



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 161774 Report

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

Pham number 161774 has 98 members, 11 are drafts.

Phages represented in each track:

- Track 1 : Jorgensen\_102, Abrogate\_900, Sagefire\_87, SkiPole\_101, Marsha\_95, RidgeCB\_92, Paraselene\_89, Jerm2\_91, BigMau\_92, Marge\_88, PinkPlastic\_84, Solon\_85
- Track 2 : BaconJack\_97, Monet\_95, Marchy\_83, Payneful\_79, Parliament\_92, Bob3\_93, Nerujay\_95, Mule\_94, Edtherson\_90, Lamina13\_95, Homines\_86, Bxb1\_86, Smairt\_99, Trouble\_92, Gandalf20\_93, Perseus\_92, Fushigi\_86, Sumter\_89, Aeneas\_98, JackSparrow\_93, Hami1\_84, Ashballer\_94, Crispicous1\_88
- Track 3 : Applejack\_92
- Track 4 : Gyzlar\_86
- Track 5 : Violet\_89
- Track 6 : BluSpix\_87, IgnatiusPatJac\_91
- Track 7 : HanShotFirst\_89, Froghopper\_78
- Track 8 : Espresso\_87, StewieG\_89
- Track 9 : Sunshine924\_95, MPlant7149\_91
- Track 10 : Mryolo\_86
- Track 11 : Bones\_88, HarryOW\_93
- Track 12 : JC27\_96
- Track 13 : Zeuska\_93, HermioneGrange\_95
- Track 14 : PhrostyMug\_96
- Track 15 : KBG\_89
- Track 16 : Tasp14\_88
- Track 17 : Rhynn\_84
- Track 18 : Alsfro\_98
- Track 19 : Courthouse\_240, Kalah2\_227, Constella\_227, LittleE\_227, DmpstrDiver\_237, Optimus\_229
- Track 20 : Squint\_237, Minerva\_236, Odette\_237, Duke13\_238
- Track 21 : JuicyJay\_233, Klein\_246, Wanda\_238, Beem\_241, Zelink\_231
- Track 22 : Hughesyang\_240, Schatzie\_230, Yeet\_232, Phoebus\_236
- Track 23 : Redno2\_229, ThreeRngTarjay\_237, EricMillard\_235
- Track 24 : Bombitas\_222, Bagrid\_243, Ejimix\_229, HokkenD\_230
- Track 25 : Superphikiman\_236, Ariel\_244
- Track 26 : Thibault\_212
- Track 27 : Halley\_240, Lucky2013\_236, Gonephishing\_235, Dallas\_236, MiaZeal\_249, Porcelain\_240
- Track 28 : NihilNomen\_239
- Track 29 : Hannaconda\_228, KashFlow\_230
- Track 30 : Bobby\_216

- Track 31 : Pound\_226
- Track 32 : Dove\_229

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

The start number called the most often in the published annotations is 9, it was called in 42 of the 87 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abrogate\_900, Aeneas\_98, Applejack\_92, Ashballer\_94, BaconJack\_97, BigMau\_92, BluSpix\_87, Bob3\_93, Bones\_88, Bxb1\_86, Crispicious1\_88, Edtherson\_90, Espresso\_87, Fushigi\_86, Gandalf20\_93, Gyzlar\_86, Hami1\_84, HarryOW\_93, Homines\_86, IgnatiusPatJac\_91, JC27\_96, JackSparrow\_93, Jerm2\_91, Jorgensen\_102, KBG\_89, Lamina13\_95, MPlant7149\_91, Marchy\_83, Marge\_88, Marsha\_95, Monet\_95, Mryolo\_86, Mule\_94, Nerujay\_95, Paraselene\_89, Parliament\_92, Payneful\_79, Perseus\_92, PinkPlastic\_84, RidgeCB\_92, Sagefire\_87, SkiPole\_101, Smairt\_99, Solon\_85, StewieG\_89, Sumter\_89, Sunshine924\_95, Trouble\_92, Violet\_89,

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

- Alsfro\_98, HermioneGrange\_95, PhrostyMug\_96, Tasp14\_88, Zeuska\_93,

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

- Ariel\_244, Bagrid\_243, Beem\_241, Bobby\_216, Bombitas\_222, Constella\_227, Courthouse\_240, Dallas\_236, DmpstrDiver\_237, Dove\_229, Duke13\_238, Ejimix\_229, EricMillard\_235, Frogopper\_78, Gonephishing\_235, Halley\_240, HanShotFirst\_89, Hannaconda\_228, HokkenD\_230, Hughesyang\_240, JuicyJay\_233, Kalah2\_227, KashFlow\_230, Klein\_246, LittleE\_227, Lucky2013\_236, MiaZeal\_249, Minerva\_236, NihilNomen\_239, Odette\_237, Optimus\_229, Phoebus\_236, Porcelain\_240, Pound\_226, Redno2\_229, Rhynn\_84, Schatzie\_230, Squint\_237, Superphikiman\_236, Thibault\_212, ThreeRngTarjay\_237, Wanda\_238, Yeet\_232, Zelink\_231,

### **Summary by start number:**

Start 5:

- Found in 49 of 98 ( 50.0% ) of genes in pham
- Manual Annotations of this start: 5 of 87
- Called 10.2% of time when present
- Phage (with cluster) where this start called: Alsfro\_98 (A1), HermioneGrange\_95 (A1), PhrostyMug\_96 (A1), Tasp14\_88 (A1), Zeuska\_93 (A1),

Start 7:

- Found in 2 of 98 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 87
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Frogopper\_78 (A1), HanShotFirst\_89 (A1),

Start 8:

- Found in 3 of 98 ( 3.1% ) of genes in pham
- Manual Annotations of this start: 1 of 87
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Rhynn\_84 (A1),

#### Start 9:

- Found in 54 of 98 ( 55.1% ) of genes in pham
- Manual Annotations of this start: 42 of 87
- Called 90.7% of time when present
- Phage (with cluster) where this start called: Abrogate\_900 (A1), Aeneas\_98 (A1), Applejack\_92 (A1), Ashballer\_94 (A1), BaconJack\_97 (A1), BigMau\_92 (A1), BluSpix\_87 (A1), Bob3\_93 (A1), Bones\_88 (A1), Bxb1\_86 (A1), Crispicious1\_88 (A1), Edtherson\_90 (A1), Espresso\_87 (A1), Fushigi\_86 (A1), Gandalf20\_93 (A1), Gyzlar\_86 (A1), Hami1\_84 (A1), HarryOW\_93 (A1), Homines\_86 (A1), IgnatiusPatJac\_91 (A1), JC27\_96 (A1), JackSparrow\_93 (A1), Jerm2\_91 (A1), Jorgensen\_102 (A1), KBG\_89 (A1), Lamina13\_95 (A1), MPlant7149\_91 (A1), Marchy\_83 (A1), Marge\_88 (A1), Marsha\_95 (A1), Monet\_95 (A1), Mryolo\_86 (A1), Mule\_94 (A1), Nerujay\_95 (A1), Paraselene\_89 (A1), Parliament\_92 (A1), Payneful\_79 (A1), Perseus\_92 (A1), PinkPlastic\_84 (A1), RidgeCB\_92 (A1), Sagefire\_87 (A1), SkiPole\_101 (A1), Smairt\_99 (A1), Solon\_85 (A1), StewieG\_89 (A1), Sumter\_89 (A1), Sunshine924\_95 (A1), Trouble\_92 (A1), Violet\_89 (A1),

#### Start 10:

- Found in 22 of 98 ( 22.4% ) of genes in pham
- Manual Annotations of this start: 20 of 87
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ariel\_244 (J), Bobby\_216 (J), Constella\_227 (J), Courthouse\_240 (J), Dallas\_236 (J), DmpstrDiver\_237 (J), Duke13\_238 (J), Gonephishing\_235 (J), Halley\_240 (J), Kalah2\_227 (J), LittleE\_227 (J), Lucky2013\_236 (J), MiaZeal\_249 (J), Minerva\_236 (J), NihilNomen\_239 (J), Odette\_237 (J), Optimus\_229 (J), Porcelain\_240 (J), Pound\_226 (J), Squint\_237 (J), Superphikiman\_236 (J), Thibault\_212 (J),

#### Start 11:

- Found in 19 of 98 ( 19.4% ) of genes in pham
- Manual Annotations of this start: 17 of 87
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bagrid\_243 (J), Beem\_241 (J), Bombitas\_222 (J), Dove\_229 (J), Ejimix\_229 (J), EricMillard\_235 (J), Hannaconda\_228 (J), HokkenD\_230 (J), Hughesyang\_240 (J), JuicyJay\_233 (J), KashFlow\_230 (J), Klein\_246 (J), Phoebus\_236 (J), Redno2\_229 (J), Schatzie\_230 (J), ThreeRngTarjay\_237 (J), Wanda\_238 (J), Yeet\_232 (J), Zelink\_231 (J),

### Summary by clusters:

There are 2 clusters represented in this pham: A1, J,

Info for manual annotations of cluster A1:

- Start number 5 was manually annotated 5 times for cluster A1.
- Start number 7 was manually annotated 2 times for cluster A1.
- Start number 8 was manually annotated 1 time for cluster A1.
- Start number 9 was manually annotated 42 times for cluster A1.

Info for manual annotations of cluster J:

- Start number 10 was manually annotated 20 times for cluster J.
- Start number 11 was manually annotated 17 times for cluster J.

**Gene Information:**

Gene: Abrogate\_900 Start: 51556, Stop: 51744, Start Num: 9

Candidate Starts for Abrogate\_900:

(Start: 5 @51478 has 5 MA's), (Start: 9 @51556 has 42 MA's), (13, 51595), (17, 51652), (21, 51700), (22, 51703),

Gene: Aeneas\_98 Start: 52710, Stop: 52898, Start Num: 9

Candidate Starts for Aeneas\_98:

(Start: 5 @52632 has 5 MA's), (Start: 9 @52710 has 42 MA's), (13, 52749), (15, 52785), (17, 52806), (21, 52854), (22, 52857),

Gene: Alsfro\_98 Start: 50848, Stop: 51114, Start Num: 5

Candidate Starts for Alsfro\_98:

(Start: 5 @50848 has 5 MA's), (Start: 9 @50926 has 42 MA's), (13, 50965), (17, 51022), (22, 51073),

Gene: Applejack\_92 Start: 48809, Stop: 48997, Start Num: 9

Candidate Starts for Applejack\_92:

(Start: 5 @48731 has 5 MA's), (Start: 9 @48809 has 42 MA's), (13, 48848), (15, 48884), (21, 48953), (22, 48956),

Gene: Ariel\_244 Start: 108574, Stop: 108404, Start Num: 10

Candidate Starts for Ariel\_244:

(Start: 10 @108574 has 20 MA's), (14, 108520), (16, 108499), (18, 108493), (19, 108478), (22, 108448), (23, 108415),

Gene: Ashballer\_94 Start: 51247, Stop: 51435, Start Num: 9

Candidate Starts for Ashballer\_94:

(Start: 5 @51169 has 5 MA's), (Start: 9 @51247 has 42 MA's), (13, 51286), (15, 51322), (17, 51343), (21, 51391), (22, 51394),

Gene: BaconJack\_97 Start: 52821, Stop: 53009, Start Num: 9

Candidate Starts for BaconJack\_97:

(Start: 5 @52743 has 5 MA's), (Start: 9 @52821 has 42 MA's), (13, 52860), (15, 52896), (17, 52917), (21, 52965), (22, 52968),

Gene: Bagrid\_243 Start: 112655, Stop: 112485, Start Num: 11

Candidate Starts for Bagrid\_243:

(Start: 11 @112655 has 17 MA's), (14, 112601), (16, 112580), (18, 112574), (20, 112544), (22, 112529), (23, 112496),

Gene: Beem\_241 Start: 111780, Stop: 111610, Start Num: 11

Candidate Starts for Beem\_241:

(Start: 11 @111780 has 17 MA's), (16, 111705), (18, 111699), (20, 111669), (22, 111654), (23, 111621),

Gene: BigMau\_92 Start: 51680, Stop: 51868, Start Num: 9

Candidate Starts for BigMau\_92:

(Start: 5 @51602 has 5 MA's), (Start: 9 @51680 has 42 MA's), (13, 51719), (17, 51776), (21, 51824), (22, 51827),

Gene: BluSpix\_87 Start: 46262, Stop: 46450, Start Num: 9

Candidate Starts for BluSpix\_87:

(Start: 5 @46184 has 5 MA's), (Start: 9 @46262 has 42 MA's), (13, 46301), (17, 46358), (22, 46409),

Gene: Bob3\_93 Start: 51264, Stop: 51452, Start Num: 9

Candidate Starts for Bob3\_93:

(Start: 5 @51186 has 5 MA's), (Start: 9 @51264 has 42 MA's), (13, 51303), (15, 51339), (17, 51360), (21, 51408), (22, 51411),

Gene: Bobby\_216 Start: 109229, Stop: 109059, Start Num: 10

Candidate Starts for Bobby\_216:

(Start: 10 @109229 has 20 MA's), (14, 109175), (16, 109154), (18, 109148), (19, 109133), (22, 109103), (23, 109070),

Gene: Bombitas\_222 Start: 108057, Stop: 107887, Start Num: 11

Candidate Starts for Bombitas\_222:

(Start: 11 @108057 has 17 MA's), (14, 108003), (16, 107982), (18, 107976), (20, 107946), (22, 107931), (23, 107898),

Gene: Bones\_88 Start: 51556, Stop: 51744, Start Num: 9

Candidate Starts for Bones\_88:

(Start: 5 @51478 has 5 MA's), (Start: 9 @51556 has 42 MA's), (13, 51595), (21, 51700), (22, 51703),

Gene: Bxb1\_86 Start: 49573, Stop: 49761, Start Num: 9

Candidate Starts for Bxb1\_86:

(Start: 5 @49495 has 5 MA's), (Start: 9 @49573 has 42 MA's), (13, 49612), (15, 49648), (17, 49669), (21, 49717), (22, 49720),

Gene: Constella\_227 Start: 109142, Stop: 108972, Start Num: 10

Candidate Starts for Constella\_227:

(Start: 10 @109142 has 20 MA's), (14, 109088), (16, 109067), (18, 109061), (19, 109046), (22, 109016), (23, 108983),

Gene: Courthouse\_240 Start: 109338, Stop: 109168, Start Num: 10

Candidate Starts for Courthouse\_240:

(Start: 10 @109338 has 20 MA's), (14, 109284), (16, 109263), (18, 109257), (19, 109242), (22, 109212), (23, 109179),

Gene: Crispicous1\_88 Start: 49851, Stop: 50039, Start Num: 9

Candidate Starts for Crispicous1\_88:

(Start: 5 @49773 has 5 MA's), (Start: 9 @49851 has 42 MA's), (13, 49890), (15, 49926), (17, 49947), (21, 49995), (22, 49998),

Gene: Dallas\_236 Start: 109912, Stop: 109742, Start Num: 10

Candidate Starts for Dallas\_236:

(Start: 10 @109912 has 20 MA's), (14, 109858), (16, 109837), (18, 109831), (19, 109816), (20, 109801), (22, 109786), (23, 109753),

Gene: DmpstrDiver\_237 Start: 110235, Stop: 110065, Start Num: 10

Candidate Starts for DmpstrDiver\_237:

(Start: 10 @110235 has 20 MA's), (14, 110181), (16, 110160), (18, 110154), (19, 110139), (22, 110109), (23, 110076),

Gene: Dove\_229 Start: 106531, Stop: 106361, Start Num: 11

Candidate Starts for Dove\_229:

(Start: 11 @106531 has 17 MA's), (14, 106477), (16, 106456), (18, 106450), (19, 106435), (20, 106420), (22, 106405), (23, 106372),

Gene: Duke13\_238 Start: 110743, Stop: 110573, Start Num: 10

Candidate Starts for Duke13\_238:

(Start: 10 @110743 has 20 MA's), (14, 110689), (16, 110668), (18, 110662), (19, 110647), (20, 110632), (22, 110617), (23, 110584),

Gene: Edtherson\_90 Start: 50521, Stop: 50709, Start Num: 9

Candidate Starts for Edtherson\_90:

(Start: 5 @50443 has 5 MA's), (Start: 9 @50521 has 42 MA's), (13, 50560), (15, 50596), (17, 50617), (21, 50665), (22, 50668),

Gene: Ejimix\_229 Start: 110016, Stop: 109846, Start Num: 11

Candidate Starts for Ejimix\_229:

(Start: 11 @110016 has 17 MA's), (14, 109962), (16, 109941), (18, 109935), (20, 109905), (22, 109890), (23, 109857),

Gene: EricMillard\_235 Start: 111867, Stop: 111697, Start Num: 11

Candidate Starts for EricMillard\_235:

(Start: 11 @111867 has 17 MA's), (14, 111813), (16, 111792), (18, 111786), (20, 111756), (22, 111741), (23, 111708),

Gene: Espresso\_87 Start: 50872, Stop: 51060, Start Num: 9

Candidate Starts for Espresso\_87:

(Start: 5 @50794 has 5 MA's), (Start: 9 @50872 has 42 MA's), (13, 50911), (21, 51016),

Gene: Froghopper\_78 Start: 46994, Stop: 47188, Start Num: 7

Candidate Starts for Froghopper\_78:

(Start: 7 @46994 has 2 MA's), (Start: 8 @46997 has 1 MA's), (12, 47015),

Gene: Fushigi\_86 Start: 49426, Stop: 49614, Start Num: 9

Candidate Starts for Fushigi\_86:

(Start: 5 @49348 has 5 MA's), (Start: 9 @49426 has 42 MA's), (13, 49465), (15, 49501), (17, 49522), (21, 49570), (22, 49573),

Gene: Gandalf20\_93 Start: 50762, Stop: 50950, Start Num: 9

Candidate Starts for Gandalf20\_93:

(Start: 5 @50684 has 5 MA's), (Start: 9 @50762 has 42 MA's), (13, 50801), (15, 50837), (17, 50858), (21, 50906), (22, 50909),

Gene: Gonephishing\_235 Start: 109462, Stop: 109292, Start Num: 10

Candidate Starts for Gonephishing\_235:

(Start: 10 @109462 has 20 MA's), (14, 109408), (16, 109387), (18, 109381), (19, 109366), (20, 109351), (22, 109336), (23, 109303),

Gene: Gyzlar\_86 Start: 48081, Stop: 48269, Start Num: 9

Candidate Starts for Gyzlar\_86:

(Start: 9 @48081 has 42 MA's), (13, 48120), (15, 48156), (17, 48177), (21, 48225), (22, 48228),

Gene: Halley\_240 Start: 110399, Stop: 110229, Start Num: 10

Candidate Starts for Halley\_240:

(Start: 10 @110399 has 20 MA's), (14, 110345), (16, 110324), (18, 110318), (19, 110303), (20, 110288), (22, 110273), (23, 110240),

Gene: Hami1\_84 Start: 46730, Stop: 46918, Start Num: 9

Candidate Starts for Hami1\_84:

(Start: 5 @46652 has 5 MA's), (Start: 9 @46730 has 42 MA's), (13, 46769), (15, 46805), (17, 46826), (21, 46874), (22, 46877),

Gene: HanShotFirst\_89 Start: 51158, Stop: 51352, Start Num: 7

Candidate Starts for HanShotFirst\_89:

(Start: 7 @51158 has 2 MA's), (Start: 8 @51161 has 1 MA's), (12, 51179),

Gene: Hannaconda\_228 Start: 110059, Stop: 109889, Start Num: 11

Candidate Starts for Hannaconda\_228:

(Start: 11 @110059 has 17 MA's), (16, 109984), (18, 109978), (19, 109963), (20, 109948), (22, 109933), (23, 109900),

Gene: HarryOW\_93 Start: 51952, Stop: 52140, Start Num: 9

Candidate Starts for HarryOW\_93:

(Start: 5 @51874 has 5 MA's), (Start: 9 @51952 has 42 MA's), (13, 51991), (21, 52096), (22, 52099),

Gene: HermioneGrange\_95 Start: 52097, Stop: 52363, Start Num: 5

Candidate Starts for HermioneGrange\_95:

(Start: 5 @52097 has 5 MA's), (Start: 9 @52175 has 42 MA's), (13, 52214), (17, 52271), (21, 52319), (22, 52322),

Gene: HokkenD\_230 Start: 111715, Stop: 111545, Start Num: 11

Candidate Starts for HokkenD\_230:

(Start: 11 @111715 has 17 MA's), (14, 111661), (16, 111640), (18, 111634), (20, 111604), (22, 111589), (23, 111556),

Gene: Homines\_86 Start: 47514, Stop: 47702, Start Num: 9

Candidate Starts for Homines\_86:

(Start: 5 @47436 has 5 MA's), (Start: 9 @47514 has 42 MA's), (13, 47553), (15, 47589), (17, 47610), (21, 47658), (22, 47661),

Gene: Hughesyang\_240 Start: 111748, Stop: 111578, Start Num: 11

Candidate Starts for Hughesyang\_240:

(Start: 11 @111748 has 17 MA's), (14, 111694), (16, 111673), (18, 111667), (20, 111637), (22, 111622), (23, 111589),

Gene: IgnatiusPatJac\_91 Start: 50207, Stop: 50395, Start Num: 9

Candidate Starts for IgnatiusPatJac\_91:

(Start: 5 @50129 has 5 MA's), (Start: 9 @50207 has 42 MA's), (13, 50246), (17, 50303), (22, 50354),

Gene: JC27\_96 Start: 51183, Stop: 51371, Start Num: 9

Candidate Starts for JC27\_96:



(Start: 5 @51105 has 5 MA's), (Start: 9 @51183 has 42 MA's), (13, 51222), (15, 51258), (17, 51279), (21, 51327),

Gene: JackSparrow\_93 Start: 50623, Stop: 50811, Start Num: 9

Candidate Starts for JackSparrow\_93:

(Start: 5 @50545 has 5 MA's), (Start: 9 @50623 has 42 MA's), (13, 50662), (15, 50698), (17, 50719), (21, 50767), (22, 50770),

Gene: Jerm2\_91 Start: 52244, Stop: 52432, Start Num: 9

Candidate Starts for Jerm2\_91:

(Start: 5 @52166 has 5 MA's), (Start: 9 @52244 has 42 MA's), (13, 52283), (17, 52340), (21, 52388), (22, 52391),

Gene: Jorgensen\_102 Start: 52791, Stop: 52979, Start Num: 9

Candidate Starts for Jorgensen\_102:

(Start: 5 @52713 has 5 MA's), (Start: 9 @52791 has 42 MA's), (13, 52830), (17, 52887), (21, 52935), (22, 52938),

Gene: JuicyJay\_233 Start: 111729, Stop: 111559, Start Num: 11

Candidate Starts for JuicyJay\_233:

(Start: 11 @111729 has 17 MA's), (16, 111654), (18, 111648), (20, 111618), (22, 111603), (23, 111570),

Gene: KBG\_89 Start: 52596, Stop: 52784, Start Num: 9

Candidate Starts for KBG\_89:

(Start: 9 @52596 has 42 MA's), (13, 52635), (17, 52692), (21, 52740),

Gene: Kalah2\_227 Start: 109290, Stop: 109120, Start Num: 10

Candidate Starts for Kalah2\_227:

(Start: 10 @109290 has 20 MA's), (14, 109236), (16, 109215), (18, 109209), (19, 109194), (22, 109164), (23, 109131),

Gene: KashFlow\_230 Start: 109952, Stop: 109782, Start Num: 11

Candidate Starts for KashFlow\_230:

(Start: 11 @109952 has 17 MA's), (16, 109877), (18, 109871), (19, 109856), (20, 109841), (22, 109826), (23, 109793),

Gene: Klein\_246 Start: 110960, Stop: 110790, Start Num: 11

Candidate Starts for Klein\_246:

(Start: 11 @110960 has 17 MA's), (16, 110885), (18, 110879), (20, 110849), (22, 110834), (23, 110801),

Gene: Lamina13\_95 Start: 52275, Stop: 52463, Start Num: 9

Candidate Starts for Lamina13\_95:

(Start: 5 @52197 has 5 MA's), (Start: 9 @52275 has 42 MA's), (13, 52314), (15, 52350), (17, 52371), (21, 52419), (22, 52422),

Gene: LittleE\_227 Start: 107654, Stop: 107484, Start Num: 10

Candidate Starts for LittleE\_227:

(Start: 10 @107654 has 20 MA's), (14, 107600), (16, 107579), (18, 107573), (19, 107558), (22, 107528), (23, 107495),

Gene: Lucky2013\_236 Start: 107449, Stop: 107279, Start Num: 10

Candidate Starts for Lucky2013\_236:

(Start: 10 @107449 has 20 MA's), (14, 107395), (16, 107374), (18, 107368), (19, 107353), (20, 107338), (22, 107323), (23, 107290),

Gene: MPlant7149\_91 Start: 50406, Stop: 50594, Start Num: 9

Candidate Starts for MPlant7149\_91:

(6, 50346), (Start: 9 @50406 has 42 MA's), (13, 50445), (17, 50502), (21, 50550), (22, 50553),

Gene: Marchy\_83 Start: 49213, Stop: 49401, Start Num: 9

Candidate Starts for Marchy\_83:

(Start: 5 @49135 has 5 MA's), (Start: 9 @49213 has 42 MA's), (13, 49252), (15, 49288), (17, 49309), (21, 49357), (22, 49360),

Gene: Marge\_88 Start: 50288, Stop: 50476, Start Num: 9

Candidate Starts for Marge\_88:

(Start: 5 @50210 has 5 MA's), (Start: 9 @50288 has 42 MA's), (13, 50327), (17, 50384), (21, 50432), (22, 50435),

Gene: Marsha\_95 Start: 53472, Stop: 53660, Start Num: 9

Candidate Starts for Marsha\_95:

(Start: 5 @53394 has 5 MA's), (Start: 9 @53472 has 42 MA's), (13, 53511), (17, 53568), (21, 53616), (22, 53619),

Gene: MiaZeal\_249 Start: 109586, Stop: 109416, Start Num: 10

Candidate Starts for MiaZeal\_249:

(Start: 10 @109586 has 20 MA's), (14, 109532), (16, 109511), (18, 109505), (19, 109490), (20, 109475), (22, 109460), (23, 109427),

Gene: Minerva\_236 Start: 108644, Stop: 108474, Start Num: 10

Candidate Starts for Minerva\_236:

(Start: 10 @108644 has 20 MA's), (14, 108590), (16, 108569), (18, 108563), (19, 108548), (20, 108533), (22, 108518), (23, 108485),

Gene: Monet\_95 Start: 52421, Stop: 52609, Start Num: 9

Candidate Starts for Monet\_95:

(Start: 5 @52343 has 5 MA's), (Start: 9 @52421 has 42 MA's), (13, 52460), (15, 52496), (17, 52517), (21, 52565), (22, 52568),

Gene: Mryolo\_86 Start: 49530, Stop: 49718, Start Num: 9

Candidate Starts for Mryolo\_86:

(Start: 9 @49530 has 42 MA's), (13, 49569), (15, 49605), (17, 49626), (22, 49677),

Gene: Mule\_94 Start: 50492, Stop: 50680, Start Num: 9

Candidate Starts for Mule\_94:

(Start: 5 @50414 has 5 MA's), (Start: 9 @50492 has 42 MA's), (13, 50531), (15, 50567), (17, 50588), (21, 50636), (22, 50639),

Gene: Nerujay\_95 Start: 52483, Stop: 52671, Start Num: 9

Candidate Starts for Nerujay\_95:

(Start: 5 @52405 has 5 MA's), (Start: 9 @52483 has 42 MA's), (13, 52522), (15, 52558), (17, 52579), (21, 52627), (22, 52630),

Gene: NihilNomen\_239 Start: 109469, Stop: 109299, Start Num: 10

Candidate Starts for NihilNomen\_239:

(1, 109667), (2, 109631), (Start: 10 @109469 has 20 MA's), (14, 109415), (16, 109394), (18, 109388), (19, 109373), (22, 109343), (23, 109310),

Gene: Odette\_237 Start: 110839, Stop: 110669, Start Num: 10

Candidate Starts for Odette\_237:

(Start: 10 @110839 has 20 MA's), (14, 110785), (16, 110764), (18, 110758), (19, 110743), (20, 110728), (22, 110713), (23, 110680),

Gene: Optimus\_229 Start: 108240, Stop: 108070, Start Num: 10

Candidate Starts for Optimus\_229:

(Start: 10 @108240 has 20 MA's), (14, 108186), (16, 108165), (18, 108159), (19, 108144), (22, 108114), (23, 108081),

Gene: Paraselene\_89 Start: 50197, Stop: 50385, Start Num: 9

Candidate Starts for Paraselene\_89:

(Start: 5 @50119 has 5 MA's), (Start: 9 @50197 has 42 MA's), (13, 50236), (17, 50293), (21, 50341), (22, 50344),

Gene: Parliament\_92 Start: 52757, Stop: 52945, Start Num: 9

Candidate Starts for Parliament\_92:

(Start: 5 @52679 has 5 MA's), (Start: 9 @52757 has 42 MA's), (13, 52796), (15, 52832), (17, 52853), (21, 52901), (22, 52904),

Gene: Payneful\_79 Start: 48305, Stop: 48493, Start Num: 9

Candidate Starts for Payneful\_79:

(Start: 5 @48227 has 5 MA's), (Start: 9 @48305 has 42 MA's), (13, 48344), (15, 48380), (17, 48401), (21, 48449), (22, 48452),

Gene: Perseus\_92 Start: 52288, Stop: 52476, Start Num: 9

Candidate Starts for Perseus\_92:

(Start: 5 @52210 has 5 MA's), (Start: 9 @52288 has 42 MA's), (13, 52327), (15, 52363), (17, 52384), (21, 52432), (22, 52435),

Gene: Phoebus\_236 Start: 112956, Stop: 112786, Start Num: 11

Candidate Starts for Phoebus\_236:

(Start: 11 @112956 has 17 MA's), (14, 112902), (16, 112881), (18, 112875), (20, 112845), (22, 112830), (23, 112797),

Gene: PhrostyMug\_96 Start: 52584, Stop: 52850, Start Num: 5

Candidate Starts for PhrostyMug\_96:

(Start: 5 @52584 has 5 MA's), (Start: 9 @52662 has 42 MA's), (13, 52701), (15, 52737), (17, 52758), (21, 52806), (22, 52809),

Gene: PinkPlastic\_84 Start: 48627, Stop: 48815, Start Num: 9

Candidate Starts for PinkPlastic\_84:

(Start: 5 @48549 has 5 MA's), (Start: 9 @48627 has 42 MA's), (13, 48666), (17, 48723), (21, 48771), (22, 48774),

Gene: Porcelain\_240 Start: 108396, Stop: 108226, Start Num: 10

Candidate Starts for Porcelain\_240:

(Start: 10 @108396 has 20 MA's), (14, 108342), (16, 108321), (18, 108315), (19, 108300), (20, 108285), (22, 108270), (23, 108237),

Gene: Pound\_226 Start: 108635, Stop: 108465, Start Num: 10

Candidate Starts for Pound\_226:

(Start: 10 @108635 has 20 MA's), (14, 108581), (16, 108560), (18, 108554), (19, 108539), (22, 108509), (23, 108476),

Gene: Redno2\_229 Start: 107065, Stop: 106895, Start Num: 11

Candidate Starts for Redno2\_229:

(Start: 11 @107065 has 17 MA's), (14, 107011), (16, 106990), (18, 106984), (20, 106954), (22, 106939), (23, 106906),

Gene: Rhynn\_84 Start: 50499, Stop: 50690, Start Num: 8

Candidate Starts for Rhynn\_84:

(Start: 8 @50499 has 1 MA's), (12, 50517),

Gene: RidgeCB\_92 Start: 49870, Stop: 50058, Start Num: 9

Candidate Starts for RidgeCB\_92:

(Start: 5 @49792 has 5 MA's), (Start: 9 @49870 has 42 MA's), (13, 49909), (17, 49966), (21, 50014), (22, 50017),

Gene: Sagefire\_87 Start: 50489, Stop: 50677, Start Num: 9

Candidate Starts for Sagefire\_87:

(Start: 5 @50411 has 5 MA's), (Start: 9 @50489 has 42 MA's), (13, 50528), (17, 50585), (21, 50633), (22, 50636),

Gene: Schatzie\_230 Start: 109981, Stop: 109811, Start Num: 11

Candidate Starts for Schatzie\_230:

(Start: 11 @109981 has 17 MA's), (14, 109927), (16, 109906), (18, 109900), (20, 109870), (22, 109855), (23, 109822),

Gene: SkiPole\_101 Start: 52158, Stop: 52346, Start Num: 9

Candidate Starts for SkiPole\_101:

(Start: 5 @52080 has 5 MA's), (Start: 9 @52158 has 42 MA's), (13, 52197), (17, 52254), (21, 52302), (22, 52305),

Gene: Smairt\_99 Start: 53679, Stop: 53867, Start Num: 9

Candidate Starts for Smairt\_99:

(Start: 5 @53601 has 5 MA's), (Start: 9 @53679 has 42 MA's), (13, 53718), (15, 53754), (17, 53775), (21, 53823), (22, 53826),

Gene: Solon\_85 Start: 48499, Stop: 48687, Start Num: 9

Candidate Starts for Solon\_85:

(Start: 5 @48421 has 5 MA's), (Start: 9 @48499 has 42 MA's), (13, 48538), (17, 48595), (21, 48643), (22, 48646),

Gene: Squint\_237 Start: 109202, Stop: 109032, Start Num: 10

Candidate Starts for Squint\_237:

(Start: 10 @109202 has 20 MA's), (14, 109148), (16, 109127), (18, 109121), (19, 109106), (20, 109091), (22, 109076), (23, 109043),

Gene: StewieG\_89 Start: 48436, Stop: 48624, Start Num: 9

Candidate Starts for StewieG\_89:

(Start: 5 @48358 has 5 MA's), (Start: 9 @48436 has 42 MA's), (13, 48475), (21, 48580),

Gene: Sumter\_89 Start: 51678, Stop: 51866, Start Num: 9  
Candidate Starts for Sumter\_89:  
(Start: 5 @51600 has 5 MA's), (Start: 9 @51678 has 42 MA's), (13, 51717), (15, 51753), (17, 51774),  
(21, 51822), (22, 51825),

Gene: Sunshine924\_95 Start: 50380, Stop: 50568, Start Num: 9  
Candidate Starts for Sunshine924\_95:  
(6, 50320), (Start: 9 @50380 has 42 MA's), (13, 50419), (17, 50476), (21, 50524), (22, 50527),

Gene: Superphikiman\_236 Start: 108134, Stop: 107964, Start Num: 10  
Candidate Starts for Superphikiman\_236:  
(Start: 10 @108134 has 20 MA's), (14, 108080), (16, 108059), (18, 108053), (19, 108038), (22,  
108008), (23, 107975),

Gene: Tasp14\_88 Start: 50361, Stop: 50627, Start Num: 5  
Candidate Starts for Tasp14\_88:  
(Start: 5 @50361 has 5 MA's), (Start: 9 @50439 has 42 MA's), (13, 50478), (21, 50583), (22, 50586),

Gene: Thibault\_212 Start: 104920, Stop: 104750, Start Num: 10  
Candidate Starts for Thibault\_212:  
(3, 105046), (4, 105043), (Start: 10 @104920 has 20 MA's), (14, 104866), (16, 104845), (18, 104839),  
(19, 104824), (22, 104794), (23, 104761),

Gene: ThreeRngTarjay\_237 Start: 112169, Stop: 111999, Start Num: 11  
Candidate Starts for ThreeRngTarjay\_237:  
(Start: 11 @112169 has 17 MA's), (14, 112115), (16, 112094), (18, 112088), (20, 112058), (22,  
112043), (23, 112010),

Gene: Trouble\_92 Start: 51117, Stop: 51305, Start Num: 9  
Candidate Starts for Trouble\_92:  
(Start: 5 @51039 has 5 MA's), (Start: 9 @51117 has 42 MA's), (13, 51156), (15, 51192), (17, 51213),  
(21, 51261), (22, 51264),

Gene: Violet\_89 Start: 51521, Stop: 51709, Start Num: 9  
Candidate Starts for Violet\_89:  
(Start: 5 @51443 has 5 MA's), (Start: 9 @51521 has 42 MA's), (13, 51560), (17, 51617), (21, 51665),

Gene: Wanda\_238 Start: 108590, Stop: 108420, Start Num: 11  
Candidate Starts for Wanda\_238:  
(Start: 11 @108590 has 17 MA's), (16, 108515), (18, 108509), (20, 108479), (22, 108464), (23,  
108431),

Gene: Yeet\_232 Start: 110085, Stop: 109915, Start Num: 11  
Candidate Starts for Yeet\_232:  
(Start: 11 @110085 has 17 MA's), (14, 110031), (16, 110010), (18, 110004), (20, 109974), (22,  
109959), (23, 109926),

Gene: Zelink\_231 Start: 109673, Stop: 109503, Start Num: 11  
Candidate Starts for Zelink\_231:  
(Start: 11 @109673 has 17 MA's), (16, 109598), (18, 109592), (20, 109562), (22, 109547), (23,  
109514),

Gene: Zeuska\_93 Start: 52658, Stop: 52924, Start Num: 5

Candidate Starts for Zeuska\_93:

(Start: 5 @52658 has 5 MA's), (Start: 9 @52736 has 42 MA's), (13, 52775), (17, 52832), (21, 52880),  
(22, 52883),