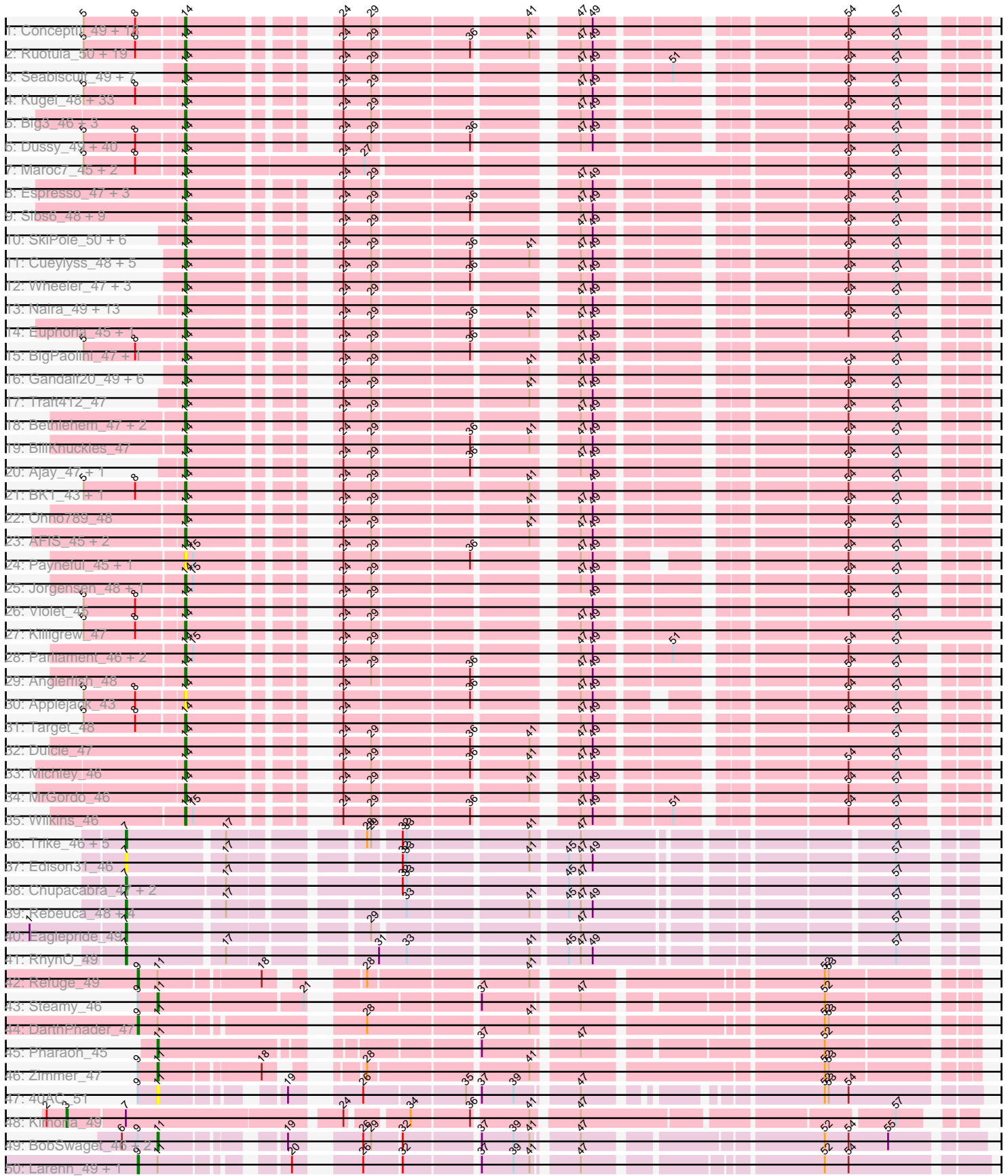


Pham 163298





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 163298 Report

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

Pham number 163298 has 294 members, 23 are drafts.

Phages represented in each track:

- Track 1 : ConceptII\_49, GrecoEtereo\_48, Bxb1\_43, NEHalo\_45, Jasper\_49, Sandaddy\_46, Zephyr\_47, Sumter\_44, Dreamboat\_49, QTRlifeCrisis\_51, Solon\_46, HarryOW\_46, DrFeelGood\_45, GageAP\_48, DD5\_46, Sorpresa\_45, Lockley\_46, PherrisBueller\_47, Pinto\_47
- Track 2 : Ruotula\_50, ILeeKay\_51, Francis47\_46, Perseus\_47, Crispicous1\_45, Doom\_47, JackSparrow\_48, Marge\_47, PacerPaul\_47, Rufus\_48, Rubeus\_47, Petruccio\_47, Aeneas\_49, Gompeii16\_46, Marsha\_47, Bircsak\_46, Mule\_44, Agaliana\_43, PhrostyMug\_46, Smairt\_49
- Track 3 : Seabiscuit\_49, Tasp14\_48, DreamCatcher\_50, KSSJEB\_46, Snazzy\_45, Dynamix\_48, Lamina13\_47, PinkPlastic\_46
- Track 4 : Kugel\_48, Thor\_45, KBG\_49, Forsytheast\_47, Moose\_47, Sagefire\_50, SwissCheese\_49, Beatrix\_47, Alvin\_47, Chanagan\_44, Lesedi\_44, Zeeculate\_45, StrongArm\_47, Corvo\_48, Bexan\_46, SarFire\_45, Niza\_50, Alsfro\_51, Pippin\_49, Makemake\_47, Fajezeel\_49, Froghopper\_45, Bruns\_46, LilBib\_47, Greg\_49, Monet\_50, Scowl\_48, ShortQueendom\_41, MPlant7149\_46, Seanderson\_49, MaryBeth\_47, Ringer\_48, Hermia\_48, MetalQZJ\_46
- Track 5 : Big3\_46, Fushigi\_45, Dexes\_47, Pelly\_46
- Track 6 : Dussy\_49, Marcell\_45, PattyP\_48, JuliaChild\_48, Arlo\_45, Tote\_43, Hami1\_40, Acme\_49, Slagathor\_49, Bob3\_45, Lopton\_48, BigMau\_48, Arcanine\_48, StewieG\_46, Mryolo\_45, Abbysshoes\_50, Treddle\_48, BPBiebs31\_48, TheloniousMonk\_48, Pepe\_44, Trip13t\_47, KyMonks1A\_49, Rhynn\_46, Rajelicia\_48, Bigfoot\_43, Ciao\_47, Abrogate\_460, Pita2\_50, Edtherson\_47, Rohr\_48, Kenmech\_51, TwoPeat\_47, RidgeCB\_47, Jerm2\_48, Kykar\_47, Zeuska\_46, Swole\_48, HermioneGrange\_47, Paraselene\_45, Watermelon\_48, PSullivan\_47
- Track 7 : Maroc7\_45, Fascinus\_43, Gyzlar\_43
- Track 8 : Espresso\_47, Barriga\_48, Nhonho\_48, Sunshine924\_48
- Track 9 : Sibs6\_48, Carlyle\_46, Blue\_47, Burton\_47, Rutherford\_49, PascalRango\_48, Museum\_48, Petp2012\_48, Molly\_48, Paphu\_45
- Track 10 : SkiPole\_50, Buttons\_45, Oogway\_44, Adahisdi\_46, Magnito\_44, Turj99\_44, STLscum\_48
- Track 11 : Cueylyss\_48, CactusRose\_44, Graduation\_50, Gwendoluna\_51, HanShotFirst\_46, Bones\_47
- Track 12 : Wheeler\_47, Ashballer\_48, Briton15\_49, JC27\_48
- Track 13 : Naira\_49, Trouble\_49, Eyeball\_48, Hope4ever\_49, Nerujay\_49, BluSpix\_46, Fenn\_49, IgnatiusPatJac\_47, Squee\_47, Atkinbua\_49, Smeagol\_48, Homines\_39, McGuire\_48, Ichabod\_49
- Track 14 : Euphoria\_45, Papez\_50

- Track 15 : BigPaolini\_47, Licorice\_50
- Track 16 : Gandalf20\_49, Switzer\_48, Manatee\_48, Kanely\_48, Magnar\_46, U2\_46, BeesKnees\_48
- Track 17 : Traft412\_47
- Track 18 : Bethlehem\_47, Pari\_48, Altman\_49
- Track 19 : BillKnuckles\_47
- Track 20 : Ajay\_47, Peterson\_50
- Track 21 : BK1\_43, A6\_43
- Track 22 : Ohno789\_48
- Track 23 : AFIS\_45, SpikeBT\_47, BaconJack\_50
- Track 24 : Payneful\_45, Marchy\_40
- Track 25 : Jorgensen\_48, Norz\_47
- Track 26 : Violet\_45
- Track 27 : Killigrew\_47
- Track 28 : Parliament\_46, Teodoridan\_45, Topgun\_46
- Track 29 : Anglerfish\_48
- Track 30 : Applejack\_43
- Track 31 : Target\_48
- Track 32 : Dulcie\_47
- Track 33 : Michley\_46
- Track 34 : MrGordo\_46
- Track 35 : Wilkins\_46
- Track 36 : Trike\_46, Poompha\_47, KittenMittens\_45, Severus\_46, PeaceMeal1\_46, Drake94\_46
- Track 37 : Edison31\_46
- Track 38 : Chupacabra\_47, OKCentral2016\_47, Goose\_48
- Track 39 : Rebeuca\_48, Kristoff\_48, Topanga\_46, WalterMcMickey\_46, Twister\_46
- Track 40 : Eaglepride\_49
- Track 41 : RhynO\_49
- Track 42 : Refuge\_49
- Track 43 : Steamy\_46
- Track 44 : DARTHPhader\_47
- Track 45 : Pharaoh\_45
- Track 46 : Zimmer\_47
- Track 47 : 40AC\_51
- Track 48 : Kimona\_49
- Track 49 : BobSwaget\_46, Rachaly\_49, Lokk\_47
- Track 50 : Larenn\_49, Malec\_50
- Track 51 : NothingSpecial\_48
- Track 52 : EvilGenius\_52, Agape74\_52, Leviathan\_52
- Track 53 : Miko\_47
- Track 54 : Changeling\_49
- Track 55 : Piro94\_50
- Track 56 : AN3\_53
- Track 57 : EZMoney23\_48
- Track 58 : ArcherNM\_45
- Track 59 : Acolyte\_46
- Track 60 : JF2\_48, MK4\_50, JF4\_48, Isca\_49, Rockstar\_50
- Track 61 : Phantastic\_51
- Track 62 : B1\_45
- Track 63 : Bluefalcon\_41, SydNat\_44, MarysWell\_41, Ghouboy\_44, Theia\_40, Zolita\_43
- Track 64 : Midas2\_42, Coog\_42

- Track 65 : Lev2\_42, Tiger\_41, Jovo\_42, Dublin\_41, Conspiracy\_42, AgentM\_41, ForGetIt\_42
- Track 66 : Micasa\_43
- Track 67 : DroogsArmy\_45, Timshel\_47
- Track 68 : PP\_51
- Track 69 : HINdeR\_45
- Track 70 : Roary\_47, Smeadley\_47, Astro\_46, Dixon\_46, Danforth\_46, Groundhog\_45, Phillis\_48, Expelliarmus\_46
- Track 71 : NearlyHeadless\_46, Saintus\_41
- Track 72 : Stephig9\_47
- Track 73 : Ibantik\_26
- Track 74 : Success\_22

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

The start number called the most often in the published annotations is 14, it was called in 196 of the 271 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- A6\_43, AFIS\_45, Abbyshoes\_50, Abrogate\_460, Acme\_49, Adahisdi\_46, Aeneas\_49, Agaliana\_43, Ajay\_47, Alsfro\_51, Altman\_49, Alvin\_47, Anglerfish\_48, Applejack\_43, Arcanine\_48, Arlo\_45, Ashballer\_48, Atkinbua\_49, BK1\_43, BPBiebs31\_48, BaconJack\_50, Barriga\_48, Beatrix\_47, BeesKnees\_48, Bethlehem\_47, Bexan\_46, Big3\_46, BigMau\_48, BigPaolini\_47, Bigfoot\_43, BillKnuckles\_47, Bircsak\_46, BluSpix\_46, Blue\_47, Bob3\_45, Bones\_47, Briton15\_49, Bruns\_46, Burton\_47, Buttons\_45, Bxb1\_43, CactusRose\_44, Carlyle\_46, Chanagan\_44, Ciao\_47, ConceptII\_49, Corvo\_48, Crispicous1\_45, Cueyllyss\_48, DD5\_46, Dexes\_47, Doom\_47, DrFeelGood\_45, DreamCatcher\_50, Dreamboat\_49, Dulcie\_47, Dussy\_49, Dynamix\_48, Edtherson\_47, Espresso\_47, Euphoria\_45, Eyeball\_48, Fajezeel\_49, Fascinus\_43, Fenn\_49, Forsytheast\_47, Francis47\_46, Froghopper\_45, Fushigi\_45, GageAP\_48, Gandalf20\_49, Gompeii16\_46, Graduation\_50, GrecoEtereo\_48, Greg\_49, Gwendoluna\_51, Gyzlar\_43, Hami1\_40, HanShotFirst\_46, HarryOW\_46, Hermia\_48, HermioneGrange\_47, Homines\_39, Hope4ever\_49, ILeeKay\_51, Ibantik\_26, Ichabod\_49, IgnatiusPatJac\_47, JC27\_48, JackSparrow\_48, Jasper\_49, Jerm2\_48, Jorgensen\_48, JuliaChild\_48, KBG\_49, KSSJEB\_46, Kanely\_48, Kenmech\_51, Killigrew\_47, Kugel\_48, KyMonks1A\_49, Kykar\_47, Lamina13\_47, Lesedi\_44, Licorice\_50, LilBib\_47, Lockley\_46, Lopton\_48, MPlant7149\_46, Magnar\_46, Magnito\_44, Makemake\_47, Manatee\_48, Marcell\_45, Marchy\_40, Marge\_47, Maroc7\_45, Marsha\_47, MaryBeth\_47, McGuire\_48, MetalQZJ\_46, Michley\_46, Molly\_48, Monet\_50, Moose\_47, MrGordo\_46, Mryolo\_45, Mule\_44, Museum\_48, NEHalo\_45, Naira\_49, Nerujay\_49, Nhonho\_48, Niza\_50, Norz\_47, Ohno789\_48, Oogway\_44, PSullivan\_47, PacerPaul\_47, Papez\_50, Paphu\_45, Paraselene\_45, Pari\_48, Parliament\_46, PascalRango\_48, PattyP\_48, Payneful\_45, Pelly\_46, Pepe\_44, Perseus\_47, Peterson\_50, Petp2012\_48, Petruccio\_47, PherrisBueller\_47, PhrostyMug\_46, PinkPlastic\_46, Pinto\_47, Pippin\_49, Pita2\_50, QTRlifeCrisis\_51, Rajelicia\_48, Rhynn\_46, RidgeCB\_47, Ringer\_48, Rohr\_48, Rubeus\_47, Rufus\_48, Ruotula\_50, Rutherford\_49, STLscum\_48, Sagefire\_50, Sandaddy\_46, SarFire\_45, Scowl\_48, Seabiscuit\_49, Seanderson\_49, ShortQueendom\_41, Sibs6\_48, SkiPole\_50, Slagathor\_49, Smairt\_49, Smeagol\_48, Snazzy\_45, Solon\_46,

Sorpresa\_45, SpikeBT\_47, Squee\_47, StewieG\_46, StrongArm\_47, Sumter\_44, Sunshine924\_48, SwissCheese\_49, Switzer\_48, Swole\_48, Target\_48, Tasp14\_48, Teodoridan\_45, TheloniousMonk\_48, Thor\_45, Topgun\_46, Tote\_43, Traft412\_47, Treddle\_48, Tripl3t\_47, Trouble\_49, Turj99\_44, TwoPeat\_47, U2\_46, Violet\_45, Watermelon\_48, Wheeler\_47, Wilkins\_46, Zeeculate\_45, Zephyr\_47, Zeuska\_46,

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

- 

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

- 40AC\_51, AN3\_53, Acolyte\_46, Agape74\_52, AgentM\_41, ArcherNM\_45, Astro\_46, B1\_45, Bluefalcon\_41, BobSwaget\_46, Changeling\_49, Chupacabra\_47, Conspiracy\_42, Coog\_42, Danforth\_46, DarthPhader\_47, Dixon\_46, Drake94\_46, DroogsArmy\_45, Dublin\_41, EZMoney23\_48, Eaglepride\_49, Edison31\_46, EvilGenius\_52, Expelliarmus\_46, ForGetIt\_42, Ghoulboy\_44, Goose\_48, Groundhog\_45, HINdeR\_45, Isca\_49, JF2\_48, JF4\_48, Jovo\_42, Kimona\_49, KittenMittens\_45, Kristoff\_48, Larenn\_49, Lev2\_42, Leviathan\_52, Lokk\_47, MK4\_50, Malec\_50, MarysWell\_41, Micasa\_43, Midas2\_42, Miko\_47, NearlyHeadless\_46, NothingSpecial\_48, OKCentral2016\_47, PP\_51, PeaceMeal1\_46, Phantastic\_51, Pharaoh\_45, Phillis\_48, Piro94\_50, Poompha\_47, Rachaly\_49, Rebeuca\_48, Refuge\_49, RhynO\_49, Roary\_47, Rockstar\_50, Saintus\_41, Severus\_46, Smeadley\_47, Steamy\_46, Stephig9\_47, Success\_22, SydNat\_44, Theia\_40, Tiger\_41, Timshel\_47, Topanga\_46, Trike\_46, Twister\_46, WalterMcMickey\_46, Zimmer\_47, Zolita\_43,

### Summary by start number:

Start 3:

- Found in 9 of 294 ( 3.1% ) of genes in pham
- Manual Annotations of this start: 1 of 271
- Called 11.1% of time when present
- Phage (with cluster) where this start called: Kimona\_49 (A19),

Start 4:

- Found in 7 of 294 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 6 of 271
- Called 85.7% of time when present
- Phage (with cluster) where this start called: Isca\_49 (A3), JF2\_48 (A3), JF4\_48 (A3), MK4\_50 (A3), Phantastic\_51 (A3), Rockstar\_50 (A3),

Start 7:

- Found in 27 of 294 ( 9.2% ) of genes in pham
- Manual Annotations of this start: 18 of 271
- Called 70.4% of time when present
- Phage (with cluster) where this start called: B1\_45 (A3), Chupacabra\_47 (A10), Drake94\_46 (A10), Eaglepride\_49 (A10), Edison31\_46 (A10), Goose\_48 (A10), KittenMittens\_45 (A10), Kristoff\_48 (A10), OKCentral2016\_47 (A10), PP\_51 (A7), PeaceMeal1\_46 (A10), Poompha\_47 (A10), Rebeuca\_48 (A10), RhynO\_49 (A10), Severus\_46 (A10), Topanga\_46 (A10), Trike\_46 (A10), Twister\_46 (A10), WalterMcMickey\_46 (A10),

Start 9:

- Found in 21 of 294 ( 7.1% ) of genes in pham

- Manual Annotations of this start: 11 of 271
- Called 52.4% of time when present
- Phage (with cluster) where this start called: Acolyte\_46 (A2), Agape74\_52 (A2), ArcherNM\_45 (A2), DarthPhader\_47 (A12), EvilGenius\_52 (A2), Larenn\_49 (A2), Leviathan\_52 (A2), Malec\_50 (A2), NothingSpecial\_48 (A2), Piro94\_50 (A2), Refuge\_49 (A12),

#### Start 10:

- Found in 16 of 294 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 15 of 271
- Called 93.8% of time when present
- Phage (with cluster) where this start called: AgentM\_41 (A5), Bluefalcon\_41 (A5), Conspiracy\_42 (A5), Coog\_42 (A5), Dublin\_41 (A5), ForGetIt\_42 (A5), Ghouboy\_44 (A5), Jovo\_42 (A5), Lev2\_42 (A5), MarysWell\_41 (A5), Midas2\_42 (A5), SydNat\_44 (A5), Theia\_40 (A5), Tiger\_41 (A5), Zolita\_43 (A5),

#### Start 11:

- Found in 33 of 294 ( 11.2% ) of genes in pham
- Manual Annotations of this start: 20 of 271
- Called 66.7% of time when present
- Phage (with cluster) where this start called: 40AC\_51 (A17), AN3\_53 (A2), Astro\_46 (A8), BobSwaget\_46 (A2), Changeling\_49 (A2), Danforth\_46 (A8), Dixon\_46 (A8), EZMoney23\_48 (A2), Expelliarmus\_46 (A8), Groundhog\_45 (A8), Loko\_47 (A2), Miko\_47 (A2), NearlyHeadless\_46 (A8), Pharaoh\_45 (A12), Phillis\_48 (A8), Rachaly\_49 (A2), Roary\_47 (A8), Saintus\_41 (A8), Smeadley\_47 (A8), Steamy\_46 (A12), Stephig9\_47 (A8), Zimmer\_47 (A12),

#### Start 13:

- Found in 3 of 294 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 3 of 271
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DroogsArmy\_45 (A7), HINdeR\_45 (A7), Timshel\_47 (A7),

#### Start 14:

- Found in 215 of 294 ( 73.1% ) of genes in pham
- Manual Annotations of this start: 196 of 271
- Called 100.0% of time when present
- Phage (with cluster) where this start called: A6\_43 (A1), AFIS\_45 (A1), Abbyshoes\_50 (A1), Abrogate\_460 (A1), Acme\_49 (A1), Adahisdi\_46 (A1), Aeneas\_49 (A1), Agaliana\_43 (A1), Ajay\_47 (A1), Alsfro\_51 (A1), Altman\_49 (A1), Alvin\_47 (A1), Anglerfish\_48 (A1), Applejack\_43 (A1), Arcanine\_48 (A1), Arlo\_45 (A1), Ashballer\_48 (A1), Atkinbua\_49 (A1), BK1\_43 (A1), BPIebs31\_48 (A1), BaconJack\_50 (A1), Barriga\_48 (A1), Beatrix\_47 (A1), BeesKnees\_48 (A1), Bethlehem\_47 (A1), Bexan\_46 (A1), Big3\_46 (A1), BigMau\_48 (A1), BigPaolini\_47 (A1), Bigfoot\_43 (A1), BillKnuckles\_47 (A1), Bircsak\_46 (A1), BluSpix\_46 (A1), Blue\_47 (A1), Bob3\_45 (A1), Bones\_47 (A1), Briton15\_49 (A1), Bruns\_46 (A1), Burton\_47 (A1), Buttons\_45 (A1), Bxb1\_43 (A1), CactusRose\_44 (A1), Carlyle\_46 (A1), Chanagan\_44 (A1), Ciao\_47 (A1), ConceptII\_49 (A1), Corvo\_48 (A1), Crispicious1\_45 (A1), Cueyliss\_48 (A1), DD5\_46 (A1), Dexes\_47 (A1), Doom\_47 (A1), DrFeelGood\_45 (A1), DreamCatcher\_50 (A1), Dreamboat\_49 (A1), Dulcie\_47 (A1), Dussy\_49 (A1), Dynamix\_48 (A1), Edtherson\_47 (A1), Espresso\_47 (A1), Euphoria\_45 (A1), Eyeball\_48 (A1), Fajezeel\_49 (A1), Fascinus\_43 (A1), Fenn\_49

(A1), Forsytheast\_47 (A1), Francis47\_46 (A1), FrogHopper\_45 (A1), Fushigi\_45 (A1), GageAP\_48 (A1), Gandalf20\_49 (A1), Gompeii16\_46 (A1), Graduation\_50 (A1), GrecoEtereo\_48 (A1), Greg\_49 (A1), Gwendoluna\_51 (A1), Gyzlar\_43 (A1), Hami1\_40 (A1), HanShotFirst\_46 (A1), HarryOW\_46 (A1), Hermia\_48 (A1), HermioneGrange\_47 (A1), Homines\_39 (A1), Hope4ever\_49 (A1), ILeeKay\_51 (A1), Ibantik\_26 (singleton), Ichabod\_49 (A1), IgnatiusPatJac\_47 (A1), JC27\_48 (A1), JackSparrow\_48 (A1), Jasper\_49 (A1), Jerm2\_48 (A1), Jorgensen\_48 (A1), JuliaChild\_48 (A1), KBG\_49 (A1), KSSJEB\_46 (A1), Kanely\_48 (A1), Kenmech\_51 (A1), Killigrew\_47 (A1), Kugel\_48 (A1), KyMonks1A\_49 (A1), Kykar\_47 (A1), Lamina13\_47 (A1), Lesedi\_44 (A1), Licorice\_50 (A1), LilBib\_47 (A1), Lockley\_46 (A1), Lopton\_48 (A1), MPlant7149\_46 (A1), Magnar\_46 (A1), Magnito\_44 (A1), Makemake\_47 (A1), Manatee\_48 (A1), Marcell\_45 (A1), Marchy\_40 (A1), Marge\_47 (A1), Maroc7\_45 (A1), Marsha\_47 (A1), MaryBeth\_47 (A1), McGuire\_48 (A1), MetalQZJ\_46 (A1), Michley\_46 (A1), Molly\_48 (A1), Monet\_50 (A1), Moose\_47 (A1), MrGordo\_46 (A1), Mryolo\_45 (A1), Mule\_44 (A1), Museum\_48 (A1), NEHalo\_45 (A1), Naira\_49 (A1), Nerujay\_49 (A1), Nhonho\_48 (A1), Niza\_50 (A1), Norz\_47 (A1), Ohno789\_48 (A1), Oogway\_44 (A1), PSullivan\_47 (A1), PacerPaul\_47 (A1), Papez\_50 (A1), Paphu\_45 (A1), Paraselene\_45 (A1), Pari\_48 (A1), Parliament\_46 (A1), PascalRango\_48 (A1), PattyP\_48 (A1), Payneful\_45 (A1), Pelly\_46 (A1), Pepe\_44 (A1), Perseus\_47 (A1), Peterson\_50 (A1), Petp2012\_48 (A1), Petruchio\_47 (A1), PherrisBueller\_47 (A1), PhrostyMug\_46 (A1), PinkPlastic\_46 (A1), Pinto\_47 (A1), Pippin\_49 (A1), Pita2\_50 (A1), QTRlifeCrisis\_51 (A1), Rajelicia\_48 (A1), Rhynn\_46 (A1), RidgeCB\_47 (A1), Ringer\_48 (A1), Rohr\_48 (A1), Rubeus\_47 (A1), Rufus\_48 (A1), Ruotula\_50 (A1), Rutherferd\_49 (A1), STLscum\_48 (A1), Sagefire\_50 (A1), Sandaddy\_46 (A1), SarFire\_45 (A1), Scowl\_48 (A1), Seabiscuit\_49 (A1), Seanderson\_49 (A1), ShortQueendom\_41 (A1), Sibs6\_48 (A1), SkiPole\_50 (A1), Slagathor\_49 (A1), Smairt\_49 (A1), Smeagol\_48 (A1), Snazzy\_45 (A1), Solon\_46 (A1), Sorpresa\_45 (A1), SpikeBT\_47 (A1), Squee\_47 (A1), StewieG\_46 (A1), StrongArm\_47 (A1), Sumter\_44 (A1), Sunshine924\_48 (A1), SwissCheese\_49 (A1), Switzer\_48 (A1), Swole\_48 (A1), Target\_48 (A1), Tasp14\_48 (A1), Teodoridan\_45 (A1), TheloniousMonk\_48 (A1), Thor\_45 (A1), Topgun\_46 (A1), Tote\_43 (A1), Traft412\_47 (A1), Treddle\_48 (A1), Tripl3t\_47 (A1), Trouble\_49 (A1), Turj99\_44 (A1), TwoPeat\_47 (A1), U2\_46 (A1), Violet\_45 (A1), Watermelon\_48 (A1), Wheeler\_47 (A1), Wilkins\_46 (A1), Zeeculate\_45 (A1), Zephyr\_47 (A1), Zeuska\_46 (A1),

Start 16:

- Found in 1 of 294 ( 0.3% ) of genes in pham
- Manual Annotations of this start: 1 of 271
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Success\_22 (singleton),

Start 24:

- Found in 253 of 294 ( 86.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 0.4% of time when present
- Phage (with cluster) where this start called: Micasa\_43 (A5),

### Summary by clusters:

There are 11 clusters represented in this pham: singleton, A10, A12, A19, A17, A1, A3, A2, A5, A7, A8,

Info for manual annotations of cluster A1:



- Start number 14 was manually annotated 195 times for cluster A1.

Info for manual annotations of cluster A10:

- Start number 7 was manually annotated 16 times for cluster A10.

Info for manual annotations of cluster A12:

- Start number 9 was manually annotated 2 times for cluster A12.
- Start number 11 was manually annotated 3 times for cluster A12.

Info for manual annotations of cluster A19:

- Start number 3 was manually annotated 1 time for cluster A19.

Info for manual annotations of cluster A2:

- Start number 9 was manually annotated 9 times for cluster A2.
- Start number 11 was manually annotated 6 times for cluster A2.

Info for manual annotations of cluster A3:

- Start number 4 was manually annotated 6 times for cluster A3.
- Start number 7 was manually annotated 1 time for cluster A3.

Info for manual annotations of cluster A5:

- Start number 10 was manually annotated 15 times for cluster A5.

Info for manual annotations of cluster A7:

- Start number 7 was manually annotated 1 time for cluster A7.
- Start number 13 was manually annotated 3 times for cluster A7.

Info for manual annotations of cluster A8:

- Start number 11 was manually annotated 11 times for cluster A8.

### ***Gene Information:***

Gene: 40AC\_51 Start: 34942, Stop: 34445, Start Num: 11

Candidate Starts for 40AC\_51:

(Start: 9 @34957 has 11 MA's), (Start: 11 @34942 has 20 MA's), (19, 34873), (26, 34837), (35, 34765), (37, 34759), (39, 34735), (47, 34696), (52, 34552), (53, 34549), (54, 34534),

Gene: A6\_43 Start: 34340, Stop: 33849, Start Num: 14

Candidate Starts for A6\_43:

(5, 34412), (8, 34373), (Start: 14 @34340 has 196 MA's), (24, 34259), (29, 34238), (41, 34130), (49, 34097), (54, 33938), (57, 33902),

Gene: AFIS\_45 Start: 35135, Stop: 34641, Start Num: 14

Candidate Starts for AFIS\_45:

(Start: 14 @35135 has 196 MA's), (24, 35054), (29, 35033), (41, 34925), (47, 34901), (49, 34892), (54, 34733), (57, 34697),

Gene: AN3\_53 Start: 34524, Stop: 34060, Start Num: 11

Candidate Starts for AN3\_53:

(Start: 9 @34539 has 11 MA's), (Start: 11 @34524 has 20 MA's), (32, 34434), (39, 34359), (47, 34320), (52, 34170), (54, 34152), (55, 34122),

Gene: Abbyshoes\_50 Start: 35780, Stop: 35289, Start Num: 14

Candidate Starts for Abbyshoes\_50:

(5, 35852), (8, 35813), (Start: 14 @35780 has 196 MA's), (24, 35699), (29, 35678), (36, 35609), (47, 35546), (49, 35537), (54, 35378), (57, 35342),

Gene: Abrogate\_460 Start: 35795, Stop: 35316, Start Num: 14

Candidate Starts for Abrogate\_460:

(5, 35867), (8, 35828), (Start: 14 @35795 has 196 MA's), (24, 35714), (29, 35693), (36, 35624), (47, 35561), (49, 35552), (54, 35405), (57, 35369),

Gene: Acme\_49 Start: 35657, Stop: 35166, Start Num: 14

Candidate Starts for Acme\_49:

(5, 35729), (8, 35690), (Start: 14 @35657 has 196 MA's), (24, 35576), (29, 35555), (36, 35486), (47, 35423), (49, 35414), (54, 35255), (57, 35219),

Gene: Acolyte\_46 Start: 33097, Stop: 32558, Start Num: 9

Candidate Starts for Acolyte\_46:

(Start: 9 @33097 has 11 MA's), (Start: 11 @33082 has 20 MA's), (26, 32968), (32, 32941), (37, 32890), (41, 32854), (47, 32827), (50, 32800), (52, 32671), (53, 32668),

Gene: Adahisdi\_46 Start: 35135, Stop: 34644, Start Num: 14

Candidate Starts for Adahisdi\_46:

(Start: 14 @35135 has 196 MA's), (24, 35054), (29, 35033), (47, 34901), (49, 34892), (54, 34733), (57, 34697),

Gene: Aeneas\_49 Start: 35748, Stop: 35269, Start Num: 14

Candidate Starts for Aeneas\_49:

(5, 35820), (8, 35781), (Start: 14 @35748 has 196 MA's), (24, 35667), (29, 35646), (36, 35577), (41, 35538), (47, 35514), (49, 35505), (54, 35358), (57, 35322),

Gene: Agaliana\_43 Start: 32395, Stop: 31904, Start Num: 14

Candidate Starts for Agaliana\_43:

(5, 32467), (8, 32428), (Start: 14 @32395 has 196 MA's), (24, 32314), (29, 32293), (36, 32224), (41, 32185), (47, 32161), (49, 32152), (54, 31993), (57, 31957),

Gene: Agape74\_52 Start: 34153, Stop: 33611, Start Num: 9

Candidate Starts for Agape74\_52:

(Start: 9 @34153 has 11 MA's), (Start: 11 @34138 has 20 MA's), (19, 34051), (26, 34015), (32, 33988), (35, 33943), (37, 33937), (39, 33913), (47, 33874), (52, 33721), (54, 33703), (55, 33673),

Gene: AgentM\_41 Start: 32065, Stop: 31532, Start Num: 10

Candidate Starts for AgentM\_41:

(Start: 10 @32065 has 15 MA's), (24, 31933), (25, 31927), (47, 31783),

Gene: Ajay\_47 Start: 35453, Stop: 34962, Start Num: 14

Candidate Starts for Ajay\_47:

(Start: 14 @35453 has 196 MA's), (24, 35372), (29, 35351), (36, 35282), (47, 35219), (49, 35210), (54, 35051), (57, 35015),

Gene: Alsfro\_51 Start: 35855, Stop: 35364, Start Num: 14

Candidate Starts for Alsfro\_51:

(5, 35927), (8, 35888), (Start: 14 @35855 has 196 MA's), (24, 35774), (29, 35753), (47, 35621), (49, 35612), (54, 35453), (57, 35417),

Gene: Altman\_49 Start: 36087, Stop: 35596, Start Num: 14

Candidate Starts for Altman\_49:

(Start: 14 @36087 has 196 MA's), (24, 36006), (29, 35985), (47, 35853), (49, 35844), (54, 35685), (57, 35649),

Gene: Alvin\_47 Start: 36107, Stop: 35616, Start Num: 14

Candidate Starts for Alvin\_47:

(5, 36179), (8, 36140), (Start: 14 @36107 has 196 MA's), (24, 36026), (29, 36005), (47, 35873), (49, 35864), (54, 35705), (57, 35669),

Gene: Anglerfish\_48 Start: 35637, Stop: 35146, Start Num: 14

Candidate Starts for Anglerfish\_48:

(Start: 14 @35637 has 196 MA's), (24, 35556), (29, 35535), (36, 35466), (47, 35403), (49, 35394), (54, 35235), (57, 35199),

Gene: Applejack\_43 Start: 32017, Stop: 31538, Start Num: 14

Candidate Starts for Applejack\_43:

(5, 32089), (8, 32050), (Start: 14 @32017 has 196 MA's), (24, 31936), (36, 31846), (47, 31783), (49, 31774), (54, 31627), (57, 31591),

Gene: Arcanine\_48 Start: 35327, Stop: 34836, Start Num: 14

Candidate Starts for Arcanine\_48:

(5, 35399), (8, 35360), (Start: 14 @35327 has 196 MA's), (24, 35246), (29, 35225), (36, 35156), (47, 35093), (49, 35084), (54, 34925), (57, 34889),

Gene: ArcherNM\_45 Start: 33685, Stop: 33152, Start Num: 9

Candidate Starts for ArcherNM\_45:

(Start: 9 @33685 has 11 MA's), (Start: 11 @33670 has 20 MA's), (20, 33595), (26, 33562), (32, 33535), (35, 33490), (36, 33487), (37, 33484), (39, 33460), (47, 33421), (52, 33265), (54, 33247),

Gene: Arlo\_45 Start: 34984, Stop: 34493, Start Num: 14

Candidate Starts for Arlo\_45:

(5, 35056), (8, 35017), (Start: 14 @34984 has 196 MA's), (24, 34903), (29, 34882), (36, 34813), (47, 34750), (49, 34741), (54, 34582), (57, 34546),

Gene: Ashballer\_48 Start: 36113, Stop: 35622, Start Num: 14

Candidate Starts for Ashballer\_48:

(Start: 14 @36113 has 196 MA's), (24, 36032), (29, 36011), (36, 35942), (47, 35879), (49, 35870), (54, 35711), (57, 35675),

Gene: Astro\_46 Start: 31898, Stop: 31377, Start Num: 11

Candidate Starts for Astro\_46:

(Start: 11 @31898 has 20 MA's), (24, 31781), (38, 31682), (47, 31631), (48, 31625), (58, 31400),

Gene: Atkinbua\_49 Start: 35740, Stop: 35249, Start Num: 14

Candidate Starts for Atkinbua\_49:

(Start: 14 @35740 has 196 MA's), (24, 35659), (29, 35638), (47, 35506), (49, 35497), (54, 35338), (57, 35302),

Gene: B1\_45 Start: 31865, Stop: 31290, Start Num: 7

Candidate Starts for B1\_45:

(2, 31922), (Start: 3 @31907 has 1 MA's), (Start: 4 @31895 has 6 MA's), (Start: 7 @31865 has 18 MA's), (17, 31793), (24, 31715), (32, 31682), (33, 31679), (41, 31595), (49, 31550), (53, 31382), (57, 31331),

Gene: BK1\_43 Start: 34340, Stop: 33849, Start Num: 14

Candidate Starts for BK1\_43:

(5, 34412), (8, 34373), (Start: 14 @34340 has 196 MA's), (24, 34259), (29, 34238), (41, 34130), (49, 34097), (54, 33938), (57, 33902),

Gene: BPBiebs31\_48 Start: 35699, Stop: 35208, Start Num: 14

Candidate Starts for BPBiebs31\_48:

(5, 35771), (8, 35732), (Start: 14 @35699 has 196 MA's), (24, 35618), (29, 35597), (36, 35528), (47, 35465), (49, 35456), (54, 35297), (57, 35261),

Gene: BaconJack\_50 Start: 36404, Stop: 35910, Start Num: 14

Candidate Starts for BaconJack\_50:

(Start: 14 @36404 has 196 MA's), (24, 36323), (29, 36302), (41, 36194), (47, 36170), (49, 36161), (54, 35999), (57, 35963),

Gene: Barriga\_48 Start: 35242, Stop: 34751, Start Num: 14

Candidate Starts for Barriga\_48:

(Start: 14 @35242 has 196 MA's), (24, 35161), (29, 35140), (47, 35008), (49, 34999), (54, 34840), (57, 34804),

Gene: Beatrix\_47 Start: 36955, Stop: 36464, Start Num: 14

Candidate Starts for Beatrix\_47:

(5, 37027), (8, 36988), (Start: 14 @36955 has 196 MA's), (24, 36874), (29, 36853), (47, 36721), (49, 36712), (54, 36553), (57, 36517),

Gene: BeesKnees\_48 Start: 35448, Stop: 34954, Start Num: 14

Candidate Starts for BeesKnees\_48:

(Start: 14 @35448 has 196 MA's), (24, 35367), (29, 35346), (41, 35238), (47, 35214), (49, 35205), (54, 35046), (57, 35010),

Gene: Bethlehem\_47 Start: 36106, Stop: 35615, Start Num: 14

Candidate Starts for Bethlehem\_47:

(Start: 14 @36106 has 196 MA's), (24, 36025), (29, 36004), (47, 35872), (49, 35863), (54, 35704), (57, 35668),

Gene: Bexan\_46 Start: 36633, Stop: 36142, Start Num: 14

Candidate Starts for Bexan\_46:

(5, 36705), (8, 36666), (Start: 14 @36633 has 196 MA's), (24, 36552), (29, 36531), (47, 36399), (49, 36390), (54, 36231), (57, 36195),

Gene: Big3\_46 Start: 35559, Stop: 35068, Start Num: 14

Candidate Starts for Big3\_46:

(Start: 14 @35559 has 196 MA's), (24, 35478), (29, 35457), (47, 35325), (49, 35316), (54, 35157), (57, 35121),

Gene: BigMau\_48 Start: 35214, Stop: 34723, Start Num: 14

Candidate Starts for BigMau\_48:

(5, 35286), (8, 35247), (Start: 14 @35214 has 196 MA's), (24, 35133), (29, 35112), (36, 35043), (47, 34980), (49, 34971), (54, 34812), (57, 34776),

Gene: BigPaolini\_47 Start: 34397, Stop: 33906, Start Num: 14

Candidate Starts for BigPaolini\_47:

(5, 34469), (8, 34430), (Start: 14 @34397 has 196 MA's), (24, 34316), (29, 34295), (36, 34226), (47, 34163), (49, 34154), (57, 33959),

Gene: Bigfoot\_43 Start: 34618, Stop: 34127, Start Num: 14

Candidate Starts for Bigfoot\_43:

(5, 34690), (8, 34651), (Start: 14 @34618 has 196 MA's), (24, 34537), (29, 34516), (36, 34447), (47, 34384), (49, 34375), (54, 34216), (57, 34180),

Gene: BillKnuckles\_47 Start: 36158, Stop: 35667, Start Num: 14

Candidate Starts for BillKnuckles\_47:

(Start: 14 @36158 has 196 MA's), (24, 36077), (29, 36056), (36, 35987), (41, 35948), (47, 35924), (49, 35915), (54, 35756), (57, 35720),

Gene: Bircsak\_46 Start: 35971, Stop: 35480, Start Num: 14

Candidate Starts for Bircsak\_46:

(5, 36043), (8, 36004), (Start: 14 @35971 has 196 MA's), (24, 35890), (29, 35869), (36, 35800), (41, 35761), (47, 35737), (49, 35728), (54, 35569), (57, 35533),

Gene: BluSpix\_46 Start: 31820, Stop: 31326, Start Num: 14

Candidate Starts for BluSpix\_46:

(Start: 14 @31820 has 196 MA's), (24, 31739), (29, 31718), (47, 31586), (49, 31577), (54, 31418), (57, 31382),

Gene: Blue\_47 Start: 35881, Stop: 35390, Start Num: 14

Candidate Starts for Blue\_47:

(Start: 14 @35881 has 196 MA's), (24, 35800), (29, 35779), (36, 35710), (47, 35647), (49, 35638), (54, 35479), (57, 35443),

Gene: Bluefalcon\_41 Start: 32577, Stop: 32050, Start Num: 10

Candidate Starts for Bluefalcon\_41:

(Start: 10 @32577 has 15 MA's), (24, 32442), (25, 32436), (47, 32292),

Gene: Bob3\_45 Start: 34564, Stop: 34073, Start Num: 14

Candidate Starts for Bob3\_45:

(5, 34636), (8, 34597), (Start: 14 @34564 has 196 MA's), (24, 34483), (29, 34462), (36, 34393), (47, 34330), (49, 34321), (54, 34162), (57, 34126),

Gene: BobSwaget\_46 Start: 32491, Stop: 31973, Start Num: 11

Candidate Starts for BobSwaget\_46:

(6, 32518), (Start: 9 @32506 has 11 MA's), (Start: 11 @32491 has 20 MA's), (19, 32419), (26, 32383), (29, 32377), (32, 32356), (37, 32305), (39, 32281), (41, 32269), (47, 32242), (52, 32083), (54, 32065), (55, 32035),

Gene: Bones\_47 Start: 35893, Stop: 35402, Start Num: 14

Candidate Starts for Bones\_47:

(Start: 14 @35893 has 196 MA's), (24, 35812), (29, 35791), (36, 35722), (41, 35683), (47, 35659), (49, 35650), (54, 35491), (57, 35455),

Gene: Briton15\_49 Start: 35674, Stop: 35183, Start Num: 14

Candidate Starts for Briton15\_49:

(Start: 14 @35674 has 196 MA's), (24, 35593), (29, 35572), (36, 35503), (47, 35440), (49, 35431), (54, 35272), (57, 35236),

Gene: Bruns\_46 Start: 35176, Stop: 34685, Start Num: 14

Candidate Starts for Bruns\_46:

(5, 35248), (8, 35209), (Start: 14 @35176 has 196 MA's), (24, 35095), (29, 35074), (47, 34942), (49, 34933), (54, 34774), (57, 34738),

Gene: Burton\_47 Start: 35109, Stop: 34618, Start Num: 14

Candidate Starts for Burton\_47:

(Start: 14 @35109 has 196 MA's), (24, 35028), (29, 35007), (36, 34938), (47, 34875), (49, 34866), (54, 34707), (57, 34671),

Gene: Buttons\_45 Start: 33856, Stop: 33365, Start Num: 14

Candidate Starts for Buttons\_45:

(Start: 14 @33856 has 196 MA's), (24, 33775), (29, 33754), (47, 33622), (49, 33613), (54, 33454), (57, 33418),

Gene: Bxb1\_43 Start: 34921, Stop: 34430, Start Num: 14

Candidate Starts for Bxb1\_43:

(5, 34993), (8, 34954), (Start: 14 @34921 has 196 MA's), (24, 34840), (29, 34819), (41, 34711), (47, 34687), (49, 34678), (54, 34519), (57, 34483),

Gene: CactusRose\_44 Start: 34746, Stop: 34255, Start Num: 14

Candidate Starts for CactusRose\_44:

(Start: 14 @34746 has 196 MA's), (24, 34665), (29, 34644), (36, 34575), (41, 34536), (47, 34512), (49, 34503), (54, 34344), (57, 34308),

Gene: Carlyle\_46 Start: 33607, Stop: 33113, Start Num: 14

Candidate Starts for Carlyle\_46:

(Start: 14 @33607 has 196 MA's), (24, 33526), (29, 33505), (36, 33436), (47, 33373), (49, 33364), (54, 33205), (57, 33169),

Gene: Chanagan\_44 Start: 34413, Stop: 33922, Start Num: 14

Candidate Starts for Chanagan\_44:

(5, 34485), (8, 34446), (Start: 14 @34413 has 196 MA's), (24, 34332), (29, 34311), (47, 34179), (49, 34170), (54, 34011), (57, 33975),

Gene: Changeling\_49 Start: 34250, Stop: 33735, Start Num: 11

Candidate Starts for Changeling\_49:

(Start: 9 @34265 has 11 MA's), (Start: 11 @34250 has 20 MA's), (32, 34115), (35, 34070), (37, 34064), (39, 34040), (47, 34001), (52, 33848), (54, 33830),

Gene: Chupacabra\_47 Start: 33046, Stop: 32486, Start Num: 7

Candidate Starts for Chupacabra\_47:

(Start: 7 @33046 has 18 MA's), (17, 32974), (32, 32860), (33, 32857), (45, 32749), (47, 32740), (57, 32533),

Gene: Ciao\_47 Start: 35564, Stop: 35061, Start Num: 14

Candidate Starts for Ciao\_47:

(5, 35636), (8, 35597), (Start: 14 @35564 has 196 MA's), (24, 35483), (29, 35462), (36, 35393), (47, 35330), (49, 35321), (54, 35153), (57, 35117),

Gene: ConceptII\_49 Start: 36256, Stop: 35765, Start Num: 14

Candidate Starts for ConceptII\_49:

(5, 36328), (8, 36289), (Start: 14 @36256 has 196 MA's), (24, 36175), (29, 36154), (41, 36046), (47, 36022), (49, 36013), (54, 35854), (57, 35818),

Gene: Conspiracy\_42 Start: 32307, Stop: 31774, Start Num: 10

Candidate Starts for Conspiracy\_42:

(Start: 10 @32307 has 15 MA's), (24, 32175), (25, 32169), (47, 32025),

Gene: Coog\_42 Start: 32408, Stop: 31872, Start Num: 10

Candidate Starts for Coog\_42:

(Start: 10 @32408 has 15 MA's), (24, 32273), (25, 32267), (47, 32123), (58, 31895),

Gene: Corvo\_48 Start: 36116, Stop: 35625, Start Num: 14

Candidate Starts for Corvo\_48:

(5, 36188), (8, 36149), (Start: 14 @36116 has 196 MA's), (24, 36035), (29, 36014), (47, 35882), (49, 35873), (54, 35714), (57, 35678),

Gene: Crispicous1\_45 Start: 34739, Stop: 34248, Start Num: 14

Candidate Starts for Crispicous1\_45:

(5, 34811), (8, 34772), (Start: 14 @34739 has 196 MA's), (24, 34658), (29, 34637), (36, 34568), (41, 34529), (47, 34505), (49, 34496), (54, 34337), (57, 34301),

Gene: Cueyllyss\_48 Start: 37026, Stop: 36535, Start Num: 14

Candidate Starts for Cueyllyss\_48:

(Start: 14 @37026 has 196 MA's), (24, 36945), (29, 36924), (36, 36855), (41, 36816), (47, 36792), (49, 36783), (54, 36624), (57, 36588),

Gene: DD5\_46 Start: 36122, Stop: 35631, Start Num: 14

Candidate Starts for DD5\_46:

(5, 36194), (8, 36155), (Start: 14 @36122 has 196 MA's), (24, 36041), (29, 36020), (41, 35912), (47, 35888), (49, 35879), (54, 35720), (57, 35684),

Gene: Danforth\_46 Start: 31927, Stop: 31406, Start Num: 11

Candidate Starts for Danforth\_46:

(Start: 11 @31927 has 20 MA's), (24, 31810), (38, 31711), (47, 31660), (48, 31654), (58, 31429),

Gene: DARTHPhader\_47 Start: 34512, Stop: 33961, Start Num: 9

Candidate Starts for DARTHPhader\_47:

(Start: 9 @34512 has 11 MA's), (Start: 11 @34497 has 20 MA's), (28, 34371), (41, 34257), (52, 34062), (53, 34059),

Gene: Dexes\_47 Start: 36156, Stop: 35665, Start Num: 14

Candidate Starts for Dexes\_47:

(Start: 14 @36156 has 196 MA's), (24, 36075), (29, 36054), (47, 35922), (49, 35913), (54, 35754), (57, 35718),

Gene: Dixon\_46 Start: 31800, Stop: 31279, Start Num: 11

Candidate Starts for Dixon\_46:

(Start: 11 @31800 has 20 MA's), (24, 31683), (38, 31584), (47, 31533), (48, 31527), (58, 31302),

Gene: Doom\_47 Start: 35900, Stop: 35409, Start Num: 14

Candidate Starts for Doom\_47:

(5, 35972), (8, 35933), (Start: 14 @35900 has 196 MA's), (24, 35819), (29, 35798), (36, 35729), (41, 35690), (47, 35666), (49, 35657), (54, 35498), (57, 35462),

Gene: DrFeelGood\_45 Start: 35584, Stop: 35093, Start Num: 14

Candidate Starts for DrFeelGood\_45:

(5, 35656), (8, 35617), (Start: 14 @35584 has 196 MA's), (24, 35503), (29, 35482), (41, 35374), (47, 35350), (49, 35341), (54, 35182), (57, 35146),

Gene: Drake94\_46 Start: 32305, Stop: 31757, Start Num: 7

Candidate Starts for Drake94\_46:

(Start: 7 @32305 has 18 MA's), (17, 32236), (28, 32152), (29, 32149), (32, 32131), (33, 32128), (41, 32044), (47, 32011), (57, 31804),

Gene: DreamCatcher\_50 Start: 36623, Stop: 36132, Start Num: 14

Candidate Starts for DreamCatcher\_50:

(Start: 14 @36623 has 196 MA's), (24, 36542), (29, 36521), (47, 36389), (49, 36380), (51, 36329), (54, 36221), (57, 36185),

Gene: Dreamboat\_49 Start: 35340, Stop: 34837, Start Num: 14

Candidate Starts for Dreamboat\_49:

(5, 35412), (8, 35373), (Start: 14 @35340 has 196 MA's), (24, 35259), (29, 35238), (41, 35130), (47, 35106), (49, 35097), (54, 34929), (57, 34893),

Gene: DroogsArmy\_45 Start: 34322, Stop: 33822, Start Num: 13

Candidate Starts for DroogsArmy\_45:

(Start: 13 @34322 has 3 MA's), (24, 34217), (41, 34097), (47, 34067), (57, 33869),

Gene: Dublin\_41 Start: 32129, Stop: 31593, Start Num: 10

Candidate Starts for Dublin\_41:

(Start: 10 @32129 has 15 MA's), (24, 31994), (25, 31988), (47, 31844),

Gene: Dulcie\_47 Start: 35420, Stop: 34929, Start Num: 14

Candidate Starts for Dulcie\_47:

(Start: 14 @35420 has 196 MA's), (24, 35339), (29, 35318), (36, 35249), (41, 35210), (47, 35186), (49, 35177), (57, 34982),

Gene: Dussy\_49 Start: 35800, Stop: 35309, Start Num: 14

Candidate Starts for Dussy\_49:

(5, 35872), (8, 35833), (Start: 14 @35800 has 196 MA's), (24, 35719), (29, 35698), (36, 35629), (47, 35566), (49, 35557), (54, 35398), (57, 35362),

Gene: Dynamix\_48 Start: 35419, Stop: 34928, Start Num: 14

Candidate Starts for Dynamix\_48:

(Start: 14 @35419 has 196 MA's), (24, 35338), (29, 35317), (47, 35185), (49, 35176), (51, 35125), (54, 35017), (57, 34981),

Gene: EZMoney23\_48 Start: 33569, Stop: 33063, Start Num: 11

Candidate Starts for EZMoney23\_48:

(Start: 9 @33584 has 11 MA's), (Start: 11 @33569 has 20 MA's), (26, 33476), (32, 33449), (35, 33404), (37, 33398), (39, 33374), (47, 33335), (52, 33176), (54, 33158),



Gene: Eaglepride\_49 Start: 33105, Stop: 32554, Start Num: 7

Candidate Starts for Eaglepride\_49:

(1, 33174), (Start: 7 @33105 has 18 MA's), (29, 32946), (47, 32808), (57, 32601),

Gene: Edison31\_46 Start: 33061, Stop: 32510, Start Num: 7

Candidate Starts for Edison31\_46:

(Start: 7 @33061 has 18 MA's), (17, 32992), (32, 32884), (33, 32881), (41, 32797), (45, 32773), (47, 32764), (49, 32755), (57, 32557),

Gene: Edtherson\_47 Start: 36064, Stop: 35573, Start Num: 14

Candidate Starts for Edtherson\_47:

(5, 36136), (8, 36097), (Start: 14 @36064 has 196 MA's), (24, 35983), (29, 35962), (36, 35893), (47, 35830), (49, 35821), (54, 35662), (57, 35626),

Gene: Espresso\_47 Start: 35666, Stop: 35175, Start Num: 14

Candidate Starts for Espresso\_47:

(Start: 14 @35666 has 196 MA's), (24, 35585), (29, 35564), (47, 35432), (49, 35423), (54, 35264), (57, 35228),

Gene: Euphoria\_45 Start: 34917, Stop: 34426, Start Num: 14

Candidate Starts for Euphoria\_45:

(Start: 14 @34917 has 196 MA's), (24, 34836), (29, 34815), (36, 34746), (41, 34707), (47, 34683), (49, 34674), (54, 34515), (57, 34479),

Gene: EvilGenius\_52 Start: 35429, Stop: 34887, Start Num: 9

Candidate Starts for EvilGenius\_52:

(Start: 9 @35429 has 11 MA's), (Start: 11 @35414 has 20 MA's), (19, 35327), (26, 35291), (32, 35264), (35, 35219), (37, 35213), (39, 35189), (47, 35150), (52, 34997), (54, 34979), (55, 34949),

Gene: Expelliarmus\_46 Start: 31956, Stop: 31435, Start Num: 11

Candidate Starts for Expelliarmus\_46:

(Start: 11 @31956 has 20 MA's), (24, 31839), (38, 31740), (47, 31689), (48, 31683), (58, 31458),

Gene: Eyeball\_48 Start: 35803, Stop: 35312, Start Num: 14

Candidate Starts for Eyeball\_48:

(Start: 14 @35803 has 196 MA's), (24, 35722), (29, 35701), (47, 35569), (49, 35560), (54, 35401), (57, 35365),

Gene: Fajezeel\_49 Start: 35913, Stop: 35422, Start Num: 14

Candidate Starts for Fajezeel\_49:

(5, 35985), (8, 35946), (Start: 14 @35913 has 196 MA's), (24, 35832), (29, 35811), (47, 35679), (49, 35670), (54, 35511), (57, 35475),

Gene: Fascinus\_43 Start: 34815, Stop: 34276, Start Num: 14

Candidate Starts for Fascinus\_43:

(5, 34887), (8, 34848), (Start: 14 @34815 has 196 MA's), (24, 34704), (27, 34689), (54, 34365), (57, 34329),

Gene: Fenn\_49 Start: 37378, Stop: 36884, Start Num: 14

Candidate Starts for Fenn\_49:

(Start: 14 @37378 has 196 MA's), (24, 37297), (29, 37276), (47, 37144), (49, 37135), (54, 36976), (57, 36940),

Gene: ForGetIt\_42 Start: 32332, Stop: 31799, Start Num: 10  
Candidate Starts for ForGetIt\_42:  
(Start: 10 @32332 has 15 MA's), (24, 32200), (25, 32194), (47, 32050),

Gene: Forsytheast\_47 Start: 35394, Stop: 34903, Start Num: 14  
Candidate Starts for Forsytheast\_47:  
(5, 35466), (8, 35427), (Start: 14 @35394 has 196 MA's), (24, 35313), (29, 35292), (47, 35160), (49, 35151), (54, 34992), (57, 34956),

Gene: Francis47\_46 Start: 36239, Stop: 35748, Start Num: 14  
Candidate Starts for Francis47\_46:  
(5, 36311), (8, 36272), (Start: 14 @36239 has 196 MA's), (24, 36158), (29, 36137), (36, 36068), (41, 36029), (47, 36005), (49, 35996), (54, 35837), (57, 35801),

Gene: Froghopper\_45 Start: 34909, Stop: 34418, Start Num: 14  
Candidate Starts for Froghopper\_45:  
(5, 34981), (8, 34942), (Start: 14 @34909 has 196 MA's), (24, 34828), (29, 34807), (47, 34675), (49, 34666), (54, 34507), (57, 34471),

Gene: Fushigi\_45 Start: 33557, Stop: 33066, Start Num: 14  
Candidate Starts for Fushigi\_45:  
(Start: 14 @33557 has 196 MA's), (24, 33476), (29, 33455), (47, 33323), (49, 33314), (54, 33155), (57, 33119),

Gene: GageAP\_48 Start: 35709, Stop: 35215, Start Num: 14  
Candidate Starts for GageAP\_48:  
(5, 35781), (8, 35742), (Start: 14 @35709 has 196 MA's), (24, 35628), (29, 35607), (41, 35499), (47, 35475), (49, 35466), (54, 35307), (57, 35271),

Gene: Gandalf20\_49 Start: 36393, Stop: 35902, Start Num: 14  
Candidate Starts for Gandalf20\_49:  
(Start: 14 @36393 has 196 MA's), (24, 36312), (29, 36291), (41, 36183), (47, 36159), (49, 36150), (54, 35991), (57, 35955),

Gene: Ghoulboy\_44 Start: 33072, Stop: 32536, Start Num: 10  
Candidate Starts for Ghoulboy\_44:  
(Start: 10 @33072 has 15 MA's), (24, 32937), (25, 32931), (47, 32787),

Gene: Gompeii16\_46 Start: 35972, Stop: 35481, Start Num: 14  
Candidate Starts for Gompeii16\_46:  
(5, 36044), (8, 36005), (Start: 14 @35972 has 196 MA's), (24, 35891), (29, 35870), (36, 35801), (41, 35762), (47, 35738), (49, 35729), (54, 35570), (57, 35534),

Gene: Goose\_48 Start: 32859, Stop: 32299, Start Num: 7  
Candidate Starts for Goose\_48:  
(Start: 7 @32859 has 18 MA's), (17, 32787), (32, 32673), (33, 32670), (45, 32562), (47, 32553), (57, 32346),

Gene: Graduation\_50 Start: 37122, Stop: 36631, Start Num: 14  
Candidate Starts for Graduation\_50:  
(Start: 14 @37122 has 196 MA's), (24, 37041), (29, 37020), (36, 36951), (41, 36912), (47, 36888), (49, 36879), (54, 36720), (57, 36684),

Gene: GrecoEtereo\_48 Start: 35721, Stop: 35230, Start Num: 14  
Candidate Starts for GrecoEtereo\_48:  
(5, 35793), (8, 35754), (Start: 14 @35721 has 196 MA's), (24, 35640), (29, 35619), (41, 35511), (47, 35487), (49, 35478), (54, 35319), (57, 35283),

Gene: Greg\_49 Start: 35913, Stop: 35422, Start Num: 14  
Candidate Starts for Greg\_49:  
(5, 35985), (8, 35946), (Start: 14 @35913 has 196 MA's), (24, 35832), (29, 35811), (47, 35679), (49, 35670), (54, 35511), (57, 35475),

Gene: Groundhog\_45 Start: 31854, Stop: 31342, Start Num: 11  
Candidate Starts for Groundhog\_45:  
(Start: 11 @31854 has 20 MA's), (24, 31737), (38, 31638), (47, 31587), (48, 31581), (58, 31365),

Gene: Gwendoluna\_51 Start: 37558, Stop: 37067, Start Num: 14  
Candidate Starts for Gwendoluna\_51:  
(Start: 14 @37558 has 196 MA's), (24, 37477), (29, 37456), (36, 37387), (41, 37348), (47, 37324), (49, 37315), (54, 37156), (57, 37120),

Gene: Gyzlar\_43 Start: 33635, Stop: 33096, Start Num: 14  
Candidate Starts for Gyzlar\_43:  
(5, 33707), (8, 33668), (Start: 14 @33635 has 196 MA's), (24, 33524), (27, 33509), (54, 33185), (57, 33149),

Gene: HINdeR\_45 Start: 34149, Stop: 33646, Start Num: 13  
Candidate Starts for HINdeR\_45:  
(2, 34242), (Start: 3 @34227 has 1 MA's), (Start: 7 @34182 has 18 MA's), (Start: 13 @34149 has 3 MA's), (24, 34044), (34, 34005), (47, 33894), (57, 33693),

Gene: Hami1\_40 Start: 30016, Stop: 29537, Start Num: 14  
Candidate Starts for Hami1\_40:  
(5, 30088), (8, 30049), (Start: 14 @30016 has 196 MA's), (24, 29935), (29, 29914), (36, 29845), (47, 29782), (49, 29773), (54, 29626), (57, 29590),

Gene: HanShotFirst\_46 Start: 34746, Stop: 34255, Start Num: 14  
Candidate Starts for HanShotFirst\_46:  
(Start: 14 @34746 has 196 MA's), (24, 34665), (29, 34644), (36, 34575), (41, 34536), (47, 34512), (49, 34503), (54, 34344), (57, 34308),

Gene: HarryOW\_46 Start: 34893, Stop: 34402, Start Num: 14  
Candidate Starts for HarryOW\_46:  
(5, 34965), (8, 34926), (Start: 14 @34893 has 196 MA's), (24, 34812), (29, 34791), (41, 34683), (47, 34659), (49, 34650), (54, 34491), (57, 34455),

Gene: Hermia\_48 Start: 36340, Stop: 35849, Start Num: 14  
Candidate Starts for Hermia\_48:  
(5, 36412), (8, 36373), (Start: 14 @36340 has 196 MA's), (24, 36259), (29, 36238), (47, 36106), (49, 36097), (54, 35938), (57, 35902),

Gene: HermioneGrange\_47 Start: 35708, Stop: 35217, Start Num: 14  
Candidate Starts for HermioneGrange\_47:

(5, 35780), (8, 35741), (Start: 14 @35708 has 196 MA's), (24, 35627), (29, 35606), (36, 35537), (47, 35474), (49, 35465), (54, 35306), (57, 35270),

Gene: Homines\_39 Start: 31549, Stop: 31058, Start Num: 14

Candidate Starts for Homines\_39:

(Start: 14 @31549 has 196 MA's), (24, 31468), (29, 31447), (47, 31315), (49, 31306), (54, 31147), (57, 31111),

Gene: Hope4ever\_49 Start: 36165, Stop: 35674, Start Num: 14

Candidate Starts for Hope4ever\_49:

(Start: 14 @36165 has 196 MA's), (24, 36084), (29, 36063), (47, 35931), (49, 35922), (54, 35763), (57, 35727),

Gene: lLeeKay\_51 Start: 36502, Stop: 36011, Start Num: 14

Candidate Starts for lLeeKay\_51:

(5, 36574), (8, 36535), (Start: 14 @36502 has 196 MA's), (24, 36421), (29, 36400), (36, 36331), (41, 36292), (47, 36268), (49, 36259), (54, 36100), (57, 36064),

Gene: lbantik\_26 Start: 11875, Stop: 11306, Start Num: 14

Candidate Starts for lbantik\_26:

(12, 11887), (Start: 14 @11875 has 196 MA's), (23, 11779), (56, 11383), (57, 11380), (59, 11338),

Gene: Ichabod\_49 Start: 35764, Stop: 35270, Start Num: 14

Candidate Starts for Ichabod\_49:

(Start: 14 @35764 has 196 MA's), (24, 35683), (29, 35662), (47, 35530), (49, 35521), (54, 35362), (57, 35326),

Gene: IgnatiusPatJac\_47 Start: 35765, Stop: 35271, Start Num: 14

Candidate Starts for IgnatiusPatJac\_47:

(Start: 14 @35765 has 196 MA's), (24, 35684), (29, 35663), (47, 35531), (49, 35522), (54, 35363), (57, 35327),

Gene: Isca\_49 Start: 33194, Stop: 32589, Start Num: 4

Candidate Starts for Isca\_49:

(2, 33221), (Start: 3 @33206 has 1 MA's), (Start: 4 @33194 has 6 MA's), (Start: 7 @33164 has 18 MA's), (17, 33092), (24, 33014), (32, 32981), (33, 32978), (41, 32894), (49, 32849), (53, 32681), (57, 32630),

Gene: JC27\_48 Start: 35809, Stop: 35318, Start Num: 14

Candidate Starts for JC27\_48:

(Start: 14 @35809 has 196 MA's), (24, 35728), (29, 35707), (36, 35638), (47, 35575), (49, 35566), (54, 35407), (57, 35371),

Gene: JF2\_48 Start: 31895, Stop: 31290, Start Num: 4

Candidate Starts for JF2\_48:

(2, 31922), (Start: 3 @31907 has 1 MA's), (Start: 4 @31895 has 6 MA's), (Start: 7 @31865 has 18 MA's), (17, 31793), (24, 31715), (32, 31682), (33, 31679), (41, 31595), (49, 31550), (53, 31382), (57, 31331),

Gene: JF4\_48 Start: 31895, Stop: 31290, Start Num: 4

Candidate Starts for JF4\_48:

(2, 31922), (Start: 3 @31907 has 1 MA's), (Start: 4 @31895 has 6 MA's), (Start: 7 @31865 has 18 MA's), (17, 31793), (24, 31715), (32, 31682), (33, 31679), (41, 31595), (49, 31550), (53, 31382), (57,

31331),

Gene: JackSparrow\_48 Start: 35944, Stop: 35465, Start Num: 14

Candidate Starts for JackSparrow\_48:

(5, 36016), (8, 35977), (Start: 14 @35944 has 196 MA's), (24, 35863), (29, 35842), (36, 35773), (41, 35734), (47, 35710), (49, 35701), (54, 35554), (57, 35518),

Gene: Jasper\_49 Start: 35226, Stop: 34723, Start Num: 14

Candidate Starts for Jasper\_49:

(5, 35298), (8, 35259), (Start: 14 @35226 has 196 MA's), (24, 35145), (29, 35124), (41, 35016), (47, 34992), (49, 34983), (54, 34815), (57, 34779),

Gene: Jerm2\_48 Start: 35963, Stop: 35472, Start Num: 14

Candidate Starts for Jerm2\_48:

(5, 36035), (8, 35996), (Start: 14 @35963 has 196 MA's), (24, 35882), (29, 35861), (36, 35792), (47, 35729), (49, 35720), (54, 35561), (57, 35525),

Gene: Jorgensen\_48 Start: 35503, Stop: 35012, Start Num: 14

Candidate Starts for Jorgensen\_48:

(Start: 14 @35503 has 196 MA's), (15, 35497), (24, 35422), (29, 35401), (47, 35269), (49, 35260), (54, 35101), (57, 35065),

Gene: Jovo\_42 Start: 32588, Stop: 32055, Start Num: 10

Candidate Starts for Jovo\_42:

(Start: 10 @32588 has 15 MA's), (24, 32456), (25, 32450), (47, 32306),

Gene: JuliaChild\_48 Start: 35588, Stop: 35097, Start Num: 14

Candidate Starts for JuliaChild\_48:

(5, 35660), (8, 35621), (Start: 14 @35588 has 196 MA's), (24, 35507), (29, 35486), (36, 35417), (47, 35354), (49, 35345), (54, 35186), (57, 35150),

Gene: KBG\_49 Start: 36909, Stop: 36418, Start Num: 14

Candidate Starts for KBG\_49:

(5, 36981), (8, 36942), (Start: 14 @36909 has 196 MA's), (24, 36828), (29, 36807), (47, 36675), (49, 36666), (54, 36507), (57, 36471),

Gene: KSSJEB\_46 Start: 35208, Stop: 34714, Start Num: 14

Candidate Starts for KSSJEB\_46:

(Start: 14 @35208 has 196 MA's), (24, 35127), (29, 35106), (47, 34974), (49, 34965), (51, 34914), (54, 34806), (57, 34770),

Gene: Kanely\_48 Start: 35863, Stop: 35372, Start Num: 14

Candidate Starts for Kanely\_48:

(Start: 14 @35863 has 196 MA's), (24, 35782), (29, 35761), (41, 35653), (47, 35629), (49, 35620), (54, 35461), (57, 35425),

Gene: Kenmech\_51 Start: 36926, Stop: 36435, Start Num: 14

Candidate Starts for Kenmech\_51:

(5, 36998), (8, 36959), (Start: 14 @36926 has 196 MA's), (24, 36845), (29, 36824), (36, 36755), (47, 36692), (49, 36683), (54, 36524), (57, 36488),

Gene: Killigrew\_47 Start: 35642, Stop: 35133, Start Num: 14

Candidate Starts for Killigrew\_47:

(5, 35714), (8, 35675), (Start: 14 @35642 has 196 MA's), (24, 35561), (29, 35540), (47, 35408), (49, 35399), (57, 35204),

Gene: Kimona\_49 Start: 32039, Stop: 31437, Start Num: 3

Candidate Starts for Kimona\_49:

(2, 32054), (Start: 3 @32039 has 1 MA's), (Start: 7 @31997 has 18 MA's), (24, 31844), (34, 31805), (36, 31763), (41, 31724), (47, 31694), (57, 31478),

Gene: KittenMittens\_45 Start: 32313, Stop: 31765, Start Num: 7

Candidate Starts for KittenMittens\_45:

(Start: 7 @32313 has 18 MA's), (17, 32244), (28, 32160), (29, 32157), (32, 32139), (33, 32136), (41, 32052), (47, 32019), (57, 31812),

Gene: Kristoff\_48 Start: 33413, Stop: 32862, Start Num: 7

Candidate Starts for Kristoff\_48:

(Start: 7 @33413 has 18 MA's), (17, 33344), (33, 33233), (41, 33149), (45, 33125), (47, 33116), (49, 33107), (57, 32909),

Gene: Kugel\_48 Start: 35883, Stop: 35392, Start Num: 14

Candidate Starts for Kugel\_48:

(5, 35955), (8, 35916), (Start: 14 @35883 has 196 MA's), (24, 35802), (29, 35781), (47, 35649), (49, 35640), (54, 35481), (57, 35445),

Gene: KyMonks1A\_49 Start: 35782, Stop: 35288, Start Num: 14

Candidate Starts for KyMonks1A\_49:

(5, 35854), (8, 35815), (Start: 14 @35782 has 196 MA's), (24, 35701), (29, 35680), (36, 35611), (47, 35548), (49, 35539), (54, 35377), (57, 35341),

Gene: Kykar\_47 Start: 35565, Stop: 35086, Start Num: 14

Candidate Starts for Kykar\_47:

(5, 35637), (8, 35598), (Start: 14 @35565 has 196 MA's), (24, 35484), (29, 35463), (36, 35394), (47, 35331), (49, 35322), (54, 35175), (57, 35139),

Gene: Lamina13\_47 Start: 35176, Stop: 34685, Start Num: 14

Candidate Starts for Lamina13\_47:

(Start: 14 @35176 has 196 MA's), (24, 35095), (29, 35074), (47, 34942), (49, 34933), (51, 34882), (54, 34774), (57, 34738),

Gene: Larenn\_49 Start: 33825, Stop: 33295, Start Num: 9

Candidate Starts for Larenn\_49:

(Start: 9 @33825 has 11 MA's), (Start: 11 @33810 has 20 MA's), (20, 33738), (26, 33705), (32, 33678), (37, 33627), (39, 33603), (41, 33591), (47, 33564), (52, 33408), (54, 33390),

Gene: Lesedi\_44 Start: 34760, Stop: 34239, Start Num: 14

Candidate Starts for Lesedi\_44:

(5, 34832), (8, 34793), (Start: 14 @34760 has 196 MA's), (24, 34649), (29, 34628), (47, 34496), (49, 34487), (54, 34328), (57, 34292),

Gene: Lev2\_42 Start: 32220, Stop: 31687, Start Num: 10

Candidate Starts for Lev2\_42:

(Start: 10 @32220 has 15 MA's), (24, 32088), (25, 32082), (47, 31938),

Gene: Leviathan\_52 Start: 34282, Stop: 33740, Start Num: 9

Candidate Starts for Leviathan\_52:

(Start: 9 @34282 has 11 MA's), (Start: 11 @34267 has 20 MA's), (19, 34180), (26, 34144), (32, 34117), (35, 34072), (37, 34066), (39, 34042), (47, 34003), (52, 33850), (54, 33832), (55, 33802),

Gene: Licorice\_50 Start: 36999, Stop: 36508, Start Num: 14

Candidate Starts for Licorice\_50:

(5, 37071), (8, 37032), (Start: 14 @36999 has 196 MA's), (24, 36918), (29, 36897), (36, 36828), (47, 36765), (49, 36756), (57, 36561),

Gene: LilBib\_47 Start: 36057, Stop: 35566, Start Num: 14

Candidate Starts for LilBib\_47:

(5, 36129), (8, 36090), (Start: 14 @36057 has 196 MA's), (24, 35976), (29, 35955), (47, 35823), (49, 35814), (54, 35655), (57, 35619),

Gene: Lockley\_46 Start: 35284, Stop: 34793, Start Num: 14

Candidate Starts for Lockley\_46:

(5, 35356), (8, 35317), (Start: 14 @35284 has 196 MA's), (24, 35203), (29, 35182), (41, 35074), (47, 35050), (49, 35041), (54, 34882), (57, 34846),

Gene: Lokk\_47 Start: 33016, Stop: 32498, Start Num: 11

Candidate Starts for Lokk\_47:

(6, 33043), (Start: 9 @33031 has 11 MA's), (Start: 11 @33016 has 20 MA's), (19, 32944), (26, 32908), (29, 32902), (32, 32881), (37, 32830), (39, 32806), (41, 32794), (47, 32767), (52, 32608), (54, 32590), (55, 32560),

Gene: Lopton\_48 Start: 36884, Stop: 36393, Start Num: 14

Candidate Starts for Lopton\_48:

(5, 36956), (8, 36917), (Start: 14 @36884 has 196 MA's), (24, 36803), (29, 36782), (36, 36713), (47, 36650), (49, 36641), (54, 36482), (57, 36446),

Gene: MK4\_50 Start: 33179, Stop: 32574, Start Num: 4

Candidate Starts for MK4\_50:

(2, 33206), (Start: 3 @33191 has 1 MA's), (Start: 4 @33179 has 6 MA's), (Start: 7 @33149 has 18 MA's), (17, 33077), (24, 32999), (32, 32966), (33, 32963), (41, 32879), (49, 32834), (53, 32666), (57, 32615),

Gene: MPlant7149\_46 Start: 34826, Stop: 34335, Start Num: 14

Candidate Starts for MPlant7149\_46:

(5, 34898), (8, 34859), (Start: 14 @34826 has 196 MA's), (24, 34745), (29, 34724), (47, 34592), (49, 34583), (54, 34424), (57, 34388),

Gene: Magnar\_46 Start: 35936, Stop: 35445, Start Num: 14

Candidate Starts for Magnar\_46:

(Start: 14 @35936 has 196 MA's), (24, 35855), (29, 35834), (41, 35726), (47, 35702), (49, 35693), (54, 35534), (57, 35498),

Gene: Magnito\_44 Start: 34508, Stop: 34017, Start Num: 14

Candidate Starts for Magnito\_44:

(Start: 14 @34508 has 196 MA's), (24, 34427), (29, 34406), (47, 34274), (49, 34265), (54, 34106), (57, 34070),

Gene: Makemake\_47 Start: 36354, Stop: 35863, Start Num: 14

Candidate Starts for Makemake\_47:

(5, 36426), (8, 36387), (Start: 14 @36354 has 196 MA's), (24, 36273), (29, 36252), (47, 36120), (49, 36111), (54, 35952), (57, 35916),

Gene: Malec\_50 Start: 34392, Stop: 33859, Start Num: 9

Candidate Starts for Malec\_50:

(Start: 9 @34392 has 11 MA's), (Start: 11 @34377 has 20 MA's), (20, 34305), (26, 34272), (32, 34245), (37, 34194), (39, 34170), (41, 34158), (47, 34131), (52, 33972), (54, 33954),

Gene: Manatee\_48 Start: 35062, Stop: 34571, Start Num: 14

Candidate Starts for Manatee\_48:

(Start: 14 @35062 has 196 MA's), (24, 34981), (29, 34960), (41, 34852), (47, 34828), (49, 34819), (54, 34660), (57, 34624),

Gene: Marcell\_45 Start: 35220, Stop: 34729, Start Num: 14

Candidate Starts for Marcell\_45:

(5, 35292), (8, 35253), (Start: 14 @35220 has 196 MA's), (24, 35139), (29, 35118), (36, 35049), (47, 34986), (49, 34977), (54, 34818), (57, 34782),

Gene: Marchy\_40 Start: 31968, Stop: 31489, Start Num: 14

Candidate Starts for Marchy\_40:

(Start: 14 @31968 has 196 MA's), (15, 31962), (24, 31887), (29, 31866), (36, 31797), (47, 31734), (49, 31725), (54, 31578), (57, 31542),

Gene: Marge\_47 Start: 36031, Stop: 35540, Start Num: 14

Candidate Starts for Marge\_47:

(5, 36103), (8, 36064), (Start: 14 @36031 has 196 MA's), (24, 35950), (29, 35929), (36, 35860), (41, 35821), (47, 35797), (49, 35788), (54, 35629), (57, 35593),

Gene: Maroc7\_45 Start: 35124, Stop: 34585, Start Num: 14

Candidate Starts for Maroc7\_45:

(5, 35196), (8, 35157), (Start: 14 @35124 has 196 MA's), (24, 35013), (27, 34998), (54, 34674), (57, 34638),

Gene: Marsha\_47 Start: 36587, Stop: 36096, Start Num: 14

Candidate Starts for Marsha\_47:

(5, 36659), (8, 36620), (Start: 14 @36587 has 196 MA's), (24, 36506), (29, 36485), (36, 36416), (41, 36377), (47, 36353), (49, 36344), (54, 36185), (57, 36149),

Gene: MaryBeth\_47 Start: 35493, Stop: 35002, Start Num: 14

Candidate Starts for MaryBeth\_47:

(5, 35565), (8, 35526), (Start: 14 @35493 has 196 MA's), (24, 35412), (29, 35391), (47, 35259), (49, 35250), (54, 35091), (57, 35055),

Gene: MarysWell\_41 Start: 32408, Stop: 31881, Start Num: 10

Candidate Starts for MarysWell\_41:

(Start: 10 @32408 has 15 MA's), (24, 32273), (25, 32267), (47, 32123),

Gene: McGuire\_48 Start: 35312, Stop: 34818, Start Num: 14

Candidate Starts for McGuire\_48:

(Start: 14 @35312 has 196 MA's), (24, 35231), (29, 35210), (47, 35078), (49, 35069), (54, 34910), (57, 34874),

Gene: MetalQZJ\_46 Start: 35493, Stop: 35002, Start Num: 14



Candidate Starts for MetalQZJ\_46:

(5, 35565), (8, 35526), (Start: 14 @35493 has 196 MA's), (24, 35412), (29, 35391), (47, 35259), (49, 35250), (54, 35091), (57, 35055),

Gene: Micasa\_43 Start: 32549, Stop: 32157, Start Num: 24

Candidate Starts for Micasa\_43:

(Start: 10 @32684 has 15 MA's), (24, 32549), (25, 32543), (47, 32399), (58, 32180),

Gene: Michley\_46 Start: 35011, Stop: 34520, Start Num: 14

Candidate Starts for Michley\_46:

(Start: 14 @35011 has 196 MA's), (24, 34930), (29, 34909), (36, 34840), (41, 34801), (47, 34777), (49, 34768), (54, 34609), (57, 34573),

Gene: Midas2\_42 Start: 32408, Stop: 31872, Start Num: 10

Candidate Starts for Midas2\_42:

(Start: 10 @32408 has 15 MA's), (24, 32273), (25, 32267), (47, 32123), (58, 31895),

Gene: Miko\_47 Start: 33800, Stop: 33279, Start Num: 11

Candidate Starts for Miko\_47:

(6, 33827), (Start: 9 @33815 has 11 MA's), (Start: 11 @33800 has 20 MA's), (19, 33728), (26, 33692), (29, 33686), (32, 33665), (37, 33614), (39, 33590), (41, 33578), (47, 33551), (52, 33392), (54, 33374),

Gene: Molly\_48 Start: 34897, Stop: 34406, Start Num: 14

Candidate Starts for Molly\_48:

(Start: 14 @34897 has 196 MA's), (24, 34816), (29, 34795), (36, 34726), (47, 34663), (49, 34654), (54, 34495), (57, 34459),

Gene: Monet\_50 Start: 37023, Stop: 36532, Start Num: 14

Candidate Starts for Monet\_50:

(5, 37095), (8, 37056), (Start: 14 @37023 has 196 MA's), (24, 36942), (29, 36921), (47, 36789), (49, 36780), (54, 36621), (57, 36585),

Gene: Moose\_47 Start: 35394, Stop: 34903, Start Num: 14

Candidate Starts for Moose\_47:

(5, 35466), (8, 35427), (Start: 14 @35394 has 196 MA's), (24, 35313), (29, 35292), (47, 35160), (49, 35151), (54, 34992), (57, 34956),

Gene: MrGordo\_46 Start: 34805, Stop: 34314, Start Num: 14

Candidate Starts for MrGordo\_46:

(Start: 14 @34805 has 196 MA's), (24, 34724), (29, 34703), (41, 34595), (47, 34571), (49, 34562), (54, 34403), (57, 34367),

Gene: Mryolo\_45 Start: 34872, Stop: 34381, Start Num: 14

Candidate Starts for Mryolo\_45:

(5, 34944), (8, 34905), (Start: 14 @34872 has 196 MA's), (24, 34791), (29, 34770), (36, 34701), (47, 34638), (49, 34629), (54, 34470), (57, 34434),

Gene: Mule\_44 Start: 33043, Stop: 32564, Start Num: 14

Candidate Starts for Mule\_44:

(5, 33115), (8, 33076), (Start: 14 @33043 has 196 MA's), (24, 32962), (29, 32941), (36, 32872), (41, 32833), (47, 32809), (49, 32800), (54, 32653), (57, 32617),

Gene: Museum\_48 Start: 35048, Stop: 34557, Start Num: 14

Candidate Starts for Museum\_48:

(Start: 14 @35048 has 196 MA's), (24, 34967), (29, 34946), (36, 34877), (47, 34814), (49, 34805), (54, 34646), (57, 34610),

Gene: NEHalo\_45 Start: 34818, Stop: 34324, Start Num: 14

Candidate Starts for NEHalo\_45:

(5, 34890), (8, 34851), (Start: 14 @34818 has 196 MA's), (24, 34737), (29, 34716), (41, 34608), (47, 34584), (49, 34575), (54, 34416), (57, 34380),

Gene: Naira\_49 Start: 37425, Stop: 36931, Start Num: 14

Candidate Starts for Naira\_49:

(Start: 14 @37425 has 196 MA's), (24, 37344), (29, 37323), (47, 37191), (49, 37182), (54, 37023), (57, 36987),

Gene: NearlyHeadless\_46 Start: 31699, Stop: 31181, Start Num: 11

Candidate Starts for NearlyHeadless\_46:

(Start: 11 @31699 has 20 MA's), (24, 31582), (34, 31543), (38, 31483), (47, 31432), (48, 31426), (58, 31204),

Gene: Nerujay\_49 Start: 36116, Stop: 35637, Start Num: 14

Candidate Starts for Nerujay\_49:

(Start: 14 @36116 has 196 MA's), (24, 36035), (29, 36014), (47, 35882), (49, 35873), (54, 35726), (57, 35690),

Gene: Nhonho\_48 Start: 35986, Stop: 35495, Start Num: 14

Candidate Starts for Nhonho\_48:

(Start: 14 @35986 has 196 MA's), (24, 35905), (29, 35884), (47, 35752), (49, 35743), (54, 35584), (57, 35548),

Gene: Niza\_50 Start: 36895, Stop: 36404, Start Num: 14

Candidate Starts for Niza\_50:

(5, 36967), (8, 36928), (Start: 14 @36895 has 196 MA's), (24, 36814), (29, 36793), (47, 36661), (49, 36652), (54, 36493), (57, 36457),

Gene: Norz\_47 Start: 35704, Stop: 35213, Start Num: 14

Candidate Starts for Norz\_47:

(Start: 14 @35704 has 196 MA's), (15, 35698), (24, 35623), (29, 35602), (47, 35470), (49, 35461), (54, 35302), (57, 35266),

Gene: NothingSpecial\_48 Start: 34231, Stop: 33707, Start Num: 9

Candidate Starts for NothingSpecial\_48:

(Start: 9 @34231 has 11 MA's), (Start: 11 @34216 has 20 MA's), (32, 34084), (35, 34039), (37, 34033), (47, 33970), (52, 33817), (53, 33814),

Gene: OKCentral2016\_47 Start: 32762, Stop: 32202, Start Num: 7

Candidate Starts for OKCentral2016\_47:

(Start: 7 @32762 has 18 MA's), (17, 32690), (32, 32576), (33, 32573), (45, 32465), (47, 32456), (57, 32249),

Gene: Ohno789\_48 Start: 36219, Stop: 35725, Start Num: 14

Candidate Starts for Ohno789\_48:

(Start: 14 @36219 has 196 MA's), (24, 36138), (29, 36117), (41, 36009), (47, 35985), (49, 35976), (54, 35817), (57, 35781),

Gene: Oogway\_44 Start: 34350, Stop: 33859, Start Num: 14

Candidate Starts for Oogway\_44:

(Start: 14 @34350 has 196 MA's), (24, 34269), (29, 34248), (47, 34116), (49, 34107), (54, 33948), (57, 33912),

Gene: PP\_51 Start: 36962, Stop: 36378, Start Num: 7

Candidate Starts for PP\_51:

(Start: 7 @36962 has 18 MA's), (22, 36830), (30, 36791), (36, 36722), (47, 36653), (53, 36479),

Gene: PSullivan\_47 Start: 34862, Stop: 34371, Start Num: 14

Candidate Starts for PSullivan\_47:

(5, 34934), (8, 34895), (Start: 14 @34862 has 196 MA's), (24, 34781), (29, 34760), (36, 34691), (47, 34628), (49, 34619), (54, 34460), (57, 34424),

Gene: PacerPaul\_47 Start: 35606, Stop: 35115, Start Num: 14

Candidate Starts for PacerPaul\_47:

(5, 35678), (8, 35639), (Start: 14 @35606 has 196 MA's), (24, 35525), (29, 35504), (36, 35435), (41, 35396), (47, 35372), (49, 35363), (54, 35204), (57, 35168),

Gene: Papez\_50 Start: 37983, Stop: 37492, Start Num: 14

Candidate Starts for Papez\_50:

(Start: 14 @37983 has 196 MA's), (24, 37902), (29, 37881), (36, 37812), (41, 37773), (47, 37749), (49, 37740), (54, 37581), (57, 37545),

Gene: Paphu\_45 Start: 35117, Stop: 34626, Start Num: 14

Candidate Starts for Paphu\_45:

(Start: 14 @35117 has 196 MA's), (24, 35036), (29, 35015), (36, 34946), (47, 34883), (49, 34874), (54, 34715), (57, 34679),

Gene: Paraselene\_45 Start: 35484, Stop: 34990, Start Num: 14

Candidate Starts for Paraselene\_45:

(5, 35556), (8, 35517), (Start: 14 @35484 has 196 MA's), (24, 35403), (29, 35382), (36, 35313), (47, 35250), (49, 35241), (54, 35082), (57, 35046),

Gene: Pari\_48 Start: 35131, Stop: 34640, Start Num: 14

Candidate Starts for Pari\_48:

(Start: 14 @35131 has 196 MA's), (24, 35050), (29, 35029), (47, 34897), (49, 34888), (54, 34729), (57, 34693),

Gene: Parliament\_46 Start: 35665, Stop: 35174, Start Num: 14

Candidate Starts for Parliament\_46:

(Start: 14 @35665 has 196 MA's), (15, 35659), (24, 35584), (29, 35563), (47, 35431), (49, 35422), (51, 35371), (54, 35263), (57, 35227),

Gene: PascalRango\_48 Start: 35376, Stop: 34882, Start Num: 14

Candidate Starts for PascalRango\_48:

(Start: 14 @35376 has 196 MA's), (24, 35295), (29, 35274), (36, 35205), (47, 35142), (49, 35133), (54, 34974), (57, 34938),

Gene: PattyP\_48 Start: 35244, Stop: 34753, Start Num: 14

Candidate Starts for PattyP\_48:

(5, 35316), (8, 35277), (Start: 14 @35244 has 196 MA's), (24, 35163), (29, 35142), (36, 35073), (47, 35010), (49, 35001), (54, 34842), (57, 34806),

Gene: Payneful\_45 Start: 34685, Stop: 34206, Start Num: 14

Candidate Starts for Payneful\_45:

(Start: 14 @34685 has 196 MA's), (15, 34679), (24, 34604), (29, 34583), (36, 34514), (47, 34451), (49, 34442), (54, 34295), (57, 34259),

Gene: PeaceMeal1\_46 Start: 32314, Stop: 31766, Start Num: 7

Candidate Starts for PeaceMeal1\_46:

(Start: 7 @32314 has 18 MA's), (17, 32245), (28, 32161), (29, 32158), (32, 32140), (33, 32137), (41, 32053), (47, 32020), (57, 31813),

Gene: Pelly\_46 Start: 35645, Stop: 35154, Start Num: 14

Candidate Starts for Pelly\_46:

(Start: 14 @35645 has 196 MA's), (24, 35564), (29, 35543), (47, 35411), (49, 35402), (54, 35243), (57, 35207),

Gene: Pepe\_44 Start: 33805, Stop: 33314, Start Num: 14

Candidate Starts for Pepe\_44:

(5, 33877), (8, 33838), (Start: 14 @33805 has 196 MA's), (24, 33724), (29, 33703), (36, 33634), (47, 33571), (49, 33562), (54, 33403), (57, 33367),

Gene: Perseus\_47 Start: 35929, Stop: 35450, Start Num: 14

Candidate Starts for Perseus\_47:

(5, 36001), (8, 35962), (Start: 14 @35929 has 196 MA's), (24, 35848), (29, 35827), (36, 35758), (41, 35719), (47, 35695), (49, 35686), (54, 35539), (57, 35503),

Gene: Peterson\_50 Start: 37831, Stop: 37337, Start Num: 14

Candidate Starts for Peterson\_50:

(Start: 14 @37831 has 196 MA's), (24, 37750), (29, 37729), (36, 37660), (47, 37597), (49, 37588), (54, 37429), (57, 37393),

Gene: Petp2012\_48 Start: 35856, Stop: 35365, Start Num: 14

Candidate Starts for Petp2012\_48:

(Start: 14 @35856 has 196 MA's), (24, 35775), (29, 35754), (36, 35685), (47, 35622), (49, 35613), (54, 35454), (57, 35418),

Gene: Petruchio\_47 Start: 35590, Stop: 35099, Start Num: 14

Candidate Starts for Petruchio\_47:

(5, 35662), (8, 35623), (Start: 14 @35590 has 196 MA's), (24, 35509), (29, 35488), (36, 35419), (41, 35380), (47, 35356), (49, 35347), (54, 35188), (57, 35152),

Gene: Phantastic\_51 Start: 33380, Stop: 32778, Start Num: 4

Candidate Starts for Phantastic\_51:

(2, 33407), (Start: 3 @33392 has 1 MA's), (Start: 4 @33380 has 6 MA's), (Start: 7 @33350 has 18 MA's), (17, 33281), (24, 33203), (33, 33167), (41, 33083), (57, 32819),

Gene: Pharaoh\_45 Start: 33439, Stop: 32915, Start Num: 11

Candidate Starts for Pharaoh\_45:

(Start: 11 @33439 has 20 MA's), (37, 33241), (47, 33178), (52, 33016),

Gene: PherrisBueller\_47 Start: 34859, Stop: 34356, Start Num: 14

Candidate Starts for PherrisBueller\_47:

(5, 34931), (8, 34892), (Start: 14 @34859 has 196 MA's), (24, 34778), (29, 34757), (41, 34649), (47, 34625), (49, 34616), (54, 34448), (57, 34412),

Gene: Phillis\_48 Start: 32245, Stop: 31724, Start Num: 11

Candidate Starts for Phillis\_48:

(Start: 11 @32245 has 20 MA's), (24, 32128), (38, 32029), (47, 31978), (48, 31972), (58, 31747),

Gene: PhrostyMug\_46 Start: 35208, Stop: 34729, Start Num: 14

Candidate Starts for PhrostyMug\_46:

(5, 35280), (8, 35241), (Start: 14 @35208 has 196 MA's), (24, 35127), (29, 35106), (36, 35037), (41, 34998), (47, 34974), (49, 34965), (54, 34818), (57, 34782),

Gene: PinkPlastic\_46 Start: 35066, Stop: 34575, Start Num: 14

Candidate Starts for PinkPlastic\_46:

(Start: 14 @35066 has 196 MA's), (24, 34985), (29, 34964), (47, 34832), (49, 34823), (51, 34772), (54, 34664), (57, 34628),

Gene: Pinto\_47 Start: 35047, Stop: 34556, Start Num: 14

Candidate Starts for Pinto\_47:

(5, 35119), (8, 35080), (Start: 14 @35047 has 196 MA's), (24, 34966), (29, 34945), (41, 34837), (47, 34813), (49, 34804), (54, 34645), (57, 34609),

Gene: Pippin\_49 Start: 35957, Stop: 35466, Start Num: 14

Candidate Starts for Pippin\_49:

(5, 36029), (8, 35990), (Start: 14 @35957 has 196 MA's), (24, 35876), (29, 35855), (47, 35723), (49, 35714), (54, 35555), (57, 35519),

Gene: Piro94\_50 Start: 34062, Stop: 33535, Start Num: 9

Candidate Starts for Piro94\_50:

(Start: 9 @34062 has 11 MA's), (Start: 11 @34047 has 20 MA's), (19, 33978), (26, 33942), (32, 33915), (37, 33864), (39, 33840), (41, 33828), (47, 33801), (49, 33792), (50, 33774), (52, 33648),

Gene: Pita2\_50 Start: 36359, Stop: 35868, Start Num: 14

Candidate Starts for Pita2\_50:

(5, 36431), (8, 36392), (Start: 14 @36359 has 196 MA's), (24, 36278), (29, 36257), (36, 36188), (47, 36125), (49, 36116), (54, 35957), (57, 35921),

Gene: Poompha\_47 Start: 32312, Stop: 31764, Start Num: 7

Candidate Starts for Poompha\_47:

(Start: 7 @32312 has 18 MA's), (17, 32243), (28, 32159), (29, 32156), (32, 32138), (33, 32135), (41, 32051), (47, 32018), (57, 31811),

Gene: QTRlifeCrisis\_51 Start: 36055, Stop: 35564, Start Num: 14

Candidate Starts for QTRlifeCrisis\_51:

(5, 36127), (8, 36088), (Start: 14 @36055 has 196 MA's), (24, 35974), (29, 35953), (41, 35845), (47, 35821), (49, 35812), (54, 35653), (57, 35617),

Gene: Rachaly\_49 Start: 33948, Stop: 33430, Start Num: 11

Candidate Starts for Rachaly\_49:

(6, 33975), (Start: 9 @33963 has 11 MA's), (Start: 11 @33948 has 20 MA's), (19, 33876), (26, 33840), (29, 33834), (32, 33813), (37, 33762), (39, 33738), (41, 33726), (47, 33699), (52, 33540), (54, 33522), (55, 33492),

Gene: Rajelicia\_48 Start: 35989, Stop: 35498, Start Num: 14

Candidate Starts for Rajelicia\_48:

(5, 36061), (8, 36022), (Start: 14 @35989 has 196 MA's), (24, 35908), (29, 35887), (36, 35818), (47, 35755), (49, 35746), (54, 35587), (57, 35551),

Gene: Rebeuca\_48 Start: 33414, Stop: 32863, Start Num: 7

Candidate Starts for Rebeuca\_48:

(Start: 7 @33414 has 18 MA's), (17, 33345), (33, 33234), (41, 33150), (45, 33126), (47, 33117), (49, 33108), (57, 32910),

Gene: Refuge\_49 Start: 34874, Stop: 34341, Start Num: 9

Candidate Starts for Refuge\_49:

(Start: 9 @34874 has 11 MA's), (Start: 11 @34859 has 20 MA's), (18, 34790), (28, 34748), (41, 34637), (52, 34442), (53, 34439),

Gene: RhynO\_49 Start: 33216, Stop: 32662, Start Num: 7

Candidate Starts for RhynO\_49:

(Start: 7 @33216 has 18 MA's), (17, 33147), (31, 33054), (33, 33033), (41, 32949), (45, 32925), (47, 32916), (49, 32907), (57, 32709),

Gene: Rhynn\_46 Start: 35290, Stop: 34811, Start Num: 14

Candidate Starts for Rhynn\_46:

(5, 35362), (8, 35323), (Start: 14 @35290 has 196 MA's), (24, 35209), (29, 35188), (36, 35119), (47, 35056), (49, 35047), (54, 34900), (57, 34864),

Gene: RidgeCB\_47 Start: 35205, Stop: 34714, Start Num: 14

Candidate Starts for RidgeCB\_47:

(5, 35277), (8, 35238), (Start: 14 @35205 has 196 MA's), (24, 35124), (29, 35103), (36, 35034), (47, 34971), (49, 34962), (54, 34803), (57, 34767),

Gene: Ringer\_48 Start: 36321, Stop: 35830, Start Num: 14

Candidate Starts for Ringer\_48:

(5, 36393), (8, 36354), (Start: 14 @36321 has 196 MA's), (24, 36240), (29, 36219), (47, 36087), (49, 36078), (54, 35919), (57, 35883),

Gene: Roary\_47 Start: 31912, Stop: 31391, Start Num: 11

Candidate Starts for Roary\_47:

(Start: 11 @31912 has 20 MA's), (24, 31795), (38, 31696), (47, 31645), (48, 31639), (58, 31414),

Gene: Rockstar\_50 Start: 33188, Stop: 32583, Start Num: 4

Candidate Starts for Rockstar\_50:

(2, 33215), (Start: 3 @33200 has 1 MA's), (Start: 4 @33188 has 6 MA's), (Start: 7 @33158 has 18 MA's), (17, 33086), (24, 33008), (32, 32975), (33, 32972), (41, 32888), (49, 32843), (53, 32675), (57, 32624),

Gene: Rohr\_48 Start: 36009, Stop: 35518, Start Num: 14

Candidate Starts for Rohr\_48:

(5, 36081), (8, 36042), (Start: 14 @36009 has 196 MA's), (24, 35928), (29, 35907), (36, 35838), (47, 35775), (49, 35766), (54, 35607), (57, 35571),

Gene: Rubeus\_47 Start: 33866, Stop: 33372, Start Num: 14

Candidate Starts for Rubeus\_47:

(5, 33938), (8, 33899), (Start: 14 @33866 has 196 MA's), (24, 33785), (29, 33764), (36, 33695), (41, 33656), (47, 33632), (49, 33623), (54, 33461), (57, 33425),

Gene: Rufus\_48 Start: 35636, Stop: 35142, Start Num: 14

Candidate Starts for Rufus\_48:

(5, 35708), (8, 35669), (Start: 14 @35636 has 196 MA's), (24, 35555), (29, 35534), (36, 35465), (41, 35426), (47, 35402), (49, 35393), (54, 35231), (57, 35195),

Gene: Ruotula\_50 Start: 37126, Stop: 36635, Start Num: 14

Candidate Starts for Ruotula\_50:

(5, 37198), (8, 37159), (Start: 14 @37126 has 196 MA's), (24, 37045), (29, 37024), (36, 36955), (41, 36916), (47, 36892), (49, 36883), (54, 36724), (57, 36688),

Gene: Rutherferd\_49 Start: 36503, Stop: 36024, Start Num: 14

Candidate Starts for Rutherferd\_49:

(Start: 14 @36503 has 196 MA's), (24, 36422), (29, 36401), (36, 36332), (47, 36269), (49, 36260), (54, 36113), (57, 36077),

Gene: STLscum\_48 Start: 36506, Stop: 36015, Start Num: 14

Candidate Starts for STLscum\_48:

(Start: 14 @36506 has 196 MA's), (24, 36425), (29, 36404), (47, 36272), (49, 36263), (54, 36104), (57, 36068),

Gene: Sagefire\_50 Start: 36875, Stop: 36384, Start Num: 14

Candidate Starts for Sagefire\_50:

(5, 36947), (8, 36908), (Start: 14 @36875 has 196 MA's), (24, 36794), (29, 36773), (47, 36641), (49, 36632), (54, 36473), (57, 36437),

Gene: Saintus\_41 Start: 28634, Stop: 28113, Start Num: 11

Candidate Starts for Saintus\_41:

(Start: 11 @28634 has 20 MA's), (24, 28517), (34, 28478), (38, 28418), (47, 28367), (48, 28361), (58, 28136),

Gene: Sandaddy\_46 Start: 35676, Stop: 35182, Start Num: 14

Candidate Starts for Sandaddy\_46:

(5, 35748), (8, 35709), (Start: 14 @35676 has 196 MA's), (24, 35595), (29, 35574), (41, 35466), (47, 35442), (49, 35433), (54, 35274), (57, 35238),

Gene: SarFire\_45 Start: 35227, Stop: 34736, Start Num: 14

Candidate Starts for SarFire\_45:

(5, 35299), (8, 35260), (Start: 14 @35227 has 196 MA's), (24, 35146), (29, 35125), (47, 34993), (49, 34984), (54, 34825), (57, 34789),

Gene: Scowl\_48 Start: 36163, Stop: 35660, Start Num: 14

Candidate Starts for Scowl\_48:

(5, 36235), (8, 36196), (Start: 14 @36163 has 196 MA's), (24, 36082), (29, 36061), (47, 35929), (49, 35920), (54, 35752), (57, 35716),

Gene: Seabiscuit\_49 Start: 35399, Stop: 34908, Start Num: 14

Candidate Starts for Seabiscuit\_49:

(Start: 14 @35399 has 196 MA's), (24, 35318), (29, 35297), (47, 35165), (49, 35156), (51, 35105), (54, 34997), (57, 34961),

Gene: Seanderson\_49 Start: 36566, Stop: 36075, Start Num: 14

Candidate Starts for Seanderson\_49:

(5, 36638), (8, 36599), (Start: 14 @36566 has 196 MA's), (24, 36485), (29, 36464), (47, 36332), (49, 36323), (54, 36164), (57, 36128),

Gene: Severus\_46 Start: 32312, Stop: 31764, Start Num: 7

Candidate Starts for Severus\_46:

(Start: 7 @32312 has 18 MA's), (17, 32243), (28, 32159), (29, 32156), (32, 32138), (33, 32135), (41, 32051), (47, 32018), (57, 31811),

Gene: ShortQueendom\_41 Start: 31740, Stop: 31246, Start Num: 14

Candidate Starts for ShortQueendom\_41:

(5, 31812), (8, 31773), (Start: 14 @31740 has 196 MA's), (24, 31659), (29, 31638), (47, 31506), (49, 31497), (54, 31338), (57, 31302),

Gene: Sibs6\_48 Start: 34494, Stop: 34003, Start Num: 14

Candidate Starts for Sibs6\_48:

(Start: 14 @34494 has 196 MA's), (24, 34413), (29, 34392), (36, 34323), (47, 34260), (49, 34251), (54, 34092), (57, 34056),

Gene: SkiPole\_50 Start: 36227, Stop: 35736, Start Num: 14

Candidate Starts for SkiPole\_50:

(Start: 14 @36227 has 196 MA's), (24, 36146), (29, 36125), (47, 35993), (49, 35984), (54, 35825), (57, 35789),

Gene: Slagathor\_49 Start: 35914, Stop: 35423, Start Num: 14

Candidate Starts for Slagathor\_49:

(5, 35986), (8, 35947), (Start: 14 @35914 has 196 MA's), (24, 35833), (29, 35812), (36, 35743), (47, 35680), (49, 35671), (54, 35512), (57, 35476),

Gene: Smairt\_49 Start: 36201, Stop: 35722, Start Num: 14

Candidate Starts for Smairt\_49:

(5, 36273), (8, 36234), (Start: 14 @36201 has 196 MA's), (24, 36120), (29, 36099), (36, 36030), (41, 35991), (47, 35967), (49, 35958), (54, 35811), (57, 35775),

Gene: Smeadley\_47 Start: 32078, Stop: 31557, Start Num: 11

Candidate Starts for Smeadley\_47:

(Start: 11 @32078 has 20 MA's), (24, 31961), (38, 31862), (47, 31811), (48, 31805), (58, 31580),

Gene: Smeagol\_48 Start: 36735, Stop: 36244, Start Num: 14

Candidate Starts for Smeagol\_48:

(Start: 14 @36735 has 196 MA's), (24, 36654), (29, 36633), (47, 36501), (49, 36492), (54, 36333), (57, 36297),

Gene: Snazzy\_45 Start: 34933, Stop: 34439, Start Num: 14

Candidate Starts for Snazzy\_45:

(Start: 14 @34933 has 196 MA's), (24, 34852), (29, 34831), (47, 34699), (49, 34690), (51, 34639), (54, 34531), (57, 34495),

Gene: Solon\_46 Start: 35558, Stop: 35067, Start Num: 14

Candidate Starts for Solon\_46:

(5, 35630), (8, 35591), (Start: 14 @35558 has 196 MA's), (24, 35477), (29, 35456), (41, 35348), (47, 35324), (49, 35315), (54, 35156), (57, 35120),



Gene: Sorpresa\_45 Start: 35678, Stop: 35184, Start Num: 14

Candidate Starts for Sorpresa\_45:

(5, 35750), (8, 35711), (Start: 14 @35678 has 196 MA's), (24, 35597), (29, 35576), (41, 35468), (47, 35444), (49, 35435), (54, 35276), (57, 35240),

Gene: SpikeBT\_47 Start: 35915, Stop: 35421, Start Num: 14

Candidate Starts for SpikeBT\_47:

(Start: 14 @35915 has 196 MA's), (24, 35834), (29, 35813), (41, 35705), (47, 35681), (49, 35672), (54, 35513), (57, 35477),

Gene: Squee\_47 Start: 35892, Stop: 35398, Start Num: 14

Candidate Starts for Squee\_47:

(Start: 14 @35892 has 196 MA's), (24, 35811), (29, 35790), (47, 35658), (49, 35649), (54, 35490), (57, 35454),

Gene: Steamy\_46 Start: 33175, Stop: 32648, Start Num: 11

Candidate Starts for Steamy\_46:

(Start: 9 @33190 has 11 MA's), (Start: 11 @33175 has 20 MA's), (21, 33073), (37, 32971), (47, 32908), (52, 32749),

Gene: Stephig9\_47 Start: 31916, Stop: 31395, Start Num: 11

Candidate Starts for Stephig9\_47:

(Start: 11 @31916 has 20 MA's), (24, 31799), (38, 31700), (46, 31652), (47, 31649), (48, 31643), (58, 31418),

Gene: StewieG\_46 Start: 33078, Stop: 32599, Start Num: 14

Candidate Starts for StewieG\_46:

(5, 33150), (8, 33111), (Start: 14 @33078 has 196 MA's), (24, 32997), (29, 32976), (36, 32907), (47, 32844), (49, 32835), (54, 32688), (57, 32652),

Gene: StrongArm\_47 Start: 36761, Stop: 36270, Start Num: 14

Candidate Starts for StrongArm\_47:

(5, 36833), (8, 36794), (Start: 14 @36761 has 196 MA's), (24, 36680), (29, 36659), (47, 36527), (49, 36518), (54, 36359), (57, 36323),

Gene: Success\_22 Start: 13796, Stop: 13275, Start Num: 16

Candidate Starts for Success\_22:

(Start: 16 @13796 has 1 MA's), (24, 13724), (26, 13709), (40, 13592), (42, 13583), (43, 13577), (44, 13574),

Gene: Sumter\_44 Start: 35263, Stop: 34772, Start Num: 14

Candidate Starts for Sumter\_44:

(5, 35335), (8, 35296), (Start: 14 @35263 has 196 MA's), (24, 35182), (29, 35161), (41, 35053), (47, 35029), (49, 35020), (54, 34861), (57, 34825),

Gene: Sunshine924\_48 Start: 35178, Stop: 34687, Start Num: 14

Candidate Starts for Sunshine924\_48:

(Start: 14 @35178 has 196 MA's), (24, 35097), (29, 35076), (47, 34944), (49, 34935), (54, 34776), (57, 34740),

Gene: SwissCheese\_49 Start: 35894, Stop: 35403, Start Num: 14

Candidate Starts for SwissCheese\_49:

(5, 35966), (8, 35927), (Start: 14 @35894 has 196 MA's), (24, 35813), (29, 35792), (47, 35660), (49, 35651), (54, 35492), (57, 35456),

Gene: Switzer\_48 Start: 35468, Stop: 34977, Start Num: 14

Candidate Starts for Switzer\_48:

(Start: 14 @35468 has 196 MA's), (24, 35387), (29, 35366), (41, 35258), (47, 35234), (49, 35225), (54, 35066), (57, 35030),

Gene: Swole\_48 Start: 35063, Stop: 34572, Start Num: 14

Candidate Starts for Swole\_48:

(5, 35135), (8, 35096), (Start: 14 @35063 has 196 MA's), (24, 34982), (29, 34961), (36, 34892), (47, 34829), (49, 34820), (54, 34661), (57, 34625),

Gene: SydNat\_44 Start: 33081, Stop: 32545, Start Num: 10

Candidate Starts for SydNat\_44:

(Start: 10 @33081 has 15 MA's), (24, 32946), (25, 32940), (47, 32796),

Gene: Target\_48 Start: 34467, Stop: 33976, Start Num: 14

Candidate Starts for Target\_48:

(5, 34539), (8, 34500), (Start: 14 @34467 has 196 MA's), (24, 34386), (47, 34233), (49, 34224), (54, 34065), (57, 34029),

Gene: Tasp14\_48 Start: 35800, Stop: 35309, Start Num: 14

Candidate Starts for Tasp14\_48:

(Start: 14 @35800 has 196 MA's), (24, 35719), (29, 35698), (47, 35566), (49, 35557), (51, 35506), (54, 35398), (57, 35362),

Gene: Teodoridan\_45 Start: 34988, Stop: 34497, Start Num: 14

Candidate Starts for Teodoridan\_45:

(Start: 14 @34988 has 196 MA's), (15, 34982), (24, 34907), (29, 34886), (47, 34754), (49, 34745), (51, 34694), (54, 34586), (57, 34550),

Gene: Theia\_40 Start: 32347, Stop: 31820, Start Num: 10

Candidate Starts for Theia\_40:

(Start: 10 @32347 has 15 MA's), (24, 32212), (25, 32206), (47, 32062),

Gene: TheloniousMonk\_48 Start: 36922, Stop: 36431, Start Num: 14

Candidate Starts for TheloniousMonk\_48:

(5, 36994), (8, 36955), (Start: 14 @36922 has 196 MA's), (24, 36841), (29, 36820), (36, 36751), (47, 36688), (49, 36679), (54, 36520), (57, 36484),

Gene: Thor\_45 Start: 34585, Stop: 34094, Start Num: 14

Candidate Starts for Thor\_45:

(5, 34657), (8, 34618), (Start: 14 @34585 has 196 MA's), (24, 34504), (29, 34483), (47, 34351), (49, 34342), (54, 34183), (57, 34147),

Gene: Tiger\_41 Start: 31886, Stop: 31353, Start Num: 10

Candidate Starts for Tiger\_41:

(Start: 10 @31886 has 15 MA's), (24, 31754), (25, 31748), (47, 31604),

Gene: Timshel\_47 Start: 34579, Stop: 34079, Start Num: 13

Candidate Starts for Timshel\_47:

(Start: 13 @34579 has 3 MA's), (24, 34474), (41, 34354), (47, 34324), (57, 34126),

Gene: Topanga\_46 Start: 33064, Stop: 32513, Start Num: 7

Candidate Starts for Topanga\_46:

(Start: 7 @33064 has 18 MA's), (17, 32995), (33, 32884), (41, 32800), (45, 32776), (47, 32767), (49, 32758), (57, 32560),

Gene: Topgun\_46 Start: 35080, Stop: 34586, Start Num: 14

Candidate Starts for Topgun\_46:

(Start: 14 @35080 has 196 MA's), (15, 35074), (24, 34999), (29, 34978), (47, 34843), (49, 34834), (51, 34783), (54, 34675), (57, 34639),

Gene: Tote\_43 Start: 32330, Stop: 31839, Start Num: 14

Candidate Starts for Tote\_43:

(5, 32402), (8, 32363), (Start: 14 @32330 has 196 MA's), (24, 32249), (29, 32228), (36, 32159), (47, 32096), (49, 32087), (54, 31928), (57, 31892),

Gene: Traft412\_47 Start: 36020, Stop: 35529, Start Num: 14

Candidate Starts for Traft412\_47:

(Start: 14 @36020 has 196 MA's), (24, 35939), (29, 35918), (41, 35810), (47, 35786), (49, 35777), (54, 35618), (57, 35582),

Gene: Treddle\_48 Start: 36535, Stop: 36044, Start Num: 14

Candidate Starts for Treddle\_48:

(5, 36607), (8, 36568), (Start: 14 @36535 has 196 MA's), (24, 36454), (29, 36433), (36, 36364), (47, 36301), (49, 36292), (54, 36133), (57, 36097),

Gene: Trike\_46 Start: 32321, Stop: 31773, Start Num: 7

Candidate Starts for Trike\_46:

(Start: 7 @32321 has 18 MA's), (17, 32252), (28, 32168), (29, 32165), (32, 32147), (33, 32144), (41, 32060), (47, 32027), (57, 31820),

Gene: Tripl3t\_47 Start: 36206, Stop: 35715, Start Num: 14

Candidate Starts for Tripl3t\_47:

(5, 36278), (8, 36239), (Start: 14 @36206 has 196 MA's), (24, 36125), (29, 36104), (36, 36035), (47, 35972), (49, 35963), (54, 35804), (57, 35768),

Gene: Trouble\_49 Start: 36916, Stop: 36437, Start Num: 14

Candidate Starts for Trouble\_49:

(Start: 14 @36916 has 196 MA's), (24, 36835), (29, 36814), (47, 36682), (49, 36673), (54, 36526), (57, 36490),

Gene: Turj99\_44 Start: 34778, Stop: 34287, Start Num: 14

Candidate Starts for Turj99\_44:

(Start: 14 @34778 has 196 MA's), (24, 34697), (29, 34676), (47, 34544), (49, 34535), (54, 34376), (57, 34340),

Gene: Twister\_46 Start: 32975, Stop: 32424, Start Num: 7

Candidate Starts for Twister\_46:

(Start: 7 @32975 has 18 MA's), (17, 32906), (33, 32795), (41, 32711), (45, 32687), (47, 32678), (49, 32669), (57, 32471),

Gene: TwoPeat\_47 Start: 35654, Stop: 35163, Start Num: 14

Candidate Starts for TwoPeat\_47:

(5, 35726), (8, 35687), (Start: 14 @35654 has 196 MA's), (24, 35573), (29, 35552), (36, 35483), (47, 35420), (49, 35411), (54, 35252), (57, 35216),

Gene: U2\_46 Start: 35448, Stop: 34957, Start Num: 14

Candidate Starts for U2\_46:

(Start: 14 @35448 has 196 MA's), (24, 35367), (29, 35346), (41, 35238), (47, 35214), (49, 35205), (54, 35046), (57, 35010),

Gene: Violet\_45 Start: 35592, Stop: 35101, Start Num: 14

Candidate Starts for Violet\_45:

(5, 35664), (8, 35625), (Start: 14 @35592 has 196 MA's), (24, 35511), (29, 35490), (49, 35349), (54, 35190), (57, 35154),

Gene: WalterMcMickey\_46 Start: 32975, Stop: 32424, Start Num: 7

Candidate Starts for WalterMcMickey\_46:

(Start: 7 @32975 has 18 MA's), (17, 32906), (33, 32795), (41, 32711), (45, 32687), (47, 32678), (49, 32669), (57, 32471),

Gene: Watermelon\_48 Start: 35984, Stop: 35463, Start Num: 14

Candidate Starts for Watermelon\_48:

(5, 36056), (8, 36017), (Start: 14 @35984 has 196 MA's), (24, 35873), (29, 35852), (36, 35783), (47, 35720), (49, 35711), (54, 35552), (57, 35516),

Gene: Wheeler\_47 Start: 35662, Stop: 35171, Start Num: 14

Candidate Starts for Wheeler\_47:

(Start: 14 @35662 has 196 MA's), (24, 35581), (29, 35560), (36, 35491), (47, 35428), (49, 35419), (54, 35260), (57, 35224),

Gene: Wilkins\_46 Start: 35010, Stop: 34519, Start Num: 14

Candidate Starts for Wilkins\_46:

(Start: 14 @35010 has 196 MA's), (15, 35004), (24, 34929), (29, 34908), (36, 34839), (47, 34776), (49, 34767), (51, 34716), (54, 34608), (57, 34572),

Gene: Zeeculate\_45 Start: 35637, Stop: 35146, Start Num: 14

Candidate Starts for Zeeculate\_45:

(5, 35709), (8, 35670), (Start: 14 @35637 has 196 MA's), (24, 35556), (29, 35535), (47, 35403), (49, 35394), (54, 35235), (57, 35199),

Gene: Zephyr\_47 Start: 35477, Stop: 34986, Start Num: 14

Candidate Starts for Zephyr\_47:

(5, 35549), (8, 35510), (Start: 14 @35477 has 196 MA's), (24, 35396), (29, 35375), (41, 35267), (47, 35243), (49, 35234), (54, 35075), (57, 35039),

Gene: Zeuska\_46 Start: 35568, Stop: 35089, Start Num: 14

Candidate Starts for Zeuska\_46:

(5, 35640), (8, 35601), (Start: 14 @35568 has 196 MA's), (24, 35487), (29, 35466), (36, 35397), (47, 35334), (49, 35325), (54, 35178), (57, 35142),

Gene: Zimmer\_47 Start: 34365, Stop: 33847, Start Num: 11

Candidate Starts for Zimmer\_47:

(Start: 9 @34380 has 11 MA's), (Start: 11 @34365 has 20 MA's), (18, 34296), (28, 34257), (41, 34146), (52, 33948), (53, 33945),

Gene: Zolita\_43 Start: 33085, Stop: 32549, Start Num: 10

Candidate Starts for Zolita\_43:

(Start: 10 @33085 has 15 MA's), (24, 32950), (25, 32944), (47, 32800),