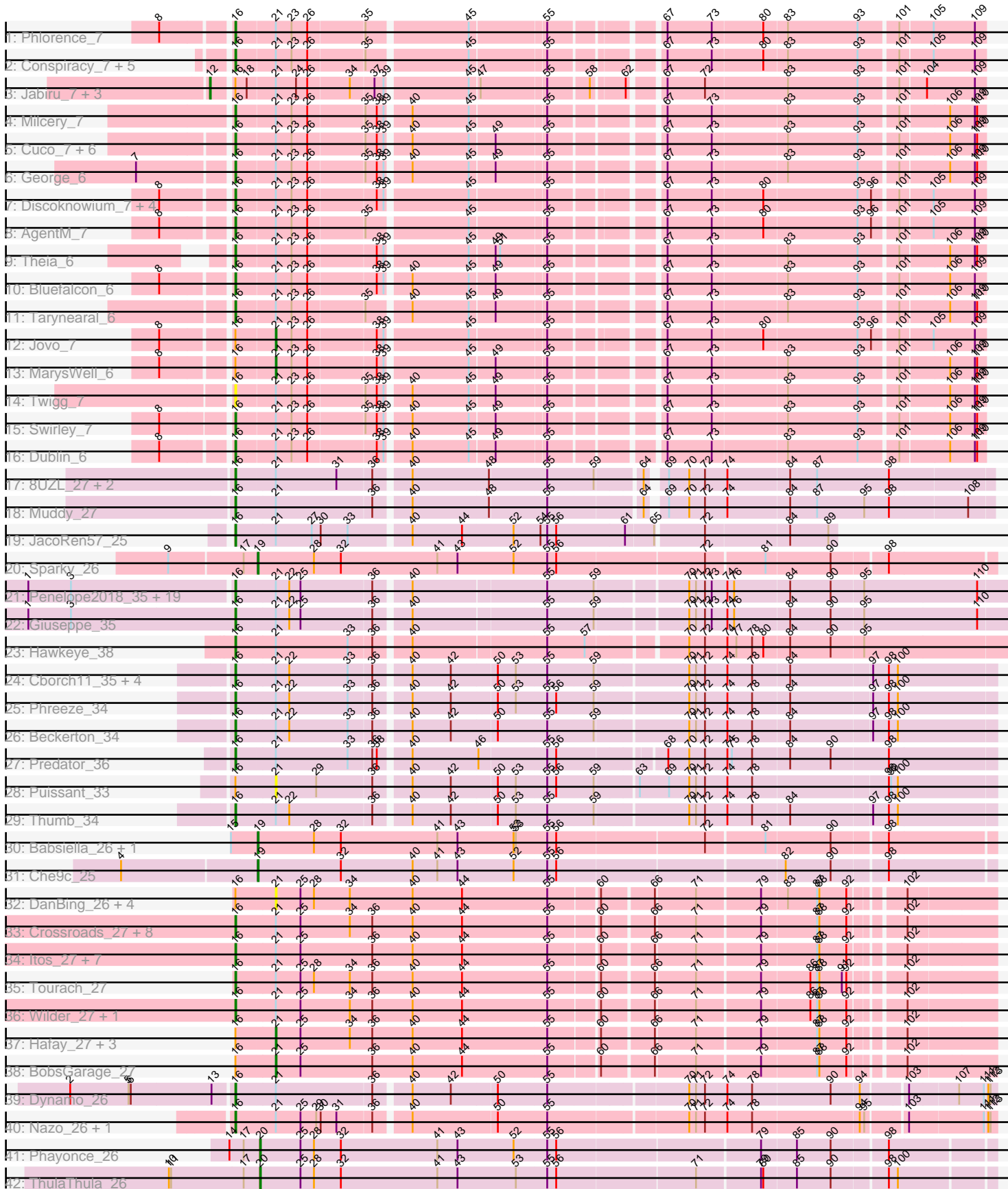


Pham 196405



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 196405 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196405 has 110 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Phlorence\_7
- Track 2 : Conspiracy\_7, Lev2\_7, ForGetIt\_7, PickleBack\_7, Tiger\_7, Archetta\_7
- Track 3 : Jabiru\_7, Airmid\_7, Benedict\_7, ElTiger69\_7
- Track 4 : Milcery\_7
- Track 5 : Cuco\_7, Coog\_7, HuhtaEnerson15\_7, LittleCherry\_7, Micasa\_7, Bonamassa\_7, Midas2\_7
- Track 6 : George\_6
- Track 7 : Discoknowium\_7, Zolita\_6, Aragog\_7, Ghouboy\_7, SydNat\_7
- Track 8 : AgentM\_7
- Track 9 : Theia\_6
- Track 10 : Bluefalcon\_6
- Track 11 : Tarynearal\_6
- Track 12 : Jovo\_7
- Track 13 : MarysWell\_6
- Track 14 : Twigg\_7
- Track 15 : Swirley\_7
- Track 16 : Dublin\_6
- Track 17 : 8UZL\_27, FF47\_27, Maco6\_25
- Track 18 : Muddy\_27
- Track 19 : JacoRen57\_25
- Track 20 : Sparky\_26
- Track 21 : Penelope2018\_35, Thoth\_35, Delton\_35, Nova\_35, Butterscotch\_35, Erk16\_35, PLOT\_36, BigMama\_33, Prager\_35, Chill\_36, SirHarley\_34, KandZ\_35, Troll4\_35, Adjutor\_36, Mopey\_35, Visconti\_35, PBI1\_35, WaldoWhy\_36, Gumball\_34, Helpful\_36
- Track 22 : Giuseppe\_35
- Track 23 : Hawkeye\_38
- Track 24 : Cborch11\_35, Oaker\_34, Megatron06\_36, Konstantine\_39, Damien\_34
- Track 25 : Phreeze\_34
- Track 26 : Beckerton\_34
- Track 27 : Predator\_36
- Track 28 : Puissant\_33
- Track 29 : Thumb\_34
- Track 30 : Babsiella\_26, HC\_27
- Track 31 : Che9c\_25
- Track 32 : DanBing\_26, Baoshan\_26, DHan\_27, Claus\_27, ZhongYanYuan\_26

- Track 33 : Crossroads\_27, LilDestine\_27, Loadrie\_27, Vetrix\_27, Wigglewiggle\_27, GuuelaD\_27, Gardann\_27, MkaliMitinis3\_27, Nicholasp3\_27
- Track 34 : Itos\_27, Breezona\_27, DrSeegs\_27, Netyap\_27, Winky\_27, Faith1\_27, BigCheese\_27, Miley16\_27
- Track 35 : Tourach\_27
- Track 36 : Wilder\_27, Kahlid\_27
- Track 37 : Hafay\_27, Soap141\_27, Sarshaun\_27, Lewan\_27
- Track 38 : BobsGarage\_27
- Track 39 : Dynamo\_26
- Track 40 : Nazo\_26, BigNuz\_26
- Track 41 : Phayonce\_26
- Track 42 : ThulaThula\_26

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

The start number called the most often in the published annotations is 16, it was called in 83 of the 97 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- 8UZL\_27, Adjutor\_36, AgentM\_7, Aragog\_7, Archetta\_7, Beckerton\_34, BigCheese\_27, BigMama\_33, BigNuz\_26, Bluefalcon\_6, Bonamassa\_7, Breezona\_27, Butterscotch\_35, Cborch11\_35, Chill\_36, Conspiracy\_7, Coog\_7, Crossroads\_27, Cucu\_7, Damien\_34, Delton\_35, Discoknowium\_7, DrSeegs\_27, Dublin\_6, Dynamo\_26, Erk16\_35, FF47\_27, Faith1\_27, ForGetIt\_7, Gardann\_27, George\_6, Ghoulyboy\_7, Giuseppe\_35, Gumball\_34, GuuelaD\_27, Hawkeye\_38, Helpful\_36, HuhtaEnerson15\_7, Itos\_27, JacoRen57\_25, Kahlid\_27, KandZ\_35, Konstantine\_39, Lev2\_7, LilDestine\_27, LittleCherry\_7, Loadrie\_27, Maco6\_25, Megatron06\_36, Micasa\_7, Midas2\_7, Milcery\_7, Miley16\_27, MkaliMitinis3\_27, Mopey\_35, Muddy\_27, Nazo\_26, Netyap\_27, Nicholasp3\_27, Nova\_35, Oaker\_34, PBI1\_35, PLOT\_36, Penelope2018\_35, Phlorence\_7, Phreeze\_34, PickleBack\_7, Prager\_35, Predator\_36, SirHarley\_34, Swirley\_7, SydNat\_7, Tarynearal\_6, Theia\_6, Thoth\_35, Thumb\_34, Tiger\_7, Tourach\_27, Troll4\_35, Twigg\_7, Vetrix\_27, Visconti\_35, WaldoWhy\_36, Wigglewiggle\_27, Wilder\_27, Winky\_27, Zolita\_6,

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

- Airmid\_7, Baoshan\_26, Benedict\_7, BobsGarage\_27, Claus\_27, DHan\_27, DanBing\_26, EITiger69\_7, Hafay\_27, Jabiru\_7, Jovo\_7, Lewan\_27, MarysWell\_6, Puissant\_33, Sarshaun\_27, Soap141\_27, ZhongYanYuan\_26,

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

- Babsiella\_26, Che9c\_25, HC\_27, Phayonce\_26, Sparky\_26, ThulaThula\_26,

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

Start 12:

- Found in 4 of 110 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 4 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Airmid\_7 (A5), Benedict\_7 (A5), EITiger69\_7 (A5), Jabiru\_7 (A5),

Start 16:

- Found in 104 of 110 ( 94.5% ) of genes in pham
- Manual Annotations of this start: 83 of 97
- Called 83.7% of time when present
- Phage (with cluster) where this start called: 8UZL\_27 (AB), Adjutor\_36 (D1), AgentM\_7 (A5), Aragog\_7 (A5), Archetta\_7 (A5), Beckerton\_34 (H1), BigCheese\_27 (L2), BigMama\_33 (D1), BigNuz\_26 (P4), Bluefalcon\_6 (A5), Bonamassa\_7 (A5), Breezona\_27 (L2), Butterscotch\_35 (D1), Cborch11\_35 (H1), Chill\_36 (D1), Conspiracy\_7 (A5), Coog\_7 (A5), Crossroads\_27 (L2), Cuco\_7 (A5), Damien\_34 (H1), Delton\_35 (D1), Discoknowium\_7 (A5), DrSeegs\_27 (L2), Dublin\_6 (A5), Dynamo\_26 (P1), Erk16\_35 (D1), FF47\_27 (AB), Faith1\_27 (L2), ForGetIt\_7 (A5), Gardann\_27 (L2), George\_6 (A5), Ghouboy\_7 (A5), Giuseppe\_35 (D1), Gumball\_34 (D1), GuuelaD\_27 (L2), Hawkeye\_38 (D2), Helpful\_36 (D1), HuhtaEnerson15\_7 (A5), Itos\_27 (L2), JacoRen57\_25 (AB), Kahlid\_27 (L2), KandZ\_35 (D1), Konstantine\_39 (H1), Lev2\_7 (A5), LilDestine\_27 (L2), LittleCherry\_7 (A5), Loadrie\_27 (L2), Maco6\_25 (AB), Megatron06\_36 (H1), Micasa\_7 (A5), Midas2\_7 (A5), Milcery\_7 (A5), Miley16\_27 (L2), MkaliMitinis3\_27 (L2), Mopey\_35 (D1), Muddy\_27 (AB), Nazo\_26 (P4), Netyap\_27 (L2), Nicholasp3\_27 (L2), Nova\_35 (D1), Oaker\_34 (H1), PBI1\_35 (D1), PLOT\_36 (D1), Penelope2018\_35 (D1), Phlorence\_7 (A5), Phreeze\_34 (H1), PickleBack\_7 (A5), Prager\_35 (D1), Predator\_36 (H1), SirHarley\_34 (D1), Swirley\_7 (A5), SydNat\_7 (A5), Tarynearal\_6 (A5), Theia\_6 (A5), Thoth\_35 (D1), Thumb\_34 (H1), Tiger\_7 (A5), Tourach\_27 (L2), Troll4\_35 (D1), Twigg\_7 (A5), Vetric\_27 (L2), Visconti\_35 (D1), WaldoWhy\_36 (D1), Wigglewigg\_27 (L2), Wilder\_27 (L2), Winky\_27 (L2), Zolita\_6 (A5),

Start 19:

- Found in 4 of 110 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 4 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Babsiella\_26 (I1), Che9c\_25 (I2), HC\_27 (I1), Sparky\_26 (AF),

Start 20:

- Found in 2 of 110 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Phayonce\_26 (P5), ThulaThula\_26 (P5),

Start 21:

- Found in 104 of 110 ( 94.5% ) of genes in pham
- Manual Annotations of this start: 4 of 97
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Baoshan\_26 (L2), BobsGarage\_27 (L2), Claus\_27 (L2), DHan\_27 (L2), DanBing\_26 (L2), Hafay\_27 (L2), Jovo\_7 (A5), Lewan\_27 (L2), MarysWell\_6 (A5), Puissant\_33 (H1), Sarshaun\_27 (L2), Soap141\_27 (L2), ZhongYanYuan\_26 (L2),

**Summary by clusters:**

There are 12 clusters represented in this pham: AB, P4, P5, I1, H1, P1, A5, AF, L2, D2, I2, D1,

Info for manual annotations of cluster A5:

- Start number 12 was manually annotated 4 times for cluster A5.
- Start number 16 was manually annotated 27 times for cluster A5.
- Start number 21 was manually annotated 2 times for cluster A5.

Info for manual annotations of cluster AB:

- Start number 16 was manually annotated 3 times for cluster AB.

Info for manual annotations of cluster AF:

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

Info for manual annotations of cluster D1:

- Start number 16 was manually annotated 20 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 16 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster H1:

- Start number 16 was manually annotated 9 times for cluster H1.

Info for manual annotations of cluster I1:

- Start number 19 was manually annotated 2 times for cluster I1.

Info for manual annotations of cluster I2:

- Start number 19 was manually annotated 1 time for cluster I2.

Info for manual annotations of cluster L2:

- Start number 16 was manually annotated 20 times for cluster L2.
- Start number 21 was manually annotated 2 times for cluster L2.

Info for manual annotations of cluster P1:

- Start number 16 was manually annotated 1 time for cluster P1.

Info for manual annotations of cluster P4:

- Start number 16 was manually annotated 2 times for cluster P4.

Info for manual annotations of cluster P5:

- Start number 20 was manually annotated 2 times for cluster P5.

### **Gene Information:**

Gene: 8UZL\_27 Start: 23139, Stop: 24086, Start Num: 16

Candidate Starts for 8UZL\_27:

(Start: 16 @23139 has 83 MA's), (Start: 21 @23190 has 4 MA's), (31, 23271), (36, 23316), (40, 23358), (48, 23457), (55, 23529), (59, 23589), (64, 23643), (69, 23661), (70, 23688), (72, 23709), (74, 23739), (84, 23820), (87, 23856), (98, 23952),

Gene: Adjutor\_36 Start: 30210, Stop: 31193, Start Num: 16

Candidate Starts for Adjutor\_36:

(1, 29943), (3, 30000), (Start: 16 @30210 has 83 MA's), (Start: 21 @30261 has 4 MA's), (22, 30279), (25, 30294), (36, 30387), (40, 30429), (55, 30597), (59, 30657), (70, 30768), (71, 30777), (72, 30789),

(73, 30798), (74, 30819), (76, 30828), (84, 30900), (90, 30954), (95, 30996), (110, 31146),

Gene: AgentM\_7 Start: 4522, Stop: 5436, Start Num: 16

Candidate Starts for AgentM\_7:

(8, 4438), (Start: 16 @4522 has 83 MA's), (Start: 21 @4573 has 4 MA's), (23, 4594), (26, 4615), (35, 4687), (45, 4813), (55, 4906), (67, 5032), (73, 5089), (80, 5155), (93, 5278), (96, 5296), (101, 5326), (105, 5368), (109, 5422),

Gene: Airmid\_7 Start: 4242, Stop: 5183, Start Num: 12

Candidate Starts for Airmid\_7:

(Start: 12 @4242 has 4 MA's), (Start: 16 @4266 has 83 MA's), (18, 4281), (Start: 21 @4317 has 4 MA's), (24, 4344), (26, 4359), (34, 4413), (37, 4443), (39, 4455), (45, 4557), (47, 4569), (55, 4650), (58, 4701), (62, 4740), (67, 4776), (72, 4824), (83, 4932), (93, 5025), (101, 5073), (104, 5106), (109, 5169),

Gene: Aragog\_7 Start: 4552, Stop: 5466, Start Num: 16

Candidate Starts for Aragog\_7:

(8, 4468), (Start: 16 @4552 has 83 MA's), (Start: 21 @4603 has 4 MA's), (23, 4624), (26, 4645), (38, 4732), (39, 4741), (45, 4843), (55, 4936), (67, 5062), (73, 5119), (80, 5185), (93, 5308), (96, 5326), (101, 5356), (105, 5398), (109, 5452),

Gene: Archetta\_7 Start: 4261, Stop: 5175, Start Num: 16

Candidate Starts for Archetta\_7:

(Start: 16 @4261 has 83 MA's), (Start: 21 @4312 has 4 MA's), (23, 4333), (26, 4354), (35, 4426), (45, 4552), (55, 4645), (67, 4771), (73, 4828), (80, 4894), (83, 4924), (93, 5017), (101, 5065), (105, 5107), (109, 5161),

Gene: Babsiella\_26 Start: 23158, Stop: 24111, Start Num: 19

Candidate Starts for Babsiella\_26:

(15, 23122), (Start: 19 @23158 has 4 MA's), (28, 23233), (32, 23269), (41, 23398), (43, 23425), (52, 23500), (53, 23503), (55, 23542), (56, 23554), (72, 23746), (81, 23821), (90, 23905), (98, 23974),

Gene: Baoshan\_26 Start: 25225, Stop: 26124, Start Num: 21

Candidate Starts for Baoshan\_26:

(Start: 16 @25174 has 83 MA's), (Start: 21 @25225 has 4 MA's), (25, 25258), (28, 25276), (34, 25324), (40, 25408), (44, 25474), (55, 25585), (60, 25645), (66, 25708), (71, 25759), (79, 25840), (83, 25873), (87, 25912), (88, 25915), (92, 25951), (102, 26011),

Gene: Beckerton\_34 Start: 31940, Stop: 32905, Start Num: 16

Candidate Starts for Beckerton\_34:

(Start: 16 @31940 has 83 MA's), (Start: 21 @31991 has 4 MA's), (22, 32009), (33, 32087), (36, 32117), (40, 32159), (42, 32210), (50, 32267), (55, 32330), (59, 32390), (70, 32507), (71, 32516), (72, 32528), (74, 32558), (78, 32591), (84, 32639), (97, 32744), (98, 32765), (100, 32777),

Gene: Benedict\_7 Start: 4244, Stop: 5185, Start Num: 12

Candidate Starts for Benedict\_7:

(Start: 12 @4244 has 4 MA's), (Start: 16 @4268 has 83 MA's), (18, 4283), (Start: 21 @4319 has 4 MA's), (24, 4346), (26, 4361), (34, 4415), (37, 4445), (39, 4457), (45, 4559), (47, 4571), (55, 4652), (58, 4703), (62, 4742), (67, 4778), (72, 4826), (83, 4934), (93, 5027), (101, 5075), (104, 5108), (109, 5171),

Gene: BigCheese\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for BigCheese\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: BigMama\_33 Start: 30286, Stop: 31269, Start Num: 16

Candidate Starts for BigMama\_33:

(1, 30019), (3, 30076), (Start: 16 @30286 has 83 MA's), (Start: 21 @30337 has 4 MA's), (22, 30355), (25, 30370), (36, 30463), (40, 30505), (55, 30673), (59, 30733), (70, 30844), (71, 30853), (72, 30865), (73, 30874), (74, 30895), (76, 30904), (84, 30976), (90, 31030), (95, 31072), (110, 31222),

Gene: BigNuz\_26 Start: 23755, Stop: 24702, Start Num: 16

Candidate Starts for BigNuz\_26:

(Start: 16 @23755 has 83 MA's), (Start: 21 @23806 has 4 MA's), (25, 23839), (29, 23860), (30, 23866), (31, 23887), (36, 23932), (40, 23974), (50, 24082), (55, 24145), (70, 24319), (71, 24328), (72, 24340), (74, 24370), (78, 24403), (94, 24541), (95, 24547), (103, 24592), (111, 24688), (112, 24691), (113, 24694),

Gene: Bluefalcon\_6 Start: 4519, Stop: 5436, Start Num: 16

Candidate Starts for Bluefalcon\_6:

(8, 4435), (Start: 16 @4519 has 83 MA's), (Start: 21 @4570 has 4 MA's), (23, 4591), (26, 4612), (38, 4699), (39, 4708), (40, 4735), (45, 4810), (49, 4840), (55, 4903), (67, 5032), (73, 5089), (83, 5185), (93, 5278), (101, 5326), (106, 5389), (109, 5422),

Gene: BobsGarage\_27 Start: 25404, Stop: 26303, Start Num: 21

Candidate Starts for BobsGarage\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Bonamassa\_7 Start: 4441, Stop: 5358, Start Num: 16

Candidate Starts for Bonamassa\_7:

(Start: 16 @4441 has 83 MA's), (Start: 21 @4492 has 4 MA's), (23, 4513), (26, 4534), (35, 4606), (38, 4621), (39, 4630), (40, 4657), (45, 4732), (49, 4762), (55, 4825), (67, 4954), (73, 5011), (83, 5107), (93, 5200), (101, 5248), (106, 5311), (109, 5344), (110, 5347),

Gene: Breezona\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Breezona\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Butterscotch\_35 Start: 30270, Stop: 31253, Start Num: 16

Candidate Starts for Butterscotch\_35:

(1, 30003), (3, 30060), (Start: 16 @30270 has 83 MA's), (Start: 21 @30321 has 4 MA's), (22, 30339), (25, 30354), (36, 30447), (40, 30489), (55, 30657), (59, 30717), (70, 30828), (71, 30837), (72, 30849), (73, 30858), (74, 30879), (76, 30888), (84, 30960), (90, 31014), (95, 31056), (110, 31206),

Gene: Cborch11\_35 Start: 31405, Stop: 32370, Start Num: 16

Candidate Starts for Cborch11\_35:

(Start: 16 @31405 has 83 MA's), (Start: 21 @31456 has 4 MA's), (22, 31474), (33, 31552), (36, 31582), (40, 31624), (42, 31675), (50, 31732), (53, 31756), (55, 31795), (59, 31855), (70, 31972), (71, 31981), (72, 31993), (74, 32023), (78, 32056), (84, 32104), (97, 32209), (98, 32230), (100, 32242),

Gene: Che9c\_25 Start: 23257, Stop: 24210, Start Num: 19

Candidate Starts for Che9c\_25:

(4, 23080), (Start: 19 @23257 has 4 MA's), (32, 23368), (40, 23464), (41, 23497), (43, 23524), (52, 23599), (55, 23641), (56, 23653), (82, 23944), (90, 24004), (98, 24073),

Gene: Chill\_36 Start: 30276, Stop: 31259, Start Num: 16

Candidate Starts for Chill\_36:

(1, 30009), (3, 30066), (Start: 16 @30276 has 83 MA's), (Start: 21 @30327 has 4 MA's), (22, 30345), (25, 30360), (36, 30453), (40, 30495), (55, 30663), (59, 30723), (70, 30834), (71, 30843), (72, 30855), (73, 30864), (74, 30885), (76, 30894), (84, 30966), (90, 31020), (95, 31062), (110, 31212),

Gene: Claus\_27 Start: 25381, Stop: 26280, Start Num: 21

Candidate Starts for Claus\_27:

(Start: 16 @25330 has 83 MA's), (Start: 21 @25381 has 4 MA's), (25, 25414), (28, 25432), (34, 25480), (40, 25564), (44, 25630), (55, 25741), (60, 25801), (66, 25864), (71, 25915), (79, 25996), (83, 26029), (87, 26068), (88, 26071), (92, 26107), (102, 26167),

Gene: Conspiracy\_7 Start: 4262, Stop: 5176, Start Num: 16

Candidate Starts for Conspiracy\_7:

(Start: 16 @4262 has 83 MA's), (Start: 21 @4313 has 4 MA's), (23, 4334), (26, 4355), (35, 4427), (45, 4553), (55, 4646), (67, 4772), (73, 4829), (80, 4895), (83, 4925), (93, 5018), (101, 5066), (105, 5108), (109, 5162),

Gene: Coog\_7 Start: 4409, Stop: 5326, Start Num: 16

Candidate Starts for Coog\_7:

(Start: 16 @4409 has 83 MA's), (Start: 21 @4460 has 4 MA's), (23, 4481), (26, 4502), (35, 4574), (38, 4589), (39, 4598), (40, 4625), (45, 4700), (49, 4730), (55, 4793), (67, 4922), (73, 4979), (83, 5075), (93, 5168), (101, 5216), (106, 5279), (109, 5312), (110, 5315),

Gene: Crossroads\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Crossroads\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (34, 25503), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Cuco\_7 Start: 4440, Stop: 5357, Start Num: 16

Candidate Starts for Cuco\_7:

(Start: 16 @4440 has 83 MA's), (Start: 21 @4491 has 4 MA's), (23, 4512), (26, 4533), (35, 4605), (38, 4620), (39, 4629), (40, 4656), (45, 4731), (49, 4761), (55, 4824), (67, 4953), (73, 5010), (83, 5106), (93, 5199), (101, 5247), (106, 5310), (109, 5343), (110, 5346),

Gene: DHan\_27 Start: 25317, Stop: 26216, Start Num: 21

Candidate Starts for DHan\_27:

(Start: 16 @25266 has 83 MA's), (Start: 21 @25317 has 4 MA's), (25, 25350), (28, 25368), (34, 25416), (40, 25500), (44, 25566), (55, 25677), (60, 25737), (66, 25800), (71, 25851), (79, 25932), (83, 25965), (87, 26004), (88, 26007), (92, 26043), (102, 26103),

Gene: Damien\_34 Start: 31406, Stop: 32371, Start Num: 16

Candidate Starts for Damien\_34:

(Start: 16 @31406 has 83 MA's), (Start: 21 @31457 has 4 MA's), (22, 31475), (33, 31553), (36, 31583), (40, 31625), (42, 31676), (50, 31733), (53, 31757), (55, 31796), (59, 31856), (70, 31973), (71, 31982), (72, 31994), (74, 32024), (78, 32057), (84, 32105), (97, 32210), (98, 32231), (100, 32243),



Gene: DanBing\_26 Start: 25221, Stop: 26120, Start Num: 21

Candidate Starts for DanBing\_26:

(Start: 16 @25170 has 83 MA's), (Start: 21 @25221 has 4 MA's), (25, 25254), (28, 25272), (34, 25320), (40, 25404), (44, 25470), (55, 25581), (60, 25641), (66, 25704), (71, 25755), (79, 25836), (83, 25869), (87, 25908), (88, 25911), (92, 25947), (102, 26007),

Gene: Delton\_35 Start: 30282, Stop: 31265, Start Num: 16

Candidate Starts for Delton\_35:

(1, 30015), (3, 30072), (Start: 16 @30282 has 83 MA's), (Start: 21 @30333 has 4 MA's), (22, 30351), (25, 30366), (36, 30459), (40, 30501), (55, 30669), (59, 30729), (70, 30840), (71, 30849), (72, 30861), (73, 30870), (74, 30891), (76, 30900), (84, 30972), (90, 31026), (95, 31068), (110, 31218),

Gene: Discoknowium\_7 Start: 4552, Stop: 5466, Start Num: 16

Candidate Starts for Discoknowium\_7:

(8, 4468), (Start: 16 @4552 has 83 MA's), (Start: 21 @4603 has 4 MA's), (23, 4624), (26, 4645), (38, 4732), (39, 4741), (45, 4843), (55, 4936), (67, 5062), (73, 5119), (80, 5185), (93, 5308), (96, 5326), (101, 5356), (105, 5398), (109, 5452),

Gene: DrSeegs\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for DrSeegs\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Dublin\_6 Start: 4408, Stop: 5325, Start Num: 16

Candidate Starts for Dublin\_6:

(8, 4324), (Start: 16 @4408 has 83 MA's), (Start: 21 @4459 has 4 MA's), (23, 4480), (26, 4501), (38, 4588), (39, 4597), (40, 4624), (45, 4699), (49, 4729), (55, 4792), (67, 4921), (73, 4978), (83, 5074), (93, 5167), (101, 5215), (106, 5278), (109, 5311), (110, 5314),

Gene: Dynamo\_26 Start: 23519, Stop: 24466, Start Num: 16

Candidate Starts for Dynamo\_26:

(2, 23309), (5, 23387), (6, 23390), (13, 23495), (Start: 16 @23519 has 83 MA's), (Start: 21 @23570 has 4 MA's), (36, 23696), (40, 23738), (42, 23789), (50, 23846), (55, 23909), (70, 24083), (71, 24092), (72, 24104), (74, 24134), (78, 24167), (90, 24269), (94, 24305), (103, 24356), (107, 24419), (111, 24452), (112, 24455), (113, 24458),

Gene: EITiger69\_7 Start: 4242, Stop: 5183, Start Num: 12

Candidate Starts for EITiger69\_7:

(Start: 12 @4242 has 4 MA's), (Start: 16 @4266 has 83 MA's), (18, 4281), (Start: 21 @4317 has 4 MA's), (24, 4344), (26, 4359), (34, 4413), (37, 4443), (39, 4455), (45, 4557), (47, 4569), (55, 4650), (58, 4701), (62, 4740), (67, 4776), (72, 4824), (83, 4932), (93, 5025), (101, 5073), (104, 5106), (109, 5169),

Gene: Erk16\_35 Start: 30273, Stop: 31262, Start Num: 16

Candidate Starts for Erk16\_35:

(1, 30006), (3, 30063), (Start: 16 @30273 has 83 MA's), (Start: 21 @30324 has 4 MA's), (22, 30342), (25, 30357), (36, 30450), (40, 30492), (55, 30660), (59, 30720), (70, 30837), (71, 30846), (72, 30858), (73, 30867), (74, 30888), (76, 30897), (84, 30969), (90, 31023), (95, 31065), (110, 31215),

Gene: FF47\_27 Start: 23066, Stop: 24013, Start Num: 16

Candidate Starts for FF47\_27:

(Start: 16 @23066 has 83 MA's), (Start: 21 @23117 has 4 MA's), (31, 23198), (36, 23243), (40, 23285), (48, 23384), (55, 23456), (59, 23516), (64, 23570), (69, 23588), (70, 23615), (72, 23636), (74, 23666), (84, 23747), (87, 23783), (98, 23879),

Gene: Faith1\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Faith1\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: ForGetIt\_7 Start: 4288, Stop: 5202, Start Num: 16

Candidate Starts for ForGetIt\_7:

(Start: 16 @4288 has 83 MA's), (Start: 21 @4339 has 4 MA's), (23, 4360), (26, 4381), (35, 4453), (45, 4579), (55, 4672), (67, 4798), (73, 4855), (80, 4921), (83, 4951), (93, 5044), (101, 5092), (105, 5134), (109, 5188),

Gene: Gardann\_27 Start: 25355, Stop: 26305, Start Num: 16

Candidate Starts for Gardann\_27:

(Start: 16 @25355 has 83 MA's), (Start: 21 @25406 has 4 MA's), (25, 25439), (34, 25505), (36, 25535), (40, 25589), (44, 25655), (55, 25766), (60, 25826), (66, 25889), (71, 25940), (79, 26021), (87, 26093), (88, 26096), (92, 26132), (102, 26192),

Gene: George\_6 Start: 4441, Stop: 5358, Start Num: 16

Candidate Starts for George\_6:

(7, 4324), (Start: 16 @4441 has 83 MA's), (Start: 21 @4492 has 4 MA's), (23, 4513), (26, 4534), (35, 4606), (38, 4621), (39, 4630), (40, 4657), (45, 4732), (49, 4762), (55, 4825), (67, 4954), (73, 5011), (83, 5107), (93, 5200), (101, 5248), (106, 5311), (109, 5344), (110, 5347),

Gene: Ghouboy\_7 Start: 4521, Stop: 5435, Start Num: 16

Candidate Starts for Ghouboy\_7:

(8, 4437), (Start: 16 @4521 has 83 MA's), (Start: 21 @4572 has 4 MA's), (23, 4593), (26, 4614), (38, 4701), (39, 4710), (45, 4812), (55, 4905), (67, 5031), (73, 5088), (80, 5154), (93, 5277), (96, 5295), (101, 5325), (105, 5367), (109, 5421),

Gene: Giuseppe\_35 Start: 30271, Stop: 31254, Start Num: 16

Candidate Starts for Giuseppe\_35:

(1, 29995), (3, 30052), (Start: 16 @30271 has 83 MA's), (Start: 21 @30322 has 4 MA's), (22, 30340), (25, 30355), (36, 30448), (40, 30490), (55, 30658), (59, 30718), (70, 30829), (71, 30838), (72, 30850), (73, 30859), (74, 30880), (76, 30889), (84, 30961), (90, 31015), (95, 31057), (110, 31207),

Gene: Gumball\_34 Start: 30220, Stop: 31203, Start Num: 16

Candidate Starts for Gumball\_34:

(1, 29953), (3, 30010), (Start: 16 @30220 has 83 MA's), (Start: 21 @30271 has 4 MA's), (22, 30289), (25, 30304), (36, 30397), (40, 30439), (55, 30607), (59, 30667), (70, 30778), (71, 30787), (72, 30799), (73, 30808), (74, 30829), (76, 30838), (84, 30910), (90, 30964), (95, 31006), (110, 31156),

Gene: GuuelaD\_27 Start: 25387, Stop: 26337, Start Num: 16

Candidate Starts for GuuelaD\_27:

(Start: 16 @25387 has 83 MA's), (Start: 21 @25438 has 4 MA's), (25, 25471), (34, 25537), (36, 25567), (40, 25621), (44, 25687), (55, 25798), (60, 25858), (66, 25921), (71, 25972), (79, 26053), (87, 26125), (88, 26128), (92, 26164), (102, 26224),

Gene: HC\_27 Start: 23214, Stop: 24167, Start Num: 19

Candidate Starts for HC\_27:

(15, 23178), (Start: 19 @23214 has 4 MA's), (28, 23289), (32, 23325), (41, 23454), (43, 23481), (52, 23556), (53, 23559), (55, 23598), (56, 23610), (72, 23802), (81, 23877), (90, 23961), (98, 24030),

Gene: Hafay\_27 Start: 25437, Stop: 26336, Start Num: 21

Candidate Starts for Hafay\_27:

(Start: 16 @25386 has 83 MA's), (Start: 21 @25437 has 4 MA's), (25, 25470), (34, 25536), (36, 25566), (40, 25620), (44, 25686), (55, 25797), (60, 25857), (66, 25920), (71, 25971), (79, 26052), (87, 26124), (88, 26127), (92, 26163), (102, 26223),

Gene: Hawkeye\_38 Start: 30443, Stop: 31420, Start Num: 16

Candidate Starts for Hawkeye\_38:

(Start: 16 @30443 has 83 MA's), (Start: 21 @30494 has 4 MA's), (33, 30590), (36, 30620), (40, 30662), (55, 30830), (57, 30878), (70, 30998), (72, 31019), (74, 31049), (77, 31061), (78, 31082), (80, 31097), (84, 31130), (90, 31184), (95, 31226),

Gene: Helpful\_36 Start: 30270, Stop: 31253, Start Num: 16

Candidate Starts for Helpful\_36:

(1, 30003), (3, 30060), (Start: 16 @30270 has 83 MA's), (Start: 21 @30321 has 4 MA's), (22, 30339), (25, 30354), (36, 30447), (40, 30489), (55, 30657), (59, 30717), (70, 30828), (71, 30837), (72, 30849), (73, 30858), (74, 30879), (76, 30888), (84, 30960), (90, 31014), (95, 31056), (110, 31206),

Gene: HuhtaEnerson15\_7 Start: 4441, Stop: 5358, Start Num: 16

Candidate Starts for HuhtaEnerson15\_7:

(Start: 16 @4441 has 83 MA's), (Start: 21 @4492 has 4 MA's), (23, 4513), (26, 4534), (35, 4606), (38, 4621), (39, 4630), (40, 4657), (45, 4732), (49, 4762), (55, 4825), (67, 4954), (73, 5011), (83, 5107), (93, 5200), (101, 5248), (106, 5311), (109, 5344), (110, 5347),

Gene: Itos\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Itos\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Jabiru\_7 Start: 4242, Stop: 5183, Start Num: 12

Candidate Starts for Jabiru\_7:

(Start: 12 @4242 has 4 MA's), (Start: 16 @4266 has 83 MA's), (18, 4281), (Start: 21 @4317 has 4 MA's), (24, 4344), (26, 4359), (34, 4413), (37, 4443), (39, 4455), (45, 4557), (47, 4569), (55, 4650), (58, 4701), (62, 4740), (67, 4776), (72, 4824), (83, 4932), (93, 5025), (101, 5073), (104, 5106), (109, 5169),

Gene: JacoRen57\_25 Start: 24411, Stop: 25172, Start Num: 16

Candidate Starts for JacoRen57\_25:

(Start: 16 @24411 has 83 MA's), (Start: 21 @24462 has 4 MA's), (27, 24510), (30, 24522), (33, 24558), (40, 24633), (44, 24699), (52, 24762), (54, 24798), (55, 24807), (56, 24819), (61, 24906), (65, 24942), (72, 25002), (84, 25110), (89, 25161),

Gene: Jovo\_7 Start: 4604, Stop: 5467, Start Num: 21

Candidate Starts for Jovo\_7:

(8, 4469), (Start: 16 @4553 has 83 MA's), (Start: 21 @4604 has 4 MA's), (23, 4625), (26, 4646), (38, 4733), (39, 4742), (45, 4844), (55, 4937), (67, 5063), (73, 5120), (80, 5186), (93, 5309), (96, 5327), (101, 5357), (105, 5399), (109, 5453),

Gene: Kahlid\_27 Start: 25358, Stop: 26308, Start Num: 16

Candidate Starts for Kahlid\_27:

(Start: 16 @25358 has 83 MA's), (Start: 21 @25409 has 4 MA's), (25, 25442), (34, 25508), (36, 25538), (40, 25592), (44, 25658), (55, 25769), (60, 25829), (66, 25892), (71, 25943), (79, 26024), (86, 26087), (87, 26096), (88, 26099), (92, 26135), (102, 26195),

Gene: KandZ\_35 Start: 30370, Stop: 31353, Start Num: 16

Candidate Starts for KandZ\_35:

(1, 30103), (3, 30160), (Start: 16 @30370 has 83 MA's), (Start: 21 @30421 has 4 MA's), (22, 30439), (25, 30454), (36, 30547), (40, 30589), (55, 30757), (59, 30817), (70, 30928), (71, 30937), (72, 30949), (73, 30958), (74, 30979), (76, 30988), (84, 31060), (90, 31114), (95, 31156), (110, 31306),

Gene: Konstantine\_39 Start: 32607, Stop: 33572, Start Num: 16

Candidate Starts for Konstantine\_39:

(Start: 16 @32607 has 83 MA's), (Start: 21 @32658 has 4 MA's), (22, 32676), (33, 32754), (36, 32784), (40, 32826), (42, 32877), (50, 32934), (53, 32958), (55, 32997), (59, 33057), (70, 33174), (71, 33183), (72, 33195), (74, 33225), (78, 33258), (84, 33306), (97, 33411), (98, 33432), (100, 33444),

Gene: Lev2\_7 Start: 4261, Stop: 5175, Start Num: 16

Candidate Starts for Lev2\_7:

(Start: 16 @4261 has 83 MA's), (Start: 21 @4312 has 4 MA's), (23, 4333), (26, 4354), (35, 4426), (45, 4552), (55, 4645), (67, 4771), (73, 4828), (80, 4894), (83, 4924), (93, 5017), (101, 5065), (105, 5107), (109, 5161),

Gene: Lewan\_27 Start: 25404, Stop: 26303, Start Num: 21

Candidate Starts for Lewan\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (34, 25503), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: LilDestine\_27 Start: 25352, Stop: 26302, Start Num: 16

Candidate Starts for LilDestine\_27:

(Start: 16 @25352 has 83 MA's), (Start: 21 @25403 has 4 MA's), (25, 25436), (34, 25502), (36, 25532), (40, 25586), (44, 25652), (55, 25763), (60, 25823), (66, 25886), (71, 25937), (79, 26018), (87, 26090), (88, 26093), (92, 26129), (102, 26189),

Gene: LittleCherry\_7 Start: 4442, Stop: 5359, Start Num: 16

Candidate Starts for LittleCherry\_7:

(Start: 16 @4442 has 83 MA's), (Start: 21 @4493 has 4 MA's), (23, 4514), (26, 4535), (35, 4607), (38, 4622), (39, 4631), (40, 4658), (45, 4733), (49, 4763), (55, 4826), (67, 4955), (73, 5012), (83, 5108), (93, 5201), (101, 5249), (106, 5312), (109, 5345), (110, 5348),

Gene: Loadrie\_27 Start: 25385, Stop: 26335, Start Num: 16

Candidate Starts for Loadrie\_27:

(Start: 16 @25385 has 83 MA's), (Start: 21 @25436 has 4 MA's), (25, 25469), (34, 25535), (36, 25565), (40, 25619), (44, 25685), (55, 25796), (60, 25856), (66, 25919), (71, 25970), (79, 26051), (87, 26123), (88, 26126), (92, 26162), (102, 26222),

Gene: Maco6\_25 Start: 22400, Stop: 23347, Start Num: 16

Candidate Starts for Maco6\_25:

(Start: 16 @22400 has 83 MA's), (Start: 21 @22451 has 4 MA's), (31, 22532), (36, 22577), (40, 22619), (48, 22718), (55, 22790), (59, 22850), (64, 22904), (69, 22922), (70, 22949), (72, 22970), (74, 23000), (84, 23081), (87, 23117), (98, 23213),

Gene: MarysWell\_6 Start: 4460, Stop: 5326, Start Num: 21

Candidate Starts for MarysWell\_6:

(8, 4325), (Start: 16 @4409 has 83 MA's), (Start: 21 @4460 has 4 MA's), (23, 4481), (26, 4502), (38, 4589), (39, 4598), (45, 4700), (49, 4730), (55, 4793), (67, 4922), (73, 4979), (83, 5075), (93, 5168), (101, 5216), (106, 5279), (109, 5312), (110, 5315),

Gene: Megatron06\_36 Start: 31939, Stop: 32904, Start Num: 16

Candidate Starts for Megatron06\_36:

(Start: 16 @31939 has 83 MA's), (Start: 21 @31990 has 4 MA's), (22, 32008), (33, 32086), (36, 32116), (40, 32158), (42, 32209), (50, 32266), (53, 32290), (55, 32329), (59, 32389), (70, 32506), (71, 32515), (72, 32527), (74, 32557), (78, 32590), (84, 32638), (97, 32743), (98, 32764), (100, 32776),

Gene: Micasa\_7 Start: 4410, Stop: 5327, Start Num: 16

Candidate Starts for Micasa\_7:

(Start: 16 @4410 has 83 MA's), (Start: 21 @4461 has 4 MA's), (23, 4482), (26, 4503), (35, 4575), (38, 4590), (39, 4599), (40, 4626), (45, 4701), (49, 4731), (55, 4794), (67, 4923), (73, 4980), (83, 5076), (93, 5169), (101, 5217), (106, 5280), (109, 5313), (110, 5316),

Gene: Midas2\_7 Start: 4409, Stop: 5326, Start Num: 16

Candidate Starts for Midas2\_7:

(Start: 16 @4409 has 83 MA's), (Start: 21 @4460 has 4 MA's), (23, 4481), (26, 4502), (35, 4574), (38, 4589), (39, 4598), (40, 4625), (45, 4700), (49, 4730), (55, 4793), (67, 4922), (73, 4979), (83, 5075), (93, 5168), (101, 5216), (106, 5279), (109, 5312), (110, 5315),

Gene: Milcery\_7 Start: 4446, Stop: 5363, Start Num: 16

Candidate Starts for Milcery\_7:

(Start: 16 @4446 has 83 MA's), (Start: 21 @4497 has 4 MA's), (23, 4518), (26, 4539), (35, 4611), (38, 4626), (39, 4635), (40, 4662), (45, 4737), (55, 4830), (67, 4959), (73, 5016), (83, 5112), (93, 5205), (101, 5253), (106, 5316), (109, 5349), (110, 5352),

Gene: Miley16\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Miley16\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: MkaliMitinis3\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for MkaliMitinis3\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (34, 25503), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Mopey\_35 Start: 30270, Stop: 31253, Start Num: 16

Candidate Starts for Mopey\_35:

(1, 30003), (3, 30060), (Start: 16 @30270 has 83 MA's), (Start: 21 @30321 has 4 MA's), (22, 30339), (25, 30354), (36, 30447), (40, 30489), (55, 30657), (59, 30717), (70, 30828), (71, 30837), (72, 30849), (73, 30858), (74, 30879), (76, 30888), (84, 30960), (90, 31014), (95, 31056), (110, 31206),

Gene: Muddy\_27 Start: 23347, Stop: 24294, Start Num: 16

Candidate Starts for Muddy\_27:

(Start: 16 @23347 has 83 MA's), (Start: 21 @23398 has 4 MA's), (36, 23524), (40, 23566), (48, 23665), (55, 23737), (64, 23851), (69, 23869), (70, 23896), (72, 23917), (74, 23947), (84, 24028), (87,

24064), (95, 24127), (98, 24160), (108, 24262),

Gene: Nazo\_26 Start: 23758, Stop: 24705, Start Num: 16

Candidate Starts for Nazo\_26:

(Start: 16 @23758 has 83 MA's), (Start: 21 @23809 has 4 MA's), (25, 23842), (29, 23863), (30, 23869), (31, 23890), (36, 23935), (40, 23977), (50, 24085), (55, 24148), (70, 24322), (71, 24331), (72, 24343), (74, 24373), (78, 24406), (94, 24544), (95, 24550), (103, 24595), (111, 24691), (112, 24694), (113, 24697),

Gene: Netyap\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Netyap\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: Nicholasp3\_27 Start: 25355, Stop: 26305, Start Num: 16

Candidate Starts for Nicholasp3\_27:

(Start: 16 @25355 has 83 MA's), (Start: 21 @25406 has 4 MA's), (25, 25439), (34, 25505), (36, 25535), (40, 25589), (44, 25655), (55, 25766), (60, 25826), (66, 25889), (71, 25940), (79, 26021), (87, 26093), (88, 26096), (92, 26132), (102, 26192),

Gene: Nova\_35 Start: 30697, Stop: 31680, Start Num: 16

Candidate Starts for Nova\_35:

(1, 30430), (3, 30487), (Start: 16 @30697 has 83 MA's), (Start: 21 @30748 has 4 MA's), (22, 30766), (25, 30781), (36, 30874), (40, 30916), (55, 31084), (59, 31144), (70, 31255), (71, 31264), (72, 31276), (73, 31285), (74, 31306), (76, 31315), (84, 31387), (90, 31441), (95, 31483), (110, 31633),

Gene: Oaker\_34 Start: 31663, Stop: 32628, Start Num: 16

Candidate Starts for Oaker\_34:

(Start: 16 @31663 has 83 MA's), (Start: 21 @31714 has 4 MA's), (22, 31732), (33, 31810), (36, 31840), (40, 31882), (42, 31933), (50, 31990), (53, 32014), (55, 32053), (59, 32113), (70, 32230), (71, 32239), (72, 32251), (74, 32281), (78, 32314), (84, 32362), (97, 32467), (98, 32488), (100, 32500),

Gene: PBI1\_35 Start: 30201, Stop: 31184, Start Num: 16

Candidate Starts for PBI1\_35:

(1, 29934), (3, 29991), (Start: 16 @30201 has 83 MA's), (Start: 21 @30252 has 4 MA's), (22, 30270), (25, 30285), (36, 30378), (40, 30420), (55, 30588), (59, 30648), (70, 30759), (71, 30768), (72, 30780), (73, 30789), (74, 30810), (76, 30819), (84, 30891), (90, 30945), (95, 30987), (110, 31137),

Gene: PLOT\_36 Start: 30273, Stop: 31256, Start Num: 16

Candidate Starts for PLOT\_36:

(1, 30006), (3, 30063), (Start: 16 @30273 has 83 MA's), (Start: 21 @30324 has 4 MA's), (22, 30342), (25, 30357), (36, 30450), (40, 30492), (55, 30660), (59, 30720), (70, 30831), (71, 30840), (72, 30852), (73, 30861), (74, 30882), (76, 30891), (84, 30963), (90, 31017), (95, 31059), (110, 31209),

Gene: Penelope2018\_35 Start: 30270, Stop: 31253, Start Num: 16

Candidate Starts for Penelope2018\_35:

(1, 30003), (3, 30060), (Start: 16 @30270 has 83 MA's), (Start: 21 @30321 has 4 MA's), (22, 30339), (25, 30354), (36, 30447), (40, 30489), (55, 30657), (59, 30717), (70, 30828), (71, 30837), (72, 30849), (73, 30858), (74, 30879), (76, 30888), (84, 30960), (90, 31014), (95, 31056), (110, 31206),

Gene: Phayonce\_26 Start: 23684, Stop: 24628, Start Num: 20

Candidate Starts for Phayonce\_26:

(14, 23645), (17, 23663), (Start: 20 @23684 has 2 MA's), (25, 23738), (28, 23756), (32, 23792), (41, 23921), (43, 23948), (52, 24023), (55, 24065), (56, 24077), (79, 24338), (85, 24383), (90, 24428), (98, 24497),

Gene: Phlorence\_7 Start: 4552, Stop: 5466, Start Num: 16

Candidate Starts for Phlorence\_7:

(8, 4468), (Start: 16 @4552 has 83 MA's), (Start: 21 @4603 has 4 MA's), (23, 4624), (26, 4645), (35, 4717), (45, 4843), (55, 4936), (67, 5062), (73, 5119), (80, 5185), (83, 5215), (93, 5308), (101, 5356), (105, 5398), (109, 5452),

Gene: Phreeze\_34 Start: 31406, Stop: 32371, Start Num: 16

Candidate Starts for Phreeze\_34:

(Start: 16 @31406 has 83 MA's), (Start: 21 @31457 has 4 MA's), (22, 31475), (33, 31553), (36, 31583), (40, 31625), (42, 31676), (50, 31733), (53, 31757), (55, 31796), (56, 31808), (59, 31856), (70, 31973), (71, 31982), (72, 31994), (74, 32024), (78, 32057), (84, 32105), (97, 32210), (98, 32231), (100, 32243),

Gene: PickleBack\_7 Start: 4262, Stop: 5176, Start Num: 16

Candidate Starts for PickleBack\_7:

(Start: 16 @4262 has 83 MA's), (Start: 21 @4313 has 4 MA's), (23, 4334), (26, 4355), (35, 4427), (45, 4553), (55, 4646), (67, 4772), (73, 4829), (80, 4895), (83, 4925), (93, 5018), (101, 5066), (105, 5108), (109, 5162),

Gene: Prager\_35 Start: 30282, Stop: 31265, Start Num: 16

Candidate Starts for Prager\_35:

(1, 30015), (3, 30072), (Start: 16 @30282 has 83 MA's), (Start: 21 @30333 has 4 MA's), (22, 30351), (25, 30366), (36, 30459), (40, 30501), (55, 30669), (59, 30729), (70, 30840), (71, 30849), (72, 30861), (73, 30870), (74, 30891), (76, 30900), (84, 30972), (90, 31026), (95, 31068), (110, 31218),

Gene: Predator\_36 Start: 30631, Stop: 31587, Start Num: 16

Candidate Starts for Predator\_36:

(Start: 16 @30631 has 83 MA's), (Start: 21 @30682 has 4 MA's), (33, 30778), (36, 30808), (38, 30814), (40, 30850), (46, 30937), (55, 31021), (56, 31033), (68, 31159), (70, 31186), (72, 31207), (74, 31237), (75, 31243), (78, 31270), (84, 31318), (90, 31372), (98, 31447),

Gene: Puissant\_33 Start: 31945, Stop: 32859, Start Num: 21

Candidate Starts for Puissant\_33:

(Start: 16 @31894 has 83 MA's), (Start: 21 @31945 has 4 MA's), (29, 31999), (36, 32071), (40, 32113), (42, 32164), (50, 32221), (53, 32245), (55, 32284), (56, 32296), (59, 32344), (63, 32395), (69, 32434), (70, 32461), (71, 32470), (72, 32482), (74, 32512), (78, 32545), (98, 32719), (99, 32722), (100, 32731),

Gene: Sarshaun\_27 Start: 25437, Stop: 26336, Start Num: 21

Candidate Starts for Sarshaun\_27:

(Start: 16 @25386 has 83 MA's), (Start: 21 @25437 has 4 MA's), (25, 25470), (34, 25536), (36, 25566), (40, 25620), (44, 25686), (55, 25797), (60, 25857), (66, 25920), (71, 25971), (79, 26052), (87, 26124), (88, 26127), (92, 26163), (102, 26223),

Gene: SirHarley\_34 Start: 30202, Stop: 31185, Start Num: 16

Candidate Starts for SirHarley\_34:

(1, 29935), (3, 29992), (Start: 16 @30202 has 83 MA's), (Start: 21 @30253 has 4 MA's), (22, 30271), (25, 30286), (36, 30379), (40, 30421), (55, 30589), (59, 30649), (70, 30760), (71, 30769), (72, 30781), (73, 30790), (74, 30811), (76, 30820), (84, 30892), (90, 30946), (95, 30988), (110, 31138),

Gene: Soap141\_27 Start: 25437, Stop: 26336, Start Num: 21

Candidate Starts for Soap141\_27:

(Start: 16 @25386 has 83 MA's), (Start: 21 @25437 has 4 MA's), (25, 25470), (34, 25536), (36, 25566), (40, 25620), (44, 25686), (55, 25797), (60, 25857), (66, 25920), (71, 25971), (79, 26052), (87, 26124), (88, 26127), (92, 26163), (102, 26223),

Gene: Sparky\_26 Start: 24326, Stop: 25279, Start Num: 19

Candidate Starts for Sparky\_26:

(9, 24212), (17, 24308), (Start: 19 @24326 has 4 MA's), (28, 24401), (32, 24437), (41, 24566), (43, 24593), (52, 24668), (55, 24710), (56, 24722), (72, 24914), (81, 24989), (90, 25073), (98, 25142),

Gene: Swirley\_7 Start: 4411, Stop: 5328, Start Num: 16

Candidate Starts for Swirley\_7:

(8, 4324), (Start: 16 @4411 has 83 MA's), (Start: 21 @4462 has 4 MA's), (23, 4483), (26, 4504), (35, 4576), (38, 4591), (39, 4600), (40, 4627), (45, 4702), (49, 4732), (55, 4795), (67, 4924), (73, 4981), (83, 5077), (93, 5170), (101, 5218), (106, 5281), (109, 5314), (110, 5317),

Gene: SydNat\_7 Start: 4521, Stop: 5435, Start Num: 16

Candidate Starts for SydNat\_7:

(8, 4437), (Start: 16 @4521 has 83 MA's), (Start: 21 @4572 has 4 MA's), (23, 4593), (26, 4614), (38, 4701), (39, 4710), (45, 4812), (55, 4905), (67, 5031), (73, 5088), (80, 5154), (93, 5277), (96, 5295), (101, 5325), (105, 5367), (109, 5421),

Gene: Tarynearal\_6 Start: 4438, Stop: 5355, Start Num: 16

Candidate Starts for Tarynearal\_6:

(Start: 16 @4438 has 83 MA's), (Start: 21 @4489 has 4 MA's), (23, 4510), (26, 4531), (35, 4603), (40, 4654), (45, 4729), (49, 4759), (55, 4822), (67, 4951), (73, 5008), (83, 5104), (93, 5197), (101, 5245), (106, 5308), (109, 5341), (110, 5344),

Gene: Theia\_6 Start: 4377, Stop: 5294, Start Num: 16

Candidate Starts for Theia\_6:

(Start: 16 @4377 has 83 MA's), (Start: 21 @4428 has 4 MA's), (23, 4449), (26, 4470), (38, 4557), (39, 4566), (45, 4668), (49, 4698), (51, 4704), (55, 4761), (67, 4890), (73, 4947), (83, 5043), (93, 5136), (101, 5184), (106, 5247), (109, 5280), (110, 5283),

Gene: Thoth\_35 Start: 30267, Stop: 31250, Start Num: 16

Candidate Starts for Thoth\_35:

(1, 30000), (3, 30057), (Start: 16 @30267 has 83 MA's), (Start: 21 @30318 has 4 MA's), (22, 30336), (25, 30351), (36, 30444), (40, 30486), (55, 30654), (59, 30714), (70, 30825), (71, 30834), (72, 30846), (73, 30855), (74, 30876), (76, 30885), (84, 30957), (90, 31011), (95, 31053), (110, 31203),

Gene: ThulaThula\_26 Start: 23690, Stop: 24634, Start Num: 20

Candidate Starts for ThulaThula\_26:

(10, 23570), (11, 23573), (17, 23669), (Start: 20 @23690 has 2 MA's), (25, 23744), (28, 23762), (32, 23798), (41, 23927), (43, 23954), (53, 24032), (55, 24071), (56, 24083), (71, 24263), (79, 24344), (80, 24347), (85, 24389), (90, 24434), (98, 24503), (100, 24515),

Gene: Thumb\_34 Start: 31403, Stop: 32368, Start Num: 16

Candidate Starts for Thumb\_34:

(Start: 16 @31403 has 83 MA's), (Start: 21 @31454 has 4 MA's), (22, 31472), (36, 31580), (40, 31622), (42, 31673), (50, 31730), (53, 31754), (55, 31793), (59, 31853), (70, 31970), (71, 31979), (72, 31991), (74, 32021), (78, 32054), (84, 32102), (97, 32207), (98, 32228), (100, 32240),



Gene: Tiger\_7 Start: 4261, Stop: 5175, Start Num: 16

Candidate Starts for Tiger\_7:

(Start: 16 @4261 has 83 MA's), (Start: 21 @4312 has 4 MA's), (23, 4333), (26, 4354), (35, 4426), (45, 4552), (55, 4645), (67, 4771), (73, 4828), (80, 4894), (83, 4924), (93, 5017), (101, 5065), (105, 5107), (109, 5161),

Gene: Tourach\_27 Start: 25350, Stop: 26300, Start Num: 16

Candidate Starts for Tourach\_27:

(Start: 16 @25350 has 83 MA's), (Start: 21 @25401 has 4 MA's), (25, 25434), (28, 25452), (34, 25500), (36, 25530), (40, 25584), (44, 25650), (55, 25761), (60, 25821), (66, 25884), (71, 25935), (79, 26016), (86, 26079), (87, 26088), (88, 26091), (91, 26121), (92, 26127), (102, 26187),

Gene: Troll4\_35 Start: 30271, Stop: 31254, Start Num: 16

Candidate Starts for Troll4\_35:

(1, 30004), (3, 30061), (Start: 16 @30271 has 83 MA's), (Start: 21 @30322 has 4 MA's), (22, 30340), (25, 30355), (36, 30448), (40, 30490), (55, 30658), (59, 30718), (70, 30829), (71, 30838), (72, 30850), (73, 30859), (74, 30880), (76, 30889), (84, 30961), (90, 31015), (95, 31057), (110, 31207),

Gene: Twigg\_7 Start: 4410, Stop: 5327, Start Num: 16

Candidate Starts for Twigg\_7:

(Start: 16 @4410 has 83 MA's), (Start: 21 @4461 has 4 MA's), (23, 4482), (26, 4503), (35, 4575), (38, 4590), (39, 4599), (40, 4626), (45, 4701), (49, 4731), (55, 4794), (67, 4923), (73, 4980), (83, 5076), (93, 5169), (101, 5217), (106, 5280), (109, 5313), (110, 5316),

Gene: Vetric\_27 Start: 25359, Stop: 26309, Start Num: 16

Candidate Starts for Vetric\_27:

(Start: 16 @25359 has 83 MA's), (Start: 21 @25410 has 4 MA's), (25, 25443), (34, 25509), (36, 25539), (40, 25593), (44, 25659), (55, 25770), (60, 25830), (66, 25893), (71, 25944), (79, 26025), (87, 26097), (88, 26100), (92, 26136), (102, 26196),

Gene: Visconti\_35 Start: 30280, Stop: 31263, Start Num: 16

Candidate Starts for Visconti\_35:

(1, 30013), (3, 30070), (Start: 16 @30280 has 83 MA's), (Start: 21 @30331 has 4 MA's), (22, 30349), (25, 30364), (36, 30457), (40, 30499), (55, 30667), (59, 30727), (70, 30838), (71, 30847), (72, 30859), (73, 30868), (74, 30889), (76, 30898), (84, 30970), (90, 31024), (95, 31066), (110, 31216),

Gene: WaldoWhy\_36 Start: 30276, Stop: 31259, Start Num: 16

Candidate Starts for WaldoWhy\_36:

(1, 30009), (3, 30066), (Start: 16 @30276 has 83 MA's), (Start: 21 @30327 has 4 MA's), (22, 30345), (25, 30360), (36, 30453), (40, 30495), (55, 30663), (59, 30723), (70, 30834), (71, 30843), (72, 30855), (73, 30864), (74, 30885), (76, 30894), (84, 30966), (90, 31020), (95, 31062), (110, 31212),

Gene: Wigglewigg\_27 Start: 25385, Stop: 26335, Start Num: 16

Candidate Starts for Wigglewigg\_27:

(Start: 16 @25385 has 83 MA's), (Start: 21 @25436 has 4 MA's), (25, 25469), (34, 25535), (36, 25565), (40, 25619), (44, 25685), (55, 25796), (60, 25856), (66, 25919), (71, 25970), (79, 26051), (87, 26123), (88, 26126), (92, 26162), (102, 26222),

Gene: Wilder\_27 Start: 25358, Stop: 26308, Start Num: 16

Candidate Starts for Wilder\_27:

(Start: 16 @25358 has 83 MA's), (Start: 21 @25409 has 4 MA's), (25, 25442), (34, 25508), (36, 25538), (40, 25592), (44, 25658), (55, 25769), (60, 25829), (66, 25892), (71, 25943), (79, 26024), (86,

26087), (87, 26096), (88, 26099), (92, 26135), (102, 26195),

Gene: Winky\_27 Start: 25353, Stop: 26303, Start Num: 16

Candidate Starts for Winky\_27:

(Start: 16 @25353 has 83 MA's), (Start: 21 @25404 has 4 MA's), (25, 25437), (36, 25533), (40, 25587), (44, 25653), (55, 25764), (60, 25824), (66, 25887), (71, 25938), (79, 26019), (87, 26091), (88, 26094), (92, 26130), (102, 26190),

Gene: ZhongYanYuan\_26 Start: 25225, Stop: 26124, Start Num: 21

Candidate Starts for ZhongYanYuan\_26:

(Start: 16 @25174 has 83 MA's), (Start: 21 @25225 has 4 MA's), (25, 25258), (28, 25276), (34, 25324), (40, 25408), (44, 25474), (55, 25585), (60, 25645), (66, 25708), (71, 25759), (79, 25840), (83, 25873), (87, 25912), (88, 25915), (92, 25951), (102, 26011),

Gene: Zolita\_6 Start: 4522, Stop: 5436, Start Num: 16

Candidate Starts for Zolita\_6:

(8, 4438), (Start: 16 @4522 has 83 MA's), (Start: 21 @4573 has 4 MA's), (23, 4594), (26, 4615), (38, 4702), (39, 4711), (45, 4813), (55, 4906), (67, 5032), (73, 5089), (80, 5155), (93, 5278), (96, 5296), (101, 5326), (105, 5368), (109, 5422),