA's), (29, 33283), (37, 33163), (48, 33091), (54, 33043), (58, 32935), (59, 32920), (60, 32902), (62, 32887), (69, 32845), (84, 32695),

Gene: Morrigan\_45 Start: 32063, Stop: 31353, Start Num: 18

Candidate Starts for Morrigan\_45:

(Start: 18 @32063 has 14 MA's), (31, 31979), (33, 31940), (37, 31883), (48, 31817), (50, 31796), (52, 31781), (53, 31772), (58, 31658), (74, 31490), (86, 31385),

Gene: MrWorldwide\_46 Start: 33813, Stop: 33088, Start Num: 19

Candidate Starts for MrWorldwide\_46:

(Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: Nagem\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Nagem\_46:

(Start: 19 @33806 has 139 MA's), (21, 33791), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Nattles\_45 Start: 33495, Stop: 32770, Start Num: 19

Candidate Starts for Nattles\_45:

(15, 33528), (Start: 19 @33495 has 139 MA's), (Start: 28 @33426 has 4 MA's), (37, 33303), (49, 33228), (59, 33060), (60, 33042), (62, 33027), (68, 32988), (71, 32943), (84, 32835),

Gene: Nebulous\_42 Start: 34114, Stop: 33332, Start Num: 19

Candidate Starts for Nebulous\_42:

(Start: 19 @34114 has 139 MA's), (Start: 28 @34045 has 4 MA's), (36, 33928), (38, 33916), (41, 33868), (44, 33832), (48, 33790), (50, 33769), (51, 33763), (58, 33631), (61, 33595), (63, 33580), (67, 33547),

Gene: Neferthema\_45 Start: 33455, Stop: 32673, Start Num: 19

Candidate Starts for Neferthema\_45:

(16, 33485), (17, 33482), (Start: 19 @33455 has 139 MA's), (Start: 28 @33395 has 4 MA's), (36, 33275), (38, 33263), (41, 33215), (50, 33110), (51, 33104), (58, 32972), (63, 32921), (67, 32888),

Gene: NickSell\_48 Start: 33747, Stop: 33091, Start Num: 28

Candidate Starts for NickSell\_48:

(Start: 19 @33816 has 139 MA's), (Start: 28 @33747 has 4 MA's), (37, 33624), (49, 33549), (59, 33381), (60, 33363), (62, 33348), (68, 33309), (71, 33264), (84, 33156),

Gene: Nucci\_43 Start: 32264, Stop: 31485, Start Num: 19

Candidate Starts for Nucci\_43:

(Start: 19 @32264 has 139 MA's), (Start: 27 @32204 has 2 MA's), (Start: 28 @32198 has 4 MA's), (36, 32081), (38, 32072), (41, 32024), (48, 31946), (50, 31925), (51, 31919), (53, 31901), (58, 31787), (59, 31772), (61, 31751), (63, 31736), (65, 31724), (67, 31703), (75, 31616), (77, 31598), (78, 31580), (82, 31556), (84, 31547), (85, 31538), (86, 31514),

Gene: Oats\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for Oats\_45:

(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: OldNelly\_47 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for OldNelly\_47:

(Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),

Gene: Oxtober96\_47 Start: 33811, Stop: 33086, Start Num: 19

Candidate Starts for Oxtober96\_47:

(11, 33898), (Start: 19 @33811 has 139 MA's), (Start: 28 @33742 has 4 MA's), (37, 33619), (49, 33544), (59, 33376), (60, 33358), (62, 33343), (68, 33304), (71, 33259), (84, 33151),

Gene: Pajaza\_43 Start: 32217, Stop: 31417, Start Num: 19

Candidate Starts for Pajaza\_43:

(9, 32328), (13, 32268), (Start: 19 @32217 has 139 MA's), (Start: 27 @32157 has 2 MA's), (32, 32121), (36, 32028), (39, 32010), (50, 31860), (55, 31761), (56, 31758), (60, 31689), (69, 31632), (72, 31587), (81, 31494), (83, 31485), (84, 31482), (86, 31449),

Gene: Papafritta\_45 Start: 33519, Stop: 32794, Start Num: 19

Candidate Starts for Papafritta\_45:

(15, 33552), (Start: 19 @33519 has 139 MA's), (Start: 28 @33450 has 4 MA's), (37, 33327), (49, 33252), (59, 33084), (60, 33066), (62, 33051), (68, 33012), (71, 32967), (84, 32859),

Gene: ParleG\_46 Start: 33813, Stop: 33088, Start Num: 19

Candidate Starts for ParleG\_46:

(Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: Peep\_46 Start: 33798, Stop: 33073, Start Num: 19

Candidate Starts for Peep\_46:

(Start: 19 @33798 has 139 MA's), (Start: 28 @33729 has 4 MA's), (37, 33606), (49, 33531), (59, 33363), (60, 33345), (62, 33330), (68, 33291), (71, 33246), (84, 33138),

Gene: Peppino\_46 Start: 33755, Stop: 33027, Start Num: 19

Candidate Starts for Peppino\_46:

(Start: 19 @33755 has 139 MA's), (20, 33749), (Start: 23 @33731 has 7 MA's), (Start: 27 @33695 has 2 MA's), (Start: 28 @33689 has 4 MA's), (37, 33566), (49, 33485), (50, 33467), (60, 33299), (62, 33284), (69, 33242), (73, 33170), (84, 33092),

Gene: Pherbot\_43 Start: 32544, Stop: 31732, Start Num: 19

Candidate Starts for Pherbot\_43:

(Start: 19 @32544 has 139 MA's), (Start: 27 @32484 has 2 MA's), (Start: 28 @32478 has 4 MA's), (36, 32358), (39, 32328), (50, 32175), (52, 32160), (53, 32151), (55, 32076), (58, 32037), (60, 32004), (70, 31920), (73, 31875), (80, 31821), (84, 31797),

Gene: Pherferi\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Pherferi\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Phiderman\_46 Start: 33803, Stop: 33078, Start Num: 19

Candidate Starts for Phiderman\_46:

(Start: 19 @33803 has 139 MA's), (Start: 28 @33734 has 4 MA's), (37, 33611), (49, 33536), (59, 33368), (60, 33350), (62, 33335), (68, 33296), (71, 33251), (84, 33143),

Gene: Phireproof\_46 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for Phireproof\_46:

(Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),

Gene: PhredFlintston\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for PhredFlintston\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Phriends\_46 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for Phriends\_46:

(Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),

Gene: Pikmin\_43 Start: 32217, Stop: 31417, Start Num: 19

Candidate Starts for Pikmin\_43:

(9, 32328), (13, 32268), (Start: 19 @32217 has 139 MA's), (Start: 27 @32157 has 2 MA's), (32, 32121), (36, 32028), (39, 32010), (50, 31860), (55, 31761), (56, 31758), (60, 31689), (69, 31632), (72, 31587), (81, 31494), (83, 31485), (84, 31482), (86, 31449),

Gene: Pocket\_45 Start: 33535, Stop: 32810, Start Num: 19

Candidate Starts for Pocket\_45:

(15, 33568), (Start: 19 @33535 has 139 MA's), (Start: 28 @33466 has 4 MA's), (37, 33343), (49, 33268), (59, 33100), (60, 33082), (62, 33067), (68, 33028), (71, 32983), (84, 32875),

Gene: PrincePhergus\_43 Start: 32560, Stop: 31748, Start Num: 19

Candidate Starts for PrincePhergus\_43:

(Start: 19 @32560 has 139 MA's), (Start: 27 @32500 has 2 MA's), (Start: 28 @32494 has 4 MA's), (36, 32374), (39, 32344), (50, 32191), (53, 32167), (55, 32092), (58, 32053), (60, 32020), (70, 31936), (73, 31891), (80, 31837), (84, 31813), (86, 31780),

Gene: PuppyEggo\_46 Start: 33813, Stop: 33088, Start Num: 19

Candidate Starts for PuppyEggo\_46:

(11, 33900), (Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: QuadZero\_44 Start: 31373, Stop: 30591, Start Num: 18

Candidate Starts for QuadZero\_44:

(Start: 18 @31373 has 14 MA's), (Start: 28 @31307 has 4 MA's), (36, 31187), (38, 31178), (41, 31130), (50, 31031), (51, 31025), (59, 30878), (61, 30857), (66, 30812), (67, 30809), (75, 30722), (82, 30662),

Gene: Quartz\_44 Start: 32394, Stop: 31615, Start Num: 19

Candidate Starts for Quartz\_44:

(Start: 19 @32394 has 139 MA's), (Start: 27 @32334 has 2 MA's), (Start: 28 @32328 has 4 MA's), (36, 32211), (38, 32202), (41, 32154), (48, 32076), (50, 32055), (51, 32049), (53, 32031), (58, 31917), (59, 31902), (61, 31881), (63, 31866), (65, 31854), (67, 31833), (75, 31746), (77, 31728), (78, 31710), (82, 31686), (85, 31668),

Gene: Raccoon\_46 Start: 33712, Stop: 32984, Start Num: 19

Candidate Starts for Raccoon\_46:

(Start: 19 @33712 has 139 MA's), (Start: 23 @33688 has 7 MA's), (Start: 27 @33652 has 2 MA's), (Start: 28 @33646 has 4 MA's), (37, 33523), (49, 33442), (50, 33424), (60, 33256), (62, 33241), (69, 33199), (73, 33127), (84, 33049),

Gene: Rapheph\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Rapheph\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: Raptor\_46 Start: 33813, Stop: 33088, Start Num: 19

Candidate Starts for Raptor\_46:

(11, 33900), (Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: Redfield\_46 Start: 33763, Stop: 33035, Start Num: 19

Candidate Starts for Redfield\_46:

(Start: 19 @33763 has 139 MA's), (20, 33757), (Start: 23 @33739 has 7 MA's), (Start: 27 @33703 has 2 MA's), (Start: 28 @33697 has 4 MA's), (37, 33574), (49, 33493), (50, 33475), (60, 33307), (62, 33292), (69, 33250), (73, 33178), (84, 33100),

Gene: Renzie\_46 Start: 33801, Stop: 33076, Start Num: 19

Candidate Starts for Renzie\_46:

(Start: 19 @33801 has 139 MA's), (Start: 28 @33732 has 4 MA's), (37, 33609), (49, 33534), (59, 33366), (60, 33348), (62, 33333), (68, 33294), (71, 33249), (84, 33141),

Gene: Riyhil\_46 Start: 33816, Stop: 33091, Start Num: 19

Candidate Starts for Riyhil\_46:

(Start: 19 @33816 has 139 MA's), (Start: 28 @33747 has 4 MA's), (37, 33624), (49, 33549), (59, 33381), (60, 33363), (62, 33348), (68, 33309), (71, 33264), (84, 33156),

Gene: Robinson\_46 Start: 33735, Stop: 33079, Start Num: 28

Candidate Starts for Robinson\_46:

(Start: 19 @33804 has 139 MA's), (Start: 28 @33735 has 4 MA's), (37, 33612), (49, 33537), (59, 33369), (60, 33351), (62, 33336), (68, 33297), (71, 33252), (84, 33144),

Gene: Rog141\_45 Start: 33498, Stop: 32773, Start Num: 19

Candidate Starts for Rog141\_45:

(15, 33531), (Start: 19 @33498 has 139 MA's), (Start: 28 @33429 has 4 MA's), (37, 33306), (49, 33231), (59, 33063), (60, 33045), (62, 33030), (68, 32991), (71, 32946), (84, 32838),

Gene: SJay\_46 Start: 33807, Stop: 33082, Start Num: 19

Candidate Starts for SJay\_46:

(Start: 19 @33807 has 139 MA's), (Start: 28 @33738 has 4 MA's), (37, 33615), (49, 33540), (59, 33372), (60, 33354), (62, 33339), (68, 33300), (71, 33255), (84, 33147),

Gene: Sansa\_43 Start: 32812, Stop: 32033, Start Num: 19

Candidate Starts for Sansa\_43:

(14, 32845), (Start: 19 @32812 has 139 MA's), (Start: 27 @32752 has 2 MA's), (36, 32629), (38, 32620), (48, 32494), (50, 32473), (51, 32467), (54, 32443), (59, 32320), (63, 32284), (66, 32254), (74, 32167), (82, 32104),

Gene: Saratos\_44 Start: 32567, Stop: 31788, Start Num: 19

Candidate Starts for Saratos\_44:

(Start: 19 @32567 has 139 MA's), (Start: 27 @32507 has 2 MA's), (36, 32384), (38, 32375), (48, 32249), (50, 32228), (51, 32222), (54, 32198), (59, 32075), (63, 32039), (66, 32009), (74, 31922), (76, 31916), (77, 31901), (82, 31859),

Gene: Schimmels22\_41 Start: 31619, Stop: 30921, Start Num: 19

Candidate Starts for Schimmels22\_41:

(Start: 19 @31619 has 139 MA's), (Start: 28 @31559 has 4 MA's), (35, 31457), (48, 31385), (50, 31364), (52, 31349), (58, 31226), (59, 31211), (60, 31193), (74, 31058), (80, 31010), (84, 30986), (86, 30953),

Gene: Schnapsidee\_46 Start: 33770, Stop: 33042, Start Num: 19

Candidate Starts for Schnapsidee\_46:

(Start: 19 @33770 has 139 MA's), (20, 33764), (Start: 23 @33746 has 7 MA's), (Start: 27 @33710 has 2 MA's), (Start: 28 @33704 has 4 MA's), (37, 33581), (49, 33500), (50, 33482), (60, 33314), (62, 33299), (69, 33257), (73, 33185), (84, 33107),

Gene: Schubert\_43 Start: 32437, Stop: 31721, Start Num: 19

Candidate Starts for Schubert\_43:

(16, 32467), (Start: 19 @32437 has 139 MA's), (Start: 27 @32377 has 2 MA's), (37, 32248), (45, 32215), (48, 32185), (50, 32164), (58, 32026), (59, 32011), (66, 31945), (69, 31936), (80, 31810), (84, 31786),

Gene: Sedgewig\_45 Start: 33496, Stop: 32771, Start Num: 19

Candidate Starts for Sedgewig\_45:

(15, 33529), (Start: 19 @33496 has 139 MA's), (Start: 28 @33427 has 4 MA's), (37, 33304), (49, 33229), (59, 33061), (60, 33043), (62, 33028), (68, 32989), (71, 32944), (84, 32836),

Gene: ShaiHulud\_47 Start: 33753, Stop: 33097, Start Num: 28

Candidate Starts for ShaiHulud\_47:

(11, 33909), (Start: 19 @33822 has 139 MA's), (Start: 28 @33753 has 4 MA's), (37, 33630), (49, 33555), (59, 33387), (60, 33369), (62, 33354), (68, 33315), (71, 33270), (84, 33162),

Gene: Shamu\_45 Start: 32746, Stop: 31967, Start Num: 19

Candidate Starts for Shamu\_45:

(Start: 19 @32746 has 139 MA's), (Start: 27 @32686 has 2 MA's), (36, 32563), (38, 32554), (48, 32428), (50, 32407), (51, 32401), (54, 32377), (59, 32254), (63, 32218), (66, 32188), (74, 32101), (76, 32095), (82, 32038),

Gene: Shee\_46 Start: 33803, Stop: 33078, Start Num: 19

Candidate Starts for Shee\_46:

(Start: 19 @33803 has 139 MA's), (Start: 28 @33734 has 4 MA's), (37, 33611), (49, 33536), (59, 33368), (60, 33350), (62, 33335), (68, 33296), (71, 33251), (84, 33143),

Gene: Sinatra\_44 Start: 32555, Stop: 31743, Start Num: 19

Candidate Starts for Sinatra\_44:

(Start: 19 @32555 has 139 MA's), (Start: 27 @32495 has 2 MA's), (Start: 28 @32489 has 4 MA's), (36, 32369), (39, 32339), (50, 32186), (52, 32171), (53, 32162), (55, 32087), (58, 32048), (60, 32015), (70, 31931), (73, 31886), (80, 31832), (84, 31808),

Gene: SirVictor\_44 Start: 32628, Stop: 31822, Start Num: 19

Candidate Starts for SirVictor\_44:

(8, 32742), (Start: 19 @32628 has 139 MA's), (Start: 27 @32568 has 2 MA's), (Start: 28 @32562 has 4 MA's), (36, 32442), (39, 32415), (48, 32286), (50, 32265), (54, 32235), (56, 32163), (58, 32127), (59, 32112), (60, 32094), (70, 32010), (84, 31887),

Gene: SoilGremlin\_47 Start: 33740, Stop: 33084, Start Num: 28

Candidate Starts for SoilGremlin\_47:

(Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: SonOfLevi\_46 Start: 33526, Stop: 32801, Start Num: 19

Candidate Starts for SonOfLevi\_46:

(15, 33559), (Start: 19 @33526 has 139 MA's), (Start: 28 @33457 has 4 MA's), (37, 33334), (49, 33259), (59, 33091), (60, 33073), (62, 33058), (68, 33019), (71, 32974), (84, 32866),

Gene: Stanktossa\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Stanktossa\_46:

(Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: StingRay\_45 Start: 33511, Stop: 32786, Start Num: 19

Candidate Starts for StingRay\_45:

(15, 33544), (Start: 19 @33511 has 139 MA's), (Start: 28 @33442 has 4 MA's), (37, 33319), (49, 33244), (59, 33076), (60, 33058), (62, 33043), (68, 33004), (71, 32959), (84, 32851),

Gene: StirfryIV\_47 Start: 33507, Stop: 32782, Start Num: 19

Candidate Starts for StirfryIV\_47:

(15, 33540), (Start: 19 @33507 has 139 MA's), (Start: 28 @33438 has 4 MA's), (37, 33315), (49, 33240), (59, 33072), (60, 33054), (62, 33039), (68, 33000), (71, 32955), (84, 32847),

Gene: Stormbreaker8\_45 Start: 33622, Stop: 32918, Start Num: 23

Candidate Starts for Stormbreaker8\_45:

(Start: 19 @33646 has 139 MA's), (20, 33640), (Start: 23 @33622 has 7 MA's), (Start: 27 @33586 has 2 MA's), (Start: 28 @33580 has 4 MA's), (37, 33457), (49, 33376), (50, 33358), (60, 33190), (62, 33175), (69, 33133), (73, 33061), (84, 32983),

Gene: Strathdee\_46 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for Strathdee\_46:

(11, 33899), (Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),



Gene: Superfresh\_46 Start: 33801, Stop: 33076, Start Num: 19

Candidate Starts for Superfresh\_46:

(Start: 19 @33801 has 139 MA's), (Start: 28 @33732 has 4 MA's), (37, 33609), (49, 33534), (59, 33366), (60, 33348), (62, 33333), (68, 33294), (71, 33249), (84, 33141),

Gene: TatarkaPM\_46 Start: 33816, Stop: 33091, Start Num: 19

Candidate Starts for TatarkaPM\_46:

(Start: 19 @33816 has 139 MA's), (Start: 28 @33747 has 4 MA's), (37, 33624), (49, 33549), (59, 33381), (60, 33363), (62, 33348), (68, 33309), (71, 33264), (84, 33156),

Gene: Teagan\_46 Start: 33806, Stop: 33081, Start Num: 19

Candidate Starts for Teagan\_46:

(11, 33893), (Start: 19 @33806 has 139 MA's), (Start: 28 @33737 has 4 MA's), (37, 33614), (49, 33539), (59, 33371), (60, 33353), (62, 33338), (68, 33299), (71, 33254), (84, 33146),

Gene: TeddyBear\_45 Start: 33508, Stop: 32783, Start Num: 19

Candidate Starts for TeddyBear\_45:

(15, 33541), (Start: 19 @33508 has 139 MA's), (Start: 28 @33439 has 4 MA's), (37, 33316), (49, 33241), (59, 33073), (60, 33055), (62, 33040), (68, 33001), (71, 32956), (84, 32848),

Gene: Tenda\_45 Start: 33506, Stop: 32781, Start Num: 19

Candidate Starts for Tenda\_45:

(15, 33539), (Start: 19 @33506 has 139 MA's), (Start: 28 @33437 has 4 MA's), (37, 33314), (49, 33239), (59, 33071), (60, 33053), (62, 33038), (68, 32999), (71, 32954), (84, 32846),

Gene: Thompsone\_46 Start: 33813, Stop: 33088, Start Num: 19

Candidate Starts for Thompsone\_46:

(11, 33900), (Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: Thorongil\_46 Start: 33327, Stop: 32602, Start Num: 19

Candidate Starts for Thorongil\_46:

(11, 33414), (Start: 19 @33327 has 139 MA's), (Start: 28 @33258 has 4 MA's), (37, 33135), (49, 33060), (59, 32892), (60, 32874), (62, 32859), (68, 32820), (71, 32775), (84, 32667),

Gene: TinSulphur\_47 Start: 33812, Stop: 33087, Start Num: 19

Candidate Starts for TinSulphur\_47:

(Start: 19 @33812 has 139 MA's), (Start: 28 @33743 has 4 MA's), (37, 33620), (49, 33545), (59, 33377), (60, 33359), (62, 33344), (68, 33305), (71, 33260), (84, 33152),

Gene: Tinyman4\_41 Start: 31320, Stop: 30547, Start Num: 19

Candidate Starts for Tinyman4\_41:

(Start: 19 @31320 has 139 MA's), (35, 31158), (40, 31140), (46, 31041), (48, 31011), (50, 30990), (58, 30852), (59, 30837), (60, 30819), (61, 30816), (74, 30684), (75, 30681), (80, 30636), (84, 30612), (86, 30579),

Gene: Velene\_46 Start: 33811, Stop: 33086, Start Num: 19

Candidate Starts for Velene\_46:

(11, 33898), (Start: 19 @33811 has 139 MA's), (Start: 28 @33742 has 4 MA's), (37, 33619), (49, 33544), (59, 33376), (60, 33358), (62, 33343), (68, 33304), (71, 33259), (84, 33151),

Gene: Vispistious\_47 Start: 33744, Stop: 33088, Start Num: 28

Candidate Starts for Vispistious\_47:

(11, 33900), (Start: 19 @33813 has 139 MA's), (Start: 28 @33744 has 4 MA's), (37, 33621), (49, 33546), (59, 33378), (60, 33360), (62, 33345), (68, 33306), (71, 33261), (84, 33153),

Gene: WestPM\_40 Start: 31386, Stop: 30691, Start Num: 19

Candidate Starts for WestPM\_40:

(Start: 19 @31386 has 139 MA's), (Start: 28 @31326 has 4 MA's), (35, 31224), (48, 31155), (50, 31134), (52, 31119), (59, 30981), (60, 30963), (61, 30960), (74, 30828), (75, 30825), (80, 30780), (84, 30756), (86, 30723),

Gene: WildNOut\_46 Start: 33809, Stop: 33084, Start Num: 19

Candidate Starts for WildNOut\_46:

(11, 33896), (Start: 19 @33809 has 139 MA's), (Start: 28 @33740 has 4 MA's), (37, 33617), (49, 33542), (59, 33374), (60, 33356), (62, 33341), (68, 33302), (71, 33257), (84, 33149),

Gene: WilliamStrong\_44 Start: 32618, Stop: 31935, Start Num: 23

Candidate Starts for WilliamStrong\_44:

(Start: 18 @32645 has 14 MA's), (Start: 23 @32618 has 7 MA's), (Start: 28 @32576 has 4 MA's), (29, 32573), (37, 32465), (43, 32429), (48, 32399), (50, 32378), (57, 32255), (58, 32240), (59, 32225), (66, 32159), (69, 32150), (74, 32072),

Gene: Winzigespinne\_45 Start: 33494, Stop: 32769, Start Num: 19

Candidate Starts for Winzigespinne\_45:

(15, 33527), (Start: 19 @33494 has 139 MA's), (Start: 28 @33425 has 4 MA's), (37, 33302), (49, 33227), (59, 33059), (60, 33041), (62, 33026), (68, 32987), (71, 32942), (84, 32834),

Gene: YuuY\_44 Start: 32861, Stop: 32082, Start Num: 19

Candidate Starts for YuuY\_44:

(Start: 19 @32861 has 139 MA's), (Start: 27 @32801 has 2 MA's), (Start: 28 @32795 has 4 MA's), (33, 32732), (36, 32678), (38, 32669), (41, 32621), (48, 32543), (53, 32498), (58, 32384), (59, 32369), (65, 32321), (67, 32300), (75, 32213), (77, 32195), (78, 32177), (82, 32153), (84, 32144),

Gene: Zada\_47 Start: 33713, Stop: 33057, Start Num: 28

Candidate Starts for Zada\_47:

(Start: 19 @33782 has 139 MA's), (Start: 28 @33713 has 4 MA's), (37, 33590), (49, 33515), (59, 33347), (60, 33329), (62, 33314), (68, 33275), (71, 33230), (84, 33122),

Gene: Zayuliv\_44 Start: 31844, Stop: 31062, Start Num: 18

Candidate Starts for Zayuliv\_44:

(Start: 18 @31844 has 14 MA's), (Start: 28 @31778 has 4 MA's), (36, 31658), (38, 31649), (41, 31601), (50, 31502), (51, 31496), (59, 31349), (61, 31328), (66, 31283), (67, 31280), (75, 31193), (82, 31133),

Gene: Zenitsu\_44 Start: 32612, Stop: 31833, Start Num: 19

Candidate Starts for Zenitsu\_44:

(14, 32645), (Start: 19 @32612 has 139 MA's), (Start: 27 @32552 has 2 MA's), (36, 32429), (38, 32420), (48, 32294), (50, 32273), (51, 32267), (54, 32243), (59, 32120), (63, 32084), (66, 32054), (74, 31967), (76, 31961), (82, 31904),

Gene: Zepp\_44 Start: 31278, Stop: 30496, Start Num: 18

Candidate Starts for Zepp\_44:

(Start: 18 @31278 has 14 MA's), (Start: 28 @31212 has 4 MA's), (36, 31092), (38, 31083), (41, 31035), (50, 30936), (51, 30930), (59, 30783), (61, 30762), (66, 30717), (67, 30714), (75, 30627), (82,

30567),